FDOT

FLORIDA'S TURNPIKE

Central Polk Parkway
Polk Parkway (S.R. 570) to S.R. 60
FPID: 440897-2 & 440897-4

Final
Project Traffic Analysis Report (PTAR)

March 2020

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A Project Development and Environment (PD&E) study for the proposed Central Polk Parkway (CPP) was completed in 2011 by the Florida Department of Transportation (FDOT) District One (FPID: 423601-1-22-01). The original alignment was 44 miles long, forming a loop around Polk County, starting from Polk Parkway (S.R. 570) on the west and ending at Interstate 4 (I-4), near the Polk/Osceola county line. The 2011 PD&E study was then advanced to design but placed on hold by District One. The preferred alignment for CPP was divided into eight segments.

The Florida's Turnpike Enterprise (FTE) conducted a PD&E re-evaluation study and a design project of the westernmost portion of the CPP (FPID: 440897-2), from Polk Parkway to S.R. 35 (U.S. 17), a 6.7-mile section. This section was previously within Segment One of the 2011 PD&E study preferred alignment. This project will include modification of the existing partial interchange at Polk Parkway and Winter Lake Road (S.R. 540) ramps to and from the east, to create a system to system interchange at Polk Parkway and a diamond interchange at S.R. 540. This project will terminate CPP as a partial interchange at S.R. 35 (U.S. 17) with ramps to and from the west.

FTE is also conducting a PD&E study (FPID: 440897-4) and design project (FPID: 440897-3) to extend the CPP from U.S. 17 to S.R. 60, a 2.1-mile section. This will be a realignment and a reconfiguration of the 2011 PD&E study concept. A full interchange will be added at U.S. 17 and the CPP will terminate at S.R. 60 as a T intersection. The entire CPP is designated as S.R. 570B. This Project Traffic Analysis Report (PTAR) supports the PD&E studies and design projects for the entire CPP from Polk Parkway to S.R. 60. The report provides existing conditions data, future traffic forecasts, and the operational analysis for the 2018 existing, 2025 opening and 2045 design year conditions.

The CPP is anticipated to accommodate increased future travel demand expected from projected residential and employment growth within the county and throughout the entire region. The facility will also provide a new multi-lane limited access freeway that will improve connectivity to the regional transportation network, enhance freight mobility and economic competitiveness and improve emergency evacuation capabilities. The addition of an alternative to the existing network will reduce traffic congestion on several corridors in central Polk County and redistribute truck traffic in the region.

The analysis showed that the Polk Parkway mainline operated acceptably in the 2018 existing conditions and the interchange ramps within the study limits had adequate capacity. Also, the signalized intersections within the Area of Influence (AOI) operated at an acceptable Level of Service (LOS). However, the unsignalized intersections operated at unacceptable LOS F during either the AM or PM peak hour (or both). Unacceptable operations were mainly on the minor driveways with a single shared lane. High traffic on the major roadways reduces gaps for traffic turning from the driveways. Crash data analysis for the most recent five years (2012 to 2016) showed that most of the crashes resulted in property damage only and injury. Two fatalities were reported in the five-year study period; one occurred at night in dark lighted conditions and the other during the day. The analysis shows that there are no safety deficiencies within the study area.

Various Build alternatives were evaluated for the PD&E study. The Preferred Build interchange configuration selected reduced bridge and ramp lengths compared to the other alternatives, while allowing all ramps to be designed with a speed of 50 mph. It also minimized right of way and wetland impacts, conflicts points and delay. This PTAR only documents traffic analysis for the No Build and the Preferred Build (referred to Build herein) alternatives. The No Build assumed that existing lane geometry will remain the same in the future, since there are no programmed capacity improvements within the AOI. The Build assumed the addition of the CPP facility and proposed interchanges and connections. Future lane requirement analysis showed that additional capacity will be required along Polk Parkway for both No Build and Build, towards year 2040. The Build showed the need a few years sooner than the No Build, since traffic will be diverted and attracted to the proposed CPP facility. The proposed two lanes for the CPP mainline and single lane ramps will be adequate through the 2045 design year.

It is anticipated that intersections along S.R. 540 and most of the unsignalized intersections within the study limits will be over capacity by the 2025 opening year under No Build conditions and the operations are expected to degrade for most of the intersections by the 2045 design year. However, operations are expected to improve with the construction of the CPP facility. It is estimated that cumulative intersection control delay within the AOI will reduce by 47 and 50 percent in 2045 AM and PM peak hours, respectively. Intersection turn lane improvements and three lanes per direction along S.R. 540 and U.S. 17 will be required in the future, with or without the CPP project.

A Restricted Crossing U-Turn (RCUT) configuration is proposed where S.R. 60 intersects the CPP and 91 Mine Road. This will enhance safety between the two closely spaced intersections and increase throughput. The analysis showed that the proposed RCUT intersections are expected to operate acceptably through the design year. Overall, the CPP facility is anticipated to relieve congestion by redistributing traffic from other facilities in the region, thereby improving operations on Polk Parkway, S.R. 540, U.S. 98 and S.R. 60.

The Central Polk Parkway (CPP) is a new limited access expressway that was originally planned to be 44 miles, forming a loop around the Polk County communities of Winter Haven, Auburndale, Eagle Lake, Dundee, Lake Hamilton, Haines City, and Davenport. It would connect on the west with Polk Parkway (S.R. 570) and on the east with Interstate 4 (I-4), near the Polk/Osceola county line. The Project Development and Environment (PD&E) study for the original alignment was completed in 2011 by the Florida Department of Transportation (FDOT) District One (FPID: 423601-1-22-01). Along its length, the proposed Parkway would include interchanges with several major crossroads. The 2011 PD&E study preferred alignment for CPP was divided into eight segments.

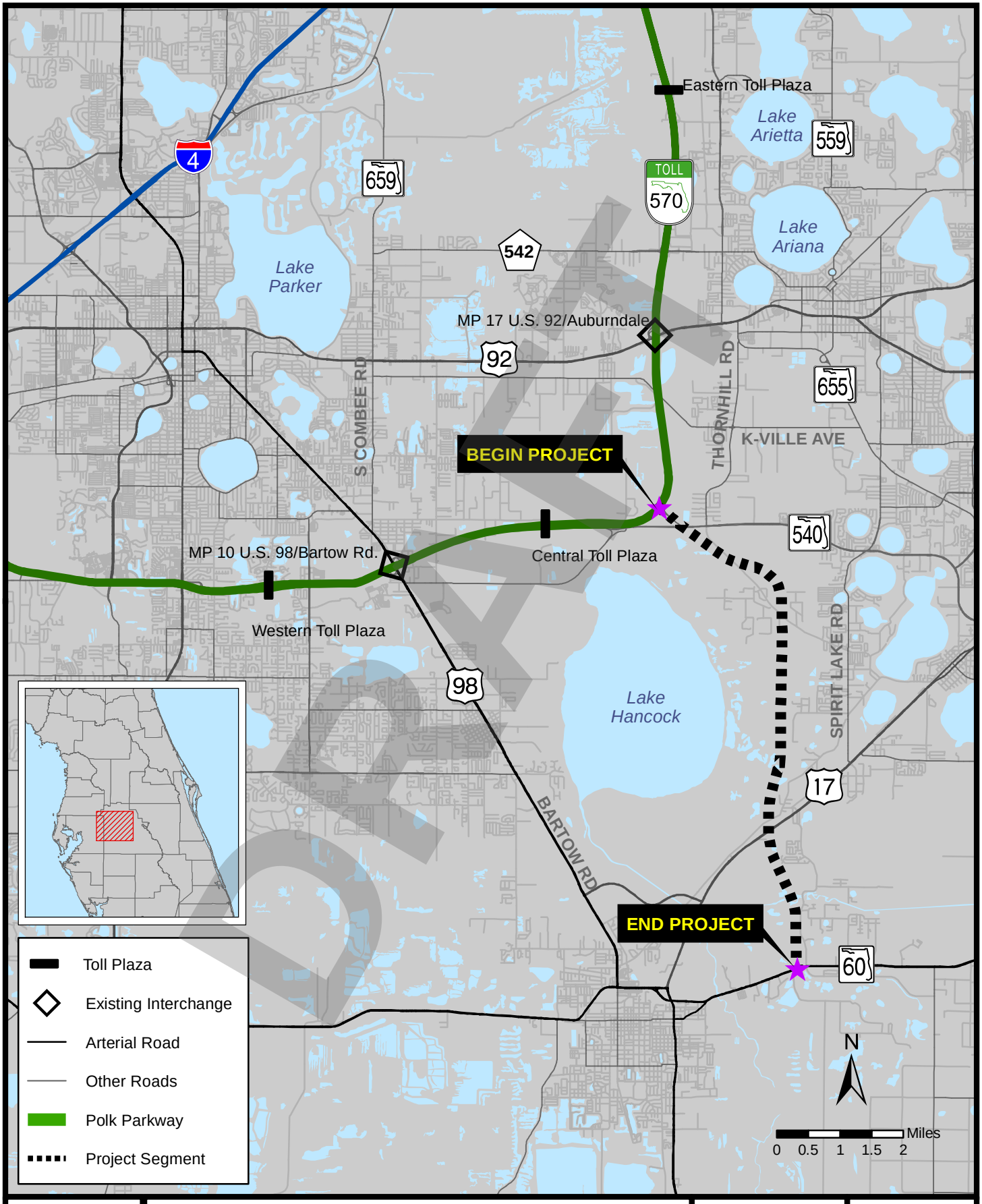
The Florida's Turnpike Enterprise (FTE) conducted a PD&E re-evaluation study and a design project of the westernmost portion of CPP (FPID: 440897-2), starting at Polk Parkway to S.R. 35 (U.S. 17), a 6.7-mile section. This section was previously within Segment One of the 2011 PD&E study preferred alignment. This project will include modification of the existing partial interchange at Polk Parkway and Winter Lake Road (S.R. 540) ramps to and from the east, to create a system to system interchange at Polk Parkway and a diamond interchange at S.R. 540. The eastern terminus of the project will be a partial interchange at U.S. 17, with ramps to and from the west.

The FTE is also conducting a PD&E study (FPID: 440897-4) and design project (FPID: 440897-3) to extend CPP from U.S. 17 to S.R. 60, a 2.1-mile section. This will be a realignment and a reconfiguration of the 2011 PD&E study concept. This project will complete the partial interchange at U.S. 17 by adding ramps to and from the east and terminate at S.R. 60 as a T intersection. The project location and study limits are shown on **Figure 1.1**. The entire CPP is designated as S.R. 570B.

This Project Traffic Analysis Report (PTAR) is prepared for the entire CPP project from Polk Parkway to S.R. 60, in support of the two PD&E studies and concurrent design projects (FPIDs: 440897-2, 440897-3 and 440897-4). It provides existing conditions data, future traffic forecasts, and the operational analysis for the existing (2018), opening year (2025) and design year (2045) conditions.

1.1. PROJECT PURPOSE AND NEED

Polk County is uniquely positioned between the Tampa Bay region on the west and the Central Florida region around Orlando on the east. These regions are anticipated to grow over the next few decades into one economic region. As a result, transportation needs in these regions will continue to be focused around congestion relief. The CPP is anticipated to accommodate the increased travel demand expected from the continued residential and employment growth projected within the county and throughout the entire region. The facility will provide a new multi-lane limited access freeway that will improve connectivity to the regional transportation network, enhance freight mobility and economic competitiveness, improve emergency evacuation capabilities and accommodate future population and growth.



FLORIDA'S TURNPIKE

Central Polk Parkway (Polk Parkway to S.R. 60)
Project Traffic Analysis Report (PTAR)

Project Location

Figure 1.1

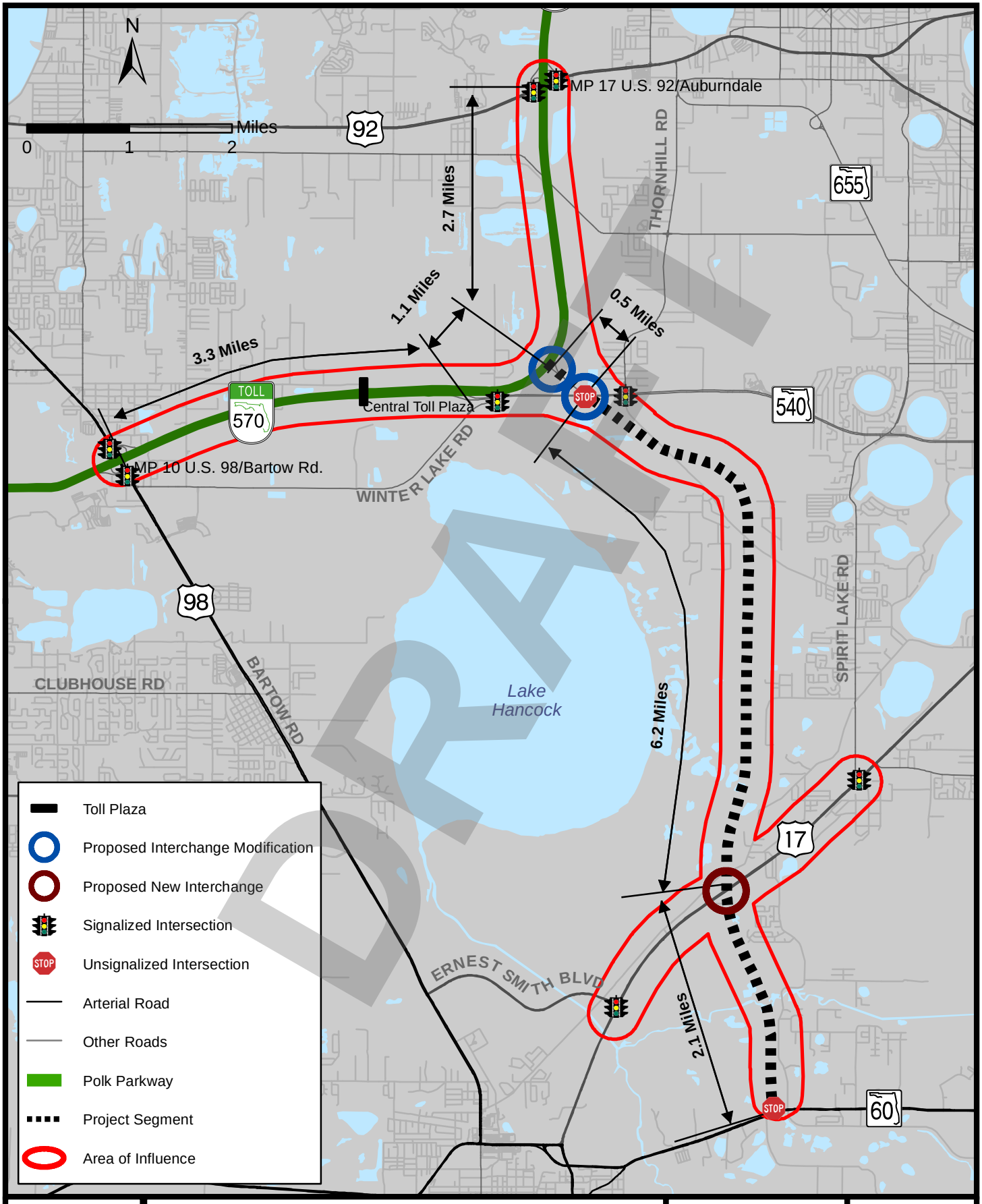
The addition of an alternative to the network will reduce traffic congestion on several corridors in central Polk County, particularly U.S. 98, S.R. 540, U.S. 17 and S.R. 60. The CPP will provide additional connections to the local roadway network and Strategic Intermodal System (SIS) facilities such as Polk Parkway, U.S. 98 and S.R. 60. The Polk Parkway is a belt route that provides easier access to I-4 from Polk County cities such as Winter Haven, Bartow, and Auburndale, and the south side of Lakeland. S.R. 60 provides coast to coast traffic movement across Central Florida, while U.S. 98 provides north-south movement through the state and beyond. The addition of the CPP connecting these regional roadways would not only relieve congestion by distributing traffic, but allow for better connectivity, thereby enhancing mobility in Polk County and west central Florida. Improved connectivity will increase mobility during an emergency event and enhance emergency response times. The 2011 PD&E study identified the need for a new facility within the project area, in addition to the planned highway and transit improvements within the cost feasible network of the Polk County 2035 Mobility Vision Plan, published in 2010.

1.2. PROJECT AREA OF INFLUENCE

The CPP is a future expansion project of the FTE. It is a limited access freeway that is planned to begin along the Polk Parkway at approximately Mile Post (MP) 14 within the existing S.R. 540 interchange, extending south east to intersect with U.S. 17 and terminate at S.R. 60. The existing Polk Parkway and S.R. 540 partial interchange with ramps to and from the east will be modified to add system to system ramps at Polk Parkway, and create a diamond interchange at S.R. 540. The new CPP facility is currently planned to terminate at U.S. 17 as a partial interchange, with ramps to and from the west. In the ultimate Build condition, the CPP will form a full interchange with U.S. 17.

The segments from Polk Parkway to U.S. 17 and from U.S. 17 to S.R. 60 are approximately 6.7 and 2.1 miles long, respectively. The anticipated AOI of the CPP is shown on **Figure 1.2**. The AOI includes the following existing interchanges and intersections:

- Interchanges along the Polk Parkway
  - U.S. 98
  - S.R. 540 ramps to and from west
  - S.R. 540 ramps to and from east
  - U.S. 92
- Intersections along S.R. 540
  - Landfill Road
  - Polk Parkway ramps to and from east
  - Thornhill Road
- Intersections along U.S. 17
  - Ernest Smith Boulevard
  - 91 Mine Road
  - Spirit Lake Road
- Intersections along S.R. 60
  - 91 Mine Road/Connersville Road



FLORIDA'S TURNPIKE

Central Polk Parkway (Polk Parkway to S.R. 60)
Project Traffic Analysis Report (PTAR)

Area of Influence

Figure 1.2

This section highlights the traffic operational analysis methodology and traffic factors used in development of the analysis contained in this document.

2.1. TRAFFIC OPERATIONAL ANALYSIS PROCEDURE

Detailed operational analyses were performed for existing (2018), opening (2025), and design year (2045) conditions.

Freeway segments (basic and merge/diverge) analysis was based on the capacity targets published in the 2013 FDOT Quality and Level of Service (LOS) Handbook. The FDOT thresholds were adjusted for local conditions such as speed, truck proportion, Peak Hour Factor (PHF), and driver population.

The Highway Capacity Software (HCS) Version 7.6 was used to identify LOS along freeway segments. The analysis was based on the FDOT Traffic Analysis Handbook and followed the Highway Capacity Manual (HCM) Sixth Edition methodologies. The HCM estimates LOS based on density – a function of flow rate (volumes) and travel speed – for uninterrupted flow facilities such as basic freeway/Collector-Distributor (C-D) roadway segments, merge and diverge segments, and freeway/C-D roadway weaving segments. Density is measured in passenger cars per mile per lane (pcpmpl). The HCM Sixth Edition LOS and density thresholds for freeway segments are listed in **Table 2.1.**

Table 2.1
Freeway Segments HCM Sixth Edition LOS Criteria

LOS	Basic (HCM Exhibit 12-15)	Merge and Diverge (HCM Exhibit 14-3)	Weaving (HCM Exhibit 13-6)
A	≤ 11	≤ 10	0-10
B	> 11-18	> 10-20	> 10-20
C	> 18-26	> 20-28	> 20-28
D	> 26-35	> 28-35	> 28-35
E	> 35-45	> 35	> 35
F	Demand exceeds capacity or density > 45	Demand Exceeds Capacity	Demand Exceeds Capacity

The HCS software was calibrated based on the adjusted FDOT capacities. Tests were conducted using the following parameters and assumptions for Polk Parkway to determine a factor for calibrating capacity and speed:

- Polk Parkway Future Free-Flow Speed (FFS) = 70 mph
- Polk Parkway Design Hour Truck (DHT) percentage = 6%
- Lane width = 12 feet
- Right shoulder clearance = 6 feet
- Driver Population = Mostly Familiar
- Weather Type = Non-Severe Weather

- Incident Type = No Incident
- Demand Adjustment Factor = 1.00

A capacity and speed adjustment factor of 0.88 was determined.

For freeway merge and diverge areas, the HCM methodology also includes a capacity check for the influence area and the upstream or downstream ramp roadway. Capacity is dependent upon FFS and number of lanes. HCM capacity targets for ramp roadways are shown in **Table 2.2**. Similar to freeway segments capacities, the HCM ramp roadway capacities were also adjusted for local conditions.

Table 2.2
Ramp Roadway Capacity 2010 HCM LOS Criteria

Ramp FFS	Single-Lane Ramps	Two-Lane Ramps
(HCM Exhibit 13-10)		
> 50	2,200	4,400
> 40 - 50	2,100	4,200
> 30 - 40	2,000	4,000
≥ 20 - 30	1,900	3,800
< 20	1,800	3,600

Signalized intersections were evaluated using Synchro Version 10.1, based on the HCM Sixth Edition LOS and delay thresholds presented in **Table 2.3**. Unlike the HCM, Synchro has additional procedures for estimating control delay, such as estimation of right turn on red and queue delay associated with starvation and spillback. Thus, Synchro is felt to yield more accurate results than HCM because of these additional refinements.

Table 2.3
Signalized Intersection 2010 HCM LOS Criteria

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio*	
	≤1.0	>1.0
(HCM Exhibit 19-8)		
≤ 10	A	F
> 10 - 20	B	F
> 20 - 35	C	F
> 35 - 55	D	F
> 55 - 80	E	F
> 80	F	F

*For approach-based and intersection-wide assessments, LOS is defined solely by control delay. Control delay and volume-to-capacity ratio are used to characterize LOS for a lane group.

Unsignalized intersections were evaluated using the HCS Version 7.6, following the criteria presented in **Table 2.4**.

Table 2.4
Unsignalized Intersection HCM Sixth Edition LOS Criteria

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio*	
	≤1.0	>1.0
(HCM Exhibit 20-2)		
≤ 10	A	F
> 10-15	B	F
>15-25	C	F
> 25-35	D	F
>35-50	E	F
>50	F	F

*For approach-based and intersection wide assessments, LOS is defined solely by control delay. Control delay and volume-to-capacity ratio are used to characterize LOS for a lane group.

Analysis methodology and parameters for the Polk Parkway were assumed for the new CPP facility since traffic characteristics of the two roadways are expected to be similar.

2.2. TRAFFIC FACTORS

The traffic factors for this study are presented in **Table 2.5**. The Design Hour Factor (K) is the proportion of the Annual Average Daily Traffic (AADT) that occurs during the design hour. The Directional Distribution Factor (D) is the proportion of traffic traveling in the peak direction during the design hour. The K and D factors represent the traffic demand a roadway is typically designed to accommodate.

For the future condition analyses, this study used the standard K factor for the Polk Parkway mainline and arterials. Consistent with other FDOT districts, FTE has developed standard K factors for use in planning and design applications. The K factors for the Polk Parkway ramps as well as the D factors for the mainline and ramps were obtained from the FTE's Traffic Planning and Engineering Report. The D factors for the arterials were calculated using count data. The K and D factors were adjusted where applicable based on future projections to account for anticipated changes in land use and traffic patterns.

The Design Hour Truck (DHT) factor is the proportion of trucks within the peak hour and is assumed to be half of the daily truck (T_{24}) proportion in this study. Daily truck (T_{24}) factors for the Polk Parkway mainline and tolled ramps were estimated from FTE's monthly class data from Fiscal Year *2017 Enterprise One Reports* (Toll Traffic by Vehicle Class by Month). The data were averaged to estimate daily trucks (3 axles and more) and adjusted to account for buses and 2-axle single unit trucks. Truck percentages for the non-tolled ramps were estimated from applicable adjacent truck toll data. Truck percentages for arterials were estimated using count data. A PHF of 0.95 was assumed for future conditions. The PHF is the ratio of total peak hour volume to the peak rate of flow within the hour. It accounts for the variability of traffic within the hour. Traffic factors for the Polk Parkway were

assumed for the new CPP facility since traffic characteristics of the two roadways are expected to be similar.

Table 2.5
Future Traffic Factors

Segment	Traffic Factors			
	K	D	T_{24}	DHT
Polk Parkway Mainline	10.0%*	56.4%	12.3%	6.0%
Polk Parkway Ramps				
U.S. 98: Eastbound On and Westbound Off-ramps	11.5%	60.2%	12.3%	6.0%
U.S. 98: Eastbound Off and Westbound On-ramps	11.9%	54.6%	12.3%	6.0%
S.R. 540: Eastbound On and Westbound Off-ramps	11.6%	57.7%	12.3%	6.0%
S.R. 540: Eastbound Off and Westbound On-ramps	11.5%	56.1%	12.3%	6.0%
U.S. 92: Eastbound On and Westbound Off-ramps	11.7%	55.9%	12.3%	6.0%
U.S. 92: Eastbound Off and Westbound On-ramps	11.5%	55.9%	12.3%	6.0%
Arterials				
U.S. 98	9.5%*	57.5%	8.4%	4.0%
S.R. 540		50.5%	6.8%	3.0%
U.S. 92		54.6%	10.1%	5.0%
U.S. 17		53.1%	10.2%	5.0%
S.R. 60		58.8%	17.3%	9.0%

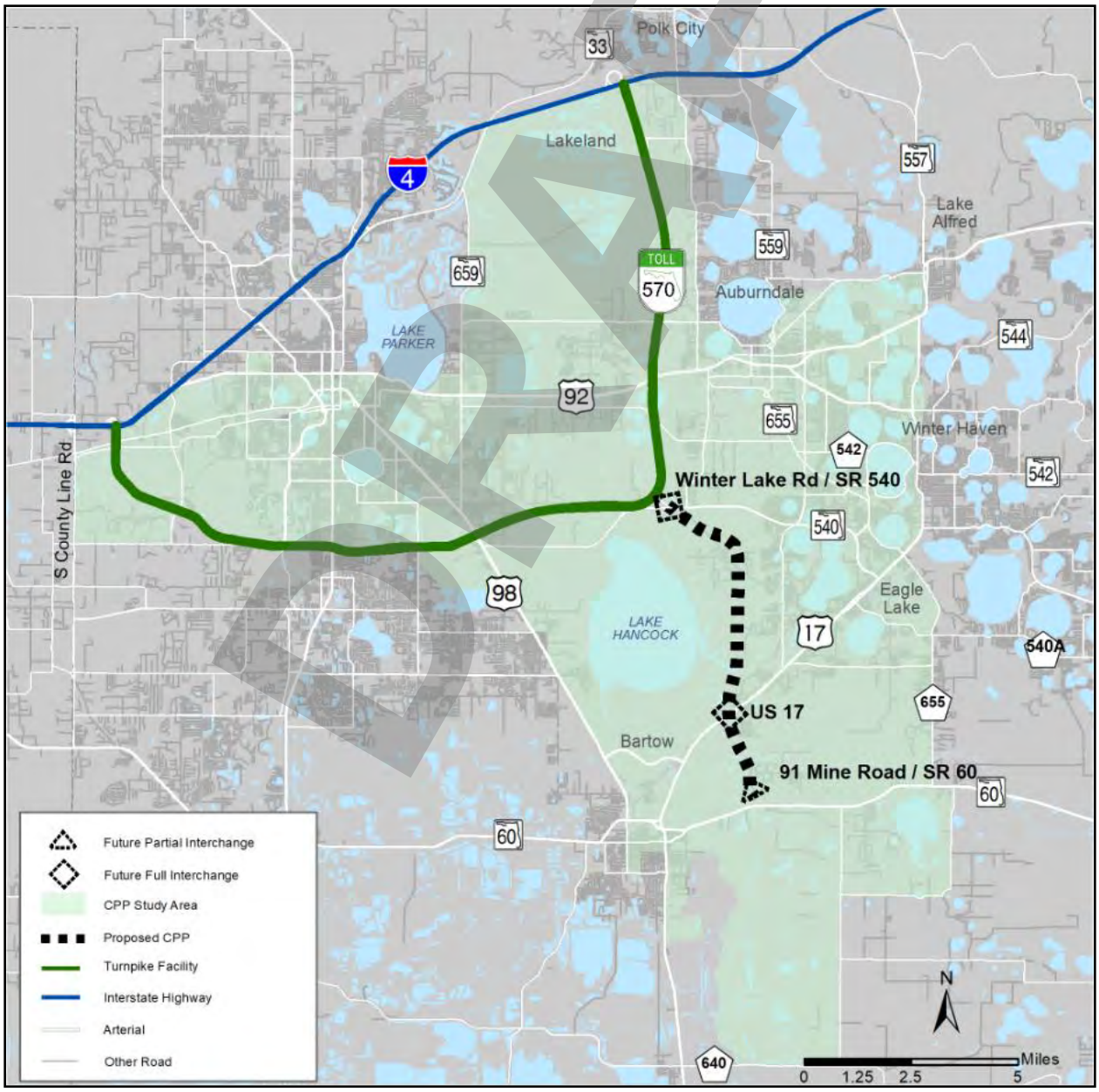
Source:
*FTE's Standard K factor is based on FTE's annual factor development. Arterials Standard K is from Florida Transportation Information (FTI) and FDOT Project Traffic Forecasting Handbook.
K for ramps, D and T estimated from FTE's Traffic Planning and Engineering Report, toll and count data - following the FDOT Project Traffic Forecasting Handbook.

Existing conditions such as population, land use, roadway facilities, existing traffic data collection, and crash data are described in this section.

3.1. REGIONAL POPULATION, EMPLOYMENT AND LAND USE

The CPP regional study area is located in central Polk County. Portions of five municipalities (Auburndale, Bartow, Eagle Lake, Lake Alfred and Lakeland) are located within in the study area, as shown on **Figure 3.1**.

Figure 3.1
Regional Project Study Area



Polk County is the ninth-most populous county in Florida. According to the University of Florida's Bureau of Economic and Business Research (BEBR), between 2010 and 2017, the county population grew by 9.9 percent, slightly outpacing the state's growth of 9 percent in the same time span. In addition to the population growth in Polk County and the state of Florida, **Table 3.1** displays the growth in neighboring Orange and Osceola counties for comparison.

Employment trends in the region from 2010 to 2017 were estimated from the United States Bureau of Economic Analysis (BEA) and Bureau of Labor Statistics (BLS) data, as shown in **Table 3.2**. Polk County has the second highest total employment in the region, however, it features the lowest percentage change (15.2 percent) and is lower than the overall state growth percentage (21.5 percent).

Table 3.1
Historical Population and Growth

County/State	US Census	BEBR Estimate	Change	% Change
	April 1 2010	April 1 2017	2010 - 2017	2010-2017
Orange	1,145,956	1,313,880	167,924	14.7%
Osceola	268,685	337,614	68,929	25.7%
Polk	602,095	661,645	59,550	9.9%
Florida	18,801,310	20,484,142	1,682,832	9.0%

Source: 2010 Census and BEBR Florida Population Study 180

Table 3.2
Historical Employment and Growth

County/State	BEA	BEA Estimate	Change	% Change
	2010	2017	2010 - 2017	2010-2017
Orange	822,557	1,069,752	247,195	30.1%
Osceola	101,338	139,892	38,554	38.0%
Polk	255,704	294,603	38,899	15.2%
Florida	9,805,154	11,912,889	2,107,735	21.5%

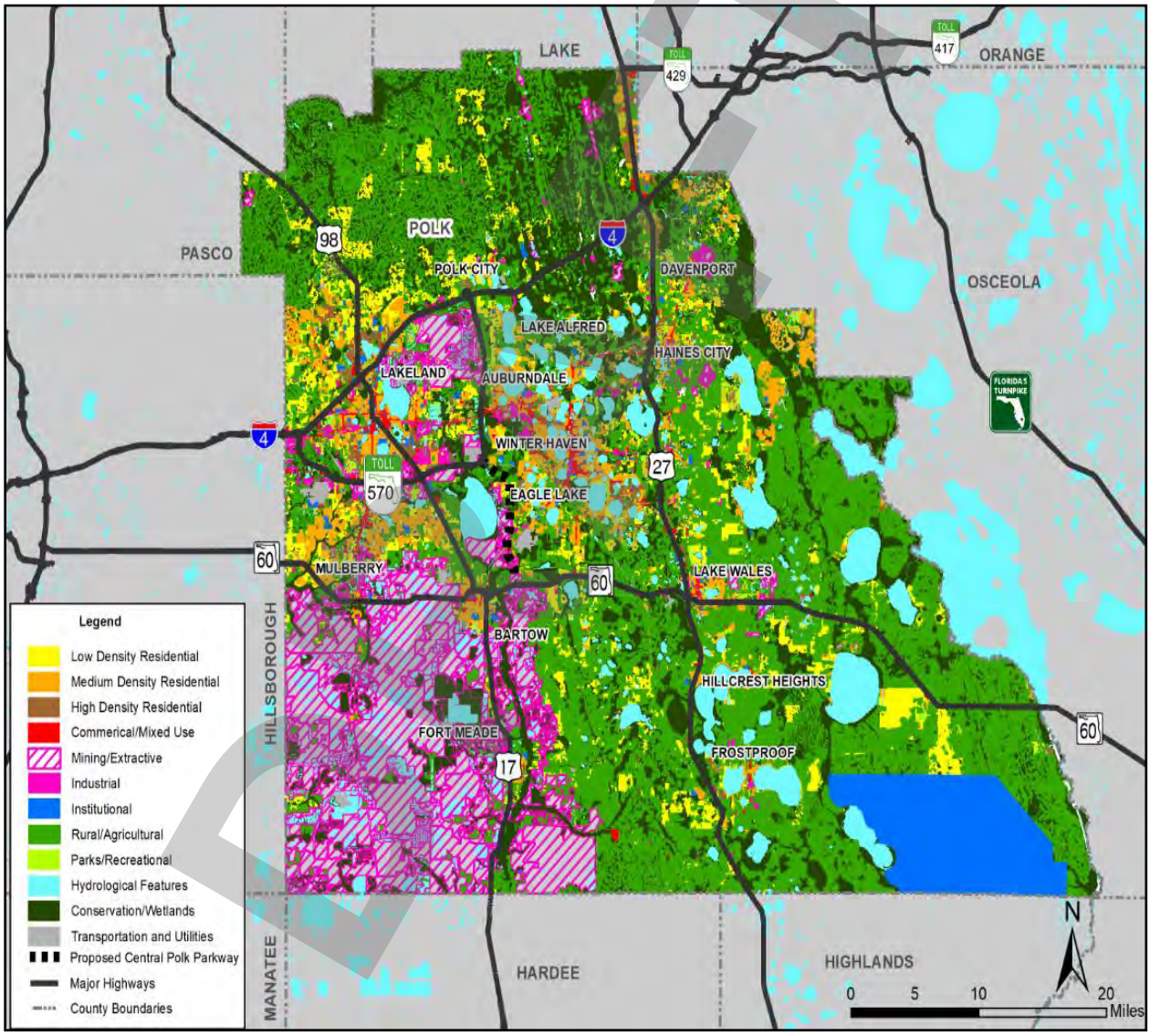
Source: U.S Bureau of Economic Analysis (BEA) and U.S. Bureau of Labor Statistics (BLS)

Land use in the study area is primarily a mix of rural/agricultural and low density residential. Specifically, in the vicinity of the proposed CPP corridor, the land use intensifies on the eastern side. The cities of Auburndale, Eagle Lake and Winter Haven feature the most intense land uses and highest densities east of the Polk Parkway and the proposed CPP corridor. Lakes and other hydrological features are also prominent in the area, particularly between the Polk Parkway and U.S. 27.

Polk County also features over 20 current or former mining sites. Most of these are located in the central and southwestern areas of the county. **Figure 3.2** shows the existing land uses in the county and their location in relation to the proposed facility corridor.

The project study area also contains seven Developments of Regional Impact (DRI) and 20 Planned Unit Developments (PUD). Each development was evaluated to determine its status as well as its outlook for future development. This was particularly important for the DRIs as these large-scale developments would have the largest impact on current and future traffic growth along the proposed facility:

Figure 3.2
Existing Land Use



Lakeland Central Park DRI

Lakeland Central Park is located in western Lakeland. It was first approved in 2006. The development is proposed as a mixed-use development that is primarily non-residential in nature but will feature a limited amount of residential land use.

Oakbridge DRI

Oakbridge is located in the southwest section of Lakeland. It was first approved in 1986 as a DRI. The development is a mixed-use development that features residential units, a large shopping center, and a golf course.

Old Florida Plantation DRI

Old Florida Plantation is located on the northern side of U.S. 17; the property now represents the northern edge of the City of Bartow after annexation. The property was originally sold as surplus property by the Southwest Florida Water Management District for development and was approved for 6,748 residential units and 185,000 square feet of retail use. However, due to the presence of wetlands and other factors, heavy development is unlikely. This area also would be in the direct path of the proposed facility.

Polk Commerce Center DRI

Polk Commerce Center is located south of I-4 near the I-4 and Polk Parkway interchange. The development extends from I-4 to Braddock Road. The property was originally proposed as a DRI in 1997 by the Polk Commerce Center Community Redevelopment Agency (CRA). The CRA functions as the developer for the project. Local officials believe that while there will eventually be development on the site, it will not be of the same intensity as the originally approved Development Order. The FDOT's new SunTrax Transportation Technology Testing facility is constructed on the property within the DRI, phase 1 is complete and the facility is open for operation.

Publix Supermarket Corporate Headquarters

Publix Supermarket Corporate Headquarters is located in southwest Lakeland near the Airport Road interchange along the Polk Parkway. The development was first approved in 2001 for a corporate office park with up to 600,000 square feet of office space.

Polk State College (formerly Polk County College/University of South Florida)

Polk State College is located in Central Polk County. The site is located on U.S. 98 just south of C.R. 540. The site was originally proposed as a joint-use facility between the University of South Florida and Polk County College. The site was approved and was eventually developed as Polk State College.

Williams DRI

The Williams DRI is located on the south side of the easternmost I-4 and Polk Parkway interchange. The development was originally approved in 2001 as a DRI. Currently, the only development on the site is Florida Polytechnic University, which features a classroom building, office building and two dormitory buildings. The pace of development on the site has been extremely slow and the developer may try to downsize or sell the site. Local officials believe the site will develop eventually but at much lower intensities.

3.2. ROADWAY FACILITIES

The following is a description of the major roadways within the corridor study limits:

Polk Parkway

The Polk Parkway is an expansion project of the FTE. It begins at I-4 (MP 27) near the Hillsborough-Polk County line west of Lakeland and ends at I-4 near Polk City (MP 41). The Polk Parkway is a four-lane divided freeway within the study location, with 4-foot inside and outside paved shoulders. The Polk Parkway mainline is currently tolled at approximately MP 12 and the posted speed is 65 mph within the project limits.

U.S. 98

U.S. 98 is a principal arterial connecting the communities of Lakeland and Bartow. It is a six-lane divided facility with a posted speed limit of 55 mph within the project area. U.S. 98 runs from north-west to south-east and crosses the Polk Parkway at approximately MP 10. The Polk Parkway and U.S. 98 form a partial cloverleaf interchange with six ramps which are not tolled. An aerial map of the Polk Parkway and U.S. 98 interchange is shown on **Figure 3.3**.

S.R. 540

S.R. 540 is an east-west four-lane divided principal arterial starting at the Polk Parkway to the west and ending at U.S. 17. The Polk Parkway and S.R. 540 form a split interchange, with the ramps to and from the west terminating at the intersection of Landfill Road whereas, the ramps to and from the east terminate at a T-intersection with S.R. 540. The four ramps are tolled. The posted speed is 50 mph to the west and 60 mph to the east of the Polk Parkway ramps. The intersection of Thornhill Road and S.R. 540 is about 2,000 feet from the Polk Parkway ramp terminal intersection. An aerial photograph of the interchange is presented on **Figure 3.4**.

U.S. 92

U.S. 92 is an east-west principal arterial that runs from Lakeland to Auburndale. It is a four-lane divided roadway with a posted speed limit of 50 mph within the project area. U.S. 92 crosses the Polk Parkway at approximately MP 17, forming a partial cloverleaf interchange with four ramps which are not tolled. An aerial photograph of the interchange is presented on **Figure 3.5**.

U.S. 17

U.S. 17 is a four-lane divided principal arterial with a posted speed limit of 60 mph within the project limits. U.S. 17 has a south-west to north-east orientation within the study area, generally serving the Bartow and Winter Haven communities. 91 Mine Road is a two-lane, north-south minor collector with a posted speed of 40 mph within the project area. 91 Mine Road starts at U.S. 17 and terminates at S.R. 60. S.R. 60 is an east-west four-lane divided principal arterial starting in Tampa on the west and traversing across the state to Vero Beach on the east. The posted speed is 55 mph within the project limits. **Figure 3.6** and **Figure 3.7** are aerial maps of U.S. 17, 91 Mine Road and S.R. 60 within the study limits.

FLORIDA'S TURNPIKE

Central Polk Parkway (Polk Parkway to S.R. 60)
Project Traffic Analysis Report (PTAR)

Polk Parkway and U.S. 98 Interchange
Aerial Photograph

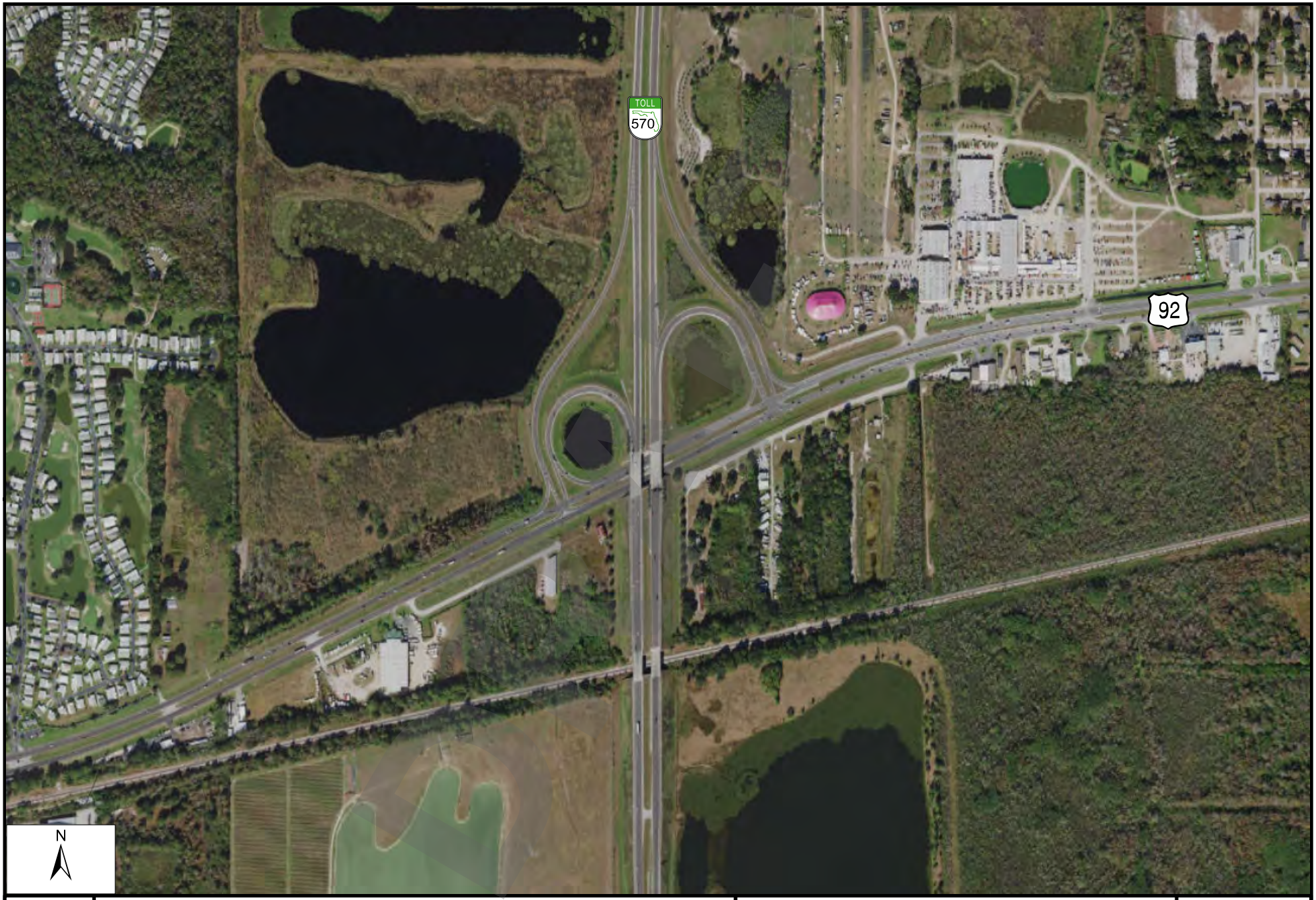
Figure 3.3

FLORIDA'S TURNPIKE

Central Polk Parkway (Polk Parkway to S.R. 60)
Project Traffic Analysis Report (PTAR)

Polk Parkway and S.R. 540 Interchange
Aerial Photograph

Figure 3.4



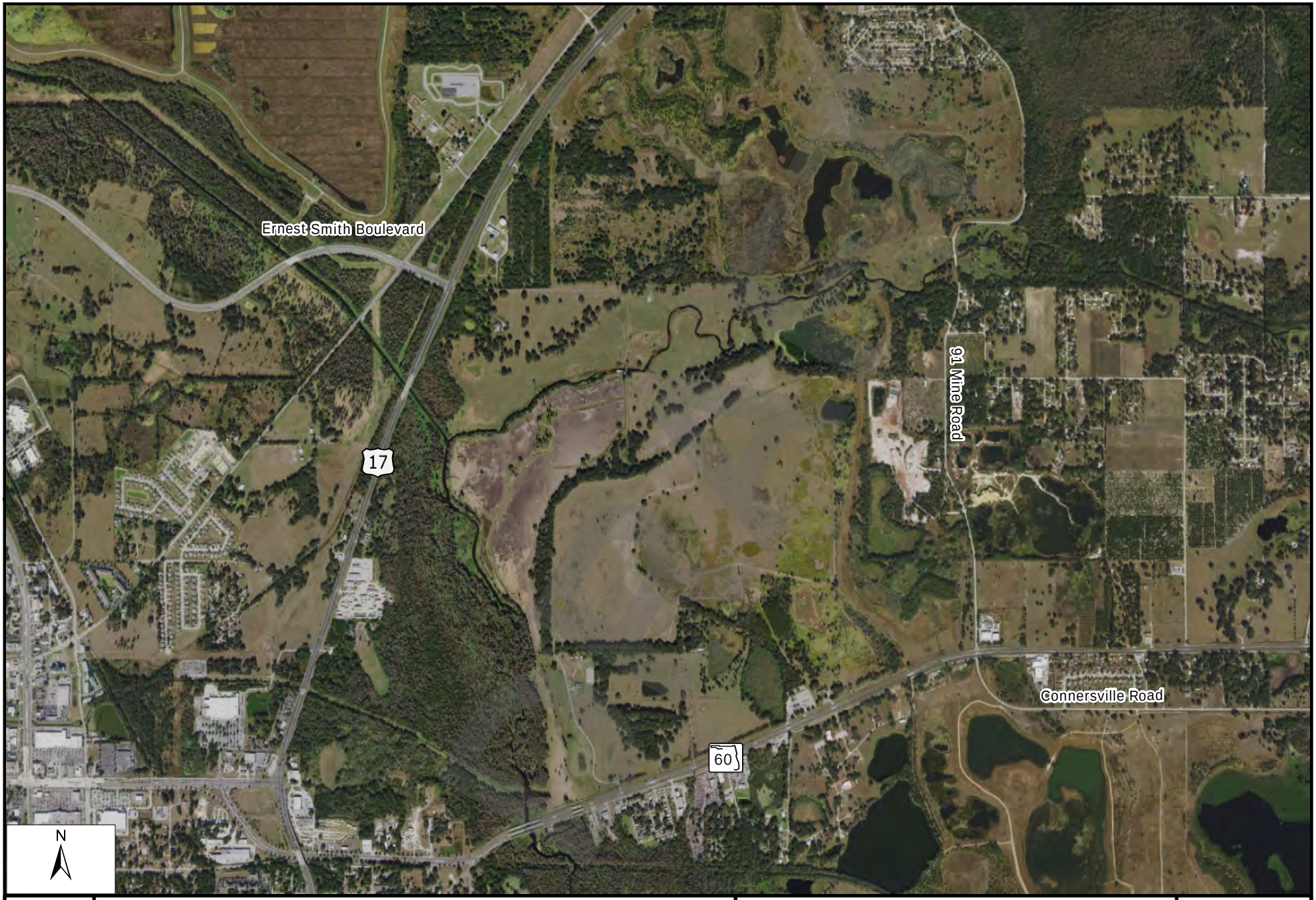
FLORIDA'S TURNPIKE

Central Polk Parkway (Polk Parkway to S.R. 60)
Project Traffic Analysis Report (PTAR)

Polk Parkway and U.S. 92 Interchange
Aerial Photograph

Figure 3.5

FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	U.S. 17, 91 Mine Road and Spirit Lake Road Aerial Photograph	Figure 3.6



Central Polk Parkway (Polk Parkway to S.R. 60)
Project Traffic Analysis Report (PTAR)

U.S. 17, 91 Mine Road and S.R. 60
Aerial Photograph

Figure 3.7

3.3. EXISTING CRASH DATA

Crash data for existing facilities within the AOI were processed using the most recent five-year data from the state's Crash Analysis Reporting System (CARS), from 2012 through 2016. Detailed crash reports (long forms) were reviewed to verify the accuracy of the information obtained from the databases.

A total of 385 crashes were reported within the AOI during the five-year study period from 2012 to 2016, as presented in **Table 3.3**. There was an increase in crashes from 2012 to 2015 and a slight decrease in 2016. Most of the crashes resulted in injury and property damage only. Two fatalities were reported during the five-year analysis period.

Table 3.3
Number of Crashes and Crash Severity by Year

Crash Severity	2012	2013	2014	2015	2016	*Total*	Proportion
Fatality	0	0	0	0	2	***2***	0.5%
Injury	34	29	29	59	37	***188***	48.8%
Property Damage Only	27	41	41	35	51	***195***	50.6%
Total	***61***	***70***	***70***	***94***	***90***	***385***	100.0%

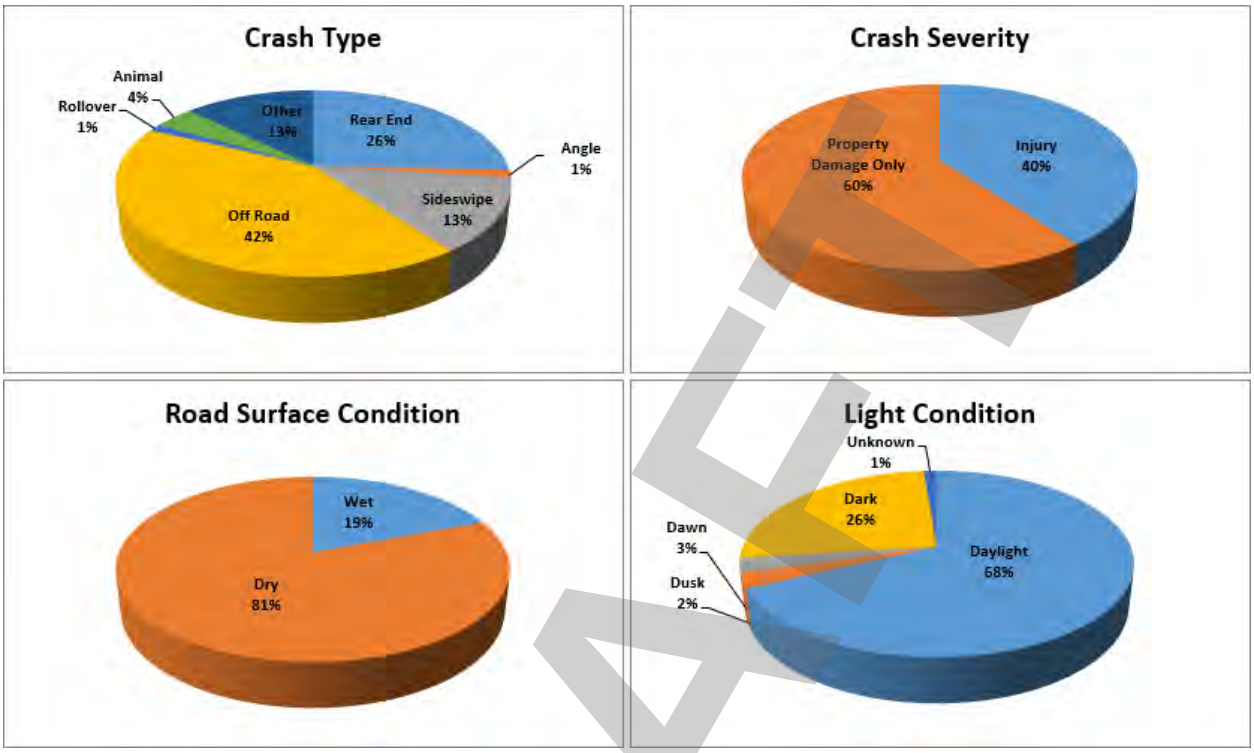
Table 3.4 summarizes the crashes based on location. Forty-four percent of the crashes occurred at intersections, 34 percent along Polk Parkway mainline and ramps, and 22 percent at arterial mid-block locations (i.e., outside the intersection influence areas). Crash analysis at the intersections included a 250-foot influence area.

Table 3.4
Number of Crashes on Road Segments

Roadway Segment	2012	2013	2014	2015	2016	*Total*	Proportion
Freeway Mainline and Ramps	14	24	22	31	39	***130***	33.8%
Intersections	29	26	29	44	42	***170***	44.2%
Arterials Mid-Block	18	20	19	19	9	***85***	22.1%
Total	***61***	***70***	***70***	***94***	***90***	***385***	100.0%

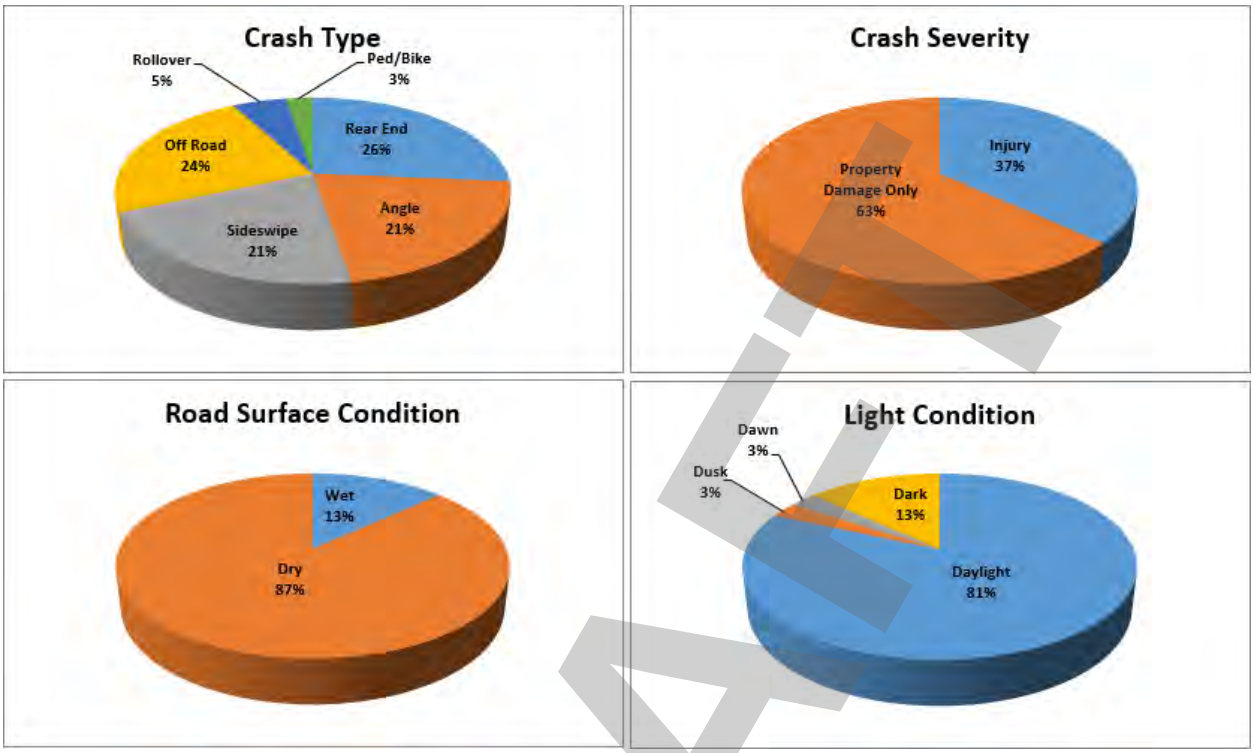
Crash data summaries are provided on **Figure 3.8** through **Figure 3.19**. Detailed crash data tables and reports are provided in **Appendix A**. A total of 78 crashes were reported along Polk Parkway mainline within the study limits during the five-year study period. The crashes were mainly off-road (42 percent) as illustrated on **Figure 3.8**. Many of the crashes resulted in property damage only and occurred under dry pavement conditions during the day. The crashes occurred at different positions on the roadway thus no hotspot was identified and also were evenly distributed throughout the week.

Figure 3.8
Polk Parkway Mainline from MP 9 to 18 Crash Data Summary



At the U.S. 98 Ramps to/from Polk Parkway, 38 crashes were reported during the five-year analysis period. The majority of the crash types were rear end (26 percent), off-road (24 percent), angle and side swipe (21 percent each), as illustrated on **Figure 3.9**. Sixty-three percent of the crashes resulted in property damage only and the remaining 37 percent resulted in injury. The crashes were evenly distributed throughout the week. One pedestrian and bicycle crash were reported during the study period. The crash resulted in injury and occurred under dry pavement condition during the day.

Figure 3.9
U.S. 98 Ramp Roadways Crash Data Summary



Eight crashes were reported at the S.R. 540 Ramps to/from Polk Parkway during the five-year study period. Four of the crashes (50 percent) were rear end, as illustrated on **Figure 3.10**. Most of the crashes resulted in property damage only (75 percent) and occurred under dry pavement conditions. All the eight crashes were evenly distributed throughout the week and mostly occurred between 3:00 PM to 6:00 PM.

At the U.S. 92 Ramps to/from Polk Parkway, only six crashes were reported during the five-year period; three rollover (50 percent), two off-road (33 percent) and one rear end (17 percent), as illustrated on **Figure 3.11**. Four crashes (67 percent) resulted in injury (67 percent) and the remaining two (33 percent) resulted in property damage only. Many of the crashes occurred on Saturday between 10:00 AM and 12:00 PM. All the crashes occurred under dry pavement conditions.

Most of the 24 crashes reported at the S.R. 540 and Landfill Road intersection were rear end, as illustrated on **Figure 3.12**. Majority of the crashes resulted in property damage only and occurred under dry pavement conditions during the day, on weekdays. There were no crashes reported at the S.R. 540 and Polk Parkway ramps to/from east intersection during the five-year study period.

Twenty-eight crashes were reported at the S.R. 540 and Thornhill Road intersection, mainly rear end, as illustrated on **Figure 3.13**. Most of the crashes resulted in injury and occurred under dry pavement conditions during the day. The crashes were evenly distributed through all the weekdays and mainly occurred during the afternoon period from 1:00 PM to 7:00 PM.

Figure 3.10
S.R. 540 Ramp Roadways Crash Data Summary

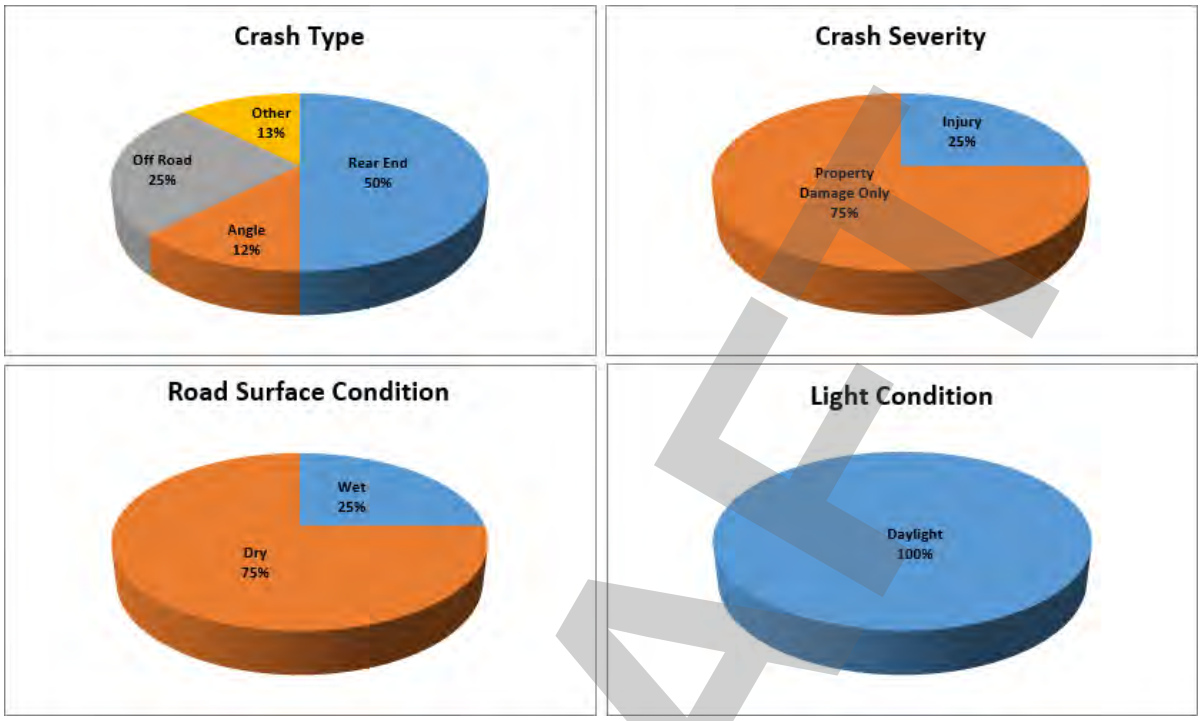


Figure 3.11
U.S. 92 Ramp Roadways Crash Data Summary

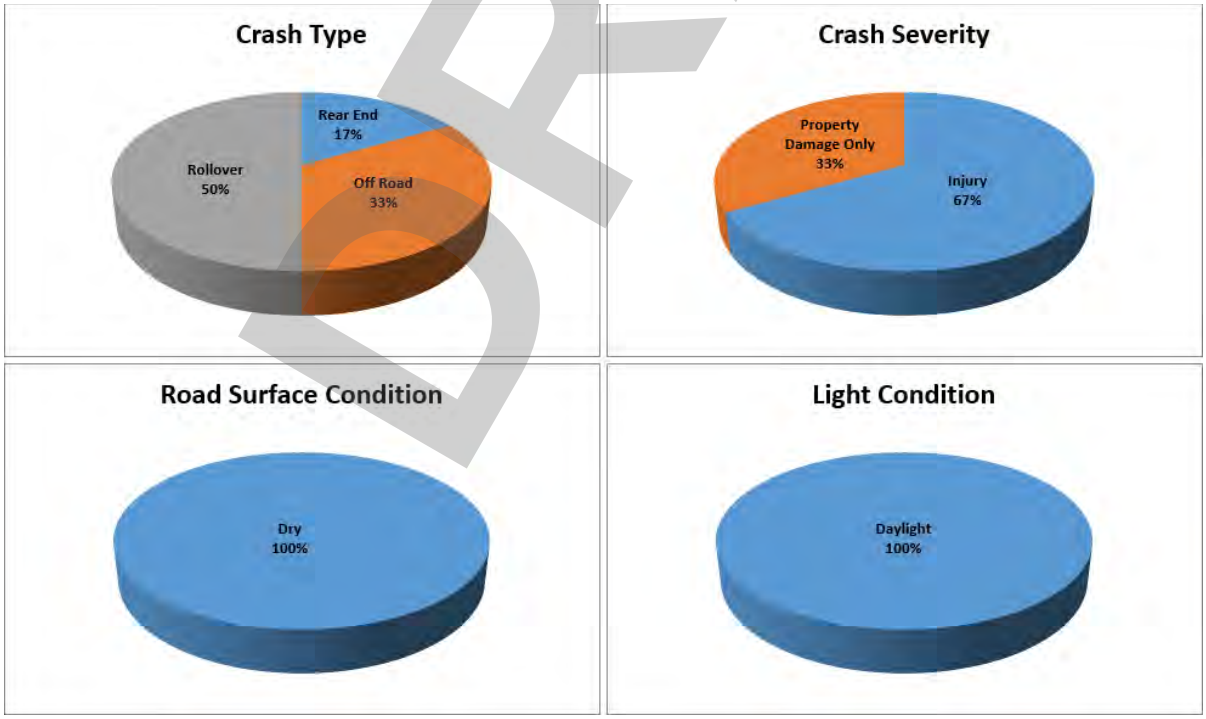


Figure 3.12
S.R. 540 and Landfill Road Intersection Crash Data Summary

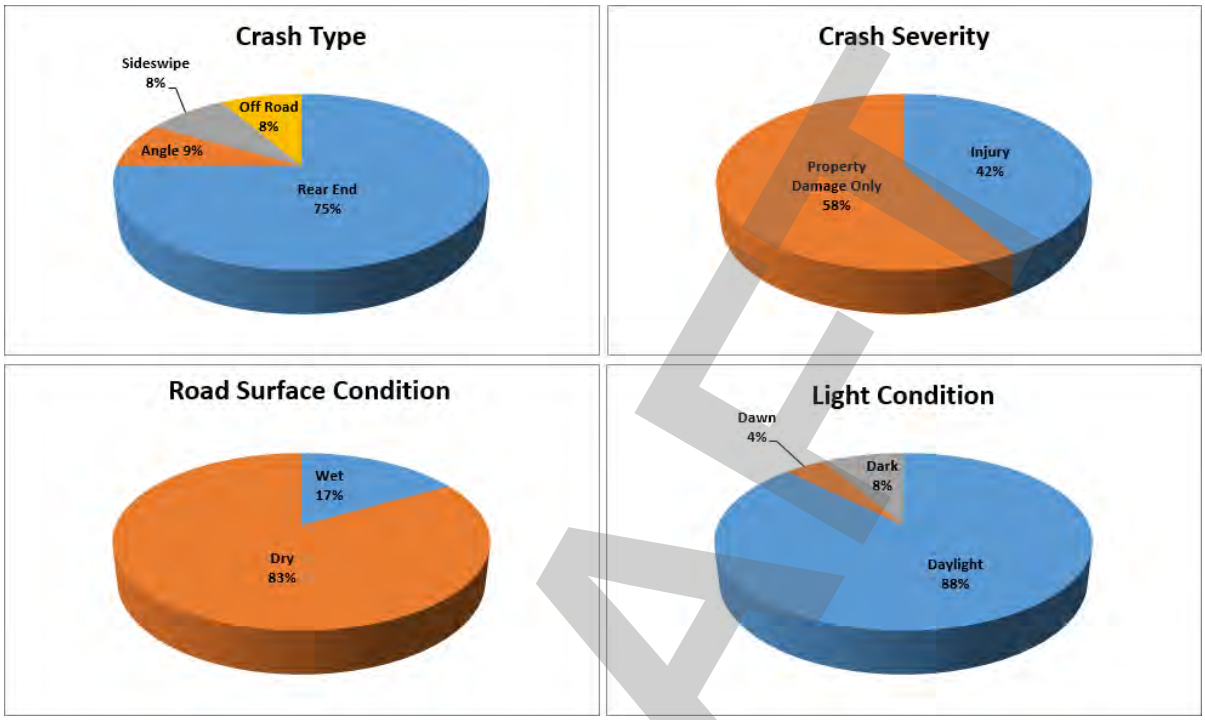
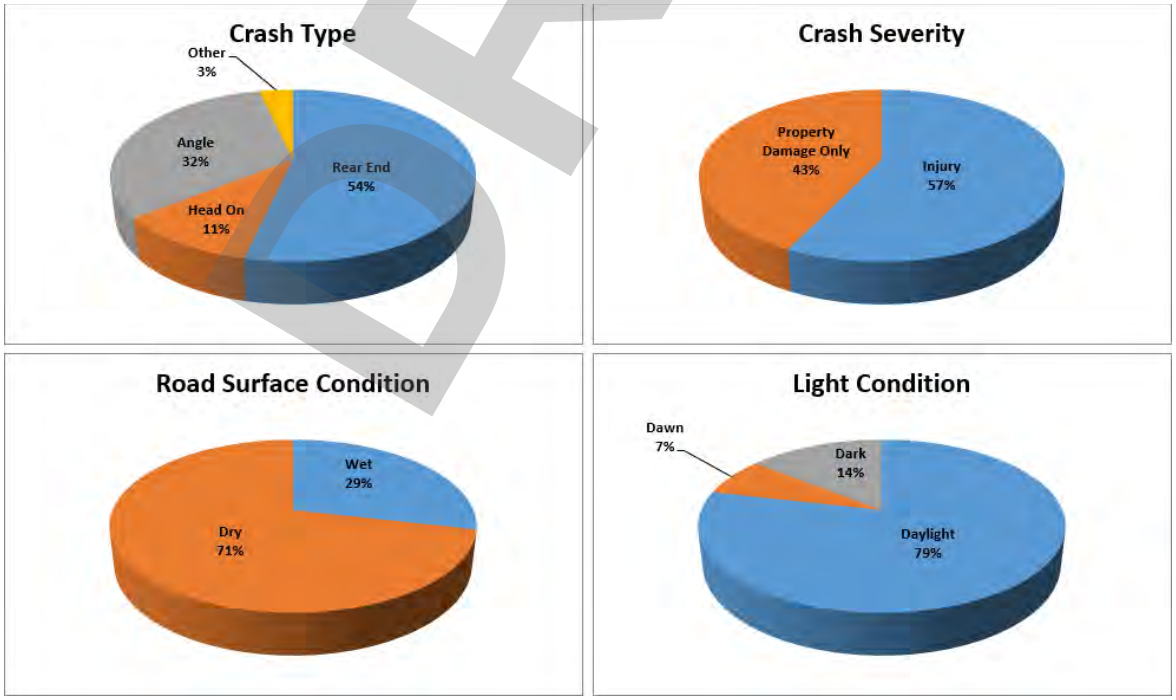


Figure 3.13
S.R. 540 and Thornhill Road Intersection Crash Data Summary



At the U.S. 17 and Ernest Smith Boulevard intersection, 36 crashes were reported. The crash types were mainly rear end (25 percent), angle (25 percent), off-road (22 percent) and sideswipe (19 percent), as illustrated on **Figure 3.14**. There was one (three percent) fatality reported due to angle crash. Most of the crashes resulted in property damage only and occurred mostly under dry pavement conditions during the day.

Most of the 22 crashes reported at the U.S. 17 and 91 Mine Road intersection were rear end, as illustrated on **Figure 3.15**. Crashes mainly occurred during the day under dry road surface conditions. There was an even split between injury and property damage severity types, out of the 22 crashes reported.

Forty-seven crashes were reported at the U.S. 17 and Spirit Lake Road intersection. As illustrated on **Figure 3.16**, the majority of crashes reported were rear end (72 percent). The crashes were distributed throughout the week with most of them resulting to injury and occurred under dry pavement conditions. Seventy-two percent of crashes occurred during the day.

At the 91 Mine Road and S.R. 60 intersection, 13 crashes were reported during the five-year analysis period. The main crash types were angle (38 percent) and off-road (31 percent), as illustrated on **Figure 3.17**. Most of the crashes occurred under dry pavement conditions during the AM and PM peak hours, with majority causing injury.

Figure 3.14
U.S. 17 and Ernest Smith Boulevard Intersection Crash Data Summary

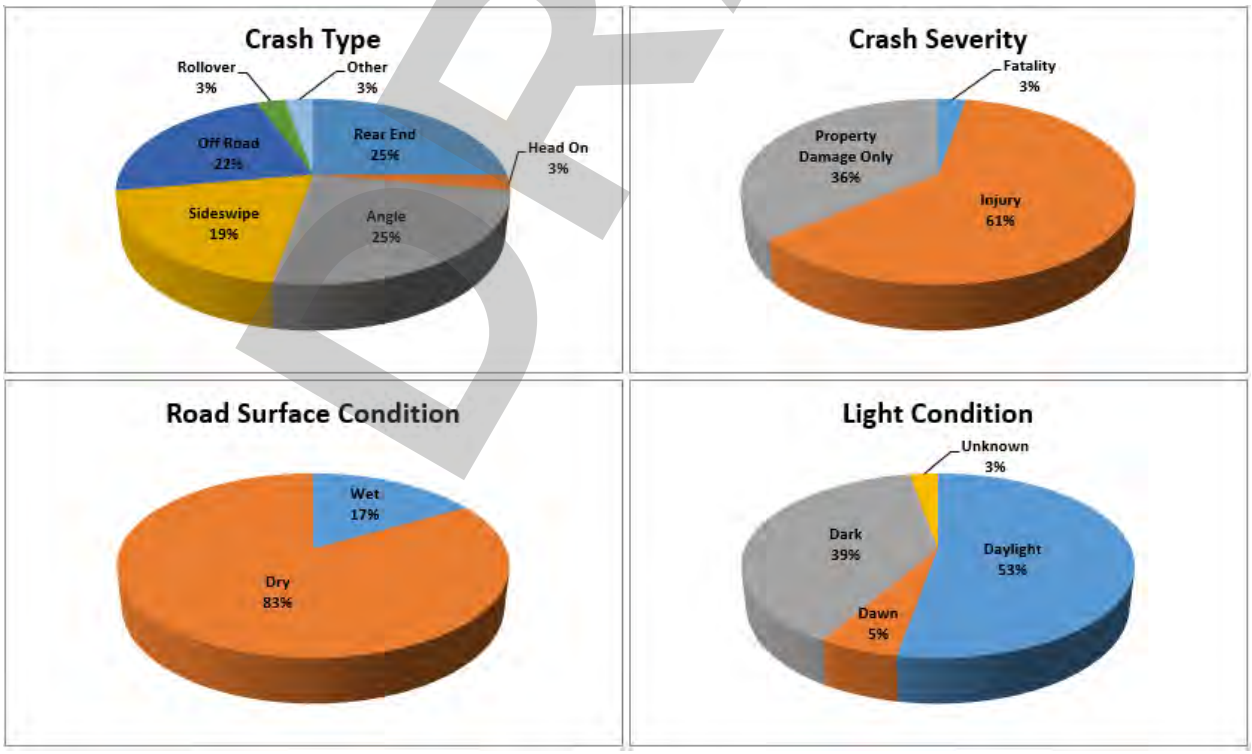


Figure 3.15
U.S. 17 and 91 Mine Road Intersection Crash Data Summary

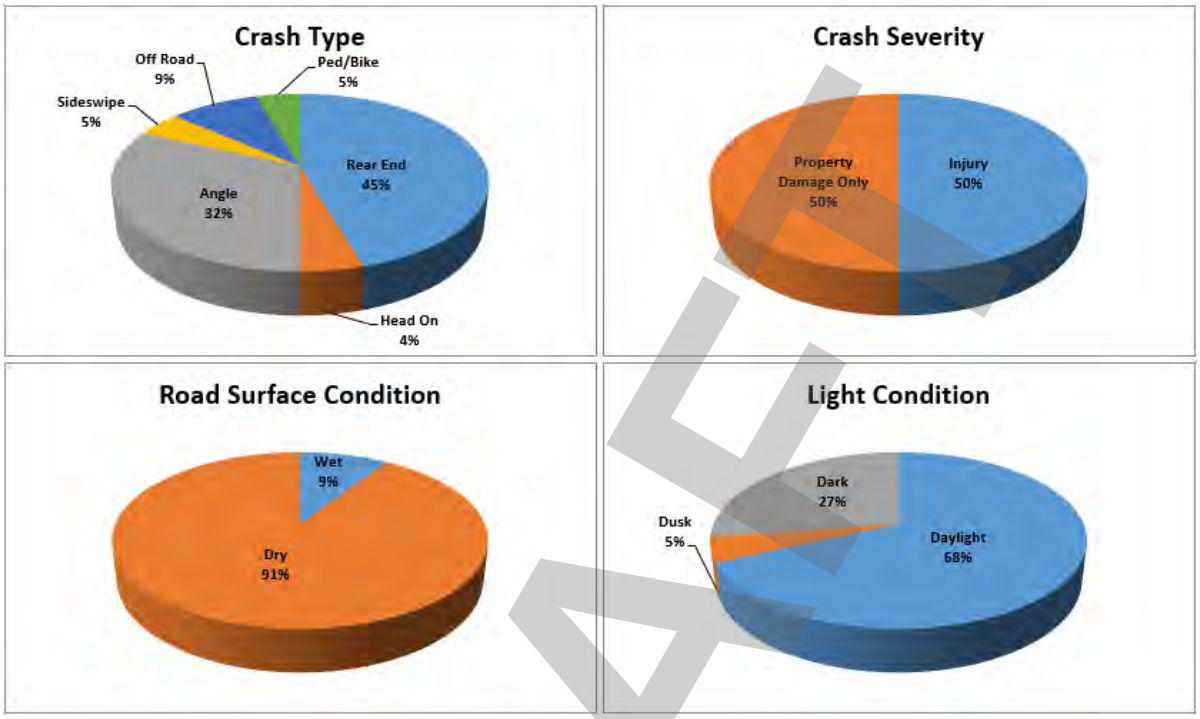


Figure 3.16
U.S. 17 and Spirit Lake Road Intersection Crash Data Summary

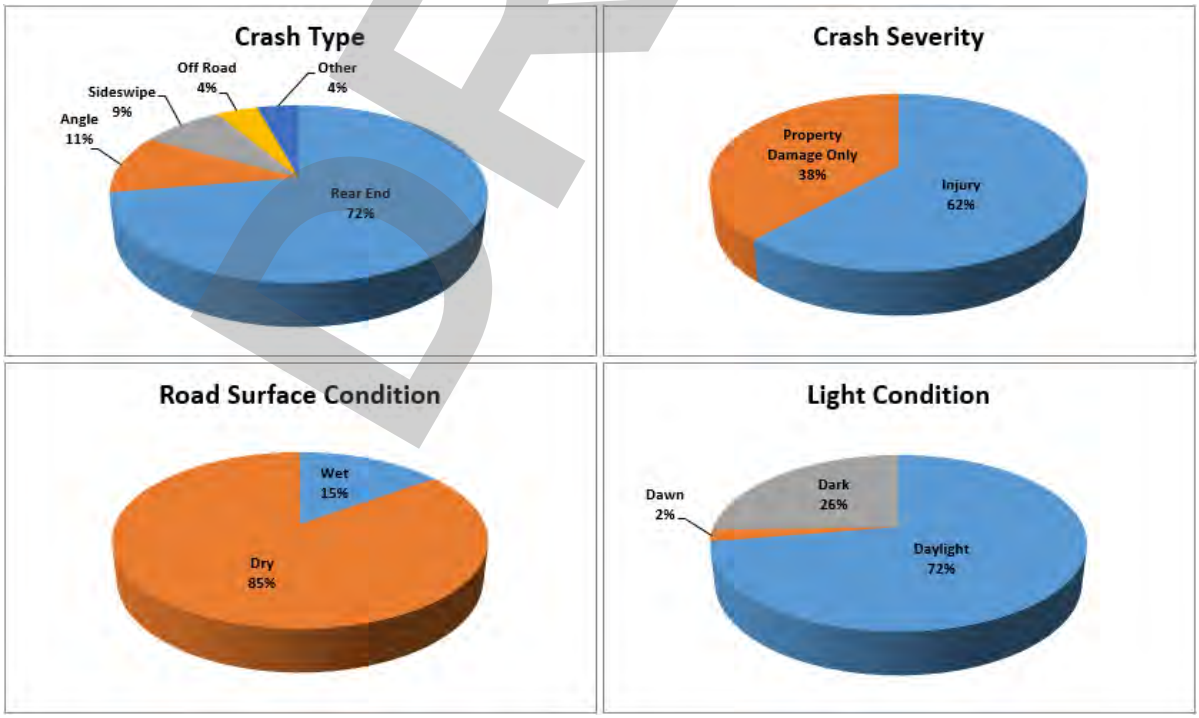


Figure 3.17
91 Mine Road and S.R. 60 Intersection Crash Data Summary

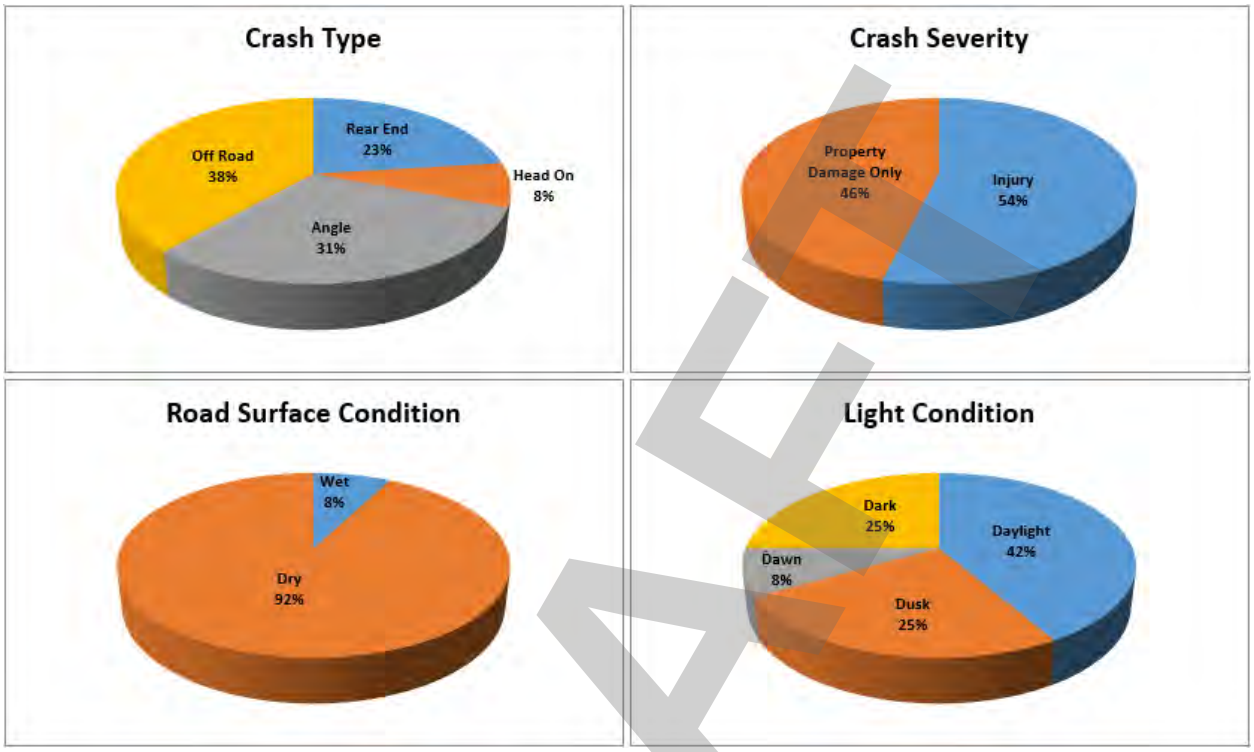


Figure 3.18 and **Figure 3.19** show the crash analysis summary at arterial mid-block locations (i.e., outside the intersection influence areas), which represents 22 percent of the total crashes within the AOI, from 2012 to 2016. Thirty-five crashes were reported at S.R. 540 mid-block locations within the study limits. Most of them were rear end and resulted in property damage only, as illustrated on **Figure 3.18**. There was one (three percent) fatality, it resulted from a rear end crash. The crashes occurred mostly under dry pavement conditions during the day.

Fifty crashes were reported along U.S. 17 mid-block locations within the study limits. Forty-one percent of the reported crashes were rear end, as illustrated on **Figure 3.19**. Crash severity types were injury and property damage only. Eighty percent of the crashes occurred under dry pavement conditions during the day.

Figure 3.18
S.R. 540 Mid-Block Crash Data Summary

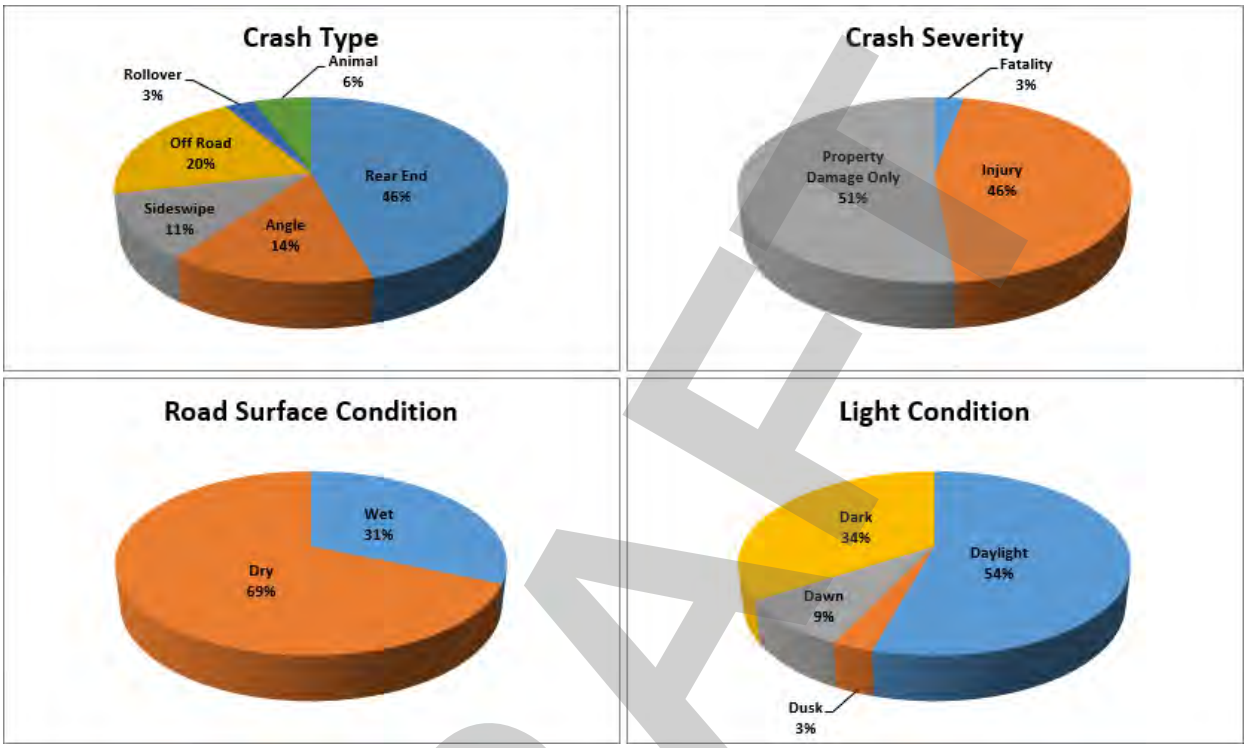
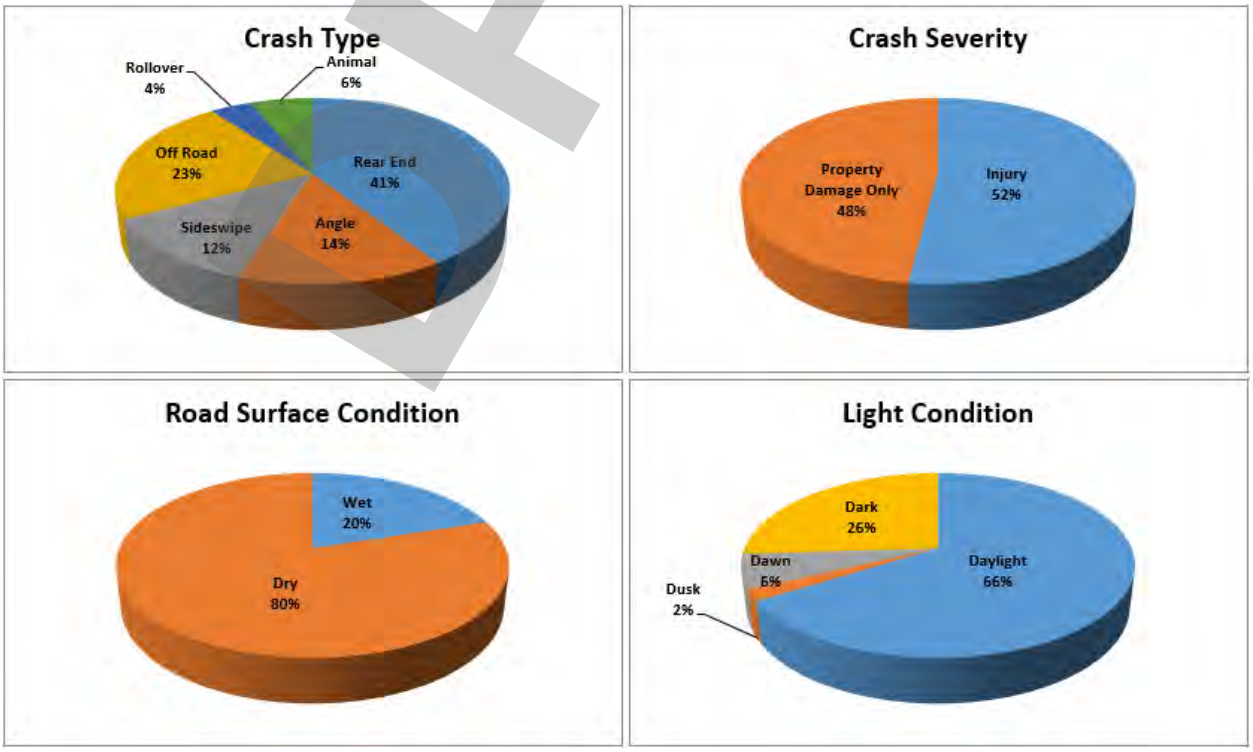


Figure 3.19
U.S. 17 Mid-Block Crash Data Summary



Actual crash rates were computed and compared with average crash rates for similar facilities within Polk County to assess the safety condition within the study area. Critical crash rates and safety ratios were also estimated. Crash rates for the Polk Parkway mainline, ramps and arterial mid-block segments were estimated as crashes per Million Vehicle Miles Travelled (MVMT) and for the intersections as crashes per Million Entering Vehicles (MEV). The critical crash rate is based on the average crash rate for a similar facility adjusted by vehicle exposure and a probability constant. The safety ratio represents the actual crash rate divided by the critical crash rate. If a segment has an actual crash rate higher than the critical crash rate (i.e., safety ratio > 1.0), it may have a safety deficiency. The crash rates are listed in **Table 3.5**. The analysis shows that the Polk Parkway mainline, ramps, intersections, and arterial mid-block segments within the study area currently have actual crash rates lower than the critical crash rates, indicating that there are no major crash issues within the study area.

Table 3.5

Crash Rates and Safety Ratios for 2012 through 2016

Description	Total Crashes	Actual Crash Rate	Average Crash Rate*	Critical Crash Rate	Safety Ratio
Freeway Mainline Or Ramps					
Polk Parkway Mainline	78	0.43	0.47	0.75	0.57
S.R. 540 Ramps	8	0.09	0.47	0.88	0.10
U.S. 98 Ramps	38	0.29	0.47	0.80	0.36
U.S. 92 Ramps	6	0.30	0.47	1.41	0.22
Intersections					
S.R. 540 and Landfill Road	24	0.60	0.43	1.03	0.58
S.R. 540 and Thornhill Road	28	0.40	0.43	0.88	0.46
U.S. 17 and Ernest Smith Road	36	0.71	0.43	0.96	0.74
U.S. 17 and 91 Mine Road	22	0.52	0.43	1.02	0.51
U.S. 17 and Spirit Lake Road	47	0.84	0.43	0.93	0.90
S.R. 60 and 91 Mine Road	13	0.19	0.43	0.88	0.21
Arterial Mid-block Segments					
U.S. 17 Mid Block	50	0.40	0.61	1.00	0.40
S.R. 540 Mid-Block	35	0.36	0.61	1.05	0.34

* FDOT CARS Polk County, 5-year Average Crash Rate
Polk Parkway Mainline: Toll Road Rural
Crash rate not available, used rate for "Interstate Rural"
Polk Parkway Ramps: Ramp Rural
Crash rate not available, used rate for mainline
Intersection: Rural 4-5Ln 2 Way Divided Raised

Crash Rate:
Highway/Ramps: Crashes per Million Vehicle Miles Travelled (MVMT)
Intersections: Crashes per Million Entering Vehicles (MEV)
Mid-Block: Crashes per Million Vehicle Miles Travelled (MVMT)

3.3.1. Crash Analysis Summary

The most recent five-year crash data from the state's CARS database is from 2012 through 2016. The CARS data reported a total of 385 crashes within the AOI during the five-year study period. Forty four percent of the total crashes occurred at intersections, with rear end being the most common type of crashes causing over 50 percent of the intersection crashes. Thirty three percent of crashes occurred on the Polk Parkway mainline, and the remaining 22 percent occurred at the mid-block location (i.e. out of the influence area of the intersections). Crashes occurred on the freeway and intersections at different location hence no hotspot was identified. Most of the crashes resulted in property damage only (50 percent) and injury (49 percent). Two fatalities were reported in the five -year study period. The analysis shows that there are no safety deficiencies within the study area.

Existing traffic data and traffic operational analyses are provided in this section.

4.1. EXISTING TRAFFIC DATA AND LANE GEOMETRY

Traffic volumes for the Polk Parkway mainline and S.R. 540 ramps (tolled) were obtained from Fiscal Year *2017 Enterprise One Reports* (Toll Traffic by Vehicle Class). Daily tube counts and intersection turning movement counts were collected at the locations listed in **Table 4.1**.

Table 4.1
Field Data Collection Locations

Location	Date	Time
Daily Tube Counts		
U.S. 92 and Polk Parkway Ramps	10/1/2017 - 10/7/2017	24 Hours
U.S. 92, West of Polk Parkway Ramps	3/13/2018 - 3/15/2018	
U.S. 98 and Polk Parkway Ramps	9/17/2017 - 9/23/2017	
U.S. 98, South of Polk Parkway Ramps	9/17/2017 - 9/23/2017	
S.R. 540 A, South	03/08/2017 - 03/10/2017	
S.R. 540, East of Landfill Road	03/08/2017 - 03/10/2017	
Landfill Road	03/08/2017 - 03/10/2017	
S.R. 540, East of Polk Parkway Ramps	03/08/2017 - 03/10/2017	
Thornhill Road, South of S.R. 540	03/08/2017 - 03/10/2017	
U.S. 17, East of 91 Mine Road	3/13/2016 - 3/15/2019	
U.S. 17, East of Ernest Smith Boulevard	3/20/2016 - 3/22/2016	
Ernest Smith Boulevard, West of U.S. 17	3/20/2016 - 3/22/2016	
S.R. 60, West of 91 Mine Road	3/13/2016 - 3/15/2019	
S.R. 60, East of 91 Mine Road	3/13/2016 - 3/15/2019	
Intersection Movement Counts		
U.S. 92 and Polk Parkway Ramps	9/18/2018	6:00 – 9:00 AM (3 Hours) 4:00 – 7:00 PM (3 Hours)
U.S. 98 and Polk Parkway Ramps	3/13/2018	
S.R. 540 and Landfill Road	3/9/2017	
S.R. 540 and Polk Parkway Ramps	3/9/2017	
S.R. 540 and Thornhill Road	3/9/2017	
U.S. 17 and Ernest Smith Boulevard	3/13/2018	
U.S. 17 and 91 Mine Road	3/13/2018	
U.S. 17 and Spirit Lake Road	3/13/2018	
S.R. 60 and 91 Mine Road	3/13/2018	

The data collection was conducted in accordance with the procedures from the latest edition of the FDOT's *Manual on Uniform Traffic Studies* (MUTS), FDOT Manual Number 750-020-007. Seasonal and axle adjustment factors were applied to the data where necessary. A linear growth rate of 4.1 percent was estimated from historical data and applied to the 2017 counts to create a 2018 profile. The growth rate was estimated from the Fiscal *Year 2017 Enterprise One Report* (Toll Traffic by Vehicle Class). The study area AM and PM peak hour volumes were calculated using data for the four-highest consecutive 15-minute periods in the morning and evening at each count location. The peak hours

generally occurred between 7:15 AM to 8:15 AM and 4:45 PM to 5:45 PM but varied slightly based on the location. The 2018 data were then aggregated and balanced to ensure continuity of flow and consistency. Intersection turning movement counts were adjusted using daily tube counts where applicable. **Table 4.2** summarizes the final 2018 AADT and AM and PM peak hour volumes for the freeway mainline, ramps and arterials. **Figure 4.1** graphically depicts the final 2018 AM and PM peak hour volumes. Signal timing data were provided by Polk County. Field observations and high-resolution aerial maps were used to verify the geometry. The existing lane geometry is depicted on **Figure 4.2**.

Table 4.2
2018 AADT and Peak Hour Volumes

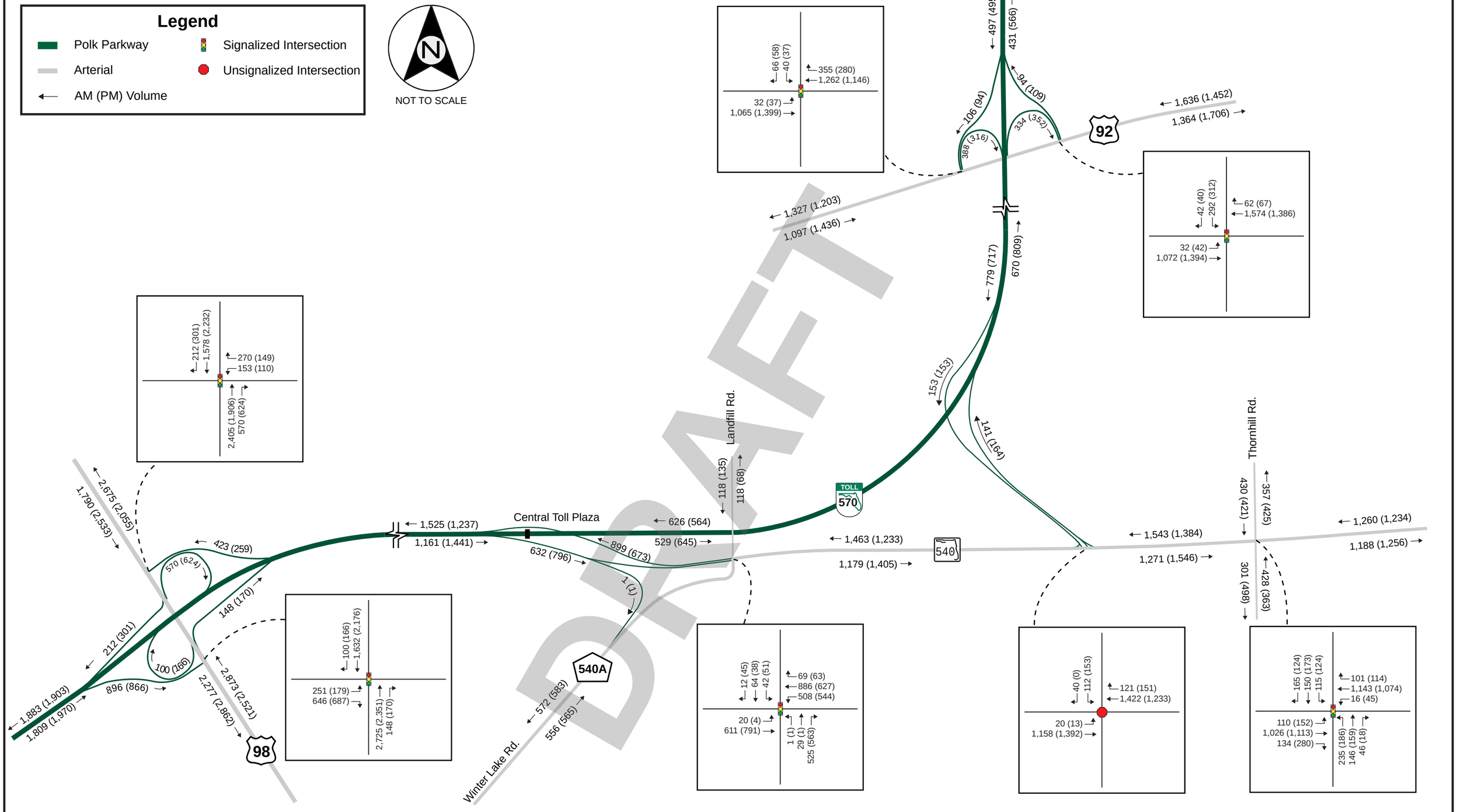
Location	Direction	AADT		Peak Hour Volumes	
		Directional	Total	AM	PM
Polk Parkway and U.S. 92 Interchange	Eastbound On-Ramp	1,400	1,400	94	109
	Westbound Off-Ramp	1,200	1,200	106	94
	Eastbound Off-Ramp	3,300	3,300	334	352
	Westbound On-Ramp	3,400	3,400	388	316
Polk Parkway and S.R. 540 Interchange	Eastbound On-Ramp to the East	1,700	3,500	141	164
	Westbound Off-Ramp from the East	1,800		153	153
	Eastbound Off-Ramp from the West	7,400	15,500	632	796
	Westbound On-Ramp to the West	8,100		899	673
Polk Parkway Central Plaza	Eastbound	6,800	13,200	529	645
	Westbound	6,400		626	564
Polk Parkway and U.S. 98 Interchange	Eastbound On-Ramp from U.S. 98 Northbound	1,700	1,700	148	170
	Eastbound On-Ramp from U.S. 98 Southbound	1,200	1,200	100	166
	Westbound Off-Ramp	3,200	3,200	423	259
	Eastbound Off-Ramp	9,500	9,500	896	866
	Westbound On-Ramp from U.S. 98 Northbound	7,200	7,200	570	624
	Westbound On-Ramp from U.S. 98 Southbound	2,400	2,400	212	301
S.R. 540 A, South	Northbound	6,000	11,700	556	565
	Southbound	5,700		572	583
S.R. 540, East of Landfill Road	Eastbound	13,100	26,500	1,179	1,406
	Westbound	13,400		1,463	1,233
Landfill Road	Northbound	1,000	2,000	118	68
	Southbound	1,000		118	135
S.R. 540, East of Polk Parkway Ramps	Eastbound	14,400	29,300	1,271	1,546
	Westbound	14,900		1,544	1,385
Thornhill Road, South of S.R. 540	Northbound	4,300	8,900	428	363
	Southbound	4,600		301	498
U.S. 17, East of 91 Mine Road	Northbound	11,200	22,300	962	1,309
	Southbound	11,100		1,252	1,150
U.S. 17, East of Ernest Smith Boulevard	Northbound	11,500	22,800	971	1,356
	Southbound	11,300		1,212	1,066
Ernest Smith Boulevard, West of U.S. 17	Northbound	3,900	8,500	415	499
	Southbound	4,600		431	378
S.R. 60, West of 91 Mine Road	Eastbound	14,600	29,300	824	1,287
	Westbound	14,700		1,142	954
S.R. 60, East of 91 Mine Road	Eastbound	13,900	28,100	787	1,196
	Westbound	14,200		1,099	926

Legend

- Polk Parkway
- Arterial
- AM (PM) Volume
- Signalized Intersection
- Unsignalized Intersection

N

NOT TO SCALE



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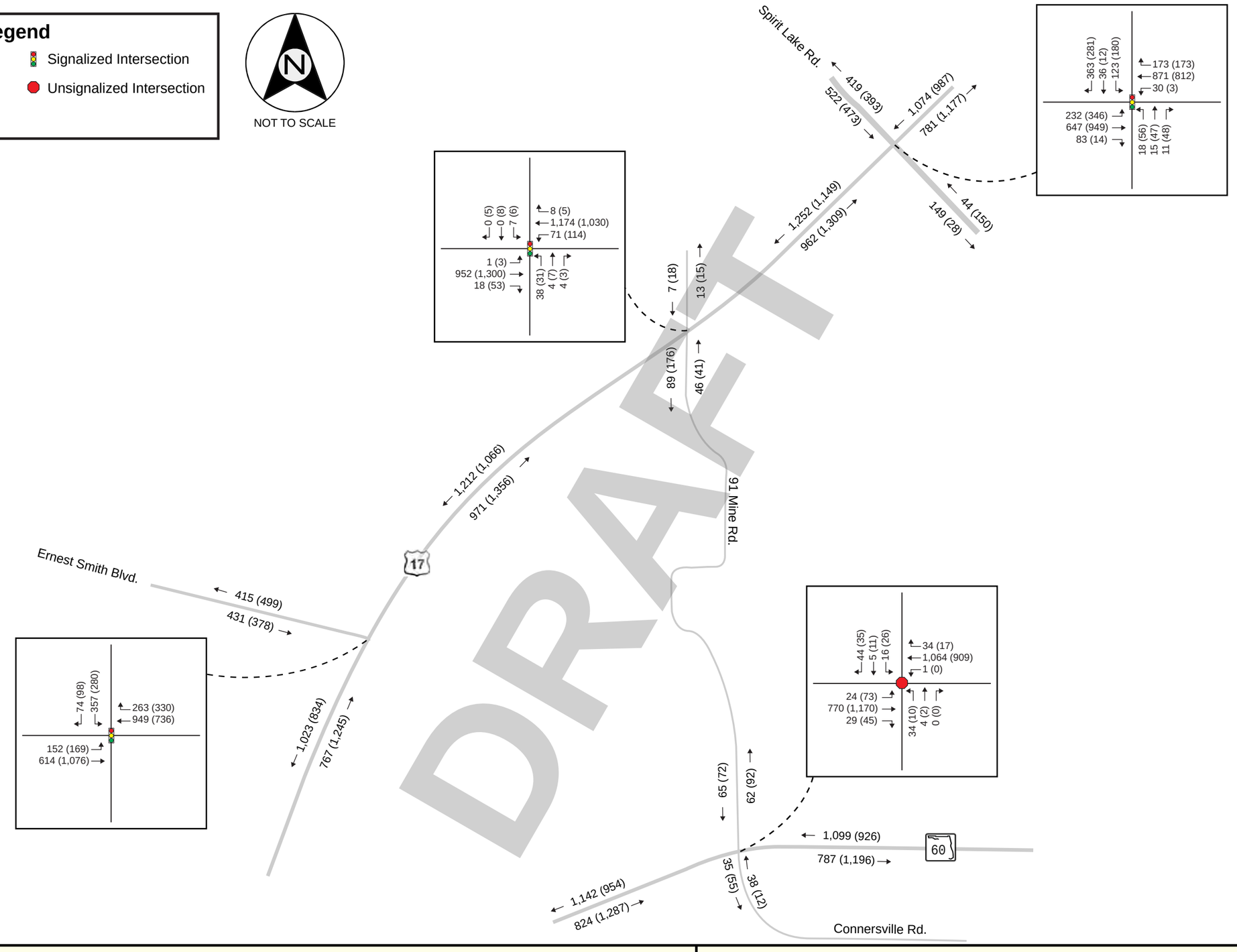
FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2018 (Existing) AM and PM Peak Hour Traffic Volumes	Figure 4.1 (1 of 2)

Legend

- Polk Parkway
- Arterial
- AM (PM) Volume
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE

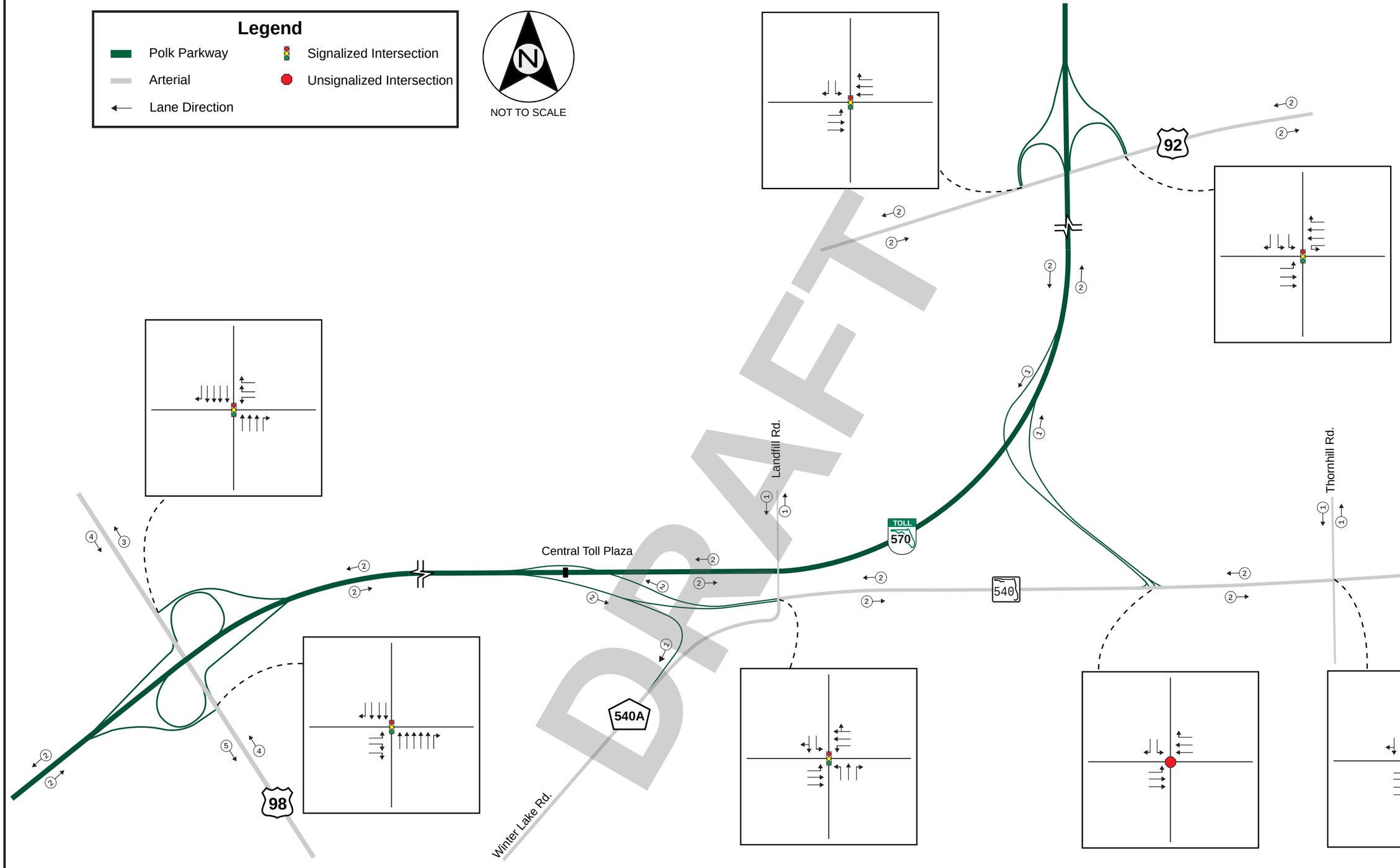


FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2018 (Existing) AM and PM Peak Hour Traffic Volumes Figure 4.1 (2 of 2)

Legend

- Polk Parkway
- Arterial
- Lane Direction
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE

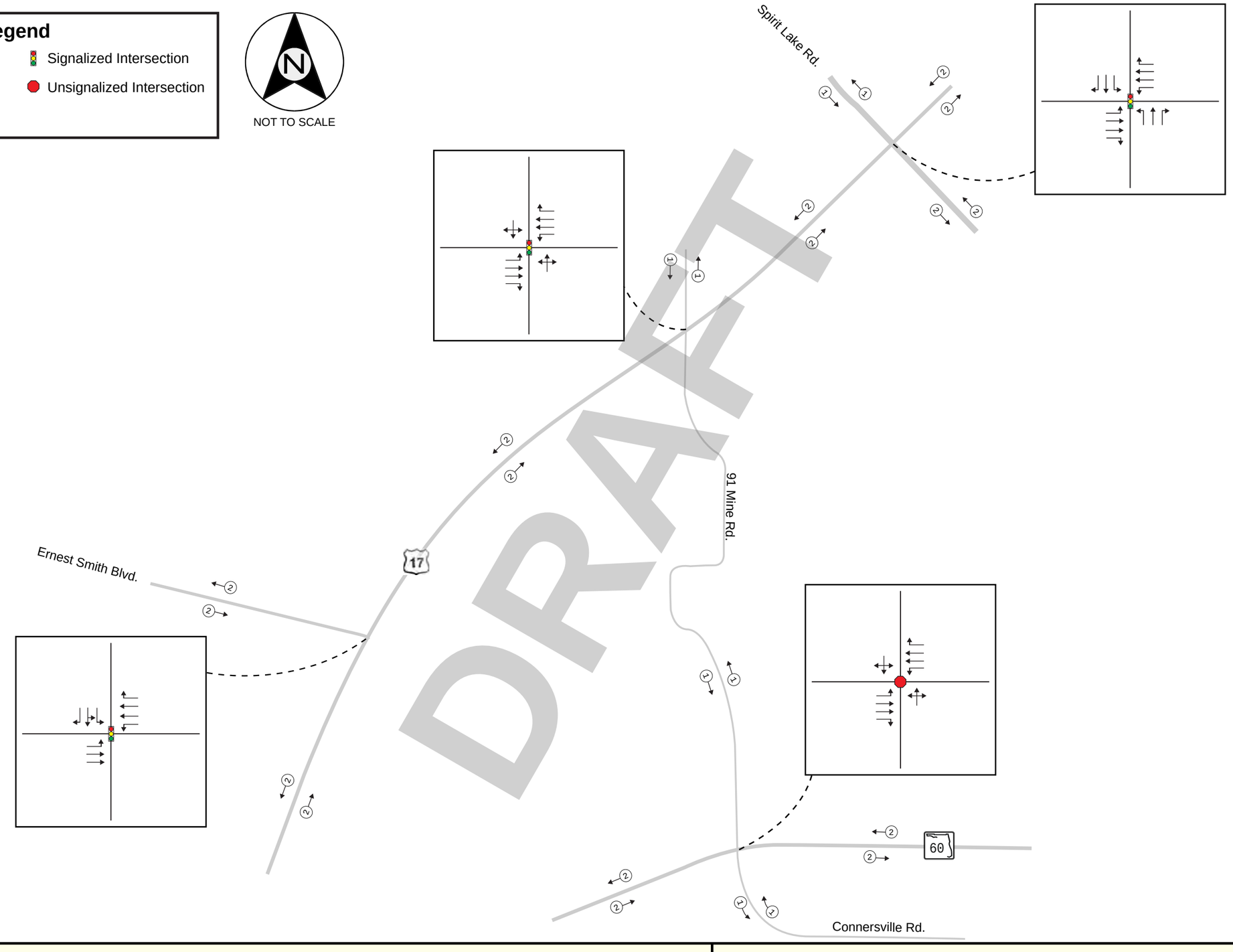


FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2018 (Existing) Lane Geometry	Figure 4.2 (1 of 2)

Legend

- Polk Parkway
- Arterial
- Lane Direction
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE



FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2018 (Existing) Lane Geometry

Figure 4.2
(2 of 2)

4.2. EXISTING OPERATIONAL PERFORMANCE

This section provides a summary of traffic performance results for existing conditions. Detailed output reports and analysis files are provided in **Appendix B**.

4.2.1. Polk Parkway Mainline Segment Analysis

The section of Polk Parkway within the study limits was evaluated using HCS software Version 7.6. As shown in **Table 4.3**, the segments currently operate at an acceptable LOS C or better during both the AM and PM Peak hours.

Table 4.3
2018 (Existing) Peak Hour Freeway Mainline Segment Operations

Segment	Segment Type	Lanes	Trucks	Volume (vph)		LOS/Density	
				AM	PM	AM	PM
Polk Parkway - Eastbound							
Upstream of U.S. 98 Off-ramp	Basic	2	6	1,809	1,970	B/17	C/19
Upstream of U.S. 98 Off-ramp*	Diverge	2	6	1,809	1,970	A/9	B/11
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	913	1,105	A/9	A/11
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	6	1,013	1,271	A/5	A/8
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	1,013	1,271	A/10	B/12
U.S 98 On-ramp to S.R. 540 Off-ramp	Merge	2	6	1,161	1,441	B/14	B/16
U.S 98 On-ramp to S.R. 540 Off-ramp	Basic	2	6	1,161	1,441	A/11	B/14
U.S 98 On-ramp to S.R. 540 Off-ramp*	Diverge	2	6	1,161	1,441	A/2	A/5
S.R. 540 Off-ramp to On-ramp	Basic	2	6	529	645	A/5	A/6
S.R. 540 On-ramp to U.S. 92 Off-ramp	Merge	2	6	670	809	A/6	A/8
S.R. 540 On-ramp to U.S. 92 Off-ramp	Basic	2	6	670	809	A/6	A/8
S.R. 540 On-ramp to U.S. 92 Off-ramp*	Diverge	2	6	670	809	A/0	A/0
U.S. 92 Off-ramp to On-ramp	Basic	2	6	337	457	A/3	A/4
Downstream of U.S. 92 On-ramp	Merge	2	6	431	566	A/3	A/4
Downstream of U.S. 92 On-ramp	Basic	2	6	431	566	A/4	A/5

Table 4.3 (Continued)
2018 (Existing) Peak Hour Freeway Mainline Segment Operations

Segment	Segment Type	Lanes	Trucks	Volume (vph)		LOS/Density	
				AM	PM	AM	PM
Polk Parkway - Westbound							
Upstream of U.S. 92 Off-ramp	Basic	2	6	497	495	A/5	A/5
Upstream of U.S. 92 Off-ramp	Diverge	2	6	497	495	A/7	A/7
U.S. 92 Off-ramp to On-ramp	Basic	2	6	391	401	A/4	A/4
U.S. 92 On-ramp to S.R 540 Off-ramp*	Merge	2	6	779	717	A/3	A/3
U.S. 92 On-ramp to S.R 540 Off-ramp	Basic	2	6	779	717	A/7	A/7
U.S. 92 On-ramp to S.R 540 Off-ramp	Diverge	2	6	779	717	A/5	A/4
S.R. 540 Off-ramp to On-ramp	Basic	2	6	626	564	A/6	A/5
S.R. 540 On-ramp to U.S. 98 Off-ramp	Merge	2	6	1,525	1,237	B/14	B/12
S.R. 540 On-ramp to U.S. 98 Off-ramp	Basic	2	6	1,525	1,237	B/14	B/12
S.R. 540 On-ramp to U.S. 98 Off-ramp*	Diverge	2	6	1,525	1,237	A/6	A/3
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	1,101	978	A/10	A/9
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	6	1,671	1,602	B/11	B/11
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	1,671	1,602	B/16	B/15
Downstream of U.S. 98 On-ramp*	Merge	2	6	1,883	1,903	B/13	B/14
Downstream of U.S. 98 On-ramp	Basic	2	6	1,883	1,903	B/18	C/19

**Lane Add/Drop or Acceleration/Deceleration Lane > 1,500 ft, HCM Methodology is limited to 1,500 ft.*

4.2.2. Ramp Capacity Analysis

Capacity on the ramp roadways was assessed by comparing it with existing demand. The ramp Volume-to-Capacity (V/C) analysis is summarized in **Table 4.4**. Results show that the highest V/C is 0.2, indicating that the ramps have a considerable amount of unused capacity during both the 2018 AM and PM peak hours.

Table 4.4
2018 (Existing) Peak Hour Ramp Capacity Analysis

Interchange	Ramp	Lanes	Volume (vph)		Capacity (vph)	V/C	
			AM	PM		AM	PM
U.S. 98	Eastbound On-ramp (Diagonal)	1	148	170	1,850	0.1	0.1
	Westbound Off-ramp	1	423	259	1,850	0.2	0.1
	Eastbound On-ramp (Loop)	1	100	166	1,810	0.1	0.1
	Westbound On-ramp (Loop)	2	570	624	3,700	0.2	0.2
	Eastbound Off-ramp	2	896	866	3,700	0.2	0.2
	Westbound On-ramp (Diagonal)	1	212	301	1,850	0.1	0.2
S.R. 540	Eastbound On-ramp	1	141	164	1,850	0.1	0.1
	Westbound Off-ramp	1	153	153	1,850	0.1	0.1
	Eastbound Off-ramp	2	632	796	3,700	0.2	0.2
	Westbound On-ramp	2	899	673	3,700	0.2	0.2
U.S. 92	Eastbound On-ramp	1	94	109	1,850	0.1	0.1
	Westbound Off-ramp	1	106	94	1,850	0.1	0.1
	Eastbound Off-ramp	2	334	352	3,620	0.1	0.1
	Westbound On-ramp	2	388	316	3,620	0.1	0.1

4.2.3. Intersection Analysis

Signalized intersections were analyzed using Synchro Version 10.0. Unsignalized intersections were analyzed using the HCS software Version 7.6. The analysis output summary is presented in **Table 4.5** for both the signalized and unsignalized intersection. The results show that signalized intersections operate at LOS D or better in both 2018 AM and PM peak hours, except the S.R. 540 and Thornhill Road intersection which is reported with an unacceptable LOS E during the AM, although very close to LOS D. All unsignalized intersections operate at unacceptable LOS E or F in both 2018 AM and PM peak hours, with an exception of the S.R. 60 and 91 Mine Road intersection which operates at LOS D in the AM. Unacceptable operations are mainly reported for cross-street movements which experience protracted delays due to lack of gaps along the major street. Lane geometry also plays a part since most of the cross-streets do not have exclusive turn lanes or have capacity deficiencies.

Table 4.5
2018 (Existing) Peak Hour Intersection Operations

Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	E/70	-	E/69	-	A/6	A/0	-	A/6	A/0	B/10
Polk Parkway Eastbound Ramps	D/48	-	E/65	-	-	-	-	B/16	A/0	-	B/12	A/1	C/22
S.R. 540													
Landfill Road/Polk Parkway West Ramps	D/39	D/47	-	D/43	C/35	-	E/57	E/57	B/17	D/46	D/43	-	D/36
Polk Parkway East Ramps*	B/14	-	-	-	-	-	-	-	-	**F/159**	-	C/17	**F/159**
Thornhill Road	D/36	C/31	A/2	B/17	E/79	A/1	**F/97**	D/46	-	C/29	**F/82**	-	**E/56**
U.S. 92													
Polk Parkway Westbound Ramps	A/4	A/4	-	-	A/3	A/1	-	-	-	D/55	-	B/18	A/4
Polk Parkway Eastbound Ramps	A/9	A/5	-	-	A/9	A/1	-	-	-	E/56	-	B/14	B/12
U.S. 17													
Ernest Smith Boulevard	D/46	-	B/11	-	-	-	D/53	A/8	-	-	C/31	A/4	C/25
91 Mine Road*	B/12	-	-	B/12	-	-	-	**F/55**	-	-	E/41	-	**F/55**
Spirit Lake Road	E/57	D/41	A/10	D/40	D/39	A/0	D/54	B/14	A/3	E/56	C/32	A/6	C/25
S.R. 60													
91 Mine Road/Connersville Road*	B/12	-	-	A	-	-	D/30	-	-	-	D/27	-	D/30
PM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	**F/88**	-	E/76	-	A/3	A/0	-	A/5	A/4	A/7
Polk Parkway Eastbound Ramps	D/52	-	**F/97**	-	-	-	-	B/15	A/3	-	B/17	A/1	C/26
S.R. 540													
Landfill Road/Polk Parkway West Ramps	D/36	E/57	-	D/48	C/29	-	D/54	D/54	C/32	D/53	D/36	-	D/42
Polk Parkway Ramps*	B/13	-	-	-	-	-	-	-	-	**F/261**	-	B/15	**F/261**
Thornhill Road	D/52	D/44	A/4	C/21	E/65	A/2	E/58	D/48	-	C/30	**F/81**	-	D/50
U.S. 92													
Polk Parkway Westbound Ramps	A/4	A/5	-	-	A/2	A/0	-	-	-	D/54	-	B/18	A/4
Polk Parkway Eastbound Ramps	A/6	A/5	-	-	A/7	A/1	-	-	-	E/63	-	B/15	B/11
U.S. 17													
Ernest Smith Boulevard	D/39	-	B/10	-	-	-	D/43	A/10	-	-	C/26	A/5	B/19
91 Mine Road*	B/11	-	-	C/18	-	-	-	-	-	-	**F/528**	-	**F/528**
Spirit Lake Road	E/60	C/35	A/8	D/39	D/37	A/1	E/59	B/14	A/0	D/51	D/39	A/6	C/29
S.R. 60													
91 Mine Road/Connersville Road*	B/11	-	-	B/12	-	-	-	**F/58**	-	-	**F/68**	-	**F/68**

**Unsignalized - LOS/Delay based on HCS Analysis*

- Not applicable

This section provides information on the development of future traffic daily forecasts, design hour volumes, and future lane requirements. A summary of the travel demand modeling process is provided herein. The full Travel Demand Model Development Report is provided in **Appendix C**.

5.1. TRAVEL DEMAND MODEL DEVELOPMENT

5.1.1. Travel Demand Model

The Central Florida Regional Planning Model (CFRPM) developed by FDOT District 5, CFRPM 6.1, was used as the basis for the CPP project. The CFRPM 6.1 was developed in two versions, a Daily model and a Time-of-Day (ToD) model, the latter of which included the most recent available Socioeconomic (SE) data from MetroPlan Orlando and Polk County Transportation Planning Organization (TPO). The CFRPM 6.1 has a 2010 base year; it includes cost feasible scenarios for years 2015 through 2045 in 5-year increments. The ToD version of the model was revalidated for year 2015 by FTE and named as CFRPMv6.1 ToD FTE Version for the CPP study.

5.1.2. Base Year Validation

With the need to estimate tolled lanes traffic, the model validation process consisted of several stages: regional validation, county validation for Polk County, subarea validation for CPP subarea and corridor validation for major facilities.

The CFRPM 6.1 ToD FTE Version is a Peak Season Weekday Average Daily Traffic (PSWADT) model. The 2015 cost feasible scenario was updated with 2015 daily and ToD period volumes within the regional study area, previously presented on **Figure 3.1**. Land use was also updated. The model was then validated based on year 2015 conditions. During validation, the Root Mean Square Error (RMSE) statistic was reviewed for daily and ToD periods to verify the accuracy of the model validation.

Table 5.1 summarizes the results of the RMSE statistic for the regional model for Daily, AM, Midday (MD), PM, and Night (NT). The RMSE results for the regional model for some ToD periods and count ranges do not provide an acceptable value and show a need for further refinement at the subarea level.

To improve the model validation for the CPP study area, a subarea model validation was performed with focus on the project study area. The subarea model characteristics were updated to 2017 conditions to better reflect existing travel pattern and traffic volumes. Subarea model inputs for Polk County, including highway network, socioeconomic data, traffic counts, and toll parameters were reviewed and updated to validate the subarea model to 2017 conditions. Project level validation for the CPP study area was performed to enhance the trip assignment. **Table 5.2** summarizes the results of the 2017 RMSE statistics for the Polk County area for Daily, AM, MD, PM, and NT. The RMSE results for the study area show improved RMSE statistics, although further refinements were still needed in some ToD periods that were still not within the acceptable range.

Table 5.1
2015 Regional Time-of-Day Model Validation

Volume Group	RMSE (%)	Acceptable RMSE (%)	Volume/Count	Number of Counts
Daily				
1 - 5,000	97.3	45 - 55	1.06	5,470
5,000 - 10,000	53.1	35 - 45	0.94	2,786
10,000 - 20,000	34.6	27 - 35	0.95	2,570
20,000 - 30,000	29.8	24 - 27	0.98	743
30,000 - 40,000	30.4	22 - 24	1.05	156
40,000 - 50,000	27.2	20 - 22	1.22	53
50,000 - 60,000	28.4	18 - 20	1.16	19
60,000 - 70,000	21.1	17 - 18	1.16	21
70,000 - 80,000	40.0	16 - 17	1.30	12
80,000 - 90,000	32.7	15 - 16	1.29	23
90,000 - 100,000	19.6	14 - 15	1.17	5
100,000 - 500,000	18.4	< 14	1.13	4
1 - 500,000	51.8	32 - 39	1.00	11,862
AM Period				
1 - 500	143.3	45 - 100	1.30	3,475
500 - 1,250	69.9	45 - 100	0.95	3,123
1,250 - 2,500	49.3	35 - 45	0.97	2,546
2,500 - 5,000	38.7	27 - 35	0.93	1,374
5,000 - 10,000	41.4	24 - 27	0.95	199
10,000 - 20,000	32.0	18 - 24	1.18	53
20,000 - 50,000	-	14 - 18	0.82	1
1 - 50,000	64.0	32 - 39	0.98	10,771
MD Period				
1 - 500	266.8	45 - 100	1.84	1,151
500 - 1,250	108.0	45 - 100	1.12	2,077
1,250 - 2,500	71.0	35 - 45	0.95	2,506
2,500 - 5,000	56.8	27 - 35	1.01	2,541
5,000 - 10,000	38.0	24 - 27	0.98	2,087
10,000 - 20,000	34.6	18 - 24	1.07	341
20,000 - 50,000	45.1	14 - 18	1.39	68
1 - 50,000	62.9	32 - 39	1.03	10,771
PM Period				
1 - 500	185.5	45 - 100	1.58	2,111
500 - 1,250	76.4	45 - 100	0.96	2,940
1,250 - 2,500	55.8	35 - 45	0.92	2,673
2,500 - 5,000	36.4	27 - 35	0.90	2,389
5,000 - 10,000	40.4	24 - 27	0.95	572
10,000 - 20,000	30.4	18 - 24	1.17	84
20,000 - 50,000	16.1	14 - 18	1.11	2
1 - 50,000	57.3	32 - 39	0.96	10,771

Table 5.1 (Continued)
2015 Regional Time-of-Day Model Validation

Volume Group	RMSE (%)	Acceptable RMSE (%)	Volume/Count	Number of Counts
NT Period				
1 - 500	162.8	45 – 100	1.32	2,386
500 - 1,250	74.2	45 – 100	0.90	2,930
1,250 - 2,500	52.9	35 – 45	0.91	2,504
2,500 - 5,000	37.5	27 – 35	0.90	2,086
5,000 - 10,000	31.4	24 – 27	0.86	731
10,000 - 20,000	27.8	18 – 24	0.90	93
20,000 - 50,000	22.1	14 – 18	1.01	41
1 - 50,000	54.1	32 – 39	0.91	10,771

Table 5.2
2017 Polk County Time-of-Day Model Validation

Volume Group	RMSE (%)	Acceptable RMSE (%)	Volume/Count	Number of Counts
Daily				
1 - 5,000	69.3	45 - 55	1.00	175
5,000 - 10,000	34.9	35 - 45	1.04	148
10,000 - 20,000	22.0	27 - 35	1.01	237
20,000 - 30,000	18.1	24 - 27	1.01	47
30,000 - 40,000	-	22 - 24	-	-
40,000 - 50,000	13.2	20 - 22	1.10	8
50,000 - 60,000	9.0	18 - 20	0.96	8
60,000 - 70,000	5.8	17 - 18	0.98	4
1 - 500,000	25.6	32 - 39	1.01	627
AM Period				
1 - 500	125.7	45 - 100	1.24	86
500 - 1,250	48.8	45 - 100	0.96	182
1,250 - 2,500	35.1	35 – 45	0.99	218
2,500 - 5,000	26.1	27 – 35	0.96	120
5,000 - 10,000	15.3	24 - 27	1.05	18
10,000 - 20,000	22.2	18 - 24	1.16	3
1 - 50,000	35.0	32 - 39	1.00	627
MD Period				
1 - 500	126.3	45 - 100	0.99	31
500 - 1,250	115.5	45 - 100	1.39	62
1,250 - 2,500	54.4	35 - 45	1.06	135
2,500 - 5,000	31.7	27 - 35	1.08	178
5,000 - 10,000	24.6	24 - 27	1.03	195
10,000 - 20,000	16.8	18 - 24	1.11	17
20,000 - 50,000	8.0	14 - 18	1.03	9
1 - 50,000	30.5	32 - 39	1.06	627

Table 5.2 (continued)
2017 Polk County Time-of-Day Model Validation

Volume Group	RMSE (%)	Acceptable RMSE (%)	Volume/Count	Number of Counts
PM Period				
1 - 500	152.2	45 - 100	1.35	54
500 - 1,250	61.3	45 - 100	1.08	148
1,250 - 2,500	30.6	35 - 45	1.01	167
2,500 - 5,000	26.8	27 - 35	1.00	222
5,000 - 10,000	28.4	24 - 27	1.10	26
10,000 - 20,000	18.0	18 - 24	1.05	10
1 - 50,000	34.3	32 - 39	1.03	627
NT Period				
1 - 500	134.2	45 - 100	0.99	60
500 - 1,250	54.0	45 - 100	0.93	133
1,250 - 2,500	35.1	35 - 45	1.02	155
2,500 - 5,000	22.2	27 - 35	0.95	225
5,000 - 10,000	22.6	24 - 27	0.90	34
10,000 - 20,000	25.9	18 - 24	0.80	19
20,000 - 50,000	*	14 - 18	0.68	1
1 - 50,000	35.8	32 - 39	0.93	627

Finally, the CPP Subarea network was extracted from the regional model with the corresponding subarea trip tables. These subarea trip tables were then adjusted through an Origin Destination Matrix Estimation (ODME) process to improve the subarea assignment. **Table 5.3** summarizes the results of the 2017 RMSE statistic for the CPP Subarea validation for Daily, AM, MD, PM, and NT. With the subarea validation using the ODME process, the RMSE statistic for the subarea provides a low RMSE and great confidence on the model for forecasting future traffic within the subarea. In addition, four different corridors, U.S. 17, U.S. 98, S.R. 60 and Polk Parkway, were also reviewed to ensure that the model performs well and could be used for forecasting future traffic for the CPP project. **Table 5.4** summarizes the results of the corridor daily 2017 RMSE statistic for the four major corridors.

Table 5.3
2017 CPP Subarea Time-of-Day Model Validation

Volume Group	RMSE (%)	Acceptable RMSE (%)	Volume/Count	Number of Counts
Daily				
1 - 5,000	35.8	45 - 55	1.01	75
5,000 - 10,000	24.4	35 - 45	0.95	55
10,000 - 20,000	5.4	27 - 35	1.01	128
20,000 - 30,000	0.9	24 - 27	1.00	18
40,000 - 50,000	0.8	20 - 22	1.00	6
50,000 - 60,000	1.2	18 - 20	1.00	6
60,000 - 70,000	0.3	17 - 18	1.00	2
1 - 500,000	8.5	32 - 39	1.00	290
AM Period				
1 - 500	48.3	45 - 100	0.98	46
500 - 1,250	21.3	45 - 100	0.99	60
1,250 - 2,500	10.9	35 - 45	1.01	102
2,500 - 5,000	3.3	27 - 35	0.99	67
5,000 - 10,000	1.6	24 - 27	1.01	13
10,000 - 20,000	1.7	18 - 24	0.99	2
1 - 50,000	8.3	32 - 39	1.00	290
MD Period				
1 - 500	77.4	45 - 100	0.75	25
500 - 1,250	40.0	45 - 100	0.96	22
1,250 - 2,500	31.8	35 - 45	1.02	46
2,500 - 5,000	16.6	27 - 35	1.00	83
5,000 - 10,000	5.7	24 - 27	1.00	100
10,000 - 20,000	0.8	18 - 24	1.00	8
20,000 - 50,000	0.6	14 - 18	1.00	6
1 - 50,000	10.2	32 - 39	1.00	290
PM Period				
1 - 500	55.1	45 - 100	0.81	34
500 - 1,250	18.3	45 - 100	1.05	46
1,250 - 2,500	18.5	35 - 45	0.97	70
2,500 - 5,000	4.4	27 - 35	1.00	122
5,000 - 10,000	1.7	24 - 27	1.00	11
10,000 - 20,000	1.6	18 - 24	1.00	7
1 - 50,000	8.1	32 - 39	1.00	290
NT Period				
1 - 500	101.1	45 - 100	1.14	37
500 - 1,250	40.6	45 - 100	1.06	41
1,250 - 2,500	27.2	35 - 45	0.94	64
2,500 - 5,000	7.8	27 - 35	1.01	123
5,000 - 10,000	3.2	24 - 27	0.98	11
10,000 - 20,000	2.4	18 - 24	0.99	14
1 - 50,000	11.8	32 - 39	1.00	290

Table 5.4
2017 Corridor Daily Validation

Corridor	RMSE (%)	Acceptable RMSE (%)	Volume/Count	Number of Counts
Daily				
U.S. 17	5.0	32 - 39	1.00	16
U.S. 98	4.5	32 - 39	1.01	26
S.R. 60	2.5	32 - 39	0.99	18
S.R. 570	4.1	32 - 39	0.98	26

5.1.3. Future Year Transportation Network

The future year network improvements were based on the Blueprint 2040 Long Range Transportation Plan – Cost Feasible Plan from the Polk TPO, adopted on December 10, 2015. The network improvements are also based on the FDOT District 1 FY 2019 - 2023 Five-Year Work Program for Polk County and the FY 2019 - 2023 Work Program from FTE, as of March 2018. Details of the network improvements are included in the CPP TDM Report in the **Appendix C.**

The future No Build assumed that CPP would not be built. The Build scenario included two segments of four lanes limited access, which are toll lanes. The first segment, from Polk Parkway to U.S. 17, is approximately 6.7 miles. The second segment, from U.S. 17 to S.R. 60, is approximately 2.1 miles. The full facility would feature interchanges at S.R. 540, U.S. 17, and at-grade access at S.R. 60.

5.1.4. Future Socioeconomic Data and Land Use

The SE data for the future model years was developed using population projections from BEBR Florida Population Study (FPS) 181 and employment projections from Woods & Poole Economics 2017 dataset. The population and employment totals were used as countywide control totals for the growth between the model years. **Table 5.5** shows the BEBR projections for Polk County, as well as Orange and Osceola counites for comparison. The study shows that, from 2015 to 2045, the total Polk County population growth (49 percent) is slightly higher than the state (46 percent).

Table 5.5
Population Projections

County/State	BEBR Estimate	BEBR Projections		Change	% Change
	April 1 2015	2025	2045	2015 - 2045	2015-2045
Orange	1,252,396	1,576,700	2,013,600	761,204	61%
Osceola	308,327	452,400	649,800	341,473	111%
Polk	633,052	768,300	943,600	310,548	49%
Florida	18,801,310	23,061,900	27,423,600	8,622,290	46%

Source: 2010 Census and Bureau of Economic and Business Research (BEBR), Florida Population Study 177

Table 5.6 shows the projected employment for Orange, Osceola and Polk counties along with statewide employment projections. Though Polk County features the lowest percentage change of three counties and is lower than the statewide percentage change, the total employment increase is similar to that in Osceola County.

Table 5.6
Employment Projections

County/State	BEA	Woods & Poole Projections		Change	% Change
	2015	2025	2045	2015 - 2045	2015-2045
Orange	988,811	1,193,718	1,617,403	628,592	64%
Osceola	126,407	162,628	258,177	131,770	104%
Polk	281,099	323,858	408,969	127,870	45%
Florida	9,813,714	13,434,820	17,835,290	8,021,576	82%

Source: U.S. Bureau of Economic Analysis and Woods & Poole 2017 Employment Projections

While the CFRPM model does not directly use income as an attribute for trip generation and production, it does account for other attributes such as the number of vehicles owned in both single and multi-family households, which are often an indirect indicator of household income.

The original future year data from the CFRPM model was evaluated to ensure that growth would occur at realistic rates in areas that were most likely to see future growth. Land use patterns in the region were analyzed and future population and employment growth was distributed among Traffic Analysis Zones (TAZs) in the study area. Most of this growth was concentrated in zones with active DRIs, PUDs or other significant developments. Growth was also assigned to areas where development would likely occur in the future using inputs from city and county local government planning staffs. Population, dwelling units, and employment were reallocated within the TAZs in the future year models to create the most realistic growth scenario possible, with the population and employment projections serving as control totals.

5.1.5. Future Year Model Trip Matrix Adjustment

The subarea Origin-Destination (O-D) matrices for the future year were extracted from the regional model. Adjustment factors developed from the ODME process base year 2017 were then applied to the future year matrix to create the future year trip tables for the subarea assignment.

5.2. TRAFFIC FORECASTS

Traffic projections were developed using the updated CFRPM 6.1 ToD model (FTE Version) for years 2025 and 2045, corresponding to the opening and design analysis years for the CPP study, respectively. The PSWADT from the model was converted to AADT by applying a Model Output Conversion Factor (MOCF) of 0.98. The model period volumes (AM, MD, PM, NT) were adjusted accordingly based on AADT. A factor of 0.42 and 0.35 was applied to the AM and PM period volumes, respectively, to develop hourly volumes. The hourly factors were estimated using traffic counts. The model AADT and hourly volumes for AM and PM were then adjusted following the National Cooperative Highway Research Program (NCHRP) 765 methodology. Additional adjustments were made based on growth rates and traffic factors (K and D) to ensure reasonableness and accuracy. The volumes were eventually adjusted for continuity of flow to develop final profiles for AADT and Directional Design Hour Volumes (DDHV).

The mainline and ramps AADT and the corresponding DDHVs for years 2025, 2035, and 2045 are provided in **Table 5.8** and **Table 5.9** for the No Build and Build conditions, respectively. The year 2035 volumes were developed through interpolation. The bold values represent the mainline volumes and the non-bold values represent ramp volumes.

Future year turn movement volumes for ramp-terminal intersections were developed using the projected ramp DDHVs. Turn proportions were estimated using peak period data from the CFRPM model and adjusted using existing conditions volumes where applicable. Cross-street through movements and adjacent intersections traffic were developed using linear growth rates estimated from historical data and verified with the CFRPM model. The growth rates varied by location and are shown in **Table 5.7**. The 2025 and 2045 peak hour volumes are depicted in **Figure 5.1** through **Figure** 5.4.

Table 5.7
Growth Rates for Cross-Street Through and Adjacent Intersections

Location	No Build		Build	
	2018 - 2025	2025 - 2045	2018 - 2025	2025 - 2045
U.S. 98	2.8%	1.8%	1.0%	0.8%
S.R. 540	2.4%	1.4%	5.2%	1.6%
U.S. 92	1.2%	1.5%	1.2%	1.5%
S.R. 60	4.8%	3.0%	5.7%	3.5%
U.S. 17	1.3%	0.9%	4.2%	2.3%

Table 5.8

Mainline and Ramp Forecasts for No Build

Location	Polk Parkway	2025 AADT	2025 AM - DDHV WB	2025 AM - DDHV EB	2025 PM - DDHV WB	2025 PM - DDHV EB	2035 AADT	2035 AM - DDHV WB	2035 AM - DDHV EB	2035 PM - DDHV WB	2035 PM - DDHV EB	2045 AADT	2045 AM - DDHV WB	2045 AM - DDHV EB	2045 PM - DDHV WB	2045 PM - DDHV EB
		19,000	**1,070**	**830**	**830**	**1,070**	**25,600**	**1,370**	**1,100**	**1,100**	**1,370**	**32,200**	**1,660**	**1,380**	**1,380**	**1,660**
17 - U.S. 92		2,900	190	150	150	190	4,000	260	200	200	260	5,000	320	250	250	320
		7,200	460	360	360	460	10,500	670	530	530	670	13,700	880	690	690	880
		23,300	**1,340**	**1,040**	**1,040**	**1,340**	**32,100**	**1,780**	**1,430**	**1,430**	**1,780**	**40,900**	**2,220**	**1,820**	**1,820**	**2,220**
14 - S.R. 540		3,600	230	180	180	230	4,800	310	240	240	310	6,000	390	300	300	390
13 - CENTRAL MAINLINE PLAZA		**19,700**	**1,110**	**860**	**860**	**1,110**	**27,300**	**1,470**	**1,190**	**1,190**	**1,470**	**34,900**	**1,830**	**1,520**	**1,520**	**1,830**
13 - S.R. 540		16,500	1,060	830	830	1,060	22,700	1,280	1,010	1,010	1,280	28,800	1,500	1,180	1,180	1,500
		36,200	**2,170**	**1,690**	**1,690**	**2,170**	**50,000**	**2,750**	**2,200**	**2,200**	**2,750**	**63,700**	**3,330**	**2,700**	**2,700**	**3,330**
10 - U.S. 98		11,100	770	510	510	770	14,000	970	640	640	970	16,800	1,160	770	770	1,160
		19,600	1,060	1,190	1,190	1,060	27,400	1,360	1,530	1,530	1,360	35,200	1,650	1,870	1,870	1,650
		44,700	**2,460**	**2,370**	**2,370**	**2,460**	**63,400**	**3,140**	**3,090**	**3,090**	**3,140**	**82,100**	**3,820**	**3,800**	**3,800**	**3,820**

Note: Values in RED indicate PEAK direction and values in BLUE indicate OFF-PEAK direction

Table 5.9
Mainline and Ramp Forecasts for Build

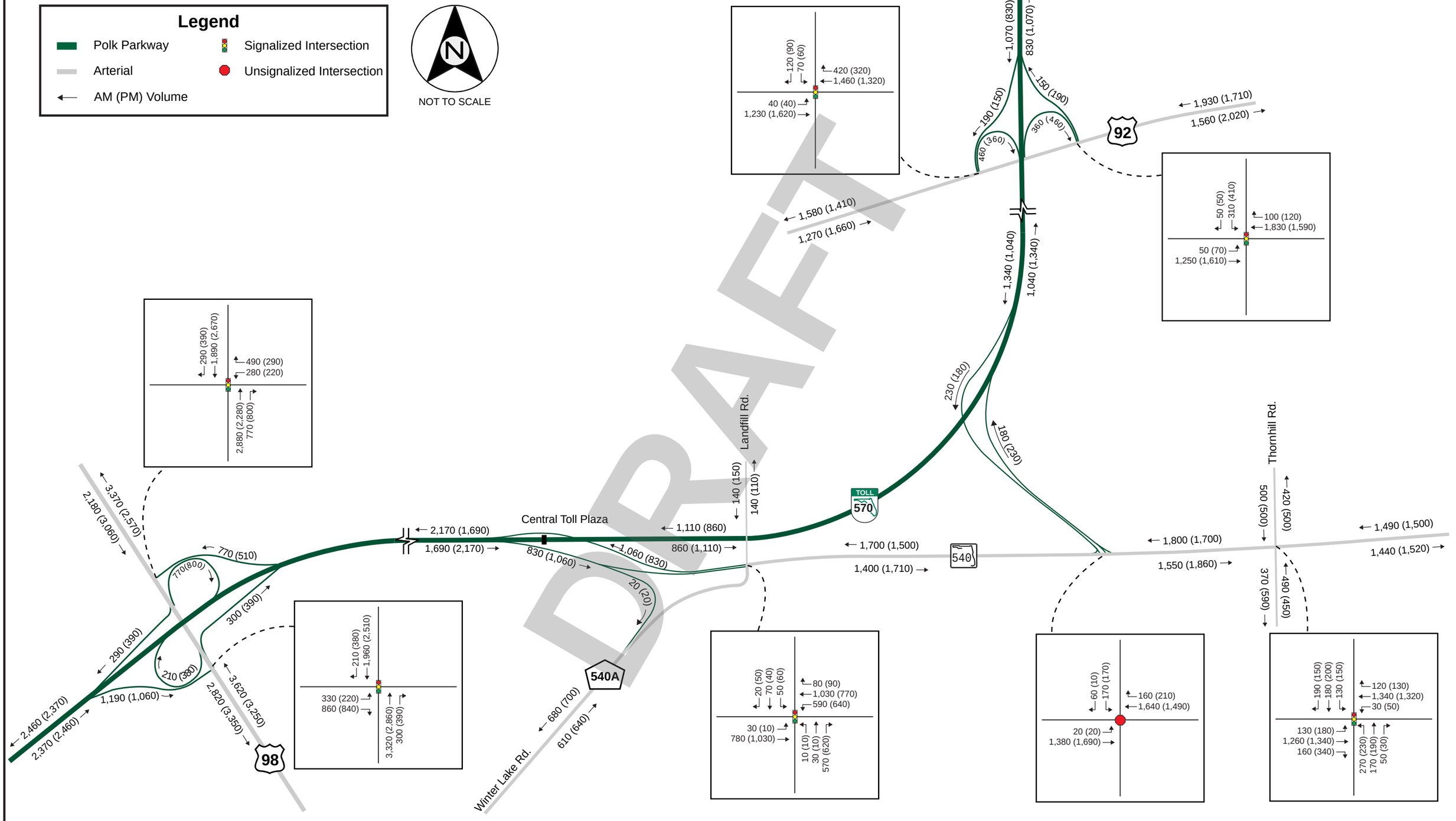
Location	Polk Parkway	2025 AADT	2025 AM - DDHV WB	2025 AM - DDHV EB	2025 PM - DDHV WB	2025 PM - DDHV EB	2035 AADT	2035 AM - DDHV WB	2035 AM - DDHV EB	2035 PM - DDHV WB	2035 PM - DDHV EB	2045 AADT	2045 AM - DDHV WB	2045 AM - DDHV EB	2045 PM - DDHV WB	2045 PM - DDHV EB
		22,000	**1,350**	**880**	**880**	**1,350**	**34,600**	**1,720**	**1,190**	**1,190**	**1,720**	**35,500**	**1,950**	**1,400**	**1,400**	**1,950**
17 - U.S. 92		2,900	190	150	150	190	4,000	260	200	200	260	5,000	320	250	250	320
		8,100	520	410	410	520	10,500	680	530	530	680	15,000	970	760	760	970
16 - CENTRAL MAINLINE PLAZA 2		**27,200**	**1,680**	**1,140**	**1,140**	**1,680**	**41,100**	**2,140**	**1,520**	**1,520**	**2,140**	**45,500**	**2,600**	**1,910**	**1,910**	**2,600**
14 - CPP		10,600	710	520	520	710	13,800	880	680	680	880	17,000	1,050	840	840	1,050
		5,900	300	360	360	300	7,300	350	460	460	350	8,600	400	550	550	400
13 - CENTRAL MAINLINE PLAZA 1		**22,500**	**1,270**	**980**	**980**	**1,270**	**34,600**	**1,610**	**1,300**	**1,300**	**1,610**	**37,100**	**1,950**	**1,620**	**1,620**	**1,950**
13 - S.R. 540		16,300	1,050	820	820	1,050	22,400	1,270	1,000	1,000	1,270	28,500	1,480	1,170	1,170	1,480
		38,800	**2,320**	**1,800**	**1,800**	**2,320**	**57,000**	**2,880**	**2,300**	**2,300**	**2,880**	**65,600**	**3,430**	**2,790**	**2,790**	**3,430**
10 - U.S. 98		8,500	590	390	390	590	9,500	660	440	440	660	10,400	720	480	480	720
		15,400	830	1,000	1,000	830	22,500	1,110	1,290	1,290	1,110	29,600	1,390	1,570	1,570	1,390
		45,700	**2,560**	**2,410**	**2,410**	**2,560**	**70,000**	**3,330**	**3,150**	**3,150**	**3,330**	**84,800**	**4,100**	**3,880**	**3,880**	**4,100**
	CPP															
S.R. 540 + CPP Ramps to/from East Polk Parkway		10,600	710	520	520	710	13,800	880	680	680	880	17,000	1,050	840	840	1,050
S.R. 540 Ramps to/from East Polk Parkway		2,000	130	100	100	130	3,300	210	170	170	210	4,500	290	230	230	290
CPP Ramps to/from East Polk Parkway		8,600	580	420	420	580	10,500	670	510	510	670	12,500	760	610	610	760
CPP Ramps to/from West Polk Parkway		5,900	360	300	300	360	7,300	460	350	350	460	8,600	550	400	400	550
		14,500	**940**	**720**	**720**	**940**	**17,800**	**1,130**	**860**	**860**	**1,130**	**21,100**	**1,310**	**1,010**	**1,010**	**1,310**
S.R. 540		1,700	110	90	90	110	2,600	170	140	140	170	3,500	230	180	180	230
MAINLINE PLAZA		**16,200**	**1,050**	**810**	**810**	**1,050**	**20,400**	**1,300**	**1,000**	**1,000**	**1,300**	**24,600**	**1,540**	**1,190**	**1,190**	**1,540**
U.S. 17		13,100	850	660	660	850	16,100	1,030	790	790	1,030	19,100	1,200	920	920	1,200
		2,000	130	100	100	130	2,700	180	140	140	180	3,400	220	170	170	220
MAINLINE PLAZA		**5,100**	**330**	**250**	**250**	**330**	**7,000**	**450**	**350**	**350**	**450**	**8,900**	**560**	**440**	**440**	**560**
S.R. 60		5,100	330	250	250	330	7,000	450	350	350	450	8,900	560	440	440	560

Note: Values in RED indicate PEAK direction and values in BLUE indicate OFF-PEAK direction

Legend

- Polk Parkway
- Arterial
- AM (PM) Volume
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE

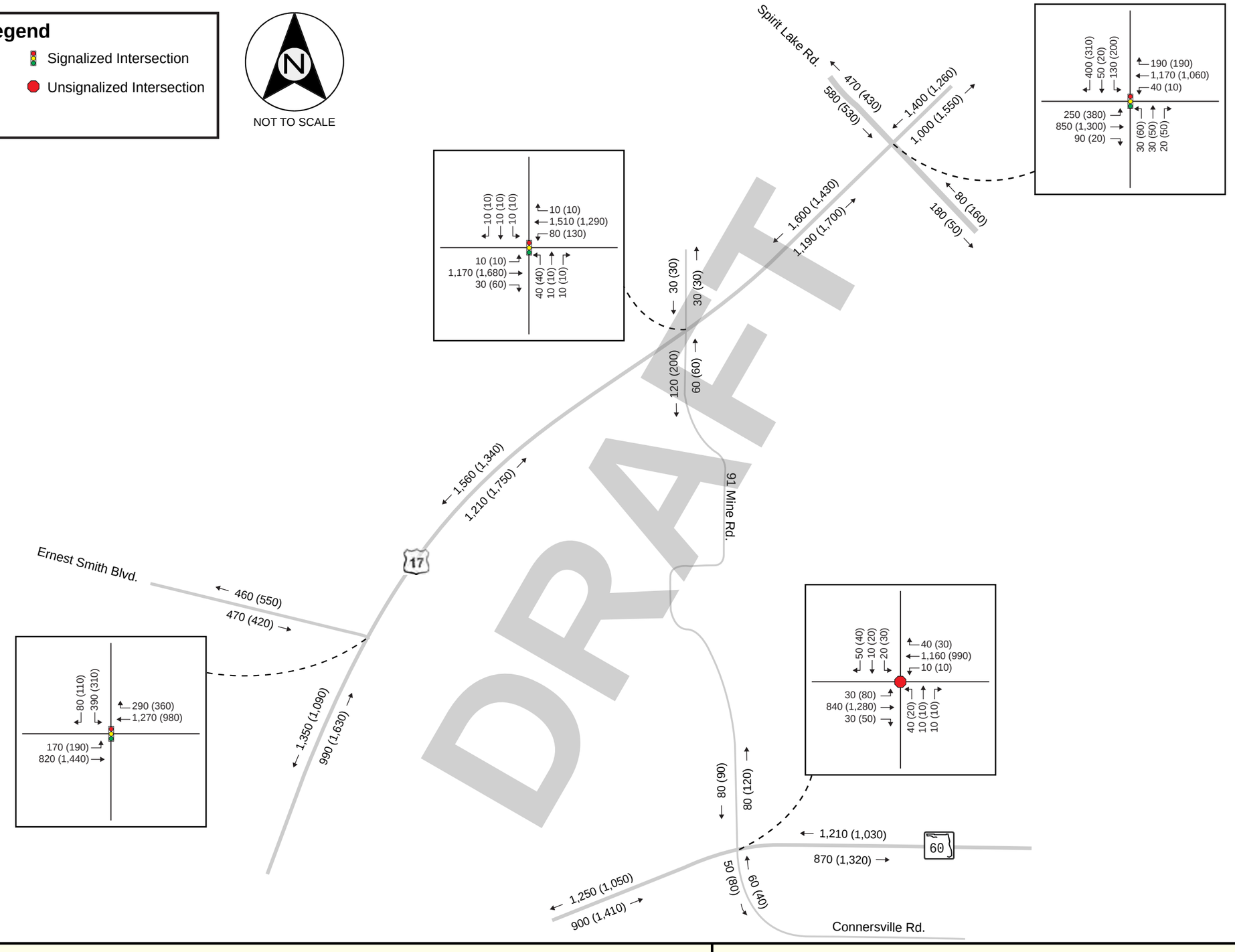


FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2025 Design Hour Volumes for No Build	Figure 5.1 (1 of 2)

Legend

- Polk Parkway
- Arterial
- AM (PM) Volume
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE



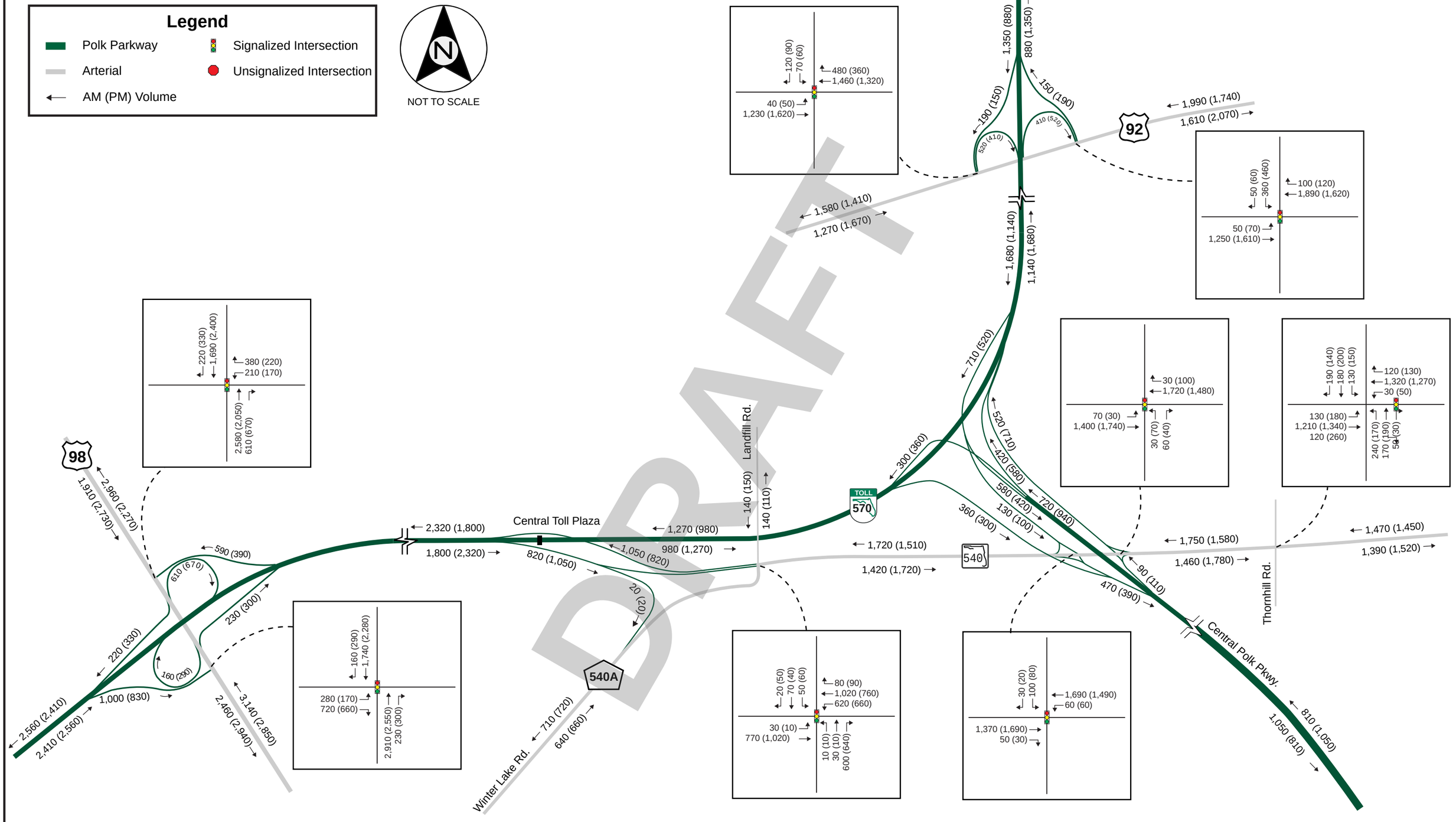
FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2025 Design Hour Volumes for No Build

Figure 5.1
(2 of 2)

Legend

- Polk Parkway
- Arterial
- AM (PM) Volume
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE



FLORIDA'S TURNPIKE

Central Polk Parkway (Polk Parkway to S.R. 60)
Project Traffic Analysis Report (PTAR)

2025 Design Hour Volumes for Build

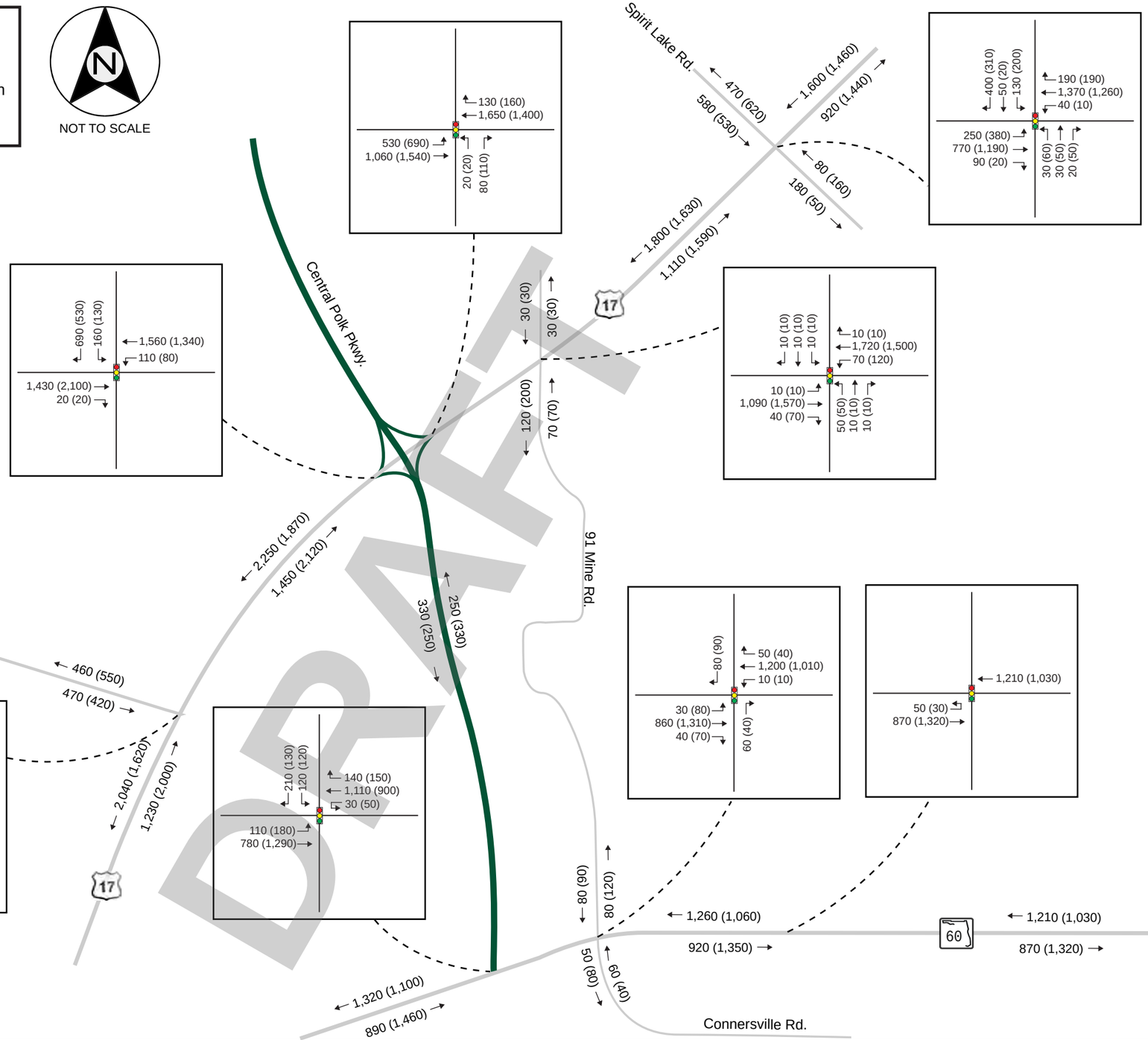
Figure 5.2
(1 of 2)

Legend

- Polk Parkway
- Arterial
- AM (PM) Volume
- Signalized Intersection
- Unsignalized Intersection

N

NOT TO SCALE



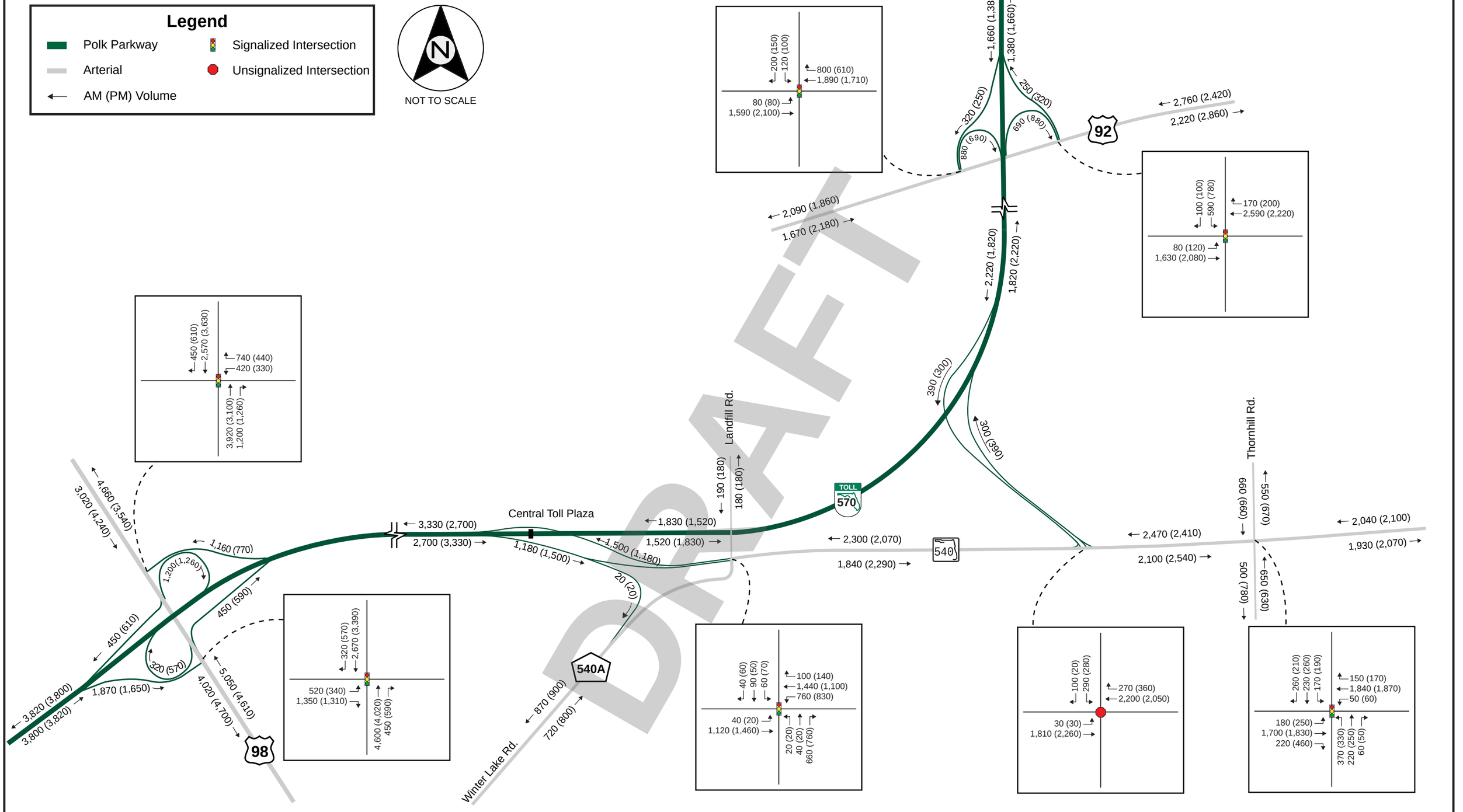
FLORIDA'S TURNPIKE

Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2025 Design Hour Volumes for Build	Figure 5.2 (2 of 2)

Legend

- Polk Parkway
- Arterial
- AM (PM) Volume
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE

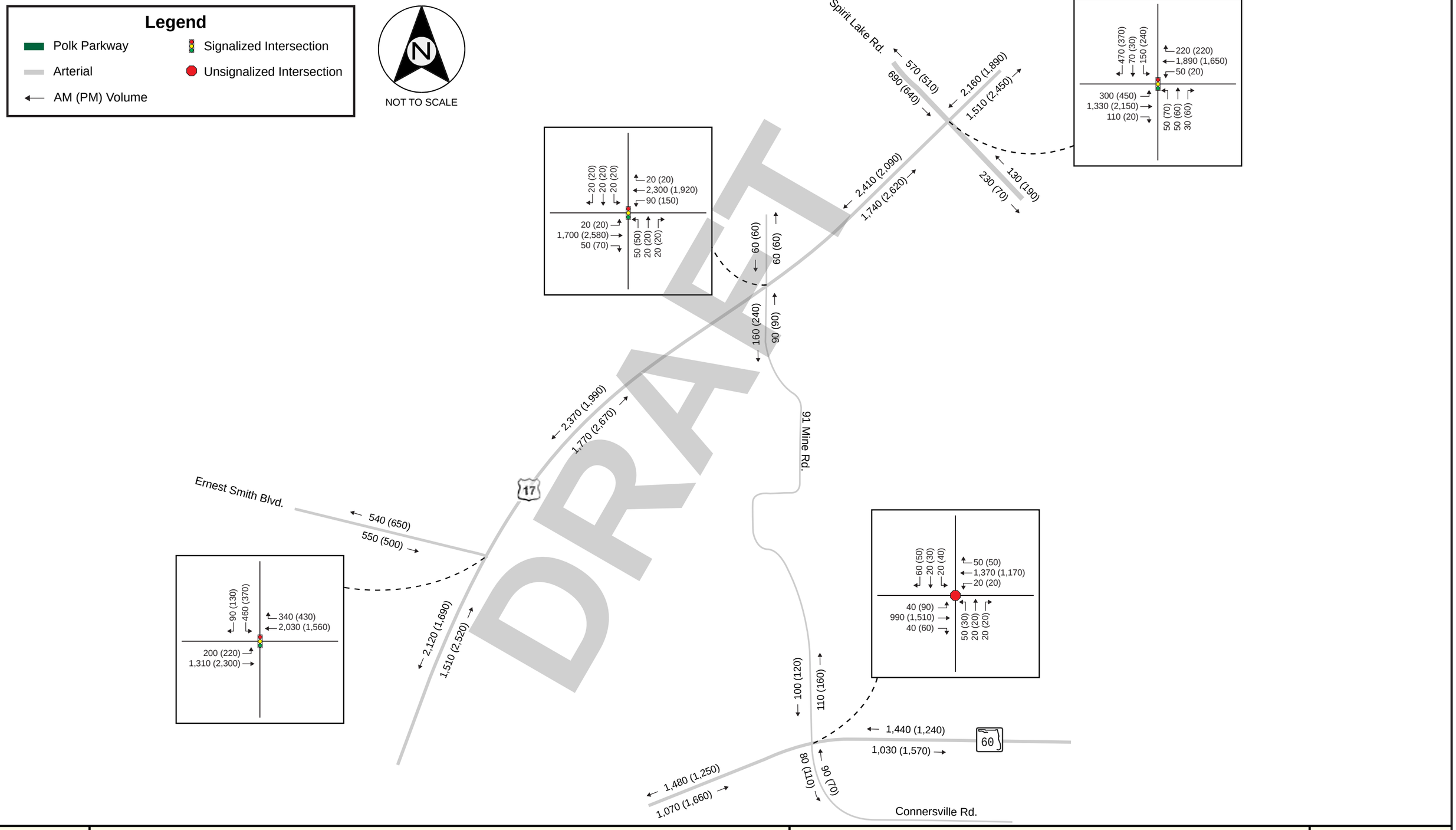


FLORIDA'S TURNPIKE

Central Polk Parkway (Polk Parkway to S.R. 60)
Project Traffic Analysis Report (PTAR)

2045 Design Hour Volumes for No Build

Figure 5.3
(1 of 2)

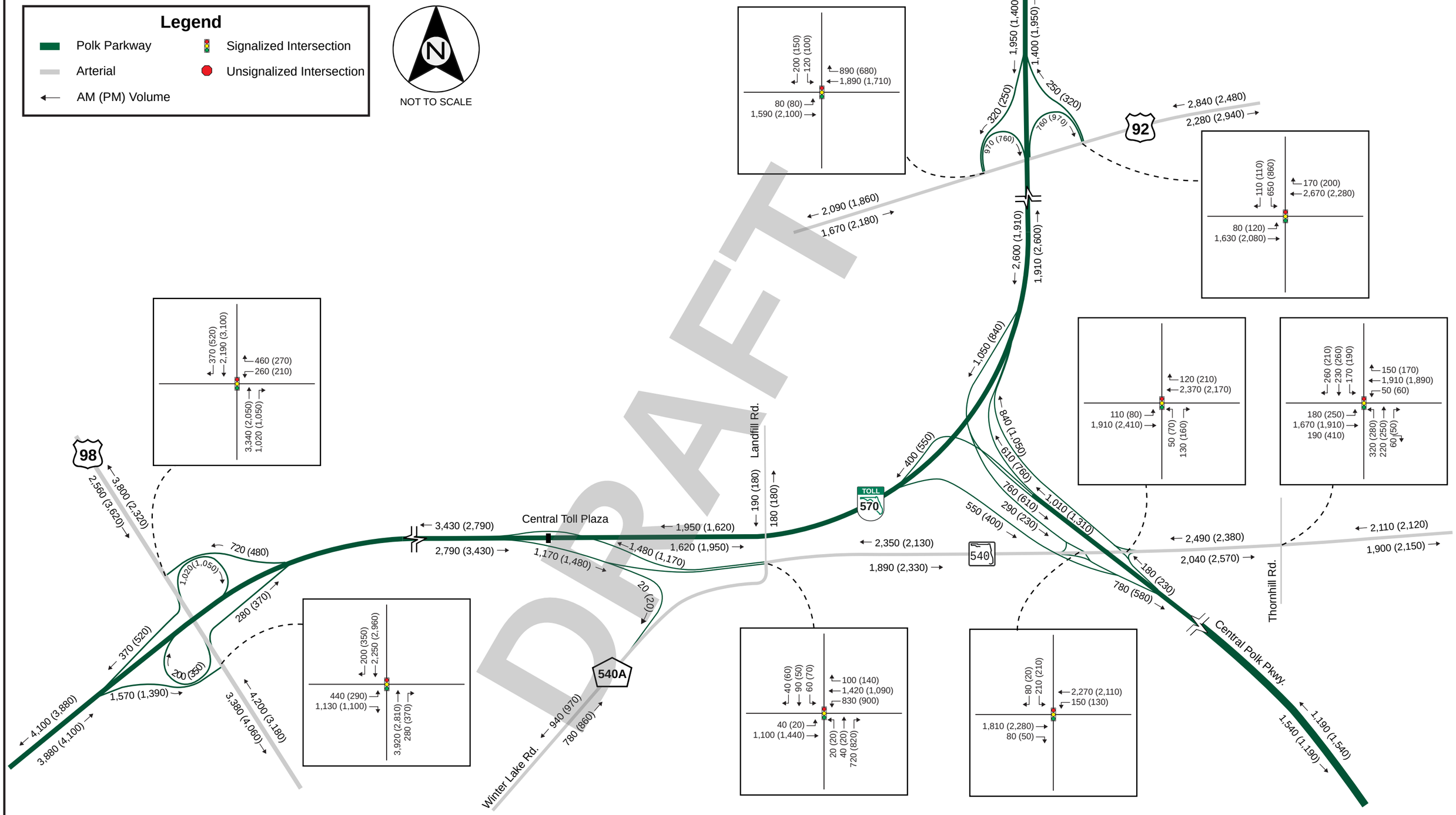


FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2045 Design Hour Volumes for No Build	Figure 5.3 (2 of 2)

Legend

- Polk Parkway
- Arterial
- AM (PM) Volume
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE



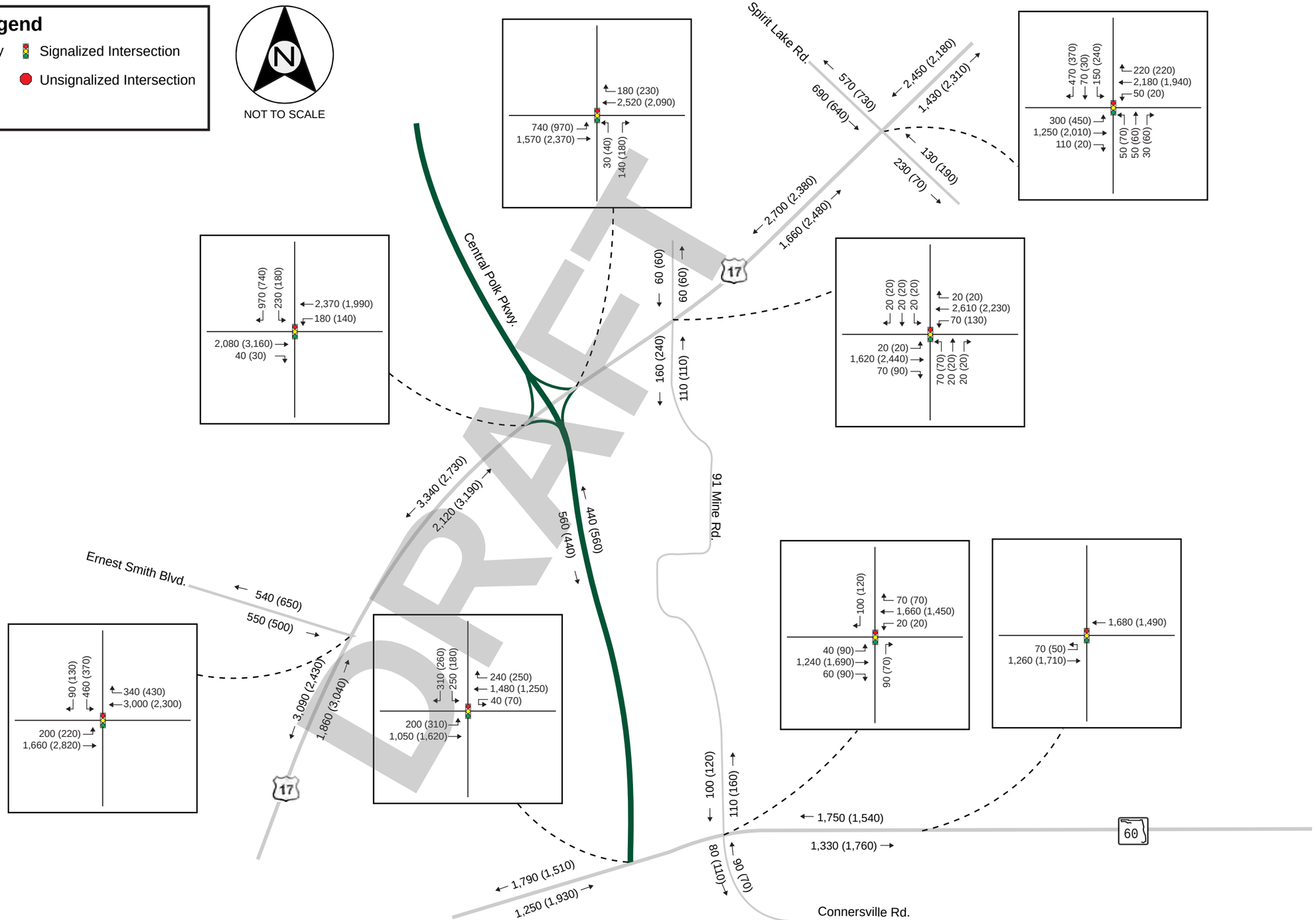
FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2045 Design Hour Volumes for Build

Figure 5.4
(1 of 2)

Legend

- Central Polk Parkway
- Arterial
- AM (PM) Volume
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE



FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	2045 Design Hour Volumes for Build Figure 5.4 (2 of 2)

5.3. MAINLINE AND RAMPS LANE REQUIREMENTS

Future lane requirements were evaluated to provide an estimated timeline for the onset of capacity deficiencies along the mainline and ramp roadways. Freeway mainline LOS targets were based on the 2013 FDOT Quality and Level of Service (LOS) Handbook. Capacity analysis for ramp roadways were based on targets from the HCM. The FDOT and HCM targets were adjusted for local conditions. **Table 5.10** and **Table 5.11** show the detailed color-coded lane requirements corresponding to LOS D constraints for the mainline and LOS E (capacity) for the ramp roadways for the No Build and Build conditions, respectively.

Under No Build conditions, the analysis in **Table 5.10** shows that the demand for the Polk Parkway mainline will not exceed two-lane capacity in each direction through the 2045 design year, east of the central mainline plaza. The sections between U.S. 98 and the central mainline plaza and west of U.S. 98 will require three lanes per direction by year 2045 and 2038, respectively. The demand for most of the Polk Parkway ramps within the vicinity of the project will not exceed single lane capacity, except the ramps to and from the west at U.S. 98 which will require two lanes each by year 2045. The eastbound off-ramp currently has two lanes and there are two eastbound on-ramps, a one-lane loop ramp and a single lane diagonal ramp.

For the Build CPP conditions, the data in **Table 5.11** indicates that additional capacity along the Polk Parkway mainline will only be required to the west of the current central mainline plaza (MP 13), similar to No Build conditions but at a slightly earlier date, in 2044 and 2035, respectively, for the sections between U.S. 98 and the central mainline plaza and west of U.S. 98. All the Polk Parkway ramps within the study limits will not need to be widened through the 2045 design year. The earlier onset of additional capacity along the Polk Parkway mainline, and lack of need for additional ramp capacity under Build conditions is due to traffic diversion and attraction to the CPP. **Table 5.11** also shows that the demand for the CPP mainline will not exceed two-lane capacity through the 2045 design year. Single lane ramps will be required along the CPP through the 2045 design year.

Table 5.10

Lane Requirements by Year for No Build

Mainline Maximum Service Volume (LOS D) and Ramp LOS E

DDHV - Worst Case AM or PM Peak Hour

Location	Polk Parkway	Trends	Interpolated Volumes																		Trends
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
		1,070	1,100	1,130	1,160	1,190	1,220	1,250	1,280	1,310	1,340	1,370	1,400	1,430	1,460	1,490	1,520	1,540	1,570	1,600	1,630	1,660
17 - U.S. 92		190	200	200	210	220	230	230	240	250	250	260	270	270	280	280	290	300	300	310	310	320
		460	480	500	520	540	570	590	610	630	650	670	690	710	730	750	780	800	820	840	860	880
		1,340	1,380	1,430	1,470	1,520	1,560	1,600	1,650	1,690	1,740	1,780	1,820	1,870	1,910	1,960	2,000	2,040	2,090	2,130	2,180	2,220
14 - S.R. 540		230	240	250	250	260	270	280	290	290	300	310	320	330	330	340	350	360	370	370	380	390
13 - CENTRAL MAINLINE PLAZA		1,110	1,150	1,180	1,220	1,250	1,290	1,330	1,360	1,400	1,430	1,470	1,510	1,540	1,580	1,610	1,650	1,690	1,720	1,760	1,790	1,830
13 - S.R. 540		1,060	1,080	1,100	1,130	1,150	1,170	1,190	1,210	1,240	1,260	1,280	1,300	1,320	1,350	1,370	1,390	1,410	1,430	1,460	1,480	1,500
		2,170	2,230	2,290	2,340	2,400	2,460	2,520	2,580	2,630	2,690	2,750	2,810	2,870	2,920	2,980	3,040	3,100	3,160	3,210	3,270	3,330
10 - U.S. 98		770	790	810	830	850	870	890	910	930	950	970	990	1,010	1,030	1,050	1,070	1,080	1,100	1,120	1,140	1,160
		1,190	1,220	1,260	1,290	1,330	1,360	1,390	1,430	1,460	1,500	1,530	1,560	1,600	1,630	1,670	1,700	1,730	1,770	1,800	1,840	1,870
		2,460	2,530	2,600	2,660	2,730	2,800	2,870	2,940	3,000	3,070	3,140	3,210	3,280	3,340	3,410	3,480	3,550	3,620	3,680	3,750	3,820

Inputs	
Truck % (t_f)	6.0%
Free Flow Speed (mph)	70
Peak Hour Factor (PHF)	0.95

Freeway LOS Thresholds	
Lanes	LOS D
2	3,320
3	4,980
4	6,640
5	8,300
6	9,960

Ramp Capacity by Number of Lanes	
1	1,850
2	3,700
3	5,550

Speed - 40 to 50 MPH

Table 5.11

Lane Requirements by Year for Build

Mainline Maximum Service Volume (LOS D) and Ramp LOS E

DDHV - Worst Case AM or PM Peak Hour

Location	Polk Parkway	Model	Interpolated Volumes																			Model
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
		1,350	1,390	1,420	1,460	1,500	1,540	1,570	1,610	1,650	1,680	1,720	1,740	1,770	1,790	1,810	1,840	1,860	1,880	1,900	1,930	1,950
17 - U.S. 92		190	200	200	210	220	230	230	240	250	250	260	270	270	280	280	290	300	300	310	310	320
		520	540	550	570	580	600	620	630	650	660	680	710	740	770	800	830	850	880	910	940	970
16 - CENTRAL MAINLINE PLAZA 2		1,680	1,730	1,770	1,820	1,860	1,910	1,960	2,000	2,050	2,090	2,140	2,190	2,230	2,280	2,320	2,370	2,420	2,460	2,510	2,550	2,600
14 - CPP		710	730	740	760	780	800	810	830	850	860	880	900	910	930	950	970	980	1,000	1,020	1,030	1,050
		360	370	380	390	400	410	420	430	440	450	460	470	480	490	500	510	510	520	530	540	550
13 - CENTRAL MAINLINE PLAZA 1		1,270	1,300	1,340	1,370	1,410	1,440	1,470	1,510	1,540	1,580	1,610	1,640	1,680	1,710	1,750	1,780	1,810	1,850	1,880	1,920	1,950
13 - S.R. 540		1,050	1,070	1,090	1,120	1,140	1,160	1,180	1,200	1,230	1,250	1,270	1,290	1,310	1,330	1,350	1,380	1,400	1,420	1,440	1,460	1,480
		2,320	2,380	2,430	2,490	2,540	2,600	2,660	2,710	2,770	2,820	2,880	2,940	2,990	3,050	3,100	3,160	3,210	3,270	3,320	3,380	3,430
10 - U.S. 98		590	600	600	610	620	630	630	640	650	650	660	670	670	680	680	690	700	700	710	710	720
		1,000	1,030	1,060	1,090	1,120	1,150	1,170	1,200	1,230	1,260	1,290	1,320	1,350	1,370	1,400	1,430	1,460	1,490	1,510	1,540	1,570
		2,560	2,640	2,710	2,790	2,870	2,950	3,020	3,100	3,180	3,250	3,330	3,410	3,480	3,560	3,640	3,720	3,790	3,870	3,950	4,020	4,100
CPP																						
S.R. 540 + CPP Ramps to/from East Polk Parkway		710	730	740	760	780	800	810	830	850	860	880	900	910	930	950	970	980	1,000	1,020	1,030	1,050
S.R. 540 Ramps to/from East Polk Parkway		130	140	150	150	160	170	180	190	190	200	210	220	230	230	240	250	260	270	270	280	290
CPP Ramps to/from East Polk Parkway		580	590	600	610	620	630	630	640	650	660	670	680	690	700	710	720	720	730	740	750	760
CPP Ramps to/from West Polk Parkway		360	370	380	390	400	410	420	430	440	450	460	470	480	490	500	510	510	520	530	540	550
		940	960	980	1,000	1,020	1,040	1,050	1,070	1,090	1,110	1,130	1,150	1,170	1,180	1,200	1,220	1,240	1,260	1,270	1,290	1,310
S.R. 540		110	120	120	130	130	140	150	150	160	160	170	180	180	190	190	200	210	210	220	220	230
MAINLINE PLAZA		1,050	1,080	1,100	1,130	1,150	1,180	1,200	1,230	1,250	1,280	1,300	1,320	1,350	1,370	1,400	1,420	1,440	1,470	1,490	1,520	1,540
U.S. 17		850	870	890	900	920	940	960	980	990	1,010	1,030	1,050	1,060	1,080	1,100	1,120	1,130	1,150	1,170	1,180	1,200
		130	140	140	150	150	160	160	170	170	180	180	180	190	190	200	200	200	210	210	220	220
MAINLINE PLAZA		330	340	350	370	380	390	400	410	430	440	450	460	470	480	490	510	520	530	540	550	560
S.R. 60		330	340	350	370	380	390	400	410	430	440	450	460	470	480	490	510	520	530	540	550	560

Inputs	
Truck % (t_T)	6.0%
Free Flow Speed (mph) - Polk Parkway	70
Free Flow Speed (mph) - Central Polk Parkway (CPP)	75
Peak Hour Factor (PHF)	0.95

Freeway LOS	
Lanes	LOS D
2	3,320
3	4,980
4	6,640
5	8,300
6	9,960

Ramp Capacity by	
1	1,850
2	3,700
3	5,550

Speed - 40 to 50 MPH

The alternatives evaluated for the proposed interchange are described in this section, as well as future traffic operational analysis.

6.1. ANALYSIS ALTERNATIVES

The CPP project study evaluated several Build alternatives for the proposed interchanges at the Polk Parkway, S.R. 540 and U.S. 17. The detailed evaluation and screening of the alternatives is documented in the Alternatives Evaluation Report provided in **Appendix D**. The terminus of the CPP at S.R. 60 was also evaluated to determine the preferred intersection configuration. The Build alternatives are summarized as follows:

Polk Parkway and S.R. 540 Interchange

Alternative 1 – District One 15 Percent Line and Grade Configuration

This was the configuration developed by District One in 2012 but was only advanced to 15 percent line and grade design. It utilized a third level flyover bridge that spanned over the Polk Parkway and two ramps. It required widening of the Polk Parkway westbound bridge over Landfill Road to accommodate CPP ramps to/from the west of Polk Parkway. The interchange at S.R. 540 was a traditional diamond configuration.

Alternative 2 – Directional Configuration

The directional configuration was similar to Alternative 1 but reduced the span of the third level flyover bridge. Another variation was that the Polk Parkway eastbound off-ramp was separated from the interchange and merged with S.R. 540 eastbound on-ramp to CPP. It utilized a diamond interchange configuration with U.S. 17 spanning the CPP with a single span bridge.

Alternative 3 – Trumpet Configuration

This alternative utilized the same overall ramp configuration as Alternative 2 except the Polk Parkway westbound ramps to/from CPP that had a trumpet configuration. This interchange type eliminated the bridge crossing of these two ramps and reduced other bridge lengths and wall heights.

Central Polk Parkway and U.S. 17 Interchange

Alternative 1 – District One 15 Percent Line and Grade Configuration

This was the configuration at U.S. 17 developed by District One but was only advanced to 15 percent line and grade design. It utilized a tight diamond interchange configuration with the CPP mainline spanning U.S 17 with two single span bridges. This alternative crossed the CSX corridor and gas mains at-grade.

Alternative 1A – This was similar to Alternative 1 but provided four three-span bridges over the gas mains and Old Bartow Road.

Alternative 2 – Diamond Configuration

The diamond configuration was similar to Alternative 1 but U.S. 17 was elevated to span the CPP mainline with a large single span mainline bridge.

Alternative 3 – Partial Cloverleaf Configuration

This alternative utilized partial cloverleaf configuration to eliminate gas line impacts west of U.S. 17 with CPP spanning U.S. 17 with two mainline bridges. It crossed the CSX corridor and gas lines at-grade.

Alternative 3A – This was an option to Alternative 3 evaluated to provide two three-span bridges over Old Bartow Road and the gas lines.

Alternative 3B – A second option to Alternative 3 with the same configuration as Alternative 3A but allowed two long bridges to span over the entire CSX and gas lines.

Alternative 4 – Combined Diamond/Partial Cloverleaf Configuration

The combined configuration provided three diagonal ramps and a loop ramp in the northeast quadrant of the interchange.

Central Polk Parkway and S.R. 60 Intersection

Alternative 1

This configuration terminated CPP at 91 Mine Road with ramps to/from the west. It also included widening of 91 Mine Road to four lanes from the CPP terminus to S.R. 60.

Alternative 2

In Alternative 2, the CPP was terminated at S.R. 60 at a T-intersection, approximately 500 feet from the 91 Mine Road/ Connersville Road intersection. All possible movements were allowed at the two intersections.

Alternative 3

Alternative 3 was a reconfiguration of the S.R. 60 intersections in Alternative 2 to create a Restricted Crossing U-Turn (R-CUT) where left turns at the 91 Mine Road intersection are restricted. The restricted left turns would be maneuvered through U-turns at the CPP intersection and at a median opening just east of 91 Mine Road.

Preferred Build Alternative Selection

Alternatives 2 and 1A were selected as the Preferred Build configurations at the Polk Parkway/S.R. 540 and U.S. 17 interchanges, respectively. These configurations reduced bridge and ramp lengths compared to the other alternatives, while allowing all ramps to be designed with a speed of 50 mph. They also minimized right of way and wetland impacts. Alternative 3 was selected at the CPP and S.R. 60 intersection because it reduced conflict points and delay.

This PTAR only documents traffic analysis for the No Build and the Preferred Build (referred to Build herein) alternatives. The results are provided for the 2025 opening and 2045 design years. The No Build and Build alternatives are described as follows:

No Build Alternative

This alternative did not include any improvements on the Polk Parkway or construction of the CPP facility. Existing lane geometry and configurations were maintained, as previously presented on **Figure 4.2**.

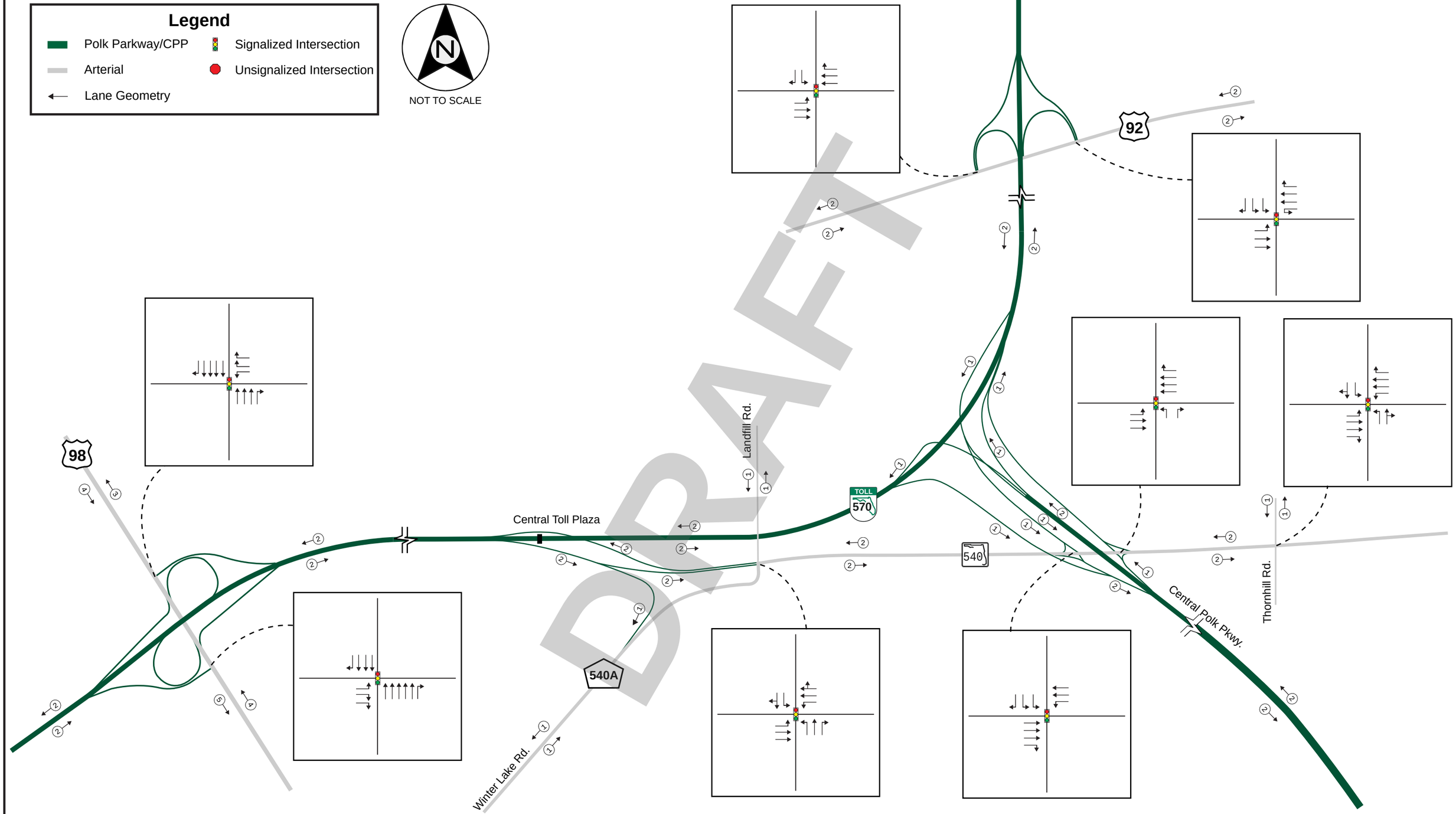
Build Alternative

The Build alternative included system to system ramp connections between Polk Parkway and CPP, a diamond interchange at S.R. 540 and U.S. 17, and an R-CUT at S.R. 60. The CPP was evaluated as a four-lane tolled limited access facility that begins at Polk Parkway and extends southeast past the U.S. 17 to S.R. 60. The Build alternative lane configurations are depicted on **Figure 6.1**, within the AOI of the PTAR. A conceptual layout of the Build alternative is provided in **Appendix E**.

Legend

- Polk Parkway/CPP
- Arterial
- Lane Geometry
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE

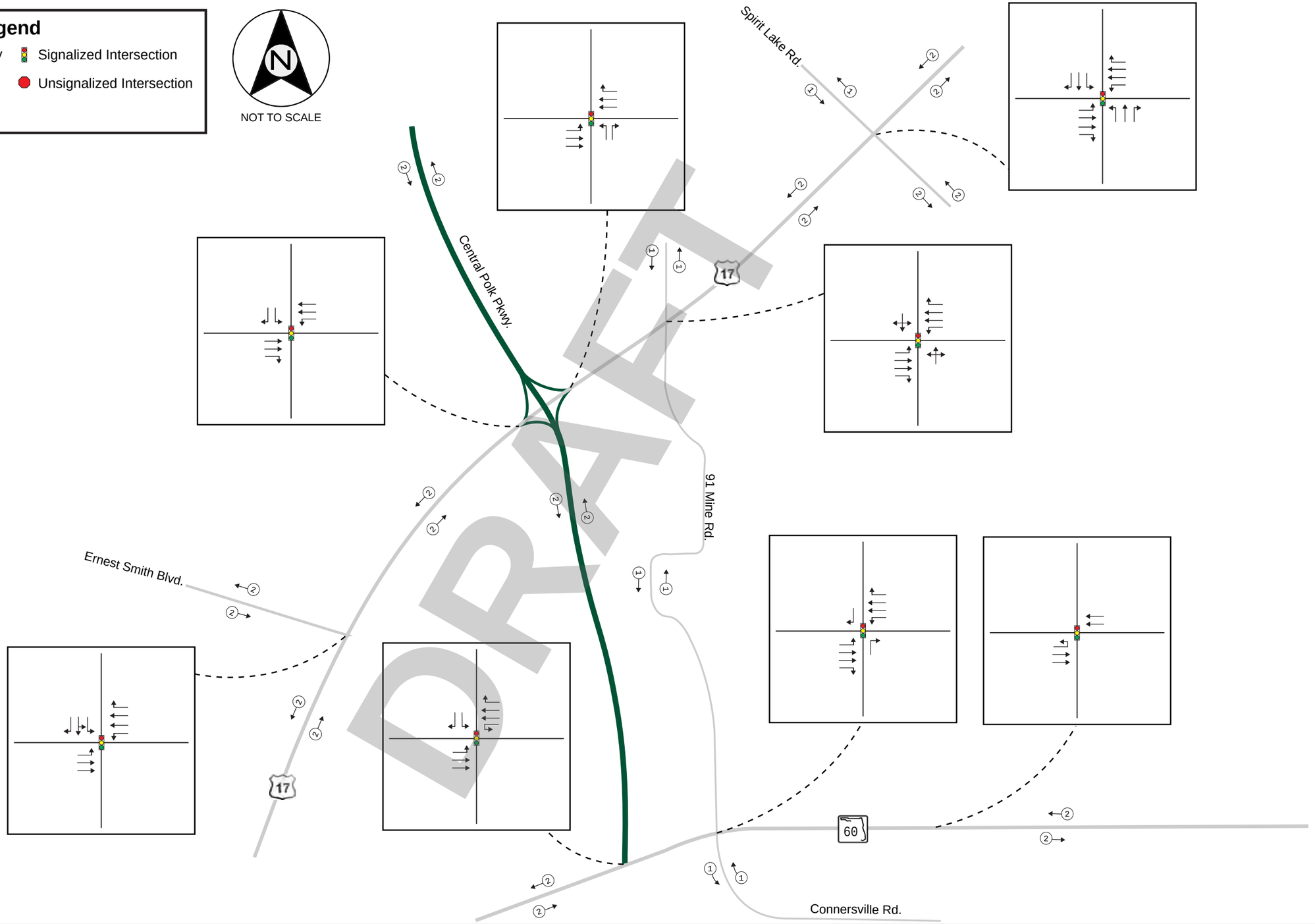


FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	Future Build Lane Geometry	Figure 6.1 (1 of 2)

Legend

- Central Polk Parkway
- Arterial
- Lane Direction
- Signalized Intersection
- Unsignalized Intersection

NOT TO SCALE



FLORIDA'S TURNPIKE	Central Polk Parkway (Polk Parkway to S.R. 60) Project Traffic Analysis Report (PTAR)	Future Build Lane Geometry	Figure 6.1 (2 of 2)

6.2. FUTURE OPERATIONAL PERFORMANCE

This section provides a summary of traffic performance results for future conditions, years 2025 and 2045. Detailed output reports and analysis files are provided in **Appendix F**.

6.2.1. Freeway Segment Analysis

The future year peak hour traffic volumes were evaluated in each direction for freeway segments: basic and merge/diverge influence areas using HCS.

The opening year 2025 HCS output for the mainline segments is summarized in **Table 6.1** and **Table 6.2** for the No Build and Build alternatives, respectively. The results show that the freeway segments are expected to operate at an acceptable LOS C or better in the both the 2025 No Build and Build conditions.

For the 2045 design year, the mainline segments analysis is summarized in **Table 6.3** and **Table 6.4** for the No Build and Build alternatives, respectively. The results show that, most of the freeway segments along the Polk Parkway are expected to operate at LOS D or better but the section west of U.S. 98 is expected to operate at unacceptable LOS E or F in both No Build and Build conditions. Lane requirement analysis indicated that this section needs three lanes in each direction before the 2045 design year. Also, the section between U.S. 98 and S.R. 540 is expected to operate at LOS E either in the AM or PM Peak hours. This is because of an increase in demand during the 2045 design year.

6.2.2. Ramp Capacity Analysis

Table 6.5 and **Table 6.6** summarize ramp capacity evaluation for the opening year 2025 conditions, for the No Build and Build alternatives, respectively. Results show that the highest V/C expected at the ramp roadways is 0.4 for both the 2025 No Build and 2025 Build alternative.

For the design year 2045**,** results on **Table 6.7** and **Table 6.8** summarize ramp capacity evaluation for the No Build and Build conditions, respectively. The results show that the highest V/C expected at the ramp roadways is 0.6 for both the 2045 No Build and 2045 Build alternatives.

Table 6.1
2025 No Build Design Hour Freeway Mainline Segment Operations

Segment	Segment Type	Lanes	Trucks	Volume (vph)		LOS/Density	
				AM	PM	AM	PM
Polk Parkway - Eastbound							
Upstream of U.S. 98 Off-ramp	Basic	2	6	2,370	2,460	C/22	C/23
Upstream of U.S. 98 Off-ramp*	Diverge	2	6	2,370	2,460	B/14	B/14
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	1,180	1,400	A/11	B/13
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	6	1,390	1,780	A/8	B/11
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	1,390	1,780	B/13	B/16
U.S 98 On-ramp to S.R. 540 Off-ramp	Merge	2	6	1,690	2,170	B/18	C/22
U.S 98 On-ramp to S.R. 540 Off-ramp	Basic	2	6	1,690	2,170	B/15	C/20
U.S 98 On-ramp to S.R. 540 Off-ramp*	Diverge	2	6	1,690	2,170	A/7	B/12
S.R. 540 Off-ramp to On-ramp	Basic	2	6	860	1,110	A/8	A/10
S.R. 540 On-ramp to U.S. 92 Off-ramp	Merge	2	6	1,040	1,340	A/9	B/12
S.R. 540 On-ramp to U.S. 92 Off-ramp	Basic	2	6	1,040	1,340	A/9	B/12
S.R. 540 On-ramp to U.S. 92 Off-ramp*	Diverge	2	6	1,040	1,340	A/1	A/4
U.S. 92 Off-ramp to On-ramp	Basic	2	6	680	880	A/6	A/8
Downstream of U.S. 92 On-ramp	Merge	2	6	830	1,070	A/6	A/9
Downstream of U.S. 92 On-ramp	Basic	2	6	830	1,070	A/8	A/10
Polk Parkway - Westbound							
Upstream of U.S. 92 Off-ramp	Basic	2	6	1,070	830	A/10	A/8
Upstream of U.S. 92 Off-ramp	Diverge	2	6	1,070	830	B/12	A/10
U.S. 92 Off-ramp to On-ramp	Basic	2	6	880	680	A/8	A/6
U.S. 92 On-ramp to S.R 540 Off-ramp*	Merge	2	6	1,340	1,040	A/8	A/5
U.S. 92 On-ramp to S.R 540 Off-ramp	Basic	2	6	1,340	1,040	B/12	A/9
U.S. 92 On-ramp to S.R 540 Off-ramp	Diverge	2	6	1,340	1,040	A/10	A/7
S.R. 540 Off-ramp to On-ramp	Basic	2	6	1,110	860	A/10	A/8
S.R. 540 On-ramp to U.S. 98 Off-ramp	Merge	2	6	2,170	1,690	B/19	B/15
S.R. 540 On-ramp to U.S. 98 Off-ramp	Basic	2	6	2,170	1,690	C/20	B/15
S.R. 540 On-ramp to U.S. 98 Off-ramp*	Diverge	2	6	2,170	1,690	B/12	A/7
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	1,400	1,180	B/13	A/11
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	6	2,170	1,980	B/15	B/13
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	2,170	1,980	C/20	B/18
Downstream of U.S. 98 On-ramp*	Merge	2	6	2,460	2,370	B/17	B/17
Downstream of U.S. 98 On-ramp	Basic	2	6	2,460	2,370	C/23	C/22

**Lane Add/Drop or Acceleration/Deceleration Lane > 1,500 ft, HCM Methodology is limited to 1,500 ft.*

Table 6.2
2025 Build Design Hour HCS Freeway Segment LOS

Segment	Segment Type	Lanes	Trucks	Volume (vph)		LOS/Density	
				AM	PM	AM	PM
Polk Parkway - Eastbound							
Upstream of U.S. 98 Off-ramp	Basic	2	6	2,410	2,560	C/22	C/24
Upstream of U.S. 98 Off-ramp*	Diverge	2	6	2,410	2,560	B/14	B/15
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	1,410	1,730	B/13	B/16
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	6	1,570	2,020	A/10	B/14
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	1,570	2,020	B/14	C/18
U.S 98 On-ramp to S.R. 540 Off-ramp	Merge	2	6	1,800	2,320	B/19	C/23
U.S 98 On-ramp to S.R. 540 Off-ramp	Basic	2	6	1,800	2,320	B/16	C/21
U.S 98 On-ramp to S.R. 540 Off-ramp*	Diverge	2	6	1,800	2,320	A/8	B/13
S.R. 540 Off-ramp to Central Polk Parkway Off-ramp	Basic	2	6	980	1,270	A/9	B/12
S.R. 540 Off-ramp to Central Polk Parkway Off-ramp	Diverge	2	6	980	1,270	A/5	A/7
Central Polk Parkway Off-ramp to S.R. 540 and Central Polk Parkway On-ramp	Basic	2	6	620	970	A/6	A/9
S.R. 540 and Central Polk Parkway On-ramp to U.S. 92 Off-ramp	Merge	2	6	1,140	1,680	A/9	B/14
S.R. 540 and Central Polk Parkway On-ramp to U.S. 92 Off-ramp	Basic	2	6	1,140	1,680	A/10	B/15
S.R. 540 and Central Polk Parkway On-ramp to U.S. 92 Off-ramp*	Diverge	2	6	1,140	1,680	A/2	A/7
U.S. 92 Off-ramp to On-ramp	Basic	2	6	730	1,160	A/7	A/11
Downstream of U.S. 92 On-ramp	Merge	2	6	880	1,350	A/7	B/11
Downstream of U.S. 92 On-ramp	Basic	2	6	880	1,350	A/8	B/12
Polk Parkway - Westbound							
Upstream of U.S. 92 Off-ramp	Basic	2	6	1,350	880	B/12	A/8
Upstream of U.S. 92 Off-ramp	Diverge	2	6	1,350	880	B/15	A/10
U.S. 92 Off-ramp to On-ramp	Basic	2	6	1,160	730	A/11	A/7
U.S. 92 On-ramp to S.R 540 and Central Polk Parkway Off-ramp*	Merge	2	6	1,680	1,140	B/11	A/6
U.S. 92 On-ramp to S.R 540 and Central Polk Parkway Off-ramp	Basic	2	6	1,680	1,140	B/15	A/10
U.S. 92 On-ramp to S.R 540 and Central Polk Parkway Off-ramp	Diverge	2	6	1,680	1,140	B/11	A/6
S.R. 540 and Central Polk Parkway Off-ramp to Central Polk Parkway On-ramp	Basic	2	6	970	620	A/9	A/6
Central Polk Parkway On-ramp to S.R. 540 On-ramp	Merge	2	6	1,270	980	B/10	A/8
Central Polk Parkway On-ramp to S.R. 540 On-ramp	Basic	2	6	1,270	980	B/12	A/9
S.R. 540 On-ramp to U.S. 98 Off-ramp	Merge	2	6	2,320	1,800	C/20	B/16
S.R. 540 On-ramp to U.S. 98 Off-ramp	Basic	2	6	2,320	1,800	C/21	B/16
S.R. 540 On-ramp to U.S. 98 Off-ramp*	Diverge	2	6	2,320	1,800	B/13	A/8
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	1,730	1,410	B/16	B/13
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	6	2,340	2,080	B/16	B/14
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	2,340	2,080	C/21	C/19
Downstream of U.S. 98 On-ramp*	Merge	2	6	2,560	2,410	B/18	B/17
Downstream of U.S. 98 On-ramp	Basic	2	6	2,560	2,410	C/24	C/22
Central Polk Parkway - Eastbound							
S.R. 540 On-ramp to U.S. 17 Off-ramp***	Major Merge	2	6	1,050	810	A/10	A/7
S.R. 540 On-ramp to U.S. 17 Off-ramp	Basic	2	6	1,050	810	A/10	A/7
S.R. 540 On-ramp to U.S. 17 Off-ramp	Diverge	2	6	1,050	810	A/1	A/0
U.S. 17 Off-ramp to On-ramp	Basic	2	6	200	150	A/2	A/1
U.S. 17 On-ramp to S.R. 60	Merge	2	6	330	250	A/0	A/0
U.S. 17 On-ramp to S.R. 60	Basic	2	6	330	250	A/3	A/2
Central Polk Parkway - Westbound							
S.R. 60 to U.S. 17 Off-ramp	Basic	2	6	250	330	A/2	A/3
S.R. 60 to U.S. 17 Off-ramp	Diverge	2	6	250	330	A/1	A/0
U.S. 17 Off-ramp to On-ramp	Basic	2	6	150	200	A/1	A/2
U.S. 17 On-ramp to S.R. 540 Off-ramp	Merge	2	6	810	1,050	A/3	A/5
U.S. 17 On-ramp to S.R. 540 Off-ramp	Basic	2	6	810	1,050	A/7	A/10
U.S. 17 On-ramp to S.R. 540 Off-ramp	Diverge	2	6	810	1,050	A/0	A/1
S.R. 540 Off-ramp to Polk Parkway Ramps***	Major Diverge	2	6	720	940	A/6	A/8

**Lane Add/Drop or Acceleration/Deceleration Lane > 1,500 ft, HCM Methodology is limited to 1,500 ft.*

***Major Merge with no lane dropped. The freeway segment downstream of the merge is considered to be a basic freeway segment, per HCM Chapter 14.*

****Major Diverge. Eqn 14-28*

Table 6.3
2045 No Build Design Hour HCS Freeway Segment LOS

Segment	Segment Type	Lanes	Trucks	Volume (vph)		LOS/Density	
				AM	PM	AM	PM
Polk Parkway - Eastbound							
Upstream of U.S. 98 Off-ramp	Basic	2	6	3,800	3,820	F	F
Upstream of U.S. 98 Off-ramp*	Diverge	2	6	3,800	3,820	F	F
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	1,930	2,170	B/18	C/20
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	6	2,250	2,740	B/16	B/20
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	2,250	2,740	C/20	C/26
U.S 98 On-ramp to S.R. 540 Off-ramp	Merge	2	6	2,700	3,330	C/26	D/32
U.S 98 On-ramp to S.R. 540 Off-ramp	Basic	2	6	2,700	3,330	C/25	E/36
U.S 98 On-ramp to S.R. 540 Off-ramp*	Diverge	2	6	2,700	3,330	B/17	C/23
S.R. 540 Off-ramp to On-ramp	Basic	2	6	1,520	1,830	B/14	B/17
S.R. 540 On-ramp to U.S. 92 Off-ramp	Merge	2	6	1,820	2,220	B/16	B/19
S.R. 540 On-ramp to U.S. 92 Off-ramp	Basic	2	6	1,820	2,220	B/17	C/20
S.R. 540 On-ramp to U.S. 92 Off-ramp*	Diverge	2	6	1,820	2,220	A/8	B/12
U.S. 92 Off-ramp to On-ramp	Basic	2	6	1,130	1,340	A/10	B/12
Downstream of U.S. 92 On-ramp	Merge	2	6	1,380	1,660	B/11	B/14
Downstream of U.S. 92 On-ramp	Basic	2	6	1,380	1,660	B/13	B/15
Polk Parkway - Westbound							
Upstream of U.S. 92 Off-ramp	Basic	2	6	1,660	1,380	B/15	B/13
Upstream of U.S. 92 Off-ramp	Diverge	2	6	1,660	1,380	B/18	B/15
U.S. 92 Off-ramp to On-ramp	Basic	2	6	1,340	1,130	B/12	A/10
U.S. 92 On-ramp to S.R 540 Off-ramp*	Merge	2	6	2,220	1,820	B/15	B/12
U.S. 92 On-ramp to S.R 540 Off-ramp	Basic	2	6	2,220	1,820	C/20	B/17
U.S. 92 On-ramp to S.R 540 Off-ramp	Diverge	2	6	2,220	1,820	B/18	B/15
S.R. 540 Off-ramp to On-ramp	Basic	2	6	1,830	1,520	B/17	B/14
S.R. 540 On-ramp to U.S. 98 Off-ramp	Merge	2	6	3,330	2,700	D/29	C/23
S.R. 540 On-ramp to U.S. 98 Off-ramp	Basic	2	6	3,330	2,700	E/36	C/25
S.R. 540 On-ramp to U.S. 98 Off-ramp*	Diverge	2	6	3,330	2,700	C/23	B/17
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	2,170	1,930	C/20	B/18
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	4	3,370	3,190	C/25	C/23
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	3,370	3,190	E/37	D/33
Downstream of U.S. 98 On-ramp*	Merge	2	6	3,820	3,800	F	F
Downstream of U.S. 98 On-ramp	Basic	2	6	3,820	3,800	F	F

Highlighted:
LOS E LOS F

**Lane Add/Drop or Acceleration/Deceleration Lane > 1,500 ft, HCM Methodology is limited to 1,500 ft.*

Table 6.4

2045 Build Design Hour HCS Freeway Segment LOS

Segment	Segment Type	Lanes	Trucks	Volume (vph)		LOS/Density	
				AM	PM	AM	PM
Polk Parkway - Eastbound							
Upstream of U.S. 98 Off-ramp	Basic	2	6	3,880	4,100	F	F
Upstream of U.S. 98 Off-ramp*	Diverge	2	6	3,880	4,100	F	F
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	2,310	2,710	C/21	C/26
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	6	2,510	3,060	B/18	C/23
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	2,510	3,060	C/23	D/31
U.S 98 On-ramp to S.R. 540 Off-ramp	Merge	2	6	2,790	3,430	C/27	D/33
U.S 98 On-ramp to S.R. 540 Off-ramp	Basic	2	6	2,790	3,430	D/27	E/39
U.S 98 On-ramp to S.R. 540 Off-ramp*	Diverge	2	6	2,790	3,430	B/18	C/24
S.R. 540 Off-ramp to Central Polk Parkway Off-ramp	Basic	2	6	1,620	1,950	B/15	B/18
S.R. 540 Off-ramp to Central Polk Parkway Off-ramp	Diverge	2	6	1,620	1,950	B/11	B/14
Central Polk Parkway Off-ramp to S.R. 540 and Central Polk Parkway On-ramp	Basic	2	6	1,070	1,550	A/10	B/14
S.R. 540 and Central Polk Parkway On-ramp to U.S. 92 Off-ramp	Merge	2	6	1,910	2,600	B/16	C/21
S.R. 540 and Central Polk Parkway On-ramp to U.S. 92 Off-ramp	Basic	2	6	1,910	2,600	B/17	C/24
S.R. 540 and Central Polk Parkway On-ramp to U.S. 92 Off-ramp*	Diverge	2	6	1,910	2,600	A/9	B/16
U.S. 92 Off-ramp to On-ramp	Basic	2	6	1,150	1,630	A/10	B/15
Downstream of U.S. 92 On-ramp	Merge	2	6	1,400	1,950	B/11	B/16
Downstream of U.S. 92 On-ramp	Basic	2	6	1,400	1,950	B/13	B/18
Polk Parkway - Westbound							
Upstream of U.S. 92 Off-ramp	Basic	2	6	1,950	1,400	B/18	B/13
Upstream of U.S. 92 Off-ramp	Diverge	2	6	1,950	1,400	C/20	B/15
U.S. 92 Off-ramp to On-ramp	Basic	2	6	1,630	1,150	B/15	A/10
U.S. 92 On-ramp to S.R 540 and Central Polk Parkway Off-ramp*	Merge	2	6	2,600	1,910	B/18	B/12
U.S. 92 On-ramp to S.R 540 and Central Polk Parkway Off-ramp	Basic	2	6	2,600	1,910	C/24	B/17
U.S. 92 On-ramp to S.R 540 and Central Polk Parkway Off-ramp	Diverge	2	6	2,600	1,910	C/20	B/14
S.R. 540 and Central Polk Parkway Off-ramp to Central Polk Parkway On-ramp	Basic	2	6	1,550	1,070	B/14	A/10
Central Polk Parkway On-ramp to S.R. 540 On-ramp	Merge	2	6	1,950	1,620	B/16	B/13
Central Polk Parkway On-ramp to S.R. 540 On-ramp	Basic	2	6	1,950	1,620	B/18	B/15
S.R. 540 On-ramp to U.S. 98 Off-ramp	Merge	2	6	3,430	2,790	D/30	C/24
S.R. 540 On-ramp to U.S. 98 Off-ramp	Basic	2	6	3,430	2,790	E/39	D/27
S.R. 540 On-ramp to U.S. 98 Off-ramp*	Diverge	2	6	3,430	2,790	C/24	B/18
U.S. 98 Off-ramp to On-ramp (Loop)	Basic	2	6	2,710	2,310	C/26	C/21
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)*	Merge	2	6	3,730	3,360	F	C/25
U.S. 98 On-ramp (Loop) to On-ramp (Diagonal)	Basic	2	6	3,730	3,360	F	E/37
Downstream of U.S. 98 On-ramp*	Merge	2	6	4,100	3,880	F	F
Downstream of U.S. 98 On-ramp	Basic	2	6	4,100	3,880	F	F
Central Polk Parkway - Eastbound							
S.R. 540 On-ramp to U.S. 17 Off-ramp***	Major Merge	2	6	1,540	1,190	B/14	A/11
S.R. 540 On-ramp to U.S. 17 Off-ramp	Basic	2	6	1,540	1,190	B/14	A/11
S.R. 540 On-ramp to U.S. 17 Off-ramp	Diverge	2	6	1,540	1,190	A/6	A/2
U.S. 17 Off-ramp to On-ramp	Basic	2	6	340	270	A/3	A/2
U.S. 17 On-ramp to S.R. 60	Merge	2	6	560	440	A/4	A/0
U.S. 17 On-ramp to S.R. 60	Basic	2	6	560	440	A/5	A/4
Central Polk Parkway - Westbound							
S.R. 60 to U.S. 17 Off-ramp	Basic	2	6	440	560	A/4	A/5
S.R. 60 to U.S. 17 Off-ramp	Diverge	2	6	440	560	A/0	A/0
U.S. 17 Off-ramp to On-ramp	Basic	2	6	270	340	A/2	A/3
U.S. 17 On-ramp to S.R. 540 Off-ramp	Merge	2	6	1,190	1,540	A/6	A/9
U.S. 17 On-ramp to S.R. 540 Off-ramp	Basic	2	6	1,190	1,540	A/11	B/14
U.S. 17 On-ramp to S.R. 540 Off-ramp	Diverge	2	6	1,190	1,540	A/7	A/6
S.R. 540 Off-ramp to Polk Parkway Ramps***	Major Diverge	2	6	1,010	1,310	A/9	B/11

Highlighted:

LOS E LOS F

**Lane Add/Drop or Acceleration/Deceleration Lane > 1,500 ft, HCM Methodology is limited to 1,500 ft.*

** *Major Merge with no lane dropped. The freeway segment downstream of the merge is considered to be a basic freeway segment, per HCM Chapter 14.*

****Major Diverge. Eqn 14-28*

Table 6.5
2025 No Build Design Hour Ramp Capacity Analysis

Interchange	Ramp	Lanes	Volume (vph)		Capacity (vph)	V/C	
			AM	PM		AM	PM
U.S. 98	Eastbound On-ramp (Diagonal)	1	300	390	1,850	0.2	0.2
	Westbound Off-ramp	1	770	510	1,850	0.4	0.3
	Eastbound On-ramp (Loop)	1	210	380	1,810	0.1	0.2
	Westbound On-ramp (Loop)	2	770	800	3,700	0.2	0.2
	Eastbound Off-ramp	2	1,190	1,060	3,700	0.3	0.3
	Westbound On-ramp (Diagonal)	1	290	390	1,850	0.2	0.2
S.R. 540	Eastbound On-Ramp	1	180	230	1,850	0.1	0.1
	Westbound Off-Ramp	1	230	180	1,850	0.1	0.1
	Eastbound Off-Ramp	2	830	1,060	3,700	0.2	0.3
	Westbound On-Ramp	2	1,060	830	3,700	0.3	0.2
U.S 92	Eastbound On-Ramp	1	150	190	1,850	0.1	0.1
	Westbound Off-Ramp	1	190	150	1,850	0.1	0.1
	Eastbound Off-Ramp	2	360	460	3,620	0.1	0.1
	Westbound On-Ramp	2	460	360	3,620	0.1	0.1

Table 6.6
2025 Build Design Hour Ramp Capacity Analysis

Interchange	Ramp	Lanes	Volume (vph)		Capacity (vph)	V/C	
			AM	PM		AM	PM
Polk Parkway							
U.S. 98	Eastbound On-ramp (Diagonal)	1	230	300	1,850	0.1	0.2
	Westbound Off-ramp	1	590	390	1,850	0.3	0.2
	Eastbound On-ramp (Loop)	1	160	290	1,810	0.1	0.2
	Westbound On-ramp (Loop)	2	610	670	3,620	0.2	0.2
	Eastbound Off-ramp	2	1,000	830	3,620	0.3	0.2
	Westbound On-ramp (Diagonal)	1	220	330	1,850	0.1	0.2
S.R. 540 and Central Polk Parkway	Eastbound On-ramp	1	520	710	1,850	0.3	0.4
	Westbound Off-ramp	1	710	520	1,850	0.4	0.3
	Eastbound Off-ramp to Central Polk Parkway	1	360	300	1,850	0.2	0.2
	Westbound On-ramp from Central Polk Parkway	1	300	360	1,850	0.2	0.2
	Eastbound Off-ramp to S.R. 540	2	820	1,050	3,700	0.2	0.3
	Westbound On-ramp from S.R. 540	2	1,050	820	3,700	0.3	0.2
U.S 92	Eastbound On-ramp	1	150	190	1,850	0.1	0.1
	Westbound Off-ramp	1	190	150	1,850	0.1	0.1
	Eastbound Off-ramp	2	410	520	3,620	0.1	0.1
	Westbound On-ramp	2	520	410	3,620	0.1	0.1
Central Polk Parkway							
S.R. 540	Westbound On-ramp to Polk Parkway	1	100	130	1,850	0.1	0.1
	Eastbound Off-ramp from Polk Parkway	1	130	100	1,850	0.1	0.1
	Westbound Off-ramp from Central Polk Parkway	1	90	110	1,850	0.0	0.1
	Eastbound On-ramp to Central Polk Parkway	2	470	390	3,700	0.1	0.1
U.S. 17	Westbound On-ramp	2	660	850	3,700	0.2	0.2
	Eastbound Off-ramp	2	850	660	3,700	0.2	0.2
	Westbound Off-ramp	1	100	130	1,850	0.1	0.1
	Eastbound On-ramp	1	130	100	1,850	0.1	0.1

Table 6.7
2045 No Build Design Hour Ramp Capacity Analysis

Interchange	Ramp	Lanes	Volume (vph)		Capacity (vph)	V/C	
			AM	PM		AM	PM
U.S. 98	Eastbound On-ramp (Diagonal)	1	450	590	1,850	0.2	0.3
	Westbound Off-ramp	1	1,160	770	1,850	0.6	0.4
	Eastbound On-ramp (Loop)	1	320	570	1,810	0.2	0.3
	Westbound On-ramp (Loop)	2	1,200	1,260	3,700	0.3	0.3
	Eastbound Off-ramp	2	1,870	1,650	3,700	0.5	0.4
	Westbound On-ramp (Diagonal)	1	450	610	1,850	0.2	0.3
S.R. 540	Eastbound On-ramp	1	300	390	1,850	0.2	0.2
	Westbound Off-ramp	1	390	300	1,850	0.2	0.2
	Eastbound Off-ramp	2	1,180	1,500	3,700	0.3	0.4
	Westbound On-ramp	2	1,500	1,180	3,700	0.4	0.3
U.S 92	Eastbound On-ramp	1	250	320	1,850	0.1	0.2
	Westbound Off-ramp	1	320	250	1,850	0.2	0.1
	Eastbound Off-ramp	2	690	880	3,620	0.2	0.2
	Westbound On-ramp	2	880	690	3,620	0.2	0.2

Table 6.8
2045 Build Design Hour Ramp Capacity Analysis

Interchange	Ramp	Lanes	Volume (vph)		Capacity (vph)	V/C	
			AM	PM		AM	PM
Polk Parkway							
U.S. 98	Eastbound On-ramp (Diagonal)	1	280	370	1,850	0.2	0.2
	Westbound Off-ramp	1	720	480	1,850	0.4	0.3
	Eastbound On-ramp (Loop)	1	200	350	1,810	0.1	0.2
	Westbound On-ramp (Loop)	2	1,020	1,050	3,620	0.3	0.3
	Eastbound Off-ramp	2	1,570	1,390	3,620	0.4	0.4
	Westbound On-ramp (Diagonal)	1	370	520	1,850	0.2	0.3
S.R. 540 and Central Polk Parkway	Eastbound On-ramp	1	840	290	1,850	0.5	0.2
	Westbound Off-ramp	1	1,050	230	1,850	0.6	0.1
	Eastbound Off-ramp to Central Polk Parkway	1	550	400	1,850	0.3	0.2
	Westbound On-ramp from Central Polk Parkway	1	400	550	1,850	0.2	0.3
	Eastbound Off-ramp to S.R. 540	2	1,170	1,480	3,700	0.3	0.4
	Westbound On-ramp from S.R. 540	2	1,480	1,170	3,700	0.4	0.3
U.S 92	Eastbound On-ramp	1	250	320	1,850	0.1	0.2
	Westbound Off-ramp	1	320	250	1,850	0.2	0.1
	Eastbound Off-ramp	2	760	970	3,620	0.2	0.3
	Westbound On-ramp	2	970	760	3,620	0.3	0.2
Central Polk Parkway							
S.R. 540	Westbound On-ramp to Polk Parkway	1	230	290	1,850	0.1	0.2
	Eastbound Off-ramp from Polk Parkway	1	290	230	1,850	0.2	0.1
	Westbound Off-ramp from Central Polk Parkway	1	180	230	3,700	0.0	0.1
	Eastbound On-ramp to Central Polk Parkway	2	780	580	1,850	0.4	0.3
U.S. 17	Westbound On-ramp	2	250	320	3,700	0.1	0.1
	Eastbound Off-ramp	2	320	250	3,700	0.1	0.1
	Westbound Off-ramp	1	760	970	1,850	0.4	0.5
	Eastbound On-ramp	1	970	760	1,850	0.5	0.4

6.2.3. Signal Warrant Analysis

Signal warrant analysis was conducted at the following proposed intersections for the Build alternative:

- S.R. 540 and CPP Eastbound Ramps
- S.R. 540 and CPP Westbound Ramps
- U.S 17 and CPP Eastbound Ramps
- U.S 17 and CPP Westbound Ramps
- S.R. 60 and 91 Mine Road/Connersville Road

The Manual of Uniform Traffic Control Devices (MUTCD 2009 Edition) and the FDOT MUTS handbook were followed in conducting the signal warrant analysis. Warrants 1 through 9 of the MUTCD were evaluated at the proposed intersections where applicable, for the 2025 opening year.

All the proposed intersections met Warrant 1 (Eight-Hour Vehicular Volume), Warrant 2 (Four-Hour Vehicular Volume) and Warrant 3 (Peak Hour). A detailed report of the Signal Warrant Analysis is provided in **Appendix F**. Signalization of the intersections that met the warrants was assumed in the 2025 and 2045 intersection analysis. Modification of S.R. 60 is also proposed to create a Restricted Crossing U-Turn (RCUT) configuration at the intersections with the CPP and 91 Mine Road.

6.2.4. Intersection Analysis

The intersection analysis for the No Build and Build alternatives are summarized in **Table 6.9** through **Table 6.12** for the 2025 opening year and 2045 design year. Synchro was used to analyze signalized intersections and HCS was used to analyze unsignalized intersections.

In the 2025 No Build alternative, results in **Table 6.9** show that most of the signalized intersections are expected to operate at LOS D or better. The exception is the S.R. 540 intersections at Landfill Road/Polk Parkway Ramps and Thornhill Road which are reported with an unacceptable LOS E. All unsignalized intersections operate at unacceptable LOS F with long delays. Cross-street traffic is expected to continue experiencing long delays due to heavy traffic along S.R. 540, U.S. 17 and S.R. 60.

Table 6.10 shows results for the 2025 Build alternative. There is a noticeable improvement in operations at the existing intersections since traffic is diverted to the CPP. Most of the signalized intersections operate at LOS D or better. The signalized intersections along S.R. 540, at Landfill Road/Polk Parkway Ramps and Thornhill Road, operate at LOS E but with shorter delays compared to No Build. Turn lane improvements are required at these intersections by year 2025. The unsignalized intersection at U.S. 17 and 91 Mine Road is expected to operate at an unacceptable LOS F with very long delays, similar to No Build.

In the 2045 design year, under the No Build condition (**Table 6.11**), all the signalized intersections are anticipated to operate at LOS E or F with unacceptable delays for either AM or PM Peak Hour or Both

except for the U.S. 92 and Polk Parkway Westbound ramps which is expected to operate at LOS B for both the AM and PM peak hour. Also, all the unsignalized intersections are expected to worsen to unacceptable LOS F. Under Build conditions (**Table 6.12),** the proposed signalized intersections along S.R. 540 and S.R. 60 are expected to operate at LOS D or better during both the AM and PM peak hour. The RCUT intersection is expected to operate acceptably through the design year. Also, operations at U.S. 98 and Polk Parkway Ramps intersections are expected to improve due to traffic diversion to the new CPP facility. The analysis showed that three through lanes per direction will be required on S.R. 540 and U.S. 17 in the future.

Table 6.9
2025 No Build Design Hour Intersection LOS/Delay (s/veh)

Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	E/68	-	E/71	-	A/9	A/0	-	B/11	A/0	B/15
Polk Parkway Eastbound Ramps	D/38	-	D/55	-	-	-	-	C/33	A/0	-	C/21	A/3	C/30
S.R. 540													
Landfill Road/Polk Parkway West Ramps	D/38	E/57	-	D/54	D/42	-	E/61	E/62	C/25	D/54	D/50	-	D/45
Polk Parkway Ramps*	C/16	-	-	-	-	-	-	-	-	**F/511**	-	C/20	**F/511**
Thornhill Road	**F/87**	D/41	A/4	C/21	**F/84**	A/2	**F/89**	D/43	-	C/30	**F/128**	-	**E/65**
U.S. 92													
Polk Parkway Westbound Ramps	A/8	A/6	-	-	A/3	A/1	-	-	-	D/54	-	D/39	A/6
Polk Parkway Eastbound Ramps	C/28	A/5	-	-	A/9	A/1	-	-	-	E/65	-	C/24	B/13
U.S. 17													
Ernest Smith Boulevard	D/52	-	B/12	-	-	-	E/67	A/8	-	-	C/31	A/3	C/26
91 Mine Road*	B/15	-	-	B/13	-	-	-	-	-	-	**F/923**	-	**F/923**
Spirit Lake Road	**F/117**	E/53	D/47	D/53	D/51	A/0	**F/91**	B/11	A/2	E/58	C/21	A/2	C/31
S.R. 60													
91 Mine Road/Connersville Road*	B/13	-	-	B/10	-	-	-	**F/93**	-	-	**F/63**	-	**F/93**
PM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	**F/84**	-	E/69	-	A/4	A/0	-	B/11	A/8	B/12
Polk Parkway Eastbound Ramps	D/42	-	E/69	-	-	-	-	C/26	B/13	-	C/29	A/7	C/31
S.R. 540													
Landfill Road/Polk Parkway West Ramps	C/35	**F/84**	-	E/78	D/37	-	E/61	E/60	C/35	E/59	C/35	-	**E/59**
Polk Parkway Ramps*	C/16	-	-	-	-	-	-	-	-	**F/441**	-	C/16	**F/441**
Thornhill Road	**F/120**	D/46	A/4	C/24	E/71	A/2	**F/97**	D/49	-	C/34	**F/116**	-	**E/60**
U.S. 92													
Polk Parkway Westbound Ramps	A/5	A/7	-	-	A/6	A/1	-	-	-	E/57	-	B/16	A/7
Polk Parkway Eastbound Ramps	C/26	B/10	-	-	B/11	A/1	-	-	-	E/56	-	B/16	B/15
U.S. 17													
Ernest Smith Boulevard	D/44	-	B/11	-	-	-	D/49	B/11	-	-	C/29	A/4	C/21
91 Mine Road*	B/13	-	-	C/25	-	-	-	-	-	-	**F/>999**	-	**F/>999**
Spirit Lake Road	**F/93**	D/42	A/10	D/46	D/44	A/1	E/65	B/13	A/0	D/52	D/42	A/6	C/32
S.R. 60													
91 Mine Road/Connersville Road*	B/12	-	-	B/13	-	-	-	**F/522**	-	-	-	-	**F/522**

**Unsignalized - LOS/Delay based on HCS Analysis*

- Not applicable

Table 6.10
2025 Build Design Hour Intersection LOS/Delay (s/veh)

Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	E/66	-	E/69	-	B/11	A/0	-	A/8	A/0	B/15
Polk Parkway Eastbound Ramps	D/41	-	D/53	-	-	-	-	C/21	A/0	-	B/18	A/2	C/24
S.R. 540													
Landfill Road/Polk Parkway West Ramps	D/38	E/59	-	E/56	D/39	-	E/61	E/62	C/26	D/55	D/50	-	D/45
Central Polk Parkway Eastbound Ramps	-	A/8	A/0	A/1	A/2	-	-	-	-	D/44	-	A	A/6
Central Polk Parkway Westbound Ramps	B/13	A/4	-	-	A/6	A/0	D/43	-	A/3	-	-	-	A/6
Thornhill Road	**F/91**	D/37	A/4	C/27	E/67	A/2	**F/94**	D/52	-	D/42	**F/103**	-	**E/58**
U.S. 92													
Polk Parkway Westbound Ramps	A/5	A/5	-	-	A/1	A/0	-	-	-	E/60	-	B/17	A/4
Polk Parkway Eastbound Ramps	C/20	A/6	-	-	C/23	A/2	-	-	-	E/65	-	B/14	C/21
U.S. 17													
Ernest Smith Boulevard	**F/100**	-	B/14	-	-	-	**F/137**	A/7	-	-	D/55	A/2	D/45
Central Polk Parkway Eastbound Ramps	E/74	-	A/1	-	-	-	-	A/9	A/0	B/14	A/7	-	A/10
Central Polk Parkway Westbound Ramps	-	-	-	E/71	-	A/0	D/45	A/3	-	-	C/23	A/3	B/19
91 Mine Road*	C/17	-	-	B/12	-	-	-	-	-	-	**F/>999**	-	**F/>999**
Spirit Lake Road	E/62	D/45	D/54	D/45	D/44	A/0	E/76	B/14	A/2	E/58	C/35	A/5	C/35
S.R. 60													
Central Polk Parkway Ramps	B/16	B/12	-	B/13	A/10	A/2	-	-	-	D/42	-	A/9	B/12
91 Mine Road/Connersville Road	A/1	A/2	A/0	A/1	A/8	A/1	-	-	A/1	-	-	A/0	A/5
U-Turn	C/23	A/0	-	-	A/5	-	-	-	-	-	-	-	A/3
PM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	**F/86**	-	E/72	-	A/5	A/0		A/7	A/6	B/10
Polk Parkway Eastbound Ramps	D/47	-	E/68	-	-	-	-	B/17	A/8	-	C/21	A/4	C/24
S.R. 540													
Landfill Road/Polk Parkway West Ramps	C/34	E/74	-	**F/92**	D/38	-	E/61	E/60	D/40	E/59	C/35	-	**E/60**
Central Polk Parkway Eastbound Ramps	-	B/11	A/0	A/4	A/3	-	-	-	-	D/43	-	A/0	A/8
Central Polk Parkway Westbound Ramps	A/1	A/5	-	-	A/6	A/0	D/46	-	A/1	-	-	-	A/6
Thornhill Road	E/79	C/35	A/6	C/30	E/58	A/5	E/73	E/64	-	D/48	**F/98**	-	D/50
U.S. 92													
Polk Parkway Westbound Ramps	A/6	A/7	-	-	A/5	A/1	-	-	-	E/59	-	B/17	A/7
Polk Parkway Eastbound Ramps	C/27	A/7	-	-	C/21	A/2	-	-	-	E/61	-	B/12	B/19
U.S. 17													
Ernest Smith Boulevard	E/63	-	B/13	-	-	-	E/73	B/13	-	-	D/36	A/3	C/26
Central Polk Parkway Eastbound Ramps	E/65	-	A/1	-	-	-	-	B/13	A/0	E/64	A/8	-	B/13
Central Polk Parkway Westbound Ramps	-	-	-	E/59	-	A/0	C/35	A/5	-	-	D/37	A/4	C/22
91 Mine Road*	B/14	-	-	C/21	-	-	-	-	-	-	**F/>999**	-	**F/>999**
Spirit Lake Road	**F/119**	D/44	B/11	D/49	D/46	A/1	E/78	B/11	A/0	D/52	D/47	A/7	D/37
S.R. 60													
Central Polk Parkway Ramps	A/9	B/15	-	A/7	A/5	A/1	-	-	-	D/53	-	B/12	B/12
91 Mine Road/Connersville Road	A/2	A/3	A/0	A/5	A/9	A/1	-	-	A/1	-	-	A/0	A/5
U-Turn	C/23	-	A/0	-	A/4	-	-	-	-	-	-	-	A/2

**Unsignalized - LOS/Delay based on HCS Analysis*

- Not applicable

Table 6.11
2045 No Build Design Hour Intersection LOS/Delay (s/veh)

Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	E/116	-	**F/150**	-	**F/122**	A/1	-	B/15	A/0	**E/73**
Polk Parkway Eastbound Ramps	D/49	-	**F/186**	-	-	-	-	F/160	A/1	-	E/76	A/7	**F/123**
S.R. 540													
Landfill Road/Polk Parkway West Ramps	D/38	**F/162**	-	**F/121**	**F/123**	-	E/65	E/66	C/33	E/57	D/54	-	**F/115**
Polk Parkway Ramps*	D/33	-	-	-	-	-	-	-	-	**F/>999**	-	E/46	**F/>999**
Thornhill Road	**F/251**	**F/112**	A/4	C/23	**F/183**	A/3	**F/333**	E/58	-	D/46	**F/296**	-	**F/159**
U.S. 92													
Polk Parkway Westbound Ramps	**F/126**	A/9	-	-	B/10	A/2	-	-	-	E/56	-	**F/89**	B/15
Polk Parkway Eastbound Ramps	**F/205**	A/4	-	-	D/55	A/1	-	-	-	**F/216**	-	D/49	**E/58**
U.S. 17													
Ernest Smith Boulevard	**F/107**	-	B/13	-	-	-	E/160	A/9	-	-	**F/85**	A/2	**E/60**
91 Mine Road*	D/28	-	-	C/21	-	-	-	-	-	-	**F/>999**	-	**F/>999**
Spirit Lake Road	**F/160**	E/56	**F/130**	E/59	D/53	A/1	**F/140**	B/14	A/2	E/60	E/66	A/5	**E/61**
S.R. 60													
91 Mine Road/Connersville Road*	B/15	-	-	B/11	-	-	-	**F/813**	-	-	-	-	**F/813**
PM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	**F/93**	-	E/70	-	B/11	A/1	-	C/22	B/15	B/20
Polk Parkway Eastbound Ramps	D/43	-	**F/199**	-	-	-	-	E/68	C/24	-	**F/171**	B/10	**F/113**
S.R. 540													
Landfill Road/Polk Parkway West Ramps	C/34	**F/237**	-	**F/195**	E/68	-	E/64	E/61	E/78	E/62	D/40	-	**F/147**
Polk Parkway Ramps*	D/31	-	-	-	-	-	-	-	-	**F/>999**	-	C/24	**F/>999**
Thornhill Road	**F/333**	**F/119**	A/6	C/26	**F/180**	A/4	**F/344**	**F/94**	-	E/77	**F/311**	-	**F/160**
U.S. 92													
Polk Parkway Westbound Ramps	D/35	B/14	-	-	A/6	A/1	-	-	-	E/59	-	E/61	B/12
Polk Parkway Eastbound Ramps	**F/454**	A/8	-	-	B/20	A/1	-	-	-	**F/352**	-	D/44	**E/72**
U.S. 17													
Ernest Smith Boulevard	E/75	-	B/12	-	-	-	**F/86**	C/27	-	D/39	-	A/3	D/34
91 Mine Road*	C/20	-	-	**F/211**	-	-	-	-	-	-	**F/>999**	-	**F/>999**
Spirit Lake Road	**F/210**	D/46	C/25	D/52	D/48	A/1	**F/155**	C/35	A/0	D/54	**F/110**	A/7	**E/74**
S.R. 60													
91 Mine Road/Connersville Road*	B/14	-	-	C/16	-	-	-	**F/>999**	-	-	-	-	**F/>999**

**Unsignalized - LOS/Delay based on HCS Analysis*

- Not applicable

Table 6.12
2045 Build Design Hour Intersection LOS/Delay (s/veh)

Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	**F/84**	-	**F/94**	-	D/53	A/0	-	A/9	A/0	C/34
Polk Parkway Eastbound Ramps	D/38	-	E/80	-	-	-	-	D/46	A/0	-	E/61	A/5	D/52
S.R. 540													
Landfill Road/Polk Parkway West Ramps	D/39	**F/172**	-	**F/153**	**F/108**	-	E/65	E/66	D/41	E/57	D/54	-	**F/118**
Central Polk Parkway Eastbound Ramps	-	B/14	A/0	D/35	B/17	-	-	-	-	D/52	-	A/0	B/18
Central Polk Parkway Westbound Ramps	C/32	B/10	-	-	B/15	A/0	D/45	-	B/17	-	-	-	B/13
Thornhill Road	**F/231**	E/56	A/6	D/55	**F/170**	A/4	**F/254**	E/69	-	D/50	**F/236**	-	**F/127**
U.S. 92													
Polk Parkway Westbound Ramps	C/25	A/8	-	-	A/3	A/4	-	-	-	E/69	-	E/55	A/9
Polk Parkway Eastbound Ramps	**C/32**	A/8	-	-	**F/160**	A/2	-	-	-	**F/198**	-	B/17	**F/108**
U.S. 17													
Ernest Smith Boulevard	**F/214**	-	B/15	-	-	-	**F/280**	A/9	-	-	**F/249**	A/2	**F/160**
Central Polk Parkway Eastbound Ramps	**F/86**	-	A/2	-	-	-	-	B/16	A/0	E/73	B/20	-	B/20
Central Polk Parkway Westbound Ramps	-	-	-	E/72	-	A/0	**F/104**	A/2	-	-	C/32	A/4	C/32
91 Mine Road*	E/37	-	-	C/19	-	-	-	-	-	-	**F/>999**	-	**F/>999**
Spirit Lake Road	**F/136**	D/54	**F/133**	E/56	D/52	A/1	**F/162**	B/14	A/2	E/60	**F/133**	A/6	**F/92**
S.R. 60													
Central Polk Parkway Ramps	D/49	B/16	-	B/18	C/34	A/1	-	-	-	D/54	-	B/15	C/27
91 Mine Road/Connersville Road	B/10	A/6	A/0	A/8	B/20	A/2	-	-	A/1	-	-	A/0	B/12
U-Turn	C/30	A/0	-	-	A/9	-	-	-	-	-	-	-	A/6
PM													
U.S. 98													
Polk Parkway Westbound Ramps	-	-	-	**F/85**	-	E/69	-	A/6	A/2	-	B/11	A/9	B/12
Polk Parkway Eastbound Ramps	D/44	-	**F/147**	-	-	-	-	C/24	B/13	-	**F/117**	A/7	**E/76**
S.R. 540													
Landfill Road/Polk Parkway West Ramps	C/34	**F/245**	-	**F/230**	E/60	-	E/65	E/61	**F/101**	E/62	D/40	-	**F/157**
Central Polk Parkway Eastbound Ramps	-	B/18	A/0	C/34	B/18	-	-	-	-	D/53	-	A/0	B/20
Central Polk Parkway Westbound Ramps	B/20	B/19	-	-	B/12	A/0	E/62	-	C/28	-	-	-	B/16
Thornhill Road	**F/270**	**F/102**	A/5	E/67	**F/164**	A/4	**F/255**	**F/82**	-	E/66	**F/232**	-	**F/134**
U.S. 92													
Polk Parkway Westbound Ramps	B/19	B/12	-	-	A/2	A/1	-	-	-	E/67	-	C/32	A/9
Polk Parkway Eastbound Ramps	**D/48**	B/20	-	-	F/148	A/2	-	-	-	**F/181**	-	B/12	**F/96**
U.S. 17													
Ernest Smith Boulevard	**F/150**	-	B/15	-	-	-	**F/197**	E/79	-	-	**F/110**	A/2	**F/92**
Central Polk Parkway Eastbound Ramps	E/75	-	A/1	-	-	-	-	C/22	A/0	E/77	E/61	-	C/35
Central Polk Parkway Westbound Ramps	-	-	-	E/60	-	A/0	**F/82**	B/19	-	-	E/60	A/6	D/43
91 Mine Road*	D/26	-	-	**F/117**	-	-	-	-	-	-	**F/>999**	-	**F/>999**
Spirit Lake Road	**F/241**	D/47	B/14	D/54	D/49	A/1	**F/192**	C/25	A/0	D/54	**F/163**	A/10	**F/96**
S.R. 60													
Central Polk Parkway Ramps	D/52	C/25	-	D/39	C/23	A/4	-	-	-	D/54	-	A/10	C/26
91 Mine Road/Connersville Road	A/8	A/3	A/0	A/3	B/10	A/1	-	-	A/5	-	-	A/0	A/6
U-Turn	C/22	A/1	-	-	A/7	-	-	-	-	-	-	-	A/4

**Unsignalized - LOS/Delay based on HCS Analysis*

- Not applicable

Even though this PTAR documents the operations of the entire CPP project from Polk Parkway to S.R. 60 with a full interchange at U.S. 17, traffic operations were also evaluated for the initial project (FPN: 440897-2) which terminates CPP as a partial interchange at U.S. 17 with ramps to/from the west. The results are summarized in **Table 6.13**. The analysis showed that all the movements at the two ramp terminal intersections are expected to operate acceptably in the 2025 opening year. However, some movements would operate at an unacceptable LOS E or F in the 2045 design year. This is mainly due to lack of capacity along U.S. 17, the analysis showed that three through lanes per direction will be required along U.S. 17 beyond year 2035.

Table 6.13
Central Polk Parkway and U.S. 17 Partial Interchange LOS/Delay (s/veh)

Intersection	Eastbound			Northbound			Southbound			Overall
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2025										
AM										
Central Polk Parkway Southbound Off-ramp	D/36	-	A/1	-	A/6	-	-	A/2	-	A/5
Central Polk Parkway Northbound On-ramp	-	-	-	D/39	A/0	-	-	C/23	A/7	B/18
PM										
Central Polk Parkway Southbound Off-ramp	D/36	-	A/1	-	A/7	-	-	A/7	-	A/7
Central Polk Parkway Northbound On-ramp	-	-	-	C/31	A/1	-	-	C/25	B/11	B/16
2045										
AM										
Central Polk Parkway Southbound Off-ramp	E/74	-	A/4	-	A/7	-	-	B/10	-	B/11
Central Polk Parkway Northbound On-ramp	-	-	-	**F/127**	A/1	-	-	E/79	B/11	E/60
PM										
Central Polk Parkway Southbound Off-ramp	E/75	-	A/2	-	B/10	-	-	A/7	-	B/10
Central Polk Parkway Northbound On-ramp	-	-	-	**F/111**	A/3	-	-	E/64	B/18	D/46

- Not applicable

A summary of the cumulative delay for the intersections is presented in **Figure 6.2**. Results indicate that the Build alternative will have a 47 and 50 percent reduction in total intersection control delay within the AOI in the 2045 design year AM and PM peak hour, respectively, when compared to the No Build. This major reduction in delay will reduce congestion within the AOI and improve traffic operations.

Figure 6.2
Cumulative Intersection Control Delay (secs)

The FTE evaluated the potential to add a new limited access tolled facility from Polk Parkway to S.R. 60 in Polk County, Florida. The project will include modification of the existing partial interchange at Polk Parkway and S.R. 540 ramps to and from the east. A system to system interchange at the western terminus of the CPP and Polk Parkway will be added as well as a diamond interchange at S.R. 540. The CPP will also include a diamond interchange at U.S. 17 and terminate at S.R. 60 as a T intersection. This PTAR is prepared for the entire CPP project from Polk Parkway to S.R. 60.

The analysis showed that the Polk Parkway mainline operated acceptably in the 2018 existing conditions and the interchange ramps within the study limits had adequate capacity. Signalized intersections operated at acceptable levels but unsignalized intersections operated at unacceptable levels. The cross-street movements at unsignalized intersections experienced protracted delays due to lack of gaps along the major streets. Lane geometry also plays a part since most of the cross-streets do not have exclusive turn lanes.

Crash data analysis for the most recent five years (2012 – 2016) showed that 44 percent of the crashes occurred at intersections, whereas 34 percent occurred on the freeway and ramps and the remaining 22 percent occurred at arterial mid-block locations. Most of the crashes resulted in property damage only and injury. Two fatalities were reported in the five-year study period; one occurred at night in dark lighted conditions and the other during the day. The analysis showed that there is currently no safety deficiency within the AOI.

The CPP project study evaluated various Build alternatives. The Preferred Build interchange configuration selected reduced bridge and ramp lengths compared to the other alternatives, while allowing all ramps to be designed with a speed of 50 mph. It also minimized right of way and wetland impacts, conflict points and delay. This PTAR only documents traffic analysis for the No Build and the Preferred Build (referred to Build herein) alternatives. The No Build assumed that existing lane geometry will remain the same in the future, since there are no programmed improvements within the AOI. The Build included the CPP facility and the preferred alternatives on Polk Parkway, U.S. 17 and S.R. 60 interchanges with the CPP.

Future lane requirement analysis shows that additional capacity will be required along Polk Parkway for No Build conditions. The section west of U.S. 98 will require three lanes of travel in each direction by year 2038. The section from U.S. 98 to S.R. 540 will also require three lanes by the 2045 design year. The U.S. 98 ramps to and from the west will require two lanes by the 2045 design year. For the Build conditions, additional Polk Parkway mainline capacity will be required west of S.R. 540 a few years sooner than No Build since trips will be diverted and attracted to the proposed CPP facility. The U.S. 98 ramps to and from the west will not require any additional lane capacity due to traffic diversion. The proposed two lanes per direction for the CPP mainline and single lane ramps will be adequate through the 2045 design year.

It is anticipated that most of the S.R. 540 intersections and the unsignalized intersections within the study limits will be over capacity by the 2025 opening year under No Build conditions. The operations are expected to degrade by the 2045 design year under No Build condition with most of the

intersections within the AOI operating at unacceptable LOS E or worse. However, operations are expected to be improved with the construction of the CPP facility and signalization of intersections. It is estimated that cumulative intersection control delay within the AOI will reduce by 47 and 50 percent in 2045 AM and PM peak hours, respectively. The CPP facility is anticipated to relieve congestion by distributing traffic, thereby improving operations on S.R. 540 and U.S. 98. Modification of S.R. 60 is also proposed to create an RCUT configuration at the intersections with the CPP and 91 Mine Road. This will enhance safety between the two closely spaced intersections and increase throughput. Overall, the CPP is anticipated to relieve congestion by distributing traffic, thereby improving operations on Polk Parkway, S.R. 540, U.S. 98, U.S. 17 and S.R. 60.

APPENDICES

PROVIDED ELECTRONICALLY