

MetroPlan Orlando 2014

# Travel Time Studies and B/C Analysis



metroplan orlando  
A REGIONAL TRANSPORTATION PARTNERSHIP



GMB ENGINEERS  
& PLANNERS, INC.

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## INTRODUCTION

### OVERVIEW

MetroPlan Orlando has requested GMB Engineers & Planners, Inc. (GMB) to assess the benefits of the recently completed signal retiming projects on 20 selected roadways spread throughout the tri-county (Orange, Seminole, and Osceola) area in the Central Florida region. Out of the 20 study roadways, three (3) fall within Seminole County, 14 fall within Orange County, and three (3) falls within Osceola County.

To determine whether the benefits from the completed signal retiming projects would outweigh the implementation costs, a Benefit-Cost (B-C) analysis was performed for each of the study roadways using the input parameters collected during the Travel Time (TT) study conducted before (before scenario) and after (after scenario) the implementation of retiming plans.

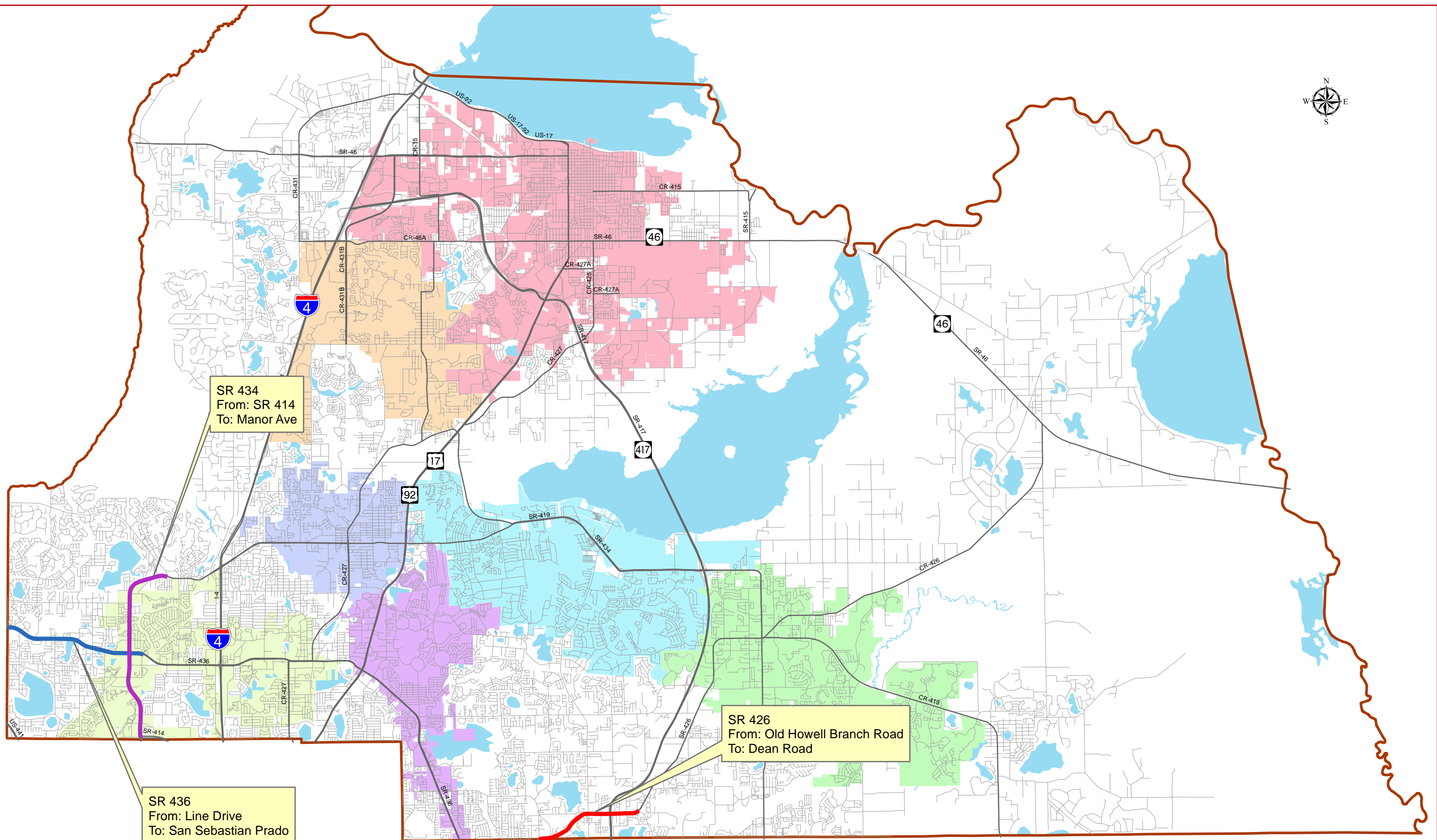
The study roadways for each of these three (3) jurisdictions are depicted in **Figures 1** through **4**. A list of the 20 study roadways with information on segment limits, length, and maintaining jurisdiction is provided in **Table 1**.

This report, in particular, presents the results of the TT studies and the B-C analysis for these recently completed signal-retiming projects.

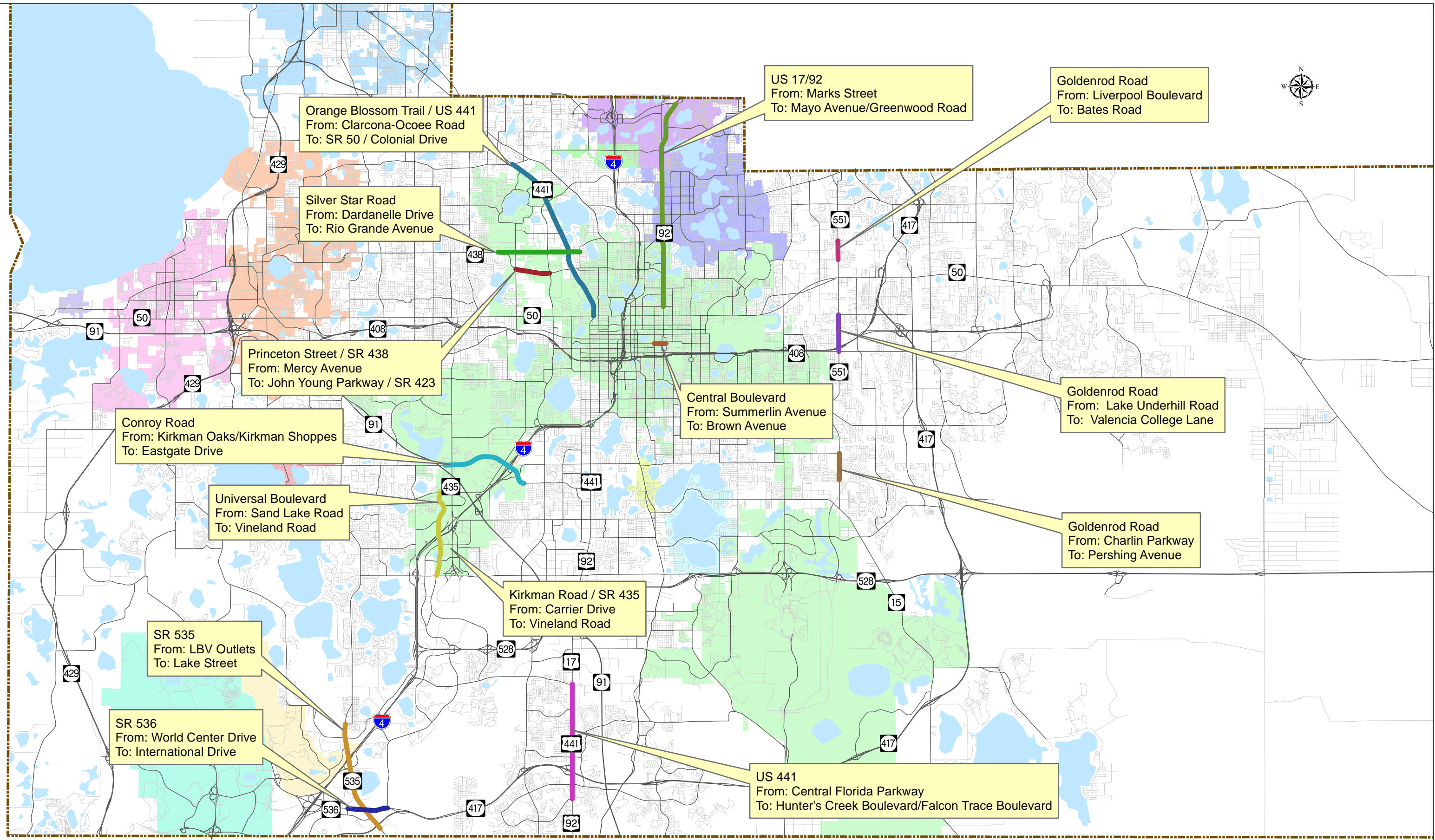
### BACKGROUND

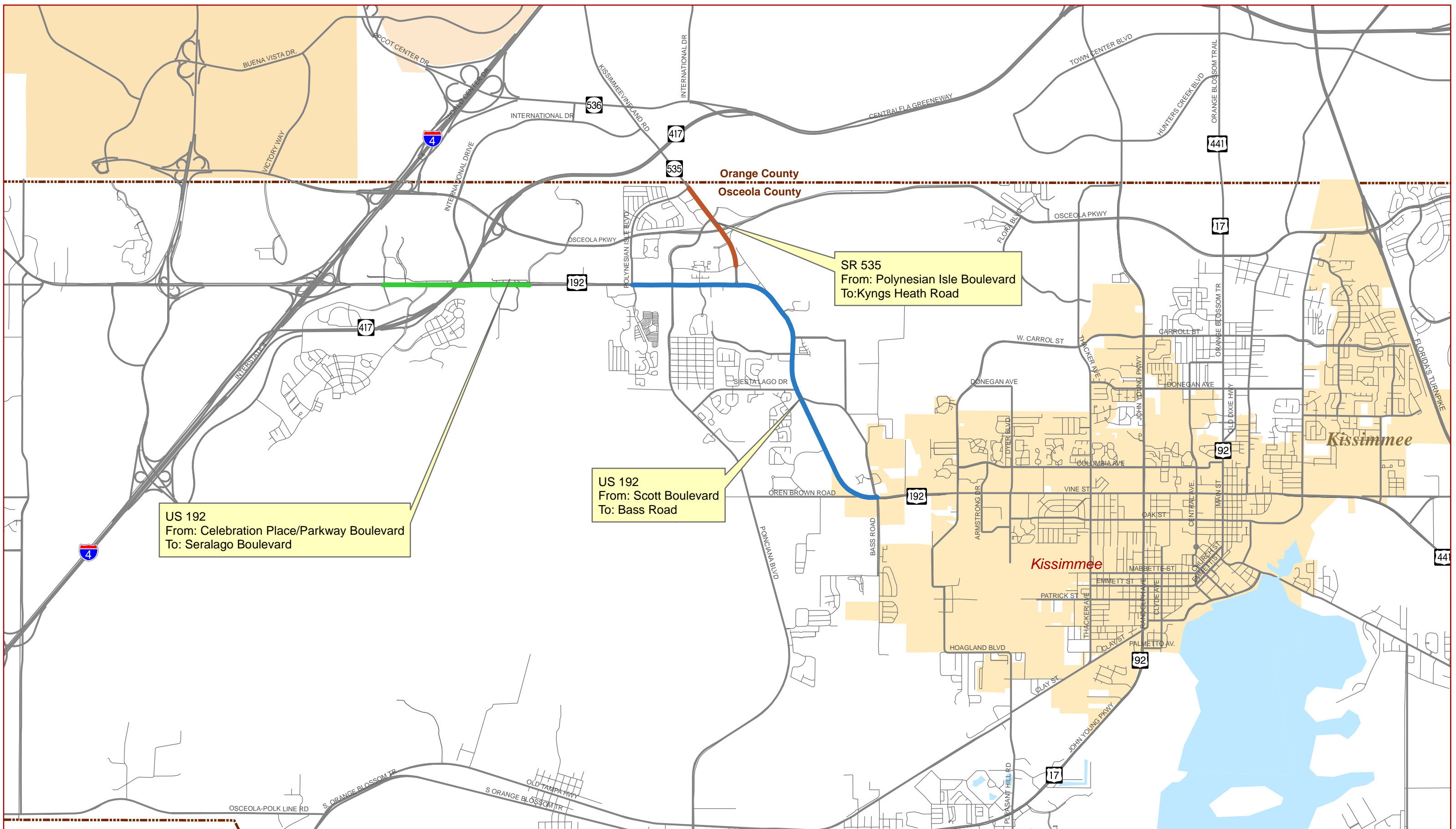
Signal re-timing projects generally demonstrate positive results with measurable benefits such as reduced delay, fuel savings, improved air quality, and others. Signal re-timing is one of the most cost-effective strategies to improve traffic flow, enhance safety, and lessen driver frustration. As part of the periodical signal retiming projects to improve the traffic flow on selected study roadways in Central Florida (Study Area), Florida Department of Transportation (FDOT) has recently completed signal re-timing on those roadways for the year 2014. GMB's role is to conduct TT studies for both the before scenario and after scenario and to assess the benefits achieved through these signal-retiming projects.













**Table 1: List of Study Roadways**

Roadway Name	Segment Limits	Length (Miles)	County
SR 436	Line Dr. to San Sebastian Prado	3.50	Seminole
SR 434	SR 414 to Manor Ave.	4.40	Seminole
SR 426	Old Howell Branch Rd. to Dean Rd.	2.20	Seminole
Goldenrod Rd. (SR 551)	Liverpool Blvd. to Bates Rd.	0.51	Orange
Goldenrod Rd. (SR 551)	Charlin Pkwy. To Pershing Ave.	0.73	Orange
Goldenrod Rd. (SR 551)	Lake Underhill Rd. to Valencia College Ln.	1.00	Orange
O.B.T South (US 441)	Central Florida Pkwy. To Hunters Creek Blvd.	3.99	Orange
US 17-92	Marks St. to Mayo Ave.	5.62	Orange
Orange Blossom Trail (US 441)	Clarcona Ocoee Rd. to SR 50	4.80	Orange
Universal Blvd.	Sand Lake Rd. to Vineland Rd.	2.36	Orange
Conroy Rd.	Kirkman Oaks to Eastgate Dr.	2.46	Orange
Princeton St. (SR 438)	Mercy Ave. to John Young Pkwy. (SR 423)	0.93	Orange
Kirkman Rd. (SR 435)	Carrier Dr. to Vineland Rd.	1.75	Orange
Central Blvd.	Summerlin Ave. to Brown Ave.	0.32	Orange
Silver Star (SR 416)	Dardanelle Dr. to Rio Grande Ave.	2.23	Orange
SR 536	World Center Dr. to International Dr.	1.10	Orange
Apopka Vineland Rd. (SR 535)	Lake Buena Vista Outlets to Lake St.	3.10	Orange
SR 535	Polynesian Isle Blvd. to Kyngs Heath Rd.	0.88	Osceola
US 192	Scott Blvd. to Bass Rd.	3.66	Osceola
US 192	Celebration Pl. to Seralago Blvd.	1.35	Osceola

Total - 46.89 miles

## TRAVEL TIME & DELAY STUDIES

### OVERVIEW

For the purpose of TT studies, Bluetooth technology for data collection and computer algorithm for data reduction are used. The Bluetooth approach has proven to be cost-effective, safer, and more accurate than other methods. The before and after travel time data of the study roadways were collected using the MiniToad devices developed by TrafficCast. TrafficCast's web based data analysis tool was used to process the MiniToad log files. The travel time output from before and after TT studies along with the cost of signal retiming were used in calculating the B-C ratio for the study corridors.

### BACKGROUND

Bluetooth is an open, wireless communication platform used to connect myriad electronic devices. Many computers, car radios and dashboard systems, PDAs, cell phones, headsets, or other personal equipment are, or can be, Bluetooth-enabled to streamline the flow of information between devices. Each Bluetooth device uses a unique electronic identifier known as a Media Access Control (MAC) address. Conceptually, as a Bluetooth-equipped device travels along a roadway, it can be anonymously detected at multiple points where the MAC address, time of detection, and location are logged. By determining the difference in detection time of a particular MAC address, the travel time between locations can be derived. A significant advantage of the use of Bluetooth MAC addresses for travel time monitoring is that typically only one inconspicuous roadside installation is necessary (consisting of field processor with appropriate software and antenna) to capture the unique address of Bluetooth devices travelling in all directions of flow.

Travel time is a direct measure of the performance of the roadway network. High travel times are an indication of congestion, delay, loss of time by drivers, increased fuel use and increased pollution emissions. The travel time data collected can be an important component of the Congestion Management Process (CMP), which alerts the decision makers of progress toward meeting congestion and mobility goals, when collected on a regular basis.

## METHODOLOGY

### STUDY PROCEDURE

The Bluetooth receivers (MiniToad Devices) are placed at the end point of the study corridor for a period of 24-hours during the weekdays. Each Bluetooth device contains a unique MAC identifier. The standard format for a MAC address is six groups of hexadecimal digits separated by hyphens or colons. A representative example of a MAC address is “01:23:45:67:89:AB”. As the Bluetooth enabled device travels along the study corridor, the MiniToad logs the unique MAC address, along with its location and time of the day that the device was detected. When the same MAC address is detected by the MiniToad device at the other end of the study corridor, a travel time can be determined by calculating the difference in detection time at the end points. Using the known distance between the MiniToad devices along the study corridor, an average speed is determined.

The field data were collected from Tuesday through Thursday during the morning and afternoon peak periods.

In performing the data collection, the Bluetooth receivers (MiniToad devices) were placed at the end points of the study segments so as to minimize the logs of vehicles in turn lanes and other minor street traffic. The MiniToads were generally placed at an approximate distance of 200 feet further from the end point of the study segment.

The technicians took field notes describing any factors or conditions that may affect the traffic operations. As a rule, data collection runs were not performed when external factors such as inclement weather, or special events affected the typical traffic flow of the study roadway.

The data collected for each roadway segment for each period and direction included street name, beginning and ending cross street, jurisdiction, facility type, area type, number of through lanes, left turn and right turn lanes, length, average travel time, average travel speed, and speed limit. The procedures described above that were used in collecting the data for the “before” conditions prior to the signal timing plans are implemented were followed in the case of “after” conditions after the signal timing plans are implemented also.



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## DATA ANALYSIS

The travel time data collected using the MiniTods were used to determine directly the following two crucial parameters for each of the study roadways during the identified peak hour before and after a retiming plan has been implemented. The two travel parameters are defined as follows:

**Average Travel Time:** The average time needed to travel between two control points.

**Average Travel Speed:** The average speed of travel between two control points, including all delays. It is calculated by dividing the total length of the section under consideration by the Average Travel Time.

These parameters were used as inputs for assessing the effectiveness of the completed signal retiming process.

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## LEVEL OF SERVICE CALCULATION

Level of Service (LOS) is one of the vital measures used to evaluate intersection or roadway performance. LOS was calculated before and after a retiming plan is implemented. Using the Average Travel Speed and roadway class (predetermined using the posted speed limit) as inputs, the roadway LOS was determined using the HCM (2000) Exhibit 15-2 Urban Street LOS by Roadway Class and Average Travel Speed. The HCM (2000) Exhibit 15-2 is shown as **Table 2**.

Tables showing the TT study results for each study roadway are provided in **Appendix A** of this report. In addition, GIS maps graphically illustrating the LOS conditions and listing the travel time and delay summaries are also provided in **Appendix A** of this report.

Table 2: HCM Exhibit 15-2 - Urban Street LOS by Roadway Class

Arterial Classification				
	I	II	III	IV
Range of Free-flow	45 – 55 MPH	35 – 45 MPH	30 – 35 MPH	25 – 35 MPH
Typical Free Flow Speed	50 MPH	40 MPH	33 MPH	30 MPH
Level of Service	Speed (MPH)			
A	>42	>35	>30	>25
B	>34	>28	>24	>19
C	>27	>22	>18	>13
D	>21	>17	>14	>9
E	>16	>13	>10	>7
F	<=16	<=13	<=10	<=7

## BENEFIT COST ANALYSIS

To determine whether the completed signal retiming process benefits outweighed the implementation costs, a B-C analysis was performed using the input parameters collected during the travel time and delay studies conducted before and after the implementation of retiming plans. Some of the direct benefits of signal retiming include fuel savings, reduced delays & stops, improved traffic flow, reduced toxic emissions & improved air quality, reduced response time for emergency vehicles, etc. In addition, numerous indirect benefits could be attributed to signal retiming such as postponing long-term capacity improvements, reduced driver frustration, better air quality, etc.

The benefits of the improved signal plans are projected over three years using two peak hours of travel time, one during the morning peak hour and the other during the evening peak hour. The following paragraphs describe the overall procedure of B-C analysis utilized for the signal retiming evaluation process.

## BENEFITS

As the first step, the cost savings associated with various parameters that were improved because of the retiming process were identified. Benefits are defined in terms of annualized cost savings and were calculated based on reduction in travel times derived from the before and after travel time data. As the first step, the benefit input parameter (travel time [seconds/vehicle])

was multiplied with the corresponding peak hour directional traffic volume for each peak hour and direction to obtain the total travel time (vehicle-hours) for one hour. These calculations were performed for the before and after scenarios and the differences were obtained for the AM and PM peak hours. Then these differences (total travel time) were multiplied with the corresponding dollar value to obtain the time savings in dollars. The daily savings in dollars are obtained by adding the benefits for AM and PM peak hours. The yearly savings are obtained by applying the daily savings for 300 days per year. This accounts for reduced benefits anticipated from lower weekend traffic volumes.

The above-mentioned calculations are explained in the following paragraphs for an example roadway: SR 535 between Lake Buena Vista Outlets and Lake Street.

### TRAVEL TIME COST SAVINGS

The cost associated with the lost travel time is valued at \$16.79 per hour for the year 2011 based on the latest Urban Mobility Report published by Texas Transportation Institute. The Urban Mobility Report page containing the delay value is provided in **Appendix B** of this memorandum.

Based on the calculations using the field travel time data and traffic volume data from the year 2014 Orange County Traffic Counts, a total annual cost savings (two peak hours combined) of \$1,559,202.00 was obtained from reduction in travel time for the SR 535 (Lake Buena Vista Outlets to Lake Street) study corridor.

### COSTS

The second step is to obtain the project implementation cost of the signal retiming process. These project costs were provided by the FDOT and are provided in **Appendix C** of this report for the study projects. The annualized implementation costs were calculated assuming three (3) years of service life for the improvement and a 7% rate of return on investment as currently recommended by the Federal Highway Administration (FHWA).

The annualized total signal-retiming cost was determined as \$22,543.78 from a one-time implementation cost of \$59,162.62 for the SR 535 (Lake Buena Vista Outlets to Lake Street) study corridor.



**Tables 3 and 4** summarize the Measures of Effectiveness (MOEs) including travel time, delay, and average speed for the through movement for the before and after scenarios, respectively during the AM and PM peak periods. **Table 5** shows the benefits, costs, and B-C ratio for the example study corridor.

**Table 3: Summary of Before Study MOEs: SR 535 between Lake Buena Vista Outlets and Lake Avenue**

Traffic Volume	MOE's per Vehicle		MOEs for all
	Travel Time (sec/vehicle)	Average Speed (mph)	Total Travel Time (Vehicle-hour)
<b>Northbound/Eastbound - AM Peak Hour</b>			
2,268	472	26.0	297.36
<b>Northbound/Eastbound - PM Peak Hour</b>			
2,477	617	19.8	424.53
<b>Southbound/Eastbound - AM Peak Hour</b>			
1,292	444	27.6	159.35
<b>Southbound/Eastbound - PM Peak Hour</b>			
2,469	789	15.5	541.12

**Table 4: Summary of After Study MOEs: SR 535 between Lake Buena Vista Outlets and Lake Avenue**

Traffic Volume	MOE's per Vehicle		MOEs for all
	Travel Time (sec/vehicle)	Average Speed (mph)	Total Travel Time (Vehicle-hour)
<b>Northbound/Eastbound - AM Peak Hour</b>			
2,268	381	32.1	240.03
<b>Northbound/Eastbound - PM Peak Hour</b>			
2,477	430	28.5	295.86
<b>Southbound/Eastbound - AM Peak Hour</b>			
1,292	459	26.7	164.73
<b>Southbound/Eastbound - PM Peak Hour</b>			
2,469	601	20.4	412.19

**Table 5: Summary of MOEs & Benefit Cost Analysis: SR 535 between Lake Buena Vista Outlets and Lake Avenue**

MOE	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hours)	456.71	404.76	965.65	708.05
BENEFITS	AM PEAK HOUR		PM PEAK HOUR	
User Benefit Per Day	\$872.24		\$4,325.10	
Annual User Benefit	\$261,672.00		\$1,297,530.00	
Total Annual User Benefit	\$1,559,202.00			
Total Signal Retiming Annual Cost	\$22,543.78			
User Benefit / Cost Ratio	69.16			
Notes:				
1. Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)				
2. Benefits apply for 300 days per year. This accounts for reduced benefits anticipated from lower weekend traffic volumes.				
3. The service life of the improvement is assumed to be three (3) years.				
4. Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.				

### BENEFIT-COST RATIO

As shown in **Table 5**, a **B-C ratio of 69.16 (greater than 1.0)** was derived from the analysis for SR 535 study corridor. The strong ratio indicates that the funds spent by FDOT/MetroPlan Orlando to increase the operational capacity of the study corridor on SR 535 between Lake Buena Vista Outlets and Lake Street in Orange County receive approximately sixty nine times in benefits derived through reduced costs associated with reduced travel time. Therefore, the positive results of this B-C analysis justify the implementation of the recently completed signal timing improvements on this study corridor.

Similar to the MOE calculations and summaries shown in **Tables 3** through **5**, summary tables for each study roadway are provided in **Appendix A** of this report.

## CONCLUSIONS

This chapter presents the conclusions derived from the TT study results and a summary of B-C ratio analysis results. GMB has conducted before and after travel time studies on 20 study roadways in the tri-county area (Orange, Seminole, and Osceola) of the Central Florida region to evaluate the benefits of the recently completed signal retiming projects on these roadways.

## BENEFIT-COST RATIO ANALYSIS

As part of the current study, B-C ratios were calculated for the 20 study roadways falling within the Central Florida region. **Tables 6 through 8** illustrate the B-C ratios by jurisdiction. **Table 6** lists B-C ratios for Seminole County, **Table 7** lists B-C ratios for Orange County, and **Table 8** lists the B-C ratios for Osceola County.

**Table 6: Benefit-Cost Ratio Summary for Seminole County Roadways**

Roadway	Limits	Annual Benefit	Annual Cost	B/C Ratio
<b>SR 436</b>	Line Dr. to San Sebastian Prado	\$250,338.00	\$28,363.20	<b>8.83</b>
<b>SR 434</b>	SR 414 to Manor Avenue	\$561,525.00	\$30,051.64	<b>18.69</b>
<b>SR 426</b>	Old Howell Branch Rd. to Dean Rd.	\$440,535.00	\$20,204.88	<b>21.80</b>



**Table 7: Benefit-Cost Ratio Summary for Orange County Roadways**

Roadway	Limits	Annual Benefit	Annual Cost	B/C Ratio
Goldenrod Rd. (SR 551)	Liverpool Blvd. to Bates Rd.	\$9,318.00	\$5,701.68	1.63
Goldenrod Rd. (SR 551)	Charlin Pkwy. To Pershing Ave.	\$97,011.00	\$6,576.95	14.75
Goldenrod Rd. (SR 551)	Lake Underhill Rd. to Valencia College Ln.	\$467,886.00	\$8,111.45	57.68
O.B.T. South (US 441)	Central Florida Pkwy. To Hunters Creek Blvd.	\$817,503.00	\$18,825.10	43.43
US 17-92	Marks St. to Mayo Ave.	\$354,606.00	\$33,818.72	10.48
Orange Blossom Trail (US 441)	Clarcona Ocoee Rd. to SR 50	\$388,554.00	\$12,754.94	30.46
Universal Blvd.	Sand Lake Rd. to Vineland Rd.	\$55,608.00	\$18,062.61	3.08
Conroy Rd.	Kirkman Oaks to Eastgate Dr.	\$193,773.00	\$17,166.38	11.29
Princeton St. (SR 438)	Mercy Ave. to John Young Pkwy. (SR 423)	\$42,765.00	\$6,616.58	6.46
Kirkman Rd. (SR 435)	Carrier Dr. to Vineland Rd.	\$228,579.00	\$8,374.37	27.30
Central Blvd.	Summerlin Ave. to Brown Ave.	\$33,798.00	\$5,816.75	5.81
Silver Star (SR 416)	Dardanelle Dr. to Rio Grande Ave.	\$101,847.00	\$11,054.31	9.21
SR 536	World Center Dr. to International Dr.	\$109,905.00	\$7,514.67	14.63
Apopka Vineland Rd. (SR 535)	Lake Buena Vista Outlets to Lake Street	\$1,559,202.00	\$22,543.78	69.16

**Table 8: Benefit-Cost Ratio Summary for Osceola County Roadways**

Roadway	Limits	Annual Benefit	Annual Cost	B/C Ratio
<b>SR 535</b>	Polynesian Isle Blvd. to Kyngs Heath Rd.	\$70,113.00	\$10,019.56	7.00
<b>US 192</b>	Scott Blvd. to Bass Rd.	\$948,114.00	\$12,944.71	73.24
<b>US 192</b>	Celebration Pl. to Seralago Blvd.	\$161,736.00	\$10,254.48	15.77

As shown in **Table 6**, the B-C ratios range between 8 and 21 for the signal retiming projects on study roadways within Seminole County. From **Table 7**, the B-C ratios range between 1 and 69 for the signal retiming projects on study roadways within Orange County. As shown in **Table 8**, the B-C ratios range from 7 to 73 for the signal retiming project on study roadways within Osceola County.

**In conclusion, all the 20 study signal-retiming projects have B-C ratios of greater than one (1). This means that the cost benefits derived from reduced travel time exceeded the costs incurred from implementing improved signal timing plans on the study roadways. Therefore, these traffic operational improvements are well justified.**

**In addition, a summary of the annual travel time is shown in Table 9 for the study roadways. As shown in Table 9, 410,527.00 vehicle-hours of travel time is estimated to be saved with the improved signal timings on the study roadways.**

**Table 9: Annual Travel Time Savings Summary**

Roadway Name	Segment Limits	Annual User Travel Time Savings (Veh-Hours)
SR 436	Line Dr. to San Sebastian Prado	14,911.83
SR 434	SR 414 to Manor Ave.	33,444.25
SR 426	Old Howell Branch Rd. to Dean Rd.	26,235.00
Goldenrod Rd. (SR 551)	Liverpool Blvd. to Bates Rd.	552.58
Goldenrod Rd. (SR 551)	Charlin Pkwy. To Pershing Ave.	5,781.92
Goldenrod Rd. (SR 551)	Lake Underhill Rd. to Valencia College Ln.	27,867.50
O.B.T South (US 441)	Central Florida Pkwy. To Hunters Creek Blvd.	48,689.83
US 17-92	Marks St. to Mayo Ave.	21,118.75
Orange Blossom Trail (US 441)	Clarcona Ocoee Rd. to SR 50	23,138.17
Universal Blvd.	Sand Lake Rd. to Vineland Rd.	3,312.50
Conroy Rd.	Kirkman Oaks to Eastgate Dr.	11,542.75
Princeton St. (SR 438)	Mercy Ave. to John Young Pkwy. (SR 423)	2,544.83
Kirkman Rd. (SR 435)	Carrier Dr. to Vineland Rd.	13,617.00
Central Blvd.	Summerlin Ave. to Brown Ave.	2,014.75
Silver Star (SR 416)	Dardanelle Dr. to Rio Grande Ave.	6,068.67
SR 536	World Center Dr. to International Dr.	6,545.75
Apopka Vineland Rd. (SR 535)	Lake Buena Vista Outlets to Lake St.	92,864.92
SR 535	Polynesian Isle Blvd. to Kyngs Heath Rd.	4,175.00
US 192	Scott Blvd. to Bass Rd.	56,468.25
US 192	Celebration Pl. to Seralago Blvd.	9,632.75
Total		410,527.00

## QUEUE LENGTH PILOT STUDY

As part of Year 2014 Travel Time and Delay Study, a pilot study was conducted to determine the effect of signal retiming on the queue lengths along minor streets. Two signalized intersections 1) US 192 and Poinciana Boulevard (Osceola County) and 2) Orange Blossom Trail and Lee Road (Orange County) were selected for this study. The queue lengths along the minor street were measured for before and after signal retiming effort. It is to be noted that the queue lengths along the minor street and the travel time along the major street were collected on the same day.

### US 192 AND POINCIANA BOULEVARD

The intersection of US 192 and Poinciana Boulevard is one of the signalized intersections along the study corridor US 192 (Scott Boulevard to Bass Road) for which the signal retiming effort was performed. The queue lengths were collected along the Poinciana Boulevard in the peak direction during the A.M. and P.M. peak period. Based on the latest Turning Movement Count (TMC) information for this intersection, it was determined that the northbound was the peak direction during A.M. peak period and southbound direction was the peak direction during the P.M. peak period. **Table 10** summarizes the queue lengths (in vehicles) along Poinciana Boulevard before and after the signal retiming effort.

**Table 10: Queue Length Summary Along Poinciana Boulevard**

Before (Vehicles)	After (Vehicles)
<b>Northbound from 7:15 to 7:45 AM</b>	
52	34
<b>Southbound from 5:15 to 5:45 PM</b>	
58	57

As shown in Table 10, there was a significant drop in the queue lengths along Poinciana Boulevard in the northbound direction during the A.M. peak hour after the signal retiming effort was performed. However, there was no significant change in the queue lengths during the P.M. peak period.

### ORANGE BLOSSOM TRAIL AND LEE ROAD

The intersection of Orange Blossom Trail and Lee Road is one of the signalized intersections along the study corridor Orange Blossom Trail (Clarcona-Ocoee Road to SR 50) for which the signal retiming effort was performed. The queue lengths were collected along the Lee Road in the peak direction during the A.M. and P.M. peak period. Based on the latest Turning Movement Count (TMC) information for this intersection, it was determined that the westbound was the peak direction during A.M. peak period and eastbound direction was the peak direction during

the P.M. peak period. **Table 11** summarizes the queue lengths (in vehicles) along Lee Road before and after the signal retiming effort.

**Table 11: Queue Length Summary Along Lee Road**

Before (Vehicles)	After (Vehicles)
<b>Westbound from 7:00 to 7:30 AM</b>	
<b>22</b>	22
<b>Eastbound from 5:00 to 5:30 PM</b>	
<b>21</b>	21

As shown in the Table 11, no significant changes were observed in the queue lengths with the signal retiming effort.

## CONCLUSION

The pilot study conducted doesn't show definitive results to relate the impact of the signal retiming effort on the operating conditions of Minor Street. It is recommended that the study be conducted at a minimum of three working days during the peak hour conditions on both directions before and after signal retiming.

## PRESENTATIONS MADE TO VARIOUS COMMITTEES

The results of this Year 2014 MetroPlan Orlando Travel Time Study and Benefit Cost Analysis were presented by GMB and MetroPlan Orlando to the following committees.

- ❖ Management & Operations Committee on June 27, 2014
- ❖ Transportation Technical Committee on August 22, 2014
- ❖ Citizens Advisory Committee on August 27, 2014.
- ❖ Municipal Advisory Committee on September 4, 2014.
- ❖ MetroPlan Orlando Board on September 10, 2014.

The PowerPoint presentation is provided in Appendix D.

## APPENDICES

**Appendix A:** *Before & After Travel Time & Delay Study Results, GIS Maps, MOE Summaries, and Benefit-Cost Ratio Calculation Sheets*

**Appendix B:** *Page from 2011 Urban Mobility Report*

**Appendix C:** *Signal Retiming Project Costs*

**Appendix D:** *Power Point Presentation*



**Appendix A:**  
**Before & After Travel Time Study Results, GIS  
Maps, MOE Summaries, and, Benefit-Cost Ratio  
Calculation Sheets**

# **SR 436**

## **Line Dr. to San Sebastian Prado**

**Year 2014 MetroPlan Orlando Travel Time Study**  
Before Condition

**Roadway:** SR 436  
**Segment:** Line Drive to Montgomery Road\*\*  
**Jurisdiction:** Seminole County  
**Area Type:** Divided Arterial  
**Facility Type:** Residential /Other Outlying Business District  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 3.5 miles    **Arterial Class:** I  
**Distance between BlueToad Devices:** 3.5 miles

**Eastbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Line Drive	1	3	0	45	
Balmy Beach Road	1	3	1	45	
S Hunt Cub Boulevard	1	3	1	45	
Bear Lake Road	1	3	0	45	
Harley Lester Lane	1	3	0	45	
Post Lake Place	1	3	1	45	
W Lake Brantley Road	1	3	0	45	
Willow Avenue	1	3	0	45	
Maple Street	1	3	1	45	
SR 434	2	3	1	45	
San Sabastian Prado	1	4	0	45	
Orange Avenue	0	4	0	45	
Weathersfield Avenue	1	3	1	45	
Montgomery Road	2	3	1	45	

Direction of Travel	Analysis		Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period	# of Samples			
Eastbound	AM	56	432	29.2	C
Eastbound	PM	25	520	24.2	D

**Westbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Montgomery Road	1	4	0	45	
Weathersfield Avenue	1	4	0	45	
Orange Avenue	1	4	0	45	
San Sabastian Prado	1	4	0	45	
SR 434	2	3	1	45	
Lake Harriet Drive	1	3	1	45	
Willow Avenue	1	3	1	45	
W Lake Brantley Road	1	3	0	45	
Post Lake Place	1	3	0	45	
Harley Lester Lane	1	3	0	45	
Bear Lake Road	1	3	0	45	
S Hunt Cub Boulevard	1	3	1	45	
Foxhill Circle	2	3	1	45	
Line Drive	1	3	1	45	

Direction of Travel	Analysis		Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period	# of Samples			
Westbound	AM	10	365	34.6	B
Westbound	PM	16	435	29.0	C

Note:

The BlueToad data is obtained from Seminole County website

\*\*The Study limit has been changed to SR 436 - Line Drive to Montgomery Road, due to the BlueToad locations.

**Year 2014 MetroPlan Orlando Travel Time Study**  
After Condition

**Roadway:** SR 436  
**Segment:** Line Drive to Montgomery Road\*\*  
**Jurisdiction:** Seminole County  
**Area Type:** Divided Arterial  
**Facility Type:** Residential /Other Outlying Business District  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 3.5 miles    **Arterial Class:** I  
**Distance between BlueToad Devices:** 3.5 miles

**Eastbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Line Drive	1	3	0	45	
Balmy Beach Road	1	3	1	45	
S Hunt Cub Boulevard	1	3	1	45	
Bear Lake Road	1	3	0	45	
Harley Lester Lane	1	3	0	45	
Post Lake Place	1	3	1	45	
W Lake Brantley Road	1	3	0	45	
Willow Avenue	1	3	0	45	
Maple Street	1	3	1	45	
SR 434	2	3	1	45	
San Sabastian Prado	1	4	0	45	
Orange Avenue	0	4	0	45	
Weathersfield Avenue	1	3	1	45	
Montgomery Road	2	3	1	45	

Direction of Travel	Analysis		Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period	# of Samples			
Eastbound	AM	47	430	29.3	C
Eastbound	PM	25	440	28.6	C

**Westbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Montgomery Road	1	4	0	45	
Weathersfield Avenue	1	4	0	45	
Orange Avenue	1	4	0	45	
San Sabastian Prado	1	4	0	45	
SR 434	2	3	1	45	
Lake Harriet Drive	1	3	1	45	
Willow Avenue	1	3	1	45	
W Lake Brantley Road	1	3	0	45	
Post Lake Place	1	3	0	45	
Harley Lester Lane	1	3	0	45	
Bear Lake Road	1	3	0	45	
S Hunt Cub Boulevard	1	3	1	45	
Foxhill Circle	2	3	1	45	
Line Drive	1	3	1	45	

Direction of Travel	Analysis		Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period	# of Samples			
Westbound	AM	27	341	37.0	B
Westbound	PM	35	433	29.1	C

Note:

The BlueToad data is obtained from Seminole County website

\*\*The Study limit has been changed to SR 436 - Line Drive to Montgomery Road, due to the BlueToad locations.

**SR 436 - Line Drive to A obh ca YmFcUX**  
**Summary of Before & After Study Travel Time Results**

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
2,848	432.0	29.2	341.76	430.0	29.3	340.18
Northbound/Eastbound - PM Peak Hour						
1,724	520.0	24.2	249.02	440.0	28.6	210.71
Southbound/Westbound - AM Peak Hour						
1,270	365.0	34.6	128.76	341.0	37.0	120.30
Southbound/Westbound - PM Peak Hour						
2,423	435.0	29.0	292.78	433.0	29.1	291.43

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

**SR 436 - Line Drive to A obh ca YmFcUX**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	470.52	460.48	541.80	502.14

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$168.57	\$665.89
Annual User Benefit	\$50,571.00	\$199,767.00
Total Annual User Benefit	\$250,338.00	
Total Signal Retiming Annual Cost	\$28,363.20	
User Benefit / Cost Ratio	8.83	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



**SR 436  
- AM Peak**

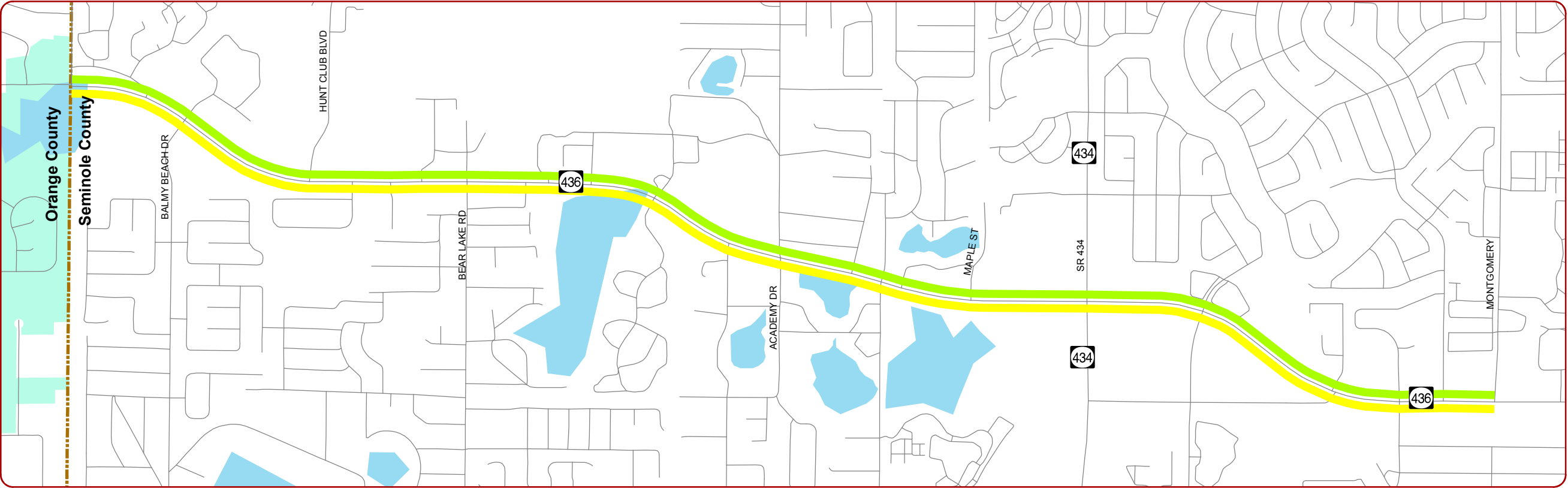
***Before Condition***

Distance: 3.50 miles  
From: Line Dr.  
To: Montgomery Rd

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 29.2 MPH  
EB Travel Time: 7.20 MIN

WB Avg Speed: 34.6 MPH  
WB Travel Time: 6.08 MIN



**SR 436  
- AM Peak**

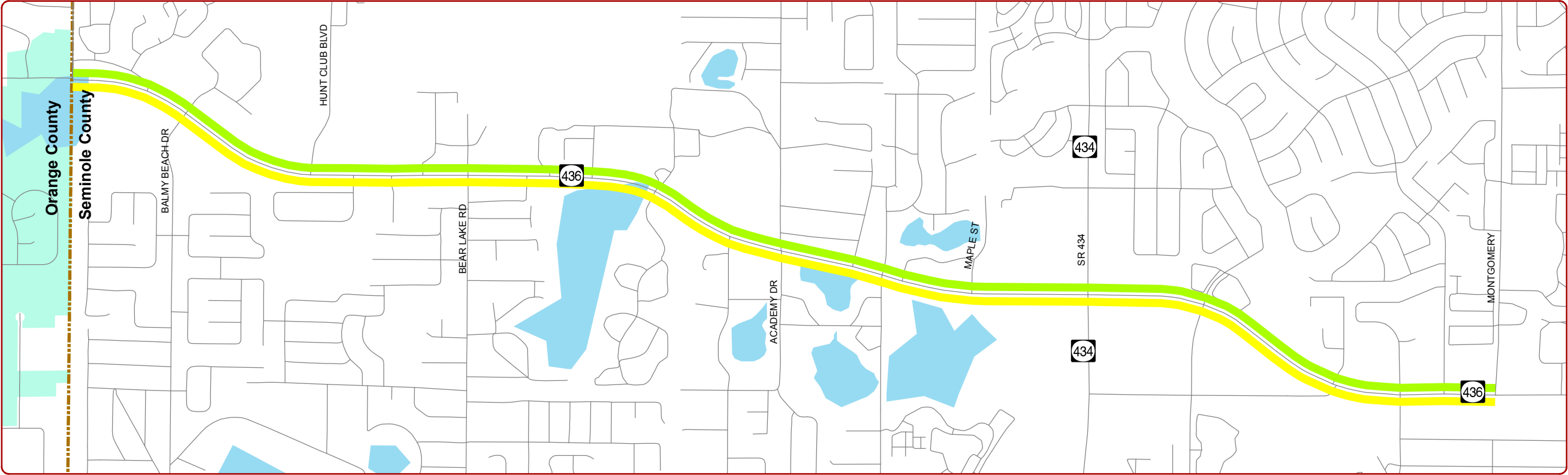
***After Condition***

Distance: 3.50 miles  
From: Line Dr.  
To: Montgomery Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 29.3 MPH  
EB Travel Time: 7.17 MIN

WB Avg Speed: 37.0 MPH  
WB Travel Time: 5.68 MIN



**Level of Services:**



**2014 METROPLAN ORLANDO**



**SR 436  
- PM Peak**

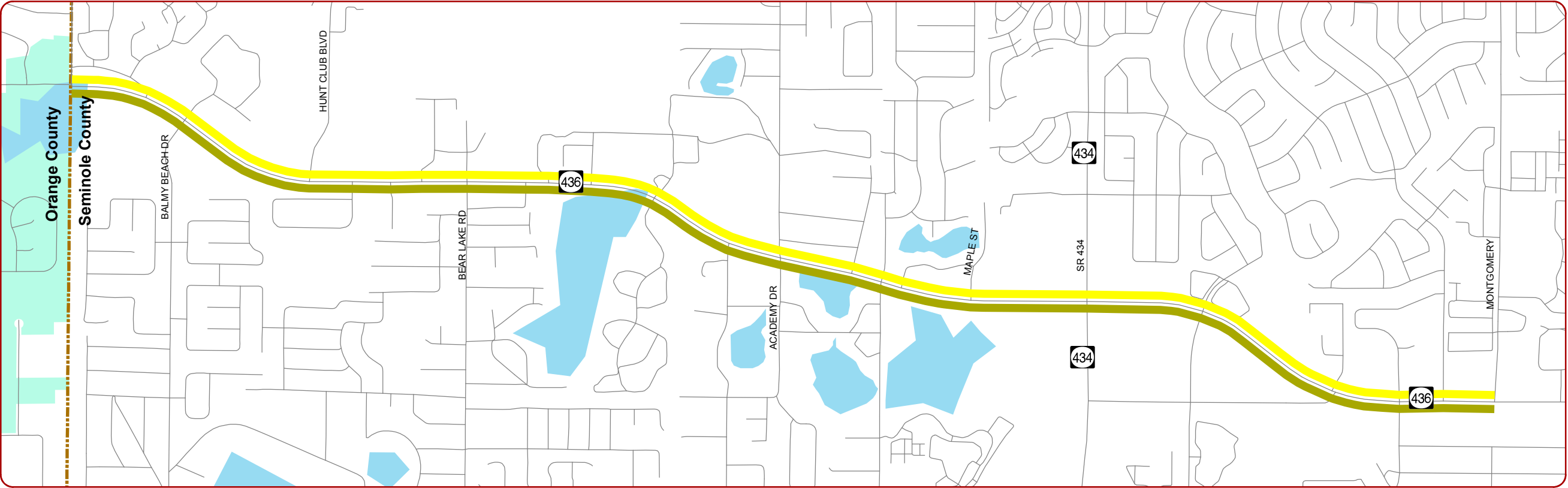
**Before Condition**

Distance: 3.50 miles  
From: Line Dr.  
To: Montgomery Rd

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 24.2 MPH  
EB Travel Time: 8.67 MIN

WB Avg Speed: 29.0 MPH  
WB Travel Time: 7.25 MIN



**SR 436  
- PM Peak**

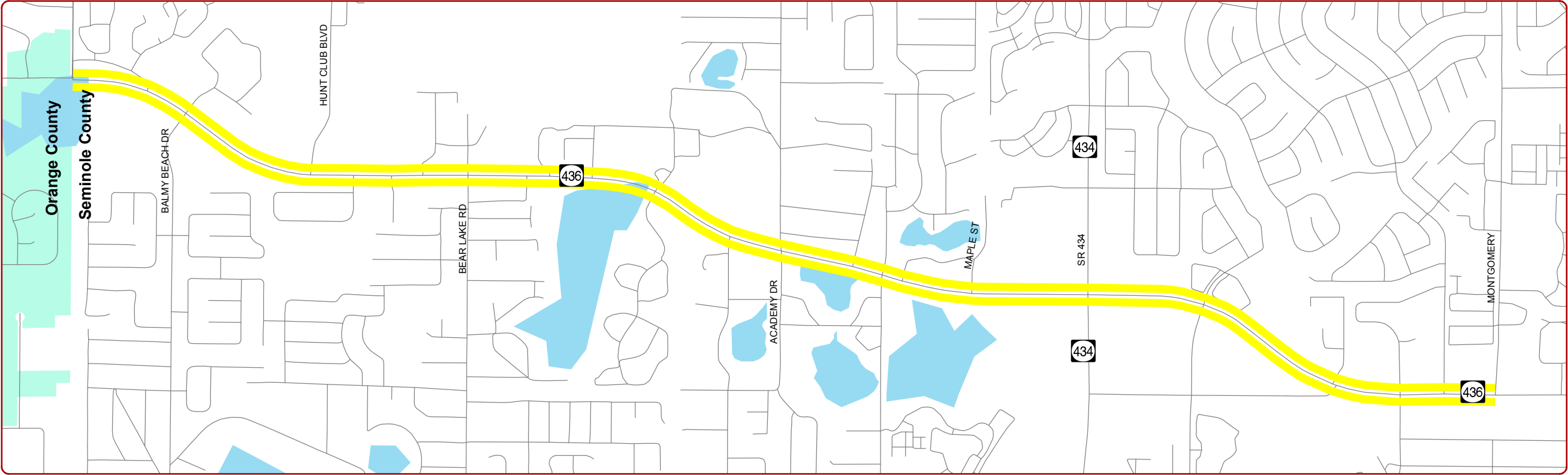
**After Condition**

Distance: 3.50 miles  
From: Line Dr.  
To: Montgomery Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 28.6 MPH  
EB Travel Time: 7.33 MIN

WB Avg Speed: 29.1 MPH  
WB Travel Time: 7.22 MIN

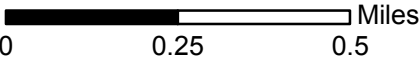


**Level of Services:**



**2014 METROPLAN ORLANDO**

*Travel Time Study*



**SR 434**  
**SR 414 to Manor Ave.**

## Year 2014 MetroPlan Orlando Travel Time Study

*Before Condition*

**Roadway:** SR 434  
**Segment:** Maitland Boulevard to Montgomery Road  
**Jurisdiction:** Seminole County  
**Area Type:** Residential/Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 4.1 Mi.    **Arterial Class:** I  
**Length of Analysis Segment:** 4.1 Mi.

### Northbound Direction:

Segment	Travel Time (Sec)	Average Speed (MPH)	LOS
<b>AM Peak Period</b>			
Maitland Boulevard to SR 436	249	25.4	D
SR 436 to Montgomery Road	326	25.4	D
<b>**Maitland Boulevard to Montgomery Road</b>	<b>575</b>	<b>25.7</b>	<b>D</b>
<b>PM Peak Period</b>			
Maitland Boulevard to SR 436	301	21.0	D
SR 436 to Montgomery Road	311	26.6	D
<b>**Maitland Boulevard to Montgomery Road</b>	<b>612</b>	<b>24.1</b>	<b>D</b>

### Southbound Direction:

Segment	Travel Time (Sec)	Average Speed (MPH)	LOS
<b>AM Peak Period</b>			
Maitland Boulevard to SR 436	163	39.0	B
SR 436 to Montgomery Road	430	19.2	E
<b>**Maitland Boulevard to Montgomery Road</b>	<b>593</b>	<b>24.9</b>	<b>D</b>
<b>PM Peak Period</b>			
Maitland Boulevard to SR 436	233	27.2	C
SR 436 to Montgomery Road	310	26.7	D
<b>**Maitland Boulevard to Montgomery Road</b>	<b>542</b>	<b>27.2</b>	<b>C</b>

Note:

Travel Time for SR 434 from Maitland Boulevard to SR 436 was obtained from Seminole County Travel Time and delay Study (Date: June 2013).

Travel Time for SR 434 from SR 436 to Montgomery Road was obtained from Seminole County BlueToad Data.

**Year 2014 MetroPlan Orlando Travel Time Study**  
*Before Condition*

**Roadway:** SR 434  
**Segment:** Montgomery Road to SR 436 \*\*  
**Jurisdiction:** Seminole County  
**Area Type:** Residential /Other Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 2.3 miles    **Arterial Class:** I  
**Distance between BlueToad Devices:** 2.3 miles

**Northbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
SR 436	2	3	1	45	
San Sabastian Prado	1	2	0	45	
Sand Lake Road	1	2	0	45	
Jamestown Boulevard	1	2	1	45	
E Lake Brantley Drive	1	2	0	45	
Manor Avenue	1	2	0	45	
Montgomery Road	1	3	1	45	

Direction of Travel	Analysis		Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period	# of Samples			
Northbound	AM	85	326	25.4	D
Northbound	PM	189	311	26.6	D

**Southbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Montgomery Road	2	3	1	45	
Manor Avenue	1	2	0	45	
E Lake Brantley Drive	1	2	0	45	
Jamestown Boulevard	1	2	0	45	
Sand Lake Road	1	2	1	45	
San Sabastian Prado	1	2	0	45	
SR 436	2	3	1	45	

Direction of Travel	Analysis		Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period	# of Samples			
Southbound	AM	206	430	19.2	E
Southbound	PM	112	310	26.7	D

**Note:**

The BlueToad data is obtained from Seminole County BlueToad website

\*\* - BlueToad data is available for the segment of SR 434 -Montgomery Road to SR 436 within the study limits.

Travel Time data for SR 434 - SR 436 to SR 414 (Maitland Boulevard) is submitted seperately.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**SR 434 from SR 436 to Maitland Boulevard - Northbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
													Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
													(mph)	LOS		
AM PEAK HOUR																
Maitland Boulevard to Gateway Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,478	Signal	42.6	4.2	I	23.7	D	0.53	
Gateway Drive to Trailwood Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	2,323	Signal	64.2	21.6	I	24.7	D	0.55	
Trailwood Drive to W Town Parkway	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	2,904	Signal	48.0	0.0	I	41.2	B	0.92	
W Town Parkway to Orange Avenue	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,320	Signal	33.0	6.6	I	27.3	C	0.61	
Orange Avenue to SR 436	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	1,267	Signal	61.2	30.6	I	14.1	F	0.31	
TOTAL							45	9,292		249.0	63.0	I	25.4	D	0.57	
PM PEAK HOUR																
Maitland Boulevard to Gateway Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,478	Signal	62.4	18.6	I	16.1	E	0.36	
Gateway Drive to Trailwood Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	2,323	Signal	52.2	7.8	I	30.3	C	0.67	
Trailwood Drive to W Town Parkway	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	2,904	Signal	52.8	1.8	I	37.5	B	0.83	
W Town Parkway to Orange Avenue	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,320	Signal	40.8	7.8	I	22.1	D	0.49	
Orange Avenue to SR 436	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	1,267	Signal	93.0	54.0	I	9.3	F	0.21	
TOTAL							45	9,292		301.2	90.0	I	21.0	D	0.47	

Note:

The Travel Time and Stop Delay information for the study corridor is obtained from the 2013 Seminole County Travel Time and Delay Study (Dated June 2013)

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. OBD - Outlying Business District



**Year 2014 METROPLAN Orlando Travel Time Study**  
**SR 434 from SR 436 to Maitland Boulevard - Southbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary		
													Average Speed		Avg Speed/	Avg. Fuel	
													(mph)	LOS	Speed Limit	Consump..	
AM PEAK HOUR																	
SR 436 TO Orange Avenue	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,267	Signal	22.8	0.0	I	37.9	B	0.84		
Orange Avenue to W Town Parkway	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,320	Signal	30.6	5.4	I	29.4	C	0.65		
W Town Parkway to Trailwood Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	2,904	Signal	46.2	0.0	I	42.9	A	0.95		
Trailwood Drive to Gateway Drive	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	2,323	Signal	39.6	0.0	I	40.0	B	0.89		
Gateway Drive to Maitland Boulevard	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	1,478	Signal	23.4	0.0	I	43.1	A	0.96		
TOTAL							45	9,292		162.6	5.4	I	39.0	B	0.87		
PM PEAK HOUR																	
SR 436 TO Orange Avenue	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,267	Signal	51.0	15.0	I	16.9	E	0.38		
Orange Avenue to W Town Parkway	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,320	Signal	53.4	19.2	I	16.9	E	0.37		
W Town Parkway to Trailwood Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	2,904	Signal	47.4	0.0	I	41.8	B	0.93		
Trailwood Drive to Gateway Drive	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	2,323	Signal	44.4	3.6	I	35.7	B	0.79		
Gateway Drive to Maitland Boulevard	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	1,478	Signal	36.6	8.4	I	27.5	C	0.61		
TOTAL							45	9,292		232.8	46.2	I	27.2	C	0.60		

Note:

The Travel Time and Stop Delay information for the study corridor is obtained from the 2013 Seminole County Travel Time and Delay Study (Dated June 2013)

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. OBD - Outlying Business District

## Year 2014 MetroPlan Orlando Travel Time Study

*After Condition*

**Roadway:** SR 434  
**Segment:** Maitland Boulevard to Montgomery Road  
**Jurisdiction:** Seminole County  
**Area Type:** Residential/Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 4.1 Mi.    **Arterial Class:** I  
**Length of Analysis Segment:** 4.1 Mi.

### Northbound Direction:

Segment	Travel Time (Sec)	Average Speed (MPH)	LOS
<b>AM Peak Period</b>			
Maitland Boulevard to SR 436	263	24.1	D
SR 436 to Montgomery Road	316	26.2	D
<b>**Maitland Boulevard to Montgomery Road</b>	<b>579</b>	<b>25.5</b>	<b>D</b>
<b>PM Peak Period</b>			
Maitland Boulevard to SR 436	268	23.6	D
SR 436 to Montgomery Road	311	26.6	D
<b>**Maitland Boulevard to Montgomery Road</b>	<b>580</b>	<b>25.5</b>	<b>D</b>

### Southbound Direction:

Segment	Travel Time (Sec)	Average Speed (MPH)	LOS
<b>AM Peak Period</b>			
Maitland Boulevard to SR 436	171	37.0	B
SR 436 to Montgomery Road	318	26.0	D
<b>**Maitland Boulevard to Montgomery Road</b>	<b>489</b>	<b>30.2</b>	<b>D</b>
<b>PM Peak Period</b>			
Maitland Boulevard to SR 436	188	33.7	C
SR 436 to Montgomery Road	308	26.9	D
<b>**Maitland Boulevard to Montgomery Road</b>	<b>495</b>	<b>29.8</b>	<b>C</b>

Note:

Travel Time for SR 434 from Maitland Boulevard to SR 436 was obtained from 2014 Seminole County Travel Time and delay Study .  
 Travel Time for SR 434 from SR 436 to Montgomery Road was obtained from Seminole County BlueToad Data.

**Year 2014 MetroPlan Orlando Travel Time Study**  
After Condition

**Roadway:** SR 434  
**Segment:** Montgomery Road to SR 436 \*\*  
**Jurisdiction:** Seminole County  
**Area Type:** Residential /Other Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 2.3 miles **Arterial Class:** I  
**Distance between BlueToad Devices:** 2.3 miles

**Northbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
SR 436	2	3	1	45	
San Sabastian Prado	1	2	0	45	
Sand Lake Road	1	2	0	45	
Jamestown Boulevard	1	2	1	45	
E Lake Brantley Drive	1	2	0	45	
Manor Avenue	1	2	0	45	
Montgomery Road	1	3	1	45	

Direction of Travel	Analysis		Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period	# of Samples			
Northbound	AM	88	316	26.2	D
Northbound	PM	117	311	26.6	D

**Southbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Montgomery Road	2	3	1	45	
Manor Avenue	1	2	0	45	
E Lake Brantley Drive	1	2	0	45	
Jamestown Boulevard	1	2	0	45	
Sand Lake Road	1	2	1	45	
San Sabastian Prado	1	2	0	45	
SR 436	2	3	1	45	

Direction of Travel	Analysis		Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period	# of Samples			
Southbound	AM	164	318	26.0	D
Southbound	PM	138	308	26.9	D

Note:

The BlueToad data is obtained from Seminole County BlueToad website

\*\*, BlueToad data is available for the segment of SR 434 -Montgomery Road to SR 436 within the study limits.

Travel Time data for SR 434 - SR 436 to SR 414 (Maitland Boulevard) is submitted seperately.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**SR 434 from SR 436 to Maitland Boulevard - Northbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
													Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
													(mph)	LOS		
AM PEAK HOUR																
Maitland Boulevard to Gateway Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,478	Signal	70.8	27.6	I	14.2	F	0.32	
Gateway Drive to Trailwood Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	2,323	Signal	58.8	18.0	I	26.9	D	0.60	
Trailwood Drive to W Town Parkway	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	2,904	Signal	45.0	0.0	I	44.0	A	0.98	
W Town Parkway to Orange Avenue	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,320	Signal	33.6	7.2	I	26.8	D	0.60	
Orange Avenue to SR 436	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	1,267	Signal	54.6	12.0	I	15.8	F	0.35	
TOTAL							45	9,292		262.8	64.8	I	24.1	D	0.54	
PM PEAK HOUR																
Maitland Boulevard to Gateway Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,478	Signal	52.2	16.2	I	19.3	E	0.43	
Gateway Drive to Trailwood Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	2,323	Signal	36.6	0.0	I	43.3	A	0.96	
Trailwood Drive to W Town Parkway	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	2,904	Signal	60.6	9.0	I	32.7	C	0.73	
W Town Parkway to Orange Avenue	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,320	Signal	43.2	16.2	I	20.8	E	0.46	
Orange Avenue to SR 436	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	1,267	Signal	75.6	28.2	I	11.4	F	0.25	
TOTAL							45	9,292		268.2	69.6	I	23.6	D	0.52	

Note:

The Travel Time and Stop Delay information for the study corridor is obtained from the 2014 Seminole County Travel Time and Delay Study.

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.

2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.

3. OBD - Outlying Business District

**Year 2014 METROPLAN Orlando Travel Time Study**  
**SR 434 from SR 436 to Maitland Boulevard - Southbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary		
													Average Speed		Avg Speed/	Avg. Fuel	
													(mph)	LOS	Speed Limit	Consump..	
AM PEAK HOUR																	
SR 436 to Orange Avenue	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,267	Signal	33.6	0.0	I	25.7	D	0.57		
Orange Avenue to W Town Parkway	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,320	Signal	30.0	2.4	I	30.0	C	0.67		
W Town Parkway to Trailwood Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	2,904	Signal	45.6	0.6	I	43.4	A	0.96		
Trailwood Drive to Gateway Drive	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	2,323	Signal	38.4	0.0	I	41.2	B	0.92		
Gateway Drive to Maitland Boulevard	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	1,478	Signal	23.4	0.0	I	43.1	A	0.96		
TOTAL							45	9,292		171.0	3.0	I	37.0	B	0.82		
PM PEAK HOUR																	
SR 436 to Orange Avenue	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,267	Signal	22.2	0.0	I	38.9	B	0.86		
Orange Avenue to W Town Parkway	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	1,320	Signal	53.4	21.6	I	16.9	E	0.37		
W Town Parkway to Trailwood Drive	Seminole County	Divided Arterial	Residential/OBD	1	3	1	45	2,904	Signal	45.6	0.0	I	43.4	A	0.96		
Trailwood Drive to Gateway Drive	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	2,323	Signal	42.0	1.8	I	37.7	B	0.84		
Gateway Drive to Maitland Boulevard	Seminole County	Divided Arterial	Residential/OBD	2	3	1	45	1,478	Signal	24.6	0.0	I	41.0	B	0.91		
TOTAL							45	9,292		187.8	23.4	I	33.7	C	0.75		

Note:

The Travel Time and Stop Delay information for the study corridor is obtained from the 2014 Seminole County Travel Time and Delay Study.

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. OBD - Outlying Business District

**SR 434 - Mcbride Ynf cUXto SR 414**  
**Summary of Before & After Study Travel Time Results**

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
1,123	575.0	25.7	179.37	579.0	25.5	180.62
Northbound/Eastbound - PM Peak Hour						
2,591	612.0	24.1	440.47	580.0	25.5	417.44
Southbound/Westbound - AM Peak Hour						
2,291	593.0	24.9	377.38	489.0	30.2	311.19
Southbound/Westbound - PM Peak Hour						
1,801	542.0	27.2	271.15	495.0	29.8	247.64

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.



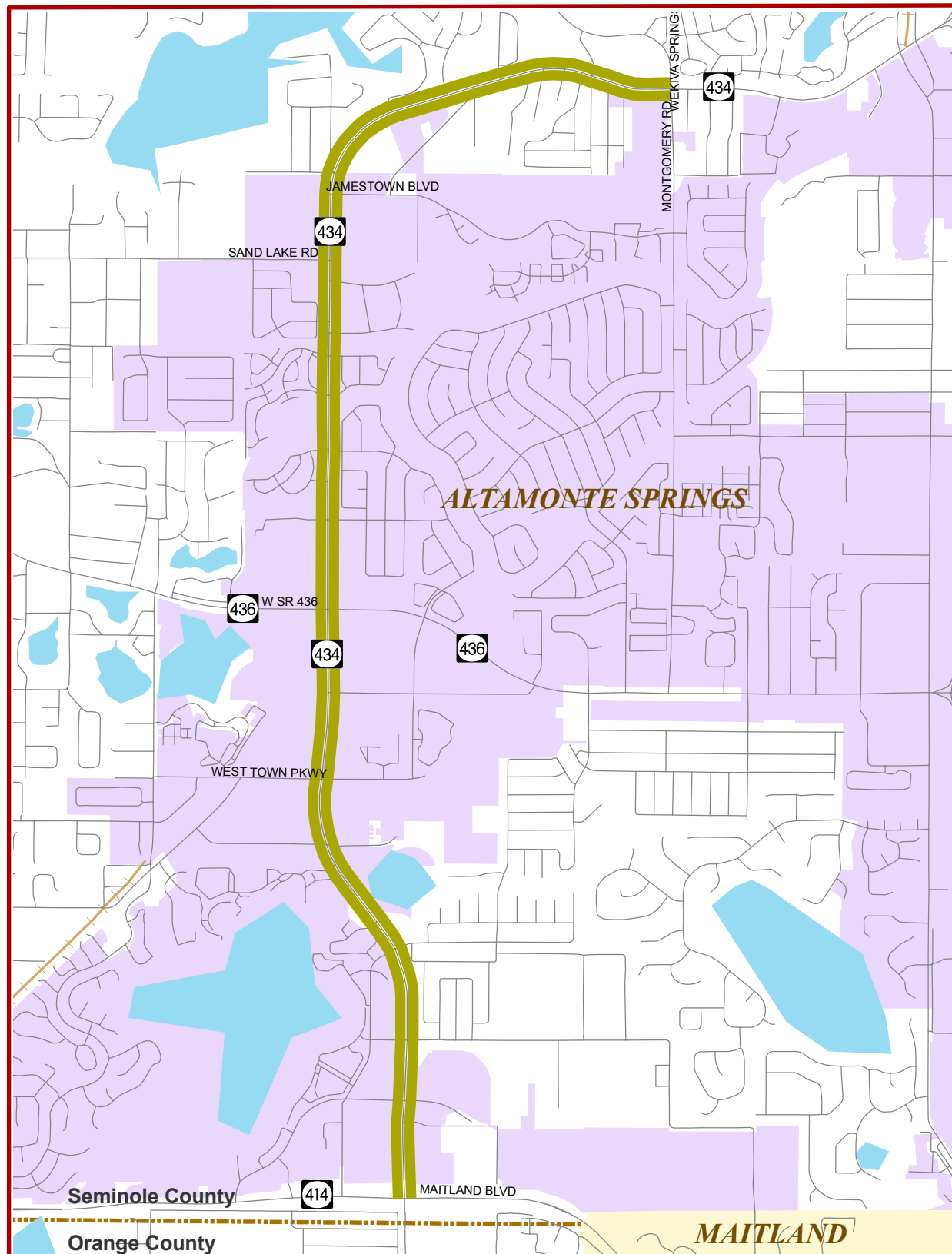
**SR 434 - Mcbride to SR 414**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	556.75	491.81	711.62	665.08

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$1,090.34	\$781.41
Annual User Benefit	\$327,102.00	\$234,423.00
Total Annual User Benefit	\$561,525.00	
Total Signal Retiming Annual Cost	\$30,051.64	
User Benefit / Cost Ratio	18.69	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



## SR 434 - AM Peak

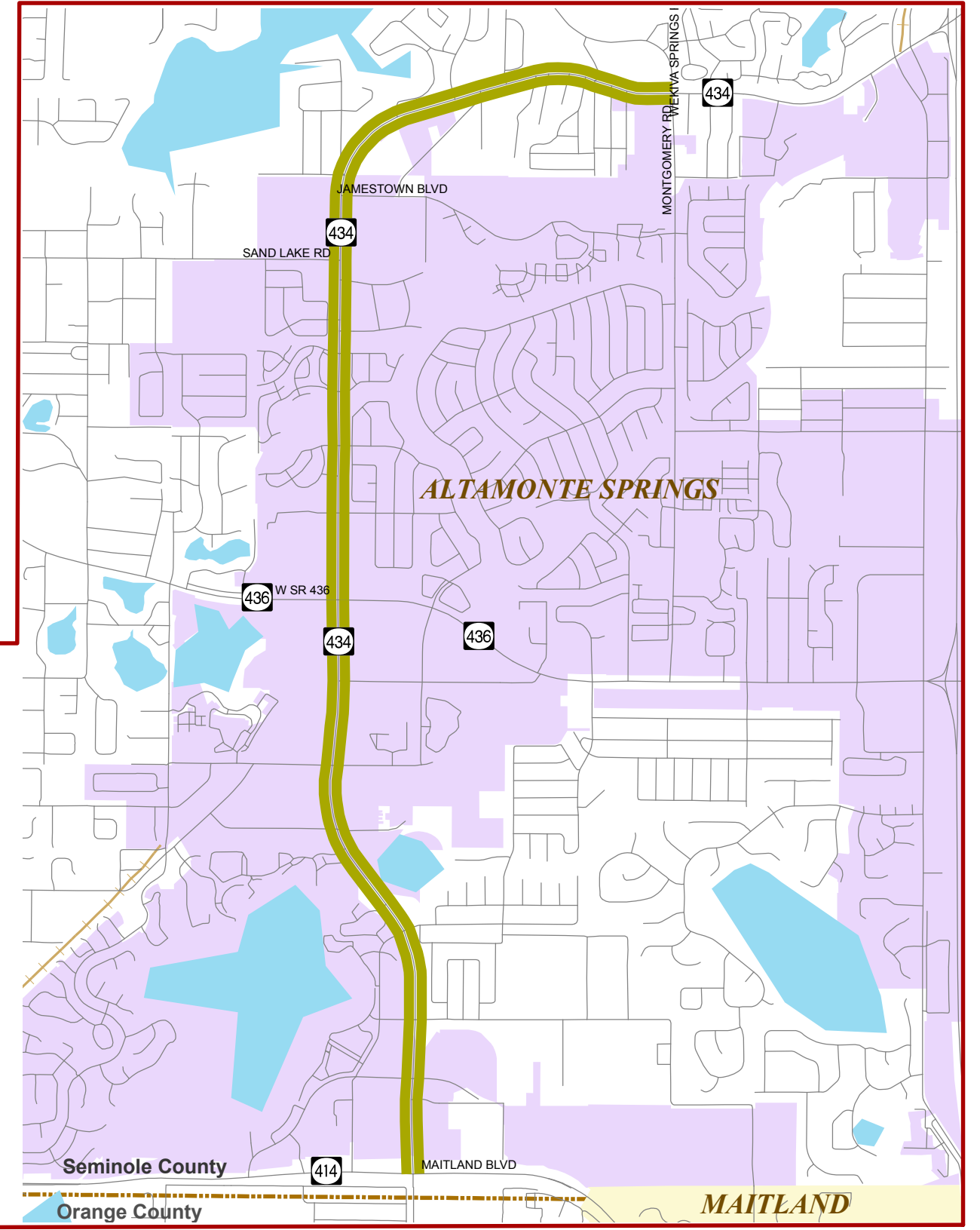
### Before Condition

Distance: 4.10 miles  
From: Montgomery Rd.  
To: SR 414

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 25.7 MPH  
NB Travel Time: 9.58 MIN

SB Avg Speed: 24.9 MPH  
SB Travel Time: 9.88 MIN



## SR 434 - AM Peak

### After Condition

Distance: 4.10 miles  
From: Montgomery Rd.  
To: SR 414

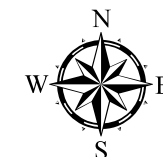
Start Time: 7:00 AM  
End Time: 9:00 AM

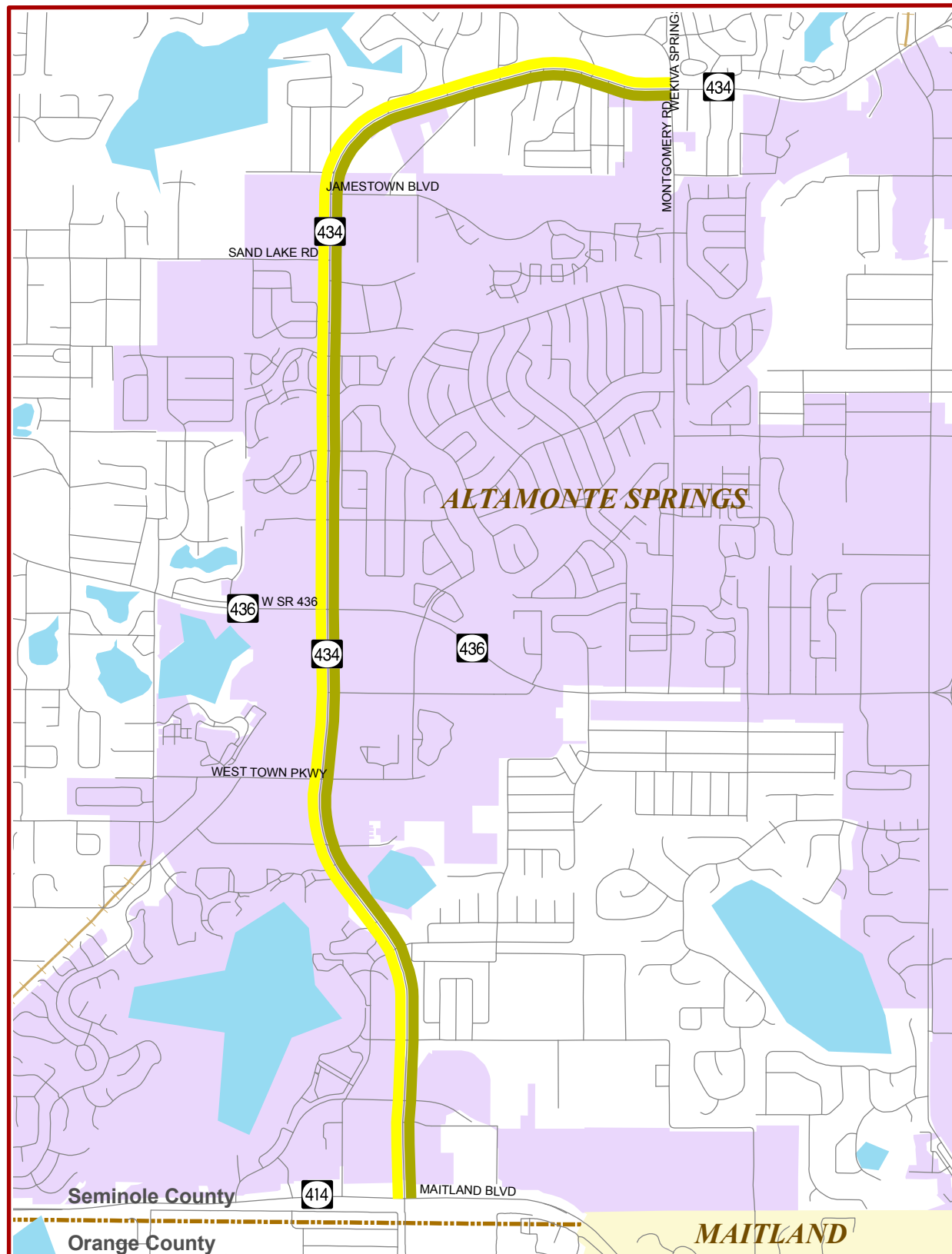
NB Avg Speed: 25.5 MPH  
NB Travel Time: 9.65 MIN

SB Avg Speed: 30.2 MPH  
SB Travel Time: 8.15 MIN

### Level of Services:

	A		D		Roads
	B		E		City Boundary
	C		F		Water





## SR 434 - PM Peak

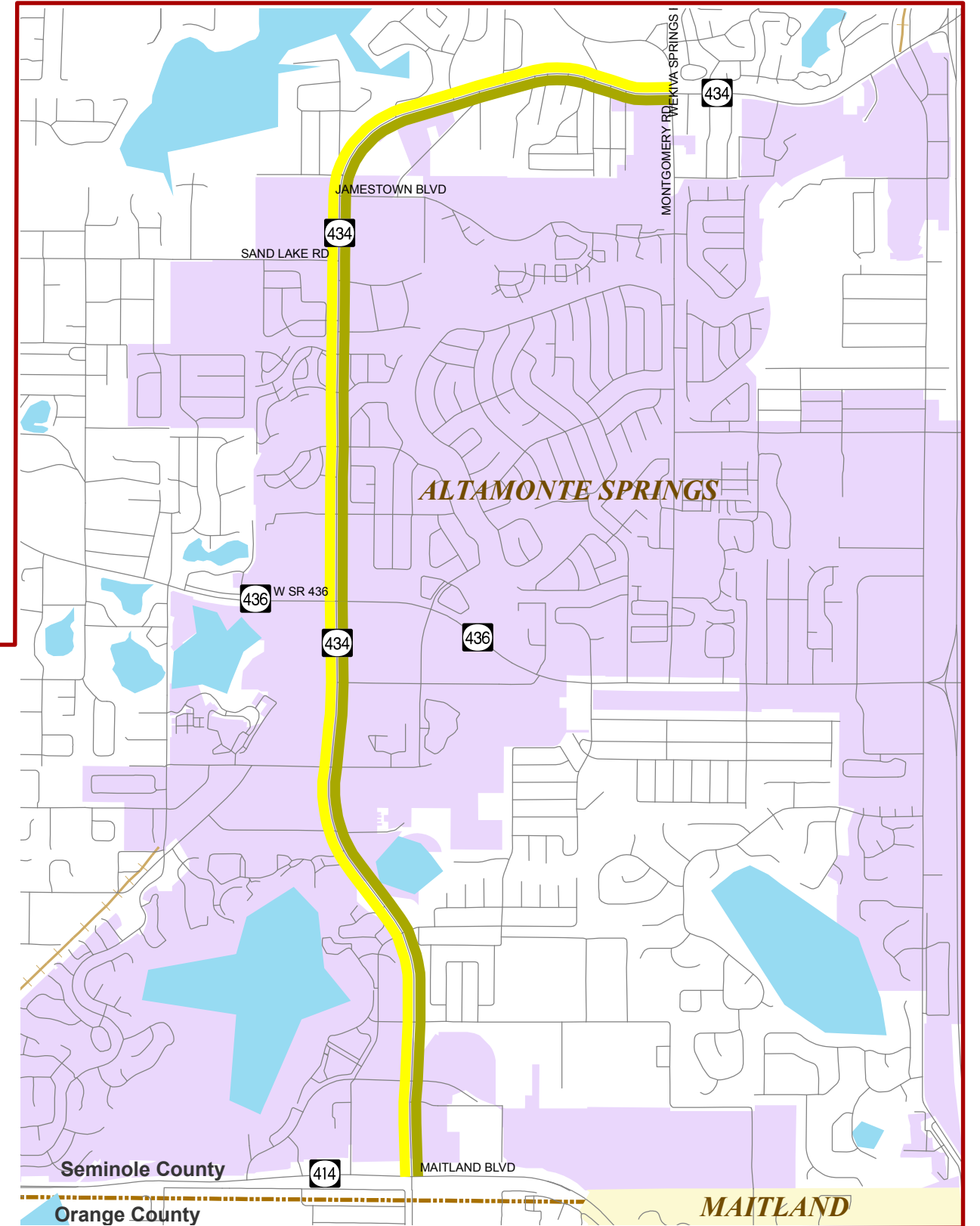
### Before Condition

Distance: 4.10 miles  
From: Montgomery Rd.  
To: SR 414

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 24.1 MPH  
NB Travel Time: 10.2 MIN

SB Avg Speed: 27.2 MPH  
SB Travel Time: 9.03 MIN



## SR 434 - PM Peak

### After Condition

Distance: 4.10 miles  
From: Montgomery Rd.  
To: SR 414

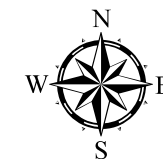
Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 25.5 MPH  
NB Travel Time: 9.67 MIN

SB Avg Speed: 29.8 MPH  
SB Travel Time: 8.25 MIN

### Level of Services:

	A		D		Roads
	B		E		City Boundary
	C		F		Water



# **SR 426**

## **Old Howell Branch Rd. to Dean Rd.**

**Year 2014 METROPLAN Orlando Travel Time Study**  
**SR 426 from Old Howell Branch Road to Dean Road - Eastbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary		
													Average Speed		Avg Speed/ Speed Limit	Avg. Fuel Consump.	
													(mph)	LOS			
AM PEAK HOUR																	
Old Howell Branch Road to Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	1,267	Signal	53	28	I	16.3	E	0.36		
Howell Branch Road to Trinity Prep School	Seminole County	Divided Arterial	Residential	1	2	0	45	2,112	Signal	38	1	I	37.9	B	0.84		
Trinity Prep School to Tuskawilla Road	Seminole County	Divided Arterial	Residential	2	3	0	45	2,746	Signal	55	7	I	34.0	B	0.76		
Tuskawilla Road to Clayton Crossing Way	Seminole County	Divided Arterial	Residential	2	3	0	45	1,373	Signal	44	11	I	21.3	D	0.47		
Clayton Crossing Way to SR 417 (W. Ramp)	Seminole County	Divided Arterial	Residential	0	3	0	45	845	Signal	15	0	I	38.4	B	0.85		
SR 417 (W. Ramp) to SR 417 (E. Ramp)	Seminole County	Divided Arterial	Residential	1	2	0	45	370	Signal	10	2	I	25.2	D	0.56		
SR 417 (E. Ramp) to Dean Road	Seminole County	Divided Arterial	Residential	1	2	1	45	2,851	Signal	104	38	I	18.7	E	0.42		
TOTAL							45	11,564		318	86	I	24.8	D	0.55		
PM PEAK HOUR																	
Old Howell Branch Road to Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	1,267	Signal	61	29	I	14.2	F	0.31		
Howell Branch Road to Trinity Prep School	Seminole County	Divided Arterial	Residential	1	2	0	45	2,112	Signal	37	0	I	38.9	B	0.86		
Trinity Prep School to Tuskawilla Road	Seminole County	Divided Arterial	Residential	2	3	0	45	2,746	Signal	77	13	I	24.3	D	0.54		
Tuskawilla Road to Clayton Crossing Way	Seminole County	Divided Arterial	Residential	2	3	0	45	1,373	Signal	68	26	I	13.8	F	0.31		
Clayton Crossing Way to SR 417 (W. Ramp)	Seminole County	Divided Arterial	Residential	0	3	0	45	845	Signal	17	0	I	33.9	C	0.75		
SR 417 (W. Ramp) to SR 417 (E. Ramp)	Seminole County	Divided Arterial	Residential	1	2	0	45	370	Signal	7	0	I	36.0	B	0.80		
SR 417 (E. Ramp) to Dean Road	Seminole County	Divided Arterial	Residential	1	2	1	45	2,851	Signal	104	27	I	18.7	E	0.42		
TOTAL							45	11,564		370	95	I	21.3	D	0.47		

Note:

The Travel Time and Stop Delay information for the study corridor is obtained from the 2013 Seminole County Travel Time and Delay Study (Dated June 2013)

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.

2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**SR 426 from Old Howell Branch Road to Dean Road - Westbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary		
													Average Speed		Avg Speed/ Speed Limit	Avg. Fuel Consump.	
													(mph)	LOS			
AM PEAK HOUR																	
Dean Road to SR 417 (E. Ramp)	Seminole County	Divided Arterial	Residential	0	3	0	45	2,851	Signal	52	1	I	37.4	B	0.83		
SR 417 (E. Ramp) to SR 417 (W. Ramp)	Seminole County	Divided Arterial	Residential	1	2	0	45	370	Signal	7	0	I	36.0	B	0.80		
SR 417 (W. Ramp) to Clayton Crossing way	Seminole County	Divided Arterial	Residential	2	3	0	45	845	Signal	36	5	I	16.0	E	0.36		
Clayton Crossing Way to Tuskawilla Road	Seminole County	Divided Arterial	Residential	1	2	1	45	1,373	Signal	47	17	I	19.9	E	0.44		
Tuskawilla Road to Trinity Prep. School	Seminole County	Divided Arterial	Residential	1	2	0	45	2,746	Signal	55	5	I	34.0	B	0.76		
Trinity Prep. School to Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	2,112	Signal	50	6	I	28.8	C	0.64		
Howell Branch Road to Old Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	1,267	Signal	23	1	I	37.6	B	0.83		
TOTAL							45	11,564		270	36	I	29.2	C	0.65		
PM PEAK HOUR																	
Dean Road to SR 417 (E. Ramp)	Seminole County	Divided Arterial	Residential	0	3	0	45	2,851	Signal	107	40	I	18.2	E	0.40		
SR 417 (E. Ramp) to SR 417 (W. Ramp)	Seminole County	Divided Arterial	Residential	1	2	0	45	370	Signal	7	0	I	36.0	B	0.80		
SR 417 (W. Ramp) to Clayton Crossing way	Seminole County	Divided Arterial	Residential	2	3	0	45	845	Signal	55	35	I	10.5	F	0.23		
Clayton Crossing Way to Tuskawilla Road	Seminole County	Divided Arterial	Residential	1	2	1	45	1,373	Signal	37	10	I	25.3	D	0.56		
Tuskawilla Road to Trinity Prep. School	Seminole County	Divided Arterial	Residential	1	2	0	46	2,746	Signal	53	4	I	35.3	B	0.77		
Trinity Prep. School to Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	47	2,112	Signal	52	2	I	27.7	C	0.59		
Howell Branch Road to Old Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	1,267	Signal	22	0	I	39.3	B	0.87		
TOTAL							45	11,564		333	91	I	23.7	D	0.53		

Note:

The Travel Time and Stop Delay information for the study corridor is obtained from the 2013 Seminole County Travel Time and Delay Study (Dated June 2013)

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.



**Year 2014 METROPLAN Orlando Travel Time Study**  
**SR 426 from Old Howell Branch Road to Dean Road - Eastbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
													Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
													(mph)	LOS		
AM PEAK HOUR																
Old Howell Branch Road to Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	1,267	Signal	43.8	15.0	I	19.7	E	0.44	
Howell Branch Road to Trinity Prep School	Seminole County	Divided Arterial	Residential	1	2	0	45	2,112	Signal	45.6	3.6	I	31.6	C	0.70	
Trinity Prep School to Tuskawilla Road	Seminole County	Divided Arterial	Residential	2	3	0	45	2,746	Signal	57.0	9.0	I	32.8	C	0.73	
Tuskawilla Road to Clayton Crossing Way	Seminole County	Divided Arterial	Residential	2	3	0	45	1,373	Signal	27.6	4.2	I	33.9	C	0.75	
Clayton Crossing Way to SR 417 (W. Ramp)	Seminole County	Divided Arterial	Residential	0	3	0	45	845	Signal	16.8	1.8	I	34.3	B	0.76	
SR 417 (W. Ramp) to SR 417 (E. Ramp)	Seminole County	Divided Arterial	Residential	1	2	0	45	370	Signal	6.0	0.0	I	42.0	A	0.93	
SR 417 (E. Ramp) to Dean Road	Seminole County	Divided Arterial	Residential	1	2	1	45	2,851	Signal	50.4	2.4	I	38.6	B	0.86	
TOTAL							45	11,564		247.2	36.0	I	31.9	C	0.71	
PM PEAK HOUR																
Old Howell Branch Road to Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	1,267	Signal	54.6	14.4	I	15.8	F	0.35	
Howell Branch Road to Trinity Prep School	Seminole County	Divided Arterial	Residential	1	2	0	45	2,112	Signal	34.2	0.0	I	42.1	A	0.94	
Trinity Prep School to Tuskawilla Road	Seminole County	Divided Arterial	Residential	2	3	0	45	2,746	Signal	63.0	6.0	I	29.7	C	0.66	
Tuskawilla Road to Clayton Crossing Way	Seminole County	Divided Arterial	Residential	2	3	0	45	1,373	Signal	33.6	3.6	I	27.9	C	0.62	
Clayton Crossing Way to SR 417 (W. Ramp)	Seminole County	Divided Arterial	Residential	0	3	0	45	845	Signal	26.4	9.6	I	21.8	D	0.48	
SR 417 (W. Ramp) to SR 417 (E. Ramp)	Seminole County	Divided Arterial	Residential	1	2	0	45	370	Signal	7.8	0.0	I	32.3	C	0.72	
SR 417 (E. Ramp) to Dean Road	Seminole County	Divided Arterial	Residential	1	2	1	45	2,851	Signal	67.2	13.2	I	28.9	C	0.64	
TOTAL							45	11,564		286.8	46.8	I	27.5	C	0.61	

Note:

The Travel Time and Stop Delay information for the study corridor is obtained from the 2014 Seminole County Travel Time and Delay Study

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.

2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**SR 426 from Old Howell Branch Road to Dean Road - Westbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary		
													Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.	
													(mph)	LOS			
AM PEAK HOUR																	
Dean Road to SR 417 (E. Ramp)	Seminole County	Divided Arterial	Residential	0	3	0	45	2,851	Signal	63.0	11.4	I	30.9	C	0.69		
SR 417 (E. Ramp) to SR 417 (W. Ramp)	Seminole County	Divided Arterial	Residential	1	2	0	45	370	Signal	7.2	0.0	I	35.0	B	0.78		
SR 417 (W. Ramp) to Clayton Crossing way	Seminole County	Divided Arterial	Residential	2	3	0	45	845	Signal	43.8	9.0	I	13.2	F	0.29		
Clayton Crossing Way to Tuskawilla Road	Seminole County	Divided Arterial	Residential	1	2	1	45	1,373	Signal	37.2	3.0	I	25.2	D	0.56		
Tuskawilla Road to Trinity Prep. School	Seminole County	Divided Arterial	Residential	1	2	0	45	2,746	Signal	74.4	24.6	I	25.2	D	0.56		
Trinity Prep. School to Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	2,112	Signal	66.6	25.8	I	21.6	D	0.48		
Howell Branch Road to Old Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	1,267	Signal	21.0	0.0	I	41.1	B	0.91		
TOTAL							45	11,564		313.2	73.8	I	25.2	D	0.56		
PM PEAK HOUR																	
Dean Road to SR 417 (E. Ramp)	Seminole County	Divided Arterial	Residential	0	3	0	45	2,851	Signal	105.6	19.8	I	18.4	E	0.41		
SR 417 (E. Ramp) to SR 417 (W. Ramp)	Seminole County	Divided Arterial	Residential	1	2	0	45	370	Signal	7.2	0.0	I	35.0	B	0.78		
SR 417 (W. Ramp) to Clayton Crossing way	Seminole County	Divided Arterial	Residential	2	3	0	45	845	Signal	14.4	0.0	I	40.0	B	0.89		
Clayton Crossing Way to Tuskawilla Road	Seminole County	Divided Arterial	Residential	1	2	1	45	1,373	Signal	40.2	15.0	I	23.3	D	0.52		
Tuskawilla Road to Trinity Prep. School	Seminole County	Divided Arterial	Residential	1	2	0	46	2,746	Signal	42.6	0.0	I	43.9	A	0.96		
Trinity Prep. School to Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	47	2,112	Signal	34.2	0.0	I	42.1	A	0.90		
Howell Branch Road to Old Howell Branch Road	Seminole County	Divided Arterial	Residential	1	2	0	45	1,267	Signal	18.6	0.0	I	46.4	A	1.03		
TOTAL							45	11,564		262.8	34.8	I	30.0	C	0.67		

Note:

The Travel Time and Stop Delay information for the study corridor is obtained from the 2014 Seminole County Travel Time and Delay Study

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.

## SR 426 - Old Howell Branch Road to Dean Road

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
1,431	318.0	24.8	126.41	247.0	31.9	98.18
Northbound/Eastbound - PM Peak Hour						
2,268	370.0	21.3	233.10	287.0	27.5	180.81
Southbound/Westbound - AM Peak Hour						
1,135	270.0	29.2	85.13	313.0	25.2	98.68
Southbound/Westbound - PM Peak Hour						
1,054	333.0	23.7	97.50	263.0	30.0	77.00

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

**SR 426 - Old Howell Branch Road to Dean Road**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	211.53	196.86	330.60	257.81

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$246.31	\$1,222.14
Annual User Benefit	\$73,893.00	\$366,642.00
Total Annual User Benefit	\$440,535.00	
Total Signal Retiming Annual Cost	\$20,204.88	
User Benefit / Cost Ratio	21.80	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.

**SR 426  
- AM Peak**

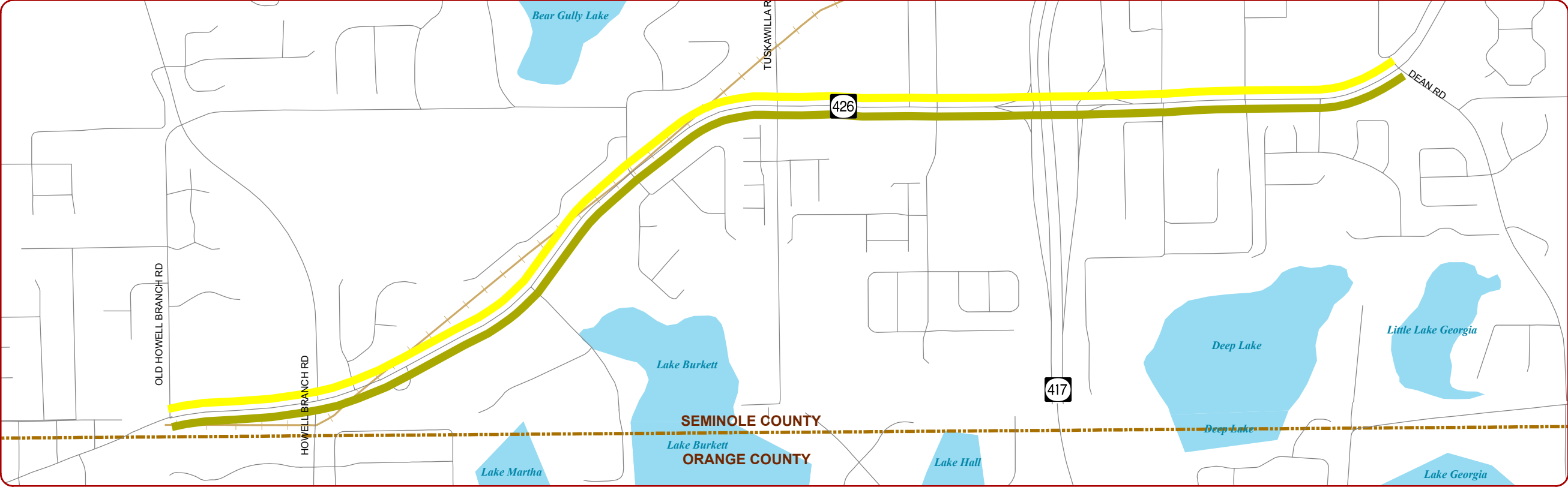
**Before Condition**

Distance: 2.19 miles  
From: Old Howell Branch Rd.  
To: Dean Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 24.8 MPH  
EB Travel Time: 5.30 MIN

WB Avg Speed: 29.2 MPH  
WB Travel Time: 4.50 MIN



**SR 426  
- AM Peak**

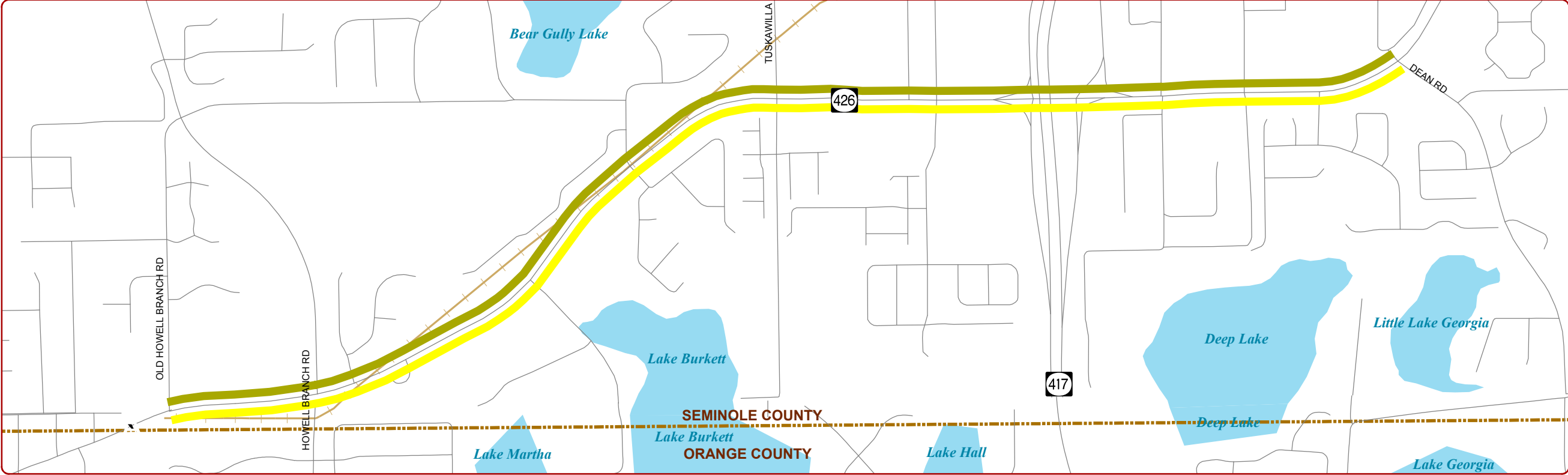
**After Condition**

Distance: 2.19 miles  
From: Old Howell Branch Rd.  
To: Dean Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 31.9 MPH  
EB Travel Time: 4.12 MIN

WB Avg Speed: 25.2 MPH  
WB Travel Time: 5.22 MIN



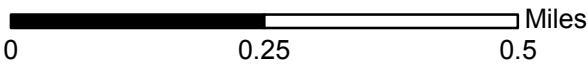
**Level of Services:**

- |  |   |  |   |  |               |
|--|---|--|---|--|---------------|
|  | A |  | D |  | Roads         |
|  | B |  | E |  | City Boundary |
|  | C |  | F |  | Water         |



**2014 METROPLAN ORLANDO**

*Travel Time Study*



**SR 426  
- PM Peak**

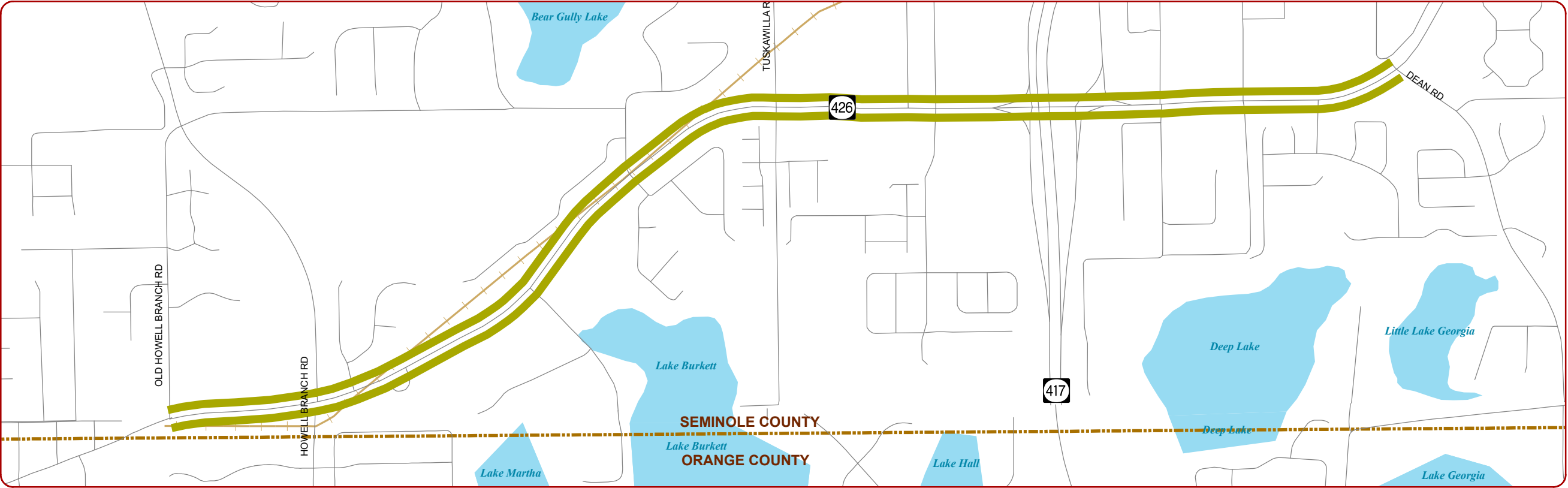
**Before Condition**

Distance: 2.19 miles  
From: Old Howell Branch Rd.  
To: Dean Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 21.3 MPH  
EB Travel Time: 6.17 MIN

WB Avg Speed: 23.7 MPH  
WB Travel Time: 5.55 MIN



**SR 426  
- PM Peak**

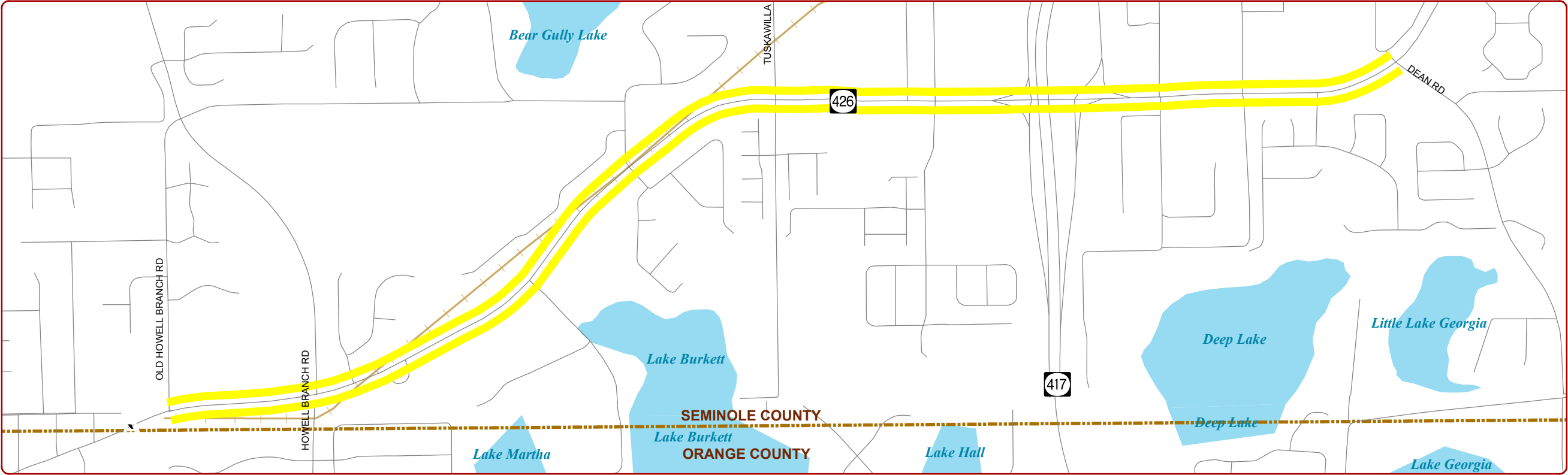
**After Condition**

Distance: 2.19 miles  
From: Old Howell Branch Rd.  
To: Dean Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 27.5 MPH  
EB Travel Time: 4.78 MIN

WB Avg Speed: 30.0 MPH  
WB Travel Time: 4.38 MIN



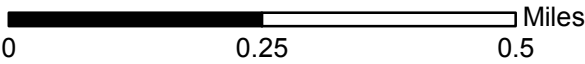
**Level of Services:**

- |   |   |               |
|---|---|---------------|
| A | D | Roads         |
| B | E | City Boundary |
| C | F | Water         |



**2014 METROPLAN ORLANDO**

*Travel Time Study*





**Goldenrod Rd. (SR 551)**  
**Liverpool Blvd. to Bates Rd.**

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Goldenrod Road from Liverpool Boulevard to Bates Road - Northbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Median Opening to Liverpool Blvd	Orange County	Divided Arterial	Residential	1	2	0	45	898	16	Signal	26	7.8	II	23.7	C	0.53	
Liverpool Blvd to Bates Rd	Orange County	Divided Arterial	Residential	0	2	0	45	2,587	16	Signal	53	6.0	II	33.4	B	0.74	
TOTAL							45	3,485			79	13.8	II	30.1	B	0.67	0.023 gal/veh
PM PEAK HOUR																	
Median Opening to Liverpool Blvd	Orange County	Divided Arterial	Residential	1	2	0	45	898	17	Signal	18	3.0	II	34.0	B	0.76	
Liverpool Blvd to Bates Rd	Orange County	Divided Arterial	Residential	0	2	0	45	2,587	17	Signal	55	7.2	II	32.3	B	0.72	
TOTAL							45	3,485			73	10.2	II	32.5	B	0.72	0.023 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Goldenrod Road from Liverpool Boulevard to Bates Road - Southbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Median Opening to Bates Rd	Orange County	Divided Arterial	Residential	1	2	0	45	528	16	Signal	12	1.2	II	30.0	B	0.67	
Bates Rd to Liverpool Blvd	Orange County	Divided Arterial	Residential	1	2	0	45	2,587	16	Signal	51	7.2	II	34.6	B	0.77	
TOTAL							45	3,115			63	8.4	II	33.7	B	0.75	0.020 gal/veh
PM PEAK HOUR																	
Median Opening to Bates Rd	Orange County	Divided Arterial	Residential	1	2	0	45	528	16	Signal	22	3.6	II	16.7	E	0.37	
Bates Rd to Liverpool Blvd	Orange County	Divided Arterial	Residential	1	2	0	45	2,587	16	Signal	43	3.0	II	41.4	A	0.92	
TOTAL							45	3,115			64	6.6	II	33.2	B	0.74	0.020 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Goldenrod Road from Liverpool Boulevard to Bates Road - Northbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Median Opening to Liverpool Blvd	Orange County	Divided Arterial	Residential	1	2	0	45	898	35	Signal	28	1.0	II	21.9	D	0.49	
Liverpool Blvd to Bates Rd	Orange County	Divided Arterial	Residential	0	2	0	45	2,587	35	Signal	44	2.0	II	40.1	A	0.89	
TOTAL							45	3,485			72	3.0	II	33.0	B	0.73	0.027 gal/veh
PM PEAK HOUR																	
Median Opening to Liverpool Blvd	Orange County	Divided Arterial	Residential	1	2	0	45	898	28	Signal	30	2.0	II	20.4	D	0.45	
Liverpool Blvd to Bates Rd	Orange County	Divided Arterial	Residential	0	2	0	45	2,587	28	Signal	55	9.0	II	32.1	B	0.71	
TOTAL							45	3,485			85	11.0	II	28.0	C	0.62	0.028 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Goldenrod Road from Liverpool Boulevard to Bates Road - Southbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/ Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Median Opening to Bates Rd	Orange County	Divided Arterial	Residential	1	2	0	45	528	34	Signal	11	2.0	II	32.7	B	0.73	
Bates Rd to Liverpool Blvd	Orange County	Divided Arterial	Residential	1	2	0	45	2,587	34	Signal	44	2.0	II	40.1	A	0.89	
TOTAL							45	3,115			55	4.0	II	38.6	A	0.86	0.028 gal/veh
PM PEAK HOUR																	
Median Opening to Bates Rd	Orange County	Divided Arterial	Residential	1	2	0	45	528	29	Signal	12	2.0	II	30.0	B	0.67	
Bates Rd to Liverpool Blvd	Orange County	Divided Arterial	Residential	1	2	0	45	2,587	29	Signal	45	1.0	II	39.2	A	0.87	
TOTAL							45	3,115			57	3.0	II	37.3	A	0.83	0.028 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.

2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.

## Goldenroad Road (SR 551) - Liverpool Boulevard to Bates Road

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
965	79.0	30.1	21.18	72.0	33.0	19.30
Northbound/Eastbound - PM Peak Hour						
1,463	73.0	32.5	29.67	85.0	28.0	34.54
Southbound/Westbound - AM Peak Hour						
1,192	63.0	33.7	20.86	55.0	38.6	18.21
Southbound/Westbound - PM Peak Hour						
1,128	64.0	33.2	20.05	57.0	37.3	17.86

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

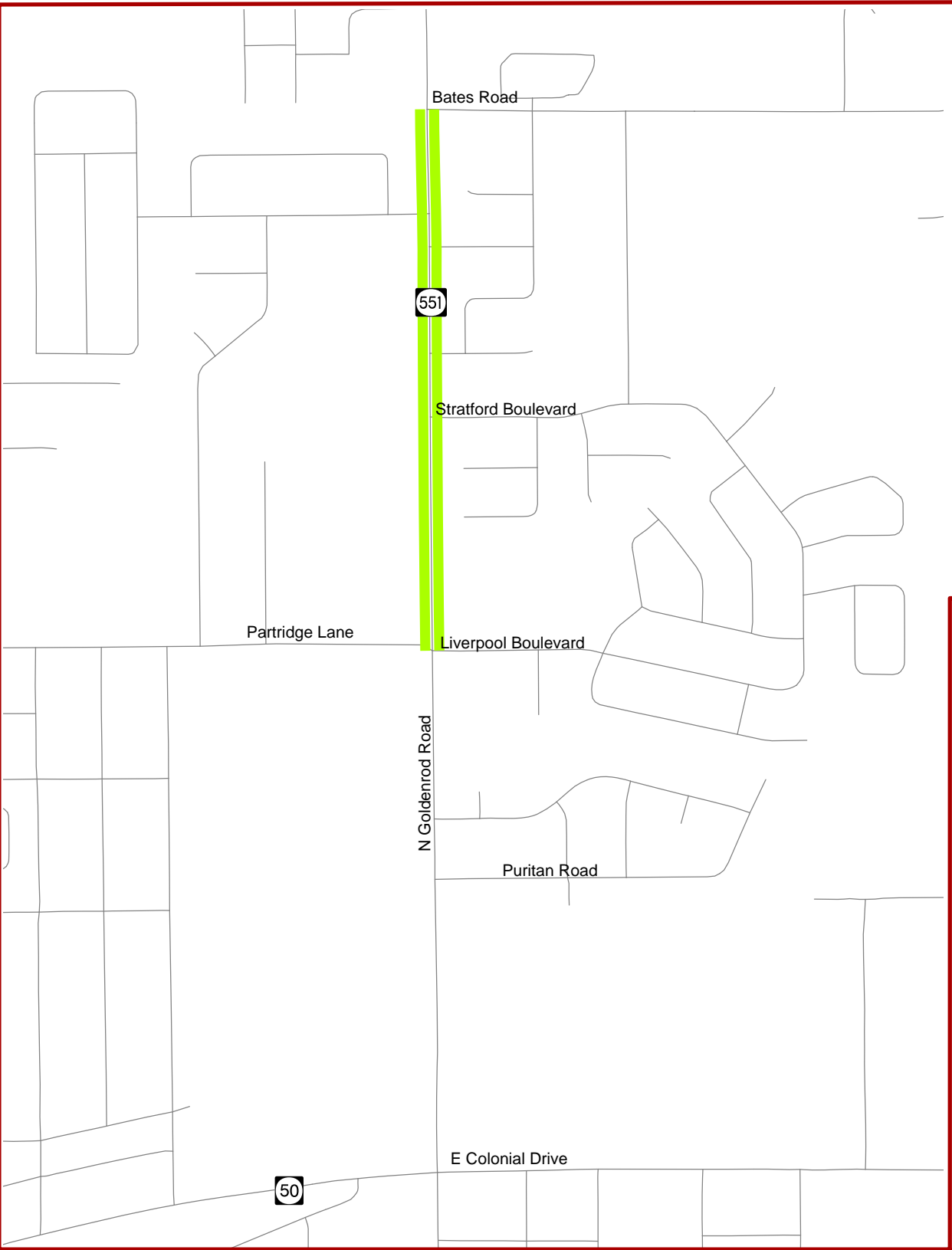
**Goldenroad Road (SR 551) - Liverpool Boulevard to Bates Road**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	42.04	37.51	49.72	52.40

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$76.06	-\$45.00
Annual User Benefit	\$22,818.00	-\$13,500.00
Total Annual User Benefit	\$9,318.00	
Total Signal Retiming Annual Cost	\$5,701.68	
User Benefit / Cost Ratio	1.63	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



**Goldenrod Rd.  
- AM Peak**

**Before Condition**

Date of Collection: 1/15/2014  
Distance: 0.66 miles  
From: Liverpool Blvd.  
To: Bates Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 30.1 MPH  
NB Travel Time: 1.32 MIN

SB Avg Speed: 33.7 MPH  
SB Travel Time: 1.05 MIN

**Goldenrod Rd.  
- AM Peak**

**After Condition**

Date of Collection: 5/6/2014  
Distance: 0.66 miles  
From: Liverpool Blvd.  
To: Bates Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 33.0 MPH  
NB Travel Time: 1.20 MIN

SB Avg Speed: 38.6 MPH  
SB Travel Time: 0.92 MIN



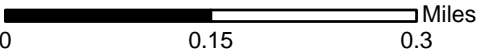
**Level of Services:**

	A		D		Roads
	B		E		City Boundary
	C		F		Water



**2014 METROPLAN ORLANDO**

*Travel Time Study*







**Goldenrod Rd.  
- PM Peak**

**Before Condition**

Date of Collection: 1/15/2014  
Distance: 0.66 miles  
From: Liverpool Blvd.  
To: Bates Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 32.5 MPH  
NB Travel Time: 1.22 MIN

SB Avg Speed: 33.2 MPH  
SB Travel Time: 1.07 MIN

**Goldenrod Rd.  
- PM Peak**

**After Condition**

Date of Collection: 5/6/2014  
Distance: 0.66 miles  
From: Liverpool Blvd.  
To: Bates Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 28.0 MPH  
NB Travel Time: 1.42 MIN

SB Avg Speed: 37.3 MPH  
SB Travel Time: 0.95 MIN

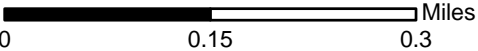


**Level of Services:**



**2014 METROPLAN ORLANDO**

*Travel Time Study*



**Goldenrod Rd. (SR 551)**  
**Charlin Pkwy. to Pershing Ave.**

# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** Goldenrod Road (SR 551)  
**Segment:** Charlin Parkway to Pershing Avenue  
**Jurisdiction:** Orange County  
**Area Type:** Residential  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 0.73 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 0.9 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Charlin Parkway	1	2	0	45	
Sun Vista Way	1	2	0	45	
Pershing Avenue	2	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	18	112	28.9	C
Northbound	PM	21	123	26.3	D

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Pershing Avenue	1	2	1	45	
Sun Vista Way	1	2	0	45	
Charlin Parkway	1	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	10	87	37.2	B
Southbound	PM	11	83	39.0	B

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** Goldenrod Road (SR 551)  
**Segment:** Charlin Parkway to Pershing Avenue  
**Jurisdiction:** Orange County  
**Area Type:** Residential  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 0.73 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 0.9 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Charlin Parkway	1	2	0	45	
Sun Vista Way	1	2	0	45	
Pershing Avenue	2	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	18	101	32.1	C
Northbound	PM	21	105	30.9	C

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Pershing Avenue	1	2	1	45	
Sun Vista Way	1	2	0	45	
Charlin Parkway	1	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	19	72	45.0	A
Southbound	PM	10	71	45.6	A

## Goldenroad Road (SR 551) - Charlin Parkway to Pershing Avenue

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
748	112.0	28.9	23.27	101.0	32.1	20.99
Northbound/Eastbound - PM Peak Hour						
1,542	123.0	26.3	52.69	105.0	30.9	44.98
Southbound/Westbound - AM Peak Hour						
1,313	87.0	37.2	31.73	72.0	45.0	26.26
Southbound/Westbound - PM Peak Hour						
1,142	83.0	39.0	26.33	71.0	45.6	22.52

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

**Goldenroad Road (SR 551) - Charlin Parkway to Pershing Avenue**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

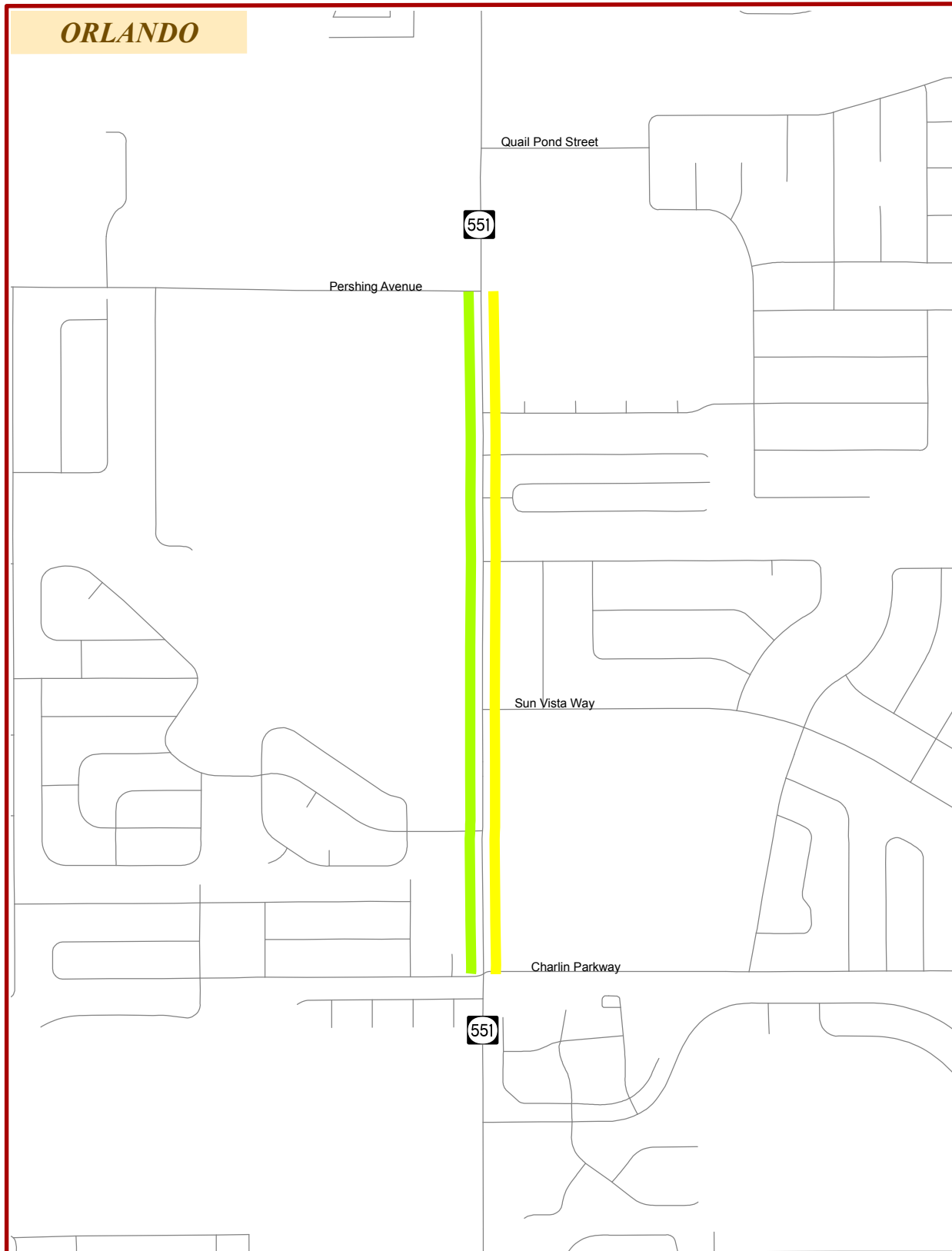
MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	55.00	47.25	79.01	67.50

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$130.12	\$193.25
Annual User Benefit	\$39,036.00	\$57,975.00
Total Annual User Benefit	\$97,011.00	
Total Signal Retiming Annual Cost	\$6,576.95	
User Benefit / Cost Ratio	14.75	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.

ORLANDO



## SR 551 - AM Peak

### Before Condition

Date of Collection: 2/27/2014  
Distance: 0.73 miles  
From: Charlin Parkway  
To: Pershing Ave.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 28.9 MPH  
NB Travel Time: 1.87 MIN

SB Avg Speed: 37.2 MPH  
SB Travel Time: 1.45 MIN

## SR 551 - AM Peak

### After Condition

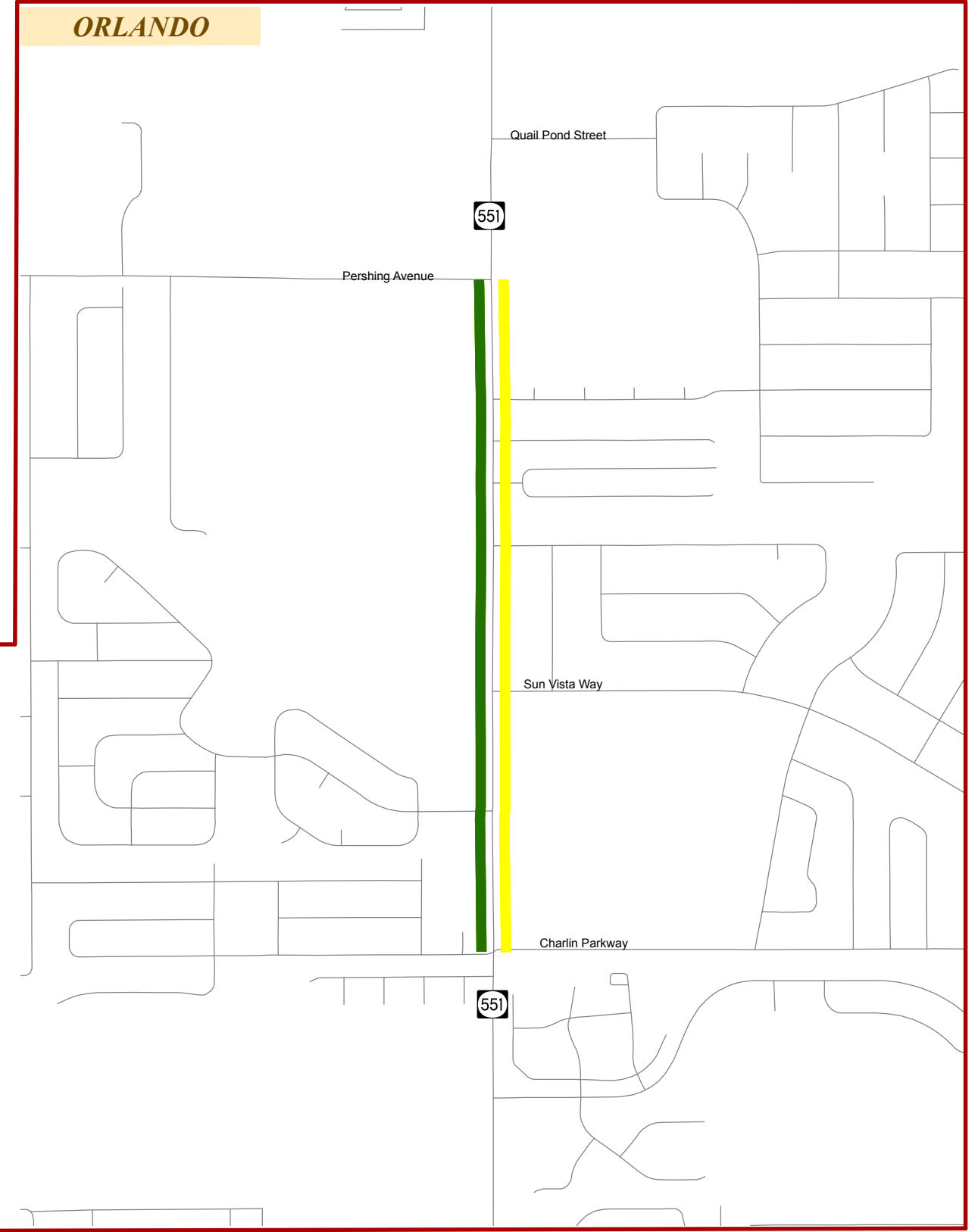
Date of Collection: 5/22/2014  
Distance: 0.73 miles  
From: Charlin Parkway  
To: Pershing Ave.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 32.1 MPH  
NB Travel Time: 1.68 MIN

SB Avg Speed: 45.0 MPH  
SB Travel Time: 1.20 MIN

ORLANDO



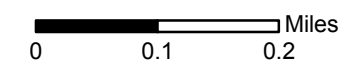
### Level of Services:

	A		D		Roads
	B		E		City Boundary
	C		F		Water

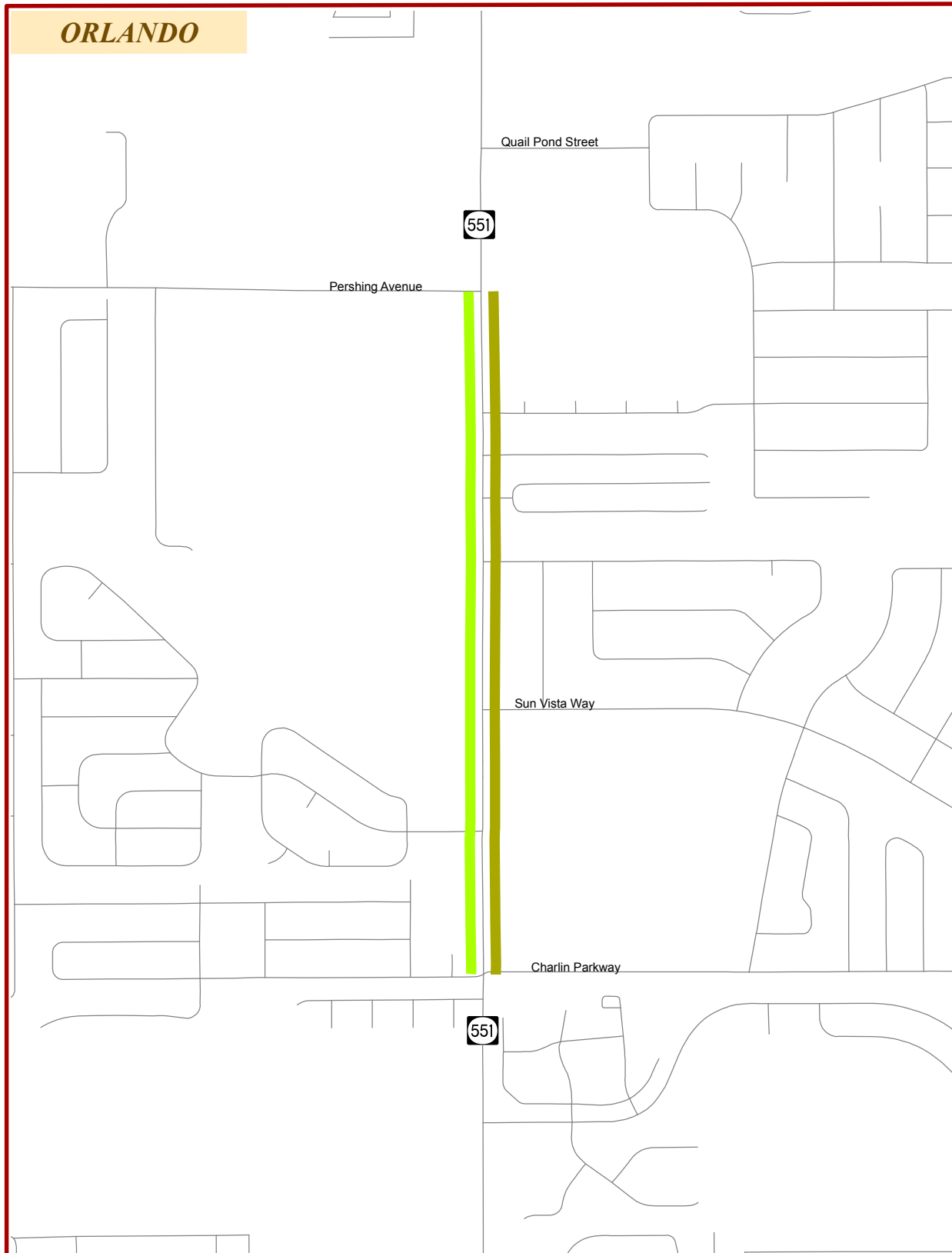


2014 METROPLAN ORLANDO

*Travel Time Study*



ORLANDO



## SR 551 -PM Peak

### Before Condition

Date of Collection: 2/27/2014  
Distance: 0.73 miles  
From: Charlin Parkway  
To: Pershing Ave.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 26.3 MPH  
NB Travel Time: 2.05 MIN

SB Avg Speed: 39.0 MPH  
SB Travel Time: 1.38 MIN

## SR 551 - PM Peak

### After Condition

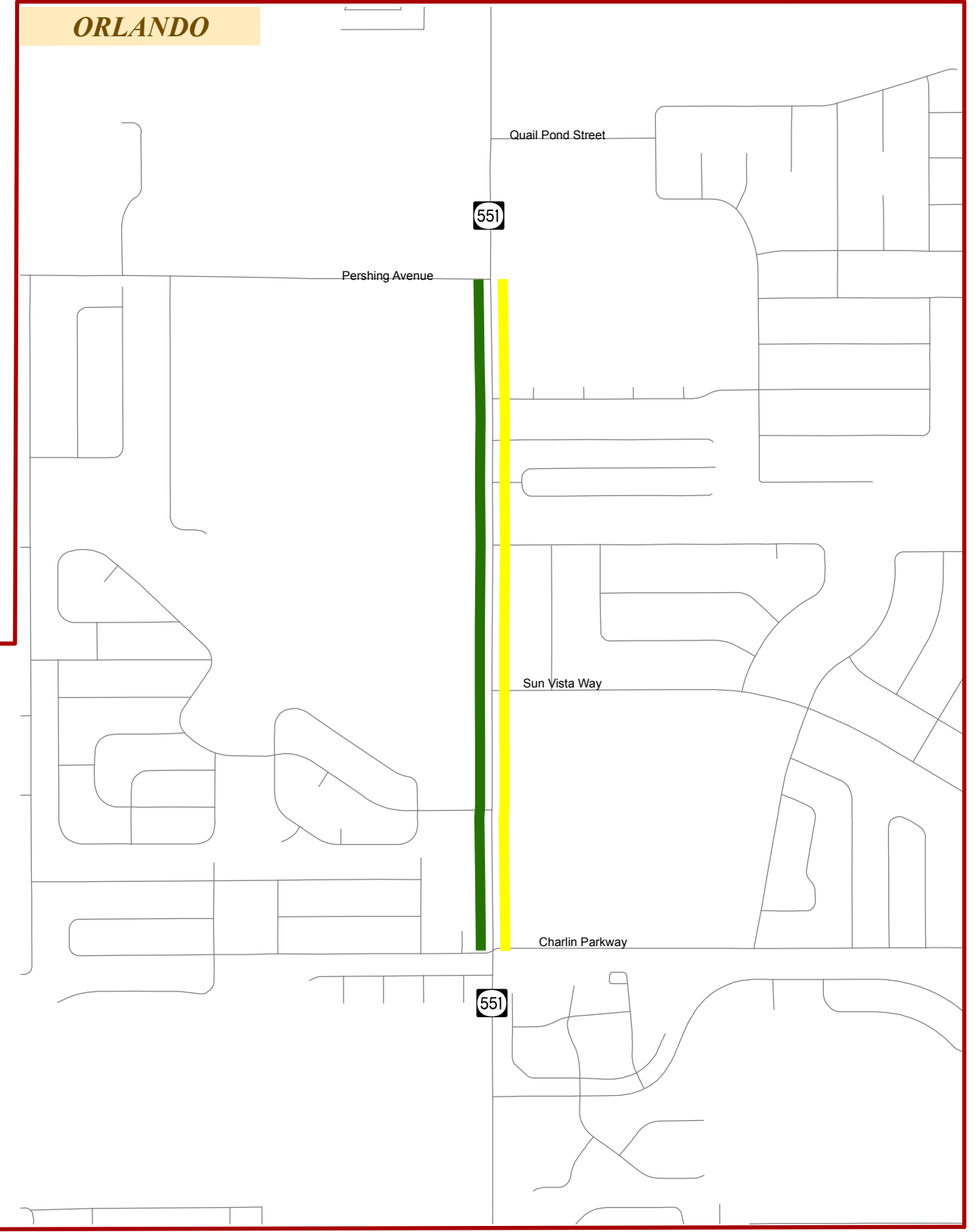
Date of Collection: 5/22/2014  
Distance: 0.73 miles  
From: Charlin Parkway  
To: Pershing Ave.

Start Time: 4:00 PM  
End Time: 6:00 PM

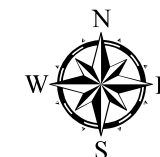
NB Avg Speed: 30.9 MPH  
NB Travel Time: 1.75 MIN

SB Avg Speed: 45.6 MPH  
SB Travel Time: 1.18 MIN

ORLANDO



### Level of Services:





**Goldenrod Rd. (SR 551)**  
**Lake Underhill Rd. to Valencia College Ln.**

# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** Goldenrod Road (SR 551)  
**Segment:** Lake Underhill Road to Valencia College Lane  
**Jurisdiction:** Orange County  
**Area Type:** Residential  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 1.0 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.3 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Lake Underhill Road	1	2	1	45	
SR 408 EB Ramp	0	2	0	45	
SR 408 WB Ramp	2	2	0	45	
Valencia College Lane	1	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	48	214	21.9	D
Northbound	PM	45	265	17.7	E

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Valencia College Lane	1	2	0	45	
SR 408 EB Ramp	0	2	1	45	
SR 408 WB Ramp	1	2	0	45	
Lake Underhill Road	2	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	36	173	27.0	C
Southbound	PM	30	257	18.2	E

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** Goldenrod Road (SR 551)  
**Segment:** Lake Underhill Road to Valencia College Lane  
**Jurisdiction:** Orange County  
**Area Type:** Residential  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 1.0 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.3 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Lake Underhill Road	1	2	1	45	
SR 408 EB Ramp	0	2	0	45	
SR 408 WB Ramp	2	2	0	45	
Valencia College Lane	1	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	46	129	36.3	B
Northbound	PM	43	147	31.8	C

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Valencia College Lane	1	2	0	45	
SR 408 EB Ramp	0	2	1	45	
SR 408 WB Ramp	1	2	0	45	
Lake Underhill Road	2	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	30	145	32.3	C
Southbound	PM	40	187	25.0	D

## Goldenroad Road (SR 551) - Lake Underhill Road to Valencia College Lane

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
902	214.0	21.9	53.62	129.0	36.3	32.32
Northbound/Eastbound - PM Peak Hour						
1,232	265.0	17.7	90.69	147.0	31.8	50.31
Southbound/Westbound - AM Peak Hour						
1,083	173.0	27.0	52.04	145.0	32.3	43.62
Southbound/Westbound - PM Peak Hour						
1,172	257.0	18.2	83.67	187.0	25.0	60.88

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

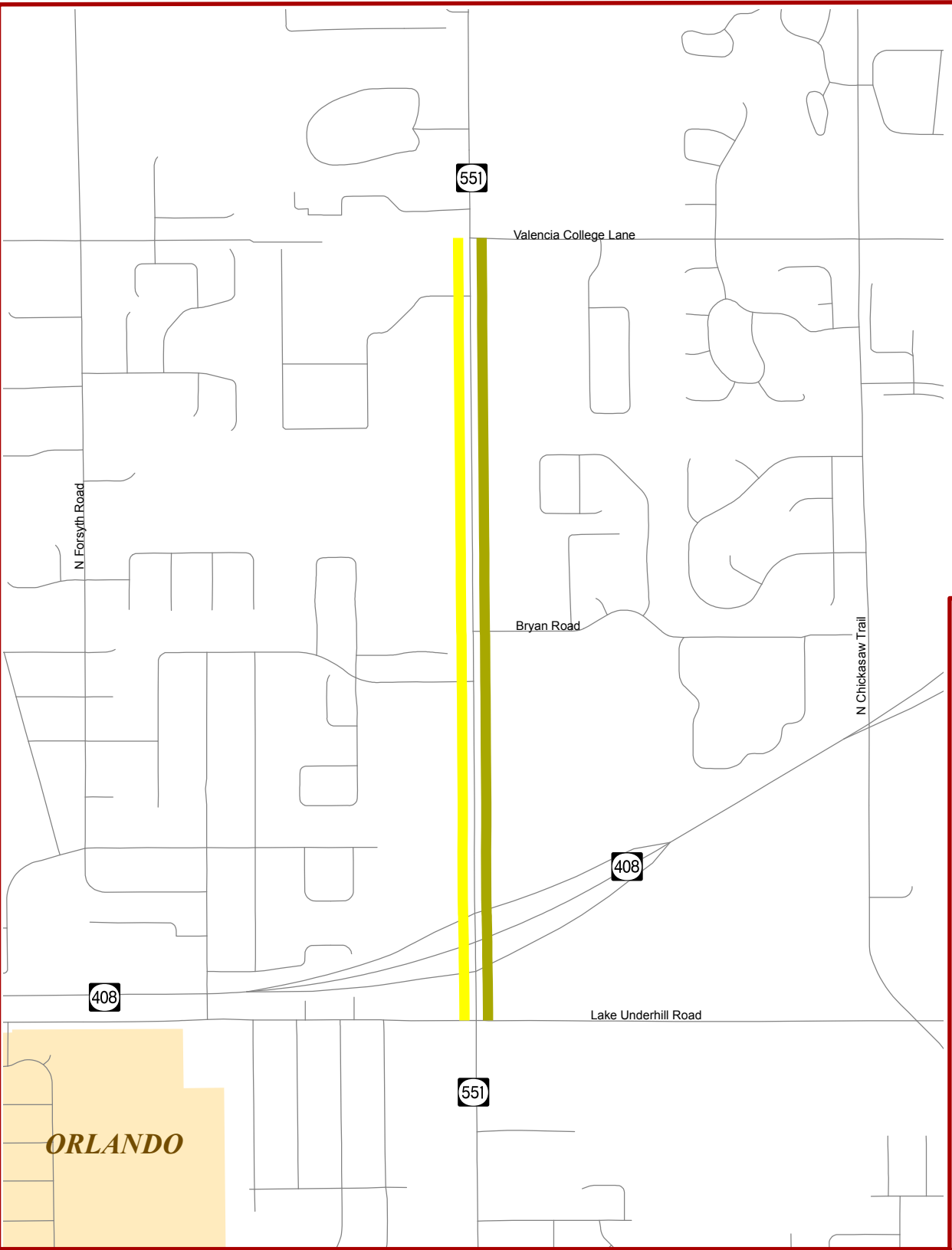
**Goldenroad Road (SR 551) - Lake Underhill Road to Valencia College Lane**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	105.66	75.94	174.36	111.19

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$499.00	\$1,060.62
Annual User Benefit	\$149,700.00	\$318,186.00
Total Annual User Benefit	\$467,886.00	
Total Signal Retiming Annual Cost	\$8,111.45	
User Benefit / Cost Ratio	57.68	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



**SR 551  
- AM Peak**

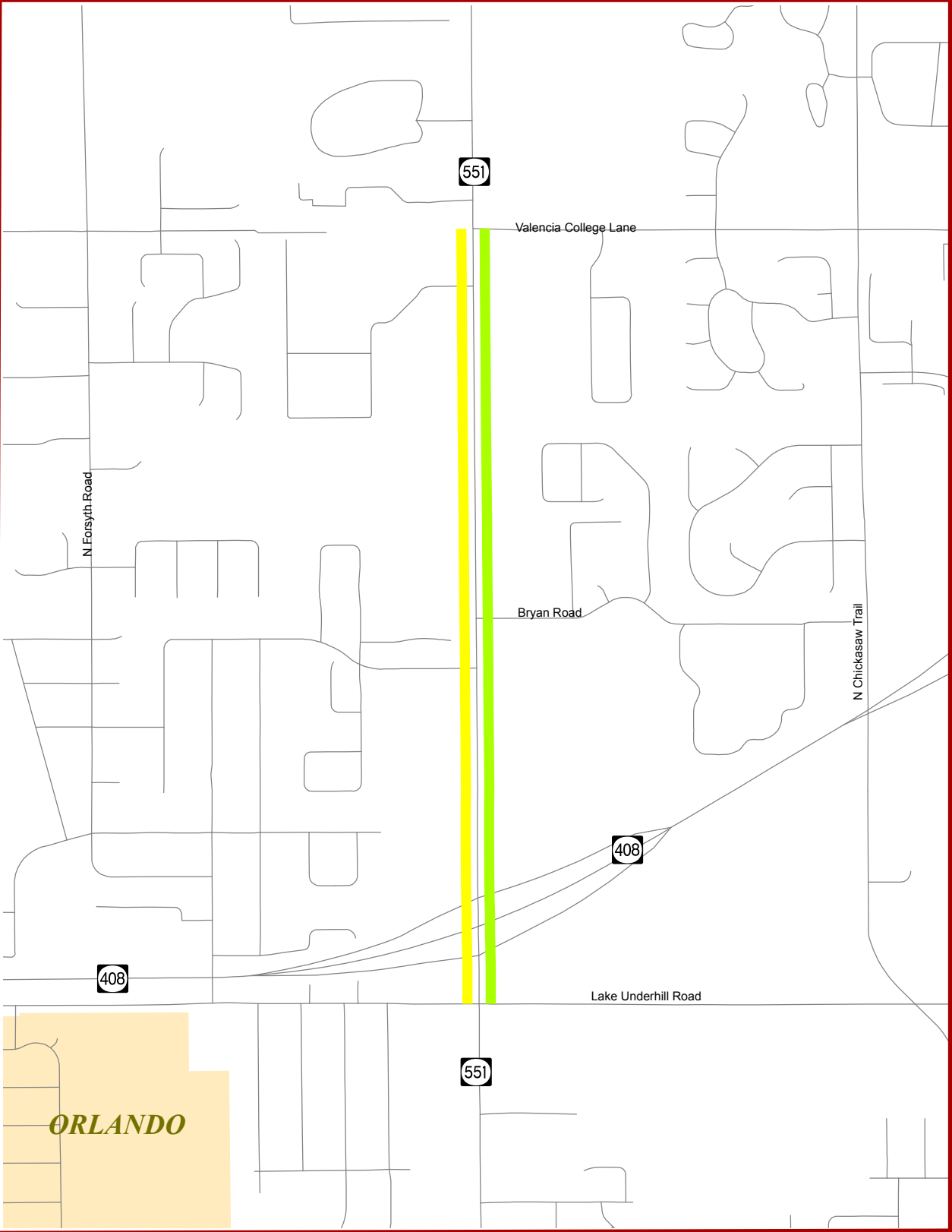
**Before Condition**

Date of Collection: 2/27/2014  
Distance: 1.0 miles  
From: Lake Underhill Rd  
To: Valencia College Ln.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 21.9 MPH  
NB Travel Time: 3.57 MIN

SB Avg Speed: 27.0 MPH  
SB Travel Time: 2.88 MIN



**SR 551  
- AM Peak**

**After Condition**

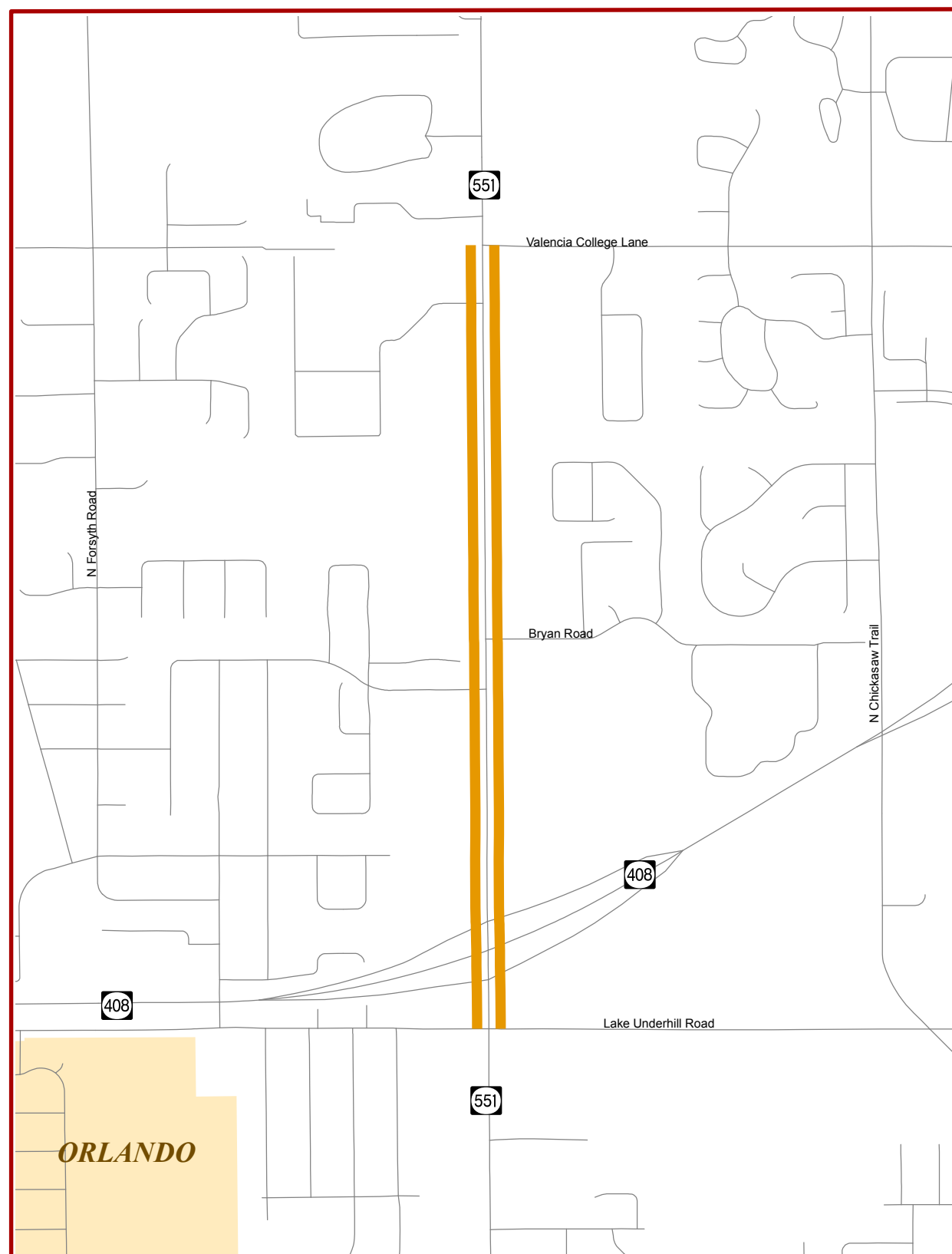
Date of Collection: 4/29/2014  
Distance: 1.0 miles  
From: Lake Underhill Rd.  
To: Valencia Collage Ln.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 36.3 MPH  
NB Travel Time: 2.15 MIN

SB Avg Speed: 32.3 MPH  
SB Travel Time: 2.42 MIN





## SR 551 - PM Peak

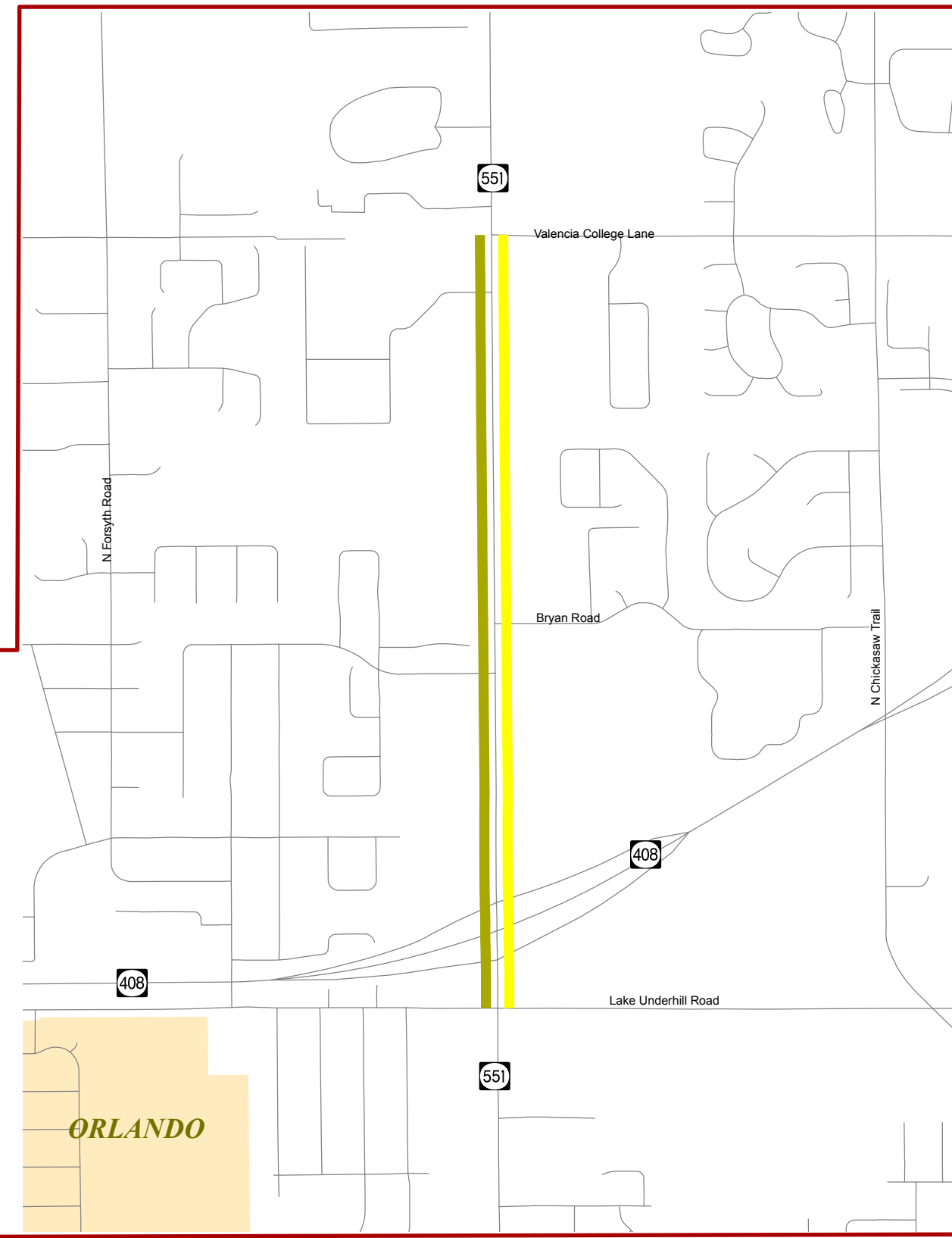
### Before Condition

Date of Collection: 2/27/2014  
Distance: 1.0 miles  
From: Lake Underhill Rd  
To: Valencia College Ln.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 17.7 MPH  
NB Travel Time: 4.42 MIN

SB Avg Speed: 18.2 MPH  
SB Travel Time: 4.28 MIN



## SR 551 - PM Peak

### After Condition

Date of Collection: 4/29/2014  
Distance: 1.0 miles  
From: Lake Underhill Rd.  
To: Valencia Collage Ln.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 31.8 MPH  
NB Travel Time: 2.45 MIN

SB Avg Speed: 25.0 MPH  
SB Travel Time: 3.12 MIN

### Level of Services:

	A		D		Roads
	B		E		City Boundary
	C		F		Water



**O.B.T. South (US 441)**  
**Central Florida Pkwy. to Hunters Creek Blvd.**



# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** US 441  
**Segment:** Central Florida Parkway to Hunter's Creek Boulevard/Falcon Trace Boulevard  
**Jurisdiction:** Orange County  
**Area Type:** Residential Area  
**Facility Type:** Divided Arterial  
**Speed Limit:** 50 MPH  
**Length of Arterial:** 3.99 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 4.1 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Hunter's Creek Boulevard/Falcon Trace Boulevard	2	3	1	50	
Town Center Boulevard	1	3	1	50	
SR-417 NB/EB Ramps	2	3	0	50	
SR-417 SB/WB Ramps	2	3	0	50	
Deerfield Boulevard	1	3	1	50	
Stable Drive	1	3	0	50	
Wetherbee Road	1	3	1	50	
Pepper Mill Boulevard	1	3	0	50	
Whisper Lakes Boulevard	1	3	0	50	
Waterbridge Boulevard	1	3	0	50	
Central Florida Parkway	2	3	1	50	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	16	430	34.3	B
Northbound	PM	15	538	27.4	C

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Central Florida Parkway	2	3	1	50	
Waterbridge Boulevard	1	3	1	50	
Whisper Lakes Boulevard	1	3	1	50	
Pepper Mill Boulevard	1	3	1	50	
Wetherbee Boulevard	2	3	1	50	
Stable Drive	1	3	0	50	
Deerfield Boulevard	1	3	1	50	
SR-417 SB/WB Ramps	1	3	1	50	
SR-417 NB/EB Ramps	1	3	1	50	
Town Center Boulevard	2	3	1	50	
Hunter's Creek Boulevard/Falcon Trace Boulevard	2	3	1	50	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	17	368	40.1	B
Southbound	PM	41	650	22.7	D

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** US 441  
**Segment:** Central Florida Parkway to Hunter's Creek Boulevard/Falcon Trace Boulevard  
**Jurisdiction:** Orange County  
**Area Type:** Residential Area  
**Facility Type:** Divided Arterial  
**Speed Limit:** 50 MPH  
**Length of Arterial:** 3.99 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 4.1 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Hunter's Creek Boulevard/Falcon Trace Boulevard	2	3	1	50	
Town Center Boulevard	1	3	1	50	
SR-417 NB/EB Ramps	2	3	0	50	
SR-417 SB/WB Ramps	2	3	0	50	
Deerfield Boulevard	1	3	1	50	
Stable Drive	1	3	0	50	
Wetherbee Road	1	3	1	50	
Pepper Mill Boulevard	1	3	0	50	
Whisper Lakes Boulevard	1	3	0	50	
Waterbridge Boulevard	1	3	0	50	
Central Florida Parkway	2	3	1	50	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	11	346	42.6	A
Northbound	PM	15	434	34.0	B

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Central Florida Parkway	2	3	1	50	
Waterbridge Boulevard	1	3	1	50	
Whisper Lakes Boulevard	1	3	1	50	
Pepper Mill Boulevard	1	3	1	50	
Wetherbee Boulevard	2	3	1	50	
Stable Drive	1	3	0	50	
Deerfield Boulevard	1	3	1	50	
SR-417 SB/WB Ramps	1	3	1	50	
SR-417 NB/EB Ramps	1	3	1	50	
Town Center Boulevard	2	3	1	50	
Hunter's Creek Boulevard/Falcon Trace Boulevard	2	3	1	50	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	6	363	40.6	B
Southbound	PM	19	479	30.8	C

## US 441 - Central Florida Parkway to Hunter's Creek Boulevard

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
1,912	430.0	34.3	228.38	364.0	42.6	193.32
Northbound/Eastbound - PM Peak Hour						
875	538.0	27.4	130.76	434.0	34.0	105.49
Southbound/Westbound - AM Peak Hour						
1,392	368.0	40.1	142.29	363.0	40.6	140.36
Southbound/Westbound - PM Peak Hour						
2,106	650.0	22.7	380.25	479.0	30.8	280.22

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

## US 441 - Central Florida Parkway to Hunter's Creek Boulevard

### Summary of Measures of Effectiveness & Benefit Cost Analysis

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	370.67	333.68	511.01	385.70

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$621.06	\$2,103.95
Annual User Benefit	\$186,318.00	\$631,185.00
Total Annual User Benefit	\$817,503.00	
Total Signal Retiming Annual Cost	\$18,825.10	
User Benefit / Cost Ratio	43.43	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



## US 441 - AM Peak

### Before Condition

Date of Collection: 1/30/2014  
 Distance: 3.99 miles  
 From: Central Florida Pkwy  
 To: Hunter's Creek Blvd.  
 /Falcon Trace Blvd.

Start Time: 7:00 AM  
 End Time: 9:00 AM

NB Avg Speed: 34.3 MPH  
 NB Travel Time: 7.17 MIN

SB Avg Speed: 40.1 MPH  
 SB Travel Time: 6.13 MIN

## US 441 - AM Peak

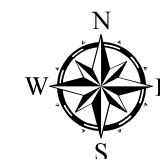
### After Condition

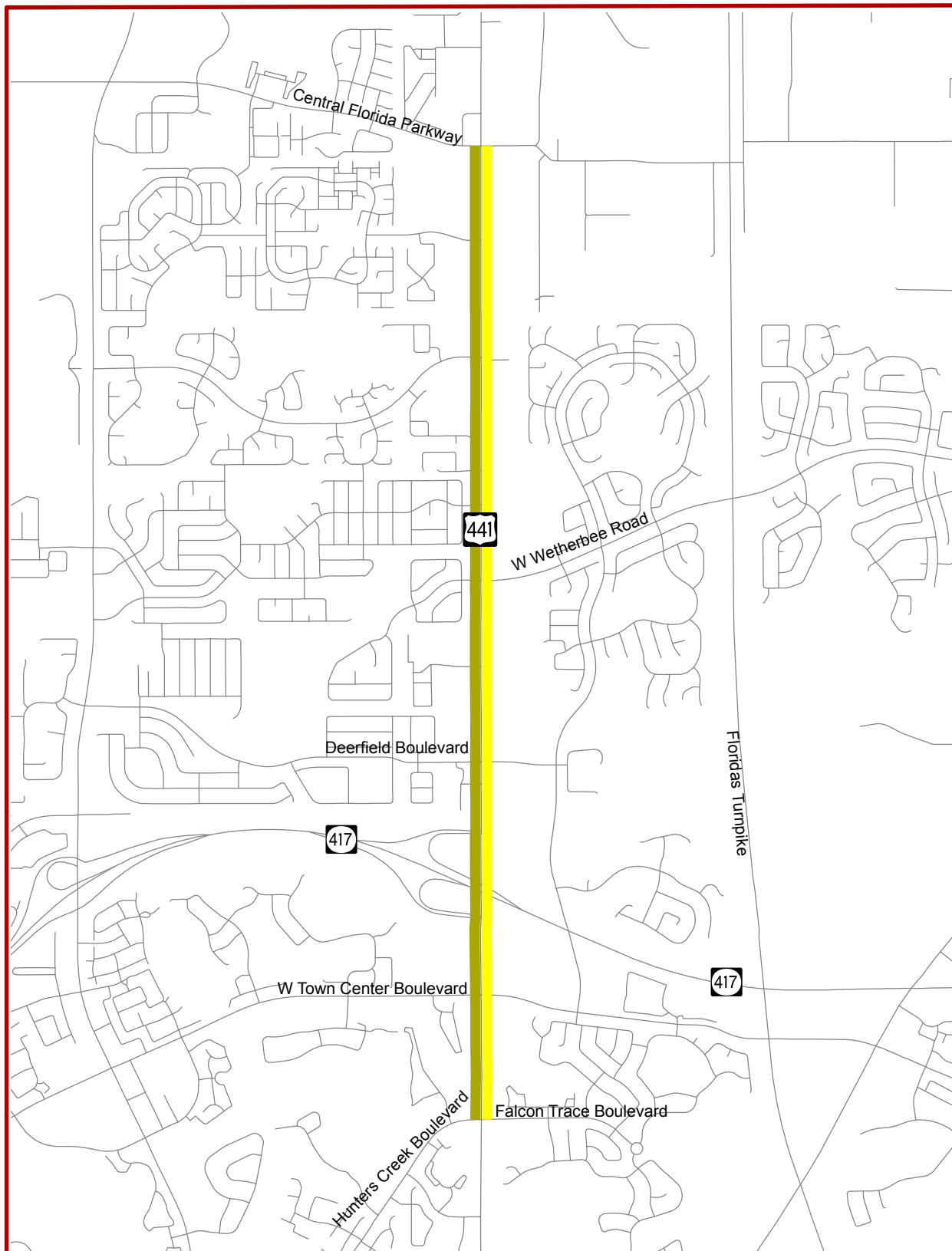
Date of Collection: 4/10/2014  
 Distance: 3.99 miles  
 From: Central Florida Pkwy  
 To: Hunter's Creek Blvd.  
 / Falcon Trace Blvd.

Start Time: 7:00 AM  
 End Time: 9:00 AM

NB Avg Speed: 42.6 MPH  
 NB Travel Time: 5.77 MIN

SB Avg Speed: 40.6 MPH  
 SB Travel Time: 6.05 MIN





## US 441 - PM Peak

### Before Condition

Date of Collection: 1/30/2014  
Distance: 3.99 miles  
From: Central Florida Pkwy  
To: Hunter's Creek Blvd.  
/Falcon Trace Blvd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 27.4 MPH  
NB Travel Time: 8.97 MIN

SB Avg Speed: 22.7 MPH  
SB Travel Time: 10.83 MIN

## US 441 - PM Peak

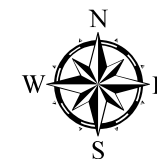
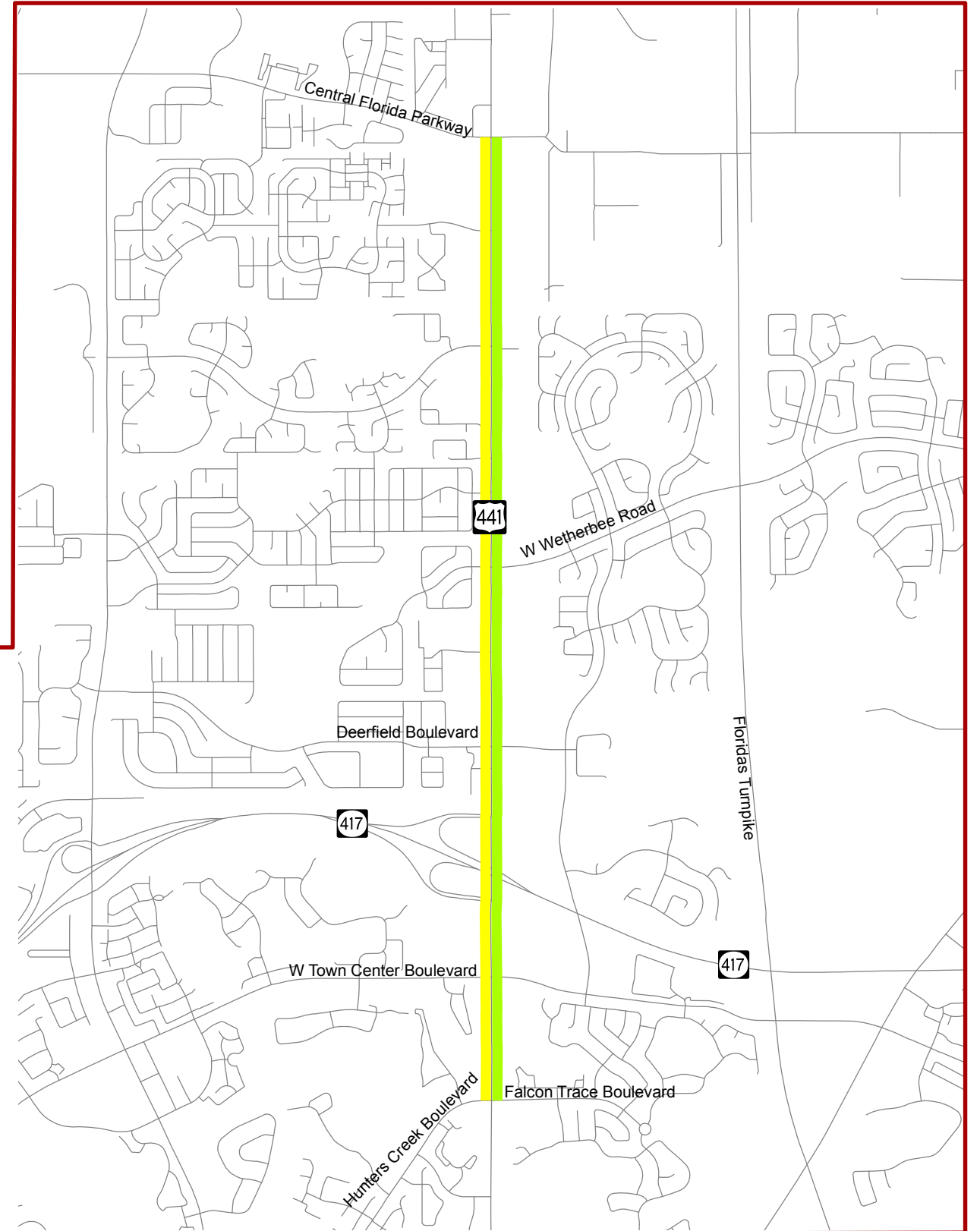
### After Condition

Date of Collection: 4/10/2014  
Distance: 3.99 miles  
From: Central Florida Pkwy  
To: Hunter's Creek Blvd.  
/ Falcon Trace Blvd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 34.0 MPH  
NB Travel Time: 7.23 MIN

SB Avg Speed: 30.8 MPH  
SB Travel Time: 7.98 MIN



**US 17-92**  
**Mark St. to Mayo Ave.**

# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** US 17/92  
**Segment:** Marks Street to Mayo Avenue/Greenwood Road  
**Jurisdiction:** Orange County  
**Area Type:** Urbanized Residential Area/Other Outlying Business District  
**Facility Type:** Divided Arterial/Collector  
**Speed Limit:** 35/40/45 MPH  
**Length of Arterial:** 5.62 miles **Arterial Class:** II  
**Distance between BlueToad Devices:** 5.8 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Marks Street	1	2	0	35	
Lake Highland Drive	1	2	0	35	
Virginia Drive	1	2	0	35	
Nebraska Street	1	2	0	35	
Princeton Street	2	2	0	35	
Lake Shore Drive / Rollins Street	1	2	0	35	
RR Xing	0	2	0	35	
Orange Avenue	1	2	0	35	
Minnesota Avenue	1	2	0	35	
Fairbanks Avenue	1	2	0	35	
Morse Blvd.	1	2	0	35	
Gay Road	1	2	1	35	
Webster Avenue	1	2	0	35	
Lee Road (SR-423)	2	2	0	35	
Park Avenue	0	2	0	40	
Magnolia Road	1	3	0	40	
Lake Avenue	1	3	0	40	
Manor Road / Maitland Avenue	1	3	0	40	
Packwood Avenue	1	3	0	40	
Horatio Avenue	1	2	1	40	
Sybelia Parkway	1	3	0	45	
Mayo Avenue/Greenwood Road	1	3	0	45	

Direction of Travel	Analysis	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period				
Northbound	AM	13	833	25.1	C
Northbound	PM	25	1006	20.8	D



## Year 2014 MetroPlan Orlando Travel Time Study

*Before Condition*

**Roadway:** US 17/92  
**Segment:** Marks Street to Mayo Avenue/Greenwood Road  
**Jurisdiction:** Orange County  
**Area Type:** Urbanized Residential Area/Other Outlying Business District  
**Facility Type:** Divided Arterial/Collector  
**Speed Limit:** 35/40/45 MPH  
**Length of Arterial:** 5.62 miles    **Arterial Class:** II  
**Distance between BlueToad Devices:** 5.8 miles

### Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Mayo Avenue/Greenwood Road	1	3	0	45	
Sybelia Parkway	1	3	0	45	
Horatio Avenue	1	3	0	40	
Packwood Avenue	1	3	0	40	
Maitland Avenue / Manor Road	1	3	0	40	
Lake Avenue	1	3	0	40	
Magnolia Road	1	3	0	40	
Park Avenue	1	3	0	40	
Lee Road (SR-423)	0	2	1	35	
Webster Avenue	1	2	0	35	
Gay Road	1	2	0	35	
Morse Blvd.	1	2	0	35	
Fairbanks Avenue	1	2	1	35	
Minnesota Avenue	1	2	0	35	
Orange Avenue	1	2	0	35	
RR Xing	0	2	0	35	
Rollins Street / Lake Shore Drive	1	2	0	35	
Princeton Street	0	2	0	35	
Nebraska Street	1	2	0	35	
Virginia Drive	2	2	0	35	
Lake Highland Drive	1	2	0	35	
Marks Street	1	2	0	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	46	982	21.3	D
Southbound	PM	34	933	22.4	C

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** US 17/92  
**Segment:** Marks Street to Mayo Avenue/Greenwood Road  
**Jurisdiction:** Orange County  
**Area Type:** Urbanized Residential Area/Other Outlying Business District  
**Facility Type:** Divided Arterial/Collector  
**Speed Limit:** 35/40/45 MPH  
**Length of Arterial:** 5.62 miles **Arterial Class:** II  
**Distance between BlueToad Devices:** 5.8 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Marks Street	1	2	0	35	
Lake Highland Drive	1	2	0	35	
Virginia Drive	1	2	0	35	
Nebraska Street	1	2	0	35	
Princeton Street	2	2	0	35	
Lake Shore Drive / Rollins Street	1	2	0	35	
RR Xing	0	2	0	35	
Orange Avenue	1	2	0	35	
Minnesota Avenue	1	2	0	35	
Fairbanks Avenue	1	2	0	35	
Morse Blvd.	1	2	0	35	
Gay Road	1	2	1	35	
Webster Avenue	1	2	0	35	
Lee Road (SR-423)	2	2	0	35	
Park Avenue	0	2	0	40	
Magnolia Road	1	3	0	40	
Lake Avenue	1	3	0	40	
Manor Road / Maitland Avenue	1	3	0	40	
Packwood Avenue	1	3	0	40	
Horatio Avenue	1	2	1	40	
Sybelia Parkway	1	3	0	45	
Mayo Avenue/Greenwood Road	1	3	0	45	

Direction of Travel	Analysis	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
	Time Period				
Northbound	AM	16	824	25.3	C
Northbound	PM	21	990	21.1	D

## Year 2014 MetroPlan Orlando Travel Time Study

*After Condition*

**Roadway:** US 17/92  
**Segment:** Marks Street to Mayo Avenue/Greenwood Road  
**Jurisdiction:** Orange County  
**Area Type:** Urbanized Residential Area/Other Outlying Business District  
**Facility Type:** Divided Arterial/Collector  
**Speed Limit:** 35/40/45 MPH  
**Length of Arterial:** 5.62 miles    **Arterial Class:** II  
**Distance between BlueToad Devices:** 5.8 miles

### Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Mayo Avenue/Greenwood Road	1	3	0	45	
Sybelia Parkway	1	3	0	45	
Horatio Avenue	1	3	0	40	
Packwood Avenue	1	3	0	40	
Maitland Avenue / Manor Road	1	3	0	40	
Lake Avenue	1	3	0	40	
Magnolia Road	1	3	0	40	
Park Avenue	1	3	0	40	
Lee Road (SR-423)	0	2	1	35	
Webster Avenue	1	2	0	35	
Gay Road	1	2	0	35	
Morse Blvd.	1	2	0	35	
Fairbanks Avenue	1	2	1	35	
Minnesota Avenue	1	2	0	35	
Orange Avenue	1	2	0	35	
RR Xing	0	2	0	35	
Rollins Street / Lake Shore Drive	1	2	0	35	
Princeton Street	0	2	0	35	
Nebraska Street	1	2	0	35	
Virginia Drive	2	2	0	35	
Lake Highland Drive	1	2	0	35	
Marks Street	1	2	0	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	27	892	23.4	C
Southbound	PM	27	912	22.9	C

## US 17-92 - Marks Street to Mayo Avenue/Greenwood Road

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
649	833.0	25.1	150.17	824.0	25.3	148.55
Northbound/Eastbound - PM Peak Hour						
1,149	1006.0	20.8	321.08	990.0	21.1	315.98
Southbound/Westbound - AM Peak Hour						
2,227	982.0	21.3	607.48	892.0	23.4	551.80
Southbound/Westbound - PM Peak Hour						
1,370	933.0	22.4	355.06	912.0	22.9	347.07

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

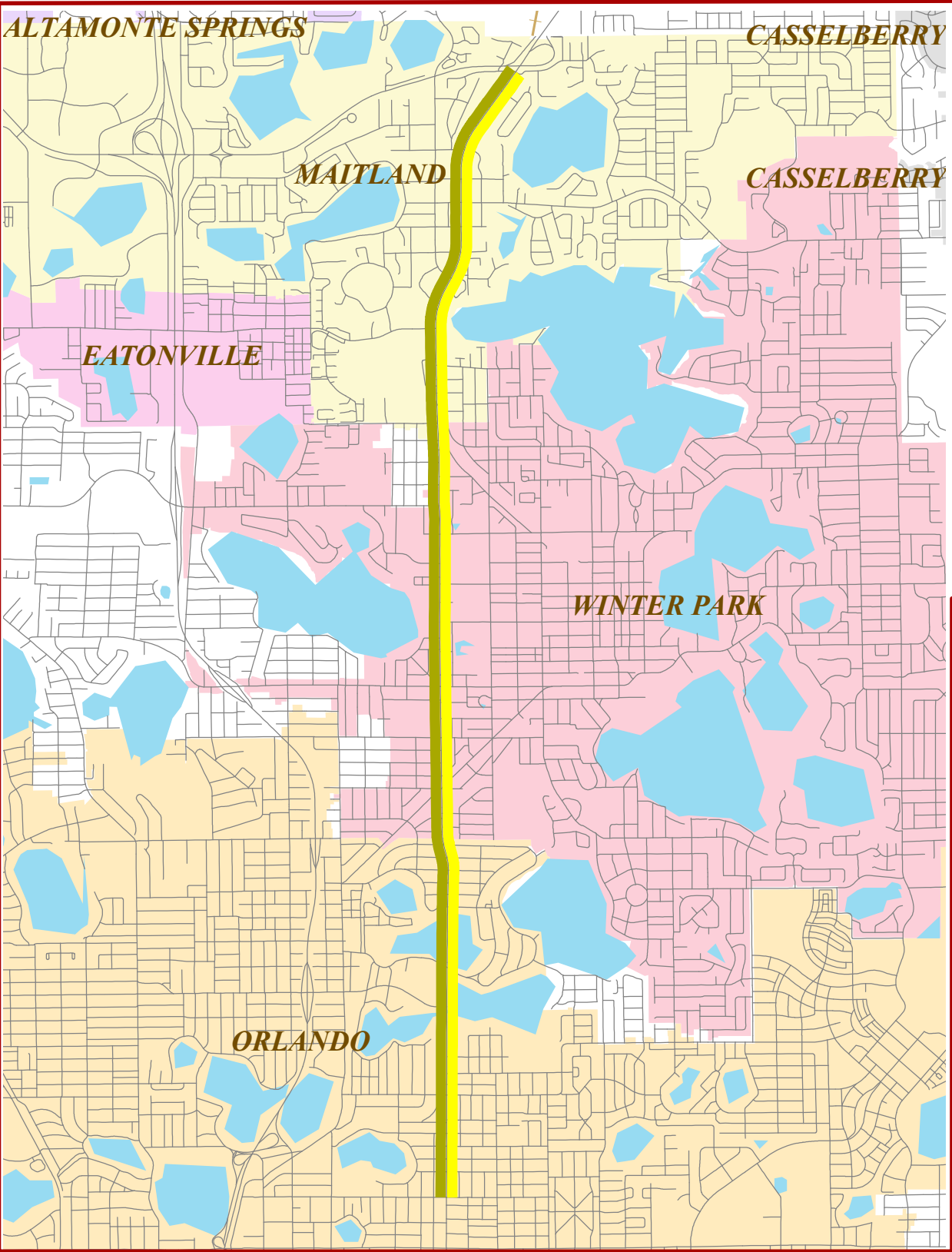
**US 17-92 - Marks Street to Mayo Avenue/Greenwood Road**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	757.65	700.35	676.14	663.04

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$962.07	\$219.95
Annual User Benefit	\$288,621.00	\$65,985.00
Total Annual User Benefit	\$354,606.00	
Total Signal Retiming Annual Cost	\$33,818.72	
User Benefit / Cost Ratio	10.49	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



# **US 17/92 - AM Peak**

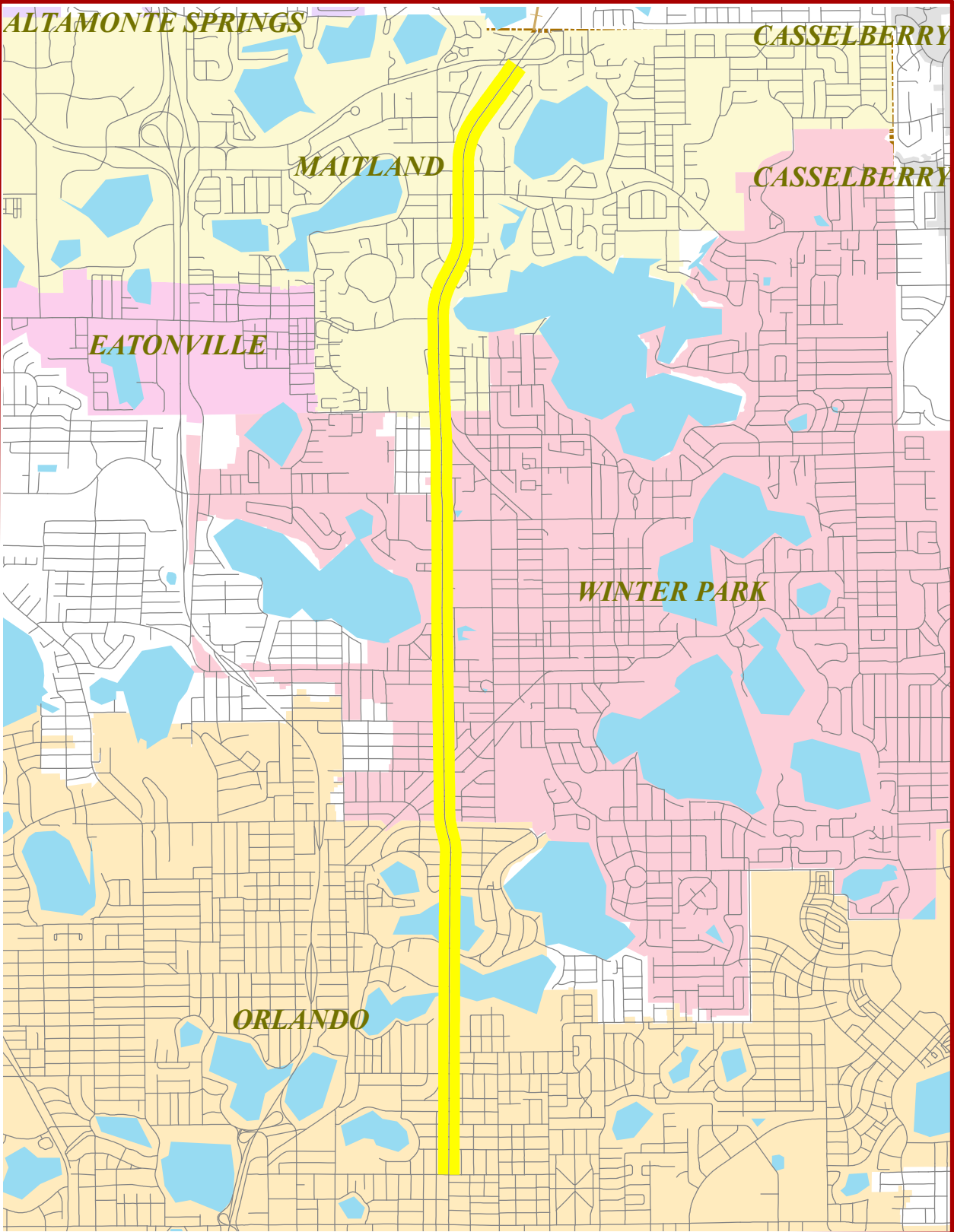
## **Before Condition**

Date of Collection: 1/28/2014  
 Distance: 5.62 miles  
 From: Mark St.  
 To: Mayo Ave. / Greenwood Rd.

Start Time: 7:00 AM  
 End Time: 9:00 AM

NB Avg Speed: 25.1 MPH  
 NB Travel Time: 13.88 MIN

SB Avg Speed: 21.3 MPH  
 SB Travel Time: 16.37 MIN



# **US 17/92 - AM Peak**

## **After Condition**

Date of Collection: 4/29/2014  
 Distance: 5.62 miles  
 From: Mark St.  
 To: Mayo Ave. / Greenwood Rd.

Start Time: 7:00 AM  
 End Time: 9:00 AM

NB Avg Speed: 25.3 MPH  
 NB Travel Time: 13.73 MIN

SB Avg Speed: 23.4 MPH  
 SB Travel Time: 14.87 MIN

## **Level of Services:**

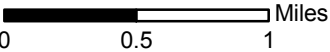


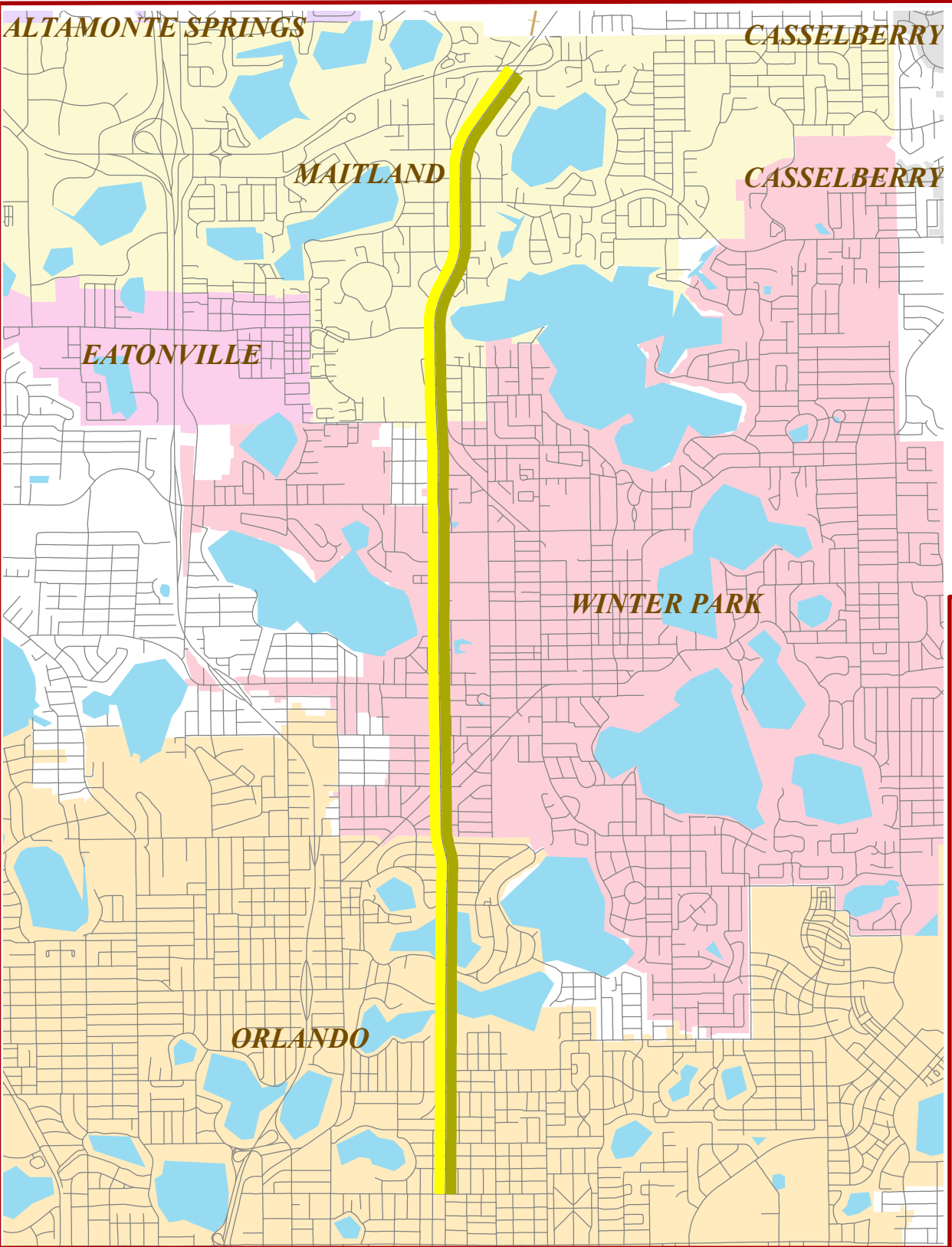
- |  |   |  |   |  |               |
|--|---|--|---|--|---------------|
|  | A |  | D |  | Roads         |
|  | B |  | E |  | City Boundary |
|  | C |  | F |  | Water         |



## **2014 METROPLAN ORLANDO**

### *Travel Time Study*





# **US 17/92 - PM Peak**

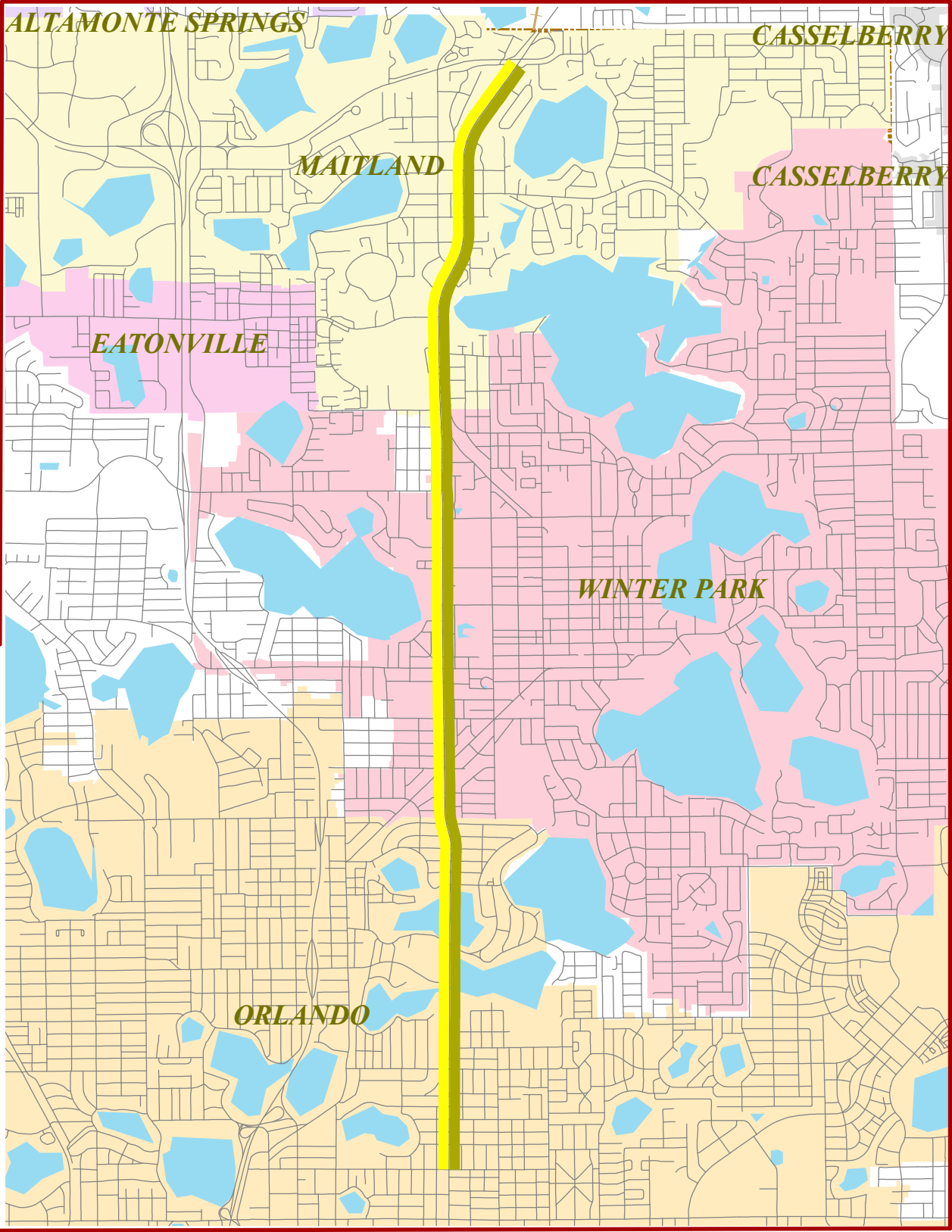
## **Before Condition**

Date of Collection: 1/28/2014  
Distance: 5.62 miles  
From: Mark St.  
To: Mayo Ave. / Greenwood Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 20.8 MPH  
NB Travel Time: 16.77 MIN

SB Avg Speed: 22.4 MPH  
SB Travel Time: 15.55 MIN



# **US 17/92 - PM Peak**

## **After Condition**

Date of Collection: 4/29/2014  
Distance: 5.62 miles  
From: Mark St.  
To: Mayo Ave. / Greenwood Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 21.1 MPH  
NB Travel Time: 16.5 MIN

SB Avg Speed: 22.9 MPH  
SB Travel Time: 15.2 MIN

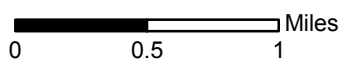
## **Level of Services:**

- |  |   |   |
|--|---|---|
|  A |  D |  Roads         |
|  B |  E |  City Boundary |
|  C |  F |  Water         |



## **2014 METROPLAN ORLANDO**

### *Travel Time Study*



# **Orange Blossom Trail (US 441)**

## **Clarcona Ocoee Rd. to SR 50**



# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** Orange Blossom Trail (US 441)  
**Segment:** Clarcona-Ocoee Road to SR 50 (Colonial Drive)  
**Jurisdiction:** Orange County  
**Area Type:** Residential  
**Facility Type:** Divided Arterial  
**Speed Limit:** 35/40/45/50 MPH  
**Length of Arterial:** 4.80 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 5.1 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
SR 50 (Colonial Drive)	1	2	0	35	
County Club Drive	1	2	0	40	
Princeton Street	2	2	0	40	
Silver Star Road	2	2	0	40	
Lee Road/ John Young Parkway	1	2	1	50	
All American Boulevard	1	2	1	50	
Cinderlane Parkway	1	2	1	50	
Clarcona Ocoee Road	2	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	16	678	27.1	C
Northbound	PM	16	747	24.6	D

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Clarcona Ocoee Road	2	2	0	45	
Cinderlane Parkway	1	2	1	50	
All American Boulevard	1	2	1	50	
Lee Road/John Young Parkway	2	2	1	50	
Silver Star Road	1	2	1	40	
Princeton Street	1	2	0	40	
Country Club Drive	1	2	0	40	
SR 50 (Colonial Drive)	1	2	0	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	27	719	25.5	D
Southbound	PM	20	595	30.9	C

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** Orange Blossom Trail (US 441)  
**Segment:** Clarcona-Ocoee Road to SR 50 (Colonial Drive)  
**Jurisdiction:** Orange County  
**Area Type:** Residential  
**Facility Type:** Divided Arterial  
**Speed Limit:** 35/40/45/50 MPH  
**Length of Arterial:** 4.80 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 5.1 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
SR 50 (Colonial Drive)	1	2	0	35	
County Club Drive	1	2	0	40	
Princeton Street	2	2	0	40	
Silver Star Road	2	2	0	40	
Lee Road/ John Young Parkway	1	2	1	50	
All American Boulevard	1	2	1	50	
Cinderlane Parkway	1	2	1	50	
Clarcona Ocoee Road	2	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	24	523	35.1	B
Northbound	PM	79	722	25.4	D

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Clarcona Ocoee Road	2	2	0	45	
Cinderlane Parkway	1	2	1	50	
All American Boulevard	1	2	1	50	
Lee Road/John Young Parkway	2	2	1	50	
Silver Star Road	1	2	1	40	
Princeton Street	1	2	0	40	
Country Club Drive	1	2	0	40	
SR 50 (Colonial Drive)	1	2	0	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	108	637	28.8	C
Southbound	PM	59	609	30.1	C

## Orange Blossom Trail - Clarcona Ocoee Road to SR 50

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
879	678.0	27.1	165.55	523.0	35.1	127.70
Northbound/Eastbound - PM Peak Hour						
1,583	747.0	24.6	328.47	722.0	25.4	317.48
Southbound/Westbound - AM Peak Hour						
1,399	719.0	25.5	279.41	637.0	28.8	247.55
Southbound/Westbound - PM Peak Hour						
920	595.0	30.9	152.06	609.0	30.1	155.63

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

**Orange Blossom Trail - Clarcona Ocoee Road to SR 50**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	444.96	375.24	480.53	473.11

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$1,170.60	\$124.58
Annual User Benefit	\$351,180.00	\$37,374.00
Total Annual User Benefit	\$388,554.00	
Total Signal Retiming Annual Cost	\$12,754.94	
User Benefit / Cost Ratio	30.46	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



## US 441 - AM Peak

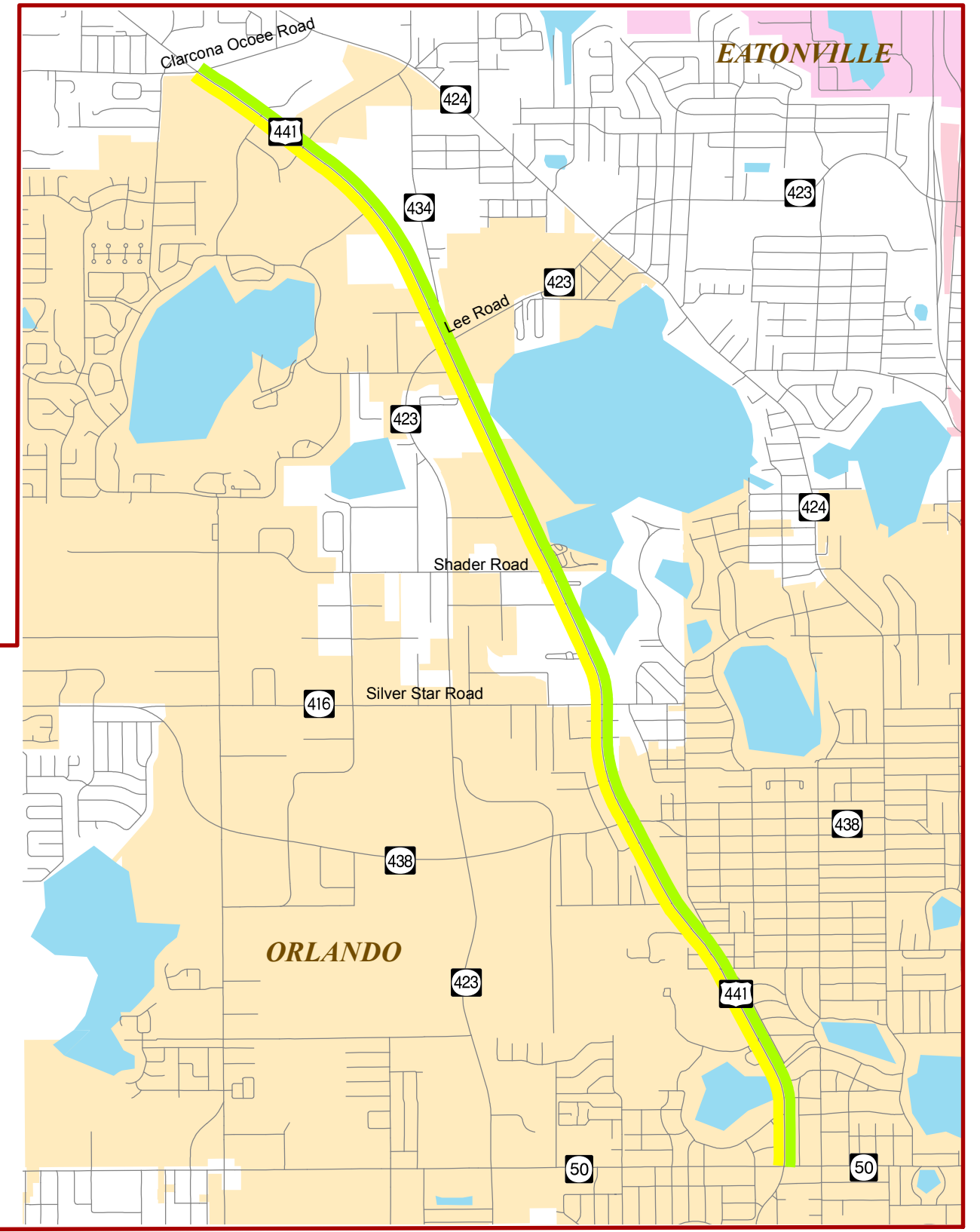
### Before Condition

Date of Collection: 2/25/2014  
Distance: 4.80 miles  
From: Clarcona-Ocoee Rd  
To: SR 50

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 27.10 MPH  
NB Travel Time: 11.30 MIN

SB Avg Speed: 25.50 MPH  
SB Travel Time: 11.98 MIN



## US 441 - AM Peak

### After Condition

Date of Collection: 5/15/2014  
Distance: 4.80 miles  
From: Clarcona-Ocoee Rd  
To: SR 50

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 35.1 MPH  
NB Travel Time: 8.72 MIN

SB Avg Speed: 28.8 MPH  
SB Travel Time: 10.62 MIN

### Level of Services:





## US 441 - PM Peak

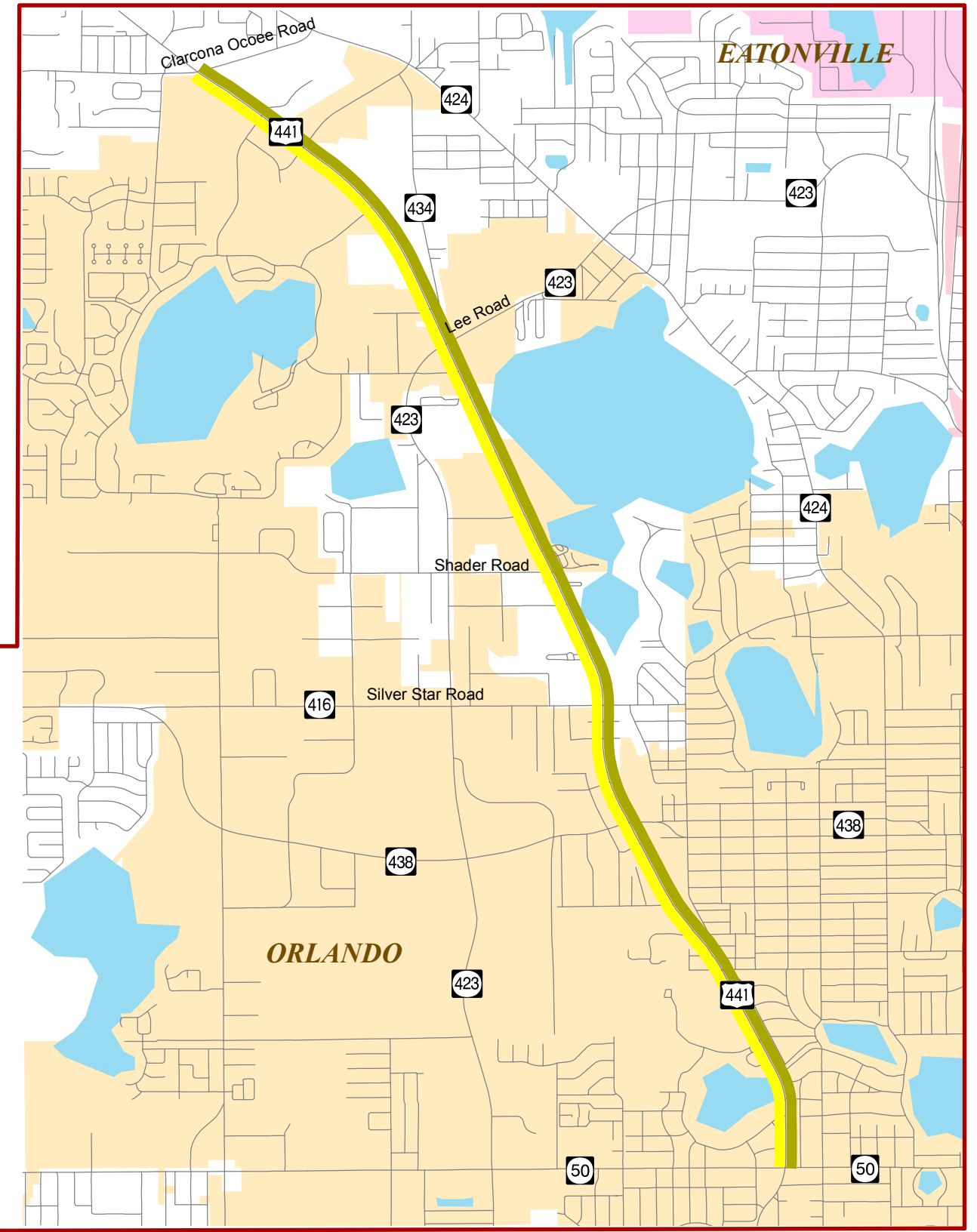
### Before Condition

Date of Collection: 2/25/2014  
Distance: 4.80 miles  
From: Clarcona-Ocoee Rd  
To: SR 50

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 24.60 MPH  
NB Travel Time: 12.45 MIN

SB Avg Speed: 30.90 MPH  
SB Travel Time: 9.92 MIN



## US 441 - AM Peak

### After Condition

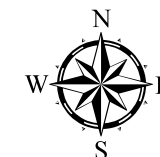
Date of Collection: 5/15/2014  
Distance: 4.80 miles  
From: Clarcona-Ocoee Rd  
To: SR 50

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 25.4 MPH  
NB Travel Time: 12.03 MIN

SB Avg Speed: 30.1 MPH  
SB Travel Time: 10.15 MIN

### Level of Services:



**Universal Blvd.  
Sand Lake Rd. to Vineland Rd.**

# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** Universal Boulevard  
**Segment:** Sandlake Road to Vineland Road  
**Jurisdiction:** Orange County  
**Area Type:** Outlying Business District  
**Facility Type:** Collector/Divided Arterial  
**Speed Limit:** 30/35/45 MPH  
**Length of Arterial:** 2.36 Mi.    **Arterial Class:** II/III

## Northbound Direction:

Segment	Travel Time (Sec)	Average Speed (MPH)	LOS
<b>AM Peak Period</b>			
Sandlake Road to Hollywood Way	224	25.7	C
Hollywood Way to Vineland Road	163	18.6	C
<b>**Sandlake Road to Vineland Road</b>	<b>387</b>	<b>22.0</b>	<b>C</b>
<b>PM Peak Period</b>			
Sandlake Road to Hollywood Way	355	16.2	E
Hollywood Way to Vineland Road	148	20.5	C
<b>**Sandlake Road to Vineland Road</b>	<b>503</b>	<b>16.9</b>	<b>E</b>

## Southbound Direction:

Segment	Travel Time (Sec)	Average Speed (MPH)	LOS
<b>AM Peak Period</b>			
Sandlake Road to Hollywood Way	283	20.4	D
Hollywood Way to Vineland Road	189	16.1	D
<b>**Sandlake Road to Vineland Road</b>	<b>472</b>	<b>18.0</b>	<b>D</b>
<b>PM Peak Period</b>			
Sandlake Road to Hollywood Way	309	18.6	D
Hollywood Way to Vineland Road	153	19.9	C
<b>**Sandlake Road to Vineland Road</b>	<b>462</b>	<b>18.4</b>	<b>D</b>

## Note:

Travel Time for Universal Boulevard from Sandlake Road to Hollywood Way was conducted using BlueToad.

Travel Time for Universal Boulevard from Hollywood Way to Vineland was conducted using GPS.

\*\* The entire study segment is analyzed as an Arterial Class II



## Year 2014 MetroPlan Orlando Travel Time Study

*Before Condition*

**Roadway:** Universal Boulevard  
**Segment:** Sandlake Road to Hollywood Way  
**Jurisdiction:** Orange County  
**Area Type:** Outlying Business District  
**Facility Type:** Collector/Divided Arterial  
**Speed Limit:** 30/35/45 MPH  
**Length of Arterial:** 1.5 Mi.    **Arterial Class:** II  
**Distance between BlueToad Devices:** 1.6 miles

### Northbound Direction:

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Sandlake Road	2	2	1	45	
Carrier Drive	1	2	0	45	
Pedestrian Crossing	0	2	0	35	
International Drive	1	2	0	35	Construction on I-Drive
I-4 EB Ramp	0	3	1	35	
Universal Parking Access	0	3	0	35	
Hollywood Way	2	3	0	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	19	224	25.7	C
Northbound	PM	44	355	16.2	E

### Southbound Direction:

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Hollywood Way	2	3	0	30	
I-4 WB Ramp	0	2	0	30	
I-4 EB Ramp	2	3	0	30	Construction on I-Drive
International Drive	2	2	2	30	
Pedestrian Crossing	0	2	0	35	
Carrier Drive	1	2	1	35	
Sandlake Road	1	2	0	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	25	283	20.3	D
Southbound	PM	52	309	18.6	D

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Universal Boulevard from Hollywood Way to Vineland Road- Northbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Hollywood Way to Valet Parking Road	Orange County	Divided Arterial	OBD	1	3	0	35	1,349	13	Signal	47.4	13.8	III	19.4	C	0.55	
Valet Parking Road to Major Boulevard	Orange County	Divided Arterial	OBD	1	3	0	30	998	13	Signal	43.8	16.2	III	15.5	D	0.52	
Major Boulevard to Portofino Bay	Orange County	Divided Arterial	OBD	1	3	0	30	683	13	Signal	19.2	4.2	III	24.3	B	0.81	
Portofino Bay to Vineland Road	Orange County	Divided Arterial	OBD	0	1	2	30	1,415	13	Signal	52.2	18.0	III	18.5	C	0.62	
TOTAL								4,445			163.0	52.2	III	18.6	C		0.046 gal/veh
PM PEAK HOUR																	
Hollywood Way to Valet Parking Road	Orange County	Divided Arterial	OBD	1	3	0	35	1,349	12	Signal	55.8	25.2	III	16.5	D	0.47	
Valet Parking Road to Major Boulevard	Orange County	Divided Arterial	OBD	1	3	0	30	998	12	Signal	34.8	7.2	III	19.6	C	0.65	
Major Boulevard to Portofino Bay	Orange County	Divided Arterial	OBD	1	3	0	30	683	12	Signal	16.2	0.6	III	28.7	B	0.96	
Portofino Bay to Vineland Road	Orange County	Divided Arterial	OBD	0	1	2	30	1,415	12	Signal	41.4	5.4	III	23.3	C	0.78	
TOTAL								4,445			148.0	38.4	III	20.5	C		0.046 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. OBD - Outlying Business District.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Universal Boulevard from Vineland Road to Hollywood Way - Southbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Vineland Road to Portofino Bay	Orange County	Divided Arterial	OBD	1	3	0	30	1,475	13	Signal	43.2	6.0	III	23.3	C	0.78	
Portofino Bay to Major Boulevard	Orange County	Divided Arterial	OBD	1	3	0	30	636	13	Signal	15.0	1.8	III	28.9	B	0.96	
Major Boulevard to Valet Parking Road	Orange County	Divided Arterial	OBD	1	3	0	30	962	13	Signal	55.2	25.2	III	11.9	E	0.40	
Valet Parking Road to Hollywood Way	Orange County	Divided Arterial	OBD	2	3	0	30	1,385	13	Signal	75.6	34.8	III	12.5	E	0.42	
TOTAL								4,458			189.0	67.8	III	16.1	D		0.053 gal/veh
PM PEAK HOUR																	
Vineland Road to Portofino Bay	Orange County	Divided Arterial	OBD	1	3	0	30	1,475	12	Signal	62.4	23.4	III	16.1	D	0.54	
Portofino Bay to Major Boulevard	Orange County	Divided Arterial	OBD	1	3	0	30	636	12	Signal	11.4	0.0	III	38.0	A	1.27	
Major Boulevard to Valet Parking Road	Orange County	Divided Arterial	OBD	1	3	0	30	962	12	Signal	48.6	19.2	III	13.5	E	0.45	
Valet Parking Road to Hollywood Way	Orange County	Divided Arterial	OBD	2	3	0	30	1,385	12	Signal	30.6	0.6	III	30.9	A	1.03	
TOTAL								4,458			153.0	43.2	III	19.9	C		0.052 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. OBD - Outlying Business District.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Universal Boulevard from Sandlake Road to Vineland Road- Northbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Sandlake Road to Carrier Drive	Orange County	Collector	OBD	1	2	0	45	2,264	6	Signal	51.0	5.0	I	30.3	C	0.67	
Carrier Drive to Pedestrian Crossing	Orange County	Collector	OBD	0	2	0	35	1,056	6	Signal	89.0	29.0	II	8.1	F	0.23	
Carrier Drive to International Drive	Orange County	Collector	OBD	1	2	0	35	1,300	6	Signal	20.0	0.0	II	44.3	A	1.27	
International Drive to I-4 EB Ramp	Orange County	Divided Arterial	OBD	0	3	1	35	1,055	6	Signal	17.0	0.0	II	42.3	A	1.21	
I-4 EB Ramp to Universal Parking Access	Orange County	Divided Arterial	OBD	0	3	0	35	1,338	6	Signal	10.0	1.0	II	91.2	A	2.61	
Universal Parking Access to Hollywood Way	Orange County	Divided Arterial	OBD	2	3	0	35	1,002	6	Signal	65.0	38.0	III	10.5	E	0.30	
Hollywood Way to Valet Parking Road	Orange County	Divided Arterial	OBD	1	3	0	35	1,349	6	Signal	52.0	21.0	III	17.7	D	0.51	
Valet Parking Road to Major Boulevard	Orange County	Divided Arterial	OBD	1	3	0	30	998	6	Signal	29.0	5.0	III	23.5	C	0.78	
Major Boulevard to Portofino Bay	Orange County	Divided Arterial	OBD	1	3	0	30	683	6	Signal	19.0	2.0	III	24.5	B	0.82	
Portofino Bay to Vineland Road	Orange County	Divided Arterial	OBD	0	1	2	30	1,415	6	Signal	46.0	4.0	III	21.0	C	0.70	
TOTAL								12,460			398.0	105.0	II	21.3	D		0.118 gal/veh
PM PEAK HOUR																	
Sandlake Road to Carrier Drive	Orange County	Collector	OBD	1	2	0	45	2,264	6	Signal	62.0	17.0	I	24.9	D	0.55	
Carrier Drive to Pedestrian Crossing	Orange County	Collector	OBD	0	2	0	35	1,056	6	Signal	120.0	59.0	II	6.0	F	0.17	
Carrier Drive to International Drive	Orange County	Collector	OBD	1	2	0	35	1,300	6	Signal	47.0	20.0	II	18.9	D	0.54	
International Drive to I-4 EB Ramp	Orange County	Divided Arterial	OBD	0	3	1	35	1,055	6	Signal	19.0	0.0	II	37.9	A	1.08	
I-4 EB Ramp to Universal Parking Access	Orange County	Divided Arterial	OBD	0	3	0	35	1,338	6	Signal	9.0	0.0	II	101.4	A	2.90	
Universal Parking Access to Hollywood Way	Orange County	Divided Arterial	OBD	2	3	0	35	1,002	6	Signal	25.0	1.0	III	27.3	B	0.78	
Hollywood Way to Valet Parking Road	Orange County	Divided Arterial	OBD	1	3	0	35	1,349	6	Signal	41.0	11.0	III	22.4	C	0.64	
Valet Parking Road to Major Boulevard	Orange County	Divided Arterial	OBD	1	3	0	30	998	6	Signal	28.0	3.0	III	24.3	B	0.81	
Major Boulevard to Portofino Bay	Orange County	Divided Arterial	OBD	1	3	0	30	683	6	Signal	17.0	0.0	III	27.4	B	0.91	
Portofino Bay to Vineland Road	Orange County	Divided Arterial	OBD	0	1	2	30	1,415	6	Signal	51.0	7.0	III	18.9	C	0.63	
TOTAL								12,460			419.0	118.0	II	20.3	D		0.102 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. OBD - Outlying Business District.

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Universal Boulevard from Vineland Road to Sandlake Road - Southbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Vineland Road to Portofino Bay	Orange County	Divided Arterial	OBD	1	3	0	30	1,475	6	Signal	43.0	10.0	III	23.4	C	0.78	
Portofino Bay to Major Boulevard	Orange County	Divided Arterial	OBD	1	3	0	30	636	6	Signal	35.0	16.0	III	12.4	E	0.41	
Major Boulevard to Valet Parking Road	Orange County	Divided Arterial	OBD	1	3	0	30	962	6	Signal	52.0	25.0	III	12.6	E	0.42	
Valet Parking Road to Hollywood Way	Orange County	Divided Arterial	OBD	2	3	0	30	1,385	6	Signal	64.0	29.0	III	14.8	D	0.49	
Hollywood Way to Universal Parking Access	Orange County	Divided Arterial	OBD	0	2	0	30	1,472	6	Signal	20.0	0.0	III	50.2	A	1.67	
Universal Parking Access to I-4 EB Ramp	Orange County	Divided Arterial	OBD	2	3	0	30	868	6	Signal	9.0	0.0	III	65.8	A	2.19	
I-4 EB Ramp to International Drive	Orange County	Divided Arterial	OBD	2	2	2	30	1,055	6	Signal	26.0	5.0	III	27.7	B	0.92	
International Dive to Pedestrian Crossing	Orange County	Collector	OBD	0	2	0	35	1,300	6	Signal	70.0	41.0	II	12.7	F	0.36	
Pedestrian Crossing to Carrier Drive	Orange County	Collector	OBD	1	2	1	35	1,056	6	Signal	56.0	2.0	II	12.9	F	0.37	
Carrier Drive to Sandlake Road	Orange County	Collector	OBD	1	2	0	35	2,264	6	Signal	74.0	30.0	II	20.9	D	0.60	
TOTAL								12,473			449.0	158.0	II	18.9	D		0.101 gal/veh
PM PEAK HOUR																	
Vineland Road to Portofino Bay	Orange County	Divided Arterial	OBD	1	3	0	30	1,475	6	Signal	46.0	13.0	III	21.9	C	0.73	
Portofino Bay to Major Boulevard	Orange County	Divided Arterial	OBD	1	3	0	30	636	6	Signal	26.0	10.0	III	16.7	D	0.56	
Major Boulevard to Valet Parking Road	Orange County	Divided Arterial	OBD	1	3	0	30	962	6	Signal	50.0	23.0	III	13.1	E	0.44	
Valet Parking Road to Hollywood Way	Orange County	Divided Arterial	OBD	2	3	0	30	1,385	6	Signal	32.0	0.0	III	29.5	B	0.98	
Hollywood Way to Universal Parking Access	Orange County	Divided Arterial	OBD	0	2	0	30	1,472	6	Signal	21.0	0.0	III	47.8	A	1.59	
Universal Parking Access to I-4 EB Ramp	Orange County	Divided Arterial	OBD	2	3	0	30	868	6	Signal	9.0	0.0	III	65.8	A	2.19	
I-4 EB Ramp to International Drive	Orange County	Divided Arterial	OBD	2	2	2	30	1,055	6	Signal	18.0	0.0	III	40.0	A	1.33	
International Dive to Pedestrian Crossing	Orange County	Collector	OBD	0	2	0	35	1,300	6	Signal	83.0	52.0	II	10.7	F	0.31	
Pedestrian Crossing to Carrier Drive	Orange County	Collector	OBD	1	2	1	35	1,056	6	Signal	68.0	14.0	II	10.6	F	0.30	
Carrier Drive to Sandlake Road	Orange County	Collector	OBD	1	2	0	35	2,264	6	Signal	125.0	67.0	II	12.3	F	0.35	
TOTAL								12,473			478.0	179.0	II	17.8	D		0.101 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. OBD - Outlying Business District.

## Universal Boulevard - Sandlake Road to Vineland Road

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
323	387.0	22.0	34.72	398.0	21.3	35.71
Northbound/Eastbound - PM Peak Hour						
564	503.0	16.9	78.80	419.0	20.3	65.64
Southbound/Westbound - AM Peak Hour						
241	472.0	18.0	31.60	449.0	18.9	30.06
Southbound/Westbound - PM Peak Hour						
601	462.0	18.4	77.13	478.0	17.8	79.80

\*Traffic Volumes are obtained from the latest 2013 Orange County Traffic Counts.

## Universal Boulevard - Sandlake Road to Vineland Road

### Summary of Measures of Effectiveness & Benefit Cost Analysis

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	66.32	65.77	155.93	145.44

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$9.23	\$176.13
Annual User Benefit	\$2,769.00	\$52,839.00
Total Annual User Benefit	\$55,608.00	
Total Signal Retiming Annual Cost	\$18,062.61	
User Benefit / Cost Ratio	3.08	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



## Universal Blvd. - AM Peak

### Before Condition

Date of Collection: 2/4/2014  
Distance: 2.60 miles  
From: Sandlake Rd.  
To: Vineland Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 22.0 MPH  
NB Travel Time: 6.45 MIN

SB Avg Speed: 18.0 MPH  
SB Travel Time: 7.87 MIN



## Universal Blvd. - AM Peak

### After Condition

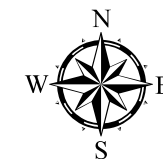
Date of Collection: 4/23/2014  
Distance: 2.60 miles  
From: Sandlake Rd.  
To: Vineland Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 21.3 MPH  
NB Travel Time: 6.63 MIN

SB Avg Speed: 18.9 MPH  
SB Travel Time: 7.48 MIN

### Level of Services:







## Universal Blvd. - PM Peak

### Before Condition

Date of Collection: 2/4/2014  
Distance: 2.60 miles  
From: Sandlake Rd.  
To: Vineland Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 16.9 MPH  
NB Travel Time: 8.38 MIN

SB Avg Speed: 18.4 MPH  
SB Travel Time: 7.70 MIN



## Universal Blvd. - PM Peak

### After Condition

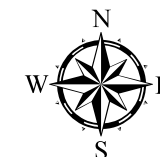
Date of Collection: 4/23/2014  
Distance: 2.60 miles  
From: Sandlake Rd.  
To: Vineland Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 20.3 MPH  
NB Travel Time: 6.98 MIN

SB Avg Speed: 17.8 MPH  
SB Travel Time: 7.97 MIN

### Level of Services:



**Conroy Rd.**  
**Kirkman Oaks to Eastgate Rd.**

# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** Conroy Road  
**Segment:** Kirkman Oaks/Kirkman Shoppes to Eastgate Drive  
**Jurisdiction:** Orange County  
**Area Type:** Residential Area  
**Facility Type:** Collector  
**Speed Limit:** 35/45 MPH  
**Length of Arterial:** 2.46 miles **Arterial Class:** II  
**Distance between BlueToad Devices:** 2.8 miles

## Eastbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Kirkman Shoppes/Kirkman Oaks	1	3	0	45	
Kirkman Road	2	2	0	45	
Cypress Woods Dr./Middlebrook Rd.	1	2	0	35	
Southgate Drive/President Barack Obama Parkway	1	2	0	35	
Vineland Road	2	3	1	35	
I-4 WB Ramps	0	4	1	35	
I-4 EB Ramps	0	3	0	35	
Millenia Boulevard	2	3	1	35	
Water Garden Road	1	3	0	35	
Eastgate Drive	1	2	1	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	187	465	21.7	D
Eastbound	PM	167	373	27.0	C

## Westbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Eastgate Drive	1	2	0	35	
Water Garden Drive	1	2	0	35	
Millenia Boulevard	1	3	1	35	
I-4 EB Ramps	0	3	0	35	
I-4 WB Ramps	2	3	0	35	
Vineland Road	2	3	1	35	
Southgate Drive/President Barack Obama Parkway	1	2	1	35	
Middlebrook Rd./ Cypress Woods Dr.	1	2	0	35	
Kirkman Road	2	2	1	35	
Kirkman Oaks / Kirkman Shoppes	1	3	0	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	102	428	23.6	C
Westbound	PM	238	570	17.7	D

**Year 2014 MetroPlan Orlando Travel Time Study**  
*After Condition*

**Roadway:** Conroy Road  
**Segment:** Kirkman Oaks/Kirkman Shoppes to Eastgate Drive  
**Jurisdiction:** Orange County  
**Area Type:** Residential Area  
**Facility Type:** Collector  
**Speed Limit:** 35/45 MPH  
**Length of Arterial:** 2.46 miles **Arterial Class:** II  
**Distance between BlueToad Devices:** 2.8 miles

**Eastbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Kirkman Shoppes/Kirkman Oaks	1	3	0	45	
Kirkman Road	2	2	0	45	
Cypress Woods Dr./Middlebrook Rd.	1	2	0	35	
Southgate Drive/President Barack Obama Parkway	1	2	0	35	
Vineland Road	2	3	1	35	
I-4 WB Ramps	0	4	1	35	
I-4 EB Ramps	0	3	0	35	
Millenia Boulevard	2	3	1	35	
Water Garden Road	1	3	0	35	
Eastgate Drive	1	2	1	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	187	390	25.8	C
Eastbound	PM	107	364	27.7	C

**Westbound Direction**

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Eastgate Drive	1	2	0	35	
Water Garden Drive	1	2	0	35	
Millenia Boulevard	1	3	1	35	
I-4 EB Ramps	0	3	0	35	
I-4 WB Ramps	2	3	0	35	
Vineland Road	2	3	1	35	
Southgate Drive/President Barack Obama Parkway	1	2	1	35	
Middlebrook Rd./ Cypress Woods Dr.	1	2	0	35	
Kirkman Road	2	2	1	35	
Kirkman Oaks / Kirkman Shoppes	1	3	0	35	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	157	373	27.0	C
Westbound	PM	102	556	18.1	D

## Conroy Road - Kirkman Oaks/Kirkman Shoppes to Eastgate Drive

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
950	465.0	21.7	122.71	390.0	25.8	102.92
Northbound/Eastbound - PM Peak Hour						
1,235	373.0	27.0	127.96	364.0	27.7	124.87
Southbound/Westbound - AM Peak Hour						
748	428.0	23.6	88.93	373.0	27.0	77.50
Southbound/Westbound - PM Peak Hour						
1,072	570.0	17.7	169.73	556.0	18.1	165.56

\*Traffic Volumes are obtained from the latest 2013 Orange County Counts

**Conroy Road - Kirkman Oaks/Kirkman Shoppes to Eastgate Drive**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	211.64	180.42	297.69	290.44

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$524.18	\$121.73
Annual User Benefit	\$157,254.00	\$36,519.00
Total Annual User Benefit	\$193,773.00	
Total Signal Retiming Annual Cost	\$17,166.38	
User Benefit / Cost Ratio	11.29	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.

## Conroy Rd. - AM Peak

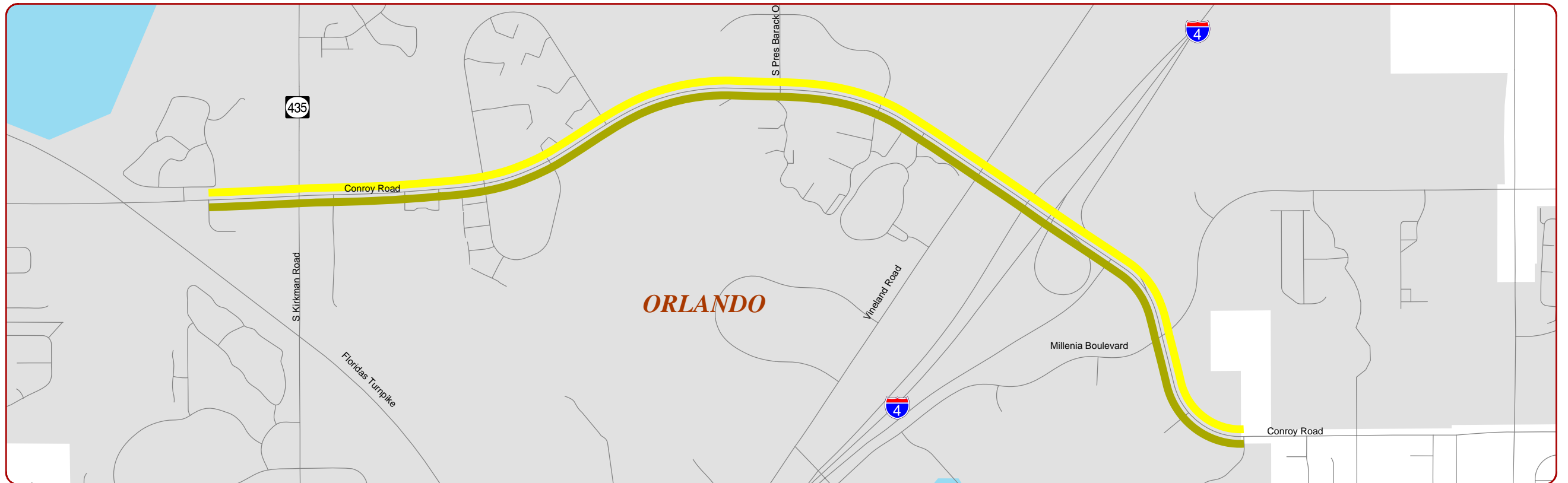
### Before Condition

Date of Collection: 2/18/2014  
Distance: 2.46 miles  
From: Kirkman Oaks/  
Kirkman Shoppes  
To: Eastgate Dr.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 21.7 MPH  
EB Travel Time: 7.75 MIN

WB Avg Speed: 23.6 MPH  
WB Travel Time: 7.13 MIN



## Conroy Rd. - AM Peak

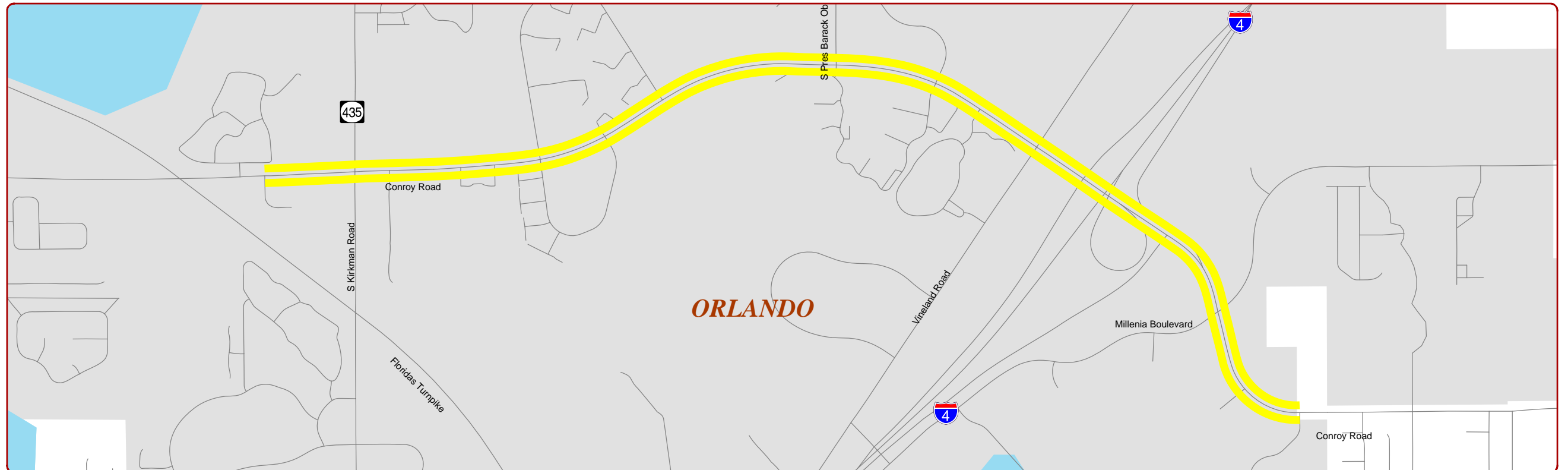
### After Condition

Date of Collection: 5/22/2014  
Distance: 2.46 miles  
From: Kirkman Oaks /  
Kirkman Shoppes  
To: Eastgate Dr.

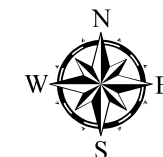
Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 25.8 MPH  
EB Travel Time: 6.50 MIN

WB Avg Speed: 27.0 MPH  
WB Travel Time: 6.22 MIN



### Level of Services:



## 2014 METROPLAN ORLANDO

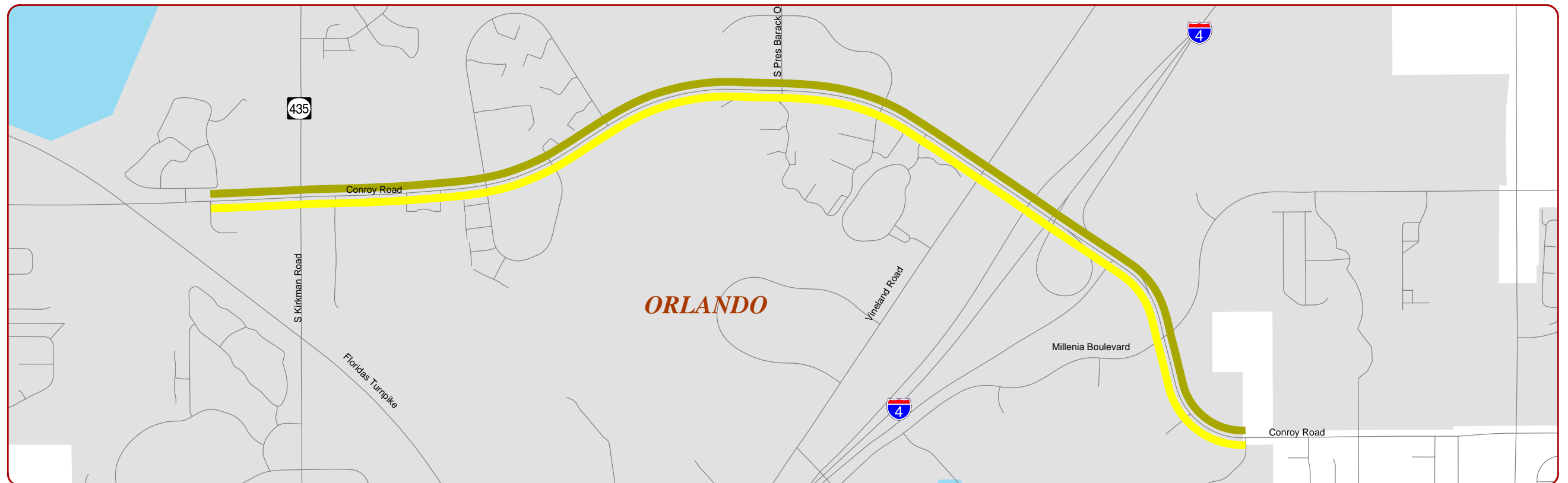


### ***Before Condition***

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 27.0 MPH  
EB Travel Time: 6.22 MIN

WB Avg Speed: 17.7 MPH  
WB Travel Time: 9.50 MIN

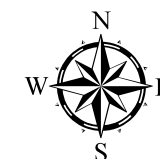
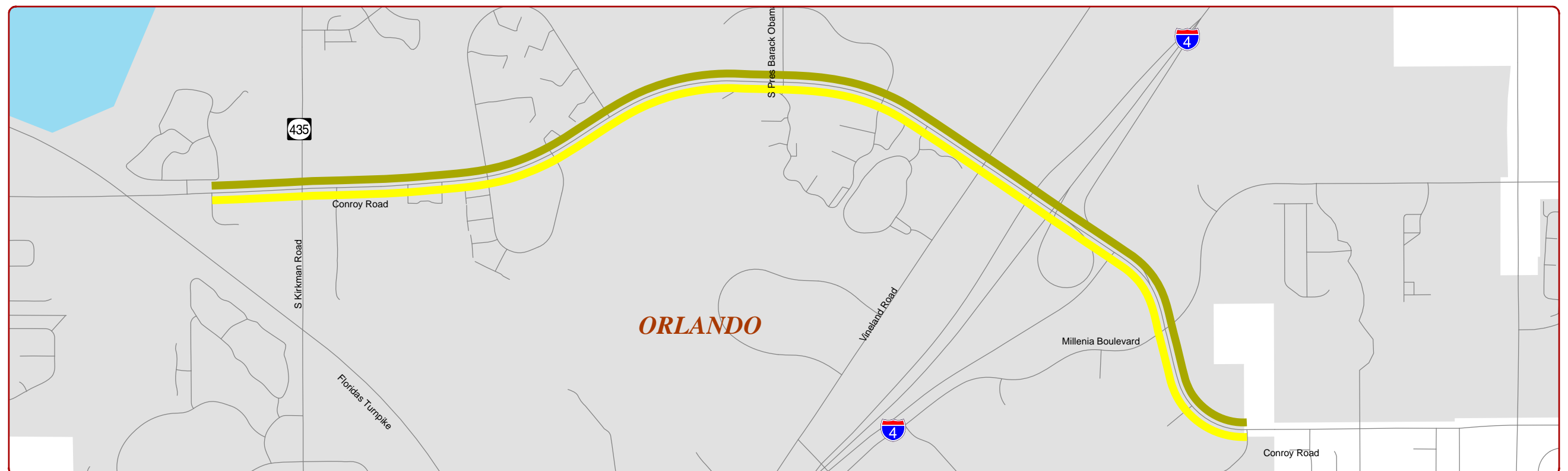


### ***After Condition***

Start Time: 4:00 PM  
End Time: 6:00 PM

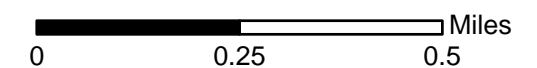
EB Avg Speed: 27.7 MPH  
EB Travel Time: 6.07 MIN

WB Avg Speed: 18.1 MPH  
WB Travel Time: 9.27 MIN



## 2014 METROPLAN ORLANDO

## Travel Time Study





**Princeton St. (SR 438)**  
**Mercy Ave. to John Young Pkwy. (SR 423)**

## Year 2014 MetroPlan Orlando Travel Time Study

*Before Condition*

**Roadway:** Princeton Street (SR 438)  
**Segment:** Mercy Avenue to John Young Parkway (SR 423)  
**Jurisdiction:** Orange County  
**Area Type:** Residential  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 0.93 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.3 miles

### *Eastbound Direction*

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Mercy Drive	1	2	1	45	
Walmart Plaza	1	2	0	45	
John Young Parkway (SR 423)	2	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	31	119	39.3	B
Eastbound	PM	11	176	26.6	D

### *Westbound Direction*

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
John Young Parkway (SR 423)	2	3	1	45	
Walmart Plaza	1	2	1	45	
Mercy Drive	2	2	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	10	136	34.4	B
Westbound	PM	26	196	23.9	D

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** Princeton Street (SR 438)  
**Segment:** Mercy Avenue to John Young Parkway (SR 423)  
**Jurisdiction:** Orange County  
**Area Type:** Residential  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 0.93 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.3 miles

## Eastbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Mercy Drive	1	2	1	45	
Walmart Plaza	1	2	0	45	
John Young Parkway (SR 423)	2	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	23	123	38.0	B
Eastbound	PM	20	145	32.3	C

## Westbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
John Young Parkway (SR 423)	2	3	1	45	
Walmart Plaza	1	2	1	45	
Mercy Drive	2	2	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	23	131	35.7	B
Westbound	PM	26	192	24.4	D

## Princeton Street - Mercy Avenue to John Young Parkway

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
991	119.0	39.3	32.76	123.0	38.0	33.86
Northbound/Eastbound - PM Peak Hour						
840	176.0	26.6	41.07	145.0	32.3	33.83
Southbound/Westbound - AM Peak Hour						
702	136.0	34.4	26.52	131.0	35.7	25.55
Southbound/Westbound - PM Peak Hour						
1,238	196.0	23.9	67.40	192.0	24.4	66.03

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

**Princeton Street - Mercy Avenue to John Young Parkway**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	59.28	59.40	108.47	99.86

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	-\$2.01	\$144.56
Annual User Benefit	-\$603.00	\$43,368.00
Total Annual User Benefit	\$42,765.00	
Total Signal Retiming Annual Cost	\$6,616.58	
User Benefit / Cost Ratio	6.46	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.

**Princeton St./SR 438  
- AM Peak**

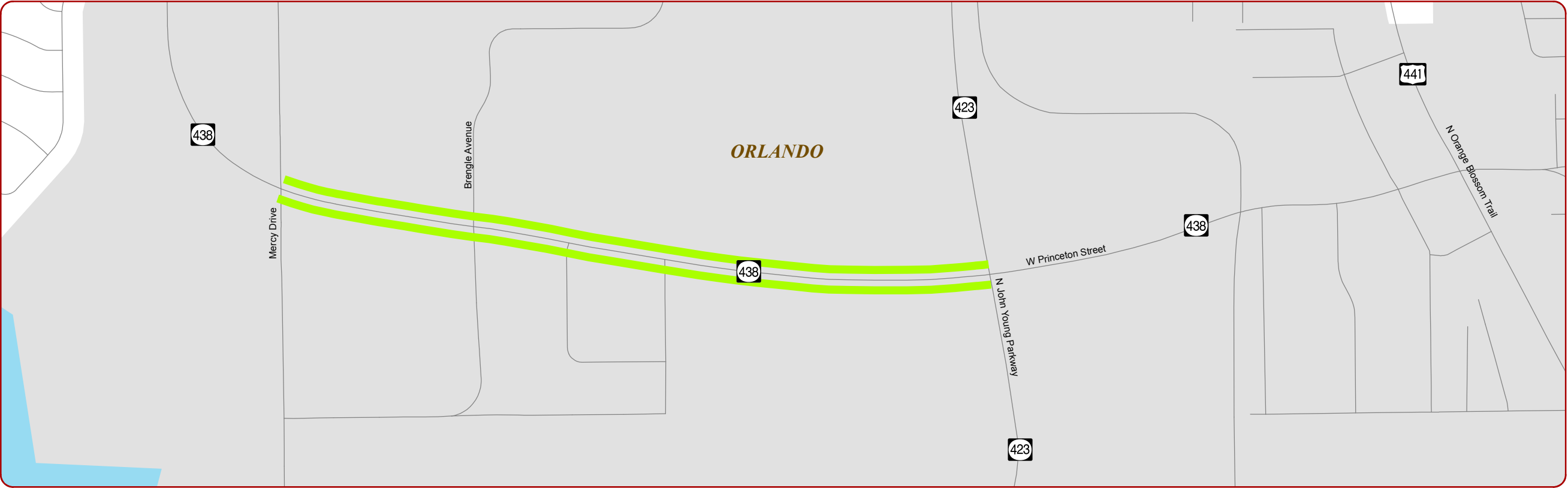
**Before Condition**

Date of Collection: 2/27/2014  
Distance: 0.93 miles  
From: Mercy Ave.  
To: John Young Pkway

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 39.3 MPH  
EB Travel Time: 1.98 MIN

WB Avg Speed: 34.4 MPH  
WB Travel Time: 2.27 MIN



**Princeton St./SR 438  
- AM Peak**

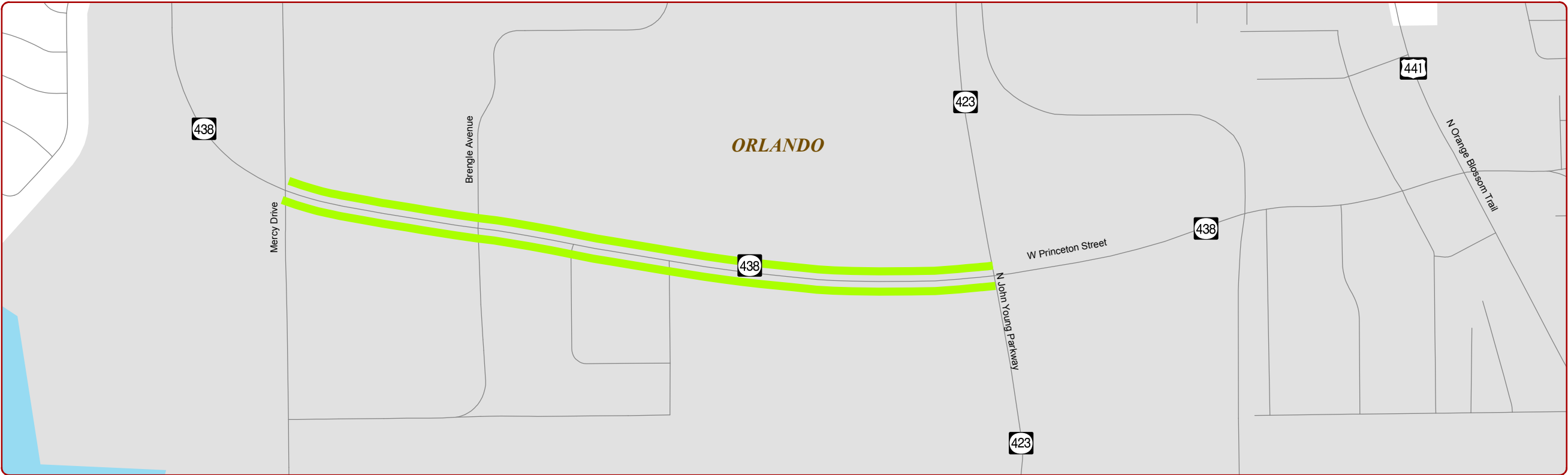
**After Condition**

Date of Collection: 5/14/2014  
Distance: 0.93 miles  
From: Mercy Ave.  
To: John Young Pkway

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 38.0 MPH  
EB Travel Time: 2.05 MIN

WB Avg Speed: 35.7 MPH  
WB Travel Time: 2.18 MIN

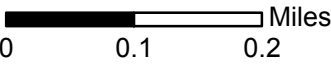


**Level of Services:**



**2014 METROPLAN ORLANDO**

**Travel Time Study**



**Princeton St./SR 438  
- PM Peak**

**Before Condition**

Date of Collection: 2/27/2014  
Distance: 0.93 miles  
From: Mercy Ave.  
To: John Young Pkwy

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 26.6 MPH  
EB Travel Time: 2.93 MIN

WB Avg Speed: 23.9 MPH  
WB Travel Time: 3.27 MIN



**Princeton St./SR 438  
- PM Peak**

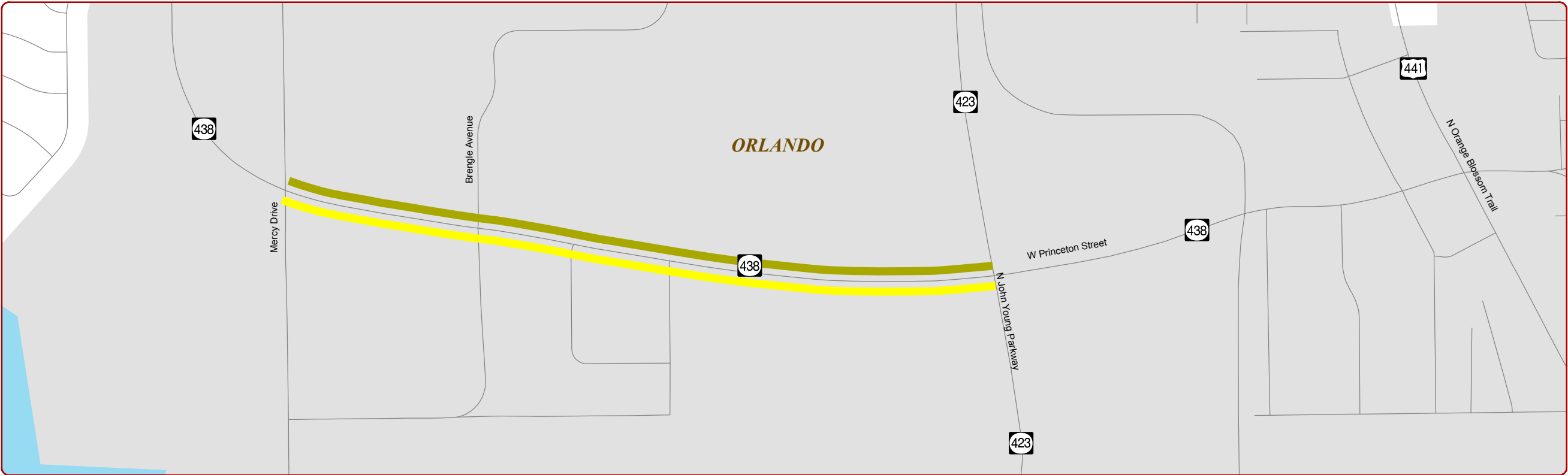
**After Condition**

Date of Collection: 5/14/2014  
Distance: 0.93 miles  
From: Mercy Ave.  
To: John Young Pkwy

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 32.3 MPH  
EB Travel Time: 2.42 MIN

WB Avg Speed: 24.4 MPH  
WB Travel Time: 3.20 MIN

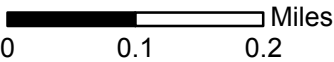


**Level of Services:**



**2014 METROPLAN ORLANDO**

**Travel Time Study**



**Kirkman Rd. (SR 435)**  
**Carrier Dr. to Vineland Rd.**



# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** Kirkman Road (SR 435)  
**Segment:** Carrier Drive to Vineland Road  
**Jurisdiction:** Orange County  
**Area Type:** Other Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 1.75 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.9 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Carrier Drive	1	3	1	45	
International Drive	1	3	1	45	
Major Boulevard	2	4	0	45	
Vineland Road	2	4	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	20	295	23.2	D
Northbound	PM	37	508	13.5	F

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Vineland Road	2	3	1	45	
Major Boulevard	1	3	1	45	
International Drive	2	3	1	45	
Carrier Drive	1	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	33	258	26.5	D
Southbound	PM	14	267	25.6	D

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** Kirkman Road (SR 435)  
**Segment:** Carrier Drive to Vineland Road  
**Jurisdiction:** Orange County  
**Area Type:** Other Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 1.75 mile      **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.9 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Carrier Drive	1	3	1	45	
International Drive	1	3	1	45	
Major Boulevard	2	4	0	45	
Vineland Road	2	4	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	44	292	23.4	D
Northbound	PM	37	485	14.1	F

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Vineland Road	2	3	1	45	
Major Boulevard	1	3	1	45	
International Drive	2	3	1	45	
Carrier Drive	1	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	31	239	28.6	C
Southbound	PM	84	234	29.2	C

## Kirkman Road (SR 435) - Carrier Drive to Vineland Road

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
1,755	295.0	23.2	143.81	292.0	23.4	142.35
Northbound/Eastbound - PM Peak Hour						
2,475	508.0	13.5	349.25	485.0	14.1	333.44
Southbound/Westbound - AM Peak Hour						
2,034	258.0	26.5	145.77	239.0	28.6	135.04
Southbound/Westbound - PM Peak Hour						
1,896	267.0	25.6	140.62	234.0	29.2	123.24

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

**Kirkman Road (SR 435) - Carrier Drive to Vineland Road**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	289.58	277.39	489.87	456.68

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$204.67	\$557.26
Annual User Benefit	\$61,401.00	\$167,178.00
Total Annual User Benefit	\$228,579.00	
Total Signal Retiming Annual Cost	\$8,374.37	
User Benefit / Cost Ratio	27.30	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



**Kirkman Rd  
- AM Peak**

**Before Condition**

Date of Collection: 2/20/2014  
 Distance: 1.75 miles  
 From: Carrier Dr.  
 To: Vineland Rd.

Start Time: 7:00 AM  
 End Time: 9:00 AM

NB Avg Speed: 23.2 MPH  
 NB Travel Time: 4.92 MIN

SB Avg Speed: 26.5 MPH  
 SB Travel Time: 4.30 MIN



**Kirkman Rd.  
- AM Peak**

**After Condition**

Date of Collection: 5/6/2014  
 Distance: 1.75 miles  
 From: Carrier Dr.  
 To: Vineland Rd.

Start Time: 7:00 AM  
 End Time: 9:00 AM

NB Avg Speed: 23.4 MPH  
 NB Travel Time: 4.87 MIN

SB Avg Speed: 28.6 MPH  
 SB Travel Time: 3.98 MIN



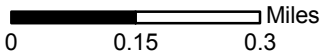
**Level of Services:**

- |   |   |  |
|---|---|--|
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| <span style="display:inline-block; width:20px; height:10px; background-color:lightgreen; border:1px solid black;"></span> B | <span style="display:inline-block; width:20px; height:10px; background-color:orange; border:1px solid black;"></span> E | <span style="display:inline-block; width:20px; height:10px; background-color:lightorange; border:1px solid black;"></span> City Boundary |
| <span style="display:inline-block; width:20px; height:10px; background-color:yellow; border:1px solid black;"></span> C     | <span style="display:inline-block; width:20px; height:10px; background-color:red; border:1px solid black;"></span> F    | <span style="display:inline-block; width:20px; height:10px; background-color:lightblue; border:1px solid black;"></span> Water           |



**2014 METROPLAN ORLANDO**

*Travel Time Study*





**Kirkman Rd  
- PM Peak**

**Before Condition**

Date of Collection: 2/20/2014  
Distance: 1.75 miles  
From: Carrier Dr.  
To: Vineland Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 13.5 MPH  
NB Travel Time: 8.47 MIN

SB Avg Speed: 25.6 MPH  
SB Travel Time: 4.45 MIN



**Kirkman Rd.  
- PM Peak**

**After Condition**

Date of Collection: 5/6/2014  
Distance: 1.75 miles  
From: Carrier Dr.  
To: Vineland Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 14.1 MPH  
NB Travel Time: 8.08 MIN

SB Avg Speed: 29.2 MPH  
SB Travel Time: 3.90 MIN

**Level of Services:**

	A		D		Roads
	B		E		City Boundary
	C		F		Water



**Central Blvd.**  
**Summerlin Ave. to Brown Ave.**

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Central Boulevard from Summerlin Avenue to Brown Avenue - Eastbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Median Opening to Summerlin Ave	Orange County	Collector	Residential	1	1	0	25	475	17	Signal	26.4	9.6	IV	12.3	D	0.49	
Summerlin Ave to Thorton Ave	Orange County	Collector	Residential	0	1	0	25	1,109	17	Signal	39.6	6.0	IV	19.1	B	0.76	
Thorton Ave to Brown Ave	Orange County	Collector	Residential	0	1	0	25	528	17	Signal	40.8	24.6	IV	8.8	E	0.35	
TOTAL							25	2,112			106.8	40.2	IV	13.5	C	0.54	0.017 gal/veh
PM PEAK HOUR																	
Median Opening to Summerlin Ave	Orange County	Collector	Residential	1	1	0	25	475	20	Signal	30.6	15.0	IV	10.6	D	0.42	
Summerlin Ave to Thorton Ave	Orange County	Collector	Residential	0	1	0	25	1,109	20	Signal	64.2	27.0	IV	11.8	D	0.47	
Thorton Ave to Brown Ave	Orange County	Collector	Residential	0	1	0	25	528	20	Signal	29.4	11.4	IV	12.2	D	0.49	
TOTAL							25	2,112			124.2	53.4	IV	11.6	D	0.46	0.017 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. CBD - Central Business District



**Year 2014 METROPLAN Orlando Travel Time Study**  
**Central Boulevard from Summerlin Avenue to Brown Avenue - Westbound Direction Summary - Before Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Median Opening to Brown Ave	Orange County	Collector	Residential	0	1	0	25	370	17	Signal	16.2	6.0	IV	15.6	C	0.62	
Brown Ave to Thorton Ave	Orange County	Collector	Residential	0	1	0	25	528	17	Signal	37.8	19.2	IV	9.5	D	0.38	
Thorton Ave to Summerlin Ave	Orange County	Collector	Residential	1	1	0	25	1,109	17	Signal	57.0	22.8	IV	13.3	C	0.53	
TOTAL							25	2,006			111.0	48.0	IV	12.3	D	0.49	0.016 gal/veh
PM PEAK HOUR																	
Median Opening to Brown Ave	Orange County	Collector	Residential	0	1	0	25	370	19	Signal	36.0	21.6	IV	7.0	F	0.28	
Brown Ave to Thorton Ave	Orange County	Collector	Residential	0	1	0	25	528	19	Signal	27.0	9.0	IV	13.3	C	0.53	
Thorton Ave to Summerlin Ave	Orange County	Collector	Residential	1	1	0	25	1,109	19	Signal	50.4	18.6	IV	15.0	C	0.60	
TOTAL							25	2,006			113.4	49.2	IV	12.1	D	0.48	0.015 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. CBD - Central Business District

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Central Boulevard from Summerlin Avenue to Brown Avenue - Eastbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Median Opening to Summerlin Ave	Orange County	Collector	Residential	1	1	0	25	475	28	Signal	22.0	13.0	IV	14.7	C	0.59	
Summerlin Ave to Thorton Ave	Orange County	Collector	Residential	0	1	0	25	1,109	28	Signal	29.0	7.0	IV	26.1	A	1.04	
Thorton Ave to Brown Ave	Orange County	Collector	Residential	0	1	0	25	528	28	Signal	18.0	22.0	IV	20.0	B	0.80	
TOTAL							25	2,112			69.0	42.0	IV	20.9	B	0.83	0.016 gal/veh
PM PEAK HOUR																	
Median Opening to Summerlin Ave	Orange County	Collector	Residential	1	1	0	25	475	26	Signal	27.0	20.0	IV	12.0	D	0.48	
Summerlin Ave to Thorton Ave	Orange County	Collector	Residential	0	1	0	25	1,109	26	Signal	37.0	9.0	IV	20.4	B	0.82	
Thorton Ave to Brown Ave	Orange County	Collector	Residential	0	1	0	25	528	26	Signal	32.0	32.0	IV	11.2	D	0.45	
TOTAL							25	2,112			96.0	61.0	IV	15.0	C	0.60	0.017 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. CBD - Central Business District

**Year 2014 METROPLAN Orlando Travel Time Study**  
**Central Boulevard from Summerlin Avenue to Brown Avenue - Westbound Direction Summary - After Condition**

Roadway Segment	Jurisdiction	Facility Type <sup>1</sup>	Area Type <sup>1</sup>	Left Turn Lanes <sup>2</sup>	Thru Lanes <sup>2</sup>	Right Turn Lanes <sup>2</sup>	Speed Limit (mph)	Distance (ft)	# Runs	Traffic Control Device	Travel Time (sec)	Stop Delay (sec)	Roadway Class	Roadway Segment		Roadway Summary	
														Average Speed		Avg Speed/Speed Limit	Avg. Fuel Consump.
														(mph)	LOS		
AM PEAK HOUR																	
Median Opening to Brown Ave	Orange County	Collector	Residential	0	1	0	25	370	27	Signal	11.0	7.0	IV	22.9	B	0.92	
Brown Ave to Thorton Ave	Orange County	Collector	Residential	0	1	0	25	528	27	Signal	23.0	35.0	IV	15.7	C	0.63	
Thorton Ave to Summerlin Ave	Orange County	Collector	Residential	1	1	0	25	1,109	27	Signal	34.0	3.0	IV	22.2	B	0.89	
TOTAL							25	2,006			68.0	45.0	IV	20.1	B	0.80	0.015 gal/veh
PM PEAK HOUR																	
Median Opening to Brown Ave	Orange County	Collector	Residential	0	1	0	25	370	26	Signal	40.0	25.0	IV	6.3	F	0.25	
Brown Ave to Thorton Ave	Orange County	Collector	Residential	0	1	0	25	528	26	Signal	28.0	25.0	IV	12.9	D	0.51	
Thorton Ave to Summerlin Ave	Orange County	Collector	Residential	1	1	0	25	1,109	26	Signal	36.0	9.0	IV	21.0	B	0.84	
TOTAL							25	2,006			104.0	59.0	IV	13.2	C	0.53	0.015 gal/veh

Note:

1. The Facility type and Area type definitions were obtained from the latest Orlando Urban Area Transportation Study (OUATS) Model.
2. The Through lanes and Turn lanes are provided for the approach of the direction of travel.
3. CBD - Central Business District

## Central Boulevard - Summerlin Avenue to Brown Road

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
78	107.0	13.5	2.32	69.0	20.9	1.50
Northbound/Eastbound - PM Peak Hour						
249	124.0	11.6	8.58	96.0	15.0	6.64
Southbound/Westbound - AM Peak Hour						
291	111.0	12.3	8.97	68.0	20.1	5.50
Southbound/Westbound - PM Peak Hour						
192	113.0	12.1	6.03	104.0	13.2	5.55

\*Traffic Volumes are obtained from the latest 2013 Turning Movement Counts.

**Central Boulevard - Summerlin Avenue to Brown Road**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	11.29	6.99	14.60	12.19

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$72.20	\$40.46
Annual User Benefit	\$21,660.00	\$12,138.00
Total Annual User Benefit	\$33,798.00	
Total Signal Retiming Annual Cost	\$5,816.75	
User Benefit / Cost Ratio	5.81	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.

**Central Boulevard  
- AM Peak**

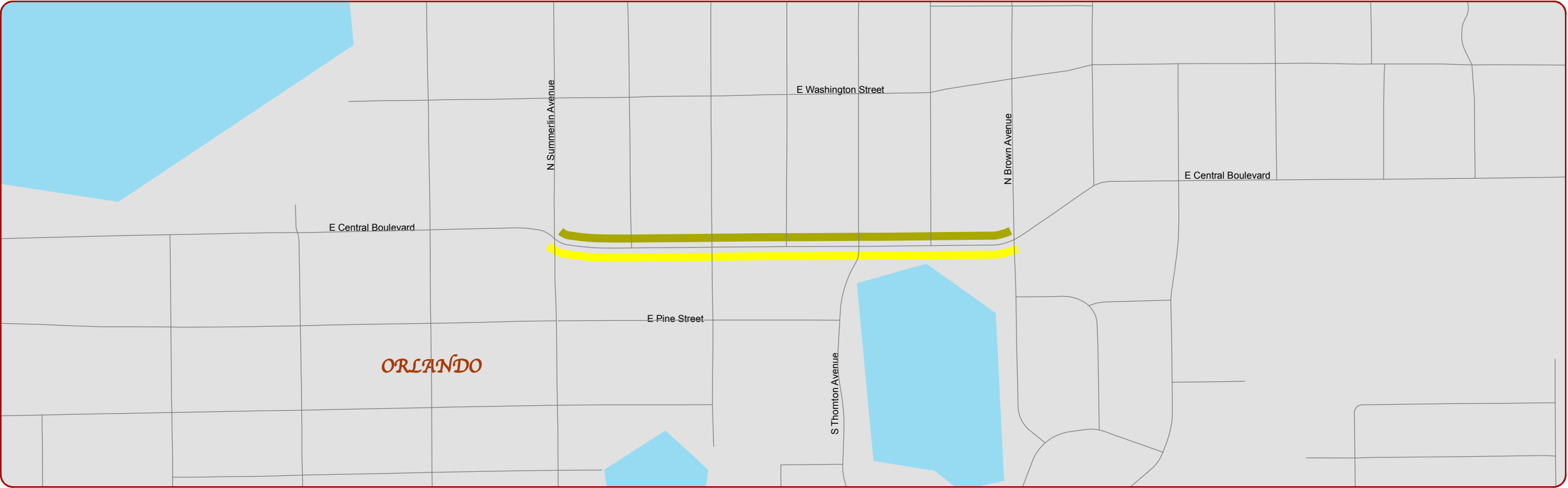
**Before Condition**

Date of Collection: 1/16/2014  
Distance: 0.40 miles  
From: Summerlin Ave.  
To: Brown Ave.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 13.5 MPH  
EB Travel Time: 1.78 MIN

WB Avg Speed: 12.3 MPH  
WB Travel Time: 1.85 MIN



**Central Boulevard  
- AM Peak**

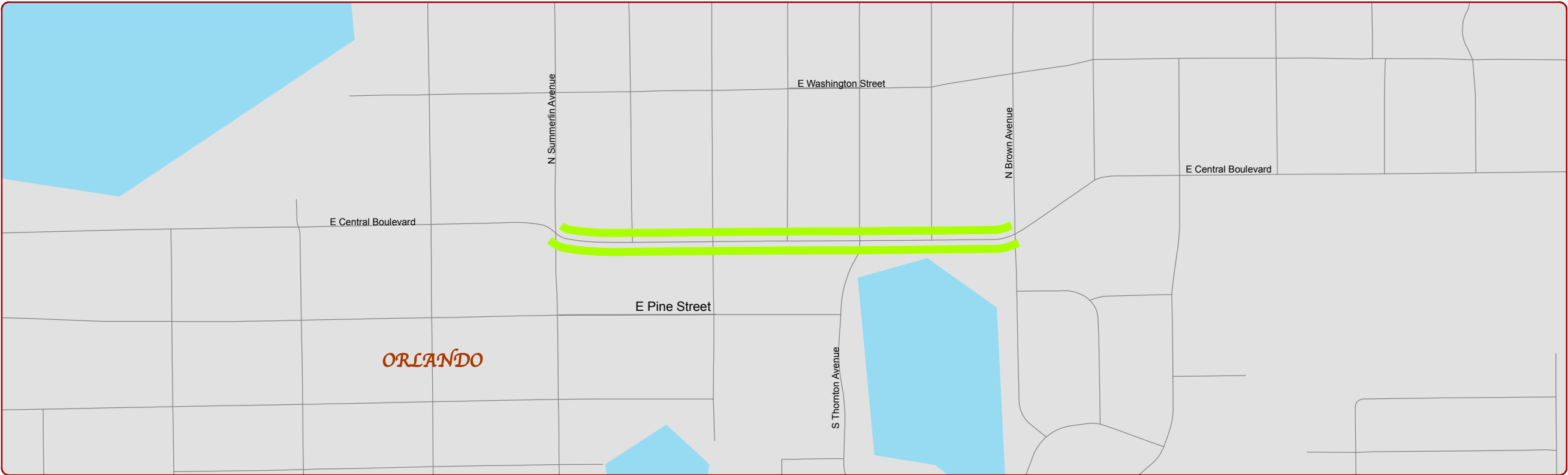
**After Condition**

Date of Collection: 4/2/2014  
Distance: 0.40 miles  
From: Summerlin Ave.  
To: Brown Ave

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 20.9 MPH  
EB Travel Time: 1.15 MIN

WB Avg Speed: 20.1 MPH  
WB Travel Time: 1.13 MIN



**Level of Services:**

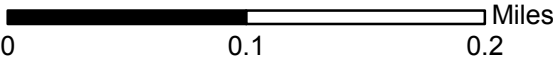


	A		D		Roads
	B		E		City Boundary
	C		F		Water



**2014 METROPLAN ORLANDO**

*Travel Time Study*



Central Boulevard  
- PM Peak

Before Condition

Date of Collection: 1/16/2014  
Distance: 0.40 miles  
From: Summerlin Ave.  
To: Brown Ave.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 11.6 MPH  
EB Travel Time: 2.07 MIN

WB Avg Speed: 12.1 MPH  
WB Travel Time: 1.88 MIN



Central Boulevard  
- AM Peak

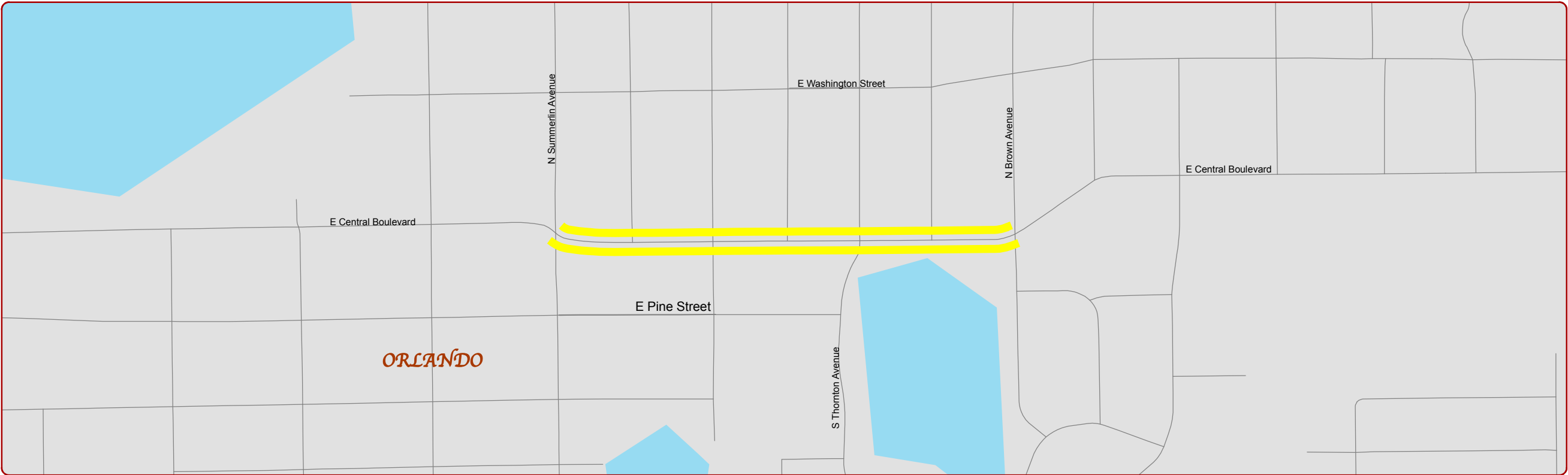
After Condition

Date of Collection: 4/2/2014  
Distance: 0.40 miles  
From: Summerlin Ave.  
To: Brown Ave.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 15.0 MPH  
EB Travel Time: 1.60 MIN

WB Avg Speed: 13.2 MPH  
WB Travel Time: 1.73 MIN

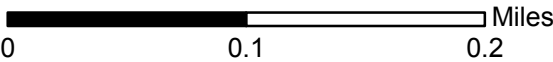


Level of Services:



2014 METROPLAN ORLANDO

*Travel Time Study*



**Silver Star (SR 416)**  
**Dardanelle Dr. to Rio Grande Ave.**



# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** Silver Star Road (SR 416)  
**Segment:** Dardanelle Drive to Rio Grande Avenue  
**Jurisdiction:** Orange County  
**Area Type:** Residential/Other Outlying Business District  
**Facility Type:** Divided Arterial/Undivided Arterial  
**Speed Limit:** 40 MPH  
**Length of Arterial:** 2.23 mile      **Arterial Class:** II  
**Distance between BlueToad Devices:** 2.4 miles

## Eastbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Dardanelle Drive	1	3	0	40	
Princeton Street	2	2	0	40	
Mercy Drive	1	2	0	40	
Eunice Avenue	1	1	0	40	
John Young Parkway	1	1	0	40	
Orange Blossom Trail (US 441)	1	2	0	40	
Rio Grande Avenue	1	0	1	40	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	39	422	20.5	D
Eastbound	PM	46	416	20.8	D

## Westbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Rio Grande Avenue NB	0	2	0	40	
Rio Grande Avenue SB	0	1	1	40	
Orange Blossom Trail (US 441)	1	2	0	40	
John Young Parkway	1	1	0	40	
Eunice Avenue	1	1	0	40	
Mercy Drive	1	2	0	40	
Princeton Street	0	1	0	40	
Dardanelle Drive	1	3	0	40	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	59	485	17.8	D
Westbound	PM	101	407	21.2	D

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** Silver Star Road (SR 416)  
**Segment:** Dardanelle Drive to Rio Grande Avenue  
**Jurisdiction:** Orange County  
**Area Type:** Residential/Other Outlying Business District  
**Facility Type:** Divided Arterial/Undivided Arterial  
**Speed Limit:** 40 MPH  
**Length of Arterial:** 2.23 mile      **Arterial Class:** II  
**Distance between BlueToad Devices:** 2.4 miles

## Eastbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Dardanelle Drive	1	3	0	40	
Princeton Street	2	2	0	40	
Mercy Drive	1	2	0	40	
Eunice Avenue	1	1	0	40	
John Young Parkway	1	1	0	40	
Orange Blossom Trail (US 441)	1	2	0	40	
Rio Grande Avenue	1	0	1	40	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	90	369	23.4	C
Eastbound	PM	93	404	21.4	D

## Westbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Rio Grande Avenue NB	0	2	0	40	
Rio Grande Avenue SB	0	1	1	40	
Orange Blossom Trail (US 441)	1	2	0	40	
John Young Parkway	1	1	0	40	
Eunice Avenue	1	1	0	40	
Mercy Drive	1	2	0	40	
Princeton Street	0	1	0	40	
Dardanelle Drive	1	3	0	40	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	76	399	21.7	D
Westbound	PM	102	413	20.9	D

## Silver Star (SR 416) - Dardanelle Drive to Rio Grande Avenue

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
580	422.0	20.5	67.99	369.0	23.4	59.45
Northbound/Eastbound - PM Peak Hour						
423	416.0	20.8	48.88	404.0	21.4	47.47
Southbound/Westbound - AM Peak Hour						
477	485.0	17.8	64.26	399.0	21.7	52.87
Southbound/Westbound - PM Peak Hour						
669	407.0	21.2	75.63	413.0	20.9	76.75

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

**Silver Star (SR 416) - Dardanelle Drive to Rio Grande Avenue**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	132.25	112.32	124.51	124.22

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$334.62	\$4.87
Annual User Benefit	\$100,386.00	\$1,461.00
Total Annual User Benefit	\$101,847.00	
Total Signal Retiming Annual Cost	\$11,054.31	
User Benefit / Cost Ratio	9.21	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.

**Silver Star Road  
- AM Peak**

**Before Condition**

Date of Collection: 3/11/2014  
Distance: 2.23 miles  
From: Dardanelle Dr.  
To: Rio Grande Ave.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 20.5 MPH  
EB Travel Time: 7.03 MIN

WB Avg Speed: 17.8 MPH  
WB Travel Time: 8.08 MIN



**Silver Star Road  
- AM Peak**

**After Condition**

Date of Collection: 5/13/2014  
Distance: 2.23 miles  
From: Dardanelle Dr.  
To: Rio Grande Ave.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 23.4 MPH  
EB Travel Time: 6.15 MIN

WB Avg Speed: 21.7 MPH  
WB Travel Time: 6.65 MIN

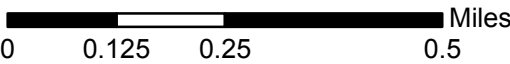


**Level of Services:**



**2014 METROPLAN ORLANDO**

*Travel Time Study*



**Silver Star Road  
- PM Peak**

**Before Condition**

Date of Collection: 3/11/2014  
Distance: 2.23 miles  
From: Dardanelle Dr.  
To: Rio Grande Ave.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 20.8 MPH  
EB Travel Time: 6.93 MIN

WB Avg Speed: 21.2 MPH  
WB Travel Time: 6.78 MIN



**Silver Star Road  
- PM Peak**

**After Condition**

Date of Collection: 5/13/2014  
Distance: 2.23 miles  
From: Dardanelle Dr.  
To: Rio Grande Ave.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 21.4 MPH  
EB Travel Time: 6.73 MIN

WB Avg Speed: 20.9 MPH  
WB Travel Time: 6.88 MIN

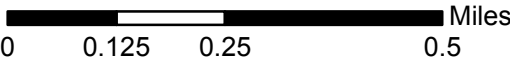


**Level of Services:**



**2014 METROPLAN ORLANDO**

*Travel Time Study*



**SR 536**

**World Center Dr. to International Dr.**

# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** SR 536  
**Segment:** World Center Drive to International Drive  
**Jurisdiction:** Orange County  
**Area Type:** Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 1.1 Mi.    **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.3 Mi.

## Eastbound Direction:

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
World Center Drive	1	3	1	45	
Vineland Road	1	2	2	45	
International Drive	2	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	15	155	30.2	C
Eastbound	PM	19	326	14.4	F

## Westbound Direction:

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
International Drive	1	2	1	45	
Vineland Road	2	2	1	45	
World Center Drive	1	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	14	153	30.6	C
Westbound	PM	16	146	32.1	C



# Year 2014 MetroPlan Orlando Travel Time Study

*After Condition*

Roadway: SR 536  
 Segment: World Center Drive to International Drive  
 Jurisdiction: Orange County  
 Area Type: Outlying Business District  
 Facility Type: Divided Arterial  
 Speed Limit: 45 MPH  
 Length of Arterial: 1.1 Mi. Arterial Class: I  
 Distance between BlueToad Devices: 1.3 Mi.

## Eastbound Direction:

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
World Center Drive	1	3	1	45	
Vineland Road	1	2	2	45	
International Drive	2	2	0	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	18	166	28.2	C
Eastbound	PM	45	237	19.7	E

## Westbound Direction:

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
International Drive	1	2	1	45	
Vineland Road	2	2	1	45	
World Center Drive	1	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	28	171	27.4	C
Westbound	PM	25	167	28.0	C

## SR 536 - World Center Drive to International Drive

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
793	155.0	30.2	34.14	166.0	28.2	36.57
Northbound/Eastbound - PM Peak Hour						
1,564	326.0	14.4	141.63	237.0	19.7	102.96
Southbound/Westbound - AM Peak Hour						
1,347	153.0	30.6	57.25	171.0	27.4	63.98
Southbound/Westbound - PM Peak Hour						
1,318	146.0	32.1	53.45	167.0	28.0	61.14

\*Traffic Volumes are obtained from the latest 2013 Orange County Traffic Counts.

**SR 536 - World Center Drive to International Drive**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (Vehicle - hrs)	91.39	100.55	195.08	164.10

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	-\$153.80	\$520.15
Annual User Benefit	-\$46,140.00	\$156,045.00
Total Annual User Benefit	\$109,905.00	
Total Signal Retiming Annual Cost	\$7,514.67	
User Benefit / Cost Ratio	14.63	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.

**SR 536  
- AM Peak**

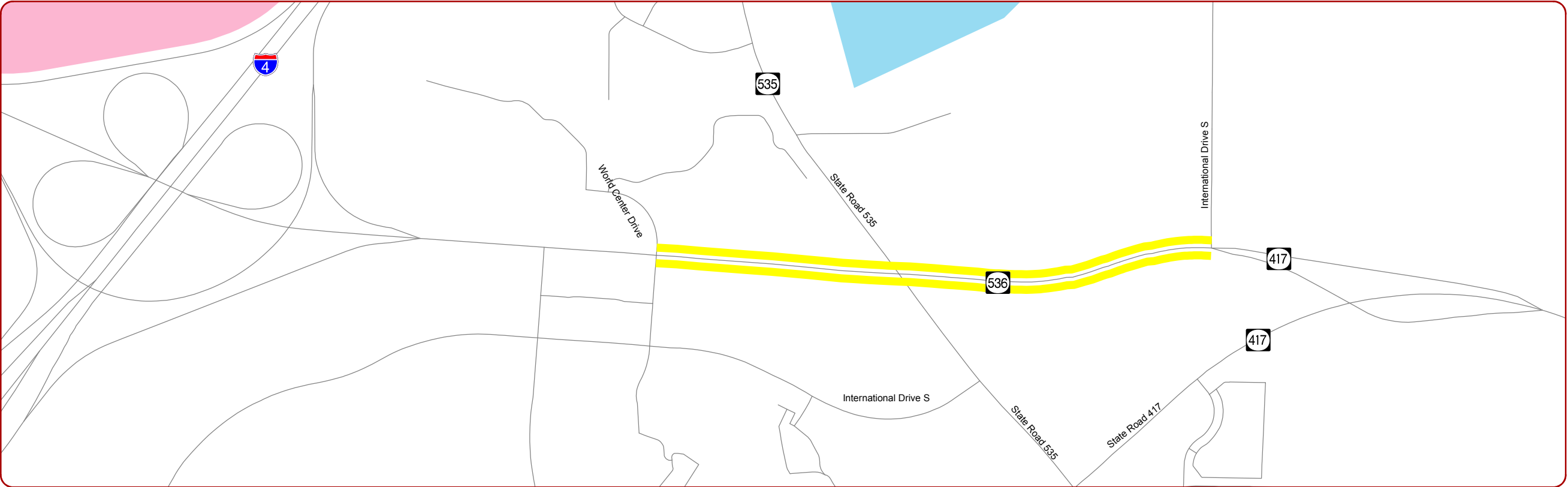
***Before Condition***

Date of Collection: 2/20/2014  
Distance: 1.10 miles  
From: World Center Dr.  
To: International Dr.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 30.2 MPH  
EB Travel Time: 2.58 MIN

WB Avg Speed: 30.6 MPH  
WB Travel Time: 2.55 MIN



**SR 536  
- AM Peak**

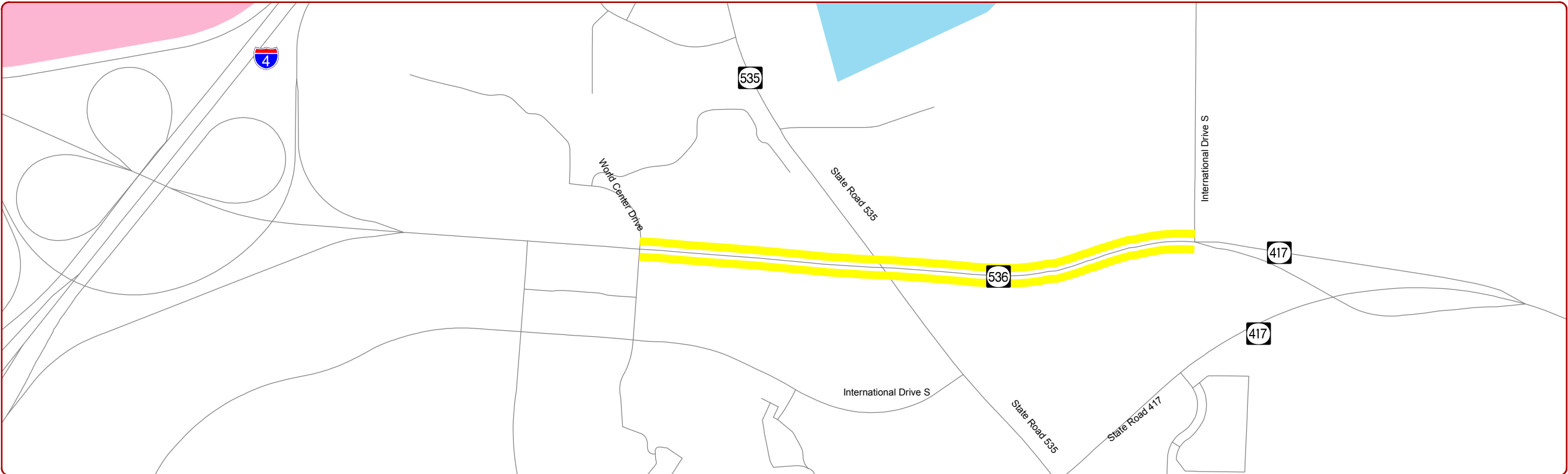
***After Condition***

Date of Collection: 5/8/2014  
Distance: 1.10 miles  
From: World Center Dr.  
To: International Dr.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 28.2 MPH  
EB Travel Time: 2.77 MIN

WB Avg Speed: 27.4 MPH  
WB Travel Time: 2.85 MIN

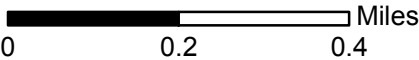


**Level of Services:**



**2014 METROPLAN ORLANDO**

***Travel Time Study***



**SR 536  
- PM Peak**

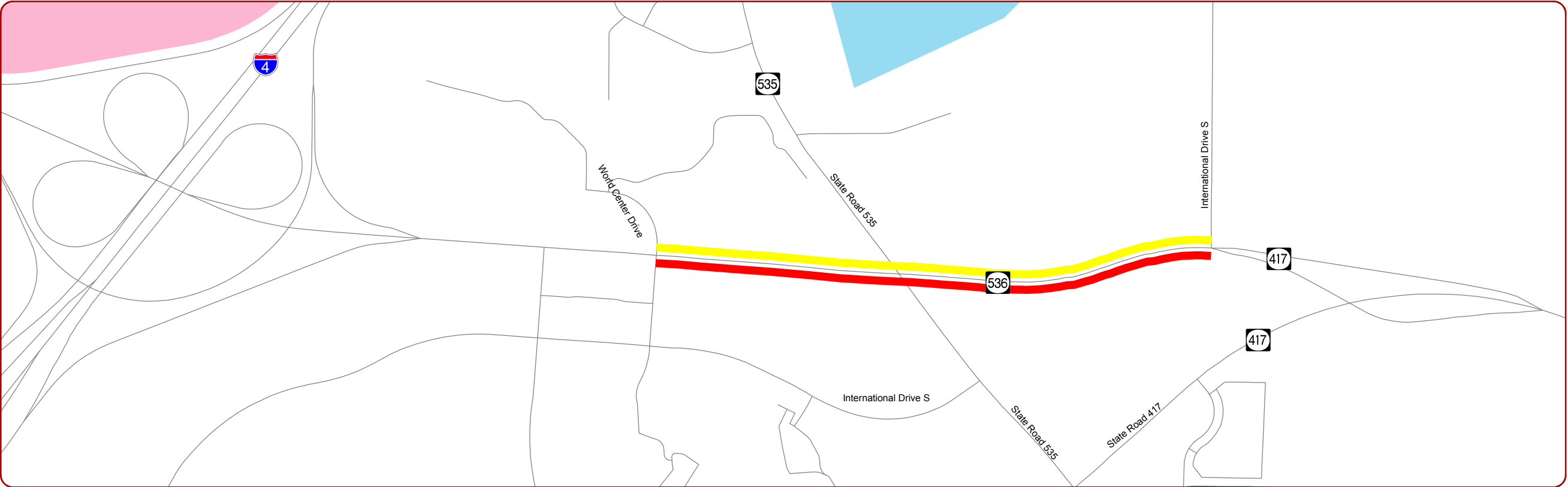
**Before Condition**

Date of Collection: 2/20/2014  
Distance: 1.10 miles  
From: World Center Dr.  
To: International Dr.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 14.4 MPH  
EB Travel Time: 5.43 MIN

WB Avg Speed: 32.1 MPH  
WB Travel Time: 2.43 MIN



**SR 536  
- PM Peak**

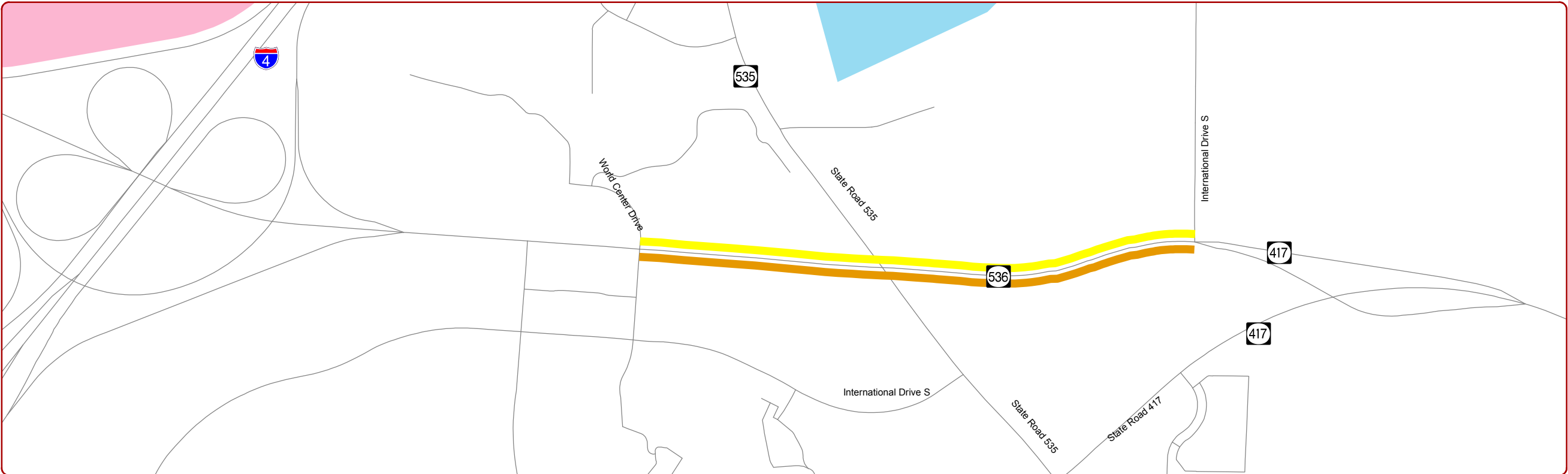
**After Condition**

Date of Collection: 5/8/2014  
Distance: 1.10 miles  
From: World Center Dr.  
To: International Dr.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 19.7 MPH  
EB Travel Time: 3.95 MIN

WB Avg Speed: 28.0 MPH  
WB Travel Time: 2.78 MIN



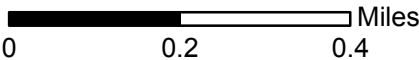
**Level of Services:**

	A		D		Roads
	B		E		City Boundary
	C		F		Water



**2014 METROPLAN ORLANDO**

*Travel Time Study*



**Apopka Vineland Rd. (SR 535)**  
**Lake Buena Vista Outlets to Lake St.**

## Year 2014 MetroPlan Orlando Travel Time Study

*Before Condition*

**Roadway:** SR 535  
**Segment:** LBV Outlets to Lake Street  
**Jurisdiction:** Orange County  
**Area Type:** Divided Arterial/Collector  
**Facility Type:** Urban Residential Area/ Other Outlying Business District  
**Speed Limit:** 40/45/55 MPH  
**Length of Arterial:** 3.10 miles **Arterial Class:** I  
**Distance between BlueToad Devices:** 3.4 miles

### Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
LBV Outlets	1	2	1	55	
SR 536 (World Center Drive)	2	3	1	55	
Meadow Creek Drive	1	3	0	45	
Vineland Avenue/L-4 EB Off Ramp	0	3	1	40	
L-4 WB Off Ramp	1	3	0	40	
Hotel Plaza Boulevard	2	3	1	40	
Palm Parkway	2	2	1	40	
Vinings Way Boulevard	1	2	0	40	
Lake Street	0	2	0	40	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	215	472	26.0	D
Northbound	PM	259	617	19.8	E

### Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Lake Street	1	2	0	40	
Vinings Way Boulevard	1	2	0	40	
Palm Parkway	1	2	1	40	
Hotel Plaza Boulevard	1	3	1	40	
L-4 WB Off Ramp	0	3	2	40	
Vineland Avenue/L-4 EB Off Ramp	2	3	0	40	
Meadow Creek Drive	1	3	1	45	
SR 536 (World Center Drive)	2	3	1	55	
LBV Outlets	1	2	1	55	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	222	444	27.6	C
Southbound	PM	478	789	15.5	F

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** SR 535  
**Segment:** LBV Outlets to Lake Street  
**Jurisdiction:** Orange County  
**Area Type:** Divided Arterial/Collector  
**Facility Type:** Urban Residential Area/ Other Outlying Business District  
**Speed Limit:** 40/45/55 MPH  
**Length of Arterial:** 3.10 miles **Arterial Class:** I  
**Distance between BlueToad Devices:** 3.4 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
LBV Outlets	1	2	1	55	
SR 536 (World Center Drive)	2	3	1	55	
Meadow Creek Drive	1	3	0	45	
Vineland Avenue/L-4 EB Off Ramp	0	3	1	40	
L-4 WB Off Ramp	1	3	0	40	
Hotel Plaza Boulevard	2	3	1	40	
Palm Parkway	2	2	1	40	
Vinings Way Boulevard	1	2	0	40	
Lake Street	0	2	0	40	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	11	381	32.1	C
Northbound	PM	17	430	28.5	C

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Lake Street	1	2	0	40	
Vinings Way Boulevard	1	2	0	40	
Palm Parkway	1	2	1	40	
Hotel Plaza Boulevard	1	3	1	40	
L-4 WB Off Ramp	0	3	2	40	
Vineland Avenue/L-4 EB Off Ramp	2	3	0	40	
Meadow Creek Drive	1	3	1	45	
SR 536 (World Center Drive)	2	3	1	55	
LBV Outlets	1	2	1	55	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	18	459	26.7	D
Southbound	PM	14	601	20.4	E



## SR 535 - Lake Buena Vista Boulevard to Lake Street

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
2,268	472.0	26.0	297.36	381.0	32.1	240.03
Northbound/Eastbound - PM Peak Hour						
2,477	617.0	19.8	424.53	430.0	28.5	295.86
Southbound/Westbound - AM Peak Hour						
1,292	444.0	27.6	159.35	459.0	26.7	164.73
Southbound/Westbound - PM Peak Hour						
2,469	789.0	15.5	541.12	601.0	20.4	412.19

\*Traffic Volumes are obtained from the latest 2013 Turning Movement Count information.

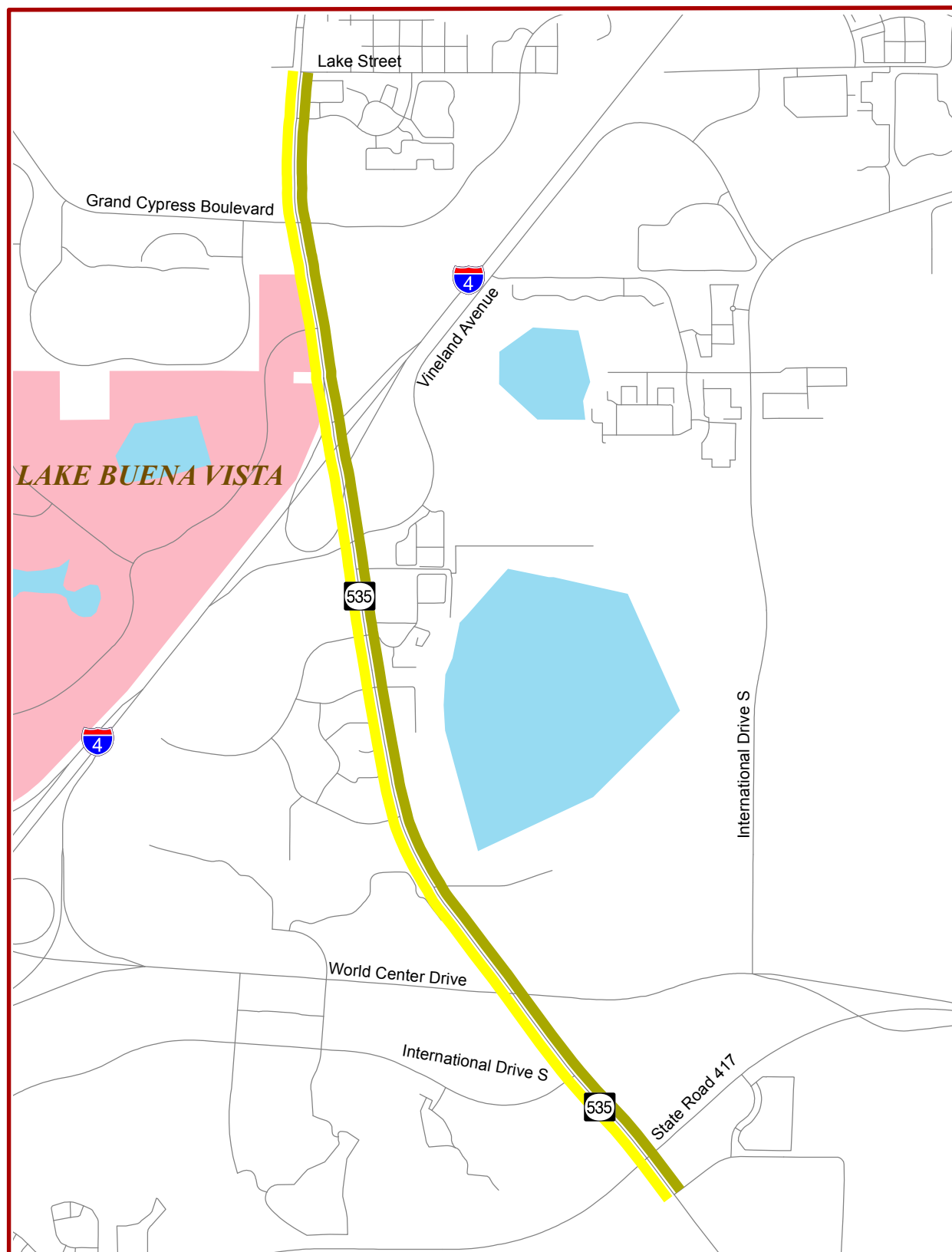
**SR 535 - Lake Buena Vista Boulevard to Lake Street**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	456.71	404.76	965.65	708.05

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$872.24	\$4,325.10
Annual User Benefit	\$261,672.00	\$1,297,530.00
Total Annual User Benefit	\$1,559,202.00	
Total Signal Retiming Annual Cost	\$22,543.78	
User Benefit / Cost Ratio	69.16	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



## SR 535 - AM Peak

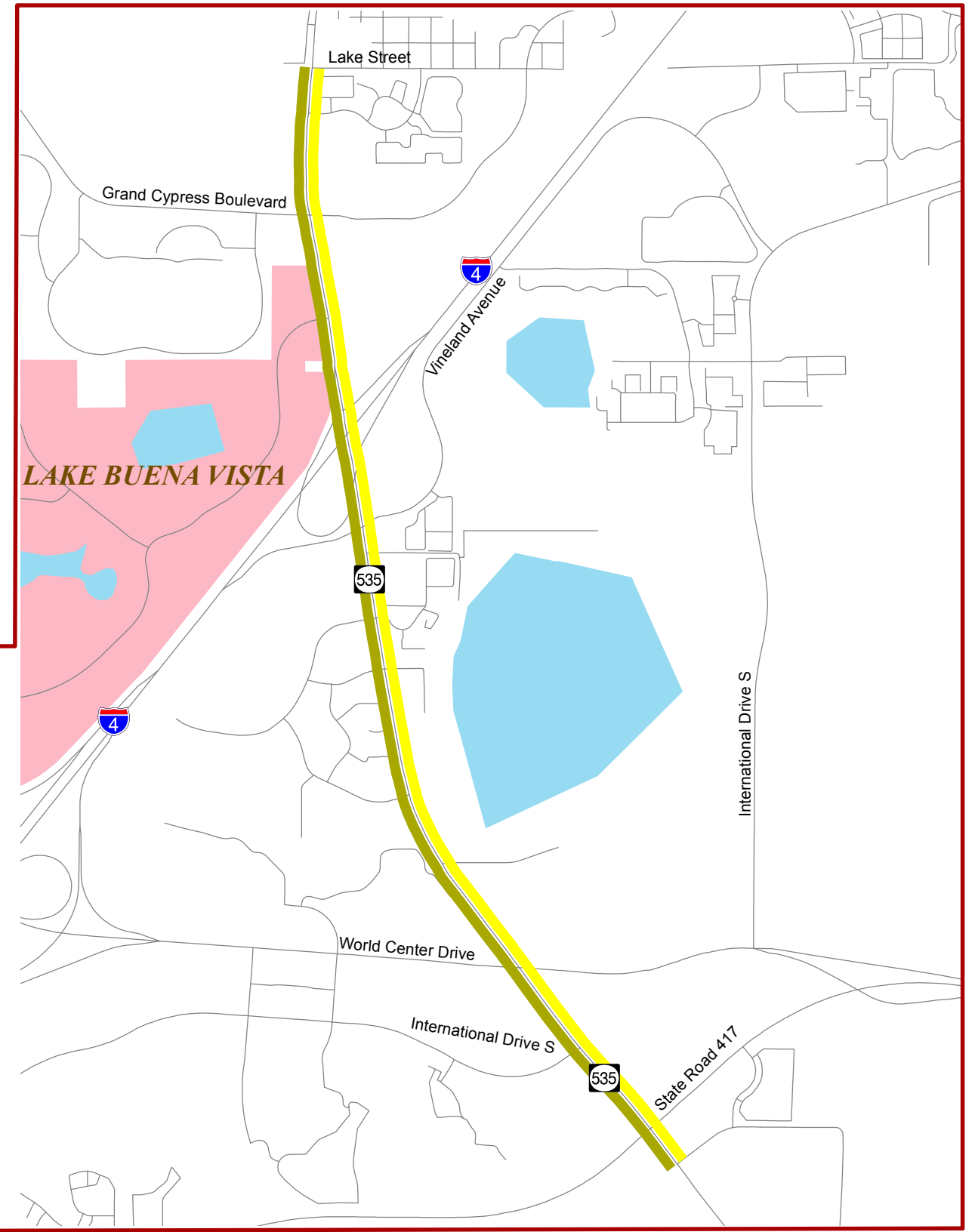
### Before Condition

Date of Collection: 2/12/2014  
Distance: 3.10 miles  
From: LBV Outlets  
To: Lake Street.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 26.0 MPH  
NB Travel Time: 7.87 MIN

SB Avg Speed: 27.6 MPH  
SB Travel Time: 7.40 MIN



## SR 535 - AM Peak

### After Condition

Date of Collection: 4/22/2014  
Distance: 3.10 miles  
From: LBV Outlets  
To: Lake Street.

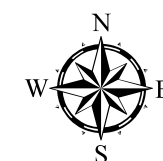
Start Time: 7:00 AM  
End Time: 9:00 AM

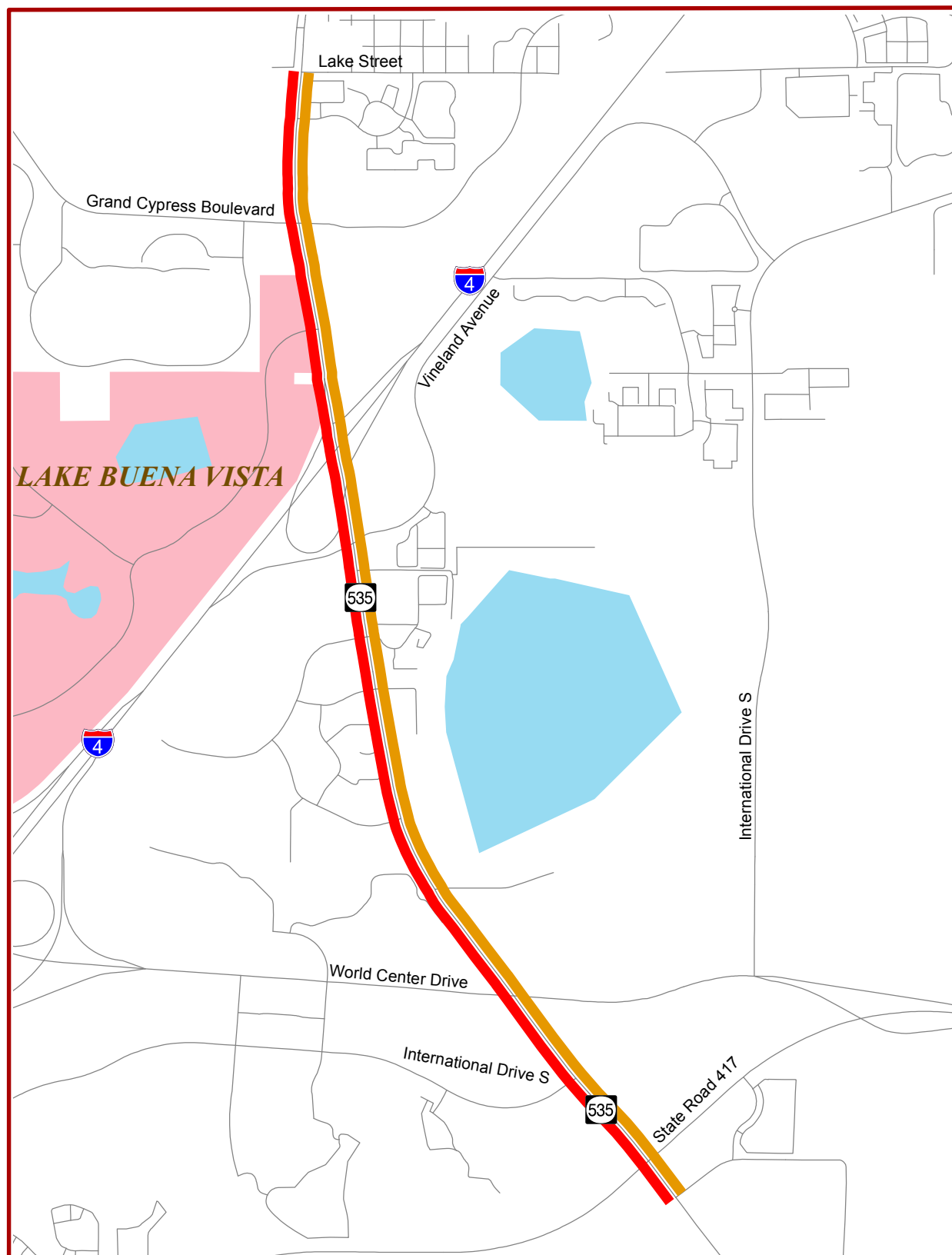
NB Avg Speed: 32.1 MPH  
NB Travel Time: 6.35 MIN

SB Avg Speed: 26.7 MPH  
SB Travel Time: 7.65 MIN

### Level of Services:

	A		D		Roads
	B		E		City Boundary
	C		F		Water





## SR 535 - PM Peak

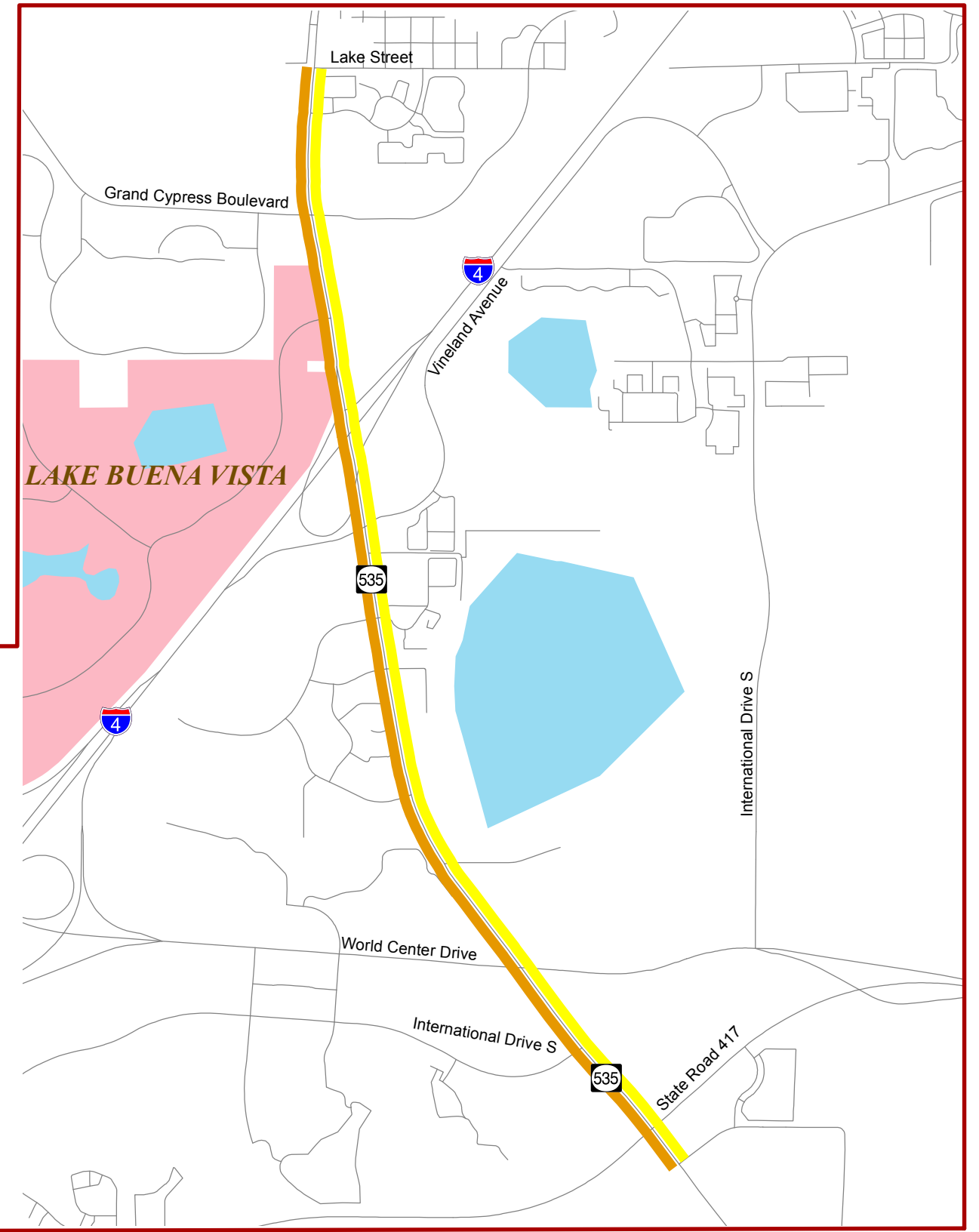
### Before Condition

Date of Collection: 2/12/2014  
Distance: 3.10 miles  
From: LBV Outlets  
To: Lake Street.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 19.80 MPH  
NB Travel Time: 10.28 MIN

SB Avg Speed: 15.50 MPH  
SB Travel Time: 13.15 MIN



## SR 535 - PM Peak

### After Condition

Date of Collection: 4/22/2014  
Distance: 3.10 miles  
From: LBV Outlets  
To: Lake Street.

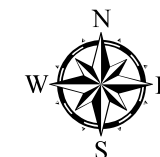
Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 28.5 MPH  
NB Travel Time: 7.17 MIN

SB Avg Speed: 20.4 MPH  
SB Travel Time: 10.01 MIN

### Level of Services:

	A		D		Roads
	B		E		City Boundary
	C		F		Water



**SR 535**

**Polynesian Isle Blvd. to Kyngs Heath Rd.**

# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** SR 535  
**Segment:** Polynesian Isle Boulevard to Kyngs Heath Road  
**Jurisdiction:** Osceola County  
**Area Type:** Divided Arterial  
**Facility Type:** Other Outlying Business District  
**Speed Limit:** 45/55 MPH  
**Length of Arterial:** 0.88 miles **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.0 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Kyngs Heath Road	1	2	1	45	
Osceola Parkway EB Ramp	0	2	0	55	
Poinciana Boulevard	2	2	0	55	
Polynesian Isle Boulevard	2	2	0	55	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	86	124	29.0	C
Northbound	PM	75	136	26.5	D

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Polynesian Isle Boulevard	0	3	1	55	
Poinciana Boulevard	1	3	0	55	
Osceola Parkway EB Ramp	2	3	0	55	
Kyngs Heath Road	1	2	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	37	106	34.0	B
Southbound	PM	76	143	25.2	D

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** SR 535  
**Segment:** Polynesian Isle Boulevard to Kyngs Heath Road  
**Jurisdiction:** Osceola County  
**Area Type:** Divided Arterial  
**Facility Type:** Other Outlying Business District  
**Speed Limit:** 45/55 MPH  
**Length of Arterial:** 0.88 miles **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.0 miles

## Northbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Kyngs Heath Road	1	2	1	45	
Osceola Parkway EB Ramp	0	2	0	55	
Poinciana Boulevard	2	2	0	55	
Polynesian Isle Boulevard	2	2	0	55	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Northbound	AM	21	119	30.3	C
Northbound	PM	47	126	28.6	C

## Southbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Polynesian Isle Boulevard	0	3	1	55	
Poinciana Boulevard	1	3	0	55	
Osceola Parkway EB Ramp	2	3	0	55	
Kyngs Heath Road	1	2	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Southbound	AM	18	102	35.3	B
Southbound	PM	50	131	27.5	C

## SR 535 - Polynesian Isle Boulevard to Kyngs Heath Road

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
1,976	124.0	29.0	68.06	119.0	30.3	65.32
Northbound/Eastbound - PM Peak Hour						
1,250	136.0	26.5	47.22	126.0	28.6	43.75
Southbound/Westbound - AM Peak Hour						
858	106.0	34.0	25.26	102.0	35.3	24.31
Southbound/Westbound - PM Peak Hour						
2,024	143.0	25.2	80.40	131.0	27.5	73.65

\*Traffic Volumes are obtained from the latest 2013 Turning Movement Count information.



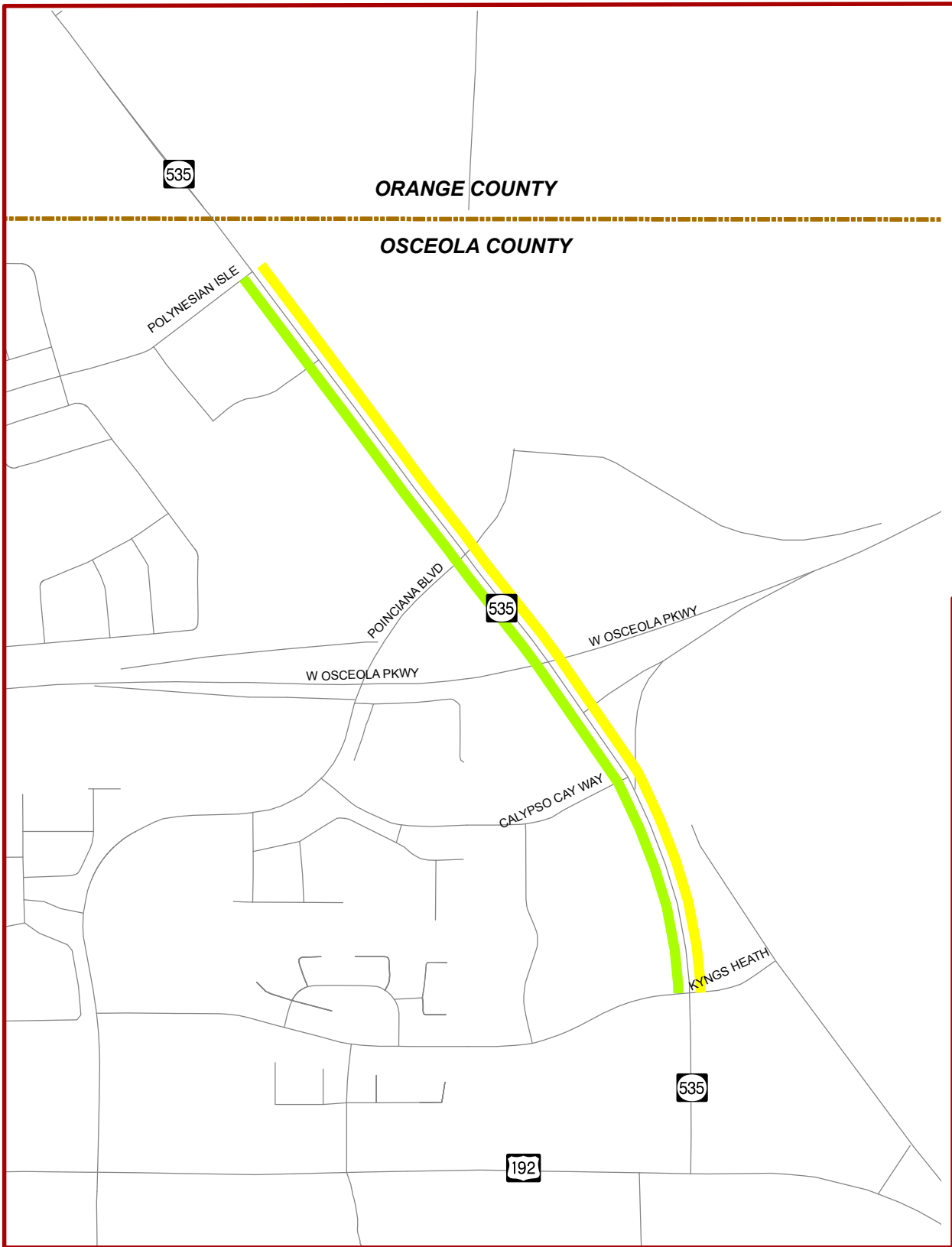
**SR 535 - Polynesian Isle Boulevard to Kyngs Heath Road**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	93.33	89.63	127.62	117.40

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$62.12	\$171.59
Annual User Benefit	\$18,636.00	\$51,477.00
Total Annual User Benefit	\$70,113.00	
Total Signal Retiming Annual Cost	\$10,019.56	
User Benefit / Cost Ratio	7.00	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.



### SR 535 - AM Peak

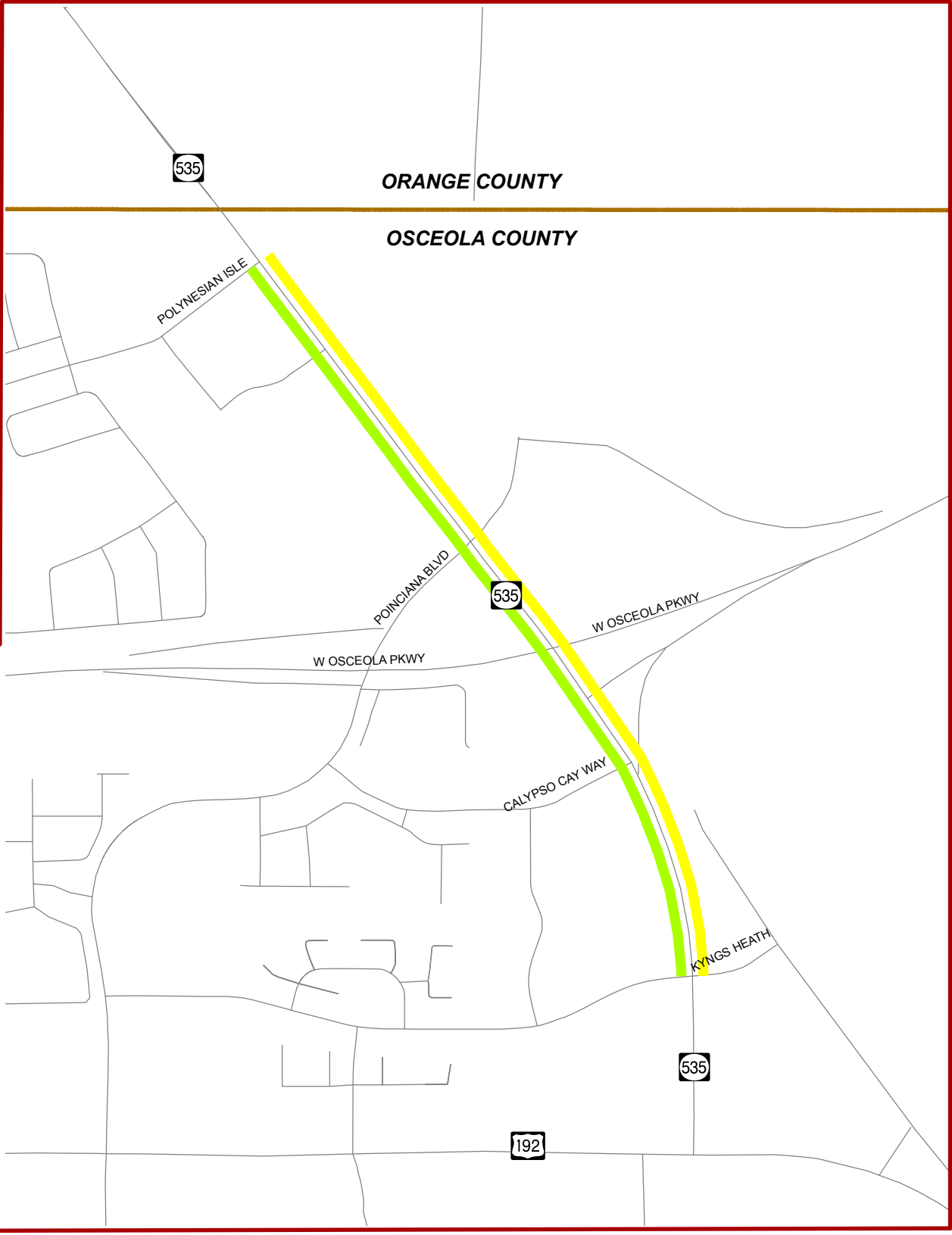
#### Before Condition

Date of Collection: 2/11/2014  
Distance: 0.88 miles  
From: Polynesian Isle Blvd.  
To: Kyngs Heath Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 29.0 MPH  
NB Travel Time: 2.07 MIN

SB Avg Speed: 34.0 MPH  
SB Travel Time: 1.77 MIN



### SR 535 - AM Peak

#### After Condition

Date of Collection: 4/24/2014  
Distance: 0.88 miles  
From: Polynesian Isle Blvd  
To: Kyngs Heath Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

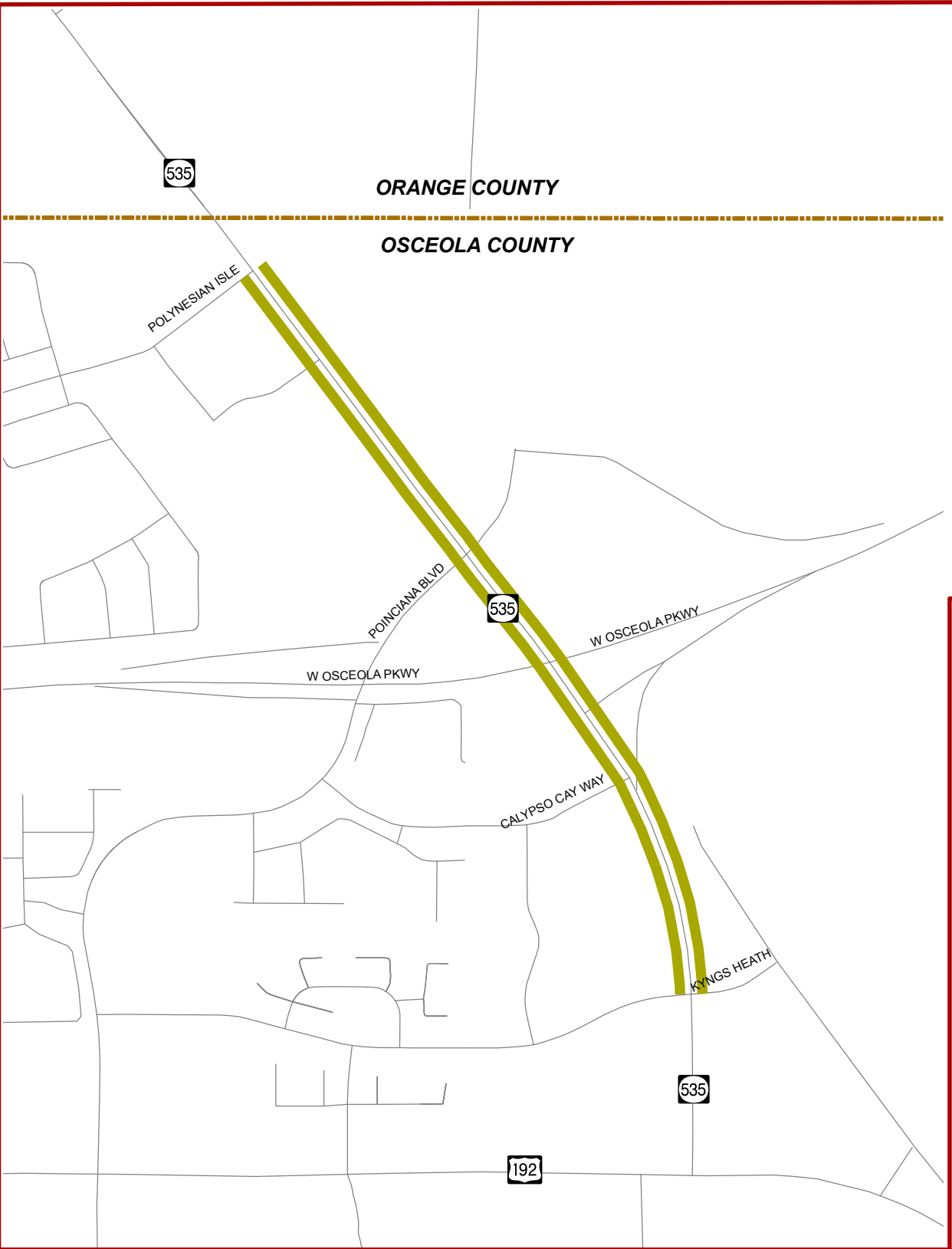
NB Avg Speed: 30.3 MPH  
NB Travel Time: 1.98 MIN

SB Avg Speed: 35.3 MPH  
SB Travel Time: 1.70 MIN

#### Level of Services:

	A		D		Roads
	B		E		City Boundary
	C		F		Water





**SR 535  
- PM Peak**

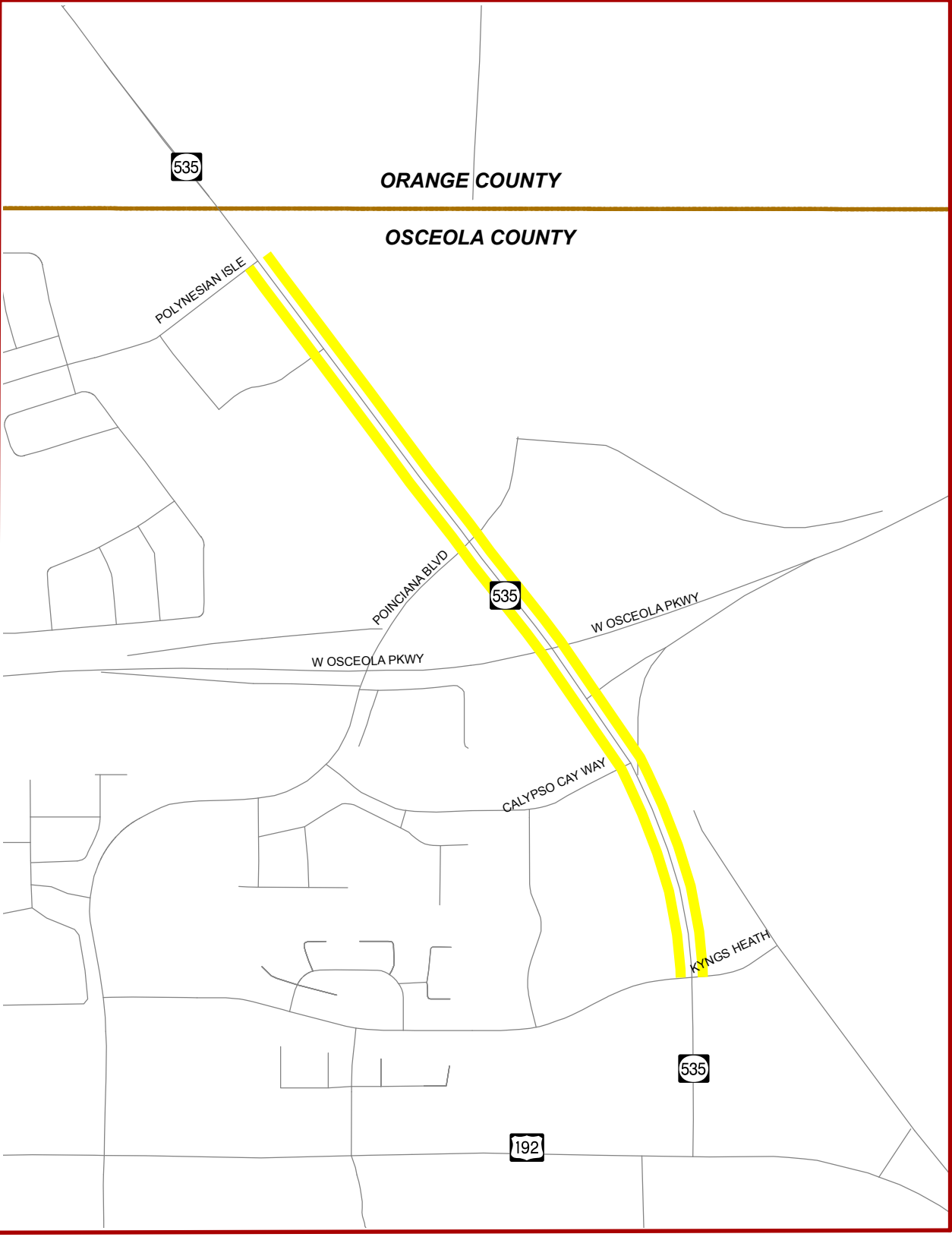
**Before Condition**

Date of Collection: 2/11/2014  
Distance: 0.88 miles  
From: Polynesian Isle Blvd.  
To: Kyngs Heath Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 26.5 MPH  
NB Travel Time: 2.27 MIN

SB Avg Speed: 25.2 MPH  
SB Travel Time: 2.38 MIN



**SR 535  
- PM Peak**

**After Condition**

Date of Collection: 4/24/2014  
Distance: 0.88 miles  
From: Polynesian Isle Blvd  
To: Kyngs Heath Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB Avg Speed: 28.6 MPH  
NB Travel Time: 2.10 MIN

SB Avg Speed: 27.5 MPH  
SB Travel Time: 2.18 MIN

**Level of Services:**

- |  |   |   |
|--|---|---|
|  A |  D |  Roads         |
|  B |  E |  City Boundary |
|  C |  F |  Water         |



**US 192**  
**Scott Blvd. to Bass Rd.**

# Year 2014 MetroPlan Orlando Travel Time Study

Before Condition

**Roadway:** US 192  
**Segment:** Scott Boulevard/Polynesian Isle Boulevard to Bass Road  
**Jurisdiction:** Osceola County  
**Area Type:** Other Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 3.66      **Arterial Class:** 1  
**Distance between BlueToad Devices:** 3.9 miles

## Eastbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Scott Boulevard/Polynesian Isle Boulevard	2	3	1	45	
Poinciana Boulevard	2	3	1	45	
SR 535 (Vineland Road)	2	3	0	45	
Target Enternace	2	3	0	45	
Seven Swarfs Lane	2	3	0	45	
Siesta Lago Drive	1	3	1	45	
Bass Road	1	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	10	469	29.9	C
Eastbound	PM	17	735	19.1	E

## Westbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Bass Road	2	3	1	45	
Siesta Lago Drive	1	3	0	45	
Seven Swarfs Lane	1	3	0	45	
Target Enternace	1	3	1	45	
SR 535 (Vineland Road)	1	3	1	45	
Poinciana Boulevard	2	3	1	45	
Scott Boulevard/Polynesian Isle Boulevard	1	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	29	444	31.6	C
Westbound	PM	32	496	28.3	C

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

Roadway: US 192  
 Segment: Scott Boulevard/Polynesian Isle Boulevard to Bass Road  
 Jurisdiction: Osceola County  
 Area Type: Other Outlying Business District  
 Facility Type: Divided Arterial  
 Speed Limit: 45 MPH  
 Length of Arterial: 3.66 Arterial Class: 1  
 Distance between BlueToad Devices: 3.9 miles

## Eastbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Scott Boulevard/Polynesian Isle Boulevard	2	3	1	45	
Poinciana Boulevard	2	3	1	45	
SR 535 (Vineland Road)	2	3	0	45	
Target Enternace	2	3	0	45	
Seven Swarfs Lane	2	3	0	45	
Siesta Lago Drive	1	3	1	45	
Bass Road	1	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	22	375	37.4	B
Eastbound	PM	58	537	26.1	D

## Westbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Bass Road	2	3	1	45	
Siesta Lago Drive	1	3	0	45	
Seven Swarfs Lane	1	3	0	45	
Target Enternace	1	3	1	45	
SR 535 (Vineland Road)	1	3	1	45	
Poinciana Boulevard	2	3	1	45	
Scott Boulevard/Polynesian Isle Boulevard	1	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	22	426	33.0	C
Westbound	PM	37	447	31.4	C

## US 192 - Scott Boulevard/Polynesian Isle Boulevard to Basss Road

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
1,038	469.0	29.9	135.23	375.0	37.4	108.13
Northbound/Eastbound - PM Peak Hour						
2,380	735.0	19.1	485.92	537.0	26.1	355.02
Southbound/Westbound - AM Peak Hour						
2,035	444.0	31.6	250.98	426.0	33.0	240.81
Southbound/Westbound - PM Peak Hour						
1,473	496.0	28.3	202.95	447.0	31.4	182.90

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

**US 192 - Scott Boulevard/Polynesian Isle Boulevard to Basss Road**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

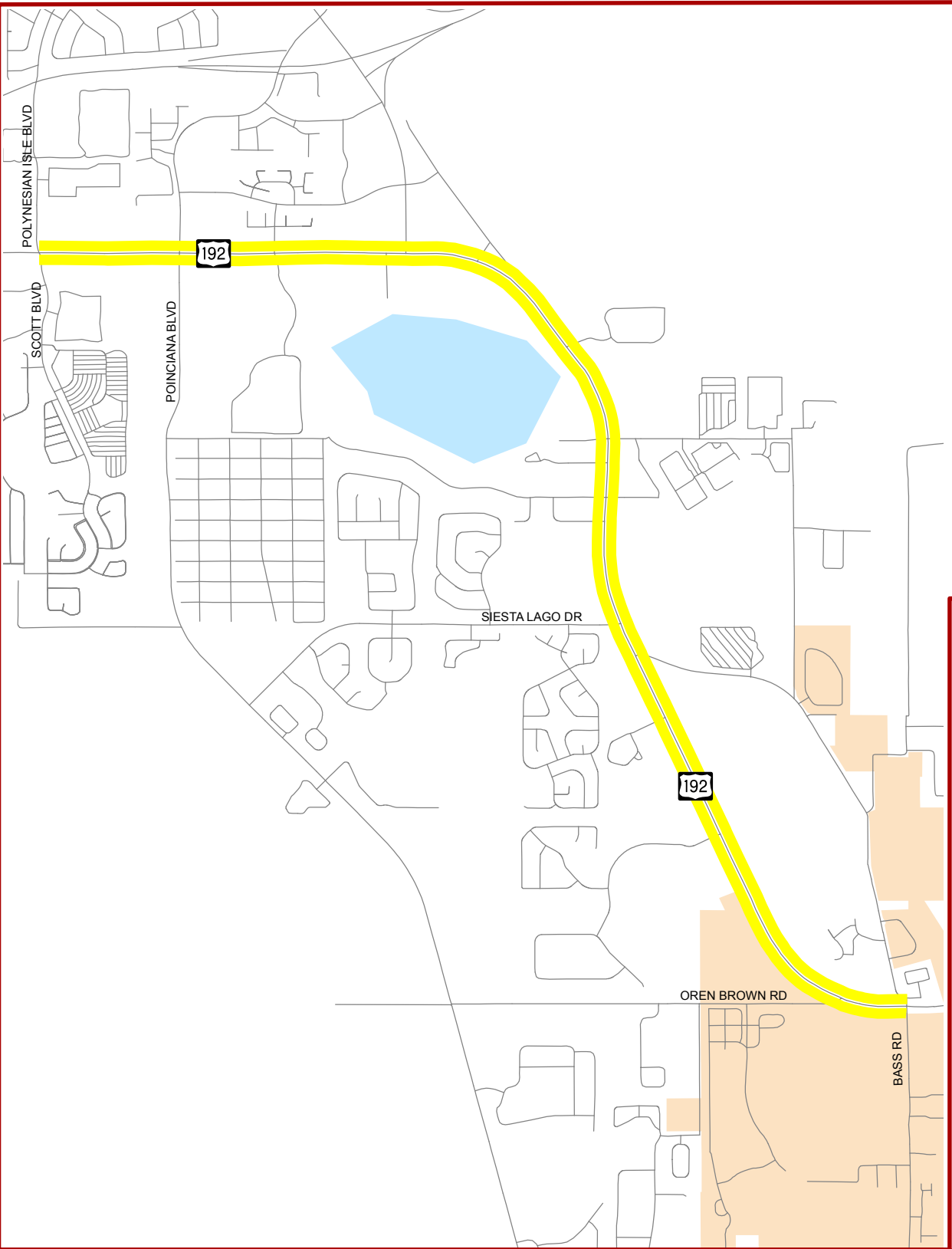
MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	386.21	348.93	688.86	537.91

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$625.93	\$2,534.45
Annual User Benefit	\$187,779.00	\$760,335.00
Total Annual User Benefit	\$948,114.00	
Total Signal Retiming Annual Cost	\$12,944.71	
User Benefit / Cost Ratio	73.24	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.





### US 192 - AM Peak

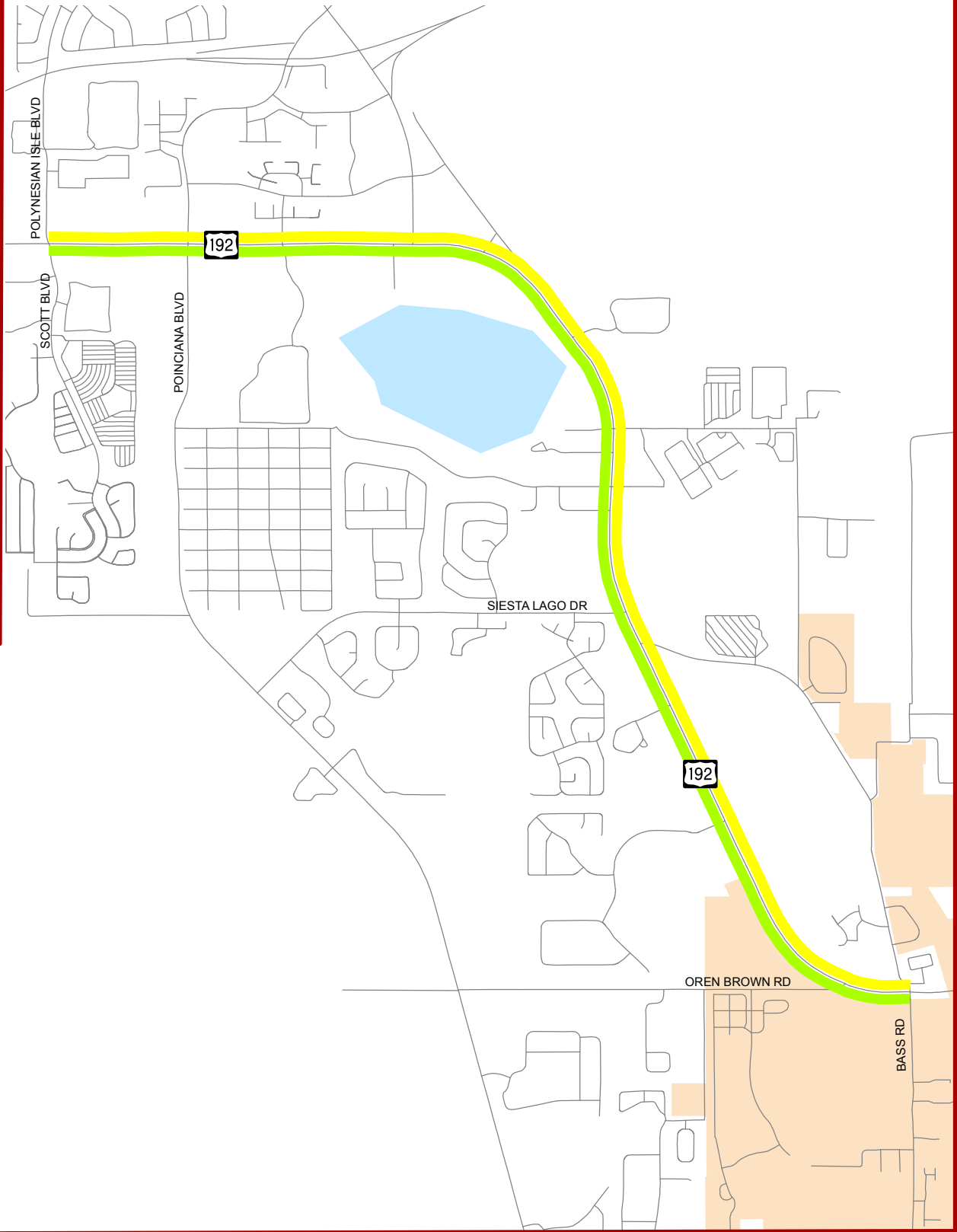
#### Before Condition

Date of Collection: 3/13/2014  
Distance: 3.66 miles  
From: Scott Blvd.  
To: Bass Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB/EB Avg Speed: 29.9 MPH  
NB/EB Travel Time: 7.82 MIN

SB/WB Avg Speed: 31.6 MPH  
SB/WB Travel Time: 7.40 MIN



### US 192 - AM Peak

#### After Condition

Date of Collection: 5/27/2014  
Distance: 3.66 miles  
From: Scott Blvd.  
To: Bass Rd.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB/EB Avg Speed: 37.4 MPH  
NB/EB Travel Time: 6.25 MIN

SB/WB Avg Speed: 33.0 MPH  
SB/WB Travel Time: 7.10 MIN

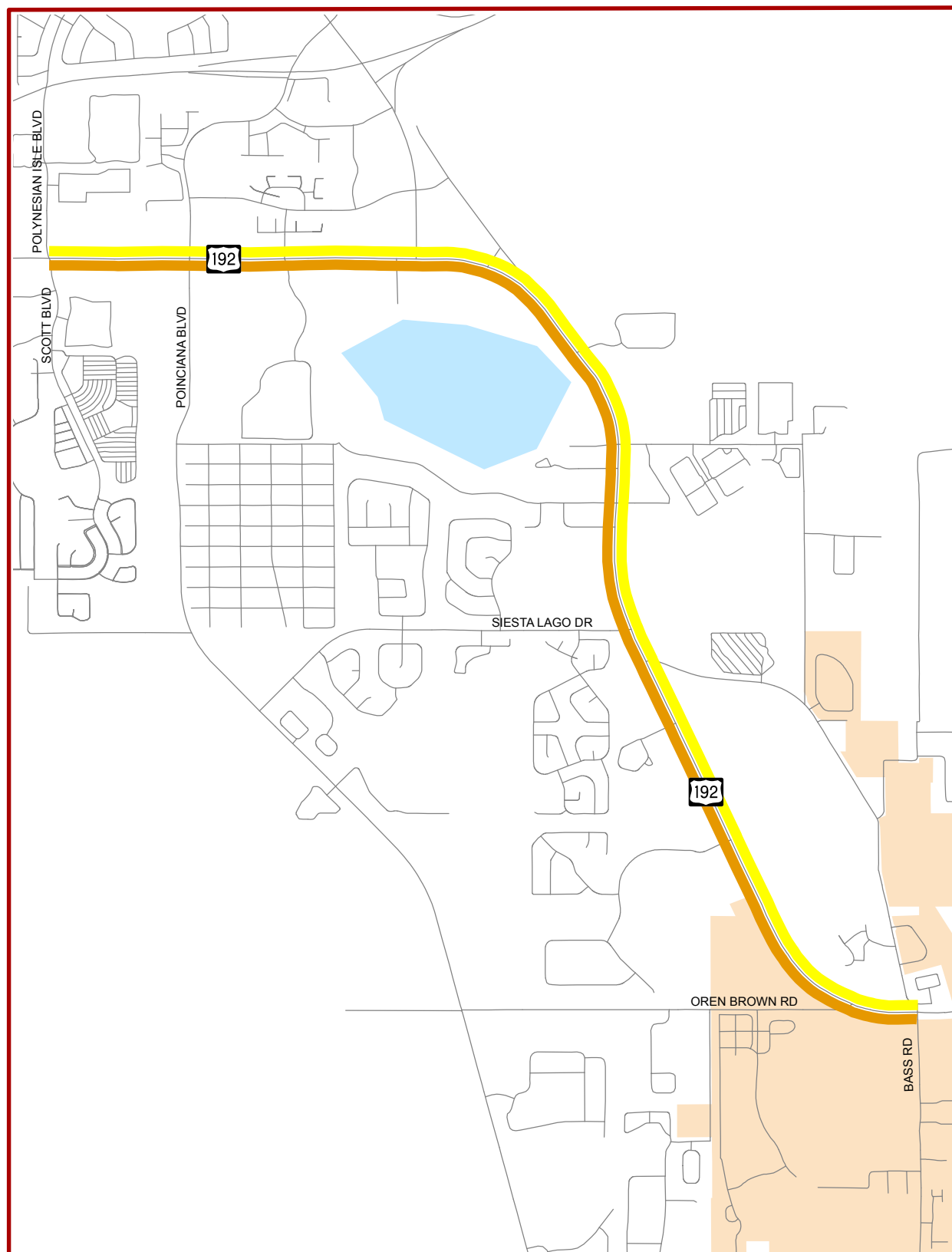
#### Level of Services:

— A  
— B  
— C

— D  
— E  
— F

— Roads  
— City Boundary  
— Water





## US 192 - PM Peak

### Before Condition

Date of Collection: 3/13/2014  
Distance: 3.66 miles  
From: Scott Blvd.  
To: Bass Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB/EB Avg Speed: 19.1 MPH  
NB/EB Travel Time: 12.25 MIN

SB/WB Avg Speed: 28.3 MPH  
SB/WB Travel Time: 8.27 MIN

## US 192 - PM Peak

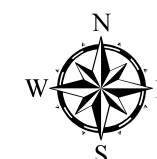
### After Condition

Date of Collection: 5/27/2014  
Distance: 3.66 miles  
From: Scott Blvd.  
To: Bass Rd.

Start Time: 4:00 PM  
End Time: 6:00 PM

NB/EB Avg Speed: 26.1 MPH  
NB/EB Travel Time: 8.95 MIN

SB/WB Avg Speed: 31.4 MPH  
SB/WB Travel Time: 7.45 MIN



**US 192**  
**Celebration Pl. to Seralago Blvd.**

## Year 2014 MetroPlan Orlando Travel Time Study

*Before Condition*

**Roadway:** US 192  
**Segment:** Celebration Place/Parkway Boulevard to Seralago Boulevard  
**Jurisdiction:** Osceola County  
**Area Type:** Other Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 1.35 miles **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.6 miles

### *Eastbound Direction*

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Celebration Place/Parkway Boulevard	2	3	1	45	
Arabian Nights Boulevard	2	3	0	45	
Celebration Avenue	1	3	1	45	
International Drive	2	3	0	45	
Holiday Trail	1	3	1	45	
Seralago Boulevard	2	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	14	190	30.3	C
Eastbound	PM	41	220	26.2	D

### *Westbound Direction*

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Seralago Boulevard	1	3	1	45	
Holiday Trail	1	3	1	45	
International Drive	0	3	1	45	
Celebration Avenue	2	3	1	45	
Arabian Nights Blvd	0	3	1	45	
Celebration Place/Parkway Boulevard	2	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	10	191	30.2	C
Westbound	PM	16	217	26.5	D

# Year 2014 MetroPlan Orlando Travel Time Study

After Condition

**Roadway:** US 192  
**Segment:** Celebration Place/Parkway Boulevard to Seralago Boulevard  
**Jurisdiction:** Osceola County  
**Area Type:** Other Outlying Business District  
**Facility Type:** Divided Arterial  
**Speed Limit:** 45 MPH  
**Length of Arterial:** 1.35 miles **Arterial Class:** I  
**Distance between BlueToad Devices:** 1.6 miles

## Eastbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Celebration Place/Parkway Boulevard	2	3	1	45	
Arabian Nights Boulevard	2	3	0	45	
Celebration Avenue	1	3	1	45	
International Drive	2	3	0	45	
Holiday Trail	1	3	1	45	
Seralago Boulevard	2	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Eastbound	AM	23	166	34.6	B
Eastbound	PM	62	207	27.8	C

## Westbound Direction

Signalized Intersection	# of Lanes			Speed Limit (MPH)	Observations
	Left	Through	Right		
Seralago Boulevard	1	3	1	45	
Holiday Trail	1	3	1	45	
International Drive	0	3	1	45	
Celebration Avenue	2	3	1	45	
Arabian Nights Blvd	0	3	1	45	
Celebration Place/Parkway Boulevard	2	3	1	45	

Direction of Travel	Analysis Time Period	# of Samples	Travel Time (Sec)	Average Speed (MPH)	LOS
Westbound	AM	47	185	31.2	C
Westbound	PM	33	196	29.3	C

## US 192 - Celebration Place to Seralago Boulevard

### Summary of Before & After Study Travel Time Results

	Before Scenario			After Scenario		
Traffic Volume	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)	Travel Time (sec/veh)	Average Speed (mph)	Total Travel Time (Veh-hour)
Northbound/Eastbound - AM Peak Hour						
1,800	190.0	30.3	95.00	166.0	34.6	83.00
Northbound/Eastbound - PM Peak Hour						
1,674	220.0	26.2	102.30	207.0	27.8	96.26
Southbound/Westbound - AM Peak Hour						
1,561	191.0	30.2	82.82	185.0	31.2	80.22
Southbound/Westbound - PM Peak Hour						
1,965	217.0	26.5	118.45	196.0	29.3	106.98

\*Traffic Volumes are obtained from the latest 2013 Florida Traffic Information.

**US 192 - Celebration Place to Seralago Boulevard**  
**Summary of Measures of Effectiveness & Benefit Cost Analysis**

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	177.82	163.22	220.75	203.24

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$245.13	\$293.99
Annual User Benefit	\$73,539.00	\$88,197.00
Total Annual User Benefit	\$161,736.00	
Total Signal Retiming Annual Cost	\$10,254.48	
User Benefit / Cost Ratio	15.77	

Notes:

- \* Value of Delay Time is \$16.79 per hour (Mobility Data for Orlando for the year 2011)
- \* Benefits apply for 300 days per year. This accounts for the reduced benefits anticipated from lower weekend traffic.
- \* The service life of the improvement is assumed to be three (3) years.
- \* Interest rate of 7% (Source: FDOT) was used in estimating the annual cost of improvements.

**US 192  
- AM Peak**

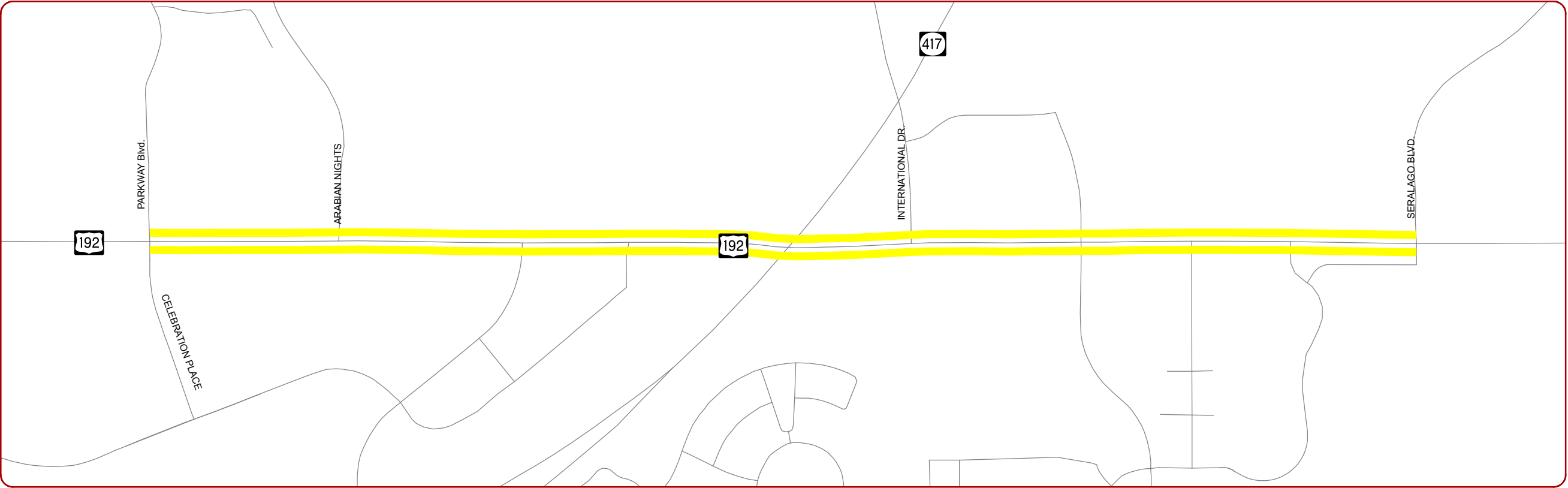
**Before Condition**

Date of Collection: 2/6/2014  
Distance: 1.35 miles  
From: Celebration Place  
/Parkway Blvd.  
To: Seralago Blvd.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 30.3 MPH  
EB Travel Time: 3.17 MIN

WB Avg Speed: 30.2 MPH  
WB Travel Time: 3.18 MIN



**US 192  
- AM Peak**

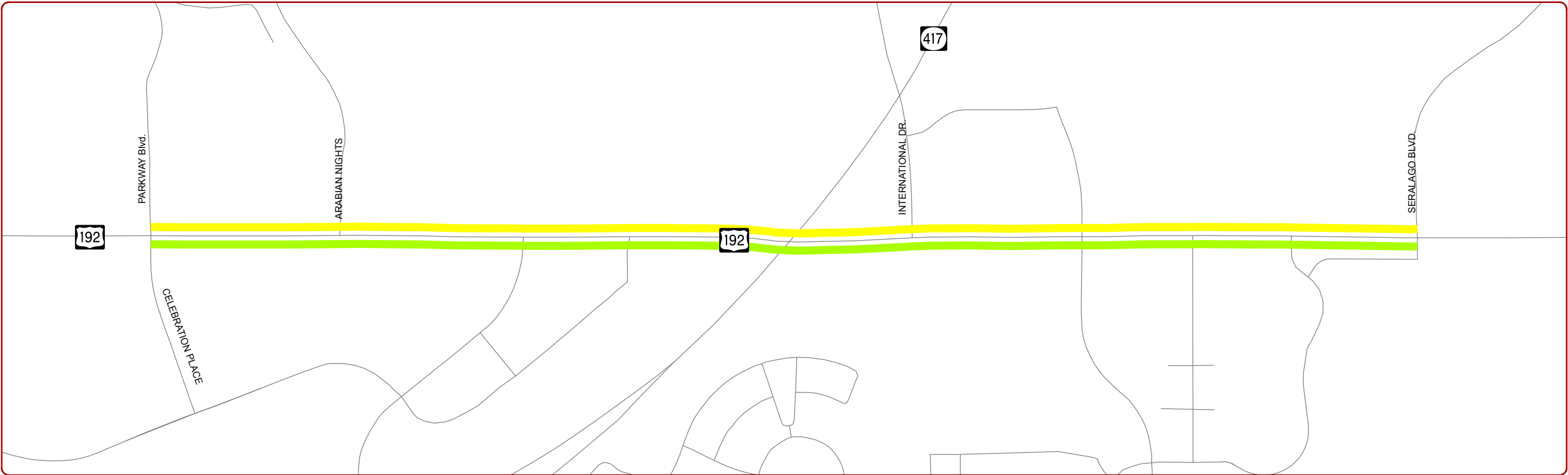
**After Condition**

Date of Collection: 4/1/2014  
Distance: 1.35 miles  
From: Celebration Place  
/Parkway Blvd.  
To: Seralago Blvd.

Start Time: 7:00 AM  
End Time: 9:00 AM

EB Avg Speed: 34.6 MPH  
EB Travel Time: 2.77 MIN

WB Avg Speed: 31.2 MPH  
WB Travel Time: 3.08 MIN

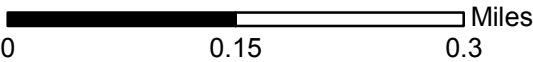


**Level of Services:**



**2014 METROPLAN ORLANDO**

*Travel Time Study*





**US 192  
- PM Peak**

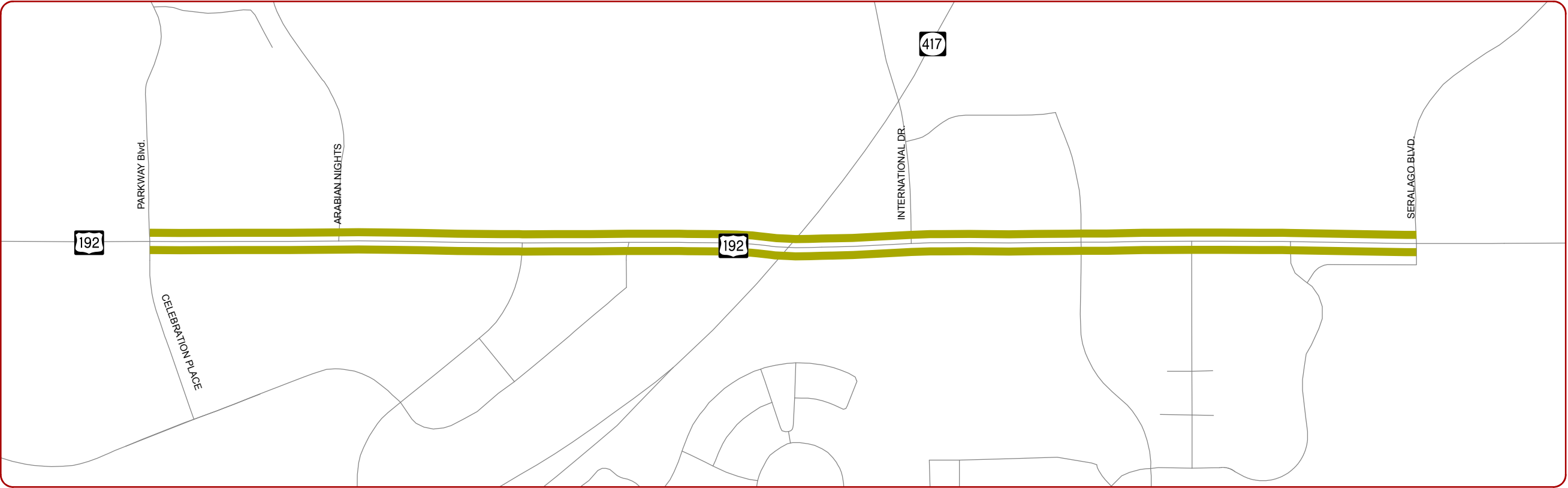
**Before Condition**

Date of Collection: 2/6/2014  
Distance: 1.35 miles  
From: Celebration Place  
/Parkway Blvd.  
To: Seralago Blvd.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 26.2 MPH  
EB Travel Time: 3.67 MIN

WB Avg Speed: 26.5 MPH  
WB Travel Time: 3.62 MIN



**US 192  
- PM Peak**

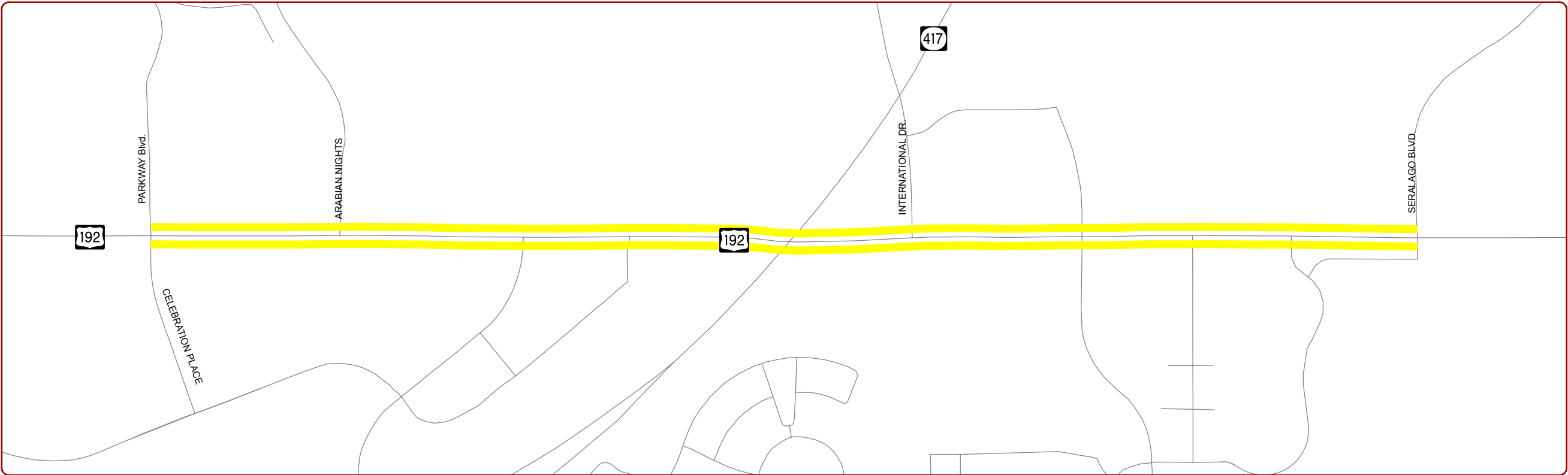
**After Condition**

Date of Collection: 4/1/2014  
Distance: 1.35 miles  
From: Celebration Place  
/Parkway Blvd.  
To: Seralago Blvd.

Start Time: 4:00 PM  
End Time: 6:00 PM

EB Avg Speed: 27.8 MPH  
EB Travel Time: 3.45 MIN

WB Avg Speed: 29.3 MPH  
WB Travel Time: 3.27 MIN

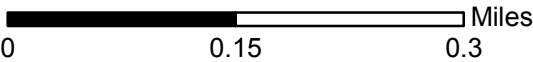


**Level of Services:**



**2014 METROPLAN ORLANDO**

*Travel Time Study*



## **Appendix B:**

### **Page from 2010 Urban Mobility Report**

## Performance Measure Summary - Orlando FL

There are several inventory and performance measures listed in the pages of this Urban Area Report for the years from 1982 to 2011. There is no single performance measure that experts agree "says it all." A few key points should be recognized by users of the Urban Mobility Report data.

**Use the Trends** – The multi-year performance measures are better indicators, in most cases, than any single year. Examining a few measures over many years reduces the chance that data variations or the estimating procedures may have caused a "spike" in any single year. (*5 years is 5 times better than 1 year*).

**Use several measures** – Each performance measure illustrates a different element of congestion. (*The view is more interesting from atop several measures*).

**Compare to similar regions** – Congestion analyses that compare areas with similar characteristics (for example population, growth rate, road and public transportation system design) are usually more insightful than comparisons of different regions. (*Los Angeles is not Peoria*).

**Compare ranking changes and performance measure values** – In some performance measures a small change in the value may cause a significant change in rank from one year to the next. This is the case when there are several regions with nearly the same value. (*15 hours is only 1 hour more than 14 hours*).

**Consider the scope of improvement options** – Any improvement project in a corridor within most of the regions will only have a modest effect on the regional congestion level. (*To have an effect on areawide congestion, there must be significant change in the system or service*).

## Performance Measures and Definition of Terms

**Travel Time Index** – A measure of congestion that focuses on each trip and each mile of travel. It is calculated as the ratio of travel time in the peak period to travel time in free-flow. A value of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak.

**Planning Time Index** - a travel time reliability measure that represents the total travel time that should be planned for a trip. Computed with the 95th percentile travel time it represents the amount of time that should be planned for a trip to be late for only 1 day a month. Computed with the 80th percentile travel time it represents the amount of time that should be planned for a trip to be late for only 1 day a week. A PTI of 3.00 means that for a 20-minute trip in light traffic, 60 minutes should be planned.

**Peak Commuters** – Number of travelers who begin a trip during the morning or evening peak travel periods (6 to 10 a.m. and 3 to 7 p.m.). "Commuters" are private vehicle users unless specifically noted.

**Annual Delay per Commuter** – A yearly sum of all the per-trip delays for those persons who travel in the peak period (6 to 10 a.m. and 3 to 7 p.m.). This measure illustrates the effect of the per-mile congestion as well as the length of each trip.

**Total Delay** – The overall size of the congestion problem. Measured by the total travel time above that needed to complete a trip at free-flow speeds. The ranking of total delay usually follows the population ranking (larger regions usually have more delay).

**CO<sub>2</sub> per Commuter** - represents the pounds of additional CO<sub>2</sub> emissions generated by a commuter during a year due to traffic congestion.

**Free-Flow Speeds** -- These values are derived from overnight speeds in the INRIX speed database. They are used as the national comparison thresholds. Other speed values may be appropriate for urban project evaluations or sub-regions studies.

**Excess Fuel Consumed** – Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

**Public Transportation** – Regular route service from all public transportation providers in an urban area.

**Operations Treatments** – Freeway incident management, freeway ramp metering, arterial street signal coordination and arterial street access management.

**Congestion Cost** – Value of travel delay for 2011 (estimated at \$16.79 per hour of person travel and \$86.81 per hour of truck time) and excess gasoline consumption (passenger vehicles) and diesel (trucks) estimated using state average cost per gallon.

**Urban Area** – The developed area (population density more than 1,000 persons per square mile) within a metropolitan region. The urban area boundaries change frequently (every year for most growing areas). The annual change in miles traveled and lane-miles, therefore, includes both new travel and roads due to growth and travel and roads that were previously in areas designated as rural.

**Number of Rush Hours** – Time when the road system might have congestion.

## **Appendix C:**

### **Signal Retiming Project Costs**

## APPENDIX A

## Signal Retiming List for FY 2013-2014

Street	From	To	Distance	# of Signals	County
SR 436	Line Drive	San Sebastian Prado <del>\$74,434</del>	3.50	11	Seminole County
SR 434	SR 414	Manor Avenue <del>\$78,865</del>	4.40	12	Seminole County
SR 426	Old Howell Branch Road	Dean Road <del>\$53,024</del>	2.20	8	Seminole County
Goldenrod Rd (SR 551)	Liverpool Blvd	Bates Rd <del>\$14,963</del>	0.51	2	Orange County
Goldenrod Rd (SR 551)	Charlin Pkwy	Pershing Ave. <del>\$17,260</del>	0.73	3	Orange County
Goldenrod Rd (SR 551)	Lake Underhill Rd	Valencia College Ln. <del>\$21,287</del>	1.00	4	Orange County
O.B.T. South (US 441)	Central Florida Pkwy	Hunters Creek Bv-Falcon Trace Bv <del>\$49,403</del>	3.99	11	Orange County
US 17-92	Marks St.	Mayo Ave / Greenwood Rd <del>\$88,751</del>	5.62	21	Orange County
Park Avenue	Park Avenue	5th Street <del>\$3,674</del>	0.00	1	Orange County
Orange Blossom Trail (US 441)	Clarcona Ocoee Rd	SR 50 <del>\$33,473</del>	4.80	7	Orange County
Universal Blvd.	Sand Lake Rd.	Vineland Rd. <del>\$47,402</del>	2.36	11	Orange County
Conroy Rd	Kirkman Oaks/Turkey Lake Pz.	Eastgate Dr. <del>\$45,050</del>	2.46	10	Orange County
Princeton St (SR 438)	Mercy Ave.	John Young Pkwy (SR 423) <del>\$17,364</del>	0.93	3	Orange County
Kirkman Rd (SR 435)	Carrier Dr	Vineland Rd. <del>\$21,977</del>	1.75	4	Orange County
Central Blvd	Summerlin Ave.	Brown Ave. (SR 15) <del>\$15,265</del>	0.32	3	Orange County
Silver Star (SR 416)	Dardanelle Dr.	Rio Grande Ave. <del>\$29,010</del>	2.23	6	Orange County
SR 536	World Center Dr	International Dr * <del>\$11,000</del>	1.10	3	Orange County
SR 535 (Apopka Vineland Rd)	LBV Outlets	Lake Ave * <del>\$11,000</del>	3.10	9	Orange County
SR 535	Polynesian Isle Blvd	Kyns Heath Rd <del>\$105,178</del>	0.88	4	Osceola County
US 192	Scott Blvd/Polynesian Isle Bv	Bass Rd <del>\$33,971</del>	3.66	7	Osceola County
US 192	Celebration Pl/Pkwy Bv	Seralago Blvd <del>\$26,911</del>	1.35	6	Osceola County

Total Estimated Miles & Signals for 2013-2014

46.89

146

## **Appendix D:**

### **Power Point Presentation**

# Year 2014 Travel Time Study and Benefit - Cost Analysis



GMB Engineers and  
Planners, Inc.



# Study Purpose



- Benefit/Cost Analysis of Signal Retiming was performed by FDOT
- GMB Engineers and Planners, Inc.
- Bluetooth Technology
- Graphs depicting the Benefit – Cost Analysis and Travel Time Comparison



# Why Signal Retiming?



- Improves traffic flow
- Account for changes in traffic patterns
- Reduce driver frustration, emissions and fuel consumption
- Regular signal timing updates has a benefit/cost ratio between 20:1 and 55:1\*

\* ITS Benefits, Costs and Lessons Learned Database. U.S. Department of Transportation (U.S. DOT) Intelligent Transportation Systems Joint Program Office. Accessible via [www.benefitcost.its.dot.gov](http://www.benefitcost.its.dot.gov).

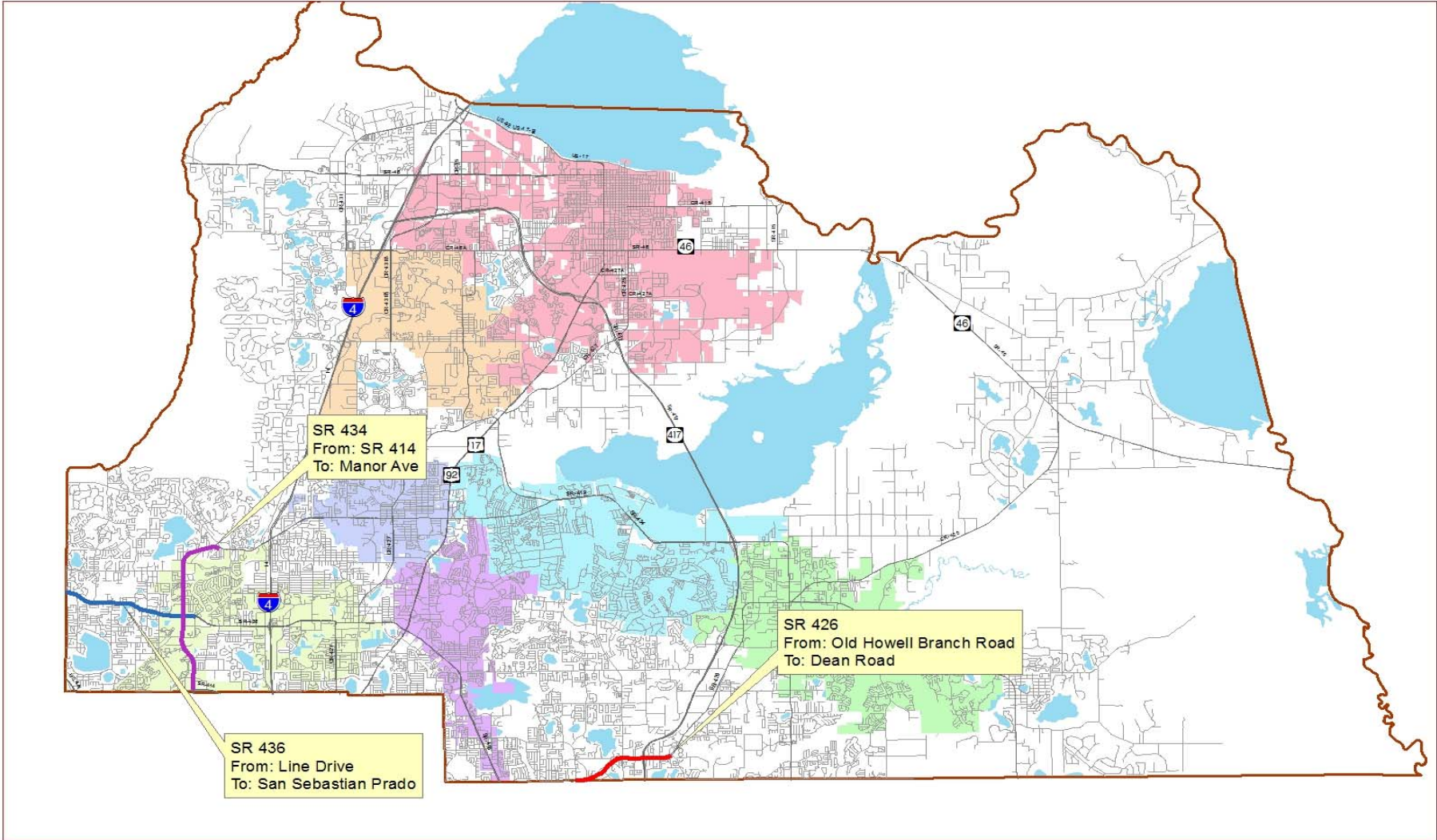
## Year 2014 MetroPlan Orlando Travel Time Study – Roadway Limits

Street	From	To	Distance	County
SR 436	LINE DR.	SAN SEBASTIAN PRADO	3.50	SEMINOLE
SR 434	SR 414	MANOR AVE.	4.40	SEMINOLE
SR 426	OLD HOWELL BRANCH RD.	DEAN RD.	2.20	SEMINOLE
GOLDENROD RD. (SR 551)	LIVERPOOL BLVD.	BATES RD.	0.51	ORANGE
GOLDENROD RD. (SR 551)	CHARLIN PKWY.	PERSHING AVE.	0.73	ORANGE
GOLDENROD RD. (SR 551)	LAKE UNDERHILL RD.	VALENCIA COLLEGE LN.	1.00	ORANGE
O.B.T. SOUTH (US 441)	CENTRAL FLORIDA PKWY.	HUNTERS CREEK BLVD.	3.99	ORANGE
US 17-92	MARKS ST.	MAYO AVE.	5.62	ORANGE
ORANGE BLOSSOM TRAIL (US 441)	CLARCONA OCOEE RD.	SR 50	4.80	ORANGE
UNIVERSAL BLVD.	SAND LAKE RD.	VINELAND RD.	2.36	ORANGE
CONROY RD.	KIRKMAN OAKS	EASTGATE DR.	2.46	ORANGE
PRINCETON ST. (SR 438)	MERCY AVE.	JOHN YOUNG PKWY. (SR 423)	0.93	ORANGE
KIRKMAN RD. (SR 435)	CARRIER DR.	VINELAND RD.	1.75	ORANGE
CENTRAL BLVD.	SUMMERLIN AVE.	BROWN AVE.	0.32	ORANGE
SILVER STAR (SR 416)	DARDANELLE DR.	RIO GRANDE AVE.	2.23	ORANGE
SR 536	WORLD CENTER DR.	INTERNATIONAL DR.	1.10	ORANGE
APOPKA VINELAND RD. (SR 535)	LAKE BUENA VISTA OUTLETS	LAKE ST.	3.10	ORANGE
SR 535	POLYNESIAN ISLE BLVD.	KYNGS HEATH RD.	0.88	OSCEOLA
US 192	SCOTT BLVD.	BASS RD.	3.66	OSCEOLA
US 192	CELEBRATION PL.	SERALAGO BLVD.	1.35	OSCEOLA

TOTAL – 46.89 MILES



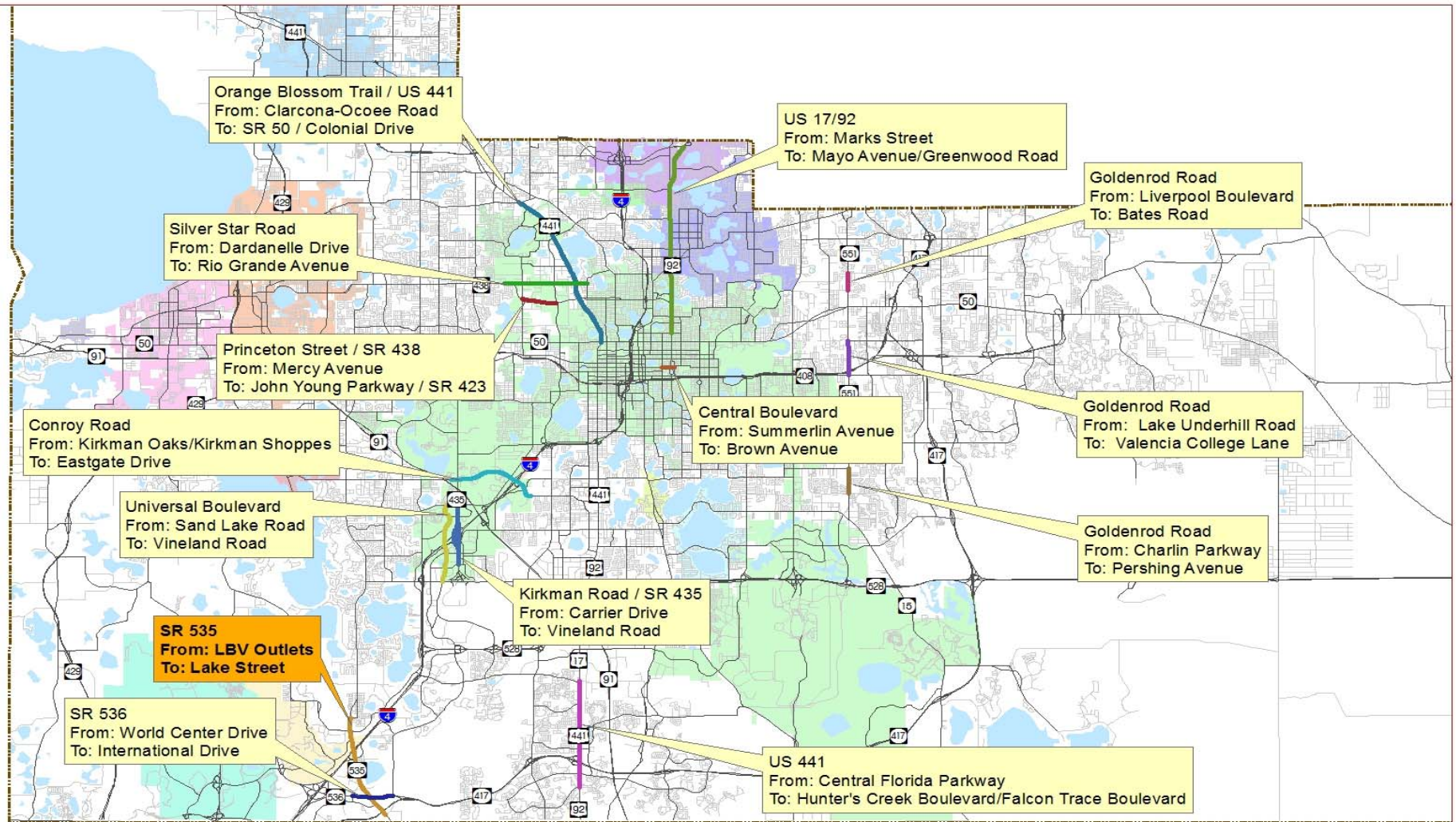
# Year 2014 MetroPlan Orlando Travel Time Study Seminole County





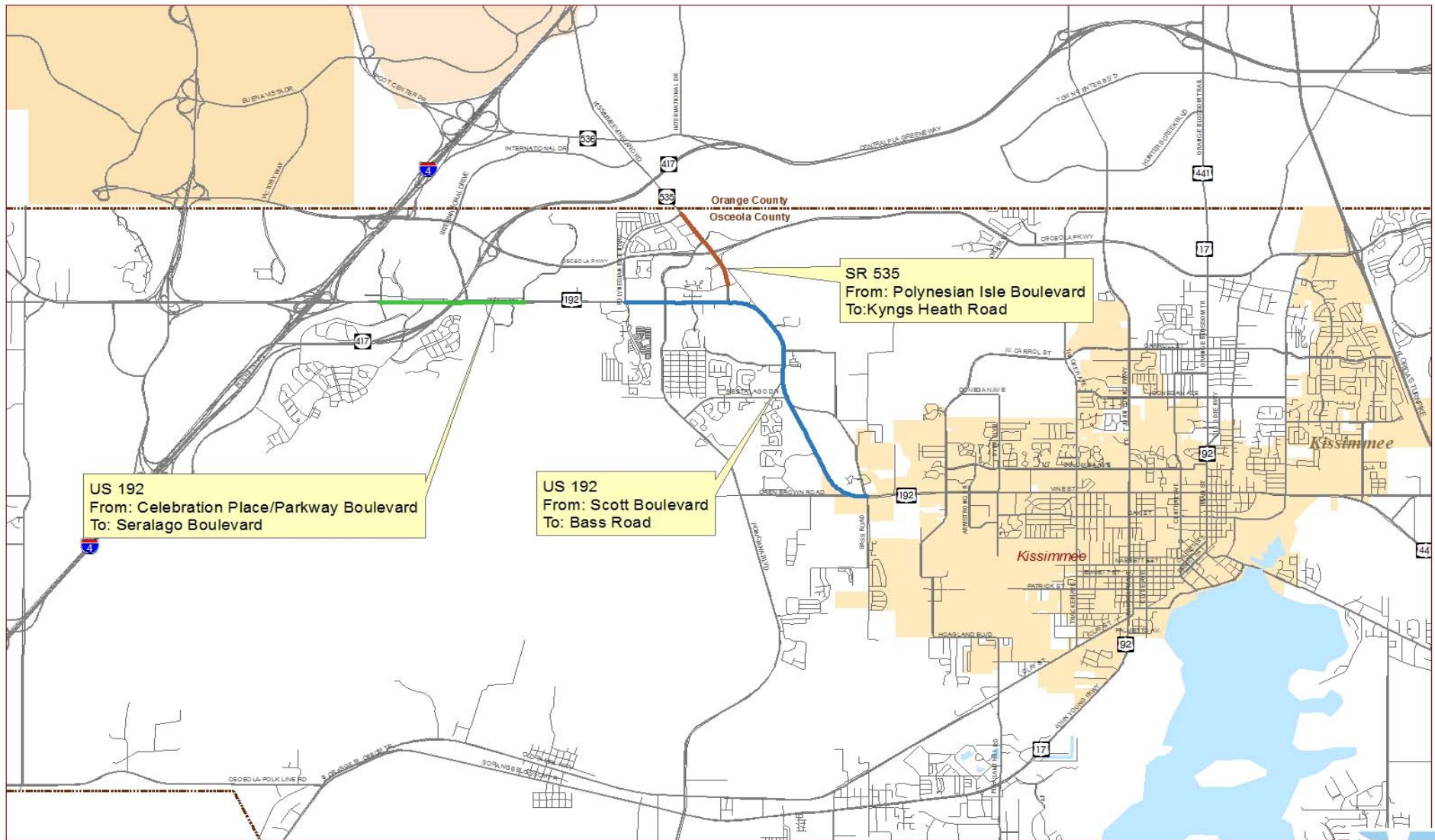
# Year 2014 MetroPlan Orlando Travel Time Study

## Orange County



# Year 2014 MetroPlan Orlando Travel Time Study

## Osceola County



# Benefit – Cost Analysis



- Input Benefit Items
  - \*Travel Time Cost Savings: \$16.79/hr for Orlando
- Signal Retiming Costs obtained from FDOT

**\*Source:** Year 2012 Mobility Data for Orlando



## Sample Benefit / Cost Calculation

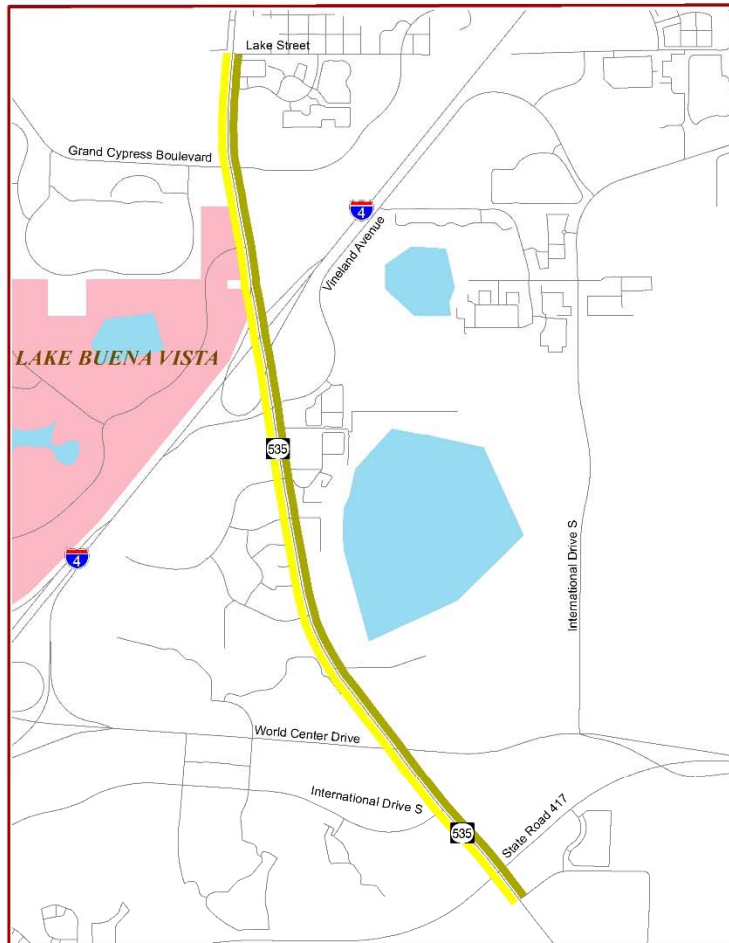
### SR 535 – Lake Buena Vista Outlets to Lake Street

### Summary of Measures of Effectiveness & Benefit Cost Analysis

MOE's	AM PEAK HOUR		PM PEAK HOUR	
	Before	After	Before	After
Total Travel Time (vehicle - hrs)	456.71	404.76	965.65	708.05

BENEFITS	AM PEAK HOUR	PM PEAK HOUR
User Benefit Per Day	\$872.24	\$4,325.10
<b>Annual User Benefit</b>	<b>\$261,672.00</b>	<b>\$1,297,530.00</b>
<b>Total Annual User Benefit</b>	<b>\$1,559,202.00</b>	
Total Signal Retiming Annual Cost	\$22,543.78	
<b>User Benefit / Cost Ratio</b>	<b>69.16</b>	

# Year 2014 MetroPlan Orlando Travel Time Study



## SR 535 - AM Peak

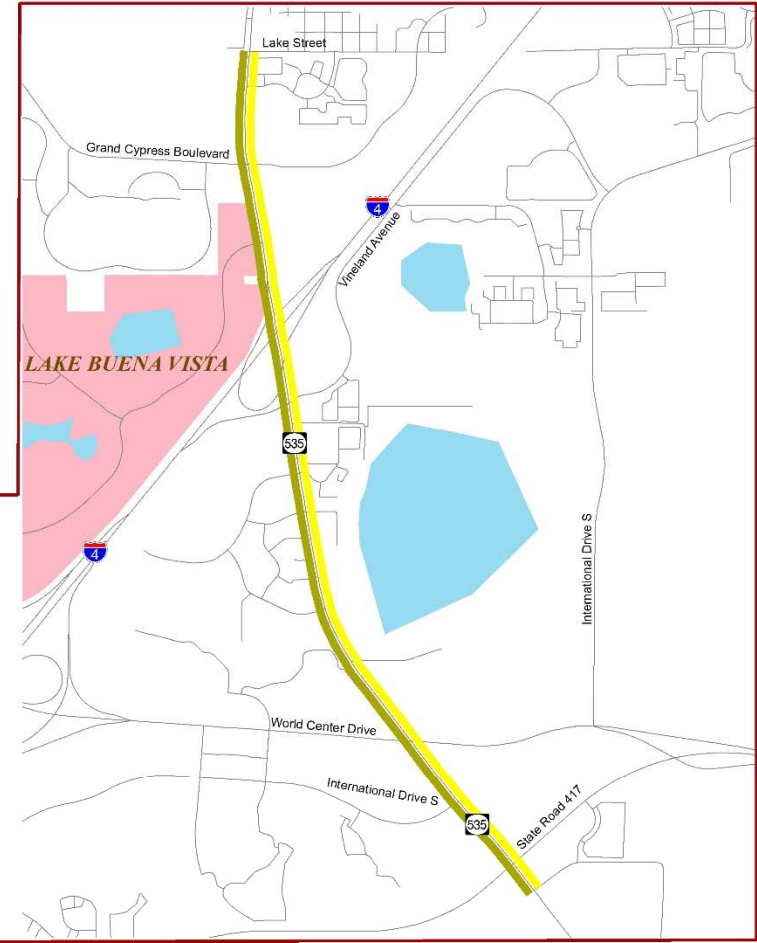
### Before Condition

Date of Collection: 2/12/2014  
Distance: 3.10 miles  
From: LBV Outlets  
To: Lake Street.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 26.0 MPH  
NB Travel Time: 7.87 MIN

SB Avg Speed: 27.6 MPH  
SB Travel Time: 7.40 MIN



## SR 535 - AM Peak

### After Condition

Date of Collection: 4/22/2014  
Distance: 3.10 miles  
From: LBV Outlets  
To: Lake Street.

Start Time: 7:00 AM  
End Time: 9:00 AM

NB Avg Speed: 32.1 MPH  
NB Travel Time: 6.35 MIN

SB Avg Speed: 26.7 MPH  
SB Travel Time: 7.65 MIN



### Level of Services:

	A		D		Roads
	B		E		City Boundary
	C		F		Water



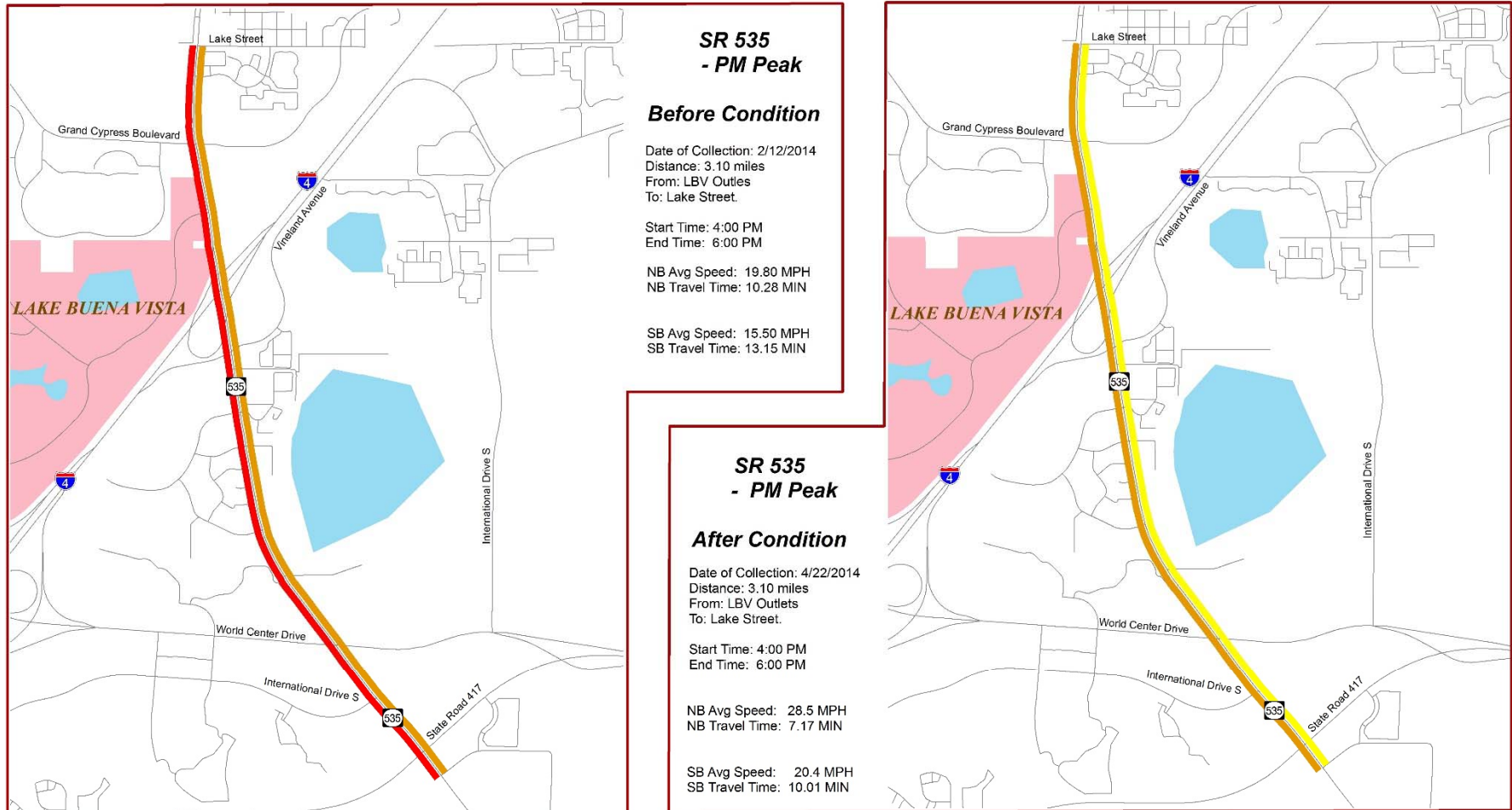
2014 METROPLAN ORLANDO

Travel Time Study

0 0.25 0.5 Miles



# Year 2014 MetroPlan Orlando Travel Time Study



## Level of Services:

<span style="color: green;">■</span> A	<span style="color: olive;">■</span> D	<span style="color: gray;">—</span> Roads
<span style="color: lightgreen;">■</span> B	<span style="color: gold;">■</span> E	<span style="color: orange;">■</span> City Boundary
<span style="color: yellow;">■</span> C	<span style="color: red;">■</span> F	<span style="color: lightblue;">■</span> Water

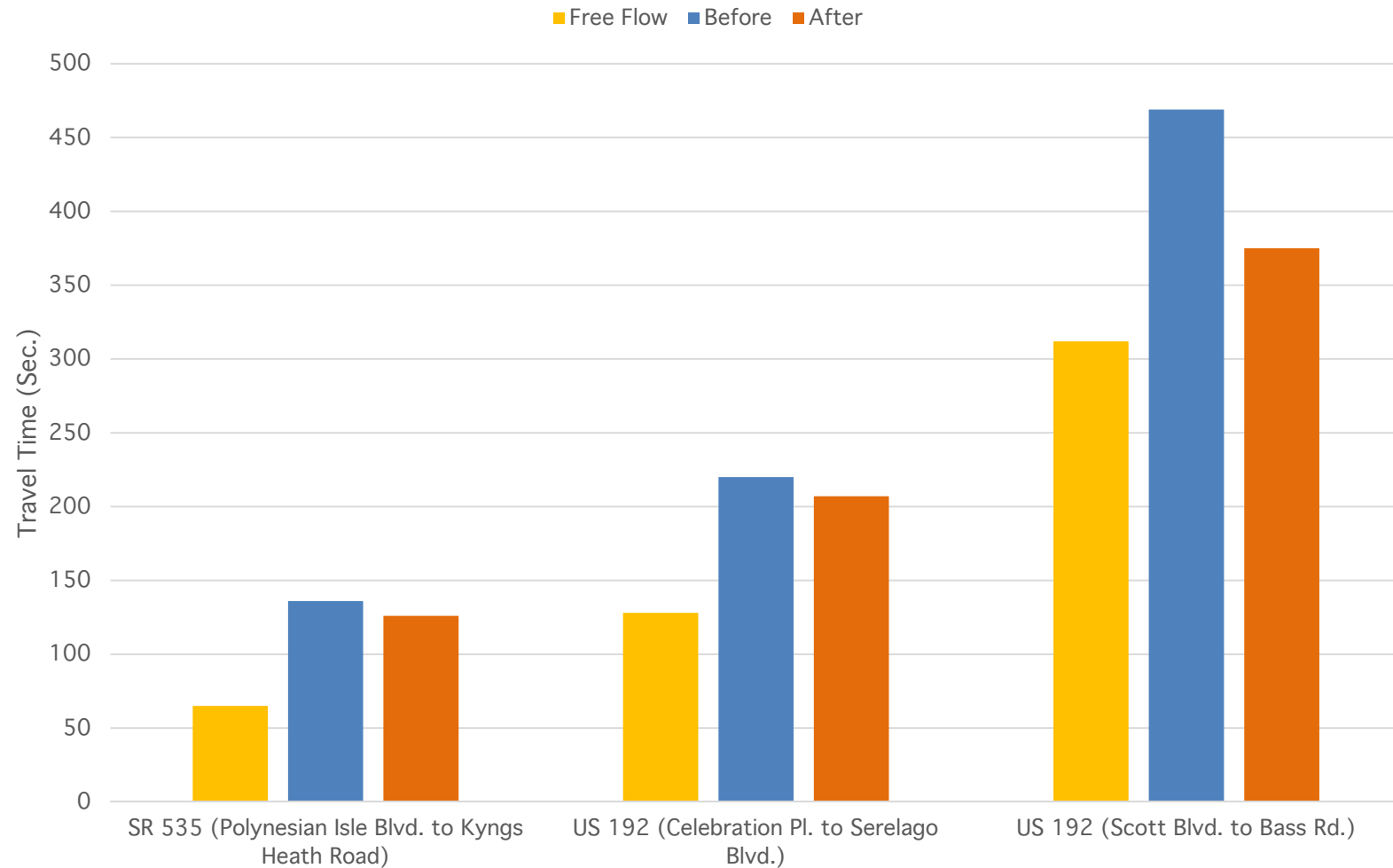


**2014 METROPLAN ORLANDO**

*Travel Time Study*

0 0.25 0.5 Miles

# Year 2014 Osceola County Corridors NB/EB Travel Time Comparison – AM Peak Hour



# Annual Travel Time and Fuel Savings



- Annual Time Savings (vehicle hours): **410,527.00**
- Overall Annual User Benefit: **\$6,892,716.00**
- Overall Annual Cost: **\$294,776.76**
- Overall B/C: **23.38**

## Year 2014 MetroPlan Orlando Travel Time Study

### Queue Length Study

US 192 from Scott Blvd. to Bass Rd.

Travel Time (Sec.)						
Eastbound		Westbound		Total		
Before	After	Before	After	Before	After	
AM	469	375	444	426	913	801
PM	735	537	496	447	1,231	984

Queue along Poinciana Blvd.

Before (vehicle)	After (vehicle)
Northbound from 7:15 to 7:45 AM	
52	34
Southbound from 5:15 to 5:45 PM	
58	57

## Year 2014 MetroPlan Orlando Travel Time Study

### Queue Length Study

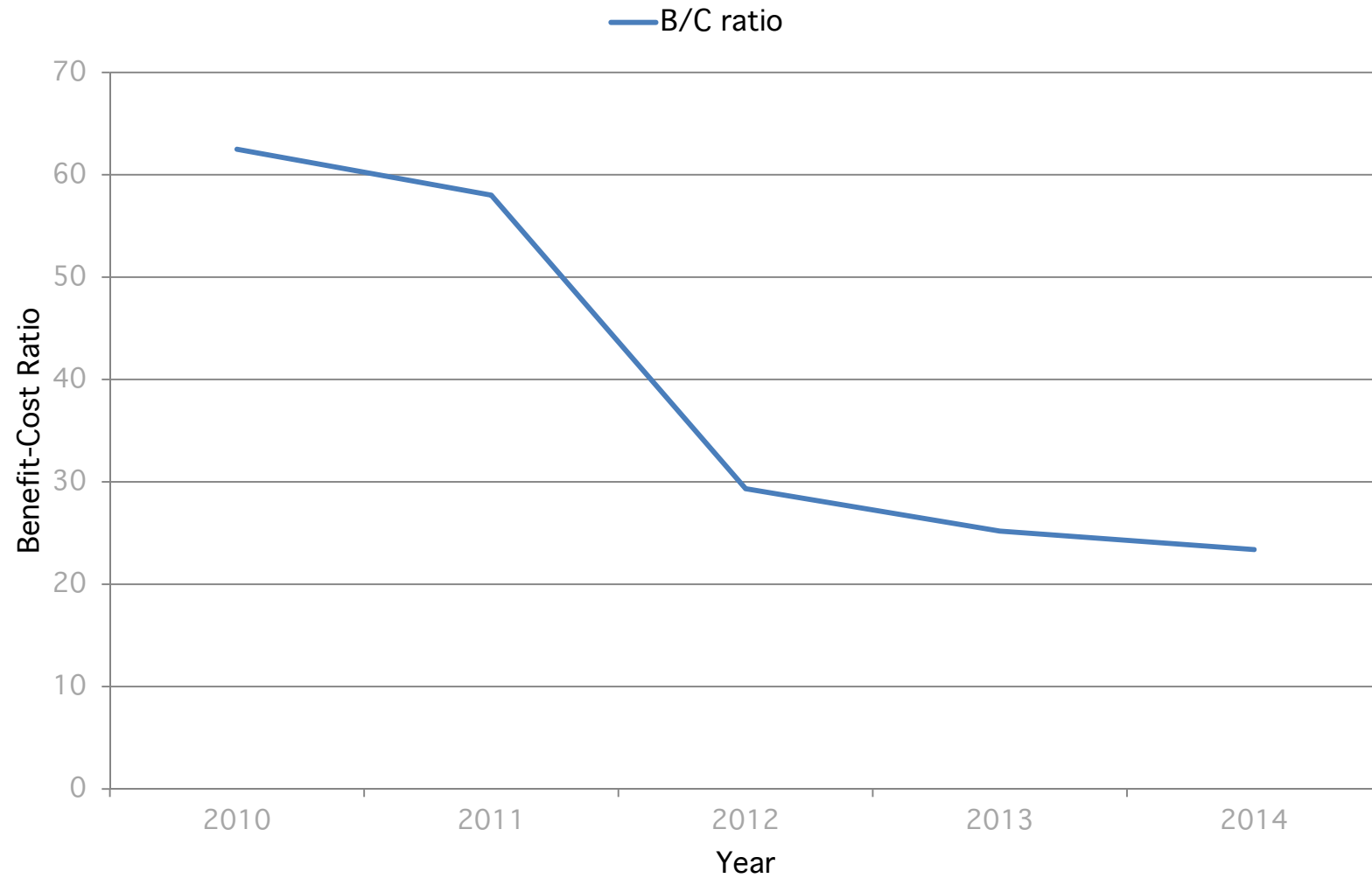
Orange Blossom Trail from Clarcona-Ocoee Rd. to SR 50

Travel Time (Sec.)						
Northbound		Southbound		Total		
	Before	After	Before	After	Before	After
AM	678	523	719	637	1,397	1,160
PM	747	722	595	609	1,342	1,331

Queue along Lee Rd.

Before (vehicle)	After (vehicle)
Westbound from 7:00 to 7:30 AM	
22	22
Eastbound from 5:00 to 5:30 PM	
21	21

# Five Year MetroPlan Orlando Overall Benefit-Cost Ratio





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## B/C Ratio Summary – Seminole County

S No.	Street	From	To	Annual User Benefit	Annual Cost	B/C Ratio
1	SR 436	LINE DR.	SAN SEBASTIAN PRADO	\$250,338.00	\$28,363.20	8.83
2	SR 434	SR 414	MANOR AVE.	\$561,525.00	\$30,051.64	18.69
3	SR 426	OLD HOWELL BRANCH RD.	DEAN RD.	\$440,535.00	\$20,204.88	21.80



# B/C Ratio Summary – Orange County

S No.	Street	From	To	Annual User Benefit	Annual Cost	B/C Ratio
1	GOLDENROD RD. (SR 551)	LIVERPOOL BLVD.	BATES RD.	\$9,318.00	\$5,701.68	<b>1.63</b>
2	GOLDENROD RD. (SR 551)	CHARLIN PKWY.	PERSHING AVE.	\$97,011.00	\$6,576.95	<b>14.75</b>
3	GOLDENROD RD. (SR 551)	LAKE UNDERHILL RD.	VALENCIA COLLEGE LN.	\$467,886.00	\$8,111.45	<b>57.68</b>
4	O.B.T. SOUTH (US 441)	CENTRAL FLORIDA PKWY.	HUNTERS CREEK BLVD.	\$817,503.00	\$18,825.10	<b>43.43</b>
5	US 17-92	MARKS ST.	MAYO AVE.	\$354,606.0	\$33,818.72	<b>10.48</b>
6	ORANGE BLOSSOM TRAIL (US 441)	CLARCONA OCOEE RD.	SR 50	\$388,554.00	\$12,754.94	<b>30.46</b>
7	UNIVERSAL BLVD.	SAND LAKE RD.	VINELAND RD.	\$55,608.00	\$18,062.61	<b>3.08</b>
8	CONROY RD.	KIRKMAN OAKS	EASTGATE DR.	\$193,773.00	\$17,166.38	<b>11.29</b>
9	PRINCETON ST. (SR 438)	MERCY AVE.	JOHN YOUNG PKWY. (SR 423)	\$42,765.00	\$6,616.58	<b>6.46</b>
10	KIRKMAN RD. (SR 435)	CARRIER DR.	VINELAND RD.	\$228,579.00	\$8,374.37	<b>27.30</b>
11	CENTRAL BLVD. SILVER STAR (SR 416)	SUMMERLIN AVE.	BROWN AVE.	\$33,798.00	\$5,816.75	<b>5.81</b>
12		DARDANELLE DR.	RIO GRANDE AVE.	\$101,847.00	\$11,054.31	<b>9.21</b>
13	SR 536	WORLD CENTER DR.	INTERNATIONAL DR.	\$109,905.00	\$7,514.67	<b>14.63</b>
14	APOPKA VINELAND RD. (SR 535)	LAKE BUENA VISTA OUTLETS	LAKE ST.	\$1,559,202.00	\$22,543.78	<b>69.16</b>

## B/C Ratio Summary – Osceola County

S No.	Street	From	To	Annual User Benefit	Annual Cost	B/C Ratio
1	SR 535	POLYNESIAN ISLE BLVD.	KYNGS HEATH RD.	\$70,113.00	\$10,019.56	<b>7.00</b>
2	US 192	SCOTT BLVD.	BASS RD.	\$948,114.00	\$12,944.71	<b>73.24</b>
3	US 192	CELEBRATION PL.	SERALAGO BLVD.	\$161,736.00	\$10,254.48	<b>15.77</b>