

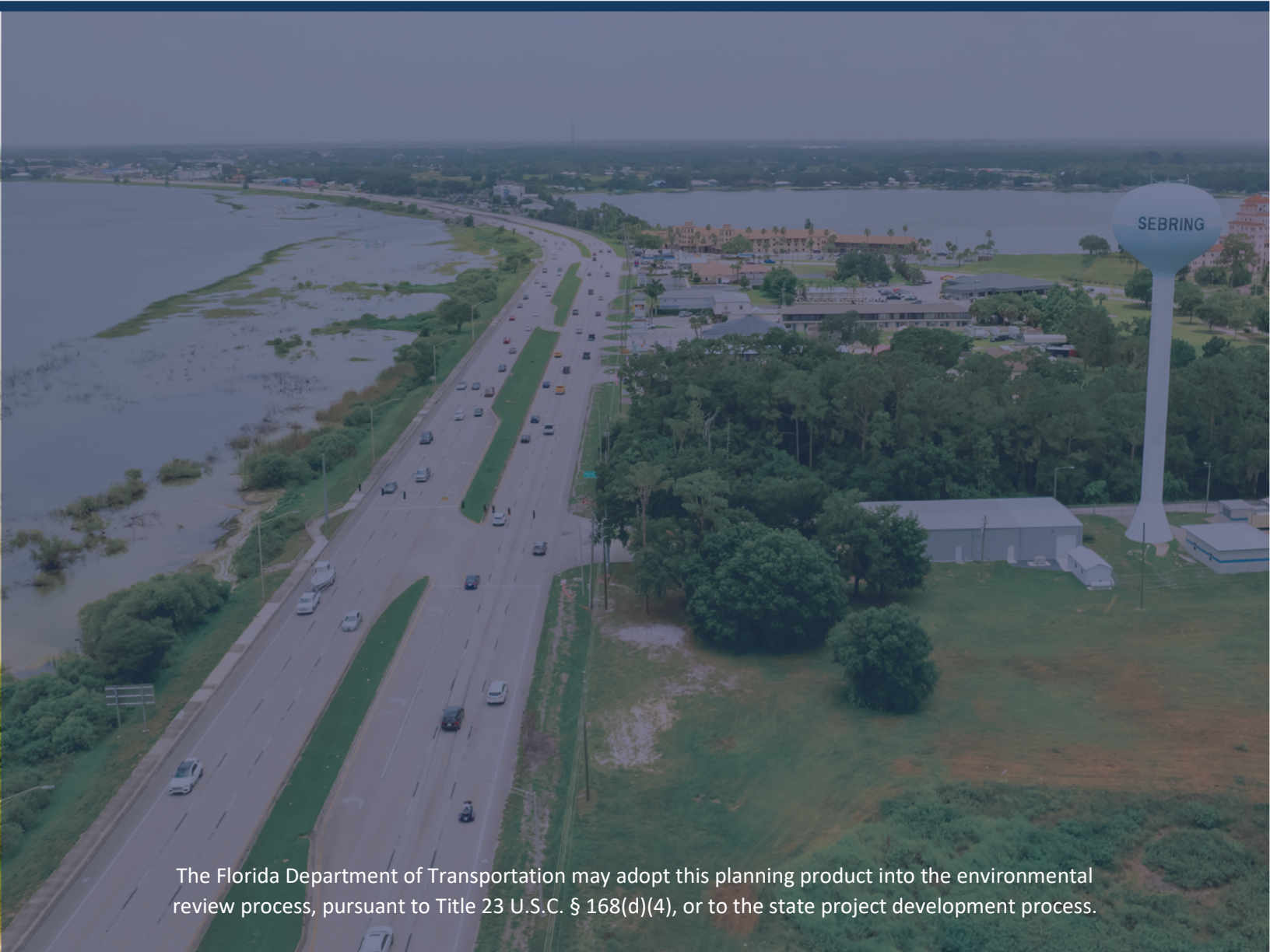


DISTRICT ONE

Highlands County

FEASIBILITY STUDY

FPID: 449503-1



The Florida Department of Transportation may adopt this planning product into the environmental review process, pursuant to Title 23 U.S.C. § 168(d)(4), or to the state project development process.

OCTOBER 2024

Executive Summary

The purpose of this Highlands County Feasibility Study is to evaluate the US 27 corridor from CR 17 to SR 17 in Highlands County in terms of regional safety, mobility, and accessibility needs to support the communities' quality of life, regional and local economies, and to minimizing impacts to the environment. The observations of the assessment include:

Existing Conditions

- **Safety:** Crashes are concentrated near Sebring and Avon Park, with multiple segments of the corridor exceeding the statewide crash rate. Between the years 2019 and 2023, there was a total of 2,782 crashes with an estimated economic loss of \$903 million. A total of 22 of those involved a pedestrian, and 21 involved a bicyclist. Five-year crash data shows that nearly 50% of pedestrian crashes resulted in fatality along US 27. The lack of continuous bicycle/pedestrian infrastructure along the corridor could be a contributing factor to the increase in the bicycle crashes over the years.
- **Freight:** US 27 is an FDOT priority freight investment corridor primarily serving the agriculture industry. Segments of the corridor experience high truck percentages (over 40%) and truck parking facilities operate beyond capacity. The northern and southern portions of the study corridor feature high truck percentages between 20%-43%. Daily truck volumes at US 27 and SR 66 are approximately around 4,200. The urbanized areas of the county experience daily truck volume between 2,800 and 3,400.
- **Evacuation/Vulnerability:** US 27 is a primary north-south evacuation route and recently served as an alternative to I-75 and I-95 due to interstate closures following Hurricane Ian. During the widespread evacuations during Hurricane Irma (2017), travel times were four times longer than normal on portions of US 27. Alternative north-south routes in the vicinity are limited and if US 27 is obstructed, the next best available route adds an estimated hour to the travel time. This lack of options for detours makes US 27 and the entire Southwest Florida transportation network vulnerable to emergency events.
- **Transportation Demand:** The Annual Average Daily Traffic (AADT) for the corridor ranges from 9,400 to 44,000 vehicles per day. The highest AADTs are around the Lakeview Dr/Sebring area.
- **Land Use:** The study region includes rural and urbanized areas with land uses primarily being classified as for agricultural uses or as wetlands. Twelve percent of the County's land use is considered urbanized, with half of those lands classified as for residential use.
- **Roadway Characteristics:** Posted speed limits along US 27 range from 45 miles per hour (mph) to 65 mph. Dedicated through lanes range from four- to six-lanes and the context classification varies. Existing right-of-way width ranges from 100-feet to 300-feet.
- **Structures:** Eight bridges exist along US 27 ranging between 20 to 79 years old (average age 48). The oldest bridges, Bridge No. 090003 over Josephine Creek and Bridge No. 050047 over County Line Creek, may require replacement as indicated by the low Health Index and Inventory Rating.
- **Natural Environment:** The study region potentially contains 25 federally listed species, state-listed protected species, and managed (non-listed) species. Approximately 20% of the area surrounding US 27 is comprised of wetlands.
- **Physical Environment:** Several land use areas are potentially susceptible to traffic noise impacts. Noise sensitive receptors may include residential areas, businesses, and recreational areas. Air

quality is designated as being in attainment for criteria air pollutants. Around 16,700 contamination sites have been identified within the study region.

- **Cultural Environment:** The study region contains 267 archaeological or historic sites and 24 sites registered in the National Register of Historic Places (NRHP).
- **Socioeconomics:** The communities adjacent to US 27 are predominantly white, non-Hispanic, older adults (65+), whose household income and educational attainment are lower than the state averages. Approximately 95% of households have access to a vehicle, indicating auto travel is the main transportation mode in the study region.

Future No-Build Conditions (2045)

- **Future Transportation Demand:** With AADT close to 63,000, US 27 is anticipated to be at or near capacity by 2045. The busiest sections of US 27 in Highlands County are within the cities of Sebring and Avon Park.
- **Future Land Use:** The Heartland region is expected to experience population and development growth as rural lands are urbanized and agricultural lands are shifted to residential and commercial developments. Over the next 10-years, it is anticipated there will also be an influx of jobs from the Sebring Airport expansion and Airglades Aviation development near the US 27 corridor. Increased residential uses along the US 27 corridor are expected to increase pedestrian, bicycle, and automobile traffic. Based on the review of existing crash types, conflicts between vehicles and bicyclist/pedestrians are anticipated to increase if transportation and safety improvements are not made along US 27.
- **Freight:** Freight activity is expected to shift from agriculture to distribution and trade. Truck traffic is expected to increase due to overall growth in the regional economy.

Future Build Scenarios (2045)

- With the AADT close to 71,500 near the Highlands/Polk County Line and more than 55,000 within the Sebring area, a general-purpose lane widening alternative along US 27 may not be the best solution considering the induced demand contributing to further capacity constraints and potential crash increases.
- Based on the Crash Reduction Factors (CRF) applied by FDOT, improvements in the general-purpose lane widening alternative decreases the total crashes by 13%. However, the general-purpose lane widening improvement increases sideswipe, fixed-object, wrong-way, and pedestrian crashes.
- Capacity improvements consisting of six/eight-lane widening typical sections were evaluated for segments where the Level of Service (LOS) was not within the acceptable range. The widening alternative have the potential to impact up to 304 parcels.
- Planning-level cost estimates for the capacity improvements are approximately \$120 million.

Recommendations

This feasibility study concluded that further analysis is warranted to assess opportunities for improvements along the US 27 corridor as well as adjacent communities to support mobility options, minimize ROW impacts, enhance freight movement, ensure efficient emergency evacuation through the region, and safe mobility for all users. Based on the needs outlined in this report, several actions are recommended. The recommendations consist of:

- A Mobility Analysis with more detailed analysis focused on a larger section of US 27
- A Project Development and Environment (PD&E) study to connect SR 70 and SR 66
- A PD&E study to connect SR 66 to US 98

A Mobility Analysis is recommended to ensure the US 27 corridor adequately accommodates the evolving transportation demands of the Heartland region. The District One Regional Planning Model's (D1RPM) estimated population growth for District 1 is 54% and employment growth is 62%. Highlands County is expected to have population growth of 54% and a 37% growth in employment. Expanding the analysis area to include Polk County will capture the regional impacts of land use and planned developments, freight growth, and new strategic network connections, including improvements on SR 60 and the Central Polk Parkway at the north end and SR 70 at the south end respectively. This approach will continue to evaluate opportunities for improvements along the existing US 27 corridor and the adjacent communities to support meeting the stated purpose. A Speed Harmonization Study could be incorporated into the Mobility Analysis to further improve safety along the corridor.

A PD&E study is recommended between SR 70 and SR 66 due to several critical factors, including:

- **Network Resiliency:** Recent detour analyses revealed the vulnerability of Southwest Florida's transportation network with significant detour lengths if portions of SR 70, SR 66 or US 27 are closed. The PD&E study will explore ways to improve network resilience.
- **Emergency Evacuation:** During natural disasters or disruptive events, the regional network has been stressed and analysis shows delays at critical chokepoints. The PD&E study will explore ways to ensure smoother emergency evacuation and faster recovery.
- **Freight Mobility and Safety:** Detailed freight analysis will help determine the origin and destination points for truck traffic within the Heartland region. Additionally, this study will explore the identification and prioritization of truck routes. Notably, the segment of US 27 experiences a significant presence of truck traffic of nearly 30%. Fourteen out of 56 serious injury crashes and six out of 21 fatal crashes involved trucks. The portions of this study segment displayed 5-year average total crash rate twice the statewide and districtwide average crash rate.

A PD&E study is recommended between SR 66 and US 98 due to several critical factors, including:

- **Land Use Changes:** Urbanization and changes in land uses (from agricultural to commercial and residential) around Sebring and in Polk County further supports the need to accommodate both regional and local traffic.
- **Traffic Congestion:** The PD&E will explore options to improve future traffic congestion and forecasting. This segment of US 27 has the highest traffic growth in the Highlands County. By the year 2045, segments of US 27 between SR 66 and US 98 will not meet the capacity needs of the corridor even with a capacity expansion alternative.

- **Safety Concerns:** This section of US 27 from SR 66 to US 98 displays a high fatal crash rate that exceeds the statewide average. The total fatal crash rate is more than twice the state/national average (0.5%). Additionally, the fatal crash rate for pedestrians is over 30% which exceeds the statewide rate of 8%.
- **Freight mobility and Safety:** This section of US 27 is expected to continue to experience increased freight traffic from the Central Florida Intermodal Logistic Center and other intermodal hubs along the corridor. Prioritizing truck movements and identifying truck routes are important for the economic growth of the Heartland region. Over 20% of total fatal crashes within the study area involved trucks, therefore, a potential need for an alternative route might be needed to enhance safety.
- **Network resiliency:** Recent detour analyses revealed the vulnerability of Southwest Florida's transportation network with significant detour lengths if portions of SR 70, SR 66 or US 27 are closed. The PD&E study will explore ways to improve network resilience.

Conclusion

Considerations for future US 27 improvements include:

- Increased bicycle/pedestrian crashes as well as the shifting of agriculture land uses to residential development along US 27 indicate a change in the character of the corridor.
- The US 27 corridor is the major freight route through the Heartland despite surrounding land use changes. With heavy freight traffic and the community's desire to be more bicycle and pedestrian friendly, appropriate improvements will need to be made along the corridor.
- Large storm events in recent years have required US 27 to be used as a detour or emergency evacuation route. Resiliency must be considered for future improvements to the US 27 corridor and any alternative corridors to maintain a viable evacuation route for the Heartland.

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Appendix A: Traffic Technical Memo

1. Introduction

1.1. Study Overview

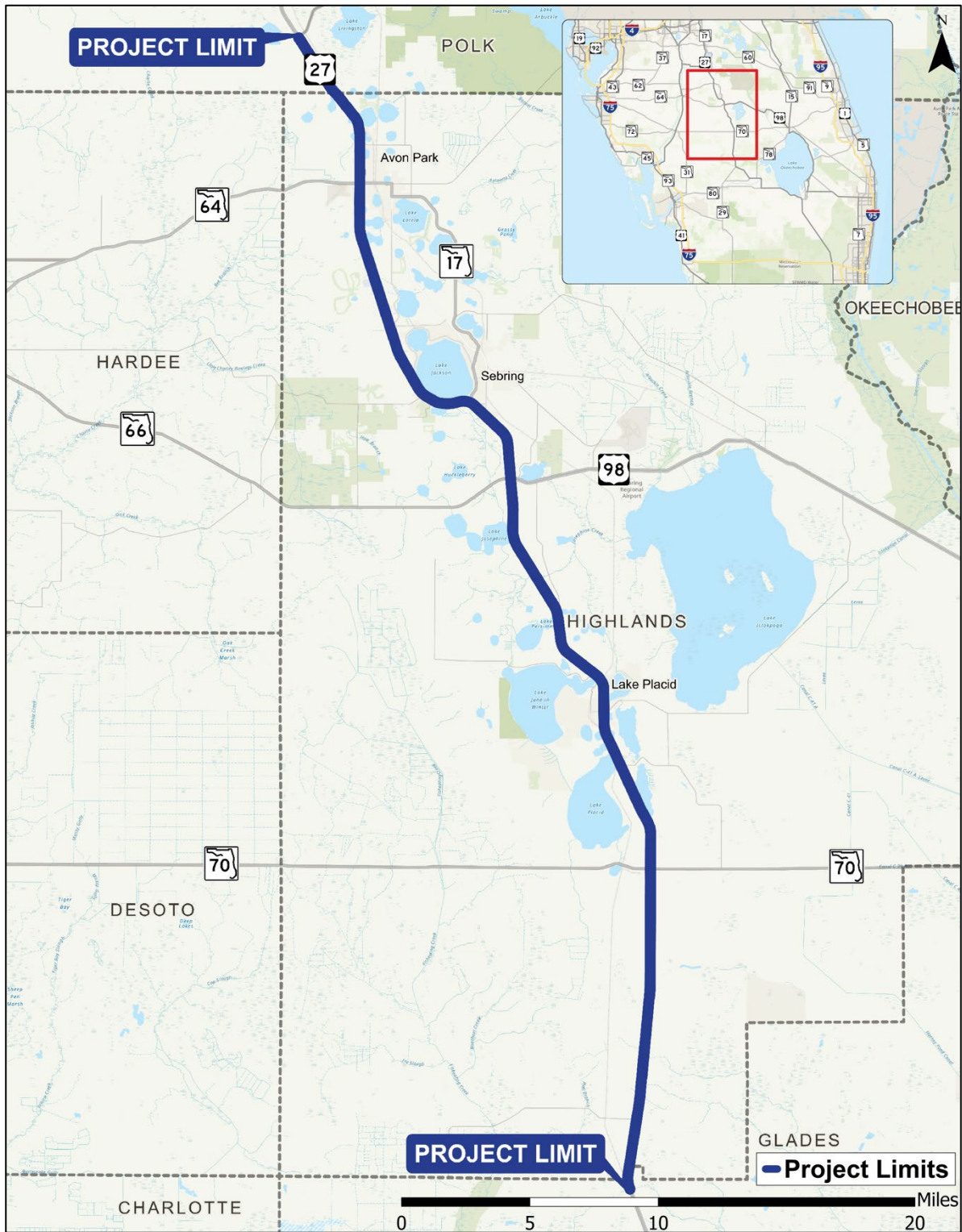
The purpose of this Feasibility Study (Study) is to evaluate the existing US 27 corridor from CR 17 to SR 17 in Highlands County to identify regional safety, mobility and accessibility needs that support the surrounding economy and quality of life for adjacent communities. The Study was conducted as a high-level analysis to identify constraints for capacity improvements to the US 27 corridor. The need for this study originates from District One's identification of US 27 as a priority investment corridor. This high-level planning study reflects the visions and goals outlined in the Florida Transportation Plan and the Florida Department of Transportation Project Development Process.

US 27 is the main north-south roadway through Highlands County connecting the Heartland Region to South and Central Florida. Running as a four to six-lane principal arterial divided highway, the posted speed limit ranges from 45 mph to 65 mph. Bicycle and pedestrian infrastructure is limited to the urban areas of Avon Park and Sebring. Segments of US 27 around the Highlands/Polk County Line, Avon Park, Sebring and south of SR 66 are anticipated to be at or near capacity by 2045 making the quality of transportation service also unacceptable by FDOT level of service (LOS) targets for the State Highway System (SHS). A roadway analysis using field collected data is needed for portions of US 27, including an analysis of potential parallel facilities or alternative routes which will add motorized and non-motorized capacity, improve safety, and optimize freight operations to support the regional economy and preserve the quality of life for communities along the corridor.

1.2. Project Location

The study corridor represents approximately 50 miles of US 27 through Highlands County, Florida. The limits extend from CR 17 at the southern end to SR 17 at the northern end and include the communities of Lake Placid, Sebring, and Avon Park. **Figure 1** displays the US 27 study corridor and the surrounding region.

Figure 1: US 27 Study Corridor



1.3. Previous Studies and Planned Improvements

FDOT has prioritized the US 27 corridor for improvements to support the emerging growth of the Heartland region, emergency evacuation for the state and the movement of freight and goods. North of the study corridor (Polk County), US 27 is proposed to be widened from four to six lanes extending from the Highlands/Polk County Line north to CR 630A (FPID 419243-2). North of that, the Central Polk Parkway (CPP) East and the Poinciana Parkway Extension will provide a direct connection from Highlands County to I-4 southwest of Orlando. On January 30, 2023, the Poinciana Parkway Extension was announced as one of the twenty priority infrastructure investments under the Governor's Moving Florida Forward initiative. Improvements to SR 70 are planned along with improvements along US 98 north of SR 70.

The FDOT Five-Year Work Program, FDOT Strategic Intermodal Systems (SIS) funding plans and the Heartland Regional Transportation Planning Organization (HRTPO) Long Range Transportation Plan (LRTP) and fiscally constrained Transportation Improvement Program (TIP) were reviewed to identify planned and programmed projects on the US 27 corridor. No vehicular capacity improvements are programmed within the study limits; however, the corridor is partially funded to undergo a Project Development and Environment (PD&E) study for future widening south of Skipper Road to the Highlands/Glades County Line.

FDOT studies including the Northeast Polk US 27 Mobility Study Existing Conditions Report, US 27 Mobility Study, the District One Freight Mobility and Trade Plan and The District One Arterial Rural Highways Study indicate the changing context of the US 27 corridor and the need to add transportation options to support population growth and an increase in transportation demand. The need to accommodate safety, mobility and growing freight activity is also an FDOT priority for US 27 in Highlands County.

The HRTPO planning documents were reviewed to understand the regional community vision for the US 27 corridor. HRTPO studies emphasize a more context sensitive vision in the urban communities with a focus on complete streets, walkability and access to pedestrian and transit infrastructure. The TPO's Bicycle Pedestrian Safety Plan prioritized US 27 for safety improvements, as sections of the corridor have the higher average bicycle and pedestrian crashes compared to other state roadways within the county. The Study recommends improvements to the sidewalk network and filling sidewalk gaps within the urbanized areas of Avon Park and Sebring. Heartland's Transit Development Plan, adopted in 2017 by the HRTPO, provides a vision for the planning, development, and implementation of transit services on US 27 between Avon Park and Sebring.

The following municipal comprehensive plans and regional planning initiatives were reviewed to ensure consistency with local government plans. No physical or policy constraints were found that inhibit multimodal transportation improvements to the US 27 corridor or adjacent routes.

- Highlands County 2030 Comprehensive Plan
- Desoto County 2040 Comprehensive Plan
- Hardee County 2030 Comprehensive Plan
- Polk County Comprehensive Plan
- Polk TPO Momentum 2045 (2045 LRTP)
- Heartland Regional TPO 2045 LRTP
- Heartland 2060 – Central Florida Regional Planning Council
- City of Sebring Comprehensive Plan

- City of Avon Park Comprehensive Plan
- Town of Lake Placid 2030 Comprehensive Plan

2. Existing Conditions (2023)

Traffic data, safety data, roadway conditions and the social and environmental context were assessed to understand the existing conditions within the US 27 corridor and adjacent communities.

2.1. Transportation Demand

US 27 through Highlands County runs as a four-lane divided and six-lane divided roadway with functional classifications of principal rural arterial and principal urban arterial within the study corridor. These existing characteristics are summarized in **Figure 2**. Note the functional classification switches between principal rural arterial and principal urban arterial as the corridor traverses the urbanized areas of Lake Placid, Sebring and Avon Park.

Existing traffic volumes were analyzed for the study corridor using available data from the 2023 Florida Traffic Online (FTO). As summarized in **Figure 3**, the Average Annual Daily Traffic (AADT) ranges from 9,400 to 44,000 vehicles per day (vpd) along the study corridor. The existing level of service (LOS) is LOS C, which is higher than the acceptable FDOT target of LOS D on the State Highway System in urbanized areas for peak travel hours. The highest AADTs are observed along US 27 around the Lakeview Drive/Sebring communities. **Figure 3** also includes the truck percentages which range from 7% to 40%, with the highest truck percentages observed north of SR 70. Per Florida Traffic Online (2023), the northern and southern portions of the study corridor feature truck percentages between 20%-43%, with daily truck volumes 4,200 south of SR 66. Urbanized areas of the study corridor experience daily truck volumes between 2,800 and 3,400.

Subarea Analysis

The FDOT District One Regional Planning Model (D1RPM v2.0) 2015 base year data and highway network in the subarea region was updated and validated to define existing transportation demand. The subarea analysis for model calibration includes a larger area of influence surrounding the US 27 study corridor including the existing parallel facilities of US 17, Sebring Parkway/Panther Parkway, SR 17 and CR 671, and connecting facilities of SR 70, SR 66, SR 64, US 98 and SR 60. The subarea region of the model produces a broader traffic analysis of existing facilities in Highlands County and evaluates the impacts of adjacent roadways in the future year analysis.

The purpose of the subarea validation for the base year was to reduce the discrepancy between the Base Year 2015 estimates on socioeconomic data and Base Year field network loading and the D1RPM 2015 base model for Highlands County. The employment data was adjusted, and the validation statistics provided Root Mean Square Error (RMSE) values within the allowable range, while simultaneously incorporating the difference in the socioeconomic data. The modification of employment data to match Bureau of Economic Analysis (BEA) totals resulted in the reduction of the volume to capacity (V/C) ratio from the default model. Since the deviation is seen more in the traffic analysis zones (TAZs) closer to Highlands/Polk County Line and Highlands/Glades County Line, a validation procedure involving adjacent counties is further needed to evaluate the regional traffic accessing US 27. The validated model along with National Cooperative Highway Research Program (NCHRP) smoothing method will be utilized for the 2045 forecasting, which will further reduce the discrepancy while minimizing the differences in the socioeconomic data. The subarea analysis is detailed in the Traffic Technical Memo in **Appendix A**.

Figure 2: US 27 Number of Lanes and Functional Classification

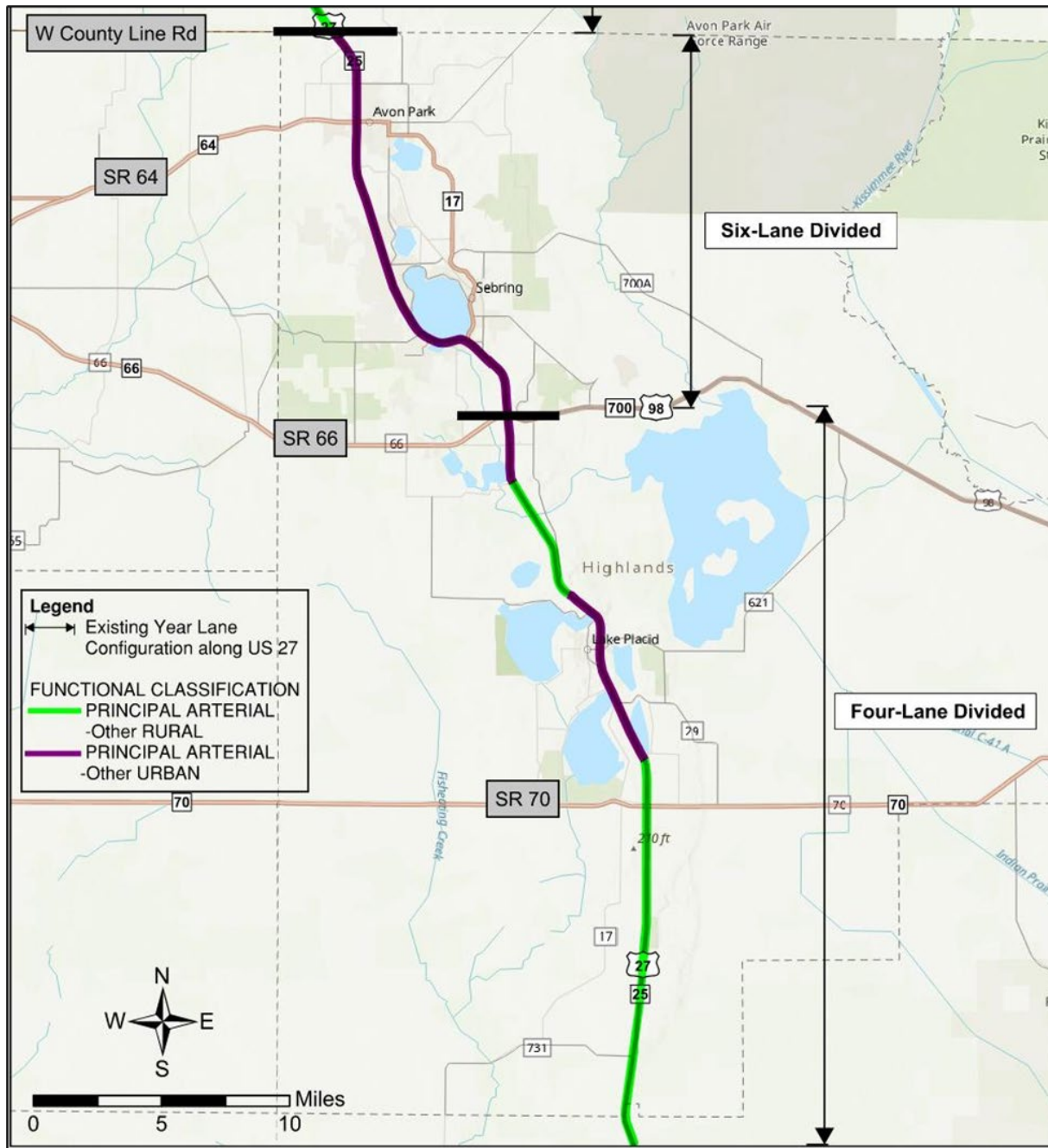
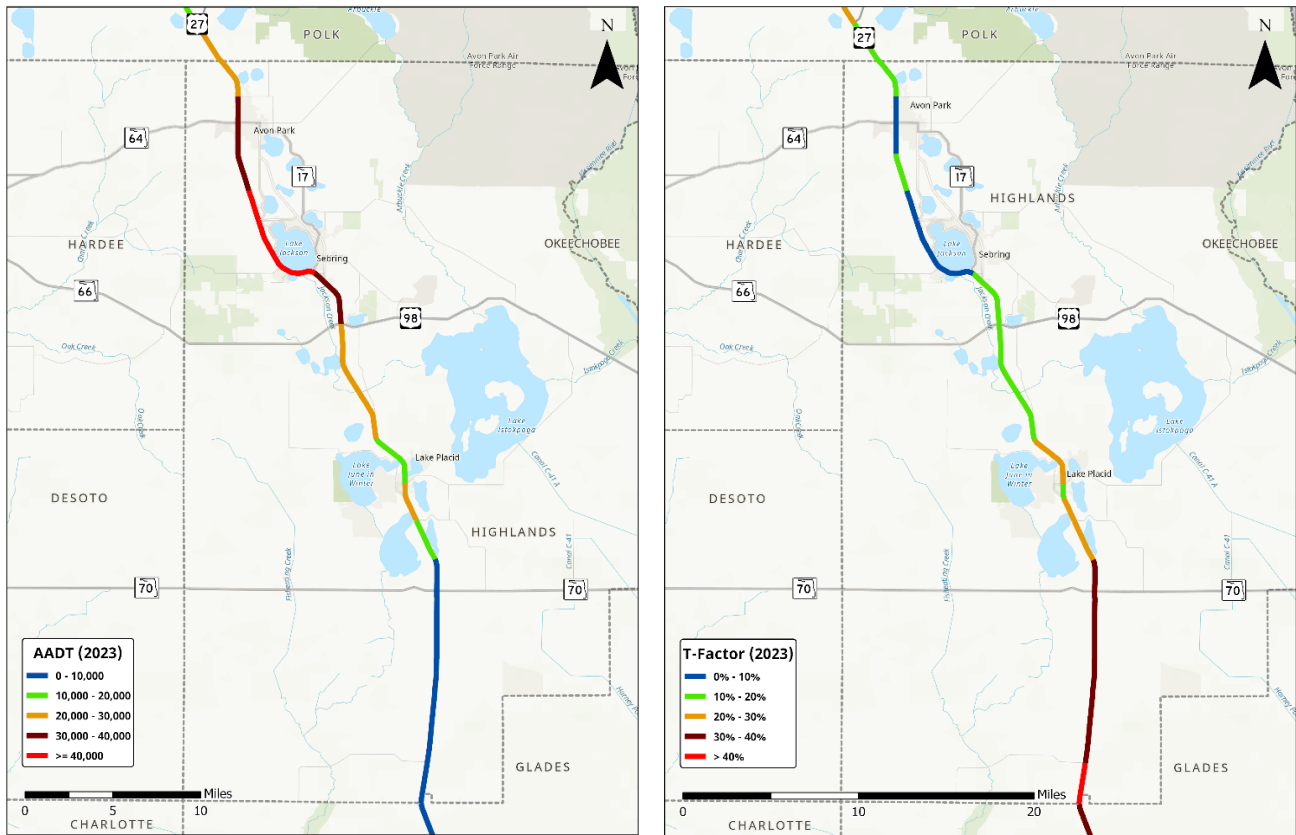


Figure 3: Existing 2023 AADT and Daily Truck Factor



Source: 2023 Florida Traffic Online

2.2. Safety

Based on 2019 to 2023 data from the University of Florida’s Signal Four Analytics database, a high-level analysis of safety conditions documented a high crash rate on segments of the US 27 corridor. Multiple portions in the northern and southern limits exceeded the statewide crash rate of 0.75 and district-wide average crash rate 0.70 (0.83 and 2.48 respectively). Crash density was the heaviest around Sebring, with the US 27 and Sebring Parkway intersection having the highest number of crashes (128 total). Intersection crashes occurred mostly in the Sebring area of the study corridor between Sun Lake Blvd to Golfview Rd, where intersections are heavily concentrated.

Figure 4 shows the crash summary for the study corridor. During the five-year analysis period, there was a total of 2,782 crashes along US 27 in Highlands County resulting in 57 fatalities and 145 resulted in serious injury crashes. There were 22 pedestrian crashes, ten of which were fatal. There were and 21 bicycle crashes, of which three were fatal. Pedestrian and bicycle crashes increased over the years. Pedestrian crashes were spread throughout the study corridor with the majority of fatal pedestrian crashes occurring around Avon Park, and bicycle crashes concentrated within the Avon Park and Sebring communities. There was a noticeable jump in fatalities from 2020 (8) to 2021 (15). Out of the 17 fatal crashes in the year 2019, four were pedestrian crashes, which is 25% of the fatal crashes compared to the state average of 7% and county-wide average of 10% (total pedestrian fatal crash percent in the study area for 5 analysis years is ~30%).

Figure 5 represents a summary of truck crashes and their locations along the US 27 study corridor. Out of 2,782 total crashes, there were 342 truck related crashes, of which, 15 resulted in a fatality and 22 resulted in a serious injury. There were six crashes that involved vulnerable road users and trucks. These crashes resulted in three fatalities.

The total number of crashes, the fatal crashes per segment and the crash rates per million vehicle miles traveled (MVMT) over the five-year period are shown in **Table 1**. The segment crashes are on-street crashes along US 27 which also contain a portion of the intersection crashes that occurred along US 27. The five-year average segment crash rates are lower than the statewide and district-wide averages along US 27, with the exception of two segments: one along the southern portion north of CR 731 to south of Sun N Lakes Blvd, the other being the northernmost segment from South of the Highlands/Polk County line to the northern study limit.

FDOT’s CAR System provides unit costs for the financial cost or losses as a result of crashes and injuries. Based on these unit costs, crashes along US 27 have an estimated cost of \$903 million as shown **Table 2**.

Crash frequency is the densest in the urbanized areas of Sebring and Avon Park, as shown in the crash heat map in **Figure 7**. The location of intersection crashes, pedestrian/bicycle crashes and contributing causes are detailed in **Appendix A**.

Figure 4: US 27 Crash Summary (2019-2023)

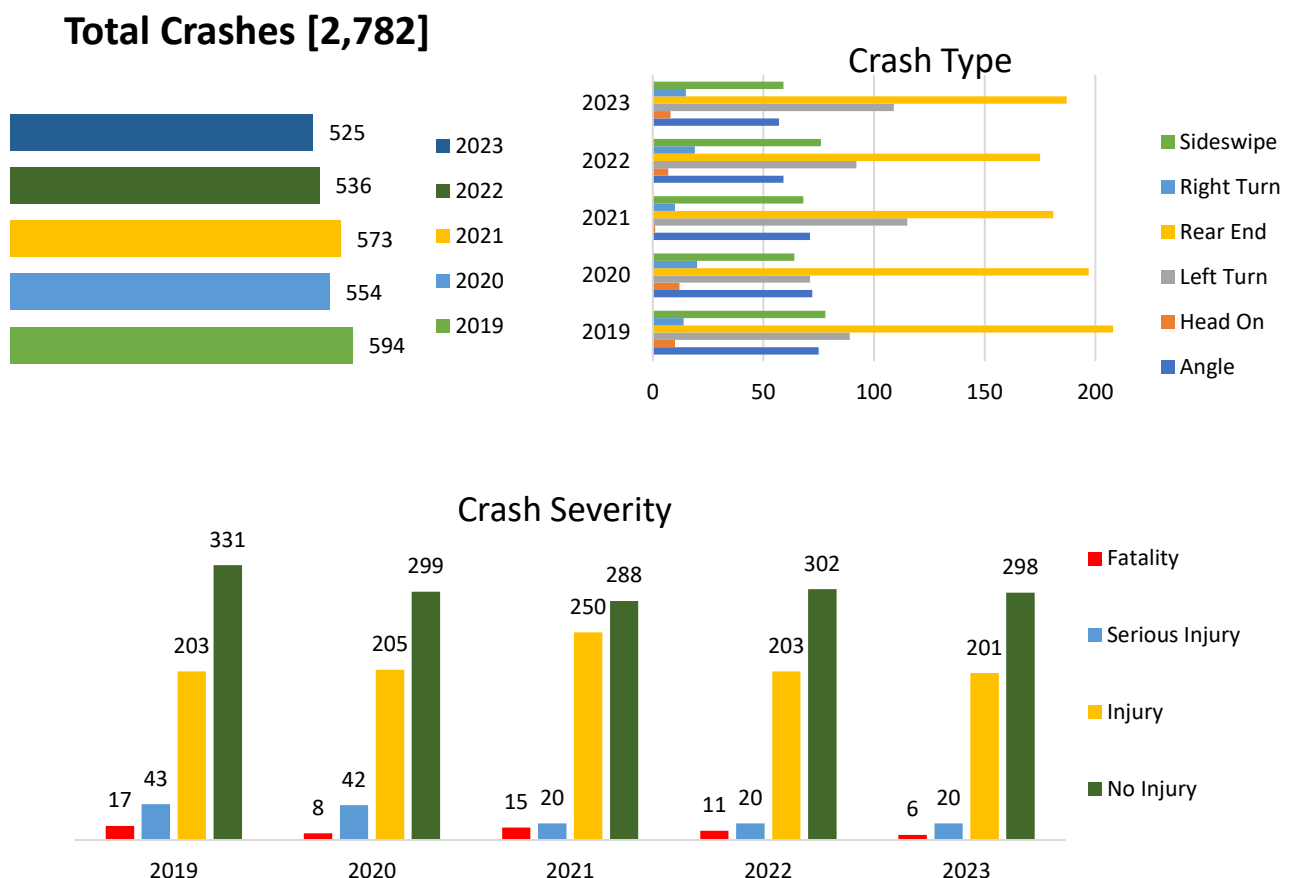


Figure 5: Bicycle and Pedestrian Crash Severity Trends along US 27 (2019-2023)

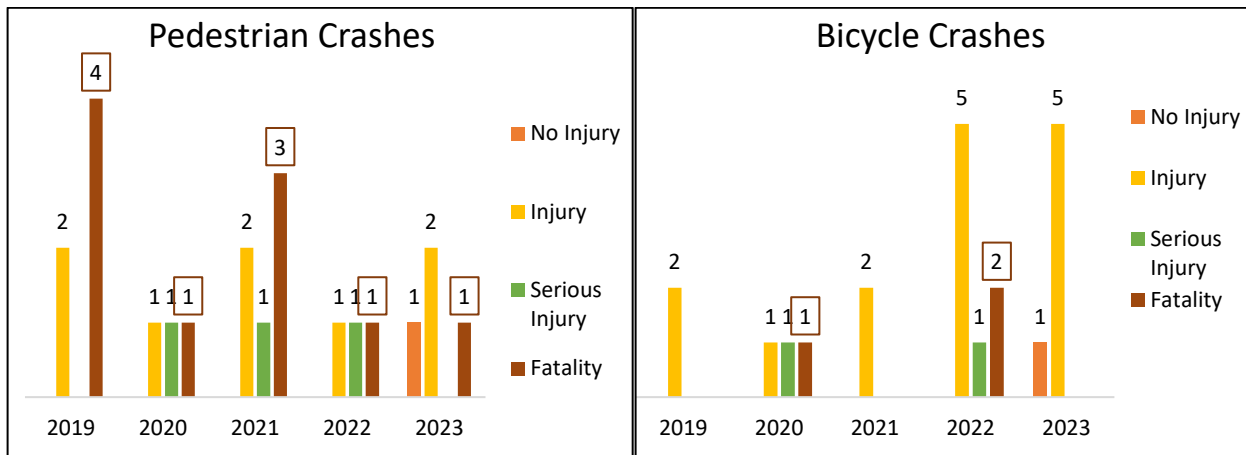
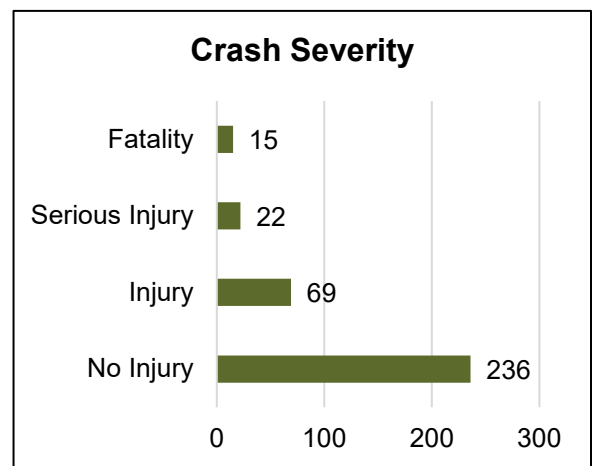
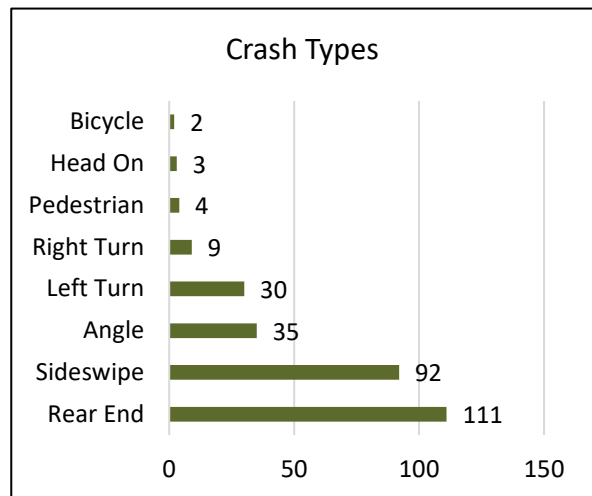
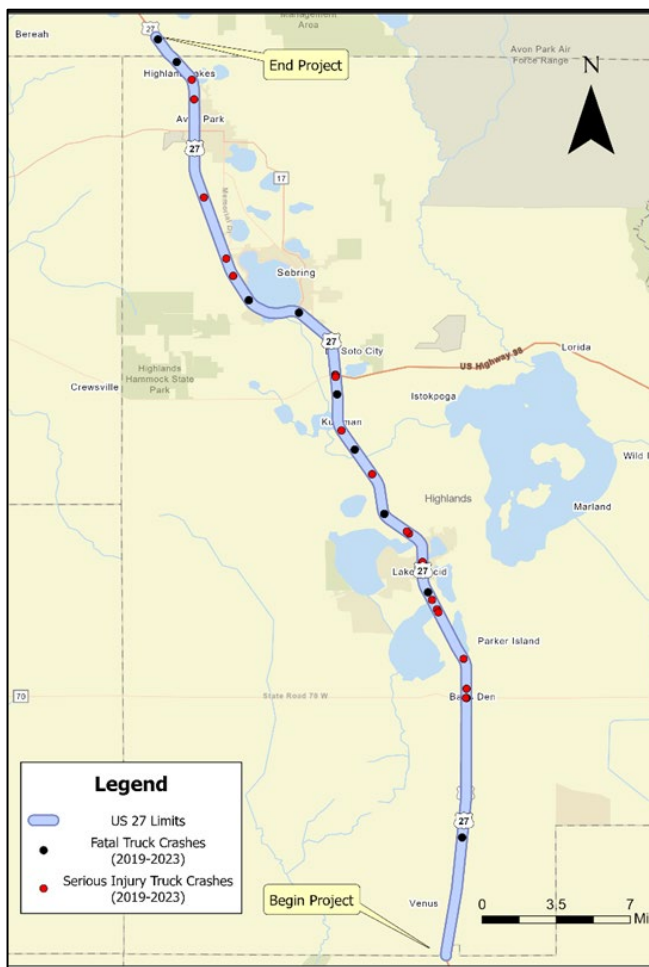


Figure 6: Truck Crash Locations along US 27 (2019-2023)



Source for Figure 4 and Figure 6: Analysis is based on 2019 to 2023 data from University of Florida's Signal Four Analytics database.

Table 1: Segment Crash Rates along US 27 (2019 – 2023)

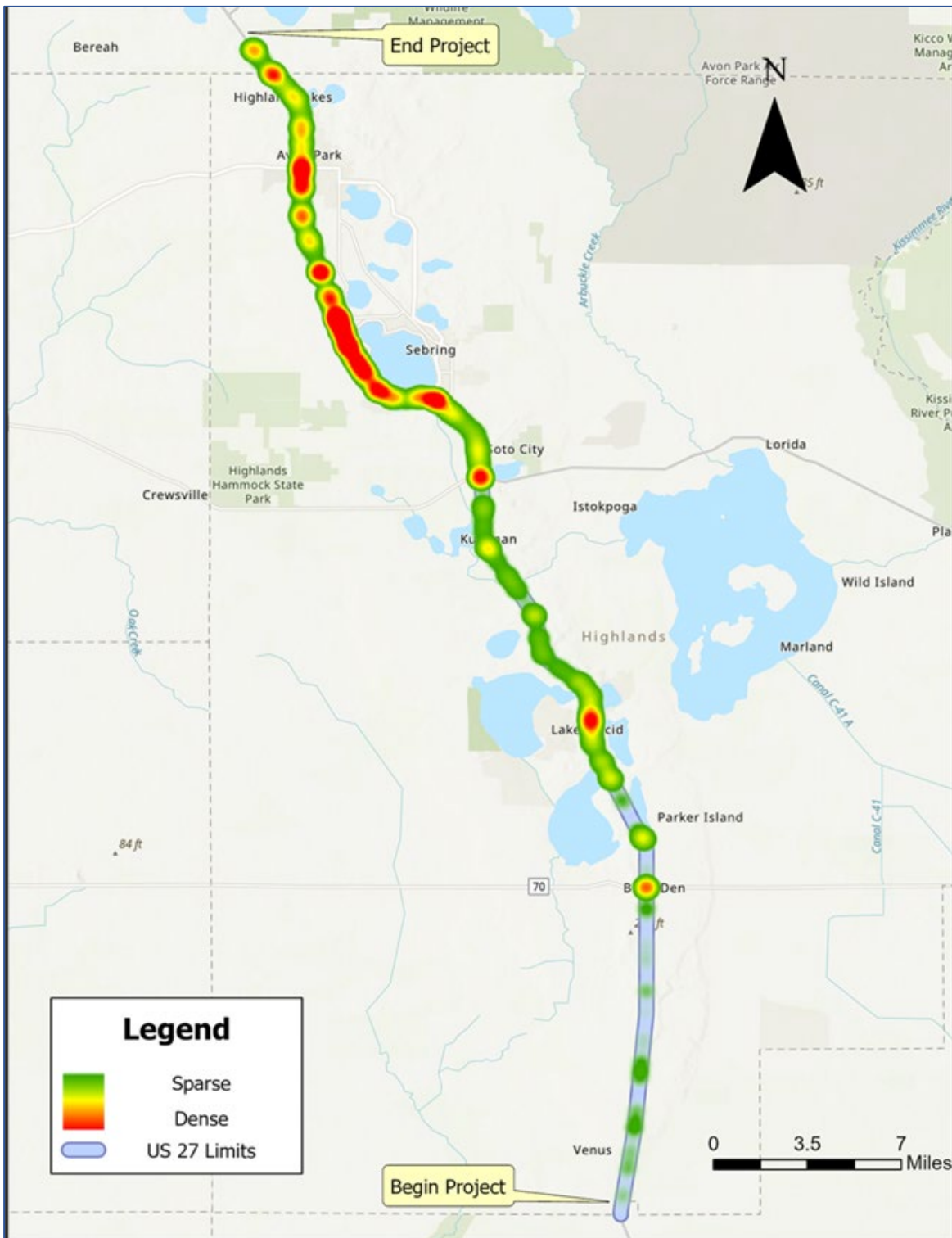
Segment	Length (miles)	Total Crashes	Fatal Crashes	Crash Rate (MVMT)	Statewide Crash Rate	District Crash Rate
US 27 from Glades/Highlands County Line to North of CR 731	3.26	17	0	0.35	0.75	0.70
US 27 from North of CR 731 to North of Sun N Lakes Blvd	11.17	149	6	0.83	0.75	0.70
US 27 from North of Sun N Lakes Blvd to North of CR 29	2.23	37	1	0.79	3.86	2.61
US 27 from North of CR 29 to South of CR 17N	5.11	267	10	1.47	3.86	2.61
US 27 from South of CR 17N to South of Lake Josephine Dr	4.32	104	4	0.61	0.75	0.70
US 27 from South of Lake Josephine Dr to South of US 98	2.55	80	2	0.79	3.86	2.61
US 27 from South of US 98 to South of Lakeview Dr	3.90	243	8	1.13	4.97	2.73
US 27 from South of Lakeview Dr to South of Sun N Lake Blvd	6.48	1,083	10	2.30	4.97	2.73
US 27 from South of Sun N Lake Blvd to South of W Stryker Rd	5.52	537	9	1.57	4.97	2.73
US 27 from South of W Stryker Rd to South of Sunpure Rd	1.88	121	3	1.23	4.97	2.73
US 27 from South of Sunpure Rd to South of County Line Rd	0.43	20	1	1.06	4.97	2.73
US 27 from South of County Line Road to Avon Park Cutoff Rd	1.27	124	2	2.46	0.75	0.70

Table 2: Estimated Economic Loss from All Crash Types (KABCO) along US 27 (2019-2023)

Crash Severity	# of Crashes	Comprehensive Crash Cost	Economic Loss
Fatal (K)	57	\$10,890,000	\$620,730,000
Severe Injury (Incapacitating) (A)	145	\$888,030	\$128,764,350
Moderate Injury (Non-incapacitating) (B)	417	\$180,180	\$75,135,060
Minor Injury (Possible Injury) (C)	645	\$103,950	\$67,047,750
Property Damage Only (O)	1,518	\$7,700	\$11,688,600
Total			\$903,365,760

Source: The comprehensive crash cost is from Florida Department of Transportation State Safety Office’s Crash Analysis Reporting (CAR) System, analysis years 2014 through 2018. Published by FDOT State Safety Office on 2/23/2022.

Figure 7: US 27 Crash Heat Map (2019-2023)

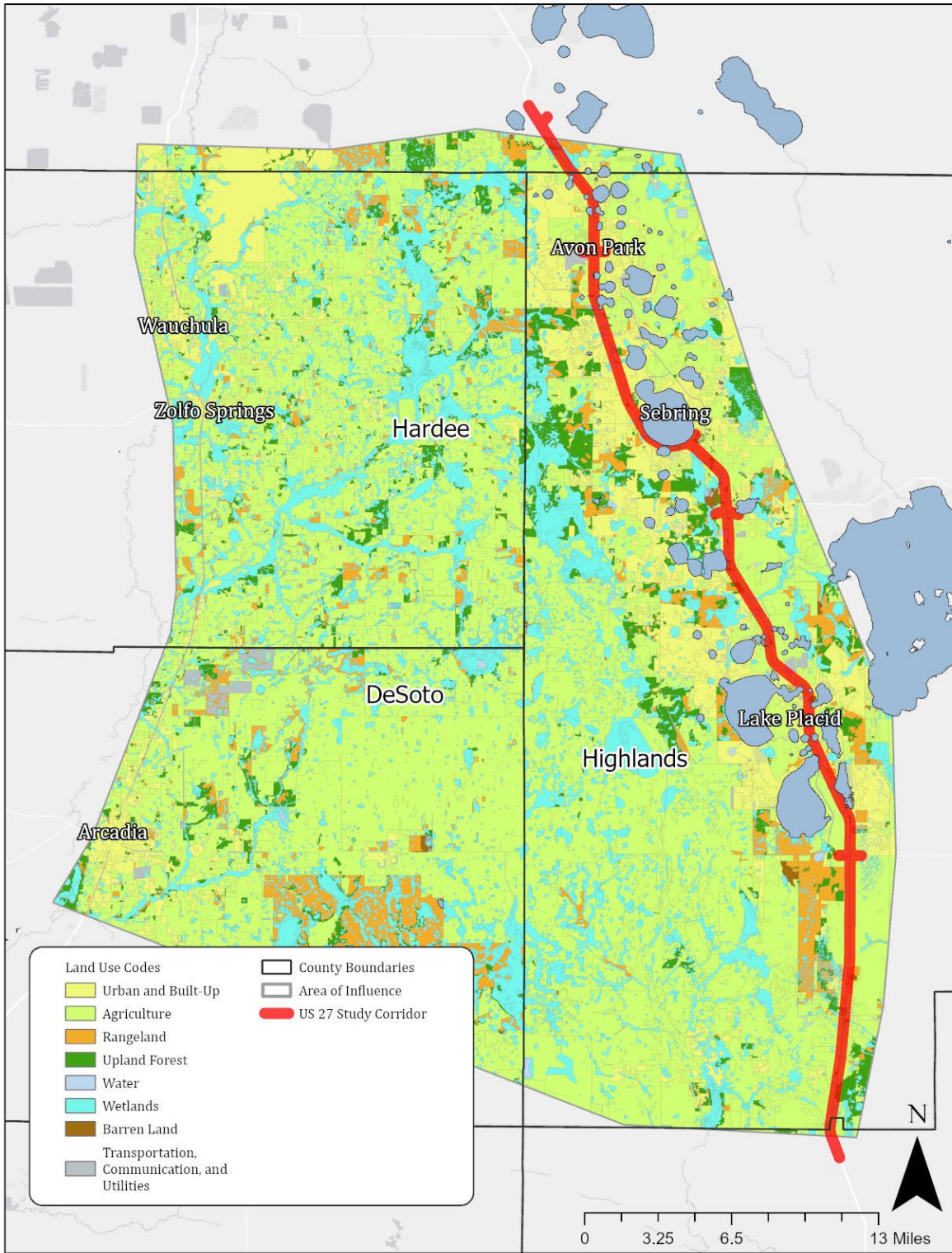


Source: University of Florida's Signal Four Analytics database (2019-2023).

2.3. Land Use

For the land use analysis, the study corridor was expanded to include a much larger area of influence to better understand the region's built environment and development patterns impacting the US 27 corridor. The area of influence includes the entire study corridor and extends east of US 27 and west to US 17, which includes portions of Hardee and Desoto County, as shown in **Figure 8**. Existing land uses were identified using the 2017 Florida Land Use Cover and Classification System (FLUCCS) codes developed by the Southwest and South Florida Water Management Districts. The major land use identified was agriculture (54%), primarily cropland, pastureland, and tree crops. Almost 20% of the area of influence lands are wetlands, which includes wetland hardwood forests and vegetated non-forested wetlands. Twelve percent is urban, with over half of that being residential low and medium density. Rangeland (6%), upland forests (5%), water (3%) and transportation, communications, and utilities (>1%) make up the remaining land uses.

Figure 8: US 27 Study Corridor Land Use Map



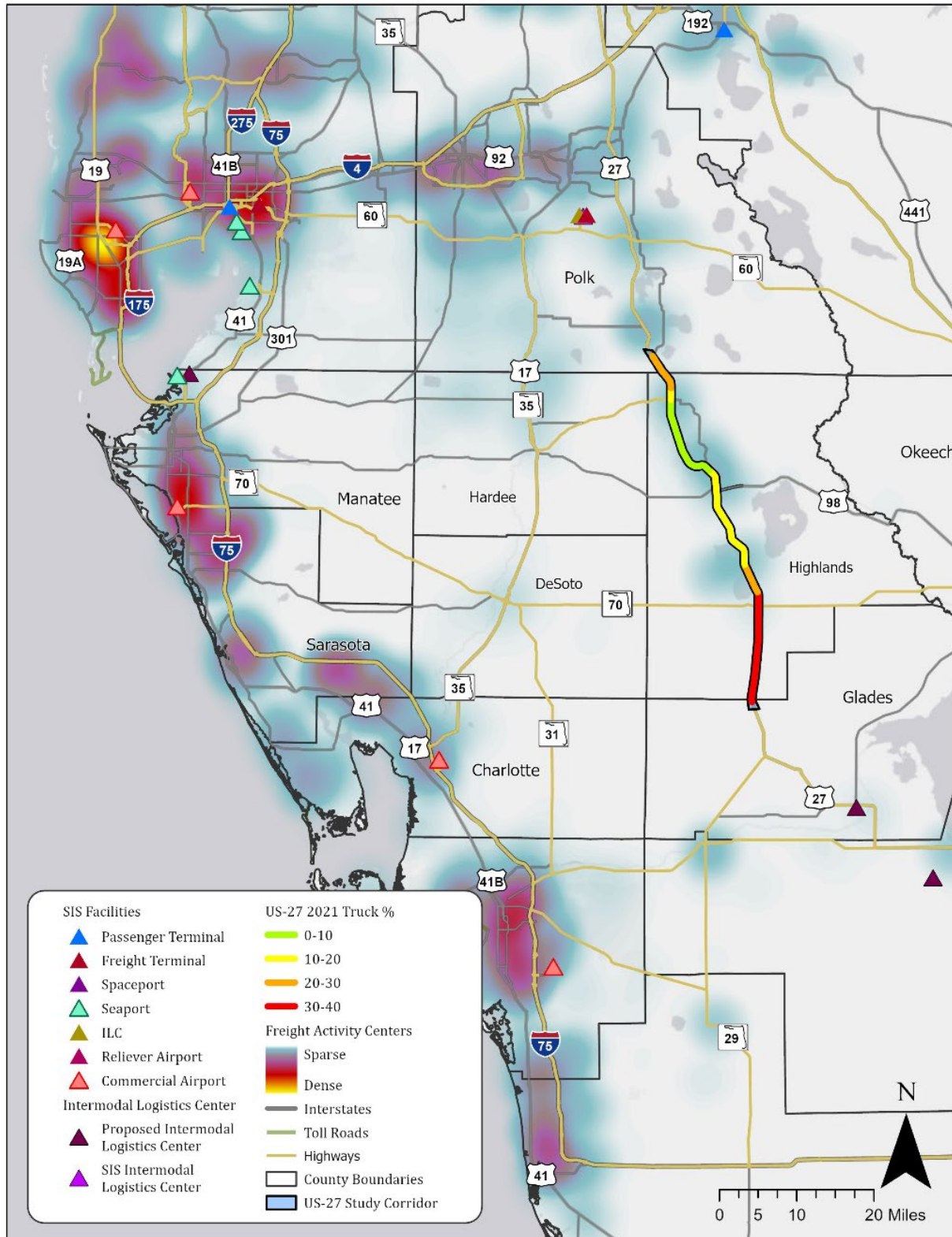
Source: FLUCCS Level 1 Code, 2017

2.4. Freight Operations

US 27 in Highlands County is a designated FDOT Strategic Intermodal System (SIS) facility and is a part of the FHWA National Highway Freight Network (both Critical Urban and Critical Rural Corridor). Per the District One Freight Mobility and Trade Plan, US 27 is the main truck route in the central portion of the State operating as the main trade and distribution network for the Heartland region. Highlands County has an extensive agricultural history that continues to this day with substantial citrus and cattle industry operations. There are currently no freight or intermodal logistics facilities within the study corridor. However, US 27 is one of the main regional access roads to the Central Florida Intermodal Logistics Center. As surrounding counties continue to experience trade and logistics growth, freight will increasingly utilize central Florida's transportation corridors.

Similar to the land use analysis, an area of influence was used to understand freight impact in the region. **Figure 9** shows proximity of US 27 to major freight activity centers. Per Florida Traffic Online (2023), the northern and southern portions of the study corridor feature high truck percentages, 20%-43%, with daily truck volumes of 4,200 south of SR 66. The urbanized areas experience daily truck volumes between 2,800 and 3,400.

Figure 9: US 27 Proximity to Freight Activity Centers and Freight Generators

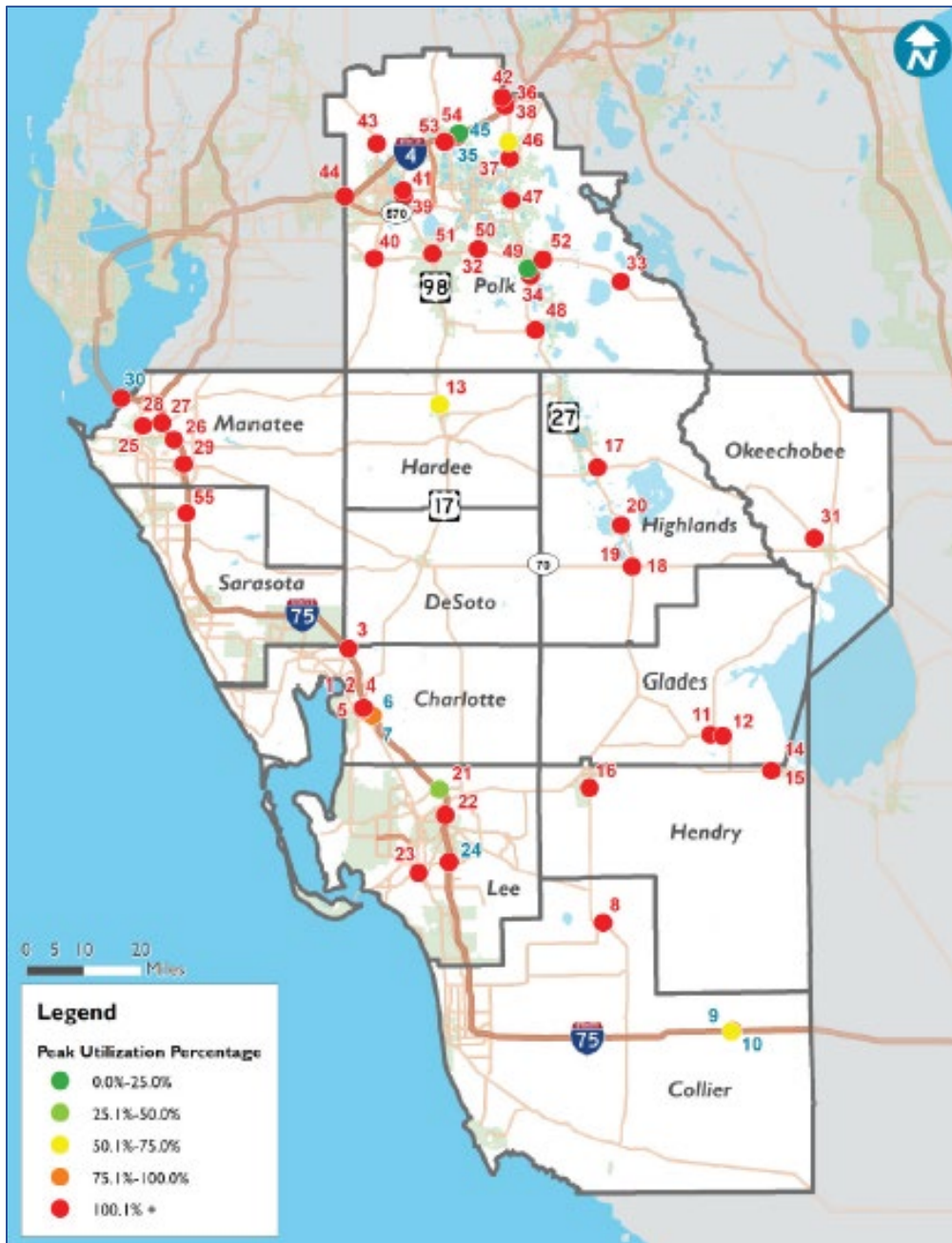


Source: DOR, 2021 filtered by NAICS codes

Note: Freight Activity Centers are defined as facilities which generate, distribute or attract significant freight activity.

According to the FDOT Statewide Truck Parking Study, truck parking facilities in and around the US 27 corridor operate beyond capacity. **Figure 10** identifies truck parking capacity as a need throughout the Heartland region. The limited availability of truck parking spaces creates overcrowding and unsafe conditions for all roadway users. This increase in truck parking demand further illustrates the prevalence of freight activity in the corridor and creates an opportunity to address truck parking supply and access while exploring alternative truck routes.

Figure 10: FDOT District One Truck Parking Utilization



Source: FDOT District One Truck Parking White Paper, July 2022

Note: Red numbers represent number of available truck parking supply per location.

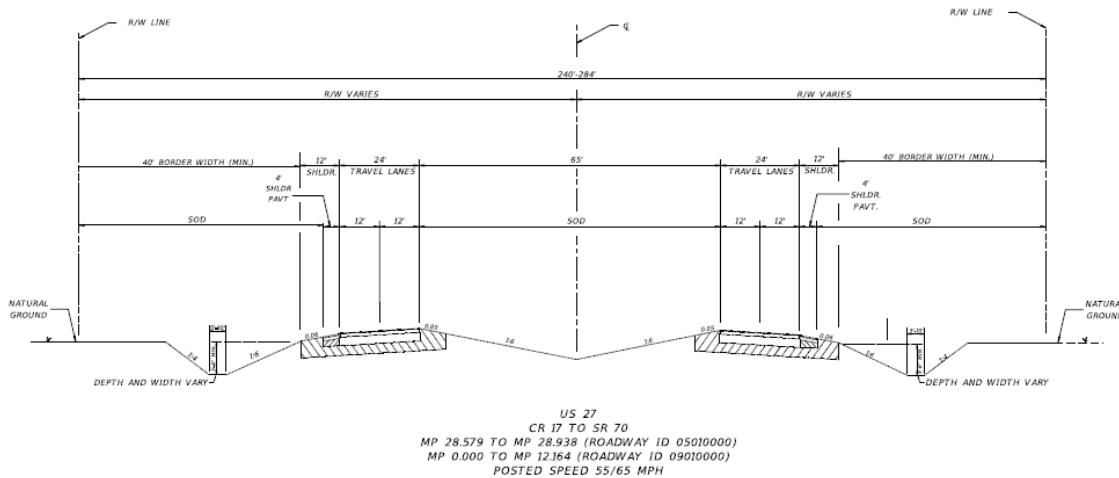
Before traffic improvement needs can be identified, an understanding of the physical, natural and sociocultural characteristics is necessary so the right improvement can be identified and evaluated. The next sections discuss a series of US 27 characteristics from an engineering and environmental standpoint.

2.5. Roadway

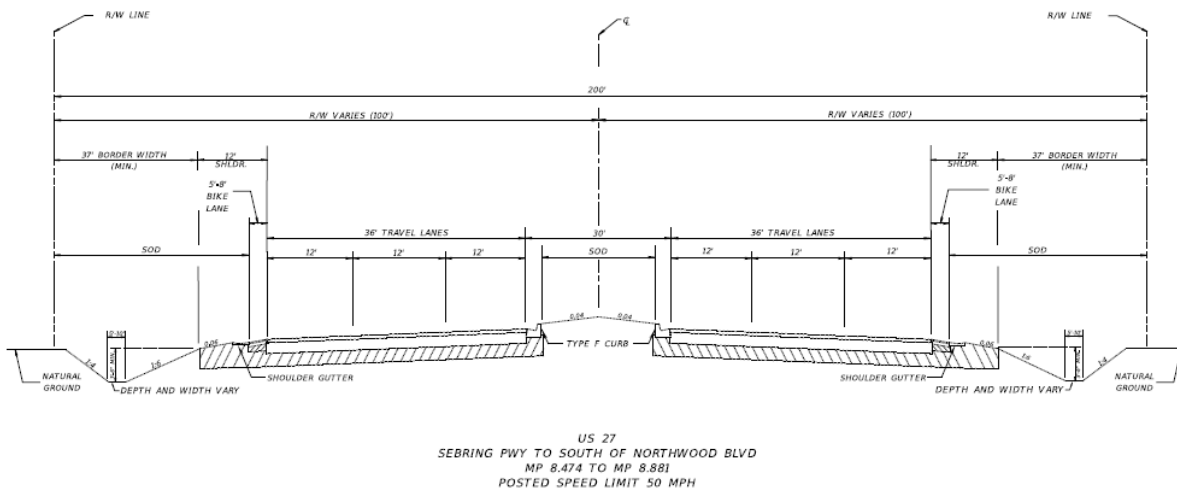
Major intersections along the US 27 study corridor include SR 70, SR 66/US 98, SR 17 and SR 64/SR 17. As noted previously, the posted speeds range from 45 mph to 65 mph and the number of through lanes range from four to six 12-foot-wide travel lanes with existing ROW widths varying from 100 feet to 300 feet. Existing bicycle facilities consist of four to five-foot paved shoulders and keyholes¹ or through bike lanes. Pedestrian facilities are limited to intermittent sidewalks within Sebring and Avon Park. **Figure 11** details the existing typical sections throughout the project corridor.

Figure 11: Existing Typical Section Diagram

CR 17 to SR 70 (Four Lanes)



Sebring Pkwy to South of Northwood Blvd (Six Lanes)

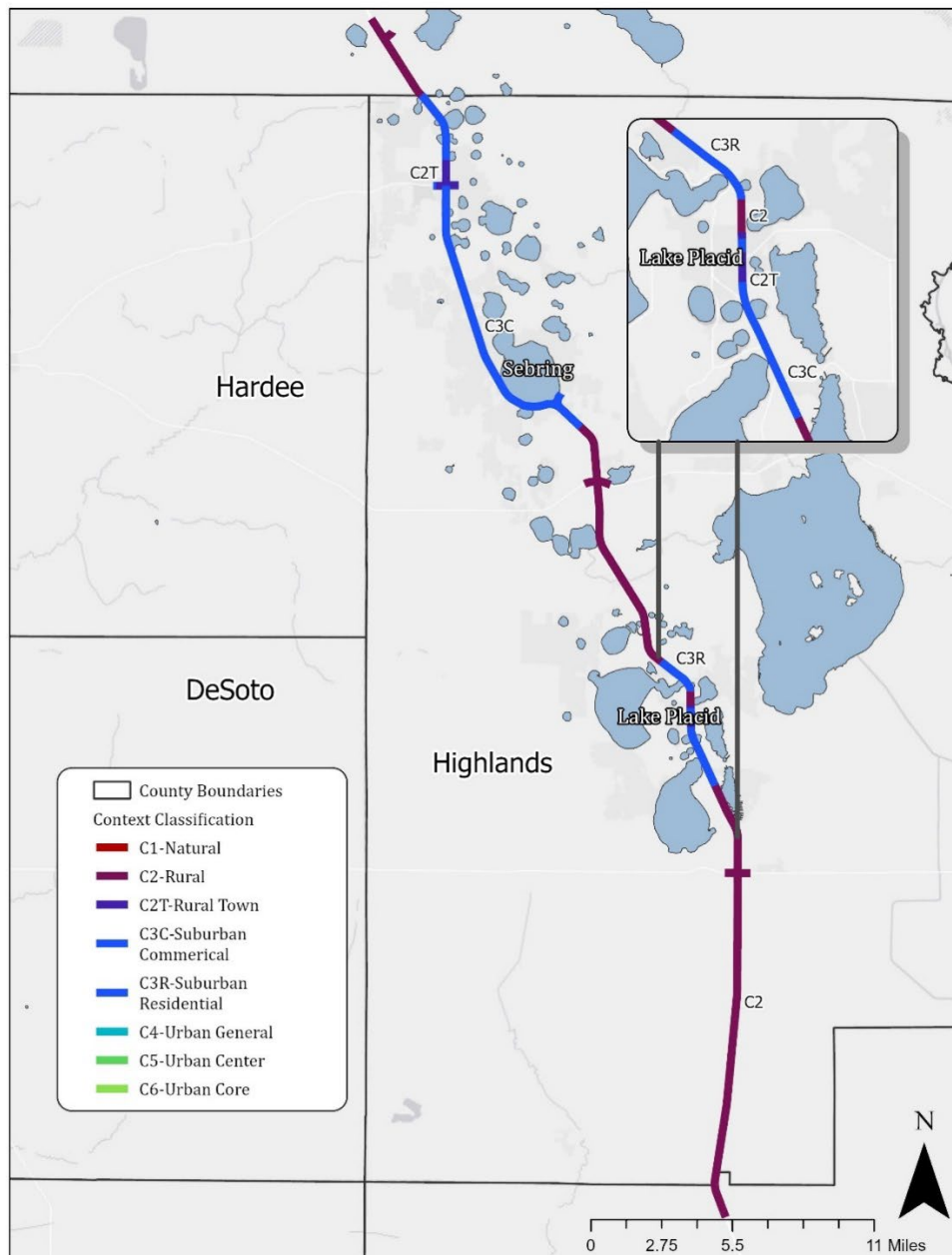


¹ A keyhole lane is placed between a through lane and an adjacent right turn lane, bus bay or parking lane, FDM, 2018

Context Classification

FDOT uses context classification zones to design roadways based on the travel characteristics, users and the built environment. As shown in previous figures, US 27 alternates between urban and rural contexts. US 27 has a rural context (C2) for the first 15 miles from the Glades County line to south of Lake Placid. Based on the FDOT Context Classification Guide, a rural context is characterized by sparsely populated land and wide high-speed roadways. US 27 through the urban communities of Lake Placid, Sebring and Avon Park are classified as suburban residential (C3R) or commercial (C3C). These are characterized by sprawling development patterns and a disconnected and sparse roadway network. The section of US 27 through downtown Lake Placid and Avon Park is classified as a rural town (C2T) zone which emphasizes complete streets design elements and multimodality. **Figure 12** shows the context classification variation along the study corridor.

Figure 12: FDOT Context Classification on the US 27 Study Corridor



2.6. Drainage

The study corridor and surrounding region is located within the Fisheating Creek, Indian Prairie, and Lake Istokpoga subwatersheds of the Lake Okeechobee watershed. It traverses 21 Florida Department of Environmental Protection (FDEP) Waterbody ID (WBID) sub-basins; out of which, six WBIDs are listed as verified impaired at the time of this report. The study relevant WBIDs are summarized in **Table 3**. The existing US 27 corridor along the study limits also falls within the Lake Okeechobee Basin Management Action Plan (BMAP). The study corridor does not discharge to any Outstanding Florida Waters (OFW) or Outstanding Florida Springs (OFS).

Table 3: Summary of WBIDs and Impairment Status

WBID	Name	Impairment
3201J	Gopher Gully	n/a
3201B	Gator Slough	n/a
3204	Harney Pond Canal	Dissolved Oxygen, Nutrients
1932	Grassy Creek	Nutrients
1932I	Buck Lake	Nutrients
1932A	Lake Grassy	n/a
1932N	Little Lake Grassy	n/a
1938Y	Lake Placid Outlet	Dissolved Oxygen, Metal
1932K	Lake McCoy	n/a
1938Z	Lake June in Winter Drain	n/a
1938M	Unnamed "E" Lake	n/a
1860A	Josephine Creek	Nutrients
1860C	Jackson Creek	Nutrients
1891	Yellow Bluff Creek	n/a
1860D	Lake Jackson	n/a
1860G	Little Lake Jackson	n/a
1842C	Lake Sebring Outlet	n/a
1831R	Lake Letta Outlet	n/a
1813I	Lake Anoka	n/a
1758K	Lake Damon Outlet	n/a
1730F	Lake Livingston Drain	n/a

Based on the straight-line diagrams, there are six bridges over waterbodies, one bridge culvert, and 84 cross drains within the study limits. The existing cross culverts are summarized in **Table 4**.

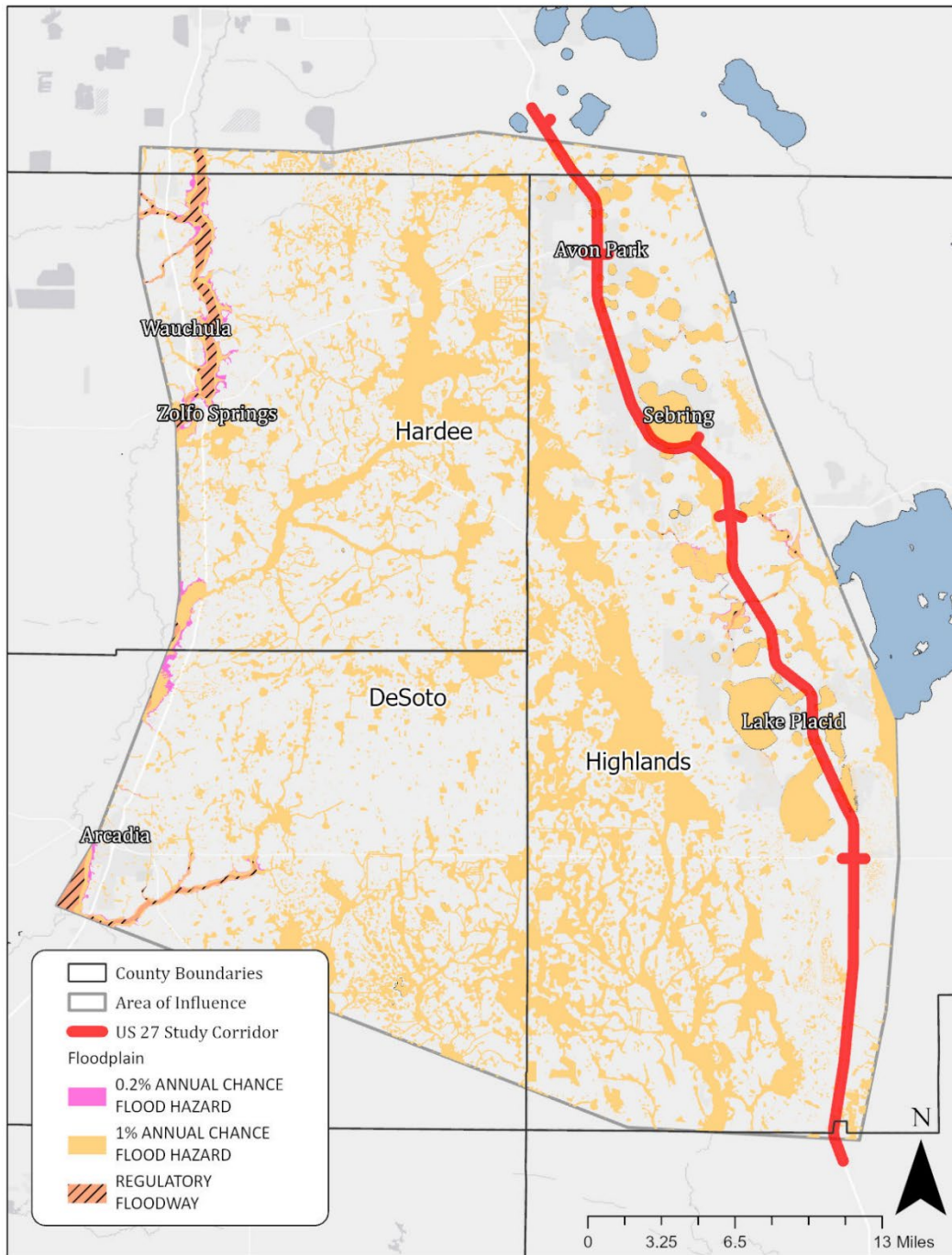
US 27 traverses Federal Emergency Management Agency (FEMA) identified regulatory floodplains around Josephine Creek. FEMA-identified 100-year floodplains are illustrated in **Figure 13**, which is based upon the National Flood Hazard Layer (NFHL) from the effective Flood Insurance Rate Maps (FIRMs) dated November 18, 2015.

Table 4: Existing Cross Culverts

Mile Post	Size
Roadway #	05070000
28.927 to 28.934	Br. 050047
Roadway #	09010000
0.647	10' x 4'
1.030	(2) 30"
1.337	(3) 30"
1.612	(3) 36"
2.294	(2) 30"
2.607	(3) 36"
3.076	(3) 36"
3.390	(4) 36"
4.037	(3) 30"
4.661	(2) 36"
4.926	8' x 4'
5.286	30"
5.788	30"
6.761	24"
7.463	24"
8.346	24"
9.924	24"
10.832	24"
11.835	24"
12.499	18" (SB) & 24" (NB)
14.068	24"
14.416	24"
14.740	24"
15.319	10' x 10'
16.427	24"
16.721	10' x 4'
17.123	24"
17.559	24"
17.691	24"
17.748	24"
18.569	24"
19.173	24"
20.453	24"
21.404	24"
21.781	24"
22.640	30"
24.860 to 24.898	Br. 090003 (SB) & 090004 (NB)
25.700	24"
26.337	24"
27.599	24"
28.044	24"
28.565	18"
28.786	18"
28.935	18"

Mile Post	Size
Roadway #	09030000
0.345	(2) 24"
0.372	36"
0.406	24"
1.332	24"
2.013	24"
2.458	30"
2.937	(2) 24"
4.258	24"
4.730 to 4.746	Br. 090051 (SB) & 090050 (NB)
5.116	18"
5.204	(2) 24"
5.296	(2) 30"
5.415	18"
5.480	24"
5.677	(3) 36"
5.873	18"
6.011	(3) 36"
6.355	10' x 5'
6.901	24"
7.087	30"
7.298	(3) 36"
7.734	(3) 48"
8.008	(2) 24"
8.504	10' x 5'
8.749	(2) 42"
9.017	9' x 4'
9.294	6' x 4'
9.390	18"
9.682	10' x 5'
9.883	(2) 48"
10.074	(2) 48"
10.140	24"
10.503	(3) 18"
11.607	(3) 48"
11.690	10' x 4'
12.308	(3) 48"
12.475	18"
12.547	18"
12.734	24"
13.168 to 13.191	Br. 090054 (SB) & 090028 (NB)
15.986	24"
16.264	(2) 36"
Roadway #	16170000
0.138	(2) 36"

Figure 13: Map of Existing 2015 Floodplains



Regulatory Agency/Permits

The US 27 study limits fall within the jurisdictional boundaries of both the South Florida Water Management District (SFWMD) and the Southwest Florida Water Management District (SWFWMD). From the southern study limit to approximately 5.1 miles north of the county line, the study limits are within the SFWMD jurisdictional boundary. The remaining study limits are within the SWFWMD jurisdictional boundary. Based on the preliminary permit research, the following permits were identified within the study region:

- SWFWMD Permit # 25519 for US 27 and SR 70 Intersection
- SWFWMD Permit # 42688 for Lake McCoy Drainage Improvements
- SWFWMD Permit # 19087 for US 27 from Cloverleaf Road to south of US 98/CR 66
- SWFWMD Permit # 16148 for US 27 from south of US 98/CR 66 to Emergency Lane
- SWFWMD Permit # 12845 for US 27 from Emergency Lane to West Hal McRae Boulevard
- SWFWMD Permit # 29106 for US 27 from Main Street to Highlands/Polk County Line

2.7. Structures

There are eight existing bridges along US 27 within Highlands County, shown in **Figure 14**. The bridges were built between 1943 and 2002, making them between 20 and 79 years old, respectively. Most of the bridges are constructed with reinforced concrete slabs, however, one is constructed with steel girders, and one is a reinforced concrete box culvert. With the exception of the South-Central Florida Express (SCXE) railroad bridge over US 27, all the other bridges carry US 27 over a waterbody. **Table 5** summarizes the structure type and geometry as provided in the existing plans.

Figure 14: Map of Existing Bridges

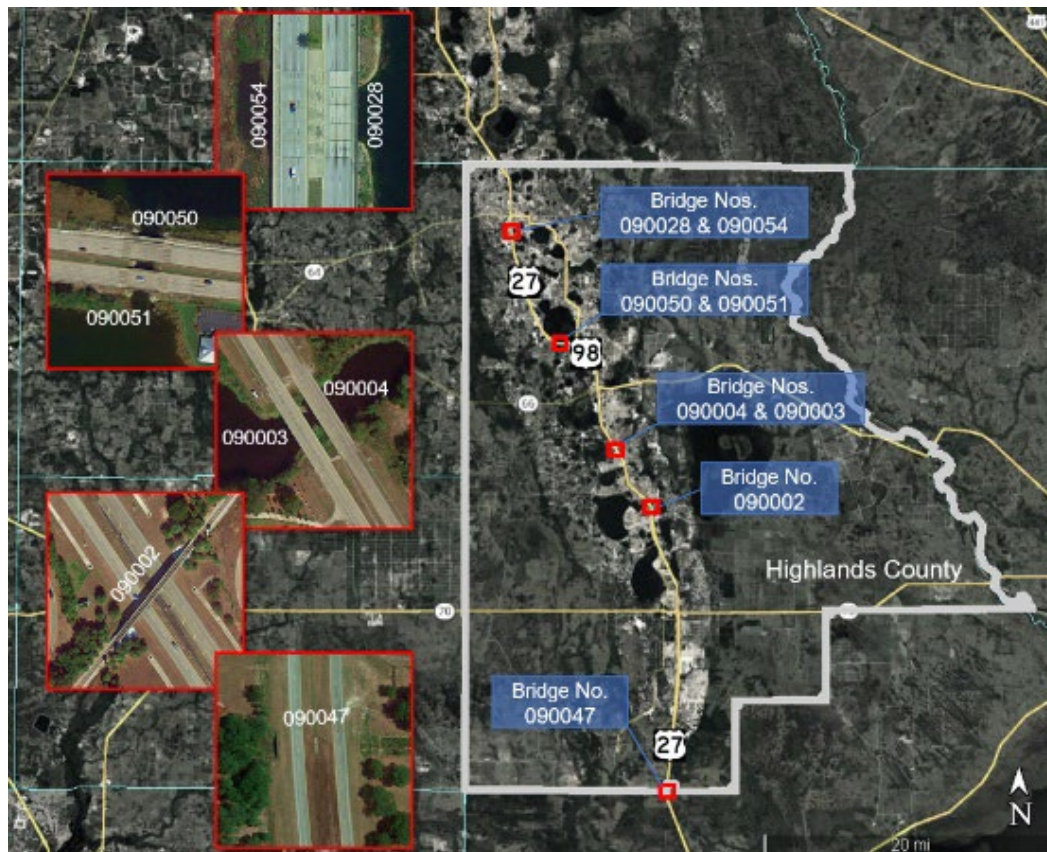


Table 5: Existing Bridge Geometry

Bridge No.	Facility Carried	Facility Crossed	Main Span Material	Main Span Design	No. Spans/ Cells	Max Span Length (ft)	Width (ft)	Length (ft)	Vertical Clearance (ft)
090028	US-27 NB	Lake Anoka	R/Conc.	Slab	5	25	60.83	125	2.0
090054	US-27 SB	Lake Anoka	R/Conc.	Slab	5	25	60.83	125	2.0
090050	US-27 NB	Lake Jackson	R/Conc.	Slab	3	28	61.1	84.0	5.7
090051	US-27 SB	Lake Jackson	R/Conc.	Slab	3	28	53.58	84.0	5.7
090004	US-27 NB	Josephine Creek	R/Conc.	Slab	13	15.25	42.24	195.5	3.5
090003	US-27 SB	Josephine Creek	R/Conc.	Slab	13	15.25	42.24	195.5	2.4
090002	SCXF RR	US-27	Steel	Plate Girder	4	80.5	14.1*	246.0	15.5
050047	US-27	County Line Creek	R/Conc.	Box Culvert	3	10.0	125.0	32.5	4.0

* Bridge width as provided in the bridge inspection report.

Existing Bridge Condition

The bridge inspection reports (BIR) provide detailed information on the condition of various bridge components (e.g., deck, girders, bearings, traffic railings, slope protection, etc.); rate the condition of major components (e.g., deck, superstructure, substructure, channel); and provide an overall health index rating. Generally, the bridges are in good overall condition; none of the bridges are considered fracture critical, scour critical or functionally obsolete.

Table 6 summarizes the information provided in the 2021 or 2022 BIRs for each bridge. Bridges have at least a rating of six (satisfactory) for the structural condition and meet vertical clearance requirements, as defined by FDOT standards. Bridge No. 050047 (indicated with red text) has a relatively low health index indicating the structural condition is deteriorating and may need to be replaced. Bridge No. 090003 (indicated with red text) does not meet load capacity standards which is determined by the Inventory and Operating rating factors.

Table 6: Summary of Existing Bridge Conditions

Bridge No.	Year Built	Year Reconstructed	Age as of 2022	Deck Rating (0 - 9)	Super. Rating (0 - 9)	Sub. Rating (0 - 9)	Channel Rating (0 - 9)	Culvert Rating (0 - 9)	Health Index (0 - 100)	Inventory Rating (tons)	Operating Rating (tons)
090028	1969	2002	53	6	6	7	9	-	73.17	45.9	76.7
090054	2002	-	20	7	7	7	9	-	87.07	50.0	83.5
090050	1998	-	24	7	7	7	9	-	94.77	55.1	92.0
090051	1998	-	24	7	7	7	9	-	92.58	55.1	92.0
090004	1968	2000	54	7	7	7	7	-	97.85	37.0	61.9
090003	1944	2000	78	7	7	6	7	-	94.42	34.3	57.3
090002	1971	-	51	-	-	-	-	-	100	-	-
050047	1943	1973	79	-	-	-	6	5	34.27	43.1	71.8

2.8. Environment

FDOT’s Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) was used as the primary source of information to screen the existing cultural, natural, physical and social resources in the region.

An area of influence, as defined in the previous sections, was used to perform a desktop analysis to identify environmental impacts within the US 27 corridor and adjacent communities, herein referred to as study region in this section.

Natural

The natural resources analysis performed in the study region included a review for the presence of federal and/or state protected species and their suitable habitats, Essential Fish Habitats, wetlands, Outstanding Florida Waters, Wild and Scenic Rivers, floodplains and Coastal Barrier Resources.

Thirteen federally listed species, ten state listed species and two managed, non-listed species were determined to be present or have likelihood for utilization of habitats within or adjacent to the study region. The study region overlaps designated United States Fish and Wildlife Service (USFWS) critical habitat for the Florida Bonneted Bat and the West Indian Manatee. **Table 7**, **Table 8** and **Table 9** list the federal, state and non-listed species respectively, which may utilize habitats within or adjacent to the US 27 corridor.

Table 7: Federally Protected Species

Common Name	Scientific Name	Federal Status
MAMMAL		
Florida Bonneted Bat	<i>Eumops floridanus</i>	Endangered
Florida Panther	<i>Felis concolor coryi</i>	Endangered
West Indian Manatee	<i>Trichechus manatus</i>	Threatened
BIRD		
Audubon’s Crested Caracara	<i>Polyborus plancus audubonii</i>	Threatened
Florida Grasshopper Sparrow	<i>Ammodramus savannarum floridanus</i>	Endangered
Red-cockaded Woodpecker	<i>Picoides borealis</i>	Endangered
Florida Scrub-Jay	<i>Aphelocoma coerulescens</i>	Threatened
Everglades Snail Kite	<i>Rostrhamus sociabilis plumbeus</i>	Endangered
Eastern Black Rail	<i>Laterallus jamaicensis ssp. Jamaicensis</i>	Threatened
Wood Stork	<i>Mycteria americana</i>	Threatened
REPTILE		
Bluetail Mole Skink	<i>Eumeces egregius lividus</i>	Threatened
Sand Skink	<i>Neoseps reynoldsi</i>	Threatened
Eastern Indigo Snake	<i>Drymarchon couperi</i>	Threatened

Table 8: State Protected Species

Common Name	Scientific Name	State Status
BIRD		
Burrowing Owl	<i>Athene cunicularia</i>	Threatened
Sandhill Crane	<i>Grus canadensis</i>	Threatened
Southeastern American Kestrel	<i>Falco sparverius paulus</i>	Threatened
Least Tern (beach-nesting bird)	<i>Sternula antillarum</i>	Threatened
Little blue heron (wading bird)	<i>Egretta caerulea</i>	Threatened
Roseate Spoonbill (wading bird)	<i>Platalea ajaja</i>	Threatened
REPTILE		
Alligator snapping turtle	<i>Macrochelys suwanniensis</i>	Threatened
Key ringneck snake	<i>Diadophis punctatus acricus</i>	Threatened
Short-tailed snake	<i>Lampropeltis extenuate</i>	Threatened
Gopher Tortoise	<i>Gopherus polyphemus</i>	Threatened

Table 9: Non-Listed Protected Species

Common Name	Scientific Name	Protection Acts
BIRD		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Bald Eagle & Golden Eagle Protection Act and Migratory Bird Treaty Act
MAMMAL		
Florida Black Bear	<i>Ursus americanus floridanus</i>	F.A.C. 68A-4.009 Florida Black Bear Conservation

Essential Fish Habitat

There is no Essential Fish Habitat (EFH) in the study region.

Wetlands and Other Surface Waters

The study region is in the Kissimmee River and Sarasota Bay-Peace-Myakka Watersheds. A review of the FLUCCS Code Level Two wetlands layer determined that approximately 20% of the study region is wetlands. **Table 10** shows a breakdown of the wetlands identified within the study region.

Table 10: FLUCCS Level 2 Wetland Inventory

FLUCCS Code	Wetland Type	Acres within Study Region	Percentage of Study Region
6100	Wetland Hardwood Forests	84,056.3	8.7%
6200	Wetland Coniferous Forests	7,047.8	0.7%
6300	Wetland Forested Mixed	5,577.2	0.6%
6400	Vegetated Non-Forested Wetlands	92,896.7	9.6%
6500	Non-Vegetated Wetlands	639.2	0.1%
TOTAL		190,217.3	19.7%

Floodplains

According to the FEMA Flood Insurance Rate Maps (FIRM), the study region crosses areas designated as Zone AE, Zone A, and Zone X. Zone AE is classified as an area within the 100-year floodplain, subject to having a 1% or greater annual chance of flooding in any given year with base flood elevations being determined. Zone A is an area also classified within the 100-year floodplain, subject to having a 1% or greater annual chance of flooding in any given year, however, base flood elevations have not been determined. Zone X is found outside of the 100-year floodplain, and is an area with minimal flood hazard, subject to having a 0.2% annual chance of flooding in any given year.

Physical

The physical resources analysis performed for the study region include a review of noise-sensitive receptors based on current land use, air quality designations and federal and/or state registered contamination sites.

Noise

Noise-sensitive receptors in the study region have been identified through aerial photography and land use parcel data. Within the communities of Avon Park, Sebring and Lake Placid in Highlands County, Bowling Green, Wauchula and Zolfo Springs in Hardee County, and Arcadia in DeSoto County. Potential receptors include low and medium density residential areas, businesses, and recreational areas. Low density areas include less than two dwelling units per acre. Medium density areas include two to five dwelling units per acre. These receptors can be grouped into Common Noise Environments (CNEs) which are groups within the same Noise Abatement Criteria (NAC) Activity Category that are exposed to similar noise sources, traffic volumes, traffic mix, speed and topographic features. The NAC are used to evaluate whether noise abatement may be considered for exterior

areas of frequent human use. Noise abatement must be considered for properties that will be impacted by the project (approach or exceed the NAC in the future build scenario).

Exterior areas of frequent human use and CNEs where potential traffic noise impacts may occur will be identified within the study region. Further noise analysis and a Noise Study Report will need be completed in a future PD&E phase to determine traffic noise impacts and abatement measures that are feasible and reasonable.

Air Quality

The study region is designated as being in attainment for all criteria air pollutants: ozone, nitrogen dioxide, particulate matter, sulfur dioxide, carbon monoxide and lead –consistent with the National Ambient Air Quality Standards (NAAQS). An Air Quality assessment will need to be completed to determine impacts from greenhouse gases and carbon monoxide emissions as a result of a transportation improvement.

Contamination

A review of state and federal databases was conducted for known contamination sources located within the study region. The following contamination sites have been identified:

- 286 Biomedical Waste Facilities
- 6 Dry Cleaning Program Sites
- 92 Environmental Restoration Integrated Cleanup (ERIC) Sites
- 438 Hazardous Waste Facilities
- 13,904 Onsite Sewage
- 63 Petroleum Contamination Monitoring Sites
- 468 Resource Conservation and Recovery Act (RCRA) Regulated Facilities
- 61 Solid Waste Facilities
- 1,121 Storage Tank Contamination Monitoring (STCM) Sites
- 270 Super Act Risk Sources
- 5 Superfund Hazardous Waste Sites (Not on the NPL)
- 17 Toxic Release Inventory Sites

Cultural

Cultural resources analysis was performed to identify the presence of significant, or potentially significant, archaeological, cultural, historic resources, listed or eligible for listing on the National Register of Historic Places (NRHP), as well as, publicly owned parks, recreation areas, and wildlife or waterfowl refuges. This review was conducted in an effort to begin cataloguing known sites and documenting the presence of known features that may impact US 27 and adjacent communities.

Archaeological and Historic Resources

A review of the Bureau of Archaeological Research (BAR) Florida Master Site File (FMSF) database identified 267 archaeological or historic sites. These include 18 cemeteries, 35 historic bridges, 2,226 historic standing structures and 48 resource groups. Additionally, 24 sites have been registered in the National Register of Historic Places (NRHP).

Section 4(f) Resources and Parks and Recreational Areas

Analysis of the Florida Natural Areas Inventory (FNAI) database identified various recreational trails, Florida Forever Acquisitions, State Managed Conservation Lands and Florida Forever Board of Trustees (BOT) Projects. A summary of the sites is listed below.

- 3 Florida State Parks
- 28 Florida Forever Acquisitions & Florida Forever BOT Projects
- 26 FNAI State Managed Conservation Lands & FWC Management Areas
- 10 Existing Recreational Trails
- 8 Fish and Wildlife Research Institute (FWRI) Great Florida Birding Trail Sites
- 15 Office of Greenways and Trails (OGT) Hiking, Multi-Use and Paddling Trails Opportunities

Further evaluations will need to be conducted to verify potential for involvement with a Section 4(f) property. Coordination with the Official with Jurisdiction (OWJ), dependent on the property type, is necessary to obtain a significance determination.

Social

The Sociocultural Data Report (SDR) produced from the ETDM screening tool uses the US Census Bureau American Community Survey Five-Year data from 2016-2020. An estimated 142,891 people live within the study region. The predominant race is white (79%), followed by black or African American (9.5%), and the remaining races accounting for just over 1%. The majority of residents are not of Hispanic or Latino ethnicity (72%). The population of the study region trends older, similar to the rest of the state, with over 30% aged 65 and older. The median household income of \$39,994 for the study region is significantly lower than the state average (\$57,703) and 17% of households are below the poverty line. Only 15% of residents aged 25 and older have a bachelor's degree or higher, which is significantly lower than the state average of 31%. Ninety-five percent of occupied dwelling units (households) have access to at least one vehicle which supports the notion that auto travel is the main transportation mode for accessing jobs and services within the study region.

2.9. Vulnerability

As documented in the Statewide Regional Evacuation Study by the Florida Division of Emergency Management, US 27 serves as a primary north-south emergency evacuation route for the southern portion of the State. It serves as an alternative to I-75 and I-95, supporting evacuation from the more densely populated southern Florida and coastal counties including the Florida Keys. When the state experienced Hurricane Irma in 2017, 6.8 million Floridians evacuated their homes, mostly in southern Florida. US 27 was used as a major evacuation route to move Floridians north into Central Florida and outside of the state. During that time, portions of US 27 through Highlands County experienced travel times nearly four times higher than normal. This is not sustainable in a worst-case scenario emergency.

Mass evacuation events such as Hurricane Irma demonstrate that US 27 along with Florida's main interstates do not have the capacity to handle the totality of traffic evacuating as well as the need to support the movements of disaster response teams and recovery fleets. As storm frequency and intensity increase due to changing climate conditions, additional capacity is needed on the transportation network to serve regional evacuation trips and alleviate the increased congestion and travel times on the US 27 corridor.

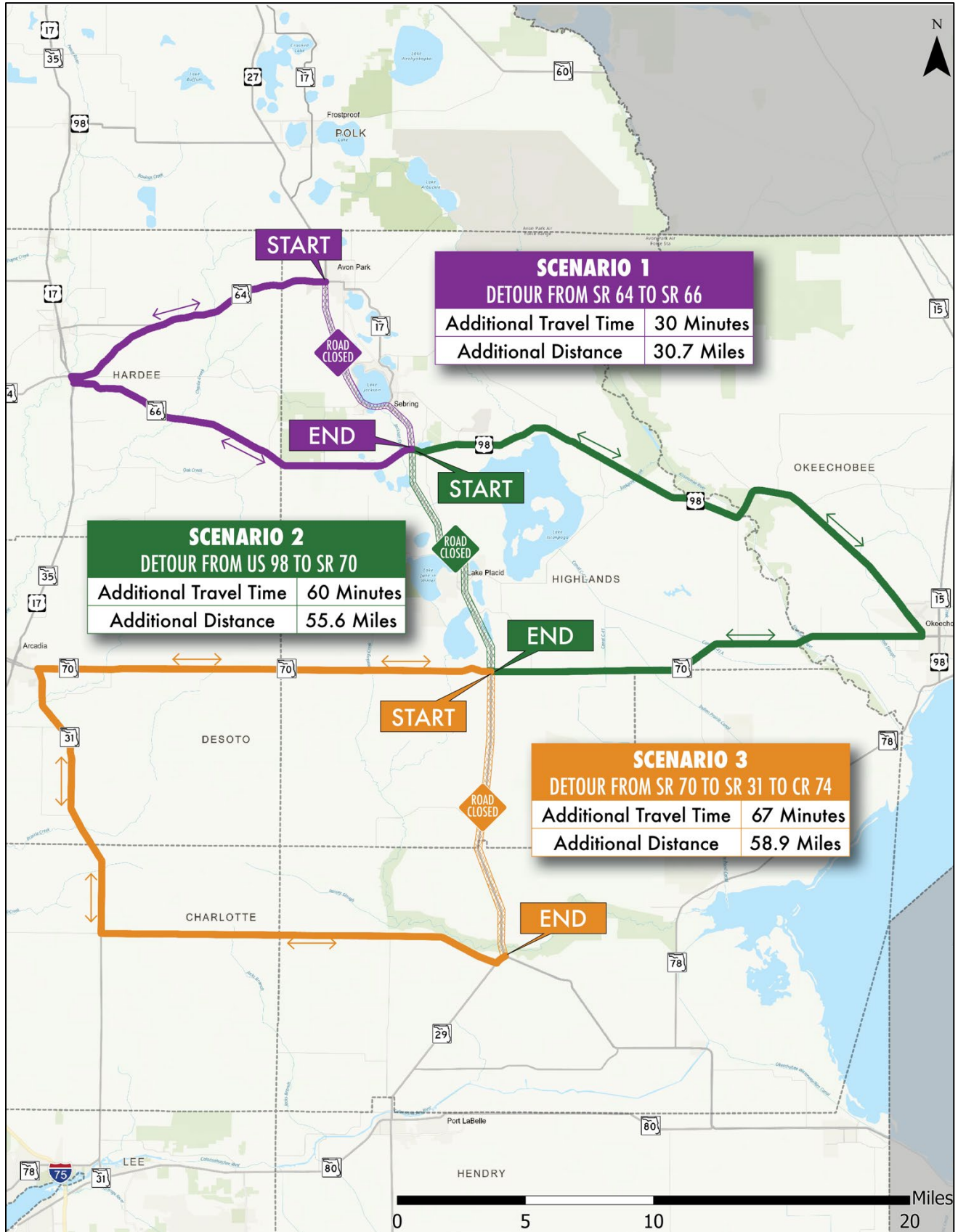
Within the Heartland region, there are currently no limited-access, north-south roadway facilities, and north-south routes are limited mainly to US 27 and US 17. An analysis of available detours from the District One Arterial Rural Highways Study demonstrates that if US 27 is obstructed, the next best available route will take an average of 52 minutes longer and will add 48 additional miles to the trip length (**Figure 15** and **Table 11**). This intensifies when multiple facilities are obstructed or fail due to crashes, major weather events and natural hazards such as wildfires and flooding. This lack of options for detours makes US 27 and the entire Southwest Florida transportation network vulnerable to natural hazard and disruptive events. This concern became substantially

magnified with the recent impacts from Hurricane Ian. Due to significant inland flooding, and with portions of I-75 impassable during the aftermath of the storm, the lack of alternate evacuation and emergency management corridors through the Heartland region was evident.

Table 11: Detour Routes and Additional Travel Time (Mins) and Distance (Miles)

Road	From	To	Alt. Route Description	Direct Travel Time	Direct Distance	Alt. Travel Time	Alt. Distance	Add'l Travel Time	Add'l Distance
US 27	SR 64	SR 66	SR 64 to SR 60	16	14.2	46	44.9	30	30.7
US 27	SR 66	SR 70	US 98 to SR 70	17	16.8	77	72.4	60	55.6
US 27	SR 70	CR 74	SR 70 to SR 31 to CR 74 / Bermont Rd	18	19.9	79	78.8	67	58.9

Figure 15: Map of Detour Routes



3. Future 2045 No-Build Conditions

Using the existing conditions analysis as a base, high level scenario planning and modeling were conducted to determine the future 2045 conditions of US 27 without improvements to the study corridor. This is known as a No-Build scenario.

3.1. Transportation Demand

The subarea validation adjustments made to the Base Year 2015 were carried over to the 2045 Cost Feasible model. The National Cooperative Highway Research Board (NCHRP) Report 765 recommends the Factoring Procedure-Difference Method and Ratio Method approach, which was further utilized to correct the error associated with the validated regional model projected volumes. The averaging from the two methods reduces the extremes that may be reached by one of the individual methods of difference method or ratio method. More details on the traffic methodology are included in **Appendix A**. As part of this Study, two alternatives were evaluated, the No-Build alternative and General-Purpose widening (or Build alternative), The results of this analysis are provided in following section. The results of the Build alternative will be discussed in **Section 4**.

The No-Build alternative from the 2045 cost-feasible model was used to predict future traffic volumes and patterns. This alternative included improvements based on the 2045 Cost Feasible Plan consisting of improvements north of the study corridor and completion of the Central Polk Parkway East and West and the Poinciana Parkway Extension, as shown in **Figure 16**. These projects have the potential to enhance the mobility of the transportation network by providing direct access to I-4 which could contribute to additional demand on US 27. The potential developments (not incorporated in current version of D1RPM), received from the Highlands County and the District 1 office (<https://arcg.is/1r5GvC>) were also included.

The No-Build model evaluation indicates that US 27 near the Highlands/Polk County Line, Sebring and south of SR 66 and north of the study corridor is predicted to be at or near capacity by 2045, resulting LOS outside the acceptable range (LOS D), according to FDOT standards, as shown in **Table 12**. Segments are divided based on the resulting LOS. Segments of US 27 operate with volume-to-capacity (V/C) ratio over 1.0 in 2045 indicating a congested transportation system. For US 27, acceptable Level of Service Standard is "D". The AADTs ranged from 17,500 to 63,000 in the No-Build along US 27 within Highlands County. The highest AADTs were observed around Sebring, south of US 98, within Avon Park and at Highlands/Polk County line. The peak hour LOS analysis shows that most of the sections along US 27 withing Sebring, at the Highlands/Polk County Line and south of SR 66 shows LOS E, and is not within acceptable LOS standards. Providing additional capacity is considered as an initial alternative to address this increase in demand and growth of the region.

Figure 17 shows the peak hour and peak direction LOS along US 27. **Figure 18** depicts the ranges of AADTs and **Figure 19** shows the daily truck volume along the US 27 study corridor. 2045 Daily Truck Volume is calculated by multiplying 2045 AADT from D1RPM and 2023 T- factors from FTO.

Figure 16: 2045 Cost Feasible Model Adjacent Projects

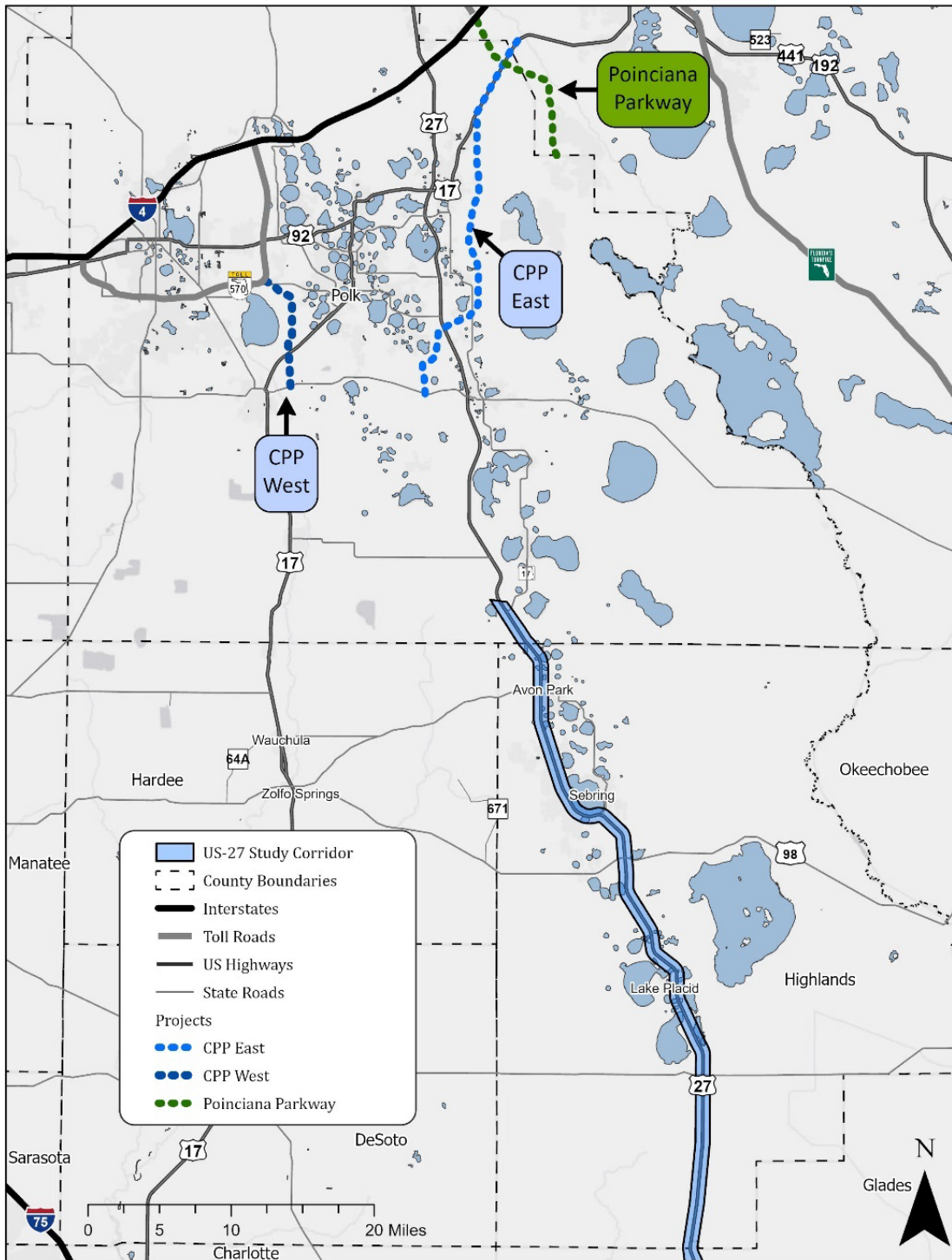


Table 12: No-Build 2045 Level of Service

FROM	TO	MAX PEAK HOUR VOLUME	SERVICE VOLUME CAPACITY LOS D	MAX V/C RATIO RANGE	PEAK HOUR-LOS
Highlands/Glades County Line	Lake Henry Dr	1,850	1,580-2,000	0.95	C
Lake Henry Dr	Touchton Rd	1,550	1,580	0.98	D
Touchton Rd	Lake Josephine Dr	1,700	1,580	1.08	E
Lake Josephine Dr	Lake Josephine Shores Rd	1,750	2,000	0.88	C
Lake Josephine Shores Rd	SR 66/US 98	2,450	2,000	1.23	E
SR 66/US 98	Sebring Pkwy	2,600	3,020	0.86	C
Sebring Pkwy	Lakeview Dr	3,050	3,020	1.01	E
Lakeview Dr	Hammock Rd	2,900	3,020	0.96	C
Hammock Rd	Sebring Pkwy	3,150	3,020	1.03	E
Sebring Pkwy	Ridge Dr	2,900	3,020	0.96	C
Ridge Dr	Highlands/Polk County Line	3,450	3,020	1.14	E

Figure 17: 2045 No-Build Peak Hour Peak Direction Level of Service

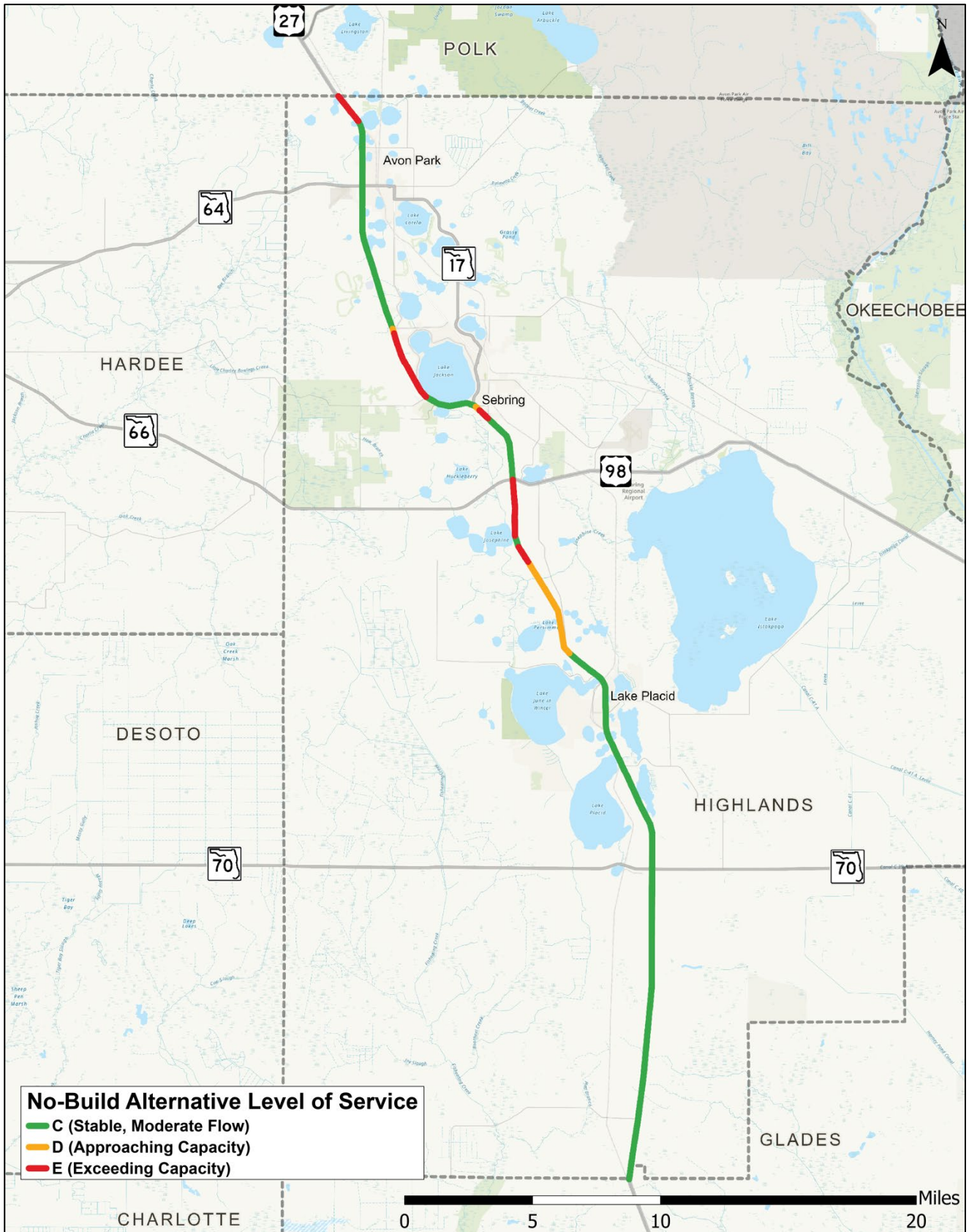


Figure 18: 2045 No-Build Daily Traffic (AADT)

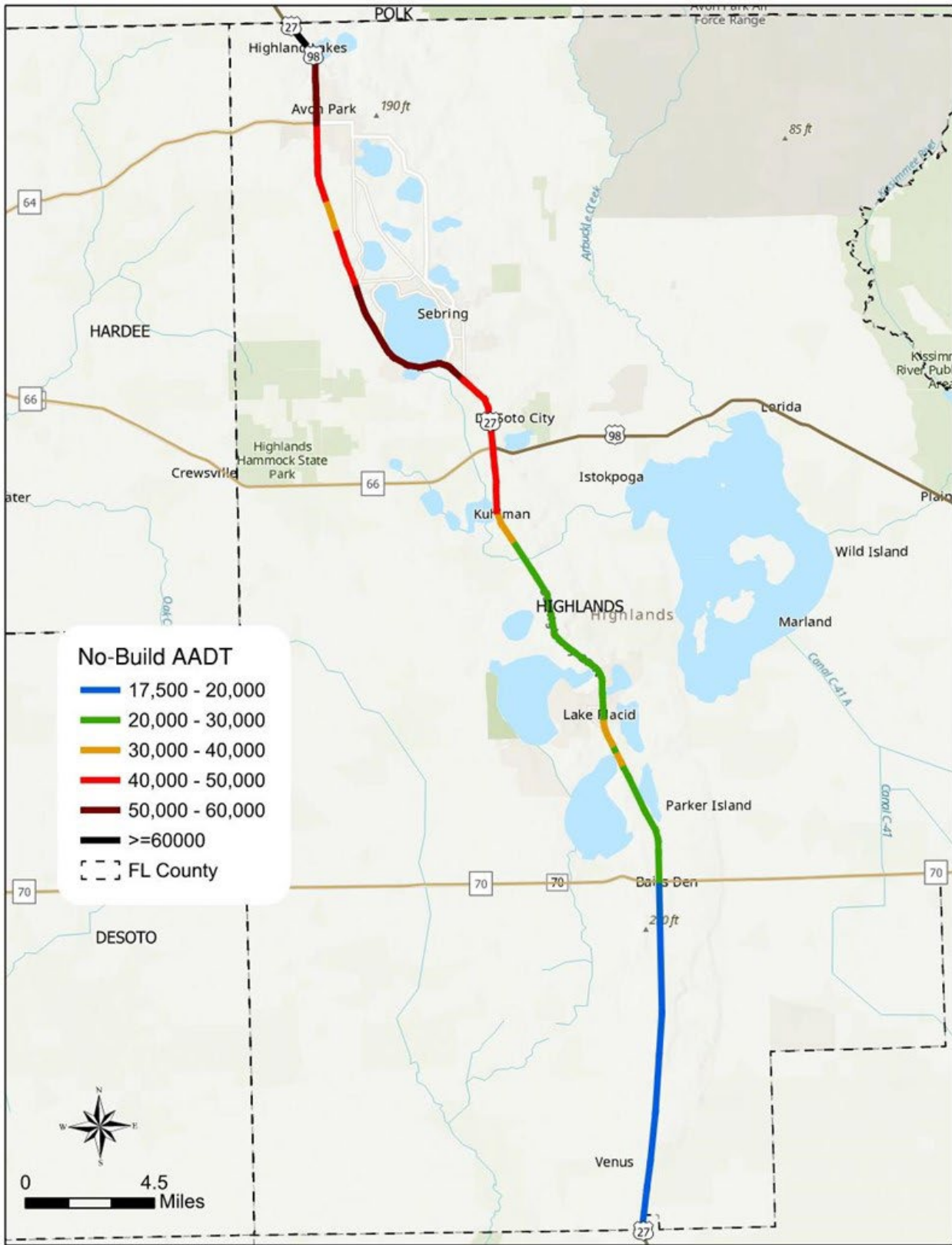
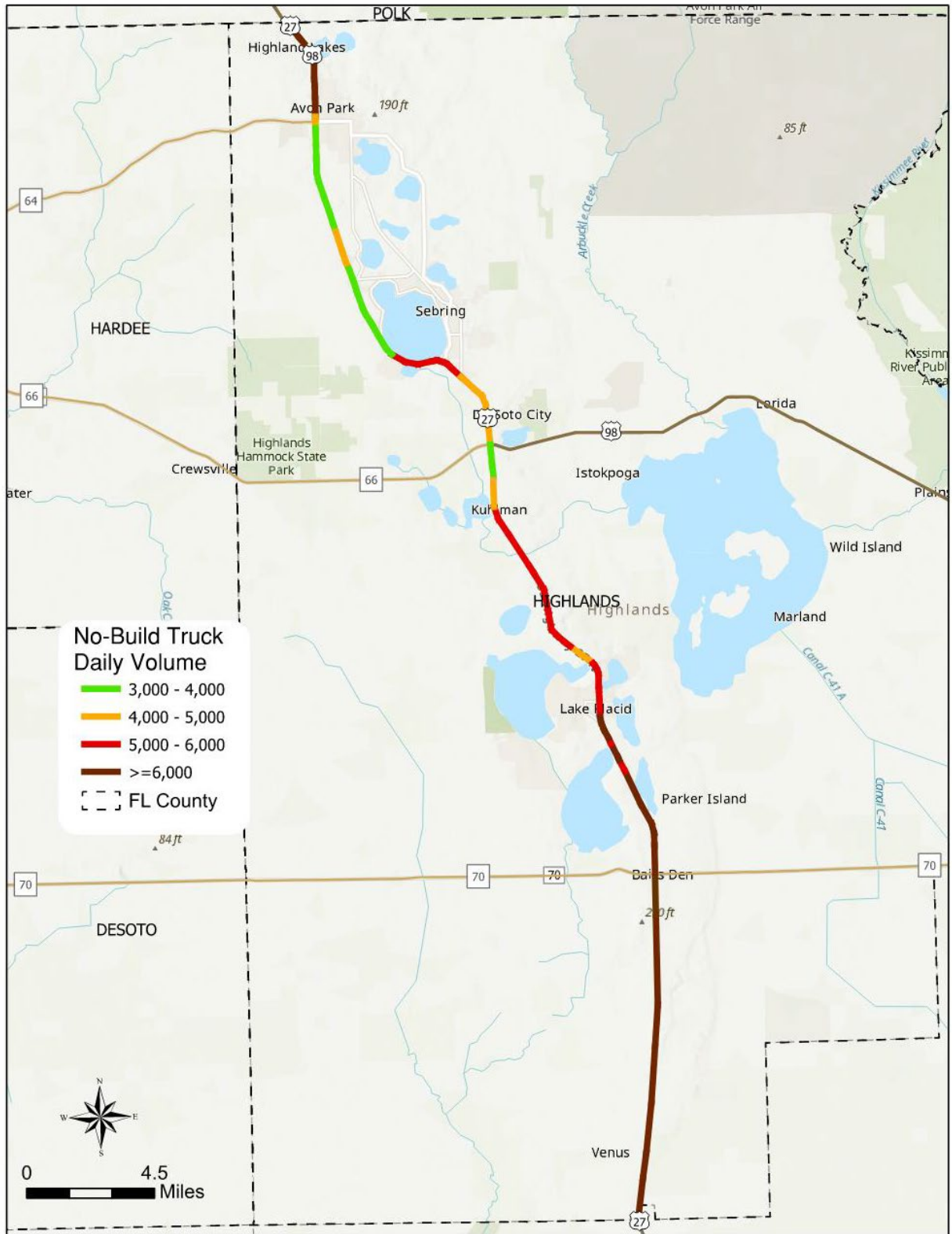


Figure 19: 2045 No-Build Daily Traffic (Truck Volume)



3.2. Land Use

Future land use data was identified from the Highlands County Planning and Zoning Department to correlate growth with its impact on the transportation network. The Heartland region is experiencing a continued trend of urbanization and the overall shift from farming and agriculture to residential and commercial uses. As the land uses and context of US 27 diversify, transportation needs to accommodate that shift and help shape future demand and travel modes. Discussions with county officials revealed major regional and planned developments that will impact US 27 travel patterns. This includes multiple new residential subdivisions that will impact access to US 27, and an influx of industrial employment generated from the Sebring Airport expansion adjacent to US 27 and the Air-Glades Aviation and America's Gateway Logistic Center south of the study corridor in Glades County. Future land use maps and discussions with county officials confirm that Highlands County will continue to welcome new residents and businesses as a cost effective and desirable alternative to coastal and Southern Florida. Continued coordination with county officials and periodically reviewing updated land use maps is necessary to ensure development does not significantly impact traffic patterns. A more detailed land use study is needed to understand future development patterns within the region and their alignment with the community vision and future roadway context.

3.3. Freight Operations

The truck volumes and truck parking utilization rates discussed in **Section 2.4 Freight Operations** indicate the need to address freight impacts. Freight activity will continue to play a significant role in the economic growth of the Heartland region. As agriculture land is redeveloped into industrial employment, freight will continue to drive the regional economy and truck traffic on the US 27 corridor. Polk County is expected to experience trade and logistics growth, the expansion of the Airglades International Airport and the development of the Americas Gateway Logistics Center to the south of the study corridor is projected to add ten thousand new industrial jobs. As noted in the Existing Conditions discussion, truck parking is already at or over capacity throughout the Heartland region. Increased freight will continue to exacerbate this demand. Freight mobility can be addressed by exploring alternative or bypass routes.

3.4. Resiliency

The detour analysis referenced in **Section 2.9. Vulnerability** demonstrated a lack of redundancy on the transportation network. Hurricane Irma in 2017 and most recently Hurricane Ian in 2022 forced mass evacuations to where Florida's north-south corridors could not handle the influx of traffic generated by evacuation, disaster response and recovery fleet movements. Furthermore, Hurricane Ian's aftermath revealed the worst-case scenario for the region with the Peace River rising and closing a 20-mile stretch of I-75, and alternative routes throughout the region. This unprecedented disaster damaged critical transportation infrastructure isolating coastal and inland communities and cutting off freight mobility in Southwest Florida. A more resilient transportation network emphasizes increased accessibility by providing alternative routes. The transportation network needs more route choices for travelers within, through and around the Heartland region. This makes the transportation system less vulnerable to major events by facilitating quicker recovery from disrupted operations. As storm frequency and intensity increase due to changing climate conditions, additional capacity and a focus on more resilient infrastructure is needed on the transportation network to help mitigate emergency and disruptive events.

4. Future 2045 Build Scenarios

Based on the existing and projected traffic analysis, the US 27 corridor was analyzed for potential widening of the general-purpose lanes by one lane in each direction to six-lane and eight-lane alternatives (depending on the existing number of through lanes today). This Study identifies where those widenings might occur. Further study would be needed to determine capacity improvements when looking at the whole area of influence as a transportation system. Capacity improvements could be improvements to the US 27 corridor directly or nearby improvements that could improve safety and the operations of US 27.

4.1. Transportation Demand and Predictive Safety

The No-Build Alternative identified projected deficiencies along the corridor if no improvements are made to address increased demand. Capacity deficiencies were noted in the No-Build Alternative as measured by LOS values that are not within the acceptable range. The major improvements included adding capacity to the segments where LOS was not within the acceptable range. The segments and their improvements are shown in **Table 13**. The resulting range of LOS are shown in **Table 14** and AADTs and peak hour analysis are shown in **Figure 20** and **Figure 21**.

The Build Alternative AADT ranges from 17,500 to 71,500. The highest AADTs were observed from Highlands/Polk County Line to south of SR 66. The analysis of the widening capacity improvements addressed the vehicular capacity issues along most of the areas compared to the No-Build Alternative. However, with an increase in capacity within the improvement limits induced additional demand from nearby roadways onto the adjacent sections of US 27. This additional demand triggered sections of US 27 to operate at an LOS that is not within the acceptable range, further exasperating the capacity issues within the study area compared to the No Build. Compared to the No-Build Alternative, the Build Alternative may address some of the project capacity issues but additional study would be needed to determine if this is a truly viable option that address demand along with safety, evacuation, freight and other functional needs of the corridor.

Table 13: Improvements for Sections on US 27

FROM	TO	Improvements
Touchton Rd	Lake Josephine Dr	Adding one lane capacity along each direction
Lake Josephine Shores Rd	SR 66/US 98	
Sebring Pkwy	Lakeview Dr	
Hammock Rd	Sebring Pkwy	
Ridge Dr	Highlands/Polk County Line	

Table 14: Level of Service analysis along US 27 for General-Purpose Lane Widening Alternative

FROM	TO	MAX PEAK HOUR VOLUME	SERVICE VOLUME CAPACITY LOS D	MAX V/C RATIO RANGE	PEAK HOUR-LOS
Highlands/Glades County Line	Lake Henry Dr	1,850	1,580-2000	0.95	C
Lake Henry Dr	Touchton Rd	1,600	1,580	1.01	E
Touchton Rd	Desoto Dr	3,100	3,020-4,040	0.88	C
Desoto Dr	Lakeview Dr	3,100	3,020	0.99	D
Lakeview Dr	W Main St	3,200	3,020-4,040	0.96	C
W Main St	Palmetto St	3,000	3,020	0.99	D
Palmetto St	County Rd	3,150	3,020	1,04	E
County Rd	Highlands/Polk County Line	3,950	4,040	0.97	C

*- The generalized peak hour directional volumes for Florida's rural areas have a limit of 3-lane divided roadways, hence capacity of 1-lane is added to 3-lane divided roadways for the capacity analysis for 4-lane rural roadways.

Predictive Safety

The Crash Reduction Factors (CRF) developed by FDOT were applied to proposed improvements in the study area. FDOT Safety Office Crash Reduction Analysis Safety Hub (CRASH) program is a safety improvement tools used by FDOT to conduct benefit-cost analyses and calculate CRF (https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/qa/tools/crfguide.pdf?sfvrsn=2e360f88_2). The improvement in the Build Alternative decreases the total crashes by 13%. However, the improvement increases sideswipe, fixed-object, wrong-way and pedestrian crashes.

Figure 20: 2045 Build Alternative - General-Purpose Lane Widening AADT

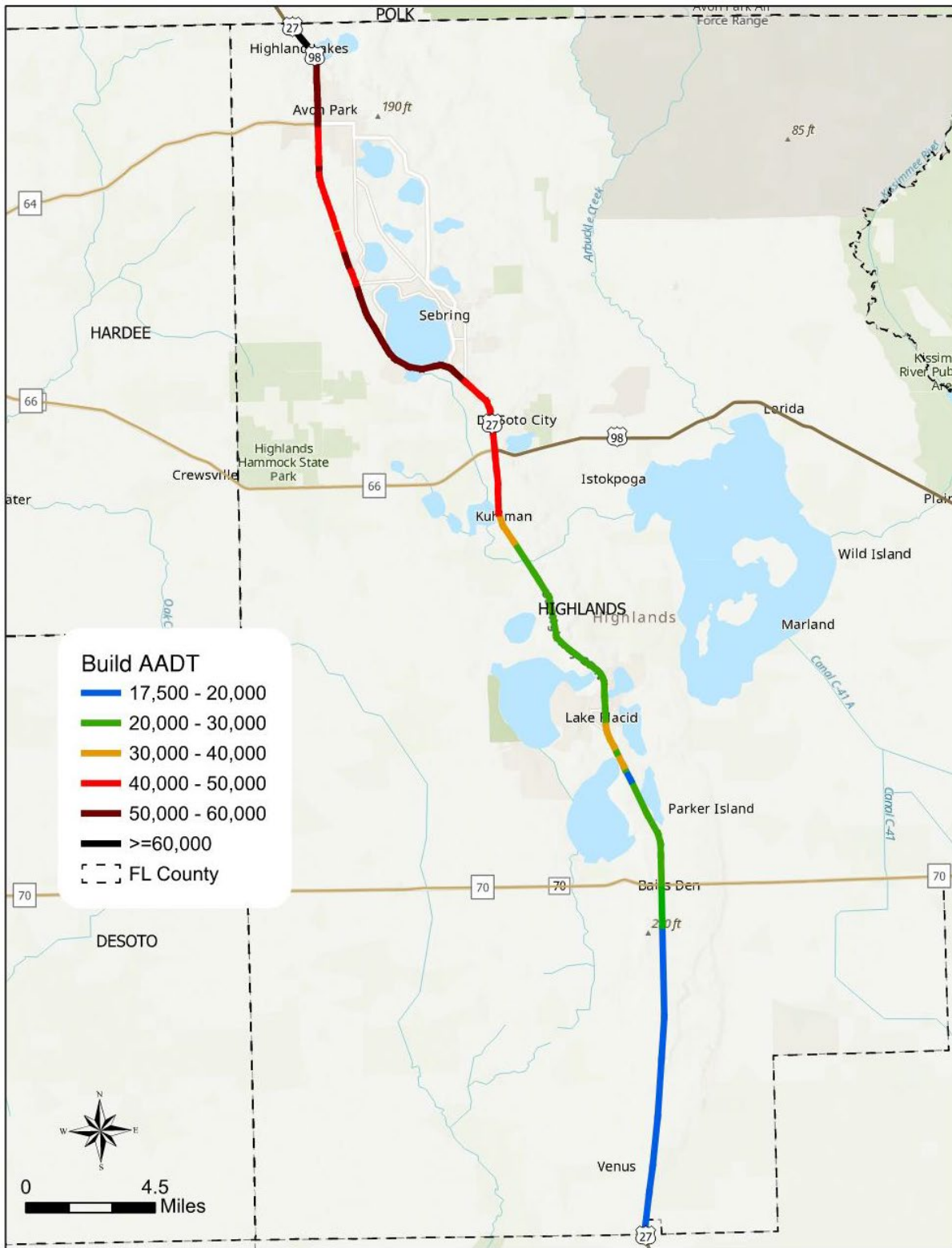
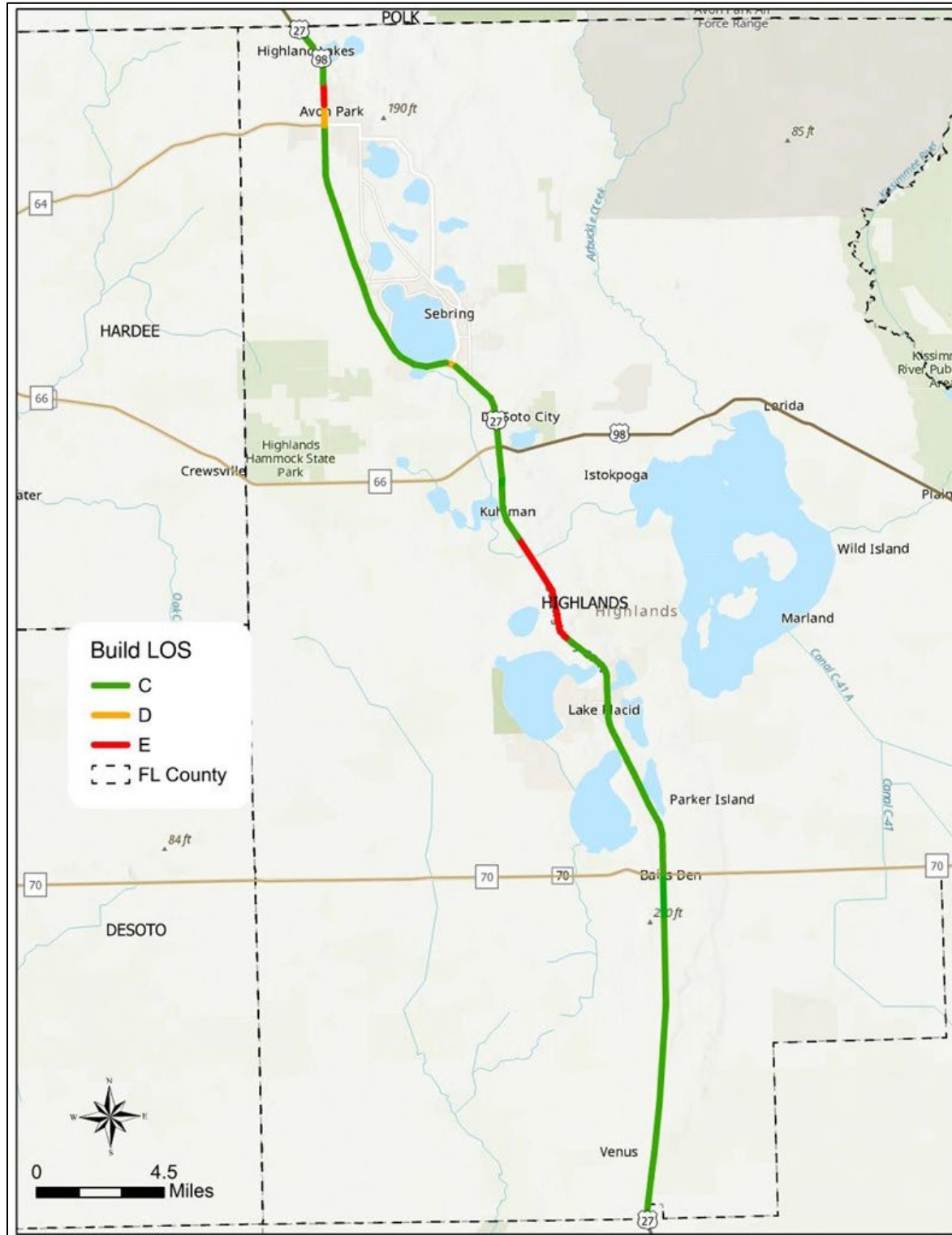


Figure 21: 2045 Build Alternative - General-Purpose Lane Widening Peak Hour Peak Direction LOS



4.2. 2045 Typical Sections

Proposed roadway typical sections were evaluated for the locations noted in **Table 13**. **Figure 22** and **Table 15** show the number of lanes in each direction included in the proposed typical sections.

4.3. Structures

Although eight bridges are located along US 27 within the project study limits, an analysis of bridge capacity improvements were not completed as part of this study. Improvements to these structures will be considered in future studies.

4.4. Cost Estimates and ROW Impacts

Table 15 shows planning-level construction cost estimates and the potential number of parcels impacted for each segment where widening was evaluated. Cost estimates (updated 9/5/2024) are based on the 2045 Build Scenario and generated using FDOT cost per mile models with 25% added for project unknowns. Estimates do not include structures, right-of-way, utilities, potential contamination remediation or amenities such as trailheads, parking, and wayside areas. The following project development phases were estimated as a percentage of the construction cost: PD&E at 8%, design at 12%, Construction Engineering and Inspection (CEI) at 12%. Environmental mitigation was estimated at \$12.5 million.

The outsized cost and ROW impacts relative to the desired outcome would appear to indicate that six and eight-lane widening alternatives are not feasible. The study demonstrates that a significant improvement in the critical areas of safety, freight mobility and detour route/evacuation can be achieved by diverting traffic onto an alternate parallel corridor, acting as a relief for US 27 and reducing or eliminating the need to widen US 27.

Table 15: Planning-Level Construction Cost Estimates and ROW Impacts

FROM	TO	EXISTING NUMBER OF LANES EACH DIRECTION	PROPOSED NUMBER OF LANES EACH DIRECTION	WIDENING COST PER MILE	LENGTH (MILES)	TOTAL COST	POTENTIAL PARCELS IMPACTED
Touchton Rd	Lake Josephine Dr	2	3	\$ 6,046,201	0.59	\$ 3,600,000	19
Lake Josephine Shores Rd	SR 66/US 98	2	3	\$ 6,046,201	2.12	\$ 12,800,000	45
Sebring Pkwy	Lakeview Dr	3	4	\$ 13,025,235	1.00	\$ 13,000,000	53
Hammock Rd	Sebring Pkwy	3	4	\$ 13,025,235	3.00	\$ 39,100,000	140
Ridge Dr	Highlands/Polk County Line	3	4	\$ 7,283,921	1.82	\$ 13,300,000	47
CONSTRUCTION COST SUBTOTAL					8.53	\$81,800,000	304
						Environmental Mitigation	\$ 12,500,000
						PD&E (8%)	\$ 6,500,000
						Design (12%)	\$ 9,800,000
						CEI (12%)	\$ 9,800,000
						TOTAL ESTIMATED BUILD ALTERNATIVE COST	\$ 120,400,000

Note: FDOT Cost per Mile Estimates Used. Rural 4 to 6 lane estimate was modified for the 6 to 8 lane rural scenario as that scenario was not available.

Figure 22: Build Alternative Lanes (Each Direction)



4.5. Summary

In summary, general-purpose lane widening/capacity alternatives along US 27 alone may not fully address projected traffic demand and the need for improved safety, efficient freight movement, additional evacuation options and enhanced mobility options for all modes. The anticipated induced demand may cause further capacity constraints outside the improvement limits or push existing bottlenecks into Polk County between the Highlands County line and the CPP East or Poinciana Parkway Extension improvements. Additionally, the Build Alternatives evaluated are projected to result in increased crashes, especially nonmotorized crashes.

Additional studies are recommended to look at a combination of Build Alternatives on and off the US 27 corridor to achieve a solution that increases regional mobility for all travelers and addresses the additional corridor needs not related to travel demand. This Study identified a potential change in character along the US 27 corridor that could be further understood through field data collection and analysis including planning-level study outreach to stakeholders. If no improvements are made to US 27 and its area of influence, conflicts will continue to persist with the anticipated land use changes and increases in vulnerable road user activity. The current US 27 corridor should be evaluated to better understand and address the needs for the motorized and non-motorized roadway users and address the context and purpose of the corridor, while maintaining efficient access to key business, residential, and activity centers and regional economic development.

Table 16 shows a summary comparison of the 2045 conditions between the No-Build Alternative and the Build Alternative. Traffic volumes are slightly higher, but congestion levels remain in the same range.

Table 16: 2045 Comparison of the Build and No-Build Alternatives Summary

	2045 No-Build	2045 Build
Traffic (AADT)	17,500-63,000	17,500-71,500
V/C Ratio	0.86 – 1.23	0.88 – 1.04
LOS	LOS C- LOS E	LOS C- LOS E
ROW Impacts	N/A	0-304 parcels
Costs (Million \$)	N/A	\$120M

5. Recommendations

Based on the needs outlined in this report, several actions are recommended. The recommendations consist of:

- A Mobility Analysis with more detailed analysis focused on a larger section of US 27
- A PD&E study to connect SR 70 and SR 66
- A PD&E study to connect SR 66 to US 98

In addition, a Corridor Access Management Plan (CAMP) is proceeding independent of this study's findings. Discussions with District One Safety Office staff provided the team with insight into upcoming access management reviews of the corridor study limits. The crash analysis, coupled with local complaints and coordination with the Community Traffic Safety Team, have prompted the District to pursue access modifications.

5.1. Mobility Analysis

A comprehensive feasibility study is recommended to ensure the US 27 corridor adequately accommodates the evolving transportation demands of the Heartland region. Expanding the analysis area to include Polk County will capture the regional impacts of land use and planned developments, freight growth and new strategic network connections, including improvements on SR 60 and Central Polk Parkway at the north end and SR 70 at the south end. This approach will continue to evaluate opportunities for improvements along the existing US 27 corridor and adjacent communities to support the stated purpose, in addition to addressing critical considerations for the corridor's future:

- **Land Use Integration:** The study should incorporate future land-use data from Highlands County Planning and Zoning. This data will be instrumental in understanding how anticipated developments such as county-wide thirty 6% of population growth adjacent to US 27, notably residential subdivisions, approximately twenty 5% growth in employment including industrial growth near Sebring Airport, will have major impact on traffic patterns. This knowledge will inform strategies to manage future demand and encourage multi-modal transportation options in growing communities. Additionally, a more detailed land-use study encompassing Polk and other neighboring counties would provide a holistic view of regional development trends and their alignment with the overall transportation vision.
- **Strategic Freight Management:** The study should delve into freight operations within the corridor. US 27 is a major SIS corridor and designated as regional facility that provides high-capacity connections between limited access facilities and regional freight activity centers, serving the region through movements for long-haul truck trips and accommodating high volumes of truck traffic. One of the major goals identified by Florida trade and logistics 2030 is elevating the gross domestic product, jobs and manufacturing output. Highlands County anticipates around 60% growth in value of commodity flow by 2045. Additionally, 97% of freight movement is by trucks in the county. This consists of truck percentage from ten to 40% along the corridor. Considering the projected trade and logistics growth in Polk County, along with the expansion of logistics centers across the regions, integrating freight into the transportation network becomes crucial. This proactive approach will not only alleviate congestion on US 27 but also improve efficiency for the growing regional economy.
- **Enhanced Network Resilience:** Recent hurricane events highlighted the lack of redundancy within the current transportation network. The study should identify strategies to improve route options

within, through, and around the Heartland region. This will enhance network resilience by facilitating quicker recovery and smoother evacuation during emergencies. Given the increasing frequency and intensity of extreme weather events, the study should also explore the need for additional capacity and more resilient infrastructure to mitigate disruptions.

- **Addressing Capacity and Beyond:** The proposed Build Alternative from this study requires further analysis to understand unintended consequences. While it might address capacity issues in specific areas, it could potentially push congestion to other sections of US 27, particularly around Avon Park, or even into Polk County. A comprehensive study encompassing Polk County is necessary to determine if the Build Alternative truly addresses all functional needs of the corridor, including safety, evacuation capabilities, and freight movement.
- **Prioritizing Safety:** The study should prioritize safety improvements throughout the corridor, as over 40% of crashes resulted in injury over the analysis years. The analysis shows an increase in fatal crashes along the corridor for vulnerable road users. The current crashes involving vulnerable road users, and crashes involving other modes especially trucks, requires significant attention. Diverting freight traffic could be a transformative solution. This would not only reduce crashes but also create opportunities for pedestrian and bicycle infrastructure in growing communities like Sebring and Avon Park, fostering a safer and more vibrant environment for residents.
- **Redefine Context Zones:** As noted in Section 2.5, the variability in context zones create sections of the corridor that inadvertently encourage higher speed differentials among vehicles. Coupling higher speed differential with significant truck traffic results in error-prone driver behavior – increasing the likelihood of crashes. This is supported by the crash analysis, wherein careless driving, and failure to yield represented the two highest contributing causes to reported crashes both involving and not involving injury. Redefining the US 27 context zones can help shape the future desired conditions for the corridor. The Rural Towns and Suburban contexts should support local traffic and nonmotorized activity. This will allow FDOT to collaborate with local communities in redefining the context zones along the US 27 mainline. For example, the C2T (Rural Town) context zone in downtown Lake Placid and Avon Park could be re-designed to incorporate Complete Streets elements that emphasize pedestrian and bicycle activity.
- **Synergy with regional Improvements:** Proposed improvements along SR 70 and the Central Polk Parkway could significantly impact traffic flow on US 27 and within the region. The Mobility Analysis will ensure these projects are coordinated for optimal system linkage and network resilience.

Improvements to the existing US 27 corridor to improve safety could be incorporated into the Mobility Analysis including a Speed Harmonization Study:

- Throughout the study corridor, it was noted that the existing posted speed varies substantially from 65-45 miles per hour. Furthermore, it is noted that the posted speed limits do not align directly with the context zones. This inconsistency may cause motorists to avoid altering their operating speed, as the context clues in the built and natural environments may not dissuade them from maintaining their higher speeds.
- It is recommended that FDOT conduct a speed harmonization analysis within the project limits. If possible, while reconfiguring context zones, consider speed management design strategies that would support more homogenous speeds for this corridor.

By taking a comprehensive approach that considers future development, freight movement, network resilience and safety, the Mobility Analysis can ensure the corridor remains a vital transportation artery that supports economic growth, safety and a high quality of life for the Heartland region.

5.2. PD&E Study from SR 70 to SR 66

A PD&E study is recommended between SR 70 and SR 66 due to several critical factors:

- **Network Resiliency:** Recent detour analyses revealed the vulnerability of Southwest Florida's transportation network with significant detour lengths if portions of SR 70, SR 66 or US 27 are closed. The PD&E study will explore ways to improve network resilience.
- **Emergency Evacuation:** During natural disasters or disruptive events, the regional network has been stressed and analysis show delays at critical chokepoints. The PD&E study will explore ways to ensure smoother emergency evacuation and faster recovery.
- **Freight Mobility:** Detailed freight analysis will help determine the origin and destination points for truck traffic within the Heartland region. Additionally, this study will explore the identification and prioritization of truck routes.
- **Synergy with SR 70 Improvements:** Proposed improvements along SR 70 could significantly impact traffic flow on US 27 and within the region. The PD&E study will ensure these projects are coordinated for optimal system linkage and network resilience.
- **Development Potential on US 98:** Understanding future regional development trends and their impact on the transportation system is crucial for informed planning and infrastructure investments. Anticipated developments along US 98 necessitate a comprehensive study to ensure proper connection between the two corridors. This will improve overall network efficiency and cater to future needs.
- **Safety Concerns:** This section of US 27 between SR 70 and SR 66 exhibits high crash rate exceeding both statewide and district averages. Notably, the segment experiences a significant presence of truck traffic of nearly 30%. Fourteen out of 56 serious injury truck crashes and six out of 21 fatal crashes involved trucks. The study will focus on both segment and intersection improvement alternatives to enhance safety for all road users.

5.3. PD&E from SR 66 to US 98

This segment spanning approximately 25 miles along US 27 needs significant safety and mobility enhancements due to the factors listed below.

- **Land Use Changes:** Urbanization and change in land uses around Sebring area and in Polk County will have more impact on this section. This is a vital corridor section in Highlands County, serving both regional and local traffic. With anticipated growth in both commercial and residential land use, over 90% around US 98 and SR 60, this section will experience increased passenger and freight traffic.
- **Traffic Congestion:** The PD&E will explore options to improve future traffic congestion and forecasting. Currently, by the year 2045 SR 66 to US 98 will not meet the needs and capacity of the corridor even with consideration of expanding lanes. This segment has highest growth in traffic in the Highlands County. The Study identified sections with AADT close to 63,000 for the No Build and 71,500 for the Build Alternative. This drastic impact on the existing facility needs to further be studied to mitigate the congestion and enhance safety.

- **Safety Concerns:** Over 60% crashes were observed within the study area during the analysis years. The fatal crash percentage is more than twice the state/national average (0.5%). The intersection crashes were also the high along this segment, with intersection at Sebring Parkway being highest (126 crashes). Vulnerable road users are also at risk, with over 60% crashes and six fatal crashes in this section occurred along this section of the study limits. This PD&E will identify areas in need of systemic safety improvements that help reduce crashes and make drivers more aware of vulnerable road user activity.
- **Freight Mobility and safety:** Detailed freight analysis will help determine the local and regional freight traffic in this segment. Additionally, this study will identify the alternatives to enhance the freight mobility. Over 20% of total fatal crashes in this section involved trucks. The analysis shows a potential need for alternative route in this area and enhancing the safety.

6. Conclusion

Freight needs and regional growth, along with the changing context of US 27 in urbanized areas, necessitates a review of network connectivity and freight mobility. Additionally, capacity is needed on the transportation network to serve regional evacuation trips and alleviate increased congestion and travel times in the urban areas of the US 27 corridor. This study recommends a Mobility Analysis, a PD&E study from SR 70 to SR 66 and a second PD&E study from SR 66 to US 98 to identify opportunities to enhance safety, increase network resiliency, support freight mobility, and improve travel options throughout the Heartland region.

Considerations for future US 27 improvements include:

- Increased bicycle/pedestrian crashes and shifting agriculture land use to residential development along US 27 indicate a change in character along the corridor.
- The US 27 corridor is still the major freight route through the Heartland despite land use changes. With heavy freight traffic and the community's desire to be more bike and pedestrian friendly, appropriate improvements will need to be addressed along the corridor.
- Large storm events in recent years have required US 27 to be used as a detour or emergency evacuation route. Resiliency must be considered for future improvements to the US 27 corridor to maintain a viable evacuation route for the Heartland.

Appendix A

Traffic Technical Memo

DRAFT

Traffic Technical Memorandum
Highlands County Feasibility Study

FPID 449503-1
Highlands County, Florida

Prepared for:



Florida Department of Transportation (FDOT)

August 2024

EXECUTIVE SUMMARY

US Highway 27 is a major north-south controlled access roadway that plays an important role in regional mobility and the state economy. With connections throughout Florida and into other states, US 27 is a part of the state's Strategic Intermodal System (SIS). The SIS is a statewide network of high-priority transportation facilities, including the state's largest and most significant commercial airports, spaceport, deep water seaports, freight rail terminals, passenger rail and intercity bus terminals, rail corridors, waterways, and highways. In providing direct access between South and Central Florida regions, it also acts as a major truck route being a part of Federal Highway Administration National Highway Freight Network (Critical Urban Corridor), and connects with several other important SIS facilities in the state. US 27 also designated as an important evacuation route by Florida Division of Emergency Management connecting other major arterials in District 1. Improvements along US 27 will increase capacity, and efficiency, leading to improved evacuation and emergency response times.

The US 27 Corridor under evaluation in Highlands County is a divided facility with majority of facility running along urbanized areas. The study area represents the vital corridor in the transportation network for the Sebring-Avon Park Urbanized Area and provides access to employment, residential neighborhoods, and recreational destinations, and services. The District One Regional Planning Model (D1RPM) estimated population growth of 54% and employment growth of 62% for the district and 54% growth in population and 37% growth in employment for the Highlands County. Aviation and its related industries have shown significant potential in recent years and are identified as continuing to have regional impact in the future. The Sebring Airport is expected to have major impact on trade and logistics, and employment, in the years to come as per LRTP.

Daily traffic volumes through the Sebring and Avon Park communities are the highest within the study area. US 27 around Avon Park and northward are predicted to be at or near capacity by 2045, making the quality of transportation service unacceptable by FDOT standards. The 2045 cost feasible model includes network improvements to the north of the study area including the completion of the Central Polk Parkway East and the Poinciana Parkway Extension.

Per the District One Freight Mobility and Trade Plan, US 27 is the lifeline of the agriculture industry for the Heartland region. Per the D1RPM v2.0 freight growth, along with the changing context of US 27 in urbanized areas, necessitates a review of alternative north-

south corridors to reduce freight impacts on the corridor and the surrounding community. Per Florida Traffic Online (2023), the northern and southern portions of the study corridor feature high truck percentages, 20%-40%, with truck daily volume around 4,500 and while the urbanized areas experience truck daily volume around 3,500.

US 27 has served as a major hurricane evacuation especially during hurricane Irma and as part a of I-75 detour following the interstate's temporary closure post hurricane Ian. During Irma, portions of US 27 through Highlands County experienced travel times nearly four times higher than normal. Mass evacuation events such as Hurricane Irma demonstrate US 27 along with Florida's main interstates do not have the capacity to handle the totality of traffic evacuating as well as the need to support the movements of disaster response teams and recovery fleets as storm frequency and intensity increase due to changing climate conditions.

Maintaining efficient access to key business, residential, and activity centers, and improving capacity that will provide reliable travel times along these roadways is crucial to economic development and vitality in the region. Additionally, ensuring safe and efficient operations along US 27 is critical given that the facility is on the SIS plan and is designated evacuation routes to be used during a disaster.

A review of the D1RPM Model 2015 Base Year model was conducted to assess whether the model is replicating travel patterns in the study area of influence at a reasonable and acceptable level. The subarea model adjustments were made in the 2015 Base Year model and was carried over to 2045 model along with the updated potential developments in the subarea. The Annual Average Daily Traffic (AADTs) ranged from 17,500 to 63,000 in No-Build. Highest AADTs were observed around Avon Park, Highlands/Polk County line, Sebring area, and south of US 98.

Segments of US 27 operate with volume-to-capacity (V/C) ratio over 1.0 in 2045 indicating a congested transportation system. Based on the results of the analysis, improvement alternatives will be developed and evaluated in coordination with engineering and environmental sections. The evaluations will identify potential impacts associated with various alternatives, including impacts to other regional facilities in the project study area. A general-purpose lane widening/capacity Build alternative was evaluated.

The Build alternative AADT ranges from 17,500 to 71,500. The highest AADTs were observed from Highlands/Polk County Line to south of SR 66 within the study limits. The improvements considered from the general-purpose lane widening/capacity alternative addressed the capacity issues along most of the areas. However, with an increase in

capacity within the improvement limits induced additional demand from nearby roadways onto the adjacent sections of US 27. This additional demand triggered sections of US 27 to operate at LOS that are not within the acceptable range further exasperating the capacity issues within the study area compared than the No Build and fails to meet the purpose and need for the Highlands County.

The crash data for the five-year period from January 1, 2019 to December 31, 2023 was analyzed based on Florida Department of Transportation's Crash Analysis Reporting System and the University of Florida's Signal Four Analytics database for the US 27 from the Highlands County/Glades County Line to Avon Park Cut Off Road in Polk County. Between the years 2019 and 2023, there was a total of 2,782 crashes with an economic loss of an estimated \$903 million. Of the 2,782 crashes, there were 57 (2.04%) fatal crashes along US 27, 145 (5.2%) serious injury crashes, 1,062 (38%) injury crashes and 1,518 property damage only crashes (55%).

Multiple segments in the northern and southern limits of the study area exceed the statewide crash rate of 0.75 and district wide crash rate of 0.70 (0.83 and 2.46 respectively). While the overall, total crashes in the US 27 study corridor have decreased over years, fatal crashes have increased over the five-year period. 2% of crashes in the study corridor were fatal crashes, with the highest number occurring at US 27 and Main Street in Avon Park.

The Crash Reduction Factors (CRF) developed by FDOT is used for the improvements in the study area. FDOT Safety Office Crash Reduction Analysis Safety Hub (CRASH) program is a safety improvement tools used by FDOT to conduct benefit-cost analyses and calculate CRF (https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/qa/tools/crfguide.pdf?sfvrsn=2e360f88_2). The improvement in the alternative by 'lanes added to the travel way' decreases the total crashes by 13%. However, the improvement increases the sideswipe, fixed-object, wrong-way, and pedestrian crashes.

In summary, general-purpose lane widening/capacity alternatives along US 27 is not viable considering the induced demand causing further capacity constraints outside the improvement limits and doesn't meet the purpose and need for the corridor as the crashes also increases with lane widening.

The need to identify an alternative corridor to US 27 that provides the critical mobility for the travelers and trucks along with providing the necessary resiliency needs to be examined. The current US 27 corridor can be reconfigured to address the needs for the



vehicular and vulnerable road users, address the context and purpose of the corridor while maintaining efficient access to key business, residential, and activity centers, and economic development and vitality in the region.

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Acronyms

AADT	Annual Average Daily Traffic
BEA	Bureau of Economic Analysis
BEBR	Bureau of Economic and Business Research
CAR	Crash Analysis Reporting System
CRASH	Crash Reduction Analysis Safety Hub
CFRPM	Central Florida Regional Planning Model
CFX	Central Florida Expressway
CRF	Crash Reduction Factors
D1RPM	District One Regional Planning Model
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FTO	Florida Traffic Online
HSM	Highway Safety Manual
I	Interstate
LOS	Level of Service
L RTP	Long Range Transportation Plan
NCHRP	National Cooperative Highway Research Program
OCX	Osceola County Expressway Authority
PD&E	Project Development & Environment
RMSE	Root Mean Square Error
SFA	Signal Four Analytics
SIS	Strategic Intermodal System

1. INTRODUCTION

US Highway 27 is a major north-south controlled access roadway that plays an important role in regional mobility and the state economy. With connections throughout Florida and into other states, US 27 is a part of the state's Strategic Intermodal System (SIS). The SIS is a statewide network of high-priority transportation facilities, including the state's largest and most significant commercial airports, spaceport, deep water seaports, freight rail terminals, passenger rail and intercity bus terminals, rail corridors, waterways, and highways. In providing direct access between South and Central Florida regions, it also acts as a major truck route and connects with several other important SIS facilities in the state. US 27 also designated as an important evacuation route by Florida Division of Emergency Management connecting other major arterials in District 1. Improvements along US 27 will increase capacity, and efficiency, leading to improved evacuation and emergency response times.

US 27 serves as the main arterial through Highlands County connecting the Heartland region Florida including the six counties of DeSoto, Glades, Hardee, Hendry, Highlands and Okeechobee to South Florida. The US 27 Corridor under evaluation in Highlands County is a divided facility with majority of facility running along urbanized areas of Highlands County including the cities of Sebring and Avon Park. The study area represents the vital corridor in the transportation network for the Sebring-Avon Park Urbanized Area in Highlands County and provides access to employment, residential neighborhoods, and recreational destinations, and services. The District 1 Regional Planning Model estimated population growth of 54% and employment growth of 62 % for the district and 54% growth in population and 37% growth in employment for Highlands County. Aviation and its related industries have shown significant potential in recent years and are identified as continuing to have regional impact in the future. The Sebring Airport is expected to have major impact on trade and logistics, and employment, in the years to come as per LRTP.

Maintaining efficient access to key business, residential, and activity centers, and improving capacity that will provide reliable travel times along these roadways is crucial to economic development and vitality in the region. Additionally, ensuring safe and efficient operations along US 27 is critical given that the facility is on the SIS plan and is designated evacuation routes to be used during a disaster.

The need for this project is to evaluate and improve safety and mobility along US 27. Ensuring safe and efficient operations along US 27 is critical given that the major arterial is on the SIS and the Florida Division of Emergency Management has designated US 27 as evacuation routes to be used during a natural disaster.

2. PURPOSE AND NEED

Florida Department of Transportation's (FDOT's) commitment towards developing a comprehensive and multimodal regional transportation systems to modernize infrastructure and prepare for the future include:

- Move people and goods safely and efficiently
- Build a comprehensive regional transportation system
- Create meaningful opportunities for public input
- Balance regional needs with community concerns
- Commit to sustainable infrastructure decisions

The purpose of this project is to improve the safety, quality, and reliability of mobility in support of existing and future demand on the US 27 corridor in Highlands County. This study will address all modes of transportation and their users including passenger vehicles, bicyclists, pedestrians, and freight movements.

Transportation Demand

US 27 serves as the main arterial through Highlands County connecting the Heartland region Florida including the six counties of DeSoto, Glades, Hardee, Hendry, Highlands and Okeechobee and the urbanized area of Highlands County including the cities of Sebring and Avon Park to South Florida. Daily traffic volumes through the Sebring and Avon Park communities are the highest within the study area. US 27 around Avon Park and northward are predicted to be at or near capacity by 2045, making the quality of transportation service unacceptable by FDOT standards. The 2045 cost feasible model includes network improvements to the north of the study area including the completion of the Central Polk Parkway East and the Poinciana Parkway Extension. These improvements will alleviate traffic on I-4 allowing for enhanced accessibility to US 27. To supplement this additional demand, the need to add capacity to the transportation system and identify alternative routes is increased. Highlands County has a higher growth potential than the model predicts, as population trends shift more inland, inland and rural communities become a more desirable and cost-effective alternative to coastal communities. Developing a greater understanding of the importance of connectivity between rural and urban areas is also important to meeting rural challenges in the corridor. The region also assumes employment growth around the major activity centers with the expansion of the Sebring Airport and the Airglades Airfield development immediately south of the study area. Highlands County will continue to experience an influx of new residents and

businesses, and the transportation system will need to accommodate future demand and the anticipated regional growth.

Safety

An analysis of safety conditions from 2019 to 2023 demonstrated the need for safety improvements on the US 27 corridor. Multiple segments in the northern and southern limits of the study area exceed the statewide crash rate, and the US 27 corridor consistently experiences one of the highest serious injury and fatal crashes per lane mile, districtwide. Overall, total crashes in the US 27 study corridor have decreased, but fatal crashes have increased over the five-year period. Almost 20% of crashes in the study corridor were fatal crashes, with the highest number occurring at US 27 and Main Street in Avon Park. Crash density was the heaviest around Sebring, with the US 27 and Sebring Parkway intersection having the highest number of crashes (80). Intersection crashes occurred mostly in the northern portion of the study area, where intersections are more heavily concentrated. There were thirty-six pedestrian crashes, seven of which were fatal, and ten bicycle crashes. Pedestrian crashes were spread throughout the study area limits, with the most fatal pedestrian crashes occurring around Avon Park, and bicycle crashes mostly occurring in the Avon Park and Sebring communities.

Freight Mobility and Operations

US 27 in Highlands County is on FDOT's SIS and is a part of the Federal Highway Administration (FHWA) National Highway Freight Network (Critical Urban Corridor). US 27 is the main truck route in the central portion of the state, operating as the main trade and distribution network, and the lifeline of the agriculture industry for the Heartland region. Freight growth, along with the changing context of US 27 in urbanized areas, necessitates a review of alternative north-south corridors to reduce freight impacts on the corridor and the surrounding community. The northern and southern portions of the study corridor feature high truck percentages, 20%-40%, with truck daily volume around 4,500 and while the urbanized areas experience truck daily volume around 3,500. Additionally, truck parking facilities in and around the study area operate beyond capacity further illustrating the prevalence of freight activity in the corridor. As surrounding counties continue to experience trade and logistics growth, freight will increasingly utilize central Florida's transportation corridors.

Regional Evacuation

As documented in the Statewide Regional Evacuation Study by the Florida Division of Emergency Management, US 27 serves as a primary north-south hurricane evacuation route



for southern portions of the state. It serves as an alternative to I-75 and I-95, supporting evacuation from the more densely populated southern Florida and coastal counties including the Florida Keys. When the State experienced Hurricane Irma in 2017, 6.8 million Floridians evacuated their homes, mostly in southern Florida. US 27 was used as a major evacuation route to move Floridians north into Central Florida and outside of the state. Portions of US 27 through Highlands County experienced travel times nearly four times higher than normal. Mass evacuation events such as Hurricane Irma demonstrate US 27 along with Florida's main interstates do not have the capacity to handle the totality of traffic evacuating as well as the need to support the movements of disaster response teams and recovery fleets. As storm frequency and intensity increase due to changing climate conditions, additional capacity is needed on the transportation network to serve regional evacuation trips and alleviate the increased congestion and travel times on the US 27 corridor. Most recently, US 27 in Highlands County served as part of the I-75 detour following the interstate's temporary closure post Hurricane Ian.

3. PROJECT DESCRIPTION & LOCATION

3.1 Project Description

US 27 serves as the main arterial through Highlands County connecting the Heartland region Florida including the six counties of DeSoto, Glades, Hardee, Hendry, Highlands and Okeechobee and the urbanized area of Highlands County including the cities of Sebring and Avon Park to South Florida. The purpose of the traffic analysis is to evaluate US 27 and identify other existing parallel and connecting facilities to US 27 that could potentially be improved to meet the purpose and need.

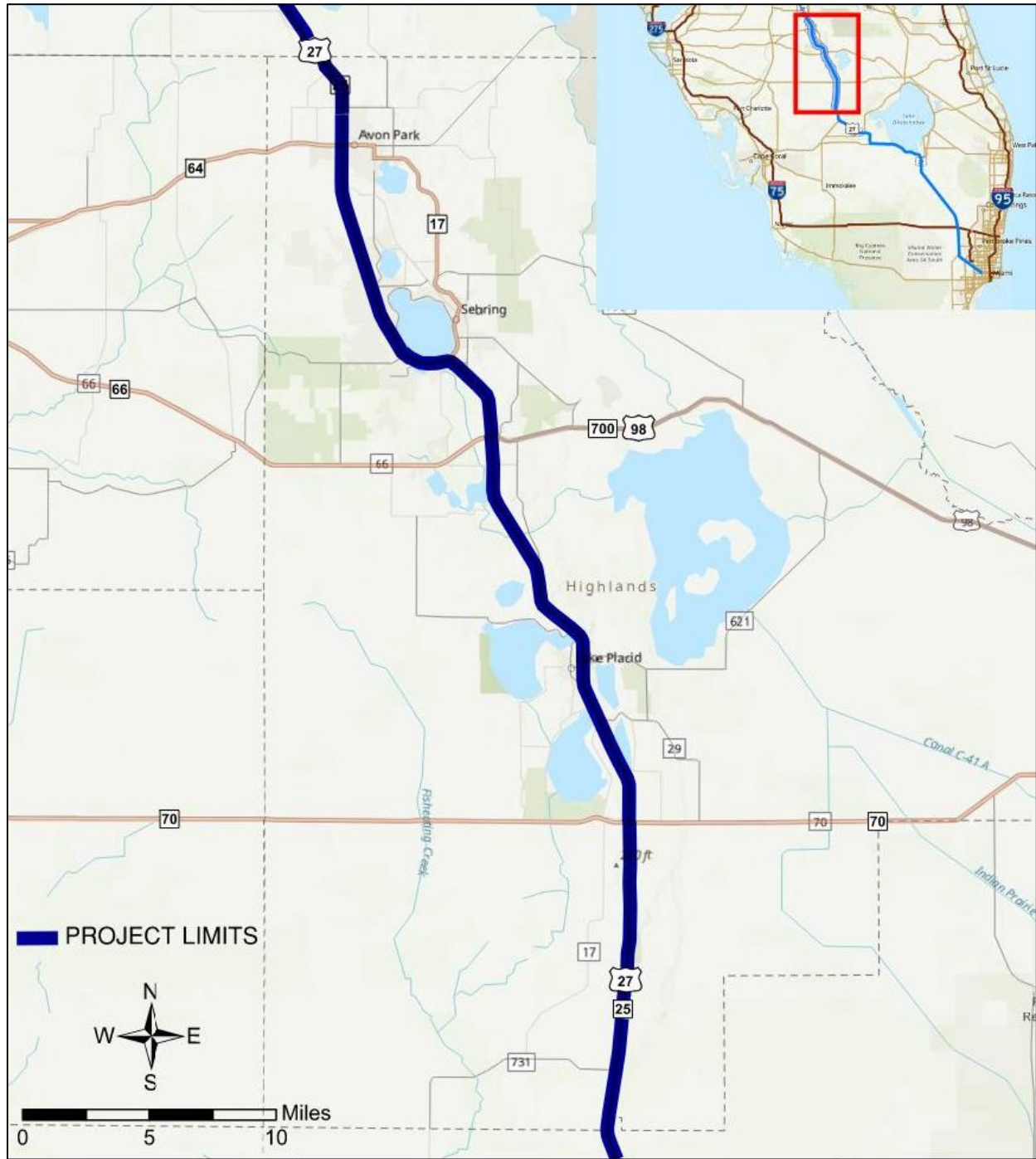
Based on the results of the analysis improvement alternatives will be developed and evaluated in coordination with other engineering and environmental sections. The evaluations will identify potential impacts associated with various alternatives, including impacts to other regional facilities in the project study area. Three (3) alternatives will be evaluated: a no-build scenario, a general-purpose lane widening/capacity alternative, and a limited-access toll facility alternative. Capacity analyses will be conducted for each alternative, as needed.

3.2 Project Location

The study limits extend approximately 56 miles of US Hwy 27/US Hwy 98 corridor in the Highlands County boundary limits. The project location and adjacent roadways are shown in **Figure 3-1**.

The major intersecting roadways along the study limits include SR 64/Avon Park Road, SR 17, SR 66, and SR 70.

Figure 3-1 – Project Location



4. EXISTING CONDITIONS

US 27 in the Highlands County is a 4-lane divided and 6-lane divided roadway with functional classification of principal arterial rural and principal arterial urban along the study area. **Figure 4-1** shows the current lane configuration and functional classification along US 27 within the study area. **Figure 4-2** shows the Annual Average Daily Traffic (AADT), and **Figure 4-3** shows daily truck percentages from Florida Traffic Online (FTO). The AADT ranges from 5,000 to 41,500 in the study area. The highest AADTs are observed along US 27 around the Lakeview Dr/Sebring. The truck percentage ranges from 6% to 43.4% in the study area with the highest truck percentages observed south of SR 70.

Figure 4-1 – Lane Configuration and Functional Classification

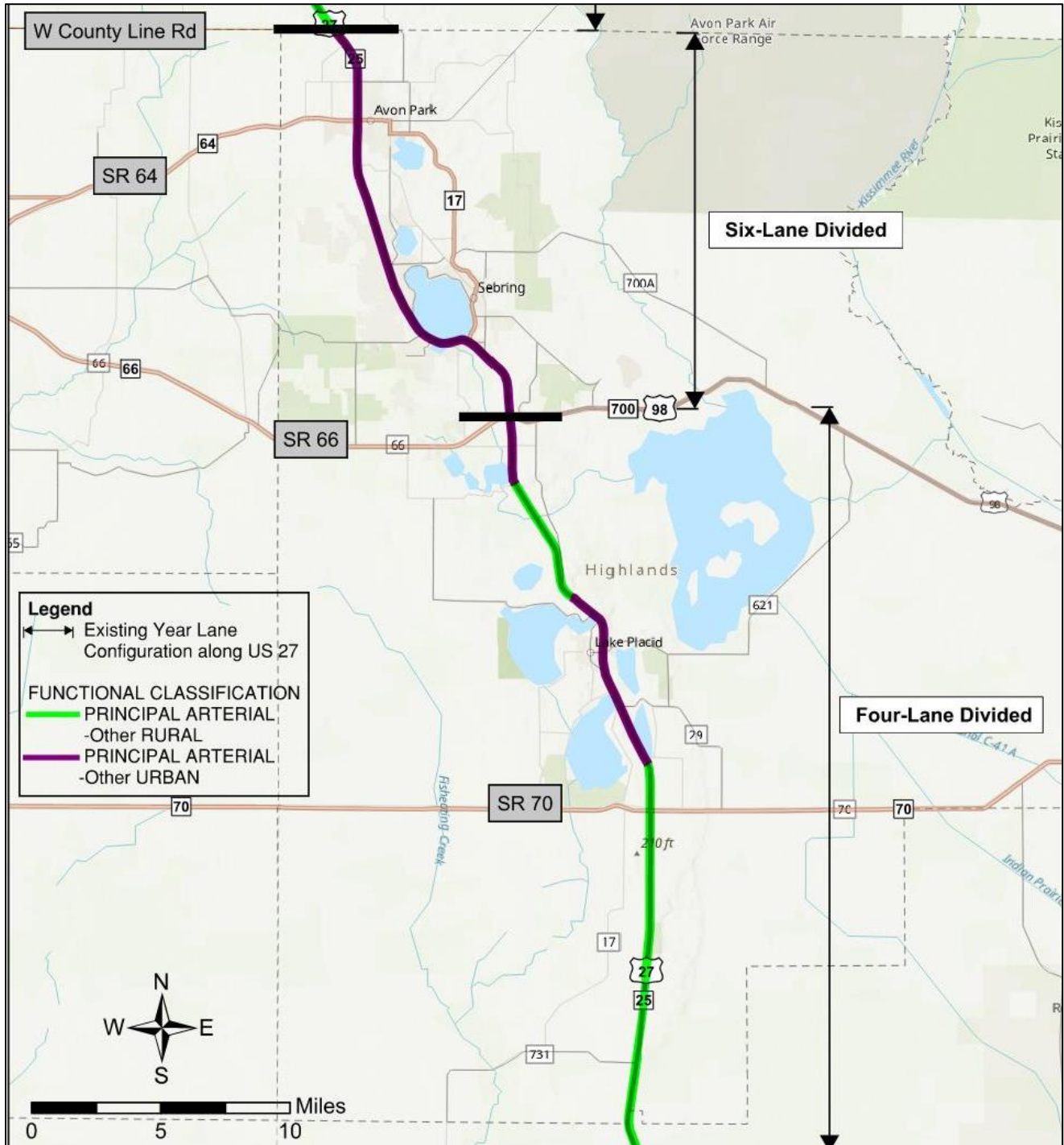


Figure 4-2 - 2023 AADT from Florida Traffic Online

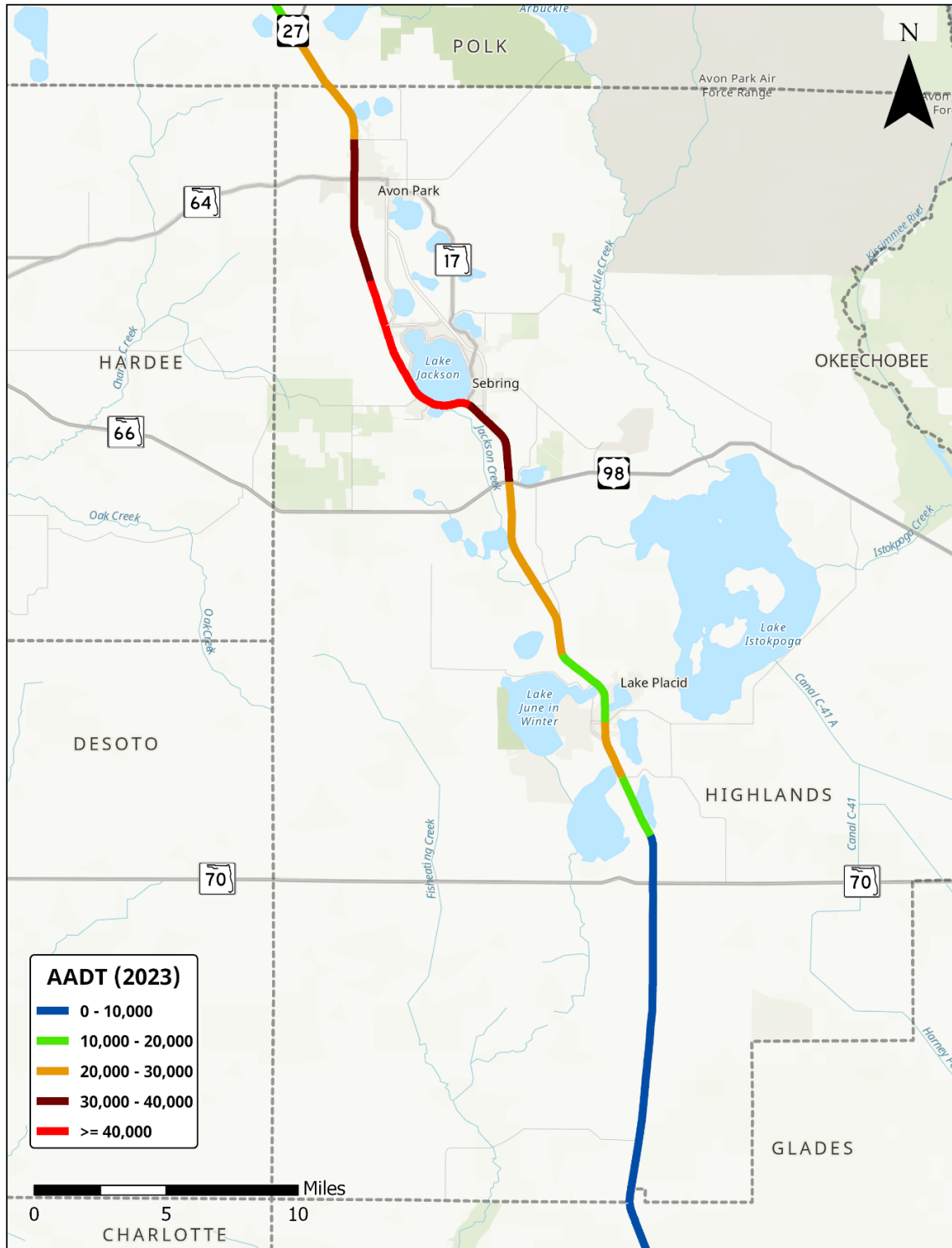
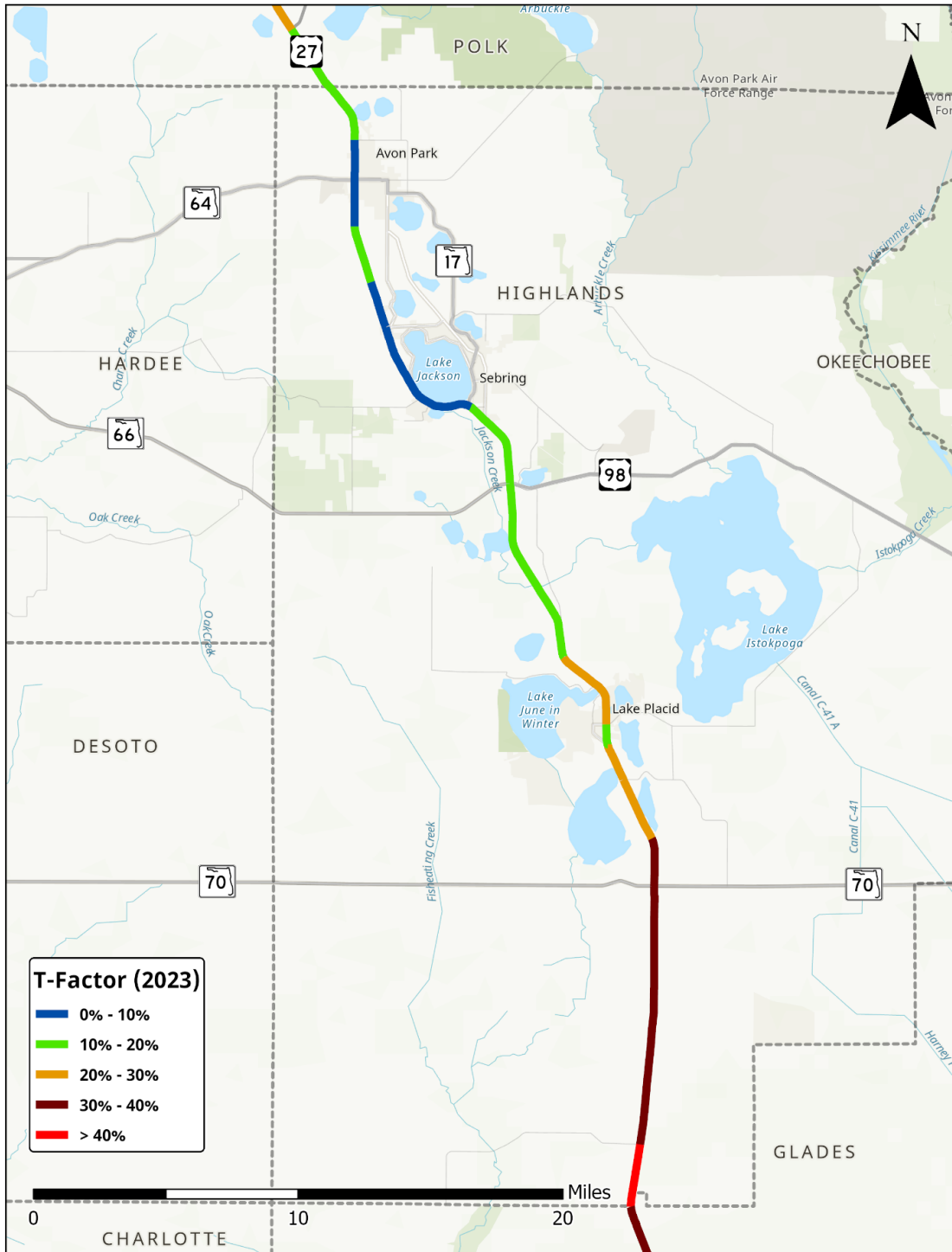


Figure 4-3 - 2023 T-Factor from Florida Traffic Online



5. STUDY METHODOLOGY

5.1 Overview

The methodology was documented for the analysis and evaluation. The methodology was submitted to FDOT, District One and the approved methodology is provided in **Appendix A**. The purpose of the traffic analysis is to evaluate US 27 and identify other existing parallel and connecting facilities to US 27 that could potentially be improved to meet the purpose and need.

5.2 Regional Model Coverage and Subarea

FDOT District One Regional Planning Model (D1RPM) v2.0 developed by the FDOT District One was utilized for the study. A traffic analysis subarea model shown in **Figure 5-1** was developed to include areas and facilities along US 27 and the existing parallel facilities of US 17, Sebring Parkway/Panther Parkway, SR 17, and CR 671, and Martin Luther King Jr Boulevard/Power Line Road and the connecting facilities of SR 70, SR 66, SR 64, US 98, and SR 60 for a broader traffic analysis of existing facilities in Highlands County.

The study limits of corridor along US 27 extends approximately 56 miles within the Highlands County boundary limits. US 27 is a north-south facility with four-lane from North of US 98 to W County Line Rd, six-lane from W county Line Rd to SR 66 and four-lane from SR 66 to Highlands/Glades County Line. US 27 is functionally classified as an urban principal arterial and rural principal arterial within the study area.

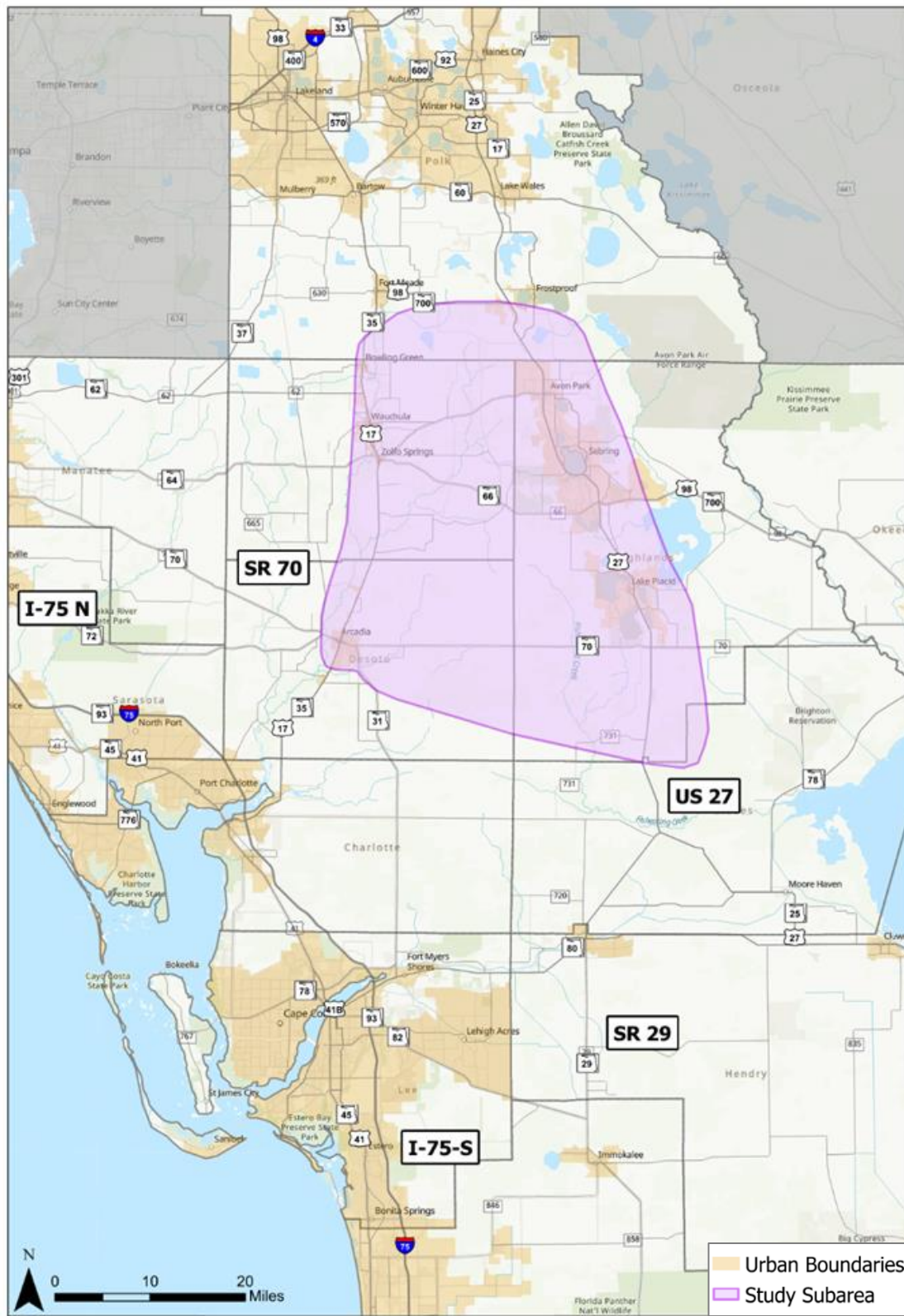
5.3 Review of 2015 Base

D1RPM v2.0 represents the latest available and includes a 2015 Base Year and 2045 Forecast Year. The D1RPM has validated daily demand model. This document includes travel demand modeling procedure that was used for the US 27 Corridor Alternative Study.

5.4 Highway Network

The highway network modeling efforts included updating the base year 2015 traffic counts, reviewing speeds, facility types, area types, and number of lanes for highway links and checking centroid connector locations.

Figure 5-1 – US 27 Alternative Study Subarea Map



The regional existing year 2015 scenario was updated to validate the regional model to actual 2015 conditions. The overall modeling efforts included reviewing and updating the base year 2015 land use, roadways, and reviewing the base year 2015 traffic counts and locations.

5.5 Traffic Counts Update

The 2015 AADT counts in the D1RPM are reviewed using historical AADT data obtained from FTO. For the model validation, the 2015 AADT counts are compared with the model output volumes for validation.

5.6 Model Parameter Updates

The model parameters were reviewed in this validation process.

5.7 Review of 2045 Forecast Model

The travel demand model forecasts future year auto and truck trips, and travel patterns, congestion and delay on along US 27. Forecasted demand and the associated Level of Service is used in identifying the proposed strategies are most effective in reducing future year congestion and delay on US 27 in the Highlands County.

The analysis of corridor needs will go through a structured process of characterizing existing and projected corridor conditions, evaluate improvement options and its performance measures such as level of service, and evaluating potential corridor improvements against these performance measures to develop a set of recommended improvements.

6. BASE YEAR-MODEL VALIDATION RESULTS

FDOT D1RPM v2.0 includes thirteen counties within FDOT namely Charlotte, Collier, Desoto, Glades, Hardee, Hendry, Highlands, Lee, Manatee, Okeechobee, Osceola, Polk, and Sarasota. The study limits of corridor along US 27 extends approximately 56 miles in the Highlands County boundary limits. A traffic analysis subarea model includes existing parallel facilities in Highlands County such as US 17, Sebring Parkway/Panther Parkway, SR 17, CR 671, and Martin Luther King Jr Boulevard/Power Line Road and connecting facilities of SR 70, SR 66, SR 64, US 98, and SR 60 for a broader traffic analysis of existing facilities.

6.1 Socioeconomic Data

In the D1RPM model socioeconomic data is based on Household data from the 2015 American Community Survey (US Census) supplemented with National Household Travel Survey Data from Florida as well as Property Appraiser Parcel Data. Non-household data was obtained from FDOT and the InfoUSA employer database; School and University data were obtained from the Florida Department of Education, and Hotel/Motel data was taken from Florida Department of Business and Professional Regulations. Also, data were adjusted to match Bureau of Economic and Business Research (BEBR) control totals.

Data from BEBR and Bureau of Economic Analysis (BEA) employment data are shown in **Table 6-1** along with model data for population and employment in Highlands County.

Table 6-1 - 2015 Base Year Socioeconomic Data - Total Population & Employment for Highlands County

Data	Total Population	Total Employment
BEBR Totals ¹	100,078	-
D1RPM -Highlands County Population	99,770	-
BEA Totals ²	-	38,834
D1RPM-Highlands County Employment	-	29,867

1. Bureau of Economics and Business Research, Florida Population Studies, Bulletin 174 https://www.bibr.ufl.edu/sites/default/files/Research%20Reports/projections_2016.pdf
2. <https://apps.bea.gov/itable/iTable.cfm?ReqID=70&step=1>

The updated 2015 SE data were used as input to perform the regional validation. ZDATA files, namely ZONEDATA_15A.DBF was updated accordingly for the model inputs. As previously noted, centroid connectors of several traffic analyses zones (TAZs) were reconfigured along the US 27 corridor consistent with the base condition to better represent land use and development along the corridor and to improve the model trip assignment for the US 27 study area.

6.2 Initial Subarea Validation Process and Results

The 2015 base year model was updated with the 2015 daily traffic counts from FTO, and 2015 land use, as detailed in the previous sections. The subarea model was then validated based on year 2015 conditions. Initial step before validation was to evaluate the Root Mean Square Error (RMSE) by volume group and volume/count (V/C) by facility type for the daily volumes. The acceptable and preferable thresholds were taken from FSUTMS- Cube framework Phase II, Model Calibration and Validation Standards and D1RPM.

Tables 6-2 and **Table 6-3** summarize the results of the subarea model RMSE and V/C statistics for daily volumes before validation. For the base subarea model overall V/C statistics are within the acceptable range for the daily volumes for most of the facility types. Also, the subarea model RMSEs are within the acceptable range for the daily volumes for all volume groups. However, the daily volume along US 27 were lower by - 31% around the Sebring area. Even though the subarea model RMSE statistics does not showed the need for further refinement at the subarea level, the efforts were focused to areas surrounding the US 27 corridor to reduce the disparity between daily counts from FTO and model volumes and refinement of TAZs.

Table 6-2 - 2015 Daily Volume Subarea V/C by Facility Type

Facility type	Description	Links	Average Count Volume	Average Model Volume	V/C	Acceptable Threshold	Acceptable Threshold - Report (D1RPM/FSUTMS)	Preferable Threshold - Report (D1RPM/FSUTMS)
2x	Divided Arterials	45	15,947	15,823	0.99	0.90-1.10	+/-15%(+/-10%)	+/-10%(+/-7%)
3x	Undivided Arterials	37	6,068	5,759	0.95	0.90-1.10	+/-15%(+/-10%)	+/-10%(+/-7%)
4x	Collector Facilities	51	3,176	3,837	1.21	0.85-1.15	+/-25%(+/-15%)	+/-20%(+/-10%)
5x	Centroid Connectors	-						
6x	One-way Facilities	10	9,020	7,282	0.81	0.80-1.20	(+/-20%)	(+/-15%)

Table 6-3 - 2015 Daily Volume Subarea RMSE by Volume Group

Volume Group	No. Links	Count	Model	%RMSE	Acceptable Threshold	Preferable Threshold
Less Than 5,000	62	2,491	2,869	110.1	100%	45%
5,000 - 9,999	41	5,173	5,555	14.1	45%	35%
10,000 - 14,999	19	12,089	11,710	29.3	35%	27%
15,000 - 19,999	12	17,333	18,440	24.7	35%	25%
20,000 - 29,999	3	24,167	25,277	21.0	27%	15%
30,000 - 49,999	6	35,667	32,904	13.1	25%	15%
50,000 - 59,999						
60,000+						
Area-wide		8,411	8,350	34%	50%	30%

Table 6-4 below shows the AADT counts from FTO and daily volume along US 27 at FTO count stations for the base year 2015. **Table 6-5** shows the corridor level RMSE for US 27 and US 17. The validation statistics for the evaluated corridors provide very low RMSE values, which is an indication of a good match between model volumes and observed traffic counts; thus, the model was determined to be well validated and could be used with confidence for forecasting future traffic for the alternative corridors.

Table 6-4 - 2015 Corridor Daily Volume

STATION	DESCRIPTION	2015 AADT_FTO	2015 TOT VOL_D1RPM	DIFFERENCE
160087	SR 25/US 27, NORTHWEST OF SR 700/US 98	16,400	19,448	3,048
160087	SR 25/US 27, NORTHWEST OF SR 700/US 98	16,400	19,509	3,109
160076	SR 25/US 27, SOUTHEAST OF SR 700/US 98	17,800	17,918	118
160020	SR 25/US 27, NORTH OF HIGHLANDS COUNTY LINE	18,600	20,426	1,826
090001	SR 25/700/US 27/98, N OF CR 17A/STRYKER RD AVON PK HC 01	23,000	23,485	485
095007	SR 25/700/US 27/98, N OF SR 17/64/MAIN ST AVON PK	30,000	26,416	-3,584
090017	SR 25/700/US 27/98, S OF HAL MCRAE & W CASTLE ST	33,000	35,528	2,528
095023	SR 25/US 27, NORTH OF SUN N'LAKES BLVD SEBRING	29,000	35,282	6,282
095022	SR 25/US 27, N OF CR 634A/SEBRING PKWY SEBRING	40,500	41,077	577
095020	SR 25/700, US 27/98 NW OF LAKEVIEW DRIVE SEBRING	41,000	36,450	-4,550
095016	SR 25/700/US27/98, SE OF CR 634/HAMMOCK RD SEBRING	39,000	34,188	-4,812
090026	SR 25/700/US 27/98, SE OF CR 17A/HIGHLANDS AVE	30,500	23,767	-6,733
090039	SR 25/US 27, S OF HIGHLANDER BLVD	20,500	17,065	-3,435
090021	SR 25/US 27, NORTH OF CR 621 LAKE PLACID	18,800	20,906	2,106
090031	SR 25/US 27, SOUTH OF CR 621 LAKE PLACID	17,800	10,804	-6,996
090006	SR 25/US 27, S OF CR 17/MCCOY ST, LAKE PLACID	18,400	14,703	-3,697
090032	SR 25/US27, SOUTH OF CR 29 SOUTH LAKE PLACID	10,700	11,457	757
090005	SR 25/US 27, NORTH OF SR 70 BAIRS DEN	8,900	6,413	-2,487
090327	SR-25/US-27,2.7 MI SOUTH OF SR-70, HIGHLANDS CO.	7,664	5,279	-2,385
090019	SR 35/US 17 NB, N OF SR 70 EB	6,200	4,436	-1,764
045002	SR 35/US 17 NB, SOUTH OF SR 70 EB	6,600	5,943	-657
045001	SR 35/US 17 SB, N OF CYPRESS STREET	6,900	6,778	-122
045008	SR 35/US 17, N OF CR 665/FISH BRANCH RD GARDNER	7,500	7,679	179
060022	SR 35/US 17 SB, N OF SR 70 EB	7,700	7,180	-520
045007	SR-35/US-17,0.3 MI N LIVINGSTON ST, DESOTO CO.	7,800	6,001	-1799
040145	SR-35/US-17, N OF CR-660	8,124	9,054	930
041000	SR 35/US 17, SOUTH OF SR 66	8,600	9,830	1230
065008	SR 35/US 17 NB, SOUTH OF SR 636/MAIN ST, WAUCHULA	8,700	7,969	-731
065011	SR-35/US-17,0.3 MI N OF BILL BRYAN RD, POLK CO.	9,800	7,598	-2202
160319	SR 35/US 17, 0.2 MI N OF HARDEE/POLK COUNTY LINE	9,810	11,915	2105
160052	SR 35/US 17 NB, NORTH OF SR 636/MAIN ST, WAUCHULA	10,300	11,860	1560

STATION	DESCRIPTION	2015 AADT_FTO	2015 TOT VOL_D1RPM	DIFFERENCE
065012	SR35/US17,S OF SR700/US98/CR630/BROADWAY FT MEADE	11,000	9,811	-1189
165043	SR 35/US 17, SOUTH OF PEACE RIVER BRIDGE	11,200	20,729	9529
060003	SR 35/US 17, N OF HARDEE ST/CR 668 BOWLING GREEN	12,700	13,323	623
060019	SR 35/US 17, SOUTH OF US 17 SB/DESOTO AVE	13,600	12,593	-1007
045000	SR 35/US 17, NORTH OF SR 66	13,700	11,488	-2212
065007	SR 35/US 17 NORTH OF SR 62	13,800	11,174	-2626
060024	SR35/700/US17/98, N OF CR630/BROADWAY FT MEADE	15,400	16,628	1228
165044	SR 35/US 17, SOUTH OF SR 62 HARDEE COUNTY	16,000	18,574	2574
060016	SR 35/US 17 NB, N OF SR 70 EB	17,500	19,199	1699

Table 6-5 – Corridor level RMSE

Corridor	Allowed RMSE %	Model RMSE %	2015 Count	Model Volume	Vol/Count	No: of Links
US 27	32-39	16.4%	444,164	424,557	0.96	20
US 17	32-39	24.6%	216,734	225,326	1.03	20

6.3 Subarea Adjustments

The subarea adjustments were majorly focused on adjusting Highlands County data and area surrounding the US 27 corridor in Highlands County. The following sections details the procedure adopted for subarea adjustments.

6.3.1 Socioeconomic Data

The Highlands County employment data discrepancy as shown in **Table 6-1** is incorporated to the County ZDATA. The additional employment was adjusted based on BEA totals and based on the current employment distribution. It was also made sure that the new employment data in the Base Year 2015 does not exceed the 2045 Cost Affordable model employment data. The changes applied are shown in **Figure 6-1**.

6.3.2 Highway Network

All the Highway network was verified for the correct facility type. The facilities for the study area appear to be coded reasonably and matching the base year condition. Highway network edit was changed along SR 17/N Ridgewood Drive from 46 to 42 from Lakeview Dr to Sebring Parkway.

6.3.3 Traffic Analysis Zones loading

The TAZ loading or centroid connector locations from surrounding TAZs such as, 1727, 1748, 1755, 1765, 1812, along US 27 were adjusted to match the Base Year conditions and thereby reducing the difference between the FTO counts and model volume.

Table 6-6 and **Table 6-7** shows the results in total volume after adjustment in TAZ loading and total employment.

Figure 6-1 – TAZ Employment Adjustments in Highlands County

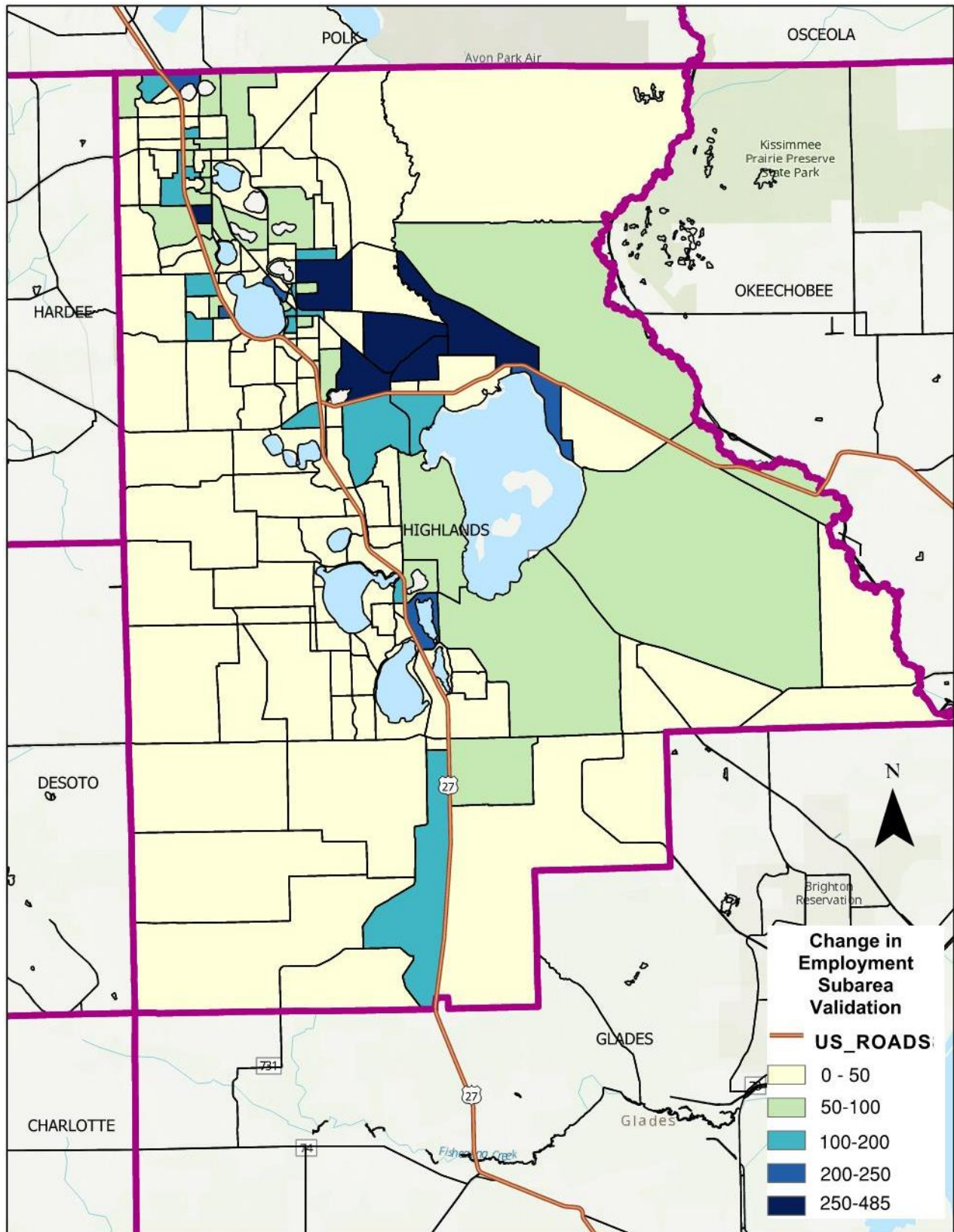


Table 6-6 – 2015 Daily Volume with TAZ Employment Adjustment Results

STATION	DESCRIPTION	2015 AADT_FTO	2015 TOT VOL	2015 TOTAL VOL AFTER VALIDATION
160087	SR 25/US 27, NORTHWEST OF SR 700/US 98	16,400	19,448	14,371
160087	SR 25/US 27, NORTHWEST OF SR 700/US 98	16,400	19,509	14,432
160076	SR 25/US 27, SOUTHEAST OF SR 700/US 98	17,800	17,918	12,534
160020	SR 25/US 27, NORTH OF HIGHLANDS COUNTY LINE	18,600	20,426	13,097
090001	SR 25/700/US 27/98, N OF CR 17A/STRYKER RD AVON PK HC 01	23,000	23,485	18,587
095007	SR 25/700/US 27/98, N OF SR 17/64/MAIN ST AVON PK	30,000	26,416	23,634
090017	SR 25/700/US 27/98, S OF HAL MCRAE & W CASTLE ST	33,000	35,528	36,866
095023	SR 25/US 27, NORTH OF SUN N'LAKES BLVD SEBRING	29,000	35,282	35,137
095022	SR 25/US 27, N OF CR 634A/SEBRING PKWY SEBRING	40,500	41,077	41,374
095020	SR 25/700, US 27/98 NW OF LAKEVIEW DRIVE SEBRING	41,000	36,450	35,007
095016	SR 25/700/US27/98, SE OF CR 634/HAMMOCK RD SEBRING	39,000	34,188	33,648
090026	SR 25/700/US 27/98, SE OF CR 17A/HIGHLANDS AVE	30,500	23,767	23,009
090039	SR 25/US 27, S OF HIGHLANDER BLVD	20,500	17,065	18,821
090021	SR 25/US 27, NORTH OF CR 621 LAKE PLACID	18,800	20,906	22,377
090031	SR 25/US 27, SOUTH OF CR 621 LAKE PLACID	17,800	10,804	14,464
090006	SR 25/US 27, S OF CR 17/MCCOY ST, LAKE PLACID	18,400	14,703	15,087
090032	SR 25/US27, SOUTH OF CR 29 SOUTH LAKE PLACID	10,700	11,457	11,742
090005	SR 25/US 27, NORTH OF SR 70 BAIRS DEN	8,900	6,413	4,858
090327	SR-25/US-27, 2.7 MI SOUTH OF SR-70, HIGHLANDS CO.	7,664	5,279	4,172
090019	SR-25/US-27, S OF CR 731	6,200	4,436	2,911
045002	SR 35/US 17 NB, N OF SR 70 EB	6,600	5,943	5,668
045001	SR 35/US 17 NB, SOUTH OF SR 70 EB	6,900	6,778	6,664
045008	SR 35/US 17 SB, N OF CYPRESS ST	7,500	7,679	7,259
060022	SR 35/US 17, N OF CR 665/FISH BRANCH RD GARDNER	7,700	7,180	5,414
045007	SR 35/US 17 SB, N OF SR 70 EB	7,800	6,001	5,716
040145	SR-35/US-17, 0.3 MI N LIVINGSTON ST	8,124	9,054	7,839

STATION	DESCRIPTION	2015 AADT_FTO	2015 TOT VOL	2015 TOTAL VOL AFTER VALIDATION
041000	SR-35/US-17, N OF CR-660	8,600	9,830	8,191
065008	SR 35/US 17, SOUTH OF SR 66	8,700	7,969	6,367
065011	SR 35/US 17 NB, SOUTH OF SR 636/MAIN	9,800	7,598	7,284
160319	SR-35/US-17,0.3 MI N OF BILL BRYAN RD	9,810	11,915	11,037
160052	SR 35/US 17, 0.2 MI N OF HARDEE/POLK COUNTY LINE	10,300	11,860	10,964
065012	SR 35/US 17 NB, NORTH OF SR 636/MAIN ST WAUCHULA	11,000	9,811	9,641
165043	SR35/US17, S OF SR700/US98/CR630/BROADWAY FT MEADE	11,200	20,729	19,727
060003	SR 35/US 17, SOUTH OF PEACE RIVER BRIDGE ZOLFO	12,700	13,323	12,196
060019	SR 35/US 17, N OF HARDEE ST/CR 668 BOWLING GREEN	13,600	12,593	12,434
045000	SR 35/US 17, SOUTH OF US 17 SB/DESOTO AVE	13,700	11,488	11,237
065007	SR 35/US 17, NORTH OF SR 66 ZOLFO	13,800	11,174	9,901
060024	SR 35/US 17 NORTH OF SR 62	15,400	16,628	16,592
165044	SR35/700/US17/98, N OF CR630/BROADWAY FT MEADE	16,000	18,574	17,290
060016	SR 35/US 17, SOUTH OF SR 62 HARDEE COUNTY	17,500	19,199	18,777

Table 6-7 – Corridor level RMSE

Corridor	Allowed RMSE %	Model RMSE %	2015 Count	Model Volume	Vol/Count	No: of Links
US 27	32-39	18.0%	444,164	412,115	0.93	20
US 17	32-38	23.8%	216,734	210,198	0.97	20

6.3.4 Summary

The intent of the subarea validation for the base year was to reduce the discrepancy between the Base Year 2015 estimates on socioeconomic data and Base Year field network loading and the D1RPM 2015 base model for the Highlands County. The employment data was adjusted, and the validation statistics provided RMSE values within

the allowed range as shown in **Table 6-7**, and while simultaneously incorporating the difference in the socioeconomic data. The modification of employment data to match BEA totals resulted in the reduction of the V/C ratio from the default model. Since the deviation is seen more in the TAZs closer to Highland/Polk County and Highlands/Glades County, a validation procedure involving adjacent counties is further needed to evaluate the regional traffic accessing US 27. The validated model along with National Cooperative Highway Research Program (NCHRP) smoothing method will be utilized for the 2045 forecasting which will further minimize the discrepancy while minimizing the differences in the socioeconomic data.

7. HISTORICAL CRASH SUMMARY

7.1 Crash History (2019-2023)

The crash data for the five-year period from January 1, 2019 to December 31, 2023 was analyzed for US 27 from the Highlands County/Glades County Line to Avon Park Cut Off Road in Polk County. The crash data was downloaded from the University of Florida's Signal Four Analytics (S4) system database.

7.2 Crash Review by Year

Between the years 2019 and 2023, there was a total of 2,782 crashes. Crash totals from 2019 to 2023 show decreasing crash totals since 2021 as seen in **Figure 7-1**. Of the 2,782 crashes, there were 57 (2.04%) fatal crashes along US 27, 145 (5.2%) serious injury crashes, 1,062 (38%) injury crashes and 1,518 property damage only crashes (55%). There were 22 pedestrian crashes along US 27, in which ten (10) resulted in a fatality, three resulted in serious injury, eight resulted in an injury, and the remaining one (1) caused no injury. There were 21 bicycle crashes along US 27. Of these, three (3) resulted in a fatality, two resulted in serious injury, 15 crashes resulted in injuries, and one resulted in property damage only.

Figure 7-1 shows the total crashes, crash severity, crash type, as well as a heat map of all crashes along US 27. It is evident from the heat map that majority of crashes occurred around Lake Jackson in the northern region of Highlands County. **Figure 7-2** shows location of fatal and serious injury crashes along US 27.

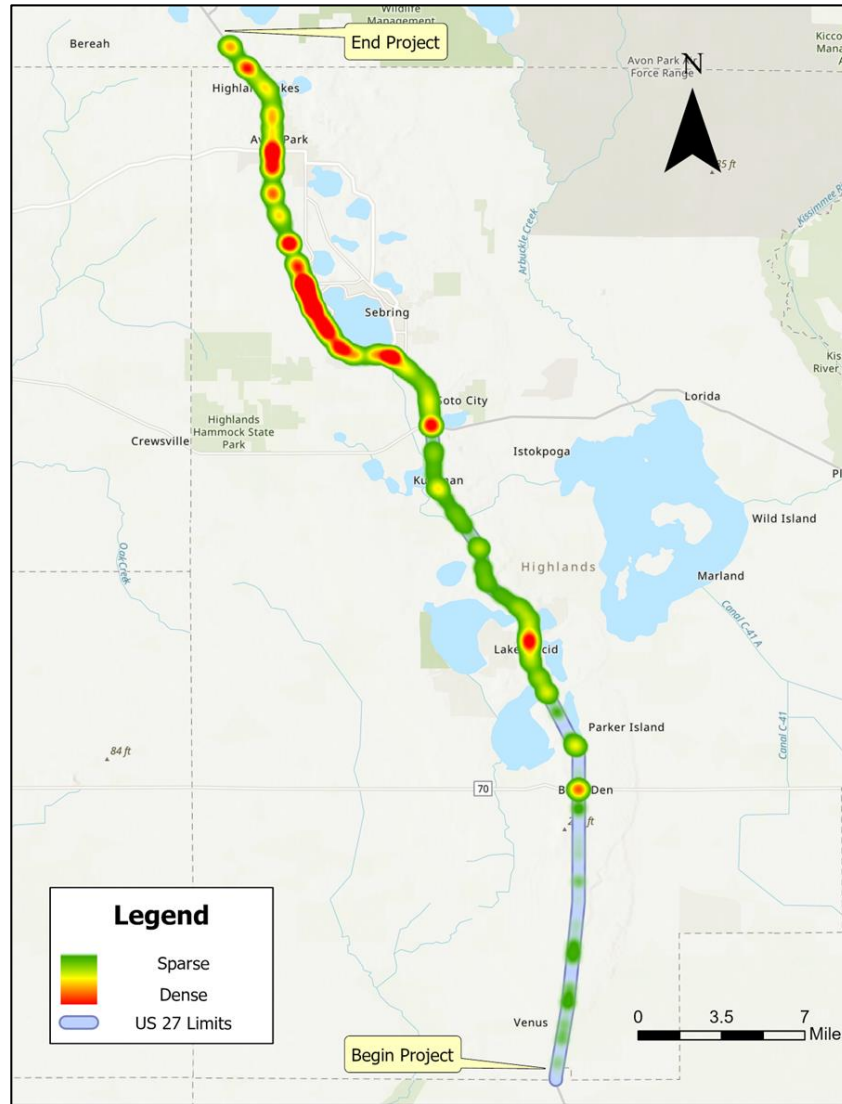
A comprehensive review of all crash types along US 27 was performed. There were 948 rear end crashes which was the predominant type of crash. Rear end crashes are common on an interrupted flow facility at intersections. As congestion increases, the probability of rear end collisions increases. Dense crash locations are US 27 at SR 64, between Sebring Parkway and South of Lakeview Dr, US 27 at SR 66 and US 27 at E Interlake Blvd/County Rd 621 E.

The second highest crash type are left turn crashes (476), followed by sideswipe crashes (345). Left turn crashes are generally caused by a motorist failing to stop at a red light or stop sign or failing to yield ROW to oncoming traffic. Sideswipes occur in an interrupted flow facility due to aggressive or negligent driving and thereby failing to keep proper lane

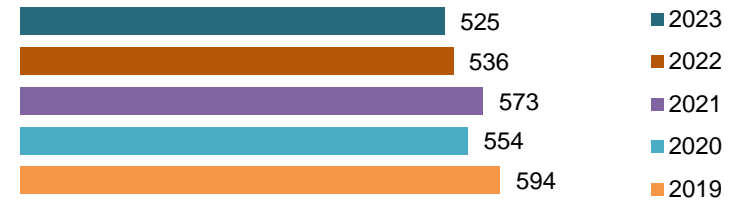
or failing to yield right-of-way.

Figure 7-3 graphically displays crash types that occurred along US 27. **Figure 7-4** shows the contributing causes for the crashes and the lighting and weather conditions during the crashes.

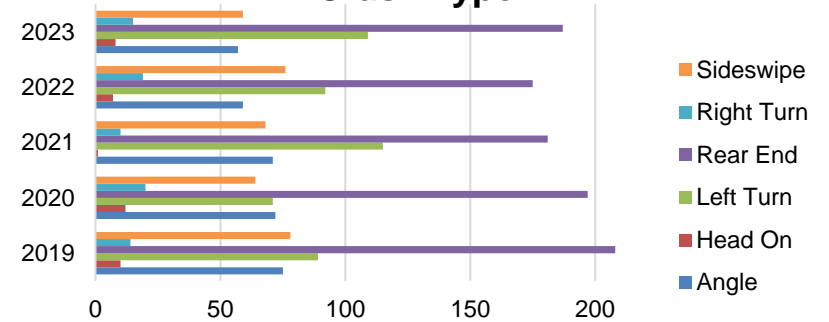
Figure 7-1 – US 27 Crash Summary and Heat Map (2019-2023)



Total Crashes [2,782]



Crash Type



Crash Severity

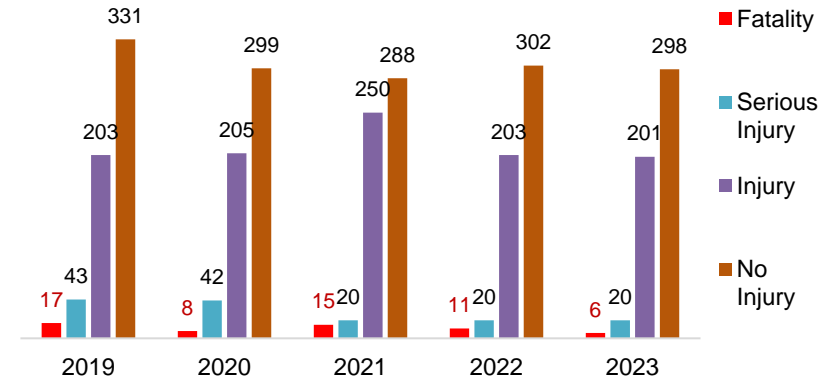


Figure 7-2 – Fatal and Serious Injury Crashes along US 27

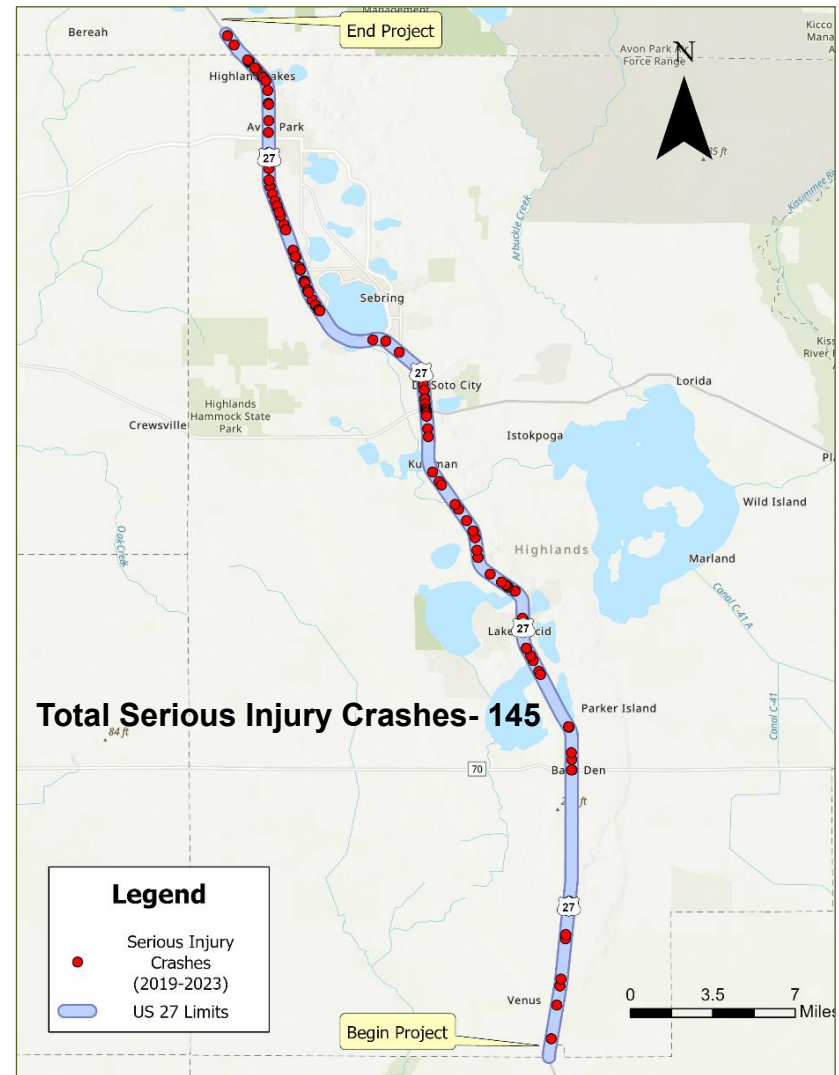
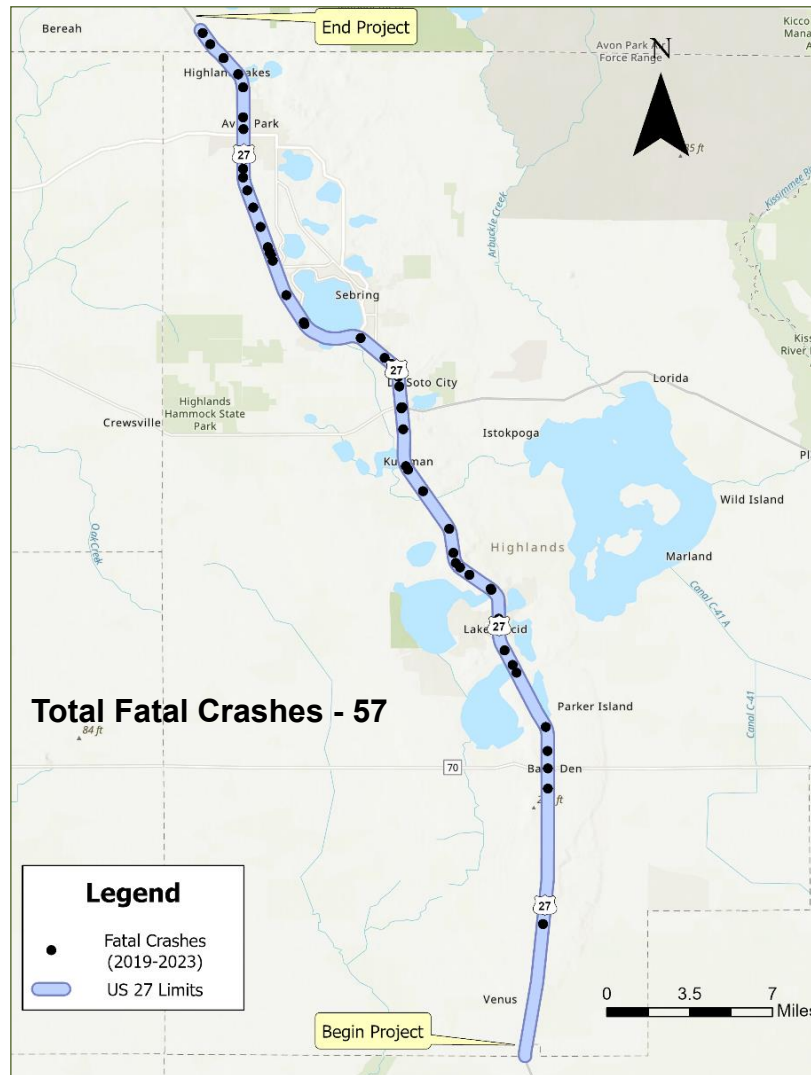


Figure 7-3 - Harmful Events Crash Summary along US 27

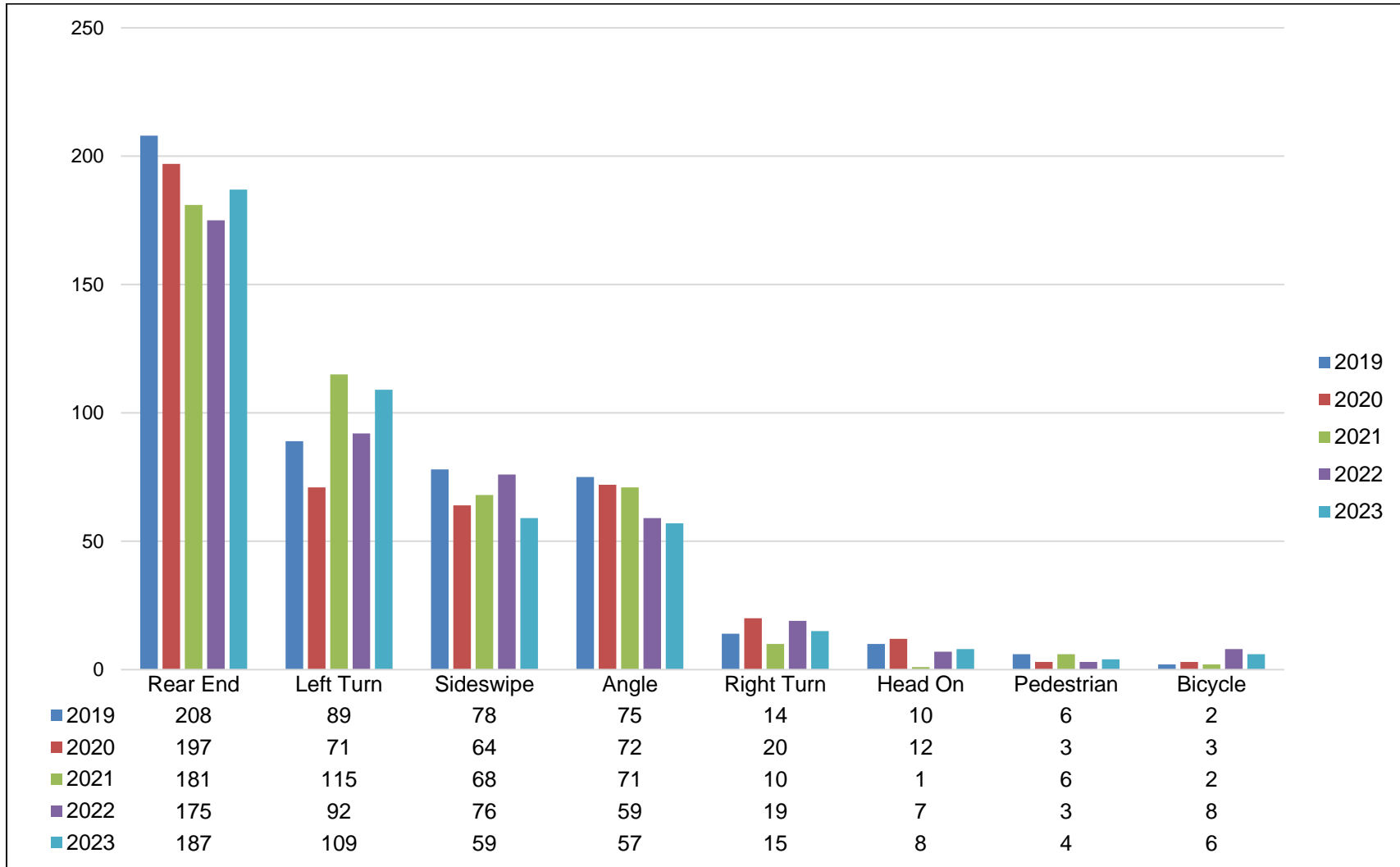
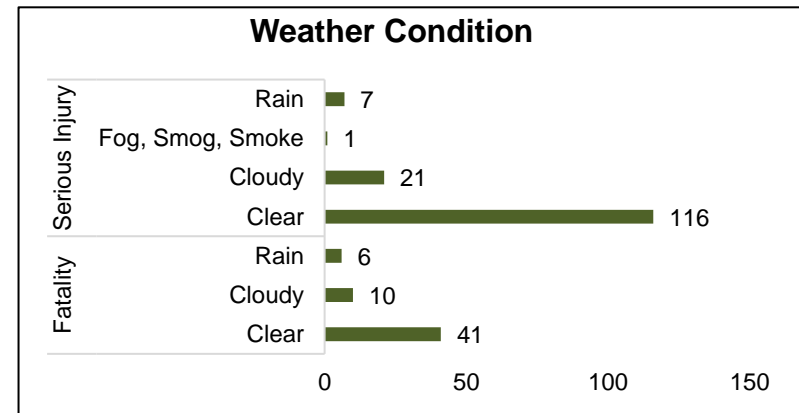
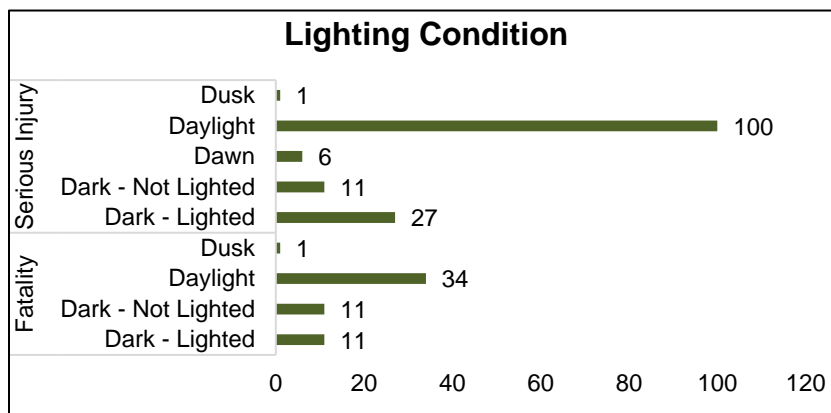
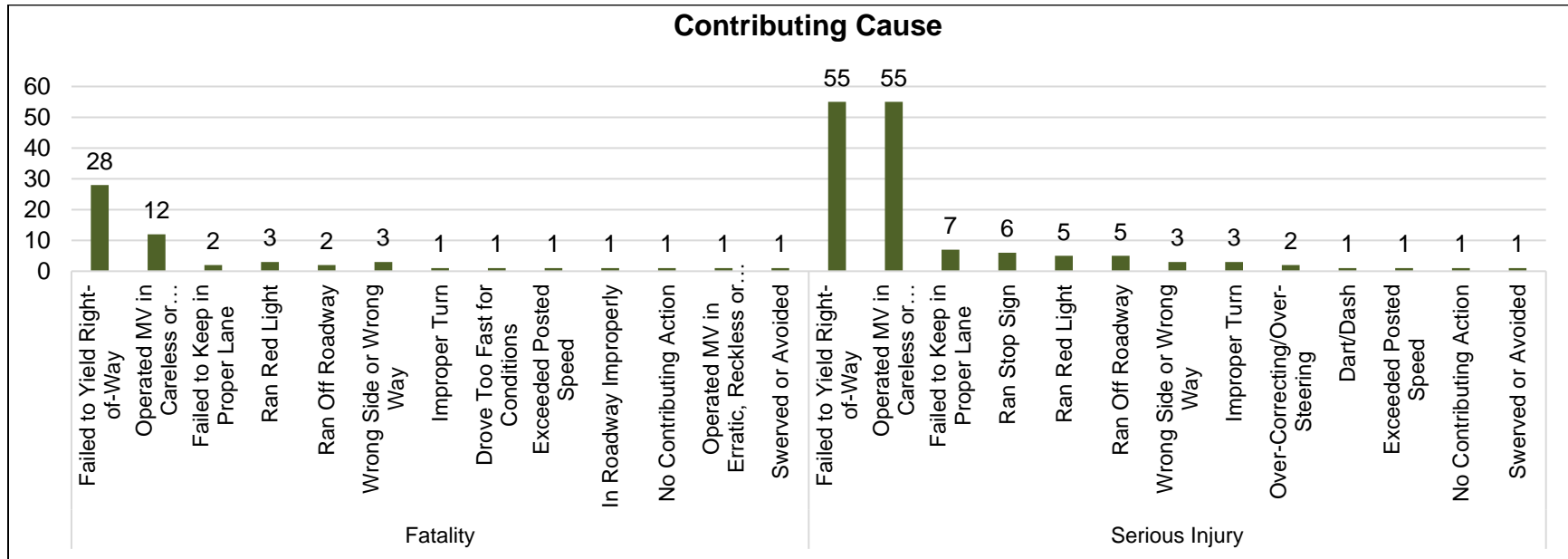


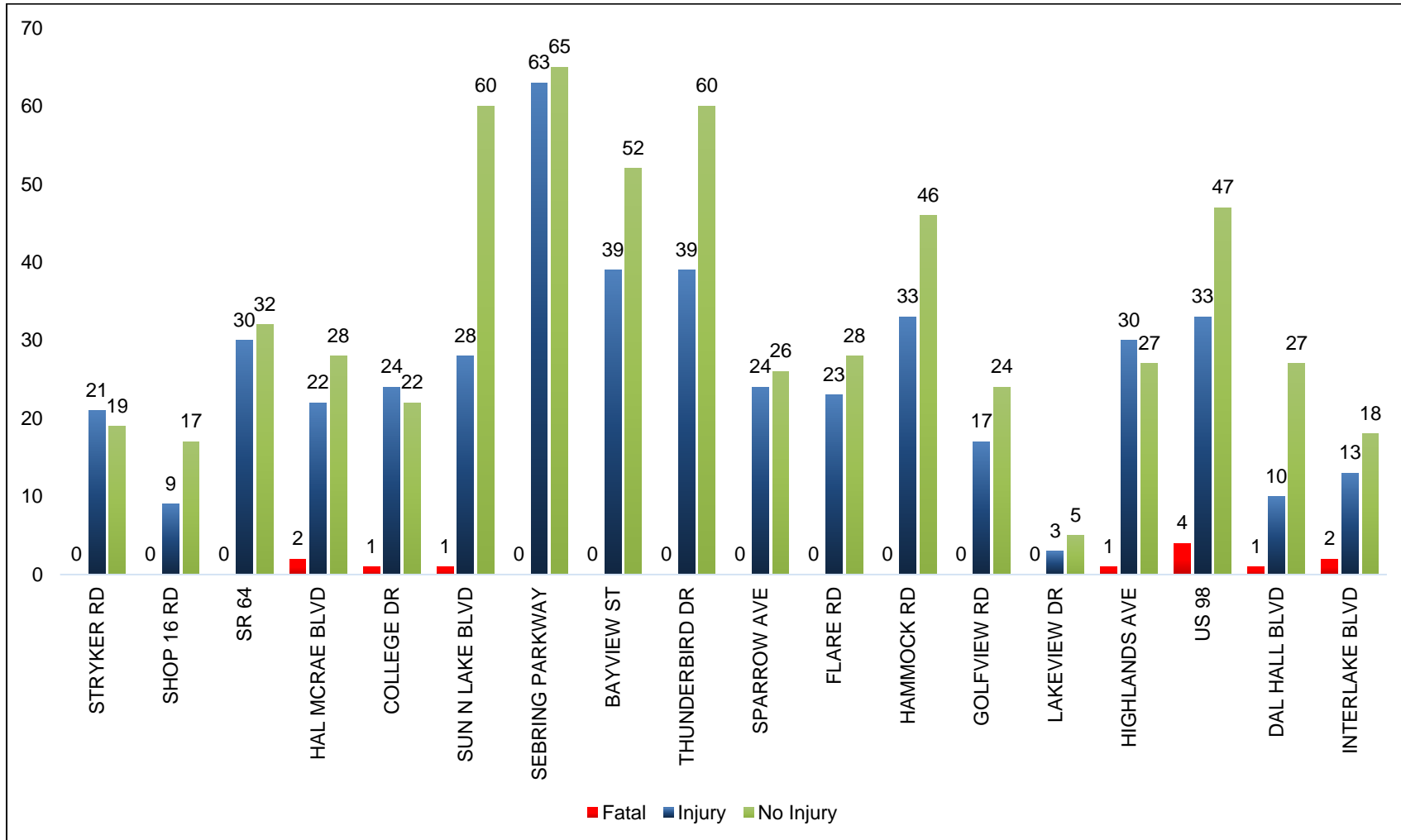
Figure 7-4 - Contributing Causes, Lighting Conditions and Weather Conditions along US 27



7.3 Intersection Crash Summary

There was a total of 1,076 intersection crashes along US 27. **Figure 7-5** shows the number of crashes at major intersections within the study area. The intersection influence area was based on the turn lanes for each approach. Highest number of fatal crashes occurred at the intersection of US 27 and SR 66 (4 fatal crashes), two (2) fatal crashes at the intersection of Hal McRae Blvd and US 27, and two (2) fatal crashes at the intersection of Interlake Blvd and US 27. Most crashes occurred at US 27 and Sebring Parkway - 128 crashes. There were 63 injury crashes and 65 no-injury crashes. There were no fatal and serious injury crashes at this intersection.

Figure 7-5 - Intersection Related Crash Summary



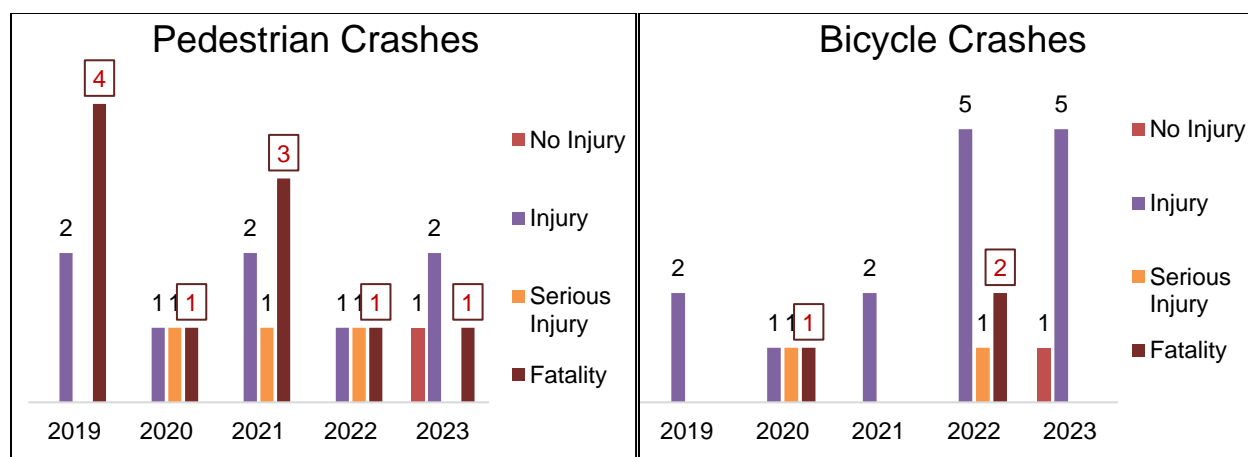
7.4 Summary of Pedestrian and Bicycle Crashes

There were 22 pedestrian crashes along US 27, in which ten (10) resulted in a fatality, three (3) resulted in serious injury crashes, eight (8) resulted in an injury, and the remainder caused no injury. Prominent causes of fatal crashes are failing to yield right-of-way and operating motor vehicle in careless or negligent manner.

There were 21 bicycle crashes along US 27. Of these, three (3) resulted in fatality, two (2) resulted in serious injury, fifteen resulted in an injury and one resulted in property damage only. Prominent causes of crashes are failing to yield right-of-way, failing to keep in proper lane and operating motor vehicle in careless or negligent manner.

Figure 7-6 displays the trend of crashes and severity. **Figure 7-7** displays the location of pedestrian and bicycle crashes, along with the crash severity.

Figure 7-6 - Bicycle and Pedestrian Crash Severity Trends along US 27



7.5 Segment Crash Rate along US 27 (2019-2023)

The total number of crashes, fatal crashes, the crash rates per million vehicle miles traveled (MVMT) over the five-year period per segment are shown in **Table 7-1**. The table contains crash rates from 2015 to 2019 and 2019 to 2023. The crashes from 2015 to 2019 is included for comparison purposes as the latest 5year average the state-wide, district-wide and the county-wide crash rates were published for 2019. The segment crashes are on-street crashes along US 27 which also contain a portion of the intersection crashes that occurred along US 27.

The most recent five-year statewide average segment crash rate (2015-2019) is 5.21. The five-year county-wide average segment crash rate for Highlands County (2015-2019) is 5.39 and the district-wide crash rate is 2.48 for the same time period. The five-year average segment crash rates are lower than the statewide and district-wide averages along US 27, apart from two of the segments (highlighted in the table), one along the southern portion, North of CR 731 to S Sun N Lakes Blvd, the other being the northernmost segment from South of the Highlands/Polk County line to the project end.

Figure 7-7 - Bicycle and Pedestrian Crash Locations along US 27

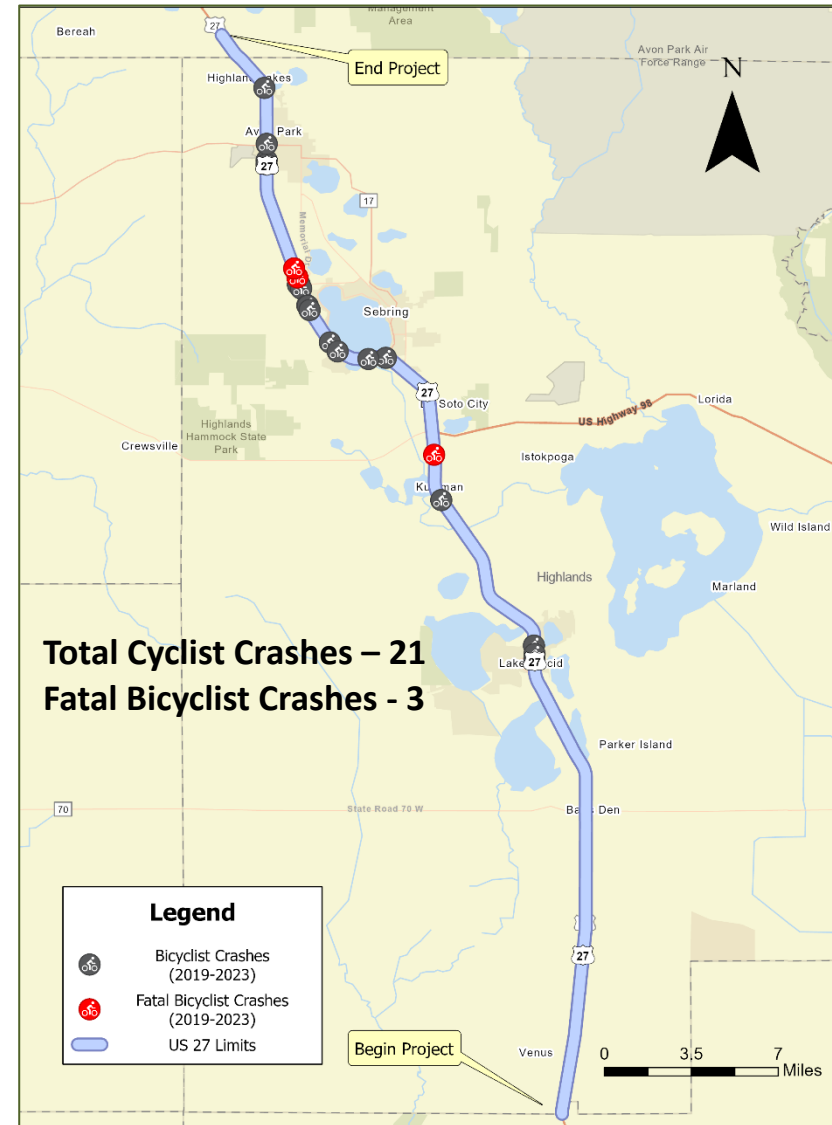


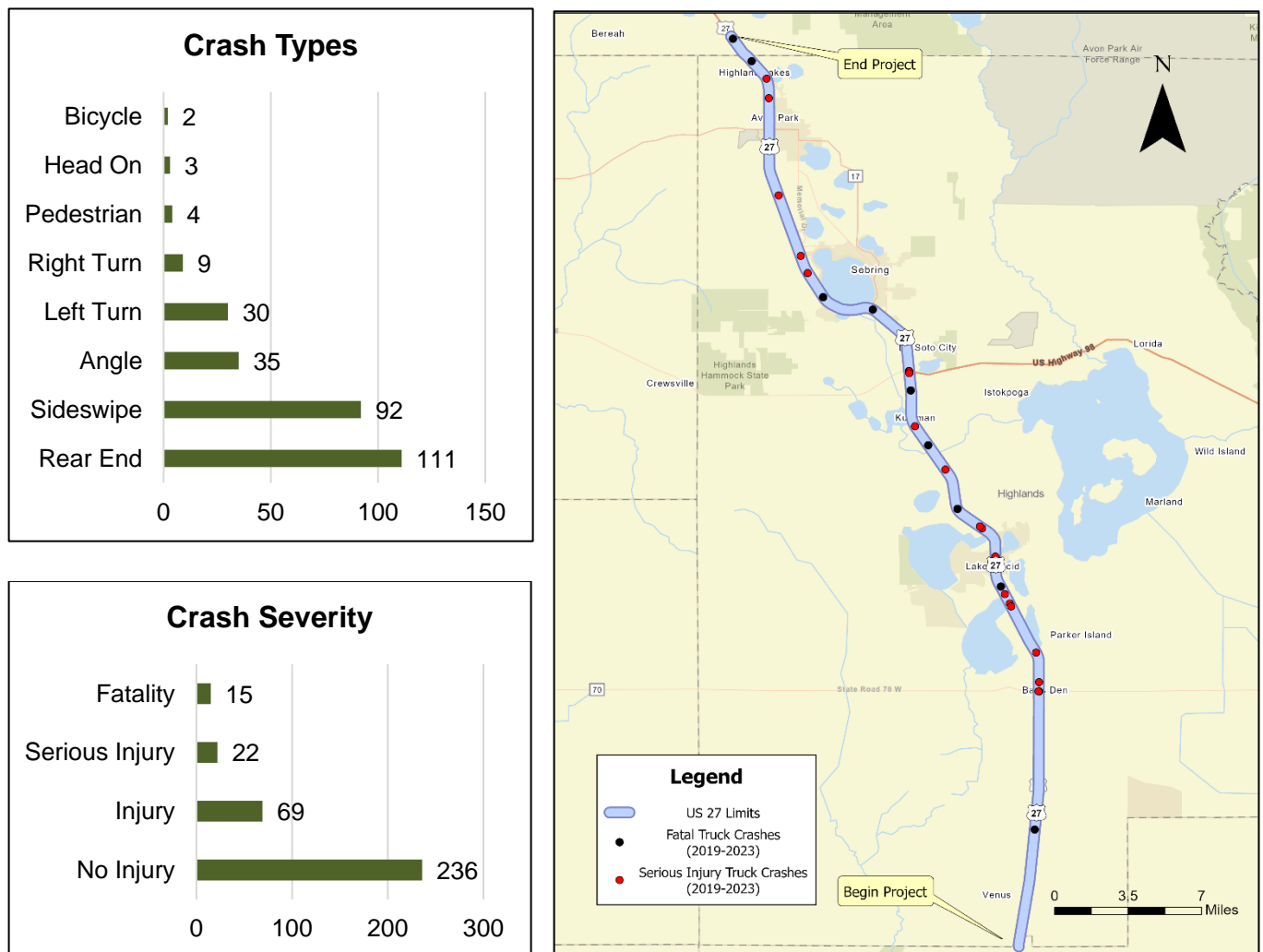
Table 7-1 - Segment Crash Rate along US 27 (2015-2019 & 2019-2023)

Segment	Length (miles)	2015-2019			2019-2023			Statewide Crash Rate	District Crash Rate
		Total Crash	Fatal Crash	Crash Rate (MVMT)	Total Crash	Fatal Crash	Crash Rate (MVMT)		
US 27 from Glades/Highlands County Line to North of CR 731	3.26	11	0	0.25	17	0	0.35	0.75	0.70
US 27 from North of CR 731 to North of S Sun N Lakes Blvd	11.17	219	2	1.28	149	6	0.83	0.75	0.70
US 27 from North of Sun N Lakes Blvd to North of CR 29	2.23	50	0	0.82	37	1	0.79	3.86	2.61
US 27 from North of CR 29 to South of CR 17N	5.11	332	10	1.84	267	10	1.47	3.86	2.61
US 27 from South of CR 17N to South of Lake Josephine Dr	4.32	97	3	0.58	104	4	0.61	0.75	0.70
US 27 from South of Lake Josephine Dr to South of US 98	2.55	74	1	0.75	80	2	0.79	3.86	2.61
US 27 from South of US 98 to South of Lakeview Dr	3.90	406	8	2.21	243	8	1.13	4.97	2.73
US 27 from South of Lakeview Dr to South of Sun N Lake Blvd	6.48	1,117	9	2.39	1,083	10	2.30	4.97	2.73
US 27 from South of Sun N Lake Blvd to South of W Stryker Rd	5.52	654	8	1.96	537	9	1.57	4.97	2.73
US 27 from South of W Stryker Rd to South of Sunpure Rd	1.88	100	1	1.08	121	3	1.23	4.97	2.73
US 27 from South of Sunpure Rd to South of County Line Rd	0.43	6	0	0.34	20	1	1.06	4.97	2.73
US 27 from South of County Line Road to Avon Park Cutoff Rd	1.27	64	4	1.38	124	2	2.46	0.75	0.70

7.6 Truck Related Crashes

The total truck related crashes along US 27 are 342. Of these, 15 crashes resulted in fatal crashes and 22 crashes resulted in serious injury. **Figure 7-8** presents fatal and serious injury crash locations along with crash summary.

Figure 7-8 - Truck Crash Locations along US 27



7.7 Economic Loss from Crashes

FDOT's CAR System provides unit costs for calculating the cost of crashes and injuries. Based on these unit costs, the crashes along US 27 cost an estimated \$903 million as shown in **Table 7-2**.

**Table 7-2 - Estimated Economic Loss from All Crash Types (KABCO) along US 27
(2019-2023)**

Crash Severity	Crashes along U.S. 27	Comprehensive Crash Cost	Economic Loss
Fatal (K)	57	\$10,890,000	\$620,730,000
Severe Injury (Incapacitating) (A)	145	\$888,030	\$128,764,350
Moderate Injury (Non-incapacitating) (B)	417	\$180,180	\$75,135,060
Minor Injury (Possible Injury) (C)	645	\$103,950	\$67,047,750
Property Damage Only (O)	1,518	\$7,700	\$11,688,600
Total			\$903,365,760

Source: The comprehensive crash cost is from Florida Department of Transportation State Safety Office's Crash Analysis Reporting (CAR) System, analysis years 2014 through 2018. Published by FDOT State Safety Office on 2/23/2022.

8. DESCRIPTION OF ALTERNATIVES

8.1 2045 D1RPM AADT

The subarea validation adjustments made to the Base Year 2015 were carried over to the 2045 cost Feasible model.

8.2 Volume Development

The NCHRP report 765 recommends the Factoring Procedure-Difference Method and Ratio Method approach, which was further utilized to correct the error associated with validated regional model projected volumes. Following this procedure, future year D1RPM models will have similar nature to the Base Year 2015 AADTs trend. These values were compared to 2015 traffic count (year 2015 FTO data) and the difference (delta) and ratio were calculated. This delta and ratio were applied to the future year 2045 D1RPM model AADT values to correct the error in the model and to make sure growth rates are reasonable. The averaging from the two methods reduces the extremes that may be reached by one of the individual methods of difference method or ratio method. The similar method is used for the development of AADT for No-Build Alternative and General-Purpose Lane Widening/Capacity Improvement Alternative. The AADTs and peak hour volumes for No-Build and Build alternatives are given in **APPENDIX B**.

After the AADTs were established, the K-factor of 9% and D-factor of 61.2% from the FTO were applied to calculate the demand in the peak hour. K-factor D-factor were calculated from historical data from FTO.

The alternatives evaluated are described in the following sections.

8.3 No-Build Alternative

The socio-economic data and highway network changes made in the SR 70 Traffic Forecast Modeling Technical Memorandum and US 98 Project Development and Environment Study are incorporated in the No-Build Alternative. The potential developments (not incorporated in current version of D1RPM), received from the Highlands County and D1 office (<https://arcg.is/1r5GvC>) were also included. Traffic in the northeast Polk County of the D1RPM includes the flow to/from the Central Florida Regional Planning Model (CFRPM7) while maintaining previous agreements with the Polk County TPO as to external station volumes. Known Developments of Regional Impact (DRIs) or other significant developments within this area were closely analyzed to make sure they were properly accounted for based on their build-out capacities and dates, resulting in some adjustments to total population and employment at the county level.

8.3.1 Future Year Land Use

The 2045 socioeconomic data in the D1RPM is compared with BEBR (2015) medium-level population projections for 2045 and employment projections from InfoUSA. **Table 8-1** shows the total from the BEBR and the D1RPM for Highlands County. The TAZs within the land use study area were reviewed and updated, as needed, to reflect projected 2045 conditions. **Table 8.2** presents the potential growth added to each TAZs in addition to the developments in D1RPM. **Figures 8-1** and **Figure 8-2** graphically display the population and employment growth, respectively, by TAZ, between 2017 and 2045.

Table 8-1 - 2045 Socioeconomic Data - Total Population for Highlands County

Data Source	Total Population		Total Employment	% Growth from Validated 2015 to 2045 in D1RPM ²	% Growth Heartland TPO 2045 LRTP (2019-2045)
	Medium	High			
BEBR Totals ¹	122,500	147,300	-		
Highlands County Population	D1RPM:148,814		-	54%	23%
Highlands County Employment	-		D1RPM: 49,408	37%	15%

1. Bureau of Economics and Business Research, Florida Population Studies, Bulletin 174 https://www.bibr.ufl.edu/sites/default/files/Research%20Reports/projections_2016.pdf
2. HRTPO 2045 LRTP Adopted March 10, 2021: *The employment projections were derived from using regional economic forecasting software (REMI PI+).*

Table 8-2- Potential Growth added to 2045 Socioeconomic Data - Highlands County

TAZ	Single Family Dwelling Unit	Multifamily Dwelling Unit	Industrial Employment	Commercial Employment	Service Employment
1697	-	252	-	-	-
1700	-	272	-	-	-
1715	-	109	-	-	-
1717	-	549	-	-	-
1726	130	-	-	-	-
1730	-	230	-	-	-
1755	10	-	-	-	-
1766	-	51	-	-	-
1770	-	17	-	-	-
1774	-	497	-	-	-
1791	-	360	-	-	-
1695	-	20	-	-	-
1811	-	7	-	-	-
1834	-	50	-	-	-
1836	-	31	-	-	-
1845	-	46	-	-	-
1684	-	-	3	-	-
1686	-	-	-	-	17
1698	-	-	123	-	219
1701	-	-	-	23	-
1713	-	-	63	89	-
1723	-	-	524	-	-
1724	-	-	-	17	158
1725	-	-	-	-	32
1726	-	-	-	6	-
1727	-	-	-	95	-
1728	-	-	-	46	-
1730	-	-	72	-	-
1731	-	-	-	76	-
1735	-	-	-	-	-
1745	-	-	-	35	-
1748	-	-	-	94	-
1754	-	-	-	6	-
1758	-	-	-	78	-
1766	-	-	-	120	-
1771	-	-	-	6	-
1776	-	-	-	-	146
1782	-	-	-	6	-
1783	-	-	-	880	-
1787	-	-	-	26	-
1798	-	-	-	61	-
1809	-	-	-	31	-
1828	-	-	-	167	-
1830	-	-	32	-	-
1836	-	-	-	-	90
1845	-	-	237	-	-
1852	-	-	-	42	-
1857	-	-	20	-	-

Figure 8-1 – 2015-2045 Zonal Population Growth

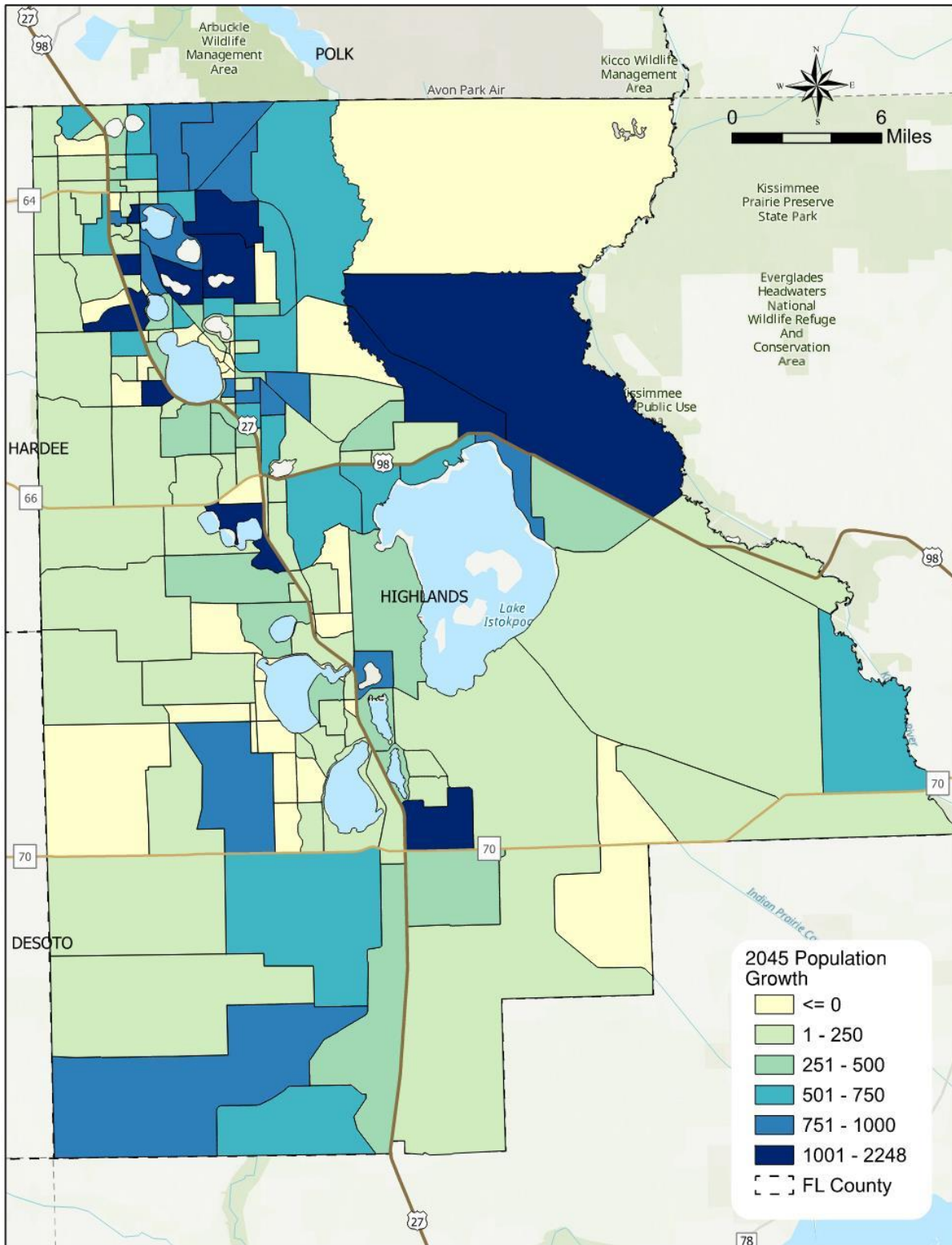
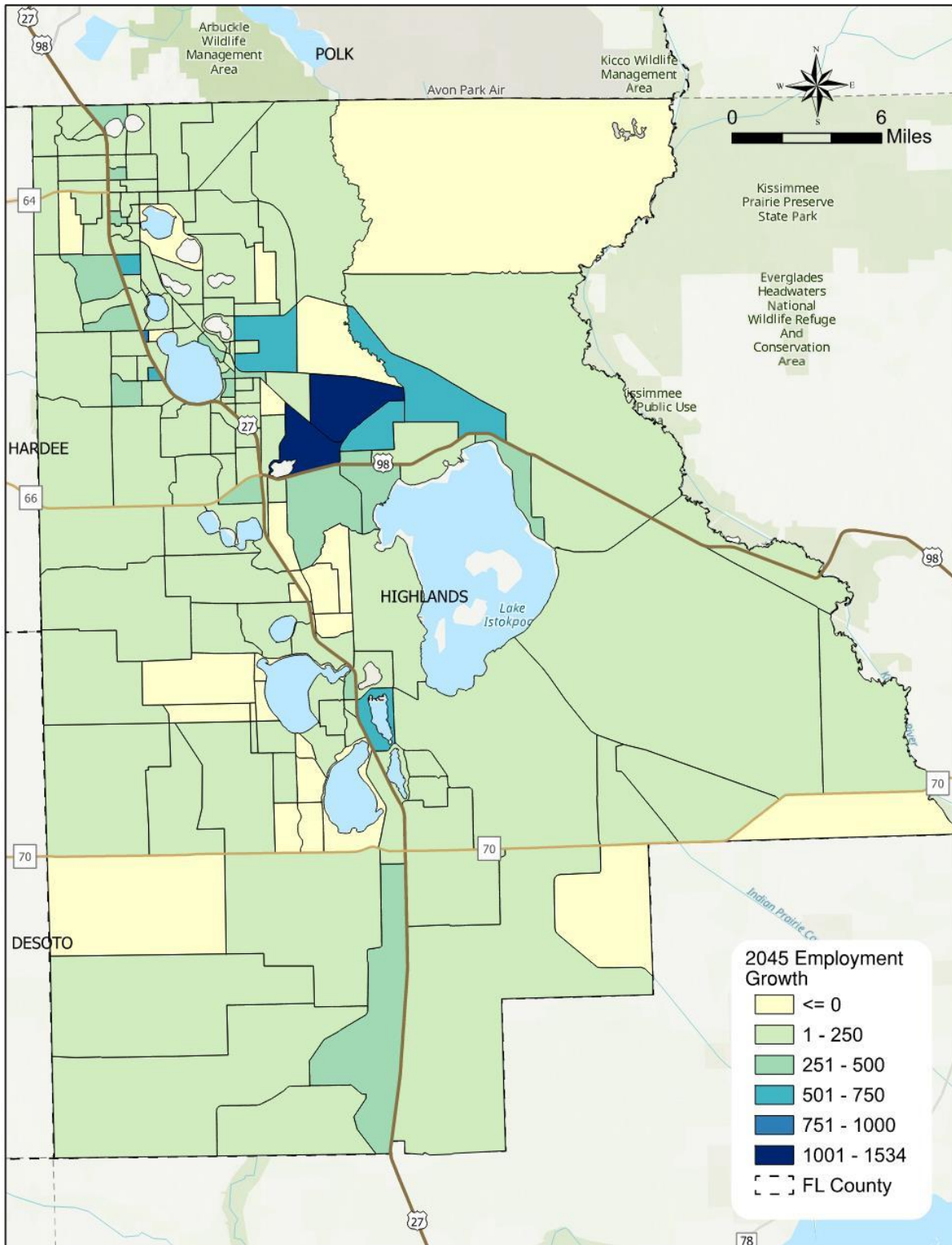


Figure 8-2 – 2015-2045 Zonal Employment Growth



The No-Build alternative from 2045 cost feasible model was used to predict future traffic volumes and patterns. The alternative included improvements based on the 2045 SIS Cost Feasible Plan including improvements to the north of the study area and the completion of the Central Polk Parkway East and the Poinciana Parkway Extension.

8.3.2 Future Year Adjacent Developments

Long Range Transportation Plan (LRTP) improvements were added based on the SIS Cost Feasible Plan 2045. Major planned projects surrounding the study area are detailed below. The adjacent developments are included in **Figure 8-3**.

A. Central Polk Parkway

The proposed parkway will extend from the Polk Parkway/SR 570 at SR 540 west of Winter Haven and looping through south central Polk County – Central Polk Parkway West and Central Polk Parkway East. The Central Polk Parkway West (FPID: 440897-2 & 440897-4) extends from Polk Parkway (SR 570) to SR 60. Central Polk Parkway East extends from SR 60 to the proposed Poinciana Parkway Extension Connector. This new roadway will also connect with Interstate 4 (I-4) between US 27 in Polk County and SR 429 in Osceola County.

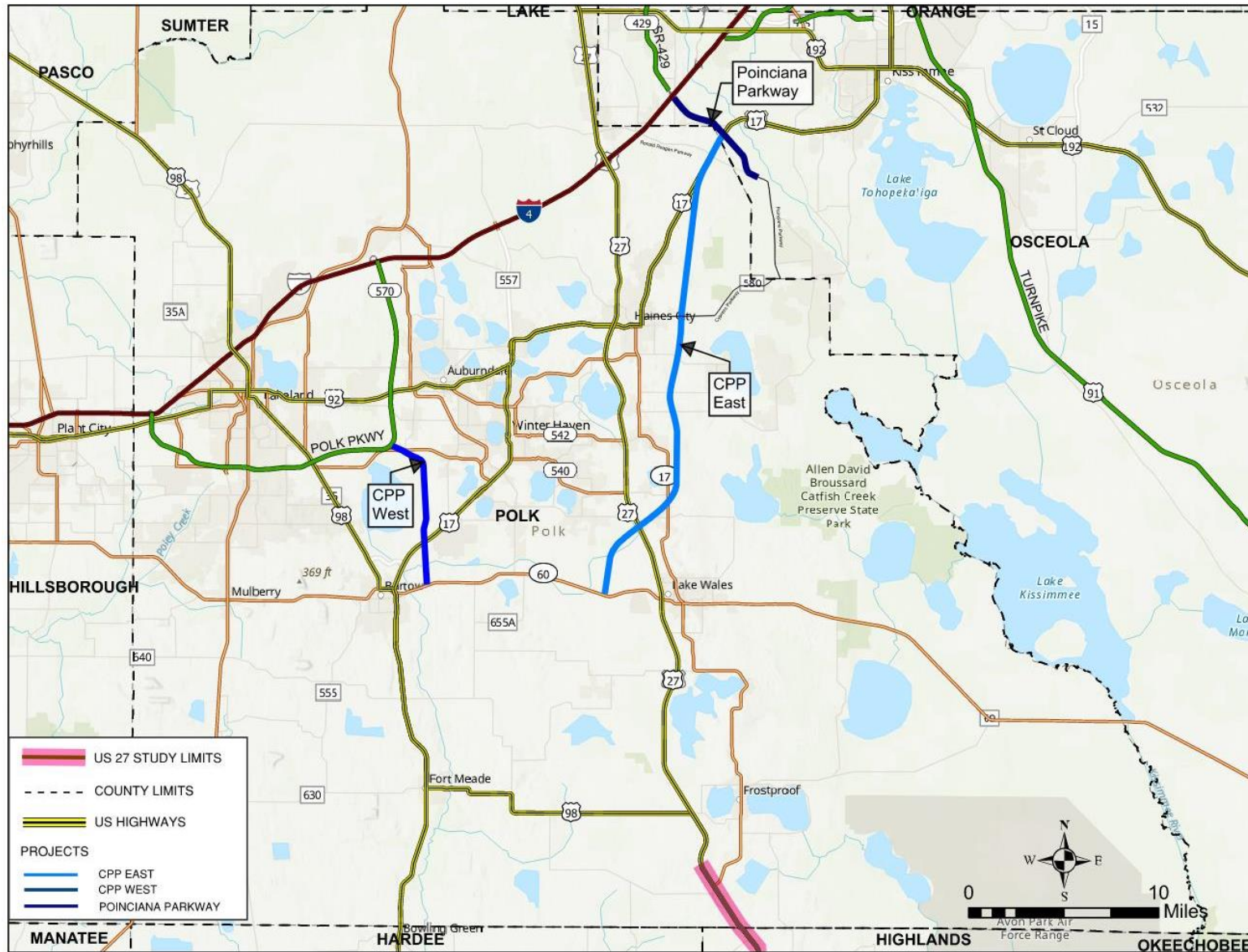
The purpose of the Central Polk Parkway study was to identify an environmentally sensitive preferred alternative for a new four lane limited access highway. The objective of the new facility is to provide an additional north-south facility to enhance mobility and increase accessibility on the regional roadway network and also improve emergency evacuation and response times. The facility is anticipated to reduce traffic congestion, including truck traffic, on several corridors in central Polk County, particularly parallel facilities such as US 98, US 17 and US 27. The Central Polk Parkway is being planned to support the increased travel demands expected from the continued residential and employment growth projected within the County and throughout the entire region.

B. Poinciana Parkway Extension

The proposed parkway extends from south of CR 532 to north of the I-4 / SR 429 Interchange by Central Florida Expressway (CFX) Authority (approximately 4 miles). Poinciana Parkway from US 17 to I-4 connecting to SR 429 (toll facility) (FPID-446581-1).

An extension of the Poinciana Parkway to I-4 in Osceola County has been identified as a

Figure 8-3 – Adjacent Projects



need in several local comprehensive plans, long-range transportation plans and expressway authority master plans. As a result, the parkway extension and remaining portions of the Osceola County Expressway Authority (OCX) 2040 Master Plan was incorporated into the CFX 2040 Master Plan. CFX recently completed a Concept, Feasibility and Mobility Study for the Poinciana Parkway Extension that concluded the project may be viable under CFX policy. The CFX Board accepted that study's findings and approved a Project Development & Environment (PD&E) project at their Board meeting on March 8, 2018.

8.3.3 Volume Development

2045 Cost Feasible Model w/ Base Year Model Calibration was used for the future year AADTs. The NCHRP smoothing method was applied to the projected volume. After the AADTs were established, the K- factors and D-factors recommended for the project were applied to calculate the demand in the peak hour according to the existing peak direction. The K-factor and D-factor are same as those used in the base year volume development. The AADTs ranged from 17,500 to 63,000 along US 27 within Highlands County. Highest AADTs were observed around Sebring area, south of SR 66, Avon Park and Highlands/Polk County line.

Figure 8-4 depicts the ranges of AADTs along US 27 within the study area in Highlands County. **Figure 8-5** shows the peak hour LOS along US 27 and **Figure 8-6** shows the daily truck volume. 2045 Daily Truck Volume is calculated by multiplying 2045 AADT from D1RPM and 2023 T- factors from FTO. **Table 8-3** shows the peak hour LOS for sections along US 27 for No-Build 2045.

Segments are divided based on the number of lanes, functional classification of roadways and the resulting LOS. Segments of US 27 operate with volume-to-capacity (V/C) ratio over 1.0 in 2045 indicating a congested transportation system. FDOT Topic No. 525-000-006 provides LOS targets for the State Highway System (SHS). For US 27, acceptable Level of Service Standard is "D". The AADTs in the No-Build alternative ranged from 17,500 to 63,000 along US 27. Additional capacity or alternative route(s) are needed to address this increase in demand and growth of the region.

Table 8-3 – Level of Service (LOS) analysis along US 27 for No-Build 2045

FROM	TO	MAX PEAK HOUR VOLUME	SERVICE VOLUME CAPACITY LOS D	MAX V/C RATIO RANGE	PEAK HOUR-LOS
Highlands/Glades County Line	Lake Henry Dr	1,850	1,580-2000	0.95	C
Lake Henry Dr	Touchton Rd	1,550	1,580	0.98	D
Touchton Rd	Lake Josephine Dr	1,700	1,580	1.08	E
Lake Josephine Dr	Lake Josephine Shores Rd	1,750	2,000	0.88	C
Lake Josephine Shores Rd	SR 66/US 98	2,450	2,000	1.23	E
SR 66/US 98	Sebring Parky	2,600	3,020	0.86	C
Sebring Parky	Lakeview Dr	3,050	3,020	1.01	E
Lakeview Dr	Hammock Rd	2,900	3,020	0.96	C
Hammock Rd	Sebring Pkwy	3,150	3,020	1.03	E
Sebring Pkwy	Ridge Dr	2,900	3,020	0.96	C
Ridge Dr	Highlands/Polk County Line	3,450	3,020	1.14	E

Figure 8-4 – 2045 No-Build AADTs

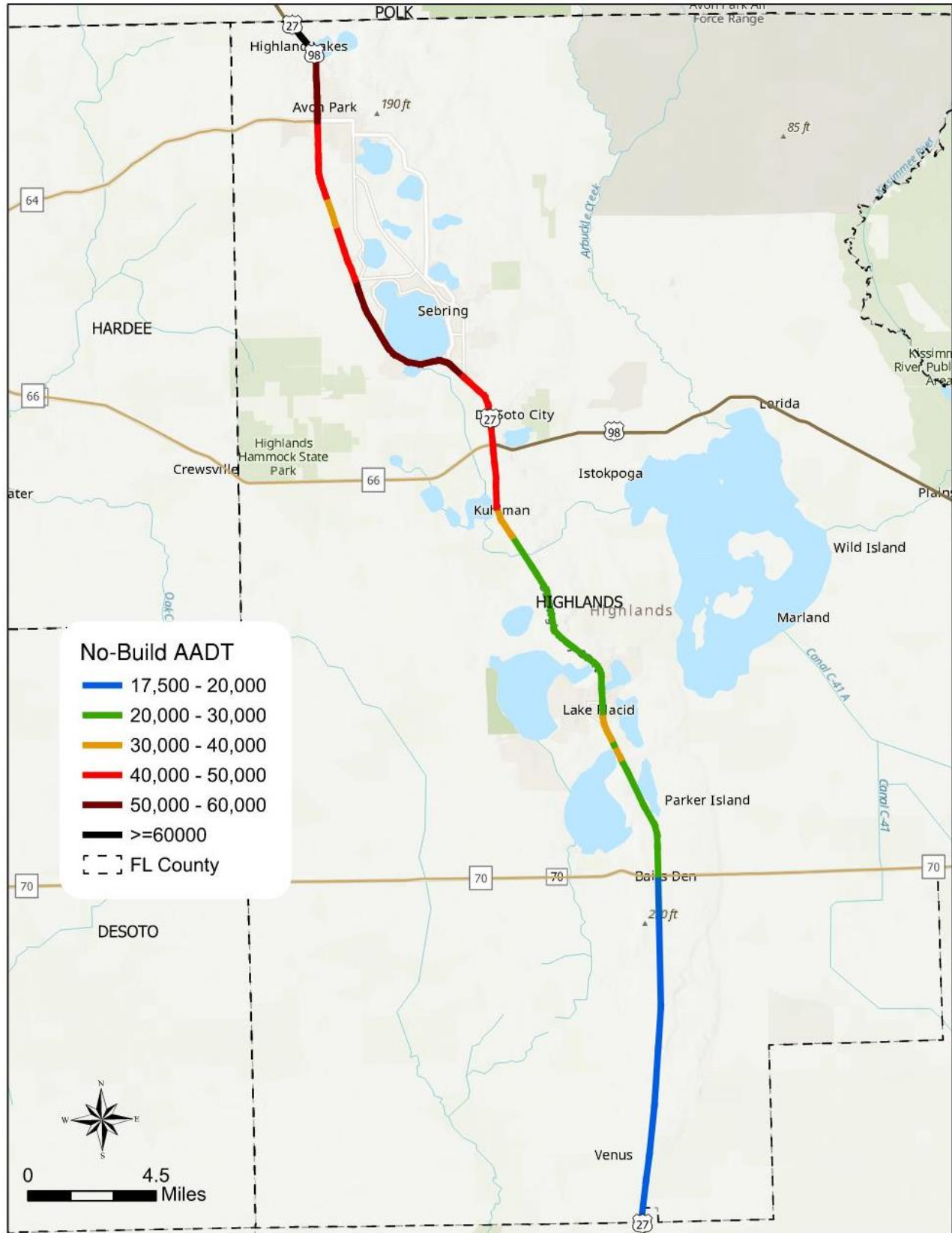


Figure 8-5 – 2045 No-Build Peak Hour LOS

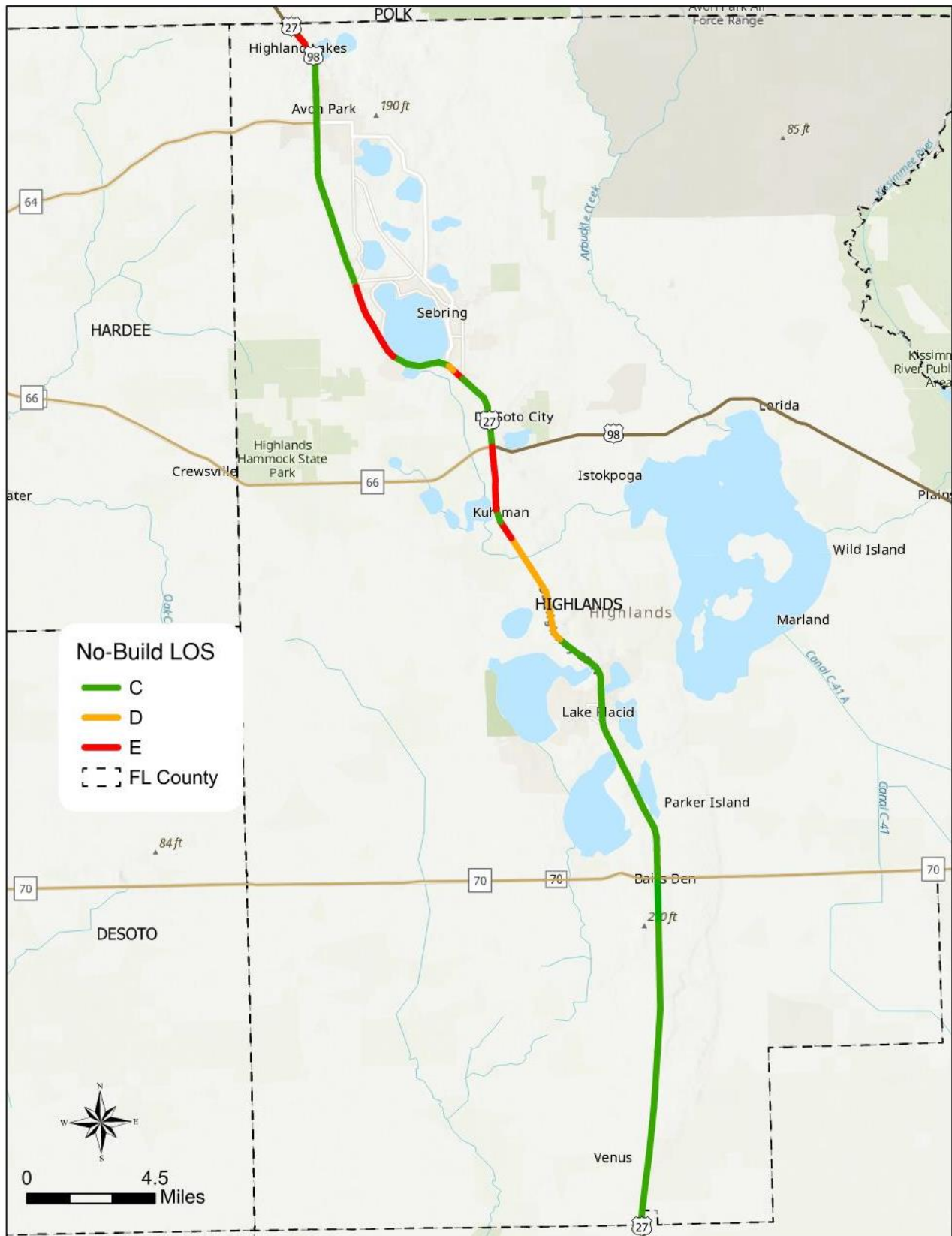
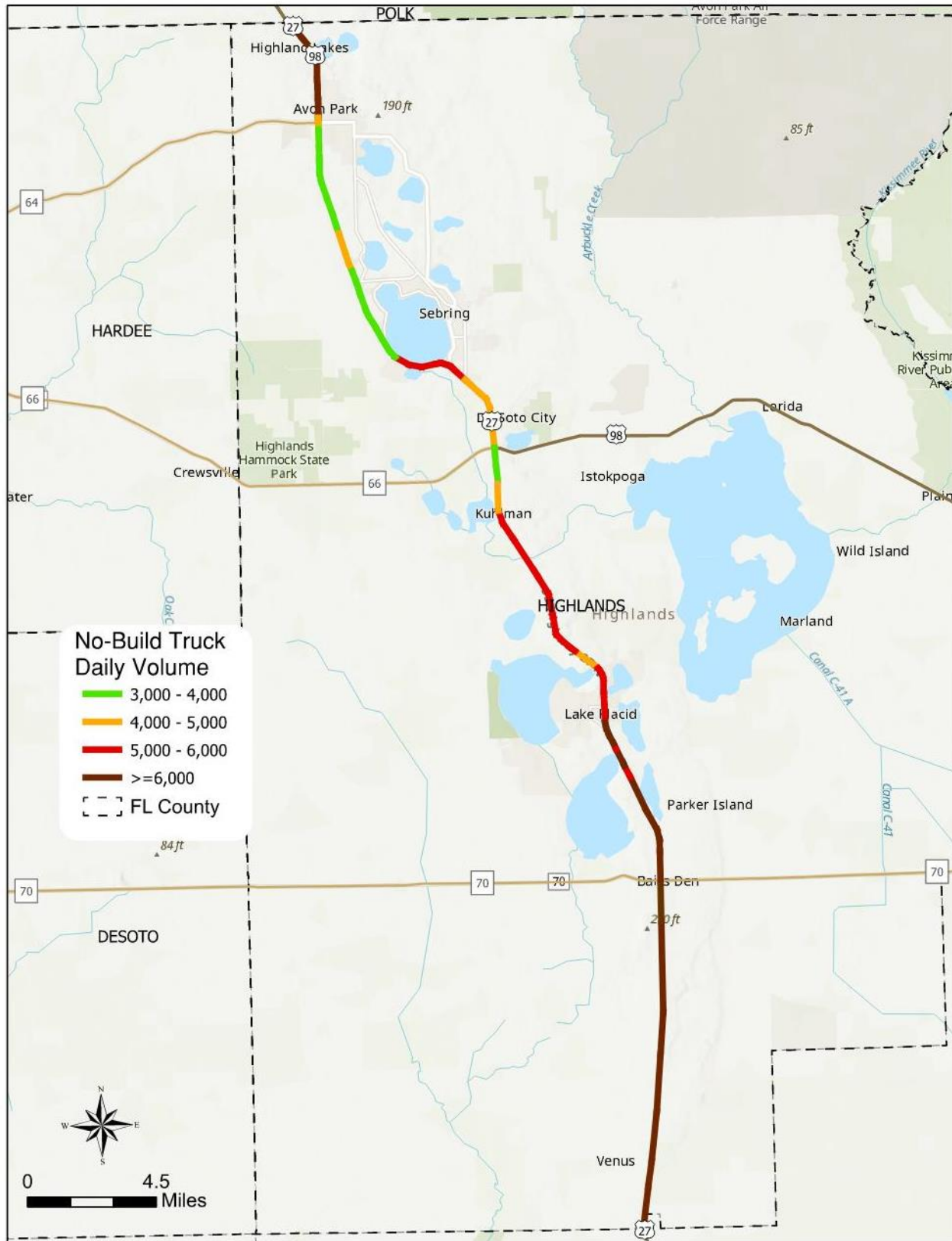


Figure 8-6 – 2045 No-Build Daily Truck Volume



8.4 Build Alternative - General – Purpose Lane Widening

Based on the analysis of No-Build Alternative, the capacity deficiencies along the corridor were identified. Capacity deficiencies were noted in the No-Build alternative as measured by LOS values that are not within the acceptable range. Hence general-purpose lane widening/capacity alternative was considered. The major improvements included adding lane capacity to the sections where the LOS was not within the acceptable range in the No-Build Alternative. The proposed improvement sections are shown in **Table 8-4**. The range of AADTs and peak hour analysis are given in **Figure 8-7** and **Figure 8-8**. The AADT ranges from 17,500 to 71,500. The highest AADTs were observed from Highlands/Polk County Line to south of SR 66 within the study limits.

Table 8-4 – Improvements for sections along US 27

FROM	TO	Improvements
Touchton Rd	Lake Josephine Dr	Adding one lane capacity along each direction
Lake Josephine Shores Rd	SR 66/US 98	
Sebring Parky	Lakeview Dr	
Hammock Rd	Sebring Pkwy	
Ridge Dr	Highlands/Polk County Line	

Table 8-5 shows the peak hour volume and LOS for sections along US 27 for General-Purpose Lane Widening/Capacity Alternative.

Table 8-5 – Peak Hour Volumes and Level of Service along US 27 for Build Alternative-General-Purpose Lane Widening

FROM	TO	MAX PEAK HOUR VOLUME	SERVICE VOLUME CAPACITY LOS D	MAX V/C RATIO RANGE	PEAK HOUR-LOS
Highlands/Glades County Line	Lake Henry Dr	1,850	1,580-2000	0.95	C
Lake Henry Dr	Touchton Rd	1,600	1,580	1.01	E
Touchton Rd	Desoto Dr	3,100	3,020-4,040	0.88	C
Desoto Dr	Lakeview Dr	3,100	3,020	0.99	D
Lakeview Dr	W Main St	3,200	3,020-4,040	0.96	C
W Main St	Palmetto St	3,000	3,020	0.99	D
Palmetto St	County Rd	3,150	3,020	1,04	E
County Rd	Highlands/Polk County Line	3,950	4,040	0.97	C

*- The generalized peak hour directional volumes for Florida’s rural areas has a limit of 3-lane divided roadways, hence capacity of 1-lane is added to 3-lane divided roadways for the capacity analysis for 4-lane rural roadways.

As shown in **Table 8-6** and **Figure 8-7 and 8-8**, the analysis of general-purpose lane widening/capacity alternative addressed the capacity issues along some of the areas compared to the No-Build alternative. However, with an increase in capacity additional induced demand from nearby roadways onto the adjacent sections of US 27 are noted. This induced demand triggered sections of US 27 to operate at LOS worse than the LOS Standard with increase traffic volume and thereby further exasperating the capacity issues within the study area compared than the No-Build and fails to meet the purpose and need for the Highlands County.

Figure 8-7 – Build Alternative -General-Purpose Lane Widening AADT

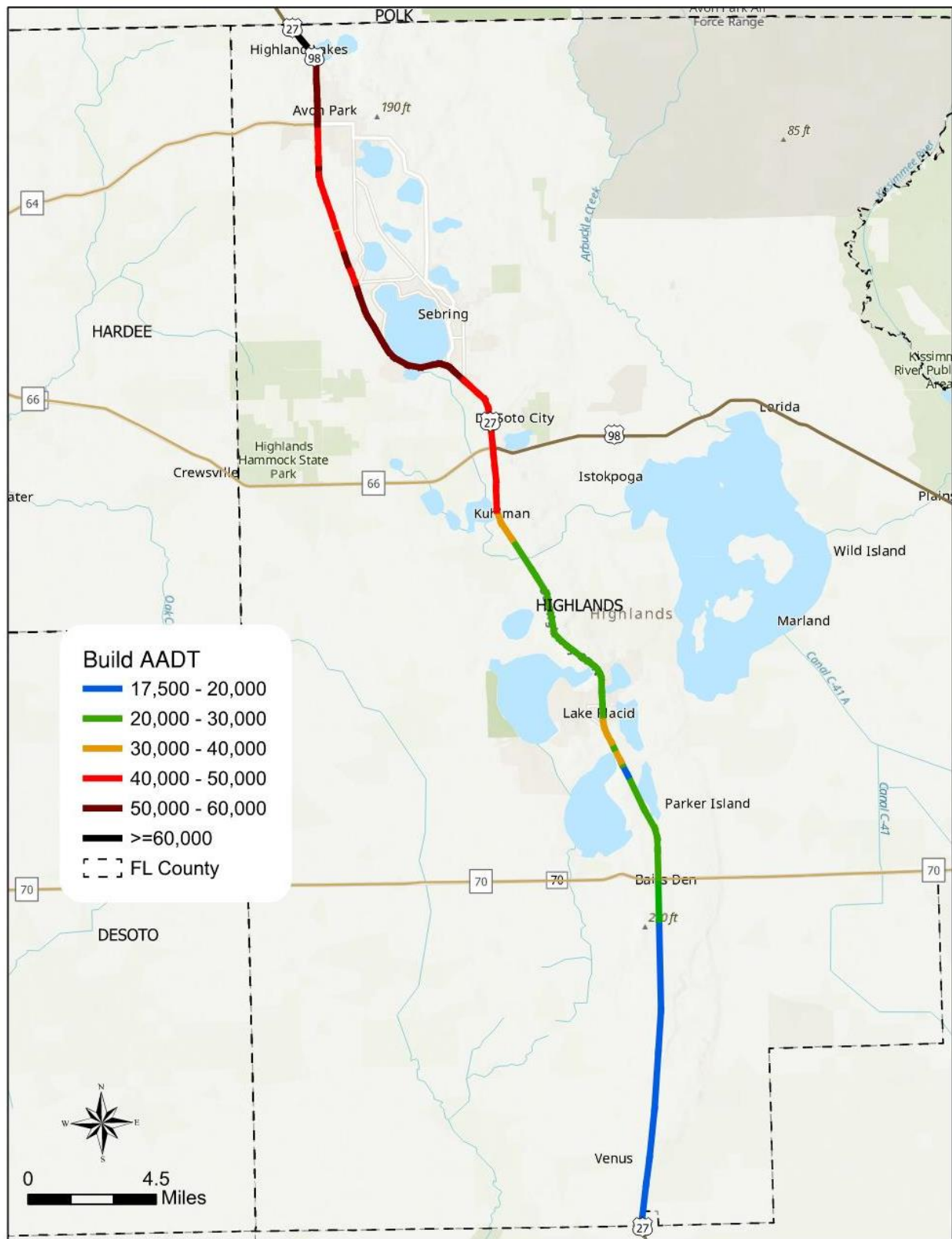
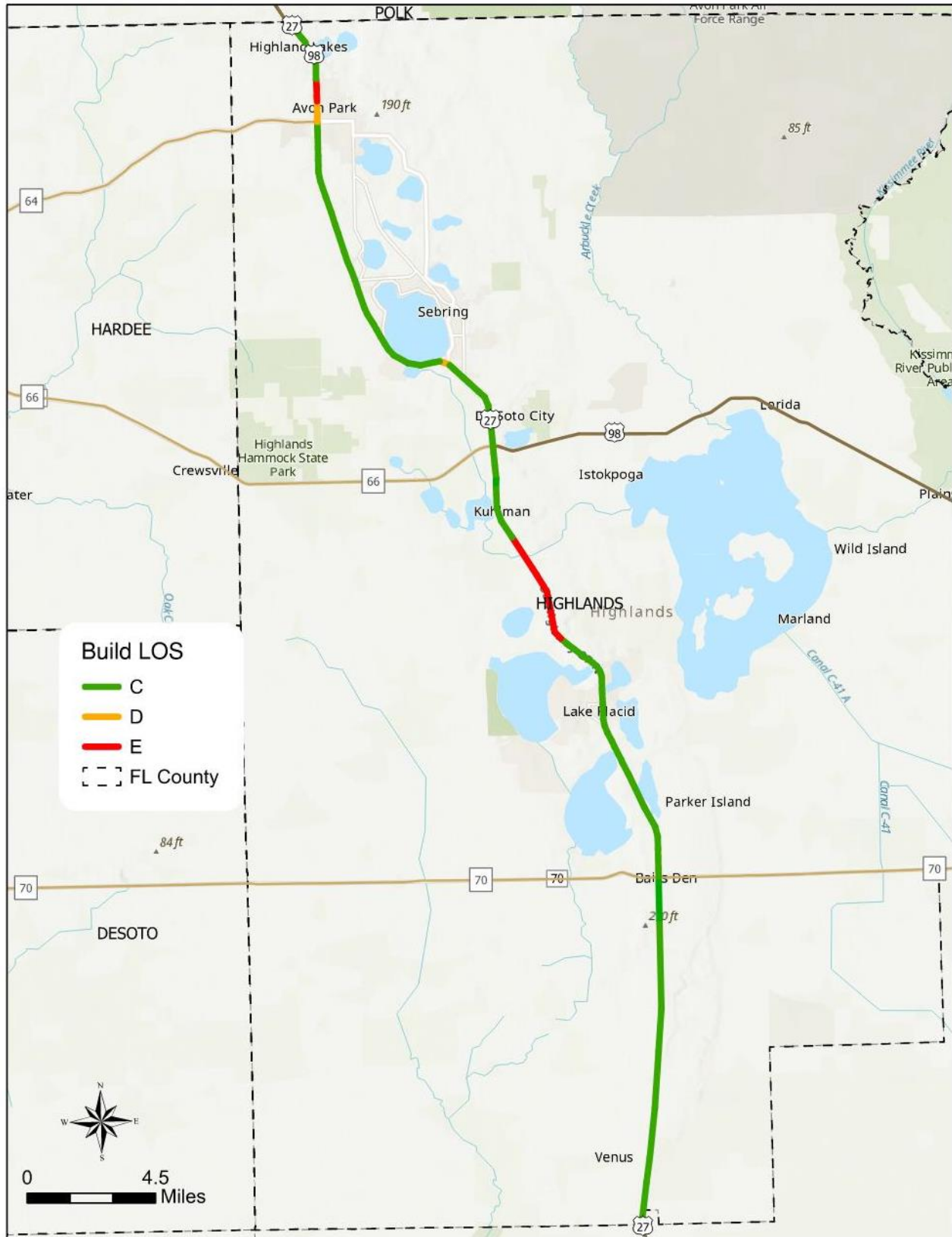


Figure 8-8 – Build Alternative - General-Purpose Lane Widening LOS



9. PREDICTIVE SAFETY

FDOT Safety Office Crash Reduction Analysis Safety Hub (CRASH) program is a safety improvement tools used by FDOT to conduct benefit-cost analyses and calculate crash reduction factors (CRF) (https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/qa/tools/crfguide.pdf?sfvrsn=2e360f88_2). The CRF developed by FDOT is used for the improvements in the study area. Factors generated by the CRASH program that are used to estimate the effects the corresponding countermeasure has on the crash occurrence type. The source of data is from the Department of Highway Safety and Motor Vehicles (DHSMV), the official custodian of the crash reports. The numbers that DHSMV reports are the official numbers. (https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/qa/tools/crf.pdf?sfvrsn=ffd98504_2). The FDOT Safety Office maintains its own database with crash data obtained from DHSMV, and conducts analyses based on this data for internal FDOT purposes.

The improvement in the alternative by 'lanes added to the travel way' decreases the total crashes by 13%. However, the improvement increases the sideswipe, fixed-object, wrong-way, and pedestrian crashes respectively. Crash Reduction Factors (CRFs) from FDOT is given in **APPENDIX C**. The estimated crash reduction is in turn estimated as the number of crashes before project improvement multiplied by a crash reduction factor (CRF) for the specific type of project being evaluated.

General-purpose lane widening/capacity alternatives is not viable considering the purpose and need for the corridor as the crashes increases with lane widening.

10. SUMMARY/CONCLUSION

US 27 serves as the main arterial through Highlands County connecting the Heartland region Florida including the six counties of DeSoto, Glades, Hardee, Hendry, Highlands and Okeechobee and the urbanized area of Highlands County including the cities of Sebring and Avon Park to South Florida. The purpose of the traffic analysis is to evaluate US 27 and identify other existing parallel and connecting facilities to US 27 that could potentially be improved to meet the purpose and need. The addition of employment data resulted in the reduction of the V/C ratio from the initial model. Hence a validation procedure involving adjacent counties is further needed to evaluate the regional traffic accessing US 27. Thus, the model within the subarea is used for No-Build alternative in this study with further investigation needed before the model could be used for forecasting future traffic for the alternative corridors.

The subarea adjustments were made in the 2015 Base Year D1RPM model and was carried over to 2045 Cost Feasible D1RPM model to project AADT and thereby evaluate the roadway performance. The AADTs ranged from 17,500 to 63,000 in the No-Build along US 27 within Highlands County. Highest AADTs were observed around Sebring area, south of US 98, Avon Park and Highlands/Polk County line. The peak hour LOS analysis within the area shows that most of the sections along US 27 around Sebring area, near to Highlands/Polk County Line and south of SR 66 shows LOS E, is not within acceptable LOS standards.

Based on the results of the No Build alternative analysis, improvement alternatives will be developed and evaluated in coordination with engineering and environmental sections. The evaluations will identify potential impacts associated with various alternatives, including impacts to other regional facilities in the project study area. A general-purpose lane widening/capacity Build alternative was evaluated.

The Build alternative AADT ranges from 17,500 to 71,500. The highest AADTs were observed from Highlands/Polk County Line to south of SR 66. The improvements considered from the general-purpose lane widening/capacity alternative did address the capacity issues along most of the areas. However, with an increase in capacity within the improvement limits induced additional demand from nearby roadways onto the adjacent sections of US 27. This additional demand triggered sections of US 27 to operate at LOS that are not within the acceptable range further exasperating the capacity issues within the study area compared than the No-Build and fails to meet the purpose and need for the Highlands County.

The crash data for the five-year period from January 1, 2019 to December 31, 2023 was

analyzed for US 27 from the Highlands County/Glades County Line to Avon Park Cut Off Road in Polk County. Between the years 2019 and 2023, there was a total of 2,782 crashes that costs an estimated economic loss of \$903 million. Of the 2,782 crashes, there were 57 (2.04%) fatal crashes along US 27, 145 (5.2%) serious injury crashes, 1,062 (38%) injury crashes and 1,518 property damage only crashes (55%).

The Crash Reduction Factors (CRF) developed by FDOT is used for the improvements in the study area. FDOT Safety Office Crash Reduction Analysis Safety Hub (CRASH) program is a safety improvement tools used by FDOT to conduct benefit-cost analyses and calculate CRF (https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/qa/tools/crfguide.pdf?sfvrsn=2e360f88_2). The improvement in the alternative by 'lanes added to the travel way' decreases the total crashes by 13%. However, the improvement increases the sideswipe, fixed-object, wrong-way, and pedestrian crashes.

In summary, general-purpose lane widening/capacity alternatives along US 27 is not viable considering the induced demand causing further capacity constraints outside the improvement limits and doesn't meet the purpose and need for the corridor as the crashes also increases with lane widening.

The need to identify an alternative corridor to US 27 that provides the critical mobility for the travelers and trucks along with providing the necessary resiliency needs to be examined. The current US 27 corridor can be reconfigured to address the needs for the vehicular and vulnerable road users, address the context and purpose of the corridor while maintaining efficient access to key business, residential, and activity centers, and economic development and vitality in the region.

APPENDIX A

Methodology Letter

Draft Methodology
Travel Demand Forecasting and Traffic Analysis
449503-1 US 27 Corridor Alternative Study
FDOT, District One

1.0 Model Review and Subarea Validation

The purpose of the traffic analysis is to evaluate US 27 and identify other existing parallel and connecting facilities to US 27 that could potentially be improved to meet the purpose and need. A traffic analysis subarea model shown in **Figure 1** will be developed to include existing parallel facilities of US 17, Sebring Parkway/Panther Parkway, SR 17, CR 671, and MLK Jr Blvd/Power Line Road and connecting facilities of SR 70, SR 66, SR 64, US 98, and SR 60 for a broader traffic analysis of existing facilities. This study will utilize the currently adopted D1RPM v2.0.1. This version of the D1RPM represents the latest available and includes a 2015 Base Year and 2045 Forecast Year.

1.1 Review of 2015 Base and 2045 Forecast Model

A review of the D1RPM 2015 Base model will be conducted to assess whether the model is replicating travel patterns in the study area of influence at a reasonable and acceptable level. The guidelines set forth in the FDOT FSUTMS Model Calibration and Validation Standards and 2019 FDOT Project Traffic Forecasting Handbook will be used in the assessment of the model accuracy and later in the validation process. The model subarea to be analyzed is illustrated in Figure 1.

The 2015 socioeconomic and network inputs will be verified using 2015 Google Earth imagery. The 2015 count information will be compared to FDOT Traffic Online (FTO) historic count data. Additional online research may be required to verify zone population and employment assumptions. Observed discrepancies will be documented and discussed with District One and appropriate changes will be made to the model inputs.

The primary measures used to assess the performance of the 2015 Base model include the percent deviation between the counts and assigned volumes, and the percent Root Mean Square Error (%RMSE) of these deviations. The results of this evaluation will serve as the basis for determining the necessity and scale of a subarea model validation.

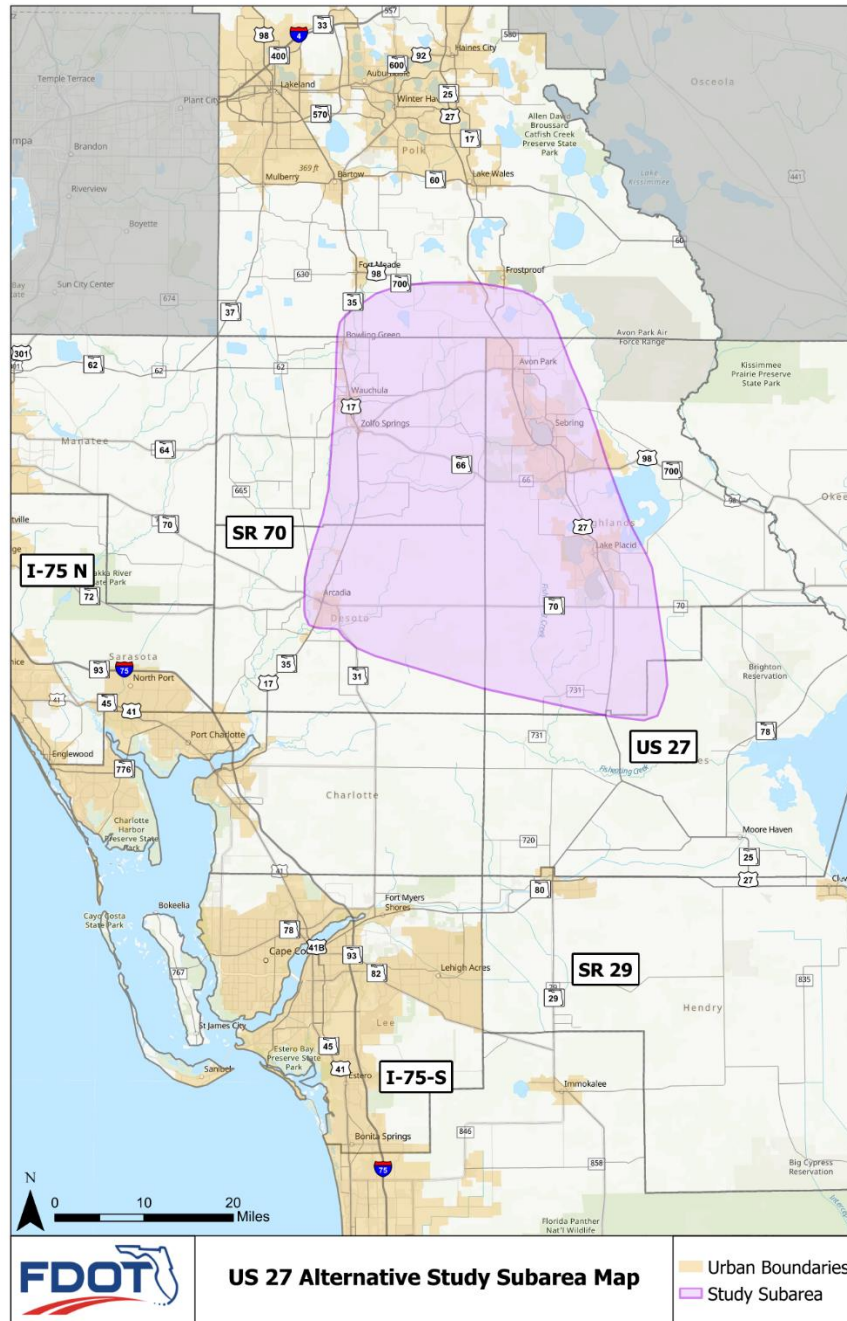
A review of the 2045 model will be conducted to assess the reasonableness of future traffic projections in the study area. The study area model review will check for illogical speed and capacity calculations, illogical trip pathing, reasonableness of trip distribution and assignment, and the reasonableness of population and employment growth.

1.2 Subarea Model Validation

Based on the results of the model review, a subarea validation may be necessary to further refine the traffic forecasting capabilities of the model in the study area. Based on potential deficiencies identified in the model review, a number of refinements will be considered including:

- Refinements to locations of centroids and centroid connectors
- TAZ structure refinement consistent with the Heartland TPO.
- Link coding including facility type, area type, number of lanes, etc.
- Refinement of socioeconomic data in the study area
- Refinement of internal street network in the study area
- Refinements to other factors influencing trip distribution

Figure 1: Project Model Subarea Limits



If necessary, some traffic analysis zones (TAZs) will be split into smaller zones in the project subarea to better represent land use and development to improve the model trip assignment. In addition, Streetlight Data will be used if available for the O-D comparisons to the subarea model to replicate the travel patterns and will discuss with the department if any adjustments are needed.

Once the study subarea validation has been completed, the revised model will be reviewed and assessed to ensure that it is predicting travel patterns at an acceptable level per FDOT and FHWA guidelines. Validation statistics comparing the pre and post subarea model changes for the important corridors within the study

area comparing the model volumes and the observed traffic counts and Streetlight Data. Scatter plots comparing the traffic counts to the model volumes for the subarea along with the R-squared value.

2.0 Forecast Model Development

Review the 2045 Cost Feasible model for planned roadway improvements, anticipated regional growth of population and employment. BEBR projections for County data will be compared for the limits that are within the subarea model network. In addition, TAZs within the land use study area will be reviewed and updated as necessary to reflect projected 2045 conditions. Known Development of Regional Impact (DRIs) or other regional significant developments within the study area will be analyzed to ensure that they were properly accounted for in the SE data based on their build-out capacities and dates. For the limits that are within the subarea model network, any adjustments necessary to the total population and employment growth by TAZ between 2015 and 2045 will be updated in coordination with the review agencies.

2.1 Development of Alternative Forecasts

The No-Build and two (2) Build forecast alternatives (Widening of US 27 general-purpose lanes, and Limited-access toll facility alternative on US 27) will be coded and run. Coordinate with FDOT to determine the appropriate access points and the toll rates to be utilized for the project corridor as part of the alternatives analysis development. A toll plan including the toll lane access points will be developed along the existing corridor for illustration. Results will be reviewed and summarized.

3.0 Peak Traffic Forecasts and Analysis

3.1 Base Year Volume Development

Model AADT values will be used to estimate daily volume along corridors. Base year DDHVs will be developed using K and D values recommended from the 2019 Traffic Forecasting Handbook. Model-derived hourly volumes will be compared to traffic counts to identify any necessary adjustment (diurnal) factors.

3.2 Base Year Capacity Analysis

A base year capacity analysis will be conducted using FDOT Quality Level of Service (QLOS) Handbook Generalized Service Volumes Tables (GSVT) with hourly base year link volumes.

3.3 Design Year Volume Development

The 2045 Cost Feasible model will be compared against BEBR projection within subarea. Subarea daily traffic (2045) will be compared for reasonableness. 2045 bidirectional peak hour volumes (DHVs) will be estimated by applying diurnal factors to 2045 model AADT values. Any further adjustments necessary to either daily or peak hour traffic volumes will be coordinated with FDOT. Traffic projections will be provided comparing 2045 No-Build and 2045 Build scenarios.

3.4 Design Year Capacity Analysis

Design year capacity analysis will be conducted using FDOT Quality Level of Service (QLOS) Handbook Generalized Service Volumes Tables (GSVT) with hourly design year link volumes. Alternatives will also be compared by calculating volume/percent change. Corridors including US 17, Sebring Parkway/Panther Parkway, SR 17, CR 671, and MLK Jr Blvd/Power Line Road will be evaluated to determine whether the existing facilities can accommodate anticipated demand. Any ongoing studies will be taken into consideration and are not expected to be affected by this study.

3.5 Development and Evaluation of Potential Improvements

Based on the results of the No-Build analysis, improvement alternatives will be developed and evaluated in coordination with other engineering and environmental sections. The evaluations will identify potential impacts associated with various alternatives, including impacts to other regional facilities in the project

study area. Three (3) alternatives will be evaluated: a no-build scenario, a general-purpose lane widening/capacity alternative, and a limited-access toll facility alternative. Capacity analyses will be conducted for each alternative, as needed.

4.0 Deliverable

A draft Traffic Technical Memorandum will be developed documenting the steps described above and the results of the alternatives analysis. After receiving feedback from FDOT on the draft document, a final Tech Memo will be developed and submitted with recommendations for next steps.

APPENDIX B

2045 No-Build & Build Alternatives AADT, Peak Hour Volume and V/C Ratio

NCHRP SMOOTHING METHOD FOR BOTH NO-BUILD AND GENERAL -PURPOSE LANE WIDENING/CAPACITY AT SSECTIONS WITH FTO STATIONS

STATION	DESCRIPTION	2015 AADT_FTO	2015 D1RPM TOT VOL	2015 TOTAL VOL AFTER VALIDATION	NCHRP SMOOTHED 2045 NO-BUILD AADT	DDHV (SMOOTHED VOLUME* K-factor*D-factor)	V/C Ratio	2045 D1RPM GP/LANE CAPACITY AADT	NCHRP SMOOTHED 2045 GP/LANE CAPACITY AADT	DDHV (SMOOTHED VOLUME* K-factor*D-factor)	V/C Ratio
160020	SR 25/US 27, NORTH OF HIGHLANDS COUNTY LINE	18,600	20,400	13,097	53,500	2,950	1.23	39,000	61,000	3,350	1.06
090001	SR 25/700/US 27/98, N OF CR 17A/STRYKER RD AVON PK HC 01	23,000	23,500	18,587	52,500	2,900	0.96	42,600	59,000	3,250	0.80
095007	SR 25/700/US 27/98, N OF SR 17/64/MAIN ST AVON PK	30,000	26,400	23,634	51,000	2,800	0.93	40,500	54,500	3,000	0.99
090017	SR 25/700/US 27/98, S OF HAL MCRAE & W CASTLE ST	33,000	35,500	36,866	48,000	2,650	0.88	51,500	50,000	2,750	0.91
095023	SR 25/US 27, NORTH OF SUN N'LAKES BLVD SEBRING	29,000	35,300	35,137	35,000	1,950	0.65	41,200	37,000	2,050	0.68
095022	SR 25/US 27, N OF CR 634A/SEBRING PKWY SEBRING	40,500	41,100	41,374	46,000	2,550	0.84	47,400	47,500	2,600	0.86
095020	SR 25/700, US 27/98 NW OF LAKEVIEW DRIVE SEBRING	41,000	36,500	35,007	55,000	3,050	1.01	49,400	57,500	3,150	0.78
095016	SR 25/700/US27/98, SE OF CR 634/HAMMOCK RD SEBRING	39,000	34,200	33,648	51,500	2,850	0.94	46,000	53,000	2,900	0.96
090026	SR 25/700/US 27/98, SE OF CR 17A/HIGHLANDS AVE	30,500	23,800	23,009	47,500	2,600	0.86	37,600	48,500	2,650	0.88
090039	SR 25/US 27, S OF HIGHLANDER BLVD	20,500	17,100	18,821	32,000	1,750	0.88	29,600	33,000	1,800	0.60
090021	SR 25/US 27, NORTH OF CR 621 LAKE PLACID	18,800	20,900	22,377	26,500	1,450	0.73	30,900	26,500	1,450	0.73
090031	SR 25/US 27, SOUTH OF CR 621 LAKE PLACID	17,800	10,800	14,464	26,500	1,450	0.73	22,400	26,500	1,450	0.73
090006	SR 25/US 27, S OF CR 17/MCCOY ST, LAKE PLACID	18,400	14,700	15,087	33,500	1,850	0.93	28,900	33,500	1,850	0.93
090032	SR 25/US27, SOUTH OF CR 29 SOUTH LAKE PLACID	10,700	11,500	11,742	20,500	1,150	0.58	21,900	20,000	1,100	0.55
090005	SR 25/US 27, NORTH OF SR 70 BAIRS DEN	8,900	6,400	4,858	24,000	1,300	0.82	15,300	23,500	1,300	0.82
090327	SR-25/US-27,2.7 MI SOUTH OF SR-70,HIGHLANDS CO.	7,664	5,300	4,172	19,500	1,050	0.66	12,700	19,500	1,050	0.66
090019	SR-25/US-27, S OF CR 731	6,200	4,100	2,911	17,500	9,50	0.60	10,300	17,500	9,50	0.60

APPENDIX C

Crash Reduction Factors from FDOT

Crash Reduction Factors (as of 02/14/2014)

Florida Department of Transportation

Note: Use of CRFs based on less than 5 projects (Column C) are not recommended for use in B/C analysis. Positive CRFs imply reduced crashes. Negative CRFs imply increased crashes.

Table with 28 columns: ID, Improvement, Potential Controlling Criteria Application (DS, LW, SW, BW, HA, SE, VA, G, SSD, CS, VC, HC, SC, Other), Number of Projects, Total, Fatal, Injury, PDO, Urban, Rural, Night, Day, Rear-End, Angle, Left-Turn, Right-Turn, Sideswipe, Fixed-Object, Head-On, Pedestrian, Ran-Off-Road, Wet Surface.

