



To: Scott Siemens
West Oak Developers LLC
2595 NW 21st Avenue
Ocala, FL 34475

Date: December 3, 2025

Memorandum

Project #: 201329.00

From: Babuji Ambikapathy, PE, AICP
Srinivas Kandala, PE
Mohamed El-Agroudy, PE

Re: West Oaks Proportionate Share
Improvements Timeline

Objective

The West Oaks development is currently undergoing construction with an anticipated final buildout of 2030 to 2031. As part of the development approval, the developer has entered into a proportionate fair share agreement to address the deficiencies that will be triggered due to the project impact, per the latest approved Transportation Impact Analysis (TIA), dated March 2024. The most recent Proportionate Share and Cost Estimates Tables are included in the **Attachments**.

The following memorandum was developed to estimate the anticipated timeline of deficiencies based on the development buildout timeline from 2025 through 2030. The methodology is generally consistent with the growth applied in TIA. The anticipated year of failure and percent of project buildout in terms of trip thresholds were calculated for each improvement in the proportionate share agreement.

The following improvements were identified for proportionate share in the TIA:

1. New westbound left-turn lane (WBL) at the Project Entrance and NW 35th Street
2. New eastbound right-turn lane (EBR) at NW MLK Avenue and NW 21st Street
3. New northbound right-turn lane (NBR) at NW 35th Avenue Road and NW 21st Street
4. New westbound right-turn lane (WBR) at NW 35th Avenue Road and NW 21st Street
5. Extension of the eastbound left-turn (EBL) lanes (dual left-turns were assumed for the background condition) at US 27 and NW 35th Avenue Road

Note that signal retiming costs were also included in the Proportionate Share Agreement for five (5) intersections, however, are considered due at full buildout.

Development Timeline

The following **Table 1** summarizes the anticipated annual and cumulative project buildout by year. The project is anticipated for full buildout by 2030 to 2031. 2030 is considered as the final year for consistency with the TIA methodology and results in a conservative analysis.

Table 1: Project Buildout Schedule

Land-Use	2025	2026	2027	2028	2029	2030
Annual Buildout Units						
Single Family	100	70				
Single-Family Attached		138				
Multi-Family Low-Rise		75	75			
Multi-Family Mid-Rise	368	354	258	258	257	257
Sr. Adult Housing Attached			90			
Strip Retail Center (<40K)			12.5			12.5
Cumulative Buildout Units						
Single Family	100	170	170	170	170	170
Single-Family Attached	0	138	138	138	138	138
Multi-Family Low-Rise	0	75	150	150	150	150
Multi-Family Mid-Rise	368	722	980	1,238	1,495	1,752
Sr. Adult Housing Attached	0	0	90	90	90	90
Strip Retail Center (<40K)	0.0	0.0	12.5	12.5	12.5	25.0

Trip Generation

The trip generation was computed for each year from 2025 through 2030 based on the above buildout schedule. Trip generation rates were applied based on the 11th Edition ITE Trip Generation Manual, consistent with the approved TIA. The trip generation was conducted for the AM and PM peak hours, which were used for analysis purposes in the approved TIA.

The following **Table 2** summarizes the trip generation by year in terms of external trips (gross trips minus internal trips) and percent of total external trips at full buildout. Note that, as the deficiencies related to turning movements, none of the movements were reduced by pass-by reductions in the TIA, therefore, the pass-by reductions were not considered for this analysis. Detailed trip generation tables for each year are provided in the **Attachments**.

Table 2: Annual Trip Generation Summary

Year	2025	2026	2027	2028	2029	2030
Number of Total (Enter + Exit) External Trips						
AM Peak	224	539	717	830	943	1,072
PM Peak	243	578	793	893	993	1,135
Percentage of Total External Trips						
AM Peak	21%	50%	67%	77%	88%	100%
PM Peak	21%	51%	70%	79%	87%	100%

Turn Lane Warrant and Extension Analysis

Turn Lane Warrants and Synchro analysis were conducted for the improvements for each year based on the percentage of trips from the annual trip generation for each year.

- Project trips were computed based on the percentage of total trips for that peak hour and year and whether the specific movement is an entering (in) or exiting (out) trip.
- Background volumes were computed by interpolating non-project trips between years 2025 to 2030.

The NCHRP 457 warrant was applied for improvements 1 and 3 (based on the latest 2023 FDOT Access Management Guidebook, consistent with Marion County Land Development Code). Noting that there were no advancing or opposing volumes for improvements 2 and 4, the NCHRP 457 warrant was not applicable. Therefore, NCHRP 420 was applied for improvements 2 and 4 (based on the 2019 FDOT Access Management Guidebook).

For improvement 5, Synchro analysis was applied to determine the 95th percentile queue length for the EBL movement for each year. Noting that the 110-foot project-related deficiency was computed as the difference between the buildout and background deficiency (290 feet and 180 feet, respectively), the background deficiency of 180 feet was considered the threshold for triggering the extension need.

All related TIA volumes, volume computation tables, warrants, and Synchro analysis reports are provided in the **Attachments**.

Conclusion

Based on the results of the above analyses, the year of need (YON), total project trips at the YON, and percent of full buildout trips were determined for each improvement. The YON represents the first year in which the project trips exceed the warrants or extension threshold; therefore, it should be noted that warrants or extension threshold will be met between the start of the prior year and YON. **Table 3** below summarizes the results of the analysis.

Table 3: YON and Project Trip Calculations

Intersection	Movement	Mitigation	Year of Need	Critical Period	Total Project Trips at YON	Percent of Full Buildout Trips
Project Entrance and NW 35th Street	WBL	New turn lane	By 2025	PM	243	21%
NW MLK Avenue and NW 21st Street	EBR	New turn lane	By 2026	AM	539	50%
NW 35th Avenue Road and NW 21st Street	WBR	New turn lane	By 2028	PM	893	79%
NW 35th Avenue Road and US 27	EBL	Extension	By 2029	AM	943	88%
NW 35th Avenue Road and NW 21st Street	NBR	New turn lane	By 2030	PM	1,135	100%

Consistent with the proportionate share cost table provided in the attachments, the following **Table 4** summarizes the developer's share of improvement costs due each year based on the schedule of improvements shown in **Table 3**. The costs shown below do not include the costs of Signal Retiming for (5) intersections at \$6,000.00 each. The signal retiming costs totaling \$30,000.00 are considered due at full project buildout.

Table 4: Proportionate Share Costs Due by Year (Excluding Signal Retiming Costs)

Intersection	Movement - Mitigation	Totals less Retiming	2025	2026	2027	2028	2029	2030
Project Entrance and NW 35th Street	WBL - New turn lane	\$ 62,297.39	\$ 62,297.39	-	-	-	-	-
NW MLK Avenue and NW 21st Street	EBR - New turn lane	\$ 103,678.39	-	\$ 103,678.39	-	-	-	-
NW 35th Avenue Road and NW 21st Street	WBR - New turn lane	\$ 96,799.25	-	-	-	\$ 96,799.25	-	-
NW 35th Avenue Road and US 27	EBL - Extension	\$ 56,468.41	-	-	-	-	\$ 56,468.41	-
NW 35th Avenue Road and NW 21st Street	NBR - New turn lane	\$ 81,428.52	-	-	-	-	-	\$ 81,428.52
Propshare due by Year		\$ 400,671.96	\$ 62,297.39	\$ 103,678.39	-	\$ 96,799.25	\$ 56,468.41	\$ 81,428.52

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Memorandum

Attachments

West Oaks - Proportionate Share Estimate

Location	Improvement	Total Amount	Prop Share	Developer's Cost	City's Cost
NW MLK and NW 21st St	185 Ft Eastbound Right Turn Lane - Rural Section	\$ 112,693.90	92%	\$ 103,678.39	\$ 9,015.51
NW 35th Ave Rd and NW 21st St	185 Ft Northbound Right Turn Lane - Curb Section	\$ 190,848.09	43%	\$ 81,428.52	\$ 109,419.57
NW 35th Ave Rd and NW 21st St	185 Ft Westbound Right Turn Lane - Curb Section	\$ 186,152.40	52%	\$ 96,799.25	\$ 89,353.15
NW 35th St and Entrance	250 Ft Westbound Left Turn Lane - Curb Section	\$ 135,429.11	46%	\$ 62,297.39	\$ 73,131.72
NW 35th St and US 27	110 Ft Eastbound Left Turn Lane Extension - Curb Section	\$ 56,468.41	100%	\$ 56,468.41	\$ -
US 27 at SW 35th Ave	Signal Timing	\$ 6,000.00	100%	\$ 6,000.00	\$ -
US 27 at SW 27th Ave	Signal Timing	\$ 6,000.00	100%	\$ 6,000.00	\$ -
US 27 at NW MLK Ave	Signal Timing	\$ 6,000.00	100%	\$ 6,000.00	\$ -
US 27 at US 441	Signal Timing	\$ 6,000.00	100%	\$ 6,000.00	\$ -
NW 27th Ave at SR 40	Signal Timing	\$ 6,000.00	100%	\$ 6,000.00	\$ -
Total		\$ 711,591.91		\$ 430,671.96	\$ 280,919.96

Note: Cost Estimates for turn lane improvements include a construction contingency of 15% and 30% of construction estimate for Design, Post Design and CEI. Signal Timing estimates includes the signal timing study, implementation and observations.

WEST OAKS - EB RIGHT TURN LANE @ NW MLK AVE & NW 21st ST
ENGINEER'S ESTIMATE OF PROBABLE COST

BID ITEM NO.	FDOT PAY ITEM NO.	UNIT	APPROX. QUANTITY	ITEM DESCRIPTION	Unit Cost	BID AMOUNT
1	0101 1	LS	1	MOBILIZATION	\$ 8,700.00	\$ 8,700.00
2	0102 1	LS	1	MAINTENANCE OF TRAFFIC	\$ 8,700.00	\$ 8,700.00
3	104 10 3	LF	185	SEDIMENT BARRIER	\$ 3.70	\$ 684.50
4	110 1 1	AC	0.15	CLEARING & GRUBBING	\$ 43,000.00	\$ 6,450.00
5	120 1	CY	265	REGULAR EXCAVATION	\$ 34.00	\$ 9,010.00
6	0160 4	SY	305	TYPE B STABILIZATION	\$ 15.39	\$ 4,693.95
7	0285711	SY	305	OPTIONAL BASE, BASE GROUP 11	\$ 46.41	\$ 14,155.05
8	0334 1 13	TN	52	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	\$ 153.56	\$ 7,985.12
9	0337 7 81	TN	26	ASPHALT CONCRETE FRICTION COURSE, TRAFFIC B, FC-12.5, PG 76-22	\$ 164.91	\$ 4,287.66
10	0520 1 10	LF	51	CONCRETE CURB & GUTTER, TYPE F	\$ 49.31	\$ 2,514.81
11	0522 1	SY	39	CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	\$ 82.43	\$ 3,214.77
12	0527 2	SF	25	DETECTABLE WARNING	\$ 44.35	\$ 1,108.75
13	570 1 2	SY	165	PERFORMANCE TURF, SOD	\$ 6.00	\$ 990.00
14	700 1 12	AS	1	SINGLE POST SIGN, F&I GROUND MOUNT, 12-20 SF	\$ 1,800.00	\$ 1,800.00
15	700 1 60	AS	1	SINGLE POST SIGN, REMOVE	\$ 66.00	\$ 66.00
17	706 1 3	EA	18	RAISED PAVMT MARK, TYPE B	\$ 18.00	\$ 324.00
18	0711 11123	LF	20	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12" FOR CROSSWALK AND ROUNDABOUT	\$ 4.11	\$ 82.20
19	0711 11125	LF	35	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24" FOR STOP LINE AND CROSSWALK	\$ 7.81	\$ 273.35
20	0711 11170	EA	2	THERMOPLASTIC, STANDARD, WHITE ARROW	\$ 98.66	\$ 197.32
21	0711 16101	GM	0.03	THERMOPLASTIC, STANDARD-OTHER SURFACES, WHITE, SOLID, 6"	\$ 5,502.00	\$ 143.05
					Subtotal:	\$ 75,380.53
					15% Contingency	\$ 11,307.08
				Construction Total:		\$ 86,687.61
				Design/CEI/Post Design (30% of Construction Costs)		\$ 26,006.28
				Total:		\$ 112,693.90

NOTES:

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2.) No permit application fees are included in this EOPC.

3.) The contingency dollars includes undefined items such as utility adjustments/relocation, residential/commercial service lines impacts, and market adjustments.

JAIME L. IGUA, P.E.
P.E. # 69884
DATE: MARCH 15, 2024

WEST OAKS - NB RIGHT TURN LANE @ NW 35th AVE RD & NW 21st ST
ENGINEER'S ESTIMATE OF PROBABLE COST

BID ITEM NO.	FDOT PAY ITEM NO.	UNIT	APPROX. QUANTITY	ITEM DESCRIPTION	Unit Cost	BID AMOUNT
General/Utility						
1	0101 1	LS	1	MOBILIZATION	\$ 14,800.00	\$ 14,800.00
2	0102 1	LS	1	MAINTENANCE OF TRAFFIC	\$ 14,800.00	\$ 14,800.00
3	104 10 3	LF	185	SEDIMENT BARRIER	\$ 3.70	\$ 684.50
4	110 1 1	AC	0.15	CLEARING & GRUBBING	\$ 43,000.00	\$ 6,450.00
5	0160 4	SY	324	TYPE B STABILIZATION	\$ 15.39	\$ 4,986.36
6	0285711	SY	324	OPTIONAL BASE, BASE GROUP 11	\$ 46.41	\$ 15,036.84
7	0334 1 13	TN	54	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	\$ 153.56	\$ 8,292.24
8	0337 7 81	TN	27	ASPHALT CONCRETE FRICTION COURSE, TRAFFIC B, FC-12.5, PG 76-22	\$ 164.91	\$ 4,452.57
9	0425 1351	EA	1	INLETS, CURB, TYPE P-5, <10'	\$ 9,578.30	\$ 9,578.30
10	0425 1521	EA	1	INLETS, DT BOT, TYPE C, <10'	\$ 6,615.05	\$ 6,615.05
11	0425 4	EA	1	INLETS, ADJUST	\$ 1,745.00	\$ 1,745.00
12	0520 1 10	LF	300	CONCRETE CURB & GUTTER, TYPE F	\$ 49.31	\$ 14,793.00
13	0522 1	SY	180	CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	\$ 82.43	\$ 14,837.40
14	0527 2	SF	25	DETECTABLE WARNINGS	\$ 44.35	\$ 1,108.75
15	570 1 2	SY	165	PERFORMANCE TURF, SOD	\$ 6.00	\$ 990.00
16	700 1 11	AS	1	SINGLE POST SIGN, F&I, GROUND MOUNTED	\$ 590.00	\$ 590.00
17	700 1 60	AS	1	SINGLE POST SIGN, REMOVE	\$ 66.00	\$ 66.00
18	700 2 50	AS	0	MULTI- POST SIGN, F&I, GROUND MOUNTED, 31-50 SF, RELOCATE	\$ 5,067.00	\$ -
19	706 1 3	EA	20	RAISED PAVMT MARK, TYPE B	\$ 6.00	\$ 120.00
20	0711 11170	EA	3	THERMOPLASTIC, STANDARD, WHITE ARROW	\$ 98.66	\$ 295.98
21	0711 16101	GM	0.03	THERMOPLASTIC, STANDARD-OTHER SURFACES, WHITE, SOLID, 6"	\$ 5,502.00	\$ 143.05
22	0715 68000	EA	1	LIGHT POLE COMPLETE, RELOCATE	\$ 7,272.54	\$ 7,272.54
					Subtotal:	\$ 127,657.58
					15% Contingency	\$ 19,148.64
					Construction Total:	\$146,806.22
					Design/CEI/Post Design (30% of Construction Costs)	\$ 44,041.87
					Total:	\$ 190,848.09

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P.E. # 69884
DATE: MARCH 15, 2024

WEST OAKS - WB LEFT TURN LANE @ NW 35th AVE RD & NW 21st St
ENGINEER'S ESTIMATE OF PROBABLE COST

BID ITEM NO.	FDOT PAY ITEM NO.	UNIT	APPROX. QUANTITY	ITEM DESCRIPTION	Unit Cost	BID AMOUNT
General/Utility						
1	0101 1	LS	1	MOBILIZATION	\$ 14,400.00	\$ 14,400.00
2	0102 1	LS	1	MAINTENANCE OF TRAFFIC	\$ 14,400.00	\$ 14,400.00
3	104 10 3	LF	250	SEDIMENT BARRIER	\$ 3.70	\$ 925.00
4	110 1 1	AC	0.20	CLEARING & GRUBBING	\$ 43,000.00	\$ 8,600.00
5	0160 4	SY	494	TYPE B STABILIZATION	\$ 15.39	\$ 7,602.66
6	0285711	SY	494	OPTIONAL BASE, BASE GROUP 11	\$ 46.41	\$ 22,926.54
7	0334 1 13	TN	82	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	\$ 153.56	\$ 12,591.92
8	0337 7 81	TN	41	ASPHALT CONCRETE FRICTION COURSE, TRAFFIC B, FC-12.5, PG 76-22	\$ 164.91	\$ 6,761.31
9	0425 4	EA	1	INLETS, ADJUST	\$ 1,745.00	\$ 1,745.00
10	0520 1 10	LF	512	CONCRETE CURB & GUTTER, TYPE F	\$ 49.31	\$ 25,246.72
11	0522 1	SY	38	CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	\$ 82.43	\$ 3,132.34
12	0527 2	SF	25	DETECTABLE WARNINGS	\$ 44.35	\$ 1,108.75
13	570 1 2	SY	195	PERFORMANCE TURF, SOD	\$ 6.00	\$ 1,170.00
14	700 1 11	AS	2	SINGLE POST SIGN, F&I, GROUND MOUNTED	\$ 590.00	\$ 1,180.00
15	700 1 60	AS	2	SINGLE POST SIGN, REMOVE	\$ 66.00	\$ 132.00
17	706 1 3	EA	28	RAISED PAVMT MARK, TYPE B	\$ 6.00	\$ 168.00
20	0711 11123	LF	115	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12" FOR CROSSWALK AND ROUNDABOUT	\$ 4.11	\$ 472.65
21	0711 11125	LF	100	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24" FOR STOP LINE AND CROSSWALK	\$ 7.81	\$ 781.00
22	0711 11170	EA	3	THERMOPLASTIC, STANDARD, WHITE ARROW	\$ 98.66	\$ 295.98
23	0711 16101	GM	0.05	THERMOPLASTIC, STANDARD-OTHER SURFACES, WHITE, SOLID, 6"	\$ 5,502.00	\$ 258.59
24	0711 16201	GM	0.10	THERMOPLASTIC, STANDARD-OTHER SURFACES, YELLOW, SOLID, 6"	\$ 6,181.90	\$ 618.19
					Subtotal:	\$ 124,516.65
					15% Contingency	\$ 18,677.50
					Construction Total:	\$ 143,194.15
					Design/CEI/Post Design (30% of Construction Costs)	\$ 42,958.25
					Total:	\$ 186,152.40

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WEST OAKS - WB LEFT TURN LANE @ NW 35th ST & NW 21st AVE
ENGINEER'S ESTIMATE OF PROBABLE COST

BID ITEM NO.	FDOT PAY ITEM NO.	UNIT	APPROX. QUANTITY	ITEM DESCRIPTION	Unit Cost	BID AMOUNT
General/Utility						
1	0101 1	LS	1	MOBILIZATION	\$ 10,500.00	\$ 10,500.00
2	0102 1	LS	1	MAINTENANCE OF TRAFFIC	\$ 10,500.00	\$ 10,500.00
3	104 10 3	LF	250	SEDIMENT BARRIER	\$ 3.70	\$ 925.00
4	110 1 1	AC	0.16	CLEARING & GRUBBING	\$ 43,000.00	\$ 6,880.00
5	0160 4	SY	374	TYPE B STABILIZATION	\$ 15.39	\$ 5,755.86
6	0285711	SY	374	OPTIONAL BASE, BASE GROUP 11	\$ 46.41	\$ 17,357.34
7	0334 1 13	TN	62	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	\$ 153.56	\$ 9,520.72
8	0337 7 81	TN	31	ASPHALT CONCRETE FRICTION COURSE, TRAFFIC B, FC-12.5, PG 76-22	\$ 164.91	\$ 5,112.21
9	0520 1 10	LF	335	CONCRETE CURB & GUTTER, TYPE F	\$ 49.31	\$ 16,518.85
10	570 1 2	SY	195	PERFORMANCE TURF, SOD	\$ 6.00	\$ 1,170.00
11	700 1 11	AS	1	SINGLE POST SIGN, F&I, GROUND MOUNTED	\$ 590.00	\$ 590.00
12	700 1 60	AS	1	SINGLE POST SIGN, REMOVE	\$ 66.00	\$ 66.00
13	700 2 50	AS	1	MULTI- POST SIGN, F&I, GROUND MOUNTED, 31-50 SF, RELOCATE	\$ 5,067.00	\$ 5,067.00
14	706 1 3	EA	20	RAISED PAVMT MARK, TYPE B	\$ 6.00	\$ 120.00
15	0527 2	SF	0	DETECTABLE WARNINGS	\$ 44.35	\$ -
16	0711 11170	EA	3	THERMOPLASTIC, STANDARD, WHITE ARROW	\$ 98.66	\$ 295.98
17	0711 16101	GM	0.04	THERMOPLASTIC, STANDARD-OTHER SURFACES, WHITE, SOLID, 6"	\$ 5,502.00	\$ 209.08
					Subtotal:	\$ 90,588.04
					15% Contingency	\$ 13,588.21
					Construction Total:	\$104,176.24
					Design/CEI/Post Design (30% of Construction Costs)	\$ 31,252.87
					Total:	\$ 135,429.11

NOTES:

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P.E. # 69884
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WEST OAKS - EB LEFT TURN EXTENSION @ US 27 AND NW 35th AVE RD
ENGINEER'S ESTIMATE OF PROBABLE COST

BID ITEM NO.	FDOT PAY ITEM NO.	UNIT	APPROX. QUANTITY	ITEM DESCRIPTION	Unit Cost	BID AMOUNT
General/Utility						
1	0101 1	LS	1	MOBILIZATION	\$ 4,400.00	\$ 4,400.00
2	0102 1	LS	1	MAINTENANCE OF TRAFFIC	\$ 4,400.00	\$ 4,400.00
3	104 10 3	LF	220	SEDIMENT BARRIER	\$ 4.00	\$ 880.00
4	110 1 1	AC	0.05	CLEARING & GRUBBING	\$ 43,000.00	\$ 2,150.00
5	0160 4	SY	87	TYPE B STABILIZATION	\$ 15.39	\$ 1,338.93
6	0285711	SY	87	OPTIONAL BASE, BASE GROUP 11	\$ 46.41	\$ 4,037.67
7	0334 1 13	TN	15	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	\$ 153.56	\$ 2,303.40
8	0337 7 81	TN	8	ASPHALT CONCRETE FRICTION COURSE, TRAFFIC B, FC-12.5, PG 76-22	\$ 164.91	\$ 1,319.28
9	0520 1 10	LF	120	CONCRETE CURB & GUTTER, TYPE F	\$ 49.31	\$ 5,917.20
10	0522 1	SY	131	CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	\$ 82.43	\$ 10,798.33
11	706 1 3	EA	3	RAISED PAVMT MARK, TYPE B	\$ 6.00	\$ 18.00
12	0711 11170	EA	1	THERMOPLASTIC, STANDARD, WHITE ARROW	\$ 98.66	\$ 98.66
13	0711 16101	GM	0.02	THERMOPLASTIC, STANDARD-OTHER SURFACES, WHITE, SOLID, 6"	\$ 5,502.00	\$ 110.04
					Subtotal:	\$ 37,771.51
					15% Contingency	\$ 5,665.73
					Construction Total:	\$43,437.24
					Design/CEI/Post Design (30% of Construction Costs)	\$13,031.17
					Total:	\$ 56,468.41

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DATE: MARCH 15, 2024

Annual Trip Generation Calculations (11th Edition ITE Trip Generation Manual)

Land-Use	LUC	2025 Intensity	2025 Buildout									Full Buildout from TIA									
			AM			PM			AM			PM									
			In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Single Family	210	100	19	55	74	63	36	99	31	90	121	103	61	164							
Single-Family Attached	215	0	0	0	0	0	0	0	20	46	66	45	34	79							
Multi-Family Low-Rise	220	0	0	0	0	0	0	0	17	52	69	54	31	85							
Multi-Family Mid-Rise	221	368	35	115	150	88	56	144	175	584	759	417	267	684							
Sr. Adult Housing Attached	252	0	0	0	0	0	0	0	6	12	18	13	10	23							
Strip Retail Center (<40K)	822	0	0	0	0	0	0	0	35	24	59	83	82	165							
Internal Capture		0	0	0	0	0	0	0	-10	-10	-20	-32	-33	-65							
External Trips		54	170	224	151	92	243	274	798	1072	683	452	1135								
Percent of Total Trips in 2025			20%	21%	21%	22%	20%	21%	100%	100%	100%	100%	100%	100%							

Land-Use	LUC	2026 Intensity	2026 Buildout									Full Buildout from TIA									
			AM			PM			AM			PM									
			In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Single Family	210	170	31	90	121	103	61	164	31	90	121	103	61	164							
Single-Family Attached	215	138	20	46	66	45	34	79	20	46	66	45	34	79							
Multi-Family Low-Rise	220	75	11	35	46	33	20	53	17	52	69	54	31	85							
Multi-Family Mid-Rise	221	722	70	236	306	172	110	282	175	584	759	417	267	684							
Sr. Adult Housing Attached	252	0	0	0	0	0	0	0	6	12	18	13	10	23							
Strip Retail Center (<40K)	822	0	0	0	0	0	0	0	35	24	59	83	82	165							
Internal Capture		0	0	0	0	0	0	0	-10	-10	-20	-32	-33	-65							
External Trips		132	407	539	353	225	578	274	798	1072	683	452	1135								
Percent of Total Trips in 2026			48%	51%	50%	52%	50%	51%	100%	100%	100%	100%	100%	100%							

Land-Use	LUC	2027 Intensity	2027 Buildout									Full Buildout from TIA									
			AM			PM			AM			PM									
			In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Single Family	210	170	31	90	121	103	61	164	31	90	121	103	61	164							
Single-Family Attached	215	138	20	46	66	45	34	79	20	46	66	45	34	79							
Multi-Family Low-Rise	220	150	17	52	69	54	31	85	17	52	69	54	31	85							
Multi-Family Mid-Rise	221	980	97	323	420	233	150	383	175	584	759	417	267	684							
Sr. Adult Housing Attached	252	90	6	12	18	13	10	23	6	12	18	13	10	23							
Strip Retail Center (<40K)	822	12.5	20	13	33	46	45	91	35	24	59	83	82	165							
Internal Capture		-5	-5	-10	-16	-16	-16	-32	-10	-10	-20	-32	-33	-65							
External Trips		212	618	830	540	353	893	274	798	1072	683	452	1135								
Percent of Total Trips in 2027			68%	67%	67%	70%	70%	70%	100%	100%	100%	100%	100%	100%							

Land-Use	LUC	2028 Intensity	2028 Buildout									Full Buildout from TIA									
			AM			PM			AM			PM									
			In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Single Family	210	170	31	90	121	103	61	164	31	90	121	103	61	164							
Single-Family Attached	215	138	20	46	66	45	34	79	20	46	66	45	34	79							
Multi-Family Low-Rise	220	150	17	52	69	54	31	85	17	52	69	54	31	85							
Multi-Family Mid-Rise	221	1,238	123	410	533	295	188	483	175	584	759	417	267	684							
Sr. Adult Housing Attached	252	90	6	12	18	13	10	23	6	12	18	13	10	23							
Strip Retail Center (<40K)	822	12.5	20	13	33	46	45	91	35	24	59	83	82	165							
Internal Capture		-5	-5	-10	-16	-16	-16	-32	-10	-10	-20	-32	-33	-65							
External Trips		212	618	830	540	353	893	274	798	1072	683	452	1135								
Percent of Total Trips in 2028			87%	88%	88%	88%	87%	87%	100%	100%	100%	100%	100%	100%							

Land-Use	LUC	2030 Intensity	2030 Buildout									Full Buildout from TIA									
			AM			PM			AM			PM									
			In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Single Family	210	170	31	90	121	103	61	164	31	90	121	103	61	164							
Single-Family Attached	215	138	20	46	66	45	34	79	20	46	66	45	34	79							
Multi-Family Low-Rise	220	150	17	52	69	54	31	85	17	52	69	54	31	85							
Multi-Family Mid-Rise	221	1,752	175	584	759	417	267	684	175	584	759	417	267	684							
Sr. Adult Housing Attached	252	90	6	12	18	13	10	23	6	12	18	13	10	23							
Strip Retail Center (<40K)	822	25.0	35	24	59	83	82	165	35	24	59	83	82	165							
Internal Capture		-10	-10	-20	-32	-33	-65	-10	-10	-20	-32	-33	-65	-65							
External Trips		274	798	1072	683	452	1135	274	798	1072	683	452	1135								
Percent of Total Trips in 2030			100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%							

Figure 3

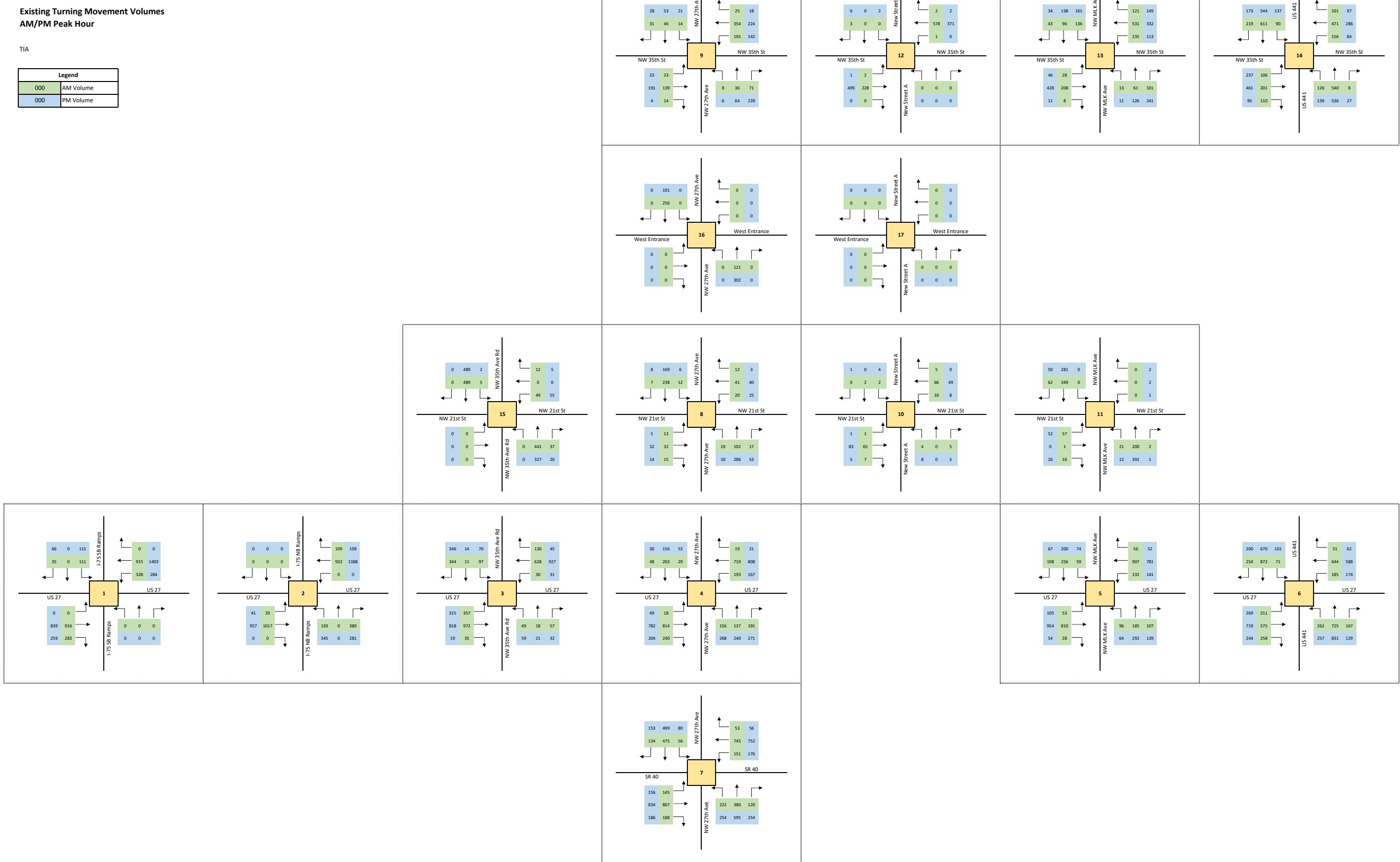


Figure 4

Future Turning Movement Volumes
AM Peak Hour

TIA

Legend			
000	Background	000	Passby Project Trips
000	External Project Trips	000	Total Volume

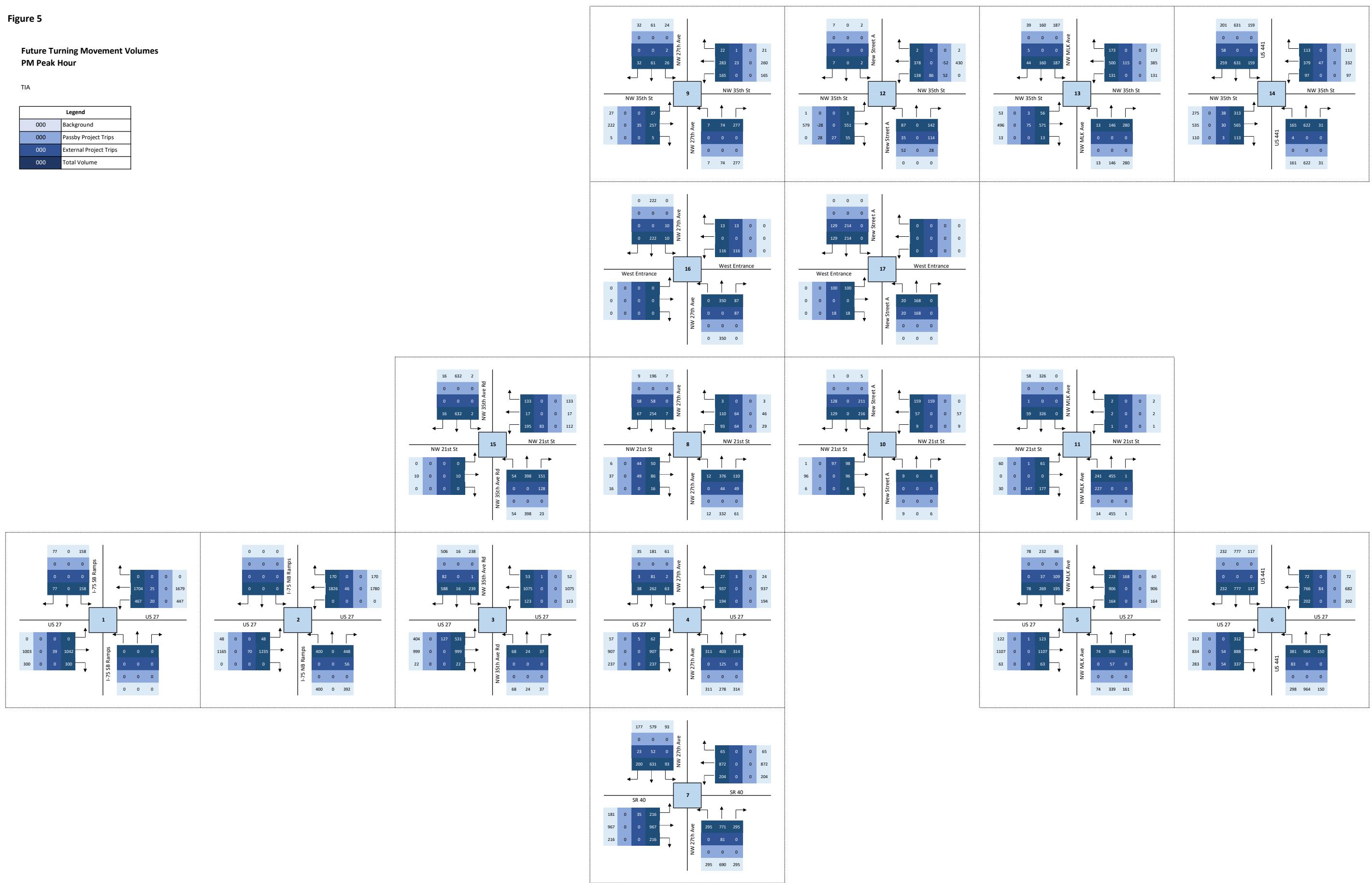


Figure 5

Future Turning Movement Volumes
PM Peak Hour

TIA

Legend			
000	Background	000	Passby Project Trips
000	External Project Trips	000	Total Volume



Volume Development for Turn Lane Warrants

WBL - Project Entrance and NW 35th Street

Trip Type - In

1	Existing V-o	Background V-o	Buildout V-o	Existing V-a	Background V-a	Buildout V-a	Existing V-left	Buildout V-left	Project Trips by Year (% of Full Build Trips)	V-o at Year	V-a at Year	V-left at Year
2025												
AM	228	264	290	581	673	758	0	86	20%	240	614	17
PM	499	551	606	373	380	518	0	138	22%	521	406	31

Warrant threshold is exceeded by 2025 due to PM peak hour trips.

EBR - NW MLK Avenue and NW 21st Street

Trip Type - Out

2	Existing V-right	Background V-right	Buildout V-right	Project Trips by Year (% of Full Build Trips)	V-right at Year
Warrant Threshold of V-right = 80 trips					
2025					
AM	16	19	295	21%	76
PM	26	30	177	20%	57
2026					
AM	16	19	295	51%	158
PM	26	30	177	50%	101

Warrant threshold is exceeded by 2026 due to AM peak hour trips.

*NCHRP 457 not applicable, use NCHRP 420 based on 2019 FDOT Access Management Guide (80 vph threshold)

NBR - NW 35th Avenue Road and NW 21st Street

Trip Type - In

3	Existing V-a	Background V-a	Buildout V-a	Existing V-right	Background V-right	Buildout V-right	Project Trips by Year (% of Full Build Trips)	V-a at Year	V-right at Year
2025									
AM	478	555	609	37	43	97	20%	502	49
PM	347	475	603	20	23	151	22%	398	49
2026									
AM	478	555	609	37	43	97	48%	531	66
PM	347	475	603	20	23	151	52%	457	88
2027									
AM	478	555	609	37	43	97	68%	554	77
PM	347	475	603	20	23	151	70%	501	112
2028									
AM	478	555	609	37	43	97	77%	572	83
PM	347	475	603	20	23	151	79%	535	124
2029									
AM	478	555	609	37	43	97	87%	590	89
PM	347	475	603	20	23	151	88%	567	136
2030									
AM	478	555	609	37	43	97	100%	609	97
PM	347	475	603	20	23	151	100%	603	151

Warrant threshold is exceeded by 2030 due to PM peak hour trips.

WBR - NW 35th Avenue Road and NW 21st Street

Trip Type - Out

4	Existing V-right	Background V-right	Buildout V-right	Project Trips by Year (% of Full Build Trips)	V-right at Year
Warrant Threshold of V-right = 80 trips					
2025					
AM	12	14	14	21%	13
PM	5	133	133	20%	27
2026					
AM	12	14	14	51%	13
PM	5	133	133	50%	48
2027					
AM	12	14	14	67%	13
PM	5	133	133	70%	69
2028					
AM	12	14	14	77%	14
PM	5	133	133	78%	91

Warrant threshold is exceeded by 2028 in the PM peak hour. Note project trips are assigned to the WBL only.

*NCHRP 457 not applicable, use NCHRP 420 based on 2019 FDOT Access Management Guide (80 vph threshold)

NCHRP 457 - WBL turn lane warrant at NW 35th Street and Project Entrance

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

4-lane roadway

INPUT

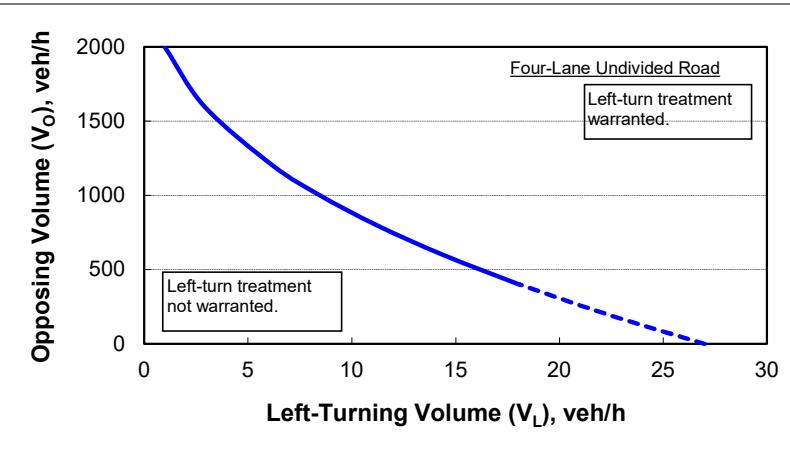
Variable	Value
Left-turning volume (V_L), veh/h:	31
Advancing volume (V_A), veh/h:	406
Opposing volume (V_O), veh/h:	521

OUTPUT

Variable	Message
Opposing volume (V_O) check:	O.K.
Combined volume (V_A and V_O) check:	O.K.
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	4.0
Critical headway, s:	6.0



Note: When $V_O < 400$ veh/h (dashed line), a left-turn lane is not normally warranted unless the advancing volume (V_A) in the same direction as the left-turning traffic exceeds 400 veh/h ($V_A > 400$ veh/h).

NCHRP 457 - NBR turn lane warrant at NW 25th Avenue Road and NW 21st Street

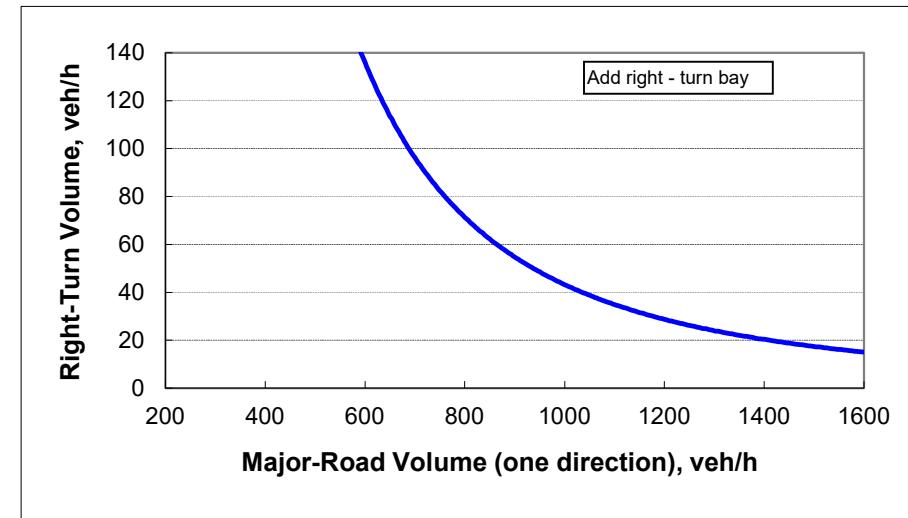
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	4-lane roadway
Variable	Value
Major-road speed, mph:	40
Major-road volume (one direction), veh/h:	603
Right-turn volume, veh/h:	151

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	134
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Add right-turn bay.	



When Not to Consider Exclusive Right-Turn Lanes

- Dense or built-out corridors with limited space
- Right-turn lane that would negatively impact pedestrians or bicyclists
- Vehicular movements from driveways or median openings that cross the right-turn lane resulting in multiple threat crashes
- Context classifications C2T, C4, C5, or C6

When Exclusive Right-Turn Lanes are Beneficial

There are instances when adding an exclusive right-turn lane for unsignalized driveways are beneficial to traffic operations and safety. **Table 27** provides some guidance for this situation based on the speed limit of the roadway and how many right turns occur per hour. Locations where the Auto and Truck Modal Emphasis is "High" may be appropriate for consideration of Exclusive Right Turn Lanes.

Table 27 – Recommended Guidelines for Exclusive Right-Turn Lanes to Unsignalized Driveway¹⁰

Roadway Posted Speed Limit	Number of Right Turns Per Hour
45 mph or less	80 – 125 ¹
Over 45 mph	35 – 55 ²

Note: A posted speed limit of 45 mph may be used with these thresholds if the operating speeds are known to be over 45 mph during the time of peak right turn demand.

Note on traffic projections: Projecting turning volumes is, at best, a knowledgeable estimate. Keep this in mind especially if the projections of right turns are close to meeting the guidelines. In that case, consider requiring the turn lane.

¹ The lower threshold of 80 right-turn vehicles per hour would be most used for higher volume (greater than 600 vehicles per hour, per lane in one direction on the major roadway) or two-lane roads where lateral movement is restricted. The 125 right-turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with a large entry radius (50 feet or greater).

² The lower threshold of 35 right-turn vehicles per hour would be most appropriately used on higher volume two-lane roadways where lateral movement is restricted. The 55 right-turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with large entry radius (50 feet or greater).

Source: [NCHRP Report 420 \(Impacts of Access Management Techniques\)](#)

These recommendations are primarily based on the research done in [NCHRP Report 420, Impacts of Access Management Techniques, Chapter 4 – Unsignalized Access Spacing \(Technique 1B\)](#), and [Use of Speed Differential as a Measure to Evaluate the Need for Right-Turn Deceleration Lane at Unsignalized Intersections](#).

In the *NCHRP Report 420*, the observed high-speed roads, 30 to 40 right-turn vehicles per hour caused evasive maneuvers on 5 - 10 percent of the following through vehicles. For lower speed roadways, 80 to 110 right-turn vehicles caused 15 - 20 percent of the following through vehicles to make evasive maneuvers. The choice of acceptable percentages of through vehicles impacted is a decision based on reasonable expectations of the different roadways.

In this study, by modeling speed differentials, a better understanding of the impacts of through volume and driveway radius was discovered.

¹⁰ May not be appropriate for signalized locations where signal phasing plays an important role in determining the need for right turn lanes.

Volume Calculations for Synchro (EBL Extension)

EBL Extension at US 27 and NW 35th Avenue Road

Scenario	Year	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Existing AM	2024	357	972	35	30	628	130	49	18	57	97	11	344	
Background AM*	2025	397	998	36	31	652	157	51	19	59	110	12	360	
	2026	437	1024	37	32	675	184	52	19	60	122	12	376	
	2027	476	1050	38	33	698	210	53	20	62	134	12	391	
	2028	516	1076	39	34	721	237	55	20	63	146	13	407	
	2029	556	1102	40	35	744	264	56	21	65	158	13	423	
	2030	595	1128	41	35	767	290	57	21	66	170	13	438	
	Future Year Buildout AM Volumes													
In	Out	Year	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Percent of Project Trips by Year		In Project Trips (Full Buildout)	53					1						
		Out Project Trips (Full Buildout)										2	154	
20%	21%	2025	408	998	36	31	652	158	51	19	59	111	12	393
48%	51%	2026	463	1024	37	32	675	185	52	19	60	124	12	455
68%	67%	2027	512	1050	38	33	698	211	53	20	62	136	12	494
77%	77%	2028	558	1076	39	34	721	238	55	20	63	148	13	527
87%	88%	2029	603	1102	40	35	744	265	56	21	65	160	13	560
100%	100%	2030	648	1128	41	35	767	291	57	21	66	172	13	592

The EBL turn lane storage will exceed the 180 foot background deficiency by 2029.

*To account for the TIA growth methodology of 2% annual growth plus vested trips, background volumes from 2024 to 2030 were calculated by interpolation.

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↔	↔	↔	↑↑	↑↑	↑↑
Traffic Volume (vph)	558	1076	39	34	721	238	55	20	63	148	13	527
Future Volume (vph)	558	1076	39	34	721	238	55	20	63	148	13	527
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		140	230		225	0		0	0		460
Storage Lanes	2		1	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850			0.850			0.939			0.850
Flt Protected	0.950			0.950			0.980			0.950		
Satd. Flow (prot)	3155	3505	1583	1752	3343	1583	0	1640	0	1752	1743	1468
Flt Permitted	0.255			0.195			0.863			0.496		
Satd. Flow (perm)	847	3505	1583	360	3343	1583	0	1444	0	915	1743	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152			251			23			268
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1211			1897			581			1308	
Travel Time (s)		18.3			28.7			9.9			22.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	11%	3%	2%	3%	8%	2%	8%	11%	4%	3%	9%	10%
Adj. Flow (vph)	587	1133	41	36	759	251	58	21	66	156	14	555
Shared Lane Traffic (%)												
Lane Group Flow (vph)	587	1133	41	36	759	251	0	145	0	156	14	555
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases	1	6			5	2			4		3	8
Permitted Phases	6		6	2			2	4			8	8
Detector Phase	1	6	6	5	2	2	4	4		3	8	8
Switch Phase												
Minimum Initial (s)	8.0	20.0	20.0	8.0	20.0	20.0	12.0	12.0		8.0	12.0	12.0
Minimum Split (s)	15.5	26.9	26.9	15.3	26.9	26.9	22.5	22.5		16.3	22.5	22.5
Total Split (s)	27.0	79.0	79.0	20.0	72.0	72.0	29.0	29.0		22.0	51.0	51.0
Total Split (%)	18.0%	52.7%	52.7%	13.3%	48.0%	48.0%	19.3%	19.3%		14.7%	34.0%	34.0%
Yellow Time (s)	4.9	4.9	4.9	4.8	4.9	4.9	4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.6	2.0	2.0	2.5	2.0	2.0	3.8	3.8		3.8	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.5	6.9	6.9	7.3	6.9	6.9	8.3	8.3		8.3	8.3	8.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes		Yes									
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	94.8	83.2	83.2	78.1	70.5	70.5		17.9		39.4	39.4	39.4
Actuated g/C Ratio	0.63	0.55	0.55	0.52	0.47	0.47		0.12		0.26	0.26	0.26
v/c Ratio	0.73	0.58	0.04	0.14	0.48	0.29		0.75		0.50	0.03	0.95
Control Delay (s/veh)	22.5	11.7	0.1	11.0	25.8	6.9		76.8		49.8	39.3	54.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay (s/veh)	22.5	11.7	0.1	11.0	25.8	6.9		76.8		49.8	39.3	54.7
LOS	C	B	A	B	C	A		E		D	D	D
Approach Delay (s/veh)			15.1			20.7		76.8			53.4	
Approach LOS		B			C			E			D	
Queue Length 50th (ft)	81	203	0	10	345	89		115		120	10	307



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	174	237	m0	m17	387	87	196	187	29	#545		
Internal Link Dist (ft)			1131		1817		501			1228		
Turn Bay Length (ft)	250		140	230		225					460	
Base Capacity (vph)	835	1943	945	316	1571	877	219		316	496	609	
Starvation Cap Reductn	0	0	0	0	0	0	0		0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0		0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0		0	0	0	
Reduced v/c Ratio	0.70	0.58	0.04	0.11	0.48	0.29	0.66		0.49	0.03	0.91	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 126 (84%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay (s/veh): 26.7

Intersection LOS: C

Intersection Capacity Utilization 82.1%

ICU Level of Service E

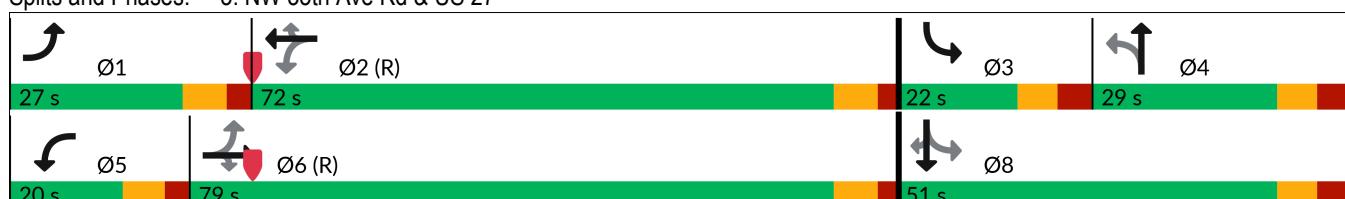
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: NW 35th Ave Rd & US 27



	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Traffic Volume (vph)	603	1102	40	35	744	265	56	21	65	160	13	560
Future Volume (vph)	603	1102	40	35	744	265	56	21	65	160	13	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		140	230		225	0		0	0		460
Storage Lanes	2		1	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850			0.850			0.938			0.850
Flt Protected	0.950			0.950			0.981			0.950		
Satd. Flow (prot)	3155	3505	1583	1752	3343	1583	0	1640	0	1752	1743	1468
Flt Permitted	0.235			0.182			0.864			0.507		
Satd. Flow (perm)	780	3505	1583	336	3343	1583	0	1444	0	935	1743	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152			279			23			261
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1211			1897			581			1308	
Travel Time (s)		18.3			28.7			9.9			22.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	11%	3%	2%	3%	8%	2%	8%	11%	4%	3%	9%	10%
Adj. Flow (vph)	635	1160	42	37	783	279	59	22	68	168	14	589
Shared Lane Traffic (%)												
Lane Group Flow (vph)	635	1160	42	37	783	279	0	149	0	168	14	589
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases	1	6			5	2			4		3	8
Permitted Phases	6		6	2			2	4			8	8
Detector Phase	1	6	6	5	2	2	4	4		3	8	8
Switch Phase												
Minimum Initial (s)	8.0	20.0	20.0	8.0	20.0	20.0	12.0	12.0		8.0	12.0	12.0
Minimum Split (s)	15.5	26.9	26.9	15.3	26.9	26.9	22.5	22.5		16.3	22.5	22.5
Total Split (s)	27.0	79.0	79.0	20.0	72.0	72.0	29.0	29.0		22.0	51.0	51.0
Total Split (%)	18.0%	52.7%	52.7%	13.3%	48.0%	48.0%	19.3%	19.3%		14.7%	34.0%	34.0%
Yellow Time (s)	4.9	4.9	4.9	4.8	4.9	4.9	4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.6	2.0	2.0	2.5	2.0	2.0	3.8	3.8		3.8	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.5	6.9	6.9	7.3	6.9	6.9	8.3	8.3		8.3	8.3	8.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes		Yes									
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	92.4	80.7	80.7	74.6	67.0	67.0	20.3		41.8	41.8	41.8	
Actuated g/C Ratio	0.62	0.54	0.54	0.50	0.45	0.45	0.14		0.28	0.28	0.28	0.28
v/c Ratio	0.82	0.62	0.05	0.15	0.52	0.32	0.69		0.51	0.03	0.99	
Control Delay (s/veh)	33.0	13.4	0.1	11.7	28.7	7.7	69.3		48.9	39.1	63.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.0	13.4	0.1	11.7	28.7	7.7	69.3		48.9	39.1	63.1	
LOS	C	B	A	B	C	A	E		D	D	E	
Approach Delay (s/veh)		19.8			22.8		69.3			59.6		
Approach LOS		B			C		E			E		
Queue Length 50th (ft)	135	231	0	10	361	105	119		131	10	367	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	226	249	m0	m17	404	99	#204			200	29	#629
Internal Link Dist (ft)			1131		1817		501					1228
Turn Bay Length (ft)	250			140	230		225					460
Base Capacity (vph)	788	1885	921	297	1492	860	219			335	496	604
Starvation Cap Reductn	0	0	0	0	0	0	0			0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0			0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0			0	0	0
Reduced v/c Ratio	0.81	0.62	0.05	0.12	0.52	0.32	0.68			0.50	0.03	0.98

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 126 (84%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay (s/veh): 30.6

Intersection LOS: C

Intersection Capacity Utilization 84.8%

ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: NW 35th Ave Rd & US 27

