

# BLUE RIVER TRAFFIC IMPACT ANALYSIS

MARION COUNTY, FLORIDA

March 2024



# PROFESSIONAL ENGINEER CERTIFICATE

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I hereby certify that I am a registered professional engineer in the State of Florida, practicing with Kittelson & Associates, a corporation authorized to operate as a Professional Engineering business by the State of Florida Department of Professional Regulation, Board of Professional Engineers, and that I have approved the Blue River Traffic Impact Analysis report in Marion County, Florida, dated March 2024.

PROJECT: Blue River

LOCATION: Marion County, Florida

CLIENT: Blue River Development, LLC

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

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DATE: March 11, 2024



Kok Wan Mah

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# Blue River Traffic Impact Analysis

## Marion County, Florida

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# Section 1

## Introduction

# INTRODUCTION

Kittelson & Associates, Inc. has been retained by Blue River Development LLC to conduct a Traffic Impact Analysis (TIA) for the proposed Blue River residential development. The 84.37-acre site consists of parcels 37515-000-01 and 37515-000-05 and is located north of SE 92<sup>nd</sup> Loop and east of SE 58<sup>th</sup> Avenue near Belleview, Florida. The project location is illustrated on **Figure 1**.

Access to the development will be provided via a full access extension of SE 64<sup>th</sup> Avenue to SE 92<sup>nd</sup> Loop and a left-in right-in right-out connection SE 92<sup>nd</sup> Loop. The site will be located to the north of SE 92<sup>nd</sup> Loop. The preliminary site plan is shown in **Appendix A**.

The purpose of this study is to evaluate the roadway capacity and operating conditions on the roadways and intersections likely to be impacted by traffic generated by the development to determine how impacts should be mitigated. The following analysis was prepared in accordance with the MARION COUNTY TRAFFIC IMPACT ANALYSIS GUIDELINES (September 2022).

## PROJECT DESCRIPTION

The 84.37-acre site consists of parcels 37515-000-01 and 37515-000-05 and is located north of SE 92<sup>nd</sup> Loop and east of SE 58<sup>th</sup> Avenue near Belleview, Florida. The development is planned to include 337 single family homes. Access to the development will be provided via a full access extension of SE 64<sup>th</sup> Avenue to SE 92<sup>nd</sup> Loop and a left-in right-in right-out connection SE 92<sup>nd</sup> Loop. The site will be located to the north of SE 92<sup>nd</sup> Loop. The development will be constructed in a single phase with an anticipated buildout year of 2028.

## STUDY AREA

The study area was determined using a test for significance documented in the methodology provided as **Appendix B**. The following roadway segments and intersections are included in the analysis:

### Roadway Segments:

- SE 92<sup>nd</sup> Loop
  - SE 58<sup>th</sup> Avenue (SR 35) to Site Entrance
  - Site Entrance to SE 110<sup>th</sup> Street Road
- SE 92<sup>nd</sup> Place Road
  - US 441/US 301 to SE 58<sup>th</sup> Avenue (SR 35)
- SE 58<sup>th</sup> Avenue (SR 35)
  - SR 25 to SE 92<sup>nd</sup> Loop
  - SE 92<sup>nd</sup> Loop to Laurel Road

### Intersections:

- SE 58<sup>th</sup> Avenue (SR 35) at Laurel Road (November 14, 2023)
- US 441/US 301 at SE 92<sup>nd</sup> Place Road (November 14, 2023)
- SE 58<sup>th</sup> Avenue (SR 35) at SE 92<sup>nd</sup> Place Road/SE 92<sup>nd</sup> Loop (November 14, 2023)
- SE 58<sup>th</sup> Avenue (SR 35) at SR 25 (November 14, 2023)
- SE 92<sup>nd</sup> Loop at SE 110<sup>th</sup> Street Road (November 14, 2023)

## PLANNED AND PROGRAMMED IMPROVEMENTS

A verification of the Ocala Marion Transportation Planning Organization (TPO) Transportation Improvement Program (TIP) (2024 to 2028) and Florida Department of Transportation's (FDOT) website CFLRoads.com shows that there are no planned or programmed capacity improvements within the study area.



Figure 1: Location Map



## VESTED DEVELOPMENT

Future vested trips will be accounted for in the development of build traffic volumes. Traffic impact analyses from nearby developments will be used for this purpose, including:

- SE 92<sup>nd</sup> Loop Development
- SE 58<sup>th</sup> Avenue & 92<sup>nd</sup> Loop – Convenience Store with Gasoline

The impacts of these developments will be discussed further in the **Future Volume Development** section.



## Section 2

### Existing Conditions

# EXISTING CONDITIONS

Evaluation of the traffic impacts associated with the proposed development first requires an assessment of the existing roadway conditions in the vicinity of the site. The existing conditions section summarizes the existing transportation conditions including geometry and existing traffic control observed in the study area, collection of existing peak hour traffic volumes, and an assessment of the study area roadways and intersections.

## DATA COLLECTION

Existing turning movement counts (TMCs) were collected on the dates listed above for the AM (7:00 to 9:00) and PM (4:00 to 6:00) peak hour periods at the five study intersections. The existing TMCs were adjusted using the corresponding seasonal factor of 1.01 based on the 2022 data from FDOT's Florida Traffic Online (FTO) Web Application. Raw turning movement counts and the FDOT Peak Season Category Report are provided in **Appendix C. Figure 2** illustrates the seasonal factor adjusted existing AM and PM peak hour traffic volumes. Heavy truck percentages were also calculated from the turning movement volumes and applied to each study intersection in each study period.

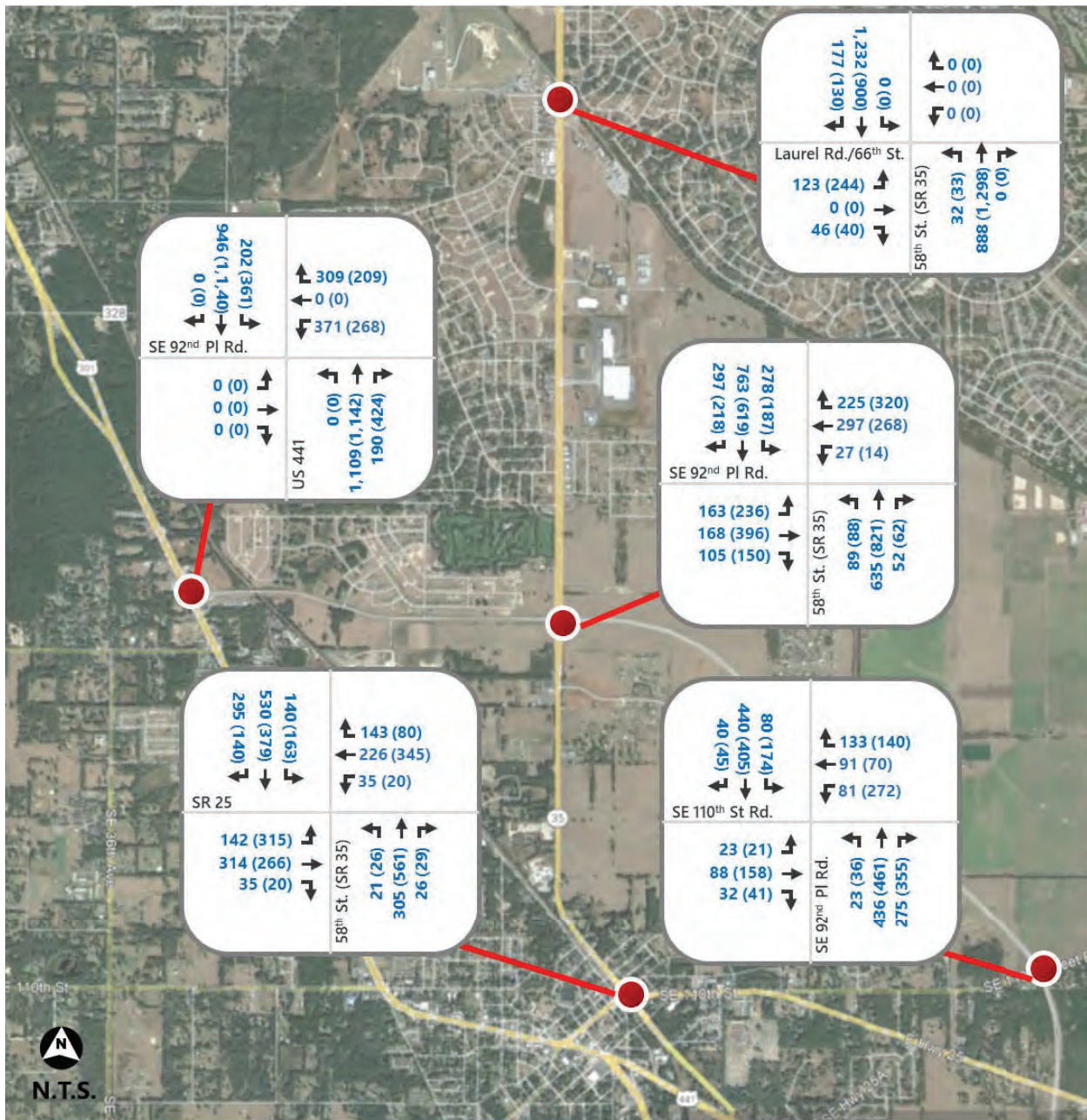
## EXISTING ROADWAY CAPACITY ANALYSIS

To determine the operational conditions along the study area roadway segments, Kittelson conducted a roadway capacity analysis to help quantify the existing level of service (LOS) of the study roadways for the PM peak hour conditions.

The level of service and remaining capacity for each of the study roadways were determined based on the Ocala Marion TPO 2023 Congestion Management Process (CMP) Database is shown in **Appendix C** and was used for existing volumes. A comparison of the peak hour peak direction (PHPD) roadway traffic volumes was made against the roadway capacities to determine the existing level of service. The existing roadway capacity analysis was performed for all roadways within the study area as shown in **Table 1**.

In summary, the study roadway segments operate acceptably and are shown to have sufficient capacity under existing conditions.

Figure 2: Existing Traffic Volumes



AM (PM) Peak

Table 1: Existing Roadway Capacity Analysis

Roadway	Limits	No. of Lanes	Fun Class	LOS Std.	Daily Capacity	Pk Hr Pk Dir Capacity	2023 AADT	PM PH NB/EB Vol <sup>1</sup>	PM PH SB/WB Vol <sup>1</sup>	v/c
SE 92 <sup>nd</sup> Loop	SE 58 <sup>th</sup> Street (SR 35) to Site Entrance	4	Arterial	E	67,770	3,357	12,400	501	615	0.18
	Site Entrance to SE 110 <sup>th</sup> Street Road	4	Arterial	E	67,770	3,357	12,400	501	615	0.18
SE 92 <sup>nd</sup> Place Road	US 441/US 301 to SE 58 <sup>th</sup> St (SR 35)	2	Arterial	E	12,744	634	10,900	628 <sup>2</sup>	372 <sup>2</sup>	0.99
SE 58 <sup>th</sup> Street (SR 35)	SR 25 to SE 92 <sup>nd</sup> Loop	4	Arterial	D	32,970	1,722	12,700	630	513	0.37
	SE 92 <sup>nd</sup> Loop to Laurel Road	4	Arterial	D	58,485	3,056	27,600	1,369	1,115	0.45

<sup>1</sup>The PM peak hour peak direction volumes were estimated using the AADT, a K factor of 9.0 and a D factor of 55.1. The K and D factors were derived from FDOT Count Station 360012 which is provided in **Appendix C**.

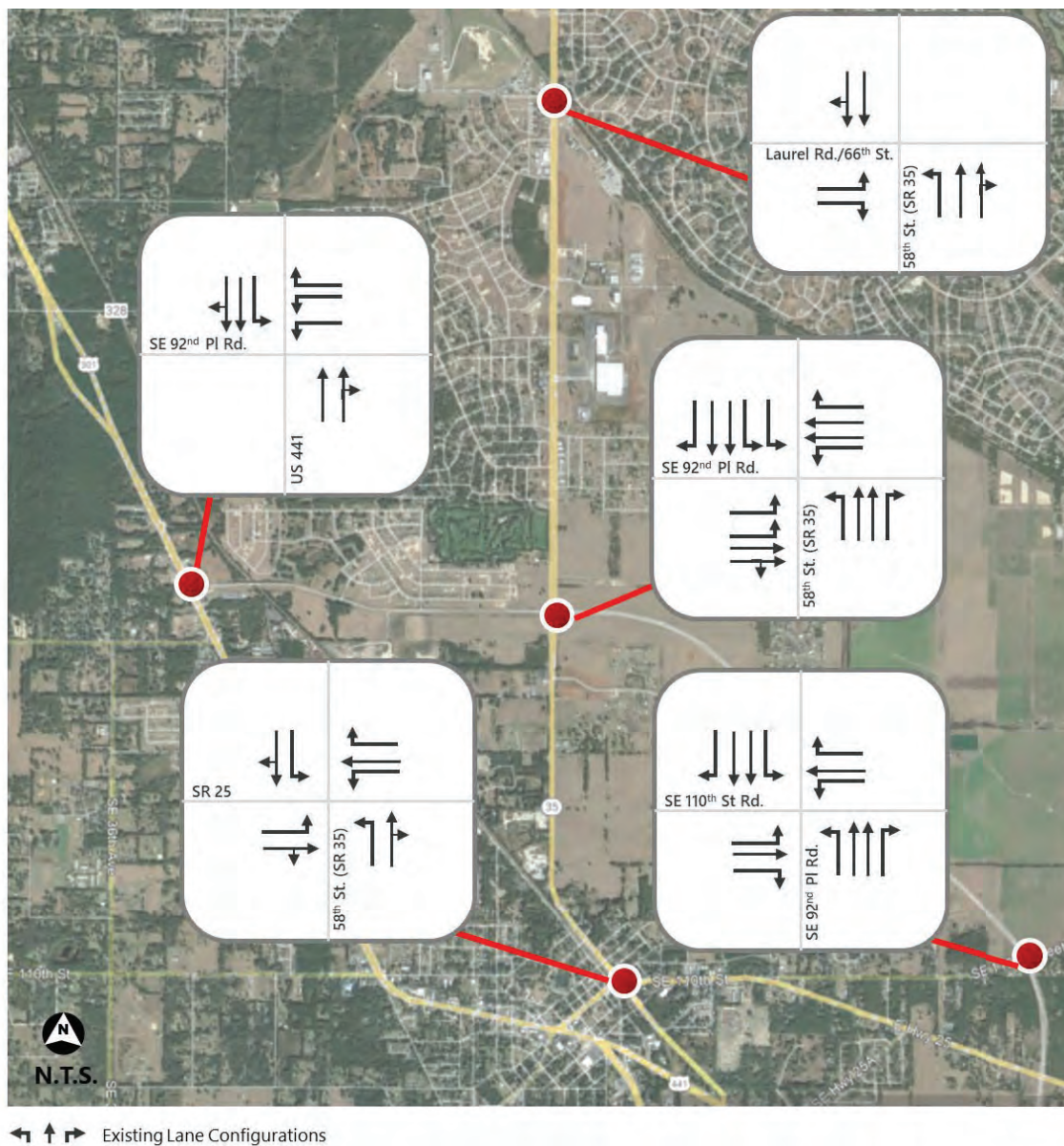
<sup>2</sup>These peak hour volumes were determined from the segment volume counts provided by Marion County and included in **Appendix C**.

# EXISTING INTERSECTION CAPACITY ANALYSIS

The existing intersections were evaluated using the methodology outlined in the Highway Capacity Manual and using Synchro 11 Software. The existing lane configurations are shown in **Figure 3**. Signal timings were provided by Marion County and are shown in **Appendix D**. Due to HCM 6th Edition (HCM6) analysis limitations (expecting strict NEMA phasing), one of the study intersections (US 441/US 301 at SE 92<sup>nd</sup> Place Road) was reported utilizing HCM 2000 instead of HCM6 to quantify the operational performance at the intersections. The results of the study area existing conditions intersection capacity analysis for the AM and PM peak hour are shown in **Table 2**. The Synchro analysis printouts can be found in **Appendix E**.

As shown in **Table 2**, the study area intersections are operating at an overall LOS of E or better except for SE 58<sup>th</sup> Avenue (SR 35) at SR 25. That intersection also has movements that operate at LOS F or over capacity.

Figure 3: Existing Lane Configurations



**Table 2: Existing Conditions Intersection Capacity Analysis**

Intersection	Control Type	Performance Measure	AM Peak Period					PM Peak Period				
			Overall	EB	WB	NB	SB	Overall	EB	WB	NB	SB
1 - SE 58 <sup>th</sup> Avenue (SR 35) at Laurel Road	Signalized	Delay (s/veh)	12.9	59.8	-	5.7	12.2	18.2	69.4	-	10.4	14.8
		LOS	B	E	-	A	B	B	E	-	B	B
		v/c ratio*		0.80	-	0.59	0.61		0.91	-	0.61	0.48
2 - US 441/US 301 at SE 92 <sup>nd</sup> Place Road	Signalized	Delay (s/veh)	27.9	-	53.0	30.0	10.7	39.7	-	61.2	54.0	17.8
		LOS	C	-	D	C	B	D	-	E	D	B
		v/c ratio*		-	0.72	0.79	0.62		-	0.71	0.99	0.84
3 - SE 58 <sup>th</sup> Avenue (SR 35) at SE 92 <sup>nd</sup> Place Road/SE 92 <sup>nd</sup> Loop	Signalized	Delay (s/veh)	32.2	32.8	35.6	32.5	30.5	36.8	36.7	39.9	36.9	33.7
		LOS	C	C	D	C	C	D	D	D	D	C
		v/c ratio*		0.56	0.69	0.77	0.75		0.75	0.83	0.81	0.71
4 - SE 58 <sup>th</sup> Avenue (SR 35) at SR 25	Signalized	Delay (s/veh)	72.8	21.5	31.2	36.8	128.5	94.3	29.2	43.1	260.0	42.0
		LOS	E	C	C	D	F	F	C	D	F	D
		v/c ratio*		0.49	0.55	0.69	<b>1.24</b>		0.86	0.84	<b>1.47</b>	0.86
5 - SE 92 <sup>nd</sup> Loop at SE 110 <sup>th</sup> Street Road	Signalized	Delay (s/veh)	20.9	25.9	22.5	21.9	17.4	24.7	33.9	23.9	26.0	20.6
		LOS	C	C	C	C	B	C	C	C	C	C
		v/c ratio*		0.41	0.34	0.51	0.43		0.71	0.65	0.74	0.48

\*v/c ratio reported for the highest movement





## Section 3 Future Volume Development

# FUTURE VOLUME DEVELOPMENT

Build-out of the proposed development is anticipated by the year 2028. Traffic volumes for the future year were developed by growing the existing roadway volumes and adding proposed project volumes. The following sections describe the development of the future traffic volumes. The volume development spreadsheet used to develop no-build and build volumes is provided in **Appendix F**.

## BACKGROUND GROWTH

The Ocala Marion TPO 2023 Online Traffic Counts Map provides preferred growth rates for the study roadways as documented in the traffic methodology in **Appendix B**. Growth rates were not available for SE 92<sup>nd</sup> Loop so the growth rate on SE 92<sup>nd</sup> Place Road were used instead.

An annual composite growth rate of 6.84% was calculated for the study area. This is based on the weighted average growth rates for the study area roadways. The calculation of the composite rate is shown in **Table 3**. Growth used for future background conditions is proposed to use the background growth of 6.84% per year plus vested trips.

Table 3: 2028 Background Traffic

Segment	Limits	2022 AADT	Annual Growth Rate	Weighted Growth
SE 92 <sup>nd</sup> Loop	SE 58 <sup>th</sup> Avenue (SR 35) to Site Entrance	12,300	11.30%	8,339
	Site Entrance to SE 110 <sup>th</sup> Street Road	12,300	11.30%	8,339
SE 92 <sup>nd</sup> Place Road	US 441/US 301 to SE 58 <sup>th</sup> Avenue (SR 35)	10,400	11.30%	7,051
SE 58 <sup>th</sup> Avenue (SR 35)	SR 25 to SE 92 <sup>nd</sup> Loop	26,500	2.10%	3,339
	SE 92 <sup>nd</sup> Loop to Laurel Road	26,500	5.70%	9,063
<b>Composite Annual Average Growth Rate</b>				<b>6.84%</b>

## VESTED DEVELOPMENT

Future vested trips will be accounted for in the development of build traffic volumes. Traffic impact analyses (TIAs) from nearby developments will be used for this purpose, including:

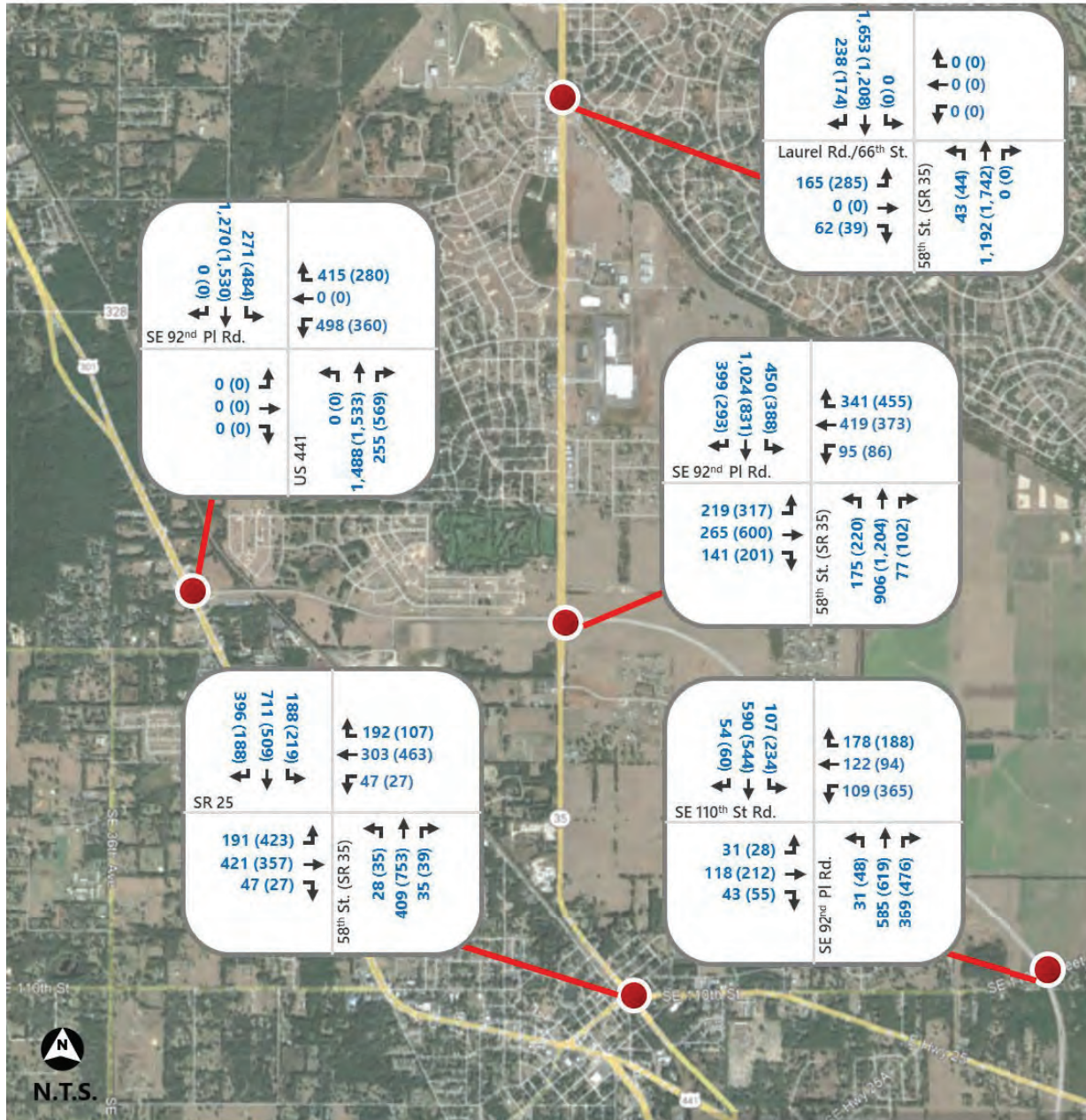
- SE 92<sup>nd</sup> Loop Development
  - A development with 234 residential units located approximately 630 feet east of the intersection of SE 58<sup>th</sup> Avenue (SR 35) and SE 92<sup>nd</sup> Loop. Units will be on the north and south side of SE 92<sup>nd</sup> Loop.
- SE 58<sup>th</sup> Avenue & 92<sup>nd</sup> Loop – Convenience Store with Gasoline
  - A convenience store with 4,650 square feet located on the southeast corner of the intersection of SE 58<sup>th</sup> Avenue (SR 35) and SE 92<sup>nd</sup> Loop.

The traffic impact analyses associated with these developments are provided in **Appendix G**.

# 2028 NO-BUILD VOLUMES

The selected 6.84 percent annual growth rate was applied to the existing 2022 segment volumes and 2023 turning movement volumes (shown in **Figure 2**) and vested trips were accounted for to develop the 2028 no-build volumes, as shown in **Figure 4**.

Figure 4: 2028 No-Build Volumes



## TRIP GENERATION

**Table 4** summarizes the Daily, AM, and PM peak hour trip generation for the proposed development based on equations contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The proposed development will consist of 337 dwelling units of Single Family Detached Housing (ITE code 210). As shown in **Table 4**, the proposed development is expected to generate 3,086 new daily trips, 225 new AM peak hour trips, and 311 new PM peak hour trips for the buildout condition. The ITE Trip Generation summary sheets can be found in **Appendix H**.

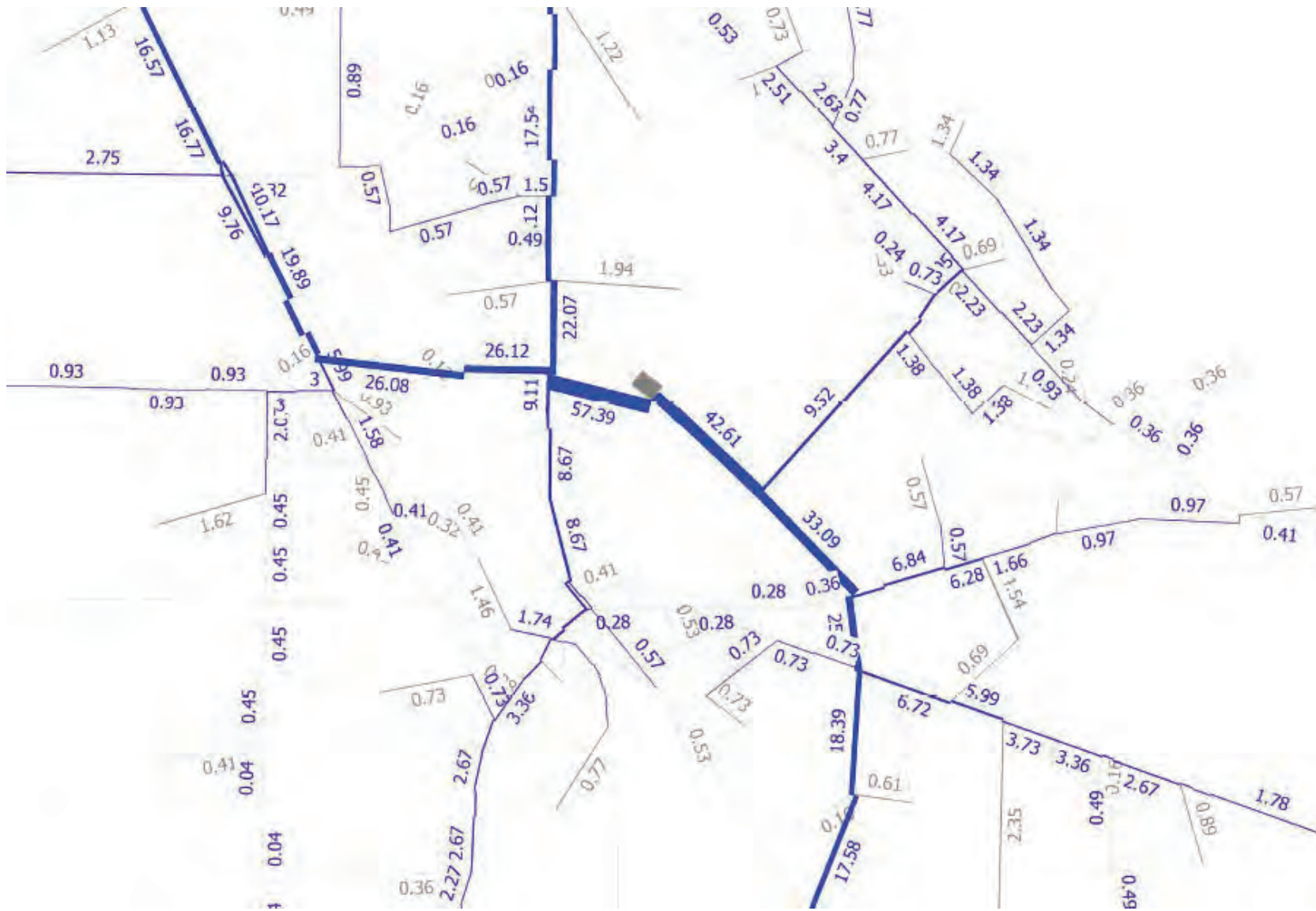
## TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of site generated traffic is a function of population in surrounding areas, existing travel patterns, ease of access to the site, and traffic conditions on area roadways. The primary project traffic to and from the site will be distributed to the adjacent roadways and intersections based on the existing plus committed Central Florida Regional Planning Model (CFRPMv7) results, utilizing the existing and committed network. The model output is provided in **Figure 5** and **Appendix I**.

Table 4: Project Trip Generation

Land Use	ITE Code	Intensity		Daily	AM Peak Period						PM Peak Period					
				Trips	In		Out		Total		In		Out		Total	
					%	Trips	%	Trips	Rate	Trips	%	Trips	%	Trips	Rate	Trips
Single Family Detached Housing	210	337	DUs	3,086	25%	56	75%	169	0.67	225	63%	196	37%	115	0.92	311
<b>Total</b>				<b>3,086</b>		<b>56</b>		<b>169</b>		<b>225</b>		<b>196</b>		<b>115</b>		<b>311</b>

Figure 5: Project Distribution



# FUTURE BUILD VOLUMES

The project trips were distributed according to the model results shown in **Figure 5** and added to the 2028 no-build volumes to develop the 2028 build volumes. The project trips for the larger study area are shown in **Figure 6**. The project trip distribution and total project trips at the site driveways are shown in **Figure 7** and **Figure 8**. The 2028 build volumes are shown in **Figure 9** and **Figure 10**.

Figure 6: Project Trips in Study Area

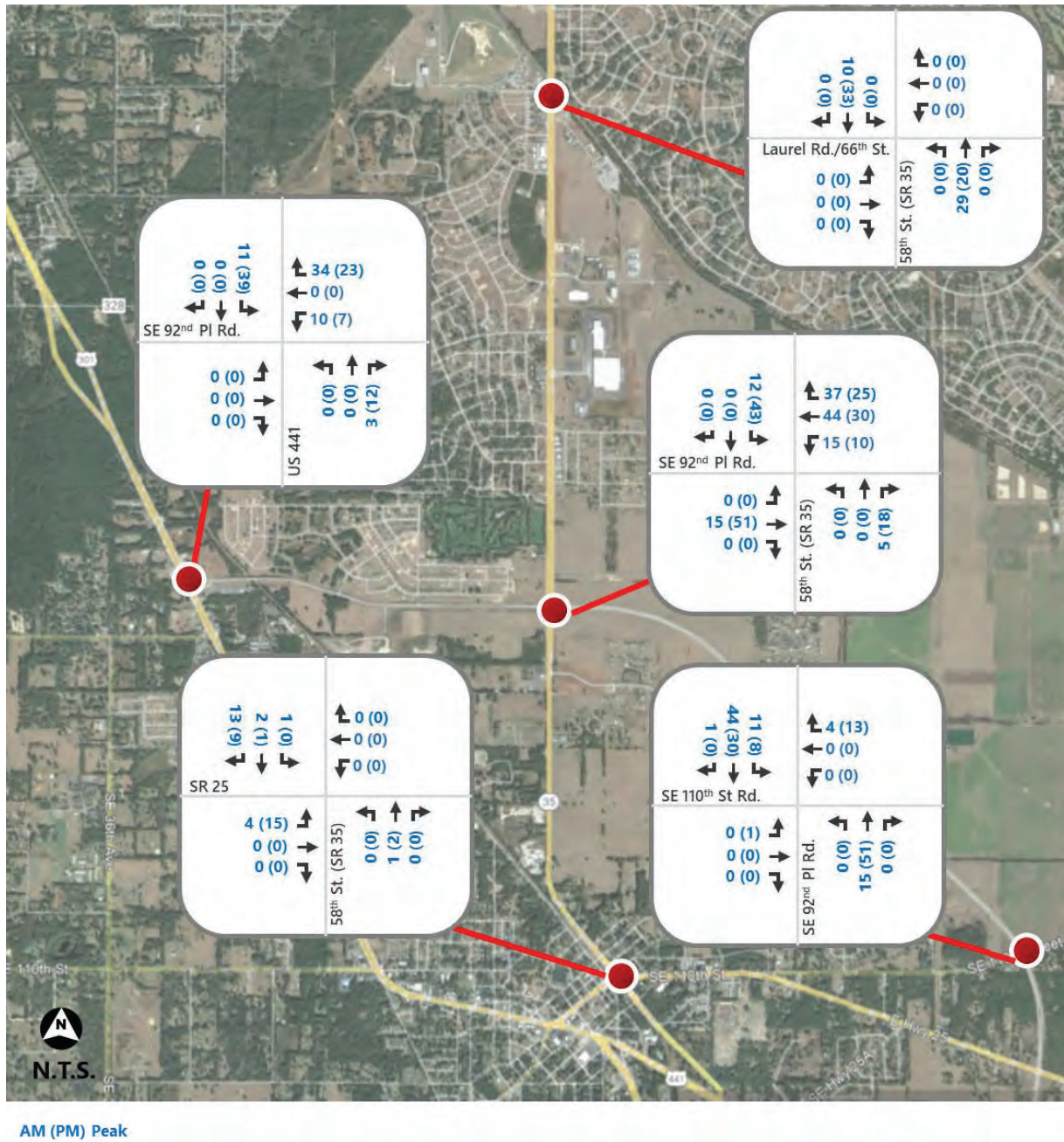


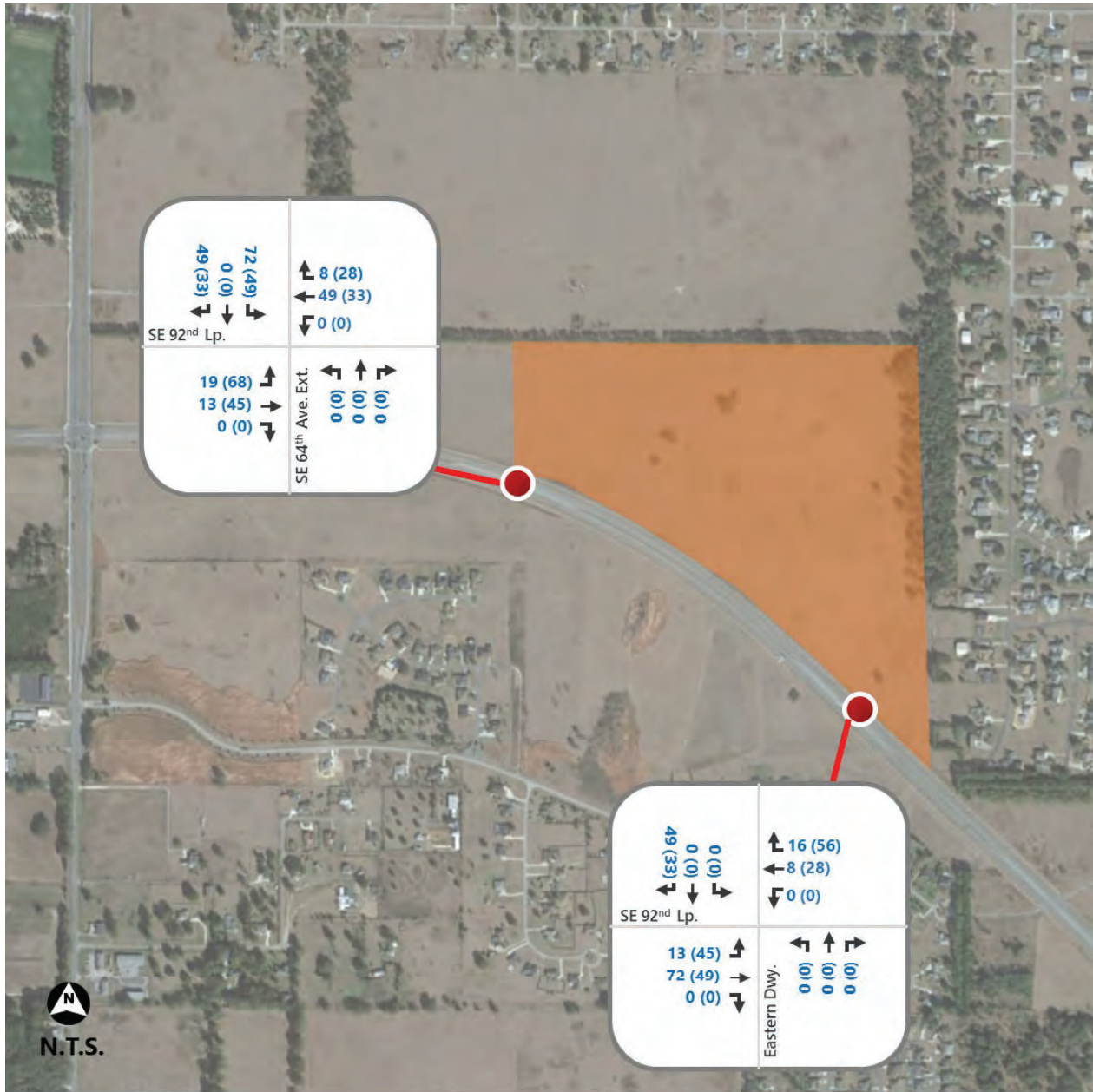
Figure 7: Site Driveway Project Trip Distribution



% Trips In  
% Trips Out

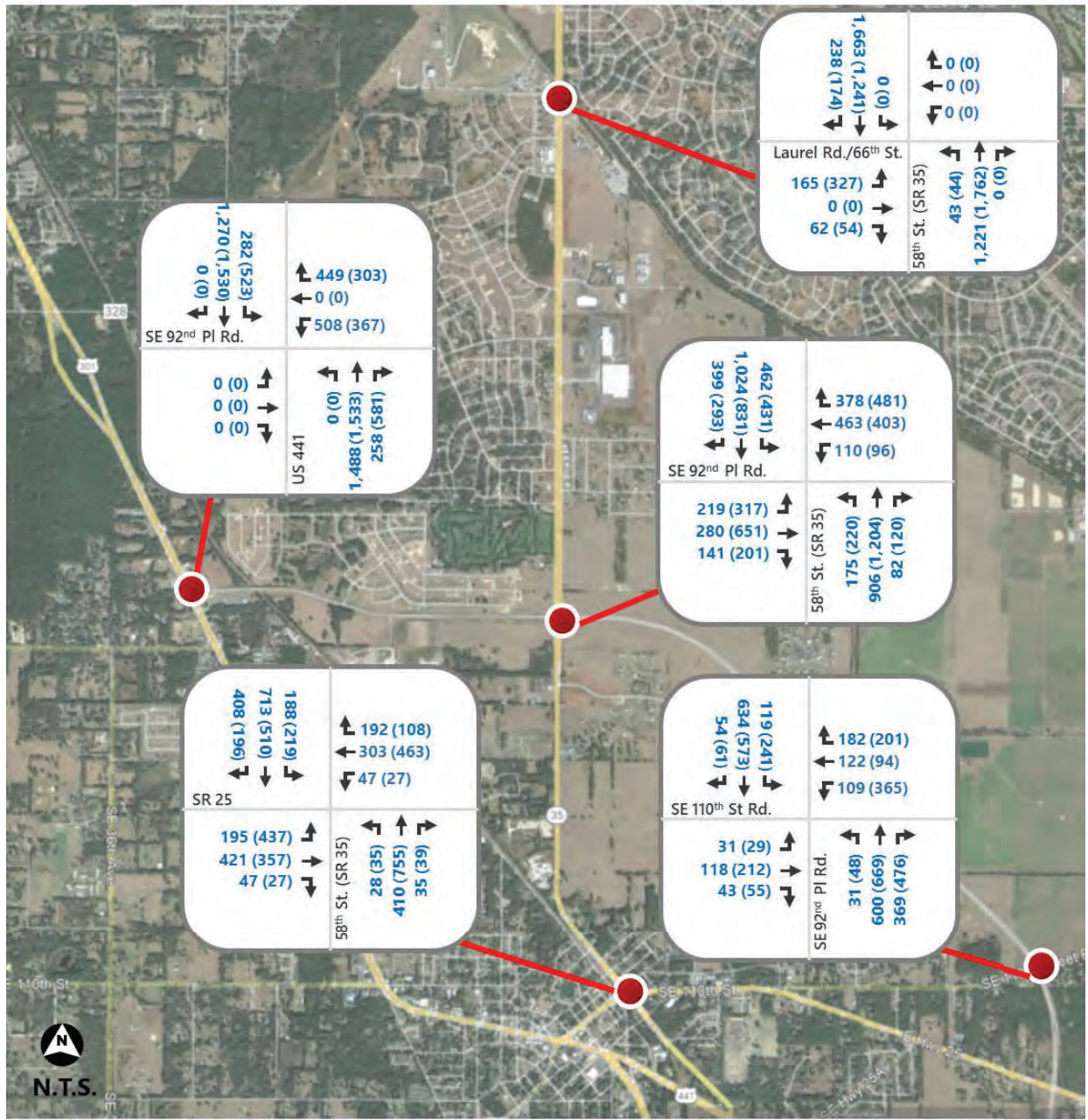


Figure 8: Project Trips at Site Driveways



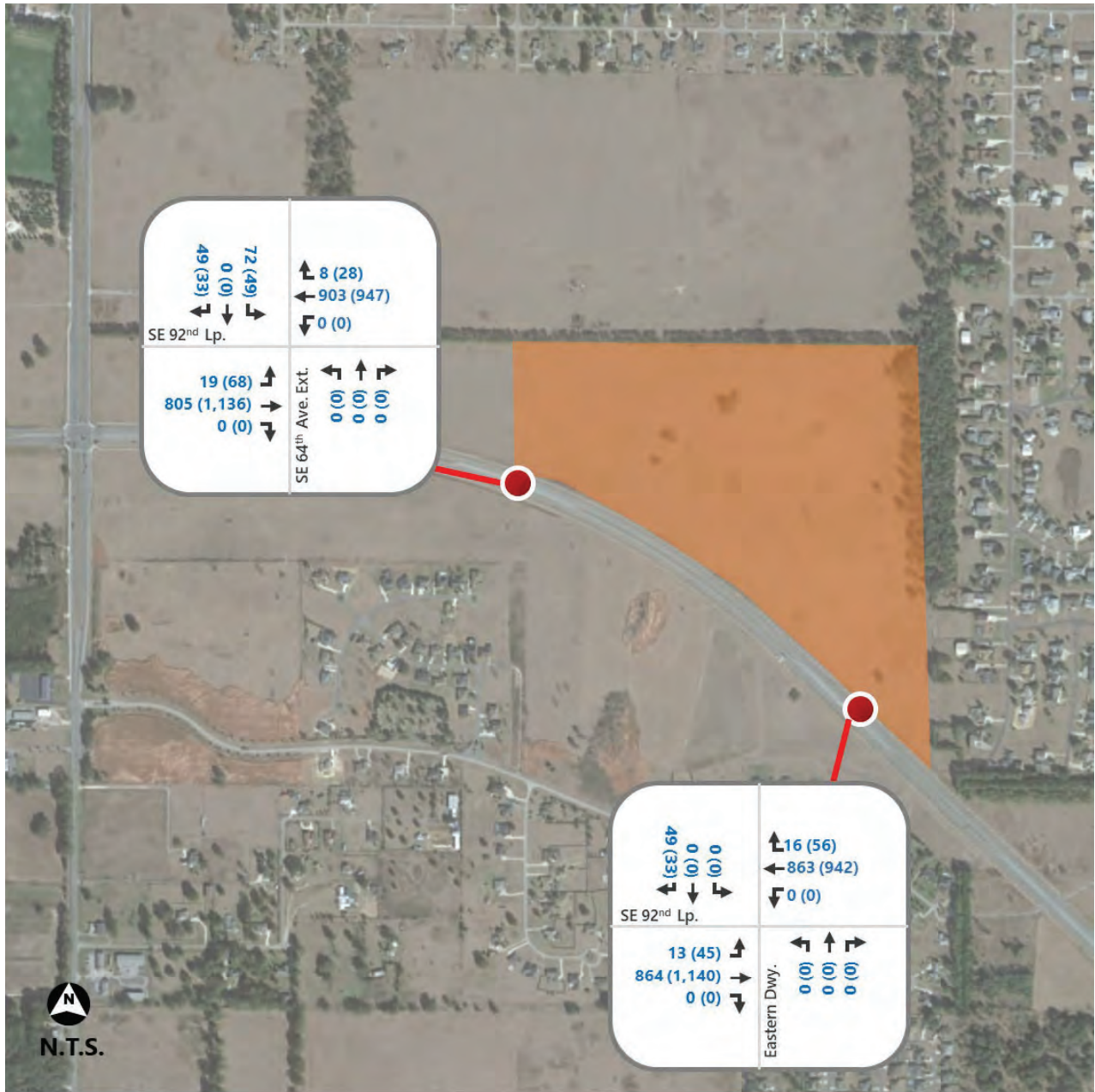
AM (PM) Peak

Figure 9: 2028 Build Volumes



AM (PM) Peak

Figure 10: 2028 Build Volumes at Site Driveways



AM (PM) Peak



## Section 4

### Future Conditions

# FUTURE CONDITIONS

To determine the impacts of the site-generated traffic volumes on the surrounding roadways and study intersections, future traffic conditions were analyzed.

## 2028 NO-BUILD ROADWAY CAPACITY ANALYSIS

The PM peak hour 2028 future background capacity analysis for the study area roadways is shown in **Table 5**.

As seen in **Table 5**, the analysis concludes that the SE 92<sup>nd</sup> Place Road segment operates over capacity as a result from no-build traffic conditions with a v/c ratio of 1.44. This is consistent with the TPO's 2023 CMP Database, which shows a v/c of 1.09 by 2028 without accounting for vested trips. The future background roadway analysis in the Convenience Store with Gas Station TIA provided in **Appendix G** also show the SE 92<sup>nd</sup> Place Road segment to be overcapacity with a v/c ratio of 1.08.

It should also be noted that when using the latest capacity guidance from FDOT's 2023 Multimodal Quality/Level of Service (MQ/LOS) Handbook, the roadway capacity on the SE 92<sup>nd</sup> Place Road segment is estimated to be higher. As this roadway segment has a context classification of C2-Rural in the FDOT preliminary context classification layer and an LOS Standard of E per the Ocala Marion TPO CMP Database, the peak hour peak direction capacity is estimated at 1,490. This would result in a v/c ratio of 0.61 if this capacity was used. This capacity estimate is documented in **Appendix J**.

Table 5: 2028 Future No-Build Roadway Capacity Analysis

Roadway	Limits	No. of Lanes	Fun Class	LOS Std.	Daily Capacity	Pk Hr Pk Dir Capacity	Historical Growth	Background PM PH NB/EB Vol	Background PM PH SB/WB Vol	Vested PM PH NB/EB Vol	Vested PM PH SB/WB Vol	Total No-Build PM PH NB/EB Vol	Total No-Build PM PH SB/WB Vol	No-Build v/c
SE 92 <sup>nd</sup> Loop	SE 58 <sup>th</sup> Street (SR 35) to Site Entrance	4	Arterial	E	67,770	3,357	6.84%	707	867	77	77	784	944	0.28
	Site Entrance to SE 110 <sup>th</sup> Street Road	4	Arterial	E	67,770	3,357	6.84%	707	867	77	77	784	944	0.28
SE 92 <sup>nd</sup> Place Road	US 441/US 301 to SE 58 <sup>th</sup> St (SR 35)	2	Arterial	E	12,744	634	6.84%	886	526	28	28	914	554	<b>1.44</b>
SE 58 <sup>th</sup> Street (SR 35)	SR 25 to SE 92 <sup>nd</sup> Loop	4	Arterial	D	32,970	1,722	6.84%	889	724	28	28	917	752	0.53
	SE 92 <sup>nd</sup> Loop to Laurel Road	4	Arterial	D	58,485	3,056	6.84%	1,931	1,573	57	57	1,988	1,630	0.65

## 2028 NO-BUILD INTERSECTION CAPACITY ANALYSIS

The no-build intersection lane configurations are the same as the existing condition and are shown in **Figure 3**. The results of the intersection capacity analysis for the PM peak hour are shown in **Table 6**. The analysis reflects the v/c ratios, delays per turning movement (in seconds), and the operating LOS. **Table 6** shows that under future no-build conditions (which does not include project traffic), the study intersections are projected to operate with an overall LOS of E or better with the exception of:

- US 441/US 301 at SE 92<sup>nd</sup> Place Road
- SE 58<sup>th</sup> Avenue (SR 35) at SR 25

In addition, the following intersections operate with overcapacity movements:

- US 441/US 301 at SE 92<sup>nd</sup> Place Road
- SE 58<sup>th</sup> Avenue (SR 35) at SE 92<sup>nd</sup> Place Road/SE 92<sup>nd</sup> Loop
- SE 58<sup>th</sup> Avenue (SR 35) at SR 25

The improvements needed for the no-build intersections to operate acceptably will be further evaluated and analyzed in the following sections. The future no-build Synchro intersection report printouts are provided in **Appendix J**.

**Table 6: 2028 No-Build Intersection Capacity Analysis**

Intersection	Control Type	Performance Measure	AM Peak Period					PM Peak Period				
			Overall	EB	WB	NB	SB	Overall	EB	WB	NB	SB
1 - SE 58 <sup>th</sup> Avenue (SR 35) at Laurel Road	Signalized	Delay (s/veh)	20.3	57.4	-	8.9	23.4	26.8	71.2	-	18.4	25.7
		LOS	C	E	-	A	C	C	E	-	B	C
		v/c ratio*		0.84	-	0.79	0.86		0.93	-	0.76	0.72
2 - US 441/US 301 at SE 92 <sup>nd</sup> Place Road	Signalized	Delay (s/veh)	100.6	-	61.1	198.5	13.3	252.9	-	65.4	538.5	14.3
		LOS	<b>F</b>	-	E	<b>F</b>	B	<b>F</b>	-	E	<b>F</b>	B
		v/c ratio*		-	0.90	<b>1.34</b>	0.62		-	0.85	<b>2.08</b>	0.71
3 - SE 58 <sup>th</sup> Avenue (SR 35) at SE 92 <sup>nd</sup> Place Road/SE 92 <sup>nd</sup> Loop	Signalized	Delay (s/veh)	55.2	57.9	55.3	55.0	54.4	97.3	78.5	72.9	128.1	94.2
		LOS	E	E	E	E	D	<b>F</b>	E	E	<b>F</b>	<b>F</b>
		v/c ratio*		0.83	0.82	0.88	0.90		<b>1.07</b>	0.96	<b>1.15</b>	<b>1.21</b>
4 - SE 58 <sup>th</sup> Avenue (SR 35) at SR 25	Signalized	Delay (s/veh)	92.7	99.6	88.7	33.5	111.0	137.6	149.7	115.7	189.5	96.4
		LOS	<b>F</b>	<b>F</b>	<b>F</b>	C	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>
		v/c ratio*		<b>1.21</b>	<b>1.00</b>	0.59	<b>1.19</b>		<b>1.44</b>	<b>1.12</b>	<b>1.30</b>	<b>1.31</b>
5 - SE 92 <sup>nd</sup> Loop at SE 110 <sup>th</sup> Street Road	Signalized	Delay (s/veh)	22.5	32.0	28.3	22.2	17.6	37.9	50.0	38.1	42.1	28.2
		LOS	C	C	C	C	B	D	D	D	D	C
		v/c ratio*		0.62	0.58	0.76	0.49		0.82	0.85	0.90	0.73

\*v/c ratio reported for the highest movement



## 2028 NO-BUILD ROADWAY CAPACITY ANALYSIS WITH IMPROVEMENTS

Based on the future background roadway capacity analysis, it is recommended that the following roadway segment be widened to enhance operations and increase capacity to better accommodate future no-build traffic volumes:

- Widen the following roadway segments from two to four lanes:
  - SE 92<sup>nd</sup> Place Road:
    - From US 441/US 301 to SE 58<sup>th</sup> St (SR 35)

The 2028 no-build PM peak hour capacity analysis for the study area roadways with roadway improvements can be found in **Table 7**. All study area roadways are anticipated to operate acceptably in 2028 no-build PM peak hour conditions with the addition of the improvements described above.

However, as noted in the **2028 No-Build Roadway Capacity Analysis** section, this roadway segment could be considered under capacity in the future no-build condition without widening when using the estimated capacity from the 2023 MQ/LOS Handbook.

Table 7: 2028 Future No-Build Roadway Capacity Analysis with Improvements

Roadway	Limits	No. of Lanes	Fun Class	LOS Std.	Daily Capacity	Pk Hr Pk Dir Capacity	Historical Growth	Background PM PH NB/EB Vol	Background PM PH SB/WB Vol	Vested PM PH NB/EB Vol	Vested PM PH SB/WB Vol	Total No-Build PM PH NB/EB Vol	Total No-Build PM PH SB/WB Vol	No-Build v/c
SE 92 <sup>nd</sup> Place Road	US 441/US 301 to SE 58 <sup>th</sup> St (SR 35)	4	Arterial	E	25,488 <sup>1</sup>	1,268 <sup>1</sup>	6.84%	886	526	28	28	914	554	0.72

<sup>1</sup>The four-lane capacity was estimated by doubling the two-lane capacity on this roadway.

## 2028 NO-BUILD INTERSECTION CAPACITY ANALYSIS WITH IMPROVEMENTS

The following no-build related improvements are recommended to help improve operations at the intersections showing an overall LOS F or overcapacity movements under the 2028 peak hour no-build conditions:

- US 441/US 301 at SE 92<sup>nd</sup> Place Road
  - Add an exclusive northbound right turn lane
  - Add an additional southbound left turn lane
    - Change the left turn phasing to protected only.
- SE 58<sup>th</sup> Avenue (SR 35) at SE 92<sup>nd</sup> Place Road/SE 92<sup>nd</sup> Loop
  - Add an exclusive eastbound right turn lane.
  - Add an additional northbound left turn lane.
  - Add permitted-overlap phasing to the westbound right turn lane.
- SE 58<sup>th</sup> Avenue (SR 35) at SR 25
  - Add an additional eastbound left turn lane
    - Change the left turn phasing to protected only.
  - Add an additional southbound left turn lane
    - Change the left turn phasing to protected only.
  - Add an additional northbound through lane.
    - While this section of SE 58th Avenue (SR 35) is two lanes, the section a mile and half to the north is four lanes.
  - Add an additional southbound through lane.
    - While this section of SE 58th Avenue (SR 35) is two lanes, the section a mile and half to the north is four lanes.
  - Change the westbound and northbound left turn phasing to protected only due to additional turn lanes and the railroad crossing.

These intersection improvements are shown in **Figure 11**. With the above recommended improvements, these intersections are expected to operate at an overall LOS E or better and with no overcapacity movements. The results of the improved no-build conditions are presented in **Table 8** and the Synchro intersection report printouts are provided in **Appendix K**.



**Table 8: 2028 No-Build Intersection Capacity Analysis with Improvements**

Intersection	Control Type	Performance Measure	AM Peak Period					PM Peak Period				
			Overall	EB	WB	NB	SB	Overall	EB	WB	NB	SB
2 - US 441/US 301 at SE 92 <sup>nd</sup> Place Road	Signalized	Delay (s/veh)	40.8	-	71.7	48.1	14.1	39.5	-	81.5	47.7	16.9
		LOS	D	-	E	D	B	D	-	F	D	B
		v/c ratio*		-	0.99	0.98	0.51		-	0.98	0.99	0.62
3 - SE 58 <sup>th</sup> Avenue (SR 35) at SE 92 <sup>nd</sup> Place Road/SE 92 <sup>nd</sup> Loop	Signalized	Delay (s/veh)	45.5	52.6	44.4	47.9	42.3	63.3	73.2	63.9	69.1	49.9
		LOS	D	D	D	D	D	E	E	E	E	E
		v/c ratio*		0.81	0.82	0.87	0.88		0.95	0.86	0.98	0.93
4 - SE 58 <sup>th</sup> Avenue (SR 35) at SR 25	Signalized	Delay (s/veh)	48.4	62.8	55.4	35.6	43.3	56.2	56.1	63.2	58.6	49.8
		LOS	D	E	E	D	D	E	E	E	E	D
		v/c ratio*		0.89	0.79	0.75	0.79		0.89	0.90	0.78	0.84

## 2028 BUILD ROADWAY CAPACITY ANALYSIS

The 2028 build PM peak hour roadway capacity analysis for the study area roadways with addition of the no-build improvements can be found in **Table 9**. The analysis concludes none of the study segments operate overcapacity in the build condition when assuming the no-build roadway improvements discussed in the **2028 No-Build Roadway Capacity Analysis with Improvements** section.

Table 9: 2028 Future Build Roadway Capacity Analysis

Roadway	Limits	No. of Lanes	Fun Class	LOS Std.	Daily Capacity	Pk Hr Pk Dir Capacity	Total No-Build PM PH NB/EB Vol	Total No-Build PM PH SB/WB Vol	Model Distribution	PM PH NB/EB Project Trips	PM PH NB/EB Project Trips	Total Build PM PH NB/EB Vol	Total Build PM PH SB/WB Vol	Build v/c
SE 92 <sup>nd</sup> Loop	SE 58 <sup>th</sup> Street (SR 35) to Site Entrance	4	Arterial	E	67,770	3,357	784	944	57%	112	66	896	1,010	0.30
	Site Entrance to SE 110 <sup>th</sup> Street Road	4	Arterial	E	67,770	3,357	784	944	43%	49	84	833	1,028	0.31
SE 92 <sup>nd</sup> Place Road	US 441/US 301 to SE 58 <sup>th</sup> St (SR 35)	4 <sup>1</sup>	Arterial	E	25,488 <sup>2</sup>	1,268 <sup>2</sup>	<b>914</b>	554	26%	51	30	965	584	0.76
SE 58 <sup>th</sup> Street (SR 35)	SR 25 to SE 92 <sup>nd</sup> Loop	4	Arterial	D	32,970	1,722	917	752	9%	18	10	935	762	0.54
	SE 92 <sup>nd</sup> Loop to Laurel Road	4	Arterial	D	58,485	3,056	1,988	1,630	22%	25	43	2,013	1,673	0.66

<sup>1</sup>Two-to-four lane widening assumed on SE 92<sup>nd</sup> Place Road in the **2028 No-Build Roadway Capacity Analysis with Improvements** section.

<sup>2</sup>The four-lane capacity was estimated by doubling the two-lane capacity on this roadway.

## 2028 BUILD INTERSECTION CAPACITY ANALYSIS

The build intersection analysis used the no-build with improvement lane configurations shown in **Figure 10** for the main intersections, while lane configurations at the site driveways are shown in **Figure 12**. The results of the build intersection capacity analysis are shown in **Table 10**. Two new intersections were analyzed in the buildout condition including:

- SE 92<sup>nd</sup> Loop
  - One stop controlled full access intersection
  - One stop-controlled left in, right-in, right-out intersection
    - An exclusive westbound right turn lane was included at this location based on guidance from Table 27 of the FDOT Access Management Guidebook.
    - The recommended length for this new turn lane is 350 feet based on guidance from Exhibit 212-1 the FDOT Design Manual and a posted speed limit of 50 miles per hour.

As shown in **Table 10**, the study intersections operate at LOS E or better and without overcapacity movements. The future build conditions Synchro intersection report printouts are provided in **Appendix L**.

Figure 12: Build Lane Configurations at Site Driveways

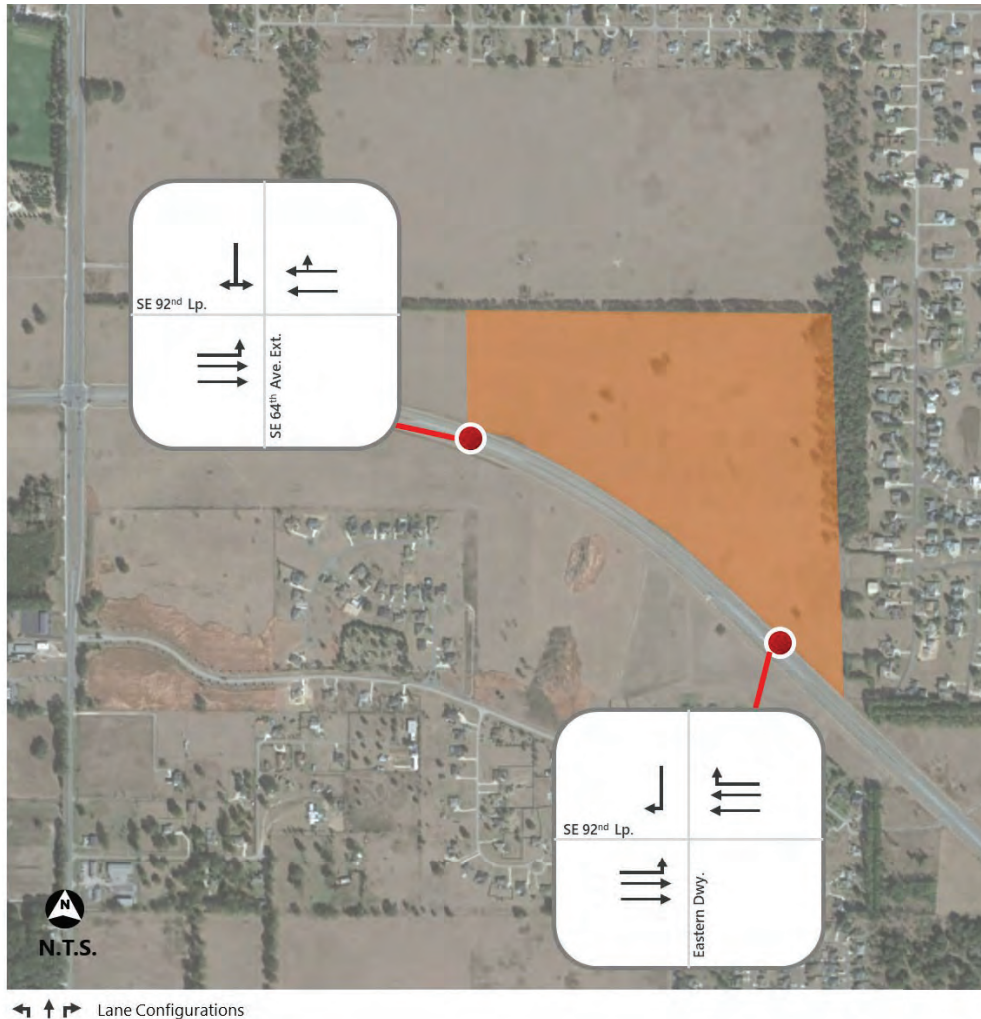


Table 10: 2028 Build Intersection Capacity Analysis

Intersection	Control Type	Performance Measure	AM Peak Period					PM Peak Period				
			Overall	EB	WB	NB	SB	Overall	EB	WB	NB	SB
1 - SE 58 <sup>th</sup> Avenue (SR 35) at Laurel Road	Signalized	Delay (s/veh)	20.4	57.4	-	8.9	23.7	27.2	71.2	-	18.7	26.4
		LOS	C	E	-	A	C	C	E	-	B	C
		v/c ratio*		0.84	-	0.79	0.87		0.93	-	0.77	0.74
2 - US 441/US 301 at SE 92 <sup>nd</sup> Place Road	Signalized	Delay (s/veh)	41.9	-	68.4	51.3	14.9	38.2	-	74.8	45.4	18.8
		LOS	D	-	E	D	B	D	-	E	D	B
		v/c ratio*		-	0.95	0.99	0.52		-	0.94	0.98	0.70
3 - SE 58 <sup>th</sup> Avenue (SR 35) at SE 92 <sup>nd</sup> Place Road/SE 92 <sup>nd</sup> Loop	Signalized	Delay (s/veh)	48.8	55.3	46.9	52.5	45.2	67.3	73.5	73.2	72.3	54.2
		LOS	D	E	D	D	D	E	E	E	E	E
		v/c ratio*		0.82	0.84	0.89	0.89		0.89	0.90	0.99	0.98
4 - SE 58 <sup>th</sup> Avenue (SR 35) at SR 25	Signalized	Delay (s/veh)	49.4	63.9	56.2	35.7	43.8	56.6	55.7	63.0	60.1	50.2
		LOS	D	E	E	D	D	E	E	E	E	D
		v/c ratio*		0.89	0.79	0.75	0.79		0.89	0.90	0.80	0.84
5 - SE 92 <sup>nd</sup> Loop at SE 110 <sup>th</sup> Street Road	Signalized	Delay (s/veh)	22.6	32.2	28.7	22.3	17.8	38.5	50.5	39.5	42.1	29.1
		LOS	C	C	C	C	B	D	D	D	D	C
		v/c ratio*		0.63	0.60	0.75	0.52		0.83	0.86	0.89	0.77
6 - SE 92 <sup>nd</sup> Loop at 64 <sup>th</sup> Street Extension	Unsignalized	Delay (s/veh)		10.6**	-	-	24.4		11.1**	-	-	27.3
		LOS		B	-	-	C		B	-	-	D
		v/c ratio*		0.03	-	-	0.41		0.11	-	-	0.35
7 - SE 92 <sup>nd</sup> Loop at Eastern Driveway	Unsignalized	Delay (s/veh)		10.0**	-	-	12.2		10.8	-	-	12.3
		LOS		A	-	-	B		B	-	-	B
		v/c ratio*		0.02	-	-	0.09		0.07	-	-	0.07

\*v/c ratio reported for the highest movement

\*\*Major street left-turn movement results reported at unsignalized intersection



## MULTIMODAL ASSESSMENT

A multimodal assessment was conducted to determine existing and proposed alternate modes of transportation within the immediate project study area. The following is a summary of transit, pedestrian, and bicycle facilities:

### TRANSIT

Transit services within Marion County are provided by Marion Transit. Marion Transit only provides paratransit services and does not operate fixed route services.

### PEDESTRIAN FACILITIES

There is an existing sidewalk on both sides of SE 92<sup>nd</sup> Loop adjacent to the site. The development is expected to connect to the existing sidewalk network, but the specific locations of sidewalk installation have not yet been determined. Marion County will be working with the developer on the provisions of sidewalks for the site and this will be included in the Developer's Agreement.

### BICYCLE FACILITIES

There is a paved shoulder on both sides of SE 92<sup>nd</sup> Loop adjacent to the site but no bicycle lanes or shared use path are planned.



## Section 5

### Conclusions

# CONCLUSIONS

This traffic analysis has been prepared to evaluate the traffic impacts associated with the Blue River residential development to be located north of SE 92<sup>nd</sup> Loop in support of obtaining concurrency through Marion County.

The following is a summary of the study findings:

## Trip Generation

- The proposed development is expected to generate 3,086 new daily trips, 225 new AM peak hour trips, and 311 new PM peak hour trips.

## Proposed Access

- Access to the development will be provided via a full access extension of SE 64<sup>th</sup> Avenue to SE 92<sup>nd</sup> Loop, a right-in right-out connection to SE 92<sup>nd</sup> Loop, and a left-in right-in right-out connection SE 92<sup>nd</sup> Loop.

## Existing Conditions

- All study roadway segments operate acceptably and are shown to have sufficient capacity under existing conditions.
- The study intersections operate at an overall LOS of E or better and without overcapacity movements except for SE 58<sup>th</sup> Avenue (SR 35) at SR 25.

## No-Build Conditions

- One roadway segments for future conditions operate over capacity as a result from background traffic conditions:
  - SE 92<sup>nd</sup> Place Road from US 441/US 301 to SE 58<sup>th</sup> St (SR 35)
- It is recommended that the SE 92<sup>nd</sup> Place Road segment described above be widened from two to four lanes due to deficiencies identified in the no-build traffic conditions. This will enhance operations and increase capacity in an effort to better accommodate future traffic conditions:
- Under future no-build conditions, the study intersections are projected to operate with an overall LOS of E or better with the exception of:
  - US 441/US 301 at SE 92<sup>nd</sup> Place Road
  - SE 58<sup>th</sup> Avenue (SR 35) at SR 25
- In addition, the following intersections operate with overcapacity movements in future no-build conditions:
  - US 441/US 301 at SE 92<sup>nd</sup> Place Road
  - SE 58<sup>th</sup> Avenue (SR 35) at SE 92<sup>nd</sup> Place Road/SE 92<sup>nd</sup> Loop
  - SE 58<sup>th</sup> Avenue (SR 35) at SR 25
- To help improve operations at the intersections showing an overall LOS F or overcapacity movements in the 2028 no-build peak hour conditions, the following improvements are recommended:
  - US 441/US 301 at SE 92<sup>nd</sup> Place Road
    - Add an exclusive northbound right turn lane
    - Add an additional southbound left turn lane
      - Change the left turn phasing to protected only.
  - SE 58<sup>th</sup> Avenue (SR 35) at SE 92<sup>nd</sup> Place Road/SE 92<sup>nd</sup> Loop
    - Add an exclusive eastbound right turn lane.
    - Add an additional northbound left turn lane.

- Add permitted-overlap phasing to the westbound right turn lane.
- SE 58<sup>th</sup> Avenue (SR 35) at SR 25
  - Add an additional eastbound left turn lane
    - Change the left turn phasing to protected only.
  - Add an additional southbound left turn lane
    - Change the left turn phasing to protected only.
  - Add an additional northbound through lane.
  - Add an additional southbound through lane.
  - Change the westbound and northbound left turn phasing to protected only due to additional turn lanes and the railroad crossing.

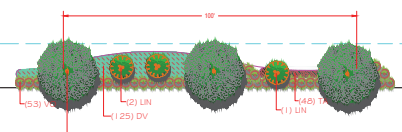
#### **Buildout Conditions**

- The analysis concludes that in the build condition (assuming no-build improvements), the roadway segments operate acceptably.
- The analysis concludes that in the build condition (assuming no-build improvements), the study intersections operate at an overall LOS of E or better and without overcapacity movements.
- The Right of Way for the 64<sup>th</sup> Avenue extension discussed in this project is not within the property of the proposed Blue River development. Instead, the ROW needed for the proposed roadway construction is within a separate proposed development just west of the Blue River development. Per Marion County planning staff, there is an existing zoning petition in place for the west property and dedication of that ROW will be a condition of approval. The Blue River developer is proposing that the construction of this roadway extension be cost shared with the other development based on the number of units between each project.
- An exclusive westbound right turn lane is recommended at the eastern site driveway based on guidance from Table 27 of the FDOT Access Management Guidebook. The recommended length for this new turn lane is 350 feet based on guidance from Exhibit 212-1 the FDOT Design Manual and a posted speed limit of 50 miles per hour.

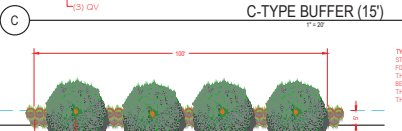
# **Appendix A:** Preliminary Site Plan



Land Use Code	Weekday ADT			Weekday AM Peak Hour			Weekday PM Peak Hour			
	Entry	Exit	Total	Entry	Exit	Total	Entry	Exit	Total	
337 Single Family Lots (Detached)	210	1543	1543	3086	64	182	246	206	315	321
<b>Total</b>	<b>210</b>	<b>1543</b>	<b>1543</b>	<b>3086</b>	<b>64</b>	<b>182</b>	<b>246</b>	<b>206</b>	<b>315</b>	<b>321</b>



TYPICAL C-TYPE BUFFER SHALL CONSIST OF A 15-FOOT WIDE LANDSCAPE STRIP WITHOUT A BUFFER WALL. THE BUFFER SHALL CONTAIN AT LEAST TWO BAKED TREES AND THREE ACCENT (ORNAMENTAL) TREES FOR EVERY 100 LINEAL FEET OR FRACTIONAL PART THEREOF. SHRUBS AND GRASS/COVERS, EXCLUDING TURFGRASS, SHALL COMPRISE AT LEAST 20 PERCENT OF THE REQUIRED BUFFER AND FORM A LAYERED LANDSCAPE SCREEN WITH A MINIMUM HEIGHT OF THREE FEET ACHIEVED WITHIN ONE YEAR.



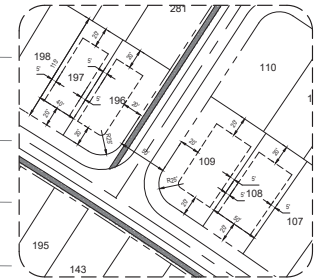
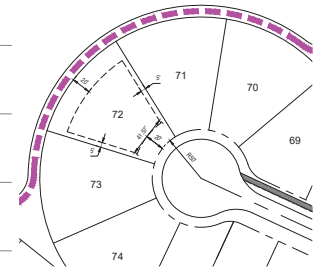
TYPICAL E-TYPE BUFFER SHALL CONSIST OF A FIVE-FOOT WIDE LANDSCAPE STRIP WITHOUT A BUFFER WALL. THE BUFFER SHALL CONTAIN AT LEAST FOUR BAKED TREES FOR EVERY 100 LINEAL FEET OR FRACTIONAL PART THEREOF. SHRUBS SHALL BE PLANTED IN A DOUBLE STAGGERED ROW AND BE CAPABLE OF REACHING A MAINTAINED HEIGHT OF SIX FEET WITHIN THREE YEARS. GRASS/COVERS AND/OR TURFGRASS SHALL NOT BE USED IN THIS BUFFER.

- ### GENERAL NOTES - LAND USE
- THE EXISTING SITE IS VACANT PASTURE WITH GROUND SLOPES RANGING FROM 1.0% TO 1.0%. THE PROPOSED USE IS SINGLE FAMILY RESIDENTIAL ARRANGED IN 50' AND 40' LOTS.
  - STORMWATER MANAGEMENT WILL BE PROVIDED IN DRAINAGE RETENTION AREAS. WATER AND SEDIMENT ARE AVAILABLE THROUGH THE CITY OF BELLEVUE AND WILL BE EXTENDED TO THE SITE.
  - PROPOSED CONSTRUCTION SHALL INCLUDE: ROAD CONSTRUCTION, ALL UNDERGROUND UTILITIES, SIGNING AND STRIPING AND DRAINAGE CONVEYANCE SYSTEMS TO DISCHARGE TO THE CONSTRUCTED DRAINS. ALL IMPROVEMENTS SPECIFIED ON THE IMPROVEMENT PLANS SHALL BE CONSTRUCTED, AS BUILT, AND SUBMITTED TO THE PROJECT ENGINEER & APPLICABLE AGENCIES FOR FINAL APPROVAL.
  - STORMWATER SHALL BE ROUTED VIA CURB & GUTTER SYSTEMS TO THE PROPOSED RETENTION AREAS WHICH WILL ATTENUATE THE 100YR-24HR POST STORM EVENT.
  - ALL FINISH FLOOR ELEVATIONS OF THE PROPOSED BUILDINGS SHALL BE SET AT 1.1 FT ABOVE THE 100 YR24HR DRA ELEVATION.
  - ALL LOT/TRACTS SHALL USE THIS SUBDIVISION'S INTERNAL ROADS FOR VEHICLE/DRIVEWAY ACCESS.
  - COMMON AREAS, INCLUDING PRIVATE RHW'S, DRAINAGE RETENTION AREAS, PARKS AND OPEN SPACE, WILL BE MAINTAINED BY A HOME OWNERS ASSOCIATION AS PLATTED LOTS OR EASEMENTS.

**J.M.U.**  
ENGINEERING | CONSULTING | PLANNING

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WWW.JMUGROUP.NET | 228.516.0877

SCALE: 1" = 120'



### TYPICAL LOT DIMENSIONS & SETBACKS

SCALE: 1" = 60'

1

### LEGEND

- 40' LOTS
- 50' LOTS
- OPEN SPACE

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT: **BELLEVUE 85**

19 - 16S - 23E  
MARION COUNTY, FL

PUD APPLICATION,  
11-27-23

REVISIONS  
REV. DATE DESCRIPTION

SHEET TITLE:  
**LAND USE PLAN**

DRAWN BY: GJP  
CHECKED BY: GJP  
JOB NO.: 01308  
SHEET NUMBER: **C-010**

## **Appendix B:** TIA Methodology

# MEMORANDUM

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Date: November 9, 2023 Project #: 29634

To: Development Review  
Marion County Office of the County Engineer  
601 SE 25<sup>th</sup> Avenue  
Ocala, FL 34471

From: Kok Wan Mah, P.E.  
225 E Robinson Street, Suite 355  
Orlando, FL 32801

Project: Blue River Development

Subject: Proposed Methodology for Blue River Development TIA

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## INTRODUCTION AND PROJECT DESCRIPTION

This technical memorandum provides a recommended Transportation Impact Study (TIS) methodology for the proposed Blue River PUD residential development in unincorporated Marion County near Belleview, Florida. The 84.37-acre site consists of parcels 37515-000-01 and 37515-000-05 and is located north of SE 92<sup>nd</sup> Loop and east of SE 58<sup>th</sup> Avenue near Belleview, Florida. The project location with site boundary in blue is shown in **Figure 1**.

The development is planned to include 337 single family homes. Based upon the generated project trips, a Transportation Impact Study (TIS) will be conducted per the *MARION COUNTY TRAFFIC IMPACT ANALYSIS GUIDELINES (September 2022)*.

The development will be constructed in a single phase with an anticipated buildout year of 2028. Access to the development will be provided via a full access extension of SE 64<sup>th</sup> Avenue to SE 92<sup>nd</sup> Loop, a right-in right-out connection to SE 92<sup>nd</sup> Loop, and a left-in right-in right-out connection SE 92<sup>nd</sup> Loop. The site will be located to the north of SE 92<sup>nd</sup> Loop. These access points and the development location are depicted in the site plan provided in **Appendix A**.



Figure 1: Project Location



## TRIP GENERATION

The trip generation analysis was conducted using information published by the Institute of Transportation Engineers (ITE) Trip Generation (11th Edition) and Trip Generation Handbook (3rd Edition). **Table 1** summarizes the resulting trip generation analysis. The ITE trip generation information sheets are included in **Appendix B**.

The proposed development is projected to generate 3,086 daily trips of which 225 trips occur during the AM peak hour and 311 trips occur during the PM peak hour. No reduction was made for internal capture or pass-by.

**Table 1: Trip Generation**

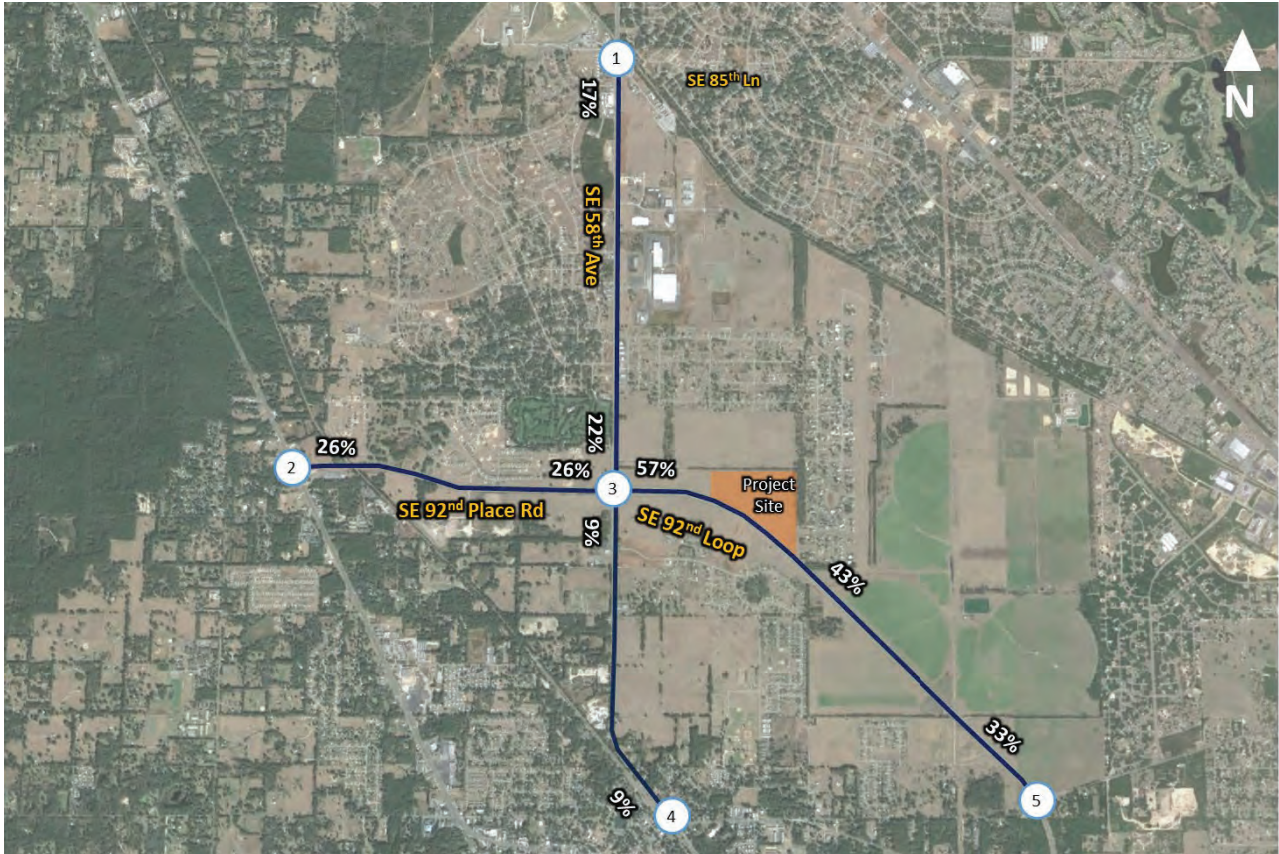
Land Use	ITE Code	Size		Daily Trip Ends	AM Peak Hour			PM Peak Hour		
					In Trips	Out Trips	Total Trips	In Trips	Out Trips	Total Trips
Single Family Detached Housing	210	337	DUs	3,086	56	169	225	196	115	311
<b>Total Trips</b>				<b>3,086</b>	<b>56</b>	<b>169</b>	<b>225</b>	<b>196</b>	<b>115</b>	<b>311</b>

## TRIP DISTRIBUTION AND ASSIGNMENT

The project trip distribution and assignment were estimated based on a select zone analysis using the Central Florida Regional Planning Model Version 7.0 project driveway distribution and local traffic patterns. The daily select zone model plot for the future year is included in **Figure 2** with larger scales included in **Appendix C**. The trip distribution on the study segments is also shown in **Figure 3**.



Figure 3: Study Area Trip Distribution



## STUDY AREA DETERMINATION

Per *MARION COUNTY TRAFFIC IMPACT ANALYSIS GUIDELINES (September 2022)*, a study area for a Traffic Study level of analysis includes any public roadway where the net new project’s traffic consumes at least three percent of the maximum service volume based on the adopted level of service plus one segment beyond. In addition, all roadways having a LOS below the adopted LOS standard shall be included in the study area unless they meet state statutory thresholds for ‘de minimis’ developments.

**Table 2** presents the project’s significance review, which indicates that three segments are projected to have project trips that consume at least three percent of its maximum service volume or are adjacent to the site. Roadway characteristics and daily/peak hour directional capacities were obtained from the Ocala Marion Transportation Planning Organization (TPO) Congestion Management Process (CMP) Database, while 2022 Annual Average Daily Traffic (AADT) volumes were obtained from the Ocala Marion TPO 2023 Traffic Counts Report, as shown in **Appendix D**. Project trips were calculated by using trips generated by the proposed development and trip distribution presented in **Appendix C**.

Based on the expected trip generation, distribution, assignment, and significance review, it is recommended that the following roadway segments and intersections to be evaluated in the TIA.

Roadway segments:

- SE 92<sup>nd</sup> Loop
  - SE 58<sup>th</sup> Avenue (SR 35) to Site Entrance
  - Site Entrance to SE 110<sup>th</sup> Street Road
- SE 92<sup>nd</sup> Place Road
  - US 441/US 301 to SE 58<sup>th</sup> Avenue (SR 35)
- SE 58<sup>th</sup> Avenue (SR 35)
  - SR 25 to SE 92<sup>nd</sup> Loop
  - SE 92<sup>nd</sup> Loop to Laurel Road

Intersections:

- SE 58<sup>th</sup> Avenue (SR 35) at Laurel Road
- US 441/US 301 at SE 92<sup>nd</sup> Place Road
- SE 58<sup>th</sup> Avenue (SR 35) at SE 92<sup>nd</sup> Place Road/SE 92<sup>nd</sup> Loop
- SE 58<sup>th</sup> Avenue (SR 35) at SR 25
- SE 92<sup>nd</sup> Loop at SE 110<sup>th</sup> Street Road

Counts from the intersection turning movements will be used to develop existing baseline volumes.

Table 2: Project Trip Significance

Segment	Limits	# Lanes	Classification	LOS Std.	Daily Capacity	Pk-Hr Pk-Dir Capacity	2022 AADT	2022 PHPD Volume	% Project Trips	# of PM Project Trips	Project Significance	v/c	Significant?	Adjacent to Site?	In Study Area?
SE 92 <sup>nd</sup> Loop	SE 58th Avenue (SR 35) to Site Entrance	4	Arterial	E	67,770	3,357	12,300	610	57%	112	3.3%	0.18	Yes	Yes	Yes
	Site Entrance to SE 110th Street Road	4	Arterial	E	67,770	3,357	12,300	610	43%	84	2.5%	0.18	No	Yes	Yes
	SE 110th Street Road to US 441	4	Arterial	E	67,770	3,357	12,300	610	25%	49	1.5%	0.18	No	No	No
SE 92 <sup>nd</sup> Place Road	US 441/US 301 to SE 58th Avenue (SR 35)	2	Arterial	E	12,744	634	10,400	516	26%	51	8.0%	0.81	Yes	No	Yes
SE 58th Avenue (SR 35)	SR 25 to SE 92 <sup>nd</sup> Loop	4	Arterial	D	39,800	2,000	12,600	625	9%	18	0.9%	0.31	No	No	No
	SE 92 <sup>nd</sup> Loop to Laurel Road	4	Arterial	D	41,790	2,100	26,500	1,314	22%	43	2.0%	0.63	No	No	Yes
	Laurel Road to SR 464	4	Arterial	D	39,800	2,000	26,500	1,314	16%	31	1.6%	0.66	No	No	Yes
US 441/US 301	CR 484 to SE 110th Street	4	Arterial	D	39,800	2,000	29,500	1463	2%	4	0.2%	0.73	No	No	No
	SE 110th Street to SE 92 <sup>nd</sup> Place Road	4	Arterial	D	39,800	2,000	27,000	1339	6%	12	0.6%	0.67	No	No	No
	SE 92 <sup>nd</sup> Place Road to SE 73 <sup>rd</sup> Street	4	Arterial	D	39,800	2,000	27,500	1364	20%	39	2.0%	0.68	No	No	No
SE 110th Street Road	CR 25 to Oak Road	2	Collector	E	29,340	1,449	3,400	169	7%	14	1.0%	0.12	No	No	No
	Oak Road to CR 464	2	Collector	E	29,340	1,449	3,400	169	6%	12	0.8%	0.12	No	No	No
SE 110th Street	CR 467 to US 441	2	Collector	C	5,256	266	6,600	327	0%	0	0.0%	1.23	No	No	No

Source: Roadway characteristics and daily/peak hour directional capacities from the Ocala Marion TPO CMP Database and 2022 AADTs from the Ocala Marion TPO 2023 Traffic Counts Report

## FUTURE VOLUMES BUILDOUT (2028)

Traffic counts will be collected at the study intersections, including heavy vehicle percentages. The seasonal factor will be applied to the existing peak hour traffic data. If the seasonal factor is less than 1.0, then the counts will not be seasonally adjusted.

The Ocala Marion TPO 2023 Online Traffic Counts Map provides preferred growth rates for the study roadways, as shown in **Appendix E**. Growth rates were not available for SE 92<sup>nd</sup> Loop so the growth rate on SE 92<sup>nd</sup> Place Road were used instead.

An annual composite growth rate of 6.84% was calculated for the study area. This is based on the weighted average growth rates for the study area roadways. The calculation of the composite rate is shown in **Table 3**. Growth used for future background conditions is proposed to use the background growth of 6.84% per year plus vested trips.

**Table 3: 2028 Background Traffic**

Segment	Limits	2022 AADT	Annual Growth Rate	Weighted Growth
SE 92 <sup>nd</sup> Loop	SE 58th Avenue (SR 35) to Site Entrance	12,300	11.30%	8,339
	Site Entrance to SE 110th Street Road	12,300	11.30%	8,339
SE 92nd Place Road	US 441/US 301 to SE 58th Avenue (SR 35)	10,400	11.30%	7,051
SE 58th Avenue (SR 35)	SR 25 to SE 92nd Loop	26,500	2.10%	3,339
	SE 92nd Loop to Laurel Road	26,500	5.70%	9,063
<b>Composite Annual Average Growth Rate</b>				<b>6.84%</b>

In addition to background growth, future vested trips will be accounted for in the development of build traffic volumes. Traffic impact analyses from nearby developments will be used for this purpose, including:

- SE 92<sup>nd</sup> Loop Development
  - A development with 234 residential units located approximately 630 feet east of the intersection of SE 58<sup>th</sup> Avenue (SR 35) and SE 92<sup>nd</sup> Loop. Units will be on the north and south side of SE 92<sup>nd</sup> Loop.
- SE 58<sup>th</sup> Avenue & 92<sup>nd</sup> Loop – Convenience Store with Gasoline
  - A convenience store with 4,650 square feet located on the southeast corner of the intersection of SE 58<sup>th</sup> Avenue (SR 35) and SE 92<sup>nd</sup> Loop.

These developments are documented in more detail in **Appendix F**.

## FUTURE CONDITIONS OPERATIONAL ANALYSIS

The Traffic Impact Study will provide an analysis of weekday PM peak hour traffic operations at study intersections and driveways within the study area for Future Background and Buildout conditions. AM analysis will be included at site access driveways and at the intersection of SE 58<sup>th</sup> Avenue (SR 35) and SE 92<sup>nd</sup> Loop. HCM 6th Edition methodology included in Synchro 11 software will be used for intersection operational analyses.

The intersection operational analyses will include an assessment of overall intersection delay and level of service (LOS), as well as queues, delays, and LOS by movement, for the study intersections.

Roadway segments will be analyzed for Future Background and Future Buildout conditions using roadway capacities provided from the Ocala Marion CMP Database. For roadways or intersections found to be operating deficiently due to the addition of project trips, recommendations will be provided to address the identified deficiencies.

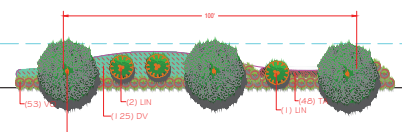


## **Appendix A: Site Plan**

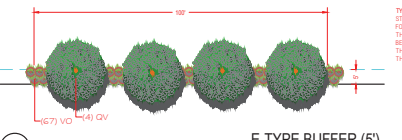
C:\Users\jg\OneDrive\Documents\Projects\2023\SE 92ND LOOP\92ND LOOP\92ND LOOP\92ND LOOP.dwg



Land Use Code	Weekday ADT			Weekday AM Peak Hour			Weekday PM Peak Hour		
	Entry	Exit	Total	Entry	Exit	Total	Entry	Exit	Total
337 Single Family Lots (Detached)	210	1543	3086	64	182	246	206	115	321
<b>Total</b>	<b>210</b>	<b>1543</b>	<b>3086</b>	<b>64</b>	<b>182</b>	<b>246</b>	<b>206</b>	<b>115</b>	<b>321</b>



**C-TYPE BUFFER (15')**



**E-TYPE BUFFER (5')**

TYPICAL C-TYPE BUFFER SHALL CONSIST OF A 15-FOOT WIDE LANDSCAPE STRIP WITHOUT A BUFFER WALL. THE BUFFER SHALL CONTAIN AT LEAST TWO SHADE TREES AND THREE ACCENT/ORNAMENTAL TREES FOR EVERY 100 LINEAL FEET OR FRACTIONAL PART THEREOF. SHRUBS AND GROUNDCOVER, EXCLUDING TURFGRASS, SHALL COMPRIZE AT LEAST 20 PERCENT OF THE REQUIRED BUFFER AND FORM A LAYERED LANDSCAPE SCREEN WITH A MINIMUM HEIGHT OF THREE FEET ACHIEVED WITHIN ONE YEAR.

TYPICAL E-TYPE BUFFER SHALL CONSIST OF A FIVE-FOOT WIDE LANDSCAPE STRIP WITHOUT A BUFFER WALL. THE BUFFER SHALL CONTAIN AT LEAST FOUR SHADE TREES FOR EVERY 100 LINEAL FEET OR FRACTIONAL PART THEREOF. SHRUBS SHALL BE PLANTED IN A DOUBLE STAGGERED ROW AND BE CAPABLE OF REACHING A MAINTAINED HEIGHT OF SIX FEET WITHIN THREE YEARS. GROUNDCOVER AND/OR TURFGRASS SHALL NOT BE USED IN THIS BUFFER.

**GENERAL NOTES - LAND USE**

- THE EXISTING SITE IS VACANT PASTURE WITH GROUND SLOPES RANGING FROM 1% TO 10%. THE PROPOSED USE IS SINGLE FAMILY RESIDENTIAL ARRANGED IN 50 LOTS AND 20 TOWNHOMES.
- STORMWATER MANAGEMENT WILL BE PROVIDED IN DRAINAGE RETENTION AREAS. WATER AND SEDIMENT ARE AVAILABLE THROUGH THE CITY OF BELLEVUE AND WILL BE EXTENDED TO THE SITE.
- PROPOSED CONSTRUCTION SHALL INCLUDE: ROAD CONSTRUCTION, ALL UNDERGROUND UTILITIES, SIGNING AND STRIPING AND DRAINAGE CONVEYANCE SYSTEMS TO DISCHARGE TO THE CONSTRUCTED DRAINS. ALL IMPROVEMENTS SPECIFIED ON THE IMPROVEMENT PLANS SHALL BE CONSTRUCTED, AS BUILT, AND SUBMITTED TO THE PROJECT ENGINEER & APPLICABLE AGENCIES FOR FINAL APPROVAL.
- STORMWATER SHALL BE ROUTED VIA CURB & GUTTER SYSTEMS TO THE PROPOSED RETENTION AREAS WHICH WILL ATTENUATE THE 100YR-24HR POST STORM EVENT.
- ALL FINISH FLOOR ELEVATIONS OF THE PROPOSED BUILDINGS SHALL BE SET AT 1.1 FT ABOVE THE 100 YR-24HR DRA ELEVATION.
- ALL LOTS/TRACTS SHALL USE THIS SUBDIVISION'S INTERNAL ROADS FOR VEHICLE/DRIVEWAY ACCESS.
- COMMON AREAS, INCLUDING PRIVATE RHW'S, DRAINAGE RETENTION AREAS, PARKS AND OPEN SPACE, WILL BE MAINTAINED BY A HOME OWNERS ASSOCIATION AS PLATTED LOTS OR EASEMENTS.

**PROJECT SUMMARY**

PARCEL NOS.	37510-000-01 & 37510-000-02
PHASES	ONE (1)
100-YR FLOODPLAIN ZONE	17
SITE AREA (ACRES)	84.37
TOTAL LOTS	337 = (140) 50' LOTS + (197) 40' LOTS
DENSITY (UNITS/ACRE)	4.0 (307 UNITS) / (84.37 AC)
LAND USE ZONING	EXISTING: MR-R-1 PROPOSED: MR-PLD
MIN. LOT SIZE (SF)	7,700
MIN. LOT WIDTH (FT)	70
MIN. LOT DEPTH (FT)	115 / 115
LOT COVERAGE	NONE
BUILDING FEAR	NONE
SETBACKS (FEET)	FRONT: 20, SIDE: 8, REAR: 20
MAX. HEIGHT (FEET)	40
OPEN SPACE	RECD OPEN SPACE (ACRES): 16.87 (20%) IMPROVED OPEN SPACE (ACRES): 28.78 - COMMON AREAS: 4.0 (2%) NET TOTAL LOS: 17.86 (21.3%)

**EXISTING ROADWAYS**

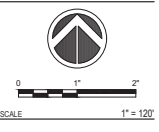
NAME	DESIGN SPEED	CLASSIFICATION	STATUS
SE 92ND LOOP	50 MPH	ARTERIAL, PAVED	LOS E

**PROJECT CONTACTS**

<b>OWNER</b> COKIAS LLC 110 ROBIN NEXT DR ONTEDO, IL 60136-8521	<b>ENGINEER</b> SERGIO G. JERRY PIONESSA, JR. PE JMJ GROUP, LLC 611 S. HANSELL ST P.O. BOX 1203 THOMASVILLE, GA 31799 (229) 516-0977
<b>DEVELOPER</b> BLUE RIVER DEVELOPMENT LLC 3810 WINDERMERE PARKWAY, SUITE 504 CUMMING, GA 30041	

**LEGEND**

- 40' LOTS
- 50' LOTS
- OPEN SPACE



PRELIMINARY  
NOT FOR  
CONSTRUCTION

PROJECT  
**S.E. 92ND LOOP**

19 - 16S - 23E  
MARION COUNTY, FL

OWNER REVIEW, 9-7-23

REV.	DATE	DESCRIPTION

SHEET TITLE  
**LAND USE PLAN**

DRAWN BY	GJP
CHECKED BY	GJP
JOB NO.	01308
SHEET NUMBER	

**C-010**

## **Appendix B: Trip Generation**

# Single-Family Detached Housing (210)

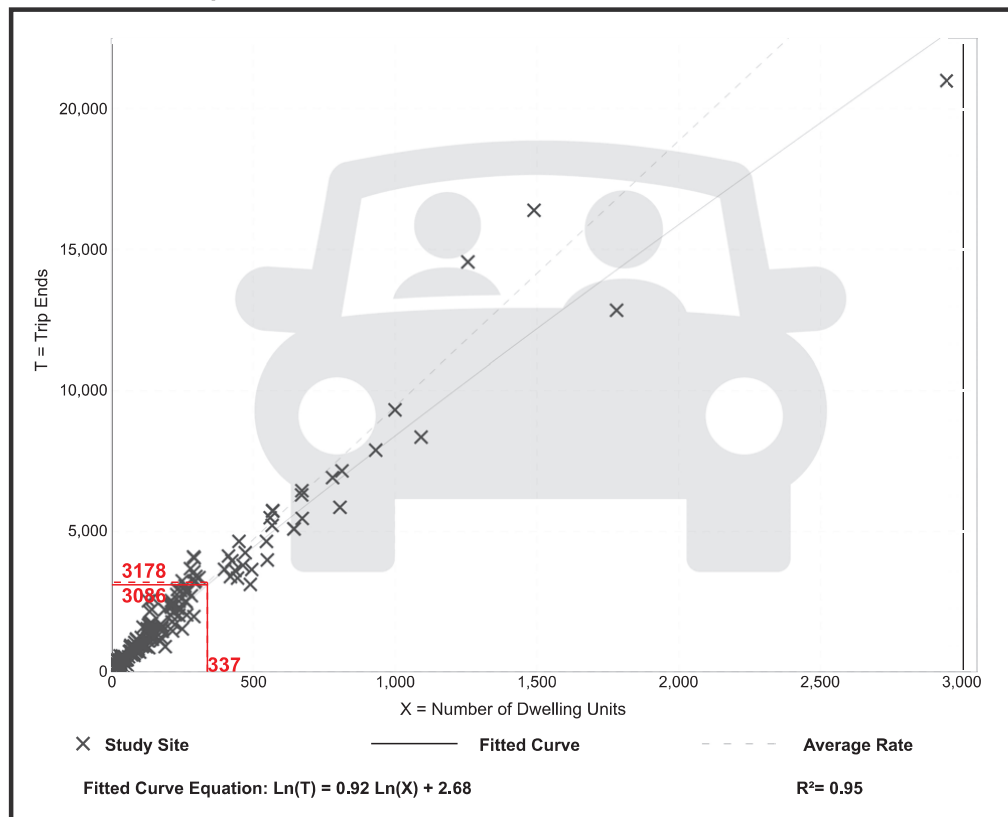
**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday**

**Setting/Location: General Urban/Suburban**  
Number of Studies: 174  
Avg. Num. of Dwelling Units: 246  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

## Data Plot and Equation



Trip Gen Manual, 11th Edition

• Institute of Transportation Engineers

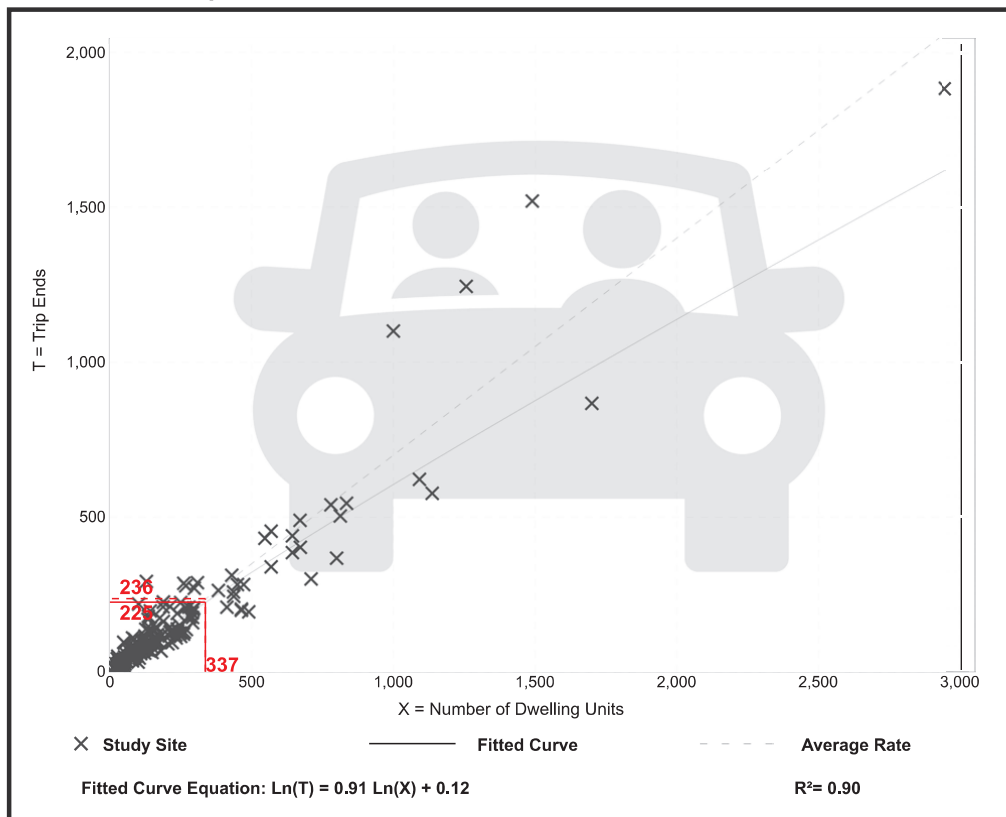
# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 192  
 Avg. Num. of Dwelling Units: 226  
 Directional Distribution: 25% entering, 75% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

## Data Plot and Equation



Trip Gen Manual, 11th Edition

Institute of Transportation Engineers

# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**

**On a: Weekday,**

**Peak Hour of Adjacent Street Traffic,  
One Hour Between 4 and 6 p.m.**

**Setting/Location: General Urban/Suburban**

Number of Studies: 208

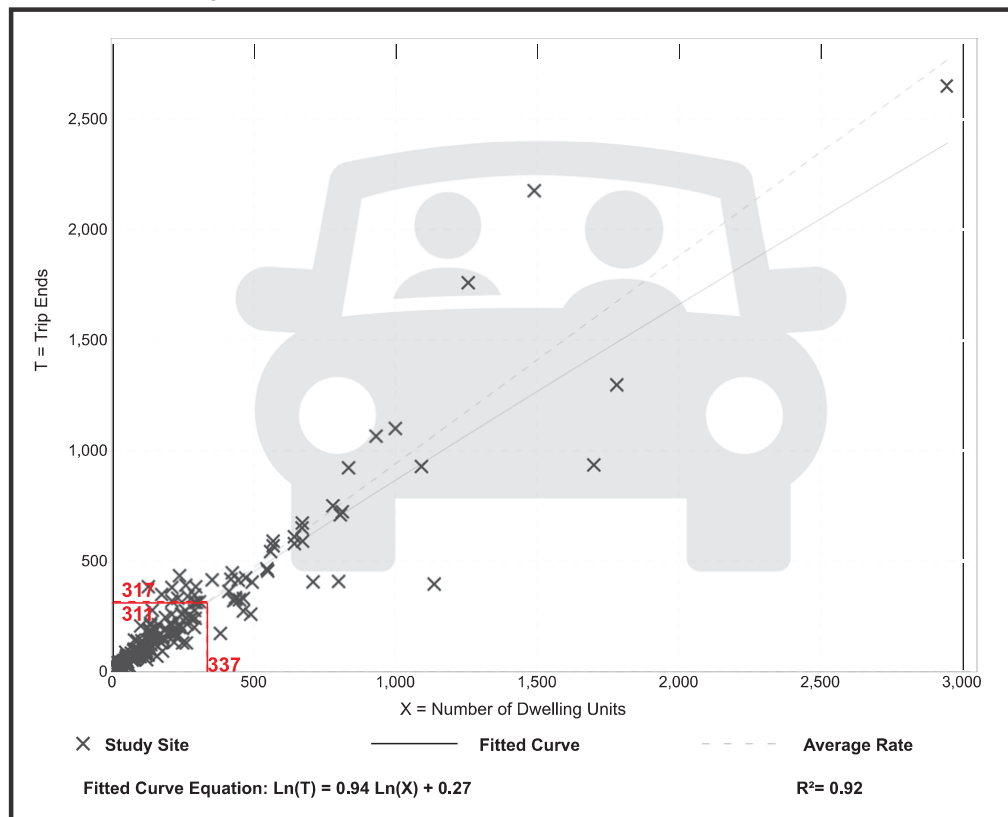
Avg. Num. of Dwelling Units: 248

Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

## Data Plot and Equation



Trip Gen Manual, 11th Edition

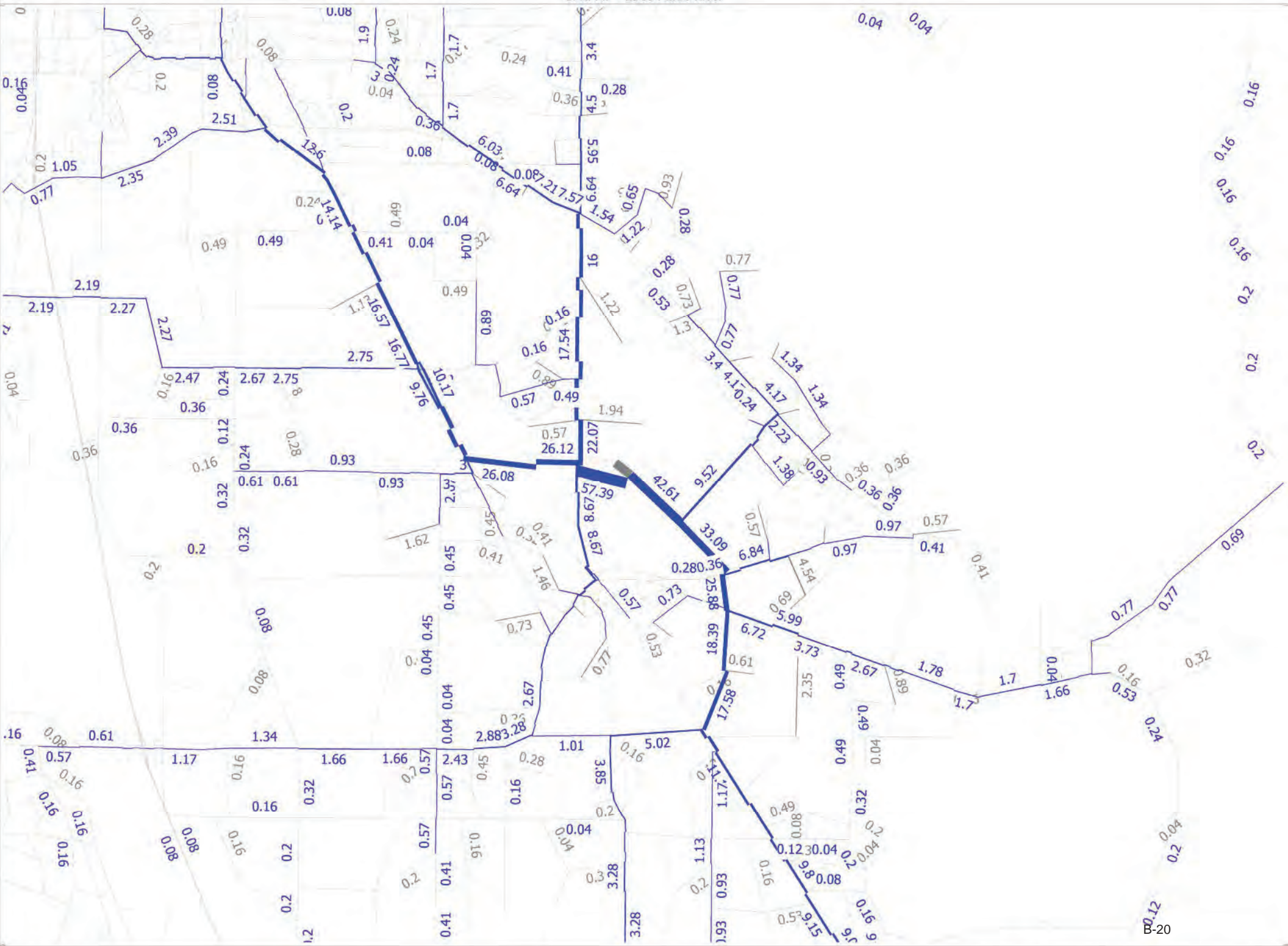
• Institute of Transportation Engineers

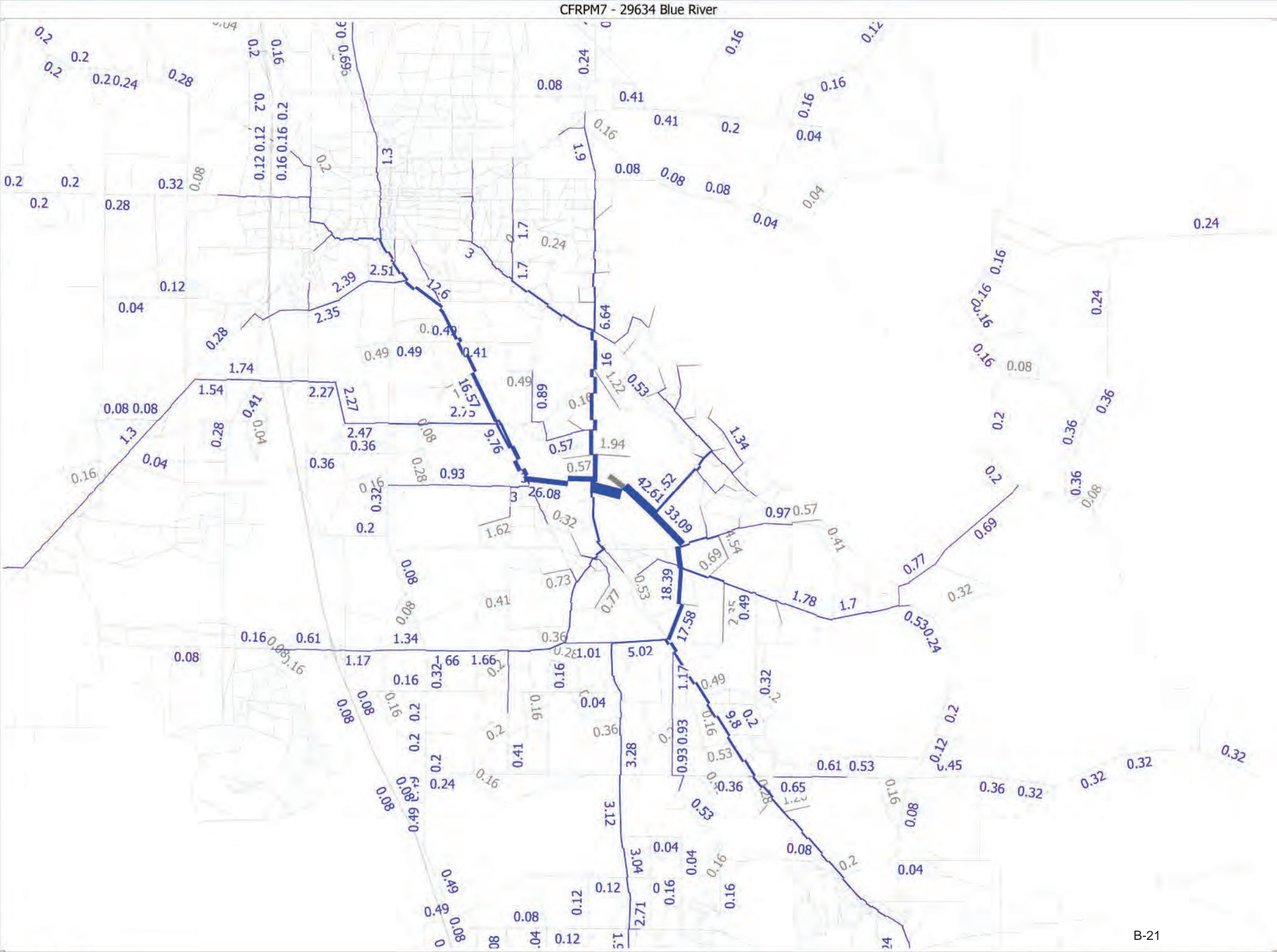
## **Appendix C: Model Plots**











## **Appendix D: Historical Traffic Data**

Ocala Marion TPO CMP Database - September 2021

SEGMENT ID	ROAD NAME	FROM	TO	LANES (2021)	FUNCTIONAL CLASSIFICATION	FLOW	DAILY SERVICE VOLUME (2021)	PEAK HOUR DIRECTIONAL SERVICE VOLUME (2021)	LANES (2026)	URBAN / RURAL	DIVIDED / UNDIVIDED	MAINTAINING AGENCY	ADOPTED LOS STANDARD	GROWTH RATE
1010	SE 92 PLACE LOOP	SR 35	US 441	4	ARTERIAL	UNINTERRUPTED	67,770	3,357	4	Urban	D	COUNTY	E	1.00%
3820	SE 110 ST	CR 467	US 441	2	COLLECTOR	INTERRUPTED	5,256	266	2	Urban	U	COUNTY	C	2.77%
3840.1	SE 110 ST RD	CR 25	OAK RD	2	COLLECTOR	UNINTERRUPTED	29,340	1,449	2	Urban	U	COUNTY	E	1.00%
3850.1	SE 110 ST RD	OAK RD	CR 464	2	COLLECTOR	UNINTERRUPTED	29,340	1,449	2	Urban	U	COUNTY	E	1.00%
4550	SE 92 PL RD	US 441	SR 35	2	ARTERIAL	INTERRUPTED	12,744	634	2	Urban	U	COUNTY	E	2.24%
5080.1	SR 35	SR 25	SE 92ND PL	4	ARTERIAL	INTERRUPTED	39,800	2,000	4	Urban	D	STATE	D	1.00%
5090.1	SR 35	SE 92ND PL	LAUREL RD	4	ARTERIAL	INTERRUPTED	41,790	2,100	4	Urban	D	STATE	D	1.00%
5100	SR 35	LAUREL RD	SR 464	4	ARTERIAL	INTERRUPTED	39,800	2,000	4	Urban	D	STATE	D	1.00%
6780	US 441	CR 484	SE 110 ST	4	ARTERIAL	INTERRUPTED	39,800	2,000	4	Urban	D	STATE	D	1.00%
6790	US 441	SE 110 ST	SE 92 PL RD	4	ARTERIAL	INTERRUPTED	39,800	2,000	4	Urban	D	STATE	D	1.77%
6840	US 441	SE 92 PL RD	SE 73 ST	4	ARTERIAL	INTERRUPTED	39,800	2,000	4	Urban	D	STATE	D	1.71%

# 2023 Traffic Counts Report



[www.ocalamariontpo.org](http://www.ocalamariontpo.org)

Location	Source	Count Type	2018	2019	2020	2021	2022	Ave Annual Growth Rate (%)
<b>SE 110th Street</b>								
W of US 441	MC	3	5,600	5,800	5,600	6,500	6,600	4.4%
<b>SE 132nd Street</b>								
E of CR 484	MC	3	12,000	11,400	11,200	13,500	13,700	3.8%
W of US 441	MC	3	10,500	11,000	10,000	13,200	14,100	8.6%
<b>SE 100th Avenue</b>								
S of CR 25	MC	3	5,300	5,400	5,100	4,700	5,000	-1.3%
<b>SE 147th Street/147th Place</b>								
W of US 441	MC	3	4,300	4,400	5,500	4,800	5,600	7.8%
<b>SE 110th Street Road</b>								
E of Oak Rd	MC	3	2,800	2,900	3,300	3,200	3,400	5.1%
<b>SE 114th Street Road</b>								
W of CR 464C	MC	3	3,500	3,600	4,200	4,500	5,000	9.4%
<b>SE Oak Road</b>								
S of CR 464	MC	3	3,200	3,500	5,000	5,100	5,300	14.5%
<b>SE 44th Avenue Road</b>								
N of SE 52nd St	MC	3	7,300	7,500	7,600	8,100	8,300	3.3%
<b>SE 92nd Place Road</b>								
E of US 441	MC	3	7,100	7,200	7,000	9,900	10,400	11.3%
<b>SE 92nd Loop</b>								
SE 110th St Rd & E HWY 25	MC	3	NC	NC	NC	8,100	12,300	N/A
<b>South Magnolia Avenue</b>								
SE 3rd St to SE 8th Street	OCA	1	4,800	4,000	3,200	5,900	5,200	9.0%
<b>SR 19</b>								
N of CR 316	FDOT	4	3,100	3,500	3,800	3,800	3,800	5.4%
S of CR 316	FDOT	4	4,200	4,200	4,300	4,300	4,300	0.6%
SE of CR 314	FDOT	4	2,100	1,900	1,900	1,900	2,200	1.6%
N of SR 40	FDOT	4	1,700	1,700	1,900	1,900	1,900	2.9%
<b>SR 35</b>								
S of SR 40	FDOT	4	14,700	12,200	12,000	12,200	15,800	3.1%
N of SR 464	FDOT	4	21,000	21,000	20,400	20,500	20,500	-0.6%
S of SR 464	FDOT	4	21,500	26,000	26,000	27,000	26,500	5.7%
N of SR 25	FDOT	4	11,600	11,800	12,400	12,600	12,600	2.1%
N of SE 92nd	FDOT	4	21,500	26,000	26,000	27,000	26,500	5.7%

Location	Source	Count Type	2018	2019	2020	2021	2022	Ave Annual Growth Rate (%)
<b>US 27</b>								
W of NW 160th Ave	FDOT	4	7,200	7,400	7,600	7,800	8,400	4.0%
South of CR 326	FDOT	4	7,800	8,000	7,800	8,000	9,900	6.6%
East of CR 225A	FDOT	4	16,700	16,900	17,500	17,900	17,900	1.8%
NW of I-75	FDOT	4	22,000	21,000	21,000	21,500	21,500	-0.5%
I-75 to NW 27th Ave	FDOT	4	22,500	22,500	21,000	21,000	21,000	-1.7%
NW 27th to NW MLK Jr	FDOT	4	25,500	22,500	22,500	23,500	23,500	-1.8%
MLK Jr Ave to US 441	FDOT	4	28,000	28,000	25,000	26,000	26,000	-1.7%
<b>US 41</b>								
North of SR 40	FDOT	4	10,900	11,300	11,100	11,300	11,700	1.8%
North of CR 484	FDOT	4	20,500	21,000	21,000	21,000	21,500	1.2%
North of CR 484	FDOT	4	25,500	26,000	26,000	24,000	24,000	-1.4%
North of Citrus County	FDOT	4	21,500	21,500	21,500	21,500	21,500	0.0%
<b>US 301</b>								
North of CR 318	FDOT	4	14,500	15,200	14,800	15,100	15,100	1.1%
North of CR 316	FDOT	4	16,700	17,300	17,000	19,000	19,000	3.4%
North of CR 329	FDOT	4	13,700	14,900	14,700	15,000	9,900	-6.1%
North of SE 118th PL	FDOT	4	13,700	13,500	13,300	13,500	13,100	-1.1%
North of CR 42	FDOT	4	17,100	17,300	17,100	17,500	17,500	0.6%
S of CR 42	FDOT	4	21,200	19,900	19,700	23,000	23,000	2.4%
<b>US 441</b>								
S of Alachua County Line	FDOT	4	8,000	8,100	5,300	5,400	5,400	-7.9%
South of CR 320	FDOT	4	9,100	9,300	8,200	8,400	8,400	-1.8%
South of CR 318	FDOT	4	9,700	9,800	9,600	8,400	8,400	-3.4%
SE of CR 25A	FDOT	4	7,600	7,800	7,200	7,400	7,400	-0.6%
South of CR 316	FDOT	4	9,000	8,900	8,700	8,900	8,500	-1.4%
North of NW 100th St	FDOT	4	29,000	22,500	22,500	28,500	28,500	1.1%
0.3 mi N of SR 326 (Telemetered)	FDOT	T	30,600	31,400	29,200	32,500	33,200	2.3%
S of SR 326	FDOT	4	18,600	16,600	16,300	16,700	16,500	-2.8%
North of CR 25A	FDOT	4	20,500	22,000	22,000	22,000	18,100	-2.6%
W. Anthony Rd to CR 25A	FDOT	4	22,000	22,000	19,300	21,200	18,100	-4.3%
N of NW 10th Street	FDOT	4	27,500	27,000	27,000	28,000	25,500	-1.8%
North of SR 40	FDOT	4	29,500	29,500	28,000	29,000	29,000	-0.4%
South of SR 40	FDOT	4	36,500	35,500	34,500	35,500	39,500	2.2%
South of SR 200	FDOT	4	26,000	26,000	26,000	32,000	32,000	5.8%
South of SR 464	FDOT	4	24,000	25,500	25,500	26,500	30,000	5.8%
South of CR 464A	FDOT	4	29,500	31,500	30,500	31,500	32,500	2.5%
S of SE 38th Terrace	FDOT	4	27,500	29,500	28,500	29,500	29,500	1.8%



Location	Source	Count Type	2018	2019	2020	2021	2022	Ave Annual Growth Rate (%)
<b>US 441 (continued)</b>								
North of US 301	FDOT	4	27,500	27,500	26,000	27,000	27,000	-0.4%
NW of US 301	FDOT	4	30,500	30,500	29,500	30,500	27,500	-2.4%
SE of US 301	FDOT	4	18,400	17,500	16,400	16,800	18,000	-0.4%
North of CR 42	FDOT	4	31,000	31,000	30,000	31,000	33,000	1.6%
County Line to CR 42	FDOT	4	39,500	39,500	37,500	38,000	38,000	-0.9%
<b>West Anthony Road</b>								
N of NW 35th Street	MC	3	5,300	5,200	5,500	5,300	5,700	1.9%
NW 35th St to US 441	FDOT	4	2,000	2,000	1,300	1,300	1,300	-8.8%

# **Appendix E: Growth Rate Documentation**

<https://marioncountyfl.maps.arcgis.com/apps/webappviewer/index.html?id=684f763711d742f893a1271ab346c28c>

Traffic Count Information	
Road	SE 92nd Pl Rd
Location	E of US 441
Source	MC
Count Type	3
2018	7,100
2019	7,200
2020	7,000
2021	9,900
2022	10,400
Ave Ann % Change	11.3%

[Zoom to](#) ...

Traffic Count Information	
Road	SR 35
Location	S of SE 92nd Place
Source	FDOT
Count Type	4
2018	11,600
2019	11,800
2020	12,400
2021	12,600
2022	12,600
Ave Ann % Change	2.1%

[Zoom to](#) ...

Traffic Count Information	
Road	SR 35
Location	N of SE 92nd Place
Source	FDOT
Count Type	4
2018	21,500
2019	26,000
2020	26,000
2021	27,000
2022	26,500
Ave Ann % Change	5.7%

[Zoom to](#) ...

## **Appendix F: Vested Trip Documentation**

TRAFFIC IMPACT ANALYSIS  
**SE 92<sup>nd</sup> LOOP DEVELOPMENT**  
MARION COUNTY, FLORIDA



Prepared for:

Red Jacket Development Group  
625 Waltham Avenue,  
Orlando, Florida 32809

Prepared by:

Traffic Planning and Design, Inc.  
535 Versailles Drive  
Maitland, Florida 32751  
407-628-9955

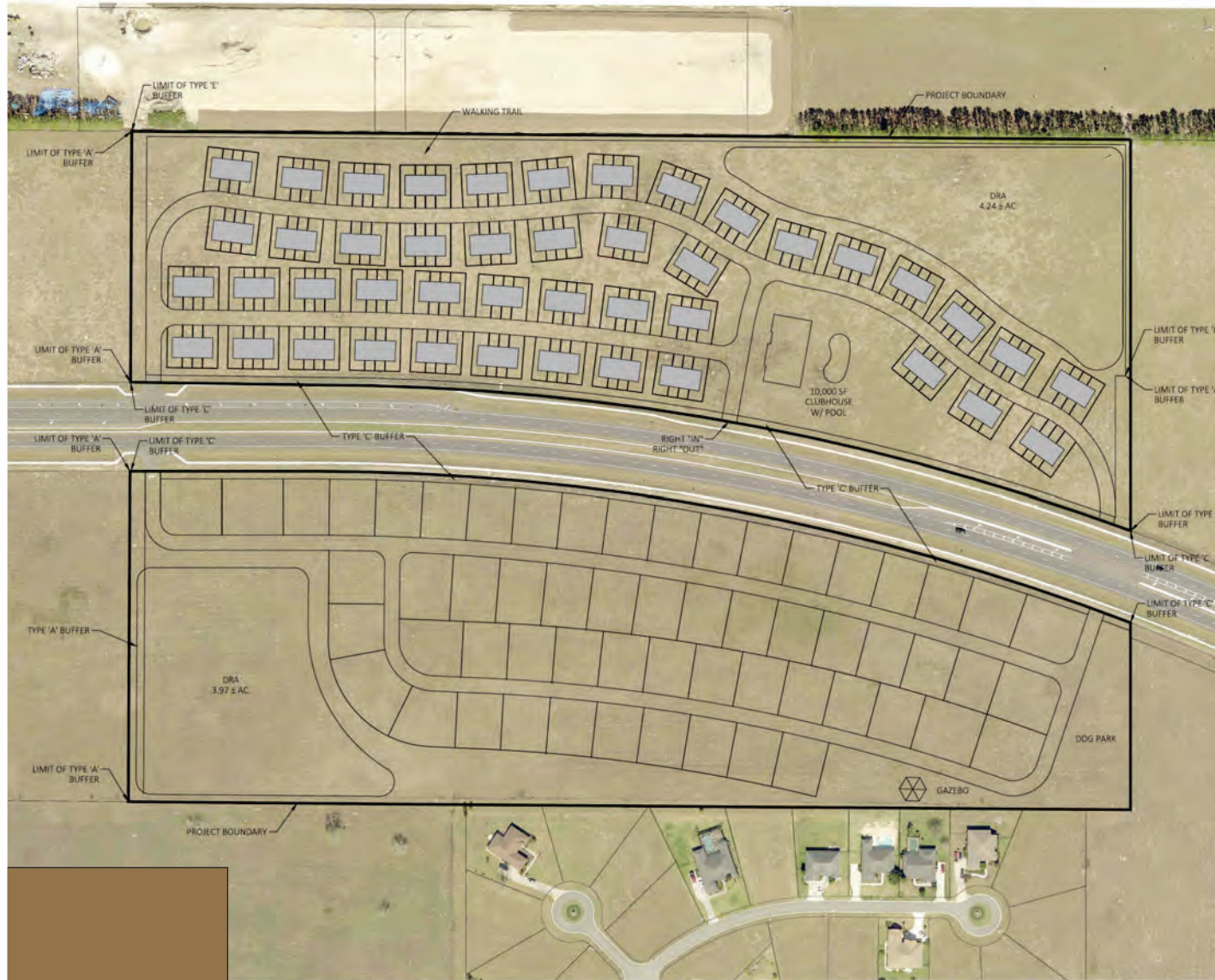
June 2023

TPD № 5735



SE 92nd Loop Development  
Project № 5735  
Figure 1





## PROPOSED DEVELOPMENT AND TRIP GENERATION

To determine the impact of the proposed development, an analysis of its trip generation characteristics was conducted. This included the determination of the trips to be generated as well as their distribution and assignment to the area roadways.

### Trip Generation

Trip generation equations obtained from the 11<sup>th</sup> Edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* were used to estimate the trip generation for the proposed development. **Table 5** provides a summary of the trip generation for the proposed development. As can be seen in the table, the project is expected to generate a total of 1,902 daily trips, of which 131 will occur during the A.M. peak hour and 162 will occur during P.M. peak hour. Copies of the ITE trip generation worksheets are included in the Study Methodology in Appendix A.

**Table 5**  
**Trip Generation Summary**

ITE Code	Land Use	Size (DU)*	Daily		A.M. Peak Hour				P.M. Peak Hour			
			Rate**	Trips	Rate**	Enter	Exit	Total	Rate**	Enter	Exit	Total
215	Single-Family Attached (Townhomes)	176	7.33	1,291	0.49	21	65	86	0.58	58	44	102
210	Single Family Detached	58	10.54	611	0.78	12	33	45	1.03	38	22	60
<b>Total Trips:</b>			<b>1,902</b>	<b>----</b>	<b>33</b>	<b>98</b>	<b>131</b>	<b>----</b>	<b>96</b>	<b>66</b>	<b>162</b>	

\* DU = Dwelling Units

\*\* R<sup>2</sup> > 0.75, therefore Equations used

### Trip Distribution / Trip Assignment

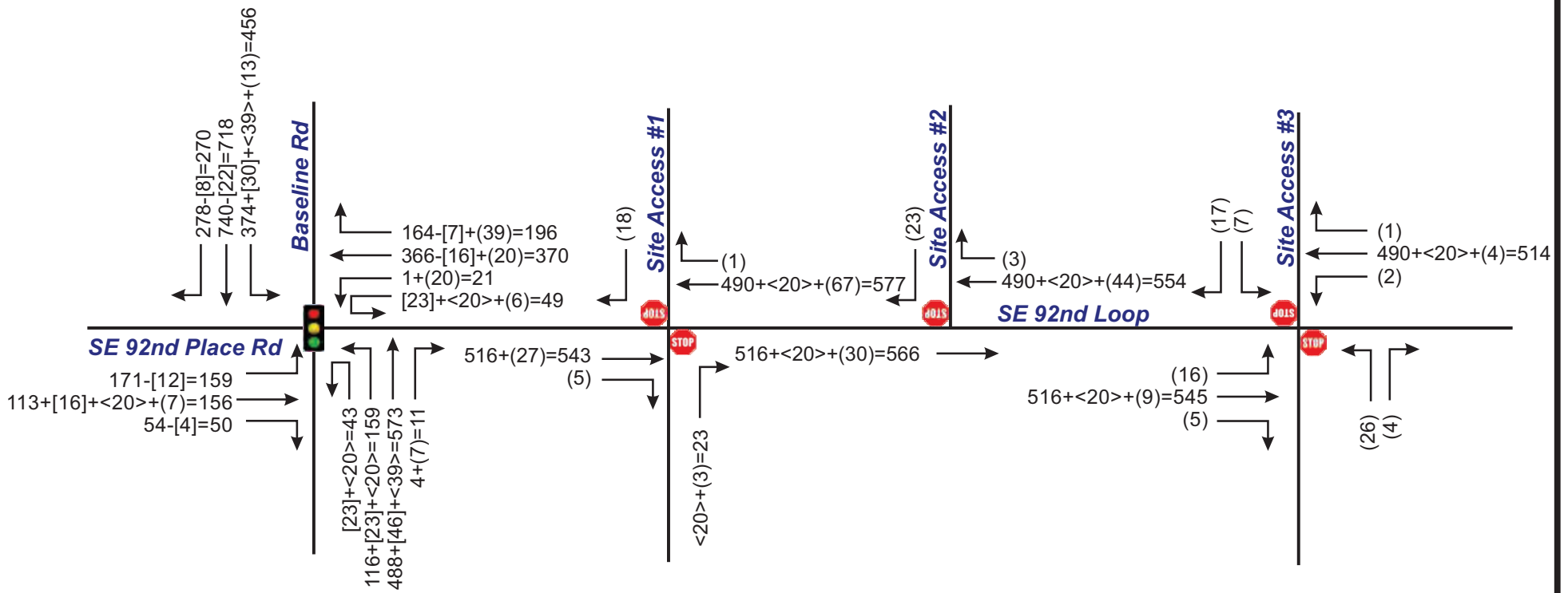
At the request of Marion County, the trip distribution was consistent with the study for the parcel just west of the site as follows:

- To/From the north on SR 35 – 40%
- To/From the south on SR 35 – 20%
- To/From the east on SE 92<sup>nd</sup> Loop – 20%
- To/From the west on SE 92<sup>nd</sup> Place Road – 20%

The trip distribution on the area roadways is illustrated in **Figure 4**. Utilizing this distribution, the development project trips were assigned to the area roadways.



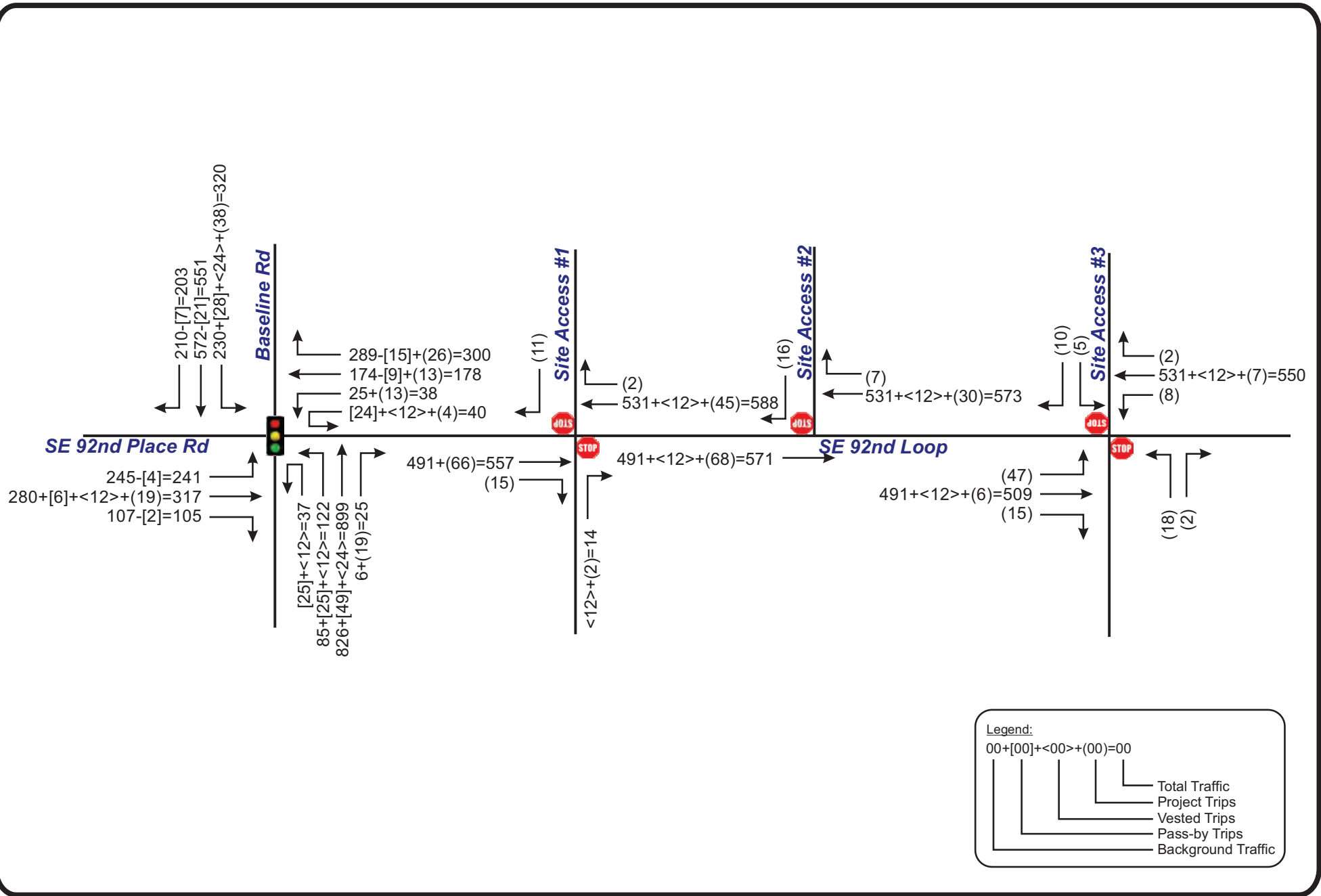




SE 92nd Loop Development  
Project № 5735  
Figure 5a

Projected A.M. Peak Hour  
Traffic Volumes





SE 92nd Loop Development  
Project № 5735  
Figure 5b

**Projected P.M. Peak Hour  
Traffic Volumes**



# TRAFFIC STUDY

## Convenience Store with Gasoline

SR 35 at SE 92nd Loop  
Southeast Corner

PROJECT NAME: SE 58TH AVE & 92ND LOOP - CONVENIENCE STORE WITH FUELING

PROJECT NUMBER: 2022080152

APPLICATION: \_\_\_\_\_

Prepared for:  
RKM Development

Prepared By:  
TRUCKIN TRAFFIC, LLC



Submitted To:  
Marion County

Original Submittal - April 17, 2023  
Updated – September 21, 2023

Jane A Caldera   
Digitally signed by Jane A Caldera  
DN: cn=Jane A Caldera,  
#C=US, #o=TRUCKIN TRAFFIC, LLC, #c=US  
Date: 2023.09.21 17:17:42-0400



Jane A. Caldera, P.E.  
P.E. # 53116

# 1. INTRODUCTION

This Traffic Study has been prepared to support the development of a 2.25-acre site located on the southeast corner of SR 35 at SE 92nd Loop in Marion County. The 2.25-acre site is planned to be developed with a 4,650 SF convenience store building, 16 vehicle fueling positions and a car wash.

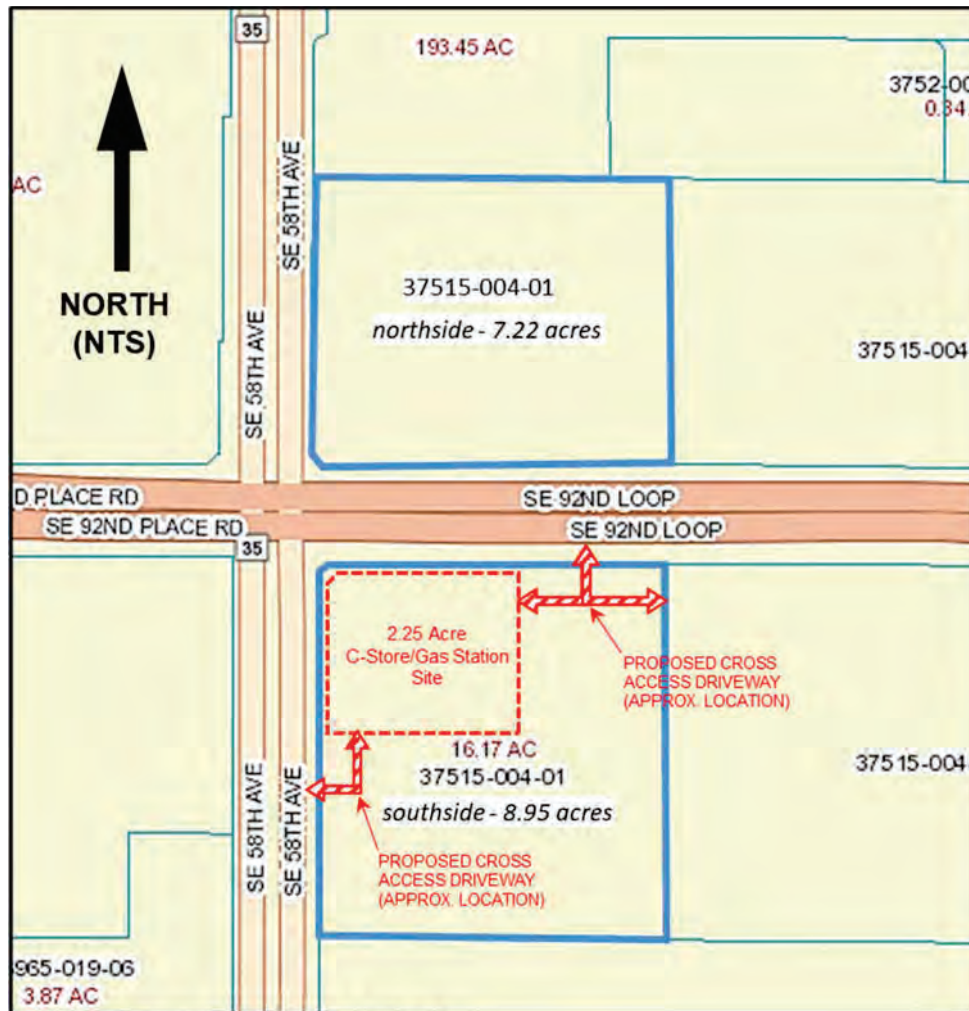
This Traffic Study has been prepared in accordance with the approved traffic study methodology letter dated February 20, 2023. A copy of the approved traffic study methodology letter and the relevant correspondences are contained in the Appendix.

The site location and area roadways are shown in Figure 1 below.



FIGURE 1 – SITE LOCATION

The 2.25-acre development site is within the 16.17 acres parcel (Parcel # 37515-004-01) that is currently located on the NEC and SEC of the SR 35 at SE 92nd Loop signalized intersection. Figure 2 below displays where the 2.25-acre site is located within the Marion County Parcel # 37515-004-01.



**FIGURE 2 – PARCEL LAYOUT**

Upon completion of the 2.25-acre Convenience Store/Gasoline Station site the size of the remainder vacant land within parcel # 37515-004-01, on the south side of SE 92nd Loop, will be 6.70 acres.

As required by Marion County, the 6.70-acre remainder parcel has been included in the traffic study as Future Phase 2. The Developer’s Agreement between Marion County and Maricamp, LLC for Parcel ID: 37515-004-01 (File#: 2005055310 OR BK 03996 PGS 0789-0792), which the remainder parcel is a part of, limits the commercial portion of the 16.17-acre parcel to 200,000 SF of commercial development. The 6.7-acre remainder parcel accounts of 41.43% of the entire 16.17-acre parcel, therefore remainder parcel’s allocation of the 200,000 SF is 82,870 SF of commercial development. The Phase 2 development analysis is included in the traffic study to determine if any additional off-site roadway improvements maybe required.

## 2. PROJECT TRIP CHARACTERISTICS

### Trip Generation

#### Phase 1

The AM and PM peak-hour trip generation estimates for the proposed development are based on the trip rates contained in the 11<sup>th</sup> Edition of the Institute of Transportation of Engineers (ITE) Trip Generation Manual. The trip generation calculations for the development are shown in Tables 1 and 2 below.

**TABLE 1 - PHASE 1 - AM PK-HR TRIP GENERATION ESTIMATES**

ITE Land-Use Category	ITE Land-Use (Code)	ITE Sub Category	Independent Variable	(1) ITE Rate/Eqn	Size	Total Trips	Pass-By Capture Rate (2)	Pass-By Trips			New-Net Trips		
								2-Way	In	Out	2-Way	In	Out
Convenience Store / Gas Station	945	VFP (16-24)	SQUARE FEET	91.35	4,650	425	54%	230	115	115	196	98	98

(1) - SOURCE: ITE Trip Generation Manual 11th Edition. Land Use: 945 - Convenience Store/Gas Station; Land Use Subcategory - Number of vehicle fueling positions (VFP) at the site between 16 and 24 VFP.

(2) - ITE Trip Generation Manual, (11th Edition) Appendices - List of Land Uses with Vehicle Pass-By Rates and Data, ITE Recommended 76% was adjusted down due to 10% adjacent street capture limit.

**TABLE 2 - PHASE 1 - PM PK-HR GENERATION ESTIMATES**

ITE Land-Use Category	ITE Land-Use (Code)	ITE Sub Category	Independent Variable	(1) ITE Rate/Eqn	Size	Total Trips	Pass-By Capture Rate (2)	Pass-By Trips			New-Net Trips		
								2-Way	In	Out	2-Way	In	Out
Convenience Store / Gas Station	945	VFP (16-24)	SQUARE FEET	78.95	4,650	367	67%	246	123	123	121	61	61

(1) - SOURCE: ITE Trip Generation Manual 11th Edition. Land Use: 945 - Convenience Store/Gas Station; Land Use Subcategory - Number of vehicle fueling positions (VFP) at the site between 16 and 24 VFP.

(2) - ITE Trip Generation Manual, (11th Edition) Appendices - List of Land Uses with Vehicle Pass-By Rates and Data, ITE Recommended 75% was adjusted down due to 10% adjacent street capture limit.

	AM	PM
Adjacent Street By-Capture Limit -	10.0%	10.0%
(1) 2023 Peak-Season Adjacent PK-HR Volume Traffic (2-way) Both Roadways -	2,304	2,491
Pass-By Cap Limit -	230.4	249.1
Adjusted By-Capture Rate due to Limit -	54.0%	67.0%

(1) Source: TMC dated January 10, 2023

## Phase 2

To be conservative, from a traffic planning standpoint, ITE Land-Use 821 (Shopping Plaza) was selected to estimate the traffic generation for the 6.7-acre remainder parcel. The AM and PM Peak-Hour Trip Generation Estimates for the Phase 2, remainder parcel, are provided in the Tables 3 and 4.

**TABLE 3**  
**AM PK-HR TRIP GENERATION ESTIMATES - REMAINDER PARCEL (PHASE 2)**

ITE Land-Use Category	ITE Land-Use (Code)	Independent Variable	(1) ITE Rate/Eqn	Size	Total Trips	Pass-By Capture Rate (2)	Pass-By Trips			New-Net Trips		
							2-Way	In	Out	2-Way	In	Out
Shopping Plaza (40-150k)	821	SQUARE FEET	1.73	82,870	143	29%	41	26	16	102	63	39

(1) - SOURCE: ITE Trip Generation Manual 11th Edition.

(2) - ITE Trip Generation Manual, (11th Edition) Appendices - List of Land Uses with Vehicle Pass-By Rates and Data, ITE Recommended 40% was adjusted down due to 10% adjacent street capture limit for both phases.

**TABLE 4**  
**PM PK-HR GENERATION ESTIMATES - REMAINDER PARCEL (PHASE 2)**

ITE Land-Use Category	ITE Land-Use (Code)	Independent Variable	(1) ITE Rate/Eqn	Size	Total Trips	Pass-By Capture Rate (2)	Pass-By Trips			New-Net Trips		
							2-Way	In	Out	2-Way	In	Out
Shopping Plaza (40-150k)	821	SQUARE FEET	5.19	82,870	430	11%	47	23	24	383	188	195

(1) - SOURCE: ITE Trip Generation Manual 11th Edition.

(2) - ITE Trip Generation Manual, (11th Edition) Appendices - List of Land Uses with Vehicle Pass-By Rates and Data, ITE Recommended 40% was adjusted down due to 10% adjacent street capture limit for both phases.

	AM	PM
Adjacent Street By-Capture Limit -	10.0%	10.0%
(1) 2023 Peak-Season Adjacent PK-HR Volume Traffic (2-way) Both Roadways -	2,304	2,491
(2) 2026 Peak-Season Adjacent PK-HR Volume Traffic (2-way) Both Roadways -	2,720	2,940
Pass-By Cap Limit -	272.0	294.0
Adjusted By-Capture Rate due to Limit -	n/a	n/a

(1) Source: TMC dated January 10, 2023

(2) Based on 6% annual growth rate.

## 7. PHASE 2 - POST DEVELOPMENT CONDITIONS

The Phase 2 Post Development Traffic Projections were developed by adding the Phase 1 and Phase 2 site traffic to the 2026 Background (Peak-Season) Traffic Projections. Figures 10 and 11 display the detailed Phase 2 site traffic assignments for the AM and PM peak hours, respectively.

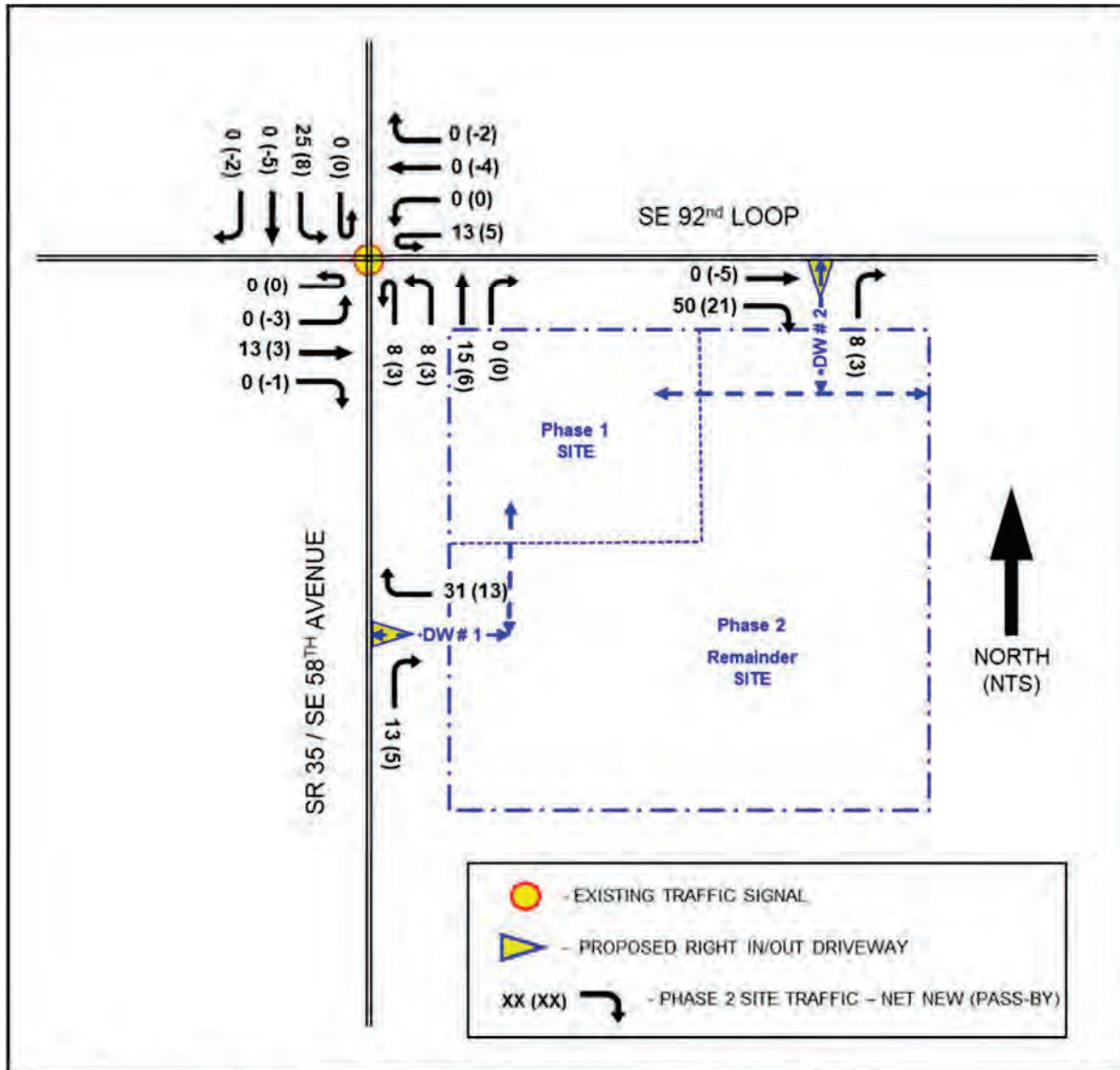
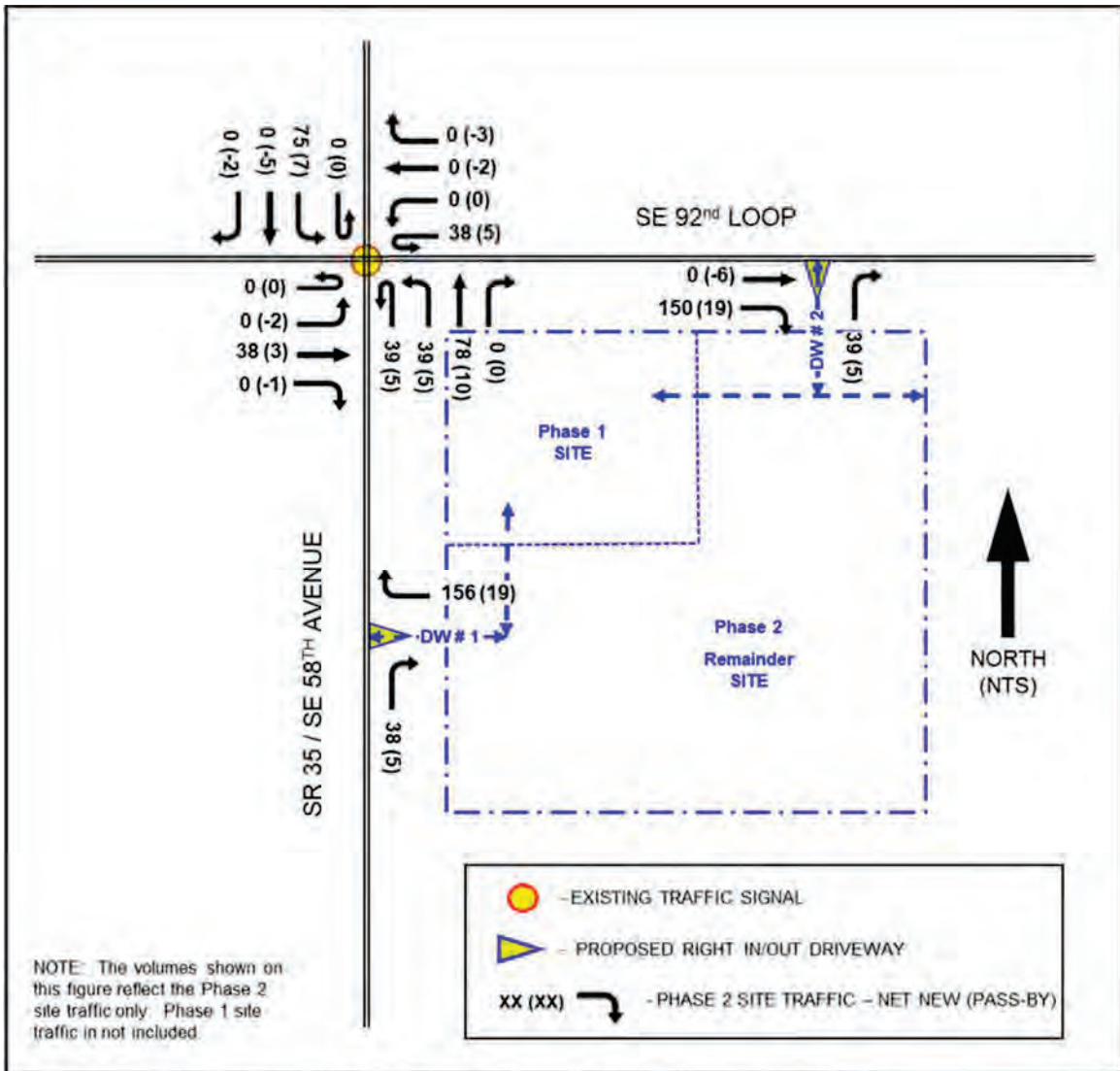


FIGURE 10 - PHASE 2 - SITE TRAFFIC ASSIGNMENT (AM PEAK-HOUR)





**FIGURE 11 - PHASE 2 - SITE TRAFFIC ASSIGNMENT (PM PEAK-HOUR)**

Figure 12 displays the Year 2026 Phase 1+2 Post Development Traffic Projections for the study intersections. The detailed assignment spreadsheets are contained in the Appendix.

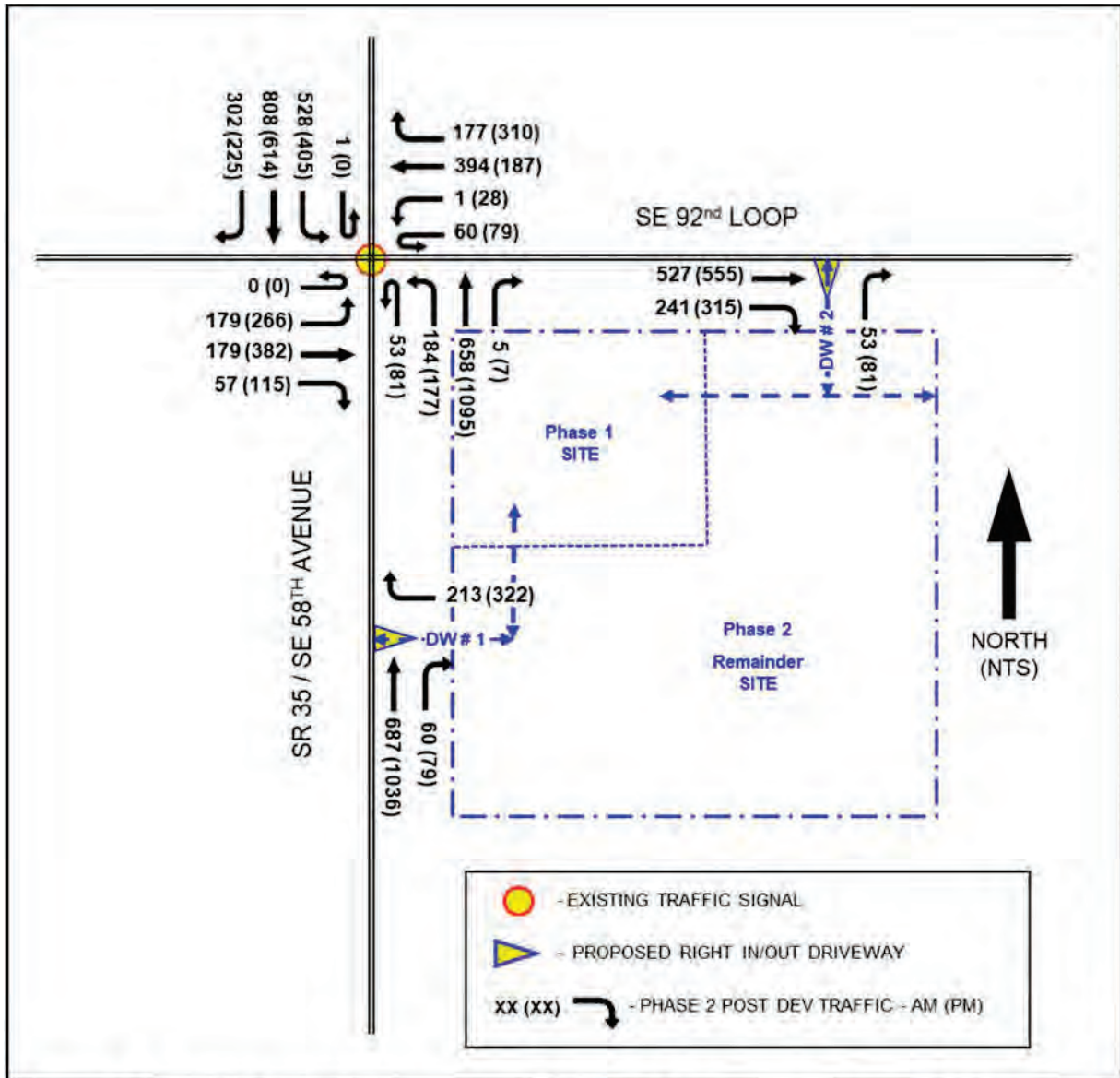


FIGURE 12 - PHASE 2 POST DEVELOPMENT TRAFFIC PROJECTIONS (PEAK-SEASON)

## **Appendix C:** Traffic Data Collection

## Raw Turning Movement Counts

**DE TRAFFIC**  
 detraffic.com  
 (386) 341-4186  
 SE 58th Ave at SE 66th St  
 Marion County, FL

File Name : 01 58th at 66  
 Site Code : 00000001  
 Start Date : 11/14/2023  
 Page No : 1

Groups Printed- Automobiles - Commercial

Start Time	SE 58th Ave Southbound					N/A Westbound					SE 58th Ave Northbound					SE 66th St Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	
07:00 AM	0	333	26	6	365	0	0	0	0	0	10	140	0	0	150	14	0	8	3	25	540
07:15 AM	0	332	27	4	363	0	0	0	0	0	11	207	0	0	218	28	0	4	3	35	616
07:30 AM	0	326	54	2	382	0	0	0	0	0	5	223	0	0	228	31	0	9	2	42	652
07:45 AM	0	296	44	2	342	0	0	0	0	0	8	229	0	0	237	25	0	12	2	39	618
Total	0	1287	151	14	1452	0	0	0	0	0	34	799	0	0	833	98	0	33	10	141	2426
08:00 AM	0	266	39	3	308	0	0	0	0	0	8	220	0	0	228	38	0	11	3	52	588
08:15 AM	0	259	31	4	294	0	0	0	0	0	8	183	0	0	191	45	0	8	4	57	542
08:30 AM	0	235	23	5	263	0	0	0	0	0	6	179	0	0	185	36	0	11	1	48	496
08:45 AM	0	212	35	3	250	0	0	0	0	0	7	170	0	0	177	28	0	8	2	38	465
Total	0	972	128	15	1115	0	0	0	0	0	29	752	0	0	781	147	0	38	10	195	2091
04:00 PM	0	243	23	2	268	0	0	0	0	0	8	257	0	0	265	42	0	9	3	54	587
04:15 PM	0	232	22	4	258	0	0	0	0	0	7	281	0	0	288	49	0	6	3	58	604
04:30 PM	0	231	22	2	255	0	0	0	0	0	6	334	0	0	340	53	0	5	3	61	656
04:45 PM	0	216	35	2	253	0	0	0	0	0	8	309	0	0	317	74	0	6	2	82	652
Total	0	922	102	10	1034	0	0	0	0	0	29	1181	0	0	1210	218	0	26	11	255	2499
05:00 PM	0	225	28	3	256	0	0	0	0	0	10	360	0	0	370	59	0	8	4	71	697
05:15 PM	0	219	32	5	256	0	0	0	0	0	9	282	0	0	291	56	0	8	4	68	615
05:30 PM	0	197	25	3	225	0	0	0	0	0	10	271	0	0	281	52	0	10	2	64	570
05:45 PM	0	214	22	2	238	0	0	0	0	0	14	263	0	0	277	46	0	10	1	57	572
Total	0	855	107	13	975	0	0	0	0	0	43	1176	0	0	1219	213	0	36	11	260	2454
Grand Total	0	4036	488	52	4576	0	0	0	0	0	135	3908	0	0	4043	676	0	133	42	851	9470
Approch %	0	88.2	10.7	1.1		0	0	0	0	0	3.3	96.7	0	0		79.4	0	15.6	4.9		
Total %	0	42.6	5.2	0.5	48.3	0	0	0	0	0	1.4	41.3	0	0	42.7	7.1	0	1.4	0.4	9	
Automobiles	0	3884	439	46	4369	0	0	0	0	0	105	3801	0	0	3906	600	0	105	35	740	9015
% Automobiles	0	96.2	90	88.5	95.5	0	0	0	0	0	77.8	97.3	0	0	96.6	88.8	0	78.9	83.3	87	95.2
Commercial	0	152	49	6	207	0	0	0	0	0	30	107	0	0	137	76	0	28	7	111	455
% Commercial	0	3.8	10	11.5	4.5	0	0	0	0	0	22.2	2.7	0	0	3.4	11.2	0	21.1	16.7	13	4.8

**DE TRAFFIC**  
 detraffic.com  
 (386) 341-4186  
 SE 58th Ave at SE 66th St  
 Marion County, FL

File Name : 01 58th at 66  
 Site Code : 00000001  
 Start Date : 11/14/2023  
 Page No : 2

Start Time	SE 58th Ave Southbound					N/A Westbound					SE 58th Ave Northbound					SE 66th St Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	332	27	4	363	0	0	0	0	0	11	207	0	0	218	28	0	4	3	35	616
07:30 AM	0	326	54	2	382	0	0	0	0	0	5	223	0	0	228	31	0	9	2	42	652
07:45 AM	0	296	44	2	342	0	0	0	0	0	8	229	0	0	237	25	0	12	2	39	618
08:00 AM	0	266	39	3	308	0	0	0	0	0	8	220	0	0	228	38	0	11	3	52	588
Total Volume	0	1220	164	11	1395	0	0	0	0	0	32	879	0	0	911	122	0	36	10	168	2474
% App. Total	0	87.5	11.8	0.8		0	0	0	0	0	3.5	96.5	0	0		72.6	0	21.4	6		
PHF	.000	.919	.759	.688	.913	.000	.000	.000	.000	.000	.727	.960	.000	.000	.961	.803	.000	.750	.833	.808	.949
Automobiles	0	1182	151	10	1343	0	0	0	0	0	22	851	0	0	873	114	0	33	7	154	2370
% Automobiles	0	96.9	92.1	90.9	96.3	0	0	0	0	0	68.8	96.8	0	0	95.8	93.4	0	91.7	70.0	91.7	95.8
Commercial	0	38	13	1	52	0	0	0	0	0	10	28	0	0	38	8	0	3	3	14	104
% Commercial	0	3.1	7.9	9.1	3.7	0	0	0	0	0	31.3	3.2	0	0	4.2	6.6	0	8.3	30.0	8.3	4.2



**DE TRAFFIC**  
 detraffic.com  
 (386) 341-4186  
 SE 58th Ave at SE 66th St  
 Marion County, FL

File Name : 01 58th at 66  
 Site Code : 00000001  
 Start Date : 11/14/2023  
 Page No : 4

Start Time	SE 58th Ave Southbound					N/A Westbound					SE 58th Ave Northbound					SE 66th St Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	231	22	2	255	0	0	0	0	0	6	334	0	0	340	53	0	5	3	61	656
04:45 PM	0	216	35	2	253	0	0	0	0	0	8	309	0	0	317	74	0	6	2	82	652
05:00 PM	0	225	28	3	256	0	0	0	0	0	10	360	0	0	370	59	0	8	4	71	697
05:15 PM	0	219	32	5	256	0	0	0	0	0	9	282	0	0	291	56	0	8	4	68	615
Total Volume	0	891	117	12	1020	0	0	0	0	0	33	1285	0	0	1318	242	0	27	13	282	2620
% App. Total	0	87.4	11.5	1.2		0	0	0	0	0	2.5	97.5	0	0		85.8	0	9.6	4.6		
PHF	.000	.964	.836	.600	.996	.000	.000	.000	.000	.000	.825	.892	.000	.000	.891	.818	.000	.844	.813	.860	.940
Automobiles	0	844	99	8	951	0	0	0	0	0	27	1255	0	0	1282	210	0	18	11	239	2472
% Automobiles	0	94.7	84.6	66.7	93.2	0	0	0	0	0	81.8	97.7	0	0	97.3	86.8	0	66.7	84.6	84.8	94.4
Commercial	0	47	18	4	69	0	0	0	0	0	6	30	0	0	36	32	0	9	2	43	148
% Commercial	0	5.3	15.4	33.3	6.8	0	0	0	0	0	18.2	2.3	0	0	2.7	13.2	0	33.3	15.4	15.2	5.6





# DE TRAFFIC

detraffic.com  
 (386) 341-4186  
 SE 58th Ave at SE 66th St  
 Marion County, FL

File Name : 01 58th at 66  
 Site Code : 00000001  
 Start Date : 11/14/2023  
 Page No : 6

## Groups Printed- Peds

Start Time	SE 58th Ave Southbound					N/A Westbound					SE 58th Ave Northbound					SE 66th St Eastbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0			
Total %																						

**DE TRAFFIC**  
 detraffic.com  
 (386) 341-4186  
 US 441 at SE 92nd Loop  
 Marion County, FL

File Name : 02 US 441 at SE 92  
 Site Code : 00000002  
 Start Date : 11/14/2023  
 Page No : 1

Groups Printed- Automobiles - Commercial

Start Time	US 441 Southbound					SE 92nd Place Rd Westbound					US 441 Northbound					N/A Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	31	188	0	0	219	67	0	60	6	133	0	232	37	3	272	0	0	0	0	0	624
07:15 AM	42	233	0	0	275	86	0	66	3	155	0	316	44	4	364	0	0	0	0	0	794
07:30 AM	50	225	0	0	275	95	0	77	2	174	0	296	38	7	341	0	0	0	0	0	790
07:45 AM	47	245	0	0	292	89	0	70	5	164	0	244	37	4	285	0	0	0	0	0	741
Total	170	891	0	0	1061	337	0	273	16	626	0	1088	156	18	1262	0	0	0	0	0	2949
08:00 AM	61	234	0	0	295	97	0	76	7	180	0	242	44	10	296	0	0	0	0	0	771
08:15 AM	45	204	0	0	249	91	0	72	7	170	0	214	28	5	247	0	0	0	0	0	666
08:30 AM	36	195	0	0	231	82	0	66	10	158	0	214	28	8	250	0	0	0	0	0	639
08:45 AM	35	183	0	0	218	83	0	64	6	153	0	187	22	7	216	0	0	0	0	0	587
Total	177	816	0	0	993	353	0	278	30	661	0	857	122	30	1009	0	0	0	0	0	2663
04:00 PM	84	236	0	0	320	63	0	36	3	102	0	276	72	6	354	0	0	0	0	0	776
04:15 PM	75	294	0	0	369	57	0	48	4	109	0	274	85	9	368	0	0	0	0	0	846
04:30 PM	88	281	0	0	369	66	0	38	5	109	0	282	99	7	388	0	0	0	0	0	866
04:45 PM	98	269	0	0	367	61	0	59	10	130	0	253	95	7	355	0	0	0	0	0	852
Total	345	1080	0	0	1425	247	0	181	22	450	0	1085	351	29	1465	0	0	0	0	0	3340
05:00 PM	90	294	0	0	384	65	0	38	8	111	0	320	90	9	419	0	0	0	0	0	914
05:15 PM	81	285	0	0	366	73	0	41	8	122	0	276	104	9	389	0	0	0	0	0	877
05:30 PM	71	272	0	0	343	67	0	42	6	115	0	219	86	9	314	0	0	0	0	0	772
05:45 PM	62	234	0	0	296	56	0	34	3	93	0	197	75	10	282	0	0	0	0	0	671
Total	304	1085	0	0	1389	261	0	155	25	441	0	1012	355	37	1404	0	0	0	0	0	3234
Grand Total	996	3872	0	0	4868	1198	0	887	93	2178	0	4042	984	114	5140	0	0	0	0	0	12186
Approch %	20.5	79.5	0	0		55	0	40.7	4.3		0	78.6	19.1	2.2		0	0	0	0		
Total %	8.2	31.8	0	0	39.9	9.8	0	7.3	0.8	17.9	0	33.2	8.1	0.9	42.2	0	0	0	0	0	
Automobiles	881	3627	0	0	4508	1148	0	811	82	2041	0	3768	904	98	4770	0	0	0	0	0	11319
% Automobiles	88.5	93.7	0	0	92.6	95.8	0	91.4	88.2	93.7	0	93.2	91.9	86	92.8	0	0	0	0	0	92.9
Commercial	115	245	0	0	360	50	0	76	11	137	0	274	80	16	370	0	0	0	0	0	867
% Commercial	11.5	6.3	0	0	7.4	4.2	0	8.6	11.8	6.3	0	6.8	8.1	14	7.2	0	0	0	0	0	7.1

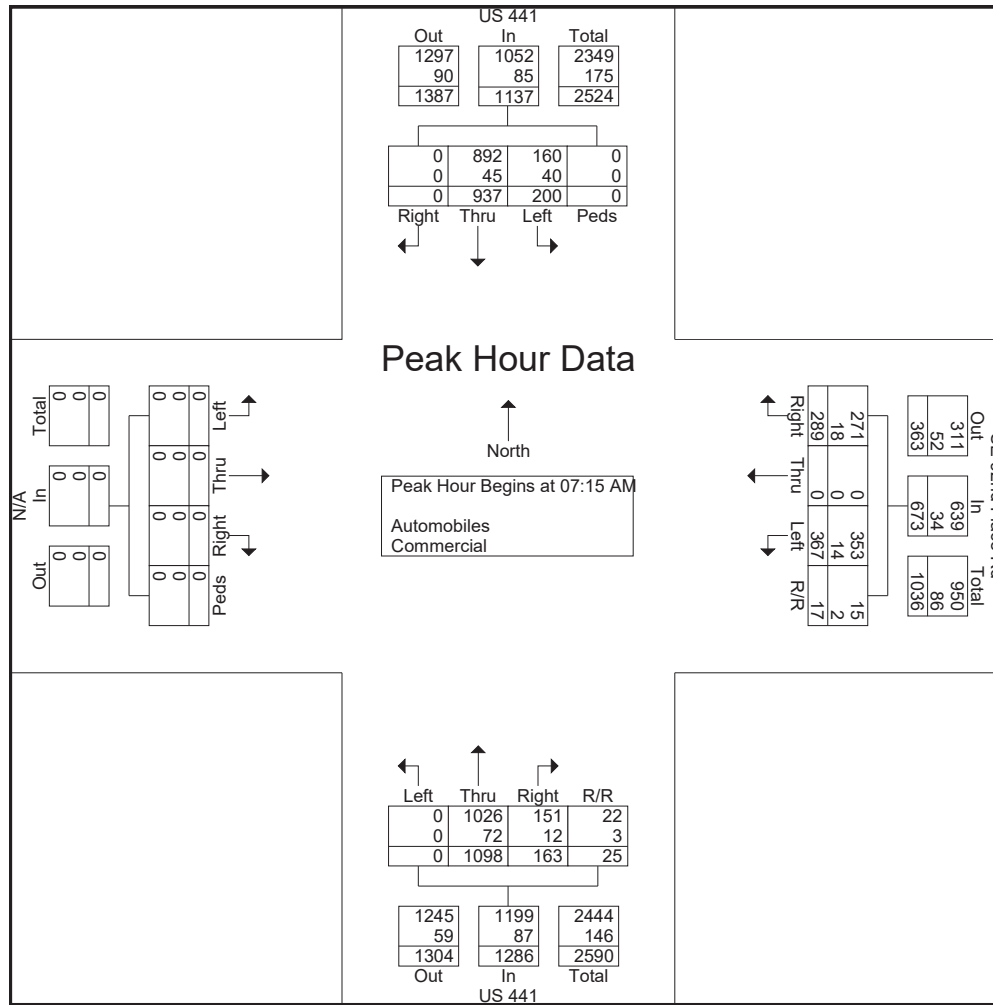
**DE TRAFFIC**  
detrtraffic.com  
(386) 341-4186  
US 441 at SE 92nd Loop  
Marion County, FL

File Name : 02 US 441 at SE 92  
Site Code : 00000002  
Start Date : 11/14/2023  
Page No : 2

Start Time	US 441 Southbound					SE 92nd Place Rd Westbound					US 441 Northbound					N/A Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	42	233	0	0	275	86	0	66	3	155	0	316	44	4	364	0	0	0	0	0	794
07:30 AM	50	225	0	0	275	95	0	77	2	174	0	296	38	7	341	0	0	0	0	0	790
07:45 AM	47	245	0	0	292	89	0	70	5	164	0	244	37	4	285	0	0	0	0	0	741
08:00 AM	61	234	0	0	295	97	0	76	7	180	0	242	44	10	296	0	0	0	0	0	771
Total Volume	200	937	0	0	1137	367	0	289	17	673	0	1098	163	25	1286	0	0	0	0	0	3096
% App. Total	17.6	82.4	0	0		54.5	0	42.9	2.5		0	85.4	12.7	1.9		0	0	0	0	0	
PHF	.820	.956	.000	.000	.964	.946	.000	.938	.607	.935	.000	.869	.926	.625	.883	.000	.000	.000	.000	.000	.975
Automobiles	160	892	0	0	1052	353	0	271	15	639	0	1026	151	22	1199	0	0	0	0	0	2890
% Automobiles	80.0	95.2	0	0	92.5	96.2	0	93.8	88.2	94.9	0	93.4	92.6	88.0	93.2	0	0	0	0	0	93.3
Commercial	40	45	0	0	85	14	0	18	2	34	0	72	12	3	87	0	0	0	0	0	206
% Commercial	20.0	4.8	0	0	7.5	3.8	0	6.2	11.8	5.1	0	6.6	7.4	12.0	6.8	0	0	0	0	0	6.7

**DE TRAFFIC**  
 detraffic.com  
 (386) 341-4186  
 US 441 at SE 92nd Loop  
 Marion County, FL

File Name : 02 US 441 at SE 92  
 Site Code : 00000002  
 Start Date : 11/14/2023  
 Page No : 3



**DE TRAFFIC**  
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(386) 341-4186  
US 441 at SE 92nd Loop  
Marion County, FL

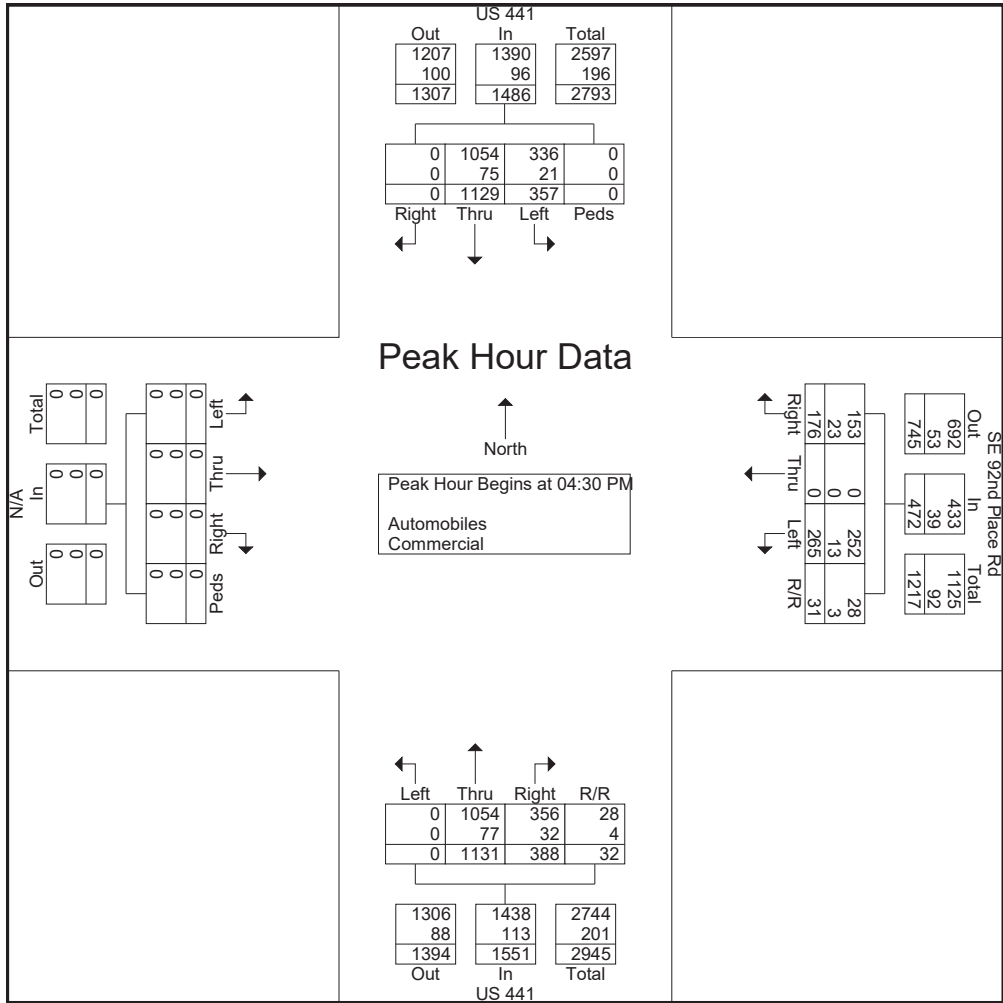
File Name : 02 US 441 at SE 92  
Site Code : 00000002  
Start Date : 11/14/2023  
Page No : 4

Start Time	US 441 Southbound					SE 92nd Place Rd Westbound					US 441 Northbound					N/A Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	88	281	0	0	369	66	0	38	5	109	0	282	99	7	388	0	0	0	0	0	866
04:45 PM	98	269	0	0	367	61	0	59	10	130	0	253	95	7	355	0	0	0	0	0	852
05:00 PM	90	294	0	0	384	65	0	38	8	111	0	320	90	9	419	0	0	0	0	0	914
05:15 PM	81	285	0	0	366	73	0	41	8	122	0	276	104	9	389	0	0	0	0	0	877
Total Volume	357	1129	0	0	1486	265	0	176	31	472	0	1131	388	32	1551	0	0	0	0	0	3509
% App. Total	24	76	0	0		56.1	0	37.3	6.6		0	72.9	25	2.1		0	0	0	0		
PHF	.911	.960	.000	.000	.967	.908	.000	.746	.775	.908	.000	.884	.933	.889	.925	.000	.000	.000	.000	.000	.960
Automobiles	336	1054	0	0	1390	252	0	153	28	433	0	1054	356	28	1438	0	0	0	0	0	3261
% Automobiles	94.1	93.4	0	0	93.5	95.1	0	86.9	90.3	91.7	0	93.2	91.8	87.5	92.7	0	0	0	0	0	92.9
Commercial	21	75	0	0	96	13	0	23	3	39	0	77	32	4	113	0	0	0	0	0	248
% Commercial	5.9	6.6	0	0	6.5	4.9	0	13.1	9.7	8.3	0	6.8	8.2	12.5	7.3	0	0	0	0	0	7.1

# DE TRAFFIC

detraffic.com  
 (386) 341-4186  
 US 441 at SE 92nd Loop  
 Marion County, FL

File Name : 02 US 441 at SE 92  
 Site Code : 00000002  
 Start Date : 11/14/2023  
 Page No : 5



# DE TRAFFIC

detraffic.com  
 (386) 341-4186  
 US 441 at SE 92nd Loop  
 Marion County, FL

File Name : 02 US 441 at SE 92  
 Site Code : 00000002  
 Start Date : 11/14/2023  
 Page No : 6

## Groups Printed- Peds

Start Time	US 441 Southbound					SE 92nd Place Rd Westbound					US 441 Northbound					N/A Eastbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0			
Total %																						



# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 58th Ave at SE 92nd Loop

Marion County, FL

File Name : 03 58th at 92

Site Code : 00000003

Start Date : 11/14/2023

Page No : 1

## Groups Printed- Automobiles - Commercial

Start Time	SE 58th Ave Southbound					SE 92nd Loop Westbound					SE 58th Ave Northbound					SE 92nd Loop Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	
07:00 AM	44	235	51	6	336	6	65	30	11	112	20	95	8	4	127	24	40	11	3	78	653
07:15 AM	62	222	65	4	353	4	73	43	9	129	18	145	5	4	172	36	40	20	5	101	755
07:30 AM	73	195	74	9	351	10	77	35	9	131	26	161	10	6	203	42	50	18	5	115	800
07:45 AM	67	186	55	8	316	5	70	53	11	139	20	160	4	5	189	37	43	18	5	103	747
Total	246	838	245	27	1356	25	285	161	40	511	84	561	27	19	691	139	173	67	18	397	2955
08:00 AM	73	152	72	7	304	8	74	45	18	145	24	163	9	8	204	46	33	26	7	112	765
08:15 AM	81	140	66	9	296	9	60	35	19	123	24	106	6	9	145	26	31	20	6	83	647
08:30 AM	79	121	56	7	263	9	72	31	11	123	19	120	6	7	152	29	42	19	4	94	632
08:45 AM	53	113	43	8	217	9	64	36	8	117	14	127	7	9	157	38	33	23	6	100	591
Total	286	526	237	31	1080	35	270	147	56	508	81	516	28	33	658	139	139	88	23	389	2635
04:00 PM	42	135	46	9	232	3	49	54	10	116	10	160	10	9	189	57	58	21	8	144	681
04:15 PM	59	174	43	7	283	2	67	75	10	154	22	180	3	7	212	71	89	30	11	201	850
04:30 PM	46	141	51	11	249	3	72	63	10	148	20	208	7	8	243	55	97	25	9	186	826
04:45 PM	37	153	45	13	248	4	53	73	18	148	27	191	10	8	236	64	101	29	12	206	838
Total	184	603	185	40	1012	12	241	265	48	566	79	739	30	32	880	247	345	105	40	737	3195
05:00 PM	43	145	37	9	234	5	73	53	15	146	18	234	5	13	270	44	105	26	7	182	832
05:15 PM	37	132	31	8	208	7	82	43	12	144	21	210	6	11	248	52	90	20	10	172	772
05:30 PM	30	144	32	7	213	4	77	37	17	135	15	194	9	9	227	45	83	24	11	163	738
05:45 PM	34	125	24	9	192	8	63	54	13	138	17	199	4	7	227	37	72	26	8	143	700
Total	144	546	124	33	847	24	295	187	57	563	71	837	24	40	972	178	350	96	36	660	3042
Grand Total	860	2513	791	131	4295	96	1091	760	201	2148	315	2653	109	124	3201	703	1007	356	117	2183	11827
Apprch %	20	58.5	18.4	3.1		4.5	50.8	35.4	9.4		9.8	82.9	3.4	3.9		32.2	46.1	16.3	5.4		
Total %	7.3	21.2	6.7	1.1	36.3	0.8	9.2	6.4	1.7	18.2	2.7	22.4	0.9	1	27.1	5.9	8.5	3	1	18.5	
Automobiles	832	2349	773	131	4085	88	1069	727	192	2076	296	2543	90	118	3047	669	895	342	116	2022	11230
% Automobiles	96.7	93.5	97.7	100	95.1	91.7	98	95.7	95.5	96.6	94	95.9	82.6	95.2	95.2	95.2	88.9	96.1	99.1	92.6	95
Commercial	28	164	18	0	210	8	22	33	9	72	19	110	19	6	154	34	112	14	1	161	597
% Commercial	3.3	6.5	2.3	0	4.9	8.3	2	4.3	4.5	3.4	6	4.1	17.4	4.8	4.8	4.8	11.1	3.9	0.9	7.4	5

# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 58th Ave at SE 92nd Loop

Marion County, FL

File Name : 03 58th at 92

Site Code : 00000003

Start Date : 11/14/2023

Page No : 2

Start Time	SE 58th Ave Southbound					SE 92nd Loop Westbound					SE 58th Ave Northbound					SE 92nd Loop Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	62	222	65	4	353	4	73	43	9	129	18	145	5	4	172	36	40	20	5	101	755
07:30 AM	73	195	74	9	351	10	77	35	9	131	26	161	10	6	203	42	50	18	5	115	800
07:45 AM	67	186	55	8	316	5	70	53	11	139	20	160	4	5	189	37	43	18	5	103	747
08:00 AM	73	152	72	7	304	8	74	45	18	145	24	163	9	8	204	46	33	26	7	112	765
Total Volume	275	755	266	28	1324	27	294	176	47	544	88	629	28	23	768	161	166	82	22	431	3067
% App. Total	20.8	57	20.1	2.1		5	54	32.4	8.6		11.5	81.9	3.6	3		37.4	38.5	19	5.1		
PHF	.942	.850	.899	.778	.938	.675	.955	.830	.653	.938	.846	.965	.700	.719	.941	.875	.830	.788	.786	.937	.958
Automobiles	271	714	260	28	1273	24	284	168	46	522	85	607	22	22	736	151	138	77	21	387	2918
% Automobiles	98.5	94.6	97.7	100	96.1	88.9	96.6	95.5	97.9	96.0	96.6	96.5	78.6	95.7	95.8	93.8	83.1	93.9	95.5	89.8	95.1
Commercial	4	41	6	0	51	3	10	8	1	22	3	22	6	1	32	10	28	5	1	44	149
% Commercial	1.5	5.4	2.3	0	3.9	11.1	3.4	4.5	2.1	4.0	3.4	3.5	21.4	4.3	4.2	6.2	16.9	6.1	4.5	10.2	4.9

# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 58th Ave at SE 92nd Loop

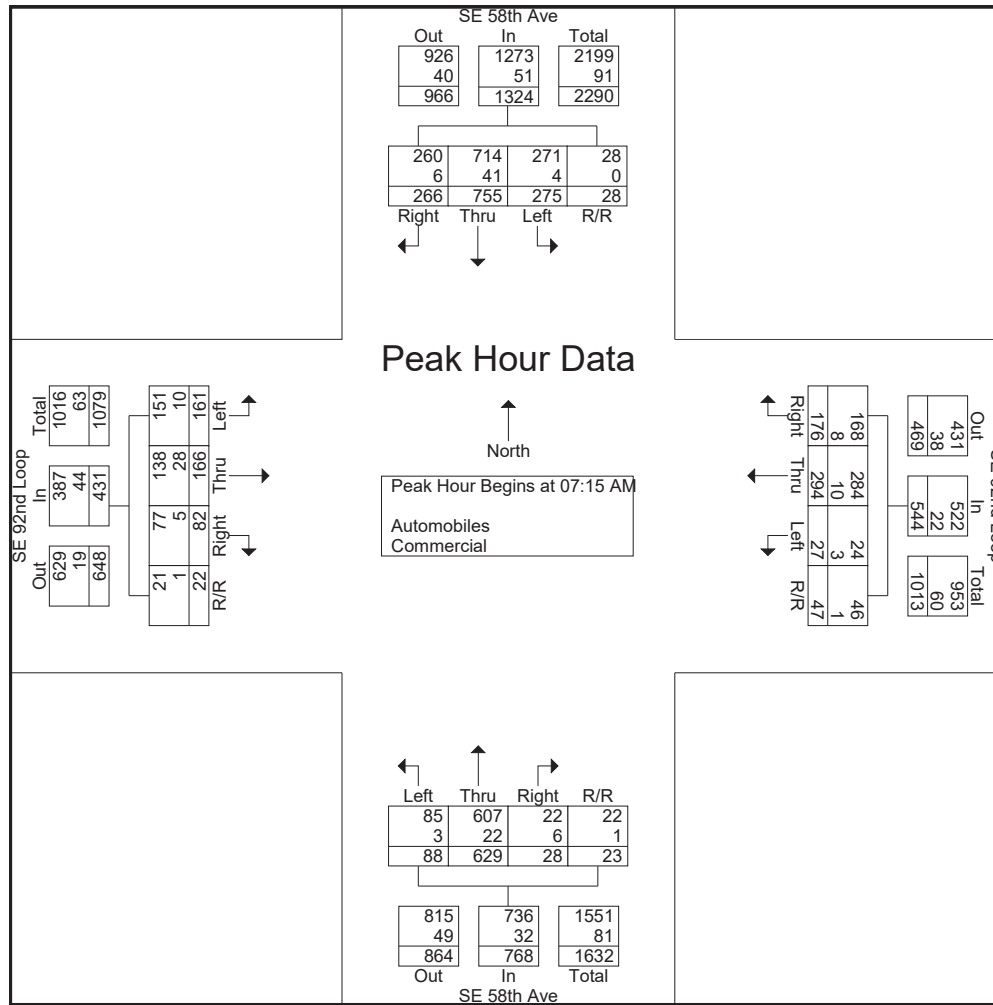
Marion County, FL

File Name : 03 58th at 92

Site Code : 00000003

Start Date : 11/14/2023

Page No : 3



# DE TRAFFIC

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(386) 341-4186

SE 58th Ave at SE 92nd Loop

Marion County, FL

File Name : 03 58th at 92

Site Code : 00000003

Start Date : 11/14/2023

Page No : 4

Start Time	SE 58th Ave Southbound					SE 92nd Loop Westbound					SE 58th Ave Northbound					SE 92nd Loop Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	59	174	43	7	283	2	67	75	10	154	22	180	3	7	212	71	89	30	11	201	850
04:30 PM	46	141	51	11	249	3	72	63	10	148	20	208	7	8	243	55	97	25	9	186	826
04:45 PM	37	153	45	13	248	4	53	73	18	148	27	191	10	8	236	64	101	29	12	206	838
05:00 PM	43	145	37	9	234	5	73	53	15	146	18	234	5	13	270	44	105	26	7	182	832
Total Volume	185	613	176	40	1014	14	265	264	53	596	87	813	25	36	961	234	392	110	39	775	3346
% App. Total	18.2	60.5	17.4	3.9		2.3	44.5	44.3	8.9		9.1	84.6	2.6	3.7		30.2	50.6	14.2	5		
PHF	.784	.881	.863	.769	.896	.700	.908	.880	.736	.968	.806	.869	.625	.692	.890	.824	.933	.917	.813	.941	.984
Automobiles	175	561	172	40	948	13	262	256	49	580	80	778	22	35	915	223	363	106	39	731	3174
% Automobiles	94.6	91.5	97.7	100	93.5	92.9	98.9	97.0	92.5	97.3	92.0	95.7	88.0	97.2	95.2	95.3	92.6	96.4	100	94.3	94.9
Commercial	10	52	4	0	66	1	3	8	4	16	7	35	3	1	46	11	29	4	0	44	172
% Commercial	5.4	8.5	2.3	0	6.5	7.1	1.1	3.0	7.5	2.7	8.0	4.3	12.0	2.8	4.8	4.7	7.4	3.6	0	5.7	5.1

# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 58th Ave at SE 92nd Loop

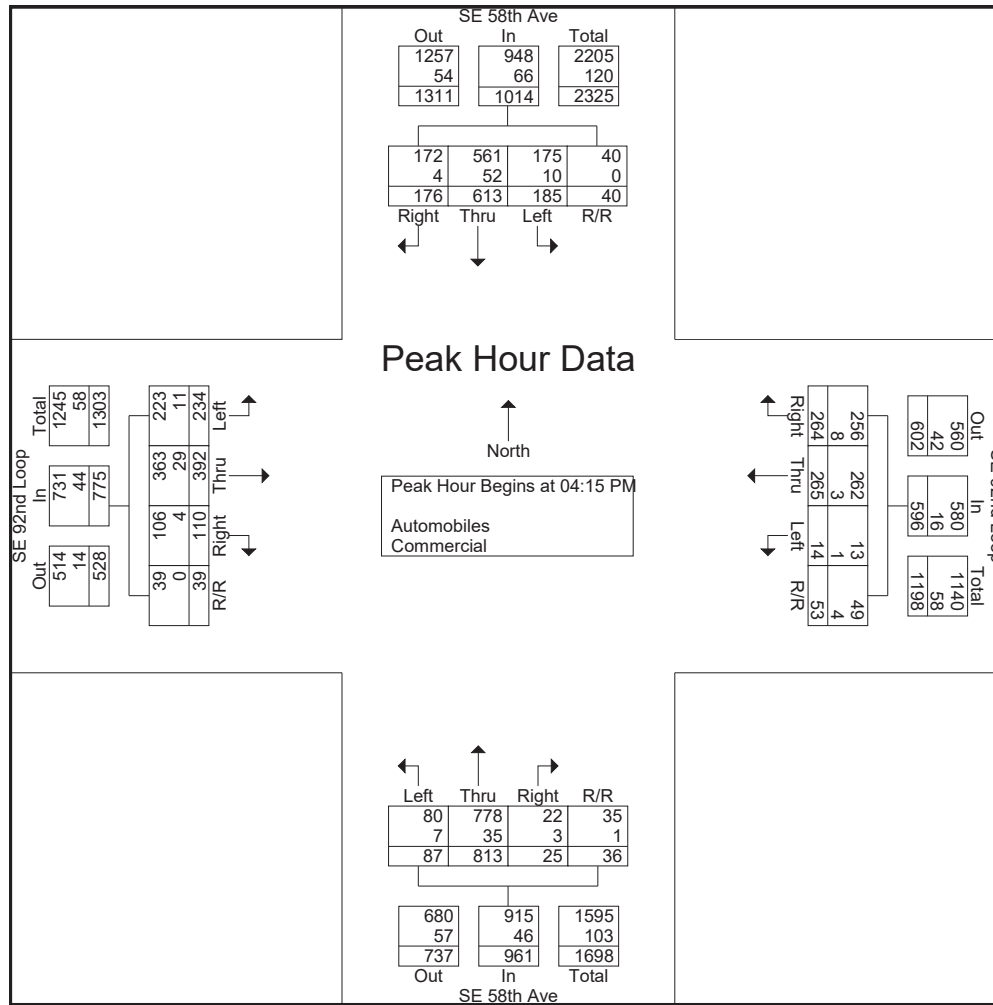
Marion County, FL

File Name : 03 58th at 92

Site Code : 00000003

Start Date : 11/14/2023

Page No : 5



# DE TRAFFIC

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(386) 341-4186

SE 58th Ave at SE 92nd Loop

Marion County, FL

File Name : 03 58th at 92

Site Code : 00000003

Start Date : 11/14/2023

Page No : 6

## Groups Printed- Peds

Start Time	SE 58th Ave Southbound					SE 92nd Loop Westbound					SE 58th Ave Northbound					SE 92nd Loop Eastbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0			
Total %																						

# DE TRAFFIC

detraffic.com  
 (386) 341-4186  
 SR 35 at SR 25  
 Marion County, FL

File Name : 04 58th at SR 25  
 Site Code : 00000004  
 Start Date : 11/14/2023  
 Page No : 1

## Groups Printed- Automobiles - Commercial

Start Time	SR 35 Southbound					SR 25 Westbound					SR 35 Northbound					SR 25 Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	
07:00 AM	11	105	62	0	178	9	56	29	1	95	4	45	5	0	54	29	64	8	0	101	428
07:15 AM	25	139	75	1	240	8	50	35	0	93	5	63	6	1	75	36	73	8	1	118	526
07:30 AM	26	132	84	0	242	11	68	43	2	124	5	76	6	2	89	42	74	9	0	125	580
07:45 AM	36	160	76	2	274	8	50	35	1	94	6	84	5	0	95	35	84	10	0	129	592
Total	98	536	297	3	934	36	224	142	4	406	20	268	22	3	313	142	295	35	1	473	2126
08:00 AM	52	94	53	1	200	8	56	26	0	90	5	79	5	1	90	28	80	7	0	115	495
08:15 AM	44	83	55	0	182	10	55	36	1	102	5	90	5	0	100	35	87	8	0	130	514
08:30 AM	25	68	45	1	139	5	60	54	0	119	4	90	4	2	100	32	68	7	1	108	466
08:45 AM	26	78	35	0	139	6	58	35	1	100	6	87	6	0	99	36	78	6	0	120	458
Total	147	323	188	2	660	29	229	151	2	411	20	346	20	3	389	131	313	28	1	473	1933
04:00 PM	35	82	48	1	166	8	58	17	1	84	4	103	2	1	110	88	48	3	1	140	500
04:15 PM	43	84	45	1	173	2	62	9	2	75	4	130	4	1	139	78	55	6	0	139	526
04:30 PM	37	92	40	1	170	5	84	11	0	100	5	106	8	0	119	71	64	6	1	142	531
04:45 PM	43	109	33	0	185	4	81	19	1	105	5	128	4	1	138	76	56	6	0	138	566
Total	158	367	166	3	694	19	285	56	4	364	18	467	18	3	506	313	223	21	2	559	2123
05:00 PM	37	95	39	2	173	7	93	18	0	118	8	143	6	0	157	84	64	4	0	152	600
05:15 PM	44	79	30	1	154	5	81	16	1	103	6	156	9	2	173	81	75	5	0	161	591
05:30 PM	37	92	33	1	163	4	87	22	2	115	7	128	6	1	142	71	68	5	0	144	564
05:45 PM	28	77	30	0	135	7	81	13	1	102	7	121	8	0	136	77	44	6	1	128	501
Total	146	343	132	4	625	23	342	69	4	438	28	548	29	3	608	313	251	20	1	585	2256
Grand Total	549	1569	783	12	2913	107	1080	418	14	1619	86	1629	89	12	1816	899	1082	104	5	2090	8438
Apprch %	18.8	53.9	26.9	0.4		6.6	66.7	25.8	0.9		4.7	89.7	4.9	0.7		43	51.8	5	0.2		
Total %	6.5	18.6	9.3	0.1	34.5	1.3	12.8	5	0.2	19.2	1	19.3	1.1	0.1	21.5	10.7	12.8	1.2	0.1	24.8	
Automobiles	534	1463	734	12	2743	99	1013	406	13	1531	73	1562	78	12	1725	856	1034	100	5	1995	7994
% Automobiles	97.3	93.2	93.7	100	94.2	92.5	93.8	97.1	92.9	94.6	84.9	95.9	87.6	100	95	95.2	95.6	96.2	100	95.5	94.7
Commercial	15	106	49	0	170	8	67	12	1	88	13	67	11	0	91	43	48	4	0	95	444
% Commercial	2.7	6.8	6.3	0	5.8	7.5	6.2	2.9	7.1	5.4	15.1	4.1	12.4	0	5	4.8	4.4	3.8	0	4.5	5.3

# DE TRAFFIC

detraffic.com  
 (386) 341-4186  
 SR 35 at SR 25  
 Marion County, FL

File Name : 04 58th at SR 25  
 Site Code : 00000004  
 Start Date : 11/14/2023  
 Page No : 2

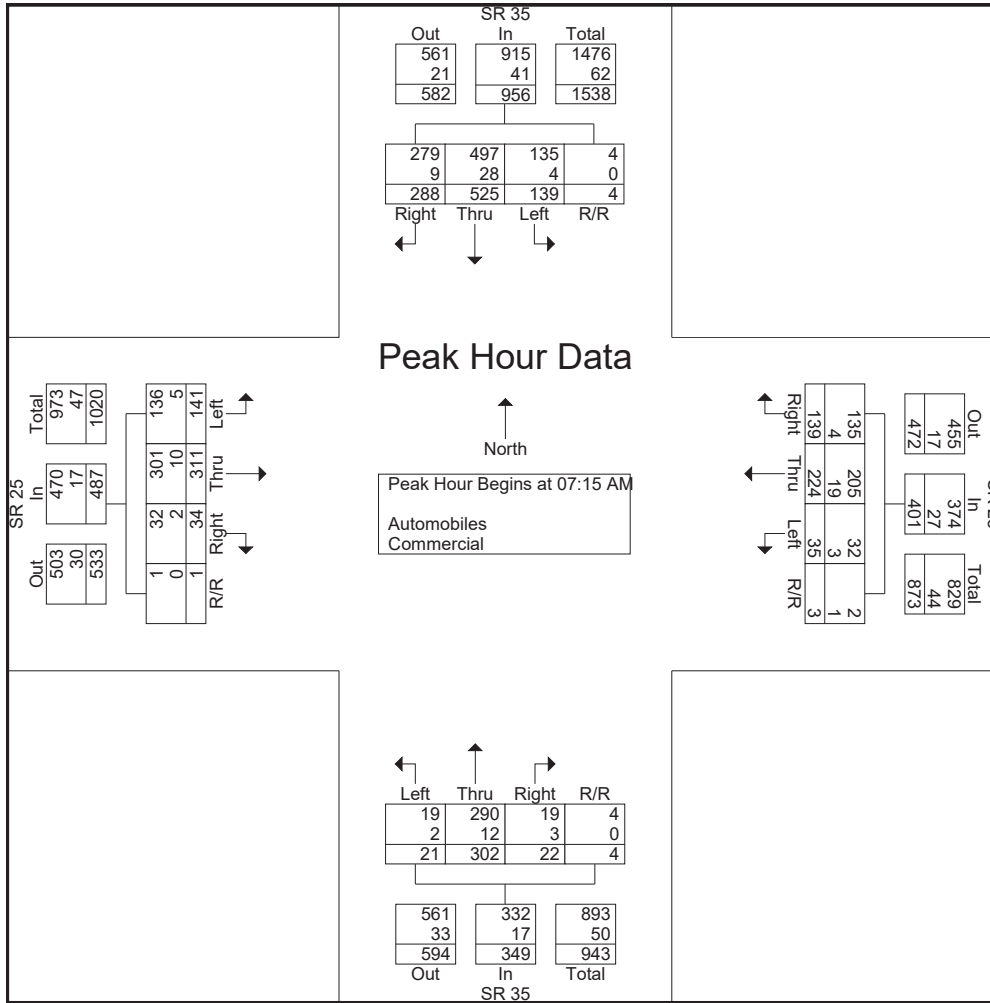
Start Time	SR 35 Southbound					SR 25 Westbound					SR 35 Northbound					SR 25 Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	25	139	75	1	240	8	50	35	0	93	5	63	6	1	75	36	73	8	1	118	526
07:30 AM	26	132	84	0	242	11	68	43	2	124	5	76	6	2	89	42	74	9	0	125	580
07:45 AM	36	160	76	2	274	8	50	35	1	94	6	84	5	0	95	35	84	10	0	129	592
08:00 AM	52	94	53	1	200	8	56	26	0	90	5	79	5	1	90	28	80	7	0	115	495
Total Volume	139	525	288	4	956	35	224	139	3	401	21	302	22	4	349	141	311	34	1	487	2193
% App. Total	14.5	54.9	30.1	0.4		8.7	55.9	34.7	0.7		6	86.5	6.3	1.1		29	63.9	7	0.2		
PHF	.668	.820	.857	.500	.872	.795	.824	.808	.375	.808	.875	.899	.917	.500	.918	.839	.926	.850	.250	.944	.926
Automobiles	135	497	279	4	915	32	205	135	2	374	19	290	19	4	332	136	301	32	1	470	2091
% Automobiles	97.1	94.7	96.9	100	95.7	91.4	91.5	97.1	66.7	93.3	90.5	96.0	86.4	100	95.1	96.5	96.8	94.1	100	96.5	95.3
Commercial	4	28	9	0	41	3	19	4	1	27	2	12	3	0	17	5	10	2	0	17	102
% Commercial	2.9	5.3	3.1	0	4.3	8.6	8.5	2.9	33.3	6.7	9.5	4.0	13.6	0	4.9	3.5	3.2	5.9	0	3.5	4.7



# DE TRAFFIC

detraffic.com  
 (386) 341-4186  
 SR 35 at SR 25  
 Marion County, FL

File Name : 04 58th at SR 25  
 Site Code : 00000004  
 Start Date : 11/14/2023  
 Page No : 3



# DE TRAFFIC

detraffic.com  
 (386) 341-4186  
 SR 35 at SR 25  
 Marion County, FL

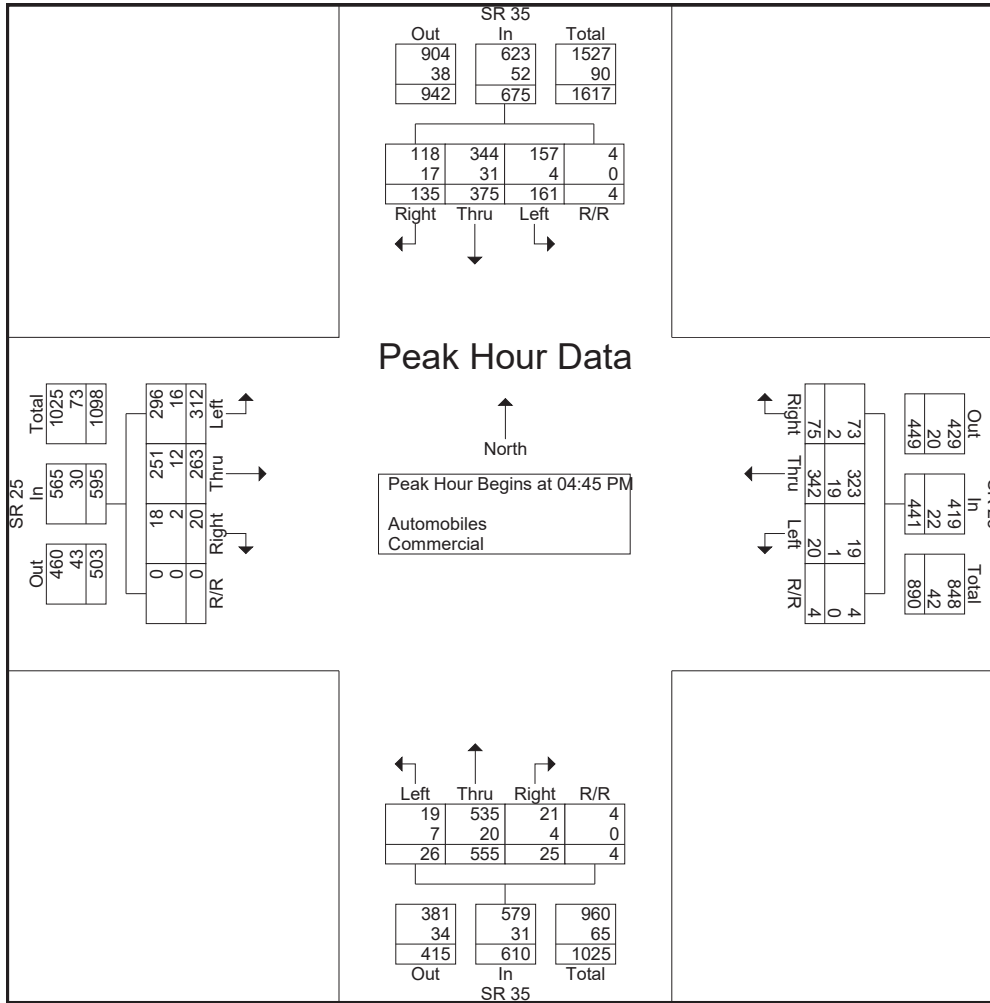
File Name : 04 58th at SR 25  
 Site Code : 00000004  
 Start Date : 11/14/2023  
 Page No : 4

Start Time	SR 35 Southbound					SR 25 Westbound					SR 35 Northbound					SR 25 Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	43	109	33	0	185	4	81	19	1	105	5	128	4	1	138	76	56	6	0	138	566
05:00 PM	37	95	39	2	173	7	93	18	0	118	8	143	6	0	157	84	64	4	0	152	600
05:15 PM	44	79	30	1	154	5	81	16	1	103	6	156	9	2	173	81	75	5	0	161	591
05:30 PM	37	92	33	1	163	4	87	22	2	115	7	128	6	1	142	71	68	5	0	144	564
Total Volume	161	375	135	4	675	20	342	75	4	441	26	555	25	4	610	312	263	20	0	595	2321
% App. Total	23.9	55.6	20	0.6		4.5	77.6	17	0.9		4.3	91	4.1	0.7		52.4	44.2	3.4	0		
PHF	.915	.860	.865	.500	.912	.714	.919	.852	.500	.934	.813	.889	.694	.500	.882	.929	.877	.833	.000	.924	.967
Automobiles	157	344	118	4	623	19	323	73	4	419	19	535	21	4	579	296	251	18	0	565	2186
% Automobiles	97.5	91.7	87.4	100	92.3	95.0	94.4	97.3	100	95.0	73.1	96.4	84.0	100	94.9	94.9	95.4	90.0	0	95.0	94.2
Commercial	4	31	17	0	52	1	19	2	0	22	7	20	4	0	31	16	12	2	0	30	135
% Commercial	2.5	8.3	12.6	0	7.7	5.0	5.6	2.7	0	5.0	26.9	3.6	16.0	0	5.1	5.1	4.6	10.0	0	5.0	5.8

# DE TRAFFIC

detraffic.com  
 (386) 341-4186  
 SR 35 at SR 25  
 Marion County, FL

File Name : 04 58th at SR 25  
 Site Code : 00000004  
 Start Date : 11/14/2023  
 Page No : 5



# DE TRAFFIC

detraffic.com  
 (386) 341-4186  
 SR 35 at SR 25  
 Marion County, FL

File Name : 04 58th at SR 25  
 Site Code : 00000004  
 Start Date : 11/14/2023  
 Page No : 6

## Groups Printed- Peds

Start Time	SR 35 Southbound					SR 25 Westbound					SR 35 Northbound					SR 25 Eastbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
07:30 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
08:00 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Total	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	1	3
05:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	1	2
Grand Total	0	0	0	2	2	0	0	0	2	2	0	0	0	1	1	0	0	0	2	2	7	7
Apprch %	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100			
Total %	0	0	0	28.6	28.6	0	0	0	28.6	28.6	0	0	0	14.3	14.3	0	0	0	28.6	28.6		

# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 92nd Loop at SE 110th Street Rd

Marion County, FL

File Name : 05 92 at 110

Site Code : 00000005

Start Date : 11/14/2023

Page No : 1

Groups Printed- Automobiles - Commercial

Start Time	SE 92nd Loop Southbound					SE 110th St Rd Westbound					SE 92nd Loop Northbound					SE 110th St Rd Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	
07:00 AM	11	73	7	2	93	16	13	11	8	48	4	77	53	2	136	3	22	3	0	28	305
07:15 AM	19	95	4	4	122	20	19	25	11	75	7	110	71	0	188	2	26	5	0	33	418
07:30 AM	17	110	8	1	136	17	25	24	10	76	4	112	63	1	180	7	23	10	0	40	432
07:45 AM	18	120	6	5	149	19	24	20	10	73	7	111	73	0	191	4	19	8	0	31	444
Total	65	398	25	12	500	72	81	80	39	272	22	410	260	3	695	16	90	26	0	132	1599
08:00 AM	25	111	7	5	148	24	22	24	8	78	5	99	64	0	168	10	19	9	0	38	432
08:15 AM	21	93	4	4	122	19	22	26	15	82	7	89	72	1	169	4	26	9	0	39	412
08:30 AM	16	101	7	2	126	17	19	20	11	67	4	79	53	0	136	8	21	9	0	38	367
08:45 AM	22	93	5	3	123	21	15	25	16	77	6	70	44	1	121	7	20	7	0	34	355
Total	84	398	23	14	519	81	78	95	50	304	22	337	233	2	594	29	86	34	0	149	1566
04:00 PM	34	92	4	3	133	56	19	20	9	104	4	89	87	11	191	3	29	2	1	35	463
04:15 PM	41	107	2	4	154	72	24	21	11	128	5	95	75	19	194	6	45	2	3	56	532
04:30 PM	42	82	8	4	136	61	16	26	17	120	11	111	68	19	209	4	36	6	4	50	515
04:45 PM	43	92	4	4	143	72	18	34	6	130	8	120	75	17	220	6	43	7	5	61	554
Total	160	373	18	15	566	261	77	101	43	482	28	415	305	66	814	19	153	17	13	202	2064
05:00 PM	52	104	9	6	171	64	17	24	5	110	8	115	69	18	210	4	35	4	4	47	538
05:15 PM	35	123	4	6	168	72	18	19	8	117	9	110	66	19	204	7	42	6	5	60	549
05:30 PM	26	94	7	5	132	52	24	22	7	105	9	118	59	11	197	4	36	6	2	48	482
05:45 PM	30	84	7	1	122	42	19	24	9	94	8	96	48	13	165	6	25	6	2	39	420
Total	143	405	27	18	593	230	78	89	29	426	34	439	242	61	776	21	138	22	13	194	1989
Grand Total	452	1574	93	59	2178	644	314	365	161	1484	106	1601	1040	132	2879	85	467	99	26	677	7218
Apprch %	20.8	72.3	4.3	2.7		43.4	21.2	24.6	10.8		3.7	55.6	36.1	4.6		12.6	69	14.6	3.8		
Total %	6.3	21.8	1.3	0.8	30.2	8.9	4.4	5.1	2.2	20.6	1.5	22.2	14.4	1.8	39.9	1.2	6.5	1.4	0.4	9.4	
Automobiles	441	1454	79	56	2030	633	302	359	154	1448	94	1505	998	127	2724	78	442	91	26	637	6839
% Automobiles	97.6	92.4	84.9	94.9	93.2	98.3	96.2	98.4	95.7	97.6	88.7	94	96	96.2	94.6	91.8	94.6	91.9	100	94.1	94.7
Commercial	11	120	14	3	148	11	12	6	7	36	12	96	42	5	155	7	25	8	0	40	379
% Commercial	2.4	7.6	15.1	5.1	6.8	1.7	3.8	1.6	4.3	2.4	11.3	6	4	3.8	5.4	8.2	5.4	8.1	0	5.9	5.3

# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 92nd Loop at SE 110th Street Rd

Marion County, FL

File Name : 05 92 at 110

Site Code : 00000005

Start Date : 11/14/2023

Page No : 2

Start Time	SE 92nd Loop Southbound					SE 110th St Rd Westbound					SE 92nd Loop Northbound					SE 110th St Rd Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	19	95	4	4	122	20	19	25	11	75	7	110	71	0	188	2	26	5	0	33	418
07:30 AM	17	110	8	1	136	17	25	24	10	76	4	112	63	1	180	7	23	10	0	40	432
07:45 AM	18	120	6	5	149	19	24	20	10	73	7	111	73	0	191	4	19	8	0	31	444
08:00 AM	25	111	7	5	148	24	22	24	8	78	5	99	64	0	168	10	19	9	0	38	432
Total Volume	79	436	25	15	555	80	90	93	39	302	23	432	271	1	727	23	87	32	0	142	1726
% App. Total	14.2	78.6	4.5	2.7		26.5	29.8	30.8	12.9		3.2	59.4	37.3	0.1		16.2	61.3	22.5	0		
PHF	.790	.908	.781	.750	.931	.833	.900	.930	.886	.968	.821	.964	.928	.250	.952	.575	.837	.800	.000	.888	.972
Automobiles	78	408	19	13	518	77	86	91	38	292	19	413	267	0	699	20	78	29	0	127	1636
% Automobiles	98.7	93.6	76.0	86.7	93.3	96.3	95.6	97.8	97.4	96.7	82.6	95.6	98.5	0	96.1	87.0	89.7	90.6	0	89.4	94.8
Commercial	1	28	6	2	37	3	4	2	1	10	4	19	4	1	28	3	9	3	0	15	90
% Commercial	1.3	6.4	24.0	13.3	6.7	3.8	4.4	2.2	2.6	3.3	17.4	4.4	1.5	100	3.9	13.0	10.3	9.4	0	10.6	5.2

# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 92nd Loop at SE 110th Street Rd

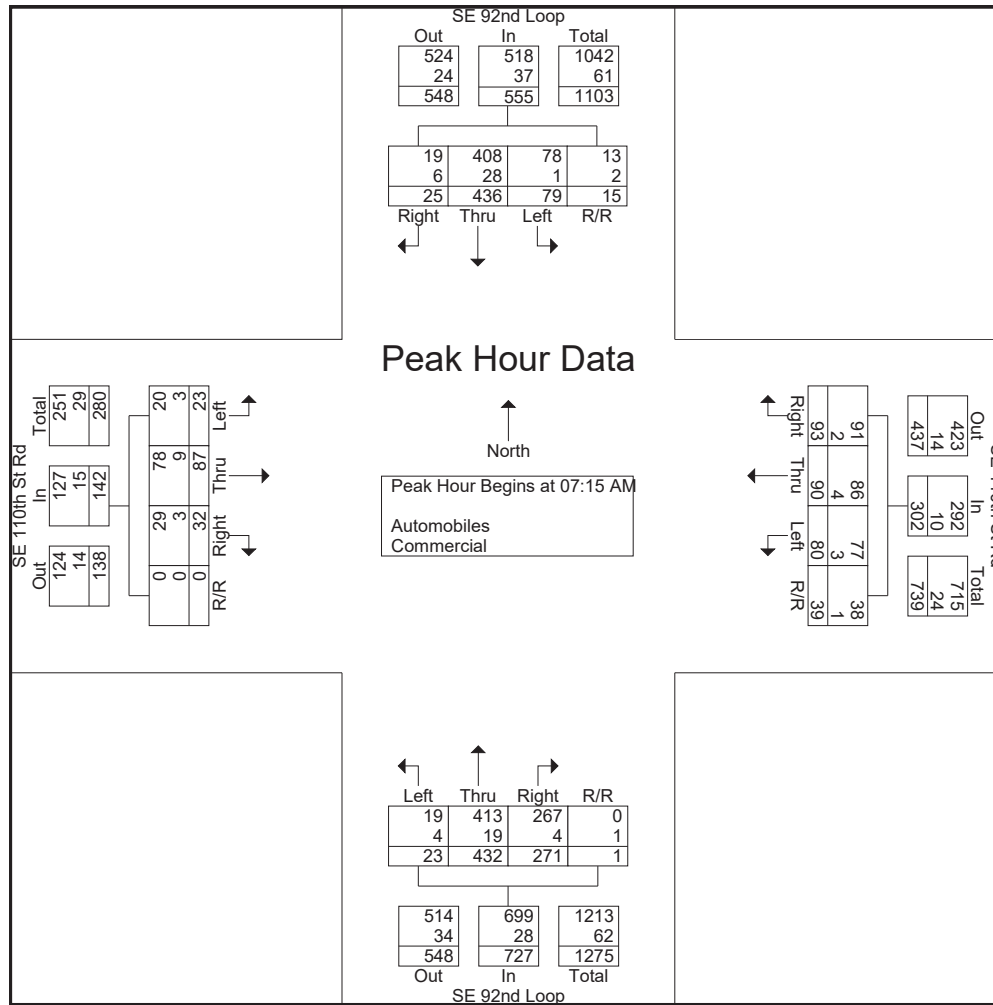
Marion County, FL

File Name : 05 92 at 110

Site Code : 00000005

Start Date : 11/14/2023

Page No : 3



# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 92nd Loop at SE 110th Street Rd

Marion County, FL

File Name : 05 92 at 110

Site Code : 00000005

Start Date : 11/14/2023

Page No : 4

Start Time	SE 92nd Loop Southbound					SE 110th St Rd Westbound					SE 92nd Loop Northbound					SE 110th St Rd Eastbound					Int. Total
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	42	82	8	4	136	61	16	26	17	120	11	111	68	19	209	4	36	6	4	50	515
04:45 PM	43	92	4	4	143	72	18	34	6	130	8	120	75	17	220	6	43	7	5	61	554
05:00 PM	52	104	9	6	171	64	17	24	5	110	8	115	69	18	210	4	35	4	4	47	538
05:15 PM	35	123	4	6	168	72	18	19	8	117	9	110	66	19	204	7	42	6	5	60	549
Total Volume	172	401	25	20	618	269	69	103	36	477	36	456	278	73	843	21	156	23	18	218	2156
% App. Total	27.8	64.9	4	3.2		56.4	14.5	21.6	7.5		4.3	54.1	33	8.7		9.6	71.6	10.6	8.3		
PHF	.827	.815	.694	.833	.904	.934	.958	.757	.529	.917	.818	.950	.927	.961	.958	.750	.907	.821	.900	.893	.973
Automobiles	168	371	22	19	580	269	69	103	34	475	32	424	259	73	788	18	152	20	18	208	2051
% Automobiles	97.7	92.5	88.0	95.0	93.9	100	100	100	94.4	99.6	88.9	93.0	93.2	100	93.5	85.7	97.4	87.0	100	95.4	95.1
Commercial	4	30	3	1	38	0	0	0	2	2	4	32	19	0	55	3	4	3	0	10	105
% Commercial	2.3	7.5	12.0	5.0	6.1	0	0	0	5.6	0.4	11.1	7.0	6.8	0	6.5	14.3	2.6	13.0	0	4.6	4.9



# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 92nd Loop at SE 110th Street Rd

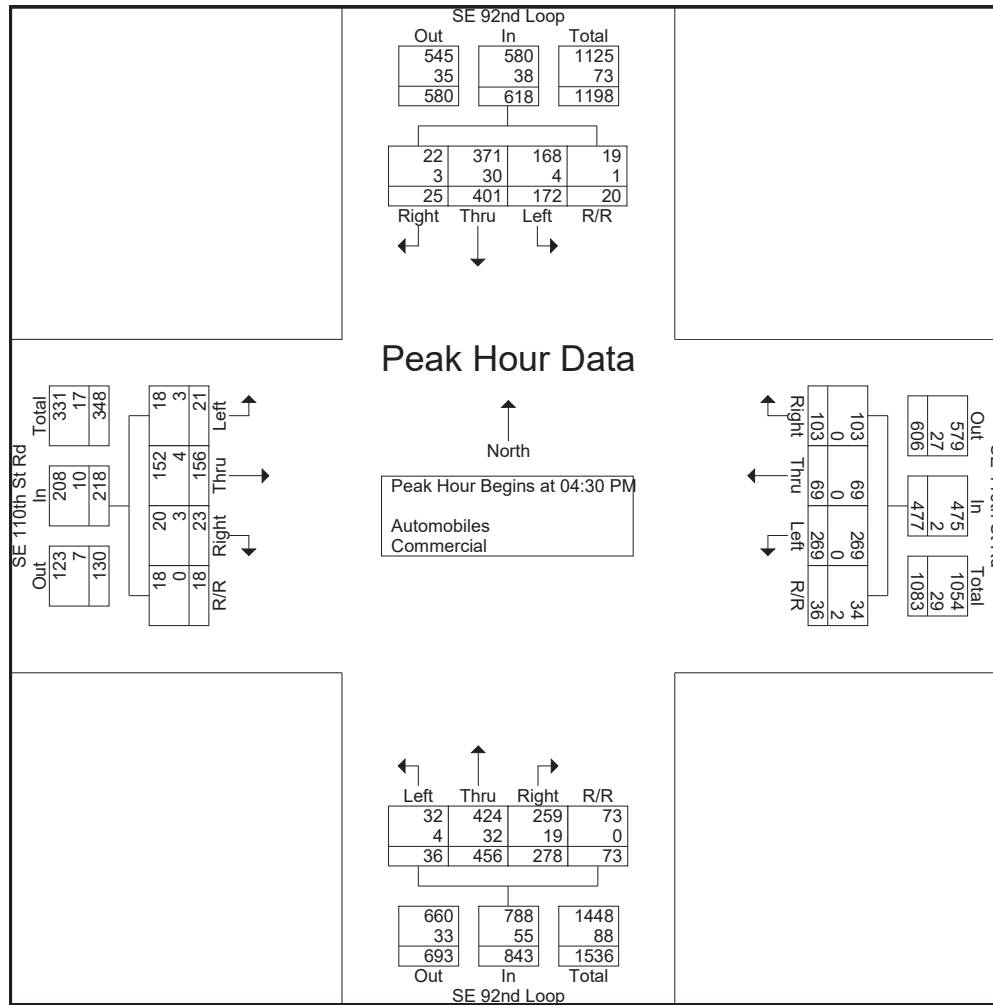
Marion County, FL

File Name : 05 92 at 110

Site Code : 00000005

Start Date : 11/14/2023

Page No : 5



# DE TRAFFIC

detraffic.com

(386) 341-4186

SE 92nd Loop at SE 110th Street Rd

Marion County, FL

File Name : 05 92 at 110

Site Code : 00000005

Start Date : 11/14/2023

Page No : 6

## Groups Printed- Peds

Start Time	SE 92nd Loop Southbound					SE 110th St Rd Westbound					SE 92nd Loop Northbound					SE 110th St Rd Eastbound					Int. Total	
	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total		
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0			
Total %																						



NB Approach



SB Approach



EB Approach



SE 58<sup>th</sup> Ave  
at SE 66<sup>th</sup> St

Marion County

[www.de-traffic.com](http://www.de-traffic.com)

299 McGregor Rd. DeLand Fl. 32720

Project  
Number: K&A-37

Sheet  
Number: 1



NB Approach



SB Approach



WB Approach



US 441  
at SE 92<sup>nd</sup> Place Rd

Marion County

[www.de-traffic.com](http://www.de-traffic.com)

299 McGregor Rd. DeLand Fl. 32720

Project  
Number: K&A-37

Sheet  
Number: 2



NB Approach



SB Approach



EB Approach



WB Approach



SE 58<sup>th</sup> Ave  
at SE 92<sup>nd</sup> Loop

Marion County

[www.de-traffic.com](http://www.de-traffic.com)

299 McGregor Rd. DeLand Fl. 32720

Project  
Number: K&A-37

Sheet  
Number: 3



NB Approach



SB Approach



EB Approach



WB Approach



SR 35  
at SR 25

Marion County

[www.de-traffic.com](http://www.de-traffic.com)

299 McGregor Rd. DeLand FL. 32720

Project  
Number: K&A-37

Sheet  
Number: 4



NB Approach



SB Approach



EB Approach



WB Approach



SE 92<sup>nd</sup> Loop  
at SE 110<sup>th</sup> St Rd

Marion County

[www.de-traffic.com](http://www.de-traffic.com)

299 McGregor Rd. DeLand FL. 32720

Project  
Number: K&A-37

Sheet  
Number: 5

## Peak Season Factor Category Report



2022 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL  
 CATEGORY: 3600 MARION COUNTYWIDE

WEEK	DATES	SF	MOCF: 0.94 PSCF
1	01/01/2022 - 01/01/2022	1.07	1.14
2	01/02/2022 - 01/08/2022	1.06	1.13
3	01/09/2022 - 01/15/2022	1.05	1.12
4	01/16/2022 - 01/22/2022	1.04	1.11
5	01/23/2022 - 01/29/2022	1.02	1.09
6	01/30/2022 - 02/05/2022	1.01	1.07
7	02/06/2022 - 02/12/2022	1.00	1.06
* 8	02/13/2022 - 02/19/2022	0.98	1.04
* 9	02/20/2022 - 02/26/2022	0.97	1.03
*10	02/27/2022 - 03/05/2022	0.96	1.02
*11	03/06/2022 - 03/12/2022	0.95	1.01
*12	03/13/2022 - 03/19/2022	0.94	1.00
*13	03/20/2022 - 03/26/2022	0.93	0.99
*14	03/27/2022 - 04/02/2022	0.92	0.98
*15	04/03/2022 - 04/09/2022	0.91	0.97
*16	04/10/2022 - 04/16/2022	0.90	0.96
*17	04/17/2022 - 04/23/2022	0.92	0.98
*18	04/24/2022 - 04/30/2022	0.94	1.00
*19	05/01/2022 - 05/07/2022	0.95	1.01
*20	05/08/2022 - 05/14/2022	0.97	1.03
21	05/15/2022 - 05/21/2022	0.99	1.05
22	05/22/2022 - 05/28/2022	0.99	1.05
23	05/29/2022 - 06/04/2022	1.00	1.06
24	06/05/2022 - 06/11/2022	1.00	1.06
25	06/12/2022 - 06/18/2022	1.01	1.07
26	06/19/2022 - 06/25/2022	1.02	1.09
27	06/26/2022 - 07/02/2022	1.02	1.09
28	07/03/2022 - 07/09/2022	1.03	1.10
29	07/10/2022 - 07/16/2022	1.03	1.10
30	07/17/2022 - 07/23/2022	1.03	1.10
31	07/24/2022 - 07/30/2022	1.03	1.10
32	07/31/2022 - 08/06/2022	1.03	1.10
33	08/07/2022 - 08/13/2022	1.03	1.10
34	08/14/2022 - 08/20/2022	1.03	1.10
35	08/21/2022 - 08/27/2022	1.04	1.11
36	08/28/2022 - 09/03/2022	1.05	1.12
37	09/04/2022 - 09/10/2022	1.06	1.13
38	09/11/2022 - 09/17/2022	1.07	1.14
39	09/18/2022 - 09/24/2022	1.05	1.12
40	09/25/2022 - 10/01/2022	1.03	1.10
41	10/02/2022 - 10/08/2022	1.01	1.07
42	10/09/2022 - 10/15/2022	0.99	1.05
43	10/16/2022 - 10/22/2022	0.99	1.05
44	10/23/2022 - 10/29/2022	1.00	1.06
45	10/30/2022 - 11/05/2022	1.00	1.06
46	11/06/2022 - 11/12/2022	1.01	1.07
47	11/13/2022 - 11/19/2022	1.01	1.07
48	11/20/2022 - 11/26/2022	1.03	1.10
49	11/27/2022 - 12/03/2022	1.04	1.11
50	12/04/2022 - 12/10/2022	1.06	1.13
51	12/11/2022 - 12/17/2022	1.07	1.14
52	12/18/2022 - 12/24/2022	1.06	1.13
53	12/25/2022 - 12/31/2022	1.05	1.12

\* PEAK SEASON

23-FEB-2023 09:11:22

830UPD

5\_3600\_PKSEASON.TXT

# 2023 Ocala Marion TPO CMP Database

Ocala Marion TPO CMP Database - August 2023

SEGMENT ID	ROAD NAME	FROM	TO	LANES (2023)	FUNCTIONAL CLASSIFICATION	FLOW	DAILY SERVICE VOLUME (2023)	PEAK HOUR DIRECTIONAL SERVICE VOLUME (2023)	2023 AADT	2023 DAILY V/MSV	2023 DAILY LOS
4550	SE 92 PL RD	US 441	SR 35	2	ARTERIAL	INTERRUPTED	12,744	634	10,900	0.86	C
1010	SE 92 PLACE LOOP	SR 35	US 441	4	ARTERIAL	UNINTERRUPTED	67,770	3,357	12,400	0.18	B
5080.1	SR 35	SR 25	SE 92ND PL	4	ARTERIAL	INTERRUPTED	32,970	1,722	12,700	0.39	C
5090.1	SR 35	SE 92ND PL	LAUREL RD	4	ARTERIAL	INTERRUPTED	58,485	3,056	27,600	0.47	B

# FDOT Count Station 360012

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2022 HISTORICAL AADT REPORT

COUNTY: 36 - MARION

SITE: 0012 - ON US 27/301/441, 0.076 MI. S OF SE 38TH TER (RCLP)

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2022	29500 C	N 15000	S 14500	9.00	55.10	7.30
2021	29500 S	N 15000	S 14500	9.00	53.20	7.30
2020	28500 F	N 14500	S 14000	9.00	53.40	7.30
2019	29500 C	N 15000	S 14500	9.00	53.80	7.30
2018	27500 C	N 14000	S 13500	9.00	54.30	9.40
2017	29000 C	N 15000	S 14000	9.00	55.50	7.40
2016	27500 C	N 14000	S 13500	9.00	56.10	7.00
2015	27500 C	N 14000	S 13500	9.00	56.30	6.90
2014	26500 C	N 13500	S 13000	9.00	56.80	7.30
2013	25500 C	N 13000	S 12500	9.00	56.70	7.20
2012	26500 C	N 13000	S 13500	9.00	56.70	5.50
2011	26000 C	N 13000	S 13000	9.00	56.00	6.90
2010	27500 C	N 14000	S 13500	10.14	57.07	7.00
2009	25500 C	N 13000	S 12500	10.04	59.21	6.40
2008	28500 C	N 14500	S 14000	9.73	57.40	9.00
2007	30000 C	N 15500	S 14500	9.71	57.95	8.30

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

## Marion County Directional Count Data

# Marion County OCE

## TRAFFIC ENGINEERING

412 SE 25th Ave, Ocala, FL 34471  
(352) 671-8686

Weather: Sunny  
Serial Number: 032507  
Installed By: Tommy Tieche  
Other Notes: TPO O(STA-76) A=E

Date Start: 02-May-23  
Date End: 03-May-23  
SE 92nd Place Rd East of US-441  
Site Code: 2023 073  
Latitude: 29' 5.2583 North  
Longitude: 82' 4.2810 West

Start Time	01-May-23		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	East	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West
12:00 AM	*	*	41	18	33	16	*	*	*	*	*	*	*	*	37	17
01:00	*	*	27	16	26	22	*	*	*	*	*	*	*	*	26	19
02:00	*	*	14	22	11	19	*	*	*	*	*	*	*	*	12	20
03:00	*	*	13	67	13	62	*	*	*	*	*	*	*	*	13	64
04:00	*	*	39	65	28	68	*	*	*	*	*	*	*	*	34	66
05:00	*	*	61	159	52	154	*	*	*	*	*	*	*	*	56	156
06:00	*	*	131	381	133	404	*	*	*	*	*	*	*	*	132	392
07:00	*	*	266	<b>801</b>	245	<b>736</b>	*	*	*	*	*	*	*	*	256	<b>768</b>
08:00	*	*	<b>290</b>	656	268	649	*	*	*	*	*	*	*	*	<b>279</b>	652
09:00	*	*	243	313	<b>290</b>	297	*	*	*	*	*	*	*	*	266	305
10:00	*	*	217	281	206	292	*	*	*	*	*	*	*	*	212	286
11:00	*	*	253	229	251	275	*	*	*	*	*	*	*	*	252	252
12:00 PM	*	*	316	292	296	295	*	*	*	*	*	*	*	*	306	294
01:00	*	*	257	333	280	325	*	*	*	*	*	*	*	*	268	329
02:00	*	*	382	338	382	336	*	*	*	*	*	*	*	*	382	337
03:00	*	*	443	<b>424</b>	488	<b>411</b>	*	*	*	*	*	*	*	*	466	<b>418</b>
04:00	*	*	<b>611</b>	356	<b>644</b>	389	*	*	*	*	*	*	*	*	<b>628</b>	372
05:00	*	*	611	349	621	384	*	*	*	*	*	*	*	*	616	366
06:00	*	*	382	269	400	297	*	*	*	*	*	*	*	*	391	283
07:00	*	*	274	174	282	192	*	*	*	*	*	*	*	*	278	183
08:00	*	*	233	144	281	156	*	*	*	*	*	*	*	*	257	150
09:00	*	*	115	86	148	73	*	*	*	*	*	*	*	*	132	80
10:00	*	*	61	61	83	71	*	*	*	*	*	*	*	*	72	66
11:00	*	*	43	23	56	35	*	*	*	*	*	*	*	*	50	29
Lane Day	0	0	5323	5857	5517	5958	0	0	0	0	0	0	0	0	5421	5904
AM Peak Vol.	-	-	08:00	07:00	09:00	07:00	-	-	-	-	-	-	-	-	08:00	07:00
PM Peak Vol.	-	-	16:00	15:00	16:00	15:00	-	-	-	-	-	-	-	-	16:00	15:00
Comb. Total	0	0	11180	11180	11475	11475	0	0	0	0	0	0	0	0	11325	11325
ADT	ADT 11,328	ADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328	AADT 11,328

## **Appendix D:** Signal Timings



## SE 58th Avenue (SR 35) at Laurel Road

STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION - DISTRICT FIVE  
SR 35 - TSMO Signal Retiming  
Marion County  
FIN 440412-1-32-02

Designed By:	S.M.P.
Date:	6/14/2022
Checked By:	R.A.A
Date:	6/14/2022

Section	36009000	Mile Post	4.156	Node	2
Sig ID	171	System ID		SOP	12
Maj. Street	SR 35	Orientation	N-S	Controller	Siemens m60
Min. Street	SE 66th Street	Orientation	E-W	Firmware	3.57b

Data Inputs									Time Of Day		
Movement # (Controller Phase Ø)	1	2	3	4	5	6	7	8	Weekday		
Direction	NBL	SB				NB		EB	Plan	C-O-S	Time
Speed Limit (mph)	45	45				45		30	FREE	0/0/4	0:00
Vehicle Traversed Width	151	125				125		100	AM	1/1/1	6:30
Approach Grades	0.2%	-1.0%				0.2%		-0.5%	MIDDAY	2/1/1	9:00
Ped-X (curb to curb)		80						109	PM	3/1/1	13:50
Crossing Time		23						32	FREE	0/0/4	18:30
Ped-X (button to curb)		8						7			
Ped-X (button to far curb)		88						116			
Crossing Time (to far curb)		30						39			

Controller Timings (seconds)									Weekend		
Movement # (Controller Phase Ø)	1	2	3	4	5	6	7	8	Saturday		
Direction	NBL	SB				NB		EB	Plan	C-O-S	Time
Turn Type	Prot								FREE	0/0/4	0:00
Min Green	5	15				15		5	MIDDAY	2/1/1	9:00
Ext	3.0	3.0				3.0		3.0	FREE	0/0/4	17:30
Yellow Change Interval	4.8	4.9				4.9		3.7			
Red Clearance Interval	3.7	2.0				2.0		2.0			
Max I	20	45				45		40			
Max II											
Walk		7						7			
Flashing Don't Walk		23						32	Sunday		
Min Splits	14.0	37.0				22.0		45.0	Plan	C-O-S	Time
Non-Lock Detection								Yes	FREE	0/0/4	0:00
Det. Cross Switch.									MIDDAY	2/1/1	10:00
Recall		Min				Min			FREE	0/0/4	17:00
Dual Entry											
Coord Phase		ON				ON					

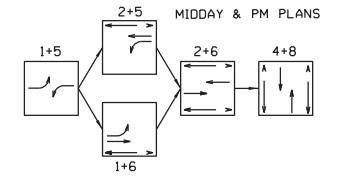
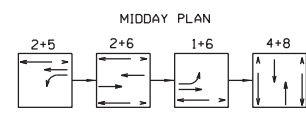
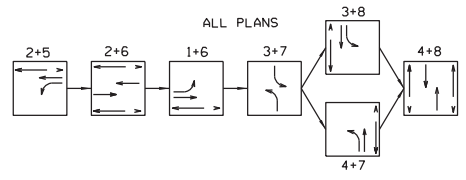
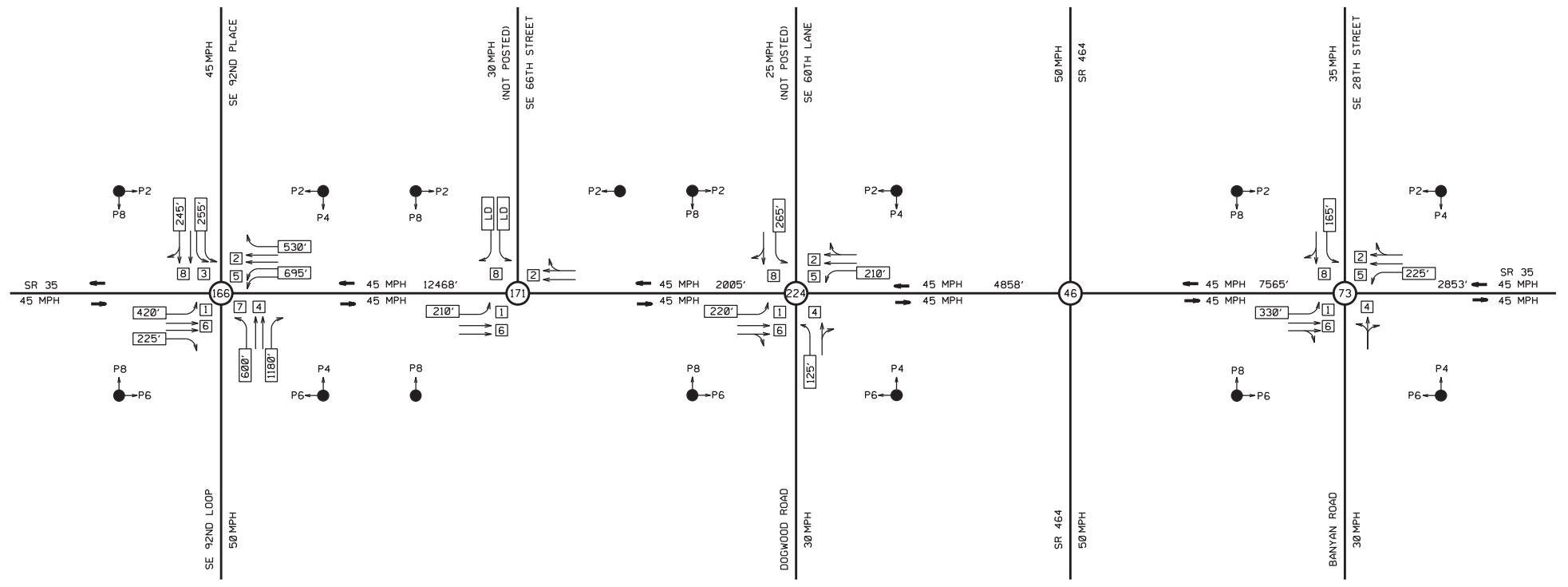
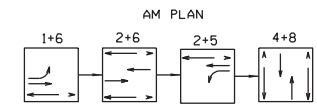
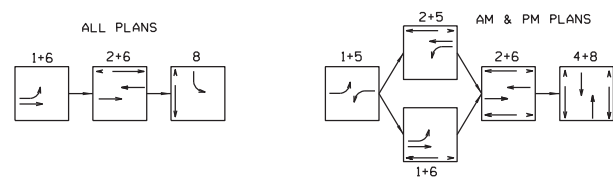
Coordination Timings (seconds)													
Plan	Pattern	C-O-S	Splits								Cycle Length	Offset	Seq
AM		1/1/1	19	66	-	-	-	85	-	35	120	28	0
MIDDAY		2/1/1	18	49	-	-	-	67	-	33	100	8	0
PM		3/1/1	20	76	-	-	-	96	-	44	140	6	0

- Notes**
- 1) Offset referenced to end of first through movement 2 & 6
  - 2) Use Plan Force-Offs
  - 3) Program Max Inhibit





NOT TO SCALE



\*SEE TIMING SHEETS FOR ALL PHASING PLANS

NODE NO.	1	SIGNAL OPERATING PLAN	
STORAGE LENGTH	315'	PEDESTRIAN SIGNAL	
PHASE NO.	2	LANE GEOMETRY	
LANE DROP	LD		

HDR Engineering, Inc.  
 315 E. Robinson Street, Suite 400  
 Orlando, FL 32801-1949  
 (407) 426-4200  
 www.hdrinc.com  
 Certificate of Authorization No. 4213

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 35	MARION	440412-1-32-02

**LINK NODE DIAGRAM  
DISTRICTWIDE TSM&O**

#USERS #DATES #TIME# #FILES#

## US 441/US 301 at SE 92nd Place Road

**STATE OF FLORIDA**  
**DEPARTMENT OF TRANSPORTATION**  
TSM&O Continuing Services Contract - Marion County 2018  
FM: 440412-1-32-01

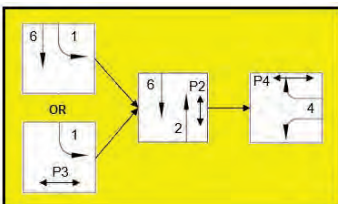
US 27/441 at SE 92nd Place Road (165)		SIGID: 36043	Prepared By: RSJ	Date: 10/11/18
North-South Roadway	US 27/441	East-West Roadway	SE 92nd Place Road (165)	

PHASE TIMES							
MOVEMENT	1	2		4		6	
DIRECTION	SBL	NB		WB		SB	
LEFT TURN	Prot/Perm	Perm		Prot		Perm	
MIN GRN	5	17		8		17	
GAP EXT	3.0	3.5		3.0		3.5	
YEL CLR	5.5	5.5		4.8		5.5	
RED CLR	2.2	2.2		3.5		2.2	
MAX 1	12	40		30		40	
MAX 2	30	50		50		50	
WALK							
PED CLR							

	TIME BASE COORDINATION				COORDINATION PATTERN TABLES			
	Plan	Start	End	Pattern	Cycle Length	Offset	Split	Sequence
<b>Weekday</b> (Monday-Friday)	Free	0:00	6:30	0/0/4	Free			
	AM	6:30	10:00	1/1/1	130	22	1	0
	Midday	10:00	14:00	1/2/1	130	43	2	0
	PM	14:00	18:15	2/1/1	140	102	1	0
	Free	18:15	0:00	0/0/4	Free			
<b>Weekend</b> (Saturday-Sunday)	Free	0:00	10:00	0/0/4	Free			
	Weekend	10:00	17:00	1/3/1	130	43	3	0
	Free	17:00	0:00	0/0/4	Free			

COORDINATION PATTERN TABLES							
<b>1/1/1</b>							
Phase	1	2		4		6	
Time (sec)	21	72		37		93	
Coord Phase		X				X	
Mode		Max				Max	
<b>1/2/1</b>							
Phase	1	2		4		6	
Time (sec)	18	87		25		105	
Coord Phase		X				X	
Mode		Max				Max	
<b>1/3/1</b>							
Phase	1	2		4		6	
Time (sec)	18	87		25		105	
Coord Phase		X				X	
Mode		Max				Max	
<b>2/1/1</b>							
Phase	1	2		4		6	
Time (sec)	35	80		25		115	
Coord Phase		X				X	
Mode		Max				Max	

NOTES	
1. Controller Type: Siemens a.) Model: m50 b.) Software: 3.34g	2. Offset Reference: End of Green 3. Force Mode: Plan 4. Inhibit Max during coordination

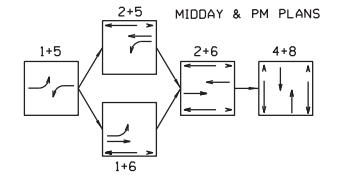
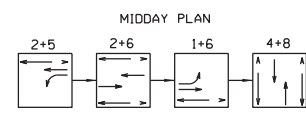
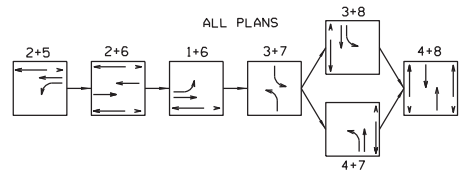
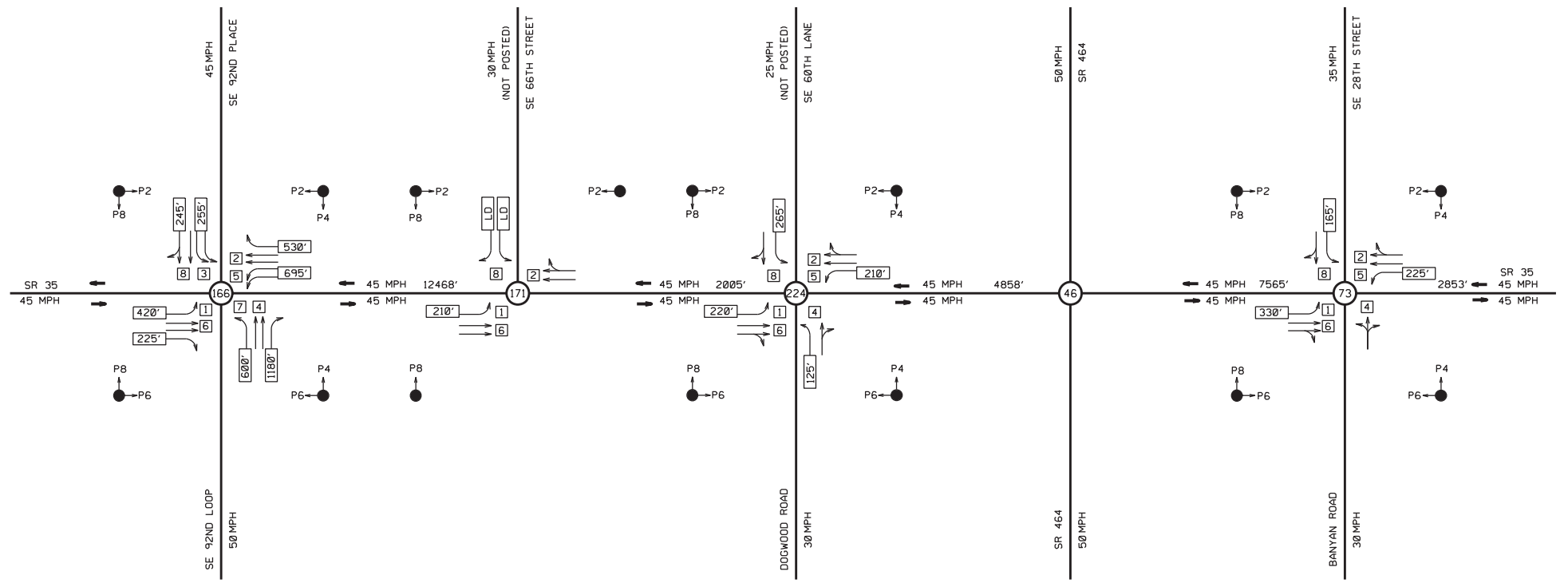
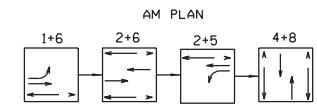
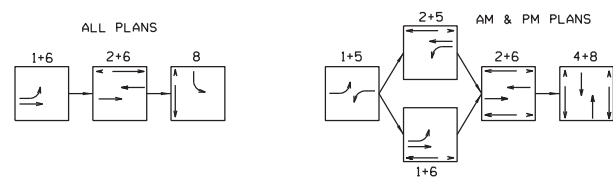


SE 58th Avenue (SR 35) at SE 92nd Place Road/SE  
92nd Loop





NOT TO SCALE



\*SEE TIMING SHEETS FOR ALL PHASING PLANS

NODE NO.	①	SIGNAL OPERATING PLAN	
STORAGE LENGTH	315'	PEDESTRIAN SIGNAL	
PHASE NO.	2	LANE GEOMETRY	
LANE DROP	LD		

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 35	MARION	440412-1-32-02

LINK NODE DIAGRAM  
 DISTRICTWIDE TSM&O

#USERS #DATES #TIME #FILES



## SE 58th Avenue (SR 35) at SR 25



**Marion County  
Office of the County Engineer**

Signal ID	Major Street	Minor Street	Date	Technician
220	SE Hames Rd (SR 25) / SE 110th St	SE Baseline Rd (SR 35)	8/4/2023	Solimando

**Basic Timing**

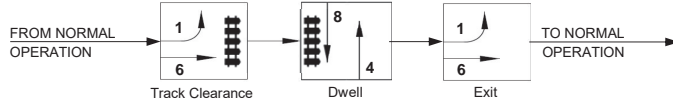
PHASE	Φ 1	Φ 2	Φ 3	Φ 4	Φ 5	Φ 6	Φ 7	Φ 8
DIRECTION	EBLT	WB	SBLT	NB		EB		SB
LEFT TURN MODE	Prot-Perm		Prot-Perm					
MIN GRN	6	24	6	10		24		10
GAP EXT	4.0	4.0	4.0	4.0		4.0		4.0
MAX 1	24	45	18	25		45		28
MAX 2								
YEL CLR	4.2	4.2	4.1	4.1		4.2		4.1
RED CLR	3.7	3.7	2.9	2.9		3.7		2.9
WALK								
PED CLR								
MIN RECALL		X				X		
MAX RECALL								
NON-LOCK CALL	X		X	X				X
DUAL ENTRY				X				X
NO SIMUL GAP								

**Signal Operating Plans**

**Normal Plan**



**Railroad Preemption Plan**



**Additional Notes (Turning Restrictions?, Overlaps?, Etc.)**

1) Railroad Preemption Timings (Preempt 1):

Min Green Before Preempt = 10, Non-Lock Preempt Call = YES, Track Green = 15, Min Dwell Green = 5

Yellow & Red Clearance times for Preemption equal to clearance times for Normal Operation (Set Yellow & Red = 0.0 for Select, Track, & Return)

Coordination? Yes  No

**Splits for Coordination**

Plan	Phase Number								Cycle Length	Offset
	1	2	3	4	5	6	7	8		

**Weekday Schedule (Mon-Fri)**

Plan	Start Time

**Weekend Schedule (Sat-Sun)**

Plan	Start Time

**General Coordination Data**

Coord Mode	Max Mode	Correction Mode	Offset Mode	Force Mode

**Detector Data**

Veh Detector Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Detector Phase	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Ped Detector Phase	1	2	3	4	5	6	7	8								
Ped Detector Phase	1	2	3	4	5	6	7	8								

## SE 92nd Loop at SE 110th Street Road

**Marion County  
Office of the County Engineer**



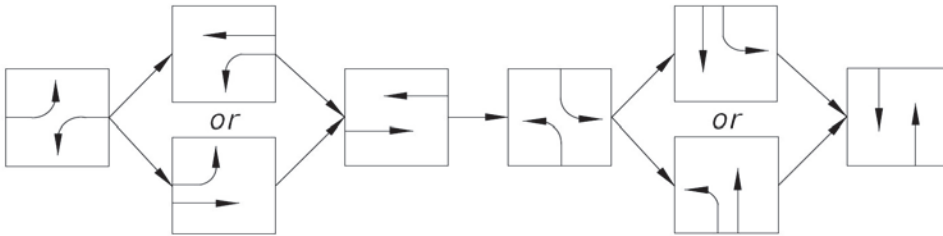
**Field Notes**

Signal ID	Major Street	Minor Street	Date	Technician
295	SE 92nd Loop	SE 110th St Rd	12/15/2020	Youman

**Basic Timing**

PHASE	Φ 1	Φ 2	Φ 3	Φ 4	Φ 5	Φ 6	Φ 7	Φ 8
DIRECTION	NBLT	SB	EBLT	WB	SBLT	NB	WBLT	EB
MIN GRN	8	16	8	8	8	16	8	8
GAP EXT	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MAX 1	15	50	15	35	15	50	15	35
MAX 2								
YEL CLR	5.1	5.1	4.0	4.0	5.1	5.1	4.0	4.0
RED CLR	2.0	2.0	2.0	3.3	2.0	2.0	2.0	3.3
WALK		7		7		7		7
PED CLR		17		27		17		27
MIN RECALL		X				X		
MAX RECALL								
PED RECALL								
NON-LOCK CALL	X		X	X	X		X	X
DUAL ENTRY				X				X
REST IN WALK								

**Signal Operating Plan**



Additional Notes (Turning Restrictions?, Overlaps?, Etc.)

Coordination

Yes

No

Split	Movement Number								COMMENTS
	1	2	3	4	5	6	7	8	
1									
2									
3									

Time Patterns for Coordination

## **Appendix E:** Existing Synchro Reports

# Lanes, Volumes, Timings

1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	123	46	32	888	1232	177
Future Volume (vph)	123	46	32	888	1232	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	265			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.981	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1687	1429	1378	3505	3417	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1687	1429	1378	3505	3417	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		48			18	
Link Speed (mph)	30			45	45	
Link Distance (ft)	484			829	1271	
Travel Time (s)	11.0			12.6	19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	13%	31%	3%	3%	8%
Adj. Flow (vph)	129	48	34	935	1297	186
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	48	34	935	1483	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	8		1	6	2	

Lanes, Volumes, Timings  
 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024

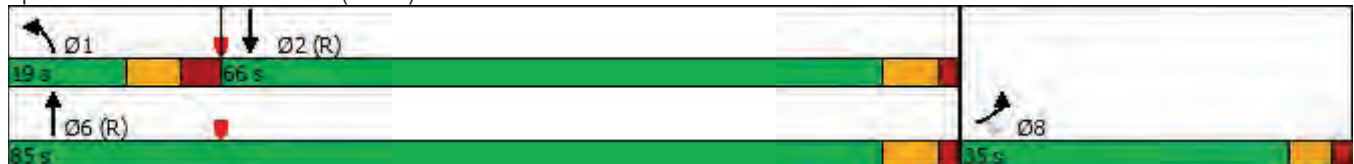


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		8				
Detector Phase	8	8	1	6	2	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	15.0	15.0	
Minimum Split (s)	44.7	44.7	13.5	24.9	36.9	
Total Split (s)	35.0	35.0	19.0	85.0	66.0	
Total Split (%)	29.2%	29.2%	15.8%	70.8%	55.0%	
Maximum Green (s)	29.3	29.3	10.5	78.1	59.1	
Yellow Time (s)	3.7	3.7	4.8	4.9	4.9	
All-Red Time (s)	2.0	2.0	3.7	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	8.5	6.9	6.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0			7.0	
Flash Dont Walk (s)	32.0	32.0			23.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	14.5	14.5	8.5	92.9	81.8	
Actuated g/C Ratio	0.12	0.12	0.07	0.77	0.68	
v/c Ratio	0.64	0.22	0.35	0.34	0.64	
Control Delay	63.5	14.9	62.2	4.9	14.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.5	14.9	62.2	4.9	14.7	
LOS	E	B	E	A	B	
Approach Delay	50.3			6.9	14.7	
Approach LOS	D			A	B	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	28 (23%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	110
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	14.2
Intersection LOS:	B
Intersection Capacity Utilization	57.0%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.



HCM 6th Signalized Intersection Summary  
 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	123	46	32	888	1232	177
Future Volume (veh/h)	123	46	32	888	1232	177
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1707	1441	1856	1856	1781
Adj Flow Rate, veh/h	129	41	34	935	1297	175
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	13	31	3	3	8
Cap, veh/h	160	136	57	2825	2151	289
Arrive On Green	0.09	0.09	0.04	0.80	0.69	0.69
Sat Flow, veh/h	1711	1447	1372	3618	3217	419
Grp Volume(v), veh/h	129	41	34	935	728	744
Grp Sat Flow(s),veh/h/ln	1711	1447	1372	1763	1763	1780
Q Serve(g_s), s	8.9	3.2	2.9	8.6	26.3	26.8
Cycle Q Clear(g_c), s	8.9	3.2	2.9	8.6	26.3	26.8
Prop In Lane	1.00	1.00	1.00			0.24
Lane Grp Cap(c), veh/h	160	136	57	2825	1214	1226
V/C Ratio(X)	0.80	0.30	0.59	0.33	0.60	0.61
Avail Cap(c_a), veh/h	418	353	120	2825	1214	1226
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.3	50.7	56.5	3.2	9.9	10.0
Incr Delay (d2), s/veh	9.0	1.2	9.5	0.3	2.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	1.2	1.1	2.1	9.2	9.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	62.3	51.9	66.0	3.5	12.1	12.2
LnGrp LOS	E	D	E	A	B	B
Approach Vol, veh/h				969	1472	
Approach Delay, s/veh				5.7	12.2	
Approach LOS				A	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.5	89.5			103.0	17.0
Change Period (Y+Rc), s	* 8.5	6.9			6.9	5.7
Max Green Setting (Gmax), s	* 11	59.1			78.1	29.3
Max Q Clear Time (g_c+l1), s	4.9	28.8			10.6	10.9
Green Ext Time (p_c), s	0.0	11.9			7.4	0.4

Intersection Summary

HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B












Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations							
Traffic Volume (vph)	371	309	1109	190	202	946	
Future Volume (vph)	371	309	1109	190	202	946	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	465	0		0	500		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				25		
Lane Util. Factor	0.97	1.00	0.95	0.95	1.00	0.95	
Frt		0.850	0.978				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	3367	1509	3295	0	1504	3438	
Flt Permitted	0.950				0.091		
Satd. Flow (perm)	3367	1509	3295	0	144	3438	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		319	16				
Link Speed (mph)	45		45			45	
Link Distance (ft)	886		2249			1233	
Travel Time (s)	13.4		34.1			18.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	
Heavy Vehicles (%)	4%	7%	7%	8%	20%	5%	
Adj. Flow (vph)	382	319	1143	196	208	975	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	382	319	1339	0	208	975	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	24		12			12	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2		1	2	
Detector Template	Left	Right	Thru		Left	Thru	
Leading Detector (ft)	20	20	100		20	100	
Trailing Detector (ft)	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	
Detector 1 Size(ft)	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA		pm+pt	NA	
Protected Phases	4		2		1	6	3

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Permitted Phases		4			6		
Detector Phase	4	4	2		1	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	17.0		5.0	17.0	5.0
Minimum Split (s)	35.7	35.7	48.7		12.7	25.7	37.5
Total Split (s)	37.0	37.0	49.0		21.0	70.0	23.0
Total Split (%)	28.5%	28.5%	37.7%		16.2%	53.8%	18%
Maximum Green (s)	31.3	31.3	41.3		13.3	62.3	14.5
Yellow Time (s)	3.4	3.4	5.5		5.5	5.5	5.5
All-Red Time (s)	2.3	2.3	2.2		2.2	2.2	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7	7.7		7.7	7.7	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max	None
Walk Time (s)	7.0	7.0	7.0				7.0
Flash Dont Walk (s)	23.0	23.0	34.0				22.0
Pedestrian Calls (#/hr)	0	0	0				0
Act Effct Green (s)	20.4	20.4	66.4		96.2	96.2	
Actuated g/C Ratio	0.16	0.16	0.51		0.74	0.74	
v/c Ratio	0.72	0.63	0.79		0.62	0.38	
Control Delay	60.0	10.8	31.1		28.9	7.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	60.0	10.8	31.1		28.9	7.0	
LOS	E	B	C		C	A	
Approach Delay	37.6		31.1			10.9	
Approach LOS	D		C			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 22 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 145  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 25.1  
 Intersection Capacity Utilization 76.1%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service D

Splits and Phases: 2: US 441 & SE 92nd PI Rd.



# HCM Signalized Intersection Capacity Analysis

## 2: US 441 & SE 92nd PI Rd.

03/08/2024


























Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	371	309	1109	190	202	946
Future Volume (vph)	371	309	1109	190	202	946
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	7.7		7.7	7.7
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3367	1509	3295		1504	3438
Flt Permitted	0.95	1.00	1.00		0.09	1.00
Satd. Flow (perm)	3367	1509	3295		145	3438
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	382	319	1143	196	208	975
RTOR Reduction (vph)	0	269	8	0	0	0
Lane Group Flow (vph)	382	50	1331	0	208	975
Heavy Vehicles (%)	4%	7%	7%	8%	20%	5%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	20.4	20.4	66.4		96.2	96.2
Effective Green, g (s)	20.4	20.4	66.4		96.2	96.2
Actuated g/C Ratio	0.16	0.16	0.51		0.74	0.74
Clearance Time (s)	5.7	5.7	7.7		7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	528	236	1682		338	2544
v/s Ratio Prot	c0.11		c0.40		c0.10	0.28
v/s Ratio Perm		0.03			0.35	
v/c Ratio	0.72	0.21	0.79		0.62	0.38
Uniform Delay, d1	52.1	47.8	26.1		26.8	6.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.9	0.5	3.9		3.3	0.4
Delay (s)	57.0	48.2	30.0		30.1	6.6
Level of Service	E	D	C		C	A
Approach Delay (s)	53.0		30.0			10.7
Approach LOS	D		C			B

### Intersection Summary

HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	29.6
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	168	105	27	297	225	89	635	52	278	763	297
Future Volume (vph)	163	168	105	27	297	225	89	635	52	278	763	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		345	645		1000	485		300	765		575
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt		0.942				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3303	3015	0	1626	3505	1553	1752	3505	1417	3467	3438	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3303	3015	0	1626	3505	1553	1752	3505	1417	3467	3438	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		78				232			155			306
Link Speed (mph)		45			50			45			45	
Link Distance (ft)		1046			1493			1329			994	
Travel Time (s)		15.8			20.4			20.1			15.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	6%	17%	6%	11%	3%	4%	3%	3%	14%	1%	5%	2%
Adj. Flow (vph)	168	173	108	28	306	232	92	655	54	287	787	306
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	281	0	28	306	232	92	655	54	287	787	306
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						4			6			2
Detector Phase	3	8		7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	15.0		5.0	15.0	15.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	16.9	51.2		15.0	52.2	52.2	13.8	49.9	49.9	13.9	43.9	43.9
Total Split (s)	30.9	37.2		28.9	35.2	35.2	30.8	54.9	54.9	32.9	56.9	56.9
Total Split (%)	20.1%	24.2%		18.8%	22.9%	22.9%	20.0%	35.7%	35.7%	21.4%	37.0%	37.0%
Maximum Green (s)	22.0	30.0		20.0	28.0	28.0	22.0	48.0	48.0	24.0	50.0	50.0
Yellow Time (s)	5.0	5.2		5.2	5.2	5.2	4.8	4.9	4.9	4.9	4.9	4.9
All-Red Time (s)	3.9	2.0		3.7	2.0	2.0	4.0	2.0	2.0	4.0	2.0	2.0
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)	8.9	7.2		8.9	7.2	7.2	8.8	6.9	6.9	8.9	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		9.0			8.0	8.0		9.0	9.0		7.0	7.0
Flash Dont Walk (s)		35.0			37.0	37.0		34.0	34.0		30.0	30.0
Pedestrian Calls (#/hr)		0			0	0		0	0		0	0
Act Effct Green (s)	11.4	28.1		7.6	17.3	17.3	11.5	29.6	29.6	14.8	33.0	33.0
Actuated g/C Ratio	0.11	0.27		0.07	0.16	0.16	0.11	0.28	0.28	0.14	0.31	0.31
v/c Ratio	0.47	0.33		0.24	0.54	0.52	0.48	0.67	0.11	0.59	0.73	0.43
Control Delay	51.9	27.7		57.3	46.7	10.5	56.8	37.8	0.4	49.9	37.4	5.3
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	51.9	27.7		57.3	46.7	10.5	56.8	37.8	0.4	49.9	37.4	5.3
LOS	D	C		E	D	B	E	D	A	D	D	A
Approach Delay		36.7			32.4			37.4			32.8	
Approach LOS		D			C			D			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 153.9  
 Actuated Cycle Length: 105.8  
 Natural Cycle: 135  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 34.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 71.7%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 3: 58th Ave. (SR 35) & SE 92nd PI Rd.



HCM 6th Signalized Intersection Summary  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	168	105	27	297	225	89	635	52	278	763	297
Future Volume (veh/h)	163	168	105	27	297	225	89	635	52	278	763	297
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1648	1811	1737	1856	1841	1856	1856	1693	1885	1826	1870
Adj Flow Rate, veh/h	168	173	86	28	306	185	92	655	31	287	787	277
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	17	6	11	3	4	3	3	14	1	5	2
Cap, veh/h	302	483	230	47	608	269	120	911	371	390	1054	481
Arrive On Green	0.09	0.23	0.23	0.03	0.17	0.17	0.07	0.26	0.26	0.11	0.30	0.30
Sat Flow, veh/h	3346	2059	979	1654	3526	1560	1767	3526	1434	3483	3469	1585
Grp Volume(v), veh/h	168	130	129	28	306	185	92	655	31	287	787	277
Grp Sat Flow(s),veh/h/ln	1673	1566	1472	1654	1763	1560	1767	1763	1434	1742	1735	1585
Q Serve(g_s), s	4.2	6.0	6.4	1.5	6.8	9.7	4.5	14.7	1.4	6.9	17.8	12.8
Cycle Q Clear(g_c), s	4.2	6.0	6.4	1.5	6.8	9.7	4.5	14.7	1.4	6.9	17.8	12.8
Prop In Lane	1.00		0.66	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	302	367	345	47	608	269	120	911	371	390	1054	481
V/C Ratio(X)	0.56	0.35	0.37	0.60	0.50	0.69	0.77	0.72	0.08	0.74	0.75	0.58
Avail Cap(c_a), veh/h	846	540	508	380	1135	502	447	1946	792	961	1994	911
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.9	27.8	27.9	41.8	32.6	33.8	39.9	29.4	24.4	37.4	27.3	25.5
Incr Delay (d2), s/veh	1.6	0.6	0.7	11.7	0.6	3.1	9.8	1.1	0.1	2.7	1.1	1.1
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	1.7	2.2	2.2	0.7	2.8	3.7	2.2	5.9	0.5	2.9	6.9	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.5	28.4	28.6	53.4	33.3	36.9	49.7	30.5	24.5	40.1	28.3	26.6
LnGrp LOS	D	C	C	D	C	D	D	C	C	D	C	C
Approach Vol, veh/h		427			519			778			1351	
Approach Delay, s/veh		32.8			35.6			32.5			30.5	
Approach LOS		C			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.7	33.3	16.8	22.2	18.6	29.4	11.4	27.6				
Change Period (Y+Rc), s	8.8	6.9	* 8.9	7.2	* 8.9	6.9	* 8.9	7.2				
Max Green Setting (Gmax), s	22.0	50.0	* 22	28.0	* 24	48.0	* 20	30.0				
Max Q Clear Time (g_c+I1), s	6.5	19.8	6.2	11.7	8.9	16.7	3.5	8.4				
Green Ext Time (p_c), s	0.2	6.7	0.4	2.1	0.8	4.5	0.0	1.3				

Intersection Summary























HCM 6th Ctrl Delay	32.2
HCM 6th LOS	C

Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	314	35	35	226	143	21	305	26	140	530	295
Future Volume (vph)	142	314	35	35	226	143	21	305	26	140	530	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	255		0	330		225	240		0	215		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.985				0.850		0.988			0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1812	0	1656	1759	1553	1641	1794	0	1752	1724	0
Flt Permitted	0.378			0.537			0.159			0.207		
Satd. Flow (perm)	691	1812	0	936	1759	1553	275	1794	0	382	1724	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				155		3			22	
Link Speed (mph)		35			35			40			35	
Link Distance (ft)		608			801			775			744	
Travel Time (s)		11.8			15.6			13.2			14.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	6%	9%	8%	4%	10%	4%	12%	3%	5%	3%
Adj. Flow (vph)	154	341	38	38	246	155	23	332	28	152	576	321
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	379	0	38	246	155	23	360	0	152	897	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	1	6			2			4		3	8	

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

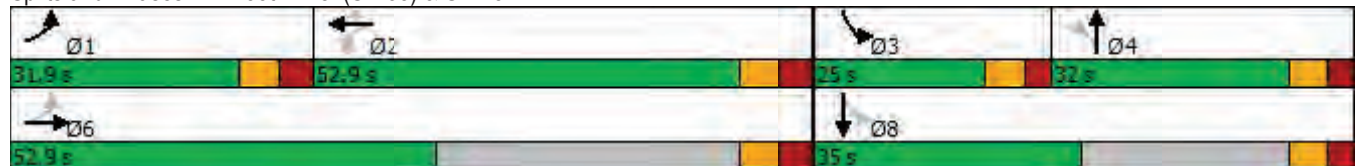


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6			2		2	4			8		
Detector Phase	1	6		2	2	2	4	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	24.0		24.0	24.0	24.0	10.0	10.0		6.0	10.0	
Minimum Split (s)	13.9	31.9		31.9	31.9	31.9	25.0	25.0		13.0	25.0	
Total Split (s)	31.9	52.9		52.9	52.9	52.9	32.0	32.0		25.0	35.0	
Total Split (%)	22.5%	37.3%		37.3%	37.3%	37.3%	22.6%	22.6%		17.6%	24.7%	
Maximum Green (s)	24.0	45.0		45.0	45.0	45.0	25.0	25.0		18.0	28.0	
Yellow Time (s)	4.2	4.2		4.2	4.2	4.2	4.1	4.1		4.1	4.1	
All-Red Time (s)	3.7	3.7		3.7	3.7	3.7	2.9	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.9	7.9		7.9	7.9	7.9	7.0	7.0		7.0	7.0	
Lead/Lag	Lead			Lag			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Act Effct Green (s)	45.6	45.6		25.4	25.4	25.4	25.1	25.1		44.5	44.5	
Actuated g/C Ratio	0.43	0.43		0.24	0.24	0.24	0.24	0.24		0.42	0.42	
v/c Ratio	0.36	0.48		0.17	0.58	0.32	0.35	0.84		0.47	1.21	
Control Delay	21.3	23.5		35.5	42.3	7.3	54.3	57.0		25.1	135.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	21.3	23.5		35.5	42.3	7.3	54.3	57.0		25.1	135.2	
LOS	C	C		D	D	A	D	E		C	F	
Approach Delay	22.9			29.4			56.9			119.2		
Approach LOS	C			C			E			F		

Intersection Summary

Area Type:	Other
Cycle Length:	141.8
Actuated Cycle Length:	105.1
Natural Cycle:	105
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.21
Intersection Signal Delay:	71.5
Intersection LOS:	E
Intersection Capacity Utilization:	119.0%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 4: 58th Ave. (SR 35) & SR 25





HCM 6th Signalized Intersection Summary  
 4: 58th Ave. (SR 35) & SR 25

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	314	35	35	226	143	21	305	26	140	530	295
Future Volume (veh/h)	142	314	35	35	226	143	21	305	26	140	530	295
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1856	1811	1767	1781	1841	1752	1841	1722	1856	1826	1856
Adj Flow Rate, veh/h	154	341	37	38	246	153	23	332	0	152	576	317
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	3	6	9	8	4	10	4	12	3	5	3
Cap, veh/h	357	695	75	316	450	394	76	484		328	465	256
Arrive On Green	0.09	0.42	0.42	0.25	0.25	0.25	0.26	0.26	0.00	0.08	0.42	0.42
Sat Flow, veh/h	1753	1645	178	949	1781	1560	583	1841	0	1767	1107	609
Grp Volume(v), veh/h	154	0	378	38	246	153	23	332	0	152	0	893
Grp Sat Flow(s),veh/h/ln	1753	0	1823	949	1781	1560	583	1841	0	1767	0	1716
Q Serve(g_s), s	5.8	0.0	14.3	3.0	11.4	7.7	0.0	15.4	0.0	5.7	0.0	39.9
Cycle Q Clear(g_c), s	5.8	0.0	14.3	3.0	11.4	7.7	25.0	15.4	0.0	5.7	0.0	39.9
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.00	1.00		0.35
Lane Grp Cap(c), veh/h	357	0	771	316	450	394	76	484		328	0	721
V/C Ratio(X)	0.43	0.00	0.49	0.12	0.55	0.39	0.30	0.69		0.46	0.00	1.24
Avail Cap(c_a), veh/h	648	0	864	525	844	739	76	484		516	0	721
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	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.4	0.0	20.0	27.6	30.8	29.4	47.5	31.5	0.0	22.6	0.0	27.5
Incr Delay (d2), s/veh	1.2	0.0	0.7	0.2	1.5	0.9	3.2	4.4	0.0	1.4	0.0	118.7
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	2.4	0.0	5.9	0.7	4.9	2.9	0.6	7.1	0.0	2.4	0.0	39.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	0.0	20.7	27.9	32.2	30.3	50.6	35.9	0.0	24.1	0.0	146.3
LnGrp LOS	C	A	C	C	C	C	D	D		C	A	F
Approach Vol, veh/h		532			437			355			1045	
Approach Delay, s/veh		21.5			31.2			36.8			128.5	
Approach LOS		C			C			D			F	
Timer - Assigned Phs	1	2	3	4		6		8				
Phs Duration (G+Y+Rc), s	16.2	31.9	14.9	32.0		48.1		46.9				
Change Period (Y+Rc), s	* 7.9	* 7.9	7.0	7.0		* 7.9		7.0				
Max Green Setting (Gmax), s	* 24	* 45	18.0	25.0		* 45		28.0				
Max Q Clear Time (g_c+I1), s	7.8	13.4	7.7	27.0		16.3		41.9				
Green Ext Time (p_c), s	0.6	3.3	0.4	0.0		3.4		0.0				

Intersection Summary

























HCM 6th Ctrl Delay	72.8
HCM 6th LOS	E

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	88	32	81	91	133	23	436	275	80	440	40
Future Volume (vph)	23	88	32	81	91	133	23	436	275	80	440	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	475		475	485		485	390		400	400		400
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	1727	1482	1736	1827	1583	1543	3471	1583	1787	3406	1346
Flt Permitted	0.697			0.528			0.492			0.405		
Satd. Flow (perm)	1172	1727	1482	965	1827	1583	799	3471	1583	762	3406	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132			136			281			133
Link Speed (mph)		30			30			50				30
Link Distance (ft)		828			917			1237				1406
Travel Time (s)		18.8			20.8			16.9				32.0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	13%	10%	9%	4%	4%	2%	17%	4%	2%	1%	6%	20%
Adj. Flow (vph)	23	90	33	83	93	136	23	445	281	82	449	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	90	33	83	93	136	23	445	281	82	449	41
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8		8	4		4	6		6	2		2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	16.0	16.0	8.0	16.0	16.0
Minimum Split (s)	14.0	41.3	41.3	14.0	41.3	41.3	15.1	31.1	31.1	15.1	31.1	31.1
Total Split (s)	21.0	42.3	42.3	21.0	42.3	42.3	22.1	57.1	57.1	22.1	57.1	57.1
Total Split (%)	14.7%	29.7%	29.7%	14.7%	29.7%	29.7%	15.5%	40.1%	40.1%	15.5%	40.1%	40.1%
Maximum Green (s)	15.0	35.0	35.0	15.0	35.0	35.0	15.0	50.0	50.0	15.0	50.0	50.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.1	5.1	5.1	5.1	5.1	5.1
All-Red Time (s)	2.0	3.3	3.3	2.0	3.3	3.3	2.0	2.0	2.0	2.0	2.0	2.0
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	0.0
Total Lost Time (s)	6.0	7.3	7.3	6.0	7.3	7.3	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	17.3	10.1	10.1	21.3	16.5	16.5	24.4	18.5	18.5	28.2	25.0	25.0
Actuated g/C Ratio	0.26	0.15	0.15	0.32	0.25	0.25	0.37	0.28	0.28	0.42	0.37	0.37
v/c Ratio	0.06	0.34	0.10	0.20	0.21	0.28	0.06	0.46	0.44	0.18	0.35	0.07
Control Delay	16.7	33.8	0.6	17.5	25.9	7.7	12.4	25.1	5.9	12.9	19.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	33.8	0.6	17.5	25.9	7.7	12.4	25.1	5.9	12.9	19.3	0.2
LOS	B	C	A	B	C	A	B	C	A	B	B	A
Approach Delay		23.6			15.7			17.5			17.0	
Approach LOS		C			B			B			B	

Intersection Summary

























Area Type: Other  
 Cycle Length: 142.5  
 Actuated Cycle Length: 66.8  
 Natural Cycle: 105  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.46  
 Intersection Signal Delay: 17.5      Intersection LOS: B  
 Intersection Capacity Utilization 49.1%      ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 5: SE 92nd Loop & SE 110th St Rd.



HCM 6th Signalized Intersection Summary  
 5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	158	41	272	70	140	36	461	355	174	405	45
Future Volume (veh/h)	21	158	41	272	70	140	36	461	355	174	405	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1752	1767	1841	1841	1870	1648	1841	1870	1885	1811	1604
Adj Flow Rate, veh/h	23	90	33	83	93	97	23	445	281	82	449	41
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	13	10	9	4	4	2	17	4	2	1	6	20
Cap, veh/h	317	219	187	379	331	285	340	880	399	390	1052	415
Arrive On Green	0.04	0.12	0.12	0.10	0.18	0.18	0.04	0.25	0.25	0.10	0.31	0.31
Sat Flow, veh/h	1626	1752	1497	1753	1841	1585	1570	3497	1585	1795	3441	1359
Grp Volume(v), veh/h	23	90	33	83	93	97	23	445	281	82	449	41
Grp Sat Flow(s),veh/h/ln	1626	1752	1497	1753	1841	1585	1570	1749	1585	1795	1721	1359
Q Serve(g_s), s	0.8	3.0	1.3	2.5	2.8	3.4	0.7	7.0	10.3	2.0	6.7	1.4
Cycle Q Clear(g_c), s	0.8	3.0	1.3	2.5	2.8	3.4	0.7	7.0	10.3	2.0	6.7	1.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	317	219	187	379	331	285	340	880	399	390	1052	415
V/C Ratio(X)	0.07	0.41	0.18	0.22	0.28	0.34	0.07	0.51	0.70	0.21	0.43	0.10
Avail Cap(c_a), veh/h	631	960	821	622	1009	869	643	2739	1242	639	2695	1064
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	25.8	25.0	20.4	22.6	22.9	16.2	20.5	21.7	14.7	17.7	15.9
Incr Delay (d2), s/veh	0.1	1.2	0.4	0.3	0.5	0.7	0.1	0.5	2.3	0.3	0.3	0.1
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	0.3	1.3	0.4	1.0	1.2	1.3	0.2	2.5	3.8	0.8	2.5	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	27.0	25.4	20.7	23.1	23.6	16.3	20.9	24.0	14.9	18.0	16.0
LnGrp LOS	C	C	C	C	C	C	B	C	C	B	B	B
Approach Vol, veh/h		146			273			749			572	
Approach Delay, s/veh		25.9			22.5			21.9			17.4	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	26.6	8.7	18.8	13.2	23.2	12.2	15.3				
Change Period (Y+Rc), s	7.1	7.1	6.0	* 7.3	7.1	7.1	6.0	* 7.3				
Max Green Setting (Gmax), s	15.0	50.0	15.0	* 35	15.0	50.0	15.0	* 35				
Max Q Clear Time (g_c+I1), s	2.7	8.7	2.8	5.4	4.0	12.3	4.5	5.0				
Green Ext Time (p_c), s	0.0	3.5	0.0	0.8	0.1	3.8	0.1	0.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				20.9								
HCM 6th LOS				C								
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Lanes, Volumes, Timings

1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	244	40	33	1298	900	130
Future Volume (vph)	244	40	33	1298	900	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	265			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.981	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1597	1262	1530	3539	3325	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1597	1262	1530	3539	3325	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		42			16	
Link Speed (mph)	30			45	45	
Link Distance (ft)	484			829	1271	
Travel Time (s)	11.0			12.6	19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	13%	28%	18%	2%	5%	17%
Adj. Flow (vph)	257	42	35	1366	947	137
Shared Lane Traffic (%)						
Lane Group Flow (vph)	257	42	35	1366	1084	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	8		1	6	2	

Lanes, Volumes, Timings

1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024

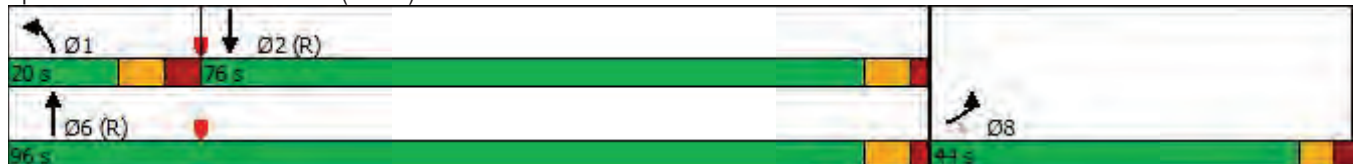


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		8				
Detector Phase	8	8	1	6	2	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	15.0	15.0	
Minimum Split (s)	44.7	44.7	13.5	24.9	36.9	
Total Split (s)	44.0	44.0	20.0	96.0	76.0	
Total Split (%)	31.4%	31.4%	14.3%	68.6%	54.3%	
Maximum Green (s)	38.3	38.3	11.5	89.1	69.1	
Yellow Time (s)	3.7	3.7	4.8	4.9	4.9	
All-Red Time (s)	2.0	2.0	3.7	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	8.5	6.9	6.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0			7.0	
Flash Dont Walk (s)	32.0	32.0			23.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	27.8	27.8	8.7	99.6	85.2	
Actuated g/C Ratio	0.20	0.20	0.06	0.71	0.61	
v/c Ratio	0.81	0.15	0.37	0.54	0.53	
Control Delay	72.5	12.4	73.2	11.3	19.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	72.5	12.4	73.2	11.3	19.0	
LOS	E	B	E	B	B	
Approach Delay	64.0			12.8	19.0	
Approach LOS	E			B	B	

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	6 (4%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	100
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	20.7
Intersection LOS:	C
Intersection Capacity Utilization	59.9%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.



HCM 6th Signalized Intersection Summary  
 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	244	40	33	1298	900	130
Future Volume (veh/h)	244	40	33	1298	900	130
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1707	1485	1633	1870	1826	1648
Adj Flow Rate, veh/h	257	30	35	1366	947	129
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	13	28	18	2	5	17
Cap, veh/h	284	220	57	2613	1957	267
Arrive On Green	0.17	0.17	0.04	0.74	0.64	0.64
Sat Flow, veh/h	1626	1259	1555	3647	3159	418
Grp Volume(v), veh/h	257	30	35	1366	535	541
Grp Sat Flow(s),veh/h/ln	1626	1259	1555	1777	1735	1751
Q Serve(g_s), s	21.7	2.8	3.1	23.1	22.6	22.6
Cycle Q Clear(g_c), s	21.7	2.8	3.1	23.1	22.6	22.6
Prop In Lane	1.00	1.00	1.00			0.24
Lane Grp Cap(c), veh/h	284	220	57	2613	1107	1117
V/C Ratio(X)	0.91	0.14	0.61	0.52	0.48	0.48
Avail Cap(c_a), veh/h	445	344	128	2613	1107	1117
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.6	48.9	66.5	8.0	13.3	13.3
Incr Delay (d2), s/veh	15.1	0.3	10.3	0.8	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	0.9	1.4	7.7	8.6	8.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	71.8	49.1	76.8	8.7	14.8	14.8
LnGrp LOS	E	D	E	A	B	B
Approach Vol, veh/h	287			1401	1076	
Approach Delay, s/veh	69.4			10.4	14.8	
Approach LOS	E			B	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.6	96.2			109.9	30.1
Change Period (Y+Rc), s	* 8.5	6.9			6.9	5.7
Max Green Setting (Gmax), s	* 12	69.1			89.1	38.3
Max Q Clear Time (g_c+I1), s	5.1	24.6			25.1	23.7
Green Ext Time (p_c), s	0.0	7.9			13.6	0.7

Intersection Summary












HCM 6th Ctrl Delay	18.2
HCM 6th LOS	B

Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations							
Traffic Volume (vph)	268	209	1142	424	361	1140	
Future Volume (vph)	268	209	1142	424	361	1140	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	465	0		0	500		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				25		
Lane Util. Factor	0.97	1.00	0.95	0.95	1.00	0.95	
Frt		0.850	0.959				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	3335	1429	3219	0	1703	3374	
Flt Permitted	0.950				0.051		
Satd. Flow (perm)	3335	1429	3219	0	91	3374	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		215	39				
Link Speed (mph)	45		45			45	
Link Distance (ft)	886		2249			1233	
Travel Time (s)	13.4		34.1			18.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	
Heavy Vehicles (%)	5%	13%	7%	9%	6%	7%	
Adj. Flow (vph)	276	215	1177	437	372	1175	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	276	215	1614	0	372	1175	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	24		12			12	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2		1	2	
Detector Template	Left	Right	Thru		Left	Thru	
Leading Detector (ft)	20	20	100		20	100	
Trailing Detector (ft)	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	
Detector 1 Size(ft)	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA		pm+pt	NA	
Protected Phases	4		2		1	6	3



Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

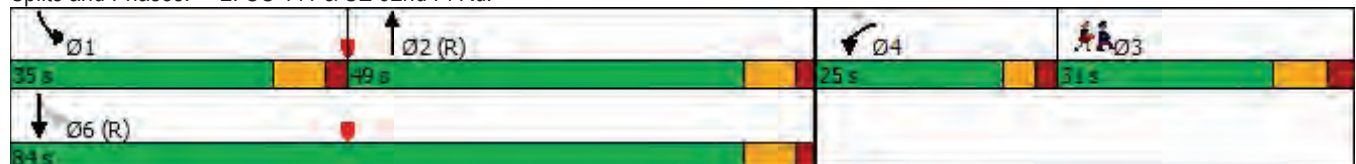


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Permitted Phases		4			6		
Detector Phase	4	4	2		1	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	17.0		5.0	17.0	5.0
Minimum Split (s)	35.7	35.7	48.7		12.7	25.7	37.5
Total Split (s)	25.0	25.0	49.0		35.0	84.0	31.0
Total Split (%)	17.9%	17.9%	35.0%		25.0%	60.0%	22%
Maximum Green (s)	19.3	19.3	41.3		27.3	76.3	22.5
Yellow Time (s)	3.4	3.4	5.5		5.5	5.5	5.5
All-Red Time (s)	2.3	2.3	2.2		2.2	2.2	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7	7.7		7.7	7.7	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max	None
Walk Time (s)	7.0	7.0	7.0				7.0
Flash Dont Walk (s)	23.0	23.0	34.0				22.0
Pedestrian Calls (#/hr)	0	0	0				0
Act Effct Green (s)	16.4	16.4	70.2		110.2	110.2	
Actuated g/C Ratio	0.12	0.12	0.50		0.79	0.79	
v/c Ratio	0.71	0.60	0.99		0.84	0.44	
Control Delay	69.5	14.3	53.7		57.1	5.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	69.5	14.3	53.7		57.1	5.7	
LOS	E	B	D		E	A	
Approach Delay	45.3		53.7			18.0	
Approach LOS	D		D			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 102 (73%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 145  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 37.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 90.3%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 2: US 441 & SE 92nd PI Rd.



# HCM Signalized Intersection Capacity Analysis

## 2: US 441 & SE 92nd PI Rd.

03/08/2024


























Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	268	209	1142	424	361	1140
Future Volume (vph)	268	209	1142	424	361	1140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	7.7		7.7	7.7
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3335	1429	3221		1703	3374
Flt Permitted	0.95	1.00	1.00		0.05	1.00
Satd. Flow (perm)	3335	1429	3221		92	3374
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	276	215	1177	437	372	1175
RTOR Reduction (vph)	0	190	19	0	0	0
Lane Group Flow (vph)	276	25	1595	0	372	1175
Heavy Vehicles (%)	5%	13%	7%	9%	6%	7%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	16.4	16.4	70.2		110.2	110.2
Effective Green, g (s)	16.4	16.4	70.2		110.2	110.2
Actuated g/C Ratio	0.12	0.12	0.50		0.79	0.79
Clearance Time (s)	5.7	5.7	7.7		7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	390	167	1615		444	2655
v/s Ratio Prot	c0.08		c0.50		c0.19	0.35
v/s Ratio Perm		0.02			0.47	
v/c Ratio	0.71	0.15	0.99		0.84	0.44
Uniform Delay, d1	59.5	55.5	34.5		44.1	4.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.8	0.4	19.6		13.0	0.5
Delay (s)	65.3	56.0	54.0		57.0	5.4
Level of Service	E	E	D		E	A
Approach Delay (s)	61.2		54.0			17.8
Approach LOS	E		D			B

### Intersection Summary

HCM 2000 Control Delay	39.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	29.6
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	396	150	14	268	320	88	821	62	187	619	218
Future Volume (vph)	236	396	150	14	268	320	88	821	62	187	619	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		345	645		1000	485		300	765		575
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt		0.959				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3269	0	1687	3574	1553	1671	3471	1509	3335	3343	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3269	0	1687	3574	1553	1671	3471	1509	3335	3343	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32				296			140			225
Link Speed (mph)		45			50			45				45
Link Distance (ft)		1046			1493			1329				994
Travel Time (s)		15.8			20.4			20.1				15.1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	7%	3%	7%	1%	4%	8%	4%	7%	5%	8%	2%
Adj. Flow (vph)	243	408	155	14	276	330	91	846	64	193	638	225
Shared Lane Traffic (%)												
Lane Group Flow (vph)	243	563	0	14	276	330	91	846	64	193	638	225
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

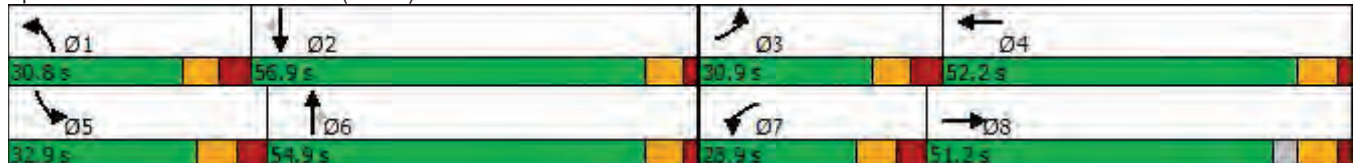


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						4			6			2
Detector Phase	3	8		7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	15.0		5.0	15.0	15.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	16.9	51.2		15.0	52.2	52.2	13.8	49.9	49.9	13.9	43.9	43.9
Total Split (s)	30.9	51.2		28.9	52.2	52.2	30.8	54.9	54.9	32.9	56.9	56.9
Total Split (%)	18.1%	30.0%		16.9%	30.5%	30.5%	18.0%	32.1%	32.1%	19.3%	33.3%	33.3%
Maximum Green (s)	22.0	44.0		20.0	45.0	45.0	22.0	48.0	48.0	24.0	50.0	50.0
Yellow Time (s)	5.0	5.2		5.2	5.2	5.2	4.8	4.9	4.9	4.9	4.9	4.9
All-Red Time (s)	3.9	2.0		3.7	2.0	2.0	4.0	2.0	2.0	4.0	2.0	2.0
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)	8.9	7.2		8.9	7.2	7.2	8.8	6.9	6.9	8.9	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		9.0			8.0	8.0		9.0	9.0		7.0	7.0
Flash Dont Walk (s)		35.0			37.0	37.0		34.0	34.0		30.0	30.0
Pedestrian Calls (#/hr)		0			0	0		0	0		0	0
Act Effct Green (s)	14.5	36.0		6.7	18.1	18.1	12.3	35.8	35.8	12.7	36.3	36.3
Actuated g/C Ratio	0.13	0.32		0.06	0.16	0.16	0.11	0.31	0.31	0.11	0.32	0.32
v/c Ratio	0.57	0.53		0.14	0.49	0.67	0.51	0.78	0.11	0.52	0.60	0.34
Control Delay	54.6	35.6		61.5	48.9	15.5	61.6	41.4	0.4	55.4	35.9	5.5
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	54.6	35.6		61.5	48.9	15.5	61.6	41.4	0.4	55.4	35.9	5.5
LOS	D	D		E	D	B	E	D	A	E	D	A
Approach Delay		41.3			31.4			40.6			33.0	
Approach LOS		D			C			D			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 170.9  
 Actuated Cycle Length: 113.8  
 Natural Cycle: 135  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 36.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 74.5%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 3: 58th Ave. (SR 35) & SE 92nd PI Rd.



HCM 6th Signalized Intersection Summary  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	236	396	150	14	268	320	88	821	62	187	619	218
Future Volume (veh/h)	236	396	150	14	268	320	88	821	62	187	619	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1796	1856	1796	1885	1841	1781	1841	1796	1826	1781	1870
Adj Flow Rate, veh/h	243	408	115	14	276	279	91	846	28	193	638	184
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	7	3	7	1	4	8	4	7	5	8	2
Cap, veh/h	323	776	216	27	769	335	116	1045	455	270	1055	494
Arrive On Green	0.10	0.29	0.29	0.02	0.21	0.21	0.07	0.30	0.30	0.08	0.31	0.31
Sat Flow, veh/h	3374	2635	735	1711	3582	1560	1697	3497	1522	3374	3385	1585
Grp Volume(v), veh/h	243	263	260	14	276	279	91	846	28	193	638	184
Grp Sat Flow(s),veh/h/ln	1687	1706	1664	1711	1791	1560	1697	1749	1522	1687	1692	1585
Q Serve(g_s), s	7.2	13.2	13.4	0.8	6.7	17.6	5.4	23.0	1.3	5.7	16.4	9.3
Cycle Q Clear(g_c), s	7.2	13.2	13.4	0.8	6.7	17.6	5.4	23.0	1.3	5.7	16.4	9.3
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	502	490	27	769	335	116	1045	455	270	1055	494
V/C Ratio(X)	0.75	0.52	0.53	0.51	0.36	0.83	0.79	0.81	0.06	0.71	0.60	0.37
Avail Cap(c_a), veh/h	723	732	713	333	1570	684	364	1636	712	789	1649	772
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	30.2	30.3	50.1	34.3	38.5	47.1	33.3	25.7	46.1	30.0	27.5
Incr Delay (d2), s/veh	3.6	0.8	0.9	13.9	0.3	5.4	11.0	1.7	0.1	3.5	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	5.3	5.2	0.4	2.8	6.9	2.6	9.4	0.5	2.5	6.4	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	31.1	31.2	64.0	34.6	43.9	58.1	35.0	25.8	49.6	30.5	28.0
LnGrp LOS	D	C	C	E	C	D	E	D	C	D	C	C
Approach Vol, veh/h		766			569			965			1015	
Approach Delay, s/veh		36.7			39.9			36.9			33.7	
Approach LOS		D			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.8	38.9	18.7	29.2	17.1	37.6	10.5	37.4				
Change Period (Y+Rc), s	8.8	6.9	* 8.9	7.2	* 8.9	6.9	* 8.9	7.2				
Max Green Setting (Gmax), s	22.0	50.0	* 22	45.0	* 24	48.0	* 20	44.0				
Max Q Clear Time (g_c+I1), s	7.4	18.4	9.2	19.6	7.7	25.0	2.8	15.4				
Green Ext Time (p_c), s	0.2	5.0	0.6	2.5	0.5	5.7	0.0	3.0				

Intersection Summary























HCM 6th Ctrl Delay	36.4
HCM 6th LOS	D

Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	266	20	20	345	80	26	561	29	163	379	140
Future Volume (vph)	315	266	20	20	345	80	26	561	29	163	379	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	255		0	330		225	240		0	215		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.989				0.850		0.993			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1784	0	1719	1792	1568	1421	1805	0	1770	1672	0
Flt Permitted	0.226			0.571			0.338			0.123		
Satd. Flow (perm)	409	1784	0	1033	1792	1568	506	1805	0	229	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				145		2			14	
Link Speed (mph)		35			35			40			35	
Link Distance (ft)		608			801			775			744	
Travel Time (s)		11.8			15.6			13.2			14.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	5%	6%	3%	27%	4%	14%	2%	8%	12%
Adj. Flow (vph)	342	289	22	22	375	87	28	610	32	177	412	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	342	311	0	22	375	87	28	642	0	177	564	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	1	6			2			4		3	8	

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

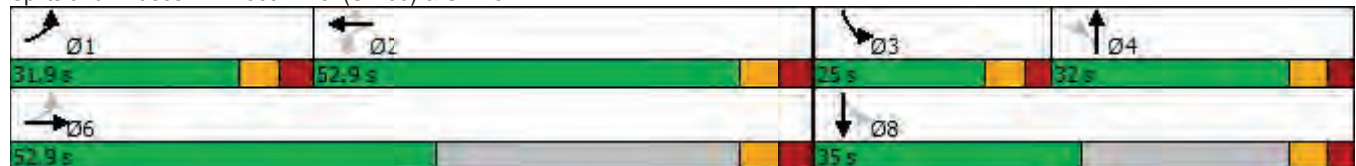


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6			2		2	4			8		
Detector Phase	1	6		2	2	2	4	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	24.0		24.0	24.0	24.0	10.0	10.0		6.0	10.0	
Minimum Split (s)	13.9	31.9		31.9	31.9	31.9	25.0	25.0		13.0	25.0	
Total Split (s)	31.9	52.9		52.9	52.9	52.9	32.0	32.0		25.0	35.0	
Total Split (%)	22.5%	37.3%		37.3%	37.3%	37.3%	22.6%	22.6%		17.6%	24.7%	
Maximum Green (s)	24.0	45.0		45.0	45.0	45.0	25.0	25.0		18.0	28.0	
Yellow Time (s)	4.2	4.2		4.2	4.2	4.2	4.1	4.1		4.1	4.1	
All-Red Time (s)	3.7	3.7		3.7	3.7	3.7	2.9	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.9	7.9		7.9	7.9	7.9	7.0	7.0		7.0	7.0	
Lead/Lag	Lead			Lag			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Act Effect Green (s)	61.6	61.6		33.0	33.0	33.0	25.4	25.4		46.9	46.9	
Actuated g/C Ratio	0.50	0.50		0.27	0.27	0.27	0.21	0.21		0.38	0.38	
v/c Ratio	0.81	0.35		0.08	0.78	0.17	0.27	1.73		0.66	0.88	
Control Delay	36.2	19.6		35.5	54.9	0.8	55.5	370.1		42.3	52.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	36.2	19.6		35.5	54.9	0.8	55.5	370.1		42.3	52.5	
LOS	D	B		D	D	A	E	F		D	D	
Approach Delay		28.3			44.3			356.9			50.1	
Approach LOS		C			D			F			D	

Intersection Summary

Area Type:	Other
Cycle Length:	141.8
Actuated Cycle Length:	123.6
Natural Cycle:	135
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.73
Intersection Signal Delay:	124.1
Intersection LOS:	F
Intersection Capacity Utilization	105.1%
ICU Level of Service	G
Analysis Period (min)	15

Splits and Phases: 4: 58th Ave. (SR 35) & SR 25



HCM 6th Signalized Intersection Summary  
 4: 58th Ave. (SR 35) & SR 25

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	266	20	20	345	80	26	561	29	163	379	140
Future Volume (veh/h)	315	266	20	20	345	80	26	561	29	163	379	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1752	1826	1811	1856	1500	1841	1693	1870	1781	1722
Adj Flow Rate, veh/h	342	289	22	22	375	83	28	610	0	177	412	148
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	10	5	6	3	27	4	14	2	8	12
Cap, veh/h	399	811	62	323	448	389	118	414		233	478	172
Arrive On Green	0.17	0.48	0.48	0.25	0.25	0.25	0.22	0.22	0.00	0.09	0.38	0.38
Sat Flow, veh/h	1739	1675	128	1043	1811	1572	681	1841	0	1781	1251	449
Grp Volume(v), veh/h	342	0	311	22	375	83	28	610	0	177	0	560
Grp Sat Flow(s),veh/h/ln	1739	0	1803	1043	1811	1572	681	1841	0	1781	0	1701
Q Serve(g_s), s	15.5	0.0	12.0	1.8	21.9	4.7	4.4	25.0	0.0	8.1	0.0	33.8
Cycle Q Clear(g_c), s	15.5	0.0	12.0	1.8	21.9	4.7	20.6	25.0	0.0	8.1	0.0	33.8
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.00	1.00		0.26
Lane Grp Cap(c), veh/h	399	0	873	323	448	389	118	414		233	0	650
V/C Ratio(X)	0.86	0.00	0.36	0.07	0.84	0.21	0.24	1.47		0.76	0.00	0.86
Avail Cap(c_a), veh/h	486	0	873	487	732	636	118	414		353	0	650
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	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	0.0	17.9	32.2	39.7	33.3	49.2	43.1	0.0	30.4	0.0	31.7
Incr Delay (d2), s/veh	13.2	0.0	0.4	0.1	6.2	0.4	1.4	226.5	0.0	7.1	0.0	11.7
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	7.6	0.0	4.9	0.5	10.3	1.8	0.8	37.0	0.0	3.9	0.0	15.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.2	0.0	18.3	32.3	45.9	33.6	50.7	269.6	0.0	37.5	0.0	43.4
LnGrp LOS	D	A	B	C	D	C	D	F		D	A	D
Approach Vol, veh/h		653			480			638				737
Approach Delay, s/veh		29.2			43.1			260.0				42.0
Approach LOS		C			D			F				D
Timer - Assigned Phs	1	2	3	4	6	8						
Phs Duration (G+Y+Rc), s	26.3	35.4	17.5	32.0	61.7	49.5						
Change Period (Y+Rc), s	* 7.9	* 7.9	7.0	7.0	* 7.9	7.0						
Max Green Setting (Gmax), s	* 24	* 45	18.0	25.0	* 45	28.0						
Max Q Clear Time (g_c+I1), s	17.5	23.9	10.1	27.0	14.0	35.8						
Green Ext Time (p_c), s	0.9	3.7	0.4	0.0	2.8	0.0						

Intersection Summary

HCM 6th Ctrl Delay	94.3
HCM 6th LOS	F

























Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	158	41	272	70	140	36	461	355	174	405	45
Future Volume (vph)	21	158	41	272	70	140	36	461	355	174	405	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	475		475	485		485	390		400	400		400
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850				0.850			0.850		0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1845	1509	1805	1900	1599	1626	3374	1553	1770	3374	1482
Flt Permitted	0.711			0.475			0.510			0.301		
Satd. Flow (perm)	1185	1845	1509	902	1900	1599	873	3374	1553	561	3374	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132			143			362			133
Link Speed (mph)		30			30			50			30	
Link Distance (ft)		828			917			1237			1406	
Travel Time (s)		18.8			20.8			16.9			32.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	14%	3%	7%	0%	0%	1%	11%	7%	4%	2%	7%	9%
Adj. Flow (vph)	21	161	42	278	71	143	37	470	362	178	413	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	161	42	278	71	143	37	470	362	178	413	46
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8		8	4		4	6		6	2		2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	16.0	16.0	8.0	16.0	16.0
Minimum Split (s)	14.0	41.3	41.3	14.0	41.3	41.3	15.1	31.1	31.1	15.1	31.1	31.1
Total Split (s)	21.0	42.3	42.3	21.0	42.3	42.3	22.1	57.1	57.1	22.1	57.1	57.1
Total Split (%)	14.7%	29.7%	29.7%	14.7%	29.7%	29.7%	15.5%	40.1%	40.1%	15.5%	40.1%	40.1%
Maximum Green (s)	15.0	35.0	35.0	15.0	35.0	35.0	15.0	50.0	50.0	15.0	50.0	50.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.1	5.1	5.1	5.1	5.1	5.1
All-Red Time (s)	2.0	3.3	3.3	2.0	3.3	3.3	2.0	2.0	2.0	2.0	2.0	2.0
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	0.0
Total Lost Time (s)	6.0	7.3	7.3	6.0	7.3	7.3	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	22.6	13.2	13.2	35.2	28.9	28.9	28.2	20.0	20.0	39.0	31.2	31.2
Actuated g/C Ratio	0.26	0.15	0.15	0.40	0.33	0.33	0.32	0.23	0.23	0.44	0.35	0.35
v/c Ratio	0.06	0.58	0.12	0.55	0.11	0.23	0.11	0.61	0.57	0.43	0.35	0.08
Control Delay	19.3	45.2	0.8	24.3	26.2	6.5	16.0	35.1	7.3	18.6	24.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	45.2	0.8	24.3	26.2	6.5	16.0	35.1	7.3	18.6	24.2	0.2
LOS	B	D	A	C	C	A	B	D	A	B	C	A
Approach Delay		34.5			19.4			22.7			20.9	
Approach LOS		C			B			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 142.5  
 Actuated Cycle Length: 88.1  
 Natural Cycle: 105  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.61  
 Intersection Signal Delay: 22.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 69.3%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 5: SE 92nd Loop & SE 110th St Rd.



HCM 6th Signalized Intersection Summary  
 5: SE 92nd Loop & SE 110th St Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	158	41	272	70	140	36	461	355	174	405	45
Future Volume (veh/h)	21	158	41	272	70	140	36	461	355	174	405	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1856	1796	1900	1900	1885	1737	1796	1841	1870	1796	1767
Adj Flow Rate, veh/h	21	161	24	278	71	143	37	470	286	178	413	27
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	14	3	7	0	0	1	11	7	4	2	7	9
Cap, veh/h	287	228	187	427	458	385	366	848	388	373	1009	443
Arrive On Green	0.04	0.12	0.12	0.16	0.24	0.24	0.06	0.25	0.25	0.10	0.30	0.30
Sat Flow, veh/h	1612	1856	1522	1810	1900	1598	1654	3413	1560	1781	3413	1497
Grp Volume(v), veh/h	21	161	24	278	71	143	37	470	286	178	413	27
Grp Sat Flow(s),veh/h/ln	1612	1856	1522	1810	1900	1598	1654	1706	1560	1781	1706	1497
Q Serve(g_s), s	0.8	6.2	1.1	9.4	2.2	5.6	1.2	9.0	12.6	5.4	7.2	1.0
Cycle Q Clear(g_c), s	0.8	6.2	1.1	9.4	2.2	5.6	1.2	9.0	12.6	5.4	7.2	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	228	187	427	458	385	366	848	388	373	1009	443
V/C Ratio(X)	0.07	0.71	0.13	0.65	0.15	0.37	0.10	0.55	0.74	0.48	0.41	0.06
Avail Cap(c_a), veh/h	550	869	713	508	890	748	603	2283	1044	545	2283	1002
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(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	31.5	29.2	21.9	22.3	23.6	18.5	24.5	25.8	18.1	21.1	18.9
Incr Delay (d2), s/veh	0.1	4.0	0.3	2.3	0.2	0.6	0.1	0.6	2.8	0.9	0.3	0.1
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	0.3	3.0	0.4	4.0	1.0	2.1	0.4	3.3	4.7	2.2	2.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	35.5	29.5	24.1	22.5	24.2	18.6	25.0	28.6	19.0	21.4	18.9
LnGrp LOS	C	D	C	C	C	C	B	C	C	B	C	B
Approach Vol, veh/h		206			492			793			618	
Approach Delay, s/veh		33.9			23.9			26.0			20.6	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.4	29.2	8.8	25.3	14.9	25.7	17.7	16.5				
Change Period (Y+Rc), s	7.1	7.1	6.0	* 7.3	7.1	7.1	6.0	* 7.3				
Max Green Setting (Gmax), s	15.0	50.0	15.0	* 35	15.0	50.0	15.0	* 35				
Max Q Clear Time (g_c+l1), s	3.2	9.2	2.8	7.6	7.4	14.6	11.4	8.2				
Green Ext Time (p_c), s	0.0	3.2	0.0	0.8	0.3	4.0	0.3	1.0				

Intersection Summary

HCM 6th Ctrl Delay	24.7
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Appendix F: Volume Development Spreadsheet

### 2028 AM Future Turning Movement Volume Development

AM	Intersection		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
1	SE 58th Avenue (SR 35) at Laurel Road	Raw Vol	32	879	0	0	1220	175	122	0	46	0	0	0		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
		Adjusted Volume	32	888	0	0	1232	177	123	0	46	0	0	0	0	
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%
		Growth Volume	11	304	0	0	421	61	42	0	16	0	0	0	0	
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Background	43	1192	0	0	1653	238	165	0	62	0	0	0	0	
		Project Trips			29		10									
Future Total	43	1221	0	0	1663	238	165	0	62	0	0	0	0			
2	US 441/US 301 at SE 92nd Place Road	Raw Vol	0	1098	188	200	937	0	0	0	0	367	0	306		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
		Adjusted Volume	0	1109	190	202	946	0	0	0	0	0	371	0	309	
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	
		Growth Volume	0	379	65	69	324	0	0	0	0	0	127	0	106	
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Future Background	0	1488	255	271	1270	0	0	0	0	0	498	0	415	
		Project Trips			3	11							10		34	
Future Total	0	1488	258	282	1270	0	0	0	0	0	508	0	449			
3	SE 58th Avenue (SR 35) at SE 92nd Place Road/SE 92nd Loop	Raw Vol	88	629	51	275	755	294	161	166	104	27	294	223		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
		Adjusted Volume	89	635	52	278	763	297	163	168	105	27	297	225		
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	
		Growth Volume	30	217	18	95	261	102	56	57	36	9	102	77		
		Vested Trips	56	54	7	77	0	0	0	40	0	59	20	39		
		Future Background	175	906	77	450	1024	399	219	265	141	95	419	341		
		Project Trips			5	12				15		15	44	37		
Future Total	175	906	82	462	1024	399	219	280	141	110	463	378				
4	SE 58th Avenue (SR 35) at SR 25	Raw Vol	21	302	26	139	525	292	141	311	35	35	224	142		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
		Adjusted Volume	21	305	26	140	530	295	142	314	35	35	226	143		
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	
		Growth Volume	7	104	9	48	181	101	49	107	12	12	77	49		
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0		
		Future Background	28	409	35	188	711	396	191	421	47	47	303	192		
		Project Trips		1		1	2	13	4					0		
Future Total	28	410	35	188	713	408	195	421	47	47	303	192				
5	SE 92nd Loop at SE 110th Street Road	Raw Vol	23	432	272	79	436	40	23	87	32	80	90	132		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
		Adjusted Volume	23	436	275	80	440	40	23	88	32	81	91	133		
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	
		Growth Volume	8	149	94	27	150	14	8	30	11	28	31	45		
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0		
		Future Background	31	585	369	107	590	54	31	118	43	109	122	178		
		Project Trips		15		11	44	1	0					4		
Future Total	31	600	369	119	634	54	31	118	43	109	122	182				

### 2028 AM Future Turning Movement Volume Development

AM	Intersection		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
6	SE 92nd Loop at SE 64th Ave Extension (Western Entrance)	Raw Vol	0	0	0	1	0	0	0	0	0	0	0	0	0	
		Seasonal Factor	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Adjusted Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Growth Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Background	0	0	0	0	0	0	0	0	792	0	0	0	855	0
		Project Trips					72		49	19	13				49	8
		Future Total	0	0	0	72	0	49	19	805	0	0	0	903	8	
7	SE 92nd Loop at Eastern Driveway	Raw Vol	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Seasonal Factor	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Adjusted Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%
		Growth Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Background	0	0	0	0	0	0	0	0	792	0	0	0	855	0
		Project Trips					0		49	13	72				8	16
		Future Total	0	0	0	0	0	0	49	13	864	0	0	0	863	16

### 2028 PM Future Turning Movement Volume Development

PM	Intersection		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
1	SE 58th Avenue (SR 35) at Laurel Road	Raw Vol	33	1285	0	0	891	129	242	0	40	0	0	0		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
		Adjusted Volume	33	1298	0	0	900	130	244	0	40	0	0	0	0	
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%
		Growth Volume	11	444	0	0	308	44	83	0	14	0	0	0	0	
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Future Background	44	1742	0	0	1208	174	327	0	54	0	0	0	0	
		Project Trips			20		33									
Future Total	44	1762	0	0	1241	174	327	0	54	0	0	0	0			
2	US 441/US 301 at SE 92nd Place Road	Raw Vol	0	1131	420	357	1129	0	0	0	0	265	0	207		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
		Adjusted Volume	0	1142	424	361	1140	0	0	0	0	0	268	0	209	
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	
		Growth Volume	0	391	145	123	390	0	0	0	0	0	92	0	71	
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Future Background	0	1533	569	484	1530	0	0	0	0	0	360	0	280	
		Project Trips			12	39							7		23	
Future Total	0	1533	581	523	1530	0	0	0	0	0	367	0	303			
3	SE 58th Avenue (SR 35) at SE 92nd Place Road/SE 92nd Loop	Raw Vol	87	813	61	185	613	216	234	392	149	14	265	317		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
		Adjusted Volume	88	821	62	187	619	218	236	396	150	14	268	320		
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	
		Growth Volume	30	281	21	64	212	75	81	135	51	5	92	109		
		Vested Trips	102	102	19	137	0	0	0	69	0	67	13	26		
		Future Background	220	1204	102	388	831	293	317	600	201	86	373	455		
		Project Trips			18	43				51		10	30	25		
Future Total	220	1204	120	431	831	293	317	651	201	96	403	481				
4	SE 58th Avenue (SR 35) at SR 25	Raw Vol	26	555	29	161	375	139	312	263	20	20	342	79		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
		Adjusted Volume	26	561	29	163	379	140	315	266	20	20	345	80		
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	
		Growth Volume	9	192	10	56	130	48	108	91	7	7	118	27		
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0		
		Future Background	35	753	39	219	509	188	423	357	27	27	463	107		
		Project Trips			2	0	1	9	15							
Future Total	35	755	39	219	510	196	437	357	27	27	463	108				
5	SE 92nd Loop at SE 110th Street Road	Raw Vol	36	456	351	172	401	45	21	156	41	269	69	139		
		Seasonal Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
		Adjusted Volume	36	461	355	174	405	45	21	158	41	272	70	140		
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%		
		Growth Volume	12	158	121	60	139	15	7	54	14	93	24	48		
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0		
		Future Background	48	619	476	234	544	60	28	212	55	365	94	188		
		Project Trips			51	8	30	0	1							
Future Total	48	669	476	241	573	61	29	212	55	365	94	201				

### 2028 PM Future Turning Movement Volume Development

PM	Intersection		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
6	SE 92nd Loop at SE 64th Ave Extension (Western Entrance)	Raw Vol	0	0	0	1	0	0	0	0	0	0	0	0	0
		Seasonal Factor	0	0	0	0	0	0	0	0	0	0	0	0	0
		Adjusted Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%
		Growth Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Background	0	0	0	0	0	0	0	0	1091	0	0	914	0
		Project Trips				49		33	68	45				33	28
		Future Total	0	0	0	49	0	33	68	1136	0	0	0	947	28
7	SE 92nd Loop at Eastern Driveway	Raw Vol	0	0	0	0	0	0	0	0	0	0	0	0	0
		Seasonal Factor	0	0	0	0	0	0	0	0	0	0	0	0	0
		Adjusted Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
		Growth Rate	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%
		Growth Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
		Vested Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Background	0	0	0	0	0	0	0	0	1091	0	0	914	0
		Project Trips				0		33	45	49				28	56
		Future Total	0	0	0	0	0	33	45	1140	0	0	0	942	56



# Appendix G: Vested Developments

## SE 92nd Loop Development

TRAFFIC IMPACT ANALYSIS  
**SE 92<sup>nd</sup> LOOP DEVELOPMENT**  
MARION COUNTY, FLORIDA



Prepared for:

Red Jacket Development Group  
625 Waltham Avenue,  
Orlando, Florida 32809

Prepared by:

Traffic Planning and Design, Inc.  
535 Versailles Drive  
Maitland, Florida 32751  
407-628-9955

June 2023

TPD № 5735



SE 92nd Loop Development  
Project № 5735  
Figure 1



**Table 6  
Projected P.M. Peak Hour Roadway Capacity Analysis**

Segment	Lanes	Adopted		Bkgd Volume*	Project Trips**		Total Traffic	LOS
		LOS Std	2-Way Capacity		%	Volume		
<b>SE 92nd Place Road</b>								
US 301 to SE 92nd Loop	2U	E	1,440	1,101	20%	32	1,133	C
<b>SE 92nd Loop</b>								
SR 35 to SE 110th St	4LD	D	3,222	1,003	80%	130	1,133	C
<b>Baseline Road (SR 35)</b>								
SR 464 to SE 92nd Loop	4LD	D	3,580	2,372	40%	65	2,437	C
SE 92nd Loop to SE 110th St	2LD	D	1,600	1,620	20%	32	1,652	F

\* Existing volumes with 6% growth rate applied

\*\* Highest on Segment

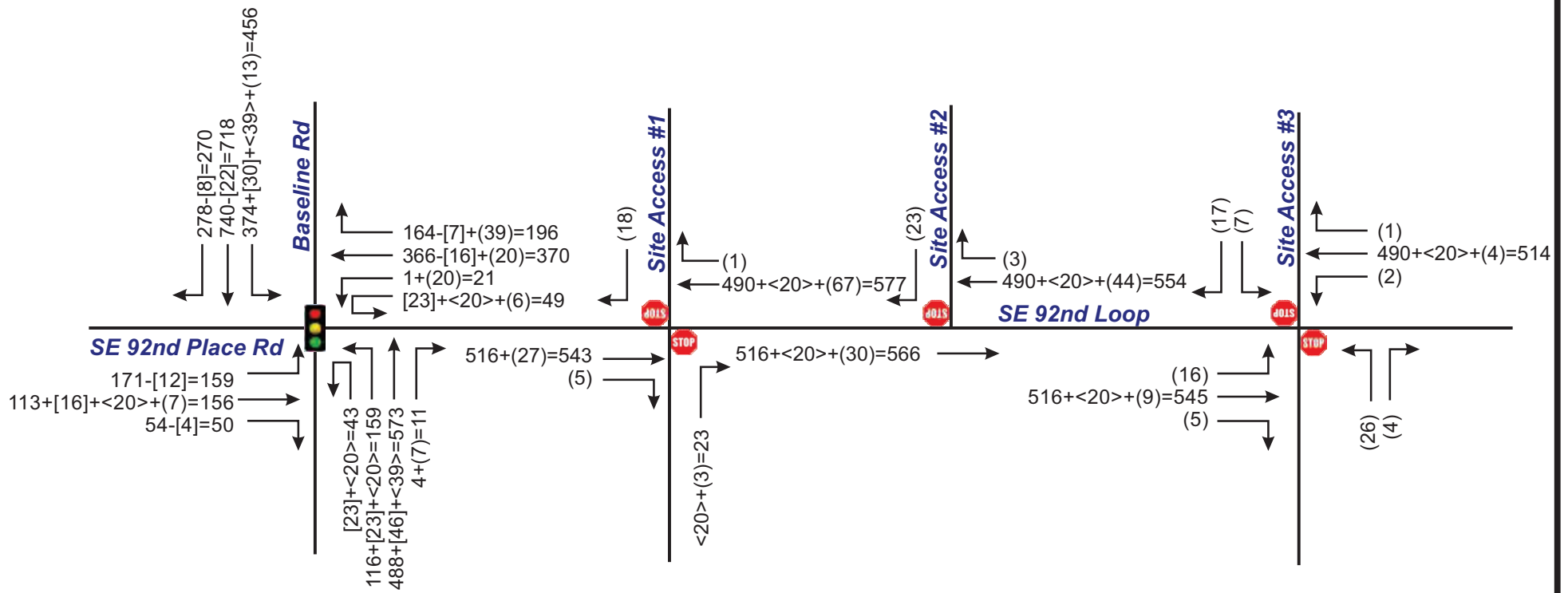
**Table 7  
Projected Daily Roadway Capacity Analysis**

Segment	Lanes	Adopted		Bkgd Volume*	Project Trips**		Total Traffic	LOS
		LOS Std	Daily Cap.		%	Volume		
<b>SE 92nd Place Road</b>								
US 301 to SE 92nd Loop	2U	E	15,930	11,685	20%	380	12,065	C
<b>SE 92nd Loop</b>								
SR 35 to SE 110th St***	4LD	D	35,820	11,148	80%	1,522	12,670	C
<b>Baseline Road (SR 35)</b>								
SR 464 to SE 92nd Loop	4LD	D	39,800	29,775	40%	761	30,536	C
SE 92nd Loop to SE 110th St	2LD	D	17,700	14,157	20%	380	14,537	C

\* Existing volumes with 6% growth rate applied

\*\* Highest on Segment

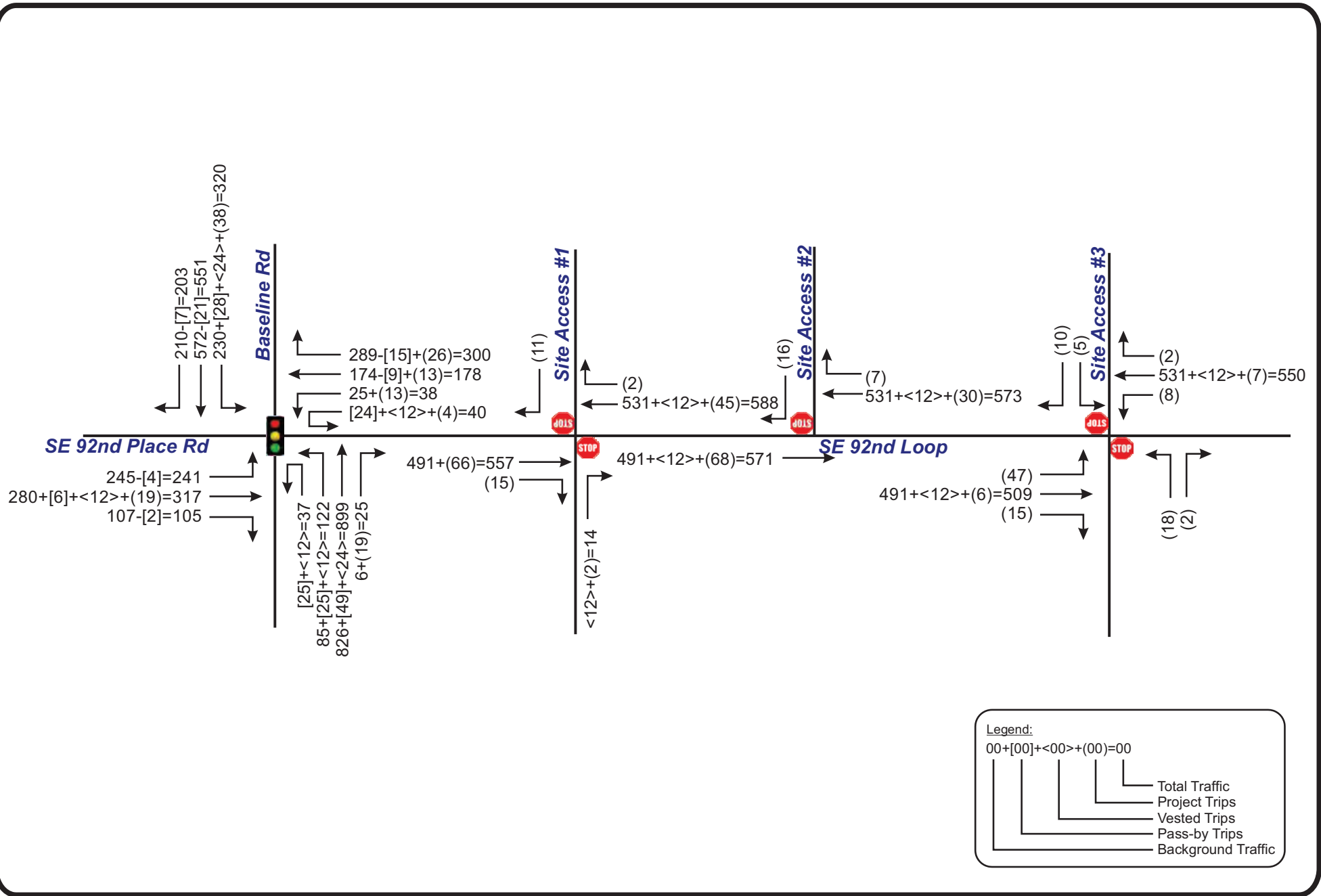




SE 92nd Loop Development  
Project № 5735  
Figure 5a

Projected A.M. Peak Hour  
Traffic Volumes





SE 92nd Loop Development  
 Project № 5735  
 Figure 5b

**Projected P.M. Peak Hour  
 Traffic Volumes**



SE 58th Avenue & 92nd Loop – Convenience Store  
with Gasoline



# TRAFFIC STUDY

## Convenience Store with Gasoline

SR 35 at SE 92nd Loop  
Southeast Corner

PROJECT NAME: SE 58TH AVE & 92ND LOOP - CONVENIENCE STORE WITH FUELING

PROJECT NUMBER: 2022080152

APPLICATION: \_\_\_\_\_

Prepared for:  
RKM Development

Prepared By:  
TRUCKIN TRAFFIC, LLC



Submitted To:  
Marion County

Original Submittal - April 17, 2023  
Updated – September 21, 2023

Jane A Caldera   
Digitally signed by Jane A Caldera  
DN: cn=Jane A Caldera,  
o=Truckin Traffic, LLC, c=US  
Date: 2023.09.21 17:17:42-0400



Jane A. Caldera, P.E.  
P.E. # 53116

# 1. INTRODUCTION

This Traffic Study has been prepared to support the development of a 2.25-acre site located on the southeast corner of SR 35 at SE 92nd Loop in Marion County. The 2.25-acre site is planned to be developed with a 4,650 SF convenience store building, 16 vehicle fueling positions and a car wash.

This Traffic Study has been prepared in accordance with the approved traffic study methodology letter dated February 20, 2023. A copy of the approved traffic study methodology letter and the relevant correspondences are contained in the Appendix.

The site location and area roadways are shown in Figure 1 below.

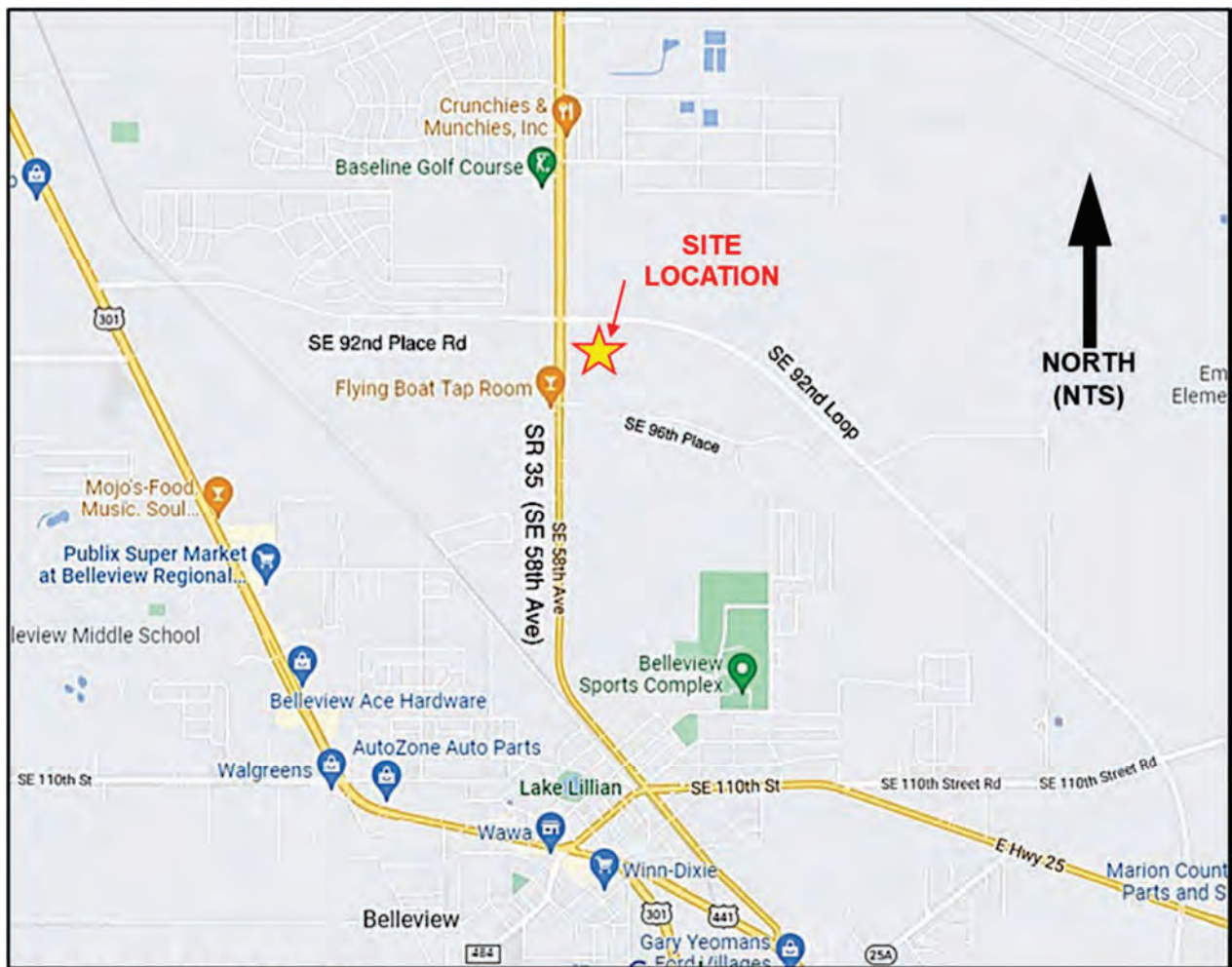


FIGURE 1 – SITE LOCATION

## 7. PHASE 2 - POST DEVELOPMENT CONDITIONS

The Phase 2 Post Development Traffic Projections were developed by adding the Phase 1 and Phase 2 site traffic to the 2026 Background (Peak-Season) Traffic Projections. Figures 10 and 11 display the detailed Phase 2 site traffic assignments for the AM and PM peak hours, respectively.

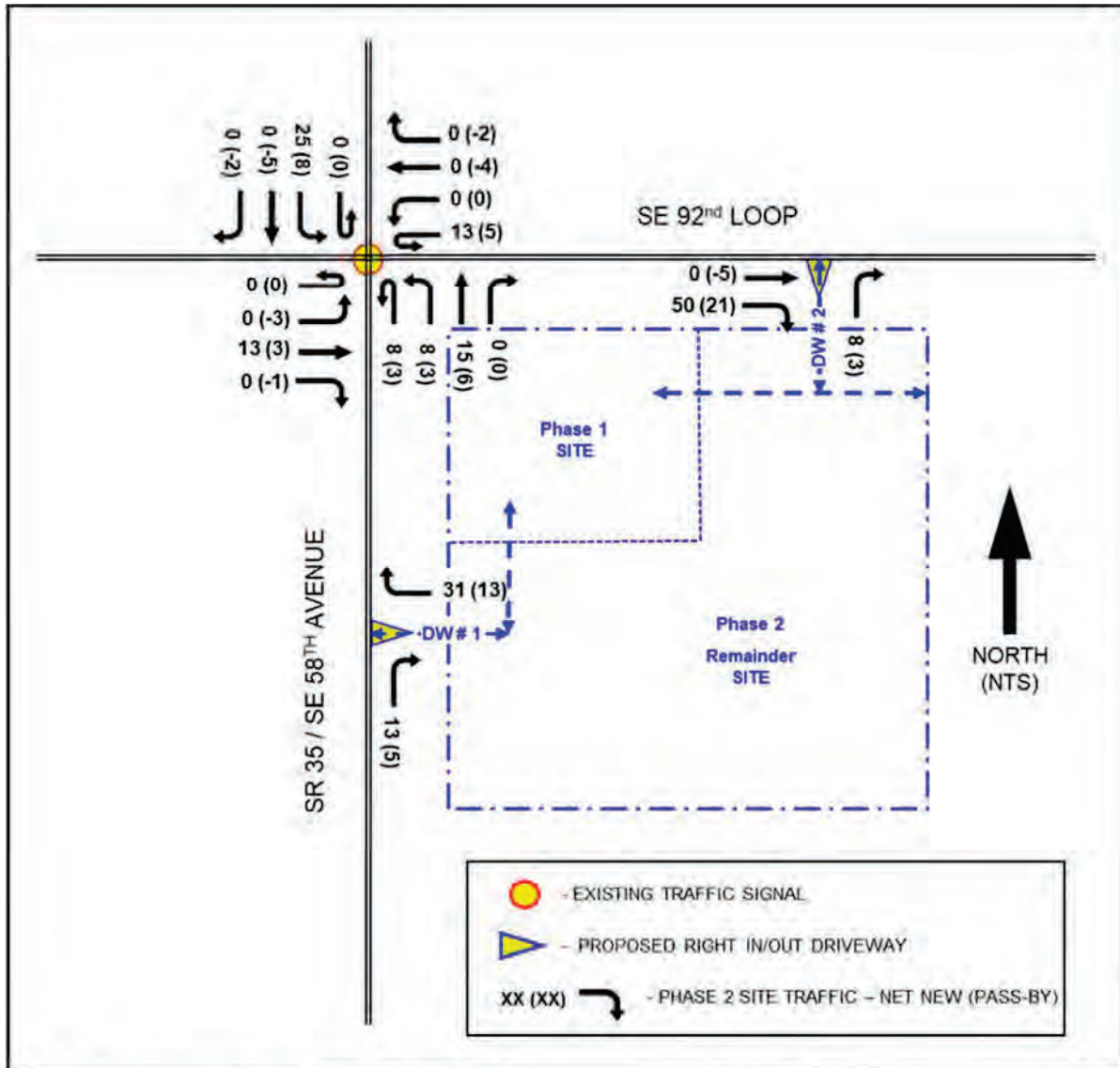
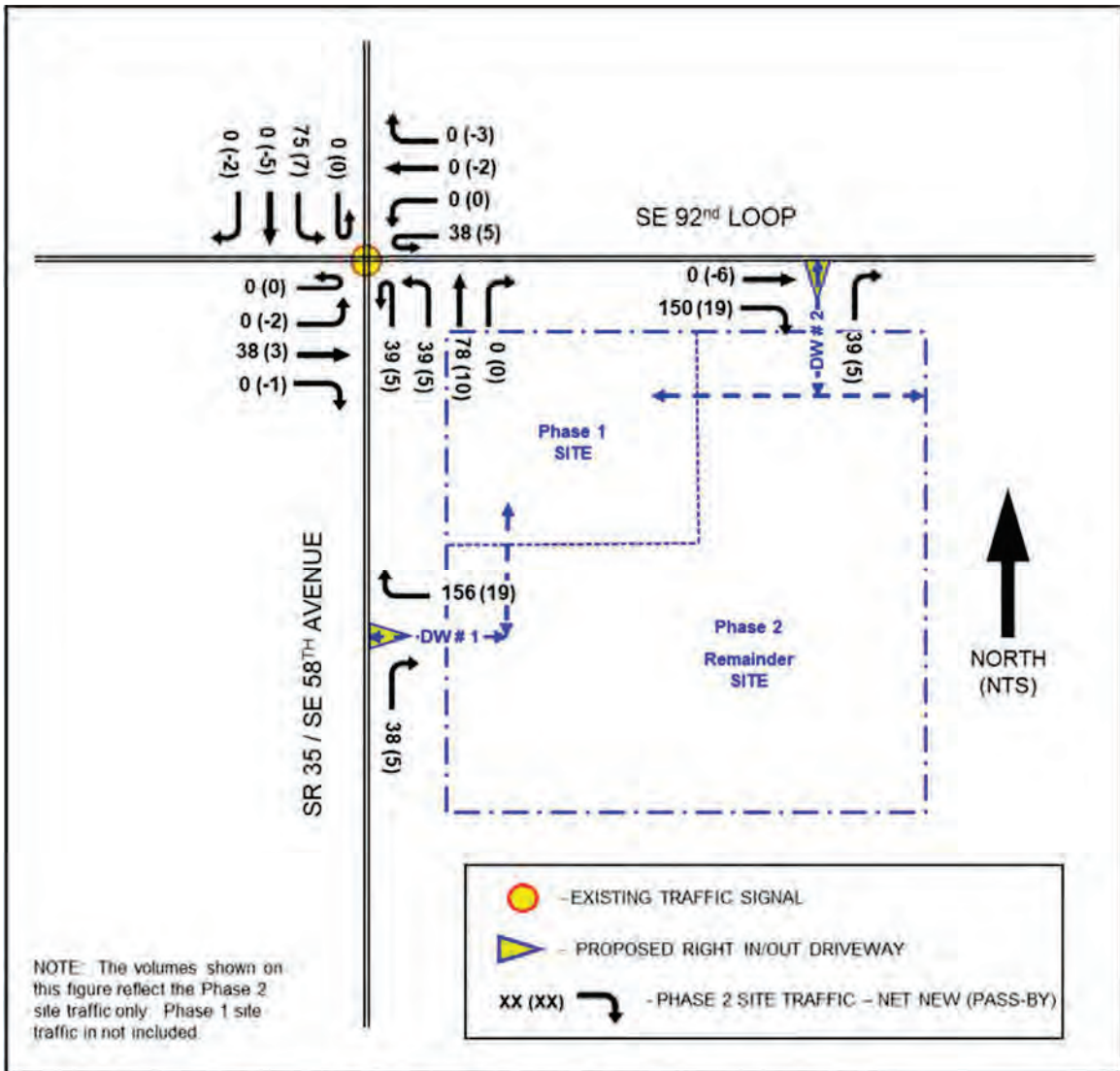


FIGURE 10 - PHASE 2 - SITE TRAFFIC ASSIGNMENT (AM PEAK-HOUR)



**FIGURE 11 - PHASE 2 - SITE TRAFFIC ASSIGNMENT (PM PEAK-HOUR)**

Figure 12 displays the Year 2026 Phase 1+2 Post Development Traffic Projections for the study intersections. The detailed assignment spreadsheets are contained in the Appendix.

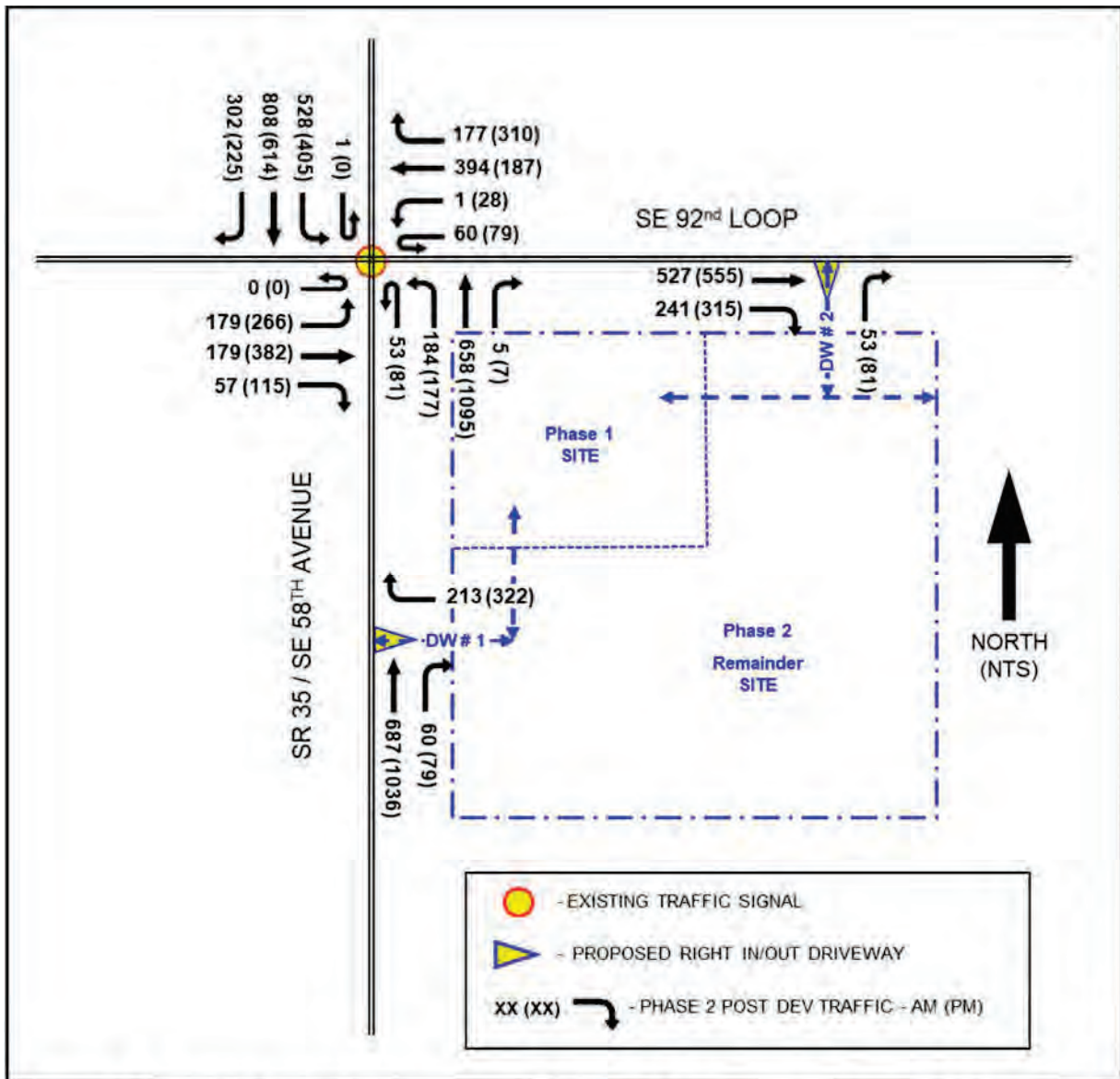


FIGURE 12 - PHASE 2 POST DEVELOPMENT TRAFFIC PROJECTIONS (PEAK-SEASON)

Tables 17 and 18 below provide the results of the Year 2026 Phase 1+2 Post Development Roadway Segment Capacity Analysis.

**TABLE 17**

**YEAR 2026 PHASE 1+2 POST DEVELOPMENT ROADWAY SEGMENT CAPACITY ANALYSIS - AM PEAK HOUR**

Segment ID	Road Name	From	To	Adopted LOS Standard	No. of Lanes	2026 BKDG TRAFFIC PROJECTION (2-WAY)	Site Traffic Dist. Peak Dir	Net New Trips (2-WAY)	PH 1+2 Post Dev Traffic	Pk-Hr Service Volume (1)	PH 1+2 Post Dev V/C Ratio
1010	SE 92 PLACE LOOP	SR 35	US 441	E	4D	1,156	20%	59	1,216	6,102	0.20
4550	SE 92 PL RD	US 441	SR 35	E	2U	1,240	20%	59	1,299	1,152	1.13
5080.1	SR 35	SR 25	SE 92ND PL	D	4D	1,588	20%	59	1,647	3,580	0.46
5090.1	SR 35	SE 92ND PL	LAUREL RD	D	4D	2,506	40%	119	2,625	3,759	0.70

(1) - Source: Ocala Marion CMP Database -2021 Version

Net-Net, AM Peak-Hour Trips 297

**TABLE 18**

**YEAR 2026 PHASE 1+2 POST DEVELOPMENT ROADWAY SEGMENT CAPACITY ANALYSIS - PM PEAK HOUR**

Segment ID	Road Name	From	To	Adopted LOS Standard	No. of Lanes	2026 BKDG TRAFFIC PROJECTION (2-WAY)	Site Traffic Dist. Peak Dir	Net New Trips (2-WAY)	PH 1+2 Post Dev Traffic	Pk-Hr Service Volume (1)	PH 1+2 Post Dev V/C Ratio
1010	SE 92 PLACE LOOP	SR 35	US 441	E	4D	1,135	20%	101	1,236	6,102	0.20
4550	SE 92 PL RD	US 441	SR 35	E	2U	1,245	20%	101	1,345	1,152	1.17
5080.1	SR 35	SR 25	SE 92ND PL	D	4D	1,832	20%	101	1,933	3,580	0.54
5090.1	SR 35	SE 92ND PL	LAUREL RD	D	4D	2,682	40%	202	2,884	3,759	0.77

(1) - Source: Ocala Marion CMP Database -2021 Version

Net-Net, PM Peak-Hour Trips 504

As indicated in Tables 17 and 18, the Year 2026 Post Development Traffic Projections are estimated to exceed the peak-hour service volume on SE 92<sup>nd</sup> Place Road (Seg ID 4550) under the AM and PM peak hour conditions. All other roadway segments in the study area are projected to operate at an acceptable level of service under Year 2026 Post Development Conditions.

## **Appendix H:** ITE Trip Generation Summary Sheets

# Single-Family Detached Housing (210)

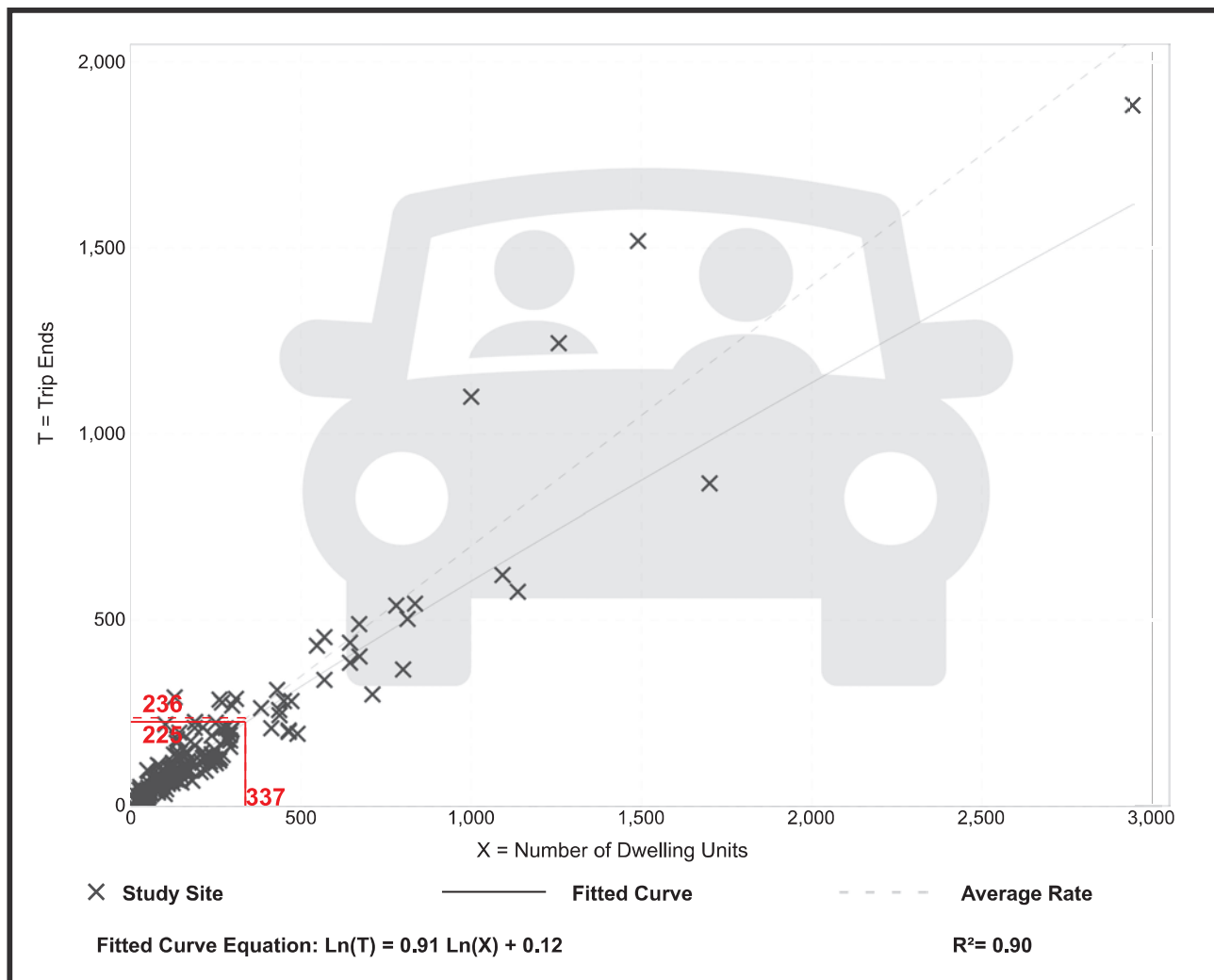
**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**

**Setting/Location: General Urban/Suburban**  
 Number of Studies: 192  
 Avg. Num. of Dwelling Units: 226  
 Directional Distribution: 25% entering, 75% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

## Data Plot and Equation





# Single-Family Detached Housing (210)

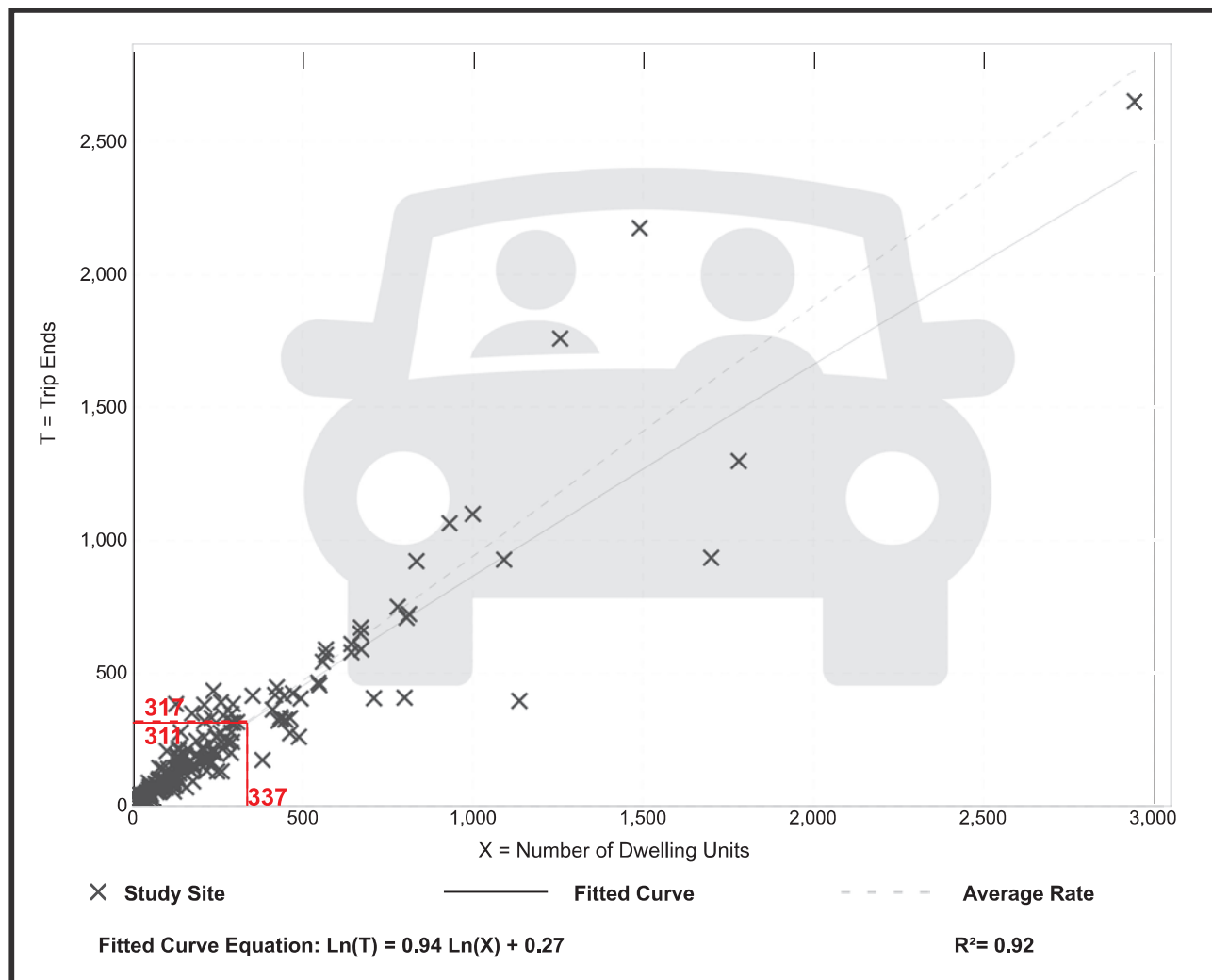
**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**

**Setting/Location: General Urban/Suburban**  
 Number of Studies: 208  
 Avg. Num. of Dwelling Units: 248  
 Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

## Data Plot and Equation



# Single-Family Detached Housing (210)

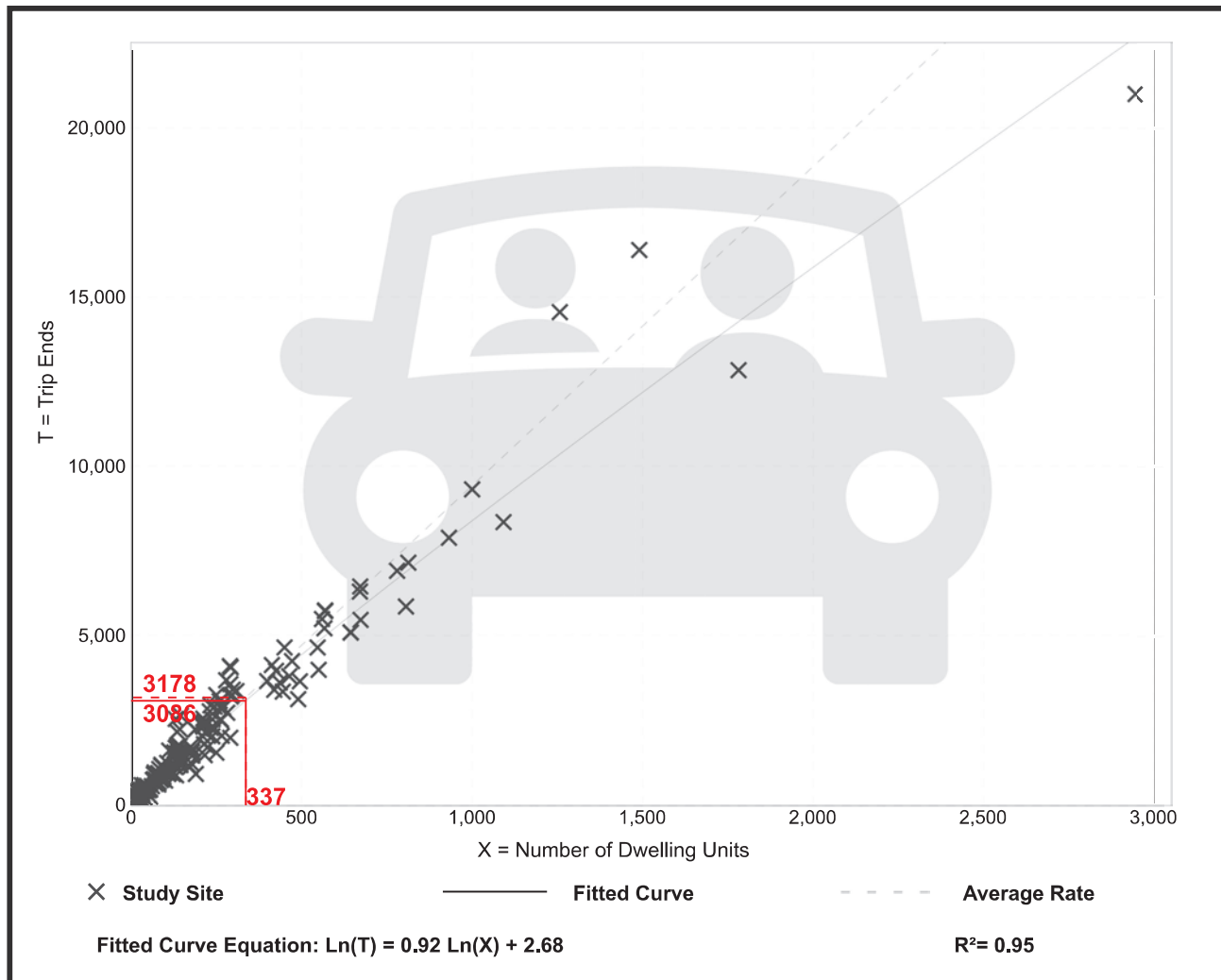
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 174  
Avg. Num. of Dwelling Units: 246  
Directional Distribution: 50% entering, 50% exiting

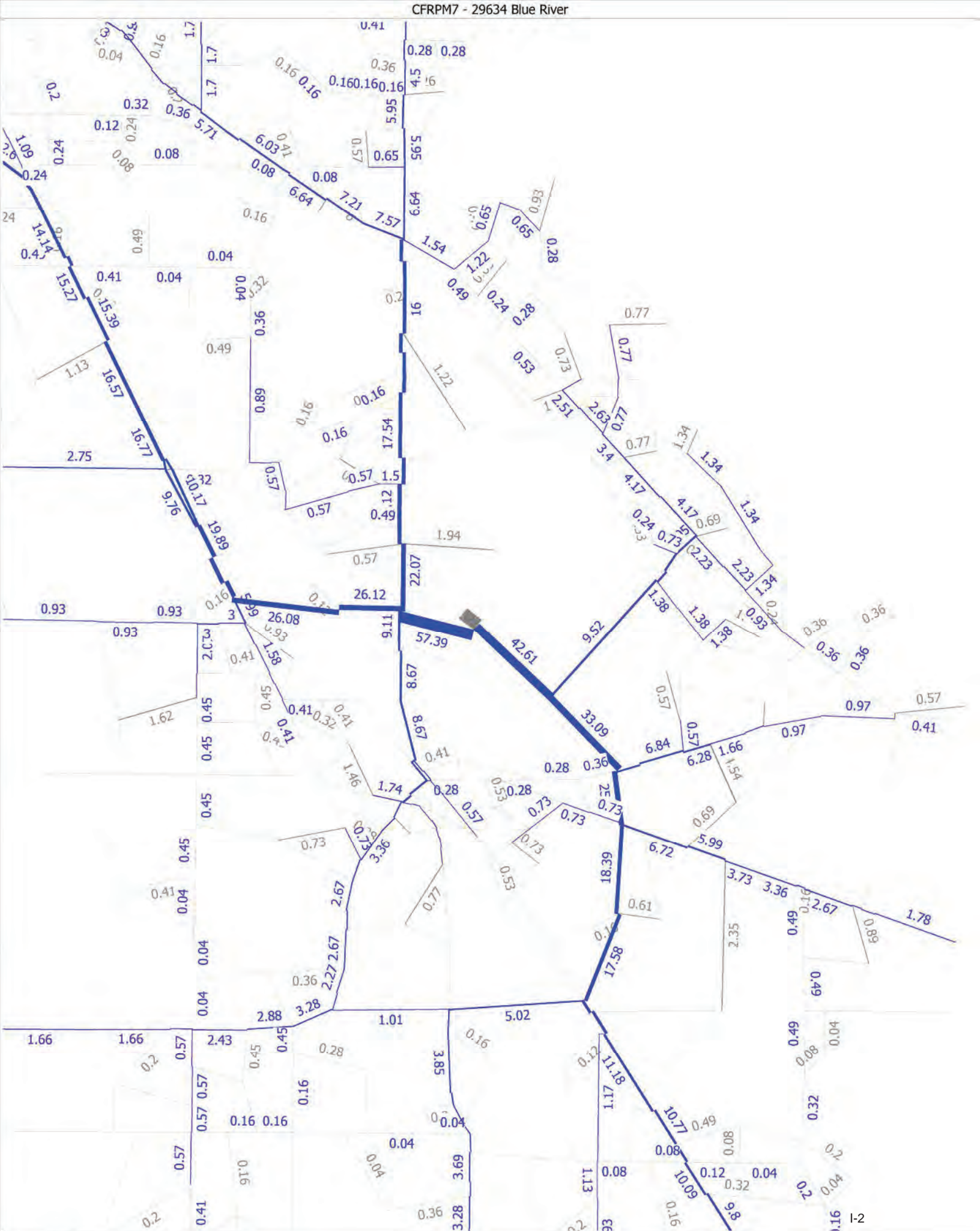
## Vehicle Trip Generation per Dwelling Unit

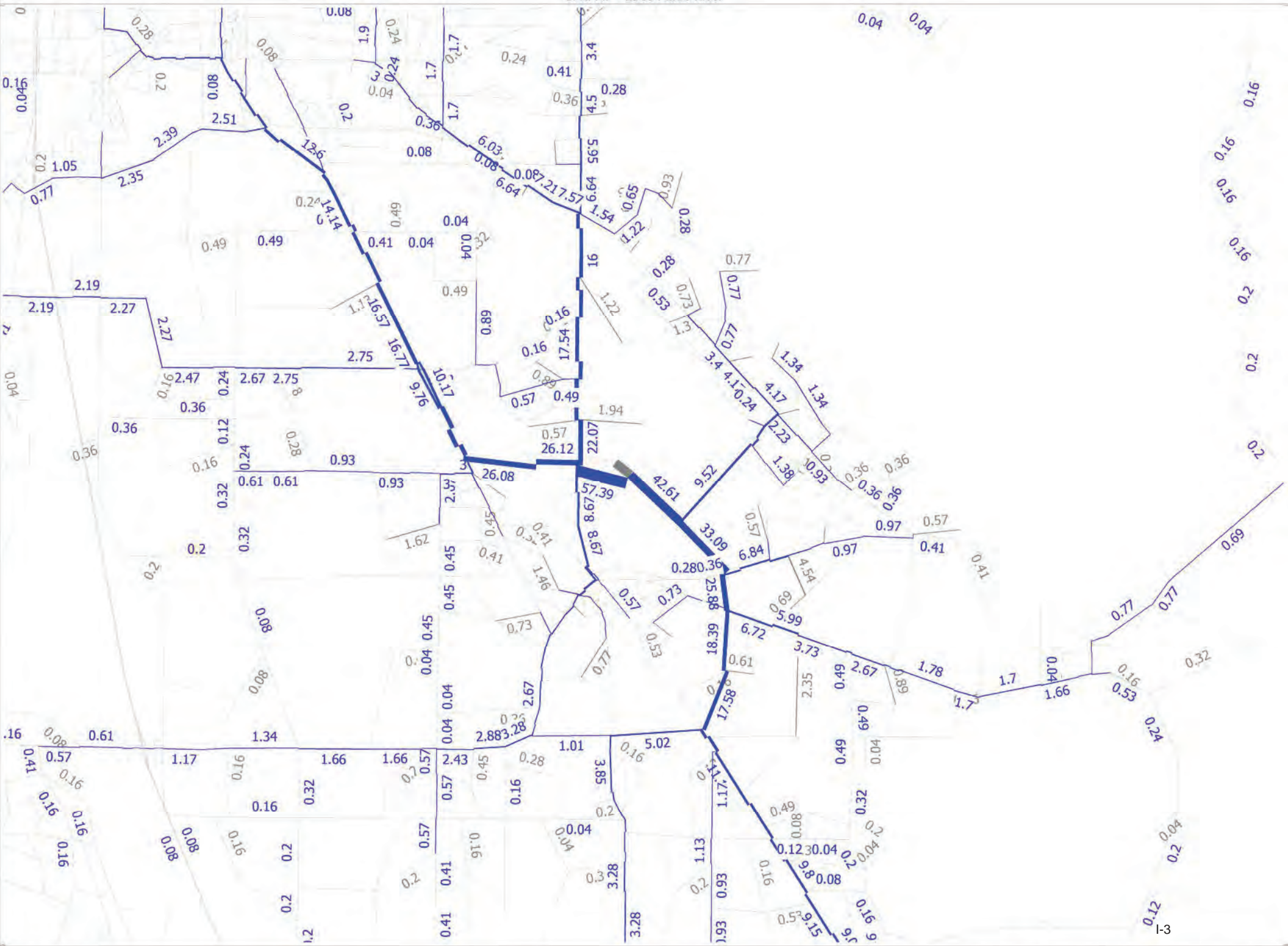
Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

## Data Plot and Equation

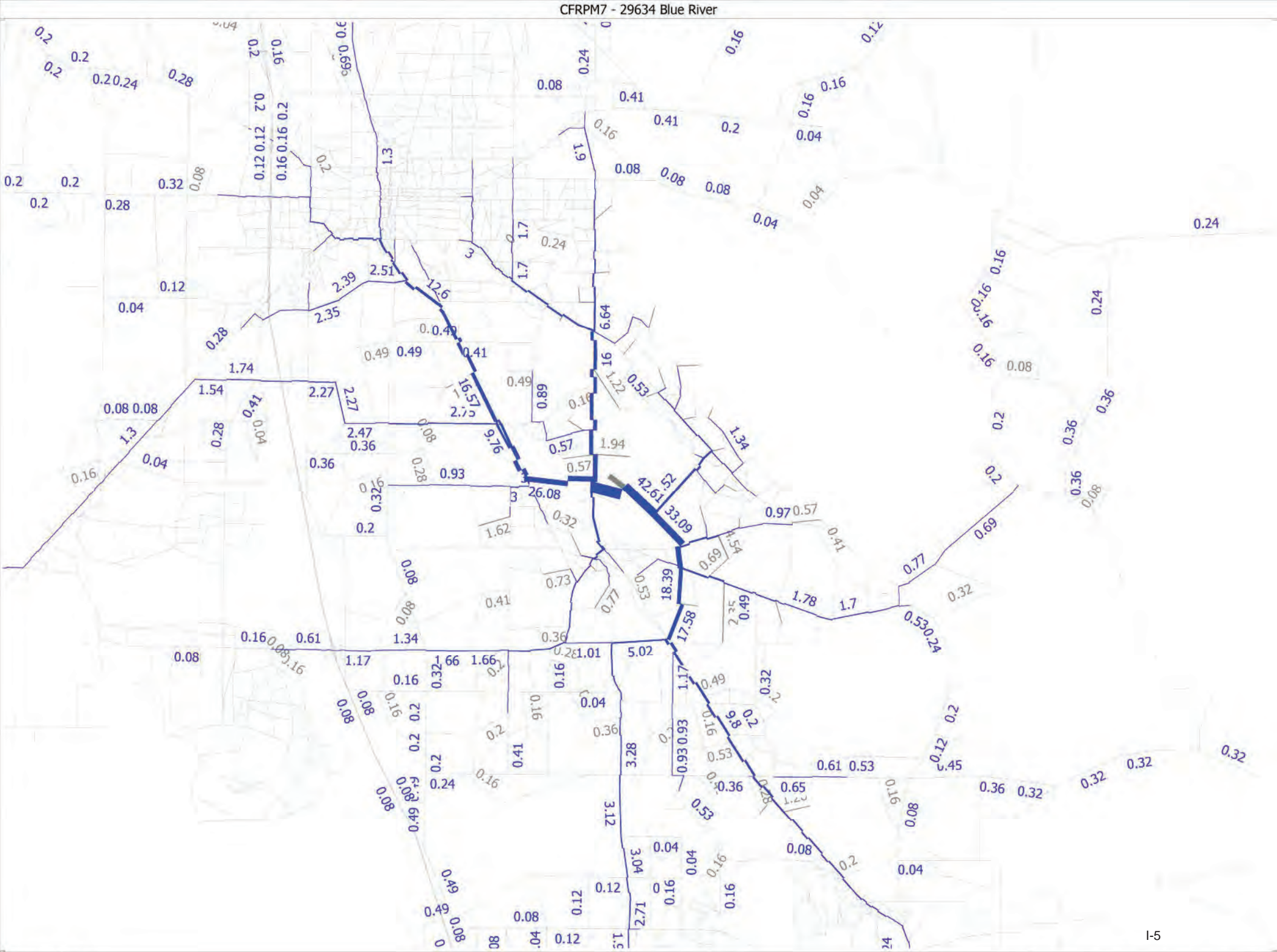


# **Appendix I:** CFRPM Travel Demand Model Plot









## **Appendix J:** No-Build Conditions Analysis



# 2023 FDOT MQ/LOS Handbook Capacity Estimate

### Preliminary Context Classification TDA

☑ Authoritative

Private Member  
Florida Department of Transportation

#### Summary

The Preliminary Context Classification feature class shows preliminary context classification for applicable Florida roadways as derived from event mapping Feature 126, characteristic(s) CCTXTCLS (current context classification), FCTXTCLS (future context classification), CCTXTDTE (current context classification date), and FCTXTDTE (future context classification date) from the FDOT Roadway Characteristics

Read More

View Full Details

Download

#### Details

Dataset  
Feature Layer

February 4, 2024  
Info Updated

Weekly  
Data Updated: February 4, 2024

I want to use this

Records: 10,894

OBJECTID	2592
ROADWAY	36000102
P_CCTXTCLS	C2
P_CCTXTDTE	113018
P_FCTXTCLS	
P_FCTXTDTE	
DISTRICT	5
COUNTYDOT	36
COUNTY	Marion
MNG_DIST	5
BEGIN_POST	0.018
END_POST	5.363

Zoom to

Map data © OpenStreetMap contributors. CC-BY-SA. Powered by



# 2023 MULTIMODAL QUALITY/ LEVEL OF SERVICE HANDBOOK

**State of Florida**  
**Department of Transportation**  
Systems Implementation Office  
605 Suwannee St. MS 19  
Tallahassee, FL 32399

[www.fdot.gov/planning](http://www.fdot.gov/planning)  
January 2023

# Appendix B: Florida's Generalized Service Volume Tables

# Limited Access

## Freeway Generalized Service Volume Tables

### Peak Hour Directional

	B	C	D	E
2 Lane	2,400	3,170	3,970	4,150
3 Lane	3,390	4,600	5,810	6,130
4 Lane	4,340	6,060	7,700	8,170
5 Lane	5,480	7,450	9,680	10,390
6 Lane	6,630	9,220	11,520	12,760

### Peak Hour Two-Way

	B	C	D	E
4 Lane	4,360	5,760	7,220	7,550
6 Lane	6,160	8,360	10,560	11,150
8 Lane	7,890	11,020	14,000	14,850
10 Lane	9,960	13,550	17,600	18,890
12 Lane	12,050	16,760	20,950	23,200

### AADT

	B	C	D	E
4 Lane	51,300	67,800	84,900	88,800
6 Lane	72,500	98,400	124,200	131,200
8 Lane	92,800	129,600	164,700	174,700
10 Lane	117,200	159,400	207,100	222,200
12 Lane	141,800	197,200	246,500	272,900

(Core Urbanized)

	B	C	D	E
2 Lane	2,500	3,300	4,070	4,240
3 Lane	3,570	4,900	6,080	6,360
4 Lane	4,720	6,500	8,090	8,490
5 Lane	5,790	8,020	10,020	10,610

	B	C	D	E
4 Lane	4,550	6,000	7,400	7,710
6 Lane	6,490	8,910	11,050	11,560
8 Lane	8,580	11,820	14,710	15,440
10 Lane	10,530	14,580	18,220	19,290

	B	C	D	E
4 Lane	50,600	66,700	82,200	85,700
6 Lane	72,100	99,000	122,800	128,400
8 Lane	95,300	131,300	163,400	171,600
10 Lane	117,000	162,000	202,400	214,300

(Urbanized)

	B	C	D	E
2 Lane	2,430	3,180	3,790	3,910
3 Lane	3,520	4,670	5,610	5,870
4 Lane	4,630	6,170	7,440	7,830
5 Lane	5,690	7,640	9,220	9,800

	B	C	D	E
4 Lane	4,420	5,780	6,890	7,110
6 Lane	6,400	8,490	10,200	10,670
8 Lane	8,420	11,220	13,530	14,240
10 Lane	10,350	13,890	16,760	17,820

	B	C	D	E
4 Lane	45,100	59,000	70,300	72,600
6 Lane	65,300	86,600	104,100	108,900
8 Lane	85,900	114,500	138,100	145,300
10 Lane	105,600	141,700	171,000	181,800

(Transitioning)

	B	C	D	E
2 Lane	2,010	2,770	3,270	3,650
3 Lane	2,820	3,990	4,770	5,470
4 Lane	3,630	5,220	6,260	7,300

	B	C	D	E
4 Lane	3,650	5,040	5,950	6,640
6 Lane	5,130	7,250	8,670	9,950
8 Lane	6,600	9,490	11,380	13,270

	B	C	D	E
4 Lane	34,800	48,000	56,700	63,200
6 Lane	48,900	69,000	82,600	94,800
8 Lane	62,900	90,400	108,400	126,400

(Rural)

### Adjustment Factors

Auxiliary Lanes Present in Analysis Direction Adjustment: +1,000  
Ramp Metering Present Adjustment: Multiply by 1.05

Auxiliary Lanes Present in Analysis Direction Adjustment: +1,800  
Ramp Metering Present Adjustment: Multiply by 1.05

Auxiliary Lanes Present in Analysis Direction Adjustment: +20,000  
Ramp Metering Present Adjustment: Multiply by 1.05

# Limited Access

## Freeway Generalized Service Volume Tables

### Input Parameters

#### Roadway Characteristics

	Core Urbanized	Urbanized	Transitioning	Rural
Number of Lanes (one direction)	2-6	2.5	2-5	2-4
Posted Speed (mph)	65	70	70	70
Auxiliary Lanes	No	No	No	No
Lane Width (feet)	12	12	12	12
Total Ramp Density (ramps/mile)	1.33	2.67	0.50	0.17
Facility Length (miles)	3	3	6	18
Terrain	Level	Level	Level	Level

#### Traffic Characteristics

	Core Urbanized	Urbanized	Transitioning	Rural
Planning Analysis Hour Factor (K)	0.085	0.090	0.098	0.105
Directional Distribution Factor (D)	0.55	0.55	0.55	0.55
Peak Hour Factor (PHF)	0.95	0.95	0.92	0.88
Base Free Flow Speed (mph)	70	75	75	75
Heavy Vehicle Percent (%)	4%	4%	9%	12%
Speed Adjustment Factor (SAF)	0.975	0.975	0.975	0.975
Capacity Adjustment Factor (CAF)	0.968	0.968	0.968	0.968

# C1 & C2

## Motor Vehicle Highway Generalized Service Volume Tables



(C1-Natural & C2-Rural)

### Peak Hour Directional

	B	C	D	E
1 Lane	240	430	730	1,490
2 Lane	1,670	2,390	2,910	3,340
3 Lane	2,510	3,570	4,370	5,010

### Peak Hour Two-Way

	B	C	D	E
2 Lane	440	780	1,330	2,710
4 Lane	3,040	4,350	5,290	6,070
6 Lane	4,560	6,490	7,950	9,110

### AADT

	B	C	D	E
2 Lane	4,600	8,200	14,000	28,500
4 Lane	32,000	45,800	55,700	63,900
6 Lane	48,000	68,300	83,700	95,900

### Adjustment Factors

- 2 Lane Divided Roadway with Exclusive Left Turn Adjustment: Multiply by 1.05
- Multilane Undivided Highway with Exclusive Left Turn Adjustment: Multiply by 0.95
- Multilane Undivided Highway without Exclusive Left Turn Adjustment: Multiply by 0.75

This table does not constitute a standard and should be used only for general planning applications. The table should not be used for corridor or intersection design, where more refined techniques exist.

# C1 & C2

## Motor Vehicle Highway Generalized Service Volume Tables

### Input Parameters

#### Roadway Characteristics

	C1	C2
Number of Lanes (one direction)	1	2-3
Posted Speed (mph)	55	55
Base Free Flow Speed (mph)	60	60
Median Type	Undivided	Divided
Shoulder Width (feet)	3	6
Lane Width (feet)	12	12
% No Passing Zone	20%	
Access-Point Density (access/mile)	2	2
Terrain	Level	Level

#### Traffic Characteristics

	C1	C2
Planning Analysis Hour Factor (K)	0.095	0.095
Directional Distribution Factor (D)	0.55	0.55
Peak Hour Factor (PHF)	0.88	0.88
Heavy Vehicle Percent (%)	5%	10%
Speed Adjustment Factor (SAF)	0.975	0.975
Capacity Adjustment Factor (CAF)	0.968	0.968



# C3C & C3R

## Motor Vehicle Arterial Generalized Service Volume Tables

### Peak Hour Directional

### Peak Hour Two-Way

### AADT



(C3C-Suburban Commercial)

	B	C	D	E
1 Lane	*	760	1,070	**
2 Lane	*	1,520	1,810	**
3 Lane	*	2,360	2,680	**
4 Lane	*	3,170	3,180	**

	B	C	D	E
2 Lane	*	1,380	1,950	**
4 Lane	*	2,760	3,290	**
6 Lane	*	4,290	4,870	**
8 Lane	*	5,760	5,780	**

	B	C	D	E
2 Lane	*	15,300	21,700	**
4 Lane	*	30,700	36,600	**
6 Lane	*	47,700	54,100	**
8 Lane	*	64,000	64,200	**



(C3R-Suburban Residential)

	B	C	D	E
1 Lane	*	970	1,110	**
2 Lane	*	1,700	1,850	**
3 Lane	*	2,620	2,730	**

	B	C	D	E
2 Lane	*	1,760	2,020	**
4 Lane	*	3,090	3,360	**
6 Lane	*	4,760	4,960	**

	B	C	D	E
2 Lane	*	19,600	22,400	**
4 Lane	*	34,300	37,300	**
6 Lane	*	52,900	55,100	**

### Adjustment Factors

The peak hour directional service volumes should be adjusted by multiplying by 1.2 for one-way facilities  
 The AADT service volumes should be adjusted by multiplying 0.6 for one way facilities  
 2 Lane Divided Roadway with an Exclusive Left Turn Lane(s): Multiply by 1.05  
 2 lane Undivided Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.80

Exclusive right turn lane(s): Multiply by 1.05  
 Multilane Undivided Roadway with an Exclusive Left Turn Lane(s): Multiply by 0.95  
 Multilane Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.75  
 Non-State Signalized Roadway: Multiply by 0.90

This table does not constitute a standard and should be used only for general planning applications. The table should not be used for corridor or intersection design, where more refined techniques exist.

\* Cannot be achieved using table input value defaults.

\*\* Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached.

# C3C & C3R

## Motor Vehicle Arterial Generalized Service Volume Tables

### Input Parameters

#### Roadway Characteristics

	C3C	C3R
Number of Lanes (one direction)	1-4	1-3
Posted Speed (mph)	45	45
Facility Length (miles)	3.98	2.57

#### Traffic Characteristics

	C3C		C3R	
Planning Analysis Hour Factor (K)	0.09		0.09	
Directional Distribution Factor (D)	0.55		0.55	
Peak Hour Factor (PHF)	0.95		0.92	
Base Saturation Flow Rate	1,950		1,950	
Heavy Vehicle Percent (%)	4		4	
Lane Width	12		12	
Median Type	Non Restrictive (1 lane)	Restrictive (2,3,4 lanes)	Non Restrictive (1 lane)	Restrictive (2,3 lanes)
Roadway Edge Type	Curbed		Flush	
On-Street Parking	None		None	

#### Control Characteristics

	C3C		C3R
Cycle Length	160		190
Major Street Through g/c	0.5 (1,2,3 lanes)	0.45 (4 lanes)	0.5
Yellow Change Interval	5.1		5.1
Red Change Interval	2		2
Number of Signals	10		5

# C2T, C4, C5, & C6

## Motor Vehicle Arterial Generalized Service Volume Tables



(C2T-Rural Town)

### Peak Hour Directional

	B	C	D	E
1 Lane	*	720	940	**
2 Lane	*	1,140	1,640	**
3 Lane	*	2,120	2,510	**

### Peak Hour Two-Way

	B	C	D	E
2 Lane	*	1,310	1,710	**
4 Lane	*	2,070	2,980	**
6 Lane	*	3,850	4,560	**

### AADT

	B	C	D	E
2 Lane	*	13,800	18,000	**
4 Lane	*	21,800	31,400	**
6 Lane	*	40,500	48,000	**



(C4-Urban General)

	B	C	D	E
1 Lane	*	*	870	1,190
2 Lane	*	1,210	1,790	2,020
3 Lane	*	2,210	2,810	2,990
4 Lane	*	2,590	3,310	3,510

	B	C	D	E
2 Lane	*	*	1,580	2,160
4 Lane	*	2,200	3,250	3,670
6 Lane	*	4,020	5,110	5,440
8 Lane	*	4,710	6,020	6,380

	B	C	D	E
2 Lane	*	*	17,600	24,000
4 Lane	*	24,400	36,100	40,800
6 Lane	*	44,700	56,800	60,400
8 Lane	*	52,300	66,900	70,900



(C5-Urban Center)

	B	C	D	E
1 Lane	*	*	690	1,080
2 Lane	*	1,290	1,900	2,130
3 Lane	*	1,410	2,670	3,110
4 Lane	*	2,910	3,560	3,640

	B	C	D	E
2 Lane	*	*	1,250	1,960
4 Lane	*	2,350	3,450	3,870
6 Lane	*	2,560	4,850	5,650
8 Lane	*	5,290	6,470	6,620

	B	C	D	E
2 Lane	*	*	13,900	21,800
4 Lane	*	26,100	38,300	43,000
6 Lane	*	28,400	53,900	62,800
8 Lane	*	58,800	71,900	73,600



(C6-Urban Core)

	B	C	D	E
1 Lane	*	***	790	1,030
2 Lane	*	***	1,490	1,920
3 Lane	*	***	2,730	2,940
4 Lane	*	***	3,250	3,490

	B	C	D	E
2 Lane	*	***	1,440	1,870
4 Lane	*	***	2,710	3,490
6 Lane	*	***	4,960	5,350
8 Lane	*	***	5,910	6,350

	B	C	D	E
2 Lane	*	***	16,000	20,800
4 Lane	*	***	30,100	38,800
6 Lane	*	***	55,100	59,400
8 Lane	*	***	65,700	70,600

### Adjustment Factors

The peak hour directional service volumes should be adjusted by multiplying by 1.2 for one-way facilities  
 The AADT service volumes should be adjusted by multiplying 0.6 for one way facilities  
 2 Lane Divided Roadway with an Exclusive Left Turn Lane(s): Multiply by 1.05  
 2 lane Undivided Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.80

Exclusive right turn lane(s): Multiply by 1.05  
 Multilane Undivided Roadway with an Exclusive Left Turn Lane(s): Multiply by 0.95  
 Multilane Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.75  
 Non-State Signalized Roadway: Multiply by 0.90

This table does not constitute a standard and should be used only for general planning applications. The table should not be used for corridor or intersection design, where more refined techniques exist.  
 \*Cannot be achieved using table input value defaults. \*\*Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached.  
 \*\*\*LOS C thresholds are not applicable for C6 as C6 roadway facilities are neither planned nor designed to achieve automobile LOS C.

# C2T, C4, C5, & C6

## Motor Vehicle Arterial Generalized Service Volume Tables

### Input Parameters

#### Roadway Characteristics

	C2T	C4	C5	C6
Number of Lanes (one direction)	1-3	1-4	1-4	1-4
Posted Speed (mph)	40	45	35	30
Facility Length (miles)	0.78	1.83	1.18	0.74
Number of Signals	4	9	9	7

#### Traffic Characteristics

	C2T	C4	C5	C6
Planning Analysis Hour Factor (K)	0.095	0.09	0.09	0.09
Directional Distribution Factor (D)	0.55	0.55	0.55	0.55
Peak Hour Factor (PHF)	0.92	0.95	0.95	0.95
Base Saturation Flow Rate	1,700	1,950	1,950	1,950
Heavy Vehicle Percent (%)	5	3	2	2
Lane Width	11	11	10	10
Median Type	Non Restrictive	Non Restrictive	Non Restrictive	Non Restrictive
Roadway Edge Type	Curb	Curb	Curb	Curb
On-Street Parking	50%	100%	100%	100%

#### Signal Characteristics

	C2T	C4	C5	C6
Cycle Length	90	170	150	120
Major Street Through g/c	0.47	0.52 (1,2,3 lanes)    0.47 (4 lanes)	0.55 (1,2,3 lanes)    0.48 (4 lanes)	0.52 (1,2,3 lanes)    0.46 (4 lanes)
Yellow Change Interval	4.4	4.8	4	3.7
Red Change Interval	2	2	2	2

## No-Build Synchro Analysis

# Lanes, Volumes, Timings

1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	165	62	43	1192	1653	238
Future Volume (vph)	165	62	43	1192	1653	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	265			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.981	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1687	1429	1378	3505	3417	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1687	1429	1378	3505	3417	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		65			17	
Link Speed (mph)	30			45	45	
Link Distance (ft)	484			829	1271	
Travel Time (s)	11.0			12.6	19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	13%	31%	3%	3%	8%
Adj. Flow (vph)	174	65	45	1255	1740	251
Shared Lane Traffic (%)						
Lane Group Flow (vph)	174	65	45	1255	1991	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	8		1	6	2	

Lanes, Volumes, Timings  
 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024

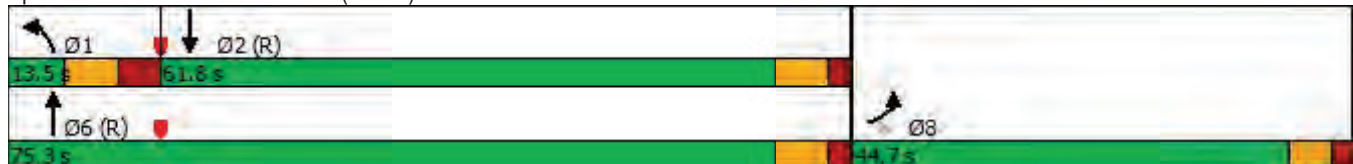


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases	8					
Detector Phase	8	8	1	6	2	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	15.0	15.0	
Minimum Split (s)	44.7	44.7	13.5	24.9	36.9	
Total Split (s)	44.7	44.7	13.5	75.3	61.8	
Total Split (%)	37.3%	37.3%	11.3%	62.8%	51.5%	
Maximum Green (s)	39.0	39.0	5.0	68.4	54.9	
Yellow Time (s)	3.7	3.7	4.8	4.9	4.9	
All-Red Time (s)	2.0	2.0	3.7	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	8.5	6.9	6.9	
Lead/Lag	Lead			Lag		
Lead-Lag Optimize?	Yes			Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0			7.0	
Flash Dont Walk (s)	32.0	32.0			23.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	17.8	17.8	10.2	89.6	73.9	
Actuated g/C Ratio	0.15	0.15	0.08	0.75	0.62	
v/c Ratio	0.70	0.24	0.38	0.48	0.94	
Control Delay	62.5	12.1	60.6	7.2	33.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.5	12.1	60.6	7.2	33.9	
LOS	E	B	E	A	C	
Approach Delay	48.8			9.1	33.9	
Approach LOS	D			A	C	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	28 (23%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	25.8
Intersection LOS:	C
Intersection Capacity Utilization:	72.9%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.



HCM 6th Signalized Intersection Summary  
 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	165	62	43	1192	1653	238
Future Volume (veh/h)	165	62	43	1192	1653	238
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1707	1441	1856	1856	1781
Adj Flow Rate, veh/h	174	58	45	1255	1740	240
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	13	31	3	3	8
Cap, veh/h	208	176	57	2726	2063	278
Arrive On Green	0.12	0.12	0.04	0.77	0.66	0.66
Sat Flow, veh/h	1711	1447	1372	3618	3215	421
Grp Volume(v), veh/h	174	58	45	1255	965	1015
Grp Sat Flow(s),veh/h/ln	1711	1447	1372	1763	1763	1780
Q Serve(g_s), s	11.9	4.4	3.9	15.0	49.2	54.1
Cycle Q Clear(g_c), s	11.9	4.4	3.9	15.0	49.2	54.1
Prop In Lane	1.00	1.00	1.00			0.24
Lane Grp Cap(c), veh/h	208	176	57	2726	1165	1176
V/C Ratio(X)	0.84	0.33	0.79	0.46	0.83	0.86
Avail Cap(c_a), veh/h	556	470	57	2726	1165	1176
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	48.2	57.0	4.8	15.2	16.1
Incr Delay (d2), s/veh	8.5	1.1	50.7	0.6	6.8	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	1.6	2.1	4.1	18.7	21.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	60.0	49.3	107.7	5.4	22.1	24.6
LnGrp LOS	E	D	F	A	C	C
Approach Vol, veh/h	232			1300	1980	
Approach Delay, s/veh	57.4			8.9	23.4	
Approach LOS	E			A	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.5	86.2			99.7	20.3
Change Period (Y+Rc), s	* 8.5	6.9			6.9	5.7
Max Green Setting (Gmax), s	* 5	54.9			68.4	39.0
Max Q Clear Time (g_c+l1), s	5.9	56.1			17.0	13.9
Green Ext Time (p_c), s	0.0	0.0			11.5	0.7

Intersection Summary

HCM 6th Ctrl Delay	20.3
HCM 6th LOS	C













Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations							
Traffic Volume (vph)	498	415	1488	255	271	1270	
Future Volume (vph)	498	415	1488	255	271	1270	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	465	0		0	500		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				25		
Lane Util. Factor	0.97	1.00	0.95	0.95	1.00	0.95	
Frt		0.850	0.978				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	3367	1509	3295	0	1504	3438	
Flt Permitted	0.950				0.066		
Satd. Flow (perm)	3367	1509	3295	0	105	3438	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		391	17				
Link Speed (mph)	45		45			45	
Link Distance (ft)	886		2249			1233	
Travel Time (s)	13.4		34.1			18.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	
Heavy Vehicles (%)	4%	7%	7%	8%	20%	5%	
Adj. Flow (vph)	513	428	1534	263	279	1309	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	513	428	1797	0	279	1309	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	24		12			12	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2		1	2	
Detector Template	Left	Right	Thru		Left	Thru	
Leading Detector (ft)	20	20	100		20	100	
Trailing Detector (ft)	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	
Detector 1 Size(ft)	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA		pm+pt	NA	
Protected Phases	4		2		1	6	3

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

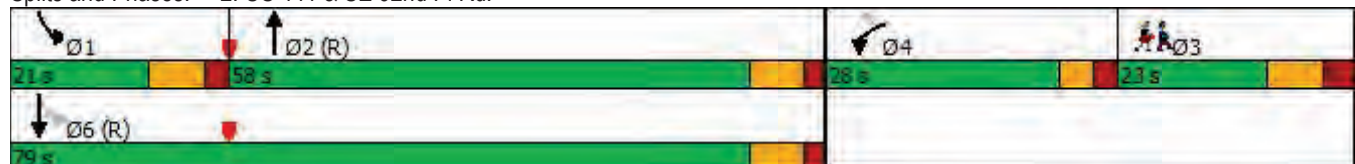


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Permitted Phases		4			6		
Detector Phase	4	4	2		1	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	17.0		5.0	17.0	5.0
Minimum Split (s)	35.7	35.7	48.7		12.7	25.7	37.5
Total Split (s)	28.0	28.0	58.0		21.0	79.0	23.0
Total Split (%)	21.5%	21.5%	44.6%		16.2%	60.8%	18%
Maximum Green (s)	22.3	22.3	50.3		13.3	71.3	14.5
Yellow Time (s)	3.4	3.4	5.5		5.5	5.5	5.5
All-Red Time (s)	2.3	2.3	2.2		2.2	2.2	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7	7.7		7.7	7.7	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max	None
Walk Time (s)	7.0	7.0	7.0				7.0
Flash Dont Walk (s)	23.0	23.0	34.0				22.0
Pedestrian Calls (#/hr)	0	0	0				0
Act Effct Green (s)	21.9	21.9	52.5		94.7	94.7	
Actuated g/C Ratio	0.17	0.17	0.40		0.73	0.73	
v/c Ratio	0.91	0.74	1.34		0.62	0.52	
Control Delay	73.7	15.6	191.3		36.1	8.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	73.7	15.6	191.3		36.1	8.7	
LOS	E	B	F		D	A	
Approach Delay	47.3		191.3			13.5	
Approach LOS	D		F			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 22 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 145  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.34  
 Intersection Signal Delay: 94.7  
 Intersection LOS: F  
 Intersection Capacity Utilization 96.1%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 2: US 441 & SE 92nd PI Rd.



# HCM Signalized Intersection Capacity Analysis

## 2: US 441 & SE 92nd PI Rd.

03/08/2024



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	498	415	1488	255	271	1270
Future Volume (vph)	498	415	1488	255	271	1270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	7.7		7.7	7.7
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3367	1509	3295		1504	3438
Flt Permitted	0.95	1.00	1.00		0.07	1.00
Satd. Flow (perm)	3367	1509	3295		105	3438
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	513	428	1534	263	279	1309
RTOR Reduction (vph)	0	325	10	0	0	0
Lane Group Flow (vph)	513	103	1787	0	279	1309
Heavy Vehicles (%)	4%	7%	7%	8%	20%	5%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	21.9	21.9	52.5		94.7	94.7
Effective Green, g (s)	21.9	21.9	52.5		94.7	94.7
Actuated g/C Ratio	0.17	0.17	0.40		0.73	0.73
Clearance Time (s)	5.7	5.7	7.7		7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	567	254	1330		447	2504
v/s Ratio Prot	c0.15		c0.54		c0.17	0.38
v/s Ratio Perm		0.07			0.29	
v/c Ratio	0.90	0.40	1.34		0.62	0.52
Uniform Delay, d1	53.0	48.2	38.8		33.2	7.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	17.9	1.1	159.7		2.7	0.8
Delay (s)	70.9	49.3	198.5		35.9	8.5
Level of Service	E	D	F		D	A
Approach Delay (s)	61.1		198.5			13.3
Approach LOS	E		F			B

### Intersection Summary

HCM 2000 Control Delay	100.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	29.6
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	265	141	95	419	341	175	906	77	450	1024	399
Future Volume (vph)	219	265	141	95	419	341	175	906	77	450	1024	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		345	645		1000	485		300	765		575
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt		0.948				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3303	3024	0	1626	3505	1553	1752	3505	1417	3467	3438	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3303	3024	0	1626	3505	1553	1752	3505	1417	3467	3438	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		62				289			155			298
Link Speed (mph)		45			50			45			45	
Link Distance (ft)		1046			1493			1329			994	
Travel Time (s)		15.8			20.4			20.1			15.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	6%	17%	6%	11%	3%	4%	3%	3%	14%	1%	5%	2%
Adj. Flow (vph)	226	273	145	98	432	352	180	934	79	464	1056	411
Shared Lane Traffic (%)												
Lane Group Flow (vph)	226	418	0	98	432	352	180	934	79	464	1056	411
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

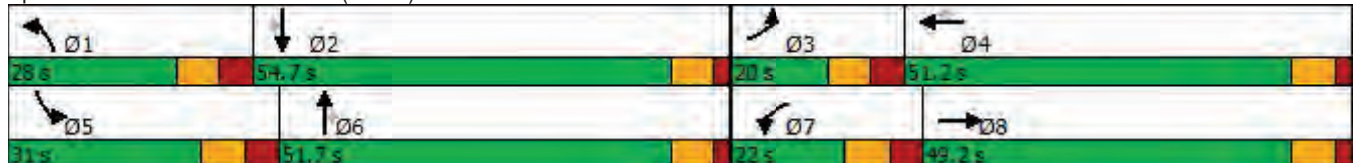


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						4			6			2
Detector Phase	3	8		7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	15.0		5.0	15.0	15.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	16.9	49.2		15.0	51.2	51.2	13.8	47.9	47.9	13.9	43.9	43.9
Total Split (s)	20.0	49.2		22.0	51.2	51.2	28.0	51.7	51.7	31.0	54.7	54.7
Total Split (%)	13.0%	32.0%		14.3%	33.3%	33.3%	18.2%	33.6%	33.6%	20.1%	35.5%	35.5%
Maximum Green (s)	11.1	42.0		13.1	44.0	44.0	19.2	44.8	44.8	22.1	47.8	47.8
Yellow Time (s)	5.0	5.2		5.2	5.2	5.2	4.8	4.9	4.9	4.9	4.9	4.9
All-Red Time (s)	3.9	2.0		3.7	2.0	2.0	4.0	2.0	2.0	4.0	2.0	2.0
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)	8.9	7.2		8.9	7.2	7.2	8.8	6.9	6.9	8.9	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		35.0			37.0	37.0		34.0	34.0		30.0	30.0
Pedestrian Calls (#/hr)		0			0	0		0	0		0	0
Act Effct Green (s)	11.2	22.0		11.8	22.7	22.7	17.5	43.2	43.2	21.4	47.2	47.2
Actuated g/C Ratio	0.09	0.17		0.09	0.17	0.17	0.13	0.33	0.33	0.16	0.36	0.36
v/c Ratio	0.80	0.74		0.67	0.71	0.69	0.77	0.81	0.14	0.82	0.85	0.54
Control Delay	80.7	52.9		80.7	57.7	18.1	76.9	46.8	0.5	66.0	46.9	12.3
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	80.7	52.9		80.7	57.7	18.1	76.9	46.8	0.5	66.0	46.9	12.3
LOS	F	D		F	E	B	E	D	A	E	D	B
Approach Delay		62.7			44.4			48.3			44.1	
Approach LOS		E			D			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 153.9  
 Actuated Cycle Length: 130.5  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 47.8      Intersection LOS: D  
 Intersection Capacity Utilization 83.7%      ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 3: 58th Ave. (SR 35) & SE 92nd PI Rd.



HCM 6th Signalized Intersection Summary  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘	↕		↖	↕	↗	↖	↕	↗	↖↘	↕	↗
Traffic Volume (veh/h)	219	265	141	95	419	341	175	906	77	450	1024	399
Future Volume (veh/h)	219	265	141	95	419	341	175	906	77	450	1024	399
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1648	1811	1737	1856	1841	1856	1856	1693	1885	1826	1870
Adj Flow Rate, veh/h	226	273	123	98	432	305	180	934	56	464	1056	382
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	17	6	11	3	4	3	3	14	1	5	2
Cap, veh/h	273	502	220	119	801	354	205	1070	435	520	1170	535
Arrive On Green	0.08	0.24	0.24	0.07	0.23	0.23	0.12	0.30	0.30	0.15	0.34	0.34
Sat Flow, veh/h	3346	2118	929	1654	3526	1560	1767	3526	1434	3483	3469	1585
Grp Volume(v), veh/h	226	200	196	98	432	305	180	934	56	464	1056	382
Grp Sat Flow(s),veh/h/ln	1673	1566	1481	1654	1763	1560	1767	1763	1434	1742	1735	1585
Q Serve(g_s), s	8.9	14.9	15.6	7.8	14.4	25.1	13.4	33.6	3.8	17.5	38.8	28.1
Cycle Q Clear(g_c), s	8.9	14.9	15.6	7.8	14.4	25.1	13.4	33.6	3.8	17.5	38.8	28.1
Prop In Lane	1.00		0.63	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	371	351	119	801	354	205	1070	435	520	1170	535
V/C Ratio(X)	0.83	0.54	0.56	0.82	0.54	0.86	0.88	0.87	0.13	0.89	0.90	0.71
Avail Cap(c_a), veh/h	278	492	465	162	1160	513	254	1181	480	576	1240	567
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	44.6	44.9	61.2	45.5	49.6	58.2	44.1	33.8	55.8	42.2	38.7
Incr Delay (d2), s/veh	18.2	1.2	1.4	21.3	0.6	9.9	23.8	6.9	0.1	15.2	9.1	4.0
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	4.4	5.8	5.7	3.9	6.2	10.5	7.2	15.2	1.3	8.6	17.5	11.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.7	45.9	46.3	82.5	46.1	59.5	81.9	51.1	33.9	71.1	51.3	42.7
LnGrp LOS	E	D	D	F	D	E	F	D	C	E	D	D
Approach Vol, veh/h		622			835			1170			1902	
Approach Delay, s/veh		57.9			55.3			55.0			54.4	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.3	52.0	19.8	37.6	28.9	47.5	18.5	38.9				
Change Period (Y+Rc), s	8.8	6.9	* 8.9	7.2	* 8.9	6.9	* 8.9	7.2				
Max Green Setting (Gmax), s	19.2	47.8	* 11	44.0	* 22	44.8	* 13	42.0				
Max Q Clear Time (g_c+I1), s	15.4	40.8	10.9	27.1	19.5	35.6	9.8	17.6				
Green Ext Time (p_c), s	0.2	4.3	0.0	3.3	0.5	4.1	0.1	2.2				

Intersection Summary























HCM 6th Ctrl Delay	55.2
HCM 6th LOS	E

Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	421	47	47	303	192	28	409	35	188	711	396
Future Volume (vph)	191	421	47	47	303	192	28	409	35	188	711	396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	255		0	330		225	240		0	215		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.985				0.850		0.988			0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1812	0	1656	1759	1553	1641	1794	0	1752	1724	0
Flt Permitted	0.137			0.239			0.060			0.307		
Satd. Flow (perm)	250	1812	0	417	1759	1553	104	1794	0	566	1724	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				198		4			34	
Link Speed (mph)		35			35			40			35	
Link Distance (ft)		608			801			775			744	
Travel Time (s)		11.8			15.6			13.2			14.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	6%	9%	8%	4%	10%	4%	12%	3%	5%	3%
Adj. Flow (vph)	208	458	51	51	329	209	30	445	38	204	773	430
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	509	0	51	329	209	30	483	0	204	1203	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	1	6			2			4		3	8	

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

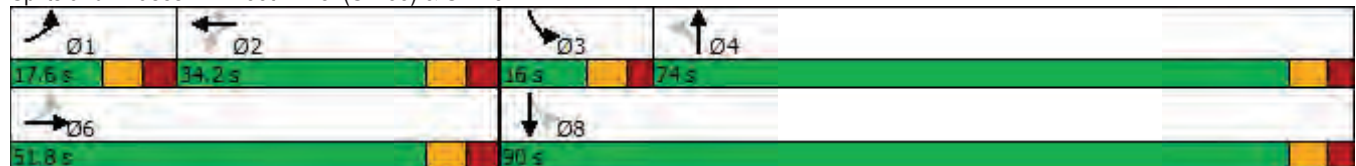


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6			2		2	4			8		
Detector Phase	1	6		2	2	2	4	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	24.0		24.0	24.0	24.0	10.0	10.0		6.0	10.0	
Minimum Split (s)	13.9	31.9		31.9	31.9	31.9	25.0	25.0		13.0	25.0	
Total Split (s)	17.6	51.8		34.2	34.2	34.2	74.0	74.0		16.0	90.0	
Total Split (%)	12.4%	36.5%		24.1%	24.1%	24.1%	52.2%	52.2%		11.3%	63.5%	
Maximum Green (s)	9.7	43.9		26.3	26.3	26.3	67.0	67.0		9.0	83.0	
Yellow Time (s)	4.2	4.2		4.2	4.2	4.2	4.1	4.1		4.1	4.1	
All-Red Time (s)	3.7	3.7		3.7	3.7	3.7	2.9	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.9	7.9		7.9	7.9	7.9	7.0	7.0		7.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Recall Mode	None	Min		Min	Min	Min	Max	Max		None	None	
Act Effct Green (s)	43.9	43.9		26.3	26.3	26.3	67.0	67.0		83.0	83.0	
Actuated g/C Ratio	0.31	0.31		0.19	0.19	0.19	0.47	0.47		0.59	0.59	
v/c Ratio	1.16	0.90		0.66	1.01	0.47	0.61	0.57		0.50	1.18	
Control Delay	154.7	67.3		92.6	108.8	11.3	81.4	30.0		18.6	117.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	154.7	67.3		92.6	108.8	11.3	81.4	30.0		18.6	117.7	
LOS	F	E		F	F	B	F	C		B	F	
Approach Delay		92.7			72.8			33.0			103.3	
Approach LOS		F			E			C			F	

Intersection Summary

Area Type:	Other
Cycle Length:	141.8
Actuated Cycle Length:	141.8
Natural Cycle:	145
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.18
Intersection Signal Delay:	84.2
Intersection LOS:	F
Intersection Capacity Utilization:	139.7%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 4: 58th Ave. (SR 35) & SR 25





HCM 6th Signalized Intersection Summary  
 4: 58th Ave. (SR 35) & SR 25

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	421	47	47	303	192	28	409	35	188	711	396
Future Volume (veh/h)	191	421	47	47	303	192	28	409	35	188	711	396
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1856	1811	1767	1781	1841	1752	1841	1722	1856	1826	1856
Adj Flow Rate, veh/h	208	458	50	51	329	207	30	445	0	204	773	426
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	3	6	9	8	4	10	4	12	3	5	3
Cap, veh/h	172	509	56	87	330	289	51	870		448	648	357
Arrive On Green	0.07	0.31	0.31	0.19	0.19	0.19	0.47	0.47	0.00	0.06	0.59	0.59
Sat Flow, veh/h	1753	1644	179	842	1781	1560	437	1841	0	1767	1106	610
Grp Volume(v), veh/h	208	0	508	51	329	207	30	445	0	204	0	1199
Grp Sat Flow(s),veh/h/ln	1753	0	1823	842	1781	1560	437	1841	0	1767	0	1716
Q Serve(g_s), s	9.7	0.0	37.8	6.1	26.2	17.7	0.0	23.8	0.0	8.3	0.0	83.0
Cycle Q Clear(g_c), s	9.7	0.0	37.8	26.3	26.2	17.7	67.0	23.8	0.0	8.3	0.0	83.0
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.00	1.00		0.36
Lane Grp Cap(c), veh/h	172	0	564	87	330	289	51	870		448	0	1005
V/C Ratio(X)	1.21	0.00	0.90	0.59	1.00	0.72	0.59	0.51		0.46	0.00	1.19
Avail Cap(c_a), veh/h	172	0	564	87	330	289	51	870		448	0	1005
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(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.7	0.0	46.8	68.7	57.7	54.2	70.9	26.0	0.0	19.2	0.0	29.4
Incr Delay (d2), s/veh	137.4	0.0	17.7	11.8	48.3	8.9	41.7	2.1	0.0	1.0	0.0	97.0
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	8.0	0.0	19.7	2.1	16.1	7.6	1.7	10.8	0.0	3.5	0.0	59.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	185.1	0.0	64.6	80.6	106.0	63.1	112.6	28.2	0.0	20.3	0.0	126.4
LnGrp LOS	F	A	E	F	F	E	F	C		C	A	F
Approach Vol, veh/h		716			587			475			1403	
Approach Delay, s/veh		99.6			88.7			33.5			111.0	
Approach LOS		F			F			C			F	
Timer - Assigned Phs	1	2	3	4		6		8				
Phs Duration (G+Y+Rc), s	17.6	34.2	16.0	74.0		51.8		90.0				
Change Period (Y+Rc), s	* 7.9	* 7.9	7.0	7.0		* 7.9		7.0				
Max Green Setting (Gmax), s	* 9.7	* 26	9.0	67.0		* 44		83.0				
Max Q Clear Time (g_c+I1), s	11.7	28.3	10.3	69.0		39.8		85.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0		1.5		0.0				

Intersection Summary

























HCM 6th Ctrl Delay	92.7
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	118	43	109	122	178	31	585	369	107	590	54
Future Volume (vph)	31	118	43	109	122	178	31	585	369	107	590	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	475		475	485		485	390		400	400		400
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850				0.850			0.850		0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	1727	1482	1736	1827	1583	1543	3471	1583	1787	3406	1346
Flt Permitted	0.677			0.506			0.424			0.273		
Satd. Flow (perm)	1138	1727	1482	924	1827	1583	689	3471	1583	514	3406	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132			182			377			133
Link Speed (mph)		30			30			50			30	
Link Distance (ft)		828			917			1237			1406	
Travel Time (s)		18.8			20.8			16.9			32.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	13%	10%	9%	4%	4%	2%	17%	4%	2%	1%	6%	20%
Adj. Flow (vph)	32	120	44	111	124	182	32	597	377	109	602	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	120	44	111	124	182	32	597	377	109	602	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8		8	4		4	6		6	2		2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	16.0	16.0	8.0	16.0	16.0
Minimum Split (s)	14.0	41.3	41.3	14.0	41.3	41.3	15.1	31.1	31.1	15.1	31.1	31.1
Total Split (s)	16.0	49.0	49.0	16.0	49.0	49.0	18.0	56.5	56.5	21.0	59.5	59.5
Total Split (%)	11.2%	34.4%	34.4%	11.2%	34.4%	34.4%	12.6%	39.6%	39.6%	14.7%	41.8%	41.8%
Maximum Green (s)	10.0	41.7	41.7	10.0	41.7	41.7	10.9	49.4	49.4	13.9	52.4	52.4
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.1	5.1	5.1	5.1	5.1	5.1
All-Red Time (s)	2.0	3.3	3.3	2.0	3.3	3.3	2.0	2.0	2.0	2.0	2.0	2.0
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	0.0
Total Lost Time (s)	6.0	7.3	7.3	6.0	7.3	7.3	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	21.0	11.5	11.5	26.0	19.2	19.2	29.8	21.7	21.7	35.8	30.1	30.1
Actuated g/C Ratio	0.26	0.14	0.14	0.32	0.24	0.24	0.37	0.27	0.27	0.45	0.38	0.38
v/c Ratio	0.09	0.48	0.13	0.28	0.28	0.35	0.09	0.64	0.54	0.29	0.47	0.09
Control Delay	20.0	40.2	0.9	21.4	31.6	7.5	12.7	29.5	5.9	14.1	22.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	40.2	0.9	21.4	31.6	7.5	12.7	29.5	5.9	14.1	22.6	0.3
LOS	B	D	A	C	C	A	B	C	A	B	C	A
Approach Delay		28.1			18.4			20.1			19.8	
Approach LOS		C			B			C			B	

Intersection Summary

Area Type:	Other
Cycle Length:	142.5
Actuated Cycle Length:	80.1
Natural Cycle:	105
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	20.3
Intersection LOS:	C
Intersection Capacity Utilization	59.2%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 5: SE 92nd Loop & SE 110th St Rd.



HCM 6th Signalized Intersection Summary  
 5: SE 92nd Loop & SE 110th St Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	118	43	109	122	178	31	585	369	107	590	54
Future Volume (veh/h)	31	118	43	109	122	178	31	585	369	107	590	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1752	1767	1841	1841	1870	1648	1841	1870	1885	1811	1604
Adj Flow Rate, veh/h	32	120	44	111	124	143	32	597	377	109	602	55
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	13	10	9	4	4	2	17	4	2	1	6	20
Cap, veh/h	281	193	165	326	288	248	335	1101	499	376	1240	490
Arrive On Green	0.05	0.11	0.11	0.10	0.16	0.16	0.05	0.31	0.31	0.10	0.36	0.36
Sat Flow, veh/h	1626	1752	1497	1753	1841	1585	1570	3497	1585	1795	3441	1359
Grp Volume(v), veh/h	32	120	44	111	124	143	32	597	377	109	602	55
Grp Sat Flow(s),veh/h/ln	1626	1752	1497	1753	1841	1585	1570	1749	1585	1795	1721	1359
Q Serve(g_s), s	1.2	4.8	2.0	3.9	4.4	6.1	1.0	10.2	15.5	2.8	9.8	2.0
Cycle Q Clear(g_c), s	1.2	4.8	2.0	3.9	4.4	6.1	1.0	10.2	15.5	2.8	9.8	2.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	281	193	165	326	288	248	335	1101	499	376	1240	490
V/C Ratio(X)	0.11	0.62	0.27	0.34	0.43	0.58	0.10	0.54	0.76	0.29	0.49	0.11
Avail Cap(c_a), veh/h	420	1006	860	394	1057	910	488	2379	1078	544	2483	981
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(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	30.9	29.6	24.4	27.7	28.4	15.2	20.6	22.4	14.2	18.0	15.5
Incr Delay (d2), s/veh	0.2	3.3	0.9	0.6	1.0	2.1	0.1	0.4	2.4	0.4	0.3	0.1
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	0.5	2.1	0.7	1.6	2.0	2.4	0.3	3.7	5.7	1.1	3.7	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	34.1	30.5	25.1	28.7	30.5	15.3	21.0	24.7	14.6	18.3	15.6
LnGrp LOS	C	C	C	C	C	C	B	C	C	B	B	B
Approach Vol, veh/h		196			378			1006			766	
Approach Delay, s/veh		32.0			28.3			22.2			17.6	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.9	33.3	9.8	18.6	14.2	30.0	13.1	15.3				
Change Period (Y+Rc), s	7.1	7.1	6.0	* 7.3	7.1	7.1	6.0	* 7.3				
Max Green Setting (Gmax), s	10.9	52.4	10.0	* 42	13.9	49.4	10.0	* 42				
Max Q Clear Time (g_c+l1), s	3.0	11.8	3.2	8.1	4.8	17.5	5.9	6.8				
Green Ext Time (p_c), s	0.0	4.9	0.0	1.2	0.2	5.3	0.1	0.8				

Intersection Summary

HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Lanes, Volumes, Timings

1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	327	54	44	1742	1208	174
Future Volume (vph)	327	54	44	1742	1208	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	265			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.981	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1597	1262	1530	3539	3325	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1597	1262	1530	3539	3325	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		57			16	
Link Speed (mph)	30			45	45	
Link Distance (ft)	484			829	1271	
Travel Time (s)	11.0			12.6	19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	13%	28%	18%	2%	5%	17%
Adj. Flow (vph)	344	57	46	1834	1272	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	344	57	46	1834	1455	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	8		1	6	2	

# Lanes, Volumes, Timings

1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024

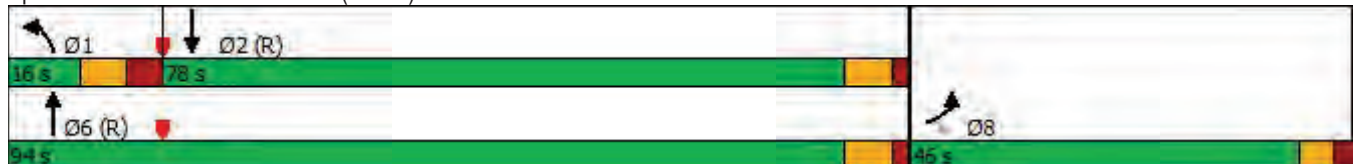


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases	8					
Detector Phase	8	8	1	6	2	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	15.0	15.0	
Minimum Split (s)	44.7	44.7	13.5	24.9	36.9	
Total Split (s)	46.0	46.0	16.0	94.0	78.0	
Total Split (%)	32.9%	32.9%	11.4%	67.1%	55.7%	
Maximum Green (s)	40.3	40.3	7.5	87.1	71.1	
Yellow Time (s)	3.7	3.7	4.8	4.9	4.9	
All-Red Time (s)	2.0	2.0	3.7	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	8.5	6.9	6.9	
Lead/Lag	Lead			Lag		
Lead-Lag Optimize?	Yes			Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0			7.0	
Flash Dont Walk (s)	32.0	32.0			23.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	34.3	34.3	7.9	93.1	79.5	
Actuated g/C Ratio	0.24	0.24	0.06	0.66	0.57	
v/c Ratio	0.88	0.16	0.53	0.78	0.77	
Control Delay	73.8	9.9	86.0	20.4	28.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	73.8	9.9	86.0	20.4	28.6	
LOS	E	A	F	C	C	
Approach Delay	64.7			22.0	28.6	
Approach LOS	E			C	C	

## Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	6 (4%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	110
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	29.2
Intersection LOS:	C
Intersection Capacity Utilization	76.8%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.



HCM 6th Signalized Intersection Summary  
 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	327	54	44	1742	1208	174
Future Volume (veh/h)	327	54	44	1742	1208	174
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1707	1485	1633	1870	1826	1648
Adj Flow Rate, veh/h	344	45	46	1834	1272	175
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	13	28	18	2	5	17
Cap, veh/h	370	287	68	2424	1772	242
Arrive On Green	0.23	0.23	0.04	0.68	0.58	0.58
Sat Flow, veh/h	1626	1259	1555	3647	3157	419
Grp Volume(v), veh/h	344	45	46	1834	717	730
Grp Sat Flow(s),veh/h/ln	1626	1259	1555	1777	1735	1750
Q Serve(g_s), s	29.0	4.0	4.1	47.5	41.6	42.3
Cycle Q Clear(g_c), s	29.0	4.0	4.1	47.5	41.6	42.3
Prop In Lane	1.00	1.00	1.00			0.24
Lane Grp Cap(c), veh/h	370	287	68	2424	1003	1012
V/C Ratio(X)	0.93	0.16	0.68	0.76	0.71	0.72
Avail Cap(c_a), veh/h	468	362	83	2424	1003	1012
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	43.3	66.0	14.6	21.2	21.4
Incr Delay (d2), s/veh	21.9	0.3	15.2	2.3	4.4	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.1	1.3	1.9	17.4	16.9	17.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	74.9	43.5	81.2	16.9	25.6	25.9
LnGrp LOS	E	D	F	B	C	C
Approach Vol, veh/h	389			1880	1447	
Approach Delay, s/veh	71.2			18.4	25.7	
Approach LOS	E			B	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	14.6	87.8			102.4	37.6
Change Period (Y+Rc), s	* 8.5	6.9			6.9	5.7
Max Green Setting (Gmax), s	* 7.5	71.1			87.1	40.3
Max Q Clear Time (g_c+l1), s	6.1	44.3			49.5	31.0
Green Ext Time (p_c), s	0.0	11.1			19.6	0.9

Intersection Summary

HCM 6th Ctrl Delay	26.8
HCM 6th LOS	C

Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations							
Traffic Volume (vph)	360	280	1533	569	484	1530	
Future Volume (vph)	360	280	1533	569	484	1530	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	465	0		0	500		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				25		
Lane Util. Factor	0.97	1.00	0.95	0.95	1.00	0.95	
Frt		0.850	0.959				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	3335	1429	3219	0	1703	3374	
Flt Permitted	0.950				0.075		
Satd. Flow (perm)	3335	1429	3219	0	134	3374	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		295	39				
Link Speed (mph)	45		45			45	
Link Distance (ft)	886		2249			1233	
Travel Time (s)	13.4		34.1			18.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	5%	13%	7%	9%	6%	7%	
Adj. Flow (vph)	379	295	1614	599	509	1611	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	379	295	2213	0	509	1611	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	24		12			12	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2		1	2	
Detector Template	Left	Right	Thru		Left	Thru	
Leading Detector (ft)	20	20	100		20	100	
Trailing Detector (ft)	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	
Detector 1 Size(ft)	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA		pm+pt	NA	
Protected Phases	4		2		1	6	3



Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

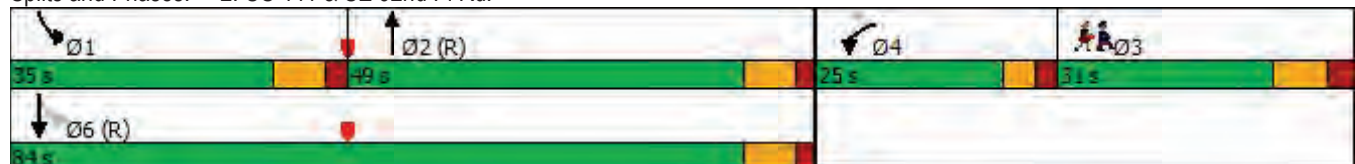


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Permitted Phases		4			6		
Detector Phase	4	4	2		1	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	17.0		5.0	17.0	5.0
Minimum Split (s)	35.7	35.7	48.7		12.7	25.7	37.5
Total Split (s)	25.0	25.0	49.0		35.0	84.0	31.0
Total Split (%)	17.9%	17.9%	35.0%		25.0%	60.0%	22%
Maximum Green (s)	19.3	19.3	41.3		27.3	76.3	22.5
Yellow Time (s)	3.4	3.4	5.5		5.5	5.5	5.5
All-Red Time (s)	2.3	2.3	2.2		2.2	2.2	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7	7.7		7.7	7.7	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max	None
Walk Time (s)	7.0	7.0	7.0				7.0
Flash Dont Walk (s)	23.0	23.0	34.0				22.0
Pedestrian Calls (#/hr)	0	0	0				0
Act Effct Green (s)	18.7	18.7	45.6		107.9	107.9	
Actuated g/C Ratio	0.13	0.13	0.33		0.77	0.77	
v/c Ratio	0.85	0.66	2.06		0.71	0.62	
Control Delay	77.5	13.6	505.5		35.6	8.4	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	77.5	13.6	505.5		35.6	8.4	
LOS	E	B	F		D	A	
Approach Delay	49.5		505.5			14.9	
Approach LOS	D		F			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 102 (73%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 145  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 2.06  
 Intersection Signal Delay: 236.4  
 Intersection LOS: F  
 Intersection Capacity Utilization 115.2%  
 ICU Level of Service H  
 Analysis Period (min) 15

Splits and Phases: 2: US 441 & SE 92nd PI Rd.



# HCM Signalized Intersection Capacity Analysis

## 2: US 441 & SE 92nd PI Rd.

03/08/2024


























Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	360	280	1533	569	484	1530
Future Volume (vph)	360	280	1533	569	484	1530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	7.7		7.7	7.7
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3335	1429	3221		1703	3374
Flt Permitted	0.95	1.00	1.00		0.08	1.00
Satd. Flow (perm)	3335	1429	3221		135	3374
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	379	295	1614	599	509	1611
RTOR Reduction (vph)	0	256	26	0	0	0
Lane Group Flow (vph)	379	39	2187	0	509	1611
Heavy Vehicles (%)	5%	13%	7%	9%	6%	7%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	18.7	18.7	45.6		107.9	107.9
Effective Green, g (s)	18.7	18.7	45.6		107.9	107.9
Actuated g/C Ratio	0.13	0.13	0.33		0.77	0.77
Clearance Time (s)	5.7	5.7	7.7		7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	445	190	1049		715	2600
v/s Ratio Prot	c0.11		c0.68		c0.28	0.48
v/s Ratio Perm		0.03			0.27	
v/c Ratio	0.85	0.21	2.08		0.71	0.62
Uniform Delay, d1	59.3	54.0	47.2		30.4	7.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	14.5	0.5	491.3		3.4	1.1
Delay (s)	73.8	54.6	538.5		33.7	8.2
Level of Service	E	D	F		C	A
Approach Delay (s)	65.4		538.5			14.3
Approach LOS	E		F			B

### Intersection Summary

HCM 2000 Control Delay	252.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	29.6
Intersection Capacity Utilization	115.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
3: 58th Ave. (SR 35) & SE 92nd PI Rd.
























03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	317	600	201	86	373	455	220	1204	102	388	831	293
Future Volume (vph)	317	600	201	86	373	455	220	1204	102	388	831	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		345	645		1000	485		300	765		575
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt		0.962				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3276	0	1687	3574	1553	1671	3471	1509	3335	3343	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3276	0	1687	3574	1553	1671	3471	1509	3335	3343	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31				247			156			282
Link Speed (mph)		45			50			45			45	
Link Distance (ft)		1046			1493			1329			994	
Travel Time (s)		15.8			20.4			20.1			15.1	
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 (%)	5%	7%	3%	7%	1%	4%	8%	4%	7%	5%	8%	2%
Adj. Flow (vph)	334	632	212	91	393	479	232	1267	107	408	875	308
Shared Lane Traffic (%)												
Lane Group Flow (vph)	334	844	0	91	393	479	232	1267	107	408	875	308
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

























HCM 6th Signalized Intersection Summary  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	600	201	86	373	455	220	1204	102	388	831	293
Future Volume (veh/h)	317	600	201	86	373	455	220	1204	102	388	831	293
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1796	1856	1796	1885	1841	1781	1841	1796	1826	1781	1870
Adj Flow Rate, veh/h	334	632	171	91	393	427	232	1267	70	408	875	266
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
Percent Heavy Veh, %	5	7	3	7	1	4	8	4	7	5	8	2
Cap, veh/h	312	844	228	101	1019	444	218	1104	481	336	974	456
Arrive On Green	0.09	0.32	0.32	0.06	0.28	0.28	0.13	0.32	0.32	0.10	0.29	0.29
Sat Flow, veh/h	3374	2656	718	1711	3582	1560	1697	3497	1522	3374	3385	1585
Grp Volume(v), veh/h	334	406	397	91	393	427	232	1267	70	408	875	266
Grp Sat Flow(s),veh/h/ln	1687	1706	1667	1711	1791	1560	1697	1749	1522	1687	1692	1585
Q Serve(g_s), s	14.2	32.7	32.8	8.1	13.5	41.4	19.7	48.5	5.1	15.3	38.1	22.1
Cycle Q Clear(g_c), s	14.2	32.7	32.8	8.1	13.5	41.4	19.7	48.5	5.1	15.3	38.1	22.1
Prop In Lane	1.00		0.43	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	312	542	530	101	1019	444	218	1104	481	336	974	456
V/C Ratio(X)	1.07	0.75	0.75	0.90	0.39	0.96	1.07	1.15	0.15	1.21	0.90	0.58
Avail Cap(c_a), veh/h	312	546	533	101	1026	447	218	1104	481	336	974	456
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.7	46.9	46.9	71.8	44.2	54.1	66.9	52.5	37.7	69.1	52.5	46.8
Incr Delay (d2), s/veh	71.0	5.6	5.8	57.9	0.2	32.8	79.6	77.1	0.1	120.6	11.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	14.4	14.2	5.1	5.9	19.9	13.2	32.5	1.9	12.1	17.3	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	140.7	52.5	52.8	129.7	44.4	87.0	146.5	129.7	37.8	189.7	63.6	48.7
LnGrp LOS	F	D	D	F	D	F	F	F	D	F	E	D
Approach Vol, veh/h		1137			911			1569			1549	
Approach Delay, s/veh		78.5			72.9			128.1			94.2	
Approach LOS		E			E			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.5	51.1	23.1	50.9	24.2	55.4	18.0	56.0				
Change Period (Y+Rc), s	8.8	6.9	* 8.9	7.2	* 8.9	6.9	* 8.9	7.2				
Max Green Setting (Gmax), s	19.7	44.2	* 14	44.0	* 15	48.5	* 9.1	49.1				
Max Q Clear Time (g_c+I1), s	21.7	40.1	16.2	43.4	17.3	50.5	10.1	34.8				
Green Ext Time (p_c), s	0.0	2.3	0.0	0.3	0.0	0.0	0.0	4.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay					97.3							
HCM 6th LOS					F							
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	423	357	27	27	463	107	35	753	39	219	509	188
Future Volume (vph)	423	357	27	27	463	107	35	753	39	219	509	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	255		0	330		225	240		0	215		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Frt		0.990				0.850		0.993			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1786	0	1719	1792	1568	1421	1806	0	1770	1672	0
Flt Permitted	0.096			0.525			0.143			0.074		
Satd. Flow (perm)	174	1786	0	950	1792	1568	214	1806	0	138	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				145		2			17	
Link Speed (mph)		35			35			40			35	
Link Distance (ft)		608			801			775			744	
Travel Time (s)		11.8			15.6			13.2			14.5	
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 (%)	5%	5%	10%	5%	6%	3%	27%	4%	14%	2%	8%	12%
Adj. Flow (vph)	445	376	28	28	487	113	37	793	41	231	536	198
Shared Lane Traffic (%)												
Lane Group Flow (vph)	445	404	0	28	487	113	37	834	0	231	734	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	1	6			2			4		3	8	

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

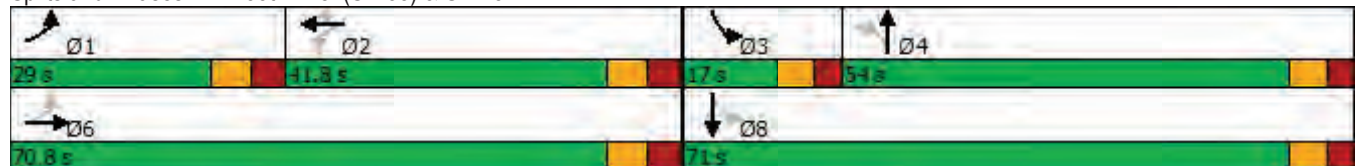
03/08/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6			2		2	4			8		
Detector Phase	1	6		2	2	2	4	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	24.0		24.0	24.0	24.0	10.0	10.0		6.0	10.0	
Minimum Split (s)	13.9	31.9		31.9	31.9	31.9	25.0	25.0		13.0	25.0	
Total Split (s)	29.0	70.8		41.8	41.8	41.8	54.0	54.0		17.0	71.0	
Total Split (%)	20.5%	49.9%		29.5%	29.5%	29.5%	38.1%	38.1%		12.0%	50.1%	
Maximum Green (s)	21.1	62.9		33.9	33.9	33.9	47.0	47.0		10.0	64.0	
Yellow Time (s)	4.2	4.2		4.2	4.2	4.2	4.1	4.1		4.1	4.1	
All-Red Time (s)	3.7	3.7		3.7	3.7	3.7	2.9	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.9	7.9		7.9	7.9	7.9	7.0	7.0		7.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Recall Mode	None	Min		Min	Min	Min	Max	Max		None	None	
Act Effct Green (s)	62.9	62.9		33.9	33.9	33.9	47.0	47.0		64.0	64.0	
Actuated g/C Ratio	0.44	0.44		0.24	0.24	0.24	0.33	0.33		0.45	0.45	
v/c Ratio	1.45	0.51		0.12	1.14	0.23	0.53	1.39		1.31	0.96	
Control Delay	252.5	30.9		44.2	134.7	3.9	68.7	223.1		202.2	61.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	252.5	30.9		44.2	134.7	3.9	68.7	223.1		202.2	61.6	
LOS	F	C		D	F	A	E	F		F	E	
Approach Delay		147.1			107.1			216.6			95.2	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other  
 Cycle Length: 141.8  
 Actuated Cycle Length: 141.8  
 Natural Cycle: 145  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.45  
 Intersection Signal Delay: 142.7  
 Intersection LOS: F  
 Intersection Capacity Utilization 126.8%  
 ICU Level of Service H  
 Analysis Period (min) 15

Splits and Phases: 4: 58th Ave. (SR 35) & SR 25



HCM 6th Signalized Intersection Summary  
 4: 58th Ave. (SR 35) & SR 25

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	423	357	27	27	463	107	35	753	39	219	509	188
Future Volume (veh/h)	423	357	27	27	463	107	35	753	39	219	509	188
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1752	1826	1811	1856	1500	1841	1693	1870	1781	1722
Adj Flow Rate, veh/h	445	376	28	28	487	109	37	793	0	231	536	194
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
Percent Heavy Veh, %	5	5	10	5	6	3	27	4	14	2	8	12
Cap, veh/h	310	745	55	280	433	376	73	610		176	563	204
Arrive On Green	0.15	0.44	0.44	0.24	0.24	0.24	0.33	0.33	0.00	0.07	0.45	0.45
Sat Flow, veh/h	1739	1678	125	958	1811	1572	582	1841	0	1781	1248	452
Grp Volume(v), veh/h	445	0	404	28	487	109	37	793	0	231	0	730
Grp Sat Flow(s),veh/h/ln	1739	0	1803	958	1811	1572	582	1841	0	1781	0	1700
Q Serve(g_s), s	21.1	0.0	22.8	3.2	33.9	8.0	5.5	47.0	0.0	10.0	0.0	58.5
Cycle Q Clear(g_c), s	21.1	0.0	22.8	3.2	33.9	8.0	47.0	47.0	0.0	10.0	0.0	58.5
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.00	1.00		0.27
Lane Grp Cap(c), veh/h	310	0	800	280	433	376	73	610		176	0	767
V/C Ratio(X)	1.44	0.00	0.51	0.10	1.12	0.29	0.51	1.30		1.31	0.00	0.95
Avail Cap(c_a), veh/h	310	0	800	280	433	376	73	610		176	0	767
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(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.7	0.0	28.3	42.3	54.0	44.1	69.2	47.4	0.0	40.6	0.0	37.4
Incr Delay (d2), s/veh	214.5	0.0	0.7	0.2	81.9	0.6	22.8	146.7	0.0	173.9	0.0	21.6
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	26.1	0.0	9.9	0.8	25.1	3.2	1.8	45.8	0.0	12.4	0.0	28.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	259.2	0.0	29.0	42.5	135.8	44.7	92.1	194.1	0.0	214.5	0.0	59.0
LnGrp LOS	F	A	C	D	F	D	F	F		F	A	E
Approach Vol, veh/h		849			624			830				961
Approach Delay, s/veh		149.7			115.7			189.5				96.4
Approach LOS		F			F			F				F
Timer - Assigned Phs	1	2	3	4	6	8						
Phs Duration (G+Y+Rc), s	29.0	41.8	17.0	54.0	70.8	71.0						
Change Period (Y+Rc), s	* 7.9	* 7.9	7.0	7.0	* 7.9	7.0						
Max Green Setting (Gmax), s	* 21	* 34	10.0	47.0	* 63	64.0						
Max Q Clear Time (g_c+I1), s	23.1	35.9	12.0	49.0	24.8	60.5						
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	3.9	2.0						

Intersection Summary

HCM 6th Ctrl Delay	137.6
HCM 6th LOS	F

























Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	212	55	365	94	188	48	619	476	234	544	60
Future Volume (vph)	28	212	55	365	94	188	48	619	476	234	544	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	475		475	485		485	390		400	400		400
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1845	1509	1805	1900	1599	1626	3374	1553	1770	3374	1482
Flt Permitted	0.693			0.340			0.436			0.181		
Satd. Flow (perm)	1155	1845	1509	646	1900	1599	746	3374	1553	337	3374	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			232			198			501			179
Link Speed (mph)		30			30			50				30
Link Distance (ft)		828			917			1237				1406
Travel Time (s)		18.8			20.8			16.9				32.0
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 (%)	14%	3%	7%	0%	0%	1%	11%	7%	4%	2%	7%	9%
Adj. Flow (vph)	29	223	58	384	99	198	51	652	501	246	573	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	223	58	384	99	198	51	652	501	246	573	63
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

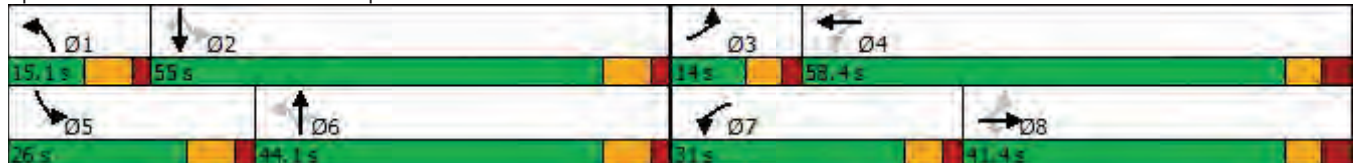
03/08/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8		8	4		4	6		6	2		2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	16.0	16.0	8.0	16.0	16.0
Minimum Split (s)	14.0	41.3	41.3	14.0	41.3	41.3	15.1	31.1	31.1	15.1	31.1	31.1
Total Split (s)	14.0	41.4	41.4	31.0	58.4	58.4	15.1	44.1	44.1	26.0	55.0	55.0
Total Split (%)	9.8%	29.1%	29.1%	21.8%	41.0%	41.0%	10.6%	30.9%	30.9%	18.2%	38.6%	38.6%
Maximum Green (s)	8.0	34.1	34.1	25.0	51.1	51.1	8.0	37.0	37.0	18.9	47.9	47.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.1	5.1	5.1	5.1	5.1	5.1
All-Red Time (s)	2.0	3.3	3.3	2.0	3.3	3.3	2.0	2.0	2.0	2.0	2.0	2.0
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	0.0
Total Lost Time (s)	6.0	7.3	7.3	6.0	7.3	7.3	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	29.2	19.7	19.7	51.2	42.2	42.2	38.1	29.9	29.9	54.2	42.8	42.8
Actuated g/C Ratio	0.25	0.17	0.17	0.43	0.36	0.36	0.32	0.25	0.25	0.46	0.36	0.36
v/c Ratio	0.09	0.73	0.13	0.75	0.15	0.28	0.17	0.77	0.65	0.69	0.47	0.10
Control Delay	24.2	62.9	0.6	35.9	30.8	5.5	22.0	48.6	7.8	31.9	32.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	62.9	0.6	35.9	30.8	5.5	22.0	48.6	7.8	31.9	32.6	0.3
LOS	C	E	A	D	C	A	C	D	A	C	C	A
Approach Delay		47.6			26.3			30.5			30.1	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 142.5  
 Actuated Cycle Length: 118.8  
 Natural Cycle: 105  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 31.2      Intersection LOS: C  
 Intersection Capacity Utilization 84.4%      ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 5: SE 92nd Loop & SE 110th St Rd.



# HCM 6th Signalized Intersection Summary

## 5: SE 92nd Loop & SE 110th St Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	212	55	365	94	188	48	619	476	234	544	60
Future Volume (veh/h)	28	212	55	365	94	188	48	619	476	234	544	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1856	1796	1900	1900	1885	1737	1796	1841	1870	1796	1767
Adj Flow Rate, veh/h	29	223	39	384	99	198	51	652	423	246	573	43
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
Percent Heavy Veh, %	14	3	7	0	0	1	11	7	4	2	7	9
Cap, veh/h	275	271	222	449	566	476	329	1030	471	337	1223	536
Arrive On Green	0.04	0.15	0.15	0.19	0.30	0.30	0.06	0.30	0.30	0.11	0.36	0.36
Sat Flow, veh/h	1612	1856	1522	1810	1900	1598	1654	3413	1560	1781	3413	1497
Grp Volume(v), veh/h	29	223	39	384	99	198	51	652	423	246	573	43
Grp Sat Flow(s),veh/h/ln	1612	1856	1522	1810	1900	1598	1654	1706	1560	1781	1706	1497
Q Serve(g_s), s	1.7	13.1	2.5	19.4	4.3	11.2	2.3	18.5	29.2	10.3	14.6	2.1
Cycle Q Clear(g_c), s	1.7	13.1	2.5	19.4	4.3	11.2	2.3	18.5	29.2	10.3	14.6	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	275	271	222	449	566	476	329	1030	471	337	1223	536
V/C Ratio(X)	0.11	0.82	0.18	0.85	0.17	0.42	0.15	0.63	0.90	0.73	0.47	0.08
Avail Cap(c_a), veh/h	322	563	462	500	863	726	353	1123	513	435	1454	638
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	46.6	42.1	30.7	29.2	31.6	24.2	33.9	37.6	24.7	27.8	23.8
Incr Delay (d2), s/veh	0.2	6.2	0.4	12.6	0.1	0.6	0.2	1.0	17.7	4.4	0.3	0.1
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	0.7	6.5	1.0	9.9	2.0	4.4	0.9	7.4	13.3	4.7	6.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	52.8	42.5	43.3	29.4	32.2	24.4	34.9	55.3	29.2	28.1	23.9
LnGrp LOS	D	D	D	D	C	C	C	C	E	C	C	C
Approach Vol, veh/h		291			681			1126			862	
Approach Delay, s/veh		50.0			38.1			42.1			28.2	
Approach LOS		D			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	47.4	10.8	40.8	19.8	41.0	27.9	23.7				
Change Period (Y+Rc), s	7.1	7.1	6.0	* 7.3	7.1	7.1	6.0	* 7.3				
Max Green Setting (Gmax), s	8.0	47.9	8.0	* 51	18.9	37.0	25.0	* 34				
Max Q Clear Time (g_c+I1), s	4.3	16.6	3.7	13.2	12.3	31.2	21.4	15.1				
Green Ext Time (p_c), s	0.0	4.5	0.0	1.3	0.4	2.7	0.5	1.3				

### Intersection Summary

HCM 6th Ctrl Delay	37.9
HCM 6th LOS	D

















### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

**Appendix K:**  
No-Build Conditions Analysis – With  
Improvements

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations	 		 		 	 	
Traffic Volume (vph)	498	415	1488	255	271	1270	
Future Volume (vph)	498	415	1488	255	271	1270	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	465	0		400	500		
Storage Lanes	1	1		1	2		
Taper Length (ft)	25				25		
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95	
Frt		0.850		0.850			
Flt Protected	0.950				0.950		
Satd. Flow (prot)	3367	1509	3374	1495	2918	3438	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	3367	1509	3374	1495	2918	3438	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		428		244			
Link Speed (mph)	45		45			45	
Link Distance (ft)	886		2249			1233	
Travel Time (s)	13.4		34.1			18.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	
Heavy Vehicles (%)	4%	7%	7%	8%	20%	5%	
Adj. Flow (vph)	513	428	1534	263	279	1309	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	513	428	1534	263	279	1309	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	24		24			24	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2	1	1	2	
Detector Template	Left	Right	Thru	Right	Left	Thru	
Leading Detector (ft)	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA	Perm	Prot	NA	
Protected Phases	4		2		1	6	3

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

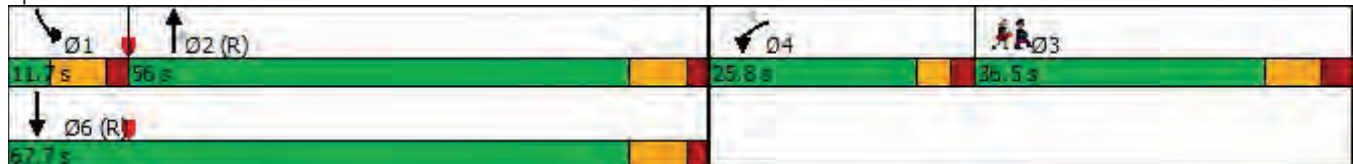


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Permitted Phases		4		2			
Detector Phase	4	4	2	2	1	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	17.0	17.0	5.0	17.0	5.0
Minimum Split (s)	35.7	35.7	48.7	48.7	12.7	25.7	37.5
Total Split (s)	25.8	25.8	56.0	56.0	11.7	67.7	36.5
Total Split (%)	19.8%	19.8%	43.1%	43.1%	9.0%	52.1%	28%
Maximum Green (s)	20.1	20.1	48.3	48.3	4.0	60.0	28.0
Yellow Time (s)	3.4	3.4	5.5	5.5	5.5	5.5	5.5
All-Red Time (s)	2.3	2.3	2.2	2.2	2.2	2.2	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	7.7	7.7	7.7	7.7	
Lead/Lag	Lead	Lead	Lag	Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0			7.0
Flash Dont Walk (s)	23.0	23.0	34.0	34.0			22.0
Pedestrian Calls (#/hr)	0	0	0	0			0
Act Effct Green (s)	20.1	20.1	60.3	60.3	28.5	96.5	
Actuated g/C Ratio	0.15	0.15	0.46	0.46	0.22	0.74	
v/c Ratio	0.99	0.72	0.98	0.32	0.44	0.51	
Control Delay	90.9	12.1	52.2	3.7	48.2	7.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	90.9	12.1	52.2	3.7	48.2	7.8	
LOS	F	B	D	A	D	A	
Approach Delay	55.1		45.2			14.9	
Approach LOS	E		D			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 22 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 145  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 36.2  
 Intersection LOS: D  
 Intersection Capacity Utilization 80.7%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 2: US 441 & SE 92nd PI Rd.



# HCM Signalized Intersection Capacity Analysis

## 2: US 441 & SE 92nd PI Rd.

03/08/2024


































Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	498	415	1488	255	271	1270
Future Volume (vph)	498	415	1488	255	271	1270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	7.7	7.7	7.7	7.7
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3367	1509	3374	1495	2918	3438
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1509	3374	1495	2918	3438
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	513	428	1534	263	279	1309
RTOR Reduction (vph)	0	362	0	131	0	0
Lane Group Flow (vph)	513	66	1534	132	279	1309
Heavy Vehicles (%)	4%	7%	7%	8%	20%	5%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2		
Actuated Green, G (s)	20.1	20.1	60.3	60.3	28.5	96.5
Effective Green, g (s)	20.1	20.1	60.3	60.3	28.5	96.5
Actuated g/C Ratio	0.15	0.15	0.46	0.46	0.22	0.74
Clearance Time (s)	5.7	5.7	7.7	7.7	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	520	233	1565	693	639	2552
v/s Ratio Prot	c0.15		c0.45		0.10	c0.38
v/s Ratio Perm		0.04		0.09		
v/c Ratio	0.99	0.28	0.98	0.19	0.44	0.51
Uniform Delay, d1	54.8	48.6	34.3	20.5	43.8	7.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	35.7	0.7	18.5	0.6	0.5	0.7
Delay (s)	90.5	49.3	52.8	21.1	44.3	7.7
Level of Service	F	D	D	C	D	A
Approach Delay (s)	71.7		48.1			14.1
Approach LOS	E		D			B

### Intersection Summary

HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	29.6
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 		 	 	
Traffic Volume (vph)	219	265	141	95	419	341	175	906	77	450	1024	399
Future Volume (vph)	219	265	141	95	419	341	175	906	77	450	1024	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		345	645		1000	485		300	765		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3303	3085	1524	1626	3505	1553	3400	3505	1417	3467	3438	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3303	3085	1524	1626	3505	1553	3400	3505	1417	3467	3438	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			153			91			155			298
Link Speed (mph)		45			50			45			45	
Link Distance (ft)		1046			1493			1329			994	
Travel Time (s)		15.8			20.4			20.1			15.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	6%	17%	6%	11%	3%	4%	3%	3%	14%	1%	5%	2%
Adj. Flow (vph)	226	273	145	98	432	352	180	934	79	464	1056	411
Shared Lane Traffic (%)												
Lane Group Flow (vph)	226	273	145	98	432	352	180	934	79	464	1056	411
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4	5	1	6		5	2	



Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

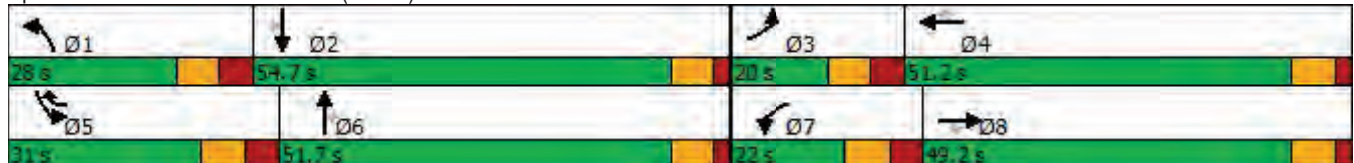


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	5.0	15.0	5.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	16.9	49.2	49.2	15.0	51.2	13.9	13.8	47.9	47.9	13.9	43.9	43.9
Total Split (s)	20.0	49.2	49.2	22.0	51.2	31.0	28.0	51.7	51.7	31.0	54.7	54.7
Total Split (%)	13.0%	32.0%	32.0%	14.3%	33.3%	20.1%	18.2%	33.6%	33.6%	20.1%	35.5%	35.5%
Maximum Green (s)	11.1	42.0	42.0	13.1	44.0	22.1	19.2	44.8	44.8	22.1	47.8	47.8
Yellow Time (s)	5.0	5.2	5.2	5.2	5.2	4.9	4.8	4.9	4.9	4.9	4.9	4.9
All-Red Time (s)	3.9	2.0	2.0	3.7	2.0	4.0	4.0	2.0	2.0	4.0	2.0	2.0
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	0.0
Total Lost Time (s)	8.9	7.2	7.2	8.9	7.2	8.9	8.8	6.9	6.9	8.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		35.0	35.0		37.0			34.0	34.0		30.0	30.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	11.2	20.4	20.4	11.8	21.1	49.7	12.1	40.3	40.3	21.4	49.6	49.6
Actuated g/C Ratio	0.09	0.16	0.16	0.09	0.17	0.39	0.10	0.32	0.32	0.17	0.39	0.39
v/c Ratio	0.77	0.55	0.39	0.64	0.74	0.53	0.55	0.83	0.14	0.79	0.78	0.51
Control Delay	75.7	54.1	9.5	76.6	58.5	24.6	62.2	47.7	0.5	61.8	38.9	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.7	54.1	9.5	76.6	58.5	24.6	62.2	47.7	0.5	61.8	38.9	10.6
LOS	E	D	A	E	E	C	E	D	A	E	D	B
Approach Delay		51.6			47.0			46.8			38.4	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 153.9  
 Actuated Cycle Length: 126  
 Natural Cycle: 140  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 44.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 83.6%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 3: 58th Ave. (SR 35) & SE 92nd PI Rd.



HCM 6th Signalized Intersection Summary  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↖	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗
Traffic Volume (veh/h)	219	265	141	95	419	341	175	906	77	450	1024	399
Future Volume (veh/h)	219	265	141	95	419	341	175	906	77	450	1024	399
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1648	1811	1737	1856	1841	1856	1856	1693	1885	1826	1870
Adj Flow Rate, veh/h	226	273	123	98	432	305	180	934	56	464	1056	382
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	17	6	11	3	4	3	3	14	1	5	2
Cap, veh/h	278	665	326	120	711	552	242	1076	438	529	1344	614
Arrive On Green	0.08	0.21	0.21	0.07	0.20	0.20	0.07	0.31	0.31	0.15	0.39	0.39
Sat Flow, veh/h	3346	3131	1535	1654	3526	1560	3428	3526	1434	3483	3469	1585
Grp Volume(v), veh/h	226	273	123	98	432	305	180	934	56	464	1056	382
Grp Sat Flow(s),veh/h/ln	1673	1566	1535	1654	1763	1560	1714	1763	1434	1742	1735	1585
Q Serve(g_s), s	8.2	9.3	8.5	7.2	13.8	19.4	6.4	31.0	3.5	16.1	33.2	24.1
Cycle Q Clear(g_c), s	8.2	9.3	8.5	7.2	13.8	19.4	6.4	31.0	3.5	16.1	33.2	24.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	278	665	326	120	711	552	242	1076	438	529	1344	614
V/C Ratio(X)	0.81	0.41	0.38	0.82	0.61	0.55	0.74	0.87	0.13	0.88	0.79	0.62
Avail Cap(c_a), veh/h	300	1063	521	175	1254	792	532	1277	520	622	1344	614
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.8	42.0	41.7	56.5	44.9	32.1	56.4	40.6	31.1	51.3	33.4	30.6
Incr Delay (d2), s/veh	14.7	0.4	0.7	17.2	0.8	0.9	4.5	5.8	0.1	12.0	3.2	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	3.6	3.2	3.5	5.9	7.2	2.8	13.8	1.2	7.7	13.9	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.4	42.4	42.4	73.7	45.7	33.0	60.8	46.4	31.2	63.3	36.5	32.5
LnGrp LOS	E	D	D	E	D	C	E	D	C	E	D	C
Approach Vol, veh/h		622			835			1170			1902	
Approach Delay, s/veh		52.6			44.4			47.9			42.3	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.5	54.8	19.2	32.2	27.7	44.7	17.9	33.5				
Change Period (Y+Rc), s	8.8	6.9	* 8.9	7.2	* 8.9	6.9	* 8.9	7.2				
Max Green Setting (Gmax), s	19.2	47.8	* 11	44.0	* 22	44.8	* 13	42.0				
Max Q Clear Time (g_c+I1), s	8.4	35.2	10.2	21.4	18.1	33.0	9.2	11.3				
Green Ext Time (p_c), s	0.4	6.6	0.1	3.5	0.7	4.8	0.1	2.1				

Intersection Summary
























HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	421	47	47	303	192	28	409	35	188	711	396
Future Volume (vph)	191	421	47	47	303	192	28	409	35	188	711	396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	255		0	330		225	240		0	215		0
Storage Lanes	2		0	1		1	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	0.95
Frt		0.985				0.850		0.988			0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	1812	0	1656	1759	1553	1641	3409	0	3400	3275	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	1812	0	1656	1759	1553	1641	3409	0	3400	3275	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				187		5			70	
Link Speed (mph)		35			35			40			35	
Link Distance (ft)		608			801			775			744	
Travel Time (s)		11.8			15.6			13.2			14.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	6%	9%	8%	4%	10%	4%	12%	3%	5%	3%
Adj. Flow (vph)	208	458	51	51	329	209	30	445	38	204	773	430
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	509	0	51	329	209	30	483	0	204	1203	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							2					
Detector Phase	1	6		5	2	2	7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	24.0		5.0	24.0	24.0	5.0	10.0		6.0	10.0	
Minimum Split (s)	13.9	31.9		9.5	31.9	31.9	9.5	25.0		13.0	25.0	
Total Split (s)	25.4	76.0		15.0	65.6	65.6	11.0	65.0		24.0	78.0	
Total Split (%)	14.1%	42.2%		8.3%	36.4%	36.4%	6.1%	36.1%		13.3%	43.3%	
Maximum Green (s)	17.5	68.1		10.5	57.7	57.7	6.5	58.0		17.0	71.0	
Yellow Time (s)	4.2	4.2		3.5	4.2	4.2	3.5	4.1		4.1	4.1	
All-Red Time (s)	3.7	3.7		1.0	3.7	3.7	1.0	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.9	7.9		4.5	7.9	7.9	4.5	7.0		7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	4.0	
Recall Mode	None	Min		None	Min	Min	None	Max		None	None	
Act Effct Green (s)	15.3	53.0		9.2	40.9	40.9	6.3	58.6		15.0	72.2	
Actuated g/C Ratio	0.10	0.33		0.06	0.26	0.26	0.04	0.37		0.09	0.45	
v/c Ratio	0.65	0.84		0.54	0.73	0.39	0.46	0.39		0.64	0.79	
Control Delay	81.5	63.6		98.3	64.3	10.2	103.0	40.3		81.7	42.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	81.5	63.6		98.3	64.3	10.2	103.0	40.3		81.7	42.4	
LOS	F	E		F	E	B	F	D		F	D	
Approach Delay		68.8			48.1			44.0			48.1	
Approach LOS		E			D			D			D	

Intersection Summary

Area Type:	Other
Cycle Length:	180
Actuated Cycle Length:	159.9
Natural Cycle:	95
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	52.1
Intersection LOS:	D
Intersection Capacity Utilization:	85.6%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 4: 58th Ave. (SR 35) & SR 25



HCM 6th Signalized Intersection Summary  
 4: 58th Ave. (SR 35) & SR 25

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↗		↖	↖	↗	↖	↖↗		↖↗	↖↗	
Traffic Volume (veh/h)	191	421	47	47	303	192	28	409	35	188	711	396
Future Volume (veh/h)	191	421	47	47	303	192	28	409	35	188	711	396
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1856	1811	1767	1781	1841	1752	1841	1722	1856	1826	1856
Adj Flow Rate, veh/h	208	458	50	51	329	207	30	445	0	204	773	426
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	3	6	9	8	4	10	4	12	3	5	3
Cap, veh/h	263	514	56	65	446	391	40	1379		259	1000	548
Arrive On Green	0.08	0.31	0.31	0.04	0.25	0.25	0.02	0.39	0.00	0.08	0.46	0.46
Sat Flow, veh/h	3401	1644	179	1682	1781	1560	1668	3589	0	3428	2162	1185
Grp Volume(v), veh/h	208	0	508	51	329	207	30	445	0	204	619	580
Grp Sat Flow(s),veh/h/ln	1700	0	1823	1682	1781	1560	1668	1749	0	1714	1735	1613
Q Serve(g_s), s	8.8	0.0	39.1	4.4	25.0	16.9	2.6	13.0	0.0	8.6	43.9	44.3
Cycle Q Clear(g_c), s	8.8	0.0	39.1	4.4	25.0	16.9	2.6	13.0	0.0	8.6	43.9	44.3
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.00	1.00		0.74
Lane Grp Cap(c), veh/h	263	0	570	65	446	391	40	1379		259	803	746
V/C Ratio(X)	0.79	0.00	0.89	0.79	0.74	0.53	0.75	0.32		0.79	0.77	0.78
Avail Cap(c_a), veh/h	405	0	844	120	699	612	74	1379		396	837	778
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	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.7	0.0	48.2	70.1	50.7	47.6	71.3	30.9	0.0	66.8	33.0	33.1
Incr Delay (d2), s/veh	7.9	0.0	9.7	18.9	3.4	1.6	23.9	0.6	0.0	7.9	4.6	5.2
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	4.1	0.0	19.1	2.2	11.5	6.7	1.4	5.6	0.0	4.0	19.2	18.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	0.0	57.9	89.0	54.1	49.2	95.2	31.5	0.0	74.7	37.7	38.3
LnGrp LOS	E	A	E	F	D	D	F	C		E	D	D
Approach Vol, veh/h		716			587			475			1403	
Approach Delay, s/veh		62.8			55.4			35.6			43.3	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.3	44.7	18.1	65.0	10.1	53.9	8.0	75.1				
Change Period (Y+Rc), s	* 7.9	* 7.9	7.0	7.0	4.5	* 7.9	4.5	7.0				
Max Green Setting (Gmax), s	* 18	* 58	17.0	58.0	10.5	* 68	6.5	71.0				
Max Q Clear Time (g_c+I1), s	10.8	27.0	10.6	15.0	6.4	41.1	4.6	46.3				
Green Ext Time (p_c), s	0.5	4.2	0.5	4.4	0.0	4.9	0.0	12.5				

Intersection Summary

















HCM 6th Ctrl Delay	48.8
HCM 6th LOS	D

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations	 		 		 	 	
Traffic Volume (vph)	360	280	1533	569	484	1530	
Future Volume (vph)	360	280	1533	569	484	1530	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	465	0		400	500		
Storage Lanes	1	1		1	2		
Taper Length (ft)	25				25		
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95	
Frt		0.850		0.850			
Flt Protected	0.950				0.950		
Satd. Flow (prot)	3335	1429	3374	1482	3303	3374	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	3335	1429	3374	1482	3303	3374	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		295		586			
Link Speed (mph)	45		45			45	
Link Distance (ft)	886		2249			1233	
Travel Time (s)	13.4		34.1			18.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	5%	13%	7%	9%	6%	7%	
Adj. Flow (vph)	379	295	1614	599	509	1611	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	379	295	1614	599	509	1611	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	24		24			24	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2	1	1	2	
Detector Template	Left	Right	Thru	Right	Left	Thru	
Leading Detector (ft)	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA	Perm	Prot	NA	
Protected Phases	4		2		1	6	3

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Permitted Phases		4		2			
Detector Phase	4	4	2	2	1	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	17.0	17.0	5.0	17.0	5.0
Minimum Split (s)	35.7	35.7	48.7	48.7	12.7	25.7	37.5
Total Split (s)	22.0	22.0	74.0	74.0	13.0	87.0	31.0
Total Split (%)	15.7%	15.7%	52.9%	52.9%	9.3%	62.1%	22%
Maximum Green (s)	16.3	16.3	66.3	66.3	5.3	79.3	22.5
Yellow Time (s)	3.4	3.4	5.5	5.5	5.5	5.5	5.5
All-Red Time (s)	2.3	2.3	2.2	2.2	2.2	2.2	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	7.7	7.7	7.7	7.7	
Lead/Lag	Lead	Lead	Lag	Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0			7.0
Flash Dont Walk (s)	23.0	23.0	34.0	34.0			22.0
Pedestrian Calls (#/hr)	0	0	0	0			0
Act Effct Green (s)	16.3	16.3	67.6	67.6	35.0	110.3	
Actuated g/C Ratio	0.12	0.12	0.48	0.48	0.25	0.79	
v/c Ratio	0.98	0.69	0.99	0.59	0.62	0.61	
Control Delay	101.3	15.2	56.2	4.3	50.7	7.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	101.3	15.2	56.2	4.3	50.7	7.2	
LOS	F	B	E	A	D	A	
Approach Delay	63.6		42.2			17.6	
Approach LOS	E		D			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 102 (73%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 145  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 34.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 84.0%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 2: US 441 & SE 92nd PI Rd.



# HCM Signalized Intersection Capacity Analysis

## 2: US 441 & SE 92nd PI Rd.

03/08/2024



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	360	280	1533	569	484	1530
Future Volume (vph)	360	280	1533	569	484	1530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	7.7	7.7	7.7	7.7
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3335	1429	3374	1482	3303	3374
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3335	1429	3374	1482	3303	3374
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	379	295	1614	599	509	1611
RTOR Reduction (vph)	0	261	0	303	0	0
Lane Group Flow (vph)	379	34	1614	296	509	1611
Heavy Vehicles (%)	5%	13%	7%	9%	6%	7%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2		
Actuated Green, G (s)	16.3	16.3	67.6	67.6	35.0	110.3
Effective Green, g (s)	16.3	16.3	67.6	67.6	35.0	110.3
Actuated g/C Ratio	0.12	0.12	0.48	0.48	0.25	0.79
Clearance Time (s)	5.7	5.7	7.7	7.7	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	166	1629	715	825	2658
v/s Ratio Prot	c0.11		c0.48		0.15	c0.48
v/s Ratio Perm		0.02		0.20		
v/c Ratio	0.98	0.21	0.99	0.41	0.62	0.61
Uniform Delay, d1	61.7	56.0	35.9	23.4	46.6	6.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	39.1	0.6	20.2	1.8	1.4	1.0
Delay (s)	100.8	56.6	56.1	25.2	47.9	7.1
Level of Service	F	E	E	C	D	A
Approach Delay (s)	81.5		47.7			16.9
Approach LOS	F		D			B

























### Intersection Summary

HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	29.6
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	317	600	201	86	373	455	220	1204	102	388	831	293
Future Volume (vph)	317	600	201	86	373	455	220	1204	102	388	831	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		345	645		1000	485		300	765		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3374	1568	1687	3574	1553	3242	3471	1509	3335	3343	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3374	1568	1687	3574	1553	3242	3471	1509	3335	3343	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			212			91			155			308
Link Speed (mph)		45			50			45			45	
Link Distance (ft)		1046			1493			1329			994	
Travel Time (s)		15.8			20.4			20.1			15.1	
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 (%)	5%	7%	3%	7%	1%	4%	8%	4%	7%	5%	8%	2%
Adj. Flow (vph)	334	632	212	91	393	479	232	1267	107	408	875	308
Shared Lane Traffic (%)												
Lane Group Flow (vph)	334	632	212	91	393	479	232	1267	107	408	875	308
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4	5	1	6		5	2	

Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	5.0	15.0	5.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	16.9	49.2	49.2	15.0	51.2	13.9	13.8	47.9	47.9	13.9	43.9	43.9
Total Split (s)	25.0	37.0	37.0	24.0	36.0	29.0	22.9	63.9	63.9	29.0	70.0	70.0
Total Split (%)	16.2%	24.0%	24.0%	15.6%	23.4%	18.8%	14.9%	41.5%	41.5%	18.8%	45.5%	45.5%
Maximum Green (s)	16.1	29.8	29.8	15.1	28.8	20.1	14.1	57.0	57.0	20.1	63.1	63.1
Yellow Time (s)	5.0	5.2	5.2	5.2	5.2	4.9	4.8	4.9	4.9	4.9	4.9	4.9
All-Red Time (s)	3.9	2.0	2.0	3.7	2.0	4.0	4.0	2.0	2.0	4.0	2.0	2.0
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	0.0
Total Lost Time (s)	8.9	7.2	7.2	8.9	7.2	8.9	8.8	6.9	6.9	8.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		35.0	35.0		37.0			34.0	34.0		30.0	30.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	16.1	29.8	29.8	12.6	26.3	53.6	13.7	57.0	57.0	20.0	63.5	63.5
Actuated g/C Ratio	0.11	0.20	0.20	0.08	0.17	0.35	0.09	0.38	0.38	0.13	0.42	0.42
v/c Ratio	0.94	0.95	0.44	0.65	0.63	0.79	0.79	0.97	0.16	0.93	0.62	0.37
Control Delay	101.8	84.6	9.3	88.6	63.0	45.6	87.3	64.8	1.5	92.1	37.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.8	84.6	9.3	88.6	63.0	45.6	87.3	64.8	1.5	92.1	37.4	4.1
LOS	F	F	A	F	E	D	F	E	A	F	D	A
Approach Delay		75.9			56.8			63.8			45.0	
Approach LOS		E			E			E			D	

Intersection Summary

Area Type:	Other
Cycle Length:	153.9
Actuated Cycle Length:	151.4
Natural Cycle:	150
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.97
Intersection Signal Delay:	59.6
Intersection LOS:	E
Intersection Capacity Utilization:	92.5%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 3: 58th Ave. (SR 35) & SE 92nd PI Rd.



# HCM 6th Signalized Intersection Summary

3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↖	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↗
Traffic Volume (veh/h)	317	600	201	86	373	455	220	1204	102	388	831	293
Future Volume (veh/h)	317	600	201	86	373	455	220	1204	102	388	831	293
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1796	1856	1796	1885	1841	1781	1841	1796	1826	1781	1870
Adj Flow Rate, veh/h	334	632	171	91	393	427	232	1267	70	408	875	266
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
Percent Heavy Veh, %	5	7	3	7	1	4	8	4	7	5	8	2
Cap, veh/h	353	775	357	111	670	496	274	1295	564	441	1416	663
Arrive On Green	0.10	0.23	0.23	0.06	0.19	0.19	0.08	0.37	0.37	0.13	0.42	0.42
Sat Flow, veh/h	3374	3413	1572	1711	3582	1560	3291	3497	1522	3374	3385	1585
Grp Volume(v), veh/h	334	632	171	91	393	427	232	1267	70	408	875	266
Grp Sat Flow(s),veh/h/ln	1687	1706	1572	1711	1791	1560	1646	1749	1522	1687	1692	1585
Q Serve(g_s), s	15.1	27.0	14.5	8.1	15.4	28.8	10.7	55.0	4.7	18.4	31.2	18.0
Cycle Q Clear(g_c), s	15.1	27.0	14.5	8.1	15.4	28.8	10.7	55.0	4.7	18.4	31.2	18.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	775	357	111	670	496	274	1295	564	441	1416	663
V/C Ratio(X)	0.95	0.82	0.48	0.82	0.59	0.86	0.85	0.98	0.12	0.93	0.62	0.40
Avail Cap(c_a), veh/h	353	775	357	168	670	496	302	1295	564	441	1416	663
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(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.5	56.4	51.6	71.1	57.1	49.3	69.6	47.8	32.0	66.2	35.1	31.3
Incr Delay (d2), s/veh	34.1	6.7	1.0	17.5	1.3	14.4	18.3	19.9	0.1	25.6	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	12.2	5.8	4.0	7.0	17.0	5.1	26.8	1.7	9.4	12.7	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	102.6	63.2	52.6	88.6	58.4	63.7	87.9	67.7	32.1	91.7	35.9	31.7
LnGrp LOS	F	E	D	F	E	E	F	E	C	F	D	C
Approach Vol, veh/h		1137			911			1569			1549	
Approach Delay, s/veh		73.2			63.9			69.1			49.9	
Approach LOS		E			E			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.6	71.3	25.0	36.0	29.0	63.9	18.8	42.2				
Change Period (Y+Rc), s	8.8	6.9	* 8.9	7.2	* 8.9	6.9	* 8.9	7.2				
Max Green Setting (Gmax), s	14.1	63.1	* 16	28.8	* 20	57.0	* 15	29.8				
Max Q Clear Time (g_c+I1), s	12.7	33.2	17.1	30.8	20.4	57.0	10.1	29.0				
Green Ext Time (p_c), s	0.1	7.4	0.0	0.0	0.0	0.0	0.1	0.4				

## Intersection Summary

HCM 6th Ctrl Delay	63.3
HCM 6th LOS	E
























## Notes

User approved pedestrian interval to be less than phase max green.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	423	357	27	27	463	107	35	753	39	219	509	188
Future Volume (vph)	423	357	27	27	463	107	35	753	39	219	509	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	255		0	330		225	240		0	215		0
Storage Lanes	2		0	1		1	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	0.95
Frt		0.990				0.850		0.993			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	1786	0	1719	1792	1568	1421	3431	0	3433	3177	0
Flt Permitted	0.950			0.525			0.373			0.950		
Satd. Flow (perm)	3335	1786	0	950	1792	1568	558	3431	0	3433	3177	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				115		3			34	
Link Speed (mph)		35			35			40			35	
Link Distance (ft)		608			801			775			744	
Travel Time (s)		11.8			15.6			13.2			14.5	
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 (%)	5%	5%	10%	5%	6%	3%	27%	4%	14%	2%	8%	12%
Adj. Flow (vph)	445	376	28	28	487	113	37	793	41	231	536	198
Shared Lane Traffic (%)												
Lane Group Flow (vph)	445	404	0	28	487	113	37	834	0	231	734	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	Perm	NA		Prot	NA	
Protected Phases	1	6			2			4		3	8	

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				2		2	4					
Detector Phase	1	6		2	2	2	4	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	24.0		24.0	24.0	24.0	10.0	10.0		6.0	10.0	
Minimum Split (s)	13.9	31.9		31.9	31.9	31.9	25.0	25.0		13.0	25.0	
Total Split (s)	36.0	104.0		68.0	68.0	68.0	54.0	54.0		22.0	76.0	
Total Split (%)	20.0%	57.8%		37.8%	37.8%	37.8%	30.0%	30.0%		12.2%	42.2%	
Maximum Green (s)	28.1	96.1		60.1	60.1	60.1	47.0	47.0		15.0	69.0	
Yellow Time (s)	4.2	4.2		4.2	4.2	4.2	4.1	4.1		4.1	4.1	
All-Red Time (s)	3.7	3.7		3.7	3.7	3.7	2.9	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.9	7.9		7.9	7.9	7.9	7.0	7.0		7.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Recall Mode	None	Min		Min	Min	Min	Max	Max		None	None	
Act Effct Green (s)	26.3	85.6		51.3	51.3	51.3	47.3	47.3		14.6	69.0	
Actuated g/C Ratio	0.16	0.51		0.30	0.30	0.30	0.28	0.28		0.09	0.41	
v/c Ratio	0.86	0.45		0.10	0.90	0.20	0.24	0.87		0.78	0.56	
Control Delay	87.3	28.0		43.0	77.0	6.9	56.5	69.7		95.1	40.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	87.3	28.0		43.0	77.0	6.9	56.5	69.7		95.1	40.0	
LOS	F	C		D	E	A	E	E		F	D	
Approach Delay		59.1			62.9			69.1			53.2	
Approach LOS		E			E			E			D	

Intersection Summary






























Area Type:	Other
Cycle Length:	180
Actuated Cycle Length:	169.5
Natural Cycle:	105
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.90
Intersection Signal Delay:	60.7
Intersection LOS:	E
Intersection Capacity Utilization:	93.7%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 4: 58th Ave. (SR 35) & SR 25



HCM 6th Signalized Intersection Summary  
 4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 		 		 		 	 	 
Traffic Volume (veh/h)	423	357	27	27	463	107	35	753	39	219	509	188
Future Volume (veh/h)	423	357	27	27	463	107	35	753	39	219	509	188
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1752	1826	1811	1856	1500	1841	1693	1870	1781	1722
Adj Flow Rate, veh/h	445	376	28	28	487	109	37	793	0	231	536	194
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
Percent Heavy Veh, %	5	5	10	5	6	3	27	4	14	2	8	12
Cap, veh/h	501	832	62	330	540	469	188	1013		276	1006	363
Arrive On Green	0.15	0.50	0.50	0.30	0.30	0.30	0.29	0.29	0.00	0.08	0.41	0.41
Sat Flow, veh/h	3374	1678	125	958	1811	1572	582	3589	0	3456	2437	879
Grp Volume(v), veh/h	445	0	404	28	487	109	37	793	0	231	372	358
Grp Sat Flow(s),veh/h/ln	1687	0	1803	958	1811	1572	582	1749	0	1728	1692	1623
Q Serve(g_s), s	21.0	0.0	23.6	3.4	41.9	8.5	8.3	33.8	0.0	10.7	26.8	27.0
Cycle Q Clear(g_c), s	21.0	0.0	23.6	3.4	41.9	8.5	15.4	33.8	0.0	10.7	26.8	27.0
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.00	1.00		0.54
Lane Grp Cap(c), veh/h	501	0	894	330	540	469	188	1013		276	698	670
V/C Ratio(X)	0.89	0.00	0.45	0.08	0.90	0.23	0.20	0.78		0.84	0.53	0.54
Avail Cap(c_a), veh/h	584	0	1068	399	671	583	188	1013		319	720	690
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	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.7	0.0	26.6	41.2	54.6	42.9	49.2	52.9	0.0	73.6	35.9	35.9
Incr Delay (d2), s/veh	14.7	0.0	0.5	0.2	14.3	0.4	2.3	6.0	0.0	16.9	1.0	1.0
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	10.1	0.0	10.4	0.8	21.1	3.4	1.3	15.5	0.0	5.4	11.3	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.4	0.0	27.1	41.3	69.0	43.3	51.6	59.0	0.0	90.5	36.8	36.9
LnGrp LOS	F	A	C	D	E	D	D	E		F	D	D
Approach Vol, veh/h		849			624			830			961	
Approach Delay, s/veh		56.1			63.2			58.6			49.8	
Approach LOS		E			E			E			D	
Timer - Assigned Phs	1	2	3	4	6	8						
Phs Duration (G+Y+Rc), s	32.0	56.3	19.9	54.0	88.3	73.9						
Change Period (Y+Rc), s	* 7.9	* 7.9	7.0	7.0	* 7.9	7.0						
Max Green Setting (Gmax), s	* 28	* 60	15.0	47.0	* 96	69.0						
Max Q Clear Time (g_c+I1), s	23.0	43.9	12.7	35.8	25.6	29.0						
Green Ext Time (p_c), s	1.1	4.5	0.2	5.3	4.1	7.7						

Intersection Summary												
HCM 6th Ctrl Delay				56.2								
HCM 6th LOS				E								

Notes  
 \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

# Appendix L: Build Conditions Analysis

# Lanes, Volumes, Timings

1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	165	62	43	1221	1663	238
Future Volume (vph)	165	62	43	1221	1663	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	265			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.981	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1687	1429	1378	3505	3417	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1687	1429	1378	3505	3417	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		65			17	
Link Speed (mph)	30			45	45	
Link Distance (ft)	484			829	1271	
Travel Time (s)	11.0			12.6	19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	13%	31%	3%	3%	8%
Adj. Flow (vph)	174	65	45	1285	1751	251
Shared Lane Traffic (%)						
Lane Group Flow (vph)	174	65	45	1285	2002	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	8		1	6	2	



Lanes, Volumes, Timings  
 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024

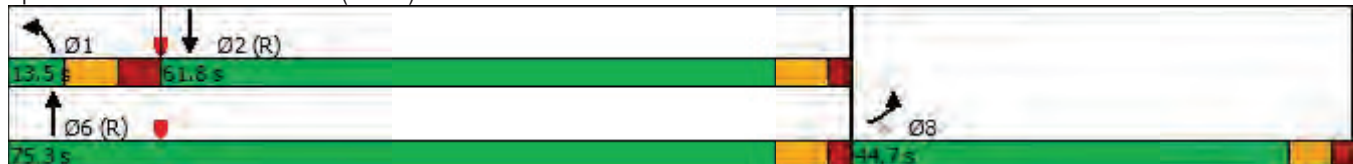


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		8				
Detector Phase	8	8	1	6	2	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	15.0	15.0	
Minimum Split (s)	44.7	44.7	13.5	24.9	36.9	
Total Split (s)	44.7	44.7	13.5	75.3	61.8	
Total Split (%)	37.3%	37.3%	11.3%	62.8%	51.5%	
Maximum Green (s)	39.0	39.0	5.0	68.4	54.9	
Yellow Time (s)	3.7	3.7	4.8	4.9	4.9	
All-Red Time (s)	2.0	2.0	3.7	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	8.5	6.9	6.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0			7.0	
Flash Dont Walk (s)	32.0	32.0			23.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	17.8	17.8	10.2	89.6	73.9	
Actuated g/C Ratio	0.15	0.15	0.08	0.75	0.62	
v/c Ratio	0.70	0.24	0.38	0.49	0.95	
Control Delay	62.5	12.1	60.6	7.4	34.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.5	12.1	60.6	7.4	34.6	
LOS	E	B	E	A	C	
Approach Delay	48.8			9.2	34.6	
Approach LOS	D			A	C	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 28 (23%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 26.1  
 Intersection Capacity Utilization 73.2%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service D

Splits and Phases: 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.



HCM 6th Signalized Intersection Summary  
 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	165	62	43	1221	1663	238
Future Volume (veh/h)	165	62	43	1221	1663	238
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1707	1441	1856	1856	1781
Adj Flow Rate, veh/h	174	58	45	1285	1751	240
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	13	31	3	3	8
Cap, veh/h	208	176	57	2726	2065	277
Arrive On Green	0.12	0.12	0.04	0.77	0.66	0.66
Sat Flow, veh/h	1711	1447	1372	3618	3217	418
Grp Volume(v), veh/h	174	58	45	1285	970	1021
Grp Sat Flow(s),veh/h/ln	1711	1447	1372	1763	1763	1780
Q Serve(g_s), s	11.9	4.4	3.9	15.6	49.8	54.7
Cycle Q Clear(g_c), s	11.9	4.4	3.9	15.6	49.8	54.7
Prop In Lane	1.00	1.00	1.00			0.24
Lane Grp Cap(c), veh/h	208	176	57	2726	1165	1176
V/C Ratio(X)	0.84	0.33	0.79	0.47	0.83	0.87
Avail Cap(c_a), veh/h	556	470	57	2726	1165	1176
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	48.2	57.0	4.9	15.4	16.2
Incr Delay (d2), s/veh	8.5	1.1	50.7	0.6	7.0	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	1.6	2.1	4.3	19.0	21.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	60.0	49.3	107.7	5.4	22.4	25.0
LnGrp LOS	E	D	F	A	C	C
Approach Vol, veh/h	232			1330	1991	
Approach Delay, s/veh	57.4			8.9	23.7	
Approach LOS	E			A	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.5	86.2			99.7	20.3
Change Period (Y+Rc), s	* 8.5	6.9			6.9	5.7
Max Green Setting (Gmax), s	* 5	54.9			68.4	39.0
Max Q Clear Time (g_c+l1), s	5.9	56.7			17.6	13.9
Green Ext Time (p_c), s	0.0	0.0			11.9	0.7

Intersection Summary













HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations							
Traffic Volume (vph)	508	449	1488	258	282	1270	
Future Volume (vph)	508	449	1488	258	282	1270	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	465	0		400	500		
Storage Lanes	1	1		1	2		
Taper Length (ft)	25				25		
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95	
Frt		0.850		0.850			
Flt Protected	0.950				0.950		
Satd. Flow (prot)	3367	1509	3374	1495	2918	3438	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	3367	1509	3374	1495	2918	3438	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		373		260			
Link Speed (mph)	45		45			45	
Link Distance (ft)	886		2249			1233	
Travel Time (s)	13.4		34.1			18.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	
Heavy Vehicles (%)	4%	7%	7%	8%	20%	5%	
Adj. Flow (vph)	524	463	1534	266	291	1309	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	524	463	1534	266	291	1309	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	24		24			24	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2	1	1	2	
Detector Template	Left	Right	Thru	Right	Left	Thru	
Leading Detector (ft)	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA	Perm	Prot	NA	
Protected Phases	4		2		1	6	3

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

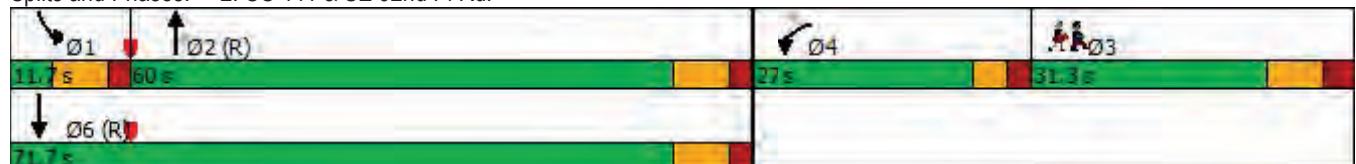


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Permitted Phases		4		2			
Detector Phase	4	4	2	2	1	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	17.0	17.0	5.0	17.0	5.0
Minimum Split (s)	35.7	35.7	48.7	48.7	12.7	25.7	37.5
Total Split (s)	27.0	27.0	60.0	60.0	11.7	71.7	31.3
Total Split (%)	20.8%	20.8%	46.2%	46.2%	9.0%	55.2%	24%
Maximum Green (s)	21.3	21.3	52.3	52.3	4.0	64.0	22.8
Yellow Time (s)	3.4	3.4	5.5	5.5	5.5	5.5	5.5
All-Red Time (s)	2.3	2.3	2.2	2.2	2.2	2.2	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	7.7	7.7	7.7	7.7	
Lead/Lag	Lead	Lead	Lag	Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0			7.0
Flash Dont Walk (s)	23.0	23.0	34.0	34.0			22.0
Pedestrian Calls (#/hr)	0	0	0	0			0
Act Effct Green (s)	21.3	21.3	59.5	59.5	28.1	95.3	
Actuated g/C Ratio	0.16	0.16	0.46	0.46	0.22	0.73	
v/c Ratio	0.95	0.83	0.99	0.32	0.46	0.52	
Control Delay	81.8	24.8	56.3	3.3	48.5	8.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	81.8	24.8	56.3	3.3	48.5	8.4	
LOS	F	C	E	A	D	A	
Approach Delay	55.0		48.5			15.7	
Approach LOS	E		D			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 22 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 145  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 38.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 81.3%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 2: US 441 & SE 92nd PI Rd.



# HCM Signalized Intersection Capacity Analysis

## 2: US 441 & SE 92nd PI Rd.

03/08/2024


































Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	508	449	1488	258	282	1270
Future Volume (vph)	508	449	1488	258	282	1270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	7.7	7.7	7.7	7.7
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3367	1509	3374	1495	2918	3438
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3367	1509	3374	1495	2918	3438
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	524	463	1534	266	291	1309
RTOR Reduction (vph)	0	312	0	141	0	0
Lane Group Flow (vph)	524	151	1534	125	291	1309
Heavy Vehicles (%)	4%	7%	7%	8%	20%	5%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2		
Actuated Green, G (s)	21.3	21.3	59.5	59.5	28.1	95.3
Effective Green, g (s)	21.3	21.3	59.5	59.5	28.1	95.3
Actuated g/C Ratio	0.16	0.16	0.46	0.46	0.22	0.73
Clearance Time (s)	5.7	5.7	7.7	7.7	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	551	247	1544	684	630	2520
v/s Ratio Prot	c0.16		c0.45		0.10	c0.38
v/s Ratio Perm		0.10		0.08		
v/c Ratio	0.95	0.61	0.99	0.18	0.46	0.52
Uniform Delay, d1	53.8	50.5	35.1	20.9	44.4	7.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.5	4.4	21.4	0.6	0.5	0.8
Delay (s)	80.3	54.9	56.5	21.4	44.9	8.2
Level of Service	F	D	E	C	D	A
Approach Delay (s)	68.4		51.3			14.9
Approach LOS	E		D			B

Intersection Summary			
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	29.6
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 		 	 	
Traffic Volume (vph)	219	280	141	110	463	378	175	906	82	462	1024	399
Future Volume (vph)	219	280	141	110	463	378	175	906	82	462	1024	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		345	645		1000	485		300	765		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3303	3085	1524	1626	3505	1553	3400	3505	1417	3467	3438	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3303	3085	1524	1626	3505	1553	3400	3505	1417	3467	3438	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			153			91			155			279
Link Speed (mph)		45			50			45			45	
Link Distance (ft)		1046			2610			1329			994	
Travel Time (s)		15.8			35.6			20.1			15.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	6%	17%	6%	11%	3%	4%	3%	3%	14%	1%	5%	2%
Adj. Flow (vph)	226	289	145	113	477	390	180	934	85	476	1056	411
Shared Lane Traffic (%)												
Lane Group Flow (vph)	226	289	145	113	477	390	180	934	85	476	1056	411
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4	5	1	6		5	2	

Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	5.0	15.0	5.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	16.9	49.2	49.2	15.0	51.2	13.9	13.8	47.9	47.9	13.9	43.9	43.9
Total Split (s)	20.0	50.2	50.2	21.0	51.2	32.0	28.0	50.7	50.7	32.0	54.7	54.7
Total Split (%)	13.0%	32.6%	32.6%	13.6%	33.3%	20.8%	18.2%	32.9%	32.9%	20.8%	35.5%	35.5%
Maximum Green (s)	11.1	43.0	43.0	12.1	44.0	23.1	19.2	43.8	43.8	23.1	47.8	47.8
Yellow Time (s)	5.0	5.2	5.2	5.2	5.2	4.9	4.8	4.9	4.9	4.9	4.9	4.9
All-Red Time (s)	3.9	2.0	2.0	3.7	2.0	4.0	4.0	2.0	2.0	4.0	2.0	2.0
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	0.0
Total Lost Time (s)	8.9	7.2	7.2	8.9	7.2	8.9	8.8	6.9	6.9	8.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		35.0	35.0		37.0			34.0	34.0		30.0	30.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	11.2	22.4	22.4	12.0	23.2	52.6	12.3	40.7	40.7	22.2	50.7	50.7
Actuated g/C Ratio	0.09	0.17	0.17	0.09	0.18	0.41	0.10	0.31	0.31	0.17	0.39	0.39
v/c Ratio	0.79	0.54	0.37	0.75	0.76	0.57	0.56	0.85	0.15	0.80	0.78	0.52
Control Delay	79.4	53.3	8.9	88.2	59.3	26.0	64.0	50.3	0.6	63.5	40.2	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.4	53.3	8.9	88.2	59.3	26.0	64.0	50.3	0.6	63.5	40.2	12.3
LOS	E	D	A	F	E	C	E	D	A	E	D	B
Approach Delay		52.5			49.4			48.8			40.0	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 153.9  
 Actuated Cycle Length: 129.3  
 Natural Cycle: 140  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 45.9  
 Intersection LOS: D  
 Intersection Capacity Utilization 84.3%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 3: 58th Ave. (SR 35) & SE 92nd PI Rd.



# HCM 6th Signalized Intersection Summary

3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	280	141	110	463	378	175	906	82	462	1024	399
Future Volume (veh/h)	219	280	141	110	463	378	175	906	82	462	1024	399
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1648	1811	1737	1856	1841	1856	1856	1693	1885	1826	1870
Adj Flow Rate, veh/h	226	289	123	113	477	343	180	934	62	476	1056	382
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	17	6	11	3	4	3	3	14	1	5	2
Cap, veh/h	275	693	340	135	778	585	239	1053	428	537	1332	608
Arrive On Green	0.08	0.22	0.22	0.08	0.22	0.22	0.07	0.30	0.30	0.15	0.38	0.38
Sat Flow, veh/h	3346	3131	1535	1654	3526	1560	3428	3526	1434	3483	3469	1585
Grp Volume(v), veh/h	226	289	123	113	477	343	180	934	62	476	1056	382
Grp Sat Flow(s),veh/h/ln	1673	1566	1535	1654	1763	1560	1714	1763	1434	1742	1735	1585
Q Serve(g_s), s	8.7	10.3	8.9	8.8	15.9	23.0	6.7	33.0	4.1	17.5	35.2	25.5
Cycle Q Clear(g_c), s	8.7	10.3	8.9	8.8	15.9	23.0	6.7	33.0	4.1	17.5	35.2	25.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	275	693	340	135	778	585	239	1053	428	537	1332	608
V/C Ratio(X)	0.82	0.42	0.36	0.84	0.61	0.59	0.75	0.89	0.14	0.89	0.79	0.63
Avail Cap(c_a), veh/h	285	1032	506	153	1189	766	504	1183	481	617	1332	608
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.0	43.6	43.0	59.1	45.8	32.7	59.6	43.7	33.5	54.1	35.6	32.6
Incr Delay (d2), s/veh	17.0	0.4	0.6	29.0	0.8	0.9	4.8	7.8	0.2	13.4	3.4	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	4.2	4.0	3.4	4.7	6.8	8.5	3.0	15.0	1.4	8.5	14.9	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.0	44.0	43.7	88.1	46.6	33.6	64.4	51.5	33.7	67.4	39.0	34.7
LnGrp LOS	E	D	D	F	D	C	E	D	C	E	D	C
Approach Vol, veh/h		638			933			1176			1914	
Approach Delay, s/veh		55.3			46.9			52.5			45.2	
Approach LOS		E			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.9	57.0	19.6	36.0	29.0	45.9	19.5	36.1				
Change Period (Y+Rc), s	8.8	6.9	* 8.9	7.2	* 8.9	6.9	* 8.9	7.2				
Max Green Setting (Gmax), s	19.2	47.8	* 11	44.0	* 23	43.8	* 12	43.0				
Max Q Clear Time (g_c+I1), s	8.7	37.2	10.7	25.0	19.5	35.0	10.8	12.3				
Green Ext Time (p_c), s	0.4	5.9	0.0	3.8	0.6	4.0	0.0	2.2				

## Intersection Summary

HCM 6th Ctrl Delay	48.8
HCM 6th LOS	D

## Notes
























User approved pedestrian interval to be less than phase max green.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	421	47	47	303	192	28	410	35	188	713	408
Future Volume (vph)	195	421	47	47	303	192	28	410	35	188	713	408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	255		0	330		225	240		0	215		0
Storage Lanes	2		0	1		1	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	0.95
Frt		0.985				0.850		0.988			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	1812	0	1656	1759	1553	1641	3409	0	3400	3272	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	1812	0	1656	1759	1553	1641	3409	0	3400	3272	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				185		5			75	
Link Speed (mph)		35			35			40			35	
Link Distance (ft)		608			801			775			744	
Travel Time (s)		11.8			15.6			13.2			14.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	6%	9%	8%	4%	10%	4%	12%	3%	5%	3%
Adj. Flow (vph)	212	458	51	51	329	209	30	446	38	204	775	443
Shared Lane Traffic (%)												
Lane Group Flow (vph)	212	509	0	51	329	209	30	484	0	204	1218	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

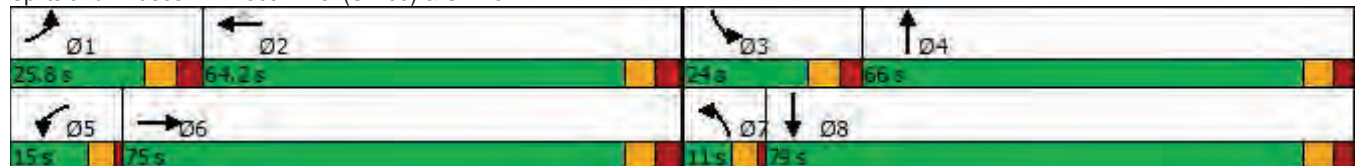


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							2					
Detector Phase	1	6		5	2	2	7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	24.0		5.0	24.0	24.0	5.0	10.0		6.0	10.0	
Minimum Split (s)	13.9	31.9		9.5	31.9	31.9	9.5	25.0		13.0	25.0	
Total Split (s)	25.8	75.0		15.0	64.2	64.2	11.0	66.0		24.0	79.0	
Total Split (%)	14.3%	41.7%		8.3%	35.7%	35.7%	6.1%	36.7%		13.3%	43.9%	
Maximum Green (s)	17.9	67.1		10.5	56.3	56.3	6.5	59.0		17.0	72.0	
Yellow Time (s)	4.2	4.2		3.5	4.2	4.2	3.5	4.1		4.1	4.1	
All-Red Time (s)	3.7	3.7		1.0	3.7	3.7	1.0	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.9	7.9		4.5	7.9	7.9	4.5	7.0		7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	4.0	
Recall Mode	None	Min		None	Min	Min	None	Max		None	None	
Act Effct Green (s)	15.6	53.1		9.2	40.7	40.7	6.3	59.6		15.0	73.1	
Actuated g/C Ratio	0.10	0.33		0.06	0.25	0.25	0.04	0.37		0.09	0.45	
v/c Ratio	0.65	0.85		0.54	0.74	0.39	0.47	0.38		0.64	0.80	
Control Delay	81.9	64.7		99.1	65.7	10.7	103.8	40.1		82.3	42.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	81.9	64.7		99.1	65.7	10.7	103.8	40.1		82.3	42.4	
LOS	F	E		F	E	B	F	D		F	D	
Approach Delay		69.7			49.1			43.8			48.1	
Approach LOS		E			D			D			D	

Intersection Summary



























Area Type:	Other
Cycle Length:	180
Actuated Cycle Length:	160.9
Natural Cycle:	95
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.85
Intersection Signal Delay:	52.4
Intersection LOS:	D
Intersection Capacity Utilization:	86.0%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 4: 58th Ave. (SR 35) & SR 25



HCM 6th Signalized Intersection Summary  
 4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 		 	 	 		 		
Traffic Volume (veh/h)	195	421	47	47	303	192	28	410	35	188	713	408
Future Volume (veh/h)	195	421	47	47	303	192	28	410	35	188	713	408
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1856	1811	1767	1781	1841	1752	1841	1722	1856	1826	1856
Adj Flow Rate, veh/h	212	458	50	51	329	207	30	446	0	204	775	439
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	3	6	9	8	4	10	4	12	3	5	3
Cap, veh/h	267	512	56	65	443	388	40	1389		258	995	560
Arrive On Green	0.08	0.31	0.31	0.04	0.25	0.25	0.02	0.40	0.00	0.08	0.47	0.47
Sat Flow, veh/h	3401	1644	179	1682	1781	1560	1668	3589	0	3428	2139	1205
Grp Volume(v), veh/h	212	0	508	51	329	207	30	446	0	204	628	586
Grp Sat Flow(s),veh/h/ln	1700	0	1823	1682	1781	1560	1668	1749	0	1714	1735	1609
Q Serve(g_s), s	9.1	0.0	39.5	4.5	25.3	17.1	2.7	13.1	0.0	8.7	45.1	45.6
Cycle Q Clear(g_c), s	9.1	0.0	39.5	4.5	25.3	17.1	2.7	13.1	0.0	8.7	45.1	45.6
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.00	1.00		0.75
Lane Grp Cap(c), veh/h	267	0	568	65	443	388	40	1389		258	807	749
V/C Ratio(X)	0.80	0.00	0.89	0.79	0.74	0.53	0.75	0.32		0.79	0.78	0.78
Avail Cap(c_a), veh/h	410	0	823	119	675	591	73	1389		392	840	780
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	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.3	0.0	48.8	70.9	51.4	48.3	72.1	31.0	0.0	67.6	33.3	33.4
Incr Delay (d2), s/veh	8.0	0.0	10.3	18.9	3.5	1.6	24.3	0.6	0.0	8.1	4.8	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	19.4	2.3	11.7	6.8	1.4	5.6	0.0	4.1	19.7	18.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.3	0.0	59.1	89.8	54.9	50.0	96.4	31.6	0.0	75.7	38.1	38.8
LnGrp LOS	E	A	E	F	D	D	F	C		E	D	D
Approach Vol, veh/h		720			587			476			1418	
Approach Delay, s/veh		63.9			56.2			35.7			43.8	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.5	44.9	18.2	66.0	10.2	54.2	8.1	76.1				
Change Period (Y+Rc), s	* 7.9	* 7.9	7.0	7.0	4.5	* 7.9	4.5	7.0				
Max Green Setting (Gmax), s	* 18	* 56	17.0	59.0	10.5	* 67	6.5	72.0				
Max Q Clear Time (g_c+I1), s	11.1	27.3	10.7	15.1	6.5	41.5	4.7	47.6				
Green Ext Time (p_c), s	0.5	4.2	0.5	4.4	0.0	4.8	0.0	12.7				

Intersection Summary

























HCM 6th Ctrl Delay	49.4
HCM 6th LOS	D

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	118	43	109	122	182	31	600	369	119	634	54
Future Volume (vph)	31	118	43	109	122	182	31	600	369	119	634	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	475		475	485		485	390		400	400		400
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1597	1727	1482	1736	1827	1583	1543	3471	1583	1787	3406	1346
Flt Permitted	0.677			0.507			0.400			0.262		
Satd. Flow (perm)	1138	1727	1482	926	1827	1583	650	3471	1583	493	3406	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132			186			377			133
Link Speed (mph)		30			30			50				30
Link Distance (ft)		828			917			1237				1406
Travel Time (s)		18.8			20.8			16.9				32.0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	13%	10%	9%	4%	4%	2%	17%	4%	2%	1%	6%	20%
Adj. Flow (vph)	32	120	44	111	124	186	32	612	377	121	647	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	120	44	111	124	186	32	612	377	121	647	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

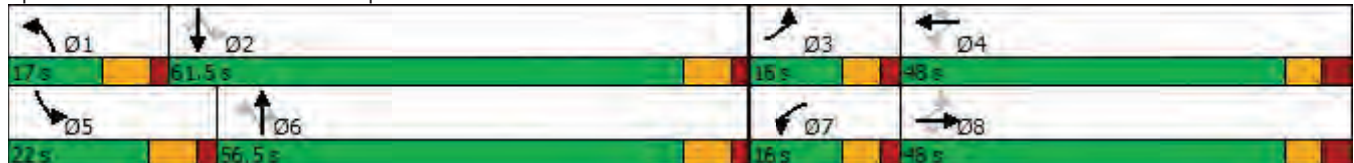


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8		8	4		4	6		6	2		2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	16.0	16.0	8.0	16.0	16.0
Minimum Split (s)	14.0	41.3	41.3	14.0	41.3	41.3	15.1	31.1	31.1	15.1	31.1	31.1
Total Split (s)	16.0	48.0	48.0	16.0	48.0	48.0	17.0	56.5	56.5	22.0	61.5	61.5
Total Split (%)	11.2%	33.7%	33.7%	11.2%	33.7%	33.7%	11.9%	39.6%	39.6%	15.4%	43.2%	43.2%
Maximum Green (s)	10.0	40.7	40.7	10.0	40.7	40.7	9.9	49.4	49.4	14.9	54.4	54.4
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.1	5.1	5.1	5.1	5.1	5.1
All-Red Time (s)	2.0	3.3	3.3	2.0	3.3	3.3	2.0	2.0	2.0	2.0	2.0	2.0
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	0.0
Total Lost Time (s)	6.0	7.3	7.3	6.0	7.3	7.3	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	21.1	11.6	11.6	26.2	19.3	19.3	30.5	22.3	22.3	37.1	31.1	31.1
Actuated g/C Ratio	0.26	0.14	0.14	0.32	0.24	0.24	0.38	0.27	0.27	0.46	0.38	0.38
v/c Ratio	0.09	0.49	0.14	0.28	0.29	0.36	0.10	0.64	0.53	0.32	0.50	0.09
Control Delay	20.6	41.0	0.9	22.1	32.3	7.6	12.7	29.7	5.8	14.3	22.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	41.0	0.9	22.1	32.3	7.6	12.7	29.7	5.8	14.3	22.7	0.3
LOS	C	D	A	C	C	A	B	C	A	B	C	A
Approach Delay		28.7			18.7			20.3			20.0	
Approach LOS		C			B			C			B	

Intersection Summary

























Area Type:	Other
Cycle Length:	142.5
Actuated Cycle Length:	81.3
Natural Cycle:	105
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	20.6
Intersection LOS:	C
Intersection Capacity Utilization:	60.4%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 5: SE 92nd Loop & SE 110th St Rd.



HCM 6th Signalized Intersection Summary  
 5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	118	43	109	122	182	31	600	369	119	634	54
Future Volume (veh/h)	31	118	43	109	122	182	31	600	369	119	634	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1752	1767	1841	1841	1870	1648	1841	1870	1885	1811	1604
Adj Flow Rate, veh/h	32	120	44	111	124	147	32	612	377	121	647	55
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	13	10	9	4	4	2	17	4	2	1	6	20
Cap, veh/h	279	192	164	324	286	246	322	1104	500	376	1251	494
Arrive On Green	0.05	0.11	0.11	0.10	0.16	0.16	0.05	0.32	0.32	0.10	0.36	0.36
Sat Flow, veh/h	1626	1752	1497	1753	1841	1585	1570	3497	1585	1795	3441	1359
Grp Volume(v), veh/h	32	120	44	111	124	147	32	612	377	121	647	55
Grp Sat Flow(s),veh/h/ln	1626	1752	1497	1753	1841	1585	1570	1749	1585	1795	1721	1359
Q Serve(g_s), s	1.2	4.8	2.0	3.9	4.5	6.3	1.0	10.6	15.6	3.1	10.8	2.0
Cycle Q Clear(g_c), s	1.2	4.8	2.0	3.9	4.5	6.3	1.0	10.6	15.6	3.1	10.8	2.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	279	192	164	324	286	246	322	1104	500	376	1251	494
V/C Ratio(X)	0.11	0.63	0.27	0.34	0.43	0.60	0.10	0.55	0.75	0.32	0.52	0.11
Avail Cap(c_a), veh/h	417	977	835	392	1026	884	453	2366	1073	563	2564	1013
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	31.1	29.8	24.6	27.9	28.7	15.3	20.7	22.4	14.3	18.2	15.4
Incr Delay (d2), s/veh	0.2	3.3	0.9	0.6	1.0	2.3	0.1	0.4	2.3	0.5	0.3	0.1
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	0.5	2.1	0.7	1.6	2.0	0.2	0.3	3.8	5.8	1.2	4.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	34.4	30.7	25.3	29.0	31.0	15.4	21.2	24.8	14.8	18.6	15.5
LnGrp LOS	C	C	C	C	C	C	B	C	C	B	B	B
Approach Vol, veh/h		196			382			1021			823	
Approach Delay, s/veh		32.2			28.7			22.3			17.8	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.9	33.6	9.8	18.6	14.4	30.1	13.2	15.3				
Change Period (Y+Rc), s	7.1	7.1	6.0	* 7.3	7.1	7.1	6.0	* 7.3				
Max Green Setting (Gmax), s	9.9	54.4	10.0	* 41	14.9	49.4	10.0	* 41				
Max Q Clear Time (g_c+I1), s	3.0	12.8	3.2	8.3	5.1	17.6	5.9	6.8				
Green Ext Time (p_c), s	0.0	5.4	0.0	1.2	0.2	5.4	0.1	0.8				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				22.6								
HCM 6th LOS				C								
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	805	903	8	72	49
Future Vol, veh/h	19	805	903	8	72	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	8	5	2	2	2
Mvmt Flow	20	847	951	8	76	52

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	959	0	-	0	1419 480
Stage 1	-	-	-	-	955 -
Stage 2	-	-	-	-	464 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	713	-	-	-	128 532
Stage 1	-	-	-	-	334 -
Stage 2	-	-	-	-	599 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	713	-	-	-	124 532
Mov Cap-2 Maneuver	-	-	-	-	242 -
Stage 1	-	-	-	-	325 -
Stage 2	-	-	-	-	599 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	24.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	713	-	-	-	311
HCM Lane V/C Ratio	0.028	-	-	-	0.41
HCM Control Delay (s)	10.2	-	-	-	24.4
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.9

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗		↗
Traffic Vol, veh/h	13	864	863	16	0	49
Future Vol, veh/h	13	864	863	16	0	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	200	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	8	5	2	0	2
Mvmt Flow	14	909	908	17	0	52

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	925	0	-	0	454
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	3.32
Pot Cap-1 Maneuver	734	-	-	-	553
Stage 1	-	-	-	-	0
Stage 2	-	-	-	-	0
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	734	-	-	-	553
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	734	-	-	-	553
HCM Lane V/C Ratio	0.019	-	-	-	0.093
HCM Control Delay (s)	10	-	-	-	12.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3



Lanes, Volumes, Timings

1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	327	54	44	1762	1241	174
Future Volume (vph)	327	54	44	1762	1241	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	265			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.982	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1597	1262	1530	3539	3329	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1597	1262	1530	3539	3329	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		57			16	
Link Speed (mph)	30			45	45	
Link Distance (ft)	484			829	1271	
Travel Time (s)	11.0			12.6	19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	13%	28%	18%	2%	5%	17%
Adj. Flow (vph)	344	57	46	1855	1306	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	344	57	46	1855	1489	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	8		1	6	2	

# Lanes, Volumes, Timings

1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024

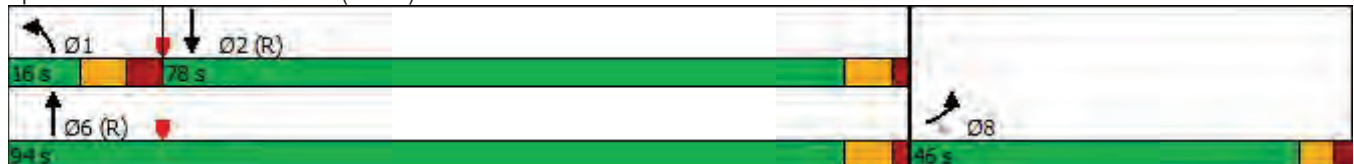


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		8				
Detector Phase	8	8	1	6	2	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	15.0	15.0	
Minimum Split (s)	44.7	44.7	13.5	24.9	36.9	
Total Split (s)	46.0	46.0	16.0	94.0	78.0	
Total Split (%)	32.9%	32.9%	11.4%	67.1%	55.7%	
Maximum Green (s)	40.3	40.3	7.5	87.1	71.1	
Yellow Time (s)	3.7	3.7	4.8	4.9	4.9	
All-Red Time (s)	2.0	2.0	3.7	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	8.5	6.9	6.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0			7.0	
Flash Dont Walk (s)	32.0	32.0			23.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	34.3	34.3	7.9	93.1	79.5	
Actuated g/C Ratio	0.24	0.24	0.06	0.66	0.57	
v/c Ratio	0.88	0.16	0.53	0.79	0.79	
Control Delay	73.8	9.9	86.0	20.8	29.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	73.8	9.9	86.0	20.8	29.4	
LOS	E	A	F	C	C	
Approach Delay	64.7			22.3	29.4	
Approach LOS	E			C	C	

## Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	6 (4%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	110
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	29.6
Intersection LOS:	C
Intersection Capacity Utilization	77.3%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.



HCM 6th Signalized Intersection Summary  
 1: 58th Ave. (SR 35) & Laurel Rd./SE 66th St.

03/08/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	327	54	44	1762	1241	174
Future Volume (veh/h)	327	54	44	1762	1241	174
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1707	1485	1633	1870	1826	1648
Adj Flow Rate, veh/h	344	45	46	1855	1306	175
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	13	28	18	2	5	17
Cap, veh/h	370	287	68	2424	1778	237
Arrive On Green	0.23	0.23	0.04	0.68	0.58	0.58
Sat Flow, veh/h	1626	1259	1555	3647	3168	410
Grp Volume(v), veh/h	344	45	46	1855	733	748
Grp Sat Flow(s),veh/h/ln	1626	1259	1555	1777	1735	1752
Q Serve(g_s), s	29.0	4.0	4.1	48.6	43.2	44.0
Cycle Q Clear(g_c), s	29.0	4.0	4.1	48.6	43.2	44.0
Prop In Lane	1.00	1.00	1.00			0.23
Lane Grp Cap(c), veh/h	370	287	68	2424	1003	1013
V/C Ratio(X)	0.93	0.16	0.68	0.77	0.73	0.74
Avail Cap(c_a), veh/h	468	362	83	2424	1003	1013
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	43.3	66.0	14.8	21.6	21.8
Incr Delay (d2), s/veh	21.9	0.3	15.2	2.4	4.7	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.1	1.3	1.9	17.9	17.6	18.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	74.9	43.5	81.2	17.2	26.3	26.6
LnGrp LOS	E	D	F	B	C	C
Approach Vol, veh/h	389			1901	1481	
Approach Delay, s/veh	71.2			18.7	26.4	
Approach LOS	E			B	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	14.6	87.8			102.4	37.6
Change Period (Y+Rc), s	* 8.5	6.9			6.9	5.7
Max Green Setting (Gmax), s	* 7.5	71.1			87.1	40.3
Max Q Clear Time (g_c+l1), s	6.1	46.0			50.6	31.0
Green Ext Time (p_c), s	0.0	11.1			19.7	0.9

Intersection Summary

















HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations	 		 		 	 	
Traffic Volume (vph)	367	303	1533	581	523	1530	
Future Volume (vph)	367	303	1533	581	523	1530	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	465	0		400	500		
Storage Lanes	1	1		1	2		
Taper Length (ft)	25				25		
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95	
Frt		0.850		0.850			
Flt Protected	0.950				0.950		
Satd. Flow (prot)	3335	1429	3374	1482	3303	3374	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	3335	1429	3374	1482	3303	3374	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		299		612			
Link Speed (mph)	45		45			45	
Link Distance (ft)	886		2249			1233	
Travel Time (s)	13.4		34.1			18.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	5%	13%	7%	9%	6%	7%	
Adj. Flow (vph)	386	319	1614	612	551	1611	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	386	319	1614	612	551	1611	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	24		24			24	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2	1	1	2	
Detector Template	Left	Right	Thru	Right	Left	Thru	
Leading Detector (ft)	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA	Perm	Prot	NA	
Protected Phases	4		2		1	6	3

Lanes, Volumes, Timings  
2: US 441 & SE 92nd PI Rd.

03/08/2024



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Permitted Phases		4		2			
Detector Phase	4	4	2	2	1	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	17.0	17.0	5.0	17.0	5.0
Minimum Split (s)	35.7	35.7	48.7	48.7	12.7	25.7	37.5
Total Split (s)	23.0	23.0	76.0	76.0	12.0	88.0	29.0
Total Split (%)	16.4%	16.4%	54.3%	54.3%	8.6%	62.9%	21%
Maximum Green (s)	17.3	17.3	68.3	68.3	4.3	80.3	20.5
Yellow Time (s)	3.4	3.4	5.5	5.5	5.5	5.5	5.5
All-Red Time (s)	2.3	2.3	2.2	2.2	2.2	2.2	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	7.7	7.7	7.7	7.7	
Lead/Lag	Lead	Lead	Lag	Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0			7.0
Flash Dont Walk (s)	23.0	23.0	34.0	34.0			22.0
Pedestrian Calls (#/hr)	0	0	0	0			0
Act Effct Green (s)	17.3	17.3	68.3	68.3	33.3	109.3	
Actuated g/C Ratio	0.12	0.12	0.49	0.49	0.24	0.78	
v/c Ratio	0.94	0.73	0.98	0.59	0.70	0.61	
Control Delay	91.4	18.5	53.3	4.1	54.4	7.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	91.4	18.5	53.3	4.1	54.4	7.6	
LOS	F	B	D	A	D	A	
Approach Delay	58.4		39.7			19.6	
Approach LOS	E		D			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 102 (73%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 145  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 33.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 85.3%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 2: US 441 & SE 92nd PI Rd.



# HCM Signalized Intersection Capacity Analysis

## 2: US 441 & SE 92nd PI Rd.

03/08/2024


































Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	367	303	1533	581	523	1530
Future Volume (vph)	367	303	1533	581	523	1530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	7.7	7.7	7.7	7.7
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3335	1429	3374	1482	3303	3374
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3335	1429	3374	1482	3303	3374
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	386	319	1614	612	551	1611
RTOR Reduction (vph)	0	262	0	313	0	0
Lane Group Flow (vph)	386	57	1614	299	551	1611
Heavy Vehicles (%)	5%	13%	7%	9%	6%	7%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2		
Actuated Green, G (s)	17.3	17.3	68.3	68.3	33.3	109.3
Effective Green, g (s)	17.3	17.3	68.3	68.3	33.3	109.3
Actuated g/C Ratio	0.12	0.12	0.49	0.49	0.24	0.78
Clearance Time (s)	5.7	5.7	7.7	7.7	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	412	176	1646	723	785	2634
v/s Ratio Prot	c0.12		c0.48		0.17	c0.48
v/s Ratio Perm		0.04		0.20		
v/c Ratio	0.94	0.32	0.98	0.41	0.70	0.61
Uniform Delay, d1	60.8	56.0	35.2	23.0	48.8	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.7	1.1	18.0	1.7	2.9	1.1
Delay (s)	89.5	57.1	53.2	24.7	51.7	7.5
Level of Service	F	E	D	C	D	A
Approach Delay (s)	74.8		45.4			18.8
Approach LOS	E		D			B

### Intersection Summary

HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	29.6
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 		 	 	
Traffic Volume (vph)	317	651	201	96	403	481	220	1204	120	431	831	293
Future Volume (vph)	317	651	201	96	403	481	220	1204	120	431	831	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		345	645		1000	485		300	765		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3374	1568	1687	3574	1553	3242	3471	1509	3335	3343	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3374	1568	1687	3574	1553	3242	3471	1509	3335	3343	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			212			91			155			246
Link Speed (mph)		45			50			45			45	
Link Distance (ft)		1046			2610			1329			994	
Travel Time (s)		15.8			35.6			20.1			15.1	
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 (%)	5%	7%	3%	7%	1%	4%	8%	4%	7%	5%	8%	2%
Adj. Flow (vph)	334	685	212	101	424	506	232	1267	126	454	875	308
Shared Lane Traffic (%)												
Lane Group Flow (vph)	334	685	212	101	424	506	232	1267	126	454	875	308
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4	5	1	6		5	2	

Lanes, Volumes, Timings  
 3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	15.0	15.0	5.0	15.0	5.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	16.9	49.2	49.2	15.0	51.2	13.9	13.8	47.9	47.9	13.9	43.9	43.9
Total Split (s)	26.0	41.9	41.9	19.0	34.9	30.0	23.0	63.0	63.0	30.0	70.0	70.0
Total Split (%)	16.9%	27.2%	27.2%	12.3%	22.7%	19.5%	14.9%	40.9%	40.9%	19.5%	45.5%	45.5%
Maximum Green (s)	17.1	34.7	34.7	10.1	27.7	21.1	14.2	56.1	56.1	21.1	63.1	63.1
Yellow Time (s)	5.0	5.2	5.2	5.2	5.2	4.9	4.8	4.9	4.9	4.9	4.9	4.9
All-Red Time (s)	3.9	2.0	2.0	3.7	2.0	4.0	4.0	2.0	2.0	4.0	2.0	2.0
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	0.0
Total Lost Time (s)	8.9	7.2	7.2	8.9	7.2	8.9	8.8	6.9	6.9	8.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		35.0	35.0		37.0			34.0	34.0		30.0	30.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	17.0	33.8	33.8	10.1	26.9	55.2	13.8	56.1	56.1	21.1	63.6	63.6
Actuated g/C Ratio	0.11	0.22	0.22	0.07	0.18	0.36	0.09	0.37	0.37	0.14	0.42	0.42
v/c Ratio	0.90	0.92	0.41	0.91	0.68	0.82	0.80	1.00	0.19	0.99	0.63	0.38
Control Delay	94.6	76.6	8.3	133.6	64.9	48.2	88.2	72.1	2.8	103.8	38.2	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	76.6	8.3	133.6	64.9	48.2	88.2	72.1	2.8	103.8	38.2	8.3
LOS	F	E	A	F	E	D	F	E	A	F	D	A
Approach Delay		69.7			63.4			69.0			50.8	
Approach LOS		E			E			E			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 153.9  
 Actuated Cycle Length: 153  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 62.7  
 Intersection LOS: E  
 Intersection Capacity Utilization 95.5%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 3: 58th Ave. (SR 35) & SE 92nd PI Rd.





# HCM 6th Signalized Intersection Summary

3: 58th Ave. (SR 35) & SE 92nd PI Rd.

03/08/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕	↖	↖	↕	↖	↖↗	↕	↖	↖↗	↕	↖
Traffic Volume (veh/h)	317	651	201	96	403	481	220	1204	120	431	831	293
Future Volume (veh/h)	317	651	201	96	403	481	220	1204	120	431	831	293
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1796	1856	1796	1885	1841	1781	1841	1796	1826	1781	1870
Adj Flow Rate, veh/h	334	685	171	101	424	454	232	1267	89	454	875	266
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
Percent Heavy Veh, %	5	7	3	7	1	4	8	4	7	5	8	2
Cap, veh/h	374	769	354	112	645	495	274	1275	555	463	1419	664
Arrive On Green	0.11	0.23	0.23	0.07	0.18	0.18	0.08	0.36	0.36	0.14	0.42	0.42
Sat Flow, veh/h	3374	3413	1572	1711	3582	1560	3291	3497	1522	3374	3385	1585
Grp Volume(v), veh/h	334	685	171	101	424	454	232	1267	89	454	875	266
Grp Sat Flow(s),veh/h/ln	1687	1706	1572	1711	1791	1560	1646	1749	1522	1687	1692	1585
Q Serve(g_s), s	15.0	29.9	14.5	9.0	16.9	27.7	10.7	55.5	6.1	20.6	31.2	18.0
Cycle Q Clear(g_c), s	15.0	29.9	14.5	9.0	16.9	27.7	10.7	55.5	6.1	20.6	31.2	18.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	374	769	354	112	645	495	274	1275	555	463	1419	664
V/C Ratio(X)	0.89	0.89	0.48	0.90	0.66	0.92	0.85	0.99	0.16	0.98	0.62	0.40
Avail Cap(c_a), veh/h	375	770	355	112	645	495	304	1275	555	463	1419	664
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.5	57.8	51.8	71.4	58.7	50.6	69.5	48.7	33.0	66.2	35.0	31.2
Incr Delay (d2), s/veh	22.8	12.6	1.0	54.6	2.4	22.1	18.1	23.6	0.1	36.8	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	14.0	5.8	5.6	7.7	19.4	5.1	27.6	2.2	11.1	12.7	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.3	70.4	52.8	126.0	61.1	72.7	87.6	72.2	33.1	103.0	35.8	31.6
LnGrp LOS	F	E	D	F	E	E	F	E	C	F	D	C
Approach Vol, veh/h		1190			979			1588			1595	
Approach Delay, s/veh		73.5			73.2			72.3			54.2	
Approach LOS		E			E			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.6	71.4	25.9	34.9	30.0	63.0	19.0	41.8				
Change Period (Y+Rc), s	8.8	6.9	* 8.9	7.2	* 8.9	6.9	* 8.9	7.2				
Max Green Setting (Gmax), s	14.2	63.1	* 17	27.7	* 21	56.1	* 10	34.7				
Max Q Clear Time (g_c+I1), s	12.7	33.2	17.0	29.7	22.6	57.5	11.0	31.9				
Green Ext Time (p_c), s	0.1	7.4	0.0	0.0	0.0	0.0	0.0	1.3				

## Intersection Summary

HCM 6th Ctrl Delay	67.3
HCM 6th LOS	E
























## Notes

User approved pedestrian interval to be less than phase max green.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	437	357	27	27	463	108	35	755	39	219	510	196
Future Volume (vph)	437	357	27	27	463	108	35	755	39	219	510	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	255		0	330		225	240		0	215		0
Storage Lanes	2		0	1		1	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	0.95
Frt		0.990				0.850		0.993			0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	1786	0	1719	1792	1568	1421	3431	0	3433	3170	0
Flt Permitted	0.950			0.525			0.370			0.950		
Satd. Flow (perm)	3335	1786	0	950	1792	1568	554	3431	0	3433	3170	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				115		3			36	
Link Speed (mph)		35			35			40			35	
Link Distance (ft)		608			801			775			744	
Travel Time (s)		11.8			15.6			13.2			14.5	
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 (%)	5%	5%	10%	5%	6%	3%	27%	4%	14%	2%	8%	12%
Adj. Flow (vph)	460	376	28	28	487	114	37	795	41	231	537	206
Shared Lane Traffic (%)												
Lane Group Flow (vph)	460	404	0	28	487	114	37	836	0	231	743	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	Perm	NA		Prot	NA	
Protected Phases	1	6			2			4		3	8	

Lanes, Volumes, Timings  
4: 58th Ave. (SR 35) & SR 25

03/08/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				2		2	4					
Detector Phase	1	6		2	2	2	4	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	24.0		24.0	24.0	24.0	10.0	10.0		6.0	10.0	
Minimum Split (s)	13.9	31.9		31.9	31.9	31.9	25.0	25.0		13.0	25.0	
Total Split (s)	37.0	105.0		68.0	68.0	68.0	53.0	53.0		22.0	75.0	
Total Split (%)	20.6%	58.3%		37.8%	37.8%	37.8%	29.4%	29.4%		12.2%	41.7%	
Maximum Green (s)	29.1	97.1		60.1	60.1	60.1	46.0	46.0		15.0	68.0	
Yellow Time (s)	4.2	4.2		4.2	4.2	4.2	4.1	4.1		4.1	4.1	
All-Red Time (s)	3.7	3.7		3.7	3.7	3.7	2.9	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.9	7.9		7.9	7.9	7.9	7.0	7.0		7.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Recall Mode	None	Min		Min	Min	Min	Max	Max		None	None	
Act Effct Green (s)	27.1	86.3		51.2	51.2	51.2	46.3	46.3		14.6	67.9	
Actuated g/C Ratio	0.16	0.51		0.30	0.30	0.30	0.27	0.27		0.09	0.40	
v/c Ratio	0.86	0.44		0.10	0.90	0.21	0.25	0.89		0.78	0.57	
Control Delay	86.5	27.4		42.9	76.8	7.0	57.6	71.9		95.0	40.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	86.5	27.4		42.9	76.8	7.0	57.6	71.9		95.0	40.8	
LOS	F	C		D	E	A	E	E		F	D	
Approach Delay		58.9			62.7			71.3			53.7	
Approach LOS		E			E			E			D	

Intersection Summary






























Area Type:	Other
Cycle Length:	180
Actuated Cycle Length:	169.2
Natural Cycle:	115
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.90
Intersection Signal Delay:	61.3
Intersection LOS:	E
Intersection Capacity Utilization:	94.0%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 4: 58th Ave. (SR 35) & SR 25



HCM 6th Signalized Intersection Summary  
 4: 58th Ave. (SR 35) & SR 25

03/08/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 		 	 	 		 	 	
Traffic Volume (veh/h)	437	357	27	27	463	108	35	755	39	219	510	196
Future Volume (veh/h)	437	357	27	27	463	108	35	755	39	219	510	196
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1752	1826	1811	1856	1500	1841	1693	1870	1781	1722
Adj Flow Rate, veh/h	460	376	28	28	487	110	37	795	0	231	537	202
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
Percent Heavy Veh, %	5	5	10	5	6	3	27	4	14	2	8	12
Cap, veh/h	518	840	63	330	540	469	181	994		276	981	368
Arrive On Green	0.15	0.50	0.50	0.30	0.30	0.30	0.28	0.28	0.00	0.08	0.41	0.41
Sat Flow, veh/h	3374	1678	125	958	1811	1572	577	3589	0	3456	2409	903
Grp Volume(v), veh/h	460	0	404	28	487	110	37	795	0	231	377	362
Grp Sat Flow(s),veh/h/ln	1687	0	1803	958	1811	1572	577	1749	0	1728	1692	1619
Q Serve(g_s), s	21.6	0.0	23.3	3.4	41.8	8.5	8.5	34.1	0.0	10.7	27.5	27.7
Cycle Q Clear(g_c), s	21.6	0.0	23.3	3.4	41.8	8.5	16.2	34.1	0.0	10.7	27.5	27.7
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.00	1.00		0.56
Lane Grp Cap(c), veh/h	518	0	903	330	540	469	181	994		276	689	659
V/C Ratio(X)	0.89	0.00	0.45	0.08	0.90	0.23	0.20	0.80		0.84	0.55	0.55
Avail Cap(c_a), veh/h	606	0	1082	400	672	584	181	994		320	711	680
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	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.1	0.0	26.0	41.0	54.5	42.8	50.4	53.7	0.0	73.4	36.6	36.6
Incr Delay (d2), s/veh	14.3	0.0	0.5	0.2	14.2	0.4	2.5	6.7	0.0	16.8	1.1	1.2
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	10.3	0.0	10.2	0.8	21.1	3.4	1.4	15.8	0.0	5.4	11.6	11.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.4	0.0	26.5	41.2	68.7	43.2	53.0	60.4	0.0	90.2	37.7	37.8
LnGrp LOS	F	A	C	D	E	D	D	E		F	D	D
Approach Vol, veh/h		864			625			832			970	
Approach Delay, s/veh		55.7			63.0			60.1			50.2	
Approach LOS		E			E			E			D	
Timer - Assigned Phs	1	2	3	4	6	8						
Phs Duration (G+Y+Rc), s	32.8	56.2	19.9	53.0	89.0	72.9						
Change Period (Y+Rc), s	* 7.9	* 7.9	7.0	7.0	* 7.9	7.0						
Max Green Setting (Gmax), s	* 29	* 60	15.0	46.0	* 97	68.0						
Max Q Clear Time (g_c+I1), s	23.6	43.8	12.7	36.1	25.3	29.7						
Green Ext Time (p_c), s	1.2	4.5	0.3	4.9	4.1	7.8						

Intersection Summary

























HCM 6th Ctrl Delay	56.6
HCM 6th LOS	E

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	212	55	365	94	201	48	669	476	241	573	61
Future Volume (vph)	29	212	55	365	94	201	48	669	476	241	573	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	475		475	485		485	390		400	400		400
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1845	1509	1805	1900	1599	1626	3374	1553	1770	3374	1482
Flt Permitted	0.693			0.338			0.424			0.160		
Satd. Flow (perm)	1155	1845	1509	642	1900	1599	726	3374	1553	298	3374	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			232			212			501			179
Link Speed (mph)		30			30			50				30
Link Distance (ft)		828			917			1237				1406
Travel Time (s)		18.8			20.8			16.9				32.0
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 (%)	14%	3%	7%	0%	0%	1%	11%	7%	4%	2%	7%	9%
Adj. Flow (vph)	31	223	58	384	99	212	51	704	501	254	603	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	223	58	384	99	212	51	704	501	254	603	64
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	

Lanes, Volumes, Timings  
5: SE 92nd Loop & SE 110th St Rd.

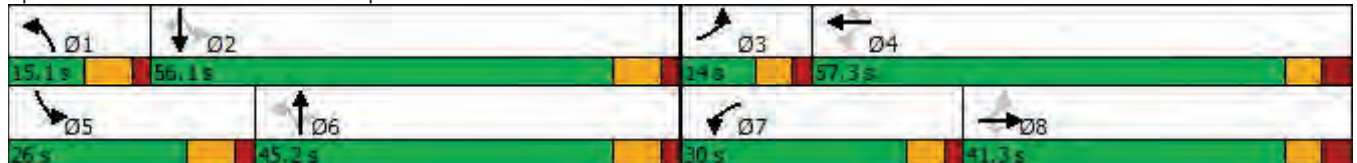
03/08/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	8		8	4		4	6		6	2		2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	16.0	16.0	8.0	16.0	16.0
Minimum Split (s)	14.0	41.3	41.3	14.0	41.3	41.3	15.1	31.1	31.1	15.1	31.1	31.1
Total Split (s)	14.0	41.3	41.3	30.0	57.3	57.3	15.1	45.2	45.2	26.0	56.1	56.1
Total Split (%)	9.8%	29.0%	29.0%	21.1%	40.2%	40.2%	10.6%	31.7%	31.7%	18.2%	39.4%	39.4%
Maximum Green (s)	8.0	34.0	34.0	24.0	50.0	50.0	8.0	38.1	38.1	18.9	49.0	49.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.1	5.1	5.1	5.1	5.1	5.1
All-Red Time (s)	2.0	3.3	3.3	2.0	3.3	3.3	2.0	2.0	2.0	2.0	2.0	2.0
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	0.0
Total Lost Time (s)	6.0	7.3	7.3	6.0	7.3	7.3	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	29.4	19.9	19.9	50.7	41.7	41.7	39.7	31.6	31.6	56.4	44.9	44.9
Actuated g/C Ratio	0.24	0.17	0.17	0.42	0.35	0.35	0.33	0.26	0.26	0.47	0.37	0.37
v/c Ratio	0.10	0.73	0.13	0.78	0.15	0.31	0.17	0.80	0.64	0.72	0.48	0.10
Control Delay	24.9	63.5	0.6	38.8	31.8	5.5	21.5	49.5	7.5	34.4	32.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	63.5	0.6	38.8	31.8	5.5	21.5	49.5	7.5	34.4	32.1	0.3
LOS	C	E	A	D	C	A	C	D	A	C	C	A
Approach Delay		48.0			27.7			31.6			30.5	
Approach LOS		D			C			C			C	

Intersection Summary

























Area Type: Other  
 Cycle Length: 142.5  
 Actuated Cycle Length: 120.4  
 Natural Cycle: 105  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 32.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 86.1%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 5: SE 92nd Loop & SE 110th St Rd.



HCM 6th Signalized Intersection Summary  
 5: SE 92nd Loop & SE 110th St Rd.

03/08/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	212	55	365	94	201	48	669	476	241	573	61
Future Volume (veh/h)	29	212	55	365	94	201	48	669	476	241	573	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1856	1796	1900	1900	1885	1737	1796	1841	1870	1796	1767
Adj Flow Rate, veh/h	31	223	39	384	99	212	51	704	423	254	603	44
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
Percent Heavy Veh, %	14	3	7	0	0	1	11	7	4	2	7	9
Cap, veh/h	275	270	222	446	561	472	321	1038	475	330	1239	544
Arrive On Green	0.04	0.15	0.15	0.19	0.30	0.30	0.06	0.30	0.30	0.12	0.36	0.36
Sat Flow, veh/h	1612	1856	1522	1810	1900	1598	1654	3413	1560	1781	3413	1497
Grp Volume(v), veh/h	31	223	39	384	99	212	51	704	423	254	603	44
Grp Sat Flow(s),veh/h/ln	1612	1856	1522	1810	1900	1598	1654	1706	1560	1781	1706	1497
Q Serve(g_s), s	1.8	13.3	2.6	19.7	4.4	12.3	2.3	20.6	29.5	10.7	15.6	2.2
Cycle Q Clear(g_c), s	1.8	13.3	2.6	19.7	4.4	12.3	2.3	20.6	29.5	10.7	15.6	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	275	270	222	446	561	472	321	1038	475	330	1239	544
V/C Ratio(X)	0.11	0.83	0.18	0.86	0.18	0.45	0.16	0.68	0.89	0.77	0.49	0.08
Avail Cap(c_a), veh/h	317	554	455	477	834	702	344	1142	522	421	1469	644
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	47.2	42.7	31.3	29.8	32.6	24.4	34.7	37.8	25.4	28.0	23.8
Incr Delay (d2), s/veh	0.2	6.3	0.4	14.1	0.1	0.7	0.2	1.4	16.4	6.5	0.3	0.1
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	0.7	6.6	1.0	10.2	2.0	4.8	0.9	8.3	13.3	5.0	6.4	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	53.6	43.0	45.4	30.0	33.3	24.6	36.2	54.2	31.9	28.3	23.9
LnGrp LOS	D	D	D	D	C	C	C	D	D	C	C	C
Approach Vol, veh/h		293			695			1178			901	
Approach Delay, s/veh		50.5			39.5			42.1			29.1	
Approach LOS		D			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	48.4	11.0	40.9	20.2	41.7	28.0	23.9				
Change Period (Y+Rc), s	7.1	7.1	6.0	* 7.3	7.1	7.1	6.0	* 7.3				
Max Green Setting (Gmax), s	8.0	49.0	8.0	* 50	18.9	38.1	24.0	* 34				
Max Q Clear Time (g_c+I1), s	4.3	17.6	3.8	14.3	12.7	31.5	21.7	15.3				
Green Ext Time (p_c), s	0.0	4.8	0.0	1.3	0.4	3.2	0.3	1.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			38.5									
HCM 6th LOS			D									
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	68	1136	947	42	49	33
Future Vol, veh/h	68	1136	947	42	49	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	7	3	2	2	2
Mvmt Flow	72	1196	997	44	52	35

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1041	0	-	0	1761 521
Stage 1	-	-	-	-	1019 -
Stage 2	-	-	-	-	742 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	664	-	-	-	76 500
Stage 1	-	-	-	-	309 -
Stage 2	-	-	-	-	432 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	664	-	-	-	68 500
Mov Cap-2 Maneuver	-	-	-	-	183 -
Stage 1	-	-	-	-	276 -
Stage 2	-	-	-	-	432 -

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	27.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	664	-	-	-	246
HCM Lane V/C Ratio	0.108	-	-	-	0.351
HCM Control Delay (s)	11.1	-	-	-	27.3
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	-	1.5



Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘		↘
Traffic Vol, veh/h	45	1140	942	56	0	33
Future Vol, veh/h	45	1140	942	56	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	200	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	47	1200	992	59	0	35

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1051	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	670	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	670	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	670	-	-	-	525
HCM Lane V/C Ratio	0.071	-	-	-	0.066
HCM Control Delay (s)	10.8	-	-	-	12.3
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2