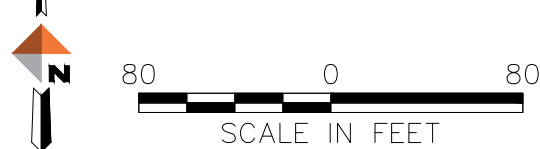


PART 1- TOP ALTERNATIVE EXHIBITS AND COST ESTIMATES

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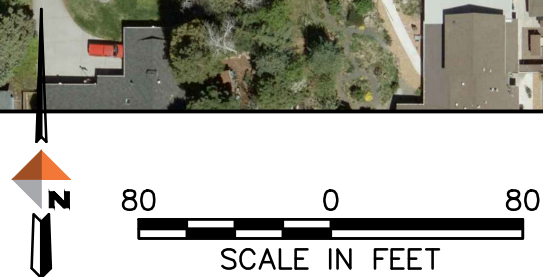


OLNEY/REVERE INTERSECTION PROJECT (1GOPI & 1GRRI)
OLNEY AVE & 8TH INTERSECTION
ALTNERATIVE 1 – UPDATED SIGNAL

PROJECT	16161.01
DATE	08/14/2026

ALT 1

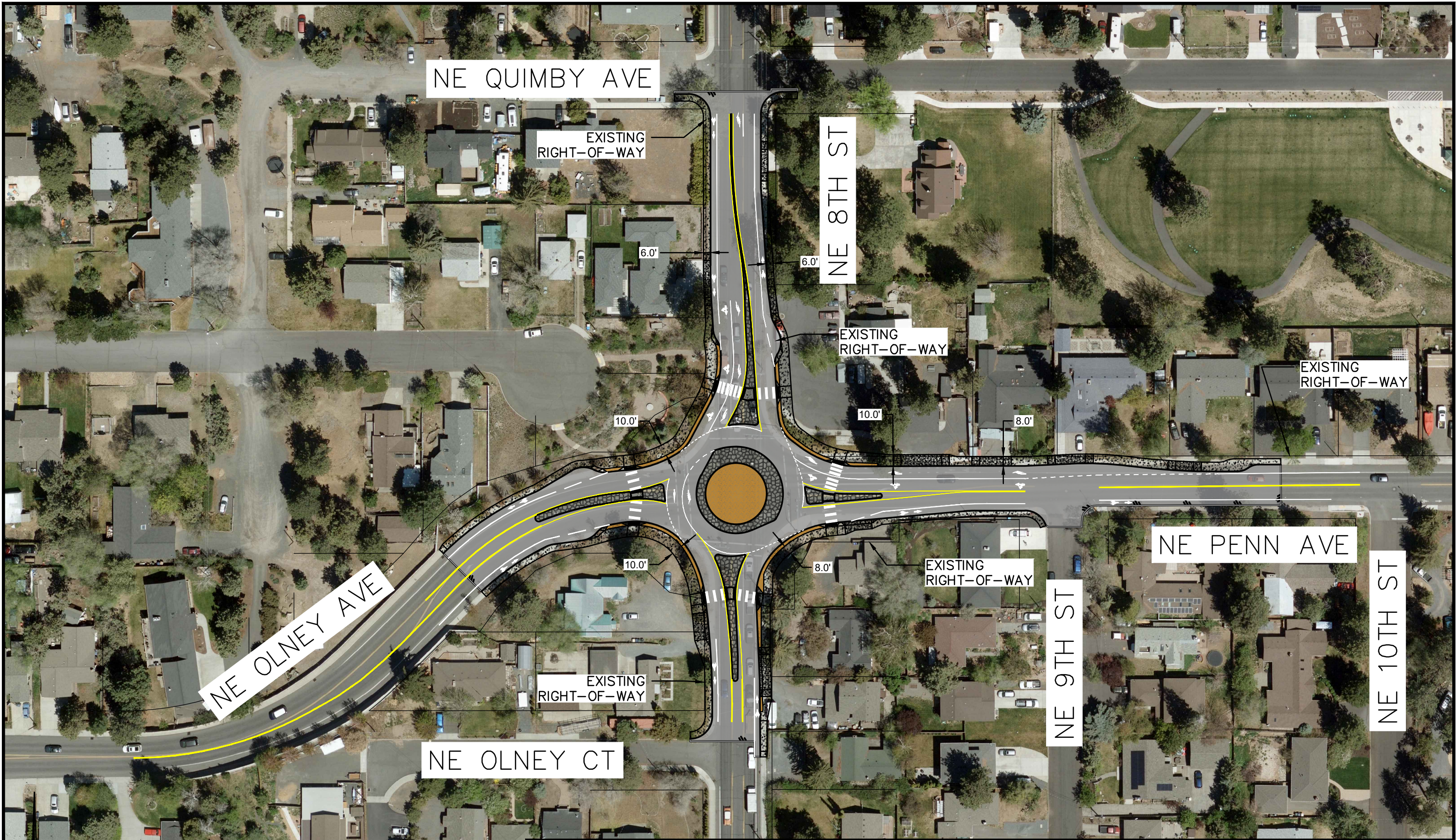
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OLNEY/REVERE INTERSECTION PROJECT (1GOPI & 1GRRI)
OLNEY AVE & 8TH INTERSECTION
ALTERNATIVE 2 - SINGLE LANE ROUNDABOUT

PROJECT	16161.01
DATE	08/14/2026
ALT 2	

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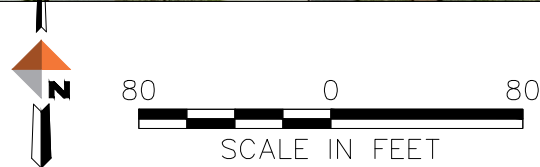


OLNEY/REVERE INTERSECTION PROJECT (1GOPI & 1GRRI)
OLNEY AVE & 8TH INTERSECTION
ALTERNATIVE 3 – PARTIAL MULTILANE ROUNDABOUT

PROJECT	16161.01
DATE	08/14/2026

ALT 3

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OLNEY/REVERE INTERSECTION PROJECT (1GOPI & 1GRRI)
OLNEY AVE & 8TH INTERSECTION
ALTERNATIVE 4 – SINGLE LANE ROUNDABOUT W/ SBR

PROJECT	16161.01
DATE	08/14/2026

ALT 4

Olney 8th - Option 1
Signal with SBR WBR Concept Cost Estimate

9/2/2026

Item No.		Description	Section	Unit	Unit Price	QTY	Total
1		MOBILIZATION	00210	LS	\$ 318,900.00	1	\$ 318,900.00
2		TEMPORARY WORK ZONE TRAFFIC CONTROL, COMPLETE	00221	LS	\$ 382,700.00	1	\$ 382,700.00
3		EROSION CONTROL	00280	LS	\$ 31,900.00	1	\$ 31,900.00
4		POLLUTION CONTROL PLAN	00290	LS	\$ 2,000.00	1	\$ 2,000.00
5		CONSTRUCTION SURVEY WORK	00305	LS	\$ 63,800.00	1	\$ 63,800.00
6		REMOVAL OF STRUCTURES AND OBSTRUCTIONS	00310	LS	\$ 159,500.00	1	\$ 159,500.00
7		CLEARING AND GRUBBING	00320	LS	\$ 15,900.00	1	\$ 15,900.00
8		STORMWATER IMPROVEMENTS	00445	LS	\$ 478,400.00	1	\$ 478,400.00
9		3/4"-0 AGGREGATE BASE	00640	CY	\$ 85.00	2028	\$ 172,380.00
10		LEVEL 4, 1/2 INCH ACP	00745	TON	\$ 135.00	3051	\$ 411,885.00
11		PG 70-28ER ASPHALT IN LEVEL 4, 1/2 INCH ACP	00745	TON	\$ 100.00	183	\$ 18,300.00
12		EXTRA FOR ASPHALT APPROACHES	00749	EA	\$ 2,000.00	8	\$ 16,000.00
13		CONCRETE DRIVEWAYS	00759	SF	\$ 16.00	2629	\$ 42,064.00
14		CONCRETE WALKS	00759	SF	\$ 12.00	15566	\$ 186,792.00
15		EXTRA FOR NEW CURB RAMPS	00759	EA	\$ 3,000.00	13	\$ 39,000.00
16		TRUNCATED DOMES ON NEW SURFACES	00759	SF	\$ 50.00	358	\$ 17,900.00
17		CONCRETE MEDIANS, PATTERNED COLORED CONCRETE SURFACING	00759	SF	\$ 30.00	1191	\$ 35,730.00
18		CONCRETE CURBS, 16 INCH STANDARD CURB	00759	FT	\$ 16.00	2092	\$ 33,472.00
19		THERMOPLASTIC, EXTRUDED, GROOVED, NON-PROFILED	00865	FT	\$ 3.50	6070	\$ 21,245.00
20		PAVEMENT LEGEND, TYPE B-HS: BICYCLE LANE STENCIL	00867	EA	\$ 550.00	4	\$ 2,200.00
21		PAVEMENT LEGEND, TYPE B-HS: ARROWS	00867	EA	\$ 450.00	8	\$ 3,600.00
22		PAVEMENT BAR, TYPE B-HS, GROOVED	00867	SF	\$ 16.00	1050	\$ 16,800.00
23		SIGNS, SUPPORTS, AND BASES	00940	LS	\$ 23,900.00	1	\$ 23,900.00
24		STREET LIGHTING	00970	LS	\$ 39,900.00	1	\$ 39,900.00
25		TRAFFIC SIGNAL INSTALLATION, OLNEY & 8TH	00990	LS	\$ 575,000.00	1	\$ 575,000.00
26		LANDSCAPE & IRRIGATION	01040	LS	\$ 79,700.00	1	\$ 79,700.00
Subtotal							\$ 3,189,000.00
Construction Administration	Construction Administration & Inspection		-	LS	12%	1	\$ 382,680.00
	Construction Administration Subtotal						\$ 382,700.00
Right of Way	1646 NE 8TH ST						\$ 96,649.74
	755 NE PENN AVE						\$ 14,251.44
	846 NE PENN AVE						\$ 449,985.08
	900 NE PENN AVE						\$ 449,985.08
	916 NE PENN AVE						\$ 12,975.20
	1515 NE 8TH ST						\$ 9,720.43
	750 NE OLNEY CT						\$ 8,241.04
	1609 NE 8TH ST						\$ 47,863.29
	ROW Subtotal						\$ 1,089,700.00
Total without Range							\$ 4,662,000
Class 3 Estimate Range						-20%	\$ (932,400.00)
						30%	\$ 1,398,600.00
Total with Range					\$ 3,729,600	to	\$ 6,060,600

- Does not include City utility improvements

Item No.	Description	Section	Unit	Unit Price	QTY	Total
1	MOBILIZATION	00210	LS	\$ 235,100.00	1	\$ 235,100.00
2	TEMPORARY WORK ZONE TRAFFIC CONTROL, COMPLETE	00221	LS	\$ 399,700.00	1	\$ 399,700.00
3	EROSION CONTROL	00280	LS	\$ 23,500.00	1	\$ 23,500.00
4	POLLUTION CONTROL PLAN	00290	LS	\$ 2,000.00	1	\$ 2,000.00
5	CONSTRUCTION SURVEY WORK	00305	LS	\$ 47,000.00	1	\$ 47,000.00
6	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	00310	LS	\$ 117,600.00	1	\$ 117,600.00
7	CLEARING AND GRUBBING	00320	LS	\$ 11,800.00	1	\$ 11,800.00
8	STORMWATER IMPROVEMENTS	00445	LS	\$ 352,700.00	1	\$ 352,700.00
9	3/4"-0 AGGREGATE BASE	00640	CY	\$ 85.00	1822	\$ 154,870.00
10	LEVEL 4, 1/2 INCH ACP	00745	TON	\$ 135.00	2585	\$ 348,975.00
11	PG 70-28ER ASPHALT IN LEVEL 4, 1/2 INCH ACP	00745	TON	\$ 100.00	155	\$ 15,500.00
12	EXTRA FOR ASPHALT APPROACHES	00749	EA	\$ 2,000.00	7	\$ 14,000.00
13	CONCRETE DRIVEWAYS	00759	SF	\$ 16.00	2180	\$ 34,880.00
14	CONCRETE WALKS	00759	SF	\$ 12.00	13311	\$ 159,732.00
15	EXTRA FOR NEW CURB RAMPS	00759	EA	\$ 3,000.00	8	\$ 24,000.00
16	TRUNCATED DOMES ON NEW SURFACES	00759	SF	\$ 50.00	321	\$ 16,050.00
17	CONCRETE MEDIANS, PATTERNED COLORED CONCRETE SURFACING	00759	SF	\$ 30.00	2033	\$ 60,990.00
18	CONCRETE APRON, DOWELLED, 9 INCHES THICK, PATTERNED COLORED CONC	00759	SF	\$ 25.00	2905	\$ 72,625.00
19	CONCRETE CURBS, HIGH STRENGTH LOW PROFILE MOUNTABLE	00759	FT	\$ 30.00	1151	\$ 34,530.00
20	CONCRETE CURBS, HIGH STRENGTH WIDE MODIFIED TRUCK APRON CURB	00759	FT	\$ 30.00	173	\$ 5,190.00
21	CONCRETE CURBS, 16 INCH STANDARD CURB	00759	FT	\$ 16.00	2041	\$ 32,656.00
22	CONCRETE WALKS AT SPLITTER ISLAND	00759	SF	\$ 10.00	336	\$ 3,360.00
23	THERMOPLASTIC, EXTRUDED, GROOVED, NON-PROFILED	00865	FT	\$ 3.50	6018	\$ 21,063.00
24	PAVEMENT LEGEND, TYPE B-HS: BICYCLE LANE STENCIL	00867	EA	\$ 550.00	4	\$ 2,200.00
25	PAVEMENT LEGEND, TYPE B-HS: ARROWS	00867	EA	\$ 450.00	4	\$ 1,800.00
26	PAVEMENT BAR, TYPE B-HS, GROOVED	00867	SF	\$ 16.00	540	\$ 8,640.00
27	SIGNS, SUPPORTS, AND BASES	00940	LS	\$ 17,600.00	1	\$ 17,600.00
28	STREET LIGHTING	00970	LS	\$ 29,400.00	1	\$ 29,400.00
29	FLASHING BEACON INSTALLATION	00990	LS	\$ 45,000.00	1	\$ 45,000.00
30	LANDSCAPE & IRRIGATION	01040	LS	\$ 58,800.00	1	\$ 58,800.00
Subtotal					\$	2,351,000.00
Construction Administration	Construction Administration & Inspection	-	LS	12%	1	\$ 282,120.00
	Construction Administration Subtotal				\$	282,100.00
Right of Way	1646 NE 8TH ST				\$	74,695.97
	755 NE PENN AVE				\$	11,307.15
	846 NE PENN AVE				\$	12,466.19
	900 NE PENN AVE				\$	14,959.91
	1597 NE 9TH ST				\$	20,765.63
	1609 NE 8TH ST				\$	22,800.25
	1515 NE 8TH ST				\$	25,703.91
	750 NE OLNEY CT				\$	28,861.76
	1518 NE 8TH ST				\$	8,316.50

Olney 8th - Option 2
Roundabout with WBR Concept Cost Estimate

8/18/2026

Item No.	Description	Section	Unit	Unit Price	QTY	Total
	1508 NE 8TH ST					\$ 6,566.42
	ROW Subtotal					\$ 226,400.00
Total without Range						\$ 2,860,000
Class 3 Estimate Range					-20%	\$ (572,000.00)
					30%	\$ 858,000.00
Total with Range				\$ 2,288,000	to	\$ 3,718,000

- Does not include City utility improvements

Olney 8th - Option 3
Roundabout with SBL WBR Concept Cost Estimate

8/18/2026

Item No.	Description	Section	Unit	Unit Price	QTY	Total
1	MOBILIZATION	00210	LS	\$ 263,300.00	1	\$ 263,300.00
2	TEMPORARY WORK ZONE TRAFFIC CONTROL, COMPLETE	00221	LS	\$ 395,000.00	1	\$ 395,000.00
3	EROSION CONTROL	00280	LS	\$ 26,300.00	1	\$ 26,300.00
4	POLLUTION CONTROL PLAN	00290	LS	\$ 2,000.00	1	\$ 2,000.00
5	CONSTRUCTION SURVEY WORK	00305	LS	\$ 52,700.00	1	\$ 52,700.00
6	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	00310	LS	\$ 131,700.00	1	\$ 131,700.00
7	CLEARING AND GRUBBING	00320	LS	\$ 13,200.00	1	\$ 13,200.00
8	STORMWATER IMPROVEMENTS	00445	LS	\$ 395,000.00	1	\$ 395,000.00
9	3/4"-0 AGGREGATE BASE	00640	CY	\$ 85.00	2043	\$ 173,655.00
10	LEVEL 4, 1/2 INCH ACP	00745	TON	\$ 135.00	2925	\$ 394,875.00
11	PG 70-28ER ASPHALT IN LEVEL 4, 1/2 INCH ACP	00745	TON	\$ 100.00	176	\$ 17,600.00
12	EXTRA FOR ASPHALT APPROACHES	00749	EA	\$ 2,000.00	8	\$ 16,000.00
13	CONCRETE DRIVEWAYS	00759	SF	\$ 16.00	3056	\$ 48,896.00
14	CONCRETE WALKS	00759	SF	\$ 12.00	13481	\$ 161,772.00
15	EXTRA FOR NEW CURB RAMPS	00759	EA	\$ 3,000.00	21	\$ 63,000.00
16	TRUNCATED DOMES ON NEW SURFACES	00759	SF	\$ 50.00	358	\$ 17,900.00
17	CONCRETE MEDIANS, PATTERNED COLORED CONCRETE SURFACING	00759	SF	\$ 30.00	2926	\$ 87,780.00
18	CONCRETE APRON, DOWELLED, 9 INCHES THICK, PATTERNED COLORED CONC	00759	SF	\$ 25.00	2232	\$ 55,800.00
19	CONCRETE CURBS, HIGH STRENGTH LOW PROFILE MOUNTABLE	00759	FT	\$ 30.00	1246	\$ 37,380.00
20	CONCRETE CURBS, HIGH STRENGTH WIDE MODIFIED TRUCK APRON CURB	00759	FT	\$ 30.00	246	\$ 7,380.00
21	CONCRETE CURBS, 16 INCH STANDARD CURB	00759	FT	\$ 16.00	2385	\$ 38,160.00
22	CONCRETE WALKS AT SPLITTER ISLAND	00759	SF	\$ 10.00	364	\$ 3,640.00
23	THERMOPLASTIC, EXTRUDED, GROOVED, NON-PROFILED	00865	FT	\$ 3.50	7119	\$ 24,916.50
24	PAVEMENT LEGEND, TYPE B-HS: BICYCLE LANE STENCIL	00867	EA	\$ 550.00	9	\$ 4,950.00
25	PAVEMENT LEGEND, TYPE B-HS: ARROWS	00867	EA	\$ 450.00	15	\$ 6,750.00
26	PAVEMENT BAR, TYPE B-HS, GROOVED	00867	SF	\$ 16.00	600	\$ 9,600.00
27	SIGNS, SUPPORTS, AND BASES	00940	LS	\$ 19,700.00	1	\$ 19,700.00
28	STREET LIGHTING	00970	LS	\$ 32,900.00	1	\$ 32,900.00
29	FLASHING BEACON INSTALLATION	00990	LS	\$ 65,000.00	1	\$ 65,000.00
30	LANDSCAPE & IRRIGATION	01040	LS	\$ 65,800.00	1	\$ 65,800.00
Subtotal						\$ 2,633,000.00
Construction Administration	Construction Administration & Inspection	-	LS	12%	1	\$ 315,960.00
Construction Administration Subtotal						\$ 316,000.00
Right of Way	1646 NE 8TH ST					\$ 114,202.30
	755 NE PENN AVE					\$ 9,488.01
	846 NE PENN AVE					\$ 23,795.12
	900 NE PENN AVE					\$ 14,561.78
	1597 NE 9TH ST					\$ 23,123.47
	1609 NE 8TH ST					\$ 27,620.39
	750 NE OLNEY CT					\$ 22,631.77
	1515 NE 8TH ST					\$ 16,007.99
	751 NE QUIMBY AVE					\$ 38,082.39

Olney 8th - Option 3
Roundabout with SBL WBR Concept Cost Estimate

8/18/2026

Item No.	Description	Section	Unit	Unit Price	QTY	Total
	ROW Subtotal					\$ 289,500.00
Total without Range						\$ 3,239,000
Class 3 Estimate Range					-20%	\$ (647,800.00)
					30%	\$ 971,700.00
Total with Range				\$ 2,591,200	to	\$ 4,210,700

- Does not include City utility improvements

Olney 8th - Option 4
Roundabout with SBR WBR Concept Cost Estimate

8/18/2026

Item No.	Description	Section	Unit	Unit Price	QTY	Total
1	MOBILIZATION	00210	LS	\$ 249,200.00	1	\$ 249,200.00
2	TEMPORARY WORK ZONE TRAFFIC CONTROL, COMPLETE	00221	LS	\$ 398,700.00	1	\$ 398,700.00
3	EROSION CONTROL	00280	LS	\$ 24,900.00	1	\$ 24,900.00
4	POLLUTION CONTROL PLAN	00290	LS	\$ 2,000.00	1	\$ 2,000.00
5	CONSTRUCTION SURVEY WORK	00305	LS	\$ 49,800.00	1	\$ 49,800.00
6	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	00310	LS	\$ 124,600.00	1	\$ 124,600.00
7	CLEARING AND GRUBBING	00320	LS	\$ 12,500.00	1	\$ 12,500.00
8	STORMWATER IMPROVEMENTS	00445	LS	\$ 373,800.00	1	\$ 373,800.00
9	3/4"-0 AGGREGATE BASE	00640	CY	\$ 85.00	1905	\$ 161,925.00
10	LEVEL 4, 1/2 INCH ACP	00745	TON	\$ 135.00	2689	\$ 363,015.00
11	PG 70-28ER ASPHALT IN LEVEL 4, 1/2 INCH ACP	00745	TON	\$ 100.00	161	\$ 16,100.00
12	EXTRA FOR ASPHALT APPROACHES	00749	EA	\$ 2,000.00	8	\$ 16,000.00
13	CONCRETE DRIVEWAYS	00759	SF	\$ 16.00	2629	\$ 42,064.00
14	CONCRETE WALKS	00759	SF	\$ 12.00	13856	\$ 166,272.00
15	EXTRA FOR NEW CURB RAMPS	00759	EA	\$ 3,000.00	11	\$ 33,000.00
16	TRUNCATED DOMES ON NEW SURFACES	00759	SF	\$ 50.00	358	\$ 17,900.00
17	CONCRETE MEDIANS, PATTERNED COLORED CONCRETE SURFACING	00759	SF	\$ 30.00	2430	\$ 72,900.00
18	CONCRETE APRON, DOWELLED, 9 INCHES THICK, PATTERNED COLORED CON	00759	SF	\$ 25.00	2905	\$ 72,625.00
19	CONCRETE CURBS, HIGH STRENGTH LOW PROFILE MOUNTABLE	00759	FT	\$ 30.00	1260	\$ 37,800.00
20	CONCRETE CURBS, HIGH STRENGTH WIDE MODIFIED TRUCK APRON CURB	00759	FT	\$ 30.00	173	\$ 5,190.00
21	CONCRETE CURBS, 16 INCH STANDARD CURB	00759	FT	\$ 16.00	2159	\$ 34,544.00
22	CONCRETE WALKS AT SPLITTER ISLAND	00759	SF	\$ 10.00	364	\$ 3,640.00
23	THERMOPLASTIC, EXTRUDED, GROOVED, NON-PROFILED	00865	FT	\$ 3.50	6061	\$ 21,213.50
24	PAVEMENT LEGEND, TYPE B-HS: BICYCLE LANE STENCIL	00867	EA	\$ 550.00	4	\$ 2,200.00
25	PAVEMENT LEGEND, TYPE B-HS: ARROWS	00867	EA	\$ 450.00	8	\$ 3,600.00
26	PAVEMENT BAR, TYPE B-HS, GROOVED	00867	SF	\$ 16.00	600	\$ 9,600.00
27	SIGNS, SUPPORTS, AND BASES	00940	LS	\$ 18,700.00	1	\$ 18,700.00
28	STREET LIGHTING	00970	LS	\$ 31,200.00	1	\$ 31,200.00
29	FLASHING BEACON INSTALLATION	00990	LS	\$ 65,000.00	1	\$ 65,000.00
30	LANDSCAPE & IRRIGATION	01040	LS	\$ 62,300.00	1	\$ 62,300.00
Subtotal						\$ 2,492,000.00
Construction Administration	Construction Administration & Inspection	-	LS	12%	1	\$ 299,040.00
	Construction Administration Subtotal					\$ 299,000.00
Right of Way	1646 NE 8TH ST					\$ 73,101.37
	755 NE PENN AVE					\$ 16,406.64
	846 NE PENN AVE					\$ 22,620.36
	900 NE PENN AVE					\$ 14,513.95
	1597 NE 9TH ST					\$ 19,735.12
	1609 NE 8TH ST					\$ 56,051.57
	750 NE OLNEY CT					\$ 29,899.31
	1515 NE 8TH ST					\$ 26,734.02
	1518 NE 8TH ST					\$ 9,640.85

Olney 8th - Option 4
Roundabout with SBR WBR Concept Cost Estimate

8/18/2026

Item No.	Description	Section	Unit	Unit Price	QTY	Total
	1508 NE 8TH ST,				\$	6,459.61
	UNKNOWN				\$	33,952.32
	751 NE QUIMBY AVE				\$	30,226.83
	ROW Subtotal				\$	339,300.00
Total without Range						\$ 3,131,000
Class 3 Estimate Range					-20%	\$ (626,200.00)
					30%	\$ 939,300.00
Total with Range				\$ 2,504,800	to	\$ 4,070,300

- Does not include City utility improvements

PART 2- SUPPLEMENTAL TRAFFIC ANALYSIS FOR NE 8TH STREET AND NE OLNEY AVENUE



MEMORANDUM

DATE: August 31, 2026

TO: Carrie Harris | City of Bend
Scott Little | DOWL

FROM: Eileen Chai, Steve Boice, PE, PTOE, Randy Johnson, PE, PTOE & Kayla Fleskes-Lane, PE
| DKS Associates

SUBJECT: Supplemental Traffic Analysis for NE 8th Street and NE Olney Avenue Project Scoping Project #21239-000

BACKGROUND

The City of Bend evaluated the operations of the NE 4th Street and NE 8th Street corridors beginning in 2021 as part of the 2020 General Obligation (GO) Bond program¹ to improve safety, mobility, and intersection traffic flow. The study included the intersection of NE 8th Street and NE Olney Avenue (Figure 1) and assessed the operational needs and physical constraints at the intersection. Based on the analysis, the study recommended a partial multi-lane roundabout with right-turn lanes along three of the approaches as the preferred intersection alternative.

Since completion of the previous study, updated traffic counts have become available, the Bend-Redmond Travel Demand Model (BRM) has been updated and the City has implemented a new Roundabout Design Manual (2024), which includes new guidance when considering turn lanes at roundabouts. Therefore, the purpose of this analysis is to reevaluate traffic operations at the study intersection to determine whether the previous recommendations are appropriate. This memorandum summarizes the development of the traffic volumes, analysis methodology and traffic operations results, including updated recommendations for the study intersection.

¹ NE 4th Street and NE 8th Street Corridors Evaluation Report, DKS Associates, 2026



FIGURE 1: STUDY INTERSECTION (NE 8TH STREET AND NE OLNEY AVENUE)

VOLUME DEVELOPMENT

EXISTING VOLUME COMPARISON

Traffic counts at this study intersection were collected from 6:00 a.m. to 10:00 p.m. and the peak hour started at 3:30 p.m. The collected counts are included in Appendix A. Figure 2 presents the existing traffic counts used in the 2021 analysis and the updated 2026 analysis. Compared to the 2021 counts, the 2026 counts show an approximately 15 percent reduction in total entering volume (TEV) at the study intersection.

Several factors may have contributed to this difference. First, the traffic counts were collected during different times of the year, with the 2021 counts collected in October and the 2026 counts collected in May, introducing potential seasonal variation. In addition, Butler Market Road, located north of the study intersection, was closed during the 2026 traffic count collection, which likely affected traffic patterns. It should be noted that the greatest reduction was observed on the southbound approach, consistent with traffic being diverted due to the roadway closure.

To account for these factors, the 2026 traffic counts were adjusted using available historical traffic count data and sensitivity testing conducted with the Bend-Redmond Travel Demand Model (BRM) to estimate the effects of the Butler Market Road closure. Additional information on the BRM is

provided in a later section of this memorandum. Following these adjustments, the difference in TEV between the 2021 and adjusted 2026 counts resulted in an approximate two percent reduction.

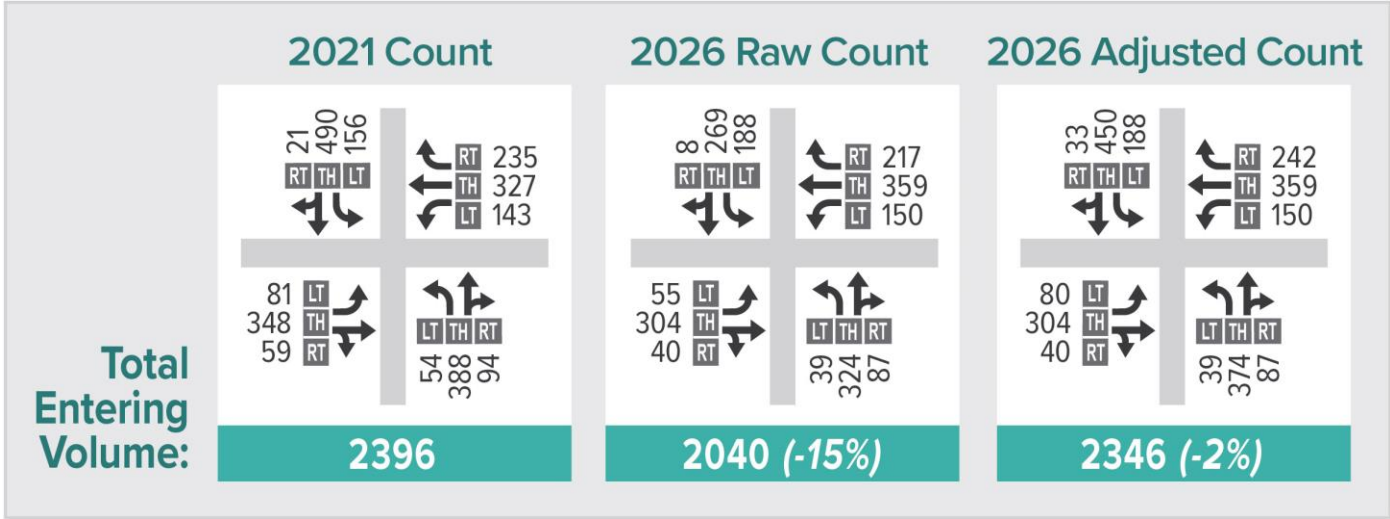


FIGURE 2: EXISTING VOLUME COMPARISON

FUTURE VOLUME FORECASTING

FORECASTING METHODOLOGY

The Oregon Department of Transportation (ODOT) developed and maintains the Bend-Redmond Travel Demand Model (BRM), which estimates daily and p.m. peak-hour travel demand for the transportation network serving the Bend and Redmond area. The current BRM includes a 2019 base-year scenario and a 2045 future-year scenario.

The 2045 baseline scenario network includes financially constrained transportation projects from the Bend Metropolitan Transportation Plan. In addition to these financially constrained projects, the network also incorporates the Hawthorne Crossing project, which restricts automobile traffic along portions of Hawthorne Avenue.

Future traffic volumes for the study intersection were forecast for a 2046 horizon year using the 2019 base-year and 2045 future-year models. Raw p.m. link level volumes from the models were post-processed using methods consistent with the ODOT Analysis Procedures Manual (APM). This approach was derived from methodologies outlined in the National Cooperative Highway Research Program (NCHRP) Report 765.²

² NCHRP Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design. Transportation Research Board, 2014.

FORECAST GROWTH

Figure 3 compares the forecast future traffic volumes developed for the previous study (2040) with the updated forecast developed for this analysis (2046).

Relative to the adjusted 2026 existing traffic volumes, northbound traffic is forecast to increase by approximately seven to nine percent, while southbound traffic is forecasted to increase by 15 to 20 percent. Eastbound traffic is projected to increase by 12 to 26 percent, and westbound traffic is projected to increase by 21 to 38 percent by 2046.

Compared to the previous study's 2040 forecast, the updated 2046 forecast results in an approximately 11 percent lower TEV at the study intersection and shows different directional growth patterns. These differences are primarily attributable to updates made to the BRM between the two studies. The 2021 analysis used the previous BRM with a 2019 base year and 2040 forecast year that included ramp metering assumptions. The current analysis uses the updated BRM with revised 2019 land use, a 2045 forecast year, and does not include ramp metering in the model network, which tends to pull more traffic from the Bend Parkway to the local City system.

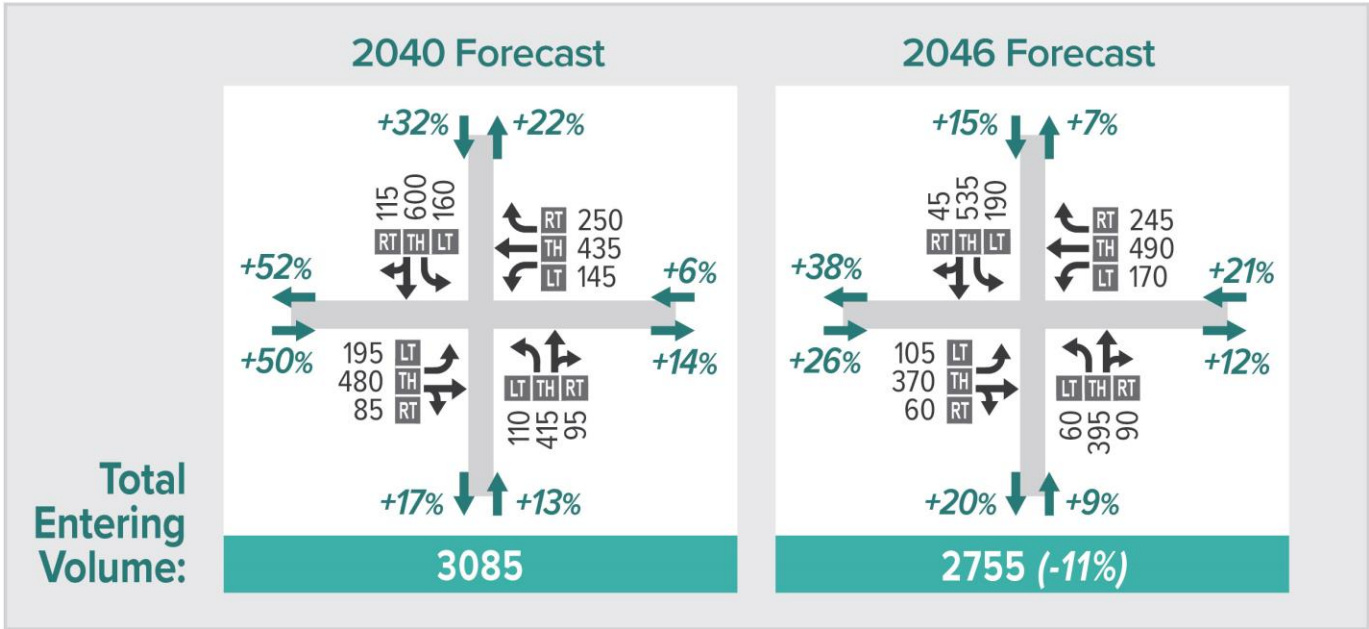


FIGURE 3: FUTURE VOLUME FORECAST COMPARISON

OFF-PEAK HOUR VOLUMES

This analysis also evaluates a 16-hour efficiency metric, which requires forecast traffic volumes throughout the day in addition to the p.m. peak hour. Off-peak turning movement volumes were developed by applying the observed 2026 turning movement proportions for each off-peak hour to the forecast 2046 p.m. peak-hour turning movement volumes.

TRAFFIC OPERATIONS PERFORMANCE MEASURES

Intersection operations were analyzed using Synchro and Sidra software and Highway Capacity Manual (HCM) 7th Edition methodology³ to assess traffic operations for each of the alternatives. Performance measures reported for this analysis include the following. Note that the original scoping evaluation report (which this memo supplements) includes additional discussion and metrics focused on safety and pedestrian and bicycle considerations.

- **Volume-to-capacity (V/C) ratios:** A proportion from zero to one that measures the approximate amount of an intersection's vehicle throughput capacity that is used. For example, a v/c ratio of 0.90 indicates that 90 percent of an intersection's capacity to move traffic is being used. Intersection v/c ratios lower than the mobility standards indicate that intersections operate at acceptable levels of mobility.
- **Level of service (LOS):** An intersection performance measure commonly used to provide an overview of how each movement, and the overall intersection is operating. The LOS provides a "report card" rating of letters A through F based on average vehicle delay through the intersection. LOS A indicates free flow conditions with minimal delay traveling through an intersection while LOS F indicates excessive vehicle delay and demand is greater than capacity.
- **Intersection delay:** The average stopped delay a vehicle experiences at an intersection.
- **Queuing:** The average queue is calculated as the average of the queue lengths recorded at two-minute intervals over the analysis period. The 95th percentile queue is defined as the queue length that is exceeded five percent of the time during the analysis period. The 95th percentile queue is useful in determining the appropriate length of turn pockets but is not representative of what an average driver would experience.
- **16-hour efficiency metric:** In addition to traditional intersection performance measures, this analysis also evaluates the 16-hour efficiency metric under future 2046 conditions, as described in NCHRP Report 1036.⁴ The metric measures the percentage of hours between 5:00 a.m. and 9:00 p.m. during which the intersection operates at or above 60 percent of its capacity ($v/c \geq 0.60$). Hours with a v/c ratio below 0.60 are considered inefficient because the available roadway capacity is substantially underutilized.

The City of Bend's mobility target for roundabout and signalized intersections is a maximum v/c ratio of 1.00 for the intersection.

To evaluate the progression of intersection operations over the planning horizon, intermediate forecast years (e.g., five-, 10-, and 15-year increments) were also analyzed as part of sensitivity analysis. Traffic volumes for these scenarios were estimated by proportionally interpolating between the adjusted 2026 existing traffic volumes and the 2046 forecast traffic volumes. These intermediate-year scenarios were used to assess when the scenario would begin exceeding the City's mobility target.

Traffic counts for this study were collected from 6:00 a.m. to 10:00 p.m. Because the p.m. peak hour occurred between 3:30 p.m. and 4:30 p.m., the hourly analysis periods were developed using

³ Highway Capacity Manual 7th Edition, Transportation Research Board, 2022.

⁴ <https://www.nationalacademies.org/read/26788>

half-hour intervals centered on the peak hour (e.g., 6:30 to 7:30 a.m., 7:30 to 8:30 a.m., ..., 8:30 to 9:30 p.m.). As a result, 15 one-hour analysis periods were evaluated. For consistency with the 16-hour efficiency metric described in NCHRP Report 1036, the 16th hour was assumed to be inefficient ($v/c < 0.60$), as traffic volumes during the adjacent early morning and late evening periods were well below peak conditions. The efficiency metric was therefore calculated using a 16-hour analysis period.

INTERSECTION ANALYSIS RESULTS

The intersection analysis includes two primary evaluations: intersection operations, queueing and multi-hour efficiency.

INTERSECTIONS OPERATIONS (LOS, V/C, DELAY) RESULTS

Consistent with the previous study, this analysis evaluated two intersection control types for the study intersection: traffic signal and roundabout. The alternatives evaluated are summarized below, also shown in Figure 4.

- Current Configuration (Baseline): Signalized intersection with the current lane configuration.
- Alternative 1: Signalized intersection with an additional exclusive southbound right-turn lane and extension of westbound right-turn lane.
- Alternative 2: Single-lane roundabout.
- Alternative 3: Partial multi-lane roundabout with westbound right-turn lane.
 - This alternative represents the first incremental capacity improvement to the single-lane roundabout and was included in evaluating the operational benefit of addressing the westbound movement independently.
- Alternative 4: Partial multi-lane roundabout with westbound and southbound right-turn lanes.
 - The previous study evaluated a similar alternative that also included an eastbound right-turn lane; however, because it provided minimal operational benefit in the updated analysis with new traffic volumes, the eastbound right-turn lane was not carried forward in this alternative.
- Alternative 5: Partial multi-lane roundabout with westbound right-turn lane and southbound left-turn lane.
 - This alternative was developed based on the critical movements identified in the updated single lane roundabout analysis (Alternative 2).

The operational analysis results are presented in Table 1 and detailed HCM reports are provided in Appendix B and C.

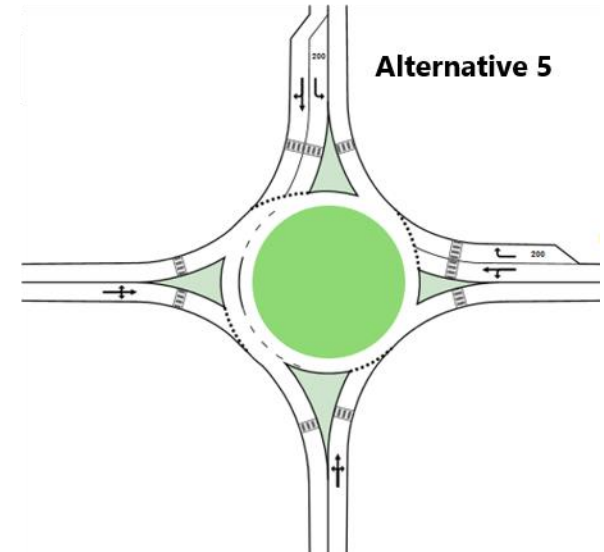
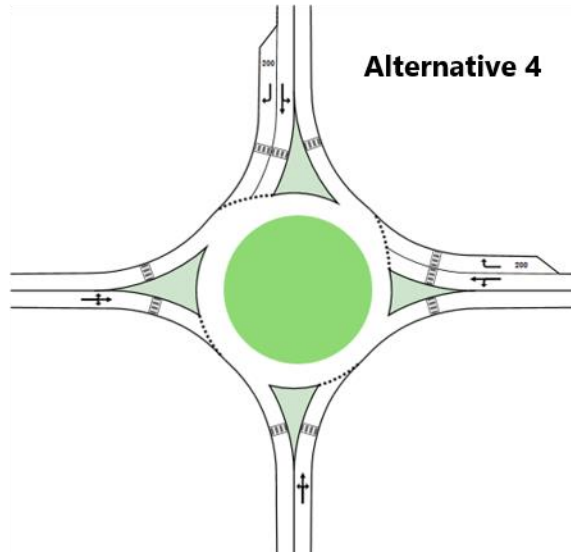
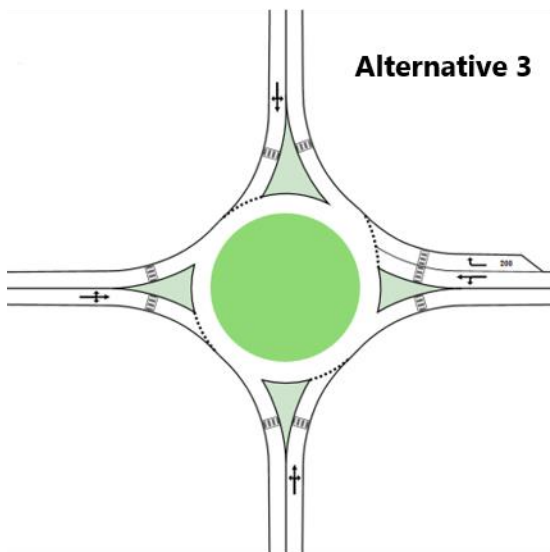
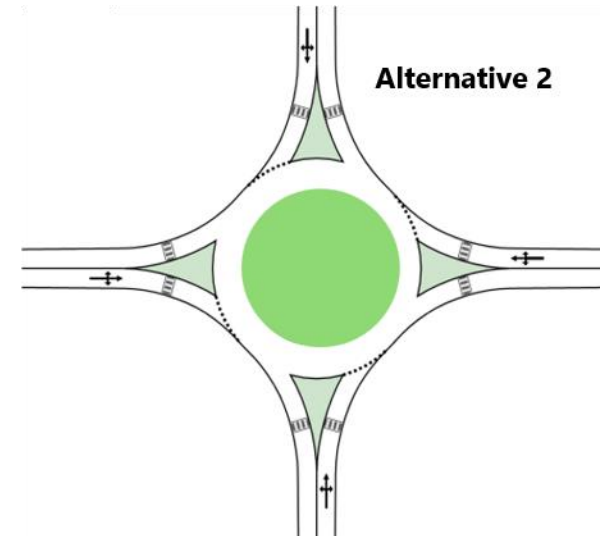
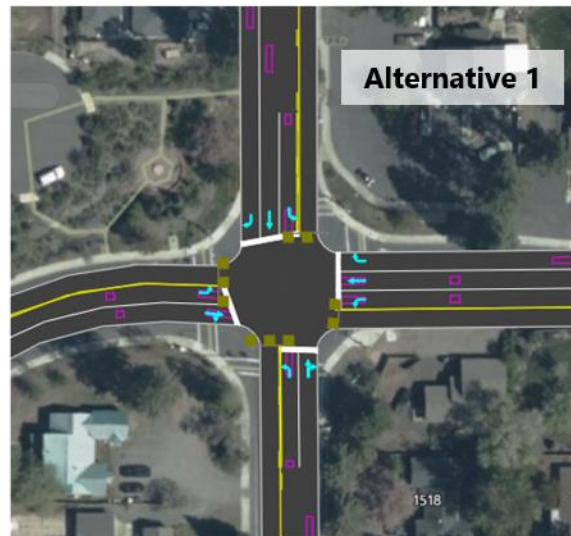
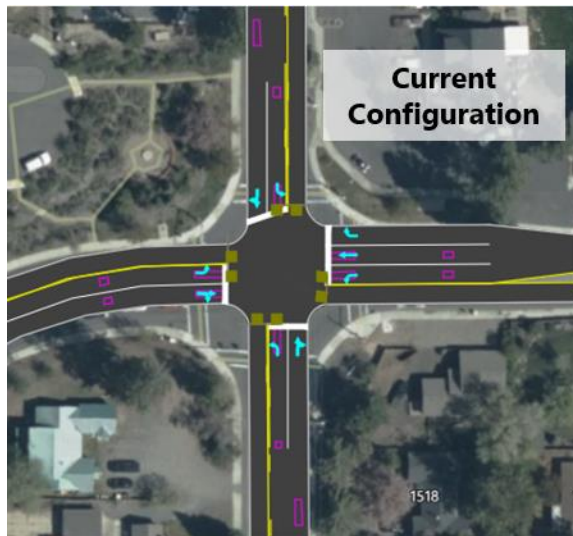


FIGURE 4: ALTERNATIVE LANE CONFIGURATIONS

As shown in Table 1, findings from the intersection operations analysis indicate:

- All alternatives meet the City's mobility target under existing 2026 traffic volumes.
- The current configuration is not expected to meet the City's mobility target⁵ under future 2046 conditions, with the intersection expected to fail to meet standards as soon as the next five years.
- Under 2046 future conditions, the single-lane roundabout (Alternative 2) and the partial multi-lane roundabout with a westbound right-turn lane (Alternative 3) are projected to fail to meet the target, indicating that additional capacity would be needed under future traffic conditions.
 - > The single-lane roundabout is projected to operate with a westbound approach v/c ratio of 0.99 in 2036 and reach capacity around 2037.
 - > With the addition of the westbound right-turn lane, Alternative 3 addresses this initial westbound constraint, however, the southbound approach subsequently becomes the critical movement, with a projected v/c of 0.99 in 2041 and capacity expected to be reached around 2042.
- Under 2046 future conditions, Alternatives 1, 4 and 5 meet the City's mobility target
 - Alternative 4, which was recommended in the previous study, continues to meet the City's mobility target, but its future performance is close to the acceptable threshold (0.997 v/c ratio compared to a target of 1.0).
 - > Alternative 4 was previously recommended as it maintained consistent lanes on all approaches to the roundabout (right turn lane and shared through/left lane), reducing the potential for driver confusion.
 - Among the roundabout alternatives, Alternative 5 provides the best overall operational performance under future conditions.
 - > Alternative 5 utilizes lane configurations that best accommodate turning movement volumes (e.g., higher southbound left volume than southbound right volume).

⁵ It should be noted that HCM analysis assumes the westbound right-turn lane operates independently at full capacity. In practice, especially under future conditions, queues in the adjacent westbound through lane are expected to block access to the right-turn lane during peak periods, reducing its operational effectiveness. As a result, the intersection was modeled without the westbound right turn lane when reporting intersection LOS, V/C and delay to try to better reflect actual performance consistent with the queueing performance discussed in the next section.

TABLE 1: BASELINE WEEKDAY P.M. PEAK HOUR INTERSECTION OPERATIONS

#	ALTERNATIVES	TRAFFIC CONTROL	MOBILITY TARGET	LOS	DELAY (SEC)	WORST V/C (APPROACH) ^A	FAILURE YEAR
EXISTING 2026							
C.	Existing signal lane configuration	Signal	v/c ≤ 1.00	C	24	0.82 (NB/EB)	NA
1	Signal with SBR lane			C	34	0.85 (NB/EB)	
2	Single lane roundabout	Roundabout		C	22	0.87 (WB)	
3	Partial multi-lane roundabout (WBR)			C	16	0.81 (SB)	
4	Partial multi-lane roundabout (SBR, WBR)			B	15	0.77 (SB)	
5	Partial multi-lane roundabout (SBL, WBR)			B	13	0.62 (NB)	
FUTURE 2046							
C.	Existing signal lane configuration	Signal	v/c ≤ 1.00	E ^B	75 ^B	1.27 (WB) ^B	By 2031 ^B
1	Signal with SBR lane			D	50	0.95 (SB)	NA
2	Single lane roundabout	Roundabout		F	51	1.10 (WB) ^C	~2037
3	Partial multi-lane roundabout (WBR)			E	35	1.06 (SB)	~2042
4	Partial multi-lane roundabout (SBR, WBR)			D	29	0.997 (SB)	NA
5	Partial multi-lane roundabout (SBL, WBR)			C	22	0.83 (EB)	

^A Overall intersection LOS and delay reported for signalized and roundabout intersections. Worst approach v/c reported for signalized and roundabout intersections.

^B Future signal operations reported without a westbound right-turn lane modeled to more accurately reflect expected conditions where the through lane blocks access to the right turn lane. If a full length right-turn lane was provided, intersection would result in LOS D, 38s delay and 0.90 (SB) v/c ratio.

^C Southbound approach also has an approach v/c >1.0 (southbound approach v/c=1.01).

Bold and Red indicates failing to meet City of Bend mobility standards.

QUEUEING RESULTS

Table 2 compares the 95th percentile and average vehicle queues under existing (2026) and future (2046) conditions for each alternative, with model output results provided in Appendix B. Under existing conditions, all alternatives operate without queue spillback to adjacent major intersections, as shown in Figure 5. The roundabout alternatives generally produce shorter queues than the signalized alternatives.

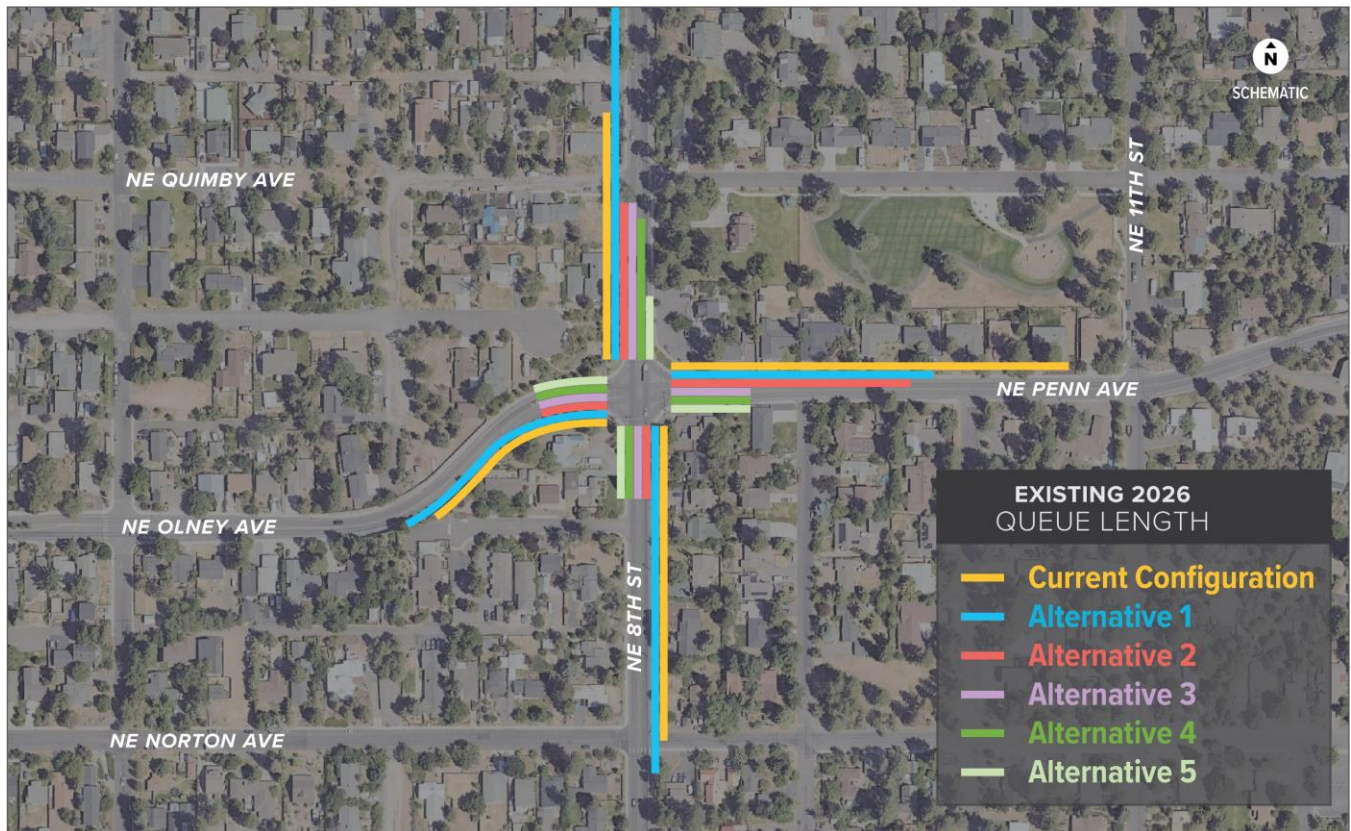


FIGURE 5: 95TH PERCENTILE VEHICLE QUEUE LENGTH UNDER EXISTING 2026 CONDITION

Under future (2046) conditions, both signalized alternatives and the single-lane roundabout are forecasted to experience substantial queueing as shown in Figure 6. The signalized alternatives result in both average and 95th percentile queues spilling back to adjacent intersections or extending beyond 800 feet, particularly on the westbound approach and southbound approach (where a future roundabout is proposed at NE Revere Avenue). Similarly, the single-lane roundabout is forecast to exceed 800 feet on the westbound approach and the southbound queue extends beyond NE Revere Avenue.

In contrast, the partial multi-lane roundabout alternatives substantially reduce queue lengths under future conditions. Alternative 3, which adds a westbound right-turn lane to the single-lane roundabout, substantially reduces the westbound queue, however, the southbound queue becomes the primary constraint and extends beyond NE Revere Avenue. Neither Alternative 4 nor Alternative 5 is forecasted to experience queue spillback to any other adjacent major intersection, however the Alternative 4 intersection the southbound queue does extend to within 75 feet of NE

Revere Avenue. Among the evaluated alternatives, Alternative 5 provides the shortest overall queues, particularly on the southbound approach, consistent with its improved operational performance presented in Table 1.

Therefore, Alternative 5 is also most compatible with the proposed roundabout at NE Revere Avenue. In particular, the signal alternatives would likely result in queue spillback into the proposed roundabout at NE Revere Avenue, reducing the roundabout capacity and creating a potential safety risk. If signalized alternatives were considered at NE Olney Avenue/NE 8th Street, a traffic signal would need to be considered at NE Revere Avenue/NE 8th Street to help better manage queues between intersections and traffic progression.



FIGURE 6: 95TH PERCENTILE VEHICLE QUEUE LENGTH UNDER FUTURE 2046 CONDITION

TABLE 2: QUEUING (FEET, 95TH PERCENTILE/AVERAGE) AT STUDY INTERSECTION

#	ALTERNATIVES	NORTHBOUND	EASTBOUND	WESTBOUND	SOUTHBOUND
	STORAGE LENGTH (FT)	525 (Norton Ave)	>800 (6 th St)	775 (11 th St)	650 (Revere Ave)
EXISTING 2026					
C.	Existing signal lane configuration	550 /325	375/225	700/325	425/250
1	Signal with SBR lane	600 /350	425/250	450/250	650/300
2	Single lane roundabout	125/50	100/50	425/175	275/100
3	Partial multi-lane roundabout (WBR)	125/50	100/50	125/50	275/125
4	Partial multi-lane roundabout (SBR, WBR)	125/50	75/50	125/50	250/100
5	Partial multi-lane roundabout (SBL, WBR)	125/50	100/50	125/50	100/50
FUTURE 2046					
C.	Existing signal lane configuration	>800/600	650/375	>800/>800	>800/>800
1	Signal with SBR lane	>800/550	>800 /450	>800 /600	>800/>800
2	Single lane roundabout	175/75	200/75	>800 /475	675 /275
3	Partial multi-lane roundabout (WBR)	175/75	200/75	275/100	800 /325
4	Partial multi-lane roundabout (SBR, WBR)	175/75	150/75	275/100	575/225
5	Partial multi-lane roundabout (SBL, WBR)	175/75	225/75	275/100	200/75

Bold and Red indicates queue spillback to the next major intersection or exceed 800 feet.

MULTI-HOUR EFFICIENCY

The 2046 16-hour efficiency analysis was used to compare how efficiently each alternative utilizes available capacity throughout the analysis period. Figure 7 summarizes, based on the worst movement, the number of analysis hours operating below 60 percent of capacity, within the target utilization range (v/c from 0.60 to 1.00), and over capacity (v/c greater than 1.00) for each alternative. Alternative 1 operates within the target range for the most hours (14 hours) while Alternative 2-5 result in a similar number of hours within the target range (8-9 hours).

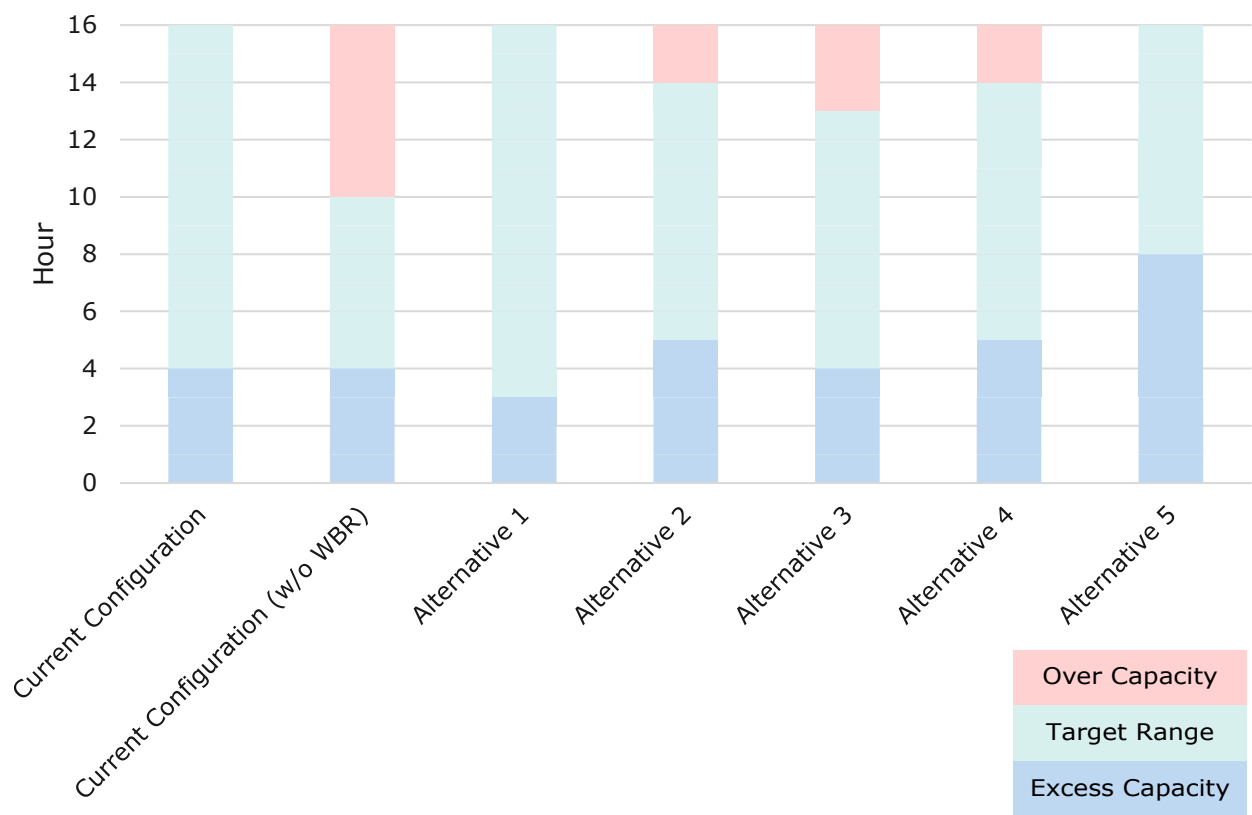


FIGURE 7: 2046 16-HOUR CAPACITY UTILIZATION BY ALTERNATIVE (WORST APPROACH)

Figure 8 presents the corresponding hourly v/c profiles for the worst movement, illustrating how capacity utilization varies throughout the analysis period and when each alternative falls within or outside these ranges. Again, Alternatives 2-5 have a fairly similar number of hours within the

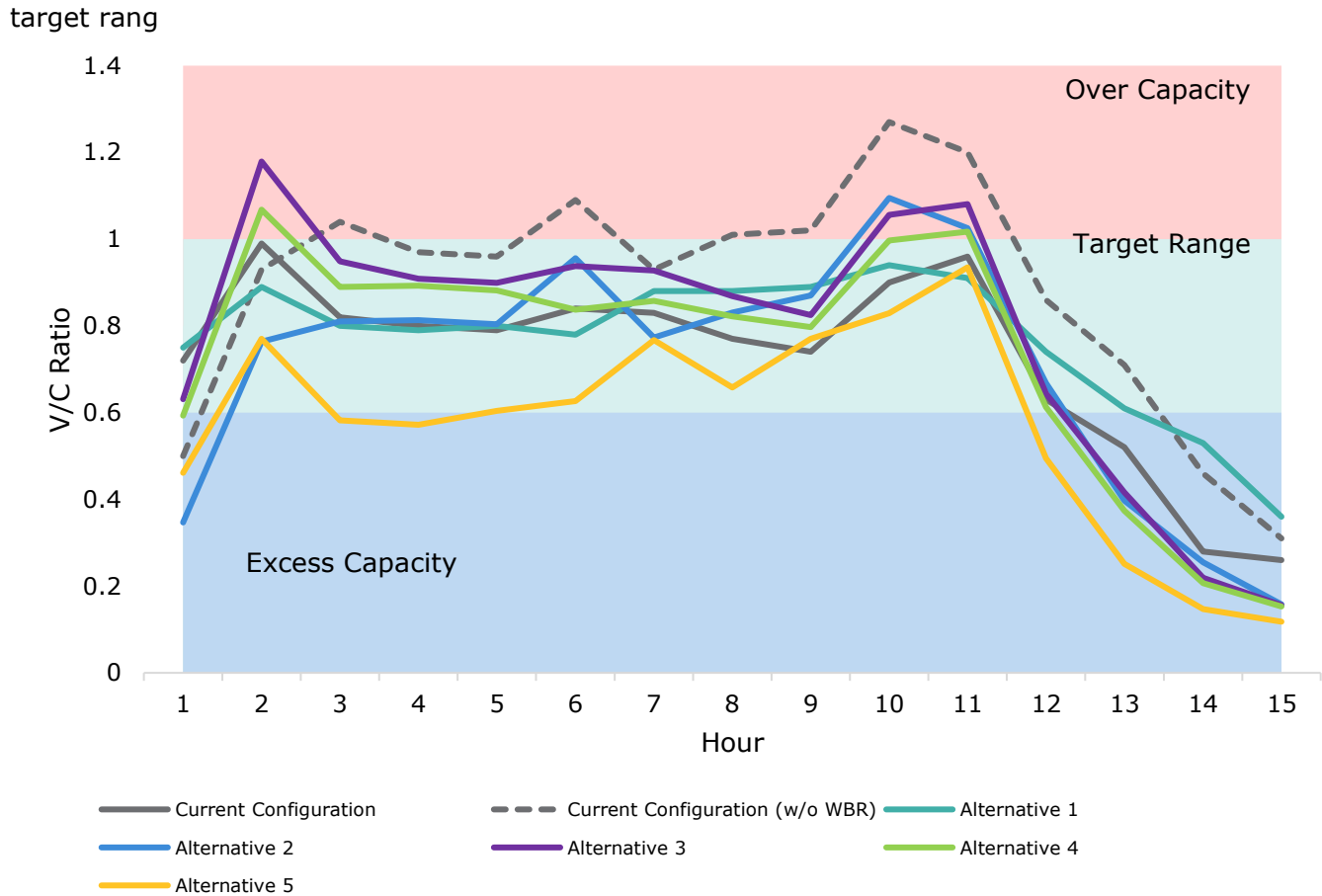


FIGURE 8: 2046 HOURLY WORST-MOVEMENT V/C PROFILES BY ALTERNATIVE

Table 3 provides the corresponding efficiency metric results by approach and for the overall intersection. Detailed results are provided in Appendix D. While there is no recommended standard for the 16-hour efficiency metric, as shown in Table 3, the study intersection with current configuration, Alternative 2, and Alternative 3 achieved the most consistent efficiency across all approaches, indicating comparable utilization of available capacity throughout the analysis period. Alternatives 4 and 5 resulted in slightly lower overall efficiency. By approach, the northbound efficiency decreased from 81 percent under the signalized alternatives to 44 percent for the roundabout alternatives, while the westbound approach showed the greatest reduction in efficiency for Alternatives 3, 4 and 5. The southbound approach generally maintained similarly high efficiency across all alternatives.

The 16-hour analysis also identifies capacity constraints that are not apparent from the study p.m. peak hour analysis alone. Although Alternatives 2 and 3 efficiently utilize their available capacity throughout much of the day, individual movements are projected to exceed capacity during three of the 16 analysis hours. Alternative 4 is projected to have two hours with individual movements exceeding capacity, despite meeting the City's mobility target during the p.m. peak hour, which represents the hour with the highest total intersection volume. Alternative 5 is not projected to have any hours with individual approaches exceeding capacity. These results illustrate the tradeoff between capacity utilization and reserve capacity, with the single-lane roundabout utilizing more of

the available capacity throughout the day and the partial multi-lane roundabouts generally providing greater reserve capacity.

TABLE 3: FUTURE 2046 16-HOUR EFFICIENCY METRIC RESULTS

#	ALTERNATIVES	HOURS WHERE WORST MOVEMENT V/C>1.0	NORTH- BOUND	EAST- BOUND	WEST- BOUND	SOUTH- BOUND	OVERALL /(WORST)
C.	Existing signal lane configuration	6 ^A	81%	75%	63%	75%	75%
1	Signal with SBR lane	0	81%	75%	75%	81%	75%
2	Single lane roundabout	3	44%	50%	69%	75%	(75%)
3	Partial multi-lane roundabout (WBR)	3	44%	50%	31%	75%	(75%)
4	Partial multi-lane roundabout (SBR, WBR)	2 ^B	44%	50%	31%	69%	(69%)
5	Partial multi-lane roundabout (SBL, WBR)	0	44%	50%	31%	63%	(63%)

^A Future signal operations reported without a westbound right-turn lane modeled to more accurately reflect expected conditions where the through lane blocks access to the right turn lane. If a full length right-turn lane was provided, there would be no hours with a v/c > 1.0.

^B While the intersection meets standards under the p.m. peak hour (which represents the hour with the highest total volume at the intersection), there are two off-peak hours where individual movements fail to meet standards.

ADDITIONAL SAFETY AND OTHER CONSIDERATIONS

According to ODOT Crash Reduction Factor Manual, converting signalized intersection into roundabouts is a Federal highway Administration (FHWA) proven safety countermeasure. It eliminates up to 75 percent of vehicle conflict points typically associated with traditional intersections and has been shown to substantially reduce 78 percent in all crashes at all injury severities. In addition to reducing the number of conflict points, roundabout geometry reduces vehicle speeds through the intersection and can shift crash patterns from higher-severity angle crashes to typically less-severe sideswipe crashes. These characteristics can substantially reduce the frequency and severity of crashes compared to a traditional signalized intersection. These considerations should be balanced with operational performance, project cost, and right-of-way impacts during project development.⁶

Compared to single-lane roundabouts, partial multi-lane roundabouts introduce additional design and operational considerations. While the additional lanes improve capacity for select movements, they also increase driver decision complexity, lane selection requirements, and the number of potential vehicle conflict points. Although partial multi-lane roundabouts generally retain many of the safety benefits associated with roundabouts, these operational and safety tradeoffs should be carefully evaluated during design development.

The City of Bend has previously evaluated the safety and operational performance of multilane and hybrid roundabouts at the Butler Market Road/NE 27th Street/Empire Avenue⁷ and SE 15th Street/Reed Market Road⁸ intersections. These studies found high driver yielding rates, lane-assignment compliance, and overall safety performance that was comparable to or better than national averages. At the Butler Market Road/NE 27th Street/Empire Avenue roundabout, observed pedestrian/bicyclist yielding rates ranged from 95 to 100 percent for entering vehicles and were approximately 65 percent for exiting vehicles, compared to national averages of 76 to 79 percent and 54 to 69 percent, respectively. The evaluation at SE 15th Street/Reed Market Road similarly found driver yielding rates of over 90 percent. The studies also identified considerations associated with multilane configurations, including lower yielding rates at roundabout exits compared to entries, particularly for bicycle crossing movements (55 percent), increased lane-selection demands, and the importance of clear signing, pavement markings, and driver education. Given the similarities between these multilane roundabouts and the alternatives evaluated in this study, these findings provide valuable local context for assessing the potential safety implications of the proposed intersection improvements.

Overall, the findings of the prior studies indicate that multilane and hybrid roundabouts can provide favorable safety performance when appropriately designed. Combined with the documented safety benefits of converting signalized intersections to roundabouts, these findings support consideration of a partial multi-lane roundabout as the ultimate configuration for the study intersection. Compared to maintaining a signalized intersection, a partial multi-lane roundabout has the

⁶ <https://www.oregon.gov/odot/Engineering/ARTS/CRF-Manual.pdf>

⁷ 15th Street & Reed Market Road – RRFB Evaluation, 2025

⁸ City of Bend Roundabout Assessment, 2017

potential to reduce the number and severity of vehicle conflicts while providing the additional capacity needed to accommodate long-term traffic demand.

RECOMMENDATIONS

Under the conservative assumption of not modeling the westbound right-turn lane due to potential blockage from the adjacent through-lane queue, the sensitivity analysis and queuing results indicate that westbound operational constraints are expected to become more significant over time, with an expected year of failure in the next five years. Rather than waiting until operational deficiencies become evident, it is appropriate to begin planning for an intersection improvement strategy.

Based on the operational analysis, **Alternative 5 (partial multi-lane roundabout with a westbound right-turn lane and southbound left-turn lane) is recommended as the long-term intersection configuration.** This alternative provides the greatest long-term operational capacity while retaining many of the safety benefits associated with roundabouts. Planning and right-of-way acquisition should account for the full Alternative 5 configuration, even if all improvements are not constructed initially. Implementation will require additional evaluation of right-of-way needs, construction footprint, utility impacts, and potential impacts to adjacent properties. Public outreach should also be conducted to address potential concerns related to access, construction impacts, and changes to traffic operations.

The intermediate-year analysis indicates that the westbound approach of a single-lane roundabout (Alternative 2) is projected to reach capacity around 2037. Adding the westbound right-turn lane (Alternative 3) addresses this initial constraint and extends the operational life of the roundabout to approximately 2042, when the southbound approach is projected to reach capacity. These results indicate that a phased construction approach could be considered, with **the westbound right-turn lane included in the initial configuration and the southbound left-turn lane could be deferred** until future traffic growth warrants the additional capacity (e.g., if future southbound queues start to spillback towards the proposed NE Revere Avenue).

However, the City does not currently have a monitoring program or mechanism to implement the southbound left-turn lane in the future. Therefore, the City currently anticipates constructing the ultimate partial multi-lane roundabout configuration rather than phasing the improvements. As the project advances through design, careful consideration should be given to addressing the safety concerns associated with the partial multi-lane roundabout, including clear lane delineation and signing, geometric design, targeted vehicle speeds, and pedestrian and bicycle crossing treatments. Potential treatments such as Rectangular Rapid Flashing Beacon (RRFB) at multi-lane crossings, raised crosswalks, and enhanced or detectable lane-separation elements should be evaluated as appropriate.

APPENDIX CONTENTS

Appendix A: Traffic Counts

Appendix B: HCM and Queueing Report

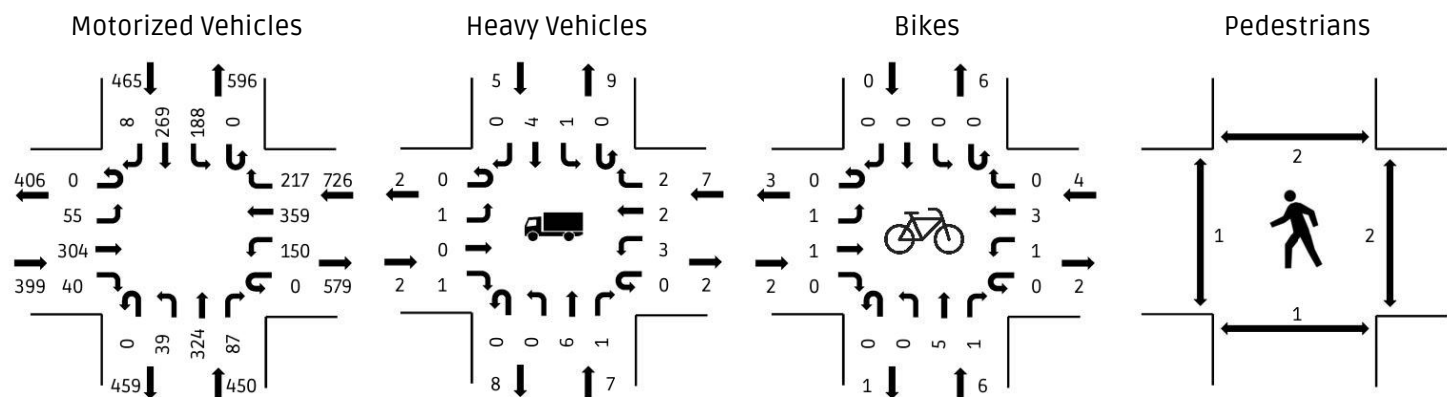
Appendix C: Multi Year Analysis

Appendix D: 16-hour Analysis

APPENDIX A. TRAFFIC COUNTS



Location: NE 8th St & NE Olney Ave
 Date: 2026-05-20
 Peak Hour Start: 03:30 PM
 Peak 15 Minute Start: 04:00 PM
 Peak Hour Factor: 0.99



(peak hour)

Percent Heavy Vehicles

Northbound (NE 8th St)					Southbound (NE 8th St)					Eastbound (NE Olney Ave)					Westbound (NE Olney Ave)				
Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR
0	2	1	0	0	0	2	0	0	0	2	0	2	0	0	2	1	1	0	0

All Vehicle Volumes

Time	NB (NE 8th St)					SB (NE 8th St)					EB (NE Olney Ave)					WB (NE Olney Ave)					Totals	
	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	15min	1hr
06:00:00 AM	1	13	7	0	0	19	16	1	0	0	2	21	1	0	0	6	15	12	0	0	114	
06:15:00 AM	4	14	14	0	0	26	32	0	0	0	0	30	2	0	0	20	11	11	0	0	164	
06:30:00 AM	2	27	25	0	0	36	34	0	0	0	1	45	1	0	0	17	14	18	0	0	220	
06:45:00 AM	1	38	28	0	0	59	51	0	0	0	1	86	0	0	0	22	33	27	0	0	346	844
07:00:00 AM	0	50	16	0	0	57	43	1	0	0	1	63	2	0	0	22	28	19	0	0	302	1032
07:15:00 AM	5	55	25	0	0	40	72	5	0	0	5	50	9	0	0	28	47	28	0	0	369	1237
07:30:00 AM	6	76	18	0	0	52	82	4	0	0	3	76	7	0	0	27	73	27	0	0	451	1468
07:45:00 AM	12	78	15	0	0	74	76	6	0	0	6	97	5	0	0	48	89	32	0	0	538	1660
08:00:00 AM	5	52	18	0	0	48	62	3	0	0	1	73	7	0	0	31	81	31	0	0	412	1770
08:15:00 AM	10	60	17	0	0	52	58	3	0	0	6	77	5	0	0	31	63	27	0	0	409	1810
08:30:00 AM	7	61	24	0	0	48	63	3	0	0	4	61	4	0	0	31	65	47	0	0	418	1777
08:45:00 AM	3	47	32	0	0	61	73	5	0	0	6	77	10	0	0	40	84	53	0	0	491	1730
09:00:00 AM	7	48	31	0	0	45	65	1	0	0	4	53	6	0	0	31	68	68	0	0	427	1745
09:15:00 AM	5	54	16	0	0	47	41	0	0	0	9	50	7	0	0	29	64	48	0	0	370	1706
09:30:00 AM	8	52	29	0	0	38	52	1	0	0	7	53	7	0	0	40	61	58	0	0	406	1694
09:45:00 AM	6	60	30	0	0	59	68	2	0	0	4	62	7	0	0	43	81	51	0	0	473	1676
10:00:00 AM	8	72	24	0	0	41	60	0	0	0	5	61	8	0	0	29	66	49	0	0	423	1672
10:15:00 AM	6	56	24	0	0	42	53	0	0	0	5	66	4	0	0	35	65	51	0	0	407	1709
10:30:00 AM	7	55	28	0	0	47	52	0	0	0	2	75	10	0	0	35	83	40	0	0	434	1737
10:45:00 AM	6	66	27	0	0	43	66	1	0	0	6	67	6	0	0	46	59	54	0	0	447	1711
11:00:00 AM	6	50	29	0	0	47	53	0	0	0	4	60	10	0	0	37	74	52	0	0	422	1710
11:15:00 AM	6	52	21	0	0	55	60	2	0	0	10	52	4	0	0	28	78	49	0	0	417	1720
11:30:00 AM	5	68	29	0	0	37	47	5	0	0	3	58	6	0	0	43	80	44	0	0	425	1711
11:45:00 AM	12	82	23	0	0	43	66	3	0	0	11	58	8	0	0	38	93	53	0	0	490	1754
12:00:00 PM	10	79	16	0	0	40	42	4	0	0	11	63	10	0	0	40	83	56	0	0	454	1786
12:15:00 PM	7	64	31	0	0	38	68	2	0	0	13	79	7	0	0	32	61	49	0	0	451	1820
12:30:00 PM	7	68	22	0	0	51	51	4	0	0	4	83	11	0	0	34	67	49	0	0	451	1846

12:45:00 PM	9	66	30	0	0	64	61	0	0	0	5	97	10	0	0	36	72	50	0	0	500	1856
01:00:00 PM	12	68	21	0	0	51	48	2	0	0	8	90	6	0	0	29	56	37	0	0	428	1830
01:15:00 PM	10	65	29	0	0	46	69	3	0	0	6	76	11	0	0	32	70	39	0	0	456	1835
01:30:00 PM	5	65	39	0	0	56	59	5	0	0	10	68	6	0	0	24	75	40	0	0	452	1836
01:45:00 PM	10	68	25	0	0	47	59	0	0	0	5	67	7	0	0	37	69	50	0	0	444	1780
02:00:00 PM	8	53	27	0	0	49	63	1	0	0	13	69	8	0	0	25	68	49	0	0	433	1785
02:15:00 PM	13	73	17	0	0	52	45	1	0	0	10	70	9	0	0	31	76	50	0	0	447	1776
02:30:00 PM	8	89	27	0	0	42	62	0	0	0	12	76	19	0	0	28	67	42	0	0	472	1796
02:45:00 PM	10	78	22	0	0	48	42	3	0	0	6	90	15	0	0	33	65	50	0	0	462	1814
03:00:00 PM	5	58	29	0	0	44	67	0	0	0	8	83	10	0	0	31	71	59	0	0	465	1846
03:15:00 PM	4	69	22	0	0	39	54	1	0	0	9	77	9	0	0	45	80	49	0	0	458	1857
03:30:00 PM	8	72	24	0	0	60	70	0	0	0	10	81	12	0	0	28	77	72	0	0	514	1899
03:45:00 PM	13	83	25	0	0	42	63	1	0	0	19	73	8	0	0	40	85	43	0	0	495	1932
04:00:00 PM	10	78	19	0	0	43	63	0	0	0	10	78	12	0	0	40	106	57	0	0	516	1983
04:15:00 PM	8	91	19	0	0	43	73	7	0	0	16	72	8	0	0	42	91	45	0	0	515	2040
04:30:00 PM	14	79	17	0	0	45	64	2	0	0	19	77	12	0	0	23	95	39	0	0	486	2012
04:45:00 PM	3	77	18	0	0	36	71	4	0	0	19	85	7	0	0	28	98	46	0	0	492	2009
05:00:00 PM	8	83	19	0	0	49	75	2	0	0	27	84	18	0	0	46	74	58	0	0	543	2036
05:15:00 PM	7	73	19	0	0	52	73	1	0	0	12	77	11	0	0	36	87	39	0	0	487	2008
05:30:00 PM	3	82	21	0	0	36	57	3	0	0	15	72	8	0	0	32	77	47	0	0	453	1975
05:45:00 PM	9	65	28	0	0	42	40	0	0	0	10	57	8	0	0	31	71	33	0	0	394	1877
06:00:00 PM	3	53	31	0	0	36	57	1	0	0	13	44	4	0	0	32	51	47	0	0	372	1706
06:15:00 PM	3	50	26	0	0	39	38	1	0	0	6	47	8	0	0	22	40	18	0	0	298	1517
06:30:00 PM	4	49	26	0	0	36	36	5	0	0	2	50	0	0	0	26	44	27	0	0	305	1369
06:45:00 PM	2	43	27	0	0	35	42	1	0	0	7	51	0	0	0	21	47	33	0	0	309	1284
07:00:00 PM	0	42	18	0	0	26	29	2	0	0	5	29	5	0	0	22	35	22	0	0	235	1147
07:15:00 PM	2	40	10	0	0	13	29	0	0	0	1	26	6	0	0	10	35	25	0	0	197	1046
07:30:00 PM	2	38	7	0	0	30	23	2	0	0	2	28	4	0	0	19	26	29	0	0	210	951
07:45:00 PM	4	36	20	0	0	23	15	1	0	0	5	29	2	0	0	15	24	25	0	0	199	841
08:00:00 PM	3	39	15	0	0	14	18	0	0	0	2	25	1	0	0	7	24	11	0	0	159	765
08:15:00 PM	2	31	14	0	0	26	12	0	0	0	3	19	1	0	0	13	21	13	0	0	155	723
08:30:00 PM	3	34	15	0	0	18	21	1	0	0	0	25	4	0	0	10	30	12	0	0	173	686
08:45:00 PM	4	30	12	0	0	16	13	0	0	0	1	22	0	0	0	6	20	16	0	0	140	627
09:00:00 PM	1	16	11	0	0	8	12	0	0	0	4	31	0	0	0	4	13	6	0	0	106	574
09:15:00 PM	1	25	12	0	0	7	14	0	0	0	3	16	2	0	0	5	15	6	0	0	106	525
09:30:00 PM	1	19	11	0	0	15	11	0	0	0	3	21	1	0	0	4	11	9	0	0	106	458
09:45:00 PM	3	10	6	0	0	13	13	0	0	0	2	15	2	0	0	3	11	8	0	0	86	404

Time	NB (NE 8th St)					SB (NE 8th St)					EB (NE Olney Ave)					WB (NE Olney Ave)					Totals	
	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	15min	1hr
06:00:00 AM	1	11	7	0	0	18	15	1	0	0	2	20	1	0	0	6	13	12	0	0	107	822
06:15:00 AM	4	13	13	0	0	25	31	0	0	0	0	30	2	0	0	20	10	10	0	0	158	
06:30:00 AM	2	27	25	0	0	35	34	0	0	0	1	45	1	0	0	17	14	18	0	0	219	
06:45:00 AM	1	35	27	0	0	58	50	0	0	0	1	85	0	0	0	22	33	26	0	0	338	
07:00:00 AM	0	47	16	0	0	54	38	1	0	0	1	59	2	0	0	22	27	18	0	0	285	
07:15:00 AM	4	54	24	0	0	39	68	4	0	0	4	48	9	0	0	26	46	26	0	0	352	
07:30:00 AM	6	72	17	0	0	51	78	4	0	0	3	75	7	0	0	25	72	27	0	0	437	
07:45:00 AM	11	75	14	0	0	73	71	6	0	0	6	97	5	0	0	48	88	32	0	0	526	
08:00:00 AM	5	49	18	0	0	45	57	3	0	0	1	73	7	0	0	31	78	31	0	0	398	
08:15:00 AM	10	57	14	0	0	50	57	3	0	0	5	74	5	0	0	30	61	26	0	0	392	
08:30:00 AM	7	60	23	0	0	48	58	3	0	0	4	59	4	0	0	30	62	46	0	0	404	1720
08:45:00 AM	3	46	31	0	0	61	71	5	0	0	6	75	10	0	0	40	80	51	0	0	479	1673
09:00:00 AM	6	46	31	0	0	45	60	1	0	0	4	53	6	0	0	30	65	67	0	0	414	1689
09:15:00 AM	5	52	16	0	0	47	38	0	0	0	9	50	7	0	0	29	62	44	0	0	359	1656
09:30:00 AM	8	50	27	0	0	37	48	1	0	0	7	51	7	0	0	39	61	57	0	0	393	1645
09:45:00 AM	6	59	29	0	0	57	63	2	0	0	4	62	7	0	0	43	81	49	0	0	462	1628
10:00:00 AM	8	69	23	0	0	40	51	0	0	0	5	61	8	0	0	28	64	49	0	0	406	1620
10:15:00 AM	6	53	23	0	0	42	48	0	0	0	5	66	4	0	0	35	62	51	0	0	395	1656
10:30:00 AM	7	51	27	0	0	45	50	0	0	0	2	73	9	0	0	34	82	38	0	0	418	1681
10:45:00 AM	6	64	25	0	0	43	61	1	0	0	6	65	6	0	0	45	59	53	0	0	434	1653
11:00:00 AM	6	50	29	0	0	47	46	0	0	0	4	59	10	0	0	37	72	52	0	0	412	1659
11:15:00 AM	6	48	21	0	0	55	58	2	0	0	10	52	4	0	0	28	77	47	0	0	408	1672

11:30:00 AM	5	65	29	0	0	35	41	5	0	0	3	57	6	0	0	42	79	43	0	0	410	1664
11:45:00 AM	12	81	22	0	0	42	65	3	0	0	11	58	8	0	0	36	93	52	0	0	483	1713
12:00:00 PM	10	76	15	0	0	39	41	4	0	0	11	62	10	0	0	39	83	56	0	0	446	1747
12:15:00 PM	6	64	29	0	0	38	66	2	0	0	12	78	7	0	0	32	60	48	0	0	442	1781
12:30:00 PM	7	67	22	0	0	49	49	4	0	0	4	83	11	0	0	34	66	49	0	0	445	1816
12:45:00 PM	9	66	30	0	0	63	57	0	0	0	5	96	10	0	0	34	71	49	0	0	490	1823
01:00:00 PM	12	66	21	0	0	49	46	2	0	0	7	90	5	0	0	29	56	37	0	0	420	1797
01:15:00 PM	10	61	28	0	0	46	66	2	0	0	6	76	11	0	0	32	69	39	0	0	446	1801
01:30:00 PM	5	61	39	0	0	54	56	5	0	0	10	67	6	0	0	24	74	38	0	0	439	1795
01:45:00 PM	10	66	25	0	0	47	57	0	0	0	5	65	7	0	0	36	69	48	0	0	435	1740
02:00:00 PM	8	51	24	0	0	49	63	1	0	0	13	68	8	0	0	25	65	48	0	0	423	1743
02:15:00 PM	13	72	17	0	0	50	45	1	0	0	10	68	9	0	0	31	75	49	0	0	440	1737
02:30:00 PM	8	87	26	0	0	41	59	0	0	0	12	75	19	0	0	27	64	42	0	0	460	1758
02:45:00 PM	10	75	22	0	0	48	40	3	0	0	6	90	14	0	0	33	64	48	0	0	453	1776
03:00:00 PM	5	57	26	0	0	42	65	0	0	0	8	82	10	0	0	29	71	57	0	0	452	1805
03:15:00 PM	4	66	22	0	0	39	53	1	0	0	9	75	9	0	0	44	79	49	0	0	450	1815
03:30:00 PM	8	72	23	0	0	60	68	0	0	0	10	81	11	0	0	28	76	72	0	0	509	1864
03:45:00 PM	13	79	25	0	0	42	62	1	0	0	18	73	8	0	0	37	85	43	0	0	486	1897
04:00:00 PM	10	78	19	0	0	42	62	0	0	0	10	78	12	0	0	40	106	55	0	0	512	1957
04:15:00 PM	8	89	19	0	0	43	73	7	0	0	16	72	8	0	0	42	90	45	0	0	512	2019
04:30:00 PM	13	79	15	0	0	45	62	2	0	0	19	76	12	0	0	23	94	38	0	0	478	1988
04:45:00 PM	3	72	18	0	0	36	71	4	0	0	19	85	7	0	0	27	98	46	0	0	486	1988
05:00:00 PM	8	82	19	0	0	47	73	2	0	0	27	84	18	0	0	46	74	58	0	0	538	2014
05:15:00 PM	7	72	18	0	0	52	71	1	0	0	12	77	11	0	0	36	86	39	0	0	482	1984
05:30:00 PM	3	80	21	0	0	36	56	3	0	0	15	72	8	0	0	32	77	47	0	0	450	1956
05:45:00 PM	7	61	28	0	0	42	39	0	0	0	10	56	8	0	0	31	71	33	0	0	386	1856
06:00:00 PM	2	51	31	0	0	36	57	1	0	0	13	44	4	0	0	32	51	46	0	0	368	1686
06:15:00 PM	3	49	26	0	0	39	37	1	0	0	6	47	8	0	0	22	40	18	0	0	296	1500
06:30:00 PM	4	49	26	0	0	36	36	5	0	0	2	50	0	0	0	26	44	27	0	0	305	1355
06:45:00 PM	2	42	26	0	0	35	40	1	0	0	7	51	0	0	0	21	47	33	0	0	305	1274
07:00:00 PM	0	41	18	0	0	26	29	2	0	0	5	29	5	0	0	21	35	22	0	0	233	1139
07:15:00 PM	2	39	10	0	0	13	29	0	0	0	1	24	6	0	0	10	35	25	0	0	194	1037
07:30:00 PM	2	37	7	0	0	29	23	2	0	0	2	28	4	0	0	19	26	28	0	0	207	939
07:45:00 PM	4	36	20	0	0	23	15	1	0	0	4	29	2	0	0	15	24	24	0	0	197	831
08:00:00 PM	3	38	15	0	0	14	17	0	0	0	2	25	1	0	0	7	24	11	0	0	157	755
08:15:00 PM	2	30	14	0	0	26	12	0	0	0	3	19	1	0	0	13	21	12	0	0	153	714
08:30:00 PM	2	33	15	0	0	18	20	1	0	0	0	25	4	0	0	10	30	12	0	0	170	677
08:45:00 PM	4	29	12	0	0	16	11	0	0	0	1	22	0	0	0	4	20	16	0	0	135	615
09:00:00 PM	1	16	11	0	0	8	11	0	0	0	4	31	0	0	0	4	13	6	0	0	105	563
09:15:00 PM	1	24	12	0	0	7	14	0	0	0	3	16	2	0	0	4	15	6	0	0	104	514
09:30:00 PM	1	19	11	0	0	14	11	0	0	0	3	21	1	0	0	4	11	9	0	0	105	449
09:45:00 PM	3	10	6	0	0	13	13	0	0	0	2	15	2	0	0	3	10	8	0	0	85	399

Time	NB (NE 8th St)					SB (NE 8th St)					EB (NE Olney Ave)					WB (NE Olney Ave)					Totals	
Time	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	15min	1hr
06:00:00 AM	0	2	0	0	0	1	1	0	0	0	0	1	0	0	0	0	2	0	0	0	7	
06:15:00 AM	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	6	
06:30:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
06:45:00 AM	0	3	1	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	0	0	8	22
07:00:00 AM	0	3	0	0	0	3	5	0	0	0	0	4	0	0	0	0	1	1	0	0	17	32
07:15:00 AM	1	1	1	0	0	1	4	1	0	0	1	2	0	0	0	2	1	2	0	0	17	43
07:30:00 AM	0	4	1	0	0	1	4	0	0	0	0	1	0	0	0	2	1	0	0	0	14	56
07:45:00 AM	1	3	1	0	0	1	5	0	0	0	0	0	0	0	0	0	1	0	0	0	12	60
08:00:00 AM	0	3	0	0	0	3	5	0	0	0	0	0	0	0	0	0	3	0	0	0	14	57
08:15:00 AM	0	3	3	0	0	2	1	0	0	0	1	3	0	0	0	1	2	1	0	0	17	57
08:30:00 AM	0	1	1	0	0	0	5	0	0	0	0	2	0	0	0	1	3	1	0	0	14	57
08:45:00 AM	0	1	1	0	0	0	2	0	0	0	0	2	0	0	0	0	4	2	0	0	12	57
09:00:00 AM	1	2	0	0	0	0	5	0	0	0	0	0	0	0	0	1	3	1	0	0	13	56
09:15:00 AM	0	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0	2	4	0	0	11	50
09:30:00 AM	0	2	2	0	0	1	4	0	0	0	0	2	0	0	0	1	0	1	0	0	13	49
09:45:00 AM	0	1	1	0	0	2	5	0	0	0	0	0	0	0	0	0	0	2	0	0	11	48
10:00:00 AM	0	3	1	0	0	1	9	0	0	0	0	0	0	0	0	1	2	0	0	0	17	52

10:15:00 AM	0	3	1	0	0	0	5	0	0	0	0	0	0	0	0	0	3	0	0	0	12	53
10:30:00 AM	0	4	1	0	0	2	2	0	0	0	0	2	1	0	0	1	1	2	0	0	16	56
10:45:00 AM	0	2	2	0	0	0	5	0	0	0	0	2	0	0	0	1	0	1	0	0	13	58
11:00:00 AM	0	0	0	0	0	0	7	0	0	0	0	1	0	0	0	0	2	0	0	0	10	51
11:15:00 AM	0	4	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	2	0	0	9	48
11:30:00 AM	0	3	0	0	0	2	6	0	0	0	0	1	0	0	0	1	1	1	0	0	15	47
11:45:00 AM	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	2	0	1	0	0	7	41
12:00:00 PM	0	3	1	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	8	39
12:15:00 PM	1	0	2	0	0	0	2	0	0	0	1	1	0	0	0	0	1	1	0	0	9	39
12:30:00 PM	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	1	0	0	0	6	30
12:45:00 PM	0	0	0	0	0	1	4	0	0	0	0	1	0	0	0	2	1	1	0	0	10	33
01:00:00 PM	0	2	0	0	0	2	2	0	0	0	1	0	1	0	0	0	0	0	0	0	8	33
01:15:00 PM	0	4	1	0	0	0	3	1	0	0	0	0	0	0	0	0	1	0	0	0	10	34
01:30:00 PM	0	4	0	0	0	2	3	0	0	0	0	1	0	0	0	0	1	2	0	0	13	41
01:45:00 PM	0	2	0	0	0	0	2	0	0	0	0	2	0	0	0	1	0	2	0	0	9	40
02:00:00 PM	0	2	3	0	0	0	0	0	0	0	0	1	0	0	0	0	3	1	0	0	10	42
02:15:00 PM	0	1	0	0	0	2	0	0	0	0	0	2	0	0	0	0	1	1	0	0	7	39
02:30:00 PM	0	2	1	0	0	1	3	0	0	0	0	1	0	0	0	1	3	0	0	0	12	38
02:45:00 PM	0	3	0	0	0	0	2	0	0	0	0	0	1	0	0	0	1	2	0	0	9	38
03:00:00 PM	0	1	3	0	0	2	2	0	0	0	0	1	0	0	0	2	0	2	0	0	13	41
03:15:00 PM	0	3	0	0	0	0	1	0	0	0	0	2	0	0	0	1	1	0	0	0	8	42
03:30:00 PM	0	0	1	0	0	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	5	35
03:45:00 PM	0	4	0	0	0	0	1	0	0	0	1	0	0	0	0	3	0	0	0	0	9	35
04:00:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	0	0	4	26
04:15:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	21
04:30:00 PM	1	0	2	0	0	0	2	0	0	0	0	1	0	0	0	0	1	1	0	0	8	24
04:45:00 PM	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	6	21
05:00:00 PM	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	22
05:15:00 PM	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	5	24
05:30:00 PM	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	19
05:45:00 PM	2	4	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	8	21
06:00:00 PM	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	20
06:15:00 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	17
06:30:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
06:45:00 PM	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	10
07:00:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	8
07:15:00 PM	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	3	9
07:30:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	12
07:45:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2	10
08:00:00 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10
08:15:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	9
08:30:00 PM	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9
08:45:00 PM	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	5	12
09:00:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11
09:15:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	11
09:30:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9
09:45:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5

Bike Volumes	NB (NE 8th St)					SB (NE 8th St)					EB (NE Olney Ave)					WB (NE Olney Ave)					Totals	
	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	Left	Thru	Right	U-turn	RTOR	15min	1hr
06:00:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
06:15:00 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	3	
06:30:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:45:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
07:00:00 AM	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	3	6
07:15:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	4
07:30:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	5
07:45:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
08:00:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	4
08:15:00 AM	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	5	8
08:30:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	8
08:45:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3	11

09:00:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	10
09:15:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
09:30:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	
09:45:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3	
10:00:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	4	
10:15:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
10:30:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	4	
10:45:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
11:00:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
11:15:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2	
11:30:00 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2	3	
11:45:00 AM	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	3	6	
12:00:00 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	8	
12:15:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
12:30:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	6	
12:45:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
01:00:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
01:15:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
01:30:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01:45:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
02:00:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	2	
02:15:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
02:30:00 PM	0	0	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	4	6	
02:45:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	8	
03:00:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
03:15:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	2	8	
03:30:00 PM	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	7	
03:45:00 PM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	7	
04:00:00 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	10	
04:15:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	4	12	
04:30:00 PM	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	4	13	
04:45:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	12	
05:00:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	10	
05:15:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	
05:30:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
05:45:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
06:00:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
06:15:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:30:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:45:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:00:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:15:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:30:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	
07:45:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
08:00:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
08:15:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
08:30:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	
08:45:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	
09:00:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
09:15:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	
09:30:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
09:45:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	

Time	Pedestrians				Totals	
Time	North	South	East	West	15min	1hr
06:00:00 AM	0	0	0	0	0	
06:15:00 AM	0	0	0	0	0	
06:30:00 AM	0	0	0	0	0	
06:45:00 AM	0	0	0	0	0	0
07:00:00 AM	0	0	0	0	0	0
07:15:00 AM	0	0	0	0	0	0
07:30:00 AM	1	1	0	0	2	2

07:45:00 AM	1	0	0	0	1	3
08:00:00 AM	0	0	0	0	0	3
08:15:00 AM	0	0	0	1	1	4
08:30:00 AM	0	0	1	1	2	4
08:45:00 AM	0	0	0	0	0	3
09:00:00 AM	0	1	0	0	1	4
09:15:00 AM	2	0	2	0	4	7
09:30:00 AM	0	0	0	0	0	5
09:45:00 AM	0	0	0	0	0	5
10:00:00 AM	0	0	0	0	0	4
10:15:00 AM	0	0	1	0	1	1
10:30:00 AM	0	0	0	0	0	1
10:45:00 AM	0	0	0	0	0	1
11:00:00 AM	0	0	0	1	1	2
11:15:00 AM	1	0	0	0	1	2
11:30:00 AM	0	0	0	0	0	2
11:45:00 AM	0	0	0	0	0	2
12:00:00 PM	1	0	0	0	1	2
12:15:00 PM	0	0	0	0	0	1
12:30:00 PM	0	0	0	0	0	1
12:45:00 PM	1	0	0	1	2	3
01:00:00 PM	0	0	0	1	1	3
01:15:00 PM	0	1	0	0	1	4
01:30:00 PM	0	0	0	0	0	4
01:45:00 PM	0	1	0	0	1	3
02:00:00 PM	0	0	0	0	0	2
02:15:00 PM	0	0	0	0	0	1
02:30:00 PM	1	0	0	0	1	2
02:45:00 PM	0	0	0	1	1	2
03:00:00 PM	0	0	0	1	1	3
03:15:00 PM	0	0	0	0	0	3
03:30:00 PM	0	0	0	1	1	3
03:45:00 PM	1	0	0	0	1	3
04:00:00 PM	0	1	2	0	3	5
04:15:00 PM	1	0	0	0	1	6
04:30:00 PM	0	0	0	0	0	5
04:45:00 PM	1	0	0	0	1	5
05:00:00 PM	0	1	0	0	1	3
05:15:00 PM	1	0	0	0	1	3
05:30:00 PM	0	0	0	0	0	3
05:45:00 PM	0	1	0	0	1	3
06:00:00 PM	0	0	0	0	0	2
06:15:00 PM	0	0	0	0	0	1
06:30:00 PM	0	0	0	0	0	1
06:45:00 PM	0	0	0	0	0	0
07:00:00 PM	0	0	0	0	0	0
07:15:00 PM	0	0	0	0	0	0
07:30:00 PM	0	0	0	0	0	0
07:45:00 PM	0	0	0	0	0	0
08:00:00 PM	0	0	0	0	0	0
08:15:00 PM	0	0	0	0	0	0
08:30:00 PM	0	0	0	0	0	0
08:45:00 PM	0	0	0	0	0	0
09:00:00 PM	0	0	0	0	0	0
09:15:00 PM	0	0	1	0	1	1
09:30:00 PM	0	0	0	0	0	1
09:45:00 PM	0	0	0	0	0	1

APPENDIX B: HCM AND QUEUEING REPORTS

HCM 7th Signalized Intersection Summary
3: 8th St & Olney Ave

2026 Current Configuration PM Peak
08/14/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	304	40	150	359	242	39	374	87	188	450	33
Future Volume (veh/h)	80	304	40	150	359	242	39	374	87	188	450	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1723	1750	1709	1723	1736	1736	1750	1723	1736	1736	1736	1750
Adj Flow Rate, veh/h	81	307	35	152	363	114	39	378	79	190	455	31
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	0	3	2	1	1	0	2	1	1	1	0
Cap, veh/h	304	375	43	322	472	399	321	461	96	351	621	42
Arrive On Green	0.08	0.24	0.23	0.10	0.27	0.27	0.06	0.34	0.32	0.11	0.39	0.37
Sat Flow, veh/h	1641	1536	175	1641	1736	1466	1667	1375	287	1654	1604	109
Grp Volume(v), veh/h	81	0	342	152	363	114	39	0	457	190	0	486
Grp Sat Flow(s),veh/h/ln	1641	0	1711	1641	1736	1466	1667	0	1662	1654	0	1713
Q Serve(g_s), s	2.7	0.0	14.6	5.1	14.9	4.7	1.1	0.0	19.5	5.3	0.0	18.8
Cycle Q Clear(g_c), s	2.7	0.0	14.6	5.1	14.9	4.7	1.1	0.0	19.5	5.3	0.0	18.8
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.17	1.00		0.06
Lane Grp Cap(c), veh/h	304	0	418	322	472	399	321	0	557	351	0	663
V/C Ratio(X)	0.27	0.00	0.82	0.47	0.77	0.29	0.12	0.00	0.82	0.54	0.00	0.73
Avail Cap(c_a), veh/h	454	0	687	490	764	645	507	0	774	450	0	798
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	27.6	19.6	25.9	22.2	16.1	0.0	23.6	16.0	0.0	20.3
Incr Delay (d2), s/veh	0.2	0.0	1.5	0.4	1.0	0.1	0.1	0.0	3.5	0.5	0.0	2.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	6.0	1.9	6.1	1.6	0.4	0.0	7.6	1.8	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	19.9	0.0	29.2	20.0	26.9	22.3	16.1	0.0	27.1	16.5	0.0	22.4
LnGrp LOS	B		C	B	C	C	B		C	B		C
Approach Vol, veh/h	423			629			496			676		
Approach Delay, s/veh	27.4			24.4			26.2			20.7		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	33.9	9.9	25.0	12.4	29.9	12.1	22.9				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	12.0	35.0	12.0	33.0	12.0	35.0	15.0	30.0				
Max Q Clear Time (g_c+I1), s	3.1	20.8	5.7	16.9	7.3	21.5	7.1	16.6				
Green Ext Time (p_c), s	0.0	3.7	0.1	1.8	0.2	3.4	0.3	1.0				
Intersection Summary												
HCM 7th Control Delay, s/veh	24.3											
HCM 7th LOS	C											

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:20	4:20	4:20	4:20	4:20	4:20	4:20
End Time	5:30	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	70	70	70	70	70	70	70
# of Intervals	3	3	3	3	3	3	3
# of Recorded Intervals	3	3	3	3	3	3	3
Vehs Entered	2709	2751	2778	2743	2703	2814	2749
Vehs Exited	2602	2628	2658	2651	2629	2704	2653
Starting Vehs	0	0	0	0	0	0	0
Ending Vehs	107	123	120	92	74	110	96
Travel Distance (mi)	2258	2308	2346	2314	2281	2367	2327
Travel Time (hr)	114.1	117.0	118.1	115.1	111.0	120.0	119.5
Total Delay (hr)	33.8	34.9	34.7	32.9	30.4	36.1	36.7
Total Stops	2482	2473	2495	2403	2286	2560	2612
Fuel Used (gal)	77.5	78.9	80.2	78.9	77.2	81.1	79.8

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:20	4:20	4:20	4:20
End Time	5:30	5:30	5:30	5:30
Total Time (min)	70	70	70	70
Time Recorded (min)	70	70	70	70
# of Intervals	3	3	3	3
# of Recorded Intervals	3	3	3	3
Vehs Entered	2810	2630	2680	2735
Vehs Exited	2705	2525	2580	2634
Starting Vehs	0	0	0	0
Ending Vehs	105	105	100	104
Travel Distance (mi)	2372	2218	2251	2304
Travel Time (hr)	125.5	107.6	109.6	115.7
Total Delay (hr)	41.3	28.8	30.0	34.0
Total Stops	2808	2233	2257	2461
Fuel Used (gal)	82.5	75.2	76.5	78.8

Interval #0 Information Seeding

Start Time	4:20
End Time	4:30
Total Time (min)	10

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	427	373	400	404	427	397	394
Vehs Exited	304	266	298	296	317	301	300
Starting Vehs	0	0	0	0	0	0	0
Ending Vehs	123	107	102	108	110	96	94
Travel Distance (mi)	293	265	293	294	311	287	291
Travel Time (hr)	15.1	12.5	13.6	14.2	14.5	13.3	13.7
Total Delay (hr)	4.7	3.1	3.1	3.7	3.6	3.1	3.3
Total Stops	330	239	272	283	292	253	271
Fuel Used (gal)	10.1	8.8	9.7	10.0	10.2	9.6	9.5

Interval #0 Information Seeding

Start Time	4:20
End Time	4:30
Total Time (min)	10

Volumes adjusted by PHF, Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	411	384	394	400
Vehs Exited	286	278	304	295
Starting Vehs	0	0	0	0
Ending Vehs	125	106	90	106
Travel Distance (mi)	294	284	297	291
Travel Time (hr)	15.6	13.7	13.8	14.0
Total Delay (hr)	5.2	3.6	3.2	3.7
Total Stops	382	288	271	288
Fuel Used (gal)	10.1	9.7	9.5	9.7

Interval #1 Information Recording1

Start Time 4:30

End Time 4:45

Total Time (min) 15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	576	619	609	563	587	628	574
Vehs Exited	592	608	582	585	595	612	572
Starting Vehs	123	107	102	108	110	96	94
Ending Vehs	107	118	129	86	102	112	96
Travel Distance (mi)	504	529	521	497	509	533	495
Travel Time (hr)	26.3	26.9	25.8	26.1	25.1	26.9	23.8
Total Delay (hr)	8.4	8.0	7.2	8.5	7.2	8.0	6.2
Total Stops	581	557	522	577	513	570	493
Fuel Used (gal)	17.4	18.0	17.5	17.3	17.4	18.1	16.4

Interval #1 Information Recording1

Start Time 4:30

End Time 4:45

Total Time (min) 15

Volumes adjusted by PHF, Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	578	567	569	587
Vehs Exited	584	587	555	588
Starting Vehs	125	106	90	106
Ending Vehs	119	86	104	106
Travel Distance (mi)	499	496	476	506
Travel Time (hr)	24.3	24.8	22.6	25.3
Total Delay (hr)	6.7	7.3	5.8	7.3
Total Stops	480	539	460	528
Fuel Used (gal)	16.8	17.1	16.1	17.2

Interval #2 Information Recording2

Start Time 4:45

End Time 5:30

Total Time (min) 45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	6	7
Vehs Entered	1706	1759	1769	1776	1689	1789	1781
Vehs Exited	1706	1754	1778	1770	1717	1791	1781
Starting Vehs	107	118	129	86	102	112	96
Ending Vehs	107	123	120	92	74	110	96
Travel Distance (mi)	1460	1514	1531	1522	1462	1548	1540
Travel Time (hr)	72.7	77.6	78.7	74.8	71.4	79.8	82.0
Total Delay (hr)	20.8	23.8	24.4	20.8	19.6	25.0	27.1
Total Stops	1571	1677	1701	1543	1481	1737	1848
Fuel Used (gal)	49.9	52.1	52.9	51.6	49.7	53.4	53.8

Interval #2 Information Recording2

Start Time 4:45

End Time 5:30

Total Time (min) 45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	8	9	10	Avg
Vehs Entered	1821	1679	1717	1748
Vehs Exited	1835	1660	1721	1751
Starting Vehs	119	86	104	106
Ending Vehs	105	105	100	104
Travel Distance (mi)	1579	1438	1478	1507
Travel Time (hr)	85.6	69.0	73.2	76.5
Total Delay (hr)	29.4	17.9	21.0	23.0
Total Stops	1946	1406	1526	1644
Fuel Used (gal)	55.6	48.4	50.9	51.8

Intersection: 3: 8th St & Olney Ave

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	300	462	200	843	200	166	618	250	558
Average Queue (ft)	76	217	122	331	136	43	330	135	241
95th Queue (ft)	208	381	230	702	247	126	557	254	435
Link Distance (ft)		2982		3593			1218		1312
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200		100		100	75		150	
Storage Blk Time (%)	0	14	12	35	5	1	53	5	22
Queuing Penalty (veh)	0	11	70	139	26	4	21	24	42

Network Summary

Network wide Queuing Penalty: 336

HCM 7th Signalized Intersection Summary 3: 8th St & Olney Ave

2046 Current Configuration PM Peak
08/14/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	370	60	170	490	245	60	395	90	190	535	45
Future Volume (veh/h)	105	370	60	170	490	245	60	395	90	190	535	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1723	1750	1709	1723	1736	1736	1750	1723	1736	1736	1736	1750
Adj Flow Rate, veh/h	105	370	55	170	490	164	60	395	83	190	535	43
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	3	2	1	1	0	2	1	1	1	0
Cap, veh/h	256	448	67	306	562	474	219	456	96	300	594	48
Arrive On Green	0.08	0.30	0.29	0.10	0.32	0.32	0.06	0.33	0.32	0.10	0.38	0.37
Sat Flow, veh/h	1641	1482	220	1641	1736	1467	1667	1373	289	1654	1582	127
Grp Volume(v), veh/h	105	0	425	170	490	164	60	0	478	190	0	578
Grp Sat Flow(s),veh/h/ln	1641	0	1702	1641	1736	1467	1667	0	1662	1654	0	1709
Q Serve(g_s), s	4.2	0.0	22.9	6.8	26.3	8.4	2.2	0.0	26.6	7.0	0.0	31.5
Cycle Q Clear(g_c), s	4.2	0.0	22.9	6.8	26.3	8.4	2.2	0.0	26.6	7.0	0.0	31.5
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.17	1.00		0.07
Lane Grp Cap(c), veh/h	256	0	514	306	562	474	219	0	552	300	0	642
V/C Ratio(X)	0.41	0.00	0.83	0.56	0.87	0.35	0.27	0.00	0.87	0.63	0.00	0.90
Avail Cap(c_a), veh/h	308	0	586	356	633	535	307	0	623	332	0	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	0.0	32.1	22.8	31.5	25.4	23.0	0.0	31.0	21.8	0.0	29.1
Incr Delay (d2), s/veh	1.3	0.0	8.9	1.9	12.1	0.5	0.8	0.0	11.6	3.7	0.0	15.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	10.6	2.7	12.7	3.0	0.9	0.0	12.0	2.8	0.0	15.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.5	0.0	41.0	24.7	43.5	26.0	23.8	0.0	42.6	25.5	0.0	44.6
LnGrp LOS	C		D	C	D	C	C		D	C		D
Approach Vol, veh/h	530			824			538			768		
Approach Delay, s/veh	37.7			36.2			40.5			39.9		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	41.1	11.9	35.9	14.1	36.8	14.0	33.8				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	10.0	37.0	10.0	35.0	11.0	36.0	12.0	33.0				
Max Q Clear Time (g_c+I1), s	4.2	33.5	7.2	28.3	9.0	28.6	8.8	24.9				
Green Ext Time (p_c), s	0.1	2.0	0.1	2.7	0.2	3.2	0.3	1.8				
Intersection Summary												
HCM 7th Control Delay, s/veh	38.4											
HCM 7th LOS	D											

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:20	4:20	4:20	4:20	4:20	4:20	4:20
End Time	5:30	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	70	70	70	70	70	70	70
# of Intervals	3	3	3	3	3	3	3
# of Recorded Intervals	3	3	3	3	3	3	3
Vehs Entered	3153	3104	3109	3154	3146	3220	3134
Vehs Exited	2885	2888	2871	2877	2916	2978	2864
Starting Vehs	0	0	0	0	0	0	0
Ending Vehs	268	216	238	277	230	242	270
Travel Distance (mi)	2600	2562	2567	2574	2595	2646	2576
Travel Time (hr)	255.4	206.0	254.1	236.7	226.7	284.8	232.6
Total Delay (hr)	164.0	116.0	164.1	146.3	135.4	191.8	141.8
Total Stops	4953	5035	5078	5594	5325	5683	5197
Fuel Used (gal)	116.4	104.0	115.4	111.8	110.0	124.7	110.7

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:20	4:20	4:20	4:20
End Time	5:30	5:30	5:30	5:30
Total Time (min)	70	70	70	70
Time Recorded (min)	70	70	70	70
# of Intervals	3	3	3	3
# of Recorded Intervals	3	3	3	3
Vehs Entered	3181	3186	3165	3154
Vehs Exited	2943	2898	2908	2903
Starting Vehs	0	0	0	0
Ending Vehs	238	288	257	251
Travel Distance (mi)	2627	2588	2604	2594
Travel Time (hr)	281.5	241.9	257.7	247.7
Total Delay (hr)	189.4	151.2	166.0	156.6
Total Stops	5613	5105	5721	5331
Fuel Used (gal)	123.6	113.2	116.9	114.7

Interval #0 Information Seeding

Start Time 4:20

End Time 4:30

Total Time (min) 10

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	459	465	452	445	476	500	445
Vehs Exited	321	325	309	307	338	329	317
Starting Vehs	0	0	0	0	0	0	0
Ending Vehs	138	140	143	138	138	171	128
Travel Distance (mi)	338	337	323	322	353	353	329
Travel Time (hr)	18.6	17.6	16.5	16.1	19.9	21.6	17.3
Total Delay (hr)	6.8	5.7	5.1	4.7	7.5	9.1	5.7
Total Stops	474	450	362	350	533	570	406
Fuel Used (gal)	11.8	11.5	10.7	10.7	12.5	12.7	11.4

Interval #0 Information Seeding

Start Time 4:20

End Time 4:30

Total Time (min) 10

Volumes adjusted by PHF, Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	444	451	436	459
Vehs Exited	317	335	310	321
Starting Vehs	0	0	0	0
Ending Vehs	127	116	126	138
Travel Distance (mi)	324	326	317	332
Travel Time (hr)	17.9	16.5	15.4	17.7
Total Delay (hr)	6.4	5.2	4.2	6.0
Total Stops	433	363	347	429
Fuel Used (gal)	11.2	10.9	10.4	11.4

Interval #1 Information Recording1

Start Time 4:30

End Time 4:45

Total Time (min) 15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	704	671	663	650	634	711	702
Vehs Exited	650	632	624	632	636	688	646
Starting Vehs	138	140	143	138	138	171	128
Ending Vehs	192	179	182	156	136	194	184
Travel Distance (mi)	575	563	558	549	552	599	581
Travel Time (hr)	38.9	42.4	43.4	41.2	33.1	50.3	38.6
Total Delay (hr)	18.6	22.6	23.9	22.0	13.6	29.2	18.3
Total Stops	1033	1199	1225	1134	878	1229	1164
Fuel Used (gal)	21.6	22.4	22.4	22.1	20.2	25.2	21.8

Interval #1 Information Recording1

Start Time 4:30

End Time 4:45

Total Time (min) 15

Volumes adjusted by PHF, Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	728	704	728	691
Vehs Exited	644	632	644	644
Starting Vehs	127	116	126	138
Ending Vehs	211	188	210	183
Travel Distance (mi)	585	580	585	573
Travel Time (hr)	40.7	40.2	40.5	40.9
Total Delay (hr)	20.2	19.7	19.9	20.8
Total Stops	1169	1063	1183	1129
Fuel Used (gal)	22.6	22.4	22.3	22.3

Interval #2 Information Recording2

Start Time	4:45
End Time	5:30
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	6	7
Vehs Entered	1990	1968	1994	2059	2036	2009	1987
Vehs Exited	1914	1931	1938	1938	1942	1961	1901
Starting Vehs	192	179	182	156	136	194	184
Ending Vehs	268	216	238	277	230	242	270
Travel Distance (mi)	1686	1663	1686	1704	1690	1694	1666
Travel Time (hr)	197.9	146.0	194.1	179.4	173.6	212.9	176.6
Total Delay (hr)	138.6	87.7	135.1	119.6	114.3	153.5	117.8
Total Stops	3446	3386	3491	4110	3914	3884	3627
Fuel Used (gal)	83.0	70.2	82.3	79.0	77.3	86.8	77.5

Interval #2 Information Recording2

Start Time	4:45
End Time	5:30
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	8	9	10	Avg
Vehs Entered	2009	2031	2001	2008
Vehs Exited	1982	1931	1954	1940
Starting Vehs	211	188	210	183
Ending Vehs	238	288	257	251
Travel Distance (mi)	1718	1683	1702	1689
Travel Time (hr)	222.9	185.2	201.8	189.1
Total Delay (hr)	162.7	126.3	141.9	129.7
Total Stops	4011	3679	4191	3775
Fuel Used (gal)	89.7	79.9	84.2	81.0

Intersection: 3: 8th St & Olney Ave

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	300	713	200	3677	200	174	1102	175	1347
Average Queue (ft)	147	367	142	2229	158	78	593	143	1030
95th Queue (ft)	329	643	244	4181	264	182	1189	218	1698
Link Distance (ft)		1813		3639			2112		1313
Upstream Blk Time (%)				18					38
Queuing Penalty (veh)				0					0
Storage Bay Dist (ft)	200		100		100	75		75	
Storage Blk Time (%)	0	36	20	55	8	4	58	46	54
Queuing Penalty (veh)	2	37	149	227	51	18	35	265	102

Network Summary

Network wide Queuing Penalty: 887

HCM 7th Signalized Intersection Summary 3: 8th St & Olney Ave

2026 Alt 1 Signalized SBR PM Peak
08/14/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	304	40	150	359	242	39	374	87	188	450	33
Future Volume (veh/h)	80	304	40	150	359	242	39	374	87	188	450	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1723	1750	1709	1723	1736	1736	1750	1723	1736	1736	1736	1750
Adj Flow Rate, veh/h	81	307	36	152	363	151	39	378	81	190	455	8
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	0	3	2	1	1	0	2	1	1	1	0
Cap, veh/h	133	362	42	198	479	615	87	444	95	237	722	689
Arrive On Green	0.08	0.24	0.23	0.12	0.28	0.28	0.05	0.32	0.31	0.14	0.42	0.40
Sat Flow, veh/h	1641	1531	179	1641	1736	1466	1667	1368	293	1654	1736	1444
Grp Volume(v), veh/h	81	0	343	152	363	151	39	0	459	190	455	8
Grp Sat Flow(s),veh/h/ln	1641	0	1710	1641	1736	1466	1667	0	1661	1654	1736	1444
Q Serve(g_s), s	4.4	0.0	17.5	8.2	17.5	6.1	2.1	0.0	23.6	10.2	19.0	0.3
Cycle Q Clear(g_c), s	4.4	0.0	17.5	8.2	17.5	6.1	2.1	0.0	23.6	10.2	19.0	0.3
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	133	0	404	198	479	615	87	0	539	237	722	689
V/C Ratio(X)	0.61	0.00	0.85	0.77	0.76	0.25	0.45	0.00	0.85	0.80	0.63	0.01
Avail Cap(c_a), veh/h	197	0	580	233	627	740	201	0	690	253	779	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	0.0	33.4	39.0	30.3	17.2	42.1	0.0	28.9	37.9	21.1	12.7
Incr Delay (d2), s/veh	1.7	0.0	5.7	9.9	2.6	0.1	1.3	0.0	6.7	14.4	1.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	7.8	3.8	7.6	2.0	0.9	0.0	9.9	5.0	7.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	42.2	0.0	39.1	48.8	32.9	17.3	43.4	0.0	35.6	52.3	22.1	12.7
LnGrp LOS	D		D	D	C	B	D		D	D	C	B
Approach Vol, veh/h	424		666				498		653			
Approach Delay, s/veh	39.7		33.0				36.2		30.8			
Approach LOS	D		C				D		C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.8	42.0	11.4	29.2	17.1	33.7	15.0	25.6				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	10.0	40.0	10.0	32.0	13.0	37.0	12.0	30.0				
Max Q Clear Time (g_c+I1), s	4.1	21.0	7.4	19.5	12.2	25.6	10.2	19.5				
Green Ext Time (p_c), s	0.0	4.0	0.0	1.3	0.0	3.1	0.0	0.9				
Intersection Summary												
HCM 7th Control Delay, s/veh			34.3									
HCM 7th LOS			C									
Notes												
User approved pedestrian interval to be less than phase max green.												

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:20	4:20	4:20	4:20	4:20	4:20	4:20
End Time	5:30	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	70	70	70	70	70	70	70
# of Intervals	3	3	3	3	3	3	3
# of Recorded Intervals	3	3	3	3	3	3	3
Vehs Entered	2695	2683	2849	2768	2734	2810	2741
Vehs Exited	2600	2581	2719	2687	2638	2684	2658
Starting Vehs	0	0	0	0	0	0	0
Ending Vehs	95	102	130	81	96	126	83
Travel Distance (mi)	2536	2513	2676	2625	2572	2628	2585
Travel Time (hr)	127.5	126.1	137.1	136.4	128.2	133.8	130.6
Total Delay (hr)	38.4	37.8	43.1	44.4	37.7	41.7	39.4
Total Stops	2310	2295	2533	2570	2312	2473	2365
Fuel Used (gal)	86.2	85.1	90.7	90.2	86.3	89.0	87.7

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:20	4:20	4:20	4:20
End Time	5:30	5:30	5:30	5:30
Total Time (min)	70	70	70	70
Time Recorded (min)	70	70	70	70
# of Intervals	3	3	3	3
# of Recorded Intervals	3	3	3	3
Vehs Entered	2791	2859	2656	2758
Vehs Exited	2655	2746	2579	2655
Starting Vehs	0	0	0	0
Ending Vehs	136	113	77	103
Travel Distance (mi)	2608	2693	2509	2595
Travel Time (hr)	137.0	138.2	127.2	132.2
Total Delay (hr)	45.3	43.6	39.2	41.1
Total Stops	2603	2557	2328	2432
Fuel Used (gal)	89.5	92.0	85.3	88.2

Interval #0 Information Seeding

Start Time 4:20

End Time 4:30

Total Time (min) 10

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	391	381	422	430	393	379	384
Vehs Exited	269	291	286	316	276	283	284
Starting Vehs	0	0	0	0	0	0	0
Ending Vehs	122	90	136	114	117	96	100
Travel Distance (mi)	317	309	342	349	318	314	320
Travel Time (hr)	15.3	14.2	17.4	16.8	14.9	14.7	14.8
Total Delay (hr)	4.0	3.5	5.4	4.6	3.7	3.8	3.5
Total Stops	283	245	355	299	272	261	239
Fuel Used (gal)	10.6	10.1	11.5	11.5	10.5	10.1	10.3

Interval #0 Information Seeding

Start Time 4:20

End Time 4:30

Total Time (min) 10

Volumes adjusted by PHF, Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	400	393	404	397
Vehs Exited	297	284	289	287
Starting Vehs	0	0	0	0
Ending Vehs	103	109	115	109
Travel Distance (mi)	326	324	332	325
Travel Time (hr)	15.5	15.0	16.1	15.5
Total Delay (hr)	4.1	3.4	4.4	4.0
Total Stops	276	249	284	276
Fuel Used (gal)	10.6	10.6	11.0	10.7

Interval #1 Information Recording1

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	633	617	610	607	575	620	599
Vehs Exited	617	577	630	585	579	603	595
Starting Vehs	122	90	136	114	117	96	100
Ending Vehs	138	130	116	136	113	113	104
Travel Distance (mi)	595	571	597	581	558	569	572
Travel Time (hr)	31.9	29.1	30.2	31.8	28.8	29.8	28.9
Total Delay (hr)	10.9	9.0	9.1	11.3	9.1	9.9	8.7
Total Stops	600	531	537	599	537	572	523
Fuel Used (gal)	20.7	19.3	20.0	20.3	19.0	19.6	19.5

Interval #1 Information Recording1

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	622	642	587	610
Vehs Exited	582	624	591	598
Starting Vehs	103	109	115	109
Ending Vehs	143	127	111	122
Travel Distance (mi)	575	607	553	578
Travel Time (hr)	35.0	33.1	28.0	30.6
Total Delay (hr)	14.6	11.7	8.7	10.3
Total Stops	789	667	489	585
Fuel Used (gal)	21.0	21.3	18.9	20.0

Interval #2 Information Recording2

Start Time	4:45
End Time	5:30
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	6	7
Vehs Entered	1671	1685	1817	1731	1766	1811	1758
Vehs Exited	1714	1713	1803	1786	1783	1798	1779
Starting Vehs	138	130	116	136	113	113	104
Ending Vehs	95	102	130	81	96	126	83
Travel Distance (mi)	1624	1634	1737	1695	1696	1745	1693
Travel Time (hr)	80.3	82.8	89.6	87.8	84.5	89.3	86.8
Total Delay (hr)	23.5	25.3	28.7	28.4	24.8	28.1	27.2
Total Stops	1427	1519	1641	1672	1503	1640	1603
Fuel Used (gal)	54.9	55.7	59.1	58.4	56.8	59.3	57.8

Interval #2 Information Recording2

Start Time	4:45
End Time	5:30
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	8	9	10	Avg
Vehs Entered	1769	1824	1665	1748
Vehs Exited	1776	1838	1699	1769
Starting Vehs	143	127	111	122
Ending Vehs	136	113	77	103
Travel Distance (mi)	1708	1762	1624	1692
Travel Time (hr)	86.6	90.2	83.1	86.1
Total Delay (hr)	26.6	28.5	26.2	26.7
Total Stops	1538	1641	1555	1575
Fuel Used (gal)	57.9	60.1	55.3	57.6

Intersection: 3: 8th St & Olney Ave

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	299	476	340	595	338	174	649	250	753	229
Average Queue (ft)	97	242	165	240	107	61	345	188	311	26
95th Queue (ft)	230	414	312	458	252	152	597	298	639	125
Link Distance (ft)		2954		3639			2247		1320	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200		250		250	75		150		150
Storage Blk Time (%)	0	18	5	8	0	6	52	32	22	
Queuing Penalty (veh)	1	15	31	33	0	26	20	155	49	

Network Summary

Network wide Queuing Penalty: 330

HCM 7th Signalized Intersection Summary
3: 8th St & Olney Ave

2046 Alt1 Signalized SBR PM Peak
08/14/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	370	60	170	490	245	60	395	90	190	535	45
Future Volume (veh/h)	105	370	60	170	490	245	60	395	90	190	535	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1723	1750	1709	1723	1736	1736	1750	1723	1736	1736	1736	1750
Adj Flow Rate, veh/h	105	370	55	170	490	117	60	395	82	190	535	22
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	3	2	1	1	0	2	1	1	1	0
Cap, veh/h	157	416	62	211	545	639	94	439	91	202	668	670
Arrive On Green	0.10	0.28	0.27	0.13	0.31	0.31	0.06	0.32	0.31	0.12	0.38	0.38
Sat Flow, veh/h	1641	1482	220	1641	1736	1467	1667	1377	286	1654	1736	1444
Grp Volume(v), veh/h	105	0	425	170	490	117	60	0	477	190	535	22
Grp Sat Flow(s),veh/h/ln	1641	0	1702	1641	1736	1467	1667	0	1662	1654	1736	1444
Q Serve(g_s), s	6.6	0.0	25.5	10.7	28.8	5.2	3.8	0.0	29.2	12.2	29.2	0.9
Cycle Q Clear(g_c), s	6.6	0.0	25.5	10.7	28.8	5.2	3.8	0.0	29.2	12.2	29.2	0.9
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	157	0	478	211	545	639	94	0	530	202	668	670
V/C Ratio(X)	0.67	0.00	0.89	0.81	0.90	0.18	0.64	0.00	0.90	0.94	0.80	0.03
Avail Cap(c_a), veh/h	169	0	527	215	586	674	172	0	561	202	668	670
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.6	0.0	36.8	45.2	35.0	18.5	49.3	0.0	34.8	46.5	29.2	15.7
Incr Delay (d2), s/veh	9.6	0.0	16.3	20.1	16.5	0.2	8.5	0.0	17.2	47.4	7.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	12.7	5.6	14.5	1.8	1.8	0.0	14.0	7.6	13.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	56.2	0.0	53.1	65.3	51.5	18.6	57.8	0.0	51.9	93.8	36.3	15.7
LnGrp LOS	E		D	E	D	B	E		D	F	D	B
Approach Vol, veh/h	530			777			537			747		
Approach Delay, s/veh	53.7			49.5			52.6			50.3		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	45.0	14.2	37.5	17.0	38.0	17.7	34.0				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	10.0	37.0	10.0	35.0	12.0	35.0	13.0	32.0				
Max Q Clear Time (g_c+I1), s	5.8	31.2	9.6	30.8	14.2	31.2	12.7	27.5				
Green Ext Time (p_c), s	0.1	2.9	0.0	1.7	0.0	1.8	0.0	1.1				
Intersection Summary												
HCM 7th Control Delay, s/veh	51.2											
HCM 7th LOS	D											

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:20	4:20	4:20	4:20	4:20	4:20	4:20
End Time	5:30	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	70	70	70	70	70	70	70
# of Intervals	3	3	3	3	3	3	3
# of Recorded Intervals	3	3	3	3	3	3	3
Vehs Entered	3146	3179	3117	3132	3172	3179	3150
Vehs Exited	2977	3007	2911	2962	2964	3034	2994
Starting Vehs	0	0	0	0	0	0	0
Ending Vehs	169	172	206	170	208	145	156
Travel Distance (mi)	2659	2672	2633	2631	2645	2678	2685
Travel Time (hr)	250.3	212.1	250.8	184.9	236.0	196.0	200.3
Total Delay (hr)	156.7	117.9	157.6	92.5	143.0	101.6	106.0
Total Stops	4470	4422	4611	3834	4651	4261	4368
Fuel Used (gal)	118.4	110.0	117.3	102.1	114.7	106.2	107.3

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:20	4:20	4:20	4:20
End Time	5:30	5:30	5:30	5:30
Total Time (min)	70	70	70	70
Time Recorded (min)	70	70	70	70
# of Intervals	3	3	3	3
# of Recorded Intervals	3	3	3	3
Vehs Entered	3183	3165	2966	3138
Vehs Exited	3004	3002	2808	2966
Starting Vehs	0	0	0	0
Ending Vehs	179	163	158	173
Travel Distance (mi)	2687	2666	2512	2647
Travel Time (hr)	262.2	172.6	252.7	221.8
Total Delay (hr)	167.5	78.5	163.8	128.5
Total Stops	5296	4020	3501	4344
Fuel Used (gal)	121.4	100.6	115.0	111.3

Interval #0 Information Seeding

Start Time 4:20

End Time 4:30

Total Time (min) 10

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	501	483	463	465	477	450	478
Vehs Exited	315	335	324	331	320	318	334
Starting Vehs	0	0	0	0	0	0	0
Ending Vehs	186	148	139	134	157	132	144
Travel Distance (mi)	345	349	330	337	332	324	345
Travel Time (hr)	20.5	19.6	18.7	17.4	18.3	16.7	18.6
Total Delay (hr)	8.3	7.3	7.0	5.4	6.8	5.3	6.4
Total Stops	535	451	435	352	404	359	402
Fuel Used (gal)	12.2	12.4	11.6	11.4	11.8	11.1	11.7

Interval #0 Information Seeding

Start Time 4:20

End Time 4:30

Total Time (min) 10

Volumes adjusted by PHF, Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	465	458	457	469
Vehs Exited	325	322	316	324
Starting Vehs	0	0	0	0
Ending Vehs	140	136	141	148
Travel Distance (mi)	331	332	326	335
Travel Time (hr)	18.2	17.9	17.7	18.4
Total Delay (hr)	6.6	6.2	6.2	6.6
Total Stops	408	426	386	417
Fuel Used (gal)	11.4	11.7	11.3	11.7

Interval #1 Information Recording1

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	639	645	665	673	651	698	692
Vehs Exited	670	624	661	673	662	667	675
Starting Vehs	186	148	139	134	157	132	144
Ending Vehs	155	169	143	134	146	163	161
Travel Distance (mi)	572	548	576	579	573	589	602
Travel Time (hr)	48.7	40.2	36.2	34.8	43.0	36.4	35.5
Total Delay (hr)	28.5	20.9	16.0	14.7	22.8	15.7	14.4
Total Stops	1240	833	854	795	840	845	803
Fuel Used (gal)	24.2	21.9	21.4	21.2	23.0	21.6	21.8

Interval #1 Information Recording1

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	709	686	627	667
Vehs Exited	652	666	627	658
Starting Vehs	140	136	141	148
Ending Vehs	197	156	141	156
Travel Distance (mi)	578	591	542	575
Travel Time (hr)	46.2	39.9	44.5	40.5
Total Delay (hr)	25.8	19.0	25.2	20.3
Total Stops	1055	971	721	895
Fuel Used (gal)	23.8	22.6	22.6	22.4

Interval #2 Information Recording2

Start Time 4:45

End Time 5:30

Total Time (min) 45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	6	7
Vehs Entered	2006	2051	1989	1994	2044	2031	1980
Vehs Exited	1992	2048	1926	1958	1982	2049	1985
Starting Vehs	155	169	143	134	146	163	161
Ending Vehs	169	172	206	170	208	145	156
Travel Distance (mi)	1743	1776	1727	1715	1741	1765	1737
Travel Time (hr)	181.2	152.2	195.9	132.7	174.7	142.9	146.2
Total Delay (hr)	119.9	89.7	134.6	72.3	113.4	80.5	85.1
Total Stops	2695	3138	3322	2687	3407	3057	3163
Fuel Used (gal)	81.9	75.7	84.3	69.5	79.8	73.6	73.9

Interval #2 Information Recording2

Start Time 4:45

End Time 5:30

Total Time (min) 45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	8	9	10	Avg
Vehs Entered	2009	2021	1882	2002
Vehs Exited	2027	2014	1865	1984
Starting Vehs	197	156	141	156
Ending Vehs	179	163	158	173
Travel Distance (mi)	1778	1743	1644	1737
Travel Time (hr)	197.9	114.8	190.5	162.9
Total Delay (hr)	135.1	53.3	132.4	101.6
Total Stops	3833	2623	2394	3034
Fuel Used (gal)	86.3	66.3	81.0	77.2

Intersection: 3: 8th St & Olney Ave

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	300	875	400	1467	400	175	939	175	1361	250
Average Queue (ft)	181	442	257	590	206	89	540	160	1085	64
95th Queue (ft)	357	813	458	1336	461	187	1009	212	1741	233
Link Distance (ft)		1800		3639			2112		1313	
Upstream Blk Time (%)									48	
Queuing Penalty (veh)									0	
Storage Bay Dist (ft)	200		300		300	75		75		150
Storage Blk Time (%)	6	43	9	26	0	14	60	66	45	
Queuing Penalty (veh)	26	45	68	106	0	68	36	383	107	

Network Summary

Network wide Queuing Penalty: 839

MOVEMENT SUMMARY

 **Site: [104 (6)] 2026 Olney and 8th - Alt2 Single Lane Roundabout (2026 Analysis V2)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	Dist]				mph
South: 8th St															
3	L2	All MCs	39	0.0	39	0.0	0.622	14.0	LOS B	4.9	125.3	0.72	0.81	1.22	16.8
8	T1	All MCs	378	2.0	378	2.0	0.622	14.5	LOS B	4.9	125.3	0.72	0.81	1.22	27.3
18	R2	All MCs	88	1.0	88	1.0	0.622	14.3	LOS B	4.9	125.3	0.72	0.81	1.22	23.9
Approach			505	1.7	505	1.7	0.622	14.4	LOS B	4.9	125.3	0.72	0.81	1.22	25.9
East: NE Olney Ave															
1	L2	All MCs	152	2.0	152	2.0	0.872	28.5	LOS D	16.5	417.4	0.98	1.58	2.44	20.6
6	T1	All MCs	363	1.0	363	1.0	0.872	28.3	LOS D	16.5	417.4	0.98	1.58	2.44	16.0
16	R2	All MCs	244	1.0	244	1.0	0.872	28.3	LOS D	16.5	417.4	0.98	1.58	2.44	20.8
Approach			759	1.2	759	1.2	0.872	28.4	LOS D	16.5	417.4	0.98	1.58	2.44	18.8
North: 8th St															
7	L2	All MCs	190	1.0	190	1.0	0.810	23.4	LOS C	11.1	278.4	0.89	1.16	1.94	21.5
4	T1	All MCs	455	1.0	455	1.0	0.810	23.4	LOS C	11.1	278.4	0.89	1.16	1.94	24.4
14	R2	All MCs	33	0.0	33	0.0	0.810	23.2	LOS C	11.1	278.4	0.89	1.16	1.94	19.7
Approach			678	1.0	678	1.0	0.810	23.4	LOS C	11.1	278.4	0.89	1.16	1.94	23.4
West: NE Olney Ave															
5	L2	All MCs	81	2.0	81	2.0	0.622	16.8	LOS C	4.0	101.4	0.75	0.93	1.24	22.1
2	T1	All MCs	307	0.0	307	0.0	0.622	16.2	LOS C	4.0	101.4	0.75	0.93	1.24	18.8
12	R2	All MCs	40	3.0	40	3.0	0.622	17.1	LOS C	4.0	101.4	0.75	0.93	1.24	22.4
Approach			428	0.7	428	0.7	0.622	16.4	LOS C	4.0	101.4	0.75	0.93	1.24	19.6
All Vehicles			2370	1.1	2370	1.1	0.872	21.8	LOS C	16.5	417.4	0.86	1.18	1.82	21.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglach M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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QUEUE ANALYSIS

 Site: [107 (16)] 2026 Olney and 8th - Alt3 Partial Multi Lane

Roundabout (WBR) (2026 Analysis V2)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Lane Queues (Distance)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (ft)	Back of Queue (ft)		Queue at Start of Gap (ft)		Cycle-Average Queue (ft)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.622	1.000	15.6	50.4	125.3	34.7	86.2	51.2	92.8	0.03	0.08	0.0	NA	NA
Approach		0.622			50.4	125.3	34.7	86.2	51.2	92.8	0.03	0.08			
East: NE Olney Ave															
Lane 1		0.593	1.000	13.6	47.6	118.4	31.9	79.3	46.4	84.1	0.03	0.07	0.0	NA	NA
Lane 2		0.281	1.000	0.0	10.7	26.5	8.7	21.6	12.2	22.1	0.05	0.13	NA	0.0	1
Approach		0.593			47.6	118.4	31.9	79.3	46.4	84.1	0.03	0.07			
North: 8th St															
Lane 1		0.810	1.000	46.8	114.7	285.1	71.9	178.6	110.9	201.1	0.07	0.18	0.0	NA	NA
Approach		0.810			114.7	285.1	71.9	178.6	110.9	201.1	0.07	0.18			
West: NE Olney Ave															
Lane 1		0.622	1.000	12.0	40.8	101.4	30.8	76.7	49.0	88.9	0.20	0.51	0.0	NA	NA
Approach		0.622			40.8	101.4	30.8	76.7	49.0	88.9	0.20	0.51			
Intersection		0.810			114.7	285.1	71.9	178.6	110.9	201.1	0.20	0.51			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Gap (veh)		Cycle-Average Queue (veh)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.622	1.000	0.6	2.0	4.9	1.4	3.4	2.0	3.7	0.03	0.08	0.0	NA	NA
Approach		0.622			2.0	4.9	1.4	3.4	2.0	3.7	0.03	0.08			
East: NE Olney Ave															
Lane 1		0.593	1.000	0.5	1.9	4.7	1.3	3.1	1.8	3.3	0.03	0.07	0.0	NA	NA
Lane 2		0.281	1.000	0.0	0.4	1.1	0.3	0.9	0.5	0.9	0.05	0.13	NA	0.0	1
Approach		0.593			1.9	4.7	1.3	3.1	1.8	3.3	0.03	0.07			
North: 8th St															
Lane 1		0.810	1.000	1.9	4.6	11.3	2.9	7.1	4.4	8.0	0.07	0.18	0.0	NA	NA

Approach	0.810			4.6	11.3	2.9	7.1	4.4	8.0	0.07	0.18			
West: NE Olney Ave														
Lane 1	0.622	1.000	0.5	1.6	4.0	1.2	3.1	1.9	3.5	0.20	0.51	0.0	NA	NA
Approach	0.622			1.6	4.0	1.2	3.1	1.9	3.5	0.20	0.51			
Intersection	0.810			4.6	11.3	2.9	7.1	4.4	8.0	0.20	0.51			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

Continuous Lane Performance												
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy Spacing	Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS	
	v/c	mph	sec	sec	ft	sec	sec	%	%	veh/mi	pc/mi	(Density Method)
There are no Continuous Lanes at this Site.												

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MOVEMENT SUMMARY

 **Site: [104 (9)] 2046 Olney and 8th - Alt2 Single Lane Roundabout (2026 Analysis V2)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	Dist]				mph
South: 8th St															
3	L2	All MCs	60	0.0	60	0.0	0.719	18.9	LOS C	6.6	167.3	0.80	0.99	1.55	15.8
8	T1	All MCs	395	2.0	395	2.0	0.719	19.4	LOS C	6.6	167.3	0.80	0.99	1.55	25.8
18	R2	All MCs	90	1.0	90	1.0	0.719	19.1	LOS C	6.6	167.3	0.80	0.99	1.55	22.7
Approach			545	1.6	545	1.6	0.719	19.3	LOS C	6.6	167.3	0.80	0.99	1.55	24.2
East: NE Olney Ave															
1	L2	All MCs	170	2.0	170	2.0	1.095	79.5	LOS F	46.1	1162.5	1.00	3.50	5.87	14.1
6	T1	All MCs	490	1.0	490	1.0	1.095	79.3	LOS F	46.1	1162.5	1.00	3.50	5.87	9.9
16	R2	All MCs	245	1.0	245	1.0	1.095	79.3	LOS F	46.1	1162.5	1.00	3.50	5.87	14.2
Approach			905	1.2	905	1.2	1.095	79.3	LOS F	46.1	1162.5	1.00	3.50	5.87	12.0
North: 8th St															
7	L2	All MCs	190	1.0	190	1.0	1.007	56.0	LOS F	26.4	664.8	1.00	2.15	4.11	16.5
4	T1	All MCs	535	1.0	535	1.0	1.007	56.0	LOS F	26.4	664.8	1.00	2.15	4.11	18.1
14	R2	All MCs	45	0.0	45	0.0	1.007	55.7	LOS F	26.4	664.8	1.00	2.15	4.11	13.3
Approach			770	0.9	770	0.9	1.007	56.0	LOS F	26.4	664.8	1.00	2.15	4.11	17.5
West: NE Olney Ave															
5	L2	All MCs	105	2.0	105	2.0	0.824	30.4	LOS D	7.9	197.4	0.88	1.33	1.95	18.0
2	T1	All MCs	370	0.0	370	0.0	0.824	29.6	LOS D	7.9	197.4	0.88	1.33	1.95	15.8
12	R2	All MCs	60	3.0	60	3.0	0.824	30.8	LOS D	7.9	197.4	0.88	1.33	1.95	18.2
Approach			535	0.7	535	0.7	0.824	29.9	LOS D	7.9	197.4	0.88	1.33	1.95	16.4
All Vehicles			2755	1.1	2755	1.1	1.095	51.3	LOS F	46.1	1162.5	0.94	2.21	3.76	16.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglach M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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QUEUE ANALYSIS

 Site: [104 (9)] 2046 Olney and 8th - Alt2 Single Lane

Roundabout (2026 Analysis V2)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Lane Queues (Distance)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (ft)	Back of Queue (ft)		Queue at Start of Gap (ft)		Cycle-Average Queue (ft)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.719	1.000	24.2	67.3	167.3	46.1	114.7	73.9	134.0	0.04	0.10	0.0	NA	NA
Approach		0.719			67.3	167.3	46.1	114.7	73.9	134.0	0.04	0.10			
East: NE Olney Ave															
Lane 1		1.095	1.000	346.2	467.7	1162.5	376.9	936.8	- ¹	913.2	0.29	0.73	0.0	NA	NA
Approach		1.095			467.7	1162.5	376.9	936.8	- ¹	913.2	0.29	0.73			
North: 8th St															
Lane 1		1.007	1.000	166.0	267.5	664.8	196.6	488.6	- ¹	547.2	0.17	0.42	0.0	NA	NA
Approach		1.007			267.5	664.8	196.6	488.6	- ¹	547.2	0.17	0.42			
West: NE Olney Ave															
Lane 1		0.824	1.000	33.1	79.4	197.4	58.2	144.6	111.6	202.5	0.40	0.99	4.6	NA	NA
Approach		0.824			79.4	197.4	58.2	144.6	111.6	202.5	0.40	0.99			
Intersection		1.095			467.7	1162.5	376.9	936.8	- ¹	913.2	0.40	0.99			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

¹ Cycle-Average Queue is not given as it is larger than the Back of Queue because the delay estimate includes a large delay experienced after the analysis period in oversaturated conditions.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Gap (veh)		Cycle-Average Queue (veh)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.719	1.000	1.0	2.7	6.6	1.8	4.5	2.9	5.3	0.04	0.10	0.0	NA	NA
Approach		0.719			2.7	6.6	1.8	4.5	2.9	5.3	0.04	0.10			
East: NE Olney Ave															
Lane 1		1.095	1.000	13.7	18.5	46.1	14.9	37.1	- ¹	36.2	0.29	0.73	0.0	NA	NA
Approach		1.095			18.5	46.1	14.9	37.1	- ¹	36.2	0.29	0.73			
North: 8th St															
Lane 1		1.007	1.000	6.6	10.6	26.4	7.8	19.4	- ¹	21.7	0.17	0.42	0.0	NA	NA

Approach	1.007		10.6	26.4	7.8	19.4	- ¹	21.7	0.17	0.42				
West: NE Olney Ave														
Lane 1	0.824	1.000	1.3	3.2	7.9	2.3	5.7	4.4	8.1	0.40	0.99	4.6	NA	NA
Approach	0.824			3.2	7.9	2.3	5.7	4.4	8.1	0.40	0.99			
Intersection	1.095			18.5	46.1	14.9	37.1	- ¹	36.2	0.40	0.99			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

- ¹ Cycle-Average Queue is not given as it is larger than the Back of Queue because the delay estimate includes a large delay experienced after the analysis period in oversaturated conditions.

Continuous Lane Performance												
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy Spacing	Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS	
	v/c	mph	sec	sec	ft	sec	sec	%	%	veh/mi	pc/mi	(Density Method)
There are no Continuous Lanes at this Site.												

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MOVEMENT SUMMARY

 **Site: [107 (16)] 2026 Olney and 8th - Alt3 Partial Multi Lane**

Roundabout (WBR) (2026 Analysis V2)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]		[Total HV]					[Veh.	Dist]				mph
			veh/h	%	veh/h	%	v/c	sec		veh	ft				
South: 8th St															
3	L2	All MCs	39	0.0	39	0.0	0.622	14.0	LOS B	4.9	125.3	0.72	0.81	1.22	16.8
8	T1	All MCs	378	2.0	378	2.0	0.622	14.5	LOS B	4.9	125.3	0.72	0.81	1.22	27.3
18	R2	All MCs	88	1.0	88	1.0	0.622	14.3	LOS B	4.9	125.3	0.72	0.81	1.22	23.9
Approach			505	1.7	505	1.7	0.622	14.4	LOS B	4.9	125.3	0.72	0.81	1.22	25.9
East: NE Olney Ave															
1	L2	All MCs	152	2.0	152	2.0	0.593	13.0	LOS B	4.7	118.4	0.68	0.77	1.09	24.0
6	T1	All MCs	363	1.0	363	1.0	0.593	12.8	LOS B	4.7	118.4	0.68	0.77	1.09	19.7
16	R2	All MCs	244	1.0	244	1.0	0.281	7.1	LOS A	1.1	26.5	0.50	0.41	0.50	25.8
Approach			759	1.2	759	1.2	0.593	11.0	LOS B	4.7	118.4	0.62	0.66	0.90	22.9
North: 8th St															
7	L2	All MCs	190	1.0	190	1.0	0.810	23.4	LOS C	11.3	285.1	0.89	1.18	1.98	21.5
4	T1	All MCs	455	1.0	455	1.0	0.810	23.4	LOS C	11.3	285.1	0.89	1.18	1.98	24.4
14	R2	All MCs	33	0.0	33	0.0	0.810	23.2	LOS C	11.3	285.1	0.89	1.18	1.98	19.7
Approach			678	1.0	678	1.0	0.810	23.4	LOS C	11.3	285.1	0.89	1.18	1.98	23.4
West: NE Olney Ave															
5	L2	All MCs	81	2.0	81	2.0	0.622	16.8	LOS C	4.0	101.4	0.75	0.93	1.24	22.1
2	T1	All MCs	307	0.0	307	0.0	0.622	16.2	LOS C	4.0	101.4	0.75	0.93	1.24	18.8
12	R2	All MCs	40	3.0	40	3.0	0.622	17.1	LOS C	4.0	101.4	0.75	0.93	1.24	22.4
Approach			428	0.7	428	0.7	0.622	16.4	LOS C	4.0	101.4	0.75	0.93	1.24	19.6
All Vehicles			2370	1.1	2370	1.1	0.810	16.2	LOS C	11.3	285.1	0.74	0.89	1.34	23.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglach M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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QUEUE ANALYSIS

 Site: [107 (16)] 2026 Olney and 8th - Alt3 Partial Multi Lane

Roundabout (WBR) (2026 Analysis V2)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Lane Queues (Distance)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (ft)	Back of Queue (ft)		Queue at Start of Gap (ft)		Cycle-Average Queue (ft)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.622	1.000	15.6	50.4	125.3	34.7	86.2	51.2	92.8	0.03	0.08	0.0	NA	NA
Approach		0.622			50.4	125.3	34.7	86.2	51.2	92.8	0.03	0.08			
East: NE Olney Ave															
Lane 1		0.593	1.000	13.6	47.6	118.4	31.9	79.3	46.4	84.1	0.03	0.07	0.0	NA	NA
Lane 2		0.281	1.000	0.0	10.7	26.5	8.7	21.6	12.2	22.1	0.05	0.13	NA	0.0	1
Approach		0.593			47.6	118.4	31.9	79.3	46.4	84.1	0.03	0.07			
North: 8th St															
Lane 1		0.810	1.000	46.8	114.7	285.1	71.9	178.6	110.9	201.1	0.07	0.18	0.0	NA	NA
Approach		0.810			114.7	285.1	71.9	178.6	110.9	201.1	0.07	0.18			
West: NE Olney Ave															
Lane 1		0.622	1.000	12.0	40.8	101.4	30.8	76.7	49.0	88.9	0.20	0.51	0.0	NA	NA
Approach		0.622			40.8	101.4	30.8	76.7	49.0	88.9	0.20	0.51			
Intersection		0.810			114.7	285.1	71.9	178.6	110.9	201.1	0.20	0.51			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Gap (veh)		Cycle-Average Queue (veh)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.622	1.000	0.6	2.0	4.9	1.4	3.4	2.0	3.7	0.03	0.08	0.0	NA	NA
Approach		0.622			2.0	4.9	1.4	3.4	2.0	3.7	0.03	0.08			
East: NE Olney Ave															
Lane 1		0.593	1.000	0.5	1.9	4.7	1.3	3.1	1.8	3.3	0.03	0.07	0.0	NA	NA
Lane 2		0.281	1.000	0.0	0.4	1.1	0.3	0.9	0.5	0.9	0.05	0.13	NA	0.0	1
Approach		0.593			1.9	4.7	1.3	3.1	1.8	3.3	0.03	0.07			
North: 8th St															
Lane 1		0.810	1.000	1.9	4.6	11.3	2.9	7.1	4.4	8.0	0.07	0.18	0.0	NA	NA

Approach	0.810			4.6	11.3	2.9	7.1	4.4	8.0	0.07	0.18			
West: NE Olney Ave														
Lane 1	0.622	1.000	0.5	1.6	4.0	1.2	3.1	1.9	3.5	0.20	0.51	0.0	NA	NA
Approach	0.622			1.6	4.0	1.2	3.1	1.9	3.5	0.20	0.51			
Intersection	0.810			4.6	11.3	2.9	7.1	4.4	8.0	0.20	0.51			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

Continuous Lane Performance												
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy Spacing	Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS	
	v/c	mph	sec	sec	ft	sec	sec	%	%	veh/mi	pc/mi	(Density Method)
There are no Continuous Lanes at this Site.												

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Project: L:\All-DKS\PD\X-Drive\Projects\2021\P21239-000 (Bend GO Bond Traffic Engineering Service)\02 Delivery\Analysis\02_Olney and Revere\Synchro_Sidra\03_8th_Olney_Updated_Analysis\Synchro_Sidra\Bend GO Sidra_new8th_v10_2026Analysis.sipx

MOVEMENT SUMMARY

 **Site: [107 (17)] 2046 Olney and 8th - Alt3 Partial Multi Lane**

Roundabout (WBR) (2026 Analysis V2)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: 8th St															
3	L2	All MCs	60	0.0	60	0.0	0.715	18.6	LOS C	6.5	165.8	0.80	0.98	1.54	15.9
8	T1	All MCs	395	2.0	395	2.0	0.715	19.1	LOS C	6.5	165.8	0.80	0.98	1.54	25.8
18	R2	All MCs	90	1.0	90	1.0	0.715	18.8	LOS C	6.5	165.8	0.80	0.98	1.54	22.7
Approach			545	1.6	545	1.6	0.715	19.0	LOS C	6.5	165.8	0.80	0.98	1.54	24.2
East: NE Olney Ave															
1	L2	All MCs	170	2.0	170	2.0	0.801	23.2	LOS C	10.6	268.2	0.88	1.28	1.93	21.7
6	T1	All MCs	490	1.0	490	1.0	0.801	22.9	LOS C	10.6	268.2	0.88	1.28	1.93	17.2
16	R2	All MCs	245	1.0	245	1.0	0.296	7.6	LOS A	1.1	27.9	0.53	0.45	0.53	25.7
Approach			905	1.2	905	1.2	0.801	18.8	LOS C	10.6	268.2	0.79	1.06	1.55	20.6
North: 8th St															
7	L2	All MCs	190	1.0	190	1.0	1.056	70.9	LOS F	31.7	798.6	1.00	2.50	5.16	14.9
4	T1	All MCs	535	1.0	535	1.0	1.056	70.9	LOS F	31.7	798.6	1.00	2.50	5.16	16.2
14	R2	All MCs	45	0.0	45	0.0	1.056	70.5	LOS F	31.7	798.6	1.00	2.50	5.16	11.6
Approach			770	0.9	770	0.9	1.056	70.8	LOS F	31.7	798.6	1.00	2.50	5.16	15.7
West: NE Olney Ave															
5	L2	All MCs	105	2.0	105	2.0	0.818	29.5	LOS D	7.8	195.0	0.88	1.31	1.93	18.2
2	T1	All MCs	370	0.0	370	0.0	0.818	28.8	LOS D	7.8	195.0	0.88	1.31	1.93	15.9
12	R2	All MCs	60	3.0	60	3.0	0.818	29.9	LOS D	7.8	195.0	0.88	1.31	1.93	18.4
Approach			535	0.7	535	0.7	0.818	29.0	LOS D	7.8	195.0	0.88	1.31	1.93	16.6
All Vehicles			2755	1.1	2755	1.1	1.056	35.4	LOS E	31.7	798.6	0.87	1.49	2.63	18.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stoeline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: L:\All-DKS\PDIX-Drive\Projects\2021\21239-000 (Bend GO Bond Traffic Engineering Service)\02 Delivery\Analysis\02_Olney and Reverse\Synchro_Sidra\03_8th_Olney_Updated_Analysis\Synchro_Sidra\Bend GO Sidra_new8th_v10_2026Analysis.sipx

QUEUE ANALYSIS

 Site: [107 (17)] 2046 Olney and 8th - Alt3 Partial Multi Lane

Roundabout (WBR) (2026 Analysis V2)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Lane Queues (Distance)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (ft)	Back of Queue (ft)		Queue at Start of Gap (ft)		Cycle-Average Queue (ft)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.715	1.000	23.8	66.7	165.8	45.6	113.3	72.8	132.0	0.04	0.10	0.0	NA	NA
Approach		0.715			66.7	165.8	45.6	113.3	72.8	132.0	0.04	0.10			
East: NE Olney Ave															
Lane 1		0.801	1.000	43.6	107.9	268.2	68.2	169.5	106.4	193.0	0.07	0.17	0.0	NA	NA
Lane 2		0.296	1.000	0.0	11.2	27.9	9.1	22.7	13.1	23.7	0.06	0.14	NA	0.0	1
Approach		0.801			107.9	268.2	68.2	169.5	106.4	193.0	0.07	0.17			
North: 8th St															
Lane 1		1.056	1.000	228.9	321.3	798.6	259.3	644.5	- ¹	692.4	0.20	0.50	0.0	NA	NA
Approach		1.056			321.3	798.6	259.3	644.5	- ¹	692.4	0.20	0.50			
West: NE Olney Ave															
Lane 1		0.818	1.000	32.4	78.5	195.0	57.1	142.0	108.5	196.8	0.39	0.98	4.3	NA	NA
Approach		0.818			78.5	195.0	57.1	142.0	108.5	196.8	0.39	0.98			
Intersection		1.056			321.3	798.6	259.3	644.5	- ¹	692.4	0.39	0.98			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

- ¹ Cycle-Average Queue is not given as it is larger than the Back of Queue because the delay estimate includes a large delay experienced after the analysis period in oversaturated conditions.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Gap (veh)		Cycle-Average Queue (veh)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.715	1.000	0.9	2.6	6.5	1.8	4.5	2.9	5.2	0.04	0.10	0.0	NA	NA
Approach		0.715			2.6	6.5	1.8	4.5	2.9	5.2	0.04	0.10			
East: NE Olney Ave															
Lane 1		0.801	1.000	1.7	4.3	10.6	2.7	6.7	4.2	7.6	0.07	0.17	0.0	NA	NA
Lane 2		0.296	1.000	0.0	0.4	1.1	0.4	0.9	0.5	0.9	0.06	0.14	NA	0.0	1
Approach		0.801			4.3	10.6	2.7	6.7	4.2	7.6	0.07	0.17			

North: 8th St													
Lane 1	1.056	1.000	9.1	12.8	31.7	10.3	25.6	- ¹	27.5	0.20	0.50	0.0	NA NA
Approach	1.056			12.8	31.7	10.3	25.6	- ¹	27.5	0.20	0.50		
West: NE Olney Ave													
Lane 1	0.818	1.000	1.3	3.1	7.8	2.3	5.6	4.3	7.8	0.39	0.98	4.3	NA NA
Approach	0.818			3.1	7.8	2.3	5.6	4.3	7.8	0.39	0.98		
Intersection	1.056			12.8	31.7	10.3	25.6	- ¹	27.5	0.39	0.98		

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

- ¹ Cycle-Average Queue is not given as it is larger than the Back of Queue because the delay estimate includes a large delay experienced after the analysis period in oversaturated conditions.

Continuous Lane Performance												
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy Spacing	Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS (Density Method)	
	v/c	mph	sec	sec	ft	sec	sec	%	%	veh/mi	pc/mi	
There are no Continuous Lanes at this Site.												

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Project: L:\All-DKS\PD\X-Drive\Projects\2021\2021-000 (Bend GO Bond Traffic Engineering Service)\02 Delivery\Analysis\02_Olney and Reverse\Synchro_Sidra\03_8th_Olney_Updated_Analysis\Synchro_Sidra\Bend GO Sidra_new8th_v10_2026Analysis.sipx

MOVEMENT SUMMARY

 **Site: [107 (14)] 2026 Olney and 8th - Alt4 Partial Multi Lane Roundabout (SBR, WBR) (2026 Analysis V2)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: 8th St															
3	L2	All MCs	39	0.0	39	0.0	0.622	14.0	LOS B	4.9	125.3	0.72	0.81	1.22	16.8
8	T1	All MCs	378	2.0	378	2.0	0.622	14.5	LOS B	4.9	125.3	0.72	0.81	1.22	27.3
18	R2	All MCs	88	1.0	88	1.0	0.622	14.3	LOS B	4.9	125.3	0.72	0.81	1.22	23.9
Approach			505	1.7	505	1.7	0.622	14.4	LOS B	4.9	125.3	0.72	0.81	1.22	25.9
East: NE Olney Ave															
1	L2	All MCs	152	2.0	152	2.0	0.593	13.0	LOS B	4.7	118.4	0.68	0.77	1.09	24.0
6	T1	All MCs	363	1.0	363	1.0	0.593	12.8	LOS B	4.7	118.4	0.68	0.77	1.09	19.7
16	R2	All MCs	244	1.0	244	1.0	0.281	7.1	LOS A	1.1	26.5	0.50	0.41	0.50	25.8
Approach			759	1.2	759	1.2	0.593	11.0	LOS B	4.7	118.4	0.62	0.66	0.90	22.9
North: 8th St															
7	L2	All MCs	190	1.0	190	1.0	0.773	20.8	LOS C	9.5	240.0	0.85	1.08	1.77	22.1
4	T1	All MCs	455	1.0	455	1.0	0.773	20.8	LOS C	9.5	240.0	0.85	1.08	1.77	25.1
14	R2	All MCs	33	0.0	33	0.0	0.039	4.6	LOS A	0.1	3.1	0.44	0.36	0.44	27.7
Approach			678	1.0	678	1.0	0.773	20.0	LOS C	9.5	240.0	0.83	1.04	1.71	24.2
West: NE Olney Ave															
5	L2	All MCs	81	2.0	81	2.0	0.622	16.8	LOS C	4.0	101.7	0.75	0.93	1.25	22.1
2	T1	All MCs	307	0.0	307	0.0	0.622	16.2	LOS C	4.0	101.7	0.75	0.93	1.25	18.8
12	R2	All MCs	40	3.0	40	3.0	0.622	17.1	LOS C	4.0	101.7	0.75	0.93	1.25	22.4
Approach			428	0.7	428	0.7	0.622	16.4	LOS C	4.0	101.7	0.75	0.93	1.25	19.6
All Vehicles			2370	1.1	2370	1.1	0.773	15.3	LOS C	9.5	240.0	0.72	0.85	1.26	23.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglach M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: L:\All-DKS\PDIX-Drive\Projects\2021\21239-000 (Bend GO Bond Traffic Engineering Service)\02 Delivery\Analysis\02_Olney and Reverse\Synchro_Sidra\03_8th_Olney_Updated_Analysis\Synchro_Sidra\Bend GO Sidra_new8th_v10_2026Analysis.sipx

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Site Scenario: 1 | Local Volumes

Roundabout Capacity Model: US HCM 6.
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
Short Lanes are not included in determining Queue Storage Ratios.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Gap (veh)		Cycle-Average Queue (veh)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.622	1.000	0.6	2.0	4.9	1.4	3.4	2.0	3.7	0.03	0.08	0.0	NA	NA
Approach		0.622			2.0	4.9	1.4	3.4	2.0	3.7	0.03	0.08			
East: NE Olney Ave															
Lane 1		0.593	1.000	0.5	1.9	4.7	1.3	3.1	1.8	3.3	0.03	0.07	0.0	NA	NA
Lane 2		0.281	1.000	0.0	0.4	1.1	0.3	0.9	0.5	0.9	0.05	0.13	NA	0.0	1
Approach		0.593			1.9	4.7	1.3	3.1	1.8	3.3	0.03	0.07			
North: 8th St															

Lane 1	0.773	1.000	1.5	3.8	9.5	2.4	6.0	3.7	6.8	0.06	0.15	0.0	NA	NA
Lane 2	0.039	1.000	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.01	0.02	NA	0.0	1
Approach	0.773			3.8	9.5	2.4	6.0	3.7	6.8	0.06	0.15			
West: NE Olney Ave														
Lane 1	0.622	1.000	0.5	1.6	4.0	1.2	3.1	1.9	3.5	0.20	0.51	0.0	NA	NA
Approach	0.622			1.6	4.0	1.2	3.1	1.9	3.5	0.20	0.51			
Intersection	0.773			3.8	9.5	2.4	6.0	3.7	6.8	0.20	0.51			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

Continuous Lane Performance												
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy Spacing		Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS (Density Method)
	v/c	mph	sec	sec	ft	ft	sec	sec	%	%	veh/mi	pc/mi
There are no Continuous Lanes at this Site.												

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Project: L:\All-DKS\PD\X-Drive\Projects\2021\P21239-000 (Bend GO Bond Traffic Engineering Service)\02 Delivery\Analysis\02_Olney and Revere\Synchro_Sidra\03_8th_Olney_Updated_Analysis\Synchro_Sidra\Bend GO Sidra_new8th_v10_2026Analysis.sipx

MOVEMENT SUMMARY

 **Site: [107 (15)] 2046 Olney and 8th - Alt4 Partial Multi Lane Roundabout (SBR, WBR) (2026 Analysis V2)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]						[Veh.]	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: 8th St															
3	L2	All MCs	60	0.0	60	0.0	0.721	19.0	LOS C	6.6	167.9	0.81	1.00	1.56	15.8
8	T1	All MCs	395	2.0	395	2.0	0.721	19.5	LOS C	6.6	167.9	0.81	1.00	1.56	25.7
18	R2	All MCs	90	1.0	90	1.0	0.721	19.3	LOS C	6.6	167.9	0.81	1.00	1.56	22.6
Approach			545	1.6	545	1.6	0.721	19.4	LOS C	6.6	167.9	0.81	1.00	1.56	24.1
East: NE Olney Ave															
1	L2	All MCs	170	2.0	170	2.0	0.801	23.2	LOS C	10.6	268.1	0.88	1.28	1.93	21.7
6	T1	All MCs	490	1.0	490	1.0	0.801	22.9	LOS C	10.6	268.1	0.88	1.28	1.93	17.2
16	R2	All MCs	245	1.0	245	1.0	0.296	7.6	LOS A	1.1	27.9	0.53	0.45	0.53	25.7
Approach			905	1.2	905	1.2	0.801	18.8	LOS C	10.6	268.1	0.79	1.06	1.55	20.6
North: 8th St															
7	L2	All MCs	190	1.0	190	1.0	0.997	54.9	LOS F	23.2	585.7	1.00	2.06	3.97	16.6
4	T1	All MCs	535	1.0	535	1.0	0.997	54.9	LOS F	23.2	585.7	1.00	2.06	3.97	18.3
14	R2	All MCs	45	0.0	45	0.0	0.061	5.5	LOS A	0.2	4.8	0.50	0.46	0.50	27.2
Approach			770	0.9	770	0.9	0.997	52.0	LOS F	23.2	585.7	0.97	1.97	3.76	18.0
West: NE Olney Ave															
5	L2	All MCs	105	2.0	105	2.0	0.844	33.0	LOS D	8.3	208.1	0.89	1.38	2.06	17.4
2	T1	All MCs	370	0.0	370	0.0	0.844	32.2	LOS D	8.3	208.1	0.89	1.38	2.06	15.3
12	R2	All MCs	60	3.0	60	3.0	0.844	33.4	LOS D	8.3	208.1	0.89	1.38	2.06	17.6
Approach			535	0.7	535	0.7	0.844	32.4	LOS D	8.3	208.1	0.89	1.38	2.06	15.9
All Vehicles			2755	1.1	2755	1.1	0.997	30.9	LOS D	23.2	585.7	0.86	1.36	2.27	19.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglach M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Site Scenario: 1 | Local Volumes

Roundabout Capacity Model: US HCM 6.
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
Short Lanes are not included in determining Queue Storage Ratios.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Gap (veh)		Cycle-Average Queue (veh)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.721	1.000	1.0	2.7	6.6	1.8	4.5	2.9	5.3	0.04	0.10	0.0	NA	NA
Approach		0.721			2.7	6.6	1.8	4.5	2.9	5.3	0.04	0.10			
East: NE Olney Ave															
Lane 1		0.801	1.000	1.7	4.3	10.6	2.7	6.7	4.2	7.6	0.07	0.17	0.0	NA	NA
Lane 2		0.296	1.000	0.0	0.4	1.1	0.4	0.9	0.5	0.9	0.06	0.14	NA	0.0	1
Approach		0.801			4.3	10.6	2.7	6.7	4.2	7.6	0.07	0.17			
North: 8th St															

Lane 1	0.997	1.000	5.7	9.4	23.2	6.9	17.3	11.0	20.0	0.15	0.37	0.0	NA	NA
Lane 2	0.061	1.000	0.0	0.1	0.2	0.1	0.2	0.1	0.1	0.01	0.02	NA	0.0	1
Approach	0.997			9.4	23.2	6.9	17.3	11.0	20.0	0.15	0.37			
West: NE Olney Ave														
Lane 1	0.844	1.000	1.4	3.3	8.3	2.5	6.1	4.8	8.7	0.42	1.04	6.2	NA	NA
Approach	0.844			3.3	8.3	2.5	6.1	4.8	8.7	0.42	1.04			
Intersection	0.997			9.4	23.2	6.9	17.3	11.0	20.0	0.42	1.04			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

Continuous Lane Performance												
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy Spacing	Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS (Density Method)	
	v/c	mph	sec	sec	ft	sec	sec	%	%	veh/mi	pc/mi	
There are no Continuous Lanes at this Site.												

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MOVEMENT SUMMARY

 **Site: [107 (12)] 2026 Olney and 8th - Alt5 Partial Multi Lane Roundabout (SBL, WBR) (2026 Analysis V2)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]		[Total HV]					[Veh.	Dist]		Rate to Depart		mph
			veh/h	%	veh/h	%	v/c	sec		veh	ft				
South: 8th St															
3	L2	All MCs	39	0.0	39	0.0	0.622	14.0	LOS B	4.9	125.2	0.72	0.81	1.22	16.8
8	T1	All MCs	378	2.0	378	2.0	0.622	14.5	LOS B	4.9	125.2	0.72	0.81	1.22	27.3
18	R2	All MCs	88	1.0	88	1.0	0.622	14.3	LOS B	4.9	125.2	0.72	0.81	1.22	23.9
Approach			505	1.7	505	1.7	0.622	14.4	LOS B	4.9	125.2	0.72	0.81	1.22	25.9
East: NE Olney Ave															
1	L2	All MCs	152	2.0	152	2.0	0.593	13.0	LOS B	4.7	118.4	0.68	0.77	1.09	24.0
6	T1	All MCs	363	1.0	363	1.0	0.593	12.8	LOS B	4.7	118.4	0.68	0.77	1.09	19.7
16	R2	All MCs	244	1.0	244	1.0	0.281	7.1	LOS A	1.1	26.5	0.50	0.41	0.50	25.8
Approach			759	1.2	759	1.2	0.593	11.0	LOS B	4.7	118.4	0.62	0.66	0.90	22.9
North: 8th St															
7	L2	All MCs	190	1.0	190	1.0	0.228	6.7	LOS A	0.8	20.4	0.50	0.42	0.50	24.6
4	T1	All MCs	455	1.0	455	1.0	0.584	13.0	LOS B	4.3	108.8	0.69	0.74	1.10	28.0
14	R2	All MCs	33	0.0	33	0.0	0.584	12.8	LOS B	4.3	108.8	0.69	0.74	1.10	23.9
Approach			678	1.0	678	1.0	0.584	11.2	LOS B	4.3	108.8	0.63	0.65	0.93	26.8
West: NE Olney Ave															
5	L2	All MCs	81	2.0	81	2.0	0.608	16.0	LOS C	4.2	105.8	0.77	0.95	1.28	22.4
2	T1	All MCs	307	0.0	307	0.0	0.608	15.4	LOS C	4.2	105.8	0.77	0.95	1.28	19.0
12	R2	All MCs	40	3.0	40	3.0	0.608	16.3	LOS C	4.2	105.8	0.77	0.95	1.28	22.7
Approach			428	0.7	428	0.7	0.608	15.6	LOS C	4.2	105.8	0.77	0.95	1.28	19.9
All Vehicles			2370	1.1	2370	1.1	0.622	12.6	LOS B	4.9	125.2	0.67	0.74	1.05	24.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Sieglach M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Site Scenario: 1 | Local Volumes

Short Lanes are not included in determining Queue Storage Ratios.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Gap (veh)		Cycle-Average Queue (veh)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.622	1.000	0.6	2.0	4.9	1.4	3.4	2.0	3.7	0.03	0.08	0.0	NA	NA
Approach		0.622			2.0	4.9	1.4	3.4	2.0	3.7	0.03	0.08			
East: NE Olney Ave															
Lane 1		0.593	1.000	0.5	1.9	4.7	1.3	3.1	1.8	3.3	0.03	0.07	0.0	NA	NA
Lane 2		0.281	1.000	0.0	0.4	1.1	0.3	0.9	0.5	0.9	0.05	0.13	NA	0.0	1
Approach		0.593			1.9	4.7	1.3	3.1	1.8	3.3	0.03	0.07			
North: 8th St															

Lane 1	0.228	1.000	0.0	0.3	0.8	0.3	0.7	0.4	0.6	0.04	0.10	NA	0.0	2
Lane 2	0.584	1.000	0.5	1.7	4.3	1.2	3.0	1.8	3.2	0.03	0.07	0.0	NA	NA
Approach	0.584			1.7	4.3	1.2	3.0	1.8	3.2	0.03	0.07			
West: NE Olney Ave														
Lane 1	0.608	1.000	0.5	1.7	4.2	1.3	3.3	1.9	3.4	0.21	0.53	0.0	NA	NA
Approach	0.608			1.7	4.2	1.3	3.3	1.9	3.4	0.21	0.53			
Intersection	0.622			2.0	4.9	1.4	3.4	2.0	3.7	0.21	0.53			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

Continuous Lane Performance												
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy Spacing	Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS (Density Method)	
	v/c	mph	sec	sec	ft	sec	sec	%	%	veh/mi	pc/mi	
There are no Continuous Lanes at this Site.												

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MOVEMENT SUMMARY

 **Site: [107 (13)] 2046 Olney and 8th - Alt5 Partial Multi Lane Roundabout (SBL, WBR) (2026 Analysis V2)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Supplemental Traffic Analysis for Olney/8th Project Scoping
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]		[Total HV]					[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: 8th St															
3	L2	All MCs	60	0.0	60	0.0	0.721	19.0	LOS C	6.6	167.7	0.81	1.00	1.56	15.8
8	T1	All MCs	395	2.0	395	2.0	0.721	19.5	LOS C	6.6	167.7	0.81	1.00	1.56	25.7
18	R2	All MCs	90	1.0	90	1.0	0.721	19.3	LOS C	6.6	167.7	0.81	1.00	1.56	22.6
Approach			545	1.6	545	1.6	0.721	19.4	LOS C	6.6	167.7	0.81	1.00	1.56	24.1
East: NE Olney Ave															
1	L2	All MCs	170	2.0	170	2.0	0.801	23.2	LOS C	10.6	268.1	0.88	1.28	1.93	21.7
6	T1	All MCs	490	1.0	490	1.0	0.801	22.9	LOS C	10.6	268.1	0.88	1.28	1.93	17.2
16	R2	All MCs	245	1.0	245	1.0	0.296	7.6	LOS A	1.1	27.9	0.53	0.45	0.53	25.7
Approach			905	1.2	905	1.2	0.801	18.8	LOS C	10.6	268.1	0.79	1.06	1.55	20.6
North: 8th St															
7	L2	All MCs	190	1.0	190	1.0	0.261	8.0	LOS A	0.9	23.1	0.57	0.52	0.57	24.2
4	T1	All MCs	535	1.0	535	1.0	0.796	24.9	LOS C	8.3	209.2	0.87	1.15	1.86	24.4
14	R2	All MCs	45	0.0	45	0.0	0.796	24.6	LOS C	8.3	209.2	0.87	1.15	1.86	19.6
Approach			770	0.9	770	0.9	0.796	20.7	LOS C	8.3	209.2	0.79	0.99	1.54	24.1
West: NE Olney Ave															
5	L2	All MCs	105	2.0	105	2.0	0.829	30.9	LOS D	8.6	217.1	0.91	1.42	2.13	17.9
2	T1	All MCs	370	0.0	370	0.0	0.829	30.1	LOS D	8.6	217.1	0.91	1.42	2.13	15.7
12	R2	All MCs	60	3.0	60	3.0	0.829	31.3	LOS D	8.6	217.1	0.91	1.42	2.13	18.1
Approach			535	0.7	535	0.7	0.829	30.4	LOS D	8.6	217.1	0.91	1.42	2.13	16.3
All Vehicles			2755	1.1	2755	1.1	0.829	21.7	LOS C	10.6	268.1	0.82	1.10	1.66	21.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Site Scenario: 1 | Local Volumes

Roundabout Capacity Model: US HCM 6.
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
Short Lanes are not included in determining Queue Storage Ratios.

Lane Queues (Vehicles)															
Lane Number	Contin. Lane	Deg. Satn	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh)		Queue at Start of Gap (veh)		Cycle-Average Queue (veh)		Queue Storage Ratio		Prob. Block.	Prob. SL Ov.	Ov. Lane No.
		v/c			Av.	95%	Av.	95%	Av.	95%	Av.	95%	%	%	
South: 8th St															
Lane 1		0.721	1.000	1.0	2.7	6.6	1.8	4.5	2.9	5.3	0.04	0.10	0.0	NA	NA
Approach		0.721			2.7	6.6	1.8	4.5	2.9	5.3	0.04	0.10			
East: NE Olney Ave															
Lane 1		0.801	1.000	1.7	4.3	10.6	2.7	6.7	4.2	7.6	0.07	0.17	0.0	NA	NA
Lane 2		0.296	1.000	0.0	0.4	1.1	0.4	0.9	0.5	0.9	0.06	0.14	NA	0.0	1
Approach		0.801			4.3	10.6	2.7	6.7	4.2	7.6	0.07	0.17			
North: 8th St															

Lane 1	0.261	1.000	0.0	0.4	0.9	0.3	0.8	0.4	0.8	0.05	0.12	NA	0.0	2
Lane 2	0.796	1.000	1.3	3.3	8.3	2.3	5.7	4.0	7.3	0.05	0.13	0.0	NA	NA
Approach	0.796			3.3	8.3	2.3	5.7	4.0	7.3	0.05	0.13			
West: NE Olney Ave														
Lane 1	0.829	1.000	1.5	3.5	8.6	2.6	6.5	4.5	8.2	0.44	1.09	7.5	NA	NA
Approach	0.829			3.5	8.6	2.6	6.5	4.5	8.2	0.44	1.09			
Intersection	0.829			4.3	10.6	2.7	6.7	4.5	8.2	0.44	1.09			

Roundabout Capacity Model: US HCM 6.

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

Short Lanes are not included in determining Queue Storage Ratios.

Continuous Lane Performance												
Lane Number	Deg. Satn	Unint. Speed	Unint. Travel Delay	Hdwy Spacing		Aver. Vehicle Length	Occup. Time	Space Time	Space Occup. Ratio	Time Occup. Ratio	Density	LOS (Density Method)
	v/c	mph	sec	sec	ft	ft	sec	sec	%	%	veh/mi	pc/mi
There are no Continuous Lanes at this Site.												

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Project: L:\All-DKS\PD\X-Drive\Projects\2021\P21239-000 (Bend GO Bond Traffic Engineering Service)\02 Delivery\Analysis\02_Olney and Revere\Synchro_Sidra\03_8th_Olney_Updated_Analysis\Synchro_Sidra\Bend GO Sidra_new8th_v10_2026Analysis.sipx

APPENDIX C: MULTI YEAR ANALYSIS

Multi-Year Sensitivity Test			LOS	Delay (sec)	V/C
Current Configuration (without WBR lane)	South Leg (Northbound)	2026	D	51	0.91
		2031	D	43	0.87
		2036	D	44	0.87
		2046	D	46	0.88
	East Leg (Westbound)	2026	D	49	0.95
		2031	F	82	1.09
		2041	F	123	1.22
		2046	F	143	1.27
	North Leg (Southbound)	2026	D	35	0.79
		2031	C	33	0.79
		2036	D	37	0.84
		2041	D	40	0.87
	West Leg (Eastbound)	2026	C	28	0.56
		2031	C	31	0.64
		2036	C	33	0.69
		2046	D	37	0.77
	Overall Intersection	2026	D	42	0.94
		2031	D	51	0.94
		2036	E	59	1.00
		2041	E	67	1.03
		2046	E	75	1.05
Future Alt 2: Single Lane Roundabout	South Leg (Northbound)	2026	B	15	0.62
		2031	C	15	0.64
		2036	C	17	0.67
		2041	C	18	0.70
		2046	C	19	0.72
	East Leg (Westbound)	2026	D	29	0.87
		2031	E	36	0.92
		2036	E	48	0.99
		2041	F	62	1.04
		2046	F	80	1.10
	North Leg (Southbound)	2026	C	23	0.81
		2031	D	29	0.86
		2036	E	39	0.93
		2041	E	47	0.97
		2046	F	56	1.01
	West Leg (Eastbound)	2026	C	17	0.62
		2031	C	19	0.66
		2036	C	23	0.73
		2041	D	27	0.78
		2046	D	31	0.82
	Overall Intersection * V/C and queue represents worst approach	2026	C	22	0.87
		2031	D	26	0.92
		2036	D	34	0.99
		2041	E	42	1.04
		2046	F	51	1.10
Future Alt 3: Partial Multi Lane Roundabout (WBR)	South Leg (Northbound)	2026	B	15	0.62
		2031	C	15	0.64
		2036	C	17	0.67
		2041	C	18	0.70
		2046	C	19	0.72
	East Leg (Westbound)	2026	B	13	0.59
		2031	B	15	0.64
		2036	C	17	0.70
		2041	C	20	0.75
		2046	C	23	0.80
	North Leg (Southbound)	2026	C	23	0.81
		2031	D	29	0.86
		2036	E	39	0.93
		2041	F	52	0.99
		2046	F	71	1.06
	West Leg (Eastbound)	2026	C	17	0.62
		2031	C	19	0.66
		2036	C	23	0.73
		2041	D	28	0.79
		2046	D	30	0.82
	Overall Intersection * V/C and queue represents worst approach	2026	C	16	0.81
		2031	C	19	0.86
		2036	C	23	0.93
		2041	D	29	0.99
		2046	E	35	1.06

APPENDIX D: 16-HOUR ANALYSIS

			Current Configuration	Current Configuration (w/o WBR)	Future Alt 1: Signal with SBR lane	Future Alt 2: Single Lane Roundabout	Future Alt 3: Partial Multi Lane Roundabout (WBR)	Future Alt 4: Partial Multi Lane Roundabout (SBR, WBR)	Future Alt 5: Partial Multi Lane Roundabout (SBL, WBR)
South Leg (Northbound)	-9hr	6:30am	0.66	0.66	0.68	0.38	0.38	0.38	0.38
	-8hr	7:30am	0.72	0.74	0.82	0.61	0.61	0.62	0.63
	-7hr	8:30am	0.65	0.72	0.76	0.48	0.48	0.48	0.48
	-6hr	9:30am	0.75	0.82	0.80	0.55	0.55	0.55	0.55
	-5hr	10:30am	0.74	0.80	0.79	0.52	0.52	0.52	0.52
	-4hr	11:30am	0.79	0.85	0.84	0.62	0.62	0.62	0.62
	-3hr	12:30pm	0.83	0.83	0.86	0.67	0.67	0.67	0.67
	-2hr	1:30pm	0.79	0.84	0.82	0.63	0.63	0.63	0.63
	-1hr	2:30pm	0.85	0.86	0.89	0.67	0.67	0.67	0.67
	2046 Peak	3:30pm	0.87	0.88	0.90	0.72	0.72	0.72	0.72
	+1hr	4:30pm	0.82	0.86	0.87	0.71	0.70	0.71	0.71
	+2hr	5:30pm	0.75	0.79	0.78	0.54	0.54	0.54	0.54
	+3hr	6:30pm	0.62	0.63	0.62	0.31	0.31	0.31	0.31
	+4hr	7:30pm	0.56	0.56	0.56	0.23	0.23	0.23	0.23
	+5hr	8:30pm	0.42	0.42	0.42	0.17	0.17	0.17	0.17
East Leg (Westbound)	-9hr	6:30am	0.31	0.50	0.66	0.35	0.25	0.25	0.25
	-8hr	7:30am	0.72	0.93	0.77	0.76	0.63	0.63	0.63
	-7hr	8:30am	0.77	1.04	0.74	0.81	0.56	0.56	0.56
	-6hr	9:30am	0.72	0.97	0.76	0.81	0.57	0.57	0.57
	-5hr	10:30am	0.74	0.96	0.76	0.80	0.58	0.58	0.58
	-4hr	11:30am	0.81	1.09	0.81	0.96	0.70	0.70	0.70
	-3hr	12:30pm	0.60	0.93	0.78	0.77	0.56	0.56	0.56
	-2hr	1:30pm	0.78	1.01	0.77	0.83	0.59	0.59	0.59
	-1hr	2:30pm	0.65	1.02	0.79	0.87	0.62	0.62	0.62
	2046 Peak	3:30pm	0.87	1.27	0.90	1.10	0.80	0.80	0.80
	+1hr	4:30pm	0.88	1.20	0.90	1.03	0.78	0.78	0.78
	+2hr	5:30pm	0.72	0.86	0.72	0.67	0.49	0.49	0.49
	+3hr	6:30pm	0.49	0.71	0.54	0.40	0.29	0.29	0.29
	+4hr	7:30pm	0.28	0.46	0.41	0.26	0.17	0.17	0.17
	+5hr	8:30pm	0.23	0.31	0.31	0.16	0.12	0.12	0.12
North Leg (Southbound)	-9hr	6:30am	0.72	0.72	0.75	0.63	0.63	0.59	0.44
	-8hr	7:30am	0.99	1.02	0.89	1.18	1.18	1.07	0.88
	-7hr	8:30am	0.82	0.89	0.80	0.95	0.95	0.89	0.70
	-6hr	9:30am	0.80	0.86	0.79	0.91	0.91	0.89	0.69
	-5hr	10:30am	0.79	0.84	0.80	0.90	0.90	0.88	0.66
	-4hr	11:30am	0.84	0.89	0.78	0.94	0.94	0.84	0.72
	-3hr	12:30pm	0.83	0.84	0.88	0.93	0.93	0.86	0.66
	-2hr	1:30pm	0.77	0.80	0.88	0.87	0.87	0.82	0.61
	-1hr	2:30pm	0.74	0.75	0.89	0.83	0.83	0.80	0.61
	2046 Peak	3:30pm	0.90	0.91	0.94	1.01	1.06	1.00	0.80
	+1hr	4:30pm	0.96	1.00	0.91	1.07	1.08	1.02	0.84
	+2hr	5:30pm	0.63	0.67	0.74	0.64	0.64	0.61	0.47
	+3hr	6:30pm	0.52	0.53	0.61	0.42	0.42	0.37	0.31
	+4hr	7:30pm	0.28	0.28	0.53	0.22	0.22	0.21	0.14
	+5hr	8:30pm	0.26	0.26	0.36	0.16	0.16	0.15	0.11
West Leg (Eastbound)	-9hr	6:30am	0.73	0.73	0.74	0.47	0.47	0.47	0.46
	-8hr	7:30am	0.87	0.82	0.88	0.70	0.70	0.75	0.77
	-7hr	8:30am	0.78	0.59	0.80	0.59	0.59	0.59	0.58
	-6hr	9:30am	0.78	0.58	0.81	0.57	0.58	0.58	0.57
	-5hr	10:30am	0.79	0.61	0.82	0.62	0.62	0.62	0.60
	-4hr	11:30am	0.78	0.64	0.84	0.64	0.64	0.64	0.63
	-3hr	12:30pm	0.88	0.86	0.91	0.78	0.78	0.78	0.77
	-2hr	1:30pm	0.82	0.65	0.84	0.67	0.67	0.67	0.66
	-1hr	2:30pm	0.89	0.85	0.93	0.79	0.79	0.79	0.77
	2046 Peak	3:30pm	0.83	0.77	0.89	0.82	0.82	0.84	0.83
	+1hr	4:30pm	0.84	0.78	0.90	0.91	0.91	0.94	0.94
	+2hr	5:30pm	0.74	0.57	0.77	0.51	0.51	0.51	0.50
	+3hr	6:30pm	0.55	0.50	0.55	0.26	0.26	0.26	0.25
	+4hr	7:30pm	0.33	0.33	0.33	0.15	0.15	0.15	0.15
	+5hr	8:30pm	0.29	0.29	0.29	0.13	0.13	0.13	0.12
Overall Intersection	-9hr	6:30am	0.63	0.63	0.63	N/A			
	-8hr	7:30am	0.89	0.90	0.85				
	-7hr	8:30am	0.74	0.88	0.73				
	-6hr	9:30am	0.76	0.87	0.76				
	-5hr	10:30am	0.76	0.86	0.76				
	-4hr	11:30am	0.80	0.95	0.80				
	-3hr	12:30pm	0.88	0.88	0.88				
	-2hr	1:30pm	0.80	0.92	0.80				
	-1hr	2:30pm	0.89	0.92	0.89				
	2046 Peak	3:30pm	0.88	1.05	0.88				
	+1hr	4:30pm	0.88	1.04	0.87				
	+2hr	5:30pm	0.70	0.79	0.70				
	+3hr	6:30pm	0.48	0.53	0.48				
	+4hr	7:30pm	0.36	0.39	0.36				
	+5hr	8:30pm	0.26	0.26	0.26				