City of Yelm
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Case Number:	SUB 2023-0028
Applicant:	Blue Fern 18300 Redmond Way Suite 120 Redmond, WA 98052
Agent:	Core Design Inc. Holli H. Heavrin, P.E. 12100 NE 195th St, Suite 300 Bothell, WA 98011
Request:	Subdivide 14.92 acres into 90 single-family residential lots
Public Hearing Date:	October 26, 2023 at 10:00am
Recommendation:	Approval with conditions

PROPOSAL

The applicant proposes to subdivide a 14.9-acre parcel into 90 residential lots for single family dwellings. The property is zoned Moderate Density Residential (R-6), which allows between 3 to 6 dwelling units per gross acre of land.

PROPERTY CHARACTERISTICS

The property is located at 16330 Railway Road SE and is located between Railway Road and Northern Pacific Road, approximately 1200 feet southwest of Canal Road SE. The property is identified by two Assessor's Tax Parcel Numbers: 64300700400 and 64300700501.

The properties have historically been used for light agricultural uses; the two parent parcels were created in their current form prior to 1970.

Surrounding properties to the east, west, and south are predominately low density/rural residential. The properties to the north are zoned Industrial and contain an auto wrecking yard and a manufacturing plant. The property to the southwest of the subject site contains an electrical substation but has the same zoning designation as the site of the proposal: Moderate Density Residential (R-6). The property is generally flat and level with less than 5% slopes.

Notice of Application and Public Hearing

Notice of this application was mailed to state and local agencies and property owners within 300 feet of the site on April 18th, 2023, as well as published in the Nisqually Valley News in the legal notice section on April 19th, 2023.

No comments were received from nearby property owners or members of the public. The Nisqually Indian Tribe commented, requesting a Cultural Resources Survey. This survey was completed in May of 2023 and found no archaeological resources in the project area. The full report was submitted to the Nisqually Indian Tribe and the Washington State Department of Archaeology and Historic Preservation. The DAHP responded, concurring with the findings of the Cultural Resources Survey and recommending that a standard Inadvertent Discovery Plan be followed during all ground disturbing activities. The Nisqually Indian Tribe also concurred, and requested to be informed of any inadvertent discoveries. The correspondence from the Nisqually Indian Tribe and the DAHP have been attached to this report as Exhibit A and Exhibit B, respectfully.

Notice of the date and time of the public hearing before the Hearing Examiner was posted on the project site, mailed to property owners within 300 feet of the site, and mailed to the recipients of the Notice of Application on October 16, 2023. Notice of the public hearing was published in the Nisqually Valley News in the legal notice section on October 12th, 2023.

State Environmental Policy Act

The City of Yelm SEPA Responsible Official issued a Determination of Non-Significance (DNS) based on Section 197-11-340(2) WAC on September 19, 2023. This determination is final and fulfills the City's responsibility for disclosure of potential significant environmental impacts.

Comments were received from the Washington State Department of Ecology (ECY), which noted that the project is subject to existing regulations regarding toxics and waste cleanup and solid waste management. The letter from ECY is attached to this report as Exhibit C.

Concurrency

The intent of the City's concurrency management program, as required by the Growth Management Act, is based on the maintenance of specified levels of service through capacity monitoring, allocation and reservation procedures.

Concurrency describes the situation in which water, sewer and/or transportation facilities are available when the impacts of development occur. [Section 18.16.020 YMC]

Water

The level of service for water infrastructure is the ability to provide potable water to the consumer for use and fire protection in accordance with adopted health and environmental regulations. [Section 18.16.030 YMC]

The State Subdivision Act, Chapter 58.17 RCW, requires that the City of Yelm make a written

determination that appropriate provisions are made for potable water supplies as part of the preliminary land division process.

There is no water main located in Railway Road. The project is proposing to connect to the existing water line located at the intersection of Railway Road SE and Middle Street SE.

The development is required to connect to and extend the main along all new proposed roadways within the subdivision. The improvements required to serve the project will be specifically identified during civil plan review. This satisfies the requirement for concurrency with water infrastructure.

Any existing well(s) on the property must be decommission pursuant to Department of Ecology standards and any water rights associated with these wells shall be dedicated to the City of Yelm.

Sewer

Concurrency with sewer infrastructure is achieved pursuant to Section 18.16.050 (B)(2) YMC when the project is within an area approved for sewer pursuant to the adopted sewer comprehensive plan for the city and, at the time of preliminary approval, the planned infrastructure identified in the six-year improvement program of the sewer system plan are sufficient to provide for the proposed land division and it is reasonably anticipated that the treatment plant has sufficient capacity to provide for the proposed land division.

The City's Sewer Comprehensive Plan identifies the property as being within the sewer service area and is not currently connected to the City's S.T.E.P. sewer system. There are no sewer mains located in Railway Road. The project is proposing to connect to the existing sewer line located at the intersection of Railway Road SE and Middle Street SE.

The development is required to connect to and extend the main along all new proposed roadways within the subdivision. The improvements required to serve the project will be specifically identified during civil plan review. This satisfies the requirement for concurrency with sewer infrastructure.

Transportation

Concurrency with transportation infrastructure is achieved pursuant to Section 18.16.050 (B)(2) YMC when the level of service at concurrency intersections will not drop below accepted levels of service due to new trips associated with the proposed land division unless the planned improvements identified in the six-year transportation improvement program would maintain levels of service.

Frontage improvements are required as part of development. The developer has indicated that frontage improvements along Railway Road will be installed to the City's adopted Neighborhood Collector standard and that internal streets will be constructed to adopted Local Access Residential standards. The Traffic Impact Analysis (TIA) describes impact to nearby intersections and is attached to this report as Exhibit D. The TIA found that the project would not cause nearby intersections to drop below accepted levels of service.

Finally, Traffic Facility Charges are applied at the time of building permit issuance. These conditions satisfy the requirement for concurrency with transportation infrastructure.

Fire Protection

Concurrency with fire protection is achieved pursuant to Section 18.16.090(C) YMC when

the developer makes a contribution to the fire protection facilities as identified in the most current version of the capital facilities plan adopted by the SE Thurston Regional Fire Authority and endorsed by resolution of the Yelm City Council. This fee is subject to change and is collected at the time of building permit issuance. Payment of this fee satisfies the requirement for concurrency with fire protection.

School

Concurrency with school infrastructure is achieved pursuant to Section 18.16.090(B) YMC when the developer makes a contribution to school facilities as identified in the most current version of the capital facilities plan adopted by Yelm Community Schools, and endorsed by resolution of the Yelm City Council. This fee is subject to change and is collected at the time of building permit issuance. Payment of this fee satisfies the requirement for concurrency with school infrastructure.

CRITICAL AREAS

The Yelm Critical Areas Code, Chapter 18.21 YMC provides protection for wetlands, critical aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat areas.

Aquifer Recharge

All of Yelm is identified as a critical aquifer recharge area. Compliance with Federal, State, and County water source protection regulations and with the City's adopted stormwater regulations are required to protect the aquifer [Section 18.21.070 (C) YMC].

The stormwater system proposed is a Bioretention treatment system which was designed using the guidelines and requirements established in the 2019 DOE Stormwater Management Manual for Western Washington (2019 SWMMWW) as required by the City of Yelm Municipal Code.

Wetlands

No wetlands were identified on site.

Fish and Wildlife habitat conservation areas, wetlands and flood zones

In April 2014, the U.S. Fish and Wildlife Service listed the Yelm subspecies of the Mazama Pocket Gopher as threatened under the Endangered Species Act. While the City of Yelm is not responsible for implementation or enforcement of the Endangered Species Act, it consults with the Service and provides notice to applicants that the pocket gopher is a federally protected species and a permit from the U.S. Fish and Wildlife Service may be required.

As part of the application, a gopher reconnaissance was completed by Land Services Northwest, LLC. The report states that there were no indicators for the Mazama Pocket Gopher.

DESIGN STANDARDS

Lot Size and Setbacks

The Yelm Unified Development Code does not establish minimum or maximum lot sizes, although it does require standard yard setbacks of 15 feet from the front property line adjacent to local access road with a minimum 20-foot driveway approach, 5 feet from side property lines, and 25 feet from the rear property line. The setback for a flanking yard is 15 feet from the property line. The preliminary site plans satisfy setback requirements.

Street Lighting

Adequate street lighting is necessary to provide safety to pedestrians, vehicles, and homeowners. The lighting plan shall meet the requirements of section 18.59.050 of the YMC. Street lighting is reviewed at the time of civil plan review in order to assure adequate lighting.

Parking

Residential uses require two spaces per dwelling unit. This is typically achieved within a standard driveway approach. [Section 18.54.030 (A)]

On-street parking is allowed on both sides of local access residential streets.

Water

Chapter 13.04 YMC and Chapter 6 of the Development Guidelines establish requirements for connection to the City's water system.

The site is currently connected to City water service. Water connections are based on Equivalent Residential Units (875 cubic feet of water consumption per month).

A new 10" water line will be extended north along the property's frontage on Railway Road, replacing the existing 8" line currently found along the frontage. The new water line will be connected to an existing line that is located in the intersection of Railway Road SE and Middle Street SE.

The City implements a cross-connection and backflow control program pursuant to Title 43 RCW and Chapter 248-54 WAC. [Section 13.04.220 YMC] A backflow prevention device is required to protect Yelm's water system from cross-connections from any irrigation systems. [Section 13.04.220 (D)].

Fire hydrant locks are required to be installed, and paid for by the applicant.

Sewer

Chapter 13.08 YMC and Chapter 7 of the Development Guidelines establish requirements for connection to the City's sewer system.

The property is located in the City of Yelm's S.T.E.P. sewer system service area, and is not connected to the City of Yelm's S.T.E.P. sewer system. Sewer connections are based on Equivalent Residential Unit (875 cubic feet of water consumption per month). There are currently no sewer connections along the stretch of Railway Road adjacent to this site.

A new 6" PVC S.T.E.P. Sewer main will be installed along Railway Road upon construction of the project.

Transportation

The City of Yelm Development Guidelines and the concurrency requirements of Chapter

18.16 YMC require all new subdivisions to improve street frontages to current City standards.

The developer has indicated that frontage improvements along Railway Road will be installed to the City's adopted Neighborhood Collector standard and that internal streets will be constructed to adopted Local Access Residential standards.

The Traffic Impact Analysis describes impacts to nearby intersections. No improvements to nearby intersections were deemed necessary by the analysis.

The Unified Development Code at Chapter 18.52 requires subdivisions of 25 or more housing units to provide more than one vehicular access from an arterial or collector street. It also requires that no street shall extend for a distance greater than 660 feet without including a provision for at least one intersection, or other traffic calming measure. The preliminary site plan meets this requirement.

Section 18.52.090 requires the layout of streets to provide for continuation of streets. The preliminary site plan shows two future connections to un-platted property to the northeast and southwest.

Stormwater

Impervious surfaces create stormwater runoff which, when uncontrolled and untreated can create health, safety, and environmental hazards. The City of Yelm has adopted the most current version of the Stormwater Management Manual for Western Washington, which requires all development to treat and control stormwater.

The applicant has submitted a preliminary stormwater report which includes a conceptual design for the treatment and infiltration of stormwater. The stormwater system proposed is a Biofiltration pond system which has a general use designation in the 2019 Stormwater Management Manual for Western Washington for source water protection.

Stormwater facilities require continued maintenance to ensure they remain in proper working condition.

Landscape

The Unified Development Code at Section 18.55.020 YMC requires landscaping for all new development. For residential subdivisions, the perimeter landscape requirement is met with a solid wood fence.

Streetscape landscaping is required as part of street frontage improvements.

The above ground stormwater bioretention pond is proposed as passive open space. Two open space tracts have been proposed as recreational open space. A perimeter landscape or other onsite landscaping theme should be incorporated.

The final landscape plan submitted with civil plans shall provide a detailed irrigation plan.

Open Space

The Unified Development Code at Section 18.56.010 YMC requires residential developments to include equal to or greater than five percent of the gross area of the development as qualified open space. The applicant has provided a preliminary landscape plan that shows 0.89 acres as open space in 4 tracts. Tracts C and D provide access to the Yelm-Tenino Trail, which runs along the northwest property line. The conceptual plan shows

pedestrian walkways, playground areas, and areas to be landscaped. Sidewalk connections for internal pathways are required. Park or play equipment should be included.

Mailboxes

New residential development shall coordinate with the US Postal Service for the location of mailboxes. Mailboxes shall be cluster box units (CBU). Placement of CBU mailboxes shall be placed in a location that does not interfere with individual driveway access, or pedestrian pathways.

Subdivision Name and Addressing

A Plat Name Reservation Certificate from the Thurston County Auditor for the name Shelm Meadows has been submitted to the City of Yelm. The current certificate is valid through March 30, 2024 and can be renewed annually.

Addressing and street naming within the subdivision will be assigned or approved by the Community Development Department prior to application for final subdivision approval.

STAFF RECOMMENDATION

Section 18.14.050 YMC requires written findings prior to a decision on a preliminary subdivision.

The applicant has established that the proposed subdivision adequately provides for the public health, safety, and general welfare; and for such open spaces, drainage ways, streets, sanitary wastes, parks and recreation, schools, and sidewalks; and that the public use and interest will be served by the subdivision of the property.

The Public Services Department recommends that the preliminary subdivision be approved. If the Examiner agrees that requirements have been met, the Department would recommend the following conditions be included with any preliminary approval:

1. Any trees removed as a result of the development shall be replaced at a ratio of two replacement trees per each removed tree (2:1).
2. A lighting plan conforming to 18.59.050 of the Yelm Municipal Code (YMC) must be submitted at the time of Civil Plan Review.
3. Plans submitted during Civil Plan Review shall include all survey monuments.
4. Any proposed irrigation system shall incorporate a backflow prevention device and conform with the cross-connection and backflow control program as defined in Section 13.04.220(D) YMC. The final landscape plan submitted with civil plans must provide a detailed irrigation plan.
5. Frontage improvements along Railway Rd are required, and must be completed to the Neighborhood Collector standard. The proposed local access roads must be completed to the Local Access Residential standard. These standards are illustrated in Chapter 2 of Yelm's Engineering Specifications and Standards Details.
6. The applicant shall pay all School Impact Fees, Fire Impact Fees, and Transportation Facility Charges at the time of building permit issuance.
7. Plans submitted during Civil Plan Review shall include an addressing map for approval by the Building Official.

8. Plans submitted during Civil Plan Review shall include the proposed location and details for mailbox placement and these plans must conform to Section 18.59.080 YMC.
9. The applicant shall provide a performance assurance device in order to provide for maintenance of the required landscaping for this subdivision, until the homeowners' association becomes responsible for the landscaping maintenance. The performance assurance device shall be 150 percent of the anticipated cost to maintain the landscaping for three years.
10. Stormwater facilities shall be located in separate recorded tracts owned and maintained by the homeowners' association. The stormwater system shall be held in common by the homeowners' association and homeowners' agreement shall include provisions for the assessment of fees against individual lots for the maintenance and repair of the stormwater facilities. All roof drain runoff shall be infiltrated on each lot according to SWMMWW standards.
11. The applicant shall secure all necessary demolition permits prior to demolition of current structures on property and shall provide the required Olympic Region Clean Air Agency (ORCAA) report before demolition may begin.
12. The applicant shall submit a fire hydrant plan to the Planning & Building Department for review and approval as part of the civil engineering plans prior to final subdivision approval. The applicant shall submit fire flow calculations for all existing and proposed hydrants. The applicant shall be responsible for the fee for hydrant locks on all fire hydrants required and installed as part of development. These fees shall be collected by the Planning & Building Department prior to final plat recording.
13. The civil engineering plans shall include a search and report of adjacent wells and their locations. Any onsite wells shall be decommissioned, and water rights dedicated to the City of Yelm. Offsite wells within 100 feet of the property shall be identified, and well protection radius provided.

Exhibit A

NISQUALLY INDIAN TRIBE
Tribal Historic Preservation Office
4820 She-Nah-Num Drive S.E.
Olympia, Washington 98513
360.456.5221 (main)
877.768.8886 (toll free)
www.nisqually-nsn.gov

July 24, 2023

To: Maryam Moeinian
Senior Planner
City of Yelm
106 2nd St SE
Yelm, WA 98597

Re: City of Yelm Notice of Application for Railway Road Subdivision - Case# 2023.0028

The Nisqually Indian Tribe's THPO has reviewed the cultural resources assessment that you provided for the above-named project and concurs with the conclusions and recommendations. Please keep us informed if there are any Inadvertent Discoveries of Archaeological Resources/Human Burials.

Although the Nisqually Indian Tribe concurs with the conclusions in this report, we respect the traditional cultural knowledge of affected tribes and support their opinions on this matter as well.

Sincerely,

Brad Beach, THPO
Nisqually Indian Tribe
360-528-1084
360-456-5221 ext 1277
beach.brad@nisqually-nsn.gov

cc: Annette Bullchild, Director, Nisqually Indian Tribe

Exhibit B

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

August 1, 2023

Maryam Moeinian
Associate Planner
City of Yelm

In future correspondence please refer to:
Project Tracking Code: 2023-05-03029
Property: Shelm Meadows, 16330 Railway Rd SE, Yelm
Re: Archaeology - Concur with Survey; Follow Inadvertent Discovery Plan

Dear Maryam Moeinian:

Thank you for contacting the State Historic Preservation Officer (SHPO) and the Department of Archaeology and Historic Preservation (DAHP) with documentation regarding the above referenced project. In response, we concur with the results and recommendations made in the survey report entitled "Cultural Resource Assessment for Shelm Meadows, 16330 Railway Rd SE, Yelm, Thurston County, WA." Specifically, as no cultural resources were found during the survey, we do not recommend further direct archaeological supervision of the project. However, we do recommend that a standard Inadvertent Discovery Plan is followed during all ground disturbing activities.

Please note that the recommendations provided in this letter reflect only the opinions of DAHP. Any interested Tribes may have different recommendations. We appreciate receiving copies of any correspondence or comments from Tribes or other parties concerning cultural resource issues that you receive.

These comments are based on the information available at the time of this review and on behalf of the SHPO pursuant to Washington State law. Please note that should the project scope of work and/or location change significantly, please contact DAHP for further review.

Thank you for the opportunity to review and comment. Please ensure that the DAHP Project Number (a.k.a. Project Tracking Code) is attached to any future communications about this project. Should you have any questions, please feel free to contact me.

Sincerely,

Stephanie Jolivette
Local Governments Archaeologist
(360) 628-2755
Stephanie.Jolivette@dahp.wa.gov

Exhibit C

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

September 29, 2023

Gary Cooper, Planning and Building Manager
City of Yelm
Community Development Department
PO Box 479
Yelm, WA 98597

Dear Gary Cooper:

Thank you for the opportunity to comment on the determination of nonsignificance for the Shelm Meadows Subdivision Project located at 16314 Railway Road Southeast as proposed by Anna Drumheller. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

SOLID WASTE MANAGEMENT: Derek Rockett (360) 995-3176

The applicant proposes to demolish an existing structure(s). In addition to any required asbestos abatement procedures, the applicant should ensure that any other potentially dangerous or hazardous materials present are removed prior to demolition. It is important that these materials and wastes are removed and appropriately managed prior to demolition. It is equally important that demolition debris is also safely managed, especially if it contains painted wood or concrete, treated wood, or other possibly dangerous materials. Please review the "Dangerous Waste Rules for Demolition, Construction, and Renovation Wastes," on Ecology's website at: Construction & Demolition Guidance. All removed debris resulting from this project must be disposed of at an approved site. All grading and filling of land must utilize only clean fill. All other materials may be considered solid waste and permit approval may be required from your local jurisdictional health department prior to filling. Contact the local jurisdictional health department for proper management of these materials.

TOXICS CLEANUP: Thomas Middleton (360) 999-9594

If contamination is suspected, discovered, or occurs during the proposed SEPA action, testing of the potentially contaminated media must be conducted. If contamination of soil or groundwater is readily apparent, or is revealed by testing, Ecology must be notified. Contact the Environmental Report Tracking System Coordinator for the Southwest Regional Office (SWRO) at (360) 407-6300. For assistance and information about subsequent cleanup and to identify the type of testing that will be required, contact Thomas Middleton with the SWRO, Toxics Cleanup Program at the phone number provided above.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(JKT:202304458)

cc: Derek Rockett, SWM
Thomas Middleton, TCP

Exhibit D

Blue Fern Railway Road

Yelm WA

Traffic Impact Analysis

February 22, 2023

Prepared for:

Blue Fern Development
18300 Redmond Way, Suite 120
Redmond, WA 98052

Prepared by:

TENW

Transportation Engineering NorthWest

11400 SE 8th Street, Suite 200

Bellevue, WA 98004

Office: (425) 889-6747

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Appendices

List of Figures and Tables

FINDINGS/CONCLUSIONS

This traffic impact analysis has been prepared for the proposed *Blue Fern Railway Road* residential project located at 16314 and 16330 Railway Road SE in Yelm, WA.

Project Proposal. The project would include the development of up to 90 single-family detached homes. The existing site is currently occupied by two (2) single-family detached homes, which will be removed as part of the proposed project. Vehicular access to and from the site is proposed via two (2) full access driveways on Railway Road SE. For this analysis, a 2026 horizon year was used.

Trip Generation. The proposed *Blue Fern Railway Road* project is estimated to generate 888 net new weekday daily trips with 66 trips occurring during the weekday AM peak hour (17 in, 49 out) and 87 trips during the weekday PM peak hour (55 in, 32 out).

Future Year LOS. Weekday PM peak hour LOS analysis was conducted at three (3) off-site study intersections. All study intersections are anticipated to operate at LOS A during the weekday PM peak hour in 2026 without or with the proposed *Blue Fern Railway Road* project.

Site Access Analysis. The controlled movements at the two site access driveways on Railway Road SE are expected to operate at LOS A in 2026 with 95th percentile queues anticipated to be less than 25 feet during the PM peak hour.

Mitigation

Off-Site Improvements

Based on the results of the analysis shown in this report, no project-specific off-site transportation mitigation is proposed for concurrency or SEPA purposes.

Transportation Impact Fees

Transportation impacts fees in the City of Yelm are assessed upon new development based on a cost per PM peak hour trip. The current transportation impact fee is $1,497 per PM peak hour trip. The final impact fee calculation will be based on the impact fee rate and project size in effect at the time of building permit issuance.

INTRODUCTION

This Traffic Impact Analysis (TIA) has been prepared for the proposed *Blue Fern Railway Road* project located at 16314 and 16330 Railway Road SE in Yelm, WA as shown in **Figure 1**.

Project Description

The project would include the development of up to 90 single-family detached homes. The existing site is currently occupied by two (2) single-family detached homes, which will be removed as part of the proposed project. Vehicular access to and from the site is proposed via two (2) full access driveways on Railway Road SE. For this analysis, a 2026 horizon year was used. A preliminary site plan is included in **Figure 2**.

Project Approach

To analyze the traffic impacts from the proposed *Blue Fern Railway Road* project, the following tasks were undertaken:

- Assessed existing conditions through field reconnaissance and reviewed existing planning documents;
- Documented existing traffic volumes and intersection LOS during the weekday PM peak hour.
- Documented future planned roadway improvements in the project vicinity.
- Developed weekday daily, AM, and PM peak hour trip generation estimates.
- Assigned weekday PM peak hour project-generated trips.
- Analyzed weekday PM peak hour LOS for future conditions without and with the project at the following study intersections:
    1. Rhoton Road NW / Railway Road SE
    2. Middle Road SE / Railway Road SE
    3. Canal Road SE / Railway Road SE
- Assessed operations at the two (2) proposed site access driveways including LOS and queuing.
- Documented proposed traffic mitigation including off-site improvements and payment of transportation impact fees.

Primary Data and Information Sources

- Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.
- Institute of Transportation Engineers (ITE), *Trip Generation Handbook*, 3rd Edition, 2017.
- City of Yelm Engineering Specifications and Standard Details Chapter 2 Transportation, December 2, 2021.
- 2023 PM peak hour traffic counts, All Traffic Data.
- SR 510 Yelm Loop - New Alignment Phase 2 Supplemental Environmental Assessment, WSDOT, May 2021.
- *Highway Capacity Manual (HCM 6th Edition),* 2016.

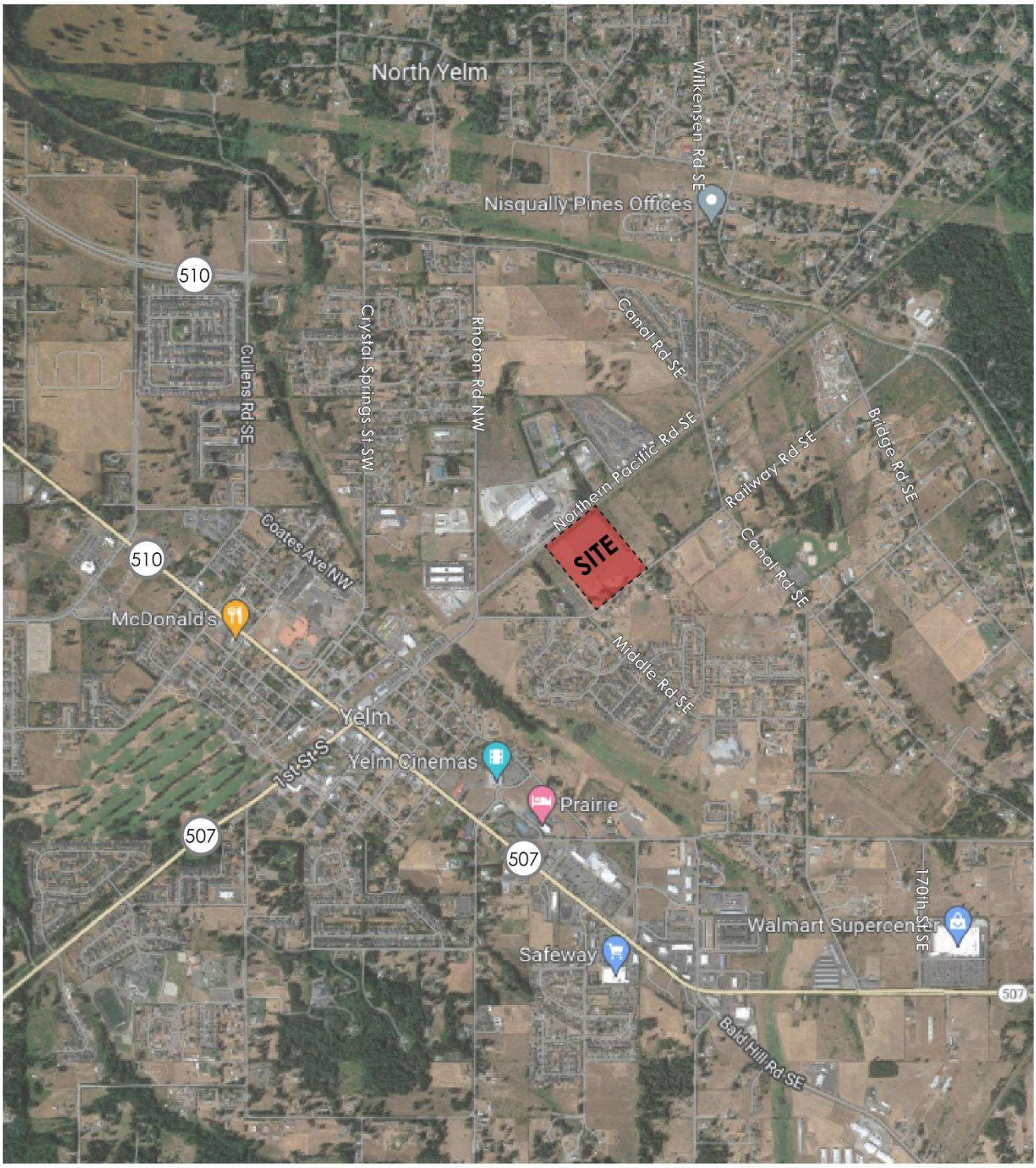

Figure 1: Site Vicinity Map

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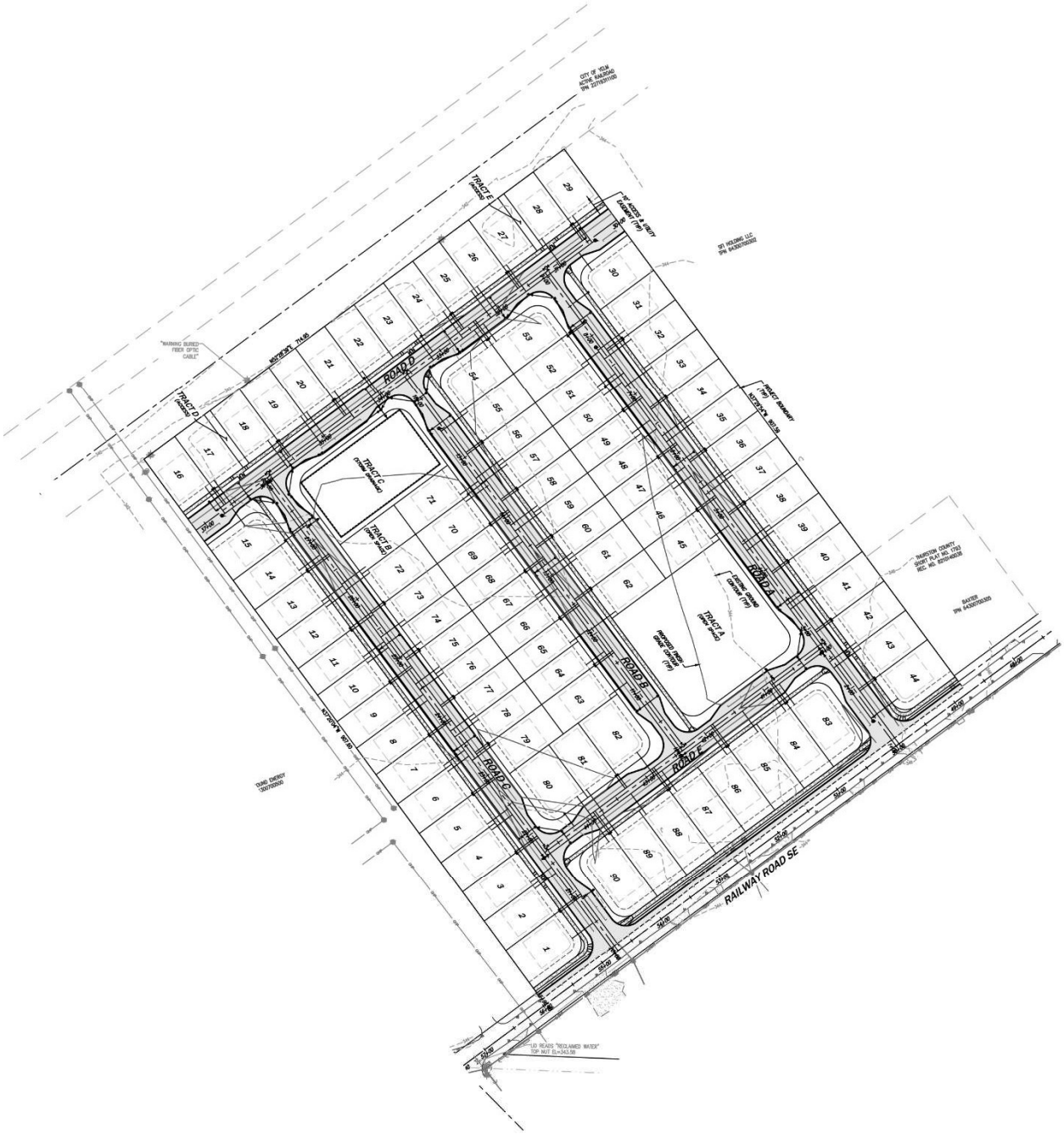


Figure 2: Preliminary Site Plan

EXISTING CONDITIONS

Roadway Network

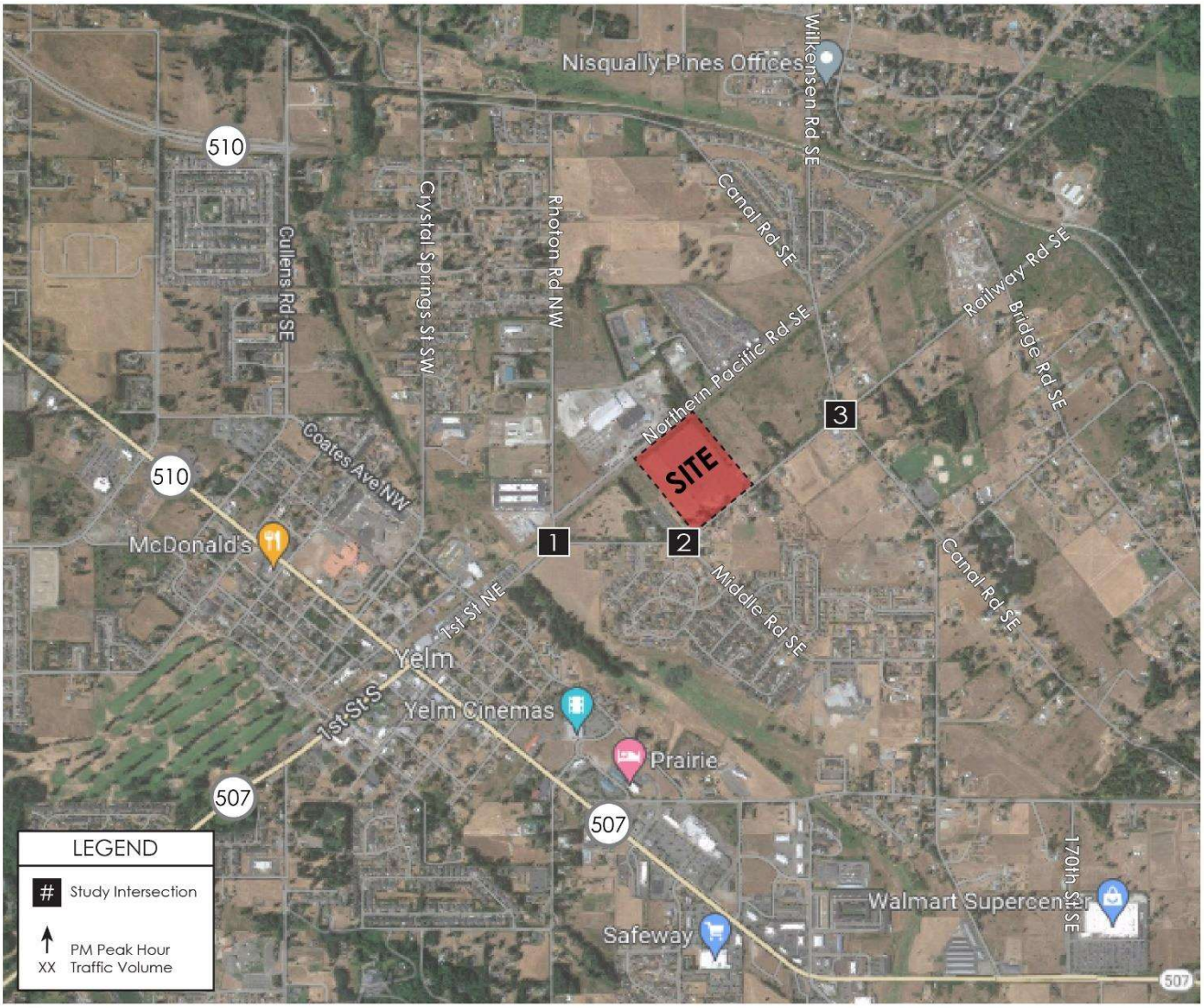
Table 1 describes the existing characteristics of the streets that would be used as primary routes to and from the site. Roadway characteristics are described in terms of orientation, arterial classification, number of lanes, posted speed limits, parking, pedestrian facilities, and bicycle facilities. The relationship of these roadways to the project site is shown in Figure 1.

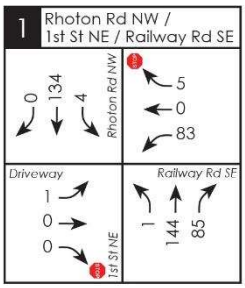
Table 1
Existing Roadway Network Summary – Project Site Vicinity

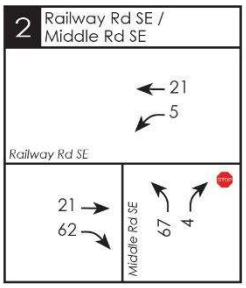
Roadway	General Orientation	Functional Classification	Speed Limit	Number of Travel Lanes	Street Parking	Sidewalks
Railway Road SE	East-West	Local Access Residential	25	2	No	Intermittent
Rhoton Rd NW	North-South	Commercial Collector	25	2	No	No
Wilkensen Road	North-South	Neighborhood Collector	25	2	No	Yes

Peak-Hour Traffic Volumes

Existing weekday PM peak hour traffic volumes at the study intersections were based on counts collected by All Traffic Data in January 2023. The PM peak hour traffic volumes represent the highest hour of traffic between 4:00 and 6:00 p.m. Figure 3 illustrates the existing 2023 PM peak hour traffic volumes at the study intersections. The 2023 traffic count sheets are included in Appendix A.







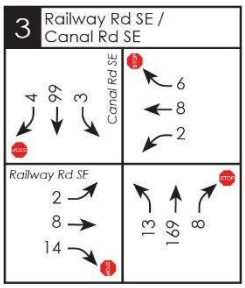


Figure 3: 2023 Weekday PM Peak Hour Existing Traffic Volumes

Intersection Levels of Service

Weekday PM peak hour level of service (LOS) analysis was conducted at the following three (3) off-site study intersections:

1. Rhoton Road NW / Railway Road SE
2. Middle Road SE / Railway Road SE
3. Canal Road SE / Railway Road SE

LOS generally refers to the degree of congestion on a roadway or intersection. It is a measure of vehicle operating speed, travel time, travel delays, and driving comfort. A letter scale from A to F generally describes intersection LOS. At signalized intersections, LOS A represents free-flow conditions (motorists experience little or no delays), and LOS F represents forced-flow conditions where motorists experience an average delay in excess of 80 seconds per vehicle.

The LOS reported for signalized intersections represents the average control delay (sec/veh) and can be reported for the overall intersection, for each approach, and for each lane group (additional v/c ratio criteria apply to lane group LOS only).

The LOS reported at stop-controlled intersections is based on the average control delay and can be reported for each controlled minor approach, controlled minor lane group, and controlled major-street movement (and for the overall intersection at all-way stop controlled intersections. Additional v/c ratio criteria apply to lane group or movement LOS only). Table 2 outlines the HCM 6th Edition LOS criteria for signalized and stop-controlled intersections based on these methodologies.

Table 2
LOS Criteria for Signalized and Stop-Controlled Intersections[1]

SIGNALIZED INTERSECTIONS			UNSIGNALIZED INTERSECTIONS		
	LOS by Volume-to Capacity (V/C) Ratio[2]			LOS by Volume-to Capacity (V/C) Ratio	
Control Delay (sec/veh)	≤ 1.0	> 1.0	Control Delay (sec/veh)	≤ 1.0	> 1.0
≤ 10	A	F	≤ 10	A	F
> 10 to ≤ 20	B	F	> 10 to ≤ 15	B	F
> 20 to ≤ 35	C	F	> 15 to ≤ 25	C	F
> 35 to ≤ 55	D	F	> 25 to ≤ 35	D	F
> 55 to ≤ 80	E	F	> 35 to ≤ 50	E	F
> 80	F	F	> 50	F	F

[1] Source: Highway Capacity Manual (6th Edition), Transportation Research Board, 2016.

[2] For approach-based and intersection-wide assessments at signals, LOS is defined solely by control delay.

Intersection LOS was calculated using the methodology and procedures outlined in the *Highway Capacity Manual* (HCM 6th Edition), Transportation Research Board (TRB), using the *Synchro 11* software program. The 2023 existing PM peak hour LOS analysis results for the study intersections are summarized in Table 3. The 2023 Existing LOS worksheets are included in Appendix B.

It should be noted that the LOS reported at the stop-controlled study intersections was based on the average delay of all legs per Yelm Municipal Code section 18.16.030.

Table 3
2023 Existing Weekday PM Peak Hour LOS Summary

Study Intersection	PM Peak Hour LOS[1]	PM Peak Hour Delay (sec)[2]
Two-Way Stop Controlled Intersections		
1. Rhoton Road NW / Railway Road SE	A	2.5
2. Middle Road SE / Railway Road SE	A	4.0
All-Way Stop Controlled Intersection		
3. Canal Road SE / Railway Road SE	A	8.0

1. LOS = Level of Service
2. Delay refers to average control delay of all legs at the intersection per Yelm Municipal Code section 18.16.030, expressed in seconds per vehicle.

As shown in Table 3, the study intersections currently operate at LOS A during the weekday PM peak hour.

Collision History

Historic collisions at the study intersections and along the project frontage were analyzed for the five-year period from 2017 to 2021. Collision data was provided by WSDOT. Summaries of the total and yearly average collisions during this period are provided in Table 4.

Table 4
Collision Data Summary, January 1, 2017 to December 31, 2021

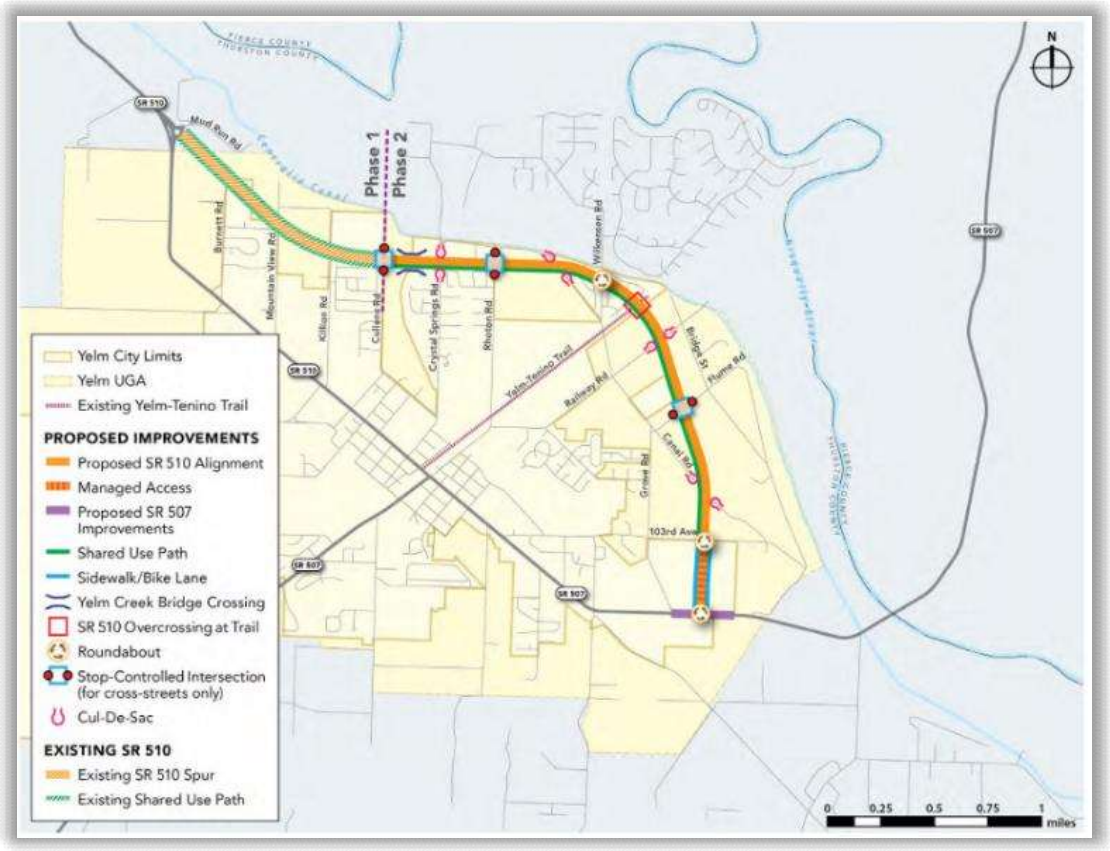
Location	Number of Collisions 2017	2018	2019	2020	2021	5-Year Total	Average Annual
Intersection							
1. NW Rhoton Rd / Railway Rd SE	0	1	1	0	1	3	0.60
2. Middle Rd SE / Railway Rd SE	0	1	1	0	1	3	0.60
3. Canal Rd SE / Railway Rd SE	0	0	0	0	0	0	0.00
Segment							
Railway Rd SE between Middle Rd SE to Canal Rd SE	1	0	0	0	0	1	0.20

Source: WSDOT Collision Records.

FUTURE CONDITIONS AND PROJECT IMPACT ANALYSIS

Planned Transportation Improvements

Future planned roadway capacity improvements in the project vicinity include the *SR 510 Yelm Loop Phase 2* project. The project involves the completion of the Yelm Loop bypass, a two-phased limited access highway intended to provide an alternate route for regional traffic around Yelm's congested downtown core. Phase 1 of the bypass was constructed in 2010. Phase 2 would complete the Yelm Loop bypass, from its existing terminus at Cullens Road to the intersection of 170th Street and SR 507. Phase 2 improvements include construction of approximately 3 miles of new highway with one travel lane in each direction; a shared-use bicycle and pedestrian pathway; and sidewalks and bike lanes in the more urbanized portion of the corridor. The anticipated project is anticipated to be completed in Fall 2026. Below is a graphic illustrating the Phase 2 Improvements.



Project Trip Generation

The new weekday daily, AM, and PM peak hour trip generation estimates were based on methodology documented in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition for Land Use Code (LUC) 210 (Single-Family Detached Housing). Table 5 summarizes the trip generation estimate for the proposed *Blue Fern Railway Road* project.

Table 5
Blue Fern Railway Road – Trip Generation Summary

Time Period	Net New Trips Generated		
	In	Out	Total
Weekday Daily	444	444	888
Weekday AM Peak Hour	17	49	66
Weekday PM Peak Hour	55	32	87

As shown in Table 5, the currently proposed 90-lot *Blue Fern Railway Road* project is estimated to generate 888 net new weekday daily trips with 66 net new trips occurring during the weekday AM peak hour (17 in, 49 out) and 87 net new trips during the weekday PM peak hour (55 in, 32 out). Detailed trip generation calculations are included in Appendix C. It should be noted that the reported trip generation estimates include trip credit for the two single family homes currently on the site that will be removed.

Project Trip Distribution and Assignment

The distribution of project-generated traffic to the adjacent road network was based on a model distribution provided by the Thurston Reginal Planning Council (TRPC). A copy of the TRPC model distribution output is included in Appendix D. It should be noted that the traffic modeling assumes the completion of the *SR 510 Yelm Loop Phase 2* project.

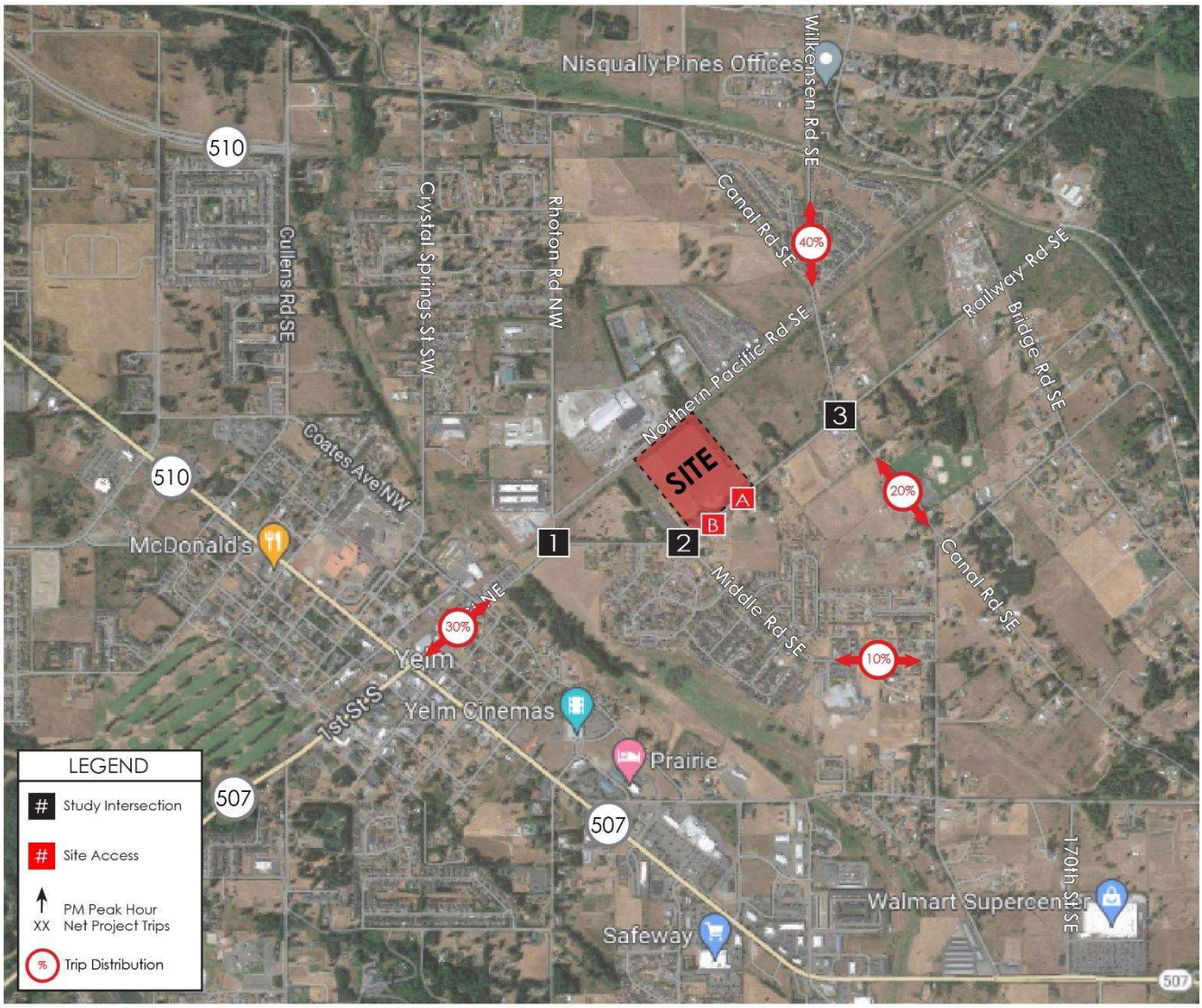
The TRPC modeling was used to assign the net new weekday PM peak hour trips (55 inbound and 32 outbound) trips generated by the proposed project to the adjacent street network. The resulting assignment of the net new weekday PM peak hour project trips through the study intersections and site access driveways is shown in Figure 4.

The new weekday PM peak hour project-generated trips were generally distributed to the vicinity street system as follows:

- 40 percent to/from the north on SR 510 Extension (via Wilkensen Road SE)
- 30 percent to/from the west on 1st Street
- 20 percent to/from the south on Canal Rd SE
- 10 percent to/from the south on Middle Rd SE

Future Traffic Volumes

To estimate the future 2026 Baseline PM peak hour traffic volumes, a 2.0 percent annual growth rate was applied to the 2023 existing traffic volumes. The resulting future 2026 Baseline PM peak hour traffic volumes at the study intersections are shown in Figure 5. The 2026 With Project traffic volumes were determined by adding the trip assignment from the proposed development (shown in Figure 4) to the future 2026 Baseline traffic volumes (shown in Figure 5). The 2026 With Project traffic volumes are shown in Figure 6.



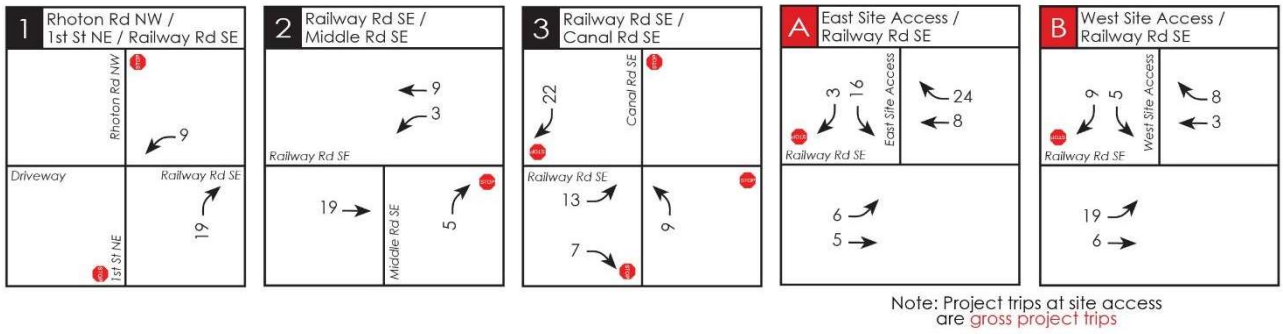
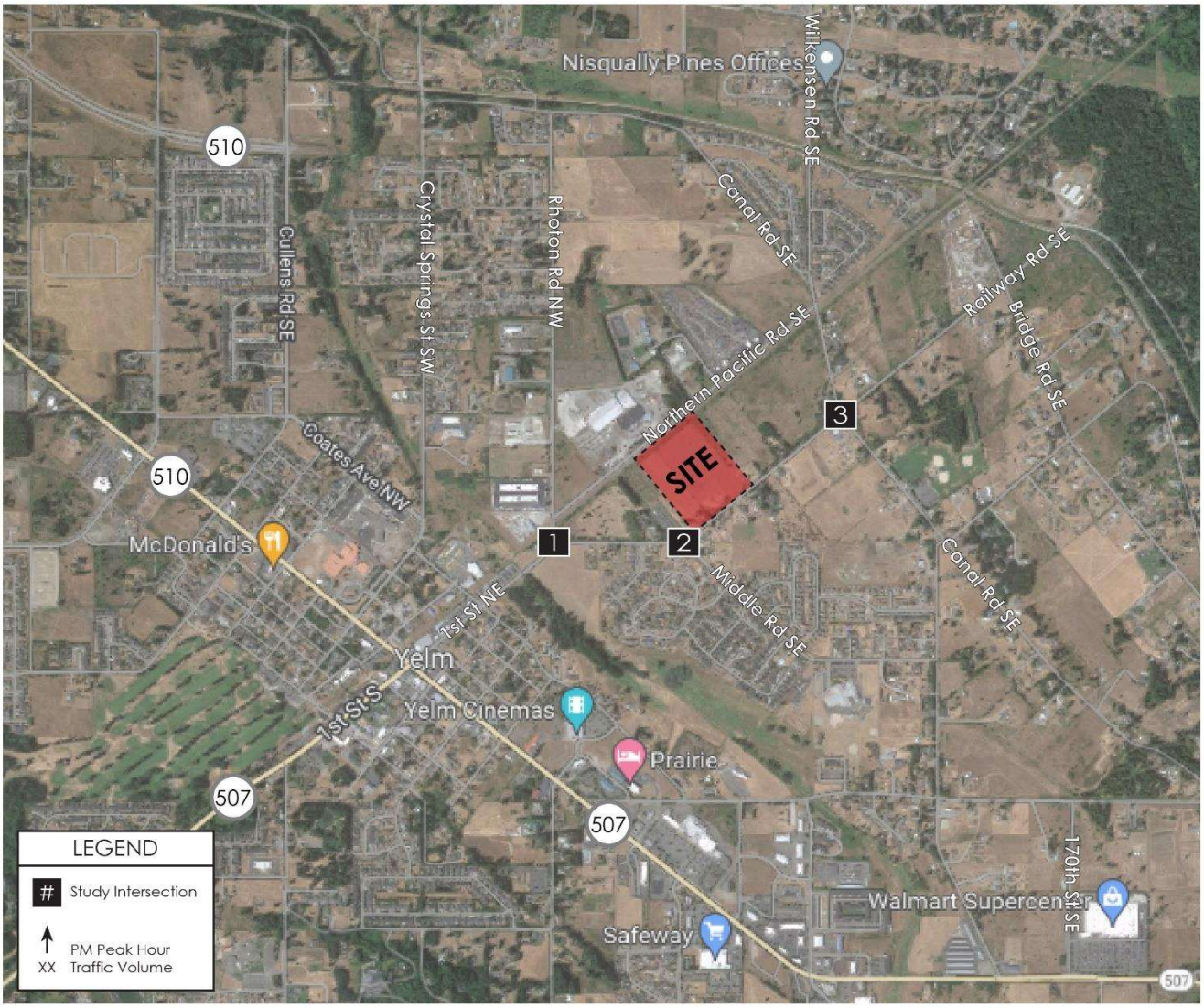
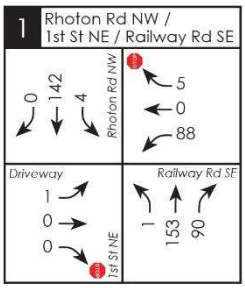
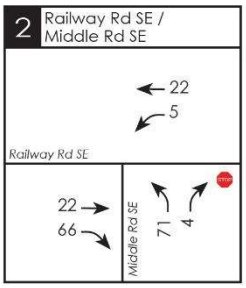


Figure 4: Weekday PM Peak Hour Project Assignment & Distribution

N
NOT TO SCALE







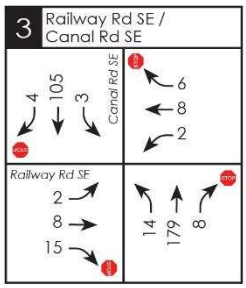
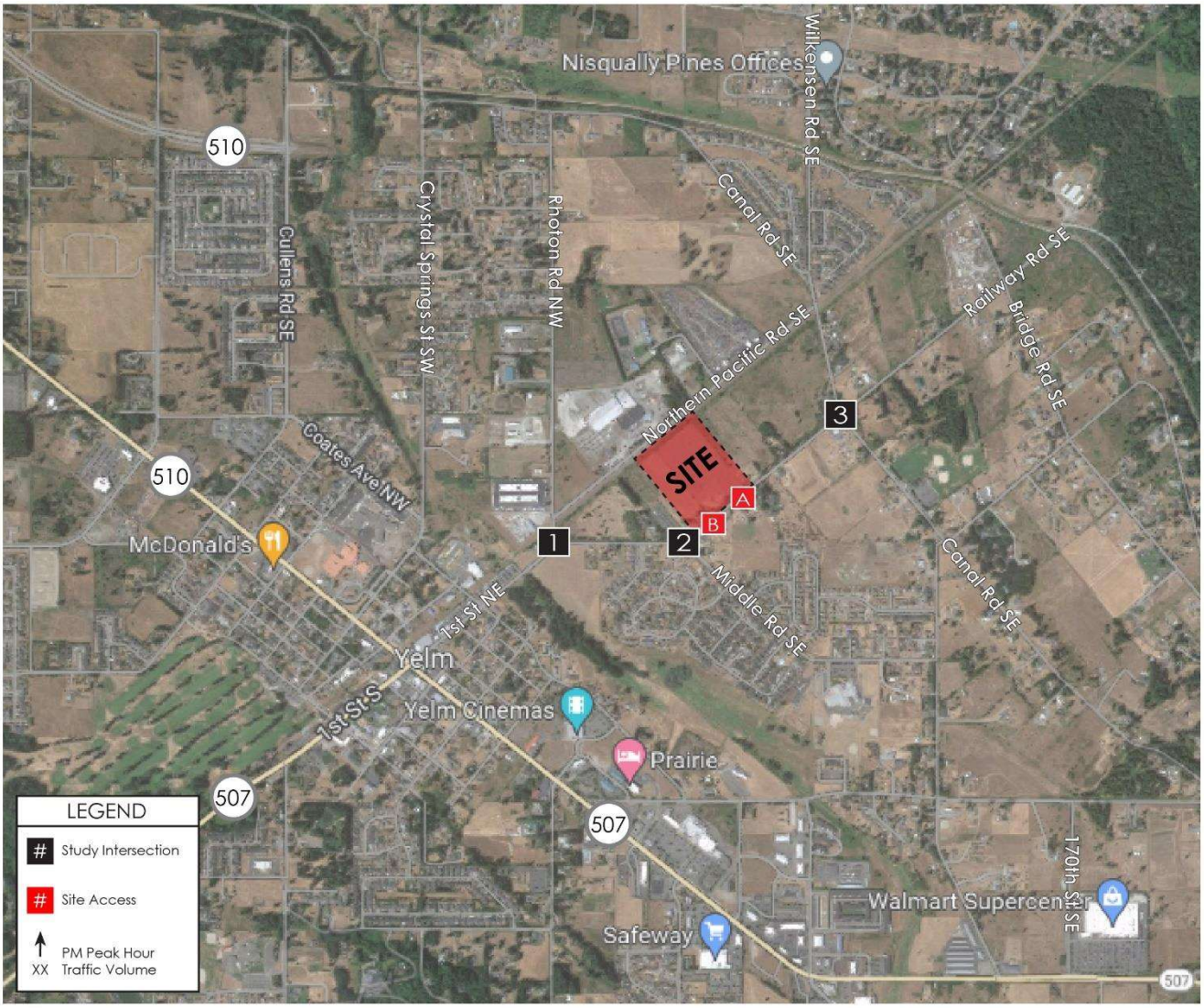


Figure 5: 2026 Weekday PM Peak Hour No Action Traffic Volumes



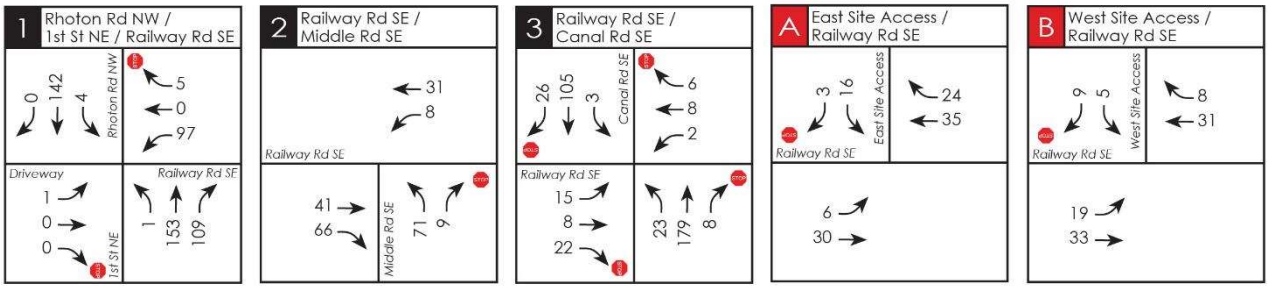


Figure 6: 2026 Weekday PM Peak Hour With Project Traffic Volumes

N
NOT TO SCALE

Future Level of Service

Future year (2026) PM peak hour LOS analyses were conducted at the study intersections under without and with project conditions. The LOS results at the study intersections without and with the proposed project are summarized in **Table 6**. The detailed LOS worksheets are included in **Appendix B**.

It should be noted that the LOS reported at the stop-controlled study intersections was based on the average delay of all legs per Yelm Municipal Code section 18.16.030.

Table 6
Year 2026 Weekday PM Peak Hour Level of Service Summary

	2026 Baseline		2026 With Project	
Study Intersection	LOS[1]	Delay (sec)[2]	LOS[1]	Delay (sec)[2]
Two-Way Stop Controlled Intersections				
1. Rhoton Road NW / Railway Road SE	A	2.5	A	2.7
2. Middle Road SE / Railway Road SE	A	4.0	A	3.8
All-Way Stop Controlled Intersection				
3. Canal Road SE / Railway Road SE	A	8.1	A	8.2

1. LOS = Level of Service
2. Delay refers to average control delay of all legs at the intersection per Yelm Municipal Code section 18.16.030, expressed in seconds per vehicle.

As shown in **Table 6**, all study intersections are anticipated to operate at LOS A during the weekday PM peak hour in 2026 without or with the proposed *Blue Fern Railway Road* project.

Site Access Assessment

Vehicle access to the site will be provided by two full access driveways on Railway Road SE. To assess operations of the proposed site access locations, level of service (LOS) and queuing were analyzed. The LOS and queue calculations were conducted using *Synchro 11* software based on methodology outlined in the *Highway Capacity Manual* (6th Edition). The reported queues are estimated 95th percentile queues that are exceeded only 5 percent of the time.

Table 7 summarizes the results of the 2026 with project LOS and queue analyses. The LOS and queue calculation sheets are included in **Appendix B**.

Table 7
Site Access Peak Hour LOS & Queue Summary

	PM Peak Hour		
Site Access	LOS	Delay (sec)	95th % Queue
A. Railway Road SE / East Driveway			
Eastbound Left-Turn	A	7.3	0'
Southbound Shared Left-Right	A	9.0	< 25'
B. Railway Road SE / West Driveway			
Eastbound Left-Turn	A	7.3	0'
Southbound Shared Left-Right	A	8.8	0'

1. Results based on HCM Methodologies (6th Edition).

As shown in Table 7, all turn movements entering and exiting the proposed site access driveways are expected to operate at LOS A during the weekday PM peak hour in 2026. Vehicle queues are all estimated to be statistically 1 vehicle or less.

MITIGATION

Off-Site Improvements

Based on the results of the analysis, the existing transportation facilities are anticipated to accommodate the additional traffic generated by the proposed project. No project-specific off-site transportation improvements are proposed.

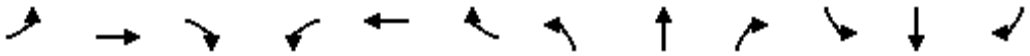
Transportation Impact Fees

Transportation impacts fees in the City of Yelm are assessed upon new development based on a cost per PM peak hour trip. The current transportation impact fee is $1,497 per PM peak hour trip. The final impact fee calculation will be based on the impact fee rate and project size in effect at the time of building permit issuance.

Appendix B

Level of Service (LOS) Calculations at Study Intersections

2023 Existing



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	83	0	5	1	144	85	4	134	0
Future Volume (vph)	1	0	0	83	0	5	1	144	85	4	134	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		283			729			720			662	
Travel Time (s)		7.7			19.9			19.6			18.1	
Confl. Peds. (#/hr)			2	2								
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	11%	0%	0%	0%	4%	2%	0%	5%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	0	83	0	5	1	144	85	4	134	0
Future Vol, veh/h	1	0	0	83	0	5	1	144	85	4	134	0
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	11	0	0	0	4	2	0	5	0
Mvmt Flow	1	0	0	89	0	5	1	155	91	4	144	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	357	400	146	357	355	201	144	0	0	246	0	0
Stage 1	152	152	-	203	203	-	-	-	-	-	-	-
Stage 2	205	248	-	154	152	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.21	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.599	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	602	541	906	582	574	845	1451	-	-	1332	-	-
Stage 1	855	775	-	779	737	-	-	-	-	-	-	-
Stage 2	802	705	-	827	775	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	597	539	904	579	572	845	1451	-	-	1332	-	-
Mov Cap-2 Maneuver	597	539	-	579	572	-	-	-	-	-	-	-
Stage 1	854	773	-	778	736	-	-	-	-	-	-	-
Stage 2	796	704	-	823	773	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	12.3	0	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1451	-	-	597	590	1332	-	-
HCM Lane V/C Ratio	0.001	-	-	0.002	0.16	0.003	-	-
HCM Control Delay (s)	7.5	0	-	11	12.3	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.6	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	21	62	5	21	67	4
Future Volume (vph)	21	62	5	21	67	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			25	25	
Link Distance (ft)	430			457	547	
Travel Time (s)	11.7			12.5	14.9	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	20%	5%	15%	25%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

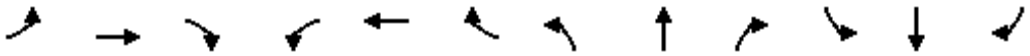
Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	21	62	5	21	67	4
Future Vol, veh/h	21	62	5	21	67	4
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	20	5	15	25
Mvmt Flow	23	69	6	23	74	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	93	0	94	59
Stage 1	-	-	-	-	59	-
Stage 2	-	-	-	-	35	-
Critical Hdwy	-	-	4.3	-	6.55	6.45
Critical Hdwy Stg 1	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.38	-	3.635	3.525
Pot Cap-1 Maneuver	-	-	1396	-	875	946
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	955	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1395	-	871	945
Mov Cap-2 Maneuver	-	-	-	-	871	-
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	951	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	875	-	-	1395	-
HCM Lane V/C Ratio	0.09	-	-	0.004	-
HCM Control Delay (s)	9.5	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	8	14	2	8	6	13	169	8	3	99	4
Future Volume (vph)	2	8	14	2	8	6	13	169	8	3	99	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			35			35			20	
Link Distance (ft)		584			605			556			566	
Travel Time (s)		15.9			11.8			10.8			19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	7%	0%	0%	0%	0%	1%	13%	0%	1%	25%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

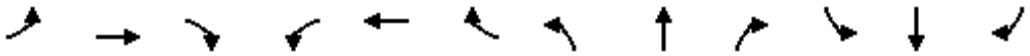
Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	8	14	2	8	6	13	169	8	3	99	4
Future Vol, veh/h	2	8	14	2	8	6	13	169	8	3	99	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	7	0	0	0	0	1	13	0	1	25
Mvmt Flow	2	8	15	2	8	6	14	178	8	3	104	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.5	8.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	8%	12%	3%
Vol Thru, %	89%	33%	50%	93%
Vol Right, %	4%	58%	38%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	24	16	106
LT Vol	13	2	2	3
Through Vol	169	8	8	99
RT Vol	8	14	6	4
Lane Flow Rate	200	25	17	112
Geometry Grp	1	1	1	1
Degree of Util (X)	0.225	0.03	0.021	0.127
Departure Headway (Hd)	4.045	4.255	4.398	4.106
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	882	846	819	864
Service Time	2.097	2.256	2.399	2.175
HCM Lane V/C Ratio	0.227	0.03	0.021	0.13
HCM Control Delay	8.3	7.4	7.5	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.1	0.1	0.4

2026 Baseline



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	88	0	5	1	153	90	4	142	0
Future Volume (vph)	1	0	0	88	0	5	1	153	90	4	142	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		283			729			720			662	
Travel Time (s)		7.7			19.9			19.6			18.1	
Confl. Peds. (#/hr)			2	2								
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	11%	0%	0%	0%	4%	2%	0%	5%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	0	88	0	5	1	153	90	4	142	0
Future Vol, veh/h	1	0	0	88	0	5	1	153	90	4	142	0
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	11	0	0	0	4	2	0	5	0
Mvmt Flow	1	0	0	95	0	5	1	165	97	4	153	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	379	425	155	379	377	214	153	0	0	262	0	0
Stage 1	161	161	-	216	216	-	-	-	-	-	-	-
Stage 2	218	264	-	163	161	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.21	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.599	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	582	524	896	563	558	831	1440	-	-	1314	-	-
Stage 1	846	769	-	766	728	-	-	-	-	-	-	-
Stage 2	789	694	-	818	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	577	522	894	560	556	831	1440	-	-	1314	-	-
Mov Cap-2 Maneuver	577	522	-	560	556	-	-	-	-	-	-	-
Stage 1	845	767	-	765	727	-	-	-	-	-	-	-
Stage 2	783	693	-	814	767	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	12.7	0	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1440	-	-	577	570	1314	-	-
HCM Lane V/C Ratio	0.001	-	-	0.002	0.175	0.003	-	-
HCM Control Delay (s)	7.5	0	-	11.3	12.7	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.6	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	22	66	5	22	71	4
Future Volume (vph)	22	66	5	22	71	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			25	25	
Link Distance (ft)	430			457	547	
Travel Time (s)	11.7			12.5	14.9	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	20%	5%	15%	25%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

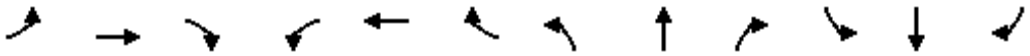
Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	22	66	5	22	71	4
Future Vol, veh/h	22	66	5	22	71	4
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	20	5	15	25
Mvmt Flow	24	73	6	24	79	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	98	0	98	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	36	-
Critical Hdwy	-	-	4.3	-	6.55	6.45
Critical Hdwy Stg 1	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.38	-	3.635	3.525
Pot Cap-1 Maneuver	-	-	1390	-	870	942
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1389	-	866	941
Mov Cap-2 Maneuver	-	-	-	-	866	-
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	950	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	870	-	-	1389	-
HCM Lane V/C Ratio	0.096	-	-	0.004	-
HCM Control Delay (s)	9.6	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	8	15	2	8	6	14	179	8	3	105	4
Future Volume (vph)	2	8	15	2	8	6	14	179	8	3	105	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			35			35			20	
Link Distance (ft)		584			605			556			566	
Travel Time (s)		15.9			11.8			10.8			19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	7%	0%	0%	0%	0%	1%	13%	0%	1%	25%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	8	15	2	8	6	14	179	8	3	105	4
Future Vol, veh/h	2	8	15	2	8	6	14	179	8	3	105	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	7	0	0	0	0	1	13	0	1	25
Mvmt Flow	2	8	16	2	8	6	15	188	8	3	111	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.5	8.4	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	8%	12%	3%
Vol Thru, %	89%	32%	50%	94%
Vol Right, %	4%	60%	38%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	201	25	16	112
LT Vol	14	2	2	3
Through Vol	179	8	8	105
RT Vol	8	15	6	4
Lane Flow Rate	212	26	17	118
Geometry Grp	1	1	1	1
Degree of Util (X)	0.238	0.031	0.021	0.135
Departure Headway (Hd)	4.053	4.283	4.438	4.118
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	880	841	811	861
Service Time	2.107	2.284	2.439	2.189
HCM Lane V/C Ratio	0.241	0.031	0.021	0.137
HCM Control Delay	8.4	7.4	7.5	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.1	0.1	0.5

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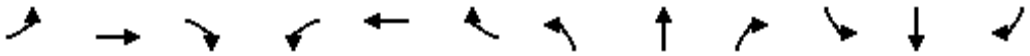


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	0	97	0	5	1	153	109	4	142	0
Future Volume (vph)	1	0	0	97	0	5	1	153	109	4	142	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		283			729			720			662	
Travel Time (s)		7.7			19.9			19.6			18.1	
Confl. Peds. (#/hr)			2	2								
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	11%	0%	0%	0%	4%	2%	0%	5%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	0	97	0	5	1	153	109	4	142	0
Future Vol, veh/h	1	0	0	97	0	5	1	153	109	4	142	0
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	11	0	0	0	4	2	0	5	0
Mvmt Flow	1	0	0	104	0	5	1	165	117	4	153	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	389	445	155	389	387	224	153	0	0	282	0	0
Stage 1	161	161	-	226	226	-	-	-	-	-	-	-
Stage 2	228	284	-	163	161	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.21	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.21	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.599	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	574	511	896	554	551	820	1440	-	-	1292	-	-
Stage 1	846	769	-	757	721	-	-	-	-	-	-	-
Stage 2	779	680	-	818	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	568	509	894	551	549	820	1440	-	-	1292	-	-
Mov Cap-2 Maneuver	568	509	-	551	549	-	-	-	-	-	-	-
Stage 1	845	767	-	756	720	-	-	-	-	-	-	-
Stage 2	773	679	-	814	767	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	13	0	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1440	-	-	568	560	1292	-	-
HCM Lane V/C Ratio	0.001	-	-	0.002	0.196	0.003	-	-
HCM Control Delay (s)	7.5	0	-	11.4	13	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.7	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	41	66	8	31	71	9
Future Volume (vph)	41	66	8	31	71	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			25	25	
Link Distance (ft)	430			291	547	
Travel Time (s)	11.7			7.9	14.9	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	20%	5%	15%	25%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

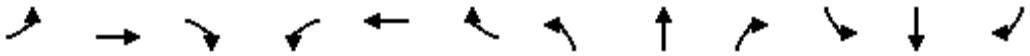
Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	41	66	8	31	71	9
Future Vol, veh/h	41	66	8	31	71	9
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	20	5	15	25
Mvmt Flow	46	73	9	34	79	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	120	0	136	84
Stage 1	-	-	-	-	84	-
Stage 2	-	-	-	-	52	-
Critical Hdwy	-	-	4.3	-	6.55	6.45
Critical Hdwy Stg 1	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.38	-	3.635	3.525
Pot Cap-1 Maneuver	-	-	1363	-	828	915
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	938	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1362	-	821	914
Mov Cap-2 Maneuver	-	-	-	-	821	-
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	931	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	831	-	-	1362	-
HCM Lane V/C Ratio	0.107	-	-	0.007	-
HCM Control Delay (s)	9.9	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	8	22	2	8	6	23	179	8	3	105	26
Future Volume (vph)	15	8	22	2	8	6	23	179	8	3	105	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			35			35			20	
Link Distance (ft)		1331			605			556			566	
Travel Time (s)		36.3			11.8			10.8			19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	7%	0%	0%	0%	0%	1%	13%	0%	1%	25%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

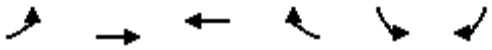
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	8	22	2	8	6	23	179	8	3	105	26
Future Vol, veh/h	15	8	22	2	8	6	23	179	8	3	105	26
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	7	0	0	0	0	1	13	0	1	25
Mvmt Flow	16	8	23	2	8	6	24	188	8	3	111	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	7.6	8.6	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	33%	12%	2%
Vol Thru, %	85%	18%	50%	78%
Vol Right, %	4%	49%	38%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	210	45	16	134
LT Vol	23	15	2	3
Through Vol	179	8	8	105
RT Vol	8	22	6	26
Lane Flow Rate	221	47	17	141
Geometry Grp	1	1	1	1
Degree of Util (X)	0.253	0.059	0.021	0.159
Departure Headway (Hd)	4.118	4.472	4.538	4.067
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	862	806	793	867
Service Time	2.193	2.473	2.54	2.163
HCM Lane V/C Ratio	0.256	0.058	0.021	0.163
HCM Control Delay	8.6	7.8	7.6	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.2	0.1	0.6



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	30	35	24	16	3
Future Volume (vph)	6	30	35	24	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		462	1331		481	
Travel Time (s)		12.6	36.3		13.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	4%	0%	2%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

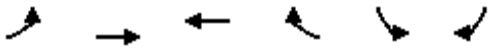
Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	30	35	24	16	3
Future Vol, veh/h	6	30	35	24	16	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	4	4	0	2	2
Mvmt Flow	7	33	38	26	17	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	64	0	-	0	98	51
Stage 1	-	-	-	-	51	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1551	-	-	-	901	1017
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	975	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1551	-	-	-	896	1017
Mov Cap-2 Maneuver	-	-	-	-	896	-
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	975	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1551	-	-	-	913
HCM Lane V/C Ratio	0.004	-	-	-	0.023
HCM Control Delay (s)	7.3	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	19	33	31	8	5	9
Future Volume (vph)	19	33	31	8	5	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		291	462		503	
Travel Time (s)		7.9	12.6		13.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	8%	8%	0%	2%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	33	31	8	5	9
Future Vol, veh/h	19	33	31	8	5	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	8	8	0	2	2
Mvmt Flow	21	36	34	9	5	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	43	0	-	0	117	39
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	78	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1579	-	-	-	879	1033
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	945	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1579	-	-	-	867	1033
Mov Cap-2 Maneuver	-	-	-	-	867	-
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	945	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1579	-	-	-	967
HCM Lane V/C Ratio	0.013	-	-	-	0.016
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Appendix C

Trip Generation Calculations

Blue Fern Railway Road
Weekday Trip Generation Summary

Land Use	Units [1]	ITE LUC [2]	Trip Rate or Equation [2]	Directional Distribution In	Directional Distribution Out	Trips Generated In	Trips Generated Out	Trips Generated Total
DAILY								
Proposed Use:								
Single Family Detached Housing	90 DU	210	Ln(T) = 0.92Ln(X)+2.68	50%	50%	458	458	916
Existing Use:								
Single Family Detached Housing	2 DU	210	Ln(T) = 0.92Ln(X)+2.68	50%	50%	-14	-14	-28
					Net New Daily Trips =	**444**	**444**	**888**
AM PEAK HOUR								
Proposed Use:								
Single Family Detached Housing	90 GFA	210	Ln(T) = 0.91Ln(X)+0.12	26%	74%	18	50	68
Existing Use:								
Single Family Detached Housing	2 DU	210	Ln(T) = 0.91Ln(X)+0.12	26%	74%	-1	-1	-2
					Net New AM Peak Hour Trips =	**17**	**49**	**66**
PM PEAK HOUR								
Proposed Use:								
Single Family Detached Housing	90 GFA	210	Ln(T) = 0.94Ln(X)+0.27	63%	37%	57	33	90
Existing Use:								
Single Family Detached Housing	2 DU	210	Ln(T) = 0.94Ln(X)+0.27	63%	37%	-2	-1	-3
					Net New PM Peak Hour Trips =	**55**	**32**	**87**

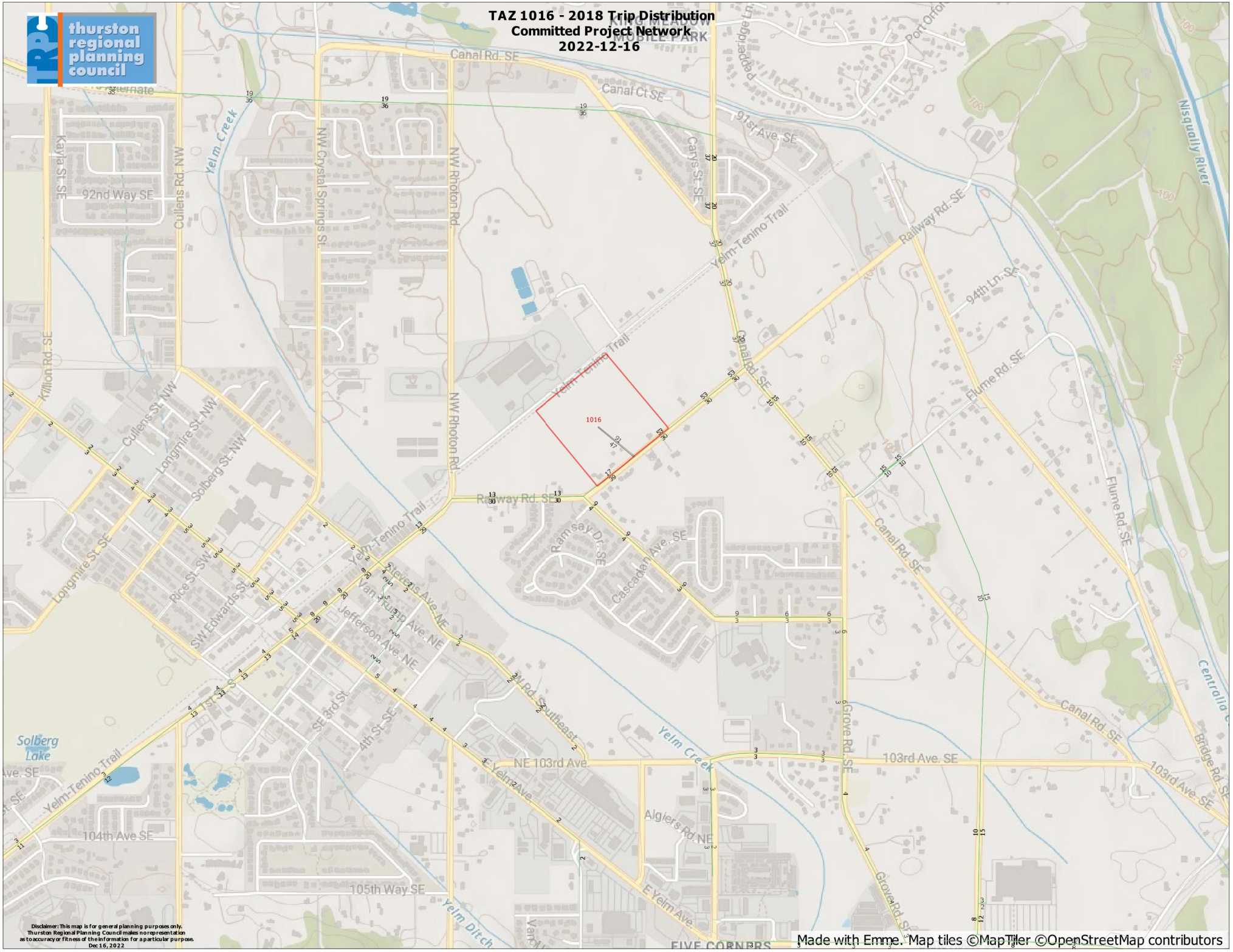
Notes:

[1] DU = Dwelling Units.

[2] Based on Institute of Transportation Engineers (ITE) *Trip Generation* Manual, 11th Edition, 2021.

Appendix D

TRPC Model Distribution


TAZ 1016 - 2018 Trip Distribution
Committed Project Network
2022-12-16
thurston regional planning council
1016
Canal Rd. SE
Canal Ct SE
91st Ave. SE
Yelm Creek
NW Crystal Springs St.
NW Rhoton Rd.
Carys St SE
Yelm-Tenino Trail
Railway Rd. SE
94th Ln. SE
Flume Rd. SE
Nisqually River
92nd Way SE
Cullens Rd NW
Kayla St SE
Killon Rd. SE
Cullens St NW
Longmire St NW
Solberg St NW
Longmire St. SE
Rice St SW
SW Edwards St
Stevens Ave. NE
Van Kirk Ave. NE
Jefferson Ave. NE
2nd Rd. Southeast
SE 3rd St
4th St SE
Ramsay Dr. SE
Cascadian Ave. SE
Grove Rd. SE
NE 103rd Ave.
103rd Ave. SE
Bridge Rd. SE
Solberg Lake
E Yelm Ave.
Algiers Rd NE
104th Ave SE
105th Way SE
Yelm Ditch
FIVE CORNERS
Disclaimer: This map is for general planning purposes only. Thurston Regional Planning Council makes no representation as to accuracy or fitness of the information for a particular purpose. Dec 16, 2022
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