GIBSONTON AREA

NETWORK ANALYSIS

Hillsborough County Florida

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1. OVERVIEW

1.1 Purpose of Study

The Gibsonton Area Network Analysis Study is a high-level transportation network analysis undertaken by Hillsborough County to identify and assess potential improvements within the Gibsonton area. The study team tested various combinations of roadway capacity and intersection improvements to see which has the potential to improve transportation network deficiencies in the greater Gibsonton area. The network approach to this study is different from other corridor or intersection specific studies, in that the performance of improvements or alternative sets was evaluated for a larger study area. Some longer term projects were also considered, but the focus of this study is on evaluating the network-wide impacts or benefits of shorter-term projects.

As shown in Figure 1, the study area included corridors and intersections extending from the area around US 41 to the west, Riverview Drive to the north, US 301 to the east, and Symmes Road to the south. As shown in Figure 2, the model developed for this study builds upon the model that was created for the Alternatives to Lithia-Pinecrest Road Widening Traffic Analysis Study that was completed in early 2020. During the study, the effectiveness of potential combinations of improvements within the study area to address deficiencies was compared against each other and the existing conditions. The comparative analysis resulted in the identification of improvement projects that could advance into more detailed phases of engineering and design.

1.2 Context Summary

Existing population and employment densities within the study area are low, with the majority of the TAZs having less than five residents or employees per acre. Based on the Tampa Bay Regional Planning Model (TBRPM v8.2) socio-economic data projections, growth between 2020 and 2040 in the Gibsonton area is anticipated to result in moderate changes in population and employment density. The increased residential growth will occur along the US 301 corridor, generally within the area between I-75, Gibsonton Drive, Symmes Road, and Balm Riverview Road. Increased residential growth is also expected in the area between Symmes Road and Nundy Avenue and I-75 and US 41. However, the population density is expected to remain low, as the entire study area remains under 10 persons per acre. Increased employment density is anticipated to be limited, primarily occurring north of Riverview Drive along the western side of US 301.

The major north-south arterials within the study area are US 41 and US 301, while the only major east-west arterial is Gibsonton Drive. These three roadways carry the majority of traffic within and through the study area, and the majority of crashes and congestion are concentrated at intersections along these corridors. Due to the limited secondary roadway network, vehicles are unable to adequately disperse through the network, favoring the high capacity major arterials over low capacity collectors and local roads.

1.3 Modeling Methods & Results

Using Aimsun traffic analysis software, the project team developed a series of traffic models for the study area. An initial model, called the Existing plus Committed (E+C) Model was developed to show roadway conditions and operations adjusted to account for committed and funded projects. This model provided a starting point for understanding network performance characteristics, defining potential improvement alternatives, and completing comparisons between the various sets of improvement alternatives.

The E+C Model run resulted in the identification of several important issues and deficiencies, including bottleneck locations with particularly high volume-to-capacity ratios and high intersection delays. During the AM peak period, high volumes of vehicles attempt to traverse the

network to areas of high employment outside of the network; in the PM peak period, these vehicles return from these outside employment centers and again must travel through the study area. These vehicles have limited options to traverse north-south and east-west through the study area due to the poor interconnectivity of local roadways and capacity constraints along major arterials.

Based on the initial modeling, the project team worked with County staff to understand factors contributing to problem areas and define potential improvement strategies. Consultation with County staff resulted in the identification of a number of potential improvement projects, which were subsequently combined into three different alternative sets. These alternative sets were developed to provide the greatest mobility of vehicles within and through the study area. Performance measures used during the evaluation included volume to capacity (V/C) ratios, intersection delay, and travel time comparisons along the study area's major roadways.

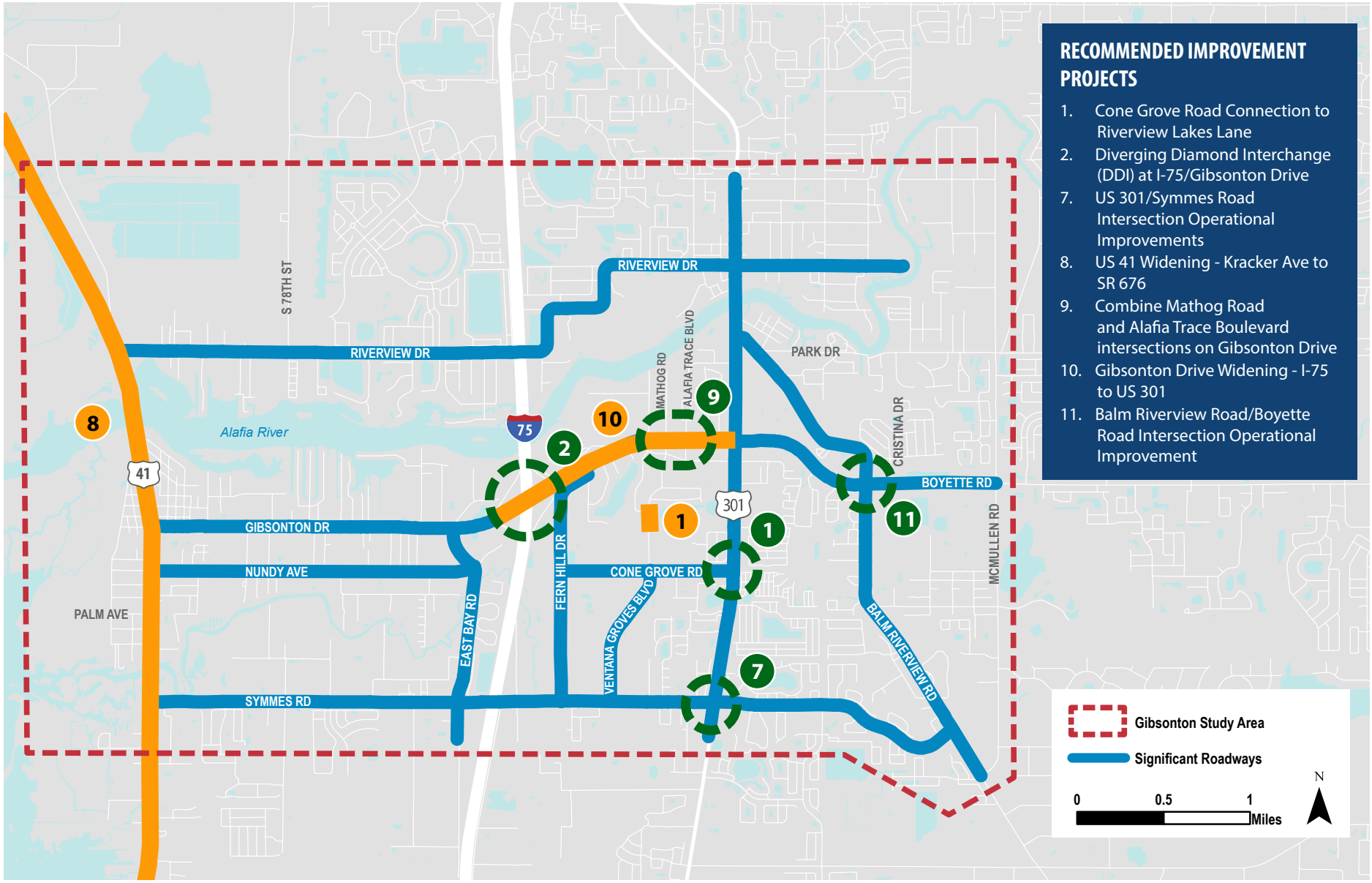
1.4 Recommendations

Of the three alternative sets tested as part of this study, Alternative 3 provided significant V/C improvements, while reducing the delay experienced at intersections with the highest volumes. Of the 11 projects included in the three alternative sets, the seven improvement projects shown in Figure 1 are recommended for further analysis for potential implementation. These were identified as having the greatest potential to improve overall network-wide performance in the AM and PM peak periods, without having to acquire substantial right of way for large scale widening projects. The seven recommended projects are as follows:

- **Improvement Project 1.** Cone Grove Road Connection to Riverview Lakes Lane. Provide a connection between Cone Grove Road to Riverview Lakes Lane, as well as a northbound left-turn to Cone Grove Road from US 301.
- **Improvement Project 2.** Diverging Diamond Interchange (DDI) at I-75/Gibsonton Drive. Provide a DDI at the I-75/Gibsonton Drive interchange. Converts the existing northbound I-75 ramp terminal from unsignalized to a two-phase signal. *(FDOT Project Status: Design is scheduled for 2025)*
- **Improvement Project 7.** US 301/Symmes Road Intersection Operational Improvements. Provides signal timing update to improve the delay of the minor approaches on Symmes Road, while encouraging the northbound through movement.
- **Improvement Project 8.** US 41 Widening from Kracker Ave to SR 676. Widen US 41 from four to six lanes from Kracker Avenue to SR 676. *(FDOT Project Status: PD&E study complete; design not yet underway)*
- **Improvement Project 9.** Combine Mathog Road and Alafia Trace Boulevard intersections on Gibsonton Drive. Combine Mathog Road and Alafia Trace Boulevard into one intersection. Provide necessary geometric and signal timing changes.
- **Improvement Project 10.** Gibsonton Drive Widening from I-75 to US 301. Widen Gibsonton Drive from four to six lanes from I-75 to US 301.
- **Improvement Project 11.** Balm Riverview Road/Boyette Road Intersection Operational Improvements. Provides signal timing update to improve the delay of the minor approaches.

The combination of these improvement projects under the recommended alternative set provides additional capacity on some of the network's most utilized roadways, while also forming a new connection between them. It is recommended that these individual improvement projects be evaluated in greater detail.

Figure 1. Network Alternatives Analysis Study Area Map & Recommended Projects



2. ANALYSIS METHODOLOGY

The alternatives analysis process included several steps to compare the network performance of improvement options within the Gibsonton area. The analysis used Aimsun simulation and forecasting software calibrated to represent existing traffic conditions using existing regional traffic model data, intersection traffic counts, and signal timings.

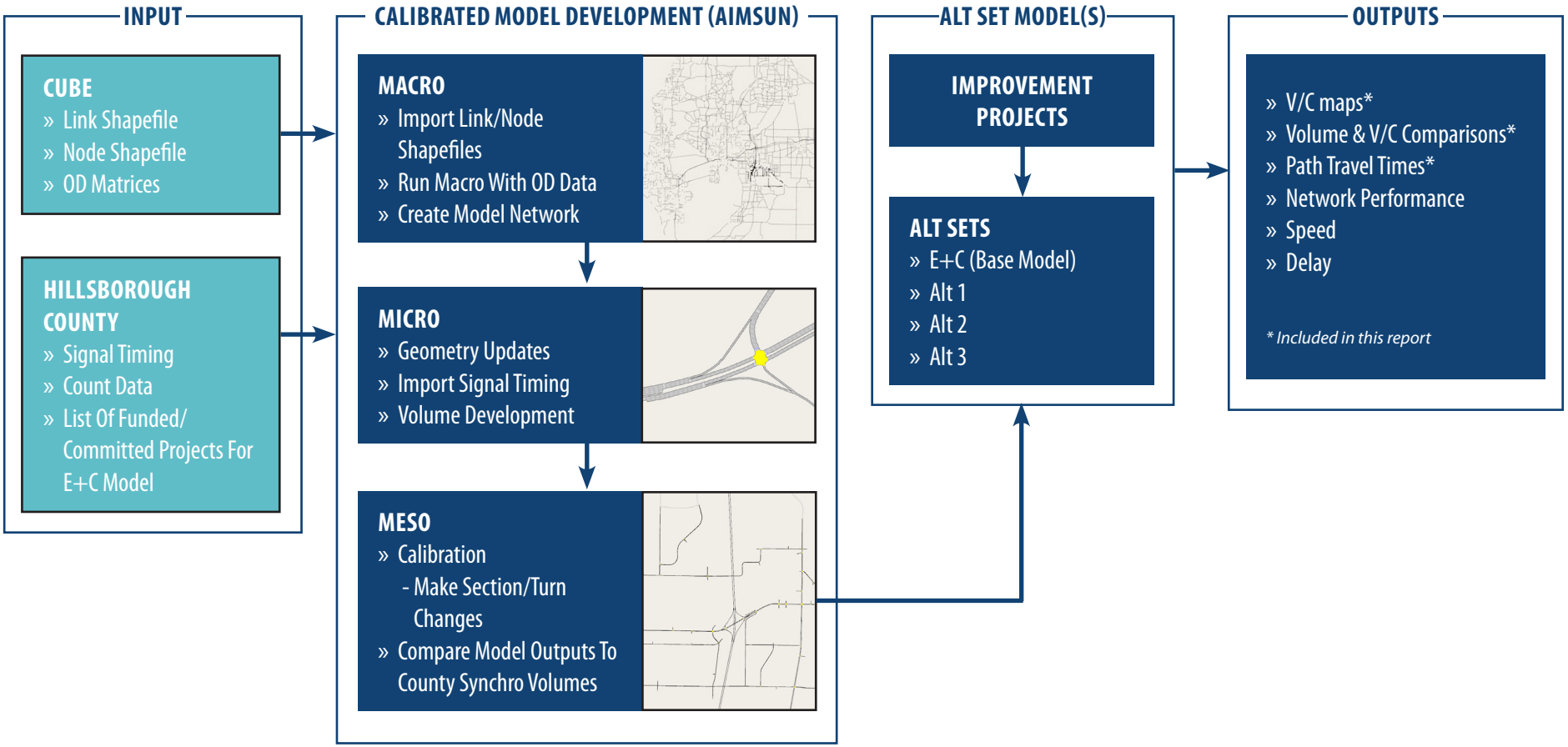
Aimsun is a unique software because of its ability to analyze the performance of roadway networks under existing or potential improvements. Analysis can be performed at either the large-scale regional level or smaller intersection and corridor level. The Aimsun software allows multiple projects to be added or removed depending on the alternative to be tested. These tests can be performed and results processed and evaluated quickly. The benefit of Aimsun for this type of study is that it combines two scales of modeling, regional model inputs (macroscopic) with intersection or corridor model inputs (microscopic), to create a hybrid model (mesoscopic) that offers a variety of analysis techniques.

Aimsun macroscopic modeling operates similar to Cube modeling, utilizing Origin-Destination (OD) matrices and link parameters in determining routing information. Aimsun microsimulation operates similar to Vissim microsimulation, utilizing traffic control features and car-following and lane changing models. These models allow for interaction between vehicles and can show model animation. Mesoscopic modeling, or hybrid models, combines the individual vehicle modeling found in microsimulation with the higher level, regional modeling performed in macrosimulation.

As described below and summarized in Figure 2, the study team employed the following process to complete the modeling effort:

1. Use the model developed for the Alternatives to *Lithia-Pinecrest Road Widening Traffic Analysis Study* as the base model for the Gibsonton area. This was done so the recommended alternatives developed for the Lithia-Pinecrest area could be seamlessly integrated into the Gibsonton study area analysis, with no rework needed. The original model was developed by running the Tampa Bay Regional Planning Model (TBRPM v8.2) using Cube software. (Note: This version was used because TBRPM v9.0 was not available when the analysis was initiated.) Cube output includes link and node shapefiles and OD matrices. The link and node shapefiles are imported into Aimsun. This allows the Aimsun model to use the same basic roadway network, roadway attributes, centroid, and OD data as the TBRPM. Using a larger model area (see Figure 3) impacts the results to and potential impacts within a larger network than modeling just within the Gibsonton Study Area.
2. Run a macroscopic Aimsun model and compare volume results to the Cube output. If the R2 value (a statistical measure of variance) is at least 0.90, the subarea network was created. A similar R2 comparison was performed for the subarea.
3. Once the modeling limits were selected, Hillsborough County provided traffic counts, signal timings, and funded or committed projects within the study area. Calibrate the model by adjusting section and turn parameters to make the AM and PM Aimsun volumes match the count data. When the majority of turning movement volumes matched between these two sources, the OD matrices and path assignments were finalized. These OD matrices and paths became the starting point for all alternative set models. However, intersection turning movement volumes may vary between models, due to the dynamic nature of the Aimsun model.
4. Update intersection and roadway geometries, along with intersection control types, to create an Existing plus Committed (E+C) Model, which was used as the starting point for all the alternative sets that were analyzed.

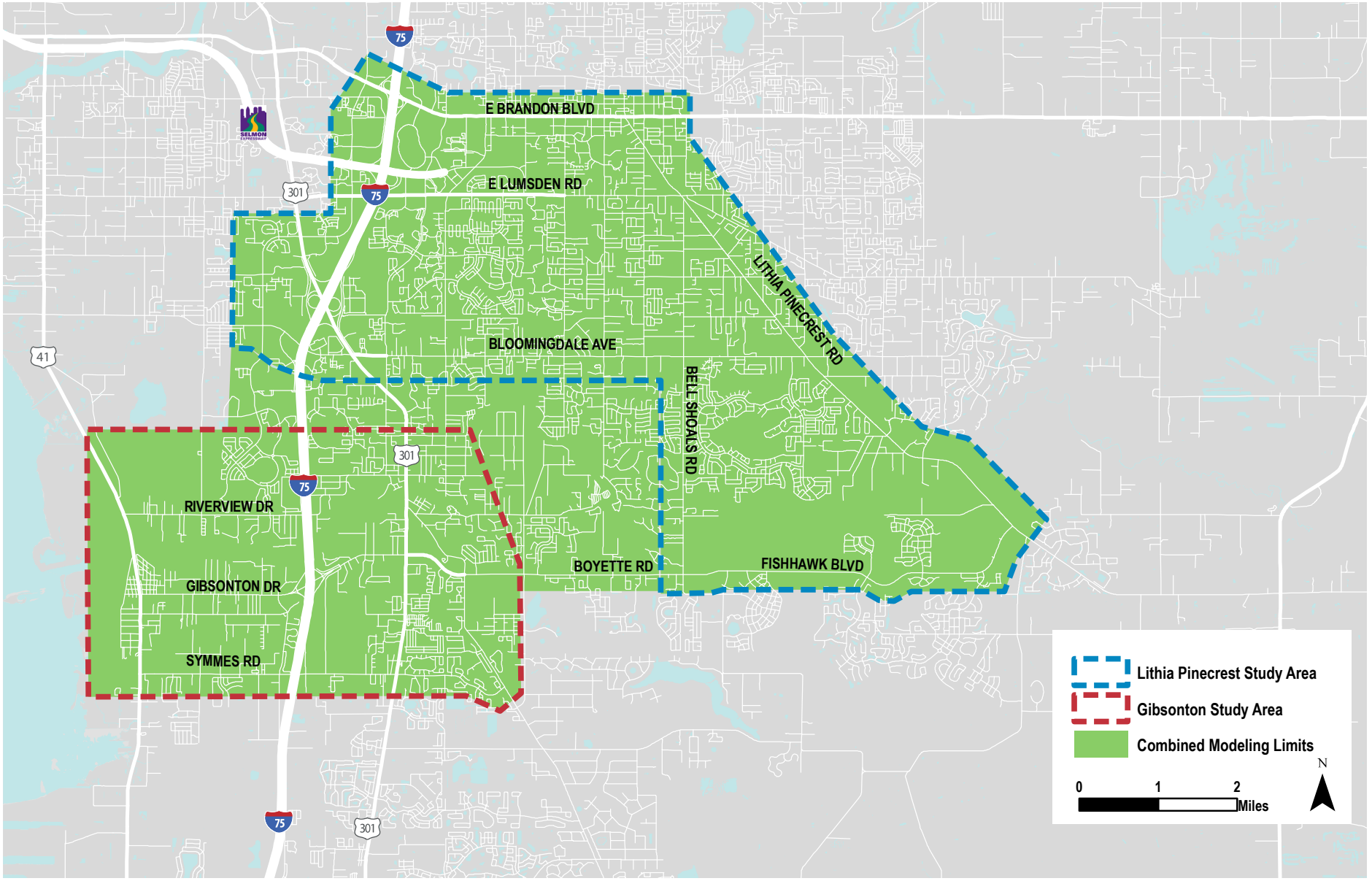
Figure 2. Traffic Modeling Process



5. Perform mesoscopic modeling on the E+C Model (results in Section 3.3). Another feature of Aimsun mesoscopic modeling that was used in this analysis is dynamic assignment, which allows the traffic to reroute at specified intervals to better mimic how drivers act in the real world.

6. Use the E+C Model as the base to code in projects for each of the three alternatives sets modeling. Compare the results of the three alternative sets to the E+C Model results (see Section 4 for results).

Figure 3. Gibsonton Area Traffic Modeling Limits



3. CONTEXT & EXISTING CONDITIONS

Development in the Gibsonton area and the communities to the south and east has resulted in increased traffic volumes, traffic congestion, and travel safety issues along corridors within the study area. Growth within and to the south and east of the study area has contributed to increases in peak period travel along US 301, Gibsonton Drive, Symmes Road, and US 41 corridors to and from regional employment centers northwest and north of the study area.

To support efforts to identify potential transportation improvements for the study, evaluations of population and employment projections as well as safety and crash data was undertaken. Summaries of these analyses follow.

3.1 Existing Population/Employment & Projected Growth

The projected population and employment growth in the Gibsonton area is anticipated to result in moderate changes in population and employment density. To understand the potential for increased demand on the area's roadways, the study team evaluated the existing population and employment estimates for 2020 and 2040 projections from the TBRPM v8.2. (The 2040 projections were used to align with the traffic model origin/destination data that was used to develop the Aimsun model because the 2045 estimates were not available at the onset of the analysis.)

In 2020, the study area is anticipated to have approximately 107,782 residents and 24,595 employees. By 2040, the area is anticipated to grow to 146,266 residents and 35,163 employees. Overall, the area is anticipated to see a 36 percent increase in residents and a 43 percent increase in employees from 2020 to 2040.

While the study area is anticipated to experience growth over the next 20 years, the study team wanted to better understand the locations where the new residents and employees are expected to change between 2020 and 2040. For each of the TAZs within the study area, the change in population and employment density between 2020 and 2040 was calculated.

As shown in Figures 4 and 6, the 2020 employment and population densities within the study area are low, with the majority of the TAZs having less than five residents or employees per acre. Population and employment densities are expected to grow modestly by 2040. As shown on Figures 5 and 7, the increased residential growth will occur along the US 301 corridor, generally within the area between I-75, Gibsonton Drive, Symmes Road and Balm Riverview Road. Increased density is also anticipated north of Symmes Road between US 41 and I-75. However, the population density is expected to remain low, as the entire study area remains under 10 persons per acre. Increased employment density is anticipated to be limited, primarily occurring north of Riverview Drive along the western side of US 301 just north of the study limits. The majority of the study area will have less than five employees per acre in 2040.

Based on the anticipated low population and employment densities over the next 20 years, the Gibsonton area will result in a continued reliance on single-occupancy vehicles and congestion will most likely continue to occur on the study area's roadways. Given the low population and employment density, options for transit solutions are also limited.

Figure 4. Population Density by TAZ, 2020

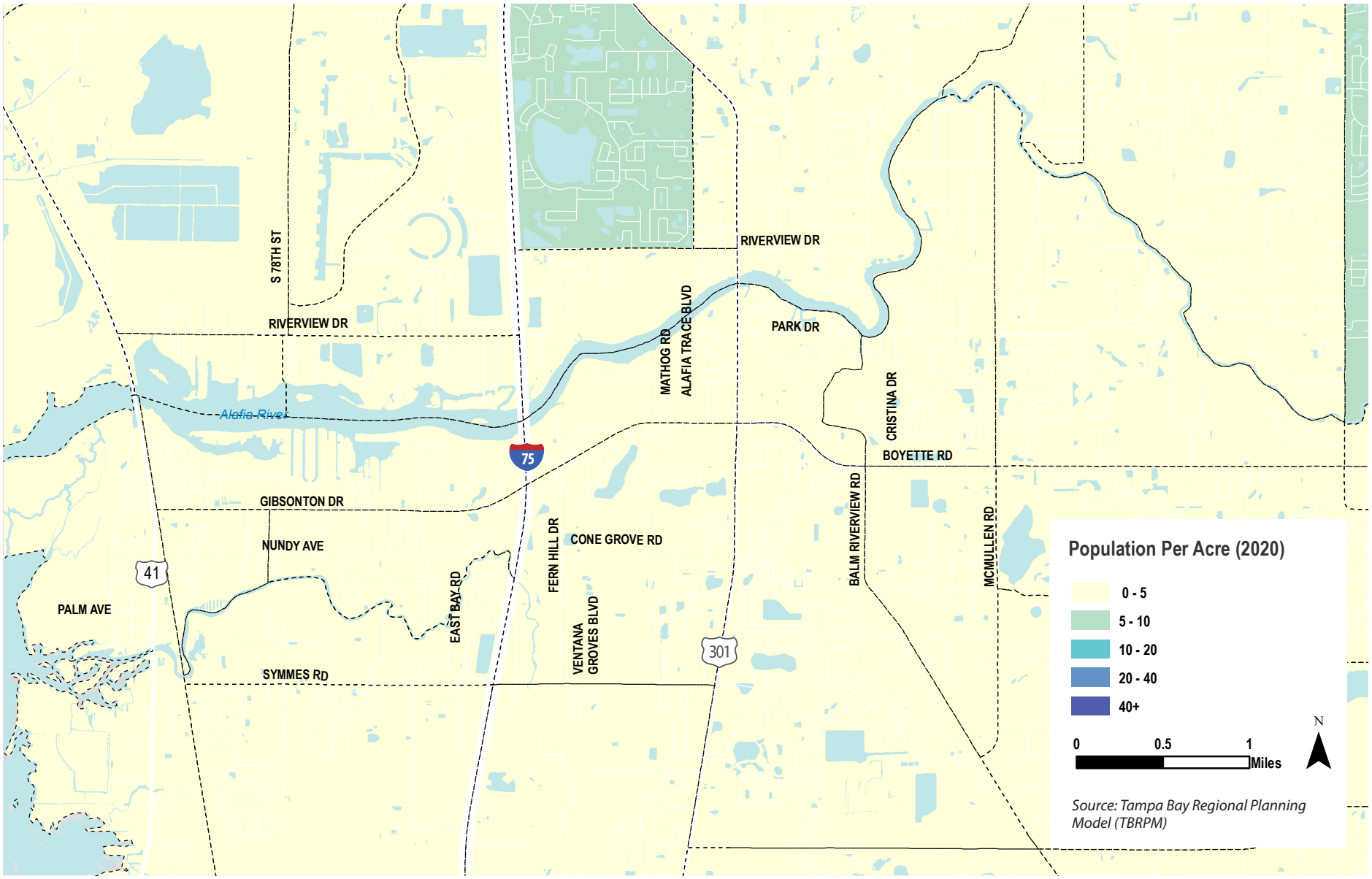


Figure 5. Population Density by TAZ, 2040

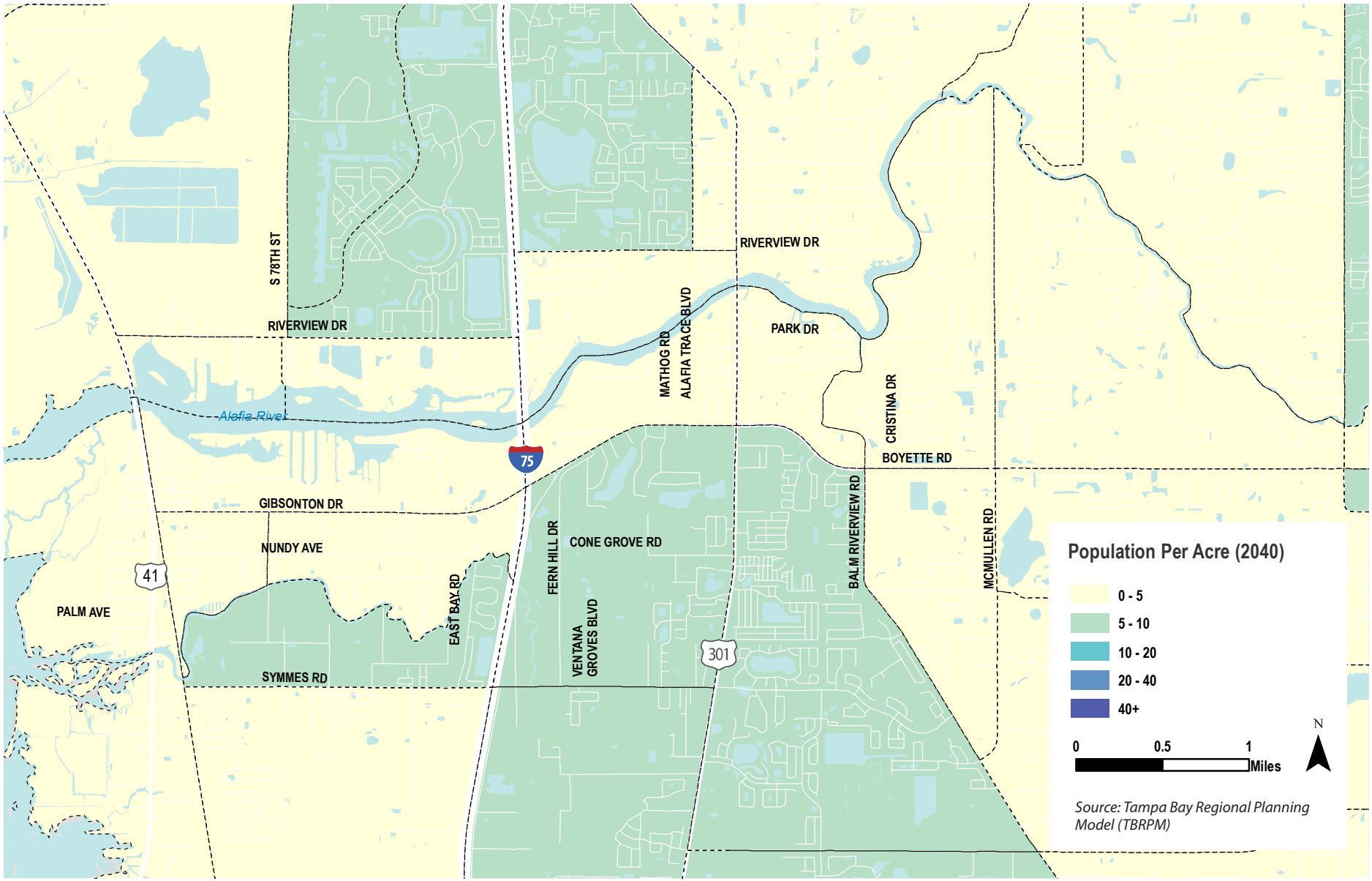


Figure 6. Employment Density by TAZ, 2020

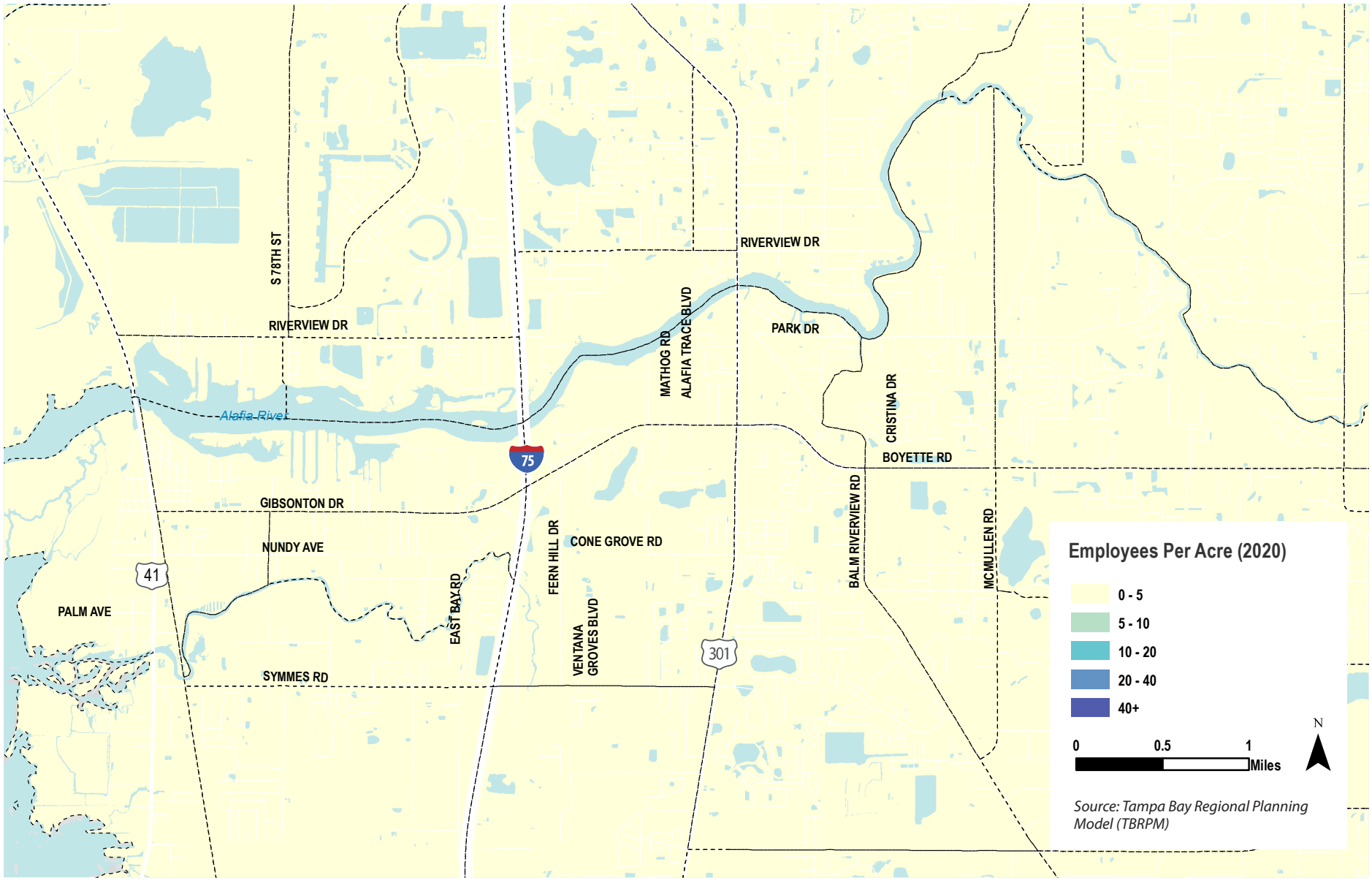


Figure 7. Employment Density by TAZ, 2040

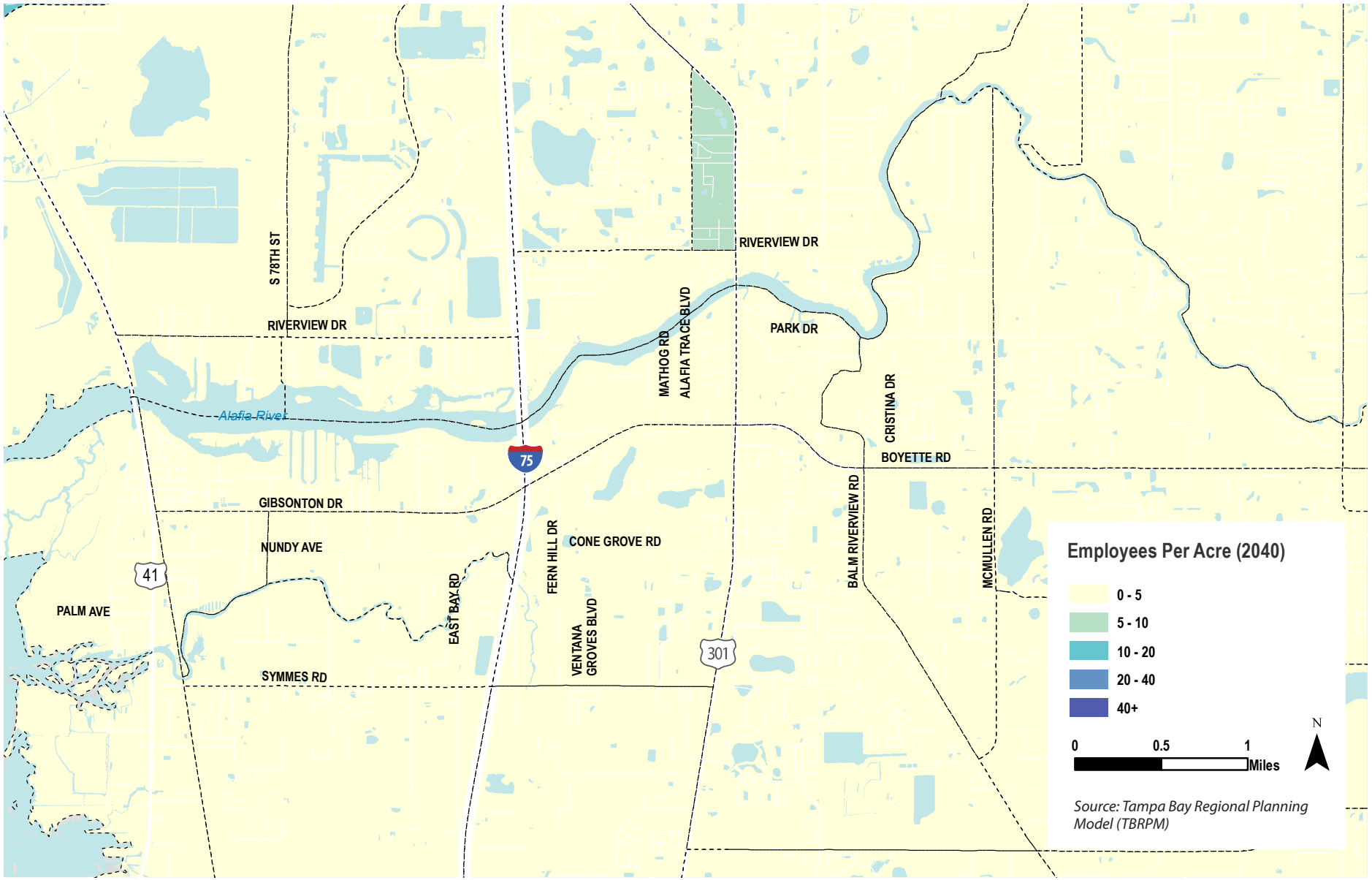


Figure 8. New Residents by TAZ, 2020 to 2040

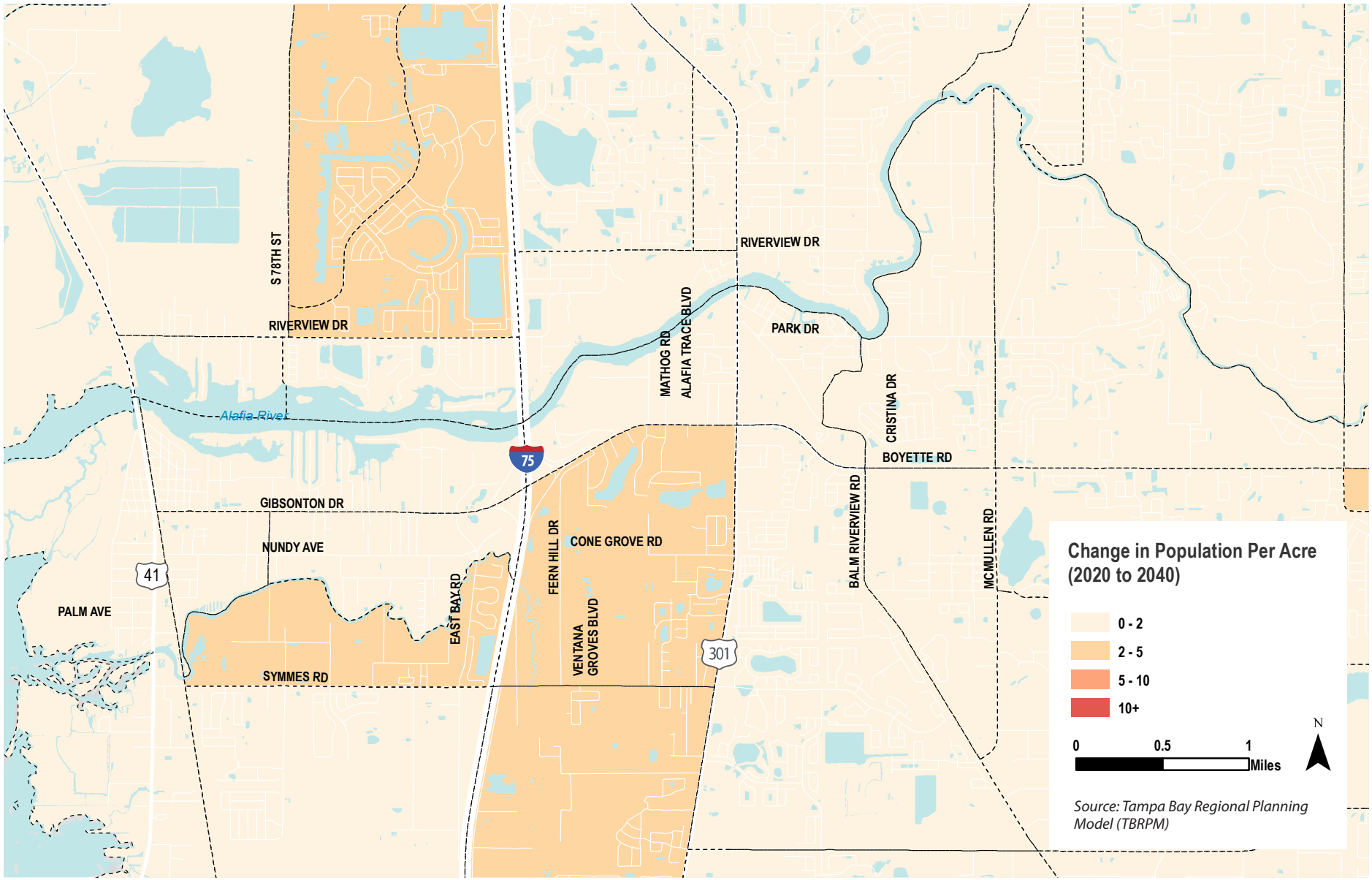
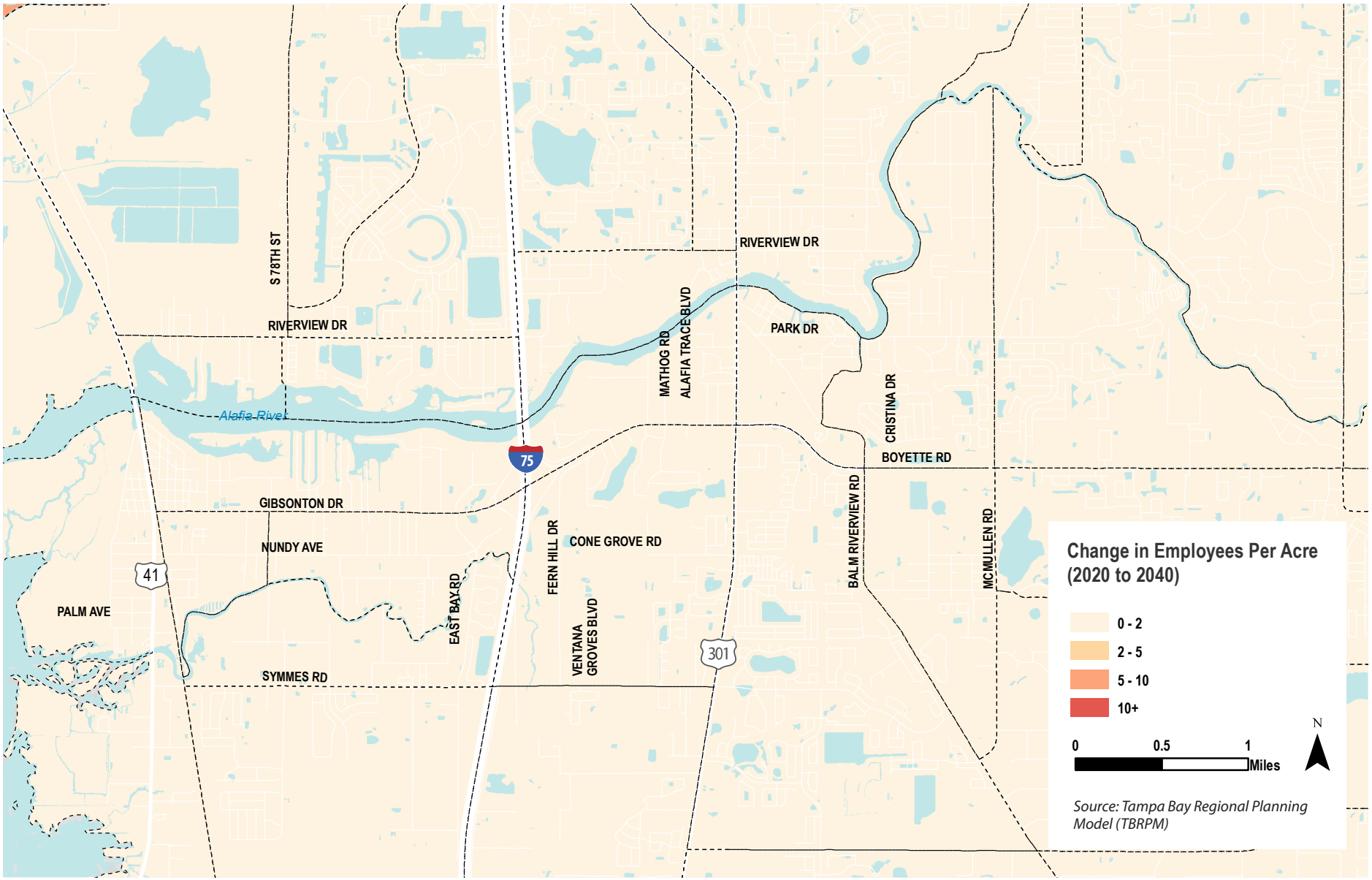


Figure 9. New Employees by TAZ, 2020 to 2040



3.2 Crash & Safety Analysis

The majority of crashes within the Gibsonton area are rear-end crashes. They are concentrated along Gibsonton Drive/Boyette Road, I-75, US 41 and US 301. This is not surprising given the area has a limited secondary roadway network forcing motorists to travel on these major arterials that carry the bulk of the volume. In addition, portions of these roadways allow for higher speeds followed by sudden and abrupt stops due to long queuing at intersections, contributing to high frequencies of rear-end crashes.

CRASH HOT SPOTS

Plan Hillsborough's Vision Zero Plan was prepared in 2017 by the Hillsborough MPO, in partnership with Hillsborough County; the Cities of Tampa, Temple Terrace, and Plant City; and the Florida Department of Transportation (FDOT) in support of reduced fatalities and serious injuries on roadways. Figure 10 shows Hillsborough County's top 20 corridors and crash spots with the highest number of severe injury crashes per mile between 2014 and 2018. The top 20 corridors with severe injury crashes are represented by black lines along the roads.

The Gibsonton Drive/Boyette Road from I-75 to Balm Riverview Road segment ranks 2nd on the Top 20 Severe Crash Corridors identified in the Safe Streets Now, Vision Zero, Action Plan. There's an ongoing effort by the Hillsborough MPO, conducting a Speed Management Study. Based on the Managing Speed on Hillsborough's High Injury Network study draft the top 20 High Injury Network (HIN) corridors were assessed with regards to posted speed and context class and found that the posted speed on the Gibsonton Drive/Boyette Road from I-75 to Balm Riverview Road segment was 10 MPH over national practice. The study also developed a top 20 priority matrix, where the Gibsonton Drive/Boyette Road segment scored medium priority. In addition to the speed management study, a Vision Zero Corridor study on Gibsonton Drive was recently completed that proposed safety improvements rather than projects that would increase capacity.

To determine specific problem locations, the study team evaluated CDMS crash data collected from 2014 to 2018 (see Figures 11 and 12).

Key observations:

- Within the study area, Gibsonton Drive/Boyette Road between I-75 and Balm Riverview Road, is identified as one of the County's top high crash corridors.
- Gibsonton Drive/Boyette Road, between I-75 and Balm Riverview Road, is a high crash area during both AM and PM peak period.
- The US 301 and I-75 intersections with Gibsonton Drive have high crash occurrences in both the AM and PM periods.
- Several intersections along Gibsonton Drive and US 301 have high crash occurrences in the PM period.
- US 41, I-75 and US 301 have higher rates of crashes in the PM period compared to the AM period.
- US 41 intersections with Riverview Drive, Gibsonton Drive and Symmes Road have high crash occurrences during the PM period.

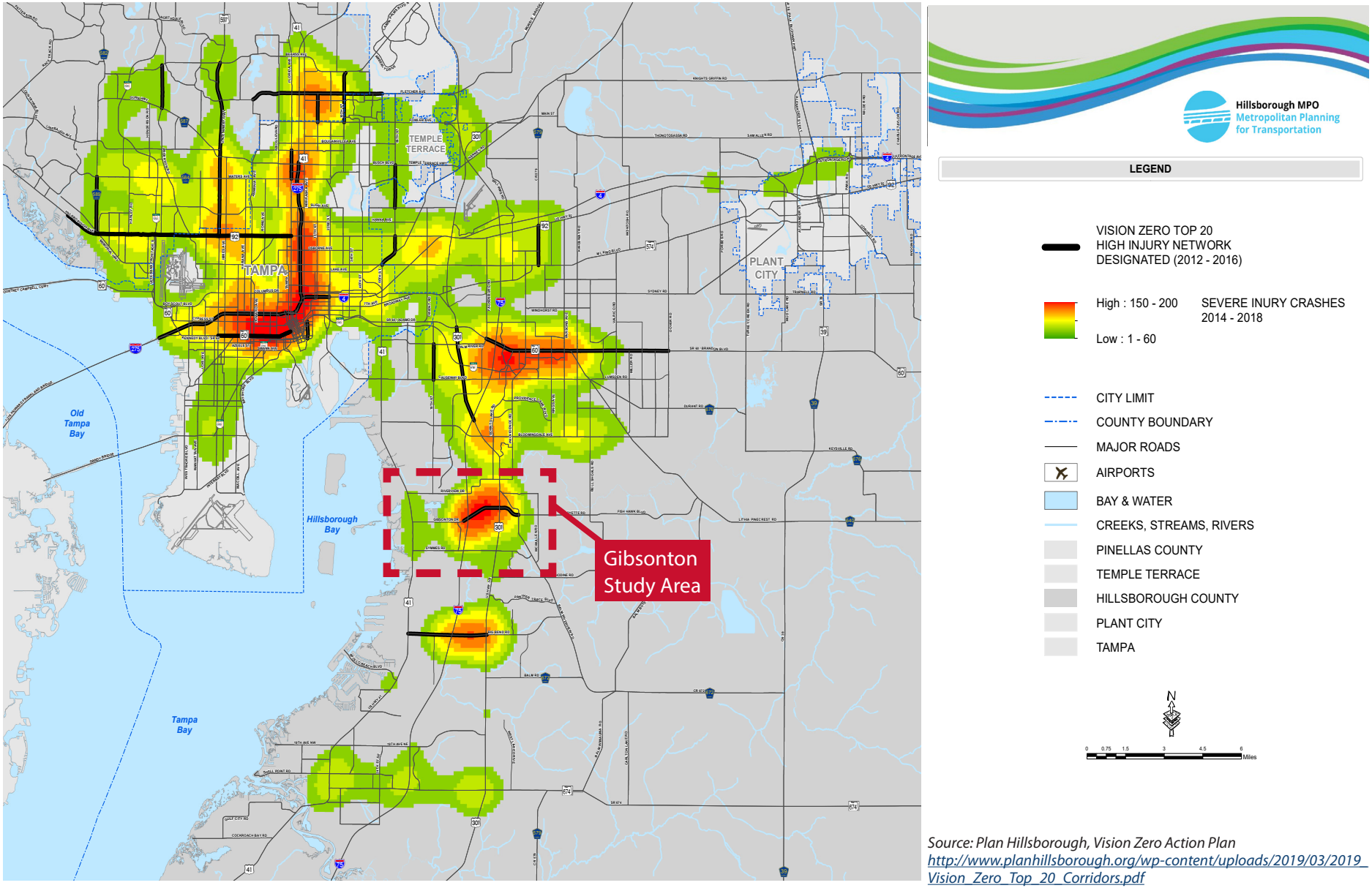
CRASH LOCATION BY TYPE

The study team also used the CDMS crash data from 2014 to 2018 to evaluate the types of crashes and where they occurred within the study area. Figures 13 and 14 show crash locations by type for AM and PM peak periods.

Key observations in the AM peak period:

- A high frequency of rear end crashes occurred along Gibsonton Drive between Prevatt Street and US 301, and along US 301, I-75 and US 41.

Figure 10. Hillsborough County Vision Zero Top 20 Corridors & High Crash Spots



Source: Plan Hillsborough, Vision Zero Action Plan
http://www.planhillsborough.org/wp-content/uploads/2019/03/2019_Vision_Zero_Top_20_Corridors.pdf

Figure 11. Study Area Crash Hotspots, AM Peak Period, 2014-2018

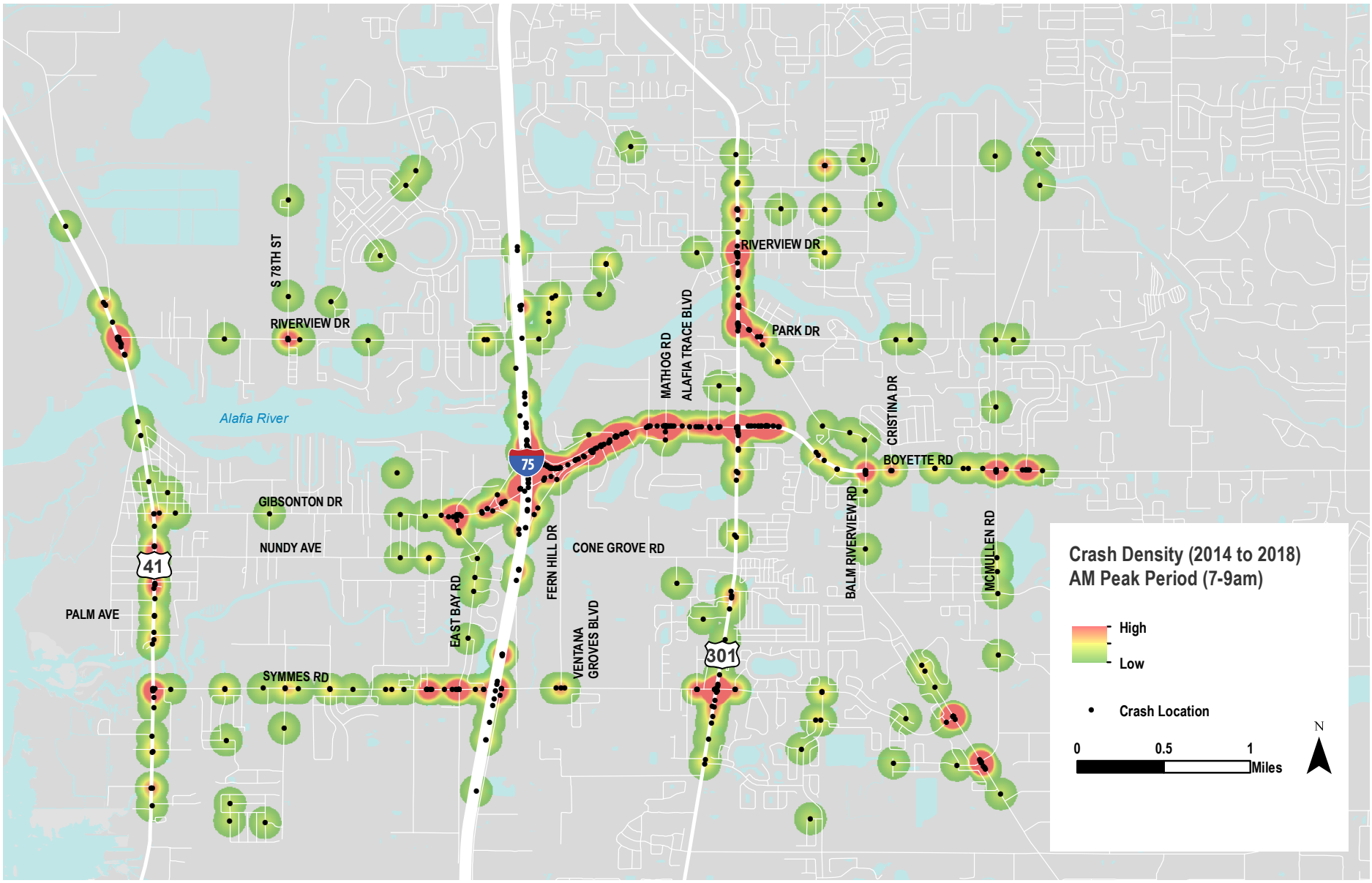


Figure 12. Study Area Crash Hotspots, PM Peak Period, 2014-2018

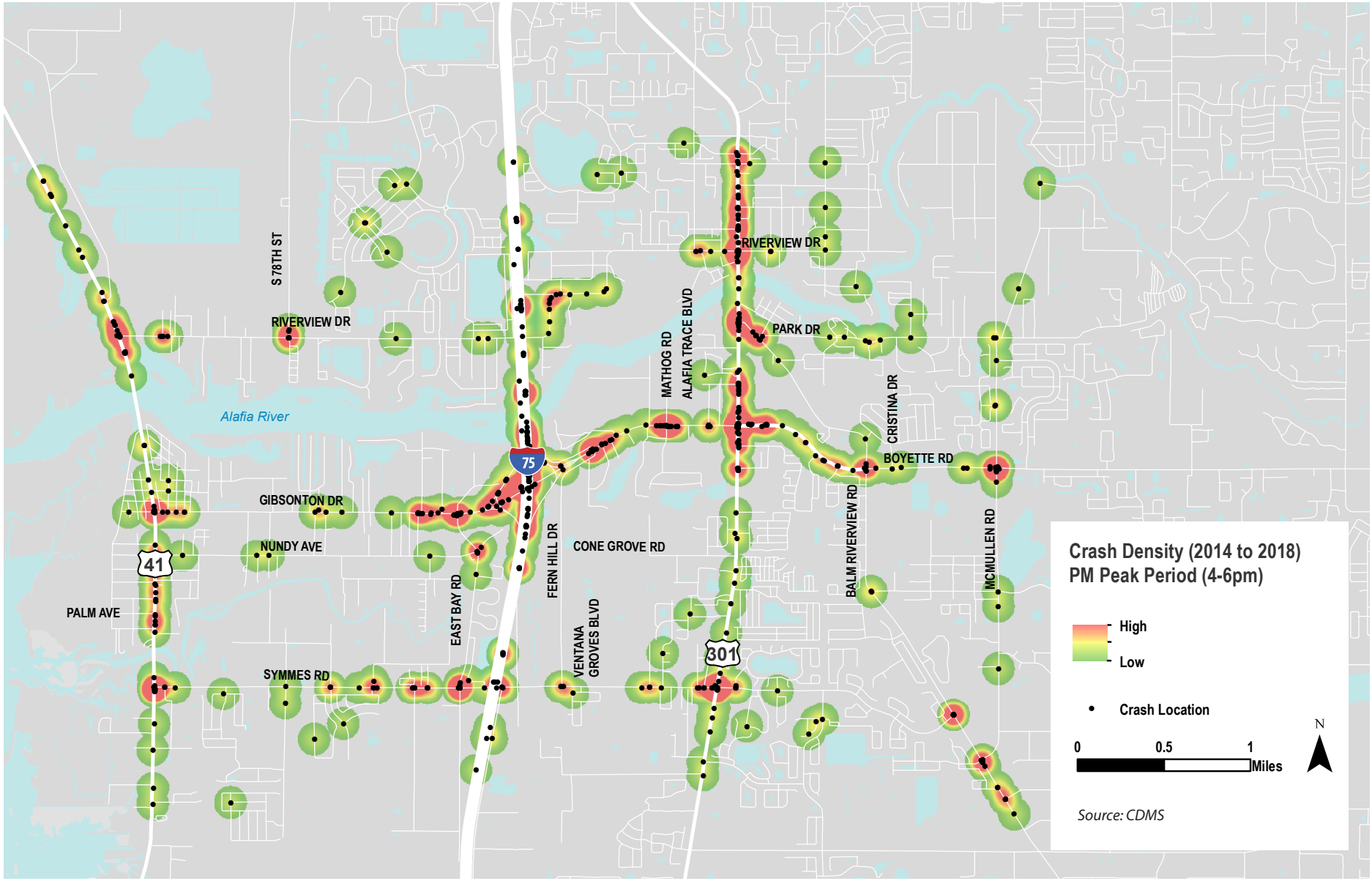


Figure 13. Study Area Crash Location by Types, AM Peak Period, 2014-2018

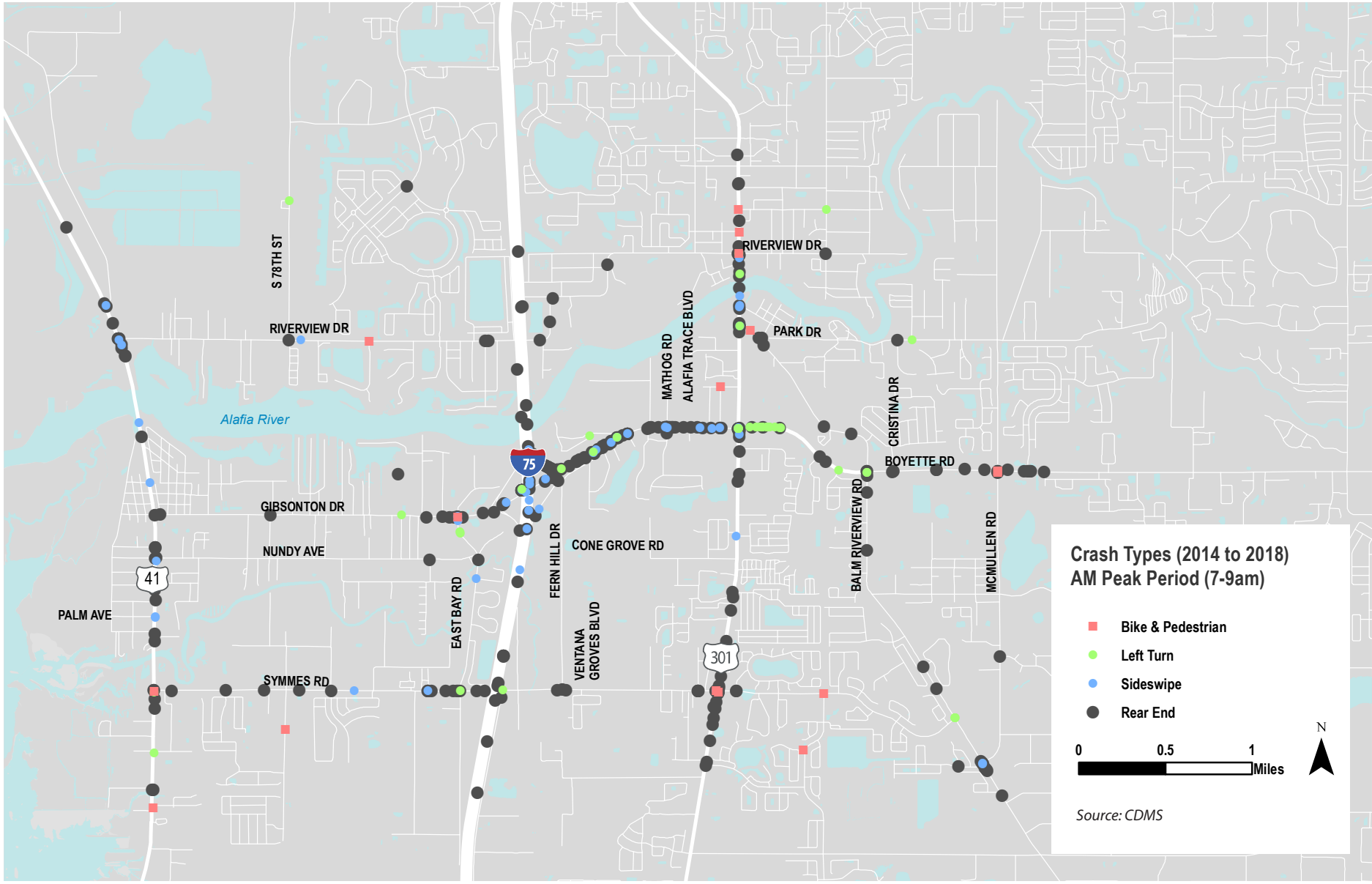
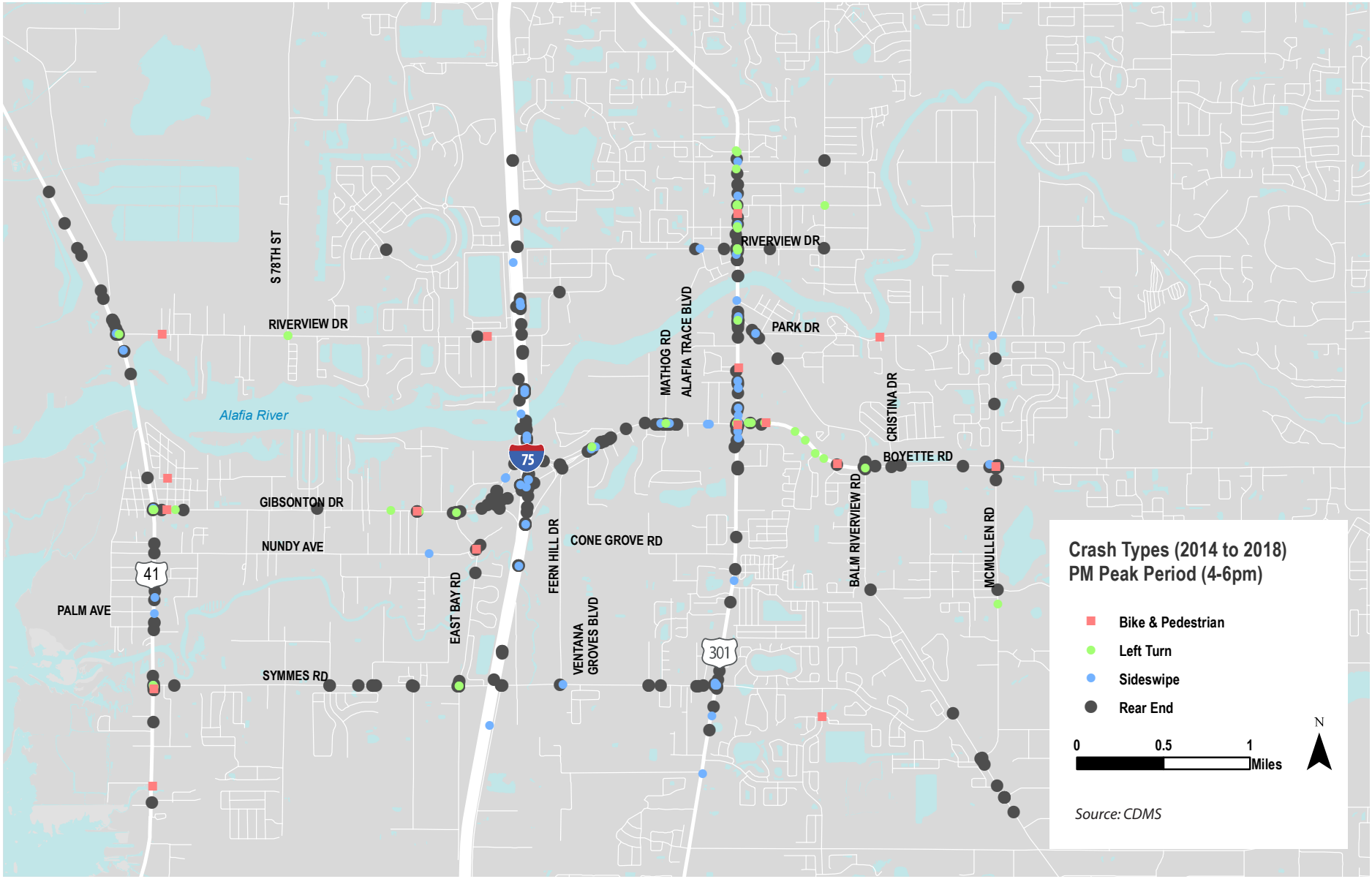


Figure 14. Study Area Crash Location by Types, PM Peak Period, 2014-2018



- Sideswipes crashes occurred along Gibsonton Drive, US 41 and I-75.
- Left turn crashes occurred along Gibsonton Drive.
- Pedestrian and bicycle crashes dispersed throughout the area with multiple crash occurrences along US 301, and at the Boyette Road/ McMullen Road intersection.

In the PM peak period:

- A high frequency of rear end crashes occurred on Gibsonton Drive between I-75 and US 301, and along US 301, I-75 and US 41.
- Sideswipes crashes occurred along I-75 and US 301.
- Left turn crashes occurred along Gibsonton Drive/Boyette Road and US 301.
- Pedestrian and bicycle crashes dispersed throughout the area with multiple crash occurrences along Gibsonton Drive/Boyette Road.

3.3 Existing Network Performance

The initial Aimsun model was developed using the existing roadway network along with funded or committed projects. The funded or committed projects that were included are shown in Table 1 and Figure 15.

The performance results of the E+C Model were analyzed to illustrate how vehicles move through the network and isolate congestion hot spots by peak travel period. Volume to capacity (V/C) ratios were determined for each of the major roadways within the study area in the AM and PM peak periods (see Figures 16 and 17). As shown in Table 2, intersection approach and overall intersection delays were also calculated for all major intersections within the network. Figures 18 and 19 show the delay for each intersection approach in the AM and PM peak periods, respectively. Figure 20 shows overall intersection delay in the AM and PM peak periods.

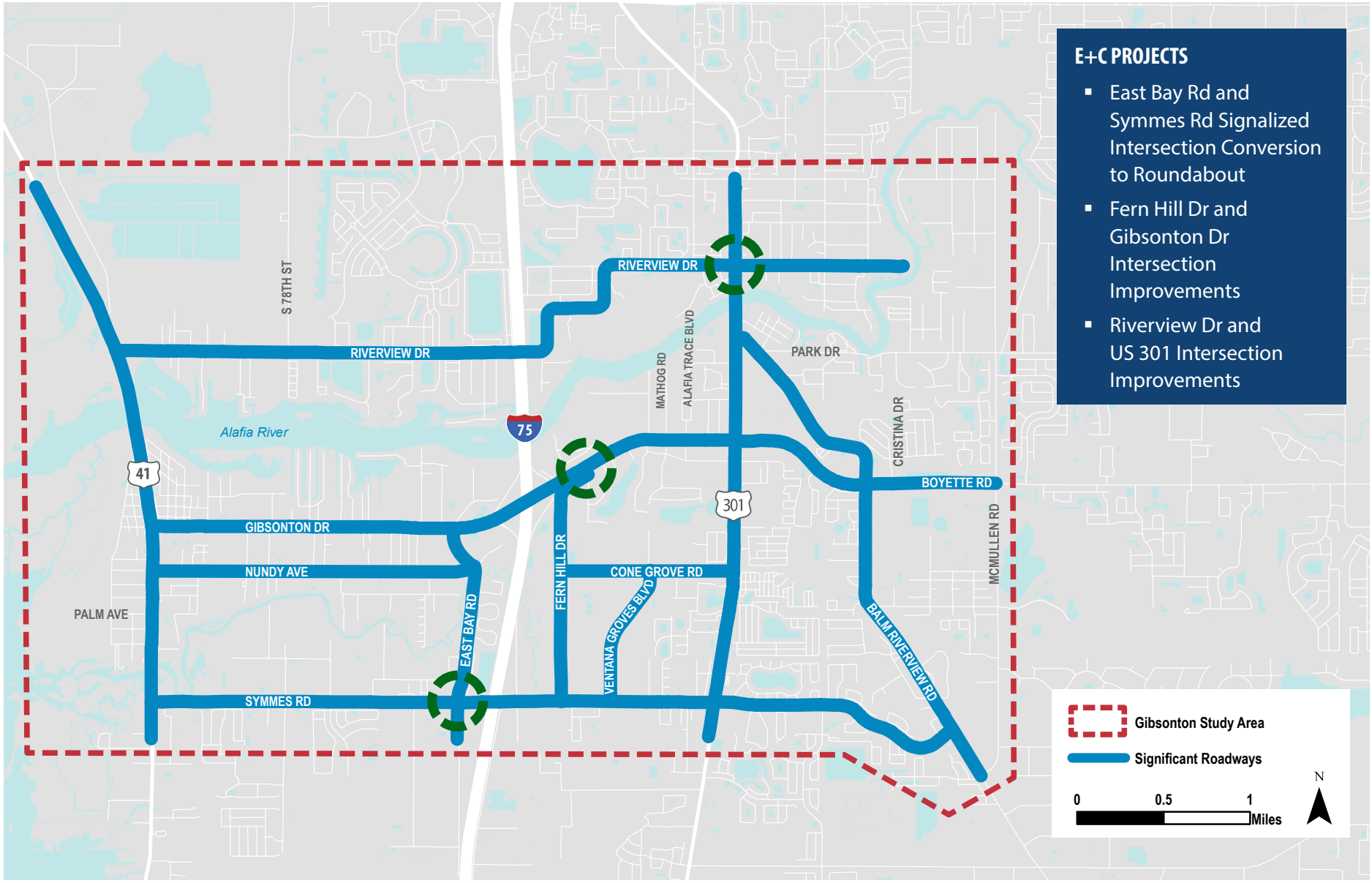
Table 1. Funded/Committed Projects Included in E+C Model

CIP	Intersection	Improvement
69600314	East Bay Rd/ Symmes Rd Intersection	Convert signalized intersection to a roundabout
69600311	Fern Hill Dr/ Gibsonton Dr Intersection	Intersection geometry improvements, including triple left turns on the northbound approach and dual left turns on the westbound approach
69645121	Riverview Dr/ US 301	Intersection geometry improvements including dual left turns on the westbound approach

It should be noted that the delay information provided in these tables and figures are calculated based on mesoscopic analysis and should not be compared to delay results seen in microscopic analysis. This means that even though an intersection appears to be performing well using microsimulation standards, it may not be operating well in the context of the network. Delay should be looked at comparatively to the other intersections and approaches within the network.

The E+C Model results show that due to the limited number of east-west and north-south corridors within the study area, drivers do not exhibit much variability in their travel patterns in the AM and PM perk periods. Dramatic growth is expected in the Ventana community located between I-75 and US 301, south of Gibsonton Drive. This area will see new construction of homes and schools, with drivers utilizing smaller roads with insufficient capacity, such as Symmes Road and Fern Hill Drive, to access the main corridors of Gibsonton Drive, US 301, and US 41. These main corridors experience heavy congestion from regional traffic commuting through the network.

Figure 15. Existing + Committed Projects



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Other key observations include:

- **US 41 experiences heavy congestion** in the northbound direction during the AM peak period and in the southbound direction during the PM peak period as commuters pass through the study area.
- **The yield condition at the northbound I-75 on ramp for the westbound right direction creates high delay and queuing that propagates along Gibsonton Drive.** This is exacerbated by the new triple northbound lefts at the Gibsonton Drive/Fern Hill Drive intersection, which allows more vehicles to fill up the available space between the westbound on ramp and the Gibsonton Drive/ Fern Hill Drive intersection. The heavy congestion along westbound Gibsonton Drive, causes drivers originating from south of the study area to access northbound I-75 via Symmes Road and East Bay Road and entering I-75 from eastbound Gibsonton Drive. Due to their limited capacity, **Symmes Road and East Bay Road also experience heavy congestion in the AM peak period.**
- **In the PM peak period, eastbound Gibsonton Drive experiences heavy congestion** as vehicles exit southbound I-75. East Bay Road and Symmes Road also experience some congestion in this time period, but not as severely as in the AM peak period; drivers tend to use Gibsonton Drive more in the PM peak period to access US 301.
- **Balm Riverview Road experiences a small uneven split in traffic between the AM and PM peak periods**. During the AM, more vehicles utilize northbound Balm Riverview Road north of Gibsonton Drive, especially as vehicles enter from neighborhoods along Balm Riverview Drive and Park Drive. However, in the PM peak period, this portion of Balm Riverview Road in the southbound direction does not experience the same level of congestion, as vehicles utilize US 301, Gibsonton Drive, or Symmes Road.
- **Corridors such as US 41, US 301, Gibsonton Drive, Symmes Road, and East Bay Road experience high V/C ratios, intersection delays along these corridors are relatively low.** This can be attributed to several factors:
  - In the areas of high V/C ratios along Symmes Road and East Bay Road, the intersections are either minor street stop-controlled or roundabouts. The roundabouts are at locations where there is little interaction between conflicting movements, which allow for a better flow of vehicles through the intersection. This means that **even though there is a high volume of vehicles utilizing Symmes Road and East Bay Road, the intersections that act as endpoints are able to accommodate the volume efficiently**, without causing high delays at the intersections.
  - **The signals along Gibsonton Drive, US 41, and US 301 are timed to provide high green time to the major approaches** to minimize the delay experienced by the high volume through movements. While the **minor approaches along these arterials experience high levels of delay**, this does not adversely affect the overall intersection delay significantly, due to their low volumes. This creates a scenario where corridors that experience high volumes in one direction are able to manage the flow of vehicles. Problems begin to occur at locations when multiple high volume conflicting movements interact, such as at the northbound I-75 on ramp and the Gibsonton Drive/Fern Hill Drive intersection.
- Congestion observed under the existing signalized intersection configuration at the Symmes Rd/East Bay Rd intersection is largely addressed by the E+C roundabout improvement project.

Figure 16. Existing + Committed Volume to Capacity (V/C) Ratio, AM Peak

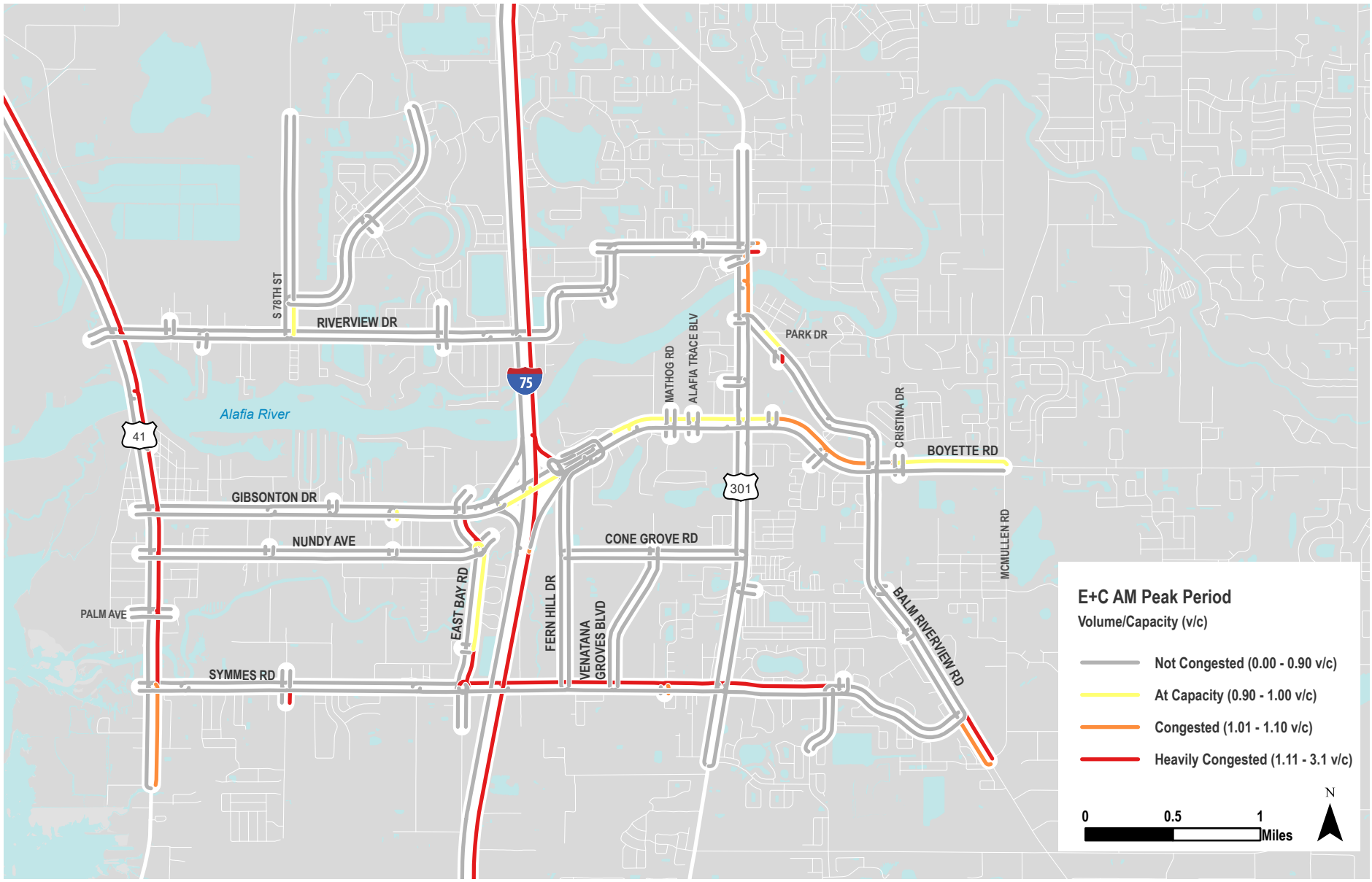


Figure 17. Existing + Committed Volume to Capacity (V/C) Ratio, PM Peak

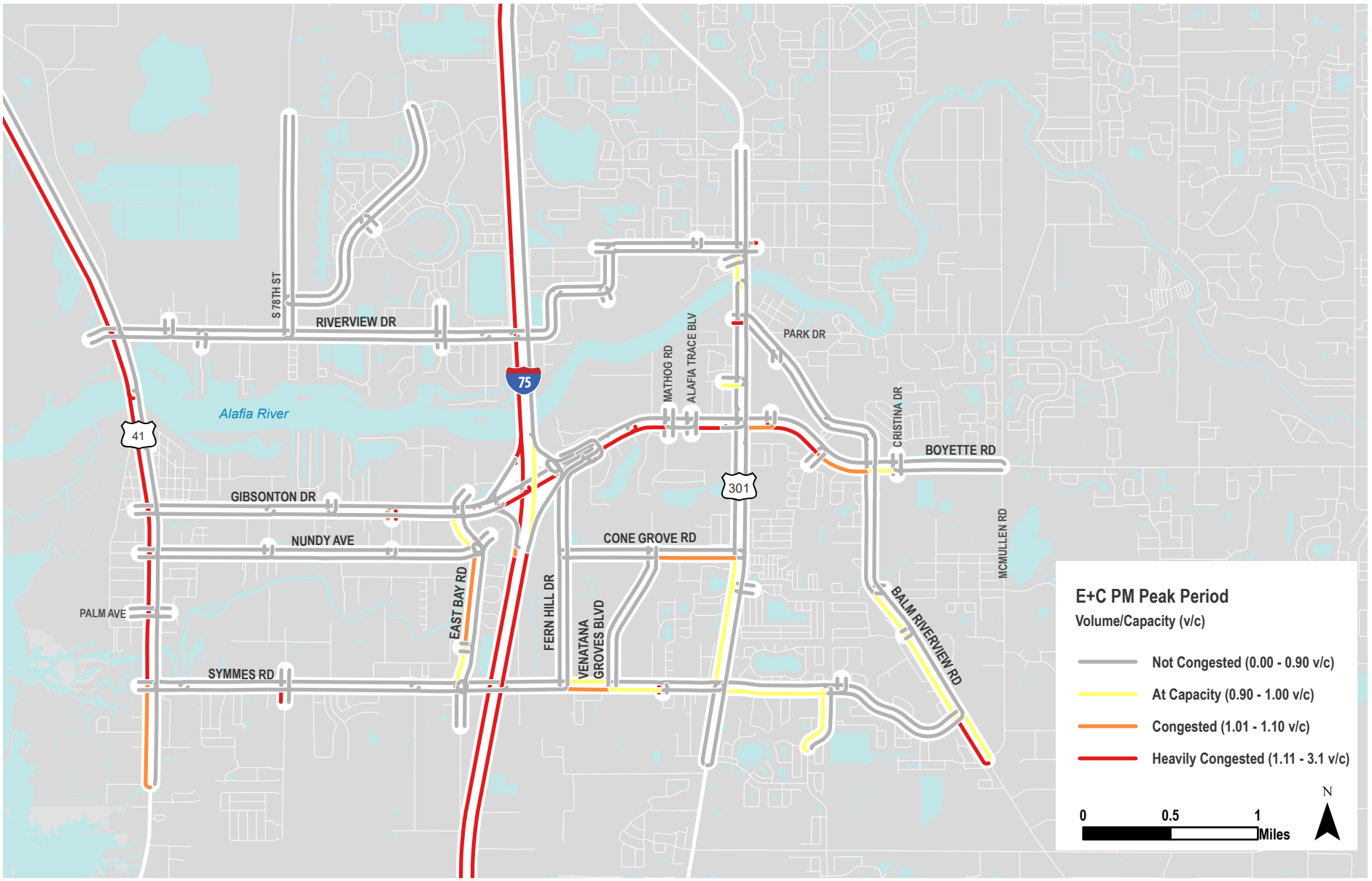


Table 2. Existing + Committed Network Intersection Delay, AM and PM Peak

Intersection	Eastbound Delay		Westbound Delay		Northbound Delay		Southbound Delay		Overall Intersection Delay	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
US 41/Symmes Rd	16.3	31.8	20.1	28.0	11.8	8.0	7.8	9.2	13.4	10.9
US 41/Palm Ave	0.0	2.4	34.9	31.2	7.3	6.2	4.3	3.2	7.2	5.0
US 41/Nundy Ave*	5.1	5.9	5.6	6.1	0.0	0.0	7.8	5.2	1.5	1.0
US 41/Gibsonton Dr-Alice Ave	67.7	77.9	24.7	44.8	13.4	11.9	8.5	8.6	14.3	13.5
US 41/Riverview Dr-Industrial Access Rd	47.0	42.2	61.8	64.5	7.1	4.2	12.8	18.5	15.8	20.4
Symmes/East Bay (E+C)**	1.3	1.9	1.6	1.0	2.0	2.8	1.9	2.9	0.8	0.8
US 301/Symmes Rd	71.1	82.5	59.2	54.9	31.8	33.4	37.2	32.3	42.6	40.4
Balm Riverview Rd/Symmes Rd*	9.1	7.2	-	-	1.2	1.8	2.6	2.8	3.4	3.2
Nundy Ave/East Bay Rd**	1.6	3.8	0.0	0.0	4.7	2.0	0.8	1.6	1.1	0.8
Gibsonton Dr/New East Bay-Old Gibsonton Dr	23.1	18.5	18.7	19.1	6.6	5.0	27.7	44.6	15.8	18.3
SB I-75/Gibsonton Dr Ramp Terminal	21.3	31.5	16.0	33.7	-	-	31.6	27.7	22.5	30.4
NB I-75/Gibsonton Dr Ramp Terminal*	20.2	18.7	15.7	5.1	7.4	15.5	-	-	8.9	3.7
Gibsonton Dr/Old Gibsonton Dr-Fern Hill Dr (E+C)	24.0	18.2	42.9	22.7	82.4	41.2	14.3	37.6	39.8	21.1
Gibsonton Dr/Mathog Rd	6.9	9.4	1.9	4.1	39.8	26.6	86.3	87.4	5.7	9.3
Gibsonton Dr/Park Place Ave-Alafia Trace Blvd	3.9	4.4	3.4	11.0	98.9	95.8	71.5	80.0	7.3	10.5
US 301/Gibsonton Dr	60.6	46.2	37.2	41.6	49.2	66.0	39.9	70.7	45.7	57.1
Boyette Rd/Balm Riverview Rd	11.6	17.3	8.3	7.7	62.2	56.2	42.5	53.0	21.4	23.1
Boyette Rd/Cristina Dr	2.9	2.4	8.4	6.2	63.5	59.9	0.0	0.0	7.6	4.3
US 301/Balm Riverview Rd	47.7	61.6	1.3	1.1	11.3	4.8	10.8	11.7	10.0	9.6
US 301/Riverview Dr (E+C)	40.9	26.3	58.4	55.4	18.6	16.3	22.4	28.2	24.9	27.8

**Approach delay of the uncontrolled approach is taken as the left-turn delay*

***Roundabout controlled intersections follow unsignalized delay thresholds*

Seconds of Delay (Signalized Intersections)

0-10	10-20	20-35	35-55	>55

Seconds of Delay (*Unsignalized Intersections)

0-10	10-15	15-25	25-35	>35

No Approach Present

Figure 18. Existing + Committed Intersection Delay, AM Peak

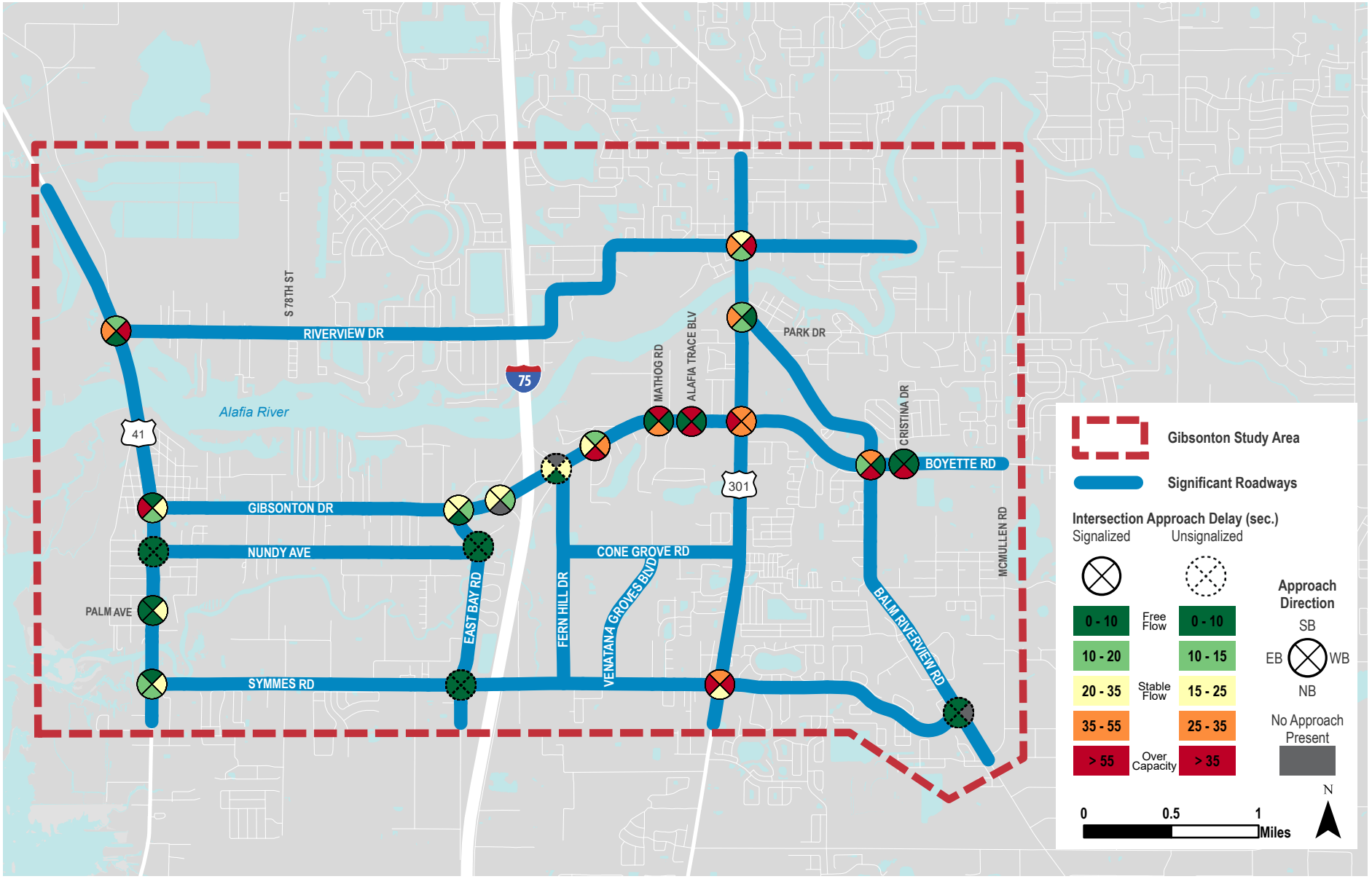


Figure 19. Existing + Committed Intersection Delay, PM Peak

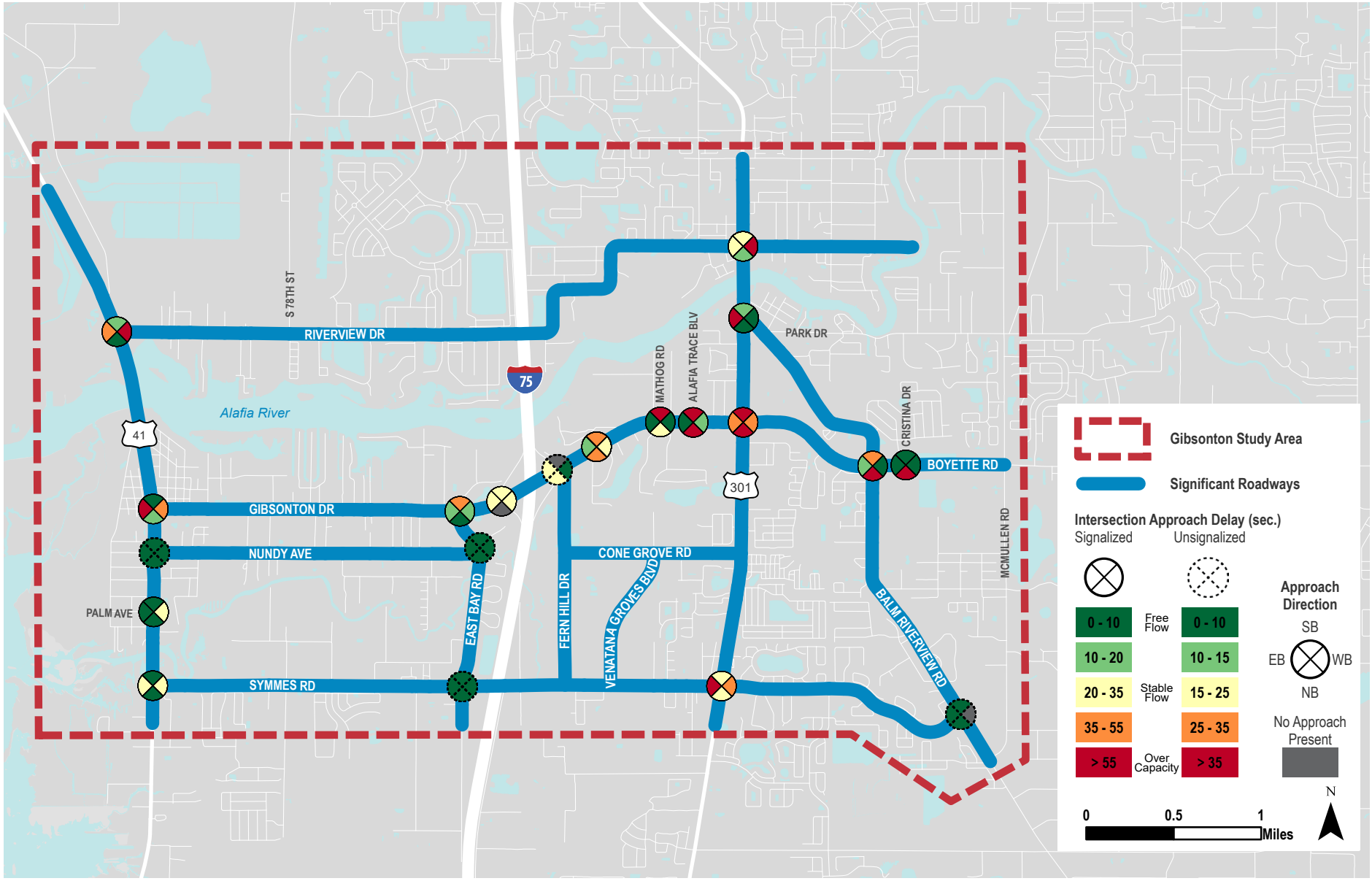
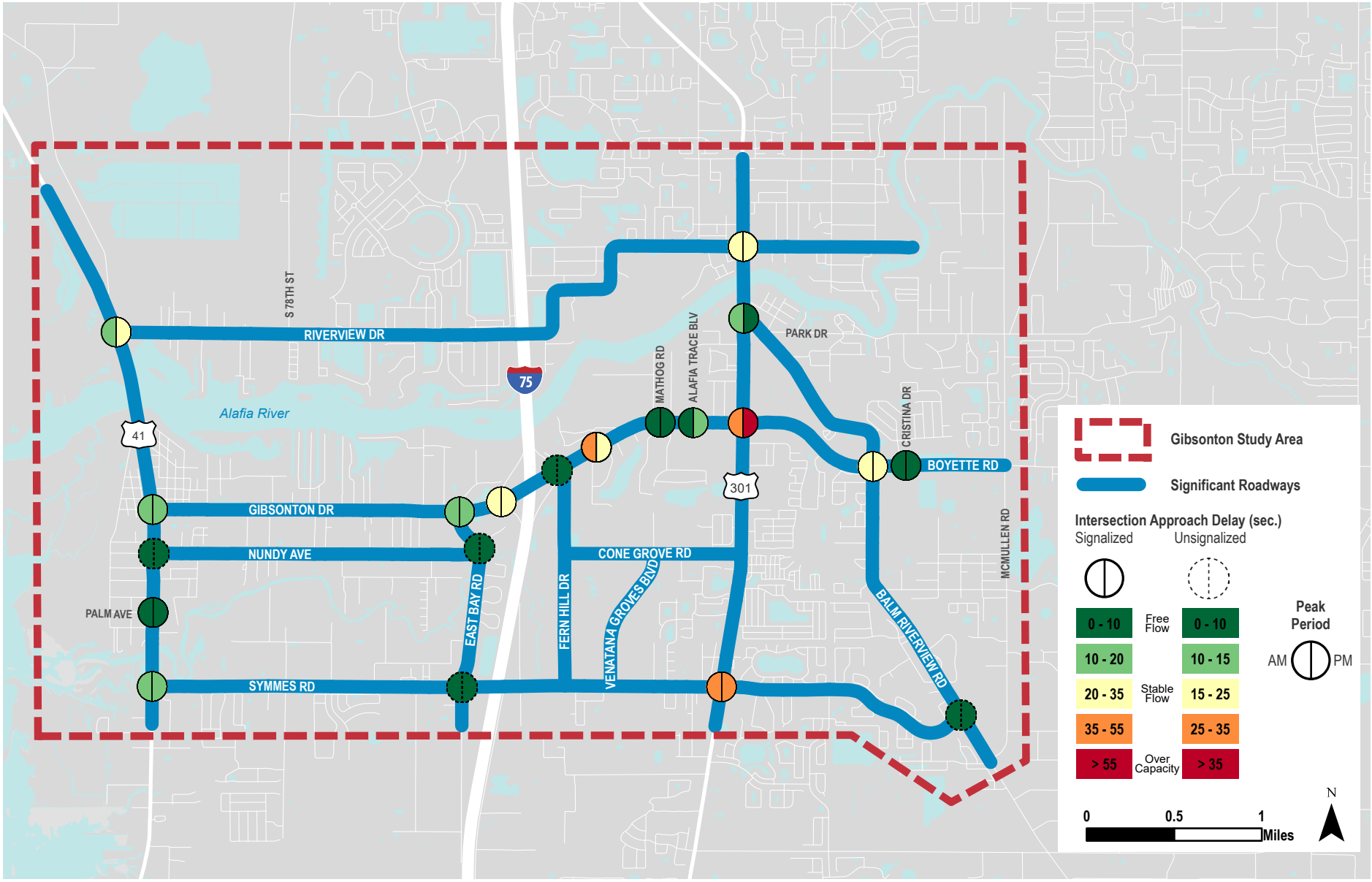


Figure 20. Existing + Committed Overall Intersection Delay, AM and PM Peak



4. NETWORK ALTERNATIVES ANALYSIS

4.1 Improvement Projects

Based on a review of the E+C Model results and existing conditions and discussions with Hillsborough County, FDOT, and Hillsborough MPO staff, the study team developed a list of potential improvement projects. These potential projects included improvements related to increased roadway capacity/lanes, intersection geometry improvements, and new roadway corridors. Given the current pattern of development and concerns for right-of-way limits and property impacts, the study area has limited potential for new corridors and significant roadway widening projects. Additionally, to address existing issues within the study area, near-termimprovements that would improve existing conditions were considered in favor of longer term projects.

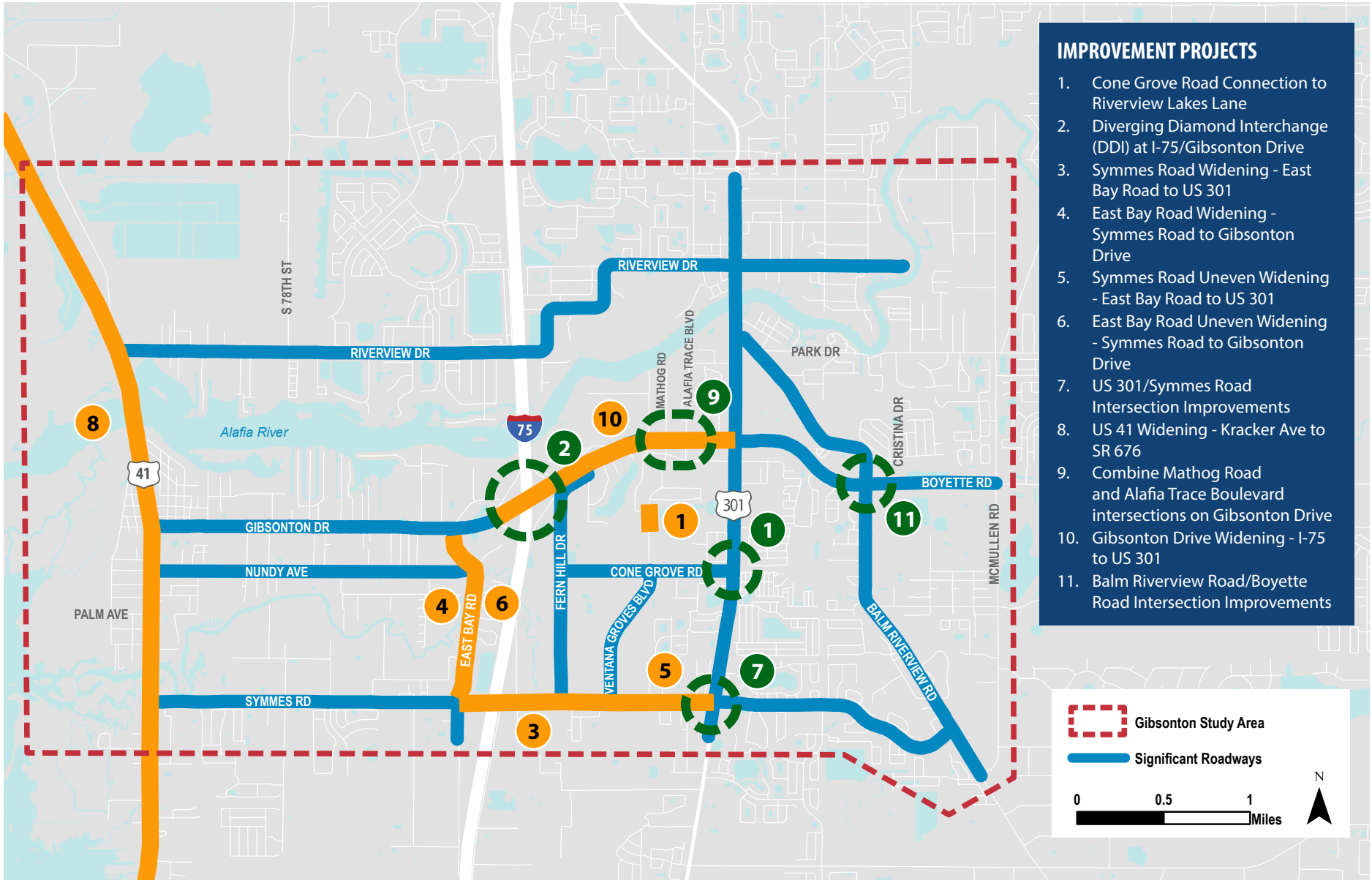
Each of the improvement projects were developed to address a specific issue or need identified in the existing conditions review and findings from the E+C Model outputs. The summary of each of these projects shown in Figure 21 is provided in Table 3.

While not included in the modeling effort, the 2007 *Gibsonton Community Plan* prepared as part of the *Hillsborough County Comprehensive Plan* recommended the designation of Gibsonton Drive from US 41 to East Bay Road as the area's "Signature Corridor" or "Main Street." The Community Plan proposed converting the roadway median along Gibsonton Drive into a landscaped median, developing and carrying out a landscaping concept including special paving and identifying the north-south greenway crossing at Gibsonton Elementary School. center bi-directional turning lane, which had been converted to a landscaped median with turn lanes. The proposed project would reduce Gibsonton Drive in this segment from four to two lanes for the entire length. The bi-directional turning lanes would be replaced with medians and separate left-turn lanes.

Table 3. Potential Improvement Project Summary

Improvement Project	Description of Improvement	Issue Addressing
1. Cone Grove Road Connection to Riverview Lakes Lane	New two lane roadway connection between Cone Grove Road and Riverview Lakes Lane dead ends. Northbound left-turn access to Cone Grove Road at US 301.	Provides an additional north-south roadway between Symmes Road and Gibsonton Drive. Provides access to Cone Grove Road from northbound US 301.
2. Diverging Diamond Interchange (DDI) at I-75/Gibsonton Drive *(FDOT Project Status: Design is scheduled for 2025))*	Provide a DDI at the I-75/Gibsonton Drive interchange. Provides a crossing maneuver at the two ramp terminals, which will be converted to two-phase signals.	The new two-phase signals will reduce delay at the ramp terminals. Will allow for smoother operations in the AM peak period at the northbound I-75 ramp terminal, which currently creates delay and queuing shockwaves along westbound Gibsonton Drive.
3. Symmes Road Widening - East Bay Road to US 301	Widen from two to four lanes for entire length of corridor.	Addresses congestion on Symmes Road, especially in the AM peak period.
4. East Bay Road Widening - Symmes Road to Gibsonton Drive	Widen from two to four lanes for entire length of corridor.	Addresses congestion on East Bay Road, especially in the AM peak period.
5. Symmes Road Uneven Widening - East Bay Road to US 301	Widen westbound lanes from one to two for entire length of corridor.	Addresses congestion associated with AM travel.
6. East Bay Road Uneven Widening - Symmes Road to Gibsonton Drive	Widen northbound lanes from one to two for entire length of corridor.	Addresses congestion associated with AM travel.
7. US 301/Symmes Road Intersection Operational Improvements	Update the signal timing to improve the delay of the minor approaches, while encouraging the northbound through movement.	Addresses congestion observed at this intersection, especially on the east and westbound directions.
8. US 41 Widening - Kracker Ave to SR 676 *(FDOT Project Status: PD&E study complete; design not yet underway*	Widen from four lanes to six lanes for entire length of corridor.	Addresses congestion on US 41.
9. Combine Mathog Road and Alafia Trace Boulevard intersections on Gibsonton Drive	Provide a connection between Mathog Road and Alafia Trace Boulevard, north of Gibsonton Drive. Remove one of the signalized intersection. Geometry changes at remaining signalized intersection.	Reduces the number of signalized intersection on Gibsonton Drive to promote improved flow. Intersection geometry improvements needed to coincide with Cone Grove Road Connection.
10. Gibsonton Widening - I-75 to US 301	Widen from four lanes to six lanes for entire length of corridor.	Addresses congestion on Gibsonton Drive. Coincides with DDI improvement.
11. Balm Riverview Road/Boyette Road Intersection Operational Improvement	Improvement to allow for better northbound through progression in the AM peak period and eastbound right progression in the PM peak period.	Addresses congestion on Balm Riverview Road and Boyette Road.

Figure 21. Improvement Projects



4.2 Alternative Sets

In coordination with Hillsborough County staff, three alternative sets were developed using combinations of the 11 improvement projects previously identified. All of the alternative sets include the E+C projects as part of the base conditions. These alternative sets were coded into separate Aimsun models and compared against the E+C model results. Table 4 provides a comparison of the improvement projects used in each of the alternative sets. Figures 22 through 24 graphically show the improvements included in each alternative set. The roadway segments with proposed capacity related projects are highlighted in orange and intersection improvement projects are circled in green on the figures.

Table 4. Alternative Sets Project Lists

Improvement Project	E+C	Alt 1	Alt 2	Alt 3
1. Cone Grove Road Connection to Riverview Lakes Lane	-	-	✓	✓
2. Diverging Diamond Interchange (DDI) at I-75/Gibsonton Drive	-	✓	✓	✓
3. Symmes Road Widening - East Bay Road to US 301	-	-	-	-
4. East Bay Road Widening - Symmes Road to Gibsonton Drive	-	-	-	-
5. Symmes Road Uneven Widening - East Bay Road to US 301	-	-	-	-
6. East Bay Road Uneven Widening - Symmes Road to Gibsonton Drive	-	-	-	-
7. US 301/Symmes Road Intersection Operational Improvements	-	-	-	✓
8. US 41 Widening - Kracker Ave to SR 676	-	✓	✓	✓
9. Combine Mathog Road and Alafia Trace Boulevard intersections on Gibsonton Drive	-	-	✓	✓
10. Gibsonton Drive Widening - I-75 to US 301	-	✓	✓	✓
11. Balm Riverview Road/Boyette Road Intersection Operational Improvements	-	-	-	✓

Figure 22. Alternative Set 1 Projects

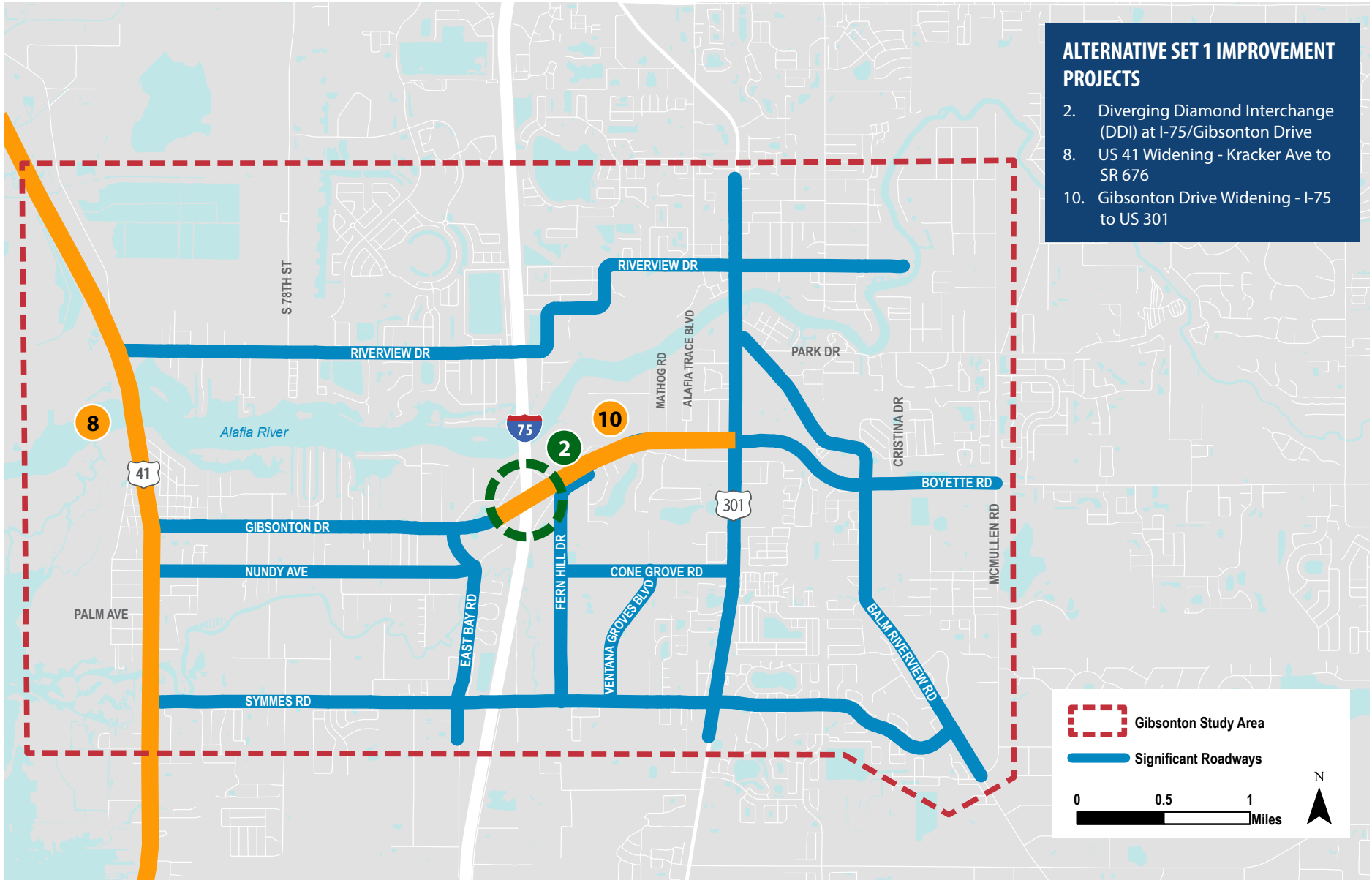


Figure 23. Alternative Set 2 Projects

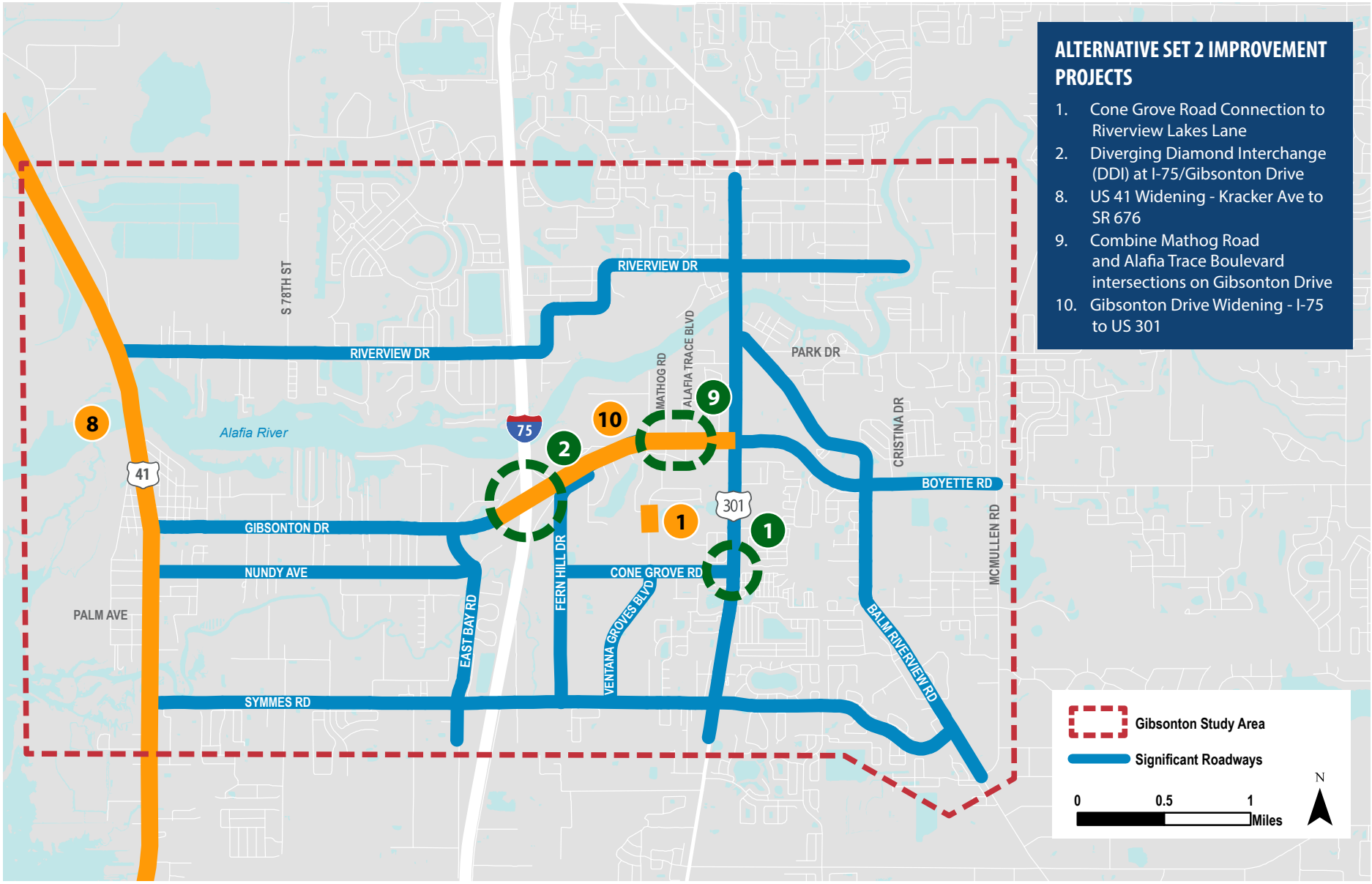
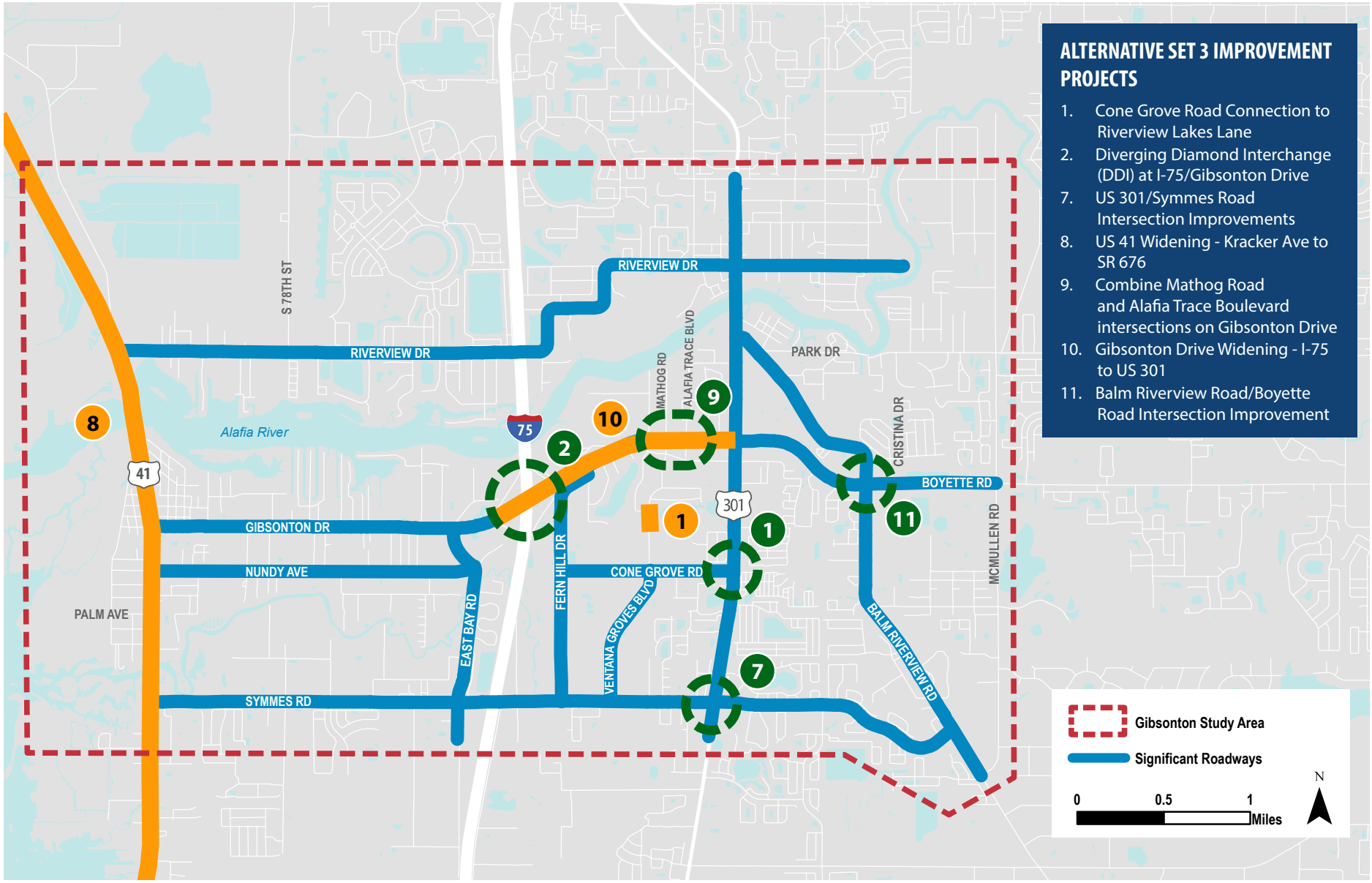


Figure 24. Alternative Set 3 Projects



4.3 Network Performance of Each Alternative Set

Similar to the analysis completed for the E+C Model, the volume to capacity (V/C) ratios and approach and overall intersection delays were calculated for the AM and PM peak periods for each of the alternative sets. Table 5 provides a summary of the findings for each of the alternative sets. Detailed results for Alternative 1 are shown in Figures 25 to 29 and Table 6. Detailed results for Alternative 2 are shown in Figures 30 to 34 and Table 7. Detailed results for Alternative 3 are shown in Figures 35 to 39 and Table 8.

Generally, the results show that individual projects included in all of the alternatives provide a benefit in some way, without causing a corresponding detriment on another roadway. In all alternatives during the AM peak period, Symmes Road continues to be congested in the westbound direction between US 301 and East Bay Road. However, Alternatives 2 and 3, see a shift in approximately 350 vehicles from Symmes Road to other roadways such as Gibsonton Drive and Cone Grove Road, the latter having new northbound left access from US 301 under these two alternatives. The remaining vehicles travelling westbound on Symmes Road in the AM peak period are destined for areas west of I-75, such as US 41 or various neighborhoods and businesses.

Delay results are similar between all three results, with the exception of the US 301/Symmes Road and Boyette Road/Balm Riverview Road intersections, and the Mathog Road and Alafia Trace Boulevard intersections along Gibsonton. Minor signal timing adjustments, along with the combining of the two closely spaced intersections on Gibsonton, result in some delay improvements on the approaches with the highest delays in the E+C Model.

Table 5. Alternative Set Comparison Project Summary

Alternative Set	Issues Addressed	Model Results
Alternative Set 1	Addresses congestion on US 41 and Gibsonton Drive, while also improving access to northbound I-75.	**Additional capacity on US 41 and Gibsonton Drive reduces these heavily congested roadways to uncongested levels.** In the AM peak period, the additional capacity on Gibsonton Drive draws some traffic away from the Symmes Road-East Bay Road route, but not enough to reduce congestion on Symmes Road and East Bay Road to uncongested levels. **Overall intersection delay is generally improved, especially along Gibsonton Road,** partly due to providing updated signal timing to reduce side street delay.
Alternative Set 2	Addresses congestion on US 41 and Gibsonton Drive, while also improving access to northbound I-75. New local road connections provide additional routes for vehicles exhibiting delay along major roadways.	**Providing an additional connection between Cone Grove Road and Gibsonton Drive,** as well as provding a northbound left turn access from US 301 to Cone Grove Road, r**emoves a small amount of vehicles away from Symmes Road.** However, **Symmes Road continues to experience high volumes**. Combining the Mathog Road and Alafia Trace Boulevard intersections does not diminish operations of the combined intersection.
Alternative Set 3	Addresses congestion on US 41 and Gibsonton Drive, while also improving access to northbound I-75. New local road connections provide additional routes for vehicles exhibiting delay along major roadways.	**Provides similar results to Alternative Set 2.** Improvements to the US 301/Symmes Road and Gibsonton Drive/Balm Riverview Road signal timing plans improves the approach delays to more acceptable levels, but does not improve the overall imtersection delay compared to Alternative Set 2.

Figure 25. Alternative Set 1 Volume to Capacity (V/C) Ratio, AM Peak

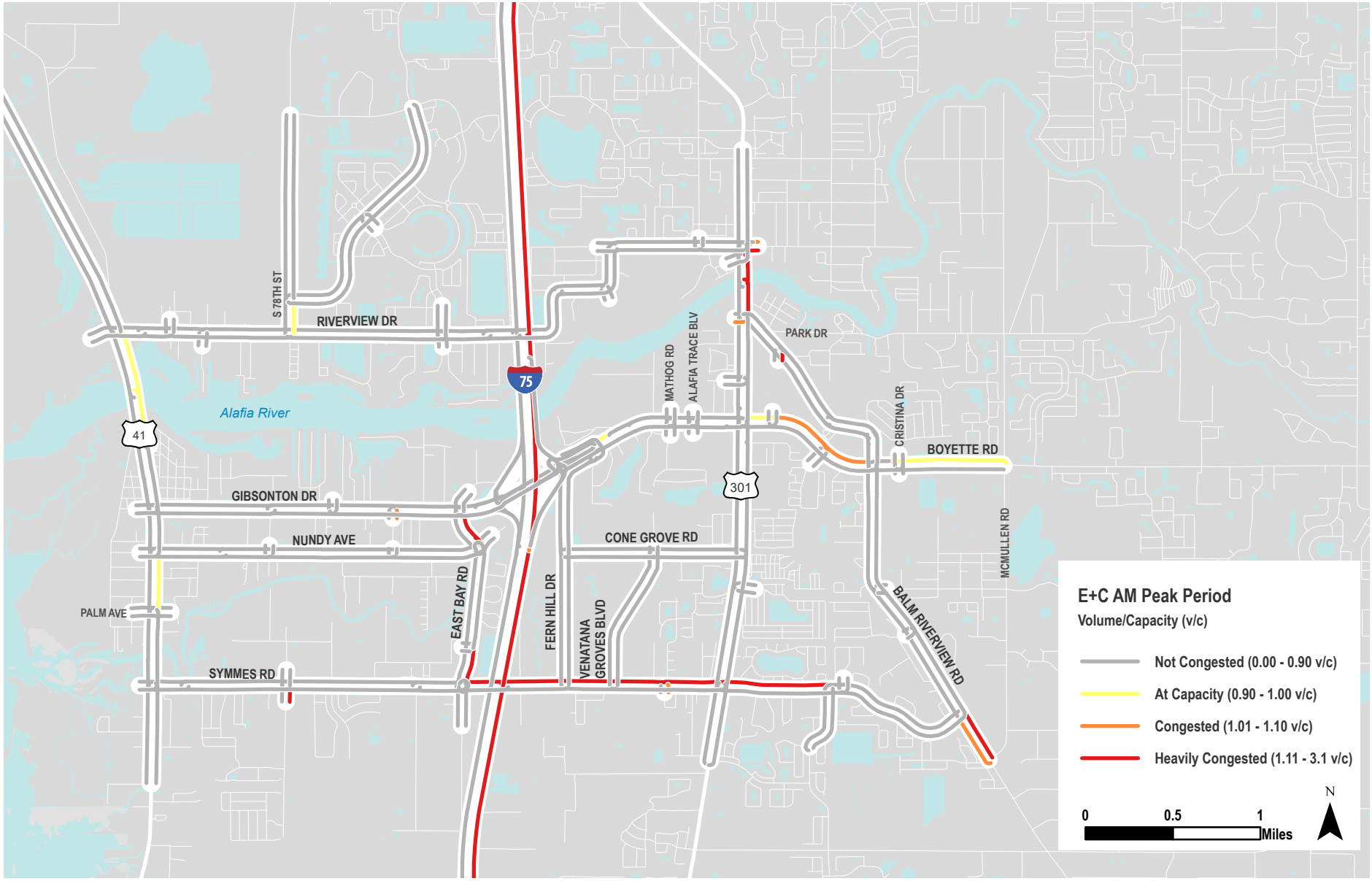


Figure 26. Alternative Set 1 Volume to Capacity (V/C) Ratio, PM Peak

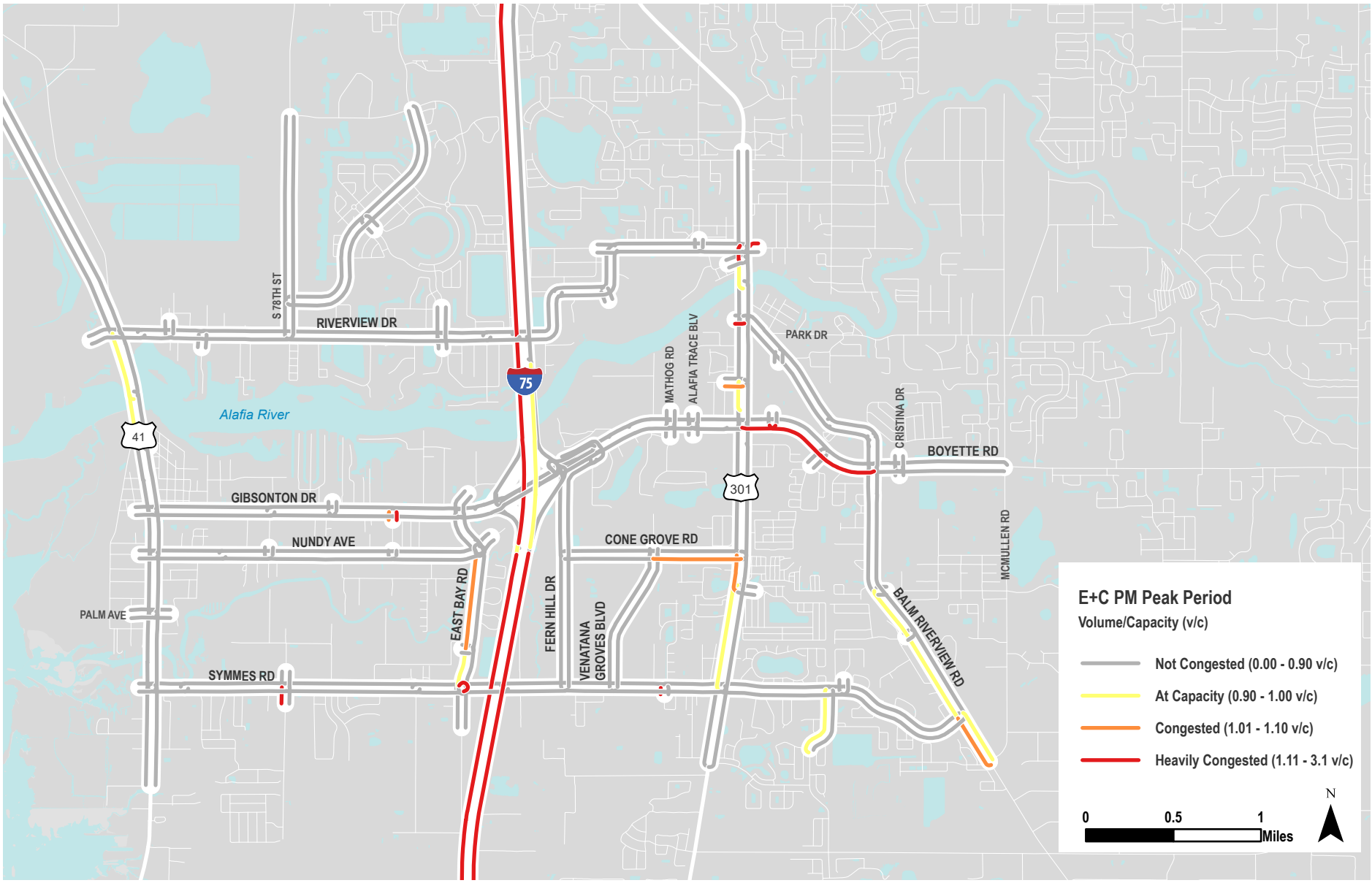


Table 6. Alternative Set 1 Network Intersection Delay, AM and PM Peak

Intersection	Eastbound Delay		Westbound Delay		Northbound Delay		Southbound Delay		Overall Intersection Delay	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
US 41/Symmes Rd	47.2	42.3	18.1	30.0	10.8	19.8	17.7	24.5	14.8	24.1
US 41/Palm Ave	52.8	64.4	37.8	31.8	6.2	11.4	4.7	4.1	6.7	7.5
US 41/Nundy Ave*	6.6	0.0	0.9	1.2	1.5	0.0	5.8	5.6	1.1	0.8
US 41/Gibsonton Dr-Alice Ave	72.8	75.6	35.4	50.4	18.0	19.4	19.8	21.8	21.9	25.6
US 41/Riverview Dr-Industrial Access Rd	46.6	42.7	46.5	63.4	4.8	4.8	14.2	19.6	12.3	21.4
Symmes/East Bay (E+C)**	1.3	1.5	1.8	1.1	1.8	2.0	2.7	2.6	0.8	0.7
US 301/Symmes Rd	61.9	77.4	40.6	50.7	29.0	31.5	32.8	26.5	35.4	35.0
Balm Riverview Rd/Symmes Rd*	7.1	8.1	-	-	3.9	4.3	2.4	2.3	2.8	2.9
Nundy Ave/East Bay Rd**	2.0	3.1	4.6	1.3	2.9	1.5	0.7	1.7	0.7	0.8
Gibsonton Dr/New East Bay-Old Gibsonton Dr	25.2	20.4	19.9	17.6	3.3	2.8	38.6	43.5	17.6	18.5
SB I-75/Gibsonton Dr Ramp Terminal	24.8	35.7	8.7	5.5	-	-	21.6	24.5	18.8	21.7
NB I-75/Gibsonton Dr Ramp Terminal*	21.4	24.2	22.0	26.9	18.2	19.3	-	-	10.0	16.2
Gibsonton Dr/Old Gibsonton Dr-Fern Hill Dr (E+C)	5.1	4.1	22.5	30.0	60.7	27.1	4.0	11.7	18.0	13.9
Gibsonton Dr/Mathog Rd	5.2	8.2	15.4	17.6	47.4	45.0	57.9	53.8	13.5	13.4
Gibsonton Dr/Park Place Ave-Alafia Trace Blvd	4.3	1.2	9.7	8.6	29.1	37.9	52.7	48.6	9.6	5.9
US 301/Gibsonton Dr	43.1	37.8	32.6	30.5	40.9	46.6	45.1	42.1	40.3	40.0
Boyette Rd/Balm Riverview Rd	10.4	10.6	8.3	6.7	62.5	63.5	38.8	55.8	20.2	17.1
Boyette Rd/Cristina Dr	2.8	1.2	8.5	5.9	79.2	60.5	0.0	0.0	8.2	3.7
US 301/Balm Riverview Rd	46.7	56.9	0.6	1.1	17.3	14.5	8.2	9.8	11.8	11.5
US 301/Riverview Dr (E+C)	37.8	25.0	56.3	55.2	18.6	17.4	22.3	28.9	24.2	28.3

**Approach delay of the uncontrolled approach is taken as the left-turn delay*

***Roundabout controlled intersections follow unsignalized delay thresholds*

Seconds of Delay (Signalized Intersections)

0-10	10-20	20-35	35-55	>55

Seconds of Delay (*Unsignalized Intersections)

0-10	10-15	15-25	25-35	>35

No Approach Present

Figure 27. Alternative Set 1 Intersection Delay, AM Peak

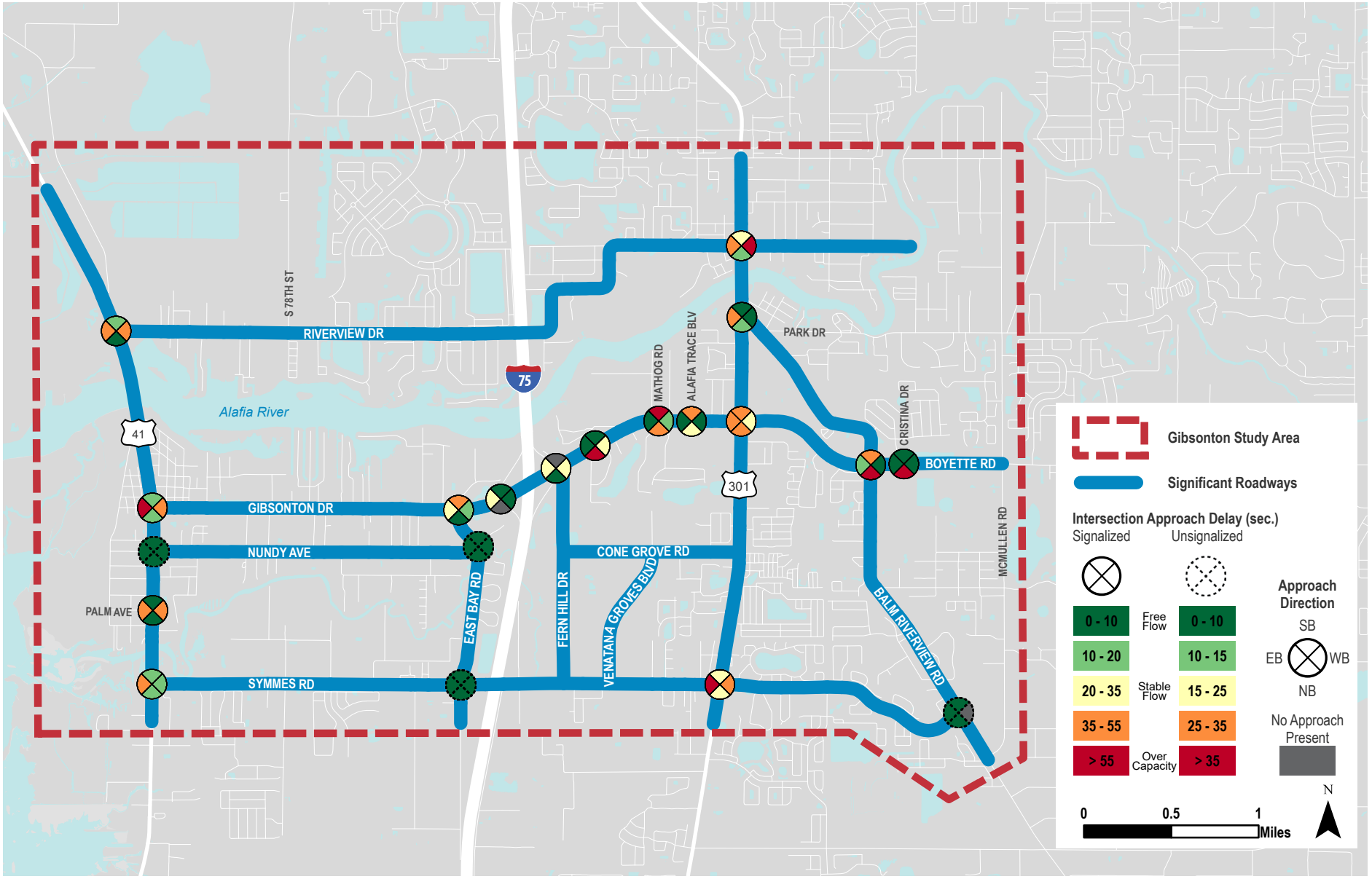


Figure 28. Alternative Set 1 Intersection Delay, PM Peak

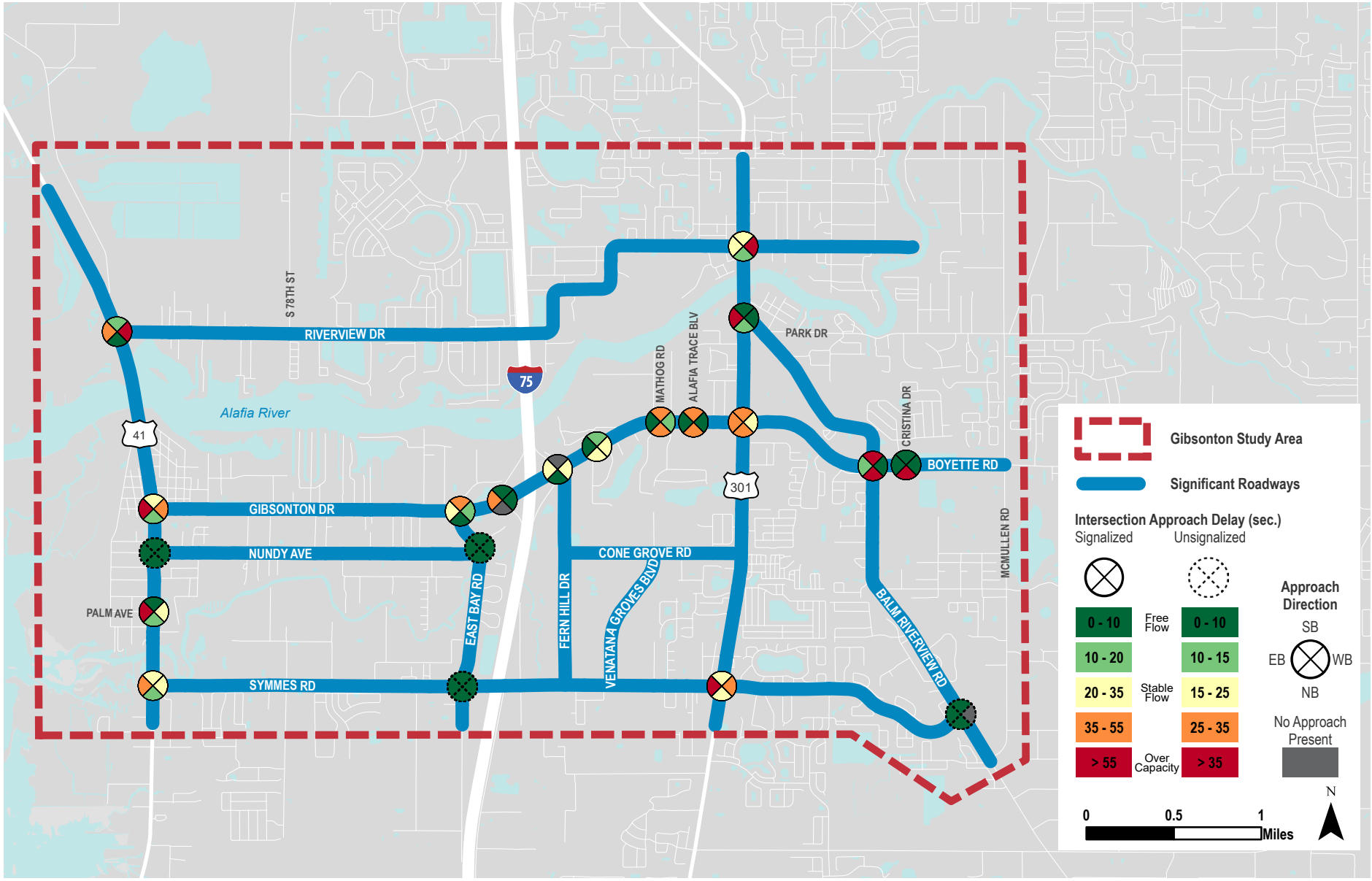


Figure 29. Alternative Set 1 Overall Intersection Delay, AM and PM Peak

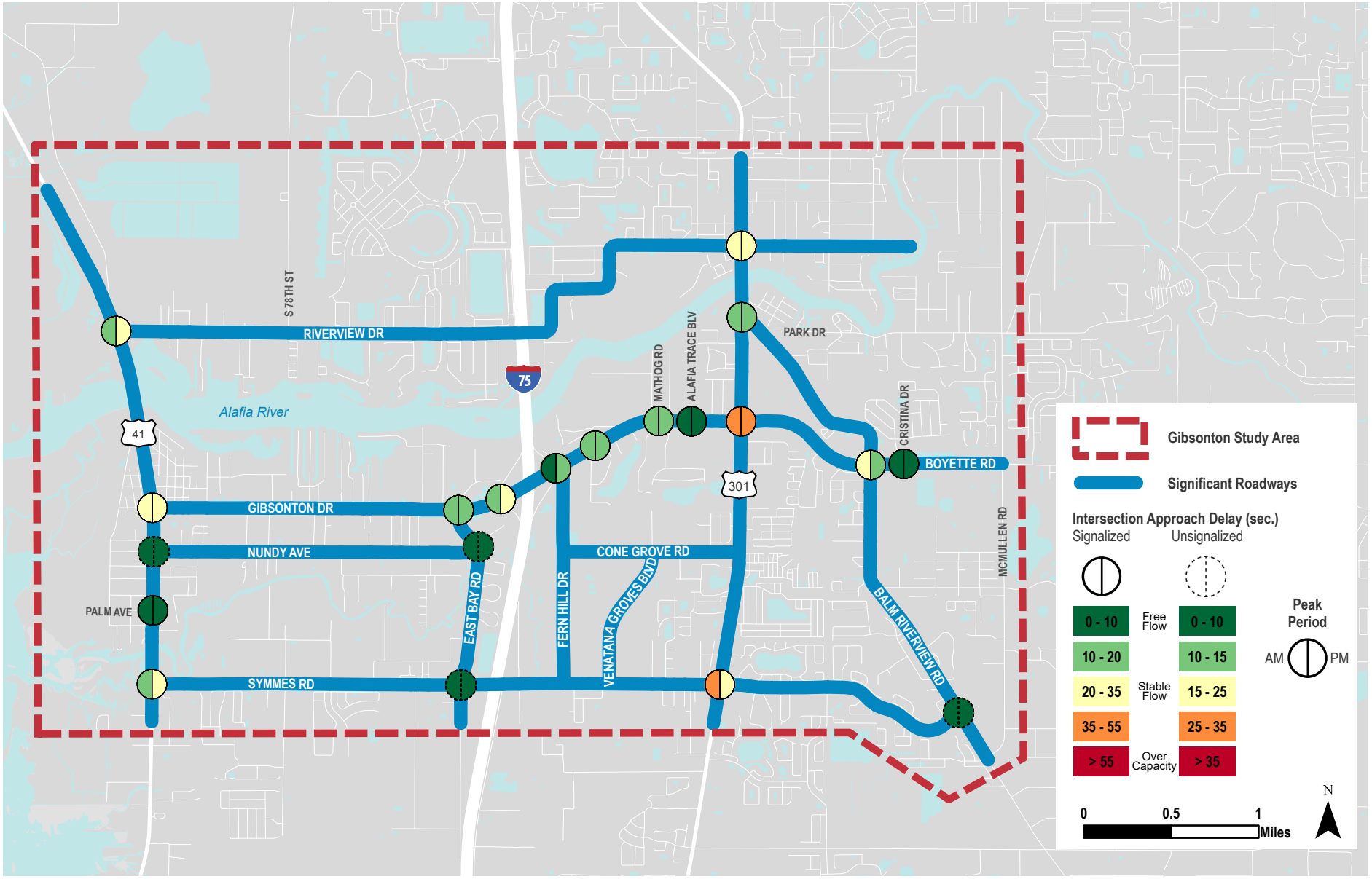


Figure 30. Alternative Set 2 Volume to Capacity (V/C) Ratio, AM Peak

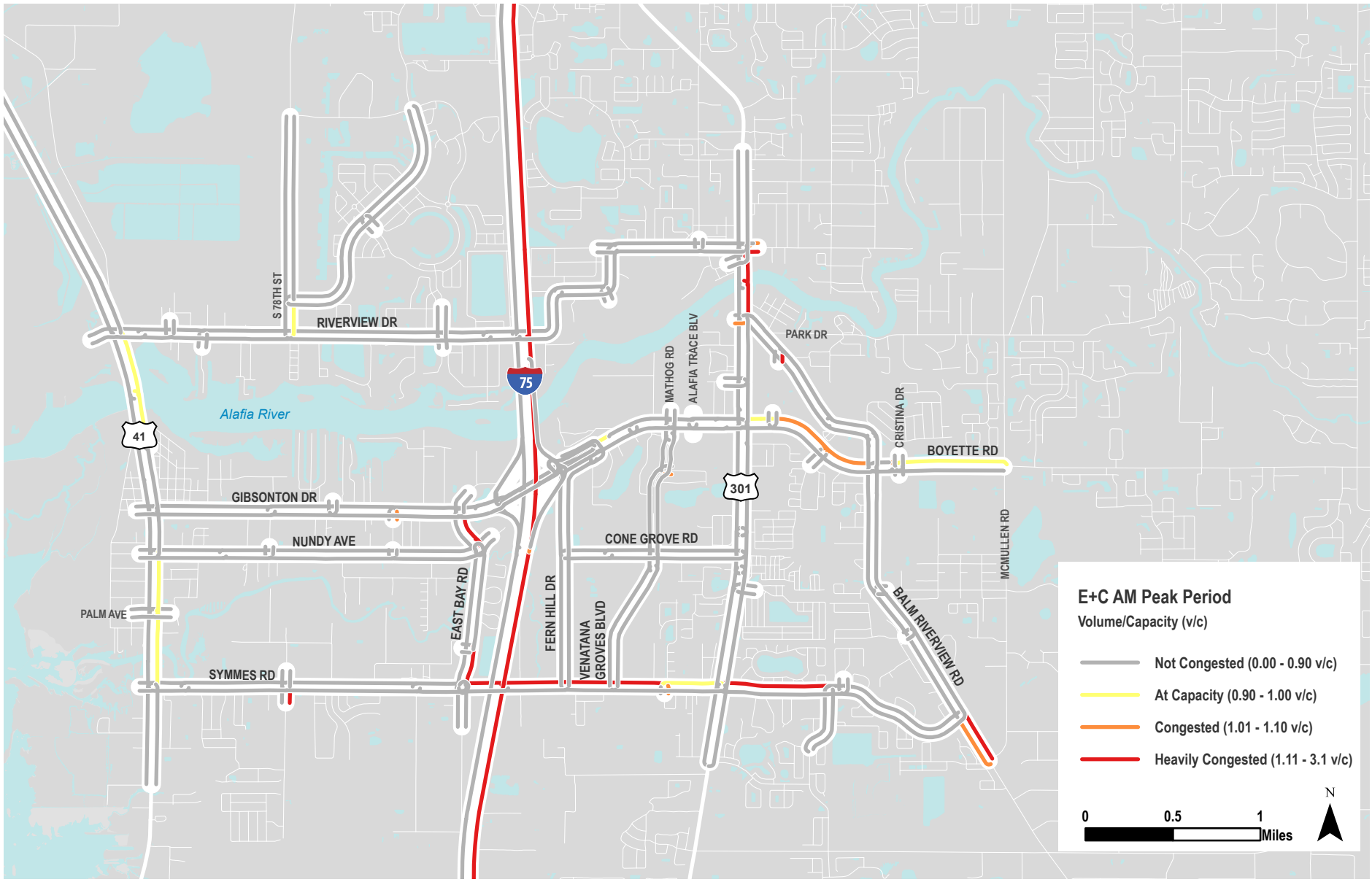


Figure 31. Alternative Set 2 Volume to Capacity (V/C) Ratio, PM Peak

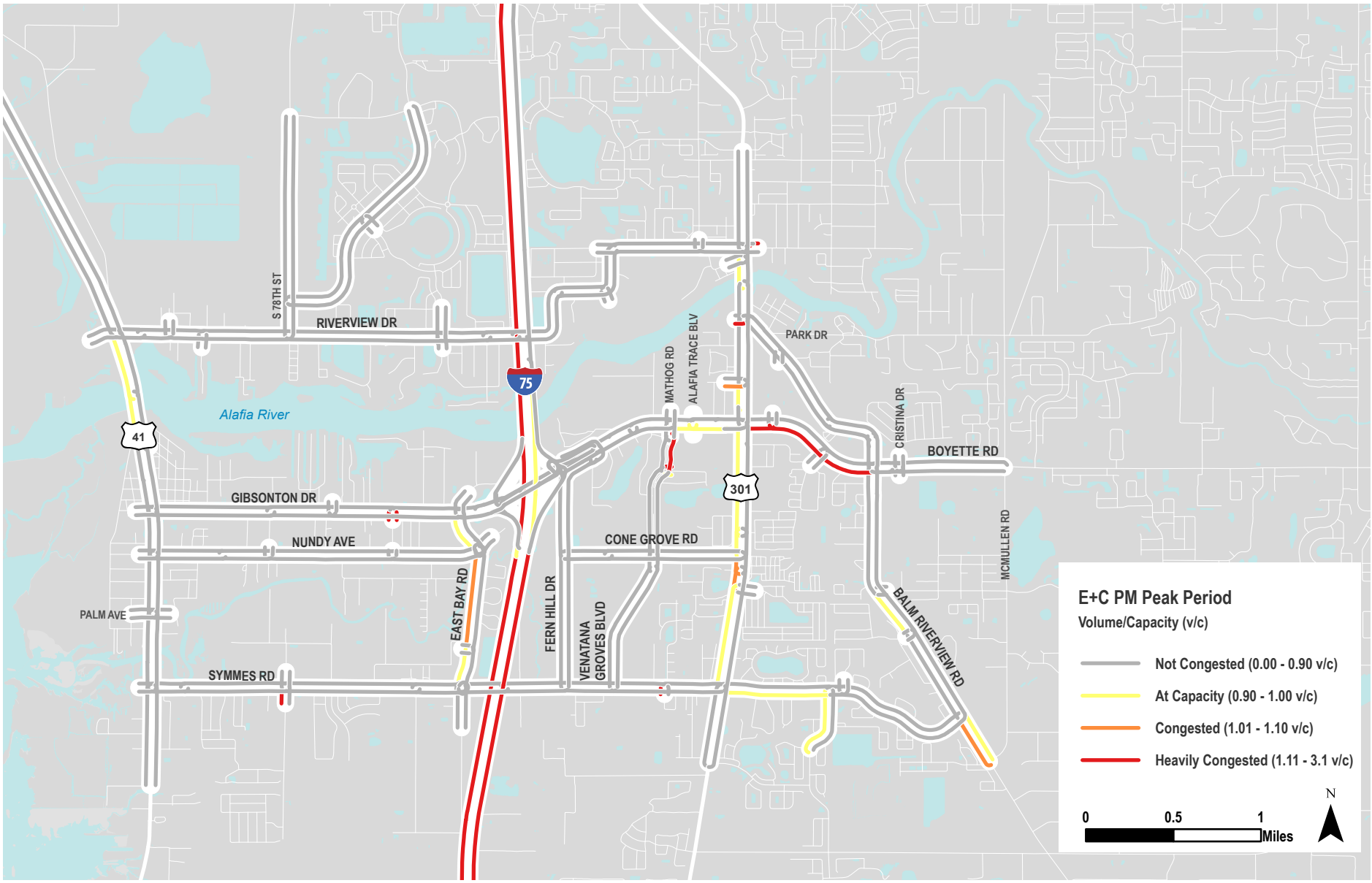


Table 7. Alternative Set 2 Network Intersection Delay, AM and PM Peak

Intersection	Eastbound Delay		Westbound Delay		Northbound Delay		Southbound Delay		Overall Intersection Delay	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
US 41/Symmes Rd	47.8	42.7	18.6	27.6	10.8	19.8	16.7	24.4	14.6	23.8
US 41/Palm Ave	49.4	52.5	38.0	30.0	6.3	10.4	4.0	4.2	6.7	7.0
US 41/Nundy Ave*	5.9	0.0	1.6	1.2	0.0	0.0	6.1	3.3	1.0	0.8
US 41/Gibsonton Dr-Alice Ave	72.3	73.2	34.6	52.2	18.2	19.9	19.5	21.9	22.0	26.0
US 41/Riverview Dr-Industrial Access Rd	46.9	42.8	45.6	63.9	4.6	4.7	14.1	19.6	12.0	21.4
Symmes/East Bay (E+C)**	1.2	1.3	1.8	1.1	2.2	1.7	2.4	2.8	0.8	0.7
US 301/Symmes Rd	57.6	61.5	38.5	50.7	27.4	30.8	29.4	26.8	33.0	33.4
Balm Riverview Rd/Symmes Rd*	8.8	7.4	-	-	3.6	4.3	2.4	2.4	3.1	2.9
Nundy Ave/East Bay Rd**	2.2	3.0	3.9	1.7	3.4	1.5	0.7	1.8	0.8	0.8
Gibsonton Dr/New East Bay-Old Gibsonton Dr	25.3	20.5	19.8	19.2	3.4	2.0	38.8	46.9	17.4	19.0
SB I-75/Gibsonton Dr Ramp Terminal	23.8	34.5	11.0	10.8	-	-	21.6	24.5	18.8	22.3
NB I-75/Gibsonton Dr Ramp Terminal*	21.3	24.0	19.1	22.4	17.9	19.3	-	-	9.6	15.3
Gibsonton Dr/Old Gibsonton Dr-Fern Hill Dr (E+C)	5.3	4.2	27.4	28.7	52.4	37.1	8.9	23.9	21.0	13.7
Gibsonton Dr/Mathog Rd-Alafia Trace Blvd	4.6	6.8	15.6	16.5	29.7	12.4	56.2	52.5	14.5	12.4
US 301/Gibsonton Dr	40.5	31.5	32.6	29.7	40.8	45.6	45.6	41.9	40.0	37.4
Boyette Rd/Balm Riverview Rd	10.5	10.7	8.1	7.0	62.5	64.1	44.6	47.4	19.9	17.3
Boyette Rd/Cristina Dr	2.6	0.6	8.5	6.2	77.9	60.9	0.0	0.0	8.0	3.4
US 301/Balm Riverview Rd	40.2	59.4	0.7	1.1	16.8	14.8	8.6	9.8	11.6	11.7
US 301/Riverview Dr (E+C)	38.9	24.5	56.9	55.5	19.0	16.3	22.9	28.7	24.8	27.8

**Approach delay of the uncontrolled approach is taken as the left-turn delay*

***Roundabout controlled intersections follow unsignalized delay thresholds*

Seconds of Delay (Signalized Intersections)

0-10	10-20	20-35	35-55	>55

Seconds of Delay (*Unsignalized Intersections)

0-10	10-15	15-25	25-35	>35

No Approach Present

Figure 32. Alternative Set 2 Intersection Delay, AM Peak

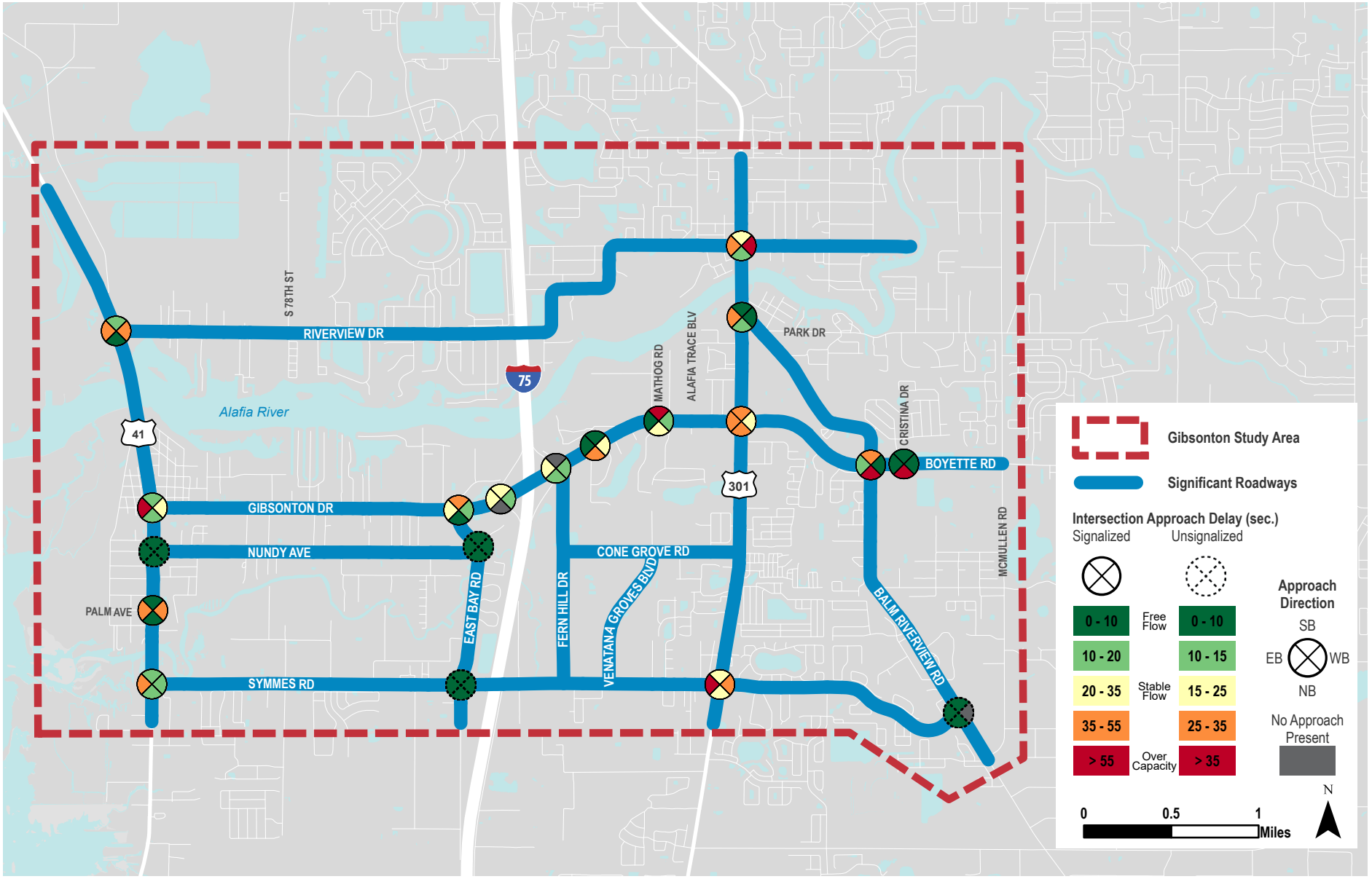


Figure 33. Alternative Set 2 Intersection Delay, PM Peak

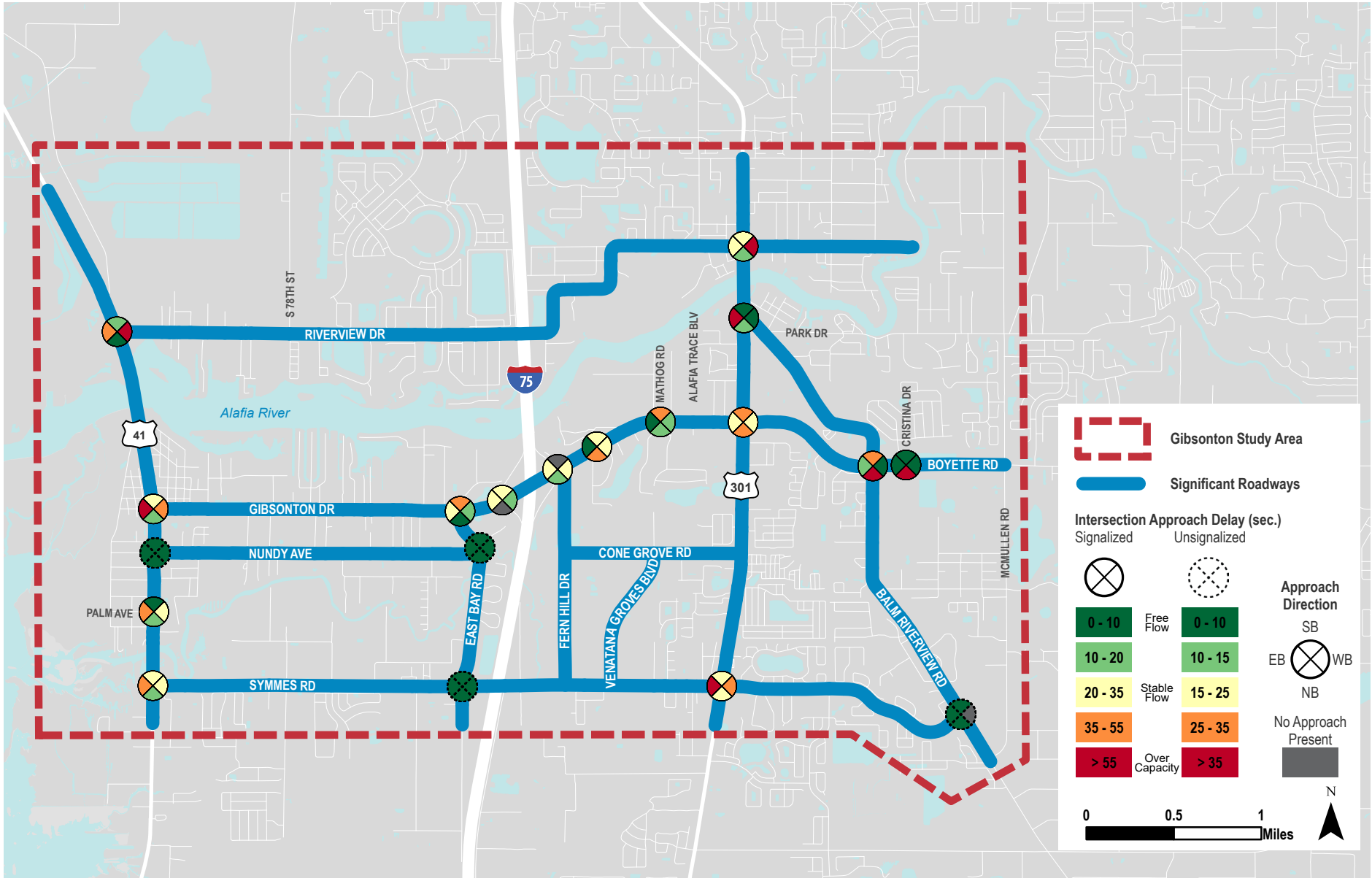


Figure 34. Alternative Set 2 Overall Intersection Delay, AM and PM Peak

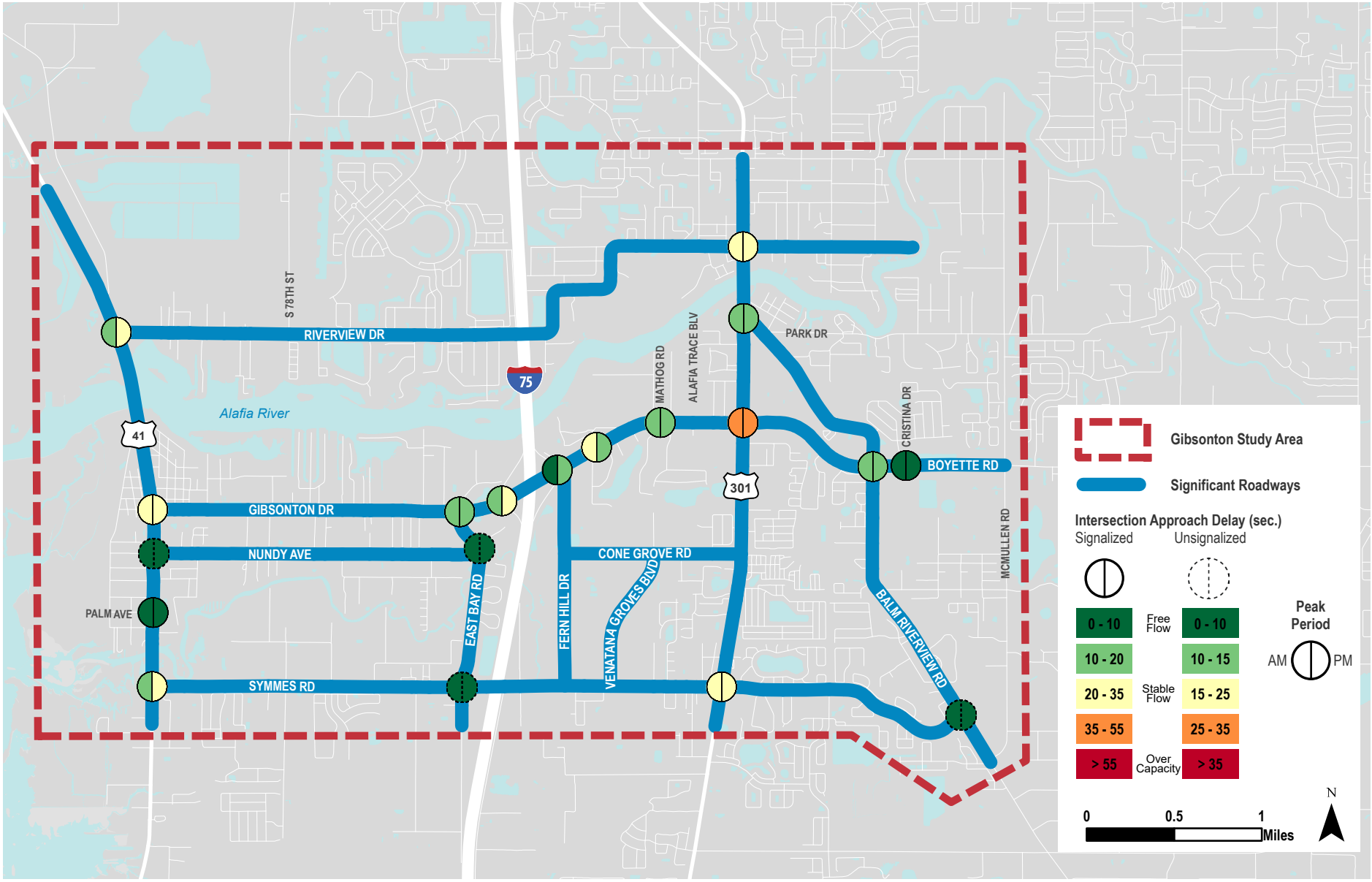


Figure 35. Alternative Set 3 Volume to Capacity (V/C) Ratio, AM Peak

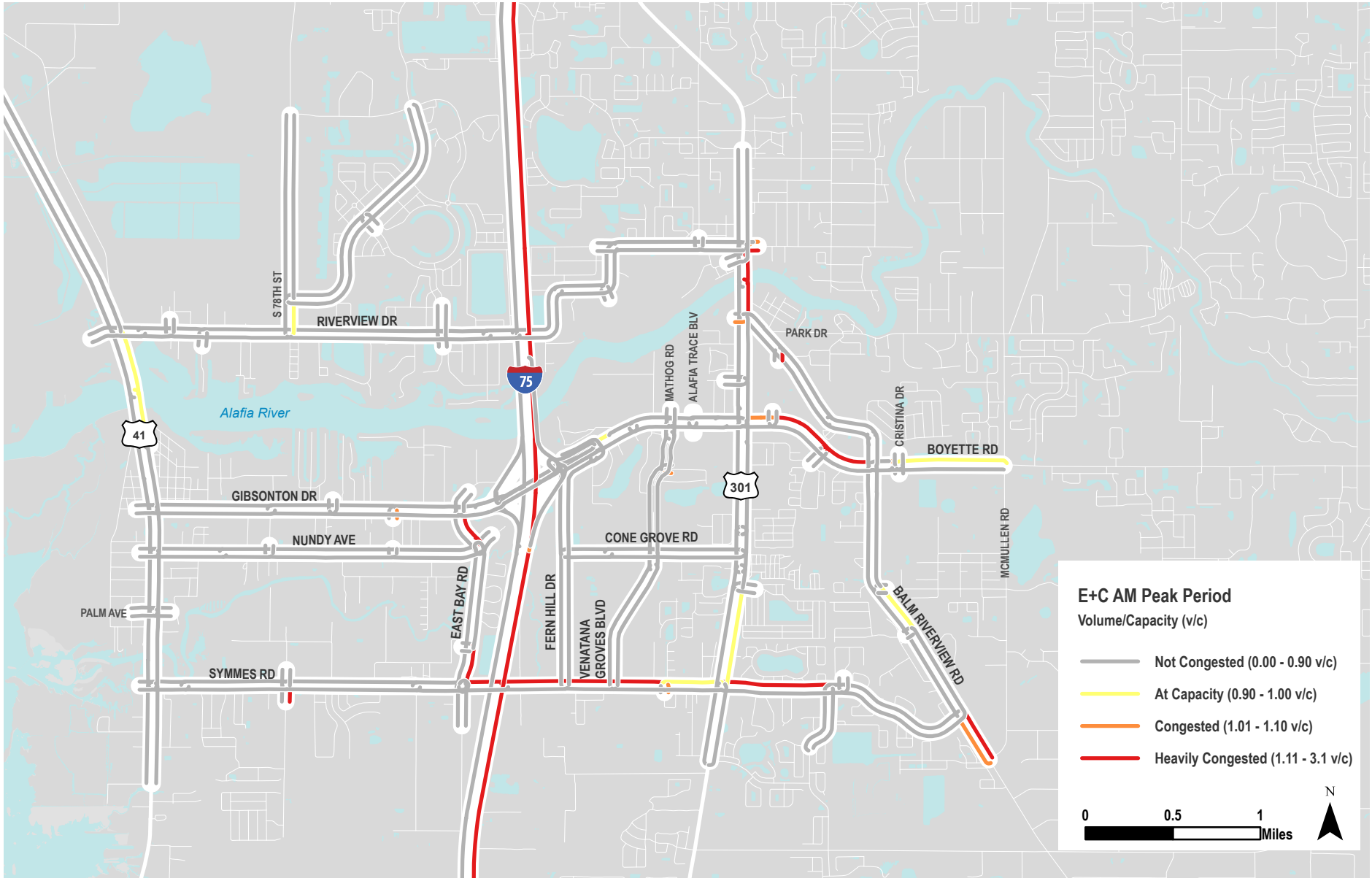


Figure 36. Alternative Set 3 Volume to Capacity (V/C) Ratio, PM Peak

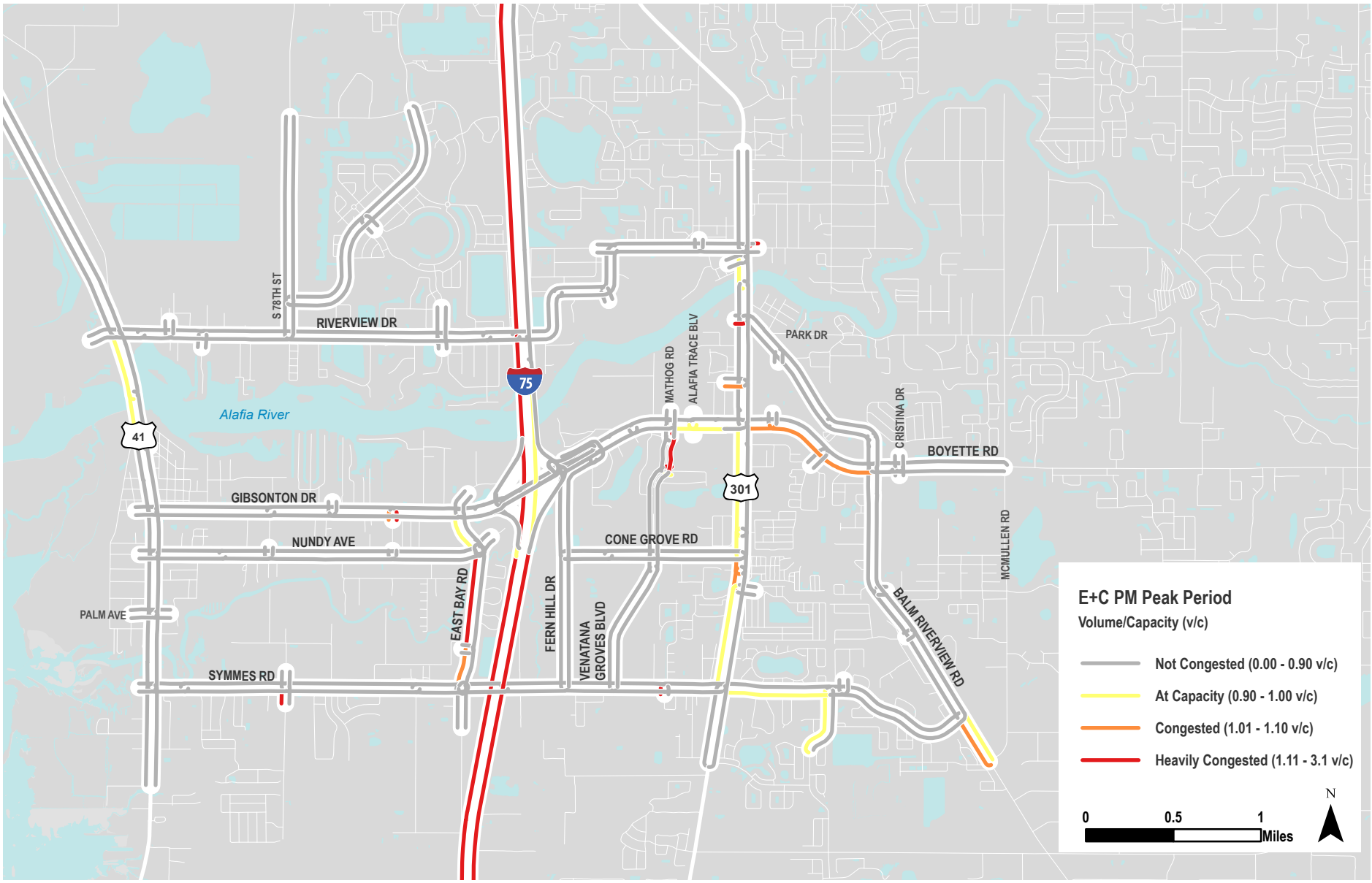


Table 8. Alternative Set 3 Network Intersection Delay, AM and PM Peak

Intersection	Eastbound Delay		Westbound Delay		Northbound Delay		Southbound Delay		Overall Intersection Delay	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
US 41/Symmes Rd	47.5	42.7	17.5	26.1	11.1	20.1	17.7	24.0	14.7	23.5
US 41/Palm Ave	58.6	58.1	38.4	31.8	6.1	11.2	3.9	4.1	6.5	7.3
US 41/Nundy Ave*	6.8	0.0	1.3	1.0	0.0	0.0	9.9	5.2	1.1	0.8
US 41/Gibsonton Dr-Alice Ave	71.6	65.2	34.2	49.0	18.8	19.9	19.8	22.6	22.5	25.9
US 41/Riverview Dr-Industrial Access Rd	46.6	43.0	44.8	64.8	4.7	4.4	15.0	19.0	12.0	21.1
Symmes/East Bay (E+C)**	1.1	1.5	1.6	1.2	2.9	1.9	2.0	2.9	0.7	0.8
US 301/Symmes Rd	37.1	40.2	24.6	26.7	25.8	29.1	23.6	25.4	26.6	28.4
Balm Riverview Rd/Symmes Rd*	7.9	7.6	-	-	3.4	3.8	2.1	2.2	2.8	2.9
Nundy Ave/East Bay Rd**	2.2	3.4	3.0	0.8	3.5	1.6	0.7	1.7	0.8	0.8
Gibsonton Dr/New East Bay-Old Gibsonton Dr	23.1	19.8	20.0	19.6	4.2	2.1	39.6	46.9	17.2	19.0
SB I-75/Gibsonton Dr Ramp Terminal	24.2	35.0	9.8	13.6	-	-	21.6	24.5	18.6	22.7
NB I-75/Gibsonton Dr Ramp Terminal*	22.1	24.5	19.5	21.5	18.2	19.4	-	-	9.6	15.2
Gibsonton Dr/Old Gibsonton Dr-Fern Hill Dr (E+C)	5.5	4.2	28.5	26.0	75.2	55.7	2.6	21.6	23.3	12.8
Gibsonton Dr/Mathog Rd-Alafia Trace Blvd	4.0	6.2	16.5	16.6	31.6	13.3	57.1	52.3	15.1	12.3
US 301/Gibsonton Dr	39.7	31.5	33.6	28.6	36.7	45.6	37.6	39.6	36.9	36.6
Boyette Rd/Balm Riverview Rd	8.0	12.1	10.3	6.1	27.2	35.3	26.3	35.5	14.2	15.3
Boyette Rd/Cristina Dr	2.7	3.6	8.1	6.1	71.2	60.1	0.0	0.0	7.5	5.1
US 301/Balm Riverview Rd	44.1	56.4	0.9	1.5	18.3	16.9	10.0	10.6	13.0	13.0
US 301/Riverview Dr (E+C)	35.5	25.0	57.3	55.6	18.9	16.0	22.3	28.8	24.4	27.8

**Approach delay of the uncontrolled approach is taken as the left-turn delay*

***Roundabout controlled intersections follow unsignalized delay thresholds*

Seconds of Delay (Signalized Intersections)

0-10	10-20	20-35	35-55	>55

Seconds of Delay (*Unsignalized Intersections)

0-10	10-15	15-25	25-35	>35

No Approach Present

Figure 37. Alternative Set 3 Intersection Delay, AM Peak

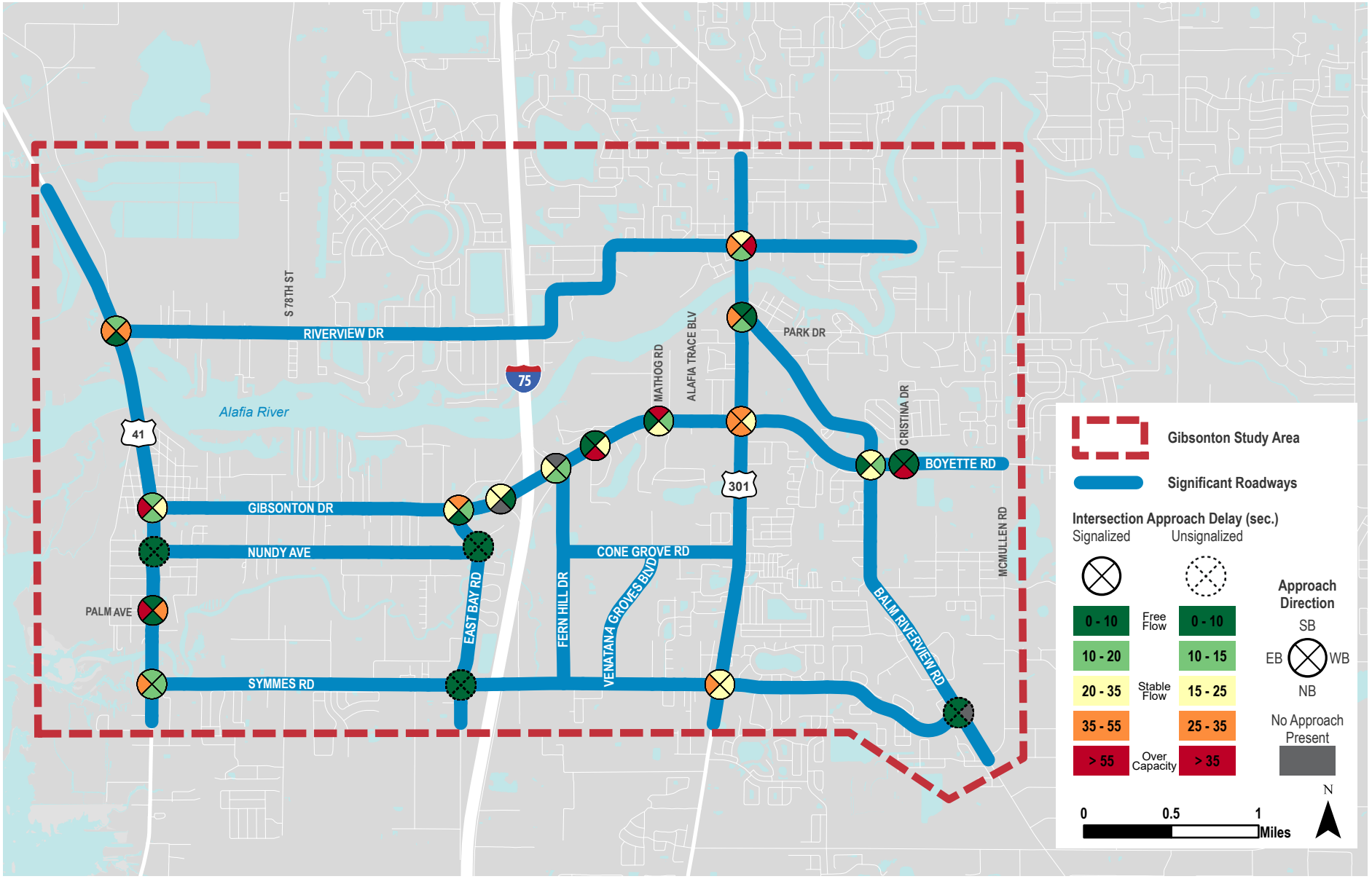


Figure 38. Alternative Set 3 Intersection Delay, PM Peak

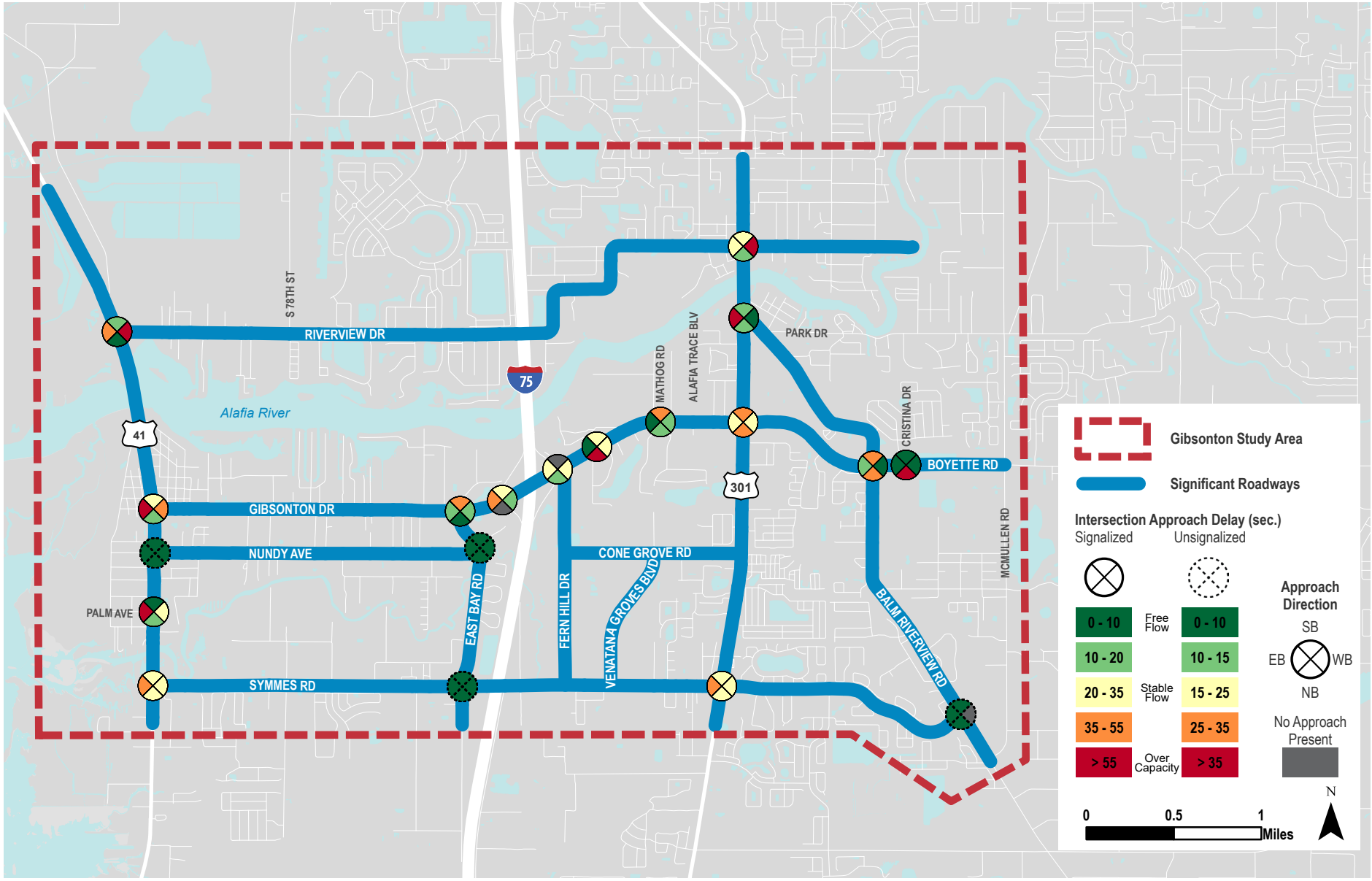
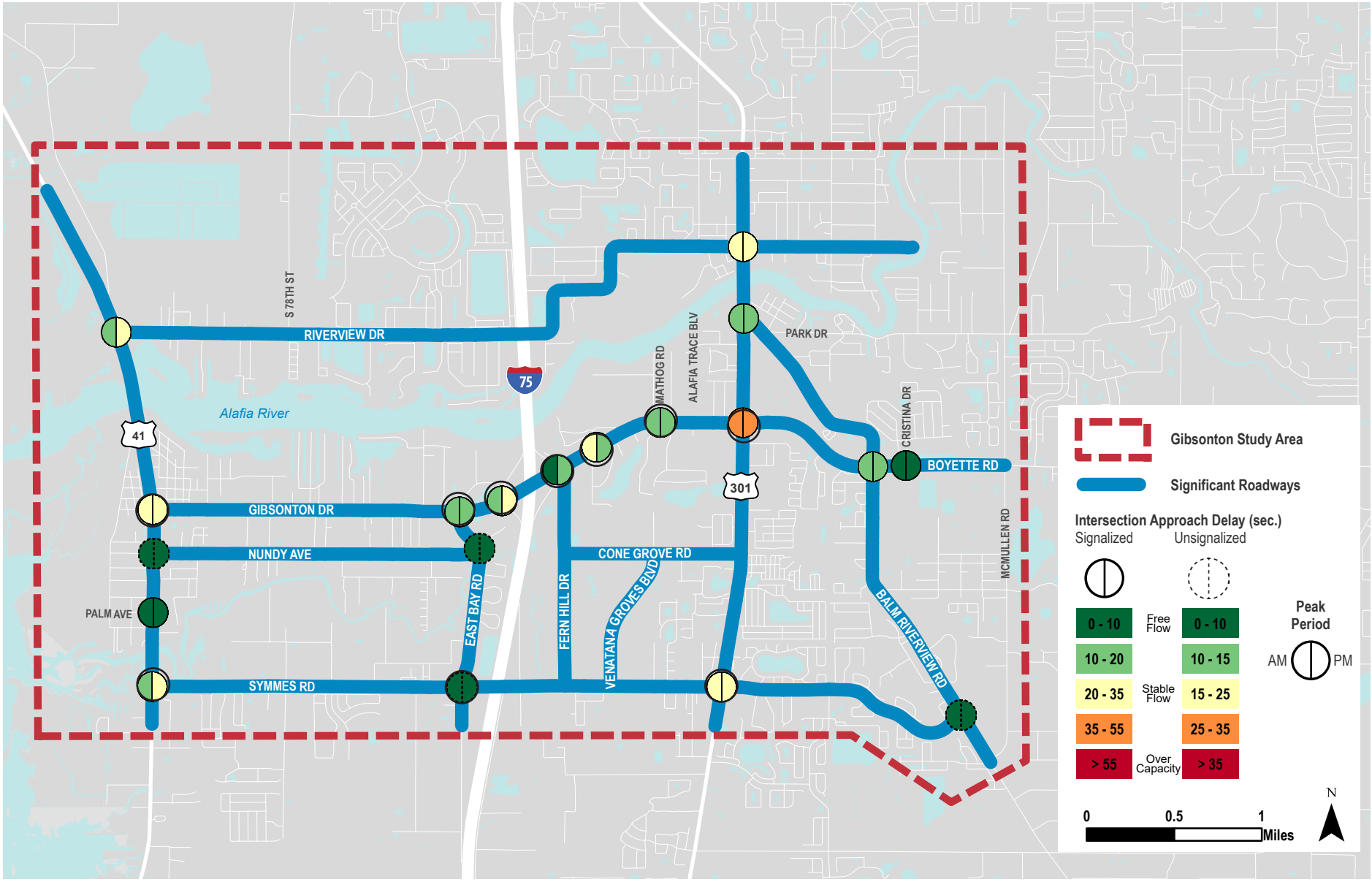


Figure 39. Alternative Set 3 Overall Intersection Delay, AM and PM Peak



4.4 Overall Summary of Performance

Each of the three alternative sets were compared to the E+C model results to determine if an alternative set could provide a benefit to the overall network wide performance. Table 9 and Table 10 compare the volume, V/C, average speed, and travel time results of the key roadway segments within the study area during the AM and PM peak, respectively. In these tables, the V/C ratio, average speed, and travel time of each of the alternatives is compared to the E+C model and color coded based on the significance of the percent change. These travel time results can also be seen graphically on Figures 40 and 41, which show a comparison for the following eight different roadway segments within the study area:

- Gibsonton Drive (US 41 to SB I-75 Terminal Ramp)
- Gibsonton Drive (SB I-75 Terminal Ramp to NB I-75 Terminal Ramp)
- Gibsonton Drive (NB I-75 Terminal Ramp to US 301)
- Gibsonton Drive (Balm Riverview Road to US 301)
- US 301 (Symmes Road to Gibsonton Drive)
- Symmes Road (US 41 to East Bay Road)
- Symmes Road (East Bay Road to US 301)
- Symmes Road (US 301 to Balm Riverview Road)

In the AM peak period:

- **The conversion of the Gibsonton Drive interchange from a traditional diamond to a DDI**, along with the widening of Gibsonton Drive from I-75 to US 301, **diverts some traffic away from Symmes Road.** Traffic volumes are decreased along westbound Symmes Road, while traffic along all westbound portions of Gibsonton Drive and northbound US 301 see an increase in volumes.
- **The increases along westbound Gibsonton Drive do not cause an adverse change in the V/C for these segments**, mostly due to the widening. Northbound US 301, however, does see a modest increase of the V/C ratio, but is still within the threshold to be considered not congested.
- **Travel times are not significantly different between the three alternatives compared to the E+C Model.** The one instance of a significant increase in travel time is the eastbound segment of Gibsonton Drive between the two ramp terminals. This can be attributed to the new signal at the northbound I-75/Gibsonton Drive ramp terminal intersection. In the E+C model, this intersection was unsignalized, with the eastbound and westbound through movements operating freely, but under all three alternatives, it becomes signalized to provide a safe crossover maneuver for the DDI. Providing a signal will result in a reduction in speed and increase in travel time for this section as there may be stops and queuing that were not present under the E+C Model.

In the PM peak period:

- **The conversion of the Gibsonton Drive interchange allows northbound I-75 users to access eastbound Gibsonton Drive easier,** increasing the volume along Gibsonton Drive, east of I-75. Many of these latent vehicles appear to either continue along Gibsonton Drive towards Balm Riverview Drive or south along US 301. Both of these segments see an increase in V/C, although the US 301 segment is the only one that sees a significant increase and approaches the congested threshold based on its V/C ratio.
- **Many of the segments along Gibsonton Drive experience a reduction in the V/C ratio, mostly due to the Gibsonton Drive widening.** Symmes Road also sees a reduction in V/C, as vehicles shift from using eastbound Symmes Road to eastbound Gibsonton Drive.
- As was the case in the AM peak period, **travel times are not significantly different among the three alternatives.** The segment between the two ramp terminals continues to see a reduction in speed and an increase in travel time, due to the conversion of

the unsignalized northbound I-75 ramp terminal to a signalized intersection. Continuing eastbound on Gibsonton Drive, however, travels are reduced between the northbound I-75 ramp terminal and US 301, likely due to the widening of Gibsonton Drive, and in Alternatives 2 and 3, the combining of the Mathog Road and Alafia Trace Boulevard intersections into one, to reduce delay along this stretch of roadway.

Key observations of these results include:

- Traffic volumes on US 41 currently exceed available capacity during the peak periods. **Widening along US 41 is necessary to accommodate the current traffic, as well as provide for future volumes** that will utilize this roadway. This widening is not expected to draw a significant amount of new trips to this roadway.
- The I-75 interchange at Gibsonton Drive experiences high delays and queuing in the AM peak period due to the high volume westbound right movement at the northbound I-75 ramp terminal operating under yield conditions. This movement must compete for access to the northbound I-75 on ramp with the eastbound left from Gibsonton Drive. **The new DDI configuration will help alleviate this by removing the yield condition and provide easier access for both the westbound right and eastbound left movements. Widening Gibsonton Drive also relieves the congestion on this roadway.** This widening draws additional traffic both destined for I-75 in the AM peak period and originating from I-75 in the PM peak period.
- In the AM peak period, Symmes Road in the westbound direction continues to operate at heavily congested conditions under all three alternatives. **Providing a connection from northbound US 301 to Cone Grove Road shifts some traffic away from Symmes Road.** While the segment of Symmes Road between East Bay Road and US 301 is heavily congested, the intersections along this segment operate at acceptable LOS. As this area continues to grow, **Symmes Road may need to be widened to accommodate this additional traffic.**

Table 9. Alternative Set Performance Comparison, AM Peak Period

Alternative Set	Roadway											
	EB Gibsonton Dr - US 41 to US 301	EB Gibsonton Dr - US 41 to SB I-75 Ramp	EB Gibsonton Dr - SB I-75 to NB I-75	EB Symmes Rd - US 41 to US 301	EB Symmes Rd - US 41 to East Bay Rd	NB US 301 - Symmes Rd to Gibsonton Dr	WB Gibsonton Dr - US 301 to US 41	WB Gibsonton Dr - Balm Riverview Rd to US 301	WB Gibsonton Dr - US 301 to NB I-75 Ramp	WB Symmes Rd - US 301 to US 41	WB Symmes Rd - Balm Riverview Dr to US 301	WB Symmes Rd - US 301 to East Bay Rd
AM Volume												
E+C	**794**	**594**	**1611**	**434**	**386**	**1758**	**842**	**1854**	**1568**	**876**	**503**	**1140**
Alt 1	846	643	1381	369	348	2052	932	1932	1762	774	508	858
Alt 2	875	655	1410	356	340	2132	940	1893	1746	733	528	773
Alt 3	839	638	1352	393	355	2128	940	2001	1732	731	482	775
AM V/C												
E+C	**0.45**	**0.35**	**0.97**	**0.54**	**0.42**	**0.69**	**0.48**	**1.03**	**0.88**	**1.11**	**0.71**	**1.62**
Alt 1	0.37	0.36	0.42	0.46	0.38	0.81	0.43	1.07	0.72	0.96	0.72	1.22
Alt 2	0.38	0.36	0.42	0.44	0.37	0.84	0.43	1.05	0.72	0.90	0.75	1.10
Alt 3	0.37	0.36	0.41	0.49	0.38	0.84	0.43	1.11	0.71	0.90	0.68	1.10
AM Speed (mph)												
E+C	**38**	**41**	**34**	**39**	**42**	**44**	**37**	**40**	**35**	**41**	**33**	**43**
Alt 1	38	41	27	40	42	44	34	40	27	41	34	44
Alt 2	39	41	27	40	42	44	34	40	29	41	34	44
Alt 3	39	41	27	41	42	44	34	40	29	41	36	44
AM Travel Time (mm:ss)												
E+C	**06:53**	**03:14**	**00:39**	**05:42**	**02:31**	**02:41**	**06:29**	**01:39**	**02:33**	**04:52**	**02:54**	**01:58**
Alt 1	06:29	03:18	00:52	05:29	02:31	02:35	06:52	01:33	02:49	04:52	02:43	01:57
Alt 2	06:23	03:19	00:51	05:22	02:31	02:32	06:53	01:33	02:46	04:50	02:39	01:56
Alt 3	06:22	03:18	00:52	05:03	02:31	02:30	06:51	01:34	02:46	04:50	02:27	01:56

Percent Change in V/C, Speed, or Travel Time Compared to E+C Condition

- > 50%	- 30-50%	- 10-30%	-10% to +10%	+10-30%	+ 30-50%	+ > 50%
Reduction			No Change		Increase	

Level of Congestion Based on V/C Ratio

<0.9 = not congested
0.9 to 1.0 = at capacity
>1.0 = congested

Figure 40. Alternative Sets Travel Time Comparison, AM Peak

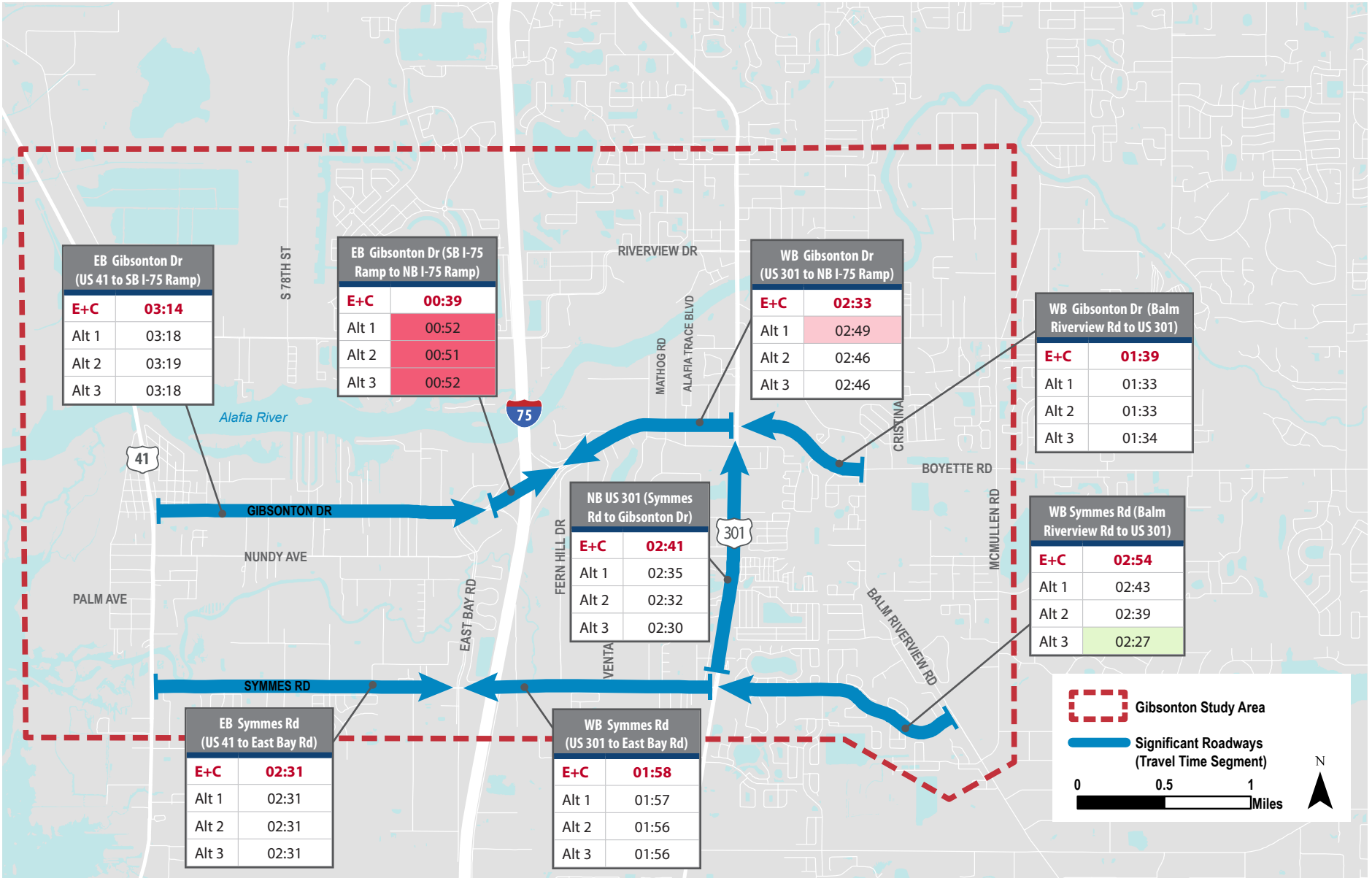


Figure 41. Alternative Sets Travel Time and Delay Comparison, AM Peak

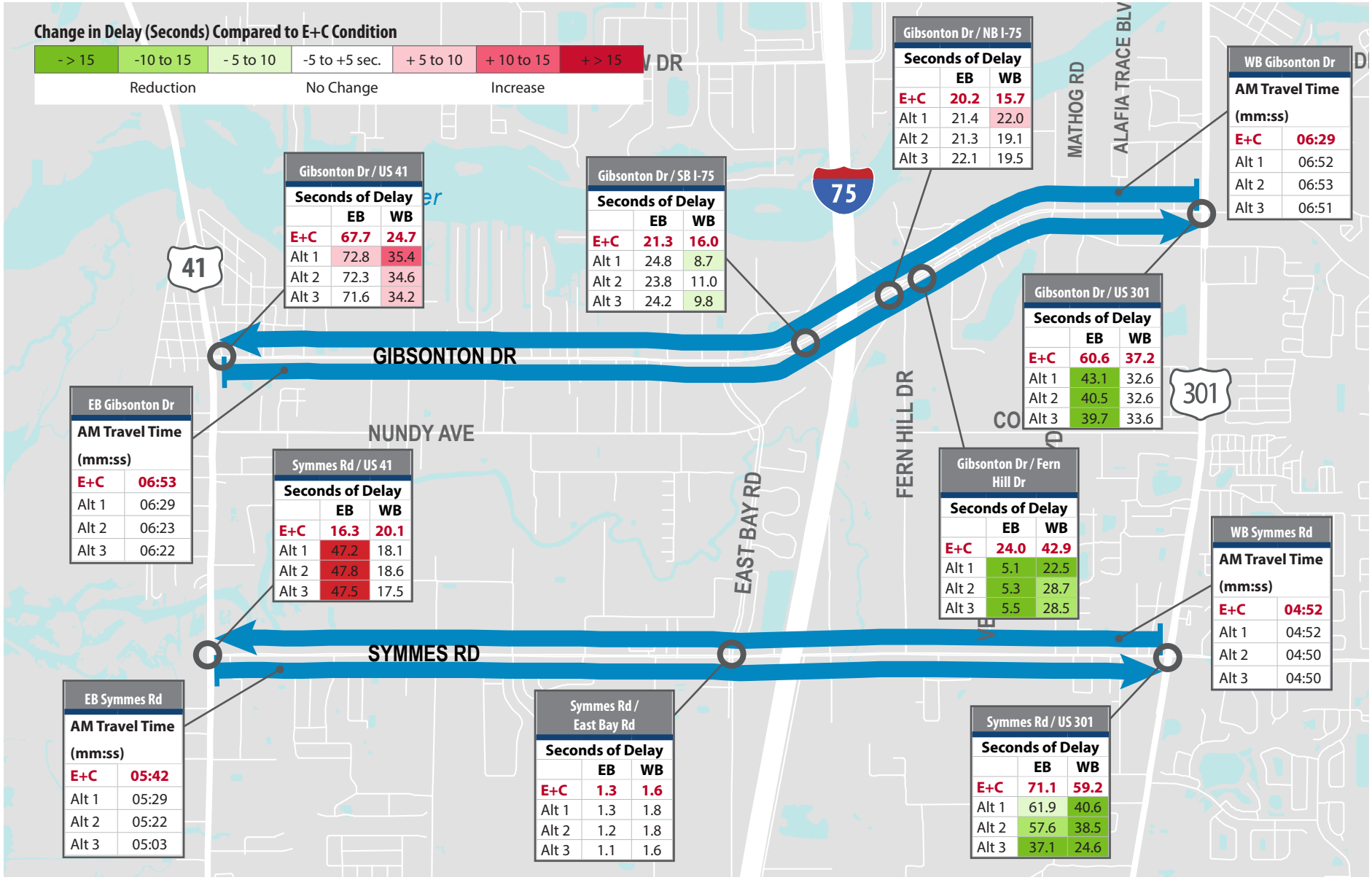


Table 10. Alternative Set Performance Comparison, PM Peak Period

Alternative Set	Roadway											
	EB Gibsonton Dr - US 41 to US 301	EB Gibsonton Dr - SB I-75 Ramp to NB I-75 Ramp	EB Gibsonton Dr - NB I-75 Ramp to US 301	EB Gibsonton Dr - US 301 to Balm Riverview Dr	EB Symmes Rd - US 41 to US 301	EB Symmes Rd - East Bay Rd to US 301	EB Symmes Rd - US 301 to Balm Riverview Dr	SB US 301 - Gibsonton Dr to Symmes Rd	WB Gibsonton Dr - US 301 to US 41	WB Gibsonton Dr - SB I-75 Ramp to US 41	WB Symmes Rd - US 301 to US 41	WB Symmes Rd - East Bay Rd to US 41
PM Volume												
E+C	**1300**	**2129**	**2023**	**1942**	**589**	**611**	**406**	**2118**	**759**	**539**	**524**	**465**
Alt 1	1342	2022	2105	2116	532	532	387	2173	798	610	513	490
Alt 2	1412	2034	2327	2133	517	485	386	2431	815	614	506	489
Alt 3	1364	1972	2222	1943	562	582	431	2465	808	607	512	493
PM V/C												
E+C	**0.73**	**1.28**	**1.06**	**1.08**	**0.72**	**0.87**	**0.58**	**0.85**	**0.43**	**0.30**	**0.66**	**0.50**
Alt 1	0.57	0.61	0.74	1.18	0.65	0.75	0.55	0.87	0.38	0.34	0.64	0.53
Alt 2	0.60	0.61	0.84	1.19	0.62	0.69	0.55	0.98	0.38	0.34	0.63	0.53
Alt 3	0.58	0.59	0.81	1.08	0.69	0.83	0.61	0.99	0.38	0.33	0.63	0.53
PM Speed (mph)												
E+C	**38**	**39**	**31**	**38**	**40**	**38**	**39**	**38**	**36**	**36**	**40**	**36**
Alt 1	38	31	35	39	39	38	38	39	34	35	40	37
Alt 2	38	32	36	39	40	38	39	39	35	35	40	37
Alt 3	38	32	36	39	40	39	39	39	35	35	40	37
PM Travel Time (mm:ss)												
E+C	**06:43**	**00:33**	**02:51**	**01:17**	**05:39**	**03:03**	**02:13**	**02:24**	**06:35**	**03:34**	**05:10**	**03:10**
Alt 1	06:33	00:51	02:15	01:11	05:39	03:01	02:14	02:21	07:00	03:43	05:08	03:09
Alt 2	06:27	00:50	02:07	01:11	05:37	02:59	02:12	02:18	06:53	03:44	05:05	03:07
Alt 3	06:24	00:51	02:06	01:12	05:10	02:33	02:12	02:17	06:48	03:43	05:06	03:08

Percent Change in V/C, Speed, or Travel Time Compared to E+C Condition

- > 50%	- 30-50%	- 10-30%	-10% to +10%	+10-30%	+ 30-50%	+ > 50%
Reduction			No Change		Increase	

Level of Congestion Based on V/C Ratio

<0.9 = not congested
0.9 to 1.0 = at capacity
>1.0 = congested

Figure 42. Alternative Sets Travel Time Comparison, PM Peak

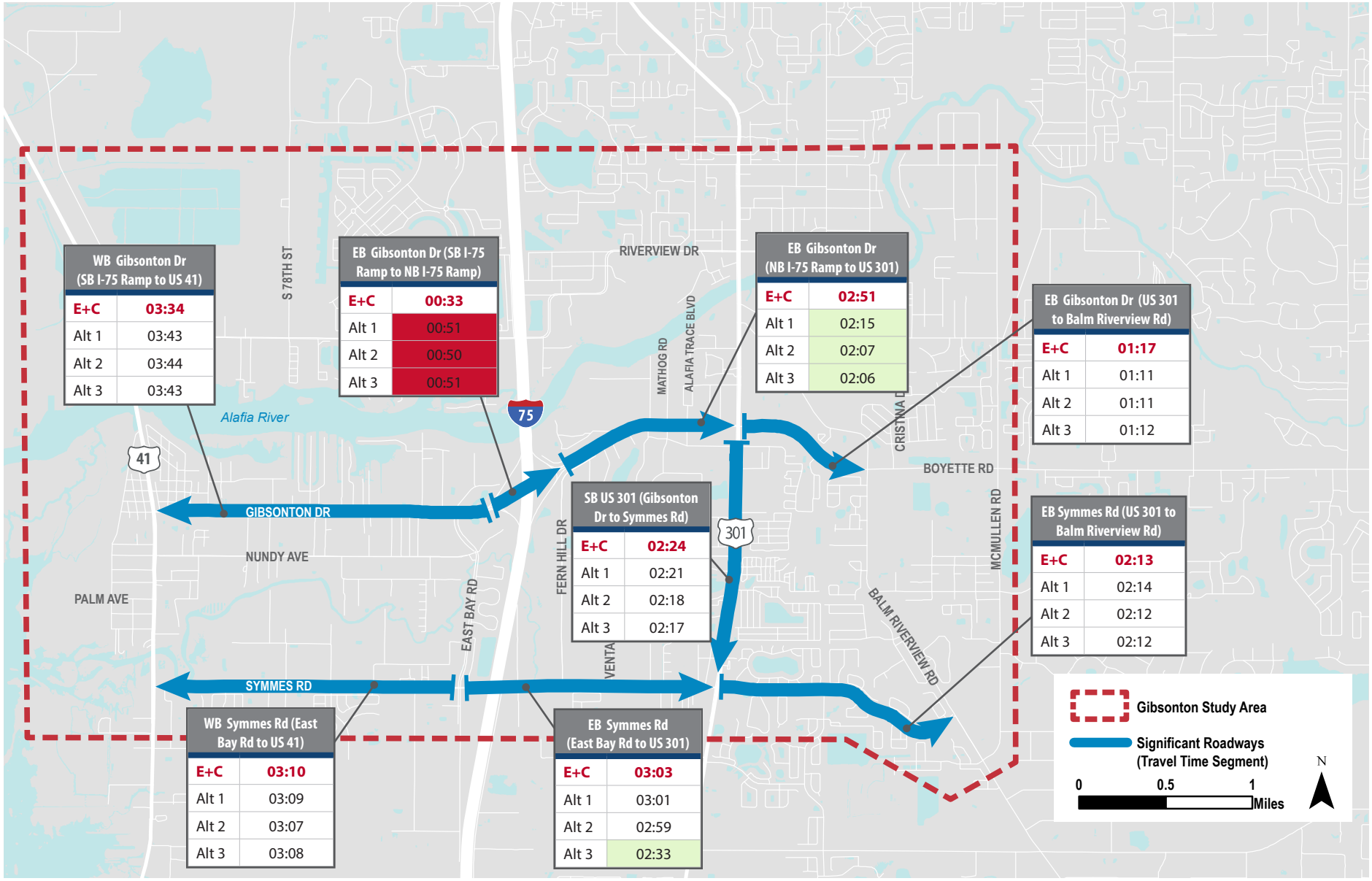
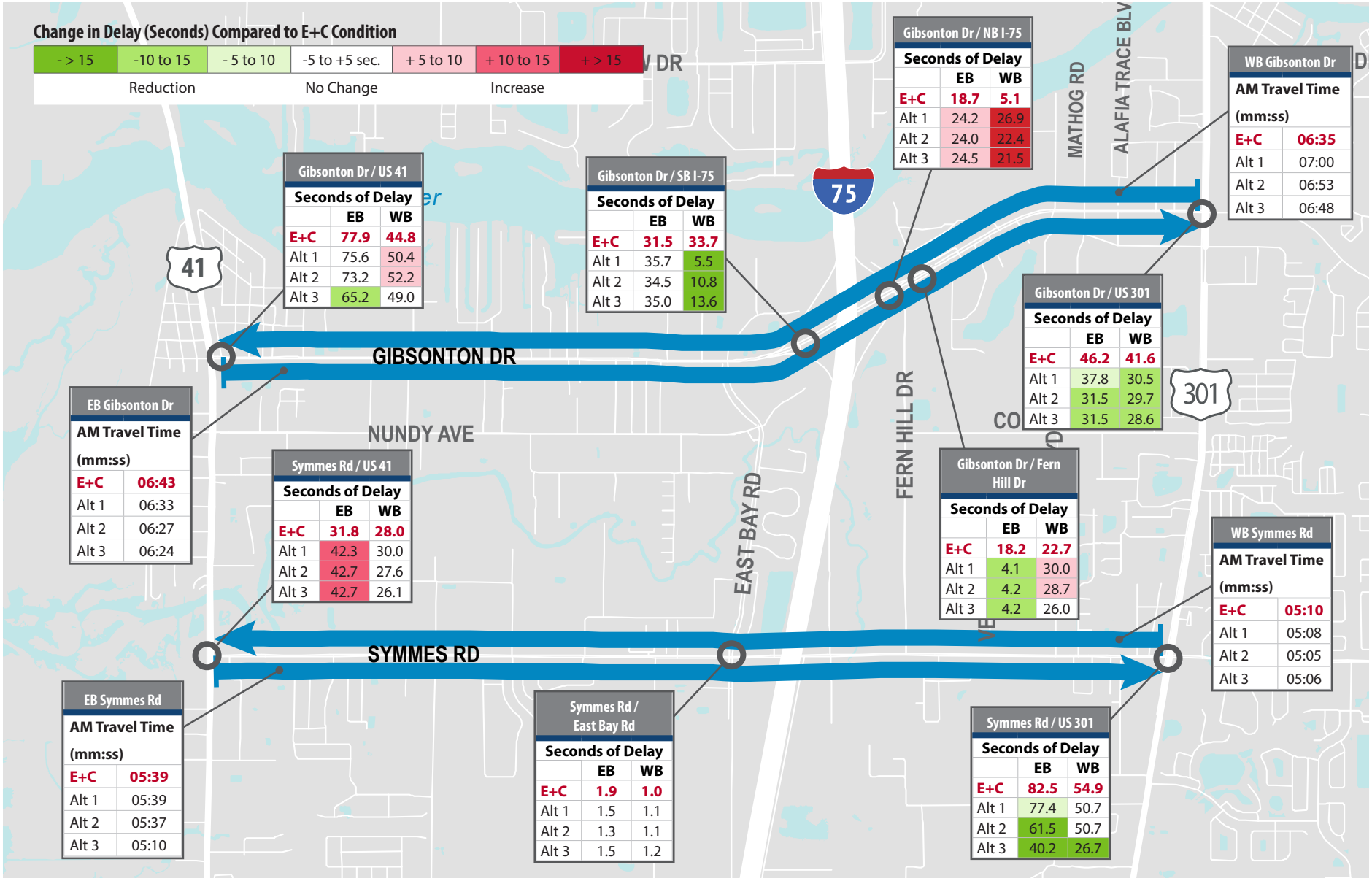


Figure 43. Alternative Sets Travel Time and Delay Comparison, PM Peak



5. RECOMMENDATIONS

The Aimsun alternatives analysis resulted in the identification of improvement projects with the greatest potential to address congestion concerns in the study area over the short term. These improvements increase capacity and improve traffic operations to help distribute traffic more evenly across the network and improve intersection operations.

RECOMMENDED PROJECTS FOR FURTHER EVALUATION

As shown on Figure 44, the following improvements have been identified as having the greatest potential to improve peak period network wide operations. These projects should be evaluated in greater detail as part of separate studies.

- **Improvement Project 1.** Cone Grove Road Connection to Riverview Lakes Lane. Provide a connection between Cone Grove Road to Riverview Lakes Lane, as well as a northbound left-turn to Cone Grove Road from US 301.
- **Improvement Project 2.** Diverging Diamond Interchange (DDI) at I-75/Gibsonton Drive. Provide a DDI at the I-75/Gibsonton Drive interchange. Converts the existing northbound I-75 ramp terminal from unsignalized to a two-phase signal. *(FDOT Project Status: Design is scheduled for 2025)*
- **Improvement Project 7.** US 301/Symmes Road Intersection Operational Improvements. Provides signal timing update to improve the delay of the minor approaches on Symmes Road, while encouraging the northbound through movement.
- **Improvement Project 8.** US 41 Widening from Kracker Ave to SR 676. Widen US 41 from four to six lanes from Kracker Avenue to SR 676. *(FDOT Project Status: PD&E study complete; design not yet underway)*
- **Improvement Project 9.** Combine Mathog Road and Alafia Trace Boulevard intersections on Gibsonton Drive. Combine Mathog Road and Alafia Trace Boulevard into one intersection. Provide necessary geometric and signal timing changes.
- **Improvement Project 10.** Gibsonton Drive Widening from I-75 to US 301. Widen Gibsonton Drive from four to six lanes from I-75 to US 301.
- **Improvement Project 11.** Balm Riverview Road/Boyette Road Intersection Operational Improvements. Provides signal timing update to improve the delay of the minor approaches.

PROJECT CONSISTENCY

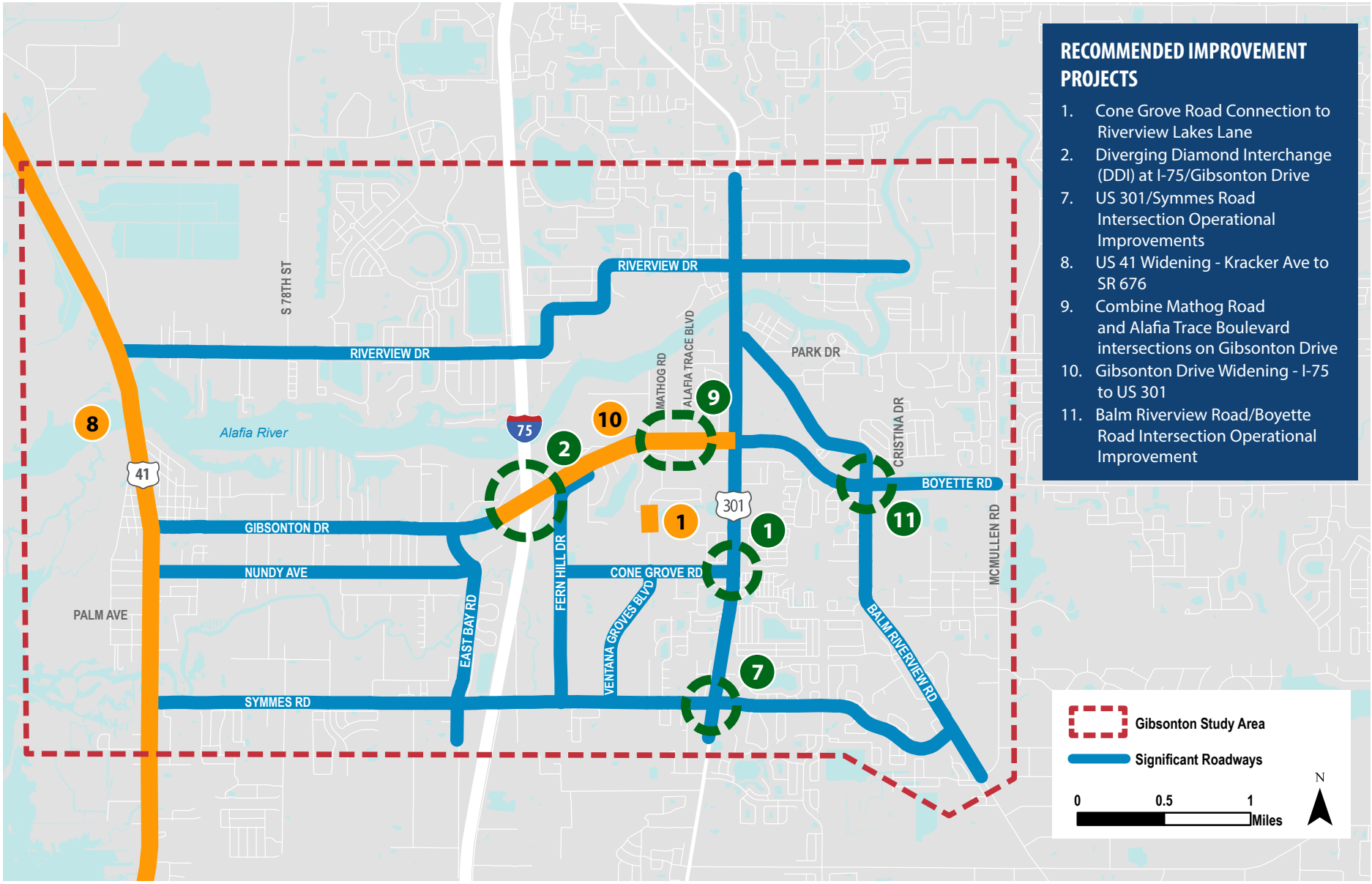
The *Vision Zero Corridor Study for Gibsonton Drive* (Draft Fall 2020) explores potential safety improvement projects for Gibsonton Drive and its intersections. Many of the improvements outlined in the Vision Zero Study can be incorporated into the design of this study's Recommended Projects discussed in the previous section. These include:

- **Pedestrian refuge areas** at signalized intersections by extending the median nose. This provides a refuge for pedestrians crossing large intersections, such as US 301/Gibsonton Dr and Gibsonton Dr/Fern Hill Dr.
- **Curb extensions** that reduce the crossing distance for bicyclists and pedestrians, while also improving their visibility to oncoming vehicular traffic. The curb extensions may also act as a deterrent for some vehicles attempting to perform illegal through movements at the intersections of Gibsonton Dr/Mathog Rd and Gibsonton Dr/Fern Hill Dr.
- **Improved signage** indicating that "turning Vehicles Yield to Pedestrians" is recommended at all intersections.
- **Enhanced lighting** is recommended at all intersections to improve pedestrian and bicyclist visibility at night.

LONG-TERM PROJECTS

Improvements to address the effects of long-term projected future growth should be studied carefully and in close coordination with FDOT and THEA.

Figure 44. Recommended Projects



Potential future changes to existing plans for I-75, US 301, and the Selmon Expressway could significantly influence peak hour travel patterns and volumes within, south, and east of the study area. For example, capacity improvements along I-75 or an extension of the Selmon Expressway along US 301 could draw significant volumes to east-west roadways that require additional improvements to the study network and beyond to accommodate these volumes. While not evaluated as part of this study, these projects may be needed as growth occurs in South County.

- **Symmes Road Widening.** Symmes Road is already over capacity between East Bay Road and US 301. As new development occurs in the area between Gibsonton Drive and Symmes Road, it will continue to operate at heavily congested levels. Widening Symmes Road from two to four lanes may help traffic travel easier between US 41 and US 301, as well as provide opportunities to improve the US 301/Symmes Road intersection geometry.
- **Boyette Road Widening.** The potential extension of the Selmon Expressway south along US 301 and possible interchange location at or near the US 301/Gibsonton Drive intersection could result in higher traffic volumes utilizing Boyette Road. The Gibsonton Drive Widening improvement analyzed as part of this study ended at US 301 and provided an additional travel lane in each direction for a total of six lanes. Additional capacity may be needed along Boyette Road to accommodate the increased traffic originating from the Fishhawk area to access the Selmon Expressway Extension.
- **South County Buildout/Alafia River Crossings Capacity Study.** Five roadways in Hillsborough County cross the Alafia River (US 41, I-75, US 301, Bell Shoals Rd, and Lithia Pinecrest). As indicated in Table 11, the collective capacity of these five crossings just barely accommodates today's existing traffic. Two roadways (US 301 and Bell Shoals Rd) currently operate above capacity. Using a moderate growth rate and considering planned projects for these roadways, these five crossings may not be able to handle future traffic volumes. Providing additional capacity at these five river crossing locations or constructing additional roads that cross the Alafia River will be needed to accommodate future traffic. To evaluate the growth potential and future demands on these key roadways over the next 25-50 years, a long-term buildout study and update to the County's Corridor Preservation Plan should be undertaken to evaluate the need for future improvements on these roads or the optimal location for a new river crossing, including the potential extension of the Selmon Expressway down US 301.

Table 11. Alafia River Crossing V/C Analysis

Roadway Across Alafia River	AADT		Current Number of Lanes	Future Number of Lanes[2]	Capacity[3]		V/C	
	2019	2040[1]			Existing	Future	Existing	Future
US 41	35,000	47,200	4	6	39,800	59,900	0.88	0.79
I-75	144,500	194,600	8	10	151,300	**189,300**	0.96	**1.03**
US 301	61,000	82,200	6	6	**59,900**	**59,900**	**1.02**	**1.37**
Bell Shoals Rd	18,000	24,300	2	4	**15,930**	35,820	**1.13**	0.68
Lithia Pinecrest Rd	6,100	8,300	2	2	15,930	15,930	0.38	0.52
Total	**264,600**	**356,300**			**282,860**	**360,850**	**0.94**	**0.99**

1) Calculated using a 1.65% growth factor to 2019 AADTs (source: BEBR growth rate, 2019 AADTs from FTO). 2) Anticipates completion of planned improvement projects.
3) Capacity is based on roadway type and number of lanes from the Generalized Service Volume Tables (GSVT)

GIBSONTON AREA

NETWORK ANALYSIS