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Technical Memorandum

March 13, 2025 Project# 29019

McMinnville Third Street Improvement Project

To: Jason White, BKF Engineers

From: Joey Bansen, PE; Sutapa Banerjee

Subject: Traffic Analysis Memorandum

Introduction

PROJECT BACKGROUND

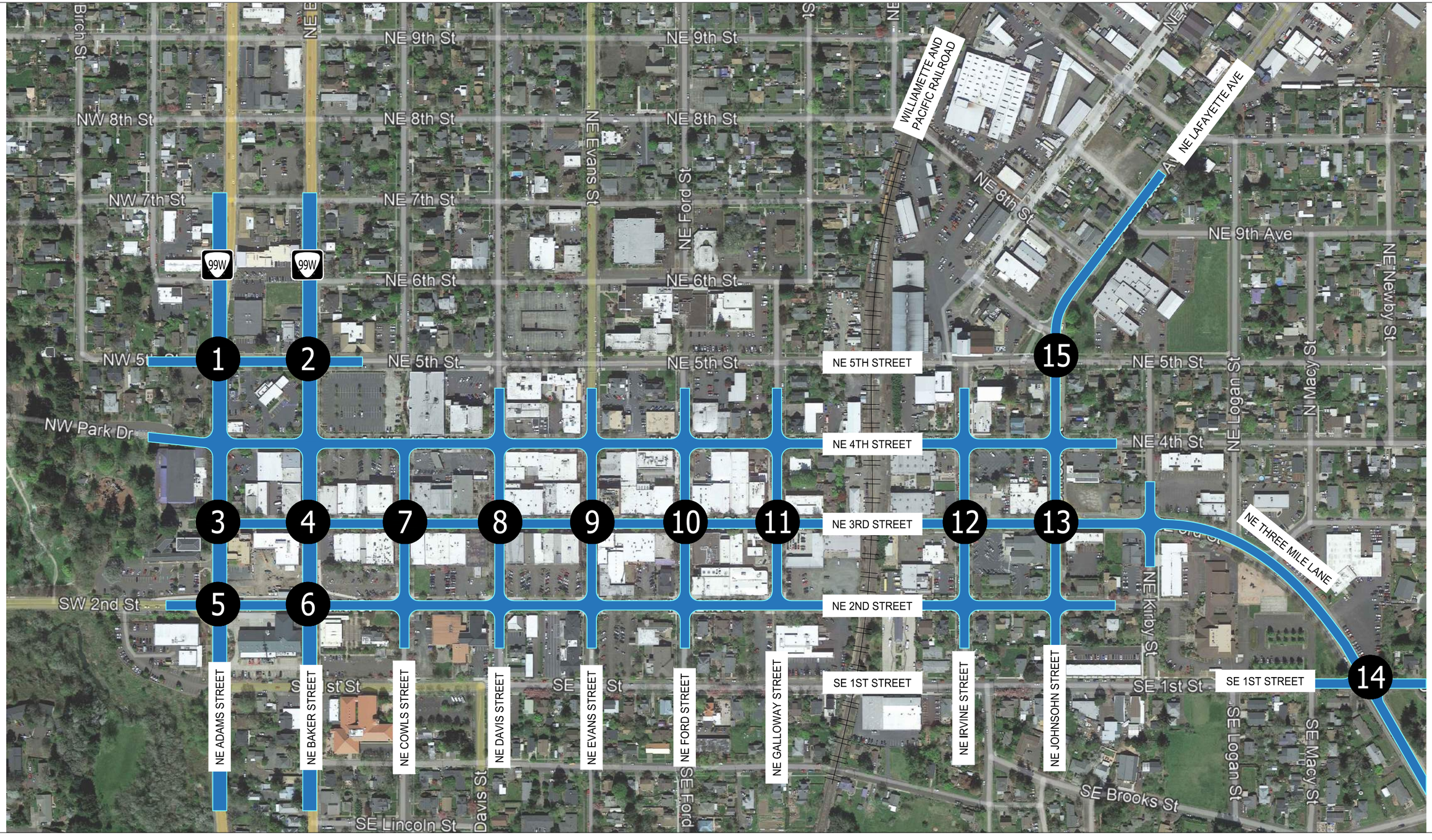
The *Third Street Improvement Project* is a nine-block street improvement project on McMinnville's downtown "main street". The project includes street and sidewalk reconstruction, underground utility infrastructure improvements, above-ground street furnishings and landscaping. The City has been planning for this project from as early as 2000, and has been working on the vision, goals, objectives, and a concept block design for the past four years in a comprehensive public process. The improvement of NE 3rd Street from NE Adams Street to NE Johnson Street is identified in the *City of McMinnville Transportation System Plan* (TSP)(Reference 1) as a planned roadway improvement project.

The concept design phase completed in 2022 set a preferred vision and functional design that keeps the existing two-lane street (single lane in each direction) and creates a "Person-Centered Main Street" by:

- Installing large curb extensions that create flexible areas for seating, art, planting, and dining spaces;
- Installing larger sidewalks providing more room for pedestrians and commerce;
- Implementing a balanced design equally serving both sides of the street; and
- Implementing narrower lanes, curb extensions, and on-street parking to calm traffic speeds.

Following the 15% design phase in 2024, the design concept was updated to incorporate a curbless "festival street" concept with flush curbs delineating the roadway and sidewalk areas to facilitate flexibility in the use of the public right-of-way in this unique strip of downtown.

Figure 1 illustrates the study area and specific study intersections for the project.



Site Plan and Study Intersections
McMinnville, OR

Figure
1

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SCOPE OF THE TRANSPORTATION ANALYSIS

The scope of this project includes the NE 3rd Street corridor between NE Adams Street and NE Johnson St. The study intersections and overall study area for this project were selected based on a review of the local transportation system and direction provided by the City of McMinnville. Operational analyses were performed at the following study intersections:

1. NE Adams Street (OR99W) & NE 5th Street
2. NE Baker Street (OR99W) & NE 5th Street
3. NE Adams Street (OR99W) & NE 3rd Street
4. NE Baker Street (OR99W) & NE 3rd Street
5. NE Adams Street (OR99W) & NE 2nd Street
6. NE Baker Street (OR99W) & NE 2nd Street
7. NE Cowls Street & NE 3rd Street
8. NE Davis Street & NE 3rd Street
9. NE Evans Street & NE 3rd Street
10. NE Ford Street & NE 3rd Street
11. NE Galloway Street & NE 3rd Street
12. NE Irvine Street & NE 3rd Street
13. NE Johnson Street & NE 3rd Street
14. NE Three Mile Lane & SE 1st Street
15. NE Lafayette Avenue/NE Johnson Street & NE 5th Street

This transportation analysis addresses specific capacity and safety needs in the project area and provides recommendations to be carried forward in the development of corridor design alternatives. This technical memorandum includes the following:

- Existing traffic volumes, geometric conditions, traffic conditions, and crash history.
- Build Year 2027 and Future Year 2047 future traffic volumes based on Oregon Department of Transportation's (ODOT) travel demand model for the City of McMinnville.
- Evaluation of intersection and/or segment improvements based on the anticipated year 2047 volumes.
- Queuing analysis for the study intersections during weekday morning and afternoon peak hours.
- Identification of deficiencies and recommendations for intersection and corridor improvements to inform the design process.

The focus of the analysis and recommendations is on the intersections along NE 3rd Street from NE Adams Street to NE Johnson Street. However, several other intersections were included in the traffic volume development and analysis with the intent of assessing impacts of possible re-routing of traffic away from NE 3rd Street to adjacent streets resulting from the implementation of these streetscape improvements.

ANALYSIS METHODOLOGY

The intersection analyses described in this memorandum were performed in accordance with the procedures stated in the *Highway Capacity Manual 7th Edition (HCM)* (Reference 2).

The operational analyses were performed using Synchro *11* traffic analysis software. *Synchro* is a software package that analyzes individual signalized and unsignalized intersections; it also enables modeling and optimizing traffic signal timings along a corridor. Synchro implements the methods outlined in the *HCM*.

Mobility Standards

A number of performance measures are used to gauge the overall quality of the travel experience through an intersection or roadway segment as it is perceived by the traveler. A brief description of each performance measure is provided below:

- ***Level of Service*** **(LOS)** has been the most commonly used performance measure. LOS uses an "A" to "F" ranking based on the average control delay experienced by motorists. LOS "A" conditions have very low vehicle delay times (10 seconds or less), while LOS "F" conditions have high delay times (over 80 seconds per vehicle at a signalized intersection and over 50 seconds at an unsignalized intersection) that are considered unacceptable to most drivers.

- ***Volume-to-Capacity Ratio*** **(V/C)** compares the volume of traffic to the theoretical capacity of the facility to accommodate traffic. A V/C ratio of 1.0 indicates an intersection is operating at capacity. A V/C ratio over 1.0 indicates the intersection's capacity is exceeded, meaning that a vehicle may have to wait more than one signal cycle length at a signalized intersection before moving through the intersection.

While overall intersection performance is calculated for signalized intersections, performance measures are only calculated for the minor approaches and the major street left-turn movements at two-way stop-controlled intersections. No delay is assumed on the major street through movements; levels of service and volume-to-capacity ratios are only calculated for each minor street lane.

Several of the study intersections are located along OR99W under ODOT jurisdiction and the remaining are under City of McMinnville jurisdiction.

CITY OF MCMINNVILLE

Chapter 2 of City of McMinnville's TSP identifies performance measures based on the 1999 Oregon Highway Plan (OHP) (Reference 3). The TSP identifies the mobility target for City-owned streets and intersections at a V/C ratio of 0.90 or lower, and intersections on OR99W at a V/C ratio of 0.85 or lower.

OREGON DEPARTMENT OF TRANSPORTATION

The *2025 ODOT Highway Design Manual (HDM)* (Reference 4) establishes project development and design mobility targets for ODOT facilities. As a Regional Highway within an urban growth boundary and a posted speed limit of 30 mph, Table 1200-2 of the HDM sets the mobility target for the OR99W intersections at a V/C ratio of 0.75 or lower.

Table 1 summarizes the intersection mobility targets for the study intersections. The OHP mobility targets were used for ODOT intersections under existing and future no-build conditions and the

HDM mobility targets were used to evaluate the future build conditions. The HDM targets are stricter than OHP targets, reflecting the desire to provide excess capacity for future growth and flexibility when investing significant funding into a project.

Table 1 Mobility Targets for Study Intersections

Intersection	Jurisdiction	Mobility Targets (V/C Ratio)	
		Oregon Highway Plan (OHP)	ODOT Highway Design Manual (HDM)
1. NE Adams St (OR99W) & NE 5th St	ODOT	0.85	0.75
2. NE Baker St (OR99W) & NE 5th St	ODOT	0.85	0.75
3. NE Adams St (OR99W) & NE 3rd St	ODOT	0.85	0.75
4. NE Baker St (OR99W) & NE 3rd St	ODOT	0.85	0.75
5. NE Adams St (OR99W) & NE 2nd St	ODOT	0.85	0.75
6. NE Baker St (OR99W) & NE 2nd St	ODOT	0.85	0.75
7. NE Cowls St & NE 3rd St	City	0.90	N/A
8. NE Davis St & NE 3rd St	City	0.90	N/A
9. NE Evans St & NE 3rd St	City	0.90	N/A
10. NE Ford St & NE 3rd St	City	0.90	N/A
11. NE Galloway St & NE 3rd St	City	0.90	N/A
12. NE Irvine St & NE 3rd St	City	0.90	N/A
13. NE Johnson St & NE 3rd St	City	0.90	N/A
14. NE Three Mile Ln & SE 1st St	City	0.90	N/A
15. NE Lafayette Ave/NE Johnson St & NE 5th St	City	0.90	N/A

COORDINATION WITH OTHER PROJECTS

OR99W Active Transportation Concept Plan

The City of McMinnville and ODOT partnered on the *OR99W (Linfield to McDonald) Active Transportation Concept Plan* (Reference 5) to develop a plan and identify improvements within the corridor that will result in a safer, more comfortable, more attractive place to walk, bike, roll, and access transit. The plan makes the following recommendations for a preferred solution concept within the project study area:

- Install a buffered bike lane along the east side of NE Baker Street (OR99W northbound).
- Install a buffed bike lane along the west side of NE Adams Street (OR99W southbound).
- Install a pedestrian-actuated rectangular rapid flashing beacon (RRFB) at the existing striped crosswalk on the north leg of NE Adams Street & NE 3rd Street.

ODOT OR99W/OR18 Curb Ramps (McMinnville)

ODOT Region 2 is currently underway with the design phase of ADA curb ramp improvements along OR99W and OR18 in McMinnville. The ODOT Statewide Transportation Improvement Program (STIP) number is K22554. Construction is planned for 2025. The project is expected to implement the following within the study area:

- Rebuild curb ramps at:
  - NE Adams Street (OR99W southbound) & NE 3rd Street – west side only
  - NE Baker Street (OR99W northbound) & NE 3rd Street – includes curb extensions/bulb-outs on all corners
  - NE Adams Street (OR99W southbound) & NE 2nd Street – southwest island only.
  - NE Baker Street (OR99W northbound) & NE 2nd Street – northeast island only.
- Install RRFB and illumination at the existing marked crosswalk on the north leg of NE Adams Street & NE 3rd Street.
- Re-stripe OR99W southbound (NE Adams Street) to include a buffered bike lane along the west side of the street.
- Re-stripe OR99W northbound (NE Baker Street) to include a buffered bike lane along the east side of the street.

Existing Transportation Facilities

Most land uses along NE 3rd Street are commercial and retail in nature. The study area maintains a downtown "main street" nature throughout its extents with store fronts abutting the right-of-way along the street. The Willamette and Pacific Railroad passes north-south through the study area between the intersections of NE Galloway Street and NE Irvine Street.

ROADWAY FACILITIES

NE 3rd Street is a two-lane roadway in downtown McMinnville that runs east-west from NE Adams Street to NE Johnson Street and is classified as a "major collector". NE 3rd Street ends in a tee-intersection at NE Adams Street at the west end, with the McMinnville Aquatic Center, City Park, and Library on the west side of the intersection. NE 3rd Street transitions to NE Three Mile Lane approximately two blocks east of NE Johnson Street. The City of McMinnville has indicated that it will likely seek a classification change to NE 3rd Street to a "local street" classification in the upcoming TSP update.

Oregon Route 99W (OR99W), also known as Pacific Highway West, is an ODOT regional highway and major arterial that runs north-south as a couplet through downtown McMinnville. Within the project limits, the southbound direction is known as NE Adams Street, and the northbound direction is known as NE Baker Street.

Most of the intersections in the study area along NE 3rd Street are stop-controlled on the minor street approaches. The NE Baker Street, NE Davis Street, and NE Ford Street intersections are currently signalized. On-street parallel parking exists on both sides of NE 3rd Street for the majority of the corridor as well as on the side street approaches.

PEDESTRIAN AND BICYCLE FACILITIES

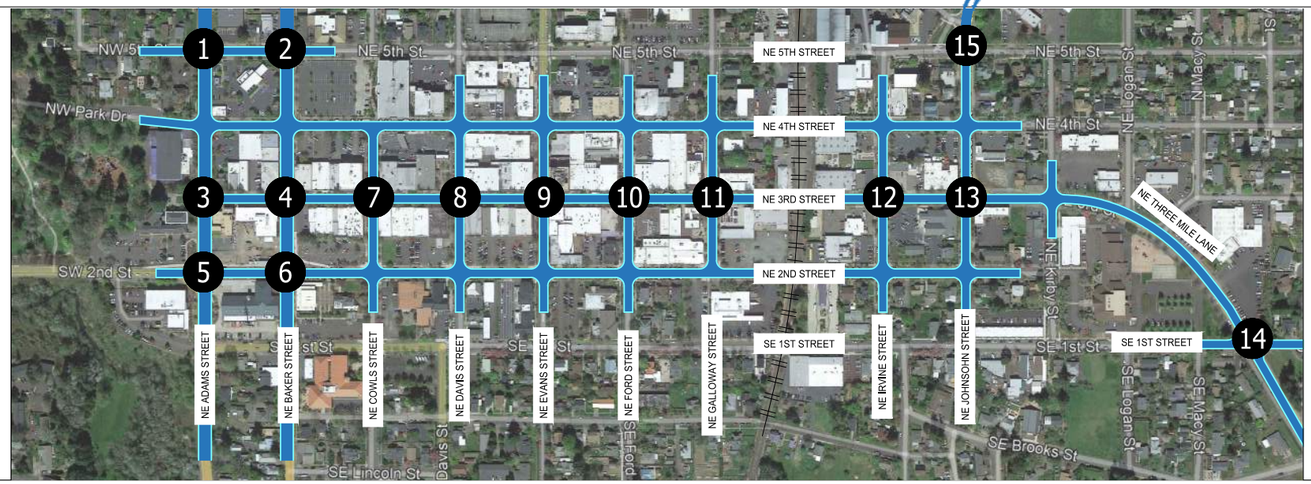
Sidewalks exist on both sides of all streets within the study area, with NE 3rd Street and most other streets having buffer strips with street trees, street lights and other street furnishings between the curb and sidewalk. No marked bicycle facilities are present along NE 3rd Street. Shared bicycle lane markings ("sharrows") exist on NE 2nd Street and NE 5th Street, while striped bicycle lanes exist on NE Three Mile Lane.

Marked crosswalks exist mid-block along the NE 3rd Street corridor on each block between NE Baker Street and NE Galloway Street.

Table 2 summarizes the street characteristics within the study area, and Figure 2 illustrates the existing lane configurations and traffic control devices at the study intersections. Note that the left-turn movements from NE 3rd Street at the signalized intersections of NE Davis Street and NE Ford Street are currently prohibited with overhead signage.

Table 2 Street Characteristics in Site Vicinity

Street	Classification	Vehicle Travel Lanes	Posted Speed (mph)	Sidewalks	Bicycle Lanes	On-Street Parking
NE 3rd St	**Major Collector**	**2**	**20**	**Both sides**	**None**	**Both sides**
NE 2nd St	Minor Collector	2	25	Both sides	Partial (Sharrows)	Both sides
NE 5th St	Minor Collector	2	25	Both sides	Partial (Sharrows)	Both sides
SE 1st St	Local Street	2	25	Both sides	Partial (Sharrows)	Both sides
NE Adams St (OR99W SB)	Major Arterial/ Regional Hwy	2	30	Both sides	None	Both sides (partial)
NE Baker St (OR99W NB)	Major Arterial/ Regional Hwy	2	30	Both sides	None	Both sides (partial)
NE Cowls St	Local Street	2	25	Both sides	None	Both sides
NE Davis St	Local Street	2	25	Both sides	None	Both sides
NE Evans St	Minor Collector	2	25	Both sides	None	Both sides
NE Ford St	Local Street	2	25	Both sides	None	Both sides
NE Galloway St	Local Street	2	25	Both sides	None	Both sides
NE Irvine St	Local Street	2	25	Both sides	None	Both sides
NE Johnson St	Local Street	2	25	Both sides	None	None
NE Three Mile Ln	Major Collector	3	35	Both sides	Both sides	None



1 NE 5 TH ST / NE ADAMS ST

2 NE 5 TH ST / NE BAKER ST

15 NE 5 TH ST / NE LAFAYETTE AVE

3 NE 3 RD ST / NE ADAMS ST

4 NE 3 RD ST / NE BAKER ST

7 NE 3 RD ST / NE COWLS ST

8 NE 3 RD ST / NE DAVIS ST

* Left-turns from NE 3rd Street prohibited

9 NE 3 RD ST / NE EVANS ST

10 NE 3 RD ST / NE FORD ST

* Left-turns from NE 3rd Street prohibited

11 NE 3 RD ST / NE GALLOWAY ST

12 NE 3 RD ST / NE IRVINE ST

13 NE 3 RD ST / NE JOHNSON ST

5 NE 2 ND ST / NE ADAMS ST

6 NE 2 ND ST / NE BAKER ST

14 SE 1 ST ST / NE THREE MILE LN

LEGEND

- STOP SIGN
- YIELD SIGN
- TRAFFIC SIGNAL

Existing Lane Configurations and Traffic Control Devices
McMinnville, OR

Figure 2

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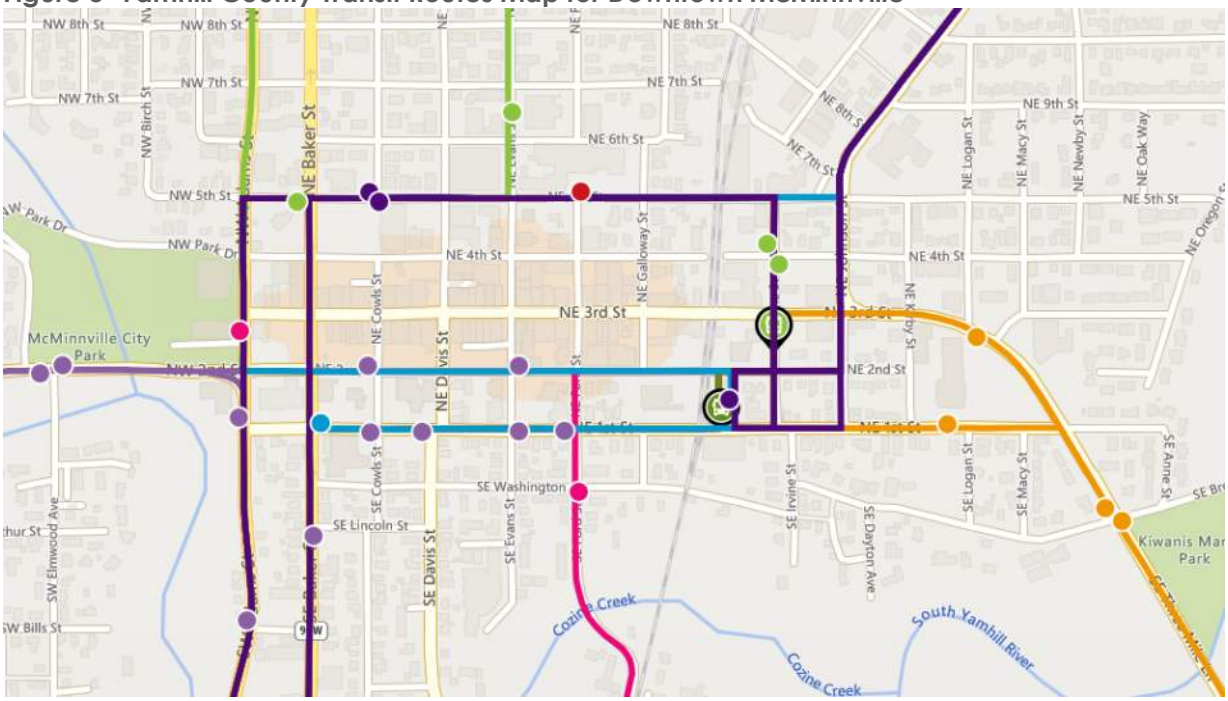
TRANSIT FACILITIES

The Yamhill County Transit Area (YCTA) provides multiple fixed route bus service lines within the project area. This includes both routes that run within the city as well as regional routes that connect various cities and towns within the county. All routes originate or end at the McMinnville Transit Center located at the NE 2nd Street & NE Irvine Street intersection near the Willamette and Pacific Railroad. The YCTA has stops along SE 1st Street, NE 2nd Street and NE 5th Street. While no stops exist on NE 3rd Street, Route #2 (orange route) accesses the Transit Center via NE 3rd Street at NE Irvine Street. Figure 3 illustrates the existing YCTA routes.

Figure 3 Yamhill County Transit Routes Map for Downtown McMinnville



Source: www.ycbus.org

Existing Traffic Conditions

TRAFFIC VOLUMES AND SPEEDS

Traffic counts were collected for a 24-hour period on the four approaches of the NE Evans Street & NE 3rd Street intersection for the purposes of conducting a signal warrant analysis for the intersection as well as to understand the daily traffic patterns, speeds, and distribution of types of vehicles. Table 3 summarizes the existing annual average daily traffic (AADT), heavy vehicle percentages, and 85th percentile speeds along NE 3rd Street and NE Evans Street. Note that pneumatic tube counts were utilized for two legs of the intersection, while the video counts were utilized for the others due to limitations in placement options for tubes on those other legs.

Attachment "A" contains the 24-hour traffic count, speed, and classification data.

Table 3 Study Area Traffic Volumes, Vehicle Class Distribution, and Speeds

Count Location	Direction	Average Annual Daily Traffic (AADT)[1]	Heavy Vehicle %	85th Percentile Speed (mph)	Source
NE Evans St – north of NE 3rd St	NB	700	7.9%	21	24-Hr Tube Count Oct. 3, 2023
	SB	1,086	8.7%	19	
NE 3rd St – east of NE Evans St	EB	1,280	10.0%	19	
	WB	1,784	10.0%	18	
NE Evans St – south of NE 3rd St	NB	458	n/a	n/a	24-Hr Video Count Oct. 3, 2023
	SB	766	n/a	n/a	
NE 3rd St – west of NE Evans St	EB	1,060	n/a	n/a	
	WB	1,698	n/a	n/a	

1. Seasonal adjustment applied to 24-hr counts

ODOT's TransGIS mapping application provides traffic data and characteristics – including functional classification, posted speed, Annual Average Daily Traffic (AADT) for current and future year, and truck percentages – for OR99W (Pacific Highway West, No. 091) within the study area. Table 4 summarizes the information that was available.

Table 4 State Highway Characteristics

Highway/ Location	Functional Class		Posted Speed (mph)	Annual Average Daily Traffic (AADT)		Truck %
	Federal Functional Class	Oregon Highway Plan		Year 2023	Year 2043	
OR99W Southbound (NE Adams St)	Urban Other Principal Arterial	Regional	30	13,810	14,500	18.3%
OR99W Northbound (NE Baker St)	Urban Other Principal Arterial	Regional	30	14,874	16,200	18.3%

INTERSECTION TRAFFIC VOLUMES

The traffic counts for this project were collected on a mid-week day when schools were in session and no special events were taking place downtown. Intersection turning movement counts were collected during the morning (7:00 a.m. to 9:00 a.m.) and afternoon (4:00 p.m. to 6:00 p.m.) peak time periods. Turning movement counts for the majority of the intersections were collected on October 3, 2023, while the counts at the intersection of NE 3rd Street & NE Cowls Street were re-collected on October 11, 2023 due to an equipment malfunction during the initial collection.

Table 5 below shows the systemwide morning and evening peak 60-minute time periods with the highest volumes during a typical weekday. The data from these hours were selected for the operational analysis.

Table 5 Weekday Morning and Afternoon System Peak Hours

Morning Peak Hour	Afternoon Peak Hour
7:30 a.m. to 8:30 a.m.	4:25 p.m. to 5:25 p.m.

Note that only the afternoon (p.m.) peak hour traffic counts were collected and analyzed at the intersections along NE 3rd Street between NE Cowls Street and NE Irvine Street, while both the morning and afternoon peaks were collected for all other intersections.

Attachment "B" contains the peak hour intersection turning movement count data.

Seasonal Adjustment

Traffic volumes often fluctuate throughout the year. In order to account for this fluctuation, Kittelson applied seasonal adjustment factors to the counted intersection volumes based on the methodology outlined in the most current version of the ODOT's *Analysis Procedures Manual (APM)* (Reference 6). The seasonal adjustment calculations used the Seasonal Trend Method described in section 5.5.4 of the APM as the project area lacks Automatic Traffic Recorder stations (ATR) and comparable available ATR sites from which to use the ATR Characteristic Table method. The calculation assumed a "commuter" seasonal trend for vehicular activity throughout the year. The analysis applied the calculated seasonal adjustment factor to the peak hour turning movement and pneumatic tube count data to represent the 30th highest traffic volumes for the weekday a.m. and p.m. peak hours, respectively.

A seasonal adjustment factor of 1.039 was applied to the counts collected on October 3, 2023, while a seasonal adjustment factor of 1.042 was applied to the turning movement counts for the NE 3rd Street & NE Cowls Street intersection collected on October 11, 2023.

Attachment "C" presents unbalanced seasonally-adjusted existing a.m. and p.m. peak hour volumes.

Rounding

The seasonally-adjusted existing a.m. and p.m. volumes were rounded to the nearest five vehicles per guidance in the ODOT APM, section 5.6.2. Volumes for movements with less than five vehicles per hour were rounded to the nearest whole number for the purposes of the analysis.

Network Balancing

The seasonally-adjusted and rounded existing a.m. and p.m. network volumes were reviewed and adjustments were made to balance traffic volumes between intersections per guidance in the ODOT APM, section 5.6.1. Existing a.m. peak volumes did not have a need for balancing, while some of the existing p.m. peak volumes along NE 3rd Street were adjusted to achieve

reasonable differences in entering and exiting volumes, given the presence of side streets, driveways, or on-street parking between intersections.

EXISTING INTERSECTION OPERATIONS

Figure 4 and Figure 5 present the existing a.m. and p.m. peak hour traffic volumes and operations analysis results. The intersection traffic volumes shown have been seasonally adjusted, rounded, and balanced as described above.

All study intersections were found to operate within the applicable City of McMinnville and ODOT mobility targets for volume-to-capacity (V/C) ratio, with the following exceptions.

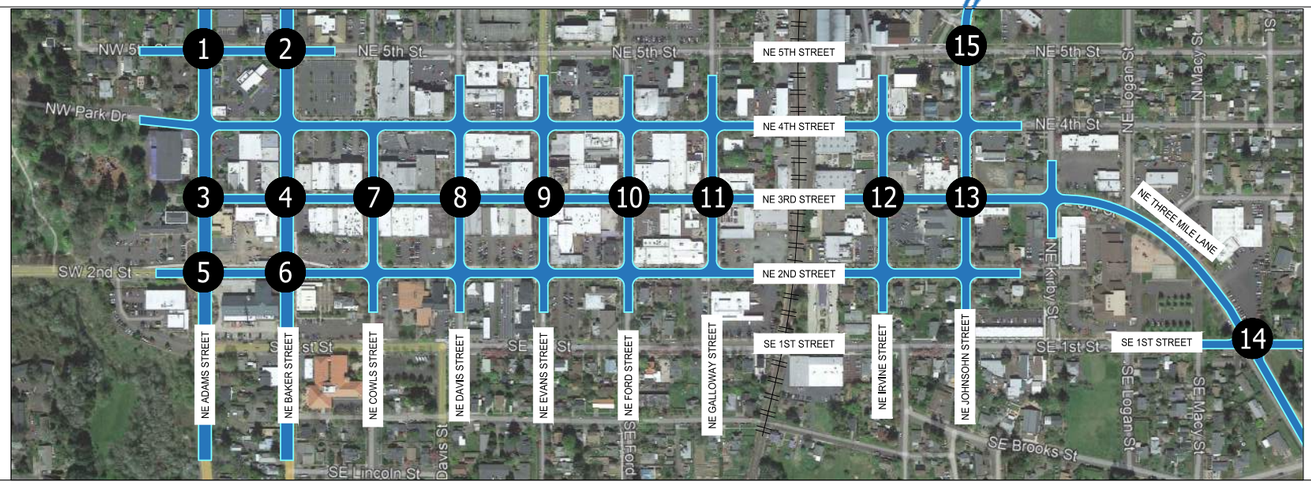
NE Adams Street & NE 2nd Street

- Exceeds both the HDM and OHP mobility targets during the p.m. peak hour.

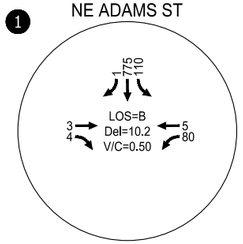
NE Baker Street & NE 2nd Street

- Exceeds the HDM mobility target of 0.75 V/C ratio during the a.m. and p.m. peak hour, but operates within the OHP target of 0.85 V/C ratio.

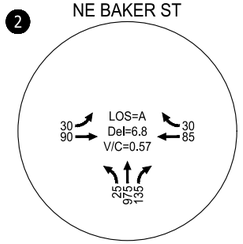
Attachment "D" includes the Synchro operations analysis worksheets for the Existing Conditions analysis.



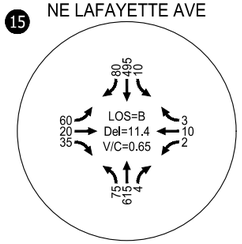
1 NE 5 TH ST / NE ADAMS ST



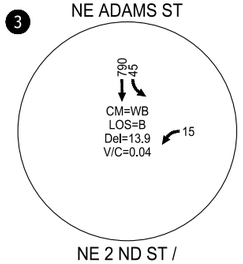
2 NE 5 TH ST / NE BAKER ST



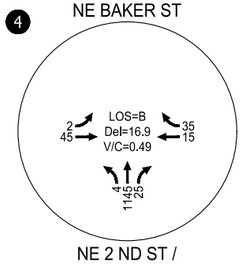
15 NE 5 TH ST / NE LAFAYETTE AVE



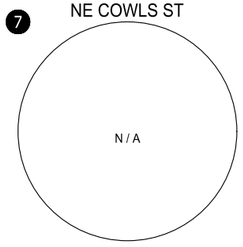
3 NE 3 RD ST / NE ADAMS ST



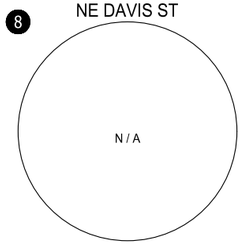
4 NE 3 RD ST / NE BAKER ST



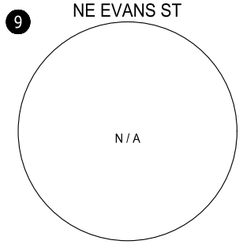
7 NE 3 RD ST / NE COWLS ST



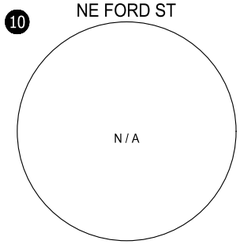
8 NE 3 RD ST / NE DAVIS ST



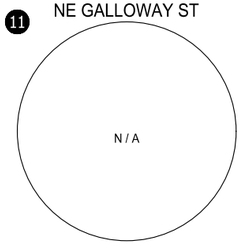
9 NE 3 RD ST / NE EVANS ST



10 NE 3 RD ST / NE FORD ST



11 NE 3 RD ST / NE GALLOWAY ST



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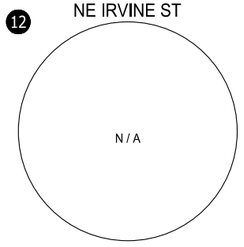
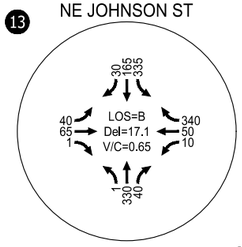
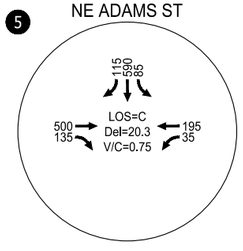


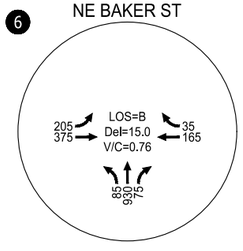
13 NE 3 RD ST / NE JOHNSON ST



5 NE 2 ND ST / NE ADAMS ST



6 NE 2 ND ST / NE BAKER ST



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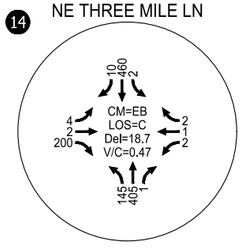
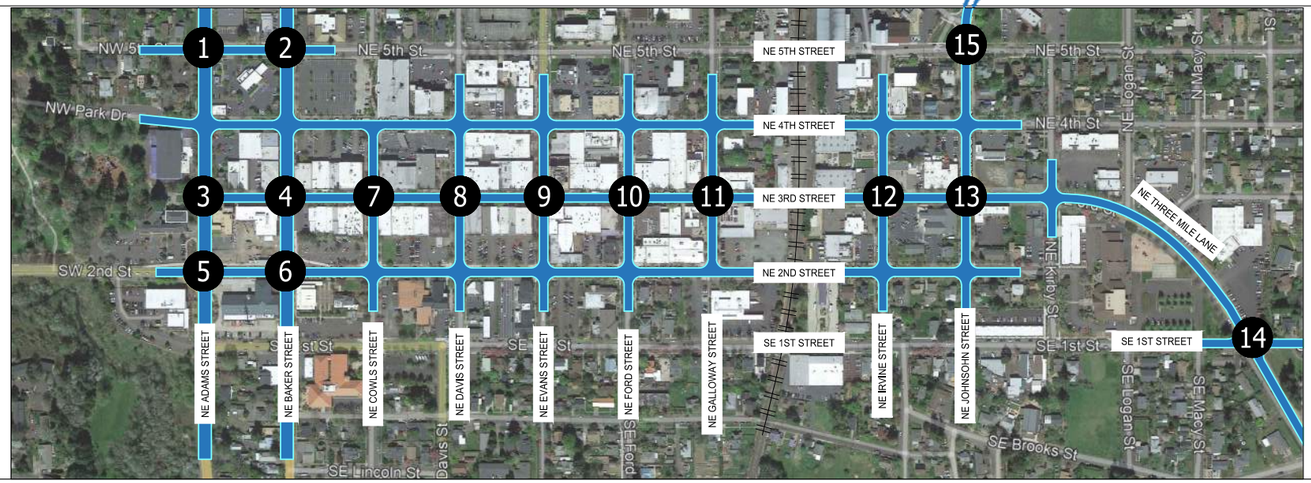


LEGEND

CM - CRITICAL MOVEMENT
LOS - LEVEL OF SERVICE
Del - CRITICAL MOVEMENT CONTROL DELAY
V/C - VOLUME-TO-CAPACITY RATIO

Existing Year 2023 AM Peak Hour Traffic Operations
McMinnville, OR

Figure 4



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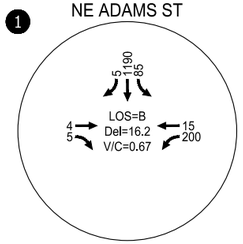

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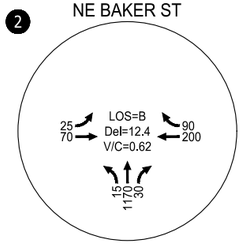

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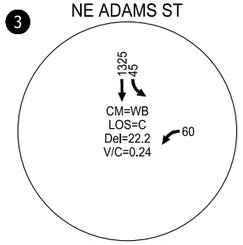

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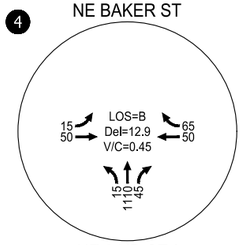

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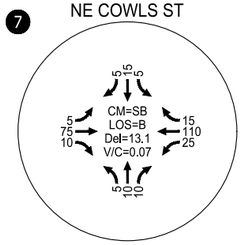

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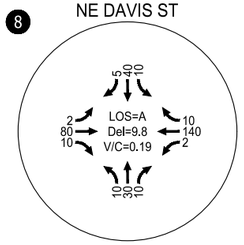

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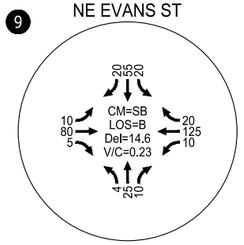

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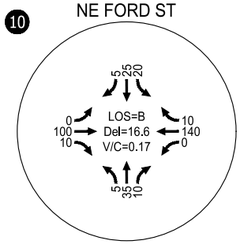

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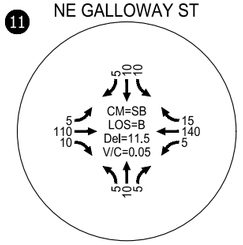

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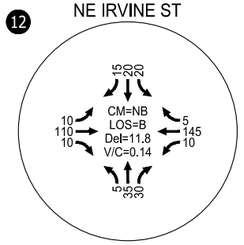

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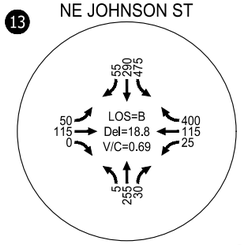

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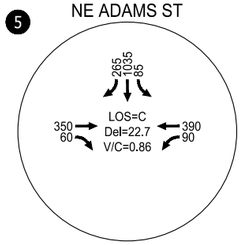

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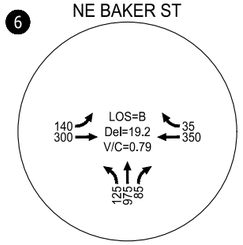
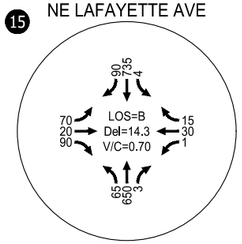


15 NE 5 TH ST / NE LAFAYETTE AVE



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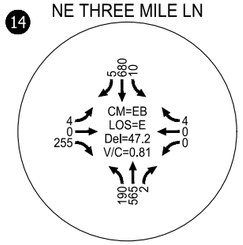

LEGEND

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Existing Year 2023 PM Peak Hour Traffic Operations
McMinnville, OR

Figure 5

KITTELSON & ASSOCIATES

CRASH ASSESSMENT

Crash data was obtained from the ODOT crash data reporting database for the most recent available five-year period between January 1, 2017 and December 31, 2021. The data includes detailed information on crashes that occurred along the corridor for which a crash report was completed. According to Oregon law, crash reports are required when damages associated with the crash exceed $1,500.[1] The data indicates that a total of 35 crashes were reported on the corridor during this 5-year period, with 33 being intersection-related and two being on segments between intersections. Table 6 summarizes the crash data for the study intersections.

Table 6 Intersection Crash Data Summary (January 1, 2017 through December 31, 2021)

Intersection	Year					Total
	2017	2018	2019	2020	2021	
NE Adams St & NE 3rd St	0	2	2	4	2	10
NE Baker St & NE 3rd St	1	-	1	-	1	3
NE Cowls St & NE 3rd St	-	2	-	-	-	2
NE Davis St & NE 3rd St	-	-	-	-	-	0
NE Evans St & NE 3rd St	4	1	-	-	1	6
NE Ford St & NE 3rd St	-	2	-	-	1	3
NE Galloway St & NE 3rd St	-	-	-	-	-	0
NE Irvine St & NE 3rd St	1	-	1	-	-	2
NE Johnson St & NE 3rd St	3	-	2	-	2	7
Total	**10**	**7**	**6**	**5**	**7**	**33**

For purposes of network screening, the intersection crash rates were calculated and compared to statewide 90th percentile crash rates from Exhibit 4-1 in ODOT's Analysis Procedures Manual. As summarized in Table 7, the NE Adams Street/NE 3rd Street and the NE Evans Street/NE 3rd Street intersections have crash rates higher than the statewide 90th percentile crash rate for similar intersection types.

None of the intersections are in the top 10% of intersection reported in ODOT's Safety Priority Index System (SPIS) list.

1The reporting threshold increased from $1,500 to $2,500 on January 1, 2018. The crash data used in this report is based on both the $1,500 and $2,500 threshold. Source: https://www.oregon.gov/ODOT/Data/documents/Crash_Data_Disclaimers.pdf

Table 7 Intersection Crash Rates

Intersection / Segment	Total Crashes	Observed Crash Rate (Crashes/MEV)	ODOT Statewide 90th Percentile Intersection Rate	Observed Crash Rate > 90th Percentile Crash Rate?
NE Adams St & NE 3rd St	**10**	**0.383**	**0.293**	**Yes**
NE Baker St & NE 3rd St	3	0.122	0.509	No
NE Cowls St & NE 3rd St	2	0.378	0.408	No
NE Davis St & NE 3rd St	0	0.000	0.860	No
NE Evans St & NE 3rd St	**6**	**0.856**	**0.408**	**Yes**
NE Ford St & NE 3rd St	3	0.460	0.860	No
NE Galloway St & NE 3rd St	0	0.000	0.408	No
NE Irvine St & NE 3rd St	2	0.260	0.408	No
NE Johnson St & NE 3rd St	7	0.210	0.860	No
Total	**33**	-	-	-

Figure 6, Figure 7, and Figure 8 summarize crash trends across the study intersections on NE 3rd Street based on crash severity and crash type. The following summarizes the reported crash data:

- Angle/turning and rear-end crashes were the most common crash types and comprised 26 of the 33 total intersection crashes. Six angle/turning movement crashes were reported at the NE Johnson Street & NE 3rd Street intersection in the 5-year period.
- There were 3 pedestrian-related crashes reported, with no more than 1 at any given intersection in the 5-years of data.
- 15 of the crashes were property damage only (PDO), 9 were moderate injury, and 11 were minor injury.
- Six of the 10 crashes reported at NE Adams Street & NE 3rd Street were minor injury. There were no reported fatalities. Five of the 10 crashes were rear-end type crashes.
    - Note: An RRFB system is being installed at the existing marked pedestrian crossing with the ODOT OR99W/OR18 Curb Ramps project. The addition of the flashing beacons may help provide more warning to drivers and reduce the likelihood of rear-end crashes.
- While five of the six crashes at the NE Evans Street & NE 3rd Street intersection were angle type crashes, all were reported as PDO severity. Four of the crashes occurred in 2017, with less than one per year reported in 2018 through 2021.
- The majority of crashes (more than 50 percent) occurred between 12:00 PM and 6:00 PM.

- Nine of the 33 total reported intersection crashes occurred during wet/ rainy conditions. The rest of the crashes occurred during dry/ typical conditions.

No trends leading to specific mitigation recommendations were identified for crash type or severity at any of the study intersections. However, the goals of the project to reinforce a slow-speed, pedestrian-focused environment through curbless "festival street", more prominent sidewalk/curb extensions, and other design features will serve to further limit moderate and severe injury crash types.

Attachment "E" contains the ODOT crash data.

Figure 6 Crashes by Severity

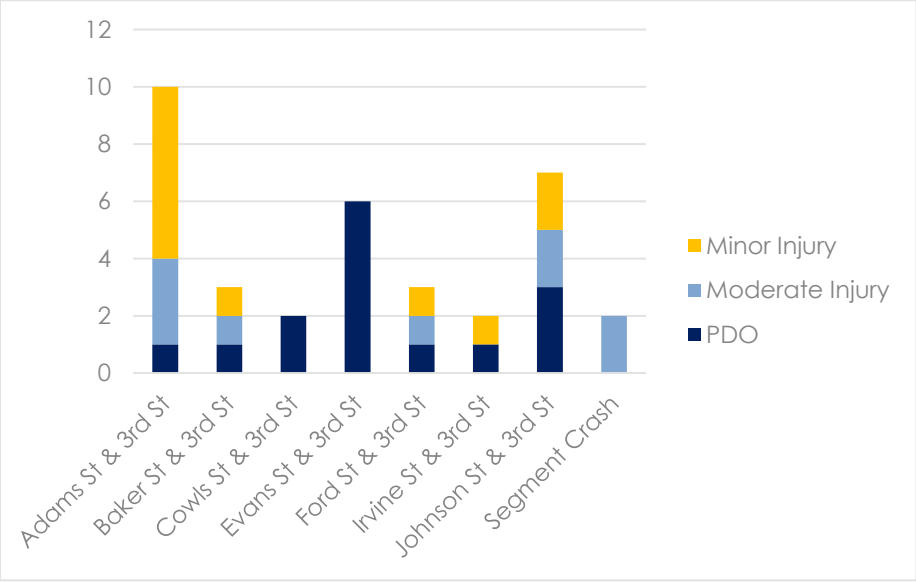


Figure 7 Crashes by Type

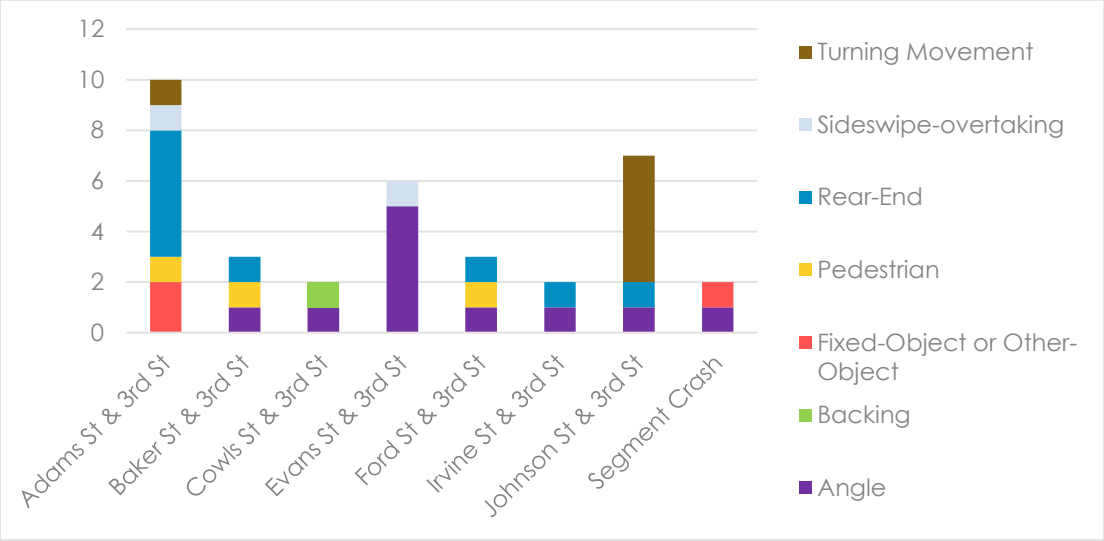
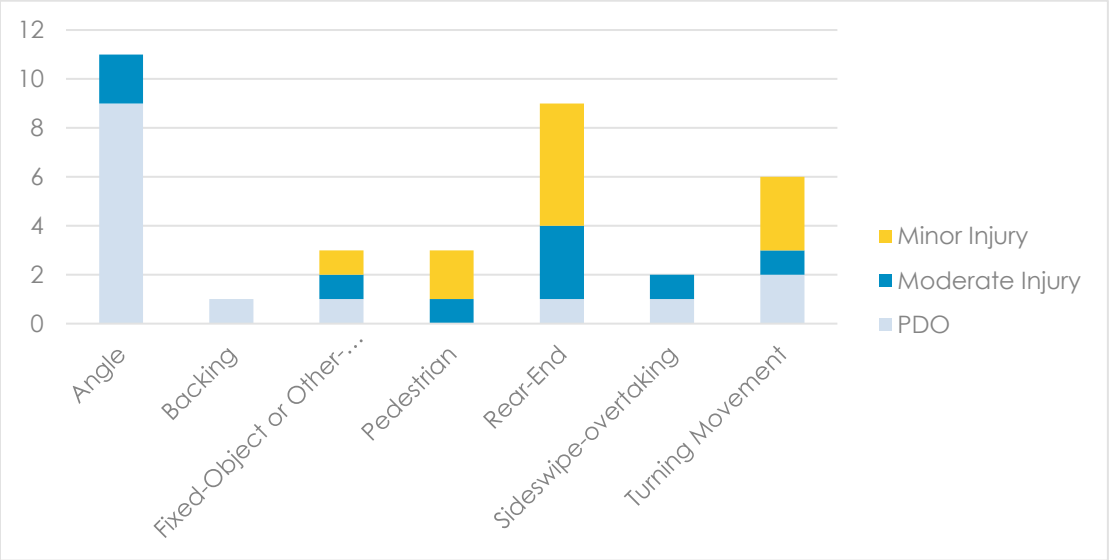


Figure 8 Crashes by Severity by Type - All Intersections Combined



Future Traffic Volumes and Peak Hour Operations

TRAFFIC VOLUME PROJECTIONS

The Third Street Improvement Project is anticipated to reach construction no earlier than 2027. Thus, the analysis includes scenarios representing traffic conditions for the estimated Opening Year 2027 and the Future Year 2047 (20-year forecast) traffic volumes during the weekday a.m. and p.m. peak hours. ODOT Transportation Planning and Analysis Unit (TPAU) provided weekday a.m. and p.m. peak hours travel demand model (TDM) forecast volumes for base year 2015 and future year 2041 conditions in downtown McMinnville. The model accounts for changes in land use and the transportation system connectivity (i.e. new roadway facility connections) based on the City's Comprehensive Plan and the Three Mile Lane Area Plan (Reference 7).

The travel demand model outputs are provided in Attachment "F".

Using the model output, Kittelson developed the forecast turning movement volumes for the Future Year 2047 by applying the TDM post-processing methodology presented in the National Cooperative Highway Research Program (NCHRP) *Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design* (Reference 8), the update to NCHRP *Report 255 Analytical Travel Forecasting Approaches for Project-Level Planning and Design*.

The travel demand model shows negative to no future growth between the 2015 base year and 2041 future year along parts of NE 5th Street, NE 2nd Street, and some of the north-south streets crossing NE 3rd Street. The growth rates for certain movements predicted to have negative growth were set to 0% in order to maintain a reasonable conservative estimate of future traffic volumes.

The Opening Year 2027 traffic volumes were developed by using the existing 2023 volumes and applying the estimated linear growth rates between the 2023 and 2047 volumes. All movements that the travel demand model showed to have negative growth were set to existing volumes (i.e. 0% growth) for the 2027 analysis, as the existing traffic patterns are not expected to significantly change between now and then.

The forecast Opening Year 2027 and Future Year 2047 traffic volumes were rounded and balanced similar to the existing traffic volumes, as described above. Figure 9 through Figure 12 present the Year 2027 and Year 2047 a.m. and p.m. traffic volumes used for the analysis.

Attachment "G" presents the growth rates for each movement used for the development of future traffic volumes, along with unbalanced year 2027 and 2047 volumes.

Volume Rerouting

At the request of the City, Kittelson performed an exercise to understand the potential for the re-routing of traffic away from NE 3rd Street to other parallel streets resulting from the construction and change in character of the Third Street Improvement Project. Kittelson worked with ODOT TPAU staff to understand the current travel demand model characteristics and assumptions, and the changes that may impact the re-routing of traffic.

NE 3rd Street is currently classified as a "major collector" with a speed of 20 mph in the travel demand model. ODOT TPAU staff performed an alternative scenario model run with NE 3rd Street classified as a "local" street. The travel demand model is only sensitive to volume rerouting when a street operates close to, or at, capacity. Because NE 3rd Street is projected to be close to capacity in the model in the future 2041 scenario, the alternative model run showed some minor trip rerouting to NE 5th Street and NE 2nd Street. However, the overall volume of rerouted traffic was insignificant (less than 10 vehicles per hour) and had very minor impacts on the nearby roads. Further, the planned construction on NE 3rd Street is not anticipated to change vehicle-carrying capacity or travel times in any appreciable way compared to the existing conditions.

The alternative scenario model run outputs are included in Attachment "F".

NO BUILD ANALYSIS SCENARIO

The operations of study area intersections were evaluated under the Opening Year 2027 and Future Year 2047 traffic volume scenarios with no changes to the existing lane configurations, traffic control devices, or traffic signal phasing operations. This "no build" analysis scenario was completed in order to understand the near-term and long-term impacts of traffic volumes growth in the study area and determine the need for changes to meet mobility standards.

Opening Year 2027 Intersection Operations – No Build Scenario

The traffic volumes and resulting intersection operations for the Opening Year 2027 a.m. and p.m. peak hours are summarized in Figure 9 and Figure 10, respectively. The following

intersections are anticipated to operate in excess of the mobility targets during the Opening Year 2027 analysis scenario:

NE Adams Street & NE 2nd Street
- Exceeds the HDM and OHP mobility targets during the p.m. peak hour.

NE Baker Street & NE 2nd Street
- Exceeds the HDM mobility target of 0.75 V/C ratio during the a.m. and p.m. peak hour. Operates within the OHP target of 0.85 V/C ratio.

NE Three Mile Lane & SE 1st Street
- Exceeds the City's mobility target of 0.90 V/C during the p.m. peak hour.
- Anticipated to operate at LOS "F" due to delay for the eastbound movements from SE 1st Street onto NE Three Mile Lane.

Attachment "H" includes the Synchro operations analysis worksheets for the Opening Year 2027 No Build analysis.

Future Year 2047 Intersection Operations – No Build Scenario

The traffic volumes and resulting intersection operations for the Future Year 2047 a.m. and p.m. peak hours are summarized in Figure 11 and Figure 12, respectively. The following intersections are anticipated to operate in excess of the mobility targets during the Future Year 2047 analysis scenario:

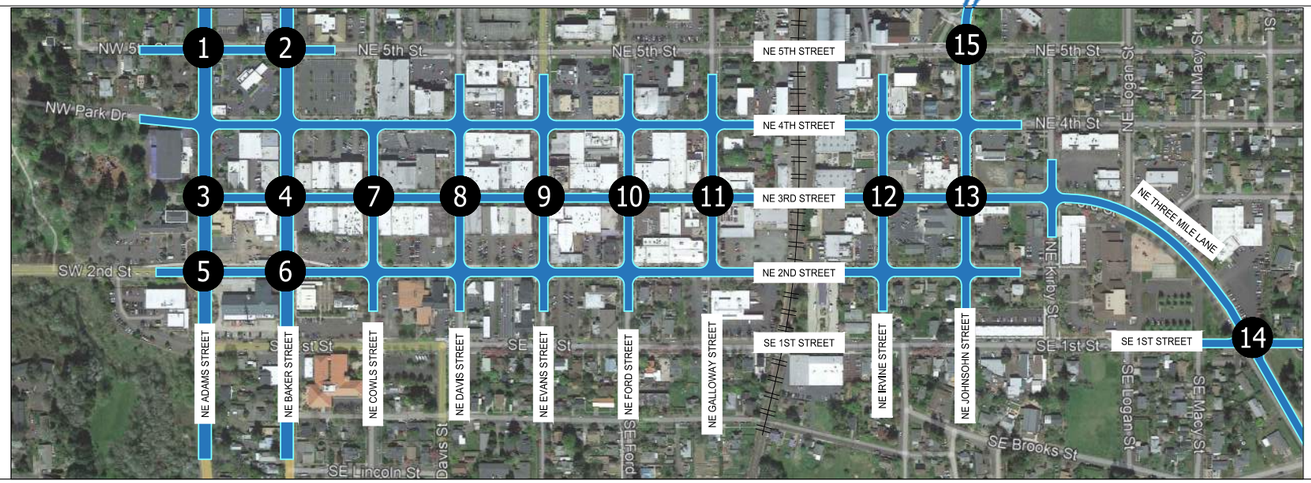
NE Adams Street & NE 3rd Street
- Exceeds both the HDM and OHP mobility targets during the p.m. peak hour.
- Anticipated to operate at LOS "F" due to delay for the westbound left-turn movements from NE 3rd Street onto NE Adams Street.

NE Adams Street & NE 2nd Street
- Exceeds the HDM mobility target of 0.75 V/C ratio during both a.m. and p.m. peak hours. Exceeds the OHP target of 0.85 V/C ratio during the p.m. peak hour.

NE Baker Street & NE 2nd Street
- Exceeds the HDM and OHP mobility targets during both the a.m. and p.m. peak hours.

NE Three Mile Lane & SE 1st Street
- Exceeds the City's mobility target with a V/C greater than 1.0 during the p.m. peak hour.
- Anticipated to operate at LOS "F" due to delay for the eastbound movements from SE 1st Street onto NE Three Mile Lane.

Attachment "I" includes the Synchro operations analysis worksheets for the Future Year 2047 No Build analysis.



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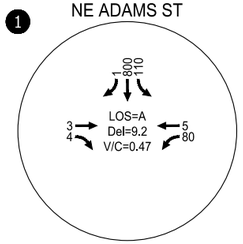

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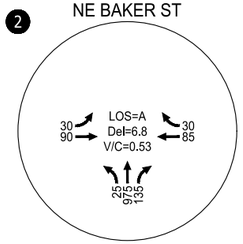
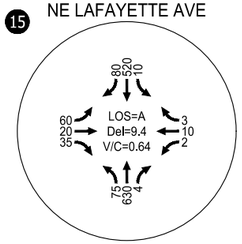


15 NE 5 TH ST / NE LAFAYETTE AVE



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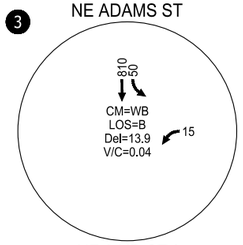

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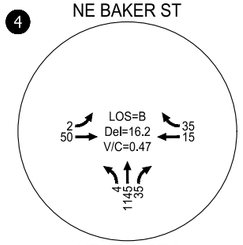

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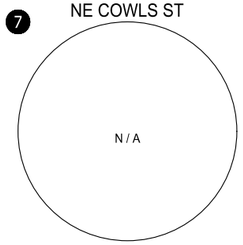

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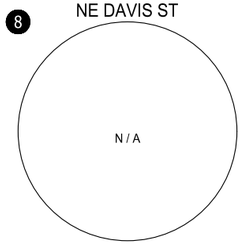

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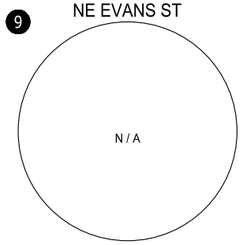

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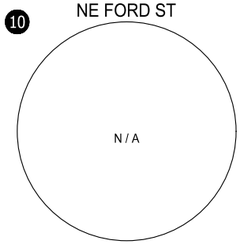

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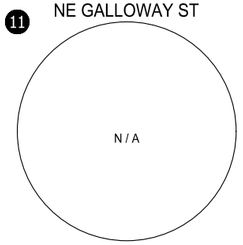
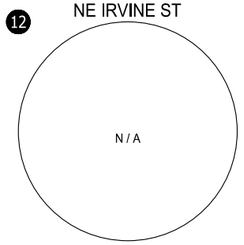
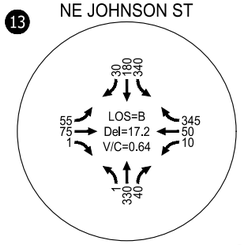


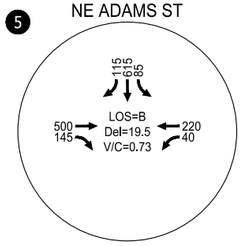
12 NE 3 RD ST / NE IRVINE ST



13 NE 3 RD ST / NE JOHNSON ST



5 NE 2 ND ST / NE ADAMS ST



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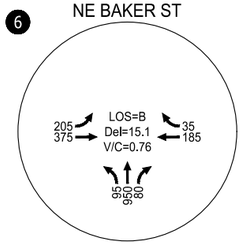
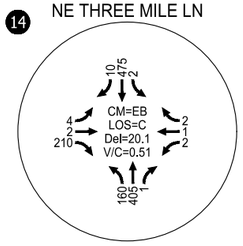


14 SE 1 ST ST / NE THREE MILE LN

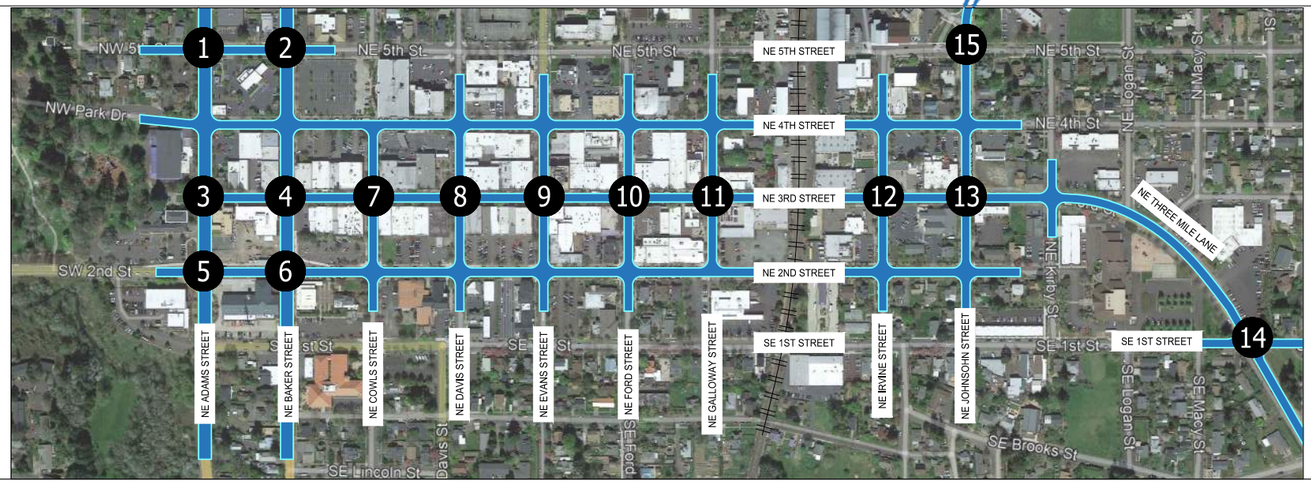


LEGEND

CM - CRITICAL MOVEMENT
LOS - LEVEL OF SERVICE
Del - CRITICAL MOVEMENT CONTROL DELAY
V/C - VOLUME-TO-CAPACITY RATIO

Opening Year 2027 AM Peak Hour Traffic Operations
No Build Scenario | McMinnville, OR

Figure 9



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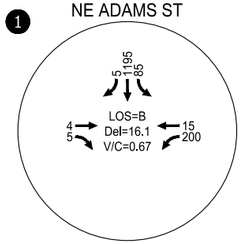

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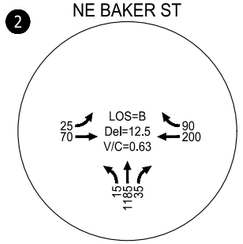
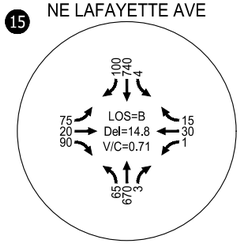


15 NE 5 TH ST / NE LAFAYETTE AVE



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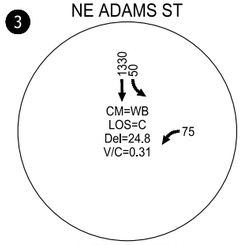

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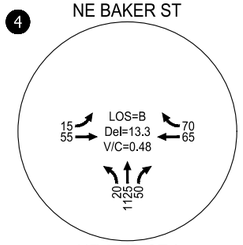

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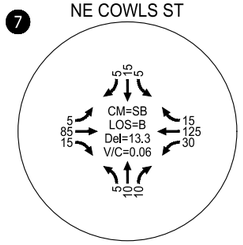

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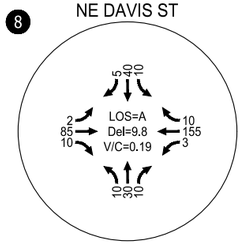

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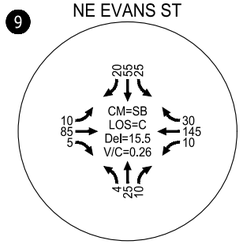

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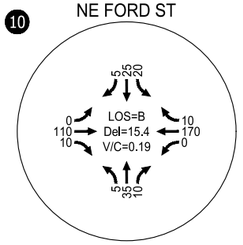

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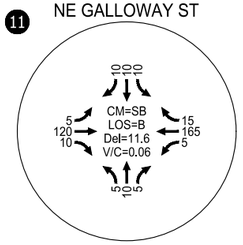

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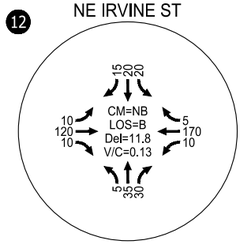

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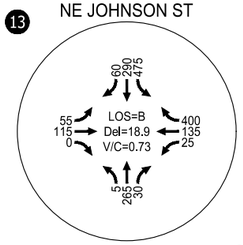

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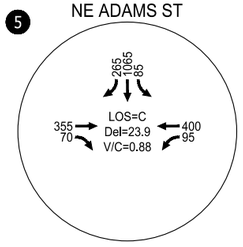

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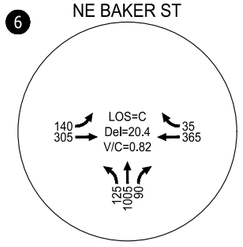
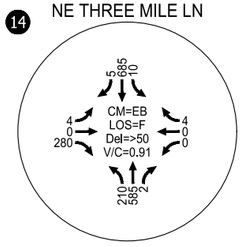


14 SE 1 ST ST / NE THREE MILE LN



LEGEND

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Opening Year 2027 PM Peak Hour Traffic Operations
No Build Scenario | McMinnville, OR

Figure 10

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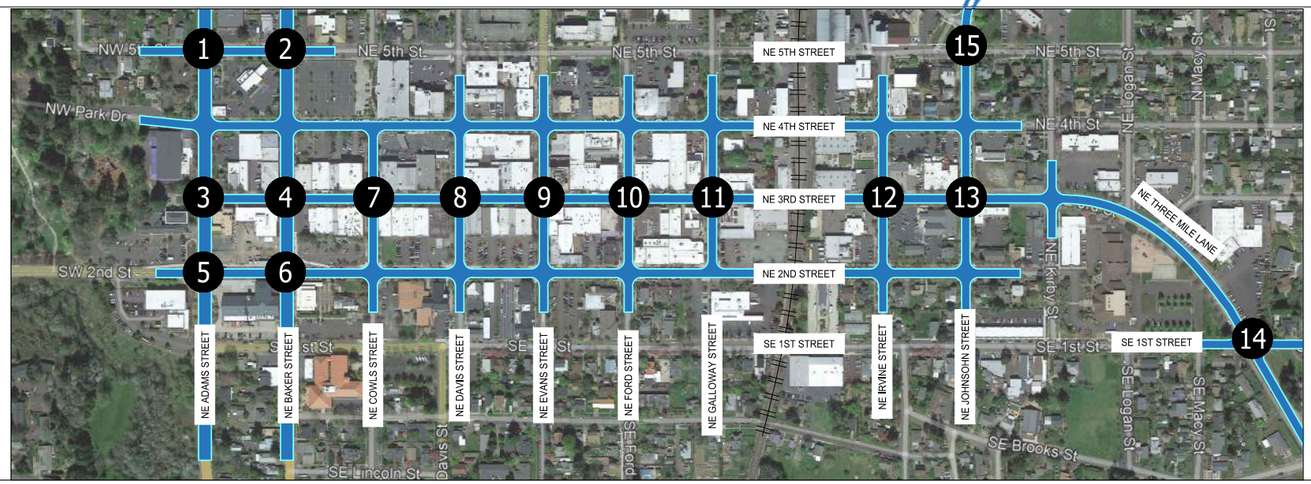

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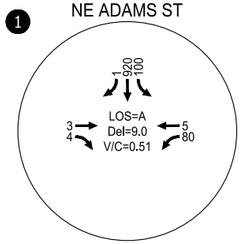

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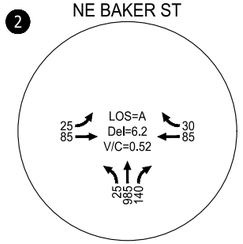
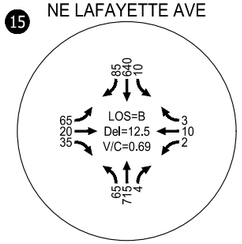


15 NE 5 TH ST / NE LAFAYETTE AVE



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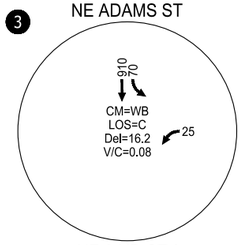

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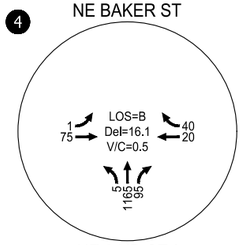

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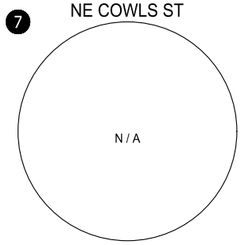

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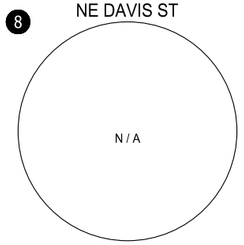

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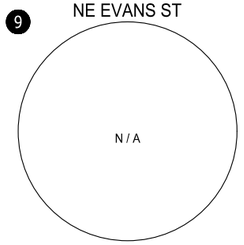

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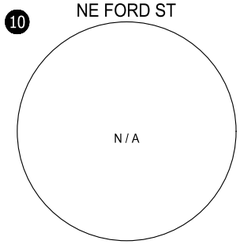

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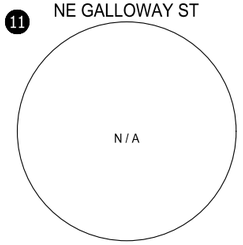

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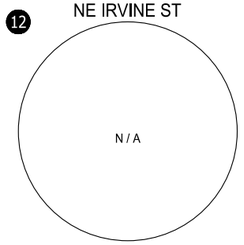

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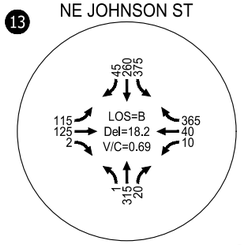

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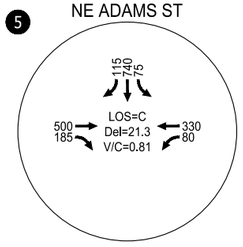

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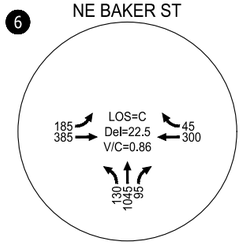
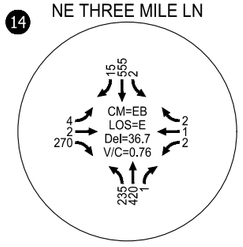


14 SE 1 ST ST / NE THREE MILE LN



LEGEND

CM - CRITICAL MOVEMENT
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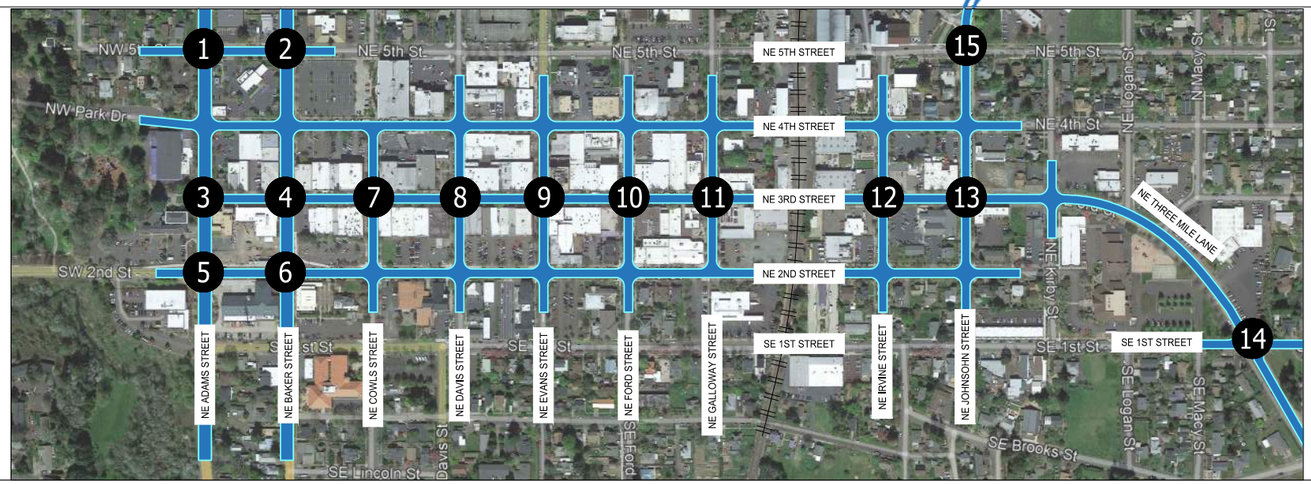
Future Year 2047 AM Peak Hour Traffic Operations
No Build Scenario | McMinnville, OR

Figure 11



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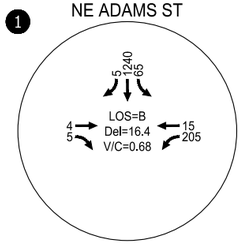

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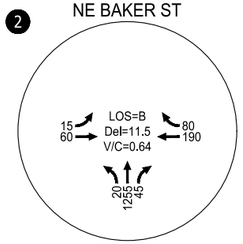
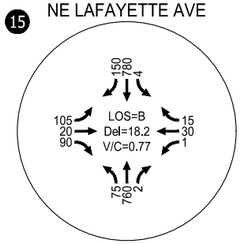


15 NE 5 TH ST / NE LAFAYETTE AVE



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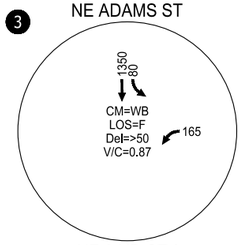

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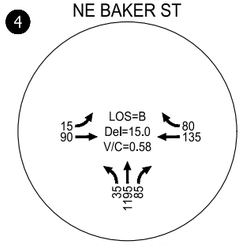
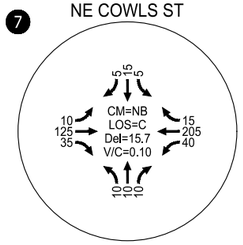
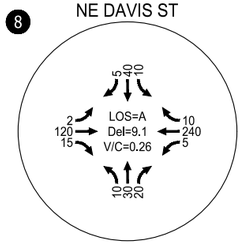


7 NE 3 RD ST / NE COWLS ST



8 NE 3 RD ST / NE DAVIS ST



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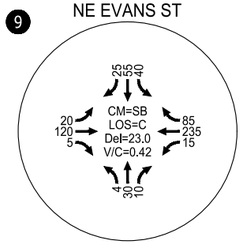
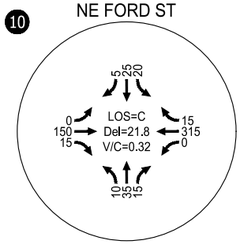


10 NE 3 RD ST / NE FORD ST



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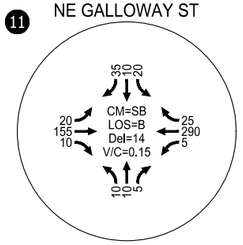
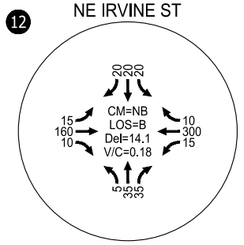


12 NE 3 RD ST / NE IRVINE ST



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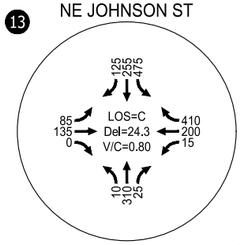

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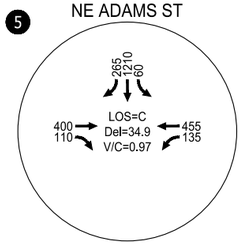

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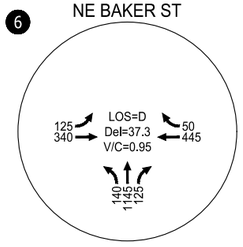
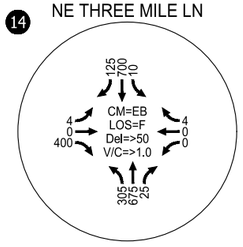


14 SE 1 ST ST / NE THREE MILE LN



LEGEND

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Future Year 2047 PM Peak Hour Traffic Operations
No Build Scenario | McMinnville, OR

Figure 12

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TRAFFIC SIGNAL WARRANT ASSESSMENT

Signal warrant analyses were conducted for the intersections along NE 3rd Street as well as any unsignalized intersections found to operate worse than the mobility targets in the No Build analysis. The *Manual on Uniform Traffic Control Devices (MUTCD)* (Reference 9) provides guidelines for justifying the installation of traffic signals based on traffic conditions, pedestrian characteristics, crash experience, and physical characteristics of the location. The MUTCD establishes the following nine traffic signal warrants:

- Warrant 1: Eight-Hour Volumes
- Warrant 2: Four-Hour Volumes
- Warrant 3: Peak Hour Volumes
- Warrant 4: Pedestrian Volume
- Warrant 5: School Crossing
- Warrant 6: Coordinated Signal System
- Warrant 7: Crash Experience
- Warrant 8: Roadway Network
- Warrant 9: Intersection Near a Grade Crossing

The signal warrant analysis for this study focused on the first three vehicular volume warrants, using the traffic volumes for existing year 2023, opening year 2027 and future year 2047. The projected p.m. peak hour volumes were used as the highest hour of the day and 24-hour volumes profiles were estimated for each intersection based on volume profiles for similar street classifications and context. The warrant analysis found the following:

NE 3rd Street & NE Adams Street

- Does not meet signal warrants for existing year 2023 or Opening Year 2027.
- Meets warrants #1, #2, and #3 with Future Year 2047 projected volumes.
- Warrant #1 is anticipated to be met by 2032 (5 years after opening year).
- Note that an RRFB system is planned for installation at the existing crosswalk on the north leg of the intersection with the ODOT OR99W/OR18 Curb Ramps project.
- Note that a traffic signal at this intersection is listed as an improvement in the 2010 McMinnville TSP.

NE Baker Street & NE 3rd Street

- This intersection is currently signalized but does not meet signal warrants with existing year 2023 or Opening Year 2027 traffic volumes.
- Meets warrants #1, #2, and #3 with Future Year 2047 projected volumes.
- Warrant #2 is anticipated to be met by 2032 (5 years after opening year).

NE Davis Street & NE 3rd Street

- This intersection is currently signalized. Does not meet the traffic volume criteria with existing year 2023, Opening Year 2027, or Future Year 2047 traffic volumes.
- Warrant #4 – Pedestrian Volume was checked and found that existing pedestrian crossing volumes do not meet the lower pedestrian threshold of the warrant regardless of vehicular volumes. The lower threshold is 107 pedestrians per hour (PPH) for the pedestrian 4-hour warrant, and 133 PPH for the pedestrian peak hour warrant. There were only 38 PPH total for both crossings of NE 3rd Street during the October 2023 counts.

NE Ford Street & NE 3rd Street

- This intersection is currently signalized. Does not meet traffic volume criteria with existing year 2023, Opening Year 2027, or Future Year 2047 traffic volumes.
- Warrant #4 – Pedestrian Volume was checked and found that existing pedestrian crossing volumes do not meet the lower pedestrian threshold of the warrant regardless of vehicular volumes. The lower threshold is 107 PPH for the pedestrian 4-hour warrant, and 133 PPH for the pedestrian peak hour warrant. There were only 21 PPH total for both crossings of NE 3rd Street during the October 2023 counts.

NE Johnson Street & NE 3rd Street

- This intersection is currently signalized and meets Warrants #1, #2, and #3 with existing 2023 traffic volumes.

NE Three Mile Lane & SE 1st Street

- Meets Warrants #1, #2, and #3 with existing 2023 traffic volumes.

Table 8 presents a summary of the signal warrant analysis. *Attachment "J" includes the Traffic Signal Warrant Assessment worksheets.*

Table 8: Signal Warrant Assessment

Intersection	Signal Warranted?		
	Existing 2023	2027 Opening Year	2047 Future Year
NE Adams St & NE 3rd St	No	No[1]	**Yes – Warrants #1, #2, #3**
NE Baker St & NE 3rd St	No	No[2]	**Yes – Warrants #1, #2, #3**
NE Cowls St & NE 3rd St	No	No	No
NE Davis St & NE 3rd St	No	No	No
NE Evans St & NE 3rd St	No	No	No
NE Ford St & NE 3rd St	No	No	No
NE Galloway St & NE 3rd St	No	No	No
NE Irvine St & NE 3rd St	No	No	No
NE Johnson St & NE 3rd St	**Yes – Warrants #1, #2, #3**	**Yes – Warrants #1, #2, #3**	**Yes – Warrants #1, #2, #3**
NE Three Mile Ln & SE 1st St	**Yes – Warrants #1, #2, #3**	**Yes – Warrants #1, #2, #3**	**Yes – Warrants #1, #2, #3**

1. Meets Warrant #1 with projected 2032 volumes (5 years after opening year)
2. Meets Warrant #2 with projected 2032 volumes (5 years after opening year)

As shown above, the existing signalized intersections of NE Davis Street/NE 3rd Street and NE Ford Street/NE 3rd Street do not meet the MUTCD volume criteria for signalization. However, the signals provide the ability for the City to manage vehicular speeds along the corridor through signal timing and coordination. Furthermore, the signals provide opportunities for controlled pedestrian crossings while maintaining traffic flows in both directions within the downtown area. For these reasons, the City may wish to maintain the signalized traffic control at these two intersections.

ALL-WAY STOP CONTROL WARRANT ASSESSMENT

Because the existing signalized intersections at NE Davis Street/NE 3rd Street and NE Ford Street/NE 3rd Street do not meet the MUTCD volume criteria for signalization, the intersections were evaluated under the all-way stop control warrant criteria from Chapter 2B of the MUTCD. The assessment was completed assuming the intersections would be two-way stop controlled on the NE Davis Street and NE Ford Street approaches if traffic signals were not in place. The five MUTCD warrants along with the applicability for the two intersections are summarized below.

Warrant A: Crash Experience

- Neither intersection were found to have five or more reported crashes in a 12-month period, or six or more reported crashes in a 36-month period that were of a type susceptible to correction by the installation of all-way stop control.

Warrant B: Sight Distance

- Neither intersection were found to have sight distance obstructions from building corners or other features within the right-of-way, based on Intersection Sight Distance (ISD) checks consistent with the American Association of State Highway and Transportation Officials (AASHTO) criteria. *Sight distance exhibits are provided in Attachment "K".*
- Adequate ISD sight triangles at the side streets of both intersections rely on vehicles to position themselves forward of the crosswalk lines, encroaching on the path of travel for pedestrians crossing along NE 3rd Street.
- All-way stop control would facilitate vehicles stopping and remaining upstream of the striped crosswalks on the side streets before proceeding through the intersection, allowing for reduced conflicts between vehicles and pedestrians.

Warrant C: Transition to Signal Control or Yield Control at a Circular Intersection

- This warrant does not apply because the intersections are already signalized.

Warrant D: 8-Hour Volume

- Neither intersection meets the traffic volume warrant for all-way stop control under the 2027 or 2047 traffic volume scenarios. The major street traffic volumes meet the 300 units (vehicles, pedestrians, bicycles) threshold for the warrant, but the side street traffic volumes are well below the 200 units per hour threshold.

Warrant E: Other Factors

- Other factors listed in the MUTCD include:
    - **The need to control left-turn conflicts** – the existing signalized intersections both prohibit left-turns from NE 3rd Street. Implementation of all-way stop control at these intersections would help to mitigate both vehicle-vehicle and vehicle-pedestrian left-turn conflicts compared to uncontrolled vehicular movements that would result with two-way stop control at the intersections.
    - **Where pedestrian and/or bicyclist movements support the installation of all-way stop control** – as mentioned above in the sight distance criteria, with two-way stop control vehicles must encroach into the marked crosswalks at these two intersections in order to obtain adequate sight distance in each direction. Implementing all-way stop control would allow for vehicles to stop and remain upstream of crosswalks before proceeding through the intersections. This would help to limit conflicts between vehicles waiting for a gap in traffic and pedestrians crossing parallel to NE 3rd Street. Further, the requirement for all

vehicles on NE 3rd Street to stop would help facilitate pedestrian movements across NE 3rd Street which are currently signalized.

Based on the assessment summarized above, the intersections of NE Davis Street/NE 3rd Street and NE Ford Street/NE 3rd Street can be all-way stop controlled if the City determines that traffic signals are not desirable for intersection traffic control. *The all-way stop control warrant worksheets and ISD exhibits are included in Attachment "K".*

FUTURE BUILD ANALYSIS SCENARIO

The Future Build analysis scenario identified and evaluated potential changes at the study intersections to address the deficiencies found in the No Build analysis. Changes to intersection traffic control related to the traffic signal warrant analysis were also evaluated. Adjustments to left-turn phasing operations at traffic signals were evaluated per the ODOT *Traffic Signal Policy and Guidelines* (Reference 10), where applicable. Traffic signal phasing split times were "optimized" in the Synchro analysis for the Future Build analysis scenarios.

The following summarizes the recommended geometric changes and/or traffic control assumptions for each study intersection under the Build scenario:

NE Adams Street & NE 3rd Street

- Keep the existing stop-control at the intersection for the Opening Year 2027 analysis. Traffic signal warrants are not met in the near-term.
  - Note: The intersection operations were checked with projected 2032 volumes (5 years after opening year) and the intersection was found to operate within ODOT mobility targets with the existing stop-control.
- Evaluate the signalization of the intersection with the Future Year 2047 traffic volumes. Signal warrants are met for this scenario.
- Signalization assumes a similar cycle length as the upstream and downstream signals on NE Adams Street at NE 5th Street and NE 2nd Street to allow for a coordinated system.
- Consider re-opening the crosswalk on the south leg of the intersection, which was closed through an ODOT approval process in 2018. Re-opening the crosswalk would improve the pedestrian connectivity east-west along NE 3rd Street, but would need to consider mitigations to ensure drivers turning left from NE 3rd Street onto one-way NE Adams Street are attentive to pedestrians in the crosswalk.
  - Re-opening the crosswalk would require additional study and approval by the ODOT State Traffic-Roadway Engineer.

NE Baker Street & NE 3rd Street

- Keep the intersection signalized with the existing lane configurations for the Opening Year 2027 and Future Year 2047 scenarios.
  - Although signal warrants are not met in the near-term, they are met within five years of the opening year of the project. Removal of the signal and then re-installing within five years is not recommended.

NE Adams Street & NE 2nd Street

- Optimize the signal phase split times at the intersection. This intersection and signal was recently rebuilt with the City of McMinnville *OR99W at 2nd Street Signal Replacement Project*.

NE Baker Street & NE 2nd Street

- Optimize the signal phase split times at the intersection. This intersection and signal was recently rebuilt with the City of McMinnville *OR99W at 2nd Street Signal Replacement Project*.

NE Davis Street & NE 3rd Street

- While traffic signal warrants are not met under any of the traffic volume scenarios, the existing signalized configuration was kept as the recommended intersection control for the Future Build analysis scenario. The traffic signal helps facilitate traffic circulation in the downtown street grid network, including north-south vehicular movement and signalized pedestrian crossing opportunities.
- Note that an alternative evaluation was completed as an all-way stop-controlled intersection with stop signs on all approaches per the warrant assessment above.
- The all-way stop-controlled configuration is shown in the Future Build scenario for comparison purposes to the No-Build signalized scenario.

NE Ford Street & NE 3rd Street

- While traffic signal warrants are not met under any of the traffic volume scenarios, the existing signalized configuration was kept as the recommended intersection control for the Future Build analysis scenario. The traffic signal helps facilitate traffic circulation in the downtown street grid network, including north-south vehicular movement and signalized pedestrian crossing opportunities.
- Note that an alternative evaluation was completed as an all-way stop-controlled intersection with stop signs on all approaches per the warrant assessment above.
- The all-way stop-controlled configuration is shown in the Future Build scenario for comparison purposes to the No-Build signalized scenario.

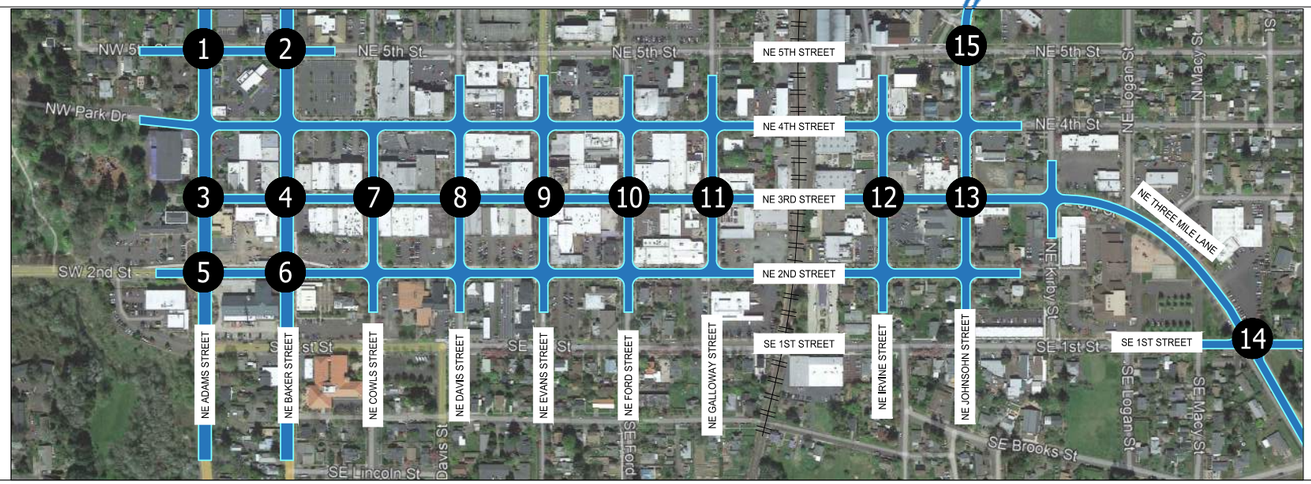
NE Johnson Street & NE 3rd Street

- Update the southbound left-turn from "protected-permissive" phasing to "protected-only" phasing. The left-turn volume exceeds the 300 vehicle/hour threshold for "protected-only" phasing per the ODOT *Traffic Signal Policy and Guidelines*.
- Maintain the eastbound and westbound left-turns with "protected-permissive" phasing based on the traffic volume thresholds in the ODOT *Traffic Signal Policy and Guidelines*.
- Keep the existing lane configurations on the east and west legs to accommodate the left-turn phasing.

NE Three Mile Lane & SE 1st Street

- Signalize the intersection to address the operational deficiencies summarized in the No Build scenario. Traffic signal warrants are met under existing 2023, Opening Year 2027, and Future Year 2047 traffic volumes.
- Operate the northbound and southbound left-turns with "protected-only" phasing. The northbound left-turn volume exceeds the 300 vehicle/hour threshold for "protected-only" phasing per the ODOT *Traffic Signal Policy and Guidelines*. Additionally, the horizontal curvature on NE Three Mile Lane is likely to present a sight distance issue for left-turning vehicles which is mitigated by "protected-only" phasing.
- Operate the eastbound and westbound approaches with "permissive-only" left-turn phasing. A separate eastbound left-turn lane is proposed.

Figure 13 summarizes the proposed lane configurations and traffic control devices at the study intersections for the Future Build analysis scenario.



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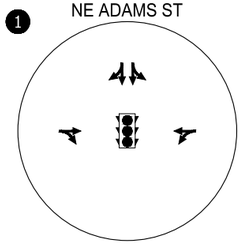
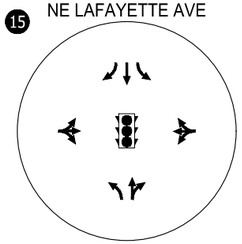
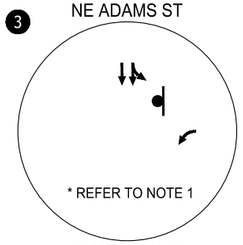


2 NE 5 TH ST / NE BAKER ST

15 NE 5 TH ST / NE LAFAYETTE AVE



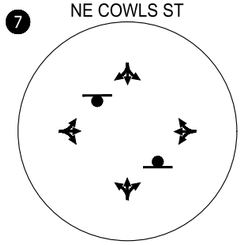
3 NE 3 RD ST / NE ADAMS ST



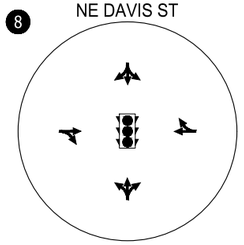
* REFER TO NOTE 1

4 NE 3 RD ST / NE BAKER ST

7 NE 3 RD ST / NE COWLS ST

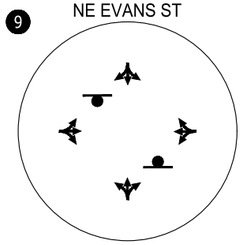


8 NE 3 RD ST / NE DAVIS ST

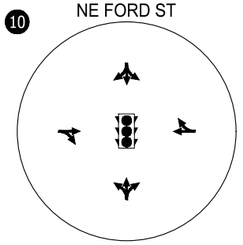


* REFER TO NOTE 2

9 NE 3 RD ST / NE EVANS ST

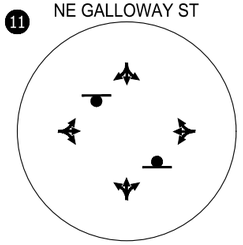


10 NE 3 RD ST / NE FORD ST

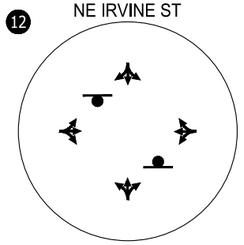


* REFER TO NOTE 2

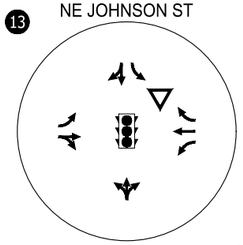
11 NE 3 RD ST / NE GALLOWAY ST



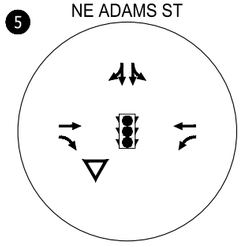
12 NE 3 RD ST / NE IRVINE ST



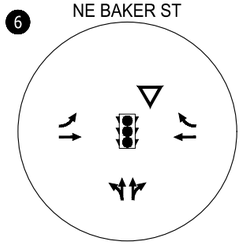
13 NE 3 RD ST / NE JOHNSON ST



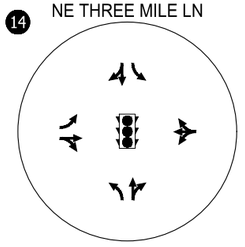
5 NE 2 ND ST / NE ADAMS ST



6 NE 2 ND ST / NE BAKER ST



14 SE 1 ST ST / NE THREE MILE LN



LEGEND

- STOP SIGN
- YIELD SIGN
- TRAFFIC SIGNAL

* NOTE 1: Analyzed as a Signalized Intersection for 2047 Build scenario

* NOTE 2: Analyzed as all-way stop controlled intersection for 2027 and 2047 Build scenario for comparison purposes.

Proposed Lane Configurations and Traffic Control Devices
McMinnville, OR

Figure 13

Opening Year 2027 Intersection Operations – Build Scenario

The traffic volumes and resulting intersection operations for the Opening Year 2027 a.m. and p.m. peak hours are summarized in Figure 14 and Figure 15, respectively. With the proposed changes summarized above for the Opening Year 2027 Build scenario, all intersections are anticipated to operate within the applicable City of McMinnville and ODOT mobility targets, with the following exceptions:

NE Adams Street & NE 2nd Street

- Exceeds the HDM mobility target of 0.75 V/C ratio during the p.m. peak hour.
- Operates just above the OHP target with a V/C ratio of 0.87. Intersection delay is at LOS "C".

NE Baker Street & NE 2nd Street

- Exceeds the HDM mobility target of 0.75 V/C ratio during both a.m. and p.m. peak hours. Operates within the OHP target of 0.85 V/C ratio.

Attachment "L" includes the Synchro operations analysis worksheets for the Future Year 2027 Build analysis.

Future Year 2047 Intersection Operations – Build Scenario

The traffic volumes and resulting intersection operations for the Future Year 2047 a.m. and p.m. peak hours are summarized in Figure 16 and Figure 17, respectively. With the proposed changes summarized above for the Future Year 2047 Build scenario, all intersections are anticipated to operate within the applicable City of McMinnville and ODOT mobility targets, with the following exceptions:

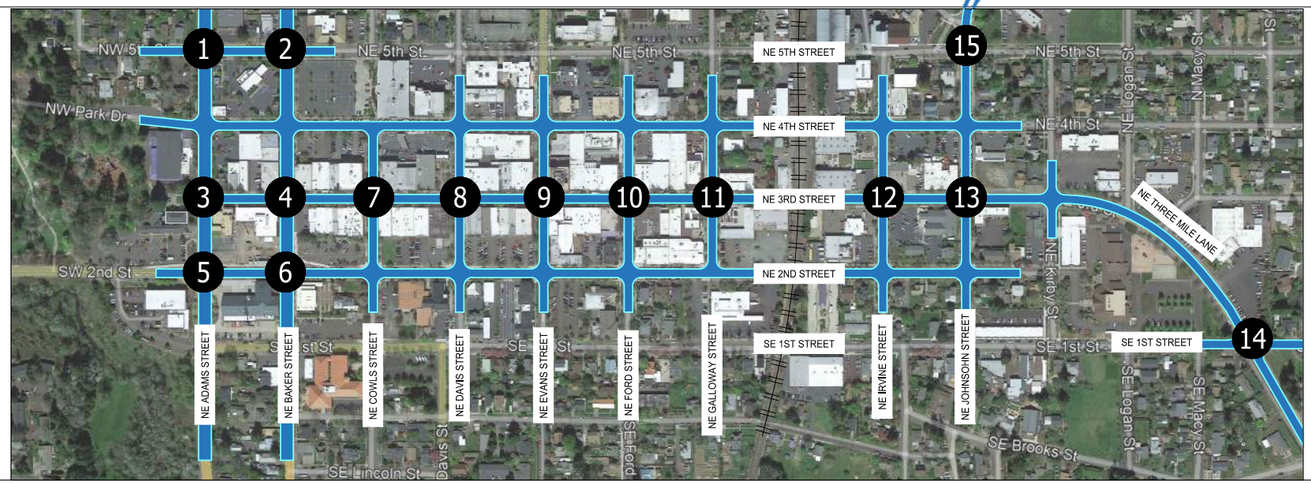
NE Adams Street & NE 2nd Street

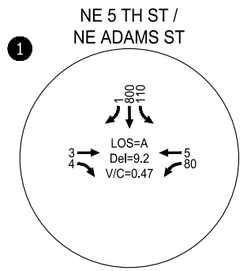
- Exceeds the HDM mobility target of 0.75 V/C ratio during the a.m. and p.m. peak hours.
- Exceeds the OHP target of 0.85 V/C ratio during the p.m. peak hour. Intersection delay is at LOS "C".

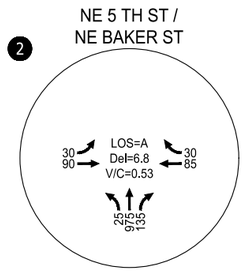
NE Baker Street & NE 2nd Street

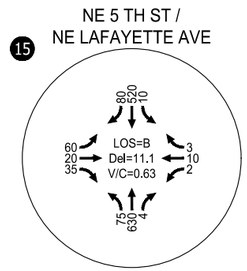
- Exceeds the HDM mobility target of 0.75 V/C ratio during both a.m. and p.m. peak hours.
- Exceeds the OHP target of 0.85 V/C ratio during the p.m. peak hour. Intersection delay is at LOS "C".

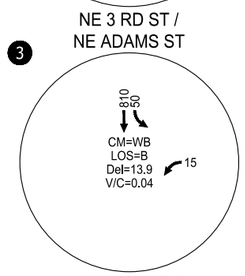
Attachment "M" includes the Synchro operations analysis worksheets for the Future Year 2047 No Build analysis.

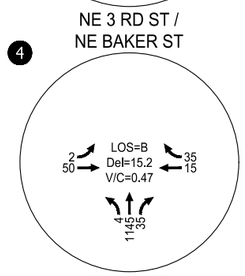


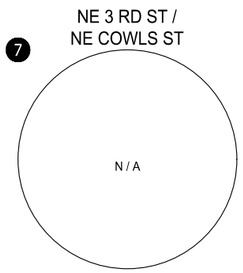


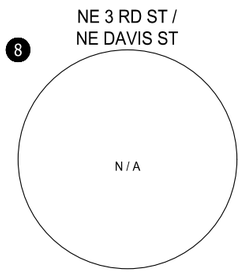


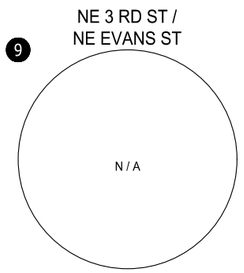


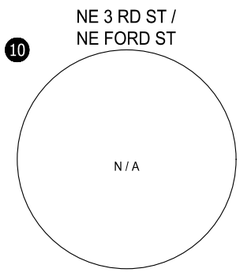


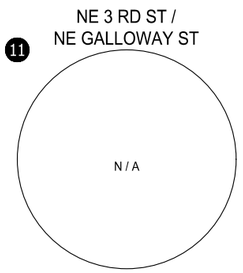


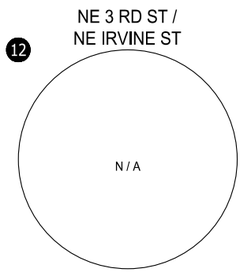


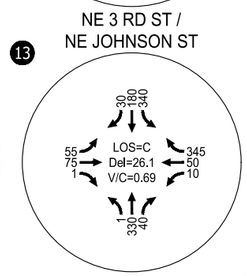


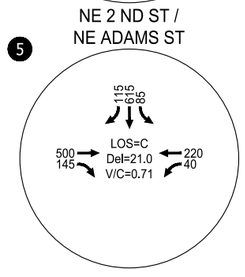


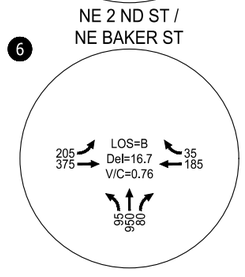


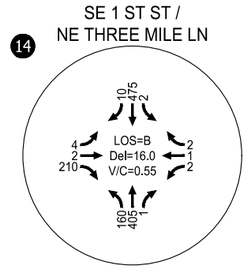










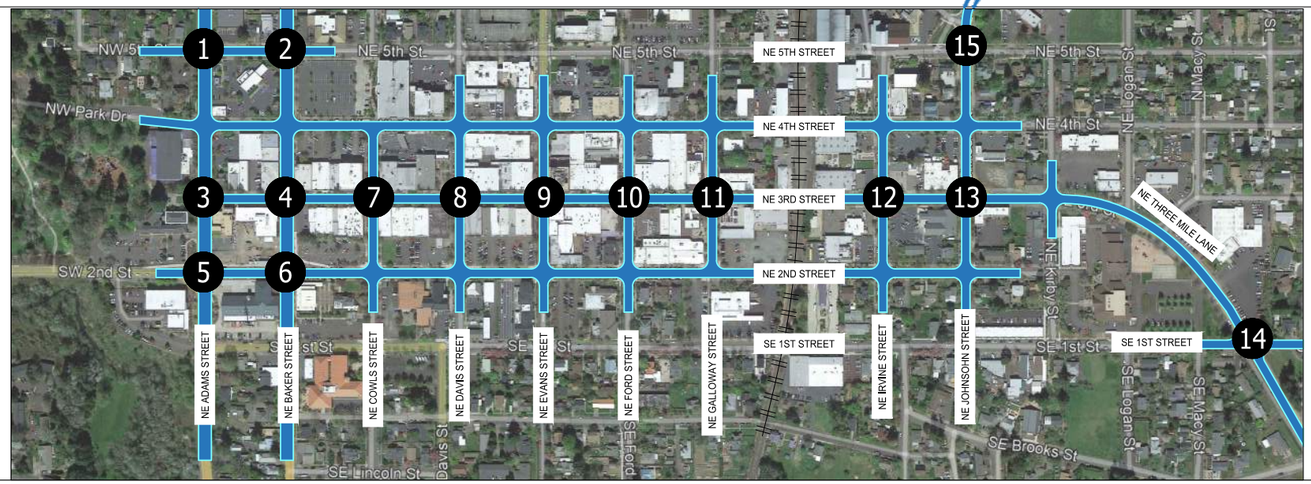


LEGEND

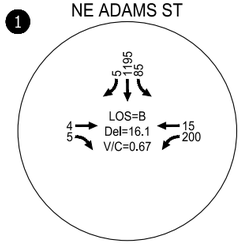
CM - CRITICAL MOVEMENT
LOS - LEVEL OF SERVICE
Del - CRITICAL MOVEMENT CONTROL DELAY
V/C - VOLUME-TO-CAPACITY RATIO

Opening Year 2027 AM Peak Hour Traffic Operations
Build Scenario | McMinnville, OR

Figure
14



1 NE 5 TH ST / NE ADAMS ST



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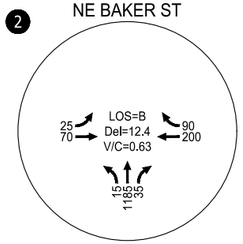
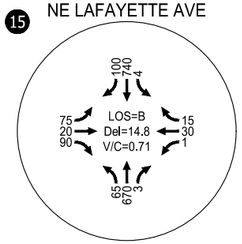


15 NE 5 TH ST / NE LAFAYETTE AVE



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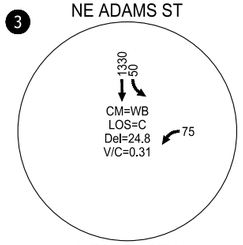

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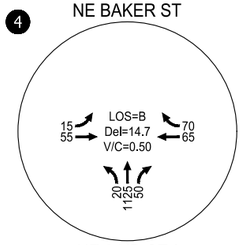

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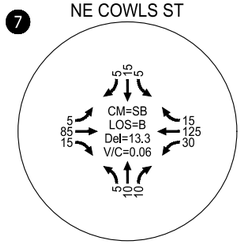

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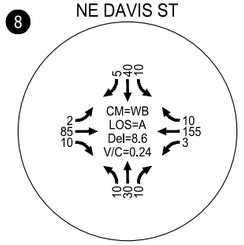

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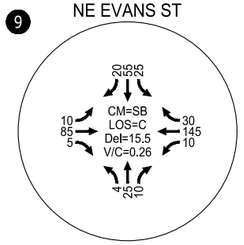
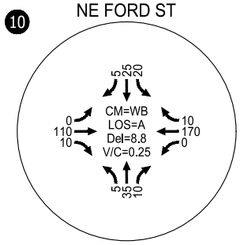
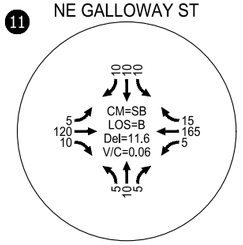


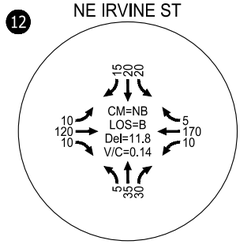
10 NE 3 RD ST / NE FORD ST



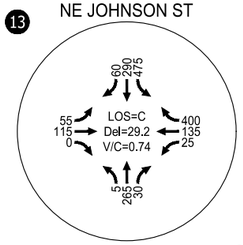
11 NE 3 RD ST / NE GALLOWAY ST



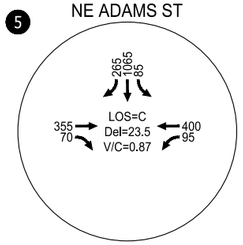
12 NE 3 RD ST / NE IRVINE ST



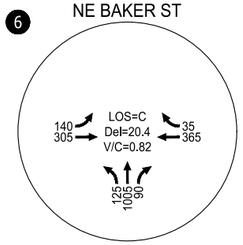
13 NE 3 RD ST / NE JOHNSON ST



5 NE 2 ND ST / NE ADAMS ST



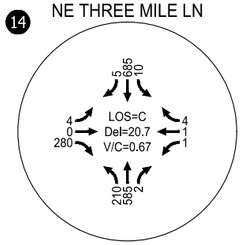
6 NE 2 ND ST / NE BAKER ST



* REFER TO NOTE 1

* REFER TO NOTE 1

14 SE 1 ST ST / NE THREE MILE LN



LEGEND

CM - CRITICAL MOVEMENT
LOS - LEVEL OF SERVICE
Del - CRITICAL MOVEMENT CONTROL DELAY
V/C - VOLUME-TO-CAPACITY RATIO

* NOTE 1: Analyzed as all-way stop controlled intersection for Build scenario for comparison purposes.

Opening Year 2027 PM Peak Hour Traffic Operations
Build Scenario | McMinnville, OR

Figure 15

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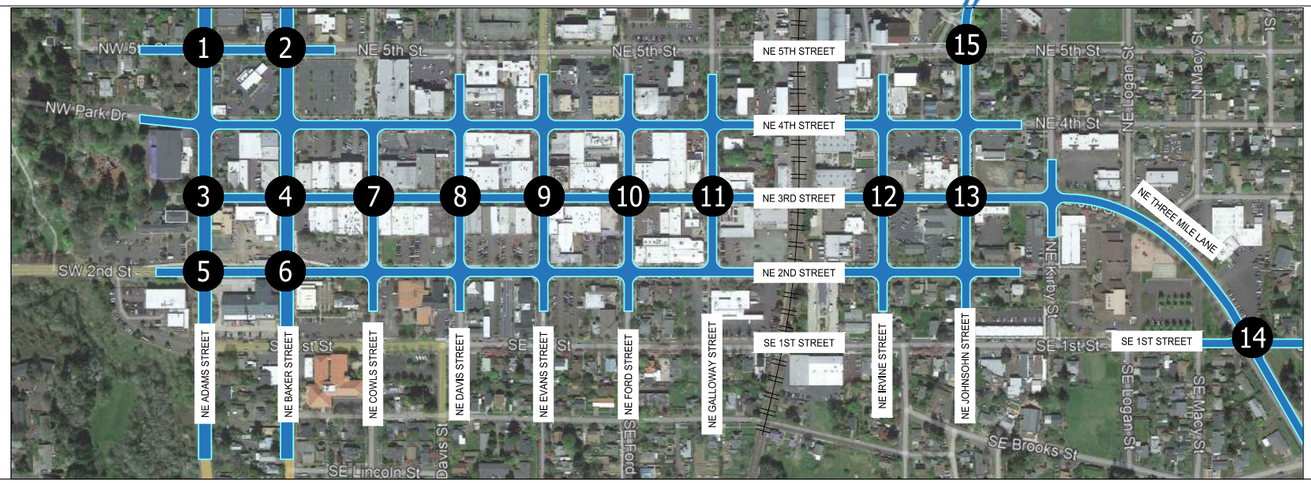
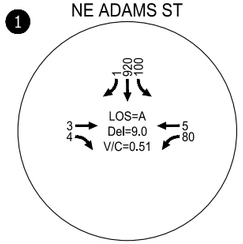
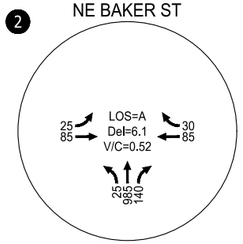


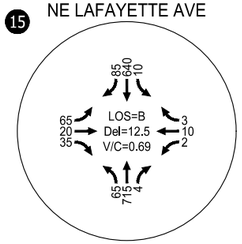
1 NE 5 TH ST / NE ADAMS ST



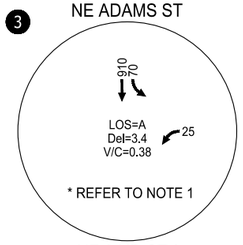
2 NE 5 TH ST / NE BAKER ST



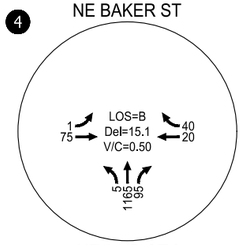
15 NE 5 TH ST / NE LAFAYETTE AVE



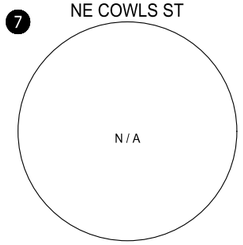
3 NE 3 RD ST / NE ADAMS ST



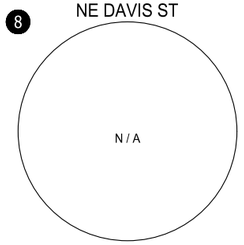
4 NE 3 RD ST / NE BAKER ST



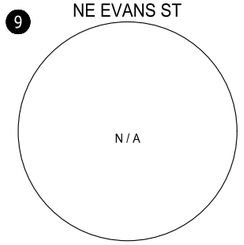
7 NE 3 RD ST / NE COWLS ST



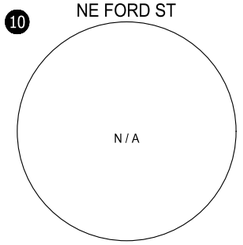
8 NE 3 RD ST / NE DAVIS ST



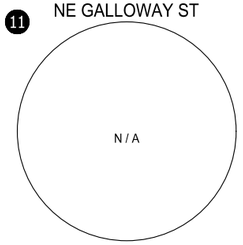
9 NE 3 RD ST / NE EVANS ST



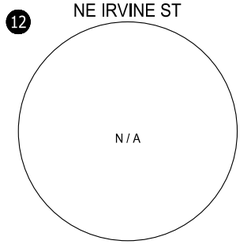
10 NE 3 RD ST / NE FORD ST



11 NE 3 RD ST / NE GALLOWAY ST



12 NE 3 RD ST / NE IRVINE ST



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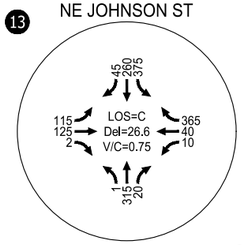
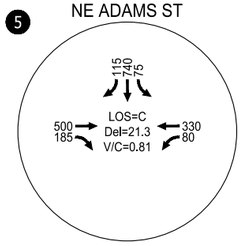
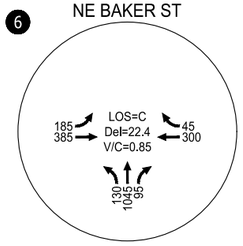


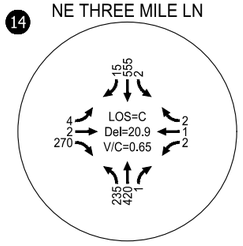
5 NE 2 ND ST / NE ADAMS ST



6 NE 2 ND ST / NE BAKER ST



14 SE 1 ST ST / NE THREE MILE LN



LEGEND

CM - CRITICAL MOVEMENT
LOS - LEVEL OF SERVICE
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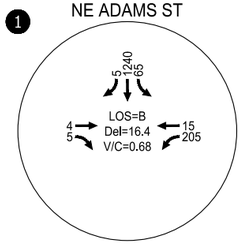
V/C - VOLUME-TO-CAPACITY RATIO

* NOTE 1: Analyzed as a Signalized Intersection

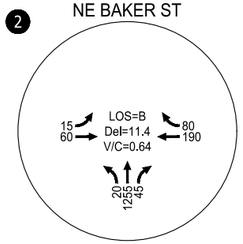
Future Year 2047 AM Peak Hour Traffic Operations
Build Scenario | McMinnville, OR

Figure
16

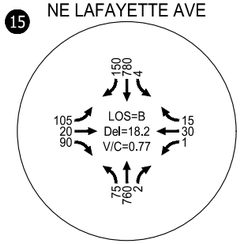
1 NE 5 TH ST / NE ADAMS ST



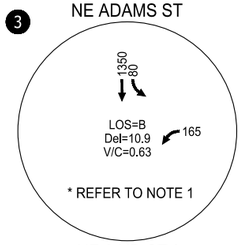
2 NE 5 TH ST / NE BAKER ST



15 NE 5 TH ST / NE LAFAYETTE AVE

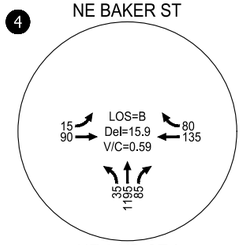


3 NE 3 RD ST / NE ADAMS ST

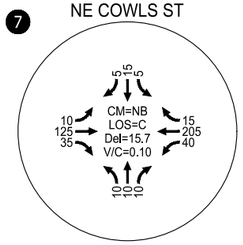


* REFER TO NOTE 1

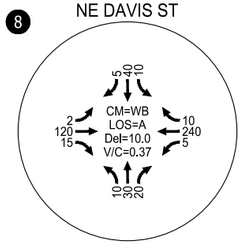
4 NE 3 RD ST / NE BAKER ST



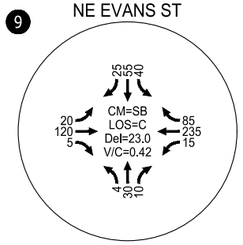
7 NE 3 RD ST / NE COWLS ST



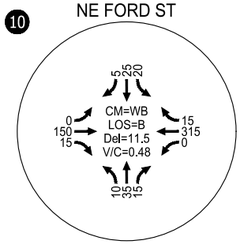
8 NE 3 RD ST / NE DAVIS ST



9 NE 3 RD ST / NE EVANS ST

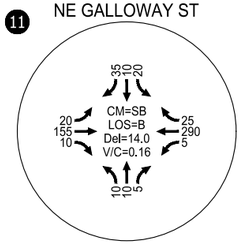


10 NE 3 RD ST / NE FORD ST

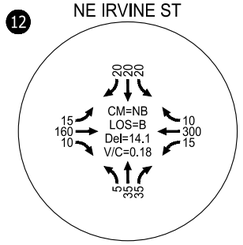


* REFER TO NOTE 2

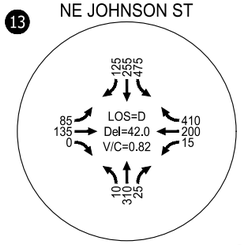
11 NE 3 RD ST / NE GALLOWAY ST



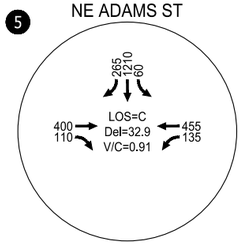
12 NE 3 RD ST / NE IRVINE ST



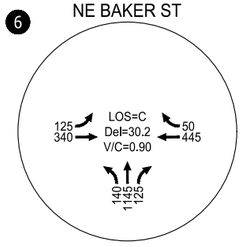
13 NE 3 RD ST / NE JOHNSON ST



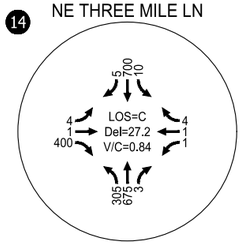
5 NE 2 ND ST / NE ADAMS ST



6 NE 2 ND ST / NE BAKER ST



14 SE 1 ST ST / NE THREE MILE LN



LEGEND

CM - CRITICAL MOVEMENT
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* NOTE 1: Analyzed as a Signalized Intersection

* NOTE 2: Analyzed as all-way stop controlled intersection for Build scenario for comparison purposes.

Future Year 2047 PM Peak Hour Traffic Operations
Build Scenario | McMinnville, OR

Figure 17

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QUEUING ANALYSIS

Table 9 summarizes the calculated 95th percentile queue lengths at the signalized study intersections along NE 3rd Street. The estimated 95th percentile vehicle queues for the Opening Year 2027 and Future Year 2047 scenarios were pulled from the corresponding Synchro analysis summary reports included in the appendices.

Queues at the stop-controlled intersections along NE 3rd Street from NE Cowl Street to NE Irvine Street were reviewed and found to be shorter than two vehicles in length for any given movement, easily fitting within the available queue storage.

The queueing analysis found the following anticipated issues with vehicle queue storage.

NE Adams Street & NE 3rd Street

- The southbound queue on NE Adams Street is shown to spill back to the NE 5th Street intersection during the p.m. peak hour under the Future Year 2047 scenario. This may be managed through signal timing and coordination if a signal is installed in the future.
- Queue storage is anticipated to be adequate during the Opening Year 2027 unsignalized scenario.

NE Baker Street & NE 3rd Street

- The northbound queue on NE Baker Street is anticipated to spill back past the NE 2nd Street intersection during all scenarios. This was also found to be an issue in the existing conditions analysis.

NE Johnson Street & NE 3rd Street

- The westbound right-turn lane storage is anticipated to be inadequate during the p.m. peak hour under the Future Year 2047 scenario.
- The queue for the shared northbound lane was found to extend back past the NE 2nd Street intersection during all scenarios. This was also found to be an issue in the existing conditions analysis.
- The queue for the southbound left-turn movement was found to extend back to NE 5th Street during the p.m. peak hour and exceeds the available queue storage under all scenarios. This was also found to be an issue in the existing conditions analysis.
- Running the southbound left-turn with the existing protected-permissive phasing instead of protected-only phasing improves the queuing for the northbound and southbound movements.

NE Three Mile Lane & SE 1st Street

- The queue for the eastbound thru/right-turn lane was found to extend past NE Macy Street during the p.m. peak hour under the Future Year 2047 scenario.
- The existing two-way left-turn lane on NE Three Mile Lane will need to be converted to left-turn storage lanes. The p.m. peak hour queue for the northbound left-turn under the Future Year 2047 scenario is expected to extend almost to SE Brooks Street, which would not leave enough space for a left-turn bay at that intersection.
- Striping the northbound left-turn lane with 200' of queue storage would accommodate the Opening Year 2027 queueing and would allow for a short (approximately 100') southbound left-turn storage bay at SE Brooks Street.

- The queues for the northbound and southbound through movements are anticipated to extend back past the adjacent upstream intersections during both the Opening Year and Future Year scenarios.

Table 9: Queueing Analysis Results

Intersection	Move-ment	Available Queue Storage (feet)	Opening Year 2027 Build Scenario 95th Percentile Queue (feet)		Future Year 2047 Build Scenario 95th Percentile Queue (feet)		Adequate Storage?
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	
NE Adams St & NE 3rd St	SB	190′	<25′	<25′	177′	**493′**	**No**
	WB	230′	<25′	50′	34′	74′	Yes
NE Baker St & NE 3rd St	NB	190′	**275′**	**261′**	**284′**	**293′**	**No**
	EB	230′	25′	48′	25′	67′	Yes
	WB	230′	26′	65′	29′	112′	Yes
NE Davis St & NE 3rd St (Signalized)	EB	230′	-	29′	-	38′	Yes
	WB	230′	-	102′	-	135′	Yes
	NB	200′	-	28′	-	30′	Yes
	SB	200′	-	32′	-	32′	Yes
NE Ford St & NE 3rd St (Signalized)	EB	230′	-	51′	-	64′	Yes
	WB	230′	-	88′	-	188′	Yes
	NB	200′	-	<25′	-	<25′	Yes
	SB	200′	-	<25′	-	<25′	Yes
NE Johnson St & NE 3rd St	EBL	230′	48′	54′	86′	78′	Yes
	EBTR	240′	71′	113′	109′	133′	Yes
	WBL	100′	<25′	30′	<25′	<25′	Yes
	WBT	250′	52′	130′	44′	166′	Yes
	WBR	100′	63′	74′	66′	**156′**	**No**
	NB	200′	**367′**	**332′**	**346′**	**392′**	**No**
	SBL	190′	**327′**	**462′**	**352′**	**456′**	**No**
	SBTR	200′	88′	150′	132′	149′	Yes
NE Three Mile Ln & SE 1st St	EBL	100′	<25′	<25′	<25′	<25′	Yes
	EBTR	120′	48′	62′	60′	**185′**	**No**
	WB	350′	<25′	<25′	<25′	<25′	Yes
	NBL	TWLTL	120′	224′	236′	**348′**	**No**
	NBTR	400′	192′	316′	209′	400′	Yes
	SBL	TWLTL	<25′	<25′	>25′	<25′	Yes
	SBTR	400′	334′	**605′**	**464′**	**672′**	**No**

Pedestrian Crossing Assessment

One of the primary goals of the project is to create a "Person-Centered Main Street" focused on calming vehicular traffic and providing a safe and inviting pedestrian environment. Thus, Kittelson conducted an evaluation of recommended treatments to enhance safety and level of comfort for pedestrians at the midblock and unsignalized intersection crosswalks along NE 3rd Street. The approved design concept from the previous phase of the project includes narrowing vehicle lanes, adding or expanding midblock and intersection corner curb extensions, and including midblock pedestrian crossings on all blocks where feasible. Additionally, the 30% design includes a curbless "festival street" design that eliminates the vertical elevation change between the street and sidewalk realms.

The FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* (Reference11) was produced as part of the Safe Transportation for Every Pedestrian (STEP) program and provides guidance on selecting appropriate countermeasures to help improve pedestrian safety at uncontrolled crossing locations.

The FHWA Guide provides a matrix of countermeasure options for evaluating appropriate levels of crosswalk protection based on roadway configuration, posted speed limit, and average annual daily traffic (AADT). Figure 18 illustrates the countermeasure matrix and highlights the applicable matrix cell based on the characteristics within the study area. All unsignalized crosswalks between NE Cowls Street and NE Irvine Street fall within the parameters of <9,000 AADT, ≤30 mph, and 2 lanes (1 lane in each direction). An RRFB pedestrian crossing is already planned for the north crossing of OR99W/NE Adams Street at NE 3rd Street.

Figure 18: FHWA Pedestrian Crash Countermeasures

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	● 1 2 4 5 6	● 1 5 6 7 9	○ 5 6 ● 7 9	● 1 4 5 6	● 1 5 6 7 9	○ 5 6 ● 7 9	● 1 4 5 6 7 9	○ 5 6 7 9	○ 5 6 ● 7 9
3 lanes with raised median (1 lane in each direction)	● 1 2 3 4 5	● 1 3 5 7 9	○ 3 5 ● 7 9	○ 3 4 5 7 9	○ 3 5 ● 7 9	○ 3 5 ● 7 9	○ 3 4 5 7 9	○ 3 5 ● 7 9	○ 3 5 ● 7 9
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	● 1 2 3 4 5 6 7 9	● 1 3 5 6 7 9	○ 3 5 6 ● 7 9	○ 3 4 5 6 7 9	○ 3 5 6 ● 7 9	○ 3 5 6 ● 7 9	○ 3 4 5 6 7 9	○ 3 5 6 ● 7 9	○ 3 5 6 ● 7 9
4+ lanes with raised median (2 or more lanes in each direction)	● 3 5 7 8 9	● 3 5 7 8 9	○ 3 5 ● 8 9	○ 3 5 7 8 9	○ 3 5 ● 7 8 9	○ 3 5 ● 8 9	○ 3 5 ● 7 8 9	○ 3 5 ● 8 9	○ 3 5 ● 8 9
4+ lanes w/o raised median (2 or more lanes in each direction)	● 3 5 6 7 8 9	○ 3 5 6 7 8 9	○ 3 5 6 ● 8 9	○ 3 5 6 7 8 9	○ 3 5 6 ● 7 8 9	○ 3 5 6 ● 8 9	○ 3 5 6 ● 7 8 9	○ 3 5 6 ● 8 9	○ 3 5 6 ● 8 9

Given the set of conditions in a cell,

\# Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.

● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.

○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2 Raised crosswalk
3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4 In-Street Pedestrian Crossing sign
5 Curb extension
6 Pedestrian refuge island
7 Rectangular Rapid-Flashing Beacon (RRFB)**
8 Road Diet
9 Pedestrian Hybrid Beacon (PHB)**

The following possible countermeasures were identified for the unsignalized and midblock pedestrian crossings on NE 3rd Street.

- Countermeasures to always be considered, but not mandated or required, based upon engineering judgement:
  - **High-visibility crosswalk markings** – Recommend for all crossings of NE 3rd Street
  - **Parking restrictions on crosswalk approaches** – Recommend for all crossings
  - **Adequate nighttime lighting levels** – Recommend for all crossings
  - **Crosswalk warning signs** – Recommend for all midblock crossings
- Additional candidate treatments to be considered:
  - **Raised crosswalk** – Not recommended for inclusion in the project. The "festival street" design will have the sidewalks at the same elevation as the street, making raised crosswalks impractical to implement.
  - **In-street pedestrian crossing signs** – Not recommended for inclusion in project. Planned cross-section will be narrowing vehicle lanes and will likely not include enough width for in-roadway signs without pedestrian refuge islands in place.
  - **Curb extensions** – Recommend for all crossings, where feasible. Used to calm vehicle speeds and improve pedestrian visibility. Consider intersection turn lane needs and design vehicle turning templates at individual intersection corners.
  - **Pedestrian refuge island** – Not recommended for inclusion in project. Overall planned cross-section and right-of-way width will not allow for refuge islands. The overall crossing width will be narrowed using curb extensions and narrower lanes.

NE 3rd Street & NE Johnson Street

Additional consideration was given to the existing marked crossing in the westbound channelized right-turn lane at the NE 3rd Street & NE Johnson Street intersection. Channelized turn lanes are considered to be challenging environments for pedestrians, especially those with vision impairment. The existing right-turn lane has a very high right-turning vehicular volume, and a low pedestrian volume.

We recommend that the raised channelizing island remain in place to reduce pedestrian crossing lengths and provide pedestrian refuge at the intersection. Possible improvements for this existing pedestrian crossing are:

- **Signalize the right-turn**: The signal timing would allow for the right-turn to go concurrently with the southbound left-turn (overlap phase), which is also a high-volume movement. A preliminary analysis indicates the signal would operate adequately with this scenario. This would facilitate a signalized ped crossing across the channelized turn lane, with a red indication for the right-turning vehicles while a pedestrian has a "walk" signal. This would require an additional signal mast arm pole at the intersection, increasing the scope and cost of improvements.
- **Lighting, signing, markings:** This would be instead of signalizing the slip lane and would be less costly and impactful. The design already proposes to add a light pole at the crosswalk to improve visibility of pedestrians in the crosswalk. Adding signs and/or advance yield lines has been shown to be beneficial in improving vehicle yielding behavior.

Conclusions and Recommendations

Table 10 below summarizes the recommended changes at the study intersections to be implemented with the Third Street Improvement Project.

Table 10 Recommended Intersection Improvements for NE 3rd Street Project Construction

Intersection	Proposed Improvements	Justification
NE Adams St & NE 3rd St	▪ Maintain existing stop-controlled intersection and lane configurations. ▪ Design to accommodate future signal installation.	▪ Signal is not warranted under 2027 volume scenario and operates acceptably as stop-controlled for at least 5 years after opening year.
NE Baker St & NE 3rd St	▪ Maintain existing signalized intersection and lane configurations. ▪ Rebuild signal with current standard poles and signal control equipment.	▪ Signal warrants will be met within 5 years of opening year. Operations without signal exceed V/C targets.
NE Cowls St & NE 3rd St	▪ Maintain existing stop-controlled intersection and lane configurations.	▪ Signal is not warranted under any of the analysis scenarios. Intersection operates acceptably as stop-controlled.
NE Davis St & NE 3rd St	▪ Maintain existing signalized intersection and lane configurations. ▪ Rebuild signal with current standard poles and signal control equipment.	▪ Maintain downtown grid circulation, speed management, and opportunities for signalized pedestrian crossings.
NE Evans St & NE 3rd St	▪ Maintain existing stop-controlled intersection and lane configurations.	▪ Signal is not warranted under any of the analysis scenarios. Intersection operates acceptably as stop-controlled.
NE Ford St & NE 3rd St	▪ Maintain existing signalized intersection and lane configurations. ▪ Rebuild signal with current standard poles and signal control equipment.	▪ Maintain downtown grid circulation, speed management, and opportunities for signalized pedestrian crossings.
NE Galloway St & NE 3rd St	▪ Maintain existing stop-controlled intersection and lane configurations.	▪ Signal is not warranted under any of the analysis scenarios. Intersection operates acceptably as stop-controlled.
NE Irvine St & NE 3rd St	▪ Maintain existing stop-controlled intersection and lane configurations.	▪ Signal is not warranted under any of the analysis scenarios. Intersection operates acceptably as stop-controlled.
NE Johnson St & NE 3rd St	▪ Maintain existing intersection lane configurations. ▪ Maintain existing protected-permissive left-turn signal phasing for EB and WB. ▪ Consider modifying SB left-turn to protected-only signal phasing.	▪ Separate left-turn lanes required for SB, EB and WB protected left-turn phases. ▪ Protected-permissive warranted per ODOT *Traffic Signal Policy and Guidelines.* ▪ Protected-only SB left-turn warranted per ODOT *Traffic Signal Policy and Guidelines.* Increases queuing at intersection.
Unsignalized & midblock pedestrian crossings	▪ Install high-visibility crosswalk markings at all crossings of NE 3rd Street. ▪ Provide adequate nighttime lighting levels at all crosswalks. ▪ Consider installing crosswalk warning signs at all mid-block crosswalks. ▪ Install curb extensions and restrict parking in advance of all crosswalks, where feasible.	▪ Based on guidance in FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.*

Additional changes to the study intersections summarized in Table 11 were identified but may need to be included in separate projects by the City, depending on funding constraints and other planning considerations.

Table 11 Other Intersection Improvements for Planning Consideration

Intersection	Proposed Improvements	Justification
NE Adams St & NE 3rd St	▪ Install a traffic signal at the intersection in the future. ▪ Consider re-opening the crosswalk on the south leg of the intersection to improve pedestrian connectivity east-west along NE 3rd St.	▪ Signal warranted and necessary for operations under 2047 traffic volume scenario. Signal not needed for operations for at least 5 years after opening year. Monitor intersection operations and volumes to determine the need and timing for signalization. ▪ A traffic signal at this intersection is listed as an improvement in the 2010 McMinnville TSP. ▪ Re-opening south leg crosswalk will require additional study and approval from ODOT State-Traffic Roadway Engineer.
NE Adams St & NE 2nd St	▪ Future retiming of signal to optimize signal phase split times and/or coordination of signals along the corridor.	▪ Intersection V/C ratio exceeds ODOT HDM and OHP standard under 2047 volume scenario. Operates within OHP V/C standard with acceptable average delay (LOS "C") at opening year.
NE Baker St & NE 2nd St	▪ Future retiming of signal to optimize signal phase split times and/or coordination of signals along the corridor.	▪ Intersection V/C ratio exceeds ODOT HDM and OHP standard under 2047 volume scenario. Operates within OHP V/C standard with acceptable average delay (LOS "C") at opening year.
NE Johnson St & NE 3rd St	▪ Consider improvements to existing pedestrian crossing of WB right-turn slip lane, including: o Possible signalization of right-turn to allow for signalized pedestrian crossing. o Additional lighting to improve pedestrian visibility. o Possible raised crosswalk. o Signage and pavement markings.	▪ Channelized turn lanes can be challenging for pedestrians, especially vision-impaired pedestrians. Often the compliance for vehicles yielding to pedestrians is low. ▪ The improvements listed are aimed at improving vehicle yielding behavior as well as enhancing the visibility of pedestrians in the crosswalk.
NE Three Mile Ln & SE 1st St	▪ Install a traffic signal at the intersection. ▪ Convert center two-way left-turn lane on NE Three Mile Ln to dedicated left-turn lanes. Add an EB left-turn lane on SE 1st St. Operate NB/SB left-turns protected-only and EB/WB left-turns permissive-only. ▪ Stripe 100' queue storage for southbound left-turn lane and 200' queue storage for northbound left-turn lane.	▪ Signal warranted and necessary for operations under 2027 and 2047 traffic volume scenarios. ▪ Protected-only NB and SB left-turn phasing is warranted per ODOT *Traffic Signal Policy and Guidelines*. ▪ 200' queue storage for northbound left-turn is inadequate for Future Year 2047; however it allows for 100' southbound left-turn queue storage at SE Brooks Street.

References

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8. Transportation Research Board. National Cooperative Highway Research Program (NCHRP) Report 765: *Analytical Travel Forecasting Approaches for Project-Level Planning and Design.* 2014.
9. U.S. Department of Transportation Federal Highway Administration. *Manual on Uniform Traffic Control Devices, 11th Edition.* December 2023.
10. Oregon Department of Transportation. *Traffic Signal Policy and Guidelines*. July 2024.
11. U.S. Department of Transportation Federal Highway Administration. *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.* July 2018.

Attachments

A. 24-hour traffic counts.
B. Intersection Turning Movement Counts
C. Unbalanced Seasonally-Adjusted Existing a.m. and p.m. Peak Hour Volumes
D. Synchro Worksheets for Existing Conditions Analysis
E. ODOT Crash Data
F. Travel Demand Model Outputs
G. Future Volumes Growth Rates, Unbalanced 2027 and 2047 Volumes
H. Opening Year 2027 No-Build Synchro Analysis Worksheets
I. Future Year 2047 No-Build Synchro Analysis Worksheets
J. Traffic Signal Warrant Analysis Worksheets
K. All-Way Stop Control Warrant Analysis
L. Opening Year 2027 Build Synchro Analysis Worksheets
M. Future Year 2047 Build Synchro Analysis Worksheets