

# QUALITATIVE ASSESSMENT OF INTERSECTION OPERATIONS

## State Road 40 at Interstate 95 Northbound Ramps

Section 79100

M.P. 26.354

Volusia County

Prepared for:

## FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5 TRAFFIC OPERATIONS

719 South Woodland Boulevard, MS 3-562

DeLand, Florida 32720



Continuing Service Contract for Traffic Operations

Financial Project Identification Number: 237974-1-32-17

Contract Number: CA652

TEDS Contract Number: 11265

Task Work Order: 12

Study: 2

Prepared by:

**Traffic Engineering Data Solutions, Inc.**

80 Spring Vista Drive

DeBary, Florida 32713

January 2021

This item has been digitally signed and sealed by

On the date adjacent to the seal

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

## TABLE OF CONTENTS

<b>INTRODUCTION .....</b>	<b>1</b>
<b>EXISTING CONDITIONS.....</b>	<b>2</b>
<b>TRAFFIC VOLUMES.....</b>	<b>8</b>
<b>COLLISION ANALYSIS.....</b>	<b>9</b>
<b>QUALITATIVE ASSESSMENT.....</b>	<b>13</b>
OPERATIONS .....	13
SAFETY: .....	14
MAINTENANCE: .....	15
<b>IMPROVEMENT RECOMMENDATIONS .....</b>	<b>16</b>
<b>APPENDIX.....</b>	<b>18</b>

## LIST OF FIGURES

FIGURE 1 GENERAL LOCATION MAP .....	1
FIGURE 2 GENERAL LOCATION AERIAL.....	2
FIGURE 3 EXISTING CONDITIONS DIAGRAM .....	4
FIGURE 4 SUMMARY OF PEAK-HOUR TURNING MOVEMENTS.....	8
FIGURE 5 COLLISION DIAGRAM .....	12
FIGURE 6 IMPROVEMENTS DIAGRAM .....	17

## LIST OF TABLES

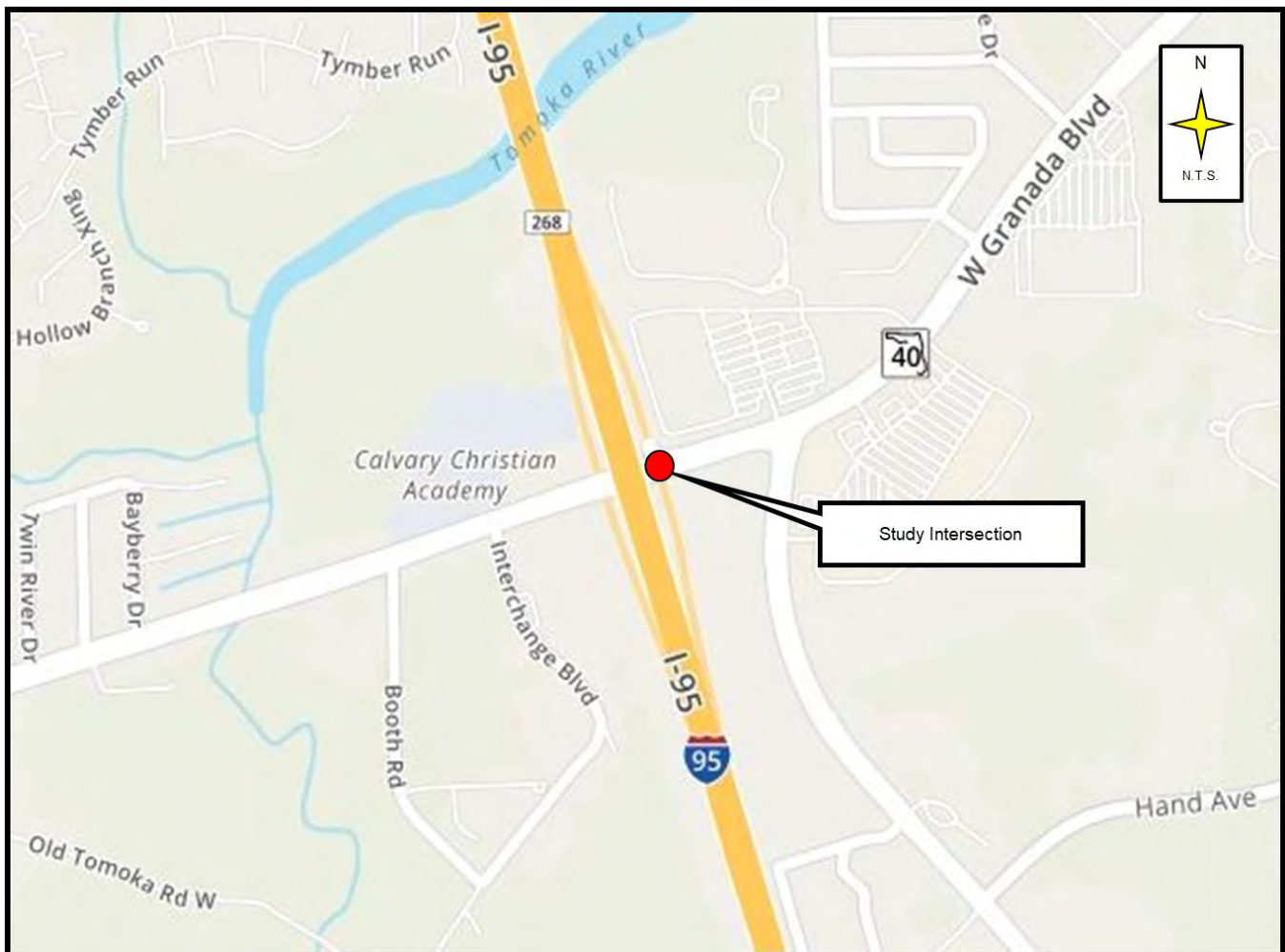
TABLE 1 EXISTING CONDITIONS.....	3
TABLE 2 SUMMARY OF COLLISION DATA.....	10

## **INTRODUCTION**

Traffic Engineering Data Solutions, Inc. (TEDS) was retained on behalf of the Florida Department of Transportation (FDOT) to conduct a Qualitative Assessment of Intersection Operations for the intersection of State Road (S.R.) 40 at the Interstate 95 (I-95) northbound ramps, located in Ormond Beach (Volusia County), Florida. A location map of the study intersection is shown below as **Figure 1**.

The study was initiated by FDOT to investigate if right-turn on red restriction is needed for the ramp to reduce downstream weaving conflicts. The analysis methods used in completing this study are consistent with the Manual on Uniform Traffic Control Devices (MUTCD), FDOT's Manual on Uniform Traffic Studies (MUTS), the Traffic Engineering Manual (TEM), and engineering judgment. This report documents existing conditions, vehicle / pedestrian / bicycle counts, collision analysis, qualitative assessment, and recommendations.

**Figure 1**  
**General Location Map**  
**S.R. 40 at I-95 Northbound Ramps**



Source: MapQuest

## EXISTING CONDITIONS

S.R. 40 is an east/west arterial that extends east from Marion County, through the study intersection, to S.R. A1A in Ormond Beach. At the study intersection, S.R. 40 is a five-lane divided arterial with bike lanes and curb and gutter. I-95 is a north/south interstate highway that extends from the Volusia/Flagler County line to the Flagler/St. Johns County line. At the study interchange, the northbound off-ramp (Exit 268) is the east ramp terminal at the diamond interchange, which allows northbound I-95 traffic to access S.R. 40, and S.R. 40 traffic to access northbound I-95. The intersection of S.R. 40 at the I-95 Northbound Ramps is a signalized intersection. A location aerial is shown below in **Figure 2**.

**Figure 2**  
General Location Aerial  
S.R. 40 at I-95 Northbound Ramps



Source: Google Earth

**Table 1** on the following page summarizes the existing conditions for the study location. An existing condition diagram is provided as **Figure 3** and photographs of the study intersection are included within this study. A straight-line diagram is also included in the **Appendix**.

**Table 1**  
**Existing Conditions**  
**S.R. 40 at I-95 Northbound Ramps**

Feature	Description
Main Street	<ul style="list-style-type: none"> <li>S.R. 40</li> </ul>
Side Street	<ul style="list-style-type: none"> <li>I-95 Northbound Ramps</li> </ul>
Area Location	<ul style="list-style-type: none"> <li>Ormond Beach, Volusia County, Florida</li> </ul>
Adjacent Land Uses	<ul style="list-style-type: none"> <li><u>Northeast:</u> Walmart</li> <li><u>Northwest:</u> I-95 (mainline and southbound off-ramp)</li> <li><u>Southeast:</u> Sunoco Gas Station</li> <li><u>Southwest:</u> I-95 (mainline and southbound on-ramp)</li> </ul>
Traffic Control	<ul style="list-style-type: none"> <li>Signalized Intersection</li> </ul>
Adjacent Signalized Intersections	<ul style="list-style-type: none"> <li><u>North:</u> None</li> <li><u>South:</u> None</li> <li><u>East:</u> Williamson Boulevard/C.R. 4009 – 840 feet</li> <li><u>West:</u> I-95 southbound ramps – 330 feet</li> </ul>
S.R. 40	<ul style="list-style-type: none"> <li><u>Cross Section:</u> Five (5) lane divided arterial (three eastbound lanes and two westbound lanes) with curb and gutter and bicycle lanes</li> <li><u>Posted Speed Limit:</u> 45 mph</li> <li><u>AADT (2019):</u> 31,500 vehicles per day (vpd) west of the intersections and 35,500 vpd east of the intersection</li> <li><u>Eastbound Approach Lanes:</u> One (1) left-turn lane, three (3) through lanes, and one (1) bicycle lane</li> <li><u>Westbound Approach Lanes:</u> Two (2) left-turn lanes (for southbound I-95 ramp), two (2) through lanes, one (1) bicycle lane, and one (1) right-turn lane</li> <li><u>Pedestrian Crossings:</u> None</li> <li><u>Sidewalks:</u> Along both sides of the roadway</li> <li><u>Utilities:</u> Along the north side of the roadway</li> <li><u>Street Lighting:</u> One (1) luminaire in the northeast corner of the intersection</li> </ul>
I-95 Northbound Ramps	<ul style="list-style-type: none"> <li><u>Cross Section:</u> Two (2) lane interstate off-ramp with paved shoulders and outside curb and gutter</li> <li><u>Posted Speed Limit:</u> 35 mph</li> <li><u>AADT (2019):</u> 10,000 vpd</li> <li><u>Northbound Approach Lanes:</u> Two (2) left-turn lanes and two (2) right-turn lanes</li> <li><u>Pedestrian Crossings:</u> Signalized crosswalks across both the north and south legs of the intersection</li> <li><u>Sidewalks:</u> None</li> <li><u>Utilities:</u> None</li> <li><u>Street Lighting:</u> High mast light pole provided in the northwest quadrant of the intersection along the northbound I-95 on-ramp</li> </ul>







**Eastbound Approach Photographs  
S.R. 40 at I-95 Northbound Ramps**



Looking East Towards Intersection



Looking West Away from Intersection

**Westbound Approach Photographs  
S.R. 40 at I-95 Northbound Ramps**



Looking West Towards Intersection



Looking East Away from Intersection



**Northbound Approach Photographs  
S.R. 40 at I-95 Northbound Ramps**



Looking North Towards Intersection

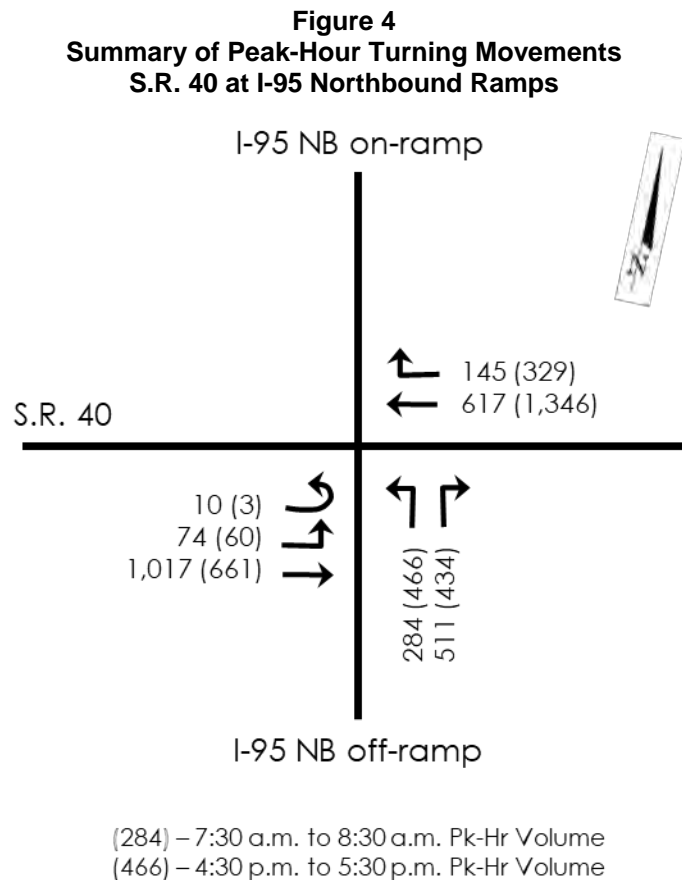


Looking South Away from Intersection

## Traffic Volumes

Eight (8) hours of manual turning movement counts were collected from 7:00 to 9:00 a.m., 11:00 a.m. to 1:00 p.m., and 2:00 to 6:00 p.m. on a weekday at S.R. 40 at the I-95 northbound ramps (included in the **Appendix**).

- The morning peak hour at the intersection occurred from 7:30 to 8:30 a.m. while the afternoon peak hour occurred from 4:30 to 5:30 p.m. As summarized below in **Figure 4**, 2,658 and 3,299 vehicles were counted entering the intersection during the morning and afternoon peak hours, respectively.



- During the eight (8) hours of manually collected turning movement counts, heavy trucks, which include single-unit trucks such as delivery trucks (Class 5 to 7) and tractor-trailer trucks (Class 8 to 15), accounted for approximately 2.0% of the traffic passing through the intersections.
- During the eight (8) hours of manually collected turning movement counts, 18 pedestrians and seven (7) bicyclists were observed traversing the intersection.



**Collision Analysis:** Crash data for the 36-month period between February 1, 2017 and January 31, 2020 was obtained from the FDOT's CAR database and the University of Florida's *Signal Four Analytics*. Forty-nine (49) crashes were reported at the intersection, consisting of the following crash types:

- 16 rear-end;
- 14 angles;
- Nine (9) side-swipe;
- Six (6) right-turn;
- Two (2) left-turn;
- One (1) bicycle; and,
- One (1) other.
- The crashes resulted in no fatalities, 12 injuries, and \$205,150 in estimated property damage.
- 39 crashes occurred during the day and 10 crash occurred at night.
- 43 crashes occurred under dry pavement conditions and six (6) under wet pavement conditions.
- 14 angle crashes occurred as follows:
  - Eight (8) westbound through drivers failed to yield to northbound left-turning vehicles. Seven (7) of these crashes noted the westbound driver disregarding the red traffic signal.
  - Six (6) occurred between northbound left-turning and eastbound through vehicles due to drivers disregarding the red traffic signal.
    - Two (2) noted northbound left-turning drivers to be at fault.
    - Four (4) noted eastbound through drivers to be at fault.
- Nine (9) sideswipe crashes occurred as follows:
  - Three (3) involved northbound left-turning vehicles.
  - One (1) involved eastbound left-turning vehicles.
  - Two (2) involved westbound vehicles in the left-turn lanes to I-95 southbound.
  - Three (3) involved eastbound vehicles changing lanes. One (1) was noted to involve a right-turn-on-red driver.
- Six (6) northbound right-turn crashes occurred, all of which noted the northbound right-turning driver to be at fault for failing to yield to eastbound vehicles. There was no pattern related to the originating northbound right-turn lane and destination eastbound through lane.

A detailed collision summary is provided on the following page in **Table 2**. A collision diagram is provided as **Figure 5**.

**Table 2**  
**Summary of Collision Data**  
**S.R. 40 at I-95 Northbound Ramps**

FLORIDA DEPARTMENT OF TRANSPORTATION												
COLLISION SUMMARY												
Section: 79100				State Road: 40				County: Volusia				
Intersecting route: I-95 NB Ramps				Milepost: 26.354				Data by: BWT				
Study period: 2/1/2017 to 1/31/2020				Date: 3/23/2020								
NO.	DATE	DAY	TIME	FATAL	INJURY	INJURY SEVERITY	PROPERTY DAMAGE	HARMFUL EVENT	DUI	DAY / NIGHT	WET / DRY	CONTRIBUTING CAUSE
1	03/11/17	Saturday	14:34	0	0	1-None	\$8,000	Side-Swipe	No	Day	Dry	Improper Lane Change
2	04/06/17	Thursday	18:47	0	0	1-None	\$2,500	Rear-End	No	Day	Dry	Careless Driving
3	05/10/17	Wednesday	12:55	0	0	1-None	\$8,000	Angle	No	Day	Dry	Ran Red Light
4	06/28/17	Wednesday	12:13	0	1	2-Possible	\$400	Rear-End	No	Day	Dry	Careless Driving
5	07/13/17	Thursday	23:00	0	0	1-None	\$2,500	Angle	No	Night	Dry	Ran Red Light
6	08/07/17	Monday	18:18	0	1	3-Non-Incapacitating	\$0	Bicycle	No	Day	Dry	FTYROW
7	08/31/17	Thursday	22:21	0	0	1-None	\$50,200	Rear-End	No	Night	Dry	Careless Driving
8	10/18/17	Wednesday	8:06	0	0	1-None	\$100	Rear-End	No	Day	Wet	Careless Driving
9	01/25/18	Thursday	7:48	0	0	1-None	\$2,000	Rear-End	No	Day	Dry	Careless Driving
10	02/03/18	Saturday	15:00	0	0	1-None	\$2,000	Angle	No	Day	Dry	Ran Red Light
11	04/04/18	Wednesday	9:36	0	0	1-None	\$500	Side-Swipe	No	Day	Dry	Improper Lane Change
12	05/05/18	Saturday	21:07	0	0	1-None	\$4,500	Right-Turn	No	Night	Dry	FTYROW
13	05/14/18	Monday	11:04	0	0	1-None	\$2,500	Angle	No	Day	Wet	Ran Red Light
14	06/08/18	Friday	15:28	0	0	1-None	\$4,000	Left-Turn	No	Day	Dry	Improper Turn
15	07/06/18	Friday	15:15	0	0	1-None	\$1,000	Other	No	Day	Dry	Unsecured Load
16	07/22/18	Sunday	13:55	0	0	1-None	\$1,800	Angle	No	Day	Wet	FTYROW
17	09/10/18	Monday	8:20	0	0	1-None	\$750	Rear-End	No	Day	Dry	Careless Driving
18	09/12/18	Wednesday	21:25	0	0	1-None	\$3,000	Angle	No	Night	Wet	Ran Red Light
19	09/14/18	Friday	8:35	0	0	1-None	\$1,000	Side-Swipe	No	Day	Dry	Careless Driving
20	12/15/18	Saturday	23:25	0	1	3-Non-Incapacitating	\$1,500	Angle	No	Night	Dry	Ran Red Light
21	01/08/19	Tuesday	9:49	0	0	1-None	\$1,000	Rear-End	No	Day	Dry	Careless Driving
22	01/22/19	Tuesday	8:19	0	0	1-None	\$7,000	Right-Turn	No	Day	Dry	FTYROW
23	02/15/19	Friday	16:18	0	3	4-Incapacitating	\$14,000	Rear-End	No	Day	Dry	Medical
24	03/11/19	Monday	19:29	0	1	3-Non-Incapacitating	\$13,000	Angle	No	Day	Dry	Ran Red Light
25	05/28/19	Tuesday	15:18	0	0	1-None	\$4,000	Side-Swipe	No	Day	Dry	Improper Turn
26	05/30/19	Thursday	15:05	0	0	1-None	\$0	Angle	No	Day	Dry	Ran Red Light
27	06/11/19	Tuesday	7:00	0	0	1-None	\$5,000	Side-Swipe	No	Day	Dry	Improper Lane Change
28	07/22/19	Monday	7:36	0	0	1-None	\$250	Side-Swipe	No	Day	Dry	Improper Lane Change
29	07/22/19	Monday	8:31	0	0	1-None	\$2,100	Angle	No	Day	Dry	Ran Red Light
30	07/27/19	Saturday	13:25	0	0	1-None	\$3,000	Left-Turn	No	Day	Wet	FTYROW
31	07/29/19	Monday	8:10	0	1	4-Incapacitating	\$10,000	Angle	No	Day	Dry	Ran Red Light
32	08/06/19	Tuesday	11:17	0	1	2-Possible	\$3,000	Rear-End	No	Day	Dry	Careless Driving
33	08/12/19	Monday	10:03	0	1	2-Possible	\$300	Rear-End	No	Day	Dry	Careless Driving
34	08/13/19	Tuesday	22:37	0	0	1-None	\$11,000	Right-Turn	No	Night	Dry	FTYROW
35	08/22/19	Thursday	3:10	0	1	3-Non-Incapacitating	\$9,000	Angle	No	Night	Dry	Ran Red Light
36	08/28/19	Wednesday	18:03	0	0	1-None	\$1,000	Rear-End	No	Day	Dry	Careless Driving
37	09/18/19	Wednesday	10:02	0	0	1-None	\$1,500	Side-Swipe	No	Day	Dry	Improper Lane Change
38	09/25/19	Wednesday	22:12	0	0	1-None	\$4,000	Side-Swipe	No	Night	Dry	Improper Lane Change
39	09/26/19	Thursday	16:55	0	0	1-None	\$1,750	Rear-End	No	Day	Dry	Following Too Closely

(Continued)

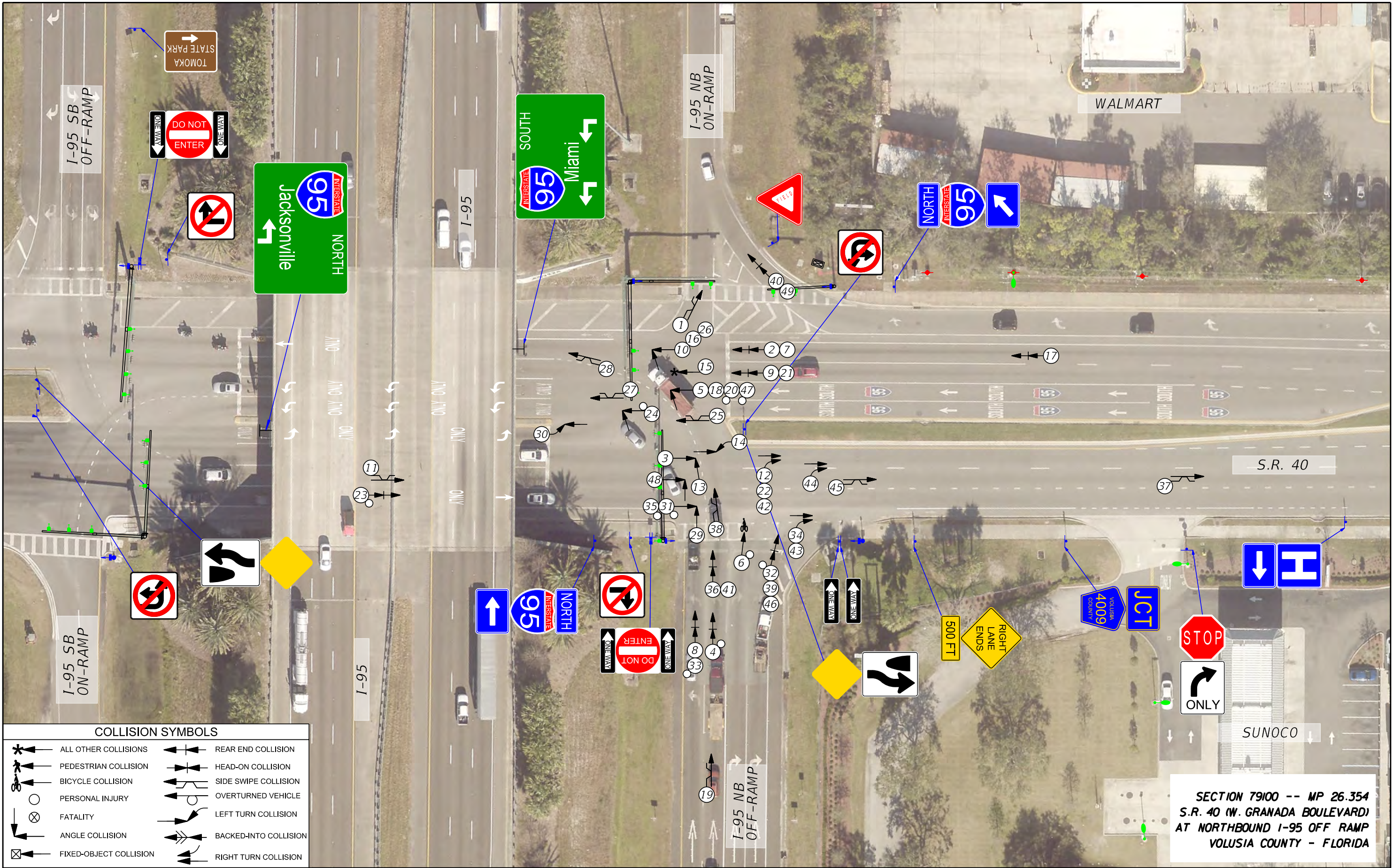


**Table 2 (Continued)**  
**Summary of Collision Data**  
**S.R. 40 at I-95 Northbound Ramps**

FLORIDA DEPARTMENT OF TRANSPORTATION													
COLLISION SUMMARY													
Section: 79100				State Road: 40				County: Volusia					
Intersecting route: I-95 NB Ramps				Milepost: 26.354				Data by: BWT					
Study period: 2/1/2017 to 1/31/2020				Date: 3/23/2020									
NO.	DATE	DAY	TIME	FATAL	INJURY	INJURY SEVERITY	PROPERTY DAMAGE	HARMFUL EVENT	DUI	DAY / NIGHT	WET / DRY	CONTRIBUTING CAUSE	
40	11/25/19	Monday	19:55	0	0	1-None	\$2,000	Rear-End	No	Night	Dry	Careless Driving	
41	11/26/19	Tuesday	13:06	0	0	1-None	\$1,000	Rear-End	No	Day	Dry	Careless Driving	
42	12/18/19	Wednesday	16:19	0	0	1-None	\$2,000	Right-Turn	No	Day	Dry	FTYROW	
43	12/26/19	Thursday	11:20	0	0	1-None	\$3,500	Right-Turn	No	Day	Dry	FTYROW	
44	12/28/19	Saturday	12:32	0	0	1-None	\$2,000	Right-Turn	No	Day	Wet	FTYROW	
45	12/31/19	Tuesday	4:30	0	0	1-None	\$1,000	Side-Swipe	No	Day	Dry	Improper Lane Change	
46	01/09/20	Thursday	9:56	0	0	1-None	\$500	Rear-End	No	Day	Dry	Careless Driving	
47	01/12/20	Sunday	0:52	0	1	2-Possible	\$2,000	Angle	No	Night	Dry	Ran Red Light	
48	01/24/20	Friday	15:15	0	0	1-None	\$3,000	Angle	No	Day	Dry	Ran Red Light	
49	01/28/20	Tuesday	14:14	0	0	1-None	\$1,000	Rear-End	No	Day	Dry	Careless Driving	
TOTAL				0	12		\$205,150						
TOTAL NO.	Injury Severity				Angle	Rear-End	Side-Swipe	Right-Turn	Left-Turn	Bicycle	Other		
	Property Damage Only		Injury	Fatality									
49	39		10	0	14	16	9	6	2	1	1	0	0
Percent	80%		20%	0%	29%	33%	18%	12%	4%	2%	2%	0%	0%
CONTRIB-CAUSE	Time of Day		Pavement Cond.		Ran Red Light	Improper Lane Change	Careless Driving	Following Too Closely	FTYROW	Medical	Improper Turn	Unsecured Load	
	Day	Night	Dry	Wet									
Total	39	10	43	6	13	7	15	1	9	1	2	1	
Percent	80%	20%	88%	12%	27%	14%	31%	2%	18%	2%	4%	2%	

Source: Florida Department of Transportation CAR Database and University of Florida's Signal Four Analytics







## **QUALITATIVE ASSESSMENT**

The intersection of S.R. 40 at I-95 northbound ramps was observed by a registered professional engineer during the morning and afternoon peak periods. The goal of the observations was to determine the need for any improvements to enhance the safety and efficiency of the study intersection.

### **Operations:**

Operations include the efficiency of operation and interaction of motor vehicles, pedestrians, and bicycles at the intersection.

### *General Observations:*

- S.R. 40 serves as an east/west arterial roadway while Interstate 95 serves as a north/south interstate roadway throughout Florida and the eastern seaboard of the United States. S.R. 40 provides access to commercial businesses, local streets and beaches. This condition leads to intersection usage by local residents as well as travelers unfamiliar with the area searching for fuel and other travel related needs.
- Pedestrian activity through the intersection is low with 18 pedestrians (eastbound and westbound) crossing the intersection during the 8-hour count period. Bicycle usage through the intersection was an infrequent occurrence, however was observed along SR 40 during all of the observation and data collection periods.
- Vehicles traveling on S.R. 40 were generally observed to be traveling at or below the 45-mph posted speed limit during the peak period.
- The signalized intersection of S.R. 40 at Williamson Boulevard is located 840 feet east of the I-95 northbound ramps. Williamson Boulevard provides a parallel alternate route to I-95 from south of S.R. 421 to S.R. 40.
- The study intersection is part of a coordinated system that includes the I-95 southbound ramp intersection (330 feet to the west). Circulation between both intersections appeared efficient with few phase failures or queue spillbacks from one intersection to the other during either peak period.
- Dual left-turn and dual right-turn lanes are provided on the I-95 northbound off-ramp. The northbound right-turn movement is higher, averaging 398 vph during the 8-hour count period. Left-turn volumes averaged 332 vph throughout the 8-hour count period. The left-turn signal phase is concurrent with the westbound through signal phase at the I-95 southbound ramp intersection. Occasional phase failures were observed with the left-turn movement during the afternoon peak hour.
- Right-turn-on-red (RTOR) movements are permitted from both northbound right-turn lanes. RTOR ranged from 53% to 77% of the total right-turn volume, averaging 68% over the 8-hour count period.
- During the protected westbound left-turn phase at the southbound ramp, there were no eastbound vehicles travelling to the northbound ramp intersection. This created periods with no approaching vehicles to conflict with the RTOR movement. RTOR drivers were observed completing their turn quickly and efficiently, often without coming to a complete stop first.

- While RTOR movement is permitted and observed to function without significant conflicts, some challenges were observed:
  - From the northbound stop bar, visibility to the west can be restricted by the signal mast arm on the southwest corner. Right-turning drivers were observed travelling beyond the stop bar to get a better view of approaching eastbound vehicles.



Looking west from the stop bar of the inside northbound right-turn lane.

- Depending on their vehicle size, larger vehicles in the inside right-turn lane appeared to restrict the visibility of right-turning drivers (in smaller vehicles) in the outside turn lane.
- Right-turning drivers were observed turning within smaller gaps in approaching eastbound through vehicles, resulting in eastbound drivers braking or changing lanes to avoid a collision.
- The gore striping adjacent to the outside right-turn lane is worn, resulting in some drivers following the curb radius to guide them through the turn. Following the curb radius results in the vehicle being more parallel than perpendicular to S.R.40 while attempting to turn right-on-red and the drivers' visibility of approaching eastbound vehicles can become restricted.
- The outermost right-turn lane is directed to the outside through lane on S.R 40 and the inside right-turn lane is directed to the middle through lane. The outside lane on S.R. 40 ultimately becomes a right-turn lane drop at Williamson Boulevard. During the northbound right-turn signal phase, occasional weaving conflicts were observed between right-turning drivers who intended on travelling eastbound beyond Williamson Boulevard and vehicles already in the middle through lane (also travelling through the Williamson Boulevard intersection).

### Safety:

In addition to the collision analysis, the following observations were made with respect to the safety of the study intersection:

- A collision summary was performed for the 36-month period from February 1, 2017 to January 31, 2020. A total of 49 collisions were reported, resulting in 12 injuries and \$205,150 in estimated property damage.
- 13 of the 14 angle crashes were noted to be the result of drivers disregarding the red traffic signal. Four (4) westbound and one (1) eastbound angle crash occurred during the hours from 9:30 p.m. to 3:00 a.m. The remaining westbound and all eastbound angle crashes occurred during daylight hours. None of the crash reports noted the at-fault drivers' vision was obstructed.



- All signal heads are mounted horizontally and backplates are provided on the east/west facing signal heads. 12 of the 14 angle crashes were the result of eastbound and westbound drivers disregarding the red traffic signal. **It is recommended retroreflective strips be added to the existing backplates of the east/west facing signal heads.**
- Six (6) right turn crashes occurred when northbound right-turning drivers failed to yield to eastbound through vehicles. Four (4) of these occurred during daylight hours and two (2) under dark conditions. A recurrent pattern for the right-turn crashes was not evident, crashes occurred in both the outside and inside turn lanes and at various times of the day. Due to the high volume of right-turns and the observed efficiency with the RTOR movements, **it is recommended northbound RTOR continue to be permitted at the intersection and right-turn skip striping be added to guide right-turning vehicles into the two inner (inside and middle) through lanes to avoid the weaving associated with the lane drop condition at Williamson Boulevard.**
- Of the nine (9) sideswipe crashes that occurred, one (1) involved a northbound right-turning driver.
- One (1) westbound left-turn crash occurred when a westbound driver performed a prohibited U-turn and struck an eastbound through vehicle. Although a combination No U-Turn/No Left Turn is ground mounted in the median of the westbound approach, five (5) U-turn movements were counted during the 8-hour count period.

#### **Maintenance:**

During the various field reviews, the condition of the study intersection's pavement, striping and signing were observed. The following are observations based on the various field reviews of the intersection:

- The signs, pavement markings and pavement conditions appeared to be in good condition with the exception of the following:
  - The pavement markings (turn arrows, crosswalk, lane lines, outside gore markings) on the northbound approach are faded. **It is recommended the pavement markings be restriped.**
  - The crosswalk and gore stripe pavement markings on the north leg (I-95 northbound on-ramp) of the intersection are faded. **It is recommended the pavement markings be restriped.**
  - The pedestrian signal displays on the northbound approach crossing appeared to be malfunctioning; the white walking man symbol does not display during the walk phase. **It is recommended the signal displays be checked and repaired as needed.**
  - The tactile mats on all four corners are damaged. **It is recommended the tactile mats be replaced.**

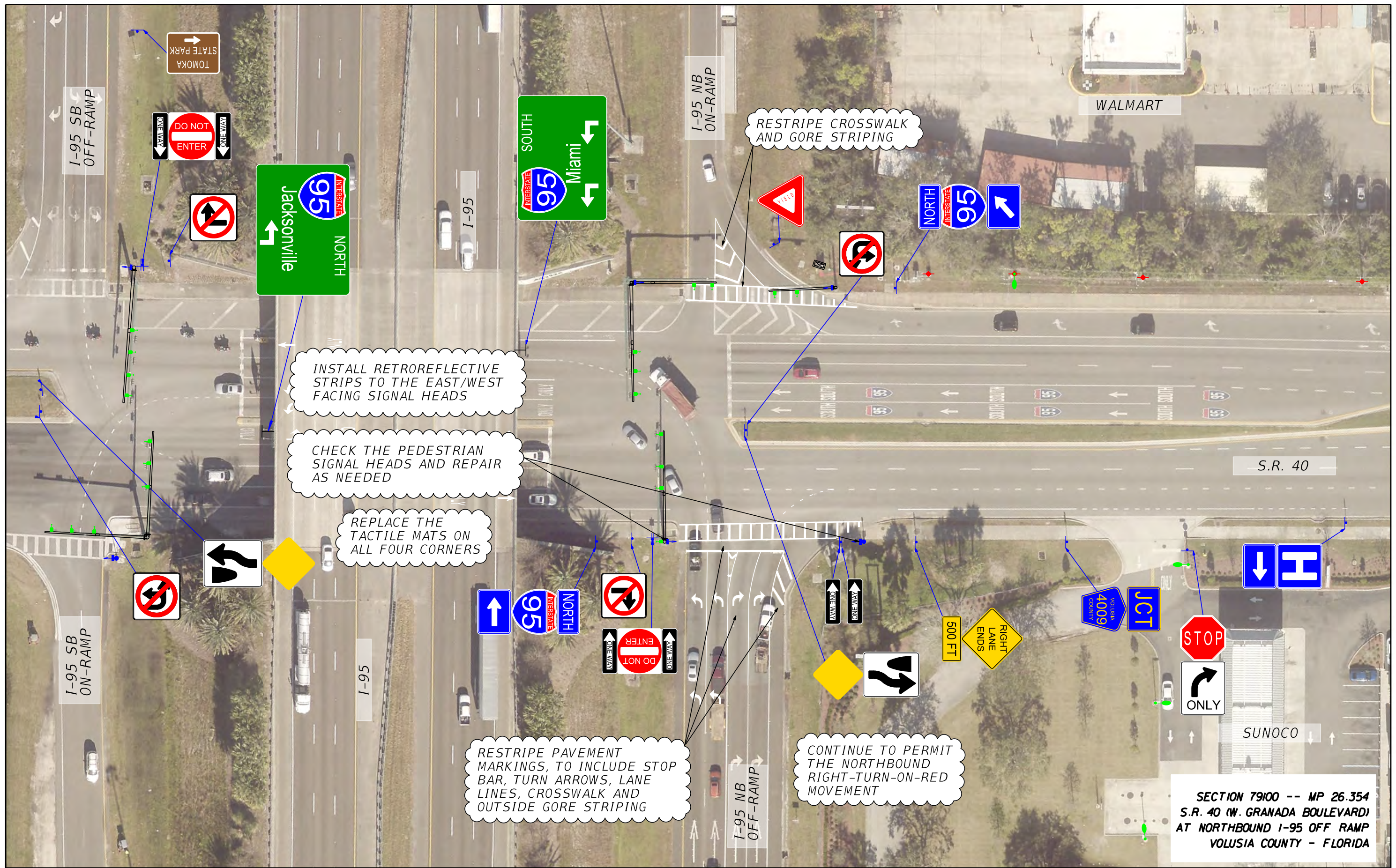
## **IMPROVEMENT RECOMMENDATIONS**

Based on the data collected, field observations, and engineering judgment, the following improvements are recommended for the intersection of S.R. 40 at I-95 northbound ramps, located in Ormond Beach (Volusia County), Florida:

- Continue to permit the northbound right-turn-on-red movement.
- Install retroreflective strips on the existing backplates of the east/west facing signal heads.
- Restripe the pavement markings on the northbound ramp approach, to include the stop bar, turn arrows, crosswalk, line lines and outside gore markings.
- Add northbound right-turn skip striping to guide right-turning vehicles into the two inner (inside and middle) through lanes.
- Restripe the pavement markings on the north leg (I-95 northbound on-ramp), to include the crosswalk and gore markings.
- Replace the tactile mats on all four corners.
- Check the pedestrian signal displays on the northbound approach crosswalk and repair as needed.

These improvements are depicted on the following page as an Improvements Diagram in **Figure 6**.





SECTION 79100 -- MP 26.354  
S.R. 40 (W. GRANADA BOULEVARD)  
AT NORTHBOUND I-95 OFF RAMP  
VOLUSIA COUNTY - FLORIDA



# **APPENDIX**



Version: 1.4.2.24 02/13/2017

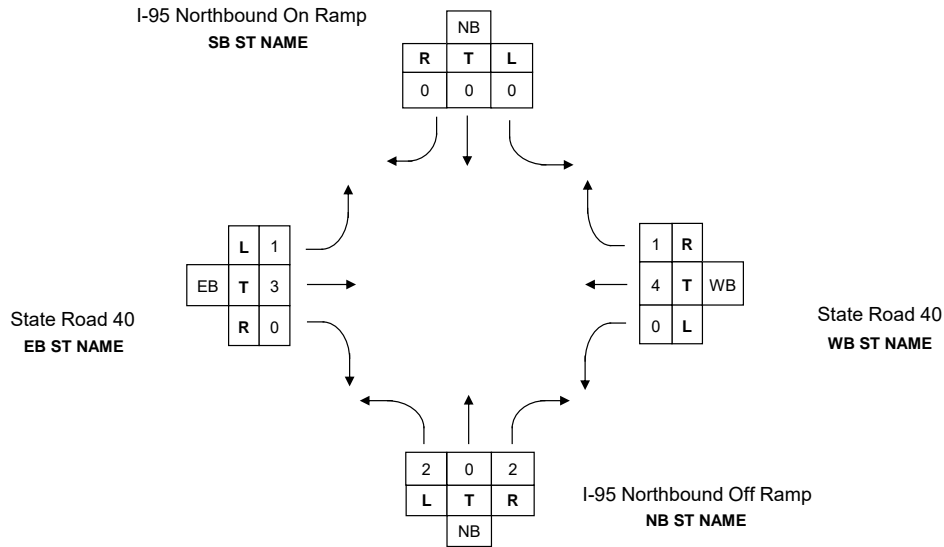
**FLORIDA DEPARTMENT OF TRANSPORTATION**

**SUMMARY OF VEHICLE MOVEMENTS**

SECTION 79100 CITY Ormond Beach COUNTY Volusia  
 STATE ROUTE State Road 40 INTERSECTING ROUTE I-95 Northbound Ramps  
 OBSERVER TEDS DATE 3/18/2020 MILEPOST 26.354  
 WEATHER Sunny ROAD CONDITION Good

REMARKS

FORM COMPLETED BY CML DATE 04/07/20



TIME	NORTHBOUND					SOUTHBOUND					TOTAL	EASTBOUND					WESTBOUND					TOTAL
BEGIN/END	L	T	R	RTOR	TOT	L	T	R	U	TOT	N/S	L	T	R	U	TOT	L	T	R	U	TOT	E/W
7:00 - 8:00	263	1	425	53%	690	0	0	0	0	0	690	72	870	0	5	947	0	554	134	0	688	1,635
8:00 - 9:00	274	1	469	61%	745	0	0	0	0	0	745	89	957	0	10	1,056	0	672	160	0	832	1,888
11:00 - 12:00	255	2	339	71%	597	0	0	0	0	0	597	59	864	0	10	933	0	966	237	0	1,203	2,136
12:00 - 1:00	280	0	396	74%	677	0	0	0	0	0	677	64	987	0	4	1,055	0	1,029	237	1	1,267	2,322
2:00 - 3:00	271	0	371	76%	643	0	0	0	0	0	643	76	831	0	3	910	0	975	250	2	1,227	2,137
3:00 - 4:00	334	0	387	77%	722	0	0	0	0	0	722	56	770	0	8	834	0	1,139	252	1	1,392	2,226
4:00 - 5:00	476	0	410	66%	887	0	0	0	0	0	887	66	661	0	4	731	0	1,250	303	1	1,554	2,285
5:00 - 6:00	499	0	388	70%	888	0	0	0	0	0	888	58	672	0	1	731	0	1,299	261	0	1,560	2,291
TOTAL	2,652	4	3,185		5,846	0	0	0	0	0	5,846	540	6,612	0	45	7,197	0	7,884	1,834	5	9,723	16,920

Percentage	45%	0%	54%	68%		0%	0%	0%	0%			8%	92%	0%	1%		0%	81%	19%	0%		
Average	332	1	398	1	731	0	0	0	0	0		68	827	0	6	900	0	986	229	1	1,215	
Maximum	499	2	469	1		0	0	0	0			89	987	0	10		0	1299	303	2		
Minimum	255	0	339	0.5271		0	0	0	0			56	661	0	1		0	554	134	0		

FLORIDA DEPARTMENT OF TRANSPORTATION

PEDESTRIAN MOVEMENT SUMMARY

SECTION 79100 CITY Ormond Beach COUNTY Volusia  
 STATE ROUTE State Road 40 INTERSECTING ROUTE I-95 Northbound Ramps  
 OBSERVER TEDS DATE 3/18/2020

REMARKS

FORM COMPLETED BY CML DATE 04/07/20

H O U R S	West side of			East side of			North side of			South side of			GRAND TOTAL
	I-95 Northbound Ramps			I-95 Northbound Ramps			State Road 40			State Road 40			
	NB	SB	TOTAL	NB	SB	TOTAL	EB	WB	TOTAL	EB	WB	TOTAL	
7:00 - 8:00	0	0	0	0	0	0	0	1	1	0	1	1	2
8:00 - 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 - 12:00	0	0	0	0	0	0	1	1	2	0	1	1	3
12:00 - 1:00	0	0	0	0	0	0	1	1	2	0	0	0	2
2:00 - 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 - 4:00	0	0	0	0	0	0	0	1	1	3	5	8	9
4:00 - 5:00	0	0	0	0	0	0	0	0	0	2	0	2	2
5:00 - 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	2	4	6	5	7	12	18



FLORIDA DEPARTMENT OF TRANSPORTATION

BICYCLE MOVEMENT SUMMARY

SECTION 79100 CITY Ormond Beach COUNTY Volusia  
 STATE ROUTE State Road 40 INTERSECTING ROUTE I-95 Northbound Ramps  
 OBSERVER TEDS DATE 3/18/2020

REMARKS

FORM COMPLETED BY CML DATE 04/07/20

H O U R S	West side of			East side of			North side of			South side of			GRAND TOTAL
	I-95 Northbound Ramps			I-95 Northbound Ramps			State Road 40			State Road 40			
	NB	SB	TOTAL	NB	SB	TOTAL	EB	WB	TOTAL	EB	WB	TOTAL	
7:00 - 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 - 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 - 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 - 1:00	0	0	0	0	0	0	0	1	1	2	1	3	4
2:00 - 3:00	0	0	0	0	0	0	0	0	0	1	0	1	1
3:00 - 4:00	0	0	0	0	0	0	0	0	0	1	0	1	1
4:00 - 5:00	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 - 6:00	0	0	0	0	0	0	0	1	1	0	0	0	1
TOTAL	0	0	0	0	0	0	0	2	2	4	1	5	7

Traffic Engineering Data Solutions Inc.

File Name : SR 40 at I-95 NB Ramps TMC (8-hr)

Site Code : 00000000

Start Date : 3/18/2020

Page No : 1

Groups Printed- Heavy Trucks

	I-95 NORTHBOUND OFF RAMP Northbound					I-95 NORTHBOUND ON RAMP Southbound					STATE ROAD 40 Eastbound					STATE ROAD 40 Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
07:00 AM	1	0	1	0	2	0	0	0	0	0	0	3	0	0	3	0	4	0	0	4	9
07:15 AM	4	0	3	0	7	0	0	0	0	0	0	0	0	0	0	0	4	2	0	6	13
07:30 AM	2	0	4	0	6	0	0	0	0	0	0	3	0	0	3	0	1	2	0	3	12
07:45 AM	4	0	3	0	7	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	10
Total	11	0	11	0	22	0	0	0	0	0	0	6	0	0	6	0	12	4	0	16	44
08:00 AM	3	0	6	0	9	0	0	0	0	0	0	7	0	0	7	0	1	0	0	1	17
08:15 AM	0	0	1	0	1	0	0	0	0	0	0	4	0	0	4	0	7	3	0	10	15
08:30 AM	6	0	3	0	9	0	0	0	0	0	0	2	0	0	2	0	3	2	0	5	16
08:45 AM	3	0	5	0	8	0	0	0	0	0	1	3	0	0	4	0	9	0	0	9	21
Total	12	0	15	0	27	0	0	0	0	0	1	16	0	0	17	0	20	5	0	25	69
*** BREAK ***																					
11:00 AM	6	0	1	0	7	0	0	0	0	0	1	0	0	0	1	0	1	2	0	3	11
11:15 AM	1	0	2	0	3	0	0	0	0	0	0	3	0	0	3	0	9	3	0	12	18
11:30 AM	4	0	7	0	11	0	0	0	0	0	1	8	0	0	9	0	7	1	0	8	28
11:45 AM	1	0	1	0	2	0	0	0	0	0	2	2	0	0	4	0	4	1	0	5	11
Total	12	0	11	0	23	0	0	0	0	0	4	13	0	0	17	0	21	7	0	28	68
12:00 PM	3	0	2	0	5	0	0	0	0	0	0	2	0	0	2	0	6	5	0	11	18
12:15 PM	7	0	5	0	12	0	0	0	0	0	2	1	0	0	3	0	4	0	0	4	19
12:30 PM	2	0	3	0	5	0	0	0	0	0	2	5	0	0	7	0	5	2	0	7	19
12:45 PM	3	0	2	0	5	0	0	0	0	0	2	4	0	0	6	0	3	1	0	4	15
Total	15	0	12	0	27	0	0	0	0	0	6	12	0	0	18	0	18	8	0	26	71
*** BREAK ***																					
02:00 PM	2	0	2	0	4	0	0	0	0	0	1	6	0	0	7	0	4	3	0	7	18
02:15 PM	1	0	1	0	2	0	0	0	0	0	1	0	0	0	1	0	6	0	0	6	9
02:30 PM	5	0	2	0	7	0	0	0	0	0	1	2	0	0	3	0	3	1	0	4	14
02:45 PM	2	0	3	0	5	0	0	0	0	0	3	4	0	0	7	0	1	0	0	1	13
Total	10	0	8	0	18	0	0	0	0	0	6	12	0	0	18	0	14	4	0	18	54
03:00 PM	1	0	3	0	4	0	0	0	0	0	1	6	0	0	7	0	7	5	0	12	23
03:15 PM	1	0	2	0	3	0	0	0	0	0	2	1	0	0	3	0	4	1	0	5	11
03:30 PM	0	0	3	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
03:45 PM	4	0	2	0	6	0	0	0	0	0	1	4	0	0	5	0	4	1	0	5	16
Total	6	0	10	0	16	0	0	0	0	0	4	14	0	0	18	0	15	7	0	22	56
04:00 PM	0	0	1	0	1	0	0	0	0	0	0	5	0	0	5	0	4	2	0	6	12
04:15 PM	3	0	2	0	5	0	0	0	0	0	0	2	0	0	2	0	2	1	0	3	10
04:30 PM	1	0	7	0	8	0	0	0	0	0	1	2	0	0	3	0	6	0	0	6	17
04:45 PM	1	0	3	0	4	0	0	0	0	0	0	3	0	0	3	0	3	3	0	6	13
Total	5	0	13	0	18	0	0	0	0	0	1	12	0	0	13	0	15	6	0	21	52
05:00 PM	1	0	1	0	2	0	0	0	0	0	3	4	0	0	7	0	2	1	0	3	12
05:15 PM	1	0	2	0	3	0	0	0	0	0	0	1	0	0	1	0	3	0	0	3	7
05:30 PM	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	9
05:45 PM	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1	0	4	0	0	4	7
Total	7	0	4	0	11	0	0	0	0	0	3	6	0	0	9	0	14	1	0	15	35
Grand Total	78	0	84	0	162	0	0	0	0	0	25	91	0	0	116	0	129	42	0	171	449
Apprch %	48.1	0	51.9	0		0	0	0	0		21.6	78.4	0	0		0	75.4	24.6	0		
Total %	17.4	0	18.7	0	36.1	0	0	0	0	0	5.6	20.3	0	0	25.8	0	28.7	9.4	0	38.1	

Traffic Engineering Data Solutions Inc.

File Name : SR 40 at I-95 NB Ramps TMC (8-hr)

Site Code : 00000000

Start Date : 3/18/2020

Page No : 2

	I-95 NORTHBOUND OFF RAMP Northbound					I-95 NORTHBOUND ON RAMP Southbound					STATE ROAD 40 Eastbound					STATE ROAD 40 Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	3	0	6	0	9	0	0	0	0	0	0	7	0	0	7	0	1	0	0	1	17
08:15 AM	0	0	1	0	1	0	0	0	0	0	0	4	0	0	4	0	7	3	0	10	15
08:30 AM	6	0	3	0	9	0	0	0	0	0	0	2	0	0	2	0	3	2	0	5	16
08:45 AM	3	0	5	0	8	0	0	0	0	0	1	3	0	0	4	0	9	0	0	9	21
Total Volume	12	0	15	0	27	0	0	0	0	0	1	16	0	0	17	0	20	5	0	25	69
% App. Total	44.4	0	55.6	0		0	0	0	0		5.9	94.1	0	0		0	80	20	0		
PHF	.500	.000	.625	.000	.750	.000	.000	.000	.000	.000	.250	.571	.000	.000	.607	.000	.556	.417	.000	.625	.821

Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM					07:00 AM					08:00 AM					08:00 AM				
+0 mins.	4	0	3	0	7	0	0	0	0	0	0	7	0	0	7	0	1	0	0	1
+15 mins.	2	0	4	0	6	0	0	0	0	0	0	4	0	0	4	0	7	3	0	10
+30 mins.	4	0	3	0	7	0	0	0	0	0	0	2	0	0	2	0	3	2	0	5
+45 mins.	3	0	6	0	9	0	0	0	0	0	1	3	0	0	4	0	9	0	0	9
Total Volume	13	0	16	0	29	0	0	0	0	0	1	16	0	0	17	0	20	5	0	25
% App. Total	44.8	0	55.2	0		0	0	0	0		5.9	94.1	0	0		0	80	20	0	
PHF	.813	.000	.667	.000	.806	.000	.000	.000	.000	.000	.250	.571	.000	.000	.607	.000	.556	.417	.000	.625

Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:30 AM

11:30 AM	4	0	7	0	11	0	0	0	0	0	1	8	0	0	9	0	7	1	0	8	28
11:45 AM	1	0	1	0	2	0	0	0	0	0	2	2	0	0	4	0	4	1	0	5	11
12:00 PM	3	0	2	0	5	0	0	0	0	0	0	2	0	0	2	0	6	5	0	11	18
12:15 PM	7	0	5	0	12	0	0	0	0	0	2	1	0	0	3	0	4	0	0	4	19
Total Volume	15	0	15	0	30	0	0	0	0	0	5	13	0	0	18	0	21	7	0	28	76
% App. Total	50	0	50	0		0	0	0	0		27.8	72.2	0	0		0	75	25	0		
PHF	.536	.000	.536	.000	.625	.000	.000	.000	.000	.000	.625	.406	.000	.000	.500	.000	.750	.350	.000	.636	.679

Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	11:30 AM					10:00 AM					11:15 AM					11:15 AM				
+0 mins.	4	0	7	0	11	0	0	0	0	0	0	3	0	0	3	0	9	3	0	12
+15 mins.	1	0	1	0	2	0	0	0	0	0	1	8	0	0	9	0	7	1	0	8
+30 mins.	3	0	2	0	5	0	0	0	0	0	2	2	0	0	4	0	4	1	0	5
+45 mins.	7	0	5	0	12	0	0	0	0	0	0	2	0	0	2	0	6	5	0	11
Total Volume	15	0	15	0	30	0	0	0	0	0	3	15	0	0	18	0	26	10	0	36
% App. Total	50	0	50	0		0	0	0	0		16.7	83.3	0	0		0	72.2	27.8	0	
PHF	.536	.000	.536	.000	.625	.000	.000	.000	.000	.000	.375	.469	.000	.000	.500	.000	.722	.500	.000	.750

Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 02:30 PM

02:30 PM	5	0	2	0	7	0	0	0	0	0	1	2	0	0	3	0	3	1	0	4	14
02:45 PM	2	0	3	0	5	0	0	0	0	0	3	4	0	0	7	0	1	0	0	1	13
03:00 PM	1	0	3	0	4	0	0	0	0	0	1	6	0	0	7	0	7	5	0	12	23
03:15 PM	1	0	2	0	3	0	0	0	0	0	2	1	0	0	3	0	4	1	0	5	11
Total Volume	9	0	10	0	19	0	0	0	0	0	7	13	0	0	20	0	15	7	0	22	61
% App. Total	47.4	0	52.6	0		0	0	0	0		35	65	0	0		0	68.2	31.8	0		
PHF	.450	.000	.833	.000	.679	.000	.000	.000	.000	.000	.583	.542	.000	.000	.714	.000	.536	.350	.000	.458	.663

Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:45 PM					02:00 PM					02:30 PM					02:15 PM				
+0 mins.	4	0	2	0	6	0	0	0	0	0	1	2	0	0	3	0	6	0	0	6
+15 mins.	0	0	1	0	1	0	0	0	0	0	3	4	0	0	7	0	3	1	0	4
+30 mins.	3	0	2	0	5	0	0	0	0	0	1	6	0	0	7	0	1	0	0	1
+45 mins.	1	0	7	0	8	0	0	0	0	0	2	1	0	0	3	0	7	5	0	12
Total Volume	8	0	12	0	20	0	0	0	0	0	7	13	0	0	20	0	17	6	0	23
% App. Total	40	0	60	0		0	0	0	0		35	65	0	0		0	73.9	26.1	0	
PHF	.500	.000	.429	.000	.625	.000	.000	.000	.000	.000	.583	.542	.000	.000	.714	.000	.607	.300	.000	.479



Traffic Engineering Data Solutions Inc.

File Name : SR 40 at I-95 NB Ramps TMC (8-hr)

Site Code : 00000000

Start Date : 3/18/2020

Page No : 1

Groups Printed- Passenger Vehicles - Heavy Trucks

	I-95 NORTHBOUND OFF RAMP Northbound					I-95 NORTHBOUND ON RAMP Southbound					STATE ROAD 40 Eastbound					STATE ROAD 40 Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
07:00 AM	51	0	61	0	112	0	0	0	0	0	11	143	0	1	155	0	112	31	0	143	410
07:15 AM	63	0	102	0	165	0	0	0	0	0	22	194	0	0	216	0	145	31	0	176	557
07:30 AM	68	1	115	0	184	0	0	0	0	0	18	257	0	2	277	0	152	37	0	189	650
07:45 AM	81	0	147	0	228	0	0	0	0	0	21	276	0	2	299	0	145	35	0	180	707
Total	263	1	425	0	689	0	0	0	0	0	72	870	0	5	947	0	554	134	0	688	2324
08:00 AM	61	0	124	0	185	0	0	0	0	0	17	245	0	4	266	0	144	34	0	178	629
08:15 AM	74	0	125	0	199	0	0	0	0	0	18	239	0	2	259	0	176	39	0	215	673
08:30 AM	69	0	115	0	184	0	0	0	0	0	24	253	0	3	280	0	141	39	0	180	644
08:45 AM	70	1	105	0	176	0	0	0	0	0	30	220	0	1	251	0	211	48	0	259	686
Total	274	1	469	0	744	0	0	0	0	0	89	957	0	10	1056	0	672	160	0	832	2632
*** BREAK ***																					
11:00 AM	66	0	96	0	162	0	0	0	0	0	19	198	0	2	219	0	235	54	0	289	670
11:15 AM	63	0	74	0	137	0	0	0	0	0	12	233	0	4	249	0	224	45	0	269	655
11:30 AM	60	0	85	0	145	0	0	0	0	0	13	217	0	3	233	0	267	68	0	335	713
11:45 AM	66	2	84	0	152	0	0	0	0	0	15	216	0	1	232	0	240	70	0	310	694
Total	255	2	339	0	596	0	0	0	0	0	59	864	0	10	933	0	966	237	0	1203	2732
12:00 PM	71	0	94	0	165	0	0	0	0	0	20	251	0	2	273	0	248	57	0	305	743
12:15 PM	76	0	100	0	176	0	0	0	0	0	15	247	0	1	263	0	266	58	0	324	763
12:30 PM	69	0	116	0	185	0	0	0	0	0	14	252	0	1	267	0	251	61	0	312	764
12:45 PM	64	0	86	0	150	0	0	0	0	0	15	237	0	0	252	0	264	61	1	326	728
Total	280	0	396	0	676	0	0	0	0	0	64	987	0	4	1055	0	1029	237	1	1267	2998
*** BREAK ***																					
02:00 PM	63	0	90	0	153	0	0	0	0	0	22	191	0	0	213	0	261	72	0	333	699
02:15 PM	68	0	98	0	166	0	0	0	0	0	21	203	0	1	225	0	243	49	0	292	683
02:30 PM	69	0	93	0	162	0	0	0	0	0	19	221	0	0	240	0	229	68	1	298	700
02:45 PM	71	0	90	0	161	0	0	0	0	0	14	216	0	2	232	0	242	61	1	304	697
Total	271	0	371	0	642	0	0	0	0	0	76	831	0	3	910	0	975	250	2	1227	2779
03:00 PM	84	0	88	0	172	0	0	0	0	0	12	175	0	1	188	0	290	66	0	356	716
03:15 PM	64	0	92	0	156	0	0	0	0	0	16	225	0	2	243	0	277	69	0	346	745
03:30 PM	77	0	102	0	179	0	0	0	0	0	14	179	0	1	194	0	304	57	1	362	735
03:45 PM	109	0	105	0	214	0	0	0	0	0	14	191	0	4	209	0	268	60	0	328	751
Total	334	0	387	0	721	0	0	0	0	0	56	770	0	8	834	0	1139	252	1	1392	2947
04:00 PM	148	0	90	0	238	0	0	0	0	0	18	164	0	0	182	0	285	64	1	350	770
04:15 PM	95	0	95	0	190	0	0	0	0	0	19	174	0	2	195	0	330	76	0	406	791
04:30 PM	97	0	119	0	216	0	0	0	0	0	16	176	0	2	194	0	323	88	0	411	821
04:45 PM	136	0	106	0	242	0	0	0	0	0	13	147	0	0	160	0	312	75	0	387	789
Total	476	0	410	0	886	0	0	0	0	0	66	661	0	4	731	0	1250	303	1	1554	3171
05:00 PM	108	0	97	0	205	0	0	0	0	0	17	172	0	0	189	0	349	87	0	436	830
05:15 PM	125	0	112	0	237	0	0	0	0	0	14	166	0	1	181	0	362	79	0	441	859
05:30 PM	138	0	107	0	245	0	0	0	0	0	12	159	0	0	171	0	293	42	0	335	751
05:45 PM	128	0	72	0	200	0	0	0	0	0	15	175	0	0	190	0	295	53	0	348	738
Total	499	0	388	0	887	0	0	0	0	0	58	672	0	1	731	0	1299	261	0	1560	3178
Grand Total	2652	4	3185	0	5841	0	0	0	0	0	540	6612	0	45	7197	0	7884	1834	5	9723	22761
Apprch %	45.4	0.1	54.5	0		0	0	0	0		7.5	91.9	0	0.6		0	81.1	18.9	0.1		
Total %	11.7	0	14	0	25.7	0	0	0	0	0	2.4	29	0	0.2	31.6	0	34.6	8.1	0	42.7	
Passenger Vehicles	2574	4	3101	0	5679	0	0	0	0	0	515	6521	0	45	7081	0	7755	1792	5	9552	22312
% Passenger Vehicles	97.1	100	97.4	0	97.2	0	0	0	0	0	95.4	98.6	0	100	98.4	0	98.4	97.7	100	98.2	98
Heavy Trucks	78	0	84	0	162	0	0	0	0	0	25	91	0	0	116	0	129	42	0	171	449
% Heavy Trucks	2.9	0	2.6	0	2.8	0	0	0	0	0	4.6	1.4	0	0	1.6	0	1.6	2.3	0	1.8	2

# Traffic Engineering Data Solutions Inc.

File Name : SR 40 at I-95 NB Ramps TMC (8-hr)

Site Code : 00000000

Start Date : 3/18/2020

Page No : 2

	I-95 NORTHBOUND OFF RAMP Northbound					I-95 NORTHBOUND ON RAMP Southbound					STATE ROAD 40 Eastbound					STATE ROAD 40 Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	68	1	115	0	184	0	0	0	0	0	18	257	0	2	277	0	152	37	0	189	650
07:45 AM	81	0	147	0	228	0	0	0	0	0	21	276	0	2	299	0	145	35	0	180	707
08:00 AM	61	0	124	0	185	0	0	0	0	0	17	245	0	4	266	0	144	34	0	178	629
08:15 AM	74	0	125	0	199	0	0	0	0	0	18	239	0	2	259	0	176	39	0	215	673
Total Volume	284	1	511	0	796	0	0	0	0	0	74	1017	0	10	1101	0	617	145	0	762	2659
% App. Total	35.7	0.1	64.2	0		0	0	0	0		6.7	92.4	0	0.9		0	81	19	0		
PHF	.877	.250	.869	.000	.873	.000	.000	.000	.000	.000	.881	.921	.000	.625	.921	.000	.876	.929	.000	.886	.940
Passenger Vehicles	275	1	497	0	773	0	0	0	0	0	74	1003	0	10	1087	0	605	140	0	745	2605
% Passenger Vehicles	96.8	100	97.3	0	97.1	0	0	0	0	0	100	98.6	0	100	98.7	0	98.1	96.6	0	97.8	98.0
Heavy Trucks	9	0	14	0	23	0	0	0	0	0	0	14	0	0	14	0	12	5	0	17	54
% Heavy Trucks	3.2	0	2.7	0	2.9	0	0	0	0	0	0	1.4	0	0	1.3	0	1.9	3.4	0	2.2	2.0

Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM					07:00 AM					07:45 AM					08:00 AM				
+0 mins.	68	1	115	0	184	0	0	0	0	0	21	276	0	2	299	0	144	34	0	178
+15 mins.	81	0	147	0	228	0	0	0	0	0	17	245	0	4	266	0	176	39	0	215
+30 mins.	61	0	124	0	185	0	0	0	0	0	18	239	0	2	259	0	141	39	0	180
+45 mins.	74	0	125	0	199	0	0	0	0	0	24	253	0	3	280	0	211	48	0	259
Total Volume	284	1	511	0	796	0	0	0	0	0	80	1013	0	11	1104	0	672	160	0	832
% App. Total	35.7	0.1	64.2	0		0	0	0	0		7.2	91.8	0	1		0	80.8	19.2	0	
PHF	.877	.250	.869	.000	.873	.000	.000	.000	.000	.000	.833	.918	.000	.688	.923	.000	.796	.833	.000	.803
Passenger Vehicles	275	1	497	0	773	0	0	0	0	0	80	1000	0	11	1091	0	652	155	0	807
% Passenger Vehicles	96.8	100	97.3	0	97.1	0	0	0	0	0	100	98.7	0	100	98.8	0	97	96.9	0	97
Heavy Trucks	9	0	14	0	23	0	0	0	0	0	0	13	0	0	13	0	20	5	0	25
% Heavy Trucks	3.2	0	2.7	0	2.9	0	0	0	0	0	0	1.3	0	0	1.2	0	3	3.1	0	3

Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 12:00 PM

12:00 PM	71	0	94	0	165	0	0	0	0	0	20	251	0	2	273	0	248	57	0	305	743
12:15 PM	76	0	100	0	176	0	0	0	0	0	15	247	0	1	263	0	266	58	0	324	763
12:30 PM	69	0	116	0	185	0	0	0	0	0	14	252	0	1	267	0	251	61	0	312	764
12:45 PM	64	0	86	0	150	0	0	0	0	0	15	237	0	0	252	0	264	61	1	326	728
Total Volume	280	0	396	0	676	0	0	0	0	0	64	987	0	4	1055	0	1029	237	1	1267	2998
% App. Total	41.4	0	58.6	0		0	0	0	0		6.1	93.6	0	0.4		0	81.2	18.7	0.1		
PHF	.921	.000	.853	.000	.914	.000	.000	.000	.000	.000	.800	.979	.000	.500	.966	.000	.967	.971	.250	.972	.981
Passenger Vehicles	265	0	384	0	649	0	0	0	0	0	58	975	0	4	1037	0	1011	229	1	1241	2927
% Passenger Vehicles	94.6	0	97.0	0	96.0	0	0	0	0	0	90.6	98.8	0	100	98.3	0	98.3	96.6	100	97.9	97.6
Heavy Trucks	15	0	12	0	27	0	0	0	0	0	6	12	0	0	18	0	18	8	0	26	71
% Heavy Trucks	5.4	0	3.0	0	4.0	0	0	0	0	0	9.4	1.2	0	0	1.7	0	1.7	3.4	0	2.1	2.4

Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	11:45 AM					10:00 AM					12:00 PM					11:30 AM				
+0 mins.	66	2	84	0	152	0	0	0	0	0	20	251	0	2	273	0	267	68	0	335
+15 mins.	71	0	94	0	165	0	0	0	0	0	15	247	0	1	263	0	240	70	0	310
+30 mins.	76	0	100	0	176	0	0	0	0	0	14	252	0	1	267	0	248	57	0	305
+45 mins.	69	0	116	0	185	0	0	0	0	0	15	237	0	0	252	0	266	58	0	324
Total Volume	282	2	394	0	678	0	0	0	0	0	64	987	0	4	1055	0	1021	253	0	1274
% App. Total	41.6	0.3	58.1	0		0	0	0	0		6.1	93.6	0	0.4		0	80.1	19.9	0	
PHF	.928	.250	.849	.000	.916	.000	.000	.000	.000	.000	.800	.979	.000	.500	.966	.000	.956	.904	.000	.951
Passenger Vehicles	269	2	383	0	654	0	0	0	0	0	58	975	0	4	1037	0	1000	246	0	1246
% Passenger Vehicles	95.4	100	97.2	0	96.5	0	0	0	0	0	90.6	98.8	0	100	98.3	0	97.9	97.2	0	97.8
Heavy Trucks	13	0	11	0	24	0	0	0	0	0	6	12	0	0	18	0	21	7	0	28
% Heavy Trucks	4.6	0	2.8	0	3.5	0	0	0	0	0	9.4	1.2	0	0	1.7	0	2.1	2.8	0	2.2

Traffic Engineering Data Solutions Inc.

File Name : SR 40 at I-95 NB Ramps TMC (8-hr)

Site Code : 00000000

Start Date : 3/18/2020

Page No : 3

	I-95 NORTHBOUND OFF RAMP Northbound					I-95 NORTHBOUND ON RAMP Southbound					STATE ROAD 40 Eastbound					STATE ROAD 40 Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	97	0	119	0	216	0	0	0	0	0	16	176	0	2	194	0	323	88	0	411	821
04:45 PM	136	0	106	0	242	0	0	0	0	0	13	147	0	0	160	0	312	75	0	387	789
05:00 PM	108	0	97	0	205	0	0	0	0	0	17	172	0	0	189	0	349	87	0	436	830
05:15 PM	125	0	112	0	237	0	0	0	0	0	14	166	0	1	181	0	362	79	0	441	859
Total Volume	466	0	434	0	900	0	0	0	0	0	60	661	0	3	724	0	1346	329	0	1675	3299
% App. Total	51.8	0	48.2	0		0	0	0	0		8.3	91.3	0	0.4		0	80.4	19.6	0		
PHF	.857	.000	.912	.000	.930	.000	.000	.000	.000	.000	.882	.939	.000	.375	.933	.000	.930	.935	.000	.950	.960
Passenger Vehicles	462	0	421	0	883	0	0	0	0	0	56	651	0	3	710	0	1332	325	0	1657	3250
% Passenger Vehicles	99.1	0	97.0	0	98.1	0	0	0	0	0	93.3	98.5	0	100	98.1	0	99.0	98.8	0	98.9	98.5
Heavy Trucks	4	0	13	0	17	0	0	0	0	0	4	10	0	0	14	0	14	4	0	18	49
% Heavy Trucks	0.9	0	3.0	0	1.9	0	0	0	0	0	6.7	1.5	0	0	1.9	0	1.0	1.2	0	1.1	1.5

Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM					02:00 PM					02:00 PM					04:30 PM				
+0 mins.	136	0	106	0	242	0	0	0	0	0	22	191	0	0	213	0	323	88	0	411
+15 mins.	108	0	97	0	205	0	0	0	0	0	21	203	0	1	225	0	312	75	0	387
+30 mins.	125	0	112	0	237	0	0	0	0	0	19	221	0	0	240	0	349	87	0	436
+45 mins.	138	0	107	0	245	0	0	0	0	0	14	216	0	2	232	0	362	79	0	441
Total Volume	507	0	422	0	929	0	0	0	0	0	76	831	0	3	910	0	1346	329	0	1675
% App. Total	54.6	0	45.4	0		0	0	0	0		8.4	91.3	0	0.3		0	80.4	19.6	0	
PHF	.918	.000	.942	.000	.948	.000	.000	.000	.000	.000	.864	.940	.000	.375	.948	.000	.930	.935	.000	.950
Passenger Vehicles	501	0	415	0	916	0	0	0	0	0	70	819	0	3	892	0	1332	325	0	1657
% Passenger Vehicles	98.8	0	98.3	0	98.6	0	0	0	0	0	92.1	98.6	0	100	98	0	99	98.8	0	98.9
Heavy Trucks	6	0	7	0	13	0	0	0	0	0	6	12	0	0	18	0	14	4	0	18
% Heavy Trucks	1.2	0	1.7	0	1.4	0	0	0	0	0	7.9	1.4	0	0	2	0	1	1.2	0	1.1