

# SR 82 Multifamily

## Traffic Impact Statement

*City of Fort Myers, Florida*

October 2022

Kimley»Horn

# ***TRAFFIC IMPACT STATEMENT***

**SR 82 Multifamily**

**City of Fort Myers, FL**

***Prepared by:***

***Kimley-Horn and Associates, Inc.***

**October 2022**

## Table of Contents

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Study Area .....	1
<b>2.0</b>	<b>DEVELOPMENT TRAFFIC.....</b>	<b>4</b>
2.1	Trip Generation.....	4
2.2	Trip Distribution .....	5
2.3	Trip Assignment.....	5
<b>3.0</b>	<b>INTERSECTION OPERATIONAL ANALYSIS.....</b>	<b>8</b>
3.1	Existing Data .....	8
3.2	Existing Conditions .....	8
3.3	Background Conditions.....	10
3.4	Buildout Conditions.....	11
3.5	Buildout Ingress Turn Lane Analysis.....	16
<b>4.0</b>	<b>ROADWAY SEGMENT ANALYSIS .....</b>	<b>17</b>
4.1	Existing Conditions .....	17
4.2	Background Conditions.....	18
4.3	Buildout Conditions.....	19
<b>5.0</b>	<b>CONCLUSION.....</b>	<b>20</b>

## Figures

Figure 1: Project Location and Study Area .....	3
Figure 2: Project Trip Distribution .....	6
Figure 3: Project Trip Assignment.....	7
Figure 4: AM Peak Hour (2024) Intersection Volumes .....	14
Figure 5: PM Peak Hour (2024) Intersection Volumes.....	15

## Tables

Table 1: Study Area .....	2
Table 2: Trip Generation.....	4
Table 3: Existing (2021) Intersection Conditions Analysis (AM Peak Hour) .....	9
Table 4: Existing (2021) Intersection Conditions (PM Peak Hour).....	9
Table 5: Background (2024) Intersection Conditions (AM Peak Hour).....	11
Table 6: Background (2024) Intersection Conditions (PM Peak Hour).....	11
Table 7: Buildout (2024) Intersection Conditions (AM Peak Hour).....	13
Table 8: Buildout (2024) Intersection Conditions (PM Peak Hour) .....	13
Table 9: Turn Lane Assessment .....	16
Table 10: AM Peak Hour Existing (2021) Roadway Segment Analysis .....	17
Table 11: PM Peak Hour Existing (2021) Roadway Segment Analysis.....	17
Table 12: AM Peak Hour Background (2024) Roadway Segment Analysis.....	18
Table 13: PM Peak Hour Background (2024) Roadway Segment Analysis).....	18
Table 14: AM Peak Hour Buildout (2024) Roadway Segment Analysis .....	19
Table 15: PM Peak Hour Buildout (2024) Roadway Segment Analysis .....	19

## Appendices

Appendix A: Site Plan
Appendix B: Approved Methodology Statement
Appendix C: Model Distribution
Appendix D: Turning Movement Counts
Appendix E: FDOT's Florida Traffic Online (FTO) Data
Appendix F: Turning Movement Volume Worksheets
Appendix G: Signal Timings
Appendix H: Synchro Outputs

## 1.0 INTRODUCTION

Kimley-Horn has been retained to analyze and document the anticipated transportation impacts associated with the development of SR 82 Multifamily in the City of Fort Myers, Florida. The following traffic impact statement was performed to support access permits.

The ±21.42-acre project site is currently vacant and is located on the north side of SR 82, east of its intersection with Forum Boulevard in the City of Fort Myers. There are 3 single family homes on the northern portion of the project site. The proposed development consists of 340 apartment dwelling units. Construction is anticipated to begin in 2023, with a horizon year of 2024.

Access to the site will be provided via one (1) access point, as shown in the site plan provided in

### Appendix A:

- SR 82 and Project Driveway – Existing Directional Median Opening

## 1.1 STUDY AREA

The proposed development is expected to generate more than 100, but less than 300, trips during the peak hour, as described in the trip generation section of this traffic impact statement. Per the City of Fort Myer's *Land Development Code* Section 134.2.29, this qualifies the development as a Level II Site Development Plan. Because of this, the study area for the analysis will include all project driveways, external intersections and roadways abutting the development, and roadways significantly impacted by the development. Per the City Code, significant impact occurs when the peak hour, directional net new trips account for 10% or more of the road segment's level of service C service volume. All signalized and unsignalized intersections along the significantly impacted road segments should also be included in the study area.

The analysis to determine the significantly impacted segments can be found in **Table 1**. The following intersections and roadways will be included in the study area, as proposed in the approved methodology (**Appendix B**) and as shown in **Figure 1**:

### Intersections

- SR 82 and Forum Boulevard– Signalized
- SR 82 and Project Driveway

### Roadways

- SR 82 from Forum Boulevard to the Project Site
- SR 82 from the Project Site to Buckingham Road

**Table 1: Study Area Calculation**

Roadway From                      To		Roadway Attributes				AM Peak Hour Project Traffic			Max % Impact <sup>3</sup>	Include Segment In Area? <sup>4</sup>
		Functional Classification	Area Type	Number of Lanes	LOS C Volume <sup>1</sup>	% Assign <sup>2</sup>	NB / EB	SB / WB		
<b>SR 82</b>										
Ortiz Avenue	I-75	Principal Arterial	U	6D	2,940	31.0%	10	33	1.12%	NO
I-75	Forum Boulevard	Principal Arterial	U	6D	2,940	58.0%	18	62	2.11%	NO
Forum Boulevard	Project Site	Principal Arterial	U	6D	2,940	75.0%	23	80	2.72%	YES
Project Site	Buckingham Road	Principal Arterial	U	6D	2,940	25.0%	27	8	0.92%	YES
Buckingham Road	Lee Boulevard	Principal Arterial	U	6D	2,940	20.0%	21	6	0.71%	NO
<b>Forum Boulevard</b>										
SR 82	Colonial Boulevard	Urban Collector	U	4D	1,719	17.0%	5	18	1.05%	NO
<b>Buckingham Road</b>										
SR 82	Alvin Ave	Urban Collector	U	2U	747	5.0%	5	2	0.67%	NO
Alvin Ave	Gunnery Road	Urban Collector	U	2U	747	3.0%	3	1	0.40%	NO
<b>Lee Boulevard</b>										
SR 82	Gunnery Road	Urban Collector	U	6D	2,646	7.0%	7	2	0.26%	NO

**Notes:**

1. Level of Service C service volume was determined from the 2020 FDOT Quality/LOS Tables.
2. Percent project traffic assignment was calculated as the maximum across the segment.
3. Percent impact was calculated as the maximum PM peak hour directional project traffic divided by the directional service volume.
4. In accordance with City of Fort Myers guidelines, the minimum threshold for significance was at least 10% impact of the road segment's LOS C service volume. In addition, adjacent roadway links are included in the study area.





LEGEND




-  Project Location
-  Study Intersection
-  Project Access

Figure 1: Location Map

SR 82 Multifamily  
Traffic Impact Analysis  
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## 2.0 DEVELOPMENT TRAFFIC

The applicant is proposing to develop the existing, vacant ±21.42 acre site with 340 multifamily housing units with a horizon year of 2024. The latest industry standards were used to determine the number of new external trips to be generated by the site at buildout. The latest adopted regional travel demand model was used to forecast the distribution of trips throughout the study area.

### 2.1 TRIP GENERATION

The 11th Edition of the Institute of Transportation Engineers' (ITE) Trip Generation Manual was referenced for Land Use Code 221 (Multifamily Housing Mid-Rise).

**Table 2** provides the daily, AM peak hour, and PM peak hour trip generation summary for the project. As shown in the table, the proposed site is anticipated to generate 1,575 daily trips, 137 AM peak hour trips (31 inbound and 106 outbound), and 133 PM peak hour trips (81 inbound and 52 outbound).

**Table 2: Trip Generation**

Daily	Land Use	ITE LUC	Size	Units	ITE Trip Generation Equation	ITE Trip Rate <sup>1</sup>	Daily Trip Generation			
							Total	In <sup>1</sup>	Out <sup>1</sup>	
	Multifamily Housing (Mid-Rise)	221	340	DU	$T = 4.77 * X - 46.46$	4.63	1,575	50%	787	50% 788
	Total Generated Trips						1,575	787	788	
AM Peak Hour	Land Use	ITE LUC	Size	Units	ITE Trip Generation Equation	ITE Trip Rate <sup>1</sup>	AM Peak Hour Trip Generation			
							Total	In <sup>1</sup>	Out <sup>1</sup>	
	Multifamily Housing (Mid-Rise)	221	340	DU	$T = 0.44 * X - 11.61$	0.40	137	23%	31	77% 106
	Total Generated Trips						137	31	106	
PM Peak Hour	Land Use	ITE LUC	Size	Units	ITE Trip Generation Equation	ITE Trip Rate <sup>1</sup>	PM Peak Hour Trip Generation			
							Total	In <sup>1</sup>	Out <sup>1</sup>	
	Multifamily Housing (Mid-Rise)	221	340	DU	$T = 0.39 * X + 0.34$	0.39	133	61%	81	39% 52
	Total Generated Trips						133	81	52	

Notes: <sup>1</sup> Vehicle trip rates and directional splits per data and procedures outlined in ITE Trip Generation Manual, 11th Edition



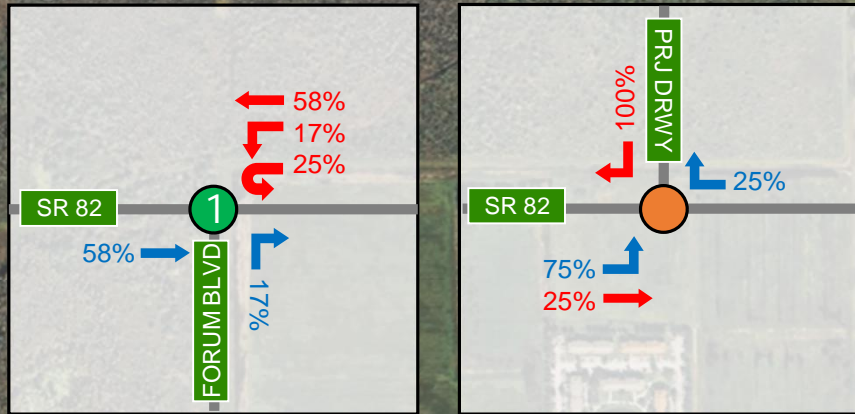
## 2.2 TRIP DISTRIBUTION

Projected traffic patterns on study area facilities were developed using the latest adopted regional travel demand model. Land use data for the project was entered into a new traffic analysis zone (TAZ) within the District 1 Regional Planning Model (D1RPM) v2.0 set and situated within the existing roadway network to appropriately represent project access. The model was used to assign trips for all trip purposes between allocated origin and destination pairs using project buildout year model data. Trip distribution for the project was extracted from the completed model assignment and reviewed for logic. The resulting model plot showing the percent of daily project distribution is provided in **Appendix C**.

Daily model project distribution was referenced to manually assign project distribution at the study area intersections in general accordance with daily model output. **Figure 2** shows the intersection movement project distribution within the local operational area for use in forecasting project trips.

## 2.3 TRIP ASSIGNMENT

Project trip distribution percentages were used to assign anticipated project trips to the study area roadways and intersections. **Figures 3** shows the anticipated peak hour project trip assignments at study area intersections during both the AM and PM peak hours.



58%

SR 82

1

FORUM BLVD

17%

25%

### LEGEND







-  Project Location
-  Study Intersection
-  Project Access
-  % Project Trips In
-  % Project Trips Out
-  Percent Project Distribution

Figure 2: Trip Distribution



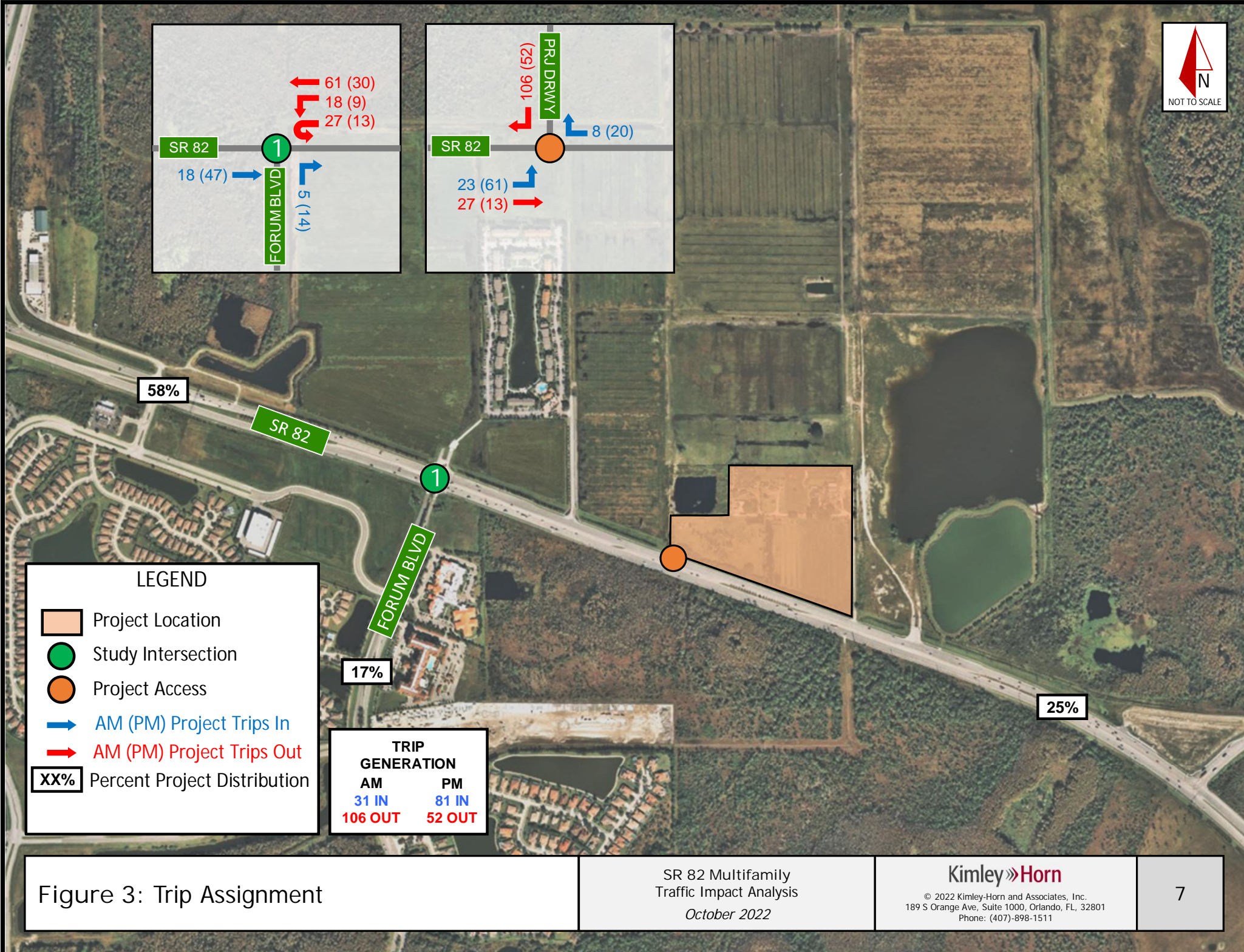


Figure 3: Trip Assignment

## 3.0 INTERSECTION OPERATIONAL ANALYSIS

### 3.1 EXISTING DATA

Turning movement counts (TMCs) were collected at the study intersections on Thursday, November 18, 2021 during the AM peak period (7:00 AM – 9:00 AM) and PM peak period (4:00 PM – 6:00 PM). The raw TMCs are provided in **Appendix D**. All traffic counts were adjusted to account for seasonal volumes using the SR 82 East of I-75 Peak Season Factor Category Report, provided by the Florida Department of Transportation (FDOT). The counts were collected during the peak season, so a conservative seasonal factor of 1.00 was applied to the field collected data. The seasonal factor data is included in **Appendix E**.

Adjusted turning movement volume worksheets for all intersections are provided in **Appendix F**. The signal timing for the existing signalized study intersection of SR 82 & Forum Boulevard was obtained from Lee County and is provided in **Appendix G**.

### 3.2 EXISTING CONDITIONS

An intersection operational analysis was performed for existing conditions during the AM and PM peak hours using procedures outlined in the *Highway Capacity Manual, 6<sup>th</sup> Edition* with Synchro (v11) software. Intersection level of service (LOS) and maximum volume to capacity (v/c) ratios for the AM and PM peak hour existing conditions are provided in **Tables 3 and 4**, respectively. Synchro outputs are provided in **Appendix H**.

As shown in **Tables 3 and 4**, the intersection of SR 82 & Forum Boulevard currently operates with an acceptable overall LOS under existing (2021) AM and PM peak hour conditions, with the exception of the northbound approach during both the AM and PM peak hour. This signal is a part of a coordinated corridor on SR 82 that gives green time prioritization for the major street, SR 82. Although the minor street approach operates with LOS F, it operates with manageable queues and v/c ratios less than one (1.0) during both the AM and PM peak hour.



**Table 3:** Existing (2021) Intersection Conditions Analysis (AM Peak Hour)

Existing Condition - 2021 - AM Peak Hour					
Intersection	Control Type	Approach	AM Peak Hour		
			Level of Service (overall delay)	Max V/C Movement	Max V/C Ratio
SR 82 & Forum Blvd	Signalized	EB	B	EBT	0.39
		WB	C	WBT	0.87
		NB	F	NBL	0.91
		SB	-	-	-
		<b>Overall</b>	<b>C (24.4 s)</b>	<b>NBL</b>	<b>0.91</b>

**Table 4:** Existing (2021) Intersection Conditions (PM Peak Hour)

Existing Condition - 2021 - PM Peak Hour					
Intersection	Control Type	Approach	PM Peak Hour		
			Level of Service (overall delay)	Max V/C Movement	Max V/C Ratio
SR 82 & Forum Blvd	Signalized	EB	C	EBT	0.85
		WB	B	WBL	0.39
		NB	F	NBR	0.91
		SB	-	-	-
		<b>Overall</b>	<b>C (29.3 s)</b>	<b>NBR</b>	<b>0.91</b>



### 3.3 BACKGROUND CONDITIONS

An intersection operational analysis was performed for background conditions during the AM and PM peak hours using procedures outlined in the *Highway Capacity Manual, 6<sup>th</sup> Edition* with Synchro (v11) software. The existing (2021) volumes were grown to Year 2024 background volumes by applying a growth rate of two percent (2%) over three (3) years. The volume development worksheets are provided in **Appendix F**.

Intersection level of service (LOS) and maximum volume to capacity (v/c) ratios for the AM and PM peak hour background conditions are provided in **Tables 5 and 6**, respectively. Synchro outputs are provided in **Appendix H**.

The study area intersection operates with acceptable overall LOS in background conditions. The minor street approach at the study intersection of SR 82 & Forum Boulevard continues to operate with LOS F due to the green time prioritization of the major street, SR 82. The minor street approach movements continue to operate with manageable queue lengths and v/c ratios less than one (1.0).

**Table 5:** Background (2024) Intersection Conditions (AM Peak Hour)

Background Condition - 2024					
Intersection	Control Type	Approach	AM Peak Hour		
			Level of Service (overall delay)	Max V/C Movement	Max V/C Ratio
SR 82 & Forum Blvd	Signalized	EB	B	EBT	0.42
		WB	C	WBT	0.93
		NB	F	NBL	0.92
		SB	-	-	-
		Overall	C (28.2 s)	WBT	0.93

**Table 6:** Background (2024) Intersection Conditions (PM Peak Hour)

Background Condition - 2024					
Intersection	Control Type	Approach	PM Peak Hour		
			Level of Service (overall delay)	Max V/C Movement	Max V/C Ratio
SR 82 & Forum Blvd	Signalized	EB	C	EBT	0.90
		WB	B	WBL	0.45
		NB	F	NBR	0.92
		SB	-	-	-
		Overall	C (31.6 s)	NBR	0.92

### 3.4 BUILDOUT CONDITIONS

Buildout volumes were developed by adding anticipated project trips to background volumes. A determination of the impact of project traffic on the study area intersections was made. Turning movement volume worksheets for all intersections and driveways are provided in **Appendix F**.

An intersection operational analysis was performed for Year 2024 buildout conditions during the AM and PM peak hours using procedures outlined in the *Highway Capacity Manual, 6<sup>th</sup> Edition* with Synchro (v11) software. Intersection level of service (LOS), delay and maximum volume to capacity (v/c) ratios for the AM and PM peak hour buildout conditions are provided in **Tables 7 and 8**, respectively. Synchro outputs are provided in **Appendix H**.

**Figures 4 and 5** illustrate turning movement buildout volumes at the study intersections for the AM and PM peak hours, respectively.

As shown in **Tables 7 and 8**, the intersection of SR 82 & Forum Boulevard continues to operate with an acceptable overall LOS under buildout (2024) AM and PM peak hour conditions, with the exception of the northbound approach. Although the minor street approach operates with high delay, it operates with manageable queues and v/c ratios less than one (1.0) during both the AM and PM peak hour.

During the AM peak hour, the southbound right movement at the Project Driveway on SR 82 operates with LOS F and a v/c ratio of 1.00. It is common for minor street approaches to operate with high delay on a high speed, major roadway corridor. Upon review of the volumes at this intersection, operations at this driveway are likely impacted by the heavy westbound through volumes at this intersection, as westbound SR 82 connects the residential districts to the east with I-75. The turning movement counts used in this analysis were collected during the peak season and a seasonal factor less than one (1.0) not applied, providing a conservative analysis and showing a worst-case-scenario for operations at the project driveway. The southbound right movement at this driveway operates with LOS B during the PM peak hour.

Therefore, no new operational deficiencies are anticipated as a result of project traffic.

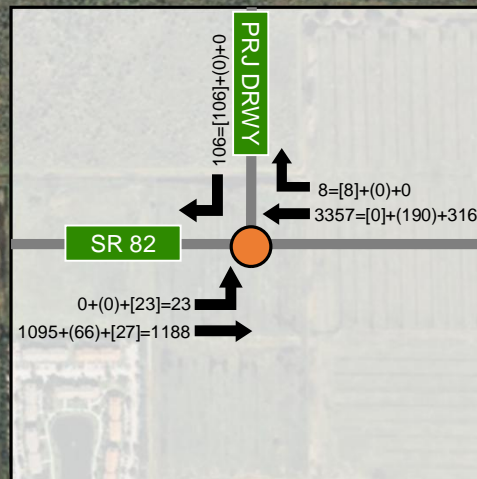
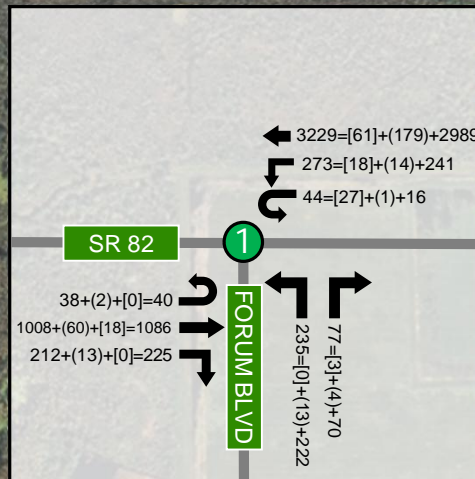
**Table 7:** Buildout (2024) Intersection Conditions (AM Peak Hour)

Buildout Condition - 2024					
Intersection	Control Type	Approach	AM Peak Hour		
			Level of Service (overall delay)	Max V/C Movement	Max V/C Ratio
SR 82 & Forum Blvd	Signalized	EB	B	EBT	0.43
		WB	C	WBT	0.95
		NB	F	NBL	0.92
		SB	-	-	-
		<b>Overall</b>	<b>C (30.5s)</b>	<b>WBT</b>	<b>0.95</b>
SR 82 & Project Driveway	TWSC	EB	E	EBL	0.18
		WB	-	-	-
		NB	-	-	-
		SB	F	SBR	1.00
		<b>Overall</b>	-	<b>SBR</b>	<b>1.00</b>

**Table 8:** Buildout (2024) Intersection Conditions (PM Peak Hour)

Buildout Condition - 2024					
Intersection	Control Type	Approach	PM Peak Hour		
			Level of Service (overall delay)	Max V/C Movement	Max V/C Ratio
SR 82 & Forum Blvd	Signalized	EB	C	EBT	0.92
		WB	A	WBL	0.57
		NB	F	NBR	0.93
		SB	-	-	-
		<b>Overall</b>	<b>C (30.0 s)</b>	<b>NBR</b>	<b>0.93</b>
SR 82 & Project Driveway	TWSC	EB	B	EBL	0.09
		WB	-	-	-
		NB	-	-	-
		SB	B	SBR	0.10
		<b>Overall</b>	-	<b>SBR</b>	<b>0.10</b>





SR 82

1

FORUM BLVD

### LEGEND

- Project Location
- AM Buildout (2024) Volumes
- Study Intersection
- Project Driveway

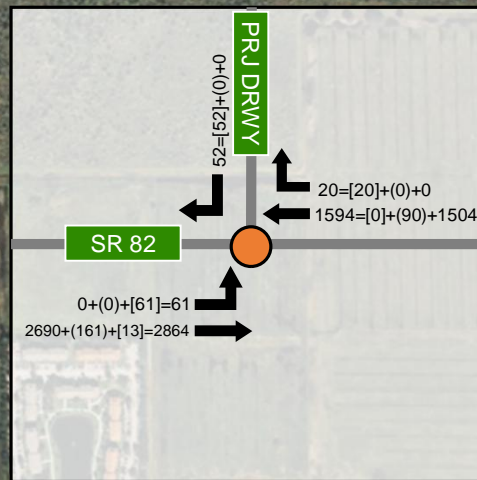
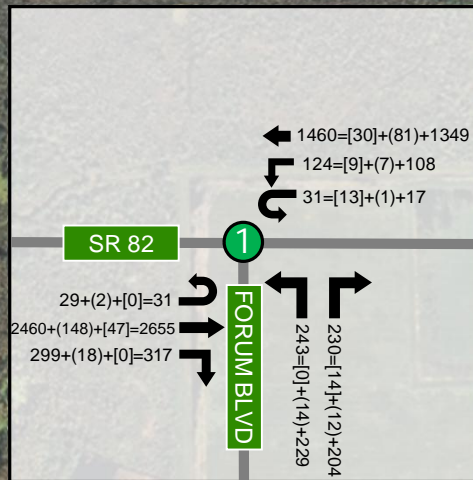
Buildout Total Traffic = [Project Traffic] + (Background Growth) + Existing

**Figure 4:** Buildout Intersection Volumes (2024) – AM Peak Hour

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SR 82

1

FORUM BLVD

### LEGEND

- Project Location
- PM Buildout (2024) Volumes
- Study Intersection
- Project Driveway

Buildout Total Traffic = [Project Traffic] + (Background Growth) + Existing

**Figure 4:** Buildout Intersection Volumes (2024) – PM Peak Hour

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### 3.5 BUILDOUT INGRESS TURN LANE ANALYSIS

The existing turn lane at the project driveway was evaluated to determine if sufficient length, including deceleration and storage, is provided to accommodate buildout project traffic. In addition, requirements from the City of Fort Myers Land Development Code were reviewed to determine if an ingress right-turn lane is warranted at the project driveway.

The total turn lane length is required to accommodate the minimum deceleration required in the 2021 FDOT Design Manual, Exhibit 212-1 and the expected 95<sup>th</sup> percentile queue as calculated using Synchro 11.

A summary of the queue length evaluation is provided in **Table 9** and shows that the existing eastbound left-turn lane at the project driveway on SR 82 is sufficient to accommodate project traffic upon buildout of the proposed development.

**Table 9: Turn Lane Assessment**

Intersection	Existing Total Turn Lane Length (Ft)	Required Deceleration (Ft) <sup>1</sup>	95th Percentile Queue Length (Ft) <sup>2</sup>	Required Total Turn Lane Length (Ft)	Existing Storage Length Sufficient? (Y/N) <sup>3</sup>
<b>SR 82 &amp; Project Driveway</b> Eastbound Left-Turn Lane	325	240	25	265	Y
Notes: 1. Based on the 2022 FDOT Design Manual. 2. Based on the 95th percentile back of queue length as reported in Synchro 11. Queue lengths were rounded up to the nearest 25 ft to accommodate for the average length of one vehicle. 3. The existing storage length was determined to be sufficient if the turn lane could accommodate the addition of the required deceleration length and 95th percentile queue length.					

In addition, the requirements from the City of Fort Myers Land Development Code were reviewed to determine if an ingress right-turn lane is warranted at the project driveway. Per Section 134.5.3 of the City of Fort Myers Code, turn lanes should be provided on state-maintained facilities in accordance with FDOT policies and standards. Per the FDOT Access Management Guidebook, on a roadway with a posted speed limit greater than 45 MPH (speed limit of SR 82 is 50 MPH), more than 35 right turns during the peak hour warrants a right-turn lane.

As shown in **Figures 4 and 5**, 8 vehicles during the AM peak hour and 20 vehicles during the PM peak hour are anticipated to complete the westbound right movement at the project driveway. Therefore, an ingress right-turn lane at the project driveway is not warranted.



## 4.0 ROADWAY SEGMENT ANALYSIS

### 4.1 EXISTING CONDITIONS

A roadway segment analysis was performed within the study area to determine existing AM and PM peak hour conditions. Existing volumes for the segment analysis were determined as the maximum, peak hour directional volume along the segment, as determined from the peak season adjusted turning movement count data from November 2021. This existing volume was then compared to the Maximum Service Volumes (MSV), determined from the City of Fort Myers Comprehensive Plan and the 2020 FDOT Quality/LOS Handbook.

The existing AM and PM peak hour roadway segment data is included in **Tables 10 and 11** for daily roadway segment conditions. As shown in the table, the analysis identifies the following existing roadway segment capacity deficiencies:

- SR 82 from Forum Boulevard to the Project Site – AM Peak Hour
- SR 82 from the Project Site to Buckingham Road – AM Peak Hour

**Table 10: AM Peak Hour Existing (2021) Roadway Segment Analysis**

Roadway  FromTo		Roadway Attributes <sup>1</sup>			Peak Hour Directional Maximum Service Volume <sup>2</sup>	Existing Peak Season Traffic Conditions				
		Area Type	Number of Lanes	Adopted LOS Standard		Volumes <sup>3</sup>		Maximum V/C Ratio	Level of Service	
						NB / EB	SB / WB			
SR 82	Forum Blvd	Project Site	U	6D	D	3,020	1,079	3,246	1.07	F
	Project Site	Buckingham Rd	U	6D	D	3,020	1,079	3,246	1.07	F

Note:

1. The roadway attributes were obtained from the City of Fort Myers Comprehensive Plan.
2. The peak hour directional service capacity was obtained from the City of Fort Myers Comprehensive Plan and the 2020 FDOT Quality/LOS Handbook.
3. Existing peak season traffic volumes are based on existing turning movement count data collected in November 2021.

**Table 11: PM Peak Hour Existing (2021) Roadway Segment Analysis**

Roadway  FromTo		Roadway Attributes <sup>1</sup>			Peak Hour Directional Maximum Service Volume <sup>2</sup>	Existing Peak Season Traffic Conditions				
		Area Type	Number of Lanes	Adopted LOS Standard		Volumes <sup>3</sup>		Maximum V/C Ratio	Level of Service	
						NB / EB	SB / WB			
SR 82										
	Forum Blvd	Project Site	U	6D	D	3,020	2,665	1,474	0.88	C
	Project Site	Buckingham Rd	U	6D	D	3,020	2,665	1,474	0.88	C

Note:

1. The roadway attributes were obtained from the City of Fort Myers Comprehensive Plan.
2. The peak hour directional service capacity was obtained from the City of Fort Myers Comprehensive Plan and the 2020 FDOT Quality/LOS Handbook.
3. Existing peak season traffic volumes are based on existing turning movement count data collected in November 2021.

## 4.2 BACKGROUND CONDITIONS

A roadway segment analysis was performed within the study area to determine background daily conditions. The existing (2021) PHPD volumes were grown to background (2024) volumes by applying an annual growth rate of 2.00% over three (3) years. This projected background volume was then compared to the PHPD Maximum Service Volumes (MSV) for the respective roadway segment.

The background (2024) roadway segment data is included in **Tables 12 and 13** for peak hour, peak direction roadway segment conditions. As shown in the table, the analysis identifies no additional roadway segment capacity deficiencies.

**Table 12: AM Peak Hour Background (2024) Roadway Segment Analysis**

Roadway  FromTo		Peak Hour Directional Maximum Service Volume <sup>1</sup>	Existing Peak Season Traffic Conditions		Applied Growth Rate <sup>3</sup>	Future Background Traffic			
			Volumes <sup>2</sup>			Volumes <sup>4</sup>		Maximum V/C Ratio	Level of Service
						NB / EB	SB / WB		
SR 82									
Forum Blvd	Project Site	3,020	1,079	3,246	2.00%	1,144	3,441	1.14	F
Project Site	Buckingham Rd	3,020	1,079	3,246	2.00%	1,144	3,441	1.14	F

Note:

1. The peak hour directional service capacity was obtained from the City of Fort Myers Comprehensive Plan and the 2020 FDOT Quality/LOS Handbook.
2. Existing peak season traffic volumes are based on existing turning movement count data collected in November 2021.
3. Use of the FDOT Traffic Trend Analysis tool resulted in a low growth rate; therefore, a conservative 2.00% growth rate was applied.
4. Future background traffic volumes are the summation of the existing peak season volumes and background growth.

**Table 13: PM Peak Hour Background (2024) Roadway Segment Analysis**

Roadway  FromTo		Peak Hour Directional Maximum Service Volume <sup>1</sup>	Existing Peak Season Traffic Conditions		Applied Growth Rate <sup>3</sup>	Future Background Traffic				
			Volumes <sup>2</sup>			Volumes <sup>4</sup>		Maximum V/C Ratio	Level of Service	
						NB / EB	SB / WB			NB / EB
SR 82										
	Forum Blvd	Project Site	3,020	2,665	1,474	2.00%	2,825	1,562	0.94	C
	Project Site	Buckingham Rd	3,020	2,665	1,474	2.00%	2,825	1,562	0.94	C

Note:

1. The peak hour directional service capacity was obtained from the City of Fort Myers Comprehensive Plan and the 2020 FDOT Quality/LOS Handbook.
2. Existing peak season traffic volumes are based on existing turning movement count data collected in November 2021.
3. Use of the FDOT Traffic Trend Analysis tool resulted in a low growth rate; therefore, a conservative 2.00% growth rate was applied.
4. Future background traffic volumes are the summation of the existing peak season volumes and background growth.

## 4.3 BUILDOUT CONDITIONS

A roadway segment analysis was performed within the study area to determine buildout daily conditions. The AM and PM peak hour analysis was conducted by comparing the projected Year 2024 buildout AM and PM peak hour segment volumes to the Maximum Service Volumes (MSV) for each roadway segment.

The buildout roadway segment data is included in **Tables 14 and 15** for AM and PM roadway segment conditions, respectively. As shown in the table, study segment roadways are anticipated to continue to operate similar to background conditions with the addition of project trips (buildout conditions). No roadway segment deficiencies were identified as a result of project traffic.

**Table 14: AM Peak Hour Buildout (2024) Roadway Segment Analysis**

Roadway FromTo		Peak Hour Directional Maximum Service Volume <sup>1</sup>	Future Background Traffic		AM Peak Hour Project Traffic			2024 Buildout AM Peak Hour Traffic Conditions				
			Volumes <sup>2</sup>					Volumes <sup>4</sup>		Maximum V/C Ratio	Level of Service	
			NB / EB	SB / WB	% Assign <sup>3</sup>	NB / EB	SB / WB	NB / EB	SB / WB			
SR 82	Forum Blvd	Project Site	3,020	1,144	3,441	100%	31	106	1,175	3,547	1.17	F
	Project Site	Buckingham Rd	3,020	1,144	3,441	25%	27	8	1,171	3,449	1.14	F

Note:

1. The peak hour directional service capacity was obtained from the City of Fort Myers Comprehensive Plan and the 2020 FDOT Quality/LOS Handbook.
2. Future background traffic volumes are the summation of the existing peak season volumes and background growth.
3. The percent project traffic is the maximum across the roadway segment
4. Buildout project traffic volumes are the summation of future background traffic and project traffic.

**Table 15: PM Peak Hour Buildout (2024) Roadway Segment Analysis**

Roadway FromTo		Peak Hour Directional Maximum Service Volume <sup>1</sup>	Future Background Traffic		PM Peak Hour Project Traffic			2024 Buildout PM Peak Hour Traffic Conditions				
			Volumes <sup>2</sup>					Volumes <sup>4</sup>		Maximum V/C Ratio	Level of Service	
			NB / EB	SB / WB	% Assign <sup>3</sup>	NB / EB	SB / WB	NB / EB	SB / WB			
SR 82	Forum Blvd	Project Site	3,020	2,825	1,562	100%	81	52	2,906	1,614	0.96	C
	Project Site	Buckingham Rd	3,020	2,825	1,562	25%	13	20	2,838	1,582	0.94	C

Note:

1. The peak hour directional service capacity was obtained from the City of Fort Myers Comprehensive Plan and the 2020 FDOT Quality/LOS Handbook.
2. Future background traffic volumes are the summation of the existing peak season volumes and background growth.
3. The percent project traffic is the maximum across the roadway segment
4. Buildout project traffic volumes are the summation of future background traffic and project traffic.



## 5.0 CONCLUSION

Kimley-Horn has been retained to analyze and document the anticipated operations associated with the development of SR 82 Multifamily in the City of Fort Myers, Florida. The ±21.42-acre project site is currently vacant and is located on the north side of SR 82, east of its intersection with Forum Boulevard in the City of Fort Myers. The proposed development consists of 340 apartment dwelling units. Construction is anticipated to begin in 2023, with a horizon year of 2024. Access to the site will be provided via one (1) access point on SR 82.

The proposed development is anticipated to generate 1,575 new daily trips, 137 new trips during the AM peak hour (31 in, 106 out) and 133 new trips during the PM peak hour (81 in, 52 out) based on the latest ITE Trip Generation Manual. Project trips were distributed onto the surrounding roadway network using the latest adopted regional travel demand model and manual assignment at the study area intersections.

An operational analysis for existing, background, and buildout conditions was performed at intersections within the study area during the AM and PM Peak Hour. The minor street approach at the intersection of SR 82 & Forum Boulevard operates with high delay but with manageable queues and v/c ratios less than one (1.0) during both the AM and PM peak hour. During the AM peak hour, the southbound right movement at the Project Driveway on SR 82 operates with LOS F. It is common for minor street approaches to operate with high delay on a major roadway corridor. The southbound right movement at this driveway operates with LOS B during the PM peak hour. No new operational deficiencies were identified at the study area intersections as a result of project traffic.

A roadway segment capacity analysis was performed for the roadway segments in the study area for existing, background, and buildout conditions during both the AM and PM peak hour. The following existing roadway segment capacity deficiencies were identified:

- SR 82 from Forum Boulevard to the Project Site – AM Peak Hour
- SR 82 from the Project Site to Buckingham Road – AM Peak Hour

No roadway segment deficiencies were identified as a result of project traffic.

The existing turn lanes at the study intersections were evaluated to determine if sufficient length, including deceleration and storage, is provided to accommodate buildout project traffic. The existing eastbound left-turn lane at the project driveway on SR 82 is sufficient in length to accommodate project traffic upon buildout of the proposed development. In addition, the need for an ingress westbound right-turn lane at the project driveway was determined using the City of Fort Myers Land Development Code and FDOT guidelines. From these guidelines, an ingress right-turn lane at the project driveway is not warranted.

# **APPENDIX A**

## Site Plan





## **APPENDIX B**

### Approved Methodology Statement

## MEMORANDUM

To: Carl Karakos  
Transportation Engineer, City of Fort Myers

From: James Taylor, P.E.  
Kimley-Horn & Associates, Inc.

Date: April 22, 2022

Subject: SR 82 Multifamily  
Traffic Impact Statement (TIS) Methodology

---

### Purpose

The purpose of this memorandum is to document assumptions and methodology to be used in a forthcoming Traffic Impact Statement (TIS) for the above-referenced project. The TIS, which is being conducted to accompany applicable permit applications for the project, will generally conform to the methodology herein and the policies established in the City of Fort Myer's *Land Development Code* Section 134.2.29 – Traffic Impact Statement Guidelines.

The ±21.42-acre project site is currently vacant and is located on the north side of SR 82, east of its intersection with Forum Boulevard in the City of Fort Myers. There are 3 single family homes on the northern portion of the project site. The proposed development consists of 350 apartment dwelling units. A conceptual site plan is included in **Attachment A**. Construction is anticipated to begin in 2023.



## Study Area

The proposed development is expected to generate more than 100 and less than 300 trips during the peak hour, as described in the trip generation section of this memorandum. Per the City of Fort Myer's *Land Development Code* Section 134.2.29 this qualifies the development as a Level II Site Development Plan. Because of this, the study area for the analysis will include all project driveways, external intersections and roadways abutting the development, and roadways significantly impacted by the development. Per the City Code, significant impact occurs when the peak hour, directional net new trips account for 10% or more of the road segment's level of service C service volume.

The analysis to determine the significantly impacted segments can be found in **Table 1**. The following intersections and roadways will be included in the study area, as shown in **Figure 1**:

### Intersections

- SR 82 and Forum Boulevard– Signalized
- SR 82 and Existing, Vacant Full Access Opening– Signalization Planned
- SR 82 and Project Driveway– Directional Median Opening

### Roadways

- SR 82 from Forum Boulevard to the Project Site
- SR 82 from the Project Site to Buckingham Road

**Table 1: Significant Impact Calculation**

Roadway From To		Roadway Attributes				AM Peak Hour Project Traffic			Max % Impact <sup>3</sup>	Include Segment In Area? <sup>4</sup>
		Functional Classification	Area Type	Number of Lanes	LOS C Volume <sup>1</sup>	% Assign <sup>2</sup>	NB / EB	SB / WB		
SR 82										
Ortiz Avenue	I-75	Principal Arterial	U	6D	2,940	31.0%	10	34	1.16%	NO
I-75	Forum Boulevard	Principal Arterial	U	6D	2,940	58.0%	19	64	2.18%	NO
Forum Boulevard	Project Site	Principal Arterial	U	6D	2,940	75.0%	24	83	2.82%	YES
Project Site	Buckingham Road	Principal Arterial	U	6D	2,940	25.0%	28	8	0.95%	YES
Buckingham Road	Lee Boulevard	Principal Arterial	U	6D	2,940	20.0%	22	6	0.75%	NO
Forum Boulevard										
SR 82	Colonial Boulevard	Urban Collector	U	4D	1,719	17.0%	5	19	1.11%	NO
Buckingham Road										
SR 82	Alvin Ave	Urban Collector	U	2U	747	5.0%	6	2	0.80%	NO
Alvin Ave	Gunnery Road	Urban Collector	U	2U	747	3.0%	3	1	0.40%	NO
Lee Boulevard										
SR 82	Gunnery Road	Urban Collector	U	6D	2,646	7.0%	8	2	0.30%	NO

**Notes:**

1. Level of Service C service volume was determined from the 2020 FDOT Quality/LOS Tables.

2. Percent project traffic assignment was calculated as the maximum across the segment.

3. Percent impact was calculated as the maximum PM peak hour directional project traffic divided by the directional service volume.

4. In accordance with City of Fort Myers guidelines, the minimum threshold for significance was at least 10% impact of the road segment's LOS C service volume. In addition, adjacent roadway links are included in the study area.



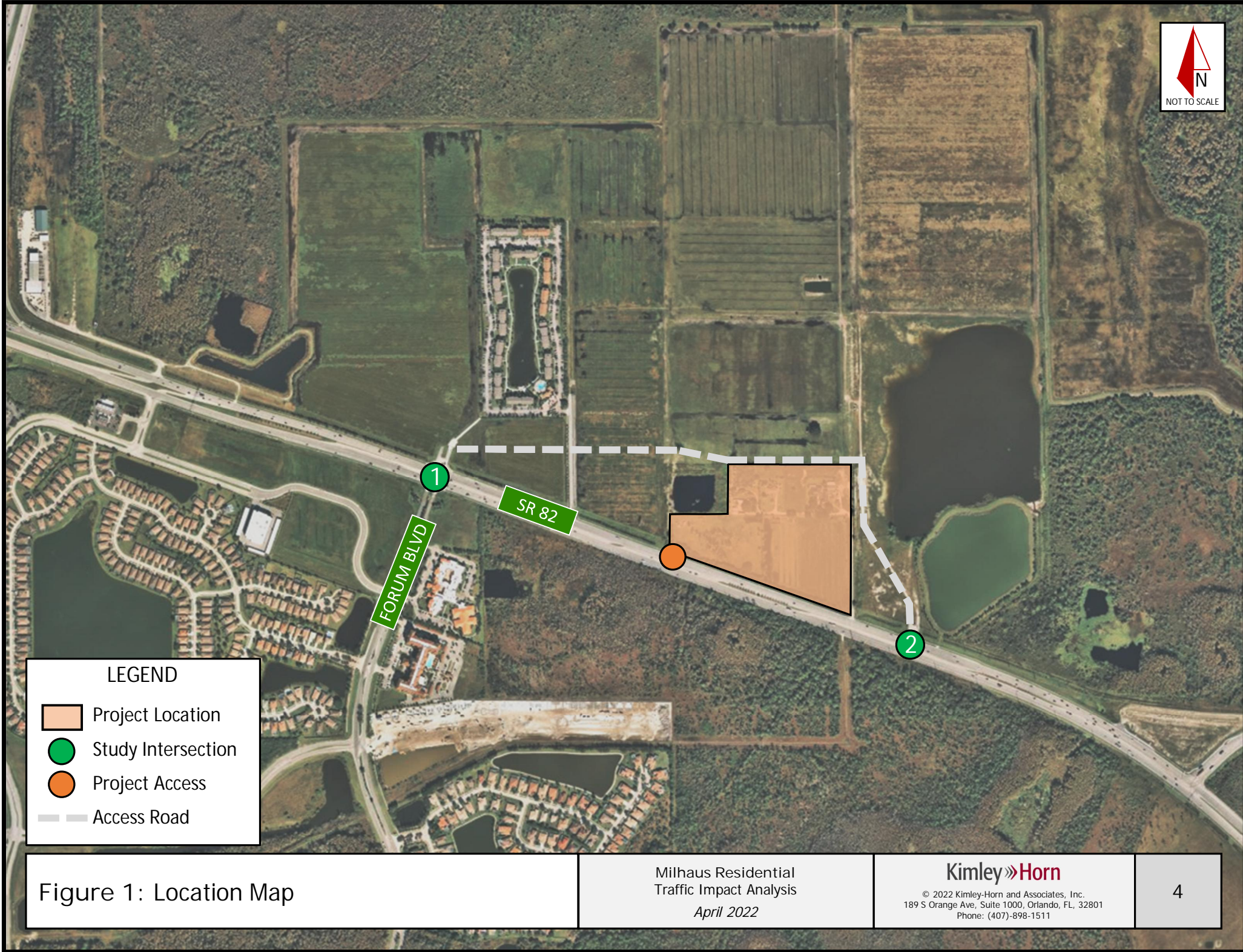


Figure 1: Location Map



## Data Collection

Per the City of Fort Myers *Requirements for Detailed Traffic Impact Analysis*, all data must be field collected. Therefore, AM (7:00–9:00 AM) and PM (4:00–6:00 PM) peak period turning movement counts will be collected at existing study area intersections for the intersection analysis. All traffic counts will be adjusted to account for seasonal volumes using the SR 82 East of I-75 Peak Season Factor Category Report, provided by the Florida Department of Transportation (FDOT). This report is included in **Attachment B**. The date the traffic counts are collected will determine the specific seasonal factor. This adjusted data will also be used to determine the peak hour, peak direction (PHPD) traffic volume for the roadway segment analysis.

## Trip Generation

For the proposed multifamily development, 11<sup>th</sup> Edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* was reviewed for available Land Use Code (LUC) that may coincide with the proposed use. LUC 221, Multifamily Housing (Mid-Rise) was used.

The Daily, AM, and PM peak hour trip generation summary for the project is shown in **Table 2**. As shown in the table, the development is anticipated to generate 1,623 new daily trips, 142 new trips during the AM peak hour (32 in, 110 out) and 137 new trips during the PM peak hour (83 in, 54 out).

**Table 2: Trip Generation Summary**

Daily	Land Use	ITE LUC	Size	Units	ITE Trip Rate <sup>1</sup>	Daily Trip Generation			
						Total	In <sup>1</sup>	Out <sup>1</sup>	
	Multifamily Housing (Mid-Rise)	221	350	DU	4.64	1,623	50%	811	50% 812
	Total Generated Trips					1,623	811	812	
AM Peak Hour	Land Use	ITE LUC	Size	Units	ITE Trip Rate <sup>1</sup>	AM Peak Hour Trip Generation			
						Total	In <sup>1</sup>	Out <sup>1</sup>	
	Multifamily Housing (Mid-Rise)	221	350	DU	0.41	142	23%	32	77% 110
	Total Generated Trips					142	32	110	
PM Peak Hour	Land Use	ITE LUC	Size	Units	ITE Trip Rate <sup>1</sup>	PM Peak Hour Trip Generation			
						Total	In <sup>1</sup>	Out <sup>1</sup>	
	Multifamily Housing (Mid-Rise)	221	350	DU	0.39	137	61%	83	39% 54
	Total Generated Trips					137	83	54	

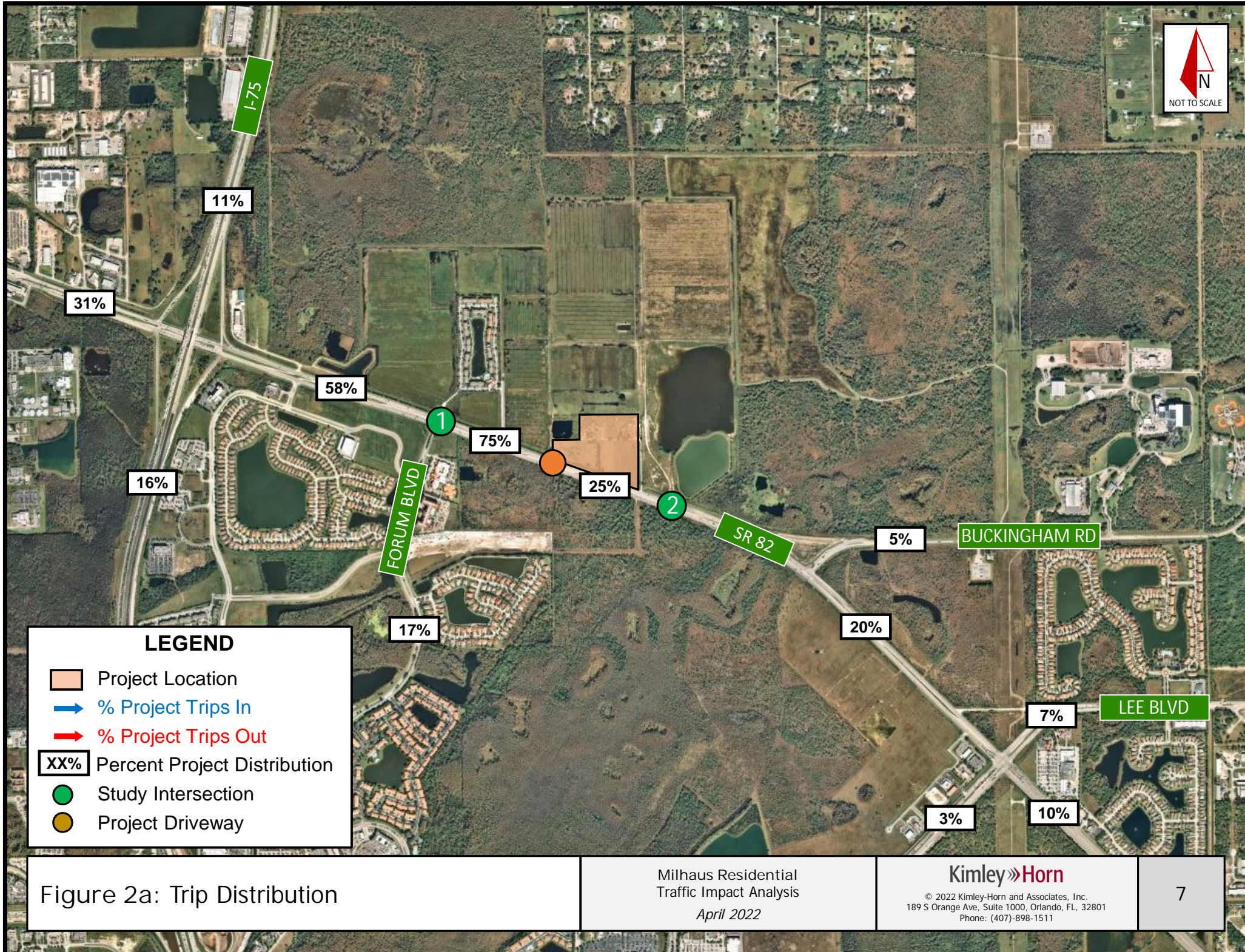
Notes: <sup>1</sup> Vehicle trip rates and directional splits per data and procedures outlined in ITE Trip Generation Manual, 11th Edition

### **Trip Distribution**

The distribution of project traffic was performed using the Florida Standard Urban Transportation Model Structure (FSUTMS). Land use data for the project was entered into a new traffic analysis zone (TAZ) within the FDOT District One Regional Planning Model (D1RPM) set and situated within the existing roadway network to appropriately represent project access. The resulting model outputs showing the distribution, as a percent, of daily project trips are provided in **Attachment C**.

**Figure 2** displays the anticipated general trip distribution in the study area. The project trips will be manually distributed and assigned at study area intersections and driveways as part of the Traffic Impact Statement.







### **Background Growth Rate**

Background traffic volumes will be forecasted to the study horizon year (2024) for the proposed development by applying an annual growth rate to existing count data. The compounded annual growth was calculated using FDOT's Traffic Trend Analysis Tool and annual traffic count data from the Lee County Traffic Count Database System and resulted in a low growth rate. Because of this, a conservative 2% growth rate was applied to determine volumes for the buildout year. **Attachment D** provides the growth trend calculation worksheet.

Committed trips from the adjacent industrial development, Project Rainforest, will be included in the background traffic volumes forecast.

### **Operational Analysis**

Operational analyses will be conducted for the AM and PM peak hours at the study intersections. Intersection analyses will be performed using procedures outlined in the Highway Capacity Manual 6<sup>th</sup> Edition with Synchro (v11) software.

Operational analyses will be conducted for existing (2022), background (2024), and buildout (2024) conditions. AM and PM peak hour existing traffic volumes will be obtained using the adjusted intersection turning movement count data. Background traffic volumes will be derived by applying the annual growth rate to the existing traffic volumes and adding vested trips. Buildout traffic conditions will be developed by adding anticipated project trips to the background volumes. If intersection deficiencies are identified, strategies and improvements will be developed as mitigation measures.

### **Roadway Segment Analysis**

A roadway segment analysis will be conducted for the roadways within the study area. These roadways will be evaluated to determine the LOS and capacity based on existing (2022), background (2024), and buildout (2024) conditions for the AM and PM peak hour, peak direction. Roadway segment volumes will be developed for the three scenarios using the same procedure as outline above.

### **Turn Lane Analysis**

Based on the Lee County *Traffic Impact Statement Guidelines for Development Orders*, an analysis to determine if turn lanes, traffic signals, or other site related improvements will be required at the project's access points. Turn lanes, if warranted, shall include and enhance turning, acceleration, deceleration and/or storage movements of vehicles as required by Lee County Land Development Code (LDC) and/or the Lee County Turn Lane Policy (Administrative Code 11-4).

### **Documentation**

All analyses and findings will be documented in a report to be provided to the City of Fort Myers for review.

Shellenberger, Erika

---

From: Carl Karakos <ckarakos@cityftmyers.com>  
Sent: Wednesday, May 4, 2022 10:15 AM  
To: Shellenberger, Erika  
Cc: Taylor, James; William L. Porter; Nicole Monahan  
Subject: RE: SR 82 MF TIS Methodology  
Attachments: SR 82 MF\_TIS Methodology\_04.22.pdf

Good morning Erika,

I reviewed your proposed methodology and I take no exception to the proposed approach.

Please keep in mind that SR 82 is an FDOT maintained roadway. As such, FDOT will also need to be included in this review based on traffic impacts to their roadway. Please also understand that no official review correspondence relating to this SIT application can be communicated other than through our site permitting program (ENERGOV).

Thank you,

*Carl Karakos*

Transportation Engineer

City of Fort Myers

Public Works/Engineering Division

2200 Second Street, Fort Myers, FL 33901

Office: 239-321-7458

Mobile: 239-771-0483

Fax: 239-344-5943

[ckarakos@cityftmyers.com](mailto:ckarakos@cityftmyers.com)

[www.cityftmyers.com](http://www.cityftmyers.com)



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From: Shellenberger, Erika <Erika.Shellenberger@kimley-horn.com>

Sent: Tuesday, May 3, 2022 5:30:47 PM

To: Carl Karakos <ckarakos@cityftmyers.com>

Cc: Taylor, James <James.Taylor@kimley-horn.com>

Subject: SR 82 MF TIS Methodology

You don't often get email from erika.shellenberger@kimley-horn.com. [Learn why this is important](#)

This email came from outside of the City of Fort Myers, please be cautious opening attachments or clicking on links.

Good afternoon Carl,

For your review, please find attached the TIS methodology for a proposed multifamily development to be located on the north side of SR 82, east of its intersection with Forum Boulevard.

Please let me know if this TIA methodology is sufficient and if you have any questions.

Thank you!

**Erika Shellenberger, E.I.**

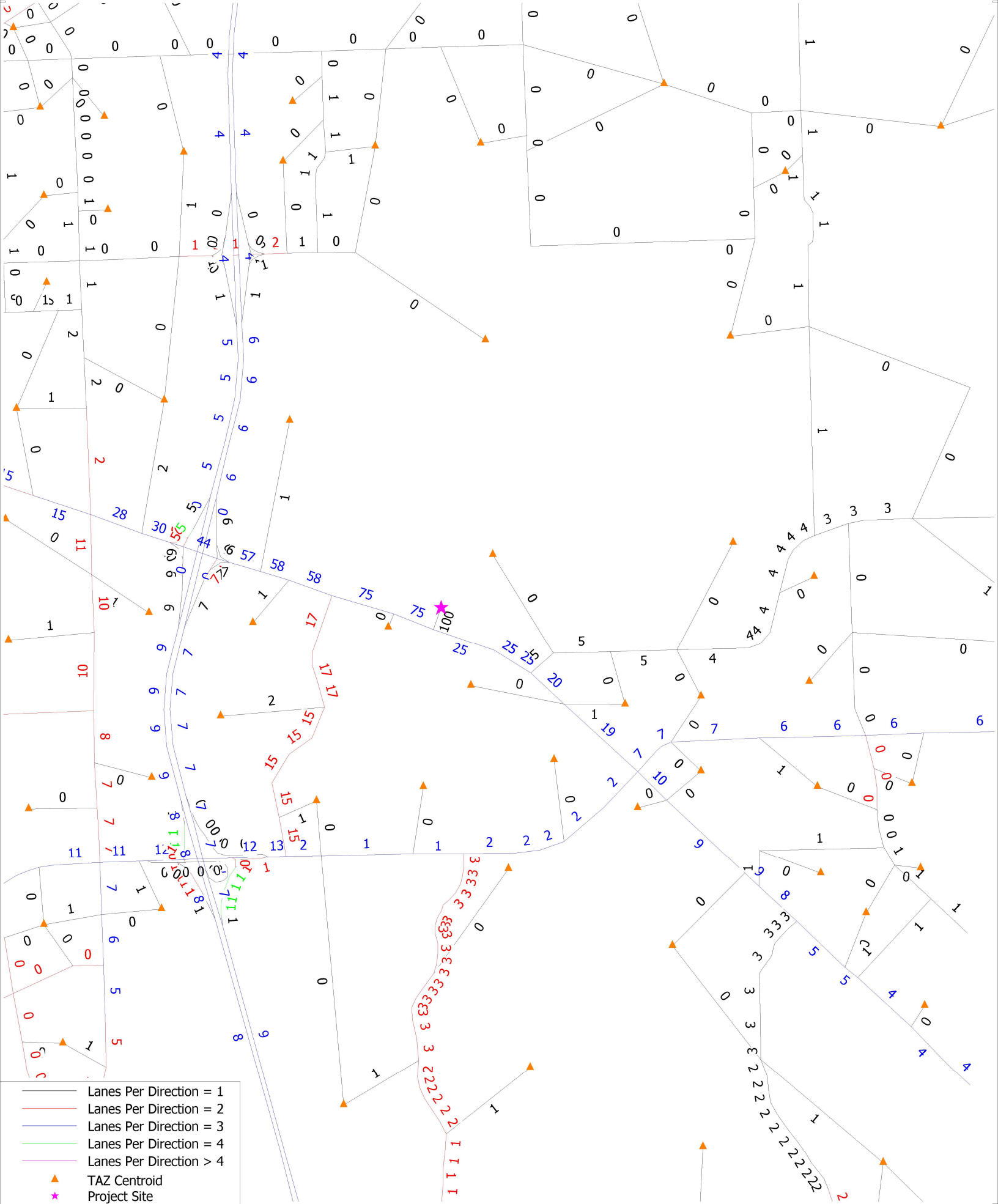
**Kimley-Horn** | 189 S. Orange Ave. Suite 1000, Orlando, FL 32801

Direct: 689 206 9002 | Mobile: 317 549 5337



## **APPENDIX C**

### D1RPM Model Plot



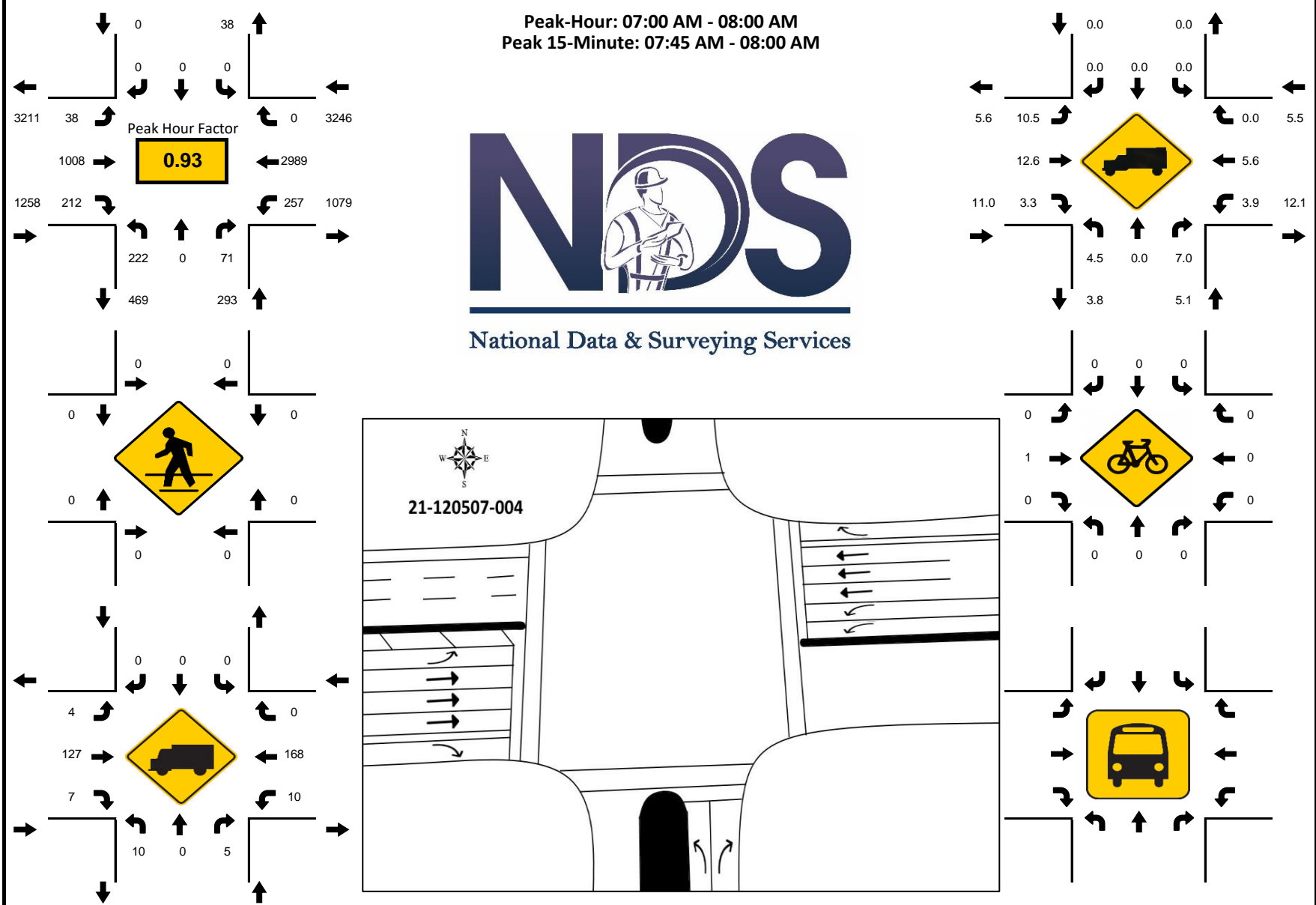
Trip Distribution - SR82 Multifamily - City of Fort Myers  
D1RPMV2 - 2022

C:\FSUTMS\D1\D1RPM\_v2.0\D1RPMv2.0\_1-29-21\YR2015\YR2023EC\SR82MF\_23\HWYLOAD\_23A.NET

## **APPENDIX D**

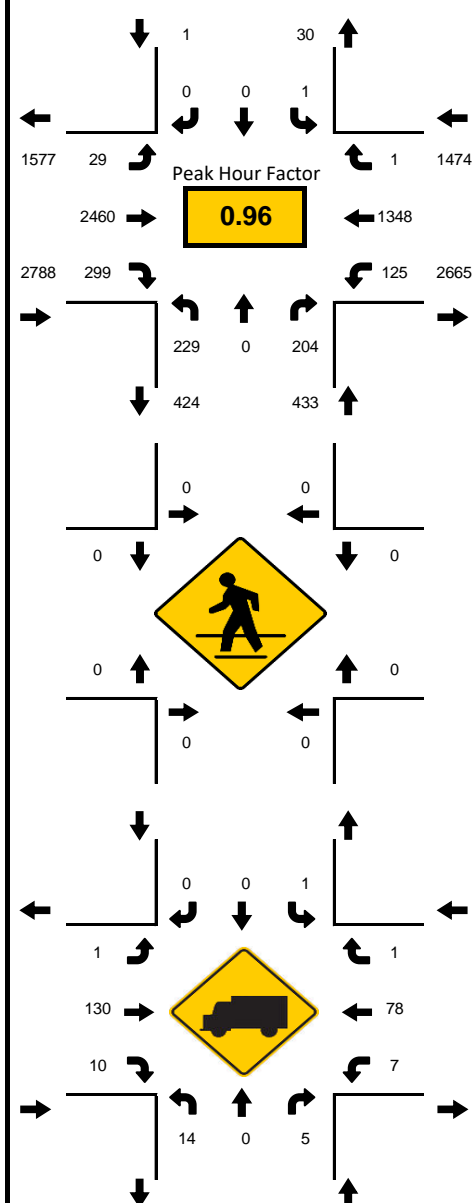
### Turning Movement Counts

**PROJECT ID:** 21-120507-004  
**DATE:** Thu, Nov 18, 2021

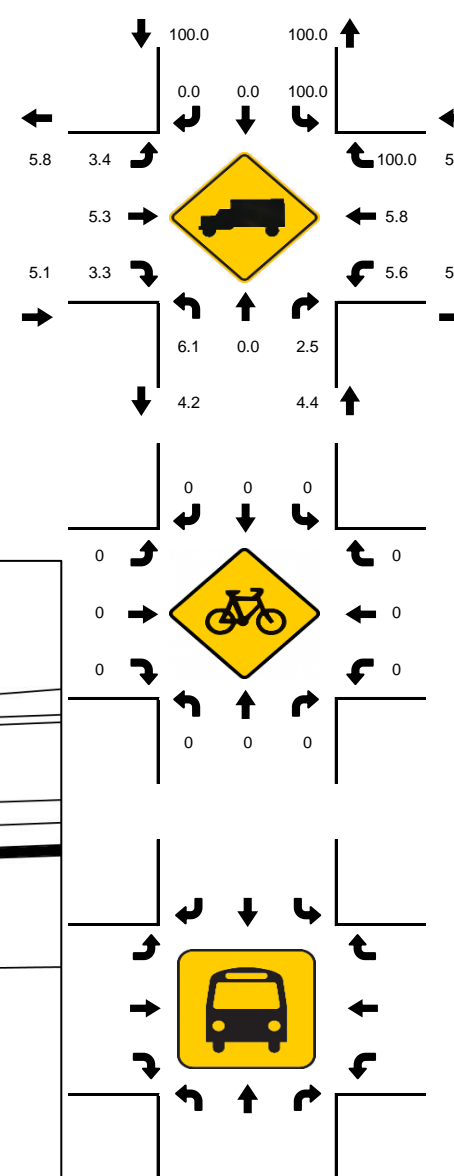
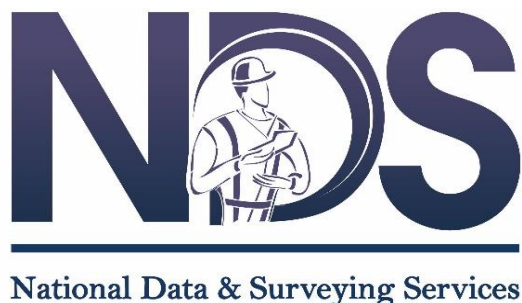
[illegible]



**PROJECT ID:** 21-120507-004  
**DATE:** Thu, Nov 18, 2021



Peak-Hour: 04:45 PM - 05:45 PM  
Peak 15-Minute: 05:15 PM - 05:30 PM

[illegible]

## **APPENDIX E**

### **FDOT's Florida Traffic Online (FTO) Data**

2021 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: COUNTY  
 CATEGORY: 1208 SR 82, E OF I-75

WEEK	DATES	SF	MOCF: 0.96 PSCF
1	01/01/2021 - 01/02/2021	0.95	0.99
2	01/03/2021 - 01/09/2021	1.01	1.05
3	01/10/2021 - 01/16/2021	1.07	1.11
4	01/17/2021 - 01/23/2021	1.05	1.09
5	01/24/2021 - 01/30/2021	1.04	1.08
6	01/31/2021 - 02/06/2021	1.02	1.06
7	02/07/2021 - 02/13/2021	1.01	1.05
8	02/14/2021 - 02/20/2021	1.00	1.04
9	02/21/2021 - 02/27/2021	0.99	1.03
10	02/28/2021 - 03/06/2021	0.98	1.02
11	03/07/2021 - 03/13/2021	0.97	1.01
12	03/14/2021 - 03/20/2021	0.96	1.00
13	03/21/2021 - 03/27/2021	0.96	1.00
14	03/28/2021 - 04/03/2021	0.97	1.01
15	04/04/2021 - 04/10/2021	0.98	1.02
16	04/11/2021 - 04/17/2021	0.98	1.02
17	04/18/2021 - 04/24/2021	0.99	1.03
18	04/25/2021 - 05/01/2021	0.99	1.03
19	05/02/2021 - 05/08/2021	1.00	1.04
20	05/09/2021 - 05/15/2021	1.00	1.04
21	05/16/2021 - 05/22/2021	1.01	1.05
22	05/23/2021 - 05/29/2021	1.01	1.05
23	05/30/2021 - 06/05/2021	1.02	1.06
24	06/06/2021 - 06/12/2021	1.02	1.06
25	06/13/2021 - 06/19/2021	1.02	1.06
26	06/20/2021 - 06/26/2021	1.03	1.07
27	06/27/2021 - 07/03/2021	1.04	1.08
28	07/04/2021 - 07/10/2021	1.05	1.09
29	07/11/2021 - 07/17/2021	1.06	1.10
30	07/18/2021 - 07/24/2021	1.06	1.10
31	07/25/2021 - 07/31/2021	1.06	1.10
32	08/01/2021 - 08/07/2021	1.06	1.10
33	08/08/2021 - 08/14/2021	1.06	1.10
34	08/15/2021 - 08/21/2021	1.06	1.10
35	08/22/2021 - 08/28/2021	1.05	1.09
36	08/29/2021 - 09/04/2021	1.05	1.09
37	09/05/2021 - 09/11/2021	1.04	1.08
38	09/12/2021 - 09/18/2021	1.04	1.08
39	09/19/2021 - 09/25/2021	1.02	1.06
*40	09/26/2021 - 10/02/2021	1.00	1.04
*41	10/03/2021 - 10/09/2021	0.98	1.02
*42	10/10/2021 - 10/16/2021	0.97	1.01
*43	10/17/2021 - 10/23/2021	0.96	1.00
*44	10/24/2021 - 10/30/2021	0.96	1.00
*45	10/31/2021 - 11/06/2021	0.96	1.00
*46	11/07/2021 - 11/13/2021	0.95	0.99
*47	11/14/2021 - 11/20/2021	0.95	0.99
*48	11/21/2021 - 11/27/2021	0.95	0.99
*49	11/28/2021 - 12/04/2021	0.95	0.99
*50	12/05/2021 - 12/11/2021	0.95	0.99
*51	12/12/2021 - 12/18/2021	0.95	0.99
*52	12/19/2021 - 12/25/2021	1.01	1.05
53	12/26/2021 - 12/31/2021	1.07	1.11

\* PEAK SEASON

11-MAR-2022 14:24:13

830UPD

1\_1208\_PKSEASON.TXT



## **APPENDIX F**

### **Turning Movement Volume Worksheets**

INTERSECTION VOLUME DEVELOPMENT  
Forum Boulevard @ SR 82  
AM Peak Hour

Case	Forum Boulevard Northbound			0 Southbound			SR 82 Eastbound			SR 82 Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
11/18/21 Observed Volumes	222	0	71	0	0	0	38	1,008	212	257	2,989	0
Peak Season 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
2021 Peak Season Volumes	222	0	71	0	0	0	38	1,008	212	257	2,989	0
Growth Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
2024 Peak Season Volumes	235	0	75	0	0	0	40	1,068	225	272	3,168	0
Project Assignment	0.0%	0.0%	17.0%	0.0%	0.0%	0.0%	0.0%	58.0%	0.0%	42.0%	58.0%	0.0%
	--	--	IN	--	--	--	--	IN	--	OUT	OUT	--
Project Traffic (Net New Trips)	0	0	5	0	0	0	0	18	0	45	61	0
Total Build-Out Volumes	235	0	80	0	0	0	40	1,086	225	317	3,229	0

Raw-To-Peak Season Factor: 1.00  
Applied Growth Rate: 2.00%  
Existing Year: 2021  
Build-Out Year: 2024  
Growth Factor: 1.06

INTERSECTION VOLUME DEVELOPMENT  
Project Driveway @ SR 82  
AM Peak Hour

Case	- Northbound			Project Driveway Southbound			SR 82 Eastbound			SR 82 Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
11/18/21 Observed Volumes	0	0	0	0	0	0	0	1,095	0	0	3,167	0
Peak Season 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
2021 Peak Season Volumes	0	0	0	0	0	0	0	1,095	0	0	3,167	0
Growth Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
2024 Peak Season Volumes	0	0	0	0	0	0	0	1,161	0	0	3,357	0
Project Assignment	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	75.0%	25.0%	0.0%	0.0%	0.0%	25.0%
	--	--	--	--	--	OUT	IN	OUT	--	--	--	IN
Project Traffic (Net New Trips)	0	0	0	0	0	106	23	27	0	0	0	8
Total Build-Out Volumes	0	0	0	0	0	106	23	1,188	0	0	3,357	8

Raw-To-Peak Season Factor: 1.00  
Applied Growth Rate: 2.00%  
Existing Year: 2021  
Build-Out Year: 2024  
Growth Factor: 1.06



INTERSECTION VOLUME DEVELOPMENT  
Forum Boulevard @ SR 82  
PM Peak Hour

Case	Forum Boulevard Northbound			- Southbound			SR 82 Eastbound			SR 82 Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
11/18/21 Observed Volumes	229	0	204	0	0	0	29	2,460	299	125	1,349	0
Peak Season 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
2021 Peak Season Volumes	229	0	204	0	0	0	29	2,460	299	125	1,349	0
Growth Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
2024 Peak Season Volumes	243	0	216	0	0	0	31	2,608	317	133	1,430	0
Project Assignment	0.0%	0.0%	17.0%	0.0%	0.0%	0.0%	0.0%	58.0%	0.0%	42.0%	58.0%	0.0%
	--	--	IN	--	--	--	--	IN	--	OUT	OUT	--
Project Traffic (Net New Trips)	0	0	14	0	0	0	0	47	0	22	30	0
Total Build-Out Volumes	243	0	230	0	0	0	31	2,655	317	155	1,460	0

Raw-To-Peak Season Factor: 1.00  
Applied Growth Rate: 2.00%  
Existing Year: 2021  
Build-Out Year: 2024  
Growth Factor: 1.06

INTERSECTION VOLUME DEVELOPMENT  
Project Driveway @ SR 82  
PM Peak Hour

Case	- Northbound			Project Driveway Southbound			SR 82 Eastbound			SR 82 Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
11/18/21 Observed Volumes	0	0	0	0	0	0	0	2,690	0	0	1,504	0
Peak Season 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
2021 Peak Season Volumes	0	0	0	0	0	0	0	2,690	0	0	1,504	0
Growth Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
2024 Peak Season Volumes	0	0	0	0	0	0	0	2,851	0	0	1,594	0
Project Assignment	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	75.0%	25.0%	0.0%	0.0%	0.0%	25.0%
	--	--	--	--	--	OUT	IN	OUT	--	--	--	IN
Project Traffic (Net New Trips)	0	0	0	0	0	52	61	13	0	0	0	20
Total Build-Out Volumes	0	0	0	0	0	52	61	2,864	0	0	1,594	20

Raw-To-Peak Season Factor: 1.00  
Applied Growth Rate: 2.00%  
Existing Year: 2021  
Build-Out Year: 2024  
Growth Factor: 1.06

## **APPENDIX G**

### Signal Timings

## Lee County, FL



MOVING TRAFFIC FORWARD

## 4205 - MLK (SR 82) &amp; Forum - - Econolite Type - ASC/3

## Controller Timing Plan (MM) 2-1

## Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	EBLT	WB		NB	WBLT	EB										
Min Green	5	20	0	10	5	20	0	0	0	0	0	0	0	0	0	0
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	7	0	7	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	26	0	37	0	31	0	37	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	2.0	5.0	0.0	2.0	2.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vehicle Ext 2	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	0.0	0.0
Max1	20	60	0	30	20	60	0	0	0	0	0	0	0	0	0	0
Max2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	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	0.0	0.0
Yellow	5.2	5.2	3.0	4.9	5.2	5.2	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Red Clear	2.0	2.6	2.0	3.0	3.0	2.2	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	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	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	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	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	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	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Min Gap	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	0.0	0.0
---------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

## Lee County, FL



MOVING TRAFFIC FORWARD

4205 - MLK (SR 82) &amp; Forum - - Econolite Type - ASC/3

## Coordination Pattern Data

## Coordinator Pattern Data (MM) 3-2

## Coordinator Pattern # 11

Split Pattern	11	TS2 (Pat-Off)	3-2	Splits In	Percent
Cycle	150	Std (COS)	0	Offsets In	Percent
Offset Value	0%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk	No	Sequence	1		
Rest					
Phase	No	Action Plan	11		
Reservice					
Max Select	MAXINH	Force Off	Fixed		

## Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB		NB	WBLT	EB										
Splits (Split Pat 11)	11	67	0	22	17	60	0	22	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	99%	0%	0%

## Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

## Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 12**

Split Pattern	12	TS2 (Pat-Off)	3-3	Splits In	Percent
Cycle	120	Std (COS)	81	Offsets In	Percent
Offset Value	39%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase	No	Action Plan	12		
Reservice					
Max Select	MAXINH	Force Off	Fixed		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB		NB	WBLT	EB										
Splits (Split Pat 12)	13	59	0	28	18	54	0	28	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

**Misc. Data**

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 13**

Split Pattern	13	TS2 (Pat-Off)	4-1	Splits In	Percent
Cycle	160	Std (COS)	9	Offsets In	Percent
Offset Value	25%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase	No	Action Plan	13		
Reservice					

Max Select      None      Force Off      Fixed

### Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB		NB	WBLT	EB										
Splits (Split Pat 13)	10	68	0	22	13	65	0	22	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

### Misc. Data

Veh Perm 1 0    Veh Perm 2 0    Veh Perm 2 Disp 0  
 Split Demand 0    Split Demand 0    Crossing Arterial 0  
 Pat 1    Pat 2    Pat

### Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

















## **APPENDIX H**

### Synchro Outputs

# Timings 1: Forum Blvd & SR 82

Existing  
AM Peak Hour

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	38	1008	212	257	2989	222	71
Future Volume (vph)	38	1008	212	257	2989	222	71
Turn Type	Prot	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	1	6		5	2	4	
Permitted Phases			6				4
Detector Phase	1	6	6	5	2	4	4
Switch Phase							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	10.0	10.0
Minimum Split (s)	12.2	27.4	27.4	13.2	27.8	25.9	25.9
Total Split (s)	16.0	90.0	90.0	27.0	101.0	33.0	33.0
Total Split (%)	10.7%	60.0%	60.0%	18.0%	67.3%	22.0%	22.0%
Yellow Time (s)	5.2	5.2	5.2	5.2	5.2	4.9	4.9
All-Red Time (s)	2.0	2.2	2.2	3.0	2.6	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.2	7.4	7.4	8.2	7.8	7.9	7.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None

## Intersection Summary

Cycle Length: 150

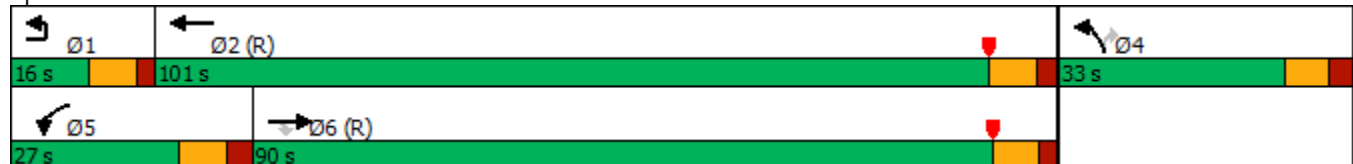
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Natural Cycle: 140

Control Type: Actuated-Coordinated

Splits and Phases: 1: Forum Blvd & SR 82



# HCM 6th Signalized Intersection Summary

## 1: Forum Blvd & SR 82





















Existing  
AM Peak Hour



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑⇑	⇑	⇑⇑	⇑⇑⇑	⇑	⇑
Traffic Volume (veh/h)	38	1008	212	257	2989	222	71
Future Volume (veh/h)	38	1008	212	257	2989	222	71
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		1737	1737	1811	1811	1826	1826
Adj Flow Rate, veh/h		1084	228	276	3214	239	76
Peak Hour Factor		0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %		11	11	6	6	5	5
Cap, veh/h		2813	873	325	3683	262	233
Arrive On Green		0.59	0.59	0.10	0.74	0.15	0.15
Sat Flow, veh/h		4898	1472	3346	5107	1739	1547
Grp Volume(v), veh/h		1084	228	276	3214	239	76
Grp Sat Flow(s),veh/h/ln		1581	1472	1673	1648	1739	1547
Q Serve(g_s), s		18.1	11.2	12.2	71.1	20.3	6.6
Cycle Q Clear(g_c), s		18.1	11.2	12.2	71.1	20.3	6.6
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2813	873	325	3683	262	233
V/C Ratio(X)		0.39	0.26	0.85	0.87	0.91	0.33
Avail Cap(c_a), veh/h		2813	873	419	3683	291	259
HCM Platoon Ratio		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
Uniform Delay (d), s/veh		16.1	14.7	66.6	14.0	62.7	56.9
Incr Delay (d2), s/veh		0.4	0.7	12.3	3.2	29.6	0.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		6.3	3.7	5.6	22.0	11.0	5.9
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		16.5	15.4	79.0	17.1	92.4	57.7
LnGrp LOS		B	B	E	B	F	E
Approach Vol, veh/h		1312			3490	315	
Approach Delay, s/veh		16.3			22.0	84.0	
Approach LOS		B			C	F	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		119.5		30.5	22.8	96.8	
Change Period (Y+Rc), s		* 7.8		7.9	8.2	* 7.8	
Max Green Setting (Gmax), s		* 93		25.1	18.8	* 83	
Max Q Clear Time (g_c+I1), s		73.1		22.3	14.2	20.1	
Green Ext Time (p_c), s		19.0		0.3	0.4	10.0	
<b>Intersection Summary</b>							
HCM 6th Ctrl Delay			24.4				
HCM 6th LOS			C				
<b>Notes</b>							
User approved ignoring U-Turning movement.							
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.							

# Timings 1: Forum Blvd & SR 82

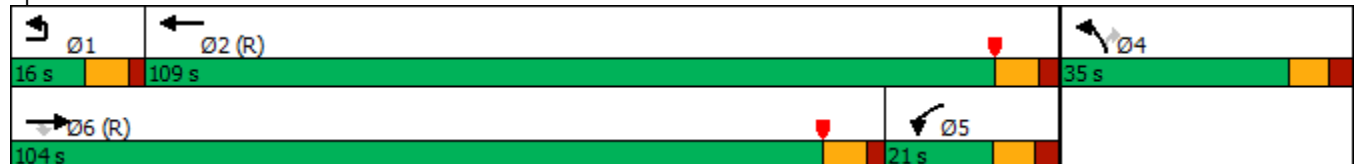
Existing  
PM Peak Hour

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		  		  	  		
Traffic Volume (vph)	29	2460	299	125	1349	229	204
Future Volume (vph)	29	2460	299	125	1349	229	204
Turn Type	Prot	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	1	6		5	2	4	
Permitted Phases			6				4
Detector Phase	1	6	6	5	2	4	4
Switch Phase							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	10.0	10.0
Minimum Split (s)	12.2	27.4	27.4	13.2	27.8	25.9	25.9
Total Split (s)	16.0	104.0	104.0	21.0	109.0	35.0	35.0
Total Split (%)	10.0%	65.0%	65.0%	13.1%	68.1%	21.9%	21.9%
Yellow Time (s)	5.2	5.2	5.2	5.2	5.2	4.9	4.9
All-Red Time (s)	2.0	2.2	2.2	3.0	2.6	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.2	7.4	7.4	8.2	7.8	7.9	7.9
Lead/Lag	Lead	Lead	Lead	Lag	Lag		
Lead-Lag Optimize?							
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None

## Intersection Summary

Cycle Length: 160  
Actuated Cycle Length: 160  
Offset: 40 (25%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
Natural Cycle: 90  
Control Type: Actuated-Coordinated

Splits and Phases: 1: Forum Blvd & SR 82





# HCM 6th Signalized Intersection Summary

## 1: Forum Blvd & SR 82

Existing  
PM Peak Hour



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑⇑	⇑	⇑⇑	⇑⇑⇑	⇑	⇑
Traffic Volume (veh/h)	29	2460	299	125	1349	229	204
Future Volume (veh/h)	29	2460	299	125	1349	229	204
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		1826	1826	1811	1811	1841	1841
Adj Flow Rate, veh/h		2562	311	130	1405	239	212
Peak Hour Factor		0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %		5	5	6	6	4	4
Cap, veh/h		3010	934	332	3705	263	234
Arrive On Green		0.60	0.60	0.10	0.75	0.15	0.15
Sat Flow, veh/h		5149	1547	3346	5107	1753	1560
Grp Volume(v), veh/h		2562	311	130	1405	239	212
Grp Sat Flow(s),veh/h/ln		1662	1547	1673	1648	1753	1560
Q Serve(g_s), s		67.0	15.9	5.8	15.9	21.5	21.4
Cycle Q Clear(g_c), s		67.0	15.9	5.8	15.9	21.5	21.4
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		3010	934	332	3705	263	234
V/C Ratio(X)		0.85	0.33	0.39	0.38	0.91	0.91
Avail Cap(c_a), veh/h		3010	934	332	3705	297	264
HCM Platoon Ratio		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
Uniform Delay (d), s/veh		25.8	15.7	67.5	7.0	66.9	66.9
Incr Delay (d2), s/veh		3.3	1.0	0.7	0.3	28.0	29.9
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		25.2	5.6	2.5	4.9	11.5	19.4
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		29.1	16.7	68.3	7.3	95.0	96.8
LnGrp LOS		C	B	E	A	F	F
Approach Vol, veh/h		2873			1535	451	
Approach Delay, s/veh		27.8			12.5	95.8	
Approach LOS		C			B	F	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		128.1		31.9	24.1	104.0	
Change Period (Y+Rc), s		* 8.2		7.9	* 8.2	7.4	
Max Green Setting (Gmax), s		* 1E2		27.1	* 13	96.6	
Max Q Clear Time (g_c+I1), s		17.9		23.5	7.8	69.0	
Green Ext Time (p_c), s		13.2		0.5	0.1	22.8	
<b>Intersection Summary</b>							
HCM 6th Ctrl Delay			29.3				
HCM 6th LOS			C				




















### Notes

User approved ignoring U-Turning movement.

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

# Timings 1: Forum Blvd & SR 82

Background  
AM Peak Hour

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		  		 	  		
Traffic Volume (vph)	40	1068	225	272	3168	235	75
Future Volume (vph)	40	1068	225	272	3168	235	75
Turn Type	Prot	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	1	6		5	2	4	
Permitted Phases			6				4
Detector Phase	1	6	6	5	2	4	4
Switch Phase							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	10.0	10.0
Minimum Split (s)	12.2	27.4	27.4	13.2	27.8	25.9	25.9
Total Split (s)	16.0	90.0	90.0	27.0	101.0	33.0	33.0
Total Split (%)	10.7%	60.0%	60.0%	18.0%	67.3%	22.0%	22.0%
Yellow Time (s)	5.2	5.2	5.2	5.2	5.2	4.9	4.9
All-Red Time (s)	2.0	2.2	2.2	3.0	2.6	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.2	7.4	7.4	8.2	7.8	7.9	7.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None

## Intersection Summary

Cycle Length: 150

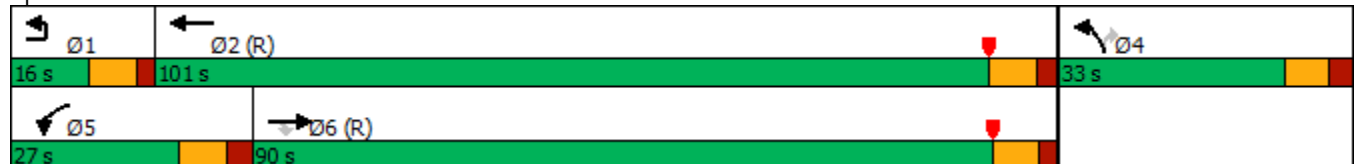
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Forum Blvd & SR 82



# HCM 6th Signalized Intersection Summary

## 1: Forum Blvd & SR 82

Background

AM Peak Hour



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑⇑	⇐	⇐⇑⇑	⇑⇑⇑	⇐	⇐
Traffic Volume (veh/h)	40	1068	225	272	3168	235	75
Future Volume (veh/h)	40	1068	225	272	3168	235	75
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		1737	1737	1811	1811	1826	1826
Adj Flow Rate, veh/h		1148	242	292	3406	253	81
Peak Hour Factor		0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %		11	11	6	6	5	5
Cap, veh/h		2756	855	340	3646	275	244
Arrive On Green		0.58	0.58	0.10	0.74	0.16	0.16
Sat Flow, veh/h		4898	1472	3346	5107	1739	1547
Grp Volume(v), veh/h		1148	242	292	3406	253	81
Grp Sat Flow(s),veh/h/ln		1581	1472	1673	1648	1739	1547
Q Serve(g_s), s		20.1	12.4	12.9	87.2	21.5	7.0
Cycle Q Clear(g_c), s		20.1	12.4	12.9	87.2	21.5	7.0
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2756	855	340	3646	275	244
V/C Ratio(X)		0.42	0.28	0.86	0.93	0.92	0.33
Avail Cap(c_a), veh/h		2756	855	419	3646	291	259
HCM Platoon Ratio		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
Uniform Delay (d), s/veh		17.4	15.7	66.3	16.6	62.2	56.1
Incr Delay (d2), s/veh		0.5	0.8	13.8	5.8	32.1	0.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		7.0	4.2	6.0	28.1	11.8	6.3
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		17.8	16.6	80.2	22.5	94.3	56.9
LnGrp LOS		B	B	F	C	F	E
Approach Vol, veh/h		1390			3698	334	
Approach Delay, s/veh		17.6			27.0	85.2	
Approach LOS		B			C	F	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		118.4		31.6	23.4	95.0	
Change Period (Y+Rc), s		* 7.8		7.9	8.2	* 7.8	
Max Green Setting (Gmax), s		* 93		25.1	18.8	* 83	
Max Q Clear Time (g_c+I1), s		89.2		23.5	14.9	22.1	
Green Ext Time (p_c), s		3.9		0.2	0.4	10.9	
<b>Intersection Summary</b>							
HCM 6th Ctrl Delay			28.2				
HCM 6th LOS			C				















### Notes

User approved ignoring U-Turning movement.

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

# Timings 1: Forum Blvd & SR 82

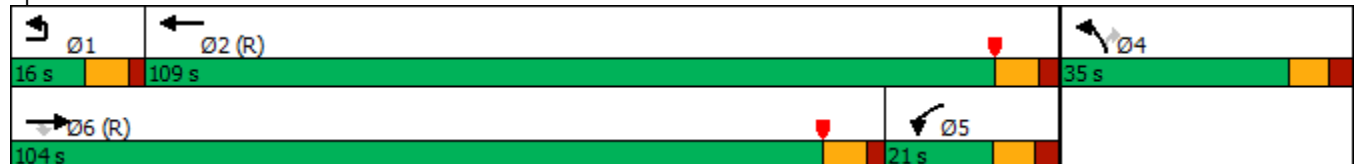
Background  
PM Peak Hour

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	31	2608	317	133	1430	243	216
Future Volume (vph)	31	2608	317	133	1430	243	216
Turn Type	Prot	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	1	6		5	2	4	
Permitted Phases			6				4
Detector Phase	1	6	6	5	2	4	4
Switch Phase							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	10.0	10.0
Minimum Split (s)	12.2	27.4	27.4	13.2	27.8	25.9	25.9
Total Split (s)	16.0	104.0	104.0	21.0	109.0	35.0	35.0
Total Split (%)	10.0%	65.0%	65.0%	13.1%	68.1%	21.9%	21.9%
Yellow Time (s)	5.2	5.2	5.2	5.2	5.2	4.9	4.9
All-Red Time (s)	2.0	2.2	2.2	3.0	2.6	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.2	7.4	7.4	8.2	7.8	7.9	7.9
Lead/Lag	Lead	Lead	Lead	Lag	Lag		
Lead-Lag Optimize?							
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None

## Intersection Summary

Cycle Length: 160  
Actuated Cycle Length: 160  
Offset: 40 (25%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
Natural Cycle: 100  
Control Type: Actuated-Coordinated

Splits and Phases: 1: Forum Blvd & SR 82



# HCM 6th Signalized Intersection Summary

## 1: Forum Blvd & SR 82

Background

PM Peak Hour



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇕⇕⇕	⇑	⇑⇑	⇕⇕⇕	⇑	⇑
Traffic Volume (veh/h)	31	2608	317	133	1430	243	216
Future Volume (veh/h)	31	2608	317	133	1430	243	216
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		1826	1826	1811	1811	1841	1841
Adj Flow Rate, veh/h		2717	330	139	1490	253	225
Peak Hour Factor		0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %		5	5	6	6	4	4
Cap, veh/h		3010	934	308	3669	276	245
Arrive On Green		0.60	0.60	0.09	0.74	0.16	0.16
Sat Flow, veh/h		5149	1547	3346	5107	1753	1560
Grp Volume(v), veh/h		2717	330	139	1490	253	225
Grp Sat Flow(s),veh/h/ln		1662	1547	1673	1648	1753	1560
Q Serve(g_s), s		76.0	17.2	6.3	17.8	22.7	22.7
Cycle Q Clear(g_c), s		76.0	17.2	6.3	17.8	22.7	22.7
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		3010	934	308	3669	276	245
V/C Ratio(X)		0.90	0.35	0.45	0.41	0.92	0.92
Avail Cap(c_a), veh/h		3010	934	308	3669	297	264
HCM Platoon Ratio		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
Uniform Delay (d), s/veh		27.6	16.0	68.8	7.6	66.4	66.4
Incr Delay (d2), s/veh		5.0	1.0	1.0	0.3	30.7	33.1
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		28.9	6.1	2.7	5.6	12.4	20.7
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		32.6	17.0	69.8	7.9	97.1	99.5
LnGrp LOS		C	B	E	A	F	F
Approach Vol, veh/h		3047			1629	478	
Approach Delay, s/veh		30.9			13.2	98.2	
Approach LOS		C			B	F	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		126.9		33.1	22.9	104.0	
Change Period (Y+Rc), s		* 8.2		7.9	* 8.2	7.4	
Max Green Setting (Gmax), s		* 1E2		27.1	* 13	96.6	
Max Q Clear Time (g_c+I1), s		19.8		24.7	8.3	78.0	
Green Ext Time (p_c), s		14.6		0.4	0.1	16.8	
<b>Intersection Summary</b>							
HCM 6th Ctrl Delay			31.6				
HCM 6th LOS			C				

### Notes





















User approved ignoring U-Turning movement.

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



# Timings 1: Forum Blvd & SR 82

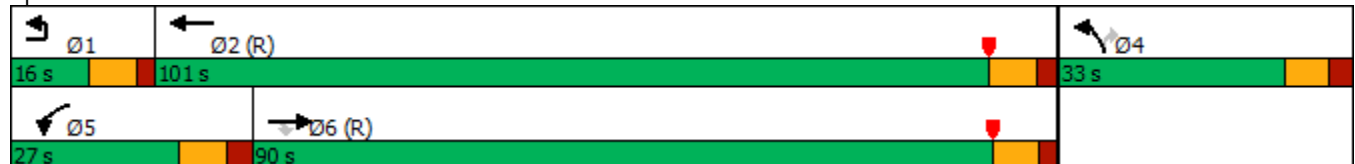
Buildout  
AM Peak Hour

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		  		  	  		
Traffic Volume (vph)	40	1086	225	317	3229	235	80
Future Volume (vph)	40	1086	225	317	3229	235	80
Turn Type	Prot	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	1	6		5	2	4	
Permitted Phases			6				4
Detector Phase	1	6	6	5	2	4	4
Switch Phase							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	10.0	10.0
Minimum Split (s)	12.2	27.4	27.4	13.2	27.8	25.9	25.9
Total Split (s)	16.0	90.0	90.0	27.0	101.0	33.0	33.0
Total Split (%)	10.7%	60.0%	60.0%	18.0%	67.3%	22.0%	22.0%
Yellow Time (s)	5.2	5.2	5.2	5.2	5.2	4.9	4.9
All-Red Time (s)	2.0	2.2	2.2	3.0	2.6	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.2	7.4	7.4	8.2	7.8	7.9	7.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None

## Intersection Summary

Cycle Length: 150  
Actuated Cycle Length: 150  
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
Natural Cycle: 150  
Control Type: Actuated-Coordinated

Splits and Phases: 1: Forum Blvd & SR 82

















# HCM 6th Signalized Intersection Summary

## 1: Forum Blvd & SR 82

Buildout

AM Peak Hour

							
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (veh/h)	40	1086	225	317	3229	235	80
Future Volume (veh/h)	40	1086	225	317	3229	235	80
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		1737	1737	1811	1811	1826	1826
Adj Flow Rate, veh/h		1168	242	341	3472	253	86
Peak Hour Factor		0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %		11	11	6	6	5	5
Cap, veh/h		2691	835	386	3646	275	244
Arrive On Green		0.57	0.57	0.12	0.74	0.16	0.16
Sat Flow, veh/h		4898	1472	3346	5107	1739	1547
Grp Volume(v), veh/h		1168	242	341	3472	253	86
Grp Sat Flow(s),veh/h/ln		1581	1472	1673	1648	1739	1547
Q Serve(g_s), s		21.2	12.8	15.1	92.9	21.5	7.4
Cycle Q Clear(g_c), s		21.2	12.8	15.1	92.9	21.5	7.4
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		2691	835	386	3646	275	244
V/C Ratio(X)		0.43	0.29	0.88	0.95	0.92	0.35
Avail Cap(c_a), veh/h		2691	835	419	3646	291	259
HCM Platoon Ratio		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
Uniform Delay (d), s/veh		18.6	16.8	65.4	17.4	62.2	56.3
Incr Delay (d2), s/veh		0.5	0.9	18.6	7.3	32.0	0.9
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		7.5	4.3	7.3	30.3	11.8	6.7
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		19.1	17.7	84.0	24.7	94.3	57.2
LnGrp LOS		B	B	F	C	F	E
Approach Vol, veh/h		1410			3813	339	
Approach Delay, s/veh		18.9			30.0	84.9	
Approach LOS		B			C	F	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		118.4		31.6	25.5	92.9	
Change Period (Y+Rc), s		* 7.8		7.9	8.2	* 7.8	
Max Green Setting (Gmax), s		* 93		25.1	18.8	* 83	
Max Q Clear Time (g_c+I1), s		94.9		23.5	17.1	23.2	
Green Ext Time (p_c), s		0.0		0.2	0.2	11.1	
<b>Intersection Summary</b>							
HCM 6th Ctrl Delay			30.5				
HCM 6th LOS			C				
<b>Notes</b>							
User approved ignoring U-Turning movement.							
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.							

# HCM 6th TWSC 2: SR 82 & Project Driveway















Buildout  
AM Peak Hour

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑↑	↑↑↑↱			↱
Traffic Vol, veh/h	23	1188	3357	8	0	106
Future Vol, veh/h	23	1188	3357	8	0	106
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	350	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	12	12	6	6	0	0
Mvmt Flow	25	1277	3610	9	0	114
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	3619	0	-	0	-	1810
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	5.54	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	3.22	-	-	-	-	3.9
Pot Cap-1 Maneuver	*138	-	-	-	0	*114
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	1	-	-	-	-	1
Mov Cap-1 Maneuver	*138	-	-	-	-	*114
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.7	0		155.7		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	* 138	-	-	-	-	114
HCM Lane V/C Ratio	0.179	-	-	-	-	1
HCM Control Delay (s)	36.7	-	-	-	-	155.7
HCM Lane LOS	E	-	-	-	-	F
HCM 95th %tile Q(veh)	0.6	-	-	-	-	6.5
Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

# Timings

## 1: Forum Blvd & SR 82

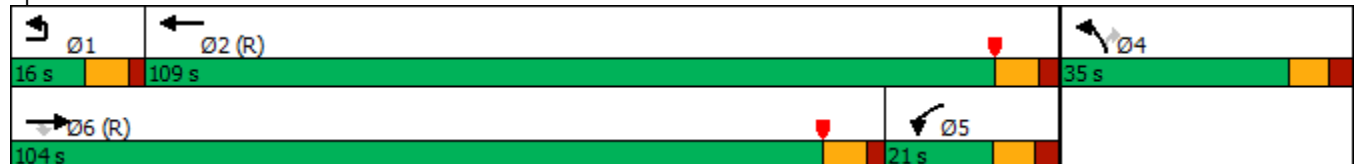
Buildout  
PM Peak Hour

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	31	2655	317	155	1460	243	230
Future Volume (vph)	31	2655	317	155	1460	243	230
Turn Type	Prot	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	1	6		5	2	4	
Permitted Phases			6				4
Detector Phase	1	6	6	5	2	4	4
Switch Phase							
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	10.0	10.0
Minimum Split (s)	12.2	27.4	27.4	13.2	27.8	25.9	25.9
Total Split (s)	16.0	104.0	104.0	21.0	109.0	35.0	35.0
Total Split (%)	10.0%	65.0%	65.0%	13.1%	68.1%	21.9%	21.9%
Yellow Time (s)	5.2	5.2	5.2	5.2	5.2	4.9	4.9
All-Red Time (s)	2.0	2.2	2.2	3.0	2.6	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.2	7.4	7.4	8.2	7.8	7.9	7.9
Lead/Lag	Lead	Lead	Lead	Lag	Lag		
Lead-Lag Optimize?							
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None

### Intersection Summary

Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 40 (25%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Forum Blvd & SR 82



# HCM 6th Signalized Intersection Summary

## 1: Forum Blvd & SR 82

Buildout

PM Peak Hour



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	⇐	⇑⇑⇑	⇑	⇑⇑	⇑⇑⇑	⇑	⇑
Traffic Volume (veh/h)	31	2655	317	155	1460	243	230
Future Volume (veh/h)	31	2655	317	155	1460	243	230
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		1826	1826	1811	1811	1841	1841
Adj Flow Rate, veh/h		2766	330	161	1521	253	240
Peak Hour Factor		0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %		5	5	6	6	4	4
Cap, veh/h		3010	934	281	3629	290	258
Arrive On Green		0.60	0.60	0.17	1.00	0.17	0.17
Sat Flow, veh/h		5149	1547	3346	5107	1753	1560
Grp Volume(v), veh/h		2766	330	161	1521	253	240
Grp Sat Flow(s),veh/h/ln		1662	1547	1673	1648	1753	1560
Q Serve(g_s), s		79.0	17.2	7.1	0.0	22.5	24.3
Cycle Q Clear(g_c), s		79.0	17.2	7.1	0.0	22.5	24.3
Prop In Lane			1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		3010	934	281	3629	290	258
V/C Ratio(X)		0.92	0.35	0.57	0.42	0.87	0.93
Avail Cap(c_a), veh/h		3010	934	281	3629	297	264
HCM Platoon Ratio		1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		28.2	16.0	63.9	0.0	65.1	65.9
Incr Delay (d2), s/veh		5.9	1.0	2.8	0.4	23.3	36.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		30.3	6.1	2.9	0.1	11.8	22.2
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		34.1	17.0	66.7	0.4	88.4	102.7
LnGrp LOS		C	B	E	A	F	F
Approach Vol, veh/h		3096			1682	493	
Approach Delay, s/veh		32.3			6.7	95.4	
Approach LOS		C			A	F	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		125.7		34.3	21.7	104.0	
Change Period (Y+Rc), s		* 8.2		7.9	* 8.2	7.4	
Max Green Setting (Gmax), s		* 1E2		27.1	* 13	96.6	
Max Q Clear Time (g_c+I1), s		2.0		26.3	9.1	81.0	
Green Ext Time (p_c), s		15.3		0.2	0.1	14.3	
<b>Intersection Summary</b>							
HCM 6th Ctrl Delay			30.0				
HCM 6th LOS			C				

### Notes






User approved ignoring U-Turning movement.

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



# HCM 6th TWSC 2: SR 82 & Project Driveway

Buildout  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	61	2864	1594	20	0	52
Future Vol, veh/h	61	2864	1594	20	0	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	350	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	5	5	6	6	0	0
Mvmt Flow	64	2983	1660	21	0	54

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1681	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	5.4	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	3.15	-	-
Pot Cap-1 Maneuver	*683	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	1	-	-
Mov Cap-1 Maneuver	*683	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	* 683	-	-	-	551
HCM Lane V/C Ratio	0.093	-	-	-	0.098
HCM Control Delay (s)	10.8	-	-	-	12.2
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.3

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon