

# **Project Development & Environment NOISE STUDY REPORT**

**CENTRAL POLK PARKWAY FROM SR 35 (US 17) TO SR 60  
Polk County, Florida**

**Financial Project Identification (FPID) Number: 440897-4**

Prepared for:



**Florida's Turnpike Enterprise**

**May 2020**

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**Financial Project ID No.: 440897-4**

Prepared for:



**Florida's Turnpike Enterprise**

Prepared by:

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**May 2020**

## Executive Summary

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The Florida Department of Transportation (FDOT), Florida's Turnpike Enterprise (FTE) is performing a Project Development and Environment (PD&E) Study to evaluate a new tolled expressway, which includes a 2.2-mile extension of the future Central Polk Parkway (State Road [SR] 570B) from US 17 (SR 35) to SR 60, in Polk County, Florida.

This PD&E phase Noise Study includes a traffic noise analysis for residential and special land use areas (i.e., non-residential) along the Preferred Alternative. The traffic noise study is completed in accordance with Title 23, Code of Federal Regulations, Part 772 (23 CFR 772), *Procedures for Abatement of Highway Traffic Noise and Construction Noise* following methodology and procedures established by the FDOT in the *PD&E Manual*, Part 2, Chapter 18. The purpose of this noise study is to identify noise sensitive sites that would be impacted by the proposed project, evaluate abatement measures at impacted noise sensitive sites and determine where noise abatement (i.e., noise barriers) needs to be included in the design plans.

Noise levels are predicted at 76 receptor points representing 74 residences and one special land use (Gordon Heights Park). For Design Year (2045) conditions, noise levels at the residences are predicted to approach, meet, or exceed the Noise Abatement Criteria (NAC) at one residence. However, because FDOT policy requires two impacted receptors to be benefited by a 5 dB(A) reduction in order for a barrier to be feasible, a barrier is not considered a feasible abatement measure for the impacted residence. In addition, compared to existing monitored conditions, noise levels for Design Year 2045 Preferred Alternative conditions are not predicted to substantially increase at any residence evaluated. Therefore, based on the noise analysis performed to date, there appears to be no feasible or reasonable solutions available to mitigate the noise impacts at the isolated impacted residence.

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# ACRONYMS

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AET	All Electronic Tolling
CFR	Code of Federal Regulations
CNE	Common Noise Environment
CPP	Central Polk Parkway
dB	Decibels
dB(A)	A-weighted decibels
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
Ft	Feet
FTE	Florida's Turnpike Enterprise
LOS	Level of Service
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NRDG	Noise Reduction Design Goal
NSR	Noise Study Report
NSRA	Noise Study Report Addendum
PD&E	Project Development and Environment
ROW	Right-of-way
SEIR	State Environmental Impact Report
SR	State Road
TIP	Transportation Improvement Program
TNM	Traffic Noise Model

# SECTION 1

## *Introduction*

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### **1.1 PROJECT DESCRIPTION**

The Florida Department of Transportation's (FDOT) Florida's Turnpike Enterprise (FTE) is performing a Project Development and Environment (PD&E) study to evaluate a new tolled four-lane limited access expressway located in Polk County, Florida. The study will evaluate extending the Central Polk Parkway beginning at US 17 approximately a half mile west of 91 Mine Road and terminating at SR 60 west of N. 91 Mine Road, a distance of approximately 2.2 miles. The project limits are shown in **Figure 1-1**. The results of the study will support determination of the type, preliminary design and location of the proposed improvements.

Previously, a PD&E study for the Central Polk Parkway (CPP), conducted by the FDOT, District One, FPID 423601-1-22-01, concluded in March 2011 with the approved State Environmental Impact Report (SEIR). The 2011 PD&E study evaluated a new six-lane limited access facility with two recommended alternatives: the Western Leg (SR 60 to the Polk Parkway [SR 570]) and the Eastern Leg (SR 60 to I-4). In February of 2013, the design for Segment One (Polk Parkway [SR 570] to US 17 [SR 35]) of the 2011 PD&E Western Leg was partially completed to Phase I design by FDOT District One, FPID 431641-1-52-01. The District One project was placed on hold in April 2016 due to insufficient funding and low forecasts for traffic across the entire corridor that did not justify the project at that time." Segment One is currently under design by the FTE to provide a new four-lane divided limited access expressway from the Polk Parkway to US 17, FPID 440897-2-52-01. This new expressway will feature all electronic tolling (AET).

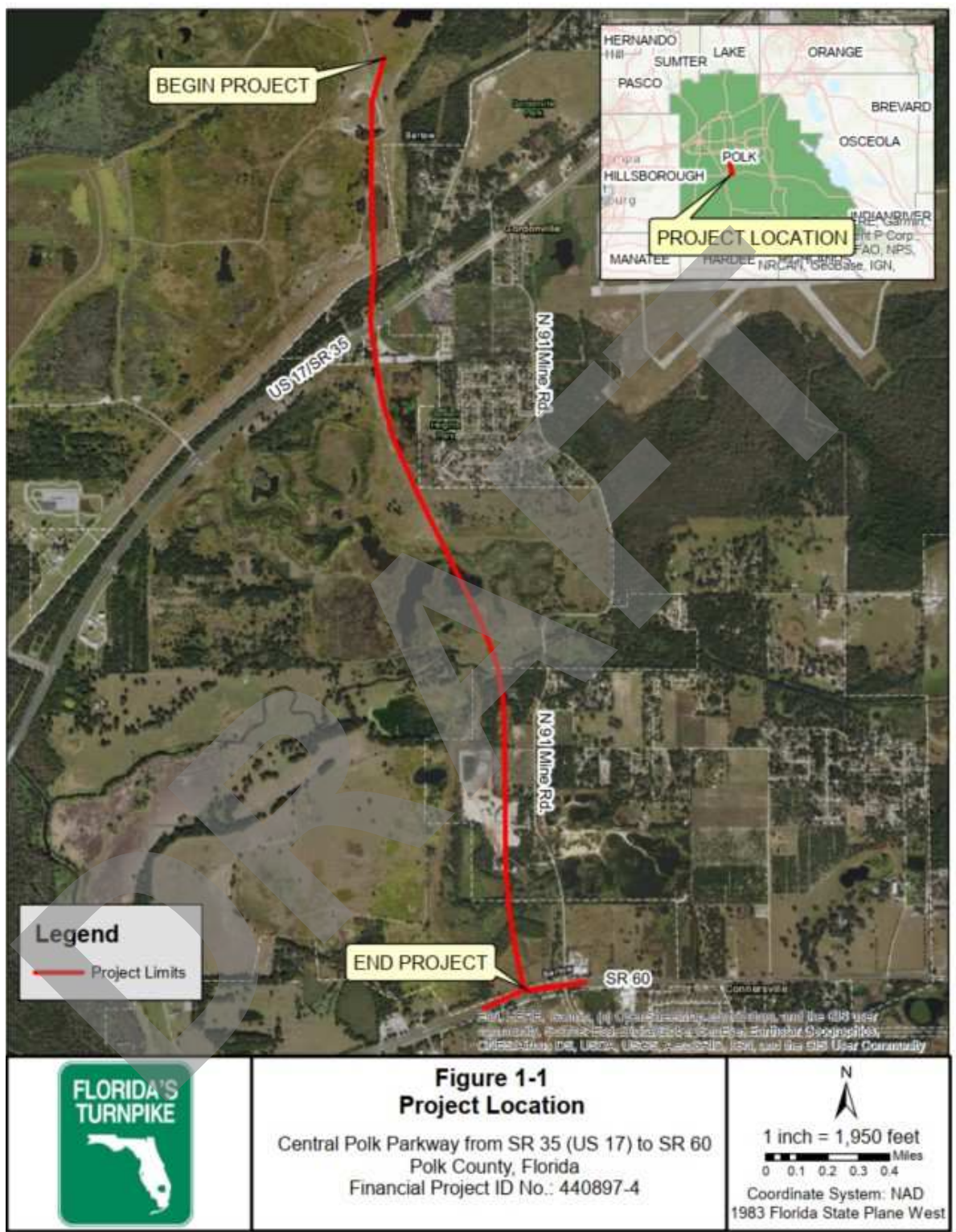
The east/west extension from US 17 to SR 60 which is being evaluated as part of this PD&E study, was not evaluated as part of the previous Central Polk Parkway PD&E study, FPID 423601-1-22-01. It should also be noted that the Central Polk Parkway nomenclature is still being utilized.

Land use in the area generally includes large sections of pasture with residential housing concentrated near N. 91 Mine Rd. Additionally, the Bartow Executive Airport is located within 2 miles of this project.

### **1.2 SUMMARY OF 2011 PD&E STUDY RESULTS AND COMMITMENTS**

Based on predictions made during the Final Noise Study Report for the Project Development and Environment Study for Central Polk Parkway from SR 60 to Polk Parkway (SR 570) and from SR 60 to I-4 (March 2011), substantial increases in noise are expected to occur in some areas since Central Polk Parkway is a new alignment highway which would be located in proximity to noise sensitive areas not currently affected by traffic noise. However, the alignment has changed since the 2011 study.

The purpose of this report is to identify noise impacts and if any reasonable and feasible noise abatement is recommended for further consideration in Design.



**Figure 1-1 Project Location Map**

## SECTION 2

# *Methodology*

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The traffic noise study is performed in accordance with the Code of Federal Regulations Title 23 Part 772 (23 CFR 772), *Procedures for Abatement of Highway Traffic Noise and Construction Noise* using methodology established in the FDOT *PD&E Manual*, Part 2, Chapter 18 (FDOT, January 2019). Predicted noise levels were produced using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM), version 2.5.

### **2.1 NOISE METRICS**

Noise levels developed for this analysis are expressed in decibels (dB) using an “A”-scale [dB(A)] weighting. This scale most closely approximates the response characteristics of the human ear to typical traffic noise levels. All reported noise levels are hourly equivalent noise levels [Leq(h)]. The Leq(h) is defined as the equivalent steady-state sound level that, in an hourly period, contains the same acoustic energy as the time-varying sound level for the same hourly period. Use of these metrics is consistent with the requirements of 23 CFR 772.

### **2.2 TRAFFIC DATA**

Among other factors, traffic noise is heavily dependent on both traffic speed and traffic volume with the amount of noise generated by traffic increasing as the vehicle speed and number of vehicles increases. The traffic conditions that result in the highest noise levels for roadways are the hourly traffic volumes that represent Level of Service (LOS) C traffic conditions because they represent maximized traffic volumes that continue to travel at free flow speed.

Traffic data were reviewed to determine maximum traffic volumes that would allow traffic to flow at speeds consistent with established speed limits. Traffic data for the 2045 Build condition were provided by FTE and reviewed to identify forecasted traffic volumes that would allow vehicles to travel at speeds consistent with established speed limits. Of note, existing and no-build scenario traffic data was not utilized (see **Section 3.1**), as this project is a new alignment. For roadway segments where the predicted hourly design year demand traffic volumes equaled or exceeded LOS C, LOS C hourly traffic was utilized. For roadway segments where the predicted hourly traffic demand was less than LOS C traffic volumes, the predicted hourly demand volumes were utilized. For ramp volumes, hourly traffic demand volumes were utilized. Traffic volumes and speeds used in the analysis are provided in **Appendix A**.

In addition, the total vehicle volume is divided between five classifications: cars, medium trucks, heavy trucks, buses, and motorcycles. Traffic vehicle percentages used in the analysis are provided in **Appendix A**.

### **2.3 NOISE ABATEMENT CRITERIA**

Noise sensitive sites are any property where frequent human use occurs and a lowered noise level would be of benefit. FHWA has established noise levels at which abatement is considered for various types of

noise sensitive sites. These levels, which are used by the Florida's Turnpike Enterprise for the purpose of evaluating traffic noise, are referred to as the Noise Abatement Criteria (NAC). As shown in **Table 2-1**, NAC vary by activity category (i.e., land use). Noise abatement measures are considered when predicted traffic noise levels for the design year (2045) approach, meet, or exceed the NAC. FDOT defines "approach" as within 1 dB(A) of FHWA criteria. For perspective, **Table 2-2** provides typical noise levels of common indoor and outdoor activities.

Noise abatement measures must also be considered when a substantial increase in traffic noise will occur as a direct result of the transportation project. FDOT defines a substantial increase as 15 or more decibels above existing conditions. A substantial increase typically occurs in areas where traffic noise is a minor component of the existing noise environment but would become a major component after the project is constructed (e.g., new alignment project).

Common Noise Environments (CNEs) are studied separately. A CNE is a group of receptors of the same NAC that are exposed to noise in a similar way. These noise exposures are due to traffic mix, volume, speed and topographic features, and typically occur between two secondary noise sources such as interchanges, intersections, and cross roads.

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**Table 2-1  
FHWA Noise Abatement Criteria**

Activity Category	Activity Leq(h)		Evaluation Location	Description of Land Use Activity Category
	FHWA	FDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67	66	Exterior	Residential.
C	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A – D or F.
F	-----	-----	-----	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	-----	-----	-----	Undeveloped lands that are not permitted.

Source: 23 CFR Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, FHWA, 2010.

**Table 2-2  
Typical Noise Levels**

Common Outdoor Activities	Noise Level dB(A)	Common Indoor Activities
Jet Fly-over at 1000 ft	---110---	Rock Band
Gas Lawn Mower at 3 ft	---100---	
Diesel Truck at 50 ft, at 50 mph	---90---	
Noise Urban Area (Daytime)	---80---	Food Blender at 3 ft Garbage Disposal at 3 ft
Gas Lawn Mower at 100 ft	---70---	Vacuum Cleaner at 10 ft Normal Speech at 3 ft
Commercial Area	---60---	
Heavy Traffic at 300 ft	---50---	Large Business Office Dishwasher Next Room
Quiet Urban Daytime	---40---	Theater, Large Conference Room (Background)
Quiet Urban Nighttime	---30---	Library
Quiet Suburban Nighttime	---20---	Bedroom at Night, Concert Hall (Background)
Quiet Rural Nighttime	---10---	
Lowest Threshold of Human Hearing	---0---	Lowest Threshold of Human Hearing

Source: California Dept. of Transportation Technical Noise Supplement, Oct. 1998, Page 18.

## 2.4 NOISE ABATEMENT MEASURES

Noise abatement is considered at all noise sensitive sites predicted to approach, meet, or exceed the NAC as stipulated by 23 CFR 772. Abatement measures include traffic management, alignment modifications, noise buffer zones through application of land use controls and noise barriers.

### 2.4.1 TRAFFIC MANAGEMENT

Traffic management techniques that limit motor vehicle speeds or reduce truck traffic can be used to abate traffic noise. A substantial speed reduction on the CPP would lower traffic noise levels. However, the capacity of the roadway to service traffic would also be reduced. Therefore, speed reduction is not a reasonable abatement measure. The CPP will serve as a north/south route for the movement of freight. Limiting truck operations would affect the movement of materials and goods over an extensive area. Therefore, prohibiting or limiting truck traffic on the CPP is not a reasonable abatement measure.

### 2.4.2 ALIGNMENT MODIFICATIONS

The proposed vertical and horizontal alignment of the CPP has been dictated by minimizing other more severe environmental impacts. Project costs and detrimental effects on land use and other environmental factors have been minimized using the proposed corridor. An alignment modification that could provide a substantial noise reduction is, therefore, not a feasible or reasonable abatement measure.

### 2.4.3 BUFFER ZONES

As properties in the vicinity of a highway are developed, providing a buffer between a highway and future noise sensitive development can minimize or eliminate noise impacts. This abatement measure can be implemented through local land use planning. The distances between the proposed highway and location where traffic noise levels approach the NAC for Activity Categories A, B, C and E are determined to facilitate future land use planning that is compatible with the traffic noise environment. For the proposed conceptual design, the distance between the nearest through lane of the CPP and the location where traffic noise levels would approach a particular NAC is provided in **Table 2-3**. The distances do not account for any reduction in noise levels that may be provided by berms, privacy walls or intervening structures in the noise propagation path. The noise contours also do not account for any increase in noise resulting from increased highway elevation (e.g., overpasses) or elevated noise sensitive sites (e.g., second floor patios). For any new development occurring in the future, local officials can use the noise contour information to establish buffer zones thereby minimizing or avoiding noise impacts at sensitive land uses.

**Table 2-3**  
**Noise Abatement Criteria Contours**

Facility	Distance (feet) <sup>1</sup>		
	Activity Category A [56 dB(A)]	Activity Category B & C [66 dB(A)]	Activity Category E [71 dB(A)]
Central Polk Parkway	323	95	36

<sup>1</sup>Distance referenced to the edge of the nearest proposed through lane. Distance does not account for any reduction in noise levels that may be provided by berms, privacy walls or intervening structures.

### 2.4.4 NOISE BARRIERS

Barriers reduce noise levels by blocking the sound path between a highway and noise sensitive site. To effectively reduce traffic noise, a barrier must be relatively long, continuous (with no intermittent openings), and of sufficient height. For a noise barrier to be considered feasible and cost reasonable, the following minimum conditions should be met:

- At least two impacted receptors must be provided a noise reduction of 5 dB(A) or more to be considered feasible.
- A noise barrier must also attain the Noise Reduction Design Goal (NRDG), which states that a minimum noise reduction of 7 dB(A) for at least one benefitted receptor must be achieved. Of importance, this receptor may also have been previously identified as meeting the feasibility requirement of receiving a 5 dB(A) reduction (first bullet).

- The cost of the noise barriers should not exceed \$42,000 per benefited receptor. This is the upper cost limit established by FDOT. A benefited receptor is defined as a recipient of an abatement measure that experiences at least a 5 dB(A) reduction as a result of providing a noise barrier. The current unit cost used to evaluate cost reasonableness is \$30 per square foot (sq. ft.).

Within the project limits, noise barrier locations were evaluated as follows:

- Right-of-way noise barriers located outside the clear recovery zone, but within the right-of-way, are initially considered at heights ranging from 8 ft. to 22 ft. in 2-ft. increments. According to the *FDOT Design Manual*, noise barriers outside the clear zone shall not exceed a maximum height of 22 ft.
- If a right-of-way barrier cannot provide at least a 5 dB(A) reduction to an impacted receptor or the barrier is not feasible due to construction limitations, then a shoulder barrier is evaluated. According to the *FDOT Design Manual*, shoulder barriers within the clear zone shall not exceed 14 ft. in height when on embankment and 8 ft. in height when on structure.
- The length and height of the noise barriers are optimized based on the benefit provided to noise sensitive sites with predicted noise levels that approach, meet, or exceed the NAC.

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## SECTION 3

# *Traffic Noise Analysis*

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### **3.1 EXISTING NOISE LEVELS**

Ambient monitoring was performed to establish existing noise levels, as the proposed Central Polk Parkway is on a new alignment and traffic noise is not a prevalent noise source at some noise sensitive areas along the Preferred Alternative. Because this project is a new alignment, modeling was not performed for Existing and No-Build scenarios. Noise monitoring was performed at representative locations to establish existing conditions where traffic noise is a minor component of the noise environment or where traffic data is not available to predict traffic noise originating from a nearby road.

Noise monitoring followed the procedures documented in FHWA's Measurement of Highway-Related Noise. Five (5) existing noise measurements were taken using a Quest Technologies Q-300 noise monitor, which was calibrated using a QC-10 calibrator. Noise sources during each monitoring event were noted to classify the various sources and assign a reasonable existing condition at noise sensitive locations based on physical conditions (e.g., characteristics of vegetation, presence of wildlife, types of man-made noise sources, etc.) and are found in **Appendix B**. Common natural noise sources included birds, other wildlife such as insects, and the effects of wind. Common man-made noise sources included airplanes, distant traffic, residential equipment (e.g., air conditioners) and noise generated by neighborhood activities.

Ambient noise monitoring results are provided in **Table 3-1**. However, it should be noted that some monitoring stations were deemed inappropriate due to high levels of construction vehicle traffic or construction equipment noise in the background (noted in **Table 3-1**). The locations of ambient noise monitoring sites are shown in the aerial sheets found in **Appendix D**.

An evaluation of substantial increases was performed for this PD&E phase analysis. Each noise sensitive site was assigned an existing noise level from a representative monitoring station's average LEQ and is provided in **Appendix C**. Based upon the monitoring values collected in **Table 3-1** and shown in **Appendix C**, no substantial increases in traffic noise are expected as a result of this project.

**Table 3-1**  
**Ambient Noise Monitoring**

Monitoring Site	Event	Duration	Date	Time	LEQ	Average LEQ	Field Notes	Validity	Notes
M1	C001	10 mins.	12/3/2019	9:00 AM	55.5	55.6	Traffic from US 17 constant and dominant, birds chirping around 7 minutes into event (lasted about 1 min.)	Valid	N/A
	C002	10 mins.	12/3/2019	9:12 AM	55.7		Traffic from US 17 constant and dominant, one car drove by for about 10 seconds, plane directly overhead (duration 30 seconds), birds chirping		
M2	C003	10 mins.	12/3/2019	9:40 AM	46.3	46.7	Airplane about 2 mins. In (duration: 30 seconds); dominant noise from traffic on US 17	Valid	N/A
	C004	10 mins.	12/3/2019	9:52 AM	47.1		Birds chirping in distance; Dominant noise from US 17		
M3	C005	10 mins.	12/3/2019	10:35 AM	57.2	58.0	Many construction vehicles; Cars on 91 Mine Rd. dominant source of noise; some cars on Gandy Blvd.; 6 planes flew directly over the noise meter;	Invalid	Heavy Construction vehicle traffic.
	C006	10 mins.	12/3/2019	10:45 AM	58.8		Many construction vehicles; 3 planes flew directly over noise meter; one plane in distance; Cars on 91 Mine Rd. dominant source of noise.		
M4	C007	10 mins.	12/3/2019	11:06 AM	52.2	49.9	Dominant source of noise from 91 Mine Rd.; construction equipment in far distance; plane overhead at 1 minute in; sandhill cranes at 7 mins in; plane overhead at 9 mins in.	Invalid	Construction equipment in background.
	C008	10 mins.	12/3/2019	11:17 AM	49.4		Plane overhead at 1 min. in; construction equipment in far distance		
	C009	10 mins.	12/3/2019	11:28 AM	48.0		Construction equipment in far distance; 2 planes flew nearby.		

Monitoring Site	Event	Duration	Date	Time	LEQ	Average LEQ	Field Notes	Validity	Notes
M5	C017	10 mins.	11/19/2020	2:51 PM	46.8	45.9	Rustling leaves, distant intermittent traffic on Old Bartow Eagle Lake Rd., distant helicopter from Bartow Airport, dog barking in distance.	Valid	N/A
	C018	10 mins.	11/19/2020	3:03 PM	45.0		Rustling leaves, distant traffic on Old Bartow Eagle Lake Rd., dog barking in distance, distant weed whacker.		
M6	C019	10 mins.	11/19/2020	3:22 PM	45.8	44.1	Two nearby planes from Bartow Airport, very distant traffic.	Valid	N/A
	C020	10 mins.	11/19/2020	3:33 PM	42.3		Really quiet, distant planes, distant traffic.		

## 3.2 PREDICTED NOISE LEVELS AND ABATEMENT ANALYSIS

Within the project limits, noise sensitive land uses adjacent to Central Polk Parkway include residential areas and a park. Residential communities are in Activity Category B of the NAC, while the park is considered Activity Category C. Noise levels were predicted at 76 receptor points in total, which represent 74 residences and one park affected by traffic noise.

The location of the receptor points representing the noise sensitive sites are in accordance with the *FDOT Project Development & Environment Manual*, Part 2, Chapter 18. Residential receptor points are located at the edge of the building closest to Central Polk Parkway.

Predicted noise levels for these sites are provided in **Appendix B**. The locations of the receptor points identified in **Appendix B** are depicted on the aerials found in **Appendix C**. The alphanumeric identification for each receptor point (e.g., W4, E13) associated with a noise sensitive site is formulated as follows:

- A “W” or “E” denotes which side of Central Polk Parkway the receptor is located (e.g., W4). A “W” indicates that the receptor is located along the southbound lanes (i.e., west of Central Polk Parkway) while an “E” indicates that the receptor is located along the northbound lanes (i.e., east of Central Polk Parkway). However, note that other than 14 residences along US 17 that will be acquired for needed right-of-way, there are no noise sensitive sites on the west side of the Central Polk Parkway alignment.
- The numbers identify a specific receptor point and generally increase from south to north.

For the year 2045 Build condition, noise levels are predicted to approach, meet, or exceed the NAC at one residence within the project limits. However, because FDOT policy requires two impacted receptors to be benefited by a 5 dB(A) reduction in order for a barrier to be feasible, a barrier is not considered a feasible abatement measure for the impacted residence. Additionally, a substantial increase is not predicted to occur at any residence (shown in **Appendix C**).

### 3.2.1 NOISE SENSITIVE SITES – EAST SIDE OF CENTRAL POLK PARKWAY

Predicted noise levels are predicted to approach, meet, or exceed the NAC for 2045 Build condition at one residence along the east side of the proposed Central Polk Parkway (E46). The discussions that follow analyze residential communities and special land uses along the east side of the proposed Central Polk Parkway from south to north.

#### 3.2.1.1 Residences along on N. 91 Mine Rd. and near Gordon Heights Park

Residences along on N. 91 Mine Rd. and near Gordon Heights Park (**Appendix D**, Aerial Sheets 1 through 5) were represented by 43 receptor points representing 43 residences (E1 through E43). Exterior traffic noise levels are predicted to range from 46.7 to 59.2 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. Furthermore, none of the residences would have a substantial increase of 15 dB(A) over existing conditions. Therefore, a noise barrier for the residences along on N. 91 Mine Rd. and near Gordon Heights Park was not considered.

### **3.2.1.2 Gordon Heights Park**

Gordon Heights Park was evaluated for traffic noise impacts (**Appendix D**, Aerial Sheet 5) and was represented by two receptors (E44 and E45). Exterior traffic noise levels are predicted to range from 55.9 to 56.1 dB(A) for the Design year and do not approach, meet or exceed the NAC at the park. Furthermore, none of the receptors would have a substantial increase of 15 dB(A) over existing conditions. Therefore, a noise barrier for Gordon Heights Park was not considered.

### **3.2.1.3 Residences along US 17**

Residences along US 17 (**Appendix D**, Aerial Sheet 6) are represented by six receptor points representing six residences (E46 through E51). While none of the residences would have a substantial increase of 15 dB(A) over existing conditions, exterior traffic noise levels are predicted to range from 62.9 to 66.5 dB(A) for the Design year and approaches, meets or exceeds the NAC at one residence (E46). However, because FDOT policy requires two impacted receptors to be benefited by a 5 dB(A) reduction in order for a barrier to be feasible, a barrier is not considered a feasible abatement measure for the impacted residence. Therefore, a noise barrier for the residences along US 17 was not considered.

### **3.2.1.4 Residences along Old Bartow Eagle Lake Rd.**

Residences along Old Bartow Eagle Lake Rd. (**Appendix D**, Aerial Sheets 6 and 7) are represented by 25 receptor points representing 25 residences (E52 through E76). Exterior traffic noise levels are predicted to range from 53.0 to 58.3 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence (E111). Furthermore, none of the residences would have a substantial increase of 15 dB(A) over existing conditions. Therefore, a noise barrier for the residences along Old Bartow Eagle Lake Rd. was not considered.

## SECTION 4

### *Conclusions*

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#### **4.1 TRAFFIC NOISE IMPACTS**

Noise levels are predicted at 76 receptor points representing 74 residences and one special land use (Gordon Heights Park). For Design Year (2045) conditions, noise levels at the residences are predicted to approach, meet, or exceed the Noise Abatement Criteria (NAC) at one residence (E46). However, because FDOT policy requires two impacted receptors to be benefited by a 5 dB(A) reduction in order for a barrier to be feasible, a barrier is not considered a feasible abatement measure for the impacted residence. In addition, compared to existing monitored conditions, noise levels for Design Year 2045 Preferred Alternative conditions are not predicted to substantially increase (i.e., increase by 15 dB(A)) at any residence evaluated (shown in **Appendix C**). Therefore, based on the noise analysis performed to date, there appears to be no feasible or reasonable solutions available to mitigate the noise impacts at the residence (E46) shown on aerial sheet 6 in **Appendix D**.

## SECTION 5

### ***Construction Noise and Vibration***

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Based on the existing land use within the limits of this project, construction of the proposed roadway improvements will not have any noise or vibration impact. If noise-sensitive land uses develop adjacent to the roadway prior to construction, additional impacts could result. It is anticipated that the application of the FDOT Standard Specifications for Road and Bridge Construction will minimize or eliminate most of the potential construction noise and vibration impacts. However, should unanticipated noise or vibration issues arise during the construction process, the Project Manager, in concert with the Florida's Turnpike Enterprise Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

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## SECTION 6

### ***Community Coordination***

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Coordination with local agencies, officials and the general public is ongoing. A Public Information Meeting was held on June 18, 2019. The public has had the opportunity to comment on the proposed project at public meetings. Florida's Turnpike Enterprise is responsible for taking measures that are prudent and feasible to minimize conflicts with existing land uses and for promoting compatibility with future development. This report provides information such as noise contours (discussed in **Section 2.4.3**) that can be used by local officials to prevent future land development from becoming incompatible with anticipated traffic noise levels. A draft copy of this noise study report will be available for public review at the next Public Hearing presently scheduled for August 27, 2020. Where possible, comments from the Public Hearing will be incorporated into the final noise study report.

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## SECTION 7

### *References*

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## ***APPENDICES***

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***Appendix A    Traffic Data***

***Appendix B    Ambient Noise Measurements***

***Appendix C    Predicted Noise Levels***

***Appendix D    Aerials***

***Appendix E    TNM Files***

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***APPENDIX A***

***TRAFFIC DATA***

**Polk Parkway and Central Polk Parkway (CPP) Mainline**

Note: AADT = Annual Average Daily Traffic; MI = Medium Trucks; HT = Heavy Trucks.

- (1) Number of lanes are obtained from the aerial maps and design layouts.
- (2) Traffic data is obtained from the Central Polk Parkway (CPP) PD&E study Project Traffic Forecast Memorandum.
- (3) Peak hour demand and LOS C peak hour maximum service volumes are provided directionally.
- (4) Freeway mainline and ramp LOS C targets are based on the FDOT Systems Planning Office Estimation of Capacities on Florida Freeways report, dated September 2014, and adjusted for local conditions. LOS C targets for the GUL are obtained from FDOT 2013 Generalized Service Volume tables and adjusted for trucks.
- (5) LOS C AADTs are estimated using K and D factors and the design hour peak direction LOS C maximum service volumes.
- (6) Polk Parkway mainline and tolled ramps design hour truck percentages are based on toll data. Truck percentages for non-tolled ramps are based on applicable adjacent toll data. Truck factors for the Polk Parkway were used for the CPP. Truck percentages for materials were estimated from counts and distributed based on class data from the Florida Traffic Online Application. The medium vehicle classifications listed here make a distinction between medium trucks and busses.
- (7) Posted speed data is obtained from field observations.

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***APPENDIX B***

***Ambient Noise Measurements***

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	12/3/19	
Time	9:00 AM	
Monitor #	1	
Event #	0001, 0002	
Location Description and Latitude & Longitude	27.9383192 -81.8061197	
Event Duration	10 minutes	
Noise Environment Sources	<p>Event 1 Traffic from I7 constant and dominant. Bird chirping around 7 minutes into event, lasted about 1 minute.</p>	
	<p>Event 2 Traffic from I7 again dominant. 1 car drove by for about 10 seconds. Plane directly overhead, duration 30 seconds. Birds chirping for about</p>	
Final LEQ	E1 55.5, E2 55.7	
Weather		
Temperature	55°F	
Humidity	50%	
Wind Speed	3 mph	
Wind Direction	N to S	
Cloud Cover	0%	

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	12/3/19	
Time	9:40	
Monitor #	Site #2	
Event #	C003 & C004	
Location Description and Latitude & Longitude	27.9349486 -81.8014375	
Event Duration	10 mins	
Noise Environment Sources	#1 airplane about 2 mins in (30 sec (approx)); Dominant noise from traffic on I-75	
	#2 Birds chirping in distance	
Final LEQ	E-1:46.3 L-2:47.1	
Weather		
Temperature	60°F	
Humidity	46%	
Wind Speed	3-6 mph	
Wind Direction	N to S	
Cloud Cover	7%	

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	12/3/19	
Time	10:35, 10:45	
Monitor #	Site #3	
Event #	C005 & C006	
Location Description and Latitude & Longitude	27.9219650 -81.7959179	
Event Duration	10 mins	
Noise Environment Sources	<p>Cars on 91 Mine Rd. Dominant source of noise, some cars on Sandy Rd. Plane @ 2 mins in flew directly over meter; 2nd plane @ 3 mins in flew directly over meter; 3rd plane @ 3 mins in flew right over meter; 4th plane @ 5 mins in flew right over meter; 5th plane @ 5 mins in flew right over meter; many construction vehicles</p> <p>Plane flew right @ 3 mins in 2nd plane @ 5 mins in 3rd plane @ 5 mins in 4th plane @ 5 mins in flew right over; many construction vehicles</p>	
Final LEQ	E1: 57.2; E2: 22.3	
Weather		
Temperature	66° F	
Humidity	38%	
Wind Speed	2 mph	
Wind Direction	N to S	
Cloud Cover	0%	

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	12/3/19	
Time	11:06 & 11:17	
Monitor #	Site #4	
Event #	0007 & 0008 & 0009	
Location Description and Latitude & Longitude	27.9148403 -81.7956252	
Event Duration	10 mins	
Noise Environment Sources	<p>Dominant noise from 91 mile Rd, construction equip. in far distance, plane overhead @ 1 min by Sandhill cranes @ 1 min in; plane overhead @ 9/10 min;</p> <hr/> <p>plane overhead @ 1 min; construction equip. in far distance</p> <hr/> <p>construction equip. in far distance; plane overhead nearby; 2nd plane @ near 1 min</p>	
Final LEQ	E1: 58.2; E2: 49.4; E3: 48.0	
Weather		
Temperature	65°	
Humidity	39%	
Wind Speed	1 mph	
Wind Direction	N to S	
Cloud Cover	0%	

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	11/19/19	11/19/19
Time	14:51-15:01	15:03-15:13
Monitor #	1	1
Event #	C017	C018
Location Description and Latitude & Longitude	27.9473858, -81.7989806 In side yard of First Love Church of God in Christ	← Same
Event Duration	10 min	10 min
Noise Environment Sources	Rustling leaves, Distant intermittent traffic on Old Bartow Eagle Lake Road Distant helicopter from Bartow airport Dog barking in distance	Rustling leaves Distant traffic on Old Bartow Eagle Lake Road, Dog barking in distance Distant weed whacker
Final LEQ	46.8 dB(A) Leq	45.0 dB(A) Leq
Weather		
Temperature	72°F	72°F
Humidity	39%	41%
Wind Speed	3-5 mph, gusts to 8	2-5 mph
Wind Direction	W	W
Cloud Cover	Clear	Clear

Ambient Monitoring Data Sheet		
	Morning Events	Afternoon Events
Date	11/19/19	11/19/19
Time	15:22-15:32	15:33-15:43
Monitor #		
Event #	C019	C020
Location Description and Latitude & Longitude	Front yard at end of Gerties Rd. 27.9483729, -81.8017725	← Same
Event Duration	10 minutes	10 minutes
Noise Environment Sources	Two Nearby planes from Bartow airport Very distant traffic	Really quiet. Distant Planes, Distant traffic
Final LEQ	45.8 Leq dB(A)	42.3 Leq dB(A)
Weather		
Temperature	74°F	70°F
Humidity	39%	43%
Wind Speed	2-3 mph	2-4 mph, gust to 5
Wind Direction	W	W
Cloud Cover	Clear	Clear

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***APPENDIX C***

***PREDICTED NOISE LEVELS***

Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2045 Build Condition dB(A)	NAC Approached or Exceeded?	Representative Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
Residences on N. 91 Mine Rd.	1 & 2	E1	B	Residential	1	51.4	NO	M2	46.7	4.7	NO
	2	E2	B	Residential	1	49.3	NO	M2	46.7	2.6	NO
	2	E3	B	Residential	1	57.8	NO	M2	46.7	11.1	NO
	2	E4	B	Residential	1	48.1	NO	M2	46.7	1.4	NO
	2	E5	B	Residential	1	47.1	NO	M2	46.7	0.4	NO
	2	E6	B	Residential	1	46.7*	NO	M2	46.7	0.0	NO
	2	E7	B	Residential	1	50.3	NO	M2	46.7	3.6	NO
	2	E8	B	Residential	1	48.9	NO	M2	46.7	2.2	NO
	2	E9	B	Residential	1	47.0	NO	M2	46.7	0.3	NO
	2	E10	B	Residential	1	47.9	NO	M2	46.7	1.2	NO
	2	E11	B	Residential	1	48.9	NO	M2	46.7	2.2	NO
	2	E12	B	Residential	1	50.4	NO	M2	46.7	3.7	NO
	3	E13	B	Residential	1	48.1	NO	M2	46.7	1.4	NO
	3	E14	B	Residential	1	50.6	NO	M2	46.7	3.9	NO
	3	E15	B	Residential	1	47.2	NO	M2	46.7	0.5	NO
	3	E16	B	Residential	1	49.3	NO	M2	46.7	2.6	NO
Residences near Gordon Heights Park	3	E17	B	Residential	1	48.5	NO	M2	46.7	1.8	NO
	3	E18	B	Residential	1	46.7*	NO	M2	46.7	0.0	NO
	4	E19	B	Residential	1	49.7	NO	M2	46.7	3.0	NO
	4	E20	B	Residential	1	50.2	NO	M2	46.7	3.5	NO
	4	E21	B	Residential	1	51.0	NO	M2	46.7	4.3	NO
	4	E22	B	Residential	1	51.8	NO	M2	46.7	5.1	NO
	4	E23	B	Residential	1	52.7	NO	M2	46.7	6.0	NO
	4	E24	B	Residential	1	54.6	NO	M2	46.7	7.9	NO
	4	E25	B	Residential	1	58.7	NO	M2	46.7	12.0	NO
	4	E26	B	Residential	1	59.2	NO	M2	46.7	12.5	NO
	4	E27	B	Residential	1	52.8	NO	M2	46.7	6.1	NO
	4	E28	B	Residential	1	52.8	NO	M2	46.7	6.1	NO
	4	E29	B	Residential	1	57.9	NO	M2	46.7	11.2	NO
	4	E30	B	Residential	1	54.0	NO	M2	46.7	7.3	NO
	4	E31	B	Residential	1	56.7	NO	M2	46.7	10.0	NO
	4	E32	B	Residential	1	56.8	NO	M2	46.7	10.1	NO
	4	E33	B	Residential	1	56.4	NO	M2	46.7	9.7	NO
	4	E34	B	Residential	1	56.0	NO	M2	46.7	9.3	NO
	4 & 5	E35	B	Residential	1	55.8	NO	M2	46.7	9.1	NO
	4	E36	B	Residential	1	49.5	NO	M2	46.7	2.8	NO
	4	E37	B	Residential	1	49.9	NO	M2	46.7	3.2	NO
	4	E38	B	Residential	1	50.3	NO	M2	46.7	3.6	NO
	4	E39	B	Residential	1	51.0	NO	M2	46.7	4.3	NO

Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2045 Build Condition dB(A)	NAC Approached or Exceeded?	Representative Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
Residences along US 17	4	E40	B	Residential	1	51.4	NO	M2	46.7	4.7	NO
		E41	B	Residential	1	51.7	NO	M2	46.7	5.0	NO
	4	E42	B	Residential	1	49.9	NO	M2	46.7	3.2	NO
	4	E43	B	Residential	1	51.9	NO	M2	46.7	5.2	NO
	4 & 5	E44	C	Park	0	56.1	NO	M2	46.7	9.4	NO
	4 & 5	E45	C	Park	0	55.9	NO	M2	46.7	9.2	NO
	5	E46	C	Park	0	55.9	NO	M2	46.7	9.2	NO
	6	E47	B	Residential	1	66.5	YES	M1	55.6	10.9	NO
	6	E48	B	Residential	1	64.6	NO	M1	55.6	9.0	NO
	6	E49	B	Residential	1	62.9	NO	M1	55.6	7.3	NO
	6	E50	B	Residential	1	63.6	NO	M1	55.6	8.0	NO
	6	E51	B	Residential	1	64.9	NO	M1	55.6	8.0	NO
	6	E52	B	Residential	1	58.3	NO	M5	45.9	9.3	NO
	6	E53	B	Residential	1	58.1	NO	M5	45.9	12.4	NO
	6	E54	B	Residential	1	57.6	NO	M5	45.9	12.2	NO
	6	E55	B	Residential	1	57.5	NO	M5	45.9	11.7	NO
	6	E56	B	Residential	1	57.5	NO	M5	45.9	11.6	NO
	6	E57	B	Residential	1	57.3	NO	M5	45.9	11.4	NO
	6	E58	B	Residential	1	57.2	NO	M5	45.9	11.3	NO
	6	E59	B	Residential	1	56.8	NO	M5	45.9	10.9	NO
Residences on Old Bartow Eagle Lake Rd.	6	E60	B	Residential	1	56.4	NO	M5	45.9	10.5	NO
	6	E61	B	Residential	1	56.0	NO	M5	45.9	10.1	NO
	6	E62	B	Residential	1	55.4	NO	M5	45.9	9.5	NO
	6	E63	B	Residential	1	55.2	NO	M5	45.9	9.3	NO
	6	E64	B	Residential	1	54.6	NO	M5	45.9	8.7	NO
	6 & 7	E65	B	Residential	1	54.1	NO	M5	45.9	8.2	NO
	6 & 7	E66	B	Residential	1	53.6	NO	M5	45.9	7.7	NO
	6 & 7	E67	B	Residential	1	53.0	NO	M5	45.9	7.1	NO
	6 & 7	E68	B	Residential	1	53.3	NO	M5	45.9	7.4	NO
	6 & 7	E69	B	Residential	1	53.8	NO	M5	45.9	7.9	NO
	6 & 7	E70	B	Residential	1	53.4	NO	M5	45.9	7.5	NO
	6 & 7	E71	B	Residential	1	55.8	NO	M5	45.9	9.9	NO
	6 & 7	E72	B	Residential	1	55.5	NO	M5	45.9	9.6	NO
	6 & 7	E73	B	Residential	1	55.8	NO	M5	45.9	9.9	NO
	6 & 7	E74	B	Residential	1	54.7	NO	M6	44.0	10.7	NO
	6 & 7	E75	B	Residential	1	54.8	NO	M6	44.0	10.8	NO
	7	E76	B	Residential	1	53.4	NO	M6	44.0	9.4	NO
	7	E76	B	Residential	1	57.4	NO	M6	44.0	13.4	NO

\*Where the future modeled traffic noise level was calculated as lower than the measured ambient level assigned to that receptor, the reported value is the ambient level, which would mask the lower levels of distant traffic noise.

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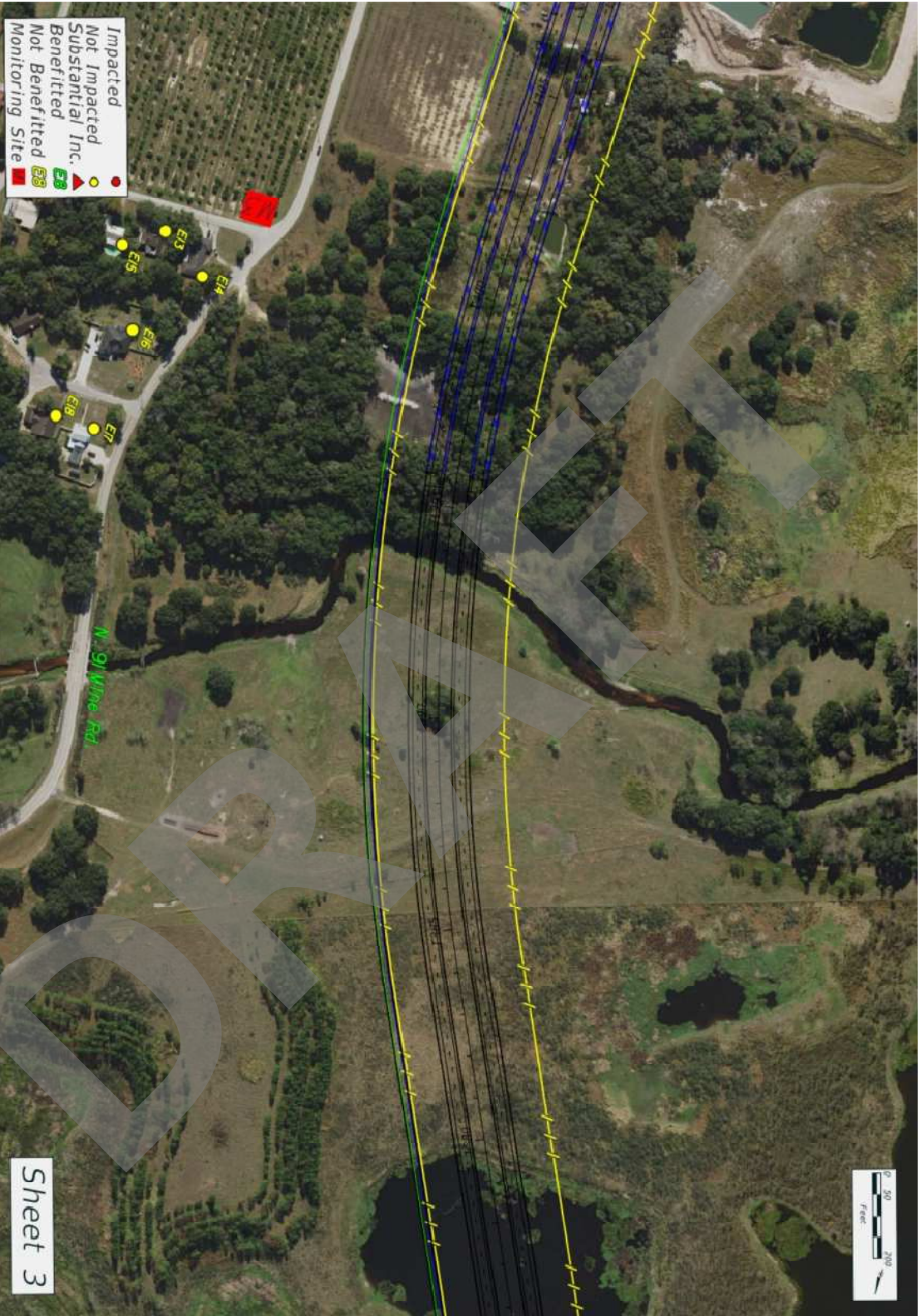
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***APPENDIX D***

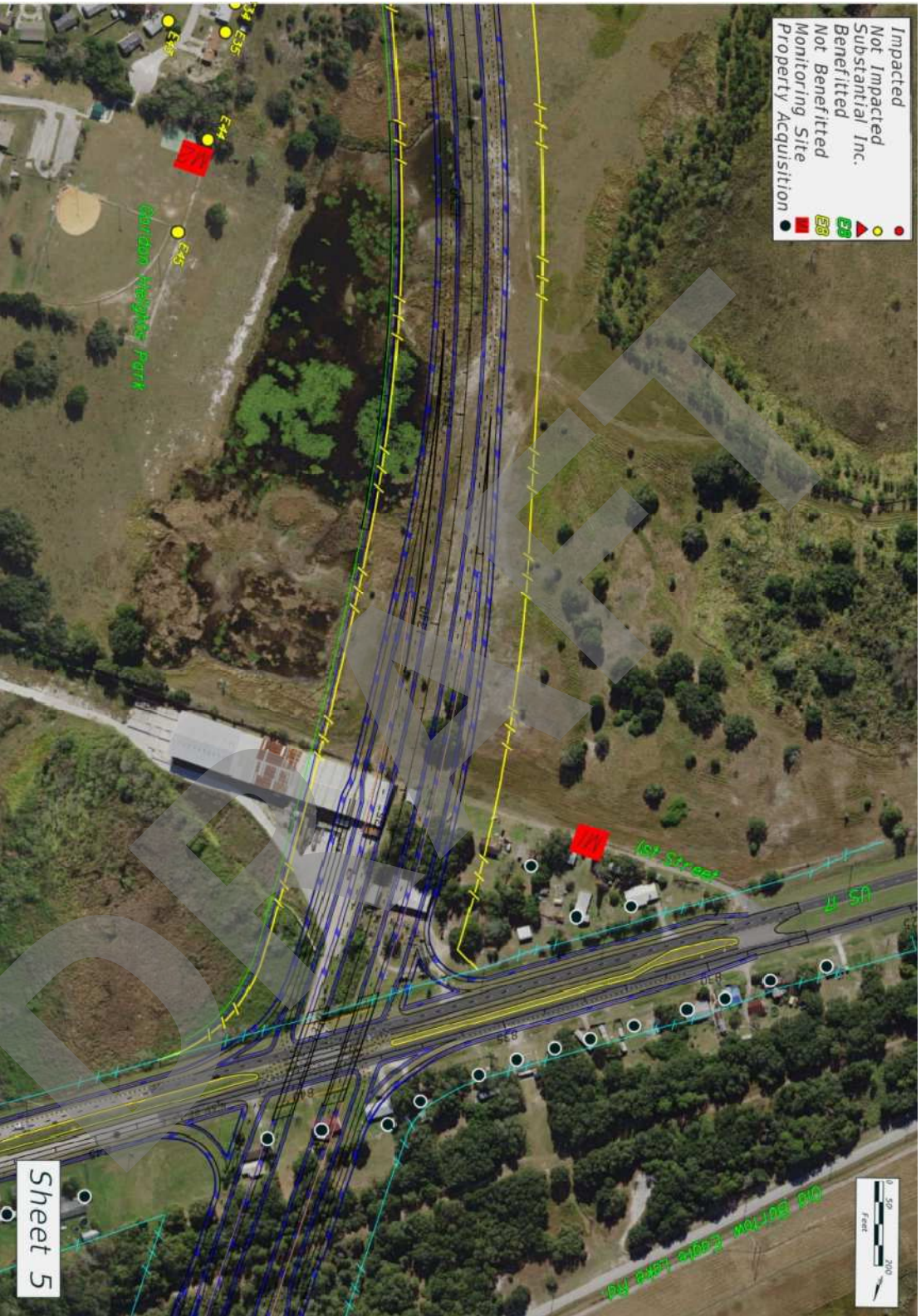
***AERIALS***



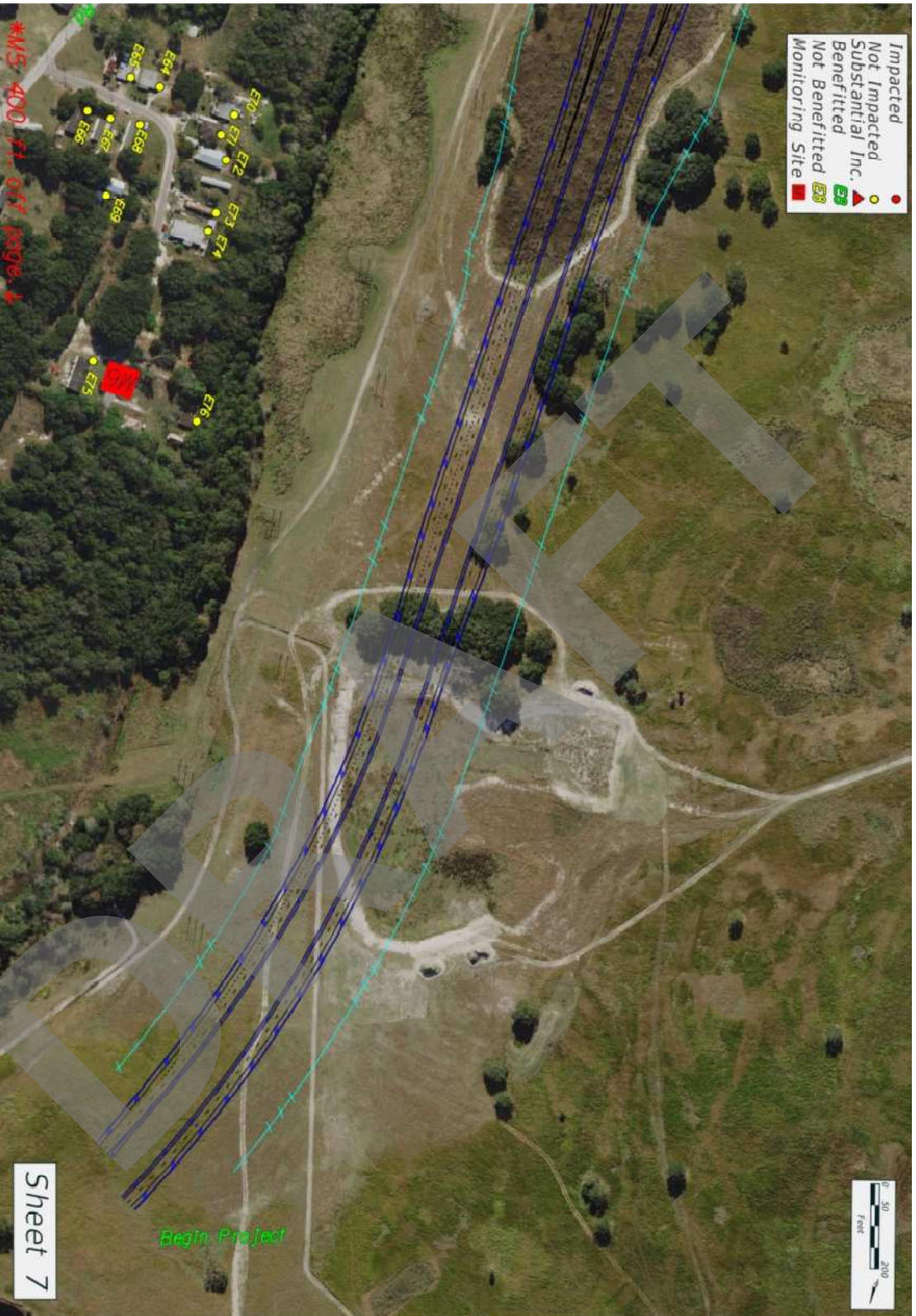












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***APPENDIX E***

***TNM Files***

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TNM Files provided in the Project File.