



# Transportation System Plan



## Appendix C

### Transportation Analyses, Bridge Ratings and Signal Warrants



## **C** Transportation System Analysis

Appendix C includes separate sections for (1) Intersection Level-Of-Service Analysis – year 2006 and 2023; (2) Bridge Rating; and (3) ODOT Travel Demand Model Summary.

### Intersection Level-of-Service Analysis

The evaluation of future traffic conditions in the McMinnville TSP focused on critical intersections along major and minor arterials throughout McMinnville. A more detailed evaluation of the downtown street system was also conducted and summarized separately. These major intersections serve as additional indicators of overall system performance, and are used to help identify operational and capacity improvements at critical junction points.

A 2003-2023 planning horizon was chosen for consistency with the *McMinnville Growth Management and Urbanization Plan*, and as directed by DLCD staff.

The McMinnville TSP update process began in 2006 with new traffic data collection of PM peak hour traffic data, recorded at 48 study area intersections. Year 2006 data were used to describe “existing” conditions (as year 2003 data were not recorded) and future year 2023 data were derived from ODOT’s Travel Demand Model.

Existing (2006) and future (2023) V/C ratios for PM peak hour operations are summarized and compared with the McMinnville TSP mobility standards (see Chapter 2).

Table C-1 summarizes year 2006 PM peak hour performance measures.

Table C-2 summarizes year 2023 PM peak hour performance measures for a select set of study area intersections that were found with future capacity problems. The table also summarizes the resulting performance measures for 2023 operations based on assumed TSP project improvements (mostly new traffic signal or intersection enhancements).

**Table C-1: 2006 PM Peak Hour**

Weekday PM Peak Hour LOS Table				
Intersection	2006 Existing			
	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup>	WM <sup>4</sup>
<b>Weekday PM Peak Hour</b>				
1 Highway 99 & LaFayette Ave	C	25.5	0.77	SBL
2 Highway 99 & McDaniel Ln	B	14.2	0.62	WBL
3 Highway 99 & McDonald Ln	C	29.2	0.59	EBL
4 Highway 99 & NE Evans St/Baker Creek Rd	B	13.3	0.62	SBL
5 19th St & Highway 99	B	12.6	0.56	EBT
6 12th St & Adams (Hwy 99)	B	11.3	0.78	WBT
7 12th St & Baker (Hwy 99)	B	16.5	0.74	EBT
8 8th St & Adams (Hwy 99)	D	30.2	0.1	EB
9 8th St & Baker (Hwy 99)	E	35.5	0.18	EBT/L
10 3rd St & Baker (Hwy 99)	B	10.3	0.58	WBT
11 2nd St & Adams (Hwy 99)	B	17.3	0.79	WBT
12 2nd St & Baker (Hwy 99)	B	12.1	0.64	WBT
13 SW Fellows St & Baker	B	12.7	0.64	EBT
14 W Linfield Ave & Baker (Hwy 99)	A	7.9	0.43	WBT
15 Keck (Albertson's/IGA) & Baker (Hwy 99)	B	11.8	0.44	EBT
16 Old Sheridan Road & Baker (Hwy 99)	C	34.1	0.72	EBT
17 WB Ramp & Hwy 99	E	38.9	0.82	WBL/R
18 EB Ramp & Hwy 99	A	3.8	0.16	SBT
19 Burnett Rd & Baker St	B	11.9	0.07	WBL/R
20 27th St & Baker St	B	12.9	0.2	WBL/R
21 NW Baker Creek Road & Baker St	A	9.2	0.43	SBT
22 19th St & Baker St	B	13.7	0.52	NB
23 27th St & McDonald Ln	C	18	0.48	WB
24 19th St & McDonald Ln	A	8.6	0.23	SB
25 NW Baker Creek Road & Michelbook Ln	B	14.7	0.26	NBL/R
26 12th St & Michelbook Ln	B	14.4	0.25	WBL/R
27 NW Wallace Rd & Michelbook Ln	B	11.7	0.5	SB
28 2nd St & Michelbook Ln	B	10.9	0.49	NBT
29 NW Baker Creek Road & Hill Rd	B	11.9	0.26	NB
30 NW Wallace Rd & Hill Ave	B	11.1	0.1	WBT/L
31 2nd St & Hill Ave	B	15	0.13	EBT/L
32 2nd St & NW Cypress St	C	21.3	0.23	SB
33 SW Fellows St & NW Cypress St	A	10	0.33	WB
34 Cypress St & SW Old Sheridan Rd	C	16	0.1	NBR
35 W Linfield Ave & SE Davis St	B	10.9	0.18	EBL/R

**2006 PM Peak Hour (cont)**

Weekday PM Peak Hour LOS Table				
Intersection	2006 Existing			
	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup>	WM <sup>4</sup>
36 2nd St & Davis St	C	18.9	0.28	SB
37 14th St & NE Evans St	B	12.8	0.16	WB
38 12th St & NE Evans St	B	14.1	0.62	SB
39 8th St & NE Evans St	A	9.4	0.3	NB
40 3rd St & NE Evans St	C	16.1	0.29	SB
41 14th St & McDonald Ln	B	11.9	0.21	SB
42 19th St & LaFayette Ave	C	24.4	0.13	EB
43 13th St & LaFayette Ave	B	12.2	0.6	WBL
44 8th St & LaFayette Ave	D	33.8	0.42	EBL/R
45 3rd St & LaFayette Ave	B	17.6	0.62	WBT
46 1st & NE Three Mile Lane	F	197.9	0.39	WB
47 OR 18 & Norton Lane	C	23.9	0.65	NBT
48 NE McDaniel Ln & LaFayette Ave	---	---	---	---

1. Level of service, based on 2000 Highway Capacity Manual methodology.
2. Average delay in seconds per vehicle.
3. Volume-to-capacity ratio reported for signalized intersections.
4. Worst movement reported for unsignalized intersections.

**Table C-2: 2023 PM Peak Hour**

**Weekday PM Peak Hour LOS: Summary of Critical Intersections & Comparison to 2006**

Intersection	2006 Existing			2023 Future			2023 Future + Improvements		
	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup> or WM <sup>4</sup>	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM
1. Hwy 99/LaFayette Ave	C	25.5	0.77	C	23.9	0.80			
2. Hwy 99/McDaniel Ln	B	14.2	0.62	A	9.9	0.54			
3. Hwy 99/McDonald Ln	C	29.2	0.59	C	30.0	0.65			
4. Hwy 99-NE Evans St/Baker Crk Rd	B	13.3	0.62	B	19.6	0.81			
5. 19th St/Hwy 99	B	12.6	0.56	A	9.7	0.56			
6. 12th St/Adams (Hwy 99)	B	11.3	0.78	C	31.1	0.97	C	21.7	0.90
16. Old Sheridan Rd/Baker (Hwy 99)	C	34.1	0.72	F	155.2	1.52	D	40.5	0.95
17. WB Ramp/Hwy 99	E	38.9	0.82/WB	F	>200	3.25/WB			
21. NW Baker Creek Rd/Baker St	A	9.2	0.43	B	13.4	0.55			
22. 19th St/Baker St	<b>B</b>	<b>12.3</b>	<b>0.53</b>	<b>C</b>	<b>16.5</b>	<b>0.60</b>			
29. NW Baker Creek Rd/Hill Rd	B	11.9	0.26/NB	F	72.5	1.01/NB	A	7.3	0.45
31. 2nd St/Hill Ave	B	15.0	0.13/EBT-L	E	39.4	0.79/WB	A	5.9	0.35
34. Cypress St/SW Old Sheridan Rd	C	16.0	0.07/NBL	F	>200	1.16/NB L	A	8.1	0.53
43. 13th St/LaFayette Ave	B	12.5	0.60	B	17.0	0.79			
47. OR 18/Norton Ln	B	19.7	0.53	E	63.3	1.02			

- 1. Level of service, based on 2000 Highway Capacity Manual methodology.
- 2. Average delay in seconds per vehicle.
- 3. Volume-to-capacity ratio reported for signalized intersections.
- 4. Worst movement reported for unsignalized intersections.

**Assumed Improvements**

- 6. 12th St/Adams (Hwy 99) Re-stripe Adams with separate left-turn, through and through-right-turn lanes
- 16. Old Sheridan Rd/Baker (Hwy 99) Added through- and turn-lanes per Highway 18/99W South Interchange Access Management Plan
- 29. New traffic signal
- 31. New traffic signal
- 34. New traffic signal

**2026 PM Peak Hour (cont.)**

**Weekday PM Peak Hour LOS Summary of Alternatives (Downtown )**

Intersection	2006 Existing			2023		
	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup> or WM <sup>4</sup>	LOS	Delay	V/C or WM
10. 3rd St & Baker (Hwy 99)	B	10.3	0.58	B	15.4	0.65
11. 2nd St & Adams (Hwy 99)	B	17.3	0.79	B	17.2	0.78
12. 2nd St & Baker (Hwy 99)	B	12.1	0.64	C	23.0	0.88
45. 3rd St & LaFayette Ave	B	17.6	0.62	C	20.9	0.71
49. 5th Street & Adams (Hwy 99)				C	21.2	0.89
50. 5th Street & Baker (Hwy 99)				C	20.2	0.86
52. 5th Street & Lafayette				B	15.6	0.75

1. Level of service, based on 2000 Highway Capacity Manual methodology.
2. Average delay in seconds per vehicle.
3. Volume-to-capacity ratio reported for signalized intersections.
4. Worst movement reported for unsignalized intersections.

**Weekday PM Peak Hour LOS Summary of Alternatives: TSP Street and TDM Improvements**

Intersection	2006 Existing			2023 w/ TSP Street Improvements			2023 TSP Plus TDM Improvements		
	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup> or WM <sup>4</sup>	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM
16. Old Sheridan Rd/Baker (Hwy 99)	C	34.1	0.72	D	40.5	0.95	D	39.6	0.93
47. OR 18/Norton Ln	B	19.7	0.53	E	63.3	1.02	E	58.0	0.99

1. Level of service, based on 2000 Highway Capacity Manual methodology.
2. Average delay in seconds per vehicle.
3. Volume-to-capacity ratio reported for signalized intersections.
4. Worst movement reported for unsignalized intersections.

## ODOT Bridge Rating

This section summarizes ODOT's Highway Bridge Replacement and Rehabilitation Program and includes a summary of ODOT's bridge ratings for bridges within or near the McMinnville Urban Growth Boundary.

### Highway Bridge Replacement and Rehabilitation Program

The purpose of ODOT's HBRR funding is to replace or rehabilitate roadway bridges over waterways, other topographical barriers, other roadways, railroads, canals, ferry landings, etc., when those bridges have been determined deficient because of structural deficiencies, physical deterioration, or functional obsolescence.

All local agencies must inventory their structures in accordance with the National Bridge Inspections Standards (NBIS) and Oregon State Law, with the results being entered according to the ODOT BMS format.

Bridges on public roads classified as deficient by Federal guidelines based on National Inventory data may be eligible for funding for rehabilitation or replacement. Bridges are defined as any highway structure with an opening measured along the centerline of roadway of more than 20 feet (6.1 m) between undercopings of abutments and spring lines of arches, or extreme ends of the openings of multiple boxes; it may include multiple pipes where the clear distance between openings is less than half of the smaller contiguous opening. The work done must result in the removal of all deficiencies, or any deficiency left in place must be covered by a design exception.

Exception: Eligible structural steel bridges can be painted and any highway bridge located in a high seismic area can be retrofitted for seismic loads without removing other deficiencies. Any highway bridge in a high seismic risk zone may be retrofitted to resist seismic loads regardless of its eligibility status for rehabilitation or

replacement. Bridges to be painted must meet the same eligibility requirements as bridges being replaced or rehabilitated; that is, they must be deficient and have a sufficiency rating less than 80.

Also, even though seismic retrofit and painting can be done as sole work items, FHWA recommends that safety defects be corrected, especially if there is a history of accidents at the bridge.

The eligibility determination has two steps:

**Step I.** The bridge first must be classified as either structurally deficient or functionally obsolete as described below based on a routine NBIS inspection.

#### Structurally Deficient

A **structurally deficient** bridge is inadequate to carry legal loads, whether caused by obsolete design standards, structural deterioration, or waterway inadequacy. A structural deficient classification is determined from the following field inspection data items as entered on the Federal Structure Inventory and Appraisal (SI&A) Form maintained within the ODOT BMS.

1. Condition rating of 4 or less for:
  - Item 58 - Deck, or
  - Item 59 - Superstructure, or
  - Item 60 - Substructure, or
  - Item 62 - Culvert

OR

2. Appraisal rating of 2 or less for:
  - Item 67 - Structural condition, or
  - Item 71 - Water way adequacy

#### Functionally Obsolete

A **functionally obsolete** bridge is inadequate to properly accommodate traffic due to inadequate vertical or horizontal clearance, approach roadway alignment, structural condition, or

waterway adequacy. A functionally obsolete bridge is determined from the following field inspection data items as entered on the Federal Structure Inventory and Appraisal (SI&A) Form maintained within the ODOT BMS.

1. Appraisal rating of 3 or less for:
  - Item 68 - Deck geometry, or
  - Item 69 - Under clearances, or
  - Item 72 - Approach roadway

OR

2. Appraisal rating of 3 for:
  - Item 67 - Structural condition, or
  - Item 71 - Waterway adequacy

**Step II.** After deficiency is established, the bridge is considered eligible for either replacement or rehabilitation depending on the value of the sufficiency rating.

- Sufficiency rating of 80 or less for rehabilitation.
- Sufficiency rating of 50 or less for replacement.

**Exception.** Deficient bridges with sufficiency ratings between 50 and 80 may be replaced if it can be shown to be more cost effective than rehabilitation using a life cycle cost analysis. Since eligibility is not exempt from FHWA review, the analysis must be reviewed and approved by both ODOT and FHWA.

Projects eligible for funding may include (but are not limited to) the following:

- a. Total replacement of a deficient bridge at or near its existing location.
- b. Total replacement of a deficient bridge by a new structure in the same general corridor.
- c. Removal of a deficient structure and provision of alternate access at or less than the cost of replacement.

- d. Rehabilitation or replacement of major structural members that increase the structural integrity and life of the bridge. This may include seismic retrofitting and painting of the structure.

The decision to rehabilitate versus replace should be based on a study of alternatives considering cost, safety, service life, and level of service. Rehabilitation alternatives are necessary only when considered feasible.



### McMinnville Bridge Ratings

McMinnville Urban Area

BRIDGE RATING (2007)

BRIDGE ID#	BRIDGE NAME	POSTING	SUFFICIENT/ OBSOLETE		SUFFICIENCY	HORIZONTAL CLEARANCE	INSPECTION DATE	DECK WIDTH	LANES UNDER	TRAFFIC	CONST. YEAR
			CONDITION								
00315F	Cozine Creek, Old Sheridan Rd	At/Above Legal Loads	Poor	Structurally Deficient	43.9	20	12/06	20	0	2-way traffic	1926
00441	North Yamhill River, OR 99W SB	At/Above Legal Loads	Fair	Functionally Obsolete	44.3	20	03/06	20	0	1-way traffic	1921
00441A	North Yamhill River, OR 99W NB	At/Above Legal Loads	Fair	Not Deficient	73.5	29.8	03/06	30	0	1-way traffic	1959
05023A	Cozine Creek, OR 99W	At/Above Legal Loads	Good	Not Deficient	83.0	27.9	05/06	0	0	2-way traffic	1900
06758	South Yamhill River, OR Hwy 18 McMinnville Spur	At/Above Legal Loads	Poor	Structurally Deficient	35.5	25.9	06/06	26	0	2-way traffic	1951
08490	South Yamhill River, OR Hwy 18 at MP 45.63	At/Above Legal Loads	Fair	Not Deficient	76.0	29.8	10/06	30	0	2-way traffic	1963
08492	Yamhill River Oflow, OR Hwy 18	At/Above Legal Loads	Fair	Not Deficient	63.1	29.8	10/06	30	0	2-way traffic	1963
08688	OR Hwy 18 over WPRR	At/Above Legal Loads	Fair	Functionally Obsolete	63.2	29.8	10/06	30	0	2-way traffic	1964
08903	Booth Bend Road over OR Hwy 18	At/Above Legal Loads	Fair	NA		23.9	10/06	24	2	2-way traffic	1964
08904	OR 99W over OR Hwy 18	At/Above Legal Loads	Fair	Functionally Obsolete	84.1	39.4	03/06	39.5	2	2-way traffic	1963
08950	OR Hwy 18 EB Conn to OR 99W over Hwy 39 WB	At/Above Legal Loads	Fair	NA		22	10/06	22	1	2-way traffic	1964
08951	OR Hwy 18 McMinnville Spur over OR Hwy 18	At/Above Legal Loads	Fair	NA		46.9		22	2	2-way traffic	1964
0M025	Cattlepass, OR Hwy 18 at MP 43.75	At/Above Legal Loads	Good	NA	98.0	49.9	10/04	50	0	2-way traffic	1948
11540A	Baker Creek, Baker Creek Rd	>39.9% below	Good	Not Deficient	49.6	26.2	12/04	26.1	0	2-way traffic	2007
11640A	Baker Creek, Westside Rd	At/Above Legal Loads	Good	Not Deficient	69.3	26.2	12/06	26.1	0	2-way traffic	2007
11713F	Cozine Creek, Hill Rd S	At/Above Legal Loads	Fair	Functionally Obsolete	66.6	20.3	12/06	20.5	0	2-way traffic	1963
16232	Sign Truss Br, OR Hwy 18 at MP 43.85	>39.9% below	Fair	NA		47.9		0	2		1978

Source data: Oregon Department of Transportation

## **ODOT Travel Demand Model**

Text provided by ODOT when completed.