DKS

WHEATLAND ROAD CORRIDOR PLAN

DECEMBER 2021

TABLE OF CONTENTS

ACKNOWLEDGMENTS

CITY OF KEIZER

Bill Lawyer, Public Works Director
Shane Witham, Planning Director

DKS ASSOCIATES

Scott Mansur, PE, PTOE
Jenna Bogert, PE
Travis Larson, EI

AKS ENGINEERING

Richard Walker, PE
Tyler Roth, PE

TECHNICAL ADVISORY COMMITTEE

Hersch Sangster (Keizer Traffic Safety-Bikeways–Pedestrian Committee)
Michael Jaffe (Mid-Willamette Valley Council of Governments)
Dan Fricke (Oregon Department of Transportation – Region 2)
Bill Lawyer and Shane Witham (City of Keizer)

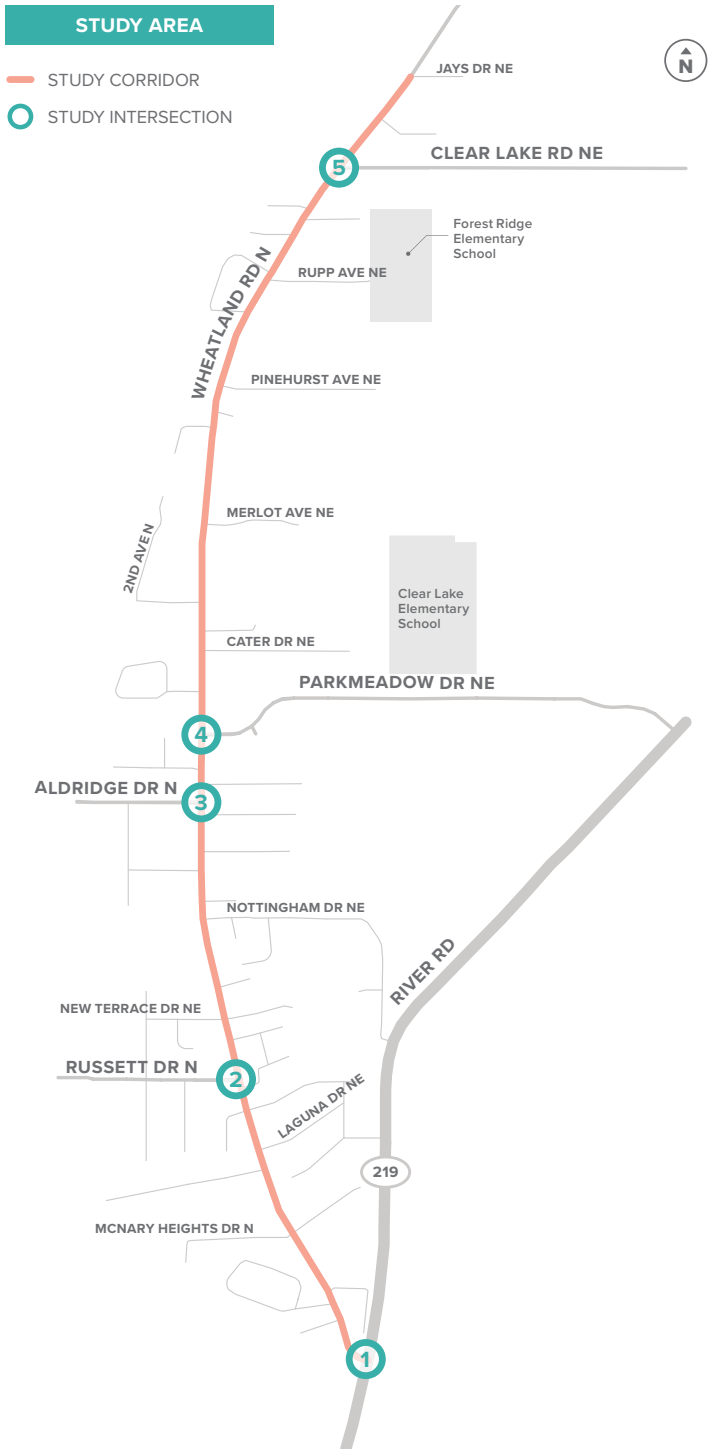
01 EXECUTIVE SUMMARY

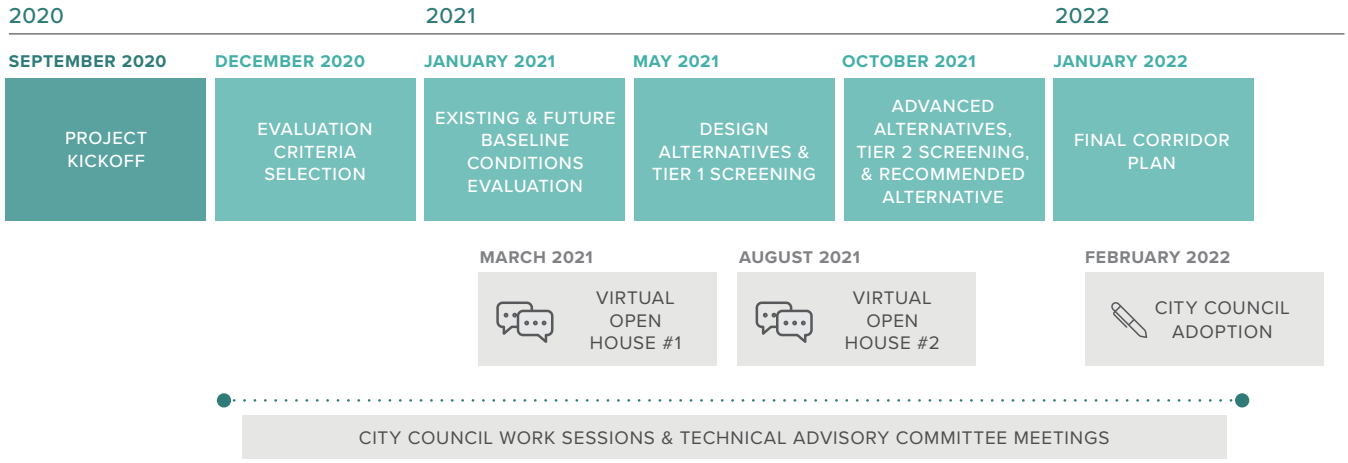
PROJECT INTRODUCTION, GOALS, AND RECOMMENDATION

The primary objective of the Wheatland Road Corridor Plan project was to develop a multimodal corridor plan and conceptual street design that removes barriers for all modes of travel, considers the latest urban safety improvements for pedestrians, bicycles, and transit riders, and creates an enjoyable experience for users. The project included community involvement to assure the design plan is consistent with the needs of key stakeholders (including neighborhoods, schools, and businesses).

The project area along Wheatland Road stretches from Jays Drive, in the north, to River Road, in the south, for a total of 1.8 miles in Keizer, Oregon. The project process included evaluating existing and future baseline conditions, identifying evaluation criteria, screening three project alternatives (Tier 1 Screening), selecting two project alternatives to further screen (Tier 2 Screening), providing a recommended alternative, presenting the findings to City Council, and then adopting the Final Corridor Plan.

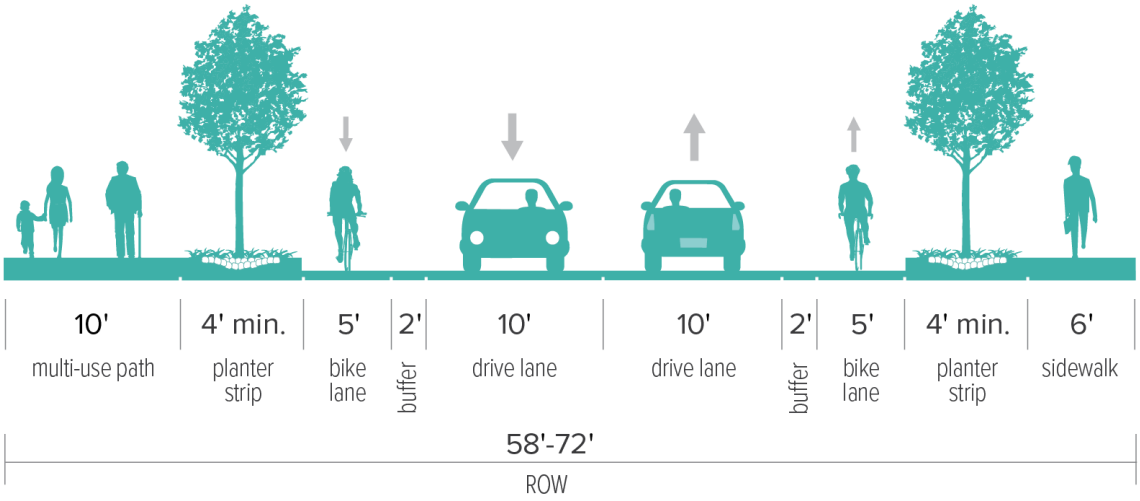
Throughout the project, the project team took time to listen and understand community issues, thereby being able to address concerns to put together the best solution for this particular community. The project team received public input primarily through the two virtual open houses held at key stages of the project. Regular meetings were also held with the City and a Technical Advisory Committee (TAC).





In weighing all the information identified in this study, including the City's transportation goals, community feedback, estimated costs, and technical analysis, the project team recommends that **Alternative #3: Multi-Use Path with Buffered Bike Lanes is the best solution for Wheatland Road**. This alternative is also the general community's preferred alternative and is anticipated to be the safest option, helps support multimodal travel, and is consistent with community's visions for Wheatland Road.

BUFFERED BIKE LANES & MULTI-USE PATH: WHEATLAND ROAD



EXISTING AND FUTURE BASELINE CONDITIONS

Existing transportation facilities and travel conditions on Wheatland Road were evaluated to establish a baseline for existing operations and to assess potential design alternatives and improvements to the corridor.

EXISTING TRANSPORTATION FACILITIES

The existing transportation facilities are summarized as follows:

- **Roadway Configuration**: Two travel lanes with on-street bike lanes
- **Pavement Condition**: Rated either good or very good condition, with some preventative maintenance recommended.
- **Roadway Context**: Majority residential/suburban uses with some commercial uses
- **Right-of-Way**: Width ranges from approximately 60 feet to 72 feet.
- **Sidewalks**: Intermittently spaced sidewalks of standard width and are typically located curbside. Large gaps in connectivity exist with safety concerns for pedestrians, especially young children. Walkability of corridor is generally rated as "Poor." The majority of curb ramps along the corridor are either missing or not meeting current ADA standards.
- **Marked Pedestrian Crossings**: Marked school crossings are located at Clear Lake Road and Parkmeadow Drive.
- **Bike Lanes**: Marked on-street bicycle lanes varying between five feet and six feet wide exist on both sides of Wheatland Road. Bikeability of corridor is generally rated as "Fair."
- **Transit**: Cherriots (Salem Area Mass Transit District) services the southern end of the corridor from Parkmeadow Drive to River Road, with five southbound bus stops located within the project corridor vicinity. None of the transit bus stops currently have amenities or covered waiting areas.
- **Posted Speed Limit**: 40 mph, 85th percentile speed is 44-45 mph.
- **Street Lighting**: Non-uniform lighting throughout the corridor on Portland General Electric (PGE) utility poles.

TRAVEL CONDITIONS HIGHLIGHTS

A wide variety of measures were used to evaluate existing and future baseline travel conditions including traffic patterns, crash data, intersection operations, and quality of travel for pedestrians and bicyclists. Traffic volumes vary by time of day and follow a typical directional pattern; both the morning (AM) peak period (7am to 9am) and evening (PM) peak period (4pm to 6pm) were analyzed.

HIGHLIGHTS OF THE EXISTING TRAVEL CONDITIONS:

DAILY TRAFFIC VOLUME RANGES BETWEEN **5,300 AND 8,600** ALONG THE CORRIDOR

2.75 MINUTES
AVERAGE **END-TO-END TRAVEL TIME** ON THE CORRIDOR DURING THE **PM PEAK PERIOD**

85TH PERCENTILE SPEEDS ARE UP TO **5 MPH HIGHER** THAN THE POSTED SPEEDS

ALL STUDY INTERSECTIONS **MEET THE CITY'S OPERATING STANDARDS** FOR BOTH THE EXISTING (2020) AND FUTURE BASELINE CONDITIONS (2042)

RUSSETT DRIVE AND CLEAR LAKE ROAD INTERSECTIONS HAD **CRASH RATES HIGHER THAN 90% OF INTERSECTIONS OF SIMILAR TYPE IN OREGON**

IN THE LAST 5 YEARS, THERE HAS BEEN:

- **1 SERIOUS INJURY**
- **3 PEDESTRIAN CRASHES**
- **1 BICYCLE CRASH**

EVALUATION CRITERIA

The goals, objectives, and policies for the future of Keizer's transportation system are found in the City's Transportation System Plan (TSP). These attributes guided the direction of the Wheatland Road Corridor Study and public process. Based on the goals, objectives, and policies, the following criteria were identified to evaluate the proposed design alternatives.

TIER 1 CRITERIA:

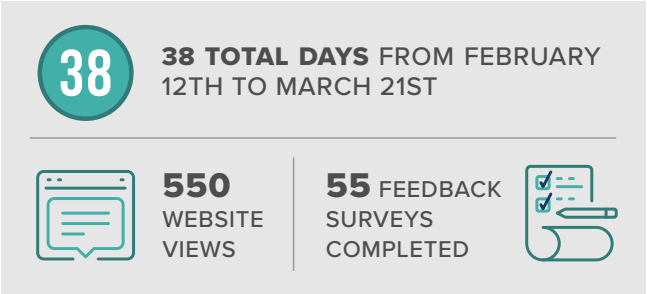
- Neighborhood Livability
- Environmental
- Utilization of Existing Infrastructure
- Traffic Operations
- Safe Routes to School
- Safety
- Transportation Mode Choices/ Multimodal Connectivity
- Equity
- Convenient and Accessible Transit
- Cost-Effective

TIER 2 CRITERIA:

- Traffic Operations (delay, queuing, and speed)
- Pedestrian and Bicycle Qualitative Assessment
- Safety Impacts (including Safe Routes to School)
- Right-of-Way and Utility Impacts
- Planning-Level Cost Estimates

VIRTUAL OPEN HOUSE #1 SUMMARY

Virtual Open House #1 was held from February 12th to March 21st (total of 38 days). The open house was accessed through the City's project website[1] and provided the general public with digital posterboards, the two technical memoranda describing the existing and future baseline conditions and evaluation criteria, as well as a 10-question feedback survey. There were over 550 website views and 55 feedback surveys completed during the open house period.



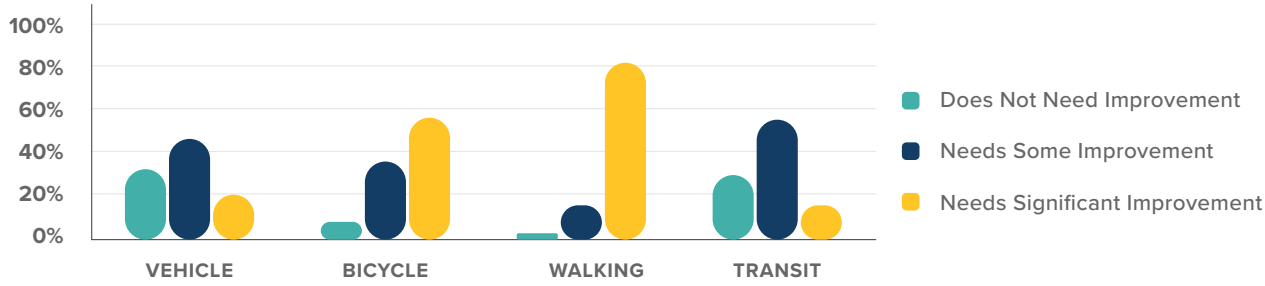
The primary goals of the open house were to determine community priorities and help identify any deficiencies in the corridor that the project team had not identified. The most significant feedback received from the survey is listed below:

- Walking and biking were the modes of travel with the biggest barriers.
- The most common corridor improvements recommended by the public were a multi-use path, continuous sidewalks, enhanced street lighting, and lower vehicle travel speeds.
- Safety, neighborhood livability, and Safe Routes to School were selected as the most important evaluation criteria.
- Over 60 percent of respondents said that they would support a speed limit reduction.

1 https://www.keizer.org/WheatlandRoadMultimodalCorridorPlan

OPEN HOUSE #1: FEEDBACK SURVEY RESULTS

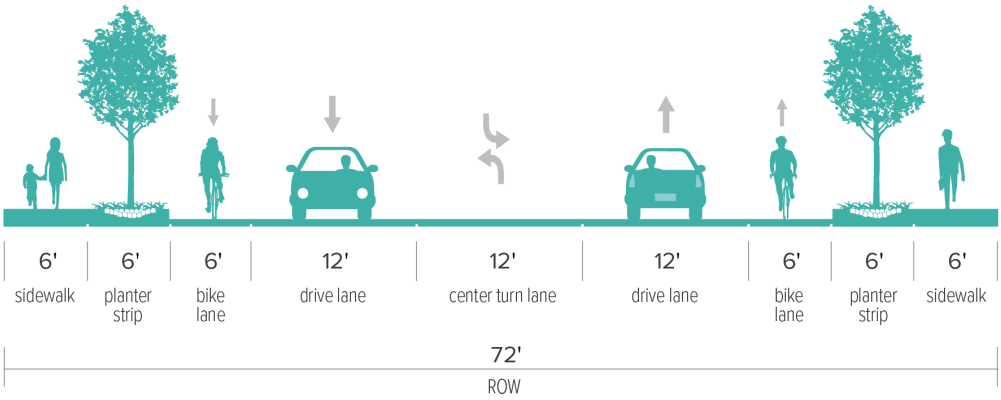
THE GOAL OF THIS PROJECT IS TO INCREASE SAFETY AND MOBILITY FOR ALL MODES OF TRAVEL. WHAT LEVEL OF IMPROVEMENT DO YOU THINK THESE MODE(S) OF TRAVEL NEED?



DESIGN ALTERNATIVES

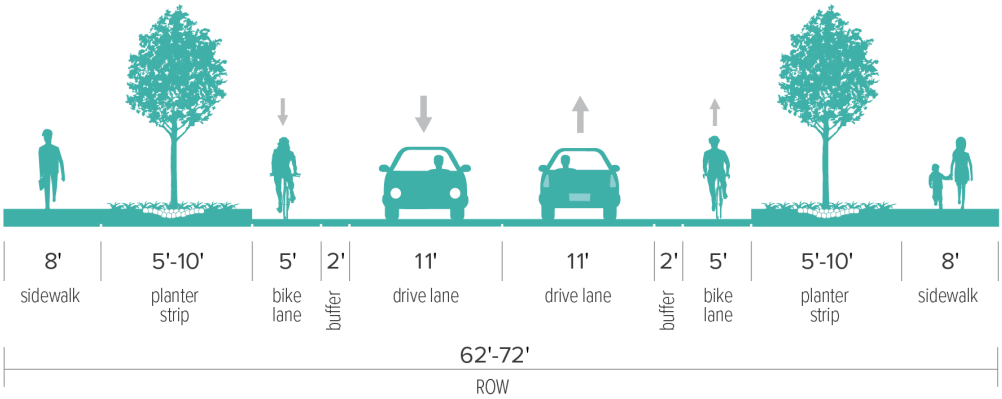
Three conceptual design alternatives and an existing (No Build) scenario were proposed for consideration for the Wheatland Road Corridor. The variety of alternatives included various transportation elements: sidewalks, planter strips, bicycle lanes, bicycle buffers, multi-use path, and vehicle travel lanes. Consideration was given to existing infrastructure and vegetation, right-of-way, and deficiencies and needs identified in Technical Memorandum #1. The three alternatives are shown below.

ALTERNATIVE #1: TRANSPORTATION SYSTEM PLAN



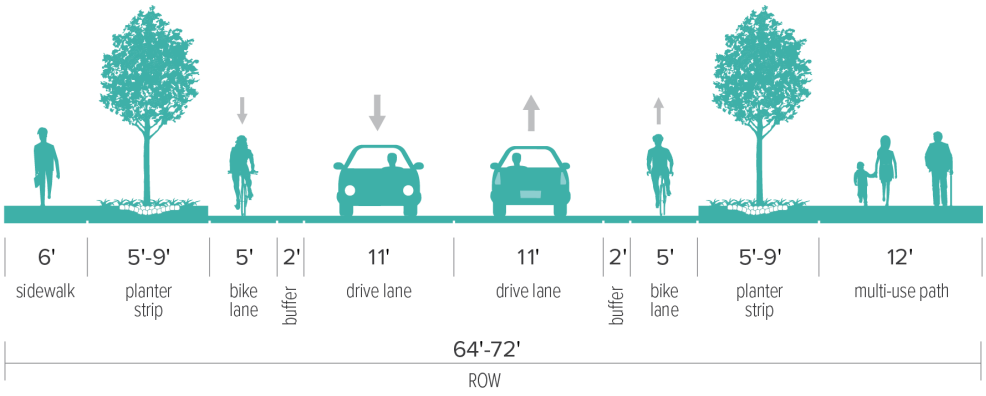
Alternative #1 is based on the City's standard for Minor Arterials and includes a center turn lane, sidewalks, on-street bike lanes, and planter strips.

ALTERNATIVE #2: BUFFERED BIKE LANES



Alternative #2 provides more comfortable bicycle facilities by adding a buffer and includes wide 8' sidewalks on both sides of the road.

ALTERNATIVE #3: BUFFERED BIKE LANES & MULTI-USE PATH



Alternative #3 provides a 12' multi-use path that accommodates cyclists of all ages and abilities as well as buffered bike lanes for more experienced riders.

TIER 1 SCREENING RESULTS

A Tier 1 Screening of the three design alternatives was performed to identify the alternative(s) that would most align with the goals, objectives, and policies of the City. This was done by scoring the alternatives based on the evaluation criteria previously determined. The criteria were scored over a range of -2 to +2 as compared to the Existing Configuration. A score of 0 implied that the alternative had no change from the existing, a negative score implied that the alternative degraded conditions, and a positive score implied that the alternative improved conditions. The scoring weighed each of the ten criterion equally.

All three alternatives were shown to be an overall improvement from existing conditions, with Alternative #3 having the most improvement and Alternative #2 not far behind. The larger difference in scores between Alternative #1 and Alternatives #2 and #3 can be attributed to two factors. First, Alternatives #2 and #3 provide increasingly safer multimodal facilities. The buffered bike lanes and wider sidewalks are safe options for students going to/from school as well as the general public. The multi-use path in Alternative #3 provides additional safety for bicyclists of all ages and abilities. Secondly, Alternatives #2 and #3 have similar pavement cross section widths as the existing condition, meaning that road reconstruction would be less invasive than Alternative #1. More of the existing infrastructure could be utilized for Alternatives #2 and #3, also decreasing the total project cost.

TIER 1 SCORING RESULTS

ALTERNATIVE #1 TRANSPORTATION SYSTEM PLAN	ALTERNATIVE #2 BUFFERED BIKE LANES	ALTERNATIVE #3 BUFFERED BIKE LANES & MULTI-USE PATH
1.25	1.65	1.75

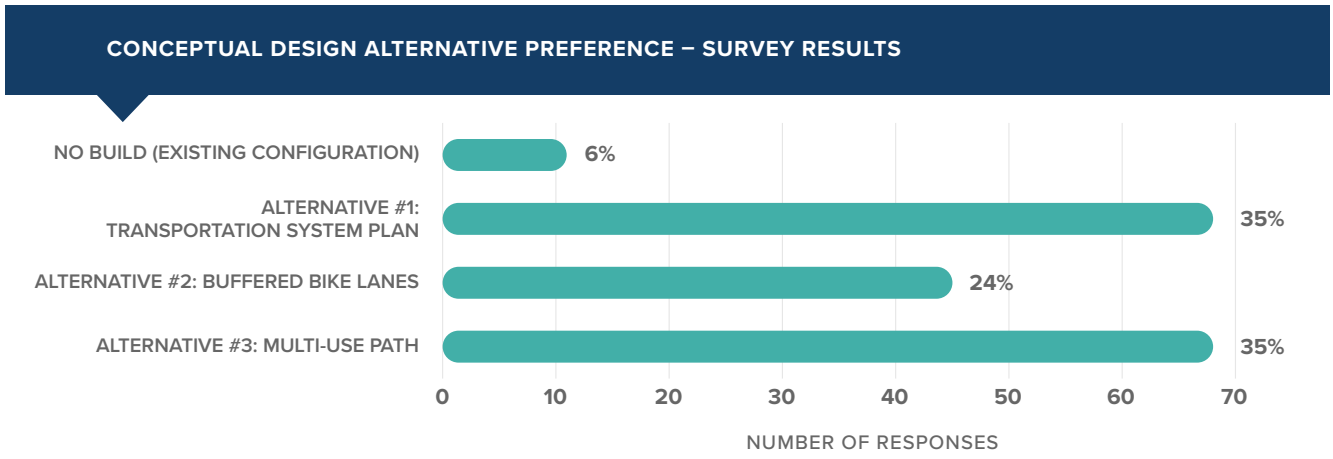
VIRTUAL OPEN HOUSE #2 SUMMARY

Virtual Open House #2 was held from July 23rd to August 8th (total of 17 days). As with the first open house, the second open house was also accessed through the City's project website and provided the public with digital posterboards, all technical documentation to-date, as well as a four-question feedback survey. There were over 740 website views and 196 feedback surveys submitted.

A few additional responses from the public were also emailed to the City staff directly. The primary goals of the open house were to gather community input on the conceptual design alternatives and collect feedback on general project concerns. A few highlights of the survey responses include:

- Alternative #1: TSP and Alternative #3: Multi-Use Path and Buffered Bike Lanes were the most preferred design concepts, both receiving 35 percent of the votes, respectively. It is important to note that Alternatives #2 and #3 are very similar and because of this, most of the voters for Alternative #2 would likely support Alternative #3 over Alternative #1, making Alternative #3 the overall preferred option by the public.
- The most common comments in the survey were related to the following:
  - » Desire for safe and connected sidewalks and bicycle lanes
  - » Need for better street lighting
  - » Right-of-way private property impacts
  - » Landscaping/buffer/planter strips maintained
  - » Speeding

VIRTUAL OPEN HOUSE #2: FEEDBACK SURVEY RESULTS



ADVANCED TWO ALTERNATIVES

Based on the results of the Tier 1 Screening, feedback at the open houses, and direction from the City, Alternative #1: TSP and Alternative #3: Multi-Use Path and Buffered Bike Lanes were advanced to the Tier 2 Screening process, which included full-corridor concept layouts and planning-level cost estimates.

Alternative #3 scored the highest in the Tier 1 Screening of the design alternatives and Alternative #1 scored the lowest of the alternatives. However, Alternative #1 and Alternative #3 shared the highest percentage of votes (approximately 35 percent) based on the public feedback surveys. The City supported the advancement of Alternative #3 based on its high scoring in both the screening process and community feedback. Although Alternative #1 had low support based on the results of the Tier 1 Screening, the alternative received support by the public and was therefore advanced for final consideration.

MODIFICATIONS TO ALTERNATIVE #3: MULTI-USE PATH AND BUFFERED BIKE LANES

During the process of creating the full-corridor concept design layouts, the original cross section design for Alternative #3 was modified to better address the concerns voiced by the public during Virtual Open House #2. Many members of the public voiced their desire for the Wheatland Road project to minimize private property and right-of-way impacts and to provide safer, separated pedestrian and bicycle facilities for all users, including school-age children. Hearing this feedback, the Wheatland Road Technical Advisory Committee (TAC) did not feel as though the original cross section for Alternative #3 provided sufficient separation for users of the multi-use path from the vehicle travel lanes. In order to provide more separation, the multi-use path was moved to the west side of the road where there was more available right-of-way and the width of the path was reduced from 12 feet to 10 feet. These two modifications increased separation and also reduced private property impacts.

During the cost estimating process, the TAC discussed ideas for improving cost savings for Alternative #3 to make the project more affordable. By reducing the travel lanes from 11 feet to 10 feet, a large cost savings was realized as the majority of the existing curb-to-curb width could be preserved along the corridor. Narrower travel lanes will encourage lower vehicle speeds, which was another major concern of the public. However, with the adjacent two-foot bicycle buffer, there is still adequate width for freight activity along the corridor.

Overall, these modifications as well as some adjustments to street utilities, resulted in a reduction of 36% in planning level cost estimates for Alternative #3.

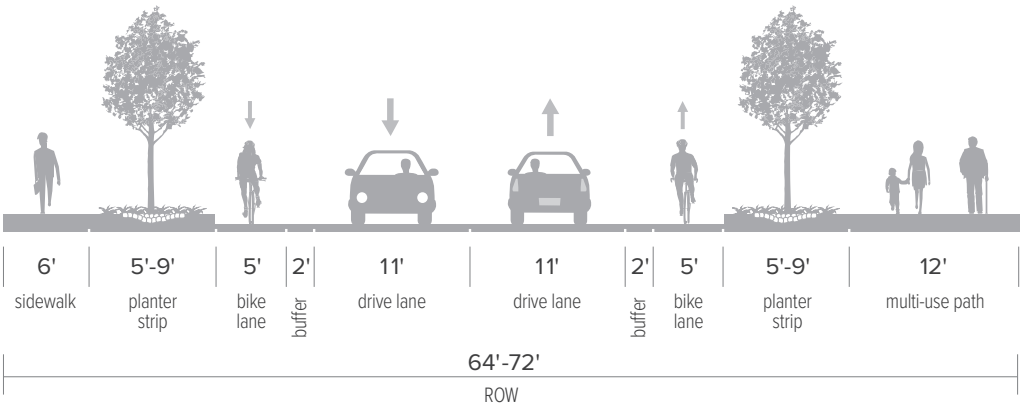
IMPROVEMENTS FOR EITHER ALTERNATIVE

Whether either alternative was selected, there are specific design improvements and details that are included for both alternatives. While they may be implemented in different ways due to cross section restraints, the following improvements were still applicable to both solutions:

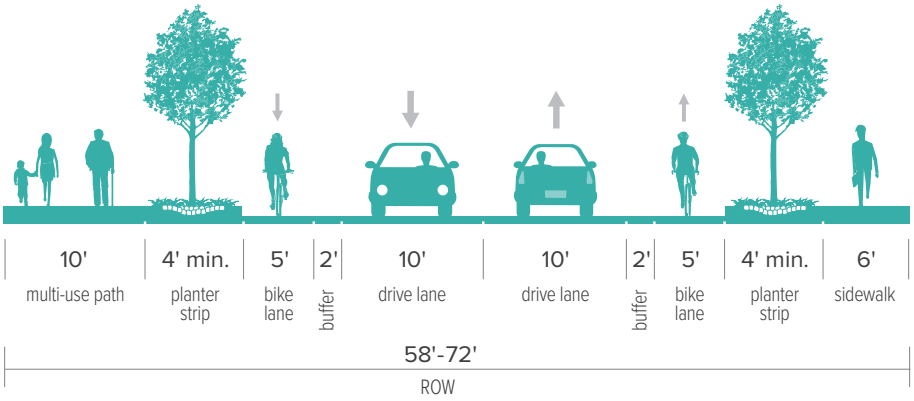
- **Enhanced Pedestrian Crossings**: Enhanced pedestrian crossing treatments including median refuge islands, enhanced signing and pavement markings, and Rectangular Rapid Flashing Beacons (RRFBs) are options to consider. The primary intersections in consideration are the intersections of Clearlake Road, Parkmeadow Drive, Russett Drive, and McNary Heights.
- **Transit Treatments**: Enhancements to the bus stops can include bus stop shelters, open-air

REVISED WHEATLAND ROAD CROSS SECTION FOR ALTERNATIVE #3

ALTERNATIVE #3 CROSS SECTION THAT WAS PRESENTED DURING VIRTUAL OPEN HOUSE #2



MODIFIED ALTERNATIVE #3



benches, and bus stop loading space for transit riders that does not conflict with multi-use path users, called "Concrete Bridges." These improvements will require collaboration with Cherriots during the design phase.

- **ADA Improvements**: All new sidewalks and curb ramps would be built along Wheatland Road and intersections would meet ADA standards. Today, nearly all curb ramps are out of compliance with current Americans with Disabilities Act (ADA) standards.
- **Practical Design Considerations**: Due to the nature of a pre-existing roadway, slight deviations to the chosen alternative cross section are expected in different sections of the corridor to match the existing infrastructure, reduce right-of-way impacts, and preserve mature trees as much as possible. This may include meandering sidewalks to save mature trees (e.g., existing oak trees near Russett Drive) or the absence of a planter strip to mitigate right-of-way acquisition.
- **Street Lighting**: New street lighting will be installed at intersections and segments along the corridor. This may entail new streetlight poles and supplemental lighting on utility poles when applicable.
- **Streetscape Elements**: Where landscaping buffers are provided, pedestrians are further separated from the roadway to increase their comfort level. The alignment of sidewalks are intended to minimize impact to adjacent properties, existing landscaping, and existing mature trees, so the width of the landscaping buffer will change along the corridor. The landscaping can include low-lying vegetation and street trees. The street tree plantings would be consistent with City standards.

SUMMARY OF ADVANCED ALTERNATIVES COMPARISON

Five Tier 2 criteria were evaluated for the final comparison of the two advanced alternatives. These criteria reflected the City's needs and most prominent comments received from the public.

TIER 2 CRITERIA EVALUATED:

- Traffic Operations
- Pedestrian and Bicycle Qualitative Assessment
- Safety Impacts
- Right-Of-Way and Utility Impacts
- Planning-Level Cost Estimates

Each criterion was analyzed for each alternative.

- **Traffic Operations**: Vehicle delay, queuing, and travel times were analyzed for each alternative. The center-turn lane in Alternative #1 provides slightly improved vehicle operations over Alternative #3 with the addition of a continuous left-turn lane.
- **Pedestrian and Bicycle Qualitative Assessment**: Walkability and bikeability scores were assessed for each alternative. Alternative #1 received a "Good" score due to complete sidewalks and standard bicycle lanes. Alternative #3 received an "Excellent" score due to the multi-use path and buffered bike lanes that provides facilities for all ages and abilities.
- **Safety Impacts**: Potential safety impacts including the mitigation of crash variables for current users as well as the enhancement of the system to encourage usage from people who do not currently feel safe using the system. The two-way left-turn lane for Alternative #1 has the ability to reduce rear-end crashes for vehicles. However, in Alternative #3, the buffered bike lanes have the ability to reduce bicycle crashes; also, the proposed bicycle and pedestrian facilities, as a whole, have a greater ability to attract new users who are currently hesitant to use the system due to safety risks. A left-turn lane at the Russett Drive intersection was identified as a key safety need and is included in the concept.
- **Right-of-Way and Utility Impacts**: Alternative #3 requires 90 percent less ROW acquisition (in square feet) than Alternative #1 due to a narrower cross section.
- **Planning-Level Cost Estimates**: Alternative #3 is approximately half the cost to construct compared to Alternative #1 due to its smaller footprint and the ability to maintain existing infrastructure.

PLANNING-LEVEL COST ESTIMATES

ALTERNATIVE #1: $17.9 MILLION

ALTERNATIVE #3: $9.9 MILLION

TIER 2 SCREENING RESULTS

A Tier 2 Screening of the final two design alternatives was performed using the five criteria mentioned previously. The criteria were scored over a range of -2 to +2 as compared to the No Build (Existing Configuration) alternative, similar to the Tier 1 Screening. The average of the Tier 1 and Tier 2 screening scores are shown below.

Alternative #1 scored an average of 1.13 and Alternative #3 scored an average of 1.58 after both Tier 1 and Tier 2 screening evaluations. Both alternatives are shown to be an overall improvement from existing conditions, however Alternative #3 received a higher score.

The difference in scores between Alternative #1 and Alternatives #3 can be attributed to two basic differences amongst the designs which were similarly seem in the Tier 1 screening process.

- First, Alternative #3 provides higher quality multimodal facilities and caters more to safety than mobility, while not sacrificing any vehicular operational measures.
- Second, Alternatives #3 has a pavement cross section width that is similar to the existing condition and will require less additional right-of-way, meaning that road reconstruction and property acquisition would be less invasive than Alternative #1 and has a significantly lower cost estimate.

TIER 1 AND 2 SCREENING SCORES

	ALTERNATIVE #1 TSP STREET DESIGN	ALTERNATIVE #3 BUFFERED BIKE LANES & MULTI-USE PATH
TIER 1 SCREENING	1.35	1.75
TIER 2 SCREENING	0.90	1.40
AVERAGE	1.13	1.58

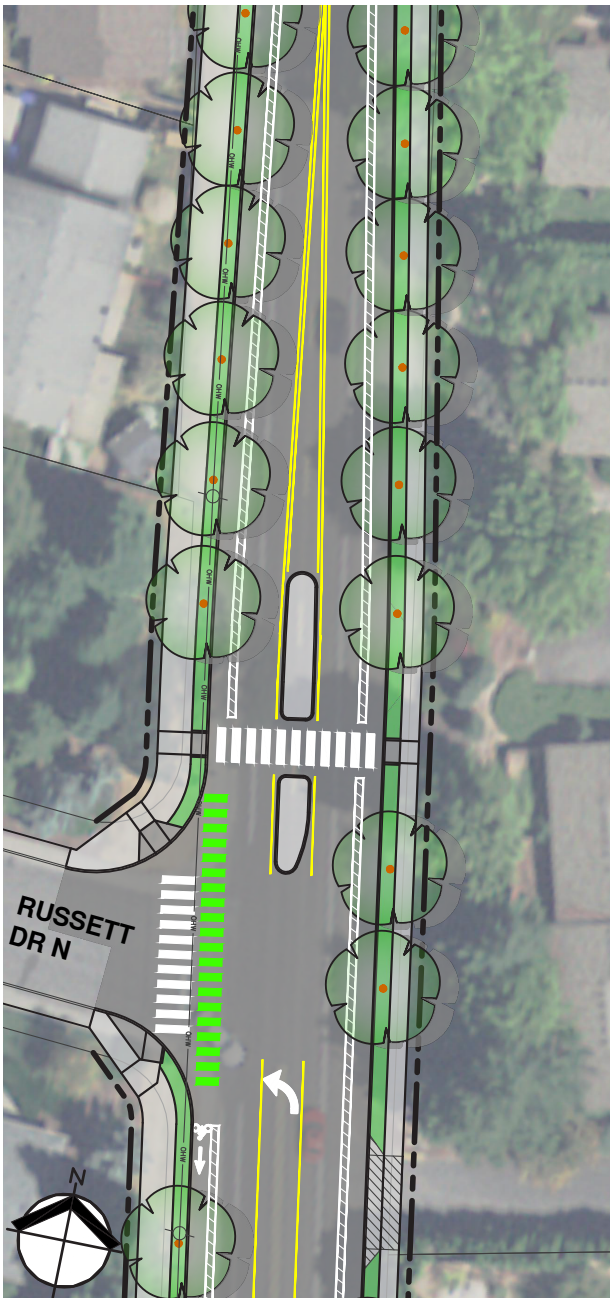
RECOMMENDED ALTERNATIVE

Based upon the results of the Tier 2 screening process, comments from the TAC, and the significant public input received, DKS recommends the following alternative for the Wheatland Road corridor:

ALTERNATIVE #3: MULTI-USE PATH AND BUFFERED BIKE LANES

Alternative #3 is best suited to meet the needs and desires of all users of the Wheatland Road corridor, specifically school-age users, while costing significantly less money and requiring less right-of-way and property impacts than the other alternatives. This solution was the preferred alternative from the general public and provides a safer system and multimodal travel options to improve what exists today. It both maintains the current level of traffic demand and is estimated to adequately accommodate future levels of traffic 20 years into the future. This alternative will also be more competitive to receive transportation funding because of the safety and multimodal design solutions provided.

The corridor plan presented is conceptual and changes to pedestrian improvements and landscaping details may occur during the design process.



02 TECHNICAL MEMORANDUM #1
EXISTING AND FUTURE FORECAST CONDITIONS

DKS 117 COMMERCIAL STREET NE, SUITE 310, SALEM, OR 97301 • 503.391.8773 • DKSASSOCIATES.COM

MEMORANDUM #1

DATE: January 21, 2021

TO: Project Management Team

FROM: Scott Mansur, P.E., PTOE | DKS Associates
Jenna Bogert, E.I. | DKS Associates
Travis Larson, E.I. | DKS Associates

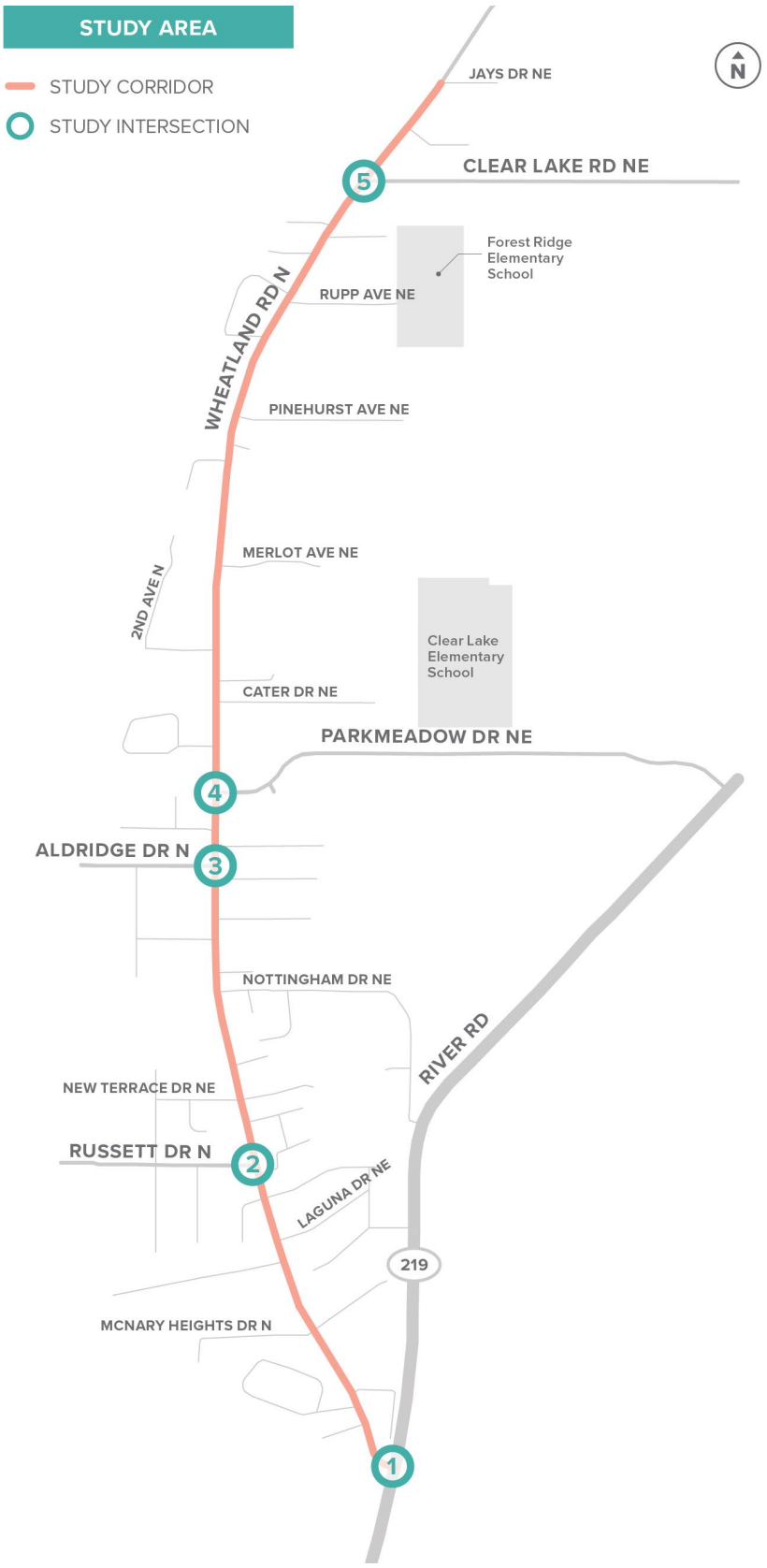
SUBJECT: Wheatland Road Corridor Plan – Existing and Future Forecast Conditions Project #20020-009

INTRODUCTION

The primary objective of the Wheatland Road Corridor Plan project is to develop a multimodal corridor plan and conceptual street design that removes barriers for all modes of travel, considers the latest urban safety improvements for pedestrians (refuge medians, street lighting, pedestrian activated flashers), bicycles (separated multi-use paths or buffered/protected bikes lanes), and transit riders (updated facilities and waiting areas), and creates an enjoyable experience for users of all ages and abilities. The project will also include community involvement to assure the design plan is consistent with the needs of key stakeholders (including neighborhoods, schools, and businesses).

This memorandum also serves as a technical evaluation of both the existing and future forecast operational conditions of Wheatland Road corridor from River Road to Jays Drive (northern city limit). The study corridor and study intersections are shown in Figure 1 and are listed below:

- Wheatland Road/River Road
- Wheatland Road/Russett Drive
- Wheatland Road/Aldridge Drive
- Wheatland Road/Parkmeadow Drive
- Wheatland Road/Clear Lake Road


STUDY AREA
STUDY CORRIDOR
STUDY INTERSECTION
N
JAYS DR NE
CLEAR LAKE RD NE
5
Forest Ridge Elementary School
RUPP AVE NE
WHEATLAND RD N
PINEHURST AVE NE
MERLOT AVE NE
2ND AVE N
Clear Lake Elementary School
CATER DR NE
PARKMEADOW DR NE
4
ALDRIDGE DR N
3
NOTTINGHAM DR NE
RIVER RD
NEW TERRACE DR NE
RUSSETT DR N
2
LAGUNA DR NE
219
MCNARY HEIGHTS DR N
1

The contents of this memorandum are listed below and include sections that address existing and future conditions of the study corridor. The sections also document safety analysis.

MEMORANDUM CONTENTS

EXISTING PEDESTRIAN AND BICYCLE CONDITIONS

This section contains an evaluation of the existing pedestrian and bicycle conditions along the study corridor. The following subsections discuss the existing facilities, a qualitative assessment of the facilities based on field observations, and an ADA assessment of the Wheatland Road corridor.

EXISTING PEDESTRIAN AND BICYCLE FACILITIES

There are existing segments of paved sidewalk along Wheatland Road in multiple areas with many gaps. This provides poor pedestrian connectivity with numerous places without sidewalk on either side of the road. Figure 2 shows a typical example of pedestrians walking along the shoulder of the road.

There are existing bicycle lanes along Wheatland Road on both sides. The bike lane widths vary between 5-feet to 6-feet wide and are always directly adjacent to the vehicular travel lanes.

Refer to Figure 3 for the locations of existing pedestrian sidewalks and existing bike lanes. Existing public transit and school conditions are discussed later in the report.

FIGURE 2: PEDESTRIANS WALKING ON ROAD SHOULDER

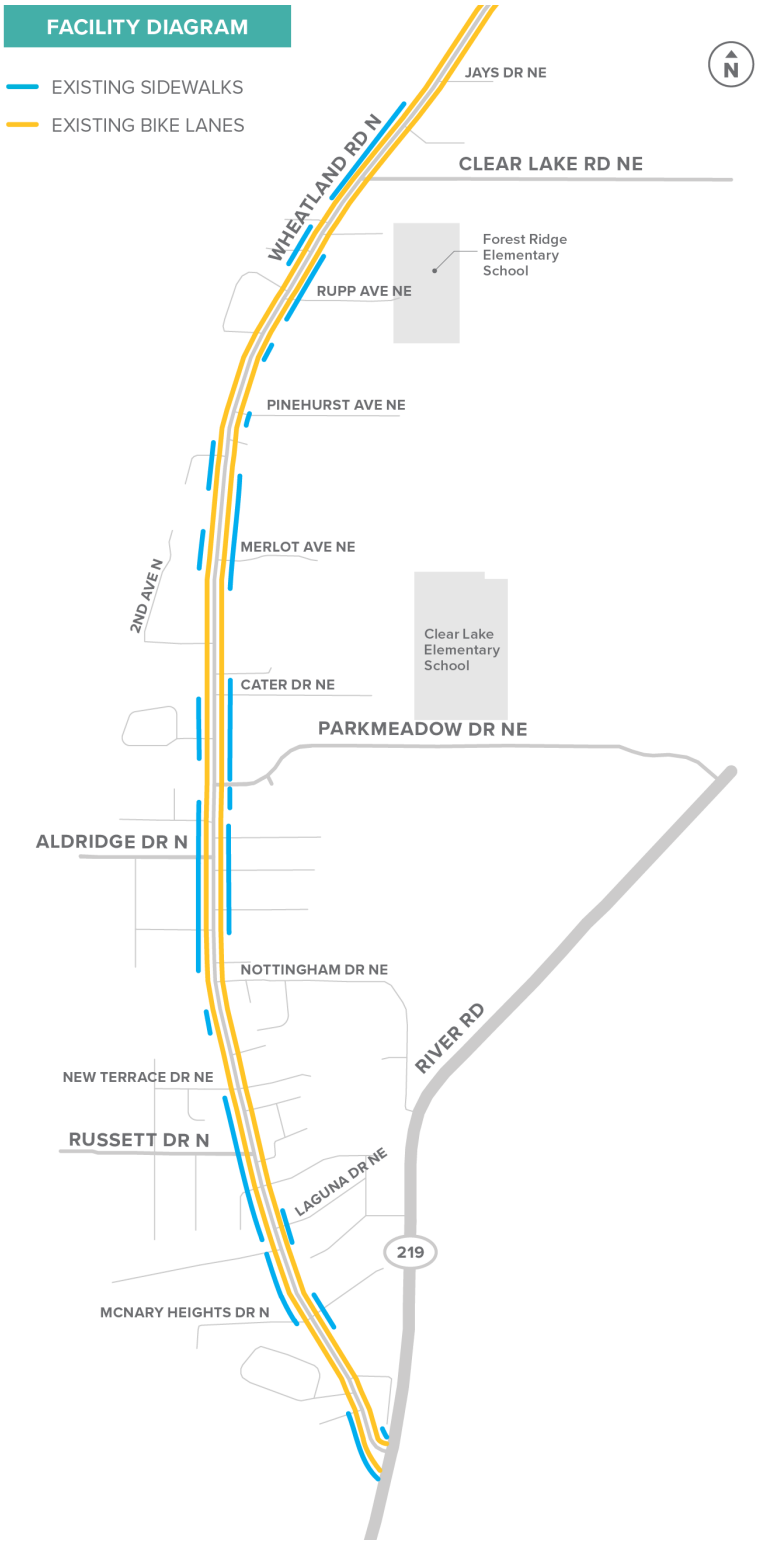


FIGURE 3: EXISTING PEDESTRIAN AND BICYCLE FACILITIES

QUALITATIVE ASSESSMENT OF FACILITIES

A qualitative assessment of the walkability and bikeability of the study intersections and whole study corridor was conducted using the Oregon Department of Transportation (ODOT) Qualitative Multimodal Assessment tool found in the ODOT Analysis Procedure Manual (APM)[1]. Various aspects of walkability and bikeability at each of the study intersections and along the corridor were assigned one of the following ratings based on study area field observations and the recommended criteria.

- "Excellent"
- "Good"
- "Fair"
- "Poor"

[1] Analysis Procedures Manual (APM), Chapter 14, Oregon Department of Transportation, Updated 10/22/2020.

Table 1 displays a summary of the qualitative grading for each study intersection and corridor segments.

TABLE 1: QUALITATIVE GRADING OF WALKABILITY AND BIKEABILITY OF WHEATLAND ROAD

LOCATION	WALKING	BIKING
SEGMENTS		
RIVER ROAD -> LAGUNA DRIVE	Poor	Poor
LAGUNA DRIVE -> PARKMEADOW DRIVE	Poor	Fair
PARKMEADOW DRIVE -> 2ND AVENUE	Poor	Fair
2ND AVENUE -> JAYS DRIVE	Poor	Fair
STUDY INTERSECTIONS		
RIVER ROAD	Good	Fair
RUSSETT DRIVE	Poor	Fair
ALDRIDGE DRIVE	Fair	Fair
PARKMEADOW DRIVE	Poor	Fair
CLEAR LAKE ROAD	Poor	Fair

The walkability grade of each segment is determined by, but limited to, sidewalk presence, lighting, adjacent traffic speed, and buffer presence. As a whole, this corridor lacks in sidewalk connectivity and adequate nighttime lighting which translates to the "Poor" rating. The walkability grade of each intersection is determined by, but not limited to, street crossing widths, median islands, and ramp presence. Most of the intersections were either missing ramps or sidewalk on one or more of the corners which translates to the mixed set of ratings. Marked school crossing were graded more stringently. The River Road intersection, however, was given a "Good" rating for ADA compliant curbs ramps and marked crosswalks which were just installed within the last few years.

The bikeability grade of each segment is determined by, but limited to, bike facility/shoulder presence and width, pavement condition, on-street parking, roadway grade, and speed of adjacent traffic. As a whole, this corridor has minimum six-foot bike lanes on both sides with no on-street parking or other obstructions which translates to the "Fair" rating for most of the segments. The River Road to Laguna Drive segment was given a "Poor" rating, though, as it has a decently steep hill (5.3% grade) which can be difficult for cyclists, especially right up against traffic. The bikeability grade of each intersection is determined by, but not limited to, street crossing widths and type of traffic control. All of the intersections had acceptable crossing widths with either no traffic control at the stop-controlled intersections or adequate bike lanes and detection at the signalized intersection which translates to the "Fair" rating.

Context sensitive design must be employed when evaluating this facility and proposing future enhancements. For pedestrians, system connectivity needs to be achieved by adding sidewalk and curb ramps. There are many segments of roadway without sidewalk on either side of the road which can discourage or inhibit walking for many users. For cyclists, all types of cyclists should be comfortable while riding along a bike facility. The National Association of City Transportation Officials (NACTO) published contextual guidance for designing bicycle facilities for all ages and abilities using the criteria of safety, comfortability, and equity[2]. For a bike facility adjacent to a high-speed roadway like Wheatland Road[3], a protected bike lane or separated bike facility is recommended.

ADA ASSESSMENT

An assessment of all curb ramps along the Wheatland Road corridor was conducted by the project team in December 2020. All but a few of the curb ramps existing within the corridor do not meet ADA requirements. In addition, curb ramps are missing at T-intersections where sidewalk exists opposite of the intersection. These are legal crossings as defined by Oregon Revised Statues (ORS). Curb ramps should be added to the opposite side of T-intersections for all legal crossings, or the legal crossing should be closed. Figure 4 provides a visual representation of the curb ramps that either pass ADA compliance, fail ADA compliance, or are missing altogether.

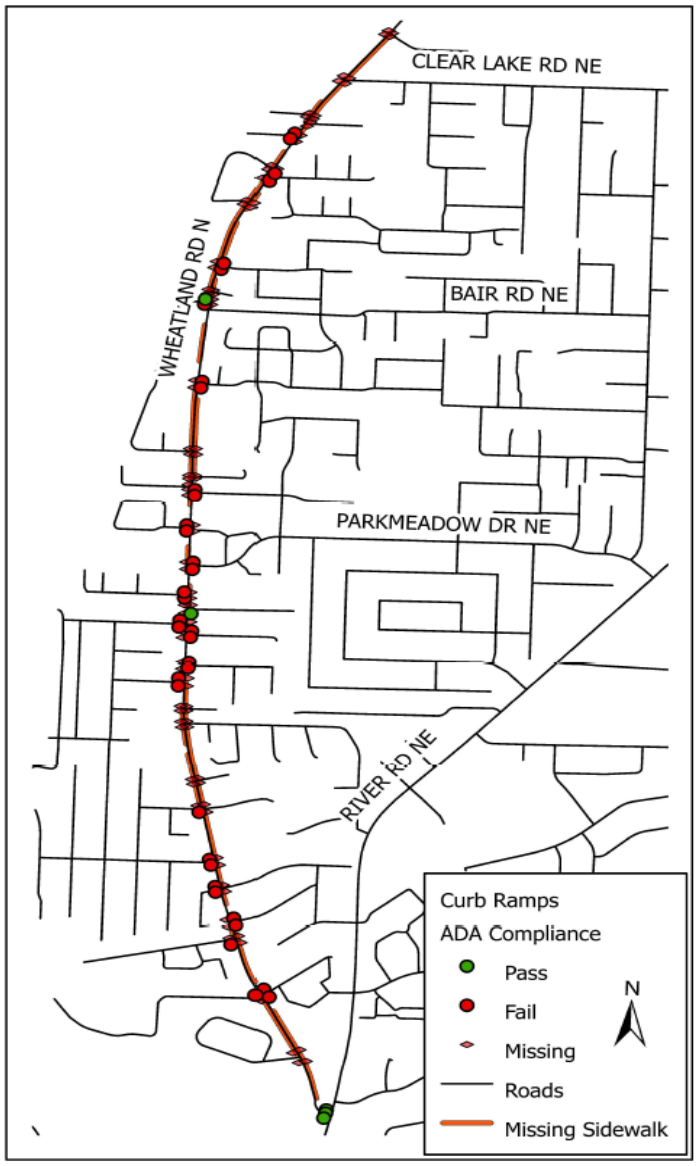


FIGURE 4: ADA RAMP COMPLIANCE

[2] Designing for All Ages and Abilities, National Association of City Transportation Officials, December 2017.

[3] See posted and 85th percentile speeds for Wheatland in Table 4.

EXISTING TRANSIT CONDITONS

CHERRIOTS TRANSIT

Cherriots provides public transit service in the Salem-Keizer area via one route. The route, Route 9 (Cherry/River Road), operates Monday through Saturday and provides service between the Downtown Transit Center in Salem and the intersection of Parkmeadow Drive and Wheatland Road. It only services the corridor south of Parkmeadow Drive and it is a southbound-only route along Wheatland Road. The bus has 30-minute headways on weekdays and one-hour headways on Saturdays. Figure 5 shows the route and bus stop locations.

Within the vicinity of the study corridor, there are five bus stops for Route 9. A wide shoulder is present at the McNary Heights bus stop; however, it is not intended for use as a bus pullout. None of the bus stops provide seating or a covered waiting area.

Many pedestrians utilize the transit bus stops along Wheatland Road and are often waiting for buses during the morning peak period.

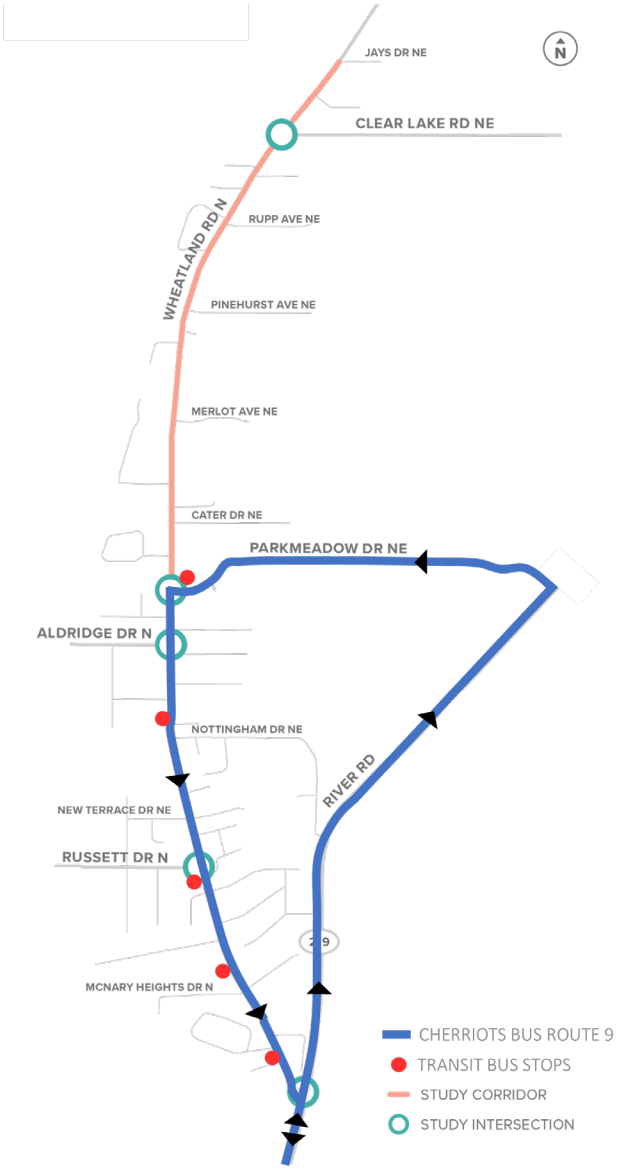


FIGURE 5: CHERRIOTS BUS ROUTE AND STOPS

NEARBY SALEM-KEIZER SCHOOLS

There are two elementary schools near the study corridor: Clear Lake Elementary School and Forest Ridge Elementary School. Many students walk from the neighborhoods around Wheatland Road to these schools. However, most students that live on the west side of Wheatland Road that attend Forest Ridge are provided school bus service. In addition to the elementary students, middle school and high school students walk the corridor to reach their respective school bus stops. Figure 7 shows the school locations, school speed zones, and school bus stops.

There are also two 20 mph school speed zones located along the corridor. The school zone for Clear Lake Elementary School is from Farmland Lane to Cater Drive and the school zone for Forest Ridge Elementary is from Marks Drive to approximately 225 feet north of Clear Lake Road intersection as well as along Clear Lake Road.

There are marked school crosswalks at Parkmeadow Drive (north leg, with a crossing guard) and at Clear Lake Road (south leg and east leg). While the crosswalks are marked, each intersection is missing curb ramps with the marked crosswalks. Figure 6 shows the Parkmeadow Drive marked school crosswalk.

School bus stop locations on Wheatland Road are shown in Table 2. There are 14 individual bus stop locations along Wheatland Road for the four schools listed.

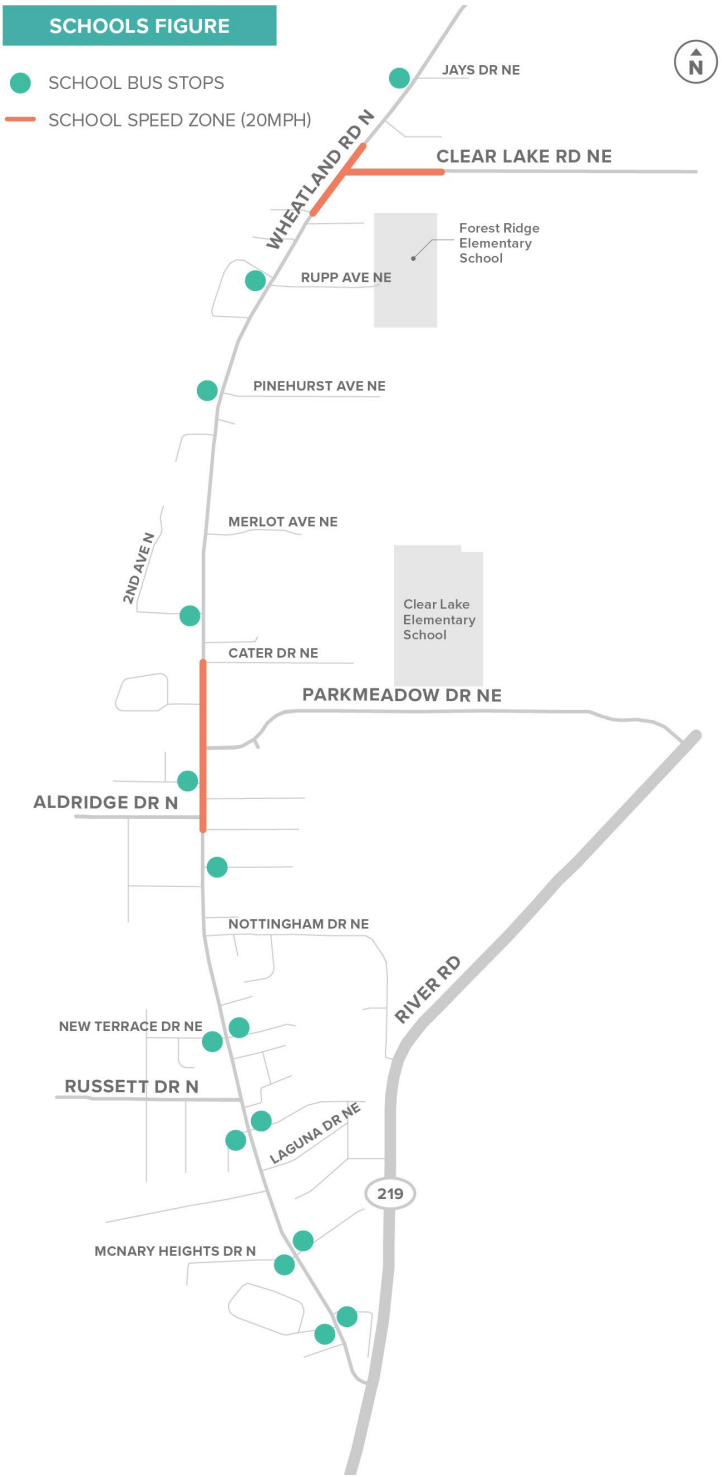


FIGURE 6: SCHOOL ZONES AND SCHOOL BUS STOPS

TABLE 2: SCHOOL BUS STOP LOCATIONS

CLEAR LAKE ELEMENTARY AND FOREST RIDGE ELEMENTARY	WHITAKER MIDDLE SCHOOL AND MCNARY HIGH SCHOOL
Courtside Manor Apartments (northbound)	Jays Drive (southbound)
Foothill Court (northbound)	Rupp Avenue (southbound)
Delta Drive (northbound)	Pinehurst Avenue (southbound)
New Terrace Court (northbound)	Otter Way (southbound)
Springridge Drive (northbound)	Hazelbrook Drive (southbound)
Otter Way (southbound)	New Terrace Drive (southbound)
Delta Court (southbound)	Delta Court (southbound)
McNary Heights Drive (southbound)	McNary Heights Drive (southbound)
	Mistletoe Loop (southbound)

Currently, there is a lack of street lighting, sidewalks, and safe pedestrian crossings of Wheatland Road for students walking to school, crossing Wheatland Road, traveling to a school bus stop, or waiting at a school bus stop. During the winter, students waiting for school buses in the morning hours are often waiting in the dark and must walk and cross along stretches of Wheatland Road without sidewalks or lighting as shown in Figure 9.

FIGURE 7: PARKMEADOW DRIVE MARKED SCHOOL CROSSWALK

EXISTING LIGHTING CONDITIONS

Street lighting observations were conducted along the Wheatland Road project area during the nighttime conditions on November 30, 2020. There is some existing street lighting along most of Wheatland Road corridor. Observed light levels indicate that additional lighting along the study corridor is needed. Existing lighting along the corridor is mainly located on utility poles and is not uniform, creating contrast between light and dark sections and making it difficult to identify pedestrians, bikes, and motor vehicles on or crossing the street. Visibility is especially challenging at several of the school bus stops as shown in Figure 9. Supplemental lighting along the corridor would be needed to meet current street lighting guidelines (average light levels and uniformity).

FIGURE 8: DARK CONDITIONS AT A SCHOOL BUS STOP

EXISTING STORMWATER AND NATURAL RESOURCE CONDITIONS

STORMWATER CONDITIONS

Most of the corridor has some existing stormwater infrastructure and piping in place that is part of the City's MS4 system. Areas of exception include between Mistle Toe Loop and River Road; between New Terrace and Malory Lane; and from Jacobsen Street to Merlot Avenue. Additional study and analysis will need to be completed to determine the available capacity of this system.

There is minimal slope along Wheatland Road north of Laguna Drive. South of Laguna Drive, Wheatland Road slopes south toward River Road with a low point around McNary Heights Drive. The City of Keizer prefers the use of Underground Injection Controls (UICs) to manage stormwater runoff which should be the preferred method of stormwater discharge for this project.

The project corridor has limited right-of-way and the roadside areas are almost completely developed. However, there are some limited opportunities for stormwater facilities to assist with stormwater management and infiltration. These include installing perforated UIC storm drain piping within the roadway, constructing narrow above ground linear features such as swales or rain garden planters along the western side of the corridor under existing transmission power lines or where there is sufficient right-of-way is available on the eastern side, between New Terrace Court and Nottingham Drive, for example. Other options could include purchasing private property at strategic undeveloped locations such as the open fields adjacent to Keizer Christian Church or at the southwest corner of the intersection of Wheatland Road and McNary Heights Drive.

Curb only exists on parts of Wheatland Road, potentially draining stormwater runoff from public infrastructure onto adjacent private properties. For example, on the west side of Wheatland Road, between Mistletoe Loop and McNary Heights Drive, the adjacent properties are below the road grade and no curb or sidewalk exists to direct stormwater runoff away from those properties. Heavy storms that do not fully infiltrate immediately adjacent to the road may runoff onto private property. Installing curb and sidewalk on both sides of the roadway should improve stormwater runoff conditions along the corridor.

NATURAL RESOURCE IMPACTS

A desktop review of the project corridor was completed to identify potential natural resources features that may be impacted by the project. Based on the review of available information, no impacts to wetlands or waters of the state are anticipated for this project. Data was reviewed on the Oregon Rapid Wetland Assessment Protocol and Stream Function Assessment Method online mapping. No mapped wetlands or mapped hydric soils are within the project boundaries.

There are several areas along the east side of Wheatland Road with mature trees that may be impacted when installing new sidewalk, separating existing curb tight sidewalk, or widening the paved surfacing. City of Keizer defines a significant tree as anything over 12-inch diameter at breast height. In many cases, meandering sidewalk would not be sufficient to avoid impacts to the critical root zone of significant trees with a widened corridor.

On the east side of the corridor, significant trees are located at the following general locations: between entrances of Courtside Manor opposite of Mistletoe Loop; near the embankment slope south of Laguna Drive; 2 large oaks north of New Terrace Court; immediately north of Farmland; immediately north of Park Meadow. On the west side of the corridor only one large oak was identified north of Russett.

EXISTING MOTOR VEHICLE CONDITIONS

Existing motor vehicle conditions were evaluated for the Wheatland Road corridor within the study area and included various inventories, observations, and analysis.

PAVEMENT CONDITION

Wheatland Road is a two-lane arterial corridor with a typical width of 32 feet. According to City provided data, the southern section beginning at River Road and ending at Bair Road, approximately 6,900-ft, has a Pavement Condition Index (PCI) of 85. This indicates that the pavement is in very good condition and is not in need of significant preservation efforts beyond crack sealing. The section beginning at Bair Road and ending 100-ft north of Jays Drive, approximately 3,000-ft, has a PCI of 70. A PCI of 70 indicates that the pavement is in good condition but is at a critical point for preventative maintenance. Delaying preventative maintenance below a PCI of approximately 65-70 will lead to significantly higher corrective maintenance, rehabilitation, or reconstruction. This is the appropriate time in the pavement's life for pavement

preservation treatment. A minor overlay or grind and inlay may be appropriate to extend the pavement life.

ROADWAY NETWORK

The transportation characteristics of the key study area roadways and key cross streets are shown in Table 3 and include functional classification, number of travel lanes, posted speeds, and the presence of sidewalks and bike lanes. All of the study roadways are under the City of Keizer's jurisdiction. The functional classification is a key roadway characteristic because it specifies the purpose of the facility[4] and is a determining factor of applicable cross-section, access spacing, and intersection performance standards.

TABLE 3: EXISTING STUDY AREA ROADWAY CHARACTERISTICS

ROADWAY	FUNCTIONAL CLASSIFICATION	TRAVEL LANES	POSTED SPEED	SIDEWALK	BIKE LANES
WHEATLAND ROAD	Minor Arterial	2	40 mph	Partial [a]	Both Sides
RIVER ROAD	Major Arterial	3-5	40 mph	Both Sides	None
RUSSETT DRIVE	Local Street	2	Not Posted	Both Sides	None
ALDRIDGE DRIVE	Local Street	2	Not Posted	Both Sides	None
PARKMEADOW DRIVE	Collector	2	25 mph	Both Sides	None
CLEAR LAKE ROAD	Collector	2	40 mph	None	None

[a] Refer to the Figure 3 to see the location of existing sidewalks and bicycle lanes on Wheatland Road.

EXISTING VEHICULAR VOLUME, SPEED, AND CLASSIFICATION

Traffic data was collected using 24-hour tube counts[5] at two locations within the project study area. The locations of these tube counts are shown in Table 4. This data includes directional average daily vehicular volumes, heavy vehicle percentages, and 85th percentile speeds.

At the time that the traffic counts were collected, traffic volumes were lighter than normal due to the COVID-19 pandemic. However, historical traffic count data collected in March 2020, prior to the COVID-19 closure of schools and businesses, were available at the intersections of River Road and

[4] The primary purpose of an arterial is to provide mobility, whereas at the opposite end of the spectrum, a local road is primarily concerned with site access. Collector roadways provide a transition between arterials and local roads.

[5] Traffic Data was collected on Tuesday, September 29, 2020 by All Traffic Data.

Clear Lake Road for the PM peak hour. These counts were used to determine the change (reduction) in traffic volumes during the peak periods of the COVID-19 pandemic so that the traffic counts collected in September of 2020 could be scaled appropriately and would therefore represent typical traffic volume levels. It was determined that a factor of 1.15 be applied (15% increase) to the September 2020 traffic counts to represent pre-COVID-19 conditions.

As shown in Table 4, Wheatland Road experiences daily traffic volumes between 5,300 and 8,600 vehicles (adjusted for impacts due to COVID-19). The 85th percentile travel speeds range from 3 mph to 5 mph above the posted speed.

TABLE 4: WHEATLAND ROAD VOLUMES, HEAVY VEHICLES, AND SPEEDS

DATA	LOCATION ALONG WHEATLAND ROAD	
	NORTH OF LAGUNA DR	SOUTH OF CATER DR
AVERAGE DAILY TRAFFIC		
NORTHBOUND	4,200	2,600
SOUTHBOUND	4,400	2,700
TOTAL	8,600	5,300
HEAVY VEHICLE PERCENTAGES		
NORTHBOUND	1.4%	2.0%
SOUTHBOUND	2.1%	1.7%
85TH PERCENTILE SPEEDS (POSTED SPEED = 40 MPH)		
NORTHBOUND	43 MPH	45 MPH
SOUTHBOUND	45 MPH	44 MPH

EXISTING 2020 TURNING MOVEMENT COUNTS

Intersection turn movement volumes were collected at the five study intersections along Wheatland Road in September 2020.[6] The intersection volumes were collected for the AM (7 am – 9am) and PM (4 pm – 6 pm) peak periods. The peak hours for each period (AM and PM) at each study intersection were calculated and will be analyzed as part of the intersection performance analysis. The five study intersections and their corresponding traffic control are listed below:

- Wheatland Road/River Road (Signalized)
- Wheatland Road/Russett Drive (Unsignalized)

[6] Traffic count data was collected on Tuesday, September 29, 2020 by All Traffic Data.

- Wheatland Road/Aldridge Drive (Unsignalized)
- Wheatland Road/Parkmeadow Drive (Unsignalized)
- Wheatland Road/Clear Lake Road (Unsignalized)

The adjusted existing 2020 intersection volumes are shown in Figure 9 on the following page. The detailed, two-hour traffic counts collected in March 2020 and September 2020 can be found in the appendix.

INTERSECTON OPERATING STANDARDS

Agency mobility standards often require intersections to meet level of service (LOS) or volume-to-capacity (V/C) intersection operation thresholds.

- The intersection LOS is similar to a "report card" rating based upon average vehicle delay. Level of service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of service D and E are progressively worse operating conditions. Level of service F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.
- The volume-to-capacity (v/c) ratio represents the level of saturation of the intersection or individual movement. It is determined by dividing the peak hour traffic volume by the maximum hourly capacity of an intersection or turn movement. When the V/C ratio approaches 0.95, operations become unstable and small disruptions can cause the traffic flow to break down, resulting in the formation of excessive queues.

All of the study intersections are under City of Keizer jurisdiction and are required to meet the City's operating standards. Per the City's Transportation System Plan[7], intersections of two arterial roadways must have a v/c ratio of 0.95 or less to be operating acceptably. This includes the Wheatland Road/River Road intersection. For the remaining unsignalized study intersections, only the LOS is used for determining intersection operation. LOS "E" (representing no more than 50 seconds of average minor street stopped delay) is the minimum acceptable level.

[7] City of Keizer Transportation System Plan, Part 1 of 2, Revised June 2014.

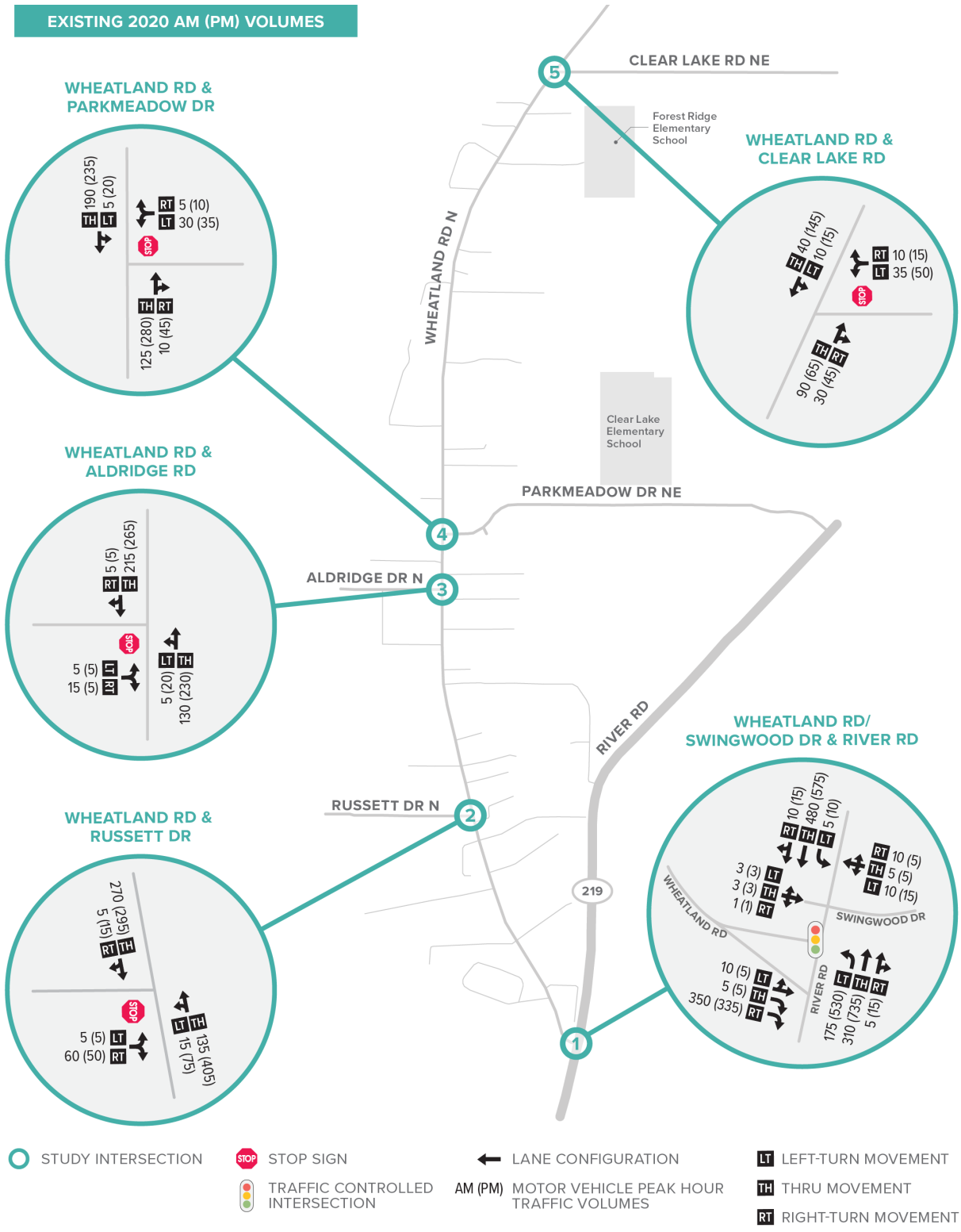


FIGURE 9: EXISITING (2020) TRAFFIC VOLUMES

EXISTING 2020 INTERSECTION PERFORMANCE

The existing performance of the study intersections was evaluated using Synchro™ software, which employs methodology from the 6th Edition of the Highway Capacity Manual[8] for both unsignalized and signalized intersections.

The intersection operation performance standards of level of service (LOS), delay, and volume-to-capacity (V/C) ratios were calculated for the AM and PM peak hours and are reported in Table 5. As shown, all intersections currently meet the City of Keizer's mobility standards.

TABLE 5: EXISTING (2020) INTERSECTION OPERATIONS

INTERSECTION	OPERATING STANDARD	AM PEAK HOUR			PM PEAK HOUR		
		V/C RATIO	DELAY	LOS	V/C RATIO	DELAY	LOS
SIGNALIZED							
WHEATLAND RD/ RIVER RD	v/c ≤ 0.95	0.33	5.9	A	0.33	11.9	B
UNSIGNALIZED							
WHEATLAND RD/ RUSSETT DR	LOS E	0.10	10.4	A/B	0.09	11.4	A/B
WHEATLAND RD/ ALDRIDGE DR	LOS E	0.03	10.1	A/B	0.02	12.0	A/B
WHEATLAND RD/ PARKMEADOW DR	LOS E	0.06	10.9	A/B	0.11	14.0	A/B
WHEATLAND RD/ CLEAR LAKE RD	LOS E	0.07	9.9	A/A	0.10	10.7	A/B

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (sec.)
v/c = Average Intersection Volume-to-Capacity Ratio
LOS = Average Intersection Level of Service

TWO-WAY STOP CONTROLLED INTERSECTION:
Delay = Critical Movement Approach Delay (sec.)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Level of Service (Major/Minor Road)

[8] Highway Capacity Manual, 6th Edition, Highway Transportation Research Board, 2017.

SAFETY ANALYSIS

A brief discussion of the crash analysis that was performed for the study area is presented in the sections below. Crash data was obtained from the ODOT Crash Analysis and Reporting Unit for the five most recent years of published data (2014-2018). Figure 10 shows the location of all crashes along Wheatland Road during this period.

CRASH STATISTICS

Between 2014 and 2018, 54 crashes were recorded along the project corridor (from River Road to Jays Drive). There were 24 Rear-End crashes (44%), 11 Turning Movement crashes (20%), and 7 Fixed Objects crashes (13%). Among the fixed object crashes, the fixed objects included mailboxes, utility poles, ditches, vegetation, signs, and curbs. The number of crashes at each study intersection is recorded in Table 6.

There were no fatal crashes in the study area. There was, however, one serious injury (Injury A) crash that occurred at the intersection of Wheatland Road/New Terrace Court. The crash occurred in 2017 during clear, dry conditions and resulted in a rear-end collision.

There were three pedestrian crashes and one bicycle crash recorded on the study corridor. The location of the pedestrian and bicycle crashes are shown in Figure 10. Three of the crashes resulted in moderate injury (Injury B) and one resulted in minor injury (Injury C). All four occurred during daylight under clear and dry conditions. The pedestrian crash at Wheatland Road/River Road was caused by a motor vehicle driver's disregard for the traffic signal.

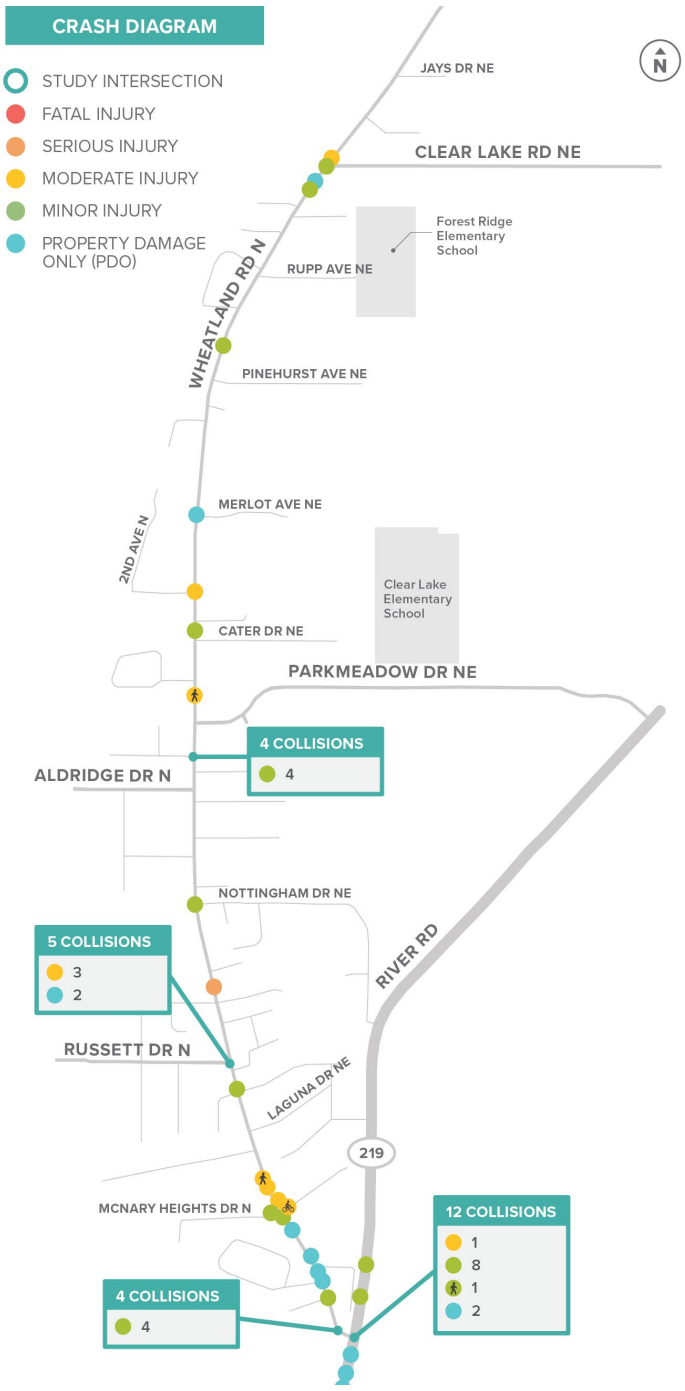


FIGURE 10: CRASH MAP (2014 – 2018)

CRITICAL CRASH RATE CALCULATIONS

ODOT guidance was followed to evaluate the crash rates at the five study intersections. Table 6 shows the results of the evaluation. The intersection types were determined by their respective geometries and traffic control. Exhibit 4-1 in the Analysis Procedures Manual[9] provides 90th percentile critical crash rates for similar intersection types in Oregon. These rates were compared to the calculated observed crash rates at the study intersections.

TABLE 6: CRITICAL CRASH RATE RESULTS

INTERSECTION	TYPE [a]	NUMBER OF CRASHES	90th %ILE CRASH RATE	AVERAGE DAILY TRAFFIC	CALCULATED CRASH RATE
SEGMENT					
WHEATLAND ROAD (RIVER RD TO JAYS DR)	-	54	2.84 [b]	7,000	2.22
INTERSECTON					
WHEATLAND RD/ RIVER RD	URBAN 4SG	21	0.860	22,500	0.511
WHEATLAND RD/ RUSSETT DR	URBAN 3ST	5	0.293	8,450	**0.324**
WHEATLAND RD/ ALDRIDGE DR	URBAN 3ST	0	0.293	6,200	0.000
WHEATLAND RD/ PARKMEADOW DR	URBAN 3ST	0	0.293	6,250	0.000
WHEATLAND RD/ CLEAR LAKE ROAD	URBAN 3ST	2	0.293	3,350	**0.327**

[a] 4SG = Four-Leg Signalized, 3ST = Three-Leg Minor Stop-Controlled

[b] The 90th percentile rate is the average of the crash rates between 2014 – 2018 for Urban Minor Arterials from ODOT's State Highway Crash Rate Table II

Bold/Highlighted = Calculated Rate exceeds Critical Rate

As shown, two intersections, Russett Drive and Clear Lake Road had calculated rates higher than the 90th percentile critical rate determined by ODOT. All five of the crashes that occurred at the Russett Drive intersection were rear-end crashes where the northbound left turning vehicle was hit by through vehicles on Wheatland Road while waiting to turn left onto Russett Drive. This is likely due to the high northbound left turn volume at Russett Drive and the lack of a left turn lane at this location. The installation of a northbound left turn lane should be considered to eliminate conflicts between northbound left turning and southbound through vehicles. Of the two crashes that the Clear Lake Road intersection, one was a Fixed Object crash and the other was a Parking Maneuver crash.

9 Analysis Procedures Manual, Oregon Department of Transportation, Updated 7/7/2020.

MOTOR VEHICLE FIELD OBSERVATIONS

The following observations have been made of the motor vehicle operations on the Wheatland Road corridor.

- The northbound left turn at the Wheatland Road/River Road intersection will often back up into the through lanes of traffic on River Road near Manzanita Street during the PM peak period. If the queue is long, vehicles will often continue north through the intersection and will use neighborhood streets, such as Nottingham Drive and Parkmeadow Drive.
- The driveway to the B&S Market just north of the Wheatland Road/River Road intersection is signalized, however, there are no right turns on red permitted. This is often ignored and vehicles conflict with protected northbound left turning vehicles from River Road.
- There have been many rear-end vehicle conflicts between vehicles waiting to turn left onto Russett Drive and northbound through vehicles on Wheatland Road. There is a hill just before Russett Drive that blocks the view of approaching vehicles and the roadway has a posted speed of 40 mph.

PLANNED IMPROVEMENTS

The City of Keizer Transportation System Plan (TSP) provides a list of projects that the City desires to construct to improve motor vehicle operations and multimodal safety.

- R2- Move the River Road/Manzanita Street intersection approximately 250 feet to the south. Realign and reconstruct Manzanita Street and McNary Estates Drive approaches to River Road. Construct separate westbound through and right-turn lanes. Medium Priority.
- R3 – At River Road/Wheatland Road intersection, construct dual northbound left-turn lanes, change north and south left-turn phases to a protected left-turn phase, and extend the length of second southbound through lane. Medium Priority.

Additionally, there is a project currently in the design phase for the installation of new optical fiber cable to connect from Shangri-La Avenue (City of Salem) to Wheatland Road (City of Keizer). This will be used to link traffic signals along the River Road to improve traffic flow. This project is currently being designed and will be constructed in 2021.

FUTURE MOTOR VEHICLE CONDITIONS

This section contains an evaluation of the future motor vehicle conditions along the study corridor. The following subsections discuss the future forecast volume development, forecasted 2042 volumes, and future 2042 intersection performance.

SALEM-KEIZER AREA TRANSPORTATION STUDY (SKATS) TRAVEL DEMAND MODEL

Future motor vehicle conditions for 2042 AM and PM peak hour intersection performance were evaluated for the study intersections. The background growth for the turning movement volumes was calculated based on traffic growth as modeled in the Salem Keizer Transportation Study (SKATS) travel demand model.[10] A rate of 1% per year growth rate was calculated based on the 2043 and 2017 models on Wheatland Road and was applied to the study intersection volumes to forecast 2042 AM and PM peak hour volumes.

FUTURE 2042 TURNING MOVEMENT COUNTS

The annual growth rate of 1% was applied to all the intersection turning movement counts at the study intersections. The traffic volumes are shown in Figure 11. The volumes shown include both the AM and PM peak hour.

[10] Salem-Keizer Transportation Study (SKATS) travel demand models 2043 and 2017 were used.

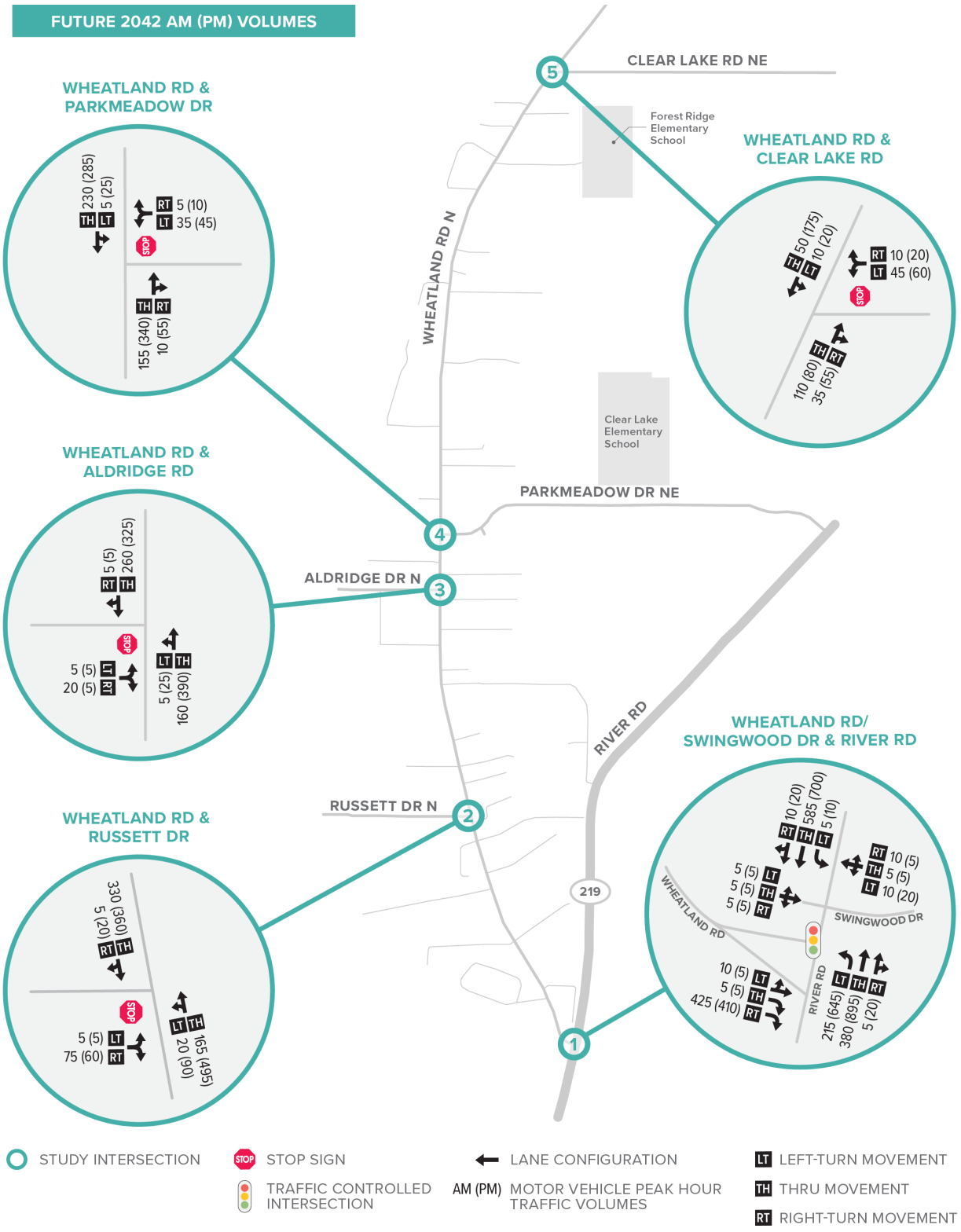


FIGURE 11: FUTURE FORECAST (2042) TRAFFIC VOLUMES

FUTURE 2042 INTERSECTION PERFORMANCE

The future performance of the study intersections was evaluated using Synchro™ software, which employs methodology from the 6th Edition of the Highway Capacity Manual[11] for unsignalized intersections and signalized intersections.

The intersection operation performance standards of level of service (LOS), delay, and volume-to-capacity (V/C) ratios, were calculated for the AM and PM peak hours and are reported in Table 7 below. As shown, all intersections currently meet the City of Keizer's mobility standards.

TABLE 7: FUTURE (2042) INTERSECTION OPERATIONS

INTERSECTION	OPERATING STANDARD	AM PEAK HOUR			PM PEAK HOUR		
		V/C RATIO	DELAY	LOS	V/C RATIO	DELAY	LOS
SIGNALIZED							
WHEATLAND RD/ RIVER RD	v/c ≤ 0.95	0.40	6.1	A	0.44	27.0	C
UNSIGNALIZED							
WHEATLAND RD/ RUSSETT DR	LOS E	0.13	11.1	A/B	0.12	12.4	A/B
WHEATLAND RD/ ALDRIDGE DR	LOS E	0.04	10.4	A/B	0.02	13.3	A/B
WHEATLAND RD/ PARKMEADOW DR	LOS E	0.07	11.7	A/B	0.16	16.4	A/C
WHEATLAND RD/ CLEAR LAKE RD	LOS E	0.08	10.2	A/B	0.14	11.4	A/B

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (sec.)
v/c = Average Intersection Volume-to-Capacity Ratio
LOS = Average Intersection Level of Service

TWO-WAY STOP CONTROLLED INTERSECTION:
Delay = Critical Movement Approach Delay (sec.)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Level of Service (Major/Minor Road)

LEFT-TURN LANE CRITERIA EVALUATION

The inclusion of a dedicated left turn pocket was investigated at each of the unsignalized study intersections for the major approach per the specific procedure described in the ODOT Analysis Procedures Manual (APM) [12]. Primarily, a left turn lane should be installed if any of the following three criteria are met: Vehicular Volume, Crash Experience, or Special Cases. No Special Cases

[11] Highway Capacity Manual, 6th Edition, Highway Transportation Research Board, 2017.

[12] Chapter 12, Analysis Procedures Manual, Oregon Department of Transportation, January 2020.

apply to these left turn lane evaluations for the corridor. It should be noted that the criteria only address left turns on the major approach and that meeting one or more of the criteria only indicates that a turn lane would be appropriate; it does not require that a turn lane be installed. For this analysis, a northbound left at Russett Drive, northbound left at Aldridge Drive, southbound left at Parkmeadow Drive, and southbound left at Clear Lake Road were evaluated.

The Vehicular Volume criteria is evaluated using major road volumes and Exhibit 12-1 from the APM[13] to determine if the volumes pass a recommended threshold of left turns versus general vehicular volume. Both AM and PM volumes for Existing and Future conditions were tested to determine current and future outcomes. The left turns at Russett Drive, Aldridge Drive, and Parkmeadow Drive all met the recommended threshold for Existing and Future Condition volumes, but the northbound left at Russett Drive significantly exceeded the threshold for both conditions. Conversely, the southbound left at Clear Lake Road did not meet the threshold for any of the conditions.

The Crash Experience criteria is evaluated by investigating prior crash history and the presence of crash remedy trials, and then examining how adding a dedicated left turn could alleviate certain crash types. The primary crash type that adding a dedicated lane turn alleviates is rear-ends. At Russett Drive, there were five rear-end crashes from vehicles trying to make a northbound left as shown in the safety analysis. While there are technically no known crash remedy trials at this location, these crashes could theoretically be minimized by adding a northbound left turn at this location. Neither Aldridge Drive, Parkmeadow Drive, nor Clear Lake Road had any rear-end crashes.

TABLE 8: LEFT-TURN LANE CRITERIA EVALUATION RESULTS

INTERSECTION	CRITERIA MET?			IS A LEFT TURN POCKET RECOMMENDED?
	VEHICULAR VOLUME	CRASH EXPERIENCE	SPECIAL CASES	
NORTHBOUND LEFT @ RUSSETT DRIVE	Yes[1]	Yes[2]	No	Yes
NORTHBOUND LEFT @ ALDRIDGE DRIVE	Yes	No	No	No
SOUTHBOUND LEFT @ PARKMEADOW DRIVE	Yes	No	No	No
SOUTHBOUND LEFT @ CLEAR LAKE DRIVE	No	No	No	No

[1] The Vehicular Volume criteria significantly exceeded the threshold.
[2] No known crash remedy trials were performed at this intersection.

[13] Chapter 12, Analysis Procedures Manual, Oregon Department of Transportation, January 2020.

Based on the findings summarized in Table 8, a northbound left turn pocket is recommended at Russett Drive only. It will potentially minimize rear-end crashes and provide queuing space for the high volume of turning vehicles (75 vehicles at PM peak hour). In an effort to conserve roadway cross-sectional width, dedicated left turn lanes at the other intersections are not recommended as they do not introduce significant operational or safety benefits to the corridor.

SUMMARY

The Wheatland Road study corridor is an approximately two-mile segment with varying levels of vehicular, pedestrian, cyclist, and transit usage. In general, the corridor works well for vehicles but has deficiencies for pedestrians, cyclists, and safe routes to schools. The study results are itemized into effective and deficient findings. From these results, the majority of the improvements for the corridor center around multi-modal transportation needs for pedestrians, bicyclists, school safety, and transit facilities.

Effective Findings

- The pavement is in either good or very good condition but could use some preventative maintenance.
- All study intersections met City of Keizer standards for both the Existing 2020 and Future 2042 traffic volume levels.
- The Wheatland Road corridor crash rate was below the critical segment crash rate, with three of the intersections also below the critical intersection crash rate.
- Bicycle lanes are present on both sides of the entire corridor.

Deficient Findings

- There is a lack of sidewalks, pedestrian connectivity, and enhanced pedestrian crossings of Wheatland Road. This is true for both the general pedestrians and school children that lack the necessary sidewalk to walk to and from school-related destinations.
- The majority of curb ramps along the corridor are either missing or not ADA compliant.
- While bicycle lanes do exist, they are not buffered, protected, or separated from vehicular traffic.
- There is inadequate street lighting throughout the corridor.
- No public transit bus stops have amenities or enhanced waiting areas.
- Two intersections had crash rates higher than the critical intersection crash rates.
- It is recommended that at Russett Drive, a northbound left turn lane be added to help prevent rear-ends (the primary crash type) and provide queuing space.

APPENDIX CONTENTS

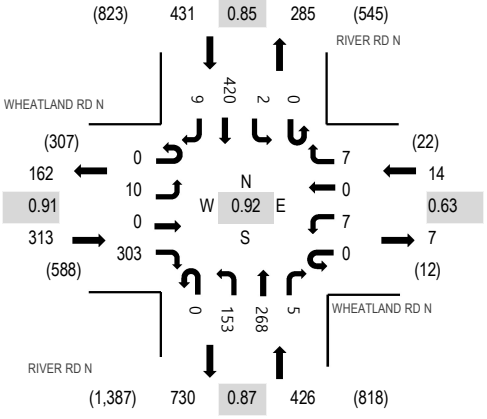
APPENDIX A: TRAFFIC COUNT DATA

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

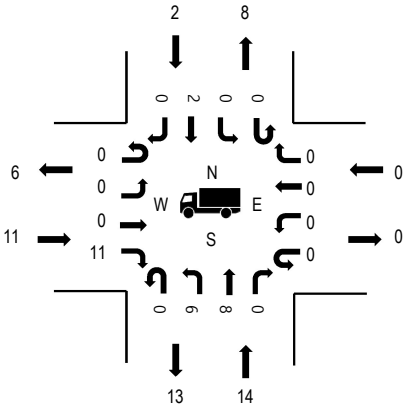
Location: 1 RIVER RD N & WHEATLAND RD N AM
Date: Tuesday, September 29, 2020
Peak Hour: 07:25 AM - 08:25 AM
Peak 15-Minutes: 07:35 AM - 07:50 AM

Peak Hour

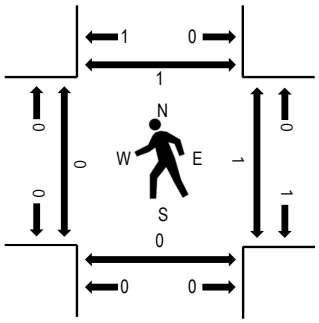
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.5%	0.91
WB	0.0%	0.63
NB	3.3%	0.87
SB	0.5%	0.85
All	2.3%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	WHEATLAND RD N Eastbound				WHEATLAND RD N Westbound				RIVER RD N Northbound				RIVER RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	0	29	0	0	0	0	0	10	22	0	0	0	33	0	94	1,142
7:05 AM	0	0	0	26	0	0	0	0	0	8	15	0	0	0	23	0	72	1,161
7:10 AM	0	1	1	30	0	0	0	1	0	6	20	1	0	0	41	0	101	1,179
7:15 AM	0	0	0	26	0	0	0	2	0	4	23	0	0	0	35	1	91	1,173
7:20 AM	0	0	0	26	0	0	0	0	0	10	14	0	0	0	37	1	88	1,168
7:25 AM	0	0	0	30	0	0	0	0	0	10	18	0	0	0	31	1	90	1,184
7:30 AM	0	1	0	22	0	1	0	2	0	6	20	1	0	0	41	1	95	1,179
7:35 AM	0	0	0	38	0	2	0	0	0	12	22	1	0	0	35	0	110	1,150
7:40 AM	0	1	0	24	0	0	0	1	0	12	21	0	0	0	47	0	106	1,129
7:45 AM	0	0	0	25	0	0	0	1	0	12	17	2	0	1	49	0	107	1,139
7:50 AM	0	2	0	30	0	0	0	2	0	8	19	0	0	0	38	1	100	1,127
7:55 AM	0	1	0	19	0	1	0	1	0	18	14	0	0	0	32	2	88	1,093
8:00 AM	0	1	0	19	0	0	0	0	0	14	37	0	0	0	42	0	113	1,109
8:05 AM	0	2	0	23	0	1	0	0	0	15	20	1	0	1	25	2	90	
8:10 AM	0	0	0	19	0	0	0	0	0	18	31	0	0	0	27	0	95	
8:15 AM	0	1	0	20	0	2	0	0	0	13	24	0	0	0	25	1	86	
8:20 AM	0	1	0	34	0	0	0	0	0	15	25	0	0	0	28	1	104	
8:25 AM	0	1	0	21	0	0	0	1	0	11	26	0	0	0	23	2	85	
8:30 AM	0	0	0	14	0	0	0	0	0	12	14	1	0	1	24	0	66	
8:35 AM	0	0	0	16	0	0	0	0	0	20	27	0	0	0	26	0	89	
8:40 AM	0	1	0	20	0	1	0	0	0	10	33	0	0	1	49	1	116	
8:45 AM	0	0	0	24	0	1	0	0	0	18	16	0	0	0	36	0	95	
8:50 AM	0	0	0	18	0	0	0	0	0	13	13	0	0	0	21	1	66	
8:55 AM	0	0	0	21	0	2	0	0	0	15	30	0	0	0	34	2	104	
Count Total	0	13	1	574	0	11	0	11	0	290	521	7	0	4	802	17	2,251	
Peak Hour	0	10	0	303	0	7	0	7	0	153	268	5	0	2	420	9	1,184	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

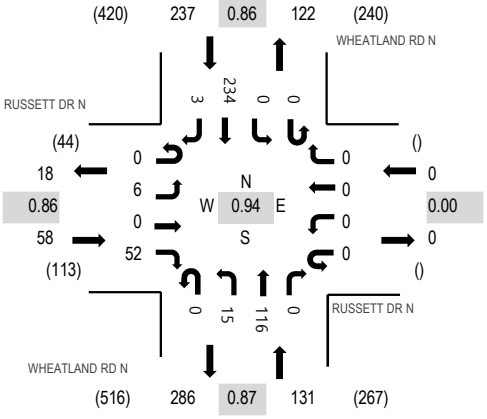
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	1	0	0	1	7:00 AM						7:00 AM	0	0	1	0	1
7:05 AM	0	1	0	2	3	7:05 AM						7:05 AM	0	0	0	0	0
7:10 AM	0	2	0	0	2	7:10 AM						7:10 AM	1	0	2	0	3
7:15 AM	1	0	0	0	1	7:15 AM						7:15 AM	2	0	0	0	2
7:20 AM	2	1	0	0	3	7:20 AM						7:20 AM	0	0	0	0	0
7:25 AM	1	2	0	0	3	7:25 AM						7:25 AM	0	0	0	1	1
7:30 AM	0	0	0	1	1	7:30 AM						7:30 AM	0	0	1	0	1
7:35 AM	0	2	0	0	2	7:35 AM						7:35 AM	0	0	0	0	0
7:40 AM	1	2	0	0	3	7:40 AM						7:40 AM	0	0	0	0	0
7:45 AM	1	0	0	1	2	7:45 AM						7:45 AM	0	0	0	0	0
7:50 AM	1	0	0	0	1	7:50 AM						7:50 AM	0	0	0	0	0
7:55 AM	1	0	0	0	1	7:55 AM						7:55 AM	0	0	0	0	0
8:00 AM	2	3	0	0	5	8:00 AM						8:00 AM	0	0	0	0	0
8:05 AM	1	0	0	0	1	8:05 AM						8:05 AM	0	0	0	0	0
8:10 AM	0	2	0	0	2	8:10 AM						8:10 AM	0	0	0	0	0
8:15 AM	1	1	0	0	2	8:15 AM						8:15 AM	0	0	0	0	0
8:20 AM	2	2	0	0	4	8:20 AM						8:20 AM	0	0	0	0	0
8:25 AM	2	0	0	0	2	8:25 AM						8:25 AM	0	0	0	0	0
8:30 AM	1	2	0	0	3	8:30 AM						8:30 AM	0	0	0	0	0
8:35 AM	1	0	0	1	2	8:35 AM						8:35 AM	0	0	0	0	0
8:40 AM	0	1	1	1	3	8:40 AM						8:40 AM	0	0	0	0	0
8:45 AM	2	1	0	1	4	8:45 AM						8:45 AM	0	0	0	0	0
8:50 AM	0	1	0	0	1	8:50 AM						8:50 AM	0	0	0	0	0
8:55 AM	1	4	0	1	6	8:55 AM						8:55 AM	0	0	0	0	0
Count Total	21	28	1	8	58	Count Total						Count Total	3	0	4	1	8
Peak Hour	11	14	0	2	27	Peak Hour						Peak Hour	0	0	1	1	2

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

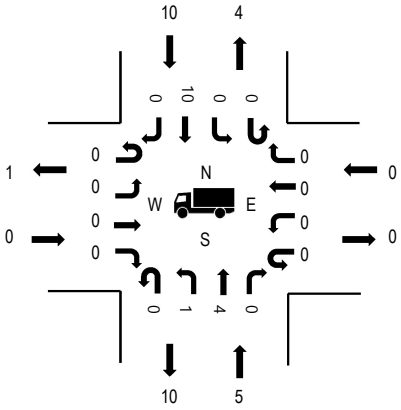
Location: 2 WHEATLAND RD N & RUSSETT DR N AM
Date: Tuesday, September 29, 2020
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:25 AM - 07:40 AM

Peak Hour

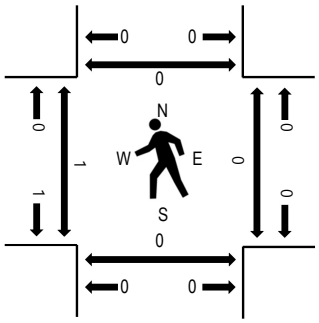
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.86
WB	0.0%	0.00
NB	3.8%	0.87
SB	4.2%	0.86
All	3.5%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	RUSSETT DR N Eastbound				RUSSETT DR N Westbound				WHEATLAND RD N Northbound				WHEATLAND RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	0	5	0	0	0	0	0	1	8	0	0	0	24	0	38	421
7:05 AM	0	0	0	7	0	0	0	0	0	1	5	0	0	0	9	0	22	415
7:10 AM	0	1	0	4	0	0	0	0	0	0	12	0	0	0	19	0	36	425
7:15 AM	0	1	0	5	0	0	0	0	0	1	5	0	0	0	27	0	39	426
7:20 AM	0	0	0	4	0	0	0	0	0	1	10	0	0	0	16	0	31	412
7:25 AM	0	0	0	6	0	0	0	0	0	0	6	0	0	0	26	1	39	421
7:30 AM	0	0	0	5	0	0	0	0	0	1	8	0	0	0	20	0	34	416
7:35 AM	0	1	0	2	0	0	0	0	0	2	11	0	0	0	24	0	40	401
7:40 AM	0	0	0	7	0	0	0	0	0	0	6	0	0	0	19	0	32	393
7:45 AM	0	1	0	6	0	0	0	0	0	1	8	0	0	0	19	0	35	390
7:50 AM	0	0	0	4	0	0	0	0	0	0	17	0	0	0	16	0	37	391
7:55 AM	0	0	0	3	0	0	0	0	0	2	8	0	0	0	25	0	38	381
8:00 AM	0	0	0	2	0	0	0	0	0	2	13	0	0	0	13	2	32	379
8:05 AM	0	3	0	6	0	0	0	0	0	1	8	0	0	0	14	0	32	
8:10 AM	0	0	0	2	0	0	0	0	0	4	16	0	0	0	15	0	37	
8:15 AM	0	0	0	5	0	0	0	0	0	1	8	0	0	0	11	0	25	
8:20 AM	0	0	0	2	0	0	0	0	0	5	7	0	0	0	26	0	40	
8:25 AM	0	2	0	7	0	0	0	0	0	2	9	0	0	0	14	0	34	
8:30 AM	0	0	0	2	0	0	0	0	0	0	8	0	0	0	9	0	19	
8:35 AM	0	0	0	4	0	0	0	0	0	3	11	0	0	0	14	0	32	
8:40 AM	0	1	0	4	0	0	0	0	0	3	11	0	0	0	10	0	29	
8:45 AM	0	0	0	2	0	0	0	0	0	1	13	0	0	0	19	1	36	
8:50 AM	0	1	0	3	0	0	0	0	0	5	9	0	0	0	9	0	27	
8:55 AM	0	2	0	3	0	0	0	0	0	3	10	0	0	0	18	0	36	
Count Total	0	13	0	100	0	0	0	0	0	40	227	0	0	0	416	4	800	
Peak Hour	0	6	0	52	0	0	0	0	0	15	116	0	0	0	234	3	426	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

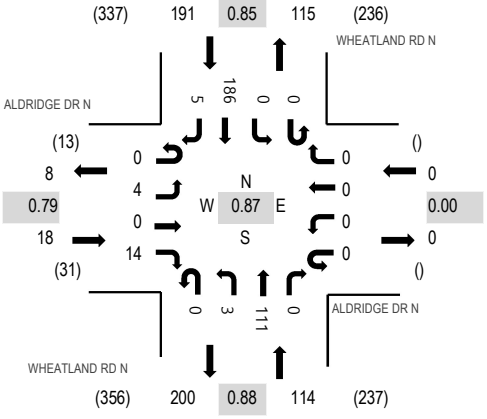
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	2	0	0	2	7:00 AM						7:00 AM	0	0	0	0	0
7:05 AM	0	1	0	0	1	7:05 AM						7:05 AM	0	0	0	0	0
7:10 AM	0	1	0	0	1	7:10 AM						7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM						7:15 AM	0	0	0	0	0
7:20 AM	0	2	0	1	3	7:20 AM						7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	3	3	7:25 AM						7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM						7:30 AM	1	0	0	0	1
7:35 AM	0	2	0	0	2	7:35 AM						7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0	7:40 AM						7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	2	2	7:45 AM						7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0	7:50 AM						7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	2	2	7:55 AM						7:55 AM	0	0	0	0	0
8:00 AM	0	1	0	1	2	8:00 AM						8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	1	1	8:05 AM						8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0	8:10 AM						8:10 AM	0	0	0	0	0
8:15 AM	1	0	0	0	1	8:15 AM						8:15 AM	0	0	0	0	0
8:20 AM	0	1	0	1	2	8:20 AM						8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	2	2	8:25 AM						8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	1	1	8:30 AM						8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	1	1	8:35 AM						8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM						8:40 AM	0	0	0	0	0
8:45 AM	0	0	0	1	1	8:45 AM						8:45 AM	0	1	0	0	1
8:50 AM	0	1	0	0	1	8:50 AM						8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	1	1	8:55 AM						8:55 AM	0	0	0	0	0
Count Total	1	11	0	17	29	Count Total						Count Total	1	1	0	0	2
Peak Hour	0	5	0	10	15	Peak Hour						Peak Hour	1	0	0	0	1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

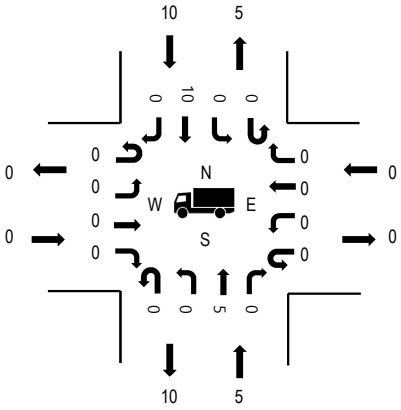
Location: 3 WHEATLAND RD N & ALDRIDGE DR N AM
Date: Tuesday, September 29, 2020
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:50 AM - 08:05 AM

Peak Hour

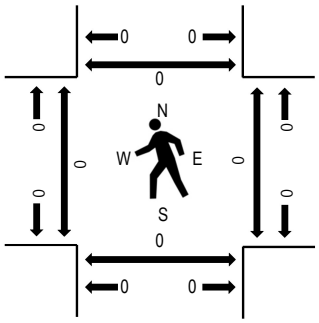
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.79
WB	0.0%	0.00
NB	4.4%	0.88
SB	5.2%	0.85
All	4.6%	0.87

Traffic Counts - Motorized Vehicles

Interval Start Time	ALDRIDGE DR N Eastbound				ALDRIDGE DR N Westbound				WHEATLAND RD N Northbound				WHEATLAND RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	1	0	2	0	0	0	0	0	0	10	0	0	0	16	0	29	314
7:05 AM	0	0	0	1	0	0	0	0	0	0	7	0	0	0	9	0	17	315
7:10 AM	0	0	0	0	0	0	0	0	0	1	11	0	0	0	16	0	28	322
7:15 AM	0	0	0	3	0	0	0	0	0	0	7	0	0	0	18	0	28	323
7:20 AM	0	0	0	2	0	0	0	0	0	0	13	0	0	0	11	0	26	317
7:25 AM	0	0	0	1	0	0	0	0	0	0	5	0	0	0	20	0	26	321
7:30 AM	0	0	0	1	0	0	0	0	0	0	8	0	0	0	15	0	24	320
7:35 AM	0	0	0	0	0	0	0	0	0	0	12	0	0	0	22	0	34	311
7:40 AM	0	1	0	1	0	0	0	0	0	1	3	0	0	0	9	0	15	300
7:45 AM	0	0	0	1	0	0	0	0	0	0	8	0	0	0	15	0	24	303
7:50 AM	0	2	0	1	0	0	0	0	0	0	11	0	0	0	17	1	32	311
7:55 AM	0	1	0	1	0	0	0	0	0	1	7	0	0	0	19	2	31	299
8:00 AM	0	0	0	1	0	0	0	0	0	0	13	0	0	0	15	1	30	291
8:05 AM	0	0	0	1	0	0	0	0	0	0	10	0	0	0	12	1	24	
8:10 AM	0	0	0	1	0	0	0	0	0	1	14	0	0	0	13	0	29	
8:15 AM	0	0	0	0	0	0	0	0	0	1	10	0	0	0	11	0	22	
8:20 AM	0	0	0	2	0	0	0	0	0	0	9	0	0	0	19	0	30	
8:25 AM	0	0	0	1	0	0	0	0	0	2	10	0	0	0	12	0	25	
8:30 AM	0	1	0	1	0	0	0	0	0	0	8	0	0	0	5	0	15	
8:35 AM	0	0	0	0	0	0	0	0	0	0	11	0	0	0	12	0	23	
8:40 AM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	8	0	18	
8:45 AM	0	0	0	1	0	0	0	0	0	0	15	0	0	0	16	0	32	
8:50 AM	0	1	0	1	0	0	0	0	0	1	8	0	0	0	9	0	20	
8:55 AM	0	0	0	1	0	0	0	0	0	0	9	0	0	0	13	0	23	
Count Total	0	7	0	24	0	0	0	0	0	8	229	0	0	0	332	5	605	
Peak Hour	0	4	0	14	0	0	0	0	0	3	111	0	0	0	186	5	323	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

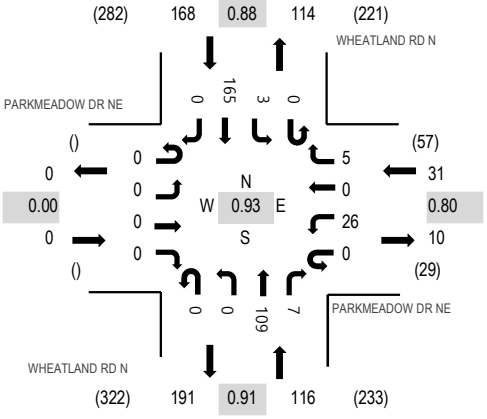
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	1	0	0	1	7:00 AM						7:00 AM	0	0	0	0	0
7:05 AM	0	1	0	0	1	7:05 AM						7:05 AM	0	0	0	0	0
7:10 AM	0	2	0	0	2	7:10 AM						7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM						7:15 AM	0	0	0	0	0
7:20 AM	0	2	0	1	3	7:20 AM						7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	2	2	7:25 AM						7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM						7:30 AM	0	0	0	0	0
7:35 AM	0	1	0	0	1	7:35 AM						7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0	7:40 AM						7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	2	2	7:45 AM						7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0	7:50 AM						7:50 AM	1	0	0	0	1
7:55 AM	0	0	0	2	2	7:55 AM						7:55 AM	0	0	0	0	0
8:00 AM	0	1	0	2	3	8:00 AM						8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	1	1	8:05 AM						8:05 AM	0	0	0	0	0
8:10 AM	0	1	0	0	1	8:10 AM						8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0	8:15 AM						8:15 AM	0	0	0	0	0
8:20 AM	0	1	0	0	1	8:20 AM						8:20 AM	0	0	0	0	0
8:25 AM	1	0	0	1	2	8:25 AM						8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	1	1	8:30 AM						8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	1	1	8:35 AM						8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM						8:40 AM	0	0	0	0	0
8:45 AM	0	1	0	0	1	8:45 AM						8:45 AM	0	0	0	0	0
8:50 AM	0	1	0	0	1	8:50 AM						8:50 AM	1	0	0	0	1
8:55 AM	0	0	0	1	1	8:55 AM						8:55 AM	1	0	0	0	1
Count Total	1	12	0	14	27	Count Total						Count Total	3	0	0	0	3
Peak Hour	0	5	0	10	15	Peak Hour						Peak Hour	1	0	0	0	1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

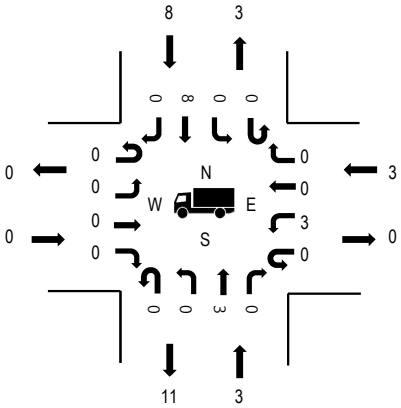
Location: 4 WHEATLAND RD N & PARKMEADOW DR NE AM
Date: Tuesday, September 29, 2020
Peak Hour: 07:25 AM - 08:25 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour

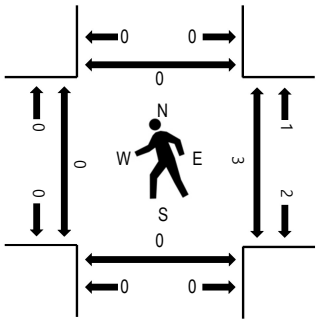
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	9.7%	0.80
NB	2.6%	0.91
SB	4.8%	0.88
All	4.4%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	PARKMEADOW DR NE Eastbound				PARKMEADOW DR NE Westbound				WHEATLAND RD N Northbound				WHEATLAND RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	0	0	0	2	0	1	0	0	7	1	0	0	9	0	20	295
7:05 AM	0	0	0	0	0	3	0	1	0	0	6	0	0	0	11	0	21	301
7:10 AM	0	0	0	0	0	2	0	0	0	0	9	2	0	0	10	0	23	304
7:15 AM	0	0	0	0	0	1	0	0	0	0	10	1	0	1	13	0	26	309
7:20 AM	0	0	0	0	0	3	0	0	0	0	8	1	0	0	9	0	21	303
7:25 AM	0	0	0	0	0	3	0	0	0	0	6	1	0	0	18	0	28	315
7:30 AM	0	0	0	0	0	2	0	1	0	0	7	0	0	0	13	0	23	303
7:35 AM	0	0	0	0	0	3	0	0	0	0	13	0	0	0	17	0	33	301
7:40 AM	0	0	0	0	0	1	0	1	0	0	2	1	0	0	10	0	15	282
7:45 AM	0	0	0	0	0	6	0	0	0	0	12	0	0	0	8	0	26	293
7:50 AM	0	0	0	0	0	1	0	0	0	0	10	2	0	0	18	0	31	296
7:55 AM	0	0	0	0	0	3	0	1	0	0	10	0	0	0	14	0	28	285
8:00 AM	0	0	0	0	0	3	0	0	0	0	11	0	0	0	12	0	26	277
8:05 AM	0	0	0	0	0	0	0	1	0	0	9	0	0	0	14	0	24	
8:10 AM	0	0	0	0	0	0	0	0	0	0	12	3	0	0	13	0	28	
8:15 AM	0	0	0	0	0	1	0	0	0	0	10	0	0	0	9	0	20	
8:20 AM	0	0	0	0	0	3	0	1	0	0	7	0	0	3	19	0	33	
8:25 AM	0	0	0	0	0	1	0	0	0	0	8	1	0	0	6	0	16	
8:30 AM	0	0	0	0	0	2	0	1	0	0	12	1	0	0	5	0	21	
8:35 AM	0	0	0	0	0	1	0	0	0	0	5	1	0	0	7	0	14	
8:40 AM	0	0	0	0	0	1	0	0	0	0	10	4	0	1	10	0	26	
8:45 AM	0	0	0	0	0	1	0	1	0	0	10	2	0	0	15	0	29	
8:50 AM	0	0	0	0	0	1	0	2	0	0	6	2	0	0	9	0	20	
8:55 AM	0	0	0	0	0	1	0	1	0	0	9	1	0	0	8	0	20	
Count Total	0	0	0	0	0	45	0	12	0	0	209	24	0	5	277	0	572	
Peak Hour	0	0	0	0	0	26	0	5	0	0	109	7	0	3	165	0	315	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

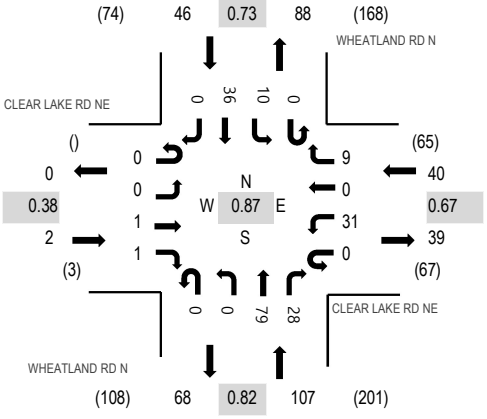
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	2	0	0	2	7:00 AM						7:00 AM	0	0	2	0	2
7:05 AM	0	1	0	0	1	7:05 AM						7:05 AM	0	0	0	0	0
7:10 AM	0	1	0	0	1	7:10 AM						7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	1	1	7:15 AM						7:15 AM	0	0	0	0	0
7:20 AM	0	2	1	1	4	7:20 AM						7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	1	1	7:25 AM						7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM						7:30 AM	0	0	1	0	1
7:35 AM	0	0	0	0	0	7:35 AM						7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	1	1	7:40 AM						7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	1	1	7:45 AM						7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	1	1	7:50 AM						7:50 AM	0	0	1	0	1
7:55 AM	0	0	1	0	1	7:55 AM						7:55 AM	0	0	1	0	1
8:00 AM	0	1	1	1	3	8:00 AM						8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	1	1	8:05 AM						8:05 AM	0	0	0	0	0
8:10 AM	0	1	0	0	1	8:10 AM						8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0	8:15 AM						8:15 AM	0	0	0	0	0
8:20 AM	0	1	1	2	4	8:20 AM						8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0	8:25 AM						8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	1	1	8:30 AM						8:30 AM	0	0	0	0	0
8:35 AM	0	0	1	0	1	8:35 AM						8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM						8:40 AM	0	0	1	0	1
8:45 AM	0	1	0	0	1	8:45 AM						8:45 AM	0	0	0	0	0
8:50 AM	0	1	0	0	1	8:50 AM						8:50 AM	0	0	0	0	0
8:55 AM	0	0	1	0	1	8:55 AM						8:55 AM	0	0	0	0	0
Count Total	0	11	6	11	28	Count Total						Count Total	0	0	6	0	6
Peak Hour	0	3	3	8	14	Peak Hour						Peak Hour	0	0	3	0	3

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

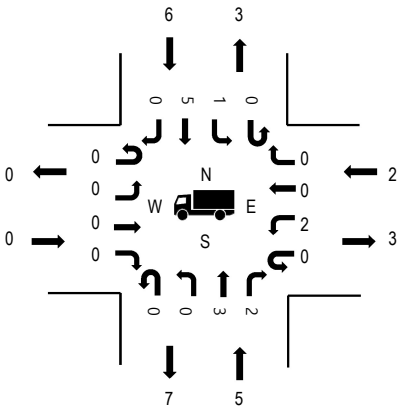
Location: 5 WHEATLAND RD N & CLEAR LAKE RD NE AM
Date: Tuesday, September 29, 2020
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:20 AM - 07:35 AM

Peak Hour

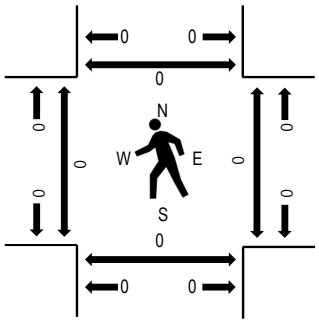
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.38
WB	5.0%	0.67
NB	4.7%	0.82
SB	13.0%	0.73
All	6.7%	0.87

Traffic Counts - Motorized Vehicles

Interval Start Time	CLEAR LAKE RD NE Eastbound				CLEAR LAKE RD NE Westbound				WHEATLAND RD N Northbound				WHEATLAND RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	0	1	0	0	0	0	0	0	7	3	0	2	2	0	15	181
7:05 AM	0	0	0	0	0	0	0	0	0	0	8	3	0	1	2	0	14	182
7:10 AM	0	0	0	0	0	3	0	0	0	0	8	0	0	0	1	0	12	189
7:15 AM	0	0	0	1	0	4	0	0	0	0	5	0	0	0	1	0	11	195
7:20 AM	0	0	1	0	0	3	0	1	0	0	10	2	0	2	3	0	22	195
7:25 AM	0	0	0	0	0	2	0	1	0	0	3	3	0	2	5	0	16	190
7:30 AM	0	0	0	0	0	4	0	0	0	0	8	2	0	2	2	0	18	187
7:35 AM	0	0	0	0	0	4	0	1	0	0	9	2	0	1	4	0	21	180
7:40 AM	0	0	0	0	0	4	0	2	0	0	5	1	0	0	1	0	13	171
7:45 AM	0	0	0	0	0	2	0	1	0	0	8	1	0	0	0	0	12	166
7:50 AM	0	0	0	0	0	2	0	0	0	0	4	2	0	0	5	0	13	166
7:55 AM	0	0	0	0	0	1	0	0	0	0	5	4	0	2	2	0	14	159
8:00 AM	0	0	0	0	0	1	0	1	0	0	6	4	0	0	4	0	16	162
8:05 AM	0	0	0	0	0	1	0	2	0	0	7	3	0	1	7	0	21	
8:10 AM	0	0	0	0	0	3	0	0	0	0	9	4	0	0	2	0	18	
8:15 AM	0	0	0	0	0	4	0	0	0	0	5	0	0	0	2	0	11	
8:20 AM	0	0	0	0	0	2	0	1	0	0	8	3	0	0	3	0	17	
8:25 AM	0	0	0	0	0	2	0	2	0	0	6	2	0	0	1	0	13	
8:30 AM	0	0	0	0	0	1	0	1	0	0	2	4	0	0	3	0	11	
8:35 AM	0	0	0	0	0	0	0	0	0	0	7	2	0	1	2	0	12	
8:40 AM	0	0	0	0	0	1	0	0	0	0	3	0	0	1	3	0	8	
8:45 AM	0	0	0	0	0	2	0	2	0	0	5	1	0	0	2	0	12	
8:50 AM	0	0	0	0	0	0	0	1	0	0	3	2	0	0	0	0	6	
8:55 AM	0	0	0	0	0	2	0	1	0	0	10	2	0	1	1	0	17	
Count Total	0	0	1	2	0	48	0	17	0	0	151	50	0	16	58	0	343	
Peak Hour	0	0	1	1	0	31	0	9	0	0	79	28	0	10	36	0	195	

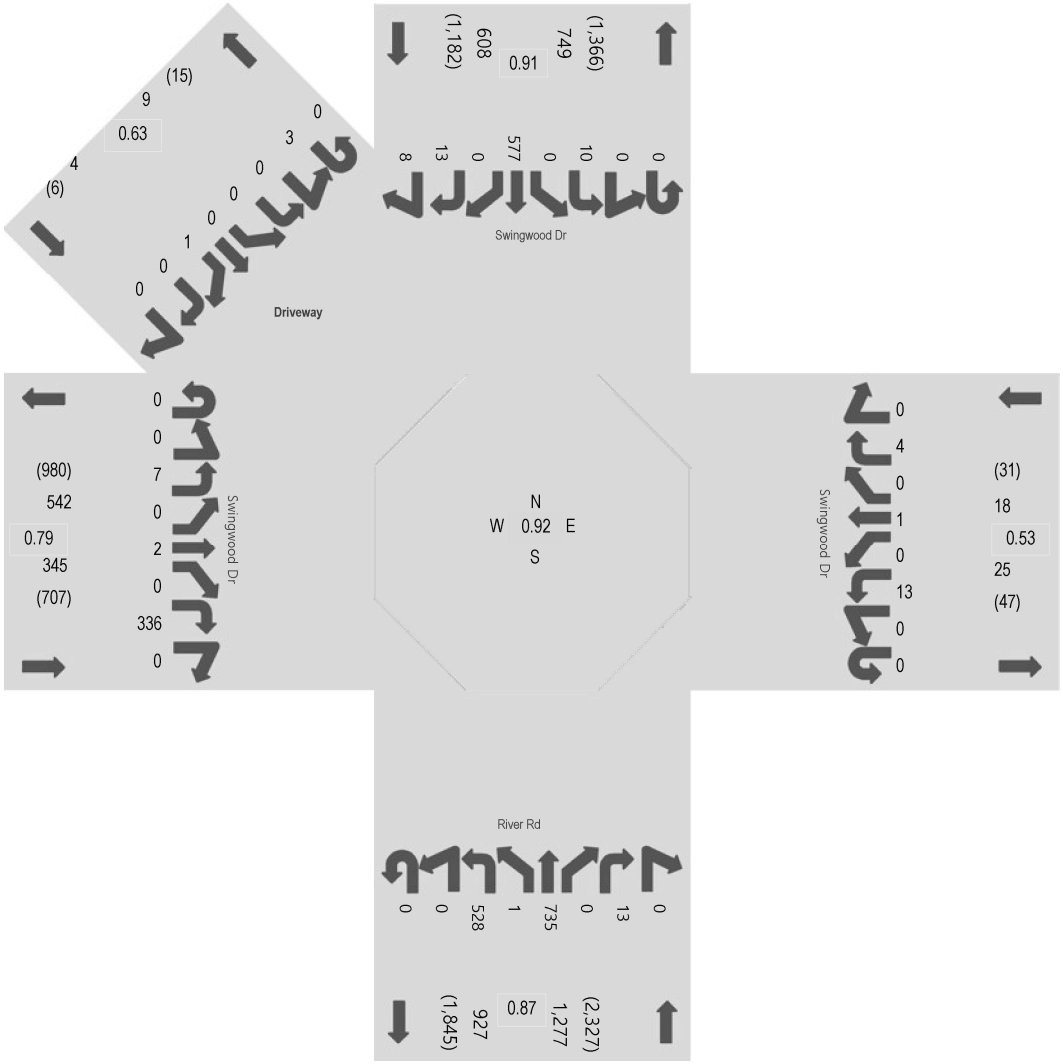
Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	1	0	0	1	7:00 AM						7:00 AM	0	0	0	0	0
7:05 AM	0	1	0	0	1	7:05 AM						7:05 AM	0	1	0	0	1
7:10 AM	0	1	0	0	1	7:10 AM						7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM						7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	1	1	7:20 AM						7:20 AM	0	0	0	0	0
7:25 AM	0	1	1	0	2	7:25 AM						7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM						7:30 AM	0	0	0	0	0
7:35 AM	0	1	0	0	1	7:35 AM						7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	1	1	7:40 AM						7:40 AM	0	0	0	0	0
7:45 AM	0	0	1	0	1	7:45 AM						7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	1	1	7:50 AM						7:50 AM	0	0	0	0	0
7:55 AM	0	1	0	1	2	7:55 AM						7:55 AM	0	0	0	0	0
8:00 AM	0	1	0	1	2	8:00 AM						8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	1	1	8:05 AM						8:05 AM	0	0	0	0	0
8:10 AM	0	1	0	0	1	8:10 AM						8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0	8:15 AM						8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	2	2	8:20 AM						8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0	8:25 AM						8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0	8:30 AM						8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	0	0	8:35 AM						8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM						8:40 AM	0	0	0	0	0
8:45 AM	0	1	0	0	1	8:45 AM						8:45 AM	0	0	0	0	0
8:50 AM	0	1	0	0	1	8:50 AM						8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM						8:55 AM	0	0	0	0	0
Count Total	0	10	2	8	20	Count Total						Count Total	0	1	0	0	1
Peak Hour	0	5	2	6	13	Peak Hour						Peak Hour	0	0	0	0	0

All Traffic Data
Services Inc.
(303) 216-2439
www.alltrafficdata.net

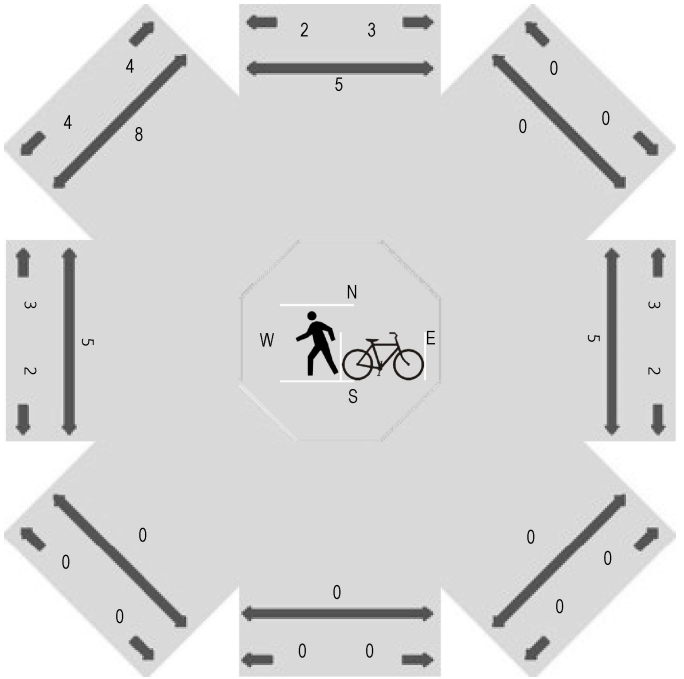
Location: River Rd & Swingwood Dr PM
Date: Tuesday, March 3, 2020
Peak Hour: 04:55 PM - 05:55 PM
Peak 15-Minutes: 04:55 PM - 05:10 PM

Peak Hour - Motorized Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



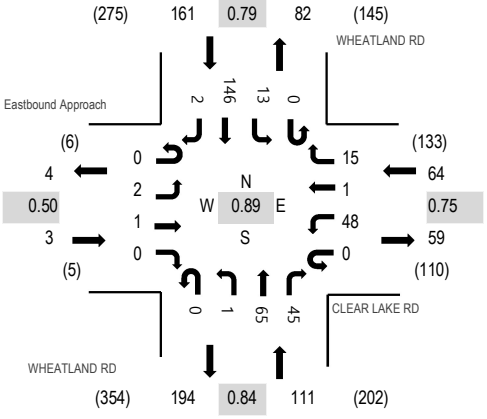
All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

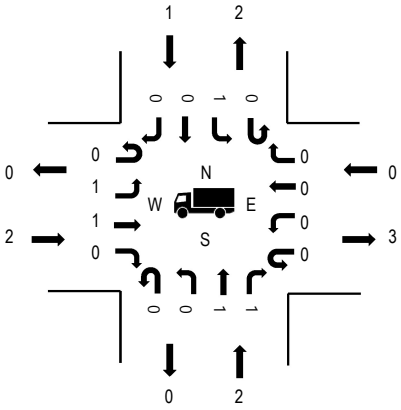
Location: WHEATLAND RD & CLEAR LAKE RD PM
Date: Tuesday, March 3, 2020
Peak Hour: 04:35 PM - 05:35 PM
Peak 15-Minutes: 04:40 PM - 04:55 PM

Peak Hour

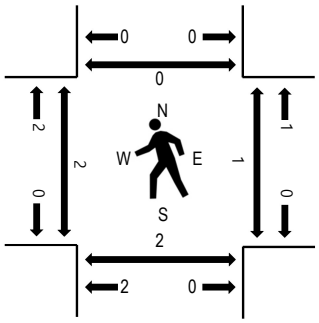
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	66.7%	0.50
WB	0.0%	0.75
NB	1.8%	0.84
SB	0.6%	0.79
All	1.5%	0.89

Traffic Counts - Motorized Vehicles

Interval Start Time	Eastbound Approach Eastbound				CLEAR LAKE RD Westbound				WHEATLAND RD Northbound				WHEATLAND RD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	0	0	0	11	0	1	0	0	5	6	0	1	5	0	29	314
4:05 PM	0	1	0	0	0	6	0	2	0	0	11	3	0	1	6	0	30	313
4:10 PM	0	0	0	1	0	1	0	2	0	0	2	3	0	0	12	0	21	305
4:15 PM	0	0	0	0	0	8	0	1	0	0	4	4	0	2	8	0	27	310
4:20 PM	0	0	0	0	0	3	0	0	0	0	2	7	0	0	7	0	19	307
4:25 PM	0	0	0	0	0	2	0	1	0	0	5	2	0	0	10	0	20	322
4:30 PM	0	0	0	0	0	2	0	2	0	0	2	4	0	0	8	0	18	331
4:35 PM	0	0	0	0	0	6	0	1	0	0	6	2	0	2	11	0	28	339
4:40 PM	0	0	1	0	0	4	0	0	0	0	4	4	0	0	15	0	28	336
4:45 PM	0	0	0	0	0	6	0	1	0	0	3	2	0	1	17	1	31	334
4:50 PM	0	0	0	0	0	2	0	2	0	0	9	6	0	2	15	0	36	319
4:55 PM	0	1	0	0	0	2	0	3	0	0	9	4	0	2	6	0	27	313
5:00 PM	0	0	0	0	0	5	0	1	0	0	5	1	0	0	16	0	28	301
5:05 PM	0	0	0	0	0	1	0	0	0	1	7	3	0	0	10	0	22	
5:10 PM	0	0	0	0	0	4	1	2	0	0	6	3	0	1	9	0	26	
5:15 PM	0	1	0	0	0	3	0	1	0	0	3	5	0	0	10	1	24	
5:20 PM	0	0	0	0	0	6	0	1	0	0	3	8	0	3	13	0	34	
5:25 PM	0	0	0	0	0	5	0	2	0	0	4	4	0	0	14	0	29	
5:30 PM	0	0	0	0	0	4	0	1	0	0	6	3	0	2	10	0	26	
5:35 PM	0	0	0	0	0	5	0	0	0	0	6	2	0	1	11	0	25	
5:40 PM	0	0	0	0	0	4	0	2	0	1	5	5	0	0	9	0	26	
5:45 PM	0	0	0	0	0	4	0	0	0	0	1	3	0	3	4	1	16	
5:50 PM	0	0	0	0	0	7	0	2	0	0	4	1	0	1	15	0	30	
5:55 PM	0	0	0	0	0	2	0	1	0	0	1	2	0	0	9	0	15	
Count Total	0	3	1	1	0	103	1	29	0	2	113	87	0	22	250	3	615	
Peak Hour	0	2	1	0	0	48	1	15	0	1	65	45	0	13	146	2	339	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

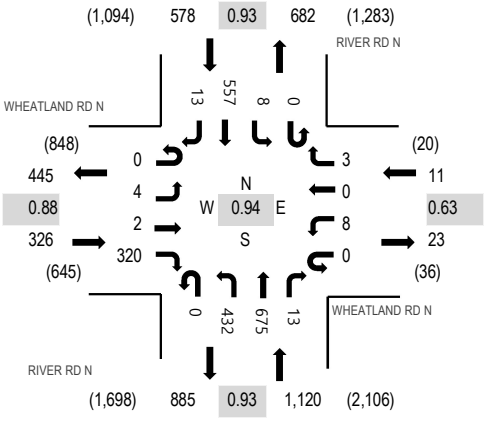
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	1	1	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	1	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	1	0	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	2	0	0	2
4:20 PM	0	1	0	0	1	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	3	0	0	3	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0	4:30 PM	1	0	0	0	1
4:35 PM	0	1	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	0	0	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	1	0	1
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	1	0	1
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	2	2	0	0	4
5:15 PM	1	0	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	1	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	1	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	2	4	2	3	11	Count Total	0	3	0	0	3	Count Total	3	4	2	0	9
Peak Hour	2	2	0	1	5	Peak Hour	0	0	0	0	0	Peak Hour	2	2	2	0	6

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

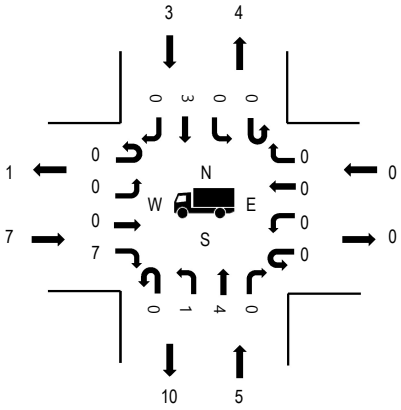
Location: 1 RIVER RD N & WHEATLAND RD N PM
Date: Tuesday, September 29, 2020
Peak Hour: 04:50 PM - 05:50 PM
Peak 15-Minutes: 05:20 PM - 05:35 PM

Peak Hour

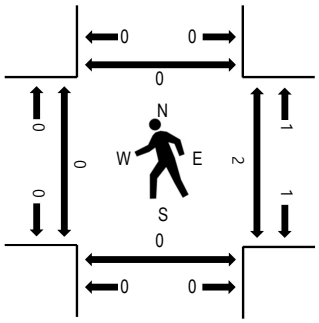
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.1%	0.88
WB	0.0%	0.63
NB	0.4%	0.93
SB	0.5%	0.93
All	0.7%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	WHEATLAND RD N Eastbound				WHEATLAND RD N Westbound				RIVER RD N Northbound				RIVER RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	4	0	25	0	0	0	0	0	21	33	1	0	0	48	0	132	1,854
4:05 PM	0	0	0	43	0	0	0	0	0	25	48	0	0	1	38	1	156	1,880
4:10 PM	0	4	0	25	0	1	1	0	0	26	55	2	0	0	42	1	157	1,917
4:15 PM	0	0	0	18	0	0	0	0	0	32	62	0	0	1	47	2	162	1,922
4:20 PM	0	0	0	24	0	1	1	0	0	37	52	1	0	1	47	1	165	1,934
4:25 PM	0	0	0	20	0	1	0	0	0	28	46	0	0	1	50	2	148	1,942
4:30 PM	0	1	0	32	0	1	0	0	0	23	51	2	0	0	47	1	158	1,981
4:35 PM	0	1	0	27	0	0	0	1	0	42	51	1	0	0	40	1	164	2,003
4:40 PM	0	0	0	30	0	1	0	1	0	33	40	1	0	0	42	1	149	2,010
4:45 PM	0	0	0	28	0	0	0	0	0	38	46	0	0	0	35	0	147	2,019
4:50 PM	0	0	0	23	0	0	0	0	0	37	61	0	0	0	39	1	161	2,035
4:55 PM	0	0	0	18	0	1	0	0	0	34	47	1	0	1	53	0	155	2,026
5:00 PM	0	0	0	39	0	1	0	0	0	34	43	0	0	0	41	0	158	2,011
5:05 PM	0	1	1	26	0	1	0	2	0	34	80	1	0	0	47	0	193	
5:10 PM	0	0	0	28	0	1	0	0	0	34	49	1	0	0	48	1	162	
5:15 PM	0	2	0	24	0	2	0	0	0	41	55	3	0	0	46	1	174	
5:20 PM	0	0	0	24	0	1	0	1	0	45	56	1	0	0	43	2	173	
5:25 PM	0	0	0	24	0	0	0	0	0	41	56	2	0	2	59	3	187	
5:30 PM	0	0	0	29	0	1	0	0	0	34	69	1	0	1	43	2	180	
5:35 PM	0	1	1	33	0	0	0	0	0	37	57	0	0	1	41	0	171	
5:40 PM	0	0	0	25	0	0	0	0	0	29	52	3	0	1	46	2	158	
5:45 PM	0	0	0	27	0	0	0	0	0	32	50	0	0	2	51	1	163	
5:50 PM	0	1	0	23	0	0	0	0	0	43	54	1	0	0	29	1	152	
5:55 PM	0	0	0	13	0	0	0	0	0	41	50	0	0	0	35	1	140	
Count Total	0	15	2	628	0	13	2	5	0	821	1,263	22	0	12	1,057	25	3,865	
Peak Hour	0	4	2	320	0	8	0	3	0	432	675	13	0	8	557	13	2,035	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

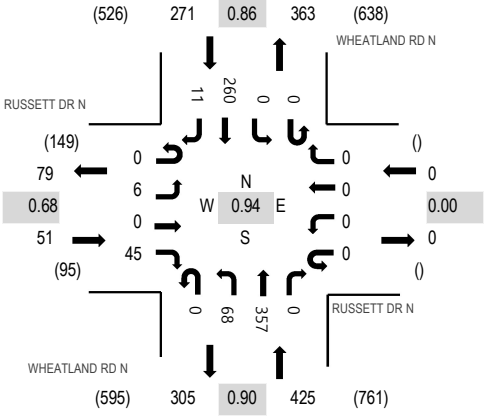
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	0	1	2	4:00 PM						4:00 PM	0	0	1	1	2
4:05 PM	1	0	0	0	1	4:05 PM						4:05 PM	2	0	0	1	3
4:10 PM	0	0	0	0	0	4:10 PM						4:10 PM	0	0	0	1	1
4:15 PM	0	1	0	0	1	4:15 PM						4:15 PM	0	0	0	2	2
4:20 PM	0	0	0	0	0	4:20 PM						4:20 PM	0	0	0	0	0
4:25 PM	1	2	0	0	3	4:25 PM						4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM						4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM						4:35 PM	0	0	0	0	0
4:40 PM	0	1	0	0	1	4:40 PM						4:40 PM	0	0	1	0	1
4:45 PM	0	1	0	1	2	4:45 PM						4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM						4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	1	1	4:55 PM						4:55 PM	0	0	0	0	0
5:00 PM	2	0	0	0	2	5:00 PM						5:00 PM	0	0	0	0	0
5:05 PM	0	1	0	0	1	5:05 PM						5:05 PM	0	0	0	0	0
5:10 PM	0	1	0	0	1	5:10 PM						5:10 PM	0	0	0	0	0
5:15 PM	2	1	0	0	3	5:15 PM						5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	1	1	5:20 PM						5:20 PM	0	0	0	0	0
5:25 PM	1	2	0	0	3	5:25 PM						5:25 PM	0	0	2	5	7
5:30 PM	0	0	0	0	0	5:30 PM						5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	1	1	5:35 PM						5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM						5:40 PM	0	0	0	0	0
5:45 PM	2	0	0	0	2	5:45 PM						5:45 PM	0	0	1	0	1
5:50 PM	0	1	0	0	1	5:50 PM						5:50 PM	0	0	0	0	0
5:55 PM	0	1	0	0	1	5:55 PM						5:55 PM	0	0	0	0	0
Count Total	11	12	0	5	28	Count Total						Count Total	2	0	5	10	17
Peak Hour	7	5	0	3	15	Peak Hour						Peak Hour	0	0	3	5	8

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

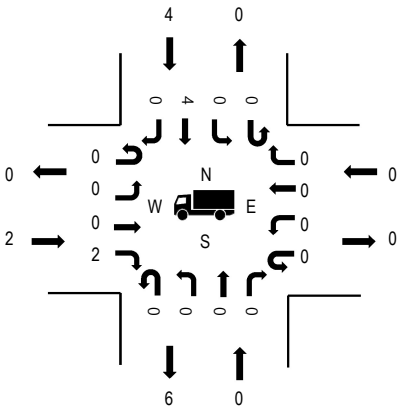
Location: 2 WHEATLAND RD N & RUSSETT DR N PM
Date: Tuesday, September 29, 2020
Peak Hour: 04:55 PM - 05:55 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour

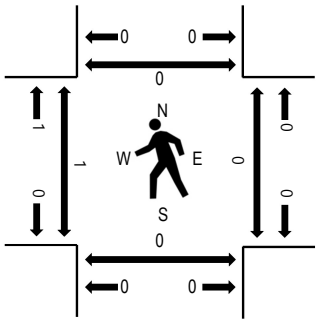
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.9%	0.68
WB	0.0%	0.00
NB	0.0%	0.90
SB	1.5%	0.86
All	0.8%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	RUSSETT DR N Eastbound				RUSSETT DR N Westbound				WHEATLAND RD N Northbound				WHEATLAND RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	0	5	0	0	0	0	0	7	12	0	0	0	25	0	49	652
4:05 PM	0	0	0	5	0	0	0	0	0	3	26	0	0	0	29	0	63	668
4:10 PM	0	0	0	5	0	0	0	0	0	2	16	0	0	0	25	0	48	666
4:15 PM	0	0	0	4	0	0	0	0	0	9	30	0	0	0	17	1	61	675
4:20 PM	0	0	0	2	0	0	0	0	0	5	26	0	0	0	14	1	48	682
4:25 PM	0	0	0	5	0	0	0	0	0	3	16	0	0	0	19	2	45	699
4:30 PM	0	1	0	1	0	0	0	0	0	6	28	0	0	0	25	0	61	719
4:35 PM	0	1	0	4	0	0	0	0	0	4	18	0	0	0	17	0	44	714
4:40 PM	0	0	0	3	0	0	0	0	0	5	35	0	0	0	25	1	69	738
4:45 PM	0	1	0	4	0	0	0	0	0	6	25	0	0	0	27	1	64	720
4:50 PM	0	0	0	2	0	0	0	0	0	7	18	0	0	0	14	0	41	723
4:55 PM	0	2	0	3	0	0	0	0	0	3	34	0	0	0	16	1	59	747
5:00 PM	0	0	0	2	0	0	0	0	0	8	33	0	0	0	22	0	65	730
5:05 PM	0	1	0	4	0	0	0	0	0	7	24	0	0	0	25	0	61	
5:10 PM	0	0	0	2	0	0	0	0	0	3	31	0	0	0	21	0	57	
5:15 PM	0	1	0	6	0	0	0	0	0	4	37	0	0	0	18	2	68	
5:20 PM	0	0	0	9	0	0	0	0	0	4	32	0	0	0	19	1	65	
5:25 PM	0	1	0	2	0	0	0	0	0	6	35	0	0	0	19	2	65	
5:30 PM	0	0	0	0	0	0	0	0	0	6	23	0	0	0	24	3	56	
5:35 PM	0	0	0	4	0	0	0	0	0	4	29	0	0	0	31	0	68	
5:40 PM	0	0	0	3	0	0	0	0	0	7	23	0	0	0	18	0	51	
5:45 PM	0	0	0	7	0	0	0	0	0	6	29	0	0	0	25	0	67	
5:50 PM	0	1	0	3	0	0	0	0	0	10	27	0	0	0	22	2	65	
5:55 PM	0	0	0	1	0	0	0	0	0	7	22	0	0	0	12	0	42	
Count Total	0	9	0	86	0	0	0	0	0	132	629	0	0	0	509	17	1,382	
Peak Hour	0	6	0	45	0	0	0	0	0	68	357	0	0	0	260	11	747	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

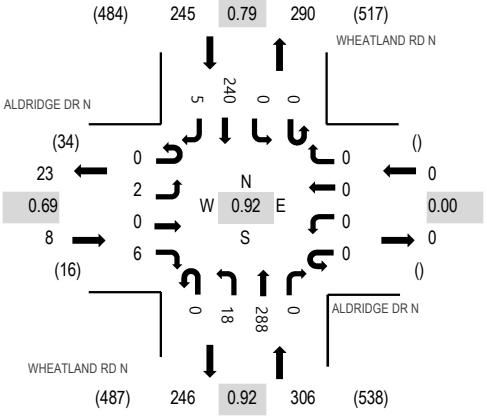
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	1	1	4:00 PM						4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM						4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM						4:10 PM	0	0	0	0	0
4:15 PM	0	1	0	0	1	4:15 PM						4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM						4:20 PM	1	0	0	0	1
4:25 PM	0	0	0	1	1	4:25 PM						4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM						4:30 PM	0	0	0	1	1
4:35 PM	0	0	0	1	1	4:35 PM						4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM						4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM						4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM						4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM						4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1	5:00 PM						5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	1	1	5:05 PM						5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM						5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	1	1	5:15 PM						5:15 PM	0	0	0	0	0
5:20 PM	1	0	0	0	1	5:20 PM						5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM						5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	1	1	5:30 PM						5:30 PM	1	0	0	0	1
5:35 PM	0	0	0	0	0	5:35 PM						5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM						5:40 PM	0	0	0	0	0
5:45 PM	1	0	0	0	1	5:45 PM						5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM						5:50 PM	0	0	0	0	0
5:55 PM	0	1	0	0	1	5:55 PM						5:55 PM	0	0	0	0	0
Count Total	2	2	0	7	11	Count Total						Count Total	2	0	0	1	3
Peak Hour	2	0	0	4	6	Peak Hour						Peak Hour	1	0	0	0	1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

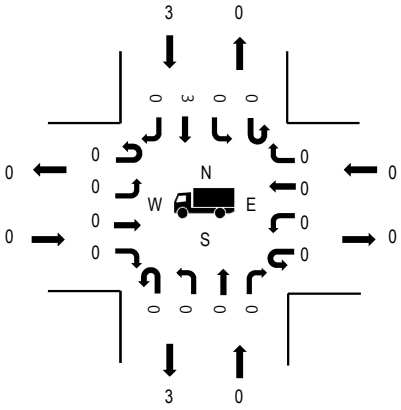
Location: 3 WHEATLAND RD N & ALDRIDGE DR N PM
Date: Tuesday, September 29, 2020
Peak Hour: 04:40 PM - 05:40 PM
Peak 15-Minutes: 05:25 PM - 05:40 PM

Peak Hour

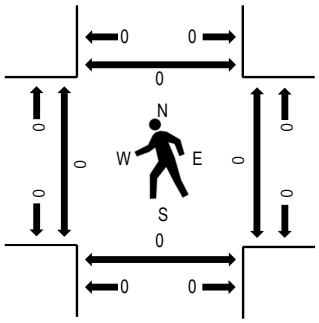
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.69
WB	0.0%	0.00
NB	0.0%	0.92
SB	1.2%	0.79
All	0.5%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	ALDRIDGE DR N Eastbound				ALDRIDGE DR N Westbound				WHEATLAND RD N Northbound				WHEATLAND RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	0	2	0	0	0	0	0	0	9	0	0	0	21	0	32	497
4:05 PM	0	0	0	1	0	0	0	0	0	0	20	0	0	0	25	0	46	512
4:10 PM	0	0	0	0	0	0	0	0	0	0	18	0	0	0	24	1	43	512
4:15 PM	0	0	0	0	0	0	0	0	0	2	20	0	0	0	19	0	41	517
4:20 PM	0	0	0	1	0	0	0	0	0	1	26	0	0	0	12	0	40	525
4:25 PM	0	0	0	0	0	0	0	0	0	1	14	0	0	0	23	1	39	528
4:30 PM	0	1	0	1	0	0	0	0	0	0	24	0	0	0	24	0	50	533
4:35 PM	0	0	0	1	0	0	0	0	0	0	12	0	0	0	18	1	32	534
4:40 PM	0	0	0	1	0	0	0	0	0	1	27	0	0	0	18	1	48	559
4:45 PM	0	0	0	0	0	0	0	0	0	3	22	0	0	0	25	0	50	551
4:50 PM	0	1	0	2	0	0	0	0	0	3	16	0	0	0	12	2	36	543
4:55 PM	0	0	0	0	0	0	0	0	0	2	23	0	0	0	14	1	40	551
5:00 PM	0	0	0	1	0	0	0	0	0	2	23	0	0	0	21	0	47	541
5:05 PM	0	0	0	0	0	0	0	0	0	2	24	0	0	0	20	0	46	
5:10 PM	0	0	0	1	0	0	0	0	0	0	28	0	0	0	18	1	48	
5:15 PM	0	0	0	0	0	0	0	0	0	1	27	0	0	0	21	0	49	
5:20 PM	0	0	0	1	0	0	0	0	0	0	27	0	0	0	15	0	43	
5:25 PM	0	0	0	0	0	0	0	0	0	2	26	0	0	0	16	0	44	
5:30 PM	0	1	0	0	0	0	0	0	0	1	21	0	0	0	28	0	51	
5:35 PM	0	0	0	0	0	0	0	0	0	1	24	0	0	0	32	0	57	
5:40 PM	0	0	0	0	0	0	0	0	0	2	20	0	0	0	17	1	40	
5:45 PM	0	0	0	0	0	0	0	0	0	0	20	0	0	0	22	0	42	
5:50 PM	0	0	0	1	0	0	0	0	0	0	22	0	0	0	21	0	44	
5:55 PM	0	0	0	0	0	0	0	0	0	0	21	0	0	0	8	1	30	
Count Total	0	3	0	13	0	0	0	0	0	24	514	0	0	0	474	10	1,038	
Peak Hour	0	2	0	6	0	0	0	0	0	18	288	0	0	0	240	5	559	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

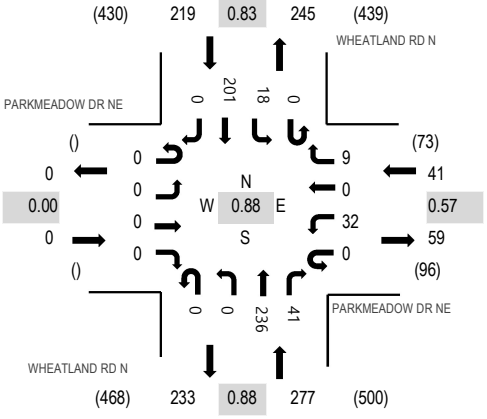
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	1	1	4:00 PM						4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM						4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM						4:10 PM	0	0	0	0	0
4:15 PM	0	1	0	1	2	4:15 PM						4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM						4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	1	1	4:25 PM						4:25 PM	1	0	0	0	1
4:30 PM	0	1	0	0	1	4:30 PM						4:30 PM	1	0	0	0	1
4:35 PM	0	0	0	0	0	4:35 PM						4:35 PM	2	0	0	0	2
4:40 PM	0	0	0	0	0	4:40 PM						4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM						4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM						4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM						4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM						5:00 PM	1	0	0	0	1
5:05 PM	0	0	0	1	1	5:05 PM						5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM						5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	1	1	5:15 PM						5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM						5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM						5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	1	1	5:30 PM						5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM						5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM						5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM						5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM						5:50 PM	0	0	0	0	0
5:55 PM	0	1	0	0	1	5:55 PM						5:55 PM	0	0	0	0	0
Count Total	0	3	0	6	9	Count Total						Count Total	5	0	0	0	5
Peak Hour	0	0	0	3	3	Peak Hour						Peak Hour	1	0	0	0	1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

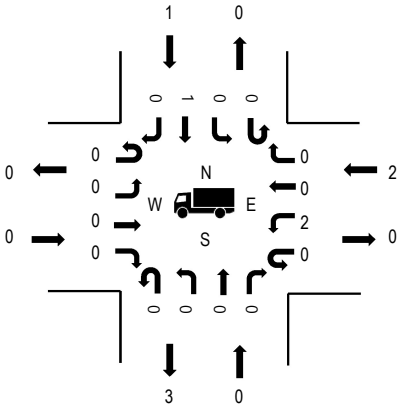
Location: 4 WHEATLAND RD N & PARKMEADOW DR NE PM
Date: Tuesday, September 29, 2020
Peak Hour: 04:55 PM - 05:55 PM
Peak 15-Minutes: 05:25 PM - 05:40 PM

Peak Hour

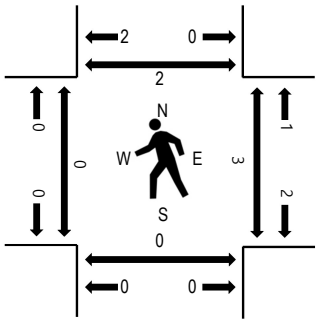
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	4.9%	0.57
NB	0.0%	0.88
SB	0.5%	0.83
All	0.6%	0.88

Traffic Counts - Motorized Vehicles

Interval Start Time	PARKMEADOW DR NE Eastbound				PARKMEADOW DR NE Westbound				WHEATLAND RD N Northbound				WHEATLAND RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	0	0	0	3	0	0	0	0	10	2	0	1	17	0	33	469
4:05 PM	0	0	0	0	0	4	0	0	0	0	19	4	0	0	22	0	49	487
4:10 PM	0	0	0	0	0	3	0	1	0	0	12	4	0	1	17	0	38	473
4:15 PM	0	0	0	0	0	1	0	0	0	0	18	1	0	0	15	0	35	485
4:20 PM	0	0	0	0	0	3	0	0	0	0	17	5	0	0	17	0	42	494
4:25 PM	0	0	0	0	0	1	0	0	0	0	9	2	0	1	17	0	30	494
4:30 PM	0	0	0	0	0	3	0	1	0	0	21	4	0	0	23	0	52	506
4:35 PM	0	0	0	0	0	4	0	0	0	0	15	1	0	1	18	0	39	513
4:40 PM	0	0	0	0	0	1	0	0	0	0	20	3	0	0	16	0	40	526
4:45 PM	0	0	0	0	0	4	0	0	0	0	19	2	0	0	17	0	42	521
4:50 PM	0	0	0	0	0	0	0	1	0	0	12	3	0	0	14	0	30	523
4:55 PM	0	0	0	0	0	1	0	1	0	0	18	6	0	0	13	0	39	537
5:00 PM	0	0	0	0	0	5	0	0	0	0	19	5	0	3	19	0	51	534
5:05 PM	0	0	0	0	0	3	0	0	0	0	15	0	0	1	16	0	35	
5:10 PM	0	0	0	0	0	1	0	0	0	0	23	5	0	3	18	0	50	
5:15 PM	0	0	0	0	0	0	0	1	0	0	24	3	0	2	14	0	44	
5:20 PM	0	0	0	0	0	1	0	0	0	0	22	2	0	2	15	0	42	
5:25 PM	0	0	0	0	0	2	0	1	0	0	23	2	0	0	14	0	42	
5:30 PM	0	0	0	0	0	4	0	0	0	0	20	6	0	1	28	0	59	
5:35 PM	0	0	0	0	0	7	0	2	0	0	17	3	0	2	21	0	52	
5:40 PM	0	0	0	0	0	3	0	0	0	0	14	6	0	0	12	0	35	
5:45 PM	0	0	0	0	0	3	0	3	0	0	20	1	0	1	16	0	44	
5:50 PM	0	0	0	0	0	2	0	1	0	0	21	2	0	3	15	0	44	
5:55 PM	0	0	0	0	0	1	0	1	0	0	18	2	0	0	14	0	36	
Count Total	0	0	0	0	0	60	0	13	0	0	426	74	0	22	408	0	1,003	
Peak Hour	0	0	0	0	0	32	0	9	0	0	236	41	0	18	201	0	537	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

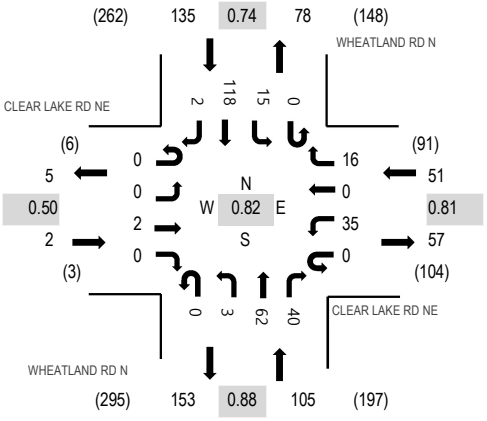
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM						4:00 PM	0	0	1	0	1
4:05 PM	0	0	0	0	0	4:05 PM						4:05 PM	0	0	1	0	1
4:10 PM	0	0	0	0	0	4:10 PM						4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM						4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM						4:20 PM	0	0	0	0	0
4:25 PM	0	0	1	0	1	4:25 PM						4:25 PM	0	3	2	0	5
4:30 PM	0	0	0	0	0	4:30 PM						4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM						4:35 PM	0	0	0	2	2
4:40 PM	0	0	0	0	0	4:40 PM						4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM						4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM						4:50 PM	0	0	1	0	1
4:55 PM	0	0	0	0	0	4:55 PM						4:55 PM	0	0	0	2	2
5:00 PM	0	0	1	0	1	5:00 PM						5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM						5:05 PM	0	0	1	0	1
5:10 PM	0	0	0	0	0	5:10 PM						5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	1	1	5:15 PM						5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM						5:20 PM	0	0	0	0	0
5:25 PM	0	0	1	0	1	5:25 PM						5:25 PM	0	0	2	0	2
5:30 PM	0	0	0	0	0	5:30 PM						5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM						5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM						5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM						5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM						5:50 PM	0	0	0	0	0
5:55 PM	0	0	1	0	1	5:55 PM						5:55 PM	0	0	1	2	3
Count Total	0	0	4	1	5	Count Total						Count Total	0	3	9	6	18
Peak Hour	0	0	2	1	3	Peak Hour						Peak Hour	0	0	3	2	5

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

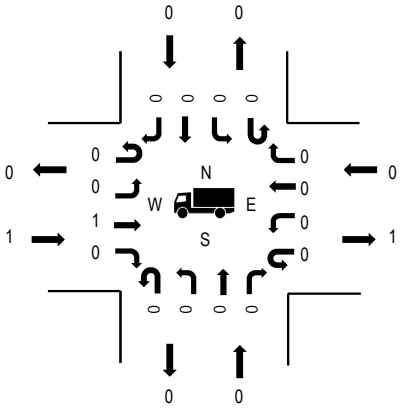
Location: 5 WHEATLAND RD N & CLEAR LAKE RD NE PM
Date: Tuesday, September 29, 2020
Peak Hour: 04:55 PM - 05:55 PM
Peak 15-Minutes: 05:25 PM - 05:40 PM

Peak Hour

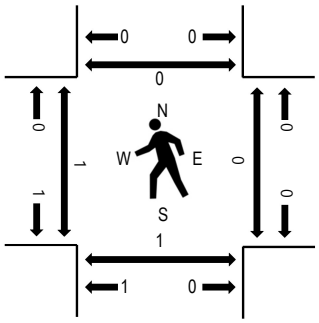
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	50.0%	0.50
WB	0.0%	0.81
NB	0.0%	0.88
SB	0.0%	0.74
All	0.3%	0.82

Traffic Counts - Motorized Vehicles

Interval Start Time	CLEAR LAKE RD NE Eastbound				CLEAR LAKE RD NE Westbound				WHEATLAND RD N Northbound				WHEATLAND RD N Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	0	0	0	4	0	0	0	0	2	0	0	0	12	0	18	263
4:05 PM	0	0	0	0	0	3	0	0	0	0	6	3	0	1	14	0	27	261
4:10 PM	0	0	0	0	0	3	0	0	0	0	3	3	0	0	8	0	17	253
4:15 PM	0	0	0	0	0	3	0	2	0	0	6	3	0	1	9	0	24	264
4:20 PM	0	0	0	0	0	6	0	2	0	0	5	4	0	1	12	0	30	267
4:25 PM	0	0	0	0	0	1	0	0	0	0	5	5	0	1	8	0	20	257
4:30 PM	0	0	0	0	0	3	0	0	0	0	5	2	0	1	6	0	17	267
4:35 PM	0	0	1	0	0	2	0	1	0	1	3	5	0	2	10	0	25	276
4:40 PM	0	0	0	0	0	1	0	1	0	0	7	3	0	4	11	0	27	284
4:45 PM	0	0	0	0	0	1	0	1	0	0	4	3	0	2	9	0	20	279
4:50 PM	0	0	0	0	0	0	0	2	0	0	7	2	0	0	5	0	16	289
4:55 PM	0	0	1	0	0	4	0	1	0	0	3	5	0	2	6	0	22	293
5:00 PM	0	0	0	0	0	5	0	0	0	0	4	1	0	0	6	0	16	290
5:05 PM	0	0	0	0	0	3	0	2	0	1	1	2	0	1	9	0	19	
5:10 PM	0	0	0	0	0	4	0	1	0	0	9	4	0	1	9	0	28	
5:15 PM	0	0	0	0	0	3	0	1	0	0	4	8	0	2	9	0	27	
5:20 PM	0	0	0	0	0	3	0	2	0	0	4	0	0	3	8	0	20	
5:25 PM	0	0	0	0	0	1	0	1	0	2	9	1	0	0	16	0	30	
5:30 PM	0	0	0	0	0	2	0	2	0	0	2	3	0	4	13	0	26	
5:35 PM	0	0	0	0	0	3	0	5	0	0	6	6	0	0	11	2	33	
5:40 PM	0	0	1	0	0	3	0	1	0	0	4	1	0	1	11	0	22	
5:45 PM	0	0	0	0	0	3	0	0	0	0	6	7	0	1	13	0	30	
5:50 PM	0	0	0	0	0	1	0	0	0	0	10	2	0	0	7	0	20	
5:55 PM	0	0	0	0	0	1	0	3	0	0	5	0	0	0	10	0	19	
Count Total	0	0	3	0	0	63	0	28	0	4	120	73	0	28	232	2	553	
Peak Hour	0	0	2	0	0	35	0	16	0	3	62	40	0	15	118	2	293	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM						4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM						4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM						4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM						4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM						4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM						4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM						4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM						4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM						4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM						4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM						4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM						4:55 PM	1	0	0	0	1
5:00 PM	0	0	0	0	0	5:00 PM						5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM						5:05 PM	0	1	0	0	1
5:10 PM	0	0	0	0	0	5:10 PM						5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM						5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM						5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM						5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM						5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM						5:35 PM	0	0	0	0	0
5:40 PM	1	0	0	0	1	5:40 PM						5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM						5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM						5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM						5:55 PM	0	0	0	0	0
Count Total	1	0	0	0	1	Count Total						Count Total	1	1	0	0	2
Peak Hour	1	0	0	0	1	Peak Hour						Peak Hour	1	1	0	0	2

All Traffic Data Services, Inc.
alltrafficdata.net

Date Start: 29-Sep-20
Date End: 29-Sep-20
Wheatland Rd N S-O Cater Dr NE
Site Code: 1

NB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
09/29/20	0	0	0	0	1	1	3	0	1	0	0	0	0	0	6	36-45	4
01:00	0	0	1	0	1	0	1	0	0	0	0	0	0	0	3	14-23	1
02:00	0	0	1	1	1	1	3	1	1	0	0	0	0	0	9	41-50	4
03:00	0	1	1	0	1	4	7	2	0	0	0	0	0	0	16	36-45	11
04:00	0	0	0	0	2	8	17	13	**4**	**3**	0	0	0	0	47	41-50	30
05:00	1	0	3	2	5	19	37	**21**	4	1	0	0	**1**	0	94	41-50	58
06:00	2	0	5	1	5	29	41	14	1	0	0	0	0	0	98	36-45	70
07:00	1	0	5	6	2	20	**54**	19	4	0	0	0	0	0	111	36-45	74
08:00	2	0	5	6	13	24	44	19	2	1	0	0	0	0	116	36-45	68
09:00	**3**	1	8	15	13	17	31	13	1	0	0	0	0	0	102	36-45	48
10:00	3	2	**24**	**42**	**37**	16	18	3	1	1	0	0	0	0	**147**	26-35	79
11:00	3	**5**	17	37	28	**31**	21	4	0	0	0	0	0	0	146	26-35	65
12 PM	3	**5**	7	**21**	**14**	42	40	10	2	**1**	0	0	0	0	145	36-45	82
13:00	6	2	3	11	11	44	55	23	**6**	1	**1**	0	0	0	163	36-45	99
14:00	2	1	9	15	4	46	52	22	3	0	0	0	0	0	154	36-45	98
15:00	**11**	0	15	6	7	**62**	67	15	3	0	0	0	0	0	186	36-45	129
16:00	6	4	**22**	18	12	46	**84**	**33**	5	1	0	0	0	0	**231**	36-45	130
17:00	1	2	16	8	9	29	65	22	6	0	0	0	**1**	0	159	36-45	94
18:00	1	1	14	7	8	38	38	14	2	1	0	0	0	0	124	36-45	76
19:00	1	0	5	2	5	16	33	13	5	0	0	0	0	0	80	36-45	49
20:00	1	0	5	2	6	16	20	15	2	0	0	0	0	0	67	36-45	36
21:00	0	0	6	1	6	6	5	7	2	1	0	0	0	0	34	31-40	12
22:00	0	0	0	0	1	5	3	2	0	0	0	0	0	0	11	35-44	8
23:00	0	0	0	0	0	1	4	0	0	0	0	0	0	0	5	36-45	5
Total	47	24	172	201	192	521	743	285	55	11	1	0	2	0	2254		
Percent	2.1%	1.1%	7.6%	8.9%	8.5%	23.1%	33.0%	12.6%	2.4%	0.5%	0.0%	0.0%	0.1%	0.0%			
AM Peak	09:00	11:00	10:00	10:00	10:00	11:00	07:00	05:00	04:00	04:00			05:00		10:00		
Vol.	3	5	24	42	37	31	54	21	4	3			1		147		
PM Peak	15:00	12:00	16:00	12:00	12:00	15:00	16:00	16:00	13:00	12:00	13:00		17:00		16:00		
Vol.	11	5	22	21	14	62	84	33	6	1	1		1		231		
Total	47	24	172	201	192	521	743	285	55	11	1	0	2	0	2254		
Percent	2.1%	1.1%	7.6%	8.9%	8.5%	23.1%	33.0%	12.6%	2.4%	0.5%	0.0%	0.0%	0.1%	0.0%			

	15th Percentile :	27 MPH
	50th Percentile :	39 MPH
	85th Percentile :	45 MPH
	95th Percentile :	49 MPH
Stats	10 MPH Pace Speed :	36-45 MPH
	Number in Pace :	1264
	Percent in Pace :	56.1%
	Number of Vehicles > 55 MPH :	14
	Percent of Vehicles > 55 MPH :	0.6%
	Mean Speed(Average) :	38 MPH

All Traffic Data Services, Inc.
alltrafficdata.net

Date Start: 29-Sep-20
Date End: 29-Sep-20
Wheatland Rd N S-O Cater Dr NE
Site Code: 1

SB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
09/29/20	0	0	1	0	0	3	3	0	0	0	0	0	0	0	7	36-45	6
01:00	0	0	1	1	1	1	2	1	0	0	0	0	0	0	7	41-50	3
02:00	0	0	1	1	1	1	1	0	0	0	0	0	0	0	5	36-45	2
03:00	0	1	0	0	1	5	9	0	0	0	0	0	0	0	16	36-45	14
04:00	0	1	3	1	0	8	21	4	0	0	0	0	0	0	38	36-45	29
05:00	0	1	11	4	5	22	33	7	0	0	0	0	0	0	83	36-45	55
06:00	2	5	14	4	8	**42**	**63**	**17**	1	0	0	0	0	0	156	36-45	105
07:00	0	3	11	3	7	36	49	15	**5**	0	0	0	0	0	129	36-45	85
08:00	2	4	12	3	9	32	39	13	1	**1**	0	0	0	0	116	36-45	71
09:00	3	2	13	3	15	34	45	16	2	0	**1**	0	0	0	134	36-45	79
10:00	4	11	40	40	22	18	7	1	0	0	0	0	0	0	143	21-30	80
11:00	**5**	**14**	**56**	**45**	**29**	17	6	0	0	0	0	0	0	0	**172**	21-30	101
12 PM	2	5	10	**14**	**30**	44	32	2	1	0	0	0	0	0	140	36-45	76
13:00	4	2	10	4	13	66	58	17	**6**	**1**	0	0	0	0	181	36-45	124
14:00	6	2	6	9	16	59	**81**	**23**	1	0	0	0	0	0	203	36-45	140
15:00	7	1	13	7	14	**69**	73	22	1	0	0	0	0	0	207	36-45	142
16:00	5	**6**	**16**	7	14	69	72	22	3	0	0	0	0	0	**214**	36-45	141
17:00	1	0	8	4	10	55	57	13	2	1	0	0	0	0	151	36-45	112
18:00	**8**	2	5	6	20	35	20	8	2	1	0	0	0	0	107	36-45	55
19:00	2	1	8	2	9	30	30	4	0	0	0	0	0	0	86	36-45	60
20:00	0	0	2	2	5	12	13	6	0	0	0	0	0	0	40	36-45	25
21:00	0	0	2	2	4	6	10	3	1	0	0	0	0	0	28	36-45	16
22:00	0	0	0	0	2	6	6	1	0	0	0	0	0	0	15	36-45	12
23:00	0	0	1	0	0	4	5	0	0	0	0	0	0	0	10	36-45	9
Total	51	61	244	162	235	674	735	195	26	4	1	0	0	0	2388		
Percent	2.1%	2.6%	10.2%	6.8%	9.8%	28.2%	30.8%	8.2%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	11:00	06:00	06:00	06:00	07:00	08:00	09:00				11:00		
Vol.	5	14	56	45	29	42	63	17	5	1	1				172		
PM Peak	18:00	16:00	16:00	12:00	12:00	15:00	14:00	14:00	13:00	13:00					16:00		
Vol.	8	6	16	14	30	69	81	23	6	1					214		
Total	51	61	244	162	235	674	735	195	26	4	1	0	0	0	2388		
Percent	2.1%	2.6%	10.2%	6.8%	9.8%	28.2%	30.8%	8.2%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	25 MPH
	50th Percentile :	38 MPH
	85th Percentile :	44 MPH
	95th Percentile :	47 MPH
Stats	10 MPH Pace Speed :	36-45 MPH
	Number in Pace :	1409
	Percent in Pace :	59.0%
	Number of Vehicles > 55 MPH :	5
	Percent of Vehicles > 55 MPH :	0.2%
	Mean Speed(Average) :	37 MPH

All Traffic Data Services, Inc.
alltrafficdata.net

Date Start: 29-Sep-20
Date End: 29-Sep-20
Wheatland Rd N S-O Cater Dr NE
Site Code: 1

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
09/29/20	0	5	0	0	1	0	0	0	0	0	0	0	0	0	6
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	6	2	0	1	0	0	0	0	0	0	0	0	0	9
03:00	0	10	5	0	1	0	0	0	0	0	0	0	0	0	16
04:00	2	23	9	0	13	0	0	0	0	0	0	0	0	0	47
05:00	1	56	18	0	18	0	0	0	0	0	0	0	0	1	94
06:00	0	49	28	2	14	0	0	2	0	1	0	0	0	2	98
07:00	0	63	29	1	15	1	0	0	0	1	0	0	0	1	111
08:00	0	54	29	1	27	1	0	1	0	1	0	0	0	2	116
09:00	1	60	19	3	14	2	0	0	0	2	0	0	0	1	102
10:00	1	89	40	1	13	0	0	1	0	0	0	0	0	2	147
11:00	2	91	29	0	18	0	0	2	0	1	0	0	0	3	146
12 PM	6	83	32	2	13	0	0	3	0	3	0	0	0	3	145
13:00	1	92	37	0	22	0	1	3	0	1	0	0	0	6	163
14:00	0	91	38	0	22	0	0	1	0	0	0	0	0	2	154
15:00	1	125	31	0	16	0	0	2	0	0	0	0	0	11	186
16:00	1	129	66	0	28	0	0	1	0	0	0	0	0	6	231
17:00	2	102	34	0	19	0	0	1	0	0	0	0	0	1	159
18:00	4	78	31	0	10	0	0	0	0	0	0	0	0	1	124
19:00	0	55	16	0	6	0	0	2	0	0	0	0	0	1	80
20:00	0	49	13	0	4	0	0	0	0	0	0	0	0	1	67
21:00	0	27	4	0	3	0	0	0	0	0	0	0	0	0	34
22:00	0	10	1	0	0	0	0	0	0	0	0	0	0	0	11
23:00	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
Total	22	1353	513	10	278	4	1	19	0	10	0	0	0	44	2254
Percent	1.0%	60.0%	22.8%	0.4%	12.3%	0.2%	0.0%	0.8%	0.0%	0.4%	0.0%	0.0%	0.0%	2.0%	
AM Peak	04:00	11:00	10:00	09:00	08:00	09:00		06:00		09:00				11:00	
Vol.	2	91	40	3	27	2		2		2				3	
PM Peak	12:00	16:00	16:00	12:00	16:00		13:00	12:00		12:00				15:00	
Vol.	6	129	66	2	28		1	3		3				11	
Grand Total	22	1353	513	10	278	4	1	19	0	10	0	0	0	44	2254
Percent	1.0%	60.0%	22.8%	0.4%	12.3%	0.2%	0.0%	0.8%	0.0%	0.4%	0.0%	0.0%	0.0%	2.0%	

All Traffic Data Services, Inc.
alltrafficdata.net

Date Start: 29-Sep-20
Date End: 29-Sep-20
Wheatland Rd N S-O Cater Dr NE
Site Code: 1

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
09/29/20	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
02:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
03:00	0	9	3	0	2	0	0	0	1	1	0	0	0	0	16
04:00	0	26	5	0	6	0	0	0	0	1	0	0	0	0	38
05:00	1	50	21	0	9	1	0	1	0	0	0	0	0	0	83
06:00	1	101	31	1	18	0	0	2	0	0	0	0	0	2	156
07:00	0	96	23	0	8	0	0	1	1	0	0	0	0	0	129
08:00	0	76	29	0	8	1	0	0	0	0	0	0	0	2	116
09:00	4	81	28	0	16	0	0	2	0	0	0	0	0	3	134
10:00	2	101	22	3	11	0	0	1	0	0	0	0	0	3	143
11:00	5	118	32	1	7	3	1	1	1	0	0	0	0	3	172
12 PM	2	98	30	0	6	0	0	3	0	0	0	0	0	1	140
13:00	3	107	42	2	21	0	0	0	0	2	0	0	0	4	181
14:00	5	129	43	2	16	0	0	3	0	0	0	0	0	5	203
15:00	7	136	47	0	12	1	0	0	0	0	0	0	0	4	207
16:00	9	145	38	0	16	0	0	1	0	0	0	0	0	5	214
17:00	2	98	32	0	18	0	0	0	0	0	0	0	0	1	151
18:00	2	77	15	0	6	0	0	1	0	0	0	0	0	6	107
19:00	1	59	18	0	5	0	0	1	0	0	0	0	0	2	86
20:00	1	33	5	0	1	0	0	0	0	0	0	0	0	0	40
21:00	0	24	3	0	1	0	0	0	0	0	0	0	0	0	28
22:00	1	12	0	0	2	0	0	0	0	0	0	0	0	0	15
23:00	0	9	1	0	0	0	0	0	0	0	0	0	0	0	10
Total	46	1603	469	9	189	6	1	17	3	4	0	0	0	41	2388
Percent	1.9%	67.1%	19.6%	0.4%	7.9%	0.3%	0.0%	0.7%	0.1%	0.2%	0.0%	0.0%	0.0%	1.7%	
AM Peak	11:00	11:00	11:00	10:00	06:00	11:00	11:00	06:00	03:00	03:00				09:00	
Vol.	5	118	32	3	18	3	1	2	1	1				3	
PM Peak	16:00	16:00	15:00	13:00	13:00	15:00		12:00		13:00				18:00	
Vol.	9	145	47	2	21	1		3		2				6	
Grand Total	46	1603	469	9	189	6	1	17	3	4	0	0	0	41	2388
Percent	1.9%	67.1%	19.6%	0.4%	7.9%	0.3%	0.0%	0.7%	0.1%	0.2%	0.0%	0.0%	0.0%	1.7%	

All Traffic Data Services, Inc.
alltrafficdata.net

Date Start: 29-Sep-20
Date End: 29-Sep-20
Wheatland Rd N N-O Laguna Dr NE
Site Code: 2

NB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
09/29/20	0	0	0	1	3	1	2	2	0	0	0	0	0	0	9	41-50	4
01:00	0	1	0	2	0	1	1	0	0	0	0	0	0	0	5	36-45	2
02:00	0	0	0	1	4	4	0	0	0	0	0	0	0	0	9	31-40	8
03:00	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3	34-43	2
04:00	0	0	0	0	3	3	2	1	0	**1**	0	0	0	0	10	31-40	6
05:00	1	0	0	1	4	16	16	2	1	1	0	0	0	0	42	36-45	32
06:00	0	0	0	2	17	18	28	9	**4**	0	0	0	0	0	78	36-45	46
07:00	7	1	1	6	19	42	35	8	4	0	0	0	0	0	123	36-45	77
08:00	4	0	0	5	31	58	43	14	0	0	0	0	0	0	155	36-45	101
09:00	7	0	**4**	2	16	71	41	9	1	0	0	0	0	0	151	36-45	112
10:00	5	0	0	**9**	27	84	40	**15**	2	0	0	0	0	0	182	36-45	124
11:00	**8**	**2**	0	4	**42**	**106**	**47**	10	2	0	0	0	0	0	**221**	36-45	153
12 PM	7	1	0	6	47	88	66	16	1	0	0	0	0	0	232	36-45	154
13:00	8	0	2	15	41	78	64	14	3	**1**	0	0	0	0	226	36-45	142
14:00	7	1	1	4	41	112	54	11	0	0	0	0	0	0	231	36-45	166
15:00	13	1	**3**	18	50	114	58	**18**	**5**	0	0	0	0	0	280	36-45	172
16:00	**16**	**2**	1	18	54	**190**	71	8	0	0	0	0	0	0	360	36-45	261
17:00	16	0	0	17	**93**	185	**81**	7	0	0	0	0	0	0	**399**	31-40	278
18:00	5	0	3	**21**	78	127	68	9	1	0	0	0	0	0	312	31-40	205
19:00	5	1	2	10	66	113	31	6	0	0	0	0	0	0	234	31-40	179
20:00	3	0	1	13	34	73	35	12	3	0	**1**	0	0	0	175	36-45	108
21:00	0	0	0	0	20	42	29	5	0	0	0	0	0	0	96	36-45	71
22:00	0	0	0	3	12	23	11	5	2	0	1	0	0	0	57	31-40	35
23:00	0	0	0	3	6	13	8	1	0	0	0	0	0	0	31	35-44	21
Total	112	10	18	161	709	1562	833	182	29	3	2	0	0	0	3621		
Percent	3.1%	0.3%	0.5%	4.4%	19.6%	43.1%	23.0%	5.0%	0.8%	0.1%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	09:00	10:00	11:00	11:00	11:00	10:00	06:00	04:00					11:00		
Vol.	8	2	4	9	42	106	47	15	4	1					221		
PM Peak	16:00	16:00	15:00	18:00	17:00	16:00	17:00	15:00	15:00	13:00	20:00				17:00		
Vol.	16	2	3	21	93	190	81	18	5	1	1				399		
Total	112	10	18	161	709	1562	833	182	29	3	2	0	0	0	3621		
Percent	3.1%	0.3%	0.5%	4.4%	19.6%	43.1%	23.0%	5.0%	0.8%	0.1%	0.1%	0.0%	0.0%	0.0%			

	15th Percentile :	31 MPH
	50th Percentile :	37 MPH
	85th Percentile :	43 MPH
	95th Percentile :	45 MPH
Stats	10 MPH Pace Speed :	36-45 MPH
	Number in Pace :	2395
	Percent in Pace :	66.1%
	Number of Vehicles > 55 MPH :	5
	Percent of Vehicles > 55 MPH :	0.1%
	Mean Speed(Average) :	37 MPH

All Traffic Data Services, Inc.
alltrafficdata.net

Date Start: 29-Sep-20
Date End: 29-Sep-20
Wheatland Rd N N-O Laguna Dr NE
Site Code: 2

SB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
09/29/20	0	0	0	0	4	4	2	0	1	0	0	0	0	0	11	31-40	8
01:00	0	0	0	1	1	3	3	0	0	0	0	0	0	0	8	36-45	6
02:00	0	0	0	0	2	1	2	1	0	0	0	0	0	0	6	41-50	3
03:00	0	0	1	0	3	4	2	2	0	0	0	0	0	0	12	31-40	7
04:00	2	0	0	1	5	7	17	2	1	0	0	0	0	0	35	36-45	24
05:00	0	0	0	3	9	22	26	18	2	1	0	0	0	0	81	36-45	48
06:00	2	0	0	3	17	41	69	35	1	0	0	0	0	0	168	36-45	110
07:00	3	0	2	4	25	84	**130**	**47**	**11**	**3**	0	0	0	0	**309**	36-45	214
08:00	1	0	1	1	24	61	91	34	7	1	0	0	0	0	221	36-45	152
09:00	1	0	0	3	19	65	103	25	10	2	0	0	0	0	228	36-45	168
10:00	5	0	3	8	25	70	83	39	4	1	0	0	0	0	238	36-45	153
11:00	**10**	**2**	**5**	**11**	**27**	**91**	70	13	1	0	0	0	0	0	230	36-45	161
12 PM	6	**1**	2	8	**42**	80	81	31	6	0	0	0	0	0	257	36-45	161
13:00	8	0	0	6	23	74	89	30	4	**1**	0	0	0	0	235	36-45	163
14:00	6	0	1	9	28	83	98	31	2	1	0	0	0	0	259	36-45	181
15:00	9	0	0	**11**	28	74	120	**43**	4	0	0	0	0	0	289	36-45	194
16:00	**13**	0	**4**	6	17	65	**145**	30	**9**	1	0	0	0	0	290	36-45	210
17:00	12	1	0	5	28	**98**	121	34	4	0	0	0	0	0	**303**	36-45	219
18:00	6	0	0	10	17	74	103	20	2	0	**1**	0	0	0	233	36-45	177
19:00	4	1	4	4	16	77	39	11	3	1	0	0	0	0	160	36-45	116
20:00	1	0	0	4	20	44	28	14	1	1	0	0	0	0	113	36-45	72
21:00	0	0	0	3	7	21	16	7	2	0	0	0	0	0	56	36-45	37
22:00	0	0	0	1	4	10	9	8	2	0	0	0	0	0	34	36-45	19
23:00	0	0	0	0	3	6	9	4	0	0	0	0	0	0	22	36-45	15
Total	89	5	23	102	394	1159	1456	479	77	13	1	0	0	0	3798		
Percent	2.3%	0.1%	0.6%	2.7%	10.4%	30.5%	38.3%	12.6%	2.0%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	11:00	11:00	07:00	07:00	07:00	07:00					07:00		
Vol.	10	2	5	11	27	91	130	47	11	3					309		
PM Peak	16:00	12:00	16:00	15:00	12:00	17:00	16:00	15:00	16:00	13:00	18:00				17:00		
Vol.	13	1	4	11	42	98	145	43	9	1	1				303		
Total	89	5	23	102	394	1159	1456	479	77	13	1	0	0	0	3798		
Percent	2.3%	0.1%	0.6%	2.7%	10.4%	30.5%	38.3%	12.6%	2.0%	0.3%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	34 MPH
	50th Percentile :	40 MPH
	85th Percentile :	45 MPH
	95th Percentile :	48 MPH
Stats	10 MPH Pace Speed :	36-45 MPH
	Number in Pace :	2615
	Percent in Pace :	68.9%
	Number of Vehicles > 55 MPH :	14
	Percent of Vehicles > 55 MPH :	0.4%
	Mean Speed(Average) :	40 MPH

All Traffic Data Services, Inc.
alltrafficdata.net

Date Start: 29-Sep-20
Date End: 29-Sep-20
Wheatland Rd N N-O Laguna Dr NE
Site Code: 2

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
09/29/20	0	7	2	0	0	0	0	0	0	0	0	0	0	0	9
01:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9
03:00	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	8	0	0	2	0	0	0	0	0	0	0	0	0	10
05:00	1	26	9	0	5	0	0	0	0	0	0	0	0	1	42
06:00	1	49	20	0	8	0	0	0	0	0	0	0	0	0	78
07:00	0	50	39	2	20	1	0	3	0	1	0	0	0	7	123
08:00	0	103	28	0	18	1	0	0	0	1	0	0	0	4	155
09:00	2	76	36	3	22	0	1	2	1	2	0	0	0	6	151
10:00	1	111	36	1	24	2	0	1	0	1	0	0	0	5	182
11:00	1	145	47	1	18	0	0	2	0	0	0	0	0	7	221
12 PM	3	148	51	0	20	0	0	1	1	1	0	0	0	7	232
13:00	6	129	50	1	25	1	0	6	0	2	0	0	0	6	226
14:00	1	157	43	0	19	0	1	2	1	1	0	0	0	6	231
15:00	2	172	59	0	32	0	0	2	0	0	0	0	0	13	280
16:00	1	260	65	1	16	0	0	1	0	0	0	0	0	16	360
17:00	3	286	70	0	25	0	0	0	0	0	0	0	0	15	399
18:00	1	216	70	0	19	0	0	1	0	0	0	0	0	5	312
19:00	4	160	53	0	12	0	0	0	0	0	0	0	0	5	234
20:00	0	127	40	0	3	0	0	2	0	0	0	0	0	3	175
21:00	0	68	21	0	7	0	0	0	0	0	0	0	0	0	96
22:00	0	47	9	0	1	0	0	0	0	0	0	0	0	0	57
23:00	0	23	6	0	2	0	0	0	0	0	0	0	0	0	31
Total	27	2382	757	9	298	5	2	23	3	9	0	0	0	106	3621
Percent	0.7%	65.8%	20.9%	0.2%	8.2%	0.1%	0.1%	0.6%	0.1%	0.2%	0.0%	0.0%	0.0%	2.9%	
AM Peak	09:00	11:00	11:00	09:00	10:00	10:00	09:00	07:00	09:00	09:00				07:00	
Vol.	2	145	47	3	24	2	1	3	1	2				7	
PM Peak	13:00	17:00	17:00	13:00	15:00	13:00	14:00	13:00	12:00	13:00				16:00	
Vol.	6	286	70	1	32	1	1	6	1	2				16	
Grand Total	27	2382	757	9	298	5	2	23	3	9	0	0	0	106	3621
Percent	0.7%	65.8%	20.9%	0.2%	8.2%	0.1%	0.1%	0.6%	0.1%	0.2%	0.0%	0.0%	0.0%	2.9%	

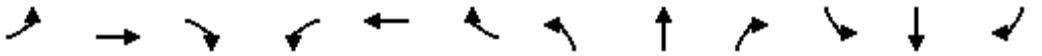
All Traffic Data Services, Inc.
alltrafficdata.net

Date Start: 29-Sep-20
Date End: 29-Sep-20
Wheatland Rd N N-O Laguna Dr NE
Site Code: 2

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
09/29/20	0	7	4	0	0	0	0	0	0	0	0	0	0	0	11
01:00	0	7	1	0	0	0	0	0	0	0	0	0	0	0	8
02:00	0	5	1	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	8	3	0	1	0	0	0	0	0	0	0	0	0	12
04:00	0	24	4	0	5	0	0	0	1	1	0	0	0	0	35
05:00	1	42	20	1	16	0	0	0	0	1	0	0	0	0	81
06:00	2	88	52	2	21	0	0	1	0	0	0	0	0	2	168
07:00	1	168	84	2	48	0	0	3	0	0	0	0	0	3	309
08:00	0	151	39	4	24	1	0	0	1	0	0	0	0	1	221
09:00	1	140	59	5	21	0	0	1	0	0	0	0	0	1	228
10:00	2	137	62	3	26	1	0	1	1	0	0	0	0	5	238
11:00	2	136	61	3	14	1	0	3	1	0	0	0	0	9	230
12 PM	0	156	67	3	24	1	0	0	0	0	0	0	0	6	257
13:00	5	132	63	2	20	0	2	3	0	0	0	0	0	8	235
14:00	3	150	55	4	35	2	0	3	0	1	0	0	0	6	259
15:00	3	188	59	4	22	0	0	4	0	0	0	0	0	9	289
16:00	5	173	74	2	21	0	0	2	0	0	0	0	0	13	290
17:00	6	194	54	3	33	0	0	2	0	0	0	0	0	11	303
18:00	2	147	50	0	28	0	0	0	0	0	0	0	0	6	233
19:00	4	106	34	1	11	0	0	1	0	0	0	0	0	3	160
20:00	0	65	39	2	6	0	0	0	0	0	0	0	0	1	113
21:00	1	41	10	1	3	0	0	0	0	0	0	0	0	0	56
22:00	0	31	3	0	0	0	0	0	0	0	0	0	0	0	34
23:00	1	12	7	0	2	0	0	0	0	0	0	0	0	0	22
Total	39	2308	905	42	381	6	2	24	4	3	0	0	0	84	3798
Percent	1.0%	60.8%	23.8%	1.1%	10.0%	0.2%	0.1%	0.6%	0.1%	0.1%	0.0%	0.0%	0.0%	2.2%	
AM Peak	06:00	07:00	07:00	09:00	07:00	08:00		07:00	04:00	04:00				11:00	
Vol.	2	168	84	5	48	1		3	1	1				9	
PM Peak	17:00	17:00	16:00	14:00	14:00	14:00	13:00	15:00		14:00				16:00	
Vol.	6	194	74	4	35	2	2	4		1				13	
Grand Total	39	2308	905	42	381	6	2	24	4	3	0	0	0	84	3798
Percent	1.0%	60.8%	23.8%	1.1%	10.0%	0.2%	0.1%	0.6%	0.1%	0.1%	0.0%	0.0%	0.0%	2.2%	

APPENDIX B: HCM REPORTS – EXISTING 2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	350	10	5	10	175	310	5	5	480	10
Future Volume (veh/h)	10	5	350	10	5	10	175	310	5	5	480	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1841	1900	1900	1900	1841	1856	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	5	0	11	5	0	190	337	4	5	522	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	4	0	0	0	4	3	0	0	0	0
Cap, veh/h	51	23	202	54	25	0	689	2623	31	774	2476	47
Arrive On Green	0.02	0.04	0.00	0.02	0.04	0.00	0.06	0.74	0.70	0.00	0.68	0.65
Sat Flow, veh/h	1263	574	2745	1263	574	0	1753	3568	42	1810	3621	69
Grp Volume(v), veh/h	16	0	0	16	0	0	190	166	175	5	260	272
Grp Sat Flow(s),veh/h/ln	1837	0	1373	1837	0	0	1753	1763	1848	1810	1805	1886
Q Serve(g_s), s	0.8	0.0	0.0	0.8	0.0	0.0	3.0	2.5	2.5	0.1	4.8	4.8
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.8	0.0	0.0	3.0	2.5	2.5	0.1	4.8	4.8
Prop In Lane	0.69		1.00	0.69		0.00	1.00		0.02	1.00		0.04
Lane Grp Cap(c), veh/h	74	0	202	78	0	0	689	1296	1358	774	1234	1289
V/C Ratio(X)	0.21	0.00	0.00	0.20	0.00	0.00	0.28	0.13	0.13	0.01	0.21	0.21
Avail Cap(c_a), veh/h	143	0	304	408	0	0	865	1296	1358	887	1234	1289
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	0.0	0.0	42.3	0.0	0.0	4.1	3.5	3.5	5.4	5.3	5.3
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.5	0.0	0.0	0.1	0.2	0.2	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.4	0.0	0.0	0.7	0.7	0.7	0.0	1.7	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	0.0	0.0	42.7	0.0	0.0	4.1	3.7	3.7	5.4	5.6	5.7
LnGrp LOS	D	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		16			16			531			537	
Approach Delay, s/veh		43.0			42.7			3.9			5.6	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	70.2		7.8	9.0	65.5		7.6				
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		6.0				
Max Green Setting (Gmax), s	6.0	38.0		18.0	14.0	30.0		5.0				
Max Q Clear Time (g_c+I1), s	2.1	4.5		2.8	5.0	6.8		2.8				
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	0.7		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		5.9
HCM 6th LOS		A

Notes

User approved changes to right turn type.

Synchro ID	Control Type	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Signal	River Rd & Wheatland Rd/Springwood Dr	Signal	A	5.9	0.33

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	60	15	135	270	5
Future Vol, veh/h	5	60	15	135	270	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	7	3	4	0
Mvmt Flow	5	64	16	144	287	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	467	291	293	0	-	0
Stage 1	291	-	-	-	-	-
Stage 2	176	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	558	753	1241	-	-	-
Stage 1	763	-	-	-	-	-
Stage 2	859	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	549	752	1240	-	-	-
Mov Cap-2 Maneuver	549	-	-	-	-	-
Stage 1	752	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1240	-	731	-	-
HCM Lane V/C Ratio	0.013	-	0.095	-	-
HCM Control Delay (s)	7.9	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	15	5	130	215	5
Future Vol, veh/h	5	15	5	130	215	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	5	5	0
Mvmt Flow	6	17	6	149	247	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	412	251	254	0	-	0
Stage 1	251	-	-	-	-	-
Stage 2	161	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	600	793	1323	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	596	792	1322	-	-	-
Mov Cap-2 Maneuver	596	-	-	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	872	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1322	-	732	-	-
HCM Lane V/C Ratio	0.004	-	0.031	-	-
HCM Control Delay (s)	7.7	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	5	125	10	5	190
Future Vol, veh/h	30	5	125	10	5	190
Conflicting Peds, #/hr	0	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	12	0	3	0	0	5
Mvmt Flow	32	5	134	11	5	204

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	357	143	0	0	148	0
Stage 1	143	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.52	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	622	910	-	-	1446	-
Stage 1	860	-	-	-	-	-
Stage 2	798	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	618	907	-	-	1442	-
Mov Cap-2 Maneuver	618	-	-	-	-	-
Stage 1	857	-	-	-	-	-
Stage 2	795	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	647	1442	-
HCM Lane V/C Ratio	-	-	0.058	0.004	-
HCM Control Delay (s)	-	-	10.9	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

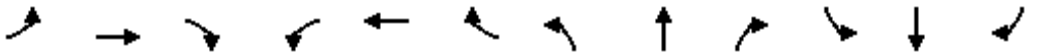
Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	35	0	10	0	90	30	10	40	0
Future Vol, veh/h	0	0	0	35	0	10	0	90	30	10	40	0
Conflicting Peds, #/hr	0	0	0	0	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	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	6	0	0	0	4	7	10	14	0
Mvmt Flow	0	0	0	40	0	11	0	103	34	11	46	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	194	205	46	188	188	120	46	0	0	137	0	0
Stage 1	68	68	-	120	120	-	-	-	-	-	-	-
Stage 2	126	137	-	68	68	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.5	6.2	4.1	-	-	4.2	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4	3.3	2.2	-	-	2.29	-	-
Pot Cap-1 Maneuver	770	695	1029	764	710	937	1575	-	-	1399	-	-
Stage 1	947	842	-	875	800	-	-	-	-	-	-	-
Stage 2	883	787	-	932	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	756	689	1029	759	704	937	1575	-	-	1399	-	-
Mov Cap-2 Maneuver	756	689	-	759	704	-	-	-	-	-	-	-
Stage 1	947	835	-	875	800	-	-	-	-	-	-	-
Stage 2	872	787	-	925	835	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	9.9	0	1.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1575	-	-	-	792	1399	-	-
HCM Lane V/C Ratio	-	-	-	-	0.065	0.008	-	-
HCM Control Delay (s)	0	-	-	0	9.9	7.6	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	335	15	5	5	530	735	15	10	575	15
Future Volume (veh/h)	5	5	335	15	5	5	530	735	15	10	575	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1781	1900	1900	1900	1885	1781	1900	1885	1900
Adj Flow Rate, veh/h	5	5	89	16	5	0	576	799	15	11	625	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	8	0	0	0	1	8	0	1	0
Cap, veh/h	68	68	610	77	24	0	701	2466	46	427	1871	42
Arrive On Green	0.05	0.07	0.05	0.03	0.06	0.00	0.17	0.69	0.65	0.01	0.52	0.49
Sat Flow, veh/h	927	927	2575	1394	436	0	1810	3595	67	1810	3581	80
Grp Volume(v), veh/h	10	0	89	21	0	0	576	398	416	11	312	327
Grp Sat Flow(s),veh/h/ln	1854	0	1288	1830	0	0	1810	1791	1871	1810	1791	1870
Q Serve(g_s), s	0.5	0.0	2.5	1.0	0.0	0.0	13.3	8.1	8.1	0.3	9.1	9.1
Cycle Q Clear(g_c), s	0.5	0.0	2.5	1.0	0.0	0.0	13.3	8.1	8.1	0.3	9.1	9.1
Prop In Lane	0.50		1.00	0.76		0.00	1.00		0.04	1.00		0.04
Lane Grp Cap(c), veh/h	136	0	610	101	0	0	701	1228	1283	427	935	977
V/C Ratio(X)	0.07	0.00	0.15	0.21	0.00	0.00	0.82	0.32	0.32	0.03	0.33	0.33
Avail Cap(c_a), veh/h	144	0	622	407	0	0	833	1228	1283	523	935	977
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	0.0	28.2	41.4	0.0	0.0	9.1	5.7	5.7	11.5	12.4	12.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	0.0	0.0	4.8	0.7	0.7	0.0	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.7	0.5	0.0	0.0	4.8	2.5	2.7	0.1	3.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	0.0	28.2	41.7	0.0	0.0	13.9	6.4	6.4	11.5	13.4	13.4
LnGrp LOS	D	A	C	D	A	A	B	A	A	B	B	B
Approach Vol, veh/h		99			21			1390			650	
Approach Delay, s/veh		29.4			41.7			9.5			13.4	
Approach LOS		C			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	65.7		9.0	19.4	51.0		10.6				
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		6.0				
Max Green Setting (Gmax), s	5.5	38.5		18.0	22.0	22.0		5.0				
Max Q Clear Time (g_c+I1), s	2.3	10.1		3.0	15.3	11.1		4.5				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.1	0.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		11.9	
HCM 6th LOS		B	

Notes

User approved changes to right turn type.

Synchro ID	Control Type	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Signal	River Rd & Wheatland Rd/Springwood Dr	Signal	B	11.9	0.33

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	50	75	405	295	15
Future Vol, veh/h	5	50	75	405	295	15
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	4	0	0	2	0
Mvmt Flow	5	53	80	431	314	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	914	323	331	0	-	0
Stage 1	323	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.2	-	-	-
Pot Cap-1 Maneuver	306	713	1240	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	557	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	279	712	1239	-	-	-
Mov Cap-2 Maneuver	279	-	-	-	-	-
Stage 1	675	-	-	-	-	-
Stage 2	556	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1239	-	624	-	-
HCM Lane V/C Ratio	0.064	-	0.094	-	-
HCM Control Delay (s)	8.1	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	5	20	320	265	5
Future Vol, veh/h	5	5	20	320	265	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
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	0	0	0	1	0
Mvmt Flow	5	5	22	348	288	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	684	292	294	0	-	0
Stage 1	292	-	-	-	-	-
Stage 2	392	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	417	752	1279	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	407	751	1278	-	-	-
Mov Cap-2 Maneuver	407	-	-	-	-	-
Stage 1	745	-	-	-	-	-
Stage 2	686	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1278	-	528	-	-
HCM Lane V/C Ratio	0.017	-	0.021	-	-
HCM Control Delay (s)	7.9	0	12	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	10	280	45	20	235
Future Vol, veh/h	35	10	280	45	20	235
Conflicting Peds, #/hr	0	2	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	6	0	0	0	0	0
Mvmt Flow	40	11	318	51	23	267

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	660	349	0	0	372	0
Stage 1	347	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Critical Hdwy	6.46	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	422	699	-	-	1198	-
Stage 1	707	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	411	696	-	-	1195	-
Mov Cap-2 Maneuver	411	-	-	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	715	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	452	1195	-
HCM Lane V/C Ratio	-	-	0.113	0.019	-
HCM Control Delay (s)	-	-	14	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	2.4

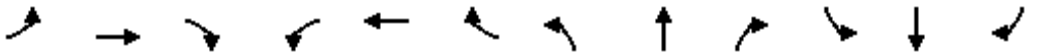
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	50	0	15	0	65	45	15	145	0
Future Vol, veh/h	0	0	0	50	0	15	0	65	45	15	145	0
Conflicting Peds, #/hr	2	0	0	0	0	2	1	0	2	2	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	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	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	50	100	0	0	0	0	0	2	2	8	0	0
Mvmt Flow	0	0	0	56	0	17	0	73	51	17	163	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	307	324	164	298	299	103	164	0	0	126	0	0
Stage 1	198	198	-	101	101	-	-	-	-	-	-	-
Stage 2	109	126	-	197	198	-	-	-	-	-	-	-
Critical Hdwy	7.6	7.5	6.2	7.1	6.5	6.2	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.9	3.3	3.5	4	3.3	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	561	463	886	658	616	957	1427	-	-	1424	-	-
Stage 1	705	586	-	910	815	-	-	-	-	-	-	-
Stage 2	792	637	-	809	741	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	544	456	885	650	606	953	1426	-	-	1421	-	-
Mov Cap-2 Maneuver	544	456	-	650	606	-	-	-	-	-	-	-
Stage 1	704	578	-	908	813	-	-	-	-	-	-	-
Stage 2	777	636	-	798	731	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	10.7	0	0.7
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1426	-	-	-	701	1421	-	-
HCM Lane V/C Ratio	-	-	-	-	0.104	0.012	-	-
HCM Control Delay (s)	0	-	-	0	10.7	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0	-	-

APPENDIX C: HCM REPORTS – FUTURE 2044



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	425	10	5	10	215	380	5	5	585	10
Future Volume (veh/h)	10	5	425	10	5	10	215	380	5	5	585	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1841	1900	1900	1900	1841	1856	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	5	1	11	5	0	234	413	4	5	636	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	4	0	0	0	4	3	0	0	0	0
Cap, veh/h	52	24	230	54	25	0	634	2626	25	717	2449	38
Arrive On Green	0.02	0.04	0.02	0.02	0.04	0.00	0.06	0.73	0.70	0.00	0.67	0.64
Sat Flow, veh/h	1263	574	2721	1263	574	0	1753	3577	35	1810	3636	57
Grp Volume(v), veh/h	16	0	1	16	0	0	234	203	214	5	316	330
Grp Sat Flow(s),veh/h/ln	1837	0	1360	1837	0	0	1753	1763	1849	1810	1805	1888
Q Serve(g_s), s	0.8	0.0	0.0	0.8	0.0	0.0	3.8	3.1	3.1	0.1	6.2	6.2
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.8	0.0	0.0	3.8	3.1	3.1	0.1	6.2	6.2
Prop In Lane	0.69		1.00	0.69		0.00	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	76	0	230	78	0	0	634	1294	1358	717	1216	1272
V/C Ratio(X)	0.21	0.00	0.00	0.20	0.00	0.00	0.37	0.16	0.16	0.01	0.26	0.26
Avail Cap(c_a), veh/h	143	0	328	408	0	0	826	1294	1358	823	1216	1272
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	0.0	37.8	42.3	0.0	0.0	4.4	3.6	3.6	5.7	5.8	5.8
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.5	0.0	0.0	0.1	0.3	0.2	0.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.4	0.0	0.0	1.0	0.9	0.9	0.0	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	0.0	37.8	42.7	0.0	0.0	4.5	3.9	3.9	5.7	6.3	6.3
LnGrp LOS	D	A	D	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		17			16			651			651	
Approach Delay, s/veh		42.6			42.7			4.1			6.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	70.1		7.8	9.8	64.6		7.7				
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		6.0				
Max Green Setting (Gmax), s	5.6	38.4		18.0	15.7	28.3		5.0				
Max Q Clear Time (g_c+I1), s	2.1	5.1		2.8	5.8	8.2		2.8				
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	0.9		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		6.1
HCM 6th LOS		A

Notes

User approved changes to right turn type.

Synchro ID	Control Type	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Signal	River Rd & Wheatland Rd/Springwood Dr	Signal	A	6.1	0.40

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	75	20	165	330	5
Future Vol, veh/h	5	75	20	165	330	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	7	3	4	0
Mvmt Flow	5	80	21	176	351	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	573	355	357	0	-	0
Stage 1	355	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	484	693	1174	-	-	-
Stage 1	714	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	473	692	1173	-	-	-
Mov Cap-2 Maneuver	473	-	-	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	822	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1173	-	673	-	-
HCM Lane V/C Ratio	0.018	-	0.126	-	-
HCM Control Delay (s)	8.1	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	20	5	160	260	5
Future Vol, veh/h	5	20	5	160	260	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	0	0	0	5	5	0
Mvmt Flow	6	22	6	178	289	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	483	293	296	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	190	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	546	751	1277	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	847	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	542	750	1276	-	-	-
Mov Cap-2 Maneuver	542	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	846	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1276	-	697	-	-
HCM Lane V/C Ratio	0.004	-	0.04	-	-
HCM Control Delay (s)	7.8	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	5	155	10	5	230
Future Vol, veh/h	35	5	155	10	5	230
Conflicting Peds, #/hr	0	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	12	0	3	0	0	5
Mvmt Flow	38	5	167	11	5	247

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	433	176	0	0	181	0
Stage 1	176	-	-	-	-	-
Stage 2	257	-	-	-	-	-
Critical Hdwy	6.52	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	561	872	-	-	1407	-
Stage 1	831	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	557	870	-	-	1403	-
Mov Cap-2 Maneuver	557	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	760	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	583	1403	-
HCM Lane V/C Ratio	-	-	0.074	0.004	-
HCM Control Delay (s)	-	-	11.7	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

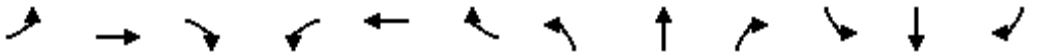
Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	45	0	10	0	110	35	10	50	0
Future Vol, veh/h	0	0	0	45	0	10	0	110	35	10	50	0
Conflicting Peds, #/hr	0	0	0	0	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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	6	0	0	0	4	7	10	14	0
Mvmt Flow	0	0	0	50	0	11	0	122	39	11	56	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	225	239	56	220	220	142	56	0	0	161	0	0
Stage 1	78	78	-	142	142	-	-	-	-	-	-	-
Stage 2	147	161	-	78	78	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.5	6.2	4.1	-	-	4.2	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4	3.3	2.2	-	-	2.29	-	-
Pot Cap-1 Maneuver	735	666	1016	728	682	911	1562	-	-	1371	-	-
Stage 1	936	834	-	851	783	-	-	-	-	-	-	-
Stage 2	860	769	-	921	834	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	722	661	1016	724	677	911	1562	-	-	1371	-	-
Mov Cap-2 Maneuver	722	661	-	724	677	-	-	-	-	-	-	-
Stage 1	936	827	-	851	783	-	-	-	-	-	-	-
Stage 2	850	769	-	914	827	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	10.2	0	1.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1562	-	-	-	752	1371	-	-
HCM Lane V/C Ratio	-	-	-	-	0.081	0.008	-	-
HCM Control Delay (s)	0	-	-	0	10.2	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	410	20	5	5	645	895	20	10	775	20
Future Volume (veh/h)	5	5	410	20	5	5	645	895	20	10	775	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1781	1900	1900	1900	1885	1781	1900	1885	1900
Adj Flow Rate, veh/h	5	5	193	22	5	0	701	973	21	11	842	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	8	0	0	0	1	8	0	1	0
Cap, veh/h	72	72	825	88	20	0	675	2425	52	329	1575	37
Arrive On Green	0.06	0.08	0.06	0.04	0.06	0.00	0.24	0.68	0.64	0.01	0.44	0.41
Sat Flow, veh/h	927	927	2575	1488	338	0	1810	3583	77	1810	3576	85
Grp Volume(v), veh/h	10	0	193	27	0	0	701	486	508	11	422	440
Grp Sat Flow(s),veh/h/ln	1854	0	1288	1826	0	0	1810	1791	1869	1810	1791	1870
Q Serve(g_s), s	0.5	0.0	5.0	1.3	0.0	0.0	22.0	10.8	10.9	0.3	15.5	15.5
Cycle Q Clear(g_c), s	0.5	0.0	5.0	1.3	0.0	0.0	22.0	10.8	10.9	0.3	15.5	15.5
Prop In Lane	0.50		1.00	0.81		0.00	1.00		0.04	1.00		0.05
Lane Grp Cap(c), veh/h	144	0	825	109	0	0	675	1212	1265	329	789	824
V/C Ratio(X)	0.07	0.00	0.23	0.25	0.00	0.00	1.04	0.40	0.40	0.03	0.53	0.53
Avail Cap(c_a), veh/h	144	0	825	406	0	0	675	1212	1265	425	789	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	0.0	23.8	41.2	0.0	0.0	17.7	6.4	6.5	15.5	18.4	18.5
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.4	0.0	0.0	44.9	1.0	0.9	0.0	2.6	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.5	0.6	0.0	0.0	15.9	3.5	3.6	0.1	6.7	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	0.0	23.9	41.6	0.0	0.0	62.6	7.4	7.4	15.5	21.0	21.0
LnGrp LOS	D	A	C	D	A	A	F	A	A	B	C	C
Approach Vol, veh/h		203			27			1695			873	
Approach Delay, s/veh		24.6			41.6			30.3			20.9	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	64.9		9.4	26.0	43.6		11.0				
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		6.0				
Max Green Setting (Gmax), s	5.5	38.5		18.0	22.0	22.0		5.0				
Max Q Clear Time (g_c+I1), s	2.3	12.9		3.3	24.0	17.5		7.0				
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	0.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		27.0
HCM 6th LOS		C

Notes

User approved changes to right turn type.

Synchro ID	Control Type	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Signal	River Rd & Wheatland Rd/Springwood Dr	Signal	C	27.0	0.44

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	60	90	495	360	20
Future Vol, veh/h	5	60	90	495	360	20
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	4	0	0	2	0
Mvmt Flow	5	64	96	527	383	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1114	395	405	0	-	0
Stage 1	395	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.2	-	-	-
Pot Cap-1 Maneuver	232	650	1165	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	204	649	1164	-	-	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	486	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1164	-	556	-	-
HCM Lane V/C Ratio	0.082	-	0.124	-	-
HCM Control Delay (s)	8.4	0	12.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	5	25	390	325	5
Future Vol, veh/h	5	5	25	390	325	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
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	0	0	0	1	0
Mvmt Flow	5	5	27	424	353	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	835	357	359	0	-	0
Stage 1	357	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	340	692	1211	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	329	691	1210	-	-	-
Mov Cap-2 Maneuver	329	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	627	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1210	-	446	-	-
HCM Lane V/C Ratio	0.022	-	0.024	-	-
HCM Control Delay (s)	8	0	13.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	10	340	55	25	285
Future Vol, veh/h	45	10	340	55	25	285
Conflicting Peds, #/hr	0	2	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	6	0	0	0	0	0
Mvmt Flow	50	11	378	61	28	317

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	785	414	0	0	442	0
Stage 1	412	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.46	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	356	643	-	-	1129	-
Stage 1	660	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	344	640	-	-	1126	-
Mov Cap-2 Maneuver	344	-	-	-	-	-
Stage 1	658	-	-	-	-	-
Stage 2	667	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.4	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	376	1126	-
HCM Lane V/C Ratio	-	-	0.163	0.025	-
HCM Control Delay (s)	-	-	16.4	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	60	0	20	0	80	55	20	175	0
Future Vol, veh/h	0	0	0	60	0	20	0	80	55	20	175	0
Conflicting Peds, #/hr	2	0	0	0	0	2	1	0	2	2	0	1
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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	50	100	0	0	0	0	0	2	2	8	0	0
Mvmt Flow	0	0	0	67	0	22	0	89	61	22	194	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	372	391	195	360	361	124	195	0	0	152	0	0
Stage 1	239	239	-	122	122	-	-	-	-	-	-	-
Stage 2	133	152	-	238	239	-	-	-	-	-	-	-
Critical Hdwy	7.6	7.5	6.2	7.1	6.5	6.2	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.9	3.3	3.5	4	3.3	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	506	420	851	599	569	932	1390	-	-	1393	-	-
Stage 1	669	559	-	887	799	-	-	-	-	-	-	-
Stage 2	768	618	-	770	711	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	486	411	850	589	557	928	1389	-	-	1390	-	-
Mov Cap-2 Maneuver	486	411	-	589	557	-	-	-	-	-	-	-
Stage 1	668	548	-	885	797	-	-	-	-	-	-	-
Stage 2	748	617	-	756	697	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.4	0	0.8
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1389	-	-	-	648	1390	-	-
HCM Lane V/C Ratio	-	-	-	-	0.137	0.016	-	-
HCM Control Delay (s)	0	-	-	0	11.4	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-

APPENDIX D: CRASH DATA (2014 – 2018)

OBJECTID	SHAPE	KABCO	Crash ID	Crash Date	Crash Hour Description	County	City	Federal Aid Urban Name	FHWA Functional Classification	Latitude	Longitude	Road Description	Intersecting Road Description
2599	No Data	A	1721195	3/1/2017	02:00 PM to 02:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01891389	-123.0247056	WHEATLAND RD	NEW TERRACE CT N
12832	No Data	B	1553301	5/27/2014	03:00 PM to 03:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01485971	-123.0231042	WHEATLAND RD	FOOTHILL DR N
18859	No Data	B	1576559	12/27/2014	11:00 PM to 11:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN PRINCIPAL ARTERIAL - OTHER	45.01193611	-123.0206583	RIVER RD N	WHEATLAND RD
28497	No Data	B	1734249	8/2/2017	06:00 PM to 06:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01465278	-123.02295	WHEATLAND RD N	MCNARY HEIGHTS DR N
31211	No Data	B	1601799	1/5/2015	12:00 PM (Noon) to 12:59	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01444444	-123.0227583	MCNARY HEIGHTS DR N	WHEATLAND RD N
32056	No Data	B	1605191	3/16/2015	12:00 PM (Noon) to 12:59	Marion	Keizer	Salem-Keizer UA	URBAN PRINCIPAL ARTERIAL - OTHER	45.0121028	-123.0206111	RIVER RD N	SWINGWOOD DR N
52627	No Data	C	1686519	1/14/2016	08:00 PM to 08:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01193611	-123.0206583	RIVER RD N	WHEATLAND RD N
55620	No Data	C	1792905	9/18/2018	07:00 AM to 07:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01193333	-123.0206556	RIVER RD N	WHEATLAND RD N
36661	No Data	B	1785167	5/25/2018	08:00 PM to 08:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.026775	-123.0252444	OTTER WAY N	WHEATLAND RD N
57926	No Data	C	1666278	5/6/2016	10:00 PM to 10:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01193611	-123.0206583	RIVER RD N	WHEATLAND RD N
48136	No Data	B	1620366	10/13/2015	04:00 PM to 04:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01444444	-123.0227583	MCNARY HEIGHTS DR N	WHEATLAND RD N
51761	No Data	C	1796497	11/29/2018	04:00 PM to 04:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.02336111	-123.0252417	WHEATLAND RD N	FARMLAND LN NE
65276	No Data	C	1797305	12/9/2018	08:00 PM to 08:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01193611	-123.0206583	RIVER RD N	WHEATLAND RD N
66459	No Data	C	1609215	6/6/2015	02:00 PM to 02:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01268889	-123.0213944	WHEATLAND RD N	RIVER RD N
56045	No Data	C	1671795	3/24/2016	02:00 PM to 02:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.02351667	-123.0252417	HAZELBROOK DR	WHEATLAND RD N
68342	No Data	C	1778932	2/26/2018	04:00 PM to 04:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01193333	-123.0206583	RIVER RD N	WHEATLAND RD N
91332	No Data	C	1604682	3/10/2015	04:00 PM to 04:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN PRINCIPAL ARTERIAL - OTHER	45.01193611	-123.0206583	RIVER RD N	WHEATLAND RD N
110963	No Data	C	1739246	10/11/2017	04:00 PM to 04:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01193611	-123.0206583	RIVER RD N	WHEATLAND RD N
112124	No Data	C	1566371	9/24/2014	07:00 AM to 07:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN PRINCIPAL ARTERIAL - OTHER	45.0123111	-123.0205694	RIVER RD N	SWINGWOOD DR N
117218	No Data	C	1572856	11/26/2014	06:00 AM to 06:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN PRINCIPAL ARTERIAL - OTHER	45.01193611	-123.0206583	RIVER RD N	WHEATLAND RD N
82829	No Data	C	1789011	7/23/2018	02:00 PM to 02:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.03172778	-123.0244083	WHEATLAND RD	PINEHURST AVE
83331	No Data	C	1798762	8/15/2018	07:00 AM to 07:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.02598056	-123.0252444	WHEATLAND RD N	CATER DR NE
132329	No Data	C	1663408	3/26/2016	01:00 PM to 01:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01193611	-123.0206583	RIVER RD N	WHEATLAND RD N
98050	No Data	C	1557238	3/7/2014	09:00 PM to 09:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.02323768	-123.025243	FARMLAND LN NE	WHEATLAND RD N
140746	No Data	C	1675426	8/11/2016	12:00 PM (Noon) to 12:59	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.0121028	-123.0206111	RIVER RD N	SWINGWOOD DR N
107140	No Data	C	1734319	8/3/2017	08:00 PM to 08:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01268889	-123.0213944	WHEATLAND RD N	MISTLETOE LP N
108329	No Data	C	1725438	5/11/2017	05:00 PM to 05:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01444444	-123.0227583	MCNARY HEIGHTS DR N	WHEATLAND RD N
109572	No Data	C	1733547	7/22/2017	08:00 PM to 08:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01444444	-123.0227583	MCNARY HEIGHTS DR N	WHEATLAND RD N
147874	No Data	O	1807853	7/9/2018	12:00 PM (Noon) to 12:59	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01146389	-123.0208	RIVER RD N	WHEATLAND RD N
151054	No Data	O	1817911	10/12/2018	09:00 AM to 09:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01158056	-123.0207639	RIVER RD N	WHEATLAND RD N
114896	No Data	C	1564827	9/6/2014	02:00 AM to 02:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN LOCAL	45.02060479	-123.0252172	NOTTINGHAM DR NE	WHEATLAND RD
116064	No Data	C	1733822	7/26/2017	11:00 AM to 11:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.02351667	-123.0252417	HAZELBROOK DR	WHEATLAND RD N
186216	No Data	O	1639962	6/12/2015	08:00 PM to 08:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01207222	-123.0211278	WHEATLAND RD N	RIVER RD N
118583	No Data	C	1564444	9/3/2014	03:00 PM to 03:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01699499	-123.024069	WHEATLAND RD N	DELTA DR NE
191921	No Data	O	1710171	9/28/2016	03:00 PM to 03:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01193611	-123.0206583	RIVER RD N	WHEATLAND RD N
229510	No Data	O	1770022	11/6/2017	03:00 PM to 03:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01151111	-123.0207833	RIVER RD N	WHEATLAND RD N
235682	No Data	O	1553984	6/26/2014	12:00 PM (Noon) to 12:59	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01199019	-123.0210127	RIVER RD N	WHEATLAND RD
262555	No Data	O	1553939	6/24/2014	12:00 PM (Noon) to 12:59	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01203146	-123.021085	WHEATLAND RD	RIVER RD N
262788	No Data	O	1555789	7/2/2014	12:00 PM (Noon) to 12:59	Marion	Keizer	Salem-Keizer UA	URBAN PRINCIPAL ARTERIAL - OTHER	45.01193546	-123.0206572	RIVER RD N	WHEATLAND RD N
35341	No Data	B	1741926	11/16/2017	11:00 AM to 11:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01743611	-123.0242139	RUSSETT DR N	WHEATLAND RD
125555	No Data	C	1745299	12/11/2017	12:00 PM (Noon) to 12:59	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01743611	-123.0242139	RUSSETT DR N	WHEATLAND RD
151334	No Data	O	1806430	5/22/2018	01:00 PM to 01:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01341944	-123.0219194	WHEATLAND RD N	MISTLETOE LP N
137562	No Data	C	1657601	1/11/2016	04:00 PM to 04:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01743611	-123.0242139	RUSSETT DR N	WHEATLAND RD
168630	No Data	O	1750395	1/15/2017	05:00 PM to 05:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01329444	-123.0218111	WHEATLAND RD N	MISTLETOE LP N
162804	No Data	O	1806215	5/15/2018	04:00 PM to 04:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01743611	-123.0242139	RUSSETT DR N	WHEATLAND RD
272310	No Data	O	1574478	12/10/2014	02:00 PM to 02:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01743611	-123.0242139	RUSSETT DR N	WHEATLAND RD
200375	No Data	O	1645740	10/18/2015	10:00 PM to 10:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01428056	-123.022625	WHEATLAND RD	FOOTHILL DR N
31551	No Data	B	1671391	6/17/2016	02:00 PM to 02:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.024575	-123.02525	WHEATLAND RD N	PARKMEADOW DR N
47531	No Data	B	1621541	11/3/2015	09:00 AM to 09:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.03531111	-123.0213417	CLEAR LAKE RD NE	WHEATLAND RD NE
68131	No Data	C	1793578	10/9/2018	03:00 PM to 03:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.03488889	-123.0218083	WHEATLAND RD NE	CLEAR LAKE RD NE
104423	No Data	C	1735321	8/19/2017	09:00 PM to 09:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.03531111	-123.0213417	CLEAR LAKE RD NE	WHEATLAND RD NE
269610	No Data	O	1693720	3/29/2016	11:00 AM to 11:59 AM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.0283	-123.0251833	MERLOT AVE N	WHEATLAND LN N
270590	No Data	O	1552918	4/26/2014	01:00 PM to 01:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.01325492	-123.0217793	WHEATLAND RD N	MISTLETOE LP N
143223	No Data	O	1805166	2/18/2018	08:00 PM to 08:59 PM	Marion	Keizer	Salem-Keizer UA	URBAN MINOR ARTERIAL	45.03500278	-123.0216889	WHEATLAND RD NE	CLEAR LAKE RD NE

Distance from Intersection	Posted Speed	Rd Character Desc	Off Roadway Flag	Intersection Type Desc	Intersection Related Flag	Roundabout Flag	Driveway Related Flag	Number of Lanes	Number of Turning Legs	Median Type Desc
71	No Data	Straight Roadway	0	No Data	1	0	0	2	No Data	No median
142	35	Driveway or Alley	0	No Data	0	0	0	2	No Data	No median
0	35	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
65	No Data	Straight Roadway	0	No Data	1	0	0	2	No Data	No median
0	No Data	Intersection	0	CROSS	0	0	0	No Data	0	No Data
0	No Data	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
0	35	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
0	No Data	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
0	No Data	Intersection	1	3-LEG	0	0	0	No Data	0	No Data
0	No Data	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
0	40	Intersection	0	CROSS	0	0	0	No Data	0	No Data
36	No Data	Straight Roadway	0	No Data	0	0	0	2	No Data	No median
0	No Data	Intersection	0	4-LEG	0	0	0	No Data	0	No Data
332	No Data	Driveway or Alley	0	No Data	0	0	0	2	No Data	No median
0	No Data	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
0	No Data	Intersection	0	4-LEG	0	0	0	No Data	0	No Data
0	40	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
0	No Data	Intersection	0	4-LEG	0	0	0	No Data	0	No Data
55	No Data	Straight Roadway	0	No Data	0	0	0	4	No Data	No median
0	No Data	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
240	No Data	Straight Roadway	1	No Data	0	0	0	2	No Data	No median
30	No Data	Driveway or Alley	0	No Data	0	0	0	2	No Data	No median
0	No Data	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
0	No Data	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
0	No Data	Intersection	0	CROSS	0	0	0	No Data	1	No Data
148	No Data	Driveway or Alley	0	No Data	0	0	0	2	No Data	No median
0	No Data	Intersection	0	CROSS	0	0	0	No Data	0	No Data
0	No Data	Intersection	0	CROSS	0	0	0	No Data	0	No Data
0	No Data	Intersection	0	CROSS	0	0	0	No Data	0	No Data
166	No Data	Straight Roadway	0	No Data	0	0	0	5	No Data	No median
119	No Data	Straight Roadway	0	No Data	0	0	0	4	No Data	No median
0	No Data	Intersection	1	3-LEG	0	0	0	No Data	0	No Data
0	No Data	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
88	No Data	Curve (horizontal curve)	0	No Data	0	0	0	3	No Data	No median
32	40	Straight Roadway	0	No Data	0	0	0	2	No Data	No median
0	No Data	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
151	No Data	Straight Roadway	0	No Data	0	0	0	4	No Data	No median
90	40	Curve (horizontal curve)	0	No Data	0	0	0	3	No Data	No median
122	No Data	Straight Roadway	0	No Data	0	0	0	3	No Data	No median
0	0	Intersection	0	4-LEG	0	0	0	No Data	1	No Data
0	No Data	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
0	No Data	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
114	No Data	Straight Roadway	1	No Data	0	0	0	2	No Data	No median
0	No Data	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
57	No Data	Straight Roadway	0	No Data	0	0	0	2	No Data	No median
0	No Data	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
0	40	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
58	No Data	Straight Roadway	1	No Data	0	0	0	2	No Data	No median
117	No Data	Straight Roadway	0	No Data	0	0	0	2	No Data	No median
0	No Data	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
158	No Data	Driveway or Alley	0	No Data	0	0	0	2	No Data	No median
0	No Data	Intersection	0	3-LEG	0	0	1	No Data	0	No Data
0	No Data	Intersection	0	3-LEG	0	0	0	No Data	0	No Data
50	40	Straight Roadway	1	No Data	0	0	0	2	No Data	No median
107	No Data	Straight Roadway	1	No Data	0	0	0	2	No Data	No median

Crash Type Desc	Collision Type Desc	Crash Severity Desc	Weather Desc	Road Surface Condition Desc	Light Condition Desc	Traffic Control Device Desc	School Zone Indicator
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Unknown or not definite	No Data
Pedestrian	Pedestrian	Non-Fatal Injury	Cloudy	Dry	Daylight	No control	0
Entering at angle - all others	Turning movement	Non-Fatal Injury	Clear	Dry	Darkness - with street lights	Traffic Signals	0
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Unknown or not definite	0
Pedalcyclist	Bike	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	No Data
Entering at angle - all others	Turning movement	Non-Fatal Injury	Clear	Dry	Daylight	Traffic Signals	0
From opposite direction-one left turn,one straight	Turning movement	Non-Fatal Injury	Rain	Wet	Darkness - with street lights	Traffic Signals	No Data
Pedestrian	Pedestrian	Non-Fatal Injury	Clear	Dry	Daylight	Traffic Signals	No Data
Fixed object	Fixed Object or Other Object	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	0
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Darkness - with street lights	Traffic Signals	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	0
From opposite direction - both going straight	Sideswipe - Meeting	Non-Fatal Injury	Clear	Dry	Daylight	Unknown or not definite	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Rain	Wet	Darkness - with street lights	Traffic Signals	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Unknown or not definite	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	0
From opposite direction-one left turn,one straight	Turning Movement	Non-Fatal Injury	Clear	Dry	Daylight	Traffic Signals	0
Entering at angle - one vehicle stopped	Turning movement	Non-Fatal Injury	Cloudy	Dry	Daylight	Traffic Signals	0
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Traffic Signals	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Rain	Wet	Daylight	Unknown or not definite	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Darkness - with street lights	Right Turn Green Arrow, Lane Markings, or Signal	No Data
Fixed object	Fixed Object or Other Object	Non-Fatal Injury	Clear	Dry	Daylight	Unknown or not definite	0
From opposite direction-one left turn,one straight	Turning Movement	Non-Fatal Injury	Cloudy	Dry	Daylight	Unknown or not definite	0
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Traffic Signals	0
From same direction - one turn, one straight	Turning movement	Non-Fatal Injury	Clear	Dry	Darkness - with street lights	No control	No Data
From same direction - one turn, one straight	Turning movement	Non-Fatal Injury	Clear	Dry	Daylight	Traffic Signals	0
Entering at angle - all others	Turning movement	Non-Fatal Injury	Clear	Dry	Daylight	Unknown or not definite	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	0
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	0
From same direction - both going straight	Sideswipe - Overtaking	Property Damage Only	Clear	Dry	Daylight	Left Turn Green Arrow, Lane Markings, or Signal	No Data
From same direction - both going straight	Sideswipe - Overtaking	Property Damage Only	Clear	Dry	Daylight	Unknown or not definite	No Data
Fixed Object	Fixed Object or Other Object	Non-Fatal Injury	Clear	Dry	Darkness - with street lights	Stop Sign	No Data
From same direction - one turn, one straight	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	No Data
From same direction - both going straight	Sideswipe - Overtaking	Property Damage Only	Clear	Dry	Daylight	Right Turn Green Arrow, Lane Markings, or Signal	0
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	No control	0
From opposite direction-one left turn,one straight	Turning movement	Property Damage Only	Clear	Dry	Daylight	Traffic Signals	0
From same direction - both going straight	Sideswipe - Overtaking	Property Damage Only	Clear	Dry	Daylight	Unknown or not definite	No Data
From same direction - both going straight	Sideswipe - Overtaking	Property Damage Only	Cloudy	Dry	Daylight	Right Turn Green Arrow, Lane Markings, or Signal	0
From same direction - both going straight	Sideswipe - Overtaking	Property Damage Only	Clear	Dry	Daylight	Right Turn Green Arrow, Lane Markings, or Signal	No Data
From same direction - one stopped	Rear-End	Property Damage Only	Clear	Dry	Daylight	Traffic Signals	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Cloudy	Wet	Daylight	Stop Sign	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	No Data
Fixed object	Fixed Object or Other Object	Property Damage Only	Clear	Dry	Daylight	Unknown or not definite	0
From same direction - one stopped	Rear-End	Non-Fatal Injury	Rain	Wet	Darkness - no street lights	Stop Sign	0
From same direction - one stopped	Rear-End	Property Damage Only	Clear	Dry	Dusk (Twilight)	Unknown or not definite	No Data
From same direction - one stopped	Rear-End	Property Damage Only	Clear	Dry	Daylight	Stop Sign	No Data
From same direction - one stopped	Rear-End	Property Damage Only	Rain	Wet	Daylight	Stop Sign	0
Fixed Object	Fixed Object or Other Object	Property Damage Only	Clear	Dry	Darkness - with street lights	Unknown or not definite	No Data
Pedestrian	Pedestrian	Non-Fatal Injury	Clear	Dry	Daylight	Unknown or not definite	0
From opposite direction-one left turn,one straight	Turning movement	Non-Fatal Injury	Clear	Dry	Daylight	Stop Sign	1
Entering at angle - all others	Parking Maneuver	Non-Fatal Injury	Clear	Dry	Daylight	Unknown or not definite	No Data
From same direction - one stopped	Rear-End	Non-Fatal Injury	Clear	Dry	Darkness - no street lights	Stop Sign	No Data
From same direction - one stopped	Rear-End	Property Damage Only	Clear	Dry	Daylight	Stop Sign	No Data
Fixed Object	Fixed Object or Other Object	Property Damage Only	Clear	Dry	Daylight	No control	0
Fixed object	Fixed Object or Other Object	Property Damage Only	Cloudy	Wet	Darkness - with street lights	Unknown or not definite	No Data

Work Zone Indicator	Alcohol Involved Flag	Drug Involved Flag	Speed Involved Flag	Hit and Run Flag	ODOT Region	ODOT District	Total Vehicles	Total Deaths	Total Serious Injuries	Total Moderate Injuries	Total Minor Injuries
No Data	0	0	0	0	2	3	3	0	1	1	2
0	0	0	0	0	2	3	1	0	0	1	0
0	1	0	0	0	2	3	2	0	0	1	0
0	0	0	0	0	2	3	2	0	0	1	2
No Data	0	0	0	0	2	3	1	0	0	1	0
0	0	0	0	0	2	3	2	0	0	2	0
No Data	0	0	0	0	2	3	2	0	0	0	1
No Data	0	0	0	0	2	3	1	0	0	0	1
0	0	0	0	0	2	3	1	0	0	1	0
No Data	0	0	0	0	2	3	2	0	0	0	1
0	0	0	0	0	2	3	2	0	0	1	0
No Data	0	0	0	0	2	3	2	0	0	0	2
No Data	0	0	0	0	2	3	2	0	0	0	1
No Data	0	0	0	0	2	3	2	0	0	0	2
0	0	0	0	0	2	3	2	0	0	0	1
0	0	0	0	0	2	3	2	0	0	0	2
0	0	1	0	0	2	3	3	0	0	0	1
No Data	0	0	0	0	2	3	2	0	0	0	1
No Data	0	0	0	0	2	3	2	0	0	0	4
No Data	0	0	0	0	2	3	2	0	0	0	1
0	0	0	1	0	2	3	2	0	0	0	2
0	0	0	0	0	2	3	2	0	0	0	1
0	0	0	0	0	2	3	2	0	0	0	2
No Data	0	0	0	0	2	3	2	0	0	0	2
0	0	0	0	0	2	3	2	0	0	0	1
No Data	0	0	0	0	2	3	2	0	0	0	2
No Data	0	0	0	0	2	3	2	0	0	0	2
0	0	0	1	0	2	3	2	0	0	0	2
No Data	0	0	0	0	2	3	2	0	0	0	2
0	0	0	1	0	2	3	2	0	0	0	2
No Data	0	0	0	0	2	3	2	0	0	0	0
No Data	0	0	0	0	2	3	2	0	0	0	0
No Data	0	0	0	0	2	3	1	0	0	0	1
No Data	0	0	0	0	2	3	2	0	0	0	1
0	1	0	0	0	2	3	2	0	0	0	0
0	0	0	0	0	2	3	2	0	0	0	1
0	0	0	0	0	2	3	2	0	0	0	0
No Data	0	0	0	0	2	3	2	0	0	0	0
0	0	0	0	0	2	3	2	0	0	0	0
No Data	0	0	0	0	2	3	2	0	0	0	0
No Data	0	0	0	0	2	3	2	0	0	0	0
No Data	0	0	0	0	2	3	2	0	0	1	0
No Data	0	0	0	0	2	3	2	0	0	0	2
0	0	0	1	0	2	3	1	0	0	0	0
0	0	0	0	0	2	3	2	0	0	0	1
No Data	0	0	0	0	2	3	2	0	0	0	0
No Data	0	0	0	0	2	3	2	0	0	0	0
0	0	0	0	0	2	3	3	0	0	0	0
No Data	1	0	0	0	2	3	1	0	0	0	0
0	0	0	0	0	2	3	1	0	0	1	0
No Data	1	0	0	0	2	3	3	0	0	2	0
No Data	0	0	0	0	2	3	2	0	0	0	1
No Data	0	0	0	0	2	3	2	0	0	0	2
No Data	0	0	0	0	2	3	2	0	0	0	0
0	0	0	0	0	2	3	1	0	0	0	0
No Data	0	1	0	0	2	3	1	0	0	0	0

Total Pedestrians	Total Pedestrian Deaths	Total Pedestrian Injuries	Total Pedal-cyclists	Total Pedal-cyclist Deaths	Total Pedal-cyclist Injuries	Total Unknown Non-Motorists	Total Unknown Non-Motorist Death	Total Unknown Non-Motorist Injured
0	0	0	0	0	0	0	0	0
1	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	1	0	1	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
1	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
1	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	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 Safety Equip Un-used	Crash Month	Crash Day	Crash Year	Day of Week	Crash Cause 1 Desc	Crash Cause 2 Desc	Crash Cause 3 Desc
0	3	1	2017	4	Careless Driving (per PAR)	Inattention	Failed to avoid vehicle ahead
0	5	27	2014	3	Did not yield right-of-way	Non-motorist illegally in roadway	Non-motorist not visible; non-reflective clothing
0	12	27	2014	7	Did not yield right-of-way	No Data	No Data
0	8	2	2017	4	Careless Driving (per PAR)	Inattention	Failed to avoid vehicle ahead
0	1	5	2015	2	Non-motorist illegally in roadway	Made improper turn	No Data
0	3	16	2015	2	Disregarded traffic signal	No Data	No Data
0	1	14	2016	5	Did not yield right-of-way	No Data	No Data
0	9	18	2018	3	Disregarded traffic signal	No Data	No Data
0	5	25	2018	6	Other improper driving	No Data	No Data
0	5	6	2016	6	Failed to avoid vehicle ahead	No Data	No Data
0	10	13	2015	3	Careless Driving (per PAR)	Followed too closely	No Data
0	11	29	2018	5	Phantom / Non-contact Vehicle	No Data	No Data
0	12	9	2018	1	Failed to avoid vehicle ahead	No Data	No Data
0	6	6	2015	7	Followed too closely	No Data	No Data
0	3	24	2016	5	Followed too closely	No Data	No Data
0	2	26	2018	2	Did not yield right-of-way	No Data	No Data
0	3	10	2015	3	Made improper turn	No Data	No Data
0	10	11	2017	4	Failed to avoid vehicle ahead	No Data	No Data
0	9	24	2014	4	Followed too closely	No Data	No Data
0	11	26	2014	4	Followed too closely	No Data	No Data
0	7	23	2018	2	Too fast for conditions (not exceed posted speed)	No Data	No Data
0	8	15	2018	4	Did not yield right-of-way	No Data	No Data
1	3	26	2016	7	Careless Driving (per PAR)	Followed too closely	No Data
0	3	7	2014	6	Improper overtaking	No Data	No Data
0	8	11	2016	5	Made improper turn	No Data	No Data
0	8	3	2017	5	Did not yield right-of-way	No Data	No Data
0	5	11	2017	5	Failed to avoid vehicle ahead	No Data	No Data
0	7	22	2017	7	Driving in excess of posted speed	Failed to avoid vehicle ahead	No Data
0	7	9	2018	2	Improper change of traffic lanes	No Data	No Data
0	10	12	2018	6	Improper change of traffic lanes	No Data	No Data
0	9	6	2014	7	Made improper turn	No Data	No Data
0	7	26	2017	4	Failed to avoid vehicle ahead	No Data	No Data
0	6	12	2015	6	Improper change of traffic lanes	No Data	No Data
0	9	3	2014	4	Followed too closely	No Data	No Data
0	9	28	2016	4	Did not yield right-of-way	No Data	No Data
0	11	6	2017	2	Improper change of traffic lanes	No Data	No Data
0	6	26	2014	5	Improper change of traffic lanes	No Data	No Data
0	6	24	2014	3	Improper change of traffic lanes	No Data	No Data
0	7	2	2014	4	Followed too closely	No Data	No Data
0	11	16	2017	5	Failed to avoid vehicle ahead	No Data	No Data
0	12	11	2017	2	Failed to avoid vehicle ahead	No Data	No Data
0	5	22	2018	3	Too fast for conditions (not exceed posted speed)	No Data	No Data
0	1	11	2016	2	Careless Driving (per PAR)	Inattention	Failed to avoid vehicle ahead
0	1	15	2017	1	Failed to avoid vehicle ahead	No Data	No Data
0	5	15	2018	3	Failed to avoid vehicle ahead	No Data	No Data
0	12	10	2014	4	Careless Driving (per PAR)	Followed too closely	No Data
0	10	18	2015	1	Inattention	No Data	No Data
0	6	17	2016	6	Non-motorist illegally in roadway	No Data	No Data
0	11	3	2015	3	Did not yield right-of-way	No Data	No Data
0	10	9	2018	3	Did not yield right-of-way	No Data	No Data
0	8	19	2017	7	Failed to avoid vehicle ahead	No Data	No Data
0	3	29	2016	3	Failed to avoid vehicle ahead	No Data	No Data
0	4	26	2014	7	Physical illness	Drove left of center on two-way road; straddling	No Data
0	2	18	2018	1	Other improper driving	No Data	No Data

Crash Event 1 Desc	Crash Event 2 Desc	Crash Event 3 Desc	Pedestrian Present Flag	Roadway Departure Flag	Motorcycle Flag
Vehicle forced by impact into another vehicle, pedalcyclist or pedestrian	No Data	No Data	0	0	0
Vertical grade / hill present at crash location	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
Mailbox	Pole – power or telephone	Fire or explosion	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
Other (phantom) non-contact vehicle	No Data	No Data	0	1	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
Other sign, including street signs	Fire or explosion	No Data	0	1	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
Tree, stump or shrubs	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
Cut slope or ditch embankment	No Data	No Data	0	1	0
Cell phone (on PAR or driver in use)	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
Curb (also narrow sidewalks on bridges)	Fence	Vehicle forced by impact into another vehicle, pedalcyclist or pedestrian	0	0	0
Curb (also narrow sidewalks on bridges)	Building or other structure	No Data	0	1	0
No Data	No Data	No Data	0	0	0
Vehicle forced by impact into another vehicle, pedalcyclist or pedestrian	No Data	No Data	0	0	0
Vehicle obscured view	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
No Data	No Data	No Data	0	0	0
Cut slope or ditch embankment	Tree, stump or shrubs	Building or other structure	0	1	0
Curb (also narrow sidewalks on bridges)	Pole – power or telephone	No Data	0	1	0

Distracted Driving Flag	Wildlife Flag	Pedalcyclist Present Flag	Graph by Day of Week	Graph by LRS and MP	Graph by Hour	Graph_LRS_MP	Highest Injury Severity Code	Highest Injury Severity Description	Marijuana Involved Flag
1	0	0	1 - Sunday	2 - Suspected Serious Injury	14:00 to 14:59	-1	2	Suspected Serious Injury (A)	0
0	0	0	No Data	3 - Suspected Minor Injury	15:00 to 15:59	-1	3	Suspected Minor Injury Crash (B)	0
0	0	0	No Data	3 - Suspected Minor Injury	23:00 to 23:59	-1	3	Suspected Minor Injury Crash (B)	0
1	0	0	2 - Monday	3 - Suspected Minor Injury	18:00 to 18:59	-1	3	Suspected Minor Injury Crash (B)	0
0	0	0	5 - Thursday	3 - Suspected Minor Injury	12:00 to 12:59	-1	3	Suspected Minor Injury Crash (B)	0
0	0	0	No Data	3 - Suspected Minor Injury	12:00 to 12:59	-1	3	Suspected Minor Injury Crash (B)	0
0	0	0	No Data	4 - Possible Injury	20:00 to 20:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	07:00 to 07:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	3 - Suspected Minor Injury	20:00 to 20:59	-1	3	Suspected Minor Injury Crash (B)	0
0	0	0	6 - Friday	4 - Possible Injury	22:00 to 22:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	3 - Suspected Minor Injury	16:00 to 16:59	-1	3	Suspected Minor Injury Crash (B)	0
0	0	0	No Data	4 - Possible Injury	16:00 to 16:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	20:00 to 20:59	-1	4	Possible Injury Crash (C)	0
0	0	0	6 - Friday	4 - Possible Injury	14:00 to 14:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	14:00 to 14:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	16:00 to 16:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	16:00 to 16:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	16:00 to 16:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	07:00 to 07:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	06:00 to 06:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	14:00 to 14:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	07:00 to 07:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	13:00 to 13:59	-1	4	Possible Injury Crash (C)	0
0	0	0	7 - Saturday	4 - Possible Injury	21:00 to 21:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	12:00 to 12:59	-1	4	Possible Injury Crash (C)	0
0	0	0	3 - Tuesday	4 - Possible Injury	20:00 to 20:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	17:00 to 17:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	20:00 to 20:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	5 - No Apparent Injury	12:00 to 12:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	4 - Possible Injury	20:00 to 20:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	5 - No Apparent Injury	12:00 to 12:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	5 - No Apparent Injury	09:00 to 09:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	6 - Friday	4 - Possible Injury	02:00 to 02:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	11:00 to 11:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	5 - No Apparent Injury	20:00 to 20:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	3 - Tuesday	4 - Possible Injury	15:00 to 15:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	5 - No Apparent Injury	15:00 to 15:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	6 - Friday	5 - No Apparent Injury	15:00 to 15:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	5 - No Apparent Injury	12:00 to 12:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	5 - No Apparent Injury	12:00 to 12:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	2 - Monday	5 - No Apparent Injury	12:00 to 12:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	3 - Suspected Minor Injury	11:00 to 11:59	-1	3	Suspected Minor Injury Crash (B)	0
0	0	0	No Data	4 - Possible Injury	12:00 to 12:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	5 - No Apparent Injury	13:00 to 13:59	-1	5	No Apparent Injury/PDO Crash (O)	0
1	0	0	No Data	4 - Possible Injury	16:00 to 16:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	5 - No Apparent Injury	17:00 to 17:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	5 - No Apparent Injury	16:00 to 16:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	5 - No Apparent Injury	14:00 to 14:59	-1	5	No Apparent Injury/PDO Crash (O)	0
1	0	0	No Data	5 - No Apparent Injury	22:00 to 22:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	3 - Suspected Minor Injury	14:00 to 14:59	-1	3	Suspected Minor Injury Crash (B)	0
0	0	0	3 - Tuesday	3 - Suspected Minor Injury	09:00 to 09:59	-1	3	Suspected Minor Injury Crash (B)	0
0	0	0	No Data	4 - Possible Injury	15:00 to 15:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	4 - Possible Injury	21:00 to 21:59	-1	4	Possible Injury Crash (C)	0
0	0	0	No Data	5 - No Apparent Injury	11:00 to 11:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	5 - No Apparent Injury	13:00 to 13:59	-1	5	No Apparent Injury/PDO Crash (O)	0
0	0	0	No Data	5 - No Apparent Injury	20:00 to 20:59	-1	5	No Apparent Injury/PDO Crash (O)	0

Route Number	Route Type	Youngest Driver Involved Age	Oldest Driver Involved Age	Youngest Driver at Error Age	Oldest Driver at Error Age	Number of Drivers at Error	Youngest Pedestrian Involved Age	Oldest Pedestrian Involved Age
No Data	No Data	18	37	18	18	1	No Data	No Data
No Data	No Data	53	53	53	53	1	16	16
No Data	No Data	33	54	54	54	1	No Data	No Data
No Data	No Data	18	70	70	70	1	No Data	No Data
No Data	No Data	53	53	No Data	No Data	No Data	No Data	No Data
No Data	No Data	19	73	19	19	1	No Data	No Data
No Data	No Data	35	37	35	35	1	No Data	No Data
No Data	No Data	45	45	45	45	1	No Data	No Data
No Data	No Data	17	17	17	17	1	No Data	No Data
No Data	No Data	16	24	16	16	1	No Data	No Data
No Data	No Data	36	64	36	36	1	No Data	No Data
No Data	No Data	32	36	36	36	1	No Data	No Data
No Data	No Data	19	41	19	19	1	No Data	No Data
No Data	No Data	16	22	16	22	2	No Data	No Data
No Data	No Data	17	35	35	35	1	No Data	No Data
No Data	No Data	42	44	44	44	1	No Data	No Data
No Data	No Data	20	50	27	27	1	No Data	No Data
No Data	No Data	16	51	51	51	1	No Data	No Data
No Data	No Data	39	39	No Data	No Data	No Data	No Data	No Data
No Data	No Data	54	67	67	67	1	No Data	No Data
No Data	No Data	53	53	53	53	1	No Data	No Data
No Data	No Data	26	43	43	43	1	No Data	No Data
No Data	No Data	25	25	25	25	1	No Data	No Data
No Data	No Data	33	47	33	33	1	No Data	No Data
No Data	No Data	17	22	22	22	1	No Data	No Data
No Data	No Data	19	25	19	19	1	No Data	No Data
No Data	No Data	24	48	48	48	1	No Data	No Data
No Data	No Data	20	78	20	20	1	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
No Data	No Data	22	22	22	22	1	No Data	No Data
No Data	No Data	23	85	23	23	1	No Data	No Data
No Data	No Data	28	49	No Data	No Data	No Data	No Data	No Data
No Data	No Data	16	17	17	17	1	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
No Data	No Data	24	32	24	24	1	No Data	No Data
No Data	No Data	69	69	No Data	No Data	No Data	No Data	No Data
No Data	No Data	24	72	72	72	1	No Data	No Data
No Data	No Data	24	40	24	24	1	No Data	No Data
No Data	No Data	18	18	18	18	1	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
No Data	No Data	20	26	20	20	1	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
No Data	No Data	16	66	16	16	1	No Data	No Data
No Data	No Data	31	31	31	31	1	No Data	No Data
No Data	No Data	16	16	No Data	No Data	No Data	4	4
No Data	No Data	28	51	28	28	1	No Data	No Data
No Data	No Data	40	70	40	40	1	No Data	No Data
No Data	No Data	17	19	17	17	1	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
No Data	No Data	55	55	55	55	1	No Data	No Data
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

Male Driver Involved	Female Driver Involved	Non-Binary Driver Involved	Male Driver at Error	Female Driver at Error	Non-Binary Driver at Error	Unknown Gender Driver at Error	Unknown Gender Driver Involved	Metropolitan Planning Organization
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
No	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	No	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
No	Yes	No	No	No	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
No	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	No	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
No	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
No	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	Yes	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	No	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
No	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
Yes	No	No	Yes	No	No	No	No	Salem/Keizer
No	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	No	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
Yes	No	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
No	No	No	No	No	No	No	Yes	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
No	No	No	No	No	No	No	Yes	Salem/Keizer
No	No	No	No	No	No	No	Yes	Salem/Keizer
Yes	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	No	No	Yes	No	No	No	No	Salem/Keizer
No	Yes	No	No	No	No	No	No	Salem/Keizer
Yes	Yes	No	No	Yes	No	No	No	Salem/Keizer
Yes	No	No	Yes	No	No	No	No	Salem/Keizer
Yes	Yes	No	Yes	No	No	No	No	Salem/Keizer
No	No	No	No	No	No	No	Yes	Salem/Keizer
Yes	No	No	Yes	No	No	No	No	Salem/Keizer
No	No	No	No	No	No	No	Yes	Salem/Keizer

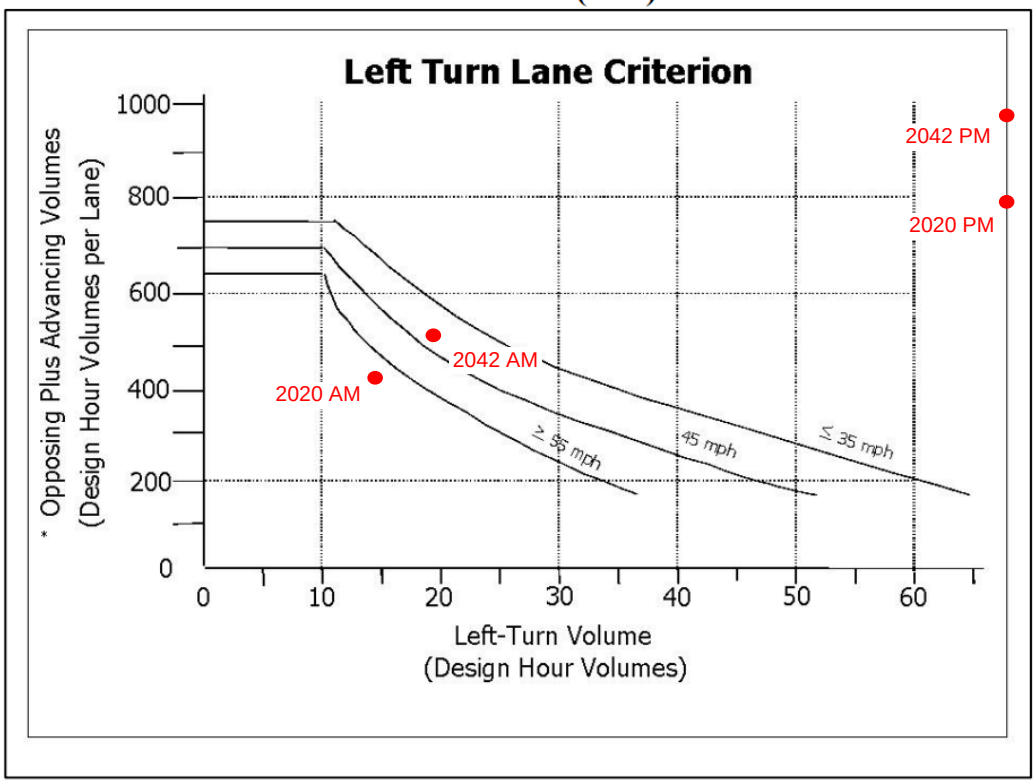
Youngest Bicyclist Involved Age	Oldest Bicyclist Involved Age	Female Bicyclist Involved	Male Bicyclist Involved	Non-Binary Bicyclist Involved	Unknown Gender Bicyclist Involved	Female Pedestrian Involved	Male Pedestrian Involved
No Data	No Data	No	No	No	No	No	No
16	16	No	Yes	No	No	No	Yes
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	Yes	No	No	No	Yes	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
4	4	No	Yes	No	No	No	Yes
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No
No Data	No Data	No	No	No	No	No	No

Non-Binary Pedestrian Involved	Unknown Gender Pedestrian Involved	x	y
No	No	-13695049.18	5624500.433
No	No	-13694870.92	5623861.997
No	No	-13694598.65	5623401.629
No	No	-13694853.76	5623829.412
No	No	-13694832.42	5623796.605
No	No	-13694593.39	5623427.873
No	No	-13694598.65	5623401.629
No	No	-13694598.34	5623401.191
No	No	-13695109.17	5625738.498
No	No	-13694598.65	5623401.629
No	No	-13694832.42	5623796.605
No	No	-13695108.86	5625200.816
No	No	-13694598.65	5623401.629
No	No	-13694680.59	5623520.164
No	No	-13695108.86	5625225.315
No	No	-13694598.65	5623401.191
No	No	-13694598.65	5623401.629
No	No	-13694598.65	5623401.629
No	No	-13694588.75	5623460.677
No	No	-13694598.65	5623401.629
No	No	-13695016.1	5626518.61
No	No	-13695109.17	5625613.371
No	No	-13694598.65	5623401.629
No	No	-13695109.02	5625181.376
No	No	-13694593.39	5623427.873
No	No	-13694680.59	5623520.164
No	No	-13694832.42	5623796.605
No	No	-13694832.42	5623796.605
No	No	-13694832.42	5623796.605
No	No	-13694614.42	5623327.272
No	No	-13694610.4	5623345.642
No	No	-13695106.14	5624766.723
No	No	-13695108.86	5625225.315
No	No	-13694650.91	5623423.061
No	No	-13694978.32	5624198.247
No	No	-13694598.65	5623401.629
No	No	-13694612.56	5623334.707
No	No	-13694638.1	5623410.144
No	No	-13694646.14	5623416.643
No	No	-13694598.53	5623401.526
No	No	-13694994.45	5624267.713
No	No	-13694994.45	5624267.713
No	No	-13694739.04	5623635.201
No	No	-13694994.45	5624267.713
No	No	-13694726.98	5623615.518
No	No	-13694994.45	5624267.713
No	No	-13694994.45	5624267.713
No	No	-13694817.58	5623770.798
No	No	-13695109.79	5625391.998
No	No	-13694674.72	5627083.063
No	No	-13694726.67	5627016.552
No	No	-13694674.72	5627083.063
No	No	-13695102.37	5625978.694
No	No	-13694723.44	5623609.294
No	No	-13694713.37	5627034.492

APPENDIX E: LEFT TURN LANE CRITERIA

NBL @ Russett Dr

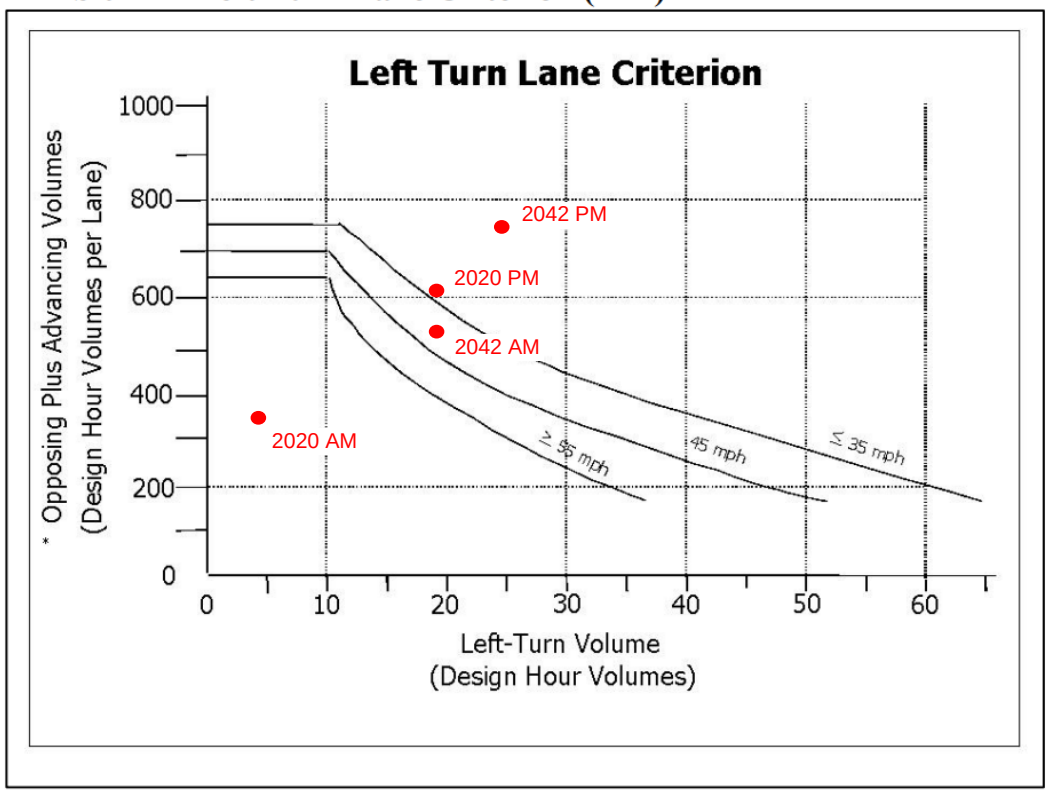
Exhibit 12-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)
Opposing left turns are not counted as opposing volumes

NBL @ Aldridge Dr

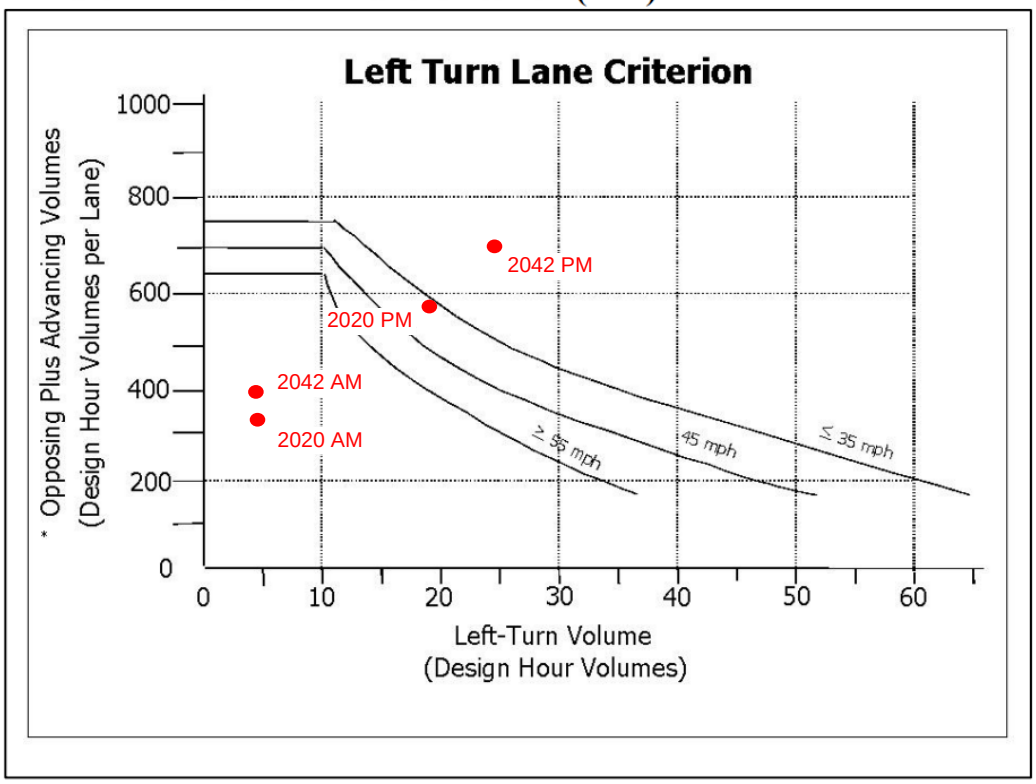
Exhibit 12-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)
Opposing left turns are not counted as opposing volumes

SBL @ Parkmeadow Dr

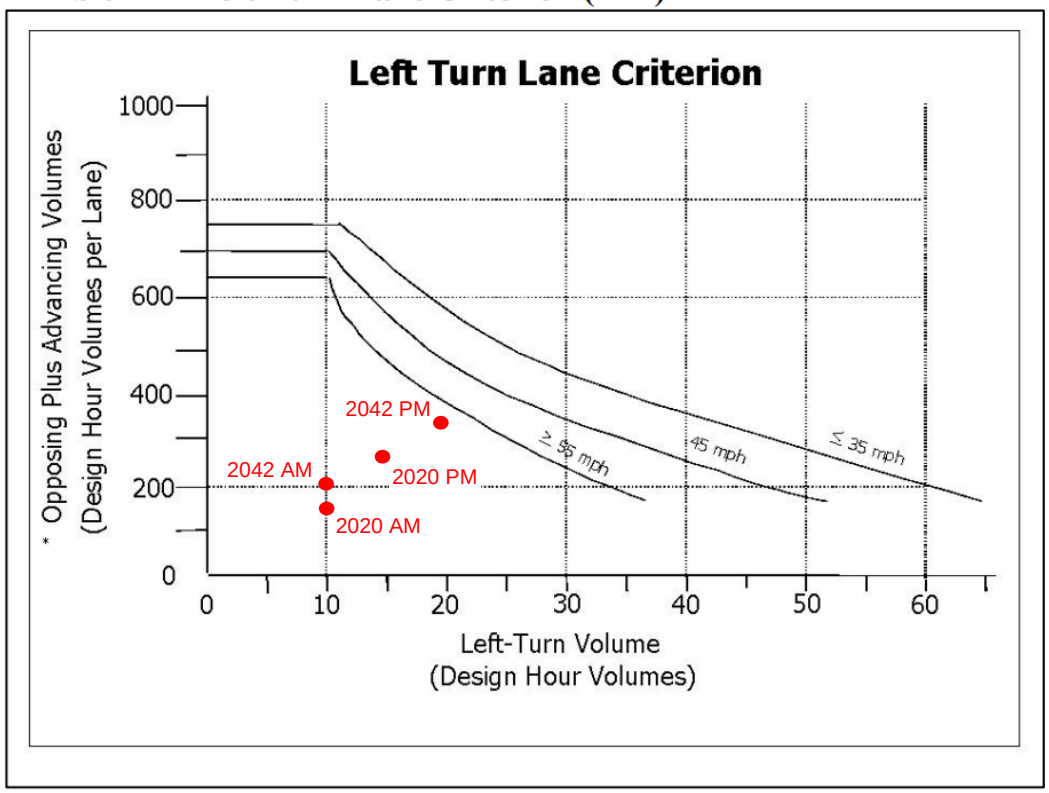
Exhibit 12-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)
Opposing left turns are not counted as opposing volumes

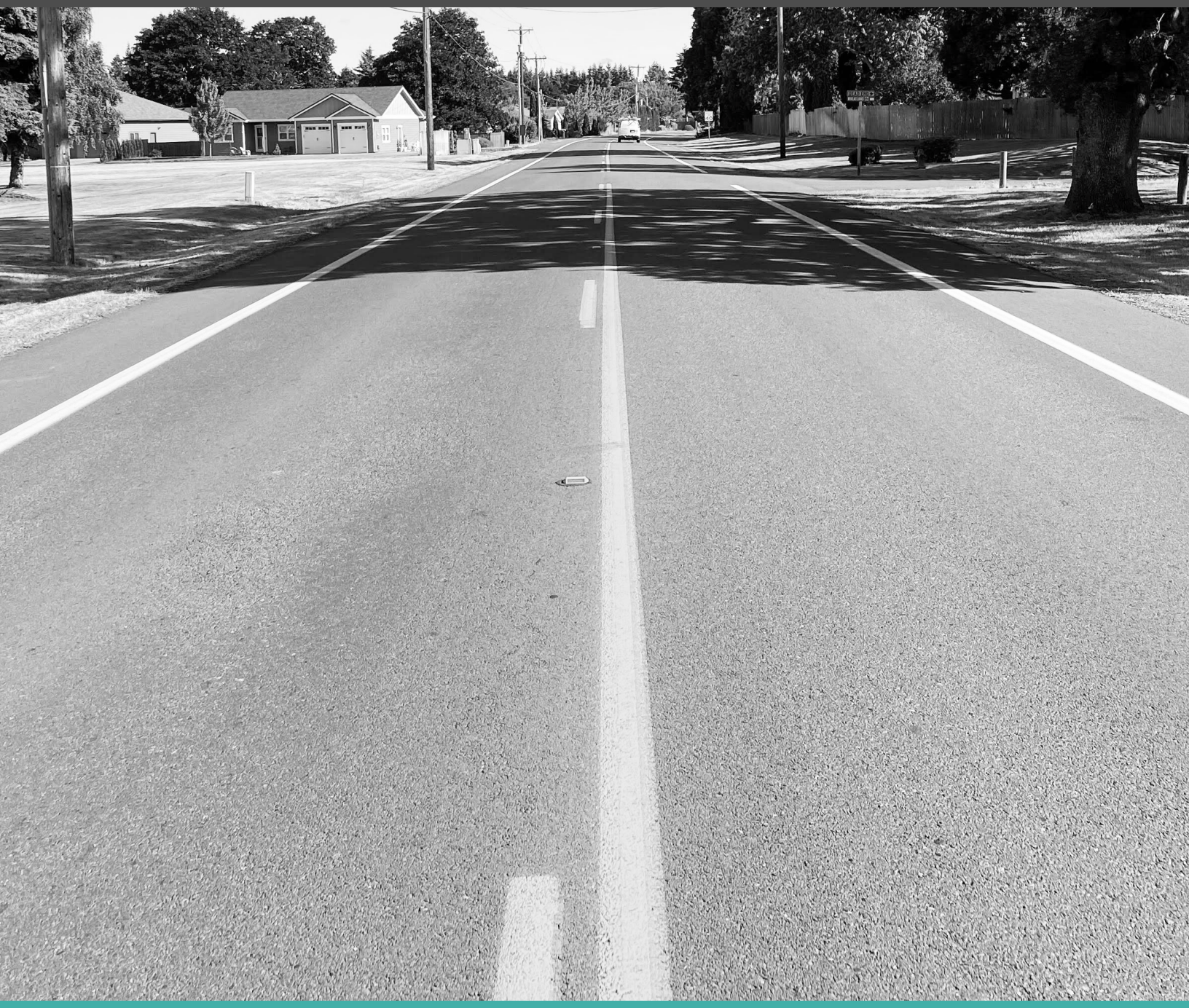
SBL @ Clear Lake Rd

Exhibit 12-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)
Opposing left turns are not counted as opposing volumes

03 TECHNICAL MEMORANDUM #2
EVALUATION CRITERIA



DKS 117 COMMERCIAL STREET NE, SUITE 310, SALEM, OR 97301 • 503.391.8773 • DKSASSOCIATES.COM

MEMORANDUM #2

DATE: December 2, 2020

TO: Project Management Team

FROM: Scott Mansur, P.E., PTOE | DKS Associates
Jenna Bogert, E.I. | DKS Associates

SUBJECT: Wheatland Road Corridor Plan – Evaluation Criteria Project #20020-009

INTRODUCTION

The goals, objectives, and policies for the future of Keizer's transportation system are found in the City's Transportation System Plan. They guide the development of the transportation system within the City and were based on the previous TSP, conversations with City of Keizer staff and the project Technical Advisory Committee. Goals and policies have been summarized below; these will guide the direction and process of the Wheatland Road Corridor Study and public process.

GOALS AND OBJECTIVES

GOAL #2: ENVIRONMENT

Provide for a sustainable transportation system which respects the environment and community.

- Objective #1: Minimize the adverse effects on **environmentally sensitive areas** and water quality.
- Objective #2: Minimize the adverse effects (e.g. noise, air, speed) **on neighborhoods**.
- Objective #3: Consider opportunities to minimize impervious surfaces through alternative material use and pavement width reductions while still meeting the necessary standards.

GOAL #3: STREETS

Maximize the efficiency of the existing transportation system.

- Objective #1: Provide a street system emphasizing connectivity that **minimizes travel time and congestion** while being compatible with other modes of transportation.
- Objective #2: Maximize available system **capacity**.

- Objective #3: Maintain the physical integrity of existing roads to preserve and **maximize infrastructure investments.**
- Objective #4: Manage on and off-street parking to support community needs.
- Objective #5: Maintain an **acceptable level of service** within the transportation system.

GOAL #4: COMPREHENSIVE, CONNECTED, AND MULTIMODAL

Provide efficient and comprehensive linkages between all modes of transportation.

- Objective #1: Develop **paths, connections, and facilities** to provide simple access between **modes** at different parts of work, shopping, or recreational trips.
- Objective #2: **Safety** must be an underlying concept for any element of the transportation system.

GOAL #5: PEDESTRIANS AND CYCLISTS

Develop a comprehensive system of pedestrian and bicycle facilities for the City of Keizer.

- Objective #1: Establish a **continuous, direct, and safe system of bicycle and pedestrian facilities** within the Keizer urban area and **connect** it to the greater regional system.
- Objective #2: Achieve greater public awareness of safe pedestrian, bicycling, and motoring practices, procedures, and skills.

GOAL #6: TRANSIT

Support a public transit system for all Keizer residents focusing on accessibility and mobility.

- Objective#1: Facilitate public transit services throughout the urbanized portions of the Keizer area that ensures **convenient accessibility** to a variety of destinations at different times of the day. Advocate affordable transit service and **increase ridership**.
- Objective #2: Encourage a transit system which offers **connectivity** between activity centers, such as schools, parks, shopping centers, and residences with minimum transfers.
- Objective #3: Support transit programs that **serve transportation disadvantaged** citizens consistent with Americans with Disabilities Act (ADA) requirements.

GOAL #11: TRANSPORTATION SYSTEM MANAGEMENT

Maximize the efficiency of the existing surface transportation system through management techniques and facility improvements

- Objective #1: Provide a system of traffic control devices maintained and operated to an acceptable LOS**.**

- Objective #2: Improve physical design and management of on-street parking consistent with community need.
- Objective #3: Increase **street system safety and capacity** through access management.

EVALUATION CRITERIA AND SCORING METHODOLOGY

Based on the goals and objectives that guide future transportation projects and programs in the City of Keizer, the following categories have been created to evaluate the alternatives that will be determined through the public process and evaluated by the project team.

- Neighborhood Livability
- Environmental
- Utilization of Existing Infrastructure
- Traffic Operations
- Safe Routes to School
- Safety
- Transportation Mode Choices/Multimodal Connectivity
- Equity
- Convenient and Accessible Transit
- Cost Effective

The goals and policies in the City's Transportation System Plan provided a basis for the development of the evaluation criteria, which are intended to assess a project's potential to meet the transportation needs of the City. The evaluation criteria were then refined.

TABLE 1: WHEATLAND ROAD EVALUATION CRITERIA AND SCORING

CRITERIA	SCORING
NEIGHBORHOOD LIVABILITY: How does the alternative influence neighborhood livability (e.g. Noise, air, speed, vehicle volume)?	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements
ENVIRONMENTAL: How does the alternative influence the natural environment (e.g. Stormwater, air quality, natural resources)?	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements
UTILIZATION OF EXISTING INFRASTRUCTURE: How much of the existing infrastructure does the alternative utilizes within the study area (e.g. sidewalks, pavement, utilities)?	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements
TRAFFIC OPERATIONS: How does the alternative accommodate commuter, transit, and heavy vehicle operations (e.g. Travel time, delay, capacity)?	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements
TRANSPORTATION MODE CHOICES/MULTIMODAL CONNECTIVITY: How well does the alternative support transportation and commuting mode choices and connectivity for users.	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements
EQUITY: How well does the alternative serve the disadvantaged population?	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements
SAFE ROUTES TO SCHOOL: How well do the alternatives support students walking, biking, and accessing school bus stops to connect to Salem-Keizer schools?	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements
SAFETY: How well does the alternative improve or impact safety for all modes of travel?	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements

CRITERIA	SCORING
CONVENIENT AND ACCESSIBLE TRANSIT: How well does the alternative support existing and future transit routes within the corridor?	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements
COST EFFECTIVE/FUNDABILITY: How do the alternatives compare in planning level cost estimates and their potential to receive state or federal funding?	-2 to +2 0 – No Change -2 – Significant Impacts +2 – Significant Improvements

The scoring methodology will be applied in the following way:

Equal weight for each goal category – Each of the eight categories receives an equal weight. In this method, evaluation scores for each criterion under a particular goal category would be averaged to determine one score for each goal category. They would then be summed to arrive at an overall evaluation score.

APPENDIX

EXAMPLE SCORING (EQUAL WEIGHT):

Alt A: separated multi use path with landscaping buffer, no transit improvements

Alt B: on-street buffered bike lanes with sidewalk infill, transit improvements, turn lanes at key intersections

EVALUATION CRITERIA	ALT A	ALT B	COMMENT
NEIGHBORHOOD LIVABILITY	+2	+1	Landscape buffer favors Alt A. Separated path to be used by all ages/abilities.
ENVIRONMENTAL	+1	+1	Both alternatives can provide equal environmental benefits
UTILIZATION OF EXISTING INFRASTRUCTURE	-1	+1	Alt A removes existing sidewalk/bike lanes and replaces with multiuse path. Alt B maintains majority of existing curb and sidewalk.
TRAFFIC OPERATIONS	0	+1	Alt B provides left turn lanes for improved operations at key intersections
SAFE ROUTES TO SCHOOL	+2	+1	Alt A provides a separated path to be used by all ages/abilities.
SAFETY	+2	+1	Separated path provides safest ped/bike options. Alt B provides multimodal connected system that also improves safety.
TRANSPORTATION MODE CHOICES/MULTIMODAL CONNECTIVITY	+1	+1	Both alternatives provide a connected multimodal system.
EQUITY	+1	+1	Both alternatives improve transportation services for transportation disadvantaged.
CONVENIENT AND ACCESSIBLE TRANSIT	0	+1	Alt B provides enhanced transit amenities.
COST EFFECTIVE/FUNDABILITY	-1	+1	Alt A has higher cost estimate, Alt B maintains more of existing infrastructure and has lower cost estimate.
TOTAL	**+7**	**+10**	

04 TECHNICAL MEMORANDUM #3
DESIGN ALTERNATIVES AND TIER 1 SCREENING

DKS 117 COMMERCIAL STREET NE, SUITE 310, SALEM, OR 97301 • 503.391.8773 • DKSASSOCIATES.COM

MEMORANDUM #3

DATE: May 26, 2021

TO: Project Management Team

FROM: Scott Mansur, P.E., PTOE | DKS Associates
Jenna Bogert, P.E. | DKS Associates
Travis Larson, E.I. | DKS Associates

SUBJECT: Wheatland Road Corridor Plan – Design Alternatives and Tier 1 Screening P#20020-009

INTRODUCTION

This memorandum summarizes the development of the design alternatives for the Wheatland Road corridor and includes a preliminary evaluation (Tier 1 Screening) of the three proposed design alternatives, building off the two previous memoranda which covered the existing conditions analysis[1] and proposed evaluation criteria[2]. The conceptual cross sections of this memorandum illustrate alternative uses of the available right-of-way along Wheatland Road. A summary of public feedback from the Virtual Open House #1 is also provided here.

VIRTUAL OPEN HOUSE #1 SUMMARY

Public outreach and feedback are important to ensure the Wheatland Road corridor transportation improvements are consistent with the community's needs and desires. The first Virtual Open House was held for the project from February 12th to March 21st (total of 38 days). Virtual Open House #1 was accessed through the City's project website[3] and provided the general public with digital posterboards, the two previous memoranda describing the existing and future baseline conditions and evaluation criteria, as well as a 10-question feedback survey. Announcement of Virtual Open House #1 was made to the following stakeholders via Facebook, flyers, emails, the Keizer Times, and at Committee meetings:

[1] Existing and Future Forecast Conditions – Memorandum #1, Wheatland Road Corridor Plan, DKS Associates, January 2021.

[2] Evaluation Criteria – Memorandum #2, Wheatland Road Corridor Plan, DKS Associates, December 2020.

[3] https://www.keizer.org/WheatlandRoadMultimodalCorridorPlan

- Traffic Safety-Bikeways-Pedestrian Committee
- Salem Bicycle Club
- Vineyard Homeowners Association
- Keizer Neighborhood Associations (Gubser, Southeast, West)
- Courthouse Athletic Club
- B&S Market
- Revis Keizer Automotive
- McNary Heights Apartments
- Wheatland Village Apartments
- Keizer Christian Church
- Parkmeadow Apartments
- Willamette Lutheran Retirement Homes
- Keizer Clearlake United Methodist Church
- Keizer Storage Center
- Marion County Fire District - Clearlake Fire Station #6
- Mr. Rooter Plumbing
- McNary Estates
- Cherriots Transit
- Clear Lake Elementary School
- Forest Ridge Elementary School

There were over 550 website views during Virtual Open House #1 (February 12th – March 21st) and 55 feedback surveys completed. See the Appendix for the feedback survey. Responses from the public feedback survey are summarized below:

CONTINUOUS SIDEWALKS

1. Many of the comments from the public expressed the need for continuous sidewalks along the entire Wheatland Road corridor. Walking was the mode of travel that was identified as needing the most improvements (above biking, motor vehicle, or transit) and the mode that most people wish was safer and more accessible to use.

SAFE ROUTES TO SCHOOLS

2. Many parents noted that their students need wider, continuous sidewalks, safer crosswalks, and improved lighting.

PEDESTRIAN IMPROVEMENTS

3. The most common overall improvements that were recommended by the public were a two-way multi-use path, continuous sidewalks, street lighting, and a lower posted speed limit.

TRANSIT IMPROVEMENTS

4. For transit, many people requested covered waiting areas with benches at the bus stops, street lighting, and expanded transit service north of Parkmeadow Drive.

EVALUATION CRITERIA

5. When asked which Evaluation Criteria were the most important to respondents, Safety, Neighborhood Livability, and Safe Routes to School were the top three choices by the public.

POSTED SPEED LIMIT

6. Over 60% of respondents said that they would support a speed limit reduction, over 25% said they would not support it, and 10% were unsure.

The second Virtual Open House will occur after the conceptual design alternatives have been created and evaluated against the ten Evaluation Criteria[4] (Tier 1 Screening). At the second Virtual Open House, the public will be able to provide feedback on their preferred design alternative.

[4] Evaluation Criteria – Memorandum #2, Wheatland Road Corridor Plan, DKS Associates, December 2020.

CROSS SECTION ELEMENTS

Practical design must be employed when evaluating this facility and proposing future enhancements. For pedestrians, system connectivity needs to be achieved by adding sidewalk, curb ramps, and separation from vehicle traffic where possible. There are many segments of roadway without sidewalks on either side of the road which can discourage or inhibit walking for many users, including people in wheelchairs or those with other mobility issues. For cyclists, all types of cyclists should be comfortable while riding along a bike facility. The National Association of City Transportation Officials (NACTO) published contextual guidance for designing bicycle facilities for all ages and abilities using the criteria of safety, comfortability, and equity[5]. Based on the average daily vehicle traffic volumes and the posted speed of Wheatland Road, a protected bike lane or separated bike facility is recommended to provide bicycle facilities where all users feel safe and comfortable.

NACTO guidelines[6] and the City of Keizer's Transportation System Plan (TSP) and Public Works Design Standards[7] recommend the following minimum widths for various cross section elements shown in Table 1.

TABLE 1: MINIMUM WIDTHS FOR CROSS SECTION ELEMENTS

CROSS SECTION ELEMENT	NACTO MINIMUM WIDTH	CITY MINIMUM WIDTH
SIDEWALK	5 feet	6 feet
MULTI-USE PATH	10 feet	12 feet
BIKE LANE	5 feet	6 feet
BIKE LANE BUFFER	1.5 feet	-
PLANTER STRIP	-	5 feet
CURB-TO-CURB WIDTH	-	36 to 50 feet (Minor Arterials)
RIGHT-OF-WAY	-	72 feet (Minor Arterials)

[5] Designing for All Ages and Abilities, National Association of City Transportation Officials, December 2017.

[6] https://nacto.org/publication/urban-street-design-guide/street-design-elements/sidewalks/
https://nacto.org/docs/usdg/shared_use_path_accessibility_guidelines_federal_register.pdf
https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/conventional-bike-lanes/
https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/buffered-bike-lanes/

[7] City of Keizer Transportation System Plan, Part 1 of 2, April 2009.
Section 3.13, Public Works Design Standards, City of Keizer.

STREET DESIGN ALTERNATIVES

Based on the comments received during the Virtual Open House #1 and guidance from City planning documents, there are three conceptual street design alternatives that are being considered for the Wheatland Road corridor. Because a left-turn lane is warranted[8] at the Russett Drive intersection, specific cross section designs were created for that area that include a center-left turn lane. There are also some additional design options for potential enhanced pedestrian crossing locations. See the Enhanced Pedestrian Crossing Treatments section.

The proposed alternatives focused on developing a design that best meets the current and future transportation needs of the corridor. To facilitate development of a conceptual design plan that can be adopted and implemented, an effort was made to identify alternatives that minimize the costs related to right-of-way acquisition and curb reconstruction. A total of three street design alternatives plus a No Build alternative are described in the following sections.

NO BUILD ALTERNATIVE (EXISTING CONFIGURATION)

The No Build alternative would involve no changes to the current roadway with no improvements or alterations. It is a baseline that gives perspective to the changes with the proposed alternatives. The current cross section along Wheatland Road consists primarily of two travel lanes, bike lanes directly adjacent to the vehicle travel lanes with no buffer zone, and intermittent sections of sidewalk. The travel lanes are 11 feet wide and bike lanes are between 5 to 7 feet wide, resulting in a 32 - 36 feet curb-to-curb width as shown in Figure 1. Where sidewalk exists, the width varies from 5 to 6 feet.

FIGURE 1: NO BUILD (EXISTING CONFIGURATION) CROSS SECTION

The table below shows a list of considerations for the No Build (Existing Configuration).

[8] Existing and Future Forecast Conditions – Memorandum #1, Wheatland Road Corridor Plan, DKS Associates, January 2021.

TABLE 2: NO BUILD (EXISTING CONFIGURATION) ALTERNATIVE CONSIDERATIONS

CATEGORY	NOTE
SAFETY	• Crash history at Russett Drive; lack of left-turn lane leads to rear-end collisions involving vehicles turning from Wheatland Road • Pedestrians are vulnerable where sidewalks are not present and at street crossings due to travel speeds and lack of enhanced pedestrian crossings (i.e., signing, striping, activated flashers, and pedestrian refuge islands)
MOTOR VEHICLE OPERATIONS	• Maintains the existing two-lane roadway configuration, current travel times, and current travel speeds • Left-turning vehicles block travel lanes
PEDESTRIAN FACILITIES	• Inconsistent sidewalk presence • Inadequate lighting • Lack of enhanced pedestrian crossings for nearby students walking to/from school and other persons walking or rolling and persons with mobility challenges • Sidewalks and curb ramps are not ADA compliant
BICYCLE FACILITIES	• On-street bicycle lanes are present (5 - 7 feet in width) • No lateral separation or protection from vehicles as recommended by NACTO for this type of roadway based on the All Ages and Abilities goal
TRANSIT SERVICE	• Provides service south of Parkmeadow Drive only • Bus stops are located on west side of corridor only • No covered waiting areas or benches • Inadequate lighting
ENVIRONMENTAL	• Large oak trees exist along the east side of the corridor
RIGHT-OF-WAY	• The existing right-of-way varies between 60 – 72 feet.
COST	• No project cost due to no improvements • Will still have typical maintenance cost

BUILD ALTERNATIVE #1: TRANSPORTATION SYSTEM PLAN (TSP) STREET DESIGN

The Transportation System Plan (TSP) alternative (Build Alternative #1) increases the existing roadway width (curb-to-curb) of Wheatland Road to 48 feet to accommodate a continuous center turn lane, two travel lanes, and bicycle lanes along the entire length of the corridor. This alternative includes 6-foot-wide planter strips and sidewalks. This cross section is based on the City's requirements for a street that is classified as a Minor Arterial in the City's adopted TSP (see Figure 2). A more detailed aerial view concept drawing of the design alternative can be found in the Appendix.

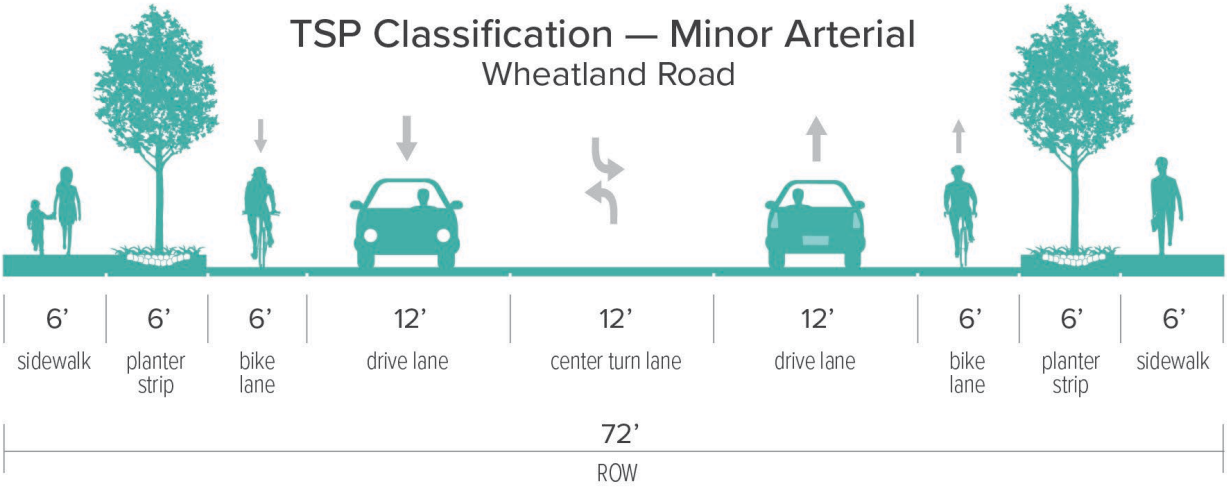


FIGURE 2: TSP STREET DESIGN

The table below shows a list of considerations for the Transportation System Plan (TSP) Street Design alternative.

TABLE 3: TRANSPORTATION SYSTEM PLAN (TSP) ALTERNATIVE CONSIDERATIONS

CATEGORY	NOTE
SAFETY	• Two-way center turn lane provides left-turn pockets at all intersections and driveways • Pedestrian must cross three-lanes of traffic at all locations • Wider curb-to-curb width results in increased speeds • Pedestrians have more separation from traffic through landscape strips • Lack of buffer zone next to bike lane puts bicyclists closer to vehicles
MOTOR VEHICLE OPERATIONS	• Provides a two-stage left-turn for vehicles turning out of side streets and driveways • Left-turning vehicles do not block through traffic on Wheatland Road • Operations meet City Level of Service (LOS) standard
PEDESTRIAN FACILITIES	• Consistent sidewalk presence with landscape buffer • New street lighting along the corridor and key pedestrian and school crossing locations • Opportunity for median refuge islands at school and pedestrian crossings • Sidewalks and curb ramps are ADA compliant
BICYCLE FACILITIES	• On-street bicycle lanes are present • No bicycle buffers or separated facilities are present
TRANSIT SERVICE	• Opportunity for improved bus stops (covered shelters, landings, etc.) • Street lighting
INFRASTRUCTURE & UTILITIES	• Because the curb-to-curb width must be widened beyond the existing curbs, this cross section has a significant impact to existing infrastructure and utilities • Opportunity to construct landscaped medians where turn lanes are not needed
RIGHT-OF-WAY	• The existing right-of-way varies between 60 – 72 feet. A minimum of 72 feet would need to be acquired. • Retaining walls would be needed near the south end of the corridor to provide the width needed for the cross section design
COST	• Preliminary cost estimate of $7 million to $9 million to construct (highest cost of the three build alternatives)

BUILD ALTERNATIVE #2: BUFFERED BIKE LANES STREET DESIGN

The Buffered Bike Lane alternative (Build Alternative #2) maintains much of the existing roadway width (curb-to-curb) of Wheatland Road (36 feet) to accommodate 2-foot-wide buffers for the 5-foot-wide bike lanes as shown in Figure 3. This alternative provides wider 8-foot-wide sidewalks along the entire length of the corridor on both sides of the roadway. The planter strip would vary between 5 feet and 10 feet depending on the available right-of-way. Alternative #2 maintains the two travel lanes. As previously discussed, a left-turn pocket at Russett Drive is needed and the cross section with the left-turn lane is shown in Figure 4. The full 72 feet of right-of-way would be required at Russett Drive to accommodate the northbound left-turn pocket. A more detailed aerial view concept drawing of the design alternative can be found in the Appendix.

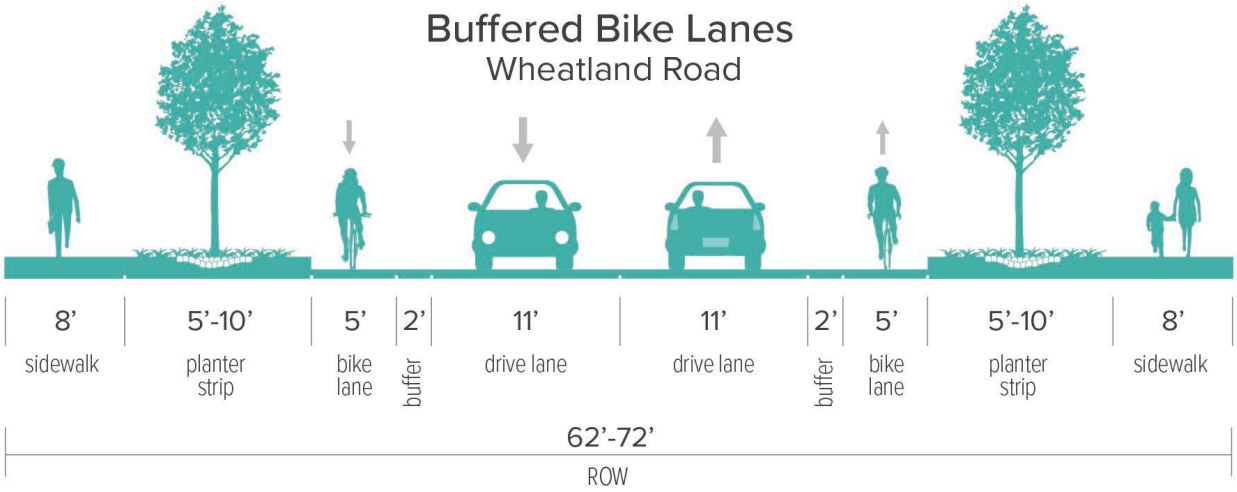


FIGURE 3: BUFFERED BIKE LANES CROSS SECTION

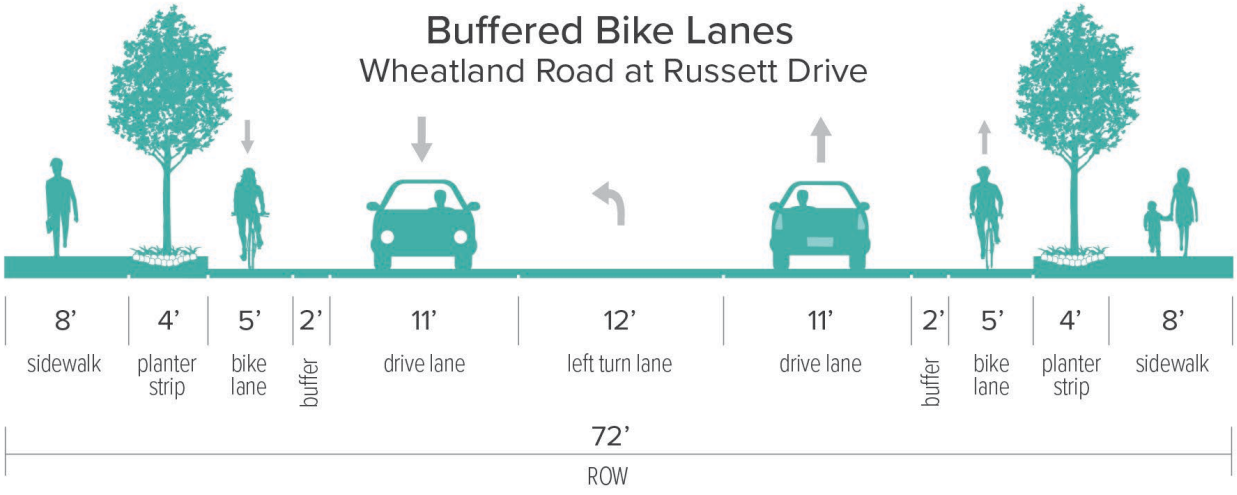


FIGURE 4: BUFFERED BIKE LANES CROSS SECTION (AT RUSSETT DRIVE)

The table below shows a list of considerations for the Buffered Bike Lanes Street Design alternative.

TABLE 4: BUFFERED BIKE LANES ALTERNATIVE CONSIDERATIONS

CATEGORY	NOTE
SAFETY	• Left-turn pocket provided at key intersection (Russet Drive) with crash history and operational/safety needs • Pedestrians and bicyclists have more separation from traffic through landscape strips and bike lane buffers
MOTOR VEHICLE OPERATIONS	• Maintains the existing two-lane roadway configuration, current travel times, and current travel speeds • Left-turning vehicles block travel lanes along the corridor • Operations meet City Level of Service (LOS) standard
PEDESTRIAN FACILITIES	• Consistent widened sidewalk presence (8’ sidewalks compared to 6’ in TSP alternative) • New street lighting • Opportunity for enhanced pedestrian crossings for nearby schools • Sidewalks and curb ramps are ADA compliant
BICYCLE FACILITIES	• On-street bicycle lanes are present (5 feet wide) • Bike lane buffers are present (2 feet wide), providing greater level of comfort for bicyclists
TRANSIT SERVICE	• Opportunity for improved bus stops (covered shelters, landings, etc.) • Street lighting
INFRASTRUCTURE & UTILITIES	• Because the existing curb-to-curb width can be maintained, this cross section has the least impact to existing infrastructure and utilities. • Retaining walls are needed near the south end of the corridor to provide the width needed for the cross section design.
RIGHT-OF-WAY	• The existing right-of-way varies between 60 – 72 feet. A minimum of 62 feet would be required for this cross section design (72 feet at Russett Drive).
COST	• Preliminary cost estimate of $4 million to $6 million to construct (lowest cost of the three build alternatives) • By maintaining the existing curb-to-curb width, savings are realized through less roadway reconstruction

BUILD ALTERNATIVE #3: BUFFERED BIKE LANES AND MULTI-USE PATH STREET DESIGN

The Buffered Bike Lanes and Multi-Use Path alternative (Build Alternative #3) maintains much of the existing roadway width (curb-to-curb) of Wheatland Road (36 feet) and is able to accommodate 2-foot-wide buffers for 5-foot-wide bike lanes as shown in Figure 5. This alternative provides 6-foot-wide sidewalks along the west side of the corridor and a 12-foot multi-use path on the east side of the corridor that can be used for both pedestrians and cyclists that are not comfortable riding adjacent to traffic on Wheatland Road. The multi-use path will result in more adults and younger users feeling comfortable walking and biking along Wheatland Road. The planter strip would vary between 5 feet and 9 feet depending on the available right-of-way. The Multi-Use Path alternative maintains the two travel lanes. A left-turn pocket at Russett Drive is needed and the cross section with the left-turn lane is shown in Figure 6. To accommodate a left-turn pocket and stay within 72 feet of ROW, the sidewalk and planter strip must be reduced by a foot. A more detailed aerial view concept drawing of the design alternative can be found in the Appendix.

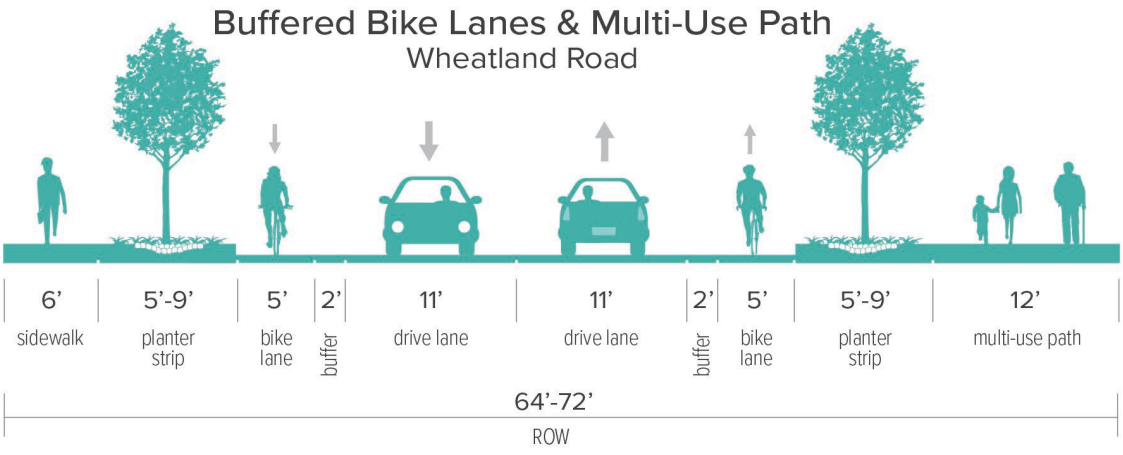


FIGURE 5: MULTI-USE PATH CROSS SECTION

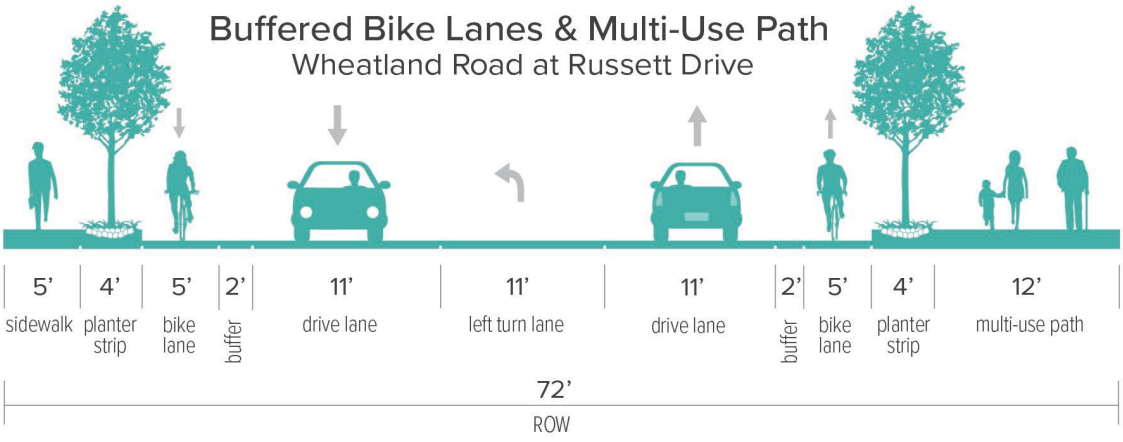


FIGURE 6: MULTI-USE PATH CROSS SECTION (AT RUSSETT DRIVE)

The table below shows a list of considerations for the Buffered Bike Lanes and Multi-Use Path Street Design alternative.

TABLE 5: BUFFERED BIKE LANES AND MULTI-USE PATH ALTERNATIVE CONSIDERATIONS

BUFFERED BIKE LANES AND MULTI-USE PATH ALTERNATIVE CONSIDERATIONS	
SAFETY	• Left-turn pocket provided at key intersection (Russet Drive) with crash history and operational/safety needs • Pedestrians and bicyclists have more separation from traffic through landscape strips and bike lane buffers
MOTOR VEHICLE OPERATIONS	• Maintains the existing two-lane roadway configuration, current travel times, and current travel speeds • Left-turning vehicles block travel lanes along the corridor • Operations meet City Level of Service (LOS) standard
PEDESTRIAN FACILITIES	• Multi-use path provides consistent, comfortable separated pedestrian facility along entire corridor • New street lighting • Opportunity for enhanced pedestrian crossings for nearby schools • Sidewalks and curb ramps are ADA compliant
BICYCLE FACILITIES	• Multi-use path provides a separated facility that accommodates all ages and abilities • On-street bicycle lanes are present (5 feet wide) • Bike lane buffers are present (2 feet wide), providing greater level of comfort for bicyclists
TRANSIT SERVICE	• Opportunity for improved bus stops (covered shelters, landings, etc.) • New street lighting
INFRASTRUCTURE & UTILITIES	• This cross section has less impact than the TSP Alternative, but slightly more impact than the Buffered Bike Lanes Alternative to existing infrastructure and utilities
RIGHT-OF-WAY	• The existing right-of-way varies between 60 – 72 feet. A minimum of 64 feet would be required for this cross section design (72 feet at Russett Drive). • Retaining walls are needed near the south end of the corridor to provide the width needed for the cross section design
COST	• Preliminary cost estimate of $5 million to $7 million to construct (Lower cost than TSP Alternative but higherhigher cost than the Buffered Bike Lane Alternatives) • By maintaining the existing curb-to-curb width, savings are realized through less roadway reconstruction

SUMMARY OF ALTERNATIVES

A summary of Alternatives #1, #2, and #3 is provided in the Table 6 below. Various considerations for each alternative are compared with the No Build Alternative (Existing Configuration).

TABLE 6: ALTERNATIVES SUMMARY

Alternative	No Build Alternative (Existing)	Build Alternative #1 TSP	Build Alternative #2 Buffered Bike Lanes	Build Alternative #3 Buffered Bike Lanes & Multi-Use Path
MEDIAN / CENTER TURN LANE	None	12 feet center two-way center turn lane for entire corridor	Left-turn pocket provided at key intersection (Russet Drive)	Left-turn pocket provided at key intersection (Russet Drive)
BIKE FACILITIES	Bike Lanes	Bike Lanes	Buffered Bike Lanes	Buffered Bike Lanes and Multi-Use Path
PEDESTRIAN FACILITIES	Intermittent Sidewalks with frequent gaps	Consistent 6' Sidewalk	Consistent 8' Sidewalk	6' Sidewalk on west side and Multi-Use Path on east side
VEHICLE LOS[A] AND DELAY	Meets City Standard	Meets City Standard	Meets City Standard	Meets City Standard
TRAVEL SPEEDS	43 mph – 45 mph (85th percentile)	Increased or similar travel speeds due to wider paved cross section	Speeds likely to be lower than No Build Alternative with narrowed lanes and street trees	Speeds likely to be lower than No Build Alternative with narrowed lanes and street trees
INFRASTRUCTURE & UTILITIES	No change	Has the largest impact	Has the smallest impact	Slightly less impact than the Alt #1, but more impact than Alt #2
RIGHT-OF-WAY	No ROW acquisition	Requires the most ROW acquisition (72')	Requires the least ROW acquisition (62' with 72' needed at Russett Drive)	Requires more ROW acquisition than Alt #2 and less than Alt #1 (64' with 72' needed at Russett Drive)
PRELIMINARY COST	-	$7 - $9 million	$4 - $6 million	$5 - $7 million

[A] LOS = LEVEL OF SERVICE

PRACTICAL DESIGN CONSIDERATIONS

In the previous section, multiple cross section concepts were identified for the Wheatland Road corridor. However, as the project progresses from concept design into detailed design, some portions of the corridor will need to slightly deviate from the cross section designs shown in this report to save critical natural resources (mature oak trees, and other substantial trees); to minimize impacts to existing properties; and to reduce the cost for structures, such as retaining walls. The section contains some practical design considerations that can be implemented to reduce costs and preserve existing infrastructure and natural resources as the conceptual design progresses.

The table below shows some practical design considerations for the Wheatland Road corridor.

TABLE 7: PRACTICAL DESIGN CONSIDERATIONS

CONDITIONS	DESIGN CONSIDERATIONS
MATURE OAK TREES; OTHER TREES	• Construct meandering sidewalk to preserve existing trees
NEED FOR RETAINING WALLS	• Eliminate or reduce landscape strip • Eliminate bicycle buffer • Shift center line of street
ROW ACQUISITOIN	• Eliminate landscape strip • Eliminate bicycle buffer

FIGURE 7: CONCEPT OF PRATICAL DESIGN ON WHEATLAND

ENHANCED PEDESTRIAN CROSSING TREATMENTS

Enhanced pedestrian crossing treatments can be implemented with the selection of any of the concept design alternatives. Below are a few examples of enhanced pedestrian crossing treatments that can be considered at key locations along the corridor:

Treatments

- Median refuge island
- Raised crosswalks
- Enhanced signing and pavement markings
- Rectangular Rapid Flashing Beacons (RRFBs) at pedestrian crosswalks

Key Locations (See Figure 7)

- Clear Lake Road (School Crossing)
- Parkmeadow Drive (School Crossing)
- Russett Drive
- McNary Heights Drive/Foothill Court

FIGURE 8: RAISED CROSSING CONCEPT

FIGURE 9: RRFB CONCEPT

FIGURE 10: POSSIBLE PEDESTRIAN ENHANCEMENT LOCATIONS

MULTI-USE PATH INTERSECTION CROSSINGS

For the Multi-Use path, it is important that the path crossings at minor streets are more visible and safer than a standard intersection crossing because many of the users will be children or the elderly. There are two options for minor street crossings that can help improve visibility and safety of pedestrians and bicyclists using the Multi-Use Path.

- Raised crossing through minor street intersection (Figure 11)
- Street-level crossing with marked crosswalks (Figure 12)

Both options included a marked crosswalk to improve visibility and would place the stop bar for vehicles before the marked crosswalk. The raised crossing option also includes raising the crosswalk above the street-level to help bring more attention to the pedestrian and bicyclists crossing the street.

FIGURE 11: EXAMPLE OF RAISED CROSSING THROUGH MINOR STREET INTERSECTION

FIGURE 12: EXAMPLE OF STREET-LEVEL CROSSING WITH MARKED CROSSWALK

TRANSIT TREATMENTS

Transit bus stop treatments can be implemented with the selection of any of the concept design alternatives. The project team is coordinating with Cherriots by presenting possible future treatment options. Below are a few examples of transit treatments that are being considered:

- Bus Stop Shelters
- Bus Stop "Concrete Bridge" (constructed over landscape strips or bioswales to provide ADA compliant boarding/deboarding)

FIGURE 13: CHERRIOTS BUS STOP SHELTER

FIGURE 14: CHERRIOTS BUS STOP "CONCRETE BRIDGE" EXAMPLE OF PRATICAL DESIGN ON PARKMEADOW

Currently, Cherriots Route 9 travels in the southbound only direction on Wheatland Road. If two-way service were ever provided, bus stops on the east side of the street would also need to be provided. This should be considered during the detailed design phase of the corridor project.

Cherriots will be conducting a needs assessment this this year to determine any deficiencies and needs in the Cherriots public transit system for potential implementation in 2022. Route 9 will be analyzed during this process and there may be improvements identified and implemented depending on public feedback received.

STREET LIGHTING

Street lighting provides increased pedestrian and bicycle visibility during the night and the dawn/dusk periods of the day by providing contrast between the pedestrian and their surroundings.

The existing lighting along this corridor is limited, especially near school bus stops and crossings. Adequate street lighting will be implemented with the selection of any of the concept design alternatives. Improvements along the Wheatland Road Corridor could include new streetlight poles as well as supplemental lighting on utility poles.

ACCESS MANAGEMENT

Along the Wheatland Road study corridor, there are a total of 62 private driveways, with a higher density near the north end of the corridor. Most of these driveways do not have alternative access to other public streets, and Wheatland Road provides the only access to the property.

Managing access points/private driveways along a minor arterial requires finding an appropriate balance between safety, mobility, and land access. As vacant lands adjacent to Wheatland Road are developed, it is recommended that existing private driveways are removed, relocated, consolidated, or aligned with existing driveways and public streets to improve safety, eliminate conflict points with pedestrian and bikes, and improve mobility. It is also recommended that access spacing be considered as well. Per the City's Development Code[9], accesses on arterial streets (public streets or driveways) shall be spaced no closer than 185-feet based on a posted speed of 40 mph.

TIER 1 SCREENING

The following section provides Tier 1 screening evaluation of the three design alternatives for Wheatland Road. The alternatives were scored using the Evaluation Criteria established in the Evaluation Criteria Memorandum.[10] Evaluation criteria were established to assess the potential of alternatives to best meet the transportation needs and community goals for the Wheatland Road Corridor Study. The evaluation criteria are listed below.

- Neighborhood Livability
- Environmental
- Utilization of Existing Infrastructure
- Traffic Operations
- Safe Routes to School
- Safety
- Transportation Mode Choices/ Multimodal Connectivity
- Equity
- Convenient and Accessible Transit
- Cost Effective

The criteria were scored over a range of -2 to +2 as compared to the No Build (Existing Configuration) alternative. A score of 0 implies the alternative has no change from the existing, a negative score implies the alternative has worse conditions than existing, and a positive score implies the alternative has improved conditions than existing. The scoring weighs each criterion equally. Tier 1 screening is only intended to be a tool that helps guide the decision process; it does not select the preferred alternative based on the City's and Community's goals. The summary matrix that documents the results of the evaluation process can be found in the Appendix.

[9] Page 320, Development Code, City of Keizer, Updated May 2020.

[10] Evaluation Criteria – Memorandum #2, Wheatland Road Corridor Plan, DKS Associates, December 2020.

ALTERNATIVE #1 TSP Street Design	ALTERNATIVE #2 Buffered Bike Lanes	ALTERNATIVE #3 Buffered Bike Lanes & Multi-Use Path
1.25	1.65	1.75

Alternative #1 scored an average of 1.25, Alternative #2 scored an average of 1.65, and Alternative #3 scored an average of 1.75. All three alternatives are shown to be an overall improvement from existing conditions. Alternatives #2 and #3 received relatively similar scores, indicating the need for the Keizer community to weigh in on their preference of design options.

The difference in scores between Alternative #1 and Alternatives #2 and #3 can be attributed to two basic differences amongst the designs. First, Alternatives #2 and #3 provide increasingly safer multimodal facilities. The buffered bike lanes and multi-use path are safe options for students going to/from school, bicyclists of all ages and abilities, and the general public, while also giving flexibility in transportation mode choice and accommodating all users and abilities. Secondly, Alternatives #2 and #3 have similar pavement cross section widths as the existing condition, meaning that road reconstruction would be less invasive than Alternative #1. More of the existing infrastructure could be utilized for Alternatives #2 and #3, also decreasing the total project cost.

APPENDIX CONTENTS

APPENDIX A: VIRTUAL OPEN HOUSE #1 FLYER

WHEATLAND ROAD CORRIDOR STUDY
VIRTUAL PUBLIC OPEN HOUSE #1

FEBRUARY/MARCH 2021

DO YOU DRIVE, WALK, BIKE, TAKE THE BUS, LIVE, OR WORK ON WHEATLAND ROAD?

If so, the City of Keizer wants your input at the first public open house!

WHEN AND WHERE IS THE FIRST PUBLIC OPEN HOUSE?

The first open house will be held virtually starting on February 15th, 2021. Please visit the website at www.keizer.org/WheatlandRoadMultimodalCorridorVirtualOpenHouse to participate and provide feedback through the online survey and comment map.

WHAT WILL BE PRESENTED?

The first public open house will present the following:

- existing and future transportation conditions of the 1.8-mile corridor between River Road and Jays Drive (map on the right)
- evaluation criteria used to assess future alternatives
- a snapshot of potential future pedestrian and bicycle enhancements

WHY IS THIS IMPORTANT?

The goal of the Wheatland Road Corridor Study is to develop a multimodal corridor plan and conceptual street design that removes barriers for all modes of travel, considers the latest urban safety improvements for pedestrians, bicycles, and transit facilities while creating an enjoyable experience for all users.

FOR FURTHER QUESTIONS ABOUT THIS PROJECT, PLEASE FEEL FREE TO CONTACT US:

- BILL LAWYER, PUBLIC WORKS DIRECTOR
  LAWYERB@KEIZER.ORG
- SCOTT MANSUR, CONSULTANT PROJECT MANAGER
  SCOTT.MANSUR@DKSASSOCIATES.COM

APPENDIX B: FEEDBACK SURVEY – VIRTUAL OPEN HOUSE #1

Wheatland Road Multimodal Corridor Plan

Public Feedback Survey (Open House #1)

Thank you for providing your input on the Wheatland Road Multimodal Corridor project!

Feel free to answer as many or as few questions as you would like in this survey. You may want to refer to the Poster Boards and/or Transportation Report as you fill out the survey.

1. The goal of this project is to increase safety and mobility for all modes of travel. What level of improvement do you think these mode(s) of travel need?

	Does Not Need Improvement	Needs Some Improvement	Needs Significant Improvement
Vehicle	○	○	○
Bicycle	○	○	○
Walking	○	○	○
Transit	○	○	○

2. Were there any key issues or deficiencies for any of the modes of transportation (walking, biking, transit, or vehicles) that we missed? If so, please explain.

3. If you have children that attend Salem-Keizer schools, how well does the Wheatland Road corridor provide safe access to school bus stops and nearby schools? What safety improvements would you recommend that would benefit school children?

4. What improvements would you recommend the City consider as part of the conceptual street design?
It could be an idea already shown on the "Toolbox" Poster Board or one of your own thinking.

5. What improvements would you recommend for an improved transit experience along Wheatland Road?

6. Which evaluation criteria are most important to you? Select up to FIVE from the list below.

- [ ] Neighborhood Livability
- [ ] Environmental
- [ ] Utilization of Existing Infrastructure
- [ ] Traffic Operations
- [ ] Safe Routes to School
- [ ] Safety
- [ ] Transportation Mode Choices/Multimodal Connectivity
- [ ] Equity
- [ ] Convenient and Accessible Transit
- [ ] Cost Effective

7. Are there other evaluation criteria that you feel are missing from the list above?

8. What modes of transportation do you currently use along Wheatland Road corridor? Check all that apply.

- [ ] Personal Vehicle
- [ ] Bicycle
- [ ] Walking
- [ ] Transit
- [ ] Other (please specify)

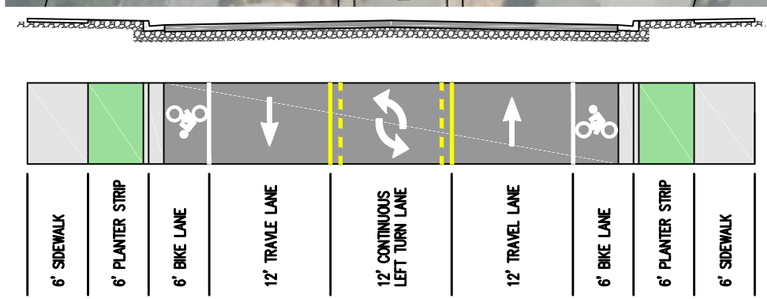
9. Of the transportation modes listed, are there any modes that you wish were safer or easier to use on Wheatland Road? Check all that apply.

- [ ] Personal Vehicle
- [ ] Bicycle
- [ ] Walking
- [ ] Transit
- [ ] Other (please specify)

10. Would you be in support of a lower posted speed limit on Wheatland Road? For example, reducing the posted speed from 40 mph to 35 mph.

- ( ) Yes
- ( ) No
- ( ) I don't know

APPENDIX C: DETAILED CONCEPT DRAWINGS (AERIAL VIEW)



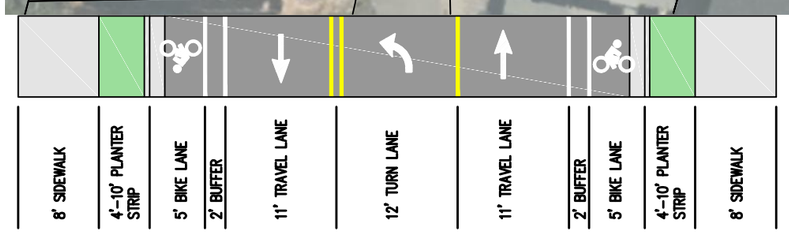
CONCEPT DRAWING - NOT TO SCALE

DATE: 5/10/2021

DESIGN ALTERNATIVE #1

WHEATLAND ROAD MULITMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM



CONCEPT DRAWING - NOT TO SCALE

DATE: 5/10/2021

DESIGN ALTERNATIVE #2

WHEATLAND ROAD MULITMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

NEW TERRACE CT NE

NEW TERRACE DR N

RUSSET DR N

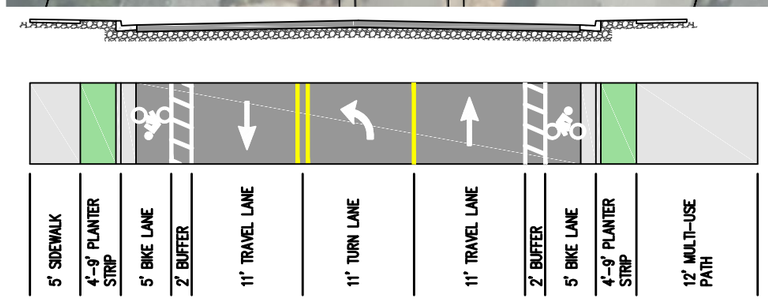
DELTA DR NE

LAGUNA DR NE

DELTA CT N

BOLF TERRACE N

N



CONCEPT DRAWING - NOT TO SCALE

DATE: 5/10/2021

DESIGN ALTERNATIVE #3

WHEATLAND ROAD MULITMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

APPENDIX D: TIER 1 SCREENING MATRIX

	Alt 1: TSP Classification - Minor Arterial		Alt 2: Buffered Bike Lanes		Alt 3: Multi-use Path	
	Score	Comment	Score	Comment	Score	Comment
NEIGHBORHOOD LIVABILITY	1	Wider pavemkent width results in higher traffic speeds; Focus on connectivity with improved sidewalks and bike lanes; May not address all roadway users' needs.	1.5	Maintains the current two-lane cross section; Focus on connectivity with improved sidewalks and bike lanes; Includes buffered bike lanes for safer and more comfortable biking options.	2	Maintains the current two-lane cross section; Focus on connectivity with improved sidewalks and bike lanes; Includes buffered bike lanes and a multi-use path for safer and more comfortable biking options.
ENVIRONMENTAL	1	Requires removal of many existing trees and natural resources; More stormwater runoff; No major environmental issues; Can apply practical design approach.	2	Preserves existing trees and natural resources; Less stormwater runoff than other options; No major environmental issues, Can apply practical design approach.	1.5	Preserves existing trees and natural resources; Less stormwater runoff than Alt #1 but slightly more than Alt #2; No major environmental issues, Can apply practical design approach.
UTILIZATION OF EXISTING INFRASTRUCTURE	0	Widens curb-to-curb width for entire corridor from 32' - 36' to 48'.	1	Maintains most of existing curb-to-curb width, requires least right-of-way acquisition.	1	Maintains most of existing curb-to-curb width, requires more right-of-way acquisition than Alt #2.
TRAFFIC OPERATIONS	2	Increases capacity and queue storage at public street intersections and private driveways due to presence of center turn lane.	1.5	Continues to meet City LOS standards, with turn lane at key intersection.	1.5	Continues to meet City LOS standards, with turn lane at key intersection
SAFE ROUTES TO SCHOOL	1	Widens crossing distance across Wheatland, but does provide opportunity for median refuge islands. Provides continuous sidewalk along entire corridor.	1.5	Provides continuous sidewalk along entire corridor; Sidewalks wider than standard width (8 feet); Buffer between travel lane and bicycle lane increases rider comfortlevel.	2	Provides continuous sidewalk and multi-use path for all ages and abilities. Buffer between travel lane and bicycle laneincreases rider comfort level.
SAFETY	1	For vehicles, it allows two-stage left turns out of side streets. For vulnerable road users, there are opportunities for RRFBs, median refuge islands, and raised crosswalks. But the wider roadway cross section width is determental for vulnerable road users	1.5	Buffered bike lanes protect bicycles; Opportunities for RRFBs and raised crosswalks; Left turn lane key intersection; Some vulnerable roadway users may not want to bike in the street.	2	Buffered bike lanes protect bicycles; Includes ability for non-confident bicyclists to ride on the sidwalk (multi-use path); Opportunities for RRFBs and raised crosswalks; Left turn lane key intersection.
TRANSPORTATION MODE OPTIONS/ MULTIMODAL CONNECTIVITY	1.5	Provides service for all modes and continuous facilities along entire corridor.	1.5	Provides service for all modes and continuous facilities along entire corridor.	2	Provides service for all modes and continuous facilities along entire corridor, including the ability to bike along the multi-use path instead of the street.
EQUITY	2	Improved multimodal options for all users and populations.	2	Improved multimodal options for all users and populations.	2	Improved multimodal options for all users and populations.
CONVENIENT AND ACCESSIBLE TRANSIT	2	Opportunities for publlic transit bus stop treatments; adequate lighting; enhanced pedestrian crossings.	2	Opportunities for publlic transit bus stop treatments; adequate lighting; enhanced pedestrian crossings.	2	Opportunities for publlic transit bus stop treatments; adequate lighting; enhanced pedestrian crossings.
COST EFFECTIVE	1	Highest cost to construct.	2	Lowest cost to construct.	1.5	More costly to construct than Alt #2, but less than Alt #1.
TOTAL	1.25		1.65		1.75	

05 TECHNICAL MEMORANDUM #4
TIER 2 EVALUATION AND SCREENING

DKS 117 COMMERCIAL STREET NE, SUITE 310, SALEM, OR 97301 • 503.391.8773 • DKSASSOCIATES.COM

MEMORANDUM #4

DATE: November 30, 2021

TO: Project Management Team

FROM: Scott Mansur, P.E., PTOE | DKS Associates
Jenna Bogert, P.E. | DKS Associates
Travis Larson, E.I. | DKS Associates

SUBJECT: Wheatland Road Corridor Plan - Tier 2 Evaluation and Screening P#20020-009

INTRODUCTION

This memorandum provides a comparison of the two alternatives for the Wheatland Road Multimodal Corridor Plan. These two alternatives were advanced for further analysis based on the results of the Tier 1 screening evaluation, public feedback from the second Virtual Open House, and direction from the Project Management Team (PMT).

For each of the two advanced alternatives, a full-corridor concept drawing is provided showing a conceptual layout of the proposed travel lanes, transit stops, sidewalks, bike lanes, landscaping, enhanced pedestrian crossings, and other roadway elements on Wheatland Road. This memorandum also contains a Tier 2 screening evaluation of both alternatives, which includes traffic operations, pedestrian and bicycle qualitative assessment, safety impacts, right-of-way impacts, and planning-level cost estimates. At the conclusion of the Tier 2 Screening Evaluation, a recommendation for the preferred Wheatland Road concept design is provided.

The following is contained in this memorandum.

VIRTUAL OPEN HOUSE #2 SUMMARY

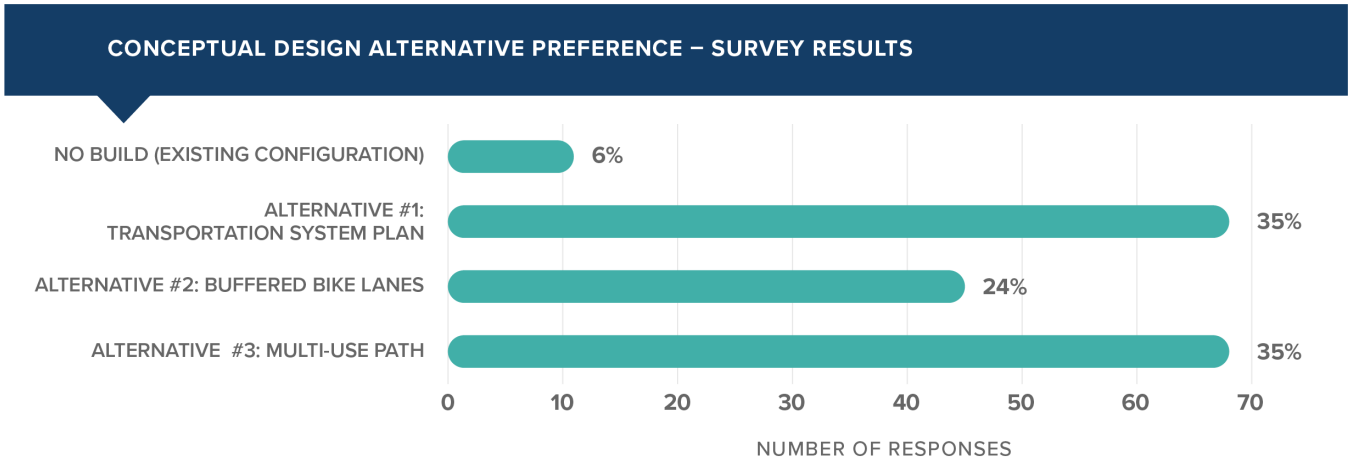
The second Virtual Open House was held from July 23rd – August 8th (17 days). As with the first Virtual Open House, the second Virtual Open House were accessed through the City's project website[1] and provided the public with digital posterboards, all technical documentation to-date, and a four-question feedback survey. See the Appendix for the four-question feedback survey that was provided to the community.

The goals of Virtual Open House #2 included:

1. Present the three conceptual design alternatives
2. Share the findings of the Tier 1 Screening Evaluation
3. Identify enhanced pedestrian crossing treatment opportunities
4. Gather community input on a preferred conceptual design alternative

Announcement of Virtual Open House #2 was made to stakeholders with Facebook, committee meetings, emails, and postcards. Postcards were delivered to over 2,600 individual residential and business addresses along the Wheatland Road corridor prior to the start of Virtual Open House #2.

There were over 740 website views of Virtual Open House #2 and 196 feedback surveys submitted. A few additional responses from the public were sent to City staff directly. The first and primary question of the survey was to hear from the community what Conceptual Design Alternative they preferred. The results of that question are shown in Figure 1.



The majority of responders (94.3 percent) favor making a change to the corridor over keeping the existing no build conditions. This displays the immense public support for this street project and the need to make changes to the corridor.

[1] https://www.keizer.org/WheatlandRoadMultimodalCorridorPlan

As for the alternative that was most favored, there was a close contest between Alternative #1 and Alternative #3, with 69 votes and 68 votes respectively. It is important to note, however, that Alternative #2 and #3 are very similar designs. If Alternative #2 was not an option, then it would be reasonable to suggest that most of the voters for Alternative #2 would have chosen Alternative #3 instead, making it the preferred alternative by the general public.

With the survey results, there were a wide range of general comments that were received regarding the project. Below are some direct comments from the surveys.

Desire for Safe and Connected Sidewalks and Bicycle Lanes: There was overwhelming support for safe and connected sidewalks and bicycle lanes.

- "*I am a moderately frequent walker along Wheatland and would feel much safer and more comfortable with the addition of continuous sidewalks. I occasionally bike along the route as well and the buffered bike lanes would be very nice*."
- "*Very excited to see this project in the works. I can't wait to have a continuous stretch of sidewalk along Wheatland!*"
- "*Alternative 3 will really transform the corridor. The 12' multiuse path will allow young children to travel along the corridor safely. I currently will not let my kids walk/bike along the corridor*."
- "*My priorities are sidewalks all along the corridor, safe walk routes to schools, and reduced speed limit on Wheatland*."
- "*We badly need sidewalks that are continuous. I love the idea of the wider multi-use lane for bikes, pedestrians, skateboards, etc*."

Need for Better Street Lighting: Many comments were made about street lighting. For all the proposed alternatives, cohesive and efficient street lighting is part of the concept drawings.

- "*Really all I want to see are more streetlights and sidewalks for the pedestrians*."
- "*Much, much more lighting. I believe there shouldn't be any dark patches between lights at night*."

Right-of-Way Concerns: There were many comments and concerns regarding land acquisition and right-of-way (ROW) impacts to property owners.

- "*I have a concern about being a homeowner that could be affected and how other homeowners will be affected as well for the ROW*."
- "*A two way left turn down the whole street is a huge waste of space; it is only needed at busy intersections*."
- "*I would prefer to keep land acquisition to a minimum*."

Maintainable Buffer/Planter Strips: A desire for balance between corridor aesthetics and realistic maintenance was shown. A range of opinions were shared about the proposed planter strips. The primary affirmative responses were in regard to better street aesthetics and the additional safety buffer. The primary unfavorable responses were in regard to the additional right-of-way and concerns about maintenance.

- "*Please no bushes or trees in the planter strip. Especially where there are driveways or side streets. It is too hard to see traffic*."
- *"Additional trees and plantings in a planter strip would do much for the aesthetics of the area."*
- *"Please consider the maintenance of the vegetation that is used. There are several areas where they are impeding into the sidewalk and I have to walk into the street to get around them."*
- *"Adding planting strips requires maintenance!"*

Speed on Wheatland Road: A range of comments were provided around the topic of speed on Wheatland Road. The majority of the comments were in favor of lowering the speed limit, some comments were in favor of maintaining the current speed limit. There were also comments on desiring better enforcement.

- "*Yes, this road is incredibly dangerous and we don't currently feel safe walking down it. Having more signage and precautions like slower speed limits to keep pedestrians safe would be awesome*."
- "*We live with Wheatland behind us and constantly hear and see cars going way too fast, above the already high speed limit*."
- *"Lower speed limit and enforce it*."
- "*We don't need reduced speed limits. We need enforcement of the speed limits already in place*."

REASONS FOR ADVANCING OR NOT ADVANCING ALTERNATIVES

Based on the results of the Tier 1 Screening (found in Technical Memorandum #3), feedback at Virtual Open House #2, and direction from the City, the existing configuration and three design alternatives were either advanced or not advanced to the Tier 2 Screening Evaluation for the following reasons. See the Appendix for the cross section of each alternative.

NO BUILD (EXISTING CONFIGURATION) – NOT ADVANCED

The No Build (Existing Configuration) scenario received the least number of votes from the public during the second Virtual Open House. In addition to having safety concerns for vulnerable roadway users like pedestrians, bicyclists, and students, this scenario is not consistent with the City's transportation goals or the needs of the community and, therefore, was not advanced for further evaluation.

ALTERNATIVE #1: TRANSPORTATION SYSTEM PLAN (TSP) - ***ADVANCED***

Alternative #1 shared the highest percentage of votes (approximately 35 percent), along with Alternative #3, based on the public feedback surveys. However, based on the results from the Tier 1 Screening Evaluation performed by the consultant and verified by the City, it scored lower than Alternatives #2 and #3. Although this design had low support based on the results of the Tier 1 Screening Evaluation, the alternative was supported by the public. Therefore, it was advanced to the Tier 2 Screening process.

This design provides two travel lanes with a two-way center left turn lane along the entire study corridor. Bicycle lanes, sidewalks, and planter strips are also provided on both sides of the road. In order to reduce right-of-way impacts and tree impacts, slight adjustments to the Alternative #1 cross section were made during the full-corridor conceptual design process (e.g., removal of landscape strip in constrained locations); these adjustments are depicted in the attached Full-Corridor Conceptual Design Layouts.

ALTERNATIVE #2: BUFFERED BIKE LANES - NOT ADVANCED

Alternative #2 received 23 percent of votes based on the public feedback surveys, placing third of the four options. The alternative scored second in the Tier 1 Screening Evaluation. Because Alternative #2 is very similar to Alternative #3, and Alternative #3 received more support from the public, Alternative #2 was not advanced to the Tier 2 Screening Evaluation.

ALTERNATIVE #3: MULTI-USE PATH AND BUFFERED BIKE LANES - ***ADVANCED***

Alternative #3 shared the highest percentage of votes (approximately 35 percent) with Alternative #1 based on the public feedback surveys. Based on the results from the Tier 1 Screening Evaluation, it scored the highest of the other options. Because this design is supported by both public feedback and the Tier 1 Screening Evaluation, the alternative was advanced to the Tier 2 Screening Evaluation.

The proposed design included two travel lanes with buffered bicycle lanes, a 6-foot sidewalk on the west side of Wheatland Road, and a 12-foot multi-use path on the east side. In order to reduce right-of-way impacts and optimize cost savings, adjustments to the cross section were made through the full-corridor conceptual design process; these adjustments are depicted in the attached Full-Corridor Conceptual Design Layouts and discussed in the following section.

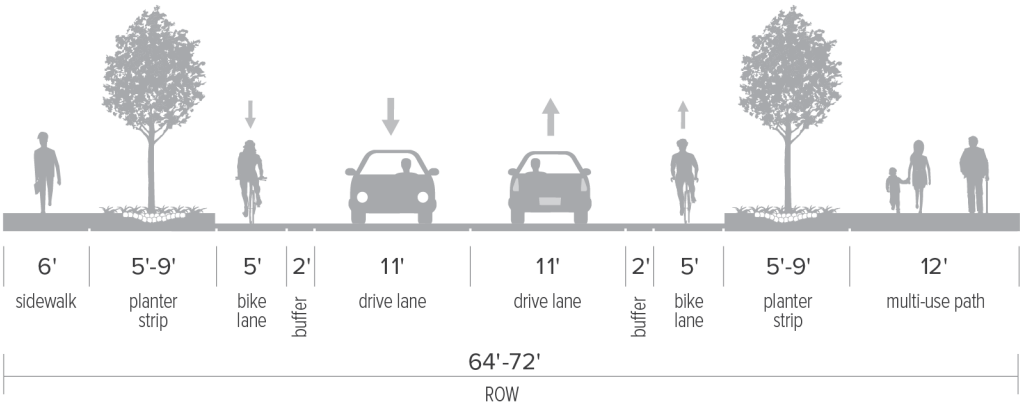
FULL-CORRIDOR CONCEPTUAL DESIGN LAYOUTS

This section contains a discussion of various design elements from the full-corridor conceptual design layouts for the two design alternatives that were advanced: Alternative #1 (Transportation System Plan) and Alternative #3 (Multi-Use Path and Buffered Bike Lanes). Refer to the Appendix to see the Full-Corridor Conceptual Design Layouts.

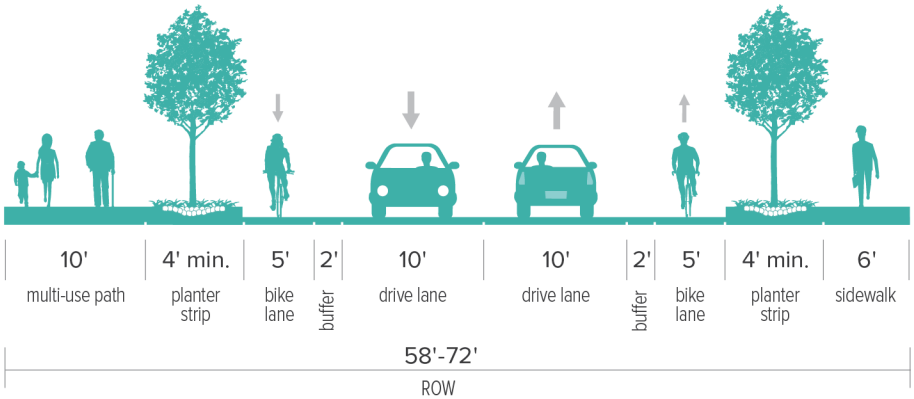
ADJUSTMENTS TO ALTERNATIVE #3: MULTI-USE PATH AND BUFFERED BIKE LANES

During the process of creating the full-corridor concept design layouts, the original cross section design for Alternative #3 was modified to better address the concerns voiced by the public during Open House #2. Many members of the public voiced their desire for the Wheatland Road project to minimize private property and right-of-way impacts and to provide safer, separated pedestrian and bicycle facilities for all users, including school-age children. Hearing this feedback, the Wheatland Road Technical Advisory Committee (TAC) did not think the original cross section for Alternative #3 provided sufficient separation for users of the multi-use path from the vehicle travel lanes. In order to provide more separation, the multi-use path was moved to the west side of the road where there is more available right-of-way. The width of the path was also reduced to 10 feet. These two modifications increased separation and reduced private property impacts.

ALTERNATIVE #3 CROSS SECTION THAT WAS PRESENTED DURING VIRTUAL OPEN HOUSE #2



MODIFIED ALTERNATIVE #3



During the cost estimating process, the TAC discussed ideas for improving cost savings for Alternative #3 to make the project more affordable. By reducing the travel lanes from 11 feet to 10 feet, a large cost savings was realized as the majority of the existing curb-to-curb width could be preserved along the corridor. Narrower travel lanes will also encourage lower vehicle speeds, which was another major concern of the public. However, with the adjacent 2-foot bicycle buffer, there is still adequate width for freight activity along the corridor.

ENHANCED PEDESTRIAN CROSSING TREATMENTS (KEY LOCATIONS)

Enhanced pedestrian crossing treatments are shown on both of the concept design layouts. Table 1 provides the type of enhanced pedestrian crossing treatments at the key locations along the corridor for each alternative. Treatments include new marked crosswalks, center medians, and/or Rectangular Rapid Flashing Beacons (RRFBs).

TABLE 1: ENHANCED PEDESTRIAN CROSSING TREATMENTS

ALTERNATIVE #1: TSP		ALTERNATIVE #3: MULTI-USE PATH	
Type	**Location**	**Type**	**Location**
RRFB* at School crosswalk with pedestrian refuge median	Clearlake Rd (south leg)	RRFB* at School crosswalk	Clear Lake Road (south leg)
RRFB* at School crosswalk with pedestrian refuge median	Parkmeadow Dr (south leg)	RRFB* at School crosswalk	Parkmeadow Dr (north leg)
Crosswalk with pedestrian refuge median	Russett Dr (north leg)	Crosswalk with pedestrian refuge median	Russett Dr (north leg)

* Rectangular Rapid Flashing Beacons (RRFBs) can be installed at locations where pedestrian volumes are frequent and meet a certain peak hour threshold. RRFBs are shown at Parkmeadow Drive and Clearlake Road for both Alternative #1 and Alternative #3. However, additional pedestrian count data will need to be collected as part of the street design process to confirm that an RRFB is warranted at these locations.

The presence of three travel lanes in Alternative #1 provides the opportunity to install a pedestrian refuge median at new or existing pedestrian crosswalks, allowing pedestrians to cross Wheatland Road in two stages. For Alternative #3, there is not enough roadway width to install pedestrian refuge medians, however, the total crossing width only requires pedestrians to cross two lanes of traffic. The exception to this for Alternative #3 is at Russett Drive where a northbound left-turn lane is proposed and there is sufficient width to install a pedestrian refuge median.

MULTI-USE PATH INTERSECTION CROSSINGS

For Alternative #3 (Multi-Use Path), it is important that the path crossings at minor streets are more visible and safer than a standard intersection crossing because many of the users will be children or elderly pedestrians. There were two options for minor street crossings that were presented to the public during Virtual Open House #2:

- Option #1: Raised Crossing
- Option #2: Street-Level Crossing

The public was asked to vote for their preferred multi-use intersection crossing type. The survey results showed that Option #1 and Option #2 had a similar percentage of votes, 39 percent and 41 percent, respectively. The remaining 20 percent of voters selected "no preference". Since neither option was significantly preferred by the public, the street-level crossings (Option #2) was selected for the Full-Corridor Conceptual Design Layout of Alternative #3 with marked crosswalks across all public street approaches to Wheatland Road.

TRANSIT TREATMENTS

Transit bus stop treatments were shown on both of the Full-Corridor Conceptual Design Layouts. Both concept layouts show:

- Bus Stop Shelters or Benches at all current bus stop locations along Wheatland Road (see example to the right)
- Bus Stop "Concrete Bridges" at all current bus stop locations along Wheatland Road

FIGURE 2: BUS SHELTER ALONG RIVER ROAD IN KEIZER

There are four bus stops located along the west side of Wheatland Road, south of Parkmeadow Road. At these bus stop locations, the safety impacts of mixing transit users and bicyclists on the multi-use path (Alternative #3 only) have been considered. The safety of transit users and multi-use path users will be addressed by installing ADA landing pads, or "concrete bridges," in the landscape strip to provide a designated loading space for transit users that does not conflict with multi-use path users (similar to what is shown in Figure 2).

Currently, Cherriots' Route 9 travels in the southbound-only direction on Wheatland Road. If two-way service were ever provided on Wheatland Road, bus stops on the east side of the street would also need to be provided.

ODOT's current standard for streets with speed limits of 40 mph or higher is to construct bus pull-outs for any transit stops along those streets. It is recommended that the posted speed on Wheatland Road be re-evaluated after the construction of the corridor project to determine if 50th and 85th percentile vehicle speeds have changed and whether the roadway should be considered for a lower posted speed (i.e., 35 mph). If the vehicle speeds indicate that the 40 mph posted speed should remain, then bus pull-outs should be considered along the corridor to meet ODOT standard practice.

STREETSCAPE ELEMENTS

Street light improvements and street trees are included in both Full-Corridor Concept Design Layouts. The alignment of sidewalks and the multi-use path are intended to minimize the impact to adjacent properties, existing landscaping, and existing mature trees. Street trees plantings are shown in locations where existing trees are expected to be impacted or don't currently exist. New tree would be planted with spacing consistent with City standards within planter strips. Alternative #3 provides more opportunities for landscaped strips and street trees than Alternative #1.

Driveway crossings over the multi-use path for Alternative #3 and access for existing residences are one of the main differences between the layouts. Retaining walls are anticipated to be necessary in both Alternatives between Foothill Court NE and Laguna Drive NE; larger walls are expected for Alternative #1 to tie into existing topography.

UTILITIES

Widening for Alternative #1 impacts existing utilities more than Alternative #3. The following is a brief list of the notable differences:

- Alternative #1 creates more conflicts with existing utilities along the corridor.
- Alternative #1 creates more impervious surfacing, which impacts capacity of the storm drainage system.
- Alternative #1 requires moving existing catch basins further and extending piping to the new curb alignment.
- Alternative #1 will have more impact to existing water system. Existing fire hydrants and water meters will need to be relocated outside of the widened corridor.

In both alternatives, the existing overhead utilities will be placed on taller poles (60-foot utility poles) to avoid conflict with the planned street trees. Undergrounding the utilities was considered during the cost estimating process, but maintaining the overhead utilities was more cost-effective.

TIER 2 SCREENING

This section summarizes the Tier 1 screening criteria and methodology, as well as the Tier 2 screening criteria and evaluation for the two advanced alternatives. For the Tier 2 screening, the alternatives were scored using similar methodology as the Tier 1 screening, which can be found in Technical Memorandum #2. The combination of the Tier 1 and Tier 2 screening results will help guide the decision to determine the final recommended alternative.

TIER 1 CRITERIA:

- Neighborhood Livability
- Environmental
- Utilization of Existing Infrastructure
- Traffic Operations
- Safe Routes to School
- Safety
- Transportation Mode Choices/ Multimodal Connectivity
- Equity
- Convenient and Accessible Transit
- Cost-Effective

TIER 2 CRITERIA:

- Traffic Operations (delay, queuing, and speed)
- Pedestrian and Bicycle Qualitative Assessment
- Safety Impacts (including Safe Routes to School)
- Right-of-Way and Utility Impacts
- Planning-Level Cost Estimates

The two advanced alternatives were scored against the five identified criteria for Tier 2 based on the findings of the analyses in the following sections. Each of the criteria were scored over a range of -2 to +2 as compared to the No Build (Existing Configuration) alternative. A score of 0 implies the alternative has no change from the existing, a negative score implies the alternative has worse conditions or impacts than existing, and a positive score implies the alternative has improved conditions or impacts than existing. The scoring weighs each criterion equally.

TRAFFIC OPERATIONS

An evaluation of future traffic impacts of the advanced alternatives is discussed in the following sections, including intersection operations analysis, vehicle queueing, and corridor travel times. All reports are included in the Appendix.

Intersection Operations Analysis

The purpose of intersection analysis is to ensure that the transportation network remains within desired performance levels as required by City of Keizer operating standards for both of the advanced alternatives. The Future (2042) No Build intersection operations were already determined to meet the standards in Technical Memorandum #3.

The future traffic operations at the study intersections were determined for the AM and PM peak hours based on the 6th Edition Highway Capacity Manual (HCM) methodology for signalized and unsignalized intersections. Table 2 and Table 3 list the v/c ratio, delay, and Level of Service (LOS) for the No Build, Alternative #1, and Alternative #3.

TABLE 2: FUTURE (2042) INTERSECTION OPERATION SCENARIOS – AM PEAK HOUR

INTERSECTION	OPERATING STANDARD	NO BUILD (EXISTING CONFIGURATION)			ALTERNATIVE #1: TSP			ALTERNATIVE #3: MULTI-USE		
		V/C RATIO	DELAY	LOS	V/C RATIO	DELAY	LOS	V/C RATIO	DELAY	LOS
SIGNALIZED										
WHEATLAND RD/ RIVER RD	v/c ≤ 0.95	0.40	6.1	A	0.40	6.1	A	0.40	6.1	A
UNSIGNALIZED										
WHEATLAND RD/ RUSSETT DR	LOS E	0.13	11.1	A/B	0.13	11.0	A/B	0.13	11.1	A/B
WHEATLAND RD/ ALDRIDGE DR	LOS E	0.04	10.4	A/B	0.04	10.2	A/B	0.04	10.4	A/B
WHEATLAND RD/ PARKMEADOW DR	LOS E	0.07	11.7	A/B	0.07	11.1	A/B	0.07	11.7	A/B
WHEATLAND RD/ CLEAR LAKE RD	LOS E	0.08	10.2	A/B	0.08	10.2	A/B	0.08	10.2	A/B

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (sec.)
v/c = Average Intersection Volume-to-Capacity Ratio
LOS = Average Intersection Level of Service

TWO-WAY STOP CONTROLLED INTERSECTION:
Delay = Critical Movement Approach Delay (sec.)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Level of Service (Major/Minor Road)

TABLE 3: FUTURE (2042) INTERSECTION OPERATION SCENARIOS – PM PEAK HOUR

INTERSECTION	OPERATING STANDARD	NO BUILD (EXISTING CONFIGURATION)			ALTERNATIVE #1: TSP			ALTERNATIVE #3: MULTI-USE		
		V/C RATIO	DELAY	LOS	V/C RATIO	DELAY	LOS	V/C RATIO	DELAY	LOS
SIGNALIZED										
WHEATLAND RD/ RIVER RD	v/c ≤ 0.95	0.44	27.0	C	0.44	27.0	C	0.44	27.0	C
UNSIGNALIZED										
WHEATLAND RD/ RUSSETT DR	LOS E	0.12	12.4	A/B	0.11	11.7	A/B	0.12	12.3	A/B
WHEATLAND RD/ ALDRIDGE DR	LOS E	0.02	13.3	A/B	0.02	11.7	A/B	0.02	13.3	A/B
WHEATLAND RD/ PARKMEADOW DR	LOS E	0.16	16.4	A/C	0.13	13.5	A/B	0.16	16.4	A/C
WHEATLAND RD/ CLEAR LAKE RD	LOS E	0.14	11.4	A/B	0.14	11.4	A/B	0.14	11.4	A/B

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (sec.)
v/c = Average Intersection Volume-to-Capacity Ratio
LOS = Average Intersection Level of Service

TWO-WAY STOP CONTROLLED INTERSECTION:
Delay = Critical Movement Approach Delay (sec.)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Level of Service (Major/Minor Road)

As shown, all of the study intersections meet the required operating standards for both Alternative #1 and Alternative #3. Overall, operations between the two advanced alternatives are very similar. However, intersections under Alternative #1 experience slightly lower delay and v/c ratios due to the addition of a left-turn pocket at all intersections. There is no significant difference in vehicle operations between the two alternatives.

Vehicle Queuing

In addition to future intersection operations, future queuing estimates were performed using SimTraffic™, which uses traffic simulation to estimate 95th percentile queues for the different movements at each intersection. The 95th percentile queue is the queue length for a given intersection movement that has only a five percent chance of being exceeded during the peak traffic hour, and it is standard engineering practice to use the 95th percentile queue length for determining the necessary storage distance and reporting estimated queue lengths. Traffic simulations were performed for the future morning (AM) and evening (PM) peak hours to estimate expected vehicle queuing.

Table 4 displays the 95th percentile queue length for key turning movement pockets at the study intersections during the AM and PM peak hours for the No Build, Alternative #1, and Alternative #3.

TABLE 4: FUTURE (2042) INTERSECTION QUEUE LENGTHS

INTERSECTION	LANE	NO BUILD (EXISTING CONFIGURATION)		ALTERNATIVE #1: TSP		ALTERNATIVE #3: MULTI-USE	
		AM	PM	AM	PM	AM	PM
UNSIGNALIZED							
WHEATLAND RD/ RUSSETT DR	Northbound Left	-	-	50 ft	75 ft	50 ft	75 ft
WHEATLAND RD/ ALDRIDGE DR	Northbound Left	-	-	50 ft	50 ft	-	-
WHEATLAND RD/ PARKMEADOW DR	Southbound Left	-	-	50 ft	50 ft	-	-
WHEATLAND RD/ CLEAR LAKE RD	Southbound Left	-	-	50 ft	50 ft	-	-

As shown, the queue lengths for both alternatives are the same at the Russett Drive intersection. Queue lengths are only shown for Alternative #1 at the other three intersections because this alternative has proposed left-turn pockets, of which all the queue lengths are an estimated 50 feet. There is no significant difference in queue lengths between the two alternatives.

Corridor Travel Times

Corridor travel time analysis was performed for the two advanced alternatives to provide a better understanding of how the overall corridor travel time operations would differ. These were then compared to the No Build (Existing Configuration) scenario. Table 5 displays the approximate travel times for the No Build, Alternative #1, and Alternative #3 for both the AM and PM peak hours. The corridor is defined as the approximately 1.7-mile stretch from Jays Drive to the north to Mistletoe Loop to the south. The final 500 feet between Mistletoe Loop and River Road was excluded due to randomness in modeling queuing from the River Road intersection that could skew results.

TABLE 5: FUTURE (2042) CORRIDOR TRAVEL TIMES – TOTAL SECONDS

INTERSECTION	NO BUILD (EXISTING CONFIGURATION)		ALTERNATIVE #1: TSP		ALTERNATIVE #3: MULTI-USE	
	AM	PM	AM	PM	AM	PM
NORTHBOUND	157	166	158	164	159	165
SOUTHBOUND	154	163	154	162	152	163

As shown, the travel times along the corridor for both alternatives are insignificantly different, with approximately less than a one percent variation (+/- two seconds) in the total travel times. Due to the variance in travel time model runs, any small difference of one percent is negligible in travel time; therefore, there is no significant difference in travel times between the alternatives.

PEDESTRIAN AND BICYCLE QUALITATIVE ASSESSMENT

A qualitative assessment of the walkability and bikeability of the study intersections, as well as all segments of the study corridor, was conducted for Alternative #1 and Alternative #3. Various aspects of walkability and bikeability were assigned one of the following ratings based on the recommended criteria in the ODOT Analysis Procedures Manual.

- "Excellent"
- "Good"
- "Fair"
- "Poor"

Table 6 displays a summary of the walkability and bikeability of each segment and study intersection under both Alternatives.

TABLE 6: QUALITATIVE GRADING OF WALKABILITY AND BIKEABILITY OF WHEATLAND ROAD

LOCATION	ALTERNATIVE #1 (TSP)		ALTERNATIVE #3 (MULTI-USE)	
	WALKING	BIKING	WALKING	BIKING
SEGMENTS				
RIVER ROAD TO LAGUNA DRIVE	Good	Good	Excellent	Good
LAGUNA DRIVE TO PARKMEADOW DRIVE	Good	Good	Excellent	Excellent
PARKMEADOW DRIVE TO 2ND AVENUE	Good	Good	Excellent	Excellent
2ND AVENUE TO JAYS DRIVE	Good	Good	Excellent	Excellent
STUDY INTERSECTIONS				
RIVER ROAD	Good	Good	Good	Good
RUSSETT DRIVE	Good	Good	Good	Good
ALDRIDGE DRIVE	Fair	Good	Fair	Good
PARKMEADOW DRIVE	Good	Good	Good	Good
CLEAR LAKE ROAD	Good	Fair	Good	Fair

For segments, Alternative #3 scored higher ("Excellent") compared to Alternative #1 ("Good") for walkability and bikeability due to the wide multi-use path and buffered bike lanes that are provided in Alternative #3 to accommodate bicyclists and pedestrians of all ages and abilities.

SAFETY IMPACTS

Safety improvements provide both the mitigation of the variables that influence crashes for current users of the system, as well as enhance the system to encourage usage from people who currently don't use it because of the safety risks.

Through the All Roads Transportation Safety (ARTS) program, Oregon Department of Transportation (ODOT) provides Crash Reduction Factors (CRFs) that provide guidance on the expected reduction of specific types of crashes for each treatment. As shared in Technical Memorandum #1, there were 54 reported crashes along the project corridor between 2014 and 2018. The majority of the crashes were rear-end crashes, there were no fatal crashes, and there were three pedestrian-related and one bicycle-related crash. The CRFs give estimated safety improvements through the reduction of crash variables for current users. Table 7 provides CRFs for some of the safety treatments proposed for each alternative.

TABLE 7: CRASH REDUCTION FACTORS FOR WHEATLAND ROAD

TREATMENT	TYPES OF CRASHES TREATED [A]	ODOT CRF VALUE(S) [A]	APPLICABLE FACTOR?	
			ALT #1	ALT #3
INSTALL TWO-WAY LEFT-TURN LANE	Rear End Crashes at All Severities	39%	✓	✗
ADD LEFT-TURN LANE ON SINGLE MAJOR ROAD APPROACH	All Crashes at All Severities	33%	✓	✓
INSTALL LIGHTING AT AN INTERSECTION	Night Crashes at All Injury Severities	38%	✓	✓
ADD STREET TREES	All Crashes at All Severities	10%	✓	✓
ADD SIDEWALK	Pedestrian – Walking Along Crashes at All Severities	20%	✓	✓
INSTALL RECTANGULAR RAPID FLASHING BEACON	Pedestrian Crashes at All Severities	10% - 56%	✓	✓
INSTALL PEDESTRIAN REFUGE ISLAND	Pedestrian Crashes at All Severities	31%	✓	✓
INSTALL BUFFERED BIKE LANES	Bicycle Crashes at All Injury Severities	47%	✗	✓
INSTALL URBAN GREEN BIKE LANES AT CONFLICT POINTS	Bicycle Crashes at All Severities	39%	✗	✓

Both Alternative #1 and Alternative #3 propose integrating many safety improvements that reduce crashes. For Alternative #1, the two-way left-turn lane (TWLTL) has been shown to reduce rear-end crashes (the highest crash type for the Wheatland corridor) by 39 percent. However, widening to a three-lane cross section increases the crossing distance for pedestrians. This extra crossing distance is mitigated at certain locations with the presence of the pedestrian refuge island, which allows pedestrians to more safely cross the street in two stages. For Alternative #3, there are

buffered bike lanes and green striping for bike lanes at conflict points, which have been shown to reduce bicycle crashes by 47 percent and 39 percent, respectively. This alternative also includes a pedestrian refuge island at Russett Drive where a left-turn lane is proposed.

A major theme of the public comments received during Virtual Open House #2 revolved around the safety and continuity of pedestrian and bicyclist facilities. Respondents shared their hesitancy with walking or biking along Wheatland Road due to the under-developed sidewalks and bicycle lanes located directly next to high-speed vehicles. While both Alternative #1 and Alternative #3 provide safer and fully connected walking and biking options, Alternative #3 provides the safest options. For bicyclists, the buffered bike lane provides additional shy space between the cyclist and motor vehicles. There is also the option to use the multi-use path for younger or less confident riders. For pedestrians, a 12-foot multi-use path provides extra space for pedestrians of all ages and mobility levels.

RIGHT-OF-WAY IMPACTS

A preliminary conceptual-level assessment was conducted to determine a rough estimate of right-of-way (ROW) needs for the two proposed alternatives. Approximately 85,000 square feet of right-of-way impacts are anticipated for Alternative #1. For Alternative #3, approximately 30,000 square feet of right-of-way impacts are anticipated. Note that these estimates do not include temporary construction easements that may be necessary.

The location with the largest impact for both alternatives is at the intersection with Clear Lake Road. Both properties on the north and south side of Clear Lake Road currently do not have a designated and limited point of access to Wheatland Road. As such, both currently use the ROW for parking and as a vehicle maneuvering area. Each alternative would require modification to existing vehicular use and circulation for these properties.

PLANNING-LEVEL COST ESTIMATES

Planning-level cost estimates were developed for both of the advanced alternatives with the design elements specified in this memorandum. The cost estimates, shown in Table 8, are planning-level estimates in 2021 dollars and are subject to change. Cost estimate details are in the Appendix.

TABLE 8: PLANNING-LEVEL COST ESTIMATES

ALTERNATVE #1: TSP	ALTERNATIVE #3: MULTI-USE PATH
$17.9 million	$9.9 million

The main cost differences between Alternative #1 and Alternative #3 are related to the larger street width required for Alternative #1 and its associated impacts. Since the proposed design cross section for Alternative #1 is wider than Alternative #3, right-of-way needs are expected to be larger for Alternative #1. The larger roadway width will also result in greater impacts to the storm drainage system and existing utilities. It is anticipated that larger walls will be needed for Alternative #1 where it is necessary to tie into the existing topography between Foothill Court NE and Laguna Drive NE.

TIER 2 CRITERIA ANALYSIS SUMMARY

A summary of the findings from the Tier 2 criteria analysis are shown in Table 9.

TABLE 9: TIER 2 CRITERIA ANALYSIS SUMMARY

CRITERIA	ALTERNATIVE #1: TSP	ALTERNATIVE #3: MULTI-USE PATH
Traffic Operations (delay, queuing, and travel time)	Center-turn lane provides slightly improved vehicle operations over Alternative #3	-
Pedestrian and Bicycle Qualitative Assessment	Walkability and Bikeability Score: "Good" due to complete sidewalks and standard bike lanes	Walkability and Bikeability Score: "Excellent" due to the multi-use path, complete sidewalks, and buffered bike lanes
Safety Impacts	Two-way center-turn lane has the potential to reduce rear-end crashes by 39 percent Rear-end crashes were the most common along Wheatland Road in the last five years of crash data	Buffered bike lanes and green bicycle conflict striping have the potential to reduce bicycle crashes by 47 percent and 39 percent, respectively
Right-of-Way and Utility Impacts	—	Almost 3 times less ROW acquisition than Alternative #1 due to narrower cross section
Cost Estimates	—	Approximately half the cost to construct than Alternative #1 due to lesser impacts to existing infrastructure

TIER 1 & 2 SCREENING RESULTS

This section provides a summary of the Tier 1 and Tier 2 screening results for the two advanced design alternatives for Wheatland Road. The detailed Tier 2 summary matrix that documents the findings of the evaluation process can be found in the Appendix.

TIER 1 AND 2 SCREENING SCORES

	ALTERNATIVE #1 TSP STREET DESIGN	ALTERNATIVE #3 BUFFERED BIKE LANES & MULTI-USE PATH
TIER 1 SCREENING	1.35	1.75
TIER 2 SCREENING	0.90	1.40
AVERAGE	1.13	1.58

Alternative #1 scored an average of 1.13 and Alternative #3 scored an average of 1.58 after both Tier 1 and Tier 2 screening. Both alternatives offer an overall improvement from existing conditions, however Alternative #3 received a higher score.

It is important to note that the tiered screening process is only intended to be a tool that helps guide the decision process and should considered alongside City staff suggestions, advice from the technical advisory committee, and feedback from the community.

The difference in scores between Alternative #1 and Alternatives #3 can be attributed to two basic differences amongst the designs which were similarly seem in the Tier 1 screening process.

- First, Alternative #3 provides higher quality multimodal facilities (separated bicycle and pedestrian facility for all ages and abilities) and caters more to safety than mobility, without sacrificing any vehicular operational measures.
- Second, Alternatives #3 has a pavement cross section width that is similar to the existing condition and will require less additional right-of-way. Therefore, the road reconstruction and property acquisition for Alternative #3 would be less invasive and cost less than Alternative #1.
- Additionally, Alternative #2 and Alternative #3 had similar feedback in Virtual Open House #2 where the majority of the general public favored either Alternative #2 or Alternative #3 (59 percent combined) over Alternative #1 (36 percent). This indicates that there is greater support from the public for the improvements proposed in Alternative #3.

RECOMMENDED ALTERNATIVE

Based upon the results of the Tier 2 screening process, City comments, and public input, DKS recommends the following alternative for the Wheatland Road corridor:

Alternative #3: Multi-Use Path and Buffered Bike Lanes

Alternative #3 is best suited to meet the needs and desires of all users of the Wheatland Road corridor, while costing less and requiring less right-of-way and property impacts than the other alternative. This solution provides a safer system with multimodal travel options and was the preferred alternative by the general public. It maintains the current level of traffic demand and is estimated to adequately accommodate future levels of traffic 20 years into the future.

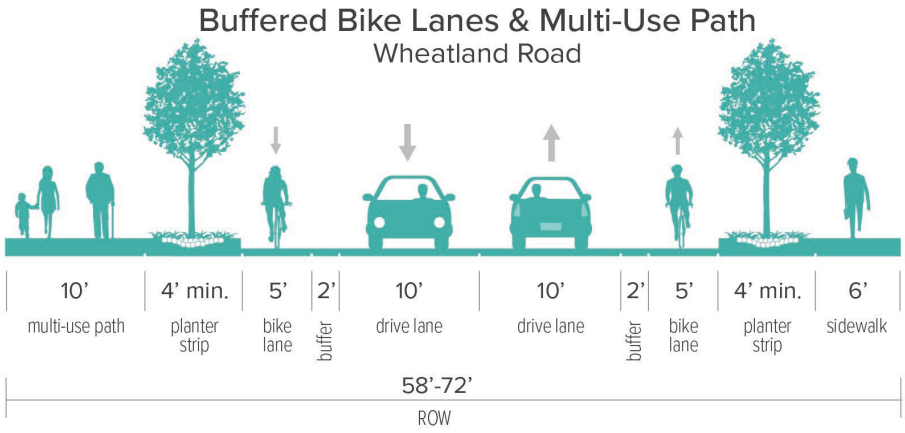


FIGURE 3: RECOMMENDED DESIGN ALTERNATIVE CROSS SECTION

POSTED SPEED LIMIT ON WHEATLAND ROAD

Based on speed data collected during the existing conditions analysis, the 85th percentile speed along Wheatland Road ranges from 43 to 45 mph and the 50th percentile speeds range from 37 to 40 mph. Until recently, ODOT established speed limits based on 85th percentile speeds. However, in May 2020, ODOT approved a new speed zoning process, which allows local governments to post speed limits within +/- 5 mph of the 50th percentile speeds and also consider the road's land use context.[2] Based on the new ODOT process, the suggested speed limit along arterials located in suburban commercial and residential areas is 30 to 35 mph.

It is recommended that the 50th and 85th percentile speeds be collected after the Wheatland Road project is built and the corridor be evaluated for a lower posted speed limit based on the new Speed Zoning Process.

[2] https://www.oregon.gov/odot/Engineering/Pages/Speed-Zones.aspx

APPENDIX CONTENTS

APPENDIX A: FEEDBACK SURVEY – VIRTUAL OPEN HOUSE #2

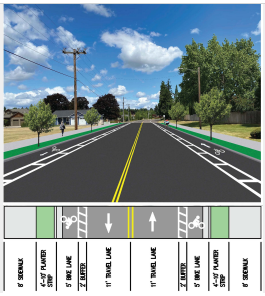
Wheatland Road Multimodal Corridor Plan

Public Feedback Survey (Open House #2)

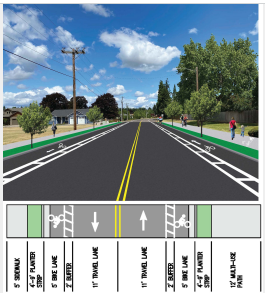
Thank you for providing your input on the Wheatland Road Multimodal Corridor project!
This survey should only take a few minutes to complete.

1. Which Conceptual Design Alternative do you prefer? Click here for a comparison of the alternatives.

Alternative #1



Alternative #2



Alternative #3

Existing Conditions (No Change)

2. If you chose Alternative #3 in the previous question, which multi-use path side street crossing would you prefer to see?

Option #1: Raised Crossing

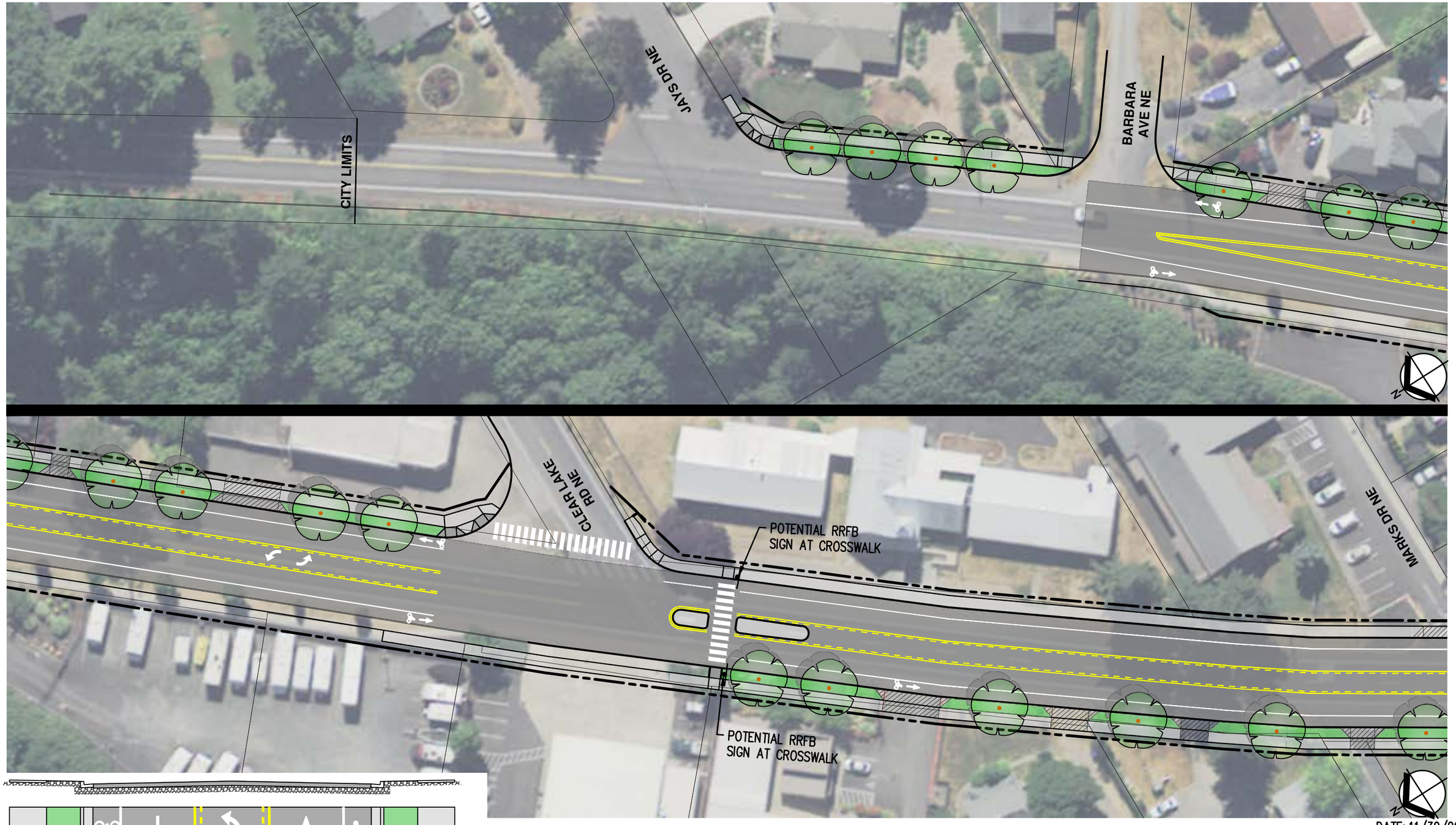
Option #2: Street Level Crossing

- No Preference

3. Take a look at the proposed Enhanced Pedestrian Crossing Treatments. Would you like to see these types of improvements on Wheatland Road (RRFBs, median islands, warning signage, etc)? Why or why not?

4. Any other comments?

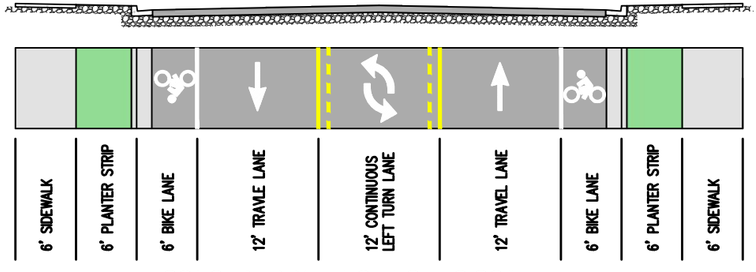
APPENDIX B: FULL-CORRIDOR CONCEPTUAL DESIGN LAYOUTS



SEE BELOW FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

SEE NEXT SHEET FOR CONTINUATION



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 11/30/2021

DESIGN ALTERNATIVE #1

WHEATLAND ROAD MULTIMODAL CORRIDOR

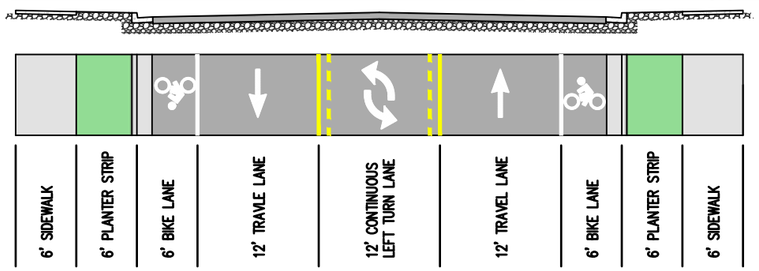
AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

SEE NEXT SHEET FOR CONTINUATION



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DKS

DATE: 11/30/2021

DESIGN ALTERNATIVE #1

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

AKS

SEE PREVIOUS SHEET FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

SEE BELOW FOR CONTINUATION

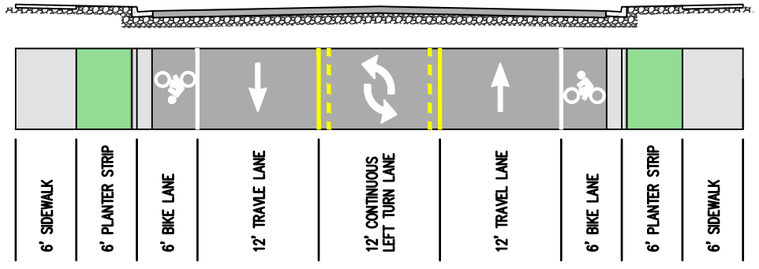
SEE NEXT SHEET FOR CONTINUATION

PINEHURST AVE NE

MEGAN LEE LN

2ND AVE N

MERLOT AVE NE



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 11/30/2021

DESIGN ALTERNATIVE #1

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

SEE PREVIOUS SHEET FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

SEE BELOW FOR CONTINUATION

SEE NEXT SHEET FOR CONTINUATION

JACOBSON ST N

CATER DR NE

OTTER WAY N

PARKMEADOW DR NE

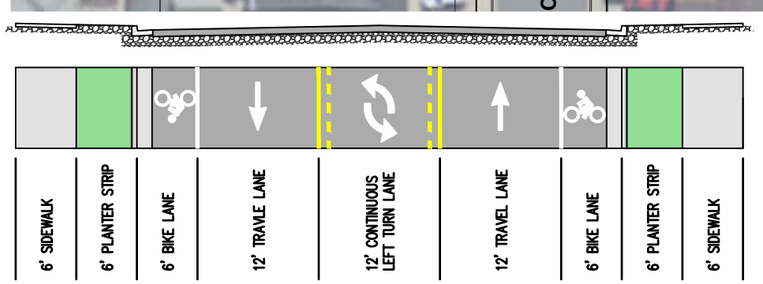
POTENTIAL RRFB SIGN AT CROSSWALK

POTENTIAL RRFB SIGN AT CROSSWALK

CEDAR BLUFF CIR N

HAZELBROOK DR N

N



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 11/30/2021

DESIGN ALTERNATIVE #1

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

FARMLAND LN NE

SHANNON CT NE

SPRINGRIDGE DR N

ALDRIDGE DR N

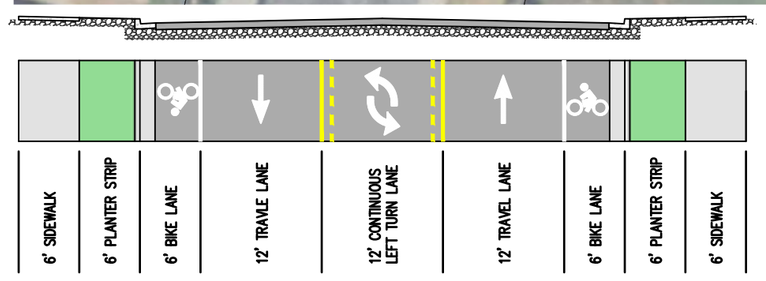
RIDGECREST DR N

NOTTINGHAM DR NE

BUS STOP

SEE ABOVE FOR CONTINUATION

SEE NEXT SHEET FOR CONTINUATION



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DKS

DATE: 11/30/2021

DESIGN ALTERNATIVE #1

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

AKS

SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

SEE NEXT SHEET FOR CONTINUATION

NEW TERRACE CT NE

NEW TERRACE DR N

RUSSETT DR N

DELTA DR NE

LAGUNA DR NE

EXISTING WALL

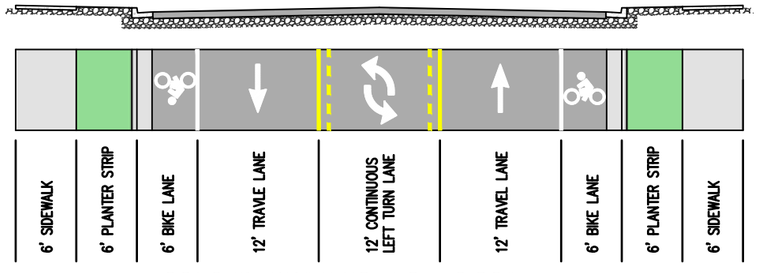
BUS STOP

DELTA CT N

RETAINING WALL

BOLF TERRACE N

N



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DKS

DATE: 11/30/2021

DESIGN ALTERNATIVE #1

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

AKS

SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

RETAINING WALL

RETAINING WALL

FOOTHILL CT NE

RETAINING WALL

RETAINING WALL

BUS STOP

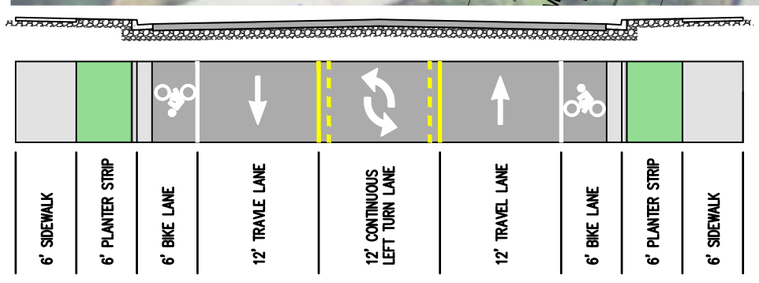
MCNARY HEIGHTS DR N

RIVER RD NE

TIE INTO EXISTING

RETAINING WALL

MISTLETOE LOOP N



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DKS

DATE: 11/30/2021

DESIGN ALTERNATIVE #1

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

AKS

CITY LIMITS

JAYS DR NE

BARBARA AVE NE

SEE BELOW FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

CLEAR LAKE RD NE

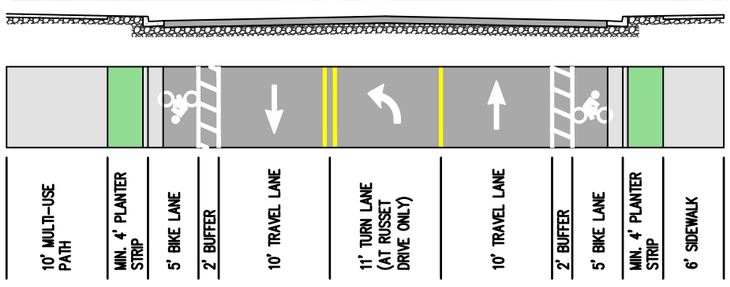
MARKS DR NE

POTENTIAL RRFB SIGN AT CROSSWALK

END MULTI-USE PATH

POTENTIAL RRFB SIGN AT CROSSWALK

SEE NEXT SHEET FOR CONTINUATION



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

ALT #3 ROW NEEDED= ±25,389 SF

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 11/30/2021

DESIGN ALTERNATIVE #3

WHEATLAND ROAD MULTIMODAL CORRIDOR

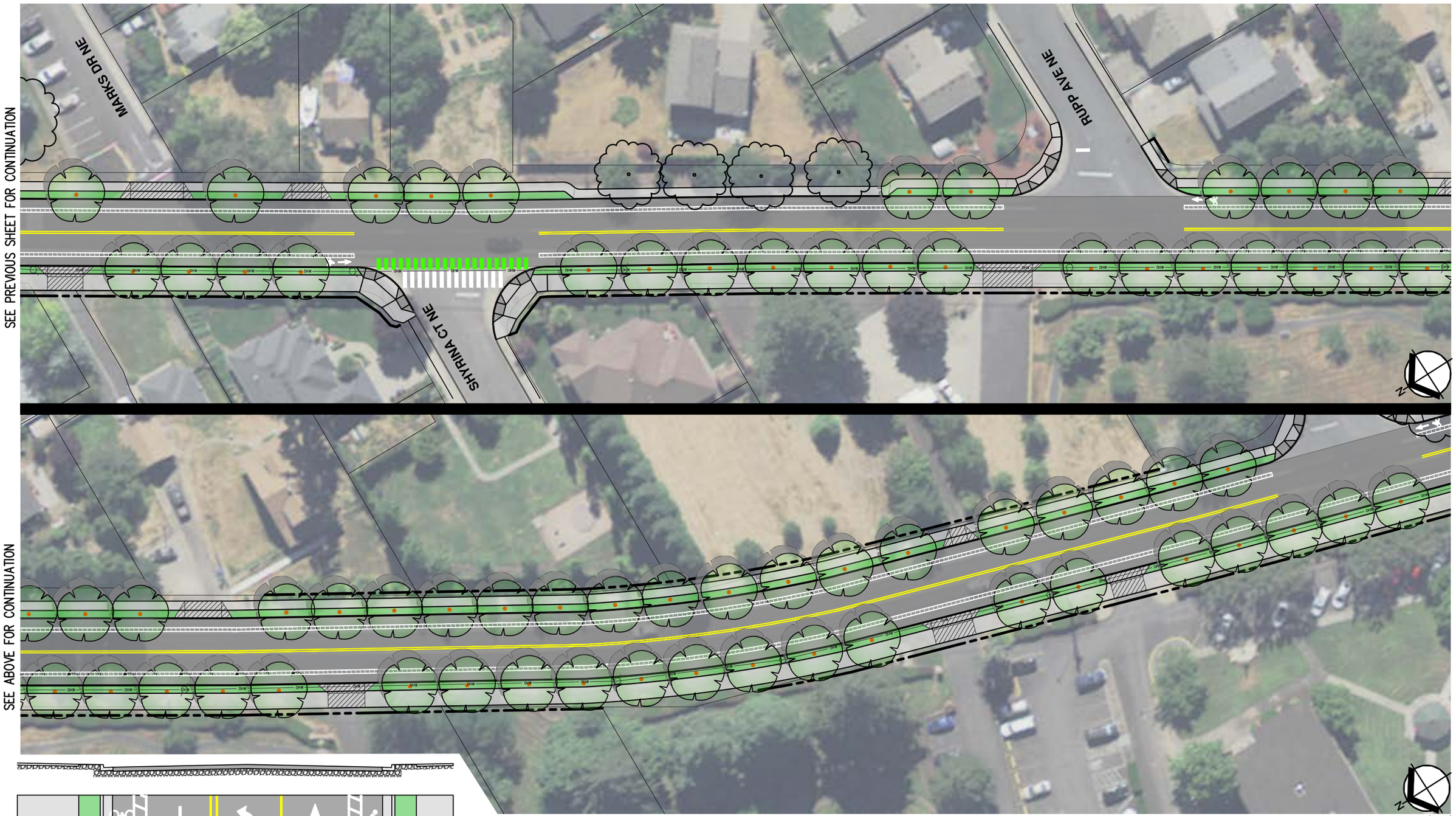
AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

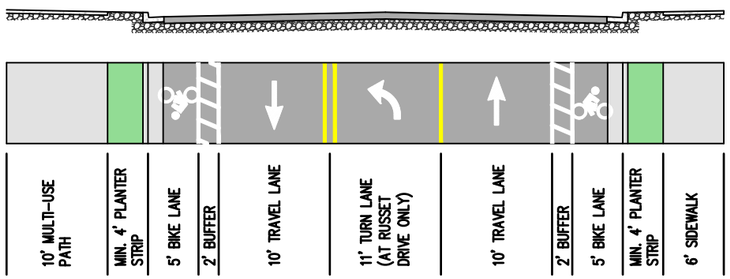
SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

SEE NEXT SHEET FOR CONTINUATION





CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

ALT #3 ROW NEEDED= ±25,389 SF

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 11/30/2021

DESIGN ALTERNATIVE #3

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

PINEHURST AVE NE

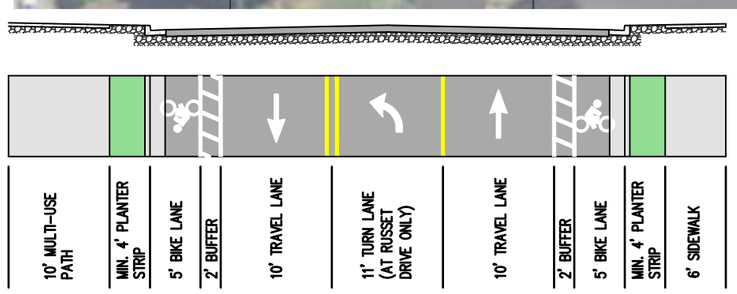
MEGAN LEE LN

2ND AVE N

MERLOT AVE NE

SEE ABOVE FOR CONTINUATION

SEE NEXT SHEET FOR CONTINUATION



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

ALT #3 ROW NEEDED= ±25,389 SF

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 11/30/2021

DESIGN ALTERNATIVE #3

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

JACOBSON ST N

CATER DR NE

OTTER WAY N

POTENTIAL RRFB SIGN AT CROSSWALK

PARKMEADOW DR NE

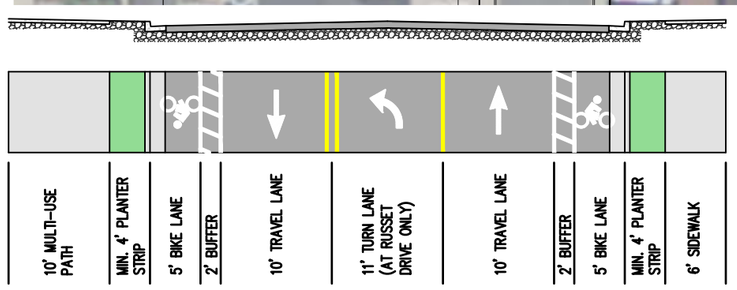
SEE ABOVE FOR CONTINUATION

CEDAR BLUFF CIR N

POTENTIAL RRFB SIGN AT CROSSWALK

HAZELBROOK DR N

SEE NEXT SHEET FOR CONTINUATION



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

ALT #3 ROW NEEDED= ±25,389 SF

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 11/30/2021

DESIGN ALTERNATIVE #3

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

SEE NEXT SHEET FOR CONTINUATION

FARMLAND LN NE

SHANNON CT NE

SPRINGRIDGE DR N

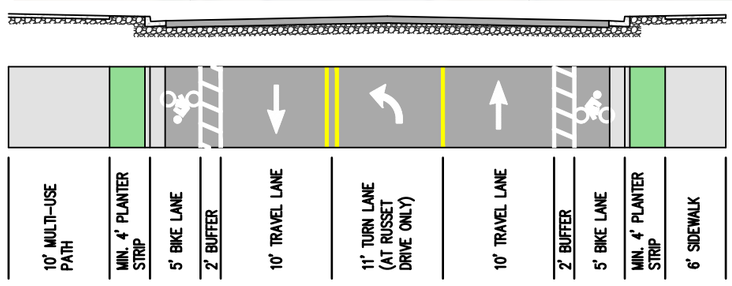
ALDRIDGE DR N

RIDGECREST DR N

NOTTINGHAM DR NE

BUS STOP

N



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

ALT #3 ROW NEEDED= ±25,389 SF

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 11/30/2021

DESIGN ALTERNATIVE #3

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

SEE NEXT SHEET FOR CONTINUATION

NEW TERRACE CT NE

NEW TERRACE DR N

RUSSETT DR N

DELTA DR NE

LAGUNA DR NE

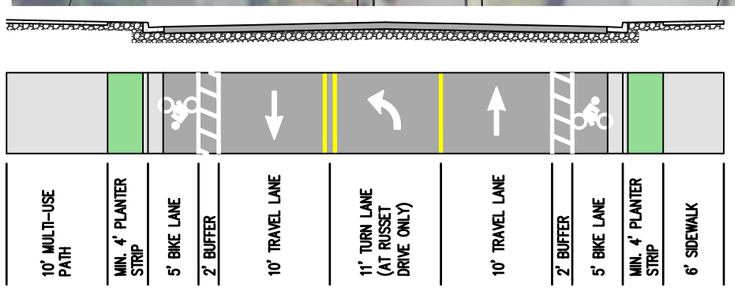
EXISTING RETAINING WALL

BUS STOP

DELTA CT N

RETAINING WALL

BOLF TERRACE N



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

ALT #3 ROW NEEDED= ±25,389 SF

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DKS

DATE: 11/30/2021

DESIGN ALTERNATIVE #3

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

AKS

SEE PREVIOUS SHEET FOR CONTINUATION

SEE BELOW FOR CONTINUATION

SEE ABOVE FOR CONTINUATION

RETAINING WALL

RETAINING WALL

FOOTHILL CT NE

RETAINING WALL

RETAINING WALL

BUS STOP

MCNARY HEIGHTS DR N

RIVER RD NE

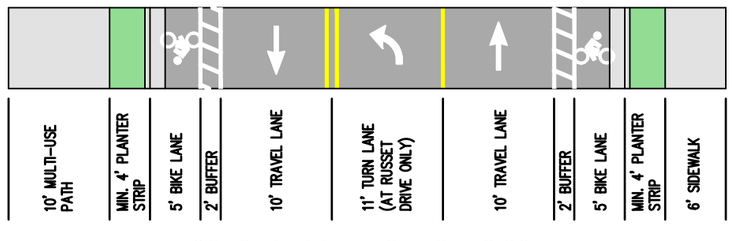
PROPOSED SIDEWALK

TIE INTO EXISTING

RETAINING WALL

MISTLETOE LOOP N

BEGIN MULTI-USE PATH



CONCEPT DRAWING - NOT TO SCALE

LEGEND

EXISTING TREE TO REMAIN

PROPOSED STREET TREE

ALT #3 ROW NEEDED= ±25,389 SF

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DKS

DATE: 11/30/2021

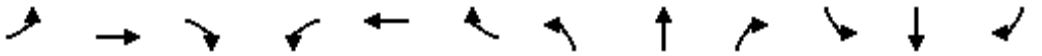
DESIGN ALTERNATIVE #3

WHEATLAND ROAD MULTIMODAL CORRIDOR

AKS ENGINEERING & FORESTRY, LLC
3700 RIVER RD N, STE 1
KEIZER, OR 97303
503.400.6028 WWW.AKS-ENG.COM

AKS

APPENDIX C: SYNCHRO HCM REPORTS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	425	10	5	10	215	380	5	5	585	10
Future Volume (veh/h)	10	5	425	10	5	10	215	380	5	5	585	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1841	1900	1900	1900	1841	1856	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	5	1	11	5	0	234	413	4	5	636	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	4	0	0	0	4	3	0	0	0	0
Cap, veh/h	52	24	230	54	25	0	634	2626	25	717	2449	38
Arrive On Green	0.02	0.04	0.02	0.02	0.04	0.00	0.06	0.73	0.70	0.00	0.67	0.64
Sat Flow, veh/h	1263	574	2721	1263	574	0	1753	3577	35	1810	3636	57
Grp Volume(v), veh/h	16	0	1	16	0	0	234	203	214	5	316	330
Grp Sat Flow(s),veh/h/ln	1837	0	1360	1837	0	0	1753	1763	1849	1810	1805	1888
Q Serve(g_s), s	0.8	0.0	0.0	0.8	0.0	0.0	3.8	3.1	3.1	0.1	6.2	6.2
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.8	0.0	0.0	3.8	3.1	3.1	0.1	6.2	6.2
Prop In Lane	0.69		1.00	0.69		0.00	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	76	0	230	78	0	0	634	1294	1358	717	1216	1272
V/C Ratio(X)	0.21	0.00	0.00	0.20	0.00	0.00	0.37	0.16	0.16	0.01	0.26	0.26
Avail Cap(c_a), veh/h	143	0	328	408	0	0	826	1294	1358	823	1216	1272
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	0.0	37.8	42.3	0.0	0.0	4.4	3.6	3.6	5.7	5.8	5.8
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.5	0.0	0.0	0.1	0.3	0.2	0.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.4	0.0	0.0	1.0	0.9	0.9	0.0	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	0.0	37.8	42.7	0.0	0.0	4.5	3.9	3.9	5.7	6.3	6.3
LnGrp LOS	D	A	D	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		17			16			651			651	
Approach Delay, s/veh		42.6			42.7			4.1			6.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	70.1		7.8	9.8	64.6		7.7				
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		6.0				
Max Green Setting (Gmax), s	5.6	38.4		18.0	15.7	28.3		5.0				
Max Q Clear Time (g_c+I1), s	2.1	5.1		2.8	5.8	8.2		2.8				
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	0.9		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		6.1
HCM 6th LOS		A

Notes

User approved changes to right turn type.

Synchro ID	Control Type	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Signal	River Rd & Wheatland Rd/Springwood Dr	Signal	A	6.1	0.40

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	75	20	165	330	5
Future Vol, veh/h	5	75	20	165	330	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	7	3	4	0
Mvmt Flow	5	80	21	176	351	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	573	355	357	0	-	0
Stage 1	355	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	484	693	1174	-	-	-
Stage 1	714	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	474	692	1173	-	-	-
Mov Cap-2 Maneuver	558	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	822	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1173	-	682	-	-
HCM Lane V/C Ratio	0.018	-	0.125	-	-
HCM Control Delay (s)	8.1	-	11	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	20	5	160	260	5
Future Vol, veh/h	5	20	5	160	260	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	5	5	0
Mvmt Flow	6	22	6	178	289	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	483	293	296	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	190	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	546	751	1277	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	847	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	542	750	1276	-	-	-
Mov Cap-2 Maneuver	610	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	846	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1276	-	717	-	-
HCM Lane V/C Ratio	0.004	-	0.039	-	-
HCM Control Delay (s)	7.8	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	5	155	10	5	230
Future Vol, veh/h	35	5	155	10	5	230
Conflicting Peds, #/hr	0	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	12	0	3	0	0	5
Mvmt Flow	38	5	167	11	5	247

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	433	176	0	0	181	0
Stage 1	176	-	-	-	-	-
Stage 2	257	-	-	-	-	-
Critical Hdwy	6.52	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	561	872	-	-	1407	-
Stage 1	831	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	557	870	-	-	1403	-
Mov Cap-2 Maneuver	615	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	760	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	638	1403	-
HCM Lane V/C Ratio	-	-	0.067	0.004	-
HCM Control Delay (s)	-	-	11.1	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

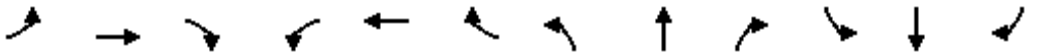
Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	45	0	10	0	110	35	10	50	0
Future Vol, veh/h	0	0	0	45	0	10	0	110	35	10	50	0
Conflicting Peds, #/hr	0	0	0	0	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	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	6	0	0	0	4	7	10	14	0
Mvmt Flow	0	0	0	50	0	11	0	122	39	11	56	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	225	239	56	220	220	142	56	0	0	161	0	0
Stage 1	78	78	-	142	142	-	-	-	-	-	-	-
Stage 2	147	161	-	78	78	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.5	6.2	4.1	-	-	4.2	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4	3.3	2.2	-	-	2.29	-	-
Pot Cap-1 Maneuver	735	666	1016	728	682	911	1562	-	-	1371	-	-
Stage 1	936	834	-	851	783	-	-	-	-	-	-	-
Stage 2	860	769	-	921	834	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	722	661	1016	724	677	911	1562	-	-	1371	-	-
Mov Cap-2 Maneuver	722	661	-	724	677	-	-	-	-	-	-	-
Stage 1	936	827	-	851	783	-	-	-	-	-	-	-
Stage 2	850	769	-	914	827	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	10.2	0	1.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1562	-	-	-	752	1371	-	-
HCM Lane V/C Ratio	-	-	-	-	0.081	0.008	-	-
HCM Control Delay (s)	0	-	-	0	10.2	7.6	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	410	20	5	5	645	895	20	10	775	20
Future Volume (veh/h)	5	5	410	20	5	5	645	895	20	10	775	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1781	1900	1900	1900	1885	1781	1900	1885	1900
Adj Flow Rate, veh/h	5	5	193	22	5	0	701	973	21	11	842	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	8	0	0	0	1	8	0	1	0
Cap, veh/h	72	72	825	88	20	0	675	2425	52	329	1575	37
Arrive On Green	0.06	0.08	0.06	0.04	0.06	0.00	0.24	0.68	0.64	0.01	0.44	0.41
Sat Flow, veh/h	927	927	2575	1488	338	0	1810	3583	77	1810	3576	85
Grp Volume(v), veh/h	10	0	193	27	0	0	701	486	508	11	422	440
Grp Sat Flow(s),veh/h/ln	1854	0	1288	1826	0	0	1810	1791	1869	1810	1791	1870
Q Serve(g_s), s	0.5	0.0	5.0	1.3	0.0	0.0	22.0	10.8	10.9	0.3	15.5	15.5
Cycle Q Clear(g_c), s	0.5	0.0	5.0	1.3	0.0	0.0	22.0	10.8	10.9	0.3	15.5	15.5
Prop In Lane	0.50		1.00	0.81		0.00	1.00		0.04	1.00		0.05
Lane Grp Cap(c), veh/h	144	0	825	109	0	0	675	1212	1265	329	789	824
V/C Ratio(X)	0.07	0.00	0.23	0.25	0.00	0.00	1.04	0.40	0.40	0.03	0.53	0.53
Avail Cap(c_a), veh/h	144	0	825	406	0	0	675	1212	1265	425	789	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	0.0	23.8	41.2	0.0	0.0	17.7	6.4	6.5	15.5	18.4	18.5
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.4	0.0	0.0	44.9	1.0	0.9	0.0	2.6	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.5	0.6	0.0	0.0	15.9	3.5	3.6	0.1	6.7	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	0.0	23.9	41.6	0.0	0.0	62.6	7.4	7.4	15.5	21.0	21.0
LnGrp LOS	D	A	C	D	A	A	F	A	A	B	C	C
Approach Vol, veh/h		203			27			1695			873	
Approach Delay, s/veh		24.6			41.6			30.3			20.9	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	64.9		9.4	26.0	43.6		11.0				
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		6.0				
Max Green Setting (Gmax), s	5.5	38.5		18.0	22.0	22.0		5.0				
Max Q Clear Time (g_c+I1), s	2.3	12.9		3.3	24.0	17.5		7.0				
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	0.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		27.0	
HCM 6th LOS		C	

Notes

User approved changes to right turn type.

Synchro ID	Control Type	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Signal	River Rd & Wheatland Rd/Springwood Dr	Signal	C	27.0	0.44

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	60	90	495	360	20
Future Vol, veh/h	5	60	90	495	360	20
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	4	0	0	2	0
Mvmt Flow	5	64	96	527	383	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1114	395	405	0	-	0
Stage 1	395	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.2	-	-	-
Pot Cap-1 Maneuver	232	650	1165	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	213	649	1164	-	-	-
Mov Cap-2 Maneuver	345	-	-	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	486	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1164	-	608	-	-
HCM Lane V/C Ratio	0.082	-	0.114	-	-
HCM Control Delay (s)	8.4	-	11.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	5	25	390	325	5
Future Vol, veh/h	5	5	25	390	325	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	1	0
Mvmt Flow	5	5	27	424	353	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	835	357	359	0	-	0
Stage 1	357	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	340	692	1211	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	332	691	1210	-	-	-
Mov Cap-2 Maneuver	452	-	-	-	-	-
Stage 1	697	-	-	-	-	-
Stage 2	627	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1210	-	547	-	-
HCM Lane V/C Ratio	0.022	-	0.02	-	-
HCM Control Delay (s)	8	-	11.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	10	340	55	25	285
Future Vol, veh/h	45	10	340	55	25	285
Conflicting Peds, #/hr	0	2	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	0	0	0	0	0
Mvmt Flow	50	11	378	61	28	317

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	785	414	0	0	442	0
Stage 1	412	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.46	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	356	643	-	-	1129	-
Stage 1	660	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	346	640	-	-	1126	-
Mov Cap-2 Maneuver	461	-	-	-	-	-
Stage 1	658	-	-	-	-	-
Stage 2	671	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	486	1126	-
HCM Lane V/C Ratio	-	-	0.126	0.025	-
HCM Control Delay (s)	-	-	13.5	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

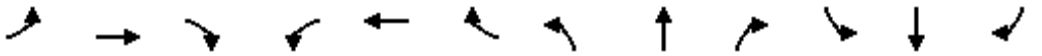
Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	60	0	20	0	80	55	20	175	0
Future Vol, veh/h	0	0	0	60	0	20	0	80	55	20	175	0
Conflicting Peds, #/hr	2	0	0	0	0	2	1	0	2	2	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	50	100	0	0	0	0	0	2	2	8	0	0
Mvmt Flow	0	0	0	67	0	22	0	89	61	22	194	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	372	391	195	360	361	124	195	0	0	152	0	0
Stage 1	239	239	-	122	122	-	-	-	-	-	-	-
Stage 2	133	152	-	238	239	-	-	-	-	-	-	-
Critical Hdwy	7.6	7.5	6.2	7.1	6.5	6.2	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.9	3.3	3.5	4	3.3	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	506	420	851	599	569	932	1390	-	-	1393	-	-
Stage 1	669	559	-	887	799	-	-	-	-	-	-	-
Stage 2	768	618	-	770	711	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	487	412	850	591	558	928	1389	-	-	1390	-	-
Mov Cap-2 Maneuver	487	412	-	591	558	-	-	-	-	-	-	-
Stage 1	668	549	-	885	797	-	-	-	-	-	-	-
Stage 2	748	617	-	758	699	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.4	0	0.8
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1389	-	-	-	650	1390	-	-
HCM Lane V/C Ratio	-	-	-	-	0.137	0.016	-	-
HCM Control Delay (s)	0	-	-	0	11.4	7.6	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	425	10	5	10	215	380	5	5	585	10
Future Volume (veh/h)	10	5	425	10	5	10	215	380	5	5	585	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1841	1900	1900	1900	1841	1856	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	5	1	11	5	0	234	413	4	5	636	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	4	0	0	0	4	3	0	0	0	0
Cap, veh/h	52	24	230	54	25	0	634	2626	25	717	2449	38
Arrive On Green	0.02	0.04	0.02	0.02	0.04	0.00	0.06	0.73	0.70	0.00	0.67	0.64
Sat Flow, veh/h	1263	574	2721	1263	574	0	1753	3577	35	1810	3636	57
Grp Volume(v), veh/h	16	0	1	16	0	0	234	203	214	5	316	330
Grp Sat Flow(s),veh/h/ln	1837	0	1360	1837	0	0	1753	1763	1849	1810	1805	1888
Q Serve(g_s), s	0.8	0.0	0.0	0.8	0.0	0.0	3.8	3.1	3.1	0.1	6.2	6.2
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.8	0.0	0.0	3.8	3.1	3.1	0.1	6.2	6.2
Prop In Lane	0.69		1.00	0.69		0.00	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	76	0	230	78	0	0	634	1294	1358	717	1216	1272
V/C Ratio(X)	0.21	0.00	0.00	0.20	0.00	0.00	0.37	0.16	0.16	0.01	0.26	0.26
Avail Cap(c_a), veh/h	143	0	328	408	0	0	826	1294	1358	823	1216	1272
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	0.0	37.8	42.3	0.0	0.0	4.4	3.6	3.6	5.7	5.8	5.8
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.5	0.0	0.0	0.1	0.3	0.2	0.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.4	0.0	0.0	1.0	0.9	0.9	0.0	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	0.0	37.8	42.7	0.0	0.0	4.5	3.9	3.9	5.7	6.3	6.3
LnGrp LOS	D	A	D	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		17			16			651			651	
Approach Delay, s/veh		42.6			42.7			4.1			6.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	70.1		7.8	9.8	64.6		7.7				
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		6.0				
Max Green Setting (Gmax), s	5.6	38.4		18.0	15.7	28.3		5.0				
Max Q Clear Time (g_c+I1), s	2.1	5.1		2.8	5.8	8.2		2.8				
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	0.9		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		6.1
HCM 6th LOS		A

Notes

User approved changes to right turn type.

Synchro ID	Control Type	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Signal	River Rd & Wheatland Rd/Springwood Dr	Signal	A	6.1	0.40

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	75	20	165	330	5
Future Vol, veh/h	5	75	20	165	330	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	7	3	4	0
Mvmt Flow	5	80	21	176	351	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	573	355	357	0	-	0
Stage 1	355	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	484	693	1174	-	-	-
Stage 1	714	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	474	692	1173	-	-	-
Mov Cap-2 Maneuver	474	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	822	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1173	-	673	-	-
HCM Lane V/C Ratio	0.018	-	0.126	-	-
HCM Control Delay (s)	8.1	-	11.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	20	5	160	260	5
Future Vol, veh/h	5	20	5	160	260	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	0	0	0	5	5	0
Mvmt Flow	6	22	6	178	289	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	483	293	296	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	190	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	546	751	1277	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	847	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	542	750	1276	-	-	-
Mov Cap-2 Maneuver	542	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	846	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1276	-	697	-	-
HCM Lane V/C Ratio	0.004	-	0.04	-	-
HCM Control Delay (s)	7.8	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	5	155	10	5	230
Future Vol, veh/h	35	5	155	10	5	230
Conflicting Peds, #/hr	0	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	12	0	3	0	0	5
Mvmt Flow	38	5	167	11	5	247

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	433	176	0	0	181	0
Stage 1	176	-	-	-	-	-
Stage 2	257	-	-	-	-	-
Critical Hdwy	6.52	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	561	872	-	-	1407	-
Stage 1	831	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	557	870	-	-	1403	-
Mov Cap-2 Maneuver	557	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	760	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	583	1403	-
HCM Lane V/C Ratio	-	-	0.074	0.004	-
HCM Control Delay (s)	-	-	11.7	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

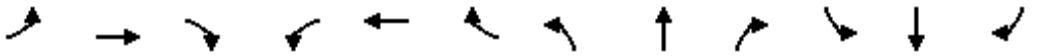
Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	45	0	10	0	110	35	10	50	0
Future Vol, veh/h	0	0	0	45	0	10	0	110	35	10	50	0
Conflicting Peds, #/hr	0	0	0	0	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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	6	0	0	0	4	7	10	14	0
Mvmt Flow	0	0	0	50	0	11	0	122	39	11	56	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	225	239	56	220	220	142	56	0	0	161	0	0
Stage 1	78	78	-	142	142	-	-	-	-	-	-	-
Stage 2	147	161	-	78	78	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.5	6.2	4.1	-	-	4.2	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4	3.3	2.2	-	-	2.29	-	-
Pot Cap-1 Maneuver	735	666	1016	728	682	911	1562	-	-	1371	-	-
Stage 1	936	834	-	851	783	-	-	-	-	-	-	-
Stage 2	860	769	-	921	834	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	722	661	1016	724	677	911	1562	-	-	1371	-	-
Mov Cap-2 Maneuver	722	661	-	724	677	-	-	-	-	-	-	-
Stage 1	936	827	-	851	783	-	-	-	-	-	-	-
Stage 2	850	769	-	914	827	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	10.2	0	1.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1562	-	-	-	752	1371	-	-
HCM Lane V/C Ratio	-	-	-	-	0.081	0.008	-	-
HCM Control Delay (s)	0	-	-	0	10.2	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	410	20	5	5	645	895	20	10	775	20
Future Volume (veh/h)	5	5	410	20	5	5	645	895	20	10	775	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1781	1900	1900	1900	1885	1781	1900	1885	1900
Adj Flow Rate, veh/h	5	5	193	22	5	0	701	973	21	11	842	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	8	0	0	0	1	8	0	1	0
Cap, veh/h	72	72	825	88	20	0	675	2425	52	329	1575	37
Arrive On Green	0.06	0.08	0.06	0.04	0.06	0.00	0.24	0.68	0.64	0.01	0.44	0.41
Sat Flow, veh/h	927	927	2575	1488	338	0	1810	3583	77	1810	3576	85
Grp Volume(v), veh/h	10	0	193	27	0	0	701	486	508	11	422	440
Grp Sat Flow(s),veh/h/ln	1854	0	1288	1826	0	0	1810	1791	1869	1810	1791	1870
Q Serve(g_s), s	0.5	0.0	5.0	1.3	0.0	0.0	22.0	10.8	10.9	0.3	15.5	15.5
Cycle Q Clear(g_c), s	0.5	0.0	5.0	1.3	0.0	0.0	22.0	10.8	10.9	0.3	15.5	15.5
Prop In Lane	0.50		1.00	0.81		0.00	1.00		0.04	1.00		0.05
Lane Grp Cap(c), veh/h	144	0	825	109	0	0	675	1212	1265	329	789	824
V/C Ratio(X)	0.07	0.00	0.23	0.25	0.00	0.00	1.04	0.40	0.40	0.03	0.53	0.53
Avail Cap(c_a), veh/h	144	0	825	406	0	0	675	1212	1265	425	789	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	0.0	23.8	41.2	0.0	0.0	17.7	6.4	6.5	15.5	18.4	18.5
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.4	0.0	0.0	44.9	1.0	0.9	0.0	2.6	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.5	0.6	0.0	0.0	15.9	3.5	3.6	0.1	6.7	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	0.0	23.9	41.6	0.0	0.0	62.6	7.4	7.4	15.5	21.0	21.0
LnGrp LOS	D	A	C	D	A	A	F	A	A	B	C	C
Approach Vol, veh/h		203			27			1695			873	
Approach Delay, s/veh		24.6			41.6			30.3			20.9	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	64.9		9.4	26.0	43.6		11.0				
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		6.0				
Max Green Setting (Gmax), s	5.5	38.5		18.0	22.0	22.0		5.0				
Max Q Clear Time (g_c+I1), s	2.3	12.9		3.3	24.0	17.5		7.0				
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	0.8		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			27.0									
HCM 6th LOS			C									

Notes

User approved changes to right turn type.

Synchro ID	Control Type	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Signal	River Rd & Wheatland Rd/Springwood Dr	Signal	C	27.0	0.44

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	60	90	495	360	20
Future Vol, veh/h	5	60	90	495	360	20
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	4	0	0	2	0
Mvmt Flow	5	64	96	527	383	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1114	395	405	0	-	0
Stage 1	395	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.2	-	-	-
Pot Cap-1 Maneuver	232	650	1165	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	213	649	1164	-	-	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	486	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1164	-	561	-	-
HCM Lane V/C Ratio	0.082	-	0.123	-	-
HCM Control Delay (s)	8.4	-	12.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	5	25	390	325	5
Future Vol, veh/h	5	5	25	390	325	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
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	0	0	0	1	0
Mvmt Flow	5	5	27	424	353	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	835	357	359	0	-	0
Stage 1	357	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	340	692	1211	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	329	691	1210	-	-	-
Mov Cap-2 Maneuver	329	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	627	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1210	-	446	-	-
HCM Lane V/C Ratio	0.022	-	0.024	-	-
HCM Control Delay (s)	8	0	13.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	10	340	55	25	285
Future Vol, veh/h	45	10	340	55	25	285
Conflicting Peds, #/hr	0	2	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	6	0	0	0	0	0
Mvmt Flow	50	11	378	61	28	317

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	785	414	0	0	442	0
Stage 1	412	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.46	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	356	643	-	-	1129	-
Stage 1	660	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	344	640	-	-	1126	-
Mov Cap-2 Maneuver	344	-	-	-	-	-
Stage 1	658	-	-	-	-	-
Stage 2	667	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.4	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	376	1126	-
HCM Lane V/C Ratio	-	-	0.163	0.025	-
HCM Control Delay (s)	-	-	16.4	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	60	0	20	0	80	55	20	175	0
Future Vol, veh/h	0	0	0	60	0	20	0	80	55	20	175	0
Conflicting Peds, #/hr	2	0	0	0	0	2	1	0	2	2	0	1
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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	50	100	0	0	0	0	0	2	2	8	0	0
Mvmt Flow	0	0	0	67	0	22	0	89	61	22	194	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	372	391	195	360	361	124	195	0	0	152	0	0
Stage 1	239	239	-	122	122	-	-	-	-	-	-	-
Stage 2	133	152	-	238	239	-	-	-	-	-	-	-
Critical Hdwy	7.6	7.5	6.2	7.1	6.5	6.2	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.9	3.3	3.5	4	3.3	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	506	420	851	599	569	932	1390	-	-	1393	-	-
Stage 1	669	559	-	887	799	-	-	-	-	-	-	-
Stage 2	768	618	-	770	711	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	486	411	850	589	557	929	1389	-	-	1390	-	-
Mov Cap-2 Maneuver	486	411	-	589	557	-	-	-	-	-	-	-
Stage 1	668	548	-	885	797	-	-	-	-	-	-	-
Stage 2	748	617	-	756	697	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.4	0	0.8
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1389	-	-	-	648	1390	-	-
HCM Lane V/C Ratio	-	-	-	-	0.137	0.016	-	-
HCM Control Delay (s)	0	-	-	0	11.4	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-

APPENDIX D: SIMTRAFFIC QUEUING REPORTS

Intersection: 1: River Rd & Wheatland Rd/Springwood Dr

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	371	184	155	74	179	92	54	38	327	33
Average Queue (ft)	59	125	59	22	66	19	8	2	131	3
95th Queue (ft)	221	204	169	56	128	61	32	21	265	23
Link Distance (ft)	501			388		853	853		735	
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)		125	125		210			90		30
Storage Blk Time (%)		12	0		0				19	0
Queuing Penalty (veh)		2	0		0				60	0

Intersection: 2: Wheatland Rd & Russett Dr

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	66	49
Average Queue (ft)	31	6
95th Queue (ft)	55	31
Link Distance (ft)	483	361
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Wheatland Rd & Aldridge Dr

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	46	32
Average Queue (ft)	19	2
95th Queue (ft)	48	14
Link Distance (ft)	471	441
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Wheatland Rd & Parkmeadow Dr

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	64	13
Average Queue (ft)	30	1
95th Queue (ft)	61	9
Link Distance (ft)	660	677
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Wheatland Rd & Clear Lake Rd

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	54	15
Average Queue (ft)	24	1
95th Queue (ft)	45	8
Link Distance (ft)	476	540
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 62

Intersection: 1: River Rd & Wheatland Rd/Springwood Dr

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	348	185	155	100	270	881	872	121	791	51
Average Queue (ft)	78	141	66	29	269	839	737	11	708	4
95th Queue (ft)	265	215	178	71	271	1022	1091	57	935	29
Link Distance (ft)	501			388		853	853		735	
Upstream Blk Time (%)	0					58	4		54	
Queuing Penalty (veh)	0					0	0		0	
Storage Bay Dist (ft)		125	125		210			90		30
Storage Blk Time (%)		16	1		66	0		0	54	0
Queuing Penalty (veh)		2	0		295	0		0	224	0

Intersection: 2: Wheatland Rd & Russett Dr

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	75	141
Average Queue (ft)	29	37
95th Queue (ft)	58	98
Link Distance (ft)	483	361
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Wheatland Rd & Aldridge Dr

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	38	49
Average Queue (ft)	12	8
95th Queue (ft)	39	34
Link Distance (ft)	471	441
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Wheatland Rd & Parkmeadow Dr

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	78	17	63
Average Queue (ft)	34	1	9
95th Queue (ft)	67	9	37
Link Distance (ft)	660	425	677
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Wheatland Rd & Clear Lake Rd

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	62	25
Average Queue (ft)	27	2
95th Queue (ft)	46	14
Link Distance (ft)	476	540
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 520

Intersection: 1: River Rd & Wheatland Rd/Springwood Dr

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	277	185	155	80	176	82	49	41	339	44
Average Queue (ft)	49	120	49	24	64	15	9	3	125	3
95th Queue (ft)	186	194	153	58	127	52	34	22	257	21
Link Distance (ft)	501			388		853	853		735	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		125	125		210			90		30
Storage Blk Time (%)		10	0		0				18	0
Queuing Penalty (veh)		2	0		0				56	0

Intersection: 2: Wheatland Rd & Russett Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	61	50
Average Queue (ft)	33	8
95th Queue (ft)	52	32
Link Distance (ft)	478	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 3: Wheatland Rd & Aldridge Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	54	27
Average Queue (ft)	20	2
95th Queue (ft)	51	14
Link Distance (ft)	465	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 4: Wheatland Rd & Parkmeadow Dr

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	76	18
Average Queue (ft)	30	1
95th Queue (ft)	64	9
Link Distance (ft)	654	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 5: Wheatland Rd & Clear Lake Rd

Movement	WB	SB
Directions Served	LTR	L
Maximum Queue (ft)	63	20
Average Queue (ft)	26	1
95th Queue (ft)	50	8
Link Distance (ft)	468	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 58

Intersection: 1: River Rd & Wheatland Rd/Springwood Dr

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	313	185	155	94	270	874	875	110	790	68
Average Queue (ft)	69	142	73	28	268	710	573	13	756	9
95th Queue (ft)	240	219	190	69	281	1079	1044	65	771	46
Link Distance (ft)	501			388		853	853		735	
Upstream Blk Time (%)						29	2		62	
Queuing Penalty (veh)						0	0		0	
Storage Bay Dist (ft)		125	125		210			90		30
Storage Blk Time (%)		16	1		59	0			55	0
Queuing Penalty (veh)		2	0		262	0			228	0

Intersection: 2: Wheatland Rd & Russett Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	67	62
Average Queue (ft)	30	24
95th Queue (ft)	56	53
Link Distance (ft)	478	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 3: Wheatland Rd & Aldridge Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	35	37
Average Queue (ft)	10	7
95th Queue (ft)	35	28
Link Distance (ft)	465	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 4: Wheatland Rd & Parkmeadow Dr

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	72	12	37	5
Average Queue (ft)	33	0	10	0
95th Queue (ft)	60	8	35	4
Link Distance (ft)	654	425		678
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			50	
Storage Blk Time (%)			0	0
Queuing Penalty (veh)			0	0

Intersection: 5: Wheatland Rd & Clear Lake Rd

Movement	WB	SB
Directions Served	LTR	L
Maximum Queue (ft)	55	34
Average Queue (ft)	27	3
95th Queue (ft)	48	22
Link Distance (ft)	468	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Network Summary

Network wide Queuing Penalty: 493

Intersection: 1: River Rd & Wheatland Rd/Springwood Dr

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	292	185	155	70	138	91	82	42	323	62
Average Queue (ft)	45	120	51	21	63	21	12	3	126	6
95th Queue (ft)	175	196	154	54	117	66	47	23	260	37
Link Distance (ft)	501			388		854	854		735	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		125	125		210			90		30
Storage Blk Time (%)		11	0		0				18	0
Queuing Penalty (veh)		2	0		0				54	0

Intersection: 2: Wheatland Rd & Russett Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	69	36
Average Queue (ft)	32	5
95th Queue (ft)	57	26
Link Distance (ft)	479	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Wheatland Rd & Aldridge Dr

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	46	18
Average Queue (ft)	19	1
95th Queue (ft)	48	10
Link Distance (ft)	471	441
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Wheatland Rd & Parkmeadow Dr

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	69	22
Average Queue (ft)	29	1
95th Queue (ft)	60	12
Link Distance (ft)	661	677
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Wheatland Rd & Clear Lake Rd

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	69	15
Average Queue (ft)	24	1
95th Queue (ft)	50	7
Link Distance (ft)	476	540
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 56

Intersection: 1: River Rd & Wheatland Rd/Springwood Dr

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	316	185	155	82	270	879	874	123	780	48
Average Queue (ft)	66	138	65	28	269	817	720	16	735	3
95th Queue (ft)	237	209	178	66	283	1044	1060	72	893	25
Link Distance (ft)	501			388		854	854		735	
Upstream Blk Time (%)						49	5		58	
Queuing Penalty (veh)						0	0		0	
Storage Bay Dist (ft)		125	125		210			90		30
Storage Blk Time (%)	0	14	1		65	0			54	0
Queuing Penalty (veh)	0	1	0		291	0			226	0

Intersection: 2: Wheatland Rd & Russett Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	65	56
Average Queue (ft)	32	22
95th Queue (ft)	56	52
Link Distance (ft)	479	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Wheatland Rd & Aldridge Dr

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	41	54
Average Queue (ft)	12	7
95th Queue (ft)	39	33
Link Distance (ft)	471	441
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Wheatland Rd & Parkmeadow Dr

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	84	8	72
Average Queue (ft)	34	0	12
95th Queue (ft)	68	5	46
Link Distance (ft)	661	425	677
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Wheatland Rd & Clear Lake Rd

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	54	42
Average Queue (ft)	26	3
95th Queue (ft)	44	19
Link Distance (ft)	476	540
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 519

APPENDIX E: SIMTRAFFIC TRAVEL TIME REPORTS

Arterial Level of Service: NB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Russett Dr	2	0.6	30.1	0.3	39
Aldridge Dr	3	0.8	34.0	0.4	40
Parkmeadow Dr	4	0.4	8.3	0.1	40
Clear Lake Rd	5	3.0	73.6	0.8	40
Jays Dr	6	0.5	11.4	0.1	40
Total		5.4	157.3	1.7	40

Arterial Level of Service: SB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Clear Lake Rd	5	0.4	10.5	0.1	43
Parkmeadow Dr	4	1.9	68.4	0.8	43
Aldridge Dr	3	0.6	8.7	0.1	38
Russett Dr	2	2.0	35.6	0.4	38
Mistletoe Lp	1	1.9	30.6	0.3	39
Total		6.8	153.8	1.7	41

Arterial Level of Service: NB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Russett Dr	2	3.2	32.3	0.3	37
Aldridge Dr	3	2.8	36.7	0.4	37
Parkmeadow Dr	4	1.7	9.7	0.1	34
Clear Lake Rd	5	5.8	74.9	0.8	39
Jays Dr	6	0.9	12.1	0.1	37
Total		14.4	165.7	1.7	38

Arterial Level of Service: SB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Clear Lake Rd	5	0.7	11.9	0.1	38
Parkmeadow Dr	4	3.4	74.7	0.8	39
Aldridge Dr	3	0.8	8.8	0.1	38
Russett Dr	2	2.5	36.1	0.4	38
Mistletoe Lp	1	2.2	31.5	0.3	38
Total		9.6	163.0	1.7	39

Arterial Level of Service: NB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Russett Dr	2	0.5	29.8	0.3	40
Aldridge Dr	3	0.9	34.0	0.4	40
Parkmeadow Dr	4	0.4	8.3	0.1	40
Clear Lake Rd	5	3.8	74.3	0.8	40
Jays Dr	6	0.7	11.6	0.1	39
Total		6.2	158.0	1.7	40

Arterial Level of Service: SB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Clear Lake Rd	5	0.4	10.3	0.1	44
Parkmeadow Dr	4	2.1	68.3	0.8	43
Aldridge Dr	3	0.5	8.6	0.1	39
Russett Dr	2	1.9	35.4	0.4	39
Mistletoe Lp	1	1.8	31.1	0.3	38
Total		6.7	153.7	1.7	41

Arterial Level of Service: NB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Russett Dr	2	1.8	30.9	0.3	38
Aldridge Dr	3	2.3	36.1	0.4	38
Parkmeadow Dr	4	1.7	9.8	0.1	34
Clear Lake Rd	5	6.3	74.5	0.8	39
Jays Dr	6	1.0	12.1	0.1	37
Total		13.0	163.5	1.7	38

Arterial Level of Service: SB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Clear Lake Rd	5	0.5	11.6	0.1	39
Parkmeadow Dr	4	3.3	74.8	0.8	39
Aldridge Dr	3	0.6	8.7	0.1	38
Russett Dr	2	2.3	35.9	0.4	38
Mistletoe Lp	1	2.1	31.5	0.3	38
Total		8.8	162.4	1.7	39

Arterial Level of Service: NB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Russett Dr	2	0.5	30.2	0.3	39
Aldridge Dr	3	0.8	34.2	0.4	40
Parkmeadow Dr	4	0.3	8.2	0.1	41
Clear Lake Rd	5	2.8	74.5	0.8	40
Jays Dr	6	0.5	11.6	0.1	39
Total		4.9	158.6	1.7	40

Arterial Level of Service: SB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Clear Lake Rd	5	0.5	10.4	0.1	43
Parkmeadow Dr	4	1.7	67.2	0.8	44
Aldridge Dr	3	0.6	8.6	0.1	39
Russett Dr	2	2.0	35.4	0.4	39
Mistletoe Lp	1	1.8	30.3	0.3	39
Total		6.6	152.0	1.7	41

Arterial Level of Service: NB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Russett Dr	2	1.7	31.2	0.3	38
Aldridge Dr	3	2.5	36.5	0.4	38
Parkmeadow Dr	4	1.9	10.0	0.1	33
Clear Lake Rd	5	6.0	75.6	0.8	39
Jays Dr	6	0.9	12.0	0.1	37
Total		13.0	165.4	1.7	38

Arterial Level of Service: SB Wheatland Rd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Clear Lake Rd	5	0.7	11.8	0.1	38
Parkmeadow Dr	4	3.4	75.2	0.8	39
Aldridge Dr	3	0.7	8.7	0.1	38
Russett Dr	2	2.2	35.9	0.4	38
Mistletoe Lp	1	2.0	31.3	0.3	38
Total		9.0	162.9	1.7	39

APPENDIX F: PLANNING-LEVEL COST ESTIMATES SPREADSHEETS

CITY OF KEIZER
WHEATLAND ROAD MULTIMODAL CORRIDOR STUDY
ALTERNATIVE 1
December 10, 2021

PRELIMINARY ENGINEER'S ESTIMATE

ODOT SPEC	DESCRIPTION	UNIT PRICE	UNIT	QTY	AMOUNT
PART 00100, ODOT (GENERAL CONDITIONS) & 00200, ODOT (TEMPORARY FEATURES & APPURTENANCES)					
00210	Mobilization	$ 750,000	L.S.	1	$ 750,000
00220-00270	Temporary Traffic Control, Work Access/Containment, Temporary Access and Fencing	$ 450,000	L.S.	1	$ 450,000
00280	Erosion and Sediment Control	$ 80,000	L.S.	1	$ 80,000
PART 00300, ODOT (ROADWORK)					
00305	Construction Surveying	$ 80,000	L.S.	1	$ 80,000
00310	Removal of Structures and Obstructions (incl. sawcut)	$ 300,000	L.S.	1	$ 300,000
00320	Clearing and Grubbing	$ 115,000	L.S.	1	$ 115,000
00330	General excavation	$ 20	C.Y.	18000	$ 360,000
PART 00400, 01000, ODOT (DRAINAGE & SEWERS)					
00445	New 12" PVC Storm Pipe, 5-Foot Depth	$ 92	L.F.	1200	$ 110,400
00445	Extend CB Leads, 10" PVC Storm Pipe, 5-Foot Depth	$ 75	L.F.	300	$ 22,500
00470	Stormwater drainage, quantity, and quality retrofit improvements	$ 2	S.F.	600000	$ 1,200,000
00470	Catch Basins	$ 2,700	EA.	40	$ 108,000
00470	New Storm Drain Manholes (Shallow)	$ 4,500	EA.	7	$ 31,500
00490	Post pave MH adjustment	$ 800	Ea.	100	$ 80,000
PART 00500, ODOT (BRIDGES)					
00510	Structure Excavation (Retaining Walls)	$ 40	CY	1900	$ 76,000
00596B	Modular Retaining Walls (incl. backfill)	$ 200	S.F.	4500	$ 900,000
00596D	Modular Retaining Walls (Landscape)	$ 50	S.F.	2200	$ 110,000
PART 00700, ODOT (WEARING SURFACES)					
00759	6' Sidewalk (4" PCC, 3300 psi)	$ 9	S.F.	100000	$ 900,000
00759	PCC Driveway Drops	$ 3,500	E.A.	60	$ 210,000
00759	Curb Ramps (per corner)	$ 7,500	E.A	55	$ 412,500
00759	Curb and gutter	$ 35	L.F.	16700	$ 584,500
00744	Level 3, 1/2- inch ACP	$ 110	TON	10000	$ 1,100,000
PART 00600, ODOT (BASES)					
00620	Cold Plane Pavement Removal	$ 6	S.Y.	12000	$ 72,000
00640	Aggregate Base	$ 35	TON	10500	$ 367,500
PART 00800, ODOT (PERMANENT TRAFFIC SAFETY & GUIDANCE DEVICES)					
00860-00865	Striping	$ 160,000	L.S.	1	$ 160,000
PART 00900, ODOT (PERMANENT TRAFFIC CONTROL & ILLUMINATION DEVICES)					
00900	Rapid Flashing Beacon	$ 30,000	EA	2	$ 60,000
00905	Signage	$ 70,000	L.S.	1	$ 70,000
00970	Street lighting	$ 350,000	L.S.	1	$ 350,000
PART 01000 ODOT (ROW DEVELOPMENT & CONTROL)					
01040	Landscape	$ 12	S.Y.	26900	$ 322,800
01040	Planting - Street Trees 2" Caliper	$ 500	EA.	240	$ 120,000
01050	Replace private yard items, signs, decorative walls, fences, etc	$ 200,000	L.S.	1	$ 200,000
01070	Mailboxes	$ 20,000	L.S.	1	$ 20,000
PART 01100 ODOT (WATER SUPPLY SYSTEMS)					
01120	Irrigation Restoration	$ 40,000	L.S.	1	$ 40,000
01140	Potable Water Pipe and Fittings - Extend fire hydrant runs and water services (incl. test, flush, chlorination)	$ 100,000	L.S.	1	$ 100,000
OTHER					
	Franchise Utilities	$ 200,000	L.S.	1	$ 200,000
	Bus Shelter/Benches	$ 7,500	EA	4	$ 30,000

CONSTRUCTION SUBTOTAL	**$ 10,092,700**
CONTIGENCY (30%)	**$ 3,027,810**
ROW Acquisition (80,000 sf) and Construction Easement	**$ 1,760,000**
Engineering and Administration (30%)	**$ 3,027,810**
ALTERNATIVE 1 PROJECT TOTAL	**$ 17,908,320**

CITY OF KEIZER
WHEATLAND ROAD MULTIMODAL CORRIDOR STUDY
ALTERNATIVE 3
November 12, 2021

PRELIMINARY ENGINEER'S ESTIMATE

ODOT SPEC	DESCRIPTION	UNIT PRICE	UNIT	QTY	AMOUNT
PART 00100, ODOT (GENERAL CONDITIONS) & 00200, ODOT (TEMPORARY FEATURES & APPURTENANCES)					
00210	Mobilization	$ 500,000	L.S.	1	$ 500,000
00220-00270	Temporary Traffic Control, Work Access/Containment, Temporary Access and Fencing	$ 200,000	L.S.	1	$ 200,000
00280	Erosion and Sediment Control	$ 50,000	L.S.	1	$ 50,000
PART 00300, ODOT (ROADWORK)					
00305	Construction Surveying	$ 50,000	L.S.	1	$ 50,000
00310	Removal of Structures and Obstructions (incl. sawcut)	$ 100,000	L.S.	1	$ 100,000
00320	Clearing and Grubbing	$ 50,000	L.S.	1	$ 50,000
00330	General excavation	$ 20	C.Y.	10000	$ 200,000
PART 00400, ODOT (DRAINAGE & SEWERS)					
00445	New 12" PVC Storm Pipe, 5-Foot Depth	$ 92	L.F.	1200	$ 110,400
00470	Stormwater drainage, quantity, and quality retrofit improvements	$ 2	S.F.	200000	$ 400,000
00470	New Catch Basins	$ 2,700	EA.	30	$ 81,000
00470	Replace existing Catch Basins, extend lateral and connect to existing storm drain	$ 3,300	EA.	0	$ -
00470	New Storm Drain Manholes (Shallow)	$ 4,500	EA.	7	$ 31,500
00490	Post pave MH adjustment	$ 800	Ea.	5	$ 4,000
PART 00500, ODOT (BRIDGES)					
00510	Structure Excavation (Retaining Walls)	$ 40	CY	1000	$ 40,000
00596B	Modular Retaining Walls	$ 110	S.F.	4500	$ 495,000
PART 00700, ODOT (WEARING SURFACES)					
00759	6' Sidewalk (4" PCC, 3300 psi)	$ 9	S.F.	40000	$ 360,000
00759	10' Multi-use Path (4" PCC, 4000 psi)	$ 10	S.F.	80000	$ 800,000
00759	PCC Driveway Drops	$ 3,500	E.A.	60	$ 210,000
00759	Curb Ramps (per corner)	$ 7,500	E.A	55	$ 412,500
00759	Curb and gutter	$ 35	L.F.	9000	$ 315,000
00744	Level 3, 1/2- inch ACP	$ 120	TON	2000	$ 240,000
PART 00600, ODOT (BASES)					
00620	Cold Plane Pavement Removal	$ 6	S.Y.	2000	$ 12,000
00640	Aggregate Base	$ 35	TON	3000	$ 105,000
PART 00800, ODOT (PERMANENT TRAFFIC SAFETY & GUIDANCE DEVICES)					
00860-00865	Striping	$ 160,000	L.S.	1	$ 160,000
PART 00900, ODOT (PERMANENT TRAFFIC CONTROL & ILLUMINATION DEVICES)					
00900	Rapid Flashing Beacon	$ 30,000	EA	2	$ 60,000
00940	Signage	$ 70,000	L.S.	1	$ 70,000
00970	Street lighting	$ 350,000	L.S.	1	$ 350,000
PART 01000 ODOT (ROW DEVELOPMENT & CONTROL)					
01040	Landscape	$ 12	S.Y.	10000	$ 120,000
01040	Planting - Street Trees 2" Caliper	$ 500	EA.	290	$ 145,000
01050	Replace private yard items, signs, decorative walls, fences, etc	$ 40,000	L.S.	1	$ 40,000
01070	Mailboxes	$ 20,000	L.S.	1	$ 20,000
PART 01100 ODOT (WATER SUPPLY SYSTEMS)					
01120	Irrigation Restoration	$ 25,000	L.S.	1	$ 25,000
01140	Potable Water Pipe and Fittings - Extend fire hydrant runs and water services (incl. test, flush, chlorination)	$ 30,000	L.S.	1	$ 30,000
OTHER					
	Franchise Utilities	$ 100,000	L.S.	1	$ 100,000
	Bus Shelter/Benches	$ 7,500	EA	4	$ 30,000

CONSTRUCTION SUBTOTAL	**$**	**5,916,400**
CONTINGENCY (30%)	**$**	**1,774,920**
ROW Acquisition (30,000 sf) and Construction Easement	**$**	**400,000**
Engineering and Administration (30%)	**$**	**1,774,920**
ALTERNATIVE 3 PROJECT TOTAL	**$**	**9,866,240**

APPENDIX G: TIER 1 & TIER 2 SCREENING MATRIX

0 – No Change
-2 – Significant Impacts
+2 – Significant Improvements

	Alt 1: TSP		Alt 3: Multi-use Path	
	Score	Comment	Score	Comment
NEIGHBORHOOD LIVABILITY	1.5	Wider pavement width results in higher traffic speeds; Focus on connectivity with improved sidewalks and bike lanes; May not address all roadway users' needs.	2	Maintains the current two-lane cross section; Focus on connectivity with improved sidewalks and bike lanes; Includes buffered bike lanes and a multi-use path for safer and more comfortable biking options.
ENVIRONMENTAL	1	Requires removal of many existing trees and natural resources; More stormwater runoff; No major environmental issues; Can apply practical design approach.	1.5	Preserves existing trees and natural resources; Less stormwater runoff than Alt #1 but slightly more than Alt #2; No major environmental issues, Can apply practical design approach. Smaller pavement cross section. Smaller stormwater footprint.
UTILIZATION OF EXISTING INFRASTRUCTURE	0	Widens curb-to-curb width for entire corridor from 32' - 36' to 48'. No opportunties for saving existing curbs and sidewalks.	1	Maintains most of existing curb-to-curb width.
TRAFFIC OPERATIONS	2	Increases capacity and queue storage at public street intersections and private driveways due to presence of center turn lane.	1.5	Continues to meet City LOS standards, with turn lane at key intersection. Less capacity at most intersections with not continuous left turn lane.
SAFE ROUTES TO SCHOOL	1	Widens crossing distance across Wheatland, but does provide opportunity for median refuge islands. Provides continuous sidewalk along entire corridor. Higher speeds creating conflicts with children crossing for bus stops.	2	Provides continuous sidewalk and multi-use path for all ages and abilities. Buffer between travel lane and bicycle laneincreases rider comfort level.
SAFETY	1.5	For vehicles, continuous left turn lane for all public street intersections and private driveways. For vulnerable road users, there are opportunities for RRFBs, median refuge islands, and raised crosswalks. But the wider roadway cross section width is detrermental for vulnerable road users.	2	Buffered bike lanes protect bicycles; Includes ability for non-confident bicyclists to ride on the sidwalk (multi-use path); Opportunities for RRFBs and raised crosswalks; Left turn lane key intersection.
TRANSPORTATION MODE OPTIONS/ MULTIMODAL CONNECTIVITY	1.5	Provides complete street for all modes and continuous facilities along entire corridor. Bike faciliites not available for all ages and abilities.	2	Provides service for all modes and continuous facilities along entire corridor, including the ability to bike along the multi-use path instead of the street. Bike facilities provided for all ages and abilities.
EQUITY	2	Improved multimodal options for all users and populations and improves existing connectivity to transit and transit stops.	2	Improved multimodal options for all users and populations and improves existing connectivity to transit and transit stops.
CONVENIENT AND ACCESSIBLE TRANSIT	2	Opportunities for publlic transit bus stop treatments; adequate lighting; enhanced pedestrian crossings.	2	Opportunities for publlic transit bus stop treatments; adequate lighting; enhanced pedestrian crossings.
COST EFFECTIVE	1	Highest cost to construct.	1.5	More costly to construct than Alt #2, but less than Alt #1.
TOTAL	1.35		1.75	

Tier 2

TRAFFIC OPERATIONS	0.5	Continues to meet City LOS standards. Minimally increases capacity and queue storage at public street intersections and private driveways due to presence of center turn lane.	0	Continues to meet City LOS standards; Similar traffic operations to Alt 1 but slightly lower capacity (no continuous left turn lane). Left turn lane provided at key intersection (Russett)
PEDESTRIAN AND BICYCLE QUALITATIVE ASSESSMENT	1.5	Provides regular bike lanes, standard sidewalks, enhanced pedestrian crossings, and fully connected sidewalks. Does not provide bike facilities for all ages and abilities with on-street bike lanes only.	2	Provides buffered bike lanes, a wide multi-use path, enhanced pedestrian crossings, and fully connected sidewalks. Multi-use path provides bike facilities for all ages and abilities.
SAFETY IMPACTS	1	Provides sidewalks with a planter strip, but no buffered bike lanes. Speeds may increase due to TWLTL. TWLTL does provide left turn queuing space and reduces rear-end crashes. Provides medians for enhanced pedestrian crossings.	1.5	Provides larger sidewalks, buffered bike lanes, green bike lane paint at key intersections, and RRFBs. Speeds may drop due to narrower lanes. Best alternative for supporting safe routes to schools.
RIGHT-OF-WAY AND UTILITY IMPACTS	0.5	Widens existing curb-to-curb width and requres ROW acquisition. Additional easements will be required for utilites behind the walk.	1.5	Maintains most of existing curb-to-curb width, still requres some ROW acquisition but less than Alt 1. Existing right-of-way may be available to keep overhead utilities.
PLANNING LEVEL COST ESTIMATES	1	Higher cost to construct.	2	Lower cost to construct, approximately half of Alternative #1
TOTAL	0.90		1.40	

AVERAGE TOTAL	1.13	1.58