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August 17, 2018

Via E-Mail
Doug.rux@newbergoregon.gov

Doug Rux, AICP
Community Development Director
City of Newberg
414 E First Street
Newberg, OR 97123

Re: **Crestview Crossing Submittal – PUD 18-0001/CUP 18-0004**

Dear Doug:

Thanks for your assistance with scheduling the follow up submittals and the next Planning Commission hearing on September 13th. Pursuant to your request, the applicant team is providing several additional and revised submittals to address concerns raised by staff, neighbors and the Planning Commission.

Today's submittals include:

- An exhibit showing typical parking configurations;
- Draft Maintenance Agreements for the Private Street and Stormwater Tracts. These items have been provided in lieu of CC&R's;
- A draft reserve study for the Private Street Tracts;
- An updated Phasing Plan;
- Two alternative plats;
- Rendering of Highway 99 frontage and the Crestview entrance;
- A Kittelson memorandum addressing the roundabout location and the 5/6 party agreement;
- A geology report addressing the wells at Oxberg Lake Estates and Hydrogeology;
- An updated Traffic Report;
- An updated land use narrative.

Specifically we want to take this opportunity to discuss a few of the submittal items and point out how they address some of the concerns raised. First the draft maintenance agreement for the private streets will ensure that the maintenance of those streets and stormwater tracts will be privately maintained in perpetuity. Our office has drafted numerous maintenance agreements and for the sake of clarity, ease of use, and convenience to the City they are usually called out in separate agreements that are eventually incorporated into the CCRs as exhibits. Along with this we have provided you the draft reserve study which demonstrates that the private streets can easily be maintained in perpetuity.

Secondly, we would like to have you pay close attention to the Kittelson memorandum which addresses concerns raised in correspondence from interested parties related to the 5/6 party agreement. The memorandum is self-explanatory, but concludes that the design of the project is consistent with the agreement.

Third we have provided the City a geology report addressing concerns raised by interested parties in relation to the wells at Oxberg Lake Estates. The report concludes that those wells will not be impacted by Crestview Crossing.

Finally, we did hear a concern both at a staff and planning commission level about the need for an amplified narrative in certain areas. We trust that our updated narrative and supplemental information should address the concerns that staff had about not having the requisite information prior to issuing the staff report.

In conclusion, we hope that by getting these today ahead of the September 11 hearing that it will allow ample time for review by city staff, outside agencies, and the Planning Commission prior to that hearing. In the interim, let us know if there is additional information that you think might be helpful.

Very truly yours,

JORDAN RAMIS PC

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Enclosures

cc: Jesse Nemec
John Wyland
Andrew Tull

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GENERAL INFORMATION

Property Owner and Applicant:	CG Commercial, LLC & VPCF Crestview, LLC 5285 Meadows Road, Suite 171 Lake Oswego, OR 97035 Contact: Jesse Nemec Phone: (503)-730-8620 Email: jnemec@jtsmithco.com
Applicant's Representative:	3J Consulting, Inc. 5075 SW Griffith Drive, Suite 150 Beaverton, OR 97005 Contact: Andrew Tull Phone: (503)-545-1907 Email: andrew.tull@3j-consulting.com
Legal Representative:	Jordan Ramis, PC 2 Centerpointe Drive, Suite 600 Lake Oswego, Oregon 97035 Contact: James Howsley Phone: (503) 598-7070 Email: jamie.howsley@jordanramis.com

SITE INFORMATION

Parcel Number:	3216AC 13800 &1100
Address:	OR 99W and Crestview Drive
Size:	33.13 acres
Zoning Designations:	R-1, R-2, C-2
Existing Use:	Vacant
Street Functional Classification:	OR-99W is classified as a Major Arterial and is an ODOT facility. Crestview Drive is classified as a Minor Arterial and is within the City's jurisdiction.
Surrounding Zoning:	The properties to the west are located within the City of Newberg and are zoned Low Density Residential (R-1). The properties to the south are zoned City Institutional (I) and County VLDR-2.5. The properties to the north are located within Yamhill county and are zoned VLDR-1. The properties to the east are located within Yamhill County and are zoned EF-20.

INTRODUCTION

APPLICANT'S REQUEST

The Applicant seeks approval of an application for a Type III Planned Unit Development (PUD) and Conditional Use Permit (CUP). This narrative has been prepared to describe the proposed development and to document compliance with the relevant sections of Newberg's Development Code.

SITE DESCRIPTION/SURROUNDING LAND USE

The subject site is 33.13 acres in size and is located north of OR-99W, south of Crestview Drive. The property is located within the City and is Zoned C-2, R-2, and R-1. The site has sloping topography which generally slopes towards the southeastern end of the property. The site currently contains numerous wetlands that will be preserved or mitigated, in compliance with Department of State Lands and Army Corps of Engineers standards.

PROPOSAL

The proposed Planned Community will create a mixture of commercial development, single-family homes, cottage style single-family homes, affordable housing and multi-family homes. The proposed development includes 18 single-family homes on large lots, 230 cottage homes, and 51 multi-family homes with modifications to the base zone's dimensions as permitted through the PUD process. The project will include a 4.4-acre parcel which has been created to allow for future commercial development.

The proposed neighborhood will feature active and passive open space areas for use by the residents. The proposed design includes a network of open spaces and wetlands, a thoughtfully linked pedestrian circulation system, and several pedestrian amenities. A neighborhood park is connected to the proposed development through a network of multi-use pathways which provide pedestrian circulation and recreation throughout the site. The development will utilize a network of public and private streets, as well as alleyways which will provide for additional on-street parking. Additional parking for residents has been provided in several off-street parking areas.

The project will include an affordable housing component. While affordable housing is not a required component of a submission for a Planned Unit Development or a Conditional Use Permit, the City does have an Affordable Housing Action Plan which identifies a significant shortage of affordably priced homes within the City and the Applicant said it would include this element. In recognition of the City's needs for affordable housing options, the Applicant proposes to create five percent of the single family detached homes with price reductions and deed restrictions designed to create perpetual affordability.

Affordable Housing is defined within the City's Affordable Housing Action Plan as when a family spends no more than 30% of its income for housing. The twelve single family homes created as part of this program will initially be marketed at rates which make them eligible for families earning less than the median family incomes as described within the Housing Action Plan's definitions of affordable housing. At closing, buyers will be required to sign covenants agreeing to limit the price of any future sale to a rate of appreciation which is tied to either the Area Median Family Income rate or another acceptable index of income. The Applicant plans to work with the Housing Authority of Yamhill County and the City's Affordable Housing Ad Hoc Committee to refine the covenants which will be recorded with the sale of these units and to eventually find parties which may qualify for the purchase of affordable houses. The proposed affordable homes will require owner occupation and will be constructed at various locations throughout the development.

As proposed, the Applicant has included two alternative plats for the property, one of which shows attached, duplex styled housing on some of the lots. The alternative plat also shows a scenario with exclusively detached products. As the project moves through construction and as sales data is received, the applicant specifically requests flexibility in preparing the final plats for the various phases within the development to allow for the platting of either detached or attached homes. The adjustments necessary to the final plat to process these changes will not require significant modifications to lots and will not result in the addition or deletion of any lots within the plan.

APPLICABLE CRITERIA

The following sections of Newberg's and Development Code have been extracted as they have been deemed to be applicable to the proposal. Following each bold applicable criteria or design standard, the Applicant has provided a series of draft findings. The intent of providing code and detailed responses and findings is to document, with absolute certainty, that the proposed development has satisfied the approval criteria for a Planned Unit Development and a Conditional Use Permit.

TITLE 15 DEVELOPMENT CODE

Division 15.200 Land Use Applications

15.225 Conditional Use Procedures
15.225.010 Description and purpose.
A. It is recognized that certain types of uses require special consideration prior to their being permitted in a particular district. The reasons for requiring such special consideration involves, among other things, the size of the area required for the full development of such uses, the nature of the traffic problems incidental to operation of the use, the effect such uses have on any adjoining land uses and on the growth and development of the community as a whole.

Applicant's Facts and Findings: The proposal includes residential development in a commercial zoning district, requiring a conditional use permit. The applicable conditional use permit standards are addressed below.

This standard is met.

B. All uses permitted conditionally are declared to be possessing such unique and special characteristics as to make impractical their being included as outright uses in any of the various districts herein defined. The authority for the location and operation of the uses shall be subject to review and the issuance of a conditional use permit. The purpose of review shall be to determine that the characteristics of any such use shall be reasonably compatible with the type of uses permitted in surrounding areas, and for the further purpose of stipulating such conditions as may be reasonable so that the basic purposes of this code shall be served. Nothing construed herein shall be deemed to require the hearing body to grant a conditional use permit.

Applicant's Facts and Findings: The development of residential housing in the C-2 (Commercial) zoning district requires a conditional use permit. The Conditional Use Permit is used in this scenario to ensure that density, lot coverage, parking, vehicular access, pedestrian and bicycle connectivity, and other residential characteristics are developed to be compatible with surrounding land uses.

This standard is met.

15.225.020 Conditional use permit prerequisite to building.
No building permit shall be issued when a conditional use permit is required by the terms of this code unless a permit has been granted by the hearing body and then only in accordance with the terms and conditions of the conditional use permit. Conditional use permits may be

temporary or permanent for any use or purpose for which such permits are required or permitted by provisions of this code.

Applicant's Facts and Findings: This land use application proposes a permanent conditional use permit for residential development in the C-2 zoning district. Building permits have not been issued for this development.

This standard is met.

15.225.030 Application.

Application for a conditional use permit shall be accompanied by such information including, but not limited to, site and building plans, drawings and elevations, and operational data, as may be required by the director to allow proper evaluation of the proposal. The plan submittal requirements identified in NMC 15.220.030 and 15.445.190 shall be used as a guide. All proposals for conditional use permit shall be accompanied by a detailed project description which includes information such as the use, information relating to utilities, the number of employees, the hours of operation, traffic information, odor impacts, and other information needed to adequately describe the project.

Applicant's Facts and Findings: The proposed Conditional Use Permit includes all information necessary for a complete and thorough review.

This standard is met.

15.225.040 Concurrent design review.

If new buildings or structures are to be included as part of the application, the planning commission shall concurrently review the application for site design review in order to streamline the review process.

Applicant's Facts and Findings: The proposed Conditional Use Permit includes a proposed Planned Unit Development on the site with both single-family detached and multi-family housing. The review of the CUP is proposed concurrent with the PUD.

This standard is met.

15.225.050 Additional information.

In order to fully evaluate the proposal, additional information may be required. This includes but is not limited to traffic studies, noise studies, visual analysis, and other site impact studies as determined by the director or planning commission.

Applicant's Facts and Findings: The proposal includes a traffic study and materials display boards. Noise studies are not necessary based on the residential proposal.

This standard is met.

15.225.060 General conditional use permit criteria – Type III.

A conditional use permit may be granted through a Type III procedure only if the proposal conforms to all the following criteria:

A. The location, size, design and operating characteristics of the proposed development are such that it can be made reasonably compatible with and have minimal impact on the livability or appropriate development of abutting properties and the surrounding neighborhood, with consideration to be given to harmony in scale, bulk, coverage and density; to the availability of public facilities and utilities; to the generation of traffic and the capacity of surrounding streets, and to any other relevant impact of the development.
B. The location, design, and site planning of the proposed development will provide a convenient and functional living, working, shopping or civic environment, and will be as attractive as the nature of the use and its location and setting warrants.
C. The proposed development will be consistent with this code.

Applicant's Facts and Findings:

The proposed residential development on this site will allow a gradual transition from the residentially-developed properties to the north and west toward the 4.4-acre retail commercial designated pad adjacent to Highway 99W. The large-lot single-family detached properties immediately adjacent to the site will be buffered by large-lot single-family detached homes. Higher-density single-family detached housing will be located central to the site and adjacent to the park on the western property boundary. The two proposed multi-family buildings are in the southeast corner of the site, adjacent to Highway 99W and near the proposed retail commercial area to be developed at a later date.

This "stair step" approach to lot size and density will serve to ensure harmony in scale, bulk, coverage and density while the multi-family near commercial will provide a convenient and functional living, working and shopping environment. All homes in the site have access via sidewalk to Spring Meadow Park and further into the City of Newberg, satisfying the requirement that the conditional use permit provide a convenient and functional civic environment.

As shown on the included design and materials boards, the proposed development includes a high level of residential design to reflect the location of the development at the eastern entry to the City of Newberg. Materials such as wood, stone, brick and northwest-style siding are all utilized to blend the site to both the natural and built surrounding areas.

Findings are made regarding all applicable sections of the Newberg Development Code throughout this narrative. As identified the findings of each individual code section, the proposed Planned Unit Development and Conditional Use Permit meet all applicable sections of the Newberg Development Code.

This standard has been met.

15.225.080 Conditions.
The hearing body shall designate conditions in connection with the conditional use permit deemed necessary to secure the purpose of this chapter and the general conditional use permit criteria and require the guarantees and evidence that such conditions will be complied with. Such conditions may include:
A. Regulation of uses.
B. Special yards, spaces
C. Fences and walls.
D. Surfacing of parking areas to city specifications.

E. Street dedications and improvements (or bonds).
F. Regulation of points of vehicular ingress and egress.
G. Regulation of signs.
H. Landscaping and maintenance of landscaping.
I. Maintenance of the grounds.
J. Regulation of noise, vibration, odors or other similar nuisances.
K. Regulation of time for certain activities.
L. Time period within which the proposed use shall be developed.
M. Duration of use.
N. Such other conditions as will make possible the development of the city in an orderly and efficient manner in conformity with the Newberg comprehensive plan and the Newberg development code.

Applicant's Facts and Findings: The Conditional Use Permit is required for residential development within the C-2 (Commercial) zoned portion of this site. The proposed residential development includes appropriate yards and spaces, parking areas, ingress and egress, landscaping, vehicular, pedestrian and bicycle connectivity and maintenance plans to ensure compliance with this Section of the Code. Additional conditions are not warranted to secure the purpose of the Conditional Use Permit chapter.

This standard is met.

15.225.090 Development in accord with plans.
Construction, site development, and landscaping shall be carried out in substantial accord with the plans, drawings, conditions, sketches, and other documents approved as part of a final decision on a conditional use permit.

Applicant's Facts and Findings: It is feasible for the Applicant to carry out development of the site in substantial accord with the plans, drawings, sketches and other documents approved as part of this final decision on the Conditional Use Permit.

This standard is met.

15.225.100 Conditional use permit must be exercised to be effective.
A. A conditional use permit granted under this code shall be effective only when the exercise of the right granted thereunder shall be commenced within one year from the effective date of the decision. The director under a Type I procedure may grant an extension for up to six months if the applicant files a request in writing prior to the expiration of the approval and demonstrates compliance with the following:

1. **The land use designation of the property has not been changed since the initial use permit approval; and**
2. **The applicable standards in this code which applied to the project have not changed.**

B. In case such right is not exercised, or extension obtained, the conditional use permit decision shall be void. Any conditional use permit granted pursuant to this code is transferable to subsequent owners or contract purchasers of the property unless otherwise provided at the time of granting such permit.

Applicant's Facts and Findings: The Applicant acknowledges that the Conditional Use Permit approval is valid for one year if an extension is not requested. The Applicant intends to begin construction of the residential development on this site within one year of the approval date. If unforeseen delay is encountered, an extension request will be filed in writing prior to the expiration date.

This standard is met.

15.225.110 Preexisting uses now listed as a conditional use.

Where a use is legally established and continuing, but that use currently would require a conditional use permit, the use shall be considered as having a conditional use permit under the terms of the prior permit approval. Any nonconforming site development shall be subject to the provisions of Chapter 15.205 NMC.

Applicant's Facts and Findings: This proposal does not include a preexisting use now listed as a conditional use and, as such, this standard is not applicable.

15.240 PD Planned Unit Development Regulations

15.240.010 Purpose.

The city's planned unit development regulations are intended to:

A. Encourage comprehensive planning in areas of sufficient size to provide developments at least equal in the quality of their environment to traditional lot-by-lot development and that are reasonably compatible with the surrounding area; and

B. Provide flexibility in architectural design, placement and clustering of buildings, use of open space and outdoor living areas, and provision of circulation facilities, parking, storage and related site and design considerations; and

C. Promote an attractive, safe, efficient and stable environment which incorporates a compatible variety and mix of uses and dwelling types; and

D. Provide for economy of shared services and facilities; and

E. Implement the density requirements of the comprehensive plan and zoning districts through the allocation of the number of permitted dwelling units based on the number of bedrooms provided.

Applicant's Facts and Findings: The Applicant proposes a residential Planned Unit Development (PUD) meeting the stated purposes of the PUD regulations. This site is of sufficient size as to warrant comprehensive planning rather than traditional lot-by-lot development. The Applicant proposes flexibility in placement and clustering of buildings, use of open space, circulation, parking and density to promote a safe, attractive, efficient and stable residential environment adjacent to a highway facility and a future commercial development.

This standard is met.

15.240.020 General provisions.

A. Ownership. Except as provided herein, the area included in a proposed planned unit development must be in single ownership or under the development control of a joint application of owners or option holders of the property involved.

Applicant's Facts and Findings: The area included in the planned unit development is in single ownership.

This standard is met.

B. Processing Steps – Type III. Prior to issuance of a building permit, planned unit development applications must be approved through a Type III procedure and using the following steps:

1. **Step One – Preliminary Plans. Consideration of applications in terms of on-site and off-site factors to assure the flexibility afforded by planned unit development regulations is used to preserve natural amenities; create an attractive, safe, efficient, and stable environment; and assure reasonable compatibility with the surrounding area. Preliminary review necessarily involves consideration of the off-site impact of the proposed design, including building height and location.**
2. **Step Two – Final Plans. Consideration of detailed plans to assure substantial conformance with preliminary plans as approved or conditionally approved. Final plans need not include detailed construction drawings as subsequently required for a building permit.**

Applicant's Facts and Findings: The Applicant acknowledges the two-step process to PUD approval and submits materials in support of Step One- Preliminary Plans.

This standard is met.

C. Phasing. If approved at the time of preliminary plan consideration, final plan applications may be submitted in phases. If preliminary plans encompassing only a portion of a site under single ownership are submitted, they must be accompanied by a statement and be sufficiently detailed to prove that the entire area can be developed and used in accordance with city standards, policies, plans and ordinances.

Applicant's Facts and Findings: The applicant is proposing the following phasing:

Phase 1: This phase will include improvements to the site's frontage along E Portland Road and the installation of underground utility connections necessary to provide service to the site.

Phase 1a: This phase will include the extension of E Crestview Drive through the site and the construction of roadways and lots located east of the E Crestview Drive extension to public road D. This phase will also include the stormwater facility located south of public road B.

Phase 2: This phase will include the installation of the roadways, infrastructure and lots which are to be located west of the E Crestview extension.

Phase 3: This phase will include the lots located east of public road D to the property's eastern property boundary.

Phases B and C will be constructed after the construction of Phases 1 and 1A and may be constructed independently of the subdivision lots and by other entities or assigns.

Due to the size of the plan and the complexity of the various components within the development, the Applicant has requested that the City grant the developer a ten (10) year window for the construction of the infrastructure shown within the plan's phases with opportunities for up to five (5) one (1) year extensions following the approval of the preliminary plat. While the Applicant does not intend to wait for ten (10) years to allow for the construction of the proposed improvements, the flexibility afforded by the ten (10) year schedule with the requested extensions will allow for the project's various components to be sensitive to changing market conditions.

This standard is met.

D. Lapse of Approval. If the applicant fails to submit material required for consideration at the next step in accordance with the schedule approved at the previous step or, in the absence of a specified schedule, within one year of such approval, the application as approved at the previous step expires. If the applicant fails to obtain a building permit for construction in accordance with the schedule as previously approved, or in the absence of a specified schedule, within three years of a preliminary plan approval, preliminary and final plan approvals expire. Prior to expiration of plan approval at any step, the hearing authority responsible for approval may, if requested, extend or modify the schedule, providing it is not detrimental to the public interest or contrary to the findings and provisions specified herein for planned unit developments. Unless the preliminary plan hearing authority provides to the contrary, expiration of final plan approval of any phase automatically renders all phases void that are not yet finally approved or upon which construction has not begun.

Applicant's Facts and Findings: The Applicant acknowledges the process for lapse of PUD approval and intends to follow through with development of the site based on the original approval timeline.

This standard is met.

E. Resubmittal Following Expiration. Upon expiration of preliminary or final plan approval, a new application and fee must be submitted prior to reconsideration. Reconsideration shall be subject to the same procedures as an original application.

Applicant's Facts and Findings: The Applicant acknowledges the process for resubmittal following expiration.

This standard is met.

F. Density. Except as provided in NMC 15.302.040 relating to subdistricts, dwelling unit density provisions for residential planned unit developments shall be as follows:

1. **Maximum Density.**
    a. **Except as provided in adopted refinement plans, the maximum allowable density for any project shall be as follows:**

District	Density Points
R-1	175 density points per gross acre, as calculated in subsection (F)(1)(b) of this section
R-2	310 density points per gross acre, as calculated in subsection (F)(1)(b) of this section
R-3	640 density points per gross acre, as calculated in subsection (F)(1)(b) of this section
RP	310 density points per gross acre, as calculated in subsection (F)(1)(b) of this section
C-1	As per required findings
C-2	As per required findings
C-3	As per required findings

b. Density point calculations in the following table are correlated to dwellings based on the number of bedrooms, which for these purposes is defined as an enclosed room which is commonly used or capable of conversion to use as sleeping quarters. Accordingly, family rooms, dens, libraries, studies, studios, and other similar rooms shall be considered bedrooms if they meet the above definitions, are separated by walls or doors from other areas of the dwelling and are accessible to a bathroom without passing through another bedroom. Density points may be reduced at the applicant's discretion by 25 percent for deed-restricted affordable dwelling units as follows:

Density Point Table

Dwelling Type	Density Points: Standard Dwelling	Density Points: Income-Restricted Affordable Dwelling Units
Studio and Efficiency	12	9
One-bedroom	14	11
Two-bedroom	21	16
Three-bedroom	28	21
Four or more bedroom	35	26

The density points in the right-hand column are applicable to income-restricted affordable dwelling units, provided the dwelling units meet the affordability criteria under NMC 15.242.030 regarding affordable housing requirements for developments using the flexible development standards.

2. Approved Density. The number of dwelling units allowable shall be determined by the hearing authority in accordance with the standards set forth in these regulations. The hearing authority may change density subsequent to preliminary plan approval only if the reduction is necessary to comply with required findings for preliminary plan approval or if conditions of preliminary plan approval cannot otherwise be satisfied.

3. **Easement Calculations. Density calculations may include areas in easements if the applicant clearly demonstrates that such areas will benefit residents of the proposed planned unit development.**
4. **Dedications. Density calculations may include areas dedicated to the public for recreation or open space.**
5. **Cumulative Density. When approved in phases, cumulative density shall not exceed the overall density per acre established at the time of preliminary plan approval.**

Applicant's Facts and Findings: This narrative includes a Density Matrix, identifying the total number of density points available to this site vs. the total number of density points necessary to develop the site as proposed. The C-2 zoning district is proposed at the same maximum allowable density as the R-3 zoning district, or 640 points per acre. The total number of density points available to this site, as detailed on the Density Matrix, is 11,859.85. The total number and type of residential dwelling units proposed requires 9,085 density points, which is less than the number of points available to this site.

This standard is met.

G. Buildings and Uses Permitted. Buildings and uses in planned unit developments are permitted as follows:

1. **R-1, R-2, R-3 and RP Zones.**
   a. **Buildings and uses permitted outright or conditionally in the use district in which the proposed planned unit development is located.**
   b. **Accessory buildings and uses.**
   c. **Duplexes.**
   d. **Dwellings, single, manufactured, and multifamily.**
   e. **Convenience commercial services which the applicant proves will be patronized mainly by the residents of the proposed planned unit development.**

Applicant's Facts and Findings: The proposal includes single-family detached and multi-family residential uses within the R-1 and R-2 portions of this site, both of which are permitted by subsection d. above.

This standard is met.

2. **C-1, C-2 and C-3 Zones.**
   a. **When proposed as a combination residential-commercial planned unit development, uses and buildings as listed in subsection (G)(1) of this section and those listed as permitted outright or conditionally in the use district wherein the development will be located.**
   b. **When proposed as a residential or commercial planned unit development, uses and buildings as permitted outright or conditionally in the use district wherein the development will be located.**

Applicant's Facts and Findings: The proposed Planned Community will create a mixture of commercial development, single-family homes, cottage style single-family homes, affordable housing and multi-family homes. All uses proposed are permitted either outright

or conditionally for the C-2 portion of this property, in compliance with subsections a. and b. above.

This standard is met.

3. **M-1, M-2 and M-3 Zones. Uses and buildings as permitted outright or conditionally in the use district wherein the development will be located.**

4. **M-4 Zone. Uses and buildings as permitted outright or conditionally in the use district wherein the development will be located. Proposed sites, structures and uses must work together to support a common theme, product or industry. Applicants for an industrial planned development in M-4 must demonstrate conformance with any adopted master plan for the subject area and provide a plan describing how the proposed structures and uses will work together to support a common theme, product or industry. Prior to subdivision, covenants must limit occupancy to the types of industrial and related uses identified in the development plan.**

Applicant's Facts and Findings: No part of this site is located within the M-1, M-2, M-3 or M-4 zoning district and, as such, this standard is not applicable.

H. Professional Coordinator and Design Team. Professional coordinators and design teams shall comply with the following:

1. **Services. A professional coordinator, licensed in the State of Oregon to practice architecture, landscape architecture or engineering, shall ensure that the required plans are prepared. Plans and services provided for the city and between the applicant and the coordinator shall include:**
   a. **Preliminary design;**
   b. **Design development;**
   c. **Construction documents, except for single-family detached dwellings and duplexes in subdivisions; and**
   d. **Administration of the construction contract, including, but not limited to, inspection and verification of compliance with approved plans.**
2. **Address and Attendance. The coordinator or the coordinator's professional representative shall maintain an Oregon address, unless this requirement is waived by the director. The coordinator or other member of the design team shall attend all public meetings at which the proposed planned unit development is discussed.**
3. **Design Team Designation. Except as provided herein, a design team, which includes an architect, a landscape architect, engineer, and land surveyor, shall be designated by the professional coordinator to prepare appropriate plans. Each team member must be licensed to practice the team member's profession in the State of Oregon.**
4. **Design Team Participation and Waiver. Unless waived by the director upon proof by the coordinator that the scope of the proposal does not require the services of all members at one or more steps, the full design team shall participate in the preparation of plans at all three steps.**
5. **Design Team Change. Written notice of any change in design team personnel must be submitted to the director within three working days of the change.**

6. **Plan Certification. Certification of the services of the professionals responsible for particular drawings shall appear on drawings submitted for consideration and shall be signed and stamped with the registration seal issued by the State of Oregon for each professional so involved. To assure comprehensive review by the design team of all plans for compliance with these regulations, the dated cover sheet shall contain a statement of review endorsed with the signatures of all designated members of the design team.**

Applicant's Facts and Findings: This Planned Unit Development application includes all of the required plans and documents. A professional engineer in the State of Oregon has ensured that all required plans are prepared, certified as necessary and submitted. The Applicant acknowledges the process for a design team change.

This standard is met.

I. Modification of Certain Regulations. Except as otherwise stated in these regulations, fence and wall provisions, general provisions pertaining to height, yards, area, lot width, frontage, depth and coverage, number of off-street parking spaces required, and regulations pertaining to setbacks specified in this code may be modified by the hearing authority, provided the proposed development will be in accordance with the purposes of this code and those regulations. Departures from the hearing authority upon a finding by the engineering director that the departures will not create hazardous conditions for vehicular or pedestrian traffic. Nothing contained in this subsection shall be interpreted as providing flexibility to regulations other than those specifically encompassed in this code.

Applicant's Facts and Findings: This Planned Unit Development proposal seeks to modify the lot size standards of the R-1, R-2 and C-2 zoning districts. The PUD further seeks to modify the minimum lot sizes, minimum lot dimensions, minimum lot frontages, maximum lot and parking area coverage and minimum setback standards. The proposed modifications are shown on the attached preliminary site plan and plat and are intended to allow for the development of smaller residential lots, allowing a lower price-point than homes built in similar zoning districts. The creativity in site design also allows for the provision of parks and open space facilities exceeding those of a typical subdivision. And finally, varying the standards allows for the construction of a street network exceeding that of a typical residential subdivision.

The proposed modifications are in accordance with the purposes of this code as they support the efficient development of land within the City Limits, provide functional, attractive housing for the residents of the City and include safe, convenient, efficient transportation design.

This standard is met.

J. Lot Coverage. Maximum permitted lot and parking area coverage as provided in this code shall not be exceeded unless specifically permitted by the hearing authority in accordance with these regulations.

Applicant's Facts and Findings: The maximum permitted lot coverage shall be maintained within the proposed development. For the R-1 lots along the northern boundary, these lots are

approximately 8,165 sf. The driveways on these lots will be approximately 20x20 feet or 400 sf. The homes within these areas will likely be two stories with first floor footprints within the 1,200-1,700 range. The maximum permitted lot coverage within the R-1 zoning district is 30% for two story homes or 40% for single story homes. Building footprints and overall lot coverage can be verified at the time of building permit issuance The anticipated coverage for these lots will be less than the stated maximum.

The Applicant proposes a coverage of up to 70% throughout the R-2 single family portions of the plan area. The smaller lot sizes allow for the provision of a more affordable housing stock and the increased parking ensures an adequate supply for residents and visitors. The lots within the R-2 zoned portions of the plan range in size from 1,474 to 2,010 depending upon product size and lot width. The first floors of most of the plans proposed for the lots will range between 520 sf to 881 sf, depending upon the width of the lot. For a 1,474 sf lot, a 17 foot wide home will likely be provided. These homes will have a first floor area of approximately 595 sf. The parking area for these lots will be approximately 12x20 feet, or 240 sf. The overall lot coverage for these lots, with parking and the anticipated first floor area will be approximately 835 sf or 56.6%.

For a 2,010 sf lot within the R-2 zone, a 25 foot wide house will likely be located on a 30 foot wide lot. The typical anticipated footprint for these lots will be approximately 881 sf. The parking area for these houses will consist of a 20x20 foot wide driveway, or 400 sf. The total anticipated lot coverage and parking total would be approximately 1,281 sf or 63.7%.

For a 1,742 sf lot within the R-2 zone, a 21 foot wide house will likely be located on a 26 foot wide lot. The typical anticipated footprint for these lots will be approximately 748 sf. The parking area for these houses will consist of a 20x20 foot wide driveway, or 400 sf. The total anticipated lot coverage and parking total would be approximately 1,148 sf or 65.9%.

While there may be some variation in the amount of coverage provided per lot, the Applicant's request for a blanket 70% allowance for lot coverage should be sufficient to allow for adequate area for parking and building areas. The lot coverage for each individual lot can be verified at the time of building permit submission. The Applicant requests these exceptions be specifically permitted by the Planning Commission in reviewing the Planned Unit Development and Conditional Use Permit request.

This standard is met.

K. Height. Unless determined by the hearing authority that intrusion of structures into the sun exposure plane will not adversely affect the occupants or potential occupants of adjacent properties, all buildings and structures shall be constructed within the area contained between lines illustrating the sun exposure plane (see Appendix A, Figure 8 and the definition of "sun exposure plane" in NMC 15.05.030). The hearing authority may further modify heights to:

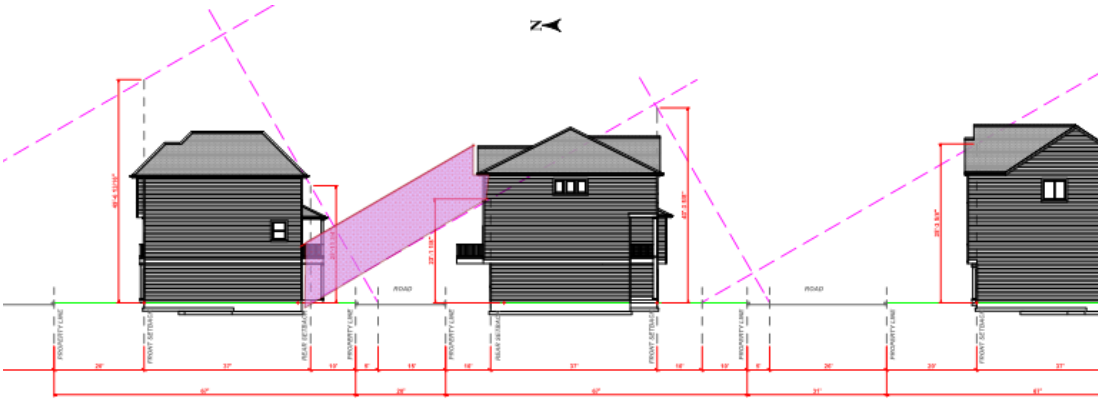
1. **Protect lines of sight and scenic vistas from greater encroachment than would occur as a result of conventional development.**

2. **Protect lines of sight and scenic vistas.**
3. **Enable the project to satisfy required findings for approval.**

Applicant's Facts and Findings: This proposed residential Planned Unit Development includes three story single-family residential structures with reduced setbacks. This development type allows the developer to provide the housing at an approachable price point, complete the much-needed transportation system for the area and provide parks and open spaces for the residents of this and neighboring developments.

The Applicant has prepared a sun exposure diagram showing that some of the north/south oriented lots may have slight impacts on the first floors of the proposed homes. Impacts due to shade along the north/south oriented lots are anticipated to be slightly experienced on lots 36-66 and on lots 81&82. The east/west oriented lots appear to be exempt from these requirements as the sun should have full access from the south on both these lots front and rear yards.

The slight impacts to the lots identified herein are illustrated within the diagram below however the impacts to the homes is limited to first floors, in areas where garages will be located.



As described elsewhere within this narrative, the benefits of housing configured within this manner provides numerous benefits to the future residents and provides opportunities for the creation of a highly efficient and well-designed community. The Applicant's proposal for closely located buildings offers numerous benefits to the community as a whole and allows the site to meet the City's other code requirements for density, site configuration, parking, and access. Because the impacts of the shade will be limited to only the ground floors of a few properties within the plan and because the Applicant has compensated for these impacts with the provision of a significant amount of open space area, parks, and site amenities, the residents of this community will not experience any adverse effects.

L. Dedication, Improvement and Maintenance of Public Thoroughfares. Public thoroughfares shall be dedicated, improved and maintained as follows:

1. **Streets and Walkways. Including, but not limited to, those necessary for proper development of adjacent properties. Construction standards that minimize maintenance and protect the public health and safety, and setbacks as specified in NMC**

15.410.050, pertaining to special setback requirements to planned rights-of-way, shall be required.

2. **Notwithstanding subsection (L)(1) of this section, a private street may be approved if the following standards are satisfied.**

   a. An application for approval of a PUD with at least 50 dwelling units may include a private street and the request for a private street shall be supported by the evidence required by this section. The planning commission may approve a private street if it finds the applicant has demonstrated that the purpose statements in NMC 15.240.010(A) through (D) are satisfied by the evidence in subsections (L)(2)(a)(i) through (v) of this section.

      i. A plan for managing on-street parking, maintenance and financing of maintenance of the private street, including a draft reserve study showing that the future homeowners association can financially maintain the private street;

      ii. A plan demonstrating that on- and off-street parking shall be sufficient for the expected parking needs and applicable codes;

      iii. Proposed conditions, covenants and restrictions that include a requirement that the homeowners association shall be established in perpetuity and shall continually employ a community management association whose duties shall include assisting the homeowners association with the private street parking management and maintenance, including the enforcement of parking restrictions;

      iv. Evidence that the private street is of sufficient width and construction to satisfy requirements of the fire marshal and cityengineer; and

      v. The PUD shall be a Class I planned community as defined in ORS Chapter 94.

   b. If the PUD is established, the homeowners association shall provide an annual written report on the anniversary date of the final approval of the PUD approval to the community development director that includes the following:

      i. The most recent reserve study.

      ii. The name and contact information for the retained community management association.

      iii. A report on the condition of the private street and any plans for maintenance of the private street.

3. **Easements. As are necessary for the orderly extension of public utilities and bicycle and pedestrian access.**

Applicant's Facts and Findings:

This proposed PUD includes a mixture of public and private streets. As identified in subsection L.2 above, private streets may be approved if:

- a PUD proposes at least 50 dwelling units,
- has provided a plan for on-street parking, maintenance and financing of maintenance of the private street,
- demonstrates sufficient parking,
- includes CCRs addressing the private street,
- is constructed to proper standards, and
- the PUD is a Class I planned community as defined in ORS Ch. 94.

The proposal meets all of the criteria for private streets identified above. The purpose statements in NMC 15.240.010(A) through (D) include:

- encourage comprehensive planning in areas of sufficient size…

- provide flexibility in architectural design, placement and clustering of buildings, use of open space and outdoor living areas, and provision of circulation facilities, parking, storage and related site and design considerations
- promote an attractive, safe, efficient and stable environment…and
- provide for economy of shared services and facilities.

The proposed PUD is of a sufficient size to warrant comprehensive planning that is similar to traditional lot-by-lot developments in the same zoning and compatible with the surrounding environment. The inclusion of private streets makes it feasible to preserve more of the natural areas on the site. The housing design and placement, open space and outdoor living areas, circulation, parking and storage on this site are all designed to work together to form a cohesive neighborhood feel. The shared services and facilities within the development include the private streets, parking areas and open spaces. The adjacent commercial development that will be added in the future will allow for shared services as well.

All public streets are designed to City standards and proposed to be dedicated to the City.

The proposal includes all of the necessary materials to approve both the public and private streets.

This standard is met.

M. Underground Utilities. Unless waived by the hearing authority, the developer shall locate all on-site utilities serving the proposed planned unit development underground in accordance with the policies, practices and rules of the serving utilities and the Public Utilities Commission.

Applicant's Facts and Findings: The proposal includes all on-site utilities located underground.

This standard is met.

N. Usable Outdoor Living Area. All dwelling units shall be served by outdoor living areas as defined in this code. Unless waived by the hearing authority, the outdoor living area must equal at least 10 percent of the gross floor area of each unit. So long as outdoor living area is available to each dwelling unit, other outdoor living space may be offered for dedication to the city, in fee or easement, to be incorporated in a city-approved recreational facility. A portion or all of a dedicated area may be included in calculating density if permitted under these regulations.

Applicant's Facts and Findings: All dwelling units are served by outdoor living areas equal to at least 10 percent of the gross floor area of each unit. The single-family units will have outdoor living on individual lots. The multi-family will utilize a combination of balconies and porches as well as common outdoor living areas located throughout the overall planned unit development. All proposed dwelling units will be able to provide at least 10% of the gross floor area in outdoor living space. Outdoor living spaces for each unit can be verified at the time of building permit issuance.

This standard is met.

O. Site Modification. Unless otherwise provided in preliminary plan approval, vegetation, topography and other natural features of parcels proposed for development shall remain substantially unaltered pending final plan approval.

Applicant's Facts and Findings: This site contains several wetlands which will be a combination of preserved on site and mitigated off-site. The permitting for this is occurring separate from the land use review. This is the only substantial change to the natural features of the site.

This standard is met.

P. Completion of Required Landscaping. If required landscaping cannot be completed prior to occupancy, or as otherwise required by a condition of approval, the director may require the applicant to post a performance bond of a sufficient amount and time to assure timely completion.

Applicant's Facts and Findings: The Applicant acknowledges the possibility of a performance bond being required to assure timely completion of any delayed landscaping.

This standard is met.

Q. Design Standards. The proposed development shall meet the design requirements for multifamily residential projects identified in NMC 15.220.060. A minimum of 40 percent of the required points shall be obtained in each of the design categories.

Applicant's Facts and Findings: There are 23 possible site design points and 23 possible building design points, therefore, this project must obtain 9 each site design and building design points (40% of each).

Site Design:
Consolidated green space: 3 points
Parking lot to the back of project when viewed from 99W: 3 points
Good-quality coordinated site landscaping: 2 points
Landscaped Edges of Parking Lots: 2 points
Street trees: 1 point
Entry Accents to mark major entries to multi-family buildings: 1 point
Appropriate Outdoor Lighting: 1 point
Total Site Design Points: 13

Building Design:
Respect scale and patterns of nearby buildings by reflecting architectural styles, building details, materials and scale of existing buildings: 3 points
Break up large buildings into bays/vary planes at least every 50 feet: 3 points
Provide variation in repeated units using color, porches, balconies, windows, railings, building materials and form, alone or in combination: 3 points
Building materials: Wood or wood-like siding applied horizontally or vertically as board and batten at entry ways; shingles, as roofing; wood or wood-like sash windows; and wood or wood-like trim: 4 points
A porch at every main entry: 2 points

Total Building Design Points: 15

This standard is met as described above.

15.240.030 Preliminary plan consideration – Step one.

A. Preapplication Conference. Prior to filing an application for preliminary plan consideration, the applicant or coordinator may request through the director a preapplication conference to discuss the feasibility of the proposed planned unit development and determine the processing requirements.

Applicant's Facts and Findings: The Applicant attended a pre-application conference with the City on March 14, 2018.

This standard is met.

B. Application. An application, with the required fee, for preliminary plan approval shall be made by the owner of the affected property, or the owner's authorized agent, on a form prescribed by and submitted to the director. Applications, accompanied by such additional copies as requested by the director for purposes of referral, shall contain or have attached sufficient information as prescribed by the director to allow processing and review in accordance with these regulations. As part of the application, the property owner requesting the planned development shall file a waiver stating that the owner will not file any demand against the city under Ballot Measure 49, approved November 6, 2007, that amended ORS Chapters 195 and 197 based on the city's decision on the planned development.

Applicant's Facts and Findings: This land use application includes all required fees, forms and documentation for review of the Planned Unit Development and Conditional Use requests.

This standard is met.

C. Type III Review and Decision Criteria. Preliminary plan consideration shall be reviewed through the Type III procedure. Decisions shall include review and recognition of the potential impact of the entire development, and preliminary approval shall include written affirmative findings that:

1. **The proposed development is consistent with standards, plans, policies and ordinances adopted by the city; and**

Applicant's Facts and Findings: As described in this narrative, the proposed development is consistent with standards, plans, policies and ordinances adopted by the City.

This standard is met.

2. **The proposed development's general design and character, including but not limited to anticipated building locations, bulk and height, location and distribution of recreation space, parking, roads, access and other uses, will be reasonably compatible with**

appropriate development of abutting properties and the surrounding neighborhood; and

Applicant's Facts and Findings: As discussed previously, the proposed PUD includes larger lot single-family detached homes along the northern property line, separating this development from a single-family detached development. Lot sizes will then decrease as one heads south into the site, with two multi-family residential buildings constructed in the southeast corner of the site. The homes on the site will all be designed and constructed so as to provide a cohesive design and character to the entire development. The distribution of recreation space, parking, roads, access and other uses is reasonably compatible with the appropriate development of abutting properties and the surrounding neighborhood.

This standard is met.

3. **Public services and facilities are available to serve the proposed development. If such public services and facilities are not at present available, an affirmative finding may be made under this criterion if the evidence indicates that the public services and facilities will be available prior to need by reason of:**
   a. **Public facility planning by the appropriate agencies; or**
   b. **A commitment by the applicant to provide private services and facilities adequate to accommodate the projected demands of the project; or**
   c. **Commitment by the applicant to provide for offsetting all added public costs or early commitment of public funds made necessary by the development; and**

Applicant's Facts and Findings: Public services and facilities are either available to serve the proposed development or can be reasonably conditioned to be installed and provided. The public improvement plans included with the land use submittal demonstrate full public facilities will be provided, including water, sanitary sewer, storm sewer, electricity and natural gas. Public services are currently available to serve this site, including police, fire, garbage/recycling and US Mail.

This standard is met.

4. **The provisions and conditions of this code have been met; and**

Applicant's Facts and Findings: As discussed in detail in this narrative, the provisions and conditions of this code have been met.

This standard is met.

5. **Proposed buildings, roads, and other uses are designed and sited to ensure preservation of features, and other unique or worthwhile natural features and to prevent soil erosion or flood hazard; and**

Applicant's Facts and Findings: The buildings, roads and other site features are located so as to preserve several wetlands and natural features and to prevent soil erosion or flood hazard.

This standard is met.

6. **There will be adequate on-site provisions for utility services, emergency vehicular access, and, where appropriate, public transportation facilities; and**

Applicant's Facts and Findings: The site is well provisioned for utility services, emergency vehicular access and, if the opportunity arises in the future, public transportation facilities. The public roadways are designed to public street standards and the private streets are designed to provide vehicular access. The application includes a letter from Tualatin Valley Fire & Rescue indicating that the private streets are adequate for emergency vehicle access.

This standard is met.

7. **Sufficient usable recreation facilities, outdoor living area, open space, and parking areas will be conveniently and safely accessible for use by residents of the proposed development; and**

Applicant's Facts and Findings: The proposed neighborhood will feature active and passive open space areas for use by the residents. The proposed design includes a civic use park which has been envisioned to provide space for community events as well as a space for featured local vendors. A smaller neighborhood park is connected to the proposed development through a network of multi-use pathways which provide pedestrian circulation and recreation throughout the site. The proposal includes multiple open spaces, most of which include a trail system within. The multi-family housing has common outdoor living areas, as well as balconies and patios for some individual units. The single-family housing has outdoor living areas adjacent to the homes.

This standard is met.

8. **Proposed buildings, structures, and uses will be arranged, designed, and constructed so as to take into consideration the surrounding area in terms of access, building scale, bulk, design, setbacks, heights, coverage, landscaping and screening, and to assure reasonable privacy for residents of the development and surrounding properties.**

Applicant's Facts and Findings: This site has been designed reflect the surrounding area and to provide a reasonable level of privacy for residents of the development and surrounding properties. Large lot single-family detached dwellings are proposed along the northern property line, separating this development from another large lot residential development, easing the transition from lower density to higher. The site is buffered from the residential developments to the west by the park that is adjacent to the site. The site as a whole is designed to provide safe and convenient access. The building scale, bulk, design, setbacks, heights, coverage, landscaping and screening are designed to provide harmony within the site while respecting and reflecting design patterns utilized in other nearby developments.

This standard is met.

D. Conditions. Applications may be approved subject to conditions necessary to fulfill the purpose and provisions of these regulations.

Applicant's Facts and Findings: The Applicant acknowledges the possibility of conditions imposed to fulfill the purpose and provisions of the PUD regulations. However, based on the findings identified in this narrative, the Applicant finds the proposal in full compliance with the PUD standards.

This standard is met.

15.240.040 Final plan consideration – Step two.

A. Application. An application, with the required fee, for final plan approval shall be submitted in accordance with the provisions of this code, and must be in compliance with all conditions imposed and schedules previously prescribed.

B. Referral. Referral of final plans and supportive material shall be provided to appropriate agencies and departments.

C. Decision Type I Procedure. The final plan consideration shall be reviewed through the Type I procedure. Upon receipt of the application and fee, final plans and required supportive material, the director shall approve, conditionally approve or deny the application for final plan approval. The decision of the director to approve or deny the application shall be based on written findings of compliance or noncompliance with approved preliminary plans and city standards, plans, policies and ordinances. Minor variations from approved preliminary plans may be permitted if consistent with the general character of the approved preliminary plans.

D. Conditions. Applications may be approved subject to such conditions as are necessary to fulfill the purpose and provisions of this code.

1. **Preparation and Signatures. A duly notarized performance agreement binding the applicant, and the applicant's successors in interest, assuring construction and performance in accordance with the approved final plans shall be prepared by the city and executed by the applicant and city prior to issuance of a building permit.**
2. **Return. Unless an executed copy of the agreement is returned to the director within 60 days of its delivery to the applicant, final plan approval shall expire, necessitating the reapplication for final plan reapproval.**
3. **Filing. The director shall file a memorandum of the performance agreement with the Yamhill County recorder.**
4. **Improvement Petitions and Dedications. Improvement petitions and all documents required with respect to dedications and easements shall be submitted prior to completion of the agreement.**
5. **Project Changes. The director may permit project changes subsequent to execution of the agreement upon finding the changes substantially conform to final approved plans and comply with city standards, plans, policies and ordinances. Other modifications are subject to reapplication at the appropriate step.**
6. **Compliance. Compliance with this section is a prerequisite to the issuance of a building permit.**

Applicant's Facts and Findings: The Applicant acknowledges the process for Step Two of a PUD review.

This standard is met.

Division 15.300 Zoning Districts

15.305 Zoning Use Table

Use	R-1	R-2	C-2
Residential Uses			
Dwelling, single-family detached	**P(2)**	**P**	**C(4)**
Dwelling, multifamily	**C**	**P**	**C(4)**
Parks and Open Spaces			
Open Space	**P**	**P**	**P**
Park	**P**	**P**	**P**

Notes.
(2) Limited to one per lot as a permitted use. More than one per lot allowed only through a conditional use permit or planned unit development, subject to density limits of NMC 15.405.010(B).
(4) The permitted density shall be stated on the conditional use permit.

Applicant's Facts and Findings: The proposed residential development requires a conditional use permit because a part of the site, including the area proposed for multi-family residential, is within the C-2 zoning district. Single-family residential development is permitted in the R-1 and R-2 zones. The Planned Unit Development proposes residential development, both single-family and multi-family, on all areas of the site (zoned R-1, R-2 and C-2).

As this application includes a conditional use permit application, this standard is met.

15.356 Bypass Interchange (BI) Overlay

Applicant's Facts and Findings: The frontage of this site is adjacent to the Bypass Interchange (BI) Overlay. While the provisions of the BI Overlay may apply to this site, the provisions only speak to permitted, conditional and prohibited uses. Residential development is a permitted use in the R-1 and R-2 zoning districts and a conditional use in the C-2 zoning district. Residential development is not prohibited in the BI Overlay.

This standard is met.

Division 15.400 Development Standards
15.405 Lot Requirements
15.405.010 Lot area – Lot areas per dwelling unit.
A. In the following districts, each lot or development site shall have an area as shown below except as otherwise permitted by this code:

1. **In the R-1 district, each lot or development site shall have a minimum area of 5,000 square feet or as may be established by a subdistrict. The average size of lots in a subdivision intended for single-family development shall not exceed 10,000 square feet.**
2. **In the R-2, R-3, and RP districts, each lot or development site shall have a minimum area of 3,000 square feet or as may be established by a subdistrict. In the R-2 and R-P districts, the average size of lots in a subdivision intended for single-family development shall not exceed 5,000 square feet.**
3. **In the AI, AR, C-1, C-2, and C-3 districts, each lot or development site shall have a minimum area of 5,000 square feet or as may be established by a subdistrict.**
4. **In the M-1, M-2 and M-3 districts, each lot or development site shall have a minimum area of 20,000 square feet.**
5. **Institutional districts shall have a minimum size of five contiguous acres in order to create a large enough campus to support institutional uses; however, additions to the district may be made in increments of any size.**
6. **Within the commercial zoning district(s) of the riverfront overlay subdistrict, there is no minimum lot size required, provided the other standards of this code can be met.**

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes reduced lot sizes and an increase in the allowable lot coverage standard for the R-2 zoned portions of the site. The standards for a PUD are discussed previously in this narrative.

This standard is met.

B. Lot or Development Site Area per Dwelling Unit.

1. **In the R-1 district, there shall be a minimum of 5,000 square feet per dwelling unit.**
2. **In the R-2, AR, and R-P districts, there shall be a minimum of 3,000 square feet of lot or development site area per dwelling unit. In the R-2 and R-P districts, lots or development sites in excess of 15,000 square feet used for multiple single-family, duplex or multifamily dwellings shall be developed at a minimum of one dwelling per 5,000 square feet lot area.**
3. **In the R-3 district, there shall be a minimum of 1,500 square feet of lot or development site area per dwelling unit. Lots or development sites in excess of 15,000 square feet used for multiple single-family, duplex or multifamily dwellings shall be developed at a minimum of one dwelling per 2,500 square feet lot area.**

C. In calculating lot area for this section, lot area does not include land within public or private streets. In calculating lot area for maximum lot area/minimum density requirements, lot area does not include land within stream corridors, land reserved for public parks or open spaces, commons buildings, land for preservation of natural, scenic, or historic resources, land on slopes exceeding 15 percent or for avoidance of identified natural hazards, land in shared access easements, public walkways, or entirely used for utilities, land held in reserve in accordance with a future development plan, or land for uses not appurtenant to the residence.

D. Lot size averaging is allowed for any subdivision. Some lots may be under the minimum lot size required in the zone where the subdivision is located, as long as the average size of all lots is at least the minimum lot size.

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes reduced lots (development site areas) and an increase in the amount of lot coverage for the R-2 zoned portions of the plan. The standards for a PUD are discussed previously in this narrative.

This standard is met.

15.405.020 Lot area exceptions.
The following shall be exceptions to the required lot areas:
A. Lots of record with less than the area required by this code.
B. Lots or development sites which, as a process of their creation, were approved in accordance with this code.
C. Planned unit developments, provided they conform to requirements for planned unit development approval.

Applicant's Facts and Findings: This proposal complies with subsection C. of this criterion as a Planned Unit Development is proposed with conformity to all PUD requirements.

This standard is met.

15.405.030 Lot dimensions and frontage.
A. Width. Widths of lots shall conform to the standards of this code.
B. Depth to Width Ratio. Each lot and parcel shall have an average depth between the front and rear lines of not more than two and one-half times the average width between the side lines. Depths of lots shall conform to the standards of this code. Development of lots under 15,000 square feet are exempt from the lot depth to width ratio requirement.
C. Area. Lot sizes shall conform to standards set forth in this code. Lot area calculations shall not include area contained in public or private streets as defined by this code.
D. Frontage.

1. **No lot or development site shall have less than the following lot frontage standards:**
    a. **Each lot or development site shall have either frontage on a public street for a distance of at least 25 feet or have access to a public street through an easement that is at least 25 feet wide. No new private streets, as defined in NMC 15.05.030, shall be created to provide frontage or access.**
    b. **Each lot in an R-2 and R-3 zone shall have a minimum width of 30 feet at the front building line.**
    c. **Each lot in an R-1, AI, or RP zone shall have a minimum width of 50 feet at the front building line.**
    d. **Each lot in an AR zone shall have a minimum width of 45 feet at the front building line.**
2. **The above standards apply with the following exceptions:**
    a. **Legally created lots of record in existence prior to the effective date of the ordinance codified in this code.**
    b. **Lots or development sites which, as a process of their creation, were approved with sub-standard widths in accordance with provisions of this code.**
    c. **Existing private streets may not be used for new dwelling units, except private streets that were created prior to March 1, 1999, including paving to fire access**

roads standards and installation of necessary utilities, and private streets allowed in the airport residential and airport industrial districts.

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes reduced lot dimensions, increased lot coverage, and reduced frontage requirements. Private streets are proposed to provide access to many of the lots in this development. Private streets are permitted as discussed previously in this narrative. The standards for a PUD are discussed previously in this narrative.

This standard is met.

15.405.040 Lot coverage and parking coverage requirements.

A. Purpose. The lot coverage and parking coverage requirements below are intended to:

1. **Limit the amount of impervious surface and storm drain runoff on residential lots.**
2. **Provide open space and recreational space on the same lot for occupants of that lot.**
3. **Limit the bulk of residential development to that appropriate in the applicable zone.**

B. Residential uses in residential zones shall meet the following maximum lot coverage and parking coverage standards. See the definitions in NMC 15.05.030 and Appendix A, Figure 4.

1. **Maximum Lot Coverage.**
    a. **R-1: 30 percent, or 40 percent if all structures on the lot are one-story.**
    b. **R-2 and RP: 50 percent.**
    c. **AR and R-3: 50 percent.**
2. **Maximum Parking Coverage. R-1, R-2, R-3, and RP: 30 percent.**
3. **Combined Maximum Lot and Parking Coverage.**
    a. **R-1, R-2 and RP: 60 percent.**
    b. **R-3: 70 percent.**

C. All other districts and uses not listed in subsection (B) of this section shall not be limited as to lot coverage and parking coverage except as otherwise required by this code.

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes an increase to the maximum lot coverage standards to 70% within the R-2 zoned portions of the site to match the R-3 standard of 70%. This increase to the maximum is proposed to provide more housing options at an approachable price point, including some affordable housing. The standards for a PUD are discussed previously in this narrative.

This standard is met.

15.410 Yard Setback Requirements

15.410.010 General yard regulations.

A. No yard or open space provided around any building for the purpose of complying with the provisions of this code shall be considered as providing a yard or open space for any other building.

B. No yard or open space on adjoining property shall be considered as providing required yard or open space for another lot or development site under the provisions of this code.

C. No front yards provided around any building for the purpose of complying with the regulations of this code shall be used for public or private parking areas or garages, or other accessory buildings, except as specifically provided elsewhere in this code.

D. When the common property line separating two or more contiguous lots is covered by a building or a permitted group of buildings with respect to such common property line or lines does not fully conform to the required yard spaces on each side of such common property line or lines, such lots shall constitute a single development site and the yards as required by this code shall then not apply to such common property lines.

E. Dwellings Where Permitted above Nonresidential Buildings. The front and interior yard requirements for residential uses shall not be applicable; provided, that all yard requirements for the district in which such building is located are complied with.

F. In the AI airport industrial district, clear areas, safety areas, object-free areas, taxiways, parking aprons, and runways may be counted as required yards for a building, even if located upon an adjacent parcel.

G. In the AR airport residential district, clear areas, safety areas, object-free areas, taxiways, parking aprons, and runways may be counted as required yards for a building, if located upon an adjacent parcel.

15.410.020 Front yard setback.

A. Residential (see Appendix A, Figure 10).

1. **AR, R-1 and R-2 districts shall have a front yard of not less than 15 feet. Said yard shall be landscaped and maintained.**
2. **R-3 and RP districts shall have a front yard of not less than 12 feet. Said yard shall be landscaped and maintained.**
3. **The entrance to a garage or carport, whether or not attached to a dwelling, shall be set back at least 20 feet from the nearest property line of the street to which access will be provided. However, the foregoing setback requirement shall not apply where the garage or carport will be provided with access to an alley only.**

B. Commercial.

1. **All lots or development sites in the C-1 district shall have a front yard of not less than 10 feet. Said yard shall be landscaped and maintained.**
2. **All lots or development sites in the C-2 district shall have a front yard of not less than 10 feet. No parking shall be allowed in said yard. Said yard shall be landscaped and maintained.**
3. **All lots or development sites in the C-3 district shall have no minimum front yard requirements. The maximum allowable front yard shall be 20 feet. In the case of a through lot with two front yards, at least one front yard must meet the maximum setback requirement. In the case of three or more front yards, at least two front yards must meet the maximum setback requirements. No parking shall be allowed in said yard. Said yard shall be landscaped and maintained.**
4. **All lots or development sites in the C-4 district will comply with the front yard requirements described in NMC 15.352.040(E).**

15.410.030 Interior yard setback.

A. Residential.

1. **All lots or development sites in the AR, R-1, R-2 and R-3 districts shall have interior yards of not less than five feet, except that where a utility easement is recorded adjacent to a side lot line, there shall be a side yard no less than the width of the easement.**
2. **All lots or development sites in the RP district shall have interior yards of not less than eight feet.**

B. Commercial.

1. **All lots or development sites in the C-1 and C-2 districts have no interior yards required where said lots or development sites abut property lines of commercially or industrially zoned property. When interior lot lines of said districts are common with property zoned residentially, interior yards of not less than 10 feet shall be required opposite the residential districts.**
2. **All lots or development sites in the C-3 district shall have no interior yard requirements.**
3. **All lots or development sites in the C-4 district will comply with the interior yard requirements described in NMC 15.352.040(E).**

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes reduced yard setbacks of 2.5 feet within the R-2 zoned portions of the site plan. The reduced yard setbacks allow innovation in design and density of this site that promotes the purpose of the PUD to provide an approachable price point for housing, including some affordable housing. The standards for a PUD are discussed previously in this narrative.

This standard is met.

15.410.060 Vision clearance setback.

The following vision clearance standards shall apply in all zones (see Appendix A, Figure 9).

A. At the intersection of two streets, including private streets, a triangle formed by the intersection of the curb lines, each leg of the vision clearance triangle shall be a minimum of 50 feet in length.

B. At the intersection of a private drive and a street, a triangle formed by the intersection of the curb lines, each leg of the vision clearance triangle shall be a minimum of 25 feet in length.

C. Vision clearance triangles shall be kept free of all visual obstructions from two and one-half feet to nine feet above the curb line. Where curbs are absent, the edge of the asphalt or future curb location shall be used as a guide, whichever provides the greatest amount of vision clearance.

D. There is no vision clearance requirement within the commercial zoning district(s) located within the riverfront (RF) overlay subdistrict.

Applicant's Facts and Findings: The proposed development maintains all required vision clearance setbacks, as demonstrated on the submitted plans.

This standard is met.

15.410.070 Yard exceptions and permitted intrusions into required yard setbacks.

The following intrusions may project into required yards to the extent and under the conditions and limitations indicated:

A. Depressed Areas. In any district, open work fences, hedges, guard railings or other landscaping or architectural devices for safety protection around depressed ramps, stairs or retaining walls may be located in required yards; provided, that such devices are not more than three and one-half feet in height.

B. Accessory Buildings. In front yards on through lots, where a through lot has a depth of not more than 140 feet, accessory buildings may be located in one of the required front yards; provided, that every portion of such accessory building is not less than 10 feet from the nearest street line.

C. Projecting Building Features. The following building features may project into the required front yard no more than five feet and into the required interior yards no more than two feet; provided, that such projections are no closer than three feet to any interior lot line:

1. **Eaves, cornices, belt courses, sills, awnings, buttresses or other similar features.**
2. **Chimneys and fireplaces, provided they do not exceed eight feet in width.**
3. **Porches, platforms or landings which do not extend above the level of the first floor of the building.**
4. **Mechanical structures (heat pumps, air conditioners, emergency generators and pumps).**

D. Fences and Walls.

1. **In the residential district, a fence or wall shall be permitted to be placed at the property line or within a yard setback as follows:**
    a. **Not to exceed six feet in height. Located or maintained within the required interior yards. For purposes of fencing only, lots that are corner lots or through lots may select one of the street frontages as a front yard and all other yards shall be considered as interior yards, allowing the placement of a six-foot fence on the property line. In no case may a fence extend into the clear vision zone as defined in NMC 15.410.060.**
    b. **Not to exceed four feet in height. Located or maintained within all other front yards.**
2. **In any commercial or industrial district, a fence or wall shall be permitted to be placed at the property line or within a yard setback as follows:**
    a. **Not to exceed eight feet in height. Located or maintained in any interior yard except where the requirements of vision clearance apply. For purposes of fencing only, lots that are corner lots or through lots may select one of the street frontages as a front yard and all other yards shall be considered as interior yards, allowing the placement of an eight-foot fence on the property line.**
    b. **Not to exceed four feet in height. Located or maintained within all other front yards.**
3. **If chain link (wire-woven) fences are used, they are manufactured of corrosion-proof materials of at least 11-1/2 gauge.**
4. **The requirements of vision clearance shall apply to the placement of fences.**

Applicant's Facts and Findings: The Applicant acknowledges permitted intrusions into required yard setbacks. The fences surrounding the single-family residential in the R-1 and R-2 zoning areas will not exceed 6-feet in height. The fencing in the C-2 zoning areas will not exceed 8-feet in height. No fence exceeding 4-feet in height will be placed in a front yard setback.

This standard is met.

E. Parking and Service Drives (Also Refer to NMC 15.440.010 through 15.440.080).

1. **In any district, service drives or accessways providing ingress and egress shall be permitted, together with any appropriate traffic control devices in any required yard.**
2. **In any residential district, public or private parking areas and parking spaces shall not be permitted in any required yard except as provided herein:**
   a. **Required parking spaces shall be permitted on service drives in the required front yard in conjunction with any single-family or two-family dwelling on a single lot.**
   b. **Recreational vehicles, boat trailers, camperettes and all other vehicles not in daily use are restricted to parking in the front yard setback for not more than 48 hours; and recreational vehicles, boat trailers, camperettes and all other vehicles not in daily use are permitted to be located in the required interior yards.**
   c. **Public or private parking areas, parking spaces or any building or portion of any building intended for parking which have been identified as a use permitted in any residential district shall be permitted in any interior yard that abuts an alley, provided said parking areas, structures or spaces shall comply with NMC 15.440.070, Parking tables and diagrams (Diagrams 1 through 3).**
   d. **Public or private parking areas, service drives or parking spaces which have been identified as a use permitted in any residential district shall be permitted in interior yards; provided, that said parking areas, service drives or parking spaces shall comply with other requirements of this code.**
3. **In any commercial or industrial district, except C-1, C-4 and M-1, public or private parking areas or parking spaces shall be permitted in any required yard (see NMC 15.410.030). Parking requirements in the C-4 district are described in NMC 15.352.040(H).**
4. **In the I district, public or private parking areas or parking spaces may be no closer to a front property line than 20 feet, and no closer to an interior property line than five feet.**

F. Public Telephone Booths and Public Transit Shelters. Public telephone booths and public transit shelters shall be permitted; provided, that vision clearance is maintained for vehicle requirements for vision clearance.

G. Hangars within the AR airport residential district may be constructed with no yard setbacks to property lines adjacent to other properties within the airport residential or airport industrial districts

Applicant's Facts and Findings:	Parking is proposed on private lots in driveways, on-street parallel, on-street in perpendicular "bays", and in designated parking lots. There are a total of 246 parking spaces proposed to serve the residential development plus either two or four parking spaces per unit within the garages of the single family homes. The location of the proposed parking areas meets the requirements of this standard. This standard is met.

15.415 Building and Site Design Standards

15.415.010 Main buildings and uses as accessory buildings.

A. Hereinafter, any building which is the only building on a lot is a main building.

B. In any residential district except RP, there shall be only one main use per lot or development site; provided, that home occupations shall be allowed where permitted.
C. In any residential district, there shall be no more than two accessory buildings on any lot or development site.

Applicant's Facts and Findings: The proposed residential development includes only main residential-use buildings at this time. The Applicant acknowledges that no more than two accessory buildings will be permitted on any lot in the R-zoned portions of the development.

This standard is met.

15.415.020 Building height limitation.
A. Residential.

1. **In the R-1, R-2, AR, and RP districts, no main building shall exceed 30 feet in height. Accessory buildings in the R-1, R-2, R-3, AR, and RP districts are limited to 16 feet in height, except as follows:**
   a. **Up to 800 square feet of an accessory building may have a height of up to 24 feet.**
   b. **Aircraft hangars in the AR district may be the same height as the main building.**
2. **In the R-3 district, no main building shall exceed 45 feet in height, except, where an R-3 district abuts upon an R-1 district, the maximum permitted building height shall be limited to 30 feet for a distance of 50 feet from the abutting boundary of the aforementioned district.**
3. **Single-family dwellings permitted in commercial or industrial districts shall not exceed 30 feet in height.**

Applicant's Facts and Findings: The proposed a combination of single-family three story attached and detached structures proposed will exceed the 30 foot height limits. The proposed buildings will be approximately 35 feet in height. The applicant has proposed a height allowance which exceeds the limitations of this section as part of an overall plan to create a planned unit development.

This standard is met.

B. Commercial and Industrial.

1. **In the C-1 district no main building or accessory building shall exceed 30 feet in height.**
2. **In the AI, C-2, C-3, M-1, M-2, and M-3 districts there is no building height limitation, except, where said districts abut upon a residential district, the maximum permitted building height shall not exceed the maximum building height permitted in the abutting residential district for a distance of 50 feet from the abutting boundary.**
3. **In the C-4 district, building height limitation is described in NMC 15.352.040(J)(1).**

Applicant's Facts and Findings: The multi-family buildings proposed in the C-2 zoned portion of this site require a conditional use permit. As such, the maximum height of buildings in the C-2 zoning district will be stated in the Conditional Use Permit, as required by subsection C., below.

This standard is not applicable as a Conditional Use Permit is requested and will state the maximum height of buildings.

C. The maximum height of buildings and uses permitted conditionally shall be stated in the conditional use permits.

Applicant's Facts and Findings: The Applicant proposes a maximum building height of 48 feet for the multi-family residential structures. This maximum height shall be stated on the Conditional Use Permit.

This standard is met.

15.415.040 Public access required.

No building or structure shall be erected or altered except on a lot fronting or abutting on a public street or having access to a public street over a private street or easement of record approved in accordance with provisions contained in this code. New private streets may not be created to provide access except as allowed under NMC 15.332.020(B)(24), 15.336.020(B)(8), and in the M-4 zone. Existing private streets may not be used for access for new dwelling units, except as allowed under NMC 15.405.030. No building or structure shall be erected or altered without provisions for access roadways as required in the Oregon Fire Code, as adopted by the city.

Applicant's Facts and Findings: All proposed residential structures will have access to a public street either directly or via a connection from a private street, as permitted by the Planned Unit Development (PUD) criteria and as previously discussed in this narrative.

This standard is met.

15.420 Landscaping and Outdoor Areas

15.420.010 Required minimum standards.

A. Private and Shared Outdoor Recreation Areas in Residential Developments.

1. **Private Areas. Each ground-level living unit in a residential development subject to a design review plan approval shall have an accessible outdoor private space of not less than 48 square feet in area. The area shall be enclosed, screened or otherwise designed to provide increased privacy for unit residents, their guests and neighbors.**
2. **Individual and Shared Areas. Usable outdoor recreation space shall be provided for the individual and/or shared use of residents and their guests in any duplex or multifamily residential development, as follows:**
   a. **One- or two-bedroom units: 200 square feet per unit.**
   b. **Three- or more bedroom units: 300 square feet per unit.**
   c. **Storage areas are required in residential developments. Convenient areas shall be provided in residential developments for the storage of articles such as bicycles, barbecues, luggage, outdoor furniture, and the like. These shall be entirely enclosed.**
3. **In the AR airport residential district a five percent landscaping standard is required with the goal of "softening" the buildings and making the development "green" with plants, where possible. The existence of the runway, taxiway, and approach open areas already provide generally for the 15 percent requirement.**

Applicant's Facts and Findings: Each ground-level home within the community will have a minimum of 48 square feet of private outdoor open space. The multi-family housing area provides the required shared usable outdoor recreation space. Enclosed storage areas are provided attached to the outdoor private areas in the multi-family residential and in the garages of the single-family residential.

This standard is met.

B. Required Landscaped Area. The following landscape requirements are established for all developments except single-family dwellings:

1. **A minimum of 15 percent of the lot area shall be landscaped; provided, however, that computation of this minimum may include areas landscaped under subsection (B)(3) of this section. Development in the C-3 (central business district) zoning district and M-4 (large lot industrial) zoning district is exempt from the 15 percent landscape area requirement of this section. Additional landscaping requirements in the C-4 district are described in NMC 15.352.040(K). In the AI airport industrial district, only a five percent landscaping standard is required with the goal of "softening" the buildings and making the development "green" with plants, where possible. The existence of the runway, taxiway, and approach open areas already provide generally for the 15 percent requirement. Developments in the AI airport industrial district with a public street frontage shall have said minimum landscaping between the front property line and the front of the building.**

Applicant's Facts and Findings: A minimum of fifteen percent (15%) of the area surrounding the multi-family development will be landscaped.

This standard is met.

2. **All areas subject to the final design review plan and not otherwise improved shall be landscaped.**

Applicant's Facts and Findings: All areas included with the final design review plan and not otherwise improved will be landscaped.

This standard is met.

3. **The following landscape requirements shall apply to the parking and loading areas:**
    a. **A parking or loading area providing 10 or more spaces shall be improved with defined landscaped areas totaling no less than 25 square feet per parking space.**
    b. **A parking, loading area, or drive aisle which runs adjacent to a property line shall be separate from any lot line adjacent to a street by a landscaped strip at least 10 feet in interior width or the width of the required yard, whichever is greater, and any other lot line by a landscaped strip of at least five feet in interior width. See subsections (B)(3)(c) and (d) of this section for material to plant within landscape strips.**
    c. **A landscaped strip separating a parking area, loading area, or drive aisle from a street shall contain street trees spaced as appropriate to the species, not to exceed 50 feet apart on average, and a combination of shrubs and ground cover,**

or lawn. This landscaping shall provide partial screening of these areas from the street.

d. A landscaped strip separating a parking area, loading area, or drive aisle from an interior lot line shall contain any combination of trees, shrubs, ground cover or lawn. Plant material shall be selected from at least two different plant material groups (example: trees and shrubs, or lawn and shrubs, or lawn and trees and shrubs).

e. Landscaping in a parking or loading area shall be located in defined landscaped areas which are uniformly distributed throughout the parking or loading area.

f. Landscaping areas in a parking lot, service drive or loading area shall have an interior width of not less than five feet.

g. All multifamily, institutional, commercial, or industrial parking areas, service drives, or loading zones which abut a residential district shall be enclosed with a 75 percent opaque, site-obscuring fence, wall or evergreen hedge along and immediately adjacent to any interior property line which abuts the residential district. Landscape plantings must be large enough to provide the required minimum screening requirement within 12 months after initial installation. Adequate provisions shall be maintained to protect walls, fences or plant materials from being damaged by vehicles using said parking areas.

h. An island of landscaped area shall be located to separate blocks of parking spaces. At a minimum, one deciduous shade tree per seven parking spaces shall be planted to create a partial tree canopy over and around the parking area. No more than seven parking spaces may be grouped together without an island separation unless otherwise approved by the director based on the following alternative standards:

i. Provision of a continuous landscaped strip, with a five-foot minimum width, which runs perpendicular to the row of parking spaces (see Appendix A, Figure 13).

ii. Provision of tree planting landscape islands, each of which is at least 16 square feet in size, and spaced no more than 50 feet apart on average, within areas proposed for back-to-back parking (see Appendix A, Figure 14).

Applicant's Facts and Findings: As identified on the included site plan, the parking areas providing 10 or more spaces all meet the minimum landscaping requirements. All landscaped areas in parking areas provide a minimum of two different plant material groups, including trees, shrubs, ground cover or lawn. Fencing will be provided in compliance with this Section.

This standard is met.

4. Trees, Shrubs and Ground Covers. The species of street trees required under this section shall conform to those authorized by the city council through resolution. The director shall have the responsibility for preparing and updating the street tree species list which shall be adopted in resolution form by the city council.

a. Arterial and minor arterial street trees shall have spacing of approximately 50 feet on center. These trees shall have a minimum two-inch caliper tree trunk or

stalk at a measurement of two feet up from the base and shall be balled and burlapped or boxed.

b. **Collector and local street trees shall be spaced approximately 35 to 40 feet on center. These trees shall have a minimum of a one and one-half or one and three-fourths inch tree trunk or stalk and shall be balled and burlapped or boxed.**
c. **Accent Trees. Accent trees are trees such as flowering cherry, flowering plum, crab-apple, Hawthorne and the like. These trees shall have a minimum one and one-half inch caliper tree trunk or stalk and shall be at least eight to 10 feet in height. These trees may be planted bare root or balled and burlapped. The spacing of these trees should be approximately 25 to 30 feet on center.**
d. **All broad-leafed evergreen shrubs and deciduous shrubs shall have a minimum height of 12 to 15 inches and shall be balled and burlapped or come from a two-gallon can. Gallon-can size shrubs will not be allowed except in ground covers. Larger sizes of shrubs may be required in special areas and locations as specified by the design review board. Spacing of these shrubs shall be typical for the variety, three to eight feet, and shall be identified on the landscape planting plan.**
e. **Ground Cover Plant Material. Ground cover plant material such as greening juniper, cotoneaster, minor Bowles, English ivy, hypericum and the like shall be one of the following sizes in specified spacing for that size:**

Gallon cans	**3 feet on center**
4" containers	**2 feet on center**
2-1/4" containers	**18" on center**
Rooted cuttings	**12" on center**

Applicant's Facts and Findings: As identified on the submitted landscaping plan, all street trees and ground cover provided in this development will meet city standards.

This standard is met.

5. **Automatic, underground irrigation systems shall be provided for all areas required to be planted by this section. The director shall retain the flexibility to allow a combination of irrigated and nonirrigated areas. Landscaping material used within nonirrigated areas must consist of drought- resistant varieties. Provision must be made for alternative irrigation during the first year after initial installation to provide sufficient moisture for plant establishment.**
6. **Required landscaping shall be continuously maintained.**
7. **Maximum height of tree species shall be considered when planting under overhead utility lines.**
8. **Landscaping requirements and standards for parking and loading areas (subsection (B)(3) of this section) will apply to development proposals unless the institution has addressed the requirements and standards by an approved site development master**

plan. With an approved site development master plan, the landscape requirements will be reviewed through an administrative Type I review process.

9. **In the M-4 zone, landscaping requirements and standards for parking and loading areas (subsection (B)(3) of this section) do not apply unless within 50 feet of a residential district.**

Applicant's Facts and Findings: Automatic, underground irrigation systems will be provided for all landscaped areas. Landscaping will be continuously maintained by the project's Homeowner's Association. As identified in the included landscaping plan, the trees and shrubs have been chosen for their appropriateness for the location in which they are to be planted.

This standard is met.

C. Installation of Landscaping. All landscaping required by these provisions shall be installed prior to the issuance of occupancy permits, unless security equal to 110 percent of the cost of the landscaping as determined by the director is filed with the city, insuring such installation within six months of occupancy. A security – cash, certified check, time certificates of deposit, assignment of a savings account, bond or such other assurance of completion as shall meet with the approval of the city attorney – shall satisfy the security requirements. If the installation of the landscaping is not completed within the six-month period, or within an extension of time authorized by the director, the security may be used by the city to complete the installation. Upon completion of the installation, any portion of the remaining security deposited with the city shall be returned to the applicant.

Applicant's Facts and Findings: Landscaping will be installed or assured according to City requirements prior to the issuance of occupancy permits.

This standard is met.

15.420.020 Landscaping and amenities in public rights-of-way.

The following standards are intended to create attractive streetscapes and inviting pedestrian spaces. A review body may require any of the following landscaping and amenities to be placed in abutting public rights-of-way as part of multifamily, commercial, industrial, or institutional design reviews, or for subdivisions and planned unit developments. In addition, any entity improving existing rights-of-way should consider including these elements in the project. A decision to include any amenity shall be based on comprehensive plan guidelines, pedestrian volumes in the area, and the nature of surrounding development.

A. Pedestrian Space Landscaping. Pedestrian spaces shall include all sidewalks and medians used for pedestrian refuge. Spaces near sidewalks shall provide plant material for cooling and dust control, and street furniture for comfort and safety, such as benches, waste receptacles and pedestrian-scale lighting. These spaces should be designed for short-term as well as long-term use. Elements of pedestrian spaces shall not obstruct sightlines and shall adhere to any other required city safety measures. Medians used for pedestrian refuge shall be designed for short-term use only with plant material for cooling and dust control, and pedestrian-scale lighting. The design of these spaces shall facilitate safe pedestrian crossing with lighting and

accent paving to delineate a safe crossing zone visually clear to motorists and pedestrians alike.

1. **Street trees planted in pedestrian spaces shall be planted according to NMC 15.420.010(B)(4).**
2. **Pedestrian spaces shall have low (two and one-half feet) shrubs and ground covers for safety purposes, enhancing visibility and discouraging criminal activity.**
   a. **Plantings shall be 90 percent evergreen year-round, provide seasonal interest with fall color or blooms, and at maturity maintain growth within the planting area (refer to plant material matrix below).**
   b. **Plant placement shall also adhere to clear sight line requirements as well as any other relevant city safety measures**
3. **Pedestrian-scale lighting shall be installed along sidewalks and in medians used for pedestrian refuge.**
   a. **Pole lights as well as bollard lighting may be specified; however, the amount and type of pedestrian activity during evening hours, e.g., transit stops, nighttime service districts, shall ultimately determine the type of fixture chosen.**
   b. **Luminaire styles shall match the area/district theme of existing luminaires and shall not conflict with existing building or roadway lights causing glare.**
   c. **Lighting heights and styles shall be chosen to prevent glare and to designate a clear and safe path and limit opportunities for vandalism (see Appendix A, Figure 17, Typical Pedestrian Space Layouts).**
   d. **Lighting shall be placed near the curb to provide maximum illumination for spaces furthest from building illumination. Spacing shall correspond to that of the street trees to prevent tree foliage from blocking light.**
4. **Street furniture such as benches and waste receptacles shall be provided for spaces near sidewalks only.**
   a. **Furniture should be sited in areas with the heaviest pedestrian activity, such as downtown, shopping districts, and shopping centers.**
   b. **Benches should be arranged to facilitate conversation between individuals with L-shaped arrangements and should face the area focal point, such as shops, fountains, plazas, and should divert attention away from nearby traffic.**
5. **Paving and curb cuts shall facilitate safe pedestrian crossing and meet all ADA requirements for accessibility.**

Applicant's Facts and Findings: The submitted landscaping plan identifies landscaping and amenities proposed for the public right-of-way. Due to the residential nature of the site and the amenities to be provided within the project's open spaces, the public rights-of-way have been provided with mainly plantings. Once the commercial component of this site develops, we would anticipate the need for more benches, trash receptacles and other pedestrian amenities, potentially within the rights-of-way.

This standard is met.

B. Planting Strip Landscaping. All planting strips shall be landscaped. Planting strips provide a physical and psychological buffer for pedestrians from traffic with plant material that reduces heat and dust, creating a more comfortable pedestrian environment. Planting strips

shall have different arrangements and combinations of plant materials according to the frequency of on-street parking (see Appendix A, Figures 18 and 19).

1. **Planting strips which do not have adjacent parking shall have a combination of ground covers, low (two and one-half feet) shrubs and trees. Planting strips adjacent to frequently used on-street parking, as defined by city staff, shall only have trees protected by tree grates, and planting strips adjacent to infrequently used on-street parking shall be planted with ground cover as well as trees (see Appendix A, Figures 18 and 19, Typical Planting Strip Layouts). District themes or corridor themes linking individual districts should be followed utilizing a unifying plant characteristic, e.g., bloom color, habit, or fall color. When specifying thematic plant material, monocultures should be avoided, particularly those species susceptible to disease.**
2. **Street trees shall be provided in all planting strips as provided in NMC 15.420.010(B)(4).**
    a. **Planting strips without adjacent parking or with infrequent adjacent parking shall have street trees in conjunction with ground covers and/or shrubs.**
    b. **Planting strips with adjacent parking used frequently shall have only street trees protected by tree grates.**
3. **Shrubs and ground covers shall be provided in planting strips without adjacent parking with low (two and one-half feet) planting masses to enhance visibility, discourage criminal activity, and provide a physical as well as psychological buffer from passing traffic.**
    a. **Plantings shall be 90 percent evergreen year-round, provide seasonal interest with fall color or blooms and at maturity maintain growth within the planting area.**
    b. **Ground cover able to endure infrequent foot traffic shall be used in combination with street trees for planting strips with adjacent occasional parking (refer to plant material matrix below).**
    c. **All plant placement shall adhere to clear sight line requirements as well as any other relevant city safety measures.**

C. Maintenance. All landscapes shall be maintained for the duration of the planting to encourage health of plant material as well as public health and safety. All street trees and shrubs shall be pruned to maintain health and structure of the plant material for public safety purposes.

Applicant's Facts and Findings: As identified in the included landscaping plan, all planting strips will be landscaped with a combination of ground covers, shrubs and trees. All landscaping will be maintained for the duration of the planting and all street trees and shrubs will be pruned to maintain the health and structure of the plants.

This standard is met.

D. Exception. In the AI airport industrial district and AR airport residential district, no landscape or amenities except for grass are required for any area within 50 feet of aircraft operation areas including aircraft parking areas, taxiways, clear areas, safety areas, object-free areas, and the runway.

Applicant's Facts and Findings: This standard is not in the AI or AR zone and, as such, this standard is not applicable.

15.425 Exterior Lighting

15.425.010 Purpose.

The purpose of this chapter is to regulate the placement, orientation, distribution patterns, and fixture types of on-site outdoor lighting. The intent of this section is to provide minimum lighting standards that promote safety, utility, and security, prevent glare on public roadways, and protect the privacy of residents.

15.425.020 Applicability and exemptions.

A. Applicability. Outdoor lighting shall be required for safety and personal security in areas of assembly, parking, and traverse, as part of multifamily residential, commercial, industrial, public, recreational and institutional uses. The applicant for any Type I or Type II development permit shall submit, as part of the site plan, evidence that the proposed outdoor lighting plan will comply with this section. This information shall contain but not be limited to the following:

1. **The location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture.**
2. **Additional information the director may determine is necessary, including but not limited to illuminance level profiles, hours of business operation, and percentage of site dedicated to parking and access.**
3. **If any portion of the site is used after dark for outdoor parking, assembly or traverse, an illumination plan for these areas is required. The plan must address safety and personal security.**

B. Exemptions. The following uses shall be exempt from the provisions of this section:

1. **Public street and airport lighting.**
2. **Circus, fair, carnival, or outdoor governmentally sponsored event or festival lighting.**
3. **Construction or emergency lighting, provided such lighting is discontinued immediately upon completion of the construction work or abatement of the emergency necessitating said lighting.**
4. **Temporary Lighting. In addition to the lighting otherwise permitted in this code, a lot may contain temporary lighting during events as listed below:**
    a. **Grand Opening Event. A grand opening is an event of up to 30 days in duration within 30 days of issuance of a certificate of occupancy for a new or remodeled structure, or within 30 days of change of business or ownership. No lot may have more than one grand opening event per calendar year. The applicant shall notify the city in writing of the beginning and ending dates prior to the grand opening event.**
    b. **Other Events. A lot may have two other events per calendar year. The events may not be more than eight consecutive days in duration, nor less than 30 days apart.**
5. **Lighting activated by motion sensor devices.**
6. **Nonconforming lighting in place as of September 5, 2000. Replacement of nonconforming lighting is subject to the requirements of NMC 15.205.010 through 15.205.100.**

7. **Light Trespass onto Industrial Properties. The lighting trespass standards of NMC 15.425.040 do not apply where the light trespass would be onto an industrially zoned property.**

Applicant's Facts and Findings: The land use submittal includes a lighting plan identifying the location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture. Lighting is provided in the parking areas and the multi-family residential buildings.

This standard is met.

15.425.030 Alternative materials and methods of construction, installation, or operation.
The provisions of this section are not intended to prevent the use of any design, material, or methods of installation or operation not specifically prescribed by this section, provided any such alternate has been approved by the director. Alternatives must be an approximate equivalent to the applicable specific requirement of this section and must comply with all other applicable standards in this section.

Applicant's Facts and Findings: This land use submittal does not include a request for alternative materials and methods of construction, installation or operation.

This standard is met.

15.425.040 Requirements.
A. General Requirements – All Zoning Districts.

1. **Low-level light fixtures include exterior lights which are installed between ground level and six feet tall. Low-level light fixtures are considered nonintrusive and are unrestricted by this code.**
2. **Medium-level light fixtures include exterior lights which are installed between six feet and 15 feet above ground level. Medium-level light fixtures must either comply with the shielding requirements of subsection (B) of this section, or the applicant shall show that light trespass from a property has been designed not to exceed one-half foot-candle at the property line.**
3. **High-level light fixtures include exterior lights which are installed 15 feet or more above ground level. High-level light fixtures must comply with the shielding requirements of subsection (B) of this section, and light trespass from a property may not exceed one-half foot-candle at the property line.**

B. Table of Shielding Requirements.

Fixture Lamp Type	Shielded
Low/high pressure sodium, mercury vapor, metal halide and fluorescent over 50 watts	Fully
Incandescent over 160 watts	Fully
Incandescent 160 watts or less	None
Fossil fuel	None

Any light source of 50 watts or less	**None**
Other sources	**As approved by NMC 15.425.030**

Applicant's Facts and Findings: The land use submittal includes a lighting plan identifying the location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture. Lighting is provided in the parking areas and the multi-family residential buildings. All medium- and high-level lighting is designed to meet this section.

This standard is met.

15.430 Underground Utility Installation

15.430.010 Underground utility installation.

A. All new utility lines, including but not limited to electric, communication, natural gas, and cable television transmission lines, shall be placed underground. This does not include surface-mounted transformers, connections boxes, meter cabinets, service cabinets, temporary facilities during construction, and high-capacity electric lines operating at 50,000 volts or above.

B. Existing utility lines shall be placed underground when they are relocated, or when an addition or remodel requiring a Type II design review is proposed, or when a developed area is annexed to the city.

C. The director may make exceptions to the requirement to underground utilities based on one or more of the following criteria:

1. **The cost of undergrounding the utility is extraordinarily expensive.**
2. **There are physical factors that make undergrounding extraordinarily difficult.**
3. **Existing utility facilities in the area are primarily overhead and are unlikely to be changed.**

Applicant's Facts and Findings: All new utility lines will be located underground.

This standard is met.

15.440 Off-Street Parking, Bicycle Parking, and Private Walkways

Article I. Off-Street Parking Requirements

15.440.010 Required off-street parking.

A. Off-street parking shall be provided on the development site for all R-1, C-1, M-1, M-2 and M-3 zones. In all other zones, the required parking shall be on the development site or within 400 feet of the development site which the parking is required to serve. All required parking must be under the same ownership as the development site served except through special covenant agreements as approved by the city attorney, which bind the parking to the development site.

B. Off-street parking is not required in the C-3 district, except for:

1. **Dwelling units meeting the requirements noted in NMC 15.305.020.**
2. **New development which is either immediately adjacent to a residential district or separated by nothing but an alley.**

C. Within the C-4 district, the minimum number of required off-street parking spaces shall be 50 percent of the number required by NMC 15.440.030, except that no reduction is permitted for residential uses.
D. All commercial, office, or industrial developments that have more than 20 off-street parking spaces and that have designated employee parking must provide at least one preferential carpool/vanpool parking space. The preferential carpool/vanpool parking space(s) must be located close to a building entrance.

Applicant's Facts and Findings: The proposed parking for the single-family homes will be on the same lot as the use. Additional on-street parking and "guest parking" areas are proposed and will be owned and maintained according by the project's Homeowner's Association. The proposed parking for the multi-family buildings will also be on the same development site as the buildings, in a parking lot adjacent to the buildings. There are no commercial, office or industrial developments proposed at this time and, as such, no carpool/vanpool parking spaces are required.

This standard is met.

15.440.020 Parking area and service drive design.
A. All public or private parking areas, parking spaces, or garages shall be designed, laid out and constructed in accordance with the minimum standards as set forth in NMC 15.440.070.
B. Groups of three or more parking spaces, except those in conjunction with single-family or two-family dwellings on a single lot, shall be served by a service drive so that no backward movement or other maneuvering of a vehicle within a street, other than an alley, will be required. Service drives shall be designed and constructed to facilitate the flow of traffic, provide maximum safety in traffic access and egress and maximum safety of pedestrian and vehicular traffic on the site, but in no case shall two-way and one-way service drives be less than 20 feet and 12 feet, respectively. Service drives shall be improved in accordance with the minimum standards as set forth in NMC 15.440.060.
C. Gates. A private drive or private street serving as primary access to more than one dwelling unit shall not be gated to limit access, except as approved by variance.
D. In the AI airport industrial district and AR airport residential district, taxiways may be used as part of the service drive design where an overall site plan is submitted that shows how the circulation of aircraft and vehicles are safely accommodated, where security fences are located, if required, and is approved by the fire marshal, planning director, and public works director. The following submittal must be made:

1. **A drawing of the area to be developed, including the probable location, height, and description of structures to be constructed; the location and description of a security fence or gate to secure the aircraft operations areas of off-airport property from the other nonsecured pedestrian/auto/truck areas of on-airport property; the proposed location of the proposed taxiway access in accordance with FAA specifications (refer to Federal Aviation Administration Advisory Circular No. 150/5300-13 regarding airport design, and AC/5370-10B regarding construction standards for specifications that should be used as a guideline); and the identification of the vehicular traffic pattern area clearly separated from aircraft traffic. Once specific buildings have been designed, FAA Form 7460-1, Notice of Proposed Construction or Alteration, must be**

submitted to the City of Newberg, the private airport owner, and the FAA for airspace review.

15.440.030 Parking spaces required.

Use	Minimum Parking Spaces Required
Residential Types	
Dwelling, multifamily and multiple single-family dwellings on a single lot	**1 per dwelling unit**
Studio or one-bedroom unit	**1.5 per dwelling unit**
Two-bedroom unit	**2 per dwelling unit**
Three- and four-bedroom unit	**0.75 spaces per bedroom**
Five- or more bedroom unit	
• Unassigned spaces	**If a development is required to have more than 10 spaces on a lot, then it must provide some unassigned spaces. At least 15 percent of the total required parking spaces must be unassigned and be located for convenient use by all occupants of the development. The location shall be approved by the director.**
• Visitor spaces	**If a development is required to have more than 10 spaces on a lot, then it must provide at least 0.2 visitor spaces per dwelling unit.**
• On-street parking credit	**On-street parking spaces may be counted toward the minimum number of required spaces for developments required to have more than 10 spaces on a lot. The on-street spaces must be directly adjoining and on the same side of the street as the subject property, must be legal spaces that meet all city standards, and cannot be counted if they could be removed by planned future street widening or a bike lane on the street.**
• Available transit service	**At the review body's discretion, affordable housing projects may reduce the required off-street parking by 10 percent if there is an adequate continuous pedestrian route no more than 1,500 feet in length from the development to transit service with an average of less than one hour regular service intervals during commuting periods or where the development provides its own transit. A developer may qualify for this parking reduction if improvements on a proposed pedestrian route are made by the developer, thereby rendering it an adequate continuous route.**
Dwelling, single-family or two-family	**2 for each dwelling unit on a single lot**

Applicant's Facts and Findings:

All single-family development will have parking on the individual lots with at least 2 parking spaces provided on each lot, one within the garage and one within the driveway provided for each single family lot. Many of the single family homes will be provided with up to 4 parking spaces on each lot as two car garages and two car driveways will be developed on the majority of the lots within the development. The multi-family development proposes to create 51 units with 27 one bedroom homes and 24 two bedroom homes. The required parking for the one bedroom units is 27 spaces, the two bedroom units require 36 parking spaces and a total of 10 visitor parking spaces are required for a total of 74 parking spaces. As proposed, 92 spaces are provided which are on the same site as the multi-family buildings. An additional 7 on-street parking spaces are provided adjacent to the multi-family lot.

In total, the project will provide the following parking space configuration:

Apartment Parking – 91 Spaces
Public Street Parking – 73 Spaces
Private Street Parking – 85 Spaces
R-1 Lot Parking – 72 Spaces
17' Front Load Parking – 46 Spaces
17' Rear Load Parking – 219 Spaces
21' Front Load Spaces – 111 Spaces
21' Rear Load Spaces – 268 Spaces
25' Front Load Spaces – 52 Spaces
25' Rear Load Spaces – 68 Spaces

The total number of spaces may vary based upon the revisions necessary to satisfy any conditions of approval or as a result of changes to the final plat and product configuration but the current design, showing detached units, currently provides 1,085 parking spaces.

This standard is met.

15.440.060 Parking area and service drive improvements.

All public or private parking areas, outdoor vehicle sales areas, and service drives shall be improved according to the following:

A. All parking areas and service drives shall have surfacing of asphaltic concrete or Portland cement concrete or other hard surfacing such as brick or concrete pavers. Other durable and dust-free surfacing materials may be approved by the director for infrequently used parking areas. All parking areas and service drives shall be graded so as not to drain stormwater over the public sidewalk or onto any abutting public or private property.

B. All parking areas shall be designed not to encroach on public streets, alleys, and other rights-of-way. Parking areas shall not be placed in the area between the curb and sidewalk or, if there is no sidewalk, in the public right-of-way between the curb and the property line. The director may issue a permit for exceptions for unusual circumstances where the design maintains safety and aesthetics.

C. All parking areas, except those required in conjunction with a single-family or two-family dwelling, shall provide a substantial bumper which will prevent cars from encroachment on abutting private and public property.

D. All parking areas, including service drives, except those required in conjunction with single-family or two-family dwellings, shall be screened in accordance with NMC 15.420.010(B).

E. Any lights provided to illuminate any public or private parking area or vehicle sales area shall be so arranged as to reflect the light away from any abutting or adjacent residential district.

F. All service drives and parking spaces shall be substantially marked and comply with NMC 15.440.070.

G. Parking areas for residential uses shall not be located in a required front yard, except as follows:

1. **Attached or detached single-family or two-family: parking is authorized in a front yard on a service drive which provides access to an improved parking area outside the front yard.**
2. **Three- or four-family: parking is authorized in a front yard on a service drive which is adjacent to a door at least seven feet wide intended and used for entrance of a vehicle (see Appendix A, Figure 12).**

H. A reduction in size of the parking stall may be allowed for up to a maximum of 30 percent of the total number of spaces to allow for compact cars. For high turnover uses, such as convenience stores or fast-food restaurants, at the discretion of the director, all stalls will be required to be full-sized.

I. Affordable housing projects may use a tandem parking design, subject to approval of the community development director.

J. Portions of off-street parking areas may be developed or redeveloped for transit-related facilities and uses such as transit shelters or park-and-ride lots, subject to meeting all other applicable standards, including retaining the required minimum number of parking spaces.

Applicant's Facts and Findings: As identified on the submitted site plan and utility plans, all parking areas and service drives will be constructed to City standards. Parking areas do not encroach on public streets. Substantial parking bumpers are provided for the multi-family parking area. All parking area lighting will be designed to reduce light spill and glare away from any proposed or existing neighboring developments.

This standard is met.

Article II. Bicycle Parking

15.440.090 Purpose.

Cycling is a healthy activity for travel and recreation. In addition, by maximizing bicycle travel, the community can reduce negative effects of automobile travel, such as congestion and pollution. To maximize bicycle travel, developments must provide effective support facilities. At a minimum, developments need to provide a secure place for employees, customers, and residents to park their bicycles. [Ord. 2564, 4-15-02; Ord. 2518, 9-21-99. Code 2001 § 151.625.1.]

15.440.100 Facility requirements.

Bicycle parking facilities shall be provided for the uses shown in the following table. Fractional space requirements shall be rounded up to the next whole number.

Use	Minimum Number of Bicycle Parking Spaces Required
New multiple dwellings, including additions creating additional dwelling units	One bicycle parking space for every four dwelling units

Applicant's Facts and Findings: The proposed 51 multi-family dwelling units requires 13 bicycle parking spaces. This proposal includes the provision of 13 bicycle parking spaces.

This standard is met.

15.440.110 Design.

A. Bicycle parking facilities shall consist of one or more of the following:

1. **A firmly secured loop, bar, rack, or similar facility that accommodates locking the bicycle frame and both wheels using a cable or U-shaped lock.**
2. **An enclosed locker.**
3. **A designated area within the ground floor of a building, garage, or storage area. Such area shall be clearly designated for bicycle parking.**
4. **Other facility designs approved by the director.**

B. All bicycle parking spaces shall be at least six feet long and two and one-half feet wide. Spaces shall not obstruct pedestrian travel.

C. All spaces shall be located within 50 feet of a building entrance of the development.

D. Required bicycle parking facilities may be located in the public right-of-way adjacent to a development subject to approval of the authority resp

Applicant's Facts and Findings: As shown on the included site development plans, the bicycle parking facility is designed to meet these requirements.

This standard is met.

Article III. Private Walkways

15.440.120 Purpose.

Sidewalks and private walkways are part of the city's transportation system. Requiring their construction is part of the city's plan to encourage multimodal travel and to reduce reliance on the automobile. Considerable funds have and will be expended to install sidewalks along the streets in the city. Yet there is little point to this expense if it is not possible for people to walk from the sidewalk to the developments along each side. The following requirements are intended to provide safe and convenient paths for employees, customers, and residents to walk from public sidewalks to development entrances, and to walk between buildings on larger sites.

15.440.130 Where required.

Private walkways shall be constructed as part of any development requiring Type II design review, including mobile home parks. In addition, they may be required as part of conditional

use permits or planned unit developments. In the airport industrial (AI) district and residential (AR) district, on-site walks are not required in aircraft operations areas, such as parking aprons, taxiways, and runways.

Applicant's Facts and Findings: As this application includes a Planned Unit Development and Conditional Use Permit, walkways and sidewalks are required.

This standard is met.

15.440.140 Private walkway design.
A. All required private walkways shall meet the applicable building code and Americans with Disabilities Act requirements.
B. Required private walkways shall be a minimum of four feet wide.
C. Required private walkways shall be constructed of portland cement concrete or brick.
D. Crosswalks crossing service drives shall, at a minimum, be painted on the asphalt or clearly marked with contrasting paving materials or humps/raised crossings. If painted striping is used, it should consist of thermoplastic striping or similar type of durable application.
E. At a minimum, required private walkways shall connect each main pedestrian building entrance to each abutting public street and to each other.
F. The review body may require on-site walks to connect to development on adjoining sites.
G. The review body may modify these requirements where, in its opinion, the development provides adequate on-site pedestrian circulation, or where lot dimensions, existing building layout, or topography preclude compliance with these standards.

Applicant's Facts and Findings: The proposal includes private walkways connecting the multi-family units to Highway 99W and connecting the western portion of the site to Spring Meadow Park. These walkways will be a minimum of 4-feet in width and will be constructed of Portland cement concrete. Crosswalks will be provided on the site to delineate the shift from public streets to private streets. Crosswalks will be painted/clearly striped in conformance with these requirements.

This standard is met.

Division 15.500 Public Improvement Standards
15.505 Public Improvements Standards
15.505.010 Purpose.
This chapter provides standards for public infrastructure and utilities installed with new development, consistent with the policies of the City of Newberg comprehensive plan and adopted city master plans. The standards are intended to minimize disturbance to natural features, promote energy conservation and efficiency, minimize and maintain development impacts on surrounding properties and neighborhoods, and ensure timely completion of adequate public facilities to serve new development.

15.505.020 Applicability.
The provision and utilization of public facilities and services within the City of Newberg shall apply to all land developments in accordance with this chapter. No development shall be

approved unless the following improvements are provided for prior to occupancy or operation, unless future provision is assured in accordance with NMC 15.505.030(E).

A. Public Works Design and Construction Standards. The design and construction of all improvements within existing and proposed rights-of-way and easements, all improvements to be maintained by the city, and all improvements for which city approval is required shall comply with the requirements of the most recently adopted Newberg public works design and construction standards.
B. Street Improvements. All projects subject to a Type II design review, partition, or subdivision approval must construct street improvements necessary to serve the development.
C. Water. All developments, lots, and parcels within the City of Newberg shall be served by the municipal water system as specified in Chapter 13.15 NMC.
D. Wastewater. All developments, lots, and parcels within the City of Newberg shall be served by the municipal wastewater system as specified in Chapter 13.10 NMC.
E. Stormwater. All developments, lots, and parcels within the City of Newberg shall manage stormwater runoff as specified in Chapters 13.20 and 13.25 NMC.
F. Utility Easements. Utility easements shall be provided as necessary and required by the review body to provide needed facilities for present or future development of the area.
G. City Approval of Public Improvements Required. No building permit may be issued until all required public facility improvements are in place and approved by the director, or are otherwise bonded for in a manner approved by the review authority, in conformance with the provisions of this code and the Newberg Public Works Design and Construction Standards.

Applicant's Facts and Findings: As identified on the included public improvement plans, the design and construction of all improvements within existing and proposed public rights-of-way and easements and all improvements to be maintained by the city are designed to comply with the requirements of the most recently adopted Newberg public works design and construction standards. All improvements for which city approval is required are proposed to the most recently adopted Newberg public works design and construction standards or, in the case of private streets, as reviewed and approved by the Newberg Engineering Department. The site development plan includes private and public streets, utility easements where necessary, connection to public water and sanitary sewer services and management of stormwater runoff.

This standard is met.

15.505.030 Street standards.
A. Purpose. The purpose of this section is to:

1. **Provide for safe, efficient, and convenient multi-modal transportation within the City of Newberg.**
2. **Provide adequate access to all proposed and anticipated developments in the City of Newberg. For purposes of this section, "adequate access" means direct routes of travel between destinations; such destinations may include residential neighborhoods, parks, schools, shopping areas, and employment centers.**
3. **Provide adequate area in all public rights-of-way for sidewalks, wastewater and water lines, stormwater facilities, natural gas lines, power lines, and other utilities commonly**

and appropriately placed in such rights-of-way. For purposes of this section, "adequate area" means space sufficient to provide all required public services to standards defined in this code and in the Newberg public works design and construction standards.

B. Applicability. The provisions of this section apply to:

1. **The creation, dedication, and/or construction of all public streets, bike facilities, or pedestrian facilities in all subdivisions, partitions, or other developments in the City of Newberg.**
2. **The extension or widening of existing public street rights-of-way, easements, or street improvements including those which may be proposed by an individual or the city, or which may be required by the city in association with other development approvals.**
3. **The construction or modification of any utilities, pedestrian facilities, or bike facilities in public rights-of-way or easements.**
4. **The designation of planter strips. Street trees are required subject to Chapter 15.420 NMC.**
5. **Developments outside the city that tie into or take access from city streets.**

Applicant's Facts and Findings: As demonstrated in the public improvement plans, this development includes public and private streets designed to provide safe and convenient vehicular and pedestrian access. Proposed improvements include paved streets, curbs (rolled curb on private streets), sidewalks, crosswalks, planter strips with street trees and appropriate groundcover, and utility easements where necessary.

This standard is met.

C. Layout of Streets, Alleys, Bikeways, and Walkways. Streets, alleys, bikeways, and walkways shall be laid out and constructed as shown in the Newberg transportation system plan. In areas where the transportation system plan or future street plans do not show specific transportation improvements, roads and streets shall be laid out so as to conform to previously approved subdivisions, partitions, and other developments for adjoining properties, unless it is found in the public interest to modify these patterns. Transportation improvements shall conform to the standards within the Newberg Municipal Code, the Newberg public works design and construction standards, the Newberg transportation system plan, and other adopted city plans.

Applicant's Facts and Findings: While no bikeways are proposed, the streets, alleys and walkways are designed to comply with the Newberg Transportation System Plan. Streets are planned to meet with adjoining roadways and to provide for future connectivity to the east.

This standard is met.

D. Construction of New Streets. Where new streets are necessary to serve a new development, subdivision, or partition, right-of-way dedication and full street improvements shall be required. Three-quarter streets may be approved in lieu of full street improvements when the city finds it to be practical to require the completion of the other one-quarter street improvement when the adjoining property is developed; in such cases, three-quarter street improvements may be allowed by the city only where all of the following criteria are met:

1. **The land abutting the opposite side of the new street is undeveloped and not part of the new development; and**
2. **The adjoining land abutting the opposite side of the street is within the city limits and the urban growth boundary.**

Applicant's Facts and Findings: Full street improvements are proposed throughout the site.

This standard is met.

E. Improvements to Existing Streets.

1. **All projects subject to partition, subdivision, or Type II design review approval shall dedicate right-of-way sufficient to improve the street to the width specified in subsection (G) of this section.**
2. **All projects subject to partition, subdivision, or Type II design review approval must construct a minimum of a three-quarter street improvement to all existing streets adjacent to, within, or necessary to serve the development. The director may waive or modify this requirement where the applicant demonstrates that the condition of existing streets to serve the development meets city standards and is in satisfactory condition to handle the projected traffic loads from the development. Where a development has frontage on both sides of an existing street, full street improvements are required.**
3. **In lieu of the street improvement requirements outlined in NMC 15.505.040(B), the review authority may elect to accept from the applicant monies to be placed in a fund dedicated to the future reconstruction of the subject street(s). The amount of money deposited with the city shall be 100 percent of the estimated cost of the required street improvements (including any associated utility improvements), and 10 percent of the estimated cost for inflation. Cost estimates used for this purpose shall be based on preliminary design of the constructed street provided by the applicant's engineer and shall be approved by the director.**

Applicant's Facts and Findings: The proposal includes development of full street improvements throughout the site. The public streets will be constructed to public street standards and dedicated to the City of Newberg. The private streets will be full street improvements and will be owned and maintained by the future Homeowner's Association subject to the CC&Rs (a draft of which is submitted with this proposal).

This standard is met.

F. Improvements Relating to Impacts. Improvements required as a condition of development approval shall be roughly proportional to the impact of the development on public facilities and services. The review body must make findings in the development approval that indicate how the required improvements are roughly proportional to the impact. Development may not occur until required transportation facilities are in place or guaranteed, in conformance with the provisions of this code. If required transportation facilities cannot be put in place or be guaranteed, then the review body shall deny the requested land use application.

Applicant's Facts and Findings: Development of the proposed street network and utilities within the development and connecting to the neighboring properties is roughly proportional to the transportation and development impacts from the development. Transportation facilities will be in place or guaranteed prior to development of the site.

This standard is met.

G. Street Width and Design Standards.

1. **Design Standards. All streets shall conform with the standards contained in Table 15.505.030(G). Where a range of values is listed, the director shall determine the width based on a consideration of the total street section width needed, existing street widths, and existing development patterns. Preference shall be given to the higher value. Where values may be modified by the director, the overall width shall be determined using the standards under subsections (G)(2) through (10) of this section.**

Table 15.505.030(G) Street Design Standards

Type of Street	Right-of-Way Width	Curb-to-Curb Pavement Width	Motor Vehicle Travel Lanes	Median Type	Striped Bike Lane (Both Sides)	On-Street Parking
Arterial Streets						
Expressway**	ODOT	ODOT	ODOT	ODOT	ODOT	ODOT
Minor arterial	69 – 80 feet	48 feet	2 lanes	TWLTL or median*	Yes	No*
Collectors						
Minor	61 – 65 feet	40 feet	2 lanes	None*	Yes*	Yes*
Local Streets						
Local residential	54-60 feet	32 feet	2 lanes	None	No	Yes

2. **Motor Vehicle Travel Lanes. Collector and arterial streets shall have a minimum width of 12 feet.**
3. **Bike Lanes. Striped bike lanes shall be a minimum of six feet wide. Bike lanes shall be provided where shown in the Newberg transportation system plan.**
4. **Parking Lanes. Where on-street parking is allowed on collector and arterial streets, the parking lane shall be a minimum of eight feet wide.**
5. **Center Turn Lanes. Where a center turn lane is provided, it shall be a minimum of 12 feet wide.**
6. **Limited Residential Streets. Limited residential streets shall be allowed only at the discretion of the review authority, and only in consideration of the following factors:**
   a. **The requirements of the fire chief shall be followed.**
   b. **The estimated traffic volume on the street is low, and in no case more than 600 average daily trips.**
   c. **Use for through streets or looped streets is preferred over cul-de-sac streets.**
   d. **Use for short blocks (under 400 feet) is preferred over longer blocks.**

e. **The total number of residences or other uses accessing the street in that block is small, and in no case more than 30 residences.**
f. **On-street parking usage is limited, such as by providing ample off-street parking, or by staggering driveways so there are few areas where parking is allowable on both sides.**

7. **Sidewalks. Sidewalks shall be provided on both sides of all public streets. Minimum width is five feet.**
8. **Planter Strips. Except where infeasible, a planter strip shall be provided between the sidewalk and the curb line, with a minimum width of five feet. This strip shall be landscaped in accordance with the standards in NMC 15.420.020. Curb-side sidewalks may be allowed on limited residential streets. Where curb-side sidewalks are allowed, the following shall be provided:**
    a. **Additional reinforcement is done to the sidewalk section at corners.**
    b. **Sidewalk width is six feet.**
9. **Slope Easements. Slope easements shall be provided adjacent to the street where required to maintain the stability of the street.**
10. **Intersections and Street Design. The street design standards in the Newberg public works design and construction standards shall apply to all public streets, alleys, bike facilities, and sidewalks in the city.**
11. **The planning commission may approve modifications to street standards for the purpose of ingress or egress to a minimum of three and a maximum of six lots through a conditional use permit.**

Applicant's Facts and Findings: Streets, sidewalks and planter strips, as identified on the proposed public improvement plans, are designed to meet the standards of the Newberg Transportation System Plan and this section.

This standard is met.

H. Modification of Street Right-of-Way and Improvement Width. The director, pursuant to the Type II review procedures of Chapter 15.220 NMC, may allow modification to the public street standards of subsection (G) of this section, when the criteria in both subsections (H)(1) and (2) of this section are satisfied:

1. **The modification is necessary to provide design flexibility in instances where:**
    a. **Unusual topographic conditions require a reduced width or grade separation of improved surfaces; or**
    b. **Lot shape or configuration precludes accessing a proposed development with a street which meets the full standards of this section; or**
    c. **A modification is necessary to preserve trees or other natural features determined by the city to be significant to the aesthetic character of the area; or**
    d. **A planned unit development is proposed and the modification of street standards is necessary to provide greater privacy or aesthetic quality to the development.**
2. **Modification of the standards of this section shall only be approved if the director finds that the specific design proposed provides adequate vehicular access based on anticipated traffic volumes.**

Applicant's Facts and Findings: Street modifications are not proposed as part of this development and, as such, this standard is not applicable.

I. Temporary Turnarounds. Where a street will be extended as part of a future phase of a development, or as part of development of an abutting property, the street may be terminated with a temporary turnaround in lieu of a standard street connection or circular cul-de-sac bulb. The director and fire chief shall approve the temporary turnaround. It shall have an all-weather surface, and may include a hammerhead-type turnaround meeting fire apparatus access road standards, a paved or graveled circular turnaround, or a paved or graveled temporary access road. For streets extending less than 150 feet and/or with no significant access, the director may approve the street without a temporary turnaround. Easements or right-of-way may be required as necessary to preserve access to the turnaround.

Applicant's Facts and Findings: The east-west minor collector dead-ends at the eastern property line for connection to future development. The easternmost north-south private street creates a hammerhead-type turnaround with the minor collector.

This standard is met.

J. Topography. The layout of streets shall give suitable recognition to surrounding topographical conditions in accordance with the purpose of this code.

Applicant's Facts and Findings: The layout of the streets takes into consideration the surrounding topography.

This standard is met.

K. Future Extension of Streets. All new streets required for a subdivision, partition, or a project requiring site design review shall be constructed to be "to and through": through the development and to the edges of the project site to serve adjacent properties for future development.

Applicant's Facts and Findings: The street network connects to the existing street to the north and future street development to the east. Connection to the west is not possible because the entire property line is adjacent to Spring Meadow Park. The connection to the south is the access from Highway 99W.

This standard is met.

L. Cul-de-Sacs.

1. **Cul-de-sacs shall only be permitted when one or more of the circumstances listed in this section exist. When cul-de-sacs are justified, public walkway connections shall be provided wherever practical to connect with another street, walkway, school, or similar destination.**
    a. **Physical or topographic conditions make a street connection impracticable. These conditions include but are not limited to controlled access streets, railroads, steep slopes, wetlands, or water bodies where a connection could not be reasonably made.**

b. **Buildings or other existing development on adjacent lands physically preclude a connection now or in the future, considering the potential for redevelopment.**
c. **Where streets or accessways would violate provisions of leases, easements, or similar restrictions.**
d. **Where the streets or accessways abut the urban growth boundary and rural resource land in farm or forest use, except where the adjoining land is designated as an urban reserve area.**

2. **Cul-de-sacs shall be no more than 400 feet long (measured from the centerline of the intersection to the radius point of the bulb).**
3. **Cul-de-sacs shall not serve more than 18 single-family dwellings.**
   Each cul-de-sac shall have a circular end with a minimum diameter of 96 feet, curb-to-curb, within a 109-foot minimum diameter right-of-way. For residential uses, a 35-foot radius may be allowed if the street has no parking, a mountable curb, curbside sidewalks, and sprinkler systems in every building along the street.

Applicant's Facts and Findings: No cul-de-sacs are proposed as part of this development and, as such, this standard is not applicable.

M. Street Names and Street Signs. Streets that are in alignment with existing named streets shall bear the names of such existing streets. Names for new streets not in alignment with existing streets are subject to approval by the director and the fire chief and shall not unnecessarily duplicate or resemble the name of any existing or platted street in the city. It shall be the responsibility of the land divider to provide street signs.

Applicant's Facts and Findings: The north-south major collector will be named Crestview Street as that is the name of the connection to the north. Other streets in the development are new and will be established with this development.

This standard is met.

N. Platting Standards for Alleys.

1. **An alley may be required to be dedicated and constructed to provide adequate access for a development, as deemed necessary by the director.**
2. **The right-of-way width and paving design for alleys shall be not less than 20 feet wide. Slope easements shall be dedicated in accordance with specifications adopted by the city council under NMC 15.505.010 et seq.**
3. **Where two alleys intersect, 10-foot corner cut-offs shall be provided.**
4. **Unless otherwise approved by the city engineer where topographical conditions will not reasonably permit, grades shall not exceed 12 percent on alleys, and centerline radii on curves shall be not less than 100 feet.**
5. **All provisions and requirements with respect to streets identified in this code shall apply to alleys the same in all respects as if the word "street" or "streets" therein appeared as the word "alley" or "alleys" respectively.**

Applicant's Facts and Findings: The alleys included with this proposal are all proposed as private streets owned and maintained by the Homeowner's Association.

This standard is met.

O. Platting Standards for Blocks.

1. **Purpose. Streets and walkways can provide convenient travel within a neighborhood and can serve to connect people and land uses. Large, uninterrupted blocks can serve as a barrier to travel, especially walking and biking. Large blocks also can divide rather than unite neighborhoods. To promote connected neighborhoods and to shorten travel distances, the following minimum standards for block lengths are established.**
2. **Maximum Block Length and Perimeter. The maximum length and perimeters of blocks in the zones listed below shall be according to the following table. The review body for a subdivision, partition, conditional use permit, or a Type II design review may require installation of streets or walkways as necessary to meet the standards below.**

Zones(s)	Maximum Block Length	Maximum Block Perimeter
R-1	800 feet	2,000 feet
R-2, R-3, RP, I	1,200 feet	3,000 feet

3. **Exceptions.**

a. **If a public walkway is installed mid-block, the maximum block length and perimeter may be increased by 25 percent.**
b. **Where a proposed street divides a block, one of the resulting blocks may exceed the maximum block length and perimeter standards provided the average block length and perimeter of the two resulting blocks do not exceed these standards.**
c. **Blocks in excess of the above standards are allowed where access controlled streets, street access spacing standards, railroads, steep slopes, wetlands, water bodies, preexisting development, ownership patterns or similar circumstances restrict street and walkway location and design. In these cases, block length and perimeter shall be as small as practical. Where a street cannot be provided because of these circumstances but a public walkway is still feasible, a public walkway shall be provided.**
d. **Institutional campuses located in an R-1 zone may apply the standards for the institutional zone.**
e. **Where a block is in more than one zone, the standards of the majority of land in the proposed block shall apply.**
f. **Where a local street plan, concept master site development plan, or specific plan has been approved for an area, the block standards shall follow those approved in the plan. In approving such a plan, the review body shall follow the block standards listed above to the extent appropriate for the plan area.**

Applicant's Facts and Findings: The proposed development would create several blocks and new blocks however the patterns of natural resources present on the site and the existing development surrounding the property make a traditional subdivision with blocks meeting the standards listed above impractical. Instead of a traditional block layout, the applicant has proposed a series of blocks which are porous and interconnected with private streets, walkways, and alleys.

This standard is met.

P. Private Streets. New private streets, as defined in NMC 15.05.030, shall not be created, except as allowed by NMC 15.240.020(L)(2).

Applicant's Facts and Findings: Private streets are proposed in compliance with NMC 15.240.020(L)(2), as addressed previously in this narrative.

This standard is met.

Q. Traffic Calming.

1. **The following roadway design features may be required in new street construction where traffic calming needs are anticipated:**
   a. **Serpentine alignment.**
   b. **Curb extensions.**
   c. **Traffic diverters/circles.**
   d. **Raised medians and landscaping.**
   e. **Other methods shown effective through engineering studies.**
2. **Traffic-calming measures such as speed humps should be applied to mitigate traffic operations and/or safety problems on existing streets. They should not be applied with new street constructions.**

Applicant's Facts and Findings: Traffic calming measures are not proposed as the submitted Transportation Impact Analysis demonstrates that the proposed street network is safe and effective.

This standard is met.

R. Vehicular Access Standards.

1. **Purpose. The purpose of these standards is to manage vehicle access to maintain traffic flow, safety, roadway capacity, and efficiency. They help to maintain an adequate level of service consistent with the functional classification of the street. Major roadways, including arterials and collectors, serve as the primary system for moving people and goods within and through the city. Access is limited and managed on these roads to promote efficient through movement. Local streets and alleys provide access to individual properties. Access is managed on these roads to maintain safe maneuvering of vehicles in and out of properties and to allow safe through movements. If vehicular access and circulation are not properly designed, these roadways will be unable to accommodate the needs of development and serve their transportation function.**
2. **Access Spacing Standards. Public street intersection and driveway spacing shall follow the standards in Table 15.505.R below. The Oregon Department of Transportation (ODOT) has jurisdiction of some roadways within the Newberg city limits, and ODOT access standards will apply on those roadways.**

Table 15.505.R. <u>Access</u> Spacing Standards

Roadway Functional Classification	Area[1]	Minimum Public Street Intersection Spacing (Feet)[2]	Driveway Setback from Intersecting Street[3]
Expressway	All	Refer to ODOT Access Spacing Standards	NA
Major Arterial	Urban CBD	Refer to ODOT Access Spacing Standards	
Minor Arterial	Urban CBD	500 200	150 100
Major Collector	All	400	150
Minor Collector	All	300	100

3. **Properties with Multiple Frontages. Where a property has frontage on more than one street, access shall be limited to the street with the lesser classification.**
4. **Driveways. More than one driveway is permitted on a lot accessed from either a minor collector or local street as long as there is at least 40 feet of lot frontage separating each driveway approach. More than one driveway is permitted on a lot accessed from a major collector as long as there is at least 100 feet of lot frontage separating each driveway approach.**
5. **Alley Access. Where a property has frontage on an alley and the only other frontages are on collector or arterial streets, access shall be taken from the alley only. The review body may allow creation of an alley for access to lots that do not otherwise have frontage on a public street provided all of the following are met:**
   a. **The review body finds that creating a public street frontage is not feasible.**
   b. **The alley access is for no more than six dwellings and no more than six lots.**
   c. **The alley has through access to streets on both ends.**
   d. **One additional parking space over those otherwise required is provided for each dwelling. Where feasible, this shall be provided as a public use parking space adjacent to the alley.**
6. **Closure of Existing Accesses. Existing accesses that are not used as part of development or redevelopment of a property shall be closed and replaced with curbing, sidewalks, and landscaping, as appropriate.**
7. **Shared Driveways.**
   a. **The number of driveways onto arterial streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The city shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes. Where there is an abutting developable property, a shared driveway shall be provided as appropriate. When shared driveways are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway temporarily ends at the property line, but may be accessed or extended in the future as the adjacent parcel develops. "Developable" means that a parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).**
   b. **Access easements (i.e., for the benefit of affected properties) and maintenance agreements shall be recorded for all shared driveways, including pathways, at the time of final plat approval or as a condition of site development approval.**

c. **No more than four lots may access one shared driveway.**
d. **Shared driveways shall be posted as no parking fire lanes where required by the fire marshal.**
e. **Where three lots or three dwellings share one driveway, one additional parking space over those otherwise required shall be provided for each dwelling. Where feasible, this shall be provided as a common use parking space adjacent to the driveway.**

8. **Frontage Streets and Alleys. The review body for a partition, subdivision, or design review may require construction of a frontage street to provide access to properties fronting an arterial or collector street.**
9. **ODOT or Yamhill County Right-of-Way. Where a property abuts an ODOT or Yamhill County right-of-way, the applicant for any development project shall obtain an access permit from ODOT or Yamhill County.**
10. **Exceptions. The director may allow exceptions to the access standards above in any of the following circumstances:**
    a. **Where existing and planned future development patterns or physical constraints, such as topography, parcel configuration, and similar conditions, prevent access in accordance with the above standards.**
    b. **Where the proposal is to relocate an existing access for existing development, where the relocated access is closer to conformance with the standards above and does not increase the type or volume of access.**
    c. **Where the proposed access results in safer access, less congestion, a better level of service, and more functional circulation, both on street and on site, than access otherwise allowed under these standards.**
11. **Where an exception is approved, the access shall be as safe and functional as practical in the particular circumstance. The director may require that the applicant submit a traffic study by a registered engineer to show the proposed access meets these criteria.**

Applicant's Facts and Findings: This application proposes one access on Highway 99W. All other driveway and intersection spacing standards are met, as demonstrated on the submitted public improvement plans.

This standard is met.

S. Public Walkways.

1. **Projects subject to Type II design review, partition, or subdivision approval may be required to provide public walkways where necessary for public safety and convenience, or where necessary to meet the standards of this code. Public walkways are meant to connect cul-de-sacs to adjacent areas, to pass through oddly shaped or unusually long blocks, to provide for networks of public paths according to adopted plans, or to provide access to schools, parks or other community destinations or public areas. Where practical, public walkway easements and locations may also be used to accommodate public utilities.**
2. **Public walkways shall be located within a public access easement that is a minimum of 15 feet in width.**

3. **A walk strip, not less than 10 feet in width, shall be paved in the center of all public walkway easements. Such paving shall conform to specifications in the Newberg public works design and construction standards.**
4. **Public walkways shall be designed to meet the Americans with Disabilities Act requirements.**
5. **Public walkways connecting one right-of-way to another shall be designed to provide as short and straight of a route as practical.**
6. **The developer of the public walkway may be required to provide a homeowners' association or similar entity to maintain the public walkway and associated improvements.**
7. **Lighting may be required for public walkways in excess of 250 feet in length.**
8. **The review body may modify these requirements where it finds that topographic, preexisting development, or similar constraints exist.**

Applicant's Facts and Findings: Public walkways are proposed to connect the multi-family resident to Highway 99W, throughout the wetland/natural areas, and connecting from the development to Spring Meadow Park to the west.

This standard is met.

T. Street Trees. Street trees shall be provided for all projects subject to Type II design review, partition, or subdivision. Street trees shall be installed in accordance with the provisions of NMC 15.420.010(B)(4).

Applicant's Facts and Findings: As indicated on the submitted landscaping plans, street trees are proposed on all streets.

This standard is met.

U. Street Lights. All developments shall include underground electric service, light standards, wiring and lamps for street lights according to the specifications and standards of the Newberg public works design and construction standards. The developer shall install all such facilities and make the necessary arrangements with the serving electric utility as approved by the city. Upon the city's acceptance of the public improvements associated with the development, the street lighting system, exclusive of utility-owned service lines, shall be and become property of the city unless otherwise designated by the city through agreement with a private utility.

Applicant's Facts and Findings: This proposal includes developer-installed underground electric service, light standards, wiring and lamps for street lights according to the specifications and standards of the Newberg public works design and construction standards.

This standard is met.

V. Transit Improvements. Development proposals for sites that include or are adjacent to existing or planned transit facilities, as shown in the Newberg transportation system plan or adopted local or regional transit plan, shall be required to provide any of the following, as applicable and required by the review authority:

1. **Reasonably direct pedestrian connections between the transit facility and building entrances of the site. For the purpose of this section, "reasonably direct" means a route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for users.**
2. **A transit passenger landing pad accessible to disabled persons.**
3. **An easement of dedication for a passenger shelter or bench if such facility is in an adopted plan.**
4. **Lighting at the transit facility.**

Applicant's Facts and Findings: There are no transit facilities within or adjacent to this site and, as such, this standard is not applicable.

15.505.040 Public utility standards.

A. Purpose. The purpose of this section is to provide adequate services and facilities appropriate to the scale and type of development.

B. Applicability. This section applies to all development where installation, extension or improvement of water, wastewater, or private utilities is required to serve the development or use of the subject property.

C. General Standards.

1. **The design and construction of all improvements within existing and proposed rights-of-way and easements, all improvements to be maintained by the city, and all improvements for which city approval is required shall conform to the Newberg public works design and construction standards and require a public improvements permit.**
2. **The location, design, installation and maintenance of all utility lines and facilities shall be carried out with minimum feasible disturbances of soil and site. Installation of all proposed public and private utilities shall be coordinated by the developer and be approved by the city to ensure the orderly extension of such utilities within public right-of-way and easements.**

D. Standards for Water Improvements. All development that has a need for water service shall install the facilities pursuant to the requirements of the city and all of the following standards. Installation of such facilities shall be coordinated with the extension or improvement of necessary wastewater and stormwater facilities, as applicable.

1. **All developments shall be required to be linked to existing water facilities adequately sized to serve their intended area by the construction of water distribution lines, reservoirs and pumping stations which connect to such water service facilities. All necessary easements required for the construction of these facilities shall be obtained by the developer and granted to the city pursuant to the requirements of the city.**
2. **Specific location, size and capacity of such facilities will be subject to the approval of the director with reference to the applicable water master plan. All water facilities shall conform with city pressure zones and shall be looped where necessary to provide adequate pressure and fire flows during peak demand at every point within the system in the development to which the water facilities will be connected. Installation costs shall remain entirely the developer's responsibility.**
3. **The design of the water facilities shall take into account provisions for the future extension beyond the development to serve adjacent properties, which, in the judgment of the city, cannot be feasibly served otherwise.**

4. **Design, construction and material standards shall be as specified by the director for the construction of such public water facilities in the city.**

E. Standards for Wastewater Improvements. All development that has a need for wastewater services shall install the facilities pursuant to the requirements of the city and all of the following standards. Installation of such facilities shall be coordinated with the extension or improvement of necessary water services and stormwater facilities, as applicable.

1. **All septic tank systems and on-site sewage systems are prohibited. Existing septic systems must be abandoned or removed in accordance with Yamhill County standards.**
2. **All properties shall be provided with gravity service to the city wastewater system, except for lots that have unique topographic or other natural features that make gravity wastewater extension impractical as determined by the director. Where gravity service is impractical, the developer shall provide all necessary pumps/lift stations and other improvements, as determined by the director.**
3. **All developments shall be required to be linked to existing wastewater collection facilities adequately sized to serve their intended area by the construction of wastewater lines which connect to existing adequately sized wastewater facilities. All necessary easements required for the construction of these facilities shall be obtained by the developer and granted to the city pursuant to the requirements of the city.**
4. **Specific location, size and capacity of wastewater facilities will be subject to the approval of the director with reference to the applicable wastewater master plan. All wastewater facilities shall be sized to provide adequate capacity during peak flows from the entire area potentially served by such facilities. Installation costs shall remain entirely the developer's responsibility.**
5. **Temporary wastewater service facilities, including pumping stations, will be permitted only if the director approves the temporary facilities, and the developer provides for all facilities that are necessary for transition to permanent facilities.**
6. **The design of the wastewater facilities shall take into account provisions for the future extension beyond the development to serve upstream properties, which, in the judgment of the city, cannot be feasibly served otherwise.**
7. **Design, construction and material standards shall be as specified by the director for the construction of such wastewater facilities in the city.**

F. Easements. Easements for public and private utilities shall be provided as deemed necessary by the city, special districts, and utility companies. Easements for special purpose uses shall be of a width deemed appropriate by the responsible agency. Such easements shall be recorded on easement forms approved by the city and designated on the final plat of all subdivisions and partitions. Minimum required easement width and locations are as provided in the Newberg public works design and construction standards.

Applicant's Facts and Findings:	The development will connect to public utilities, including water and sanitary sewer. As demonstrated on the submitted public improvement plans, all public utilities are designed to be constructed to City standards. This standard is met.

15.505.050 Stormwater system standards.

A. Purpose. The purpose of this section is to provide for the drainage of surface water from all development; to minimize erosion; and to reduce degradation of water quality due to sediments and pollutants in stormwater runoff.

B. Applicability. The provisions of this section apply to all developments subject to site development review or land division review and to the reconstruction or expansion of such developments that increases the flow or changes the point of discharge to the city stormwater system. Additionally, the provisions of this section shall apply to all drainage facilities that impact any public storm drain system, public right-of-way or public easement, including but not limited to off-street parking and loading areas.

C. General Requirement. All stormwater runoff shall be conveyed to a public storm wastewater or natural drainage channel having adequate capacity to carry the flow without overflowing or otherwise causing damage to public and/or private property. The developer shall pay all costs associated with designing and constructing the facilities necessary to meet this requirement.

D. Plan for Stormwater and Erosion Control. No construction of any facilities in a development included in subsection (B) of this section shall be permitted until an engineer registered in the State of Oregon prepares a stormwater report and erosion control plan for the project. This plan shall contain at a minimum:

1. **The methods to be used to minimize the amount of runoff, sedimentation, and pollution created from the development both during and after construction.**
2. **Plans for the construction of stormwater facilities and any other facilities that depict line sizes, profiles, construction specifications, and other such information as is necessary for the city to review the adequacy of the stormwater plans.**
3. **Design calculations shall be submitted for all drainage facilities. These drainage calculations shall be included in the stormwater report and shall be stamped by a licensed professional engineer in the State of Oregon. Peak design discharges shall be computed based upon the design criteria outlined in the public works design and construction standards for the city.**

E. Development Standards. Development subject to this section shall be planned, designed, constructed, and maintained in compliance with the Newberg public works design and construction standards.

Applicant's Facts and Findings: The submitted public improvement plans include details of the proposed stormwater detention and treatment plan. The stormwater detention and treatment plan is designed to meet City standards and to preclude stormwater drainage on surrounding properties.

This standard is met.

SUMMARY AND CONCLUSION

Based upon the materials submitted herein, the Applicant respectfully requests approval from the City's Planning Commission of this application for a Planned Unit Development and a Conditional Use Permit.

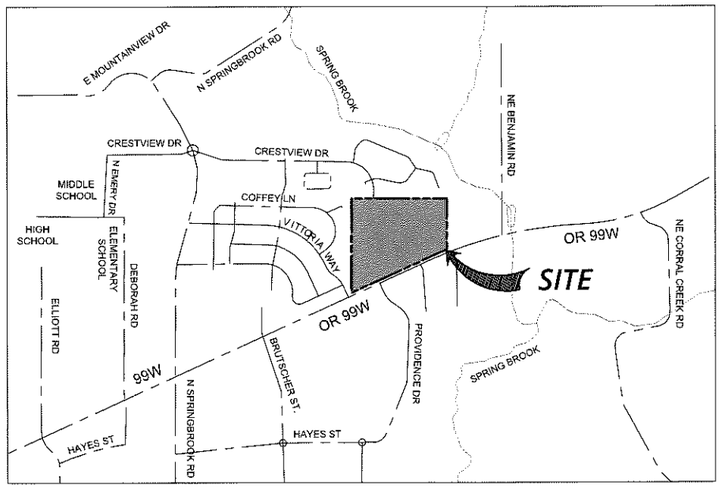
LAND USE DOCUMENTS

FOR

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

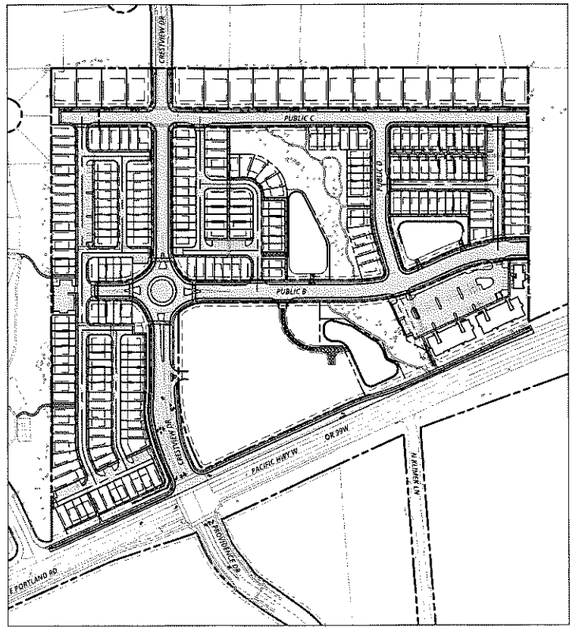
PREPARED FOR

JT SMITH COMPANIES



VICINITY MAP

NOT TO SCALE



SITE MAP

SCALE: 1" = 200'

0 200 400

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
C000	COVER SHEET
C100	EXISTING CONDITIONS PLAN
C110	TREE REMOVAL AND PRESERVATION PLAN
C120	1200C COVER SHEET
C121	1200C CLEARING AND DEMOLITION ESCP I
C122	1200C GRADING AND STREET CONSTRUCTION ESCP I
C123	1200C DETAILS I
C124	1200C DETAILS II
C150	OVERALL TENTATIVE PLAT
C151	TENTATIVE PLAT I
C152	TENTATIVE PLAT II
C153	TENTATIVE PLAT III
C154	TENTATIVE PLAT IV
C200	TYPICAL SECTIONS I
C201	TYPICAL SECTIONS II
C210	OVERALL SITE PLAN
C215	MULTI-FAMILY SITE PLAN
C218	MULTI-FAMILY GRADING PLAN
C220	ACCESS, PARKING, AND CIRCULATION PLAN
C230	FIRE ACCESS PLAN
C290	PHOTOMETRICS PLAN
C291	MULTI-FAMILY PHOTOMETRICS PLAN
C300	COMPOSITE UTILITY PLAN
C301	OFFSITE SEWER CONNECTION
C302	PRELIMINARY STREET LIGHT CONDUIT ROUTING PLAN
C303	MULTI-FAMILY COMPOSITE UTILITY PLAN
LS 1.0	LS 1.0 STREET TREE PLAN
LS 1.1	LS 1.1 PLANTING PLAN
LS 1.2	LS 1.2 PLANTING PLAN
LS 1.3	LS 1.3 PLANTING PLAN
LS 1.4	LS 1.4 PLANTING PLAN

SITE INFORMATION

SITE ADDRESS
4505 E PORTLAND RD
NEWBERG, OR 97132

TAX LOT(S)
3S2W16 13800, 1100

FLOOD HAZARD
MAP NUMBER: 41071C0241D AND 41071C0235D ZONE X (UNSHADED)

JURISDICTION
CITY OF NEWBURG

ZONING
R-1, R-2, AND C-2

GROSS SITE AREA
33.13 ACRES

UTILITIES & SERVICES

STORM, SEWER
CITY OF NEWBERG

WATER
CITY OF NEWBERG

POWER
PGE

GAS
NORTHWEST NATURAL GAS

CABLE
COMCAST, VERIZON

FIRE
TUALATIN VALLEY FIRE & RESCUE

SCHOOLS
NEWBERG OREGON SCHOOL DISTRICT

PARKS
CHEHALEM

POLICE
NEWBERG POLICE DEPARTMENT

ROADS
CITY OF NEWBERG, ODOT

PROJECT TEAM

OWNER/APPLICANT
JT SMITH COMPANIES
5285 MEADOWS ROAD, SUITE 171
LAKE OSWEGO, OR 97035
CONTACT: JESSE NEMEC
PHONE: (503) 730-8620
EMAIL: jnemec@jtsmithco.com

CIVIL ENGINEER
3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ASHLEY SEAL, PE
PHONE: (503) 946-9365
EMAIL: ashley.seal@3j-consulting.com

PLANNING CONSULTANT
3J CONSULTING, INC
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ANDREW TULL
PHONE: (503) 946-9365
EMAIL: andrew.tull@3j-consulting.com

LANDSCAPE ARCHITECT
CARDNO, INC.
6720 SW MACADAM AVE, SUITE 200
PORTLAND, OR 97219
CONTACT: ANDREW HILL
PHONE: (503) 419-2500
EMAIL: andrew.hill@cardno.com

TAX LOTS 13800 AND 01100 LOCATED IN THE NE 1/4 OF SECTION 16, T.3S., R.2W., W.M. CITY OF NEWBURG, YAMHILL COUNTY, OREGON

ALL WORK PERFORMED SHALL CONFORM TO ALL STANDARD SPECIFICATIONS FOUND WITHIN THE LATEST VERSION OF THE CITY OF NEWBURG'S PUBLIC WORKS DESIGN AND CONSTRUCTION STANDARDS.

811 Know what's below. Call before you dig.

REGISTERED PROFESSIONAL ENGINEER 87782PE OREGON JULY 14, 2017 ASHLEY ROCHELLE SEAL EXPIRES: 06/30/20

PRELIMINARY

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

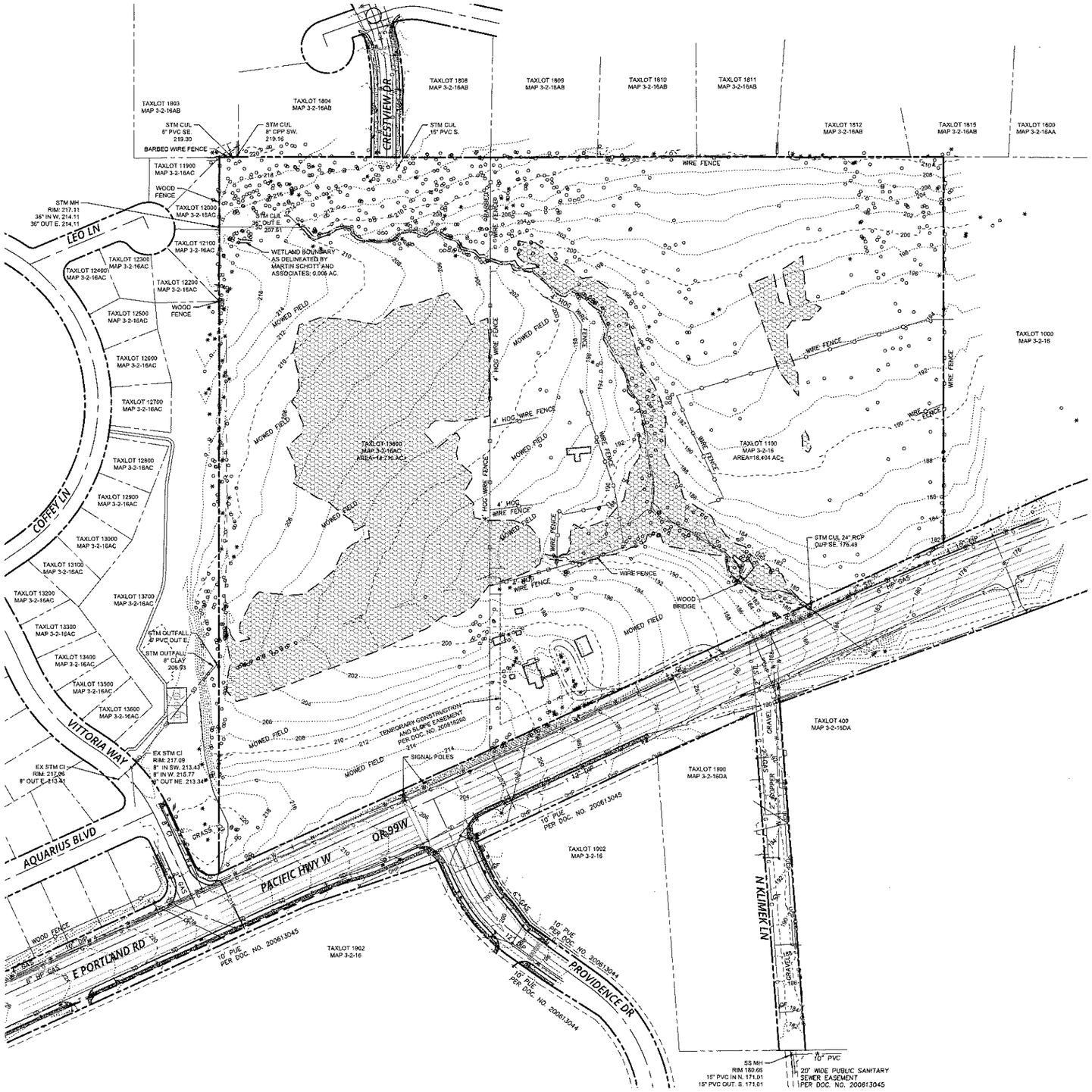
COVER SHEET
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C000

P:\17393-JTS CRESTVIEW CROSSING\DGN\CADD\DC000 COVER SHEET.DWG



EXISTING LEGEND

- EXISTING BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- RIGHT-OF-WAY CENTERLINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING CONCRETE
- EXISTING WETLAND
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING: WHITE
- EXISTING STRIPING: YELLOW
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD POWER
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATER MAIN
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING INTERSECTION SIGNAL
- EXISTING MAILBOX
- EXISTING LIGHTPOLE
- EXISTING UTILITY POLE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING POWER METER
- EXISTING GAS METER
- EXISTING TELEPHONE PEDESTAL

SURVEYOR'S NOTES:

1. WETLAND BOUNDARIES SHOWN WERE DELINEATED BY MARTIN SCHOTT AND ASSOCIATES AND WERE SURVEYED BY AKS ENGINEERING AND FORESTRY, LLC. THE WEEK OF 03/11/13 TO 03/14/13. FIELD WORK WAS CONDUCTED 03/07/13 TO 03/14/13.
2. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS PER UTILITY LOCATE TICKET NUMBERS 13163881 AND 14165137. THERE IS NO GUARANTEE THAT THE UNDERGROUND LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
3. FIELD WORK WAS CONDUCTED 08/06/13 TO 08/12/13 AND 07/07/14 TO 07/18/14.
4. DATUM: CITY OF NEWBERG (ESTABLISHED OCTOBER OF 1984 AND REVISED IN 2001)
   BM NO. 111 ELEVATION = 230.11 (NGVD 29)
   BENCHMARK LOCATION: BRASS DISK IN THE TOP OF CURB, CENTER OF THE NORTHEAST CURB RETURN AT THE CORNER OF AQUARIUS BLVD. AND MADRONNA DRIVE.
5. CONTOUR INTERVAL IS 2 FEET.

EXISTING CONDITIONS PLAN

THIS PLAN HAS BEEN PREPARED FOR ILLUSTRATIVE PURPOSES ONLY. SITE BACKGROUND INFORMATION AND FEATURES HAVE BEEN GENERATED FROM A COMBINATION OF SITE SURVEY FROM AKS ENGINEERING (SENT 07-07-2017), PUBLIC GIS DATA SOURCES, AERIAL PHOTOS, TAX ASSESSOR MAPS AND PHYSICAL SITE OBSERVATIONS. PROPOSED SITE FEATURES ARE PRELIMINARY IN NATURE AND SUBJECT TO CHANGE. NO WARRANTY OR GUARANTEE IS EXPRESSED OR IMPLIED.

ZONE X (UN-SHADED) THE SITE IS LOCATED WITHIN ZONE X (UN-SHADED) PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER **41071C0241D AND 41071C0235D** FEMA'S DEFINITION OF ZONE X (UN-SHADED) IS AN AREA OF MINIMAL FLOOD HAZARD, USUALLY DEPICTED ON FIRMS AS ABOVE THE 500-YEAR FLOOD LEVEL. ZONE X IS THE AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD AND PROTECTED BY LEVEE FROM 100-YEAR FLOOD. IN COMMUNITIES THAT PARTICIPATE IN THE NFIP, FLOOD INSURANCE IS AVAILABLE TO ALL PROPERTY OWNERS AND RENTERS IN THESE ZONES.

GENERAL NOTES:

WETLAND BOUNDARY DELINEATED BY MARTIN SCHOTT AND ASSOCIATES; SURVEYED BY AKS WEEK OF 3/11/13 - 3/14/13

Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER
87752PE
OREGON
JULY 14, 1987
BRENT ROCHELLE SIMMONS
EXPIRES: 06/30/20

PRELIMINARY

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

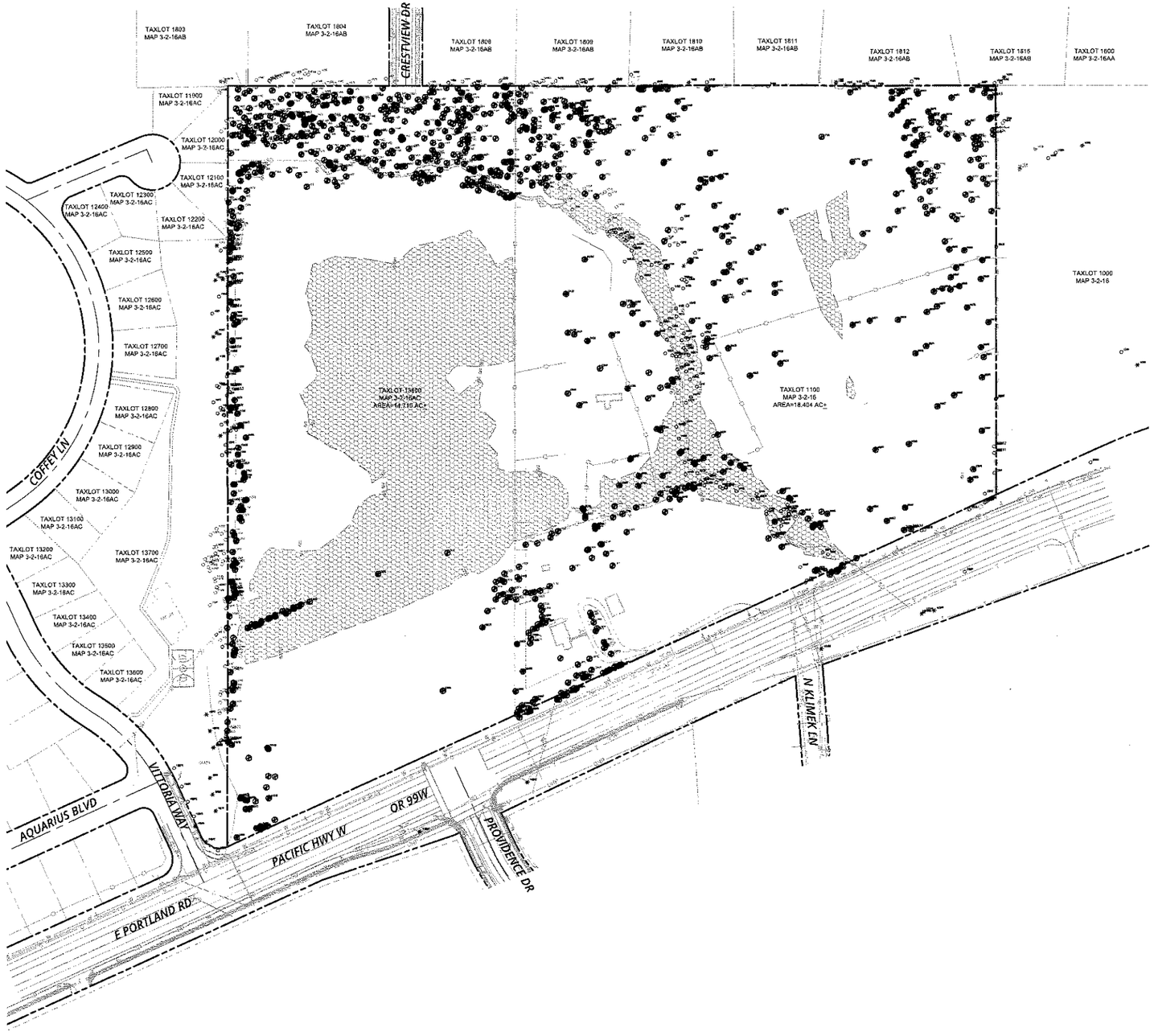
EXISTING CONDITIONS PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C100

P:\17393-JTS-CRESTVIEW CROSSING\CAD\CDVC100 EXISTING CONDITIONS AND DEMOLITION PLAN.DWG



LEGEND

- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- TREE TO BE REMOVED (848 TOTAL)

GENERAL TREE INVENTORY STATISTICS

TOTAL TREE INVENTORY (IN PROJECT LIMITS):	1,042 EA
TOTAL TREES RETAINED:	119 EA
TOTAL TREES REMOVED:	923 EA

N
W E
S

SCALE: 1" = 100'
0 100' 200'

811 Know what's below. Call before you dig.

REGISTERED PROFESSIONAL ENGINEER
87762PE
OREGON
JULY 14, 2017
PRELIMINARY
JESSY ROCHELLE SEAL
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TREE REMOVAL AND PRESERVATION PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION

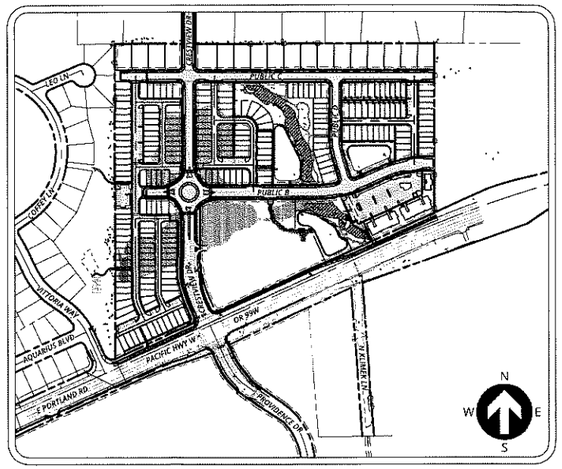
3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C110

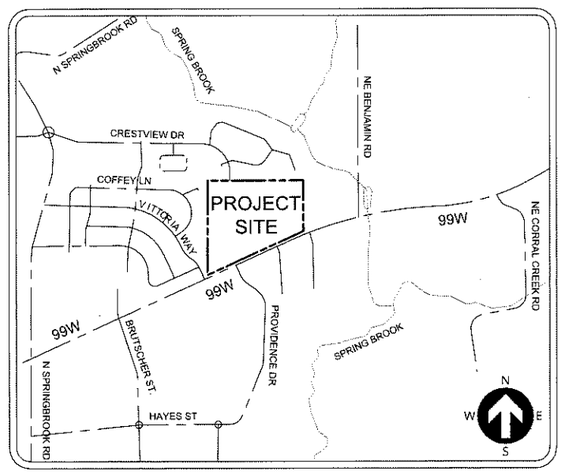
P:\17393-JTS-CRESTVIEW CROSSING\DOC\DOC\110 TREE REMOVAL AND PRESERVATION PLAN.DWG

CRESTVIEW CROSSING SUBDIVISION

EROSION AND SEDIMENT CONTROL PLAN (ESCP) COVER SHEET



SITE MAP
SCALE: 1" = 300'



VICINITY MAP
SCALE: N.T.S.

INSPECTION FREQUENCY:

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING RUNOFF FROM SNOW MELT, IS OCCURRING. AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS REGARDLESS OF WHETHER STORMWATER RUNOFF IS OCCURRING.
2. PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY.	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURES ARE IN WORKING ORDER. ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE.
3. INACTIVE PERIODS GREATER THAN FOURTEEN (14) CONSECUTIVE CALENDAR DAYS.	ONCE EVERY MONTH.
4. PERIODS DURING WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER.	IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION.
5. PERIODS DURING WHICH DISCHARGE IS UNLIKELY DUE TO FROZEN CONDITIONS.	MONTHLY. RESUME MONITORING IMMEDIATELY UPON MELT, OR WHEN WEATHER CONDITIONS MAKE DISCHARGES LIKELY.

ATTENTION EXCAVATORS:

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 503-246-6999.

811 Know what's below. Call before you dig.

PROPERTY DESCRIPTION:

TAX LOTS 13800 AND 01100 LOCATED IN THE
NE 1/4 OF SECTION 16, T.3S., R.2W., W.M.
CITY OF NEWBURG, YAMHILL COUNTY, OREGON

PROJECT LOCATION:

NEAR THE WASHINGTON COUNTY BENCHMARK #59, EL. 145.876,
WASHINGTON COUNTY, OREGON
LATITUDE = 45°29'29.53" N, LONGITUDE = 122°55'58.33" W

OWNER/APPLICANT

JT SMITH COMPANIES
5285 MEADOWS ROAD, SUITE 171
LAKE OSWEGO, OR 97035
CONTACT: JESSE NEMEC
PHONE: (503) 730-8620
EMAIL: jnemec@jtsmithco.com

PLANNING CONSULTANT

3J CONSULTING, INC
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ANDREW TULL
PHONE: (503) 946-9365
EMAIL: andrew.tull@3j-consulting.com

CIVIL ENGINEER

3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ASHLEY SEAL, PE
PHONE: (503) 946-9365
EMAIL: ashley.seal@3j-consulting.com

LANDSCAPE ARCHITECT

CARDNO, INC.
5720 SW MACADAM AVE, SUITE 200
PORTLAND, OR 97219
CONTACT: ANDREW HILL
PHONE: (503) 419-2500
EMAIL: andrew.hill@cardno.com

NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS

ONE HOUSE WITH ACCESSORY STRUCTURES. REMAINDER OF SITE CONSISTS OF WETLANDS AND GRASSY FIELD, WITH SCATTERED TREES.

DEVELOPED CONDITIONS

SUBDIVIDE INTO 4.20 ACRE COMMERCIAL SPACE, 2 APARTMENT BUILDINGS WITH 48 TOTAL UNITS, 230 HIGH DENSITY LOTS AND 18 SINGLE FAMILY HOME LOTS.

NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE

* CLEARING (JUNE 2019)
* MASS GRADING (JUNE-JULY 2019)
* UTILITY INSTALLATION (AUGUST-SEPTEMBER 2019)
* STREET CONSTRUCTION (MAY 2020)
* FINAL STABILIZATION (JUNE 2020)

TOTAL ON-SITE AREA = 1,442,521 SF = 33.13 ACRES

TOTAL OFF-SITE AREA = 50,990 SF = 1.17 ACRES

TOTAL AREA = 1,493,511 SF = 34.30 ACRES

SITE SOIL CLASSIFICATION:

* AMITY SILT LOAM, 0-3% SLOPE - 51.1%
* WOODBURN SILT LOAM, 0-3% SLOPE - 21.7%
* WOODBURN SILT LOAM, 3-12% SLOPE - 26.5%
* WOODBURN SILT LOAM, 12-20% SLOPE - 0.8%

ON-SITE SOILS HAVE A MODERATE TO HIGH EROSION POTENTIAL. ALL FILL MATERIAL SHALL BE GENERATED ON-SITE FROM GRADING EXCAVATION AND UTILITY TRENCH SPOILS.

RECEIVING WATER BODIES:

NEAREST WATER BODY: SPRING BROOK, A PART OF THE WILLAMETTE RIVER BASIN.

SITE IS ZONE X (UNSHADED) PER FEMA FIRM MAP NUMBER: 41071C0241D AND 41071C0235D. NO ELEVATED FLOOD RISK.

STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES:

1. HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS. (SCHEDULE A.8.C.I.(3))
2. ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS. (SCHEDULE A.12.B AND SCHEDULE B.1)
3. INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS. (SCHEDULE B.1.C AND B.2)
4. RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, THE ABOVE RECORDS MUST BE RETAINED BY THE PERMIT REGISTRANT BUT DO NOT NEED TO BE AT THE CONSTRUCTION SITE. (SCHEDULE B.2.C)
5. ALL PERMIT REGISTRANTS MUST IMPLEMENT THE ESCP. FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT. (SCHEDULE A.8.A)
6. THE ESCP MUST BE ACCURATE AND REFLECT SITE CONDITIONS. (SCHEDULE A.12.C.I)
7. SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS. SUBMIT ALL NECESSARY REVISION TO DEQ OR AGENT WITHIN 10 DAYS. (SCHEDULE A.12.C.IV. AND V)
8. PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION. (SCHEDULE A.7.A.III)
9. IDENTIFY, MARK, AND PROTECT (BY CONSTRUCTION FENCING OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS. (SCHEDULE A.8.C.I.(1) AND (2))
10. PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED. (SCHEDULE A.7.A.V)
11. MAINTAIN AND DELINEATE ANY EXISTING NATURAL BUFFER WITHIN THE 50-FEET OF WATERS OF THE STATE. (SCHEDULE A.7.B.I.AND (2(A)(B))
12. INSTALL PERIMETER SEDIMENT CONTROL, INCLUDING STORM DRAIN INLET PROTECTION AS WELL AS ALL SEDIMENT BASINS, TRAPS, AND BARRIERS PRIOR TO LAND DISTURBANCE. (SCHEDULE A.8.C.I.(5))
13. CONTROL BOTH PEAK FLOW RATES AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS AND DOWNSTREAM CHANNELS AND STREAMBANKS. (SCHEDULE A.7.C)
14. CONTROL SEDIMENT AS NEEDED ALONG THE SITE PERIMETER AND AT ALL OPERATIONAL INTERNAL STORM DRAIN INLETS AT ALL TIMES DURING CONSTRUCTION, BOTH INTERNALLY AND AT THE SITE BOUNDARY. (SCHEDULE A.7.D.I)
15. ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK. (SCHEDULE A.8.C.I.(6))
16. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES. TEMPORARY OR PERMANENT STABILIZATIONS MEASURES ARE NOT REQUIRED FOR AREAS THAT ARE INTENDED TO BE LEFT UNVEGETATED, SUCH AS DIRT ACCESS ROADS OR UTILITY POLE PADS.(SCHEDULE A.8.C.II.(3))
17. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS. (SCHEDULE A.8.C.I.(7))
18. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPS SUCH AS: CONSTRUCTION ENTRANCE, GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES. (SCHEDULE A.7.D.II AND A.8.C.II(4))
19. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE. (SCHEDULE A.7.D.II.(5))
20. CONTROL PROHIBITED DISCHARGES FROM LEAVING THE CONSTRUCTION SITE, I.E., CONCRETE WASH-OUT, WASTEWATER FROM CLEANOUT OF STUCCO, PAINT AND CURING COMPOUNDS. (SCHEDULE A.6)
21. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS; VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, FERTILIZER, PESTICIDES AND HERBICIDES, PAINTS, SOLVENTS, CURING COMPOUNDS AND ADHESIVES FROM CONSTRUCTION OPERATIONS. (SCHEDULE A.7.E.I.(2))
22. IMPLEMENT THE FOLLOWING BMPS WHEN APPLICABLE: WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES. (SCHEDULE A. 7.E.III.)
23. USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOIL. (SCHEDULE A 7.A.IV)
24. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE. (SCHEDULE A.9.B.III)
25. IF AN ACTIVE TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS. (SCHEDULE A.9.D)
26. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR. (SCHEDULE A.7.B)
27. AS NEEDED BASED ON WEATHER CONDITIONS, AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPS MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS. (SCHEDULE A.7.E.II.(2))
28. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND BARE GROUND ACTIVITIES DURING WET WEATHER. (SCHEDULE A.7.A.II)
29. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL. (SCHEDULE A.9.C.I)
30. OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT AND BEFORE BMP REMOVAL.(SCHEDULE A.9.C.I)
31. CATCH BASINS: CLEAN BEFORE RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AND AT COMPLETION OF PROJECT. (SCHEDULE A.9.C.III& IV)
32. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN-UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMEFRAME. (SCHEDULE A.9.B.I)
33. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS. (SCHEDULE A.9.B.II)
34. THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE. (SCHEDULE A.7.F.I)
35. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE. (SCHEDULE A.7.F.II)
36. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED, ALL TEMPORARY EROSION CONTROLS AND RETAINED SOILS MUST BE REMOVED AND DISPOSED OF PROPERLY, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. (SCHEDULE A.8.C.III(1) AND D.3.C.II AND III)

LOCAL AGENCY (CITY OF NEWBERG) SPECIFIC EROSION CONTROL NOTES:

1. THE IMPLEMENTATION OF THIS ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED, APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
2. THE ESC PLAN, ANY REVISIONS, AND INSPECTION LOGS SHALL BE KEPT ONSITE AT ALL TIMES.
3. THE ESC MEASURES SHOWN ON THE PLAN ARE THE MINIMUM REQUIREMENTS FOR THE PROJECT SITE AND SHALL BE UPGRADED AS NEEDED TO MAINTAIN COMPLIANCE WITH ALL REGULATIONS.
4. SEDIMENT MUST BE REMOVED FROM SUMPED STRUCTURES WHEN THE SEDIMENT RETENTION
5. CAPACITY HAS BEEN REDUCED BY 1/3RD AND WITHIN 30 DAYS OF PROJECT COMPLETION.
6. TOXIC AND HAZARDOUS MATERIALS MUST ALSO HAVE SECONDARY CONTAINMENT.
7. PAVING ACTIVITIES SHALL BE MINIMIZED BETWEEN OCTOBER 1ST AND MAY 31ST OF THE FOLLOWING YEAR TO AVOID POTENTIAL DISCHARGE OF PAVING CHEMICALS INTO THE STORM DRAINS, STREETS, WATERCOURSES, OR SENSITIVE AREAS.
8. ALL ESC MEASURES SHALL BE REMOVED FROM THE SITE 30 DAYS AFTER CONSTRUCTION IS COMPLETED AND APPROVED BY THE CITY.

THE PERMITTEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200C PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200C PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THIS PLAN.

BMP MATRIX FOR CONSTRUCTION PHASES

REFER TO DEQ GUIDANCE MANUAL FOR A COMPREHENSIVE LIST OF AVAILABLE BMP'S.

	CLEARING	MASS GRADING	UTILITY INSTALLATION	STREET CONSTRUCTION	FINAL STABILIZATION	WET WEATHER (OCT. 1 - MAY 31ST)
EROSION PREVENTION						
PRESERVE NATURAL VEGETATION	**X	X	X	X	X	X
GROUND COVER					X	X
HYDRAULIC APPLICATIONS					X	
PLASTIC SHEETING						X
MATTING					X	X
DUST CONTROL	X	X	X	X	X	X
TEMPORARY/PERMANENT SEEDING					X	X
BUFFER ZONE						
OTHER:						
SEDIMENT CONTROL						
SEDIMENT FENCE (PERIMETER)	**X	X	X	X	X	X
SEDIMENT FENCE (INTERIOR)			X	X	X	X
STRAW WATTLES						
FILTER BERM						
INLET PROTECTION	**X	X	X	X	X	X
DEWATERING						
SEDIMENT TRAP						
NATURAL BUFFER ENCROACHMENT	*X	*X	*X	*X	*X	*X
OTHER:						
RUN OFF CONTROL						
CONSTRUCTION ENTRANCE	**X	X	X	X	X	
WHEEL WASH	**X	X	X	X	X	
PIPE SLOPE DRAIN						
OUTLET PROTECTION		X	X	X	X	
SURFACE ROUGHENING						
CHECK DAMS	**X	X	X	X	X	
OTHER:						
POLLUTION PREVENTION						
PROPER SIGNAGE	X	X	X	X	X	X
HAZ WASTE MGMT	X	X	X	X	X	X
SPILL KIT ON-SITE	X	X	X	X	X	X
CONCRETE WASHOUT AREA	X	X	X	X	X	X
OTHER:						

* SIGNIFIES ADDITIONAL BMP'S REQUIRED FOR WORK WITHIN 50' OF WATER OF THE STATE.
** SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY.

RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ's GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMP's WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS. AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

INITIAL

PERMITTEE'S SITE INSPECTOR:

COMPANY/AGENCY: Sevin Simpson, 3J Consulting
PHONE: (503) 946.9365 x229 - WORK
(541) 508.9159 - CELL
E-MAIL: sevin.simpson@3j-consulting.com
DESCRIPTION OF EXPERIENCE: ATTENDED A TWO-DAY TRAINING COURSE ON THE PRINCIPLES AND PRACTICES OF EROSION CONTROL
CESCL #ECO-3-4131801

SHEET INDEX

EROSION AND SEDIMENT CONTROL PLANS

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON JULY 14, 2017 ASHLEY ROCHELLE SEAL
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

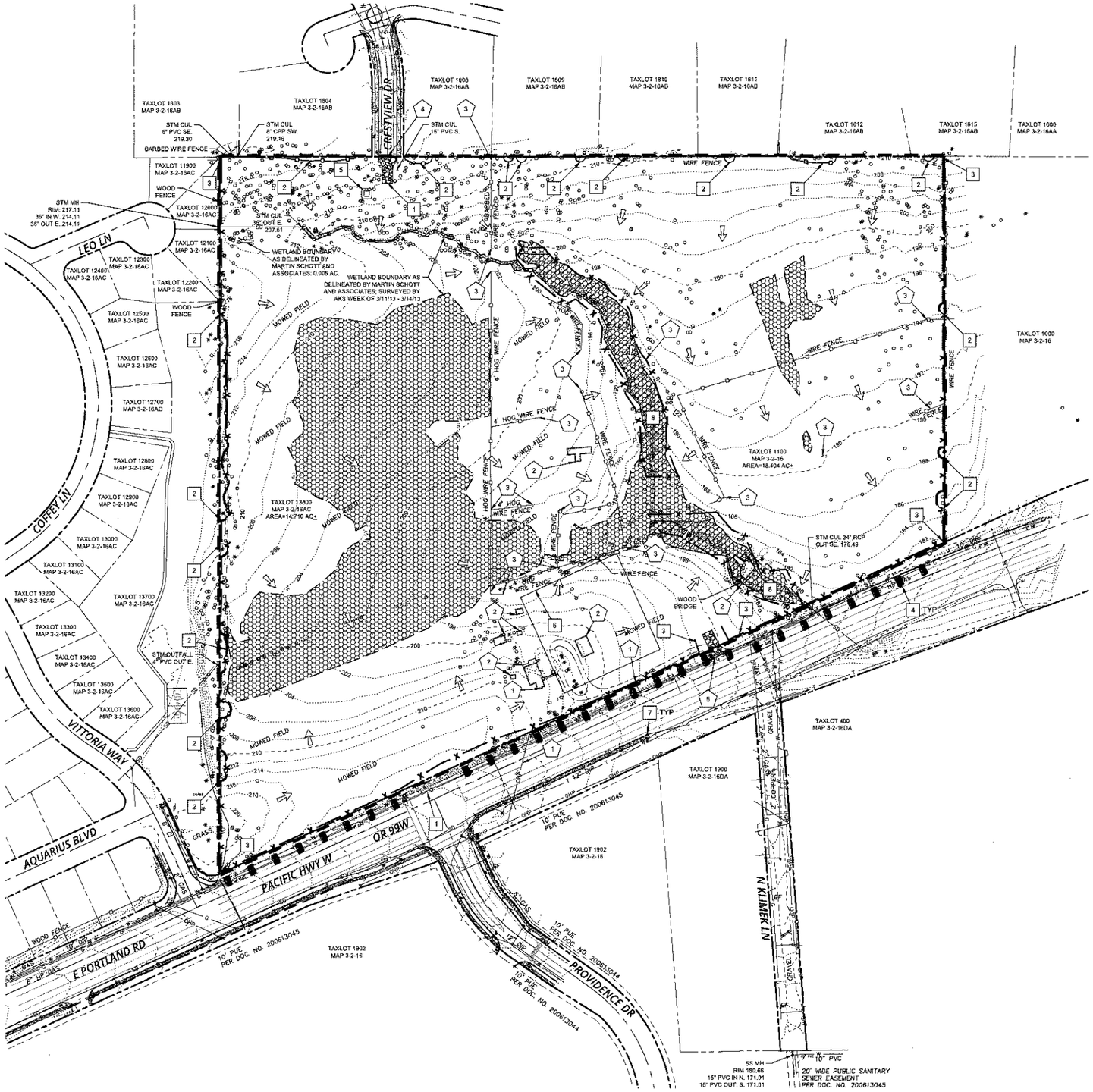
1200C COVER SHEET
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C120

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DOC\120 1200C SET.DWG



EROSION CONTROL KEY NOTES

1. CONSTRUCT CONSTRUCTION ENTRANCE PER NEWBERG STANDARD DRAWING 601 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
2. INSTALL TREE PROTECTION FENCING PER DETAIL T-1 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION. ALL RELOCATION OF TREE PROTECTION FENCING AND WORK WITHIN THE STANDARD TREE PROTECTION ZONE SHALL BE PERFORMED UNDER THE SUPERVISION OF AN ARBORIST OR THE CITY'S URBAN FORESTER. FENCING SHALL BE REPLACED TO 5' BEYOND THE TREE DRIPLINE ONCE WORK WITHIN THE TREE PROTECTION ZONE IS COMPLETED.
3. INSTALL SILT FENCING PER NEWBERG STANDARD DRAWING 602 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
4. INSTALL BIO-FILTER BAG CHECK DAMS AT 50' O.C. SPACING PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
5. CONSTRUCT CONCRETE WASHOUT BASIN PER NEWBERG STANDARD DRAWING 607 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION.
6. PROVIDE CONSTRUCTION STAGING AND PARKING AREA FOR SITE ACCESS MANAGEMENT AND JOBSITE ADMINISTRATION.
7. INSTALL INLET PROTECTION PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.

DEMOLITION KEY NOTES

1. SHUT OFF, DISCONNECT, AND REMOVE UTILITY LINES AND DISPOSE OFF-SITE.
2. REMOVE EXISTING STRUCTURE AND FOUNDATION AND DISPOSE OFF-SITE AFTER ALL UTILITY LINES ARE PROPERLY SHUT OFF AND DISCONNECTED.
3. REMOVE EXISTING FENCING AND ASSOCIATED APPURTENANCES AND DISPOSE OFF-SITE.
4. SAWCUT AND REMOVE LAST 2' OF AC AT TIME OF ROAD CONSTRUCTION, AND DISPOSE OFF-SITE.
5. REMOVE EXISTING CULVERT AND ENTRANCE, CLEAR DITCH OF DEBRIS, AND DISPOSE OFF-SITE.

GENERAL DEMOLITION NOTES

1. SEE TREE REMOVAL AND PRESERVATION PLAN (SHEET C110) FOR ALL TREE REMOVAL INFORMATION.
2. SEE GEOTECHNICAL REPORT FOR SURFACE GRUBBING AND STRIPPING INFORMATION.
3. NO UNAUTHORIZED GROUND DISTURBANCE MAY OCCUR WITHIN VEGETATED CORRIDOR AND SENSITIVE AREA.

PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.
3. SENSITIVE RESOURCES INCLUDING, BUT NOT LIMITED TO, TREES, WETLANDS, AND RIPARIAN PROTECTION AREAS SHALL BE CLEARLY DELINEATED WITH ORANGE CONSTRUCTION FENCING OR CHAIN LINK FENCING IN A MANNER THAT IS CLEARLY VISIBLE TO ANYONE IN THE AREA. NO ACTIVITIES ARE PERMITTED TO OCCUR BEYOND THE CONSTRUCTION BARRIER.
4. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, STREET SWEEPING, AND VACUUMING, MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
5. RUN-ON AND RUN-OFF CONTROLS SHALL BE IN PLACE AND FUNCTIONING PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES. RUN-ON AND RUN-OFF CONTROL MEASURES INCLUDE: SLOPE DRAINS (WITH OUTLET PROTECTION), CHECK DAMS, SURFACE ROUGHENING, AND BANK STABILIZATION.

GENERAL EROSION CONTROL NOTES

1. THESE EROSION AND SEDIMENT CONTROL PLANS ASSUME "DRY WEATHER" CONSTRUCTION. "WET WEATHER" CONSTRUCTION MEASURES SHALL BE APPLIED BETWEEN OCTOBER 1ST AND MAY 31ST.

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED SILT FENCING
- PROPOSED TREE PROTECTING FENCING
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED INLET PROTECTION
- PROPOSED BIO BAG CHECK DAM
- EXISTING SURFACE RUN-OFF FLOW ARROW
- PROPOSED LIMITS OF DISTURBANCE
- WETLAND TO REMAIN

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON JULY 14, 1987 ASHLEY ROCHELLE SIALL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

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1200C CLEARING AND DEMOLITION ESCP I

CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
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5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

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3J PROJECT #	17393
TAX LOT(S)	3S2W1S 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C121

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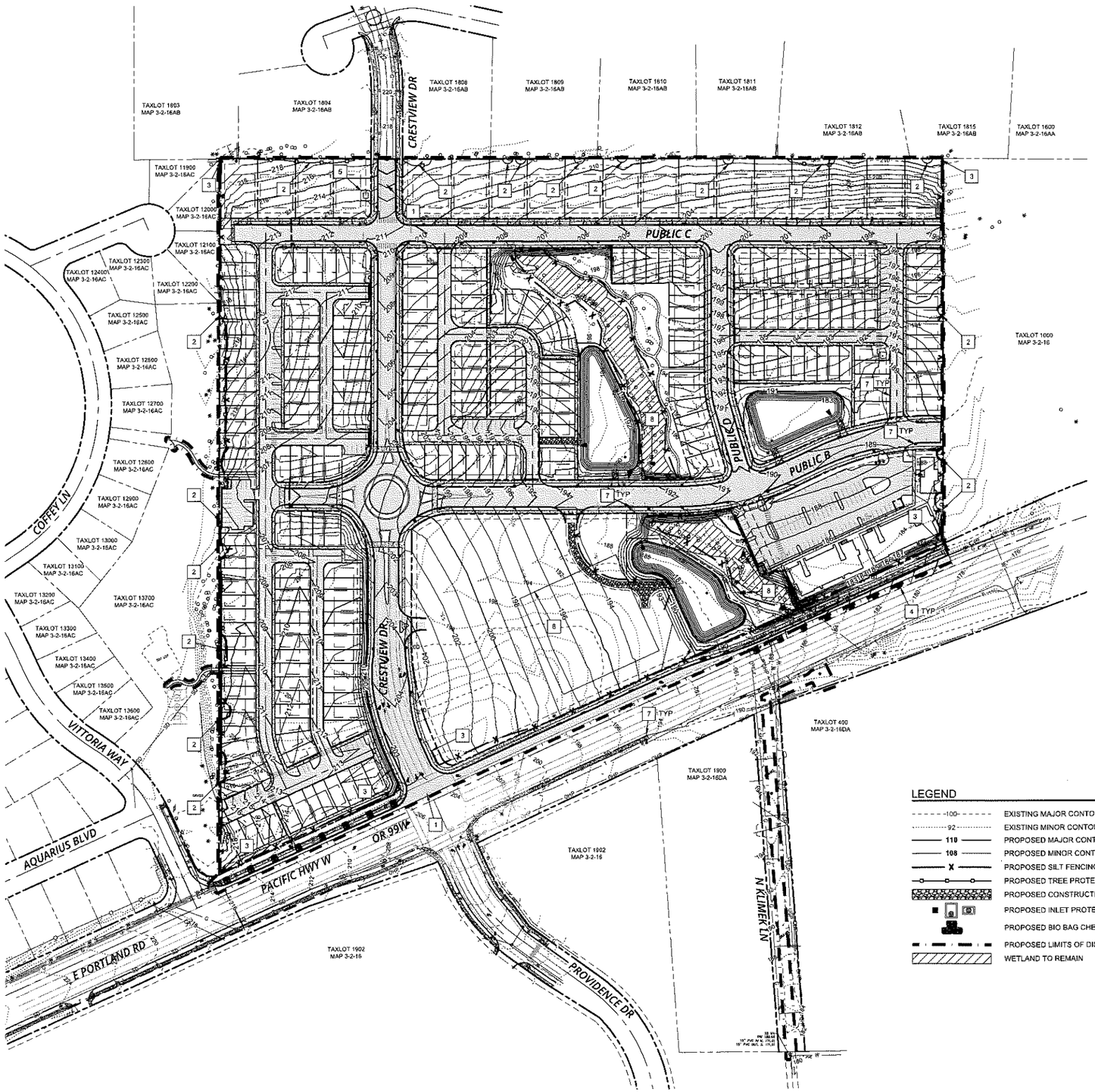

EROSION CONTROL KEY NOTES

1. INSTALL CONSTRUCTION ENTRANCE PER NEWBERG STANDARD DRAWING 601 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
2. INSTALL TREE PROTECTION FENCING PER DETAIL T-1 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION. ALL RELOCATION OF TREE PROTECTION FENCING AND WORK WITHIN THE STANDARD TREE PROTECTION ZONE SHALL BE PERFORMED UNDER THE SUPERVISION OF AN ARBORIST OR THE CITY'S URBAN FORESTER. FENCING SHALL BE REPLACED TO 5' BEYOND THE TREE DRIPLINE ONCE WORK WITHIN THE TREE PROTECTION ZONE IS COMPLETED.
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7. INSTALL INLET PROTECTION PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
8. INSTALL OUTLET PROTECTION PER NEWBERG STANDARD DRAWING 606 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.

GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES:

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES. UNLESS OTHERWISE AUTHORIZED:
   - A. VEGETATED CORRIDOR AREAS REQUIRE NATIVE SEED MIXES. SEE RESTORATION PLAN FOR APPROPRIATE SEED MIX.
   - B. DWARF GRASS MIX (MIN. 100 LB./AC.)
     1. DWARF PERENNIAL RYEGRASS (80% BY WEIGHT)
     2. CREEPING RED FESCUE (20% BY WEIGHT)
   - C. STANDARD HEIGHT GRASS MIX (MIN. 100LB./AC.)
     1. ANNUAL RYEGRASS (40% BY WEIGHT)
     2. TURF-TYPE FESCUE (60% BY WEIGHT)
2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.
4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.
5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
13. AVOID PAVING IN WET WEATHER WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.
14. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.
16. SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1ST FOR EACH PHASE OF CONSTRUCTION.

EROSION AND SEDIMENT CONTROL BMP IMPLEMENTATION

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. UTILIZATION OF STOCK PILE AREAS SHOULD TRANSITION FROM PRIMARY STOCK PILE AREA TO SECONDARY STOCK PILE AREAS ACCORDING TO CUT AND FILL ACTIVITY.
3. ALL SEDIMENT BARRIERS (TO BE INSTALLED AFTER GRADING) SHALL BE INSTALLED IMMEDIATELY FOLLOWING ESTABLISHMENT OF FINISHED GRADE AS SHOWN ON THESE PLANS.
4. LONG TERM SLOPE STABILIZATION MEASURES "INCLUDING MATTING" SHALL BE IN PLACE OVER ALL EXPOSED SOILS BY OCTOBER 1.
5. THE STORM WATER FACILITY SHALL BE CONSTRUCTED AND LANDSCAPED PRIOR TO THE STORM WATER SYSTEM FUNCTIONING AND SITE PACING.
6. INLET PROTECTION SHALL BE IN PLACE IMMEDIATELY FOLLOWING PAVING ACTIVITIES.

LEGEND

- EXISTING MAJOR CONTOUR (-100-)
- EXISTING MINOR CONTOUR (92)
- PROPOSED MAJOR CONTOUR (110)
- PROPOSED MINOR CONTOUR (108)
- PROPOSED SILT FENCING (X)
- PROPOSED TREE PROTECTING FENCING
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED INLET PROTECTION
- PROPOSED BIO BAG CHECK DAM
- PROPOSED LIMITS OF DISTURBANCE
- WETLAND TO REMAIN

Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762 OREGON JULY 14, 2017 ANDREW J. ROCHELLE RENEWAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

1200C GRADING AND STREET CONSTRUCTION ESCP I

CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C122

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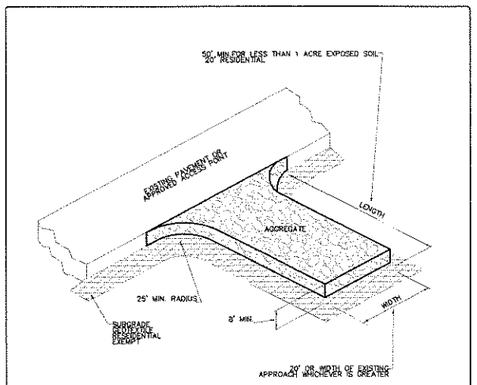
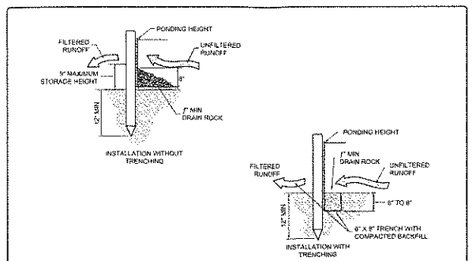


NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-RIGH-OF WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT-LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS
   SINGLE FAMILY AND DUPLEX
   20' LONG BY 20' WIDE, 8" DEEP OF 3/4 " MINUS CLEAN ROCK.
   COMMERCIAL
   50' LONG BY 20' WIDE, 3-6" DEEP CLEAN ROCK.
   GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.

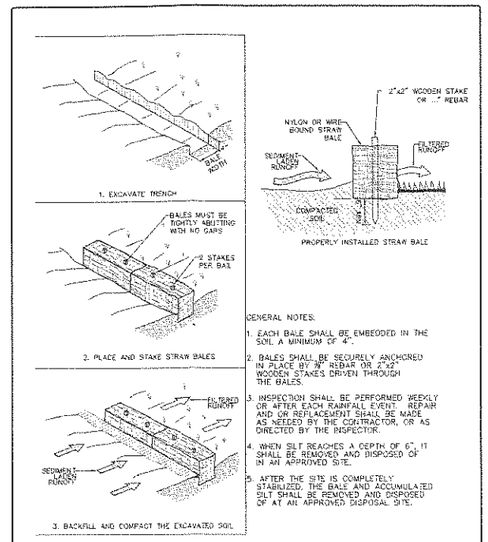
City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

REVISIONS:		CONSTRUCTION ENTRANCE	SCALE: N.T.S.
			DATE: May 2007
			APPROVED BY: D. Gerlicz
			STANDARD DRAWING 601



City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

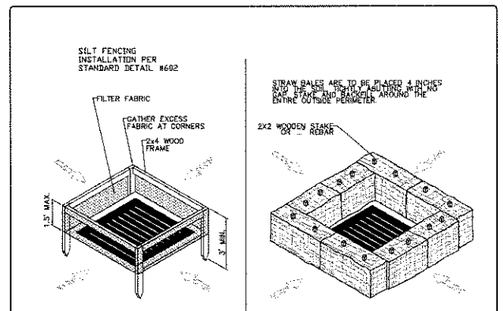
REVISIONS:		SILT FENCE	SCALE: N.T.S.
			DATE: MAY 2007
			APPROVED BY: D. DANIELS
			STANDARD DRAWING 602



GENERAL NOTES:
1. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4".
2. BALES SHALL BE SECURELY ANCHORED IN PLACE BY 36" REBAR OR 2"x2" WOODEN STAKES DRIVEN THROUGH THE BALES.
3. INSPECTION SHALL BE PERFORMED WEEKLY OR AFTER EACH RAINFALL EVENT. REPAIR AND OR REPLACEMENT SHALL BE MADE AS NEEDED BY THE CONTRACTOR, OR AS DIRECTED BY THE INSPECTOR.
4. WHEN SILT REACHES A DEPTH OF 6", IT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED SITE.
5. AFTER THE SITE IS COMPLETELY STABILIZED, THE BALE AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED DISPOSAL SITE.

City of Newberg

REVISIONS:		STRAW BALE BARRIER	SCALE: N.T.S.
			DATE: May 2007
			APPROVED BY: D. Gerlicz
			STANDARD DRAWING 603

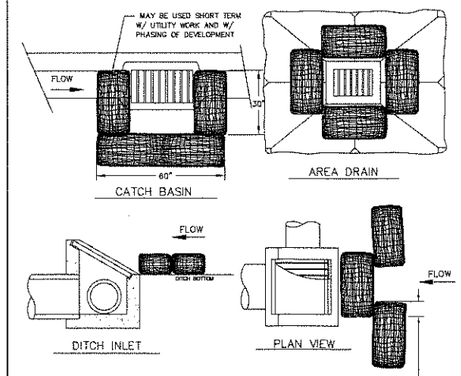


THIS METHOD OF INLET PROTECTION IS TO BE USED WHERE THE INLET DRAIN IS LOCATED IN A RELATIVELY FLAT UNPAVED AREA (SLOPE <5%).

THIS METHOD OF INLET PROTECTION SHALL NOT BE USED IN STREETS, TRAVELED AREAS, OR AREAS OF CONCENTRATED FLOW (DITCHES).

City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

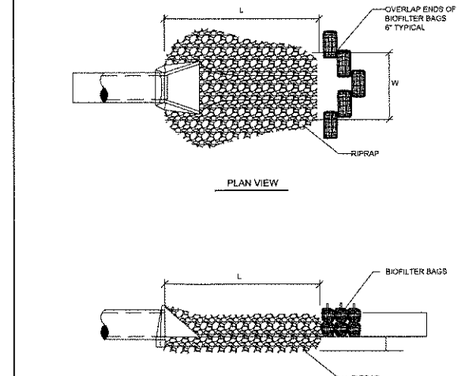
REVISIONS:		FIELD DRAIN INLET PROTECTION	SCALE: N.T.S.
12/10/2013			DATE: 12/10/2013
			APPROVED BY: PAUL CHOU
			STANDARD DRAWING 604



NOTES:
1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES.
2. BIO-FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2" WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. WHEN USING 30" BIO-BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6".

City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

REVISIONS:		INLET PROTECTION	SCALE: N.T.S.
12/10/2013			DATE: 04/04/2009
			APPROVED BY: PAUL CHOU
			STANDARD DRAWING 605



W = GREATER OF: DIAMETER + 6" OR 3x DIAMETER

L = GREATER OF: 12' OR 4x DIAMETER

NOTES:
1. BIOFILTER BAGS REQUIRED ONLY WHEN DISCHARGING SEDIMENT-LADEN WATER.
2. STAKING OF BIOFILTER BAGS REQUIRED USING (2) 1"x2" WOOD STAKES OR APPROVED EQUAL PER BAG.

City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

REVISIONS:		OUTLET PROTECTION	SCALE: N.T.S
			DATE: 01/10/2014
			APPROVED BY:
			STANDARD DRAWING 606

PRELIMINARY
REGISTERED PROFESSIONAL ENGINEER
87769
OREGON
JULY 14, 2017
JEFFREY ROCHELLE SEAL
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
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TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
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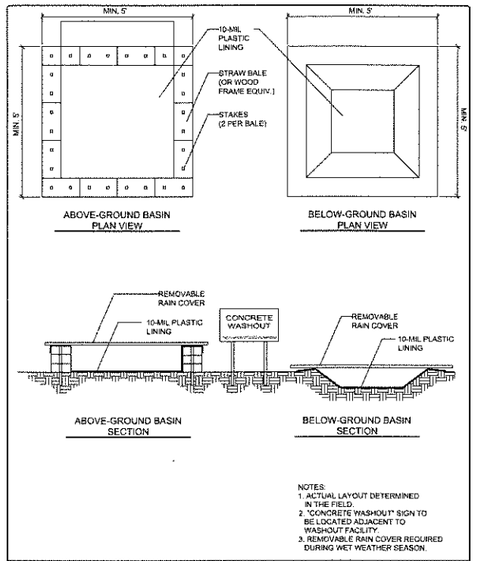
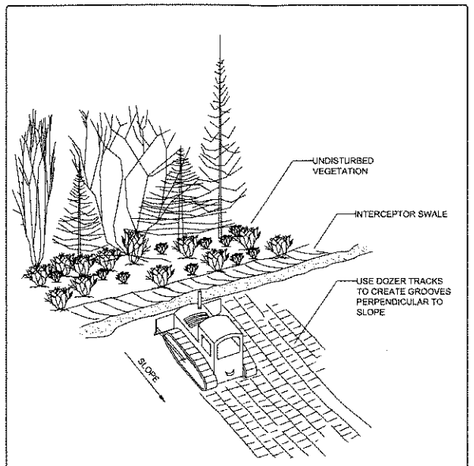


NOTES:
1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. "CONCRETE WASHOUT" SIGN TO BE LOCATED ADJACENT TO WASHOUT FACILITY.
3. REMOVABLE RAIN COVER REQUIRED DURING WET WEATHER SEASON.

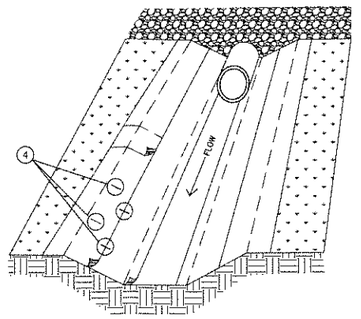
City of Newberg — Public Works Engineering Division, 414 E. First Street Newberg, OR 97132, Phone: 503-537-1240, Fax: 503-537-1277	REVISIONS: NA	CONCRETE WASTE MANAGEMENT	SCALE: N.T.S; DATE: 01/10/2014; APPROVED BY: ; STANDARD DRAWING: 607



BMP NEEDED AT MIN. AT TOE OF SLOPE

ALL SLOPES TO BE SEEDED

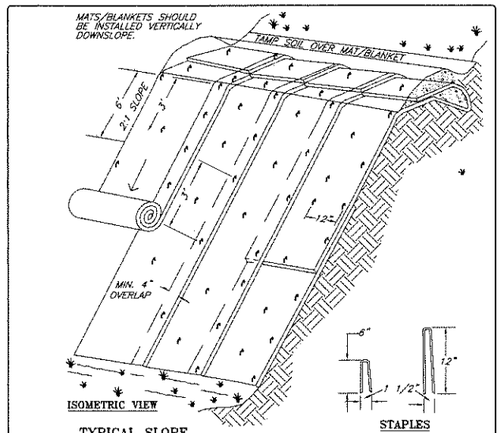
City of Newberg — Public Works Engineering Division, 414 E. First Street Newberg, OR 97132, Phone: 503-537-1240, Fax: 503-537-1277	REVISIONS: NA	SURFACE ROUGHENING CAT TRACKING	SCALE: N.T.S; DATE: 01/10/2014; APPROVED BY: ; STANDARD DRAWING: 608



CHANNEL INSTALLATION

NOTES:
1. INFORMATION PROVIDED IS MINIMUM REQUIREMENTS. MANUFACTURES REQUIREMENTS WHICH ARE MORE STRINGENT SHALL BE USED.
2. INSTALL MAT PARALLEL IN CENTER OF CHANNEL IN THE DIRECTION OF FLOW. FOR CULVERT OUTFALLS, PLACE MAT UNDER CULVERT OR RIP RAP A MINIMUM OF 12 INCHES.
3. IN CHANNEL BOTTOM, OVERLAP LENGTH ENDS A MINIMUM OF 12 INCHES.
4. LENGTH OF STAPLES SHALL BE DETERMINDED BY SOIL TYPE– COHESIVE SOIL USE 6 INCH, NON–COHESIVE SOILS 8–12 INCH.

City of Newberg — Public Works Engineering Division, 414 E. First Street Newberg, OR 97132, Phone: 503-537-1240, Fax: 503-537-1277	REVISIONS: NA	MATTING TRENCH INSTALLATION	SCALE: N.T.S; DATE: 01/10/2014; APPROVED BY: ; STANDARD DRAWING: 609



TYPICAL SLOPE SOIL STABILIZATION

NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.

NOT TO SCALE

City of Newberg — Public Works Engineering Division, 414 E. First Street Newberg, OR 97132, Phone: 503-537-1240, Fax: 503-537-1277	REVISIONS: NA	MATTING- SLOPE INSTALLATION	SCALE: N.T.S; DATE: 01/10/2014; APPROVED BY: ; STANDARD DRAWING: 610

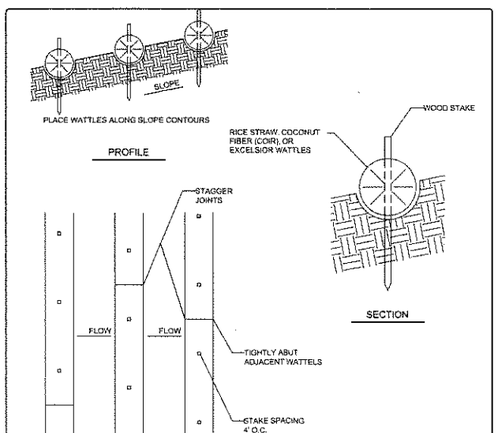
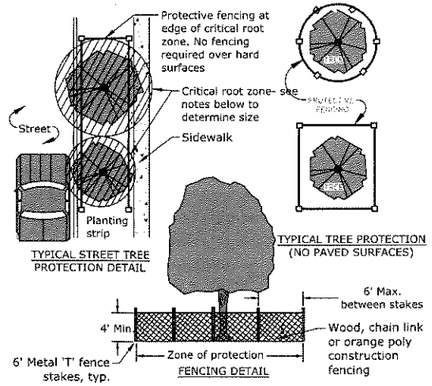


TABLE 3-12 BARRIER SPACING FOR GENERAL APPLICATION

% SLOPE	SLOPE	MAX SPACING ON SLOPE
<10%	<10:1	200 ft
10-16%	10:1 to 7:1	150 ft
16-20%	7:1 to 5:1	100 ft
20-30%	5:1 to 3.5:1	50 ft
30-50%	3.5:1 to 2:1	25 ft

NOTES:
1. STAKING SPECIFICATIONS:
   A. 1"x2" WOODEN STAKES.
   B. ADDITIONAL STAKES MAY BE INSTALLED ON DOWNHILL SIDE OF WATTLES ON STEEP SLOPES OR HIGHLY EROSIVE SOILS.
2. SPACING IN ACCORDANCE WITH TABLE 3-12

City of Newberg — Public Works Engineering Division, 414 E. First Street Newberg, OR 97132, Phone: 503-537-1240, Fax: 503-537-1277	REVISIONS: NA	WATTLES/STRAW BALE	SCALE: N.T.S; DATE: 01/10/2014; APPROVED BY: ; STANDARD DRAWING: 611



Notes:
1) The critical root zone (CRZ) shall be an area with a radius at least 5' from the edge of the tree dripline. 2) The CRZ shall be marked and protected by a construction fence placed around the perimeter prior to construction. 3) No soil grade changes or compaction shall take place within the CRZ except as directed. 4) No storage of material shall be allowed within the CRZ. 5) If work is done within the CRZ, care must be taken to minimize root disturbance. Special care shall be taken during excavation and removal of existing curb, gutter, and sidewalks to avoid damage to tree roots. Locate existing tree roots using hand tools or other approved methods such as an airspade. 6) Protective fencing is required when the work area is within the CRZ of trees, except where portions of the CRZ are covered with pavement such as streets or walks. 7) No root over 2" shall be cut without approval of the urban forester (or an approved arborist). Roots shall be cut with approved saws. No roots over 2" shall be cut or torn during trenching with power equipment such as backhoes and trenchers. Utility lines and irrigation or other pipes shall be installed by hand digging or tunneling under roots, as necessary, to avoid cutting roots 2" and larger.

TREE PROTECTION FENCING

N.T.S.

T-1
C124

REGISTERED PROFESSIONAL ENGINEER — OREGON — JANUARY 14, 2005 — BRENT ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

1200C DETAILS II

CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

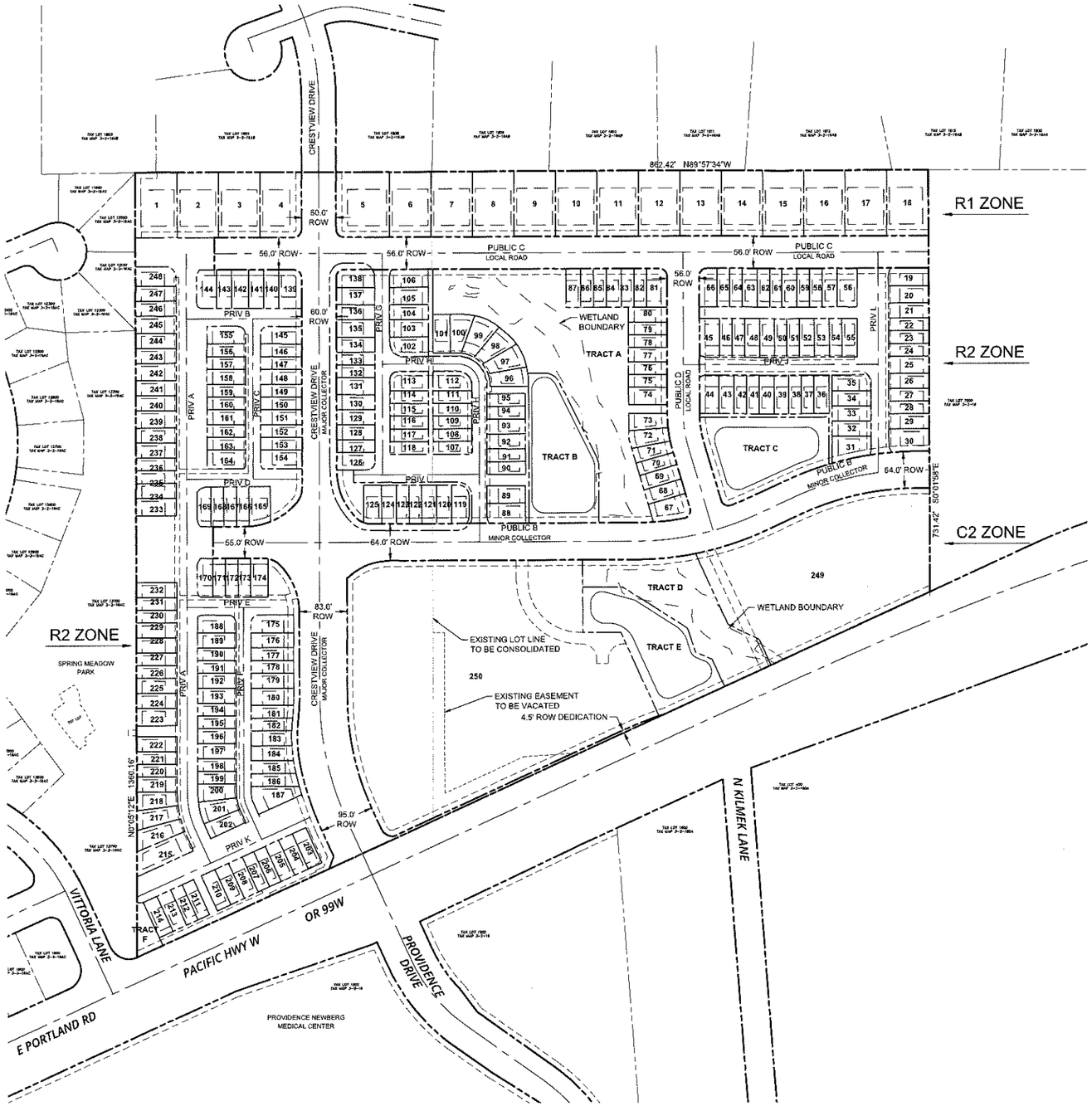
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 1300, 1100
LAND USE # | N/A
DESIGNED BY | ARB, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C124

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DID\C120 1200C SET.DWG



SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

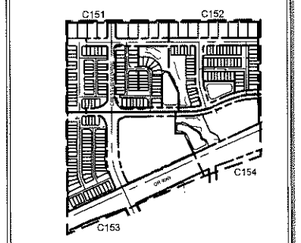
*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT

KEY MAP



811 Know what's below. Call before you dig.

N
W E
S

SCALE: 1" = 100'
0 100' 200'

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

OVERALL TENTATIVE PLAT
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

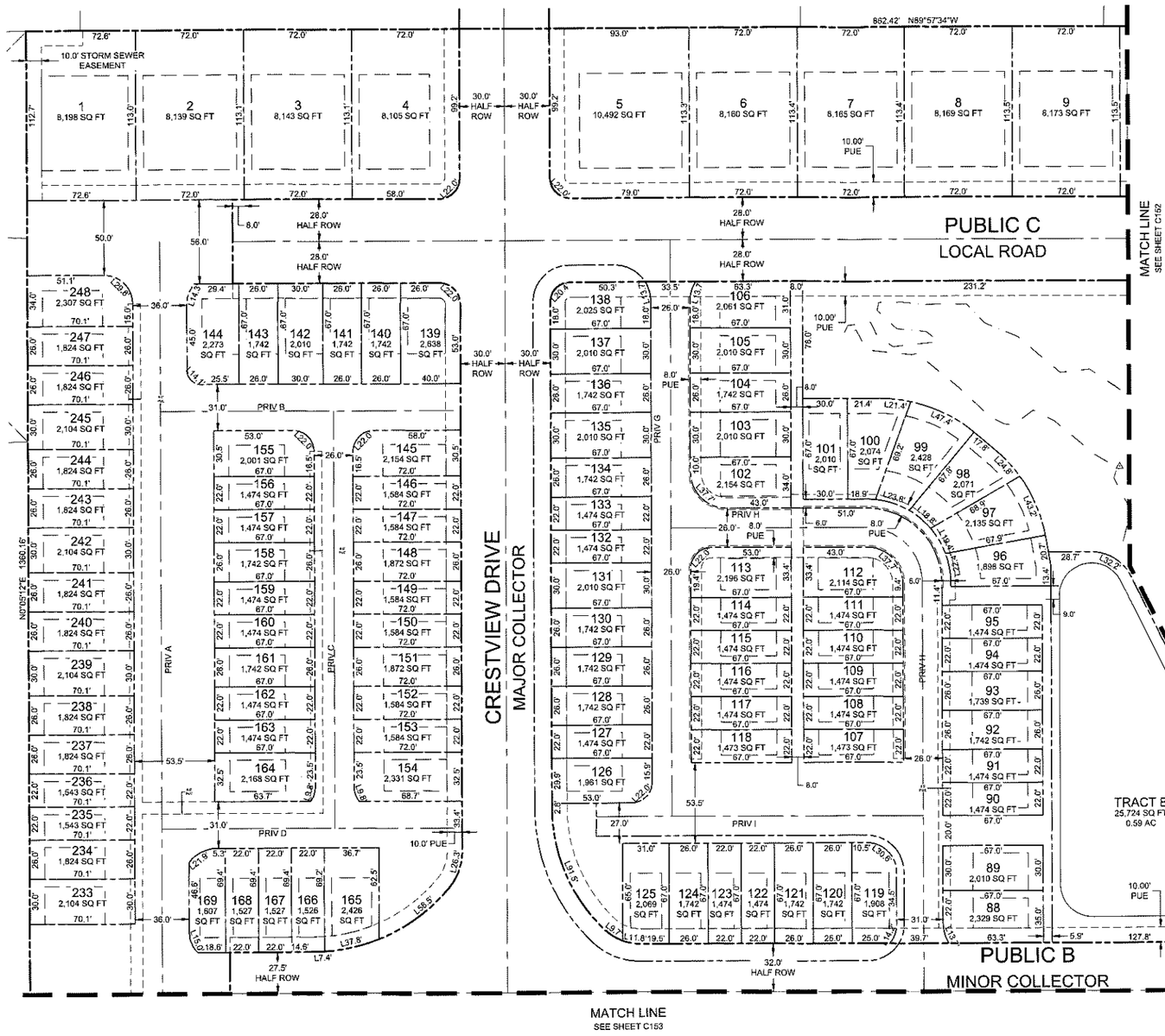
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C150

P:\17393-JTS-CRESTVIEW CROSSING\GIS\CAD\DOC\150 TENTATIVE PLAT.DWG



SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

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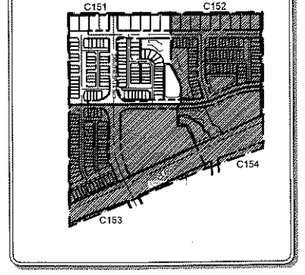
LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY

KEY MAP



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N W E S

SCALE: 1" = 100'
0 100' 200'

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT I
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C151

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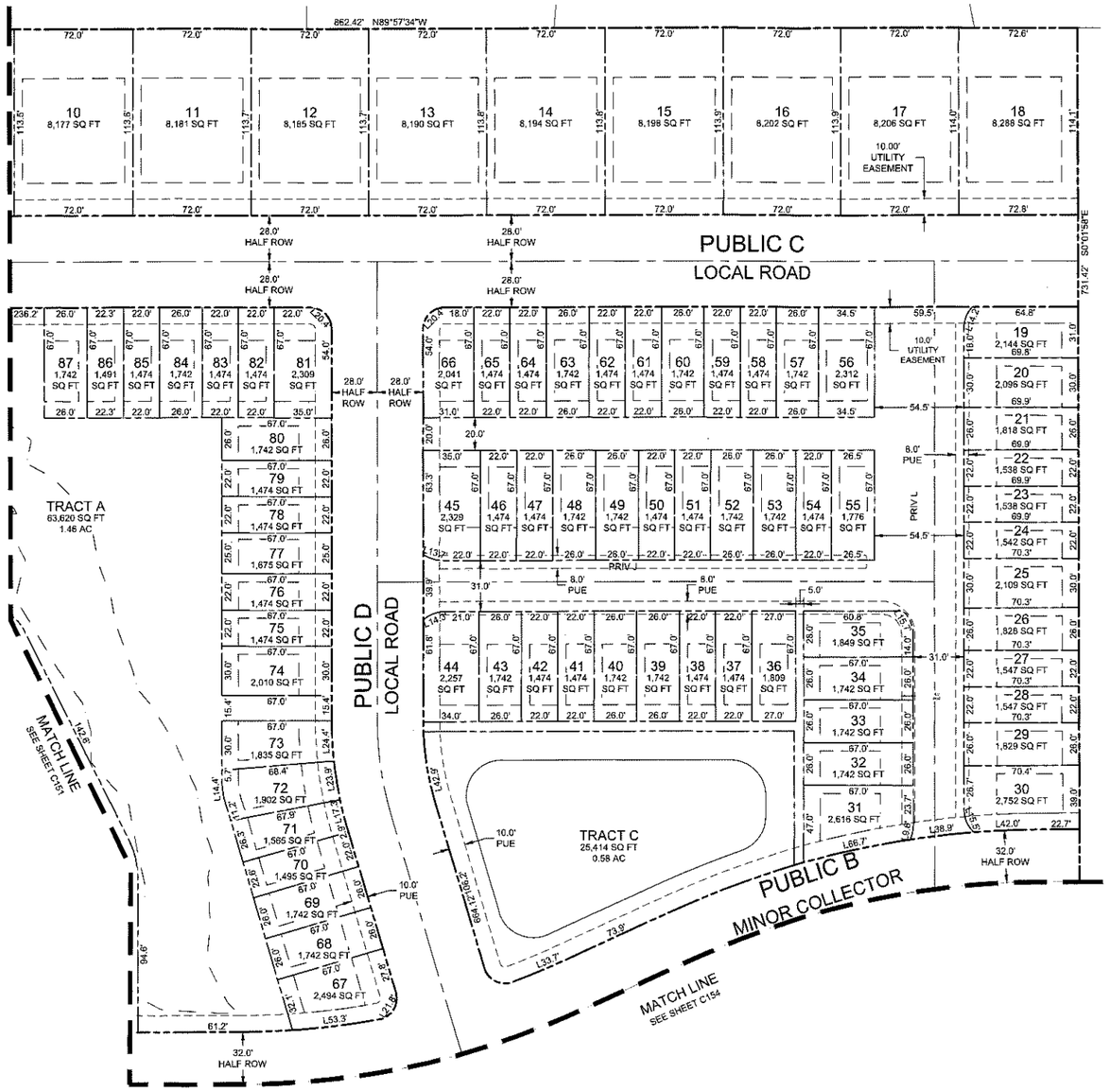

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
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MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

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LEGEND

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- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
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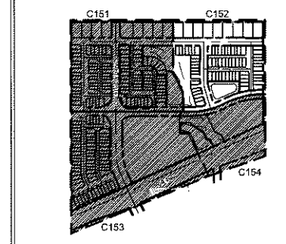
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY

KEY MAP



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SCALE: 1" = 100'
0 100' 200'

PUBLISH DATE
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LAND USE DOCUMENTS

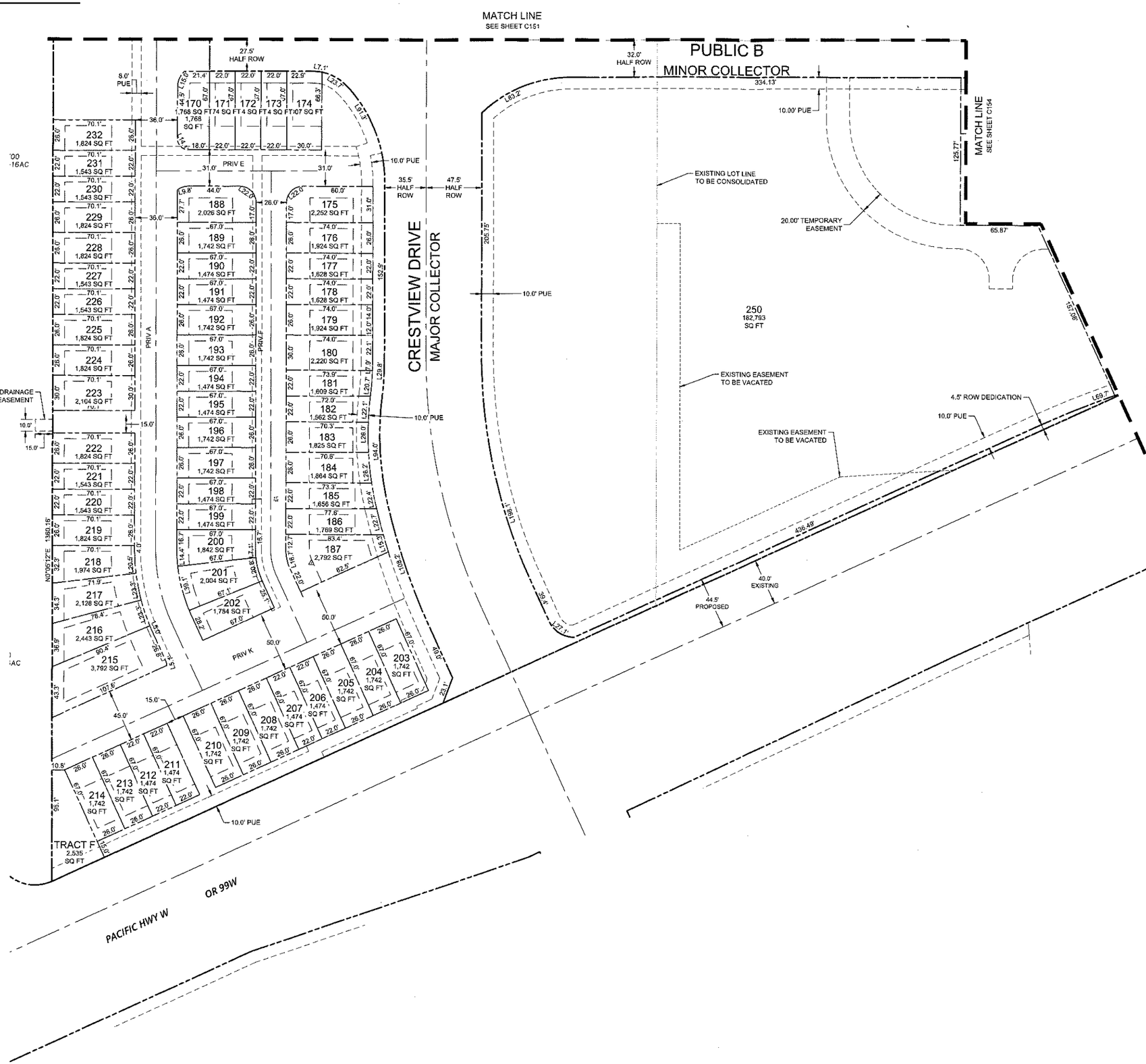
TENTATIVE PLAT II
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C152

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DGN\C150 TENTATIVE PLAT.DWG



SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.56 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
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MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

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LEGEND

- PROJECT BOUNDARY
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- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
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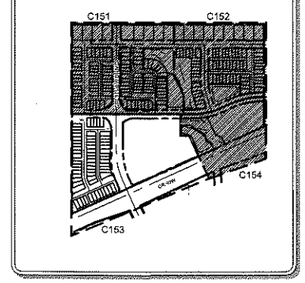
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT

KEY MAP



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SCALE: 1" = 100'
0 100' 200'

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT III
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

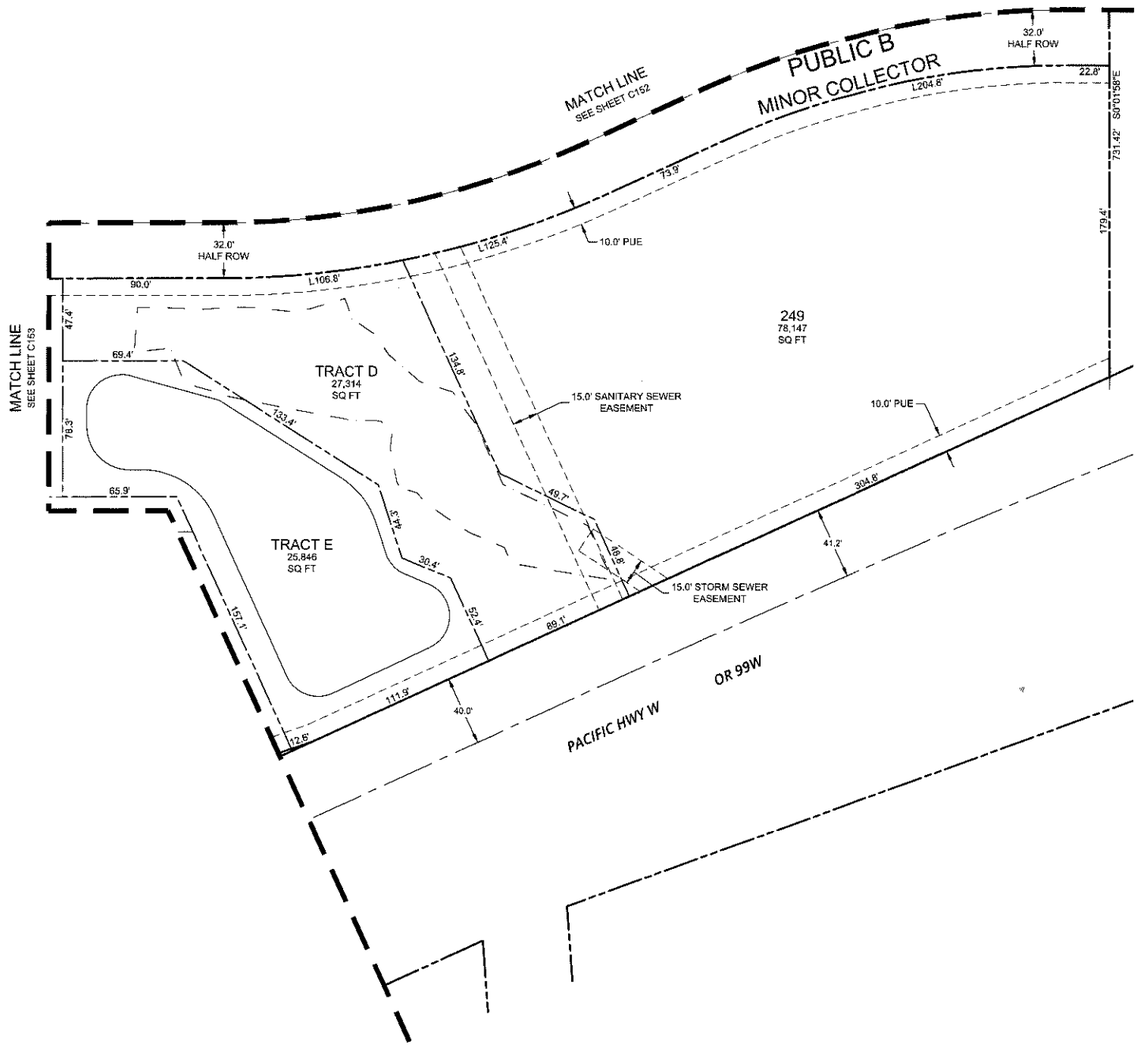
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C153

P:\17393-JTS-CRESTVIEW CROSSING\GCAD\DGC150 TENTATIVE PLAT.DWG



SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
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MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

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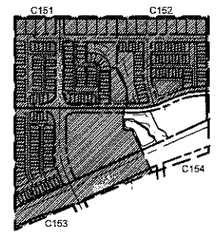
LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY

KEY MAP



811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

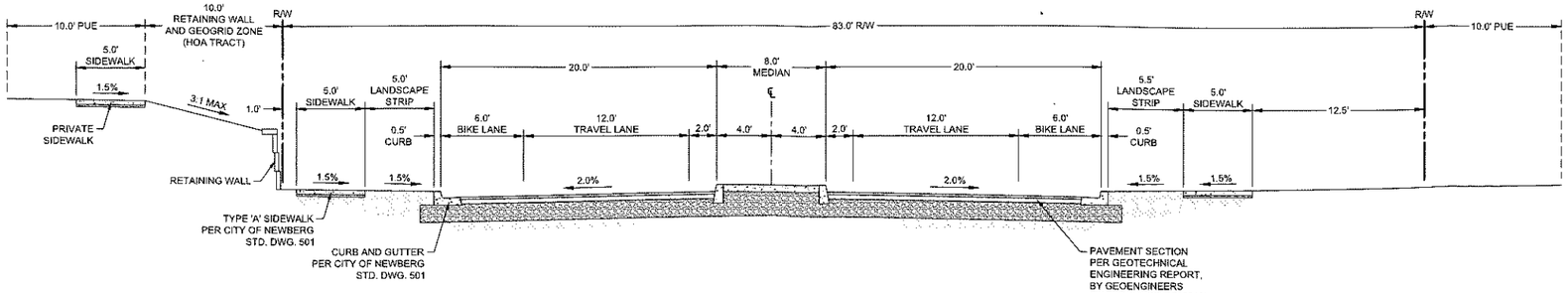
TENTATIVE PLAT IV
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

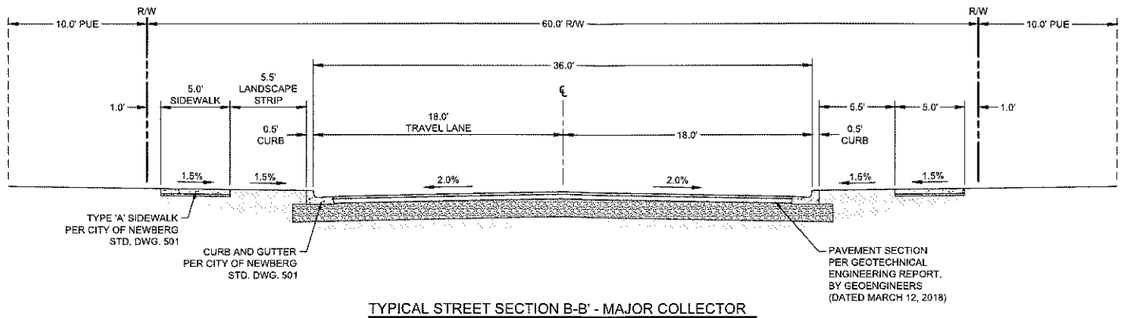
PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C154

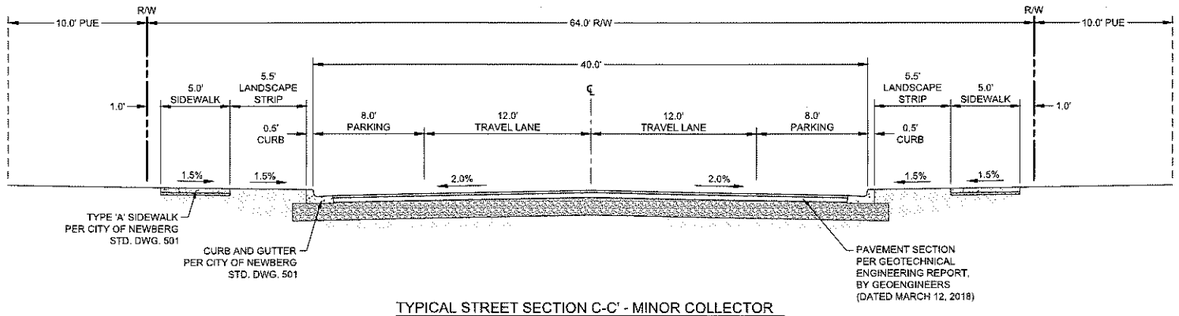
P:\17393-JTS-CRESTVIEW CROSSING\CAD\DO\C150 TENTATIVE PLAT.DWG



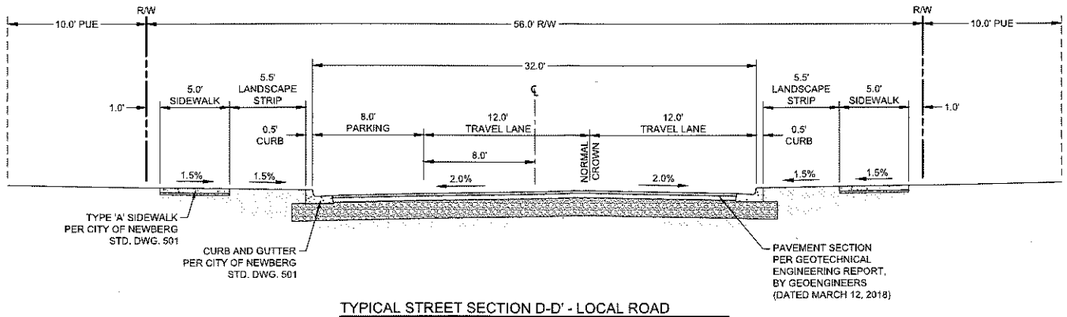
TYPICAL STREET SECTION A-A' - MAJOR COLLECTOR
CRESTVIEW DR NTS



TYPICAL STREET SECTION B-B' - MAJOR COLLECTOR
CRESTVIEW DR NTS



TYPICAL STREET SECTION C-C' - MINOR COLLECTOR
PUBLIC B NTS



TYPICAL STREET SECTION D-D' - LOCAL ROAD
PUBLIC C
PUBLIC D NTS

P:\17393-ITS-CRESTVIEW CROSSING\CAD\DDC\200 TYPICAL SECTIONS.DWG

REGISTERED PROFESSIONAL ENGINEER
67763PE
OREGON
JULY 14, 1981
ASHLEY ROCHELLE SEAL
EXPIRES: 06/30/20

PRELIMINARY

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

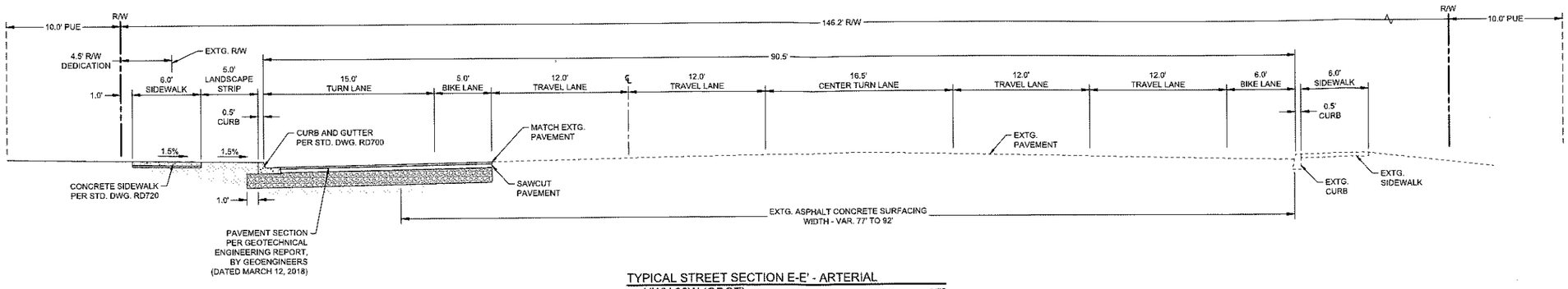
TYPICAL SECTIONS I
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMD
CHECKED BY	AJM, RGW

SHEET NUMBER
C200



TYPICAL STREET SECTION E-E' - ARTERIAL
HWY 99W (ODOT) NTS

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DGC200 TYPICAL SECTIONS.DWG

REGISTERED PROFESSIONAL ENGINEER
87763PE
OREGON
JULY 14, 2017
ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TYPICAL SECTIONS II

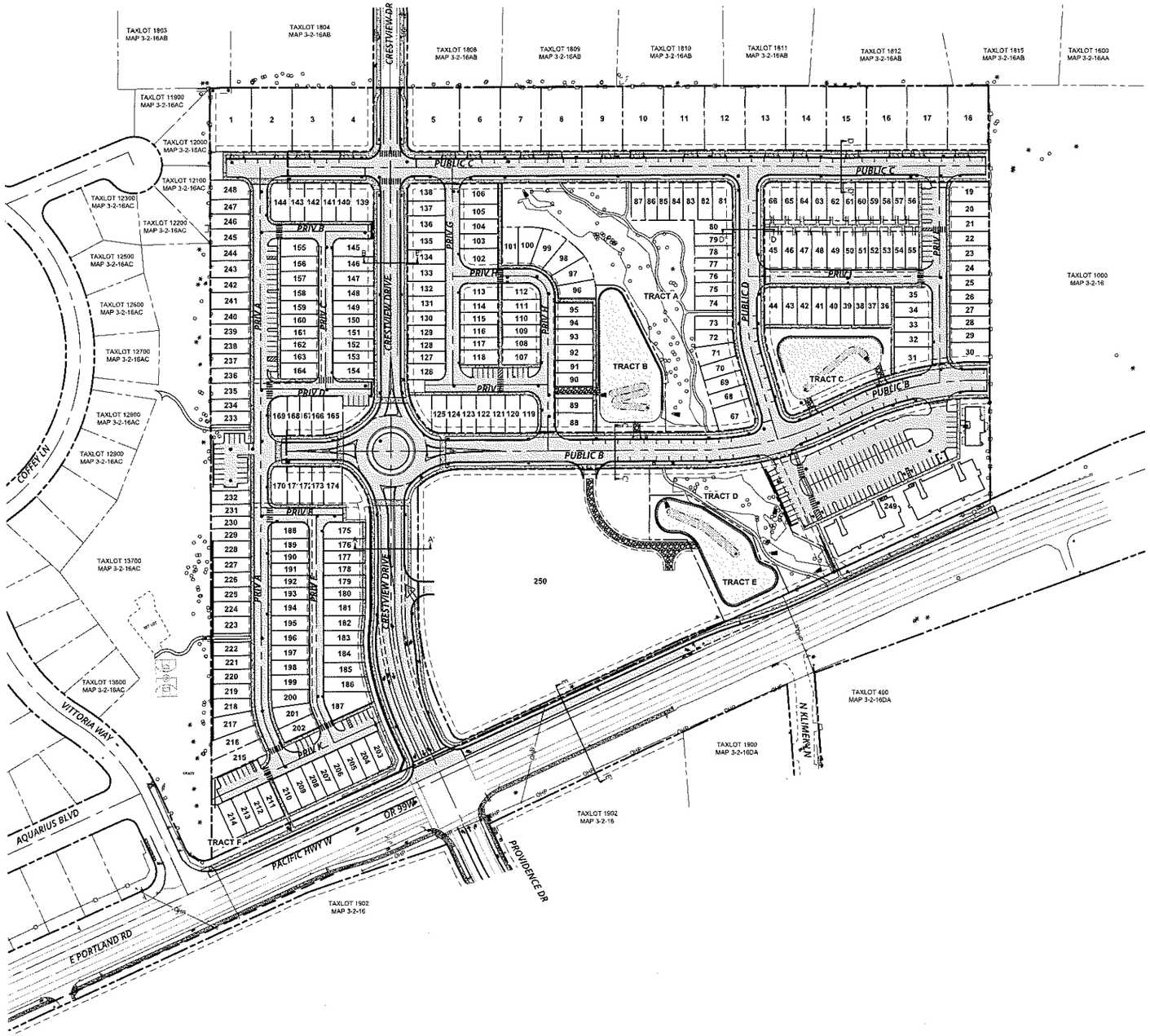
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C201



LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED STORM FACILITY
- PROPOSED SWALE
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED DRIVEWAY
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- A A' PROPOSED TYPICAL STREET SECTION SEE SHEETS C200 & C201

Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762 OREGON JULY 14, 2017 ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

OVERALL SITE PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

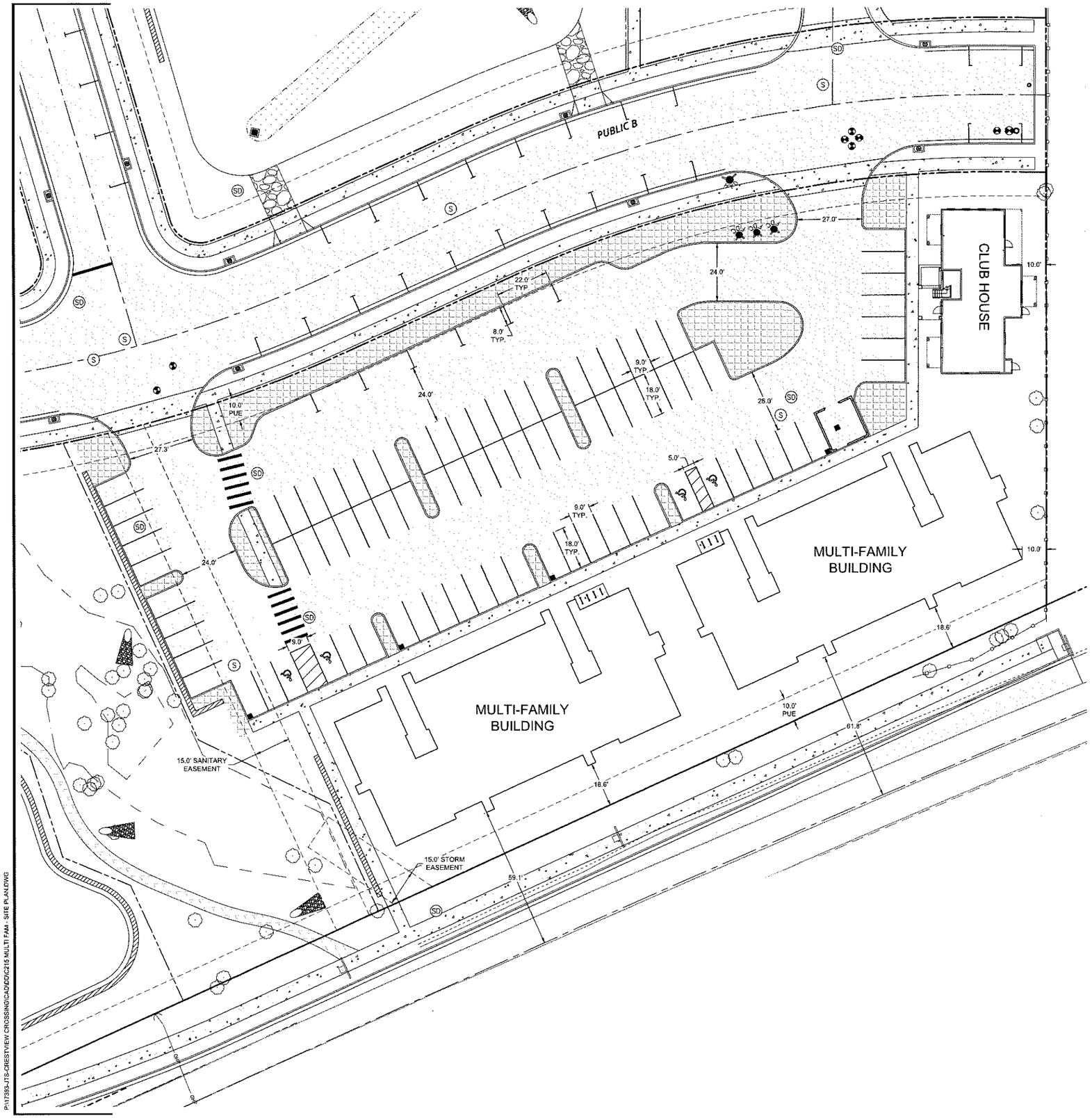
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C210

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DOC\210 SITE PLAN.DWG



P:\17393-JT\S-CRESTVIEW CROSSING\CAD\DC\C215 MULTI FAM - SITE PLAN.DWG

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED LANDSCAPING
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED DRIVEWAY
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- PROPOSED BIKE PARKING
- PROPOSED ACCESSIBLE PARKING STALL
- PROPOSED HYDRANT
- PROPOSED VALVE
- PROPOSED BLOW-OFF / AIR RELEASE ASSY.
- PROPOSED FIRE DPT. CONNECTION
- PROPOSED SEWER MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- EXISTING DECIDUOUS TREE

PARKING STATISTICS - MULITFAMILY LOT

PROPOSED STALL COUNT & SUMMARY

TYPE = (WIDTH x DEPTH)	STANDARD 9' x 18'	PARALLEL 8' x 22'	ADA 9' x 18'	ADA - VAN 9' x 18'	TOTAL
MULTIPLE FAMILY APARTMENTS =	80	7	3	1	91
TOTAL =	80	7	3	1	91

VEHICLES

DEVELOPMENT CODE CHAPTER 15.440.30

MAXIMUM PARKING - MULTI-FAMILY	NONE
MINIMUM PARKING - MULTI-FAMILY	74
PROPOSED	91

BICYCLES

DEVELOPMENT CODE CHAPTER 15.440.90

	MINIMUM	PROPOSED
MINIMUM BICYCLE PARKING - MULTI-FAMILY	13	14

ACCESSIBLE

OSSC SECTION 1106.1

MULTI-FAMILY PARKING LOT (76 TO 100)	MINIMUM	PROPOSED
ACCESSIBLE SPACES	4	4
VAN ACCESSIBLE SPACES	1	1

LANDSCAPING

DEVELOPMENT CODE CHAPTER 15.420.010

	REQUIRED	PROPOSED
MULTI-FAMILY PARKING LOT (25 SF PER STALL)	2,275 SF	6,357 SF

SETBACKS

ZONE C3 - MULTI-FAMILY LOT

FRONT	10 FT
INTERIOR	0 FT/10 FT
STREET - EXPRESSWAY CENTERLINE	50 Ft

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 20'
0 20 40

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 14, 2017
ASHLEY ROCHELLE SEAL
EXPIRES: 06/30/20
PRELIMINARY

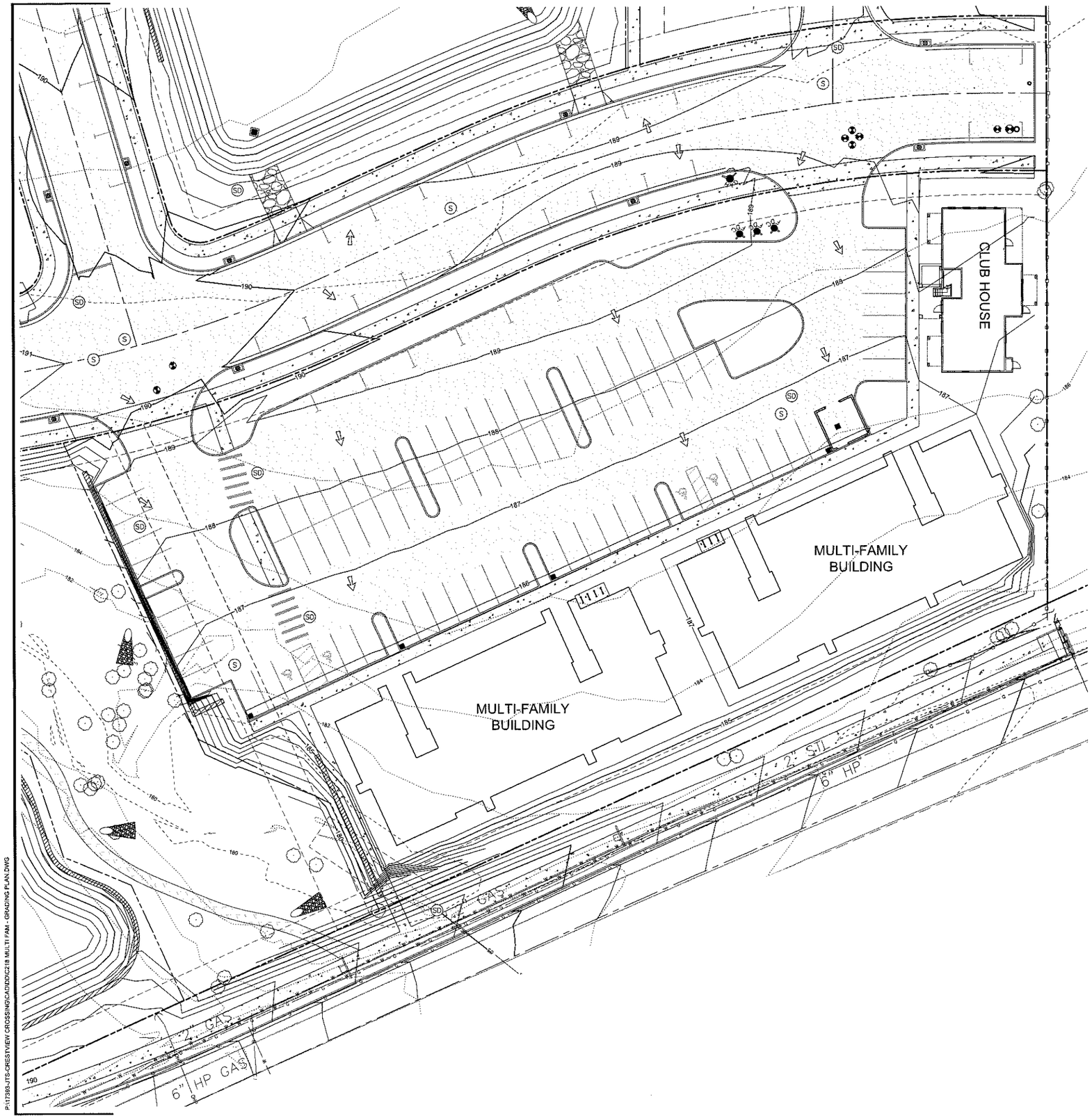
PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY SITE PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C215



LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- 100 EXISTING MAJOR CONTOUR
- 92 EXISTING MINOR CONTOUR
- 110 PROPOSED MAJOR CONTOUR
- 108 PROPOSED MINOR CONTOUR
- PROPOSED SURFACE FLOW ARROW
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- PROPOSED BIKE PARKING
- PROPOSED ACCESSIBLE PARKING STALL
- PROPOSED HYDRANT
- PROPOSED VALVE
- PROPOSED BLOW-OFF / AIR RELEASE ASSY.
- PROPOSED FIRE DPT. CONNECTION
- PROPOSED SEWER MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- EXISTING DECIDUOUS TREE

Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87763PE OREGON JULY 14, 1987 AMY ROCHELLE STALL EXPIRES: 06/30/20

PRELIMINARY

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY GRADING PLAN

CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

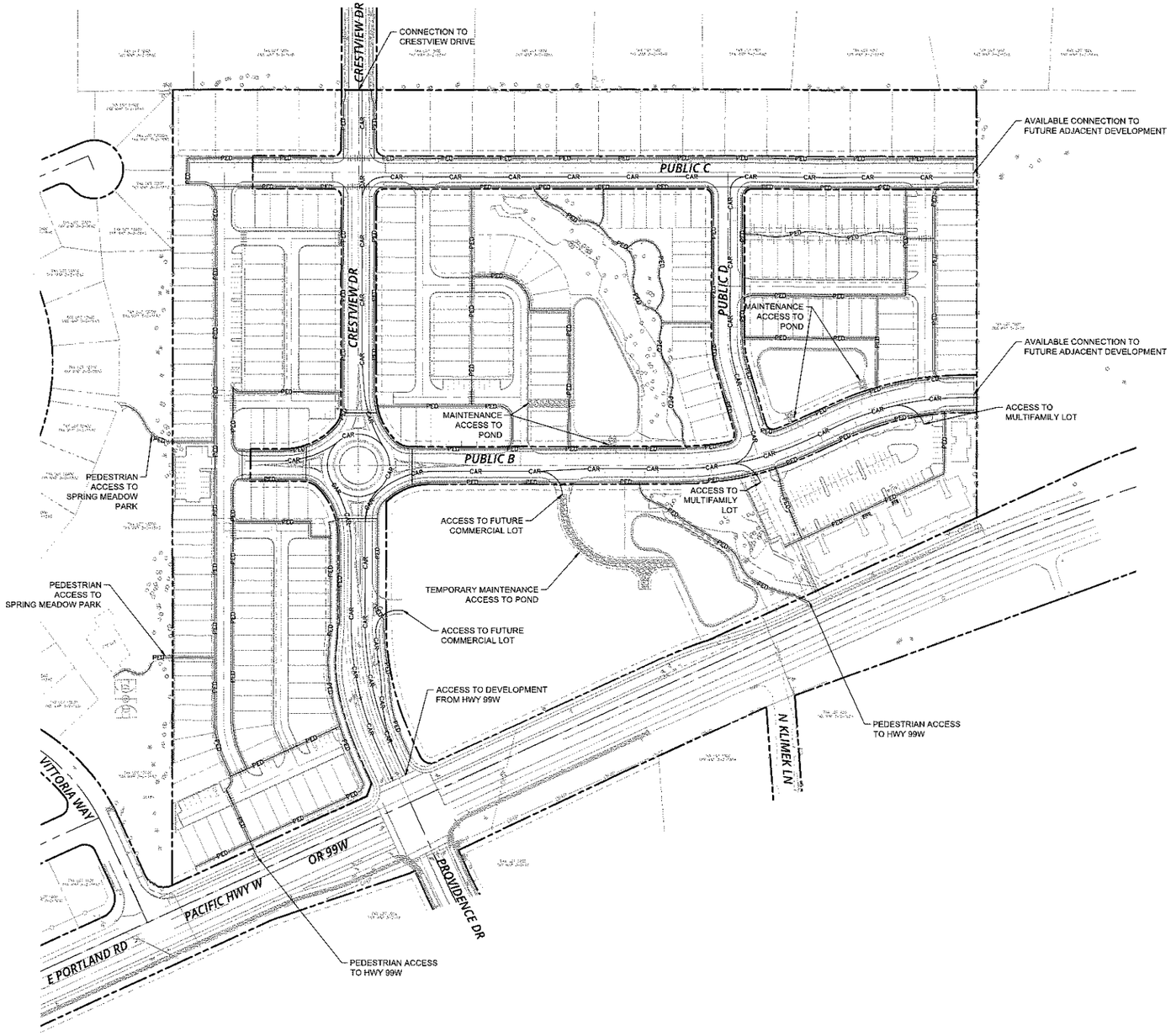
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C218

P:\17393-ITS-CRESTVIEW CROSSING\CAD\DWG\C218 MULTI FAM - GRADING PLAN.DWG



LEGEND

- CAR — PROPOSED CAR CIRCULATION
- PED — PROPOSED PEDESTRIAN CIRCULATION
- PROPOSED STANDARD PARKING STALL
- PROPOSED PARALLEL PARKING STALL
- PROPOSED ADA PARKING STALLS

PARKING STATISTICS

PROPOSED STALL COUNT & SUMMARY

TYPE = (WIDTH x DEPTH)	STANDARD (9' x 18')	PARALLEL (8' x 22')	ADA (9' x 18')	ADA VAN (9' x 18')	TOTAL
PUBLIC ON-STREET =	0	72	0	0	72
PRIVATE =	71	0	10	2	83
MULTIFAMILY LOT =	80	7	3	1	91
TOTAL =	151	79	13	3	246

MULTIFAMILY LOT PARKING - ACCESSIBLE

(OSSC SECTION 1106.1)

PARKING FACILITY TOTAL = 76 TO 100 STALLS	MINIMUM REQUIRED	AS PROPOSED
ACCESSIBLE SPACES	4	4
VAN ACCESSIBLE SPACES	1	1

Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON JULY 14, 2017 ANDREW J. MUNKITTRICK
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

ACCESS, PARKING, AND CIRCULATION PLAN

CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

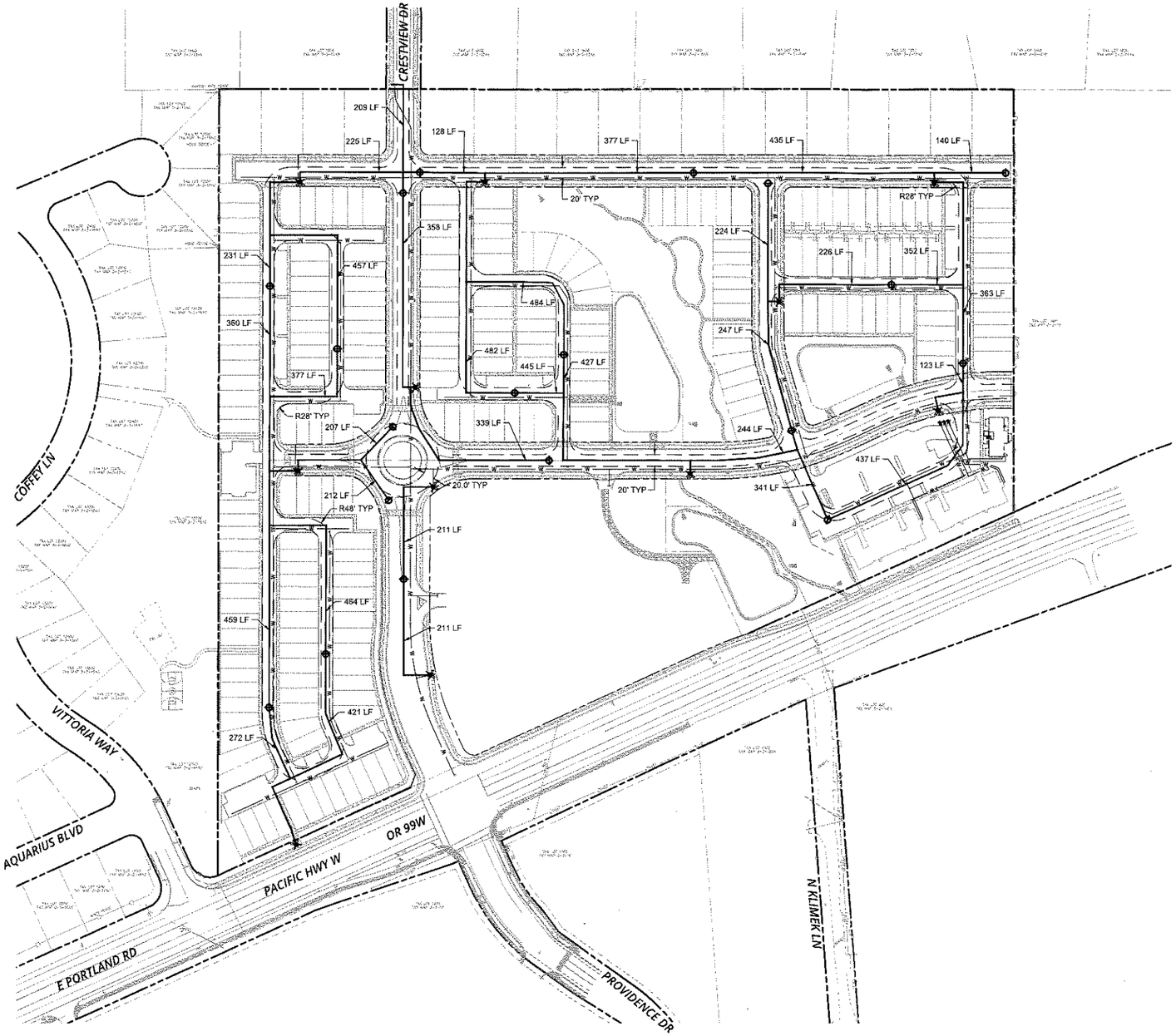
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C220

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DWG\C220 CIRCULATION PLAN.DWG



LEGEND

- PROPOSED WATER DOMESTIC SERVICE
- PROPOSED WATER FIRE SERVICE
- EXISTING FIRE HYDRANT
- PROPOSED HYDRANT
- PROPOSED HYDRANT
- PROPOSED VALVE
- FIRE HOSE LINE PULL EXTENTS FROM FIRE HYDRANT
- R25' CURVE RADIUS
- 20' DRIVE AISLE PROPOSED FIRE ACCESS LANE

Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87760PE OREGON JULY 14, 1995 AMY ROCHELLE SEAL
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

FIRE ACCESS PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C230

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DWG\C230 FIRE ACCESS PLAN.DWG

LIGHTING ZONE CALCULATIONS

ACI 1: ARTERIAL COMMERCIAL INTERSECTION #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	4.0 MIN	4.27

ACR 1: ARTERIAL COMMERCIAL ROAD #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.0 MIN	2.49

ARI 1: ARTERIAL RESIDENTIAL INTERSECTION #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.0 MIN	2.46

ARR 1: ARTERIAL RESIDENTIAL ROAD #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.0 MIN	1.41

ARR 2: ARTERIAL RESIDENTIAL ROAD #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.0 MIN	1.45

CCI 1: COLLECTOR COMMERCIAL INTERSECTION #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.4 MIN	2.49

CCI 2: COLLECTOR COMMERCIAL INTERSECTION #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.4 MIN	2.83

CCI 3: COLLECTOR COMMERCIAL INTERSECTION #3		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.4 MIN	2.69

CCR 2: COLLECTOR COMMERCIAL ROAD #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.31

CCR 1: COLLECTOR COMMERCIAL ROAD #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.31

CCR 3: COLLECTOR COMMERCIAL ROAD #3		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.51

CCR 3: COLLECTOR COMMERCIAL ROAD #4		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.39

CRI 1: COLLECTOR RESIDENTIAL INTERSECTION #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.68

CRI 2: COLLECTOR RESIDENTIAL INTERSECTION #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.65

CRI 3: COLLECTOR RESIDENTIAL INTERSECTION #3		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.82

CRI 4: COLLECTOR RESIDENTIAL INTERSECTION #4		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.47

CRR 1: COLLECTOR RESIDENTIAL ROAD #1		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.51

CRR 2: COLLECTOR RESIDENTIAL ROAD #2		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.15

CRR 3: COLLECTOR RESIDENTIAL ROAD #3		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	0.98

CRR 4: COLLECTOR RESIDENTIAL ROAD #4		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.14

CRR 5: COLLECTOR RESIDENTIAL ROAD #5		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	0.84

CRR 6: COLLECTOR RESIDENTIAL ROAD #6		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.69

CRR 7: COLLECTOR RESIDENTIAL ROAD #7		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	0.97

LRR 1: LOCAL RESIDENTIAL ROAD #1 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.5 MIN	1.01

LRR 2: LOCAL RESIDENTIAL ROAD #2 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.5 MIN	1.15

LRR 3: LOCAL RESIDENTIAL ROAD #3 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.5 MIN	1.10

APL 1: APARTMENTS PARKING LOT #1 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	N/A	1.36

CONSTRUCTION KEY NOTES

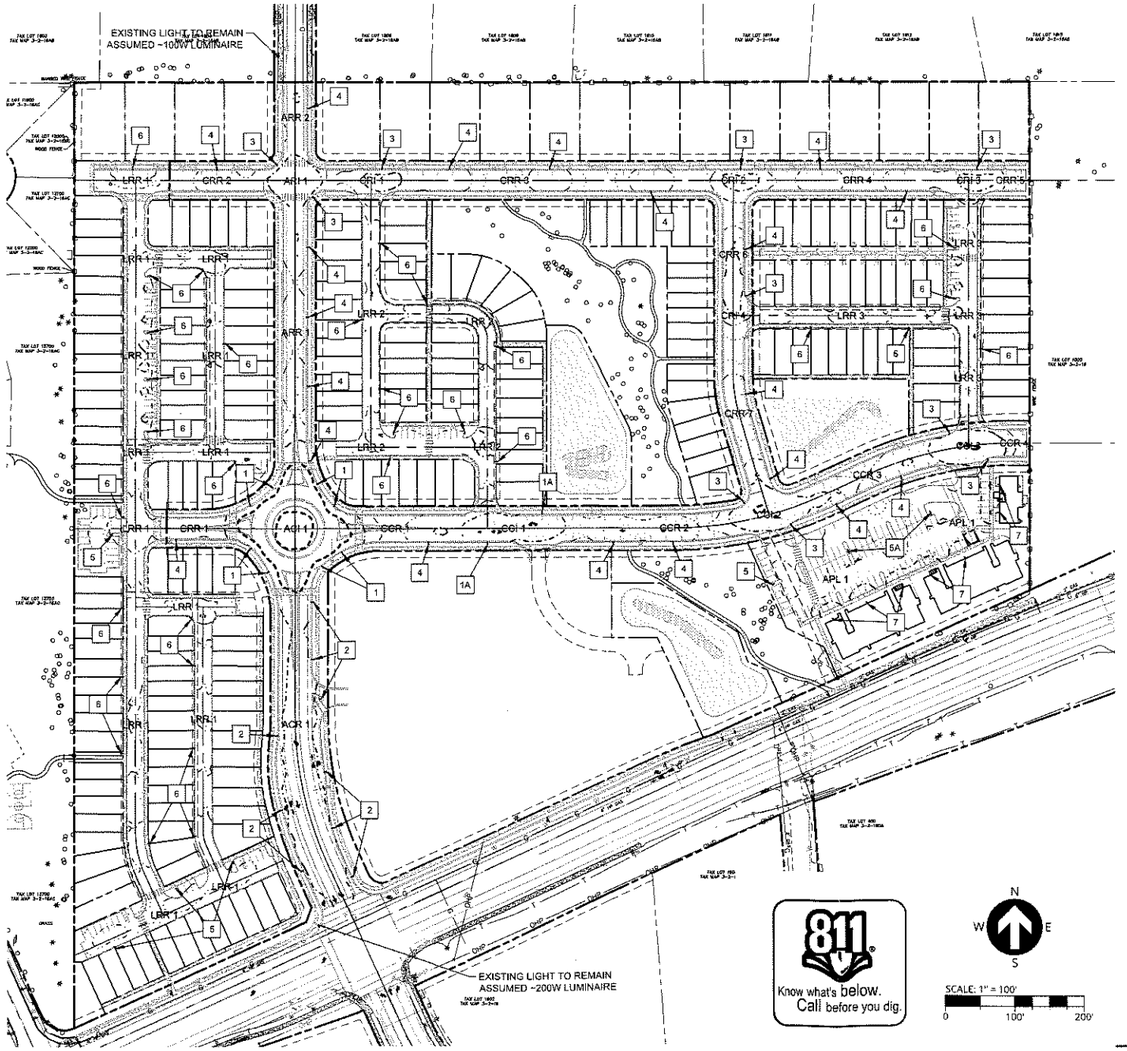
1. INSTALL 180W LED LUMINAIRE, TYPE III, 30' POLE, 6' ARM, BACKLIGHT SHIELD (17700 LUMENS). LUMINAIRE: LEOTEK GC1-80F-MV-NW-3-GY-700-HSS OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA0632S-27084580ST4-DNA OR CITY APPROVED EQUIVALENT.
1A. INSTALL 180W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM, (17700 LUMENS, 80 LEDS). LUMINAIRE: LEOTEK GC1-80F-MV-NW-3-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.
2. INSTALL 133W LED LUMINAIRE, TYPE III, 30' POLE, 6' ARM, BACKLIGHT SHIELD (13400 LUMENS). LUMINAIRE: LEOTEK GC1-60F-MV-NW-3-GY-700-HSS OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA0632S-27084580ST4-DNA OR CITY APPROVED EQUIVALENT.
3. INSTALL 133W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (13400 LUMENS, 60 LEDS). LUMINAIRE: LEOTEK GC1-60F-MV-NW-3-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.
4. INSTALL 92W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (9300 LUMENS, 40 LEDS). LUMINAIRE: LEOTEK GC1-40F-MV-NW-3-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.
5. INSTALL 70W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (7000 LUMENS, 30 LEDS). LUMINAIRE: LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.
5A. INSTALL TWO 70W LED LUMINAIRES, TYPE III, 25' POLE IN DOUBLE ARM ARRANGMENT, 6' ARMS LUMINAIRE: TWO LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 2MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.
6. INSTALL 70W LED LUMINAIRE, TYPE II, 25' POLE, 6' ARM (7000 LUMENS, 30 LEDS). LUMINAIRE: LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT. POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.
7. INSTALL 65W LED LUMINAIRE, TYPE III, WALL MOUNTED, NO ARM (7000 LUMENS, 30 LEDS MIN) LUMINAIRE: LUMARK WPSQLED-65-UNV OR APPROVED EQUIVALENT.

LEGEND

- 4.0 FOOT-CANDLE ISOLINE
- 2.0 FOOT-CANDLE ISOLINE
- 1.0 FOOT-CANDLE ISOLINE
- 0.5 FOOT-CANDLE ISOLINE

ILLUMINATION GENERAL NOTES

1. ELECTRICAL BY OTHERS
2. TOTAL LIGHT LOSS FACTOR OF 0.855 ASSUMED FOR MAINTAINED LEVEL.
3. ALL ILLUMINATION CALCULATIONS AND ISOLINES DEVELOPED USING AGI32 V14.6.13 PHOTOMETRIC SOFTWARE BY LIGHTING ANALYSTS, INC.
4. LIGHT POLES SHALL BE ALUMINUM, NATURAL FINISH, AND ELLIPTICAL MAST ARMS.
5. LUMINARIES SHALL BE LED LIGHT SOURCE WITH NO LESS THAN 30 LEDS AND NO LESS THAN 7000 LUMENS, WITH GREY COLORED "COBRAHEAD" STYLE HOUSINGS.



REGISTERED PROFESSIONAL ENGINEER
87769
OREGON
JULY 14, 2017
ASHLEY ROCHELLE SEAL
EXPIRES: 06/30/20

PRELIMINARY

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

PHOTOMETRICS PLAN

CRESTVIEW CROSSING

PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

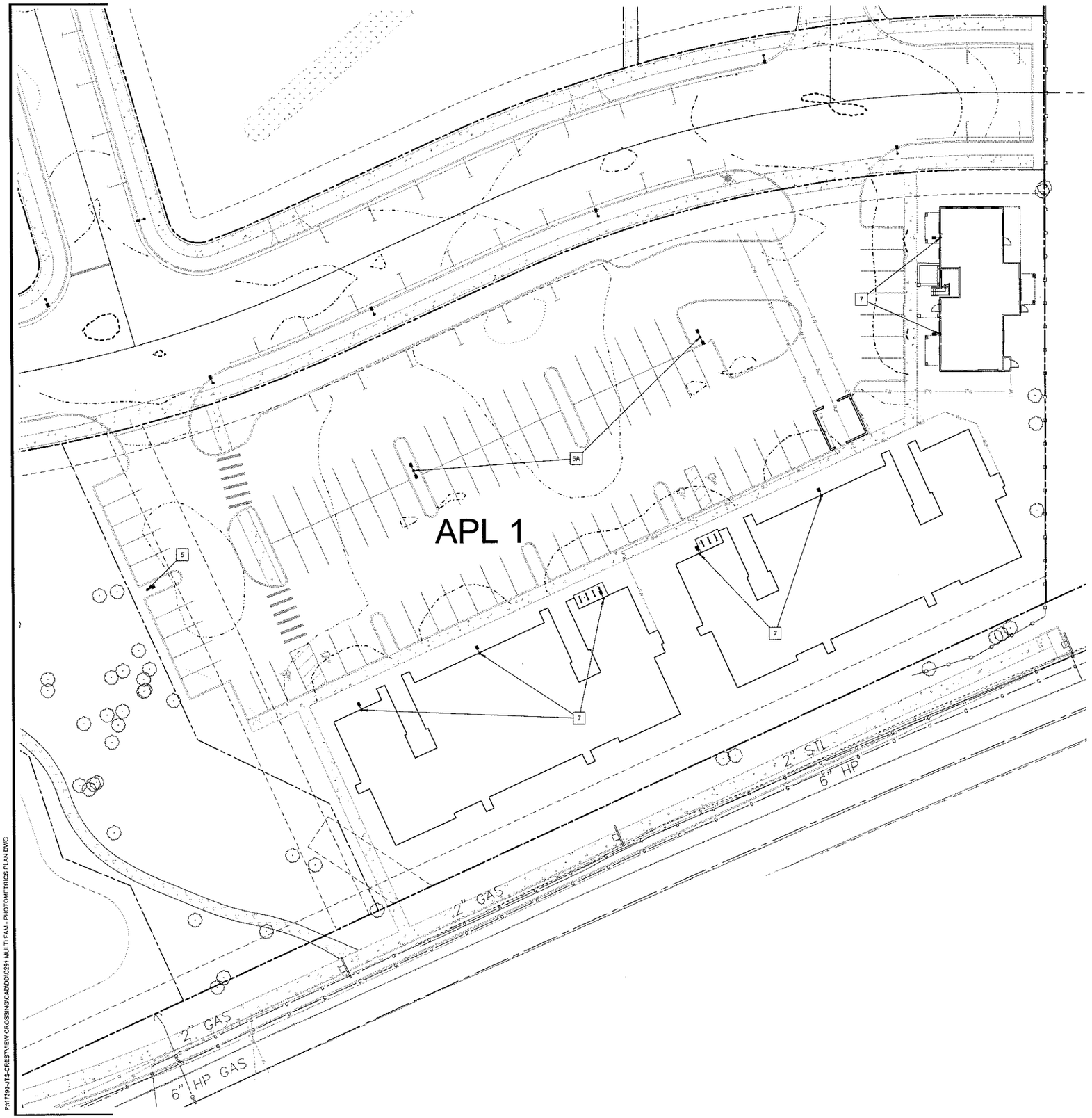
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C290

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DOC\280 PHOTOMETRICS PLAN.DWG



LEGEND

- 4.0 FOOT-CANDLE ISOLINE
- 2.0 FOOT-CANDLE ISOLINE
- 1.0 FOOT-CANDLE ISOLINE
- 0.5 FOOT-CANDLE ISOLINE

ILLUMINATION GENERAL NOTES

1. ELECTRICAL BY OTHERS
2. TOTAL LIGHT LOSS FACTOR OF 0.855 ASSUMED FOR MAINTAINED LEVEL.
3. ALL ILLUMINATION CALCULATIONS AND ISOLINES DEVELOPED USING AGI32 V14.6.13 PHOTOMETRIC SOFTWARE BY LIGHTING ANALYSTS, INC.
4. LIGHT POLES SHALL BE ALUMINUM, NATURAL FINISH, AND ELLIPTICAL MAST ARMS.
5. LUMINARIES SHALL BE LED LIGHT SOURCE WITH NO LESS THAN 30 LEDS AND NO LESS THAN 7000 LUMENS, WITH GREY COLORED "COBRAHEAD" STYLE HOUSINGS.

CONSTRUCTION KEY NOTES

5 INSTALL 70W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (7000 LUMENS, 30 LEDS).
LUMINAIRE: LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.

5A INSTALL TWO 70W LED LUMINAIRES, TYPE III, 25' POLE IN DOUBLE ARM ARRANGMENT, 6' ARMS
LUMINAIRE: TWO LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 2MA0632S-2208458O5T4-DNA OR CITY APPROVED EQUIVALENT.

7 INSTALL 65W LED LUMINAIRE, TYPE III, WALL MOUNTED, NO ARM (7000 LUMENS, 30 LEDS MIN)
LUMINAIRE: LUMARK WPSQLED-65-UNV OR APPROVED EQUIVALENT.

LIGHTING ZONE CALCULATIONS

APL 1: APARTMENTS PARKING LOT #1 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	N/A	1.36

Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER
87762PE
OREGON
JULY 14, 2017
AUDREY ROCHELLE SEAL
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY PHOTOMETRICS PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

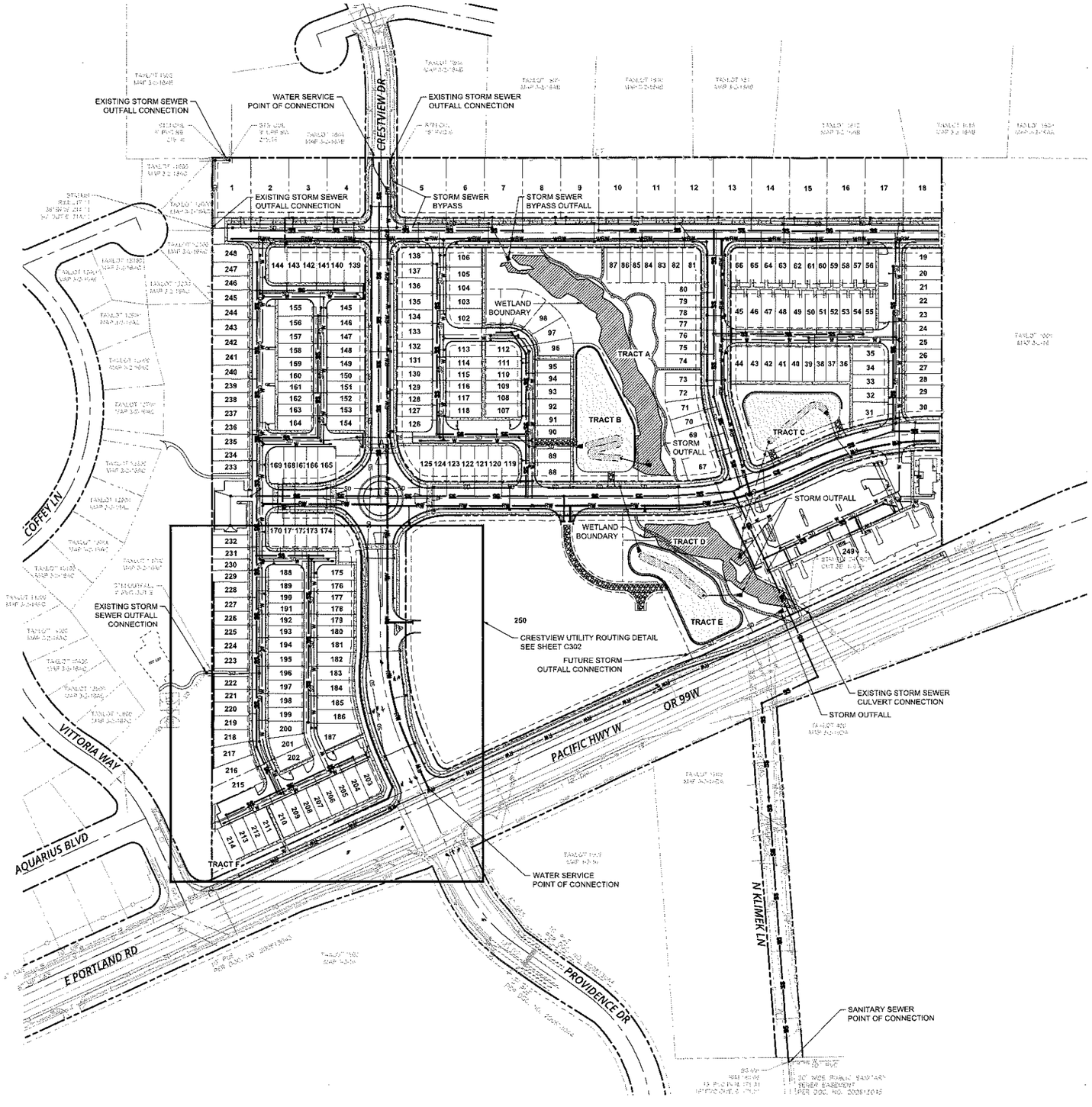
PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C291

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DO\C291 MULTI FAM - PHOTOMETRICS PLAN.DWG

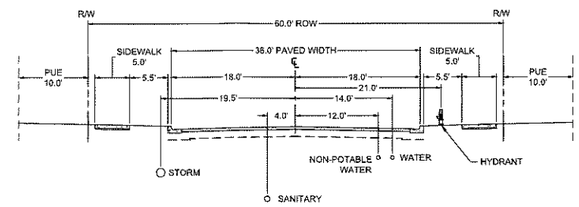
GENERAL NOTES

1. LOTS 1 THROUGH 7 SHALL HAVE STORMWATER QUALITY TREATMENT LOCATED WITHIN LOT BOUNDARIES. STORMWATER DISCHARGE FROM THESE LOTS SHALL CONNECT TO PROPOSED STORM SEWER BYPASS AND OUTFALL TO THE WETLAND.

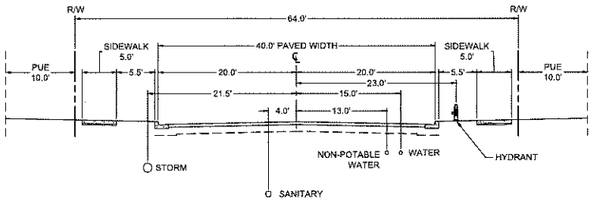


LEGEND

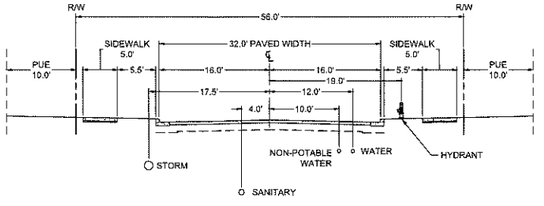
PROPOSED STORM PIPE	EXISTING TELECOM. LINE
PROPOSED SANITARY MAIN	EXISTING GAS LINE
PROPOSED WATER MAIN	EXISTING UNDERGROUND POWER
PROPOSED NON-POTABLE WATER MAIN	EXISTING OVERHEAD POWER
PROPOSED WATER FIRE SERVICE	EXISTING SANITARY SEWER
PROPOSED DETENTION POND	EXISTING STORM DRAIN
PROPOSED WATER QUALITY SWALE	EXISTING WATER MAIN
PIPE CAP / STUB	EXISTING HYDRANT
PROPOSED HYDRANT	EXISTING WATER VALVE
PROPOSED WATER VALVE	EXISTING SANITARY MANHOLE
PROPOSED WATER PIPE BLOWOFF/ PROPOSED AIR RELEASE ASSEMBLY	EXISTING STORM MANHOLE
PROPOSED FIRE DPT. CONNECTION	EXISTING STORM INLET
PROPOSED SANITARY MANHOLE	EXISTING POWER METER
PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT	EXISTING GAS METER
PROPOSED STORM MANHOLE	EXISTING TELEPHONE PEDESTAL
PROPOSED STORM OUTFALL PROTECTION	EXISTING GUY ANCHOR
PROPOSED STANDARD INLET MANHOLE	EXISTING LIGHT POLE
PROPOSED SUPERSIZED INLET MANHOLE	EXISTING UTILITY POLE
PROPOSED CATCH BASIN	EXISTING INTERSECTION SIGNAL
PROPOSED DITCH INLET	EXISTING ELECTRICAL BOX
PROPOSED STREET LIGHTING	



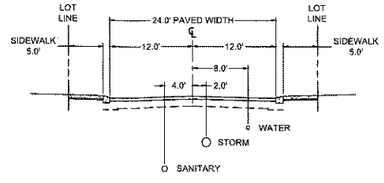
MAJOR COLLECTOR



MINOR COLLECTOR



LOCAL ROAD



PRIVATE ROAD

STREET UTILITIES TYPICAL SECTIONS

SCALE: NTS

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER
87762PE
OREGON
JULY 14, 1987
ASHLEY ROCHELLE STAL
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

COMPOSITE UTILITY PLAN

CRESTVIEW CROSSING

PLANNED UNIT DEVELOPMENT

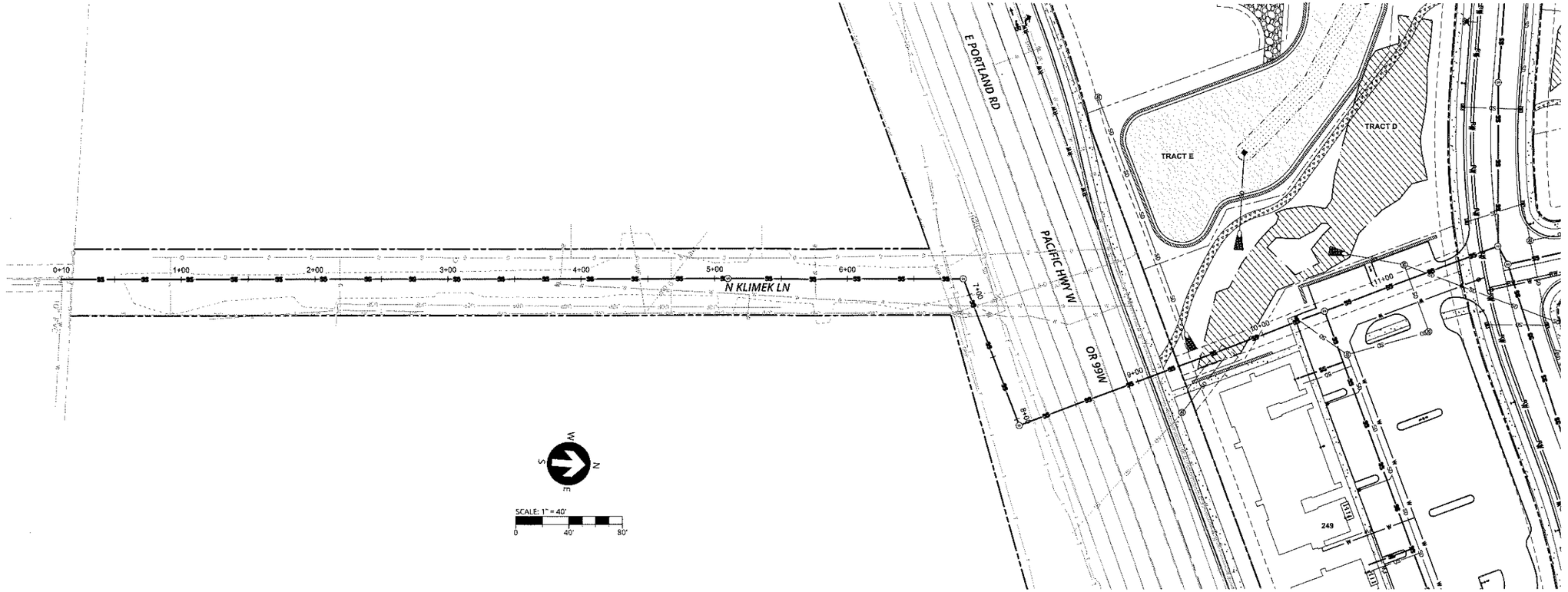
JT SMITH COMPANIES
NEWBERG, OR

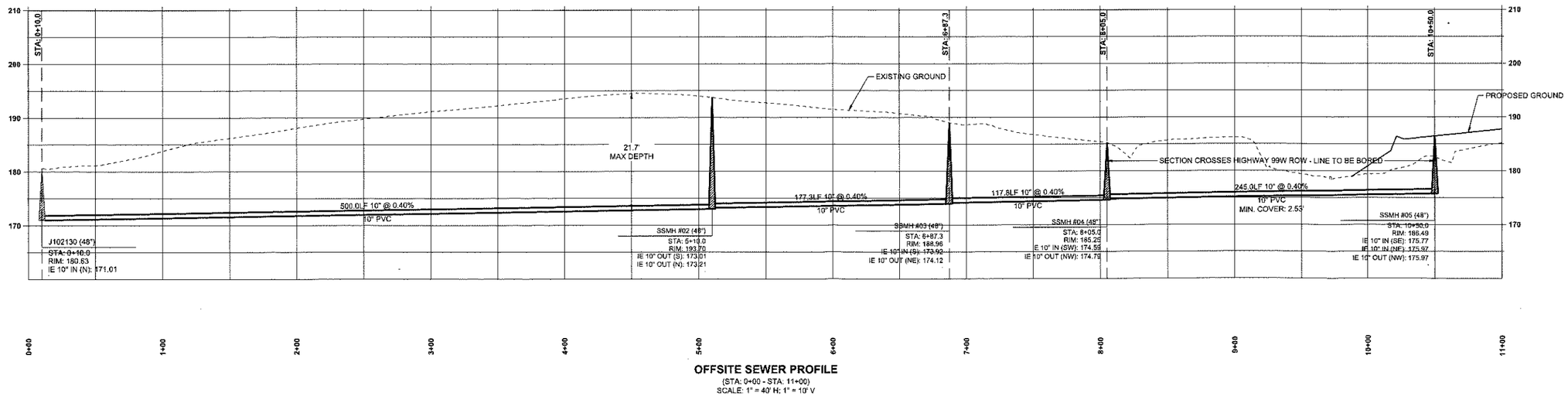
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C300

P:\17393-JT\5-CRESTVIEW CROSSING\CAD\DGN\C300 COMPOSITE UTILITY PLAN.DWG





OFFSITE SEWER PROFILE
(STA: 0+00 - STA: 11+00)
SCALE: 1" = 40' H; 1" = 10' V

REGISTERED PROFESSIONAL ENGINEER
87763PE
OREGON
JULY 14, 2017
KATHRYN ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

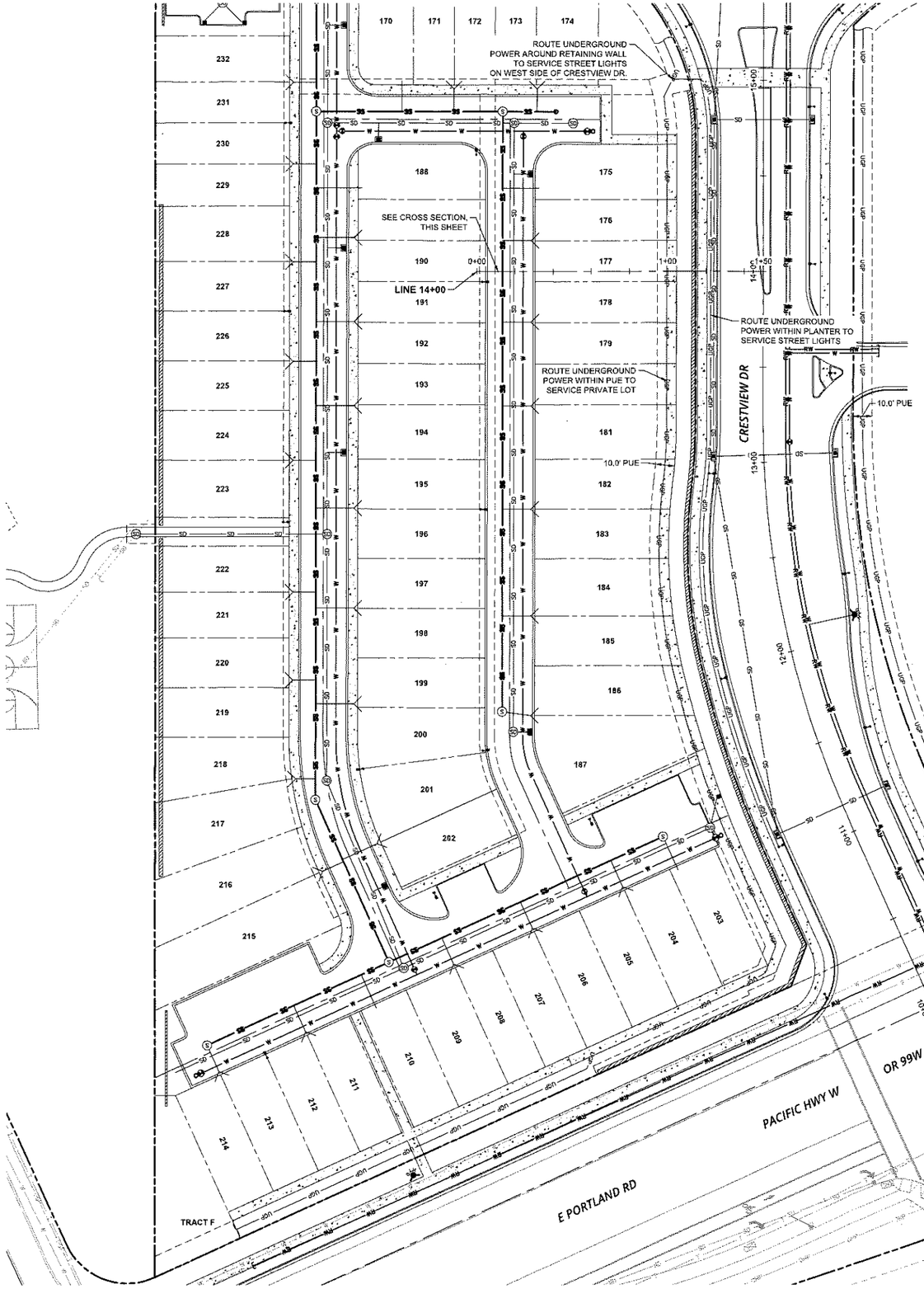
OFFSITE SEWER CONNECTION
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17383
TAX LOT(S) | 2S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

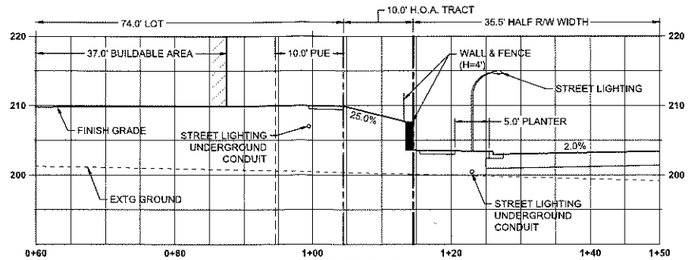
SHEET NUMBER
C301

P:\17383_JTS-CRESTVIEW CROSSING\CAD\DNC300 COMPOSITE UTILITY PLAN.DWG



LEGEND

- SD — PROPOSED STORM PIPE
- SS — PROPOSED SANITARY MAIN
- SS — PROPOSED SANITARY SERVICE LATERAL
- W — PROPOSED WATER PIPE
- RW — PROPOSED RECLAIMED WATER MAIN
- FW — PROPOSED WATER FIRE SERVICE
- UGP — PROPOSED UNDERGROUND POWER CONDUIT
- PROPOSED STREET LIGHT



14+00 PROFILE
(STA: 0+60 - STA: 1+50)
SCALE: 1" = 100' H; 1" = 100' V

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 30'
0 30' 60'

REGISTERED PROFESSIONAL ENGINEER — OREGON — JULY 14, 2017 — ASHLEY ROCHELLE SAIL — EXPIRES: 06/30/20

PRELIMINARY

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

PRELIMINARY STREET LIGHT CONDUIT ROUTING PLAN

CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

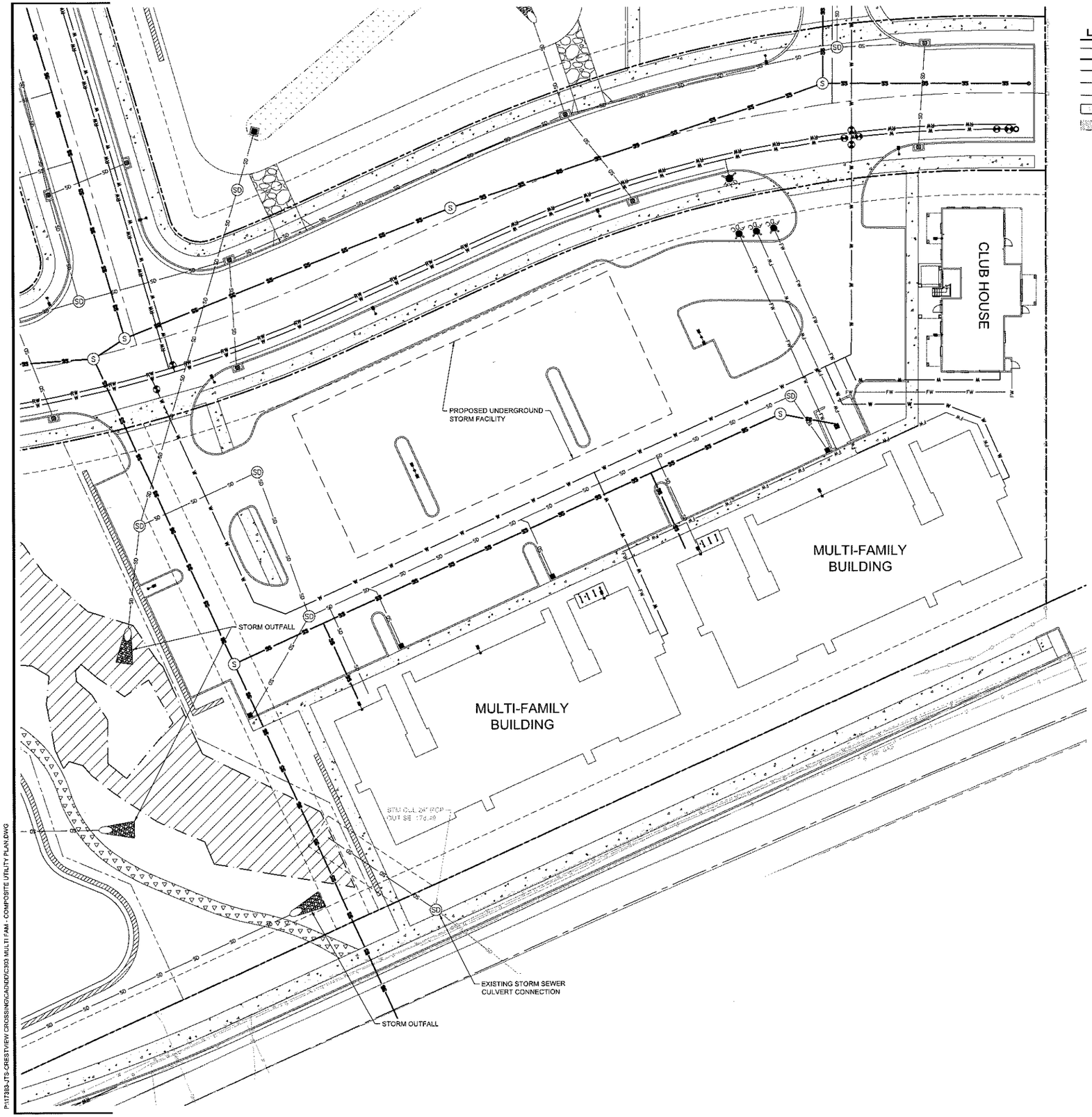
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C302

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DGN\C300 COMPOSITE UTILITY PLAN.DWG



LEGEND

- PROPOSED STORM PIPE
- PROPOSED SANITARY MAIN
- PROPOSED WATER MAIN
- PROPOSED NON-POTABLE WATER MAIN
- PROPOSED WATER FIRE SERVICE
- PROPOSED DETENTION POND
- PROPOSED WATER QUALITY SWALE
- PIPE CAP / STUB
- PROPOSED HYDRANT
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED WATER VALVE
- PROPOSED WATER PIPE BLOWOFF/ AIR RELEASE ASSEMBLY
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT
- PROPOSED STORM MANHOLE
- PROPOSED STORM OUTFALL PROTECTION
- PROPOSED STANDARD INLET MANHOLE
- PROPOSED SUPERSIZED INLET MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED DITCH INLET
- PROPOSED STREET LIGHTING
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD POWER
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING POWER METER
- EXISTING GAS METER
- EXISTING TELEPHONE PEDESTAL
- EXISTING GUY ANCHOR
- EXISTING LIGHT POLE
- EXISTING UTILITY POLE
- EXISTING INTERSECTION SIGNAL
- EXISTING ELECTRICAL BOX

Know what's below. Call before you dig. 811

N
W E
S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER
87760PE
OREGON
JULY 14, 1987
ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

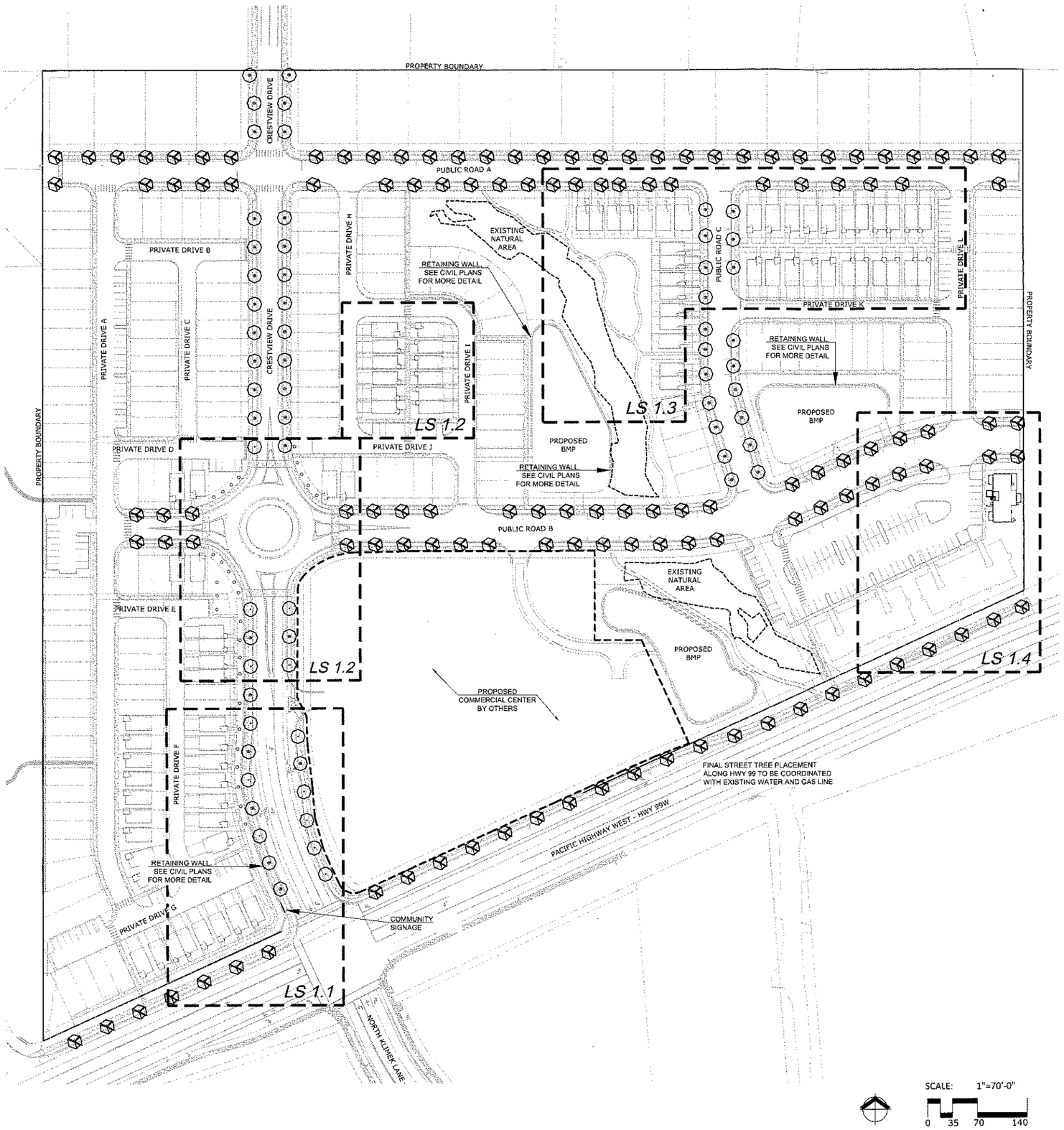
MULTI-FAMILY COMPOSITE UTILITY PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13500, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C303

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DOC\393 MULTI FAM - COMPOSITE UTILITY PLAN.DWG



STREET TREE PLANT MATERIAL SCHEDULE

SYMBOL	STREET TREES ITEM	SIZE
⊙	*ACER RUBRUM 'FRANKSRED'* RED SUNSET MAPLE	2" CAL.
⬡	*PLATANUS X ACERIFOLIA 'BLOODGOOD'* BLOODGOOD LONDON PLANE TREE	2" CAL.

NOTE: A STREET LIGHT LAYOUT PLAN HAS NOT YET BEEN GENERATED. STREET TREE LOCATIONS WILL BE COORDINATED WITH PROPOSED STREET LIGHT, DRIVEWAY, AND UTILITY LOCATIONS DURING CONSTRUCTION DOCUMENT PREPARATION.

GENERAL LANDSCAPE NOTES

1. LANDSCAPE PLANTING SHALL CONFORM TO THE STANDARDS ESTABLISHED UNDER THE CITY OF NEWBERG PLANNING DEPARTMENT.
2. ALL PLANT BEDS SHALL HAVE A 3" DEPTH OF BARK MULCH.
3. LANDSCAPE AREAS SHALL HAVE A COMPLETE UNDERGROUND AUTOMATIC IRRIGATION SYSTEM WITH FULL HEAD TO HEAD COVERAGE. WETLAND BUFFER SHALL HAVE A TEMPORARY IRRIGATION SYSTEM FOR THE TWO YEAR ESTABLISHMENT PERIOD.
4. ALL PLANT MATERIAL DELIVERED TO THIS SITE SHALL MEET THE AMERICAN STANDARD FOR NURSERY STOCK STANDARDS.
5. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER. THESE ITEMS MAY BE REQUIRED TO BE REPLACED WITH PLANT MATERIALS THAT ARE IN COMPLIANCE WITH THE DRAWINGS.

LS 1.4 — DASHED BOX AND SHEET NUMBER REFLECT CORRESPONDING SHEET WITH DETAILED ENLARGEMENT.

Cardno
Shaping the Future
PORTLAND
5415 SW WESTGATE DR., STE 100, PORTLAND, OR 97221
TEL: (503) 419 - 2600 FAX: (503) 419 - 2600
www.cardno.com

J.T. SMITH

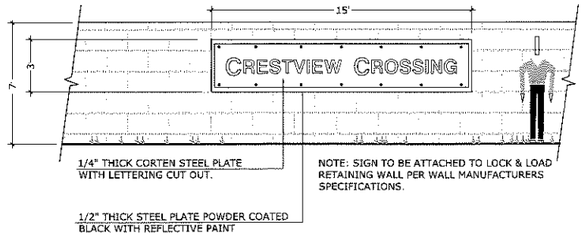
STREET TREE PLAN
CRESTVIEW CROSSING
JT SMITH COMPANIES
City of Newberg, Oregon

REGISTERED LA907
ANDREW D. HILL
OREGON
LANDSCAPE ARCHITECT
10/19/16
EXPIRES 10/31/18

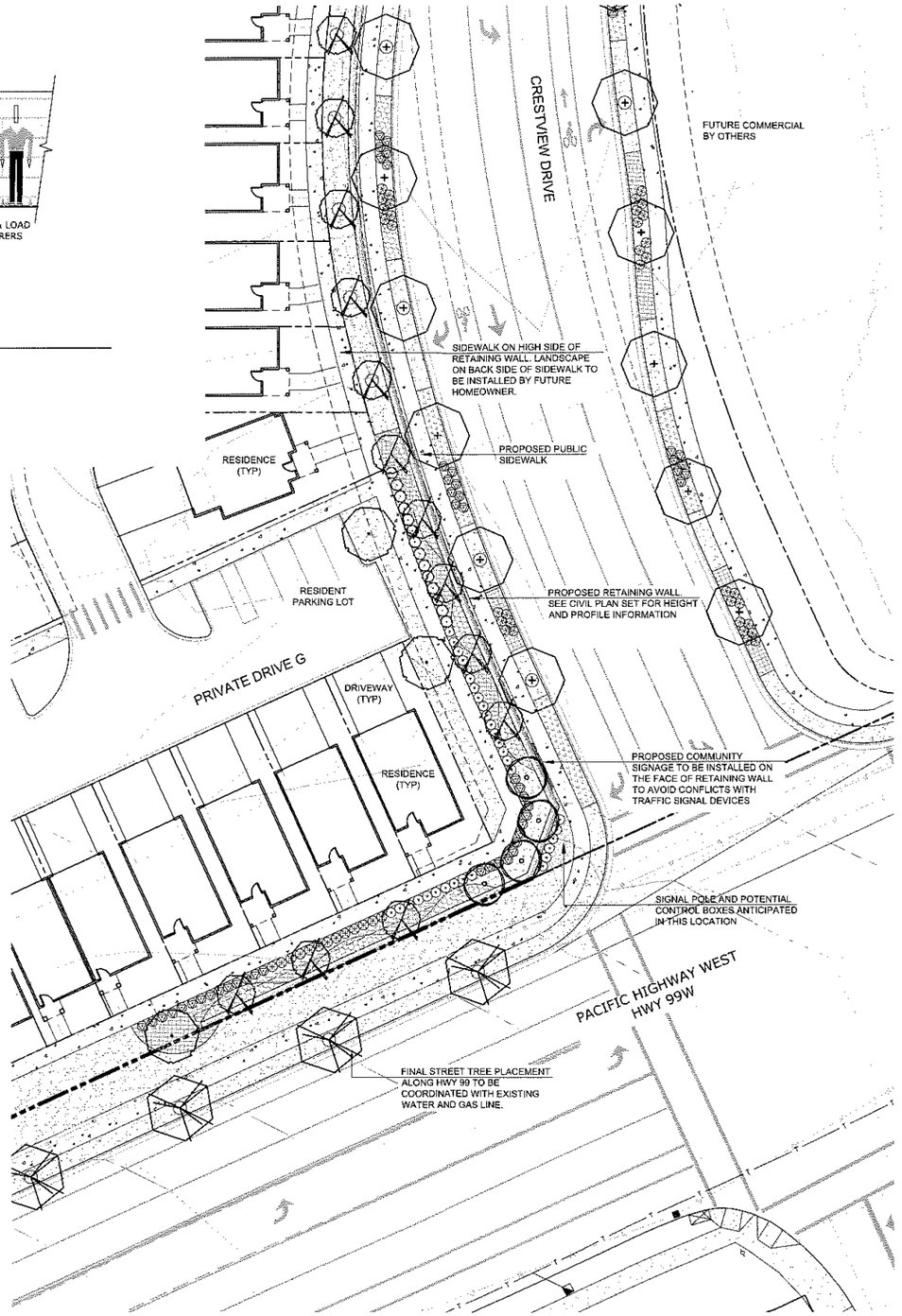
PROJECT NO.:
DATE: 06-06-2018
DESIGNED BY: ADH
DRAWN BY: KIW
CHECKED BY: ADH

STREET TREE PLAN

LS 1.0



A MAIN ENTRY SIGNAGE
SCALE 1/4"= 1'-0"



B MAIN ENTRY AND CRESTVIEW DRIVE ENLARGEMENT
SCALE 1"=20'-0"

SCALE: 1"=20'-0"
0 10 20 40

LANDSCAPE PLANT MATERIAL SCHEDULE

SYMBOL	STREET TREES ITEM	SIZE
+	*ACER RUBRUM 'FRANKSRED'* RED SUNSET MAPLE	2" CAL.
+	*PLATANUS X ACERIFOLIA 'BLOODGOOD'* BLOODGOOD LONDON PLANE TREE	2" CAL.
	TREES ITEM	SIZE
+	*ZELKOVA SERRATA 'GREEN VASE'* GREEN VASE ZELKOVA	2" CAL.
+	*TILIA CORDATA 'GREENSPIRE'* GREENSPIRE LINDEN	2" CAL.
+	*BETULA JACQUEMONTII* HIMALAYAN BIRCH	2" CAL.
+	*CERCIS CANADENSIS* EASTERN REDBUD	1.5" CAL.
+	*PRUNUS SARGENTII* SARGENT CHERRY	1.5" CAL.
+	*STYRAX JAPONICUS* JAPANESE SNOWBELL	1.5" CAL.
+	*ACER CIRCINATUM* VINE MAPLE	7'-8' HT.
	TREES-EVERGREEN ITEM	SIZE
+	*PINUS STROBUS 'FASTIGIATA'* FASTIGIATE WHITE PINE	6' HT. / B&B
+	*CHAMAECYPARIS OBTUSA 'GRACILIS'* SLENDER HINOKI FALSE CYPRESS	6' HT. / B&B
+	*THUJA PLICATA 'HOGAN'* HOGAN'S WESTERN REDCEDAR	6' HT. / B&B
	SHRUBS - DECIDUOUS ITEM	SIZE
+	*VIBURNUM P. TOMENTOSUM 'MARIESII'* DOUBLEFILE VIBURNUM	7 GAL.
+	*HYDRANGEA QUERCIFOLIA 'SNOW QUEEN'* SNOW QUEEN OAKLEAF HYDRANGEA	7 GAL.
+	*CORNUS STOLONIFERA 'FARROW'* ARCTIC FIRE RED TWIG DOGWOOD	3 GAL.
+	*BERBERIS THUN. 'CHERRY BOMB'* CHERRY BOMB BARBERRY	3 GAL.
+	*ROSA X 'RADRAZZ'* KNOCK OUT SHRUB ROSE	3 GAL.
	SHRUBS - EVERGREEN ITEM	SIZE
+	*PRUNUS LAUROCERASUS 'NANA'* DWARF ENGLISH LAUREL	7 GAL.
+	*CHOISYA TERNATA* MEXICAN ORANGE	7 GAL.
+	*ABELIA X GRANDIFLORA* GLOSSY ABELIA	7 GAL.
+	*OSMANTHUS FRAGRANS* SWEET OLIVE	7 GAL.
+	*SARCOCOCCA HOOKERIANA VAR. HUMILIS* HIMALAYAN SWEET BOX	3 GAL.
+	*DAPHNE ODORA 'AUREO-MARGINATA'* VARIEGATED WINTER DAPHNE	3 GAL.
+	*NANDINA DOMESTICA 'COMPACTA'* DWARF HEAVENLY BAMBOO	3 GAL.
+	*BUXUS SEMPERVIRENS 'SUFFRUTICOSA'* EDGING BOXWOOD	3 GAL.
+	*VIBURNUM DAVIDII* DAVID VIBURNUM	3 GAL.
+	*ESCALLONIA 'COMPAKTA'* COMPACT ESCALLONIA	3 GAL.
	GRASSES & ACCENTS ITEM	SIZE
+	*LIRIOPE MUSCARI 'BIG BLUE'* BIG BLUE LILYTURF	1 GAL.
+	*MISCANTHUS SINENSIS 'VARIEGATUS'* VARIEGATED JAPANESE SILVER GRASS	3 GAL.
+	*MISCANTHUS SINENSIS 'LITTLE KITTEN'* LITTLE KITTEN MAIDEN GRASS	3 GAL.
+	*CALAMAGROSTIS X ACUTIFLORA 'OVERDAM'* OVERDAM FEATHER REED GRASS	3 GAL.
	GROUNDCOVERS ITEM	SIZE
+	*COTONEASTER DAMMERI 'LOWFAST'* BEARBERRY COTONEASTER	1 GAL. 3' O.C.
+	*RUBUS CALY 'EMERALD CARPET'* EMERALD CARPET CREEPING BERRY	1 GAL. 3' O.C.
+	ANNUALS	4" FLATS 8" O.C.
+	*PT 769 ROUGH & READY ECO-TURF MIX* BY PRO TIME LAWN SEED	SEED 5-7 LBS. / 1,000 SF

Cardno
Shaping the Future
PORTLAND
5415 SW WESTGATE DR, STE 100, PORTLAND, OR 97221
TEL: (503) 419 - 2500 FAX: (503) 419 - 2600
www.cardno.com

J.T. SMITH COMPANIES

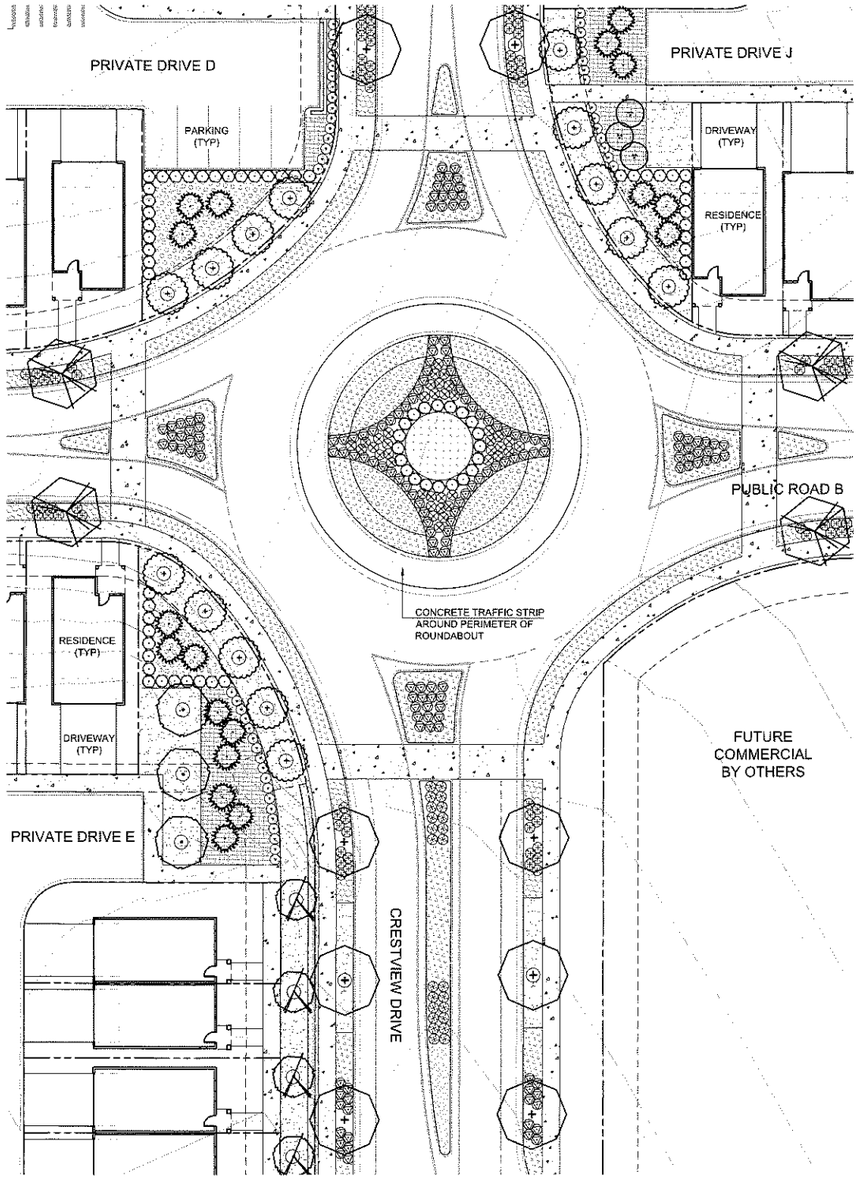
PLANTING PLAN
CRESTVIEW CROSSING
JT SMITH COMPANIES
City of Newberg, Oregon

REGISTERED LA907
ANDREW D. HILL
OREGON 10/19/16
LANDSCAPE ARCHITECT
EXPIRES 10/31/18

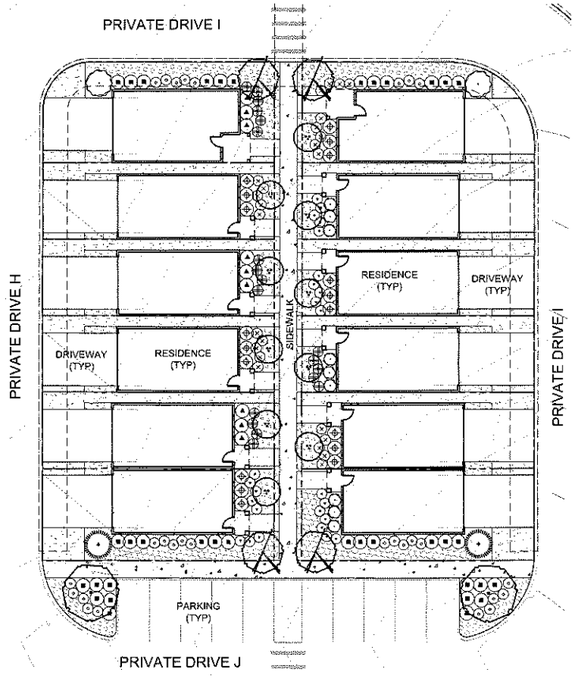
PROJECT NO.:
DATE: 06-06-2018
DESIGNED BY: ADH
DRAWN BY: KW
CHECKED BY: ADH

PLANTING PLAN

LS 1.1



A CRESTVIEW DRIVE AND ROUNDABOUT ENLARGEMENT
SCALE 1"=20'-0"



B COURTYARD ENLARGEMENT
SCALE 1"=20'-0"

SCALE: 1"=20'-0"
0 10 20 40

LANDSCAPE PLANT MATERIAL SCHEDULE

SYMBOL	ITEM	SIZE
	STREET TREES	
	ACER RUBRUM 'FRANKSRED' RED SUNSET MAPLE	2" CAL.
	PLATANUS X ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE TREE	2" CAL.
	TREES	
	ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	2" CAL.
	TILIA CORDATA 'GREENSPIRE' GREENSPIRE LINDEN	2" CAL.
	BETULA JACQUEMONTII HIMALAYAN BIRCH	2" CAL.
	CERCIS CANADENSIS EASTERN REDBUD	1.5" CAL.
	PRUNUS SARGENTII SARGENT CHERRY	1.5" CAL.
	STYRAX JAPONICUS JAPANESE SNOWBELL	1.5" CAL.
	ACER CIRCINATUM VINE MAPLE	7'-8' HT.
	TREES-EVERGREEN	
	PINUS STROBUS 'FASTIGIATA' FASTIGIATE WHITE PINE	6' HT. / B&B
	CHAMAECYPARIS OBTUSA 'GRACILIS' SLENDER HINOKI FALSE CYPRESS	6' HT. / B&B
	THUJA PLICATA 'HOGAN' HOGAN'S WESTERN REDCEDAR	6' HT. / B&B
	SHRUBS - DECIDUOUS	
	VIBURNUM P. TOMENTOSUM 'MARIESII' DOUBLEFILE VIBURNUM	7 GAL.
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN' SNOW QUEEN OAKLEAF HYDRANGEA	7 GAL.
	CORNUS STOLONIFERA 'FARROW' ARCTIC FIRE RED TWIG DOGWOOD	3 GAL.
	BERBERIS THUN. 'CHERRY BOMB' CHERRY BOMB BARBERRY	3 GAL.
	ROSA X 'RADRAZZ' KNOCK OUT SHRUB ROSE	3 GAL.
	SHRUBS - EVERGREEN	
	PRUNUS LAUROCERASUS 'NANA' DWARF ENGLISH LAUREL	7 GAL.
	CHOISYA TERNATA MEXICAN ORANGE	7 GAL.
	ABELIA X GRANDIFLORA GLOSSY ABELIA	7 GAL.
	OSMANTHUS FRAGRANS SWEET OLIVE	7 GAL.
	SARCOCOCCA HOOKERIANA VAR. HUMILIS HIMALAYAN SWEET BOX	3 GAL.
	DAPHNE ODORA 'AUREO-MARGINATA' VARIEGATED WINTER DAPHNE	3 GAL.
	NANDINA DOMESTICA 'COMPACTA' DWARF HEAVENLY BAMBOO	3 GAL.
	BUXUS SEMPERVIRENS 'SUFFRUTICOSA' EDGING BOXWOOD	3 GAL.
	VIBURNUM DAVIDII DAVID VIBURNUM	3 GAL.
	ESCALLONIA 'COMPAKTA' COMPACT ESCALLONIA	3 GAL.
	GRASSES & ACCENTS	
	LIRIOPE MUSCARI 'BIG BLUE' BIG BLUE LILYTURF	1 GAL.
	MISCANTHUS SINENSIS 'VARIEGATUS' VARIEGATED JAPANESE SILVER GRASS	3 GAL.
	MISCANTHUS SINENSIS 'LITTLE KITTEN' LITTLE KITTEN MAIDEN GRASS	3 GAL.
	CALAMAGROSTIS X ACUTIFLORA 'OVERDAM' OVERDAM FEATHER REED GRASS	3 GAL.
	GROUNDCOVERS	
	COTONEASTER DAMMERI 'LOWFAST' BEARBERRY COTONEASTER	1 GAL. 3' O.C.
	RUBUS CALY. 'EMERALD CARPET' EMERALD CARPET CREEPING BERRY	1 GAL. 3' O.C.
	ANNUALS	4" FLATS 8" O.C.
	PT 769 ROUGH & READY ECO-TURF MIX BY PRO TIME LAWN SEED	SEED 5-7 LBS. / 1,000 SF

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J.T. SMITH COMPANIES

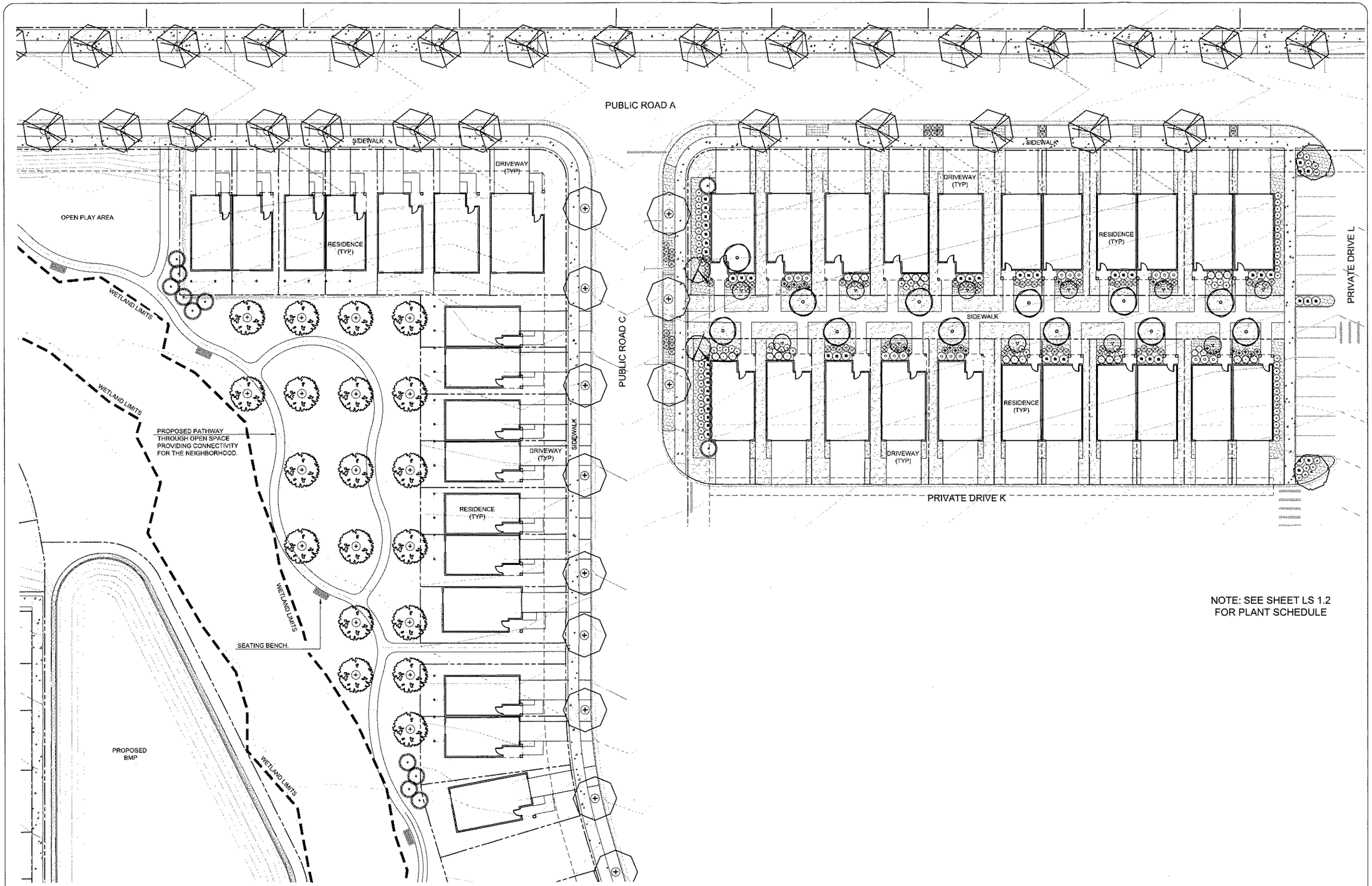
PLANTING PLAN
CRESTVIEW CROSSING
JT SMITH COMPANIES
City of Newberg, Oregon

REGISTERED LA907
ANDREW D. HILL
OREGON 10/19/16
LANDSCAPE ARCHITECT
EXPIRES 10/31/16

PROJECT NO.:	
DATE:	06-06-2018
DESIGNED BY:	ADH
DRAWN BY:	KIW
CHECKED BY:	ADH

PLANTING PLAN

LS 1.2



NOTE: SEE SHEET LS 1.2
FOR PLANT SCHEDULE

A WETLAND/ COMMON OPEN SPACE PATHWAY AND RESIDENTIAL COURTYARD ENLARGEMENT
SCALE 1"=20'-0"

SCALE: 1"=20'-0"
0 10 20 40

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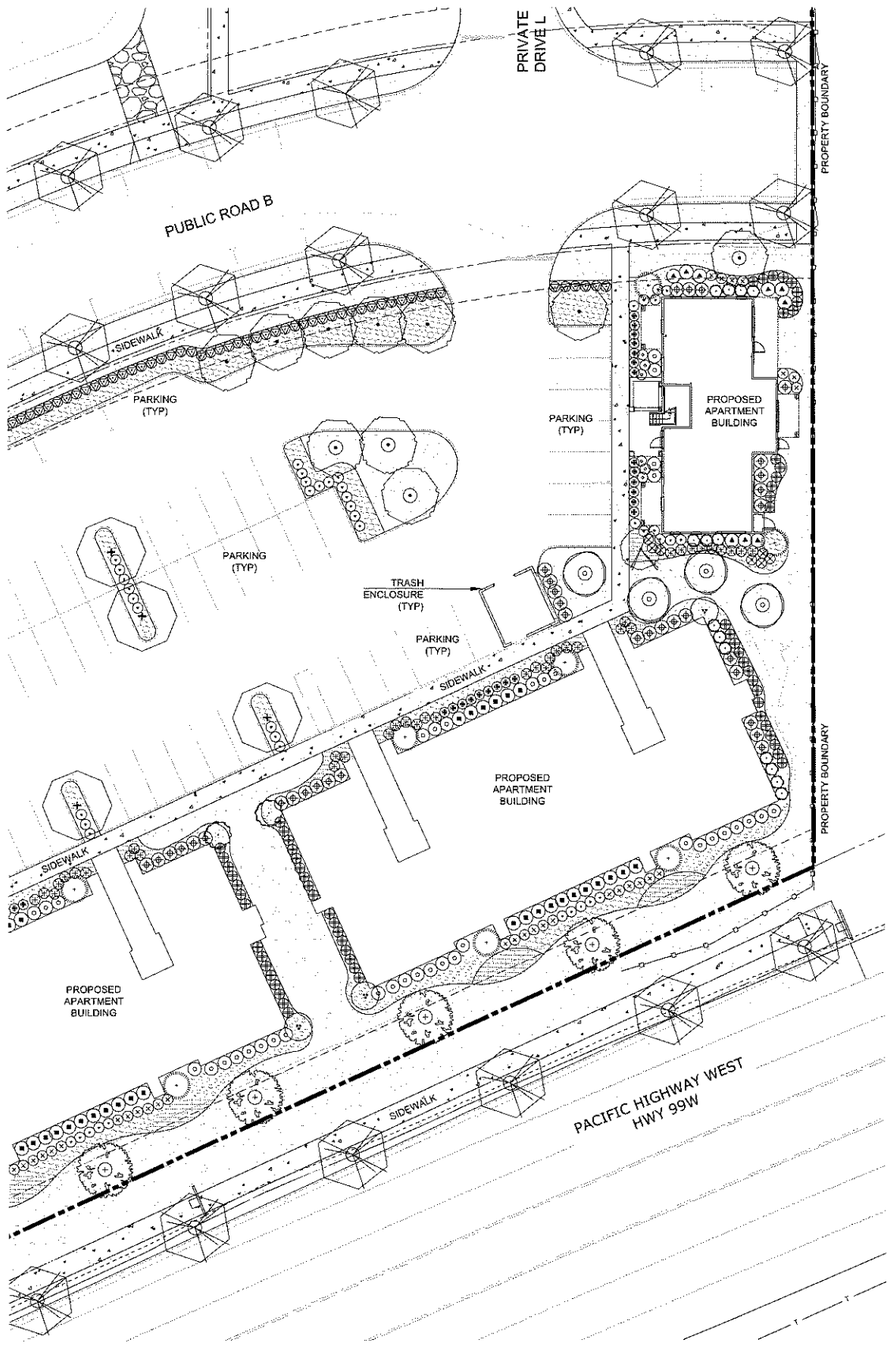
PLANTING PLAN
CRESTVIEW CROSSING
JT SMITH COMPANIES
City of Newberg, Oregon

REGISTERED
LA907
ANDREW D. HILL
OREGON
10/19/16
LANDSCAPE ARCHITECT
EXPIRES 10/31/16

PROJECT NO.:	
DATE:	06-06-2016
DESIGNED BY:	ADH
DRAWN BY:	KIW
CHECKED BY:	ADH

PLANTING PLAN

LS 1.3



A APARTMENT COMPLEX AND HWY 99 FRONTAGE ENLARGEMENT
SCALE 1"=20'-0"

SCALE: 1"=20'-0"
0 10 20 40

LANDSCAPE PLANT MATERIAL SCHEDULE

SYMBOL	ITEM	SIZE
STREET TREES		
	ACER RUBRUM 'FRANKSRED' RED SUNSET MAPLE	2" CAL.
	PLATANUS X ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE TREE	2" CAL.
TREES		
	ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	2" CAL.
	TILIA CORDATA 'GREENSPIRE' GREENSPIRE LINDEN	2" CAL.
	BETULA JACQUEMONTII HIMALAYAN BIRCH	2" CAL.
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	PRUNUS SARGENTII SARGENT CHERRY	1.5" CAL.
	STYRAX JAPONICUS JAPANESE SNOWBELL	1.5" CAL.
	ACER CIRCINATUM VINE MAPLE	7'-8' HT.
TREES-EVERGREEN		
	PINUS STROBUS 'FASTIGIATA' FASTIGIATE WHITE PINE	6' HT. / B&B
	CHAMAECYPARIS OBTUSA 'GRACILIS' SLENDER HINOKI FALSE CYPRESS	6' HT. / B&B
	THUJA PLICATA 'HOGAN' HOGAN'S WESTERN REDCEDAR	6' HT. / B&B
SHRUBS - DECIDUOUS		
	VIBURNUM P. TOMENTOSUM 'MARIESII' DOUBLEFILE VIBURNUM	7 GAL.
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN' SNOW QUEEN OAKLEAF HYDRANGEA	7 GAL.
	CORNUS STOLONIFERA 'FARROW' ARCTIC FIRE RED TWIG DOGWOOD	3 GAL.
	BERBERIS THUN 'CHERRY BOMB' CHERRY BOMB BARBERRY	3 GAL.
	ROSA X 'RADRAZZ' KNOCK OUT SHRUB ROSE	3 GAL.
SHRUBS - EVERGREEN		
	PRUNUS LAUROCERASUS 'NANA' DWARF ENGLISH LAUREL	7 GAL.
	CHOISYA TERNATA MEXICAN ORANGE	7 GAL.
	ABELIA X GRANDIFLORA GLOSSY ABELIA	7 GAL.
	OSMANTHUS FRAGRANS SWEET OLIVE	7 GAL.
	SARCOCOCCA HOOKERIANA VAR. HUMILIS HIMALAYAN SWEET BOX	3 GAL.
	DAPHNE ODORA 'AUREO-MARGINATA' VARIEGATED WINTER DAPHNE	3 GAL.
	NANDINA DOMESTICA 'COMPACTA' DWARF HEAVENLY BAMBOO	3 GAL.
	BUXUS SEMPERVIRENS 'SUFFRUTICOSA' EDGING BOXWOOD	3 GAL.
	VIBURNUM DAVIDII DAVID VIBURNUM	3 GAL.
	ESCALLONIA 'COMPAKTA' COMPACT ESCALLONIA	3 GAL.
GRASSES & ACCENTS		
	LIRIOPE MUSCARI 'BIG BLUE' BIG BLUE LILYTURF	1 GAL.
	MISCANTHUS SINENSIS 'VARIEGATUS' VARIEGATED JAPANESE SILVER GRASS	3 GAL.
	MISCANTHUS SINENSIS 'LITTLE KITTEN' LITTLE KITTEN MAIDEN GRASS	3 GAL.
	CALAMAGROSTIS X ACUTIFLORA 'OVERDAM' OVERDAM FEATHER REED GRASS	3 GAL.
GROUNDCOVERS		
	COTONEASTER DAMMERI 'LOWFAST' BEARBERRY COTONEASTER	1 GAL. 3' O.C.
	RUBUS CALY. 'EMERALD CARPET' EMERALD CARPET CREEPING BERRY	1 GAL. 3' O.C.
	ANNUALS	4" FLATS 8" O.C.
	PT 769 ROUGH & READY ECO-TURF MIX BY PRO TIME LAWN SEED	SEED 5-7 LBS. / 1,000 SF

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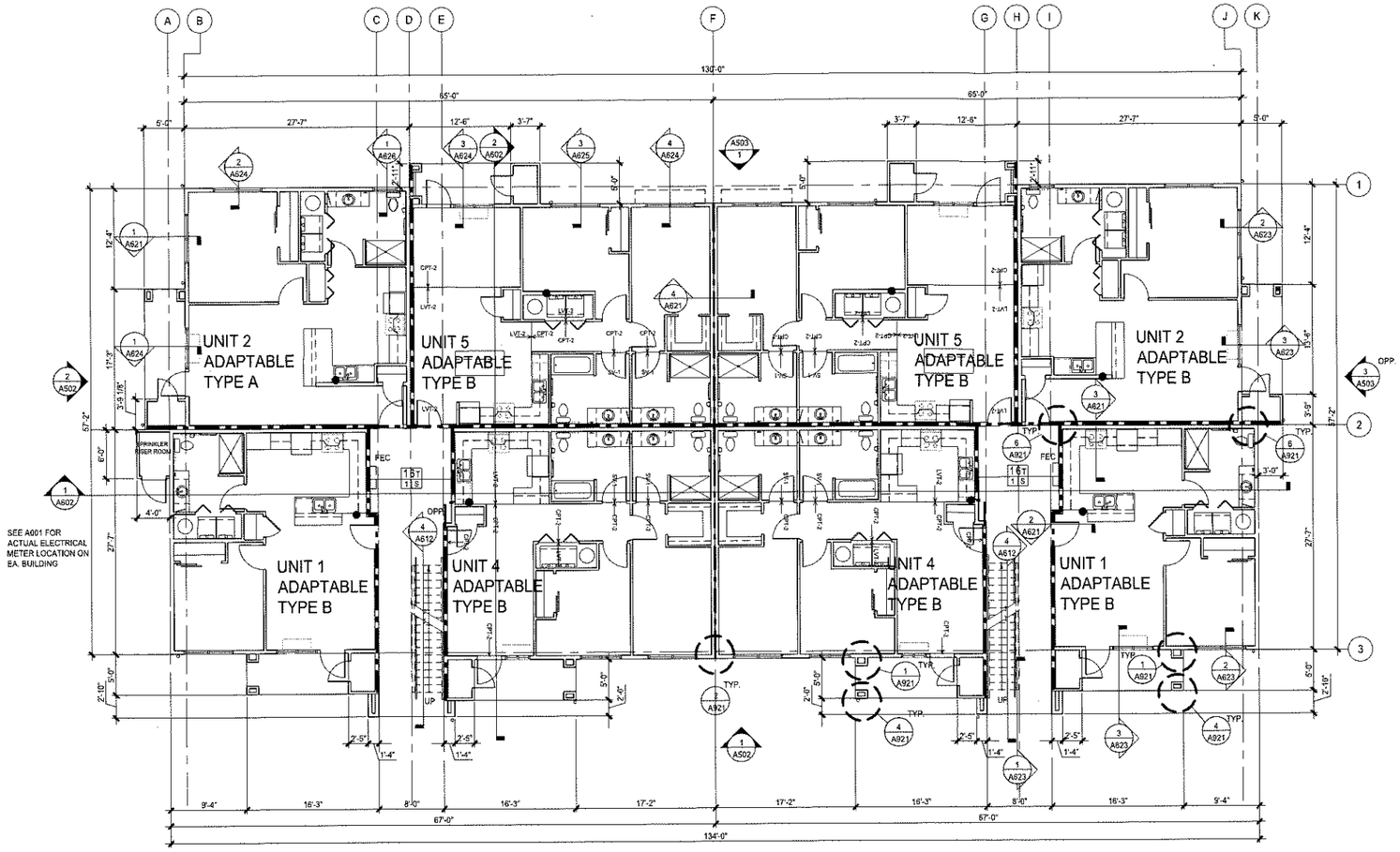
CRESTVIEW CROSSING
JT SMITH COMPANIES
City of Newberg, Oregon

REGISTERED LA907
ANDREW D. HILL
OREGON
LANDSCAPE ARCHITECT
10/19/16
EXPIRES 10/31/18

PROJECT NO.:	
DATE:	06-06-2018
DESIGNED BY:	ADH
DRAWN BY:	KW
CHECKED BY:	ADH

PLANTING PLAN

LS 1.4



1 BUILDING TYPE A2 - FIRST FLOOR ADAPTABLE UNITS

SCALE: 1/8" = 1'-0"

LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com

PRELIMINARY
NOT FOR
CONSTRUCTION

CONSULTANT:

PROJECT NUMBER:

Crestview
Crossing
NEWBERG, OR

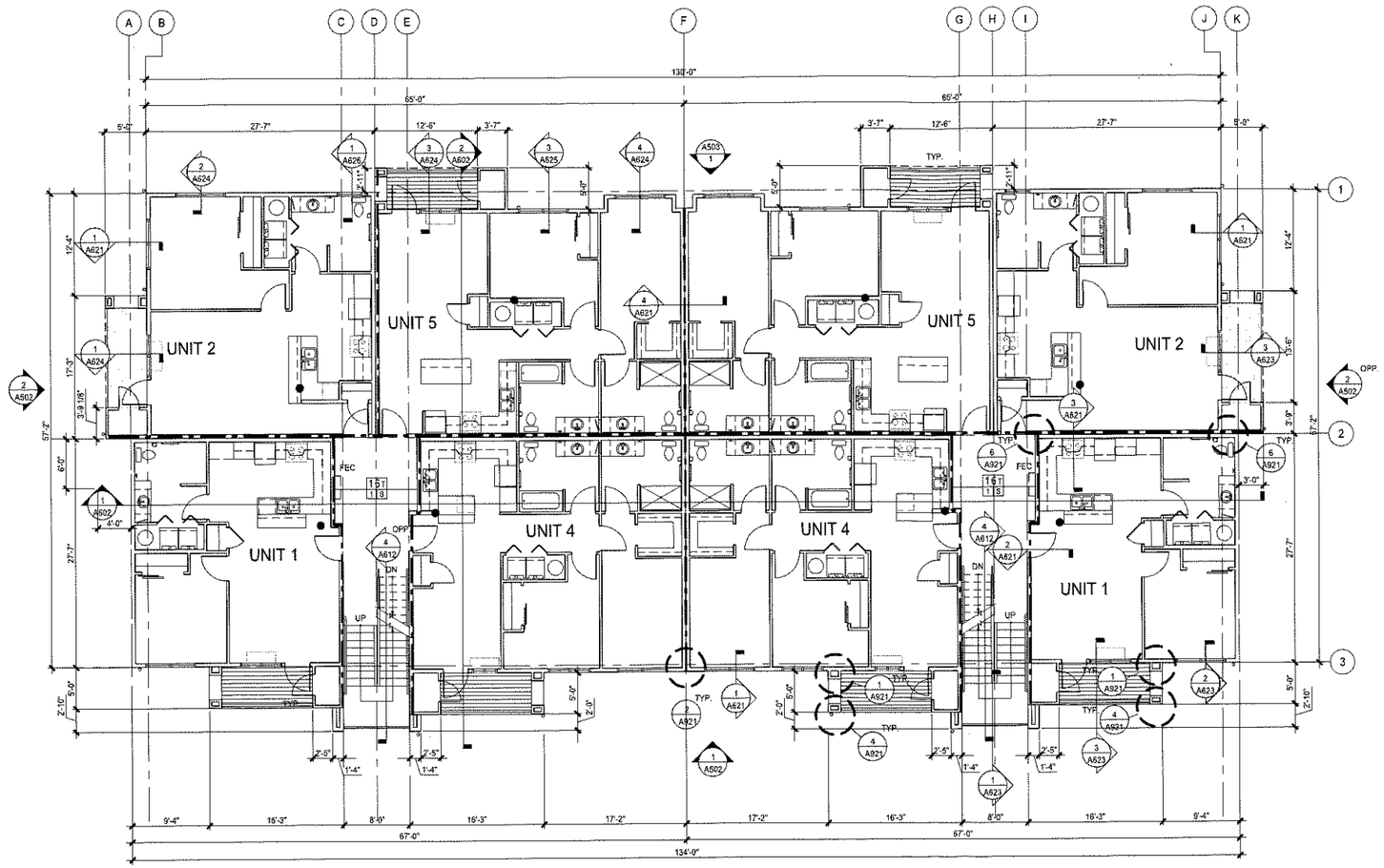
SHEET TITLE:

BUILDING A2
FLOOR PLANS

DRAWN BY: ....

DATE ISSUED:

SHEET: **A204**



1 BUILDING TYPE A2 - SECOND FLOOR UNITS

SCALE: 1/8" = 1'-0"

LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com

PRELIMINARY
NOT FOR
CONSTRUCTION

CONSULTANT:

PROJECT NUMBER:

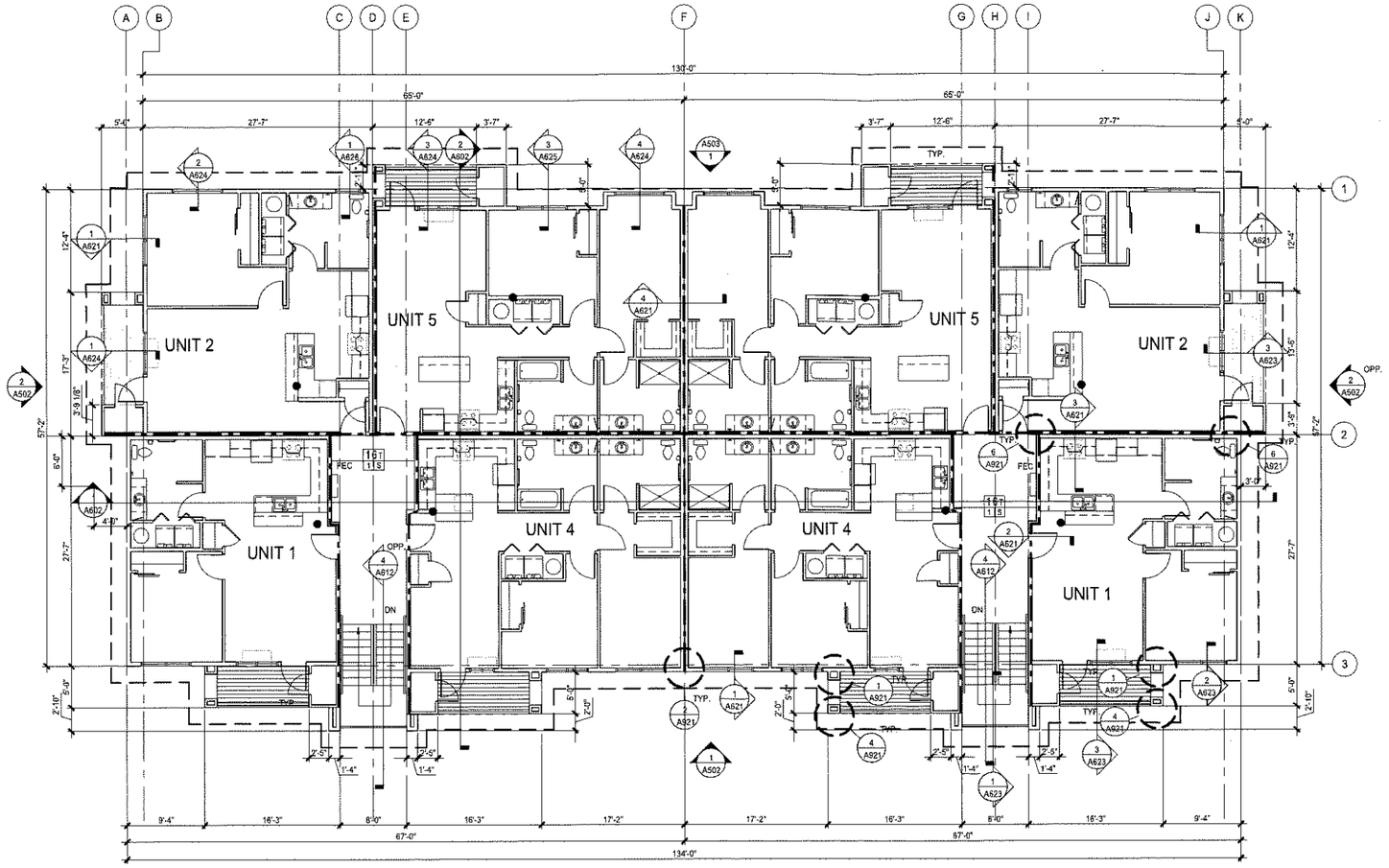
Crestview Crossing
NEWBERG, OR

SHEET TITLE:

BUILDING A2 FLOOR PLANS

DRAWN BY:
DATE ISSUED:

SHEET: **A205**



1 BUILDING TYPE A2 - THIRD FLOOR UNITS

SCALE: 1/8" = 1'-0"

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Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com

PRELIMINARY
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CONSTRUCTION

CONSULTANT:

PROJECT NUMBER:

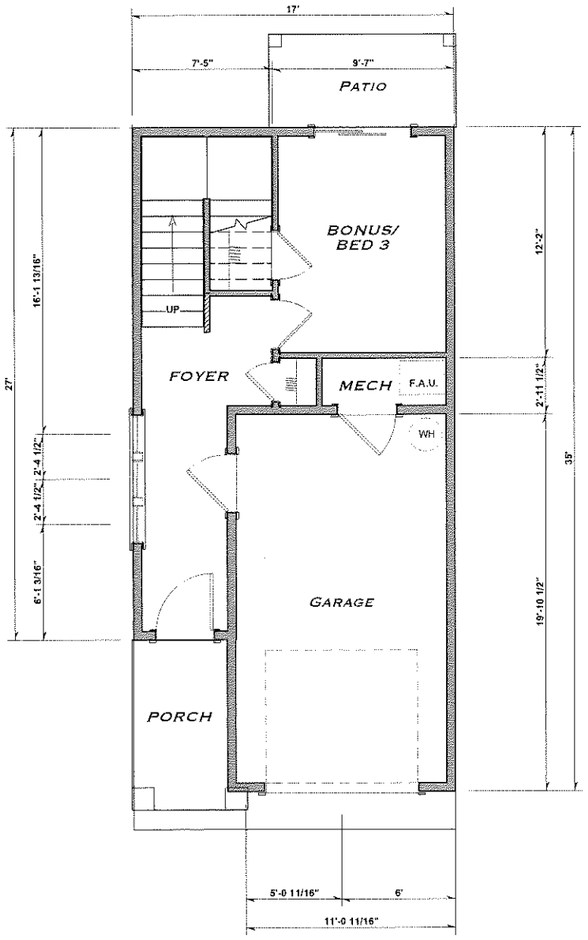
Crestview
Crossing
NEWBERG, OR

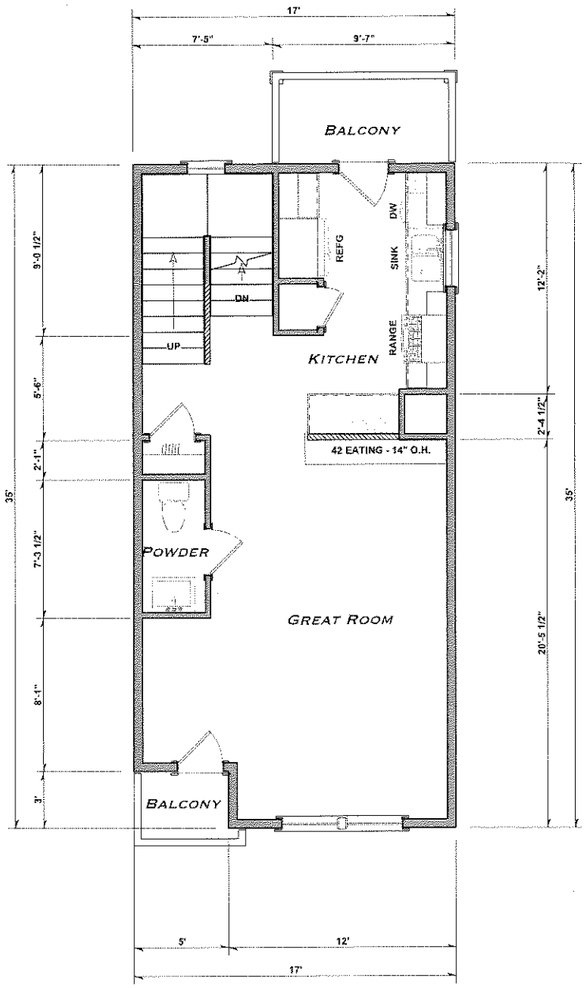
SHEET TITLE:

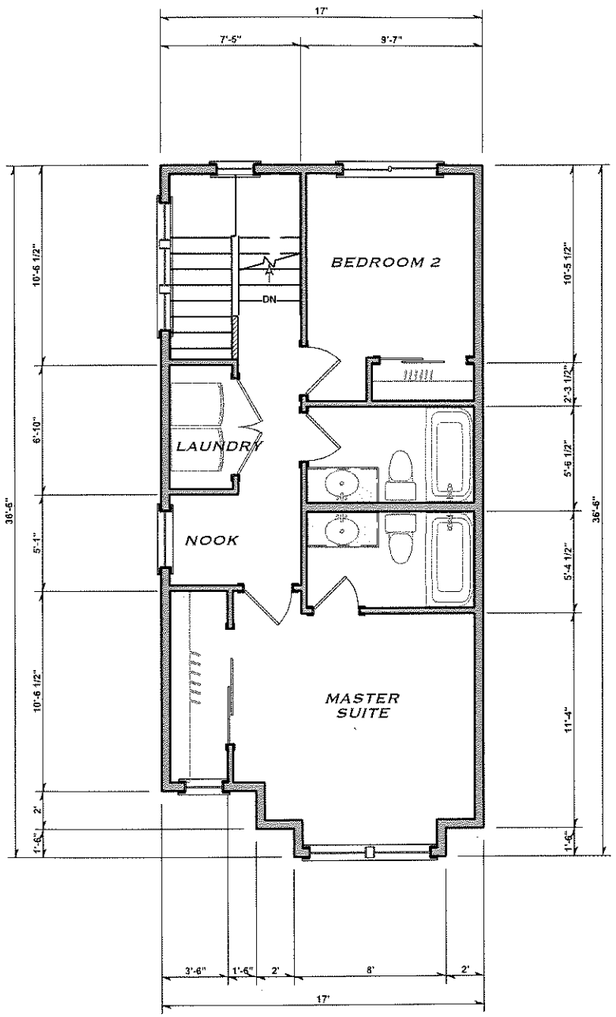
BUILDING A2
FLOOR PLANS

DRAWN BY: ---
DATE ISSUED: 0

SHEET: **A206**







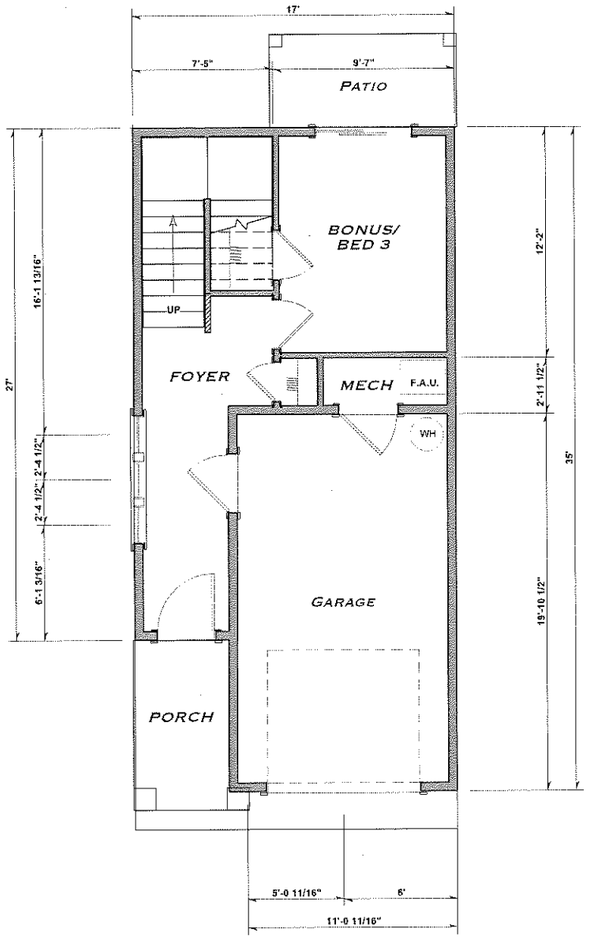
17ft wide plan concept

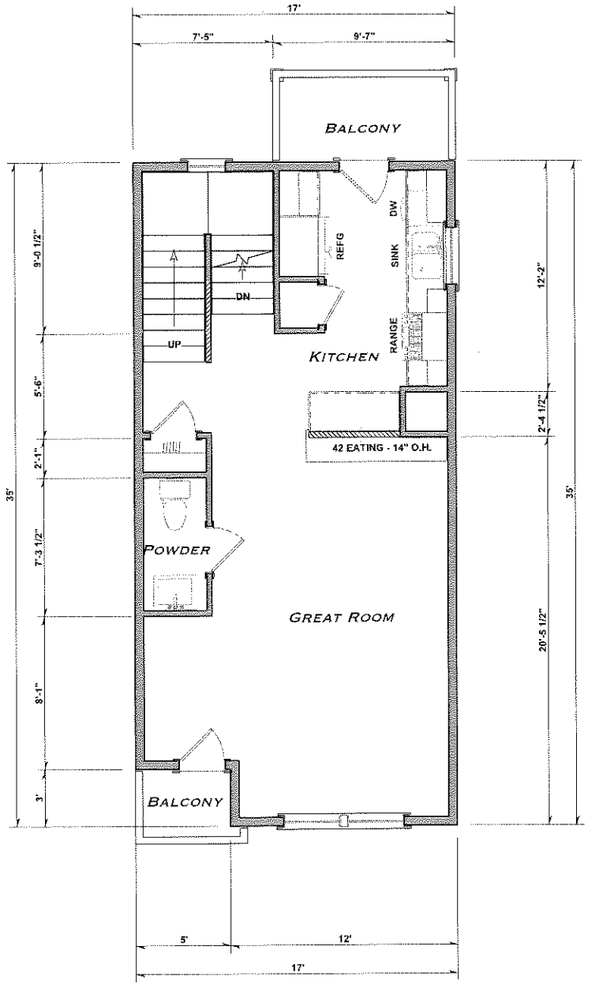
ground floor		322 sq ft
main floor		518 sq ft
upper floor		529 sq ft
total		1,369 sq ft

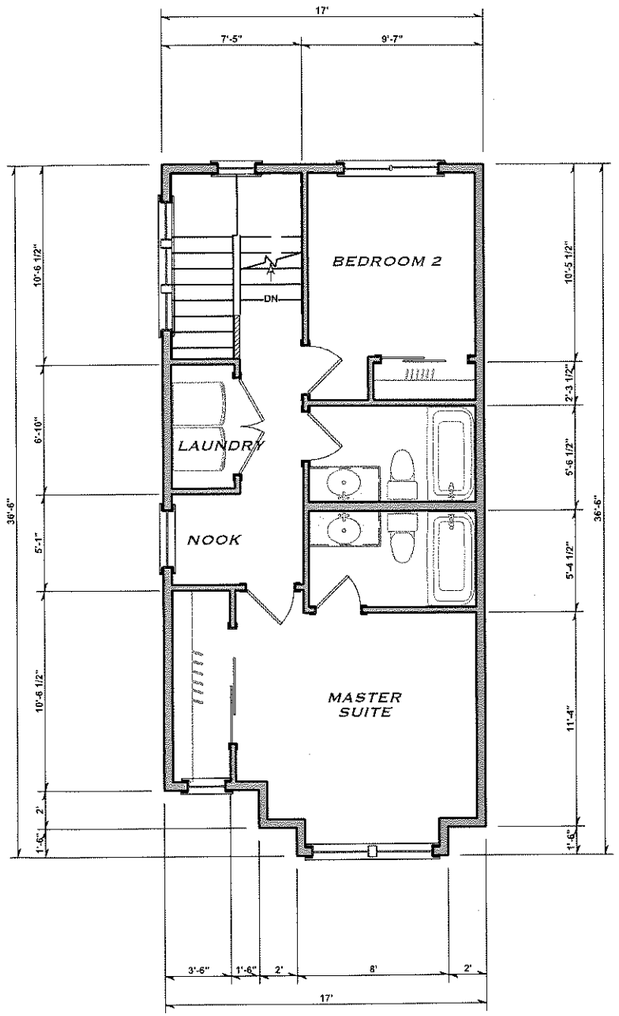
twinline design llc
architectural design + documentation

Crestview Crossing 17' wide Front Load Concept Plan | 7/10/18

 | www.twinlinedesign.com | p. 971 235 5854







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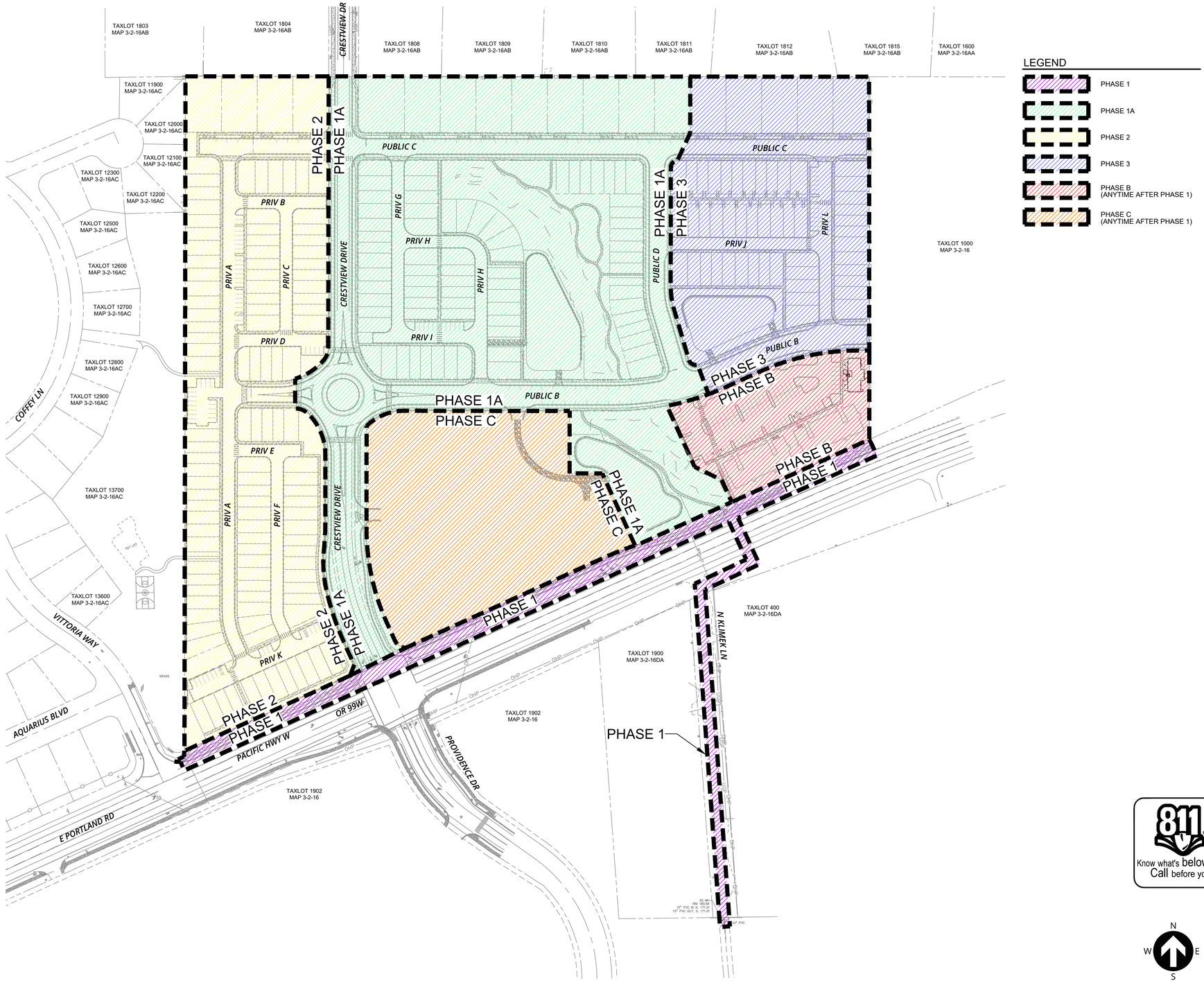

PUBLISH DATE
07.18.2018

ISSUED FOR
LAND USE DOCUMENTS

PHASING PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

Know what's below. Call before you dig.

N
W E
S

SCALE: 1" = 100'
0 100' 200'

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
EXH

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\DDEXHIBITS\2018-07-17 PHASING EXHIBIT\17393-EXH-PHASING PLAN.DWG

GeoEngineers
333 High Street NE, Suite 102
Salem, Oregon 97301
971.304.3078

August 9, 2018

J.T. Smith Companies
5285 Meadows Road, Suite 171
Lake Oswego, Oregon 97035

Attention: Jesse Nemec

Subject: Revised Geologic and Hydrogeologic Technical Memorandum
Crestview Crossing Project
Newberg, Oregon
File No. 6748-002-03

INTRODUCTION AND PROJECT UNDERSTANDING

The purpose of this memorandum is to provide J.T. Smith Companies with GeoEngineers, Inc. hydrogeologic assessment regarding Oxberg Inc.'s concern that grading and in-filling of the wetlands on the proposed Crestview Crossing Site (the Site) may harm the adjacent property's drinking water supply capacity and increase source water contamination potential. The assessment is based on infiltrations analysis on the Site, well logs, and previous area hydrogeological studies and reports. The project area is on the north side of Highway 99W, just east of the City of Newburg (Proximity Map of Crestview Crossing Site to Oxberg Well, Figure 1).

In this memorandum we summarize:

- Groundwater and surface water interaction
- Site geology and hydrogeology
- Oxberg well log
- Near-by wells
- Site-specific infiltration rates
- Source water assessment
- Conclusions

SURFACE WATER AND GROUNDWATER INTERACTION

Surface water comes in many forms; water in wetlands, streams, rivers, lakes and oceans. Groundwater on the other hand is subsurface water and is found in pore spaces between material like soil particles, sand grains and gravels; and in fractures, cracks and broken zones in rock. If these pores and fractures are full of water subsurface groundwater conditions are described as saturated and an aquifer is present. Conversely, if the pores and fractures are not completely full, then the subsurface groundwater conditions are described as unsaturated.

Aquifers are commonly described as confined or unconfined. One of the simplest ways to understand the difference is where water occurs during well drilling. If the water level in a well after it is built is the same as it was first encountered during drilling, that aquifer would be referred to as unconfined. If water level in a well after it is built is higher than where it was first encountered during drilling, that aquifer would be referred to as confined. Unconfined aquifers also are under atmospheric pressure and they are commonly in hydraulic continuity with surface water. Conversely, confined aquifers are under higher pressure than atmospheric and have very limited to essentially no hydraulic continuity with nearby surface water.

When surface water infiltrates into the ground it moves are different rates; quickly over a period of days or weeks or slowly over months and years. The ability of a porous material (rock/silt/sand/gravel) to allow fluids to pass through it is called permeability. Gravels and sands have high permeability that allow water to move quickly horizontally while finer materials like silt and clay have a lower permeability and can create layers in the subsurface that make it difficult for water to move through. Figure 2 provides a look at how long it can take water to move through a shallow unconfined aquifer into deeper confined aquifers. Generally, in a shallow unconfined aquifer the younger the water, while in a confined aquifer the older the water is.

Figure 2 also shows a common relationship between a shallow aquifer and surface water. In cases where a shallow unconfined aquifer discharges to surface water the surface waters can be described as gaining. In the opposite case, where surface water is leaking into a shallow unconfined aquifer the surface water would be described as losing. If the underlying aquifer is confined one would generally conclude that the surface water-groundwater connection is limited to non-existent with flow paths between to the two expressed in decades, centuries, or even longer.

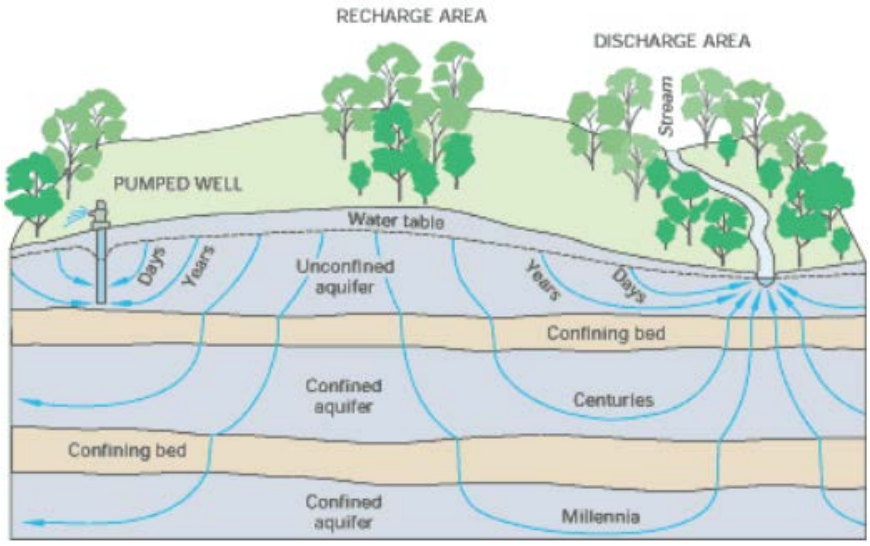

Figure 2: Groundwater Flow Paths
(Source: USGS, https://pubs.usgs.gov/circ/circ1139/htdocs/natural_processes_of_ground.htm)

SITE GEOLOGY AND HYDROGEOLOGY

The Site is located on the western edge of the Willamette Basin near the eastern edge of the Chehalem Mountains. Locally, the Site is located within the Chehalem Creek Valley, a broad alluvial drainage that forms an embayment of the Willamette Valley extending north and northwest into the Chehalem Mountains.

The *Engineering Geology of the Tualatin Valley Region, Oregon* (Schlicker and Deacon 1967) and *Groundwater in the Newberg Area, Northern Willamette Valley, Oregon* (United State Geological Survey [USGS] 1978) provide detailed descriptions of the geologic units found near the Site. For the purposes of this memorandum geologic units of interest are, from oldest to youngest, summarized as follows:

- **Columbia River Basalt Group (CRBG)**; is the **dominant groundwater source** in the Newberg area (USGS 1978). The CRBG forms the bedrock of the Chehalem Mountains. The CRBG consists of a series of individual basalt lava flows which range from 40 to 100 feet thick and may locally exceed 200 feet (Oregon Water Resources Department [OWRD] 2002). The CRBG has been deformed through faulting and folding, being uplifted into the Chehalem Mountains and underlying the Willamette Valley, including the Site. Between basalt flows there are zones of breccia, ash, and broken rock called interflow zones which are the main aquifers in the CRBG. The CRBG can produce anywhere from 15 to over 1,000 gallons a minute (gpm) but in recent years declines have been observed as recharge to the deep basalt aquifer is limited (OWRD 2002).
- **Helvetia and Troutdale Formations/Basin Fill Sediments**; the Helvetia Formation consists of reddish-brown sand, silt and clay. These deposits are often difficult to distinguish from the residual soils derived from weathered CRBG. The Troutdale Formation consists mostly of silt and clay with beds of fine sand and gravel. Aquifers hosted by these strata typically have low yields so production wells are not commonly found in them (OWRD 2002).
- **Willamette Silt**; is Missoula flood silt deposits. The Willamette Silt is found in the lowlands and flanks of bordering hills up to elevations of about 250 feet above sea level. The Willamette Silt has low

permeability but high porosity and is able to sustain low yield domestic wells (OWRD 2002). The Willamette Silt can store large amounts of groundwater in the winter releasing it in the spring as seeps and shallow groundwater discharge to streams and wetlands. However, because of the low permeability it acts as a confining layer inhibiting movement of groundwater into deeper aquifers (OWRD 2002).

Based on the reports reviewed for this memorandum the primary aquifer underlying the Site is found in CRBG interflow zones and consists of one or more confined interval approximately 100 feet or more below ground surface. These confined zones are separated from the surface by low permeability dense basalt, weathered basalt, basalt altered to clay and Willamette Silt.

OXBERG WELL LOG

It is our understanding that Oxbergs concerns focus on two wells used for water supply to the adjacent property. We were able to only locate one well log in the OWRD well log database. That well log, designated YAMH 2385, is reproduced in Attachment A.

Well YAMH 2385 is reported to have been completed in December 1986. It also is reported to consist of a 12-inch-diameter borehole drilled to 30 feet below ground surface (bgs) and an 8-inch borehole drilled to 200 feet bgs. Eight-inch casing is reported to have been installed from 1 foot above the surface to 162 feet bgs and 6-inch liner with perforations is reported to have been installed from 162 to 200 feet bgs. Per the *2004 Source Water Assessment Report for Oxberg Water System Newberg, Oregon PWS #4105308 (*Oregon Department of Human Services and Oregon Department of Environmental Quality [DHS and DEQ]) the cement seal from 0 to 30 feet bgs is adequate and no visible well construction deficiencies were noted.

The *2004 Source Water Assessment* indicates that well is drilled and screened in the CRBG (DHS and DEQ), producing from a 15-foot interval in the perforated liner between 162 and 200 feet bgs. Following well completion, the static depth to water was between 21 and 29 feet bgs which is many tens of feet above the water producing interval, suggesting the well is open to a confined aquifer in the CRBG, and not shallow unconfined water near the ground surface.

WELLS NEAR-BY

In addition to reviewing information about the Oxberg well we also reviewed information about other water wells near the Site. OWRD's online well database shows at least 64 water wells within ¾ quarters of a mile of the Site. Of these, 25 are less than 150 feet deep and 39 are more than 150 feet deep. Well construction, depth, water levels and pumping capacity reported for these wells is provided in Table 1 and summarized in Table 2. There are likely other wells in close proximity that are not identified during this OWRD search.

TABLE 2: SUMMARY OF NEAR-BY WELL DETAILS

	Wells <150 Feet Deep	Wells >150 Feet Deep
Number of wells	25	39
Average Constructed Depth	110.8	212.1
Average Depth of First Water (feet)	76.5	137.5
Post Drilling Static Water Level (feet)	31.7	56.9

Information source: https://apps.wrd.state.or.us/apps/gw/well_log/Default.aspx

We interpret the information shown on these well logs, and listed on Tables 1 and 2, to indicate that most of the area wells (including the Oxberg well) are in the CRBG, that these CRBG wells display evidence of confined conditions (final water levels are higher than the producing intervals), and there may be multiple groundwater producing intervals in the CRBG, one approximately 70 to 100 feet bgs and the other greater than approximately 125 feet bgs. **Based on that interpretation Oxberg well likely is completed in, and producing water from, a deeper confined CRBG aquifer underlying the Site area.**

SITE-SPECIFIC INFILTRATION RATES

GeoEngineers conducted infiltration testing to assist in evaluating the Site for stormwater infiltration design. Testing was conducted using the encased falling head and open pit infiltration testing procedures as described in the *Crestview Crossing Development Geotechnical Engineering Report* (May 12, 2018). Field measured infiltration results were 0.0 inches/hour for the encased falling head and 0.1 inches/hour for the open pit tests. Based on the fine-grained soil conditions and very low to negligible measured infiltration rates, infiltration of stormwater was not recommended to be used as the sole method of stormwater management at this site. Given these tests, we interpret that there is limited, to essentially no capacity for surface water to percolate into the ground and through the subsurface into the underlying confined CRBG aquifers.

These infiltration rates along with the ephemeral nature of the wetlands inform the surface water and groundwater connection at site; indicating that there is almost no connection and that surface water is not contributing to the deep aquifer in which the Oxberg well is pumping from.

SOURCE WATER ASSESSMENT

In addition to aquifer recharge potential we also address the potential for the proposed development to contaminate the groundwater being pumped by the Oxberg well. The Crestview Crossing project proposed drinking and fire protection water system will be supplied from Newberg's municipal water system, so there is no additional stress on the Oxberg wells. The *2004 Source Water Assessment* (DHS and DEQ) found:

1. The Oxberg well and aquifer are not considered highly sensitive to contamination based on well construction and the sensitivity analysis. This relates to directly around the well head and well house. Construction for the proposed development is located over 550 feet and downhill from the Oxberg well, and no deep subsurface work is proposed, so there is no potential for contamination at the well head during development. The second well, whose log was not available is understood to be on the northside of the lake, opposite of the proposed development.
2. Residential land use including apartments and condominiums was determined to be a low risk during the aquifer susceptibility analysis for potential contaminant sources inside the drinking water protection area.

The development of Crestview Crossing poses a low risk for potential source water contamination to the Oxberg well as no deep subsurface work is proposed and the Oxberg well is located in a confined aquifer. Drinking water will be supplied by the Newberg municipality so no new wells are planned.

CONCLUSIONS

Based on the hydrogeologic information reviewed for the Site and adjacent property where the Oxberg well is located, we conclude that there is little to no potential for the Crestview development to:

1. Impair groundwater recharge to the nearby Oxberg wells.
2. Effect groundwater quality in the Oxberg wells.

Both of these conclusions are based on the following observations:

- The Oxberg wells are in a confined aquifer that has limited to no hydraulic connection to the Site.
- In the unlikely event that there was a hydraulic connection between the confined aquifer the Oxberg wells pump water from, measured surface infiltration (recharge) rates are extremely low to non-existent, indicating little or no local recharge to the underlying confined aquifer.

If you have any questions, please do not hesitate to contact me at your convenience.

REFERENCES

DHS and DEQ. 2004. Oregon Department of Human Services Health Services Drinking Water Program and Oregon Department of Environmental Quality Water Quality Division Drinking Water Protection. *Source Water Assessment Report Summary of Analysis Oxberg Water System Newberg, Oregon Yamhill County PWS #4105308. April.*

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Schlicker, H.G. and R.J. Deacon. 1967. “Engineering Geology of the Tualatin Valley Region, Oregon.” Oregon Department of Geology and Mineral Industries, Bulletin 60, p. 103, 4 plates, 1:62,500 scale.

USGS. 1978. "Groundwater in the Newberg Area, Northern Willamette Valley, Oregon." Water Resource Department Ground Water Report No. 27. State of Oregon. Prepared in cooperation with the United State Department of the Interior Geological Survey.

Sincerely,
GeoEngineers, Inc.

Jonathon S. Travis, RG
Staff Geologist

Kevin A. Lindsey, PhD, LHg
Principal

ASC:LAH:JST:JCV:KAL:tjh

Attachments:
Table 1. Nearby Wells
Figure 1. Proximity Map of Crestview Crossing Site to Oxberg Well
Attachment A. Well Log YAMH 2385

Table 1

Nearby Wells
Crestview Crossing
Newberg, Oregon

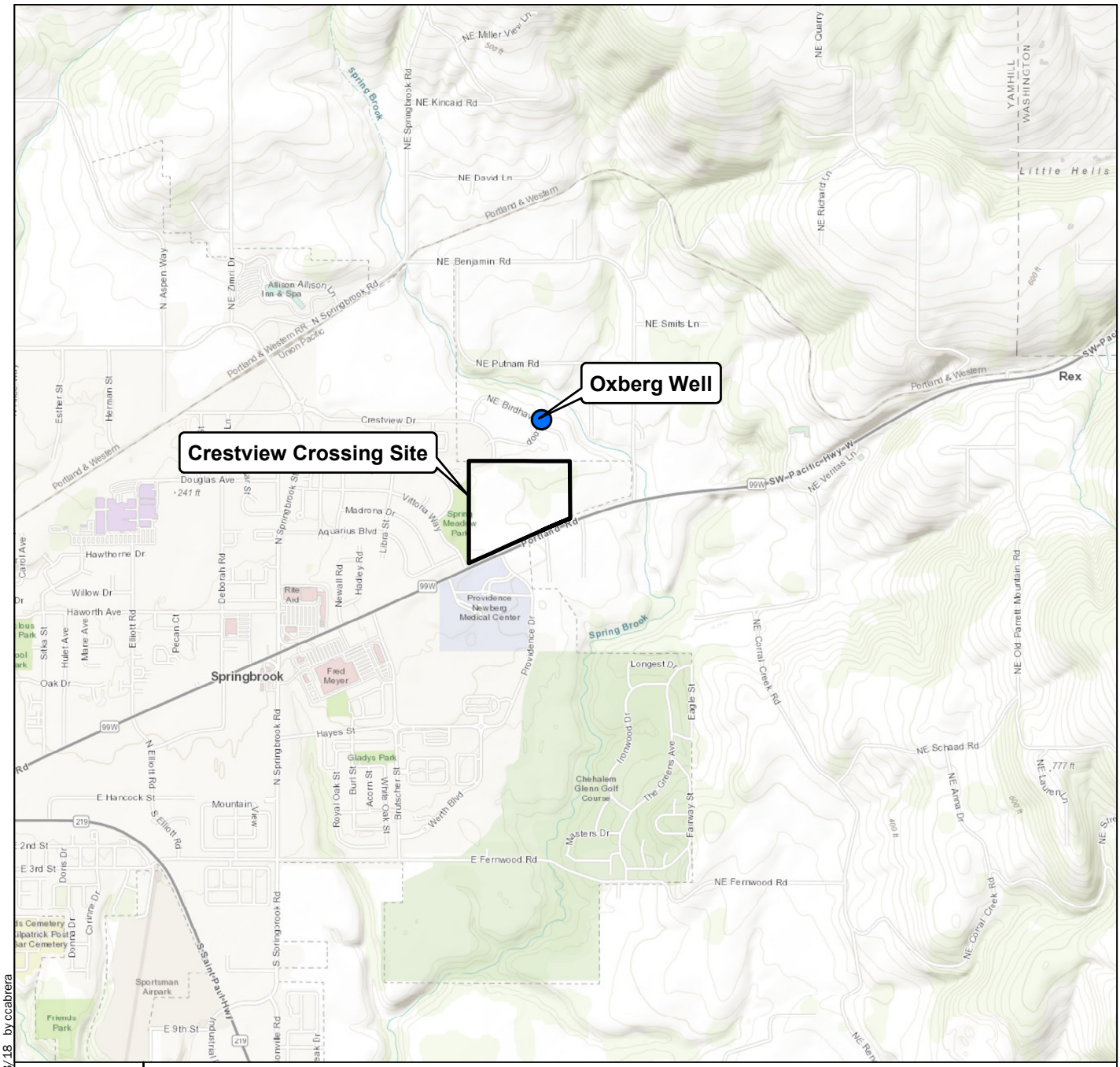
County	Well Number	Well Tag Number	Owner Last Name	Owner First Name	Company Name	Street	City	Zip	Depth of First Water (feet)	Depth Drilled (feet)	Completed Depth (feet)	Post Static Water Level (feet)	Date Drilling Complete	Township	Range	Section	Quarter 160	Quarter 40	Tax Lot	Street of Well	Max Well Yield (gpm)
Wells Drilled Less than 150 Feet																					
YAMH	2386		DAVIS	WOODROW		PO BOX 96	NEWBERG	97132		75	75	10	9/26/1958	3S	2W	16	NE				18
YAMH	2400		ROGERS	MR WALTER		2906 HOOVER BLVD	NEWBERG	97132		80	80	5	2/14/1961	3S	2W	16	SW	SW		SPRING BROOK JUNCTION & HWY 99 W SOUTH SIDE OF ROAD	7
YAMH	2399		MEEKER	FRANK		RT 2 BOX 100	NEWBERG	97132		81	81	18	12/22/1966	3S	2W	16					7
YAMH	3866	479			PARROTT MOUNTAIN CONSTRUCTION	16260 SW BELL RD	SHERWOOD	97140	78	81	81	5	4/11/1995	3S	2W	9	SE	NE	201	29935 NE BENJAMIN RD, NEWBERG	20
YAMH	2224		FELTY	RICHARD		RT 1 BOX 312B	NEWBERG		50	88	89	8	7/28/1982	3S	2W	9	SE	SW			75
YAMH	2273		ROWLAND	JERRY			NEWBERG		50	95	95	30	2/16/1957	3S	2W	9	SW	NW		RT 2 BOX 90	19
YAMH	51		ORTIZ	MR ROBERTO	ORTIZ, MRS ROBERTO	314 S EDWARDS	NEWBERG	97132	90	97	97	72	6/5/1990	3S	2W	9	SE	NW		DAVID COURT	50
YAMH	55625	100246	WEGTER	KEN		3872 CAMISHAUM COURT	SALEM	97305	40	99	99	26	3/24/2010	3S	2W	9	SE	SW	2800	29366 PUTNAM RD, NEWBERG	1
YAMH	56262	108231	MILLS	NANCY		14615 SPRINGBROOK RD	NEWBERG	97132	62	100	98	12	5/7/2012	3S	2W	9	SW	NE	1901	14615 SPRINGBROOK RD	21
YAMH	2395		MACDONALD	MRS J C		RT 2 BOX 331	NEWBERG	97132	87	100	100	90	5/5/1973	3S	2W	16	NW	SW			11
YAMH	2256		LOOKABILL	LYLE		ROUTE 2 BOX 32	NEWBERG	97132	79	104	102	56	5/18/1979	3S	2W	9	SE	SW			20
YAMH	2397		GLEASON	ELBERT		RT 2 BOX 326	NEWBERG	97132	35	105	105	26	6/21/1972	3S	2W	16					22
YAMH	2271				YOUNG AND PAWELSKI HOMES INC				60	107	108	30	9/22/1976	3S	2W	9	SE	NW			32
YAMH	298		BURGUSS	JOE		PO BOX 506	TUALATIN	97062	65	115	115	25	5/13/1976	3S	2W	16	NE				15
YAMH	4280		BURGUSS	JOE		PO BOX 506	TUALATIN	97062	80	115	115	35	1/13/1976	3S	2W	16		NE			12
YAMH	2213		WOOD	BILL	WOOD, CATHY	1506 N COLLEGE	NEWBERG	97132	75	118	111	30	9/21/1989	3S	2W	9	SE	SE			60
YAMH	2390		BURGUSS	JOE		PO BOX 506	TUALATIN	97062	90	122	122	34	3/6/1976	3S	2W	16	NE				15
YAMH	748		BENTLEY JR	MR JAMES E	BENTLEY JR, MRS JAMES E	PO BOX 856	NEWBERG	97132	85	125	125	15	6/17/1991	3S	2W	9	SE	NW		DAVID LANE & SPRINGBACK RD (INTERSECTION)	23
YAMH	1692		COCHRAN	MR MICHAEL J	COCHRAN, MRS MICHAEL J	35101 SW LADD HILL RD	WILSONVILLE	97070		125	125	32	4/3/1992	3S	2W	9	SE	NW		14630 NE SPRINGBROOK NEWBURG (NEXT DRIVEWAY NORTH)	15
YAMH	2272		LUCIANE	JOHN B		ROUTE 2 BOX 320	NEWBERG	97132	124	126	126	22	6/11/1973	3S	2W	9	SE	NW			10
YAMH	52152	26714	ALEXANDER	DON		1282 3RD ST 56	LAFAYETTE	97127	130	137	137	19	5/4/2000	3S	2W	16	SE	NE	1100	1217 KLIMEK DR, NEWBERG	25
YAMH	113		CARTER	MR JOHN	CARTER, MRS KELLI	10035 SW GARRETT #6	TIGARD	97223	68	143	143	32	9/13/1990	3S	2W	9	SE	NW		OFF SPRINGBROOK RD (1ST DIRT RD ON R, PAST BENJAMIN RD)	26
YAMH	2393		FORTUNE, JR	JOHN J		RT 2 BOX 321 C	NEWBERG	97132	105	145	145	65	2/27/1975	3S	2W	16	NE	NE			9
YAMH	2398		WAGNER	ED		RT 3 BOX 143	NEWBERG	97132		148	148	38	9/11/1965	3S	2W	16					10
YAMH	2383		DOANE	GARY		455 SE 32ND	HILLSBORO	97123		149	149	58	9/17/1949	3S	2W	16					18
Wells Drilled Greater than 100 Feet																					
YAMH	2396				LEAVITE AND WIDING	2712 NE SANDY	PORTLAND		63	150	150	61	12/17/1970	3S	2W	16					17
YAMH	2236		HUMPRES	JIM		3965 SW 202ND	ALOHA	97007	60	151	152	47	6/12/1975	3S	2W	9	SE				50
YAMH	299		BIXBY	ETHEL			NEWBERG	97132	87	152	152	35	5/5/1973	3S	2W	16					14
YAMH	2387		DAVIS	WOODROW W		ROUTE 2 BOX 96	NEWBERG	97132		155	155	22	8/28/1958	3S	2W	16	NE				5
YAMH	278		MILLER	TOM		1478 N SHERWOOD BLVD	SHERWOOD	97140	120	155	155	60	1/12/1987	3S	2W	9	SE	SW			20
YAMH	3901	2379	GAMBLE	MR VIC	GAMBLE, MRS VIC	10260 SW NIMBUS BLDG M1	TIGARD	97223	140	160	152	28	6/2/1995	3S	2W	9	SW	SE		0.5 MI N ON BENJAMIN RD OFF HWY 99W	100
YAMH	2269		STEELE	JAMES O		RT 2 BOX 312 A2	NEWBERG	97132	126	160	160	85	5/31/1978	3S	2W	9	SE	SW	3100		15
YAMH	2268				B & H CONSTRUCTION	222 NW 139TH ST	PORTLAND		156	162	162	90	11/14/1974	3S	2W	9	SE	NW			40
YAMH	2216		WAGNER	KARL		2301 JODI COURT	NEWBERG	97132	68	163	163	17	5/11/1987	3S	2W	9	SE	SE		29705 PUTNAM RD, NEWBERG	25
YAMH	767		WAGNER	MARY JANE		29705 PUTMAN RD NE	NEWBERG	97132	118	168	168	34	6/29/1991	3S	2W	9	SE	SE	3305	29705 PUTMAN RD NE	20

County	Well Number	Well Tag Number	Owner Last Name	Owner First Name	Company Name	Street	City	Zip	Depth of First Water (feet)	Depth Drilled (feet)	Completed Depth (feet)	Post Static Water Level (feet)	Date Drilling Complete	Township	Range	Section	Quarter 160	Quarter 40	Tax Lot	Street of Well	Max Well Yield (gpm)
YAMH	50354	8785	PECK	THOMAS		16050 PIT RD	HILLSBORO	97123	138	168		61	9/24/1996	3S	2W	9	SE	SE	4100	JUST EAST OF 29730 BENJAMIN RD, NEWBERG	120
YAMH	2389		SPANGLER	WILLIAM					92	170	170	62	1/20/1978	3S	2W	16	NW	SW			10
YAMH	2394		RETRY	ROBERT		312 N EDWARDS	NEWBERG	97132	103	170	170	50	4/8/1975	3S	2W	16					2
YAMH	3268		HOST	MR GARY A	HOST, MRS GARY A	8605 SW MANDAN DR	TUALATIN	97062	140	172	170	1	11/3/1994	3S	2W	9	SW	SE			100
YAMH	2211		BROWN	GLENN		29730 BENJAMIN RD	NEWBERG	97132	164	174	174	64	12/19/1989	3S	2W	9	SE	SE		29730 BENJAMIN RD	26
YAMH	2215		JOHNSON	EVERT	JOHNSON, ESTHER	29955 NE BENJAMIN RD	NEWBERG	97132	140	175	175	22	5/17/1989	3S	2W	9	SE	NE		29955 NE BENJAMIN RD	24
YAMH	50181	3228	DOBBINS	DAVE		29830 NE BENJAMIN	NEWBERG	97132	155	180	180	44	6/29/1996	3S	2W	9	SE	SE	3209	29830 NE BENJAMIN	100
YAMH	52308	37663	LOUIS	RON		739 CROSSBROOK DR	MORGEA	94556	115	183	183	115	8/10/2000	3S	2W	9	SW	NW	1800	3220 ZIMRI DR, NEWBERG	50
YAMH	54510	85530	NEWTON	FRED		30875 SW HEATER RD	SHERWOOD	97140	103	183	176	33	6/22/2006	3S	2W	9	SE	SE	3303	29815 SE PUTMAN, NEWBERG	90
YAMH	2219		SMITH	ROBERT D		RT 1 BOX 49	NEWBERG	97132	85	185	185	35	10/12/1982	3S	2W	9	SE		3900	RT 4 BOX 313 C; CO RD 54	50
YAMH	279		LUU	NGUAN		503 SE 47TH	PORTLAND	97215	140	195	196	66	11/3/1981	3S	2W	9	SE	SW		RT 2, NEWBERG	20
YAMH	2385				OXBERG INC.	PO BOX 467	NEWBERG	97132		200	200	29	12/11/1986	3S	2W	16				4100 E CRESTVIEW NEWBERG	45
YAMH	3169		DAMNAN	MR GARY	DAMNAN, MRS GARY	7750 SW 171ST	ALOHA	97223	145	200	200	52	8/4/1994	3S	2W	16	NE	NE			25
YAMH	2270		STEELE	JAMES O		607 N COLLEGE	NEWBERG	97132	183	203	204	51	7/12/1974	3S	2W	9	SE				30
YAMH	2391		RUBENS	CHRIS		118 W LEXINGTON	ASTORIA	97103	140	205	205	20	5/3/1977	3S	2W	16					30
YAMH	50344	8784	WISE	GEORGE	WISE, JAMIE	12287 SW LANSDOWNE LANE	TIGARD	97223	135	207	207	99	9/20/1996	3S	2W	9	SW	NE	1900	SPRINGBROOK RD	100
YAMH	3894		JACOBSEN	MRS JAN		4300 E PORTLAND RD	NEWBERG	97132	170	215	215	28	5/31/1995	3S	2W	16	SE	NW			30
YAMH	56487	106624			PROVIDENCE HEALTH SYSTEM	1001 PROVIDENCE DR	NEWBERG	97132		216	216	19	3/8/2013	3S	2W	16			1902	1001 PROVIDENCE DR; 150 YDS ON L	50
YAMH	50746	13498	ATZEN	NAN	ATZEN, TERRY	29365 NE PUTNAM RD	NEWBERG	97132	85	217	217	58	8/13/1997	3S	2W	9	SE	SW	3101	29365 NE PUTNAM RD	5
YAMH	2388		ROLOW	MR MIKE	ROLOW, MRS MIKE	RT 4 BOX 333C	NEWBERG		97	222	222	12	7/15/1985	3S	2W	16	SE	NW	100	RT 4 BOX 333C	28
YAMH	52800	51231	LYDA	JOHN		900 NE CHEHALEM DR	NEWBERG	97132	180	260	260	7	10/16/2001	3S	2W	16	SE	NE	900	1100 KLIMEK LANE	12
YAMH	2392		PETRY	ROBERT		312 N EDWARDS	NEWBERG	97132	270	290	290	50	4/14/1975	3S	2W	16					11
YAMH	138		COFFIELD	BILL		3104 ZIMIRI DRIVE	NEWBERG	97132		290	290	158	9/18/1990	3S	2W	9	SE	NW			2
YAMH	280		STIVERSON	JIM		RT 2 BOX 302C	NEWBERG	97132	274	290	290	160	11/16/1978	3S	2W	9	SE	NW			17
YAMH	55624	100245	MILLS	GLEN		15125 NE SPRINGBROOK LANE	NEWBERG	97132	138	300	300	102	3/22/2010	3S	2W	9	SE	SW	1604	NEAR 15125 NE SPRINGBROOK LANE	75
YAMH	362		BURGUSS	JOE		PO BOX 506	TUALATIN	97062	225	315	315	29	2/2/1976	3S	2W	16	NE				2
YAMH	281		MCKAY	GEORGE		RT 2 BOX 307	NEWBERG	97132	291	324	317	160	8/22/1984	3S	2W	9	SE				110
YAMH	900		PETRY	BOB		29465 NE PUTNAM RD	NEWBERG	97132	106	338	338	80	11/14/1991	3S	2W	9	SE	SE		29465 NE PUTNAM RD	7
YAMH	52306	37664	LOUIS	RON		739 CROSSBROOK DR	MORGEA	94556	62	424	424	75	8/11/2000	3S	2W	9	SW	NW	1800	3104 ZIMRI DR, NEWBERG	5

Notes:

Bold - Oxberg Well YAMH 2385

Source: Oregon Water Resource Well Log Query (https://apps.wrd.state.or.us/apps/gw/well_log/Default.aspx)



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2017
Topo base map from ESRI.

Projection: NAD 1983 UTM Zone 10N

Proximity Map of Crestview Crossing Site to Oxberg Well

Crestview Crossing
Newberg, Oregon

GeoEngineers

Figure 1

P:\6\6748002\GIS\MXD\6748002203_F01_OxbergWell.mxd Date Exported: 08/08/18 by ccabrera

ATTACHMENT A
Well Log YAMH 2385

ATE OF OREGON

TER WELL REPORT

as required by ORS 537.765)

WELL #2

7S/2W-16

DEC 26 1986

WATER RESOURCES DEPT. SALEM, OREGON

(1) OWNER:

name OXBERG INC.

Address P.O. BOX 467

City NEWBERG State OREG Zip 97132

(2) TYPE OF WORK:

☒ New Well ☐ Deepen ☐ Recondition ☐ Abandon

(3) DRILL METHOD

☐ Rotary Air ☐ Rotary Mud ☒ Cable

☐ Other

(4) PROPOSED USE:

☐ Domestic ☒ Community ☐ Industrial ☐ Irrigation

☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval Yes ☐ No ☐ Depth of Completed Well 200 ft.

Explosives used Yes ☐ No ☒ Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
12	0	139	CEMENT	0	30	20
8	139	200				

How was seal placed: Method ☐ A ☐ B ☒ C ☐ D ☐ E

☐ Other

Backfill placed from ____ ft. to ____ ft. Material ____

Gravel placed from 30 ft. to 139 ft. Size of gravel 3/4" TO 1/4"

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	8	+1	162	.250"	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	6	160	200	160 LB	☐	☒	☐	☐
					☐	☐	☐	☐

...al location of shoe(s) ____

(7) PERFORATIONS/SCREENS:

☒ Perforations Method MILLS KNIFE

☐ Screens Type ____ Material ____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
50	162		475	1/4"		☒	☐
162	200		160	1/4"		☐	☒
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour

☐ Pump ☒ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
			1 hr.
45	50		1

Temperature of water ____ Depth Artesian Flow Found ____

Was a water analysis done? ☐ Yes By whom ____

Did any strata contain water not suitable for intended use? ☐ Too little

☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other ____

Depth of strata: ____

(9) LOCATION OF WELL by legal description:

County YAMHILL Latitude ____ Longitude ____

Township 3S N or S, Range 2W E or W, WM.

Section 16 ¼ ¼

Tax Lot ____ Lot ____ Block ____ Subdivision ____

Street Address of Well (or nearest address) 400 E. CRESTVIEW, NEWBERG, OREGON

(10) STATIC WATER LEVEL:

29 ft. below land surface. Date 12/11/86

Artesian pressure ____ lb. per square inch. Date ____

(11) WATER BEARING ZONES:

Depth at which water was first found ____

From	To	Estimated Flow Rate	SWL
50	200	45	29

(12) WELL LOG:

Ground elevation ____

Material	From	To	SWL
TOP SOIL	0	2	
BROWN CLAY	2	25	
SOFT DECOMPOSED			
BROWN ROCK WITH			
CLAY STREAKS	25	152	29
SOFT BROWN ROCK	152	172	29
BROWN CLAY	172	178	29
SOFT BROWN ROCK	178	200	29

Date started 11/26/86 Completed 12/11/86

(unbonded) Water Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.

WWC Number ____

Signed ____ Date ____

(bonded) Water Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. all work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 462

Signed C.C. Keller Date 12/24/86

PINK COPY - CUSTOMER

Transportation Impact Analysis

Crestview Crossing

Newberg, Oregon

Final

August 2018

Transportation Impact Analysis

Crestview Crossing

Newberg, Oregon

Prepared For:
3J Consulting, Inc.
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Beaverton, OR 97005
(503) 946-9365

Prepared By:
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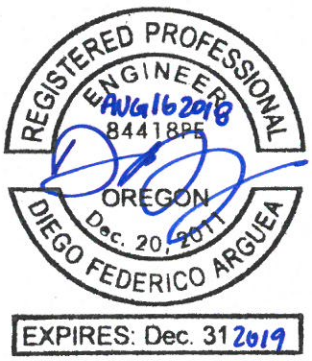
(503) 228-5230

Project Manager: Diego Arguea, PE
Project Principal: Matt Hughart, AICP
Project Analyst: Zachary Bugg, PhD



Project No. 21709

August 2018

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Appendix G Select Zone Analysis Results

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Appendix J 2025 Horizon Year Background Conditions Level of Service Worksheets

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Section 1
Executive Summary

EXECUTIVE SUMMARY

JT Smith Companies proposes to develop a 33.13-acre property in Newberg, Oregon into a residential development consisting of up to 260 single-family homes and 48 apartment units. The development is occurring adjacent to a 4.43-acre commercial property that is not included as part of this development application. The site is located on the north side of OR 99W (Portland Road) near the intersection with Providence Drive and will include an extension of Crestview Drive to the south through the property and connecting to OR 99W to form the north leg of the OR 99W/Providence Drive intersection.

The subject property is currently occupied by farm land and one single-family home. It is bordered by residential uses to the west, north, and east and by OR 99W to the south. No direct accesses to the residential units or civic space are proposed on OR 99W or the Crestview Drive extension—these will instead be accessed via new internal local roadways and one new east-west connector that will connect to Crestview Drive north of OR 99W. Completion and occupancy of the development as described in this report is expected to occur by 2020.

The results of this study indicate that the proposed Crestview Crossing development can be constructed while maintaining acceptable traffic operations and safety at the study intersections, assuming provision of the recommended mitigation measures.

FINDINGS

Year 2017 Existing Conditions

- All of the study intersections currently meet City of Newberg (and Oregon Department of Transportation, where applicable) mobility targets during the weekday AM and PM peak hours, with the following exceptions:
  - The Springbrook Road/OR 99W intersection currently experiences a volume-to-capacity ratio (v/c) of 0.86 during the weekday AM peak hour, which exceeds the ODOT mobility standard of 0.85. The intersection also operates at level of service (LOS) E during the weekday PM peak hour, which exceeds the City standard of LOS D under current conditions.
  - The southbound stop-controlled approach to the Vittoria Way/OR 99W intersection currently operates at LOS E during the weekday PM peak hour, which exceeds the City standard of LOS D.
- A review of historical crash data did not reveal any patterns or trends in the site vicinity that require mitigation associated with this project.
  - One fatal crash was reported at the Springbrook Road/Crestview Drive roundabout—this crash occurred when a southbound motorcyclist struck a curb and was thrown from the vehicle. The crash report lists the cause as driver error—driving too fast for conditions.
  - Based upon a 2016 analysis, the Springbrook Road/OR 99W intersection is currently within the top five percent of the highest-scoring intersections in Region 2.

Since 2016, pavement marking improvements and an additional westbound left turn lane on OR 99W were added to this intersection, and the proposed Crestview Crossing development is expected to result in a net decrease in traffic at this intersection due to the reassignment of traffic to the Crestview Drive extension.

Year 2020 Background Conditions

- A two-percent annual growth rate was applied to the existing mainline traffic volumes on OR 99W to reflect general background growth in the area before any in-process traffic was considered.
- Traffic generated by the Oregon Clinic, to be located on the west side of Providence Drive south of Providence Newberg Medical Center, as well as the Providence Medical Office Building, to be located on the east side of Providence Drive across from the existing Providence Medical Center, were included in the background traffic volumes as in-process traffic.

Background traffic conditions with the assumed build-out of the north leg of the Providence Drive/OR 99W intersection (and no site-added traffic) were assumed as the base case against which future traffic conditions are compared.

- The proposed development will extend Crestview Drive south through the property and to the existing Providence Drive/OR 99W intersection, where it will form the north leg.
- Traffic volumes were assigned to the Crestview Drive extension based upon existing turning movement volumes at the study intersections and the Newberg Transportation System Plan.
- The background traffic condition includes rerouted traffic from the proposed Crestview Drive extension but does not include trips associated with new land uses within the proposed development.
- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2020 background traffic conditions with reassigned traffic, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.88 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.92 and 0.98, respectively, which both exceed the ODOT mobility standard of 0.80.

Proposed Development Plan

- The proposed development is expected to generate approximately 2,826 weekday daily trips, of which approximately 213 (53 in, 160 out) are forecast to occur during the AM peak hour and approximately 285 (180 in, 105 out) are forecast to occur during the PM peak hour.
- A select-zone analysis of the Newberg Transportation Planning Model was used to develop a trip distribution pattern for the proposed development.

Year 2020 Total Conditions

- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2020 total traffic volumes, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.88 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85 but does not exceed the v/c ratio under background conditions with reassigned traffic.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 1.01 and 1.11, respectively, which both exceed the ODOT mobility standard of 0.80.
  - The new proposed Crestview Diver/East-West Connector intersection within the Crestview Crossing development is expected to operate acceptably as a single-lane roundabout.

Year 2020 Total Mitigated Conditions

- The Crestview Drive/Providence Drive/OR 99W intersection was analyzed under total traffic conditions with the following additional lane improvements:
  - Add an exclusive left turn lane on southbound Crestview Drive,
  - Add an exclusive right turn lane on southbound Crestview Drive,
  - Add an exclusive right turn lane on westbound OR 99W,
  - Restripe eastbound OR 99W to include an exclusive left turn lane, and,
  - Restripe the northbound Providence Drive approach to include an exclusive left turn lane and an exclusive right turn lane.

  With these improvements, the weekday AM and PM peak hour v/c ratios at the intersection are forecast to be 0.90 and 0.89, respectively. These exceed the ODOT mobility standard of 0.80 but do not exceed the respective v/c ratios under background conditions with reassigned traffic. As such, the impact of the development has been mitigated.

2025 Horizon Year Background Conditions

- An additional five years of growth (at a two-percent annual growth rate) was applied to the existing mainline traffic volumes on OR 99W to model horizon year background conditions.

Background traffic conditions with the assumed build-out of the north leg of the Providence Drive/OR 99W intersection (and no site-added traffic) were assumed as the base case against which future traffic conditions are compared.

- The background traffic condition includes rerouted traffic from the proposed Crestview Drive extension but does not include trips associated with new land uses within the proposed development.

- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2025 background traffic conditions with reassigned traffic, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.93 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.03, respectively, which both exceed the ODOT mobility standard of 0.80.

2025 Horizon Year Total Conditions

- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2025 total traffic volumes, with the following exceptions:
  - The weekday AM and PM peak hour v/c ratios at the Springbrook Rd/OR 99W intersection are forecast to be 0.86 and 0.92, respectively, which both exceed the ODOT mobility standard of 0.85 but are not more than 0.03 above the v/c ratios under background conditions with reassigned traffic. Per ODOT policy guidance, when an intersection exceeds mobility targets but the v/c ratio increases by less than 0.03 as a result of development, the impacts are not considered significant.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 1.08 and 1.18, respectively, which both exceed the ODOT mobility standard of 0.80.

2025 Horizon Year Total Mitigated Conditions

- With the improvements at Crestview Drive/Providence Drive/OR 99W intersection noted above, the weekday AM and PM peak hour v/c ratios at the intersection are forecast to be 0.97 and 0.96, respectively. These exceed the ODOT mobility standard of 0.80 but do not exceed the respective v/c ratios under 2025 background conditions with reassigned traffic. As such, the impact of the development has been mitigated.

95th-percentile Queuing Analysis

- All 95th-percentile queues are projected to be accommodated by the provided storage lengths under 2025 total traffic conditions, with the following exceptions:
  - The southbound right turn at Springbrook Road/OR 99W during the weekday PM peak hour.
  - The northbound left turn at Brutscher Street/OR 99W during the weekday PM peak hour.

  Each of the queues noted above is expected to decrease under 2025 total traffic conditions compared with 2025 background traffic volumes due to reassigned traffic from Springbrook Road and OR 99W to the Crestview Drive extension.

2025 Horizon Year Commercial Property Sensitivity Analysis

A planning-level analysis was prepared to account for the future development potential of the 4.43-acre commercial property adjacent to the development site. While this is NOT part of this development application, the analysis was conducted to evaluate the future effectiveness of the recommended mitigations.

- A planning-level estimate for developable commercial area was used to estimate the number of potential commercial-related site trips. The gross leasable area-to-acreage ratio was assumed at 25 percent, and the entire commercial property was assumed as shopping center land use.
- The commercial development trips were added to the residential trips of this application to arrive at a total development estimate of 5,416 weekday daily trips, of which 370 (155 in, 215 out) will occur during the AM peak hour and 440 (247 in, 193 out) will occur during the PM peak hour. The development is also expected to generate approximately 96 pass-by trips during the weekday PM peak hour—these were treated as diverted trips from OR 99W.
- The Crestview Drive/Providence Drive/OR 99W intersection and Crestview Drive/East-West Connector roundabout were analyzed under 2025 conditions assuming development of the 4.43-acre commercial property.
- The Crestview Drive/East-West Connector intersection is expected to continue operating acceptably as a single-lane roundabout.
- With the mitigation improvements associated with the residential development in place, the weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.02, respectively.

  Per ODOT policy guidance, when an intersection exceeds the mobility target but the v/c ratio increases by less than 0.03 as a result of development, the impacts are not considered significant. For this reason, no additional mitigation measures would be warranted as a result of additional commercial development.

RECOMMENDATIONS

Providence Drive/Crestview Drive/OR 99W Intersection

- The new north leg of the intersection, which will be an extension of Crestview Drive, should be configured as a four-lane section with one northbound lane and three southbound lanes (exclusive lanes for left-turn, through, and right-turn movements). At least 225 feet of southbound left turn storage and at least 150 feet of southbound right turn storage should be provided to accommodate the forecast 95th percentile queue lengths.
- The south leg of the intersection should be restriped to a four-lane section with one southbound lane and three northbound lanes (exclusive lanes for left-turn, through, and right-turn movements).
- Based on the forecast 95th percentile queuing analysis:
  - A westbound right turn lane should be constructed with at least 275 feet of storage.

  - An eastbound left turn lane should be striped to provide at least 125 feet of storage.
- Recommended signal phasing: the intersection should be operated with permissive left turn movements on the northbound and southbound approaches and fully protected left turn movements on the eastbound and westbound approaches.

On-Site Circulation/Site Access Operations

- Driveways, landscaping, utilities, and signage within the site should be located and maintained to provide sufficient sight distance at all new internal intersections and accesses.
- Other than at the Providence Drive/Crestview Drive/OR 99W intersection, a two-lane section of Crestview Drive should be adequate to accommodate turning movements and queuing within the proposed development.

Additional details of the study methodology, findings, and recommendations are provided within this report.

Section 2
Introduction

INTRODUCTION

PROJECT DESCRIPTION

JT Smith Companies proposes to develop a 33.13-acre property in Newberg, Oregon consisting of up to 260 single-family homes and 48 apartment units. The ultimate number of residential units may vary but is not anticipated to exceed the number of units analyzed in this report. The development is located adjacent to 4.43 acres of commercial property that are not included in this application but may be developed as part of a future phase.

Figure 1 displays the site vicinity, and Figure 2 illustrates the proposed site plan. The site is located on the north side of OR 99W (Portland Road) near the intersection with Providence Drive and will include an extension of Crestview Drive to the south through the property and connecting to OR 99W to form the north leg of the OR 99W/Providence Drive intersection. No direct accesses to the residential units or adjacent commercial property are proposed on OR 99W or the Crestview Drive extension—these will instead be accessed via new internal local roadways and one new east-west connector that will connect to Crestview Drive north of OR 99W. Completion and occupancy of the development as described in this report is expected to occur by 2020.

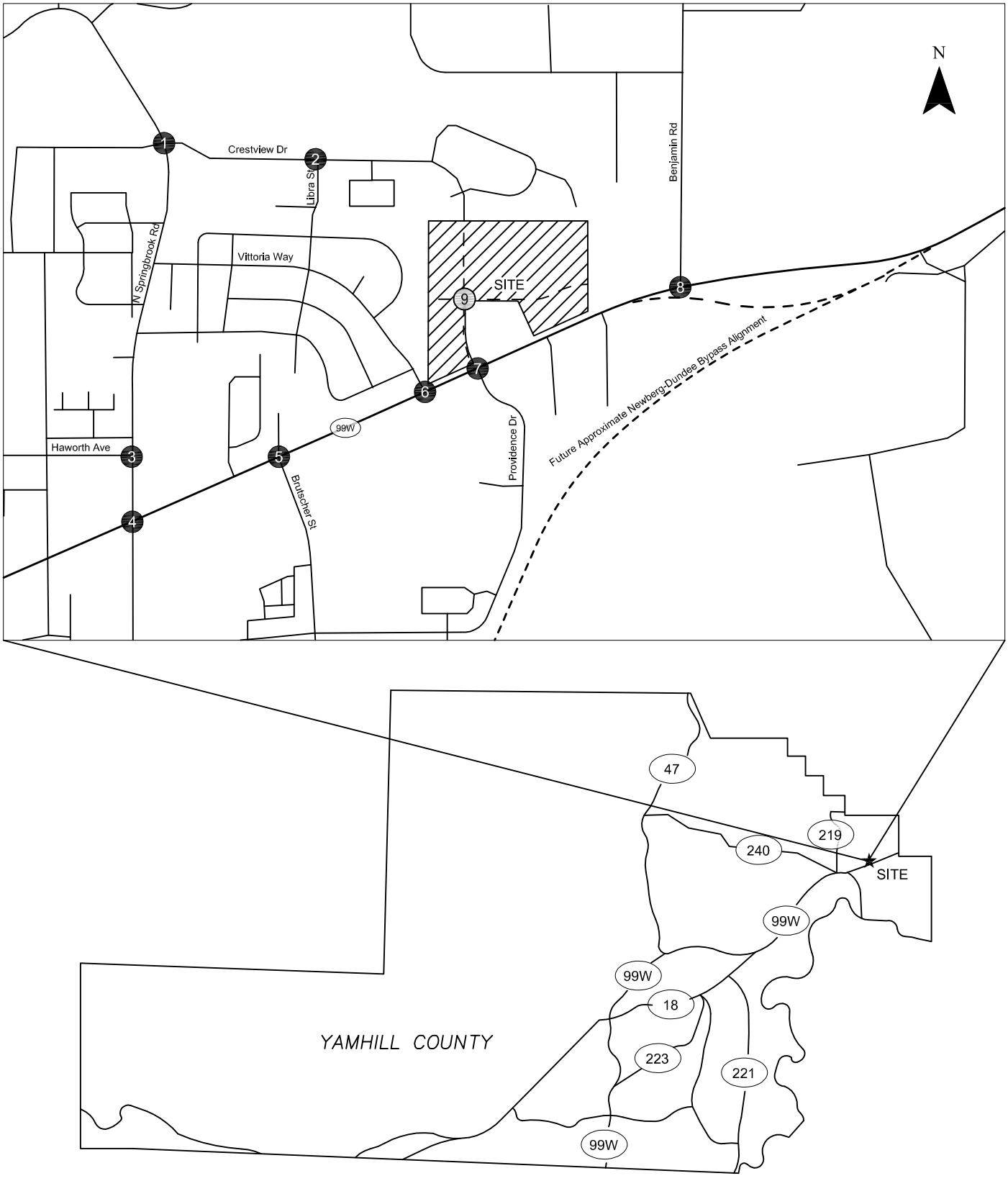
SCOPE AND ANALYSIS METHODOLOGY

This analysis determines the transportation-related impacts associated with the proposed Crestview Crossing development and was prepared in accordance with City of Newberg and Oregon Department of Transportation (ODOT) requirements for traffic impact analyses. The study intersections and scope of this project were selected based on conversations with City and ODOT staff and are documented in a scoping memorandum (dated October 19, 2017) and subsequent City and ODOT comments (*Appendix "A"*).

Study Intersections

This report includes an analysis of operations and safety at the following study intersections:

1. Springbrook Road/Crestview Drive,
2. Libra Street/Crestview Drive,
3. Springbrook Road/Haworth Avenue,
4. Springbrook Road/OR 99W,
5. Brutscher Street/OR 99W,
6. Vittoria Way/OR 99W,
7. Providence Drive/Future Crestview Drive extension/OR 99W,
8. Benjamin Road/OR 99W, and
9. Future Crestview Drive extension/Future east-west connector.



● - Study Intersection

Site Vicinity
Newberg, Oregon

Figure
1

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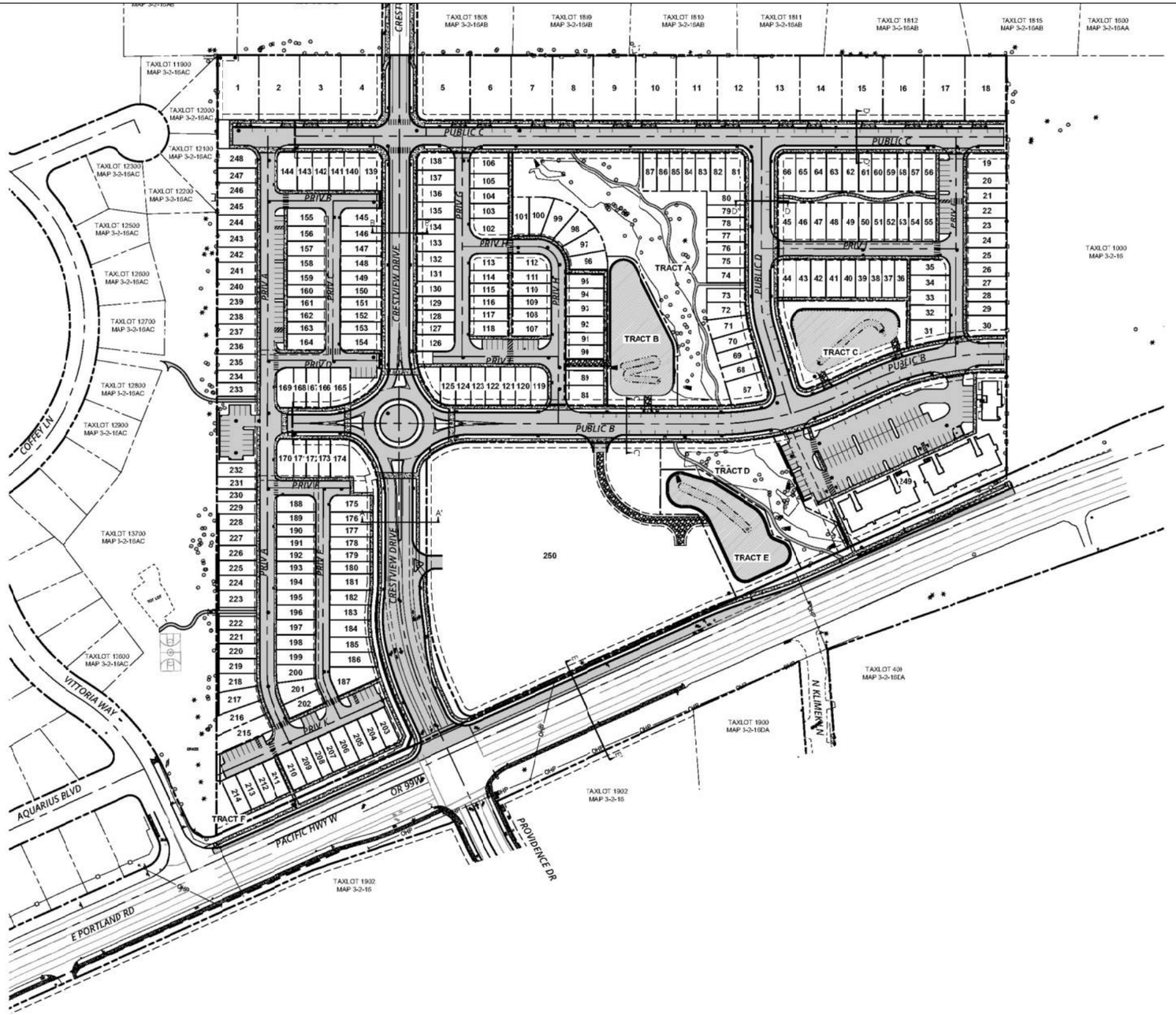
KITTELSON & ASSOCIATES



OVERALL SITE PLAN

CRESTVIEW CROSSING

PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES

3J CONSULTING

CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 1380
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BM
CHECKED BY	AJM, RGW

SHEET NUMBER C210

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Site Plan Provided by 3J Consulting 6/5/2018

Proposed Site Plan
Newberg, Oregon

Figure
2

KITTELSON & ASSOCIATES

Study Scope

This report documents evaluation of the following transportation items:

- Year 2017 existing conditions analysis, including *Highway Capacity Manual 2000* (HCM 2000, Reference 1) volume-to-capacity (v/c) ratio, control delay, and 95th-percentile queuing analysis at the study intersections during the weekday AM and PM peak hours;
- A review of reported crash data from ODOT at the study intersections for the most recent five-year period available;
- Build-out Year 2020 background conditions (includes in-process traffic and regional growth but not traffic from the development), including HCM 2000 v/c ratio, control delay, and 95th-percentile queuing analysis at the study intersections during the weekday AM and PM peak hours;
- Build-out Year 2020 total conditions analysis, including HCM 2000 v/c ratio, control delay, and 95th-percentile queuing analysis at the study intersections during the weekday AM and PM peak hours;
- Horizon Year 2025 background conditions (includes in-process traffic and regional growth but not traffic from the development), including HCM 2000 v/c ratio, control delay, and 95th-percentile queuing analysis at the study intersections during the weekday AM and PM peak hours;
- Horizon Year 2020 total conditions analysis, including HCM 2000 v/c ratio, control delay, and 95th-percentile queuing analysis at the study intersections during the weekday AM and PM peak hours; and,
- On-site traffic operations and circulation.

Analysis Methodology and Applicable Standards

All Level of Service analyses described in this report were performed in accordance with the procedures stated in the HCM 2000. The operations and queuing analyses presented in this report were completed using *Synchro 9 and SimTraffic 9* software, with the exception of the roundabout analyses, which were completed using *Highway Capacity Software (HCS) 7*. Per HCM 2000 methodology, the reported traffic operations are based upon the worst 15 minutes of each peak hour—consequently, the study intersections are expected to perform better during the rest of the day, in general.

The study intersections along OR 99W are all subject to ODOT v/c ratio mobility targets, defined by the *1999 Oregon Highway Plan,* Policy 1F. The study intersections along OR 99W are within the Newberg urban growth boundary, on a Statewide Highway, on a freight route, outside a Metropolitan Planning Organization, outside a Special Transportation Area, and not on a freeway. Thus, the mobility target for each study intersection along OR 99W is a function of the posted speed limit, as shown in Table 1.

Table 1: OR 99W Mobility Targets

Intersection	Posted Speed (mph)	Mobility Target (v/c)
OR 99W/Springbrook Road	35	0.85
OR 99W/Brutcher Street	35	0.85
OR 99W/Vittoria Way	45	0.80
OR 99W/Providence Drive	45	0.80
OR 99W/Benjamin Road	55	0.75

With the exception of OR 99W/Benjamin Road, which is outside the City limits, all study intersections are additionally subject to City of Newberg mobility standards, which require LOS D or better.

Section 3
Existing Conditions

EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and current operational and geometric characteristics of the roadways within the study area. These conditions will be compared with future conditions later in this report.

Kittelson & Associates, Inc. (KAI) staff visited and inventoried the proposed Crestview Crossing site in November 2017. At that time, KAI collected information regarding site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area.

SITE CONDITIONS AND ADJACENT LAND USES

The subject property is located on the north side of OR 99W (Portland Road) near the intersection with Providence Drive. The site is currently occupied by farm land and one single-family home, and it is bordered by residential uses to the west, north, and east and by OR 99W to the south.

Transportation Facilities

Existing lane configurations and traffic control devices at the study intersections are displayed in Figure 3. Table 2 summarizes the existing transportation facilities and roadways in the study area.

Table 2: Existing transportation facilities and roadways in the study area

Roadway	Functional Classification[1]	Number of Lanes	Posted Speed	Sidewalks	Bicycle Lanes	On-Street Parking
OR 99W	Major Arterial	4-5	35 mph – 55 mph[2]	Partial[3]	Yes	No
Springbrook Road	Minor Arterial	2-3	35 mph	Both Sides	South of Haworth Avenue	No
Crestview Drive	Major Collector	2	25 mph	Both sides east of Birdhaven Loop	East of Birdhaven Loop	No
Providence Drive	Major Collector	2	25 mph	Partial[4]	Yes	No
Brutscher Street	Major Collector	2-3	25 mph	Both Sides south of OR 99W	South of Fred Meyer entrance	No
Haworth Avenue	Major Collector	2	25 mph	Both Sides	No	Yes
Vittoria Way	Minor Collector	2	25 mph	Partial[5]	No	Yes
Libra Street	Local Street	2	25 mph	Both Sides	No	Yes
Benjamin Road	Local Street	2	45 mph	No	No	No

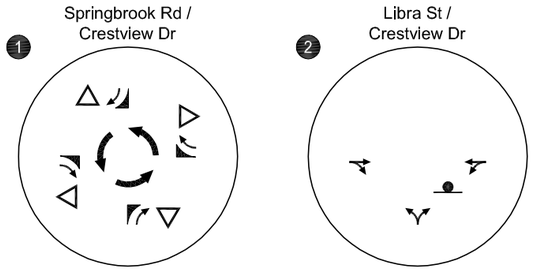
[1]City of Newberg Transportation System Plan (TSP, Reference 2)

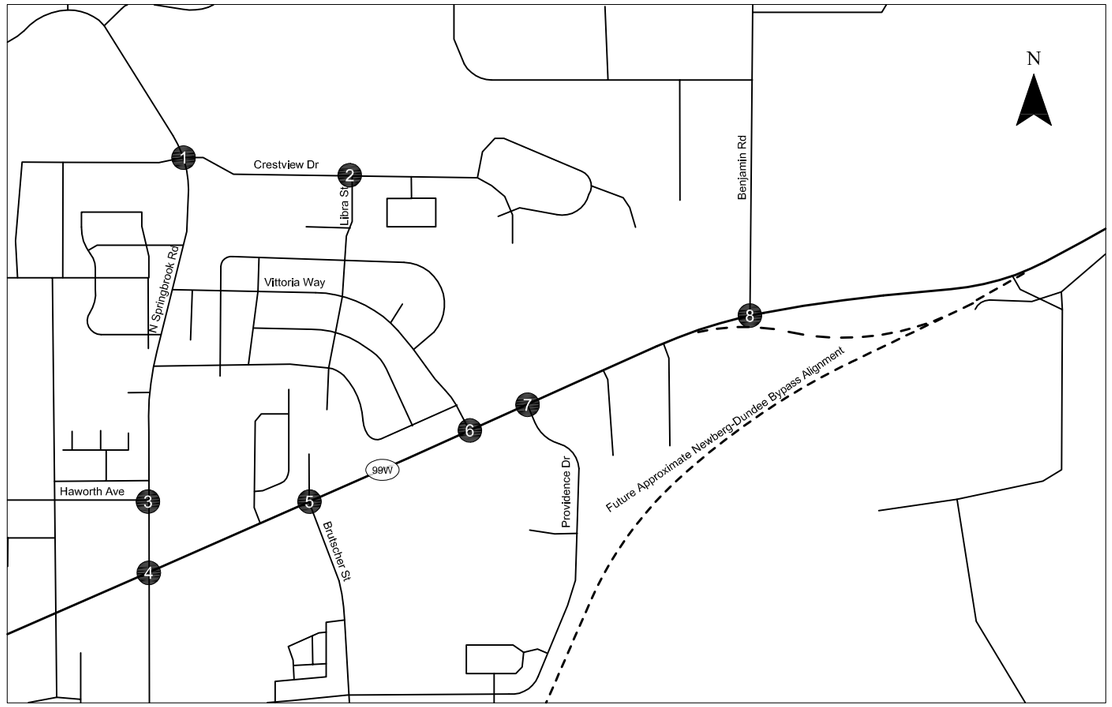
[2]Posted speed is 35 mph at and west of Brutscher Street, 45 mph from east of Brutscher Street to east of Providence Drive, and 55 mph at and east of Benjamin Road

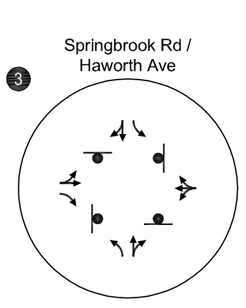
[3]Sidewalks are provided on both sides of OR 99W throughout the study area except on the north side from 250 feet east of Brutscher Street to the east end of the study area and on the south side from 400 feet east of Providence Drive to the east end of the study area

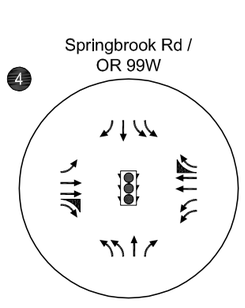
[4]The sidewalk on the east side of Providence Drive ends approximately 270 feet south of OR 99W.

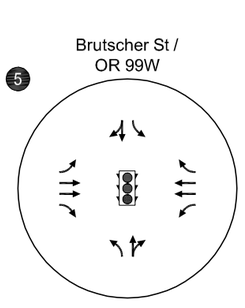
[5]No sidewalk is provided on the east side of Vittoria Way south of Aquarius Boulevard.

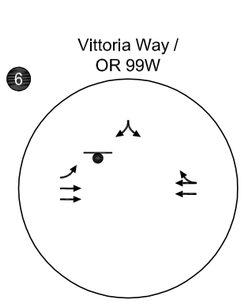


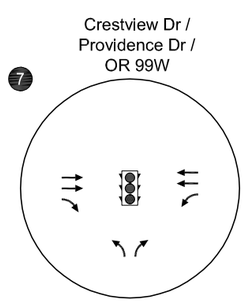


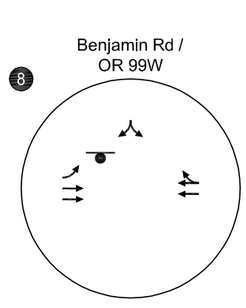












- STOP SIGN
- TRAFFIC SIGNAL
- ROUNDABOUT
- YIELD

Existing Lane Configurations and Traffic Control Devices
Newberg, Oregon

Figure 3

Roadway Facilities

The proposed Crestview Crossing development site is bordered to the south by OR 99W, which is maintained by ODOT and is classified a Major Arterial in the Newberg TSP. Crestview Drive, which is classified a Major Collector, will be extended south through the proposed development site and will connect to OR 99W to form the fourth leg of the existing OR 99W/Providence Drive intersection. The Crestview Drive extension will consist of one travel lane in either direction, except where turn lanes are needed. As shown in Figure 2, several new local streets will be constructed to serve the development, and one east-west connector roadway will intersect the Crestview Drive at a roundabout approximately 500 feet north of OR 99W.

Pedestrian and Bicycle Facilities

There are currently no sidewalks provided within the proposed site frontage along OR 99W, but sidewalks and bicycle lanes are provided on both sides of Crestview Drive and Providence Drive north and south of the proposed site. While paved shoulders are provided along both sides of OR 99W within the site vicinity, OR 99W is a high-speed roadway with no separated bicycle facilities.

TRANSIT FACILITIES

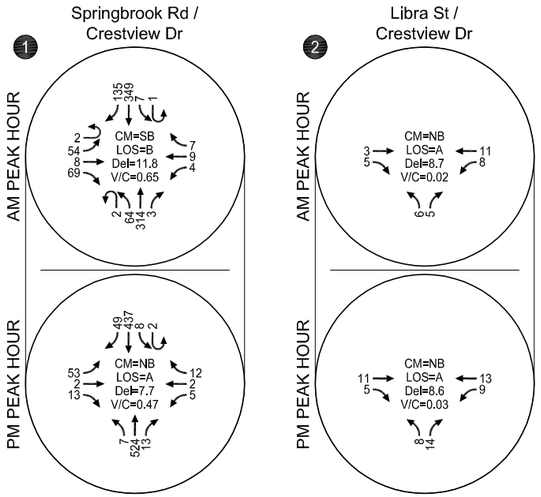
Transit service in the site vicinity is provided by Yamhill County Transit Area (YCTA, Reference 3). Route 7: Newberg Providence connects Providence Newberg Medical Center, which is approximately 0.15 mile south of the proposed development, to the Newberg Central Business District. Service is provided on weekdays at approximately one-hour intervals from approximately 7:15 AM to 6:15 PM.

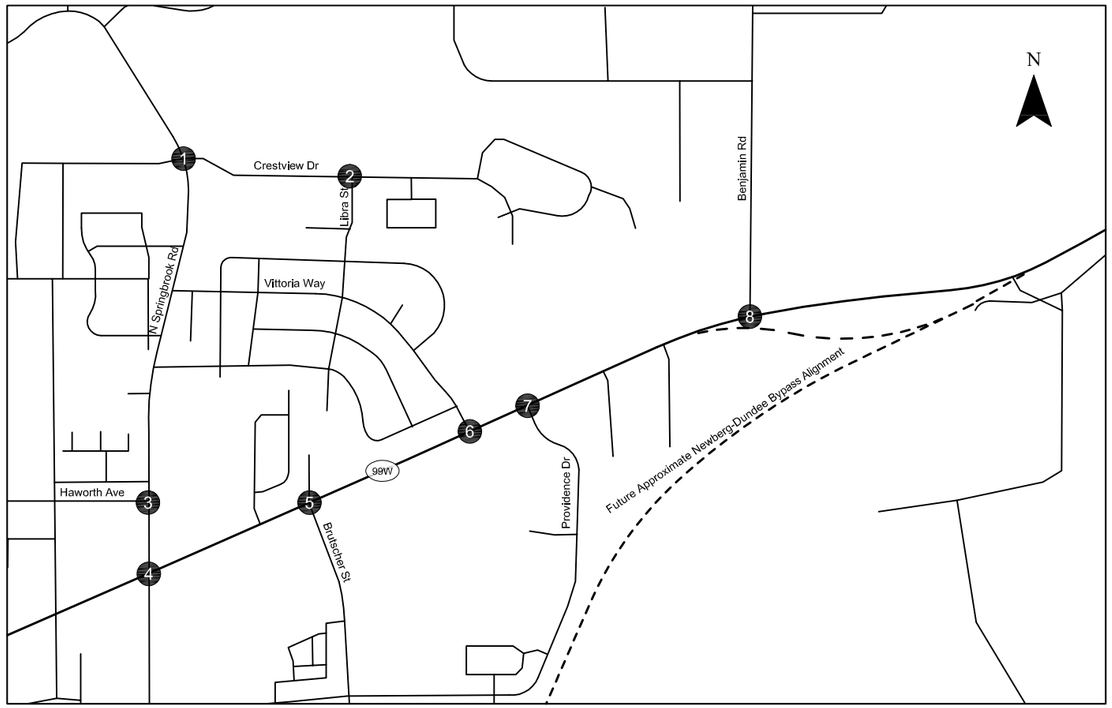
TRAFFIC VOLUMES AND PEAK HOUR OPERATIONS

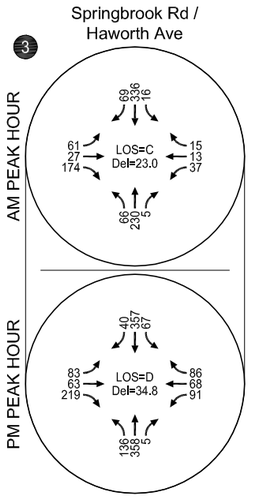
Turning movement counts were conducted at the Libra Street/Crestview Drive and Springbrook Road/Haworth Avenue intersections in November 2017 when school was in session. Counts were conducted at all other existing study intersections in September 2017 when school was in session—per scoping discussions with ODOT staff, the study intersections along OR 99W are heavily influenced by both seasonal traffic and school traffic, with the peak travel period occurring in September. Therefore, no seasonal count adjustment along OR 99W is required.

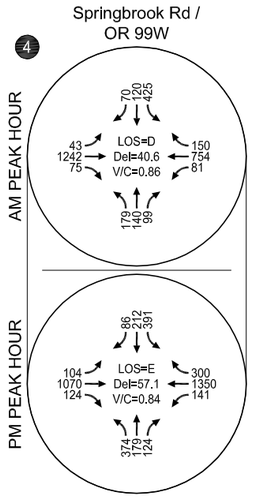
All counts used in this analysis were conducted on a typical midweek day during the morning (6:00 to 9:00 AM) and afternoon (3:00 to 6:00 PM) peak periods. The analysis time periods are based on a corridor-wide peak hour along OR 99W and individual intersection peak hours at the remaining study intersections. Figure 4 provides a summary of the year 2017 turning-movement counts.

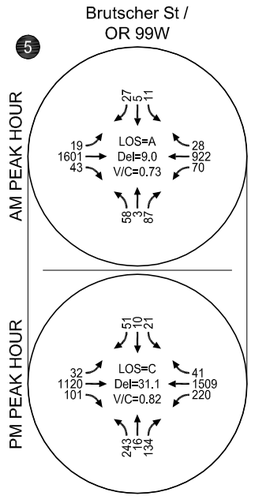
Appendix "B" contains the traffic count worksheets used in this study.

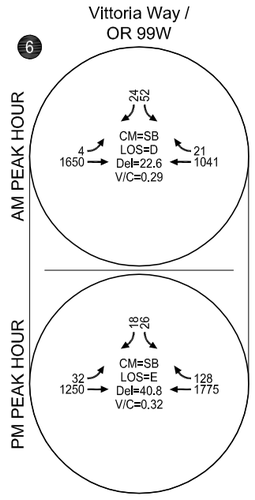


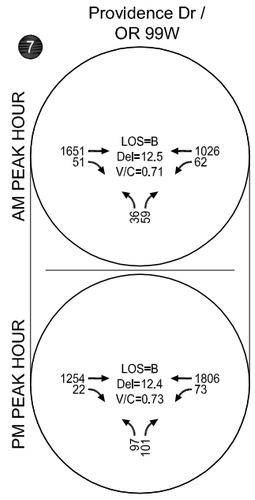


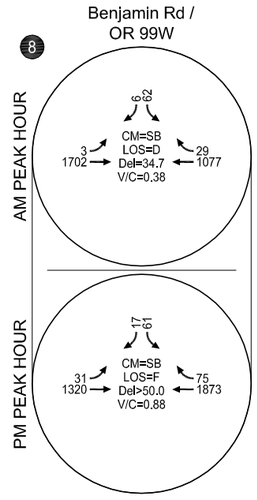












CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing Traffic Conditions
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure
4

Calibration to Field Observations

Saturation Flow Rate

ODOT requires a base saturation flow rate of 1,750 vehicles per hour per lane outside the Portland metro area. Based on field observation and video data, vehicles exhibited driving behavior typical of urban areas. Thus, a saturation flow-rate study was prepared to calibrate the analysis to real-world observations. Using video data, the base saturation flow rate was calibrated to 1,800 vehicles per hour for the following two movements:

- Westbound OR 99W at Springbrook Road, and
- Westbound OR 99W at Providence Drive.

All analysis for these movements assumes the calibrated base saturation flow rates. *Appendix "C" contains the saturation flow study worksheets for these movements.*

Queuing

The *SimTraffic* queuing analysis (provided in later sections of this report) was found to overestimate the existing conditions 95th percentile queues at the Providence Drive/OR 99W intersection during the weekday AM and PM peak hours. For example, the eastbound right turn maximum queue observed during the AM peak hour was 25 feet (one vehicle length) and the *SimTraffic* results estimate a 95th-percentile queue of 100 feet. The *Synchro* analysis was found to reflect the existing field conditions more accurately, showing approximately one vehicle for the same eastbound right-turn movement during the AM peak hour.

For these reasons, the Synchro queuing outputs are reported for the Providence Drive/OR 99W intersection in addition to the *SimTraffic* outputs. As shown in the queuing analysis tables later in this report, the actual 95th percentile queues for the identified movements are expected to operate at a queue length in between the *Synchro* and the *SimTraffic* output.

Level of Service Analysis

Figure 4 also displays the existing levels of service at each of the study intersections during the weekday AM and PM peak hours. As shown in the figure, each of the study intersections currently meets ODOT and City mobility standards, with the following exceptions:

- The volume-to-capacity ratio of the Springbrook Road/OR 99W intersection is 0.86 during the weekday AM peak hour, which exceeds the ODOT mobility standard of 0.85. The weekday PM peak hour level of service of this intersection (LOS E) does not meet the City standard of LOS D.
- The weekday PM peak hour level of service of the Vittoria Way approach to the intersection with OR 99W (LOS E) does not meet the City standard of LOS D.

Appendix "C" contains the existing conditions Level of Service worksheets.

Traffic Safety

ODOT-reported crash data was reviewed for the most recent five-year period, from January 1, 2011 to December 31, 2015. Table 3 summarizes the reported crash data at the study intersections.

Table 3: ODOT-Reported Crash Data (January 1, 2011 to December 31, 2015)

Intersection	Crash Severity			Crash Type						Crash Rate[2]
	Fatal	Injury	PDO[1]	Rear End	Turning	Sideswipe	Angle	Other	Total	
Springbrook Rd / Crestview Dr	1	0	1	1	0	0	0	1	2	0.10
Libra St / Crestview Dr	0	0	0	0	0	0	0	0	0	0.00
Springbrook Rd / Haworth Ave	0	2	5	1	2	0	3	1	7	0.24
Springbrook Rd / OR 99W	0	27	41	53	9	2	2	2	68	0.84
Brutscher St / OR 99W	0	13	7	15	4	0	0	1	20	0.31
Vittoria Way / OR 99W	0	2	2	2	2	0	0	0	4	0.07
Providence Dr / OR 99W	0	2	9	11	0	0	0	0	11	0.18
Benjamin Rd / OR 99W	0	3	1	0	4	0	0	0	4	0.06

[1]Property Damage Only

[2]Per million entering vehicles

As shown in the table, one fatal crash was reported at the Springbrook Road/Crestview Drive roundabout—this crash occurred in 2013 when a southbound motorcyclist struck a curb and was thrown from the vehicle. The crash report lists the cause as driver error—driving too fast for conditions.

ODOT maintains a ranking of intersections with potential safety problems known as the Safety Priority Index System (SPIS). Based upon a 2016 analysis, none of the study intersections ranked within the top 5 percent of the highest-scoring intersections in Region 2.

No other crash trends or safety deficiencies were identified at the study intersections.

Appendix "D" contains the reported crash data from ODOT.

Section 4
Transportation Impact Analysis

TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis identifies how the study area's transportation system will operate in the year the proposed Crestview Crossing development is expected to be fully built and occupied, year 2020. The impact of traffic generated by the proposed Crestview Crossing development during the weekday AM and PM peak hours was examined as follows:

- The Oregon Clinic and the Providence Medical Office Building were identified as in-process developments by City of Newberg and included in the background traffic volumes;
- Year 2020 background traffic volumes at the study intersections were developed by applying a two-percent annual growth rate to the existing mainline volumes along OR 99W and then adding the in-process trips;
- Some traffic was reassigned based upon the new network link created by the Crestview Drive extension;
- Site trip distribution patterns were identified based upon a select zone analysis of the Newberg Model;
- Site-generated trips were estimated for build-out of the site and assigned to the study intersections based upon the assumed trip distribution pattern;
- Year 2020 total traffic volumes at the study intersections were developed by adding the site-generated trips to the 2020 background traffic volumes, accounting for reassigned traffic due to the Crestview Drive extension;
- Year 2025 background traffic volumes at the study intersections were developed by adding an additional five years of growth (at a two-percent annual growth rate) to the existing mainline volumes along OR 99W;
- Year 2025 total traffic volumes at the study intersections were developed by adding the site-generated trips to the 2025 background traffic volumes, accounting for reassigned traffic due to the Crestview Drive extension; and,
- On-site circulation issues and site-access operations were evaluated.

YEAR 2020 BACKGROUND TRAFFIC CONDITIONS

The year 2020 background traffic analysis identifies how the study area's transportation system will operate without the proposed Crestview Crossing development. This analysis includes traffic attributed to planned developments within the study area and to general growth in the region but does not include traffic from the proposed development.

Planned Developments and Transportation Improvements

The City of Newberg identified two in-process developments within the site vicinity: the Oregon Clinic, to be located on the west side of Providence Drive south of Providence Newberg Medical Center, as well as the Providence Medical Office Building, to be located on the east side of Providence Drive across from the existing Providence Medical Center.

In-process trips are summarized in a graphic in Appendix "E".

The following two planned transportation improvements were identified, neither of which will be completed prior to development of the proposed Crestview Crossing:

- The aforementioned Crestview Drive extension, which will be incorporated into site development and is described later in this report under Proposed Development Plan; and
- The Newberg-Dundee Bypass, which will intersect OR 99W approximately 0.5 miles east of the proposed development site and is not expected to be completed until after the proposed Crestview Crossing development is fully built and occupied (2020).

Background Growth

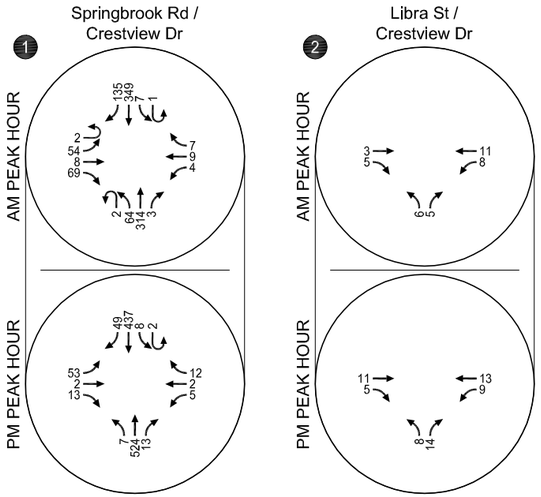
To account for general area growth, a two-percent annual growth rate was applied to the existing mainline volumes along OR 99W at the study intersections.

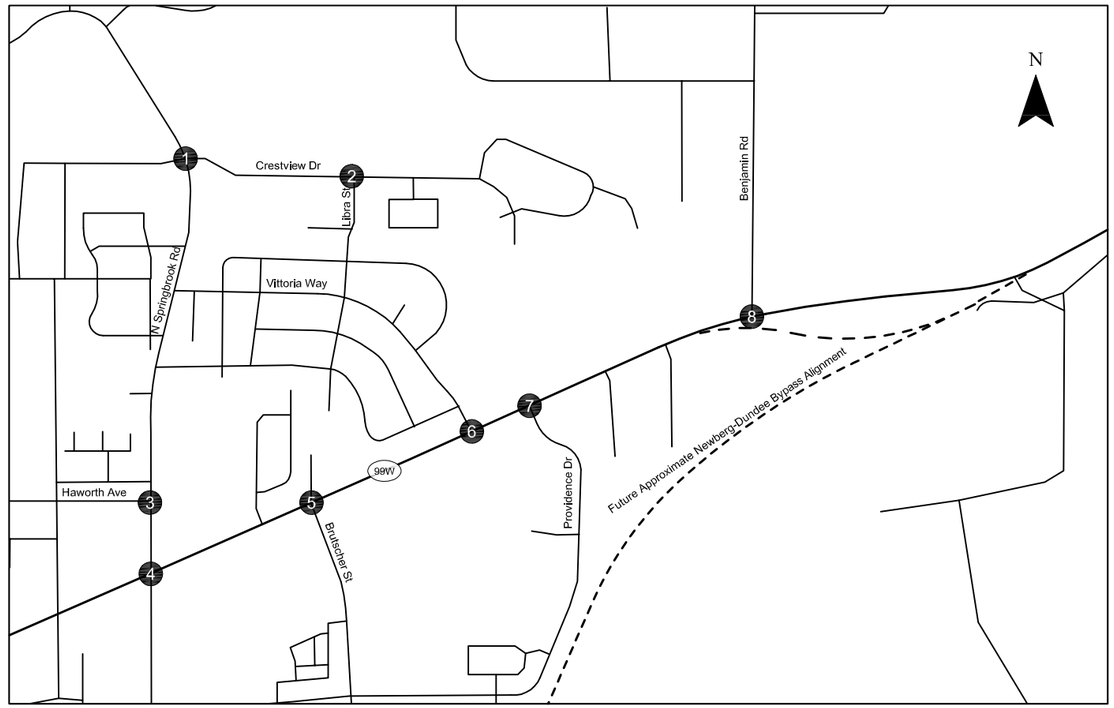
Figure 5 displays the 2020 background traffic volumes at the study intersections during the weekday AM and PM peak hours, which include general area growth and in-process trips identified previously.

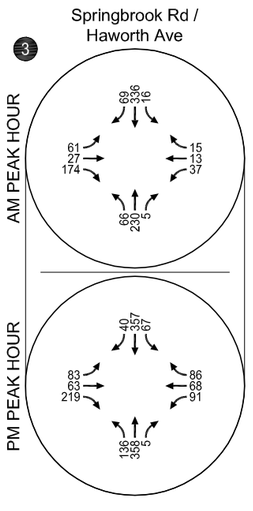
Crestview Drive Extension

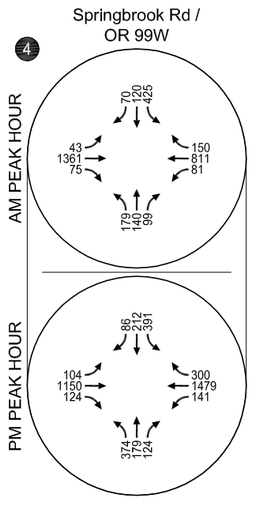
The Crestview Drive extension is contained within the City's Transportation System Plan and can be considered a regional system improvement independent of the land uses contained within the Crestview Crossing development. The construction of the Crestview Drive extension is expected to cause some traffic to shift from Springbrook Road and OR 99W. For this analysis, ttraffic volumes were reassigned to the new street system based on existing turning movement demand at the intersections of Springbrook Road/Crestview Drive, Springbrook Road/Haworth Avenue, and Springbrook Road/OR 99W.The City's Transportation System Plan was also consulted for consistency in assumptions. Figure 6 displays the estimated reassigned traffic volumes.

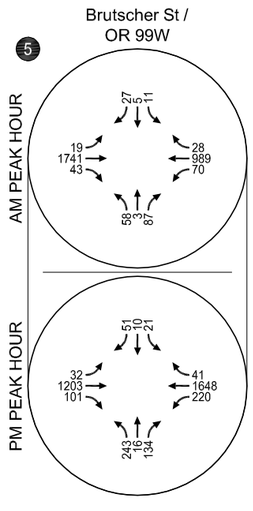
The reassigned traffic volumes shown in Figure 6 were added to the background traffic volumes in Figure 5 to arrive at the 2020 background traffic conditions, shown in Figure 7. Based on concurrence from ODOT transportation planning staff, this scenario serves as the base case against which future traffic conditions are prepared. The background condition for the Crestview Drive extension assumes a two-lane cross section, including the new north leg of the Providence Drive/OR 99W intersection. Any potential turn lane additions at the Crestview Drive/Providence Drive/OR 99W intersection will be considered mitigation measures associated with the Crestview Crossing development and are described under 2020 total traffic conditions. The assumed lane configurations for this scenario are displayed in Figure 8.

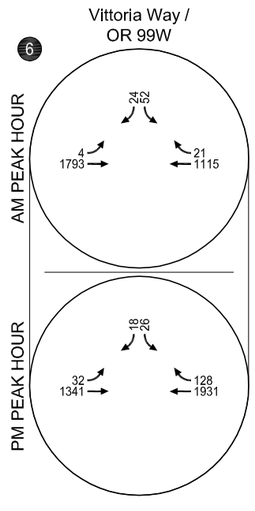


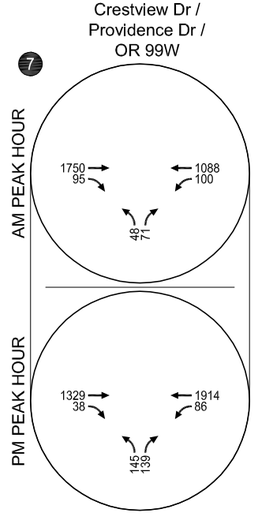


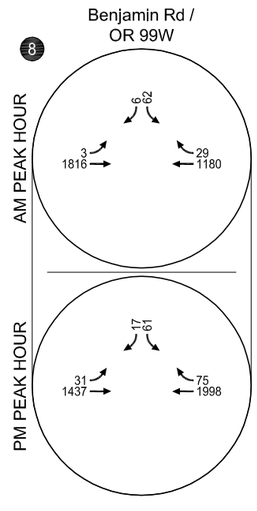






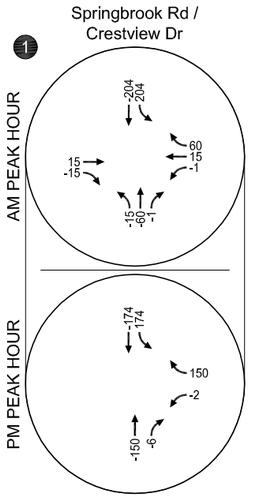


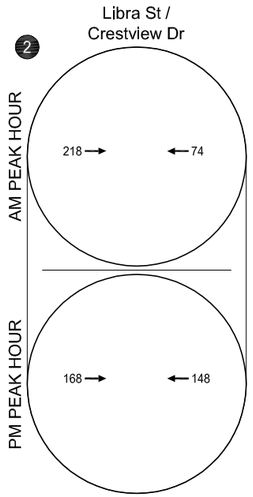


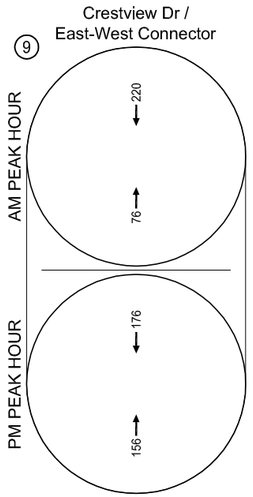


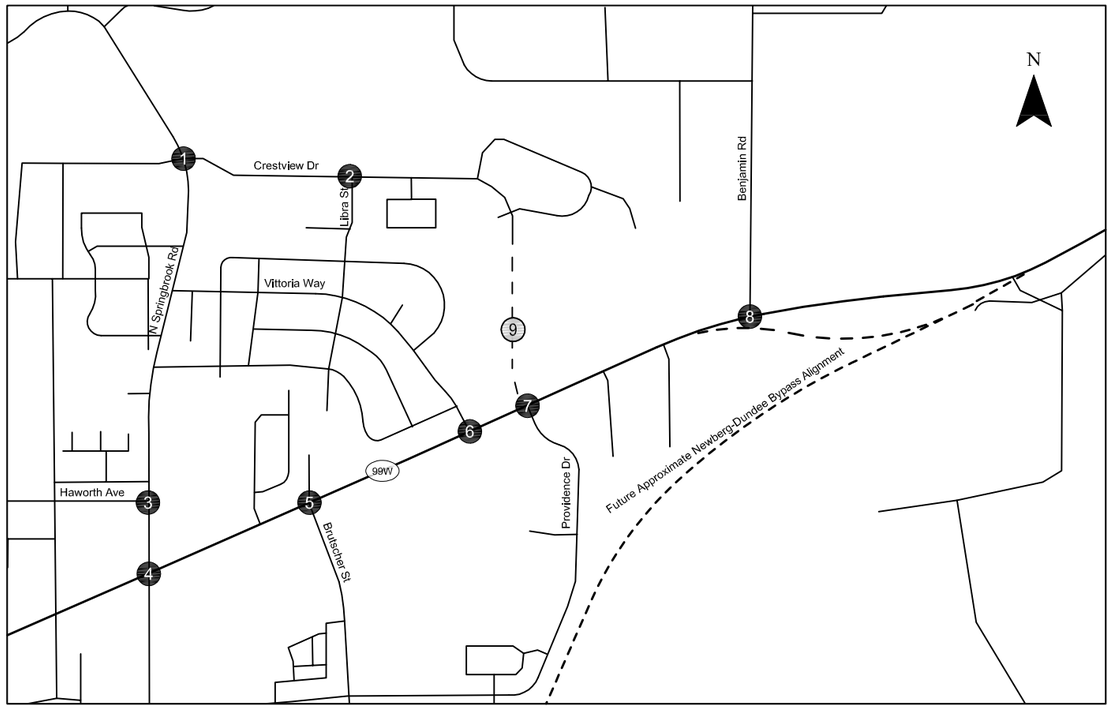
Year 2020 Background Traffic Volumes
Weekday AM and PM Peak Hours
Newberg, Oregon

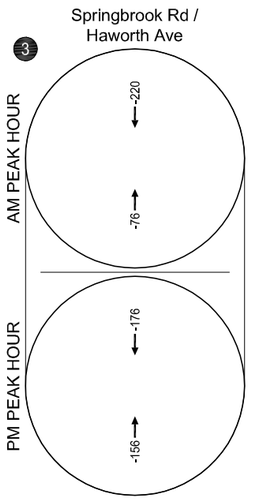
Figure
5

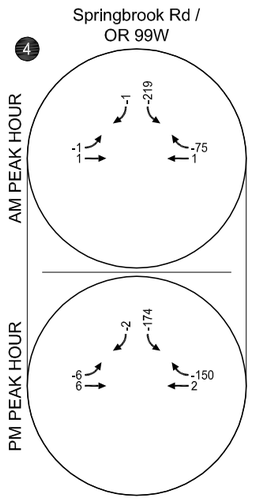


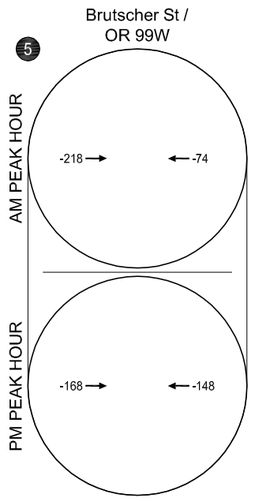


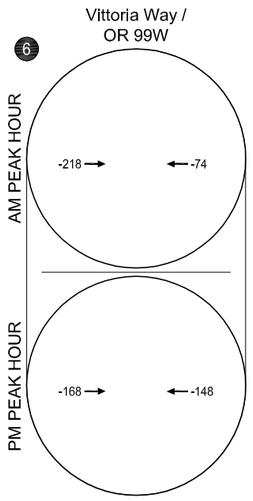


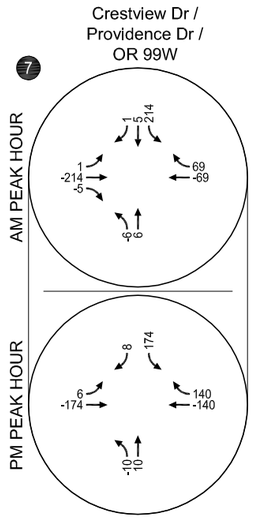


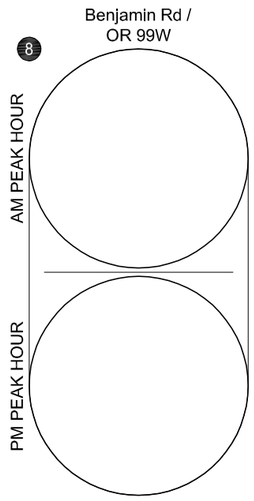






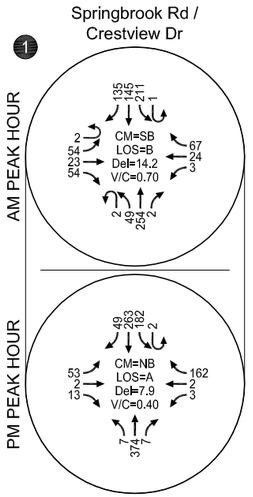


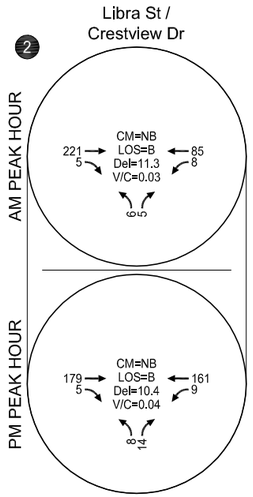


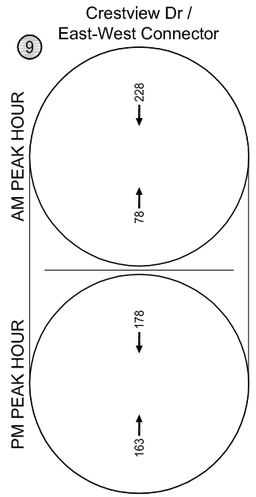


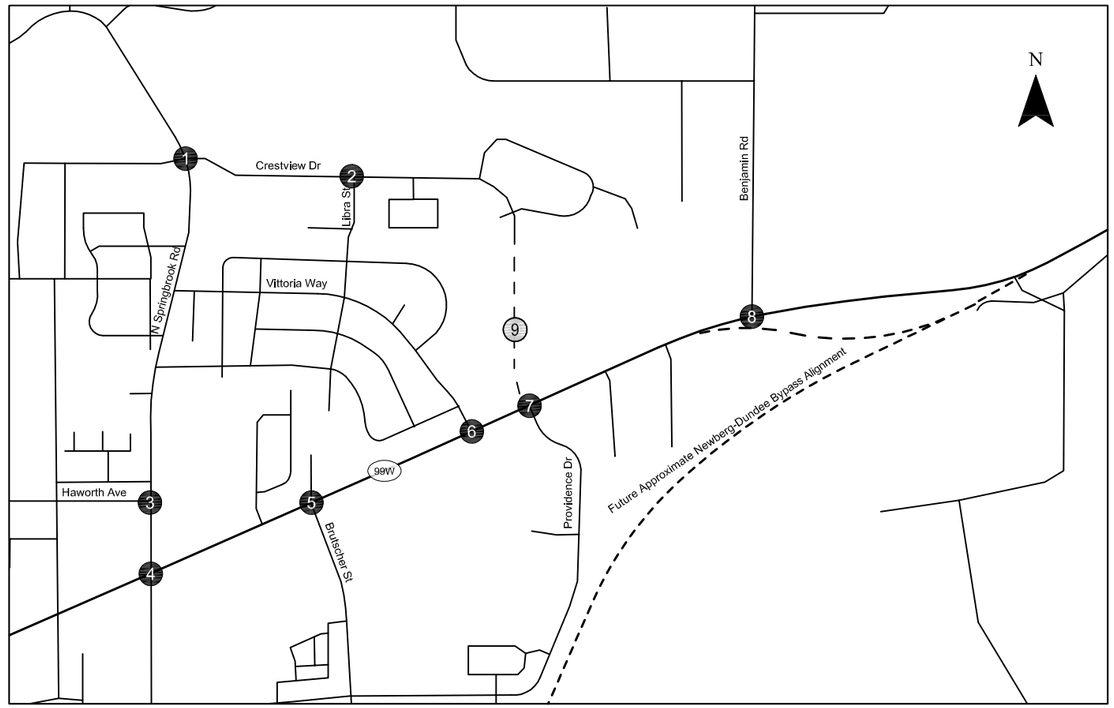
Reassigned Traffic Volumes
Weekday AM and PM Peak Hours
Newberg, Oregon

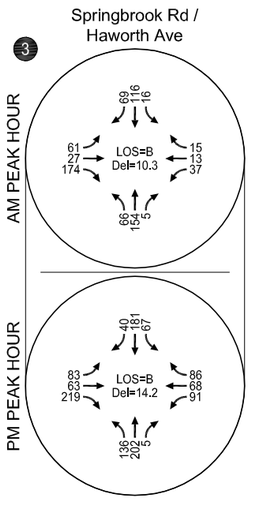
Figure
6

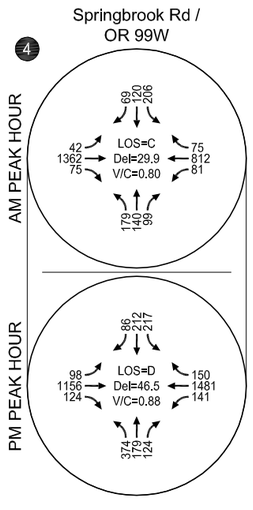


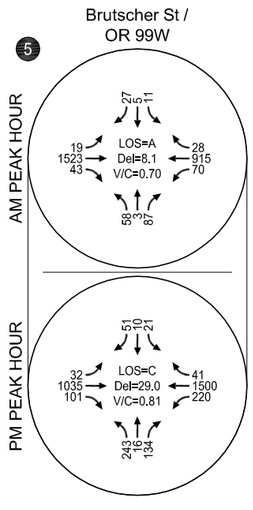


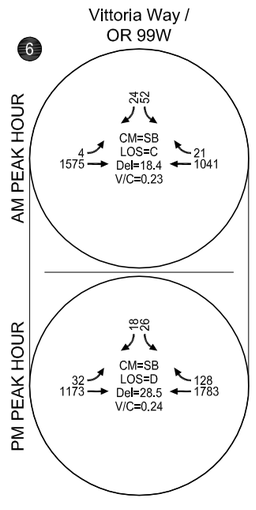


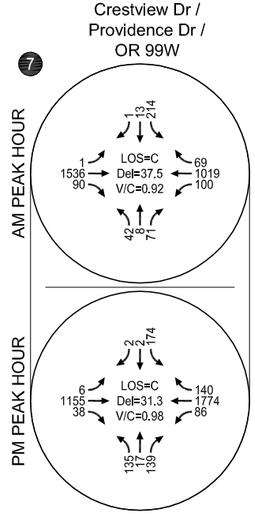


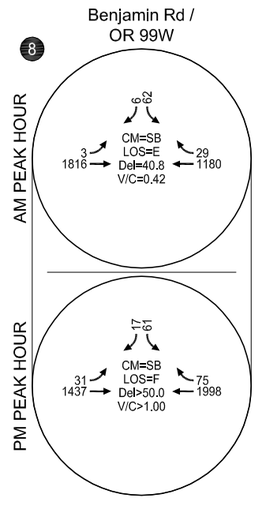








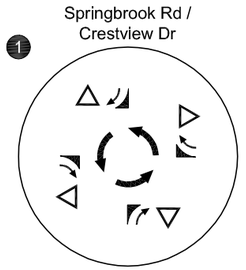


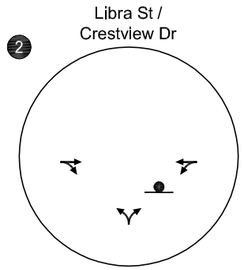


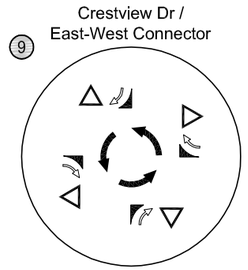
CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

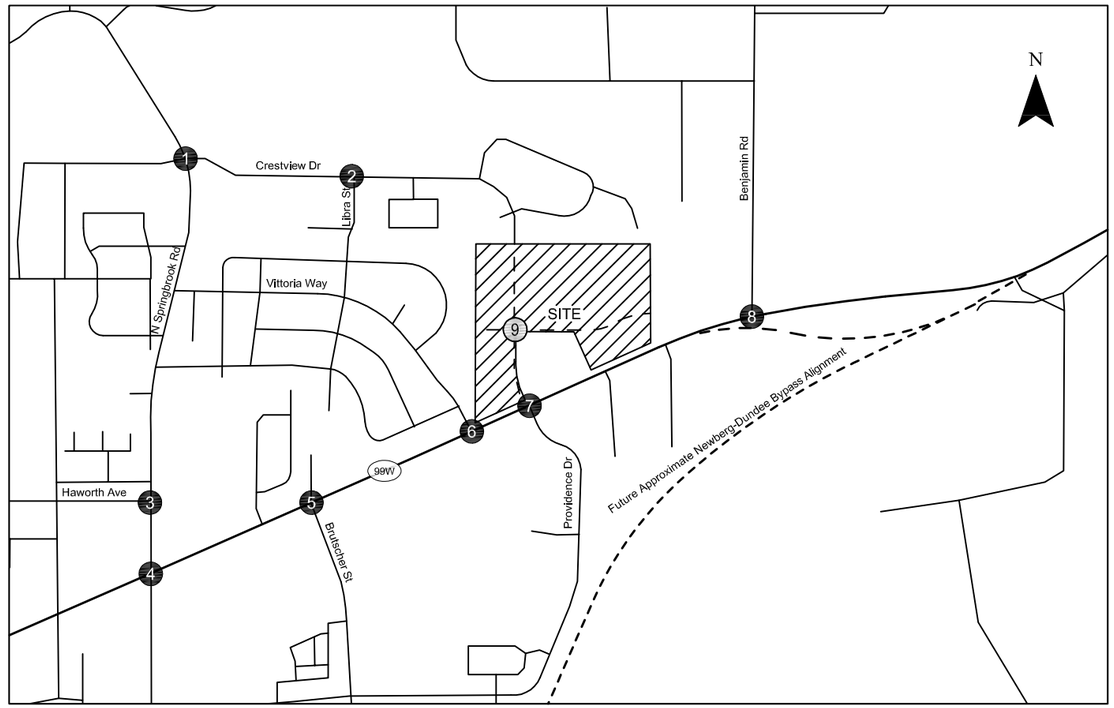
Year 2020 Background Traffic Conditions with Reassigned Traffic
Weekday AM and PM Peak Hours
Newberg, Oregon

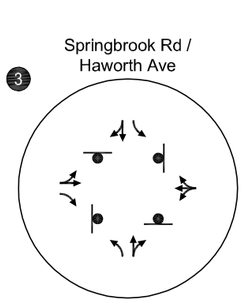
Figure
7

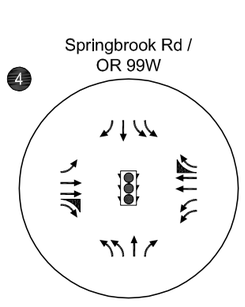


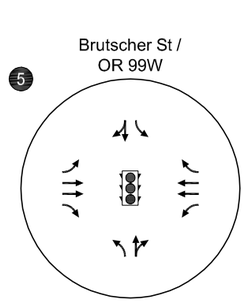


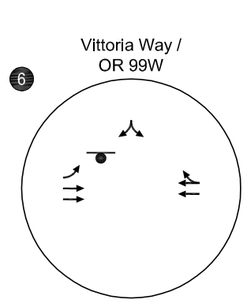


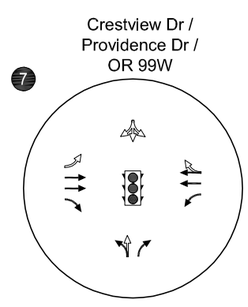


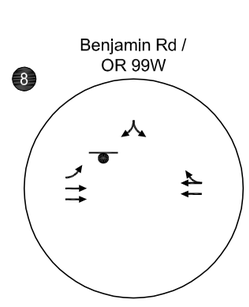












- STOP SIGN
- TRAFFIC SIGNAL
- ROUNDABOUT
- YIELD
- EXISTING
- PROPOSED

Assumed Lane Configurations
and Traffic Control Devices
Newberg, Oregon

Figure
8

KITTELSON & ASSOCIATES

Level of Service Analysis

Figure 7 also shows the corresponding level of service analysis—each of the study intersections is expected to continue meeting ODOT and City mobility standards, with the following exceptions:

- The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.88 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85.
- The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.89 and 0.92, respectively, which both exceed the ODOT mobility standard of 0.80.

Appendix "F" contains the year 2020 background with reassigned traffic Level of Service worksheets.

PROPOSED DEVELOPMENT PLAN

Per the site plan displayed in Figure 2, the Crestview Crossing development includes 248 single-family homes and 48 apartment units. However, given the potential for fluctuation in the final number of units, up to 260 single-family homes were analyzed in this report to provide a conservative analysis of the impacts. The site development will also include an extension of Crestview Drive to the south through the development and connecting to OR 99W to form the north leg of the OR 99W/Providence Drive intersection. Full-build out and occupancy of the phase of the development included in this report is expected to occur in 2020. A future development phase may include an additional 4.43 acres of commercial space adjacent to the development site but is not included in this application.

Trip Generation

The projected weekday daily, AM, and PM peak-hour vehicle trip ends for the proposed development were based on the *Trip Generation Manual*, 10th Edition (Reference 4). Table 4 summarizes the anticipated number of trips that will be generated by the proposed Crestview Crossing development.

Table 4: Proposed Trip Generation

Land Use	ITE Code	Size		Weekday Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	260	units	2,504	189	47	142	254	160	94
Apartment	220	48	units	322	24	6	18	31	20	11
Total				**2,826**	**213**	**53**	**160**	**285**	**180**	**105**

As shown in Table 4, the proposed development is expected to generate approximately 2,826 weekday daily trips, of which 213 (53 in, 160 out) will occur during the AM peak hour and 285 (180 in, 105 out) will occur during the PM peak hour.

Site Trip Distribution/Trip Assignment

The site-generated trips were distributed onto the study area roadway system according to a select zone analysis of TAZ 117, which includes the proposed development site, from the Newberg Transportation Planning Model, provided by ODOT. This model was reviewed and adjusted based on field-observed turning movement patterns. The traffic generated by the proposed Crestview Crossing development is expected to follow the following trip distribution pattern:

- 15 percent to the east along OR 99W;
- 10 percent to the south along Providence Drive;
- 10 percent to the south along Brutscher Street;
- 35 percent to the west along OR 99W to Springbrook Road; and
- 30 percent to the north along the Crestview Drive extension to Springbrook Road.

Trips were then distributed at the Springbrook Road/Crestview Drive and Springbrook Road/OR 99W intersections based upon existing turning movement counts. Figure 9 illustrates the estimated trip distribution pattern for the proposed development.

The estimated site-generated trips were assigned to the network by distributing the trips shown in Table 5 according to the trip distribution pattern shown in Figure 9. Figure 9 illustrates the site-generated trips that are expected to use the roadway system during the weekday AM and PM peak hours.

Appendix "G" contains the select zone analysis results received from ODOT.

YEAR 2020 TOTAL TRAFFIC CONDITIONS

The total traffic conditions analysis forecasts how the study area's transportation system will operate with the traffic generated by the proposed Crestview Crossing development. The weekday AM and PM peak hour site-generated traffic volumes (shown in Figure 9) were added to the year 2020 background traffic volumes with reassigned traffic (shown in Figure 7) to arrive at the total traffic volumes shown in Figure 10.

Level of Service Analysis

The weekday AM and PM peak hour turning-movement volumes shown in Figure 10 were used to conduct an operational analysis at each study intersection to determine the year 2020 total traffic levels of service. The assumed lane configurations at the Crestview Drive/Providence Drive/OR 99W and Crestview Drive/East-West Connector intersections are displayed in Figure 8. The results of the total traffic analysis shown in Figure 10 indicate that all of the study intersections and site access points are forecast to meet ODOT and City mobility standards under 2020 total traffic conditions during the weekday AM and PM peak hours, with the following exceptions:

- The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.86 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85 but does not exceed the v/c ratio under background conditions with reassigned traffic.
- The weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.08, respectively. These both exceed the ODOT mobility standard of 0.80.

Appendix "H" contains the year 2020 total traffic Level of Service worksheets.

Mitigation at Crestview Drive/Providence Drive/OR 99W

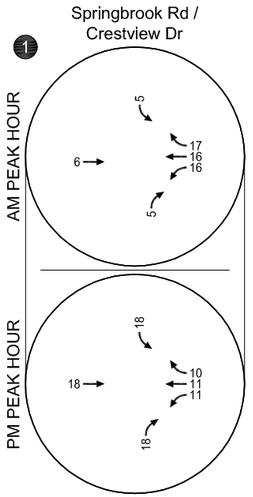
In conjunction with site development, JT Smith Companies proposes to add lanes to the Crestview Drive/Providence Drive/OR 99W intersection, shown in Figure 11 and described below:

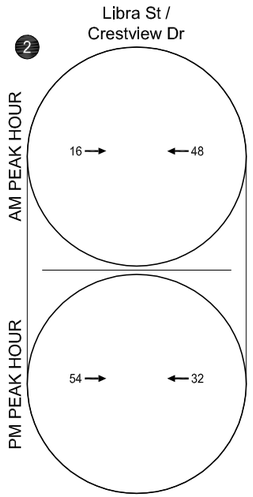
- Add an exclusive left turn lane on southbound Crestview Drive,
- Add an exclusive right turn lane on southbound Crestview Drive,
- Add an exclusive right turn lane on westbound OR 99W, and,
- Restripe the northbound Providence Drive approach to include an exclusive left turn lane and an exclusive right turn lane.

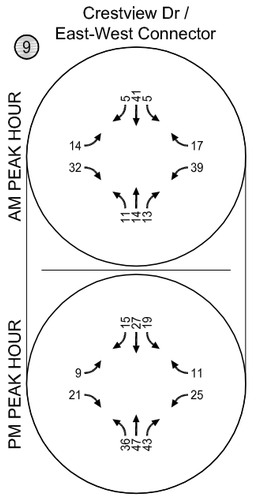
These improvements are considered to be above and beyond the geometry needed to construct the Crestview Drive extension.

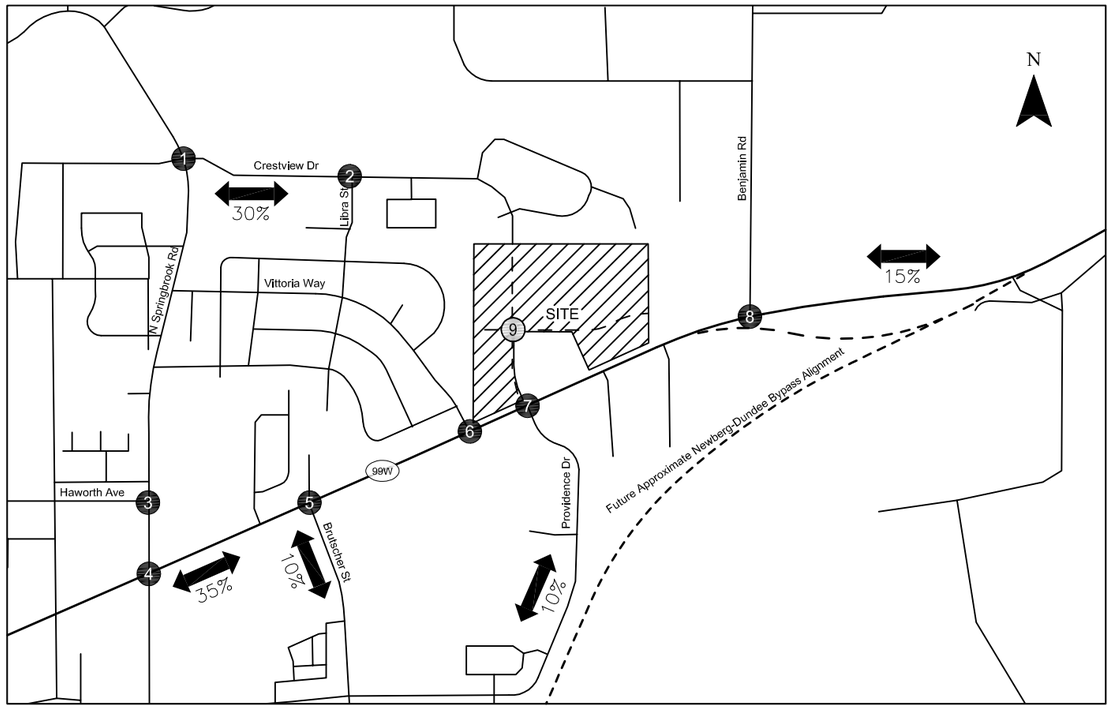
As shown in Figure 11, with these mitigation measures in place, the weekday AM and PM peak hour v/c ratios at the intersection are forecast to be 0.88 and 0.89, respectively. These both exceed the ODOT mobility standard of 0.80 but do not exceed the respective v/c ratios for background conditions with reassigned traffic.

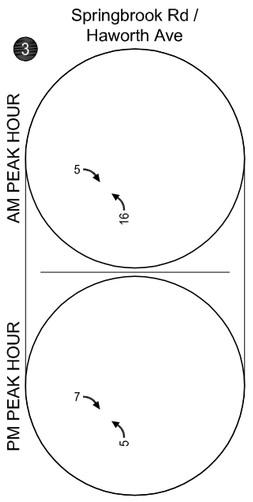
Appendix "I" contains the year 2020 total traffic with mitigation Level of Service worksheets.

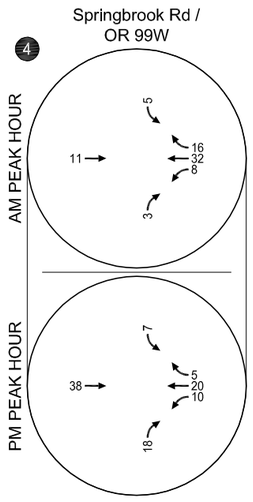


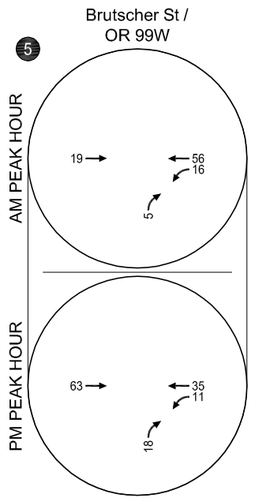


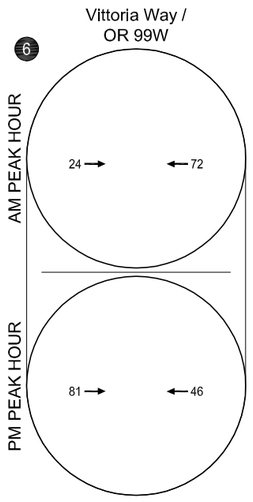


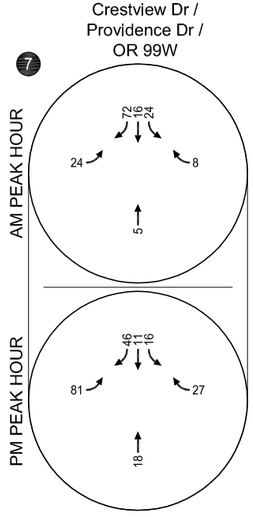


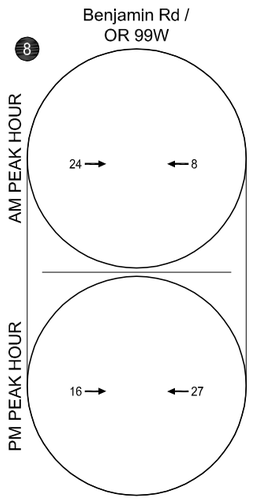








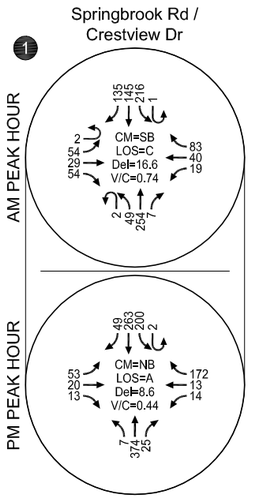


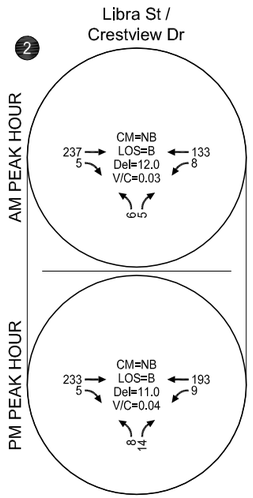


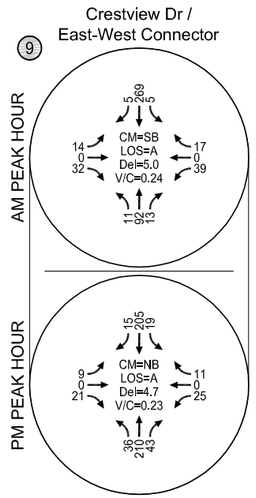
	TOTAL	IN	OUT
AM	213	53	160
PM	285	180	105

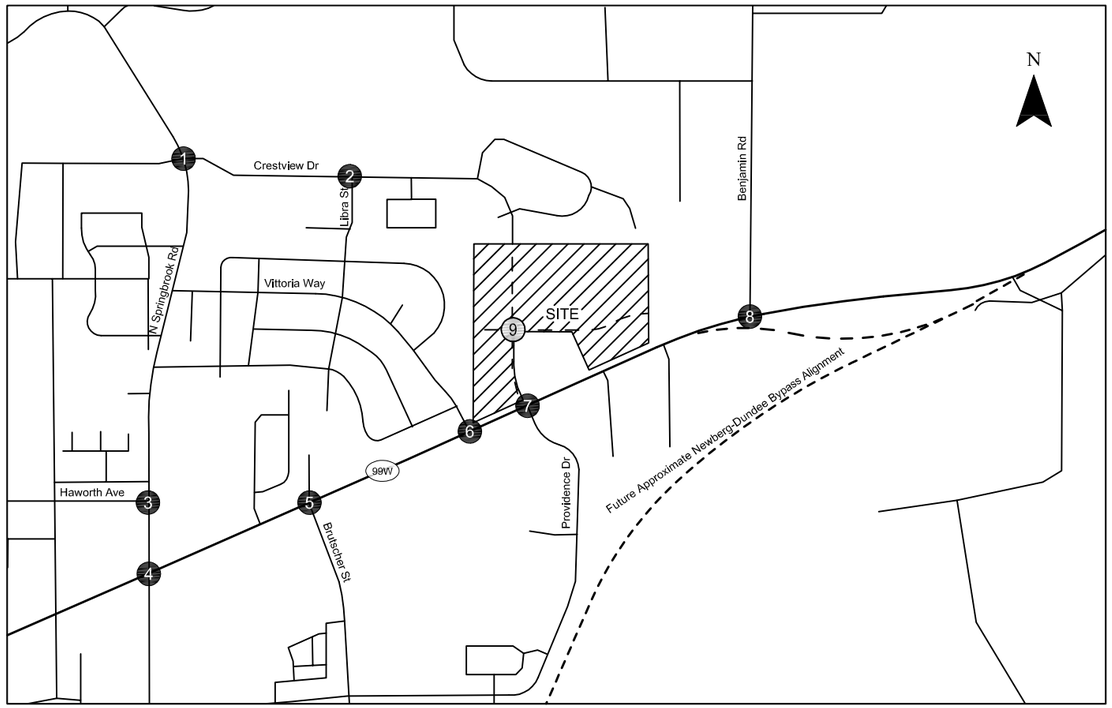
Site-Generated Trips
Weekday AM and PM Peak Hours
Newberg, Oregon

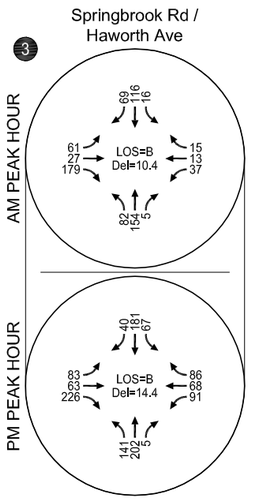
Figure
9

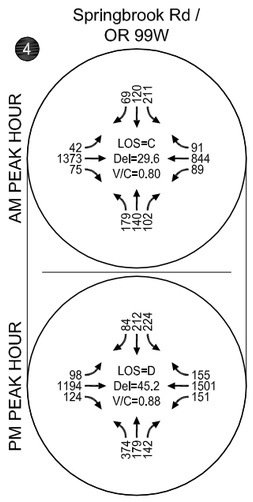


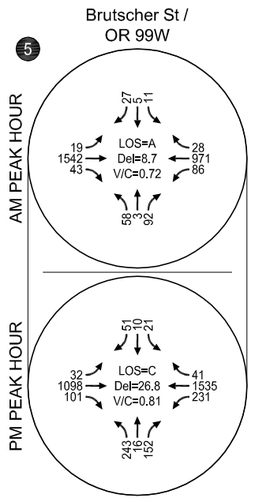


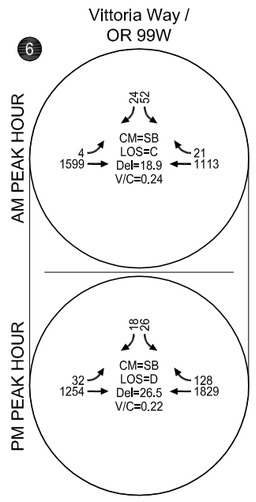


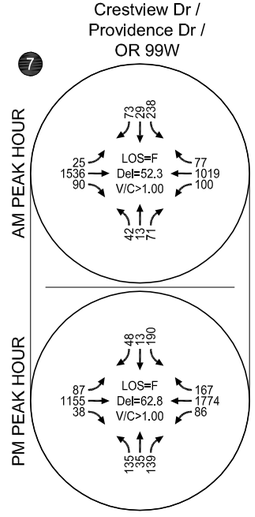


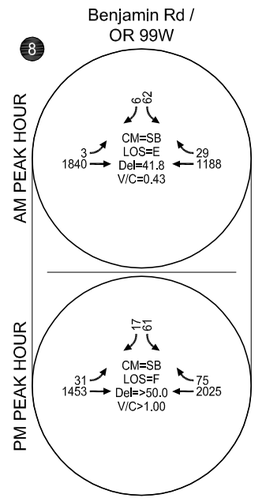












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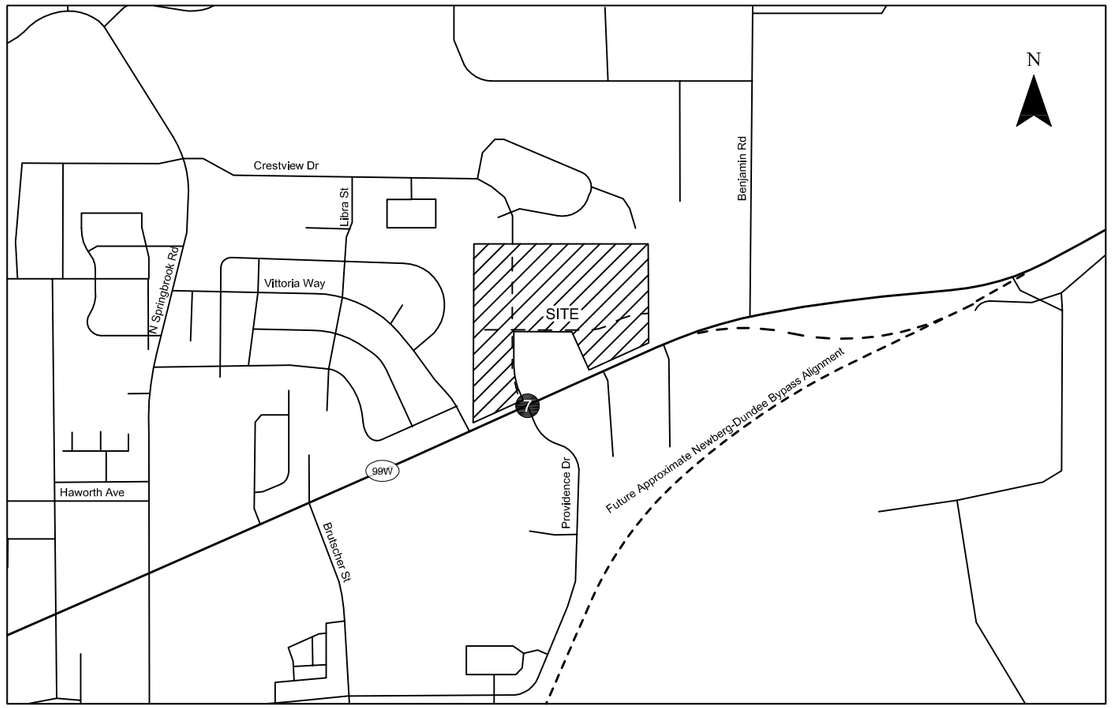
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Year 2020 Total Traffic Conditions
Weekday AM and PM Peak Hours
Newberg, Oregon

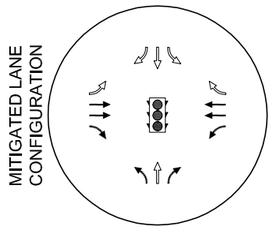
Figure
10



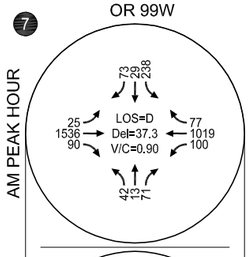
Crestview Dr / Providence Dr / OR 99W

7

MITIGATED LANE CONFIGURATION



AM PEAK HOUR



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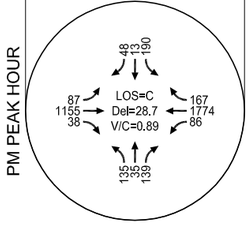

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
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Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/ CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

↖ - EXISTING
↖ - PROPOSED

Year 2020 Total Mitigated Traffic Conditions
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure 11

2025 HORIZON YEAR BACKGROUND TRAFFIC CONDITIONS

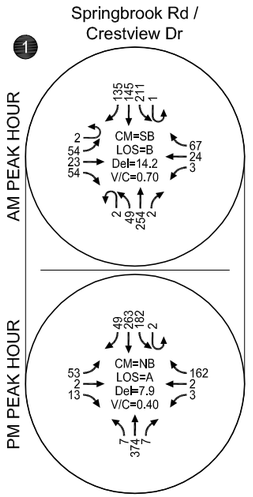
The 2025 horizon year background traffic volumes were developed from the 2020 background traffic volumes with reassigned traffic shown in Figure 8 and then adding an additional five years of growth (at two-percent annual growth) to the mainline through volumes at the study intersections on OR 99W. Figure 12 displays these volumes.

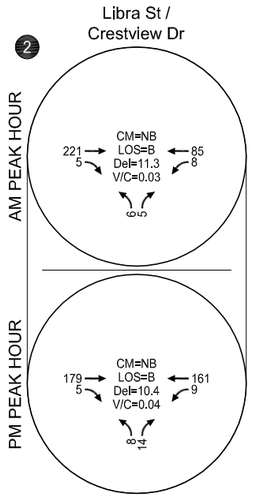
Level of Service Analysis

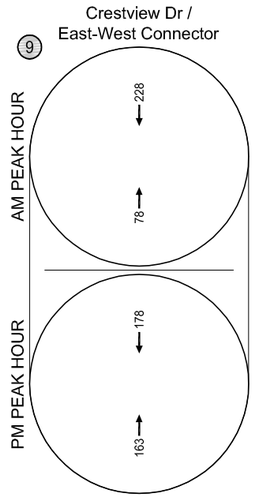
Figure 12 also shows the corresponding level of service analysis—each of the study intersections is expected to continue meeting ODOT and City mobility standards, with the following exceptions:

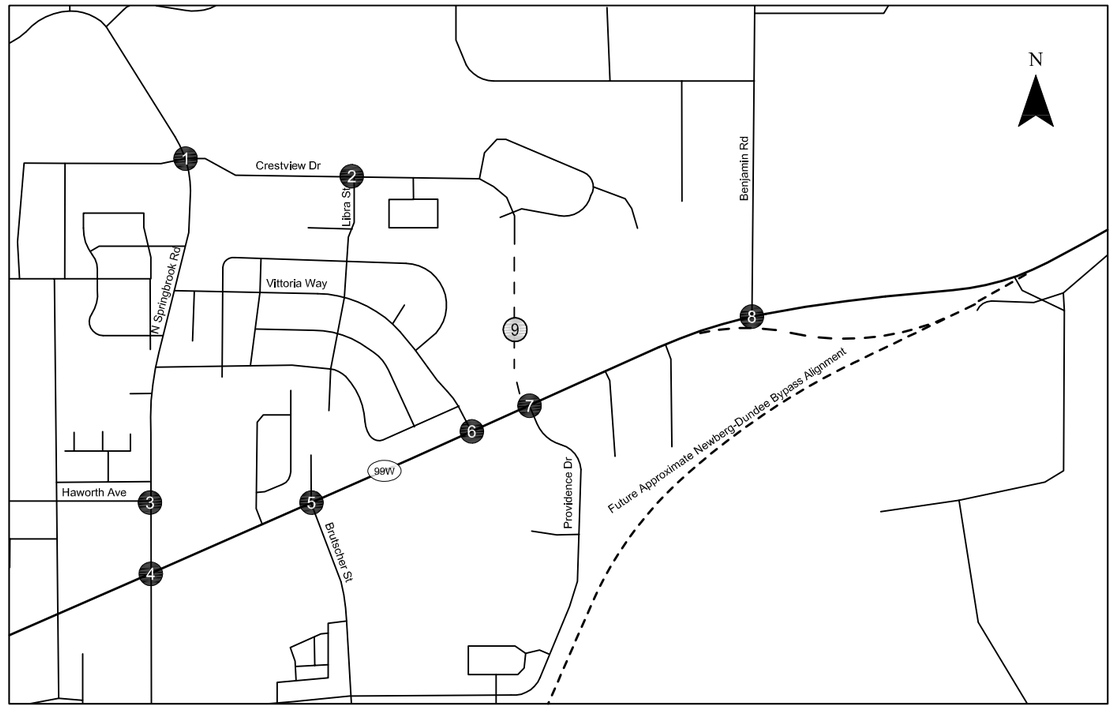
- The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.93 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85.
- The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.03, respectively, which both exceed the ODOT mobility standard of 0.80.

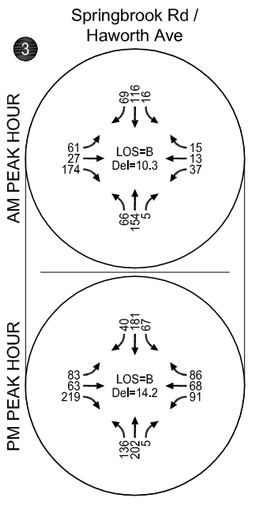
Appendix "J" contains the 2025 horizon year background traffic Level of Service worksheets.

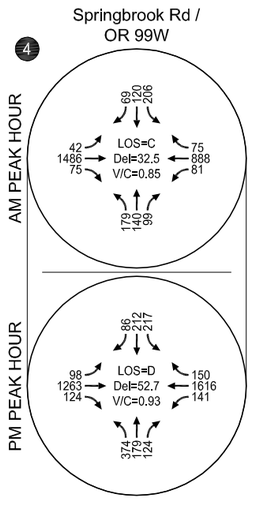


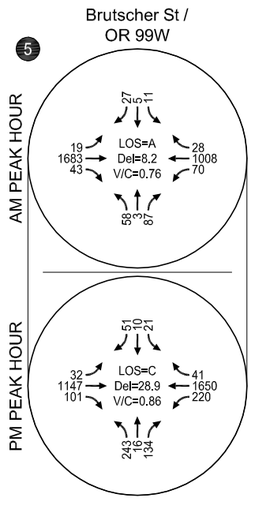


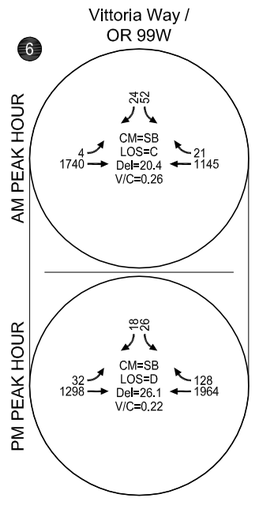


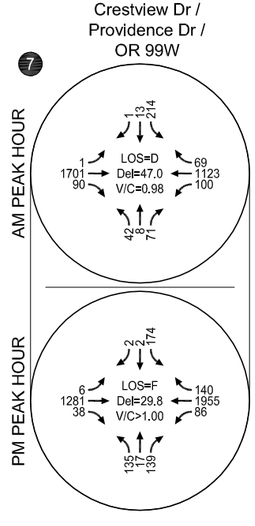


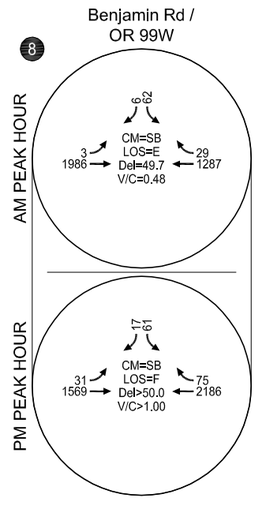












CM = CRITICAL MOVEMENT (UNSIGNALIZED)
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CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Year 2025 Background Traffic Conditions with Reassigned Traffic
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure
12

KITTELSON & ASSOCIATES

2025 HORIZON YEAR TOTAL TRAFFIC CONDITIONS

The 2025 horizon year total traffic volumes were developed by adding the site-generated trips shown in Figure 9 to the 2025 horizon year background traffic volumes shown in Figure 12. Figure 13 displays these volumes.

Level of Service Analysis

The weekday AM and PM peak hour turning-movement volumes shown in Figure 13 were used to conduct an operational analysis at each study intersection to determine the year 2025 total traffic levels of service. The assumed lane configurations at the Crestview Drive/Providence Drive/OR 99W and Crestview Drive/East-West Connector intersections are displayed in Figure 8. The results of the total traffic analysis shown in Figure 13 indicate that all of the study intersections and site access points are forecast to meet ODOT and City mobility standards under 2025 total traffic conditions during the weekday AM and PM peak hours, with the following exceptions:

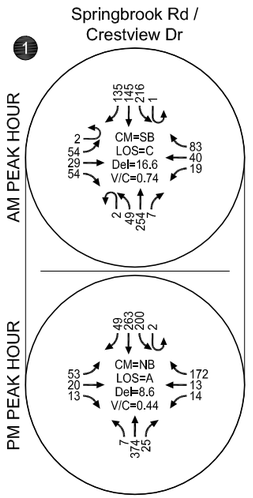
- The weekday AM and PM peak hour v/c ratios at the Springbrook Rd/OR 99W intersection are forecast to be 0.86 and 0.92, respectively. These both exceed the ODOT mobility standard of 0.85, but per ODOT policy, the v/c ratios do not reflect a significant impact because they are not more than 0.03 above the respective v/c ratios under 2025 background conditions.
- The weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 1.08 and 1.18, respectively. These both exceed the ODOT mobility standard of 0.80.

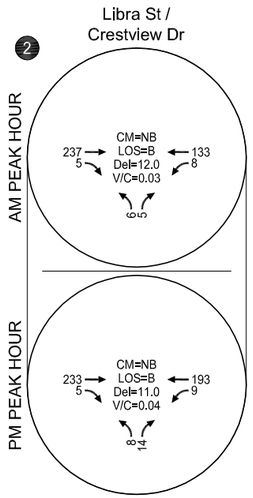
Appendix "K" contains the year 2025 total traffic Level of Service worksheets.

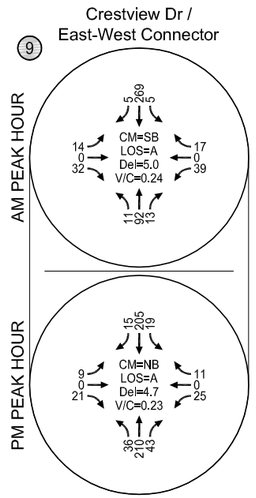
Mitigation at Crestview Drive/Providence Drive/OR 99W

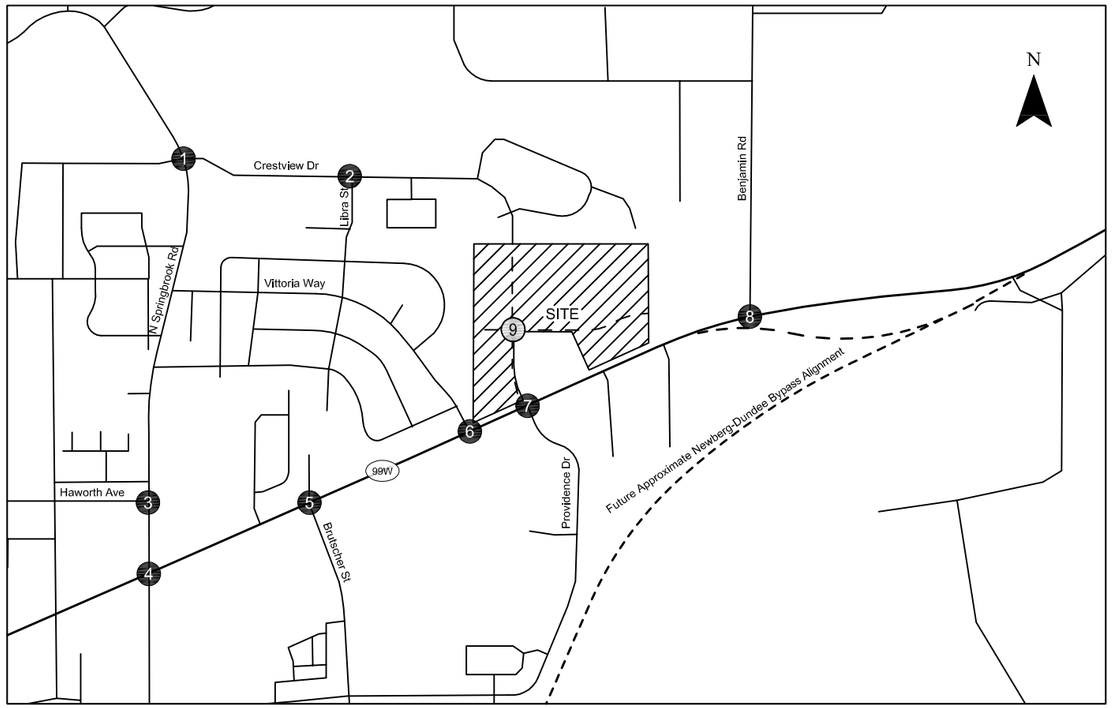
Figure 14 displays the 2025 horizon year total traffic conditions with the previously-mentioned mitigation measures at Crestview Drive/Providence Drive/OR 99W in place. As shown, the weekday AM and PM peak hour v/c ratios at the intersection are forecast to be 0.97 and 0.96, respectively. These both exceed the ODOT mobility standard of 0.80 but do not exceed the respective v/c ratios for background conditions with reassigned traffic.

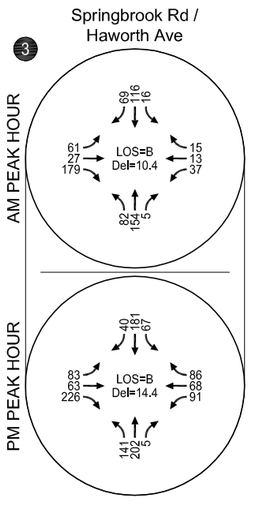
Appendix "L" contains the year 2025 total traffic with mitigation Level of Service worksheets.

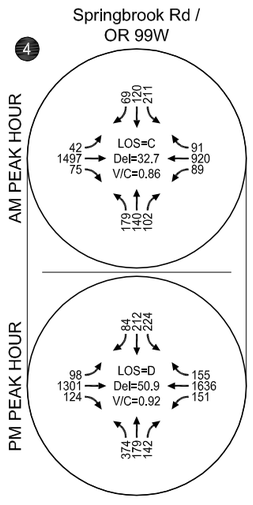


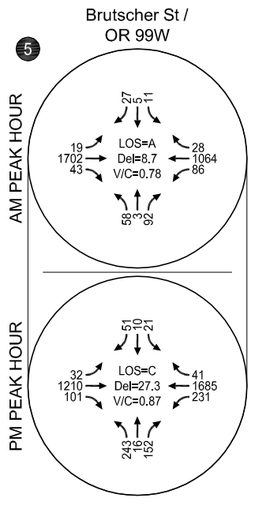


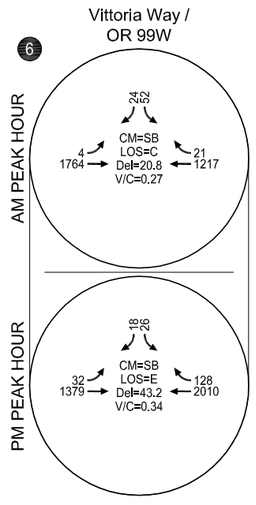


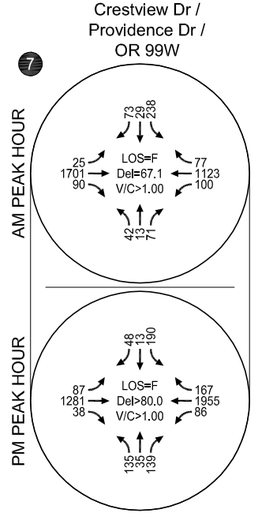


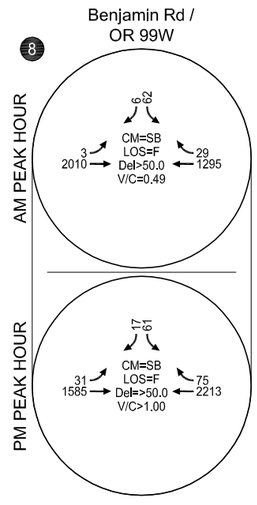










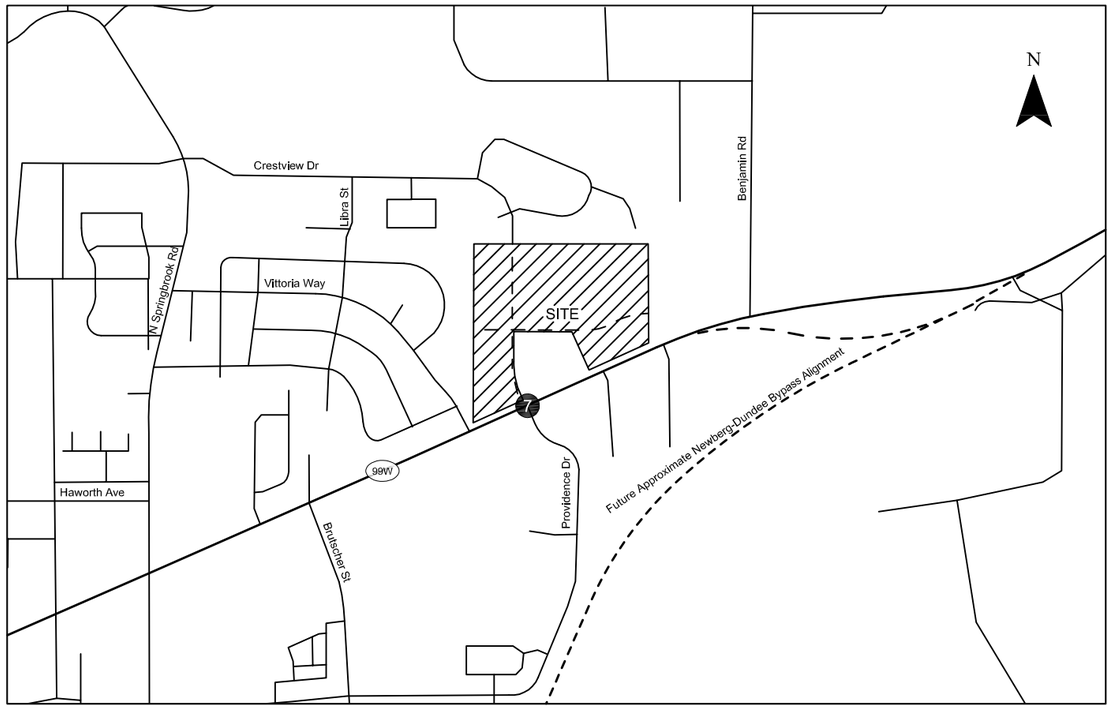


CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Year 2025 Total Traffic Conditions
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure
13

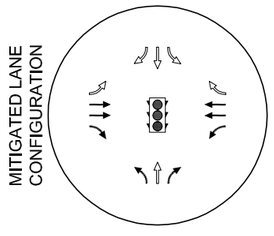
KITTELSON & ASSOCIATES



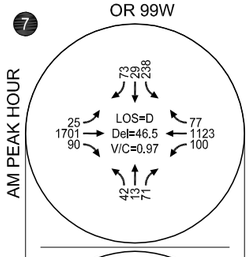
Crestview Dr / Providence Dr / OR 99W

7

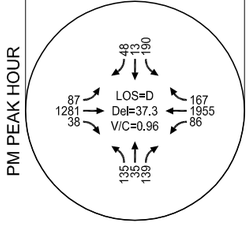
MITIGATED LANE CONFIGURATION



AM PEAK HOUR



PM PEAK HOUR



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/ CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

↖ - EXISTING
↖ - PROPOSED

Year 2025 Total Mitigated Traffic Conditions
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure 14

95TH-PERCENTILE QUEUING ANALYSIS

95th-percentile queues at the study intersections were reviewed to assess whether adequate storage would be provided at turn lanes and between intersections. *SimTraffic* was used to estimate the 95th-percentile queues at the signalized intersections along OR 99W (reflecting an average of five simulation runs), HCS was used to estimate the 95th-percentile queues at the roundabouts, and Synchro was used to estimate 95th-percentile queues elsewhere. Table 5 lists the estimated 95th-percentile queue for each movement at the study intersections under existing, 2020 background, and 2020 total traffic conditions (with the recommended mitigations in place). Reported queues are rounded up to the nearest vehicle length (approximately 25 feet). Note that minor changes in reported 95th-percentile queues between scenarios may be attributed to rounding and/or variability in random seeding.

Table 5: Summary of Existing and 2020 95th-percentile Queues

Intersection	Movement	Storage (ft)	95th-percentile Queue (ft)						Adequate Storage Provided?
			Existing		2020 Background with Reassigned Traffic		2020 Total Mitigated		
			AM	PM	AM	PM	AM	PM	
1: Springbrook Rd/ Crestview Dr	EB	N/A	50	25	50	25	50	25	Yes
	WB	N/A	25	25	25	25	50	25	Yes
	NB	N/A	75	75	125	50	125	75	Yes
	SB	N/A	125	50	150	50	200	75	Yes
2: Libra St/ Crestview Dr	EB	N/A	<25	<25	<25	<25	<25	<25	Yes
	WB	N/A	25	<25	<25	<25	<25	<25	Yes
	NB	N/A	25	<25	<25	<25	<25	<25	Yes
3: Springbrook Rd/ Haworth Ave	EB L/T	N/A	25	50	25	50	25	50	Yes
	EB R	100	50	75	50	75	50	75	Yes
	WB	N/A	25	125	25	75	25	75	Yes
	NB L	90	25	50	25	50	25	50	Yes
	NB T/R	N/A	100	250	50	75	50	75	Yes
	SB L	90	25	25	25	25	25	25	Yes
	SB T/R	N/A	275	300	50	75	50	75	Yes
4: Springbrook Rd/ OR 99W	EB L	350	175	400	150	250	150	300	Yes
	EB T	N/A	475	475	475	450	500	450	Yes
	EB R	350	175	100	125	150	150	150	Yes
	WB L	430	100	275	100	375	125	475	**No**
	WB T	N/A	225	575	175	750	175	700	Yes
	WB R	370	<25	375	<25	500	<25	400*	**No**
	NB L	320	150	400	200	325	200	325	**No**
	NB T	N/A	200	1,925	175	275	200	225	Yes
	NB R	320	100	275	100	125	100	125	Yes
	SB L	170	225	250	175	225	175	200*	**No**
	SB T	N/A	375	500	250	350	225	375	Yes
	SB R	130	125	175	125	175	125	150	**No**

Table 5: Summary of Existing and 2020 95th-percentile Queues (continued)

Intersection	Movement	Storage (ft)	95th-percentile Queue (ft)						Adequate Storage Provided?
			Existing		2020 Background with Reassigned Traffic		2020 Total Mitigated		
			AM	PM	AM	PM	AM	PM	
5: Brutscher St/ OR 99W	EB L	260	50	125	75	125	50	125	Yes
	EB T	N/A	125	375	200	400	200	400	Yes
	EB R	200	25	225	50	225	50	200	Yes
	WB L	350	125	475	125	475	150	325	Yes
	WB T	N/A	150	1,400	125	1,325	100	375	Yes
	WB R	80	50	75	25	75	25	75	Yes
	NB L	220	125	300	125	300	125	275	**No**
	NB T/R	N/A	125	500	100	500	100	300	Yes
	SB L	50	50	50	50	50	50	50	Yes
	SB T/R	N/A	50	100	50	100	50	75	Yes
6: Vittoria Way/ OR 99W	EB L	100	<25	<25	<25	<25	<25	<25	Yes
	EB T	N/A	<25	<25	<25	<25	<25	<25	Yes
	WB T/R	N/A	<25	<25	<25	<25	<25	<25	Yes
	SB	N/A	25	25	25	25	25	25	Yes
7: Crestview Dr/ Providence Dr/ OR 99W	EB L	100	N/A	N/A	25	50	100	125	**No**
	EB T	N/A	225	250	475	225	500	175	Yes
	EB R**	100	25	25	50	<25	50	<25	Yes
	WB L**	230	100	125	225	150	225	150	Yes
	WB T	N/A	100	1,175	175	425	225	525	Yes
	WB R	230	N/A	N/A	N/A	NA	75	275	**No**
	NB L	160	75	200	100	225	75	200	**No**
	NB T	N/A	N/A	N/A	N/A	N/A	50	175	Yes
	NB R	160	100	125	75	175	100	150	Yes
	SB L	200	N/A	N/A	N/A	N/A	250	250	**No**
	SB T	N/A	N/A	N/A	275	250	250	200	Yes
	SB R	200	N/A	N/A	N/A	N/A	75	75	Yes
8: Benjamin Rd/ OR 99W	EB L	250	<25	<25	<25	<25	<25	<25	Yes
	EB T	N/A	<25	<25	<25	<25	<25	<25	Yes
	WB T/R	N/A	<25	<25	<25	<25	<25	<25	Yes
	SB	N/A	50	125	75	150	50	150	Yes
9: Crestview Dr/ East-West Connector	EB	N/A	N/A	N/A	N/A	N/A	25	25	Yes
	WB	N/A	N/A	N/A	N/A	N/A	25	25	Yes
	NB	N/A	N/A	N/A	N/A	N/A	25	25	Yes
	SB	N/A	N/A	N/A	N/A	N/A	25	25	Yes

**SimTraffic* reported a maximum queue shorter than the 95th-percentile queue; therefore, the maximum queue is shown.

***SimTraffic* reported existing 95th-percentile queues that significantly overestimate field-observed maximum queues; therefore, the Synchro-reported 95th-percentile queue is shown.

The table indicates the following 95th-percentile queues are projected to exceed the provided storage lengths under 2020 total traffic conditions with the proposed mitigation measures:

- Springbrook Road/OR 99W:
  - Westbound left turn (weekday PM peak hour). The proposed development does not add trips to this movement and results in a net decrease in trips at this intersection, so no changes are recommended.
  - Westbound right turn (weekday PM peak hour). This queue will also exceed the storage length under 2020 background conditions, so no changes are recommended.
  - Northbound left turn (weekday PM peak hour). This queue will also exceed the storage length under 2020 background conditions, so no changes are recommended.
  - Southbound left turn (weekday AM and PM peak hours). These queues will also exceed the storage length under 2020 background conditions, so no changes are recommended.
  - Southbound right turn (weekday PM peak hour). This queue will also exceed the storage length under 2020 background conditions, so no changes are recommended.
- Brutscher Street/OR 99W:
  - Northbound left turn (weekday PM peak hour). This queue will also exceed the storage length under 2020 background conditions, so no changes are recommended.
- Crestview Drive/Providence Drive/OR 99W:
  - Eastbound left turn (weekday PM peak hour). Restriping the storage length is recommended (as discussed further in this section).
  - Northbound left turn (weekday PM peak hour). This queue will also exceed the storage length under 2020 background conditions, so no changes are recommended.

Table 6 displays the 95th-percentile queues at the study intersections along OR 99W for the 2025 horizon year, under the background with reassigned traffic conditions, as well as total traffic conditions.

Table 6. Summary of 2025 Horizon Year 95th-percentile Queues

Intersection	Movement	Storage (ft)	95th-percentile Queue (ft)				Adequate Storage Provided?
			2025 Background with Reassigned Traffic		2025 Total Mitigated		
			AM	PM	AM	PM	
4. Springbrook Rd/ OR 99W	EB L	350	175	325	250	325	Yes
	EB T	N/A	600	500	625	575	Yes
	EB R	350	225	150	225	250	Yes
	WB L	430	100	550	100	475	**No**
	WB T	N/A	200	1425	200	825	Yes
	WB R	370	<25	575	<25	550	**No**
	NB L	320	200	275	175	300	Yes
	NB T	N/A	200	225	175	250	Yes
	NB R	320	125	125	100	150	Yes
	SB L	170	200	225	200	200	**No**
	SB T	N/A	225	400	225	350	Yes
	SB R	130	125	175	125	175	**No**
5. Brutscher St/ OR 99W	EB L	260	50	175	75	100	Yes
	EB T	N/A	250	375	275	400	Yes
	EB R	200	50	225	75	225	**No**
	WB L	350	125	450	125	275	Yes
	WB T	N/A	100	1625	100	350	Yes
	WB R	80	25	75	25	75	Yes
	NB L	220	125	300	125	275	**No**
	NB T/R	N/A	125	500	125	275	Yes
	SB L	50	50	75	25	50	**No**
	SB T/R	N/A	50	125	50	100	Yes
6. Vittoria Way/ OR 99W	EB L	100	<25	25	<25	<25	Yes
	EB T	N/A	<25	<25	<25	<25	Yes
	WB T/R	N/A	<25	<25	<25	<25	Yes
	SB	N/A	50	25	50	25	Yes
7. Crestview Dr/ Providence Dr/ OR 99W	EB L	100	25	<25	100	150	**No**
	EB T	N/A	500	250	500	225	Yes
	EB R	100**	50	<25	50	<25	Yes
	WB L	230**	225	150	225	150	Yes
	WB T	N/A	200	1,650	250	1,300	Yes
	WB R	230	N/A	N/A	50	350	**No**
	NB L	160	100	250	100	200	**No**
	NB T	N/A	N/A	N/A	50	150	Yes
	NB R	160	100	175	100	125	Yes
	SB L	200	N/A	N/A	250	250	**No**
	SB T	N/A	325	250	300	225	Yes
	SB R	200	N/A	N/A	75	75	Yes

Table 6. Summary of 2025 Horizon Year 95th-percentile Queues (Continued)

Intersection	Movement	Storage (ft)	95th-percentile Queue (ft)				Adequate Storage Provided?
			2025 Background with Reassigned Traffic		2025 Total Mitigated		
			AM	PM	AM	PM	
8. Benjamin Rd/ OR 99W	EB L	250	25	25	25	25	Yes
	EB T	N/A	<25	<25	<25	<25	Yes
	WB T/R	N/A	<25	<25	<25	<25	Yes
	SB	N/A	50	200	50	200	Yes

**SimTraffic* reported a maximum queue shorter than the 95th-percentile queue; therefore, the maximum queue is shown.

***SimTraffic* reported existing 95th-percentile queues much higher than the field-observed maximum queues; therefore, the Synchro-reported 95th-percentile queue is shown.

In addition to the 95th-percentile queues expected to exceed the provided storage lengths under 2020 total traffic conditions, the table indicates the following 95th-percentile queues are projected to exceed the provided storage lengths under 2025 total traffic conditions with the proposed mitigation measures:

- Brutscher Street/OR 99W:
  - Eastbound right turn (weekday PM peak hour). This queue will also exceed the storage length under 2025 background conditions, so no changes are recommended.
- Crestview Drive/Providence Drive/OR 99W:
  - Eastbound right turn (weekday AM peak hour). This queue will also exceed the storage length under 2025 background conditions, so no changes are recommended.
  - Westbound left turn (weekday PM peak hour). This queue will also exceed the storage length under 2025 background conditions, so no changes are recommended.

Appendix "M" contains the SimTraffic *queuing worksheets.*

COMMERCIAL DEVELOPMENT SENSITIVITY ANALYSIS

As noted previously, approximately 4.43 acres adjacent to the proposed site could be developed in the future as commercial property. This commercial property is not included in this land use application but could be constructed at an undetermined time as part of a separate land use application. We investigated the potential impacts of developing the 4.43 acres of commercial property for the following reasons:

- To estimate the additional mitigations, if any, needed to meet ODOT policy, and
- To consider compatibility between these additional mitigations and the proposed lane geometry and mitigations on roadways and at intersections within and around the site, including the Crestview Drive/Providence Drive/OR 99W intersection and proposed Crestview Drive/East-West Connector roundabout.

A build-out year of 2020 and a horizon year of 2025 was assumed for this analysis for simplicity and for consistency with the analysis years of the residential development. Assuming a later background year would result in marginally different background traffic volumes because traffic on OR 99W could either

increase (if more in process developments are approved) or decrease (as a result of completion of the Newberg-Dundee Bypass).

Table 7 displays the trip generation for the commercial traffic (in addition to the residential), assuming 25 percent of the 4.43 acres becomes leasable floor space and that all of the property is developed as shopping center.

Table 7: Trip Generation Including Phase II

Land Use	ITE Code	Size		Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	260	Units	2,504	189	47	142	254	160	94
Less Internal Trips				*276*	*9*	*2*	*7*	*28*	*18*	*10*
Apartment	220	48	Units	322	24	6	18	31	20	11
Less Internal Trips				*36*	*1*	*0*	*1*	*3*	*2*	*1*
Shopping Center	820	48,243*	ft^2	3,662	176	109	67	317	152	165
Less Internal Trips				*402*	*9*	*5*	*4*	*35*	*17*	*18*
Less Pass-by Trips				*358*	*0*	*0*	*0*	*96*	*48*	*48*
Total Gross Trips				**6,488**	**389**	**162**	**227**	**602**	**332**	**270**
Less Internal Trips				***714***	***19***	***7***	***12***	***66***	***37***	***29***
Less Pass-by Trips				***358***	***0***	***0***	***0***	***96***	***48***	***48***
Total Net New Trips				**5,416**	**370**	**155**	**215**	**440**	**247**	**193**

*Assumes a gross leasable area to acreage ratio of 0.25.

As shown, the commercial property, if developed, could generate a total development amount of 5,416 weekday daily trips, of which 370 (155 in, 215 out) would occur during the AM peak hour and 440 (247 in, 193 out) during the PM peak hour. The development is also expected to generate approximately 96 pass-by trips during the weekday PM peak hour—to conservatively estimate the impacts to the Crestview Drive/Providence Drive/OR 99W intersection, all of the pass-by trips were treated as diverted from OR 99W.

Figure 15 shows the trip generation and year 2020 total traffic conditions at the Crestview Drive/Providence Drive/OR 99W intersection and Crestview Drive/East-West Connector Roundabout. As shown, the Crestview Drive/East-West Connector Roundabout is expected to continue operating acceptably as a single-lane roundabout. With the mitigation improvements associated with the residential development in place, the weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 0.92 and 0.95, respectively.

Figure 16 shows the trip generation and 2025 horizon year traffic conditions at the Crestview Drive/Providence Drive/OR 99W intersection and Crestview Drive/East-West Connector Roundabout. As shown, the Crestview Drive/East-West Connector Roundabout is expected to continue operating acceptably as a single-lane roundabout. With the mitigation improvements associated with the residential development in place, the weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.02, respectively.

ODOT defines no significant impact as a v/c ratio of 0.03 above the background condition—therefore, assuming the same respective background conditions, no additional mitigations would be required for either the 2020 or 2025 analysis years.

Table 8 displays the estimated resulting 95th-percentile queues at the Crestview Drive/Providence Drive/OR 99W intersection from *SimTraffic*.

Table 8: Summary of 95th-percentile Queues Including Phase II

Intersection	Movement	Storage (ft)	95th-percentile Queue (ft)			
			2020 Phase II		2025 Phase II	
			AM	PM	AM	PM
7: Crestview Dr/ Providence Dr/ OR 99W	EB L	100	125*	125*	125	125*
	EB T	N/A	500	400	500*	425
	EB R**	100	50	<25	50	<25
	WB L**	230	225	150	225	150
	WB T	N/A	275	850	300	1,400
	WB R	230	125	275*	75	275*
	NB L	160	100	175	100	200
	NB T	N/A	75	175	50	125
	NB R	160	100	125	100	150
	SB L	200	225*	225*	225*	225*
	SB T	N/A	350	325*	325	300
	SB R	200	75	150	100	150

**SimTraffic* reported a maximum queue shorter than the 95th-percentile queue; therefore, the maximum queue is shown.

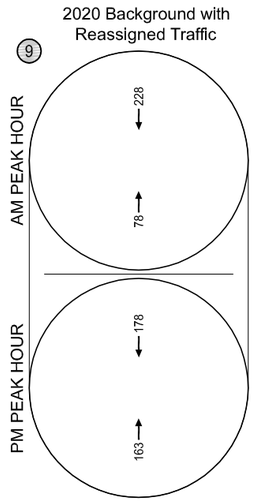
***SimTraffic* reported existing 95th-percentile queues much higher than the field-observed maximum queues; therefore, the Synchro-reported 95th-percentile queue is shown.

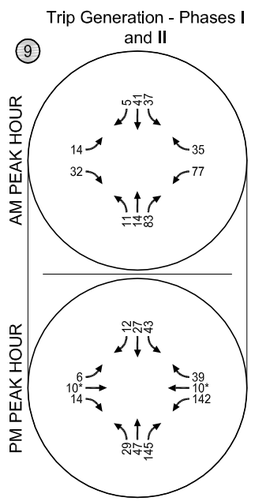
Based on the *SimTraffic* analysis, the following queue storage lengths are recommended:

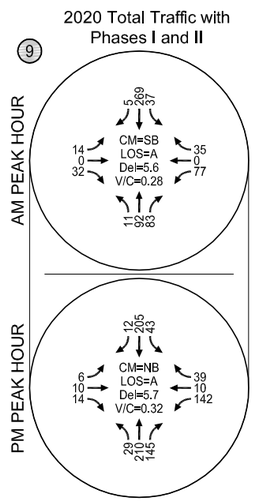
- A westbound right turn lane should be provided and include at least 275 feet of storage.
- The eastbound left turn lane should be restriped to include at least 125 feet of storage.
- An exclusive southbound left turn lane should be provided and include at least 225 feet of storage.
- An exclusive southbound right turn lane should be provided and include at least 150 feet of storage.

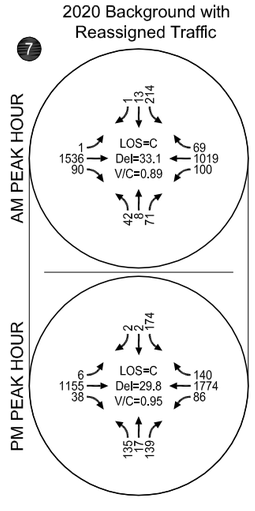
Other 95th-percentile queues at the intersection are expected to be equal in length or shorter than the 95th-percentile queues under 2025 background conditions—therefore, no other changes are recommended.

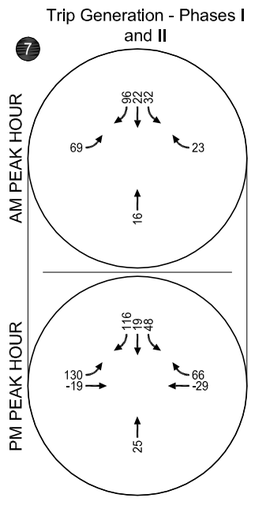
Appendix "N" contains the Phase II Sensitivity Analysis Level of Service worksheets.

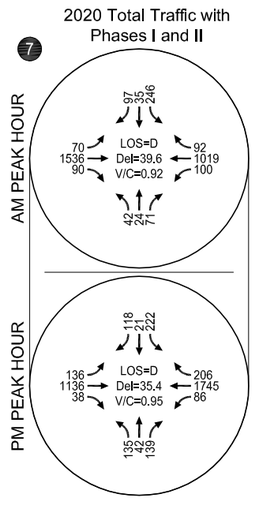












*Estimated retail-residential internal trips
Negative values indicate retail pass-by trips.

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
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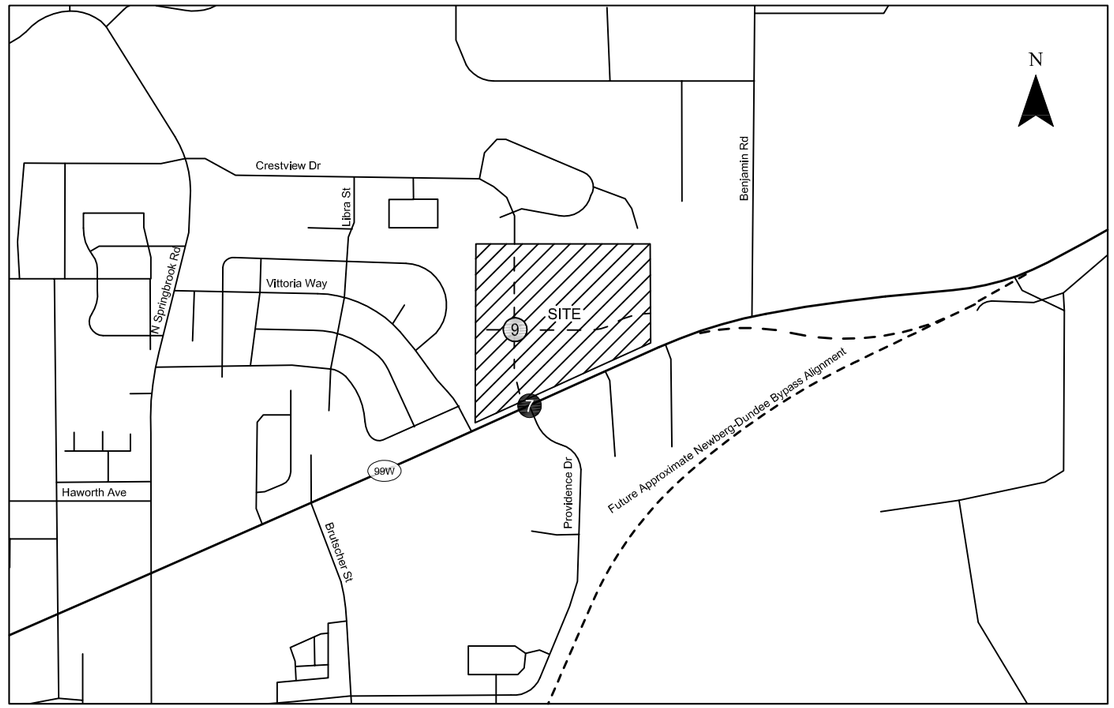
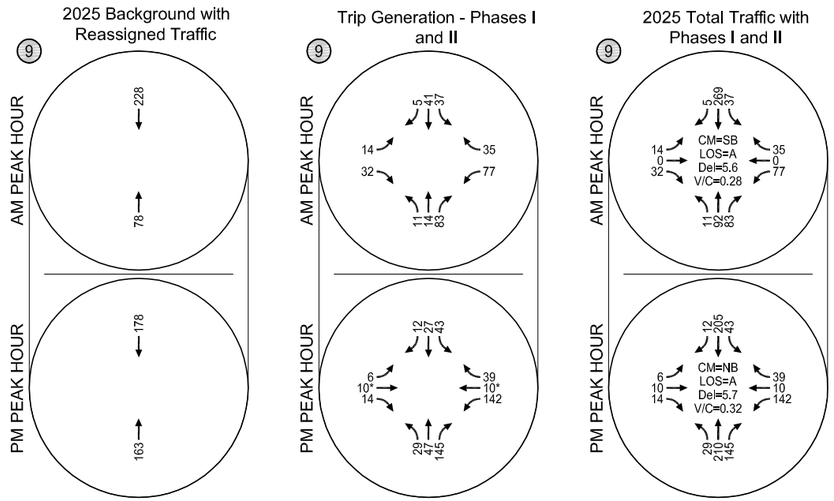
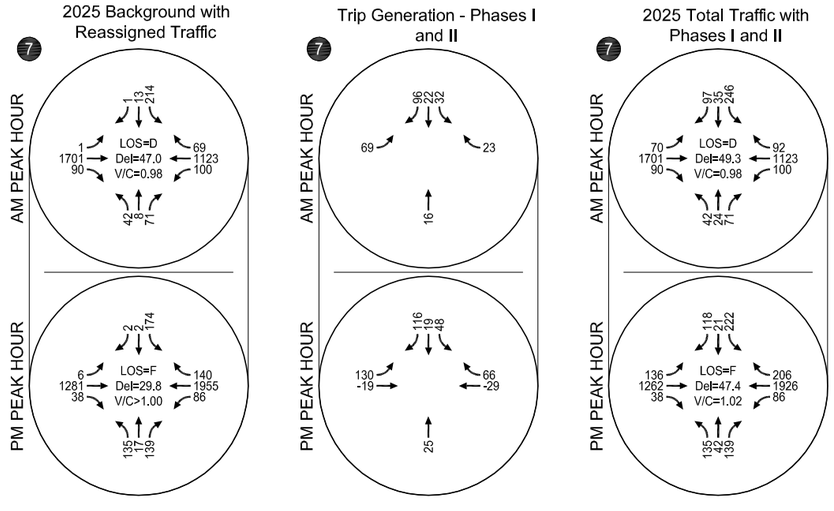


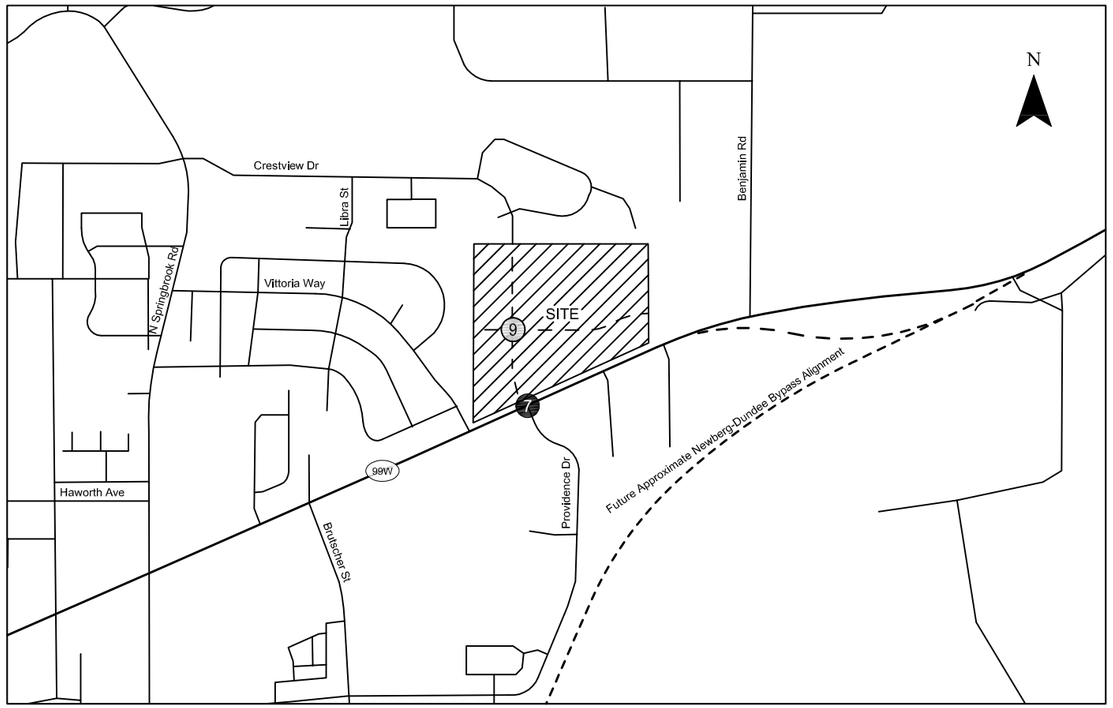
Year 2020 Total Traffic Conditions - Phase II Sensitivity Analysis
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure 15





*Estimated retail-residential internal trips
Negative values indicate retail pass-by trips.



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/
CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Year 2025 Total Traffic Conditions - Phase II Sensitivity Analysis
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure
16

ON-SITE CIRCULATION/SITE-ACCESS OPERATIONS

Internal circulation was evaluated to ensure that the site provides sufficient on-site circulation for pedestrian movements and internal traffic. Figure 2 illustrates the proposed development plan. The following activities are recommended to ensure adequate safety and operation at the internal intersections and roadways:

- All local streets within the development should have two travel lanes.
- Other than at the Providence Drive/Crestview Drive/OR 99W intersection, a two-lane section of Crestview Drive should be adequate to accommodate turning movements and queuing within the proposed development.
- Shrubbery and landscaping near the internal intersections and site access points should be maintained to ensure adequate sight distance.

Section 5
Conclusions and Recommendations

CONCLUSIONS AND RECOMMENDATIONS

The results of the traffic impact analysis indicate that the proposed Crestview Crossing development can be constructed while maintaining acceptable levels of service and safety on the surrounding transportation system, provided the appropriate mitigations are in place. The findings of this analysis and our recommendations are discussed below.

Year 2017 Existing Conditions

- All of the study intersections currently meet City of Newberg (and Oregon Department of Transportation, where applicable) mobility targets during the weekday AM and PM peak hours, with the following exceptions:
  - The Springbrook Road/OR 99W intersection currently experiences a volume-to-capacity ratio (v/c) of 0.86 during the weekday AM peak hour, which exceeds the ODOT mobility standard of 0.85. The intersection also operates at level of service (LOS) E during the weekday PM peak hour, which exceeds the City standard of LOS D under current conditions.
  - The southbound stop-controlled approach to the Vittoria Way/OR 99W intersection currently operates at LOS E during the weekday PM peak hour, which exceeds the City standard of LOS D.
- A review of historical crash data did not reveal any patterns or trends in the site vicinity that require mitigation associated with this project.
  - One fatal crash was reported at the Springbrook Road/Crestview Drive roundabout—this crash occurred when a southbound motorcyclist struck a curb and was thrown from the vehicle. The crash report lists the cause as driver error—driving too fast for conditions.
  - Based upon a 2016 analysis, the Springbrook Road/OR 99W intersection is currently within the top five percent of the highest-scoring intersections in Region 2.

    Since 2016, pavement marking improvements and an additional westbound left turn lane on OR 99W were added to this intersection, and the proposed Crestview Crossing development is expected to result in a net decrease in traffic at this intersection due to the reassignment of traffic to the Crestview Drive extension.

Year 2020 Background Conditions

- A two-percent annual growth rate was applied to the existing mainline traffic volumes on OR 99W to reflect general background growth in the area before any in-process traffic was considered.
- Traffic generated by the Oregon Clinic, to be located on the west side of Providence Drive south of Providence Newberg Medical Center, as well as the Providence Medical Office Building, to be located on the east side of Providence Drive across from the existing Providence Medical Center, were included in the background traffic volumes as in-process traffic.

Background traffic conditions with the assumed build-out of the north leg of the Providence Drive/OR 99W intersection (and no site-added traffic) were assumed as the base case against which future traffic conditions are compared.

- The proposed development will extend Crestview Drive south through the property and to the existing Providence Drive/OR 99W intersection, where it will form the north leg.
- Traffic volumes were assigned to the Crestview Drive extension based upon existing turning movement volumes at the study intersections and the Newberg Transportation System Plan.
- The background traffic condition includes rerouted traffic from the proposed Crestview Drive extension but does not include trips associated with new land uses within the proposed development.
- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2020 background traffic conditions with reassigned traffic, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.88 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.92 and 0.98, respectively, which both exceed the ODOT mobility standard of 0.80.

Proposed Development Plan

- The proposed development is expected to generate approximately 2,826 weekday daily trips, of which approximately 213 (53 in, 160 out) are forecast to occur during the AM peak hour and approximately 285 (180 in, 105 out) are forecast to occur during the PM peak hour.
- A select-zone analysis of the Newberg Transportation Planning Model was used to develop a trip distribution pattern for the proposed development.

Year 2020 Total Conditions

- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2020 total traffic volumes, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.88 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85 but does not exceed the v/c ratio under background conditions with reassigned traffic.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 1.01 and 1.11, respectively, which both exceed the ODOT mobility standard of 0.80.
  - The new proposed Crestview Diver/East-West Connector intersection within the Crestview Crossing development is expected to operate acceptably as a single-lane roundabout.

Year 2020 Total Mitigated Conditions

- The Crestview Drive/Providence Drive/OR 99W intersection was analyzed under total traffic conditions with the following additional lane improvements:
  - Add an exclusive left turn lane on southbound Crestview Drive,
  - Add an exclusive right turn lane on southbound Crestview Drive,
  - Add an exclusive right turn lane on westbound OR 99W,
  - Restripe eastbound OR 99W to include an exclusive left turn lane, and,
  - Restripe the northbound Providence Drive approach to include an exclusive left turn lane and an exclusive right turn lane.

  With these improvements, the weekday AM and PM peak hour v/c ratios at the intersection are forecast to be 0.90 and 0.89, respectively. These exceed the ODOT mobility standard of 0.80 but do not exceed the respective v/c ratios under background conditions with reassigned traffic. As such, the impact of the development has been mitigated.

2025 Horizon Year Background Conditions

- An additional five years of growth (at a two-percent annual growth rate) was applied to the existing mainline traffic volumes on OR 99W to model horizon year background conditions.

Background traffic conditions with the assumed build-out of the north leg of the Providence Drive/OR 99W intersection (and no site-added traffic) were assumed as the base case against which future traffic conditions are compared.

- The background traffic condition includes rerouted traffic from the proposed Crestview Drive extension but does not include trips associated with new land uses within the proposed development.
- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2025 background traffic conditions with reassigned traffic, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.93 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.03, respectively, which both exceed the ODOT mobility standard of 0.80.

2025 Horizon Year Total Conditions

- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2025 total traffic volumes, with the following exceptions:
  - The weekday AM and PM peak hour v/c ratios at the Springbrook Rd/OR 99W intersection are forecast to be 0.86 and 0.92, respectively, which both exceed the ODOT mobility standard of 0.85 but are not more than 0.03 above the v/c ratios under

background conditions with reassigned traffic. Per ODOT policy guidance, when an intersection exceeds mobility targets but the v/c ratio increases by less than 0.03 as a result of development, the impacts are not considered significant.

- The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 1.08 and 1.18, respectively, which both exceed the ODOT mobility standard of 0.80.

2025 Horizon Year Total Mitigated Conditions

- With the improvements at Crestview Drive/Providence Drive/OR 99W intersection noted above, the weekday AM and PM peak hour v/c ratios at the intersection are forecast to be 0.97 and 0.96, respectively. These exceed the ODOT mobility standard of 0.80 but do not exceed the respective v/c ratios under 2025 background conditions with reassigned traffic. As such, the impact of the development has been mitigated.

95th-percentile Queuing Analysis

- All 95th-percentile queues are projected to be accommodated by the provided storage lengths under 2025 total traffic conditions, with the following exceptions:
  - The southbound right turn at Springbrook Road/OR 99W during the weekday PM peak hour.
  - The northbound left turn at Brutscher Street/OR 99W during the weekday PM peak hour.

  Each of the queues noted above is expected to decrease under 2025 total traffic conditions compared with 2025 background traffic volumes due to reassigned traffic from Springbrook Road and OR 99W to the Crestview Drive extension.

2025 Horizon Year Commercial Property Sensitivity Analysis

A planning-level analysis was prepared to account for the future development potential of the 4.43-acre commercial property adjacent to the development site. While this is NOT part of this development application, the analysis was conducted to evaluate the future effectiveness of the recommended mitigations.

- A planning-level estimate for developable commercial area was used to estimate the number of potential commercial-related site trips. The gross leasable area-to-acreage ratio was assumed at 25 percent, and the entire commercial property was assumed as shopping center land use.
- The commercial development trips were added to the residential trips of this application to arrive at a total development estimate of 5,416 weekday daily trips, of which 370 (155 in, 215 out) will occur during the AM peak hour and 440 (247 in, 193 out) will occur during the PM peak hour. The development is also expected to generate approximately 96 pass-by trips during the weekday PM peak hour—these were treated as diverted trips from OR 99W.

- The Crestview Drive/Providence Drive/OR 99W intersection and Crestview Drive/East-West Connector roundabout were analyzed under 2025 conditions assuming development of the 4.43-acre commercial property.
- The Crestview Drive/East-West Connector intersection is expected to continue operating acceptably as a single-lane roundabout.
- With the mitigation improvements associated with the residential development in place, the weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.02, respectively.

  Per ODOT policy guidance, when an intersection exceeds the mobility target but the v/c ratio increases by less than 0.03 as a result of development, the impacts are not considered significant. For this reason, no additional mitigation measures would be warranted as a result of additional commercial development.

RECOMMENDATIONS

Providence Drive/Crestview Drive/OR 99W Intersection

- The new north leg of the intersection, which will be an extension of Crestview Drive, should be configured as a four-lane section with one northbound lane and three southbound lanes (exclusive lanes for left-turn, through, and right-turn movements). At least 225 feet of southbound left turn storage and at least 150 feet of southbound right turn storage should be provided to accommodate the forecast 95th percentile queue lengths.
- The south leg of the intersection should be restriped to a four-lane section with one southbound lane and three northbound lanes (exclusive lanes for left-turn, through, and right-turn movements).
- Based on the forecast 95th percentile queuing analysis:
  - A westbound right turn lane should be constructed with at least 275 feet of storage.
  - An eastbound left turn lane should be striped to provide at least 125 feet of storage.
- Recommended signal phasing: the intersection should be operated with permissive left turn movements on the northbound and southbound approaches and fully protected left turn movements on the eastbound and westbound approaches.

On-Site Circulation/Site Access Operations

- Driveways, landscaping, utilities, and signage within the site should be located and maintained to provide sufficient sight distance at all new internal intersections and accesses.
- Other than at the Providence Drive/Crestview Drive/OR 99W intersection, a two-lane section of Crestview Drive should be adequate to accommodate turning movements and queuing within the proposed development.

Section 6
References

REFERENCES

1. Transportation Research Board of the National Academies. *Highway Capacity Manual 2000*. 2000.

2. City of Newberg, Oregon. *Transportation System Plan*. 2016.

3. Yamhill County Transit Area. "Routes and Schedules." 2017. <http://www.yctransitarea.org/index.php/routes-and-schedules/>. Accessed 12-21-2017.

4. Institute of Transportation Engineers. *Trip Generation: 10th Edition*. 2017.

Appendix A
Scoping Memorandum

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

SCOPING MEMORANDUM

Date: October 19, 2017

Project #: 21709

To: Steve Olson, City of Newberg
Gerry Juster and Keith Blair, ODOT

From: Zachary Bugg, PhD; Diego Arguea, PE; and Matt Hughart, AICP

Project: Crestview Crossing

Subject: Traffic Impact Analysis Scoping Memorandum

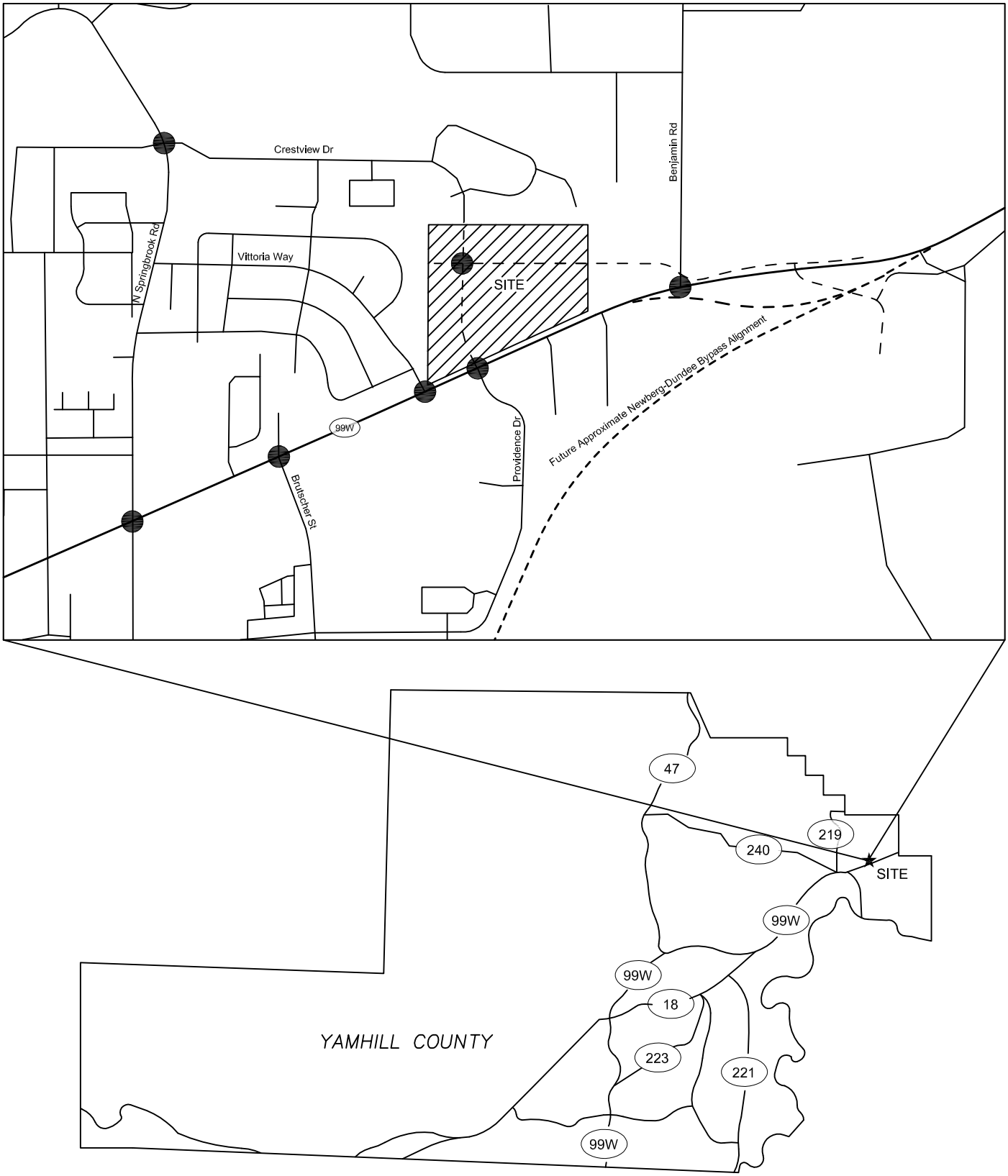
This memorandum represents a scoping needs assessment for preparing the Traffic Impact Analysis (TIA) associated with the proposed development located at the northeast corner of the OR 99W/ Providence Drive intersection in Newberg, Oregon. The assumptions for scoping the TIA are based on a review of a conceptual site plan, a preapplication meeting and discussions between City of Newberg staff and the Applicant, and our working knowledge of the transportation policies of City of Newberg and the Oregon Department of Transportation (ODOT).

Proposed Development

The Applicant, JT Smith Companies, is in the process of preparing an application to develop a 33.13-acre mixed-use development on the subject property. The site is currently occupied by farm land and one single family home. The site is bordered by OR 99W to the south and by residential uses to the west, north, and east.

Figure 1 displays a site vicinity map, and Figure 2 displays the proposed site plan. Per the current site plan, the development will include 249 single-family homes, 48 apartment units, 4.43 acres of commercial property, and 1.17 acres of civic space. As shown, the site development includes an extension of Crestview Drive to the south through the proposed development, connecting to OR 99W to form the north leg of the OR 99W/Providence Drive intersection.

Per ODOT and City of Newberg criteria, a TIA is needed as part of the design review application for the development. This memorandum presents the proposed methodology to prepare the TIA and reflects the outcome of conversations with City and ODOT staff.



● - Study Intersection

Site Vicinity
Newberg, Oregon

Figure
1

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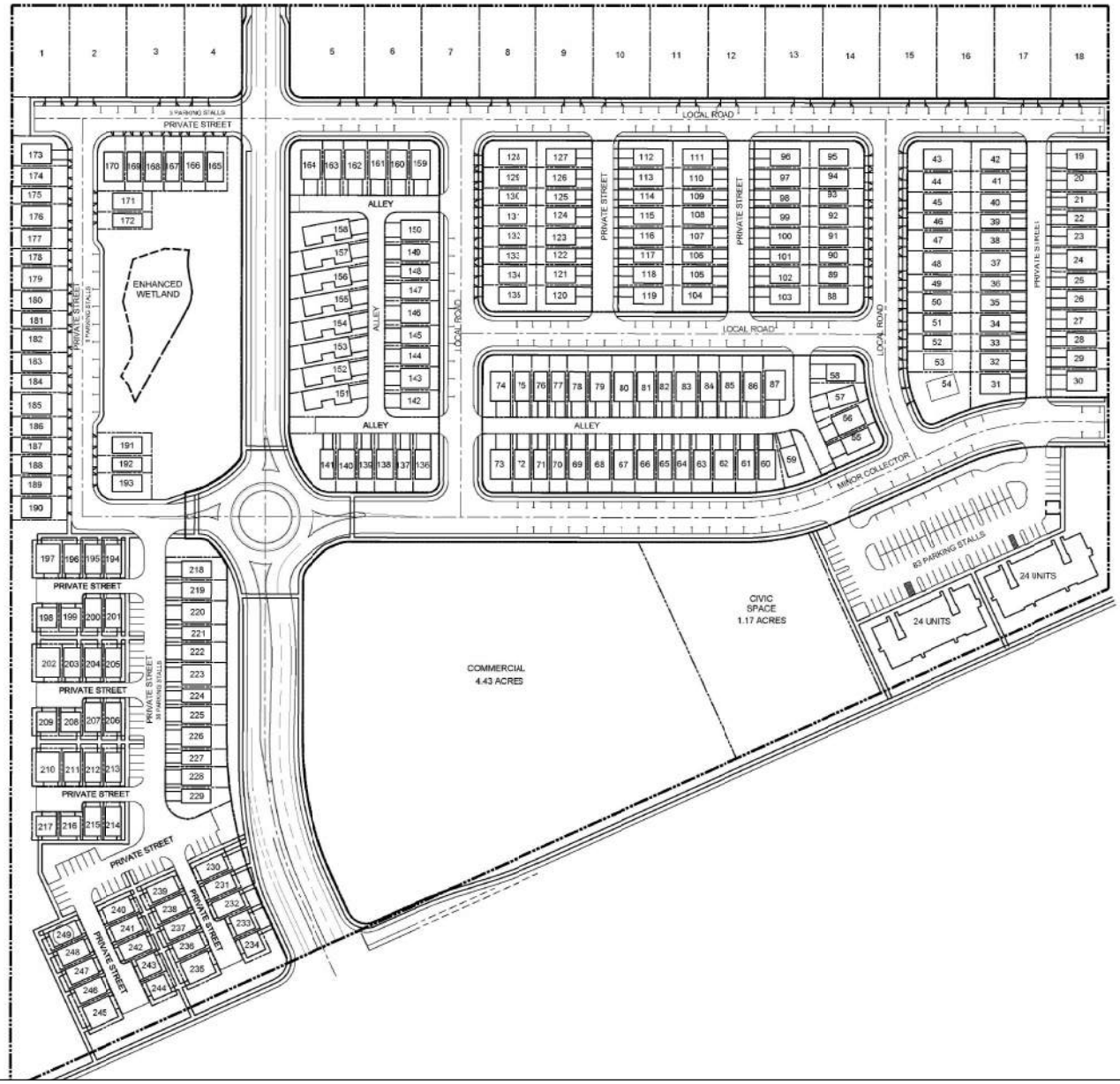
KITTELSON & ASSOCIATES



SITE STATISTICS

PROPERTY:	3216AC 13800 & 321601100
JURISDICTION:	CITY OF NEWBERG
GROSS SIZE:	33.13 ACRES
EXISTING ZONING:	
R-1:	4.31 ACRES
R-2:	6.58 ACRES
C-2:	22.24 ACRES
PROPOSED ZONING:	R-1 & R-3
R-1:	5.73 ACRES
R-3:	23.00 ACRES
C-2:	4.40 ACRES

SITE NOTE

SITE MAP HAS BEEN PREPARED USING DATA FROM EXISTING TAX MAPS AND METRO'S RLIS GIS DATA. THIS MAP HAS BEEN PREPARED FOR ILLUSTRATIVE PURPOSES ONLY. ALL BOUNDARY AND DIMENSIONAL INFORMATION SHOULD BE VERIFIED BY A PROFESSIONAL LAND SURVEYOR.

N
W E
S

SCALE:
0 150' 300'

Site Plan Provided by 3J Consulting 8/14/2017

Proposed Site Plan
Newberg, Oregon

Figure
2

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KITTELSON & ASSOCIATES

Trip Generation

Preliminary trip generation estimates for the proposed development were prepared based on the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 9th Edition (Reference 1) for weekday daily, AM peak hour, and PM peak hour time periods. The trip generation is based on the residential and commercial mix, with an assumed use of the civic space for a community center. Internal and pass-by trips were estimated based on rates identified in the *Trip Generation Handbook,* 2nd Edition (Institute of Transportation Engineers, 2004)[1]. The trip generation is summarized below in Table 1.

Table 1. Preliminary Trip Generation Estimate

Land Use	ITE Code	Size	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	249 units	2,370	187	47	140	249	157	92
Less Internal Trips (13% Daily, 8% AM, 12% PM)			*308*	*15*	*4*	*11*	*30*	*19*	*11*
Apartment	220	48 units	320	24	5	19	30	20	10
Less Internal Trips (13% Daily, 8% AM, 12% PM)			*42*	*2*	*0*	*2*	*4*	*2*	*2*
Shopping Center	820	48,243 ft²*	2,060	46	29	17	179	86	93
Less Internal Trips (13% Daily, 8% AM, 12% PM)			*268*	*4*	*2*	*2*	*21*	*10*	*11*
Less Pass-by Trips (34% Daily, AM, PM)			*610*	*14*	*7*	*7*	*54*	*27*	*27*
Recreational Community Center	495	12,741 ft²*	292	26	17	9	35	17	18
Less Internal Trips (13% Daily, 8% AM, 12% PM)			*38*	*2*	*1*	*1*	*4*	*2*	*2*
Total Gross Trips			**5,042**	**283**	**98**	**185**	**493**	**280**	**213**
Less Internal Trips			***656***	***23***	***7***	***16***	***59***	***33***	***26***
Less Pass-by Trips			***610***	***14***	***7***	***7***	***54***	***27***	***27***
Total Net New Trips			**3,776**	**246**	**84**	**162**	**380**	**220**	**160**

*Assumes gross floor area/acreage = 0.25

As shown in Table 1, the proposed development is estimated to generate a potential of up to 246 weekday AM peak hour trips and 380 weekday PM peak hour trips.

To provide a high estimate that would result in a more conservative analysis, the trip generation in Table 1 reflects the commercial property as a general Shopping Center—no further details about the development of this property are known at this time. Also, the trip generation assumes that the civic space will function as a community area, and thus has been estimated to operate as a Recreational Community Center for trip generation estimate purposes. Should the civic space only be available as a private amenity to the residential community (such as a community pool/fitness center), then all trips associated with this land use will be internal to the development, and thus the total net new trips will

[1] The ITE Trip Generation Handbook does not include trip internalization rates for the weekday AM peak hour time period. The weekday midday peak hour trip internalization rates were applied as the best available data.

be lower than what is shown in Table 1. The final TIA will document all assumptions and reflect the revised trip generation accordingly.

The internalization calculations and assumptions are included in Attachment "A" to this memorandum.

Trip Distribution and Assignment

The study area is contained within the Newberg Transportation Planning Model. A select-zone analysis will be used to develop a trip distribution pattern for the proposed site (TAZ 117). Please provide two select zone analyses, one with the Crestview Road connection and one without the Crestview Road connection through the proposed site.

Study Area and Intersections

Based on the estimated trip generation and assignment patterns, the following intersections and accesses are proposed for analysis:

- OR 99W/Springbrook Road
- OR 99W/Brutscher Street
- OR 99W/Vittoria Way
- OR 99W/Providence Drive/Crestview Drive
- OR 99W/Benjamin Road
- Crestview Drive/Site Access
- Springbrook Road/Crestview Drive

Additionally, all accesses to the commercial property and civic property will be analyzed.

Time Periods for Analysis

Existing and estimated build-out year 2020 conditions at the identified study intersections will be analyzed using Synchro/SimTraffic Version 9 software. Turning movement counts at the study intersections will be collected during the morning (6 – 9 AM) and afternoon (3 – 6 PM) periods on a typical mid-week day when school is in session. Additionally, a 16-hour count (6 AM – 10 PM) will be performed at the OR 99W/Providence Drive intersection in support of a potential modified signal design and complete safety analysis.

Based on conversations with ODOT staff, the site is located in an area influenced by both seasonal traffic and school traffic, with the peak travel period occurring in September. Therefore, the counts will be performed between September 12, 2017 and September 21, 2017 per ODOT direction, and no seasonal volume adjustment will be required.

In-process Developments

A two percent annual growth rate will be applied to the existing mainline traffic volumes on OR 99W to generate future background traffic volumes before any trips associated with approved in-process developments are added to the background traffic volumes. We request that City of Newberg and/or ODOT confirm the two percent annual growth rate and provide any other developments to be included as in-process.

Network Traffic Reassignment

The proposed development will result in a major network connection via the southward extension of Crestview Drive to OR 99W. The methodology for reassigning existing traffic to this new connection will be based upon a combination of the Transportation System Plan and the results of the select-zone analysis applying the Newberg Transportation Planning Model.

Queuing Analysis

An analysis of average and 95th-percentile queues will be prepared based on *SimTraffic* microsimulation. The analysis will be based on five simulation runs per intersection and analysis scenario.

Crash Analysis

The most recent five years of reported crash data at the study intersections will be requested from ODOT and reviewed in detail. The ODOT Statewide Priority Index System (SPIS) will also be reviewed to identify any sites where safety issues may encourage further investigation.

Signal Timing

We will obtain the latest signal timing and phasing information for the three signalized study intersections from ODOT:

- OR 99W/Springbrook Road
- OR 99W/Brutscher Street
- OR 99W/Providence Drive

Next Steps

We trust this memorandum provides adequate documentation of the proposed land use action, methodology, and specific study intersections and analysis periods to address in the TIA. We formally request that City of Newberg and ODOT Region 2 provide written confirmation and/or questions

regarding the proposed methodology and project TIA assumptions as soon as possible so that we may proceed with our analysis. If you have any questions, please give us a call at (503) 228-5230.

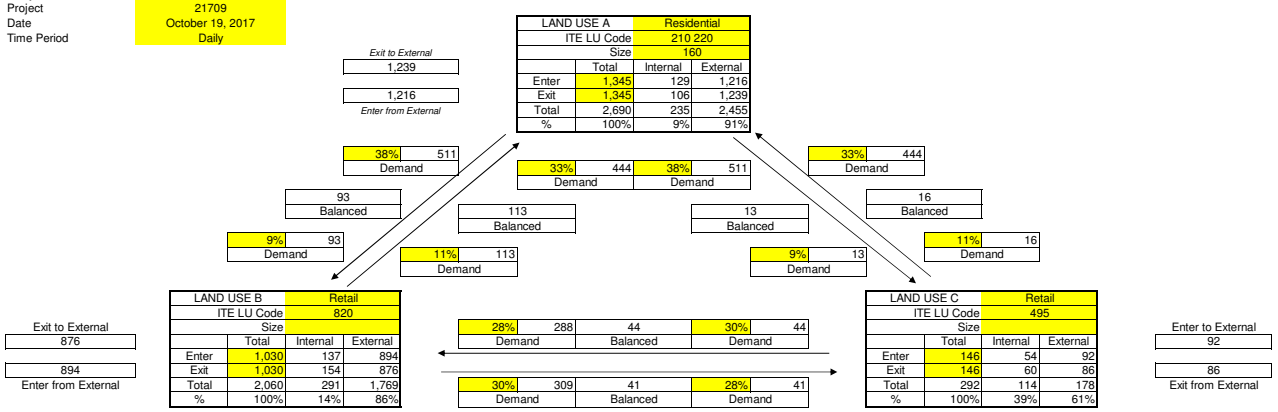
REFERENCES

1. Institute of Transportation Engineers. *Trip Generation Manual, 9th Edition*. 2012.
2. Institute of Transportation Engineers. *Trip Generation Handbook, 2nd Edition*. 2004.

ATTACHMENT A

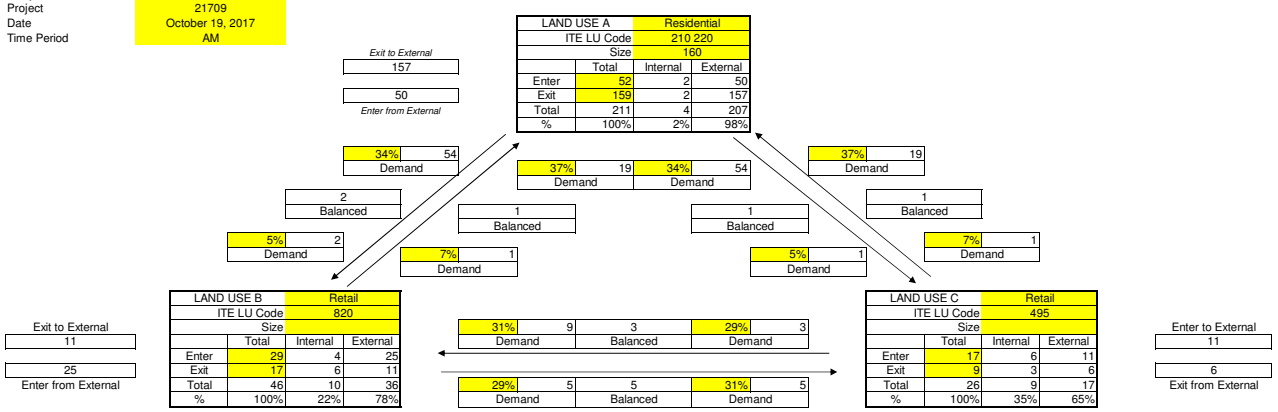
Trip Generation Internalization Calculations

Analyst	ZHB
Project	21709
Date	October 19, 2017
Time Period	Daily



NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT					
	LAND USE A	LAND USE B	LAND USE C	TOTAL	
Enter	1,216	894	92	2,201	
Exit	1,239	876	86	2,201	
Total	2,455	1,769	178	4,402	INTERNAL CAPTURE
Single-Use Trip Gen Est.	2,690	2,060	292	5,042	13%

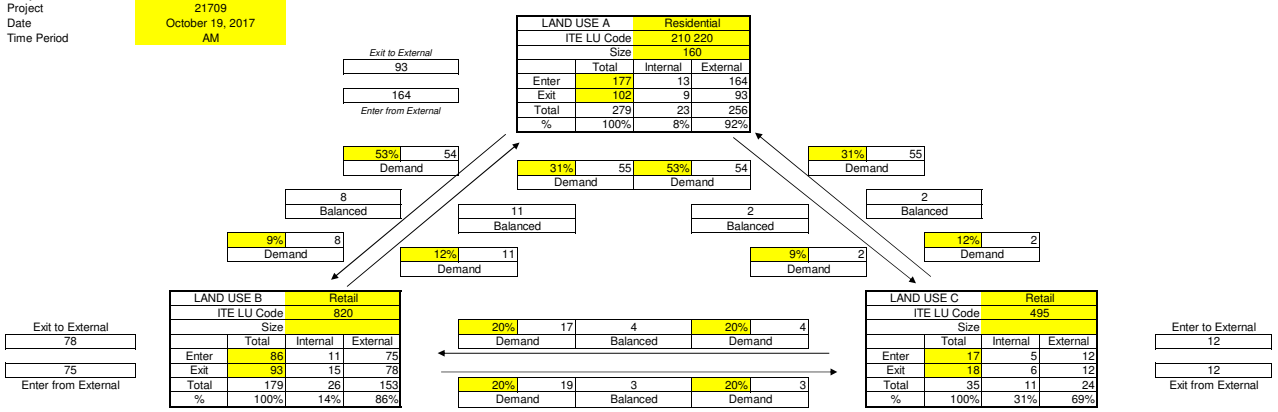
Analyst	ZHB
Project	21709
Date	October 19, 2017
Time Period	AM



NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT

	LAND USE A	LAND USE B	LAND USE C	TOTAL	
Enter	50	25	11	86	
Exit	157	11	6	173	
Total	207	36	17	260	INTERNAL CAPTURE
Single-Use Trip Gen Est.	211	46	26	283	8%

Analyst	ZHB
Project	21709
Date	October 19, 2017
Time Period	AM



NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT					
	LAND USE A	**LAND USE B**	**LAND USE C**	**TOTAL**	
Enter	164	75	12	250	
Exit	93	78	12	183	
Total	256	153	24	434	INTERNAL CAPTURE
Single-Use Trip Gen Est.	279	179	35	493	12%

Appendix B
Turning Movement Counts

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Springbrook Rd -- Crestview Dr

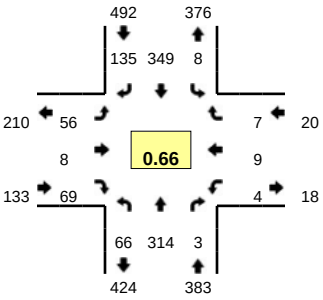
CITY/STATE: Newberg, OR

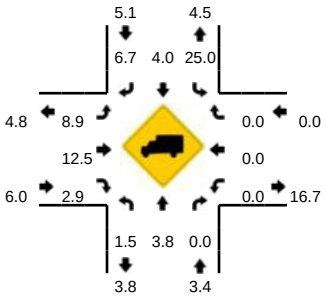
QC JOB #: 14505611

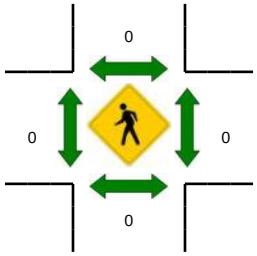
DATE: Thu, Sep 14 2017

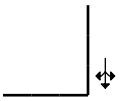
Peak-Hour: 7:05 AM -- 8:05 AM

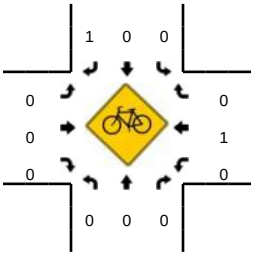
Peak 15-Min: 7:20 AM -- 7:35 AM

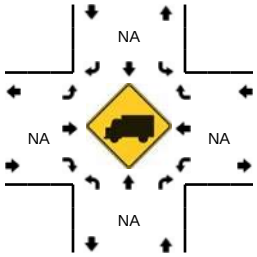


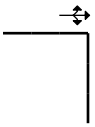


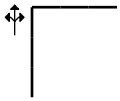


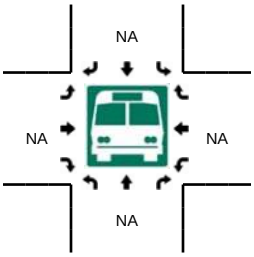












5-Min Count Period Beginning At	Springbrook Rd (Northbound)				Springbrook Rd (Southbound)				Crestview Dr (Eastbound)				Crestview Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:35 AM	0	9	0	0	0	19	2	0	0	0	1	0	0	0	0	0	31	
6:40 AM	1	10	0	0	0	22	5	0	1	0	3	0	0	0	1	0	43	
6:45 AM	0	20	0	0	0	35	5	0	0	0	1	0	0	0	0	0	61	
6:50 AM	0	10	0	0	1	30	12	0	1	0	0	0	0	2	1	0	57	
6:55 AM	0	23	0	0	1	22	9	0	1	1	0	0	1	1	0	0	59	485
7:00 AM	1	13	0	0	1	27	4	0	2	0	0	0	1	1	2	0	52	511
7:05 AM	6	21	1	1	1	23	11	1	3	0	0	0	1	0	0	0	69	558
7:10 AM	5	15	0	0	0	37	14	0	1	0	3	0	0	1	1	0	77	596
7:15 AM	14	16	0	0	1	26	23	0	9	2	6	1	0	0	0	0	98	660
7:20 AM	15	37	1	0	1	26	28	0	7	2	14	0	0	2	0	0	133	758
7:25 AM	10	30	0	0	0	29	26	0	7	3	21	0	0	5	1	0	132	851
7:30 AM	5	39	0	0	0	31	15	0	14	0	19	1	0	0	0	0	124	936
7:35 AM	1	25	1	1	1	30	8	0	8	1	2	0	0	0	1	0	79	984
7:40 AM	1	24	0	0	1	39	1	0	1	0	0	0	0	0	0	0	67	1008
7:45 AM	0	25	0	0	0	28	0	0	1	0	0	0	0	0	1	0	55	1002
7:50 AM	2	23	0	0	0	28	3	0	1	0	2	0	2	1	2	0	64	1009
7:55 AM	5	30	0	0	0	23	5	0	2	0	2	0	0	0	0	0	67	1017
8:00 AM	0	29	0	0	2	29	1	0	0	0	0	0	1	0	1	0	63	1028
8:05 AM	1	24	0	0	0	35	0	0	2	0	1	0	0	0	3	0	66	1025
8:10 AM	0	38	1	0	0	25	4	0	0	0	0	0	2	1	4	0	75	1023
8:15 AM	1	18	0	2	0	28	2	0	0	0	2	0	0	0	1	0	54	979
8:20 AM	2	17	0	0	0	39	1	0	1	0	0	0	2	0	1	0	63	909
8:25 AM	0	8	1	0	0	28	3	0	3	0	1	0	0	0	0	0	44	821
8:30 AM	0	25	0	0	0	22	0	0	2	0	0	0	0	0	0	0	49	746

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	120	424	4	0	4	344	276	0	112	20	216	4	0	28	4	0	1556
Heavy Trucks	0	12	0		0	16	16		4	4	8		0	0	0		60
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 6/5/2018 11:00 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: N Libra St -- Crestview Dr

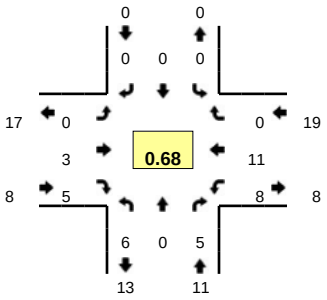
CITY/STATE: Newberg, OR

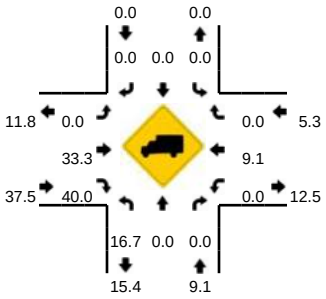
QC JOB #: 14566406

DATE: Wed, Nov 15 2017

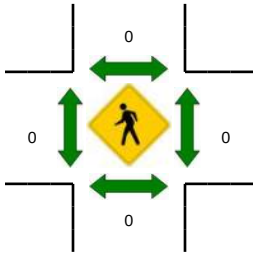
Peak-Hour: 8:00 AM -- 9:00 AM

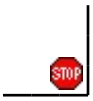
Peak 15-Min: 8:10 AM -- 8:25 AM

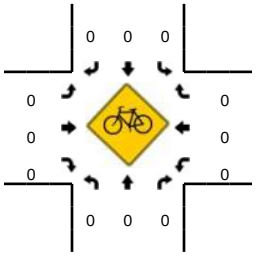


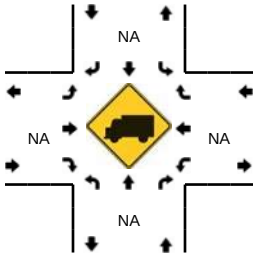


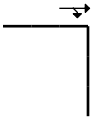
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

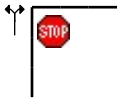


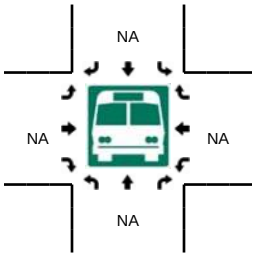












5-Min Count Period Beginning At	N Libra St (Northbound)				N Libra St (Southbound)				Crestview Dr (Eastbound)				Crestview Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	6	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	
7:10 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
7:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	4	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	
7:35 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	
7:40 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	4	
7:50 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	33
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	28
8:05 AM	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	3	28
8:10 AM	4	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	7	33
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3	33
8:20 AM	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	4	36
8:25 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	34
8:30 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	3	34
8:35 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	3	35
8:40 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	33
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	31
8:50 AM	0	0	2	0	0	0	0	0	0	0	1	0	1	1	0	0	5	35
8:55 AM	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	4	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	20	0	4	0	0	0	0	0	0	4	4	0	4	20	0	0	56
Heavy Trucks	4	0	0		0	0	0		0	0	4		0	0	0		8
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 6/5/2018 11:04 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

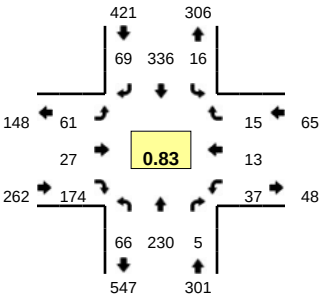
LOCATION: N Springbrook Rd -- Haworth Ave

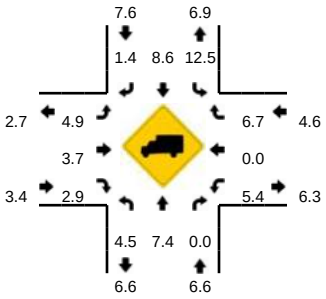
QC JOB #: 14566404

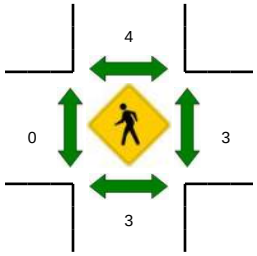
CITY/STATE: Newberg, OR

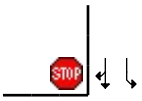
DATE: Wed, Nov 15 2017

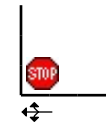
Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:20 AM -- 8:35 AM

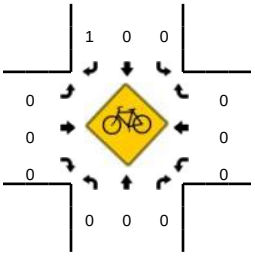


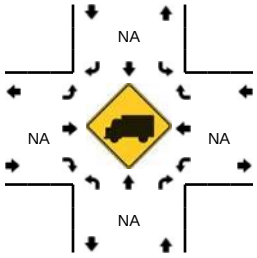


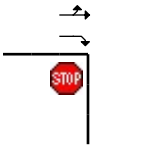


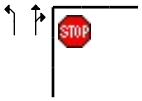


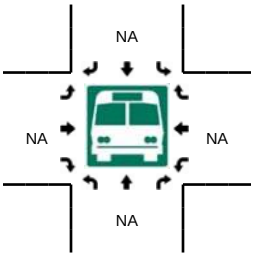












5-Min Count Period Beginning At	N Springbrook Rd (Northbound)				N Springbrook Rd (Southbound)				Haworth Ave (Eastbound)				Haworth Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	28	0	0	1	17	7	0	15	1	21	0	2	1	0	0	96	
7:05 AM	5	21	0	0	0	24	7	0	10	1	15	0	1	0	0	0	84	
7:10 AM	5	17	0	0	1	26	5	0	4	1	19	0	2	1	2	0	83	
7:15 AM	3	18	0	0	0	30	5	0	11	0	23	0	0	0	0	0	90	
7:20 AM	6	20	1	0	0	24	4	0	8	1	17	0	2	2	1	0	86	
7:25 AM	6	13	0	0	1	26	4	0	7	3	16	0	1	0	0	0	77	
7:30 AM	3	17	0	0	1	22	6	0	10	1	13	0	4	1	2	0	80	
7:35 AM	6	24	0	0	0	31	5	0	5	0	13	0	0	0	1	0	85	
7:40 AM	1	19	2	0	3	24	9	0	6	0	10	0	4	1	1	0	80	
7:45 AM	2	12	0	0	0	19	4	0	5	0	6	0	2	1	2	0	53	
7:50 AM	8	23	0	0	3	16	10	0	9	1	14	0	2	0	0	0	86	
7:55 AM	3	10	1	0	0	28	5	0	0	4	8	0	1	0	0	0	60	960
8:00 AM	5	17	0	0	1	19	5	0	5	0	11	0	3	0	3	0	69	933
8:05 AM	4	24	1	0	1	19	7	0	4	1	11	0	3	0	3	0	78	927
8:10 AM	2	24	0	0	1	23	7	0	5	3	15	0	4	1	1	0	86	930
8:15 AM	6	28	0	0	2	26	3	0	9	4	11	0	0	1	0	0	90	930
8:20 AM	5	28	0	0	1	42	5	0	3	3	11	0	5	2	0	0	105	949
8:25 AM	6	17	0	0	2	36	10	0	9	2	18	0	0	0	0	0	100	972
8:30 AM	9	13	0	0	3	35	11	0	7	3	21	0	4	3	1	0	110	1002
8:35 AM	6	17	0	0	0	40	5	0	2	2	22	0	3	1	1	0	99	1016
8:40 AM	5	14	1	0	1	30	5	0	1	3	19	0	5	1	2	0	87	1023
8:45 AM	7	17	1	0	2	16	6	0	9	2	13	0	4	0	1	0	78	1048
8:50 AM	6	16	0	0	1	18	2	0	1	1	8	0	4	1	1	0	59	1021
8:55 AM	5	15	2	0	1	32	3	0	6	3	14	0	2	3	2	0	88	1049

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	80	232	0	0	24	452	104	0	76	32	200	0	36	20	4	0	1260
Heavy Trucks	4	8	0		4	36	4		0	4	8		0	0	0		68
Pedestrians		8				4				0				4			16
Bicycles	0	0	0		0	0	1		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 11:04 AM

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

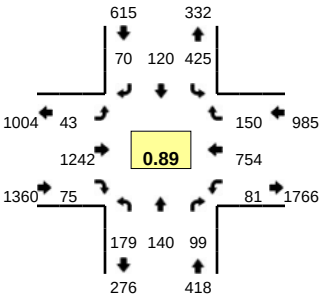
Type of peak hour being reported: User-Defined

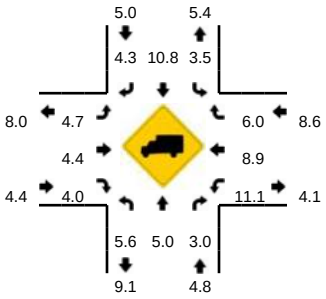
Method for determining peak hour: Total Entering Volume

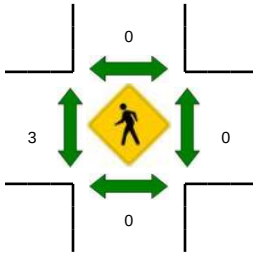
LOCATION: N Springbrook Rd -- OR 99W
CITY/STATE: Newberg, OR

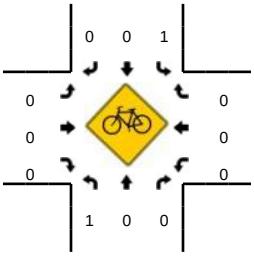
QC JOB #: 14505601
DATE: Thu, Sep 14 2017

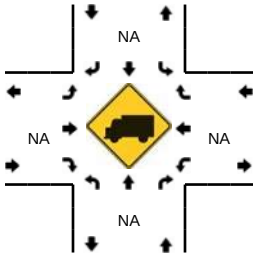
Peak-Hour: 6:55 AM -- 7:55 AM
Peak 15-Min: 7:20 AM -- 7:35 AM

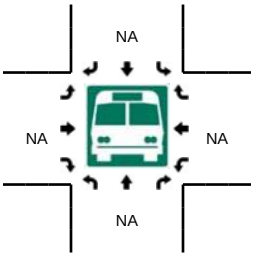


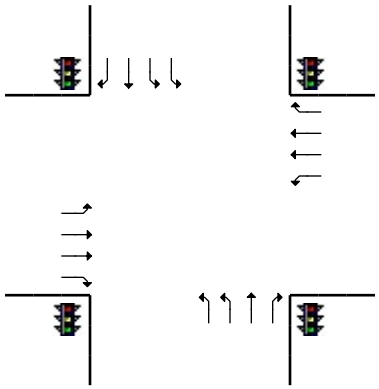












5-Min Count Period Beginning At	N Springbrook Rd (Northbound)				N Springbrook Rd (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:25 AM	5	2	7	0	27	11	3	0	0	104	3	0	2	32	4	0	200	
6:30 AM	9	4	6	0	27	7	3	0	1	141	6	0	3	39	5	0	251	
6:35 AM	12	4	11	0	43	8	1	0	0	109	3	0	5	50	4	1	251	
6:40 AM	7	5	10	0	26	6	1	0	2	136	2	0	3	42	4	0	244	
6:45 AM	5	7	9	0	23	7	4	0	3	119	0	0	0	63	9	0	249	
6:50 AM	7	9	9	0	44	4	6	0	1	111	1	0	5	52	6	0	255	
6:55 AM	5	9	7	0	36	2	4	0	4	101	5	0	6	49	14	0	242	2665
7:00 AM	6	10	6	0	33	7	9	0	4	112	2	0	4	49	19	0	261	2739
7:05 AM	8	12	7	0	17	10	6	0	3	85	3	0	8	60	12	0	231	2795
7:10 AM	13	16	7	0	42	8	5	0	3	114	5	1	7	51	6	0	278	2858
7:15 AM	14	18	9	0	33	8	9	0	1	103	2	0	7	44	13	0	261	2952
7:20 AM	18	12	7	0	41	13	7	0	3	114	3	0	6	54	11	0	289	3012
7:25 AM	18	17	15	0	31	15	5	0	1	104	15	0	5	87	21	0	334	3146
7:30 AM	20	8	11	0	48	13	7	0	5	108	6	0	5	80	15	0	326	3221
7:35 AM	20	12	11	0	33	17	6	0	6	84	9	0	8	68	10	0	284	3254
7:40 AM	19	9	8	0	48	6	2	0	2	116	12	0	8	65	9	0	304	3314
7:45 AM	18	11	6	0	25	12	5	0	10	90	6	0	9	78	11	0	281	3346
7:50 AM	20	6	5	0	38	9	5	0	0	111	7	0	8	69	9	0	287	3378
7:55 AM	10	16	11	0	17	7	6	0	3	92	11	0	16	74	14	0	277	3413
8:00 AM	13	9	9	0	35	11	9	0	0	65	10	2	10	79	14	0	266	3418
8:05 AM	17	11	9	0	28	5	11	0	3	105	8	0	4	68	11	0	280	3467
8:10 AM	23	27	14	0	22	14	8	0	3	67	8	0	9	82	17	0	294	3483
8:15 AM	25	15	11	0	29	10	5	0	2	97	1	0	4	57	7	0	263	3485
8:20 AM	11	4	8	0	34	20	4	0	5	83	6	0	8	62	8	0	253	3449

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	224	148	132	0	480	164	76	0	36	1304	96	0	64	884	188	0	3796
Heavy Trucks	16	4	0		12	20	4		4	60	8		0	80	8		216
Pedestrians		0				0				4				0			4
Bicycles	1	0	0		1	0	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 10:59 AM

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

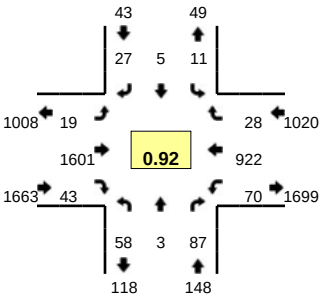
Type of peak hour being reported: User-Defined

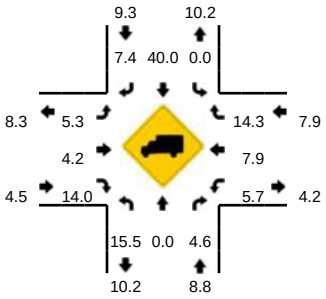
Method for determining peak hour: Total Entering Volume

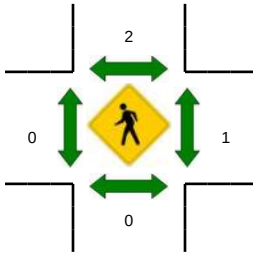
LOCATION: Brutscher St -- OR 99W
CITY/STATE: Newberg, OR

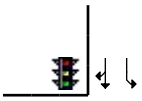
QC JOB #: 14505603
DATE: Thu, Sep 14 2017

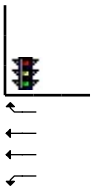
Peak-Hour: 6:55 AM -- 7:55 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

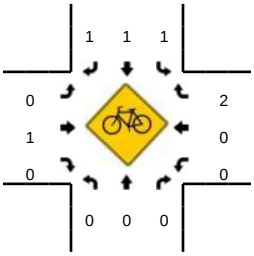


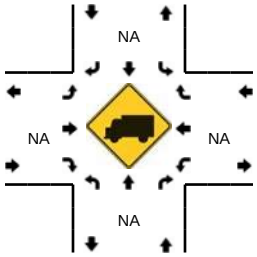


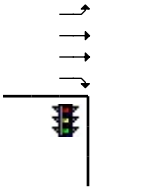


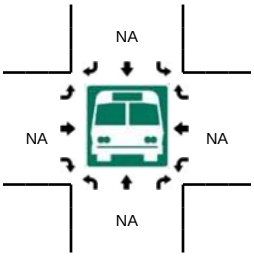












5-Min Count Period Beginning At	Brutscher St (Northbound)				Brutscher St (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:25 AM	0	0	4	0	0	0	6	0	0	139	1	0	4	36	3	0	193	
6:30 AM	2	0	10	0	0	0	2	0	1	154	3	0	3	50	0	0	225	
6:35 AM	1	0	4	0	1	0	1	0	0	173	1	0	3	48	2	0	234	
6:40 AM	2	1	10	0	1	2	0	0	4	133	1	0	6	51	0	0	211	
6:45 AM	2	1	9	0	2	0	1	0	1	170	1	0	2	66	4	0	259	
6:50 AM	1	2	14	0	4	0	3	0	1	140	5	0	11	59	3	0	243	
6:55 AM	3	0	4	0	1	1	2	0	1	148	3	0	5	73	1	0	242	2513
7:00 AM	3	0	5	0	2	0	1	0	0	126	2	0	7	55	4	0	205	2547
7:05 AM	4	0	12	0	2	0	1	0	1	117	2	0	3	73	2	0	217	2604
7:10 AM	4	0	4	0	1	0	3	0	2	132	1	0	6	64	3	0	220	2643
7:15 AM	4	0	11	0	0	0	3	0	1	158	2	0	10	62	2	0	253	2717
7:20 AM	8	0	3	0	1	1	1	0	1	124	6	0	2	71	1	0	219	2721
7:25 AM	7	0	11	0	0	0	2	0	2	145	7	1	3	94	3	0	275	2803
7:30 AM	6	1	6	0	1	0	2	0	3	128	4	0	9	92	0	0	252	2830
7:35 AM	3	1	6	0	1	2	2	0	0	144	2	0	3	81	6	0	251	2847
7:40 AM	2	0	15	0	1	0	9	0	3	131	6	0	9	65	3	0	244	2880
7:45 AM	7	1	7	0	1	0	1	0	0	137	4	0	3	98	1	0	260	2881
7:50 AM	7	0	3	0	0	1	0	0	4	111	4	0	10	94	2	0	236	2874
7:55 AM	10	2	10	0	4	0	2	0	1	122	5	1	5	78	1	0	241	2873
8:00 AM	10	1	11	0	1	0	2	0	1	83	14	0	9	80	2	0	214	2882
8:05 AM	8	0	6	0	0	1	3	0	1	106	1	0	1	90	4	0	221	2886
8:10 AM	16	2	6	0	0	1	1	0	2	100	5	1	4	80	2	0	220	2886
8:15 AM	6	0	5	0	2	1	2	0	3	93	5	1	15	69	0	0	202	2835
8:20 AM	7	1	9	0	2	0	1	0	1	114	7	1	8	60	0	0	211	2827

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	64	8	92	0	8	8	24	0	20	1668	52	4	60	1068	36	0	3112
Heavy Trucks	16	0	0		0	0	0		0	40	4		0	92	0		152
Pedestrians		0				4				0				4			8
Bicycles	0	0	0		1	0	0		0	1	0		0	0	1		3
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 10:59 AM

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

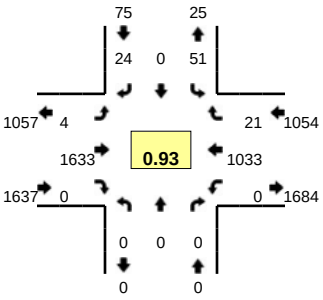
Type of peak hour being reported: User-Defined

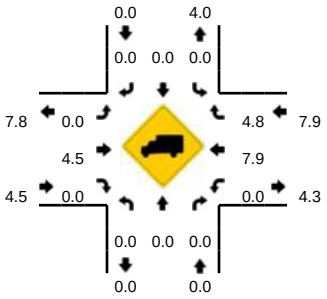
Method for determining peak hour: Total Entering Volume

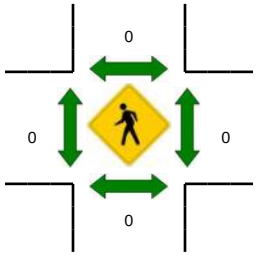
LOCATION: Vittoria Way -- OR 99W
CITY/STATE: Newberg, OR

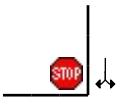
QC JOB #: 14505605
DATE: Thu, Sep 14 2017

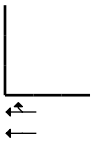
Peak-Hour: 6:55 AM -- 7:55 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

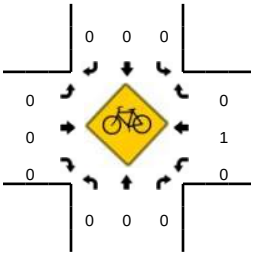


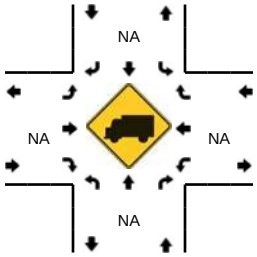


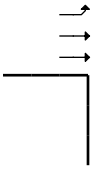


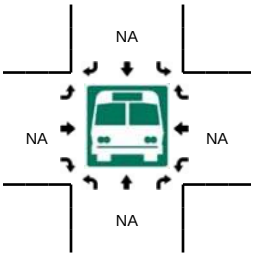












5-Min Count Period Beginning At	Vittoria Way (Northbound)				Vittoria Way (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:25 AM	0	0	0	0	10	0	0	0	0	155	0	0	0	39	3	0	207	
6:30 AM	0	0	0	0	7	0	2	0	0	141	0	0	0	54	1	0	205	
6:35 AM	0	0	0	0	3	0	2	0	0	182	0	0	0	60	1	0	248	
6:40 AM	0	0	0	0	4	0	1	0	0	126	0	0	0	63	0	0	194	
6:45 AM	0	0	0	0	1	0	3	0	1	180	0	0	0	69	0	0	254	
6:50 AM	0	0	0	0	4	0	3	0	0	131	0	0	0	65	0	0	203	
6:55 AM	0	0	0	0	7	0	1	0	0	156	0	0	0	89	1	0	254	2446
7:00 AM	0	0	0	0	3	0	0	0	0	123	0	0	0	66	2	0	194	2477
7:05 AM	0	0	0	0	6	0	2	0	0	142	0	0	0	76	1	0	227	2532
7:10 AM	0	0	0	0	5	0	3	0	0	125	0	0	0	78	2	0	213	2590
7:15 AM	0	0	0	0	5	0	1	0	1	165	0	0	0	66	0	0	238	2633
7:20 AM	0	0	0	0	6	0	1	0	1	131	0	0	0	72	2	0	213	2650
7:25 AM	0	0	0	0	5	0	3	0	1	133	0	0	0	106	4	0	252	2695
7:30 AM	0	0	0	0	3	0	2	0	0	130	0	0	0	95	2	0	232	2722
7:35 AM	0	0	0	0	3	0	2	0	1	153	0	0	0	97	4	0	260	2734
7:40 AM	0	0	0	0	3	0	1	0	0	130	0	0	0	72	1	0	207	2747
7:45 AM	0	0	0	0	2	0	2	0	0	147	0	0	0	113	1	0	265	2758
7:50 AM	0	0	0	0	3	0	6	0	0	98	0	0	0	103	1	0	211	2766
7:55 AM	0	0	0	0	2	0	1	0	0	124	0	0	0	90	3	0	220	2732
8:00 AM	0	0	0	0	2	0	3	0	3	91	0	0	0	89	1	0	189	2727
8:05 AM	0	0	0	0	1	0	0	0	0	99	0	0	0	80	1	0	181	2681
8:10 AM	0	0	0	0	1	0	0	0	2	95	0	0	0	97	0	0	195	2663
8:15 AM	0	0	0	0	4	0	1	0	1	95	0	0	0	80	2	0	183	2608
8:20 AM	0	0	0	0	1	0	0	0	4	113	0	0	0	81	1	0	200	2595

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	44	0	28	0	8	1664	0	0	0	1192	40	0	2976
Heavy Trucks	0	0	0		0	0	0		0	48	0		0	104	0		152
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 10:59 AM

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

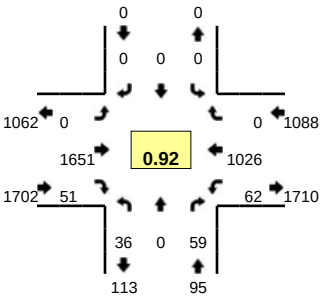
Type of peak hour being reported: User-Defined

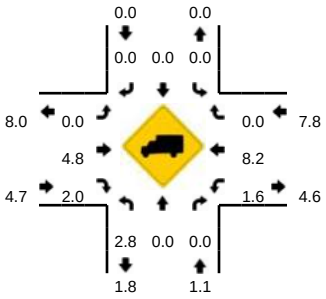
Method for determining peak hour: Total Entering Volume

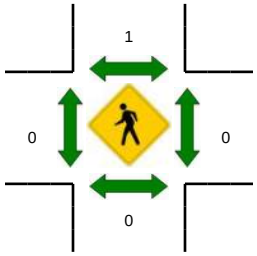
LOCATION: Providence Dr -- OR 99W
CITY/STATE: Newberg, OR

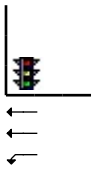
QC JOB #: 14505607
DATE: Thu, Sep 14 2017

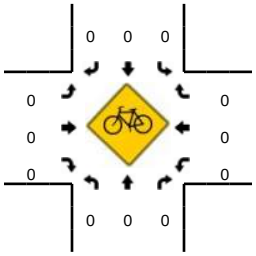
Peak-Hour: 6:55 AM -- 7:55 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

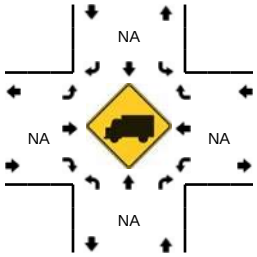


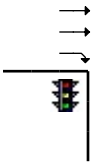


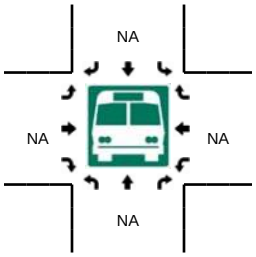












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:25 AM	1	0	2	0	0	0	0	0	0	167	3	0	4	42	0	0	219	
6:30 AM	0	0	6	0	0	0	0	0	0	149	3	0	3	53	0	0	214	
6:35 AM	0	0	3	0	0	0	0	0	0	184	6	0	6	64	0	0	263	
6:40 AM	1	0	5	0	0	0	0	0	0	132	2	0	6	60	0	0	206	
6:45 AM	0	0	1	0	0	0	0	0	0	174	6	0	2	69	0	0	252	
6:50 AM	2	0	3	0	0	0	0	0	0	130	4	0	4	63	0	0	206	
6:55 AM	2	0	4	0	0	0	0	0	0	146	4	0	14	86	0	0	256	2501
7:00 AM	1	0	2	0	0	0	0	0	0	132	3	0	6	68	0	0	212	2556
7:05 AM	0	0	3	0	0	0	0	0	0	143	5	0	4	77	0	0	232	2619
7:10 AM	3	0	9	0	0	0	0	0	0	131	2	0	3	80	0	0	228	2677
7:15 AM	2	0	3	0	0	0	0	0	0	164	2	0	3	62	0	0	236	2711
7:20 AM	2	0	10	0	0	0	0	0	0	128	6	0	4	74	0	0	224	2748
7:25 AM	4	0	2	0	0	0	0	0	0	141	4	0	6	106	0	0	263	2792
7:30 AM	6	0	8	0	0	0	0	0	0	126	3	0	7	93	0	0	243	2821
7:35 AM	4	0	6	0	0	0	0	0	0	163	4	0	5	97	0	0	279	2837
7:40 AM	5	0	7	0	0	0	0	0	0	130	6	0	4	71	0	0	223	2854
7:45 AM	4	0	2	0	0	0	0	0	0	150	5	0	6	116	0	0	283	2885
7:50 AM	3	0	3	0	0	0	0	0	0	97	7	0	0	96	0	0	206	2885
7:55 AM	2	0	2	0	0	0	0	0	0	111	14	0	6	98	0	0	233	2862
8:00 AM	1	0	3	0	0	0	0	0	0	81	1	0	5	82	0	0	173	2823
8:05 AM	8	0	3	0	0	0	0	0	0	93	7	0	4	75	0	0	190	2781
8:10 AM	1	0	3	0	0	0	0	0	0	92	5	0	4	96	0	0	201	2754
8:15 AM	2	0	0	0	0	0	0	0	0	91	10	0	3	76	0	0	182	2700
8:20 AM	3	0	1	0	0	0	0	0	0	102	8	0	6	80	0	0	200	2676

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	56	0	64	0	0	0	0	0	0	1720	44	0	72	1184	0	0	3140
Heavy Trucks	0	0	0		0	0	0		0	52	0		4	96	0		152
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 10:59 AM

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

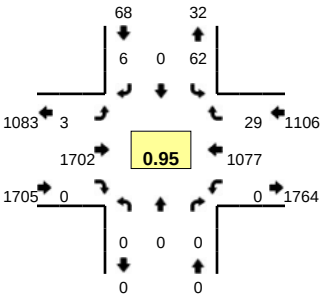
Type of peak hour being reported: User-Defined

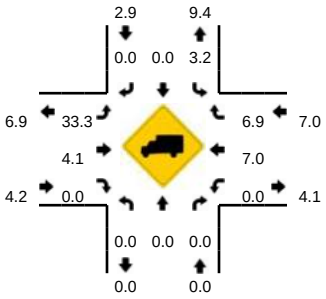
Method for determining peak hour: Total Entering Volume

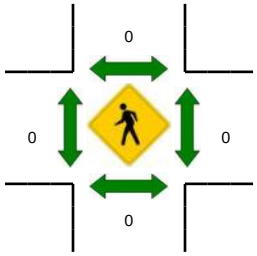
LOCATION: NE Benjamin Rd -- OR 99W
CITY/STATE: Newberg, OR

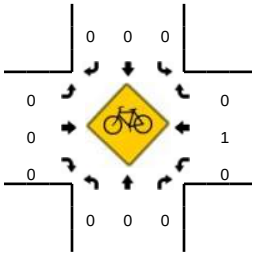
QC JOB #: 14505609
DATE: Thu, Sep 14 2017

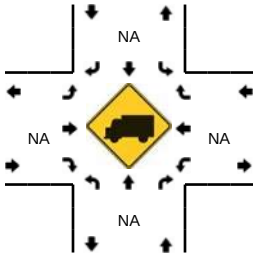
Peak-Hour: 6:55 AM -- 7:55 AM
Peak 15-Min: 7:20 AM -- 7:35 AM

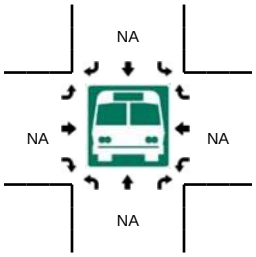












5-Min Count Period Beginning At	NE Benjamin Rd (Northbound)				NE Benjamin Rd (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:25 AM	0	0	0	0	3	0	2	0	1	155	0	0	0	47	0	0	208	
6:30 AM	0	0	0	0	2	0	0	0	0	160	0	0	0	49	0	0	211	
6:35 AM	0	0	0	0	4	0	0	0	0	180	0	0	0	71	0	0	255	
6:40 AM	0	0	0	0	7	0	0	0	0	156	0	0	0	70	1	0	234	
6:45 AM	0	0	0	0	6	0	0	0	0	170	0	0	0	74	3	0	253	
6:50 AM	0	0	0	0	3	0	1	0	0	141	0	0	0	73	3	0	221	
6:55 AM	0	0	0	0	4	0	1	0	0	127	0	0	0	95	2	0	229	2520
7:00 AM	0	0	0	0	7	0	1	0	0	154	0	0	0	72	2	0	236	2601
7:05 AM	0	0	0	0	7	0	0	0	0	139	0	0	0	77	2	0	225	2650
7:10 AM	0	0	0	0	10	0	0	0	0	145	0	0	0	85	1	0	241	2722
7:15 AM	0	0	0	0	10	0	1	0	1	149	0	0	0	60	1	0	222	2742
7:20 AM	0	0	0	0	1	0	0	0	0	158	0	0	0	95	1	0	255	2790
7:25 AM	0	0	0	0	2	0	0	0	1	126	0	0	0	107	7	0	243	2825
7:30 AM	0	0	0	0	8	0	0	0	0	150	0	0	0	101	1	0	260	2874
7:35 AM	0	0	0	0	3	0	1	0	0	153	0	0	0	86	6	0	249	2868
7:40 AM	0	0	0	0	3	0	1	0	0	152	0	0	0	76	3	0	235	2869
7:45 AM	0	0	0	0	5	0	1	0	1	136	0	0	0	116	2	0	261	2877
7:50 AM	0	0	0	0	2	0	0	0	0	113	0	0	0	107	1	0	223	2879
7:55 AM	0	0	0	0	5	0	0	0	0	106	0	0	0	99	5	0	215	2865
8:00 AM	0	0	0	0	6	0	0	0	0	105	0	0	0	82	4	0	197	2826
8:05 AM	0	0	0	0	1	0	1	0	0	103	0	0	0	82	8	0	195	2796
8:10 AM	0	0	0	0	5	0	1	0	1	81	0	0	0	93	1	0	182	2737
8:15 AM	0	0	0	0	4	0	1	0	0	106	0	0	0	78	4	0	193	2708
8:20 AM	0	0	0	0	1	0	1	0	0	94	0	0	0	93	1	0	190	2643

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	44	0	0	0	4	1736	0	0	0	1212	36	0	3032
Heavy Trucks	0	0	0		0	0	0		0	56	0		0	80	8		144
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 10:59 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

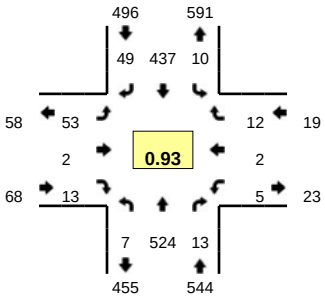
LOCATION: Springbrook Rd -- Crestview Dr

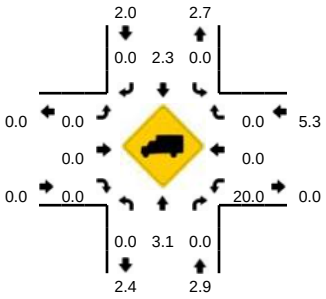
QC JOB #: 14505612

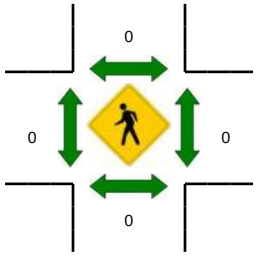
CITY/STATE: Newberg, OR

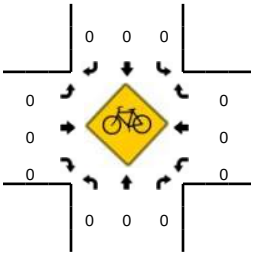
DATE: Thu, Sep 14 2017

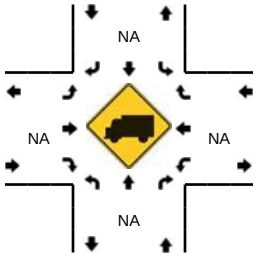
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:40 PM -- 4:55 PM

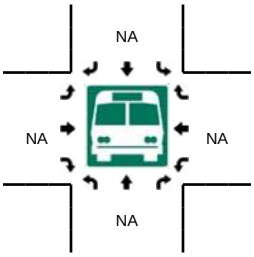












5-Min Count Period Beginning At	Springbrook Rd (Northbound)				Springbrook Rd (Southbound)				Crestview Dr (Eastbound)				Crestview Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	27	0	0	0	40	0	1	4	1	0	0	0	0	0	0	73	913
4:05 PM	1	31	0	0	1	55	3	0	2	0	0	0	1	0	1	0	95	925
4:10 PM	0	34	1	0	1	41	2	0	2	0	1	0	0	0	1	0	83	933
4:15 PM	2	26	2	0	1	35	2	0	0	0	0	0	1	0	1	0	70	923
4:20 PM	1	47	0	0	0	27	3	0	2	0	2	0	0	0	1	0	83	930
4:25 PM	1	36	1	0	0	32	6	0	1	0	0	0	0	0	0	0	77	939
4:30 PM	1	39	0	0	0	32	1	0	2	0	2	0	2	0	2	0	81	942
4:35 PM	1	31	3	0	0	38	4	0	3	0	0	0	2	0	0	0	82	922
4:40 PM	0	39	1	0	0	56	2	1	0	0	0	0	1	0	2	0	102	953
4:45 PM	2	47	1	0	2	40	4	0	2	0	0	0	0	0	2	0	100	986
4:50 PM	0	46	0	0	1	44	8	0	0	0	2	0	0	0	0	0	101	1017
4:55 PM	1	46	3	0	0	30	12	0	6	0	1	0	0	0	1	0	100	1047
5:00 PM	0	44	1	0	0	25	3	0	15	0	3	0	2	0	1	0	94	1068
5:05 PM	2	46	0	0	0	30	6	0	8	0	3	0	1	0	1	0	97	1070
5:10 PM	1	44	2	0	0	37	1	0	8	0	1	0	0	0	1	0	95	1082
5:15 PM	1	46	1	0	0	30	1	0	4	0	0	0	0	2	0	0	85	1097
5:20 PM	0	43	0	0	1	47	4	0	3	0	0	0	0	0	2	0	100	1114
5:25 PM	0	45	1	0	2	29	2	0	1	0	1	0	0	0	0	0	81	1118
5:30 PM	0	31	2	0	0	40	3	1	3	2	2	0	0	0	2	0	86	1123
5:35 PM	0	47	1	0	2	29	3	0	3	0	0	0	1	0	0	0	86	1127
5:40 PM	1	41	0	0	0	33	0	0	1	1	0	0	1	0	0	0	78	1103
5:45 PM	1	29	1	0	1	41	1	0	7	0	0	0	1	0	2	0	84	1087
5:50 PM	3	34	0	0	1	34	2	0	4	0	0	0	2	1	0	0	81	1067
5:55 PM	1	27	0	0	0	37	0	0	0	0	0	0	0	0	0	0	65	1032

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	528	8	0	12	560	56	4	8	0	8	0	4	0	16	0	1212
Heavy Trucks	0	12	0		0	8	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 6/5/2018 11:02 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

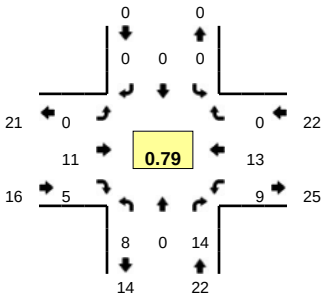
LOCATION: N Libra St -- Crestview Dr

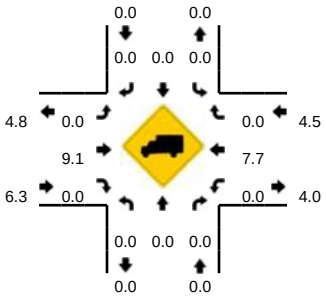
QC JOB #: 14566407

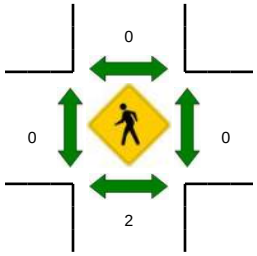
CITY/STATE: Newberg, OR

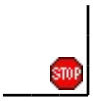
DATE: Wed, Nov 15 2017

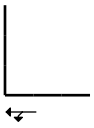
Peak-Hour: 3:40 PM -- 4:40 PM
Peak 15-Min: 4:25 PM -- 4:40 PM

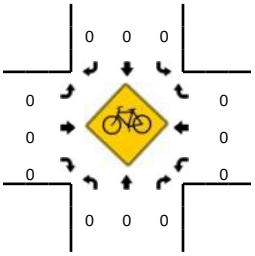


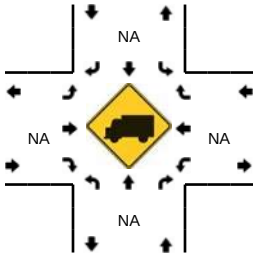


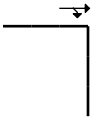


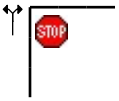


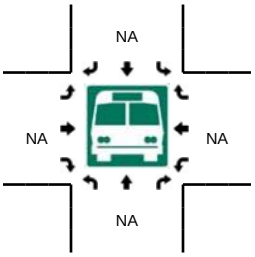












5-Min Count Period Beginning At	N Libra St (Northbound)				N Libra St (Southbound)				Crestview Dr (Eastbound)				Crestview Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:10 PM	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	3	
3:15 PM	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	4	
3:20 PM	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
3:25 PM	0	0	0	1	0	0	0	0	0	0	1	0	1	1	0	0	4	
3:30 PM	0	0	2	0	0	0	0	0	0	1	0	0	0	1	0	0	4	
3:35 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
3:40 PM	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	4	
3:45 PM	0	0	1	0	0	0	0	0	0	2	1	0	0	1	0	0	5	
3:50 PM	0	0	2	0	0	0	0	0	0	1	0	0	0	2	0	0	5	
3:55 PM	0	0	2	0	0	0	0	0	0	0	0	0	2	1	0	0	5	47
4:00 PM	2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	4	49
4:05 PM	0	0	0	0	0	0	0	0	0	3	0	0	1	1	0	0	5	48
4:10 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	47
4:15 PM	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	5	48
4:20 PM	1	0	2	0	0	0	0	0	0	2	0	0	1	0	0	0	6	51
4:25 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	2	0	0	4	51
4:30 PM	2	0	0	0	0	0	0	0	0	1	1	0	1	3	0	0	8	55
4:35 PM	2	0	1	0	0	0	0	0	0	0	1	0	2	1	0	0	7	60
4:40 PM	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	3	59
4:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	56
4:50 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	53
4:55 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	51
5:00 PM	0	0	3	0	0	0	0	0	0	3	0	0	0	0	0	0	6	53
5:05 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	50

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	0	8	0	0	0	0	0	0	8	8	0	12	24	0	0	76
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
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 6/5/2018 11:04 AM

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

Type of peak hour being reported: User-Defined

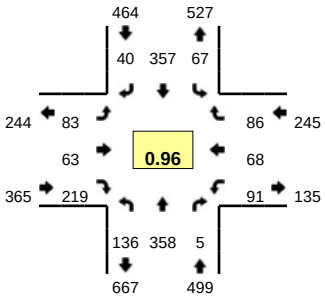
Method for determining peak hour: Total Entering Volume

LOCATION: N Springbrook Rd -- Haworth Ave

QC JOB #: 14566405

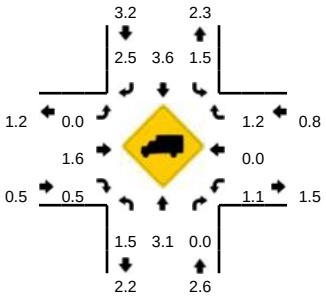
CITY/STATE: Newberg, OR

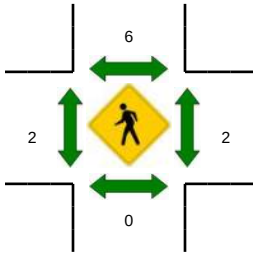
DATE: Wed, Nov 15 2017

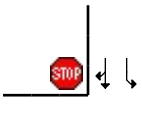


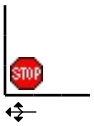
Peak-Hour: 4:20 PM -- 5:20 PM

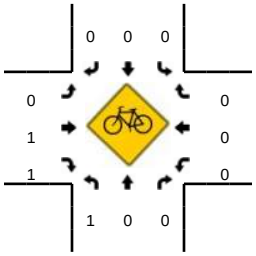
Peak 15-Min: 4:50 PM -- 5:05 PM

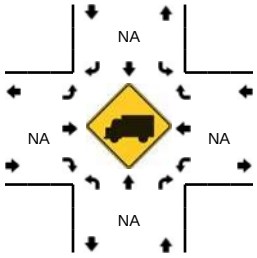


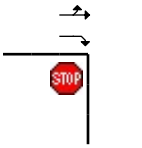


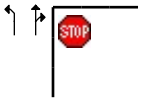


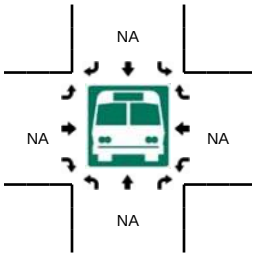












5-Min Count Period Beginning At	N Springbrook Rd (Northbound)				N Springbrook Rd (Southbound)				Haworth Ave (Eastbound)				Haworth Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:50 PM	8	18	1	0	5	30	3	0	5	5	10	0	9	4	7	0	105	
3:55 PM	10	24	0	0	3	28	5	0	10	1	18	0	10	7	4	0	120	1317
4:00 PM	11	21	3	0	2	21	3	0	7	4	11	0	7	2	1	0	93	1309
4:05 PM	14	24	1	0	9	33	5	0	7	5	18	0	7	4	3	0	130	1328
4:10 PM	11	22	2	0	6	31	5	0	7	4	13	0	11	10	5	0	127	1340
4:15 PM	12	25	0	0	6	29	3	0	8	5	11	0	11	7	7	0	124	1359
4:20 PM	8	33	0	0	9	28	5	0	4	9	12	0	6	6	7	0	127	1360
4:25 PM	13	22	1	0	3	33	3	0	5	4	12	0	10	4	1	0	111	1367
4:30 PM	14	30	0	0	4	23	5	0	12	3	18	0	6	8	6	0	129	1380
4:35 PM	12	31	0	0	5	30	4	0	10	4	16	0	9	3	5	0	129	1402
4:40 PM	9	33	2	0	5	28	6	0	5	7	27	0	4	6	10	0	142	1424
4:45 PM	14	22	1	0	3	28	2	0	8	2	18	0	8	7	8	0	121	1458
4:50 PM	12	26	1	0	2	31	5	0	6	4	23	0	12	9	8	0	139	1492
4:55 PM	6	23	0	0	9	34	3	0	9	5	17	0	5	7	7	0	125	1497
5:00 PM	13	29	0	0	6	29	2	0	9	7	23	0	8	8	10	0	144	1548
5:05 PM	13	36	0	0	6	27	0	0	3	4	16	0	6	3	8	0	122	1540
5:10 PM	13	31	0	0	8	31	2	0	6	10	14	0	11	3	6	0	135	1548
5:15 PM	9	42	0	0	7	35	3	0	6	4	23	0	6	4	10	0	149	1573
5:20 PM	19	26	2	0	2	27	3	0	3	5	16	0	10	6	6	0	125	1571
5:25 PM	8	24	0	0	1	29	4	0	7	5	12	0	10	5	6	0	111	1571
5:30 PM	14	20	2	0	3	23	3	0	6	5	7	0	5	7	7	0	102	1544
5:35 PM	18	31	1	0	3	21	3	0	7	5	18	0	4	4	5	0	120	1535
5:40 PM	10	36	2	0	2	16	5	0	3	6	15	0	11	7	5	0	118	1511
5:45 PM	11	24	0	0	2	17	1	0	1	6	5	0	14	3	4	0	88	1478

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	124	312	4	0	68	376	40	0	96	64	252	0	100	96	100	0	1632
Heavy Trucks	0	16	0		0	4	0		0	4	4		0	0	0		28
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	1		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 11:05 AM

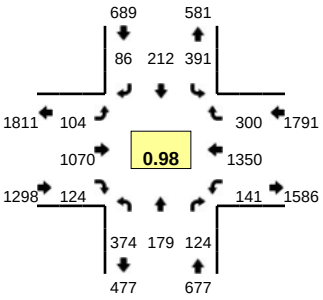
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

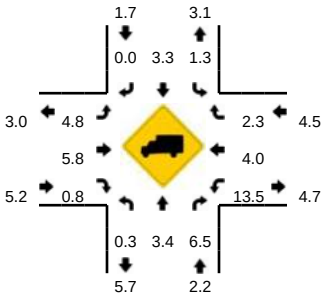
Method for determining peak hour: Total Entering Volume

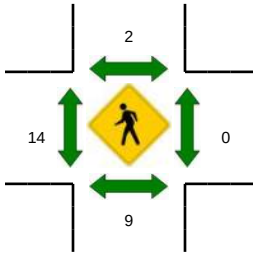
LOCATION: N Springbrook Rd -- OR 99W
CITY/STATE: Newberg, OR

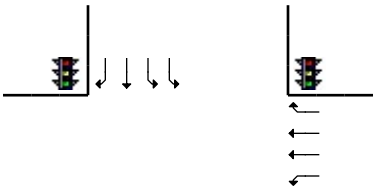
QC JOB #: 14505602
DATE: Thu, Sep 14 2017

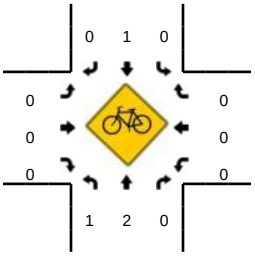


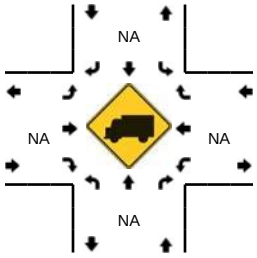
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:20 PM -- 5:35 PM

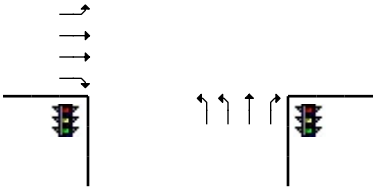


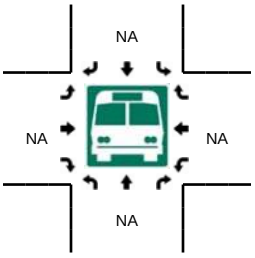












5-Min Count Period Beginning At	N Springbrook Rd (Northbound)				N Springbrook Rd (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	30	10	12	0	29	9	5	0	12	90	11	0	16	105	20	0	349	4050
4:05 PM	31	12	9	0	20	16	9	0	7	103	12	0	15	114	22	0	370	4104
4:10 PM	25	14	16	0	33	11	7	0	3	90	5	1	8	111	23	0	347	4133
4:15 PM	34	14	10	0	31	10	6	0	7	99	14	1	12	129	21	0	388	4191
4:20 PM	33	18	15	0	28	15	16	0	7	91	10	0	16	115	24	0	388	4241
4:25 PM	27	18	14	0	31	17	8	0	11	93	8	0	17	99	29	0	372	4270
4:30 PM	42	14	13	0	36	8	8	0	12	96	10	0	17	118	15	0	389	4304
4:35 PM	29	13	7	0	27	15	7	0	8	81	5	1	15	133	20	0	361	4307
4:40 PM	33	12	11	0	15	14	12	0	6	93	11	0	15	137	16	0	375	4338
4:45 PM	28	12	12	0	31	20	9	0	10	98	13	0	12	108	28	0	381	4368
4:50 PM	31	15	10	0	24	11	5	0	11	91	16	0	14	123	25	0	376	4432
4:55 PM	35	18	7	0	26	27	6	0	3	89	9	0	11	96	35	0	362	4458
5:00 PM	40	17	16	1	45	16	9	0	8	86	10	0	11	97	23	0	379	4488
5:05 PM	32	16	10	0	38	17	7	0	7	81	5	0	11	85	22	0	331	4449
5:10 PM	32	17	10	0	27	21	4	0	12	84	11	2	21	103	28	0	372	4474
5:15 PM	26	8	7	0	33	14	5	0	5	104	9	0	9	119	26	0	365	4451
5:20 PM	33	12	10	0	29	9	9	0	9	101	9	0	12	140	21	0	394	4457
5:25 PM	31	14	9	0	29	13	6	0	7	73	11	0	9	138	28	0	368	4453
5:30 PM	20	19	12	0	35	32	6	0	12	90	9	0	9	110	24	1	379	4443
5:35 PM	35	17	8	0	43	18	8	0	7	93	14	0	8	118	16	0	385	4467
5:40 PM	30	14	13	0	31	14	12	0	11	80	8	0	13	113	24	0	363	4455
5:45 PM	36	12	11	0	21	12	10	0	9	81	9	1	14	121	21	1	359	4433
5:50 PM	27	16	5	0	26	15	7	0	11	104	14	0	11	136	19	0	391	4448
5:55 PM	28	13	6	0	25	12	10	0	9	102	15	0	11	120	17	0	368	4454

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	336	180	124	0	372	216	84	0	112	1056	116	0	120	1552	292	4	4564
Heavy Trucks	0	8	8		8	4	0		4	44	0		16	64	0		156
Pedestrians		4				0				0				0			4
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad Stopped Buses																	

Comments:

Report generated on 6/5/2018 11:01 AM

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

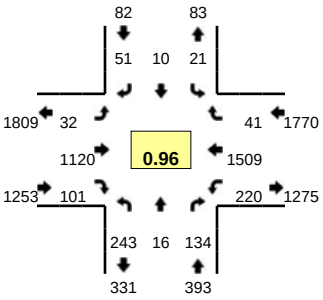
Type of peak hour being reported: User-Defined

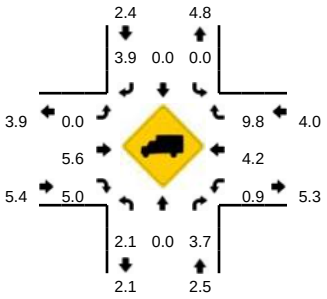
Method for determining peak hour: Total Entering Volume

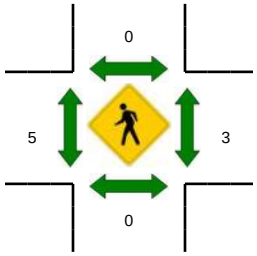
LOCATION: Brutscher St -- OR 99W
CITY/STATE: Newberg, OR

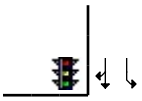
QC JOB #: 14505604
DATE: Thu, Sep 14 2017

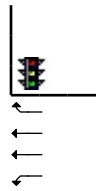
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

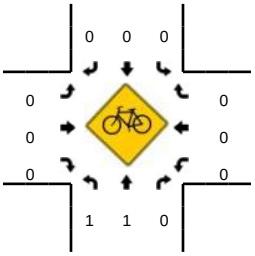


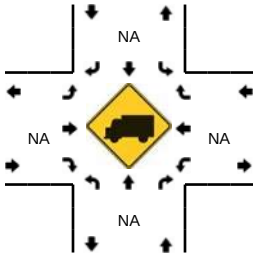


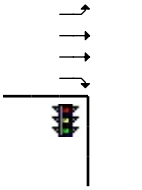


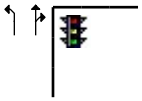


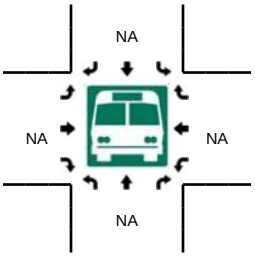












5-Min Count Period Beginning At	Brutscher St (Northbound)				Brutscher St (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	10	1	15	0	1	4	10	0	0	87	5	1	30	121	3	0	288	3289
4:05 PM	16	4	5	0	0	1	6	0	3	88	7	1	20	120	7	0	278	3283
4:10 PM	25	3	7	0	4	2	5	0	2	91	13	1	16	123	5	0	297	3335
4:15 PM	23	2	5	0	1	1	5	0	1	80	7	1	20	135	3	0	284	3307
4:20 PM	17	2	7	0	1	1	6	0	3	118	7	0	17	138	5	0	322	3368
4:25 PM	24	3	9	0	2	1	3	0	1	101	13	2	12	112	5	0	288	3385
4:30 PM	13	2	10	0	1	1	6	0	1	96	11	1	21	151	5	1	320	3433
4:35 PM	17	1	13	0	0	2	9	0	2	77	11	0	18	135	4	0	289	3462
4:40 PM	13	4	8	0	2	1	4	0	0	78	5	0	18	150	0	0	283	3500
4:45 PM	21	1	7	0	1	1	6	0	3	78	12	0	22	117	4	0	273	3469
4:50 PM	29	5	12	0	1	2	5	0	2	81	10	0	22	118	1	0	288	3501
4:55 PM	22	0	11	0	1	0	6	0	2	118	9	0	13	127	4	0	313	3523
5:00 PM	23	0	12	0	1	1	2	0	3	82	7	0	21	112	6	0	270	3505
5:05 PM	23	2	13	0	5	0	7	0	2	102	5	0	19	99	4	0	281	3508
5:10 PM	19	0	19	0	1	1	6	0	0	92	9	1	21	142	0	0	311	3522
5:15 PM	14	1	15	0	1	0	1	0	3	98	9	0	15	130	4	0	291	3529
5:20 PM	17	1	8	0	4	0	4	0	0	83	7	1	15	124	2	0	266	3473
5:25 PM	19	3	5	0	3	0	2	0	2	94	9	1	18	132	4	0	292	3477
5:30 PM	14	0	9	0	2	0	3	0	2	98	10	2	22	132	1	0	295	3452
5:35 PM	21	1	9	0	0	2	6	0	5	94	7	1	20	139	6	0	311	3474
5:40 PM	21	2	14	0	1	3	3	0	2	100	7	0	12	137	5	0	307	3498
5:45 PM	16	2	12	0	2	3	4	0	0	70	12	0	16	142	4	0	283	3508
5:50 PM	15	1	15	0	0	0	5	0	1	77	9	0	29	124	2	0	278	3498
5:55 PM	26	0	15	0	0	2	5	0	2	86	10	0	7	101	3	0	257	3442

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	224	12	128	0	12	20	48	0	36	1168	96	12	216	1632	48	0	3652
Heavy Trucks	4	0	0		0	0	4		0	72	4		0	64	8		156
Pedestrians		0				0				4				0			4
Bicycles	1	0	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 11:01 AM

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

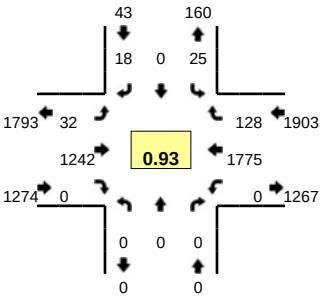
Type of peak hour being reported: User-Defined

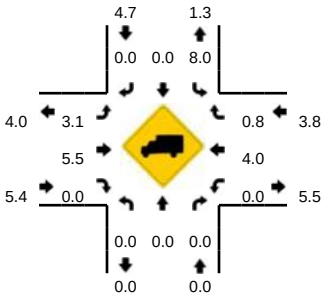
Method for determining peak hour: Total Entering Volume

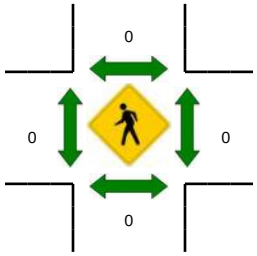
LOCATION: Vittoria Way -- OR 99W
CITY/STATE: Newberg, OR

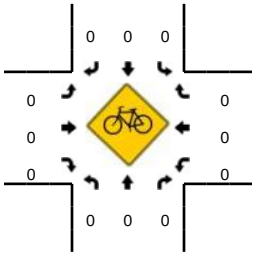
QC JOB #: 14505606
DATE: Thu, Sep 14 2017

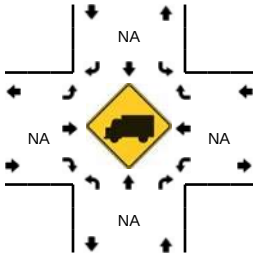
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

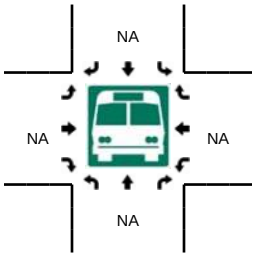












5-Min Count Period Beginning At	Vittoria Way (Northbound)				Vittoria Way (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	1	0	1	0	2	98	0	0	0	133	5	0	240	2850
4:05 PM	0	0	0	0	0	0	2	0	1	95	0	0	0	140	10	0	248	2876
4:10 PM	0	0	0	0	2	0	2	0	1	103	0	0	0	167	5	0	280	2938
4:15 PM	0	0	0	0	2	0	2	0	1	76	0	0	0	154	3	0	238	2917
4:20 PM	0	0	0	0	1	0	2	0	3	107	0	0	0	144	10	0	267	2937
4:25 PM	0	0	0	0	1	0	0	0	0	117	0	0	0	139	6	0	263	2976
4:30 PM	0	0	0	0	0	0	1	0	2	115	0	0	0	172	11	0	301	3061
4:35 PM	0	0	0	0	2	0	1	0	1	87	0	0	0	147	12	0	250	3071
4:40 PM	0	0	0	0	1	0	0	0	1	91	0	0	0	156	14	0	263	3111
4:45 PM	0	0	0	0	0	0	3	0	0	88	0	0	0	157	10	0	258	3127
4:50 PM	0	0	0	0	2	0	0	0	2	88	0	0	0	148	11	0	251	3134
4:55 PM	0	0	0	0	1	0	1	0	1	107	0	0	0	139	8	0	257	3116
5:00 PM	0	0	0	0	3	0	0	0	1	101	0	0	0	129	15	0	249	3125
5:05 PM	0	0	0	0	0	0	3	0	3	116	0	0	0	134	9	0	265	3142
5:10 PM	0	0	0	0	1	0	0	0	8	112	0	0	0	158	13	0	292	3154
5:15 PM	0	0	0	0	3	0	0	0	4	112	0	0	0	142	10	0	271	3187
5:20 PM	0	0	0	0	4	0	3	0	5	96	0	0	0	146	7	0	261	3181
5:25 PM	0	0	0	0	5	0	2	0	2	84	0	0	0	148	9	0	250	3168
5:30 PM	0	0	0	0	1	0	1	0	2	105	0	0	0	158	14	0	281	3148
5:35 PM	0	0	0	0	3	0	3	0	1	88	0	0	0	176	8	0	279	3177
5:40 PM	0	0	0	0	2	0	2	0	3	145	0	0	0	140	14	0	306	3220
5:45 PM	0	0	0	0	3	0	1	0	1	82	0	0	0	161	7	0	255	3217
5:50 PM	0	0	0	0	1	0	3	0	1	88	0	0	0	151	5	0	249	3215
5:55 PM	0	0	0	0	1	0	0	0	2	94	0	0	0	123	6	0	226	3184

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	24	0	24	0	24	1352	0	0	0	1896	144	0	3464
Heavy Trucks	0	0	0		0	0	0		0	72	0		0	76	0		148
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 6/5/2018 11:01 AM

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

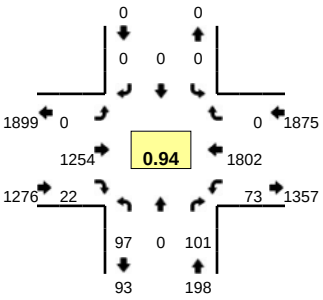
Type of peak hour being reported: User-Defined

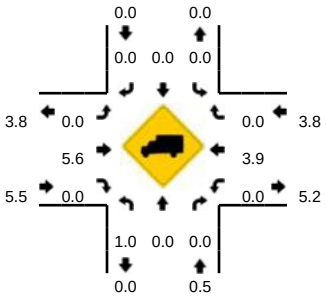
Method for determining peak hour: Total Entering Volume

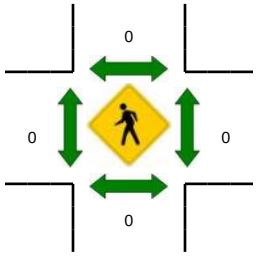
LOCATION: Providence Dr -- OR 99W
CITY/STATE: Newberg, OR

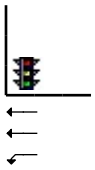
QC JOB #: 14505608
DATE: Thu, Sep 14 2017

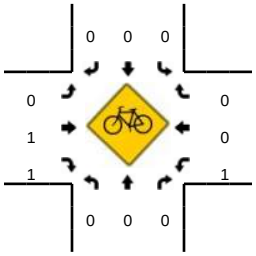
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

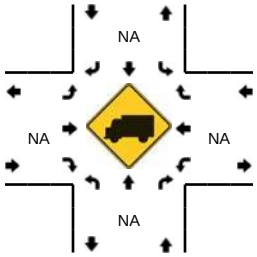


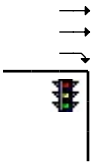


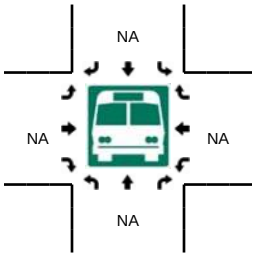












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	8	0	2	0	0	0	0	0	0	98	6	0	6	133	0	0	253	2940
4:05 PM	10	0	5	0	0	0	0	0	0	93	4	0	7	137	0	0	256	2965
4:10 PM	22	0	11	0	0	0	0	0	0	101	5	0	7	149	0	0	295	3032
4:15 PM	6	0	5	0	0	0	0	0	0	77	2	0	7	157	0	0	254	3028
4:20 PM	7	0	5	0	0	0	0	0	0	106	0	0	8	140	0	0	266	3033
4:25 PM	7	0	5	0	0	0	0	0	0	117	0	0	2	142	0	0	273	3076
4:30 PM	9	0	9	0	0	0	0	0	0	115	1	0	5	169	0	0	308	3155
4:35 PM	10	0	10	0	0	0	0	0	0	91	2	0	5	154	0	0	272	3173
4:40 PM	11	0	8	0	0	0	0	0	0	92	2	0	6	151	0	0	270	3223
4:45 PM	11	0	4	0	0	0	0	0	0	87	1	0	4	156	0	0	263	3238
4:50 PM	8	0	4	0	0	0	0	0	0	85	2	0	2	153	0	0	254	3242
4:55 PM	6	0	9	0	0	0	0	0	0	105	1	0	7	139	0	0	267	3231
5:00 PM	9	0	4	0	0	0	0	0	0	99	2	0	3	138	0	2	257	3235
5:05 PM	11	0	14	0	0	0	0	0	0	117	1	0	6	132	0	0	281	3260
5:10 PM	5	0	11	0	0	0	0	0	0	121	3	0	9	165	0	0	314	3279
5:15 PM	12	0	16	0	0	0	0	0	0	116	2	0	8	140	0	0	294	3319
5:20 PM	9	0	9	0	0	0	0	0	0	94	4	0	6	142	0	0	264	3317
5:25 PM	6	0	11	0	0	0	0	0	0	93	2	0	6	154	0	0	272	3316
5:30 PM	11	0	2	0	0	0	0	0	0	100	0	0	7	161	0	0	281	3289
5:35 PM	6	0	7	0	0	0	0	0	0	91	1	0	8	173	0	0	286	3303
5:40 PM	3	0	10	0	0	0	0	0	0	146	3	0	5	149	0	0	316	3349
5:45 PM	1	0	2	0	0	0	0	0	0	86	1	0	4	170	0	0	264	3350
5:50 PM	9	0	5	0	0	0	0	0	0	90	1	0	0	146	0	0	251	3347
5:55 PM	5	0	6	0	0	0	0	0	0	91	3	0	7	121	0	0	233	3313

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	112	0	164	0	0	0	0	0	0	1416	24	0	92	1748	0	0	3556
Heavy Trucks	0	0	0		0	0	0		0	108	0		0	68	0		176
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	1	0		1	0	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 11:01 AM

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

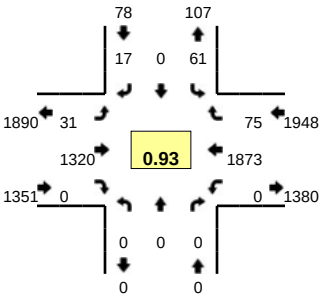
Type of peak hour being reported: User-Defined

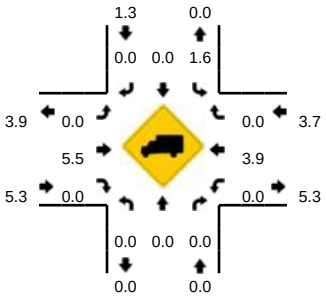
Method for determining peak hour: Total Entering Volume

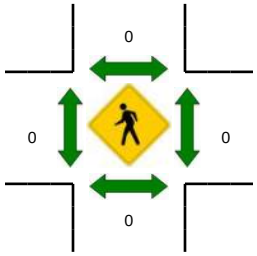
LOCATION: NE Benjamin Rd -- OR 99W
CITY/STATE: Newberg, OR

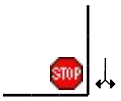
QC JOB #: 14505610
DATE: Thu, Sep 14 2017

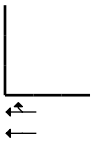
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

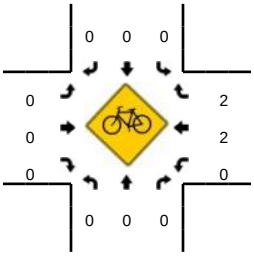


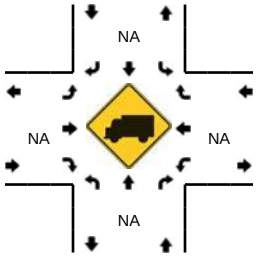


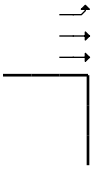


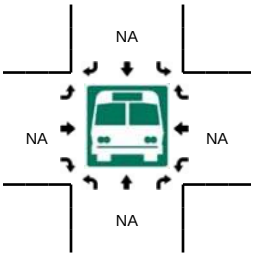












5-Min Count Period Beginning At	NE Benjamin Rd (Northbound)				NE Benjamin Rd (Southbound)				OR 99W (Eastbound)				OR 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	1	0	2	105	0	0	0	137	4	0	249	2869
4:05 PM	0	0	0	0	8	0	1	0	1	103	0	0	0	150	11	0	274	2932
4:10 PM	0	0	0	0	3	0	1	0	2	114	0	0	0	151	2	0	273	2975
4:15 PM	0	0	0	0	2	0	1	0	1	82	0	0	0	168	8	0	262	3002
4:20 PM	0	0	0	0	3	0	1	0	1	105	0	0	0	128	7	0	245	2982
4:25 PM	0	0	0	0	1	0	0	0	2	100	0	0	0	160	6	0	269	3025
4:30 PM	0	0	0	0	3	0	0	0	2	126	0	0	0	166	5	0	302	3086
4:35 PM	0	0	0	0	3	0	3	0	0	110	0	0	0	155	6	0	277	3114
4:40 PM	0	0	0	0	5	0	0	0	0	108	0	0	0	164	4	0	281	3171
4:45 PM	0	0	0	0	3	0	1	0	1	92	0	0	0	186	4	0	287	3222
4:50 PM	0	0	0	0	5	0	1	0	3	85	0	0	0	139	1	0	234	3220
4:55 PM	0	0	0	0	5	0	0	0	1	105	0	0	0	131	7	0	249	3202
5:00 PM	0	0	0	0	3	0	6	0	4	106	0	0	0	139	5	0	263	3216
5:05 PM	0	0	0	0	3	0	0	0	3	124	0	0	0	133	4	0	267	3209
5:10 PM	0	0	0	0	6	0	0	0	1	128	0	0	0	178	7	0	320	3256
5:15 PM	0	0	0	0	2	0	1	0	3	137	0	0	0	153	10	0	306	3300
5:20 PM	0	0	0	0	4	0	0	0	6	104	0	0	0	164	8	0	286	3341
5:25 PM	0	0	0	0	5	0	4	0	2	96	0	0	0	168	5	0	280	3352
5:30 PM	0	0	0	0	7	0	2	0	0	97	0	0	0	150	10	0	266	3316
5:35 PM	0	0	0	0	7	0	1	1	3	102	0	0	0	172	8	0	294	3333
5:40 PM	0	0	0	0	10	0	1	0	4	144	0	0	0	160	6	0	325	3377
5:45 PM	0	0	0	0	1	0	2	0	3	78	0	0	0	165	5	0	254	3344
5:50 PM	0	0	0	0	3	0	2	0	1	105	0	0	0	140	3	0	254	3364
5:55 PM	0	0	0	0	1	0	3	0	2	100	0	0	0	133	7	0	246	3361

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	48	0	4	0	40	1476	0	0	0	1980	100	0	3648
Heavy Trucks	0	0	0		0	0	0		0	80	0		0	84	0		164
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	1	1		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 11:01 AM

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

Appendix C
Year 2017 Existing Conditions
Level of Service Worksheets

Intersection: Pacific Highway/Providence Drive

Scenario: Weekday AM Peak 15 minutes + 15 min

Saturation Flow Summary (7:25 - 7:55 AM)

Westbound

start	end	Green Time (seconds)	Number of Vehicles	Number of headways	Flow Rate (Calculated)	Notes	Flow Rate (Usable)
7:27:14	7:27:16	0:00:02	2	1	1800		1800
7:29:14	7:29:21	0:00:07	4	3	1543		1543
7:31:12	7:31:20	0:00:08	5	4	1800		1800
7:35:12	7:35:26	0:00:14	8	7	1800		1800
7:37:08	7:37:15	0:00:07	4	3	1543		1543
7:39:11	7:39:21	0:00:10	5	4	1440		1440
7:43:08	7:43:10	0:00:02	2	1	1800		1800
7:49:15	7:49:23	0:00:08	4	3	1350	truck	
7:53:08	7:53:15	0:00:07	5	4	2057		2057
		0:00:00					
		0:00:00					
		0:00:00					
		0:00:00					
		0:00:00					
	Average Saturation Flow Rate ***				**1681**		**1723**

All observations based on queue lengths of 5 vehicles or greater, and based on the 4th vehicle to enter the intersection after beginning of green

Intersection: Pacific Highway/Providence Drive

Scenario: Weekday PM Peak 15 minutes + 15 min

Saturation Flow Summary (5:05 - 5:35 PM)

Westbound

start	end	Green Time (seconds)	Number of Vehicles	Number of headways	Flow Rate (Calculated)	Notes	Flow Rate (Usable)
17:06:23	17:06:39	0:00:16	9	8	1800		1800
17:08:53	17:09:17	0:00:24	11	10	1500		1500
17:10:53	17:11:01	0:00:08	4	3	1350	truck	
17:13:29	17:13:46	0:00:17	9	8	1694		1694
17:15:43	17:15:47	0:00:04	3	2	1800		1800
17:20:28	17:20:33	0:00:05	4	3	2160		2160
17:22:42	17:22:49	0:00:07	4	3	1543		1543
17:25:05	17:25:10	0:00:05	3	2	1440		1440
17:27:23	17:27:30	0:00:07	4	3	1543		1543
17:29:47	17:29:58	0:00:11	6				
17:32:09	17:32:17	0:00:08	5				
17:34:32	17:34:42	0:00:10	6				
		0:00:00					
		0:00:00					
	Average Saturation Flow Rate ***				**1648**		**1685**

All observations based on queue lengths of 5 vehicles or greater, and based on the 4th vehicle to enter the intersection after beginning of green

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Springbrook/Crestview
Agency or Co.	KAI	E/W Street Name	Crestview Dr
Date Performed	10/21/2017	N/S Street Name	Springbrook Rd
Analysis Year	2017	Analysis Time Period (hrs)	0.25
Time Period	Existing AM	Peak Hour Factor	0.66
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	2	54	8	69	0	4	9	7	2	64	314	3	1	7	349	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v_{PCE}), pc/h	3	89	14	108	0	6	14	11	3	99	495	5	2	13	550	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		214			31			602			784	
Entry Volume veh/h		202			31			581			746	
Circulating Flow (v_c), pc/h	574			691			121			125		
Exiting Flow (v_{ex}), pc/h	32			335			597			667		
Capacity (c_{pce}), pc/h		769			682			1220			1215	
Capacity (c), veh/h		724			682			1177			1155	
v/c Ratio (x)		0.28			0.05			0.49			0.65	

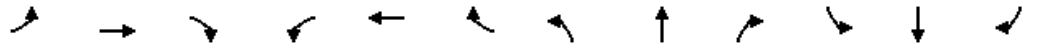
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.3			5.8			8.5			11.8	
Lane LOS		A			A			A			B	
95% Queue, veh		1.1			0.1			2.8			5.0	
Approach Delay, s/veh	8.3			5.8			8.5			11.8		
Approach LOS	A			A			A			B		
Intersection Delay, s/veh | LOS	10.0						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	3	5	8	11	6	5
Future Volume (Veh/h)	3	5	8	11	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	4	7	12	16	9	7
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			11		48	8
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			11		48	8
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1621		919	1081

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	11	28	16
Volume Left	0	12	9
Volume Right	7	0	7
cSH	1700	1621	983
Volume to Capacity	0.01	0.01	0.02
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	3.1	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	3.1	8.7
Approach LOS			A

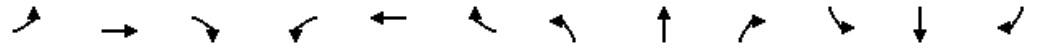
Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	17.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	174	37	13	15	66	230	5	16	336	69
Future Volume (vph)	61	27	174	37	13	15	66	230	5	16	336	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	210	45	16	18	80	277	6	19	405	83

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	106	210	79	80	283	19	488
Volume Left (vph)	73	0	45	80	0	19	0
Volume Right (vph)	0	210	18	0	6	0	83
Hadj (s)	0.42	-0.65	0.05	0.58	0.10	0.72	0.01
Departure Headway (s)	7.7	6.6	7.8	7.3	6.8	7.2	6.5
Degree Utilization, x	0.23	0.38	0.17	0.16	0.53	0.04	0.88
Capacity (veh/h)	448	519	423	471	501	480	547
Control Delay (s)	11.7	12.4	12.4	10.5	16.1	9.3	38.3
Approach Delay (s)	12.2		12.4	14.9		37.2	
Approach LOS	B		B	B		E	

Intersection Summary				
Delay	23.0			
Level of Service	C			
Intersection Capacity Utilization	48.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1242	75	81	754	150	179	140	99	425	120	70
Future Volume (vph)	43	1242	75	81	754	150	179	140	99	425	120	70
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	48	1396	84	91	847	169	201	157	111	478	135	79
RTOR Reduction (vph)	0	0	45	0	0	88	0	0	96	0	0	69
Lane Group Flow (vph)	48	1396	39	91	847	81	201	157	15	478	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.2	55.2	55.2	9.3	57.3	57.3	24.1	16.0	16.0	23.0	14.9	14.9
Effective Green, g (s)	7.2	55.2	55.2	9.3	57.3	57.3	24.1	16.0	16.0	23.0	14.9	14.9
Actuated g/C Ratio	0.06	0.46	0.46	0.08	0.48	0.48	0.20	0.13	0.13	0.19	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	94	1470	657	225	1498	669	601	218	189	594	195	174
v/s Ratio Prot	0.03	c0.44		0.03	c0.27		0.07	c0.10		c0.15	0.09	
v/s Ratio Perm			0.03			0.06			0.01			0.01
v/c Ratio	0.51	0.95	0.06	0.40	0.57	0.12	0.33	0.72	0.08	0.80	0.69	0.06
Uniform Delay, d1	54.7	31.1	18.0	52.7	22.4	17.4	41.1	49.9	45.5	46.4	50.4	46.3
Progression Factor	1.00	1.00	1.00	0.95	0.87	1.38	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	14.2	0.2	0.6	1.5	0.3	0.2	10.1	0.1	7.5	8.9	0.1
Delay (s)	57.5	45.3	18.2	50.8	21.0	24.3	41.3	59.9	45.6	53.9	59.3	46.4
Level of Service	E	D	B	D	C	C	D	E	D	D	E	D
Approach Delay (s)		44.2			23.9			48.5			54.1	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1601	43	70	922	28	58	3	87	11	5	27
Future Volume (vph)	19	1601	43	70	922	28	58	3	87	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	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	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.56	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		991	1361	
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)	21	1740	47	76	1002	30	63	3	95	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	86	0	0	26	0
Lane Group Flow (vph)	21	1740	34	76	1002	23	63	12	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.72	0.72	0.08	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2284	912	120	2375	982	108	137		96	132	
v/s Ratio Prot	0.01	c0.55		c0.05	0.33			0.01			0.01	
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.76	0.04	0.63	0.42	0.02	0.58	0.09		0.12	0.06	
Uniform Delay, d1	57.6	10.3	4.8	53.8	4.6	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.29	0.22	0.06	0.96	0.95	0.89	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	1.2	0.0	8.1	0.5	0.0	6.5	0.2		0.4	0.1	
Delay (s)	77.7	3.5	0.3	59.9	4.9	2.9	58.3	49.5		49.9	49.3	
Level of Service	E	A	A	E	A	A	E	D		D	D	
Approach Delay (s)		4.3			8.6			53.0			49.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	1650	1041	21	52	24
Future Vol, veh/h	4	1650	1041	21	52	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-2	2	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	4	8	5	0	0
Mvmt Flow	4	1774	1119	23	56	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1142	0	-	0	2027	571
Stage 1	-	-	-	-	1131	-
Stage 2	-	-	-	-	896	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	619	-	-	-	~ 51	469
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	364	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	619	-	-	-	~ 51	469
Mov Cap-2 Maneuver	-	-	-	-	165	-
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	362	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	619	-	-	-	207
HCM Lane V/C Ratio	0.007	-	-	-	0.395
HCM Control Delay (s)	10.9	-	-	-	33.3
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	1.8

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1651	51	62	1026	36	59
Future Volume (vph)	1651	51	62	1026	36	59
Ideal Flow (vphpl)	1750	1750	1750	1800	1750	1750
Grade (%)	-3%			2%	3%	
Total Lost time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3214	1480	1614	3135	1590	1465
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3214	1480	1614	3135	1590	1465
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1795	55	67	1115	39	64
RTOR Reduction (vph)	0	6	0	0	0	60
Lane Group Flow (vph)	1795	49	67	1115	39	4
Heavy Vehicles (%)	5%	2%	2%	8%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	87.1	87.1	9.8	102.9	8.1	8.1
Effective Green, g (s)	87.1	87.1	9.8	102.9	8.1	8.1
Actuated g/C Ratio	0.73	0.73	0.08	0.86	0.07	0.07
Clearance Time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	5.0	5.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	2332	1074	131	2688	107	98
v/s Ratio Prot	c0.56		c0.04	0.36	c0.02	
v/s Ratio Perm		0.03				0.00
v/c Ratio	0.77	0.05	0.51	0.41	0.36	0.04
Uniform Delay, d1	10.2	4.7	52.8	1.9	53.5	52.3
Progression Factor	1.30	0.61	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.1	4.4	0.5	2.9	0.3
Delay (s)	15.1	2.9	57.2	2.4	56.4	52.6
Level of Service	B	A	E	A	E	D
Approach Delay (s)	14.7			5.5	54.0	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1702	1077	29	62	6
Future Vol, veh/h	3	1702	1077	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	1792	1134	31	65	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1164	0	-	0	2051	582
Stage 1	-	-	-	-	1149	-
Stage 2	-	-	-	-	902	-
Critical Hdwy	4.76	-	-	-	6.46	6.7
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.53	-	-	-	3.53	3.3
Pot Cap-1 Maneuver	447	-	-	-	~ 60	477
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	391	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	447	-	-	-	~ 60	477
Mov Cap-2 Maneuver	-	-	-	-	181	-
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	388	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	34.7
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	447	-	-	-	191
HCM Lane V/C Ratio	0.007	-	-	-	0.375
HCM Control Delay (s)	13.1	-	-	-	34.7
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	1.6

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

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Springbrook/Crestview
Agency or Co.	KAI	E/W Street Name	Crestview Dr
Date Performed	10/21/2017	N/S Street Name	Springbrook Rd
Analysis Year	2017	Analysis Time Period (hrs)	0.25
Time Period	Existing PM	Peak Hour Factor	0.93
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	53	2	13	0	5	2	12	0	7	524	13	2	8	437	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	57	2	14	0	6	2	13	0	8	580	14	2	9	479	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		73			21			602			543	
Entry Volume veh/h		73			20			585			534	
Circulating Flow (v_c), pc/h	496			647			70			16		
Exiting Flow (v_{ex}), pc/h	25			63			652			499		
Capacity (c_{pce}), pc/h		832			714			1285			1358	
Capacity (c), veh/h		832			680			1249			1334	
v/c Ratio (x)		0.09			0.03			0.47			0.40	

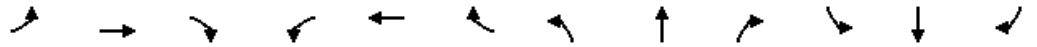
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.2			5.6			7.7			6.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.1			2.6			2.0	
Approach Delay, s/veh	5.2			5.6			7.7			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	7.0						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	11	5	9	13	8	14
Future Volume (Veh/h)	11	5	9	13	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	14	6	11	16	10	18
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			22		57	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			22		57	19
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1604		947	1063

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	20	27	28
Volume Left	0	11	10
Volume Right	6	0	18
cSH	1700	1604	1018
Volume to Capacity	0.01	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	3.0	8.6
Lane LOS		A	A
Approach Delay (s)	0.0	3.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	219	91	68	86	136	358	5	67	357	40
Future Volume (vph)	83	63	219	91	68	86	136	358	5	67	357	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	228	95	71	90	142	373	5	70	372	42

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	228	256	142	378	70	414
Volume Left (vph)	86	0	95	142	0	70	0
Volume Right (vph)	0	228	90	0	5	0	42
Hadj (s)	0.30	-0.68	-0.12	0.53	0.04	0.53	0.00
Departure Headway (s)	9.0	8.0	8.6	8.8	8.3	8.8	8.2
Degree Utilization, x	0.38	0.51	0.61	0.35	0.87	0.17	0.95
Capacity (veh/h)	379	428	395	398	426	399	426
Control Delay (s)	16.3	17.9	24.4	15.2	44.9	12.4	58.4
Approach Delay (s)	17.3		24.4	36.8		51.8	
Approach LOS	C		C	E		F	

Intersection Summary				
Delay	34.8			
Level of Service	D			
Intersection Capacity Utilization	59.5%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	1070	124	141	1350	300	374	179	124	391	212	86
Future Volume (vph)	104	1070	124	141	1350	300	374	179	124	391	212	86
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	106	1092	127	144	1378	306	382	183	127	399	216	88
RTOR Reduction (vph)	0	0	56	0	0	138	0	0	111	0	0	76
Lane Group Flow (vph)	106	1092	71	144	1378	168	382	183	16	399	216	12
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	12.5	77.8	77.8	11.7	77.0	77.0	15.1	17.7	17.7	16.3	18.9	18.9
Effective Green, g (s)	12.5	77.8	77.8	11.7	77.0	77.0	15.1	17.7	17.7	16.3	18.9	18.9
Actuated g/C Ratio	0.09	0.56	0.56	0.08	0.55	0.55	0.11	0.13	0.13	0.12	0.13	0.13
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	141	1743	800	238	1808	782	342	211	172	371	229	194
v/s Ratio Prot	c0.07	0.35		0.05	c0.42		0.12	0.11		c0.12	c0.13	
v/s Ratio Perm			0.05			0.12			0.01			0.01
v/c Ratio	0.75	0.63	0.09	0.61	0.76	0.22	1.12	0.87	0.09	1.08	0.94	0.06
Uniform Delay, d1	62.2	21.2	14.5	61.9	24.4	16.1	62.5	60.0	54.1	61.9	60.0	52.8
Progression Factor	1.00	1.00	1.00	0.96	1.16	3.14	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.7	1.7	0.2	2.2	2.0	0.4	84.1	28.6	0.1	68.3	43.5	0.1
Delay (s)	80.9	22.9	14.7	61.6	30.2	50.9	146.5	88.6	54.2	130.2	103.5	52.9
Level of Service	F	C	B	E	C	D	F	F	D	F	F	D
Approach Delay (s)		26.8			36.2			114.3			112.3	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	57.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1120	101	220	1509	41	243	16	134	21	10	51
Future Volume (vph)	32	1120	101	220	1509	41	243	16	134	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1442		1674	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.52	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1442		911	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1167	105	229	1572	43	253	17	140	22	10	53
RTOR Reduction (vph)	0	0	40	0	0	13	0	110	0	0	42	0
Lane Group Flow (vph)	33	1167	65	229	1572	30	253	47	0	22	21	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Effective Green, g (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.04	0.54	0.54	0.16	0.66	0.66	0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	63	1661	750	262	2096	886	264	312		197	318	
v/s Ratio Prot	0.02	c0.38		c0.14	c0.49			0.03			0.01	
v/s Ratio Perm			0.05			0.02	c0.21			0.02		
v/c Ratio	0.52	0.70	0.09	0.87	0.75	0.03	0.96	0.15		0.11	0.07	
Uniform Delay, d1	66.0	24.3	15.9	57.5	16.3	8.5	54.2	44.4		44.0	43.6	
Progression Factor	0.81	1.07	1.81	0.95	0.80	0.29	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	1.7	0.2	19.9	1.8	0.1	43.5	0.2		0.2	0.1	
Delay (s)	57.2	27.7	28.8	74.5	14.9	2.5	97.7	44.6		44.2	43.7	
Level of Service	E	C	C	E	B	A	F	D		D	D	
Approach Delay (s)		28.6			22.0			77.4			43.8	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	1250	1775	128	26	18
Future Vol, veh/h	32	1250	1775	128	26	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-2	2	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	3	5	4	1	8	0
Mvmt Flow	34	1344	1909	138	28	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2046	0	-	0	2718	1023
Stage 1	-	-	-	-	1977	-
Stage 2	-	-	-	-	741	-
Critical Hdwy	4.16	-	-	-	6.96	6.9
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	2.23	-	-	-	3.58	3.3
Pot Cap-1 Maneuver	268	-	-	-	~ 15	237
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	417	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	268	-	-	-	~ 13	237
Mov Cap-2 Maneuver	-	-	-	-	68	-
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	364	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	74.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	268	-	-	-	96
HCM Lane V/C Ratio	0.128	-	-	-	0.493
HCM Control Delay (s)	20.4	-	-	-	74.5
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0.4	-	-	-	2.2

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑	↰	↱
Traffic Volume (vph)	1254	22	73	1806	97	101
Future Volume (vph)	1254	22	73	1806	97	101
Ideal Flow (vphpl)	1750	1750	1750	1800	1750	1750
Grade (%)	-3%			2%	3%	
Total Lost time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3184	1479	1646	3256	1621	1465
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3184	1479	1646	3256	1621	1465
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1334	23	78	1921	103	107
RTOR Reduction (vph)	0	3	0	0	0	95
Lane Group Flow (vph)	1334	20	78	1921	103	12
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	6%	0%	0%	4%	1%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	96.9	96.9	12.9	115.8	15.2	15.2
Effective Green, g (s)	96.9	96.9	12.9	115.8	15.2	15.2
Actuated g/C Ratio	0.69	0.69	0.09	0.83	0.11	0.11
Clearance Time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	5.0	5.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	2203	1023	151	2693	175	159
v/s Ratio Prot	0.42		0.05	c0.59	c0.06	
v/s Ratio Perm		0.01				0.01
v/c Ratio	0.61	0.02	0.52	0.71	0.59	0.07
Uniform Delay, d1	11.4	6.7	60.6	5.1	59.4	56.1
Progression Factor	0.79	1.03	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.0	3.9	1.6	5.9	0.3
Delay (s)	10.0	7.0	64.5	6.7	65.3	56.3
Level of Service	B	A	E	A	E	E
Approach Delay (s)	10.0			9.0	60.7	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	1320	1873	75	61	17
Future Vol, veh/h	31	1320	1873	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1419	2014	81	66	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2095	0	-	0	2830	1047
Stage 1	-	-	-	-	2054	-
Stage 2	-	-	-	-	776	-
Critical Hdwy	4.1	-	-	-	6.44	6.7
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.2	-	-	-	3.52	3.3
Pot Cap-1 Maneuver	267	-	-	-	~ 19	242
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	452	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	267	-	-	-	~ 17	242
Mov Cap-2 Maneuver	-	-	-	-	81	-
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	396	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	142
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	267	-	-	-	95
HCM Lane V/C Ratio	0.125	-	-	-	0.883
HCM Control Delay (s)	20.4	-	-	-	142
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0.4	-	-	-	5

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

Appendix D
ODOT Crash Data

CITY OF NEWBERG, YAMHILL COUNTY

Springbrook Rd & Crestview Dr

January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	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
00762	Y	N	N	N	N	09/01/2013	16	CRESTVIEW DR	INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT										040,001	01
CITY						Sun 1P	0	SPRINGBROOK RD	S		UNKNOWN	Y	DRY	FIX		PRVTE	N S									000	040	00
No						*45 18 55.04* *-122 56 45.33*		1	05	4		N	DAY	FAT		MTRCYCLE		01	DRVR	KILL	72	F	OR-Y OR<25		047,081	000	001	01
00109	N	N	N			02/12/2013	17	CRESTVIEW DR	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07
NONE						Tue 9P	0	SPRINGBROOK RD	S		YIELD	Y	DRY	REAR		PRVTE	S N									000		00
No						*45 18 55.04* *-122 56 45.33*		1	06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y OR<25		026	000		07
															02	NONE 0	STOP											
																PRVTE	S N									011		00
																PSNGR CAR		01	DRVR	NONE	46	M	OR-Y OR<25		000	000		00

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

Libra St & Crestview Dr
January 1, 2011 through December 31, 2015

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:														
TOTAL														
FINAL TOTAL														

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 NEWBERG, YAMHILL COUNTY — N Springbrook Rd & Haworth Ave

January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / LAT/LONG	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	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
00274	N	N	N	N	N	03/27/2012	17	HAWORTH AVE	INTER	CROSS	N	N	CLR	PED	01	NONE 0	TURN-L										02
CITY						Tue 2P	0	SPRINGBROOK RD	N		STOP SIGN	N	DRY	PED		PRVTE	E S									000	00
No						*45 18 28.71* *-122 56 48.98*		1	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	33	M	OR-Y OR<25		029	000		02
																	STRGHT N S	01	CONV	INJB	53	M		01	000	000		00
00286	N	N	N			03/31/2012	17	HAWORTH AVE	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Sat 4P	0	SPRINGBROOK RD	S		UNKNOWN	N	DRY	REAR		PRVTE	S N									000	00
No						*45 18 28.71* *-122 56 48.98*		1	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y OR<25		026	000		07
															02	NONE 0	STOP											
																PRVTE	S N									011	00
																PSNGR CAR		01	DRVR	NONE	17	F	OR-Y OR<25		000	000		00
01227	N	N	N	N	N	11/16/2014	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											03
CITY						Sun 3P	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	TURN		PRVTE	N S									000	00
No						*45 18 28.71* *-122 56 48.98*		1	01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	57	F	OTH-Y N-RES		021	000		03
															02	NONE 0	TURN-L											
																PRVTE	S W									000	00
																PSNGR CAR		01	DRVR	NONE	55	M	OR-Y OR<25		000	000		00
00505	N	N	N			06/17/2013	17	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
NO RPT						Mon 2P	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	TURN		PRVTE	N S									000	00
No						*45 18 28.71* *-122 56 48.98*		1	03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	77	M	OR-Y OR<25		028	000		02
															02	NONE 0	TURN-R											
																PRVTE	W S									000	00
																PSNGR CAR		01	DRVR	NONE	78	F	OR-Y OR<25		000	000		00
00038	N	N	N			01/11/2014	17	HAWORTH AVE	INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
NO RPT						Sat 7P	0	SPRINGBROOK RD	CN		STOP SIGN	N	WET	ANGL		PRVTE	W E									000	00
No						*45 18 28.71* *-122 56 48.98*		1	03	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y OR<25		028	000		02
															02	NONE 0	STRGHT											
																PRVTE	N S									000	00
																PSNGR CAR		01	DRVR	NONE	68	M	OR-Y OR<25		000	000		00
00685	N	N	N	N	N	06/24/2014	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
CITY						Tue 9A	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE	N S									000	00
No						*45 18 28.71* *-122 56 48.98*		1	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y OR<25		028	000		02
															02	NONE 0	STRGHT											
																PRVTE	W E									000	00
																PSNGR CAR		01	DRVR	INJC	41	M	OR-Y OR<25		000	000		00

CITY OF NEWBERG, YAMHILL COUNTY

N Springbrook Rd & Haworth Ave

January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	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
00578	N	N	N			07/05/2013	17	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
NO RPT						Fri 4P	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W E									000		00
No	*45 18 28.71*					*-122 56 48.98*		1	04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	58	F	OR-Y OR<25		028	000		02
																		02	PSNG	NO<5	04	M			000	000		00
															02	NONE 0	STRGHT											
																PRVTE	S N									000		00
																PSNGR CAR		01	DRVR	NONE	75	F	OR-Y OR<25		000	000		00

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED / ALCOHOL / DRUGS	DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	CONN #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / 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
00029	N N N N N	01/10/2012	YAMHILL	1 14			INTER	CROSS	N	N	CLR	PED	01	NONE 0	TURN-R											02
CITY		Tue 3P	NEWBERG	MN 0	PACIFIC HY 99W		UN		TRF SIGNAL	N	DRY	PED		PRVTE	W S										000		00
			NEWBERG UA	22.03	SPRINGBROOK RD		05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	71	F	OR-Y		029	026		02
No	45 18 23.12	-122 56 48.94		009100100	S00	1															OR<25					
															STRGHT	01	PED	INJB	14	F		01	000	035		00
															W E											
00178	N N N	02/24/2012	YAMHILL	1 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Fri 9P	NEWBERG	MN 0	PACIFIC HY 99W		E		TRF SIGNAL	N	DRY	REAR		PRVTE	E W										000		00
			NEWBERG UA	22.03	SPRINGBROOK RD		06	2		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	50	M	OR-Y		026	000		07
No	45 18 23.12	-122 56 48.94		009100100	S00	1															OR<25					
													02	NONE 0	STOP											
														PRVTE	E W									011		00
														PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		000	000		00
																					OR<25					
00248	N N N	03/19/2012	YAMHILL	1 14			INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	27
NO RPT		Mon 7A	NEWBERG	MN 0	PACIFIC HY 99W		W		TRF SIGNAL	N	WET	REAR		PRVTE	W E										000		00
			NEWBERG UA	22.03	SPRINGBROOK RD		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	29	M	OR-Y		026	000		07
No	45 18 23.12	-122 56 48.94		009100100	S00	1															OR<25					
													02	NONE	STOP											
														PRVTE	W E									011	013	00
														PSNGR CAR		01	DRVR	NONE	73	M	OR-Y		000	000		00
																					OR<25					
													03	NONE 0	STOP											
														PRVTE	W E									011		00
														PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		000	000		00
																					OR<25					
00319	N N N N N	04/18/2013	YAMHILL	1 14			INTER	CROSS	N	N	CLR	S-OTHER	01	NONE 0	TURN-L											05
CITY		Thu 8P	NEWBERG	MN 0	PACIFIC HY 99W		UN		TRF SIGNAL	N	DRY	TURN		PRVTE	N E										000		00
			NEWBERG UA	22.05	SPRINGBROOK RD		05	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	69	M	OR-Y		080	000		05
No	45 18 23.12	-122 56 48.94		009100100	S00	1															OR<25					
													02	NONE 0	TURN-L											
														PRVTE	N E									000		00
														PSNGR CAR		01	DRVR	NONE	42	M	OR-Y		000	000		00
																					OR<25					
																02	PSNG	INJC	41	F			000	000		00
																03	PSNG	INJC	12	F			000	000		00
00732	N N N	09/11/2011	YAMHILL	1 14			INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											13
NONE		Sun 7P	NEWBERG	MN 0	PACIFIC HY 99W		NE		TRF SIGNAL	N	DRY	SS-O		PRVTE	SW NE										000		00
			NEWBERG UA	22.05	SPRINGBROOK RD		05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		045	000		13
No	45 18 23.12	-122 56 48.94		009100100	S00	1															OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHOOL BUS	WORK ZONE	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD 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	STRGHT SW NE									000	00
																	PSNGR CAR		01	DRVR	NONE	31	F	OR-Y OR<25		000	000	00
00516 NONE	N	N	N			07/07/2011 Thu 8A	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS 4	N TRF SIGNAL	N N	UNK UNK	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT NE SW										000	07 00
							NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y UNK	026		000	07
No						*45 18 23.12 -122 56 48.94*		009100100S00	1																			
																02	NONE 0 PRVTE	STOP NE SW									011	00
																	PSNGR CAR		01	DRVR	NONE	60	M	OR-Y OR<25		000	000	00
00692 NONE	N	N	N			08/26/2011 Fri 3P	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS 4	N TRF SIGNAL	N N	CLR DRY	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT NE SW										000	07 00
							NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	39	M	OR-Y OR<25	026		000	07
No						*45 18 23.12 -122 56 48.94*		009100100S00	1																			
																02	NONE 0 PRVTE	STOP NE SW									011	00
																	PSNGR CAR		01	DRVR	NONE	25	F	OR-Y OR<25		000	000	00
																			02	PSNG	NO<5	02	F			000	000	00
																			03	PSNG	NO<5	01	M			000	000	00
01087 NONE	N	N	N			12/23/2011 Fri 5P	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS 4	N TRF SIGNAL	N N	CLR DRY	S-1STOP REAR	01	NONE 0 UNKN	BACK SW NE										000	10 00
							NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y UNK	011		000	10
No						*45 18 23.12 -122 56 48.94*		009100100S00	1																			
																02	NONE 0 PRVTE	STOP NE SW									011	00
																	PSNGR CAR		01	DRVR	NONE	25	F	OR-Y OR<25		000	000	00
00690 NO RPT	N	N	N			08/11/2012 Sat 11A	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS 4	N TRF SIGNAL	N N	CLR DRY	S-1TURN TURN	01	NONE 0 PRVTE	STRGHT NE SW										000	13 00
							NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	24	F	OR-Y OR<25	045		000	13
No						*45 18 23.12 -122 56 48.94*		009100100S00	1																			
																02	NONE 0 PRVTE	TURN-L NE S									000	00
																	PSNGR CAR		01	DRVR	NONE	74	M	OR-Y OR>25		000	000	00
00851 NO RPT	N	N	N			09/28/2012 Fri 2P	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS 4	N TRF SIGNAL	N N	CLR DRY	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT NE SW										000	07 00
							NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25	026		000	07
No						*45 18 23.12 -122 56 48.94*		009100100S00	1																			

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SP ED / EA RS / DL UC / CH WO / SL RK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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	STOP NE SW									011		00
													PSNGR CAR		01	DRVR	NONE	86	M	OR-Y OR<25		000	000		00
01210 NO RPT	N N N	12/27/2012 Thu 9P	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS	N TRF SIGNAL	N	N CLR N DRY	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT NE SW									000		27 00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y OR<25		016,026	038		27
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1										02	PSNG	NO<5	04	M			000	000		00
												02	NONE 0 PRVTE	STOP NE SW									011		00
													PSNGR CAR		01	DRVR	NONE	47	M	OR-Y OR<25		000	000		00
00766 NO RPT	N N N	09/02/2013 Mon 5P	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS	N TRF SIGNAL	N	N CLR N DRY	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT NE SW									000		07 00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y OR<25		026	000		07
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1							02	NONE 0 PRVTE	STOP NE SW									011		00
													PSNGR CAR		01	DRVR	INJC	52	F	OR-Y OR<25		000	000		00
															02	PSNG	INJC	17	F			000	000		00
00947 NONE	N N N	10/26/2013 Sat 10A	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS	N L-GRN-SIG	N	N CLR N DRY	S-1STOP REAR	01	NONE 0 PRVTE	TURN-L NE S									000		07 00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	48	M	OR-Y OR>25		026	000		07
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1							02	NONE 0 PRVTE	STOP NE SW									012		00
													PSNGR CAR		01	DRVR	INJC	24	M	OR-Y OR<25		000	000		00
															02	PSNG	INJC	23	F			000	000		00
00636 NONE	N N N	06/11/2014 Wed 8A	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS	N TRF SIGNAL	N	N CLR N DRY	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT NE SW									000	004	07 00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y OR<25		026	000		07
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1							02	NONE 0 PRVTE	STOP NE SW									011	004	00
													PSNGR CAR		01	DRVR	NONE	65	M	OR-Y OR<25		000	000		00
00630 NONE	N N N	06/12/2014 Thu 12P	YAMHILL NEWBERG	1 14 MN 0	PACIFIC HY 99W	INTER NE	CROSS	N TRF SIGNAL	N	N CLR N DRY	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT NE SW									000		07 00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y OR<25		026	000		07
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1																				

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHL BUS	WORK ZONE	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC CONN # FIRST STREET SECOND STREET INTERSECTION	SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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	STOP NE SW									011		00
																		PSNGR CAR		01	DRVR	NONE	53	M	OR-Y OR<25		000	000		00
00715	N	N	N			07/03/2014	YAMHILL	1 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT													07
NONE						Thu 6P	NEWBERG	MN 0	PACIFIC HY 99W		NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							NEWBERG UA	22.05	SPRINGBROOK RD		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	56	F	OR-Y OR<25		026	000		07
No						*45 18 23.12 -122 56 48.94*		009100100	S00	1																					
																	02	NONE 0 PRVTE	STOP NE SW									011		00
																		PSNGR CAR		01	DRVR	INJC	63	F	OR-Y OR<25		000	000		00
																				02	PSNG	INJC	22	F			000	000		00
00773	N	N	N	N	N	07/17/2014	YAMHILL	1 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT													07
STATE						Thu 4P	NEWBERG	MN 0	PACIFIC HY 99W		NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							NEWBERG UA	22.05	SPRINGBROOK RD		06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y OR<25		000,026	000		00,07
No						*45 18 23.12 -122 56 48.94*		009100100	S00	1																					
																	02	NONE 0 PRVTE	STOP NE SW									011		00
																		PSNGR CAR		01	DRVR	INJC	50	M	OR-Y OR<25		000	000		00
01266	N	N	N			11/21/2014	YAMHILL	1 14			INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT													29
NONE						Fri 4P	NEWBERG	MN 0	PACIFIC HY 99W		NE		TRF SIGNAL	N	WET	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	22.05	SPRINGBROOK RD		06	2		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	49	M	OR-Y OR<25		026	000		29
No						*45 18 23.12 -122 56 48.94*		009100100	S00	1																					
																	02	NONE 0 PRVTE	STOP SW NE									011		00
																		PSNGR CAR		01	DRVR	NONE	38	F	OR-Y OR<25		000	000		00
00541	N	N	N			06/08/2015	YAMHILL	1 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT													29
NONE						Mon 4P	NEWBERG	MN 0	PACIFIC HY 99W		NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							NEWBERG UA	22.05	SPRINGBROOK RD		06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	36	F	OR-Y OR<25		026	000		29
No						*45 18 23.12 -122 56 48.94*		009100100	S00	1																					
																	02	NONE 0 PRVTE	STOP NE SW									011		00
																		PSNGR CAR		01	DRVR	INJC	51	F	OR-Y OR<25		000	000		00
00858	N	N	N			08/24/2015	YAMHILL	1 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT													29
CITY						Mon 7P	NEWBERG	MN 0	PACIFIC HY 99W		NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							NEWBERG UA	22.05	SPRINGBROOK RD		06	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y OR<25		026	026		29
No						*45 18 23.12 -122 56 48.94*		009100100	S00	1																					

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALC	SCH	WRK	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC CONN # FIRST STREET SECOND STREET INTERSECTION SEQ#	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CNTL	OFFRD 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	STOP NE SW								011		00
																PSNGR CAR		01	DRVR	NONE	34	M	OR-Y OR<25		000	000		00
00124 CITY	Y	N	N	N	02/19/2011 Sat 2P	YAMHILL NEWBERG NEWBERG UA	1 14 MN 0 22.05	PACIFIC HY 99W SPRINGBROOK RD	INTER E 05	CROSS 2	N TRF SIGNAL	N N	CLD DRY DAY	ANGL-OTH TURN PDO	01	NONE 0 PRVTE PSNGR CAR	U-TURN E E	01	DRVR	NONE	32	M	OR-Y OR<25	008		000 000		08,01 00 08,01
No	*45 18 23.12 -122 56 48.94*						009100100S00		1																			
															02	NONE 0 PRVTE	TURN-R S E								016		00
																PSNGR CAR		01	DRVR	NONE	17	M	OR-Y OR<25		000	000		00
00711 CITY	N	N	N	N	09/02/2011 Fri 4P	YAMHILL NEWBERG NEWBERG UA	1 14 MN 0 22.05	PACIFIC HY 99W SPRINGBROOK RD	INTER E 06	CROSS 0	N TRF SIGNAL	N N	CLR DRY DAY	S-1STOP REAR PDO	01	POLCE PRVTE PSNGR CAR	STRGHT E W	01	DRVR	NONE	39	M	OR-Y OR<25	026		000 000		07 00 07
No	*45 18 23.12 -122 56 48.94*						009100100S00		1																			
															02	NONE 1 PRVTE	STOP E W								011		00
																PSNGR CAR		01	DRVR	NONE	41	F	OR-Y OR<25		000	000		00
00125 CITY	N	N	N		02/19/2013 Tue 7A	YAMHILL NEWBERG NEWBERG UA	1 14 MN 0 22.05	PACIFIC HY 99W SPRINGBROOK RD	INTER E 06	CROSS 0	N TRF SIGNAL	N N	RAIN WET DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	NONE	25	F	OR-Y OR<25	026		000 000		07 00 07
No	*45 18 23.12 -122 56 48.94*						009100100S00		1																			
															02	NONE 0 PRVTE	STOP E W								011		00
																PSNGR CAR		01	DRVR	INJC	38	M	OR-Y OR<25		000	000		00
00667 CITY	N	N	N		07/31/2013 Wed 3P	YAMHILL NEWBERG NEWBERG UA	1 14 MN 0 22.05	PACIFIC HY 99W SPRINGBROOK RD	INTER E 06	CROSS 0	N NONE	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	NONE	59	M	OR-Y OR<25	052,026		000	013		32 00 32
No	*45 18 23.12 -122 56 48.94*						009100100S00		1																			
															02	NONE 0 PRVTE	STOP E W								011	013	00
																PSNGR CAR		01	DRVR	INJC	50	M	OR-Y OR<25		000	000		00
															03	NONE 0 PRVTE	STOP E W								011		00
																PSNGR CAR		01	DRVR	INJC	52	F	OR-Y OR<25		000	000		00

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEC / ALC / DRK	DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00845	N N N	09/26/2013	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
NO RPT		Thu 5P	NEWBERG	MN 0	PACIFIC HY 99W	E		TRF SIGNAL	N	WET	REAR		PRVTE	E W									000		00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		026	000		07
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	E W									011		00
													MTRCYCLE		01	DRVR	INJC	42	M	OR-Y		000	000		00
																				OR<25					
01195	N N N	12/21/2012	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	S-1STOP	01	POLCE 0	STRGHT											07
STATE		Fri 9A	NEWBERG	MN 0	PACIFIC HY 99W	S	2	TRF SIGNAL	N	WET	REAR		PUBLC	S N									000		00
			NEWBERG UA	22.05	SPRINGBROOK RD	06			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	M	OR-Y		026	000		07
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	S N									011		00
													PSNGR CAR		01	DRVR	INJC	35	F	OR-Y		000	000		00
																				OR<25					
00987	N N N	11/01/2012	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L											08,02
NO RPT		Thu 7A	NEWBERG	MN 0	PACIFIC HY 99W	SW		L-GRN-SIG	N	WET	TURN		PRVTE	S SW									000		00
			NEWBERG UA	22.05	SPRINGBROOK RD	05	0		N	DAWN	PDO		SCHL BUS		01	DRVR	NONE	58	M	OR-Y		007,028	000		08,02
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1															OR<25					
												02	NONE 0	TURN-L											
													PRVTE	S SW									000		00
													PSNGR CAR		01	DRVR	NONE	48	M	OR-Y		000	000		00
																				OR<25					
00976	N N N N N	09/12/2014	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										062,121	10
CITY		Fri 12P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	SS-O		PRVTE	SW NE									000	062,121	00
			NEWBERG UA	22.05	SPRINGBROOK RD	05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		080	000		10
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1															OR<25					
												02	NONE 0	STRGHT											
													PRVTE	SW NE									000		00
													PSNGR CAR		01	DRVR	INJC	37	M	OR-Y		000	000		00
																				OR<25					
												03	NONE 0	STRGHT											
													PRVTE	SW NE									000		00
													PSNGR CAR		01	DRVR	NONE	51	M	OR-Y		000	000		00
																				OR<25					
00507	N N N	06/20/2011	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	07
NO RPT		Mon 3P	NEWBERG	MN 0	PACIFIC HY 99W	SW		UNKNOWN	N	DRY	REAR		PRVTE	SW NE									000		00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	59	F	OR-Y		026	000		07
No	*45 18 23.12*	*-122 56 48.94*		009100100S00	1															OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	S P E D	E A U C	D R S W L G H R	C O K	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# FC CMPT/MLG MILEPNT LRS	CONN # FIRST STREET SECOND STREET INTERSECTION SEQ#	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CNTL	OFFRD WTHR SURF RNDBT LIGHT COLL TYP DRVWY	CRASH TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
														02	NONE 0 PRVTE	STOP SW NE									011	013	00
															PSNGR CAR		01	DRVR	NONE	51	M	OTH-Y N-RES		000	000		00
														03	NONE 0 PRVTE	STOP SW NE									011		00
															PSNGR CAR		01	DRVR	NONE	31	F	OR-Y OR<25		000	000		00
01023 NONE	N	N	N		12/06/2011 Tue 2P	YAMHILL NEWBERG	1 14 MN 0		INTER SW	CROSS	N TRF SIGNAL	N CLR S-1STOP N DRY REAR		01	NONE 0 PRVTE	STRGHT SW NE											07 00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N DAY PDO			PSNGR CAR		01	DRVR	NONE	00	M	UNK OR<25	026	000			07
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																			
														02	NONE 0 PRVTE	STOP SW NE									011		00
															PSNGR CAR		01	DRVR	NONE	72	M	OR-Y OR<25		000	000		00
01058 NONE	N	N	N		12/15/2011 Thu 8A	YAMHILL NEWBERG	1 14 MN 0		INTER SW	CROSS	N TRF SIGNAL	N CLD S-1STOP N WET REAR		01	NONE 0 PRVTE	STRGHT SW NE											07 00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N DAY PDO			PSNGR CAR		01	DRVR	NONE	25	M	OR-Y OR>25	026	000			07
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																			
														02	NONE 0 PRVTE	STOP SW NE									011		00
															PSNGR CAR		01	DRVR	NONE	40	M	OR-Y OR<25		000	000		00
00066 NO RPT	N	N	N		01/21/2012 Sat 9P	YAMHILL NEWBERG	1 14 MN 0		INTER SW	CROSS	N UNKNOWN	N CLR ANGL-STP N DRY TURN		01	NONE 0 PRVTE	TURN-L SW N											13 00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N DARK PDO			PSNGR CAR		01	DRVR	NONE	17	F	OR-Y OR<25	045	000			13
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																			
														02	NONE 0 PRVTE	STOP SW NE									012		00
															PSNGR CAR		01	DRVR	NONE	57	M	OR-Y OR<25		000	000		00
00818 NONE	N	N	N		09/21/2012 Fri 3P	YAMHILL NEWBERG	1 14 MN 0		INTER SW	CROSS	N TRF SIGNAL	N CLR S-1STOP N WET REAR		01	NONE 0 PRVTE	STRGHT SW NE										124 124	07 00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N DAY PDO			PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25	026	000			07
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																			
														02	NONE 0 PRVTE	STOP SW NE									011		00
															PSNGR CAR		01	DRVR	NONE	26	F	OR-Y OR<25		000	000		00

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEDLS	DRSWLK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MILEPNT / LRS	FC / MLG	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00868	N N N N N		10/02/2012	YAMHILL	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY			Tue 5P	NEWBERG	MN 0		PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
				NEWBERG UA	22.05		SPRINGBROOK RD	06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	44	M	OR-Y		043	000		07
No			*45 18 23.12 -122 56 48.94*		009100100S00		1															OR<25					
														02	NONE 0	STOP											
															PRVTE	SW NE									011		00
															PSNGR CAR		01	DRVR	INJC	41	M	OR-Y		000	000		00
																						OR<25					
																	02	PSNG	INJC	39	F			000	000		00
00873	N N N		10/03/2012	YAMHILL	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE			Wed 12P	NEWBERG	MN 0		PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
				NEWBERG UA	22.05		SPRINGBROOK RD	06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	F	OTH-Y		026	000		07
No			*45 18 23.12 -122 56 48.94*		009100100S00		1															OR<25					
														02	NONE 0	STOP											
															PRVTE	SW NE									011		00
															PSNGR CAR		01	DRVR	INJC	41	M	OR-Y		000	000		00
																						OR<25					
00888	Y N N		10/07/2012	YAMHILL	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										093		01
NO RPT			Sun 12P	NEWBERG	MN 0		PACIFIC HY 99W	SW		L-GRN-SIG	N	DRY	REAR		PRVTE	SW NE										000		00
				NEWBERG UA	22.05		SPRINGBROOK RD	06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		047	088	093	01
No			*45 18 23.12 -122 56 48.94*		009100100S00		1															OR>25					
														02	NONE 0	STOP											
															PRVTE	SW NE									012		00
															PSNGR CAR		01	DRVR	INJC	69	M	OTH-Y		000	000		00
																						N-RES					
																	02	PSNG	INJC	65	F			000	000		00
00278	N N N N N		04/04/2013	YAMHILL	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07
CITY			Thu 7A	NEWBERG	MN 0		PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
				NEWBERG UA	22.05		SPRINGBROOK RD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	47	M	OR-Y		026	000		07
No			*45 18 23.12 -122 56 48.94*		009100100S00		1															OR<25					
														02	NONE 0	STOP											
															PRVTE	SW NE									011		00
															PSNGR CAR		01	DRVR	INJC	39	M	OR-Y		000	000		00
																						OR<25					
00294	N N N		04/09/2013	YAMHILL	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NO RPT			Tue 1P	NEWBERG	MN 0		PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
				NEWBERG UA	22.05		SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		026	000		07
No			*45 18 23.12 -122 56 48.94*		009100100S00		1															OR<25					
														02	NONE 0	STOP											
															PRVTE	SW NE									011		00
															PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		000	000		00
																						OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEC	DARK	SCHL	WORK	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00460	N	N	N		06/04/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT						OR-Y				07
CITY					Tue 7A	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	62	M	OR-Y		026	000	07
No	*45 18 23.12*	*-122 56 48.94*					009100100S00	1															OR<25				
															02	NONE 0	STOP										
																PRVTE	SW NE									011	00
																PSNGR CAR		01	DRVR	INJC	44	M	OR-Y		000	000	00
																							OR<25				
00545	N	N	N		06/26/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT						OR-Y				07
NONE					Wed 9A	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000	07
No	*45 18 23.12*	*-122 56 48.94*					009100100S00	1															UNK				
															02	NONE 0	STOP										
																PRVTE	SW NE									011	00
																PSNGR CAR		01	DRVR	NONE	46	F	OR-Y		000	000	00
																							OR<25				
00688	N	N	N		08/06/2013	YAMHILL	1 14		INTER	CROSS	N	N	UNK	S-1STOP	01	NONE	STRGHT										07
NONE					Tue 3P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	UNK	REAR		PRVTE	SW NE									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		026	000	07
No	*45 18 23.12*	*-122 56 48.94*					009100100S00	1															OR<25				
															02	NONE 0	STOP										
																PRVTE	SW NE									011	00
																PSNGR CAR		01	DRVR	NONE	51	M	OR-Y		000	000	00
																							OR<25				
01203	N	N	N		12/31/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT						OR-Y				07
NO RPT					Tue 5P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y		026	000	07
No	*45 18 23.12*	*-122 56 48.94*					009100100S00	1															OR<25				
															02	NONE 0	STOP										
																PRVTE	SW NE									011	00
																PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000	00
																							OR<25				
																		02	PSNG	INJC	59	M			000	000	00
00391	N	N	N		04/12/2014	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT										07
NONE					Sat 10A	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		026	000	07
No	*45 18 23.12*	*-122 56 48.94*					009100100S00	1															OR<25				
																		02	PSNG	NO<5	04	F			000	000	00
																		03	PSNG	NO<5	01	M			000	000	00
															02	NONE 0	STOP										
																PRVTE	SW NE									011	00
																PSNGR CAR		01	DRVR	INJC	27	F	OR-Y		000	000	00
																							OR<25				

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHOOL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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			11/19/2014	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT						Wed 1P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
							NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	51	M	OTH-Y		026	000		29
No						*45 18 23.12 -122 56 48.94*		009100100S00	1															N-RES					
																02	NONE 0	STOP											
																	PRVTE	SW NE									011		00
																	PSNGR CAR		01	DRVR	NONE	64	F	OR-Y		000	000		00
																								OR<25					
00214	N	N	N	N	N	02/28/2015	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											07
CITY						Sat 5P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	52	M	OR-Y		043	000		07
No						*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	SW NE									006		00
																	PSNGR CAR		01	DRVR	INJC	32	M	OR-Y		000	000		00
																								OR<25					
00379	N	N	N	N	N	04/23/2015	YAMHILL	1 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											32,29
CITY						Thu 11A	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		052,026	000		32,29
No						*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25					
																02	NONE 0	STOP											
																	PRVTE	SW NE									011		00
																	PSNGR CAR		01	DRVR	NONE	66	M	OR-Y		000	000		00
																								OR<25					
00296	N	N	N			03/23/2014	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	TURN-R											27
NONE						Sun 6P	NEWBERG	MN 0	PACIFIC HY 99W	SW		YIELD	N	DRY	REAR		PRVTE	SW S									000		00
							NEWBERG UA	22.05	SPRINGBROOK RD	09	2		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	39	M	OR-Y		026	000		27
No						*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25					
																02	NONE 0	STOP											
																	PRVTE	SW S									011		00
																	PSNGR CAR		01	DRVR	NONE	00	F	UNK		000	000		00
																								UNK					
00038	Y	N	N			01/12/2011	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	S-STRGHT	01	NONE 0	STRGHT											01
NONE						Wed 5P	NEWBERG	MN 0	PACIFIC HY 99W	W		TRF SIGNAL	N	WET	REAR		PRVTE	W E									000		00
							NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	58	F	OR-Y		042	000		01
No						*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	W E									000		00
																	PSNGR CAR		01	DRVR	INJC	47	F	OR-Y		000	000		00
																								OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	WORK ZONE	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# / CMPT/MILEPNT / LRS	FC / MLG / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / 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
00168	N	N	N		03/02/2011	YAMHILL	1	14	INTER	CROSS	N	N	UNK	S-1STOP	01	NONE	STRGHT										07,27
NONE					Wed 4P	NEWBERG	MN 0	PACIFIC HY 99W	W		UNKNOWN	N	UNK	REAR		PRVTE	W E									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	34	M	OR-Y	026	000		07,27
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																OR<25				
															02	NONE 0	STOP										
																PRVTE	W E									011	00
																PSNGR CAR		01	DRVR	NONE	35	M	OR-Y	000	000		00
																							OR<25				
00493	Y	N	N		07/01/2011	YAMHILL	1	14	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										01
CITY					Fri 12P	NEWBERG	MN 0	PACIFIC HY 99W	W		TRF SIGNAL	N	DRY	REAR		PRVTE	E W									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK	026	000		01
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																UNK				
															02	NONE 0	STOP										
																PRVTE	E W									011	00
																PSNGR CAR		01	DRVR	NONE	37	F	OR-Y	000	000		00
																							OR<25				
																		02	PSNG	NO<5	01	M		000	000		00
00686	N	N	N		08/24/2011	YAMHILL	1	14	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT										07
NONE					Wed 4P	NEWBERG	MN 0	PACIFIC HY 99W	W		UNKNOWN	N	DRY	REAR		PRVTE	W E									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	52	F	OR-Y	026	000		07
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																OR<25				
															02	NONE	STOP										
																PRVTE	W E									011	00
																PSNGR CAR		01	DRVR	NONE	34	F	OR-Y	000	000		00
																							OR<25				
00138	N	N	N		02/21/2013	YAMHILL	1	14	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE					Thu 3P	NEWBERG	MN 0	PACIFIC HY 99W	W		YIELD	N	DRY	REAR		PRVTE	W E									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK	026	000		07
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																OR>25				
															02	NONE 0	STOP										
																PRVTE	W E									011	00
																PSNGR CAR		01	DRVR	INJC	32	M	OR-Y	000	000		00
																							OR>25				
00468	N	N	N		05/01/2014	YAMHILL	1	14	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										27
NONE					Thu 7A	NEWBERG	MN 0	PACIFIC HY 99W	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000	00
						NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	51	M	OR-Y	026	000		27
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																OR<25				
															02	NONE 0	STOP										
																PRVTE	W E									011	00
																PSNGR CAR		01	DRVR	INJC	55	M	OR-Y	000	000		00
																							OR<25				

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	WORK ZONE	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# CMPT/MILEPNT LRS	FC / MLG / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR / OWNER / VEH TYPE	QTY / MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00821	N	N	N		09/21/2012	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE	0 STRGHT											04
NO RPT					Fri 6A	NEWBERG	MN 0	PACIFIC HY 99W	CN		L-GRN-SIG	N	WET	TURN		PRVTE	NE SW									000		00
						NEWBERG UA	22.05	SPRINGBROOK RD	02	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK	020		000		04
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																UNK					
															02	NONE	0 TURN-L											
																PRVTE	SW N									000		00
																PSNGR CAR		01	DRVR	NONE	22	M	OR-Y	000		000		00
																							OR<25					
01045	N	N	N		11/15/2012	YAMHILL	1 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE	0 STRGHT										092	07,14
NONE					Thu 3P	NEWBERG	MN 0	PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
						NEWBERG UA	22.05	SPRINGBROOK RD	02	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	F	OR-Y	026		000		07,14
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																OR<25					
															02	NONE	0 STOP											
																PRVTE	NE SW									011		00
																PSNGR CAR		01	DRVR	INJC	30	M	OR-Y	000		000		00
																							OR<25					
00400	N	N	N		05/28/2011	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	0 STRGHT											07
NO RPT					Sat 4P	NEWBERG	MN 0	PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000		00
						NEWBERG UA	22.05	SPRINGBROOK RD	03	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	68	M	OR-Y	026		000		07
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																OR>25					
															02	NONE	0 STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	NONE	33	F	OR-Y	000		000		00
																							OR<25					
00272	N	N	N	N	N 03/27/2012	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	0 STRGHT											03
CITY					Tue 9P	NEWBERG	MN 0	PACIFIC HY 99W	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	W E									000		00
						NEWBERG UA	22.05	SPRINGBROOK RD	03	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	17	F	OR-Y	021		000		03
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																OR<25					
															02	NONE	0 STRGHT											
																PRVTE	N S									000		00
																PSNGR CAR		01	DRVR	INJC	63	M	OR-Y	000		000		00
																							OR<25					
00922	N	N	N	N	N 10/15/2012	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	0 STRGHT											02
CITY					Mon 7P	NEWBERG	MN 0	PACIFIC HY 99W	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	W E									000		00
						NEWBERG UA	22.05	SPRINGBROOK RD	03	2		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	65	M	OR-Y	028		000		02
No					*45 18 23.12 -122 56 48.94*		009100100S00	1																OR<25					
															02	NONE	0 STRGHT											
																PRVTE	N S									015		00
																PSNGR CAR		01	DRVR	NONE	56	M	OR-Y	000		000		00
																							OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEC / ALC / DRK	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# / CMPT/MILEPNT / LRS	FC / MLG / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00683	N N N N N	07/10/2015	YAMHILL	1 14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
CITY		Fri 11P	NEWBERG	MN 0	PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	03	2		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		020	000	04
No		*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25				
												02	NONE 0	TURN-L										
													PRVTE	NE S									015	00
													PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		000	000	00
																				OR<25				
01301	N N N	12/01/2014	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	O-OTHER	01	NONE 0	TURN-R										08,02
NONE		Mon 11A	NEWBERG	MN 0	PACIFIC HY 99W	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S NE									016	00
			NEWBERG UA	22.05	SPRINGBROOK RD	04	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	54	F	OR-Y		028	000	02
No		*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25				
												02	NONE 0	TURN-L										
													PRVTE	N NE									000	00
													PSNGR CAR		01	DRVR	INJC	18	F	OR-Y		007	000	08
																				OR<25				
00073	N N N N N	01/21/2015	YAMHILL	1 14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										04,27
CITY		Wed 6A	NEWBERG	MN 0	PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N NE									015	00
			NEWBERG UA	22.05	SPRINGBROOK RD	04	2		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	45	F	OR-Y		020,004,016	000	04,27
No		*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25				
												02	NONE 0	STRGHT										
													PRVTE	S N									000	00
													PSNGR CAR		01	DRVR	NONE	74	F	OR-Y		000	000	00
																				OR<25				
00445	N N N	04/23/2014	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	S-STRGHT	01	NONE 0	STRGHT										13
NONE		Wed 4P	NEWBERG	MN 0	PACIFIC HY 99W	W		TRF SIGNAL	N	WET	REAR		PRVTE	W E									000	00
			NEWBERG UA	22.06	SPRINGBROOK RD	06	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	25	M	OR-Y		045	000	13
No		*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25				
												02	NONE 0	STRGHT										
													PRVTE	W E									000	00
													PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		000	000	00
																				OR<25				

CITY OF NEWBERG, YAMHILL COUNTY

OR 99W & Springbrook Rd

January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	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
01068	N	N	N			11/07/2011	16	PACIFIC HY 99W	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NO RPT						Mon 7A	0	SPRINGBROOK RD	N		TRF SIGNAL	N	WET	REAR		PUBLC	N S										000		00
No						*45 18 23.13*	*-122 56 48.94*	1	06	0		N	DAY	PDO		SCHL BUS		01	DRVR	NONE	00	U	UNK		026	000		07
																							UNK					
															02	NONE 0	STOP											
																PRVTE	N S									011		00
																PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		000	000		00
																							OR<25					
00064	N	N	N	N	N	01/21/2011	14	PACIFIC HY 99W	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Fri 4P	0	SPRINGBROOK RD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S N									000		00
Yes						*45 18 23.14*	*-122 56 48.90*	1	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S N									011		00
																PSNGR CAR		01	DRVR	NONE	36	F	OR-Y		000	000		00
																							OR<25					
00790	N	N	N	N	N	09/30/2011	14	PACIFIC HY 99W	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY						Fri 3P	0	SPRINGBROOK RD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S N									000		00
No						*45 18 23.13*	*-122 56 48.94*	1	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S N									011		00
																PSNGR CAR		01	DRVR	NONE	31	F	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	NO<5	02	F			000	000		00
00604	N	N	N			07/17/2012	16	PACIFIC HY 99W	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
NONE						Tue 11A	0	SPRINGBROOK RD	S		TRF SIGNAL	N	WET	REAR		PRVTE	S N									000		00
No						*45 18 23.12*	*-122 56 48.94*	1	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		07
																							UNK					
															02	NONE 0	STOP											
																PRVTE	S N									011		00
																PSNGR CAR		01	DRVR	NONE	62	F	OR-Y		000	000		00
																							OR<25					
00744	N	N	N			07/11/2014	16	PACIFIC HY 99W	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Fri 6A	0	SPRINGBROOK RD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S N									000		00
No						*45 18 23.12*	*-122 56 48.94*	1	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		07
																							UNK					
															02	NONE 0	STOP											
																PRVTE	S N									011		00
																PSNGR CAR		01	DRVR	INJC	43	F	OR-Y		000	000		00
																							OR<25					
01229	N	N	N			11/26/2015	14	PACIFIC HY 99W	INTER	CROSS	N	N	CLR	O-1STOP	01	NONE 0	BACK											10
NONE						Thu 1P	0	SPRINGBROOK RD	S		TRF SIGNAL	N	DRY	BACK		PRVTE	N S									000		00
No						*45 18 23.15*	*-122 56 48.95*	1	06	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		011	000		10
																							OR<25					

CITY OF NEWBERG, YAMHILL COUNTY

OR 99W & Springbrook Rd

January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	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	STOP											
																PRVTE	S N									011		00
																PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		000	000		00
																							OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Brutscher St
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SP	ELC	DAUSLH	RSWCOR	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MILEPNT / LRS	FC / MLG	CONN # / FIRST STREET / SECOND STREET / INTERSECTION	SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00415	N	N	N		05/19/2012	YAMHILL	1	14			INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											013	07
NO RPT					Sat 10A	NEWBERG	MN 0		BRUTSCHER ST		NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
						NEWBERG UA	21.80		PACIFIC HY 99W		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	31	M	OR-Y		026	000		07
No					*45 18 28.53 -122 56 31.38*		009100100		S00	1																OR<25					
																	02	NONE 0	STOP										011	013	00
																		PRVTE	NE SW											
																		PSNGR CAR		01	DRVR	NONE	36	F	OR-Y		000	000		00
																									OR<25					
																	03	NONE 0	STOP										011		00
																		PRVTE	NE SW											
																		PSNGR CAR		01	DRVR	INJC	38	M	OR-Y		000	000		00
																									OR<25					
00518	N	N	N		06/22/2012	YAMHILL	1	14			INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT												27
NO RPT					Fri 4P	NEWBERG	MN 0		BRUTSCHER ST		NE		TRF SIGNAL	N	WET	REAR		PRVTE	NE SW									000		00
						NEWBERG UA	21.80		PACIFIC HY 99W		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	F	OR-Y		026	000		27
No					*45 18 28.53 -122 56 31.38*		009100100		S00	1																OR<25					
																	02	NONE 0	STOP										011		00
																		PRVTE	NE SW											
																		PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000		00
																									OR<25					
00907	N	N	N		10/04/2012	YAMHILL	1	14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE					Thu 5P	NEWBERG	MN 0		BRUTSCHER ST		NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
						NEWBERG UA	21.80		PACIFIC HY 99W		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		026	000		07
No					*45 18 28.53 -122 56 31.38*		009100100		S00	1																OR<25					
																	02	NONE 0	STOP										011		00
																		PRVTE	NE SW											
																		PSNGR CAR		01	DRVR	NONE	40	M	OR-Y		000	000		00
																									OR<25					
00829	N	N	N		09/23/2013	YAMHILL	1	14			INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT												07
NONE					Mon 2P	NEWBERG	MN 0		BRUTSCHER ST		NE		TRF SIGNAL	N	WET	REAR		PRVTE	NE SW									000		00
						NEWBERG UA	21.80		PACIFIC HY 99W		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	40	F	OR-Y		026	000		07
No					*45 18 28.53 -122 56 31.38*		009100100		S00	1																OR<25					
																	02	NONE 0	STOP										011		00
																		PRVTE	NE SW											
																		PSNGR CAR		01	DRVR	INJC	71	M	OR-Y		000	000		00
																									OR<25					
01413	N	N	N		12/30/2014	YAMHILL	1	14			INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												29
NO RPT					Tue 2P	NEWBERG	MN 0		BRUTSCHER ST		NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
						NEWBERG UA	21.80		PACIFIC HY 99W		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	33	M	OR-Y		026	000		29
No					*45 18 28.53 -122 56 31.38*		009100100		S00	1																OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Brutscher St
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	DRUG	ALC	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# FC CMPT/MLG MILEPNT LRS	CONN # FIRST STREET SECOND STREET INTERSECTION SEQ#	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CNTL	OFFRD 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	STOP NE SW									011		00
																	PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		000	000		00
00441	N	N	N			05/08/2015	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												29
NONE						Fri UNK	NEWBERG	MN 0	BRUTSCHER ST	NE		TRF SIGNAL	N	DRY	REAR		UNKN	NE SW									000		00
							NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	PDO		UNKNOWN		01	DRVR	NONE	00	U	UNK		026	000		29
No						*45 18 28.53 -122 56 31.38*		009100100S00	1															UNK					
																02	NONE 0 PRVTE	STOP NE SW									011		00
																	PSNGR CAR		01	DRVR	NONE	78	M	OR-Y OR<25		000	000		00
00661	N	N	N			08/18/2011	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013		32
NO RPT						Thu 5P	NEWBERG	MN 0	BRUTSCHER ST	E		UNKNOWN	N	DRY	REAR		PRVTE	E W									000		00
							NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	35	F	OR-Y OR<25	052,026		000		32
No						*45 18 28.53 -122 56 31.38*		009100100S00	1																				
																02	NONE 0 PRVTE	STOP E W									011	013	00
																	PSNGR CAR		01	DRVR	INJC	43	M	OR-Y OR<25		000	000		00
																03	NONE 0 PRVTE	STOP E W									011		00
																	PSNGR CAR		01	DRVR	NONE	59	M	OR-Y OR<25		000	000		00
01018	N	N	N			11/09/2012	YAMHILL	1 14		INTER	CROSS	N	N	CLD	ANGL-STP	01	NONE 0	TURN-L										092		32,27
CITY						Fri 5P	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	TURN		PRVTE	SE SW									000		00
							NEWBERG UA	21.80	PACIFIC HY 99W	05	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	44	M	OR-Y OR<25	052,016		038		32,27
No						*45 18 28.53 -122 56 31.38*		009100100S00	1																				
																02	NONE 0 PRVTE	STOP NE SW									011	092	00
																	PSNGR CAR		01	DRVR	NONE	71	M	OR-Y OR<25		000	000		00
00469	N	N	N	N	N	06/11/2012	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												27
CITY						Mon 10A	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y OR<25	026		000		27
No						*45 18 28.53 -122 56 31.38*		009100100S00	1																				
																02	NONE 0 PRVTE	STOP SW NE									011		00
																	PSNGR CAR		01	DRVR	INJB	46	F	OR-Y OR<25		000	000		00
																			02	PSNG	INJB	25	F			000	000		00

091 PACIFIC HIGHWAY WEST

OR 99W & Brutscher St
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SP ED / EL AU / DC CS / LG CO / SL WK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MILEPNT / LRS	FC / MLG / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00585	N N N N N	07/09/2013	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY		Tue 6A	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	50	M	OR-Y		026	000		07
No	*45 18 28.53*	*-122 56 31.38*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	SW NE									011		00
													PSNGR CAR		01	DRVR	INJC	36	M	OR-Y		000	000		00
																				OR<25					
00400	N N N	04/14/2014	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY		Mon 4P	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW										000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	M	OR-Y		026	000		07
No	*45 18 28.53*	*-122 56 31.38*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	NE SW									011		00
													PSNGR CAR		01	DRVR	INJC	24	M	OR-Y		000	000		00
																				OR<25					
00296	N N N	03/27/2015	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 1	STRGHT										013		07
NONE		Fri 12P	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		043,026	000		07
No	*45 18 28.53*	*-122 56 31.38*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	SW NE									011	013	00
													PSNGR CAR		01	DRVR	INJC	73	F	OR-Y		000	000		00
																				OR<25					
												03	NONE 0	STOP											
													PRVTE	SW NE									011		00
													PSNGR CAR		01	DRVR	NONE	00	M	UNK		000	000		00
																				UNK					
00806	N N N	08/13/2015	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										092		29
NONE		Thu 5P	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	29	M	OR-Y		042	000		29
No	*45 18 28.53*	*-122 56 31.38*		009100100S00	1															OR>25					
												02	NONE 0	STRGHT											
													PRVTE	SW NE									007	092	00
													PSNGR CAR		01	DRVR	INJC	19	F	OR-Y		000	000		00
																				OR<25					
00875	N N N	09/01/2015	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013		29
NONE		Tue 6P	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		026	000		29
No	*45 18 28.53*	*-122 56 31.38*		009100100S00	1															OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Brutscher St
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEC / ALCH / DRK	DAY/TIME / CITY / LAT/LONG	COUNTY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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	STOP / SW NE									011	013	00
													PSNGR CAR		01	DRVR	INJC	53	F	OR-Y / OR<25		000	000		00
												03	NONE 0 / PRVTE	STOP / SW NE									012		00
													PSNGR CAR		01	DRVR	NONE	39	F	OR-Y / OR<25		000	000		00
00045	N N N N N	01/14/2011	YAMHILL	1 14		INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
CITY		Fri 5P	NEWBERG	MN 0	BRUTSCHER ST	W		TRF SIGNAL	N	WET	REAR		PRVTE	W E									000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y / OR<25	026	000			07
No		*45 18 28.53 -122 56 31.38*		009100100S00	1																				
												02	NONE 0 / PRVTE	STOP / W E									011		00
													PSNGR CAR		01	DRVR	INJC	22	F	OR-Y / OR<25		000	000		00
01005	N N N	11/07/2011	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Mon 5P	NEWBERG	MN 0	BRUTSCHER ST	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	42	F	OR-Y / OR>25	026	000			07
No		*45 18 28.53 -122 56 31.38*		009100100S00	1																				
												02	NONE 0 / PRVTE	STOP / W E									011		00
													PSNGR CAR		01	DRVR	INJC	31	M	OR-Y / OR>25		000	000		00
00115	N N N N N	02/04/2014	YAMHILL	1 14		INTER	CROSS	N	N	CLD	O-OTHER	01	NONE	BACK											10
CITY		Tue 3P	NEWBERG	MN 0	BRUTSCHER ST	W		TRF SIGNAL	N	SNO	BACK		PRVTE	E W									000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	59	F	OR-Y / OR<25	011	000			10
No		*45 18 28.53 -122 56 31.38*		009100100S00	1																				
												02	NONE 0 / PRVTE	STOP / W E									011		00
													PSNGR CAR		01	DRVR	NONE	20	F	OR-Y / OR<25		000	000		00
00375	N N N	05/05/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	U-TURN											08
NO RPT		Sun 12P	NEWBERG	MN 0	BRUTSCHER ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S S									000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	63	M	OR-Y / OR<25	008	000			08
No		*45 18 28.53 -122 56 31.38*		009100100S00	1																				
												02	NONE 0 / PRVTE	STRGHT / E W									000		00
													PSNGR CAR		01	DRVR	NONE	46	F	OR-Y / OR<25		000	000		00

091 PACIFIC HIGHWAY WEST

OR 99W & Brutscher St
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHL ZONE	WORK ZONE	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC	CONN # FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00740	N	N	N			08/23/2013	YAMHILL	1	14		INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										002	04,27
NO RPT						Fri 1P	NEWBERG	MN 0		BRUTSCHER ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	W E									000		00
							NEWBERG UA	21.80		PACIFIC HY 99W	01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	31	F	OR-Y		020	000	002	04,27
No						*45 18 28.53 -122 56 31.38*		009100100S00																		OR<25					
																				02	PSNG	NO<5	01	M			000	000		00
																	02	NONE 0	TURN-L									000		00
																		PRVTE	S W											
																		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		000	000		00
																									OR<25					
01186	N	N	N			11/02/2014	YAMHILL	1	14		INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											02
NONE						Sun 6P	NEWBERG	MN 0		BRUTSCHER ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	NE SW									000		00
							NEWBERG UA	21.80		PACIFIC HY 99W	02	0		Y	DUSK	INJ		PSNGR CAR		01	DRVR	INJC	40	M	OR-Y		000	000		00
No						*45 18 28.53 -122 56 31.38*		009100100S00																		OR<25					
																	02	NONE 0	TURN-L									019		00
																		UNKN	SW NW											
																		PSNGR CAR		01	DRVR	NONE	00	U	UNK		028,004	000		02
																									UNK					

091 PACIFIC HIGHWAY WEST

OR 99W & Vittoria Way
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEC / ALC / DRK	DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00013	N N N N N	01/04/2012	YAMHILL	1 14		INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L											02
CITY		Wed 7P	NEWBERG	MN 0	PACIFIC HY 99W	NE		UNKNOWN	N	WET	TURN		PRVTE	N NE										000		00
			NEWBERG UA	21.54	VITTORIA WAY	05	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	28	F	OR-Y		028	000		02
No		*45 18 34.08 -122 56 14.07*		009100100S00	1															OR<25					
												02	NONE 1	STRGHT											
													PRVTE	SW NE									000		00
													SEMI TOW		01	DRVR	NONE	52	M	OTH-Y		000	000		00
																				N-RES					
00066	N N N N N	01/21/2014	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											32
CITY		Tue 8A	NEWBERG	MN 0	PACIFIC HY 99W	NE		STOP SIGN	N	DRY	REAR		PRVTE	NE SW										000		00
			NEWBERG UA	21.54	VITTORIA WAY	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		052,026	000		32
No		*45 18 34.08 -122 56 14.07*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	NE SW									011		00
													PSNGR CAR		01	DRVR	INJC	47	M	OR-Y		000	000		00
																				OR<25					
00836	N N N	10/13/2011	YAMHILL	1 14		INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
NO RPT		Thu 6P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.54	VITTORIA WAY	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	73	M	OR-Y		026	000		07
No		*45 18 34.08 -122 56 14.07*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	SW NE									011		00
													PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		000	000		00
																				OR<25					
00131	N N N	02/13/2012	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											32
NO RPT		Mon 10A	NEWBERG	MN 0	PACIFIC HY 99W	CN		UNKNOWN	N	DRY	TURN		PRVTE	SE SW										000		00
			NEWBERG UA	21.54	VITTORIA WAY	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	76	F	OR-Y		052	000		32
No		*45 18 34.08 -122 56 14.07*		009100100S00	1															OR<25					
												02	NONE 0	STRGHT											
													PRVTE	SW NE									000		00
													PSNGR CAR		01	DRVR	INJC	27	F	OR-Y		000	000		00
																				OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	DRUG	ALC	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00144	N	N	N			02/12/2015	YAMHILL	1	14							01	NONE 0	STRGHT												29
NONE						Thu 4P	NEWBERG	MN 0	PROVIDENCE DR	NE		UNKNOWN	N	DRY	REAR		UNKN	NE SW										000		00
							NEWBERG UA	21.45	PACIFIC HY 99W	06	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		29
No						*45 18 36.29 -122 56 7.21*		009100100	S00 1																UNK					
																02	NONE 0	STOP											
																	PRVTE	NE SW									011		00
																	PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		000	000		00
																									OR<25				
00824	N	N	N	N	N	09/22/2012	YAMHILL	1	14							01	NONE 0	STRGHT												32,16,27
CITY						Sat 2P	NEWBERG	MN 0	PROVIDENCE DR	NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	F	OR-Y		052,016	025		32,16,27
No						*45 18 36.11 -122 56 7.77*		009100100	S00 1																OR<25					
																02	NONE 0	STOP											
																	PRVTE	NE SW									011		00
																	PSNGR CAR		01	DRVR	NONE	25	F	OTH-Y		000	000		00
																									N-RES				
																			02	PSNG	INJC	23	F			000	000		00
																			03	PSNG	INJC	77	F			000	000		00
00565	N	N	N			06/12/2015	YAMHILL	1	14							01	NONE 0	STRGHT												29
NONE						Fri 5P	NEWBERG	MN 0	PROVIDENCE DR	NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		026	000		29
No						*45 18 36.11 -122 56 7.77*		009100100	S00 1																OR<25					
																02	NONE 0	STOP											
																	PRVTE	NE SW									011		00
																	PSNGR CAR		01	DRVR	NONE	27	F	OR-Y		000	000		00
																									OR>25				
01108	N	N	N	N	N	12/30/2011	YAMHILL	1	14							01	NONE 0	STRGHT												07
CITY						Fri 8A	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	48	M	OR-Y		042	000		07
No						*45 18 36.11 -122 56 7.77*		009100100	S00 1																OR>25					
																02	NONE 0	STRGHT											
																	PRVTE	SW NE									006		00
																	PSNGR CAR		01	DRVR	NONE	83	M	OR-Y		000	000		00
																									OR<25				
00833	N	N	N			09/25/2012	YAMHILL	1	14							01	NONE 0	STRGHT												07
NO RPT						Tue 2P	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	81	F	OTH-Y		026	000		07
No						*45 18 36.11 -122 56 7.77*		009100100	S00 1																N-RES					
																02	NONE 0	STOP											
																	PRVTE	SW NE									011		00
																	PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		000	000		00
																									OR<25				

091 PACIFIC HIGHWAY WEST

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SP ED / EL AU / DC CS / RS LH / WC OR / LK	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00623	N N N N N	07/18/2013	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											27
CITY		Thu 7P	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		026	000		27
No	*45 18 36.11*	*-122 56 7.77*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	SW NE									011		00
													PSNGR CAR		01	DRVR	NONE	40	M	OR-Y		000	000		00
																				OR<25					
00589	N N N	06/03/2014	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	07
NONE		Tue 2P	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		026	000		07
No	*45 18 36.11*	*-122 56 7.77*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	SW NE									011		00
													PSNGR CAR		01	DRVR	NONE	40	M	OR-Y		000	000		00
																				OR<25					
												03	NONE 0	STOP											
													PRVTE	SW NE									011		00
													MTRCYCLE		01	DRVR	NONE	34	M	OR-Y		000	000		00
																				OR<25					
00725	N N N	07/07/2014	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Mon 2P	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	56	M	OR-Y		026	000		07
No	*45 18 36.11*	*-122 56 7.77*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	SW NE									011		00
													PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																				OR<25					
00658	N N N	07/03/2015	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
CITY		Fri 2P	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		026	000		29
No	*45 18 36.11*	*-122 56 7.77*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	SW NE									011		00
													PSNGR CAR		01	DRVR	NONE	66	M	OR-Y		000	000		00
																				OR<25					
01343	N N N	12/21/2015	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE		Mon 12P	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE										000		00
			NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		29
No	*45 18 36.11*	*-122 56 7.77*		009100100S00	1															OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHOOL BUS	WORK ZONE	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC CONN # FIRST STREET SECOND STREET INTERSECTION	SEQ#	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CNTL	OFFRD 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	STOP SW NE										011		00
																		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y OR<25		000	000		00
00616	N	N	N			07/20/2012	YAMHILL	1 14			INTER	3-LEG	N		N	RAIN	S-1STOP	01	NONE	STRGHT												07
NONE						Fri 7A	NEWBERG	MN 0	PROVIDENCE DR		W		TRF SIGNAL		N	WET	REAR		PRVTE	W E									000		00
							NEWBERG UA	21.46	PACIFIC HY 99W		06	0			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	52	M	OR-Y OR<25		026	000		07
No						*45 18 36.11 -122 56 7.77*		009100100	S00	1																						
																	02	NONE 0 PRVTE	STOP W E										011		00
																		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y OR<25		000	000		00

091 PACIFIC HIGHWAY WEST

OR 99W & Benjamin Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEC LGHT	DRK CND	SCHL BUS	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL TRAF-CNTL	OFFRD 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
00620	N	N	N	08/08/2011	YAMHILL	1 02		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										02
NONE				Mon 4P		MN 0		CN		STOP SIGN	N	DRY	TURN		PRVTE	N E									000	00
						21.08		01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		028	000	02
No				*45 18 43.08 -122 55 42.80*		009100100S00																OR<25				
														02	NONE 0	STRGHT										
															PRVTE	E W									000	00
															PSNGR CAR		01	DRVR	NONE	66	M	OR-Y		000	000	00
																						OR<25				
00579	N	N	N	N N	07/09/2012	YAMHILL	1 02		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										02
STATE					Mon 5P		MN 0		CN		STOP SIGN	N	DRY	TURN		PRVTE	N E									015	00
						21.08		01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		028	000	02
No				*45 18 43.08 -122 55 42.80*		009100100S00																OR<25				
														02	NONE 0	STRGHT										
															PRVTE	E W									000	00
															PSNGR CAR		01	DRVR	INJC	38	M	OR-Y		000	000	00
																						OR<25				
00318	N	N	N		03/28/2014	YAMHILL	1 02		INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L										02
NO RPT					Fri 3P		MN 0		CN		STOP SIGN	N	WET	TURN		PRVTE	N E									000	00
						21.08		01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	66	F	OR-Y		028	000	02
No				*45 18 43.08 -122 55 42.80*		009100100S00																OR<25				
																	02	PSNG	NO<5	04	F			000	000	00
														02	NONE 0	STRGHT										
															PRVTE	E W									000	00
															PSNGR CAR		01	DRVR	NONE	56	M	OR-Y		000	000	00
																						OR<25				
00675	N	N	N	N N	06/23/2014	YAMHILL	1 02		INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-R										02
CITY					Mon 3P		MN 0		CN		STOP SIGN	N	DRY	TURN		PRVTE	N W									000	00
						21.08		03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	43	M	OR-Y		028	000	02
No				*45 18 43.08 -122 55 42.80*		009100100S00																OR<25				
														02	NONE 0	STRGHT										
															PRVTE	E W									000	00
															PSNGR CAR		01	DRVR	INJC	24	F	OR-Y		000	000	00
																						OR<25				

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
014	EMR V PKD	EMERGENCY VEHICLE LEGALLY PARKED IN THE ROADWAY
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED OR DISABLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING
055	SPRAY	BLINDED BY WATER SPRAY

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
088	OTHER	OTHER ACTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD; STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RO
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST NOT VISIBLE; NON-REFLECTIVE CLOTHIN
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER
51	FAIL LN	FAILED TO MAINTAIN LANE
52	OFF RD	RAN OFF ROAD

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1 L-TURN	FROM OPPOSITE DIRECTION-ONE LEFT TURN,ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TOO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WORK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAY ON RD	STANDING OR LYING IN ROADWAY
071	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
073	ELUDING	ELUDING / ATTEMPT TO ELUDE
079	F NEG CURV	FAILED TO NEGOTIATE A CURVE
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER-CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED/PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHI(
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMNT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FALLEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
074	OVERHD OBJ	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL WTNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	DSTRCT OTH	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN MAJOR COLLECTOR
18	URBAN MINOR COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY

PEDESTRIAN LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH OR PARKING LANE
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
13	AT INTERSECTION - IN BIKE LANE
14	NOT AT INTERSECTION - IN BIKE LANE
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
16	NOT AT INTERSECTION - IN PARKING LANE

ROAD CHARACTER CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING

095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS
099	UNKNOWN	UNKNOWN OR NOT DEFINITE

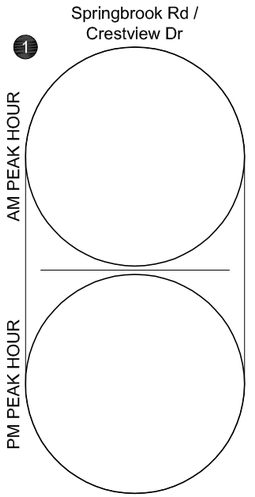
VEHICLE TYPE CODE TRANSLATION LIST

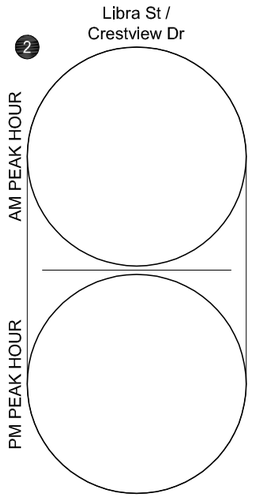
CODE	SHORT DESC	LONG DESCRIPTION
00	PDO	NOT COLLECTED FOR PDO CRASHES
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

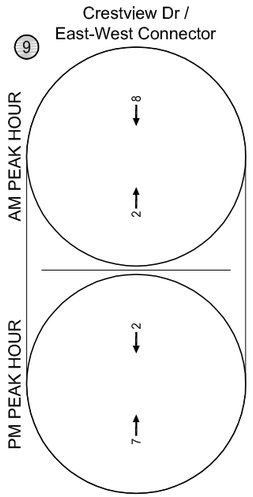
WEATHER CONDITION CODE TRANSLATION LIST

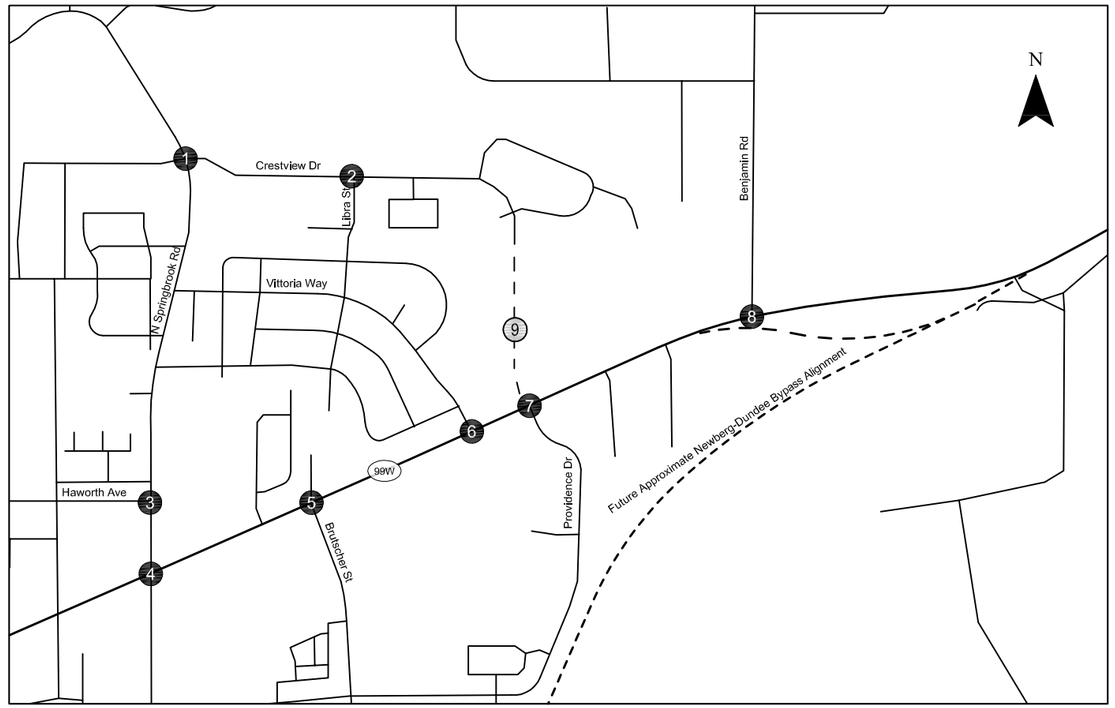
CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

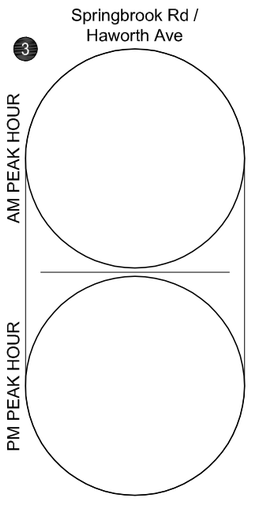
Appendix E
In-Process Developments

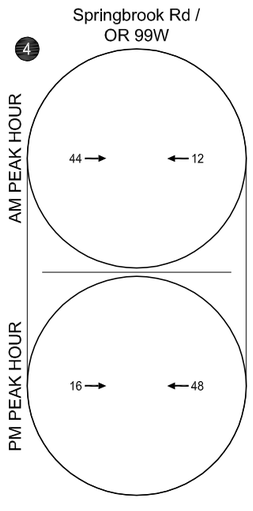


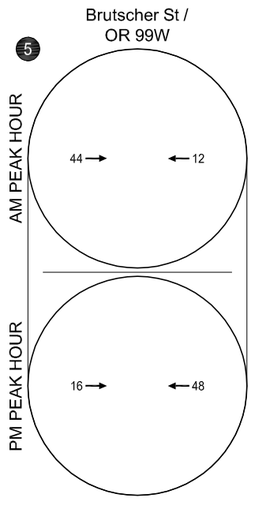


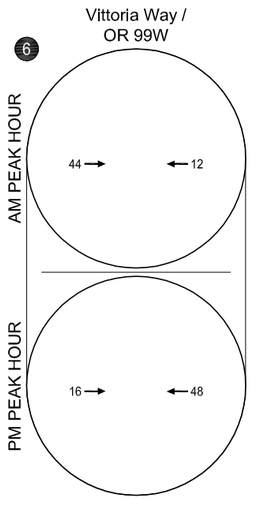


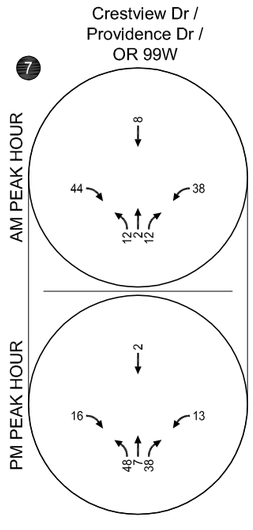


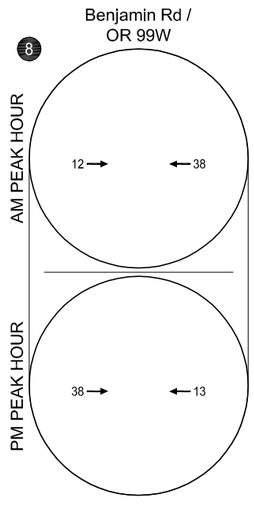












In Process Trips
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure
E-1

Traffic Impact Analysis
Newberg Ambulatory Surgical Center

Newberg, Oregon

March 9, 2017

completed with
Anderson Dabrowski Architects, LLC
Portland, Oregon

Prepared by:
Associated Transportation Engineering & Planning, Inc.
Salem, Oregon
March 6, 2017
ATEP 17-346

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Introduction:

The Oregon Clinic intends to develop a 17,510 sq. ft. Ambulatory Surgery Center on 3 acres of tax lot 2001 of tax map 3S2W16 in Newberg, Oregon. The site is west of Providence Drive and south of the Providence Hospital in Newberg. The facility will be developed with access to Providence Dr.

Figure 1 - Vicinity Map

The Newberg Ambulatory Surgical Center will use the Newberg transportation system and add traffic to the roadways. This analysis will consider the traffic impacts at the intersection of 1) Providence Dr at Hwy 99W, 2) Hayes St at Werth Blvd. 3) Hayes St at Brutscher St and 4) Site Access at Providence Dr. Brutscher St at Fernwood Rd was closed while this study was conducted, diverting traffic to other intersections. Crash data was provided by the ODOT Crash Data Unit for the most recent 5 years.

Summary of Findings:

The Newberg Ambulatory Surgical Center will generate an estimated 633 trips each day. 42 of those trips will be in the AM Peak hour and 62 trips will be in the PM Peak hour. The performance metrics at the studied intersections are shown in the following table upon opening in 2017.

	AM Peak hour		PM Peak hour	
	LOS	v/c	LOS	v/c
Hwy 99W at Providence Dr	A	0.661	B	0.721
Hayes at Werth	A		A	
Hayes at Brutscher	A		A	
Site Access at Providence Dr	A	0.012	B	0.067

Crash data from ODOT Crash Data Unit identifies 9 crashes at the studied intersections in the last 5 years. None were fatal crashes, 4 were injury crashes and 5 were property damage only crashes.

History and Existing Conditions:

The site has been vacant in the recent past and was is adjacent to the Providence Medical Center. The site is zoned Residential/Specific Plan (R R/SP). Traffic from the planned ambulatory surgery center will travel north or south on Providence Dr to access the transportation system. The intersection of Providence

Dr at Hwy 99 W is signal controlled, the intersections of Hayes at Brutscher are roundabouts, and the site access is two way stop controlled.

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.652	5.0	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		3.8	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.2	A

Existing AM Peak Hour Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.714	10.7	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		4.6	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.5	A

Existing PM Peak Hour Summary

Figure 2 - Existing Traffic Conditions

Traffic Conditions when Newberg Surgical Center is Complete:

Newberg Ambulatory Surgical Center will add 42 trips to the AM Peak hour traffic and 62 trips to the PM Peak hour traffic. This study will assume that 60% of the traffic will travel north of the site then toward Newberg, 30% north on Providence Dr then toward Sherwood and 10% to the south of the site. The study assumed that traffic volumes will increase linearly 1% per year to estimate the 2017 and 2032 performance metrics.

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.661	5.4	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		3.8	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.2	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.012	9.3	A

2017 AM Peak Hour Summary with Newberg Surgical Center

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.731	12.0	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		4.6	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.5	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.067	10.1	B

2017 PM Peak Hour Summary with Newberg Surgical Center

Figure 3 – 2017 Traffic Conditions with Newberg Surgical Center

It is anticipated traffic will continue to increase at a rate of 1% / year. The following tables estimate the performance metrics and traffic volumes in the intersections in 15 years (2032) for planning purposes.

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.758	7.7	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		4.0	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.3	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.012	9.4	A

2032 AM Peak Hour Summary with Newberg Surgical Center

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.839	17.6	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		5.0	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.6	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.069	10.3	B

2032 PM Peak Hour Summary with Newberg Surgical Center

Figure 4 – 2032 Traffic Conditions with Newberg Surgical Center

Crash Data:

The ODOT Crash Data Unit provided information about reported crashes at the shown intersections for the past 5 years.

Intersection	Fatal	Injury	Property Damage	Total Crashes
Hwy 99W at Providence Dr	0	3	5	8
Hayes at Werth	0	0	0	0
Hayes at Brutscher	0	1	0	1

Figure 5 – Reported Crashes at Studied Intersections in 2010-2014

Summary:

The development of the planned Newberg Ambulatory Surgical Center in Newberg will add traffic to the transportation system. This study finds there is and will continue to be adequate capacity at the studied intersections when it is completed. Crash data does not indicate significant safety problems at the intersections.

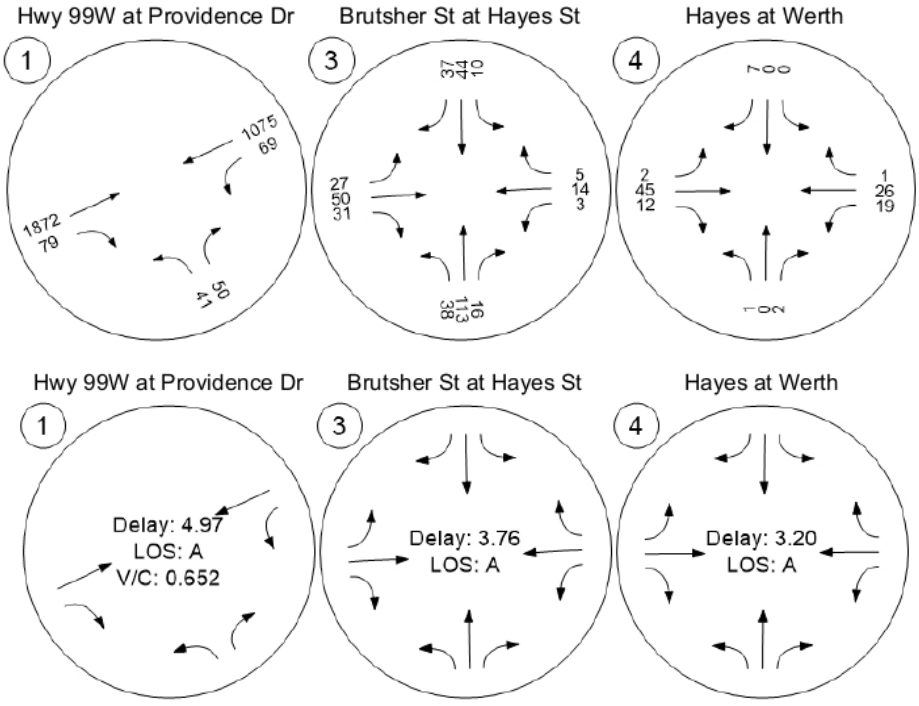


Figure 6 - Existing AM Peak hour Counts and Performance Metrics

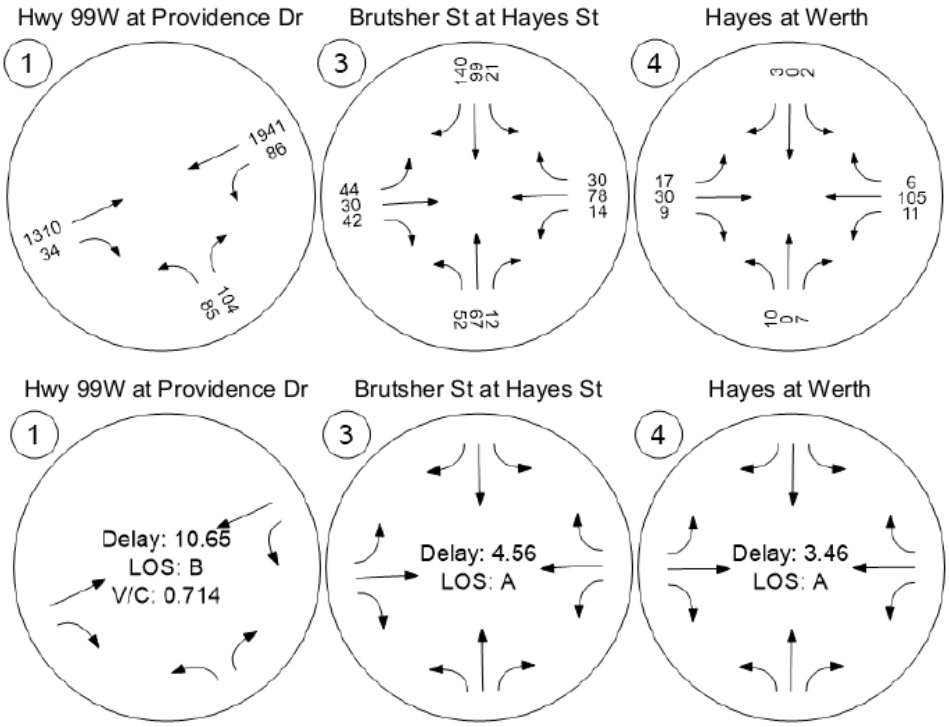


Figure 7 - Existing PM Peak hour Counts and Performance Metrics

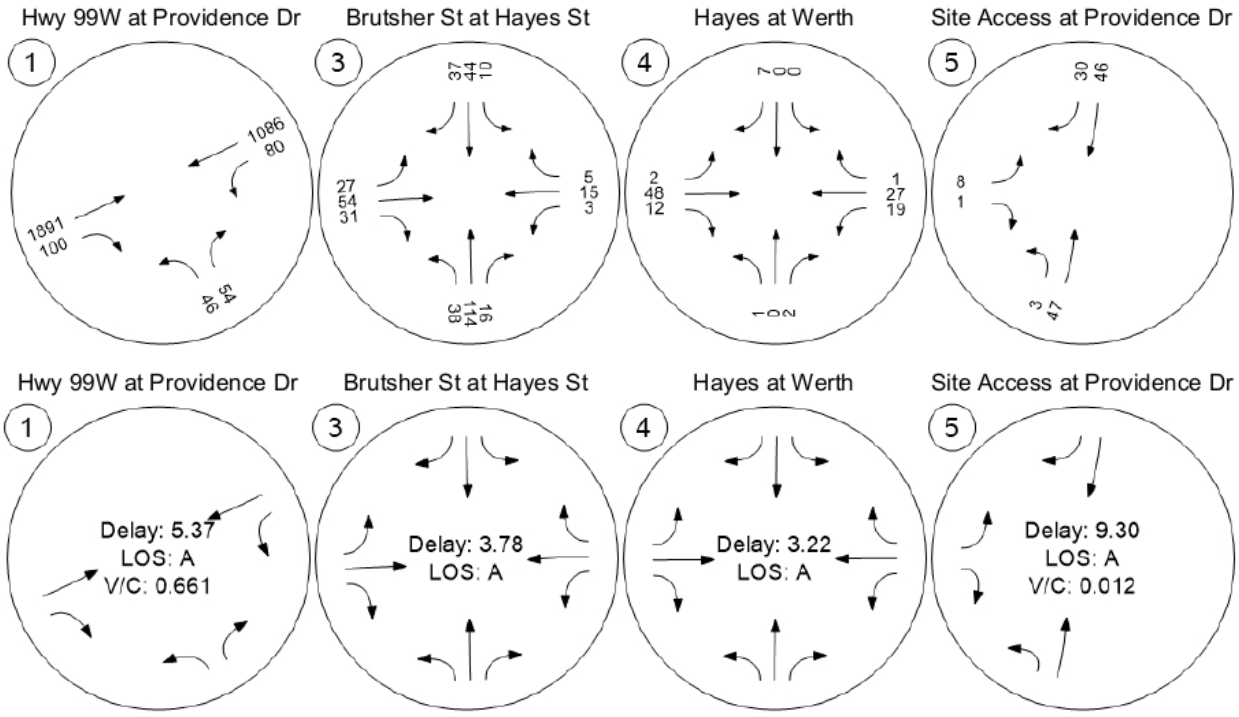


Figure 8 - 2017 AM Counts and Performance Metrics with Newberg Surgical Center

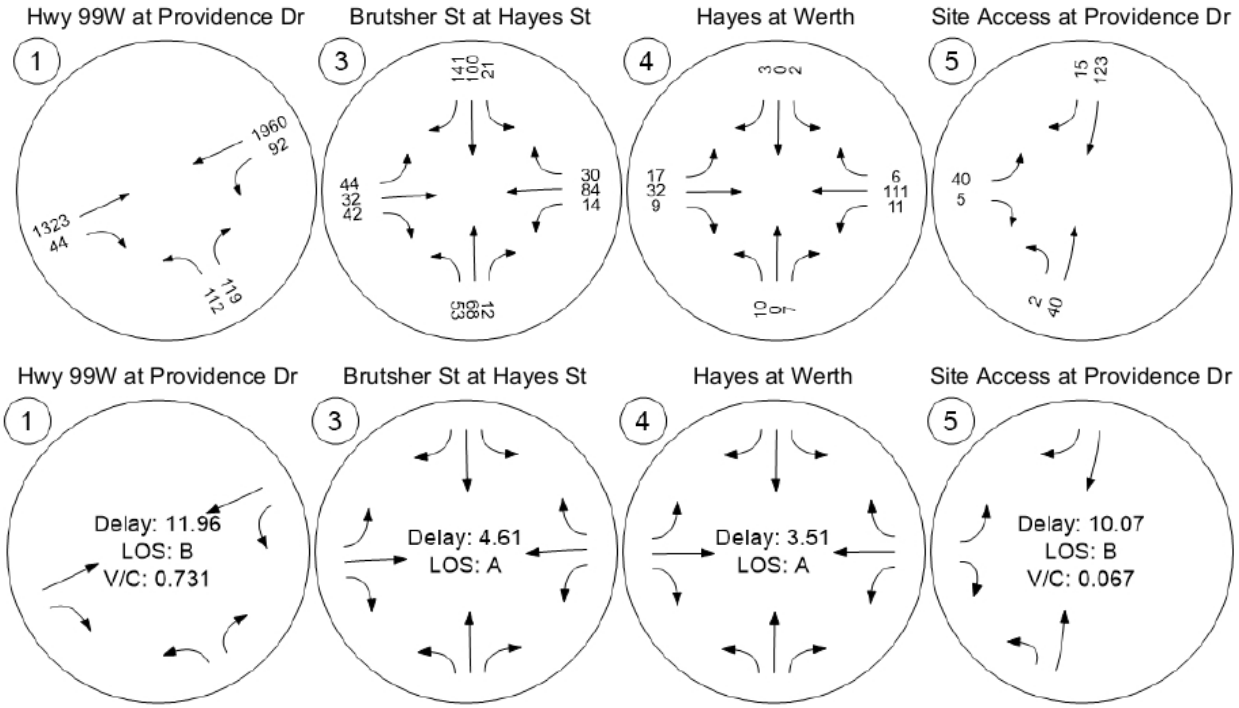


Figure 9 - 2017 PM Counts and Performance Metrics with Newberg Surgical Center

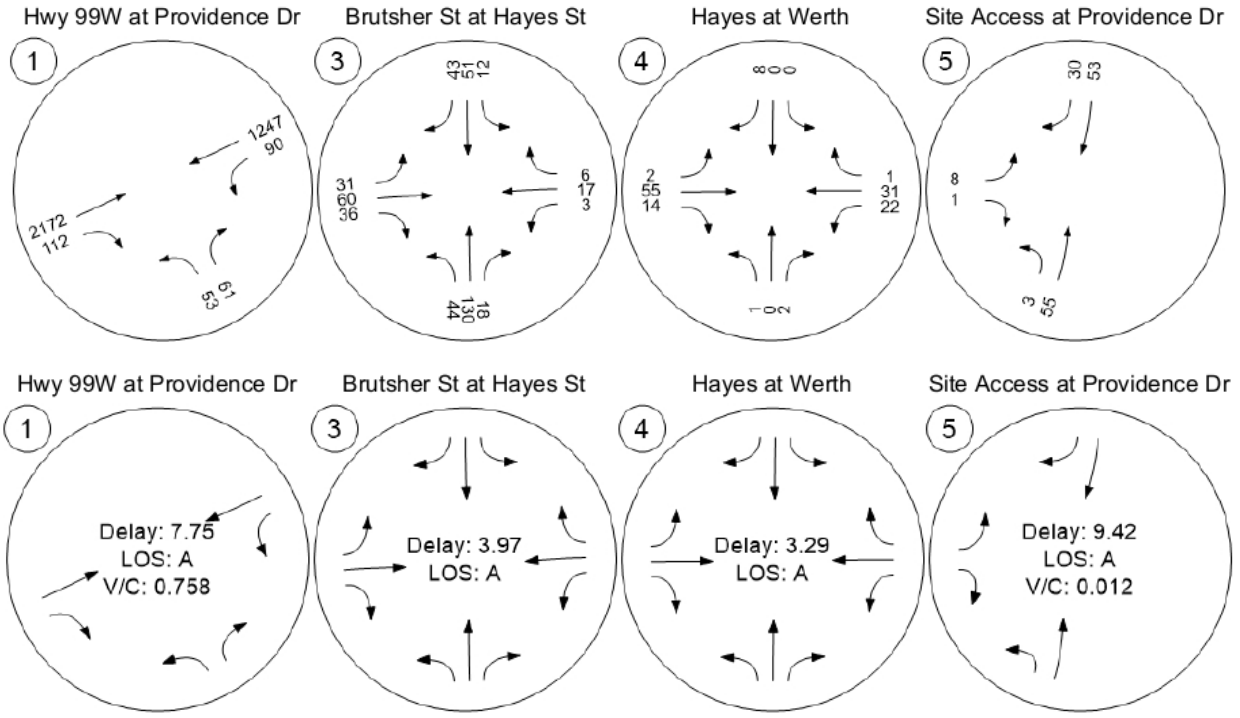


Figure 10 - 2032 AM Counts and Performance Metrics with Newberg Surgical Center

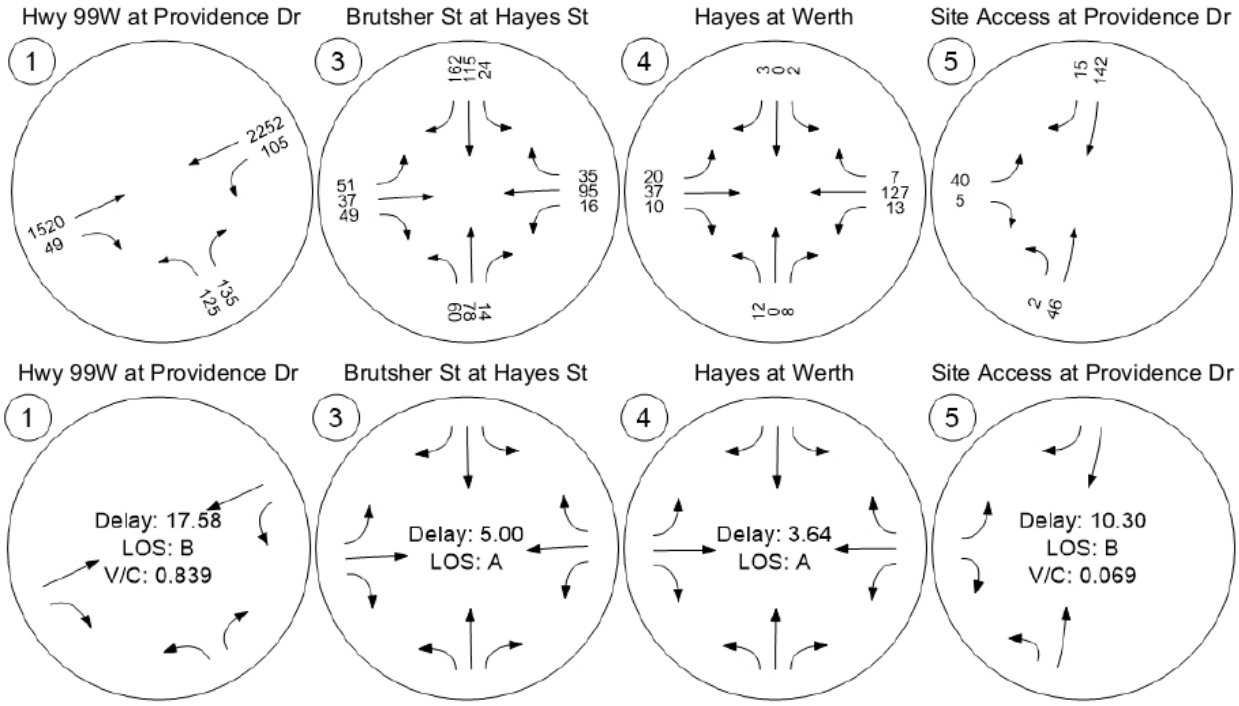


Figure 11 - 2032 PM Counts and Performance Metrics with Newberg Surgical Center

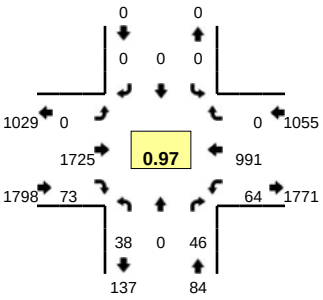
Type of peak hour being reported: Intersection Peak

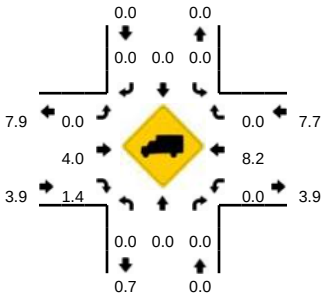
Method for determining peak hour: Total Entering Volume

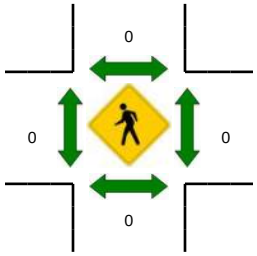
LOCATION: Providence Dr -- OR-99W
CITY/STATE: Newberg, OR

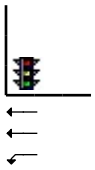
QC JOB #: 14233601
DATE: Tue, Feb 21 2017

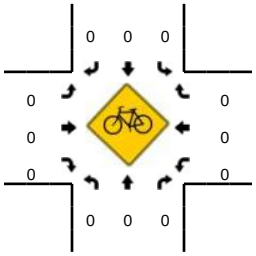
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

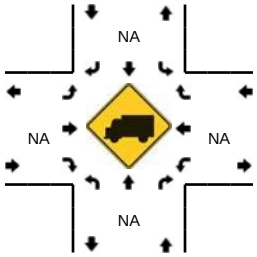


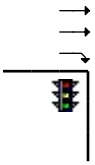


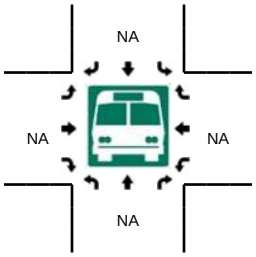












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				OR-99W (Eastbound)				OR-99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	1	0	0	0	0	0	0	171	5	0	5	68	0	0	250	
7:05 AM	1	0	4	0	0	0	0	0	0	169	6	0	4	73	0	0	257	
7:10 AM	3	0	3	0	0	0	0	0	0	132	3	0	3	88	0	0	232	
7:15 AM	1	0	1	0	0	0	0	0	0	143	2	0	10	74	0	0	231	
7:20 AM	3	0	4	0	0	0	0	0	0	176	6	0	4	77	0	0	270	
7:25 AM	4	0	8	0	0	0	0	0	0	128	3	0	3	79	0	0	225	
7:30 AM	7	0	7	0	0	0	0	0	0	141	6	0	4	87	0	0	252	
7:35 AM	1	0	6	0	0	0	0	0	0	146	7	0	10	77	0	0	247	
7:40 AM	4	0	1	0	0	0	0	0	0	134	7	0	2	70	0	0	218	
7:45 AM	6	0	5	0	0	0	0	0	0	135	4	0	7	100	0	0	257	
7:50 AM	4	0	5	0	0	0	0	0	0	129	11	0	6	96	0	0	251	
7:55 AM	4	0	1	0	0	0	0	0	0	121	13	0	6	102	0	0	247	2937
8:00 AM	3	0	7	0	0	0	0	0	0	119	5	0	4	83	0	0	221	2908
8:05 AM	1	0	4	0	0	0	0	0	0	102	4	0	7	77	0	0	195	2846
8:10 AM	4	0	3	0	0	0	0	0	0	97	4	0	3	79	0	0	190	2804
8:15 AM	6	0	2	0	0	0	0	0	0	109	7	0	2	68	0	0	194	2767
8:20 AM	4	0	5	0	0	0	0	0	0	113	7	0	9	75	0	0	213	2710
8:25 AM	4	0	5	0	0	0	0	0	0	120	1	0	2	69	0	0	201	2686
8:30 AM	2	0	4	0	0	0	0	0	0	105	4	0	5	69	0	0	189	2623
8:35 AM	5	0	3	0	0	0	0	0	0	114	6	0	3	87	0	0	218	2594
8:40 AM	7	0	3	0	0	0	0	0	0	75	4	0	4	59	0	0	152	2528
8:45 AM	11	0	6	0	0	0	0	0	0	113	5	0	6	51	0	0	192	2463
8:50 AM	9	0	2	0	0	0	0	0	0	91	4	0	3	89	0	0	198	2410
8:55 AM	7	0	0	0	0	0	0	0	0	100	5	0	3	56	0	0	171	2334

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	56	0	44	0	0	0	0	0	0	1540	112	0	76	1192	0	0	3020
Heavy Trucks	0	0	0		0	0	0		0	48	4		0	84	0		136
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 2/28/2017 2:22 PM

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

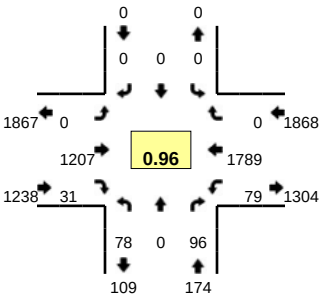
Type of peak hour being reported: Intersection Peak

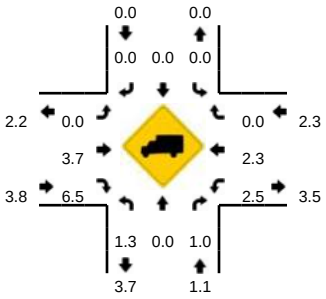
Method for determining peak hour: Total Entering Volume

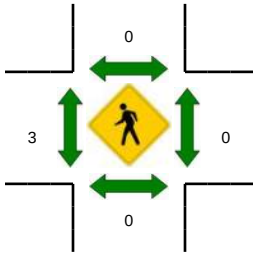
LOCATION: Providence Dr -- OR-99W
CITY/STATE: Newberg, OR

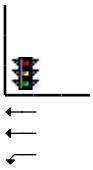
QC JOB #: 14233602
DATE: Tue, Feb 21 2017

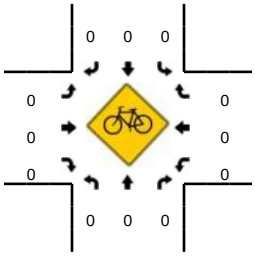
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:40 PM -- 4:55 PM

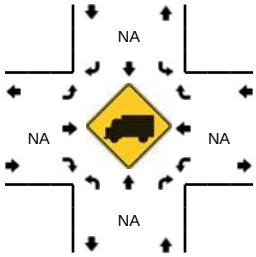


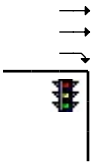


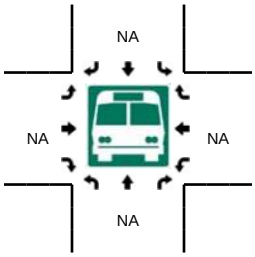












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				OR-99W (Eastbound)				OR-99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	0	4	0	0	0	0	0	0	88	0	0	7	149	0	1	253	
4:05 PM	12	0	9	0	0	0	0	0	0	91	2	0	4	145	0	0	263	
4:10 PM	6	0	8	0	0	0	0	0	0	100	3	0	11	166	0	0	294	
4:15 PM	8	0	4	0	0	0	0	0	0	92	3	0	6	146	0	0	259	
4:20 PM	9	0	6	0	0	0	0	0	0	81	4	0	7	151	0	0	258	
4:25 PM	9	0	5	0	0	0	0	0	0	97	4	0	2	114	0	0	231	
4:30 PM	5	0	6	0	0	0	0	0	0	82	5	0	2	167	0	0	267	
4:35 PM	16	0	15	0	0	0	0	0	0	86	4	0	2	133	0	0	256	
4:40 PM	1	0	7	0	0	0	0	0	0	106	3	0	8	179	0	1	305	
4:45 PM	5	0	8	0	0	0	0	0	0	90	2	0	7	147	0	0	259	
4:50 PM	6	0	10	0	0	0	0	0	0	111	4	0	6	156	0	0	293	
4:55 PM	3	0	9	0	0	0	0	0	0	105	1	0	8	151	0	0	277	3215
5:00 PM	4	0	9	0	0	0	0	0	0	82	2	0	10	138	0	0	245	3207
5:05 PM	13	0	9	0	0	0	0	0	0	121	1	0	11	120	0	0	275	3219
5:10 PM	5	0	6	0	0	0	0	0	0	123	3	0	9	132	0	0	278	3203
5:15 PM	7	0	10	0	0	0	0	0	0	96	3	0	3	146	0	0	265	3209
5:20 PM	7	0	6	0	0	0	0	0	0	94	2	0	9	167	0	0	285	3236
5:25 PM	6	0	1	0	0	0	0	0	0	111	1	0	3	153	0	0	275	3280
5:30 PM	6	0	6	0	0	0	0	0	0	98	1	0	7	140	0	0	258	3271
5:35 PM	5	0	4	0	0	0	0	0	0	84	2	0	5	151	0	1	252	3267
5:40 PM	7	0	5	0	0	0	0	0	0	101	3	0	10	149	0	0	275	3237
5:45 PM	8	0	5	0	0	0	0	0	0	86	0	0	4	142	0	0	245	3223
5:50 PM	2	0	4	0	0	0	0	0	0	84	3	0	8	147	0	0	248	3178
5:55 PM	1	0	3	0	0	0	0	0	0	108	3	0	1	145	0	0	261	3162

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	48	0	100	0	0	0	0	0	0	1228	36	0	84	1928	0	4	3428
Heavy Trucks	0	0	0		0	0	0		0	48	4		4	56	0		112
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/28/2017 2:22 PM

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

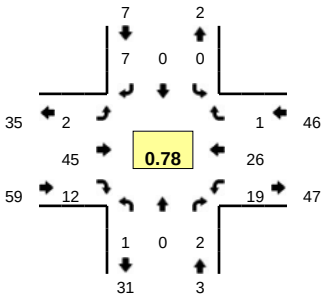
Type of peak hour being reported: Intersection Peak

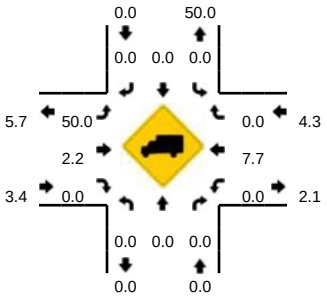
Method for determining peak hour: Total Entering Volume

LOCATION: Werth Blvd -- Hayes St
CITY/STATE: Newberg, OR

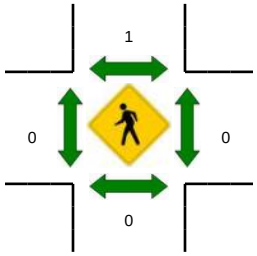
QC JOB #: 14233603
DATE: Tue, Feb 21 2017

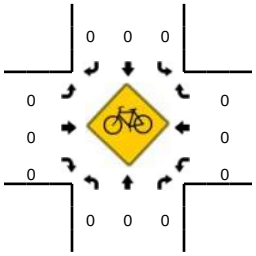
Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:45 AM -- 9:00 AM

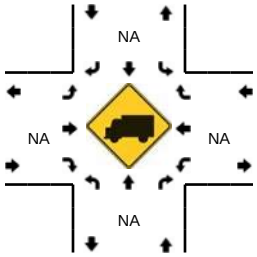


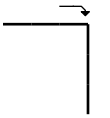


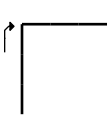
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

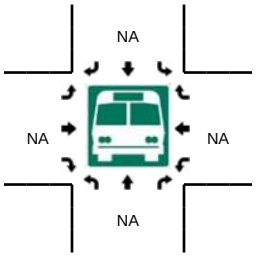












5-Min Count Period Beginning At	Werth Blvd (Northbound)				Werth Blvd (Southbound)				Hayes St (Eastbound)				Hayes St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0	0	5	
7:05 AM	0	0	1	0	1	0	0	0	1	4	1	0	0	1	0	0	9	
7:10 AM	0	0	0	0	0	1	0	0	0	4	0	0	0	3	0	0	8	
7:15 AM	0	0	1	0	1	0	0	0	0	4	1	0	1	1	0	0	9	
7:20 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	3	0	0	11	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	
7:30 AM	0	0	0	0	1	0	0	0	0	7	0	0	1	0	0	0	9	
7:35 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	5	
7:40 AM	0	0	0	0	0	0	0	0	0	4	2	1	0	3	0	0	10	
7:45 AM	0	0	0	0	0	0	0	0	0	10	1	0	0	1	0	0	12	
7:50 AM	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	0	7	
7:55 AM	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	4	91
8:00 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	3	0	0	11	97
8:05 AM	0	0	0	0	0	0	0	0	0	4	1	0	0	1	0	0	6	94
8:10 AM	1	0	0	0	0	0	0	0	0	1	1	0	3	1	0	0	7	93
8:15 AM	0	0	0	0	0	0	0	0	0	3	0	0	4	1	1	0	9	93
8:20 AM	0	0	0	0	0	0	0	0	0	1	1	0	3	3	0	0	8	90
8:25 AM	0	0	0	0	0	0	1	0	0	5	0	0	1	1	0	0	8	96
8:30 AM	0	0	0	0	0	0	1	0	0	6	1	0	1	3	0	0	12	99
8:35 AM	0	0	0	0	0	0	2	0	0	3	2	0	1	5	0	0	13	107
8:40 AM	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	4	101
8:45 AM	0	0	0	0	0	0	1	0	0	6	1	0	1	2	0	0	11	100
8:50 AM	0	0	1	0	0	0	1	0	1	5	2	0	0	4	0	0	14	107
8:55 AM	0	0	1	0	0	0	1	0	0	3	2	1	3	1	0	0	12	115

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	8	0	0	0	12	0	4	56	20	4	16	28	0	0	148
Heavy Trucks	0	0	0		0	0	0		4	0	0		0	4	0		8
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 2/28/2017 2:22 PM

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

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Werth Blvd -- Hayes St

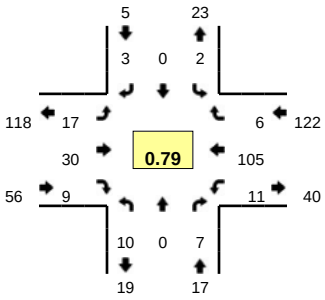
CITY/STATE: Newberg, OR

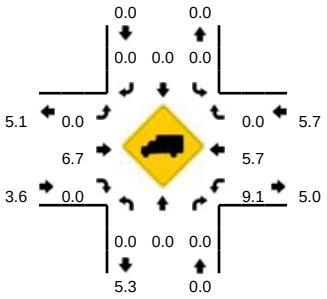
QC JOB #: 14233604

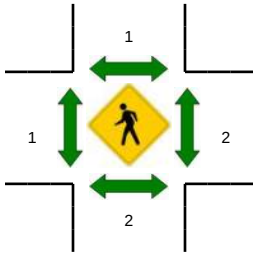
DATE: Tue, Feb 21 2017

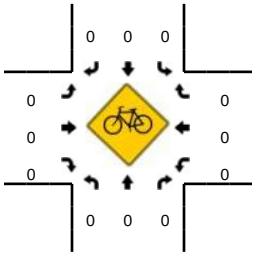
Peak-Hour: 4:10 PM -- 5:10 PM

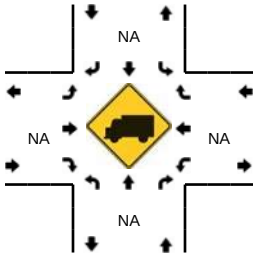
Peak 15-Min: 4:55 PM -- 5:10 PM

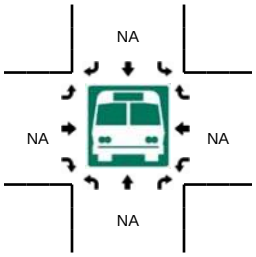












5-Min Count Period Beginning At	Werth Blvd (Northbound)				Werth Blvd (Southbound)				Hayes St (Eastbound)				Hayes St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	0	1	0	0	0	0	0	1	2	0	0	1	9	1	0	17	
4:05 PM	1	0	1	0	0	0	0	0	2	2	2	0	0	8	0	0	16	
4:10 PM	0	0	0	0	0	0	0	0	2	2	2	0	0	8	2	0	16	
4:15 PM	0	0	0	0	0	0	1	0	2	2	2	0	1	9	1	0	18	
4:20 PM	1	0	0	0	0	0	0	0	2	1	0	0	0	11	0	0	15	
4:25 PM	0	0	2	0	0	0	1	0	6	3	2	0	2	5	1	0	22	
4:30 PM	2	0	2	0	0	0	0	0	0	1	0	0	2	4	1	0	12	
4:35 PM	1	0	1	0	0	0	0	0	1	2	0	0	0	10	0	1	16	
4:40 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	6	0	0	10	
4:45 PM	2	0	1	0	0	0	0	0	0	3	2	0	1	12	0	0	21	
4:50 PM	0	0	0	0	0	0	1	0	1	2	0	0	1	2	0	0	7	
4:55 PM	0	0	0	0	0	0	0	0	0	4	0	0	1	14	0	0	19	189
5:00 PM	2	0	0	0	0	0	0	0	1	2	0	0	1	12	1	0	19	191
5:05 PM	2	0	1	0	2	0	0	0	2	4	1	0	1	12	0	0	25	200
5:10 PM	0	0	1	0	0	0	0	0	0	3	0	0	1	7	1	0	13	197
5:15 PM	0	0	1	0	0	0	1	0	0	5	1	0	0	5	0	0	13	192
5:20 PM	3	0	1	0	1	0	0	0	1	2	0	0	1	9	0	0	18	195
5:25 PM	0	0	0	0	1	0	1	0	0	3	0	0	2	8	0	0	15	188
5:30 PM	0	0	1	0	0	0	0	0	0	2	1	0	0	5	0	0	9	185
5:35 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	8	0	0	9	178
5:40 PM	0	0	1	0	0	0	3	0	1	4	2	0	0	8	1	0	20	188
5:45 PM	1	0	0	0	1	0	0	0	0	2	0	0	0	5	0	0	9	176
5:50 PM	2	0	0	0	0	0	0	0	0	1	2	0	0	2	0	0	7	176
5:55 PM	0	0	0	0	0	0	0	0	0	4	1	0	0	4	0	0	9	166

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	0	4	0	8	0	0	0	12	40	4	0	12	152	4	0	252
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	4	0		4
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/28/2017 2:22 PM

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

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Brutscher St -- Hayes St

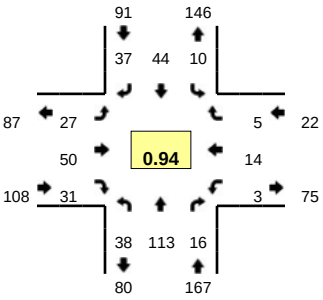
CITY/STATE: Newberg, OR

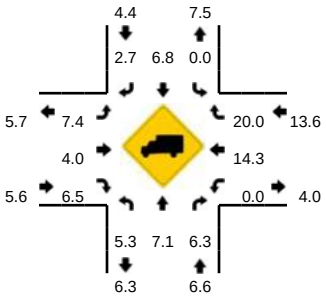
QC JOB #: 14233605

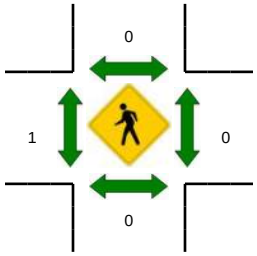
DATE: Tue, Feb 21 2017

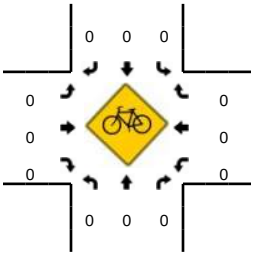
Peak-Hour: 7:15 AM -- 8:15 AM

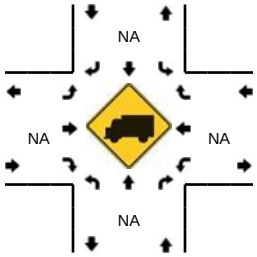
Peak 15-Min: 7:35 AM -- 7:50 AM

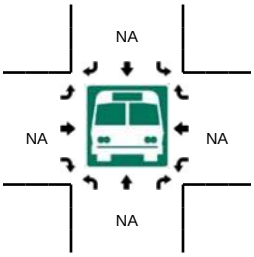












5-Min Count Period Beginning At	Brutscher St (Northbound)				Brutscher St (Southbound)				Hayes St (Eastbound)				Hayes St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	4	0	0	0	1	2	0	4	1	0	0	1	0	2	0	18	
7:05 AM	4	5	1	0	0	1	0	0	0	5	1	0	0	1	0	0	18	
7:10 AM	3	6	1	0	0	3	1	0	0	4	1	0	0	2	1	0	22	
7:15 AM	6	14	2	0	1	1	4	0	3	3	2	0	0	1	0	0	37	
7:20 AM	3	14	2	0	1	1	1	1	1	5	0	0	1	0	2	0	32	
7:25 AM	4	12	0	1	0	2	1	0	1	3	2	0	0	2	0	0	28	
7:30 AM	3	6	1	0	3	5	1	0	3	6	4	0	0	1	0	0	33	
7:35 AM	0	10	0	0	0	1	6	0	2	3	5	0	0	2	0	0	29	
7:40 AM	4	7	1	0	1	5	3	0	2	6	2	0	2	2	1	0	36	
7:45 AM	3	8	3	0	1	4	5	0	3	7	4	0	0	0	0	0	38	
7:50 AM	2	4	1	0	1	4	3	0	4	6	1	0	0	1	0	0	27	
7:55 AM	3	8	3	0	0	4	2	0	2	2	1	0	0	1	0	0	26	344
8:00 AM	1	4	1	1	1	6	3	0	1	4	4	0	0	2	1	0	29	355
8:05 AM	6	13	0	0	0	3	4	0	5	5	4	0	0	1	0	0	41	378
8:10 AM	1	13	2	0	0	8	4	0	0	0	2	0	0	1	1	0	32	388
8:15 AM	4	8	3	0	0	4	3	1	1	0	2	0	0	1	1	0	28	379
8:20 AM	5	9	1	0	0	6	2	0	2	2	2	0	0	0	2	0	31	378
8:25 AM	2	6	0	0	1	10	0	1	5	5	2	0	1	1	0	0	34	384
8:30 AM	4	6	3	0	0	4	1	0	3	3	2	0	0	2	2	0	30	381
8:35 AM	3	6	1	0	1	4	3	0	2	3	2	0	1	2	3	0	31	383
8:40 AM	1	3	1	0	0	6	4	0	1	3	3	0	0	2	1	0	25	372
8:45 AM	3	5	1	0	2	5	0	0	2	5	3	0	0	1	2	0	29	363
8:50 AM	2	1	0	0	3	8	4	0	3	3	5	0	1	2	3	0	35	371
8:55 AM	6	7	0	0	4	6	1	0	1	2	7	0	0	1	1	0	36	381

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	28	100	16	0	8	40	56	0	28	64	44	0	8	16	4	0	412
Heavy Trucks	0	4	0		0	0	0		4	4	4		0	0	0		16
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/28/2017 2:22 PM

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

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

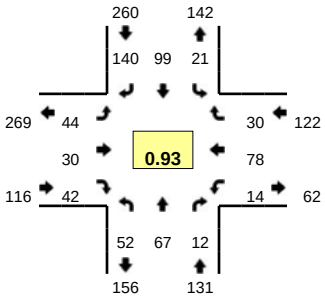
LOCATION: Brutscher St -- Hayes St

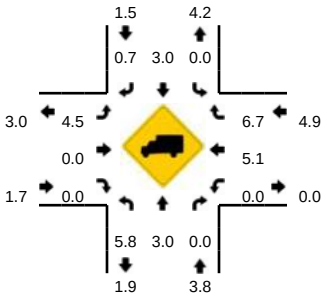
CITY/STATE: Newberg, OR

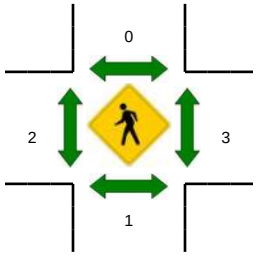
QC JOB #: 14233606

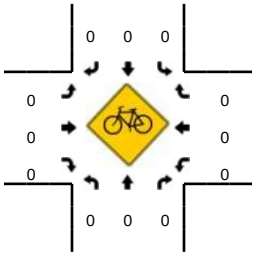
DATE: Tue, Feb 21 2017

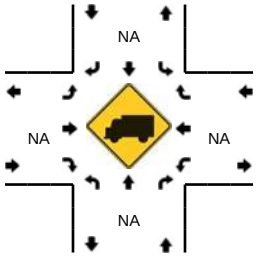
Peak-Hour: 4:20 PM -- 5:20 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

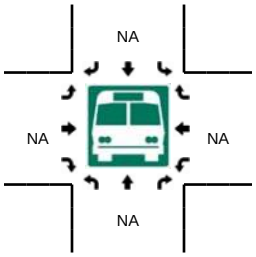












5-Min Count Period Beginning At	Brutscher St (Northbound)				Brutscher St (Southbound)				Hayes St (Eastbound)				Hayes St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	3	0	0	2	10	7	0	2	2	3	0	3	7	4	0	47	
4:05 PM	8	7	1	0	0	4	12	1	2	4	4	0	0	9	1	0	53	
4:10 PM	5	4	1	0	4	10	5	0	3	3	1	0	0	5	4	0	45	
4:15 PM	4	5	1	0	4	5	10	0	3	2	2	0	1	5	0	0	42	
4:20 PM	3	4	1	0	5	6	13	0	4	2	2	0	2	9	4	0	55	
4:25 PM	2	8	0	0	7	9	10	0	2	2	1	0	0	4	3	0	48	
4:30 PM	5	7	1	0	0	12	16	0	7	0	2	0	0	4	2	0	56	
4:35 PM	5	5	0	0	2	5	11	0	4	1	2	0	2	9	3	0	49	
4:40 PM	4	7	2	0	1	4	7	0	3	3	4	0	0	6	1	0	42	
4:45 PM	8	5	0	0	0	15	11	0	6	4	1	0	2	7	3	0	62	
4:50 PM	8	5	0	1	1	5	16	0	2	2	5	0	1	3	3	0	52	
4:55 PM	5	3	2	0	0	5	13	0	3	1	4	0	1	7	1	0	45	596
5:00 PM	1	9	3	0	2	6	6	0	2	3	4	0	1	14	3	0	54	603
5:05 PM	4	3	1	0	2	8	19	0	4	4	9	0	1	7	3	0	65	615
5:10 PM	3	4	0	0	0	13	8	0	4	4	5	0	3	5	2	0	51	621
5:15 PM	3	7	2	0	0	11	10	1	3	4	3	0	1	3	2	0	50	629
5:20 PM	0	4	1	0	1	5	14	0	3	2	2	0	1	12	0	0	45	619
5:25 PM	8	6	0	0	1	4	9	0	1	1	6	0	1	9	1	0	47	618
5:30 PM	2	2	0	0	1	9	11	0	4	2	2	0	1	3	2	0	39	601
5:35 PM	6	6	0	0	1	12	10	1	4	1	4	0	0	6	1	0	52	604
5:40 PM	0	4	2	0	0	6	12	0	4	4	1	0	1	13	0	0	47	609
5:45 PM	0	10	0	0	0	15	10	0	2	2	4	1	1	3	2	0	50	597
5:50 PM	5	9	0	0	1	8	7	0	0	3	7	0	1	3	0	0	44	589
5:55 PM	7	10	1	0	1	4	6	0	0	2	3	0	2	2	0	0	38	582

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	32	64	16	0	16	108	132	0	40	44	72	0	20	104	32	0	680
Heavy Trucks	0	4	0		0	4	0		4	0	0		0	0	0		12
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/28/2017 2:22 PM

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

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

Providence Dr & 99W Pacifice Highway (091)
January 1, 2010 through December 31, 2014

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: 2014														
REAR-END	0	0	2	2	0	0	0	2	0	2	0	2	0	0
2014 TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0	0
YEAR: 2013														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2013 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2012														
REAR-END	0	2	1	3	0	3	0	2	1	3	0	3	0	0
2012 TOTAL	0	2	1	3	0	3	0	2	1	3	0	3	0	0
YEAR: 2011														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2011 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2010														
REAR-END	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2010 TOTAL	0	1	0	1	0	2	0	1	0	1	0	1	0	0
FINAL TOTAL	0	3	5	8	0	5	0	6	2	8	0	8	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.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Hayes St & Brutscher St

January 1, 2010 through December 31, 2014

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														
NON-COLLISION	0	1	0	1	0	1	0	1	0	0	1	1	0	0
2013 TOTAL	0	1	0	1	0	1	0	1	0	0	1	1	0	0
FINAL TOTAL	0	1	0	1	0	1	0	1	0	0	1	1	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.

17-346 Newberg Surg. Ctr TIA

Vistro File: J:\...\17-346 Newberg Ambulatory Surgery TIA.vistro

Scenario 1 AM Existing 17-346

Report File: J:\...\17-346 Existing AM.pdf

3/2/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.652	5.0	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		3.8	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.2	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	5.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.652

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1725	73	64	991	38	46
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	4.50	4.50	4.50	4.50	4.50	4.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1872	79	69	1075	41	50
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	482	20	18	277	11	13
Total Analysis Volume [veh/h]	1930	81	71	1108	42	52
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	8	0	0	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	5	0	0	5	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	19	0	0	19	101	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	106	106	106	106	6	6
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.61	0.06	0.35	0.35	0.03	0.04
s, saturation flow rate [veh/h]	3140	1402	203	3140	1571	1402
c, Capacity [veh/h]	2765	1234	195	2765	83	74
d1, Uniform Delay [s]	2.22	0.91	10.29	1.32	55.27	55.86
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.49	0.10	5.16	0.43	4.72	11.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.70	0.07	0.36	0.40	0.51	0.70
d, Delay for Lane Group [s/veh]	3.71	1.01	15.45	1.76	59.99	67.32
Lane Group LOS	A	A	B	A	E	E
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	1.61	0.07	1.11	0.52	1.36	1.80
50th-Percentile Queue Length [ft]	40.21	1.77	27.64	13.03	33.90	44.91
95th-Percentile Queue Length [veh]	2.90	0.13	1.99	0.94	2.44	3.23
95th-Percentile Queue Length [ft]	72.38	3.18	49.75	23.46	61.02	80.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.71	1.01	15.45	1.76	59.99	67.32
Movement LOS	A	A	B	A	E	E
d_A, Approach Delay [s/veh]	3.60		2.58		64.04	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	4.97					
Intersection LOS	A					
Intersection V/C	0.652					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	51.34	51.34	51.34
l_p,int, Pedestrian LOS Score for Intersection	3.299	3.240	2.123
Crosswalk LOS	C	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	60.00	60.00	60.00
l_b,int, Bicycle LOS Score for Intersection	5.791	5.105	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	3.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	30	4	3	12	10	7	13	8	1	4	1
Total Analysis Volume [veh/h]	40	120	17	11	47	39	29	53	33	3	15	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	94			59			62			192		
Exiting Flow Rate [veh/h]	65			56			51			151		
Demand Flow Rate [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Adjusted Demand Flow Rate [veh/h]	40	120	17	11	47	39	29	53	33	3	15	5

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	180	99	117	24
Capacity of Entry and Bypass Lanes [veh/h]	1254	1300	1296	1135
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1234	1280	1276	1117
X, volume / capacity	0.14	0.08	0.09	0.02

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.50	0.25	0.30	0.06
95th-Percentile Queue Length [ft]	12.52	6.14	7.42	1.58
Approach Delay [s/veh]	4.12	3.42	3.55	3.39
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.76			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	0	0	2	1	14	4	6	8	0
Total Analysis Volume [veh/h]	1	0	3	0	0	9	3	58	15	24	33	1
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	64			61			25			4		
Exiting Flow Rate [veh/h]	61			36			25			3		
Demand Flow Rate [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Adjusted Demand Flow Rate [veh/h]	1	0	3	0	0	9	3	58	15	24	33	1

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.95	0.95	0.95	0.95
Entry Flow Rate [veh/h]	5	10	81	62
Capacity of Entry and Bypass Lanes [veh/h]	1293	1297	1345	1375
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1227	1231	1276	1304
X, volume / capacity	0.00	0.01	0.06	0.04

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.02	0.19	0.14
95th-Percentile Queue Length [ft]	0.25	0.55	4.74	3.49
Approach Delay [s/veh]	2.96	2.98	3.30	3.11
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.20			
Intersection LOS	A			

17-346 Newberg Surg. Ctr TIA

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Scenario 1 AM Existing 17-346

Report File: J:\...\17-346 Existing AM.pdf

3/2/2017

Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1872	79	69	1075	41	50	3186

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	38	113	16	10	44	37	27	50	31	3	14	5	388

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	1	0	2	0	0	7	2	45	12	19	26	1	115

17-346 Newberg Surg. Ctr TIA

Vistro File: J:\...\17-346 Newberg Ambulatory Surgery TIA.vistro

Scenario 1 AM Existing 17-346

Report File: J:\...\17-346 Existing AM.pdf

3/2/2017

Turning Movement Volume: Detail

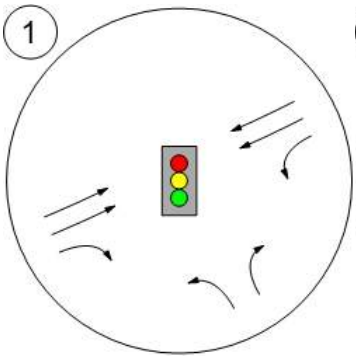
ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1872	79	69	1075	41	50	3186
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1872**	**79**	**69**	**1075**	**41**	**50**	**3186**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	38	113	16	10	44	37	27	50	31	3	14	5	388
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**38**	**113**	**16**	**10**	**44**	**37**	**27**	**50**	**31**	**3**	**14**	**5**	**388**

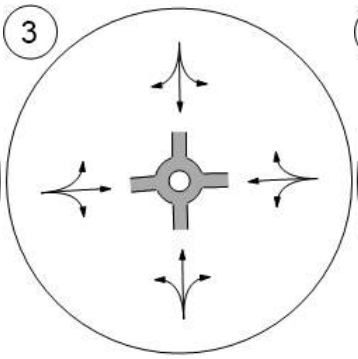
ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	1	0	2	0	0	7	2	45	12	19	26	1	115
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1**	**0**	**2**	**0**	**0**	**7**	**2**	**45**	**12**	**19**	**26**	**1**	**115**

Report Figure 1: Lane Configuration and Traffic Control

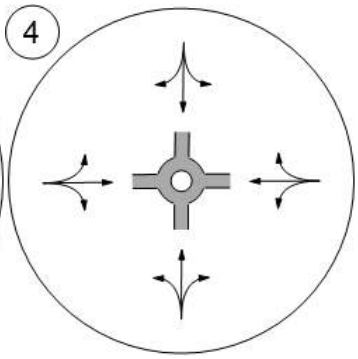
Hwy 99W at Providence Dr



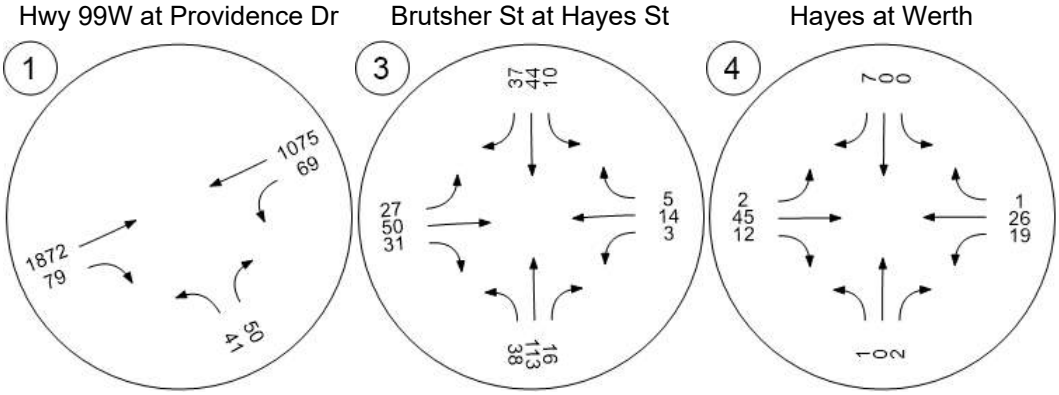
Brutsher St at Hayes St



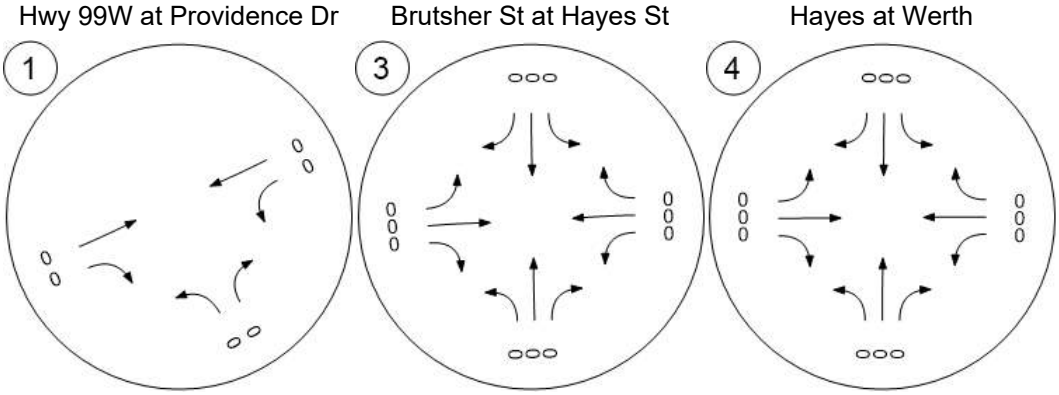
Hayes at Werth



Report Figure 2a: Traffic Volume - Base Volume

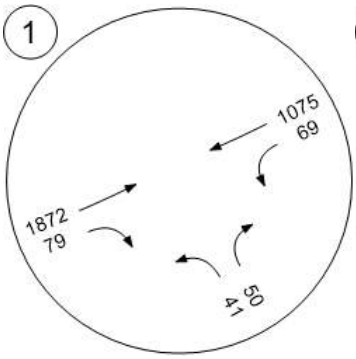


Report Figure 2c: Traffic Volume - Net New Site Trips

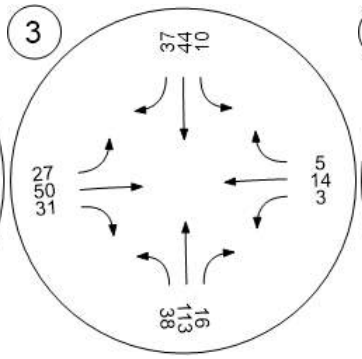


Report Figure 2e: Traffic Volume - Future Total Volume

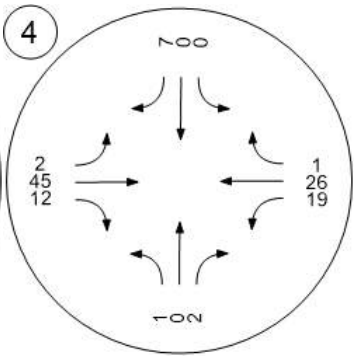
Hwy 99W at Providence Dr



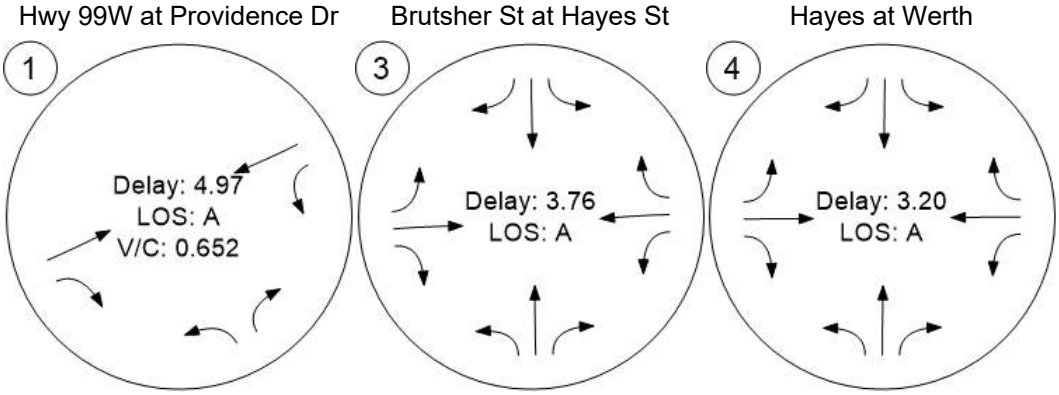
Brutsher St at Hayes St



Hayes at Werth



Report Figure 3: Traffic Conditions



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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.714	10.7	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		4.6	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.5	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1207	31	79	1789	78	96
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	3.27	3.27	3.27	3.27	3.27	3.27
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1310	34	86	1941	85	104
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	341	9	22	505	22	27
Total Analysis Volume [veh/h]	1365	35	90	2022	89	108
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	8	0	7	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	27	0	44	71	19	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	63	63	6	73	9	9
g / C, Green / Cycle	0.70	0.70	0.07	0.81	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.43	0.02	0.06	0.64	0.06	0.08
s, saturation flow rate [veh/h]	3172	1416	1587	3172	1587	1416
c, Capacity [veh/h]	2204	984	115	2575	158	141
d1, Uniform Delay [s]	7.35	4.29	41.06	4.40	38.70	39.54
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	0.07	10.96	2.49	3.16	8.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.04	0.78	0.79	0.57	0.77
d, Delay for Lane Group [s/veh]	8.67	4.36	52.02	6.89	41.86	48.03
Lane Group LOS	A	A	D	A	D	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	5.25	0.16	2.22	4.05	2.01	2.65
50th-Percentile Queue Length [ft]	131.22	4.09	55.60	101.13	50.30	66.37
95th-Percentile Queue Length [veh]	9.01	0.29	4.00	7.28	3.62	4.78
95th-Percentile Queue Length [ft]	225.15	7.36	100.08	182.04	90.54	119.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.67	4.36	52.02	6.89	41.86	48.03
Movement LOS	A	A	D	A	D	D
d_A, Approach Delay [s/veh]	8.56		8.81		45.24	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	10.65					
Intersection LOS	B					
Intersection V/C	0.714					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45
l_p,int, Pedestrian LOS Score for Intersection	3.455	3.350	2.029
Crosswalk LOS	C	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	45.00	45.00	45.00
l_b,int, Bicycle LOS Score for Intersection	5.287	5.875	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	4.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	18	3	6	27	38	12	8	11	4	21	8
Total Analysis Volume [veh/h]	56	72	13	23	106	151	47	32	45	15	84	32
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	104			158			147			178		
Exiting Flow Rate [veh/h]	56			142			123			121		
Demand Flow Rate [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Adjusted Demand Flow Rate [veh/h]	56	72	13	23	106	151	47	32	45	15	84	32

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	144	285	127	134
Capacity of Entry and Bypass Lanes [veh/h]	1242	1175	1189	1151
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1220	1155	1168	1131
X, volume / capacity	0.12	0.24	0.11	0.12

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.39	0.95	0.36	0.39
95th-Percentile Queue Length [ft]	9.77	23.80	8.89	9.80
Approach Delay [s/veh]	3.91	5.33	3.98	4.18
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	4.56			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	2	1	0	1	5	9	3	3	33	2
Total Analysis Volume [veh/h]	13	0	9	3	0	4	22	38	11	14	133	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	64			163			17			36		
Exiting Flow Rate [veh/h]	42			148			14			22		
Demand Flow Rate [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Adjusted Demand Flow Rate [veh/h]	13	0	9	3	0	4	22	38	11	14	133	8

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	23	8	73	158
Capacity of Entry and Bypass Lanes [veh/h]	1293	1170	1356	1331
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1273	1151	1335	1311
X, volume / capacity	0.02	0.01	0.05	0.12

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.05	0.02	0.17	0.40
95th-Percentile Queue Length [ft]	1.32	0.46	4.21	10.04
Approach Delay [s/veh]	2.97	3.18	3.11	3.71
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.46			
Intersection LOS	A			

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Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1310	34	86	1941	85	104	3560

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	52	67	12	21	99	140	44	30	42	14	78	30	629

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	10	0	7	2	0	3	17	30	9	11	105	6	200

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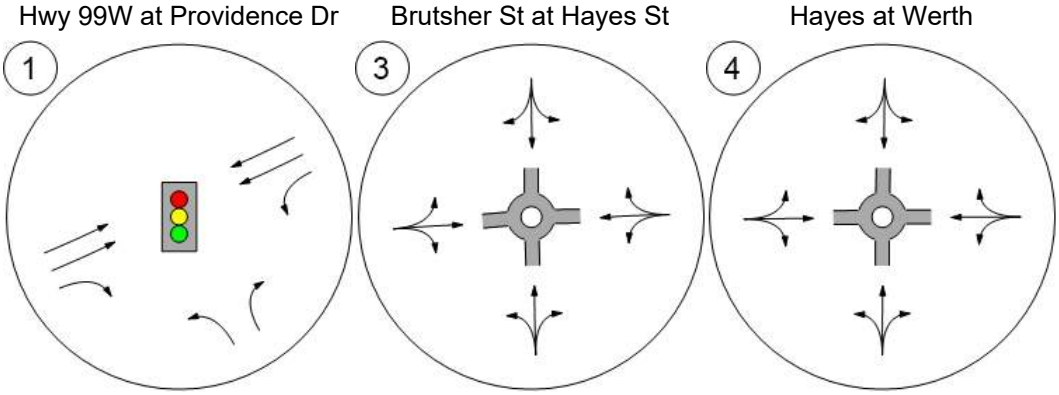
Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1310	34	86	1941	85	104	3560
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1310**	**34**	**86**	**1941**	**85**	**104**	**3560**

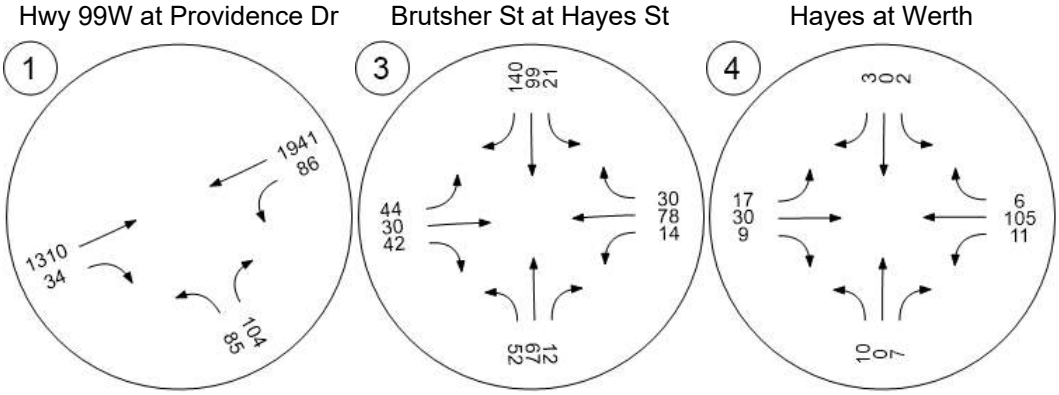
ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	52	67	12	21	99	140	44	30	42	14	78	30	629
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**52**	**67**	**12**	**21**	**99**	**140**	**44**	**30**	**42**	**14**	**78**	**30**	**629**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	10	0	7	2	0	3	17	30	9	11	105	6	200
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**10**	**0**	**7**	**2**	**0**	**3**	**17**	**30**	**9**	**11**	**105**	**6**	**200**

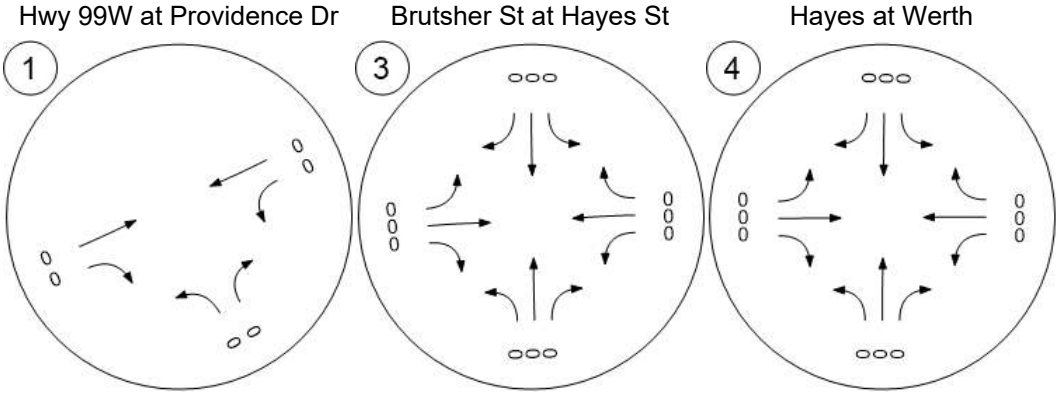
Report Figure 1: Lane Configuration and Traffic Control



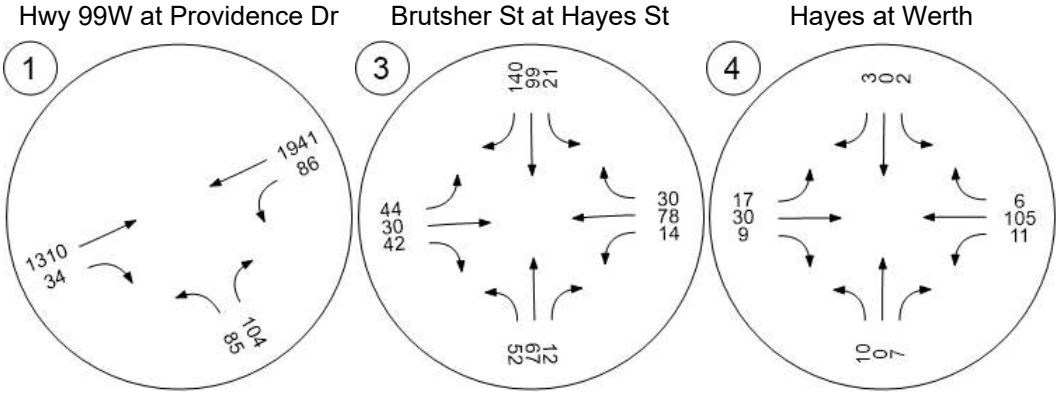
Report Figure 2a: Traffic Volume - Base Volume



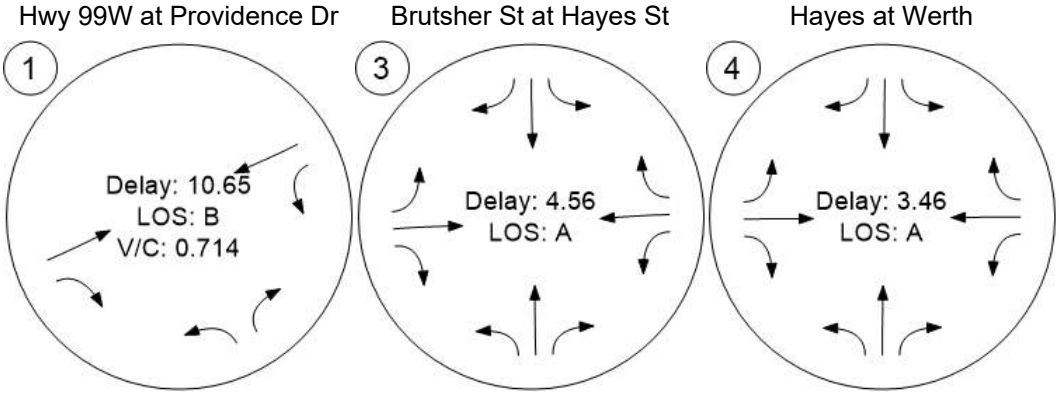
Report Figure 2c: Traffic Volume - Net New Site Trips



Report Figure 2e: Traffic Volume - Future Total Volume



Report Figure 3: Traffic Conditions



17-346 Newberg Surg. Ctr TIA

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Scenario 4 AM Developed 17-346

Report File: J:\...\17-346 Developed AM.pdf

3/6/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.661	5.4	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		3.8	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.2	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.012	9.3	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	5.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.661

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1725	73	64	991	38	46
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	4.50	4.50	4.50	4.50	4.50	4.50
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	20	10	0	5	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1891	100	80	1086	46	54
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	487	26	21	280	12	14
Total Analysis Volume [veh/h]	1949	103	82	1120	47	56
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	8	0	0	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	5	0	0	5	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	19	0	0	19	101	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	105	105	105	105	7	7
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.62	0.07	0.41	0.36	0.03	0.04
s, saturation flow rate [veh/h]	3140	1402	200	3140	1571	1402
c, Capacity [veh/h]	2754	1229	190	2754	88	79
d1, Uniform Delay [s]	2.39	0.98	12.32	1.41	55.04	55.62
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	0.13	6.98	0.45	4.89	11.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.08	0.43	0.41	0.53	0.71
d, Delay for Lane Group [s/veh]	3.95	1.11	19.31	1.86	59.93	66.76
Lane Group LOS	A	A	B	A	E	E
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	1.96	0.10	1.49	0.63	1.51	1.92
50th-Percentile Queue Length [ft]	49.00	2.62	37.15	15.81	37.87	48.08
95th-Percentile Queue Length [veh]	3.53	0.19	2.67	1.14	2.73	3.46
95th-Percentile Queue Length [ft]	88.20	4.71	66.86	28.46	68.17	86.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.95	1.11	19.31	1.86	59.93	66.76
Movement LOS	A	A	B	A	E	E
d_A, Approach Delay [s/veh]	3.81		3.05		63.65	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	5.37					
Intersection LOS	A					
Intersection V/C	0.661					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	51.34	51.34	51.34
l_p,int, Pedestrian LOS Score for Intersection	3.324	3.253	2.150
Crosswalk LOS	C	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	60.00	60.00	60.00
l_b,int, Bicycle LOS Score for Intersection	5.825	5.124	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	3.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	114	16	10	44	37	27	54	31	3	15	5
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	30	4	3	12	10	7	14	8	1	4	1
Total Analysis Volume [veh/h]	40	121	17	11	47	39	29	57	33	3	16	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	99			60			62			193		
Exiting Flow Rate [veh/h]	69			57			51			152		
Demand Flow Rate [veh/h]	38	114	16	10	44	37	27	54	31	3	15	5
Adjusted Demand Flow Rate [veh/h]	40	121	17	11	47	39	29	57	33	3	16	5

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	181	99	121	25
Capacity of Entry and Bypass Lanes [veh/h]	1249	1299	1296	1134
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1229	1278	1276	1116
X, volume / capacity	0.14	0.08	0.09	0.02

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.51	0.25	0.31	0.07
95th-Percentile Queue Length [ft]	12.66	6.15	7.70	1.65
Approach Delay [s/veh]	4.15	3.43	3.58	3.41
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.78			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	0	2	0	0	7	2	48	12	19	27	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	0	0	2	1	15	4	6	9	0
Total Analysis Volume [veh/h]	1	0	3	0	0	9	3	62	15	24	35	1
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	69			63			25			4		
Exiting Flow Rate [veh/h]	65			38			25			3		
Demand Flow Rate [veh/h]	1	0	2	0	0	7	2	48	12	19	27	1
Adjusted Demand Flow Rate [veh/h]	1	0	3	0	0	9	3	62	15	24	35	1

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.95	0.95	0.95	0.95
Entry Flow Rate [veh/h]	5	10	85	64
Capacity of Entry and Bypass Lanes [veh/h]	1287	1294	1345	1375
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1221	1228	1276	1304
X, volume / capacity	0.00	0.01	0.06	0.05

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.02	0.20	0.14
95th-Percentile Queue Length [ft]	0.25	0.55	5.01	3.61
Approach Delay [s/veh]	2.97	2.99	3.32	3.12
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.22			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 5: Site Access at Providence Dr.

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	Providence Dr		Providence Dr		Site Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Providence Dr		Providence Dr		Site Access	
Base Volume Input [veh/h]	0	47	46	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.54	0.54	0.54	0.54	0.54	0.54
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	30	8	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	47	46	30	8	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	15	10	3	0
Total Analysis Volume [veh/h]	4	60	59	38	10	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	7.40	0.00	0.00	0.00	9.30	8.70
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft]	3.33	3.33	0.00	0.00	0.97	0.97
d_A, Approach Delay [s/veh]	0.46		0.00		9.25	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.76					
Intersection LOS	A					

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Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1891	100	80	1086	46	54	3257

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	38	114	16	10	44	37	27	54	31	3	15	5	394

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	1	0	2	0	0	7	2	48	12	19	27	1	119

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	3	47	46	30	8	1	135

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Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1872	79	69	1075	41	50	3186
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	20	10	0	5	3	38
		Other	0	0	0	0	0	0	0
		Future Total	**1891**	**100**	**80**	**1086**	**46**	**54**	**3257**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	38	113	16	10	44	37	27	50	31	3	14	5	388
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	3	0	0	1	0	4
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**38**	**114**	**16**	**10**	**44**	**37**	**27**	**54**	**31**	**3**	**15**	**5**	**394**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	1	0	2	0	0	7	2	45	12	19	26	1	115
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	3	0	0	1	0	4
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1**	**0**	**2**	**0**	**0**	**7**	**2**	**48**	**12**	**19**	**27**	**1**	**119**

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	Final Base	0	47	46	0	0	0	93
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	3	0	0	30	8	1	42
		Other	0	0	0	0	0	0	0
		Future Total	**3**	**47**	**46**	**30**	**8**	**1**	**135**

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Trip Generation summary

Added Trips

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
7: Newberg Surgery Ctr	Med/Dental Office Bldg	ITE 720	ksf	2.390	17.500	79.00	21.00	33	9	42	100.00
					Added Trips Total			**33**	**9**	**42**	**100.00**

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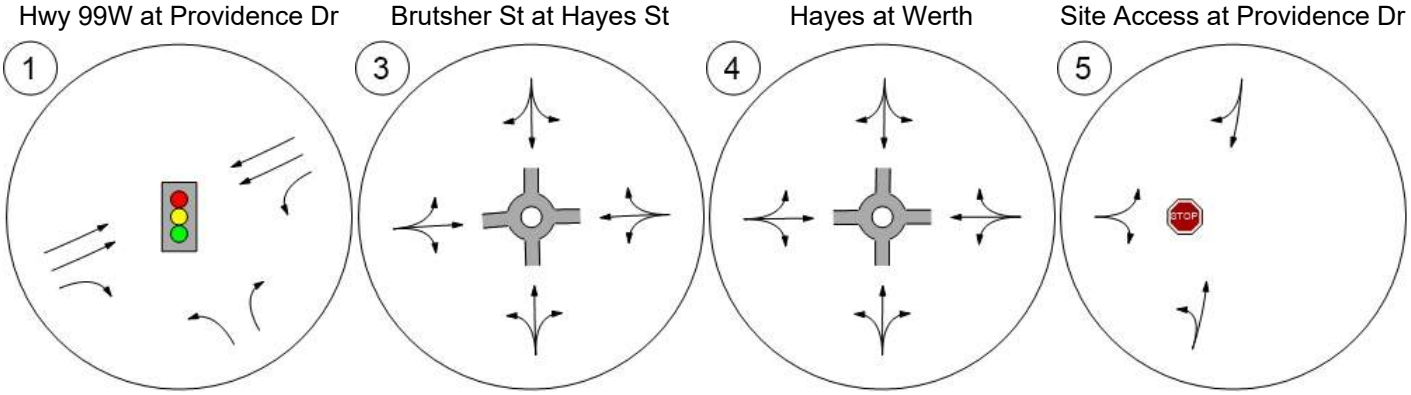
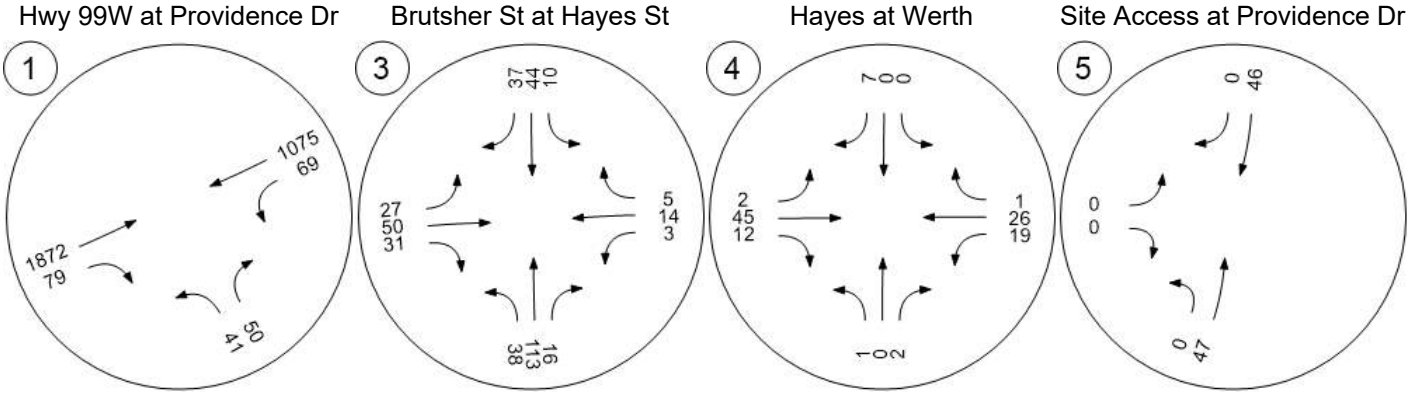
Trip Distribution summary

Zone / Gate	Zone 7: Newberg Surgery Ctr			
	To Newberg Surgery Ctr:		From Newberg Surgery Ctr:	
	Share %	Trips	Share %	Trips
1: Gate	60.00	20	60.00	5
2: Gate	30.00	10	30.00	3
3: Gate	10.00	3	10.00	1
4: Gate	0.00	0	0.00	0
5: Gate	0.00	0	0.00	0
6: Gate	0.00	0	0.00	0
8: Gate	0.00	0	0.00	0
9: Gate	0.00	0	0.00	0
Total	**100.00**	**33**	**100.00**	**9**

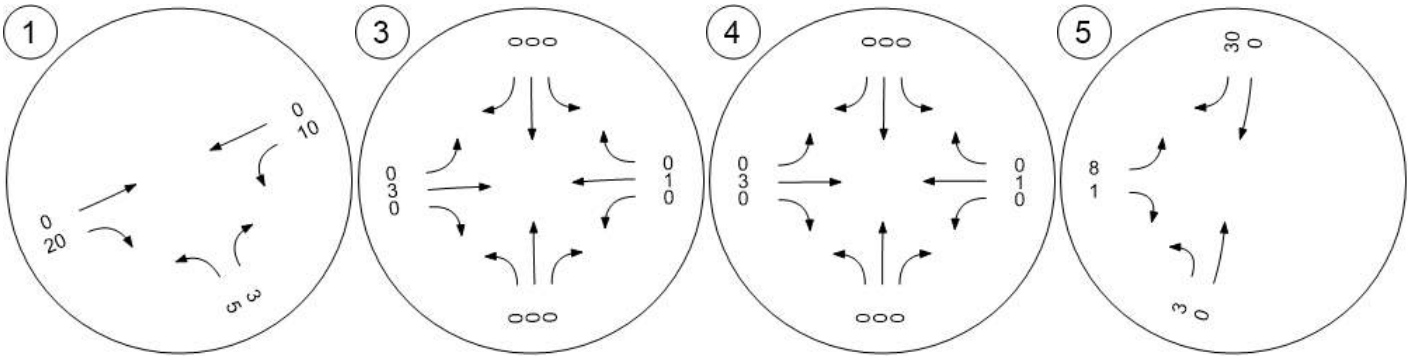
Report Figure 1: Lane Configuration and Traffic Control



Report Figure 2a: Traffic Volume - Base Volume

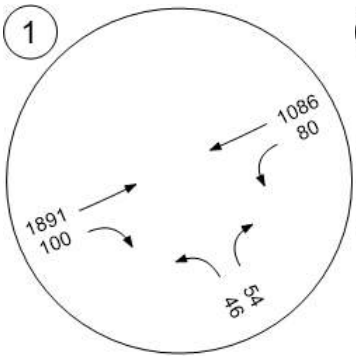


Report Figure 2c: Traffic Volume - Net New Site Trips

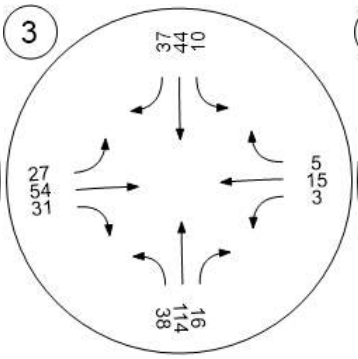


Report Figure 2e: Traffic Volume - Future Total Volume

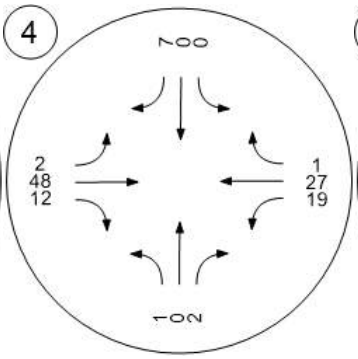
Hwy 99W at Providence Dr



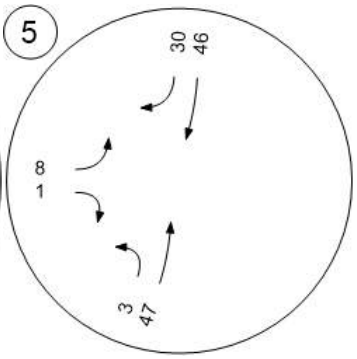
Brutsher St at Hayes St



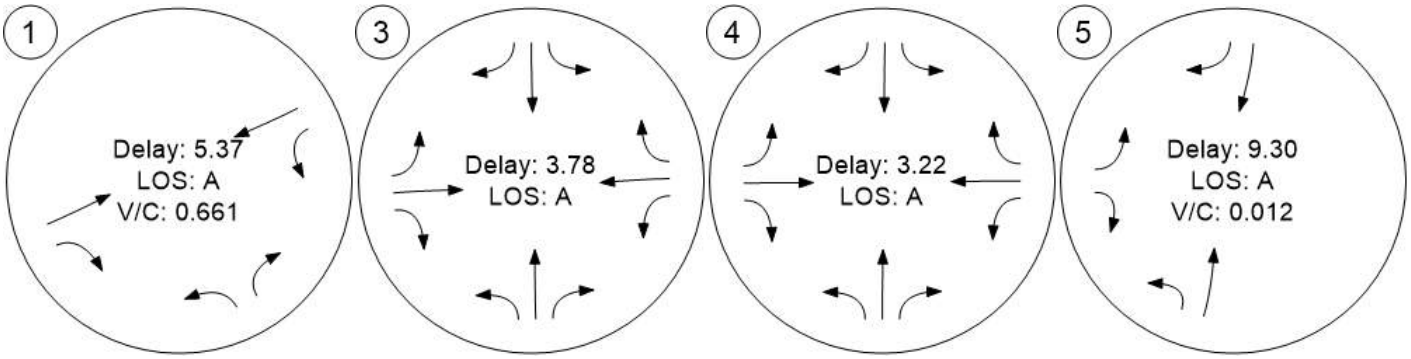
Hayes at Werth



Site Access at Providence Dr



Report Figure 3: Traffic Conditions



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Scenario 3 PM Developed 17-346

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.731	12.0	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		4.6	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.5	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.067	10.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	12.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1207	31	79	1789	78	96
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	3.27	3.27	3.27	3.27	3.27	3.27
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	5	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1323	44	92	1960	112	119
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	345	11	24	510	29	31
Total Analysis Volume [veh/h]	1378	46	96	2042	117	124
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	8	0	7	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	27	0	44	71	19	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	61	61	7	72	10	10
g / C, Green / Cycle	0.68	0.68	0.08	0.80	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.43	0.03	0.06	0.64	0.07	0.09
s, saturation flow rate [veh/h]	3172	1416	1587	3172	1587	1416
c, Capacity [veh/h]	2152	961	122	2538	176	157
d1, Uniform Delay [s]	8.22	4.81	40.82	5.05	38.41	38.99
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.47	0.09	10.48	2.83	4.24	8.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.64	0.05	0.79	0.80	0.66	0.79
d, Delay for Lane Group [s/veh]	9.70	4.90	51.30	7.88	42.65	47.46
Lane Group LOS	A	A	D	A	D	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	5.87	0.24	2.35	5.09	2.68	3.03
50th-Percentile Queue Length [ft]	146.70	5.92	58.78	127.16	67.02	75.77
95th-Percentile Queue Length [veh]	9.84	0.43	4.23	8.78	4.83	5.46
95th-Percentile Queue Length [ft]	246.02	10.66	105.80	219.62	120.64	136.38

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.70	4.90	51.30	7.88	42.65	47.46
Movement LOS	A	A	D	A	D	D
d_A, Approach Delay [s/veh]	9.54		9.83		45.13	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	11.96					
Intersection LOS	B					
Intersection V/C	0.731					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45
l_p,int, Pedestrian LOS Score for Intersection	3.516	3.366	2.045
Crosswalk LOS	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	45.00	45.00	45.00
l_b,int, Bicycle LOS Score for Intersection	5.307	5.896	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	4.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	68	12	21	100	141	44	32	42	14	84	30
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	18	3	6	27	38	12	9	11	4	23	8
Total Analysis Volume [veh/h]	57	73	13	23	108	152	47	34	45	15	90	32
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	106			165			149			180		
Exiting Flow Rate [veh/h]	58			150			125			122		
Demand Flow Rate [veh/h]	53	68	12	21	100	141	44	32	42	14	84	30
Adjusted Demand Flow Rate [veh/h]	57	73	13	23	108	152	47	34	45	15	90	32

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	146	288	129	140
Capacity of Entry and Bypass Lanes [veh/h]	1239	1167	1186	1149
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1218	1147	1166	1129
X, volume / capacity	0.12	0.25	0.11	0.12

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.40	0.97	0.36	0.41
95th-Percentile Queue Length [ft]	9.95	24.37	9.07	10.33
Approach Delay [s/veh]	3.94	5.40	4.00	4.24
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	4.61			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	0	7	2	0	3	17	32	9	11	111	6
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	2	1	0	1	5	10	3	3	35	2
Total Analysis Volume [veh/h]	13	0	9	3	0	4	22	41	11	14	141	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	67			171			17			36		
Exiting Flow Rate [veh/h]	45			156			14			22		
Demand Flow Rate [veh/h]	10	0	7	2	0	3	17	32	9	11	111	6
Adjusted Demand Flow Rate [veh/h]	13	0	9	3	0	4	22	41	11	14	141	8

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	23	8	76	166
Capacity of Entry and Bypass Lanes [veh/h]	1289	1160	1356	1331
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1269	1142	1335	1311
X, volume / capacity	0.02	0.01	0.06	0.12

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.05	0.02	0.18	0.43
95th-Percentile Queue Length [ft]	1.32	0.46	4.40	10.63
Approach Delay [s/veh]	2.97	3.20	3.13	3.76
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.51			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 5: Site Access at Providence Dr.

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.067

Intersection Setup

Name	Providence Dr		Providence Dr		Site Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Providence Dr		Providence Dr		Site Access	
Base Volume Input [veh/h]	0	40	122	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	15	40	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	40	123	15	40	5
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	39	5	13	2
Total Analysis Volume [veh/h]	3	51	156	19	51	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	7.57	0.00	0.00	0.00	10.07	9.46
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.12	0.12	0.00	0.00	0.24	0.24
95th-Percentile Queue Length [ft]	3.00	3.00	0.00	0.00	5.93	5.93
d_A, Approach Delay [s/veh]	0.42		0.00		10.01	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.07					
Intersection LOS	B					

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Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1323	44	92	1960	112	119	3650

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	53	68	12	21	100	141	44	32	42	14	84	30	641

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	10	0	7	2	0	3	17	32	9	11	111	6	208

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	2	40	123	15	40	5	225

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Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1310	34	86	1941	85	104	3560
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	10	5	0	26	14	55
		Other	0	0	0	0	0	0	0
		Future Total	**1323**	**44**	**92**	**1960**	**112**	**119**	**3650**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	52	67	12	21	99	140	44	30	42	14	78	30	629
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	2	0	0	5	0	7
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**53**	**68**	**12**	**21**	**100**	**141**	**44**	**32**	**42**	**14**	**84**	**30**	**641**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	10	0	7	2	0	3	17	30	9	11	105	6	200
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	2	0	0	5	0	7
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**10**	**0**	**7**	**2**	**0**	**3**	**17**	**32**	**9**	**11**	**111**	**6**	**208**

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	Final Base	0	40	122	0	0	0	162
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	2	0	0	15	40	5	62
		Other	0	0	0	0	0	0	0
		Future Total	**2**	**40**	**123**	**15**	**40**	**5**	**225**

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Trip Generation summary

Added Trips

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
7: Newberg Sugery Ctr	Med/Dental Office	ITE 720	ksf	3.570	17.500	28.00	72.00	17	45	62	100.00
					Added Trips Total			**17**	**45**	**62**	**100.00**

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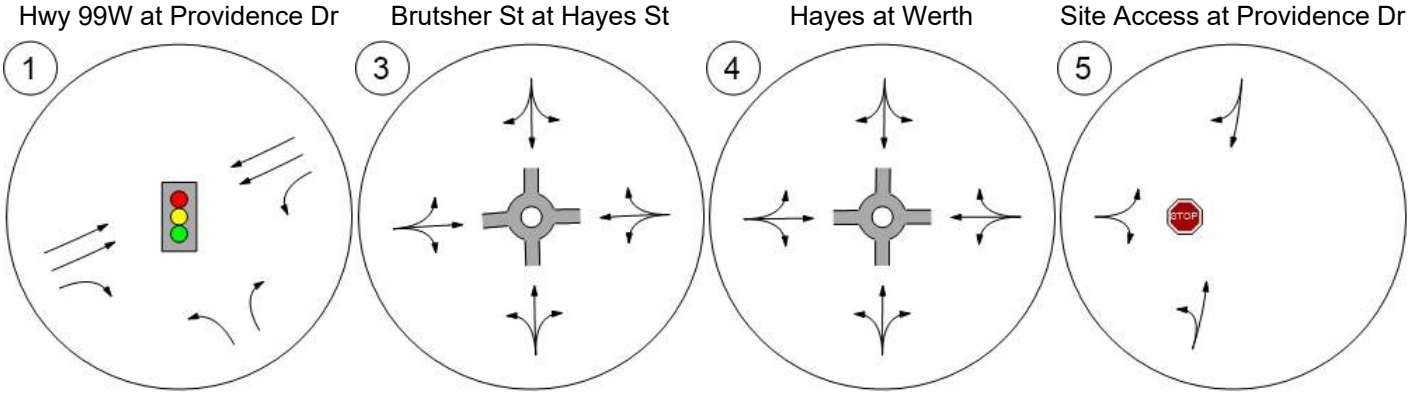
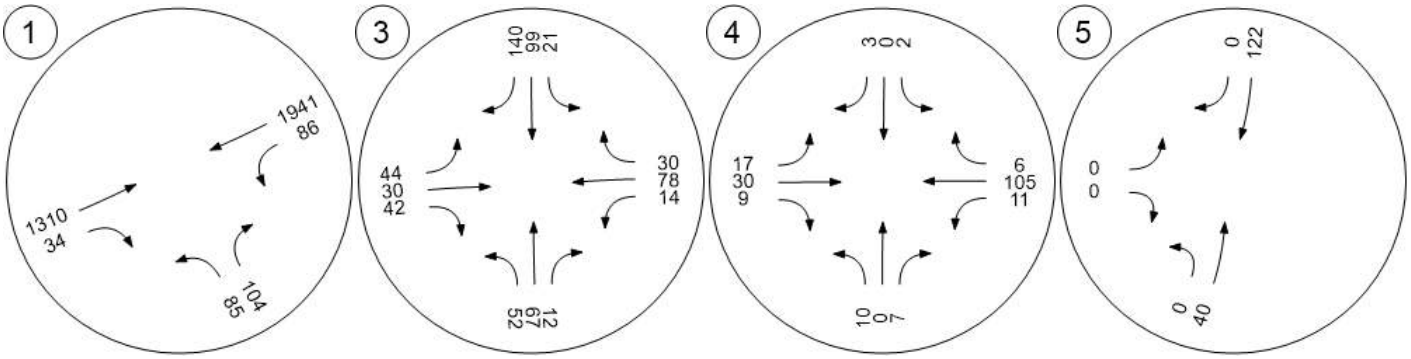
Trip Distribution summary

Zone / Gate	Zone 7: Newberg Sugery Ctr			
	To Newberg Sugery Ctr:		From Newberg Sugery Ctr:	
	Share %	Trips	Share %	Trips
1: Gate	60.00	10	60.00	26
2: Gate	30.00	5	30.00	14
3: Gate	10.00	2	10.00	5
4: Gate	0.00	0	0.00	0
5: Gate	0.00	0	0.00	0
6: Gate	0.00	0	0.00	0
8: Gate	0.00	0	0.00	0
9: Gate	0.00	0	0.00	0
Total	**100.00**	**17**	**100.00**	**45**

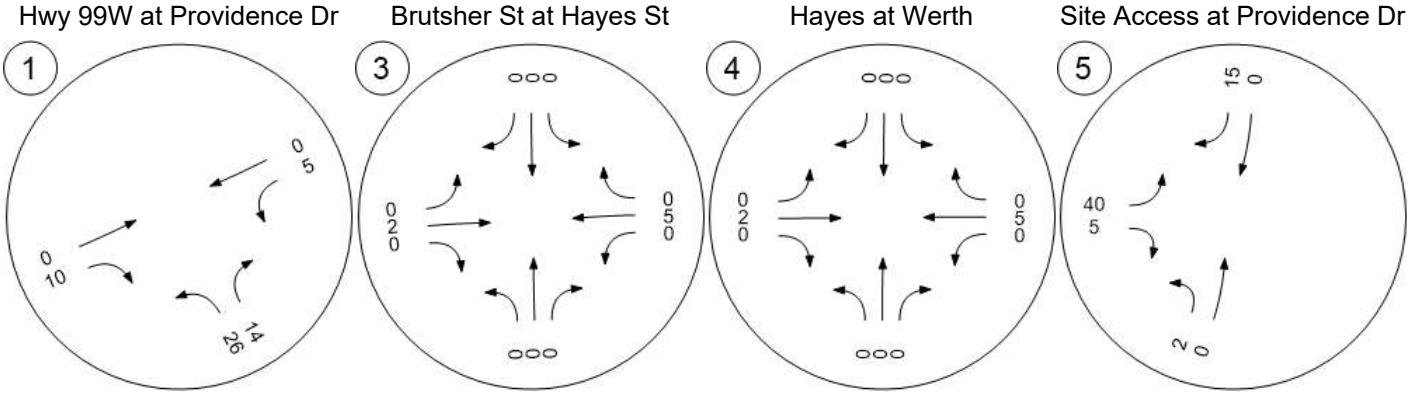
Report Figure 1: Lane Configuration and Traffic Control



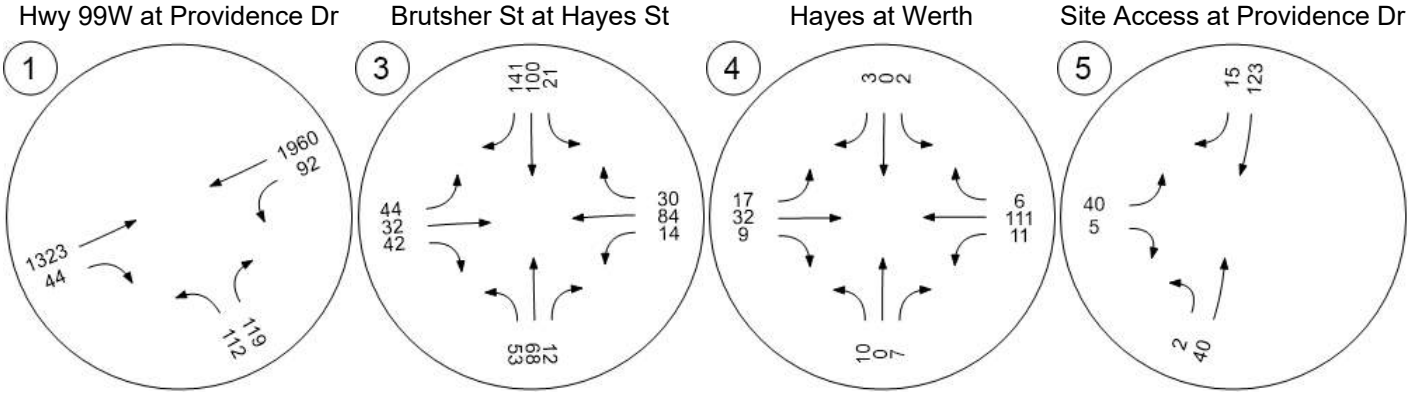
Report Figure 2a: Traffic Volume - Base Volume



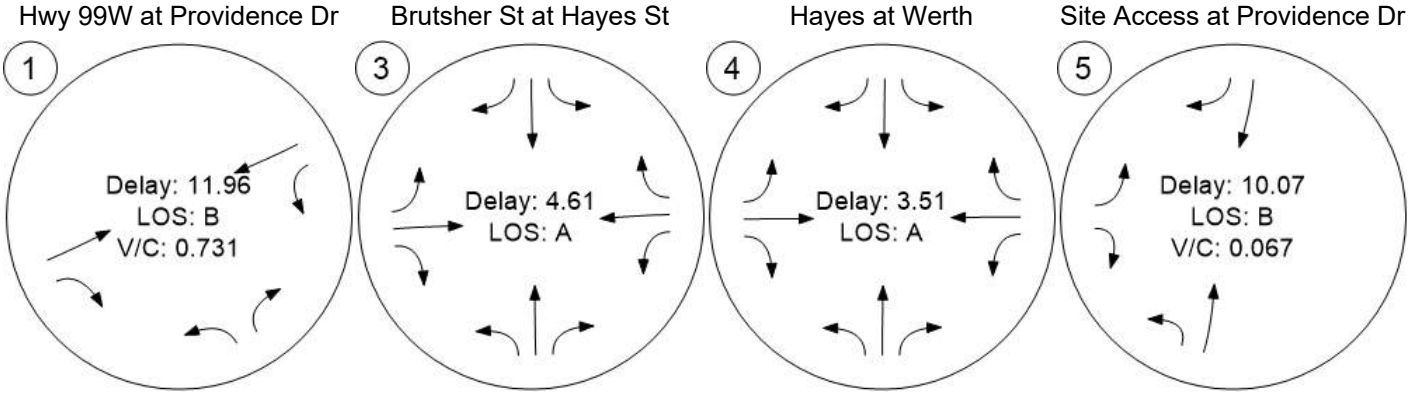
Report Figure 2c: Traffic Volume - Net New Site Trips



Report Figure 2e: Traffic Volume - Future Total Volume



Report Figure 3: Traffic Conditions



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Scenario 6 AM Future 17-346

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.758	7.7	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		4.0	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.3	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.012	9.4	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	7.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1725	73	64	991	38	46
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	4.50	4.50	4.50	4.50	4.50	4.50
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	20	10	0	5	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2172	112	90	1247	53	61
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	560	29	23	321	14	16
Total Analysis Volume [veh/h]	2239	115	93	1286	55	63
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	8	0	0	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	5	0	0	5	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	19	0	0	19	101	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	105	105	105	105	7	7
g / C, Green / Cycle	0.87	0.87	0.87	0.87	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.71	0.08	0.62	0.41	0.04	0.04
s, saturation flow rate [veh/h]	3140	1402	150	3140	1571	1402
c, Capacity [veh/h]	2736	1221	139	2736	97	87
d1, Uniform Delay [s]	3.46	1.08	33.04	1.68	54.66	55.23
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.86	0.15	22.61	0.58	5.05	10.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.09	0.67	0.47	0.56	0.72
d, Delay for Lane Group [s/veh]	6.33	1.24	55.65	2.26	59.71	66.05
Lane Group LOS	A	A	E	A	E	E
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	3.91	0.14	3.64	1.01	1.77	2.15
50th-Percentile Queue Length [ft]	97.75	3.56	91.04	25.22	44.16	53.69
95th-Percentile Queue Length [veh]	7.04	0.26	6.55	1.82	3.18	3.87
95th-Percentile Queue Length [ft]	175.95	6.42	163.87	45.40	79.49	96.65

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.33	1.24	55.65	2.26	59.71	66.05
Movement LOS	A	A	E	A	E	E
d_A, Approach Delay [s/veh]	6.08		5.87		63.09	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	7.75					
Intersection LOS	A					
Intersection V/C	0.758					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	51.34	51.34	51.34
l_p,int, Pedestrian LOS Score for Intersection	3.474	3.392	2.176
Crosswalk LOS	C	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	60.00	60.00	60.00
l_b,int, Bicycle LOS Score for Intersection	6.074	5.270	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	4.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	130	18	12	51	43	31	60	36	3	17	6
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	35	5	3	14	11	8	16	10	1	5	2
Total Analysis Volume [veh/h]	47	138	19	13	54	46	33	64	38	3	18	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	112			69			71			221		
Exiting Flow Rate [veh/h]	78			66			58			174		
Demand Flow Rate [veh/h]	44	130	18	12	51	43	31	60	36	3	17	6
Adjusted Demand Flow Rate [veh/h]	47	138	19	13	54	46	33	64	38	3	18	6

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	208	115	138	28
Capacity of Entry and Bypass Lanes [veh/h]	1232	1287	1284	1101
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1213	1266	1264	1084
X, volume / capacity	0.17	0.09	0.11	0.02

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.60	0.29	0.36	0.08
95th-Percentile Queue Length [ft]	15.11	7.34	8.95	1.92
Approach Delay [s/veh]	4.41	3.57	3.72	3.53
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.97			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	0	2	0	0	8	2	55	14	22	31	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	0	0	3	1	18	4	7	10	0
Total Analysis Volume [veh/h]	1	0	3	0	0	10	3	71	18	28	40	1
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	78			73			30			4		
Exiting Flow Rate [veh/h]	75			43			30			3		
Demand Flow Rate [veh/h]	1	0	2	0	0	8	2	55	14	22	31	1
Adjusted Demand Flow Rate [veh/h]	1	0	3	0	0	10	3	71	18	28	40	1

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.95	0.95	0.95	0.95
Entry Flow Rate [veh/h]	5	11	97	73
Capacity of Entry and Bypass Lanes [veh/h]	1275	1282	1340	1375
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1210	1216	1271	1304
X, volume / capacity	0.00	0.01	0.07	0.05

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.02	0.23	0.17
95th-Percentile Queue Length [ft]	0.25	0.62	5.85	4.19
Approach Delay [s/veh]	3.00	3.03	3.42	3.18
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.29			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 5: Site Access at Providence Dr.

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	Providence Dr		Providence Dr		Site Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Providence Dr		Providence Dr		Site Access	
Base Volume Input [veh/h]	0	47	46	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.54	0.54	0.54	0.54	0.54	0.54
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	30	8	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	55	53	30	8	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	17	10	3	0
Total Analysis Volume [veh/h]	4	71	68	38	10	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	7.42	0.00	0.00	0.00	9.42	8.75
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft]	3.96	3.96	0.00	0.00	1.00	1.00
d_A, Approach Delay [s/veh]	0.40		0.00		9.36	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.69					
Intersection LOS	A					

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Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	2172	112	90	1247	53	61	3735

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	44	130	18	12	51	43	31	60	36	3	17	6	451

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	1	0	2	0	0	8	2	55	14	22	31	1	136

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	3	55	53	30	8	1	150

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Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1872	79	69	1075	41	50	3186
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	20	10	0	5	3	38
		Other	0	0	0	0	0	0	0
		Future Total	**2172**	**112**	**90**	**1247**	**53**	**61**	**3735**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	38	113	16	10	44	37	27	50	31	3	14	5	388
		Growth Rate	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	3	0	0	1	0	4
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**44**	**130**	**18**	**12**	**51**	**43**	**31**	**60**	**36**	**3**	**17**	**6**	**451**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	1	0	2	0	0	7	2	45	12	19	26	1	115
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	3	0	0	1	0	4
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1**	**0**	**2**	**0**	**0**	**8**	**2**	**55**	**14**	**22**	**31**	**1**	**136**

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	Final Base	0	47	46	0	0	0	93
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	3	0	0	30	8	1	42
		Other	0	0	0	0	0	0	0
		Future Total	**3**	**55**	**53**	**30**	**8**	**1**	**150**

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Trip Generation summary

Added Trips

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
7: Newberg Surgery Ctr	Med/Dental Office Bldg	ITE 720	ksf	2.390	17.500	79.00	21.00	33	9	42	100.00
					Added Trips Total			**33**	**9**	**42**	**100.00**

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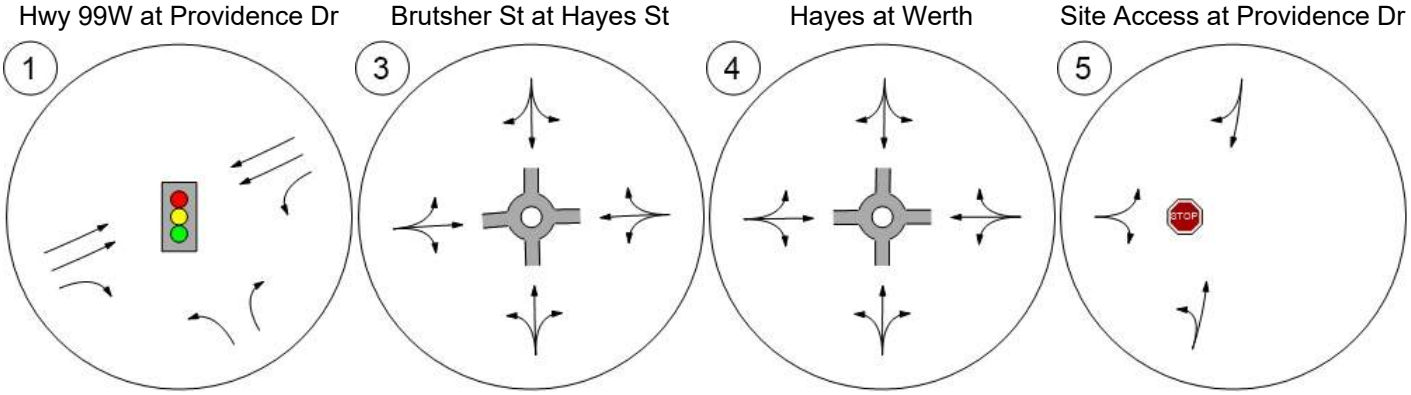
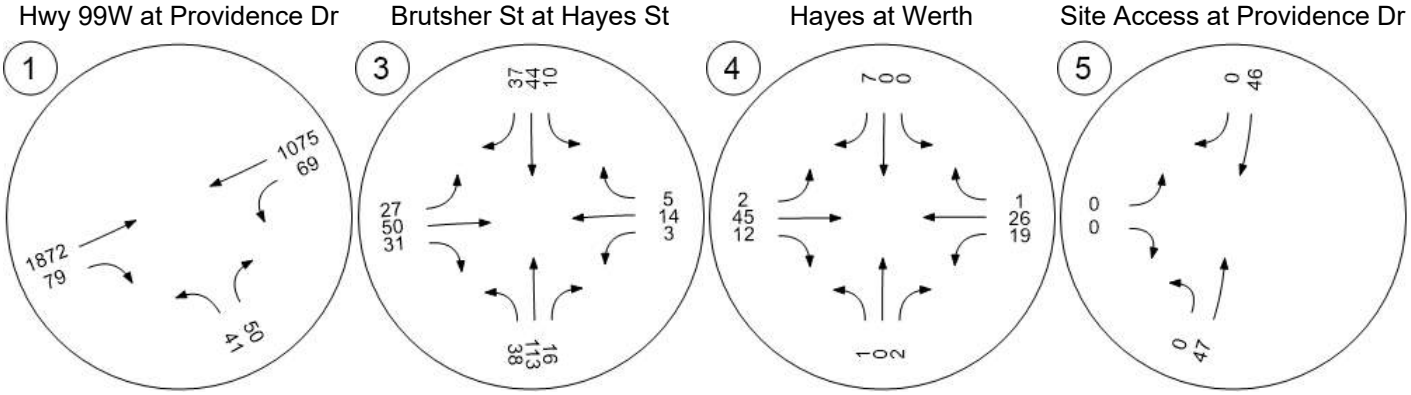
Trip Distribution summary

Zone / Gate	Zone 7: Newberg Surgery Ctr			
	To Newberg Surgery Ctr:		From Newberg Surgery Ctr:	
	Share %	Trips	Share %	Trips
1: Gate	60.00	20	60.00	5
2: Gate	30.00	10	30.00	3
3: Gate	10.00	3	10.00	1
4: Gate	0.00	0	0.00	0
5: Gate	0.00	0	0.00	0
6: Gate	0.00	0	0.00	0
8: Gate	0.00	0	0.00	0
9: Gate	0.00	0	0.00	0
Total	**100.00**	**33**	**100.00**	**9**

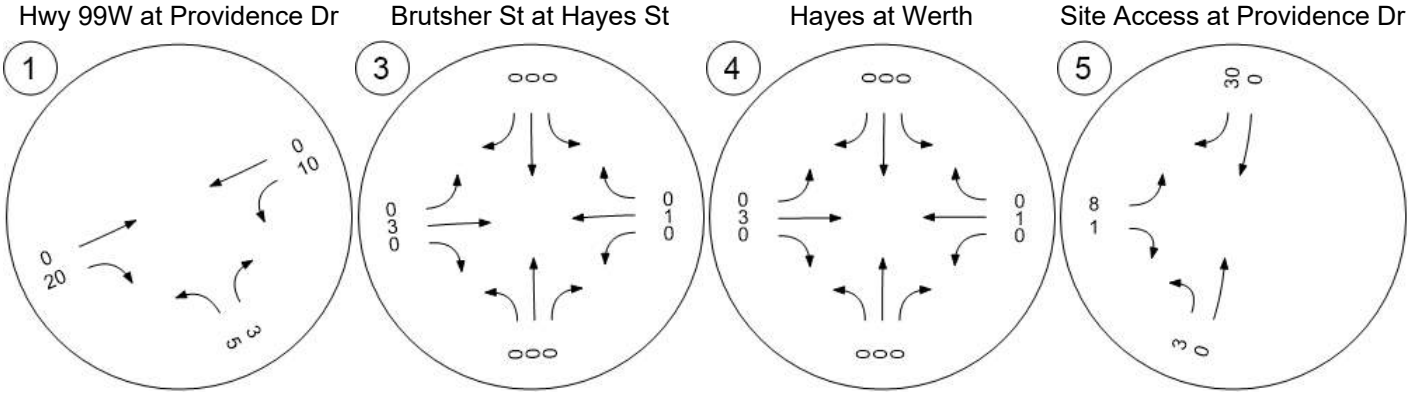
Report Figure 1: Lane Configuration and Traffic Control



Report Figure 2a: Traffic Volume - Base Volume

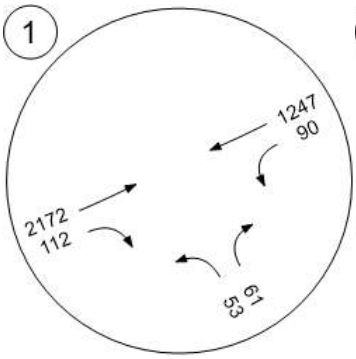


Report Figure 2c: Traffic Volume - Net New Site Trips

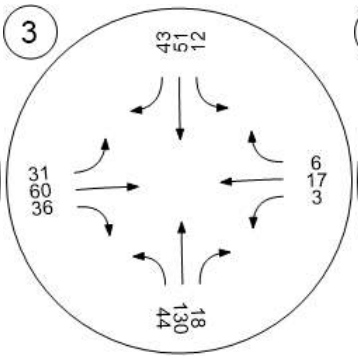


Report Figure 2e: Traffic Volume - Future Total Volume

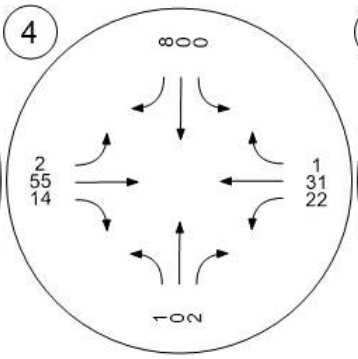
Hwy 99W at Providence Dr



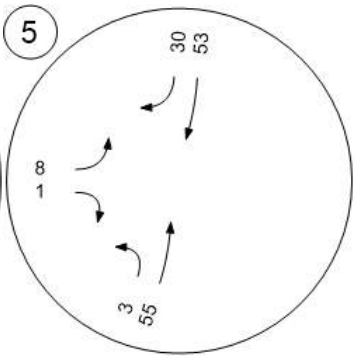
Brutsher St at Hayes St



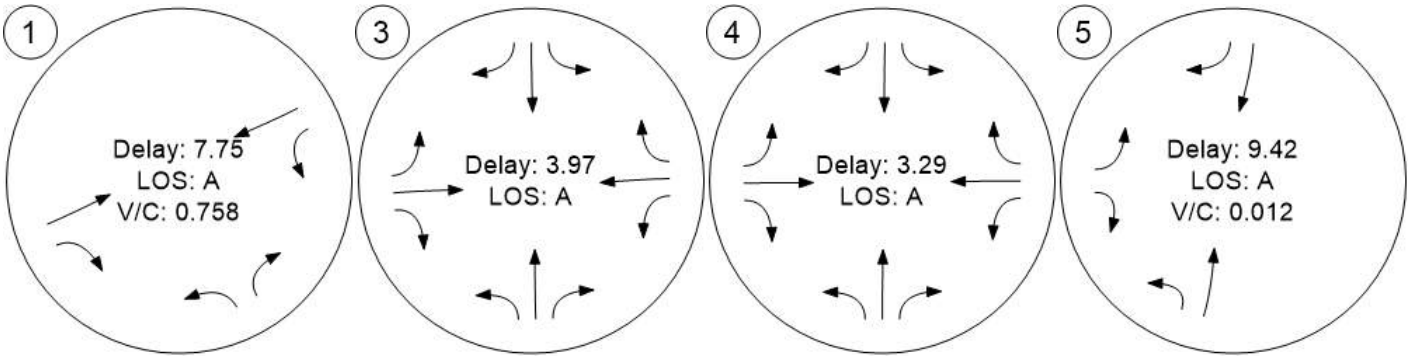
Hayes at Werth



Site Access at Providence Dr



Report Figure 3: Traffic Conditions



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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.839	17.6	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		5.0	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.6	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.069	10.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.839

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1207	31	79	1789	78	96
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	3.27	3.27	3.27	3.27	3.27	3.27
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	5	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1520	49	105	2252	125	135
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	396	13	27	586	33	35
Total Analysis Volume [veh/h]	1583	51	109	2346	130	141
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	8	0	7	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	27	0	44	71	19	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	59	59	8	71	11	11
g / C, Green / Cycle	0.66	0.66	0.09	0.79	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.50	0.04	0.07	0.74	0.08	0.10
s, saturation flow rate [veh/h]	3172	1416	1587	3172	1587	1416
c, Capacity [veh/h]	2084	930	138	2500	195	174
d1, Uniform Delay [s]	10.57	5.49	40.31	7.75	37.73	38.47
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.66	0.11	9.70	8.40	3.90	8.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.05	0.79	0.94	0.67	0.81
d, Delay for Lane Group [s/veh]	13.23	5.60	50.01	16.15	41.63	47.16
Lane Group LOS	B	A	D	B	D	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	8.66	0.29	2.63	10.67	2.94	3.44
50th-Percentile Queue Length [ft]	216.56	7.33	65.69	266.81	73.54	85.99
95th-Percentile Queue Length [veh]	13.49	0.53	4.73	16.03	5.30	6.19
95th-Percentile Queue Length [ft]	337.24	13.19	118.25	400.75	132.38	154.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	13.23	5.60	50.01	16.15	41.63	47.16
Movement LOS	B	A	D	B	D	D
d_A, Approach Delay [s/veh]	13.00		17.65		44.51	
Approach LOS	B		B		D	
d_I, Intersection Delay [s/veh]	17.58					
Intersection LOS	B					
Intersection V/C	0.839					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45
l_p,int, Pedestrian LOS Score for Intersection	3.688	3.524	2.058
Crosswalk LOS	D	D	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	45.00	45.00	45.00
l_b,int, Bicycle LOS Score for Intersection	5.480	6.158	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	5.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	78	14	24	115	162	51	37	49	16	95	35
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	21	4	6	31	44	14	10	13	4	26	9
Total Analysis Volume [veh/h]	65	84	15	26	124	174	55	40	53	17	102	38
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	123			187			170			208		
Exiting Flow Rate [veh/h]	67			170			143			141		
Demand Flow Rate [veh/h]	60	78	14	24	115	162	51	37	49	16	95	35
Adjusted Demand Flow Rate [veh/h]	65	84	15	26	124	174	55	40	53	17	102	38

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	167	330	151	160
Capacity of Entry and Bypass Lanes [veh/h]	1218	1141	1161	1117
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1197	1121	1141	1098
X, volume / capacity	0.14	0.29	0.13	0.14

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.47	1.21	0.45	0.50
95th-Percentile Queue Length [ft]	11.87	30.15	11.15	12.47
Approach Delay [s/veh]	4.17	5.96	4.28	4.54
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	5.00			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	0	8	2	0	3	20	37	10	13	127	7
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	0	3	1	0	1	6	12	3	4	40	2
Total Analysis Volume [veh/h]	15	0	10	3	0	4	25	47	13	16	161	9
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	76			195			19			41		
Exiting Flow Rate [veh/h]	51			179			16			25		
Demand Flow Rate [veh/h]	12	0	8	2	0	3	20	37	10	13	127	7
Adjusted Demand Flow Rate [veh/h]	15	0	10	3	0	4	25	47	13	16	161	9

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	26	8	87	189
Capacity of Entry and Bypass Lanes [veh/h]	1277	1132	1354	1324
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1257	1114	1332	1304
X, volume / capacity	0.02	0.01	0.06	0.14

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.06	0.02	0.20	0.50
95th-Percentile Queue Length [ft]	1.52	0.47	5.11	12.44
Approach Delay [s/veh]	3.02	3.29	3.21	3.94
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.64			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 5: Site Access at Providence Dr.

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.069

Intersection Setup

Name	Providence Dr		Providence Dr		Site Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Providence Dr		Providence Dr		Site Access	
Base Volume Input [veh/h]	0	40	122	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	15	40	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	46	142	15	40	5
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	45	5	13	2
Total Analysis Volume [veh/h]	3	58	180	19	51	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	7.62	0.00	0.00	0.00	10.30	9.62
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.25	0.25
95th-Percentile Queue Length [ft]	3.48	3.48	0.00	0.00	6.19	6.19
d_A, Approach Delay [s/veh]	0.37		0.00		10.23	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.91					
Intersection LOS	B					

17-346 Newberg Surg. Ctr TIA

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Scenario 5 PM Future 17-346

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3/6/2017

Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1520	49	105	2252	125	135	4186

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	60	78	14	24	115	162	51	37	49	16	95	35	736

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	12	0	8	2	0	3	20	37	10	13	127	7	239

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	2	46	142	15	40	5	250

17-346 Newberg Surg. Ctr TIA

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Scenario 5 PM Future 17-346

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3/6/2017

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1310	34	86	1941	85	104	3560
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	10	5	0	26	14	55
		Other	0	0	0	0	0	0	0
		Future Total	**1520**	**49**	**105**	**2252**	**125**	**135**	**4186**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	52	67	12	21	99	140	44	30	42	14	78	30	629
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	2	0	0	5	0	7
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**60**	**78**	**14**	**24**	**115**	**162**	**51**	**37**	**49**	**16**	**95**	**35**	**736**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	10	0	7	2	0	3	17	30	9	11	105	6	200
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	2	0	0	5	0	7
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**12**	**0**	**8**	**2**	**0**	**3**	**20**	**37**	**10**	**13**	**127**	**7**	**239**

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	Final Base	0	40	122	0	0	0	162
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	2	0	0	15	40	5	62
		Other	0	0	0	0	0	0	0
		Future Total	**2**	**46**	**142**	**15**	**40**	**5**	**250**

17-346 Newberg Surg. Ctr TIA

Vistro File: J:\...\17-346 Newberg Ambulatory Surgery TIA.vistro

Scenario 5 PM Future 17-346

Report File: J:\...\17-346 Future 2032 PM.pdf

3/6/2017

Trip Generation summary

Added Trips

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
7: Newberg Sugery Ctr	Med/Dental Office	ITE 720	ksf	3.570	17.500	28.00	72.00	17	45	62	100.00
					Added Trips Total			**17**	**45**	**62**	**100.00**

17-346 Newberg Surg. Ctr TIA

Vistro File: J:\...\17-346 Newberg Ambulatory Surgery TIA.vistro

Scenario 5 PM Future 17-346

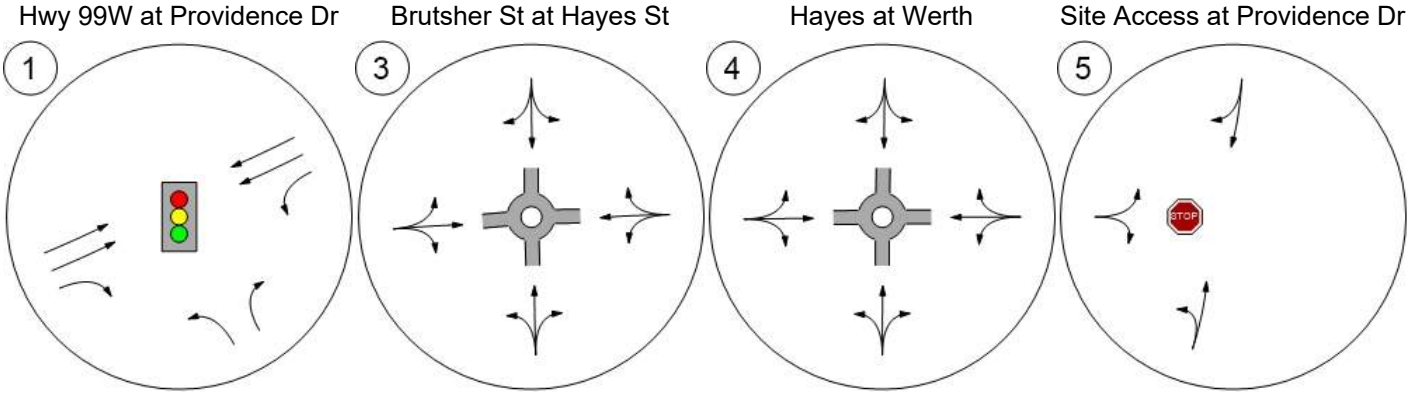
Report File: J:\...\17-346 Future 2032 PM.pdf

3/6/2017

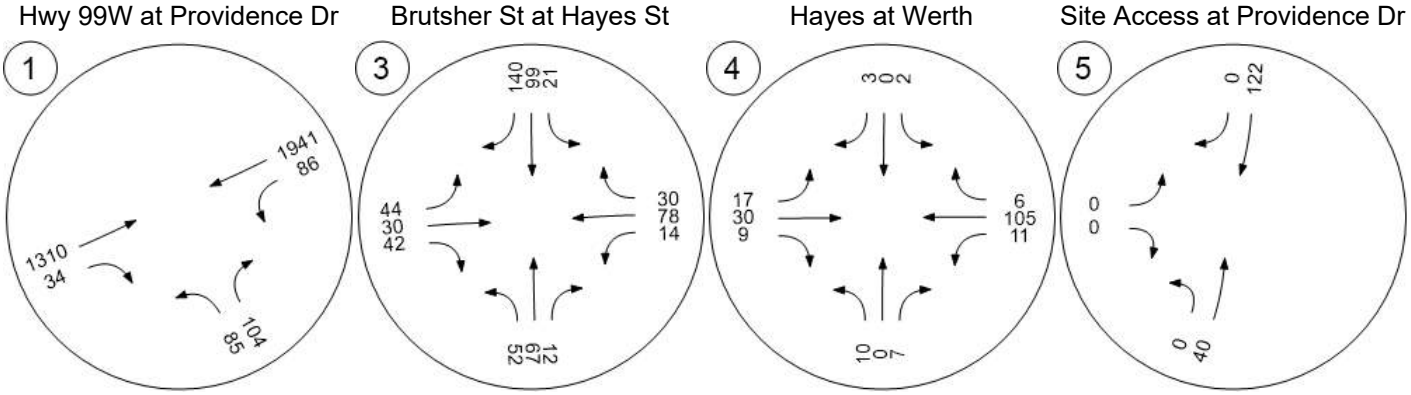
Trip Distribution summary

Zone / Gate	Zone 7: Newberg Sugery Ctr			
	To Newberg Sugery Ctr:		From Newberg Sugery Ctr:	
	Share %	Trips	Share %	Trips
1: Gate	60.00	10	60.00	26
2: Gate	30.00	5	30.00	14
3: Gate	10.00	2	10.00	5
4: Gate	0.00	0	0.00	0
5: Gate	0.00	0	0.00	0
6: Gate	0.00	0	0.00	0
8: Gate	0.00	0	0.00	0
9: Gate	0.00	0	0.00	0
Total	**100.00**	**17**	**100.00**	**45**

Report Figure 1: Lane Configuration and Traffic Control

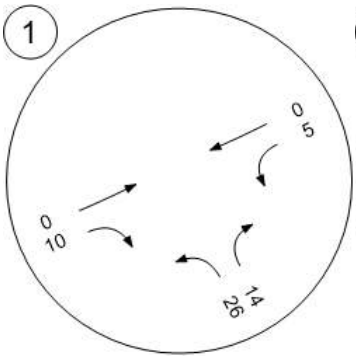


Report Figure 2a: Traffic Volume - Base Volume

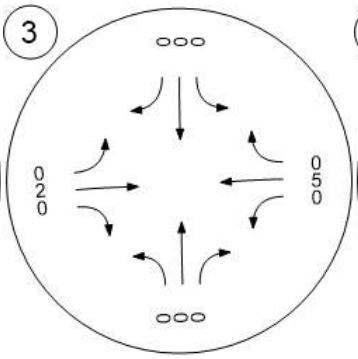


Report Figure 2c: Traffic Volume - Net New Site Trips

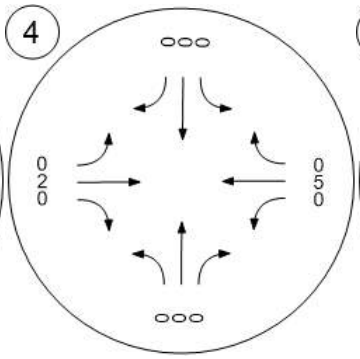
Hwy 99W at Providence Dr



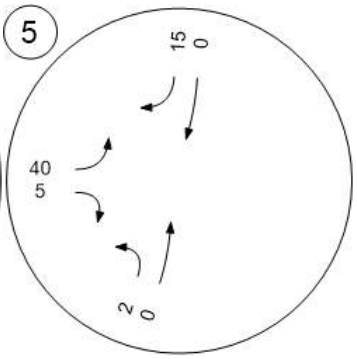
Brutsher St at Hayes St



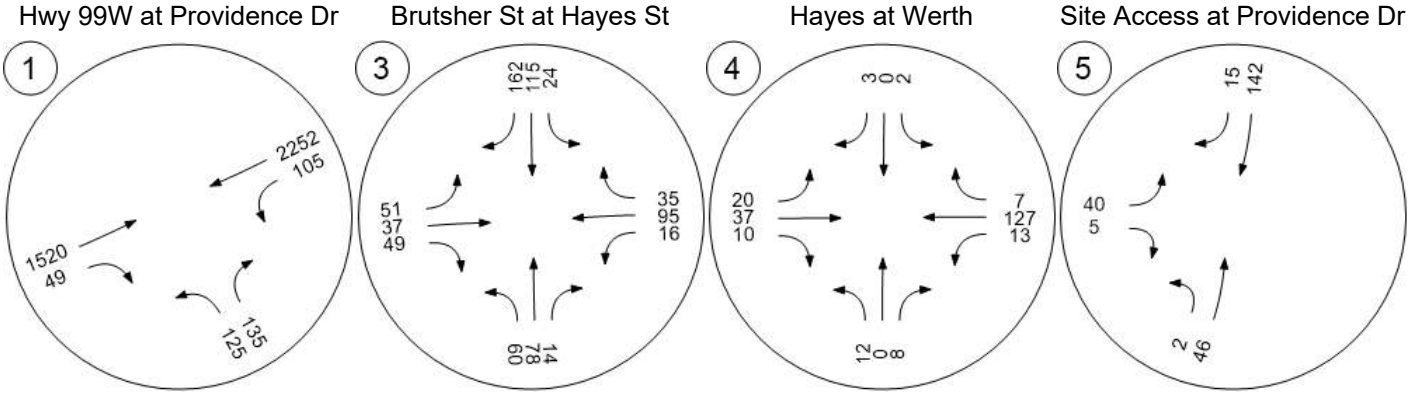
Hayes at Werth



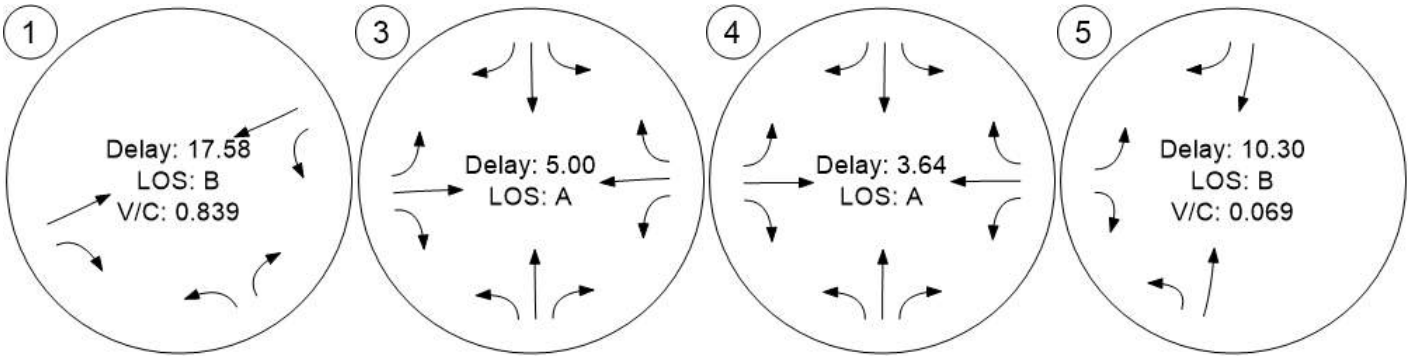
Site Access at Providence Dr



Report Figure 2e: Traffic Volume - Future Total Volume



Report Figure 3: Traffic Conditions



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TRAFFIC IMPACT STUDY

Date: March 27, 2018 Project #: 22340

To: Doug Rux & Kaaren Hofman, City of Newberg
Weston York, Providence Health & Services
Scott Harris & Tom Wesel, JRJ

From: Chris Brehmer, PE and Jacki Gulczynski
Project: Providence Medical Office Building
Subject: Traffic Analysis

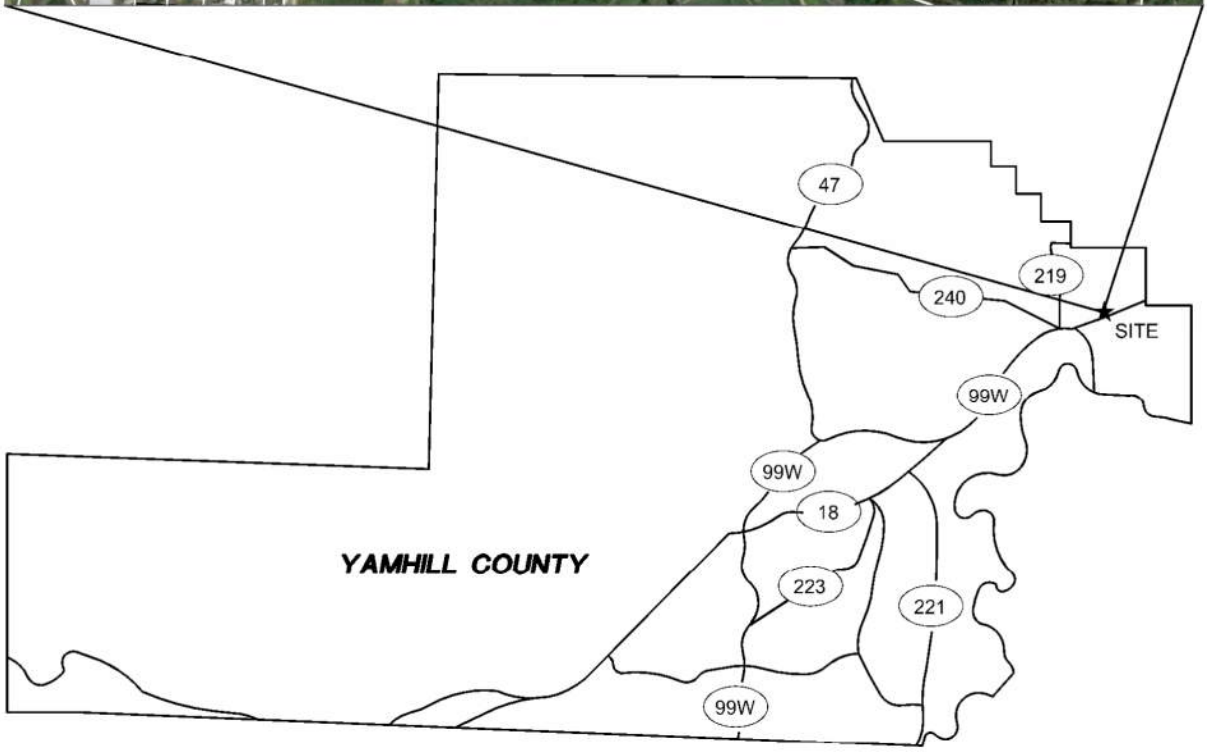
Providence Health & Services (herein referred to as "Providence") is proposing a 63,000 square feet expansion to its existing Medical Center in Newberg. As proposed, the new building would be constructed to the east of the existing campus, across Providence Drive. The property is currently vacant and to the north of the Chehalem Glenn Golf Course and south of Oregon 99W. The new building is anticipated to be constructed and occupied in 2019. This traffic study addresses the transportation-related impacts associated with the new building, in compliance with the Chapter 5 of the City of Newberg's Public Works Design and Construction Standards.

Based on the analysis herein, there are no off-site capacity needs associated with the new building and a southbound left-turn lane is not warranted at the proposed Providence Drive site driveways. We recommend that Providence locate and maintain all future landscaping, above-ground utilities, and site signage to ensure minimum required sight lines are provided at all site access points, internal intersections, and at the potential mid-block pedestrian crossing of Providence Drive.

At the request of City staff, we evaluated the need for an eastbound right-turn deceleration lane at the existing right-in, left-in access on Oregon 99W to the Medical Center. Although not warranted by the occupancy of the new building, the existing volumes at the access meet ODOT guidance for installation of a right-turn deceleration lane.

INTRODUCTION

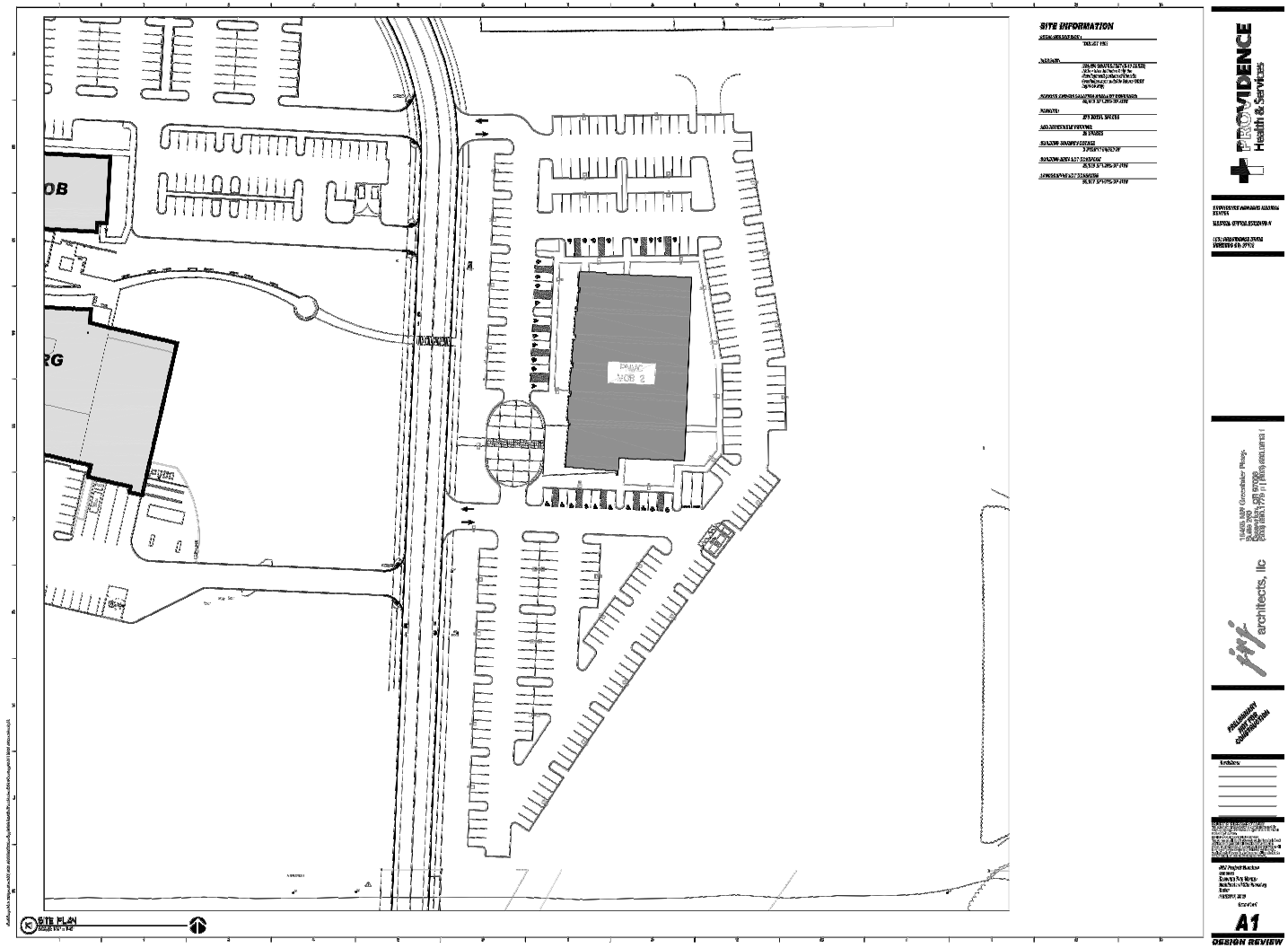
Providence is proposing up to 63,000 square feet expansion to its existing Newberg Medical Center (PNMC). Today, the campus is located to the west of Providence Drive and south of Oregon 99W and includes 180,080 square feet of hospital and medical office space. PNMC is currently served by a right-in, left-in access on Oregon 99W and four full accesses along Providence Drive. The new building will be located to the east of Providence Drive and will be served by two access points, one of which will align with an existing campus access. Figure 1 shows the site vicinity of the campus and Figure 2 shows the proposed site plan for the campus.



● # - Study Intersection

Site Vicinity
Newberg, Oregon

Figure
1



Site Plan Provided by JRJ Architects, LLC 03/20/2017

Proposed Site Plan
Newberg, Oregon

Figure
2

SCOPE OF THE REPORT

This report identifies the transportation-related impacts associated with the proposed PNMC campus expansion and was prepared in accordance with City of Newberg Traffic Analysis requirements (per Section 5.4 of the Public Works Design and Construction standards). Per City requirements, a traffic analysis is required when a development is anticipated to generate more than 40 weekday PM peak hour trips and must include the following:

- Executive summary;
- Description of site and study area roadways (as defined by those expected to experience a traffic volume increase of 5% due to the development);
- Bike, pedestrian, and transit needs;
- Off-site traffic evaluation of affected intersections (conducted for the weekday AM and PM peak hour under existing and year 2019 conditions);
- On-site traffic evaluation of accesses, circulation and parking;
- Recommendations for public improvements; and,
- The need for access management, as appropriate.

Based on scoping direction provided by the City of Newberg and Oregon Department of Transportation (ODOT) staff, the affected intersections included in this study are:

1. Oregon 99W/Providence Drive
2. Providence Drive/Existing PNMC North Driveway
3. Providence Drive/Existing PNMC Middle Driveway/Proposed Campus Expansion Access
4. Providence Drive/Existing PNMC South Driveway
5. Providence Drive/Campus Expansion Access
6. Providence Drive/Existing PNMC Shipping and Receiving Driveway
7. Oregon 99W/PNMC right-in, left-in access
8. Providence Drive-Hayes Street/Werth Boulevard
9. Brutscher Street/Werth Boulevard
10. E Fernwood Road/Brutscher Street

Analysis Methodology

The intersection operational analyses presented in this report were prepared following *Highway Capacity Manual 2000* (Reference 1) analysis procedures using Synchro 9 software (ODOT requires *Highway Capacity Manual 2000* analysis of signalized intersections on ODOT facilities). The unsignalized Highway 99W right-in, left-in only access and the Providence Drive-Hayes Street/Werth Boulevard roundabout were analyzed following the *Highway Capacity Manual 2010*.

Operating Standards

Intersection performance measures reported in this study include level of service (LOS), volume-to-capacity ratio (v/c), and delay. Queuing at the proposed accesses for the expansion area are also assessed. Intersection operating standards adopted by the respective transportation review authorities for the facilities they operate and maintain are summarized in this section.

City of Newberg

The City requires level of service "D" with maximum volume to capacity (v/c) ratio of 0.90. All study intersections are under City jurisdiction except Oregon 99W/Providence Drive.

ODOT

ODOT classifies Oregon 99W as a statewide freight route. With a 45 mile per hour posted speed, the applicable mobility target for the Oregon 99W/Providence Drive intersection is a v/c ratio of 0.80 per the Oregon Highway Plan.

EXISTING CONDITIONS

This section summarizes the existing characteristics of the transportation system and adjacent land uses near the PNMC campus, including an inventory of the existing multimodal transportation facilities and options, an evaluation of existing intersection operations for motor vehicles at the study intersections, and a summary of recent crash history.

Site Conditions and Adjacent Land Uses

The campus is located adjacent to Providence Drive and south of Oregon 99W. The expansion will occur east of Providence Drive. Commercial uses are located to the west of the campus whereas the Chehalem Glenn golf course and residential uses are located to the south.

Transportation Facilities

Table 1 summarizes the study area roadways. Figure 3 illustrates the existing lane configurations and traffic control at the study intersections.

Table 1. Street Characteristics in Site Vicinity

Street	Classification[1]	Vehicle Travel Lanes	Posted Speed (mph)	Pedestrian Facilities	Bicycle Facilities
Oregon 99W	Statewide Freight Route	5	45	South side	Yes
Providence Drive	Major Collector	2	25	Yes	Yes
Brutscher Street	Major Collector	2 – 3	25	Yes	Yes
Hayes Street	Major Collector	2	25	Yes	No
Werth Boulevard	Local Street	2	25	West side	No
Fernwood Road	Major Collector	2	25	North side	No

[1]Per the City of Newberg Transportation System Plan (Reference 2).

Pedestrian Facilities

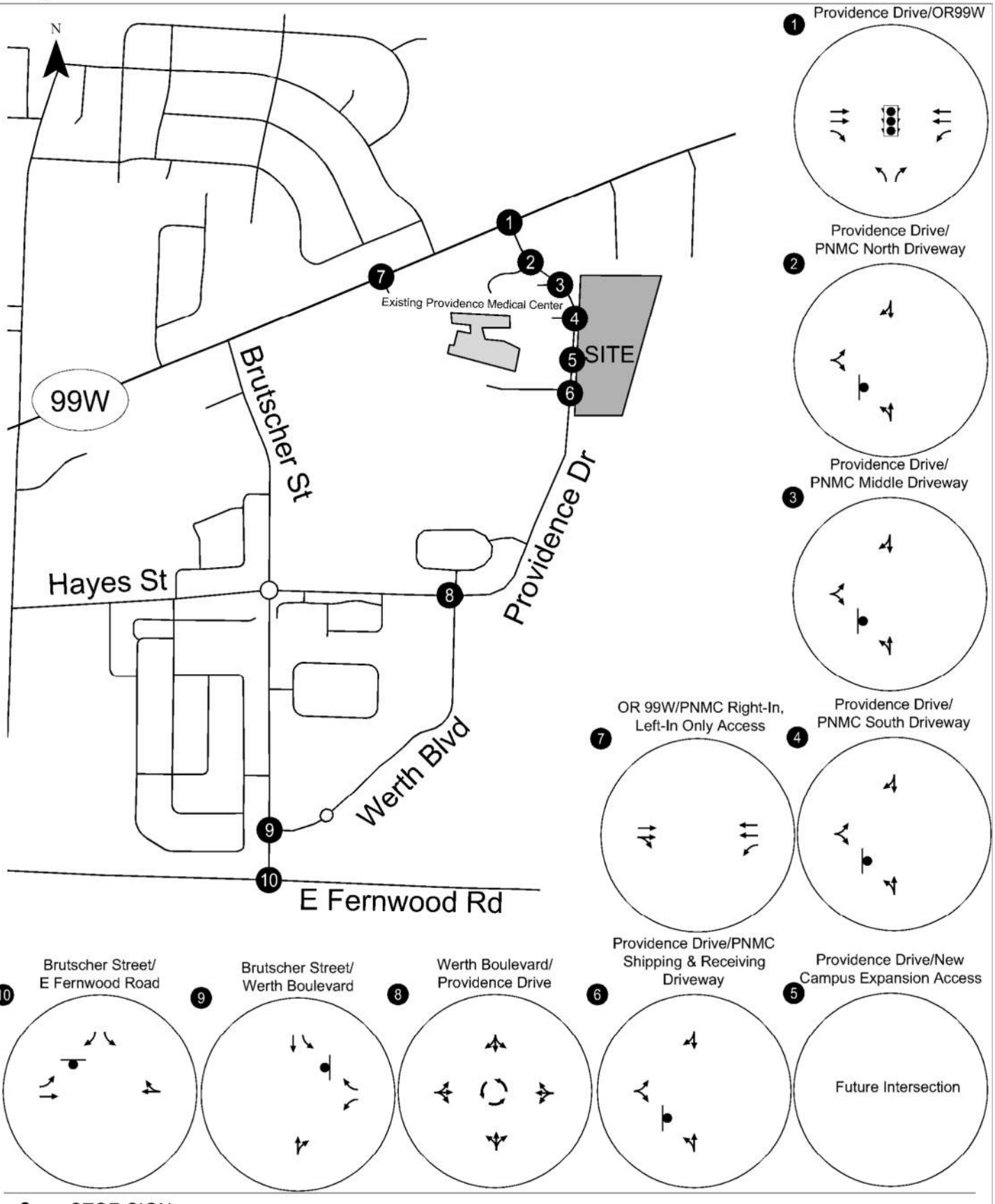
As shown in Table 1, sidewalks are generally provided along the study area roadways connecting the hospital campus to the adjacent commercial and residential areas. In addition, marked crossings are provided along Providence Drive near the campus access points as well as at key points along other study area roadways, such as Brutscher Street.

Bicycle Facilities

Bike lanes are generally provided along study area roadways. No modifications to the existing bicycle infrastructure is anticipated as part of the campus expansion.

Transit Facilities

Yamhill County Transit (YCTA) operates fixed transit route and dial-a-ride service in Newberg. Route 7 includes a stop within the Providence campus, providing convenient transit access for Providence employees, patients, and visitors. Service is provided on hourly headways between 7 AM and 7 PM on weekdays only.



Study Intersections & Traffic Control Devices
Newberg, Oregon

Figure 3

Existing Conditions Operational Analysis

Manual turning movement counts were collected at the study intersections on a mid-week day in February 2018 when school was in session and no inclement weather conditions occurred that would affect typical traffic patterns. These counts were collected approximately one month after the first phase of the Newberg-Dundee Bypass was opened to traffic. Per scoping directions, the traffic counts were conducted during the morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak time periods. Further, per ODOT Analysis Procedures Manual (APM, Reference 3) requirements, the traffic counts were seasonally adjusted. Figures 4 and 5 summarize the seasonally adjusted traffic volumes at the study intersections during the weekday AM and PM peak hours, respectively. *Appendix "A" contains the traffic count worksheets.*

The figures also reflect the operational analysis for the study intersections during the weekday AM and PM peak hours. As shown, all City intersections and PNMC accesses operate acceptably today during the weekday AM and PM peak hours. The Providence Drive/Oregon 99W exceeds ODOT's mobility target of 0.80 and operates with a v/c ratio of 0.82 during both peak hours. *Appendix "B" includes the operations analysis worksheets for the Existing Conditions analysis.*

Traffic Safety

The crash history of each study intersection was reviewed to identify potential intersection safety issues. Crash data for the study intersections was obtained from the Oregon Department of Transportation (ODOT) for the five-year period from January 1, 2011 through December 31, 2015. Table 2 summarizes the crashes reported at the study intersections. *Appendix "C" contains the ODOT crash data.*

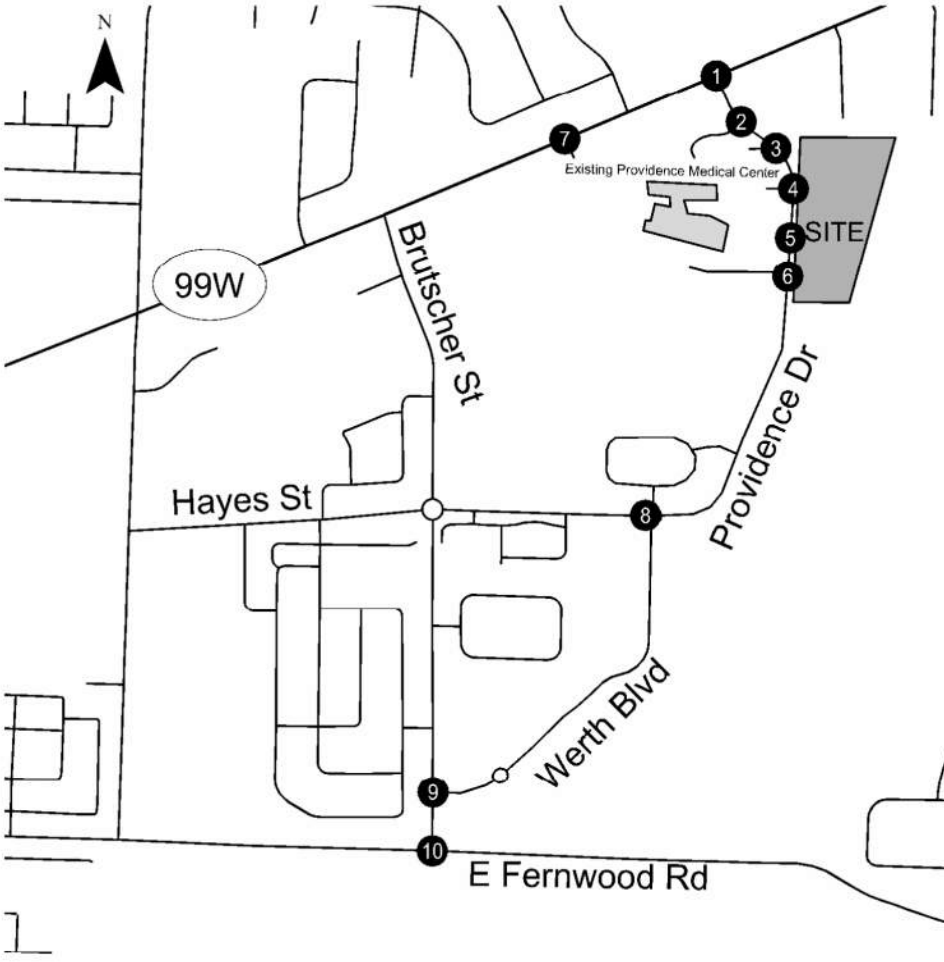
Table 2. Intersection Crash History (January 1, 2011 through December 31, 2015)

Location	Collision Type					Severity		Total Crashes	Crash Rate[2]	Statewide 90th-percentile Crash Rate[4]	Observed Crash Rate > Statewide 90th-percentile?
	Turning	Fixed Object	Rear End	Sideswipe	Angle	PDO[1]	Injury				
Oregon 99W/ Providence Drive	0	0	11	0	0	8	3	11	0.17	0.87	No
Providence Drive/ Hayes Street	0	0	0	0	0	0	0	0	0.0	1.53	No
Brutscher Street/ Werth Boulevard	0	0	0	0	0	0	0	0	0.0	1.53	No
Fernwood Road/ Brutscher Street	1	0	0	0	0	1	0	1	0.11	1.53	No

[1]PDO – Property damage only

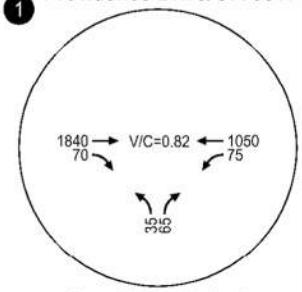
[2]Crash rate per million entering vehicles

As shown in Table 2, the observed crash rate at each intersection was compared to the statewide 90th-percentile crash rate for similar intersection types, consistent with the ODOT APM. None of the observed crash rates at the study intersections exceed the statewide 90th-percentile crash rates. As such, no safety-related mitigation measures are recommended as part of the campus expansion.

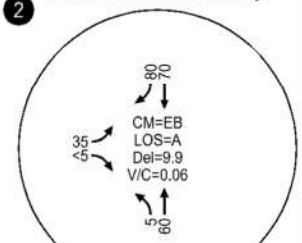


CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

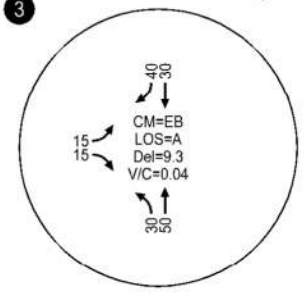
1 Providence Drive/OR 99W



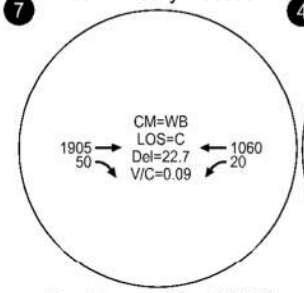
2 Providence Drive/ PNMC North Driveway



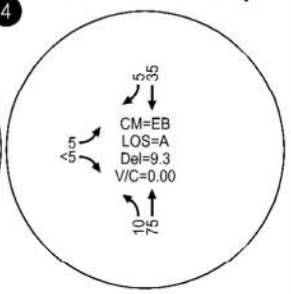
3 Providence Drive/ PNMC Middle Driveway



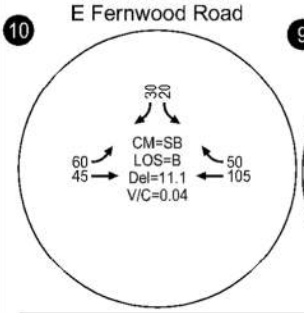
7 OR 99W/PNMC Right-In, Left-In Only Access



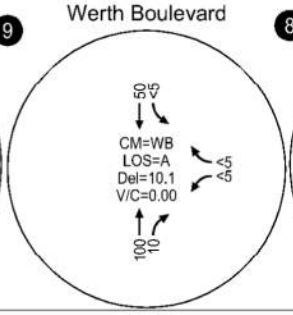
4 Providence Drive/ PNMC South Driveway



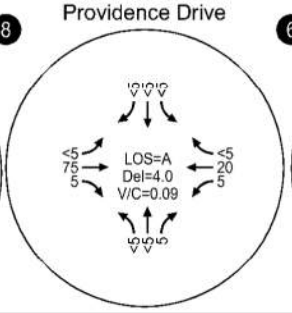
10 Brutscher Street/ E Fernwood Road



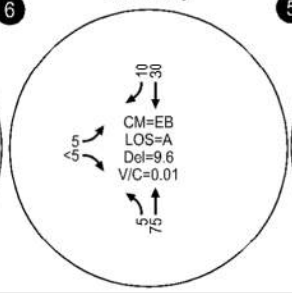
9 Brutscher Street/ Werth Boulevard



8 Werth Boulevard/ Providence Drive



6 Providence Drive/PNMC Shipping & Receiving Driveway

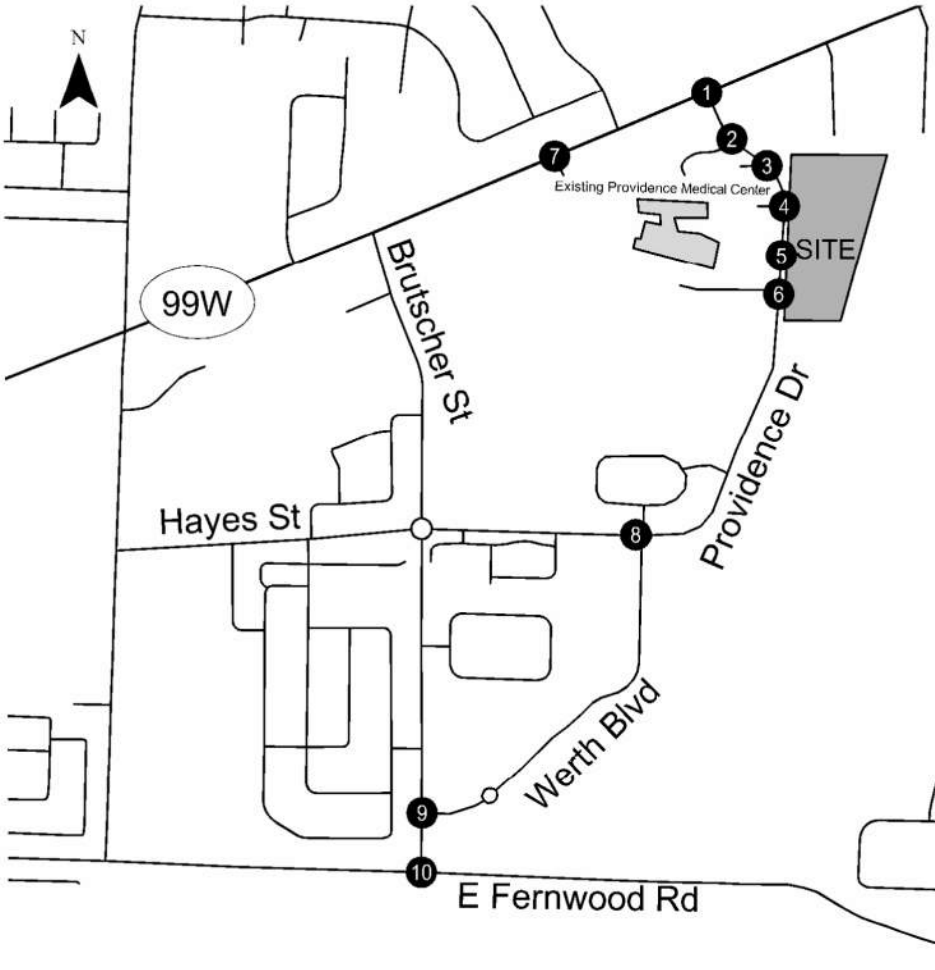


5 Providence Drive/New Campus Expansion Access

Future Intersection

Existing Traffic Conditions, Weekday AM Peak Hour
Newberg, Oregon

Figure 4



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
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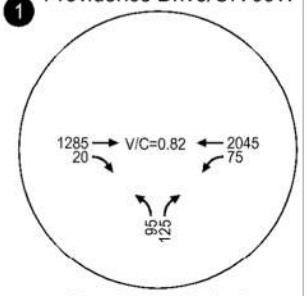
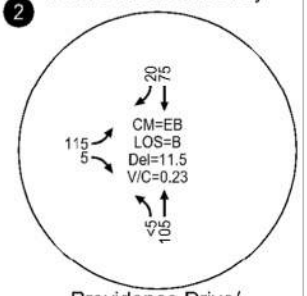
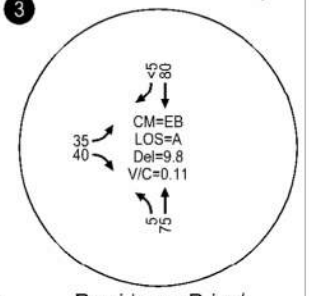
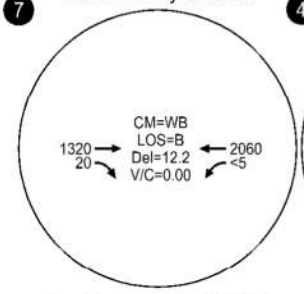
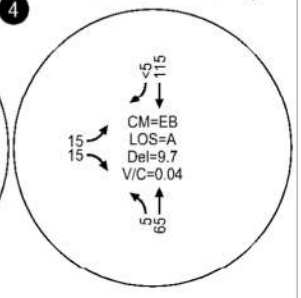
V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

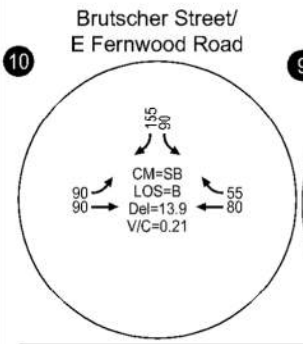


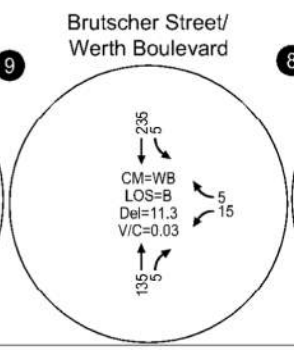


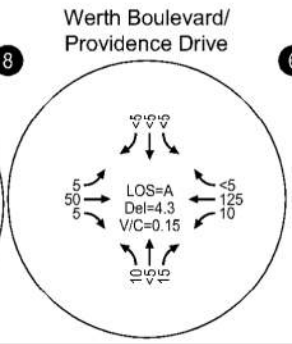


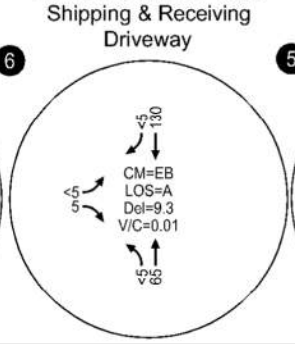


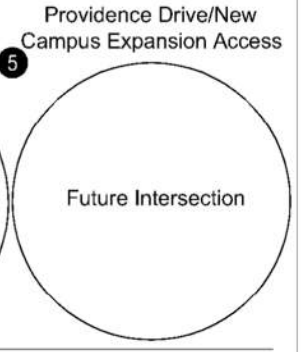












Existing Traffic Conditions, Weekday PM Peak Hour
Newberg, Oregon

Figure 5

TRAFFIC IMPACT ANALYSIS

The traffic impact analysis identifies how the study area's transportation system will operate in 2019 when the new building is expected to be occupied. This section of the report addresses the following elements:

- Build-out year 2019 background traffic conditions during the weekday AM and PM peak periods, considering in-process developments and planned transportation improvements in the study area;
- Trip generation and distribution estimates for the proposed campus expansion;
- Build-out year 2019 total traffic conditions during the weekday AM and PM peak assuming occupancy of the proposed expansion;
- Site access and circulation evaluation (including turn lane warrants);
- Providence Drive pedestrian crosswalk evaluation; and,
- Recommended improvements/intersection considerations.

2019 Background Operational Analysis

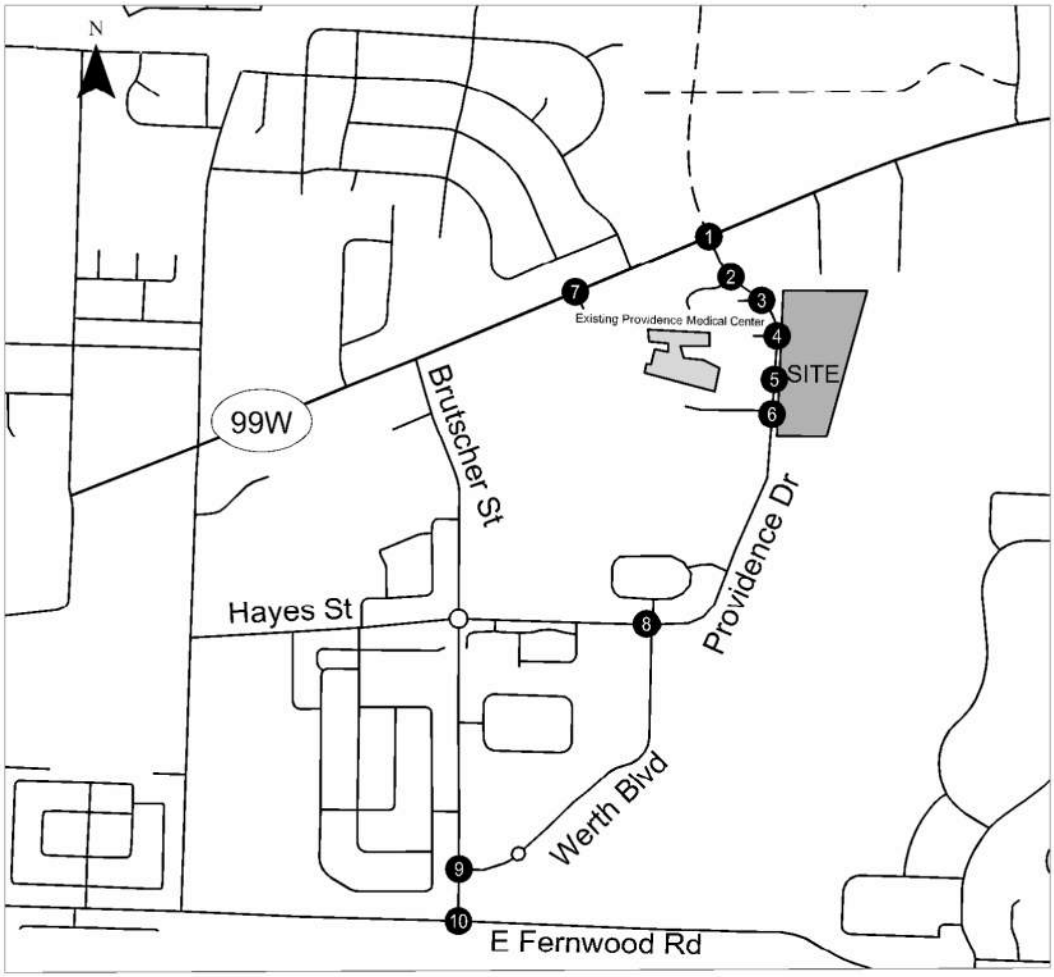
Background traffic volumes include trips from new development in the vicinity as well as general regional growth. The year 2019 analyses include a background annual growth rate of two percent at each study intersection, as well as traffic generated by two in-process developments identified by City and ODOT staff, including:

- Oregon Clinic; and,
- Crestview Crossing.

As part of the Crestview Crossing development, JT Smith will be extending Crestview Drive to the intersection of Oregon 99W/Providence Drive. Per direction from City staff, this improvement was also included in the analysis of year 2019 background conditions.

Figures 6 and 7 summarize the background traffic volumes at the study intersections during the weekday AM and PM peak hours, respectively. These figures also summarize the operational analysis for the study intersections during the weekday AM and PM peak hours. As shown, all City intersections and PNMC accesses are forecast to continue operating acceptably during both peak hours. With the Crestview Drive extension to Oregon 99W and the increase in background traffic volumes, the intersection of Providence Drive/Oregon 99W/Crestview Drive is forecast to operate at a v/c ratio of 0.95 during the weekday AM peak hour and 0.98 during the weekday PM peak hour.

Appendix "D" includes the operations analysis worksheets for the 2019 Background Conditions analysis, as well as a summary of the in-process traffic volumes and assumptions associated with the extension of Crestview Drive to the Oregon 99W/Providence Drive intersection.



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LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

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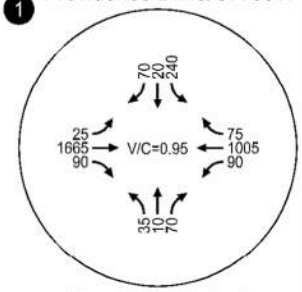
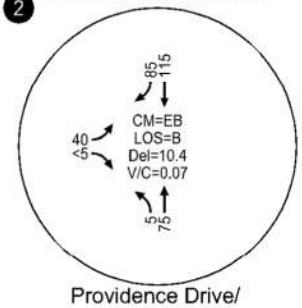


2 Providence Drive/ PNMC North Driveway



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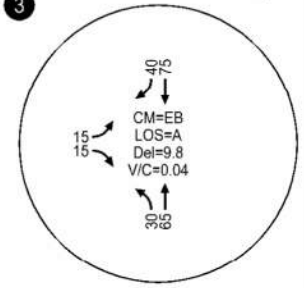
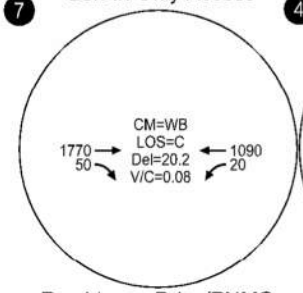
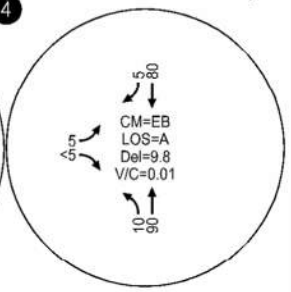


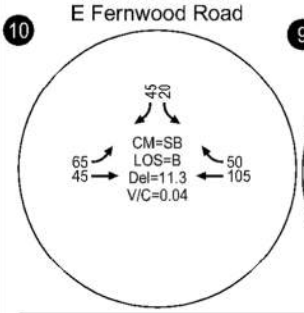
7 OR 99W/ PNMC Right-In, Left-In Only Access



4 Providence Drive /PNMC South Driveway



10 Brutscher Street/ E Fernwood Road



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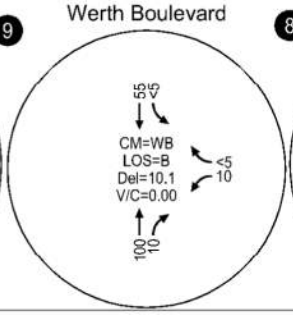
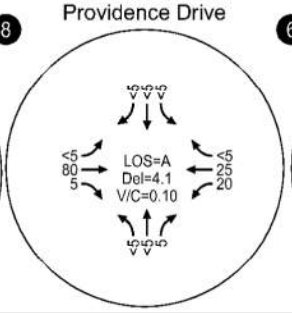
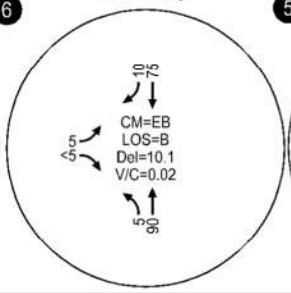


8 Werth Boulevard/ Providence Drive



6 Providence Drive/PNMC Shipping & Receiving Driveway

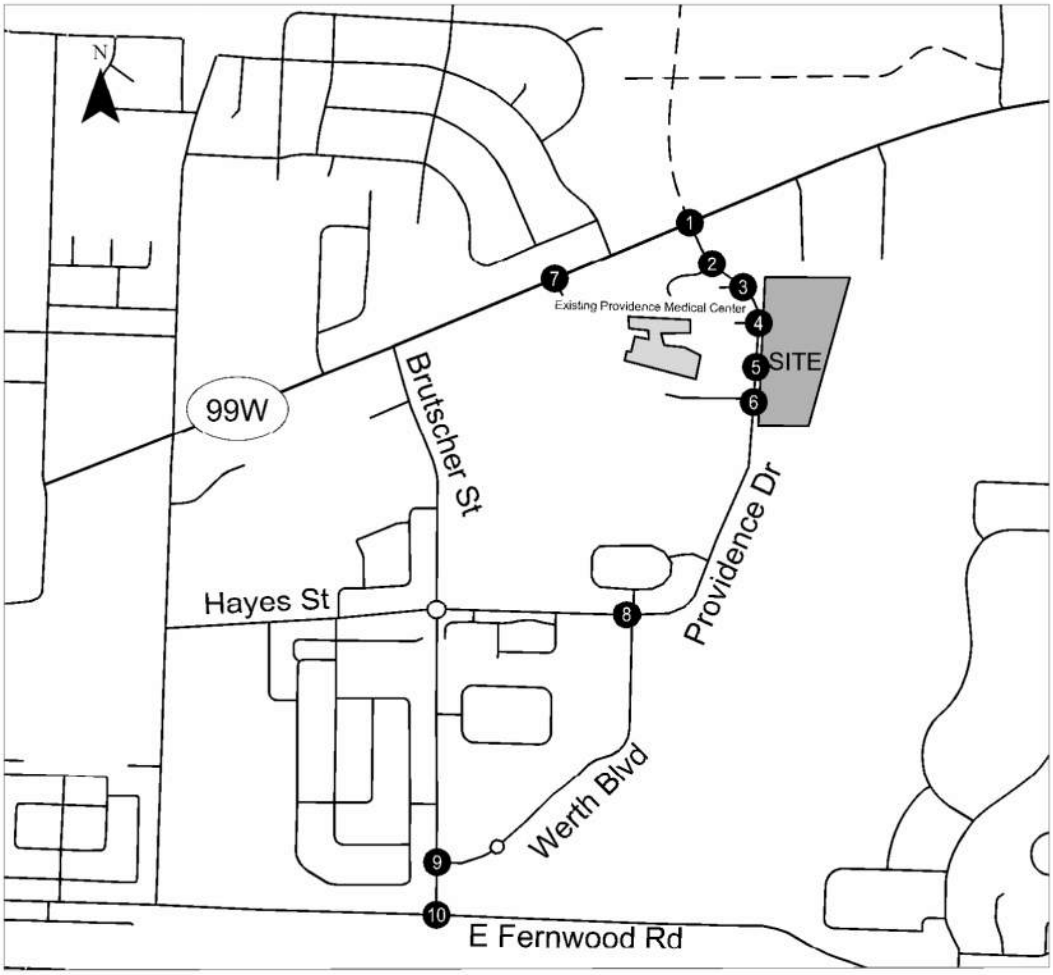


5 Providence Drive/New Campus Expansion Access

Future Intersection

Background Traffic Conditions, Weekday AM Peak Hour
Newberg, Oregon

Figure 6



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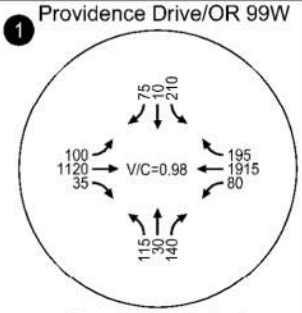
V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

1 Providence Drive/OR 99W



Providence Drive/ PNMC North Driveway

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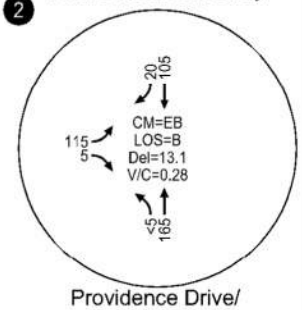

Providence Drive/ PNMC Middle Driveway

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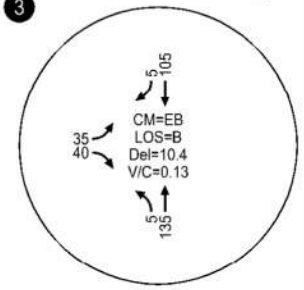
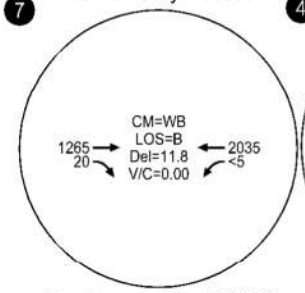


OR 99W/ PNMC Right-In, Left-In Only Access

7



Providence Drive/ PNMC South Driveway

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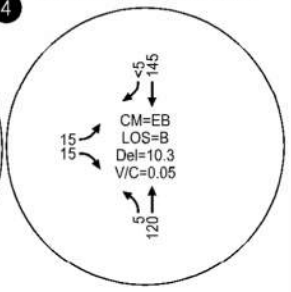

Brutscher Street/ E Fernwood Road

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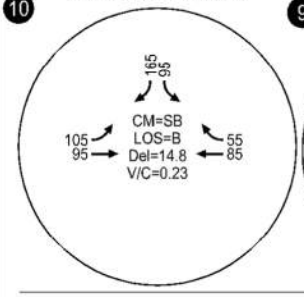

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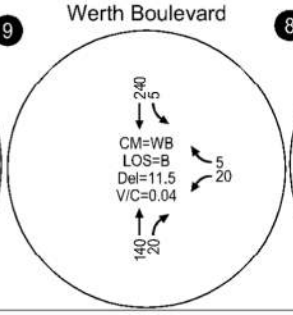
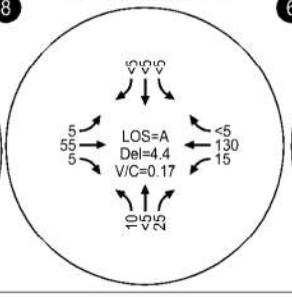


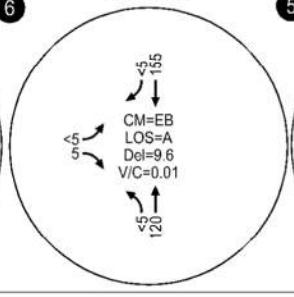
Werth Boulevard/ Providence Drive

8



Providence Drive/PNMC Shipping & Receiving Driveway

6



Providence Drive/New Campus Expansion Access

5

Future Intersection

Background Traffic Conditions, Weekday PM Peak Hour
Newberg, Oregon

Figure 7

Trip Generation Estimate

Recent studies conducted at other hospital campuses in the state have shown that it is most appropriate to identify an overall hospital campus rate, rather than trying to separate out the trip generation by use (e.g., hospital, medical office building, administrative office, etc.). These studies have shown that there is a synergy and efficiency that is gained by a campus between the main hospital, medical office buildings and ancillary uses[1].

We used the traffic counts at the four existing campus accesses along Providence Drive and the right-in, left-in access on Oregon 99W during the weekday AM (7 – 9 AM) and PM (4 – 6 PM) peak periods to determine the current campus trip rate for PNMC. An existing PNMC trip generation rate was developed by dividing the total number of vehicles observed at the driveways by the total size of the existing buildings (i.e., 180,080 square feet). This rate was applied to the new building for purposes of the traffic impact analysis. Table 3 summarizes the existing campus rate whereas Table 4 shows the estimated trip generation for the expansion area.[2]

Table 3. Existing Campus Trip Generation

Land Use	Data Source	Size (square feet)	Total Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total Trips	In	Out	Total Trips	In	Out
Existing Campus	Based on Driveway Counts	180,080	Not Measured	291 (1.62 trips per 1,000 sq. ft.)	222 (76% in)	69 (24% out)	246 (1.37 trips per 1,000 sq. ft.)	53 (22% in)	193 (78% out)

Table 4. Estimated Trip Generation for Campus Expansion

Land Use	Site Rates	Size	Total Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total Trips	In	Out	Total Trips	In	Out
Hospital Expansion	N/A	63,000	n/a	102	78	24	86	19	67

[1] Sources: *Portland Providence Medical Center Transportation Impact Analysis*, June 2011; *Providence Willamette Falls Medical Center Transportation Impact Analysis*, August 2011; *PeaceHealth Southwest Public Facilities Master Plan*, February 2015; *Adventist Medical Center Conditional Use Master Plan*, February 2018.

[2] For reference purposes, the hospital trip generation rates in *Trip Generation Manual* (10th Edition, Institute of Transportation Engineers) reflect a weekday AM peak hour rate of 0.89 trips per 1,000 square feet and a weekday PM peak hour rate of 0.97 trips per 1,000 square feet versus the PNMC measured rates of 1.62 weekday AM and 1.37 weekday PM trips per 1,000 square feet.

Trip Distribution and Assignment

Figure 8 illustrates the estimated trip distribution pattern, as well as the assignment of site-generated trips during the weekday AM and PM peak hours. The trip distribution pattern was calculated based on existing traffic patterns associated with PNMC. To ensure a conservative analysis of site-generated trip capacity impacts to off-site study intersections, no vehicle trips were assumed between the proposed building and the existing Providence campus.

2019 Total Traffic Operational Analysis

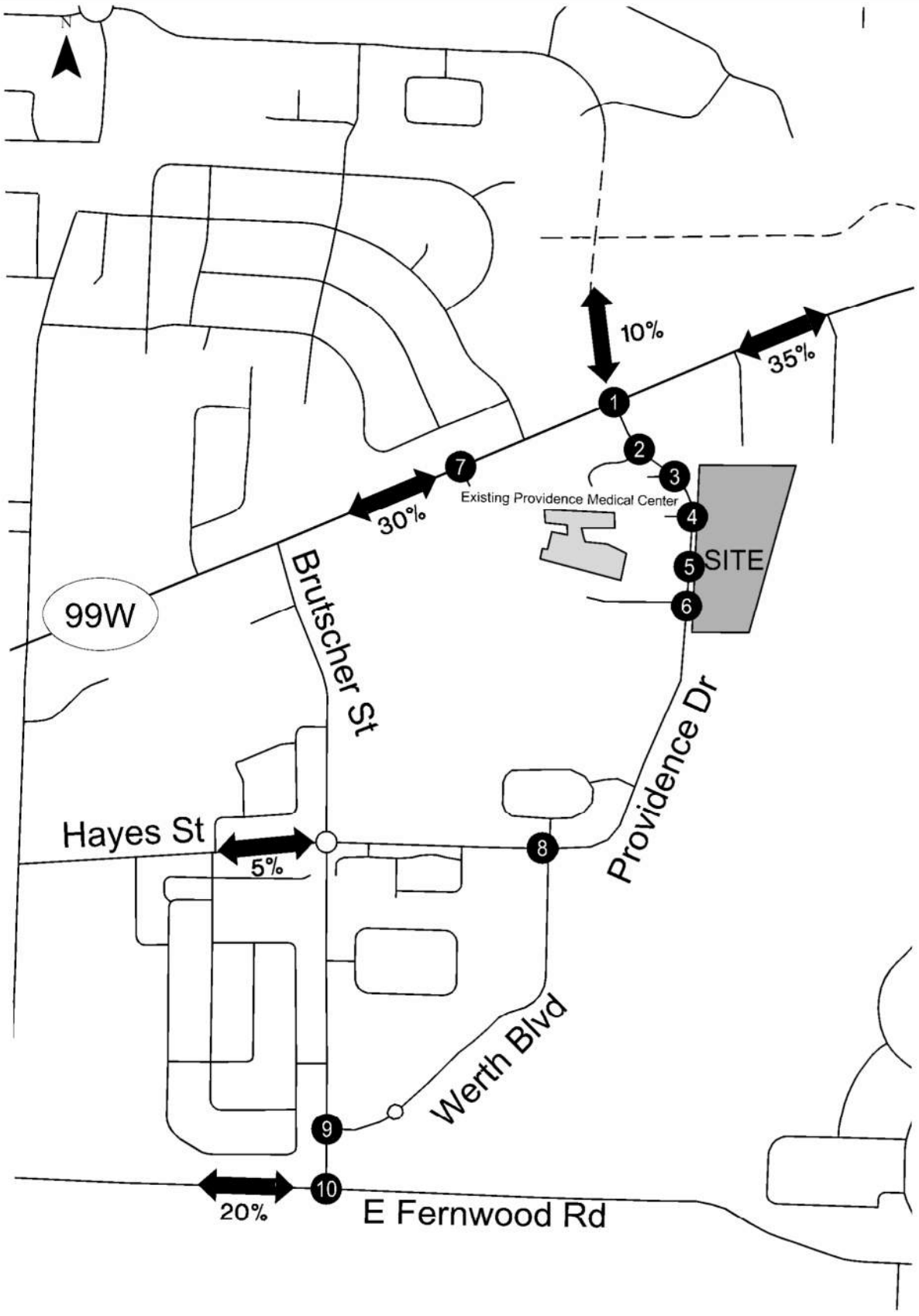
Total traffic volumes include the site-generated trips in addition to the 2019 background traffic volumes. The background traffic volumes shown in Figures 6 and 7 were added to the site-generated trips shown in Figure 8 arrive at the 2019 total traffic volumes shown in Figures 9 and 10 for the weekday AM and PM peak hours, respectively. These figures also summarize the operational analysis for the study intersections during the weekday AM and PM peak hours.

As shown, all City intersections are forecast to continue operating acceptably during both peak hours. With the addition of the traffic from the new building, the intersection of Providence Drive/Oregon 99W/Crestview Drive is forecast to operate at a v/c ratio of 0.96 during the weekday AM peak hour and 0.98 during the weekday PM peak hour. A comparison of the operational results shown in Figures 6 and 7 with those reflected in Figures 9 and 10 reveals that the v/c ratio during the weekday AM peak hour is anticipated to increase by 0.01 as a result of the new building whereas the v/c ratio during the PM peak hour is anticipated to remain the same as background conditions (although a small increase in delay is anticipated upon occupancy of the new building). Per ODOT policy guidance, when an intersection exceeds mobility targets, but the v/c ratio increases by less than 0.03 due to development, the impacts are not considered significant[3]. Based on this policy, no mitigation measures are warranted at this intersection. *Appendix "E" includes the year 2019 total traffic operations worksheets.*

Left-Turn Lane Warrant Analysis

As discussed above, two accesses are proposed to serve the new building along Providence Drive. One will align with the Middle PNMC access (i.e., Intersection 3 in the figures) and one will be located between the South access (Intersection 4 in the figures) and the PNMC Shipping and Receiving access (Intersection 5 in the figures). Based on scoping direction from the City, we evaluated the need for a southbound left-turn lane at both new access points. Based on year 2019 traffic volumes and APM procedures, a southbound left-turn-lane is not warranted at either location. *Appendix "F" includes the turn lane warrant analysis worksheets.*

[3] Source: May 25, 20011 Oregon Department of Transportation Memorandum from Matthew Garrett, Director. Subject: Oregon Highway Plan Policy Intent Statements



Providence Drive/OR 99W

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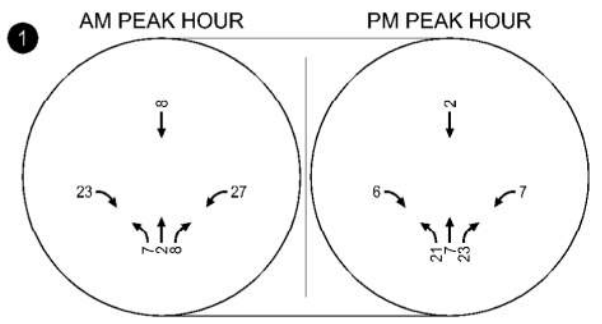

Providence Drive/PNMC North Driveway

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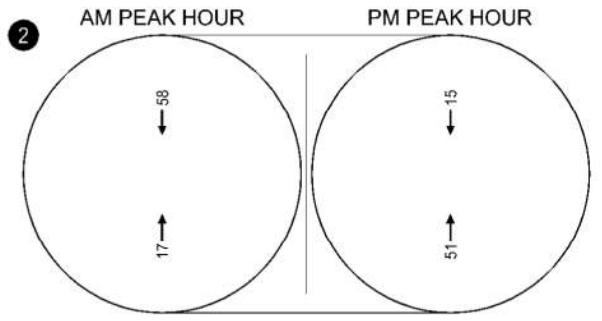

Providence Drive/PNMC Middle Driveway

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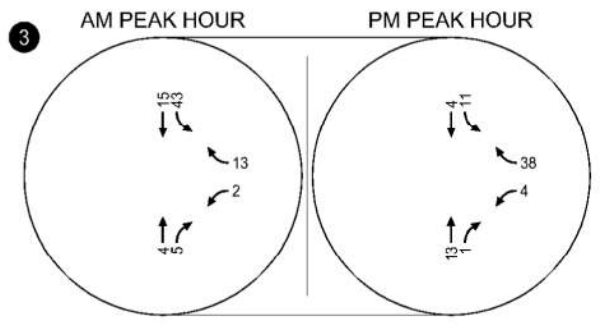

Providence Drive/PNMC South Driveway

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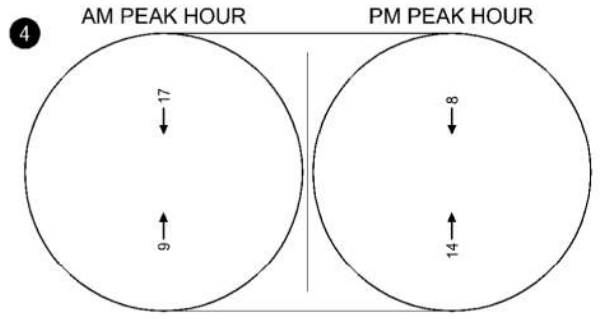

Providence Drive/New Campus Expansion

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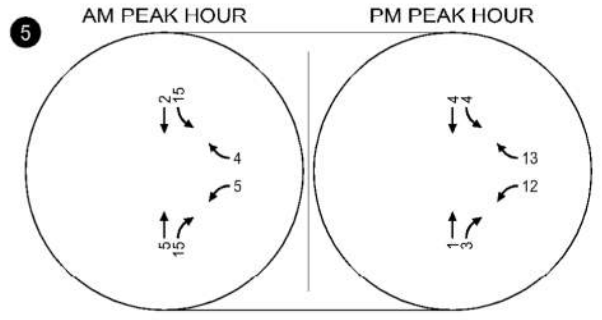

Providence Drive/PNMC Shipping & Receiving Driveway

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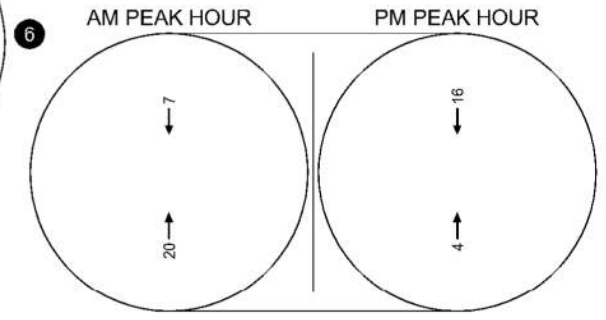
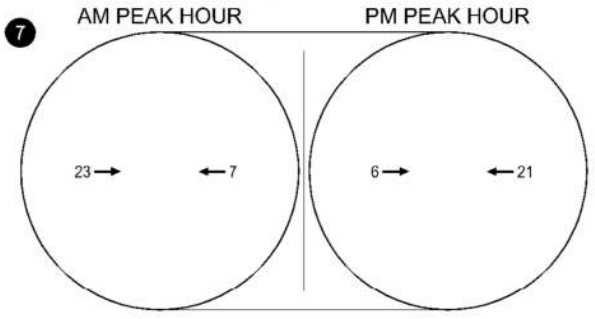


OR 99W/PNMC Right-In, Left-In Only Access

7



Werth Boulevard/Providence Drive

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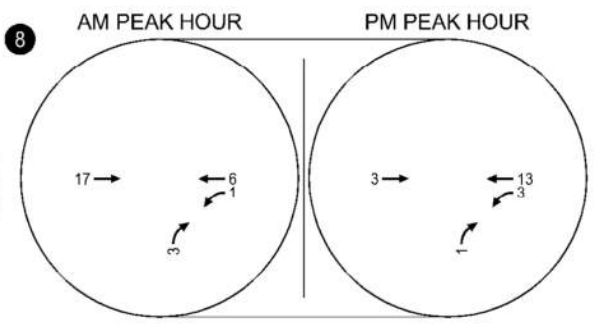
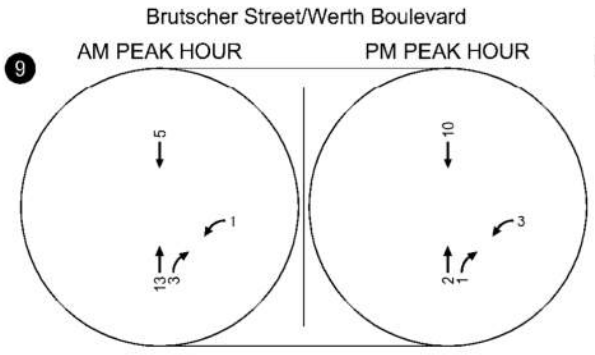


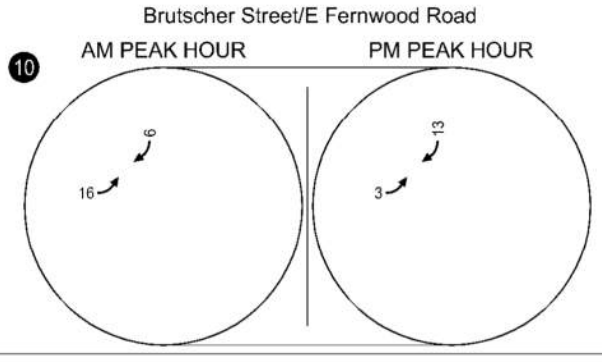
Brutscher Street/Werth Boulevard

9



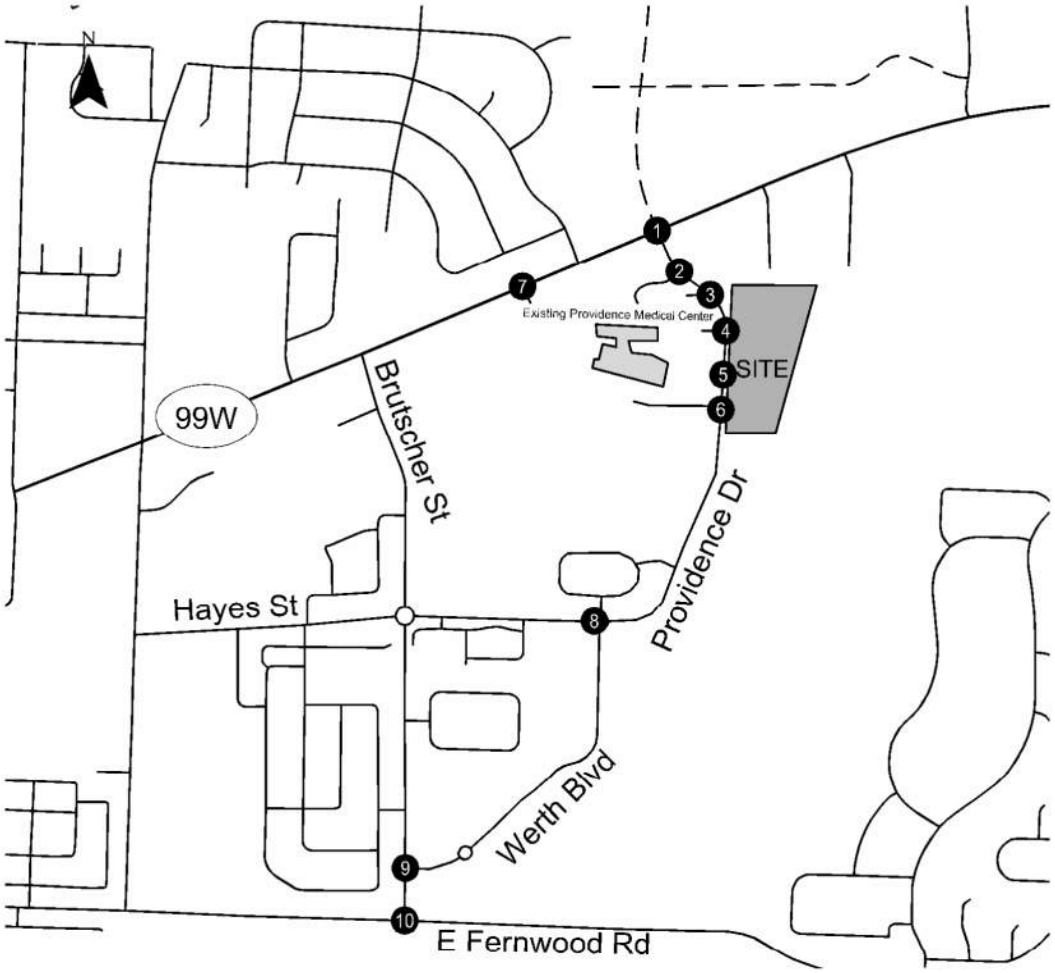
Brutscher Street/E Fernwood Road

10



Estimated Trip Distribution Pattern and Assignment
Newberg, Oregon

Figure
8



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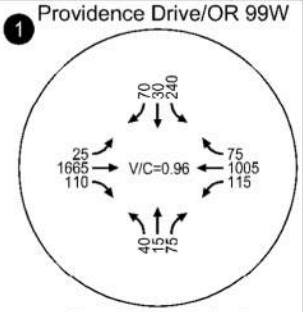
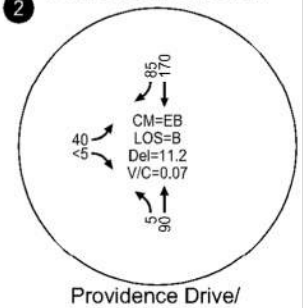
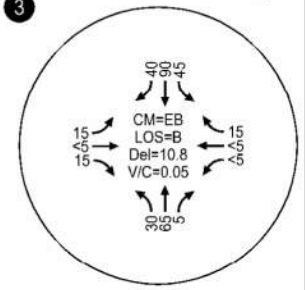
1 Providence Drive/OR 99W



Providence Drive/ PNMC North Driveway



Providence Drive/ PNMC Middle Driveway



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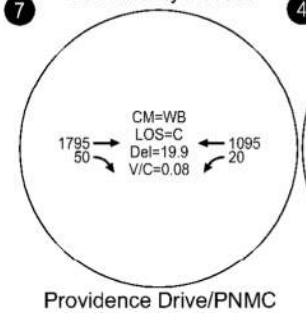

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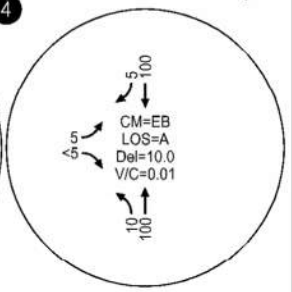
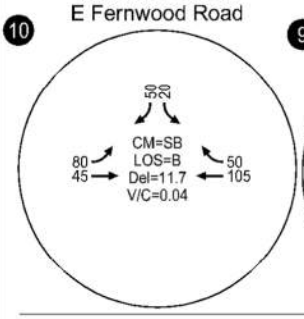
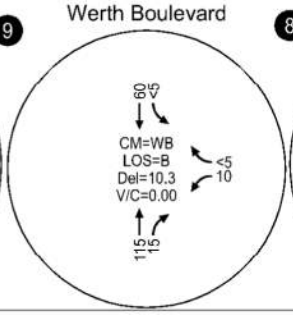


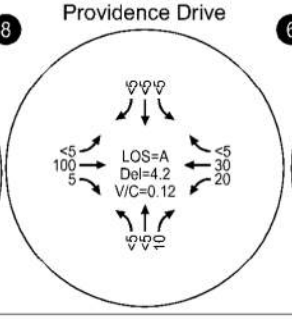
10 Brutscher Street/ E Fernwood Road



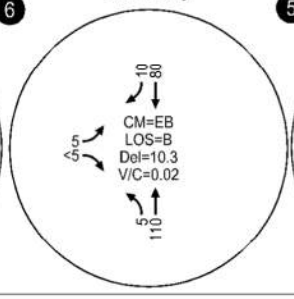
9 Brutscher Street/ Werth Boulevard



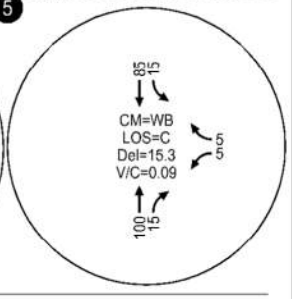
8 Werth Boulevard/ Providence Drive



6 Providence Drive/PNMC Shipping & Receiving Driveway

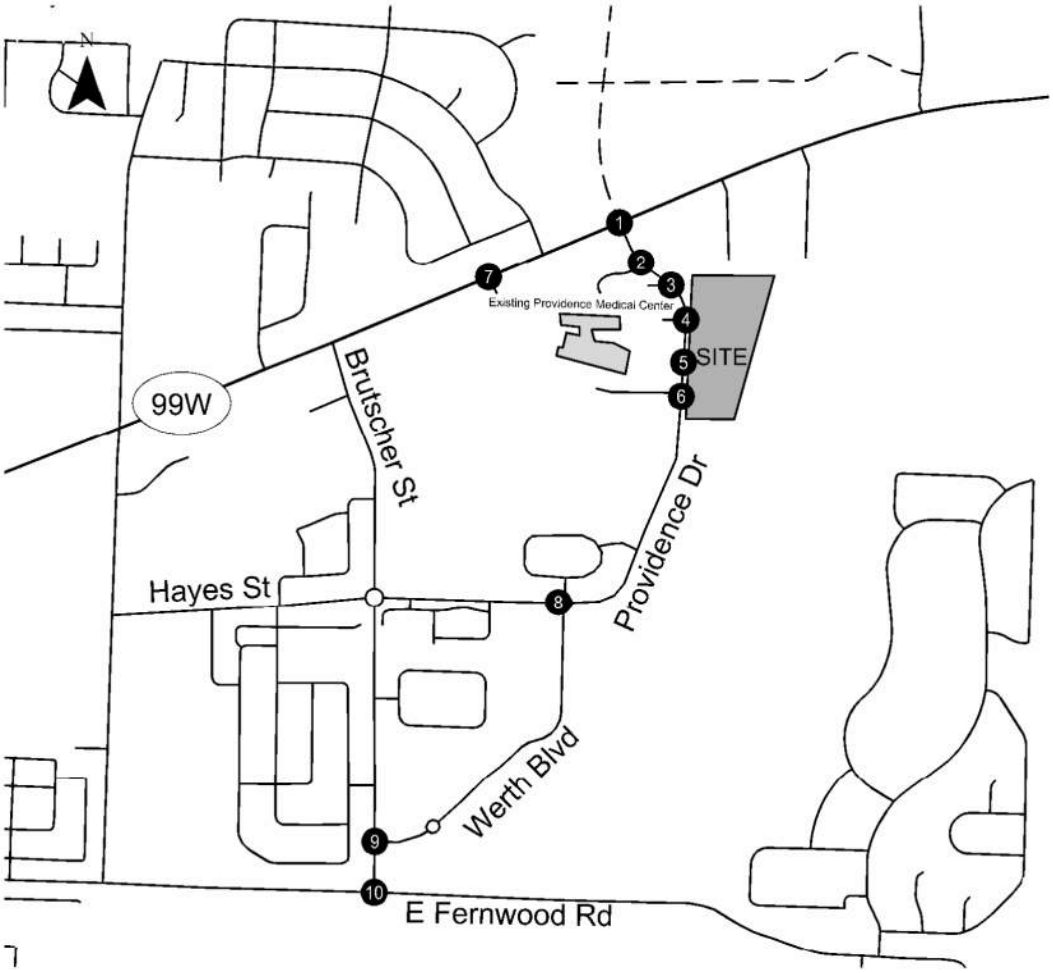


5 Providence Drive/New Campus Expansion Access



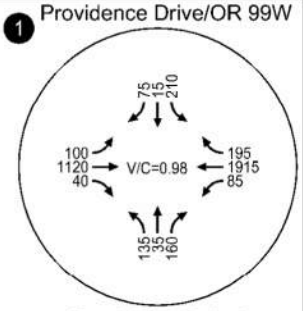
Total Traffic Conditions, Weekday AM Peak Hour
Newberg, Oregon

Figure 9

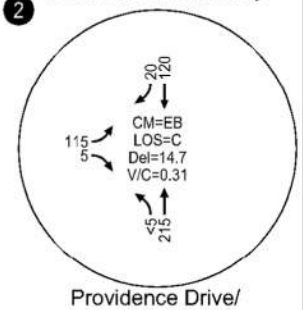


CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL CRITICAL VOLUME-TO-CAPACITY RATIO

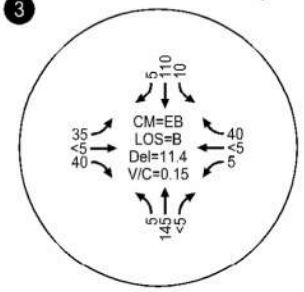
1 Providence Drive/OR 99W



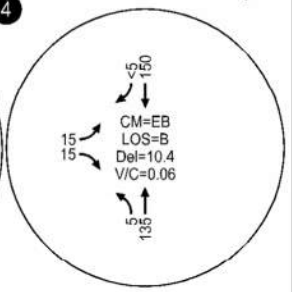
2 Providence Drive/ PNMC North Driveway



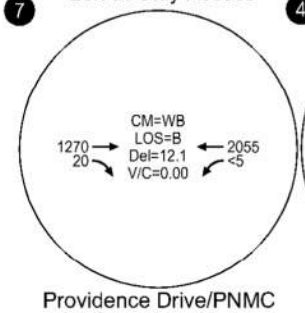
3 Providence Drive/ PNMC Middle Driveway



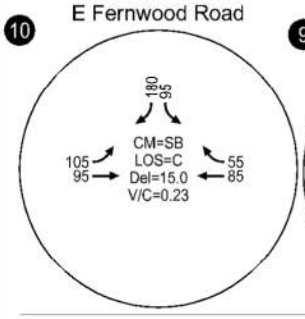
4 Providence Drive/ PNMC South Driveway



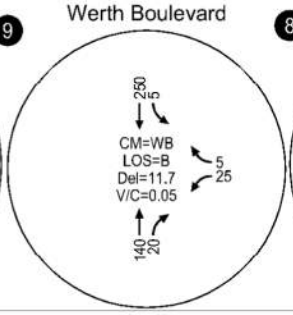
7 OR 99W/ PNMC Right-In, Left-In Only Access



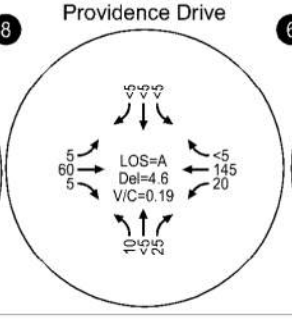
10 Brutscher Street/ E Fernwood Road



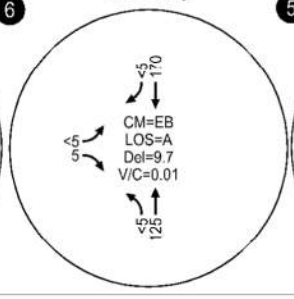
9 Brutscher Street/ Werth Boulevard



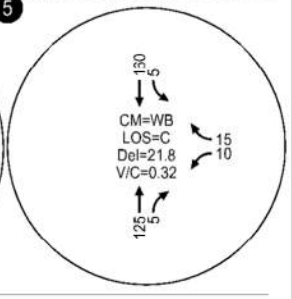
8 Werth Boulevard/ Providence Drive



6 Providence Drive/PNMC Shipping & Receiving Driveway



5 Providence Drive/New Campus Expansion Access



Total Traffic Conditions, Weekday PM Peak Hour
Newberg, Oregon

Figure 10

Oregon 99W Right-Turn Lane Warrant Analysis

At the request of City staff, we evaluated the need for an eastbound right-turn deceleration lane at the PNMC right-in, left-in access on Oregon 99W. Although not warranted by the occupancy of the new building, the existing volumes at the access meet ODOT APM guidance for installation of a deceleration lane. We recommend Providence work with the City and ODOT to determine, if and, when to construct this deceleration lane, especially in consideration of any planned construction of the next phase of the Newberg-Dundee Bypass and its effect on Oregon 99W traffic volumes. *Appendix "F" includes the turn lane warrant analysis worksheets.*

Queuing Analyses

Table 5 identifies the projected 95th percentile queuing at the two access points proposed to serve the campus expansion area along Providence Drive intersection assuming full occupancy of the new building. We worked with the project team to ensure that adequate queue storage can be provided within the parking area proposed to serve the campus expansion and that no queue spillback would occur onto Providence Drive at either location. Further, because the proposed driveways are stop-controlled on the side-street approaches and uncontrolled along Providence Drive, the driveway queues will have no impact to a potential mid-block pedestrian crossing on Providence Drive.

Table 5. 95th Percentile Queues at New Campus Accesses on Providence Drive

Location	Movement	95th-percentile Queue (ft)	
		Total AM	Total PM
Existing Middle PNMC Access/ Campus Expansion Access	Westbound	<25	<25
	Southbound	<25	<25
Campus Expansion Access (southern)	Westbound	<25	50
	Southbound	<25	<25

On-Site Circulation

The project team has provided for adequate vehicular, pedestrian and bicycle circulation and access within the campus expansion area. Further, both access points are expected to operate acceptably under stop control.

Crosswalk Assessment

The National Cooperative Highway Research Program (NCHRP) *Report 562 Improving Pedestrian Safety at Unsignalized Crossings* recommends an engineering study method for evaluating the appropriate levels of crosswalk protection. The Report 562 method was applied to determine if a striped crosswalk might be needed between the existing hospital and the new building.

Approximately 160 staff are expected to be on-site in the new building, plus visitors and patients. Some walking trips between the proposed new building and the hospital campus west of Providence Drive are

expected to be made by employees and/or visitors. The number of pedestrian crossings per day is likely to vary based on considerations including weather, time of day, and the extent of services/amenities that require trips between buildings (for example, some staff and visitors may walk to the existing hospital campus cafeteria, though a coffee/snack bar will be provided in the lobby of the proposed new building).

The NCHRP 562 analysis procedure suggests a crosswalk treatment for facilities like Providence Drive where 20 or more pedestrians cross per hour. Based on conversations with Providence staff, it is estimated that fewer than 20 pedestrian trips per hour are likely to use the pedestrian crossing (equivalent to 10 persons making a round trip between buildings in one hour). Accordingly, a striped crosswalk does not appear to be warranted and the projected traffic and pedestrian volumes also do not warrant an "active or enhanced" treatment per the NCHRP Report 562 thresholds. The need for such treatments or provision of a marked crosswalk could be re-evaluated in the future as necessary.

Providence should provide street lighting along the site frontage and ensure that all landscaping, above-ground utilities, and site signage are located to ensure a clear line of sight for vehicles on Providence Drive to detect and yield to pedestrians.

Appendix G contains the worksheet used in the crosswalk evaluation.

Intersection Sight Distance

Providence should locate and maintain all future landscaping, above-ground utilities, and site signage to ensure minimum intersection required sight lines are provided at all site accesses, as well as internal intersections in accordance with City standards.

Access Management

Per Newberg Municipal Code Section 15.505.030.R.2 and R.3, driveways along Major Collector roadways must be located 150 feet from adjacent street intersections and more than one driveway is permitted along a site frontage provided 100 feet is provided between access points. The site plan has been designed to meet these standards and as such, no access management measures are needed.

Note that the proposed north access location was chosen to align with an existing access to the west. At some point in the future, a new east-west public street is expected to be constructed along the north side of the proposed development site by ODOT to facilitate extension of the Newberg-Dundee Bypass. At that time, the north site access is expected to be closed and relocated to interface with the new east-west roadway at a location at least 150 feet east of Providence Drive. The site parking lot has been designed to accommodate this potential future access change.

RECOMMENDATIONS

Based on the analysis herein, the following recommendations are associated with the proposed campus expansion:

- Providence should locate and maintain all future landscaping, above-ground utilities, and site signage to ensure minimum required sight lines are provided at the site accesses, at all internal site intersections, and at any future mid-block pedestrian crossing of Providence Drive between the two buildings.
- Providence should work with the City and ODOT to determine, if and, when to construct an eastbound right-turn deceleration lane at the existing PNMC Oregon 99W right-in, left-in access, especially in consideration of any planned construction of the next phase of the Newberg-Dundee Bypass and its effect on Oregon 99W traffic volumes.

Please contact us at (503) 228-5230 if you have any questions regarding this study or the findings and recommendations presented.

REFERENCES

1. Transportation Research Board. *2000 Highway Capacity Manual.* 2000.
2. Newberg Transportation System Plan Update. 2016.
3. Oregon Department of Transportation. *Analysis Procedures Manual Version 2.* 2016.

APPENDICES

A. Traffic Counts

B. Existing Traffic Conditions Worksheets

C. ODOT Crash Data

D. Year 2019 Background Traffic Conditions Worksheets

E. Year 2019 Total Traffic Conditions Worksheets

F. Warrant Analysis Worksheets

G. Pedestrian Crossing Worksheets

Appendix A Traffic Counts

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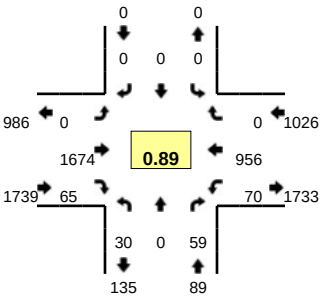
Type of peak hour being reported: User-Defined

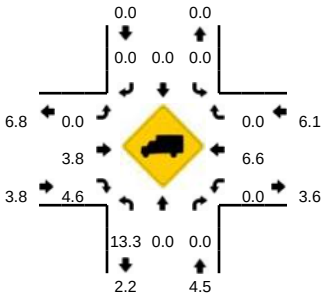
Method for determining peak hour: Total Entering Volume

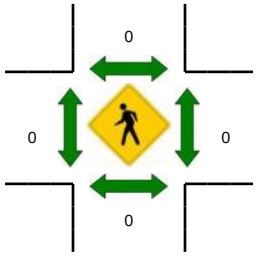
LOCATION: Providence Dr -- N Hwy 99W
CITY/STATE: Newberg, OR

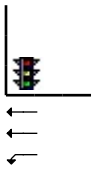
QC JOB #: 14609601
DATE: Tue, Feb 06 2018

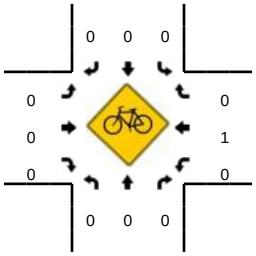
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

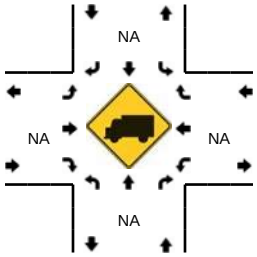


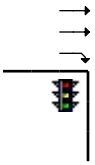


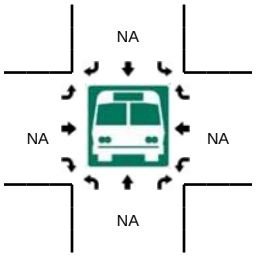












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				N Hwy 99W (Eastbound)				N Hwy 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	3	0	0	0	0	0	0	133	8	0	8	77	0	0	229	
7:05 AM	1	0	3	0	0	0	0	0	0	180	6	0	4	73	0	0	267	
7:10 AM	3	0	5	0	0	0	0	0	0	133	2	0	5	73	0	0	221	
7:15 AM	3	0	4	0	0	0	0	0	0	160	6	0	10	57	0	0	240	
7:20 AM	1	0	3	0	0	0	0	0	0	175	3	0	3	81	0	0	266	
7:25 AM	3	0	7	0	0	0	0	0	0	170	8	0	5	104	0	0	297	
7:30 AM	3	0	8	0	0	0	0	0	0	118	1	0	2	76	0	0	208	
7:35 AM	4	0	2	0	0	0	0	0	0	154	3	0	5	68	0	0	236	
7:40 AM	5	0	6	0	0	0	0	0	0	120	8	0	4	75	0	0	218	
7:45 AM	2	0	7	0	0	0	0	0	0	117	9	0	9	80	0	0	224	
7:50 AM	2	0	7	0	0	0	0	0	0	92	6	0	7	97	0	0	211	
7:55 AM	3	0	4	0	0	0	0	0	0	122	5	0	8	95	0	0	237	2854
8:00 AM	3	0	8	0	0	0	0	0	0	104	5	0	7	75	0	0	202	2827
8:05 AM	6	0	5	0	0	0	0	0	0	87	6	0	8	90	0	0	202	2762
8:10 AM	4	0	5	0	0	0	0	0	0	118	1	0	7	77	0	0	212	2753
8:15 AM	1	0	9	0	0	0	0	0	0	123	6	0	5	70	0	0	214	2727
8:20 AM	5	0	6	0	0	0	0	0	0	112	3	0	6	97	0	0	229	2690
8:25 AM	7	0	2	0	0	0	0	0	0	95	1	0	5	80	0	0	190	2583
8:30 AM	3	0	1	0	0	0	0	0	0	96	4	0	2	77	0	0	183	2558
8:35 AM	6	0	3	0	0	0	0	0	0	90	4	0	1	82	0	0	186	2508
8:40 AM	5	0	2	0	0	0	0	0	0	116	5	0	9	68	0	0	205	2495
8:45 AM	4	0	4	0	0	0	0	0	0	87	5	0	6	85	0	0	191	2462
8:50 AM	6	0	4	0	0	0	0	0	0	110	3	0	8	91	0	0	222	2473
8:55 AM	8	0	8	0	0	0	0	0	0	69	1	0	1	56	0	0	143	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	28	0	56	0	0	0	0	0	0	2020	68	0	72	968	0	0	3212
Heavy Trucks	8	0	0		0	0	0		0	80	4		0	52	0		144
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 3/22/2018 10:35 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: PNMC West Dwy -- N Hwy 99W
CITY/STATE: Newberg, OR

QC JOB #: 14609603
DATE: Tue, Feb 06 2018

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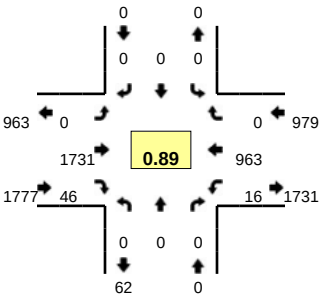
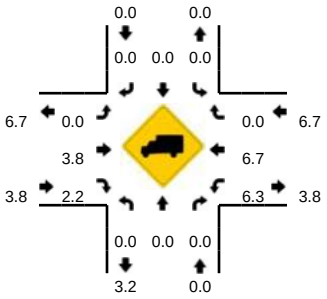
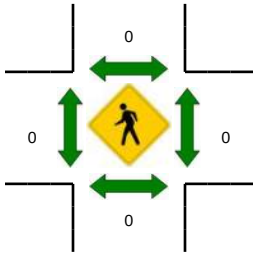
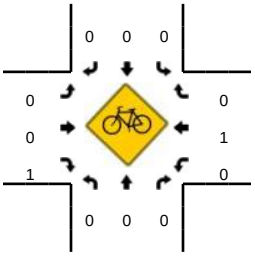
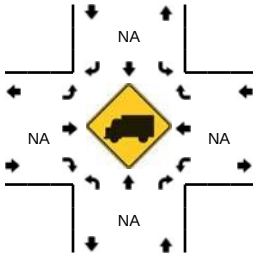
Peak 15-Min: 7:15 AM -- 7:30 AM

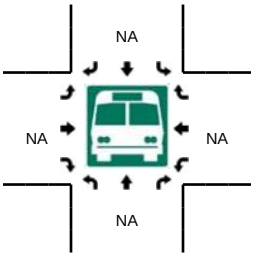












5-Min Count Period Beginning At	PNMC West Dwy (Northbound)				PNMC West Dwy (Southbound)				N Hwy 99W (Eastbound)				N Hwy 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	144	2	0	4	72	0	0	222	
7:05 AM	0	0	0	0	0	0	0	0	0	188	1	0	1	74	0	0	264	
7:10 AM	0	0	0	0	0	0	0	0	0	134	1	0	1	73	0	0	209	
7:15 AM	0	0	0	0	0	0	0	0	0	173	5	0	0	62	0	0	240	
7:20 AM	0	0	0	0	0	0	0	0	0	160	5	0	1	76	0	0	242	
7:25 AM	0	0	0	0	0	0	0	0	0	174	7	0	0	109	0	0	290	
7:30 AM	0	0	0	0	0	0	0	0	0	121	3	0	2	76	0	0	202	
7:35 AM	0	0	0	0	0	0	0	0	0	161	5	0	1	75	0	0	242	
7:40 AM	0	0	0	0	0	0	0	0	0	127	2	0	1	77	0	0	207	
7:45 AM	0	0	0	0	0	0	0	0	0	125	5	0	2	78	0	0	210	
7:50 AM	0	0	0	0	0	0	0	0	0	98	6	0	3	95	0	0	202	
7:55 AM	0	0	0	0	0	0	0	0	0	126	4	0	0	96	0	0	226	2756
8:00 AM	0	0	0	0	0	0	0	0	0	108	9	0	2	72	0	0	191	2725
8:05 AM	0	0	0	0	0	0	0	0	0	93	2	0	2	95	0	0	192	2653
8:10 AM	0	0	0	0	0	0	0	0	0	122	8	0	0	74	0	0	204	2648
8:15 AM	0	0	0	0	0	0	0	0	0	127	3	0	2	71	0	0	203	2611
8:20 AM	0	0	0	0	0	0	0	0	0	113	2	0	3	98	0	0	216	2585
8:25 AM	0	0	0	0	0	0	0	0	0	94	2	0	1	81	0	0	178	2473
8:30 AM	0	0	0	0	0	0	0	0	0	101	4	0	0	81	0	0	186	2457
8:35 AM	0	0	0	0	0	0	0	0	0	94	5	0	1	91	0	0	191	2406
8:40 AM	0	0	0	0	0	0	0	0	0	121	6	0	0	77	0	0	204	2403
8:45 AM	0	0	0	0	0	0	0	0	0	89	5	0	0	89	0	0	183	2376
8:50 AM	0	0	0	0	0	0	0	0	0	112	5	0	0	98	0	0	215	2389
8:55 AM	0	0	0	0	0	0	0	0	0	75	6	0	3	55	0	0	139	2302

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	0	0	0	0	0	2028	68	0	4	988	0	0	3088
Heavy Trucks	0	0	0		0	0	0		0	84	0		0	60	0		144
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	1		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 3/22/2018 10:35 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Providence Dr -- PNMC North Dwy

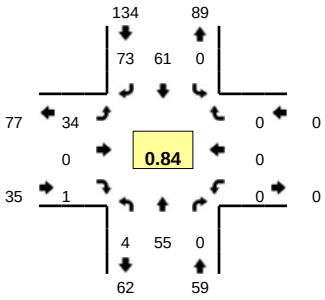
CITY/STATE: Newberg, OR

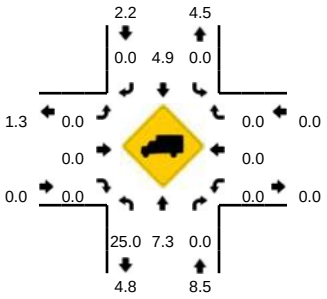
QC JOB #: 14609605

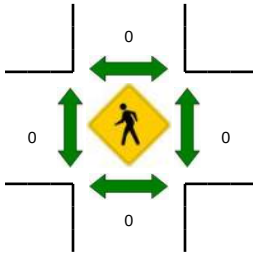
DATE: Tue, Feb 06 2018

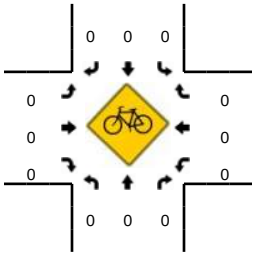
Peak-Hour: 7:00 AM -- 8:00 AM

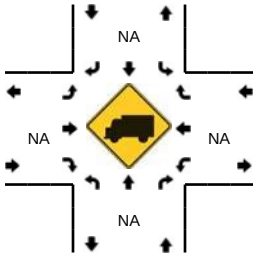
Peak 15-Min: 7:40 AM -- 7:55 AM

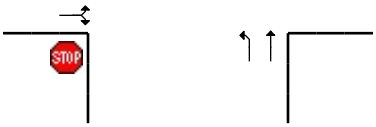


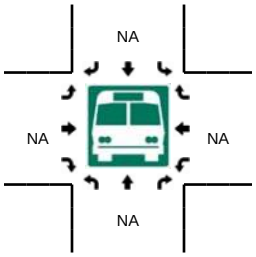












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				PNMC North Dwy (Eastbound)				PNMC North Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	3	0	0	0	8	8	0	0	0	0	0	0	0	0	0	19	
7:05 AM	0	3	0	0	0	7	3	0	1	0	0	0	0	0	0	0	14	
7:10 AM	0	3	0	0	0	4	3	0	6	0	0	0	0	0	0	0	16	
7:15 AM	1	6	0	0	0	7	9	0	0	0	0	0	0	0	0	0	23	
7:20 AM	0	4	0	0	0	3	3	0	1	0	1	0	0	0	0	0	12	
7:25 AM	0	8	0	0	0	7	6	0	3	0	0	0	0	0	0	0	24	
7:30 AM	1	5	0	0	0	2	1	0	4	0	0	0	0	0	0	0	13	
7:35 AM	0	4	0	0	0	2	6	0	6	0	0	0	0	0	0	0	18	
7:40 AM	1	5	0	0	0	3	9	0	3	0	0	0	0	0	0	0	21	
7:45 AM	0	6	0	0	0	5	13	0	4	0	0	0	0	0	0	0	28	
7:50 AM	0	6	0	0	0	8	4	0	1	0	0	0	0	0	0	0	19	
7:55 AM	1	2	0	0	0	5	8	0	5	0	0	0	0	0	0	0	21	228
8:00 AM	1	9	0	0	0	5	7	0	2	0	0	0	0	0	0	0	24	233
8:05 AM	0	5	0	0	0	6	8	0	4	0	1	0	0	0	0	0	24	243
8:10 AM	0	7	0	0	0	4	3	0	4	0	1	0	0	0	0	0	19	246
8:15 AM	1	6	0	0	0	5	4	0	1	0	0	0	0	0	0	0	17	240
8:20 AM	1	7	0	0	0	7	6	0	4	0	1	0	0	0	0	0	26	254
8:25 AM	0	4	0	0	0	3	3	0	5	0	1	0	0	0	0	0	16	246
8:30 AM	0	4	0	0	0	3	3	0	1	0	0	0	0	0	0	0	11	244
8:35 AM	1	4	0	0	0	3	2	0	5	0	0	0	0	0	0	0	15	241
8:40 AM	0	5	0	0	0	8	5	0	3	0	0	0	0	0	0	0	21	241
8:45 AM	3	6	0	0	0	2	10	0	2	0	1	0	0	0	0	0	24	237
8:50 AM	1	6	0	0	0	5	6	0	3	0	0	0	0	0	0	0	21	239
8:55 AM	2	11	0	0	0	0	2	0	7	0	0	0	0	0	0	0	22	240

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	68	0	0	0	64	104	0	32	0	0	0	0	0	0	0	272
Heavy Trucks	0	4	0		0	8	0		0	0	0		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 3/22/2018 10:35 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

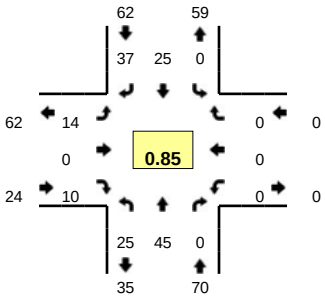
LOCATION: Providence Dr -- PNMC North-Central Dwy

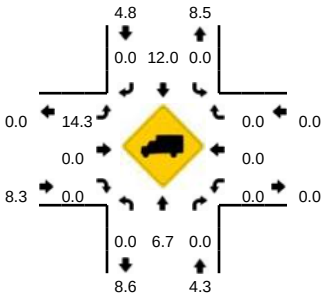
CITY/STATE: Newberg, OR

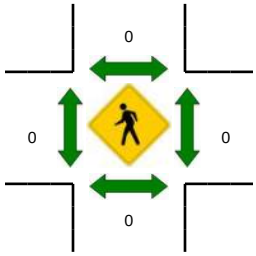
QC JOB #: 14609607

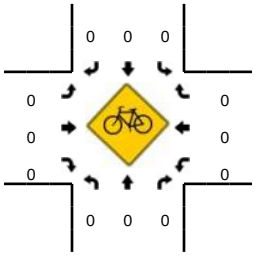
DATE: Tue, Feb 06 2018

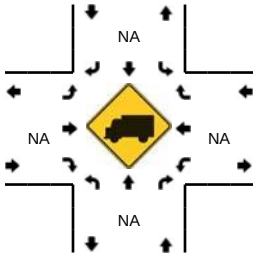
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

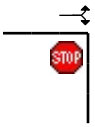


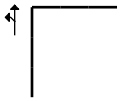


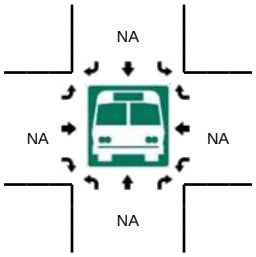












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				PNMC North-Central Dwy (Eastbound)				PNMC North-Central Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	3	0	0	0	2	5	0	0	0	0	0	0	0	0	0	10	
7:05 AM	4	2	0	0	0	1	6	0	1	0	0	0	0	0	0	0	14	
7:10 AM	0	3	0	0	0	3	2	0	1	0	1	0	0	0	0	0	10	
7:15 AM	1	4	0	0	0	4	3	0	2	0	0	0	0	0	0	0	14	
7:20 AM	3	2	0	0	0	1	2	0	2	0	0	0	0	0	0	0	10	
7:25 AM	4	5	0	0	0	3	4	0	3	0	1	0	0	0	0	0	20	
7:30 AM	2	6	0	0	0	2	1	0	0	0	3	0	0	0	0	0	14	
7:35 AM	2	2	0	0	0	0	2	0	3	0	3	0	0	0	0	0	12	
7:40 AM	1	5	0	0	0	2	1	0	0	0	0	0	0	0	0	0	9	
7:45 AM	4	5	0	0	0	0	5	0	1	0	1	0	0	0	0	0	16	
7:50 AM	4	5	0	0	0	4	4	0	1	0	1	0	0	0	0	0	19	
7:55 AM	0	3	0	0	0	3	2	0	0	0	0	0	0	0	0	0	8	156
8:00 AM	2	6	0	0	0	3	2	0	5	0	2	0	0	0	0	0	20	166
8:05 AM	0	2	0	0	0	4	3	0	2	0	0	0	0	0	0	0	11	163
8:10 AM	1	6	0	0	0	4	1	0	1	0	4	0	0	0	0	0	17	170
8:15 AM	1	5	0	0	0	5	0	0	3	0	0	0	0	0	0	0	14	170
8:20 AM	1	5	0	0	0	4	2	0	2	0	1	0	0	0	0	0	15	175
8:25 AM	0	1	0	0	0	5	1	0	3	0	1	0	0	0	0	0	11	166
8:30 AM	1	2	0	0	0	3	0	0	2	0	0	0	0	0	0	0	8	160
8:35 AM	1	4	0	0	0	2	1	0	1	0	3	0	0	0	0	0	12	160
8:40 AM	2	2	0	0	0	6	2	0	4	0	0	0	0	0	0	0	16	167
8:45 AM	3	7	0	0	0	2	1	0	1	0	1	0	0	0	0	0	15	166
8:50 AM	0	4	0	0	0	4	1	0	3	0	0	0	0	0	0	0	12	159
8:55 AM	0	10	0	0	0	0	0	0	4	0	1	0	0	0	0	0	15	166

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	32	52	0	0	0	20	28	0	24	0	28	0	0	0	0	0	184
Heavy Trucks	0	0	0		0	4	0		4	0	0		0	0	0		8
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 3/22/2018 10:35 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Providence Dr -- PNMC South-Central Dwy

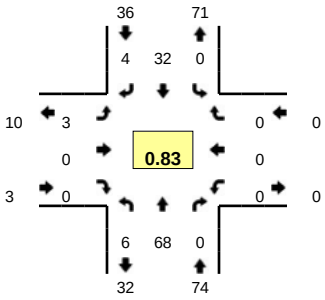
CITY/STATE: Newberg, OR

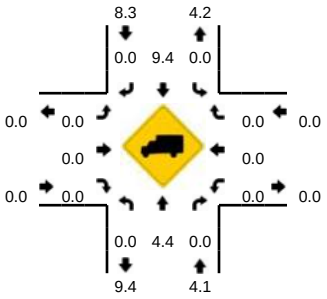
QC JOB #: 14609609

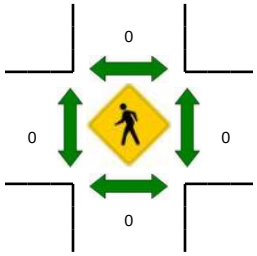
DATE: Tue, Feb 06 2018

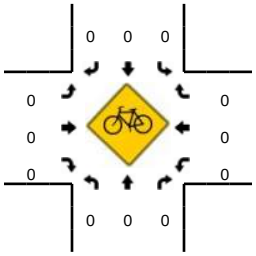
Peak-Hour: 7:00 AM -- 8:00 AM

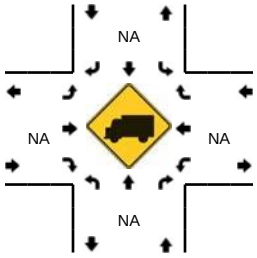
Peak 15-Min: 7:40 AM -- 7:55 AM

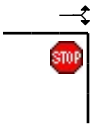


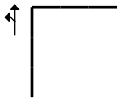


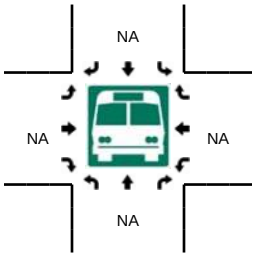












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				PNMC South-Central Dwy (Eastbound)				PNMC South-Central Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	3	0	0	0	1	2	0	0	0	0	0	0	0	0	0	6	
7:05 AM	0	7	0	0	0	1	0	0	0	0	0	0	0	0	0	0	8	
7:10 AM	2	2	0	0	0	3	1	0	1	0	0	0	0	0	0	0	9	
7:15 AM	0	5	0	0	0	3	1	0	0	0	0	0	0	0	0	0	9	
7:20 AM	0	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	7	
7:25 AM	0	8	0	0	0	4	0	0	0	0	0	0	0	0	0	0	12	
7:30 AM	0	8	0	0	0	5	0	0	0	0	0	0	0	0	0	0	13	
7:35 AM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	8	
7:40 AM	0	7	0	0	0	2	0	0	0	0	0	0	0	0	0	0	9	
7:45 AM	0	8	0	0	0	1	0	0	0	0	0	0	0	0	0	0	9	
7:50 AM	3	8	0	0	0	4	0	0	1	0	0	0	0	0	0	0	16	
7:55 AM	1	2	0	0	0	3	0	0	1	0	0	0	0	0	0	0	7	113
8:00 AM	0	8	0	0	0	5	0	0	0	0	0	0	0	0	0	0	13	120
8:05 AM	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	0	6	118
8:10 AM	1	6	0	0	0	7	1	0	1	0	0	0	0	0	0	0	16	125
8:15 AM	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0	0	11	127
8:20 AM	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0	0	11	131
8:25 AM	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7	126
8:30 AM	1	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	6	119
8:35 AM	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	10	121
8:40 AM	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0	0	10	122
8:45 AM	0	8	0	0	0	3	0	0	2	0	0	0	0	0	0	0	13	126
8:50 AM	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	9	119
8:55 AM	1	8	0	0	0	1	0	0	1	0	0	0	0	0	0	0	11	123

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	92	0	0	0	28	0	0	4	0	0	0	0	0	0	0	136
Heavy Trucks	0	4	0		0	4	0		0	0	0		0	0	0		8
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 3/22/2018 10:35 AM

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

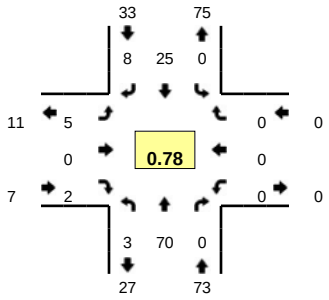
Type of peak hour being reported: User-Defined

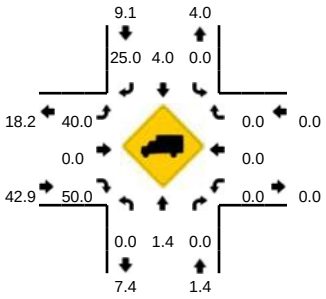
Method for determining peak hour: Total Entering Volume

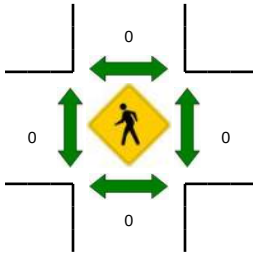
LOCATION: Providence Dr -- PNMC South Dwy
CITY/STATE: Newberg, OR

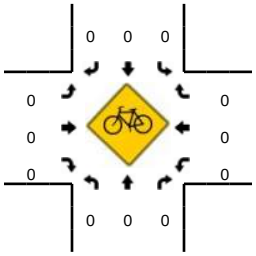
QC JOB #: 14609611
DATE: Tue, Feb 06 2018

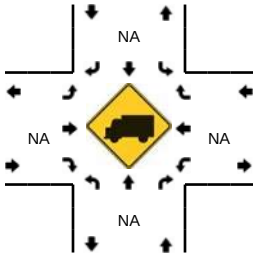
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

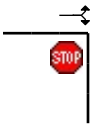


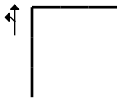


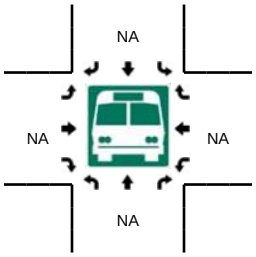












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				PNMC South Dwy (Eastbound)				PNMC South Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	
7:05 AM	0	7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	8	
7:10 AM	1	4	0	0	0	2	0	0	1	0	0	0	0	0	0	0	8	
7:15 AM	0	4	0	0	0	2	2	0	0	0	0	0	0	0	0	0	8	
7:20 AM	0	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	7	
7:25 AM	0	8	0	0	0	2	2	0	0	0	0	0	0	0	0	0	12	
7:30 AM	2	8	0	0	0	4	1	0	0	0	0	0	0	0	0	0	15	
7:35 AM	0	3	0	0	0	3	0	0	1	0	1	0	0	0	0	0	8	
7:40 AM	0	6	0	0	0	1	1	0	1	0	1	0	0	0	0	0	10	
7:45 AM	0	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	11	
7:50 AM	0	9	0	0	0	4	1	0	1	0	0	0	0	0	0	0	15	
7:55 AM	0	2	0	0	0	4	0	0	1	0	0	0	0	0	0	0	7	113
8:00 AM	0	6	0	0	0	4	1	0	2	0	0	0	0	0	0	0	13	122
8:05 AM	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	5	119
8:10 AM	0	7	0	0	0	7	1	0	0	0	0	0	0	0	0	0	15	126
8:15 AM	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0	0	11	129
8:20 AM	0	6	0	0	0	3	2	0	0	0	0	0	0	0	0	0	11	133
8:25 AM	0	1	0	0	0	4	1	0	0	0	0	0	0	0	0	0	6	127
8:30 AM	0	2	0	0	0	3	0	0	1	0	0	0	0	0	0	0	6	118
8:35 AM	0	4	0	0	0	4	0	0	1	0	0	0	0	0	0	0	9	119
8:40 AM	0	3	0	0	0	6	1	0	0	0	0	0	0	0	0	0	10	119
8:45 AM	0	7	0	0	0	3	0	0	1	0	2	0	0	0	0	0	13	121
8:50 AM	0	6	0	0	0	3	0	0	0	0	0	0	0	0	0	0	9	115
8:55 AM	0	8	0	0	0	1	0	0	0	0	0	0	0	0	0	0	9	117

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	100	0	0	0	24	8	0	8	0	4	0	0	0	0	0	144
Heavy Trucks	0	0	0		0	4	4		4	0	4		0	0	0		16
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 3/22/2018 10:35 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

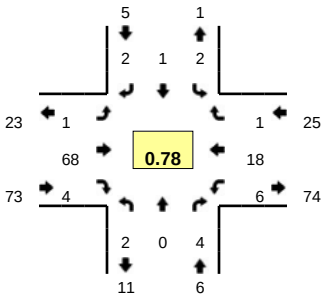
LOCATION: Werth Blvd -- Providence Dr/Hayes St

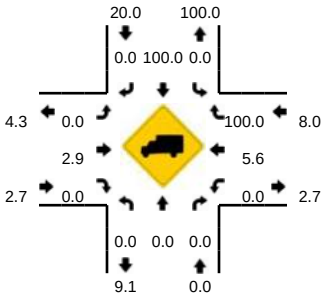
QC JOB #: 14609613

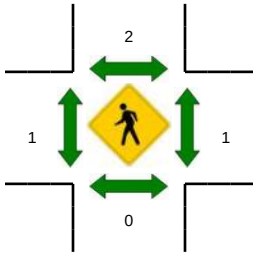
CITY/STATE: Newberg, OR

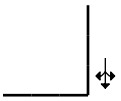
DATE: Tue, Feb 06 2018

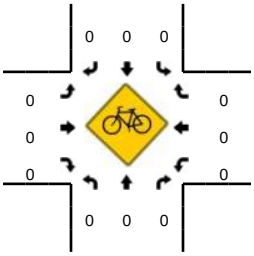
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:20 AM -- 7:35 AM

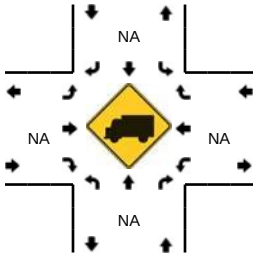


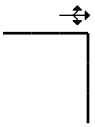


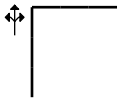


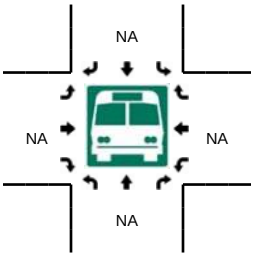












5-Min Count Period Beginning At	Werth Blvd (Northbound)				Werth Blvd (Southbound)				Providence Dr/Hayes St (Eastbound)				Providence Dr/Hayes St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5	
7:05 AM	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	6	
7:10 AM	0	0	1	0	0	0	0	0	0	4	0	0	0	2	0	0	7	
7:15 AM	1	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	7	
7:20 AM	1	0	0	0	1	0	0	0	0	5	0	0	0	2	0	0	9	
7:25 AM	0	0	0	0	0	0	1	0	0	7	0	0	1	2	0	0	11	
7:30 AM	0	0	0	0	0	0	0	0	0	11	0	0	1	3	0	0	15	
7:35 AM	0	0	0	0	0	0	0	0	0	4	0	1	0	3	0	0	8	
7:40 AM	0	0	1	0	0	0	0	0	0	3	0	0	0	2	1	0	7	
7:45 AM	0	0	2	0	1	0	0	0	0	8	0	0	0	0	0	0	11	
7:50 AM	0	0	0	0	0	1	1	0	0	9	1	0	1	3	0	0	16	
7:55 AM	0	0	0	0	0	0	0	0	0	2	1	0	3	1	0	0	7	109
8:00 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	8	112
8:05 AM	0	0	0	0	0	0	0	0	0	3	0	0	1	4	0	0	8	114
8:10 AM	0	0	2	0	0	0	0	0	0	5	1	0	2	3	0	1	14	121
8:15 AM	0	0	0	0	0	0	0	0	1	4	0	0	3	3	0	0	11	125
8:20 AM	1	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	9	125
8:25 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	4	1	0	7	121
8:30 AM	0	0	0	0	0	0	1	0	0	4	2	0	1	2	0	0	10	116
8:35 AM	0	0	0	0	0	0	0	0	1	2	2	0	1	2	0	0	8	116
8:40 AM	0	0	0	0	0	0	1	0	0	3	1	0	2	3	0	0	10	119
8:45 AM	0	0	0	0	0	0	2	0	1	7	0	0	4	3	0	0	17	125
8:50 AM	0	0	1	0	1	0	0	0	0	6	1	1	1	1	0	0	12	121
8:55 AM	0	0	1	0	1	0	0	0	0	5	0	0	1	2	0	0	10	124

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	0	0	4	0	4	0	0	92	0	0	8	28	0	0	140
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
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 3/22/2018 10:35 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

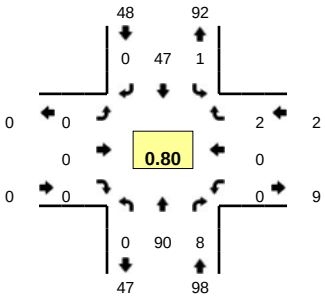
LOCATION: Brutscher St -- Werth Blvd

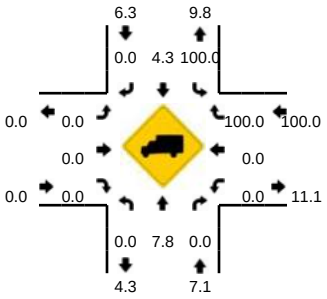
QC JOB #: 14609615

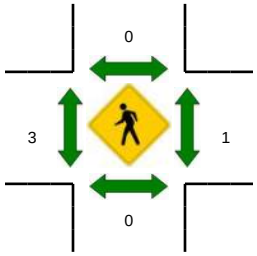
CITY/STATE: Newberg, OR

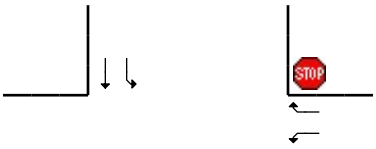
DATE: Tue, Feb 06 2018

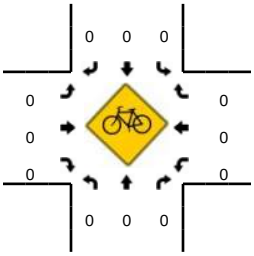
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:10 AM -- 7:25 AM

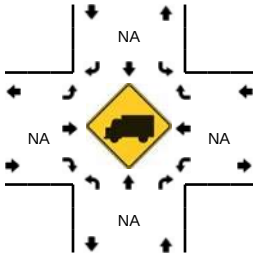


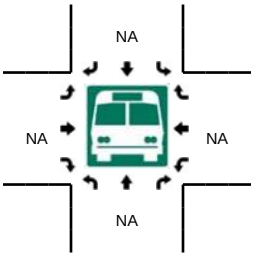












5-Min Count Period Beginning At	Brutscher St (Northbound)				Brutscher St (Southbound)				Werth Blvd (Eastbound)				Werth Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	9	0	0	0	6	0	0	0	0	0	0	0	0	0	0	15	
7:05 AM	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
7:10 AM	0	8	0	0	1	7	0	0	0	0	0	0	0	0	0	0	16	
7:15 AM	0	11	0	0	0	5	0	0	0	0	0	0	0	0	1	0	17	
7:20 AM	0	8	3	0	0	2	0	0	0	0	0	0	0	0	0	0	13	
7:25 AM	0	10	0	0	0	2	0	0	0	0	0	0	0	0	0	0	12	
7:30 AM	0	9	0	0	0	4	0	0	0	0	0	0	0	0	0	0	13	
7:35 AM	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	9	
7:40 AM	0	4	1	0	0	6	0	0	0	0	0	0	0	0	0	0	11	
7:45 AM	0	7	1	0	0	4	0	0	0	0	0	0	0	0	0	0	12	
7:50 AM	0	8	1	0	0	4	0	0	0	0	0	0	0	0	0	0	13	
7:55 AM	0	5	1	0	0	2	0	0	0	0	0	0	0	0	1	0	9	148
8:00 AM	0	7	1	0	1	5	0	0	0	0	0	0	0	0	0	0	14	147
8:05 AM	0	11	0	0	1	7	0	0	0	0	0	0	0	0	0	0	19	158
8:10 AM	0	5	2	0	2	10	0	0	0	0	0	0	1	0	0	0	20	162
8:15 AM	0	10	1	0	1	5	0	0	0	0	0	0	0	0	1	0	18	163
8:20 AM	0	9	0	0	0	5	0	0	0	0	0	0	1	0	0	0	15	165
8:25 AM	0	10	0	0	0	6	0	0	0	0	0	0	0	0	0	0	16	169
8:30 AM	0	5	0	0	1	8	0	0	0	0	0	0	1	0	0	0	15	171
8:35 AM	0	6	0	0	1	15	0	0	0	0	0	0	0	0	0	0	22	184
8:40 AM	0	5	0	0	1	6	0	0	0	0	0	0	1	0	0	0	13	186
8:45 AM	0	10	2	0	0	5	0	0	0	0	0	0	0	0	1	0	18	192
8:50 AM	0	6	0	0	2	8	0	0	0	0	0	0	1	0	0	0	17	196
8:55 AM	0	4	1	0	1	6	0	0	0	0	0	0	0	0	0	0	12	199

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	108	12	0	4	56	0	0	0	0	0	0	0	0	4	0	184
Heavy Trucks	0	8	0		4	0	0		0	0	0		0	0	4		16
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 3/22/2018 10:35 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

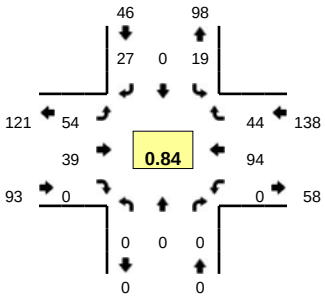
LOCATION: Brutscher St -- E Fernwood Rd

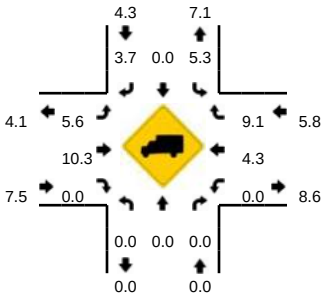
CITY/STATE: Newberg, OR

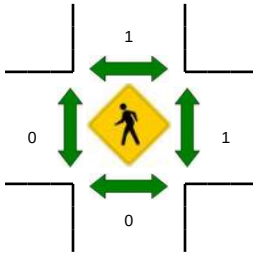
QC JOB #: 14609617

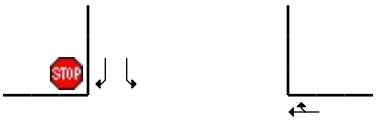
DATE: Tue, Feb 06 2018

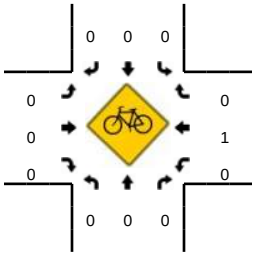
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:10 AM -- 7:25 AM

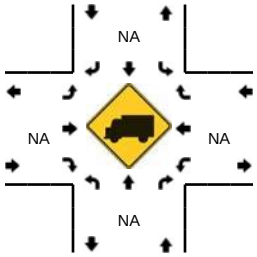


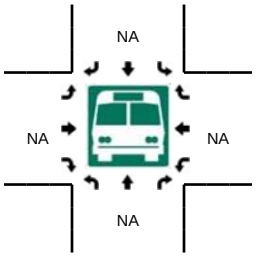












5-Min Count Period Beginning At	Brutscher St (Northbound)				Brutscher St (Southbound)				E Fernwood Rd (Eastbound)				E Fernwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	3	0	3	0	5	0	0	0	0	1	4	0	16	
7:05 AM	0	0	0	0	0	0	0	0	5	4	0	0	0	5	3	0	17	
7:10 AM	0	0	0	0	1	0	5	0	3	2	0	0	0	10	5	0	26	
7:15 AM	0	0	0	0	3	0	3	0	4	0	0	0	0	8	7	0	25	
7:20 AM	0	0	0	0	0	0	2	0	5	5	0	0	0	13	6	0	31	
7:25 AM	0	0	0	0	0	0	2	0	5	3	0	0	0	11	5	0	26	
7:30 AM	0	0	0	0	0	0	4	0	4	4	0	0	0	6	4	0	22	
7:35 AM	0	0	0	0	3	0	2	0	3	8	0	0	0	7	1	0	24	
7:40 AM	0	0	0	0	4	0	2	0	3	5	0	0	0	6	2	0	22	
7:45 AM	0	0	0	0	1	0	2	0	6	3	0	0	0	9	4	0	25	
7:50 AM	0	0	0	0	3	0	2	0	8	3	0	0	0	7	0	0	23	
7:55 AM	0	0	0	0	1	0	0	0	3	2	0	0	0	11	3	0	20	277
8:00 AM	0	0	0	0	3	0	3	0	5	5	0	0	0	3	3	0	22	283
8:05 AM	0	0	0	0	5	0	2	0	4	1	0	0	0	6	7	0	25	291
8:10 AM	0	0	0	0	4	0	7	0	3	5	0	0	0	11	4	0	34	299
8:15 AM	0	0	0	0	2	0	3	0	4	5	0	0	0	7	7	0	28	302
8:20 AM	0	0	0	0	3	0	2	0	4	2	0	0	0	3	5	0	19	290
8:25 AM	0	0	0	0	4	0	2	0	6	4	0	0	0	14	4	0	34	298
8:30 AM	0	0	0	0	8	0	2	0	2	2	0	0	0	2	2	0	18	294
8:35 AM	0	0	0	0	8	0	7	0	3	1	0	0	0	3	3	0	25	295
8:40 AM	0	0	0	0	3	0	3	0	1	4	0	0	0	6	4	0	21	294
8:45 AM	0	0	0	0	2	0	4	0	9	5	0	0	0	6	4	0	30	299
8:50 AM	0	0	0	0	6	0	3	0	3	3	0	0	0	4	3	0	22	298
8:55 AM	0	0	0	0	1	0	4	0	1	1	0	0	0	3	4	0	14	292

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	16	0	40	0	48	28	0	0	0	124	72	0	328
Heavy Trucks	0	0	0		0	0	0		4	4	0		0	4	4		16
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 3/22/2018 10:35 AM

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

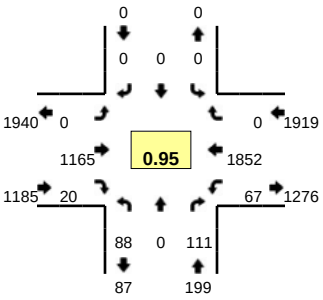
Type of peak hour being reported: User-Defined

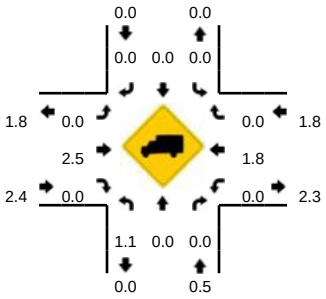
Method for determining peak hour: Total Entering Volume

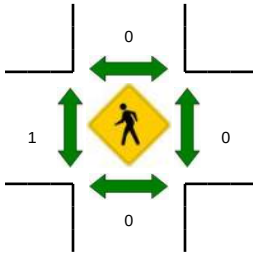
LOCATION: Providence Dr -- N Hwy 99W
CITY/STATE: Newberg, OR

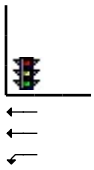
QC JOB #: 14609602
DATE: Tue, Feb 06 2018

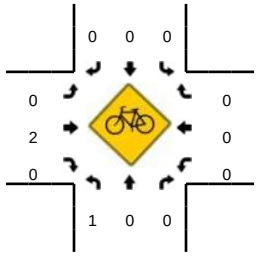
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

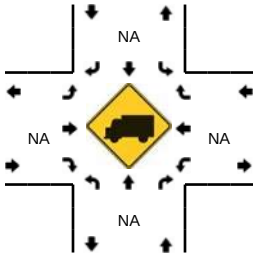


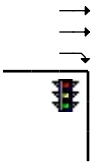


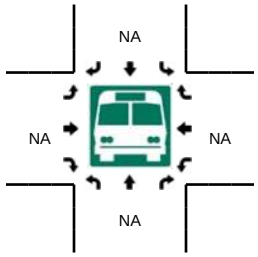












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				N Hwy 99W (Eastbound)				N Hwy 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	0	7	0	0	0	0	0	0	79	1	0	5	167	0	0	264	
4:05 PM	7	0	9	0	0	0	0	0	0	97	2	0	3	148	0	0	266	
4:10 PM	7	0	8	0	0	0	0	0	0	86	0	0	10	148	0	0	259	
4:15 PM	9	0	7	0	0	0	0	0	0	88	3	0	8	150	0	0	265	
4:20 PM	12	0	5	0	0	0	0	0	0	110	4	0	3	155	0	0	289	
4:25 PM	8	0	8	0	0	0	0	0	0	86	2	0	7	153	0	0	264	
4:30 PM	5	0	8	0	0	0	0	0	0	99	4	0	7	137	0	0	260	
4:35 PM	16	0	11	0	0	0	0	0	0	82	2	0	5	135	0	0	251	
4:40 PM	7	0	6	0	0	0	0	0	0	92	3	0	3	169	0	0	280	
4:45 PM	9	0	7	0	0	0	0	0	0	83	1	0	7	151	0	0	258	
4:50 PM	6	0	8	0	0	0	0	0	0	89	2	0	7	150	0	0	262	
4:55 PM	6	0	6	0	0	0	0	0	0	94	3	0	6	158	0	0	273	3191
5:00 PM	7	0	11	0	0	0	0	0	0	117	1	0	9	152	0	0	297	3224
5:05 PM	7	0	11	0	0	0	0	0	0	107	2	0	8	163	0	0	298	3256
5:10 PM	13	0	17	0	0	0	0	0	0	82	0	0	5	160	0	0	277	3274
5:15 PM	8	0	12	0	0	0	0	0	0	113	1	0	8	145	0	0	287	3296
5:20 PM	4	0	10	0	0	0	0	0	0	88	3	0	7	148	0	0	260	3267
5:25 PM	10	0	7	0	0	0	0	0	0	94	1	0	1	134	0	0	247	3250
5:30 PM	5	0	8	0	0	0	0	0	0	94	1	0	4	166	0	0	278	3268
5:35 PM	6	0	8	0	0	0	0	0	0	112	2	0	2	156	0	0	286	3303
5:40 PM	3	0	4	0	0	0	0	0	0	108	2	0	5	145	0	0	267	3290
5:45 PM	1	0	10	0	0	0	0	0	0	82	2	0	0	129	0	0	224	3256
5:50 PM	4	0	9	0	0	0	0	0	0	107	3	0	8	156	0	0	287	3281
5:55 PM	3	0	9	0	0	0	0	0	0	72	2	0	5	129	0	0	220	3228

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	108	0	156	0	0	0	0	0	0	1224	12	0	88	1900	0	0	3488
Heavy Trucks	0	0	0		0	0	0		0	32	0		0	16	0		48
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 3/22/2018 10:36 AM

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

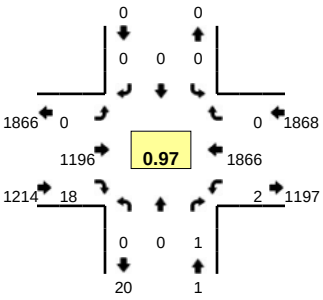
Type of peak hour being reported: User-Defined

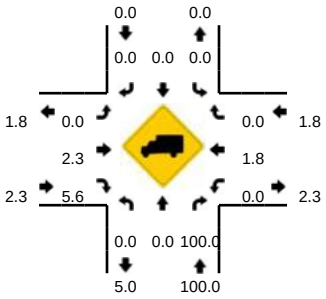
Method for determining peak hour: Total Entering Volume

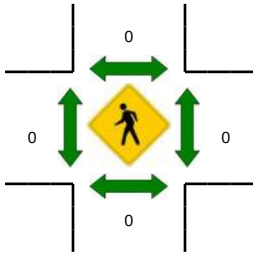
LOCATION: PNMC West Dwy -- N Hwy 99W
CITY/STATE: Newberg, OR

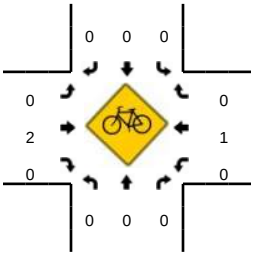
QC JOB #: 14609604
DATE: Tue, Feb 06 2018

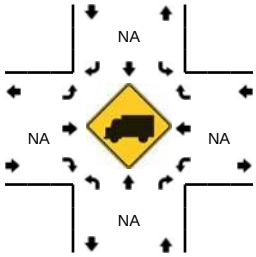
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:50 PM -- 5:05 PM

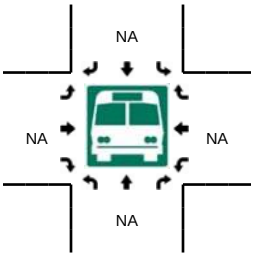












5-Min Count Period Beginning At	PNMC West Dwy (Northbound)				PNMC West Dwy (Southbound)				N Hwy 99W (Eastbound)				N Hwy 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	80	0	0	1	148	0	0	229	
4:05 PM	0	0	0	0	0	0	0	0	0	97	3	0	0	163	0	0	263	
4:10 PM	0	0	0	0	0	0	0	0	0	86	1	0	0	153	0	0	240	
4:15 PM	0	0	0	0	0	0	0	0	0	91	1	0	0	148	0	0	240	
4:20 PM	0	0	0	0	0	0	0	0	0	115	3	0	0	163	0	0	281	
4:25 PM	0	0	0	0	0	0	0	0	0	88	3	0	0	156	0	0	247	
4:30 PM	0	0	0	0	0	0	0	0	0	102	1	0	0	145	0	0	248	
4:35 PM	0	0	0	0	0	0	0	0	0	84	3	0	0	142	0	0	229	
4:40 PM	0	0	0	0	0	0	0	0	0	95	1	0	2	166	0	0	264	
4:45 PM	0	0	0	0	0	0	0	0	0	83	2	0	0	156	0	0	241	
4:50 PM	0	0	0	0	0	0	0	0	0	91	2	0	0	155	0	0	248	
4:55 PM	0	0	0	0	0	0	0	0	0	100	3	0	0	160	0	0	263	2993
5:00 PM	0	0	0	0	0	0	0	0	0	122	3	0	0	156	0	0	281	3045
5:05 PM	0	0	0	0	0	0	0	0	0	81	1	0	0	147	0	0	229	3011
5:10 PM	0	0	0	0	0	0	0	0	0	115	0	0	0	167	0	0	282	3053
5:15 PM	0	0	0	0	0	0	0	0	0	95	1	0	0	151	0	0	247	3060
5:20 PM	0	0	0	0	0	0	0	0	0	96	2	0	0	140	0	0	238	3017
5:25 PM	0	0	0	0	0	0	0	0	0	94	3	0	0	144	0	0	241	3011
5:30 PM	0	0	1	0	0	0	0	0	0	109	0	0	0	169	0	0	279	3042
5:35 PM	0	0	0	0	0	0	0	0	0	115	0	0	0	155	0	0	270	3083
5:40 PM	0	0	0	0	0	0	0	0	0	96	0	0	0	140	0	0	236	3055
5:45 PM	0	0	0	0	0	0	0	0	0	99	0	0	0	133	0	0	232	3046
5:50 PM	0	0	0	0	0	0	0	0	0	98	3	0	0	150	0	0	251	3049
5:55 PM	0	0	0	0	0	0	0	0	0	72	2	0	0	135	0	0	209	2995

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	0	0	0	0	0	1252	32	0	0	1884	0	0	3168
Heavy Trucks	0	0	0		0	0	0		0	20	4		0	24	0		48
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 3/22/2018 10:36 AM

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

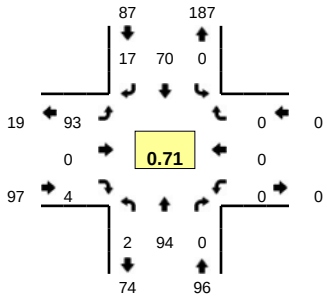
Type of peak hour being reported: User-Defined

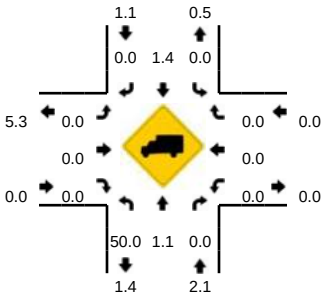
Method for determining peak hour: Total Entering Volume

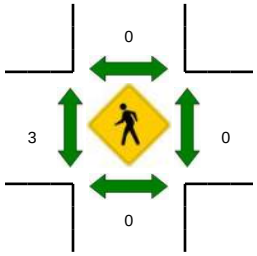
LOCATION: Providence Dr -- PNMC North Dwy
CITY/STATE: Newberg, OR

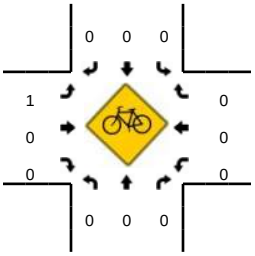
QC JOB #: 14609606
DATE: Tue, Feb 06 2018

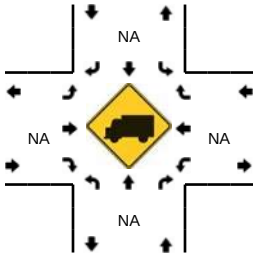
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

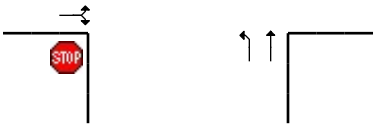


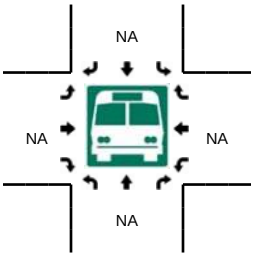












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				PNMC North Dwy (Eastbound)				PNMC North Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	7	0	0	0	5	0	0	6	0	0	0	0	0	0	0	18	
4:05 PM	0	7	0	0	0	4	1	0	8	0	0	0	0	0	0	0	20	
4:10 PM	0	6	0	0	0	5	2	0	9	0	0	0	0	0	0	0	22	
4:15 PM	2	10	0	0	0	8	5	0	5	0	0	0	0	0	0	0	30	
4:20 PM	1	10	0	0	0	3	5	0	7	0	1	0	0	0	0	0	27	
4:25 PM	0	5	0	0	0	6	3	0	12	0	0	0	0	0	0	0	26	
4:30 PM	0	5	0	0	0	4	7	0	13	0	1	0	0	0	0	0	30	
4:35 PM	0	15	0	0	0	5	2	0	9	0	4	0	0	0	0	0	35	
4:40 PM	0	6	0	0	0	1	5	0	7	0	0	0	0	0	0	0	19	
4:45 PM	0	6	0	0	0	7	1	0	5	0	0	0	0	0	0	0	19	
4:50 PM	1	7	0	0	0	7	2	0	8	0	1	0	0	0	0	0	26	
4:55 PM	0	3	0	0	0	8	1	0	8	0	0	0	0	0	0	0	20	292
5:00 PM	0	8	0	0	0	8	2	0	14	0	0	0	0	0	0	0	32	306
5:05 PM	0	18	0	0	0	8	1	0	17	0	1	0	0	0	0	0	45	331
5:10 PM	0	6	0	0	0	6	0	0	7	0	2	0	0	0	0	0	21	330
5:15 PM	0	7	0	0	0	11	0	0	10	0	0	0	0	0	0	0	28	328
5:20 PM	1	10	0	0	0	6	0	0	3	0	0	0	0	0	0	0	20	321
5:25 PM	0	9	0	0	0	3	1	0	3	0	0	0	0	0	0	0	16	311
5:30 PM	0	8	0	0	0	4	2	0	7	0	0	0	0	0	0	0	21	302
5:35 PM	0	6	0	0	0	1	2	0	4	0	0	0	0	0	0	0	13	280
5:40 PM	1	5	0	0	0	3	5	0	6	0	2	0	0	0	0	0	22	283
5:45 PM	0	9	0	0	0	3	0	0	4	0	0	0	0	0	0	0	16	280
5:50 PM	0	9	0	0	0	5	5	0	6	0	0	0	0	0	0	0	25	279
5:55 PM	0	9	0	0	0	3	2	0	3	0	0	0	0	0	0	0	17	276

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	128	0	0	0	88	12	0	152	0	12	0	0	0	0	0	392
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				8				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 3/22/2018 10:36 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Providence Dr -- PNMC North-Central Dwy

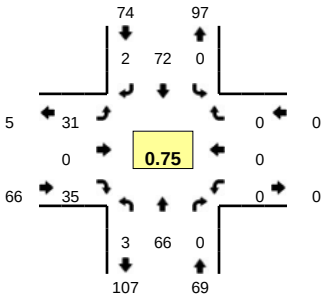
CITY/STATE: Newberg, OR

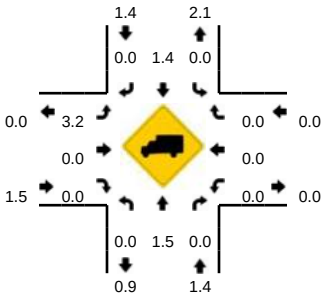
QC JOB #: 14609608

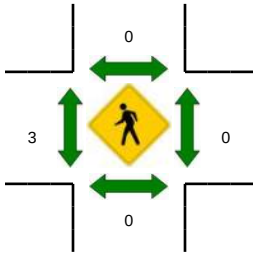
DATE: Tue, Feb 06 2018

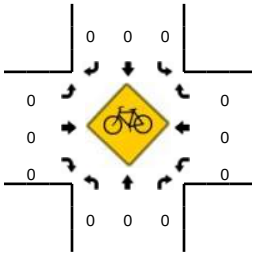
Peak-Hour: 4:40 PM -- 5:40 PM

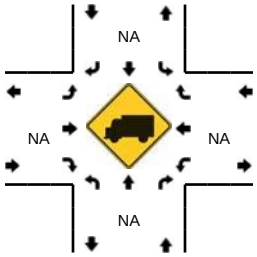
Peak 15-Min: 5:05 PM -- 5:20 PM

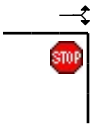


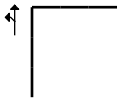


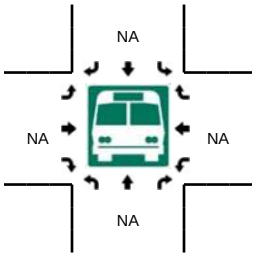












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				PNMC North-Central Dwy (Eastbound)				PNMC North-Central Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	7	0	0	0	5	0	0	0	0	1	0	0	0	0	0	14	
4:05 PM	1	3	0	0	0	4	0	0	4	0	3	0	0	0	0	0	15	
4:10 PM	0	5	0	0	0	5	0	0	1	0	1	0	0	0	0	0	12	
4:15 PM	0	7	0	0	0	5	0	0	6	0	1	0	0	0	0	0	19	
4:20 PM	1	9	0	0	0	6	1	0	2	0	4	0	0	0	0	0	23	
4:25 PM	2	1	0	0	0	5	1	0	4	0	5	0	0	0	0	0	18	
4:30 PM	0	4	0	0	0	5	0	0	2	0	1	0	0	0	0	0	12	
4:35 PM	1	10	0	0	0	9	0	0	3	0	6	0	0	0	0	0	29	
4:40 PM	0	2	0	0	0	1	0	0	6	0	3	0	0	0	0	0	12	
4:45 PM	0	2	0	0	0	7	0	0	2	0	2	0	0	0	0	0	13	
4:50 PM	0	7	0	0	0	7	0	0	1	0	8	0	0	0	0	0	23	
4:55 PM	0	1	0	0	0	9	0	0	2	0	4	0	0	0	0	0	16	206
5:00 PM	0	5	0	0	0	8	0	0	3	0	1	0	0	0	0	0	17	209
5:05 PM	0	10	0	0	0	9	0	0	8	0	4	0	0	0	0	0	31	225
5:10 PM	0	6	0	0	0	8	0	0	0	0	4	0	0	0	0	0	18	231
5:15 PM	1	6	0	0	0	11	0	0	1	0	2	0	0	0	0	0	21	233
5:20 PM	0	9	0	0	0	6	0	0	4	0	1	0	0	0	0	0	20	230
5:25 PM	0	6	0	0	0	2	1	0	1	0	3	0	0	0	0	0	13	225
5:30 PM	0	9	0	0	0	3	1	0	0	0	1	0	0	0	0	0	14	227
5:35 PM	2	3	0	0	0	1	0	0	3	0	2	0	0	0	0	0	11	209
5:40 PM	2	4	0	0	0	4	0	0	2	0	1	0	0	0	0	0	13	210
5:45 PM	0	3	0	0	0	3	1	0	6	0	0	0	0	0	0	0	13	210
5:50 PM	1	6	0	0	0	5	0	0	2	0	0	0	0	0	0	0	14	201
5:55 PM	0	4	0	0	0	3	0	0	5	0	2	0	0	0	0	0	14	199

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	88	0	0	0	112	0	0	36	0	40	0	0	0	0	0	280
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 3/22/2018 10:36 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Providence Dr -- PNMC South-Central Dwy

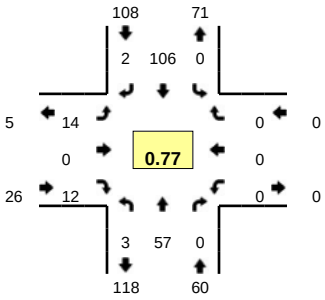
CITY/STATE: Newberg, OR

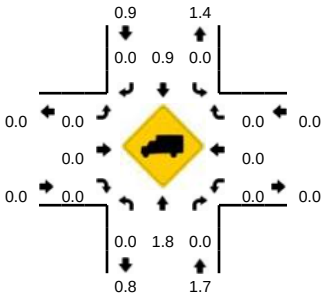
QC JOB #: 14609610

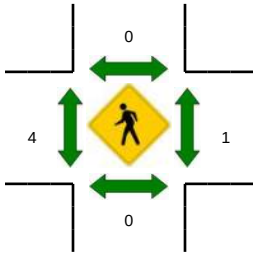
DATE: Tue, Feb 06 2018

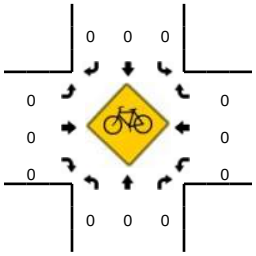
Peak-Hour: 4:40 PM -- 5:40 PM

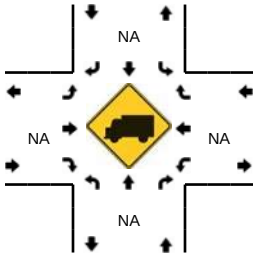
Peak 15-Min: 5:05 PM -- 5:20 PM

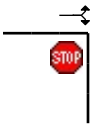


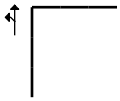


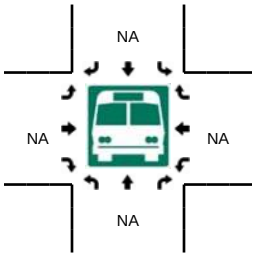












5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				PNMC South-Central Dwy (Eastbound)				PNMC South-Central Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	6	0	0	0	6	0	0	2	0	0	0	0	0	0	0	15	
4:05 PM	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0	0	10	
4:10 PM	0	5	0	0	0	7	0	0	0	0	0	0	0	0	0	0	12	
4:15 PM	0	7	0	0	0	6	0	0	0	0	0	0	0	0	0	0	13	
4:20 PM	1	10	0	0	0	10	0	0	0	0	1	0	0	0	0	0	22	
4:25 PM	0	3	0	0	0	9	1	0	0	0	1	0	0	0	0	0	14	
4:30 PM	0	3	0	0	0	6	0	0	0	0	0	0	0	0	0	0	9	
4:35 PM	0	10	0	0	0	15	0	0	1	0	0	0	0	0	0	0	26	
4:40 PM	0	2	0	0	0	3	0	0	1	0	1	0	0	0	0	0	7	
4:45 PM	0	2	0	0	0	9	0	0	0	0	0	0	0	0	0	0	11	
4:50 PM	0	7	0	0	0	16	0	0	1	0	1	0	0	0	0	0	25	
4:55 PM	0	1	0	0	0	14	1	0	0	0	0	0	0	0	0	0	16	180
5:00 PM	1	5	0	0	0	9	0	0	0	0	2	0	0	0	0	0	17	182
5:05 PM	0	6	0	0	0	13	0	0	4	0	1	0	0	0	0	0	24	196
5:10 PM	1	6	0	0	0	12	0	0	0	0	0	0	0	0	0	0	19	203
5:15 PM	0	7	0	0	0	11	1	0	0	0	1	0	0	0	0	0	20	210
5:20 PM	0	9	0	0	0	7	0	0	0	0	0	0	0	0	0	0	16	204
5:25 PM	1	4	0	0	0	5	0	0	2	0	2	0	0	0	0	0	14	204
5:30 PM	0	4	0	0	0	4	0	0	5	0	2	0	0	0	0	0	15	210
5:35 PM	0	4	0	0	0	3	0	0	1	0	2	0	0	0	0	0	10	194
5:40 PM	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0	0	11	198
5:45 PM	0	2	0	0	0	3	0	0	1	0	2	0	0	0	0	0	8	195
5:50 PM	0	7	0	0	0	5	0	0	0	0	0	0	0	0	0	0	12	182
5:55 PM	0	4	0	0	0	4	0	0	1	0	1	0	0	0	0	0	10	176

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	76	0	0	0	144	4	0	16	0	8	0	0	0	0	0	252
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				8				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 3/22/2018 10:36 AM

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

Type of peak hour being reported: User-Defined

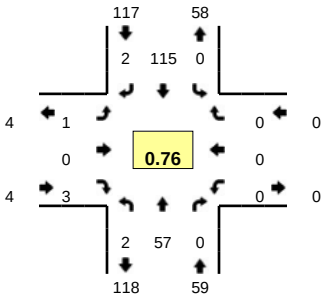
Method for determining peak hour: Total Entering Volume

LOCATION: Providence Dr -- PNMC South Dwy

CITY/STATE: Newberg, OR

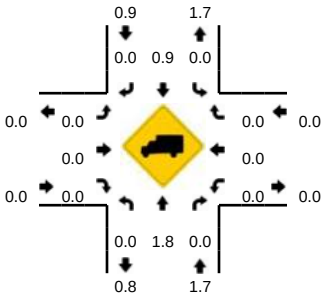
QC JOB #: 14609612

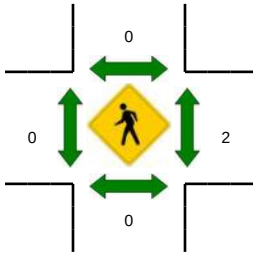
DATE: Tue, Feb 06 2018

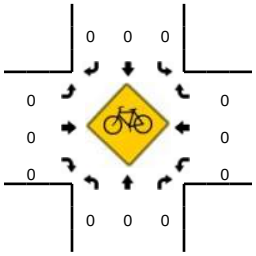


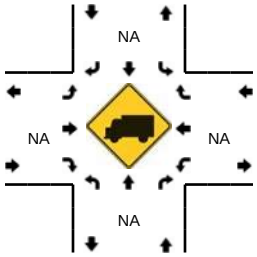
Peak-Hour: 4:40 PM -- 5:40 PM

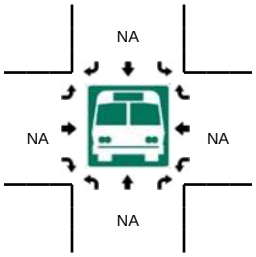
Peak 15-Min: 5:05 PM -- 5:20 PM











5-Min Count Period Beginning At	Providence Dr (Northbound)				Providence Dr (Southbound)				PNMC South Dwy (Eastbound)				PNMC South Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	6	0	0	0	5	0	0	1	0	0	0	0	0	0	0	12	
4:05 PM	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0	0	10	
4:10 PM	0	5	0	0	0	8	0	0	0	0	1	0	0	0	0	0	14	
4:15 PM	0	6	0	0	0	6	0	0	1	0	0	0	0	0	0	0	13	
4:20 PM	0	11	0	0	0	12	0	0	0	0	0	0	0	0	0	0	23	
4:25 PM	0	2	0	0	0	9	0	0	1	0	0	0	0	0	0	0	12	
4:30 PM	0	4	0	0	0	7	0	0	1	0	0	0	0	0	0	0	12	
4:35 PM	0	9	0	0	0	15	0	0	0	0	0	0	0	0	0	0	24	
4:40 PM	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	6	
4:45 PM	0	2	0	0	0	9	0	0	0	0	0	0	0	0	0	0	11	
4:50 PM	1	6	0	0	0	16	0	0	0	0	0	0	0	0	0	0	23	
4:55 PM	1	2	0	0	0	12	0	0	0	0	0	0	0	0	0	0	15	175
5:00 PM	0	5	0	0	0	11	0	0	0	0	0	0	0	0	0	0	16	179
5:05 PM	0	7	0	0	0	13	1	0	0	0	0	0	0	0	0	0	21	190
5:10 PM	0	6	0	0	0	12	0	0	0	0	0	0	0	0	0	0	18	194
5:15 PM	0	7	0	0	0	11	1	0	1	0	0	0	0	0	0	0	20	201
5:20 PM	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	16	194
5:25 PM	0	5	0	0	0	7	0	0	0	0	1	0	0	0	0	0	13	195
5:30 PM	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	9	192
5:35 PM	0	4	0	0	0	6	0	0	0	0	2	0	0	0	0	0	12	180
5:40 PM	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0	0	11	185
5:45 PM	0	2	0	0	0	3	2	0	0	0	0	0	0	0	0	0	7	181
5:50 PM	0	6	0	0	0	5	0	0	1	0	0	0	0	0	0	0	12	170
5:55 PM	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	9	164

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	80	0	0	0	144	8	0	4	0	0	0	0	0	0	0	236
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
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 3/22/2018 10:36 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

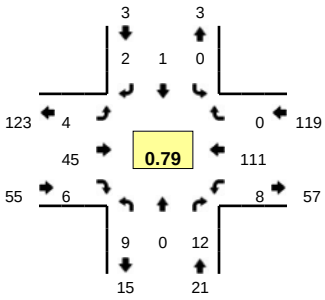
LOCATION: Werth Blvd -- Providence Dr/Hayes St

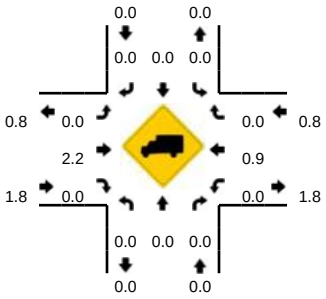
QC JOB #: 14609614

CITY/STATE: Newberg, OR

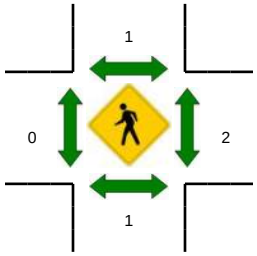
DATE: Tue, Feb 06 2018

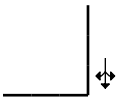
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

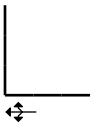


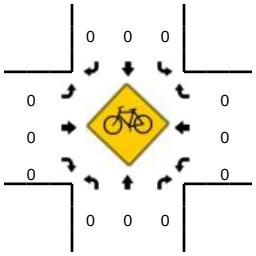


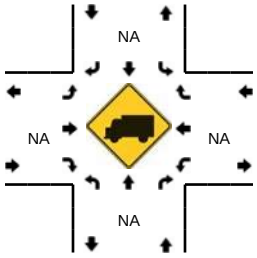
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

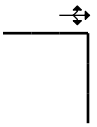


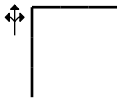


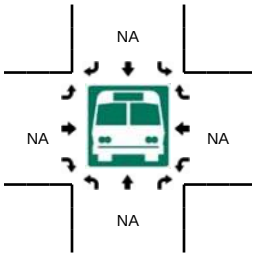












5-Min Count Period Beginning At	Werth Blvd (Northbound)				Werth Blvd (Southbound)				Providence Dr/Hayes St (Eastbound)				Providence Dr/Hayes St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	3	0	0	0	1	0	0	3	2	0	0	6	0	0	15	
4:05 PM	0	0	0	0	0	0	1	0	0	3	0	0	0	6	0	0	10	
4:10 PM	0	0	1	0	0	1	0	0	0	5	0	0	2	5	0	0	14	
4:15 PM	0	1	1	0	0	0	2	0	1	4	2	0	0	7	0	0	18	
4:20 PM	1	0	0	0	0	0	0	0	1	11	1	0	1	7	1	0	23	
4:25 PM	0	0	0	0	0	0	1	0	0	3	1	0	0	10	0	0	15	
4:30 PM	0	0	1	0	0	0	1	0	0	3	0	0	0	8	0	0	13	
4:35 PM	2	0	2	0	0	0	1	0	1	5	0	0	0	13	1	0	25	
4:40 PM	1	0	1	0	0	0	1	0	0	1	1	0	0	7	0	0	12	
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	2	7	0	0	10	
4:50 PM	0	0	1	0	0	0	0	0	1	5	0	0	2	14	0	0	23	
4:55 PM	2	0	2	0	0	0	0	0	0	2	0	0	1	9	0	0	16	194
5:00 PM	0	0	3	0	0	1	0	0	0	1	0	0	0	12	0	0	17	196
5:05 PM	2	0	1	0	0	0	0	0	1	5	0	0	1	6	0	0	16	202
5:10 PM	0	0	2	0	0	0	0	0	0	3	1	0	0	19	0	0	25	213
5:15 PM	0	0	1	0	0	0	0	0	0	6	1	1	1	10	0	0	20	215
5:20 PM	0	0	0	0	0	0	0	0	1	8	1	0	1	7	0	0	18	210
5:25 PM	2	0	1	0	0	0	1	0	0	6	1	0	0	7	0	0	18	213
5:30 PM	0	0	0	0	0	0	0	0	0	2	1	0	0	5	0	0	8	208
5:35 PM	2	0	0	0	0	0	0	0	0	5	0	0	0	8	0	0	15	198
5:40 PM	2	0	1	0	0	0	0	0	0	4	0	0	0	6	0	0	13	199
5:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	1	0	5	194
5:50 PM	1	0	1	0	0	1	1	0	1	6	3	0	0	5	0	0	19	190
5:55 PM	0	0	2	0	0	0	1	0	1	2	0	0	0	5	0	0	11	185

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	12	0	0	0	0	0	4	68	12	4	8	144	0	0	252
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	0	0		4
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 3/22/2018 10:36 AM

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

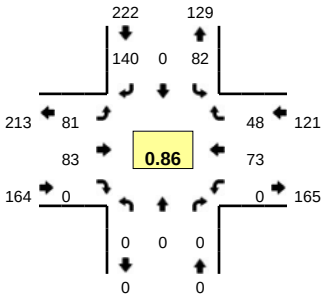
Type of peak hour being reported: User-Defined

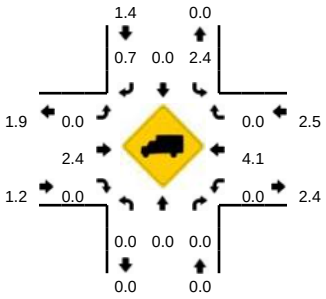
Method for determining peak hour: Total Entering Volume

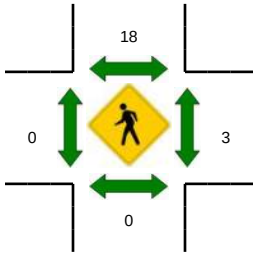
LOCATION: Brutscher St -- E Fernwood Rd
CITY/STATE: Newberg, OR

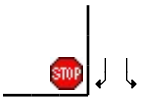
QC JOB #: 14609618
DATE: Tue, Feb 06 2018

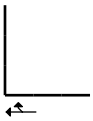
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

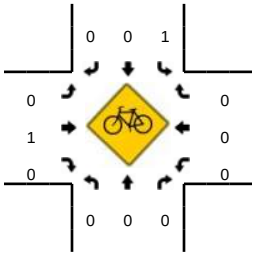


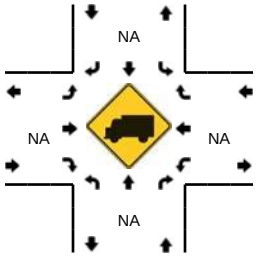


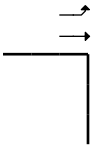


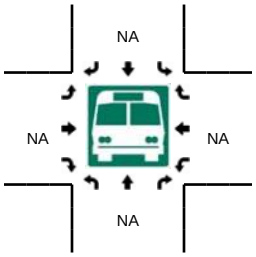












5-Min Count Period Beginning At	Brutscher St (Northbound)				Brutscher St (Southbound)				E Fernwood Rd (Eastbound)				E Fernwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	5	0	10	0	6	2	0	0	0	10	3	0	36	
4:05 PM	0	0	0	0	6	0	9	0	11	2	0	0	0	5	6	0	39	
4:10 PM	0	0	0	0	6	0	10	0	7	4	0	0	0	8	4	0	39	
4:15 PM	0	0	0	0	12	0	5	0	8	5	0	0	0	10	5	0	45	
4:20 PM	0	0	0	0	5	0	4	0	4	6	0	0	0	13	5	0	37	
4:25 PM	0	0	0	0	6	0	16	0	3	5	0	0	0	5	6	0	41	
4:30 PM	0	0	0	0	10	0	8	0	5	5	0	0	0	12	4	0	44	
4:35 PM	0	0	0	0	6	0	10	0	6	4	0	0	0	9	7	0	42	
4:40 PM	0	0	0	0	8	0	8	0	9	5	0	0	0	9	5	0	44	
4:45 PM	0	0	0	0	5	0	9	0	6	4	0	0	0	5	3	0	32	
4:50 PM	0	0	0	0	3	0	18	0	5	10	0	0	0	8	6	0	50	
4:55 PM	0	0	0	0	12	0	13	0	2	9	0	0	0	1	6	0	43	492
5:00 PM	0	0	0	0	1	0	14	0	3	7	0	0	0	7	2	0	34	490
5:05 PM	0	0	0	0	11	0	15	0	7	7	0	0	0	8	3	0	51	502
5:10 PM	0	0	0	0	9	0	11	0	6	5	0	0	0	6	7	0	44	507
5:15 PM	0	0	0	0	5	0	14	0	11	8	0	0	0	10	2	0	50	512
5:20 PM	0	0	0	0	9	0	10	0	11	13	0	0	0	8	2	0	53	528
5:25 PM	0	0	0	0	6	0	10	0	7	5	0	0	0	4	4	0	36	523
5:30 PM	0	0	0	0	8	0	7	0	6	5	0	0	0	3	7	0	36	515
5:35 PM	0	0	0	0	5	0	11	0	8	5	0	0	0	4	1	0	34	507
5:40 PM	0	0	0	0	8	0	10	0	2	4	0	0	0	6	3	0	33	496
5:45 PM	0	0	0	0	4	0	9	0	6	5	0	0	0	11	5	0	40	504
5:50 PM	0	0	0	0	6	0	7	0	14	9	0	0	0	7	6	0	49	503
5:55 PM	0	0	0	0	3	0	7	0	7	4	0	0	0	6	4	0	31	491

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	92	0	140	0	112	104	0	0	0	96	44	0	588
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	8	0		12
Pedestrians		0				36				0				8			44
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 3/22/2018 10:36 AM

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

Appendix B Existing Traffic Conditions

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2069	81	87	1182	37	73
v/c Ratio	1.02	0.09	0.52	0.51	0.15	0.24
Control Delay	50.6	8.3	61.6	6.8	44.2	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	8.3	61.6	6.8	44.2	11.7
Queue Length 50th (ft)	~930	18	65	165	25	0
Queue Length 95th (ft)	#1080	42	115	200	56	41
Internal Link Dist (ft)	676			463	180	
Turn Bay Length (ft)		80	115		150	
Base Capacity (vph)	2020	904	212	2319	247	310
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	1.02	0.09	0.41	0.51	0.15	0.24

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.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1841	72	77	1052	33	65
Future Volume (vph)	1841	72	77	1052	33	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Grade (%)	-3%			2%	3%	
Total Lost time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3245	1438	1646	3076	1449	1465
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3245	1438	1646	3076	1449	1465
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	2069	81	87	1182	37	73
RTOR Reduction (vph)	0	8	0	0	0	61
Lane Group Flow (vph)	2069	73	87	1182	37	12
Heavy Vehicles (%)	4%	5%	0%	7%	13%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	73.8	73.8	10.7	90.5	20.5	20.5
Effective Green, g (s)	73.8	73.8	10.7	90.5	20.5	20.5
Actuated g/C Ratio	0.61	0.61	0.09	0.75	0.17	0.17
Clearance Time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	5.0	5.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	1995	884	146	2319	247	250
v/s Ratio Prot	c0.64		0.05	c0.38	c0.03	
v/s Ratio Perm		0.05				0.01
v/c Ratio	1.04	0.08	0.60	0.51	0.15	0.05
Uniform Delay, d1	23.1	9.4	52.6	5.9	42.3	41.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.5	0.2	7.4	0.8	1.3	0.4
Delay (s)	53.6	9.5	60.0	6.7	43.6	42.0
Level of Service	D	A	E	A	D	D
Approach Delay (s)	51.9			10.3	42.5	
Approach LOS	D			B	D	

Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	1	4	61	68	81
Future Volume (Veh/h)	37	1	4	61	68	81
Sign Control	Stop			Free	Free	
Grade	0%			3%	-3%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	44	1	5	73	81	96
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					260	
pX, platoon unblocked						
vC, conflicting volume	212	129	177			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	212	129	177			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	94	100	100			
cM capacity (veh/h)	778	926	1272			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	45	78	177
Volume Left	44	5	0
Volume Right	1	0	96
cSH	781	1272	1700
Volume to Capacity	0.06	0.00	0.10
Queue Length 95th (ft)	5	0	0
Control Delay (s)	9.9	0.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.9	0.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	18.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	13	28	50	28	41
Future Volume (Veh/h)	15	13	28	50	28	41
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	18	15	33	59	33	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					680	
pX, platoon unblocked						
vC, conflicting volume	182	57	81			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	182	57	81			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	98	99	98			
cM capacity (veh/h)	764	1015	1529			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	33	92	81
Volume Left	18	33	0
Volume Right	15	0	48
cSH	861	1529	1700
Volume to Capacity	0.04	0.02	0.05
Queue Length 95th (ft)	3	2	0
Control Delay (s)	9.3	2.8	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	2.8	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	0	8	75	37	4
Future Volume (Veh/h)	3	0	8	75	37	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	4	0	10	90	45	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					793	
pX, platoon unblocked						
vC, conflicting volume	158	48	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	158	48	50			
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)	833	1027	1570			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	4	100	50
Volume Left	4	10	0
Volume Right	0	0	5
cSH	833	1570	1700
Volume to Capacity	0.00	0.01	0.03
Queue Length 95th (ft)	0	0	0
Control Delay (s)	9.3	0.8	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	0.8	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	2	3	77	28	9
Future Volume (Veh/h)	6	2	3	77	28	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	8	3	4	99	36	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1143	
pX, platoon unblocked						
vC, conflicting volume	149	42	48			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149	42	48			
tC, single (s)	6.8	6.7	4.1			
tC, 2 stage (s)						
tF (s)	3.9	3.8	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	760	907	1572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	103	48
Volume Left	8	4	0
Volume Right	3	0	12
cSH	795	1572	1700
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (ft)	1	0	0
Control Delay (s)	9.6	0.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	0.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	16.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCS 2010 Two-Way Stop Control Summary Report

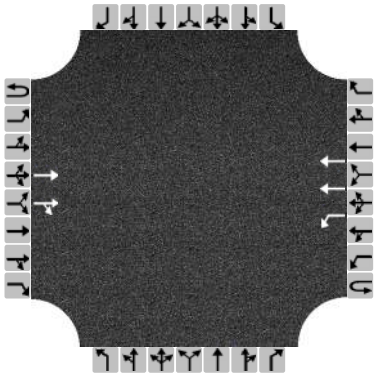
General Information

Analyst	Kittelson & Associates
Agency/Co.	City of Newberg
Date Performed	3/7/2018
Analysis Year	2018
Time Analyzed	Existing AM
Intersection Orientation	East-West
Project Description	Newberg Providence Medical Center

Site Information

Intersection	OR 99 W/PNMC Access
Jurisdiction	Newberg, Oregon
East/West Street	OR 99W
North/South Street	Right-In, Left-Out Access
Peak Hour Factor	0.89
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	1	2	0		0	0	0		0	0	0
Configuration			T	TR		L	T									
Volume (veh/h)			1904	51		18	1059									
Percent Heavy Vehicles						3										
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						20										
Capacity						234										
v/c Ratio						0.09										
95% Queue Length						0.3										
Control Delay (s/veh)						21.8										
Level of Service (LOS)						C										
Approach Delay (s/veh)					0.4											
Approach LOS																

HCS 2010 Roundabout Report

General Information

Analyst	Kittelson & Associates, Inc.
Agency or Co.	City of Newberg
Date Performed	3/6/2018
Analysis Year	2018
Time Period	Existing AM
Project Description	Newberg Providence Medical Center

Site Information

Intersection	Werth Blvd/Providence Dr/Hayes St
E/W Street Name	Providence Dr/Hayes St
N/S Street Name	Werth Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.78
Jurisdiction	Newberg, OR

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	1	75	4	0	7	20	1	0	2	0	4	0	2	1	2
Percent Heavy Vehicles, %	0	0	3	0	0	0	6	100	0	0	0	0	0	0	100	0
Flow Rate (vPCE) pc/h	0	1	99	5	0	9	27	3	0	3	0	5	0	3	3	3
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	1				1				0				2			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		105			39			8			9	
Entry Volume veh/h		102			36			8			8	
Circulating Flow (Vc), pc/h	15			4			103			39		
Exiting Flow (Vex), pc/h	107			33			4			17		
Capacity (cPCE), pc/h		1113			1126			1019			1087	
Capacity (c), veh/h		1082			1038			1019			905	
v/c Ratio (X)		0.09			0.03			0.01			0.01	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.1			3.8			3.6			4.1	
Lane LOS		A			A			A			A	
95% Queue		0.3			0.1			0.0			0.0	
Approach Delay, s/veh	4.1			3.8			3.6			4.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	4.0						A					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	2	99	9	1	52
Future Volume (Veh/h)	0	2	99	9	1	52
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	3	124	11	1	65
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	198	130			136	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	198	130			136	
tC, single (s)	6.4	7.2			5.1	
tC, 2 stage (s)						
tF (s)	3.5	4.2			3.1	
p0 queue free %	100	100			100	
cM capacity (veh/h)	794	711			1014	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	0	3	135	1	65
Volume Left	0	0	0	1	0
Volume Right	0	3	11	0	0
cSH	1700	711	1700	1014	1700
Volume to Capacity	0.00	0.00	0.08	0.00	0.04
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	10.1	0.0	8.6	0.0
Lane LOS	A	B		A	
Approach Delay (s)	10.1		0.0	0.1	
Approach LOS	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	16.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	43	103	49	21	31
Future Volume (Veh/h)	59	43	103	49	21	31
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	70	51	123	58	25	37
Pedestrians			1		1	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	182				345	153
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	182				345	153
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	95				96	96
cM capacity (veh/h)	1368				611	887

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	70	51	181	25	37
Volume Left	70	0	0	25	0
Volume Right	0	0	58	0	37
cSH	1368	1700	1700	611	887
Volume to Capacity	0.05	0.03	0.11	0.04	0.04
Queue Length 95th (ft)	4	0	0	3	3
Control Delay (s)	7.8	0.0	0.0	11.1	9.2
Lane LOS	A			B	A
Approach Delay (s)	4.5		0.0	10.0	
Approach LOS				B	

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	25.3%	ICU Level of Service	A
Analysis Period (min)	15		

Queues
1: Providence Dr & N Hwy 99W

03/06/2018

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1355	23	78	2153	102	129
v/c Ratio	0.59	0.02	0.52	0.81	0.59	0.12
Control Delay	13.6	7.0	71.8	10.1	72.2	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	7.0	71.8	10.1	72.2	1.8
Queue Length 50th (ft)	311	4	69	428	90	0
Queue Length 95th (ft)	472	17	121	680	147	25
Internal Link Dist (ft)	676			463	180	
Turn Bay Length (ft)		80	115		150	
Base Capacity (vph)	2292	1026	241	2671	353	1054
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	0.59	0.02	0.32	0.81	0.29	0.12

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1287	22	74	2045	97	123
Future Volume (vph)	1287	22	74	2045	97	123
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Grade (%)	-3%			2%	3%	
Total Lost time (s)	6.0	6.0	4.5	4.5	4.5	6.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3309	1478	1646	3227	1621	1465
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3309	1478	1646	3227	1621	1465
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1355	23	78	2153	102	129
RTOR Reduction (vph)	0	2	0	0	0	40
Lane Group Flow (vph)	1355	21	78	2153	102	89
Confl. Peds. (#/hr)					1	
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	2%	0%	0%	2%	1%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				2
Actuated Green, G (s)	97.0	97.0	12.9	115.9	15.1	97.0
Effective Green, g (s)	97.0	97.0	12.9	115.9	15.1	97.0
Actuated g/C Ratio	0.69	0.69	0.09	0.83	0.11	0.69
Clearance Time (s)	6.0	6.0	4.5	4.5	4.5	6.0
Vehicle Extension (s)	5.0	5.0	4.0	4.0	4.0	5.0
Lane Grp Cap (vph)	2292	1024	151	2671	174	1015
v/s Ratio Prot	0.41		0.05	c0.67	c0.06	
v/s Ratio Perm		0.01				0.06
v/c Ratio	0.59	0.02	0.52	0.81	0.59	0.09
Uniform Delay, d1	11.2	6.7	60.6	6.2	59.5	7.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.0	3.9	2.7	5.9	0.2
Delay (s)	12.3	6.7	64.5	9.0	65.3	7.2
Level of Service	B	A	E	A	E	A
Approach Delay (s)	12.2			10.9	32.9	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	113	5	2	107	77	19
Future Volume (Veh/h)	113	5	2	107	77	19
Sign Control	Stop			Free	Free	
Grade	0%			3%	-3%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	159	7	3	151	108	27
Pedestrians	3					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					260	
pX, platoon unblocked						
vC, conflicting volume	282	124	138			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	282	124	138			
tC, single (s)	6.4	6.2	4.6			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.7			
p0 queue free %	78	99	100			
cM capacity (veh/h)	709	929	1194			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	166	154	135
Volume Left	159	3	0
Volume Right	7	0	27
cSH	716	1194	1700
Volume to Capacity	0.23	0.00	0.08
Queue Length 95th (ft)	22	0	0
Control Delay (s)	11.5	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	11.5	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	39	3	75	80	2
Future Volume (Veh/h)	34	39	3	75	80	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	45	52	4	100	107	3
Pedestrians	3					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					680	
pX, platoon unblocked						
vC, conflicting volume	220	112	113			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	220	112	113			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	94	100			
cM capacity (veh/h)	762	944	1485			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	97	104	110
Volume Left	45	4	0
Volume Right	52	0	3
cSH	850	1485	1700
Volume to Capacity	0.11	0.00	0.06
Queue Length 95th (ft)	10	0	0
Control Delay (s)	9.8	0.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	0.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	13	3	63	117	2
Future Volume (Veh/h)	15	13	3	63	117	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	19	17	4	82	152	3
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					793	
pX, platoon unblocked						
vC, conflicting volume	248	158	159			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	248	158	159			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	100			
cM capacity (veh/h)	740	890	1427			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	36	86	155
Volume Left	19	4	0
Volume Right	17	0	3
cSH	804	1427	1700
Volume to Capacity	0.04	0.00	0.09
Queue Length 95th (ft)	4	0	0
Control Delay (s)	9.7	0.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.7	0.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	17.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	3	2	65	128	2
Future Volume (Veh/h)	1	3	2	65	128	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	1	4	3	86	168	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1143	
pX, platoon unblocked						
vC, conflicting volume	262	170	171			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	262	170	171			
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)	730	880	1418			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	5	89	171
Volume Left	1	3	0
Volume Right	4	0	3
cSH	845	1418	1700
Volume to Capacity	0.01	0.00	0.10
Queue Length 95th (ft)	0	0	0
Control Delay (s)	9.3	0.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	0.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	16.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1322	20	2	2061	0	0
Future Volume (Veh/h)	1322	20	2	2061	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	1363	21	2	2125	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				756		
pX, platoon unblocked					0.21	
vC, conflicting volume			1384		2440	692
vC1, stage 1 conf vol					1374	
vC2, stage 2 conf vol					1066	
vCu, unblocked vol			1384		327	692
tC, single (s)			4.1		6.8	8.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	4.3
p0 queue free %			100		100	100
cM capacity (veh/h)			501		180	222

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	909	475	2	1062	1062
Volume Left	0	0	2	0	0
Volume Right	0	21	0	0	0
cSH	1700	1700	501	1700	1700
Volume to Capacity	0.53	0.28	0.00	0.63	0.63
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	12.2	0.0	0.0
Lane LOS			B		
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

HCS 2010 Roundabout Report

General Information

Analyst	Kittelson & Associates, Inc.
Agency or Co.	City of Newberg
Date Performed	3/6/2018
Analysis Year	2018
Time Period	Existing PM
Project Description	Newberg Providence Medical Center

Site Information

Intersection	Werth Blvd/Providence Dr/Hayes St
E/W Street Name	Providence Dr/Hayes St
N/S Street Name	Werth Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.79
Jurisdiction	Newberg, OR

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	4	50	7	0	9	123	0	0	10	0	13	0	0	1	2
Percent Heavy Vehicles, %	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
Flow Rate (vPCE) pc/h	0	5	65	9	0	11	157	0	0	13	0	16	0	0	1	3
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				2				1				1			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		79			168			29			4	
Entry Volume veh/h		78			166			29			4	
Circulating Flow (Vc), pc/h		12			18			70			181	
Exiting Flow (Vex), pc/h		81			173			5			21	
Capacity (cPCE), pc/h		1117			1110			1054			943	
Capacity (c), veh/h		1099			1099			1053			943	
v/c Ratio (X)		0.07			0.15			0.03			0.00	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.9			4.6			3.7			3.9	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.5			0.1			0.0	
Approach Delay, s/veh	3.9			4.6			3.7			3.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	4.3						A					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	7	136	6	4	233
Future Volume (Veh/h)	14	7	136	6	4	233
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)	15	8	148	7	4	253
Pedestrians	8					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	1					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	420	160			163	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	420	160			163	
tC, single (s)	6.4	6.4			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.4	
p0 queue free %	97	99			100	
cM capacity (veh/h)	587	840			1277	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	15	8	155	4	253
Volume Left	15	0	0	4	0
Volume Right	0	8	7	0	0
cSH	587	840	1700	1277	1700
Volume to Capacity	0.03	0.01	0.09	0.00	0.15
Queue Length 95th (ft)	2	1	0	0	0
Control Delay (s)	11.3	9.3	0.0	7.8	0.0
Lane LOS	B	A		A	
Approach Delay (s)	10.6		0.0	0.1	
Approach LOS	B				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	22.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	89	92	81	53	91	156
Future Volume (Veh/h)	89	92	81	53	91	156
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	103	107	94	62	106	181
Pedestrians			3		18	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	174				459	143
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				459	143
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				79	80
cM capacity (veh/h)	1391				508	892

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	103	107	156	106	181
Volume Left	103	0	0	106	0
Volume Right	0	0	62	0	181
cSH	1391	1700	1700	508	892
Volume to Capacity	0.07	0.06	0.09	0.21	0.20
Queue Length 95th (ft)	6	0	0	19	19
Control Delay (s)	7.8	0.0	0.0	13.9	10.1
Lane LOS	A			B	B
Approach Delay (s)	3.8		0.0	11.5	
Approach LOS				B	

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C ODOT Crash Data

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Chris Brehmer

Subject: RE: Crash Data Request/Newberg Locations - Req #180020

From: WARD Kimberlee S <Kimberlee.S.WARD@odot.state.or.us>
Sent: Tuesday, February 06, 2018 9:46 AM
To: Chris Brehmer <CBREHMER@kittelson.com>
Cc: VOGEL Sylvia M <Sylvia.M.VOGEL@odot.state.or.us>
Subject: RE: Crash Data Request/Newberg Locations - Req #180020

Hi Chris,

I have placed your crash data on our FTP site in the folder named "Brehmer". The link is located below for your convenience:

ftp://ftp.odot.state.or.us/outgoing/Brehmer/

The segment of Providence Dr 1200 feet south of OR 99W you requested, had *no crashes reported during the time period 2011 to 2015.*

**Please see your original email below, the intersections highlighted have no crash data*.

Thank you again Chris and hope you have a good work week !

Kim

Kim Ward
Crash Reporting Technician
Crash Analysis and Reporting Unit
Transportation Data Section
555 13th Street NE, Suite 2
Salem, Oregon 97301-4178
ph: (503) 986-4237
fax: (503) 986-4249
mailto: kimberlee.s.ward@odot.state.or.us

From: Chris Brehmer [mailto:CBREHMER@kittelson.com]
Sent: Friday, January 19, 2018 9:17 AM
To: WARD Kimberlee S
Subject: Crash Data Request/Newberg Locations

Happy Friday Kim!

I'm writing to request crash data for several locations in Newberg, Oregon that we are studying for a traffic impact study. The locations are listed below and shown in the embedded image.

- OR99W/Providence Drive
- Providence Drive/Hayes Street
- Brutscher Street/Werth Boulevard
- E Fernwood Rd/Brutscher Street

- Four private driveways serving the Providence campus along Providence Drive – it may be easiest just to search Providence Drive as a segment from Highway 99W south about 1,200 feet?

Would you please research and provide this information at your convenience?

Thank you,
Chris

Christopher L. Brehmer, PE
Senior Principal Engineer

Please note our Portland office has a ***NEW ADDRESS***

Kittelson & Associates, Inc.
Transportation Engineering / Planning
851 SW 6th Avenue, Suite 600
Portland OR 97204
503.228.5230 (Portland)
503.535.7433 (direct)

Streetwise Twitter Facebook

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Brutscher St & Fernwood Rd

January 1, 2011 through December 31, 2015

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: 2014														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2014 TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	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.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF NEWBERG, YAMHILL COUNTY

Brutscher St & Fernwood Rd

January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	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
00594	N	N	N			06/04/2014	17	BRUTSCHER ST	INTER	3-LEG	N	N	CLR	ANGL-STP	01	NONE 0	TURN-L											08
NONE						Wed 5A	0	FERNWOOD RD	N		STOP SIGN	N	DRY	TURN		PRVTE	W N										000		00
No						*45 17 56.26*	*-122 56 26.54*	1	06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	50	F	OR-Y OR<25		002	000		08
															02	NONE 0	STOP											
																PRVTE	N S										011		00
																PSNGR CAR		01	DRVR	NONE	60	M	OR-Y OR<25		000	000		00

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
014	EMR V PKD	EMERGENCY VEHICLE LEGALLY PARKED IN THE ROADWAY
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED OR DISABLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING
055	SPRAY	BLINDED BY WATER SPRAY

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
088	OTHER	OTHER ACTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD; STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RO
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST NOT VISIBLE; NON-REFLECTIVE CLOTHIN
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER
51	FAIL LN	FAILED TO MAINTAIN LANE
52	OFF RD	RAN OFF ROAD

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1 L-TURN	FROM OPPOSITE DIRECTION-ONE LEFT TURN,ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TOO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WORK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAY ON RD	STANDING OR LYING IN ROADWAY
071	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
073	ELUDING	ELUDING / ATTEMPT TO ELUDE
079	F NEG CURV	FAILED TO NEGOTIATE A CURVE
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER-CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED/PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHIC
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMNT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FALLEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
074	OVERHD OBJ	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL WTNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	DSTRCT OTH	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY
134	TORRENTIAL	TORRENTIAL RAIN (EXCEPTIONALLY HEAVY RAIN)

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN MAJOR COLLECTOR
18	URBAN MINOR COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY

PEDESTRIAN LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH OR PARKING LANE
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
13	AT INTERSECTION - IN BIKE LANE
14	NOT AT INTERSECTION - IN BIKE LANE
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
16	NOT AT INTERSECTION - IN PARKING LANE

ROAD CHARACTER CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING

095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS
099	UNKNOWN	UNKNOWN OR NOT DEFINITE

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
00	PDO	NOT COLLECTED FOR PDO CRASHES
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

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

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

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: 2015														
REAR-END	0	0	4	4	0	0	0	4	0	3	1	4	0	0
2015 TOTAL	0	0	4	4	0	0	0	4	0	3	1	4	0	0
YEAR: 2014														
REAR-END	0	0	2	2	0	0	0	2	0	2	0	2	0	0
2014 TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0	0
YEAR: 2013														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2013 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2012														
REAR-END	0	2	1	3	0	3	0	2	1	3	0	3	0	0
2012 TOTAL	0	2	1	3	0	3	0	2	1	3	0	3	0	0
YEAR: 2011														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2011 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
FINAL TOTAL	0	2	9	11	0	3	0	9	2	10	1	11	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.

091 PACIFIC HIGHWAY WEST

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# CMPT/MLG MILEPNT LRS	FC CONN # FIRST STREET SECOND STREET INTERSECTION SEQ#	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CNTL	OFFRD 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
00144	N	N	N			02/12/2015	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE						Thu 4P	NEWBERG	MN 0	PROVIDENCE DR	NE		UNKNOWN	N	DRY	REAR		UNKN	NE SW										000		00
							NEWBERG UA	21.45	PACIFIC HY 99W	06	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		29
No						*45 18 36.29 -122 56 7.21*		009100100S00	1															UNK					
																02	NONE 0	STOP											
																	PRVTE	NE SW									011		00
																	PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		000	000		00
																								OR<25					
00824	N	N	N	N	N	09/22/2012	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											32,16,27
CITY						Sat 2P	NEWBERG	MN 0	PROVIDENCE DR	NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	F	OR-Y		052,016	025		32,16,27
No						*45 18 36.11 -122 56 7.77*		009100100S00	1															OR<25					
																02	NONE 0	STOP											
																	PRVTE	NE SW									011		00
																	PSNGR CAR		01	DRVR	NONE	25	F	OTH-Y		000	000		00
																								N-RES					
																			02	PSNG	INJC	23	F			000	000		00
																			03	PSNG	INJC	77	F			000	000		00
00565	N	N	N			06/12/2015	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE						Fri 5P	NEWBERG	MN 0	PROVIDENCE DR	NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		026	000		29
No						*45 18 36.11 -122 56 7.77*		009100100S00	1															OR<25					
																02	NONE 0	STOP											
																	PRVTE	NE SW									011		00
																	PSNGR CAR		01	DRVR	NONE	27	F	OR-Y		000	000		00
																								OR>25					
01108	N	N	N	N	N	12/30/2011	YAMHILL	1 14		INTER	3-LEG	N	N	RAIN	S-STRGHT	01	NONE 0	STRGHT											07
CITY						Fri 8A	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	WET	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	48	M	OR-Y		042	000		07
No						*45 18 36.11 -122 56 7.77*		009100100S00	1															OR>25					
																02	NONE 0	STRGHT											
																	PRVTE	SW NE									006		00
																	PSNGR CAR		01	DRVR	NONE	83	M	OR-Y		000	000		00
																								OR<25					
00833	N	N	N			09/25/2012	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NO RPT						Tue 2P	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	81	F	OTH-Y		026	000		07
No						*45 18 36.11 -122 56 7.77*		009100100S00	1															N-RES					
																02	NONE 0	STOP											
																	PRVTE	SW NE									011		00
																	PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		000	000		00
																								OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHL BUS	WORK ZONE	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / LRS	FC / MILEPNT	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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
00623	N	N	N	N	N	07/18/2013	YAMHILL	1	14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										27
CITY						Thu 7P	NEWBERG	MN	0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.46		PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		026	000		27
No						*45 18 36.11 -122 56 7.77*		009100100		S00 1															OR<25					
																	02	NONE 0	STOP									011		00
																		PRVTE	SW NE											
																		PSNGR CAR		01	DRVR	NONE	40	M	OR-Y		000	000		00
																									OR<25					
00589	N	N	N			06/03/2014	YAMHILL	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	07
NONE						Tue 2P	NEWBERG	MN	0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.46		PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		026	000		07
No						*45 18 36.11 -122 56 7.77*		009100100		S00 1															OR<25					
																	02	NONE 0	STOP									011		00
																		PRVTE	SW NE											
																		PSNGR CAR		01	DRVR	NONE	40	M	OR-Y		000	000		00
																									OR<25					
																	03	NONE 0	STOP									011		00
																		PRVTE	SW NE											
																		MTRCYCLE		01	DRVR	NONE	34	M	OR-Y		000	000		00
																									OR<25					
00725	N	N	N			07/07/2014	YAMHILL	1	14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						Mon 2P	NEWBERG	MN	0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.46		PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	56	M	OR-Y		026	000		07
No						*45 18 36.11 -122 56 7.77*		009100100		S00 1															OR<25					
																	02	NONE 0	STOP									011		00
																		PRVTE	SW NE											
																		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																									OR<25					
00658	N	N	N			07/03/2015	YAMHILL	1	14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
CITY						Fri 2P	NEWBERG	MN	0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.46		PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		026	000		29
No						*45 18 36.11 -122 56 7.77*		009100100		S00 1															OR<25					
																	02	NONE 0	STOP									011		00
																		PRVTE	SW NE											
																		PSNGR CAR		01	DRVR	NONE	66	M	OR-Y		000	000		00
																									OR<25					
01343	N	N	N			12/21/2015	YAMHILL	1	14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE						Mon 12P	NEWBERG	MN	0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
							NEWBERG UA	21.46		PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		29
No						*45 18 36.11 -122 56 7.77*		009100100		S00 1															OR<25					

091 PACIFIC HIGHWAY WEST

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	CONN #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / 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 / PRVTE	0 STOP / SW NE										011	00
																		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y / OR<25		000	000		00
00616	N	N	N			07/20/2012 / Fri 7A	YAMHILL / NEWBERG / NEWBERG UA	1 / MN / 21.46	14 / 0 / PACIFIC HY 99W	PROVIDENCE DR	INTER / W / 06	3-LEG / 0	N / TRF SIGNAL	N	N / N / N	RAIN / WET / DAY	S-1STOP / REAR / PDO	01	NONE / PRVTE	STRGHT / W E												07	
NONE																		PSNGR CAR		01	DRVR	NONE	52	M	OR-Y / OR<25		026	000		00
No						*45 18 36.11 -122 56 7.77*		009100100	S00	1																			000		07
																	02	NONE / PRVTE	0 STOP / W E										011	00
																		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y / OR<25		000	000		00

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
014	EMR V PKD	EMERGENCY VEHICLE LEGALLY PARKED IN THE ROADWAY
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED OR DISABLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING
055	SPRAY	BLINDED BY WATER SPRAY

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
088	OTHER	OTHER ACTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD; STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RO
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST NOT VISIBLE; NON-REFLECTIVE CLOTHIN
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER
51	FAIL LN	FAILED TO MAINTAIN LANE
52	OFF RD	RAN OFF ROAD

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1 L-TURN	FROM OPPOSITE DIRECTION-ONE LEFT TURN,ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TOO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WORK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAY ON RD	STANDING OR LYING IN ROADWAY
071	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
073	ELUDING	ELUDING / ATTEMPT TO ELUDE
079	F NEG CURV	FAILED TO NEGOTIATE A CURVE
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER-CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED/PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHIC
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMNT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FALLEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
074	OVERHD OBJ	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL WTNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	DSTRCT OTH	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY
134	TORRENTIAL	TORRENTIAL RAIN (EXCEPTIONALLY HEAVY RAIN)

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN MAJOR COLLECTOR
18	URBAN MINOR COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY

PEDESTRIAN LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH OR PARKING LANE
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
13	AT INTERSECTION - IN BIKE LANE
14	NOT AT INTERSECTION - IN BIKE LANE
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
16	NOT AT INTERSECTION - IN PARKING LANE

ROAD CHARACTER CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING

095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS
099	UNKNOWN	UNKNOWN OR NOT DEFINITE

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
00	PDO	NOT COLLECTED FOR PDO CRASHES
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

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Appendix D Year 2019 Background Traffic Conditions

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Queues
1: Providence Dr & N Hwy 99W

03/07/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	25	1752	93	94	1057	81	35	12	73	251	22	76
v/c Ratio	0.30	1.14	0.13	0.92	0.65	0.10	0.10	0.03	0.16	0.64	0.05	0.15
Control Delay	64.9	100.9	2.7	126.2	23.8	1.6	28.0	34.0	1.6	42.8	33.8	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.9	100.9	2.7	126.2	23.8	1.6	28.0	34.0	1.6	42.8	33.8	1.9
Queue Length 50th (ft)	19	~832	0	74	326	0	18	7	0	152	13	0
Queue Length 95th (ft)	49	#971	22	#180	407	15	43	23	7	232	35	10
Internal Link Dist (ft)		676			463			180			187	
Turn Bay Length (ft)	150		100	230		300	160		160	350		150
Base Capacity (vph)	82	1541	740	102	1622	813	354	429	464	394	488	502
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.14	0.13	0.92	0.65	0.10	0.10	0.03	0.16	0.64	0.05	0.15

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1664	88	89	1004	77	33	11	69	238	21	72
Future Volume (vph)	24	1664	88	89	1004	77	33	11	69	238	21	72
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3245	1438	1646	3076	1444	1449	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1654	3245	1438	1646	3076	1444	1133	1690	1465	1192	1699	1444
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)	25	1752	93	94	1057	81	35	12	73	251	22	76
RTOR Reduction (vph)	0	0	50	0	0	41	0	0	53	0	0	54
Lane Group Flow (vph)	25	1752	43	94	1057	40	35	12	20	251	22	22
Heavy Vehicles (%)	2%	4%	5%	0%	7%	2%	13%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	3.6	55.2	55.2	7.5	59.1	59.1	35.6	32.3	32.3	40.0	34.5	34.5
Effective Green, g (s)	3.6	55.2	55.2	7.5	59.1	59.1	35.6	32.3	32.3	40.0	34.5	34.5
Actuated g/C Ratio	0.03	0.46	0.46	0.06	0.49	0.49	0.30	0.27	0.27	0.33	0.29	0.29
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	49	1492	661	102	1514	711	344	454	394	416	488	415
v/s Ratio Prot	0.02	c0.54		c0.06	0.34		0.00	0.01		c0.03	0.01	
v/s Ratio Perm			0.03			0.03	0.03		0.01	c0.17		0.02
v/c Ratio	0.51	1.17	0.06	0.92	0.70	0.06	0.10	0.03	0.05	0.60	0.05	0.05
Uniform Delay, d1	57.3	32.4	18.0	56.0	23.6	15.9	30.4	32.3	32.5	33.4	30.9	30.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.4	85.8	0.2	64.9	2.7	0.2	0.1	0.1	0.2	2.5	0.1	0.1
Delay (s)	68.8	118.2	18.2	120.8	26.2	16.0	30.5	32.4	32.7	35.9	30.9	31.0
Level of Service	E	F	B	F	C	B	C	C	C	D	C	C
Approach Delay (s)		112.6			32.8			32.1			34.5	
Approach LOS		F			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	74.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	1	4	74	114	84
Future Volume (Veh/h)	39	1	4	74	114	84
Sign Control	Stop			Free	Free	
Grade	0%			3%	-3%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	46	1	5	88	136	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					260	
pX, platoon unblocked						
vC, conflicting volume	284	186	236			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284	186	236			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	93	100	100			
cM capacity (veh/h)	708	861	1207			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	47	93	236
Volume Left	46	5	0
Volume Right	1	0	100
cSH	710	1207	1700
Volume to Capacity	0.07	0.00	0.14
Queue Length 95th (ft)	5	0	0
Control Delay (s)	10.4	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	0.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	13	29	63	73	42
Future Volume (Veh/h)	15	13	29	63	73	42
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	18	15	34	74	86	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					680	
pX, platoon unblocked						
vC, conflicting volume	252	110	135			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	252	110	135			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	97	98	98			
cM capacity (veh/h)	694	948	1462			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	33	108	135
Volume Left	18	34	0
Volume Right	15	0	49
cSH	790	1462	1700
Volume to Capacity	0.04	0.02	0.08
Queue Length 95th (ft)	3	2	0
Control Delay (s)	9.8	2.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	2.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	0	8	89	82	4
Future Volume (Veh/h)	3	0	8	89	82	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	4	0	10	107	99	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					793	
pX, platoon unblocked						
vC, conflicting volume	228	102	104			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	228	102	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 %	99	100	99			
cM capacity (veh/h)	759	959	1500			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	4	117	104
Volume Left	4	10	0
Volume Right	0	0	5
cSH	759	1500	1700
Volume to Capacity	0.01	0.01	0.06
Queue Length 95th (ft)	0	1	0
Control Delay (s)	9.8	0.7	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	0.7	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	2	3	91	73	9
Future Volume (Veh/h)	6	2	3	91	73	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	8	3	4	117	94	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1143	
pX, platoon unblocked						
vC, conflicting volume	225	100	106			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	225	100	106			
tC, single (s)	6.8	6.7	4.1			
tC, 2 stage (s)						
tF (s)	3.9	3.8	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	684	839	1498			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	121	106
Volume Left	8	4	0
Volume Right	3	0	12
cSH	721	1498	1700
Volume to Capacity	0.02	0.00	0.06
Queue Length 95th (ft)	1	0	0
Control Delay (s)	10.1	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	10.1	0.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	17.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCS 2010 Two-Way Stop Control Summary Report

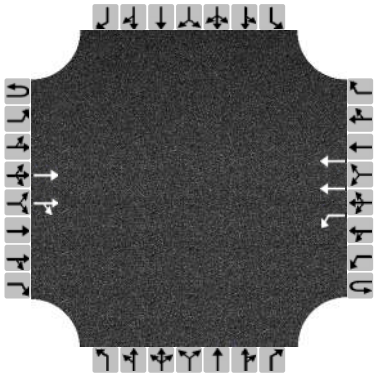
General Information

Analyst	Kittelson & Associates
Agency/Co.	City of Newberg
Date Performed	3/7/2018
Analysis Year	2020
Time Analyzed	Background AM
Intersection Orientation	East-West
Project Description	Newberg Providence Medical Center

Site Information

Intersection	OR 99 W/PNMC Access
Jurisdiction	Newberg, Oregon
East/West Street	OR 99W
North/South Street	Right-In, Left-Out Access
Peak Hour Factor	0.89
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	1	2	0		0	0	0		0	0	0
Configuration			T	TR		L	T									
Volume (veh/h)			1772	51		18	1088									
Percent Heavy Vehicles						3										
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						20										
Capacity						267										
v/c Ratio						0.07										
95% Queue Length						0.2										
Control Delay (s/veh)						19.6										
Level of Service (LOS)						C										
Approach Delay (s/veh)					0.3											
Approach LOS																

HCS 2010 Roundabout Report

General Information

Analyst	Kittelson & Associates, Inc.
Agency or Co.	City of Newberg
Date Performed	3/6/2018
Analysis Year	2020
Time Period	Background AM
Project Description	Newberg Providence Medical Center

Site Information

Intersection	Werth Blvd/Providence Dr/Hayes St
E/W Street Name	Providence Dr/Hayes St
N/S Street Name	Werth Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.78
Jurisdiction	Newberg, OR

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	1	81	4	0	18	24	1	0	2	0	7	0	2	1	2
Percent Heavy Vehicles, %	0	0	3	0	0	0	6	100	0	0	0	0	0	0	100	0
Flow Rate (vPCE) pc/h	0	1	107	5	0	23	33	3	0	3	0	9	0	3	3	3
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	1				1				0				2			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		113			59			12			9	
Entry Volume veh/h		110			56			12			8	
Circulating Flow (Vc), pc/h		29			4			111			59	
Exiting Flow (Vex), pc/h		119			39			4			31	
Capacity (cPCE), pc/h		1098			1126			1011			1065	
Capacity (c), veh/h		1067			1061			1011			887	
v/c Ratio (X)		0.10			0.05			0.01			0.01	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			3.8			3.7			4.1	
Lane LOS		A			A			A			A	
95% Queue		0.3			0.2			0.0			0.0	
Approach Delay, s/veh	4.3			3.8			3.7			4.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	4.1						A					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	2	101	12	1	53
Future Volume (Veh/h)	11	2	101	12	1	53
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	14	3	126	15	1	66
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	202	134			142	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	202	134			142	
tC, single (s)	6.4	7.2			5.1	
tC, 2 stage (s)						
tF (s)	3.5	4.2			3.1	
p0 queue free %	98	100			100	
cM capacity (veh/h)	789	707			1008	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	14	3	141	1	66
Volume Left	14	0	0	1	0
Volume Right	0	3	15	0	0
cSH	789	707	1700	1008	1700
Volume to Capacity	0.02	0.00	0.08	0.00	0.04
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	9.6	10.1	0.0	8.6	0.0
Lane LOS	A	B		A	
Approach Delay (s)	9.7		0.0	0.1	
Approach LOS	A				

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	16.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	63	44	105	50	21	43
Future Volume (Veh/h)	63	44	105	50	21	43
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	75	52	125	60	25	51
Pedestrians			1		1	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	186				359	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	186				359	156
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	94				96	94
cM capacity (veh/h)	1363				598	884

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	75	52	185	25	51
Volume Left	75	0	0	25	0
Volume Right	0	0	60	0	51
cSH	1363	1700	1700	598	884
Volume to Capacity	0.06	0.03	0.11	0.04	0.06
Queue Length 95th (ft)	4	0	0	3	5
Control Delay (s)	7.8	0.0	0.0	11.3	9.3
Lane LOS	A			B	A
Approach Delay (s)	4.6		0.0	10.0	
Approach LOS				A	

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Queues
1: Providence Dr & N Hwy 99W

03/07/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	105	1179	35	84	2018	206	121	29	146	220	12	79
v/c Ratio	0.44	0.58	0.04	0.49	1.08	0.23	0.60	0.25	0.62	1.08	0.10	0.40
Control Delay	61.9	18.1	0.1	68.5	74.4	5.8	65.3	65.7	21.0	138.9	61.1	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	18.1	0.1	68.5	74.4	5.8	65.3	65.7	21.0	138.9	61.1	10.6
Queue Length 50th (ft)	90	315	0	73	~1053	26	101	26	0	~222	11	0
Queue Length 95th (ft)	150	453	0	127	#1275	72	159	58	67	#350	31	28
Internal Link Dist (ft)		676			463			180			285	
Turn Bay Length (ft)	150		100	230		300	160		160	350		150
Base Capacity (vph)	238	2043	948	171	1873	912	202	369	428	203	371	393
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.58	0.04	0.49	1.08	0.23	0.60	0.08	0.34	1.08	0.03	0.20

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	1120	33	80	1917	196	115	28	139	209	11	75
Future Volume (vph)	100	1120	33	80	1917	196	115	28	139	209	11	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1687	3309	1478	1646	3227	1473	1619	1724	1465	1646	1732	1452
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	1687	3309	1478	1646	3227	1473	1277	1724	1465	1253	1732	1452
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)	105	1179	35	84	2018	206	121	29	146	220	12	79
RTOR Reduction (vph)	0	0	13	0	0	58	0	0	136	0	0	74
Lane Group Flow (vph)	105	1179	22	84	2018	148	121	29	10	220	12	5
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	19.8	86.5	86.5	14.5	81.2	81.2	19.3	9.5	9.5	19.7	9.7	9.7
Effective Green, g (s)	19.8	86.5	86.5	14.5	81.2	81.2	19.3	9.5	9.5	19.7	9.7	9.7
Actuated g/C Ratio	0.14	0.62	0.62	0.10	0.58	0.58	0.14	0.07	0.07	0.14	0.07	0.07
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	238	2044	913	170	1871	854	199	116	99	204	120	100
v/s Ratio Prot	c0.06	c0.36		0.05	c0.63		0.04	0.02		c0.08	0.01	
v/s Ratio Perm			0.01			0.10	0.04		0.01	c0.07		0.00
v/c Ratio	0.44	0.58	0.02	0.49	1.08	0.17	0.61	0.25	0.10	1.08	0.10	0.05
Uniform Delay, d1	55.0	15.9	10.4	59.3	29.4	13.7	56.2	61.9	61.2	59.5	61.1	60.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.2	0.0	3.1	45.6	0.4	5.2	1.5	0.6	85.4	0.5	0.3
Delay (s)	56.8	17.1	10.4	62.3	75.0	14.2	61.4	63.4	61.8	144.9	61.6	61.2
Level of Service	E	B	B	E	E	B	E	E	E	F	E	E
Approach Delay (s)		20.1			69.1			61.8			120.4	
Approach LOS		C			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	57.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	116	5	2	166	104	20
Future Volume (Veh/h)	116	5	2	166	104	20
Sign Control	Stop			Free	Free	
Grade	0%			3%	-3%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	163	7	3	234	146	28
Pedestrians	3					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					260	
pX, platoon unblocked						
vC, conflicting volume	403	163	177			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	403	163	177			
tC, single (s)	6.4	6.2	4.6			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.7			
p0 queue free %	73	99	100			
cM capacity (veh/h)	604	884	1152			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	170	237	174
Volume Left	163	3	0
Volume Right	7	0	28
cSH	612	1152	1700
Volume to Capacity	0.28	0.00	0.10
Queue Length 95th (ft)	28	0	0
Control Delay (s)	13.1	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	13.1	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	39	3	133	106	3
Future Volume (Veh/h)	35	39	3	133	106	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	47	52	4	177	141	4
Pedestrians	3					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					680	
pX, platoon unblocked						
vC, conflicting volume	331	146	148			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	331	146	148			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	94	100			
cM capacity (veh/h)	658	904	1442			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	99	181	145
Volume Left	47	4	0
Volume Right	52	0	4
cSH	768	1442	1700
Volume to Capacity	0.13	0.00	0.09
Queue Length 95th (ft)	11	0	0
Control Delay (s)	10.4	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	20.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	14	3	120	143	2
Future Volume (Veh/h)	16	14	3	120	143	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	21	18	4	156	186	3
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					793	
pX, platoon unblocked						
vC, conflicting volume	356	192	193			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	356	192	193			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	100			
cM capacity (veh/h)	642	852	1387			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	39	160	189
Volume Left	21	4	0
Volume Right	18	0	3
cSH	725	1387	1700
Volume to Capacity	0.05	0.00	0.11
Queue Length 95th (ft)	4	0	0
Control Delay (s)	10.3	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.3	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	18.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	3	2	122	155	2
Future Volume (Veh/h)	1	3	2	122	155	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	1	4	3	161	204	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1143	
pX, platoon unblocked						
vC, conflicting volume	372	206	207			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	372	206	207			
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)	631	840	1376			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	5	164	207
Volume Left	1	3	0
Volume Right	4	0	3
cSH	788	1376	1700
Volume to Capacity	0.01	0.00	0.12
Queue Length 95th (ft)	0	0	0
Control Delay (s)	9.6	0.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	0.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCS 2010 Two-Way Stop Control Summary Report

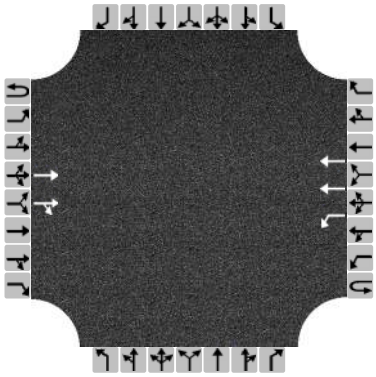
General Information

Analyst	Kittelson & Associates
Agency/Co.	City of Newberg
Date Performed	3/7/2018
Analysis Year	2020
Time Analyzed	Background PM
Intersection Orientation	East-West
Project Description	Newberg Providence Medical Center

Site Information

Intersection	OR 99 W/PNMC Access
Jurisdiction	Newberg, Oregon
East/West Street	OR 99W
North/South Street	Right-In, Left-Out Access
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	1	2	0		0	0	0		0	0	0
Configuration			T	TR		L	T									
Volume (veh/h)			1264	20		2	2034									
Percent Heavy Vehicles						3										
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						2										
Capacity						512										
v/c Ratio						0.00										
95% Queue Length						0.0										
Control Delay (s/veh)						12.1										
Level of Service (LOS)						B										
Approach Delay (s/veh)					0.0											
Approach LOS																

HCS 2010 Roundabout Report

General Information

Analyst	Kittelson & Associates, Inc.
Agency or Co.	City of Newberg
Date Performed	3/6/2018
Analysis Year	2020
Time Period	Background PM
Project Description	Newberg Providence Medical Center

Site Information

Intersection	Werth Blvd/Providence Dr/Hayes St
E/W Street Name	Providence Dr/Hayes St
N/S Street Name	Werth Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.79
Jurisdiction	Newberg, OR

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	4	56	7	0	16	132	0	0	10	0	26	0	0	1	2
Percent Heavy Vehicles, %	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
Flow Rate (vPCE) pc/h	0	5	72	9	0	20	169	0	0	13	0	33	0	0	1	3
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				2				1				1			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		86			189			46			4	
Entry Volume veh/h		85			187			46			4	
Circulating Flow (Vc), pc/h		21			18			77			202	
Exiting Flow (Vex), pc/h		105			185			5			30	
Capacity (cPCE), pc/h		1107			1110			1046			923	
Capacity (c), veh/h		1088			1100			1046			923	
v/c Ratio (X)		0.08			0.17			0.04			0.00	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.0			4.8			3.8			3.9	
Lane LOS		A			A			A			A	
95% Queue		0.3			0.6			0.1			0.0	
Approach Delay, s/veh	4.0			4.8			3.8			3.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	4.4						A					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	21	7	139	19	4	238
Future Volume (Veh/h)	21	7	139	19	4	238
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)	23	8	151	21	4	259
Pedestrians	8					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	1					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	436	170			180	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	436	170			180	
tC, single (s)	6.4	6.4			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.4	
p0 queue free %	96	99			100	
cM capacity (veh/h)	575	829			1259	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	23	8	172	4	259
Volume Left	23	0	0	4	0
Volume Right	0	8	21	0	0
cSH	575	829	1700	1259	1700
Volume to Capacity	0.04	0.01	0.10	0.00	0.15
Queue Length 95th (ft)	3	1	0	0	0
Control Delay (s)	11.5	9.4	0.0	7.9	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.0		0.0	0.1	
Approach LOS	B				

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	104	94	83	54	93	166
Future Volume (Veh/h)	104	94	83	54	93	166
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	121	109	97	63	108	193
Pedestrians			3		18	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	178				500	146
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	178				500	146
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				77	78
cM capacity (veh/h)	1386				474	888

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	121	109	160	108	193
Volume Left	121	0	0	108	0
Volume Right	0	0	63	0	193
cSH	1386	1700	1700	474	888
Volume to Capacity	0.09	0.06	0.09	0.23	0.22
Queue Length 95th (ft)	7	0	0	22	21
Control Delay (s)	7.8	0.0	0.0	14.8	10.2
Lane LOS	A			B	B
Approach Delay (s)	4.1		0.0	11.8	
Approach LOS				B	

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E Year 2019 Total Traffic Conditions

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Queues
1: Providence Dr & N Hwy 99W

03/22/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	25	1752	117	122	1057	81	42	14	81	251	31	76
v/c Ratio	0.30	1.14	0.16	1.20	0.65	0.10	0.12	0.03	0.17	0.62	0.07	0.16
Control Delay	64.4	100.9	4.4	198.8	23.8	1.6	28.3	34.1	2.6	42.2	34.7	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	100.9	4.4	198.8	23.8	1.6	28.3	34.1	2.6	42.2	34.7	1.9
Queue Length 50th (ft)	19	~832	3	~114	326	0	22	8	0	151	18	0
Queue Length 95th (ft)	49	#971	35	#239	407	15	49	26	14	231	44	10
Internal Link Dist (ft)		676			463			180			303	
Turn Bay Length (ft)	150		100	230		300	160		160	350		150
Base Capacity (vph)	84	1541	740	102	1622	812	352	438	464	402	469	488
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.14	0.16	1.20	0.65	0.10	0.12	0.03	0.17	0.62	0.07	0.16

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1664	111	116	1004	77	40	13	77	238	29	72
Future Volume (vph)	24	1664	111	116	1004	77	40	13	77	238	29	72
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1687	3245	1438	1646	3076	1442	1449	1724	1465	1646	1732	1473
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	1687	3245	1438	1646	3076	1442	1124	1724	1465	1253	1732	1473
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)	25	1752	117	122	1057	81	42	14	81	251	31	76
RTOR Reduction (vph)	0	0	58	0	0	41	0	0	60	0	0	55
Lane Group Flow (vph)	25	1752	59	122	1057	41	42	14	21	251	31	21
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	4%	5%	0%	7%	0%	13%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	3.6	56.1	56.1	7.5	60.0	60.0	35.8	31.4	31.4	38.0	32.5	32.5
Effective Green, g (s)	3.6	56.1	56.1	7.5	60.0	60.0	35.8	31.4	31.4	38.0	32.5	32.5
Actuated g/C Ratio	0.03	0.47	0.47	0.06	0.50	0.50	0.30	0.26	0.26	0.32	0.27	0.27
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	50	1517	672	102	1538	721	347	451	383	414	469	398
v/s Ratio Prot	0.01	c0.54		c0.07	0.34		0.00	0.01		c0.03	0.02	
v/s Ratio Perm			0.04			0.03	0.03		0.01	c0.16		0.01
v/c Ratio	0.50	1.15	0.09	1.20	0.69	0.06	0.12	0.03	0.06	0.61	0.07	0.05
Uniform Delay, d1	57.3	31.9	17.7	56.2	22.9	15.4	30.4	33.0	33.2	34.3	32.5	32.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.3	77.7	0.3	151.1	2.5	0.1	0.2	0.1	0.3	2.5	0.1	0.1
Delay (s)	67.6	109.6	18.0	207.3	25.4	15.6	30.6	33.1	33.5	36.8	32.6	32.4
Level of Service	E	F	B	F	C	B	C	C	C	D	C	C
Approach Delay (s)		103.4			42.4			32.5			35.5	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	73.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	1	4	91	172	84
Future Volume (Veh/h)	39	1	4	91	172	84
Sign Control	Stop			Free	Free	
Grade	0%			3%	-3%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	46	1	5	108	205	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					260	
pX, platoon unblocked						
vC, conflicting volume	373	255	305			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	373	255	305			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	93	100	100			
cM capacity (veh/h)	629	789	1136			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	47	113	305
Volume Left	46	5	0
Volume Right	1	0	100
cSH	632	1136	1700
Volume to Capacity	0.07	0.00	0.18
Queue Length 95th (ft)	6	0	0
Control Delay (s)	11.2	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	11.2	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	15	0	13	2	0	13	29	67	5	43	88	42
Future Volume (Veh/h)	15	0	13	2	0	13	29	67	5	43	88	42
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.92	0.85	0.92	0.92	0.92	0.85	0.85	0.92	0.92	0.85	0.85
Hourly flow rate (vph)	18	0	15	2	0	14	34	79	5	47	104	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											680	
pX, platoon unblocked												
vC, conflicting volume	386	374	128	387	396	82	153			84		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	386	374	128	387	396	82	153			84		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	98	100	100	99	98			97		
cM capacity (veh/h)	521	526	927	539	512	978	1440			1513		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	33	16	118	200
Volume Left	18	2	34	47
Volume Right	15	14	5	49
cSH	651	888	1440	1513
Volume to Capacity	0.05	0.02	0.02	0.03
Queue Length 95th (ft)	4	1	2	2
Control Delay (s)	10.8	9.1	2.3	1.9
Lane LOS	B	A	A	A
Approach Delay (s)	10.8	9.1	2.3	1.9
Approach LOS	B	A		

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	0	8	98	99	4
Future Volume (Veh/h)	3	0	8	98	99	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	4	0	10	118	119	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					793	
pX, platoon unblocked						
vC, conflicting volume	260	122	124			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260	122	124			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	99			
cM capacity (veh/h)	729	935	1475			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	4	128	124
Volume Left	4	10	0
Volume Right	0	0	5
cSH	729	1475	1700
Volume to Capacity	0.01	0.01	0.07
Queue Length 95th (ft)	0	1	0
Control Delay (s)	10.0	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	10.0	0.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	4	102	15	15	84
Future Volume (Veh/h)	5	4	102	15	15	84
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25
Hourly flow rate (vph)	20	16	408	60	60	336
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						1093
pX, platoon unblocked						
vC, conflicting volume	894	438			468	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	894	438			468	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	97			95	
cM capacity (veh/h)	297	623			1104	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	468	396
Volume Left	20	0	60
Volume Right	16	60	0
cSH	387	1700	1104
Volume to Capacity	0.09	0.28	0.05
Queue Length 95th (ft)	8	0	4
Control Delay (s)	15.3	0.0	1.8
Lane LOS	C		A
Approach Delay (s)	15.3	0.0	1.8
Approach LOS	C		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	21.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	2	3	111	80	9
Future Volume (Veh/h)	6	2	3	111	80	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	8	3	4	142	103	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1143	
pX, platoon unblocked						
vC, conflicting volume	259	109	115			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	259	109	115			
tC, single (s)	6.8	6.7	4.1			
tC, 2 stage (s)						
tF (s)	3.9	3.8	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	653	829	1487			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	146	115
Volume Left	8	4	0
Volume Right	3	0	12
cSH	693	1487	1700
Volume to Capacity	0.02	0.00	0.07
Queue Length 95th (ft)	1	0	0
Control Delay (s)	10.3	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.3	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCS 2010 Two-Way Stop Control Summary Report

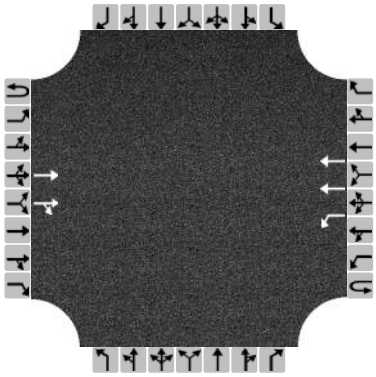
General Information

Analyst	Kittelson & Associates
Agency/Co.	City of Newberg
Date Performed	3/20/2018
Analysis Year	2020
Time Analyzed	Total Traffic AM
Intersection Orientation	East-West
Project Description	Newberg Providence Medical Center

Site Information

Intersection	OR 99 W/PNMC Access
Jurisdiction	Newberg, Oregon
East/West Street	OR 99W
North/South Street	Right-In, Left-Out Access
Peak Hour Factor	0.89
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	1	2	0		0	0	0		0	0	0
Configuration			T	TR		L	T									
Volume (veh/h)			1795	51		18	1095									
Percent Heavy Vehicles						3										
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						20										
Capacity						261										
v/c Ratio						0.08										
95% Queue Length						0.2										
Control Delay (s/veh)						19.9										
Level of Service (LOS)						C										
Approach Delay (s/veh)					0.3											
Approach LOS																

HCS 2010 Roundabout Report

General Information

Analyst	Kittelson & Associates, Inc.
Agency or Co.	City of Newberg
Date Performed	3/20/2018
Analysis Year	2020
Time Period	Total Traffic AM
Project Description	Newberg Providence Medical Center

Site Information

Intersection	Werth Blvd/Providence Dr/Hayes St
E/W Street Name	Providence Dr/Hayes St
N/S Street Name	Werth Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.78
Jurisdiction	Newberg, OR

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	1	98	4	0	19	30	1	0	2	0	10	0	2	1	2
Percent Heavy Vehicles, %	0	0	3	0	0	0	6	100	0	0	0	0	0	0	100	0
Flow Rate (vPCE) pc/h	0	1	129	5	0	24	41	3	0	3	0	13	0	3	3	3
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	1				1				0				2			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		135			68			16			9	
Entry Volume veh/h		131			64			16			8	
Circulating Flow (Vc), pc/h		30			4			133			68	
Exiting Flow (Vex), pc/h		145			47			4			32	
Capacity (cPCE), pc/h		1097			1126			989			1056	
Capacity (c), veh/h		1066			1062			989			880	
v/c Ratio (X)		0.12			0.06			0.02			0.01	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.5			3.9			3.8			4.2	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.2			0.0			0.0	
Approach Delay, s/veh	4.5			3.9			3.8			4.2		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	4.2						A					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	2	114	15	1	58
Future Volume (Veh/h)	12	2	114	15	1	58
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	15	3	143	19	1	73
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	228	154			163	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	228	154			163	
tC, single (s)	6.4	7.2			5.1	
tC, 2 stage (s)						
tF (s)	3.5	4.2			3.1	
p0 queue free %	98	100			100	
cM capacity (veh/h)	763	688			987	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	15	3	162	1	73
Volume Left	15	0	0	1	0
Volume Right	0	3	19	0	0
cSH	763	688	1700	987	1700
Volume to Capacity	0.02	0.00	0.10	0.00	0.04
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	9.8	10.3	0.0	8.7	0.0
Lane LOS	A	B		A	
Approach Delay (s)	9.9		0.0	0.1	
Approach LOS	A				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	17.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	44	105	50	21	49
Future Volume (Veh/h)	79	44	105	50	21	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	94	52	125	60	25	58
Pedestrians			1		1	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	186				397	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	186				397	156
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	93				96	93
cM capacity (veh/h)	1363				560	884

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	94	52	185	25	58
Volume Left	94	0	0	25	0
Volume Right	0	0	60	0	58
cSH	1363	1700	1700	560	884
Volume to Capacity	0.07	0.03	0.11	0.04	0.07
Queue Length 95th (ft)	6	0	0	3	5
Control Delay (s)	7.8	0.0	0.0	11.7	9.4
Lane LOS	A			B	A
Approach Delay (s)	5.0		0.0	10.1	
Approach LOS				B	

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

Queues
1: Providence Dr & N Hwy 99W

03/22/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	105	1179	41	92	2018	206	143	37	171	220	14	79
v/c Ratio	0.44	0.59	0.04	0.50	1.09	0.23	0.68	0.29	0.66	1.05	0.11	0.39
Control Delay	61.9	19.6	0.1	67.2	78.8	6.0	69.6	65.8	22.7	128.5	60.2	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	19.6	0.1	67.2	78.8	6.0	69.6	65.8	22.7	128.5	60.2	10.1
Queue Length 50th (ft)	90	328	0	80	~1061	26	120	33	7	~212	12	0
Queue Length 95th (ft)	150	472	0	137	#1294	74	182	68	80	#324	34	28
Internal Link Dist (ft)		676			463			180			257	
Turn Bay Length (ft)	150		100	230		300	160		160	350		150
Base Capacity (vph)	238	1995	928	185	1855	905	209	369	442	210	371	393
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.59	0.04	0.50	1.09	0.23	0.68	0.10	0.39	1.05	0.04	0.20

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	1120	39	87	1917	196	136	35	162	209	13	75
Future Volume (vph)	100	1120	39	87	1917	196	136	35	162	209	13	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1687	3309	1478	1646	3227	1473	1619	1724	1465	1646	1732	1452
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1687	3309	1478	1646	3227	1473	1275	1724	1465	1270	1732	1452
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)	105	1179	41	92	2018	206	143	37	171	220	14	79
RTOR Reduction (vph)	0	0	16	0	0	58	0	0	151	0	0	73
Lane Group Flow (vph)	105	1179	25	92	2018	148	143	37	20	220	14	6
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	19.8	84.4	84.4	15.8	80.4	80.4	20.3	10.3	10.3	20.3	10.3	10.3
Effective Green, g (s)	19.8	84.4	84.4	15.8	80.4	80.4	20.3	10.3	10.3	20.3	10.3	10.3
Actuated g/C Ratio	0.14	0.60	0.60	0.11	0.57	0.57	0.15	0.07	0.07	0.15	0.07	0.07
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	238	1994	891	185	1853	845	209	126	107	211	127	106
v/s Ratio Prot	c0.06	c0.36		0.06	c0.63		0.05	0.02		c0.07	0.01	
v/s Ratio Perm			0.02			0.10	0.05		0.01	c0.08		0.00
v/c Ratio	0.44	0.59	0.03	0.50	1.09	0.17	0.68	0.29	0.19	1.04	0.11	0.05
Uniform Delay, d1	55.0	17.2	11.2	58.4	29.8	14.1	56.2	61.4	60.9	59.2	60.6	60.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.3	0.1	2.9	49.7	0.5	8.9	1.8	1.2	73.6	0.5	0.3
Delay (s)	56.8	18.5	11.3	61.2	79.5	14.6	65.1	63.2	62.1	132.8	61.1	60.6
Level of Service	E	B	B	E	E	B	E	E	E	F	E	E
Approach Delay (s)		21.3			73.0			63.4			111.4	
Approach LOS		C			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	116	5	2	217	119	20
Future Volume (Veh/h)	116	5	2	217	119	20
Sign Control	Stop			Free	Free	
Grade	0%			3%	-3%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	163	7	3	306	168	28
Pedestrians	3					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					260	
pX, platoon unblocked						
vC, conflicting volume	497	185	199			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	497	185	199			
tC, single (s)	6.4	6.2	4.6			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.7			
p0 queue free %	69	99	100			
cM capacity (veh/h)	533	860	1129			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	170	309	196
Volume Left	163	3	0
Volume Right	7	0	28
cSH	542	1129	1700
Volume to Capacity	0.31	0.00	0.12
Queue Length 95th (ft)	33	0	0
Control Delay (s)	14.7	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	14.7	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	39	4	0	38	3	146	1	11	110	3
Future Volume (Veh/h)	35	0	39	4	0	38	3	146	1	11	110	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.92	0.75	0.92	0.92	0.92	0.75	0.75	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	47	0	52	4	0	41	4	195	1	12	147	4
Pedestrians		3										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											680	
pX, platoon unblocked												
vC, conflicting volume	420	380	152	428	382	196	154			196		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	420	380	152	428	382	196	154			196		
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 %	91	100	94	99	100	95	100			99		
cM capacity (veh/h)	508	544	897	500	543	846	1435			1377		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	99	45	200	163
Volume Left	47	4	4	12
Volume Right	52	41	1	4
cSH	658	797	1435	1377
Volume to Capacity	0.15	0.06	0.00	0.01
Queue Length 95th (ft)	13	4	0	1
Control Delay (s)	11.4	9.8	0.2	0.6
Lane LOS	B	A	A	A
Approach Delay (s)	11.4	9.8	0.2	0.6
Approach LOS	B	A		

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	29.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	14	3	134	151	2
Future Volume (Veh/h)	16	14	3	134	151	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	21	18	4	174	196	3
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					793	
pX, platoon unblocked						
vC, conflicting volume	384	202	203			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384	202	203			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	100			
cM capacity (veh/h)	619	841	1376			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	39	178	199
Volume Left	21	4	0
Volume Right	18	0	3
cSH	705	1376	1700
Volume to Capacity	0.06	0.00	0.12
Queue Length 95th (ft)	4	0	0
Control Delay (s)	10.4	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	13	124	3	4	161
Future Volume (Veh/h)	12	13	124	3	4	161
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25
Hourly flow rate (vph)	48	52	496	12	16	644
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						1093
pX, platoon unblocked						
vC, conflicting volume	1178	502			508	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1178	502			508	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	91			99	
cM capacity (veh/h)	210	573			1067	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	100	508	660
Volume Left	48	0	16
Volume Right	52	12	0
cSH	313	1700	1067
Volume to Capacity	0.32	0.30	0.01
Queue Length 95th (ft)	34	0	1
Control Delay (s)	21.8	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	21.8	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	21.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	3	2	126	171	2
Future Volume (Veh/h)	1	3	2	126	171	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	1	4	3	166	225	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1143	
pX, platoon unblocked						
vC, conflicting volume	398	226	228			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	398	226	228			
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)	610	818	1352			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	5	169	228
Volume Left	1	3	0
Volume Right	4	0	3
cSH	766	1352	1700
Volume to Capacity	0.01	0.00	0.13
Queue Length 95th (ft)	0	0	0
Control Delay (s)	9.7	0.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.7	0.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCS 2010 Two-Way Stop Control Summary Report

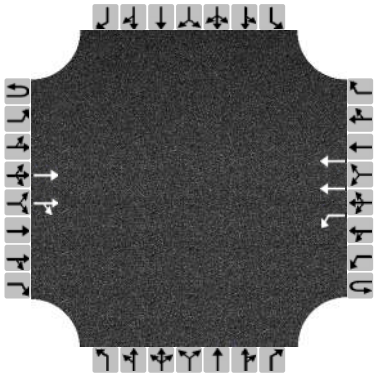
General Information

Analyst	Kittelson & Associates
Agency/Co.	City of Newberg
Date Performed	3/20/2018
Analysis Year	2020
Time Analyzed	Total Traffic PM
Intersection Orientation	East-West
Project Description	Newberg Providence Medical Center

Site Information

Intersection	OR 99 W/PNMC Access
Jurisdiction	Newberg, Oregon
East/West Street	OR 99W
North/South Street	Right-In, Left-Out Access
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	1	2	0		0	0	0		0	0	0
Configuration			T	TR		L	T									
Volume (veh/h)			1270	20		2	2055									
Percent Heavy Vehicles						3										
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						2										
Capacity						510										
v/c Ratio						0.00										
95% Queue Length						0.0										
Control Delay (s/veh)						12.1										
Level of Service (LOS)						B										
Approach Delay (s/veh)					0.0											
Approach LOS																

HCS 2010 Roundabout Report

General Information

Analyst	Kittelson & Associates, Inc.
Agency or Co.	City of Newberg
Date Performed	3/20/2018
Analysis Year	2020
Time Period	Total Traffic PM
Project Description	Newberg Providence Medical Center

Site Information

Intersection	Werth Blvd/Providence Dr/Hayes St
E/W Street Name	Providence Dr/Hayes St
N/S Street Name	Werth Blvd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.79
Jurisdiction	Newberg, OR

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	4	59	7	0	19	145	0	0	10	0	27	0	0	1	2
Percent Heavy Vehicles, %	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
Flow Rate (vPCE) pc/h	0	5	76	9	0	24	185	0	0	13	0	34	0	0	1	3
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				2				1				1			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		90			209			47			4	
Entry Volume veh/h		89			207			47			4	
Circulating Flow (Vc), pc/h	25			18			81			222		
Exiting Flow (Vex), pc/h	110			201			5			34		
Capacity (cPCE), pc/h		1102			1110			1042			905	
Capacity (c), veh/h		1084			1100			1042			905	
v/c Ratio (X)		0.08			0.19			0.05			0.00	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.0			5.0			3.8			4.0	
Lane LOS		A			A			A			A	
95% Queue		0.3			0.7			0.1			0.0	
Approach Delay, s/veh	4.0			5.0			3.8			4.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	4.6						A					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	7	141	20	4	248
Future Volume (Veh/h)	24	7	141	20	4	248
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)	26	8	153	22	4	270
Pedestrians	8					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	1					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	450	173			183	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450	173			183	
tC, single (s)	6.4	6.4			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.4	
p0 queue free %	95	99			100	
cM capacity (veh/h)	564	826			1255	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	26	8	175	4	270
Volume Left	26	0	0	4	0
Volume Right	0	8	22	0	0
cSH	564	826	1700	1255	1700
Volume to Capacity	0.05	0.01	0.10	0.00	0.16
Queue Length 95th (ft)	4	1	0	0	0
Control Delay (s)	11.7	9.4	0.0	7.9	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.1		0.0	0.1	
Approach LOS	B				

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	107	94	83	54	93	179
Future Volume (Veh/h)	107	94	83	54	93	179
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	124	109	97	63	108	208
Pedestrians			3		18	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	178				506	146
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	178				506	146
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				77	77
cM capacity (veh/h)	1386				469	888

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	124	109	160	108	208
Volume Left	124	0	0	108	0
Volume Right	0	0	63	0	208
cSH	1386	1700	1700	469	888
Volume to Capacity	0.09	0.06	0.09	0.23	0.23
Queue Length 95th (ft)	7	0	0	22	23
Control Delay (s)	7.9	0.0	0.0	15.0	10.3
Lane LOS	A			B	B
Approach Delay (s)	4.2		0.0	11.9	
Approach LOS				B	

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix F Turn Lane Warrant Worksheets

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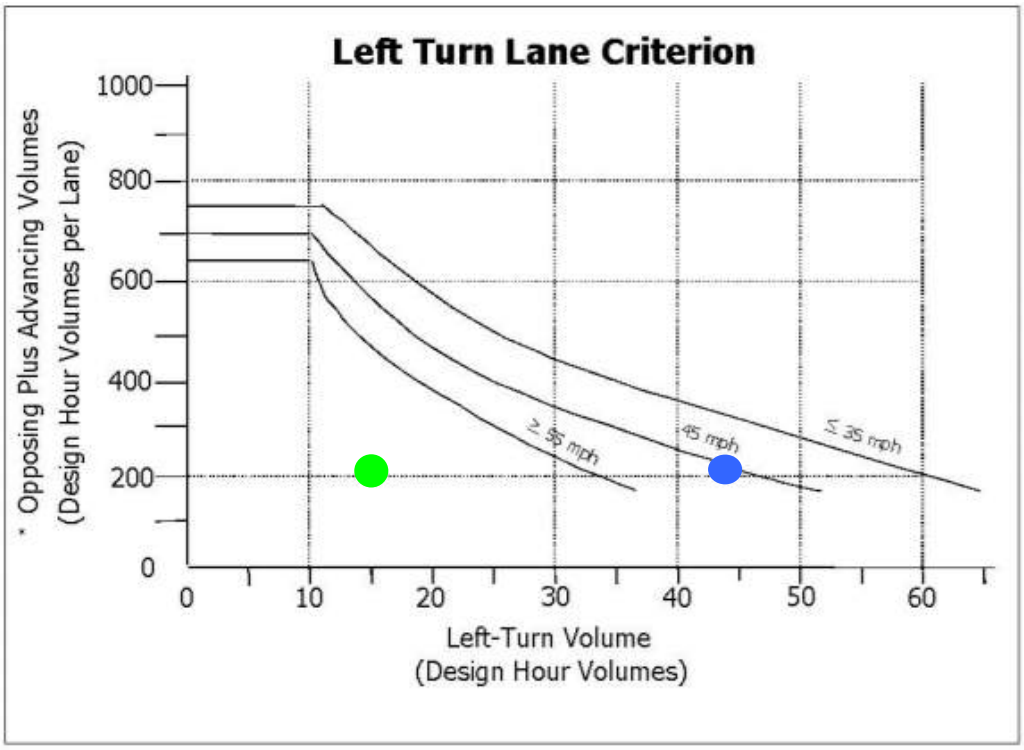
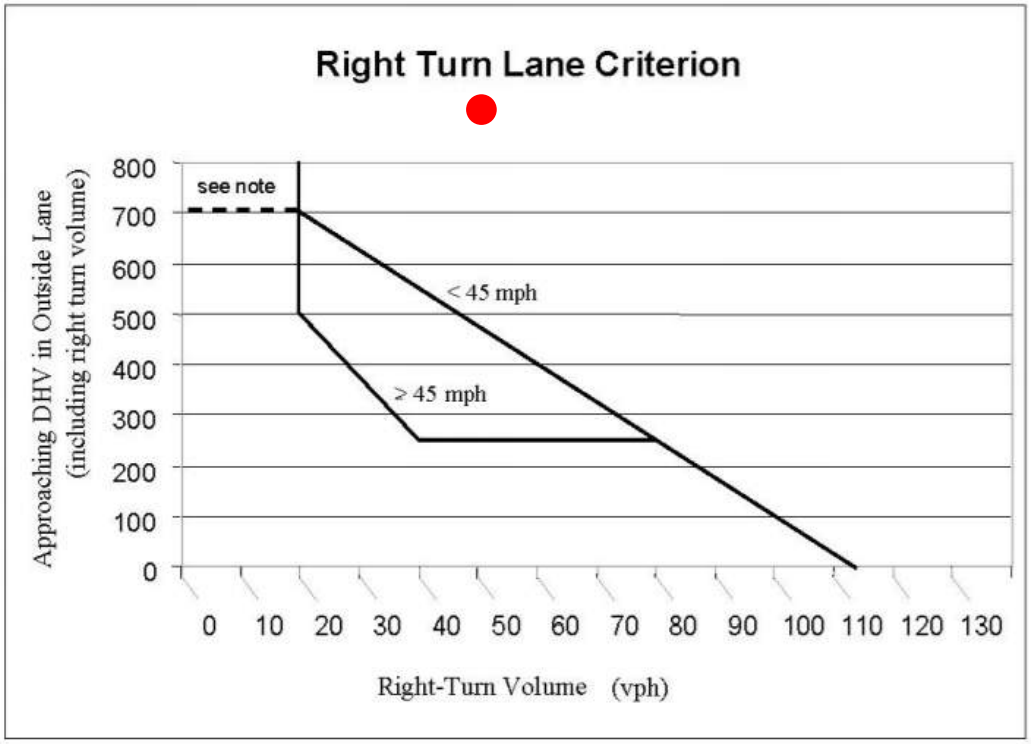
ODOT APM Turn Lane Criteria: Exhibit 7-1 & 7-2



Intersection 3: Providence Drive/PNMC Middle Driveway (AM Peak highest)

Intersection 5: Providence Drive/New Campus Expansion Access (AM Peak highest)



Intersection 7: OR 99W/ PNMC Right-In, Left-In Only Access (Above Approaching DHV limit)

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Appendix G Pedestrian Crossing Worksheets

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GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in conjunction with, and not independent of, Appendix A documentation.

This spreadsheet is still under development, please inform TTI if errors are identified.

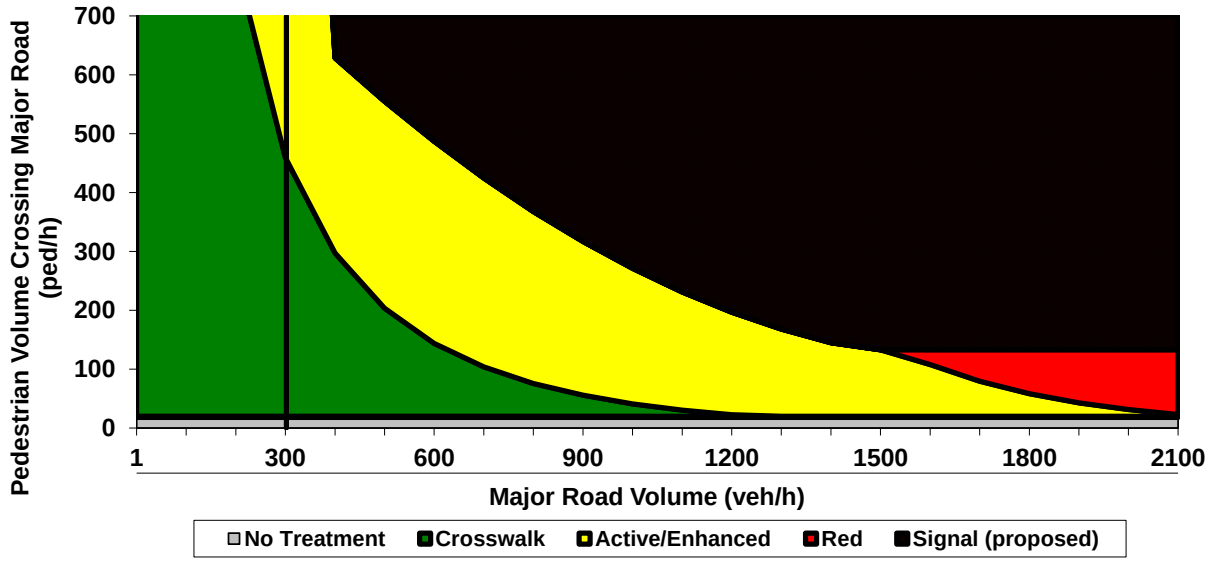
Key

- Blue fields contain descriptive information.
- Green fields are required and must be completed.
- Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).
- Gray fields are automatically calculated and should not be edited.

Analyst and Site Information			
Analyst	Chris Brehmer	Major Street	Providence Drive
Analysis Date	March 19, 2018	Minor Street or Location	Mid-block
Data Collection Date	February 6, 2018	Peak Hour	PM

Step 1: Select worksheet:			
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)		*1a*	25
Is the population of the surrounding area <10,000? (enter ***YES*** or ***NO***)		*1b*	NO
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?			
Peak-hour pedestrian volume (ped/h), V_p		*2a*	18
Result: **Consider raised median islands, curb extensions, traffic calming, etc. as feasible.**			
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?			
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}		*3a*	302
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant		*3b*	706
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant		*3c*	706
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)		*3d*	No
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce *3c* by up to 50%.	% rate of reduction for *3c* (up to 50%)	*3e*	
	Reduced value or *3c*	*3f*	706
Result:			
Step 4: Estimate pedestrian delay.			
Pedestrian crossing distance, curb to curb (ft), L		*4a*	35
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)		*4b*	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)		*4c*	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c		*4d*	13
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}		*4e*	302
Major road flow rate (veh/s), v		*4f*	0.08
Average pedestrian delay (s/person), d_p		*4g*	10
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		*4h*	0.0
		4i	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.			
Expected motorist compliance at pedestrian crossings in region: enter ***HIGH for High Compliance*** or ***LOW for Low Compliance***		*5a*	HIGH

Treatment Category:	**Consider raised median islands, curb extensions, traffic calming, etc. as feasible.**



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

Appendix F
Year 2020 Background with
Reassigned Traffic Conditions
Level of Service Worksheets

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Background with Reassigned Traffic AM
Project Description	Crestview Crossing

Site Information

Intersection	Springbrook/Crestview
E/W Street Name	Crestview Dr
N/S Street Name	Springbrook Rd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.66
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	2	54	23	54	0	3	24	67	2	49	254	2	1	211	145	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v_{PCE}), pc/h	3	89	39	84	0	5	36	102	3	76	400	3	2	400	228	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		215			143			482			849	
Entry Volume veh/h		200			143			465			746	
Circulating Flow (v_c), pc/h		638			573			533			123	
Exiting Flow (v_{ex}), pc/h		442			334			593			320	
Capacity (c_{pce}), pc/h		720			769			801			1217	
Capacity (c), veh/h		671			769			773			1069	
v/c Ratio (x)		0.30			0.19			0.60			0.70	

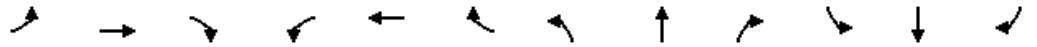
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.1			6.7			14.4			14.2	
Lane LOS		A			A			B			B	
95% Queue, veh		1.3			0.7			4.1			6.0	
Approach Delay, s/veh	9.1			6.7			14.4			14.2		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh | LOS	12.9						B					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	221	5	8	85	6	5
Future Volume (Veh/h)	221	5	8	85	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	325	7	12	125	9	7
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			332		478	328
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			332		478	328
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1239		515	717

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	332	137	16
Volume Left	0	12	9
Volume Right	7	0	7
cSH	1700	1239	587
Volume to Capacity	0.20	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.8	11.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	11.3
Approach LOS			B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	21.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	174	37	13	15	66	154	5	16	116	69
Future Volume (vph)	61	27	174	37	13	15	66	154	5	16	116	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	210	45	16	18	80	186	6	19	140	83

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	106	210	79	80	192	19	223
Volume Left (vph)	73	0	45	80	0	19	0
Volume Right (vph)	0	210	18	0	6	0	83
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16
Departure Headway (s)	6.5	5.4	6.4	6.6	6.1	6.8	5.9
Degree Utilization, x	0.19	0.32	0.14	0.15	0.32	0.04	0.36
Capacity (veh/h)	522	625	511	520	564	501	582
Control Delay (s)	9.8	9.7	10.5	9.5	10.7	8.8	11.0
Approach Delay (s)	9.7		10.5	10.4		10.8	
Approach LOS	A		B	B		B	

Intersection Summary				
Delay	10.3			
Level of Service	B			
Intersection Capacity Utilization	36.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1362	75	81	812	75	179	140	99	206	120	69
Future Volume (vph)	42	1362	75	81	812	75	179	140	99	206	120	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	47	1530	84	91	912	84	201	157	111	231	135	78
RTOR Reduction (vph)	0	0	37	0	0	38	0	0	96	0	0	68
Lane Group Flow (vph)	47	1530	47	91	912	46	201	157	15	231	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	67.0	67.0	6.3	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Effective Green, g (s)	6.9	67.0	67.0	6.3	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1784	798	152	1687	776	379	220	190	364	197	176
v/s Ratio Prot	0.03	c0.48		0.03	c0.30		0.07	c0.10		c0.07	0.09	
v/s Ratio Perm			0.03			0.03			0.01			0.01
v/c Ratio	0.52	0.86	0.06	0.60	0.54	0.06	0.53	0.71	0.08	0.63	0.69	0.06
Uniform Delay, d1	54.9	22.5	12.1	55.6	17.1	12.4	49.1	49.7	45.5	50.5	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.84	0.56	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	5.6	0.1	4.5	1.2	0.1	1.0	9.4	0.1	3.0	8.3	0.1
Delay (s)	57.9	28.0	12.2	51.2	10.7	1.5	50.0	59.1	45.6	53.4	58.5	46.3
Level of Service	E	C	B	D	B	A	D	E	D	D	E	D
Approach Delay (s)		28.1			13.3			52.0			53.7	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1523	43	70	915	28	58	3	87	11	5	27
Future Volume (vph)	19	1523	43	70	915	28	58	3	87	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	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	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.56	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		991	1361	
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)	21	1655	47	76	995	30	63	3	95	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	86	0	0	26	0
Lane Group Flow (vph)	21	1655	34	76	995	23	63	12	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.72	0.72	0.08	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2284	912	120	2375	982	108	137		96	132	
v/s Ratio Prot	0.01	c0.52		c0.05	0.32			0.01			0.01	
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.72	0.04	0.63	0.42	0.02	0.58	0.09		0.12	0.06	
Uniform Delay, d1	57.6	9.7	4.8	53.8	4.6	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.14	0.16	0.03	1.40	0.19	0.13	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.9	1.2	0.0	7.4	0.5	0.0	6.5	0.2		0.4	0.1	
Delay (s)	69.5	2.8	0.2	82.6	1.4	0.4	58.3	49.5		49.9	49.3	
Level of Service	E	A	A	F	A	A	E	D		D	D	
Approach Delay (s)		3.5			6.9			53.0			49.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	1575	1041	21	52	24
Future Volume (Veh/h)	4	1575	1041	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1694	1119	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.78				0.78	0.78
vC, conflicting volume	1142				1986	571
vC1, stage 1 conf vol					1130	
vC2, stage 2 conf vol					855	
vCu, unblocked vol	627				1704	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				80	97
cM capacity (veh/h)	755				274	854

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	847	847	746	396	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	755	1700	1700	1700	1700	350
Volume to Capacity	0.01	0.50	0.50	0.44	0.23	0.23
Queue Length 95th (ft)	0	0	0	0	0	22
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	18.4
Lane LOS	A					C
Approach Delay (s)	0.0			0.0		18.4
Approach LOS						C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1536	90	100	1019	69	42	8	71	214	13	1
Future Volume (vph)	1	1536	90	100	1019	69	42	8	71	214	13	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1607	3214	1480	1614	3111			1601	1465		1575	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.78	1.00		0.70	
Satd. Flow (perm)	1607	3214	1480	1614	3111			1305	1465		1153	
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)	1	1670	98	109	1108	75	46	9	77	233	14	1
RTOR Reduction (vph)	0	0	30	0	4	0	0	0	59	0	0	0
Lane Group Flow (vph)	1	1670	68	109	1179	0	0	55	18	0	248	0
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.0	67.5	67.5	9.0	75.5			28.5	28.5		28.5	
Effective Green, g (s)	1.0	67.5	67.5	9.0	75.5			28.5	28.5		28.5	
Actuated g/C Ratio	0.01	0.56	0.56	0.08	0.63			0.24	0.24		0.24	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	13	1807	832	121	1957			309	347		273	
v/s Ratio Prot	0.00	c0.52		c0.07	0.38							
v/s Ratio Perm			0.05					0.04	0.01		c0.22	
v/c Ratio	0.08	0.92	0.08	0.90	0.60			0.18	0.05		0.91	
Uniform Delay, d1	59.0	23.9	12.0	55.1	13.3			36.4	35.3		44.5	
Progression Factor	0.99	1.53	2.13	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	2.6	7.4	0.1	53.1	1.4			0.4	0.1		31.8	
Delay (s)	61.2	44.0	25.8	108.1	14.7			36.8	35.4		76.2	
Level of Service	E	D	C	F	B			D	D		E	
Approach Delay (s)		43.0			22.6			36.0			76.2	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1816	1180	29	62	6
Future Vol, veh/h	3	1816	1180	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	1912	1242	31	65	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1273	0	-	0	2219	636
Stage 1	-	-	-	-	1257	-
Stage 2	-	-	-	-	962	-
Critical Hdwy	4.76	-	-	-	6.46	6.7
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.53	-	-	-	3.53	3.3
Pot Cap-1 Maneuver	400	-	-	-	~ 47	441
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	366	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	400	-	-	-	~ 47	441
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	363	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	40.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	400	-	-	-	170
HCM Lane V/C Ratio	0.008	-	-	-	0.421
HCM Control Delay (s)	14.1	-	-	-	40.8
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.9

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

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Background with Reassigned Traffic PM
Project Description	Crestview Crossing

Site Information

Intersection	Springbrook/Crestview
E/W Street Name	Crestview Dr
N/S Street Name	Springbrook Rd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.93
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	53	2	13	0	3	2	162	0	7	374	7	2	182	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	57	2	14	0	4	2	174	0	8	414	8	2	196	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		73			180			430			539	
Entry Volume veh/h		73			179			418			533	
Circulating Flow (v_c), pc/h	490			481			257			14		
Exiting Flow (v_{ex}), pc/h	206			63			647			306		
Capacity (c_{pce}), pc/h		837			845			1062			1360	
Capacity (c), veh/h		837			842			1032			1346	
v/c Ratio (x)		0.09			0.21			0.40			0.40	

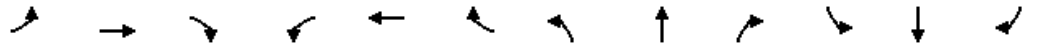
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.1			6.5			7.9			6.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.8			2.0			1.9	
Approach Delay, s/veh	5.1			6.5			7.9			6.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	6.8						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	179	5	9	161	8	14
Future Volume (Veh/h)	179	5	9	161	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	227	6	11	204	10	18
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			235		458	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			235		458	232
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1342		559	810

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	233	215	28
Volume Left	0	11	10
Volume Right	6	0	18
cSH	1700	1342	698
Volume to Capacity	0.14	0.01	0.04
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	0.5	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.4
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	219	91	68	86	136	202	5	67	181	40
Future Volume (vph)	83	63	219	91	68	86	136	202	5	67	181	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	228	95	71	90	142	210	5	70	189	42

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	228	256	142	215	70	231
Volume Left (vph)	86	0	95	142	0	70	0
Volume Right (vph)	0	228	90	0	5	0	42
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06
Departure Headway (s)	7.5	6.5	7.1	7.7	7.2	7.8	7.2
Degree Utilization, x	0.32	0.41	0.50	0.31	0.43	0.15	0.46
Capacity (veh/h)	455	525	470	432	463	431	462
Control Delay (s)	12.7	12.7	17.1	12.9	14.4	11.1	15.1
Approach Delay (s)	12.7		17.1	13.8		14.2	
Approach LOS	B		C	B		B	

Intersection Summary				
Delay	14.2			
Level of Service	B			
Intersection Capacity Utilization	53.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	1156	124	141	1481	150	374	179	124	217	212	84
Future Volume (vph)	98	1156	124	141	1481	150	374	179	124	217	212	84
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1180	127	144	1511	153	382	183	127	221	216	86
RTOR Reduction (vph)	0	0	63	0	0	75	0	0	109	0	0	67
Lane Group Flow (vph)	100	1180	64	144	1511	78	382	183	18	221	216	19
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.0	71.0	71.0	9.9	69.9	69.9	20.5	19.9	19.9	22.7	22.1	22.1
Effective Green, g (s)	11.0	71.0	71.0	9.9	69.9	69.9	20.5	19.9	19.9	22.7	22.1	22.1
Actuated g/C Ratio	0.08	0.51	0.51	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	124	1590	730	201	1596	710	465	237	193	517	268	226
v/s Ratio Prot	c0.06	0.38		0.05	c0.47		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.06			0.01			0.01
v/c Ratio	0.81	0.74	0.09	0.72	0.95	0.11	0.82	0.77	0.09	0.43	0.81	0.08
Uniform Delay, d1	63.5	27.3	17.8	63.7	33.3	18.6	58.0	57.9	52.2	52.8	56.9	50.3
Progression Factor	1.00	1.00	1.00	0.95	1.04	1.63	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.5	3.2	0.2	6.9	9.3	0.2	10.8	13.6	0.1	0.3	15.5	0.1
Delay (s)	92.9	30.4	18.0	67.2	43.9	30.5	68.8	71.5	52.3	53.1	72.3	50.4
Level of Service	F	C	B	E	D	C	E	E	D	D	E	D
Approach Delay (s)		33.8			44.6			66.5			60.6	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1035	101	220	1500	41	243	16	134	21	10	51
Future Volume (vph)	32	1035	101	220	1500	41	243	16	134	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1442		1674	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.52	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1442		911	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1078	105	229	1562	43	253	17	140	22	10	53
RTOR Reduction (vph)	0	0	43	0	0	13	0	110	0	0	42	0
Lane Group Flow (vph)	33	1078	62	229	1563	30	253	47	0	22	21	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Effective Green, g (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.04	0.54	0.54	0.16	0.66	0.66	0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	63	1661	750	262	2096	886	264	312		197	318	
v/s Ratio Prot	0.02	c0.35		c0.14	c0.49			0.03			0.01	
v/s Ratio Perm			0.04			0.02	c0.21			0.02		
v/c Ratio	0.52	0.65	0.08	0.87	0.75	0.03	0.96	0.15		0.11	0.07	
Uniform Delay, d1	66.0	23.2	15.8	57.5	16.2	8.5	54.2	44.4		44.0	43.6	
Progression Factor	0.72	1.26	1.96	0.81	0.47	0.37	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	1.5	0.2	14.6	1.2	0.0	43.5	0.2		0.2	0.1	
Delay (s)	51.6	30.7	31.1	61.4	8.8	3.2	97.7	44.6		44.2	43.7	
Level of Service	D	C	C	E	A	A	F	D		D	D	
Approach Delay (s)		31.3			15.2			77.4			43.8	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	1173	1783	128	26	18
Future Volume (Veh/h)	32	1173	1783	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1261	1917	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.41				0.41	0.41
vC, conflicting volume	2055				2684	1028
vC1, stage 1 conf vol					1986	
vC2, stage 2 conf vol					698	
vCu, unblocked vol	721				2239	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	91				84	96
cM capacity (veh/h)	361				181	452

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	630	630	1278	777	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	361	1700	1700	1700	1700	238
Volume to Capacity	0.09	0.37	0.37	0.75	0.46	0.20
Queue Length 95th (ft)	8	0	0	0	0	18
Control Delay (s)	16.0	0.0	0.0	0.0	0.0	23.8
Lane LOS	C					C
Approach Delay (s)	0.4			0.0		23.8
Approach LOS						C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1155	38	86	1774	140	135	17	139	174	2	2
Future Volume (vph)	6	1155	38	86	1774	140	135	17	139	174	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95	
Satd. Flow (prot)	1654	3184	1479	1646	3224			1632	1465		1617	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.78	1.00		0.49	
Satd. Flow (perm)	1654	3184	1479	1646	3224			1326	1465		826	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	6	1229	40	91	1887	149	144	18	148	185	2	2
RTOR Reduction (vph)	0	0	16	0	4	0	0	0	116	0	0	0
Lane Group Flow (vph)	6	1229	24	91	2032	0	0	162	32	0	189	0
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.0	82.3	82.3	12.6	93.9			30.1	30.1		30.1	
Effective Green, g (s)	1.0	82.3	82.3	12.6	93.9			30.1	30.1		30.1	
Actuated g/C Ratio	0.01	0.59	0.59	0.09	0.67			0.22	0.22		0.22	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	11	1871	869	148	2162			285	314		177	
v/s Ratio Prot	0.00	0.39		c0.06	c0.63							
v/s Ratio Perm			0.02					0.12	0.02		c0.23	
v/c Ratio	0.55	0.66	0.03	0.61	0.94			0.57	0.10		1.07	
Uniform Delay, d1	69.3	19.4	12.1	61.4	20.5			49.1	44.1		54.9	
Progression Factor	1.08	0.41	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	47.5	1.5	0.0	8.4	9.6			3.1	0.2		86.8	
Delay (s)	122.0	9.4	12.1	69.8	30.1			52.3	44.3		141.8	
Level of Service	F	A	B	E	C			D	D		F	
Approach Delay (s)		10.0			31.8			48.5			141.8	
Approach LOS		B			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	1569	2186	75	61	17
Future Vol, veh/h	31	1569	2186	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1687	2351	81	66	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2431	0	-	0	3301	1216
Stage 1	-	-	-	-	2391	-
Stage 2	-	-	-	-	910	-
Critical Hdwy	4.1	-	-	-	6.44	6.7
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.2	-	-	-	3.52	3.3
Pot Cap-1 Maneuver	197	-	-	-	~ 9	188
Stage 1	-	-	-	-	71	-
Stage 2	-	-	-	-	390	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	197	-	-	-	~ 7	188
Mov Cap-2 Maneuver	-	-	-	-	~ 55	-
Stage 1	-	-	-	-	71	-
Stage 2	-	-	-	-	325	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	$ 316.6
HCM LOS			F

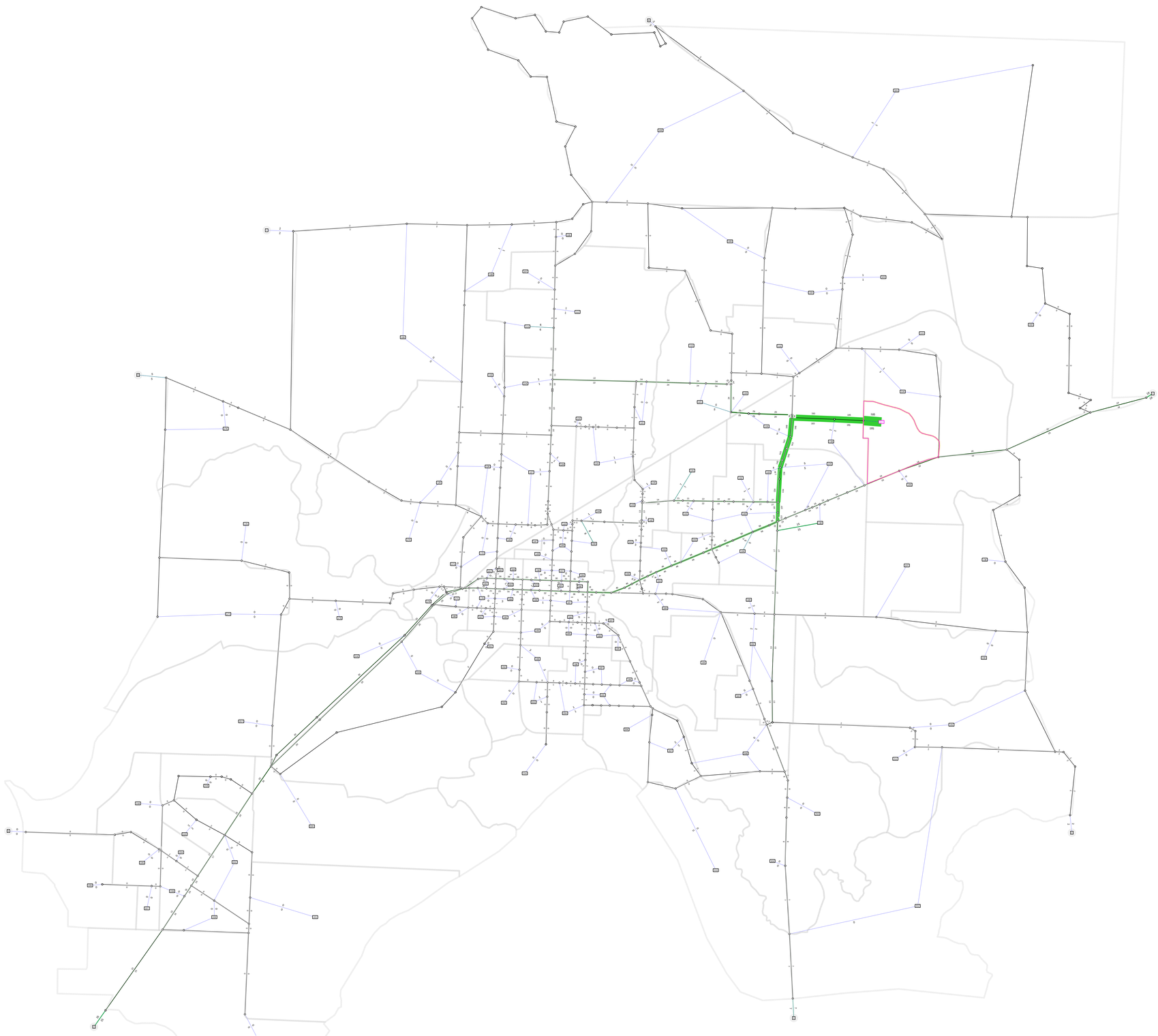
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	197	-	-	-	65
HCM Lane V/C Ratio	0.169	-	-	-	1.29
HCM Control Delay (s)	27	-	-	-	$ 316.6
HCM Lane LOS	D	-	-	-	F
HCM 95th %tile Q(veh)	0.6	-	-	-	6.9

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

Appendix G
Select Zone Analysis Results

Newberg Transportation Model 2000

Select Zone 117 Daily Volumes



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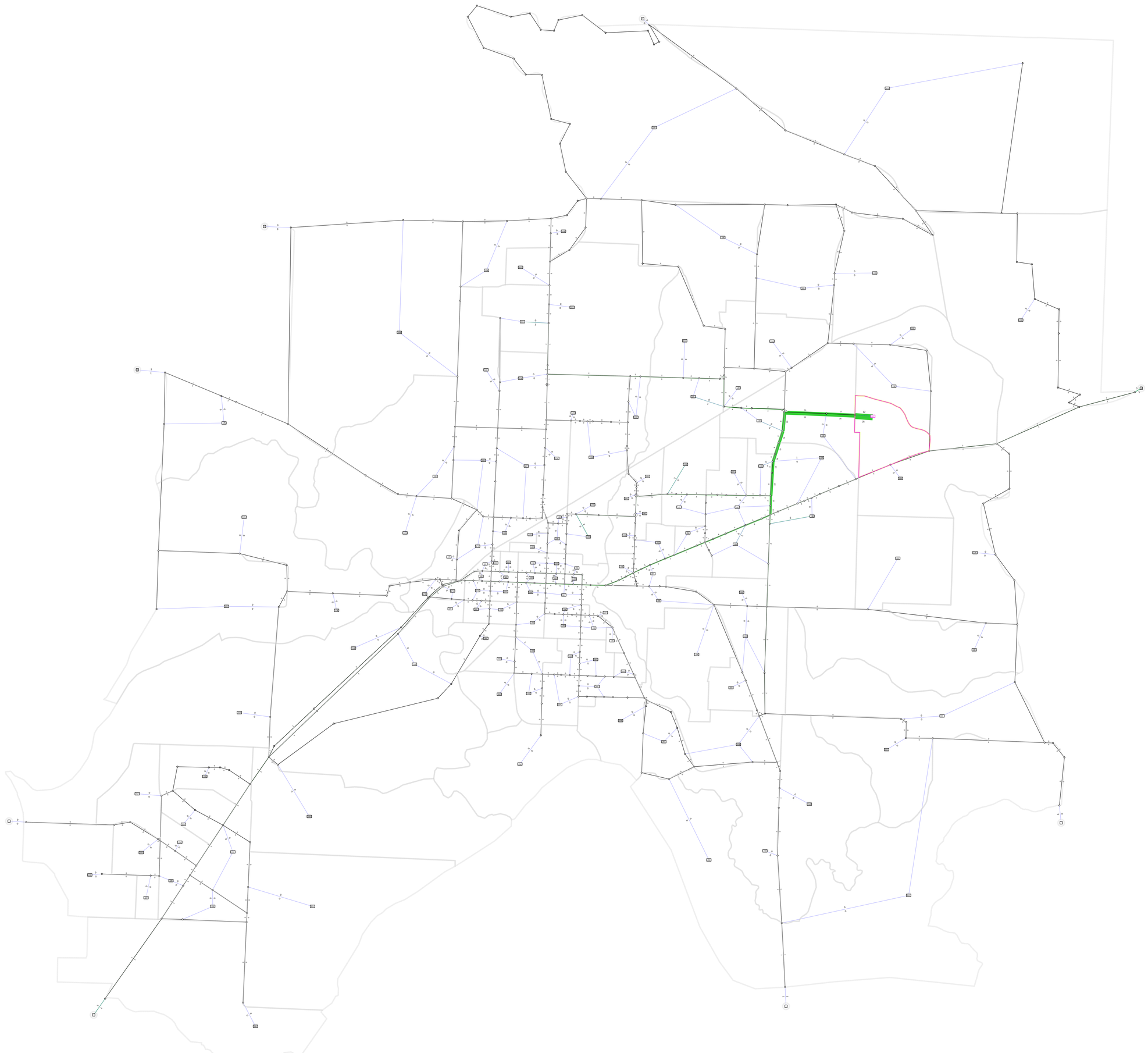
Created on: 31.10.2017		ODOT Request 001

Newberg Transportation Model 2025

Select Zone 117 PM Peak Volumes

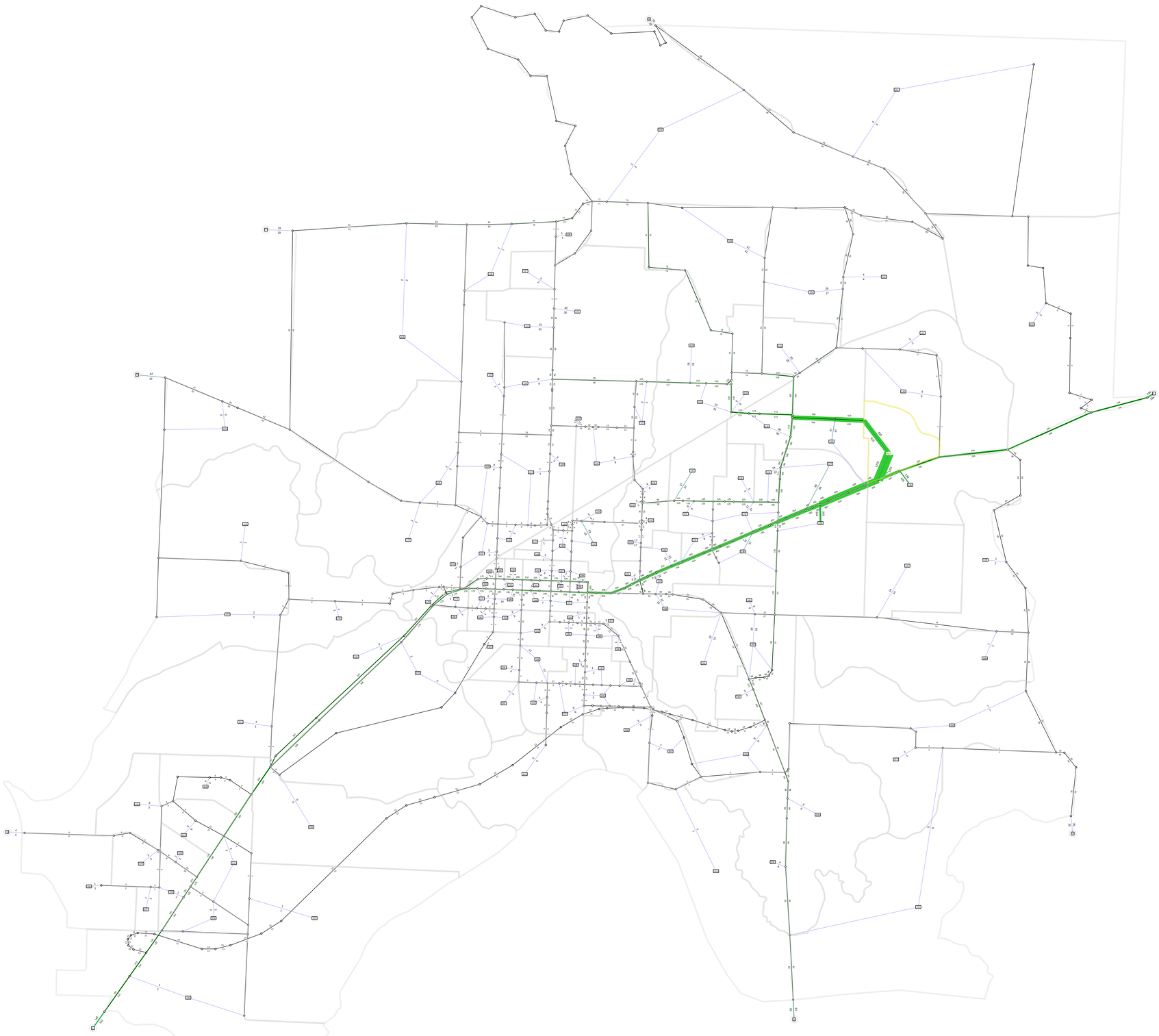


VISUM 16.01 PTV AG	beth.a.pickman@odot.state.or.us	Newberg_V2_2000.ver
Created on: 31.10.2017		ODOT Request 001

Newberg Transportation Model 2025

ODOT Request 001

Select Zone 117 Daily Volumes

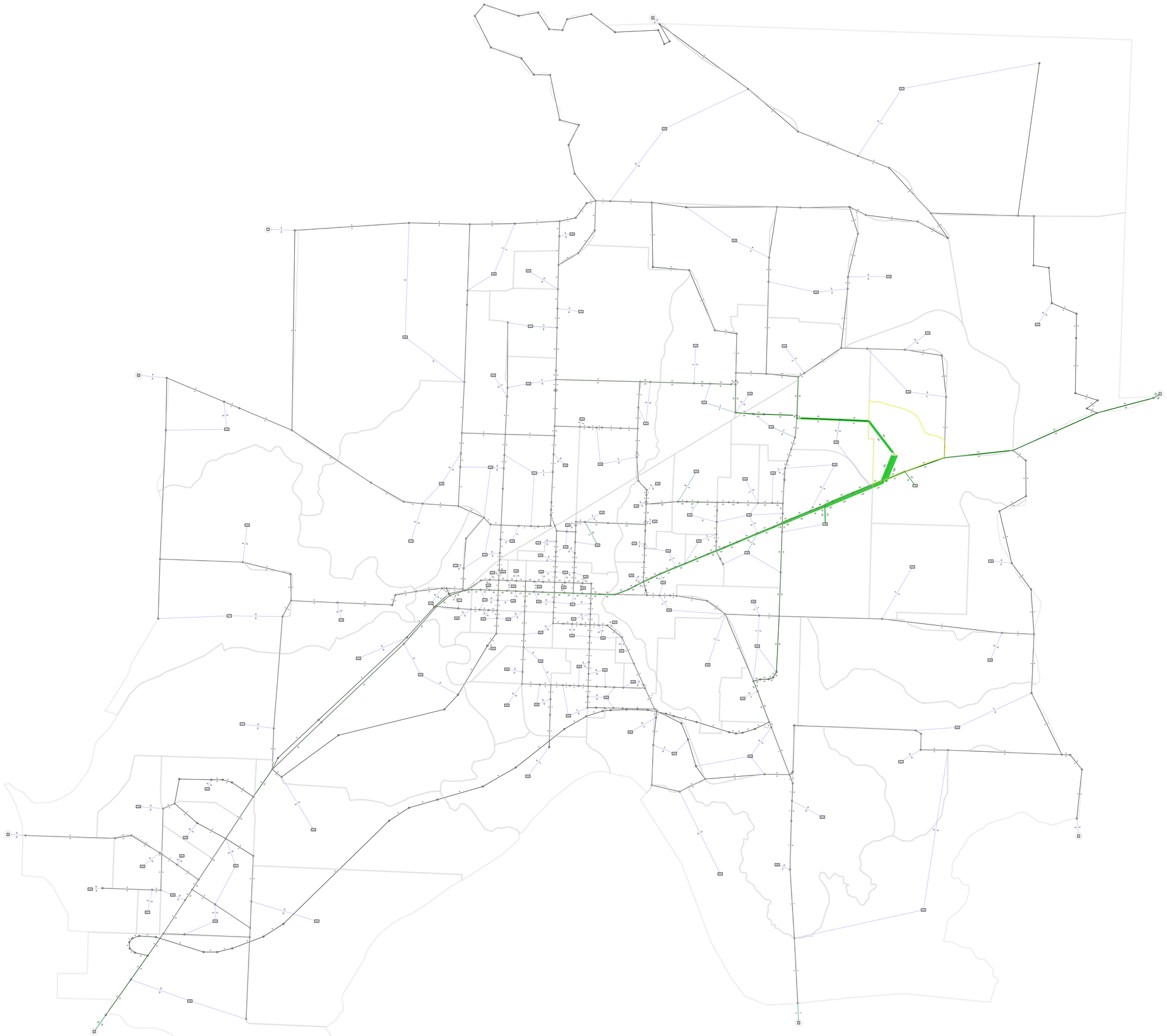


VISUM 16.01 PTV AG	beth.a.pickman@odot.state.or.us	Newberg_V2_2025_Req001_w_Bypass.ver
Created on: 31.10.2017		ODOT Request 001

Newberg Transportation Model 2025

ODOT Request 001

Select Zone 117 PM Peak Volumes



VISUM 16.01 PTV AG	beth.a.pickman@odot.state.or.us	Newberg_V2_2025_Req001_w_Bypass.ver
Created on: 31.10.2017		ODOT Request 001

Appendix H
Year 2020 Total Conditions
Level of Service Worksheets

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Total AM
Project Description	Crestview Crossing

Site Information

Intersection	Springbrook/Crestview
E/W Street Name	Crestview Dr
N/S Street Name	Springbrook Rd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.66
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	2	54	29	54	0	19	40	83	2	49	254	7	1	216	145	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v_{PCE}), pc/h	3	89	50	84	0	29	61	126	3	76	400	11	2	409	228	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		226			216			490			858	
Entry Volume veh/h		210			216			473			753	
Circulating Flow (v_c), pc/h		671			573			553			172	
Exiting Flow (v_{ex}), pc/h		470			359			617			344	
Capacity (c_{pce}), pc/h		696			769			785			1158	
Capacity (c), veh/h		647			769			758			1016	
v/c Ratio (x)		0.32			0.28			0.62			0.74	

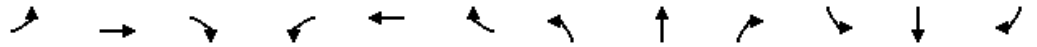
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.8			7.9			15.4			16.6	
Lane LOS		A			A			C			C	
95% Queue, veh		1.4			1.2			4.4			7.1	
Approach Delay, s/veh	9.8			7.9			15.4			16.6		
Approach LOS	A			A			C			C		
Intersection Delay, s/veh | LOS	14.3						B					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	237	5	8	133	6	5
Future Volume (Veh/h)	237	5	8	133	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	349	7	12	196	9	7
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			356		572	352
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			356		572	352
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1214		452	696

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	356	208	16
Volume Left	0	12	9
Volume Right	7	0	7
cSH	1700	1214	534
Volume to Capacity	0.21	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.5	12.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	12.0
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	179	37	13	15	82	154	5	16	116	69
Future Volume (vph)	61	27	179	37	13	15	82	154	5	16	116	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	216	45	16	18	99	186	6	19	140	83

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	106	216	79	99	192	19	223
Volume Left (vph)	73	0	45	99	0	19	0
Volume Right (vph)	0	216	18	0	6	0	83
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16
Departure Headway (s)	6.5	5.5	6.5	6.6	6.1	6.8	5.9
Degree Utilization, x	0.19	0.33	0.14	0.18	0.33	0.04	0.37
Capacity (veh/h)	517	619	505	519	562	497	576
Control Delay (s)	9.9	9.9	10.6	9.8	10.8	8.9	11.1
Approach Delay (s)	9.9		10.6	10.5		10.9	
Approach LOS	A		B	B		B	

Intersection Summary				
Delay	10.4			
Level of Service	B			
Intersection Capacity Utilization	36.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1373	75	89	844	91	179	140	102	211	120	69
Future Volume (vph)	42	1373	75	89	844	91	179	140	102	211	120	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	47	1543	84	100	948	102	201	157	115	237	135	78
RTOR Reduction (vph)	0	0	37	0	0	46	0	0	100	0	0	68
Lane Group Flow (vph)	47	1543	47	100	948	56	201	157	15	237	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Effective Green, g (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1776	794	152	1728	772	387	220	190	372	197	176
v/s Ratio Prot	0.03	c0.48		0.03	c0.30		0.07	c0.10		c0.08	0.09	
v/s Ratio Perm			0.03			0.04			0.01			0.01
v/c Ratio	0.52	0.87	0.06	0.66	0.55	0.07	0.52	0.71	0.08	0.64	0.69	0.06
Uniform Delay, d1	54.9	22.9	12.2	55.8	17.3	12.6	48.8	49.7	45.5	50.3	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.78	0.46	0.05	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	6.1	0.1	7.7	1.2	0.2	0.7	9.4	0.1	2.9	8.3	0.1
Delay (s)	57.9	29.0	12.4	51.2	9.1	0.9	49.5	59.1	45.6	53.2	58.5	46.3
Level of Service	E	C	B	D	A	A	D	E	D	D	E	D
Approach Delay (s)		29.0			12.0			51.7			53.6	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1542	43	86	971	28	58	3	92	11	5	27
Future Volume (vph)	19	1542	43	86	971	28	58	3	92	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	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	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.54	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		951	1361	
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)	21	1676	47	93	1055	30	63	3	100	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	90	0	0	26	0
Lane Group Flow (vph)	21	1676	34	93	1055	23	63	13	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.70	0.70	0.09	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2231	891	146	2375	982	108	137		92	132	
v/s Ratio Prot	0.01	c0.53		c0.06	0.34			0.01			0.01	
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.75	0.04	0.64	0.44	0.02	0.58	0.09		0.13	0.06	
Uniform Delay, d1	57.6	11.1	5.4	52.4	4.8	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.13	0.18	0.02	1.46	0.19	0.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.8	1.4	0.0	5.5	0.5	0.0	6.5	0.2		0.5	0.1	
Delay (s)	69.2	3.3	0.2	81.9	1.3	0.0	58.3	49.5		50.0	49.3	
Level of Service	E	A	A	F	A	A	E	D		D	D	
Approach Delay (s)		4.1			7.7			52.9			49.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	1599	1113	21	52	24
Future Volume (Veh/h)	4	1599	1113	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1719	1197	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.74				0.74	0.74
vC, conflicting volume	1220				2076	610
vC1, stage 1 conf vol					1208	
vC2, stage 2 conf vol					868	
vCu, unblocked vol	581				1744	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				79	97
cM capacity (veh/h)	738				269	803

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	860	860	798	422	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	738	1700	1700	1700	1700	341
Volume to Capacity	0.01	0.51	0.51	0.47	0.25	0.24
Queue Length 95th (ft)	0	0	0	0	0	23
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	18.9
Lane LOS	A					C
Approach Delay (s)	0.0			0.0		18.9
Approach LOS						C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	1536	90	100	1019	77	42	13	71	238	29	73
Future Volume (vph)	25	1536	90	100	1019	77	42	13	71	238	29	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	
Satd. Flow (prot)	1607	3214	1480	1614	3108			1604	1465		1548	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.71	1.00		0.75	
Satd. Flow (perm)	1607	3214	1480	1614	3108			1190	1465		1208	
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)	27	1670	98	109	1108	84	46	14	77	259	32	79
RTOR Reduction (vph)	0	0	26	0	4	0	0	0	55	0	8	0
Lane Group Flow (vph)	27	1670	72	109	1188	0	0	60	22	0	362	0
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Effective Green, g (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Actuated g/C Ratio	0.03	0.53	0.53	0.06	0.56			0.29	0.29		0.29	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	48	1706	785	91	1732			342	421		347	
v/s Ratio Prot	0.02	c0.52		c0.07	0.38							
v/s Ratio Perm			0.05					0.05	0.02		c0.30	
v/c Ratio	0.56	0.98	0.09	1.20	0.69			0.18	0.05		1.04	
Uniform Delay, d1	57.4	27.5	13.9	56.6	19.0			32.1	30.9		42.8	
Progression Factor	0.88	1.52	1.85	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	12.4	14.0	0.2	156.9	2.2			0.3	0.1		60.2	
Delay (s)	62.8	55.7	25.8	213.5	21.3			32.4	31.0		102.9	
Level of Service	E	E	C	F	C			C	C		F	
Approach Delay (s)		54.2			37.4			31.6			102.9	
Approach LOS		D			D			C			F	

Intersection Summary			
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1840	1188	29	62	6
Future Vol, veh/h	3	1840	1188	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	1937	1251	31	65	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1281	0	-	0	2241	641
Stage 1	-	-	-	-	1266	-
Stage 2	-	-	-	-	975	-
Critical Hdwy	4.76	-	-	-	6.46	6.7
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.53	-	-	-	3.53	3.3
Pot Cap-1 Maneuver	397	-	-	-	~ 45	438
Stage 1	-	-	-	-	261	-
Stage 2	-	-	-	-	361	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	397	-	-	-	~ 45	438
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	261	-
Stage 2	-	-	-	-	358	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	41.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	397	-	-	-	167
HCM Lane V/C Ratio	0.008	-	-	-	0.429
HCM Control Delay (s)	14.1	-	-	-	41.8
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.9

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

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Total AM
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	14	0	32	0	39	0	17	0	11	92	13	0	5	269	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v_{PCE}), pc/h	0	15	0	35	0	42	0	18	0	12	105	14	0	5	307	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		50			60			131			317	
Entry Volume veh/h		50			60			126			302	
Circulating Flow (v_c), pc/h	354			132			20			54		
Exiting Flow (v_{ex}), pc/h	19			17			138			384		
Capacity (c_{pce}), pc/h		962			1206			1352			1306	
Capacity (c), veh/h		962			1206			1301			1246	
v/c Ratio (x)		0.05			0.05			0.10			0.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.2			3.4			3.5			5.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			0.3			1.0	
Approach Delay, s/veh	4.2			3.4			3.5			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.4						A					

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Total PM
Project Description	Crestview Crossing

Site Information

Intersection	Springbrook/Crestview
E/W Street Name	Crestview Dr
N/S Street Name	Springbrook Rd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.93
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	53	20	13	0	14	13	172	0	7	374	25	2	200	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	57	22	14	0	18	14	185	0	8	414	27	2	215	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		93			217			449			558	
Entry Volume veh/h		93			214			437			552	
Circulating Flow (v_c), pc/h		523			481			296			40	
Exiting Flow (v_{ex}), pc/h		264			75			658			320	
Capacity (c_{pce}), pc/h		809			845			1020			1325	
Capacity (c), veh/h		809			833			993			1311	
v/c Ratio (x)		0.11			0.26			0.44			0.42	

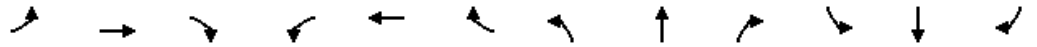
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			7.1			8.6			6.8	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			1.0			2.3			2.1	
Approach Delay, s/veh	5.6			7.1			8.6			6.8		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	7.4						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	233	5	9	193	8	14
Future Volume (Veh/h)	233	5	9	193	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	295	6	11	244	10	18
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			303		566	300
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			303		566	300
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1267		483	743

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	301	255	28
Volume Left	0	11	10
Volume Right	6	0	18
cSH	1700	1267	623
Volume to Capacity	0.18	0.01	0.04
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	0.4	11.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	11.0
Approach LOS			B

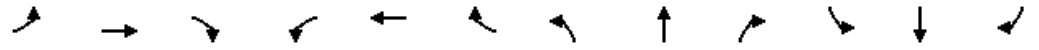
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	226	91	68	86	141	202	5	67	181	40
Future Volume (vph)	83	63	226	91	68	86	141	202	5	67	181	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	235	95	71	90	147	210	5	70	189	42

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	235	256	147	215	70	231
Volume Left (vph)	86	0	95	147	0	70	0
Volume Right (vph)	0	235	90	0	5	0	42
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06
Departure Headway (s)	7.5	6.5	7.1	7.8	7.3	7.9	7.3
Degree Utilization, x	0.32	0.42	0.51	0.32	0.43	0.15	0.47
Capacity (veh/h)	454	524	468	431	462	429	460
Control Delay (s)	12.7	13.0	17.2	13.1	14.5	11.1	15.3
Approach Delay (s)	12.9		17.2	13.9		14.3	
Approach LOS	B		C	B		B	

Intersection Summary				
Delay	14.4			
Level of Service	B			
Intersection Capacity Utilization	50.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	1194	124	151	1501	155	374	179	142	224	212	84
Future Volume (vph)	98	1194	124	151	1501	155	374	179	142	224	212	84
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1218	127	154	1532	158	382	183	145	229	216	86
RTOR Reduction (vph)	0	0	63	0	0	76	0	0	124	0	0	67
Lane Group Flow (vph)	100	1218	64	154	1532	82	382	183	21	229	216	19
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.0	70.6	70.6	10.4	70.0	70.0	20.4	19.9	19.9	22.6	22.1	22.1
Effective Green, g (s)	11.0	70.6	70.6	10.4	70.0	70.0	20.4	19.9	19.9	22.6	22.1	22.1
Actuated g/C Ratio	0.08	0.50	0.50	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	124	1581	726	212	1644	711	462	237	193	515	268	226
v/s Ratio Prot	c0.06	0.39		0.05	c0.47		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.06			0.02			0.01
v/c Ratio	0.81	0.77	0.09	0.73	0.93	0.12	0.83	0.77	0.11	0.44	0.81	0.08
Uniform Delay, d1	63.5	28.1	18.0	63.4	32.8	18.6	58.1	57.9	52.3	53.0	56.9	50.3
Progression Factor	1.00	1.00	1.00	1.02	0.96	1.38	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.5	3.7	0.2	7.1	7.8	0.2	11.2	13.6	0.1	0.4	15.5	0.1
Delay (s)	92.9	31.8	18.2	71.6	39.1	25.9	69.3	71.5	52.5	53.4	72.3	50.4
Level of Service	F	C	B	E	D	C	E	E	D	D	E	D
Approach Delay (s)		34.9			40.7			66.4			60.6	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1098	101	231	1535	41	243	16	152	21	10	51
Future Volume (vph)	32	1098	101	231	1535	41	243	16	152	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1438		1675	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.50	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1438		875	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1144	105	241	1599	43	253	17	158	22	10	53
RTOR Reduction (vph)	0	0	36	0	0	14	0	121	0	0	41	0
Lane Group Flow (vph)	33	1144	69	241	1599	29	253	54	0	22	22	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.9	69.3	69.3	25.6	91.0	91.0	32.6	32.6		32.6	32.6	
Effective Green, g (s)	3.9	69.3	69.3	25.6	91.0	91.0	32.6	32.6		32.6	32.6	
Actuated g/C Ratio	0.03	0.49	0.49	0.18	0.65	0.65	0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	45	1536	693	300	2078	878	284	334		203	342	
v/s Ratio Prot	0.02	c0.37		0.15	c0.50			0.04			0.02	
v/s Ratio Perm			0.05			0.02	c0.21			0.03		
v/c Ratio	0.73	0.74	0.10	0.80	0.77	0.03	0.89	0.16		0.11	0.07	
Uniform Delay, d1	67.5	28.3	18.8	54.8	17.2	8.8	52.0	42.8		42.3	41.8	
Progression Factor	0.76	1.08	1.16	0.73	0.51	0.37	1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.8	2.4	0.2	1.4	0.3	0.0	27.3	0.2		0.2	0.1	
Delay (s)	84.0	33.0	21.9	41.6	8.9	3.3	79.3	43.0		42.4	41.9	
Level of Service	F	C	C	D	A	A	E	D		D	D	
Approach Delay (s)		33.4			13.0			64.4			42.0	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	1254	1829	128	26	18
Future Volume (Veh/h)	32	1254	1829	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1348	1967	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.42				0.42	0.42
vC, conflicting volume	2105				2778	1052
vC1, stage 1 conf vol					2036	
vC2, stage 2 conf vol					742	
vCu, unblocked vol	848				2466	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	90				82	96
cM capacity (veh/h)	324				158	454

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	674	674	1311	794	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	324	1700	1700	1700	1700	214
Volume to Capacity	0.10	0.40	0.40	0.77	0.47	0.22
Queue Length 95th (ft)	9	0	0	0	0	20
Control Delay (s)	17.4	0.0	0.0	0.0	0.0	26.5
Lane LOS	C					D
Approach Delay (s)	0.4			0.0		26.5
Approach LOS						D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	1155	38	86	1774	167	135	35	139	190	13	48
Future Volume (vph)	87	1155	38	86	1774	167	135	35	139	190	13	48
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1654	3184	1479	1646	3219			1638	1465		1594	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.70	1.00		0.53	
Satd. Flow (perm)	1654	3184	1479	1646	3219			1191	1465		872	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	1229	40	91	1887	178	144	37	148	202	14	51
RTOR Reduction (vph)	0	0	18	0	5	0	0	0	111	0	6	0
Lane Group Flow (vph)	93	1229	22	91	2060	0	0	181	37	0	261	0
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	7.0	77.5	77.5	12.6	83.1			34.9	34.9		34.9	
Effective Green, g (s)	7.0	77.5	77.5	12.6	83.1			34.9	34.9		34.9	
Actuated g/C Ratio	0.05	0.55	0.55	0.09	0.59			0.25	0.25		0.25	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	82	1762	818	148	1910			296	365		217	
v/s Ratio Prot	c0.06	0.39		0.06	c0.64							
v/s Ratio Perm			0.01					0.15	0.03		c0.30	
v/c Ratio	1.13	0.70	0.03	0.61	1.08			0.61	0.10		1.20	
Uniform Delay, d1	66.5	22.7	14.2	61.4	28.5			46.5	40.5		52.5	
Progression Factor	1.09	0.54	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	128.1	1.8	0.0	8.4	45.4			4.2	0.2		126.7	
Delay (s)	200.5	14.0	14.2	69.8	73.9			50.8	40.6		179.2	
Level of Service	F	B	B	E	E			D	D		F	
Approach Delay (s)		26.7			73.7			46.2			179.2	
Approach LOS		C			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	62.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	1453	2025	75	61	17
Future Vol, veh/h	31	1453	2025	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1562	2177	81	66	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2258	0	-	0	3066	1129
Stage 1	-	-	-	-	2218	-
Stage 2	-	-	-	-	848	-
Critical Hdwy	4.1	-	-	-	6.44	6.7
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.2	-	-	-	3.52	3.3
Pot Cap-1 Maneuver	231	-	-	-	~ 13	214
Stage 1	-	-	-	-	88	-
Stage 2	-	-	-	-	418	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	231	-	-	-	~ 11	214
Mov Cap-2 Maneuver	-	-	-	-	68	-
Stage 1	-	-	-	-	88	-
Stage 2	-	-	-	-	358	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	207
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	231	-	-	-	80
HCM Lane V/C Ratio	0.144	-	-	-	1.048
HCM Control Delay (s)	23.2	-	-	-	207
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0.5	-	-	-	5.9

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

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Total PM
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.94
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	9	0	21	0	25	0	11	0	36	210	43	0	19	205	15
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	10	0	22	0	27	0	12	0	38	228	46	0	20	222	16
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		32			39			312			258	
Entry Volume veh/h		32			39			308			254	
Circulating Flow (v_c), pc/h	269			276			30			65		
Exiting Flow (v_{ex}), pc/h	66			54			250			271		
Capacity (c_{pce}), pc/h		1049			1041			1338			1291	
Capacity (c), veh/h		1049			1041			1319			1270	
v/c Ratio (x)		0.03			0.04			0.23			0.20	

Delay and Level of Service

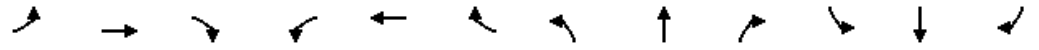
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.7			3.8			4.7			4.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.1			0.9			0.7	
Approach Delay, s/veh	3.7			3.8			4.7			4.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.5						A					

Appendix I
Year 2020 Total Conditions with Mitigation Level of Service Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	1536	90	100	1019	77	42	13	71	238	29	73
Future Volume (vph)	25	1536	90	100	1019	77	42	13	71	238	29	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1232	1642	1465	1235	1650	1402
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)	27	1670	98	109	1108	84	46	14	77	259	32	79
RTOR Reduction (vph)	0	0	30	0	0	33	0	0	59	0	0	60
Lane Group Flow (vph)	27	1670	68	109	1108	51	46	14	18	259	32	19
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	3.6	67.5	67.5	9.3	73.2	73.2	28.2	28.2	28.2	28.2	28.2	28.2
Effective Green, g (s)	3.6	67.5	67.5	9.3	73.2	73.2	28.2	28.2	28.2	28.2	28.2	28.2
Actuated g/C Ratio	0.03	0.56	0.56	0.08	0.61	0.61	0.23	0.23	0.23	0.23	0.23	0.23
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	48	1807	832	125	1912	855	289	385	344	290	387	329
v/s Ratio Prot	0.02	c0.52		c0.07	c0.35			0.01			0.02	
v/s Ratio Perm			0.05			0.04	0.04		0.01	c0.21		0.01
v/c Ratio	0.56	0.92	0.08	0.87	0.58	0.06	0.16	0.04	0.05	0.89	0.08	0.06
Uniform Delay, d1	57.4	23.9	12.0	54.8	14.1	9.5	36.5	35.4	35.6	44.4	35.8	35.6
Progression Factor	0.89	1.54	2.12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.7	7.3	0.1	45.0	1.3	0.1	0.4	0.1	0.1	27.8	0.1	0.1
Delay (s)	63.8	44.2	25.7	99.8	15.4	9.6	36.8	35.5	35.6	72.2	35.9	35.7
Level of Service	E	D	C	F	B	A	D	D	D	E	D	D
Approach Delay (s)		43.5			22.1			36.0			61.3	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	1155	38	86	1774	167	135	35	139	190	13	48
Future Volume (vph)	87	1155	38	86	1774	167	135	35	139	190	13	48
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1277	1690	1465	1245	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	1229	40	91	1887	178	144	37	148	202	14	51
RTOR Reduction (vph)	0	0	16	0	0	46	0	0	120	0	0	41
Lane Group Flow (vph)	93	1229	24	91	1887	132	144	37	28	202	14	10
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	10.3	85.6	85.6	12.6	87.9	87.9	26.8	26.8	26.8	26.8	26.8	26.8
Effective Green, g (s)	10.3	85.6	85.6	12.6	87.9	87.9	26.8	26.8	26.8	26.8	26.8	26.8
Actuated g/C Ratio	0.07	0.61	0.61	0.09	0.63	0.63	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	121	1946	904	148	2044	906	244	323	280	238	325	276
v/s Ratio Prot	c0.06	0.39		0.06	c0.58			0.02			0.01	
v/s Ratio Perm			0.02			0.09	0.11		0.02	c0.16		0.01
v/c Ratio	0.77	0.63	0.03	0.61	0.92	0.15	0.59	0.11	0.10	0.85	0.04	0.04
Uniform Delay, d1	63.7	17.2	10.7	61.4	23.1	10.7	51.6	46.8	46.7	54.6	46.1	46.1
Progression Factor	1.27	0.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.2	1.2	0.0	8.4	8.5	0.3	4.4	0.2	0.2	24.3	0.1	0.1
Delay (s)	102.1	3.7	10.8	69.8	31.6	11.0	56.0	47.0	46.9	78.9	46.2	46.1
Level of Service	F	A	B	E	C	B	E	D	D	E	D	D
Approach Delay (s)		10.6			31.5			50.9			70.9	
Approach LOS		B			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Appendix J
2025 Horizon Year Background Conditions Level of Service Worksheets

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2025
Time Analyzed	Background with Reassigned Traffic AM
Project Description	Crestview Crossing

Site Information

Intersection	Springbrook/Crestview
E/W Street Name	Crestview Dr
N/S Street Name	Springbrook Rd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.66
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	2	54	23	54	0	3	24	67	2	49	254	2	1	211	145	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v_{PCE}), pc/h	3	89	39	84	0	5	36	102	3	76	400	3	2	400	228	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		215			143			482			849	
Entry Volume veh/h		200			143			465			746	
Circulating Flow (v_c), pc/h		638			573			533			123	
Exiting Flow (v_{ex}), pc/h		442			334			593			320	
Capacity (c_{pce}), pc/h		720			769			801			1217	
Capacity (c), veh/h		671			769			773			1069	
v/c Ratio (x)		0.30			0.19			0.60			0.70	

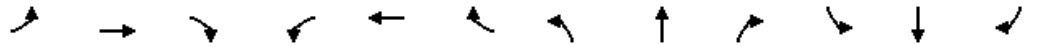
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.1			6.7			14.4			14.2	
Lane LOS		A			A			B			B	
95% Queue, veh		1.3			0.7			4.1			6.0	
Approach Delay, s/veh	9.1			6.7			14.4			14.2		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh | LOS	12.9						B					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	221	5	8	85	6	5
Future Volume (Veh/h)	221	5	8	85	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	325	7	12	125	9	7
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			332		478	328
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			332		478	328
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1239		515	717

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	332	137	16
Volume Left	0	12	9
Volume Right	7	0	7
cSH	1700	1239	587
Volume to Capacity	0.20	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.8	11.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	11.3
Approach LOS			B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	21.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	174	37	13	15	66	154	5	16	116	69
Future Volume (vph)	61	27	174	37	13	15	66	154	5	16	116	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	210	45	16	18	80	186	6	19	140	83

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	106	210	79	80	192	19	223
Volume Left (vph)	73	0	45	80	0	19	0
Volume Right (vph)	0	210	18	0	6	0	83
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16
Departure Headway (s)	6.5	5.4	6.4	6.6	6.1	6.8	5.9
Degree Utilization, x	0.19	0.32	0.14	0.15	0.32	0.04	0.36
Capacity (veh/h)	522	625	511	520	564	501	582
Control Delay (s)	9.8	9.7	10.5	9.5	10.7	8.8	11.0
Approach Delay (s)	9.7		10.5	10.4		10.8	
Approach LOS	A		B	B		B	

Intersection Summary				
Delay	10.3			
Level of Service	B			
Intersection Capacity Utilization	36.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1486	75	81	888	75	179	140	99	206	120	69
Future Volume (vph)	42	1486	75	81	888	75	179	140	99	206	120	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	47	1670	84	91	998	84	201	157	111	231	135	78
RTOR Reduction (vph)	0	0	37	0	0	38	0	0	96	0	0	68
Lane Group Flow (vph)	47	1670	47	91	998	46	201	157	15	231	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	67.0	67.0	6.3	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Effective Green, g (s)	6.9	67.0	67.0	6.3	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1784	798	152	1687	776	379	220	190	364	197	176
v/s Ratio Prot	0.03	c0.52		0.03	c0.33		0.07	c0.10		c0.07	0.09	
v/s Ratio Perm			0.03			0.03			0.01			0.01
v/c Ratio	0.52	0.94	0.06	0.60	0.59	0.06	0.53	0.71	0.08	0.63	0.69	0.06
Uniform Delay, d1	54.9	24.5	12.1	55.6	17.8	12.4	49.1	49.7	45.5	50.5	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.82	0.53	0.10	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	10.8	0.1	4.4	1.4	0.1	1.0	9.4	0.1	3.0	8.3	0.1
Delay (s)	57.9	35.3	12.2	50.1	10.9	1.4	50.0	59.1	45.6	53.4	58.5	46.3
Level of Service	E	D	B	D	B	A	D	E	D	D	E	D
Approach Delay (s)		34.8			13.3			52.0			53.7	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1683	43	70	1008	28	58	3	87	11	5	27
Future Volume (vph)	19	1683	43	70	1008	28	58	3	87	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	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	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.56	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		991	1361	
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)	21	1829	47	76	1096	30	63	3	95	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	86	0	0	26	0
Lane Group Flow (vph)	21	1829	34	76	1096	23	63	12	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.72	0.72	0.08	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2284	912	120	2375	982	108	137		96	132	
v/s Ratio Prot	0.01	c0.58		c0.05	0.36			0.01			0.01	
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.80	0.04	0.63	0.46	0.02	0.58	0.09		0.12	0.06	
Uniform Delay, d1	57.6	11.0	4.8	53.8	4.9	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.11	0.21	0.03	1.40	0.18	0.11	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	1.5	0.0	7.0	0.5	0.0	6.5	0.2		0.4	0.1	
Delay (s)	67.4	3.8	0.2	82.5	1.4	0.4	58.3	49.5		49.9	49.3	
Level of Service	E	A	A	F	A	A	E	D		D	D	
Approach Delay (s)		4.4			6.5			53.0			49.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	1740	1145	21	52	24
Future Volume (Veh/h)	4	1740	1145	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1871	1231	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.74				0.74	0.74
vC, conflicting volume	1254				2186	627
vC1, stage 1 conf vol					1242	
vC2, stage 2 conf vol					944	
vCu, unblocked vol	653				1906	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				77	97
cM capacity (veh/h)	702				245	812

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	936	936	821	433	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	702	1700	1700	1700	1700	315
Volume to Capacity	0.01	0.55	0.55	0.48	0.25	0.26
Queue Length 95th (ft)	0	0	0	0	0	26
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	20.4
Lane LOS	B					C
Approach Delay (s)	0.0			0.0		20.4
Approach LOS						C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1701	90	100	1123	69	42	8	71	214	13	1
Future Volume (vph)	1	1701	90	100	1123	69	42	8	71	214	13	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1607	3214	1480	1614	3113			1601	1465		1575	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.78	1.00		0.70	
Satd. Flow (perm)	1607	3214	1480	1614	3113			1305	1465		1153	
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)	1	1849	98	109	1221	75	46	9	77	233	14	1
RTOR Reduction (vph)	0	0	30	0	3	0	0	0	59	0	0	0
Lane Group Flow (vph)	1	1849	68	109	1293	0	0	55	18	0	248	0
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.0	67.5	67.5	9.0	75.5			28.5	28.5		28.5	
Effective Green, g (s)	1.0	67.5	67.5	9.0	75.5			28.5	28.5		28.5	
Actuated g/C Ratio	0.01	0.56	0.56	0.08	0.63			0.24	0.24		0.24	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	13	1807	832	121	1958			309	347		273	
v/s Ratio Prot	0.00	c0.58		c0.07	0.42							
v/s Ratio Perm			0.05					0.04	0.01		c0.22	
v/c Ratio	0.08	1.02	0.08	0.90	0.66			0.18	0.05		0.91	
Uniform Delay, d1	59.0	26.2	12.0	55.1	14.1			36.4	35.3		44.5	
Progression Factor	1.08	1.52	2.12	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	2.3	23.4	0.1	53.1	1.8			0.4	0.1		31.8	
Delay (s)	66.2	63.2	25.7	108.1	15.9			36.8	35.4		76.2	
Level of Service	E	E	C	F	B			D	D		E	
Approach Delay (s)		61.3			23.0			36.0			76.2	
Approach LOS		E			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	47.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1986	1287	29	62	6
Future Vol, veh/h	3	1986	1287	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	2091	1355	31	65	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1385	0	-	0	2422	693
Stage 1	-	-	-	-	1370	-
Stage 2	-	-	-	-	1052	-
Critical Hdwy	4.76	-	-	-	6.46	6.7
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.53	-	-	-	3.53	3.3
Pot Cap-1 Maneuver	357	-	-	-	~ 35	406
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	332	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	357	-	-	-	~ 35	406
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	329	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	49.7
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	357	-	-	-	149
HCM Lane V/C Ratio	0.009	-	-	-	0.48
HCM Control Delay (s)	15.2	-	-	-	49.7
HCM Lane LOS	C	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	2.2

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

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2025
Time Analyzed	Background with Reassigned Traffic PM
Project Description	Crestview Crossing

Site Information

Intersection	Springbrook/Crestview
E/W Street Name	Crestview Dr
N/S Street Name	Springbrook Rd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.93
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	53	2	13	0	3	2	162	0	7	374	7	2	182	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	57	2	14	0	4	2	174	0	8	414	8	2	196	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		73			180			430			539	
Entry Volume veh/h		73			179			418			533	
Circulating Flow (v_c), pc/h	490			481			257			14		
Exiting Flow (v_{ex}), pc/h	206			63			647			306		
Capacity (c_{pce}), pc/h		837			845			1062			1360	
Capacity (c), veh/h		837			842			1032			1346	
v/c Ratio (x)		0.09			0.21			0.40			0.40	

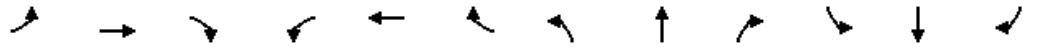
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.1			6.5			7.9			6.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.8			2.0			1.9	
Approach Delay, s/veh	5.1			6.5			7.9			6.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	6.8						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	179	5	9	161	8	14
Future Volume (Veh/h)	179	5	9	161	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	227	6	11	204	10	18
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			235		458	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			235		458	232
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1342		559	810

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	233	215	28
Volume Left	0	11	10
Volume Right	6	0	18
cSH	1700	1342	698
Volume to Capacity	0.14	0.01	0.04
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	0.5	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.4
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	219	91	68	86	136	202	5	67	181	40
Future Volume (vph)	83	63	219	91	68	86	136	202	5	67	181	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	228	95	71	90	142	210	5	70	189	42

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	228	256	142	215	70	231
Volume Left (vph)	86	0	95	142	0	70	0
Volume Right (vph)	0	228	90	0	5	0	42
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06
Departure Headway (s)	7.5	6.5	7.1	7.7	7.2	7.8	7.2
Degree Utilization, x	0.32	0.41	0.50	0.31	0.43	0.15	0.46
Capacity (veh/h)	455	525	470	432	463	431	462
Control Delay (s)	12.7	12.7	17.1	12.9	14.4	11.1	15.1
Approach Delay (s)	12.7		17.1	13.8		14.2	
Approach LOS	B		C	B		B	

Intersection Summary				
Delay	14.2			
Level of Service	B			
Intersection Capacity Utilization	53.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	1263	124	141	1616	150	374	179	124	217	212	84
Future Volume (vph)	98	1263	124	141	1616	150	374	179	124	217	212	84
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1289	127	144	1649	153	382	183	127	221	216	86
RTOR Reduction (vph)	0	0	63	0	0	68	0	0	109	0	0	67
Lane Group Flow (vph)	100	1289	64	144	1649	85	382	183	18	221	216	19
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.0	71.0	71.0	9.9	69.9	69.9	20.5	19.9	19.9	22.7	22.1	22.1
Effective Green, g (s)	11.0	71.0	71.0	9.9	69.9	69.9	20.5	19.9	19.9	22.7	22.1	22.1
Actuated g/C Ratio	0.08	0.51	0.51	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	124	1590	730	201	1596	710	465	237	193	517	268	226
v/s Ratio Prot	c0.06	0.41		0.05	c0.52		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.06			0.01			0.01
v/c Ratio	0.81	0.81	0.09	0.72	1.03	0.12	0.82	0.77	0.09	0.43	0.81	0.08
Uniform Delay, d1	63.5	28.9	17.8	63.7	35.0	18.7	58.0	57.9	52.2	52.8	56.9	50.3
Progression Factor	1.00	1.00	1.00	0.99	1.00	1.20	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.5	4.6	0.2	6.0	26.2	0.2	10.8	13.6	0.1	0.3	15.5	0.1
Delay (s)	92.9	33.5	18.0	69.2	61.2	22.5	68.8	71.5	52.3	53.1	72.3	50.4
Level of Service	F	C	B	E	E	C	E	E	D	D	E	D
Approach Delay (s)		36.1			58.7			66.5			60.6	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	52.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1147	101	220	1650	41	243	16	134	21	10	51
Future Volume (vph)	32	1147	101	220	1650	41	243	16	134	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1442		1674	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.52	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1442		911	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1195	105	229	1719	43	253	17	140	22	10	53
RTOR Reduction (vph)	0	0	39	0	0	13	0	110	0	0	42	0
Lane Group Flow (vph)	33	1195	66	229	1719	30	253	47	0	22	21	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Effective Green, g (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.04	0.54	0.54	0.16	0.66	0.66	0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	63	1661	750	262	2096	886	264	312		197	318	
v/s Ratio Prot	0.02	c0.38		0.14	c0.54			0.03			0.01	
v/s Ratio Perm			0.05			0.02	c0.21			0.02		
v/c Ratio	0.52	0.72	0.09	0.87	0.82	0.03	0.96	0.15		0.11	0.07	
Uniform Delay, d1	66.0	24.6	15.9	57.5	18.0	8.5	54.2	44.4		44.0	43.6	
Progression Factor	0.78	1.24	1.56	0.81	0.52	0.35	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	1.9	0.2	12.0	1.5	0.0	43.5	0.2		0.2	0.1	
Delay (s)	54.6	32.3	25.0	58.4	10.8	3.0	97.7	44.6		44.2	43.7	
Level of Service	D	C	C	E	B	A	F	D		D	D	
Approach Delay (s)		32.3			16.1			77.4			43.8	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	1298	1964	128	26	18
Future Volume (Veh/h)	32	1298	1964	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1396	2112	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.30				0.30	0.30
vC, conflicting volume	2250				2947	1125
vC1, stage 1 conf vol					2181	
vC2, stage 2 conf vol					766	
vCu, unblocked vol	484				2822	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	89				84	94
cM capacity (veh/h)	318				177	325

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	698	698	1408	842	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	318	1700	1700	1700	1700	217
Volume to Capacity	0.11	0.41	0.41	0.83	0.50	0.22
Queue Length 95th (ft)	9	0	0	0	0	20
Control Delay (s)	17.7	0.0	0.0	0.0	0.0	26.1
Lane LOS	C					D
Approach Delay (s)	0.4			0.0		26.1
Approach LOS						D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1281	38	86	1955	140	135	17	139	174	2	2
Future Volume (vph)	0	1281	38	86	1955	140	135	17	139	174	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)		6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor		0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes		1.00	0.98	1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.96	1.00		0.95	
Satd. Flow (prot)		3184	1479	1646	3227			1632	1465		1617	
Flt Permitted		1.00	1.00	0.95	1.00			0.78	1.00		0.49	
Satd. Flow (perm)		3184	1479	1646	3227			1326	1465		826	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1363	40	91	2080	149	144	18	148	185	2	2
RTOR Reduction (vph)	0	0	16	0	3	0	0	0	111	0	0	0
Lane Group Flow (vph)	0	1363	24	91	2226	0	0	162	37	0	189	0
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)		82.3	82.3	12.6	100.9			30.1	30.1		30.1	
Effective Green, g (s)		82.3	82.3	12.6	100.9			30.1	30.1		30.1	
Actuated g/C Ratio		0.59	0.59	0.09	0.72			0.22	0.22		0.22	
Clearance Time (s)		6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)		5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)		1871	869	148	2325			285	314		177	
v/s Ratio Prot		0.43		0.06	c0.69							
v/s Ratio Perm			0.02					0.12	0.02		c0.23	
v/c Ratio		0.73	0.03	0.61	0.96			0.57	0.12		1.07	
Uniform Delay, d1		20.8	12.1	61.4	17.6			49.1	44.2		54.9	
Progression Factor		0.37	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		2.0	0.0	8.4	11.1			3.1	0.2		86.8	
Delay (s)		9.8	12.1	69.8	28.7			52.3	44.5		141.8	
Level of Service		A	B	E	C			D	D		F	
Approach Delay (s)		9.9			30.3			48.6			141.8	
Approach LOS		A			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	1569	2186	75	61	17
Future Vol, veh/h	31	1569	2186	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1687	2351	81	66	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2431	0	-	0	3301	1216
Stage 1	-	-	-	-	2391	-
Stage 2	-	-	-	-	910	-
Critical Hdwy	4.1	-	-	-	6.44	6.7
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.2	-	-	-	3.52	3.3
Pot Cap-1 Maneuver	197	-	-	-	~ 9	188
Stage 1	-	-	-	-	71	-
Stage 2	-	-	-	-	390	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	197	-	-	-	~ 7	188
Mov Cap-2 Maneuver	-	-	-	-	~ 55	-
Stage 1	-	-	-	-	71	-
Stage 2	-	-	-	-	325	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	$ 316.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	197	-	-	-	65
HCM Lane V/C Ratio	0.169	-	-	-	1.29
HCM Control Delay (s)	27	-	-	-	$ 316.6
HCM Lane LOS	D	-	-	-	F
HCM 95th %tile Q(veh)	0.6	-	-	-	6.9

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

Appendix K
2025 Horizon Year Total Conditions Level of Service Worksheets

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2025
Time Analyzed	Total AM
Project Description	Crestview Crossing

Site Information

Intersection	Springbrook/Crestview
E/W Street Name	Crestview Dr
N/S Street Name	Springbrook Rd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.66
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	2	54	29	54	0	19	40	83	2	49	254	7	1	216	145	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v_{PCE}), pc/h	3	89	50	84	0	29	61	126	3	76	400	11	2	409	228	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		226			216			490			858	
Entry Volume veh/h		210			216			473			753	
Circulating Flow (v_c), pc/h		671			573			553			172	
Exiting Flow (v_{ex}), pc/h		470			359			617			344	
Capacity (c_{pce}), pc/h		696			769			785			1158	
Capacity (c), veh/h		647			769			758			1016	
v/c Ratio (x)		0.32			0.28			0.62			0.74	

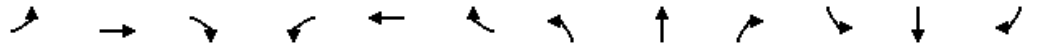
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.8			7.9			15.4			16.6	
Lane LOS		A			A			C			C	
95% Queue, veh		1.4			1.2			4.4			7.1	
Approach Delay, s/veh	9.8			7.9			15.4			16.6		
Approach LOS	A			A			C			C		
Intersection Delay, s/veh | LOS	14.3						B					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	237	5	8	133	6	5
Future Volume (Veh/h)	237	5	8	133	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	349	7	12	196	9	7
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			356		572	352
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			356		572	352
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1214		452	696

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	356	208	16
Volume Left	0	12	9
Volume Right	7	0	7
cSH	1700	1214	534
Volume to Capacity	0.21	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.5	12.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	12.0
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	179	37	13	15	82	154	5	16	116	69
Future Volume (vph)	61	27	179	37	13	15	82	154	5	16	116	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	216	45	16	18	99	186	6	19	140	83

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	106	216	79	99	192	19	223
Volume Left (vph)	73	0	45	99	0	19	0
Volume Right (vph)	0	216	18	0	6	0	83
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16
Departure Headway (s)	6.5	5.5	6.5	6.6	6.1	6.8	5.9
Degree Utilization, x	0.19	0.33	0.14	0.18	0.33	0.04	0.37
Capacity (veh/h)	517	619	505	519	562	497	576
Control Delay (s)	9.9	9.9	10.6	9.8	10.8	8.9	11.1
Approach Delay (s)	9.9		10.6	10.5		10.9	
Approach LOS	A		B	B		B	

Intersection Summary				
Delay	10.4			
Level of Service	B			
Intersection Capacity Utilization	36.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1497	75	89	920	91	179	140	102	211	120	69
Future Volume (vph)	42	1497	75	89	920	91	179	140	102	211	120	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	47	1682	84	100	1034	102	201	157	115	237	135	78
RTOR Reduction (vph)	0	0	37	0	0	46	0	0	100	0	0	68
Lane Group Flow (vph)	47	1682	47	100	1034	56	201	157	15	237	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Effective Green, g (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1776	794	152	1728	772	387	220	190	372	197	176
v/s Ratio Prot	0.03	c0.53		0.03	c0.33		0.07	c0.10		c0.08	0.09	
v/s Ratio Perm			0.03			0.04			0.01			0.01
v/c Ratio	0.52	0.95	0.06	0.66	0.60	0.07	0.52	0.71	0.08	0.64	0.69	0.06
Uniform Delay, d1	54.9	25.0	12.2	55.8	18.1	12.6	48.8	49.7	45.5	50.3	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.76	0.46	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	12.0	0.1	7.6	1.4	0.2	0.7	9.4	0.1	2.9	8.3	0.1
Delay (s)	57.9	37.0	12.4	49.9	9.6	1.6	49.5	59.1	45.6	53.2	58.5	46.3
Level of Service	E	D	B	D	A	A	D	E	D	D	E	D
Approach Delay (s)		36.4			12.2			51.7			53.6	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1702	43	86	1064	28	58	3	92	11	5	27
Future Volume (vph)	19	1702	43	86	1064	28	58	3	92	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	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	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.54	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		951	1361	
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)	21	1850	47	93	1157	30	63	3	100	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	90	0	0	26	0
Lane Group Flow (vph)	21	1850	34	93	1157	23	63	13	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.70	0.70	0.09	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2231	891	146	2375	982	108	137		92	132	
v/s Ratio Prot	0.01	c0.58		c0.06	0.38			0.01			0.01	
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.83	0.04	0.64	0.49	0.02	0.58	0.09		0.13	0.06	
Uniform Delay, d1	57.6	12.6	5.4	52.4	5.0	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.12	0.21	0.03	1.45	0.16	0.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	1.8	0.0	5.1	0.5	0.0	6.5	0.2		0.5	0.1	
Delay (s)	67.4	4.5	0.2	81.0	1.3	0.0	58.3	49.5		50.0	49.3	
Level of Service	E	A	A	F	A	A	E	D		D	D	
Approach Delay (s)		5.0			7.1			52.9			49.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	1764	1217	21	52	24
Future Volume (Veh/h)	4	1764	1217	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1897	1309	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.69				0.69	0.69
vC, conflicting volume	1332				2277	666
vC1, stage 1 conf vol					1320	
vC2, stage 2 conf vol					956	
vCu, unblocked vol	580				1951	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				77	97
cM capacity (veh/h)	692				242	752

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	948	948	873	459	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	692	1700	1700	1700	1700	309
Volume to Capacity	0.01	0.56	0.56	0.51	0.27	0.27
Queue Length 95th (ft)	0	0	0	0	0	26
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	20.8
Lane LOS	B					C
Approach Delay (s)	0.0			0.0		20.8
Approach LOS						C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	1701	90	100	1123	77	42	13	71	238	29	73
Future Volume (vph)	25	1701	90	100	1123	77	42	13	71	238	29	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	
Satd. Flow (prot)	1607	3214	1480	1614	3110			1604	1465		1548	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.71	1.00		0.75	
Satd. Flow (perm)	1607	3214	1480	1614	3110			1190	1465		1208	
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)	27	1849	98	109	1221	84	46	14	77	259	32	79
RTOR Reduction (vph)	0	0	26	0	4	0	0	0	55	0	8	0
Lane Group Flow (vph)	27	1849	72	109	1301	0	0	60	22	0	362	0
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Effective Green, g (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Actuated g/C Ratio	0.03	0.53	0.53	0.06	0.56			0.29	0.29		0.29	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	48	1706	785	91	1733			342	421		347	
v/s Ratio Prot	0.02	c0.58		c0.07	0.42							
v/s Ratio Perm			0.05					0.05	0.02		c0.30	
v/c Ratio	0.56	1.08	0.09	1.20	0.75			0.18	0.05		1.04	
Uniform Delay, d1	57.4	28.1	13.9	56.6	20.2			32.1	30.9		42.8	
Progression Factor	0.89	1.50	1.85	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	10.8	44.8	0.1	156.9	3.0			0.3	0.1		60.2	
Delay (s)	62.2	87.0	25.8	213.5	23.3			32.4	31.0		102.9	
Level of Service	E	F	C	F	C			C	C		F	
Approach Delay (s)		83.7			37.9			31.6			102.9	
Approach LOS		F			D			C			F	

Intersection Summary			
HCM 2000 Control Delay	67.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	2010	1295	29	62	6
Future Vol, veh/h	3	2010	1295	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	2116	1363	31	65	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1394	0	-	0	2442	697
Stage 1	-	-	-	-	1378	-
Stage 2	-	-	-	-	1064	-
Critical Hdwy	4.76	-	-	-	6.46	6.7
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.53	-	-	-	3.53	3.3
Pot Cap-1 Maneuver	353	-	-	-	~ 34	403
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	327	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	353	-	-	-	~ 34	403
Mov Cap-2 Maneuver	-	-	-	-	138	-
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	324	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	50.8
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	353	-	-	-	147
HCM Lane V/C Ratio	0.009	-	-	-	0.487
HCM Control Delay (s)	15.3	-	-	-	50.8
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.3

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

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2025
Time Analyzed	Total AM
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	14	0	32	0	39	0	17	0	11	92	13	0	5	269	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v_{PCE}), pc/h	0	15	0	35	0	42	0	18	0	12	105	14	0	5	307	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		50			60			131			317	
Entry Volume veh/h		50			60			126			302	
Circulating Flow (v_c), pc/h	354			132			20			54		
Exiting Flow (v_{ex}), pc/h	19			17			138			384		
Capacity (c_{pce}), pc/h		962			1206			1352			1306	
Capacity (c), veh/h		962			1206			1301			1246	
v/c Ratio (x)		0.05			0.05			0.10			0.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.2			3.4			3.5			5.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			0.3			1.0	
Approach Delay, s/veh	4.2			3.4			3.5			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.4						A					

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2025
Time Analyzed	Total PM
Project Description	Crestview Crossing

Site Information

Intersection	Springbrook/Crestview
E/W Street Name	Crestview Dr
N/S Street Name	Springbrook Rd
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.93
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	53	20	13	0	14	13	172	0	7	374	25	2	200	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	57	22	14	0	18	14	185	0	8	414	27	2	215	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		93			217			449			558	
Entry Volume veh/h		93			214			437			552	
Circulating Flow (v_c), pc/h		523			481			296			40	
Exiting Flow (v_{ex}), pc/h		264			75			658			320	
Capacity (c_{pce}), pc/h		809			845			1020			1325	
Capacity (c), veh/h		809			833			993			1311	
v/c Ratio (x)		0.11			0.26			0.44			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			7.1			8.6			6.8	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			1.0			2.3			2.1	
Approach Delay, s/veh	5.6			7.1			8.6			6.8		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	7.4						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	233	5	9	193	8	14
Future Volume (Veh/h)	233	5	9	193	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	295	6	11	244	10	18
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			303		566	300
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			303		566	300
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1267		483	743

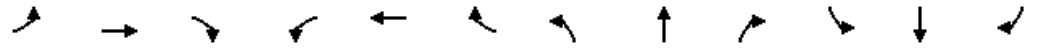
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	301	255	28
Volume Left	0	11	10
Volume Right	6	0	18
cSH	1700	1267	623
Volume to Capacity	0.18	0.01	0.04
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	0.4	11.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	11.0
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	226	91	68	86	141	202	5	67	181	40
Future Volume (vph)	83	63	226	91	68	86	141	202	5	67	181	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	235	95	71	90	147	210	5	70	189	42

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	235	256	147	215	70	231
Volume Left (vph)	86	0	95	147	0	70	0
Volume Right (vph)	0	235	90	0	5	0	42
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06
Departure Headway (s)	7.5	6.5	7.1	7.8	7.3	7.9	7.3
Degree Utilization, x	0.32	0.42	0.51	0.32	0.43	0.15	0.47
Capacity (veh/h)	454	524	468	431	462	429	460
Control Delay (s)	12.7	13.0	17.2	13.1	14.5	11.1	15.3
Approach Delay (s)	12.9		17.2	13.9		14.3	
Approach LOS	B		C	B		B	

Intersection Summary				
Delay	14.4			
Level of Service	B			
Intersection Capacity Utilization	50.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	1301	124	151	1636	155	374	179	142	224	212	84
Future Volume (vph)	98	1301	124	151	1636	155	374	179	142	224	212	84
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1328	127	154	1669	158	382	183	145	229	216	86
RTOR Reduction (vph)	0	0	63	0	0	70	0	0	124	0	0	67
Lane Group Flow (vph)	100	1328	64	154	1669	89	382	183	21	229	216	19
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.0	70.6	70.6	10.4	70.0	70.0	20.4	19.9	19.9	22.6	22.1	22.1
Effective Green, g (s)	11.0	70.6	70.6	10.4	70.0	70.0	20.4	19.9	19.9	22.6	22.1	22.1
Actuated g/C Ratio	0.08	0.50	0.50	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	124	1581	726	212	1644	711	462	237	193	515	268	226
v/s Ratio Prot	c0.06	0.42		0.05	c0.51		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.06			0.02			0.01
v/c Ratio	0.81	0.84	0.09	0.73	1.02	0.12	0.83	0.77	0.11	0.44	0.81	0.08
Uniform Delay, d1	63.5	29.8	18.0	63.4	35.0	18.7	58.1	57.9	52.3	53.0	56.9	50.3
Progression Factor	1.00	1.00	1.00	1.03	0.97	1.09	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.5	5.5	0.2	6.2	20.6	0.2	11.2	13.6	0.1	0.4	15.5	0.1
Delay (s)	92.9	35.4	18.2	71.5	54.5	20.5	69.3	71.5	52.5	53.4	72.3	50.4
Level of Service	F	D	B	E	D	C	E	E	D	D	E	D
Approach Delay (s)		37.7			53.1			66.4			60.6	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1210	101	231	1685	41	243	16	152	21	10	51
Future Volume (vph)	32	1210	101	231	1685	41	243	16	152	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1438		1675	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.50	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1438		875	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1260	105	241	1755	43	253	17	158	22	10	53
RTOR Reduction (vph)	0	0	33	0	0	14	0	121	0	0	41	0
Lane Group Flow (vph)	33	1260	72	241	1755	29	253	54	0	22	22	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.9	68.9	68.9	26.0	91.0	91.0	32.6	32.6		32.6	32.6	
Effective Green, g (s)	3.9	68.9	68.9	26.0	91.0	91.0	32.6	32.6		32.6	32.6	
Actuated g/C Ratio	0.03	0.49	0.49	0.19	0.65	0.65	0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	45	1528	689	305	2078	878	284	334		203	342	
v/s Ratio Prot	0.02	c0.41		0.15	c0.55			0.04			0.02	
v/s Ratio Perm			0.05			0.02	c0.21			0.03		
v/c Ratio	0.73	0.82	0.10	0.79	0.84	0.03	0.89	0.16		0.11	0.07	
Uniform Delay, d1	67.5	30.4	19.0	54.4	19.0	8.8	52.0	42.8		42.3	41.8	
Progression Factor	0.79	1.05	1.02	0.73	0.49	0.34	1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.1	3.4	0.2	1.3	0.4	0.0	27.3	0.2		0.2	0.1	
Delay (s)	83.6	35.5	19.6	40.9	9.7	3.0	79.3	43.0		42.4	41.9	
Level of Service	F	D	B	D	A	A	E	D		D	D	
Approach Delay (s)		35.4			13.3			64.4			42.0	
Approach LOS		D			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	1379	2010	128	26	18
Future Volume (Veh/h)	32	1379	2010	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1483	2161	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.42				0.42	0.42
vC, conflicting volume	2299				3040	1150
vC1, stage 1 conf vol					2230	
vC2, stage 2 conf vol					810	
vCu, unblocked vol	1312				3095	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	84				71	96
cM capacity (veh/h)	215				95	453

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	742	742	1441	858	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	215	1700	1700	1700	1700	140
Volume to Capacity	0.16	0.44	0.44	0.85	0.50	0.34
Queue Length 95th (ft)	14	0	0	0	0	34
Control Delay (s)	24.9	0.0	0.0	0.0	0.0	43.2
Lane LOS	C					E
Approach Delay (s)	0.6			0.0		43.2
Approach LOS						E

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	1281	38	86	1955	167	135	35	139	190	13	48
Future Volume (vph)	87	1281	38	86	1955	167	135	35	139	190	13	48
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1654	3184	1479	1646	3222			1638	1465		1594	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.70	1.00		0.53	
Satd. Flow (perm)	1654	3184	1479	1646	3222			1191	1465		872	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	1363	40	91	2080	178	144	37	148	202	14	51
RTOR Reduction (vph)	0	0	18	0	4	0	0	0	105	0	6	0
Lane Group Flow (vph)	93	1363	22	91	2254	0	0	181	43	0	261	0
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	7.0	77.5	77.5	12.6	83.1			34.9	34.9		34.9	
Effective Green, g (s)	7.0	77.5	77.5	12.6	83.1			34.9	34.9		34.9	
Actuated g/C Ratio	0.05	0.55	0.55	0.09	0.59			0.25	0.25		0.25	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	82	1762	818	148	1912			296	365		217	
v/s Ratio Prot	c0.06	0.43		0.06	c0.70							
v/s Ratio Perm			0.01					0.15	0.03		c0.30	
v/c Ratio	1.13	0.77	0.03	0.61	1.18			0.61	0.12		1.20	
Uniform Delay, d1	66.5	24.4	14.2	61.4	28.5			46.5	40.6		52.5	
Progression Factor	1.07	0.54	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	124.2	2.4	0.0	8.4	86.2			4.2	0.2		126.7	
Delay (s)	195.5	15.6	14.2	69.8	114.6			50.8	40.8		179.2	
Level of Service	F	B	B	E	F			D	D		F	
Approach Delay (s)		26.8			112.9			46.3			179.2	
Approach LOS		C			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	82.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	1585	2213	75	61	17
Future Vol, veh/h	31	1585	2213	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1704	2380	81	66	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2460	0	-	0	3339	1230
Stage 1	-	-	-	-	2420	-
Stage 2	-	-	-	-	919	-
Critical Hdwy	4.1	-	-	-	6.44	6.7
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.2	-	-	-	3.52	3.3
Pot Cap-1 Maneuver	192	-	-	-	~ 9	184
Stage 1	-	-	-	-	69	-
Stage 2	-	-	-	-	387	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	192	-	-	-	~ 7	184
Mov Cap-2 Maneuver	-	-	-	-	~ 54	-
Stage 1	-	-	-	-	69	-
Stage 2	-	-	-	-	320	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	$ 326.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	192	-	-	-	64
HCM Lane V/C Ratio	0.174	-	-	-	1.31
HCM Control Delay (s)	27.6	-	-	-	$ 326.2
HCM Lane LOS	D	-	-	-	F
HCM 95th %tile Q(veh)	0.6	-	-	-	7

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

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2025
Time Analyzed	Total PM
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.94
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	9	0	21	0	25	0	11	0	36	210	43	0	19	205	15
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	10	0	22	0	27	0	12	0	38	228	46	0	20	222	16
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		32			39			312			258	
Entry Volume veh/h		32			39			308			254	
Circulating Flow (v_c), pc/h	269			276			30			65		
Exiting Flow (v_{ex}), pc/h	66			54			250			271		
Capacity (c_{pce}), pc/h		1049			1041			1338			1291	
Capacity (c), veh/h		1049			1041			1319			1270	
v/c Ratio (x)		0.03			0.04			0.23			0.20	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.7			3.8			4.7			4.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.1			0.9			0.7	
Approach Delay, s/veh	3.7			3.8			4.7			4.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.5						A					

Appendix L
2025 Horizon Year Total
Conditions with Mitigation
Level of Service Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	1701	90	100	1123	77	42	13	71	238	29	73
Future Volume (vph)	25	1701	90	100	1123	77	42	13	71	238	29	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1232	1642	1465	1235	1650	1402
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)	27	1849	98	109	1221	84	46	14	77	259	32	79
RTOR Reduction (vph)	0	0	30	0	0	33	0	0	59	0	0	60
Lane Group Flow (vph)	27	1849	68	109	1221	51	46	14	18	259	32	19
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	3.6	67.5	67.5	9.3	73.2	73.2	28.2	28.2	28.2	28.2	28.2	28.2
Effective Green, g (s)	3.6	67.5	67.5	9.3	73.2	73.2	28.2	28.2	28.2	28.2	28.2	28.2
Actuated g/C Ratio	0.03	0.56	0.56	0.08	0.61	0.61	0.23	0.23	0.23	0.23	0.23	0.23
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	48	1807	832	125	1912	855	289	385	344	290	387	329
v/s Ratio Prot	0.02	c0.58		c0.07	c0.39			0.01			0.02	
v/s Ratio Perm			0.05			0.04	0.04		0.01	c0.21		0.01
v/c Ratio	0.56	1.02	0.08	0.87	0.64	0.06	0.16	0.04	0.05	0.89	0.08	0.06
Uniform Delay, d1	57.4	26.2	12.0	54.8	14.9	9.5	36.5	35.4	35.6	44.4	35.8	35.6
Progression Factor	0.89	1.47	2.02	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.7	25.0	0.2	45.0	1.6	0.1	0.4	0.1	0.1	27.8	0.1	0.1
Delay (s)	65.0	63.5	24.5	99.8	16.6	9.6	36.8	35.5	35.6	72.2	35.9	35.7
Level of Service	E	E	C	F	B	A	D	D	D	E	D	D
Approach Delay (s)		61.6			22.6			36.0			61.3	
Approach LOS		E			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	1281	38	86	1955	167	135	35	139	190	13	48
Future Volume (vph)	87	1281	38	86	1955	167	135	35	139	190	13	48
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1277	1690	1465	1245	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	1363	40	91	2080	178	144	37	148	202	14	51
RTOR Reduction (vph)	0	0	16	0	0	42	0	0	114	0	0	41
Lane Group Flow (vph)	93	1363	24	91	2080	136	144	37	34	202	14	10
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	10.3	85.6	85.6	12.6	87.9	87.9	26.8	26.8	26.8	26.8	26.8	26.8
Effective Green, g (s)	10.3	85.6	85.6	12.6	87.9	87.9	26.8	26.8	26.8	26.8	26.8	26.8
Actuated g/C Ratio	0.07	0.61	0.61	0.09	0.63	0.63	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	121	1946	904	148	2044	906	244	323	280	238	325	276
v/s Ratio Prot	c0.06	0.43		0.06	c0.64			0.02			0.01	
v/s Ratio Perm			0.02			0.09	0.11		0.02	c0.16		0.01
v/c Ratio	0.77	0.70	0.03	0.61	1.02	0.15	0.59	0.11	0.12	0.85	0.04	0.04
Uniform Delay, d1	63.7	18.5	10.7	61.4	26.0	10.7	51.6	46.8	46.9	54.6	46.1	46.1
Progression Factor	1.25	0.18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.2	1.8	0.0	8.4	24.4	0.4	4.4	0.2	0.3	24.3	0.1	0.1
Delay (s)	101.6	5.1	10.8	69.8	50.5	11.1	56.0	47.0	47.1	78.9	46.2	46.1
Level of Service	F	A	B	E	D	B	E	D	D	E	D	D
Approach Delay (s)		11.2			48.2			51.0			70.9	
Approach LOS		B			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Appendix M
SimTraffic Queuing Worksheets

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	320	524	561	225	77	95	228	239	24	130	148	241
Average Queue (ft)	43	273	273	21	21	46	128	135	0	42	80	99
95th Queue (ft)	154	447	453	162	59	83	207	219	0	102	133	186
Link Distance (ft)		2053	2053				1271	1271				1159
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)		4	4	0								
Queuing Penalty (veh)		2	3	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	106	182	194	417	155
Average Queue (ft)	47	143	165	159	37
95th Queue (ft)	95	212	220	353	108
Link Distance (ft)				443	
Upstream Blk Time (%)				1	
Queuing Penalty (veh)				3	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		2	12	7	0
Queuing Penalty (veh)		3	22	33	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	53	140	162	35	128	138	174	75	145	137	53	62
Average Queue (ft)	11	35	43	4	44	36	52	5	53	45	8	16
95th Queue (ft)	38	99	115	21	101	101	130	32	118	103	34	44
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)			0				2	0			1	1
Queuing Penalty (veh)			0				1	0			0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	23	163
Average Queue (ft)	2	62
95th Queue (ft)	15	126
Link Distance (ft)		204
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	219	230	125	128	90	98	78	105
Average Queue (ft)	91	104	16	61	34	30	28	35
95th Queue (ft)	191	216	76	117	83	82	66	77
Link Distance (ft)	447	447			1785	1785	301	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			100	230				160
Storage Blk Time (%)		6	0					0
Queuing Penalty (veh)		3	0					0

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	38	297
Average Queue (ft)	2	158
95th Queue (ft)	17	349
Link Distance (ft)		526
Upstream Blk Time (%)		1
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	250	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 77

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	328	465	475	148	214	410	571	589	395	332	345	1699
Average Queue (ft)	201	213	217	5	79	111	254	266	87	303	335	1616
95th Queue (ft)	385	475	455	76	174	257	530	553	352	394	383	1901
Link Distance (ft)		3631	3631				1270	1270				1649
Upstream Blk Time (%)												77
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	14	0	1	0			2	4	0	9	65	12
Queuing Penalty (veh)	76	0	1	0			2	11	0	26	197	62

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	276	182	195	451	155
Average Queue (ft)	91	144	171	427	69
95th Queue (ft)	259	229	247	482	175
Link Distance (ft)				432	
Upstream Blk Time (%)				40	
Queuing Penalty (veh)				265	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)	0	11	30	60	1
Queuing Penalty (veh)	0	33	89	286	5

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	211	409	375	225	374	984	979	105	245	388	61	123
Average Queue (ft)	27	180	188	70	313	571	565	10	214	250	12	33
95th Queue (ft)	109	360	364	216	453	1383	1382	55	295	487	41	87
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)						6	6			41		
Queuing Penalty (veh)						54	56			0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		3	7	0	39	2	18	0	50	3	2	7
Queuing Penalty (veh)		1	7	0	297	4	8	0	74	8	1	2

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	72	204	208	158
Average Queue (ft)	20	94	95	88
95th Queue (ft)	52	382	384	200
Link Distance (ft)		449	449	209
Upstream Blk Time (%)		4	5	10
Queuing Penalty (veh)		42	45	0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)	0			
Queuing Penalty (veh)	2			

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	259	285	106	189	768	748	218	131
Average Queue (ft)	118	128	7	92	303	305	90	46
95th Queue (ft)	214	228	51	196	1174	1169	177	106
Link Distance (ft)	449	449			1785	1785	301	
Upstream Blk Time (%)					1	1	0	
Queuing Penalty (veh)					11	13	0	
Storage Bay Dist (ft)			100	230				160
Storage Blk Time (%)		10	0	0	12		2	0
Queuing Penalty (veh)		2	0	0	8		2	0

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	95	158	164	541
Average Queue (ft)	28	52	51	510
95th Queue (ft)	73	354	347	607
Link Distance (ft)		746	746	526
Upstream Blk Time (%)		2	3	83
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)	250			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1908

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	320	553	506	224	91	105	193	192	186	212	219	127
Average Queue (ft)	35	282	254	13	22	51	89	91	46	118	96	43
95th Queue (ft)	137	466	430	125	61	91	159	161	143	191	171	100
Link Distance (ft)		686	686				1271	1271			527	
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)		5	3	0								
Queuing Penalty (veh)		2	2	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	169	190	294	155
Average Queue (ft)	67	103	107	44
95th Queue (ft)	146	172	233	115
Link Distance (ft)			443	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			1	
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	1	7	0
Queuing Penalty (veh)	0	2	19	1

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	114	234	249	76	130	144	163	36	132	116	54	75
Average Queue (ft)	13	66	76	8	53	19	30	2	54	47	9	16
95th Queue (ft)	60	168	182	43	109	77	104	24	114	99	33	48
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		0	1	0			1	0			1	2
Queuing Penalty (veh)		0	0	0			0	0			0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	SB
Directions Served	L	T	T	LR
Maximum Queue (ft)	34	82	92	204
Average Queue (ft)	3	5	8	104
95th Queue (ft)	17	41	49	214
Link Distance (ft)		1266	1266	204
Upstream Blk Time (%)				14
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	15	457	458	125	189	190	187	101	102	302
Average Queue (ft)	1	273	297	41	88	79	86	35	34	178
95th Queue (ft)	8	445	463	126	155	157	166	77	71	275
Link Distance (ft)		452	452			1780	1780	302		398
Upstream Blk Time (%)		0	0							
Queuing Penalty (veh)		2	3							
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)		20	23	0	0	0				
Queuing Penalty (veh)		0	20	0	0	0				

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	28	568
Average Queue (ft)	2	462
95th Queue (ft)	18	650
Link Distance (ft)		526
Upstream Blk Time (%)		61
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	250	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 55

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	337	469	431	372	131	454	811	838	395	296	322	320
Average Queue (ft)	115	308	271	15	49	127	457	473	171	176	220	138
95th Queue (ft)	237	436	389	138	102	361	716	737	493	264	308	259
Link Distance (ft)		686	686				1270	1270				527
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	0	4	2	0		0	9	16	0	0	1	0
Queuing Penalty (veh)	0	4	2	0		0	13	24	1	0	3	1

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	192	178	195	417	155
Average Queue (ft)	52	75	124	183	67
95th Queue (ft)	121	145	211	339	161
Link Distance (ft)				432	
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				1	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	1	22	0
Queuing Penalty (veh)		0	2	67	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	174	387	392	225	375	1162	1180	105	245	379	68	124
Average Queue (ft)	36	187	206	64	327	609	599	17	227	292	16	36
95th Queue (ft)	113	369	391	206	454	1319	1322	75	284	488	50	88
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)						2	2			52		
Queuing Penalty (veh)						15	18			0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		2	8	0	49	3	19	0	61	1	2	10
Queuing Penalty (veh)		1	8	0	363	6	8	0	92	2	1	2

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	74	290	295	129
Average Queue (ft)	26	35	37	45
95th Queue (ft)	63	197	204	101
Link Distance (ft)		454	454	209
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		3	3	
Storage Bay Dist (ft)	100			
Storage Blk Time (%)	0			
Queuing Penalty (veh)	3			

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	57	242	241	125	250	462	462	278	185	256
Average Queue (ft)	7	109	116	18	83	208	221	124	71	145
95th Queue (ft)	31	207	208	77	180	392	406	223	156	233
Link Distance (ft)		454	454			1780	1780	301		314
Upstream Blk Time (%)								0		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)		10	12	0	0	5		6	0	
Queuing Penalty (veh)		1	4	0	0	5		9	0	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	89	8	17	541
Average Queue (ft)	27	0	1	517
95th Queue (ft)	65	6	7	584
Link Distance (ft)		746	746	526
Upstream Blk Time (%)				90
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	250			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 666

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	213	600	564	300	90	115	201	209	181	210	210	97
Average Queue (ft)	39	302	267	13	25	52	90	90	40	102	100	40
95th Queue (ft)	142	484	458	126	70	101	165	167	127	178	178	83
Link Distance (ft)		686	686				1271	1271			527	
Upstream Blk Time (%)		1	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)	0	6	3	0								
Queuing Penalty (veh)	0	3	3	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	165	190	300	141
Average Queue (ft)	71	107	95	39
95th Queue (ft)	142	174	207	103
Link Distance (ft)			443	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	1	5	0
Queuing Penalty (veh)	0	1	14	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	55	216	237	72	180	136	137	24	133	117	47	57
Average Queue (ft)	12	72	80	7	64	17	29	1	50	42	7	15
95th Queue (ft)	38	171	186	43	136	67	79	10	115	91	27	41
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		0	1				1				1	0
Queuing Penalty (veh)		0	0				0				0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	24	201	214	5	219
Average Queue (ft)	2	34	42	0	167
95th Queue (ft)	15	139	151	3	269
Link Distance (ft)		1266	1266	452	204
Upstream Blk Time (%)					54
Queuing Penalty (veh)					0
Storage Bay Dist (ft)	100				
Storage Blk Time (%)		2			
Queuing Penalty (veh)		0			

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	124	468	472	125	233	297	277	113	89	404
Average Queue (ft)	28	353	368	38	92	147	148	42	37	243
95th Queue (ft)	76	516	526	121	181	269	265	91	74	366
Link Distance (ft)		452	452			1780	1780	302		398
Upstream Blk Time (%)		2	3							1
Queuing Penalty (veh)		14	24							0
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)	0	28	30	0	0	1				
Queuing Penalty (veh)	0	7	27	0	2	2				

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (ft)	25	352	433
Average Queue (ft)	2	12	328
95th Queue (ft)	15	252	654
Link Distance (ft)		1780	526
Upstream Blk Time (%)			39
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	250		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 98

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	359	548	497	300	124	454	746	770	395	302	325	280
Average Queue (ft)	134	328	288	13	57	177	473	485	187	168	214	135
95th Queue (ft)	281	461	423	126	116	457	680	694	512	257	302	224
Link Distance (ft)		686	686				1270	1270				527
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)		5	1	0		0	10	19	0	0	1	
Queuing Penalty (veh)		5	2	0		0	15	29	1	0	2	

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	158	161	195	425	155
Average Queue (ft)	56	69	119	189	60
95th Queue (ft)	114	139	207	364	150
Link Distance (ft)				432	
Upstream Blk Time (%)				1	
Queuing Penalty (veh)				3	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	1	22	1
Queuing Penalty (veh)		0	2	66	2

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	153	385	426	225	344	367	374	105	244	357	61	93
Average Queue (ft)	24	194	211	58	181	220	238	16	184	117	16	28
95th Queue (ft)	104	355	383	191	307	341	351	70	265	284	46	67
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)										1		
Queuing Penalty (veh)										0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		3	7	0	1	0	23	0	10	0	0	5
Queuing Penalty (veh)		1	7	0	4	0	9	0	16	0	0	1

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (ft)	79	50	30	18	17	125
Average Queue (ft)	31	3	2	1	1	43
95th Queue (ft)	68	37	26	10	7	95
Link Distance (ft)		1264	1264	454	454	209
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	2	0				

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	124	374	356	119	254	1569	1564	281	185	331
Average Queue (ft)	86	161	159	13	132	1082	1083	137	89	213
95th Queue (ft)	141	344	329	65	274	1831	1824	236	183	337
Link Distance (ft)		454	454			1780	1780	301		314
Upstream Blk Time (%)		1	0			0	0	0		5
Queuing Penalty (veh)		4	2			3	4	0		0
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)	21	12	18	0	0	34		9	0	
Queuing Penalty (veh)	124	11	7	0	0	29		12	1	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (ft)	170	202	188	172	181	537
Average Queue (ft)	77	19	14	23	22	516
95th Queue (ft)	205	156	135	136	140	570
Link Distance (ft)		1780	1780	746	746	526
Upstream Blk Time (%)						94
Queuing Penalty (veh)						0
Storage Bay Dist (ft)	250					
Storage Blk Time (%)	6	1				
Queuing Penalty (veh)	45	0				

Network Summary

Network wide Queuing Penalty: 421

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	459	467	125	188	241	246	92	94	57	99	224
Average Queue (ft)	35	318	332	43	82	120	119	14	34	12	40	175
95th Queue (ft)	87	486	497	128	149	214	218	54	75	38	79	244
Link Distance (ft)		445	445			1774	1774			301		
Upstream Blk Time (%)		1	1									
Queuing Penalty (veh)		8	10									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	0	24	26	0		0	0					10
Queuing Penalty (veh)	1	6	24	1		0	0					10

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	381	79
Average Queue (ft)	64	25
95th Queue (ft)	243	59
Link Distance (ft)	385	
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	242	201	65	254	563	586	255	184	284	163	224
Average Queue (ft)	75	70	67	5	92	292	302	96	104	48	65	151
95th Queue (ft)	123	171	148	32	209	487	521	272	176	155	132	238
Link Distance (ft)		446	446			1774	1774			300		
Upstream Blk Time (%)										1		
Queuing Penalty (veh)										0		
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	16	2	2	0		12	11	0	5		0	9
Queuing Penalty (veh)	96	2	1	0		10	19	0	9		1	6

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	300	82
Average Queue (ft)	40	26
95th Queue (ft)	188	65
Link Distance (ft)	300	
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	458	468	125	196	298	308	216	100	76	94	225
Average Queue (ft)	71	322	341	42	81	152	152	29	37	21	38	183
95th Queue (ft)	129	484	495	128	154	255	271	111	80	57	77	246
Link Distance (ft)		445	445			1774	1774			301		
Upstream Blk Time (%)		1	1									
Queuing Penalty (veh)		7	10									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	7	25	27	0		1	2	0				13
Queuing Penalty (veh)	55	17	24	0		1	1	0				17

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	372	98
Average Queue (ft)	105	34
95th Queue (ft)	328	73
Link Distance (ft)	385	
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	125	412	417	122	255	855	865	255	181	221	158	225
Average Queue (ft)	108	169	158	12	121	483	484	138	104	55	65	175
95th Queue (ft)	146	382	372	66	260	828	834	320	174	166	122	259
Link Distance (ft)		446	446			1774	1774			300		
Upstream Blk Time (%)		1	0							0		
Queuing Penalty (veh)		3	3							0		
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	47	6	11	0	0	23	24	0	3	0	0	21
Queuing Penalty (veh)	264	8	4	0	0	20	49	1	6	1	1	29

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	324	184
Average Queue (ft)	111	63
95th Queue (ft)	334	138
Link Distance (ft)	300	
Upstream Blk Time (%)	7	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	266	623	610	375	68	100	205	217	158	221	240	168
Average Queue (ft)	43	358	322	31	17	44	99	101	43	109	97	43
95th Queue (ft)	171	597	570	201	46	81	174	183	134	185	184	113
Link Distance (ft)		686	686				1271	1271			527	
Upstream Blk Time (%)		2	2									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)		11	8	0							0	
Queuing Penalty (veh)		5	6	0							0	

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	162	194	326	126
Average Queue (ft)	70	107	98	40
95th Queue (ft)	147	177	218	105
Link Distance (ft)			443	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			1	
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	1	6	0
Queuing Penalty (veh)	0	1	17	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	44	268	264	60	146	132	154	37	122	132	42	63
Average Queue (ft)	9	110	118	8	51	22	28	2	46	54	8	16
95th Queue (ft)	31	228	236	34	107	88	93	18	101	110	29	44
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		0	2				1				0	1
Queuing Penalty (veh)		0	1				0				0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	SB
Directions Served	L	T	T	LR
Maximum Queue (ft)	24	192	199	219
Average Queue (ft)	3	18	28	190
95th Queue (ft)	18	94	115	274
Link Distance (ft)		1266	1266	204
Upstream Blk Time (%)				73
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)		1		
Queuing Penalty (veh)		0		

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	10	465	469	125	149	207	217	110	93	334
Average Queue (ft)	0	332	347	40	76	91	98	42	42	189
95th Queue (ft)	5	487	500	120	136	170	181	85	82	302
Link Distance (ft)		452	452			1780	1780	302		398
Upstream Blk Time (%)		1	1							
Queuing Penalty (veh)		7	10							
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)		24	26	0		0		0		
Queuing Penalty (veh)		0	24	0		0		0		

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	36	4	554
Average Queue (ft)	3	0	493
95th Queue (ft)	19	0	638
Link Distance (ft)		746	526
Upstream Blk Time (%)			70
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	250		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 74

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	374	583	570	300	145	454	1182	1185	395	255	290	246
Average Queue (ft)	137	344	308	18	56	221	811	818	232	152	198	128
95th Queue (ft)	312	500	461	150	124	538	1395	1404	551	233	272	215
Link Distance (ft)		686	686				1270	1270				527
Upstream Blk Time (%)		0	0				4	5				
Queuing Penalty (veh)		0	0				34	46				
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	0	7	2	0		0	29	34	0		0	
Queuing Penalty (veh)	0	7	3	0		0	40	51	1		0	

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	143	150	195	437	155
Average Queue (ft)	56	73	125	209	63
95th Queue (ft)	109	134	208	399	156
Link Distance (ft)				432	
Upstream Blk Time (%)				1	
Queuing Penalty (veh)				3	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	0	23	0
Queuing Penalty (veh)		0	1	69	1

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	239	332	362	225	375	1285	1301	105	245	373	70	143
Average Queue (ft)	42	184	201	67	356	972	973	16	219	261	18	38
95th Queue (ft)	152	350	371	212	435	1597	1620	72	286	481	52	104
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)						6	7			37		
Queuing Penalty (veh)						54	65			0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		2	8	0	60	9	24	0	50	2	2	10
Queuing Penalty (veh)		1	8	0	494	19	10	0	75	5	1	2

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (ft)	85	78	41	404	401	230
Average Queue (ft)	25	3	1	178	177	154
95th Queue (ft)	69	43	29	514	517	260
Link Distance (ft)		1264	1264	454	454	209
Upstream Blk Time (%)				3	4	35
Queuing Penalty (veh)				35	43	0
Storage Bay Dist (ft)	100					
Storage Blk Time (%)	2					
Queuing Penalty (veh)	16					

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	317	316	125	254	1236	1258	281	184	289
Average Queue (ft)	119	132	18	112	630	637	136	78	144
95th Queue (ft)	232	246	75	250	1627	1633	241	167	242
Link Distance (ft)	454	454			1780	1780	301		314
Upstream Blk Time (%)					1	1	1		0
Queuing Penalty (veh)					14	14	0		0
Storage Bay Dist (ft)			100	230				160	
Storage Blk Time (%)	10	13	0	0	18		8	0	
Queuing Penalty (veh)	0	5	0	0	15		12	0	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	EB	WB	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	169	111	362	321	543
Average Queue (ft)	74	13	76	74	515
95th Queue (ft)	184	105	425	421	584
Link Distance (ft)		1780	746	746	526
Upstream Blk Time (%)			4	3	90
Queuing Penalty (veh)			0	0	0
Storage Bay Dist (ft)	250				
Storage Blk Time (%)	1	0			
Queuing Penalty (veh)	8	0			

Network Summary

Network wide Queuing Penalty: 1158

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	372	606	614	375	92	114	208	206	178	187	174	117
Average Queue (ft)	64	366	333	34	20	49	96	97	45	112	93	46
95th Queue (ft)	241	606	597	210	61	93	184	182	137	175	161	99
Link Distance (ft)		686	686				1271	1271			527	
Upstream Blk Time (%)		3	4									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)		12	9	0								
Queuing Penalty (veh)		5	7	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	170	194	324	153
Average Queue (ft)	72	110	109	40
95th Queue (ft)	150	186	223	109
Link Distance (ft)			443	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	1	6	0
Queuing Penalty (veh)	0	2	17	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	98	286	324	97	149	100	136	10	152	134	36	58
Average Queue (ft)	14	114	124	12	63	15	26	1	49	54	8	16
95th Queue (ft)	59	236	257	62	122	59	82	6	115	113	25	43
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		1	2	0			1				0	0
Queuing Penalty (veh)		0	1	0			0				0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	43	517	530	11	219
Average Queue (ft)	2	164	176	0	207
95th Queue (ft)	22	487	495	8	235
Link Distance (ft)		1266	1266	452	204
Upstream Blk Time (%)					95
Queuing Penalty (veh)					0
Storage Bay Dist (ft)	100				
Storage Blk Time (%)		11			
Queuing Penalty (veh)		0			

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	124	474	482	125	203	333	378	117	98	400
Average Queue (ft)	30	413	428	46	86	174	184	44	43	266
95th Queue (ft)	88	533	535	137	170	296	328	92	80	396
Link Distance (ft)		452	452			1780	1780	302		398
Upstream Blk Time (%)		9	10							5
Queuing Penalty (veh)		77	93							0
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)	0	35	37	0	0	2				
Queuing Penalty (veh)	0	9	34	0	0	2				

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (ft)	27	361	554
Average Queue (ft)	1	12	465
95th Queue (ft)	12	259	679
Link Distance (ft)		1780	526
Upstream Blk Time (%)		0	64
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)	250		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 250

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	375	617	557	374	138	454	877	897	395	288	328	283
Average Queue (ft)	135	386	344	39	59	184	518	526	209	170	217	128
95th Queue (ft)	313	553	509	226	118	471	819	823	534	258	294	230
Link Distance (ft)		686	686				1270	1270				527
Upstream Blk Time (%)		0	0					0				
Queuing Penalty (veh)		0	0					0				
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	0	11	5	0		0	13	22	0	0	0	0
Queuing Penalty (veh)	0	10	6	0		0	19	34	1	0	1	0

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	235	162	195	430	155
Average Queue (ft)	70	74	110	183	70
95th Queue (ft)	142	137	190	345	164
Link Distance (ft)				432	
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				1	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	0	20	0
Queuing Penalty (veh)		0	1	62	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	161	461	465	225	316	376	363	105	244	343	66	107
Average Queue (ft)	23	210	221	66	161	227	243	15	172	110	15	32
95th Queue (ft)	85	395	398	209	275	338	344	68	255	271	46	83
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)										1		
Queuing Penalty (veh)										0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)	0	5	9	0	0	1	24	0	7	0	1	6
Queuing Penalty (veh)	0	1	9	0	3	1	10	0	12	1	0	1

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	103	152	123	16	113
Average Queue (ft)	30	13	11	1	50
95th Queue (ft)	73	107	100	8	116
Link Distance (ft)		1264	1264	454	209
Upstream Blk Time (%)					1
Queuing Penalty (veh)					0
Storage Bay Dist (ft)	100				
Storage Blk Time (%)	1	2			
Queuing Penalty (veh)	5	1			

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	124	423	425	123	254	1809	1818	284	177	324
Average Queue (ft)	88	220	216	20	99	1648	1645	139	80	218
95th Queue (ft)	145	402	395	89	231	2148	2149	256	173	323
Link Distance (ft)		454	454			1780	1780	301		314
Upstream Blk Time (%)		1	1			4	5	1		3
Queuing Penalty (veh)		9	6			47	54	0		0
Storage Bay Dist (ft)	100			100	230				160	
Storage Blk Time (%)	20	20	25	0	0	36		7	1	
Queuing Penalty (veh)	130	17	9	0	0	31		10	1	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	151	797	803	541
Average Queue (ft)	50	527	530	519
95th Queue (ft)	136	1068	1069	556
Link Distance (ft)		746	746	526
Upstream Blk Time (%)		33	33	81
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)	250			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 502

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	108	457	472	125	180	280	279	47	94	78	104	224
Average Queue (ft)	31	352	366	42	86	132	128	15	39	15	43	172
95th Queue (ft)	81	493	498	130	146	239	230	38	84	50	90	243
Link Distance (ft)		445	445			1774	1774			301		
Upstream Blk Time (%)		2	2									
Queuing Penalty (veh)		13	19									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	0	27	29	0		1	1					11
Queuing Penalty (veh)	2	7	26	0		1	0					12

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	364	112
Average Queue (ft)	78	27
95th Queue (ft)	277	70
Link Distance (ft)	385	
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	260	258	125	255	1066	1064	255	180	212	156	224
Average Queue (ft)	85	101	90	9	112	702	700	140	114	38	66	159
95th Queue (ft)	137	212	196	52	244	1277	1260	328	185	127	123	244
Link Distance (ft)		446	446			1774	1774			300		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	25	6	5	0	0	26	26	0	5		0	10
Queuing Penalty (veh)	160	5	2	0	0	22	43	1	9		0	6

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	319	83
Average Queue (ft)	51	27
95th Queue (ft)	220	68
Link Distance (ft)	300	
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	470	484	125	238	355	355	142	107	61	96	225
Average Queue (ft)	67	366	379	42	94	161	160	20	37	18	40	176
95th Queue (ft)	125	520	523	129	185	281	286	72	81	48	79	244
Link Distance (ft)		445	445			1774	1774			301		
Upstream Blk Time (%)		4	4									
Queuing Penalty (veh)		29	35									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	6	29	30	0		2	2	0				10
Queuing Penalty (veh)	51	20	27	0		2	2	0				13

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	368	116
Average Queue (ft)	94	35
95th Queue (ft)	301	80
Link Distance (ft)	385	
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	125	429	442	87	255	1332	1331	255	178	192	159	224
Average Queue (ft)	113	214	185	10	104	1018	1024	161	104	42	70	177
95th Queue (ft)	143	417	408	58	240	1384	1391	344	178	125	133	257
Link Distance (ft)		446	446			1774	1774			300		
Upstream Blk Time (%)		2	2							0		
Queuing Penalty (veh)		10	10							0		
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	50	8	13	0	0	34	34	0	4		0	17
Queuing Penalty (veh)	315	12	5	0	0	30	70	1	7		1	23

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	321	177
Average Queue (ft)	83	68
95th Queue (ft)	281	140
Link Distance (ft)	300	
Upstream Blk Time (%)	4	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1795	55	67	1115	39	64
v/c Ratio	0.74	0.05	0.44	0.41	0.31	0.37
Control Delay	17.7	3.0	59.7	2.6	58.1	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	3.0	59.7	2.6	58.1	18.4
Queue Length 50th (ft)	770	7	50	77	29	0
Queue Length 95th (ft)	852	m11	94	121	64	43
Internal Link Dist (ft)	441			1753	284	
Turn Bay Length (ft)		100	230			160
Base Capacity (vph)	2412	1116	208	2735	271	303
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	0.74	0.05	0.32	0.41	0.14	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1334	23	78	1921	103	107
v/c Ratio	0.61	0.02	0.52	0.71	0.59	0.42
Control Delay	11.1	6.6	71.8	7.5	72.2	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	6.6	71.8	7.5	72.2	14.6
Queue Length 50th (ft)	196	3	69	312	91	0
Queue Length 95th (ft)	239	m5	121	486	148	55
Internal Link Dist (ft)	442			1753	284	
Turn Bay Length (ft)		100	230			160
Base Capacity (vph)	2203	1026	241	2693	353	402
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	0.61	0.02	0.32	0.71	0.29	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

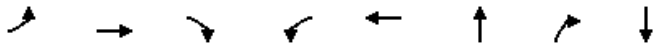
Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1	1670	98	109	1183	55	77	248
v/c Ratio	0.01	0.92	0.11	0.91	0.57	0.18	0.19	0.91
Control Delay	55.0	44.4	10.2	116.3	12.7	37.2	8.0	79.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	44.4	10.2	116.3	12.7	37.2	8.0	79.7
Queue Length 50th (ft)	1	612	29	~94	227	34	0	184
Queue Length 95th (ft)	m0	#772	m50	#214	377	70	35	#334
Internal Link Dist (ft)		441			1753	284		365
Turn Bay Length (ft)	100		100	230			160	
Base Capacity (vph)	71	1807	862	120	2083	326	427	288
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	0.92	0.11	0.91	0.57	0.17	0.18	0.86

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.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	6	1229	40	91	2036	162	148	189
v/c Ratio	0.10	0.66	0.04	0.61	0.89	0.57	0.34	1.07
Control Delay	73.7	9.6	0.1	79.0	23.5	58.1	9.0	138.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.7	9.6	0.1	79.0	23.5	58.1	9.0	138.1
Queue Length 50th (ft)	6	139	0	80	664	133	0	~189
Queue Length 95th (ft)	m11	159	m0	141	#1126	213	58	#350
Internal Link Dist (ft)		442			1753	284		281
Turn Bay Length (ft)	100		100	230			160	
Base Capacity (vph)	59	1871	908	166	2276	285	431	177
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	0.10	0.66	0.04	0.55	0.89	0.57	0.34	1.07

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.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
7: Providence Dr & OR 99W

08/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	1670	98	109	1108	84	46	14	77	259	32	79
v/c Ratio	0.32	0.92	0.11	0.87	0.56	0.09	0.16	0.04	0.19	0.90	0.08	0.20
Control Delay	56.5	44.6	10.2	107.9	15.4	2.6	37.0	34.5	8.0	76.6	35.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	44.6	10.2	107.9	15.4	2.6	37.0	34.5	8.0	76.6	35.4	8.4
Queue Length 50th (ft)	19	613	28	~94	282	0	28	8	0	191	19	0
Queue Length 95th (ft)	m30	#772	m47	#214	350	22	61	26	35	#338	46	37
Internal Link Dist (ft)		441			1753			284			365	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	85	1807	862	125	1976	914	308	410	427	308	412	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.92	0.11	0.87	0.56	0.09	0.15	0.03	0.18	0.84	0.08	0.19

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.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
7: Providence Dr/Crestview Dr & OR 99W

08/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	93	1229	40	91	1887	178	144	37	148	202	14	51
v/c Ratio	0.77	0.63	0.04	0.62	0.92	0.19	0.59	0.11	0.37	0.85	0.04	0.14
Control Delay	107.5	3.9	0.1	79.3	32.3	4.1	61.4	45.9	9.4	84.1	44.5	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.5	3.9	0.1	79.3	32.3	4.1	61.4	45.9	9.4	84.1	44.5	0.8
Queue Length 50th (ft)	90	58	0	80	771	18	118	28	0	175	10	0
Queue Length 95th (ft)	m#167	77	m0	141	#920	49	192	60	58	#294	30	0
Internal Link Dist (ft)		442			1753			284			281	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	121	1947	941	165	2045	953	273	362	430	266	364	391
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.63	0.04	0.55	0.92	0.19	0.53	0.10	0.34	0.76	0.04	0.13

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

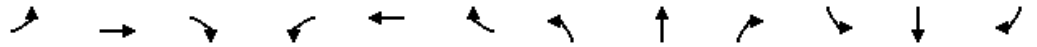
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	76	1670	98	109	1108	100	46	26	77	267	38	105
v/c Ratio	0.53	0.93	0.12	0.90	0.62	0.12	0.16	0.07	0.19	0.91	0.10	0.25
Control Delay	55.0	45.8	10.7	115.5	21.0	3.1	36.5	34.7	8.8	77.7	35.1	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	45.8	10.7	115.5	21.0	3.1	36.5	34.7	8.8	77.7	35.1	8.2
Queue Length 50th (ft)	52	655	28	~94	322	0	28	15	0	198	23	0
Queue Length 95th (ft)	m76	#820	m50	#214	401	27	60	39	38	#351	52	44
Internal Link Dist (ft)		441			1753			284			365	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	160	1794	850	121	1776	838	311	417	429	310	419	434
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.93	0.12	0.90	0.62	0.12	0.15	0.06	0.18	0.86	0.09	0.24

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.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	145	1209	40	91	1856	219	144	45	148	236	22	126
v/c Ratio	0.94	0.64	0.04	0.62	0.96	0.24	0.55	0.13	0.35	0.93	0.06	0.32
Control Delay	127.2	3.8	0.1	79.3	40.6	5.3	58.3	45.7	9.1	93.9	44.5	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.2	3.8	0.1	79.3	40.6	5.3	58.3	45.7	9.1	93.9	44.5	9.5
Queue Length 50th (ft)	~144	55	0	80	804	28	117	33	0	211	16	0
Queue Length 95th (ft)	m#252	74	m0	141	#1023	66	192	70	58	#369	41	55
Internal Link Dist (ft)		442			1753			284			281	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	154	1898	905	165	1930	914	271	362	430	265	364	408
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.64	0.04	0.55	0.96	0.24	0.53	0.12	0.34	0.89	0.06	0.31

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.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1	1849	98	109	1296	55	77	248
v/c Ratio	0.01	1.02	0.11	0.91	0.62	0.18	0.19	0.91
Control Delay	60.0	62.1	10.2	116.3	13.8	37.2	8.0	79.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	62.1	10.2	116.3	13.8	37.2	8.0	79.7
Queue Length 50th (ft)	1	~817	25	~94	266	34	0	184
Queue Length 95th (ft)	m0	#930	m44	#214	438	70	35	#334
Internal Link Dist (ft)		441			1753	284		365
Turn Bay Length (ft)	100		100	230			160	
Base Capacity (vph)	71	1807	862	120	2084	326	427	288
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	1.02	0.11	0.91	0.62	0.17	0.18	0.86

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.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1363	40	91	2229	162	148	189
v/c Ratio	0.73	0.04	0.61	0.96	0.57	0.35	1.07
Control Delay	10.1	0.1	79.0	29.2	58.1	10.2	138.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	0.1	79.0	29.2	58.1	10.2	138.1
Queue Length 50th (ft)	147	0	80	868	133	4	~189
Queue Length 95th (ft)	181	m0	141	#1122	213	63	#350
Internal Link Dist (ft)	442			1753	284		281
Turn Bay Length (ft)		100	230			160	
Base Capacity (vph)	1871	908	166	2328	285	426	177
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.04	0.55	0.96	0.57	0.35	1.07

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.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
7: Providence Dr & OR 99W

08/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	1849	98	109	1221	84	46	14	77	259	32	79
v/c Ratio	0.32	1.02	0.11	0.87	0.62	0.09	0.16	0.04	0.19	0.90	0.08	0.20
Control Delay	57.3	62.5	9.7	107.9	16.6	2.6	37.0	34.5	8.0	76.6	35.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	62.5	9.7	107.9	16.6	2.6	37.0	34.5	8.0	76.6	35.4	8.4
Queue Length 50th (ft)	19	~810	27	~94	328	0	28	8	0	191	19	0
Queue Length 95th (ft)	m31	#929	m47	#214	406	22	61	26	35	#338	46	37
Internal Link Dist (ft)		441			1753			284			365	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	85	1807	862	125	1976	914	308	410	427	308	412	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.02	0.11	0.87	0.62	0.09	0.15	0.03	0.18	0.84	0.08	0.19

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.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	93	1363	40	91	2080	178	144	37	148	202	14	51
v/c Ratio	0.77	0.70	0.04	0.62	1.02	0.19	0.59	0.11	0.38	0.85	0.04	0.14
Control Delay	107.6	5.3	0.1	79.3	50.6	4.7	61.4	45.9	10.9	84.1	44.5	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.6	5.3	0.1	79.3	50.6	4.7	61.4	45.9	10.9	84.1	44.5	0.8
Queue Length 50th (ft)	90	85	0	80	~1062	22	118	28	5	175	10	0
Queue Length 95th (ft)	m#170	109	m0	141	#1195	53	192	60	64	#294	30	0
Internal Link Dist (ft)		442			1753			284			281	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	121	1947	941	165	2045	949	273	362	424	266	364	391
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.70	0.04	0.55	1.02	0.19	0.53	0.10	0.35	0.76	0.04	0.13

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.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	76	1849	98	109	1221	100	46	26	77	267	38	105
v/c Ratio	0.53	1.03	0.12	0.90	0.69	0.12	0.16	0.07	0.19	0.91	0.10	0.25
Control Delay	56.5	65.0	10.3	115.5	22.7	3.2	36.5	34.7	8.8	77.7	35.1	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	65.0	10.3	115.5	22.7	3.2	36.5	34.7	8.8	77.7	35.1	8.2
Queue Length 50th (ft)	53	~790	27	~94	375	0	28	15	0	198	23	0
Queue Length 95th (ft)	m81	#973	m49	#214	465	27	60	39	38	#351	52	44
Internal Link Dist (ft)		441			1753			284			365	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	160	1794	850	121	1776	837	311	417	429	310	419	434
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	1.03	0.12	0.90	0.69	0.12	0.15	0.06	0.18	0.86	0.09	0.24

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.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	145	1343	40	91	2049	219	144	45	148	236	22	126
v/c Ratio	0.94	0.71	0.04	0.62	1.06	0.24	0.55	0.13	0.35	0.93	0.06	0.32
Control Delay	128.1	5.5	0.1	79.3	67.7	5.9	58.3	45.7	9.1	93.9	44.5	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	128.1	5.5	0.1	79.3	67.7	5.9	58.3	45.7	9.1	93.9	44.5	9.5
Queue Length 50th (ft)	~144	84	0	80	~1077	33	117	33	0	211	16	0
Queue Length 95th (ft)	m#252	106	m0	141	#1212	73	192	70	58	#369	41	55
Internal Link Dist (ft)		442			1753			284			281	
Turn Bay Length (ft)	100		100	230		230	160		160	200		200
Base Capacity (vph)	154	1898	905	165	1930	909	271	362	430	265	364	408
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.71	0.04	0.55	1.06	0.24	0.53	0.12	0.34	0.89	0.06	0.31

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.

m Volume for 95th percentile queue is metered by upstream signal.

Appendix N
Phase II Sensitivity Analysis
Level of Service Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	1536	90	100	1019	92	42	24	71	246	35	97
Future Volume (vph)	70	1536	90	100	1019	92	42	24	71	246	35	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1226	1642	1465	1221	1650	1402
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)	76	1670	98	109	1108	100	46	26	77	267	38	105
RTOR Reduction (vph)	0	0	24	0	0	44	0	0	58	0	0	80
Lane Group Flow (vph)	76	1670	74	109	1108	56	46	26	19	267	38	25
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	9.2	67.0	67.0	9.0	66.8	66.8	29.0	29.0	29.0	29.0	29.0	29.0
Effective Green, g (s)	9.2	67.0	67.0	9.0	66.8	66.8	29.0	29.0	29.0	29.0	29.0	29.0
Actuated g/C Ratio	0.08	0.56	0.56	0.08	0.56	0.56	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	123	1794	826	121	1745	780	296	396	354	295	398	338
v/s Ratio Prot	0.05	c0.52		c0.07	0.35			0.02			0.02	
v/s Ratio Perm			0.05			0.04	0.04		0.01	c0.22		0.02
v/c Ratio	0.62	0.93	0.09	0.90	0.63	0.07	0.16	0.07	0.05	0.91	0.10	0.08
Uniform Delay, d1	53.7	24.4	12.3	55.1	18.2	12.3	35.9	35.1	34.9	44.2	35.3	35.1
Progression Factor	0.86	1.53	1.71	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.7	8.1	0.2	53.1	1.8	0.2	0.3	0.1	0.1	29.6	0.1	0.1
Delay (s)	53.8	45.5	21.2	108.1	20.0	12.5	36.2	35.2	35.0	73.7	35.5	35.3
Level of Service	D	D	C	F	C	B	D	D	D	E	D	D
Approach Delay (s)		44.5			26.7			35.4			60.3	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Total AM Phase II Sensitivity Analysis
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	14	0	32	0	77	0	35	0	11	92	83	0	37	269	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v_{PCE}), pc/h	0	15	0	35	0	84	0	38	0	12	105	90	0	40	307	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		50			122			207			352	
Entry Volume veh/h		50			122			202			337	
Circulating Flow (v_c), pc/h	431			132			55			96		
Exiting Flow (v_{ex}), pc/h	130			17			158			426		
Capacity (c_{pce}), pc/h		889			1206			1305			1251	
Capacity (c), veh/h		889			1206			1273			1199	
v/c Ratio (x)		0.06			0.10			0.16			0.28	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			3.8			4.2			5.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.3			0.6			1.2	
Approach Delay, s/veh	4.6			3.8			4.2			5.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.8						A					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	1262	38	86	1926	206	135	42	139	222	21	118
Future Volume (vph)	136	1262	38	86	1926	206	135	42	139	222	21	118
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1268	1690	1465	1236	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	145	1343	40	91	2049	219	144	45	148	236	22	126
RTOR Reduction (vph)	0	0	16	0	0	53	0	0	117	0	0	100
Lane Group Flow (vph)	145	1343	24	91	2049	166	144	45	31	236	22	26
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	13.1	83.5	83.5	12.6	83.0	83.0	28.9	28.9	28.9	28.9	28.9	28.9
Effective Green, g (s)	13.1	83.5	83.5	12.6	83.0	83.0	28.9	28.9	28.9	28.9	28.9	28.9
Actuated g/C Ratio	0.09	0.60	0.60	0.09	0.59	0.59	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	154	1899	882	148	1930	856	261	348	302	255	350	298
v/s Ratio Prot	c0.09	0.42		0.06	c0.63			0.03			0.01	
v/s Ratio Perm			0.02			0.11	0.11		0.02	c0.19		0.02
v/c Ratio	0.94	0.71	0.03	0.61	1.06	0.19	0.55	0.13	0.10	0.93	0.06	0.09
Uniform Delay, d1	63.1	19.7	11.6	61.4	28.5	13.1	49.7	45.3	45.0	54.5	44.7	44.9
Progression Factor	1.27	0.18	0.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.9	1.8	0.0	8.4	39.1	0.5	3.1	0.2	0.2	37.0	0.1	0.2
Delay (s)	128.7	5.3	0.4	69.8	67.6	13.6	52.8	45.5	45.2	91.5	44.8	45.1
Level of Service	F	A	A	E	E	B	D	D	D	F	D	D
Approach Delay (s)		16.9			62.7			48.5			73.6	
Approach LOS		B			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2020
Time Analyzed	Total PM Phase II Sensitivity Analysis
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.94
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	6	10	14	0	142	10	39	0	29	210	145	0	43	205	12
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	6	11	15	0	151	11	41	0	31	228	154	0	46	222	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		32			203			413			281	
Entry Volume veh/h		32			203			409			277	
Circulating Flow (v_c), pc/h		419			265			63			193	
Exiting Flow (v_{ex}), pc/h		211			55			275			388	
Capacity (c_{pce}), pc/h		900			1053			1294			1133	
Capacity (c), veh/h		900			1053			1280			1116	
v/c Ratio (x)		0.04			0.19			0.32			0.25	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			5.2			5.7			5.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.7			1.4			1.0	
Approach Delay, s/veh	4.3			5.2			5.7			5.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	5.5						A					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	1701	90	100	1123	92	42	24	71	246	35	97
Future Volume (vph)	70	1701	90	100	1123	92	42	24	71	246	35	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1226	1642	1465	1221	1650	1402
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)	76	1849	98	109	1221	100	46	26	77	267	38	105
RTOR Reduction (vph)	0	0	24	0	0	44	0	0	58	0	0	80
Lane Group Flow (vph)	76	1849	74	109	1221	56	46	26	19	267	38	25
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	9.2	67.0	67.0	9.0	66.8	66.8	29.0	29.0	29.0	29.0	29.0	29.0
Effective Green, g (s)	9.2	67.0	67.0	9.0	66.8	66.8	29.0	29.0	29.0	29.0	29.0	29.0
Actuated g/C Ratio	0.08	0.56	0.56	0.08	0.56	0.56	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	123	1794	826	121	1745	780	296	396	354	295	398	338
v/s Ratio Prot	0.05	c0.58		c0.07	0.39			0.02			0.02	
v/s Ratio Perm			0.05			0.04	0.04		0.01	c0.22		0.02
v/c Ratio	0.62	1.03	0.09	0.90	0.70	0.07	0.16	0.07	0.05	0.91	0.10	0.08
Uniform Delay, d1	53.7	26.5	12.3	55.1	19.3	12.3	35.9	35.1	34.9	44.2	35.3	35.1
Progression Factor	0.87	1.46	1.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.3	27.5	0.2	53.1	2.4	0.2	0.3	0.1	0.1	29.6	0.1	0.1
Delay (s)	55.1	66.1	20.4	108.1	21.7	12.5	36.2	35.2	35.0	73.7	35.5	35.3
Level of Service	E	E	C	F	C	B	D	D	D	E	D	D
Approach Delay (s)		63.4			27.6			35.4			60.3	
Approach LOS		E			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2025
Time Analyzed	Total AM Phase II Sensitivity Analysis
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	14	0	32	0	77	0	35	0	11	92	83	0	37	269	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v_{PCE}), pc/h	0	15	0	35	0	84	0	38	0	12	105	90	0	40	307	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		50			122			207			352	
Entry Volume veh/h		50			122			202			337	
Circulating Flow (v_c), pc/h	431			132			55			96		
Exiting Flow (v_{ex}), pc/h	130			17			158			426		
Capacity (c_{pce}), pc/h		889			1206			1305			1251	
Capacity (c), veh/h		889			1206			1273			1199	
v/c Ratio (x)		0.06			0.10			0.16			0.28	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			3.8			4.2			5.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.3			0.6			1.2	
Approach Delay, s/veh	4.6			3.8			4.2			5.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.8						A					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	1262	38	86	1926	206	135	42	139	222	21	118
Future Volume (vph)	136	1262	38	86	1926	206	135	42	139	222	21	118
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1268	1690	1465	1236	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	145	1343	40	91	2049	219	144	45	148	236	22	126
RTOR Reduction (vph)	0	0	16	0	0	53	0	0	117	0	0	100
Lane Group Flow (vph)	145	1343	24	91	2049	166	144	45	31	236	22	26
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	13.1	83.5	83.5	12.6	83.0	83.0	28.9	28.9	28.9	28.9	28.9	28.9
Effective Green, g (s)	13.1	83.5	83.5	12.6	83.0	83.0	28.9	28.9	28.9	28.9	28.9	28.9
Actuated g/C Ratio	0.09	0.60	0.60	0.09	0.59	0.59	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	154	1899	882	148	1930	856	261	348	302	255	350	298
v/s Ratio Prot	c0.09	0.42		0.06	c0.63			0.03			0.01	
v/s Ratio Perm			0.02			0.11	0.11		0.02	c0.19		0.02
v/c Ratio	0.94	0.71	0.03	0.61	1.06	0.19	0.55	0.13	0.10	0.93	0.06	0.09
Uniform Delay, d1	63.1	19.7	11.6	61.4	28.5	13.1	49.7	45.3	45.0	54.5	44.7	44.9
Progression Factor	1.27	0.18	0.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.9	1.8	0.0	8.4	39.1	0.5	3.1	0.2	0.2	37.0	0.1	0.2
Delay (s)	128.7	5.3	0.4	69.8	67.6	13.6	52.8	45.5	45.2	91.5	44.8	45.1
Level of Service	F	A	A	E	E	B	D	D	D	F	D	D
Approach Delay (s)		16.9			62.7			48.5			73.6	
Approach LOS		B			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCS7 Roundabouts Report

General Information

Analyst	ZHB
Agency or Co.	KAI
Date Performed	10/21/2017
Analysis Year	2025
Time Analyzed	Total PM Phase II Sensitivity Analysis
Project Description	Crestview Crossing

Site Information

Intersection	Crestview/East-West Connector
E/W Street Name	East-West Connector
N/S Street Name	Crestview Dr
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.94
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	6	10	14	0	142	10	39	0	29	210	145	0	43	205	12
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	6	11	15	0	151	11	41	0	31	228	154	0	46	222	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		32			203			413			281	
Entry Volume veh/h		32			203			409			277	
Circulating Flow (v_c), pc/h		419			265			63			193	
Exiting Flow (v_{ex}), pc/h		211			55			275			388	
Capacity (c_{pce}), pc/h		900			1053			1294			1133	
Capacity (c), veh/h		900			1053			1280			1116	
v/c Ratio (x)		0.04			0.19			0.32			0.25	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			5.2			5.7			5.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.7			1.4			1.0	
Approach Delay, s/veh	4.3			5.2			5.7			5.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	5.5						A					

KITTELSON & ASSOCIATES
851 SW 6th AVENUE, SUITE 600
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MEMORANDUM - DRAFT

Date: August 14, 2018

Project #: 21709

To: Jesse Nemec
JT Smith Companies
5285 Meadows Road, Suite 171
Lake Oswego, OR 97035

From: Diego Arguea and Matt Hughart

Project: Crestview Crossing Development

Subject: 6-Party Agreement Transportation Considerations

Pursuant to your request, we have reviewed the *Crestview Improvement Project (From Robin Court to Highway 99W Alignment Exploration)* that was included as part of a six-party agreement (Yamhill County Board Order 06-265) prepared in April 2006. The purpose of this agreement was to begin the process to amend the 2005 Newberg Transportation System Plan (TSP) and reclassify the Crestview Drive extension from a Minor Arterial to a Major Collector designation.

The current development proposed by JT Smith Companies is required to construct a portion of the Crestview Improvement Project, connecting Highway 99W to the existing terminus of Crestview Drive at the southern boundary of the Oxberg Lake and MeadowWood subdivisions.

EXECUTIVE SUMMARY

Our assessment of the six-party agreement (Agreement) concludes that the proposed Crestview Drive alignment, intersection treatments, and cross-sectional elements are consistent with the guiding principles established in the Agreement, and as such, provides functionally equivalent transportation infrastructure as that identified in the Agreement. Additional details are provided herein.

SIX-PARTY AGREEMENT BACKGROUND

In April 2006, the Yamhill County Board of Commissioners accepted an agreement to begin the amendment of the then-current 2005 TSP. The agreement's purpose was to authorize the City to conduct an amendment to the 2005 TSP that would designate Crestview Drive as a Major Collector roadway and identify a general design and alignment of the Crestview Drive extension (Reference 1, Agreement, #3). A traffic study was prepared by JRH Engineering concluding the change in classification of Crestview Drive

to a Major Collector would not measurably affect the City's transportation network. The TSP was subsequently amended to reflect Crestview Drive as a Major Collector.

Conceptual Alignment

The alignment identified in the Agreement extends Robin Court to Highway 99W and includes one roundabout intersection (located approximately 390 feet from 99W) and one traffic calming circle located approximately 895 feet north of the roundabout location. As stated in the Agreement, this represents a *general design and alignment* to provide direction for future development. Site-specific characteristics, unforeseen challenges, and street connectivity and layout were not addressed in the Agreement, and turn lanes, if required, were to be determined at a later date. The general design and alignment shown in the Agreement Exhibit A is shown below in Figure 1.

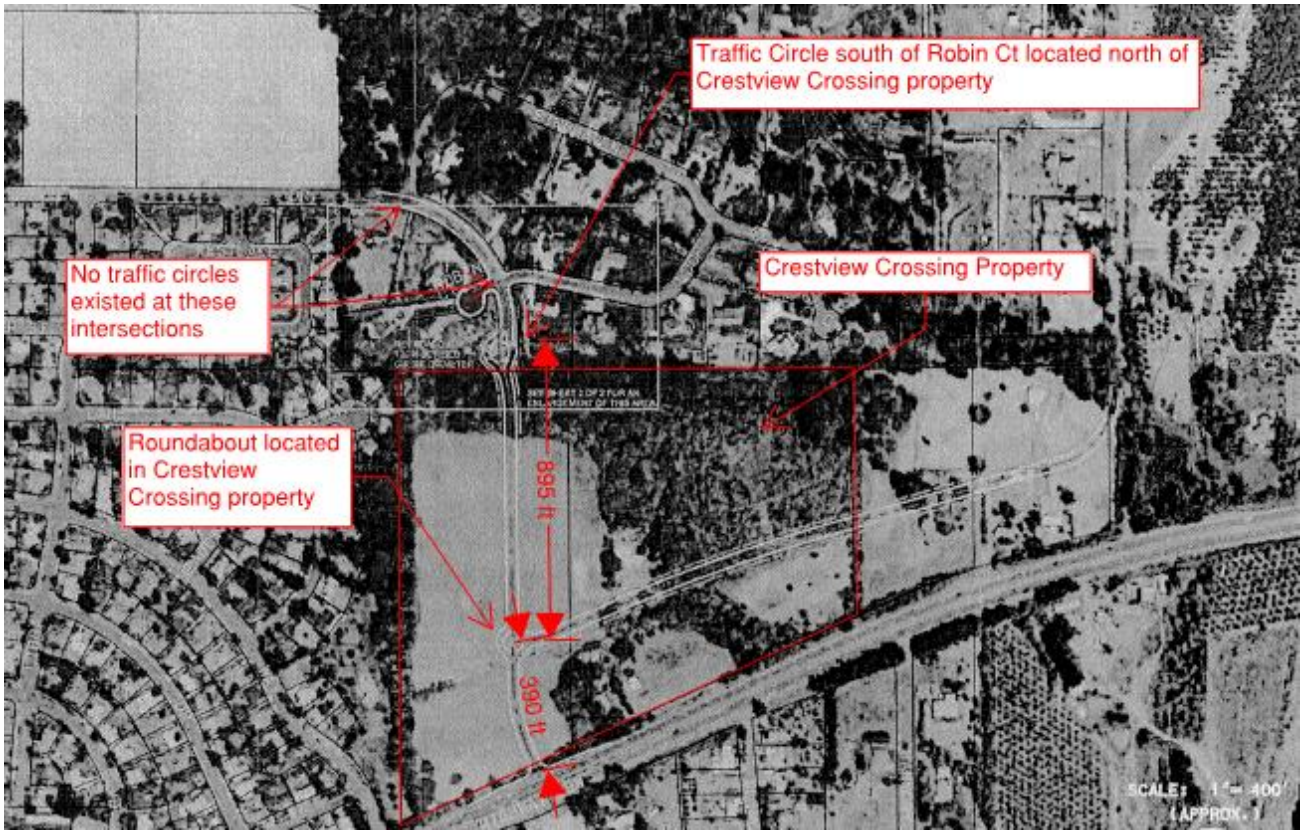


Figure 1. 6-Party Agreement Exhibit A

As shown above, the Agreement identifies a general alignment with two intersection treatments addressing intersection operations and traffic calming. As stated in the Agreement, the alignment should be *designed to encourage a 25 mph speed limit*.

PROPOSED DEVELOPMENT

The proposed residential application acknowledges responsibility to construct the extension of Crestview Drive, connecting from Robin Court to Highway 99W, and has developed an alignment consistent and in compliance with that shown in the 2006 Agreement.

Constructed To-Date

As shown in Figure 1, Crestview Drive, from Birdhaven Loop to the northern edge of Crestview Crossing, was reconstructed in 2011/2012 to include two intersection traffic calming traffic circles on Crestview Drive at Birdhaven Loop and Robin Court, depicted in Figure 2 below.

Figure 2. Traffic Calming Treatments along Crestview Drive

Neither of these traffic circles were identified in the Agreement. The traffic circles were constructed after the 2006 Agreement was adopted and are recognized to have a traffic calming effect to limit speeds to 25 mph.

PROPOSED ALIGNMENT

The June 2018 Crestview Crossing Traffic Impact Analysis (TIA) evaluated the impacts of the proposed development and identified recommended mitigation measures. The mitigation measures were selected considering anticipated traffic volumes along Crestview Drive and include the number and configuration travel lanes on the southbound approach to 99W, turn lane storage lengths, as well as transition tapers approaching the roundabout.

Roundabout Intersection

In accordance with the Agreement, construction of a roundabout is proposed to serve traffic into the residential areas north of Highway 99W, and connect to the future Benjamin Road Realignment (a Minor Collector). The roundabout location was determined based on the required queue storage length as an outcome of the TIA as well as roundabout design parameters, including entry deflection angles and transition tapers. As shown in Crestview Crossing site plan application, the roundabout is located approximately 545 feet north of Highway 99W (measured from the center of roundabout to the stop bar at Highway 99W). A southbound left-turn lane on Crestview Drive approaching Highway 99W provides 250 feet of storage and requires at least 50 feet of transition. The northbound transition taper into the roundabout is approximately 200 feet, and has been designed to accommodate all turning movements including u-turns.

The Public Improvement Standards of the Newberg Development Code (Chapter 15.505) were also reviewed to ensure consistency with Collector Roadway spacing standards (400 feet for a Major Collector designation). As such, the location of the roundabout has been designed to comply with the Newberg Development Code and the 6-Party Agreement in the context of the projected traffic operations while recognizing site-specific design considerations and constraints.

Two-way Stop Controlled Intersection

To provide efficient connectivity to adjacent residential development, a two-way stop-controlled intersection (Public Street C) has been designed approximately 500 feet north of the proposed roundabout. The location of this intersection is influenced by intersection spacing on a Major Collector (greater than 400 feet minimum spacing requirement), location of wetlands (site constraints), meeting minimum intersection sight distance requirements, and ability to provide an east-west roadway serving the proposed large lot homes of the Development. The location of this intersection is approximately 410 feet south of Robin Court, the closest public street intersection to the north.

Additional Considerations

Consideration was given to the 6-Party Agreement and the spacing between traffic calming devices during the roadway and site design process. As shown in Figure 1, the conceptual spacing shown in the Agreement between the roundabout and traffic calming circle is approximately 895 feet. The proposed site layout and intersection design maintains similar distance between the proposed roundabout and the constructed traffic calming circle on Robin Court (approximately 910 feet). We conclude that the difference in spacing (15 feet) will not impact travel speeds and that the 25 mph roadway design speed is consistent with the 6-Party Agreement.

COMPLIANCE WITH 6-PARTY AGREEMENT

In summary, we conclude the proposed alignment and intersection treatments are consistent with and satisfy the terms of the 6-Party Agreement for the following reasons.

1. The purpose of the Agreement is to re-designate Crestview Drive from a Minor Arterial to a Major Collector designation. The re-designation was successfully incorporated into the City's Transportation System Plan based in part on the JRH traffic study.

2. The current Crestview Crossing development proposal acknowledges the Agreement and proposes a roadway extension design consistent with City Major Collector requirements as well as key Agreement elements.

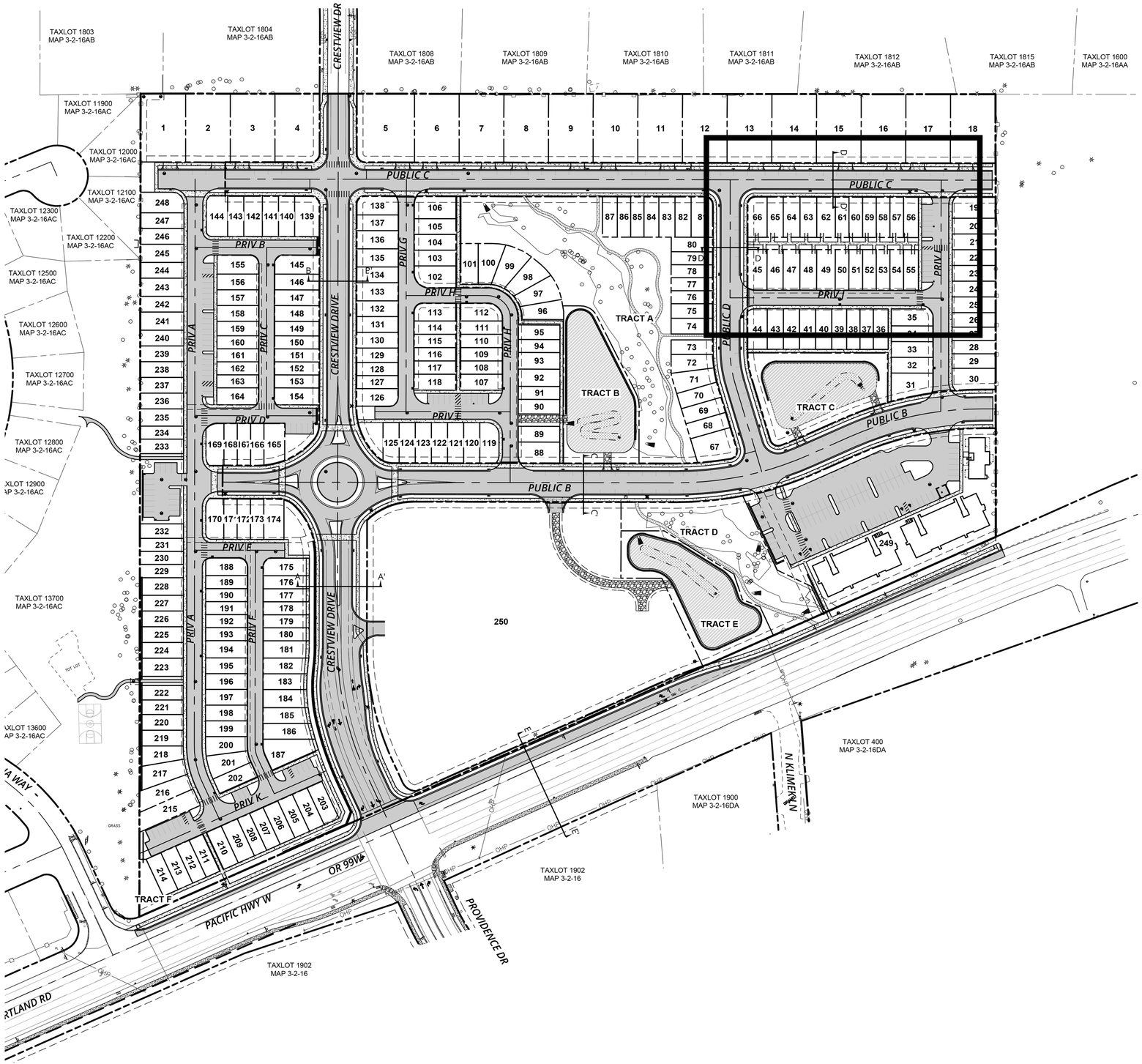
3. The spacing difference between the proposed roundabout and the recently constructed traffic calming circle at Robin Court is not expected to impact travel speeds on Crestview Drive extension and thus is consistent with the traffic calming south in the 6-Party Agreement.

4. With construction of the proposed roundabout, there will be a total of three traffic calming intersection treatments along Crestview Drive between Highway 99W and Birdhaven Loop. This is a greater amount of traffic calming than originally identified in the Agreement, indicating compliance in design and fulfillment of intent by the Applicant.

We trust this memorandum demonstrates compliance with the 6-Party Agreement.

REFERENCES

1. Yamhill County Board of Commissioners. *6-Party Agreement, Crestview Improvement Project (From Robin Court to Highway 99W Alignment Exploration).* Board Order #06-265. April 19, 2006.



PRELIMINARY PARKING COUNT:

APARTMENT PARKING:	91
PUBLIC STREET PARKING:	73
PRIVATE STREET PARKING:	85
17-FOOT FRONT LOAD PARKING:	48
17-FOOT REAR LOAD PARKING:	219
21-FOOT FRONT LOAD PARKING:	111
21-FOOT REAR LOAD PARKING:	268
25-FOOT FRONT LOAD PARKING:	52
25-FOOT REAR LOAD PARKING:	68
LARGE LOT PARKING:	72
TOTAL PARKING:	**1087**

CRESTVIEW CROSSING

PARKING EXHIBIT

3J CONSULTING
CIVIL ENGINEERING . WATER RESOURCES . LAND USE PLANNING

AUGUST 2018

BLUE MOUNTAIN
COMMUNITY MANAGEMENT
An Associa® Company

Crestview Crossing Homeowners Association

Reserve Study
2020

Prepared by
Blue Mountain Community Management
17933 NW Evergreen Place, Suite 200
Beaverton, OR 97006
503-332-2047

Table of Contents

Property Description

Crestview Crossing Homeowners Association (herein referred to as the "community") is a single family residential development located in Newberg, Yamhill County, Oregon. The **Crestview Crossing Homeowners Association** (herein referred to as the "Association") shall provide repair, replacement and maintenance on all property designated as common area by the adopted community plat, recorded in Yamhill County, Oregon.

This reserve study utilizes a mix of information provided by the developer, various construction estimating and scheduling manuals/programs, and information from the **Crestview Crossing Homeowners Association** board in order to derive the useful life and replacement cost of each common item.

Funds will be accumulated in the reserve account as required by Oregon State Law based on estimates of future need for repairs and replacement of common property components. Actual expenditures, income and provisions for income taxes may vary from estimated amounts and the variations may be significant and material. Therefore, amounts accumulated in the replacement fund may not be adequate to meet future funding expectations. Please update your reserve study on an annual basis in order to maintain the best possible estimates.

If additional funds are needed for any repair, replacement or maintenance to common area properties, the Association has the right to increase regular assessments or to levy special assessments or delay repairs or replacement until funds become available.

Reserve Study & Maintenance Plan Information Section

Blue Mountain Community Management was selected by the **Crestview Crossing Homeowners Association** to conduct a Reserve Study for implementation beginning January 1, 2020. The enclosed Reserve Study and Maintenance Plan were developed in accordance with guidelines established by the Community Associations Institute and are in compliance with Oregon State Law including changes made during the 2007 legislative session to ORS Revised State Statutes, Chapters 94 and 100.

Assumptions used for inflation, interest, and other factors are detailed in the *Reserve Study Summary*. All assumptions made herein are based upon information provided by the developer and an onsite inspection of those details. This Reserve Study offers no warranties or guarantees based upon those assumptions and observations and provides an annual baseline for funding and maintaining common elements throughout the community.

All information regarding the useful lives and costs of reserve components were derived by Blue Mountain Community Management and various construction pricing and scheduling manuals.

The terms RS Means and National Construction Estimator refer to construction industry estimating databases that are used throughout the industry to establish cost estimates and useful life estimates for common building components and products. In any case, when work is to be performed, the association should obtain firm bids for these services.

Blue Mountain Community Management is not aware of any material issues that if not disclosed would cause distortion of this report.

Certain information such as the beginning balance of reserve funds and other information as detailed on the component reports were provided by Association representatives and are deemed to be reliable by Blue Mountain Community Management. This Reserve Study is a reflection of the information provided to Blue Mountain Community Management and cannot be used for the purpose of performing an audit, quality analysis, or background check for historical records. Onsite inspections are not to be considered a project audit or quality inspection of Association property.

The two most pressing responsibilities for a homeowner association board are the annual preparation of a budget and the maintenance of a reserve fund for community components identified as “common” to all members of the association. The annual operating budget reflects the association’s annual commitment to quality and service, while the reserve budget reflects the association’s desire to maintain the community for a 30-year period at a level acceptable to all members of the association.

Reserve studies, while an important guiding document for the long-term health of the community, must be maintained on an annual basis in order to continue to reflect an association’s desire to remain at a particular level of maintenance and replacement. Blue Mountain Community Management suggests remembering the following:

1. Update your Reserve Study on an annual basis. Hire a professional to refresh your Reserve Study annually and make this commitment by including a line item in your annual budget for doing so. A Reserve Study is a “snapshot in time” and its assumptions, factors and results will become skewed without annual maintenance.

2. Reserve studies are not perfect. While a paved section of road may have a useful life of 24 years, it doesn’t necessarily mean it will be replaced in 24 years. Sometimes asphalt doesn’t adhere perfectly, or the contractor makes a mistake and the road needs to be replaced in 15 years. Occasionally, the road looks just fine in 24 years and does not need replacement. Remember, an estimate is based on the best knowledge available at the time of the study.

3. This Reserve Study and its parameters are based upon information provided by the declarant, the association members, board of directors and a host of contractors, vendors and construction estimation programs. It represents an amalgamation of the best information available and relies on the information provided by several outside sources.

4. It is assumed that all assets have been designed and constructed properly unless otherwise noted.

5. This Reserve Study is provided as an aid for planning purposes and not as an accounting tool. It describes events and occurrences that have not yet occurred and there is no assurance that the results outlined in the Reserve Study will occur as described.

Funding Methods

Reserve studies are a complicated mix of assumptions and estimates used to approximate the cost of renewal/replacement of capital and non-capital assets associated with a given community's common elements. The Reserve Study User's Guide has been developed to assist homeowners, board members and declarants better understand the Reserve Study and maintenance plan they purchased.

A Reserve Study is best described as an assessment of current assets, their approximate value and their future value at the time of replacement. A Reserve Study is typically requested by the developer of a specific parcel of land that has been subdivided for condominiums or residential units for the purpose of determining the initial value of common elements like privately owned parks, pathways, clubhouses etc. In some states, reserve studies and maintenance plans have become a legal requirement in order to develop a new community.

A Reserve Study has two primary functions:

1. Establish the initial funding goals for the association as they relate to common elements and

2. Select an appropriate funding plan for those goals.

The basis for funding of reserves is to distribute the cost of the replacement over the useful life of a particular component. The ideal level of reserves is proportionate to the expected life of a component and those costs. Therefore, if a particular component has a useful life of 20 years, the expectation would be that the individual reserve for that item is spread equally over 20 years:

(Age/Useful Life) x Current Replacement Cost = Full Funding of Reserves

Each year would equal $1/20^{th}$ of the useful life and the reserve should include $1/20^{th}$ of the value of the component over a 20-year period. If the fund meets this standard, then it is referred to as "fully funded."

Do not confuse "fully funded" with the concept that every Reserve Study has a 100% funding for all components at one time. A proper Reserve Study provides 100% funding based on expected life. If a given component fails or needs maintenance prior to its expected life cycle, the fund may become depleted or may incur a negative balance. Every Reserve Study is a "snapshot in time" based on accepted industry standards for life expectancy and costs.

There are four generally accepted funding plans from which most associations select:

1. **"Minimum Funding Method (Threshold)".** This funding method focuses on keeping the reserve fund's cash balance above zero. This means that while each component may not be fully funded, the cash balance overall does not drop below zero during the projected period. A large percentage of association's use this model because of its relative lower cost and simplicity, however an association must remember that if an item prematurely expires prior to its useful life calculation, a deficit may occur in the reserve cash balance.

2. **"Capped Minimum Funding Method (Threshold +)".** The same as the Minimum Funding model concept, however the fund balance never reaches below an arbitrarily set reserve cash balance. Instead of starting the fund with $0, an association or developer compels the prospective homeowner to contribute an amount at time of closing in order to ensure a cushion in the reserve balance. This method is typically used by Condominium Associations who need to give rise to a large amount of money early on in order to ensure proper capital maintenance and replacement of elements.

3. **"Current Assessment Funding Method".** Based on a cash flow funding model like the two previous methods, this model takes the current funding level of the reserve account and assumes that the amount will not change. The funding level is then projected over 30 years in order to illustrate the adequacy of current funding. This method is more regularly examined with long established associations with members who are sensitive to increased monthly dues.

4. **"Component Funding Method".** The simplest and most conservative method. It distributes cash reserves to individual reserve components and then calculates what the reserve assessment and interest contribution should be, again by each reserve component. The current annual assessment is then determined by adding all the individual component assessments together. This is the most conservative method and leads to a fully funded reserve position at all times.

This particular Reserve Study utilizes the "Minimum Funding Method (Threshold)" based on the association's annual cash flow. The annual balance of the fund will maintain more than $1,000 annually at any given period for the next 30 years based on the assumptions provided in the Funding Method Summary and the additional caveat that no component fails in total prior to its expected useful life.

Funding Options

In the event a component does fail prior to its expected useful life, an association has three primary options:

1. **Acquire a loan.** Lending institutions will often loan money to an association for capital improvements using the future assets of the association as collateral for the loan. Traditionally, an additional monthly assessment for the principal and interest of the loan would be assessed against each unit for the period specified by the lender.

2. **Institute a special assessment.** Some associations may not be able to secure a loan for a component that has failed unexpectedly. Typically, the association board then turns to a special assessment. The cost of the item in need of replacement is divided equally among the homeowners and assessed against their HOA dues. This may be done as a one-time payment or as a monthly assessment for a given period of time.

3. **Defer the required repair or replacement.** This option is most commonly used and is often abused. Because it is much simpler to ignore a problem, an association will defer repair or replacement in lieu of having future funds. This usually leads to more deferred repair and replacement until eventually the entire reserve schedule is woefully behind. This method should only be used in extreme cases. Please consider all options prior to selecting deferral.

Maintenance Plan 2020

Maintenance Plan Executive Summary

Regular maintenance of common elements is necessary to insure maximum useful life and optimum performance of components. Items of particular concern are those that represent a safety hazard to residents or guests if they are not maintained properly and components that provide waterproofing or protection from other elements.

This maintenance plan is a cyclical plan that calls for maintenance at regular intervals. The frequency of maintenance and cost of the activity initially will follow a short narrative description. Every maintenance plan should be reviewed and updated on an annual basis when preparing the annual operating budget for the Association.

Information herein is coordinated from a frequently updated source, Reed Construction Data, a reputable provider of construction cost data.

Pursuant to Oregon State Statutes, Sections 94 and 100—requiring a maintenance plan as an integral part of the reserve study, the following maintenance procedures are recommended:

Concrete—Maintenance Allowance
Total Maintenance Frequency: Inspect Annually

Concrete steps, common area sidewalks, the curbs on private streets shall be kept in good condition. Any cracks, damage, or displacement should be repaired. Periodic pressure washing of the concrete steps at Tract G.

Reserve Study 2020

Funding Method Summary

Report Statistics		Report Assumptions/ Parameters	
Report Date	July 20, 2018	**Inflation Factor**	3.30%
Account Number	CrstVwTerrRS1	**Annual Assessment Increase**	3.30%
Budget Year Beginning	January 1, 2020	**Interest Rate on Reserve Deposit**	0.50%
Budget Year Ending	December 31, 2020	**Tax Rate on Interest**	0.00%
Total Units	248	**Contingency**	0.00%

Funding Method Notes

- The purpose of this study is to ensure that adequate replacement funds are available when components reach the end of their useful life according to a variety of assumptions. Components will be replaced as required, not necessarily in their expected replacement year. This analysis should be updated annually.
- The following items were not included in the analysis because their useful life is greater than thirty years: sanitary sewer and storm drains, telephone, cable, internet lines, grading, all other unmentioned components with a useful life deemed greater than thirty years by industry standards.
- Two funding projections are provided. The *Threshold Method Projection* establishes a reserve funding goal that keeps the reserve balance above **$15,000**. The *Fully-Funded Projection* establishes a reserve funding goal that achieves a 100% fully-funded reserve balance by the end of the 30-year study period.

Contribution Rate Recommendation

Blue Mountain Community Management recommends that the Association adopt the contribution rates provided in the *Threshold Method Projection*.

Threshold Method Projection

This projection uses a "threshold funding" method, which establishes a reserve funding goal that keeps the reserve balance above a specified dollar or percent funded amount.

All – 248 Lots

The funding scenario for the 248 lots begins with a starting balance of **$0.00** and an annual contribution of **$16,425.00**. The annual contribution increases 3.3% each year for the remaining years of the study. A minimum balance of **$15,000** is maintained from throughout the life of the study.

Summary of Calculations – All Lots

Required Annual Contribution	$16,425.00
Required Monthly Contribution	$1,368.75
Unit Monthly Contribution	$5.52

Threshold Method Projection Chart – All Lots

Beginning Balance **$0.00**

Year	Current Cost	Annual Contribution	Annual Interest	Annual Expenditures	Target Ending Reserves
2020	$374,458	$16,425	$83	$0	$16,507
2021	$386,815	$16,967	$167	$0	$33,642
2022	$399,579	$17,527	$256	$0	$51,424
2023	$412,766	$18,105	$321	$5,291	$64,560
2024	$426,387	$18,703	$379	$7,401	$76,240
2025	$440,458	$19,320	$478	$0	$96,038
2026	$454,993	$19,958	$137	$88,579	$27,554
2027	$470,007	$20,616	$241	$0	$48,411
2028	$485,518	$21,296	$306	$8,428	$61,586
2029	$501,540	$21,999	$386	$6,429	$77,542
2030	$518,091	$22,725	$501	$0	$100,769
2031	$535,188	$23,475	$621	$0	$124,865
2032	$552,849	$24,250	$159	$117,226	$32,048
2033	$571,093	$25,050	$285	$0	$57,384
2034	$589,939	$25,877	$377	$7,877	$75,760
2035	$609,407	$26,731	$473	$7,812	$95,153
2036	$629,517	$27,613	$559	$10,927	$112,397
2037	$650,291	$28,524	$705	$0	$141,626
2038	$671,751	$29,465	$202	$130,778	$40,515
2039	$693,919	$30,438	$355	$0	$71,308
2040	$716,818	$31,442	$423	$18,186	$84,987
2041	$740,473	$32,480	$540	$9,492	$108,515
2042	$764,909	$33,552	$710	$0	$142,777
2043	$790,151	$34,659	$887	$0	$178,323
2044	$816,226	$35,802	$79	$198,358	$15,846
2045	$843,161	$36,984	$264	$0	$53,094
2046	$870,985	$38,204	$456	$0	$91,755
2047	$899,728	$39,465	$598	$11,533	$120,286
2048	$929,419	$40,768	$622	$36,610	$125,065
2049	$960,090	$42,113	$836	$0	$168,014

Component Summary by Category

Description	Replacement Year	Useful Life	Remaining Life	Current Cost
Grounds				
Asphalt - Repair, Patch & Seal	2026	6	6	$62,400
Asphalt - Overlay	2056	36	36	$218,400
Concrete Sidewalk Allowance	2040	20	20	$3,000
Fence - Chain Link	2055	35	35	$30,608
Fitness Stations	2044	24	24	$10,000
Benches	2048	28	28	$3,250
Irrigation Controller, System Allowance	2026	6	6	$5,700
Bollard Lights	2044	24	24	$1,600
Bark Mulch	2023	3	3	$4,800
Cedar Chips	2024	4	4	$2,000
Retaining Wall Allowance	2034	14	14	$2,500
Open Space/Tree Allowance	2024	4	4	$4,500
Monument & Sign Allowance	2034	14	14	$2,500
Mailboxes	2055	35	35	$23,200
Total Grounds				**$374,458**
Total Assets:				**$374,458**

Component Summary by Group

Description	Replacement Year	Useful Life	Remaining Life	Current Cost
Capital				
Asphalt - Overlay	2056	35	36	$218,400
Concrete Allowance	2040	20	20	$3,000
Fence - Chain Link	2055	35	35	$30,608
Fitness Stations	2044	24	24	$10,000
Benches	2048	28	28	$3,250
Irrigation Controller, System Allowance	2026	6	6	$5,700
Bollard Lights	2044	24	24	$1,600
Bark Mulch	2023	3	3	$4,800
Cedar Chips	2024	4	4	$2,000
Retaining Wall Allowance	2034	14	14	$2,500
Open Space/Tree Allowance	2024	4	4	$4,500
Monument & Sign Allowance	2034	14	14	$2,500
Mailboxes	2055	35	35	$23,200
Total Capital				**$312,058**
Non-Capital				
Asphalt - Repair, Patch & Seal	2026	6	6	$62,400
Total Non-Capital				**$62,400**
Total Assets:				**$374,458**

Annual Expenditure Detail

Description	Expenditure per Item	Expenditure per Year
No replacement in 2020 - 2022		
Replacement in 2023		**$5,291**
Bark Mulch	$5,291	
Replacement in 2024		**$7,401**
Cedar Chips	$2,277	
Open Space/Tree Allowance	$5,124	
No replacement in 2025		
Replacement in 2026		**$88,578**
Asphalt - Repair, Patch & Seal	$75,820	
Irrigation, Controller	$6,926	
Bark Mulch	$5,832	
No replacement in 2027		
Replacement in 2028		**$8,428**
Cedar Chips	$2,593	
Open Space/Tree Allowance	$5,835	
Replacement in 2029		**$6,429**
Bark Mulch	$6,429	
No replacement in 2030 - 2031		
Replacement in 2032		**$117,226**
Asphalt - Repair, Patch & Seal	$92,127	
Irrigation, Controller	$8,415	
Bark Mulch	$7,087	
Cedar Chips	$2,953	
Open Space/Tree Allowance	$6,644	
No replacement in 2033		
Replacement in 2034		**$7,878**
Retaining Wall Allowance	$3,939	
Monument & Sign Allowance	$3,939	
Replacement in 2035		**$7,812**
Bark Mulch	$7,812	
Replacement in 2036		**$10,927**
Cedar Chips	$3,362	
Open Space/Tree Allowance	$7,565	
No replacement in 2037		
Replacement in 2038		**$130,777**
Asphalt - Repair, Patch & Seal	$111,941	
Irrigation, Controller	$10,225	
Bark Mulch	$8,611	
No replacement in 2039		
Replacement in 2040		**$18,186**
Concrete Sidewalk Allowance	$5,743	
Cedar Chips	$3,829	
Open Space/Tree Allowance	$8,614	

Description	Expenditure per Item	Expenditure per Year
Replacement in 2041		**$9,492**
Bark Mulch	$9,492	
No replacement in 2042 - 2043		
Replacement in 2044		**$198,360**
Asphalt - Repair, Patch & Seal	$136,017	
Fitness Stations	$21,798	
Irrigation, Controller	$12,425	
Bollard Lights	$3,488	
Bark Mulch	$10,463	
Cedar Chips	$4,360	
Open Space/Tree Allowance	$9,809	
No replacement in 2045 - 2046		
Replacement in 2047		**$11,533**
Bark Mulch	$11,533	
Replacement in 2048		**$36,610**
Benches	$8,067	
Cedar Chips	$4,964	
Retaining Wall Allowance	$6,205	
Open Space/Tree Allowance	$11,169	
Monument Allowance	$6,205	
No replacement in 2049		
Total:	**$664,928**	**$664,928**

Detail Report by Category

Grounds

Asphalt Streets – Patch, Repair & Seal

Non-Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	156,000 SF @ $0.40
Useful Life:	6 years	**Asset Cost:**	$62,400
Remaining Life:	6 years	**Percent Replacement:**	100%
Replacement Year:	2026	**Replacement Year Cost:**	$75,820

This component category provides funding for the periodic application of an asphalt emulsion sealer also known as “Slurry Seal” to all asphalt surfaces maintained by the HOA. The process includes pre-cleaning of all pavement, filling of any cracks or fissures in the pavement as well as the patching of isolated, damaged pavement surfaces, followed by the application of the emulsion sealer either by hand or mechanical means.

A licensed paving contractor should perform this work and all asphalt striping (if necessary) will need to be renewed when the seal coating is applied. The component expense estimate includes the cost of this work as well the seal coating cost.

Useful life assumptions are based on accepted industry estimates established by RS Means, and/or The National Construction Estimator. The Association should obtain a bid prior to commencing work. The estimated costs obtained ranged from $0.38 - $0.56 per square foot with replacement every 7-8 years.

Asphalt Streets – Overlay

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	156,000 SF @ $1.40
Useful Life:	36 years	**Asset Cost:**	$218,400
Remaining Life:	36 years	**Percent Replacement:**	100%
Replacement Year:	2056	**Replacement Year Cost:**	$680,399

This component category provides funding for the renewal/replacement of asphalt surfaces maintained by the HOA. Renewal/replacement of asphalt paving refers to the periodic application of bituminous asphalt overlay that is typically applied in continuous sections at a thickness of 1" to 2", depending on the individual project specifications. The overlay is designed to renew the life of the pavement for another life cycle of equal duration to the initial life expectancy of the pavement. The new surface is to be maintained in the same fashion as the original surface.

A licensed paving contractor should perform this work and all asphalt striping (if necessary) will need to be renewed when the overlay is applied. The component expense estimate includes the cost of this work as well as the overlay cost.

Useful life assumptions are based on accepted industry estimates established by RS Means, and/or The National Construction Estimator. The Association should obtain a bid prior to commencing work.

Concrete Allowance

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	1 @ $3,000
Useful Life:	20 years	**Current Cost:**	$3,000
Remaining Life:	20 years	**Percent Replacement:**	100%
Replacement Year:	2040	**Replacement Year Cost:**	$5,743

This component category provides the partial replacement and repair of common area concrete.

Because this item is outside the 30-year scope of this study, this item provides an allowance for periodic maintenance and repair every 20 years or as needed.

Fence – Chain Link

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	1,155 LF @ $26.50
Useful Life:	35 years	**Asset Cost:**	$30,608
Remaining Life:	35 years	**Percent Replacement:**	100%
Replacement Year:	2055	**Replacement Year Cost:**	$95,354

This component category provides for the replacement of the chain link fence bordering the water quality facilities in the community.

Fitness Stations

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	5 @ $2,000
Useful Life:	24 years	**Asset Cost:**	$10,000
Remaining Life:	24 years	**Percent Replacement:**	100%
Replacement Year:	2044	**Replacement Year Cost:**	$21,798

This component category provides funding for the replacement of the fitness stations in the community.

Benches

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	5 @ $650
Useful Life:	28 years	**Asset Cost:**	$3,250
Remaining Life:	28 years	**Percent Replacement:**	100%
Replacement Year:	2048	**Replacement Year Cost:**	$8,067

This component category provides funding for the replacement of the benches located along the cedar path in Tract A.

Irrigation Controller

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	6 @ $950
Useful Life:	6 years	**Asset Cost:**	$5,700
Remaining Life:	6 years	**Percent Replacement:**	100%
Replacement Year:	2026	**Replacement Year Cost:**	$6,926

This component category provides funding for the replacement of the irrigation controller and system in the common areas.

Bollard Lights

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	2 @ $800
Useful Life:	24 years	**Asset Cost:**	$1,600
Remaining Life:	24 years	**Percent Replacement:**	100%
Replacement Year:	2044	**Replacement Year Cost:**	$3,488

This component category provides funding for the replenishment of the bollard style lights in the park.

Bark Mulch

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	10 @ $480
Useful Life:	3 years	**Asset Cost:**	$4,800
Remaining Life:	3 years	**Percent Replacement:**	100%
Replacement Year:	2023	**Replacement Year Cost:**	$5,291

This component category provides funding for the replenishment of the bark mulch throughout the community.

Cedar Chips

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	4 @ $500
Useful Life:	4 years	**Asset Cost:**	$2,000
Remaining Life:	4 years	**Percent Replacement:**	100%
Replacement Year:	2024	**Replacement Year Cost:**	$2,277

This component category provides funding for the replenishment of the cedar chip path in Tract A.

Retaining Wall Allowance

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	1 @ $2,500
Useful Life:	14 years	**Asset Cost:**	$2,500
Remaining Life:	14 years	**Percent Replacement:**	100%
Replacement Year:	2034	**Replacement Year Cost:**	$3,939

This component category provides funding for the maintenance of the retaining wall.

Open Space/Tree Allowance

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	1 @ $4,500
Useful Life:	4 years	**Asset Cost:**	$4,500
Remaining Life:	4 years	**Percent Replacement:**	100%
Replacement Year:	2024	**Replacement Year Cost:**	$5,124

This component category provides funding to upkeep the open space areas in Tracts A, B, C, & D.

Monument & Sign Allowance

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	1 @ $2,500
Useful Life:	14 years	**Asset Cost:**	$2,500
Remaining Life:	14 years	**Percent Replacement:**	100%
Replacement Year:	2034	**Replacement Year Cost:**	$3,939

This component category provides funding for the maintenance, partial replacement, of the monument at the entrance to the community.

Mailboxes

Capital: Grounds

Placed in Service:	2020	**Cost Basis:**	16 @ $1,450
Useful Life:	35 years	**Asset Cost:**	$23,200
Remaining Life:	35 years	**Percent Replacement:**	100%
Replacement Year:	2055	**Replacement Year Cost:**	$72,277

This component category provides funding for the replacement of the mailbox clusters in the Association. It is anticipated that the life of the mailboxes will be 30-40 years.

Grounds—Total Current Cost: $374,458

AFTER RECORDING RETURN COPY TO:

JORDAN RAMIS, PC
2 CENTERPOINTE DR, 6TH FLOOR
LAKE OSWEGO, OR 97035
ATTN: JAMES D. HOWSLEY

DRAFT

SPACE ABOVE THIS LINE FOR RECORDER'S USE

DECLARATION OF PRIVATE STREET MAINTENANCE COVENANT AND AGREEMENT

RECITALS

WHEREAS, CG Commercial, LLC, a Delaware limited liability company and VPCF Crestview, LLC, a Delaware limited liability company ("Declarants") are the owners of the real property described in Exhibit A and depicted on Exhibit B attached hereto and incorporated by this reference (the "Private Street Tracts").

WHEREAS, a Private Street Maintenance Covenant and Agreement ("Agreement") is required pursuant to the City of Newberg Final Decision dated _____, 2018 approving the Crestview Crossing Subdivision ("Subdivision") including the Private Street Tracts.

WHEREAS, the Subdivision plat will be recorded to create the Private Street Tracts.

WHEREAS, the Crestview Crossing Homeowners Association ("Association") has been created to own, administer and maintain the Private Street Tracts, among other purposes.

AGREEMENT

NOW, THEREFORE, Declarants covenant and agree on behalf of Declarants and their successors, including the Association, that the following provisions shall constitute a covenant running with the Private Street Tracts, as more particularly described herein.

1. PURPOSE OF COVENANT AND AGREEMENT.

The purpose of this Agreement is to provide for the perpetual maintenance of the Private Street Tracts by the Association.

2. LEGAL DESCRIPTION.

The legal description of the Private Street Tracts is on Exhibit A and depicted on Exhibit

B.

3. DURATION AND NATURE OF AGREEMENT.

This Agreement shall continue in perpetuity. This Agreement is intended to and does attach to and run with the land affected herein. This Agreement is binding on the Declarant, and its successors, heirs and assigns. It is the intent of Declarants to create a continuing obligation and right of the Association as the future owner of the Private Street Tracts.

4. CONSTRUCTION OF IMPROVEMENTS.

Declarants shall design and construct the street improvements to the specifications established by the City of Newberg, at Declarants' expense.

5. OWNERSHIP.

When Declarants have conveyed a sufficient number of the lots in the Subdivision to others, it will convey ownership of the Private Street Tracts to the Association and Declarants' obligations shall terminate.

6. MAINTENANCE.

The Declarants shall maintain the Private Street Tracts through a one-year warranty period expiring on _____, 2019. Once the warranty period is complete, the Association shall maintain all improvements including asphalt pavement, concrete curbs, fire lane restriction signage and striping, to the satisfaction of the City of Newberg and/or the Fire Marshal. The Association shall ensure that no lot owner, guest, invitee, licensee, contractor, vendor or agent of an owner shall cause damage, or place upon or over the Private Street Tracts any improvement, planting or other materials which would interfere with the maintenance or operation of the Private Street Tracts.

At the direction of the Association, the Private Street Tracts shall be inspected by a licensed Civil Engineer, at no less than 5 year intervals to identify needed maintenance. The Civil Engineer will recommend the amount of maintenance needed, and the recommendations shall be considered, mutually agreed and acted on by Association.

Maintenance shall include, but not be limited to:

a. The removal of leaves, trash or other unsightly or dangerous materials;
b. The removal of diseased or dead trees, landscaping or natural vegetation and the replanting of replacement materials.
c. The trimming of trees and vegetation.
d. The removal and replacement of any broken pavement.

e. The sealing of and/or the eventual repaving of the pavement, in a useable condition and in good repair.
f. The repair and/or replacement of damaged or missing fire lane restriction parking signs (as applicable) to the satisfaction of the Fire Marshal.
g. The re-painting of any and all fire lane restriction striping, including any stenciled lettering to the satisfaction of the Fire Marshal.

7. INDEMNIFICATION.

The Association shall hold harmless, defend and indemnify the Declarants, the City of Newberg and the Fire Marshal and their officers, agents and employees against all claims, demands, actions and suits, including attorneys' fees and costs brought against any of them arising out of the failure to properly design, locate, construct or maintain the Private Street Tracts which are subject to this Agreement.

All workers undertaking maintenance work within the Private Street Tracts shall have standard liability insurance in a reasonable amount from a reputable insurance company which protects the Association.

8. NOTICE.

Any notice, demand, or report required under this Agreement shall be sent to the owner of the Private Street Tracts. Any required notice of demand shall be made by hand delivery or certified mail, and shall be deemed received on actual receipt or 48 hours after being mailed whichever first occurs.

9. AMENDMENT AND TERMINATION.

The owner(s) of the Private Street Tracts may not amend, withdraw from or dissolve this Agreement without the written approval of the City of Newberg, and any such instrument shall be recorded in the deed records of Yamhill County.

10. NO DEDICATION AS PUBLIC RIGHT-OF-WAY.

Nothing in this Agreement shall be interpreted to mean the Private Street Tracts are or will be dedicated to the City of Newberg, the public, or other public agency for right-of-way purposes.

IN WITNESS WHEREOF, the Declarants have executed this Private Street Maintenance Covenant and Agreement to be effective on _____2018.

Signatures and acknowledgments are on the following page.

DECLARANTS

CG Commercial, LLC, a Delaware limited liability company LLC

By: _____

Title: _____

STATE OF OREGON
County of Clackamas

The above instrument was subscribed and sworn to before me this _____day of _____.

By _____

As _____ of _____.

_____
Notary Public – State of Oregon
My commission expires:_____

VPCF Crestview, LLC, a Delaware limited liability company

By: _____

Title: _____

STATE OF OREGON
County of Clackamas

The above instrument was subscribed and sworn to before me this _____day of _____.

By _____

As _____ of _____.

Approved as to form

DRAFT

_____

Joe Hannon
City Manager, City of Newberg

Exhibit A
Legal Description

Parcels of land in the northeast quarter of Section 16, Township 3 South, Range 2 West, Willamette Meridian, in the City of Newberg, Yamhill County, Oregon, more particulary described as follows.

Tracts F, G and H on the plat of Crestview Crossing, a subdivision recorded on _____, 2018 at Volume _____, Page _____, Book of Plats.

Exhibit B
Map of Private Street Tracts

AFTER RECORDING RETURN TO:
JORDAN RAMIS, PC
2 Centerpointe Dr, 6th Floor
Lake Oswego, OR 97035
Attn: James D. Howsley

DRAFT

This space provided for recorder's use.

STORMWATER FACILITY EASEMENT AND MAINTENANCE AGREEMENT

BETWEEN: City of Newberg, a municipal corporation of the State of Oregon ("City")

AND: CG Commercial, LLC, a Delaware limited liability company and VPCF Crestview, LLC, a Delaware limited liability company ("Declarants")

DATED: _____, 2018

RECITALS

A. WHEREAS, Declarants are the owner of the real property described in Exhibit A and depicted on Exhibit B attached hereto and incorporated by this reference (the "Private Street Tracts" and the "Stormwater Tracts").

B. WHEREAS, this Stormwater Facility Easement and Maintenance Agreement ("Agreement") is required pursuant to the City of Newberg Final Decision dated _____, 2018 approving the Crestview Crossing Subdivision ("Subdivision") including the Stormwater Tracts.

C. WHEREAS, the Subdivision plat is being recorded to create the Stormwater Tracts.

D. WHEREAS, the Crestview Crossing Homeowners Association ("Association") has been created to own, administer and maintain the Stormwater Tracts, among other purposes.

E. The Stormwater Tracts were designed by a registered professional engineer to accommodate the anticipated volume of runoff, detain such runoff, and release it at a slow rate.

F. The City desires a stormwater facility easement over a portion of the Stormwater Tracts. Declarant is willing to grant to the City a stormwater facility easement, subject to the terms and conditions of this Agreement.

NOW, THEREFORE, in consideration of the following covenants and conditions, it is agreed by and between the parties hereto as follows:

1. **Easement.** Declarants hereby grant the City, its employees, independent contractors and designees, a nonexclusive easement for ingress and egress over the Private Street Tracts, and over the Stormwater Tracts for the purpose of inspection of the Stormwater Tracts as specified below. Declarants understand and agrees that this easement limits the ability of Declarants, their successors and assigns from constructing any permanent buildings, structures, or other improvements that would interfere with the functioning of the Stormwater Tracts.

2. **Declarants' Agreement to Maintain Stormwater Tracts.** Declarants agree to maintain the Stormwater Tracts consistent with operations and maintenance program described in Exhibit C attached hereto and incorporated herein by this reference. In the event that the Declarants fail to so maintain the Stormwater Tracts, City may elect to exercise all remedies available to it in law and in equity, including the right of specific performance.

3. **City's Indemnity.** The City shall indemnify, defend and hold harmless Declarants, their officers, directors, agents and employees from any and all liability, damages, expenses, attorney's fees, causes of action, suits, claims or judgments, arising out of or connected with the City's exercise of its rights under this Agreement. In addition to the indemnity provided above, the City agrees to indemnify, defend and hold harmless Declarants, its officers, directors, agents and employees from and against all damages, costs, liabilities and expenses caused by, arising out of, or in connection with, City's handling, storage, discharge, transportation or disposal of hazardous or toxic wastes or substances, pollutants, oils, materials or contaminants, as those terms are defined by federal state or local law or regulation, as amended from time to time, on or about the Stormwater Tracts. City shall not be required to indemnify, hold harmless or defend Declarant from any claim, damage, loss, liability, cost or expense arising out of Declarant' negligence or intentional conduct.

4. **Declarant' Indemnity.** Declarant shall indemnify, defend and hold harmless City, its officials, agents and employees from any and all liability, damages, expenses, attorney's fees, causes of action, suits, claims or judgments, arising out of or connected with Declarant' acts or omissions which cause result in damage to the Stormwater Tracts. In addition to the indemnity provided above, Declarant agrees to indemnify, defend and hold harmless City, its officers, directors, agents and employees from and against all damages, costs, liabilities and expenses caused by, arising out of, or in connection with, Declarant' handling, storage, discharge, transportation or disposal of hazardous or toxic wastes or substances, pollutants, oils, materials or contaminants, as those terms are defined by federal state or local law or regulation, as amended from time to time, on or about the Stormwater Tracts. Declarant shall not be required to indemnify, hold harmless or defend the City from any claim, damage, loss, liability, cost or expense arising out of City's negligence or intentional conduct.

5. **Notice**. Any notice, demand, request, or other communication (collectively referred to in this as a "notice") required or permitted to be given or made by either party to the other pursuant to this Agreement shall be in writing and shall be delivered to the other party by delivery service (including by overnight delivery service such as Federal Express) or sent postage prepaid by registered or certified U.S. or Canadian mail, as applicable, addressed

to the party at its address set forth below or such other address as may be designated by such party by written notice hereunder. Notices shall be deemed given and shall be effective on the date of delivery or, if mailed, two (2) business days following the date of mailing.

In the case of a notice or communication, all notices shall be addressed as follows:

City: City of Newberg
414 E First St
Newberg, OR 97132
Attn: City Manager

Declarant:

With a copy to: Jordan Ramis, PC
2 Centerpointe Dr, 6th Floor
Lake Oswego, OR 97035
Attn: James D. Howsley

6. **Force and Effect.** This Agreement shall constitute deed covenants running with the land and shall be binding on all owners, their heirs, successors, and assigns.

7. **Amendments.** The terms of this Agreement may be amended by mutual agreement of the parties. Any amendments shall be in writing and shall refer specifically to this Agreement and shall be valid only when executed by both parties to this Agreement and duly recorded.

8. **Breach.** In the event either party breaches this Agreement, the nonbreaching party may elect to exercise all remedies available in law and equity.

9. **Prevailing Party.** In any action brought by either party to enforce the terms of this Agreement, or to foreclose any lien provided for herein, the prevailing party shall be entitled to recover all costs, including reasonable attorney fees as may be determined by the court having jurisdiction, including any appeal therefrom.

10. **Severability.** The invalidity of any section, clause, sentence, or provision of this Agreement shall not affect the validity of any other part of this Agreement, which can be given effect without such invalid part or parts.

11. **Duration.** This agreement shall continue in perpetuity unless otherwise terminated and released by the parties hereto or their respective heirs, successors or assigns. In the event that the Declarant fails to use the Stormwater Tracts for a period of twenty-four (24) consecutive months, then this Agreement shall terminate and the parties hereto shall execute a termination of this Agreement and record the same in the real estate records of Yamhill County, Oregon. At the time of such termination, the Stormwater Tracts shall revert to Declarant.

12. **Recording.** This Agreement shall be recorded in the deed records of Yamhill County, Oregon.

13. **Exhibits.** All Exhibits attached hereto are incorporated herein by this reference.

14. **Recitals Contractual.** The Recitals in this Agreement are contractual.

IN WITNESS WHEREOF, Declarant has set his hand and seal the day and year first above written, and City has caused these presents to be signed in its name by its City Manager, attesting to the day and year first above written.

DECLARANTS

CG Commercial, LLC, a Delaware limited liability company LLC

By: _____

Title: _____

STATE OF OREGON
County of Clackamas

The above instrument was subscribed and sworn to before me this _____day of _____.

By _____

As _____ of _____.

_____
Notary Public – State of Oregon
My commission expires:_____

VPCF Crestview, LLC, a Delaware limited liability company

By: _____

Title: _____

STATE OF OREGON
County of Clackamas

The above instrument was subscribed and sworn to before me this _____day of _____.

By _____

As _____ of _____.

CITY:

CITY OF NEWBERG, a municipal corporation of the State of Oregon

By:_____
Joe Hannon, City Manager

STATE OF OREGON)
) ss.
COUNTY OF)

This instrument was acknowledged before me on _____, 2018 by Joe Hannon as City Manager of the City of Newberg.

_____
Notary Public for Oregon
My commission expires:_____

Exhibit A
Legal Description of Property

Parcels of land in the northeast quarter of Section 16, Township 3 South, Range 2 West, Willamette Meridian, in the City of Newberg, Yamhill County, Oregon, more particulary described as follows.

Private Street Tracts

Tracts F, G and H on the plat of Crestview Crossing, a subdivision recorded on _____. 2018 at Volume _____, Page _____, Book of Plats.

Stormwater Tracts

Tracts B and C on the plat of Crestview Crossing, a subdivision ecorded on _____. 2018 at Volume _____, Page _____, Book of Plats.

Exhibit B
Map of Private Street and Stormwater Tracts

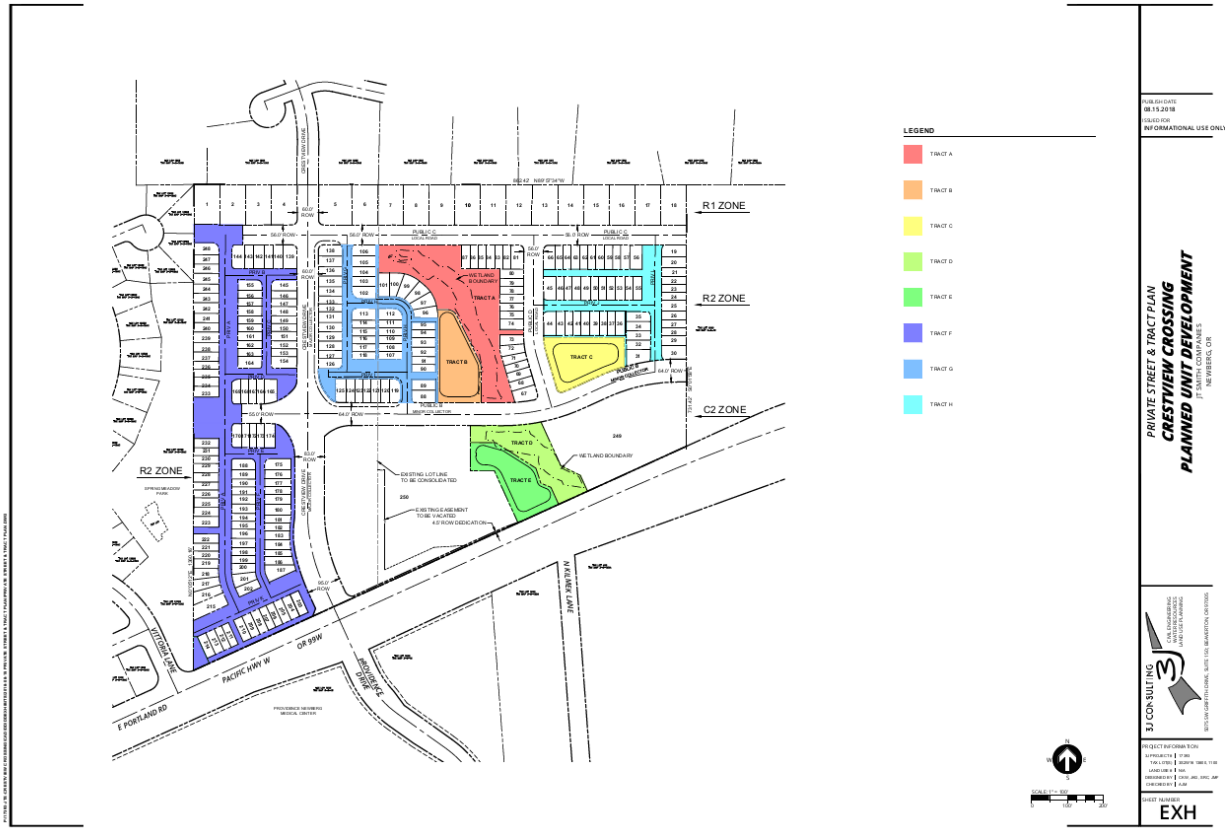


EXHIBIT C

Maintenance Requirement for Stormwater Tracts B and C

1. Stormwater Tracts shall be mowed regularly to maintain a maximum grass height of 6 inches or less. Side slopes that are planted shall be maintained to prevent erosion. Bare soil shall be replanted as needed to maintain sufficient ground coverage.
2. The Stormwater Tracts access gates shall remain free of obstructions at all times allowing access by the City's Public Works Department for inspection, maintenance, and repair, if necessary. The access gate shall remain locked at all times. The lock shall be accessible by both Declarant and the City.
3. The fence enclosing the Stormwater Tracts shall be maintained to remain structurally competent. Debris that accumulates along the fence and within the Stormwater Tracts shall be removed quarterly.
4. Inspect the Stormwater Tracts per the following table and stormwater retention basin inspection maintenance checklist.

Table 1
Routine Maintenance Activities for Retention Basins

No.	Maintenance Task	Frequency of Task
1	Conduct annual vegetation management during the summer, removing weeds and harvesting vegetation. Remove all grass cuttings and other green waste.	Once a year
2	Trim vegetation at beginning and end of wet season to prevent establishment of woody vegetation, and for aesthetics and mosquito control.	Twice a year (spring and fall)
3	Evaluate health of vegetation and remove and replace any dead or dying plants. Remove all green waste and dispose of properly.	Twice a year
4	If turf grass is included in basin design, conduct regular mowing and remove all grass cuttings. Avoid producing ruts when mowing.	Maintain less than 6-inches
5	Remove sediment when the sediment level reaches the level shown on the fixed vertical sediment marker and dispose of sediment properly.	As needed
6	Remove accumulated sediment and regrade when the accumulated sediment volume reduces the infiltration rate or impedes the outfall pipe and dispose of sediment properly.	Every 2-5 years, or as needed to maintain min. clearance below outlet
7	Remove accumulated trash and debris from the extended detention basin at the middle and end of the wet season and dispose of trash and debris properly.	Twice a year (January and April)
8	Irrigate during dry weather.	As needed
9	Inspect extended detention basin using the attached inspection checklist.	Quarterly, or as needed

Crestview Crossing

Newberg, Oregon

J.T. SMITH companies

Cardno

August 14, 2018

This perspective is conceptual in nature and may change at the owner's discretion in order to meet jurisdictional codes, final site engineering requirements and budget based on pricing for the final plan.

Highway 99 Frontage

August 14, 2018

Crestview Crossing

Newberg, Oregon

J.T. SMITH companies

Cardno

This perspective is conceptual in nature and may change at the owner's discretion in order to meet jurisdictional codes, final site engineering requirements and budget based on pricing for the final plan.

Main Entry Concept

Private Drive D

Private Drive J

Residence
(TYP)

Public Road B

Concrete Traffic Strip Around
Perimeter of Roundabout

Future Commercial Site
By Others

Crestview Drive

Right of Way

Private Drive E

August 14, 2018

Crestview Crossing

Newberg, Oregon

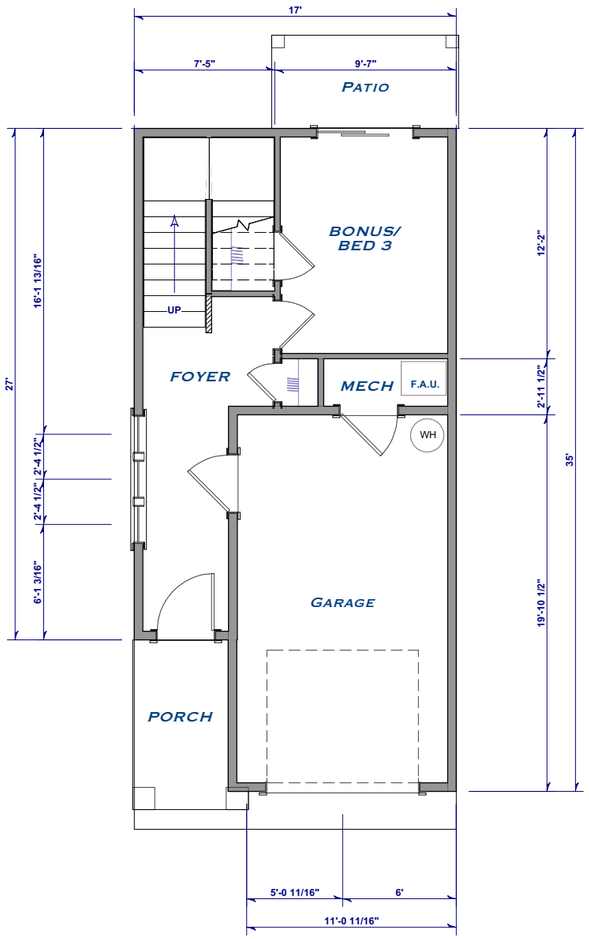
J.T. SMITH companies

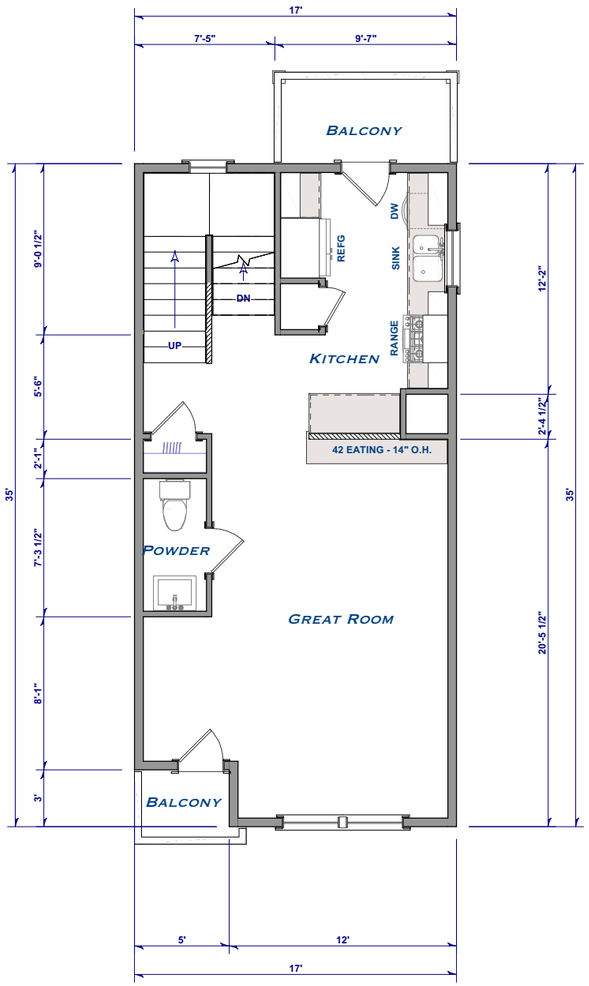
Cardno

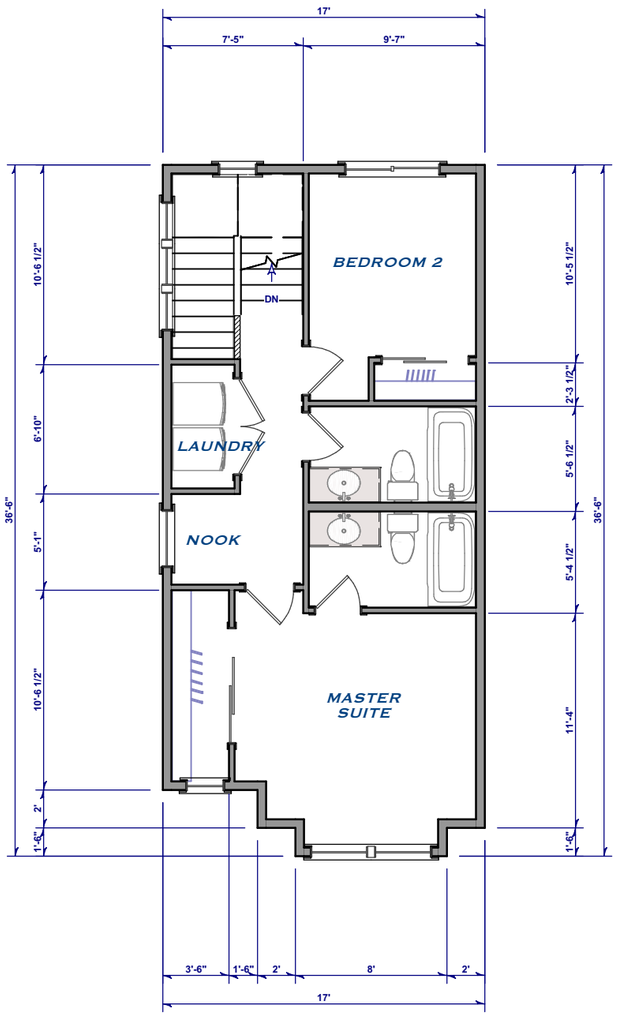
0 5 10 20

This plan is conceptual in nature and may change at the owner's discretion in order to meet jurisdictional codes, final site engineering requirements and budget based on pricing for the final plan.

Roundabout Concept



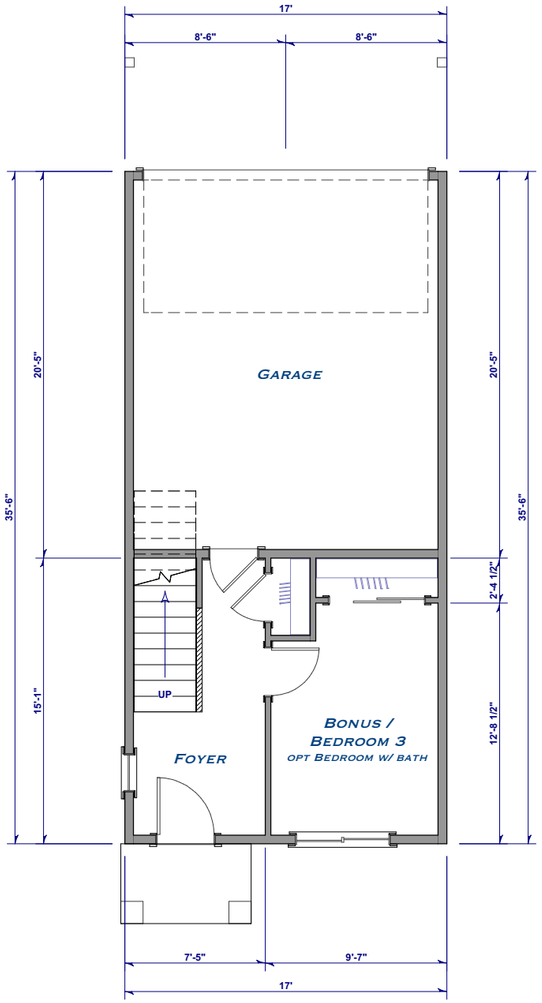


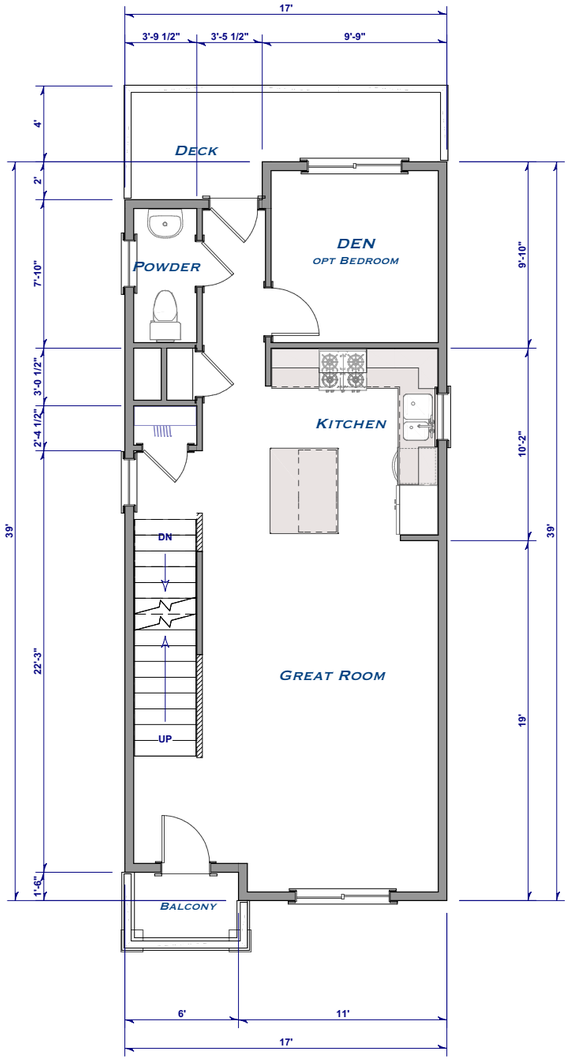


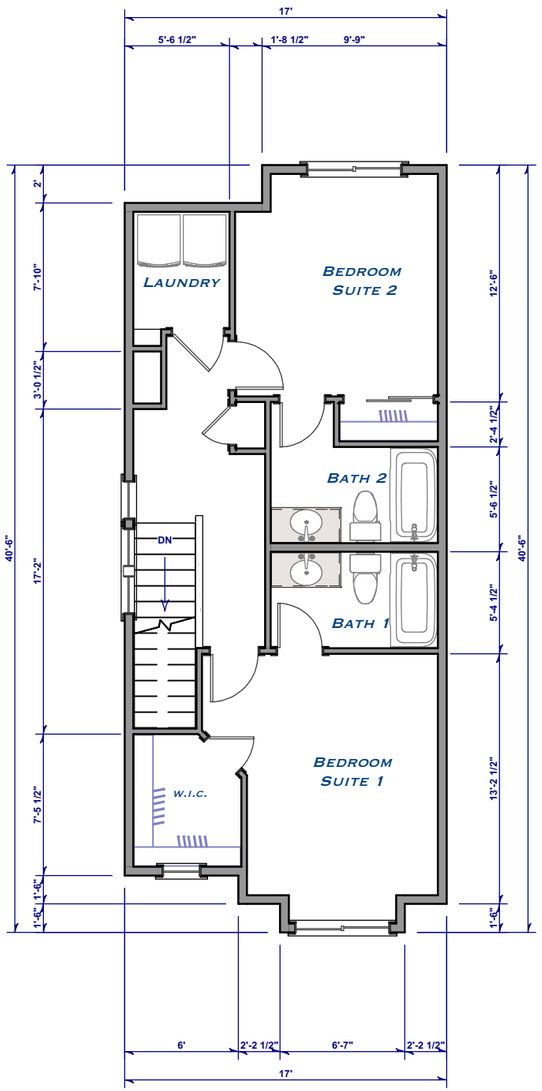
17ft wide plan concept

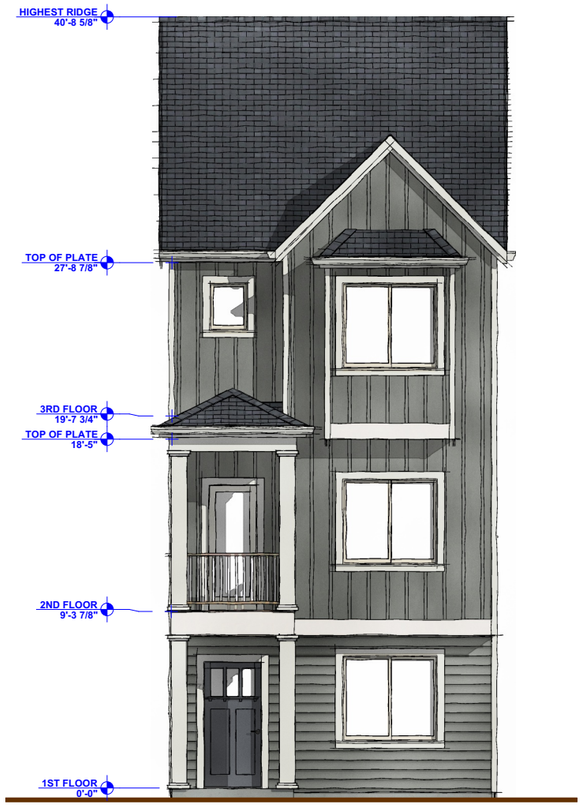
ground floor	|	322 sq ft
main floor	|	518 sq ft
upper floor	|	529 sq ft
total	|	1,369 sq ft

twinline design llc
architectural design + documentation







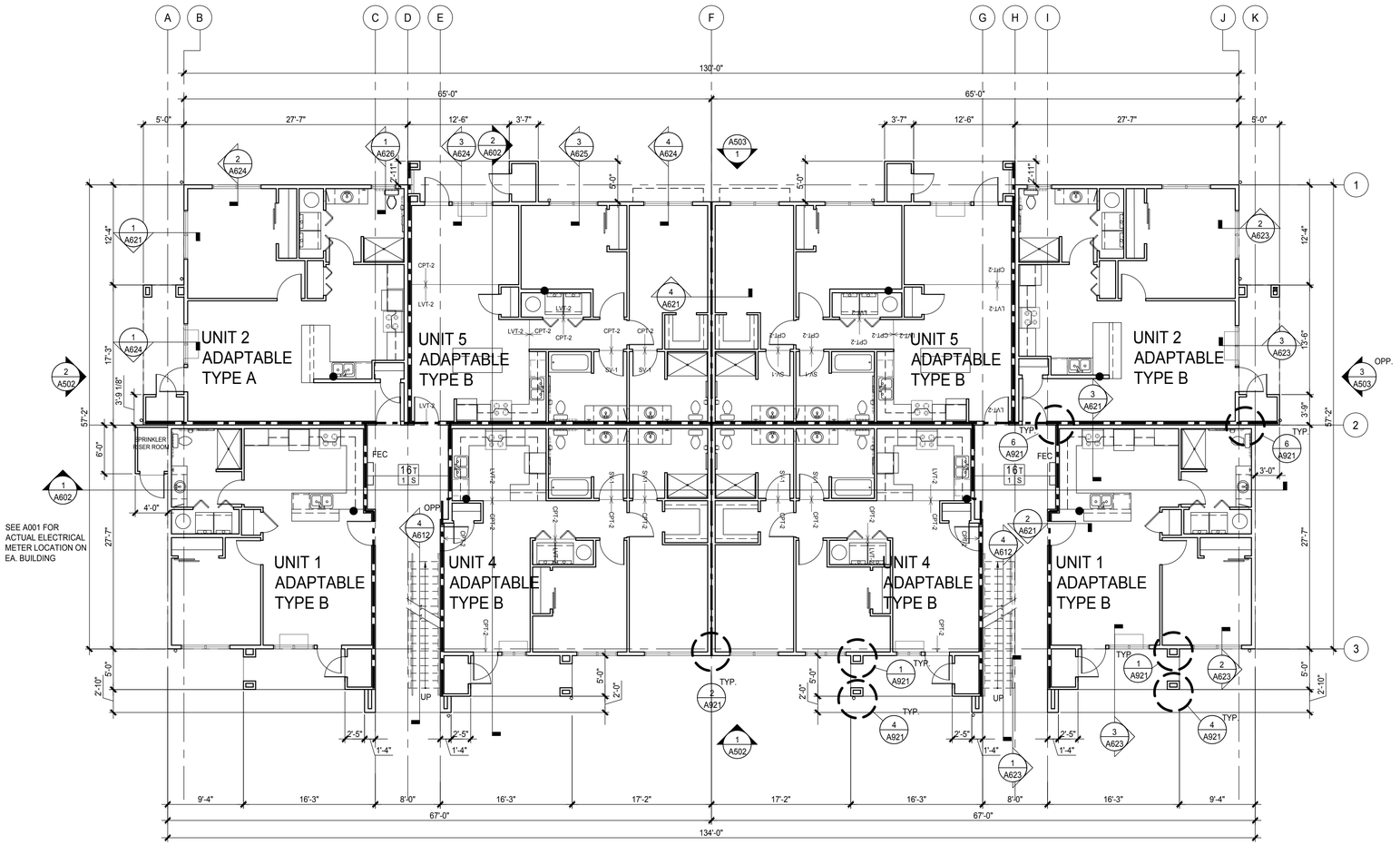


19ft rear loaded townhome plan concept

ground floor		264 sq ft
main floor		595 sq ft
upper floor		608 sq ft
total		1,467 sq ft

twinline design llc
architectural design + documentation

Crestview Crossing 17ft wide rear load Concept | 7/10/18



1 BUILDING TYPE A2 - FIRST FLOOR ADAPTABLE UNITS

SCALE: 1/8" = 1'-0"

LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503 221.2077
Portland OR 97209 www.lrsarchitects.com

PRELIMINARY
NOT FOR
CONSTRUCTION

CONSULTANT:

PROJECT NUMBER:

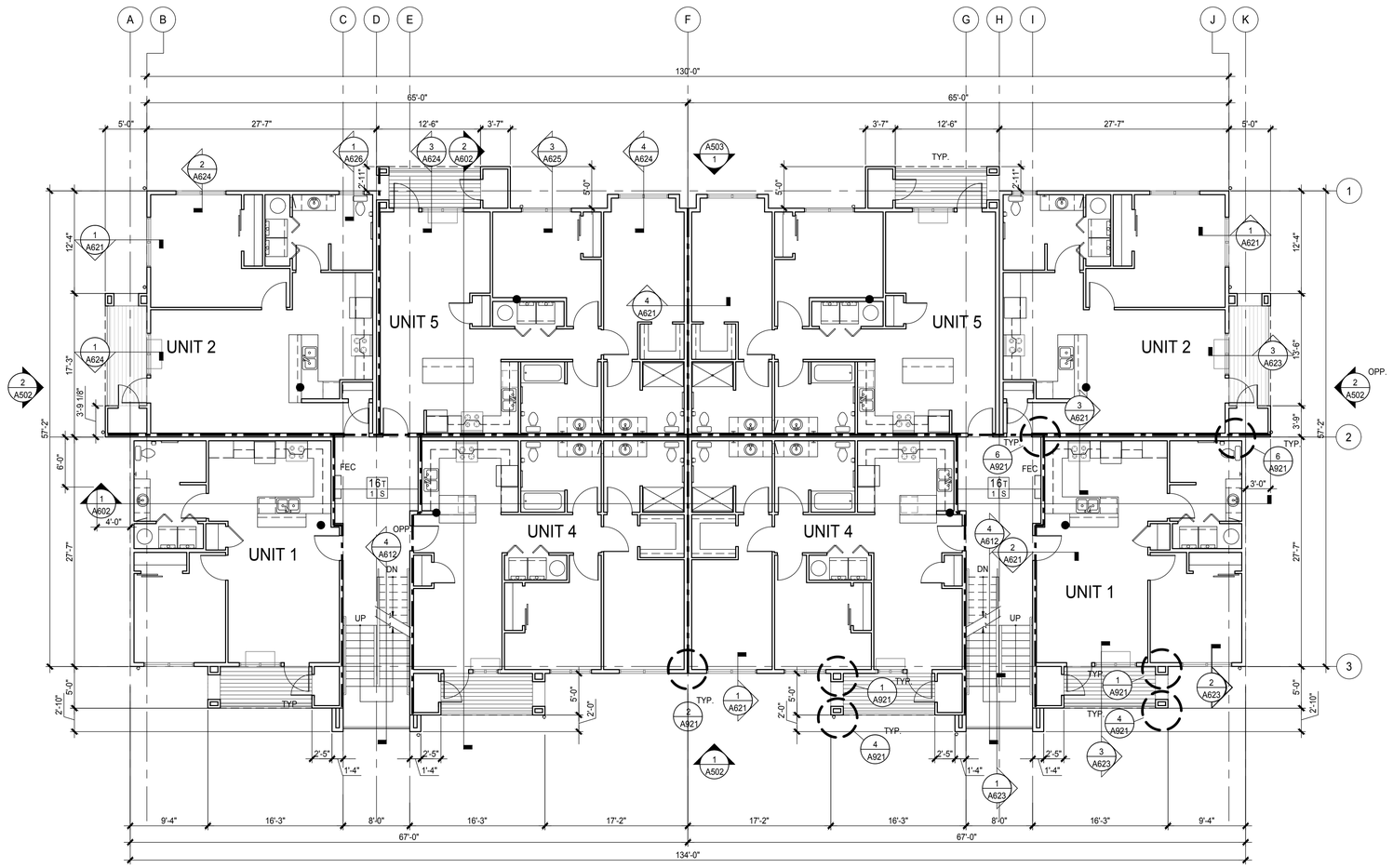
Crestview Crossing
NEWBERG, OR

SHEET TITLE:

BUILDING A2 FLOOR PLANS

DRAWN BY: ----
DATE ISSUED:

SHEET: **A204**



1 BUILDING TYPE A2 - SECOND FLOOR UNITS

SCALE: 1/8" = 1'-0"

LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503 221.2077
Portland OR 97209 www.lrsarchitects.com

PRELIMINARY
NOT FOR
CONSTRUCTION

CONSULTANT:

PROJECT NUMBER:

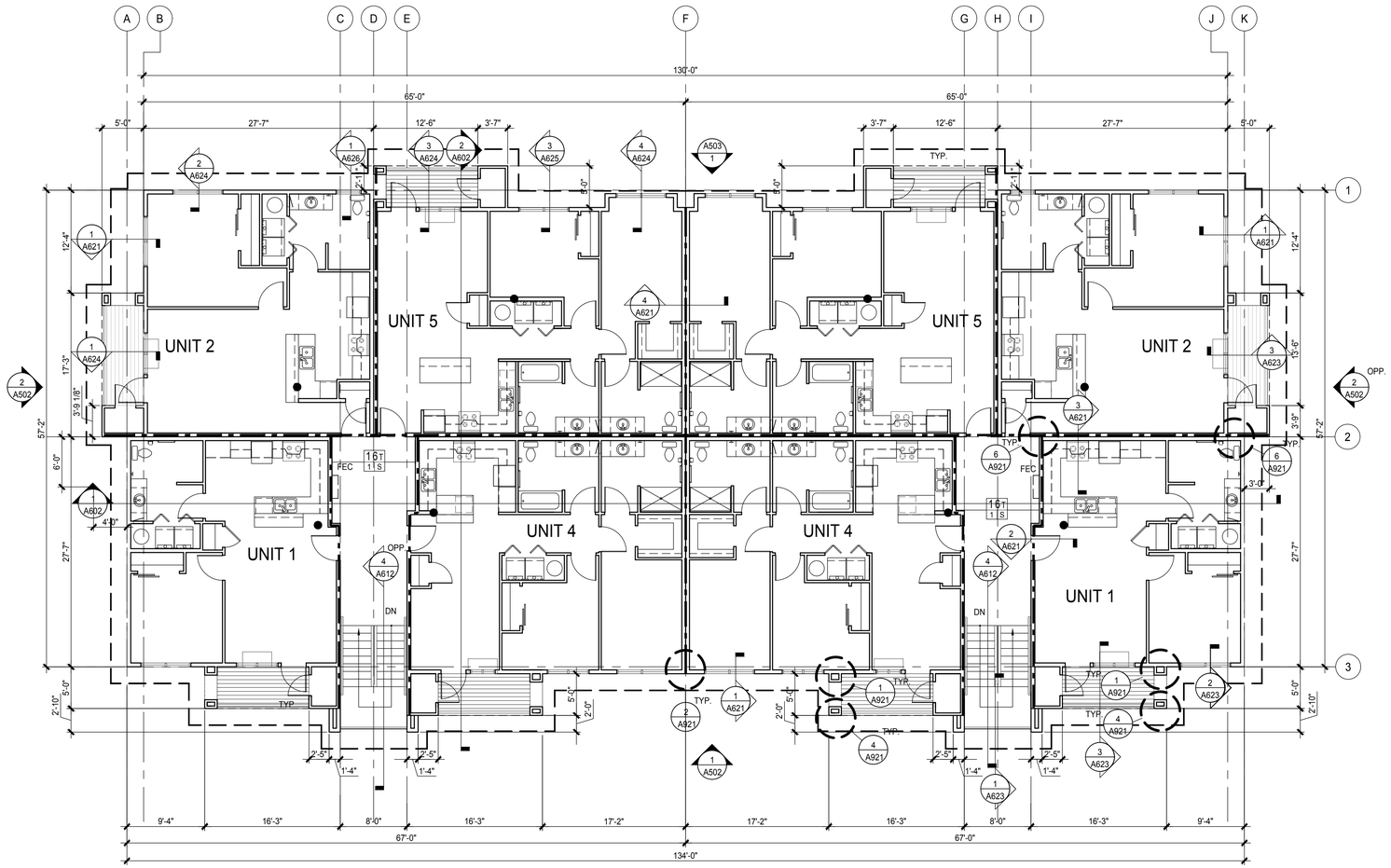
Crestview Crossing
NEWBERG, OR

SHEET TITLE:

BUILDING A2 FLOOR PLANS

DRAWN BY: ----
DATE ISSUED:

SHEET: **A205**



1 BUILDING TYPE A2 - THIRD FLOOR UNITS

SCALE: 1/8" = 1'-0"

LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503 221.2077
Portland OR 97209 www.lrsarchitects.com

PRELIMINARY NOT FOR CONSTRUCTION

CONSULTANT:

PROJECT NUMBER:

Crestview Crossing
NEWBERG, OR

SHEET TITLE:

BUILDING A2 FLOOR PLANS

DRAWN BY: ----
DATE ISSUED: *0*

SHEET: **A206**