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# TRAFFIC IMPACT STATEMENT

For

## **Russell Square RPUD** (Santa Barbara Boulevard, Collier County, Florida)

February 23, 2018  
Revised May 17, 2018

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County TIS Review Fees

*TIS Methodology Review Fee = \$500.00*

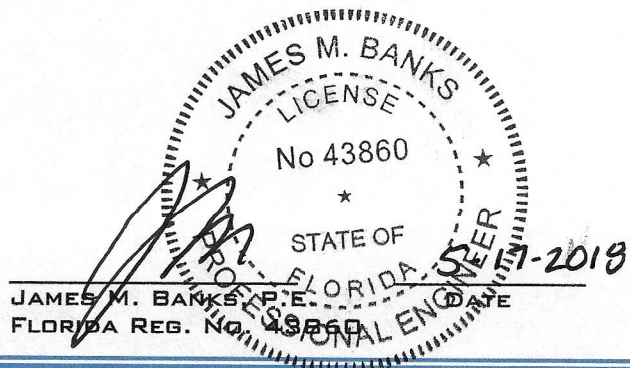
*TIS (Major Study) Review Fee = \$1,500.00*

**Prepared by:**

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CERTIFICATE OF AUTHORIZATION NO. 27830

(PROJECT NO. 170611)



## **TABLE OF CONTENTS**

<b>Conclusions</b>	<b>2</b>
<b>Methodology</b>	<b>2</b>
<b>Scope of Project</b>	<b>2</b>
<b>Table A - Existing &amp; Proposed Development</b>	<b>2</b>
<b>Figure 1 - Project Location &amp; E+C Road Classification</b>	<b>2.1</b>
<b>Master Concept Plan</b>	<b>2.2</b>
<b>Project Generated Traffic</b>	<b>3</b>
<b>Table B - Net New Trips Generated</b>	<b>3</b>
<b>Table 1 - Trip Generation Computations</b>	<b>3.1</b>
<b>Existing + Committed Road Network</b>	<b>4</b>
<b>Project Traffic Distribution</b>	<b>4</b>
<b>Area of Significant Impact</b>	<b>4</b>
<b>Figure 2 - Project Traffic Distribution</b>	<b>4.1</b>
<b>Table 2A - Area of Impact/Road Classification</b>	<b>4.2</b>
<b>Site Access Conditions</b>	<b>5</b>
<b>Table C - Build-out Traffic vs. Intersection Improvements</b>	<b>5</b>
<b>HCS Intersection Analysis</b>	<b>5.1</b>
<b>2017 thru 2023 Project Build-out Traffic Conditions</b>	<b>6</b>
<b>Table 2B - 2017 &amp; 2023 Link Volumes</b>	<b>6.1</b>
<b>Table 2C - 2023 Link Volumes/Capacity Analysis</b>	<b>6.2</b>

## Conclusions

Based upon the findings of this report, it was determined that the proposed Russell Square RPUD will not have a significant or negative impact upon the surrounding road network. It was verified that all roadways, within the project's area of influence, currently have a surplus of capacity and can accommodate the traffic associated with the proposed residential community that will consist of 230 multi-family dwelling units and associated amenities. As determined, the road network will continue to operate at acceptable levels of service for the foreseeable future and the project will not create any off-site transportation deficiencies that need to be mitigated.

## Site Access

The project proposes to construct one (1) means of ingress/egress that will be located at the southern property boundary. The access will be created by extending a two-lane road (Cope Lane East) from Santa Barbara Boulevard to the site's proposed entrance/exit. The entrance road will be aligned with an existing right-in/out and left-in (u-turn) median opening on Santa Barbara Boulevard. A right ingress turn lane and left ingress turn lane (u-turn) were previously constructed at the existing median opening and the report concludes that those turn lanes are adequate in length to accommodate the traffic generated by Russell Square. However, what will be the left-ingress turn lane was previously defined as a u-turn lane which will require restriping to indicate a left turn lane. Also, the right turn lane was previously striped as a recovery lane which will require restriping to indicate a right turn lane.

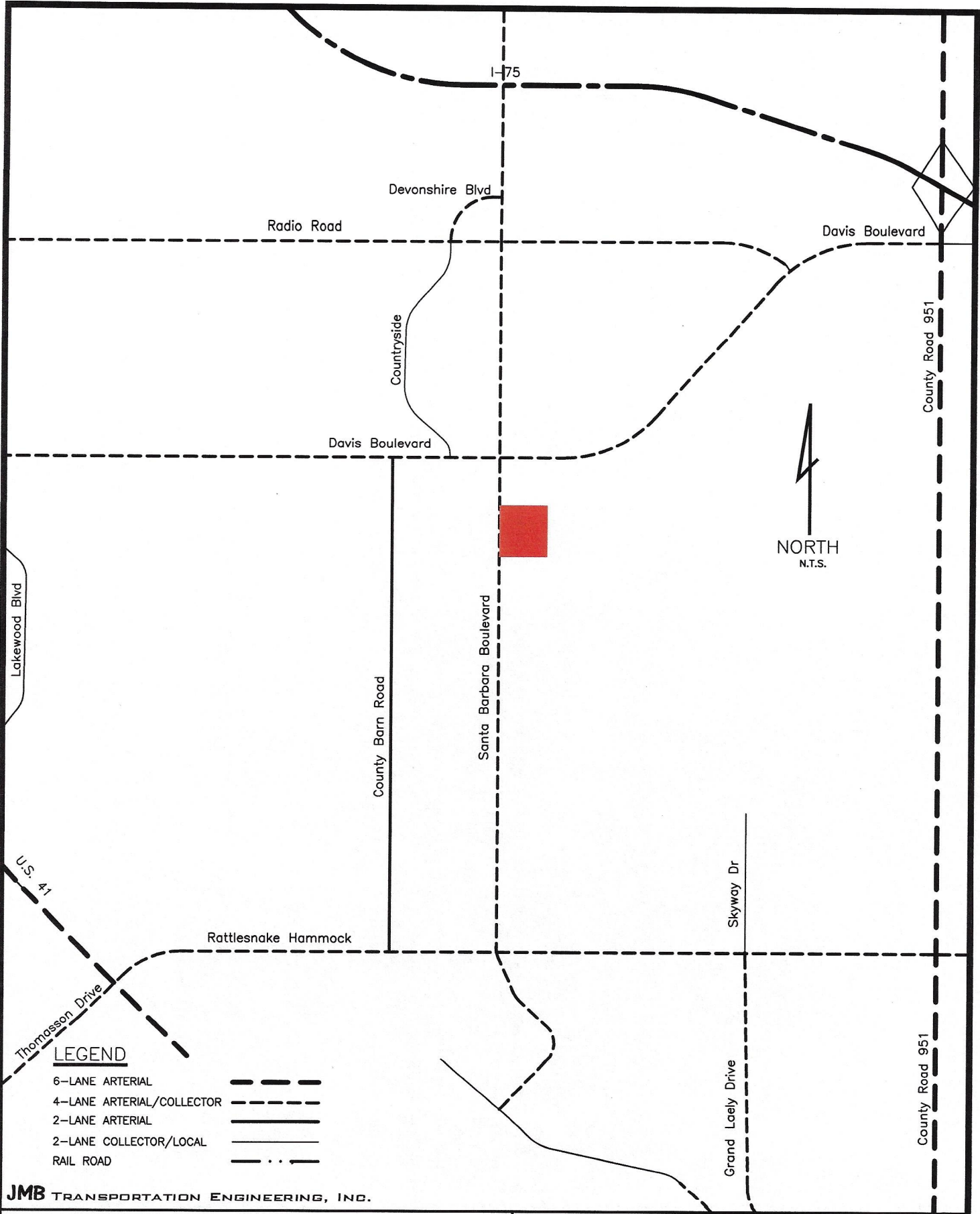
## Scope of Project

Russell Square is a proposed residential community that will consist of 230 multi-family dwelling units. The 32 +/- acre site is located on the east side of Santa Barbara Boulevard and approximately one-half mile south of Davis Boulevard, within Collier County. It is expected that the project will be completed by the year 2023.

**Table A**  
**Proposed Land Use**

Proposed Land Use	Number of Units
Multi-Family	230 d.u.'s





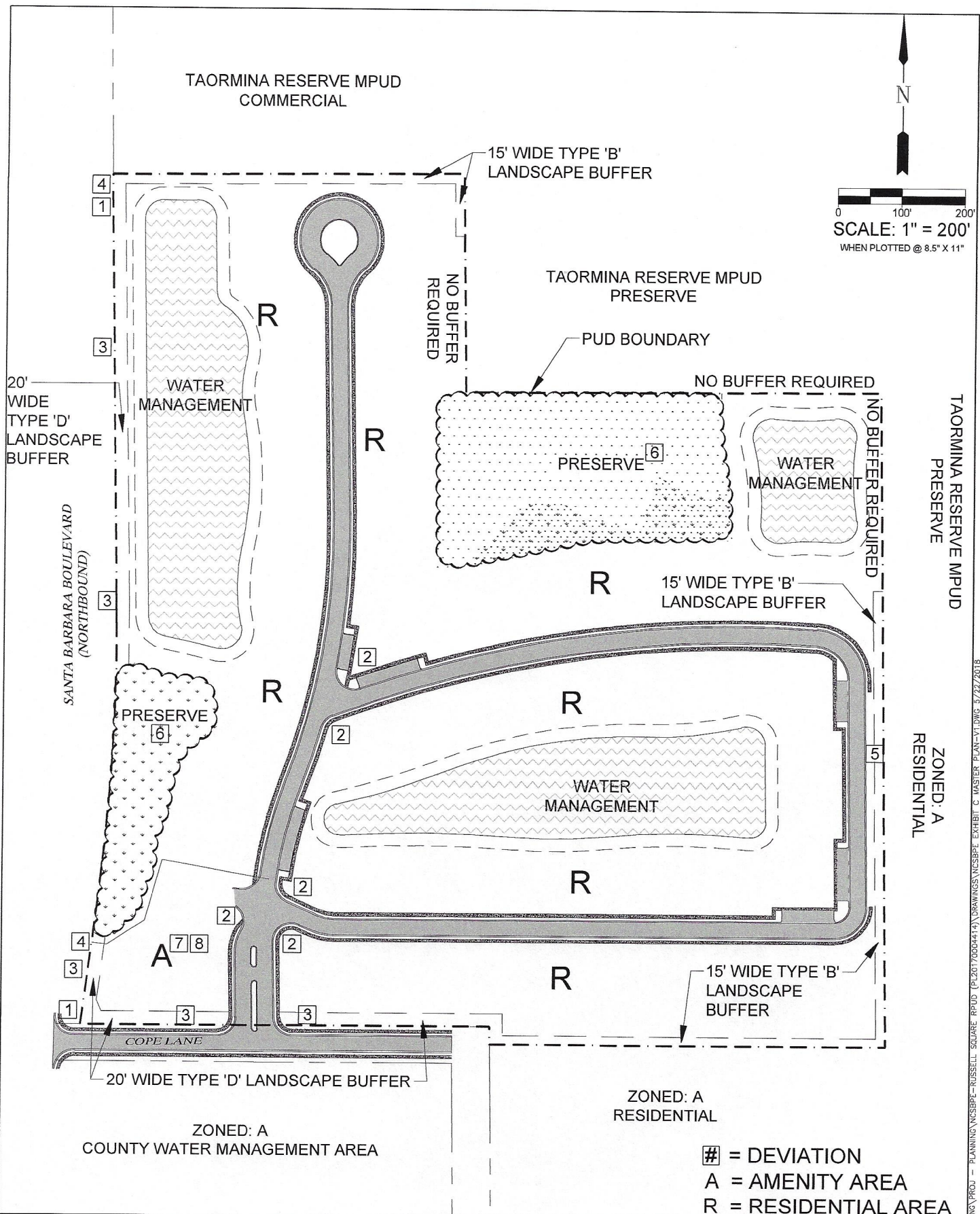
**Russell Square**

February 23, 2018

**Project Location &  
Roadway Classification**

**FIGURE 1**





**GradyMinor**  
 Civil Engineers • Land Surveyors • Planners • Landscape Architects  
 Cert. of Auth. EB 0005151 Cert. of Auth. LB 0005151 Business LC 20000266  
 Bonita Springs: 239.947.1144 www.GradyMinor.com Fort Myers: 239.690.4380

**RUSSELL SQUARE RPUD**  
 EXHIBIT C1  
 MASTER PLAN

REVISED  
 05/22/2018

SCALE: 1" = 200' @ 8.5 X 11"
JOB CODE: NCSBP
DATE: FEBRUARY 2018
FILE NAME: NCSBP EXHIBIT C MASTER PLAN-A
SHEET 1 OF 2

### **Project Generated Traffic**

Traffic that can be expected to be generated by the project was estimated based upon the guidelines established by the Institute of Transportation Engineers, Trip Generation Manual, 10<sup>th</sup> Edition. That is, historical traffic data collected at similar land uses was relied upon in estimating the project's traffic. It was determined that land use code "Multi-Family" (LUC 220) was most appropriate for the purpose of estimating the net new trips associated with the RPUD.

As determined, Russell Square RPUD will generate 105 vph & 124 vph during the AM & PM peak hours, respectively. Table 1 depicts the computations performed in determining the total new trips. Table B provides a summary of the trip generation computation results that are shown in Table 1.

**Table B**  
**Site-Generated Trips**  
*(Summation of Table 1)*

Daily Weekday Trips Generated (ADT)	AM Peak Hour Trips Generated (vph)	PM Peak Hour Trips Generated (vph)
<b>1,698</b>	<b>105</b>	<b>124</b>

The report concludes that the project will generate more than 100 net new trip ends during the weekday highest peak hour. As such, the report investigates the traffic impacts associated with the project based upon the criteria set forth by the Collier County Government's Traffic Impact Statement Guidelines for developments generating "more than 100 trips", which is defined as a major study.



**TABLE 1**  
**TRIP GENERATION COMPUTATIONS**  
Russell Square

Land Use

Code      Land Use Description  
**220**      **Multi-Family (Low Rise)**

Build Schedule  
230 Units

Land Use

<u>Code</u>	<u>Trip Period</u>	<u>Trip Generation Equation</u>	<u>Total Trips</u>	<u>Trips Enter/Exit</u>
<b>LUC 220</b>	Daily Traffic (ADT) =	$T = 7.56(X) - 40.86 =$	<b>1,698 ADT</b>	
	AM Peak Hour (vph) =	$\ln(T) = 0.95\ln(X) - 0.51 =$ 23% Enter/ 77% Exit =	<b>105 vph</b>	24 / 81    vph
	PM Peak Hour (vph) =	$\ln(T) = 0.89\ln(X) - 0.02 =$ 63% Enter/ 37% Exit =	<b>124 vph</b>	78 / 46    vph



### **Existing + Committed Road Network**

Figure 1 and Table 2A provide a detail of the surrounding E + C road network. Table 2A depicts the minimum level of service performance standards and capacity for the roads within the project's area of influence.

#### *Santa Barbara Boulevard*

Santa Barbara Boulevard varies from a four-lane to a six-lane major arterial that has a north/south orientation between its southern terminus at its intersection with Rattlesnake Hammock Road and its northern terminus at its intersection with Green Boulevard where the roadway continues north to Immokalee Road and is known as Logan Boulevard. Between Golden Gate Boulevard and Rattlesnake Hammock Road, Santa Barbara Boulevard is classified as a six-lane divided arterial having a maximum service capacity of 3,100 vphpd. Within proximity of the site, the posted speed limit of Santa Barbara Boulevard is 45 MPH.

#### *Rattlesnake Hammock Road*

Rattlesnake Hammock Road varies from a four-lane to a six-lane divided arterial that has an east/west orientation between its eastern terminus that extends past its intersection with C.R. 951 and its western terminus at its intersection with U.S. 41.

#### *Davis Boulevard*

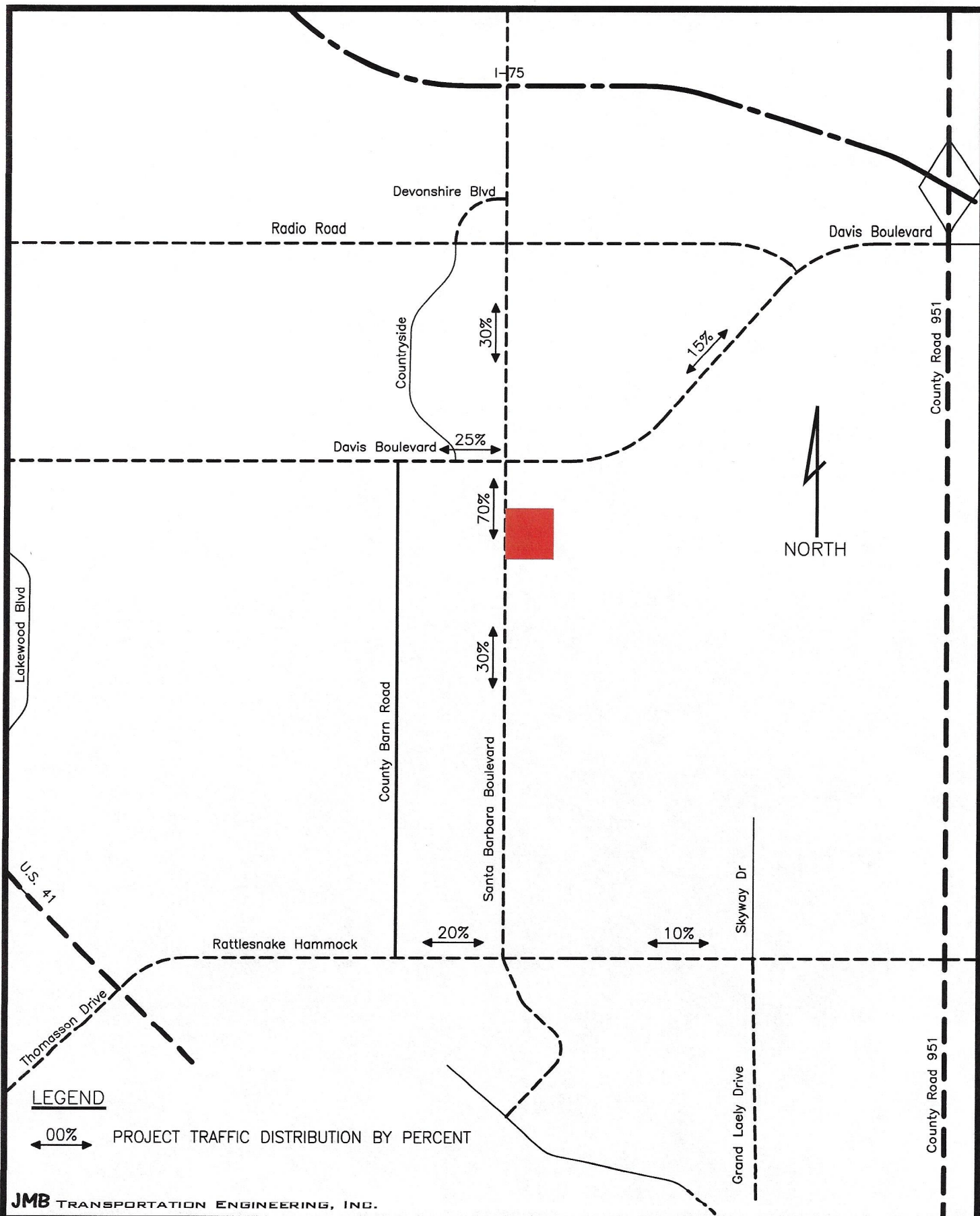
Davis Boulevard varies from a four-lane to a six-lane divided arterial that has an east/west orientation between its eastern terminus at its intersection with C.R. 951 and its western terminus at its intersection with U.S. 41.

### **Project Generated Traffic Distribution**

The project's net new traffic was distributed to the surrounding road network based upon logical means of ingress/egress, current and future traffic patterns in the area, nearby businesses and recreational features, as well as growth trends for the surrounding areas. Table 2A and Figure 2A provide a detail of the traffic distributions to the adjacent road network. Figure 2B depicts the site-generated turning movements at the project's access on Santa Barbara Boulevard for AM & PM peak hours.

### **Area of Significant Impact**

The area of significant impact was determined based upon Collier County's 2%, 2% and 3% criteria (i.e., if the project's traffic is 2% or more of a roadway's adopted level of service capacity, then the project has a significant impact upon that link). Table 2A describes the project traffic distributions and the level of impact on the surrounding roadways. Roads that were identified as being within the project's area impact are shown in Table 2A.



**Russell Square**

February 23, 2018

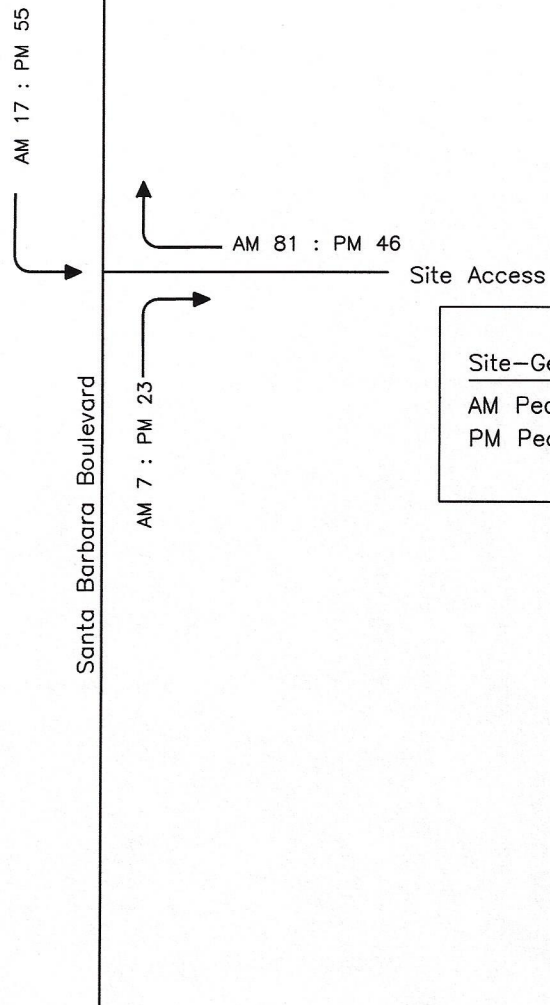
**PROJECT-GENERATED  
TRAFFIC DISTRIBUTION**

**FIGURE 2A**

**TABLE 2A**  
**PROJECT'S AREA OF IMPACT**

Project Traffic Peak Direction (vphpd) =		78	Entering											
Project Traffic Non-Peak Direction (vph) =		46	Exiting											
	Road	LOS Service			Project		Project		Project		Percent Impact	Significant Impact		
		PK Dir.	PK Direction	Volume	Traffic	PK Hr	PK Dir	Non-PK Dir	Non-PK Hr	DIR			Standard	
		Serv. Vol.	LOS	(vphpd)	% Dist.	(vphpd)	PK Dir	PK Hr	PK Dir	(vph)	W	2%	0.89%	NO
15.0	Davis Boulevard		D	2200	25.0%	20	E	12	E	12	W	2%	0.89%	NO
16.1	County Barn to Santa Barbara	D	D	2900	15.0%	12	W	7	W	7	E	2%	0.40%	NO
16.2	Santa Barbara to Radio Rd	D	D	2900	15.0%	12	W	7	W	7	E	3%	0.40%	NO
	Radio Rd to C.R. 951													
74.0	Rattlesnake Ham.		D	1900	20.0%	16	E	9	E	9	W	2%	0.82%	NO
75.0	County Barn to Santa Barbara	D	D	2900	10.0%	8	W	5	W	5	E	2%	0.27%	NO
	Santa Barbara to C.R. 951													
78.0	Santa Barbara Blvd		E	3100	30.0%	23	S	14	S	14	N	2%	0.75%	NO
79.1	Radio Rd to Davis Blvd	E	E	3100	70.0%	55	S	32	S	32	N	2%	1.76%	NO
79.2	Davis Blvd to Site	E	E	3100	30.0%	23	N	14	N	14	S	2%	0.75%	NO
	Site to Rattlesnake Hammock													





Site-Generated Trips

AM Peak Hour = 24 enter/81 exit  
PM Peak Hour = 78 enter/46 exit

LEGEND

AM 35 : PM 34 → Project Traffic Assignment

**JMB** TRANSPORTATION ENGINEERING, INC.

**Russell Square**

February 23, 2018

**PROJECT-GENERATED  
TRAFFIC ASSIGNMENT**

**FIGURE 2B**

### Site Access Conditions

The project proposes to construct one (1) means of ingress/egress that will be located at the southern property boundary. The access will be created by extending a two-lane road (referred to as Cope Lane East) from Santa Barbara Boulevard to the site's proposed entrance/exit. The entrance road will be aligned with an existing right-in/out and left-in (u-turn) median opening on Santa Barbara Boulevard. A right ingress turn lane and left ingress turn lane (u-turn) were previously constructed at the existing median opening and the report concludes that those turn lanes are adequate in length to accommodate the traffic generated by Russell Square (see turn lane analysis below). However, what will be the left-ingress turn lane was previously defined as a u-turn lane which will require restriping to indicate a left turn lane. Also, the right turn lane was previously striped as a recovery lane which will require restriping to indicate a right turn lane.

Santa Barbara Boulevard has a posted speed limits of 45 MPH. Based upon FDOT's Standard Index No. 301, the total taper + deceleration lane will need to be 185' in length. The right turn lane is a free-flow condition, so no turn vehicle storage is required. The left turn lane storage was determined based upon the criteria set forth by the Highway Capacity Manual (see HCS output on page 5.1). As determined, the southbound left turn queue will be less than 2 vehicles/hour which will require a minimum storage of 50'. Therefore, no further site access improvements are required.

**Table C**  
**Build-out Traffic Demands vs. Existing Intersection Improvements**

Intersection	SB Left Ingress Turn Lane	NB Right Ingress Turn Lane
Cope Lane E. @ Santa Barbara Blvd	Existing = 340' <i>Req. Decel+ Taper = 185'</i> <i>Req. Storage = 50'</i>	Existing = 300' <i>Req. Decel+ Taper = 185'</i> <i>Req. Storage = 0'</i>

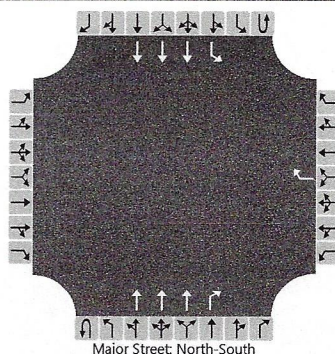


# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	JMB Transportation Eng	Intersection	
Agency/Co.		Jurisdiction	
Date Performed	5/17/2018	East/West Street	Cope Lane East
Analysis Year	2023	North/South Street	Santa Barbara Blvd
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	1	0	0	3	1	0	1	3	0
Configuration								R			T	R		L	T	
Volume (veh/h)								46			787	23	10	55	1181	
Percent Heavy Vehicles (%)								0					3	0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No				No							
Median Type   Storage	Left Only								1							

## Critical and Follow-up Headways

Base Critical Headway (sec)								7.1					5.6	5.3		
Critical Headway (sec)								7.10					5.66	5.30		
Base Follow-Up Headway (sec)								3.9					2.3	3.1		
Follow-Up Headway (sec)								3.90					2.33	3.10		

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								48						68		
Capacity, c (veh/h)								506						489		
v/c Ratio								0.10						0.14		
95% Queue Length, Q <sub>95</sub> (veh)								0.3						0.5		
Control Delay (s/veh)								12.9						13.6		
Level of Service (LOS)								B						B		
Approach Delay (s/veh)					12.9								0.7			
Approach LOS					B											



### **2017 thru 2023 Project Build-out Traffic Conditions**

In order to establish 2017 thru 2023 project build-out traffic conditions, two forecasting methods were used.

The first traffic forecasting method was the County's traffic count data was adjusted for peak season conditions, peak hour conditions, peak direction, and an annual growth rate was then applied. The peak season/peak hour/peak direction and annual growth rates were derived from the 2017 Collier County AUIR Report. Using the annual growth rate, the 2023 background traffic conditions were determined, which are depicted in Table 2B.

The second traffic forecasting method was to add the vested trips (trip bank) identified in the 2017 AUIR report to the adjusted peak season, peak hour and peak direction traffic counts. The vested trips "+" 2023 background traffic volumes are depicted in Table 2B.

The greater of the two values produced by the two forecasting procedures was then considered to reflect the 2023 background traffic. The net new project generated traffic was then added to the background traffic. Table 2C provides a summary of the 2017 thru 2023 traffic conditions and the roadways' level of service and remaining available capacity. As shown, all project impacted roadways will continue to operate at the County's adopted minimum level of service thresholds at project build-out.

**TABLE 2B**  
**2017 & 2023 ROADWAY LINK VOLUMES**

		Per Growth Rate Method				Per Vested Trips Method			
		2023				2023			
		2017 AUJR Traffic (vphpd)	AUJR PK DIR	Growth Rate per AUJR	Peak Hour PK Direction Background (vphpd)	Trip Bank (vphpd)	Peak Hour PK Direction Background Per Vested Trips (vphpd)		
15.0	Davis Boulevard								
16.1	County Barn to Santa Barbara Santa Barbara to Radio Rd	1440 700	E E	2.00% 2.00%	1622 788	144 163	1584 863		
74.0	Rattlesnake Ham.								
75.0	County Barn to Santa Barbara Santa Barbara to C.R. 951	700 490	W W	2.00% 2.00%	788 552	40 171	740 661		
78.0	Santa Barbara Blvd								
79.1	Radio Rd to Davis Blvd Davis Blvd to Site	1350 890	N S	3.98% 4.00%	1706 1126	213 112	1563 1002		
79.2	Site to Rattlesnake Hammock	890	S	4.00%	1126	112	1002		

**TABLE 2C**  
**2023 ROADWAY LINK VOLUME/CAPACITY ANALYSIS**

	2017 Peak Hour PK Direction (vphpd)	2023 Peak Hour				Project				2023 Build-Out			
		PK Direction	Background	Bkgd	PK Direction	PK Hr	PK Hr	PK Hr	PK Hr	PK Hr	PK Hr	PK Hr	PK Hr
		LOS	(vphpd)	Dir	LOS	(vphpd)	Dir	Non-PK Dir	Non-PK Dir	Dir	(vphpd)	PK Dir	PK Dir
15.0	Davis Boulevard	C	1440	E	C	20	E	12	W	W	1641	2200	2200
16.1	County Barn to Santa Barbara Santa Barbara to Radio Rd	B	700	E	B	12	W	7	E	E	870	2900	2900
												v/c Ratio	v/c Ratio
												0.75	0.30
74.0	Rattlesnake Ham.	B	700	W	B	16	E	9	W	W	798	1900	1900
75.0	County Barn to Santa Barbara Santa Barbara to C.R. 951	B	490	W	B	8	W	5	E	E	669	2900	2900
												0.42	0.23
78.0	Santa Barbara Blvd	B	1350	N	B	23	S	14	N	N	1720	3100	3100
79.1	Davis Blvd to Site	B	890	S	B	55	S	32	N	N	1181	3100	3100
79.2	Site to Rattlesnake Hammock	B	890	S	B	23	N	14	S	S	1140	3100	3100
												0.55	0.38
												0.37	0.37
												LOS	LOS
												C	C
												B	B
												B	B
												B	B
												B	B
												B	B