

NOISE STUDY REPORT

Florida Department of Transportation

District Seven

Branch Forbes Road Project Development and Environment (PD&E) Study

Limits of Project: From South of US 92 to North of I-4

Hillsborough County, Florida

Work Program Item Segment Number: 447159-1

ETDM Number: 14470

Date: August 2024

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration and FDOT.

Draft

Branch Forbes Road

Project Development & Environment (PD&E) Study
From south of US 92 to north of I-4

Noise Study Report

Work Program Item Segment No. 447159-1
ETDM Project No. 14470
Hillsborough County, Florida

Prepared for:



Florida Department of Transportation
District Seven

In Coordination with:



**Hillsborough
County Florida**

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Draft

Executive Summary

The Florida Department of Transportation (FDOT) District 7, in coordination with Hillsborough County, is conducting a Project Development and Environment (PD&E) study along Branch Forbes Road from south of US Highway 92 (US 92) to north of Interstate 4 (I-4), in Hillsborough County (Work Program Item [WPI] Segment Number [No.] 447159-1. The study focuses on widening the existing two-lane undivided facility to a four-lane divided facility roadway and includes pedestrian and bicycle accommodations. The proposed improvements will include construction of stormwater management facility (SMF) and floodplain compensation (FPC) sites. The study evaluates traffic operations, safety, access management and freight movements. Operational improvements are also being evaluated for the I-4 interchange ramps.

This Noise Study Report (NSR) was performed as part of the Branch Forbes Road PD&E Study as required by the FDOT's PD&E Manual, and in accordance with the Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772). This NSR presents the results of the noise analysis and utilized the conceptual plans for the proposed project. The objectives of the NSR are to identify land uses within the project corridor for which there are Noise Abatement Criteria (NAC); to predict and evaluate future traffic noise levels at the receptors with and without the improvements; and to evaluate the need for, and effectiveness of, noise abatement measures. Additional objectives include the identification of sites for potential construction noise and vibration impacts. In addition, this NSR will identify traffic noise impact areas to aid in future compatible land use planning adjacent to the corridor.

Future traffic noise levels were predicted with the proposed roadway improvements using Federal Highway Administration's (FHWA's) Traffic Noise Model (TNM – Version 2.5). A total of 54 noise receptors were modeled, representing 54 residences (receptor B1 represents two residences), as well as Dinosaur World. The 54 residential sites were modeled as Activity Category B. Dinosaur World was modeled as Activity Category E. No noise sensitive sites classified as Activity Category C or D were located within the project limits. All other sites are identified as Activity Category F or G and were not modeled since FHWA does not identify noise abatement levels for these sites.

Fourteen residences were predicted to approach, meet, or exceed the NAC in the Build scenario. None of the sites were predicted to experience a substantial increase of 15.0 decibels on the A-weighted scale [dB(A)] or more in traffic noise as a result of the project. Three noise barriers were analyzed for the impacted receptors to determine if noise barriers would provide the minimum required insertion loss (or more) as a feasible and reasonable abatement measure. One receptor (B29) is planned for right of way (ROW) acquisition and relocation and was not considered for a noise barrier.

Barrier 1 was evaluated for the common noise environment (CNE) involving five impacted residences on the east side of Forbes Road between Keen Road and US 92 (B3, B4, B6, B9, and B12). This barrier is separated into four segments to accommodate access to/from the properties; however, the barrier was analyzed as a single barrier for cost reasonable analysis since these residences are considered a CNE. Due to the multiple driveways, Barrier 1 could not provide a reduction in noise levels of 7dB(A) for one noise sensitive receptor for any heights evaluated. Since one or more benefited receptors must achieve a 7 dB(A) noise level reduction, Barrier 1 is not a reasonable option for noise abatement.

Barrier 2 was evaluated for the CNE involving six impacted residences on the west side of Forbes Road between Keen Road and US 92 (B18, B21, B22, B23, B26 and B27). This barrier is separated into five segments to accommodate access to/from the properties; however, the barrier was analyzed as a single

barrier for cost reasonable analysis since these residences are considered a CNE. Due to the multiple driveways, Barrier 2 could not provide a reduction in noise levels of 7dB(A) for one noise sensitive receptor for any heights evaluated. Since one or more benefited receptors must achieve a 7 dB(A) noise level reduction, Barrier 2 is not a reasonable option for noise abatement.

Barrier 3 was evaluated for the CNE involving two impacted residences south of the I-4 eastbound off ramp and west of Branch Forbes Road (B52 and B53). Based on the location of the impacted receptors it appears that the impacts were caused by the improvements to the I-4 eastbound off ramp. At barrier heights of 20 and 22 feet, both impacted receptors would receive a benefit of 5 dB(A) or more; however, the noise reduction design goal of 7 dB(A) for one noise-sensitive site could not be achieved at any of the evaluated barrier heights. Further, the cost of the barrier at all heights would be above the FDOT's cost reasonable limit. Therefore, the barrier was not considered a reasonable noise abatement measure.

Based on the noise analyses performed to date, there are no feasible and reasonable solutions available to mitigate the noise impacts at the locations identified in **Table 3-2** and shown in **Appendix C**.

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Acronyms

CFR	Code of Federal Regulations
CNE	Common Noise Environment
dB(A)	Decibels (dB) on the A-weighted scale
ETDM	Efficient Transportation Decision Making
ETAT	Environmental Technical Advisory Team
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FPC	Floodplain Compensation Site
ft	Foot (feet)
I-4	Interstate 4
LA ROW	Limited Access Right-of-Way
Leq(h)	Hourly Equivalent Sound Level
LAeq(h)	Hourly Equivalent Sound Level on the A-weighted decibel scale
LOS	Level of Service
mph	Miles per Hour
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NSR	Noise Study Report
OEM	Office of Environmental Management
PD&E	Project Development and Environment
ROW	Right-of-Way
SMF	Stormwater Management Facility
TNM	Traffic Noise Model
US 92	U.S. Highway 92
WPI	Work Program Item

Section 1 Introduction

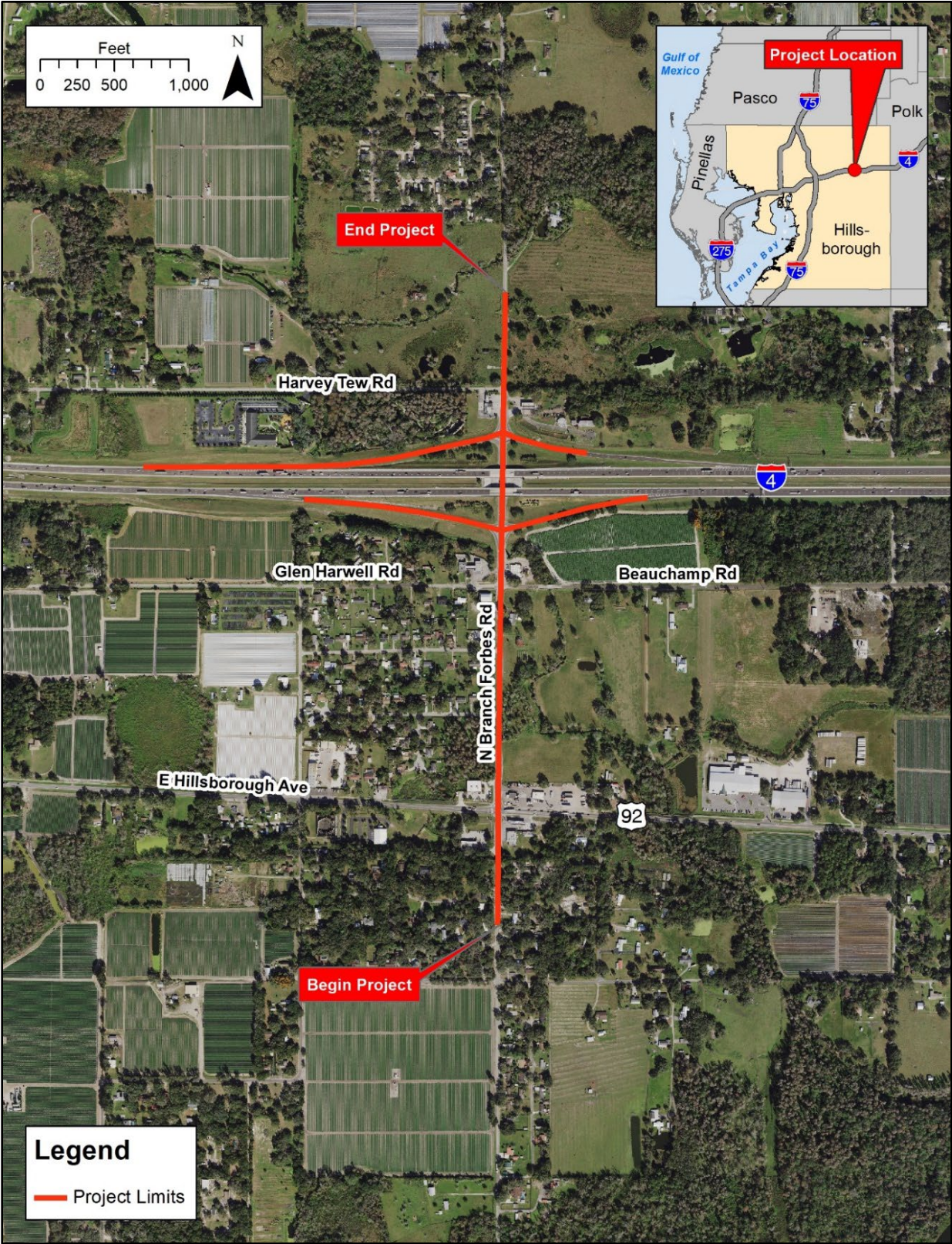
The objective of this Project Development and Environment (PD&E) study is to assist the Florida Department of Transportation (FDOT) Office of Environmental Management (OEM) in reaching a decision on the type, location, and conceptual design of the proposed improvements for the widening of Branch Forbes Road and operational improvements at the Interstate 4 (I-4) interchange, including stormwater management facilities (SMF) and floodplain compensation (FPC) sites (Work Program Item [WPI] Segment Number [No.] 447159-1. This PD&E study documents the need for the improvements as well as the procedures utilized to develop and evaluate various improvements, including elements such as proposed typical sections, preliminary horizontal alignments, intersection enhancement alternatives, and interchange operational improvements. The PD&E study satisfies all applicable requirements, including the National Environmental Policy Act (NEPA), to qualify for federal-aid funding of subsequent development phases [design, right of way (ROW) acquisition, and construction].

1.1 Project Description

The project consists of reconstructing Branch Forbes Road to widen the roadway to accommodate future capacity needs from south of US Highway 92 (US 92) to north of I-4, in Hillsborough County, a distance of approximately 0.8 miles. A project location map is provided as Figure 1-1. Improvements will include widening the roadway to a four-lane divided facility and also include adding curb and gutter and a 10-foot (ft) wide shared use path on both sides to accommodate bicycles and pedestrians. The project also includes operational improvements at the I-4 interchange and construction of SMF and FPC sites. Within the project limits, Branch Forbes Road, named Forbes Road south of US 92, is a two-lane undivided facility. Branch Forbes Road/Forbes Road is a Hillsborough County roadway and functionally classified as a collector road with an existing posted speed limit of 35 miles per hour along most of the project limits.

This project was screened through the FDOT's Efficient Transportation Decision Making (ETDM) process as ETDM Project No. 14470. The ETDM Programming Screen Summary Report was published on September 23, 2021, containing comments from the Environmental Technical Advisory Team (ETAT) on the project's effects on various natural, physical, and social resources. A Type 2 Categorical Exclusion is the class of action for this PD&E study.

Figure 1-1 | Project Location Map



1.2 Existing Facility and Proposed Improvements

1.2.1 Existing Facility

Branch Forbes Road is owned and maintained by Hillsborough County, except for just south of the I-4 interchange ramps to just north of the ramps where the limited access is maintained by FDOT. Within the project area Branch Forbes Road is currently a two-lane undivided facility functionally classified as a collector road and has a posted speed limit of 35 miles per hour (mph) within the project limits and 45 mph to the south and north of the project limits.

The existing lanes vary in width from 10 to 11 ft along the corridor, and there are unpaved shoulders on both sides of the road that are approximately 2 to 5 ft wide. Existing Branch Forbes Road within the project limits has no bicycle lanes, sidewalks or other facilities for pedestrians and bicyclists, except for two small segments of sidewalk on the west side of Branch Forbes Road, one north of the US 92 intersection and the other south of I-4. North and south of the I-4 interchange area, the existing ROW varies from 46.5 to 76 ft wide. The existing limited access ROW (LA ROW) ranges from 100 to 190 ft wide.

1.2.2 Proposed Improvements

The proposed typical section includes a four-lane divided curb and gutter facility with a 22-ft wide raised median. There will be two 11-ft travel lanes in each direction with a 10-ft wide shared use path on both sides of the road. The proposed ROW will vary along the corridor, with a minimum of 106 feet. The proposed typical section is provided as **Figure 1-2** and through the I-4 interchange as **Figure 1-3**. Operational improvements are proposed along the I-4 interchange ramps, at the I-4 interchange ramp terminal intersections and at the US 92 intersection. The improvements include signaling the ramp intersections, adding turn lanes, providing access management and other safety and operational enhancements. No improvements to the I-4 mainline are included as part of this study.

Figure 1-2 | Branch Forbes Road – Proposed Typical Section

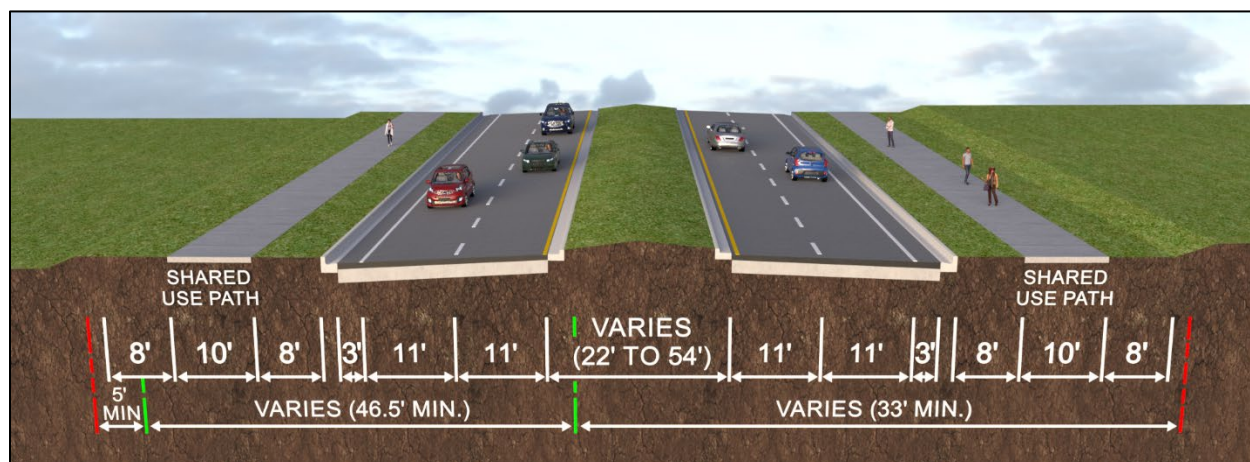
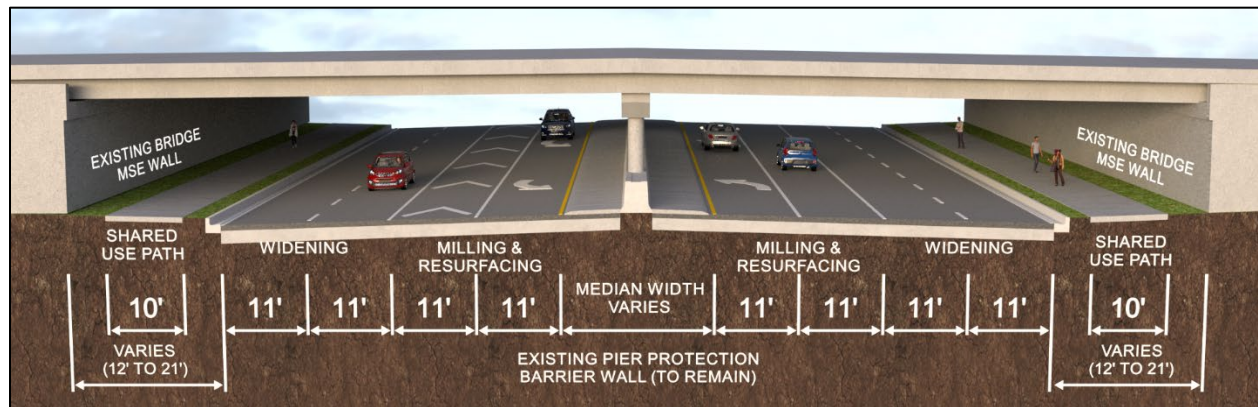


Figure 1-3 | Branch Forbes Road – Proposed Typical Section Under I-4



1.3 Report Purpose

This Noise Study Report (NSR) presents the assumptions, data, procedures, and results of the highway traffic noise analysis that was conducted to evaluate the proposed improvements to Branch Forbes Road. The objectives of the NSR are to identify land uses within the project corridor for which there are Noise Abatement Criteria (NAC); to predict and evaluate future traffic noise levels at the receptors with and without the improvements; and to evaluate the need for, and effectiveness of, noise abatement measures. Additional objectives include the identification of sites for potential construction noise and vibration impacts and the identification of traffic noise impact areas for future compatible land use planning adjacent to the corridor. This report was performed for this Type 1 project in accordance with *Title 23 Code of Federal Regulations Part 772 (23 CFR 772), Procedures for Abatement of Highway Traffic Noise and Construction Noise* (effective July 13, 2011) and Section 335.17 Florida Statutes, using methodology established by the FDOT in the PD&E Manual, Part 2, Chapter 18.

Section 2 Methodology

This traffic noise analysis was prepared in accordance with all applicable guidelines as stated within both 23 CFR 772 and the FDOT PD&E Manual, Part 2, Chapter 18 (FDOT's Noise Policy). The analysis was performed using the Federal Highway Administration's (FHWA) Traffic Noise Model (TNM), version 2.5. Use of the TNM is required when evaluating the potential for traffic noise impacts during the design year of roadway improvement projects for which the regulations, policies and guidelines within 23 CFR 772 and the PD&E Manual are applicable. This NSR utilized the conceptual plans for the proposed project (**Appendix A**).

To identify potential noise sensitive receptors, land use reviews were conducted for the project area that consisted of a field review, a review of available land use data and other available resources. For the purpose of the traffic noise analysis, the land use review and building permit review were conducted in April 2024.

As part of another project (WPI Segment No. 431746-1), the FDOT is planning to widen I-4. While this project does not propose any changes to I-4, the No-Build and Build scenarios of this NSR include the proposed future roadway configurations for I-4.

2.1 Noise Metrics

The noise levels presented in this report are expressed in decibels (dB) on the A-weighted scale [dB(A)]. This scale most closely approximates the response characteristics of the human ear to traffic noise and is defined as the level equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period. All noise levels are reported as equivalent level [Leq(h)] values, which theoretically contain the same amount of acoustic energy as an actual time-varying sound level over a period of one hour. The equivalent level value on the A-weighted decibel scale is referred to as LAeq(h).

2.2 Traffic Data

Noise levels are low when traffic volumes are low and operating conditions are good (Level of Service [LOS] A or B) and when traffic is so congested that movement is slow (LOS D, E or F). Generally, the maximum hourly noise level occurs between these two conditions (i.e. LOS C). The 2020 existing and design year 2045 traffic data used in TNM for this project are presented in **Appendix B**. For traffic inputs into the model, the lesser of the project demand volumes or LOS "C" volumes were utilized and varied along the corridor. This methodology produces the worst-case traffic noise conditions.

2.3 Noise Sensitive Receptors and Noise Abatement Criteria

Noise-sensitive receptors are defined as a discrete or representative location of a noise sensitive area(s) for any of the land use categories. To evaluate traffic noise, the FHWA established NAC. As shown in **Table 2-1**, the NAC varies according to a property's activity category. When predicted noise levels approach, meet or exceed the NAC or, when predicted noise levels increase substantially, the FHWA requires that noise abatement measures be considered. The FDOT defines approach to mean within 1.0 dB(A) of the FHWA NAC and considers that a substantial increase will occur if traffic noise levels are predicted to increase by 15.0 or more dB(A) over the existing noise levels as a direct result of a transportation

improvement project. For comparative purposes, typical noise levels for common indoor and outdoor activities are provided in **Table 2-2**.

Table 2-1 | Noise Abatement Criteria

Activity Category	Activity Leq(h) ¹		Evaluation Location	Description of 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 ²	67	66	Exterior	Residential
C ²	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, recreational 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 ²	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.

Sources: Table 1 of 23 CFR Part 772 and Figure 18-1 of Chapter 18 of the FDOT's PD&E Manual (effective July 31, 2024).

¹ The Leq(h) activity criteria values are for impact determination only and are not design standards for noise abatement measures.

² Includes undeveloped lands permitted for this activity category.

Note: FDOT defines that a substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 decibels or more as a result of the transportation improvement project. When this occurs, the requirement for abatement consideration will be followed.

Table 2-2 | Typical Noise Levels

Common Outdoor Activities	Noise Level dB(A)	Common Indoor Activities
Jet flyover at 1,000 feet	110	Rock band
Gas lawnmower at 3 feet	100	
Diesel truck at 50 feet at 50 mph	90	Food blender at 3 feet
Noisy urban area daytime	80	Garbage disposal at 3 feet
Gas lawnmower at 100 feet	70	Vacuum cleaner at 10 feet
Commercial area	60	Normal speech at 3 feet
Heavy traffic at 300 feet	50	Large business office
Quiet urban daytime	40	Dishwasher in next room
Quiet urban nighttime	30	Theater, large conference room (background)
Quiet suburban nighttime	20	Library
Quiet rural nighttime	10	Bedroom at night, concert hall (background)
	0	Broadcast/recording studio

Source: California Dept. of Transportation Technical Noise Supplement, Sept. 2013, Page 2-20.

2.4 Noise Abatement Measures

When traffic noise impacts are predicted, noise abatement measures are considered for the impacted properties and the feasibility and reasonableness of providing an abatement measure are considered. Feasibility factors are related to the acoustical and engineering properties of an abatement measure while reasonableness factors relate to the social, economic and environmental properties of a measure. The following subsections of this NSR present and discuss four potential methods of abating traffic noise impacts.

2.4.1 Traffic Management

Traffic management measures that limit motor vehicle speeds and reduce volumes can be effective noise mitigation measures. However, these measures can also negate a project's ability to accommodate forecast traffic volumes.

2.4.2 Alignment Modifications

Modifying the horizontal and/or vertical alignment of a roadway can be an effective traffic noise mitigation measure. When the horizontal alignment is shifted (i.e., moved) away from a noise sensitive property or

when the vertical alignment is shifted below (i.e., placing the roadway below the elevation of a noise sensitive land use) or above a noise sensitive property, traffic noise levels have the potential to be reduced.

2.4.3 Buffer Zones

Providing a buffer between a roadway and noise sensitive land uses is an abatement measure that can minimize/eliminate noise impacts. To abate traffic noise at an existing land use for which there are NAC, the property would be acquired to create a buffer zone. Buffer zones can also be used to eliminate the potential for new noise sensitive land uses to be impacted by traffic noise. For this purpose, and to encourage use of this abatement measure through local land use planning, noise contours have been developed and are further discussed in **Section 5** of this NSR.

2.4.4 Noise Barriers

Noise barriers have the potential to reduce traffic noise levels by blocking the sound path between the motor vehicles on the roadway (the source) and the noise sensitive land uses adjacent to the roadway. While other noise abatement measures were considered, noise barriers were determined to be the only viable abatement measure to reduce traffic noise at existing noise-sensitive receptors.

In order to effectively reduce traffic noise, a noise barrier must be relatively long, continuous (without intermittent openings) and of sufficient height. Noise barriers must meet the feasibility and reasonableness factors established by the FDOT. For a noise barrier to be considered a potential abatement measure, the barrier must meet the following FDOT criteria:

- **Minimum Noise Reduction Requirements** - A barrier must provide at least a 5 dB(A) reduction in traffic noise for two or more impacted noise sensitive receptors and also meet the FDOT's noise reduction design goal, which includes providing at least a 7 dB(A) reduction for at least one impacted receptor. Receptors are discrete representative locations on a property that has noise sensitive land uses for which there are NAC (see **Table 2-1**).
- **Cost Effectiveness Criteria** – The current estimated cost to construct noise barriers (i.e., materials and labor) is \$40 per square foot. As stipulated in FDOT's Noise Policy, a barrier should not cost more than \$64,000 per benefited noise sensitive receptor (a benefited receptor is a receptor that receives at least a 5 dB(A) reduction in noise from a mitigation measure). For special land uses (e.g., the outdoor area of a restaurant/bar), the cost should not be more than \$995,935 per person-hour per square foot (dollars/person-ft²).

Other factors considered when evaluating noise barriers as a potential noise abatement measure address both the feasibility of the barriers (given site-specific details, can a barrier actually be constructed) and the reasonableness of the barriers. Feasibility factors that relate to noise barriers include driver/pedestrian sight distance (safety), ingress and egress requirements to and from affected properties, ROW requirements including access rights and easements for construction and/or maintenance, impacts on existing/planned utilities, and drainage. The viewpoint of the impacted property owners (and renters if applicable) who may, or may not, desire a noise barrier, is also a factor that is considered when evaluating noise barriers as an abatement measure.

The TNM accounts for the shielding effect of a noise barrier, the diffraction of sound over a noise barrier, and the effects of the ground between a barrier and a receptor (i.e. sound absorption). The net effect of the barrier shielding is referred to as insertion loss (i.e. insertion loss is the difference in sound level before and after the installation of the barrier).

Section 3 Traffic Noise Analysis

3.1 Evaluated Receptors

A total of 54 noise receptors were modeled, representing 54 residences (receptor B1 represents two residences), and Dinosaur World. The location of each of the noise-sensitive receptors is shown in **Appendix C**. The residences modeled include single-family and multiple-family residences. The 54 residential sites were modeled as Activity Category B. Dinosaur World was modeled as Activity Category E. No noise sensitive sites classified as Activity Category C or D were located within the project limits. All other sites are identified as Activity Category F or G and were not modeled since FHWA does not identify noise abatement levels for these sites. Noise abatement measures were considered if the predicted traffic noise level was 66.0 dB(A) or more for Activity Categories B or if a substantial increase occurs. Noise abatement measures were considered if the predicted traffic noise level was 71.0 dB(A) or more for Activity Categories E or if a substantial increase occurs.

All receptor heights were modeled at 5 feet. Receptor elevations and other elevations along the study area were obtained utilizing topographic survey results, Google Earth Pro and other available similar resources. Elevation data for the roadway was based on previous survey data as well as the PD&E reports for WPI Segment No. 431746-1 (I-4 PD&E Study from East of 50th Street to the Polk Parkway). The use of the elevation data, proposed concept plans, and other existing and proposed project factors are included in TNM in order to predict noise levels at receptor locations. The receptor location and elevation data for Dinosaur World was also taken from the I-4 PD&E Study. The noise levels are discussed in the following section of this NSR.

The existing posted speed along Branch Forbes Road is 35 miles per hour within the limits of the project and the proposed target/posted speeds is also 35 miles per hour which is included in the evaluation.

3.2 Model Validation

As previously stated, future noise levels with the proposed improvements (design year 2045) were modeled using the TNM Version 2.5. The computer model was validated to validate the TNM input values and verify that the model reasonably predicts the existing traffic noise based on the current conditions. Traffic and meteorological data, including traffic volumes, traffic mix vehicle speeds, background noise and atmospheric conditions were recorded during each measurement period.

The field measurements for the Branch Forbes Road noise evaluation were conducted in accordance with the FHWA's Measurement of Highway Related Noise. Each field measurement was obtained using a Larson Davis SoundTrack LXT2 Type 2 Sound Level Meter. The meter was calibrated before and after each monitoring period with a Larson Davis CAL 150 Type 2 Sound Level Calibrator.

The measured field data were used as input for the TNM to determine if, given the topography and actual site conditions of the area, the computer model could re-create the measured noise levels with the existing roadway. Following FDOT guidelines, a noise prediction model is considered valid for the use of predicting traffic noise levels if the measured and predicted noise levels are within a tolerance standard of 3 dB(A). Field measurements were taken on April 18, 2024, on the east side of Branch Forbes Road just south of Pemberton Creek and north of I-4 (near approximate station 1166+00). The sound level meter was placed approximately 5 feet from the edge of pavement at a height of five feet above ground.

The location at which the measurements were taken are depicted on aerials included in **Appendix C**. Three sets of 10-minute measurements were taken for both directions of traffic. Data collected in the field is provided in **Appendix D**.

Table 3-1 presents the field measurements and the computer validation results. As shown, the computer model predicted noise levels are within 3 dB(A) of the field measured noise levels in all instances. Therefore, the ability of the model to reasonably predict noise levels for the project was confirmed.

Table 3-1 | TNM Validation Results

Validation Location	Measurement Period (time of day – PM)	Modeled dB(A)	Measured dB(A)	Difference dB(A) [Measured minus modeled]	Validation Achieved? Yes/No
East of Branch Forbes Rd. south of Pemberton Creek	1:33 - 1:43	72.9	70.0	2.9	Yes
	1:49 - 1:59	72.2	71.5	0.7	Yes
	2:04 - 2:14	71.0	68.6	2.4	Yes

3.3 Predicted Traffic Noise Levels

Table 3-2 presents the results of the traffic noise analysis for the proposed improvements. As shown, the results of the analysis indicate that existing (2020) exterior noise levels are predicted to range from 50.8 to 68.2 dB(A), the No-Build (2045) exterior traffic noise levels are predicted to range from 53.8 to 71.0 dB(A), and the Build (2045) exterior traffic noise levels are predicted to range from 54.5 to 71.6 dB(A). With the Build Alternative, fifteen of the evaluated receptors are predicted to be impacted by traffic noise that would approach, meet or exceed the NAC. Impacted receptors are all single-family residences. Documentation in support of the analysis is provided in **Appendix E**.

Abatement measures must also be considered when a substantial increase in traffic noise occurs as a direct result of the transportation project. As previously stated, a substantial increase is defined as an increase of 15 dB(A), or more, above existing conditions. When compared to the 2020 existing condition, design year 2045 Build exterior traffic noise levels with the proposed improvements range from an increase of 0.8 dB(A) to 6.0 dB(A), as shown in **Table 3-2**. None of the receptors were predicted to experience a substantial increase (15.0 dB(A) or more) in traffic noise as a result of the project.

If the posted speed limit on Branch Forbes Road were reduced, the capacity of the roadway to handle the forecast traffic demand would also be reduced. Therefore, reducing traffic speeds and/or traffic volumes is inconsistent with the goal of improving the ability of the roadway to handle the forecast volumes. Likewise, a shift in the roadway alignment would result in the need for additional ROW. The acquisition of property to provide noise buffers is not feasible due to the high cost and/or the unavailability of vacant land in proximity to noise-sensitive receptors. Noise barriers were determined to be the only viable abatement measure to reduce traffic noise at existing noise-sensitive receptors.

Table 3-2 | Summary of Traffic Noise Analysis

Receptor ID ¹	CNE	# of Units	LAeq1h [dB(A)]					Approaches, Meets or Exceeds NAC? Yes/No
			Existing (2020)	No-Build (2045)	Build (2045)	Difference between Build and Existing	Difference between Build and No-Build	
E1	5	1	64.3	66.2	66.0	1.7	-0.2	No
B1	1	2	61.6	64.4	65.2	3.6	0.8	No
B2	1	1	56.0	58.8	59.8	3.8	1.0	No
B3	1	1	68.2	71.0	71.6	3.4	0.6	Yes
B4	1	1	62.6	65.4	66.2	3.6	0.8	Yes
B5	1	1	59.1	61.9	62.8	3.7	0.9	No
B6	1	1	63.2	66.0	66.8	3.6	0.8	Yes
B7	1	1	54.6	57.4	58.4	3.8	1.0	No
B8	1	1	50.8	53.8	54.5	3.7	0.7	No
B9	1	1	63.0	65.8	66.6	3.6	0.8	Yes
B10	1	1	56.1	59.0	59.9	3.8	0.9	No
B11	1	1	53.0	55.9	56.8	3.8	0.9	No
B12	1	1	63.7	66.5	67.4	3.7	0.9	Yes
B13	1	1	52.7	55.6	56.5	3.8	0.9	No
B14	1	1	62.1	64.9	65.8	3.7	0.9	No
B15	1	1	53.2	56.1	57.1	3.9	1.0	No
B16	1	1	54.6	57.4	58.6	4.0	1.2	No
B17	1	1	60.7	63.4	65.0	4.3	1.6	No
B18	2	1	64.1	66.9	67.5	3.4	0.6	Yes
B19	2	1	55.2	58.0	59.1	3.9	1.1	No
B20	2	1	52.0	54.9	56.1	4.1	1.2	No
B21	2	1	65.2	68.0	68.7	3.5	0.7	Yes
B22	2	1	64.8	67.6	68.2	3.4	0.6	Yes
B23	2	1	64.9	67.7	68.2	3.3	0.5	Yes
B24	2	1	58.1	60.9	61.6	3.5	0.7	No
B25	2	1	53.4	56.2	57.2	3.8	1.0	No
B26	2	1	65.0	67.7	68.3	3.3	0.6	Yes
B27	2	1	65.0	67.8	68.2	3.2	0.4	Yes
B28	2	1	55.6	58.4	59.2	3.6	0.8	No
B29 ^R	3	1	62.7	64.5	68.7	6.0	4.2	Yes
B30	4	1	57.5	60.1	60.8	3.3	0.7	No
B31	4	1	55.8	58.3	59.2	3.4	0.9	No
B32	4	1	55.2	57.8	58.7	3.5	0.9	No
B33	4	1	55.0	57.6	58.5	3.5	0.9	No
B34	4	1	63.9	64.4	64.7	0.8	0.3	No
B35	4	1	58.4	59.9	60.9	2.5	1.0	No
B36	4	1	56.6	58.9	59.8	3.2	0.9	No

Receptor ID ¹	CNE	# of Units	LAeq1h [dB(A)]					Approaches, Meets or Exceeds NAC? Yes/No
			Existing (2020)	No-Build (2045)	Build (2045)	Difference between Build and Existing	Difference between Build and No-Build	
B37	4	1	55.9	58.5	59.4	3.5	0.9	No
B38	4	1	55.4	58.2	59.2	3.8	1.0	No
B39	4	1	55.1	58.1	59.0	3.9	0.9	No
B40	4	1	61.6	62.7	63.0	1.4	0.3	No
B41	4	1	56.6	59.7	60.6	4.0	0.9	No
B42	4	1	56.3	59.6	60.4	4.1	0.8	No
B43	4	1	56.1	59.4	60.3	4.2	0.9	No
B44	4	1	61.9	63.7	64.2	2.3	0.5	No
B45	4	1	58.7	61.6	62.6	3.9	1.0	No
B46	4	1	58.7	61.8	62.8	4.1	1.0	No
B47	4	1	58.3	61.5	62.4	4.1	0.9	No
B48	4	1	58.3	61.5	62.3	4.0	0.8	No
B49	4	1	61.3	64.6	65.3	4.0	0.7	No
B50	4	1	61.2	64.5	65.3	4.1	0.8	No
B51	4	1	60.8	64.2	65.0	4.2	0.8	No
B52	4	1	63.7	66.6	67.4	3.7	0.8	Yes
B53	4	1	63.4	66.5	67.3	3.9	0.8	Yes

¹ The letter included in the Receptor ID name indicates the NAC Activity Category for each receptor analyzed.

R Receptor B29 is planned for ROW acquisition and relocation and is not predicted to be impacted according to the NAC.

3.4 Noise Barrier Analysis

As previously stated, in design year 2045 with the proposed improvements to Branch Forbes Road, noise levels are predicted to approach, meet, or exceed the NAC at fifteen residences. The following presents the results of the noise barrier analysis performed to determine if noise barriers would provide at least the minimum required insertion loss at a cost within the cost reasonable limit for the sites predicted to be impacted by traffic noise with the proposed Branch Forbes Road improvements. Documentation in support of the noise barrier analysis is provided in **Appendix F**.

According to Part 2, Chapter 18 of the PD&E Manual, a minimum of two impacted sites must achieve a 5 dB(A) reduction or greater in order for a noise barrier to be considered feasible. One single-family residence (B29) was impacted but is a single or isolated site. Because the minimum feasibility requirement that abatement must benefit at least two impacted properties for which there are NAC could not be achieved, a noise barrier was not evaluated for the single/isolated sites. In addition, receptor B29 is planned for ROW acquisition and relocation and is not considered for a noise barrier.

To facilitate the noise barrier analysis, contiguous noise sensitive areas were together into common noise environments (CNEs). A CNE represents a group of impacted receptor sites of the same Activity Category that are exposed to similar noise sources and levels, traffic volumes, traffic mix, speeds, and topographic features, that would benefit from the same noise barrier or noise barrier system (i.e., overlapping/continuous noise barriers). Generally, CNEs occur between two secondary noise sources, such as interchanges, intersections, and/or crossroads, or where defined by ground features such as canals or

rivers. In addition, the primary method for determining the cost of noise abatement involves a review of the cost per benefited receptor site for the construction of a noise barrier benefiting a single location or CNE.

Five separate CNEs were used to assess noise barriers for the noise sensitive sites that are predicted to approach or exceed the NAC (**Appendix C**). The following lists the number and location of the receptors located within each of the five CNEs.

- CNE-1 – Located on the east side of Forbes Road between Keen Road and US 92. Represents receptors B1 through B17.
- CNE-2 - Located on the west side of Forbes Road between Ward Road and US 92. Represents receptors B18 through B28.
- CNE-3 – Located on the east side of Branch Forbes Road, south of Beauchamp Road. This CNE represents a single receptor, B29.
- CNE-4 - Located on the west side of Branch Forbes Road between US 92 and I-4. Represents receptors B30 through B53.
- CNE-5 – Located on the northwest quadrant of Branch Forbes Road and I-4. This CNE represents Dinosaur World, receptor E1.

3.4.1 Barrier 1

Barrier 1 was evaluated for the CNE-1 involving five impacted residences on the east side of Forbes Road between Keen Road and US 92 (B3, B4, B6, B9, and B12). Impacted receptors are single-family residences. The impacted receptors are predicted to experience traffic noise levels ranging from 66.2 dB(A) to 71.6 dB(A) with the proposed improvements, levels that approach, meet or exceed the NAC. This barrier is separated into four segments to accommodate access to/from the properties; however, the barrier was analyzed as a single barrier for cost reasonable analysis since these residences are considered a CNE. The barrier was evaluated at a length of 320 feet with the first segment beginning at station 1118+93.67 and the last segment ending at station 1122+89.5. Two of the barrier segments overlap due to a jog in the ROW. The height of the barrier was evaluated in two-foot increments from 8 to 22 feet.

The results of the evaluation are provided in **Table 3-3**.

Due to the multiple driveways, Barrier 1 could not provide a reduction in noise levels of 7dB(A) for one noise sensitive receptor for any heights evaluated. Since one or more benefited receptors must achieve a 7 dB(A) noise level reduction, Barrier 1 is not a reasonable option for noise abatement. Therefore, the barrier was not considered a reasonable noise abatement measure.

Table 3-3 | Barrier Analysis – Barrier 1

Barrier Height (ft)	Barrier Length (ft)	LAeq1h [dB(A)]						Number of Benefitted Receptors			Total Estimated Cost	Cost Per Benefitted Receptor	Cost Reasonable? Yes/No
		5	6	7	8	9	≥10	Impacted	Other *	Total			
8	320	0	0	0	0	0	0	0	0	0	\$102,401	-	No
10	320	2	0	0	0	0	0	2	0	2	\$128,001	\$64,000	Yes
12	320	1	1	0	0	0	0	2	0	2	\$153,601	\$76,801	No
14	320	1	1	0	0	0	0	2	0	2	\$179,202	\$89,601	No
16	320	1	1	0	0	0	0	2	0	2	\$204,802	\$102,401	No
18	320	1	1	0	0	0	0	2	0	2	\$230,402	\$115,201	No
20	320	1	1	0	0	0	0	2	0	2	\$256,002	\$128,001	No
22	320	0	2	0	0	0	0	2	0	2	\$281,603	\$140,802	No

* Receptors that are not impacted but benefit from the noise barrier

3.4.2 Barrier 2

Barrier 2 was evaluated for CNE-2 involving six impacted residences on the west side of Forbes Road between Keen Road and US 92 (B18, B21, B22, B23, B26 and B27). Impacted receptors are single-family residences. The impacted receptors are predicted to experience traffic noise levels ranging from 67.5 dB(A) to 68.7 dB(A) with the proposed improvements, levels that approach, meet, or exceed the NAC. This barrier is separated into five segments to accommodate access to/from the properties; however, the barrier was analyzed as a single barrier for cost reasonable analysis since these residences are considered a CNE. The barrier was evaluated at a length of 480 feet with the first segment beginning at station 1119+00 and the last segment ending at station 1125+64.62. The height of the barrier was evaluated in two-foot increments from 8 to 22 feet.

The results of the evaluation are provided in **Table 3-4**. Due to the multiple driveways, Barrier 2 could not provide a reduction in noise levels of 7dB(A) for one noise sensitive receptor for any heights evaluated. Since one or more benefitted receptors must achieve a 7 dB(A) noise level reduction, Barrier 2 is not a reasonable option for noise abatement. Therefore, the barrier was not considered a reasonable noise abatement measure.

Table 3-4 | Barrier Analysis – Barrier 2

Barrier Height (ft)	Barrier Length (ft)	LAeq1h [dB(A)]						Number of Benefitted Receptors			Total Estimated Cost	Cost Per Benefitted Receptor	Cost Reasonable? Yes/No
		5	6	7	8	9	≥10	Impacted	Other *	Total			
8	480	0	0	0	0	0	0	0	0	0	\$153,616	-	No
10	480	1	0	0	0	0	0	1	0	1	\$192,020	\$192,020	No
12	480	4	0	0	0	0	0	4	0	4	\$230,424	\$57,606	Yes
14	480	3	1	0	0	0	0	4	0	4	\$268,827	\$67,207	No
16	480	2	2	0	0	0	0	4	0	4	\$307,231	\$76,808	No
18	480	1	3	0	0	0	0	4	0	4	\$345,635	\$86,409	No
20	480	0	4	0	0	0	0	4	0	4	\$384,039	\$96,010	No
22	480	0	4	0	0	0	0	4	0	4	\$422,443	\$105,611	No

* Receptors that are not impacted but benefit from the noise barrier

3.4.3 Barrier 3

Barrier 3 was evaluated for CNE-4 involving two impacted residences south of the I-4 eastbound off ramp and west of Branch Forbes Road (B52 and B53). Impacted receptors are single-family residences. The impacted receptors are predicted to experience traffic noise levels ranging from 67.3 dB(A) to 67.4 dB(A) with the proposed improvements, levels that approach, meet, or exceed the NAC. Based on the location of the impacted receptors it appears that the impacts were caused by the improvements to the I-4 eastbound off ramp. Barrier 3 was evaluated at a length of 520 feet along the off ramp beginning at station 1786+10 and ending at station 1791+21.41. The height of the barrier was evaluated in two-foot increments from 8 to 22 feet.

The results of the evaluation are provided in **Table 3-5**. As shown, at barrier heights of 20 and 22 feet, both impacted receptors would receive a benefit of 5 dB(A) or more; however, the noise reduction design goal of 7 dB(A) for at least one noise sensitive site could not be achieved at any of the evaluated barrier heights. Further, the cost of the barrier at all heights would be above the FDOT's cost reasonable limit. Therefore, the barrier was not considered a reasonable noise abatement measure.

Table 3-5 | Barrier Analysis – Barrier 3

Barrier Height (ft)	Barrier Length (ft)	LAeq1h [dB(A)]						Number of Benefitted Receptors			Total Estimated Cost	Cost Per Benefitted Receptor	Cost Reasonable? Yes/No
		5	6	7	8	9	≥10	Impacted	Other *	Total			
8	520	0	0	0	0	0	0	0	0	0	\$166,396	-	No
10	520	0	0	0	0	0	0	0	0	0	\$207,995	-	No
12	520	0	0	0	0	0	0	0	0	0	\$249,594	-	No
14	520	0	0	0	0	0	0	0	0	0	\$291,193	-	No
16	520	0	0	0	0	0	0	0	0	0	\$332,792	-	No
18	520	1	0	0	0	0	0	1	0	1	\$374,391	\$374,391	No
20	520	2	0	0	0	0	0	2	0	2	\$415,990	\$207,995	No
22	520	1	1	0	0	0	0	2	0	2	\$457,589	\$228,795	No

* Receptors that are not impacted but benefit from the noise barrier

Section 4 Conclusions

This NSR has been prepared for the proposed project in accordance with 23 CFR 772 using methodologies established by the FDOT in the PD&E Manual, Part 2, Chapter 18. Fourteen residences were predicted to approach, meet, or exceed the NAC in the Build scenario. None of the sites were predicted to experience a substantial increase (15.0 dB(A) or more) in traffic noise as a result of the project. Three noise barriers were analyzed for the impacted receptors to determine if noise barriers would provide the minimum required insertion loss (or more) as a feasible and reasonable abatement measure. One receptor (B29) is planned for ROW acquisition and relocation and was not considered for a noise barrier.

Barrier 1 was evaluated for the CNE involving five impacted residences on the east side of Forbes Road between Keen Road and US 92 (B3, B4, B6, B9, and B12). This barrier is separated into four segments to accommodate access to/from the properties; however, the barrier was analyzed as a single barrier for cost reasonable analysis since these residences are considered a CNE. Due to the multiple driveways, Barrier 1 could not provide a reduction in noise levels of 7dB(A) for one noise sensitive receptor for any heights evaluated. Since one or more benefited receptors must achieve a 7 dB(A) noise level reduction, Barrier 1 is not a reasonable option for noise abatement.

Barrier 2 was evaluated for the CNE involving six impacted residences on the west side of Forbes Road between Keen Road and US 92 (B18, B21, B22, B23, B26 and B27). This barrier is separated into five segments to accommodate access to/from the properties; however, the barrier was analyzed as a single barrier for cost reasonable analysis since these residences are considered a CNE. Due to the multiple driveways, Barrier 2 could not provide a reduction in noise levels of 7dB(A) for one noise sensitive receptor for any heights evaluated. Since one or more benefited receptors must achieve a 7 dB(A) noise level reduction, Barrier 2 is not a reasonable option for noise abatement.

Barrier 3 was evaluated for the CNE involving two impacted residences south of the I-4 eastbound off ramp and west of Branch Forbes Road (B52 and B53). Based on the location of the impacted receptors it appears that the impacts were caused by the improvements to the I-4 eastbound off ramp. At barrier heights of 20 and 22 feet, both impacted receptors would receive a benefit of 5 dB(A) or more; however, the noise reduction design goal of 7 dB(A) **for at least one noise sensitive site** could not be achieved at any of the evaluated barrier heights. Further, the cost of the barrier at all heights would be above the FDOT's cost reasonable limit. Therefore, the barrier was not considered a reasonable noise abatement measure.

Based on the noise analyses performed to date, there are no feasible and reasonable solutions available to mitigate the noise impacts at the locations identified in **Table 3-2** and shown in **Appendix C**.

Section 5 Land Use Controls

Coordination with local agencies and officials has been accomplished during the development of this project. To aid in promoting land use compatibility, a copy of the NSR, which provides information that can be used to protect future land development from becoming incompatible with anticipated traffic noise level, will be provided to Hillsborough County. Land use controls can be used to minimize traffic noise in future developments or areas where redevelopment occurs. Land uses such as residences, hotels, schools, churches, and recreation areas are considered incompatible with highway traffic noise that exceed the NAC for their respective Activity Category. In order to reduce the possibility of additional noise related impacts, noise level contours were developed for the future improved roadway facility. These noise contours delineate the distance from the improved roadway's edge of pavement where the NAC for each exterior Activity Category (A through E) is predicted to be approached (i.e. within one dB(A) of the NAC) in the design year (2045) with the proposed improvements to Branch Forbes Road. The contours do not consider any shielding of noise provided by structures between the receptor sites and the proposed travel lanes. To minimize potential for incompatible land use, noise sensitive land uses should be located beyond this distance.

As shown in **Table 5-1** within the project limits, the extent of noise contour distances vary for each of the Activity Categories evaluated.

Table 5-1 | Design Year (2045) Noise Contours

Roadway Segment	Activity Category ¹	NAC for Activity Category dB[A]	Distance to Approach (within 1 dB(A) of NAC for Activity Category (ft) ²
Study corridor from Keen Road to US 92	A	57	>500
	B	67	70
	C	67	70
	E	72	25
Study corridor from US 92 to I-4	A	57	>500
	B	67	35
	C	67	35
	E	72	<20
Study corridor north of I-4	A	57	>500
	B	67	60
	C	67	60
	E	72	<20

¹ Refer to Table 2-1 for details on Activity Categories.

² Distances are measured from the improved roadway's edge of pavement, do not account for any reduction in noise levels that may occur from shielding, and should be used for planning purposes only

Section 6 Construction Noise and Vibrations

During the short-term construction phase of the proposed project, noise may be generated by stationery and mobile construction equipment. Using FDOT's listing of noise and vibration sensitive sites, residences, medical facilities, and churches were identified as potentially sensitive to vibration caused during construction.

The FDOT commits to coordinating with these facilities and any other construction noise and vibration sites identified during the design phase of the project. The application of the FDOT's *Standard Specifications for Road and Bridge Construction* could minimize or eliminate most of the potential construction noise and vibration. However, should unanticipatedly noise or vibration issues arise during the construction process, the Project Engineer, in concert with the District Noise Specialist and the Contractor, will investigate additional methods of controlling the issues.

Section 7 Community Coordination

A public hearing will be held for this project. This public hearing will give interested persons an opportunity to express their views concerning the conceptual design, and social, economic, and environmental effects of the proposed improvements. Any public comments specific to noise received at or following the public hearing will be addressed further during the design phase once a detailed analysis for this project has been completed.

Section 8 References

- California Department of Transportation. September 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol.
- Federal Highway Administration. U.S. Department of Transportation. July 13, 2010. Title 23 CFR, Part 772. Procedures for Abatement of Highway Traffic Noise and Construction Noise.
- Federal Highway Administration. February 2004. Traffic Noise Model, Version 2.5.
- Federal Highway Administration. December 2011. Highway Traffic Noise: Analysis and Abatement Guidance.
- Florida Department of Transportation. July 22, 2009. A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations.
- Florida Department of Transportation. July 31, 2024. Project Development and Environment Manual, Part 2, Chapter 18 – Highway Traffic Noise.
- Florida Department of Transportation. January 2023. Standard Specifications for Road and Bridge Construction.
- Florida Department of Transportation. Environmental Management Office. December 31, 2016. Traffic Noise Modeling and Analysis Practitioners Handbook.

APPENDICES

APPENDIX A Concept Plans
APPENDIX B Noise Model Traffic Data
APPENDIX C Noise Sensitive Receptor Sites
APPENDIX D Noise Model Validation Data
APPENDIX E TNM Data
APPENDIX F Barrier Analysis

APPENDIX A Concept Plans

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND
ENVIRONMENT STUDY
CONCEPT PLANS

WPI SEGMENT NO. 447159-1
HILLSBOROUGH COUNTY

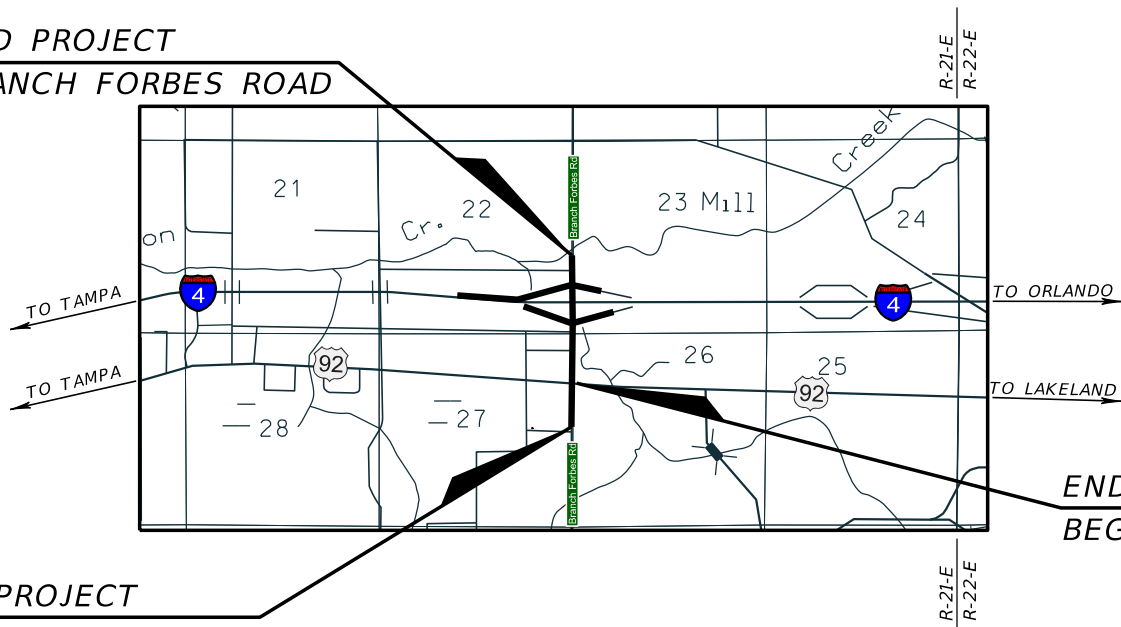
BRANCH FORBES ROAD
From South of US 92 to North of I-4

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
TS-1 TO TS-8	CONCEPTUAL TYPICAL SECTIONS
2	PROJECT LAYOUT PLAN SHEETS
3-9	CONCEPT PLAN SHEETS
10	PREFERRED SMF and FPC SITES

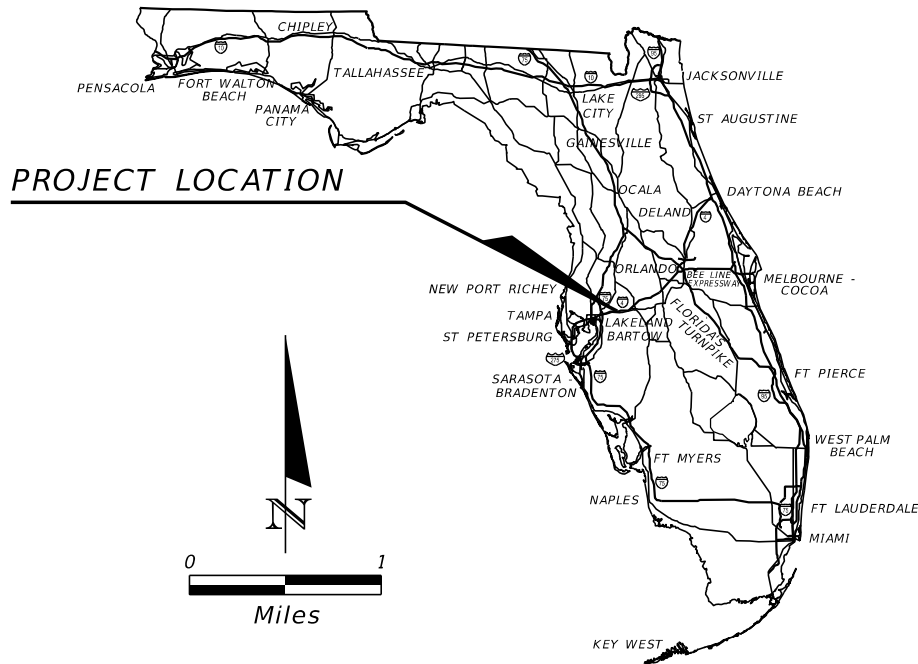
END PROJECT

BRANCH FORBES ROAD



BEGIN PROJECT
FORBES ROAD

END FORBES ROAD
BEGIN BRANCH FORBES ROAD



ROADWAY PLANS
ENGINEER OF RECORD:

ERIK C. LESCHAK, P.E.
P.E. LICENSE NUMBER 63874
CONSOR ENGINEERS, LLC
2818 CYPRESS RIDGE BLVD., SUITE 200
WESLEY CHAPEL, FLORIDA 33544
CERTIFICATE OF AUTHORIZATION NO. 9302

FDOT PROJECT MANAGER:

CRAIG FOX, P.E.

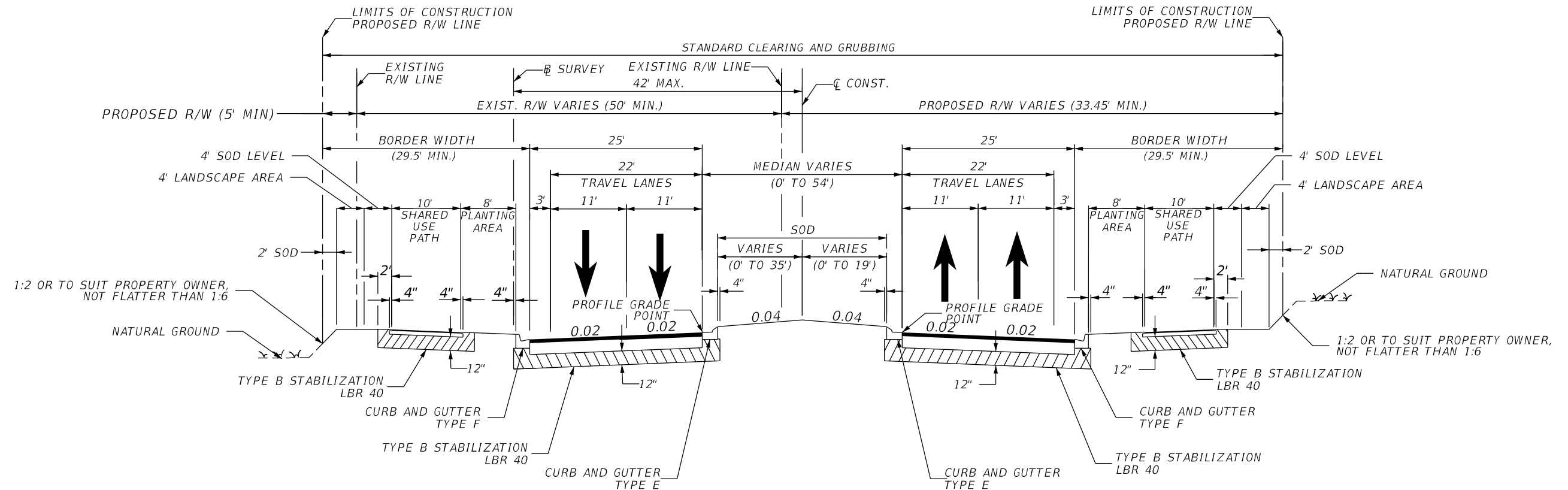
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Dated 12/14/2023

Draft

SHEET
NO.

1



BRANCH FORBES ROAD
FROM US 92 TO SOUTH OF I-4 RAMPS
STA. 1128+27.14 TO STA. 1144+14.20

TRAFFIC DATA

CURRENT YEAR = 2020 AADT = 18,500
ESTIMATED OPENING YEAR = 2025 AADT = 21,000
ESTIMATED DESIGN YEAR = 2045 AADT = 34,500
K = 9 % D = 56% T = 10% (24 HOUR)
DESIGN HOUR T = 5 %
TARGET SPEED = 35 MPH
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

DRAFT

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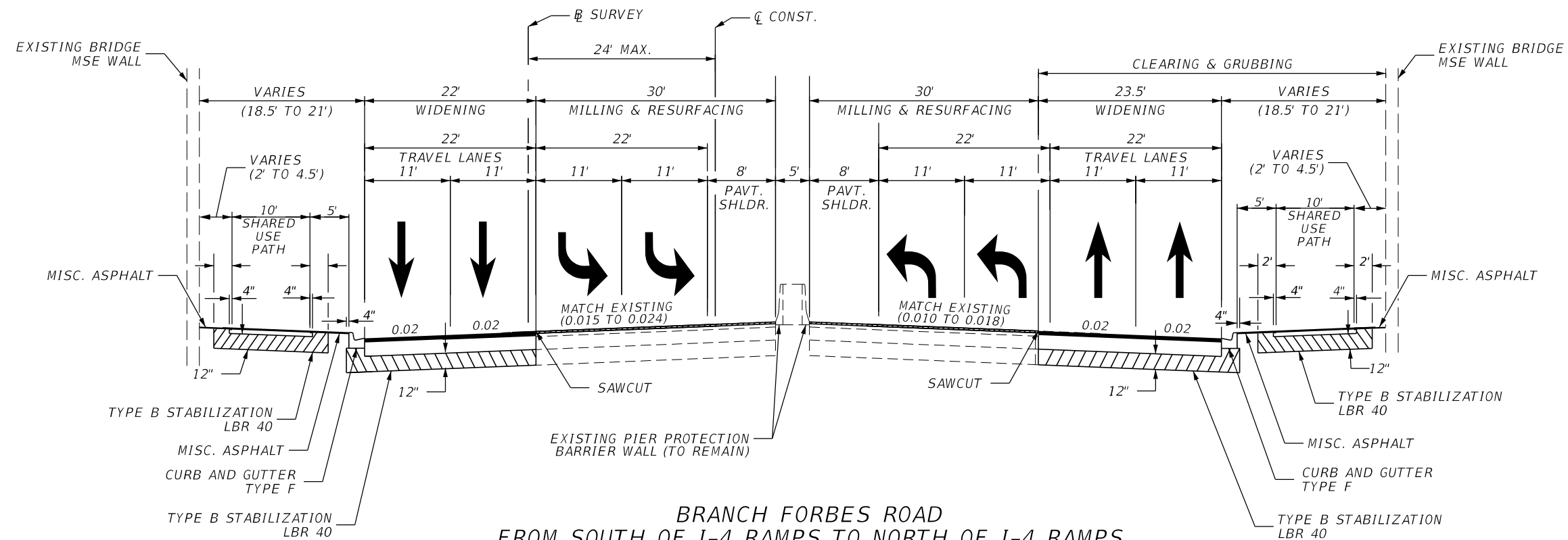
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

Branch Forbes Road PD&E STUDY
From South of US 92 to
North of Interstate 4 (SR 400)
TYPICAL SECTION
WPI Segment No.: 447159-1

SHEET
NO.

TS-2



BRANCH FORBES ROAD
FROM SOUTH OF I-4 RAMPS TO NORTH OF I-4 RAMPS
STA. 1144+14.20 TO STA. 1155+07.26

TRAFFIC DATA

CURRENT YEAR = 2020 AADT = 22,000
ESTIMATED OPENING YEAR = 2025 AADT = 25,000
ESTIMATED DESIGN YEAR = 2045 AADT = 41,000
K = 9 % D = 56% T = 10% (24 HOUR)
DESIGN HOUR T = 5 %
TARGET SPEED = 35 MPH
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

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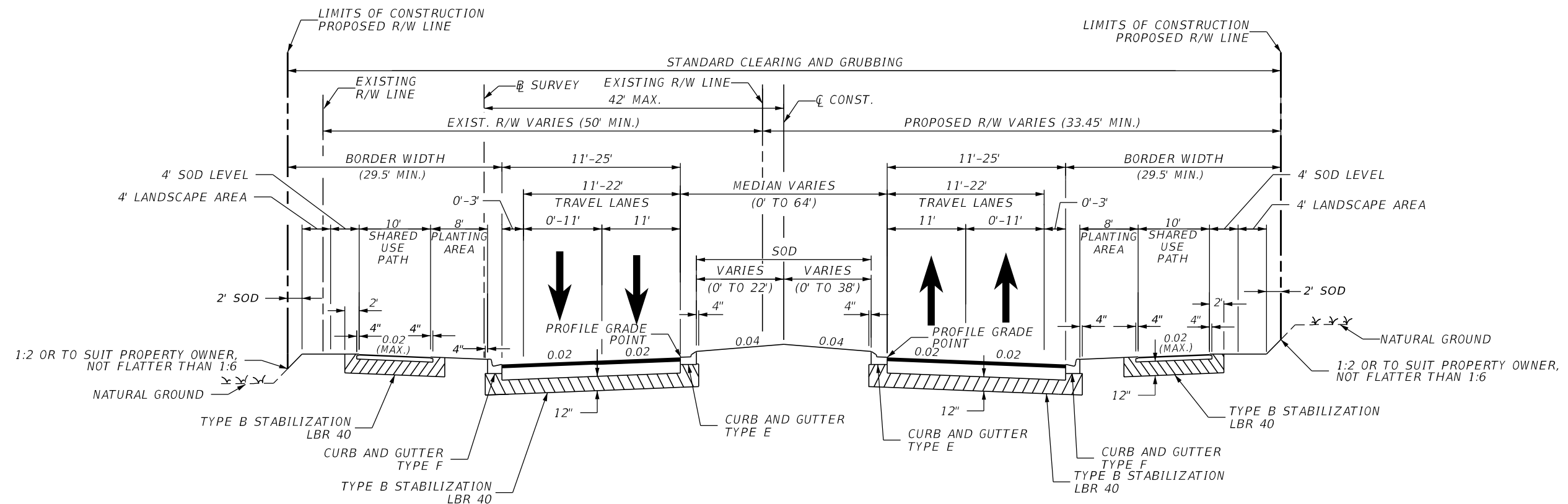
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

Branch Forbes Road PD&E STUDY
From South of US 92 to
North of Interstate 4 (SR 400)
TYPICAL SECTION
WPI Segment No.: 447159-1

SHEET
NO.

TS-3



**BRANCH FORBES ROAD
FROM NORTH OF I-4 RAMPS TO END OF PROJECT
STA. 1155+07.26 TO STA. 1166+05.71**

TRAFFIC DATA

CURRENT YEAR = 2020 AADT = 8,000
 ESTIMATED OPENING YEAR = 2025 AADT = 10,000
 ESTIMATED DESIGN YEAR = 2045 AADT = 16,500
 K = 9 % D = 56% T = 10% (24 HOUR)
 DESIGN HOUR T = 5 %
 TARGET SPEED = 35 MPH
 DESIGN SPEED = 35 MPH
 POSTED SPEED = 35 MPH

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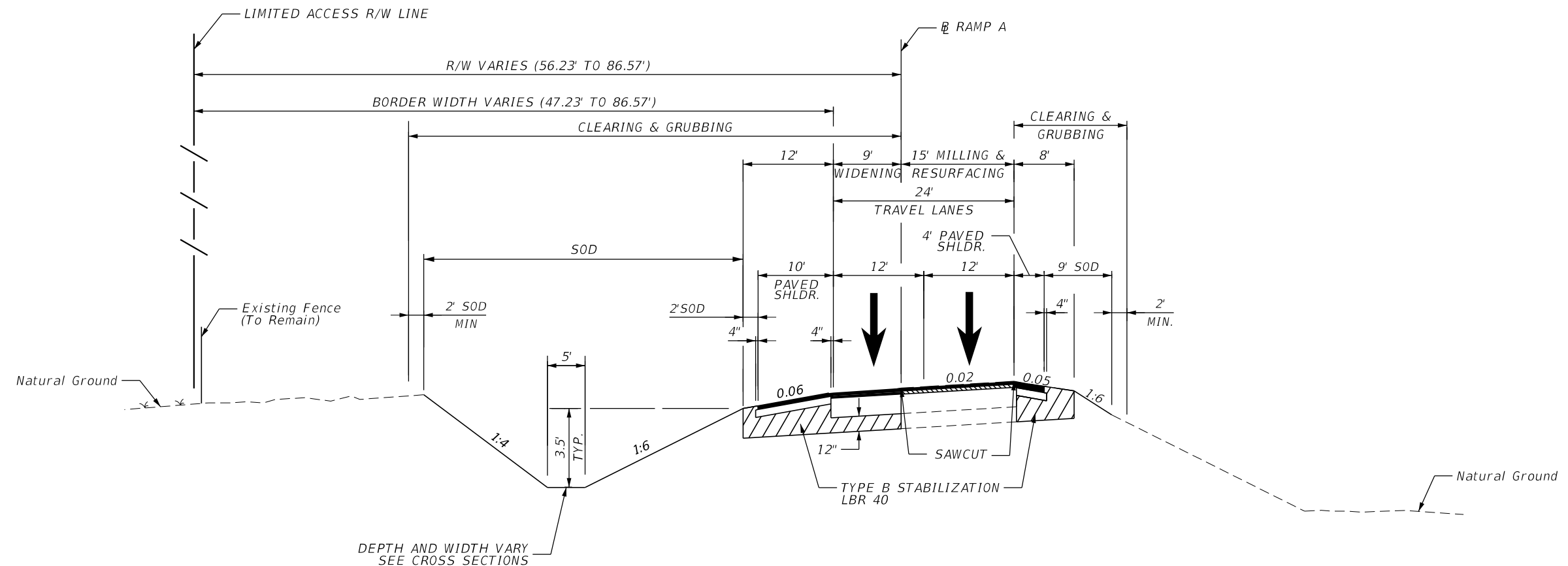
**STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION**

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

**Branch Forbes Road PD&E STUDY
 From South of US 92 to
 North of Interstate 4 (SR 400)
 TYPICAL SECTION
 WPI Segment No.: 447159-1**

SHEET
 NO.

TS-4



RAMP A
WB ON RAMP (#10190112)
I-4/SR 400
STA. 108+28.48 TO STA. 121+55.93

TRAFFIC DATA

CURRENT YEAR = 2020 AADT = 6,800
ESTIMATED OPENING YEAR = 2025 AADT = 7,700
ESTIMATED DESIGN YEAR = 2045 AADT = 12,500
K = 9 % D = 56% T = 10% (24 HOUR)
DESIGN HOUR T = 5 %
TARGET SPEED = 35 MPH
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

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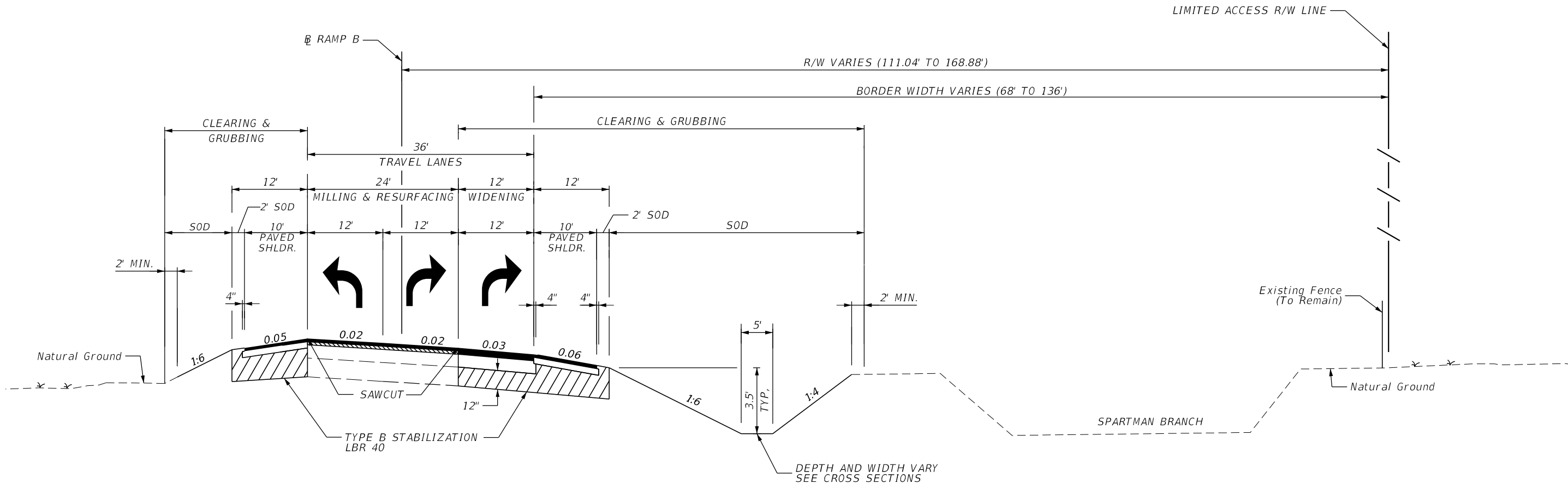
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

Branch Forbes Road PD&E STUDY
From South of US 92 to
North of Interstate 4 (SR 400)
TYPICAL SECTION
WPI Segment No.: 447159-1

SHEET
NO.

TS-5



RAMP B
EB OFF RAMP (#10190113)
I-4/SR 400
STA. 202+86.66 TO STA. 216+78.46

TRAFFIC DATA

CURRENT YEAR = 2020 AADT = 5,800
ESTIMATED OPENING YEAR = 2025 AADT = 6,600
ESTIMATED DESIGN YEAR = 2045 AADT = 11,000
K = 9 % D = 56% T = 10% (24 HOUR)
DESIGN HOUR T = 5 %
TARGET SPEED = 35 MPH
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

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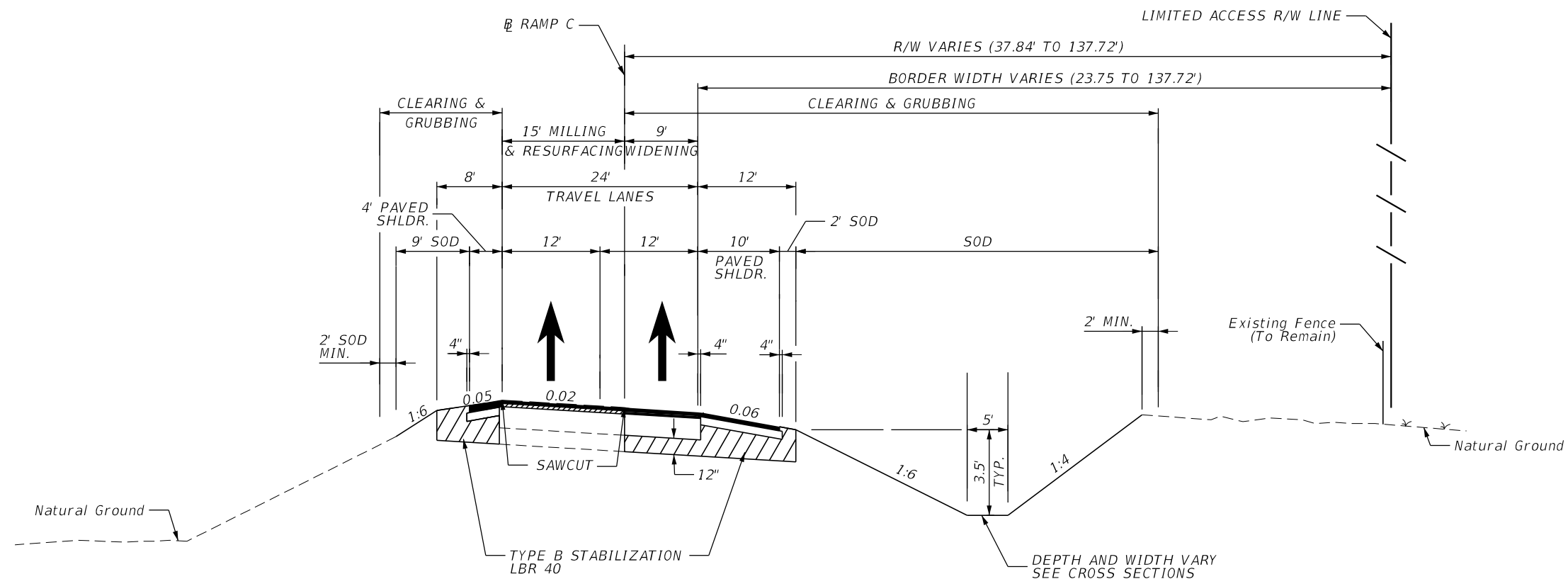
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

Branch Forbes Road PD&E STUDY
From South of US 92 to
North of Interstate 4 (SR 400)
TYPICAL SECTION
WPI Segment No.: 447159-1

SHEET
NO.

TS-6



RAMP C
EB ON RAMP (#10190115)
I-4/SR 400
STA. 300+60.00 TO STA. 311+00.00

TRAFFIC DATA

CURRENT YEAR = 2020 AADT = 4,400
ESTIMATED OPENING YEAR = 2025 AADT = 5,000
ESTIMATED DESIGN YEAR = 2045 AADT = 8,200
K = 9 % D = 56% T = 10% (24 HOUR)
DESIGN HOUR T = 5 %
TARGET SPEED = 35 MPH
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

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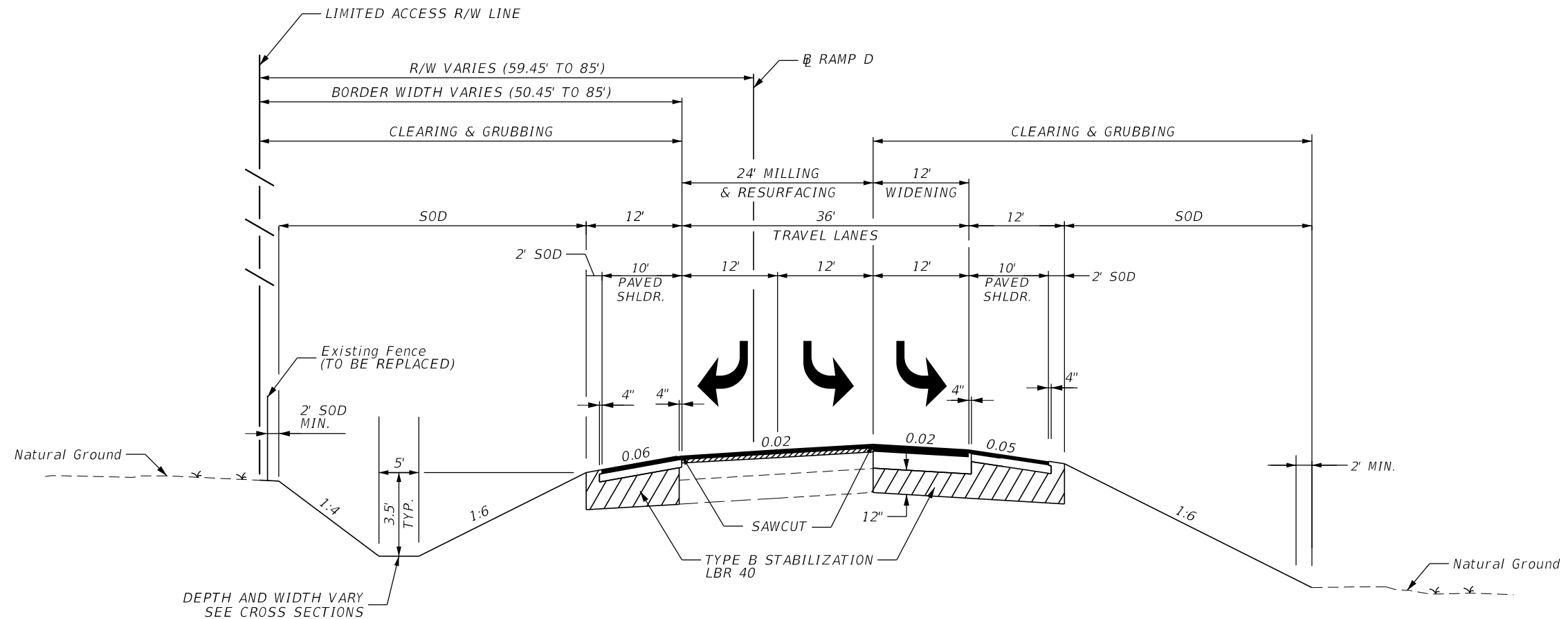
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

Branch Forbes Road PD&E STUDY
From South of US 92 to
North of Interstate 4 (SR 400)
TYPICAL SECTION
WPI Segment No.: 447159-1

SHEET
NO.

TS-7



RAMP D
WB OFF RAMP (#10190114)
I-4/SR 400
STA. 401+56.74 TO STA. 406+95.89

TRAFFIC DATA

CURRENT YEAR = 2020 AADT = 4,500
ESTIMATED OPENING YEAR = 2025 AADT = 5,100
ESTIMATED DESIGN YEAR = 2045 AADT = 8,300
K = 9 % D = 56% T = 10% (24 HOUR)
DESIGN HOUR T = 5 %
TARGET SPEED = 35 MPH
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

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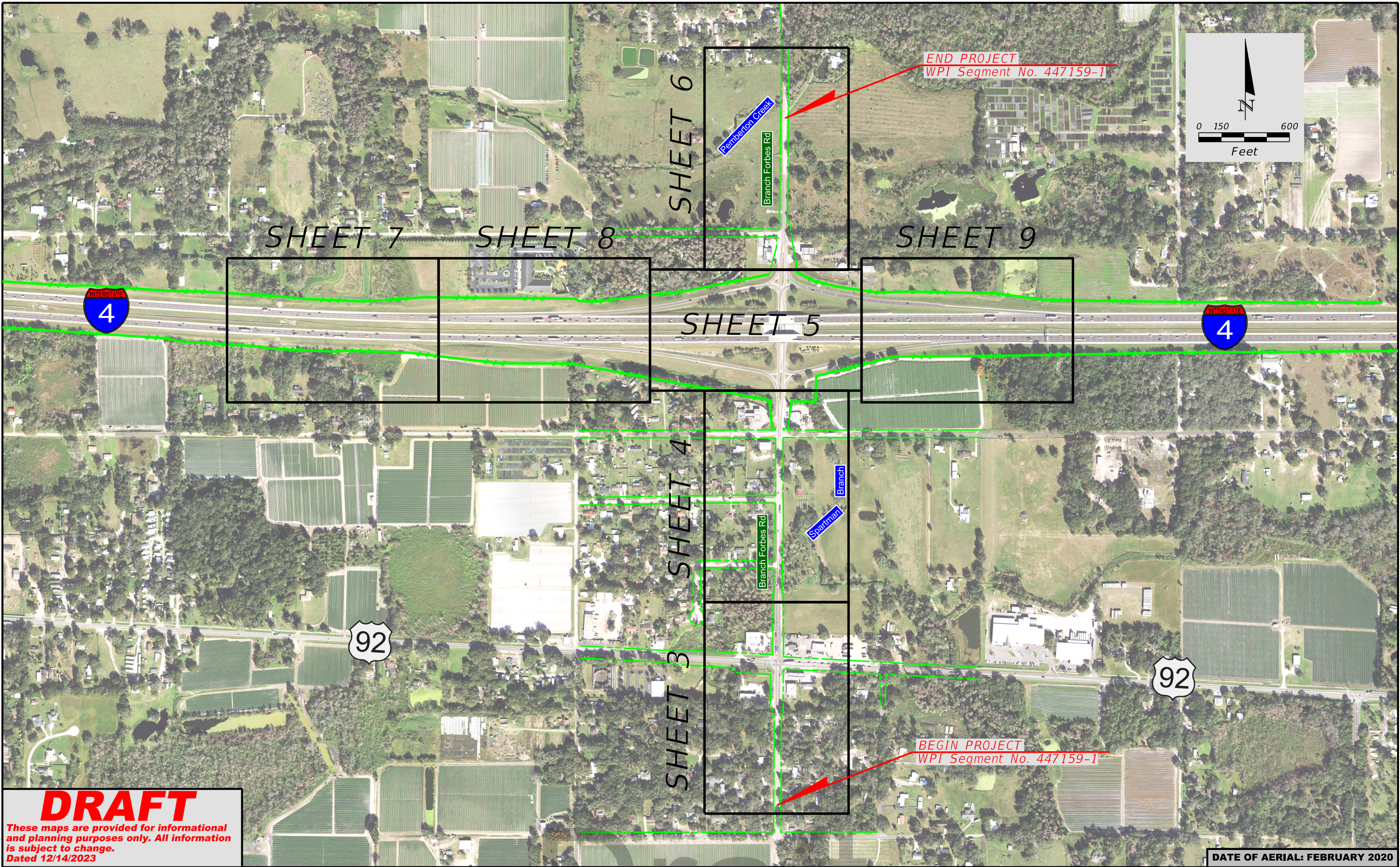
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

Branch Forbes Road PD&E STUDY
From South of US 92 to
North of Interstate 4 (SR 400)
TYPICAL SECTION
WPI Segment No.: 447159-1

SHEET
NO.

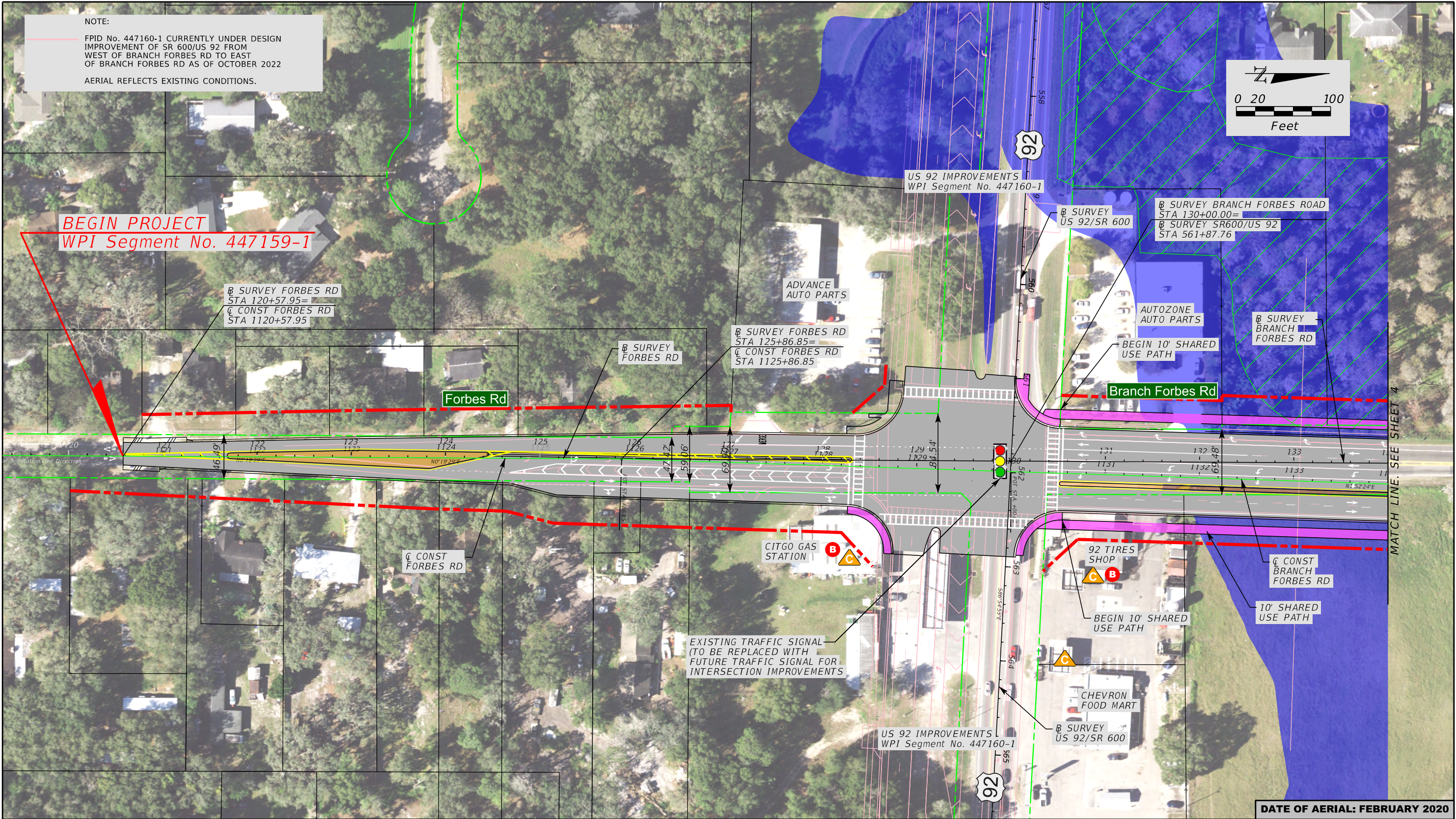
TS-8



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LEGEND		PROPERTY LINE		PLAN SHEET BOUNDARY	CONSOR ENGINEERS, LLC 2818 Cypress Ridge Blvd, Suite 200 Wesley Chapel, Florida 33544 Phone: (813) 435-2600 Fax: (813) 435-2601 Certificate of Authorization No. 9302	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			Branch Forbes Road PD&E STUDY From South of US 92 to North of Interstate 4 (SR 400) DRAFT Alternative Concept Plans WPI Segment No.: 447159-1	SHEET NO.
		EXISTING ROW		STORMWATER MANAGEMENT FACILITY/FLOODPLAIN COMPENSATION SITE		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		2
		EXISTING LA ROW		SHEET BOUNDARY			HILLSBOROUGH	447159-1-22-01		
		PROPOSED ROW								

DATE OF AERIAL: FEBRUARY 2020

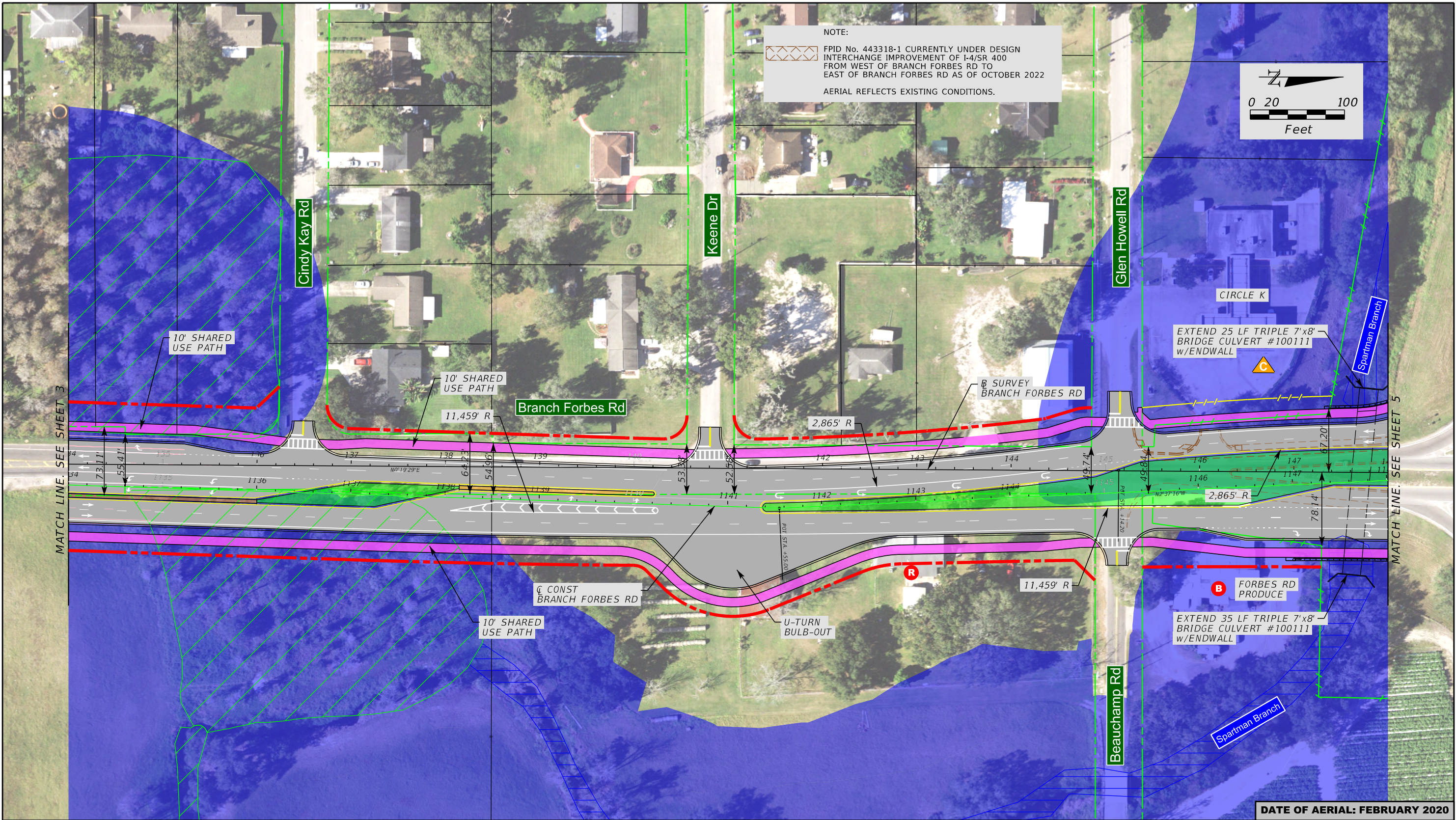


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LEGEND

	WETLANDS BOUNDARY		POTENTIALLY CONTAMINATED SITE		MILLING AND RESURFACING		IMPROVEMENTS BY FDOT
	OTHER SURFACE WATERS BOUNDARY		PROPERTY LINE		PROPOSED SIDEWALK/ SHARED USE PATH		PROPOSED MEDIAN (SOD)
	FLOODPLAINS AREA		EXISTING ROW				PROPOSED TRAFFIC SEPARATOR
	PREFERRED SMF AND FPC AREA		EXISTING LA ROW				
	POTENTIAL BUSINESS RELOCATION		PROPOSED ROW				
	POTENTIAL RESIDENTIAL RELOCATION						



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Dated 12/14/2023

LEGEND

	WETLANDS BOUNDARY		POTENTIALLY CONTAMINATED SITE		MILLING AND RESURFACING		IMPROVEMENTS BY FDOT
	OTHER SURFACE WATERS BOUNDARY		PROPERTY LINE		PROPOSED SIDEWALK/ SHARED USE PATH		PROPOSED MEDIAN (SOD)
	FLOODPLAINS AREA		EXISTING ROW				PROPOSED TRAFFIC SEPARATOR
	PREFERRED SMF AND FPC AREA		EXISTING LA ROW				
	POTENTIAL BUSINESS RELOCATION		PROPOSED ROW				
	POTENTIAL RESIDENTIAL RELOCATION						

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

Branch Forbes Road PD&E STUDY

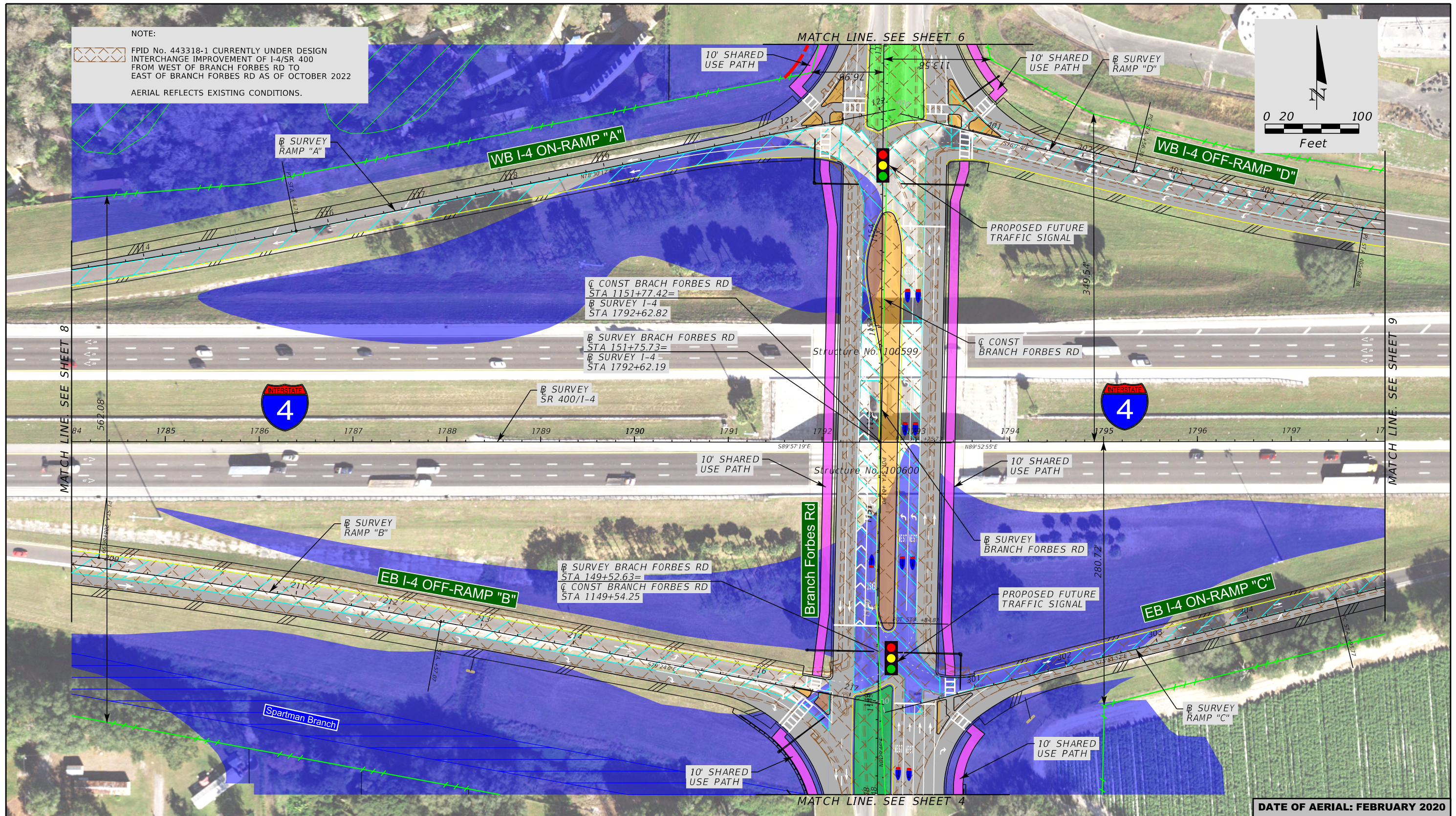
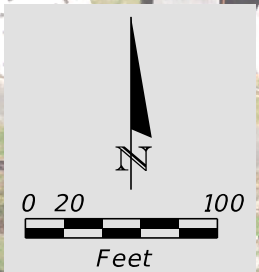
From South of US 92 to
North of Interstate 4 (SR 400)
DRAFT Alternative Concept Plans
WPI Segment No.: 447159-1

SHEET NO.

4

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NOTE:
FPID No. 443318-1 CURRENTLY UNDER DESIGN
INTERCHANGE IMPROVEMENT OF I-4/SR 400
FROM WEST OF BRANCH FORBES RD TO
EAST OF BRANCH FORBES RD AS OF OCTOBER 2022
AERIAL REFLECTS EXISTING CONDITIONS.



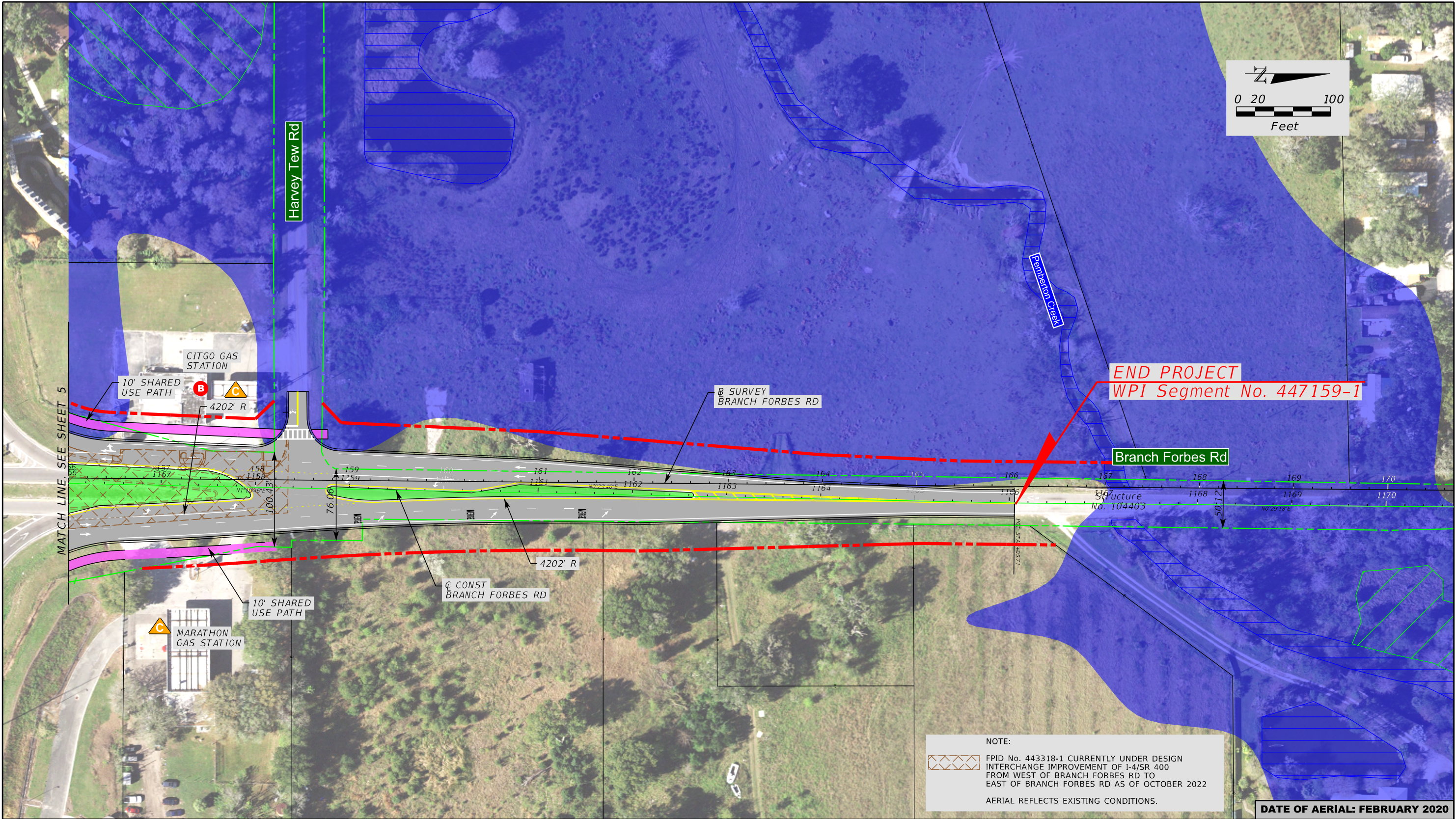
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Dated 12/14/2023

LEGEND

	WETLANDS BOUNDARY		POTENTIALLY CONTAMINATED SITE		MILLING AND RESURFACING		IMPROVEMENTS BY FDOT
	OTHER SURFACE WATERS BOUNDARY		PROPERTY LINE		PROPOSED SIDEWALK/ SHARED USE PATH		PROPOSED MEDIAN (SOD)
	FLOODPLAINS AREA		EXISTING ROW		PROPOSED TRAFFIC SEPARATOR		
	PREFERRED SMF AND FPC AREA		EXISTING LA ROW				
	POTENTIAL BUSINESS RELOCATION		PROPOSED ROW				
	POTENTIAL RESIDENTIAL RELOCATION						

CONSOR ENGINEERS, LLC 2818 Cypress Ridge Blvd, Suite 200 Wesley Chapel, Florida 33544 Phone: (813) 435-2600 Fax: (813) 435-2601 Certificate of Authorization No. 9302	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		Branch Forbes Road PD&E STUDY From South of US 92 to North of Interstate 4 (SR 400) DRAFT Alternative Concept Plans WPI Segment No.: 447159-1	SHEET NO. 5
	ROAD NO.	COUNTY		
		HILLSBOROUGH	447159-1-22-01	



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LEGEND

WETLANDS BOUNDARY

OTHER SURFACE WATERS BOUNDARY

FLOODPLAINS AREA

PREFERRED SMF AND FPC AREA

B

R

POTENTIAL BUSINESS RELOCATION

B

R

POTENTIAL RESIDENTIAL RELOCATION

POTENTIALLY CONTAMINATED SITE

PROPERTY LINE

EXISTING ROW

EXISTING LA ROW

PROPOSED ROW

MILLING AND RESURFACING

PROPOSED SIDEWALK/ SHARED USE PATH

IMPROVEMENTS BY FDOT

PROPOSED MEDIAN (SOD)

PROPOSED TRAFFIC SEPARATOR

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

Branch Forbes Road PD&E STUDY

From South of US 92 to

North of Interstate 4 (SR 400)

DRAFT Alternative Concept Plans

WPI Segment No.: 447159-1

SHEET NO.

6

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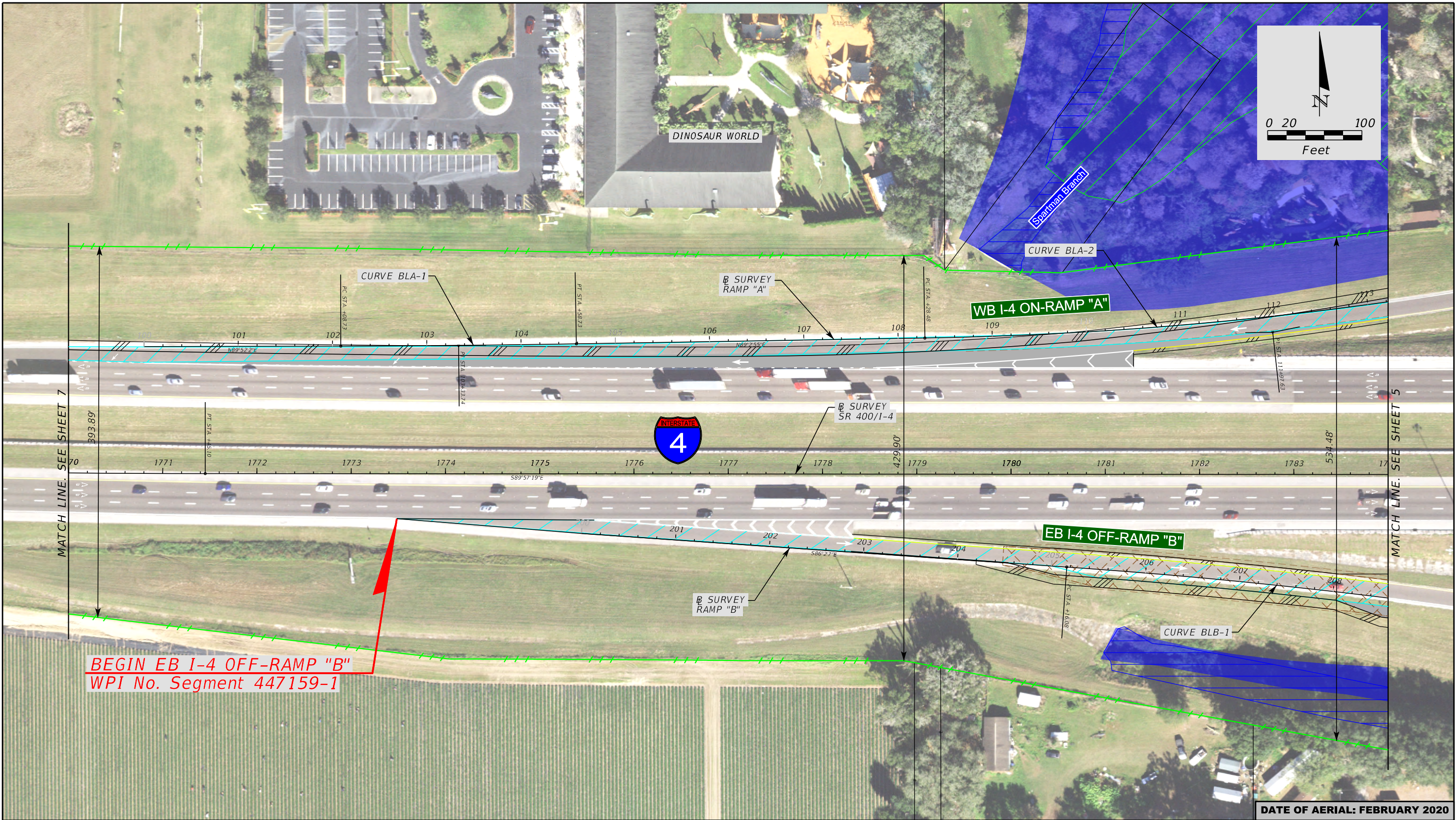
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Dated 12/14/2023

LEGEND

	WETLANDS BOUNDARY		POTENTIALLY CONTAMINATED SITE		MILLING AND RESURFACING		IMPROVEMENTS BY FDOT
	OTHER SURFACE WATERS BOUNDARY		PROPERTY LINE		PROPOSED SIDEWALK/ SHARED USE PATH		PROPOSED MEDIAN (SOD)
	FLOODPLAINS AREA		EXISTING ROW				PROPOSED TRAFFIC SEPARATOR
	PREFERRED SMF AND FPC AREA		EXISTING LA ROW				
	POTENTIAL BUSINESS RELOCATION		PROPOSED ROW				
	POTENTIAL RESIDENTIAL RELOCATION						

CONSOR ENGINEERS, LLC			STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		Branch Forbes Road PD&E STUDY From South of US 92 to North of Interstate 4 (SR 400) DRAFT Alternative Concept Plans WPI Segment No.: 447159-1	SHEET NO. 7
2818 Cypress Ridge Blvd, Suite 200 Wesley Chapel, Florida 33544 Phone: (813) 435-2600 Fax: (813) 435-2601 Certificate of Authorization No. 9302			ROAD NO.	COUNTY		
			HILLSBOROUGH	FINANCIAL PROJECT ID 447159-1-22-01		

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DATE OF AERIAL: FEBRUARY 2020

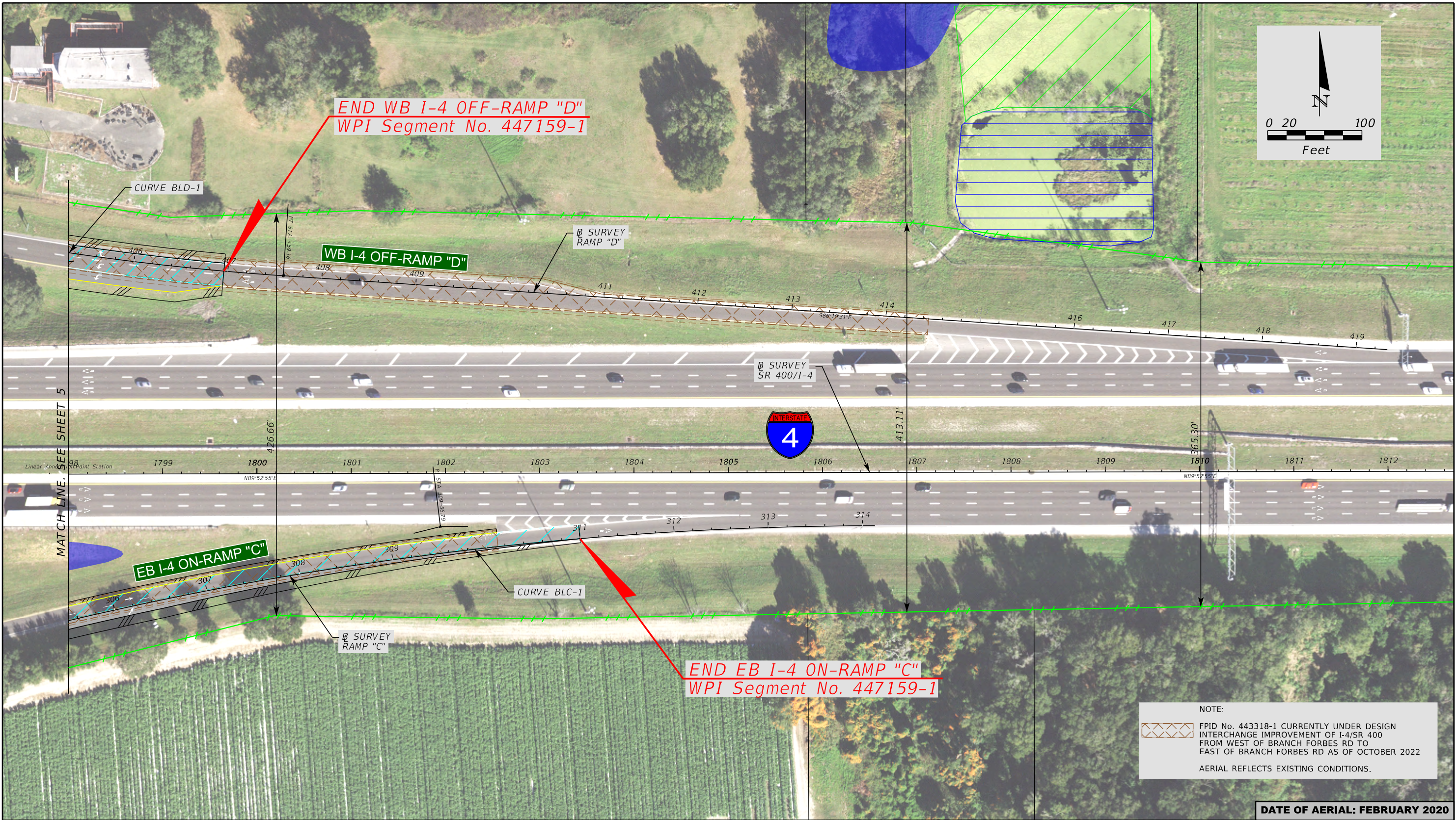
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Dated 12/14/2023

LEGEND

	WETLANDS BOUNDARY		POTENTIALLY CONTAMINATED SITE		MILLING AND RESURFACING		IMPROVEMENTS BY FDOT
	OTHER SURFACE WATERS BOUNDARY		PROPERTY LINE		PROPOSED SIDEWALK/ SHARED USE PATH		PROPOSED MEDIAN (SOD)
	FLOODPLAINS AREA		EXISTING ROW				PROPOSED TRAFFIC SEPARATOR
	PREFERRED SMF AND FPC AREA		EXISTING LA ROW				
	POTENTIAL BUSINESS RELOCATION		PROPOSED ROW				
	POTENTIAL RESIDENTIAL RELOCATION						

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	ROAD NO.	COUNTY		
		HILLSBOROUGH	447159-1-22-01	



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Dated 12/14/2023

LEGEND	WETLANDS BOUNDARY		POTENTIALLY CONTAMINATED SITE		MILLING AND RESURFACING		IMPROVEMENTS BY FDOT	
	OTHER SURFACE WATERS BOUNDARY	PROPERTY LINE	PROPOSED SIDEWALK/ SHARED USE PATH	PROPOSED MEDIAN (SOD)	FLOODPLAINS AREA	EXISTING ROW	PROPOSED TRAFFIC SEPARATOR	
	PREFERRED SMF AND FPC AREA	EXISTING LA ROW			POTENTIAL BUSINESS RELOCATION	PROPOSED ROW		
	POTENTIAL BUSINESS RELOCATION				POTENTIAL RESIDENTIAL RELOCATION			

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Wesley Chapel, Florida 33544
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Certificate of Authorization No. 9302

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	HILLSBOROUGH	447159-1-22-01

Branch Forbes Road PD&E STUDY
From South of US 92 to
North of Interstate 4 (SR 400)
DRAFT Alternative Concept Plans
WPI Segment No.: 447159-1

SHEET NO.

9

APPENDIX B Noise Model Traffic Data

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	Branch Forbes Road - North of Harvey Tew Road		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	4
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	16,800	LOS (C)	16,800	LOS (C)	37,900
Demand	7,300	Demand	13,500	Demand	13,500
Speed:	45 mph 72 kmh	Speed:	45 mph 72 kmh	Speed:	45 mph 72 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	65.0 %	D=	65.0 %	D=	65.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
4.8 % Medium Trucks DHV		4.8 % Medium Trucks DHV		4.8 % Medium Trucks DHV	
0.0 % Heavy Trucks DHV		0.0 % Heavy Trucks DHV		0.0 % Heavy Trucks DHV	
0.1 % Buses DHV		0.1 % Buses DHV		0.1 % Buses DHV	
0.1 % Motorcycles DHV		0.1 % Motorcycles DHV		0.1 % Motorcycles DHV	

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
Demand		Demand		Demand	
LOS (C)		LOS (C)		LOS (C)	
Peak:		Peak:		Peak:	
Autos	934	Autos	934	Autos	2106
Med Trucks	47	Med Trucks	47	Med Trucks	106
Hvy Trucks	0	Hvy Trucks	0	Hvy Trucks	0
Buses	1	Buses	1	Buses	2
Motorcycles	1	Motorcycles	1	Motorcycles	2
Off-Peak:		Off-Peak:		Off-Peak:	
Autos	503	Autos	503	Autos	1134
Med Trucks	25	Med Trucks	25	Med Trucks	57
Hvy Trucks	0	Hvy Trucks	0	Hvy Trucks	0
Buses	1	Buses	1	Buses	1
Motorcycles	1	Motorcycles	1	Motorcycles	1
Demand		Demand		Demand	
Peak:		Peak:		Peak:	
Autos	406	Autos	750	Autos	750
Med Trucks	20	Med Trucks	38	Med Trucks	38
Hvy Trucks	0	Hvy Trucks	0	Hvy Trucks	0
Buses	0	Buses	1	Buses	1
Motorcycles	0	Motorcycles	1	Motorcycles	1
Off-Peak:		Off-Peak:		Off-Peak:	
Autos	218	Autos	404	Autos	404
Med Trucks	11	Med Trucks	20	Med Trucks	20
Hvy Trucks	0	Hvy Trucks	0	Hvy Trucks	0
Buses	0	Buses	0	Buses	0
Motorcycles	0	Motorcycles	0	Motorcycles	0

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	Branch Forbes Road - North of I-4		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	4
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	7,300	LOS (C)	7,300	LOS (C)	14,500
Demand	8,900	Demand	16,500	Demand	16,500
Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8 % Medium Trucks DHV		1.8 % Medium Trucks DHV		1.8 % Medium Trucks DHV	
3.0 % Heavy Trucks DHV		3.0 % Heavy Trucks DHV		3.0 % Heavy Trucks DHV	
0.1 % Buses DHV		0.1 % Buses DHV		0.1 % Buses DHV	
0.1 % Motorcycles DHV		0.1 % Motorcycles DHV		0.1 % Motorcycles DHV	

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos 350	Peak:	Autos 350	Peak:	Autos 694
	Med Trucks 7		Med Trucks 7		Med Trucks 13
	Hvy Trucks 11		Hvy Trucks 11		Hvy Trucks 22
	Buses 0		Buses 0		Buses 1
	Motorcycles 0		Motorcycles 0		Motorcycles 1
Off-Peak:	Autos 275	Off-Peak:	Autos 275	Off-Peak:	Autos 545
	Med Trucks 5		Med Trucks 5		Med Trucks 10
	Hvy Trucks 9		Hvy Trucks 9		Hvy Trucks 17
	Buses 0		Buses 0		Buses 1
	Motorcycles 0		Motorcycles 0		Motorcycles 1
Demand		Demand		Demand	
Peak:	Autos 426	Peak:	Autos 790	Peak:	Autos 790
	Med Trucks 8		Med Trucks 15		Med Trucks 15
	Hvy Trucks 13		Hvy Trucks 25		Hvy Trucks 25
	Buses 0		Buses 1		Buses 1
	Motorcycles 0		Motorcycles 1		Motorcycles 1
Off-Peak:	Autos 335	Off-Peak:	Autos 621	Off-Peak:	Autos 621
	Med Trucks 6		Med Trucks 12		Med Trucks 12
	Hvy Trucks 11		Hvy Trucks 20		Hvy Trucks 20
	Buses 0		Buses 1		Buses 1
	Motorcycles 0		Motorcycles 1		Motorcycles 1

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	Branch Forbes Road - South of I-4		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	4
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	7,300	LOS (C)	7,300	LOS (C)	14,500
Demand	22,000	Demand	41,000	Demand	41,000
Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV
3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV
0.1	% Buses DHV	0.1	% Buses DHV	0.1	% Buses DHV
0.1	% Motorcycles DHV	0.1	% Motorcycles DHV	0.1	% Motorcycles DHV

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos 350	Peak:	Autos 350	Peak:	Autos 694
	Med Trucks 7		Med Trucks 7		Med Trucks 13
	Hvy Trucks 11		Hvy Trucks 11		Hvy Trucks 22
	Buses 0		Buses 0		Buses 1
	Motorcycles 0		Motorcycles 0		Motorcycles 1
Off-Peak:	Autos 275	Off-Peak:	Autos 275	Off-Peak:	Autos 545
	Med Trucks 5		Med Trucks 5		Med Trucks 10
	Hvy Trucks 9		Hvy Trucks 9		Hvy Trucks 17
	Buses 0		Buses 0		Buses 1
	Motorcycles 0		Motorcycles 0		Motorcycles 1
Demand		Demand		Demand	
Peak:	Autos 1053	Peak:	Autos 1963	Peak:	Autos 1963
	Med Trucks 20		Med Trucks 37		Med Trucks 37
	Hvy Trucks 33		Hvy Trucks 62		Hvy Trucks 62
	Buses 1		Buses 2		Buses 2
	Motorcycles 1		Motorcycles 2		Motorcycles 2
Off-Peak:	Autos 828	Off-Peak:	Autos 1542	Off-Peak:	Autos 1542
	Med Trucks 16		Med Trucks 29		Med Trucks 29
	Hvy Trucks 26		Hvy Trucks 49		Hvy Trucks 49
	Buses 1		Buses 2		Buses 2
	Motorcycles 1		Motorcycles 2		Motorcycles 2

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	Branch Forbes Road - Between I-4 Ramp Terminal Intersections		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	4
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	7,300	LOS (C)	7,300	LOS (C)	14,500
Demand	22,000	Demand	41,000	Demand	41,000
Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8 % Medium Trucks DHV		1.8 % Medium Trucks DHV		1.8 % Medium Trucks DHV	
3.0 % Heavy Trucks DHV		3.0 % Heavy Trucks DHV		3.0 % Heavy Trucks DHV	
0.1 % Buses DHV		0.1 % Buses DHV		0.1 % Buses DHV	
0.1 % Motorcycles DHV		0.1 % Motorcycles DHV		0.1 % Motorcycles DHV	

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos 350	Peak:	Autos 350	Peak:	Autos 694
	Med Trucks 7		Med Trucks 7		Med Trucks 13
	Hvy Trucks 11		Hvy Trucks 11		Hvy Trucks 22
	Buses 0		Buses 0		Buses 1
	Motorcycles 0		Motorcycles 0		Motorcycles 1
Off-Peak:	Autos 275	Off-Peak:	Autos 275	Off-Peak:	Autos 545
	Med Trucks 5		Med Trucks 5		Med Trucks 10
	Hvy Trucks 9		Hvy Trucks 9		Hvy Trucks 17
	Buses 0		Buses 0		Buses 1
	Motorcycles 0		Motorcycles 0		Motorcycles 1
Demand		Demand		Demand	
Peak:	Autos 1053	Peak:	Autos 1963	Peak:	Autos 1963
	Med Trucks 20		Med Trucks 37		Med Trucks 37
	Hvy Trucks 33		Hvy Trucks 62		Hvy Trucks 62
	Buses 1		Buses 2		Buses 2
	Motorcycles 1		Motorcycles 2		Motorcycles 2
Off-Peak:	Autos 828	Off-Peak:	Autos 1542	Off-Peak:	Autos 1542
	Med Trucks 16		Med Trucks 29		Med Trucks 29
	Hvy Trucks 26		Hvy Trucks 49		Hvy Trucks 49
	Buses 1		Buses 2		Buses 2
	Motorcycles 1		Motorcycles 2		Motorcycles 2

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	Forbes Road - South of US 92		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	4
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	16,800	LOS (C)	16,800	LOS (C)	37,900
Demand	8,500	Demand	16,000	Demand	16,000
Speed:	45 mph 72 kmh	Speed:	45 mph 72 kmh	Speed:	45 mph 72 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV
3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV
0.1	% Buses DHV	0.1	% Buses DHV	0.1	% Buses DHV
0.1	% Motorcycles DHV	0.1	% Motorcycles DHV	0.1	% Motorcycles DHV

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
Demand		Demand		Demand	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos	804	Peak:	Autos	804
	Med Trucks	15		Med Trucks	15
	Hvy Trucks	25		Hvy Trucks	25
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Off-Peak:	Autos	632	Off-Peak:	Autos	632
	Med Trucks	12		Med Trucks	12
	Hvy Trucks	20		Hvy Trucks	20
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Demand		Demand		Demand	
Peak:	Autos	407	Peak:	Autos	766
	Med Trucks	8		Med Trucks	15
	Hvy Trucks	13		Hvy Trucks	24
	Buses	0		Buses	1
	Motorcycles	0		Motorcycles	1
Off-Peak:	Autos	320	Off-Peak:	Autos	602
	Med Trucks	6		Med Trucks	11
	Hvy Trucks	10		Hvy Trucks	19
	Buses	0		Buses	1
	Motorcycles	0		Motorcycles	1

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	I-4 Eastbound Off-Ramp Segment		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	1	Lanes:	2	Lanes:	2
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	18,000	LOS (C)	18,000	LOS (C)	18,000
Demand	5,800	Demand	11,000	Demand	11,000
Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV
3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV
0.1	% Buses DHV	0.1	% Buses DHV	0.1	% Buses DHV
0.1	% Motorcycles DHV	0.1	% Motorcycles DHV	0.1	% Motorcycles DHV

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
Demand		Demand		Demand	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos	862	Peak:	Autos	862
	Med Trucks	16		Med Trucks	16
	Hvy Trucks	27		Hvy Trucks	27
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Off-Peak:	Autos	677	Off-Peak:	Autos	677
	Med Trucks	13		Med Trucks	13
	Hvy Trucks	21		Hvy Trucks	21
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Demand		Demand		Demand	
Peak:	Autos	278	Peak:	Autos	527
	Med Trucks	5		Med Trucks	10
	Hvy Trucks	9		Hvy Trucks	17
	Buses	0		Buses	1
	Motorcycles	0		Motorcycles	1
Off-Peak:	Autos	218	Off-Peak:	Autos	414
	Med Trucks	4		Med Trucks	8
	Hvy Trucks	7		Hvy Trucks	13
	Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	I-4 Eastbound On-Ramp Segment		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	1	Lanes:	1	Lanes:	2
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	18,000	LOS (C)	18,000	LOS (C)	18,000
Demand	4,400	Demand	8,200	Demand	8,200
Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV
3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV
0.1	% Buses DHV	0.1	% Buses DHV	0.1	% Buses DHV
0.1	% Motorcycles DHV	0.1	% Motorcycles DHV	0.1	% Motorcycles DHV

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
Demand		Demand		Demand	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos	862	Peak:	Autos	862
	Med Trucks	16		Med Trucks	16
	Hvy Trucks	27		Hvy Trucks	27
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Off-Peak:	Autos	677	Off-Peak:	Autos	677
	Med Trucks	13		Med Trucks	13
	Hvy Trucks	21		Hvy Trucks	21
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Demand		Demand		Demand	
Peak:	Autos	211	Peak:	Autos	393
	Med Trucks	4		Med Trucks	7
	Hvy Trucks	7		Hvy Trucks	12
	Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0
Off-Peak:	Autos	166	Off-Peak:	Autos	308
	Med Trucks	3		Med Trucks	6
	Hvy Trucks	5		Hvy Trucks	10
	Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	I-4 Westbound Off-Ramp Segment		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	2
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	18,000	LOS (C)	18,000	LOS (C)	18,000
Demand	4,500	Demand	8,300	Demand	8,300
Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV
3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV
0.1	% Buses DHV	0.1	% Buses DHV	0.1	% Buses DHV
0.1	% Motorcycles DHV	0.1	% Motorcycles DHV	0.1	% Motorcycles DHV

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
Demand		Demand		Demand	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos	862	Peak:	Autos	862
	Med Trucks	16		Med Trucks	16
	Hvy Trucks	27		Hvy Trucks	27
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Off-Peak:	Autos	677	Off-Peak:	Autos	677
	Med Trucks	13		Med Trucks	13
	Hvy Trucks	21		Hvy Trucks	21
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Demand		Demand		Demand	
Peak:	Autos	215	Peak:	Autos	397
	Med Trucks	4		Med Trucks	8
	Hvy Trucks	7		Hvy Trucks	13
	Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0
Off-Peak:	Autos	169	Off-Peak:	Autos	312
	Med Trucks	3		Med Trucks	6
	Hvy Trucks	5		Hvy Trucks	10
	Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	I-4 Westbound On-Ramp Segment		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	1	Lanes:	1	Lanes:	2
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	18,000	LOS (C)	18,000	LOS (C)	18,000
Demand	6,800	Demand	12,500	Demand	12,500
Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh	Speed:	35 mph 56 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV
3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV
0.1	% Buses DHV	0.1	% Buses DHV	0.1	% Buses DHV
0.1	% Motorcycles DHV	0.1	% Motorcycles DHV	0.1	% Motorcycles DHV

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
Demand		Demand		Demand	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos	862	Peak:	Autos	862
	Med Trucks	16		Med Trucks	16
	Hvy Trucks	27		Hvy Trucks	27
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Off-Peak:	Autos	677	Off-Peak:	Autos	677
	Med Trucks	13		Med Trucks	13
	Hvy Trucks	21		Hvy Trucks	21
	Buses	1		Buses	1
	Motorcycles	1		Motorcycles	1
Demand		Demand		Demand	
Peak:	Autos	326	Peak:	Autos	599
	Med Trucks	6		Med Trucks	11
	Hvy Trucks	10		Hvy Trucks	19
	Buses	0		Buses	1
	Motorcycles	0		Motorcycles	1
Off-Peak:	Autos	256	Off-Peak:	Autos	470
	Med Trucks	5		Med Trucks	9
	Hvy Trucks	8		Hvy Trucks	15
	Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	I-4 - East of Branch Forbes Road		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	8	Lanes:	8	Lanes:	8
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	125,200	LOS (C)	125,200	LOS (C)	125,200
Demand	119,500	Demand	194,200	Demand	194,200
Speed:	60 mph 97 kmh	Speed:	60 mph 97 kmh	Speed:	60 mph 97 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV
3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV
0.1	% Buses DHV	0.1	% Buses DHV	0.1	% Buses DHV
0.1	% Motorcycles DHV	0.1	% Motorcycles DHV	0.1	% Motorcycles DHV

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
Demand		LOS (C)		LOS (C)	
LOS (C)		LOS (C)		LOS (C)	
Peak:		Peak:		Peak:	
Autos	5995	Autos	5995	Autos	5995
Med Trucks	114	Med Trucks	114	Med Trucks	114
Hvy Trucks	189	Hvy Trucks	189	Hvy Trucks	189
Buses	6	Buses	6	Buses	6
Motorcycles	6	Motorcycles	6	Motorcycles	6
Off-Peak:		Off-Peak:		Off-Peak:	
Autos	4710	Autos	4710	Autos	4710
Med Trucks	89	Med Trucks	89	Med Trucks	89
Hvy Trucks	149	Hvy Trucks	149	Hvy Trucks	149
Buses	5	Buses	5	Buses	5
Motorcycles	5	Motorcycles	5	Motorcycles	5
Demand		Demand		Demand	
Peak:		Peak:		Peak:	
Autos	5722	Autos	9298	Autos	9298
Med Trucks	108	Med Trucks	176	Med Trucks	176
Hvy Trucks	181	Hvy Trucks	294	Hvy Trucks	294
Buses	6	Buses	10	Buses	10
Motorcycles	6	Motorcycles	10	Motorcycles	10
Off-Peak:		Off-Peak:		Off-Peak:	
Autos	4496	Autos	7306	Autos	7306
Med Trucks	85	Med Trucks	138	Med Trucks	138
Hvy Trucks	142	Hvy Trucks	231	Hvy Trucks	231
Buses	5	Buses	8	Buses	8
Motorcycles	5	Motorcycles	8	Motorcycles	8

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	I-4 - West of Branch Forbes Road		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	6	Lanes:	6	Lanes:	6
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	93,900	LOS (C)	93,900	LOS (C)	93,900
Demand	129,000	Demand	209,600	Demand	209,600
Speed:	60 mph 97 kmh	Speed:	60 mph 97 kmh	Speed:	60 mph 97 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV
3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV
0.1	% Buses DHV	0.1	% Buses DHV	0.1	% Buses DHV
0.1	% Motorcycles DHV	0.1	% Motorcycles DHV	0.1	% Motorcycles DHV

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos 4496	Peak:	Autos 4496	Peak:	Autos 4496
	Med Trucks 85		Med Trucks 85		Med Trucks 85
	Hvy Trucks 142		Hvy Trucks 142		Hvy Trucks 142
	Buses 5		Buses 5		Buses 5
	Motorcycles 5		Motorcycles 5		Motorcycles 5
Off-Peak:	Autos 3533	Off-Peak:	Autos 3533	Off-Peak:	Autos 3533
	Med Trucks 67		Med Trucks 67		Med Trucks 67
	Hvy Trucks 112		Hvy Trucks 112		Hvy Trucks 112
	Buses 4		Buses 4		Buses 4
	Motorcycles 4		Motorcycles 4		Motorcycles 4
Demand		Demand		Demand	
Peak:	Autos 6177	Peak:	Autos 10036	Peak:	Autos 10036
	Med Trucks 117		Med Trucks 190		Med Trucks 190
	Hvy Trucks 195		Hvy Trucks 317		Hvy Trucks 317
	Buses 7		Buses 11		Buses 11
	Motorcycles 7		Motorcycles 11		Motorcycles 11
Off-Peak:	Autos 4853	Off-Peak:	Autos 7885	Off-Peak:	Autos 7885
	Med Trucks 92		Med Trucks 149		Med Trucks 149
	Hvy Trucks 153		Hvy Trucks 249		Hvy Trucks 249
	Buses 5		Buses 8		Buses 8
	Motorcycles 5		Motorcycles 8		Motorcycles 8

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	I-4 - Between Ramp Terminals		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	6	Lanes:	6	Lanes:	6
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	93,900	LOS (C)	93,900	LOS (C)	93,900
Demand	129,000	Demand	209,600	Demand	209,600
Speed:	60 mph 97 kmh	Speed:	60 mph 97 kmh	Speed:	60 mph 97 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV	1.8	% Medium Trucks DHV
3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV	3.0	% Heavy Trucks DHV
0.1	% Buses DHV	0.1	% Buses DHV	0.1	% Buses DHV
0.1	% Motorcycles DHV	0.1	% Motorcycles DHV	0.1	% Motorcycles DHV

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
LOS (C)		LOS (C)		LOS (C)	
Peak:	Autos 4496	Peak:	Autos 4496	Peak:	Autos 4496
	Med Trucks 85		Med Trucks 85		Med Trucks 85
	Hvy Trucks 142		Hvy Trucks 142		Hvy Trucks 142
	Buses 5		Buses 5		Buses 5
	Motorcycles 5		Motorcycles 5		Motorcycles 5
Off-Peak:	Autos 3533	Off-Peak:	Autos 3533	Off-Peak:	Autos 3533
	Med Trucks 67		Med Trucks 67		Med Trucks 67
	Hvy Trucks 112		Hvy Trucks 112		Hvy Trucks 112
	Buses 4		Buses 4		Buses 4
	Motorcycles 4		Motorcycles 4		Motorcycles 4
Demand		Demand		Demand	
Peak:	Autos 6177	Peak:	Autos 10036	Peak:	Autos 10036
	Med Trucks 117		Med Trucks 190		Med Trucks 190
	Hvy Trucks 195		Hvy Trucks 317		Hvy Trucks 317
	Buses 7		Buses 11		Buses 11
	Motorcycles 7		Motorcycles 11		Motorcycles 11
Off-Peak:	Autos 4853	Off-Peak:	Autos 7885	Off-Peak:	Autos 7885
	Med Trucks 92		Med Trucks 149		Med Trucks 149
	Hvy Trucks 153		Hvy Trucks 249		Hvy Trucks 249
	Buses 5		Buses 8		Buses 8
	Motorcycles 5		Motorcycles 8		Motorcycles 8

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	US 92 - East of Branch Forbes Road		

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	4	Lanes:	4
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	16,800	LOS (C)	37,900	LOS (C)	37,900
Demand	16,500	Demand	30,500	Demand	30,500
Speed:	55 mph 89 kmh	Speed:	55 mph 89 kmh	Speed:	55 mph 89 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8 % Medium Trucks DHV		1.8 % Medium Trucks DHV		1.8 % Medium Trucks DHV	
3.0 % Heavy Trucks DHV		3.0 % Heavy Trucks DHV		3.0 % Heavy Trucks DHV	
0.1 % Buses DHV		0.1 % Buses DHV		0.1 % Buses DHV	
0.1 % Motorcycles DHV		0.1 % Motorcycles DHV		0.1 % Motorcycles DHV	

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
Demand		Demand		Demand	
LOS (C)		LOS (C)		LOS (C)	
Peak:		Peak:		Peak:	
Autos	804	Autos	1815	Autos	1815
Med Trucks	15	Med Trucks	34	Med Trucks	34
Hvy Trucks	25	Hvy Trucks	57	Hvy Trucks	57
Buses	1	Buses	2	Buses	2
Motorcycles	1	Motorcycles	2	Motorcycles	2
Off-Peak:		Off-Peak:		Off-Peak:	
Autos	632	Autos	1426	Autos	1426
Med Trucks	12	Med Trucks	27	Med Trucks	27
Hvy Trucks	20	Hvy Trucks	45	Hvy Trucks	45
Buses	1	Buses	2	Buses	2
Motorcycles	1	Motorcycles	2	Motorcycles	2
Demand		Demand		Demand	
Peak:		Peak:		Peak:	
Autos	790	Autos	1460	Autos	1460
Med Trucks	15	Med Trucks	28	Med Trucks	28
Hvy Trucks	25	Hvy Trucks	46	Hvy Trucks	46
Buses	1	Buses	2	Buses	2
Motorcycles	1	Motorcycles	2	Motorcycles	2
Off-Peak:		Off-Peak:		Off-Peak:	
Autos	621	Autos	1147	Autos	1147
Med Trucks	12	Med Trucks	22	Med Trucks	22
Hvy Trucks	20	Hvy Trucks	36	Hvy Trucks	36
Buses	1	Buses	1	Buses	1
Motorcycles	1	Motorcycles	1	Motorcycles	1

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project:	Branch Forbes Road from South of US 92 to North of I-4	Date:	4/22/2024
State Project Number(s):		Prepared By:	Conсор Engineering, LLC
Financial Project ID:	447159-1		
Federal Aid Number(s):			
Segment Description:	US 92 - West of Branch Forbes Road		

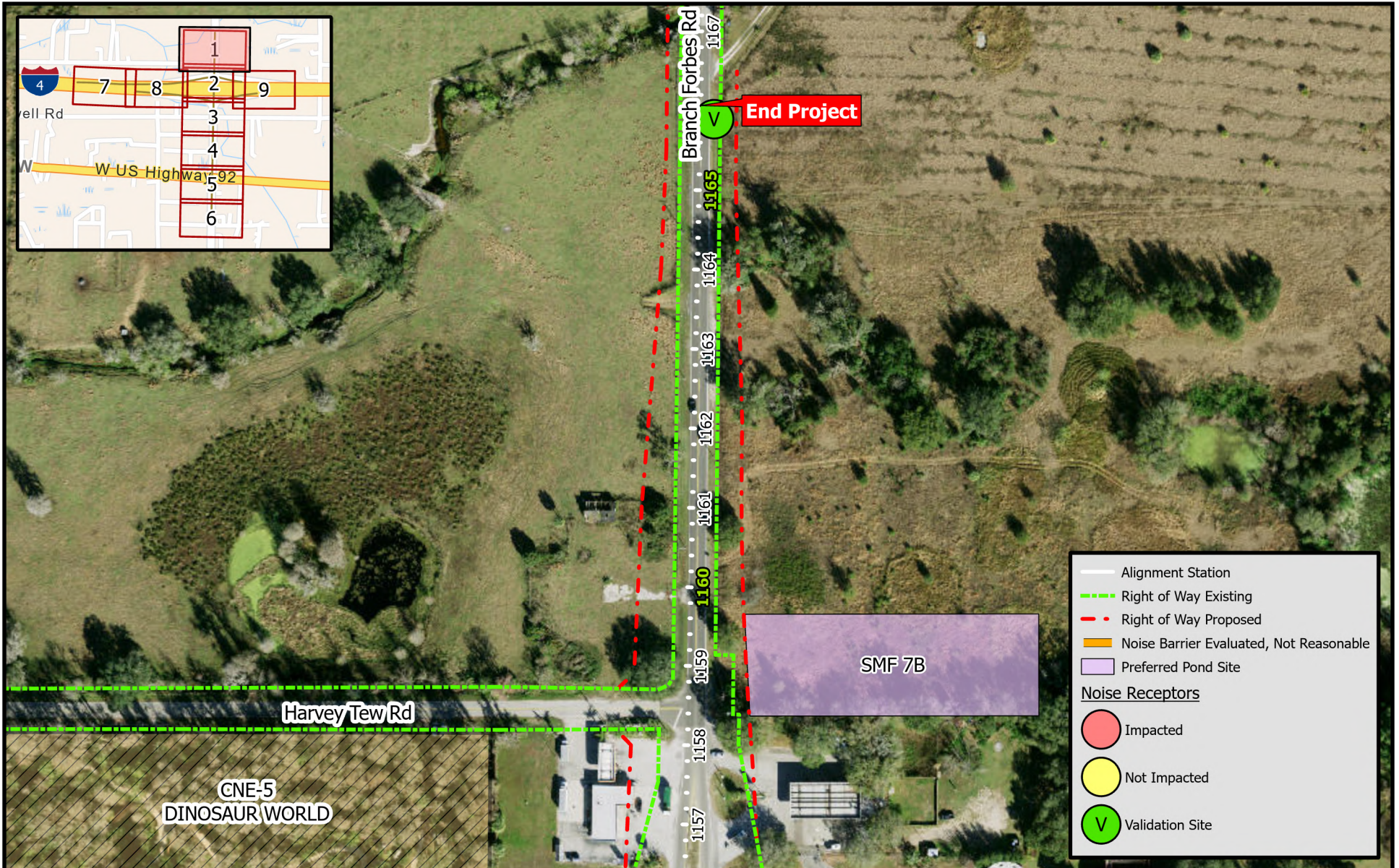
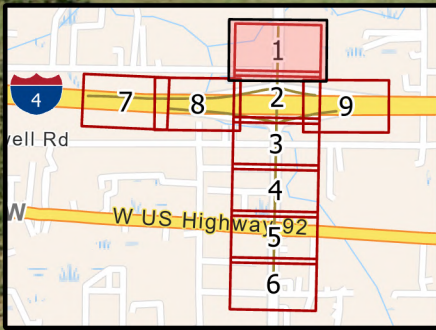
(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	4	Lanes:	4
Year:	2020	Year:	2045	Year:	2045
ADT:		ADT:		ADT:	
LOS (C)	16,800	LOS (C)	37,900	LOS (C)	37,900
Demand	11,000	Demand	20,500	Demand	20,500
Speed:	45 mph 72 kmh	Speed:	45 mph 72 kmh	Speed:	45 mph 72 kmh
K=	9.0 %	K=	9.0 %	K=	9.0 %
D=	56.0 %	D=	56.0 %	D=	56.0 %
T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.	T=	10.0 % for 24 hrs.
T=	5.0 % Design hr	T=	5.0 % Design hr	T=	5.0 % Design hr
1.8 % Medium Trucks DHV		1.8 % Medium Trucks DHV		1.8 % Medium Trucks DHV	
3.0 % Heavy Trucks DHV		3.0 % Heavy Trucks DHV		3.0 % Heavy Trucks DHV	
0.1 % Buses DHV		0.1 % Buses DHV		0.1 % Buses DHV	
0.1 % Motorcycles DHV		0.1 % Motorcycles DHV		0.1 % Motorcycles DHV	

STAMINA/TNM INPUT					
The following are spreadsheet calculations based on the input above - do not enter data below this line					
Existing Facility Model:		No-Build (Design Year) Model:		Build (Design Year) Model:	
Demand		Demand		Demand	
LOS (C)		LOS (C)		LOS (C)	
Peak:		Peak:		Peak:	
Autos	804	Autos	1815	Autos	1815
Med Trucks	15	Med Trucks	34	Med Trucks	34
Hvy Trucks	25	Hvy Trucks	57	Hvy Trucks	57
Buses	1	Buses	2	Buses	2
Motorcycles	1	Motorcycles	2	Motorcycles	2
Off-Peak:		Off-Peak:		Off-Peak:	
Autos	632	Autos	1426	Autos	1426
Med Trucks	12	Med Trucks	27	Med Trucks	27
Hvy Trucks	20	Hvy Trucks	45	Hvy Trucks	45
Buses	1	Buses	2	Buses	2
Motorcycles	1	Motorcycles	2	Motorcycles	2
Demand		Demand		Demand	
Peak:		Peak:		Peak:	
Autos	527	Autos	982	Autos	982
Med Trucks	10	Med Trucks	19	Med Trucks	19
Hvy Trucks	17	Hvy Trucks	31	Hvy Trucks	31
Buses	1	Buses	1	Buses	1
Motorcycles	1	Motorcycles	1	Motorcycles	1
Off-Peak:		Off-Peak:		Off-Peak:	
Autos	414	Autos	771	Autos	771
Med Trucks	8	Med Trucks	15	Med Trucks	15
Hvy Trucks	13	Hvy Trucks	24	Hvy Trucks	24
Buses	0	Buses	1	Buses	1
Motorcycles	0	Motorcycles	1	Motorcycles	1

APPENDIX C Noise Sensitive Receptor Sites



Branch Forbes Road PD&E Study

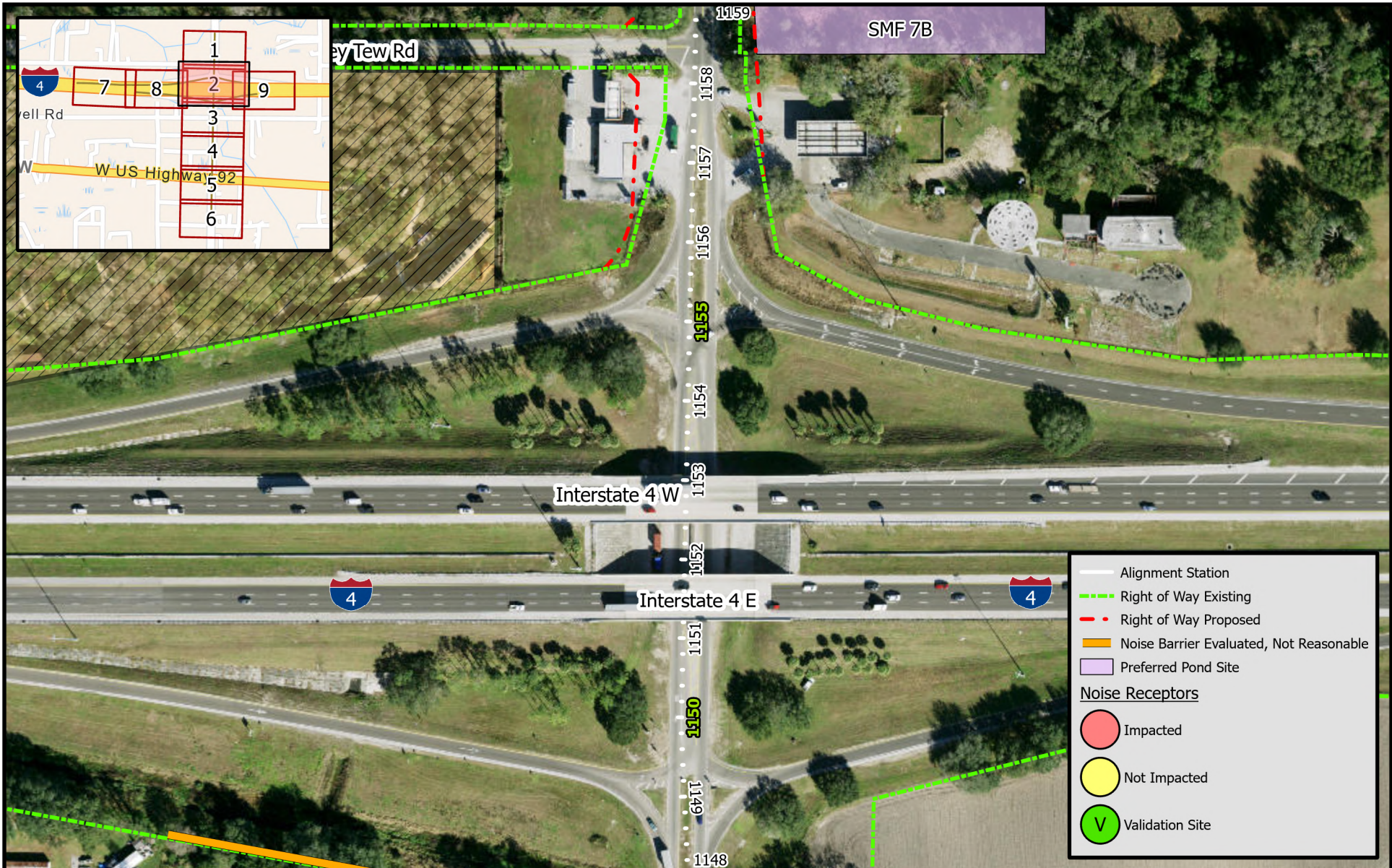
South of US 92 to North of I-4
FPID: 447159-1-32-01
Hillsborough County



Appendix C: Noise Sensitive Receptors



Sheet
Number
1 of 9



Branch Forbes Road PD&E Study

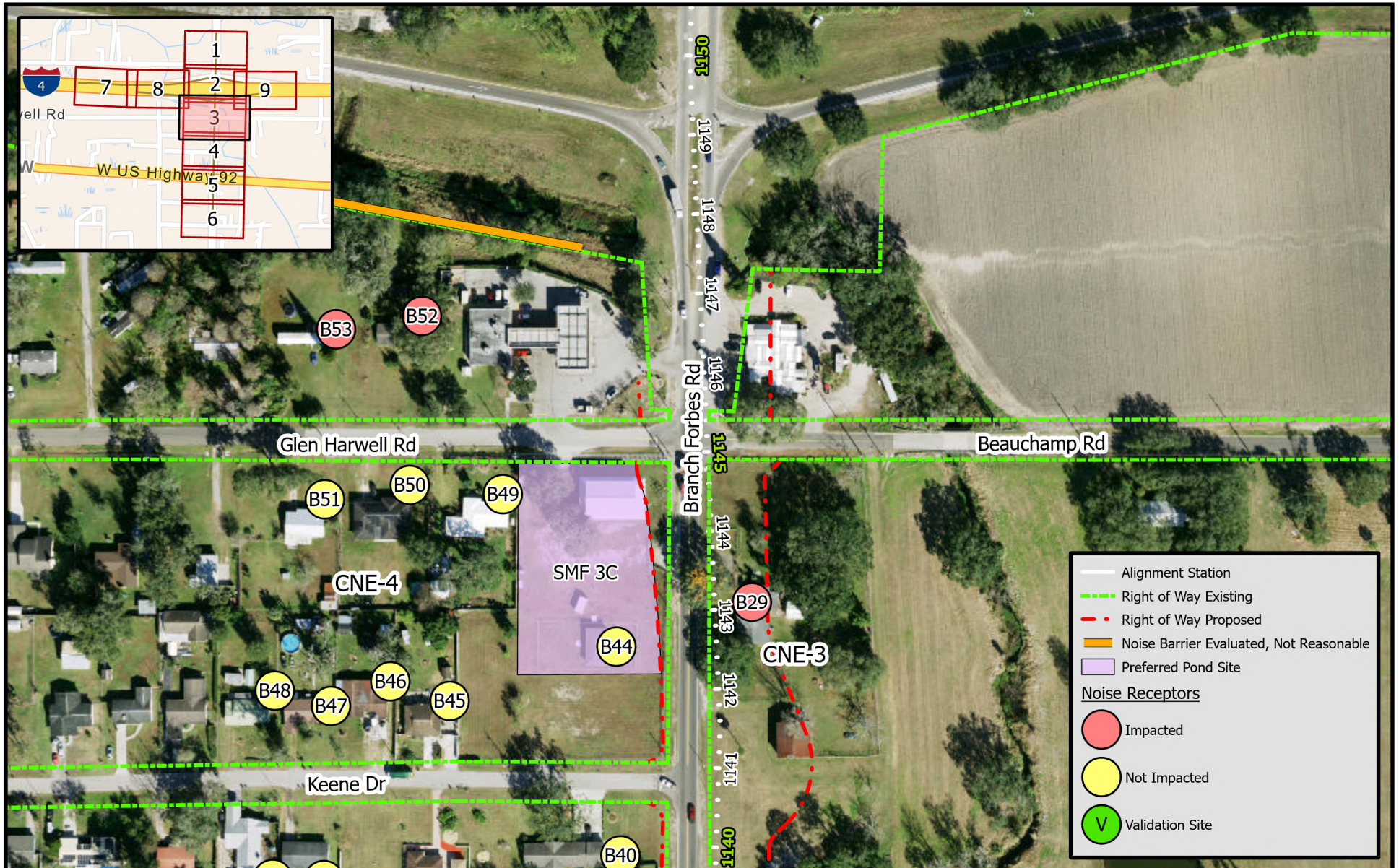
South of US 92 to North of I-4
FPID: 447159-1-32-01
Hillsborough County



Appendix C: Noise Sensitive Receptors

0 50 100 200 300
Feet

Sheet
Number
2 of 9



Branch Forbes Road PD&E Study

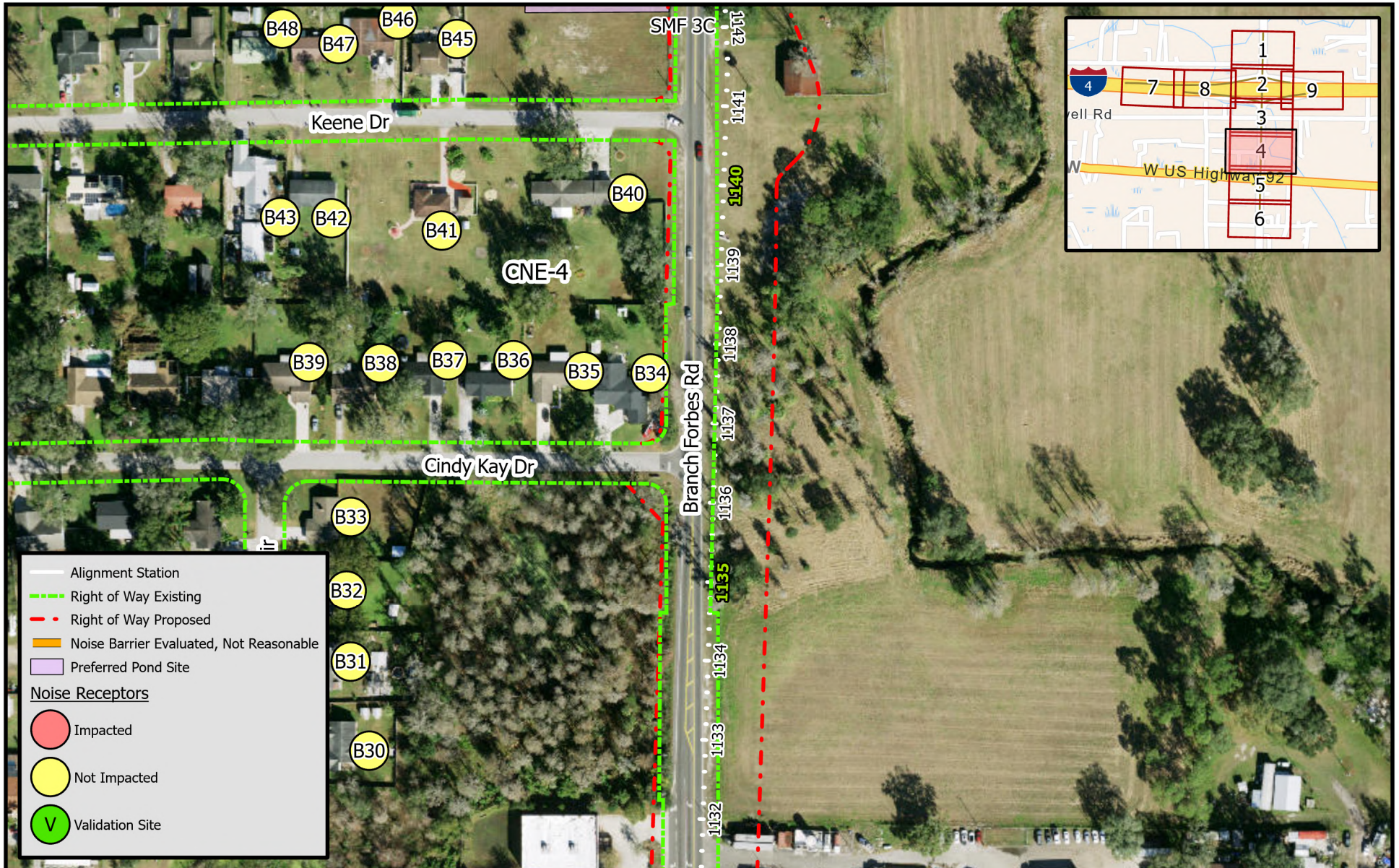
South of US 92 to North of I-4
 FPID: 447159-1-32-01
 Hillsborough County



Appendix C: Noise Sensitive Receptors

0 50 100 200 300
 Feet

Sheet
 Number
 3 of 9



Branch Forbes Road PD&E Study

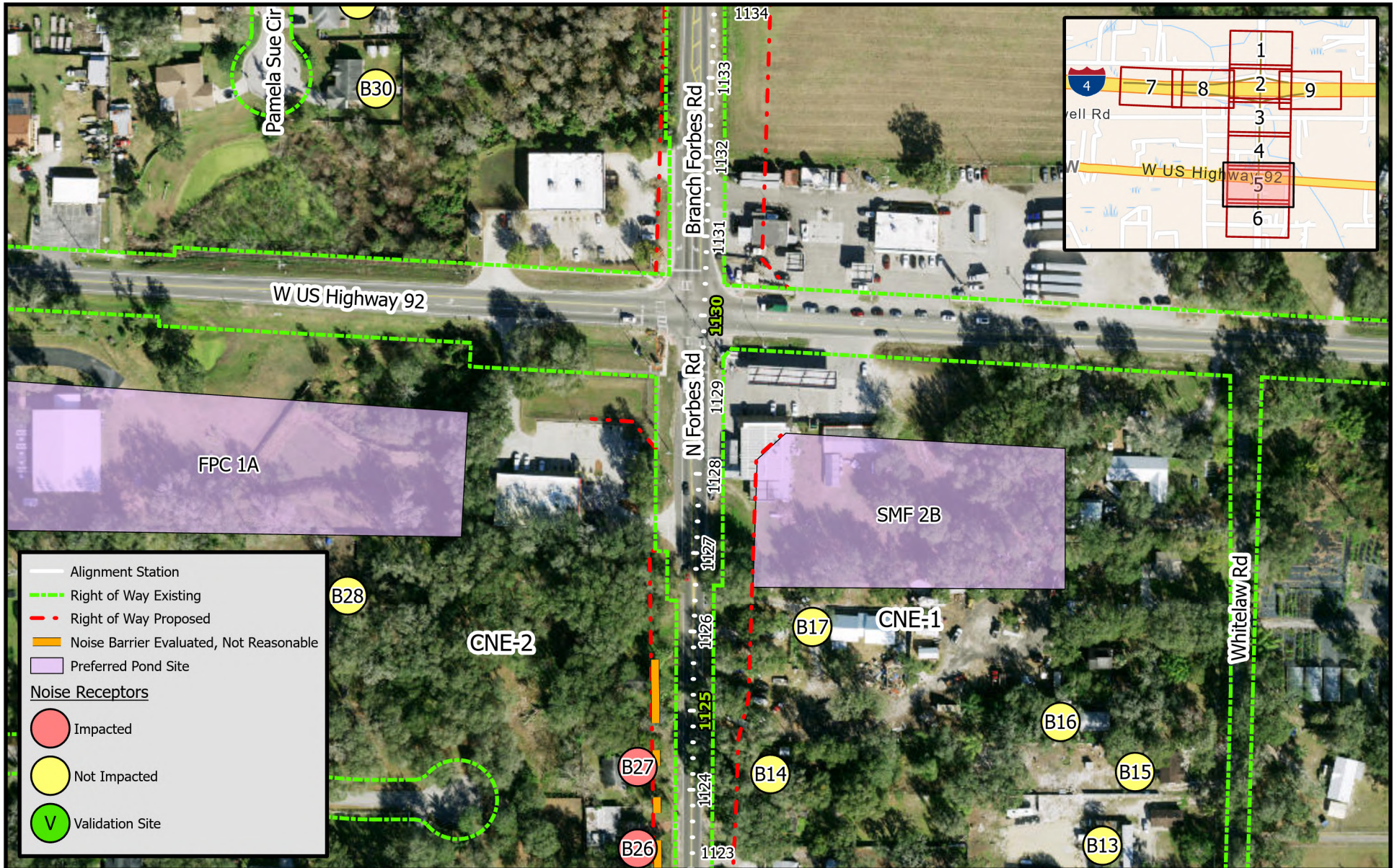
South of US 92 to North of I-4
 FPID: 447159-1-32-01
 Hillsborough County



Appendix C: Noise Sensitive Receptors

0 50 100 200 300
 Feet

Sheet
 Number
 4 of 9



Branch Forbes Road PD&E Study

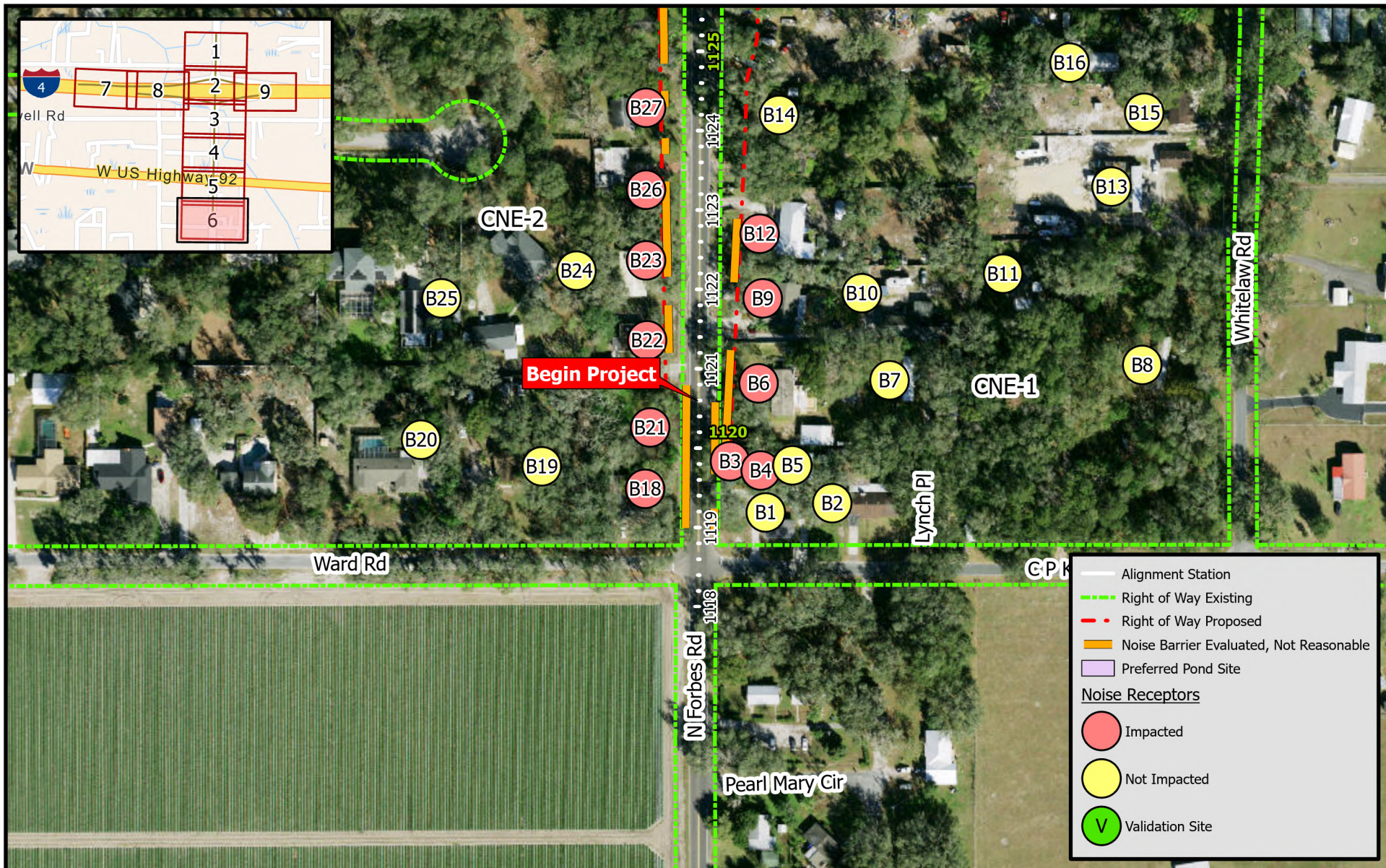
South of US 92 to North of I-4
 FPID: 447159-1-32-01
 Hillsborough County



Appendix C: Noise Sensitive Receptors

0 50 100 200 300
 Feet

Sheet
 Number
 5 of 9





Branch Forbes Road PD&E Study

South of US 92 to North of I-4
FPID: 447159-1-32-01
Hillsborough County

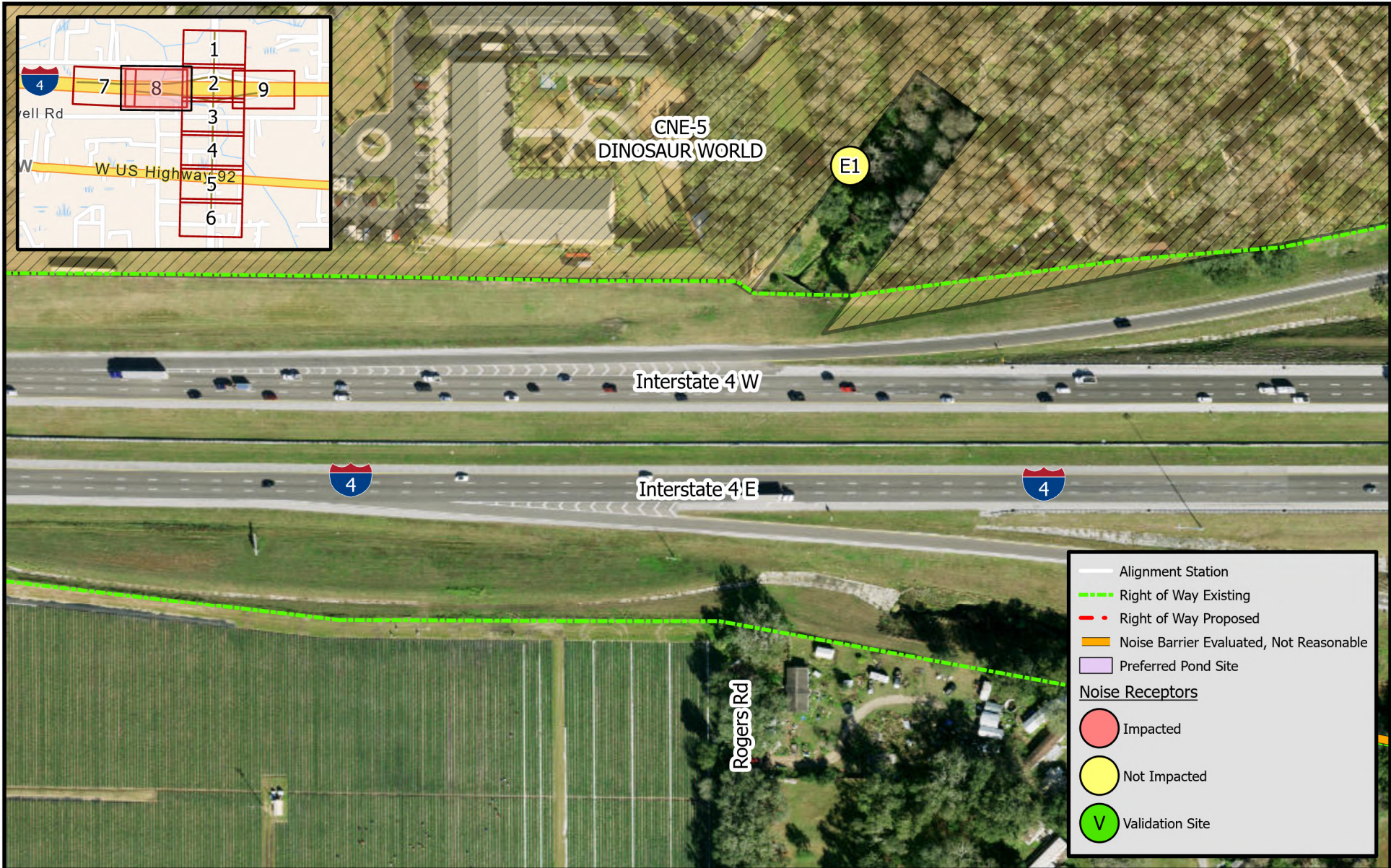


Appendix C: Noise Sensitive Receptors

0 50 100 200 300
Feet

Sheet
Number
7 of 9

Draft



Branch Forbes Road PD&E Study

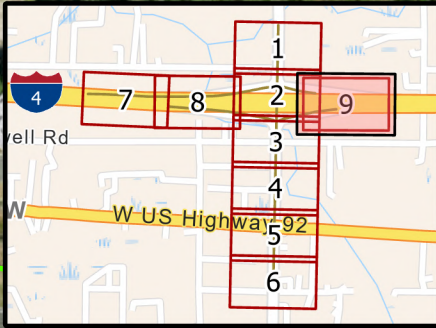
South of US 92 to North of I-4
FPID: 447159-1-32-01
Hillsborough County



Appendix C: Noise Sensitive Receptors

0 50 100 200 300
Feet

Sheet
Number
8 of 9



— Alignment Station
 - - - Right of Way Existing
 - - - Right of Way Proposed
 Noise Barrier Evaluated, Not Reasonable
 Preferred Pond Site
Noise Receptors
 (Red Circle) Impacted
 (Yellow Circle) Not Impacted
 (Green Circle with V) Validation Site



**Branch Forbes Road
PD&E Study**

South of US 92 to North of I-4
 FPID: 447159-1-32-01
 Hillsborough County



**Appendix C: Noise
Sensitive Receptors**



**Sheet
Number
9 of 9**

Draft

APPENDIX D Noise Model Validation Data

Noise Validation Data

Location (Address and County)/Site Identification	Station Number	Survey No.
Branch Forbes Rd North of I-4		1 of 3

Date	Calibration Begin	Calibration End	Time Begin	Time End	Measured dB(A)
4/18/24	113.6 _{40.4}	113.98	1:33	1:43	70.0

Weather Data

Temperature	Cloud/Sun Cover	Precipitation/ Humidity	Wind Speed Direction
86°F	patchy	49%	3 mph SW

Traffic Classification NB SB WB EB

Cars	Med Trucks	Heavy Trucks	Buses	Motorcycles
11	16		2	

Traffic Classifications - NB SB WB EB

Cars	Med Trucks	Heavy Trucks	Buses	Motorcycles
21	14	3		1

Measurements Taken By:

Sophi Hayes / Greg White

Other Comments:

location is just south of stream

Draft

Noise Validation Vehicle Speeds

Location (Address and County)/Site Identification	Station Number	Survey No.
Branch Forbes N of 1-4		1 of 3

Speed Counts - NB SB WB EB

Cars	Cars	Cars	Cars	M. Trucks	M. Trucks	H. Trucks	H. Trucks	Buses	M. Cycles
35				41	42			38	
45				40	40			33	
40				41	45				
41				34	39				
38				43					
46				36					
42				43					
47				40					
43				34					
42				51					
40				46					
				46					

Speed Counts - NB SB WB EB

Cars	Cars	Cars	Cars	M. Trucks	M. Trucks	H. Trucks	H. Trucks	Buses	M. Cycles
47	40			43	46	52			31
44	29			39	49	40			
39	42			40		52			
69	40			44					
45	35			42					
40	44			44					
48	40			47					
43	35			44					
45	38			47					
46				40					
45				42					
42				42					

Draft

Noise Validation Data

Location (Address and County)/Site Identification	Station Number	Survey No.
Branch Forbes Rd N of I-4		2 of 3

Date	Calibration Begin	Calibration End	Time Begin	Time End	Measured dB(A)
4/18/24	114.3	113.98	1:49	1:59	71.5

Weather Data

Temperature	Cloud/Sun Cover	Precipitation/ Humidity	Wind Speed Direction
87	patchy	48%	1 mph NW

Traffic Classification ~~EB~~ SB WB EB

Cars	Med Trucks	Heavy Trucks	Buses	Motorcycles
19	12	1		

Traffic Classifications - NB ~~SB~~ WB EB

Cars	Med Trucks	Heavy Trucks	Buses	Motorcycles
28	13	6		

Measurements Taken By: Greg White / Sophia Hayes

Other Comments: location just south of stream

Draft

Noise Validation Vehicle Speeds

Location (Address and County)/Site Identification	Station Number	Survey No.
Branch Forbes Rd N of 1-4		2 of 3

Speed Counts - NB SB WB EB

Cars	Cars	Cars	Cars	M. Trucks	M. Trucks	H. Trucks	H. Trucks	Buses	M. Cycles
28	36			39		40	2		
32	36			41					
43	43			43					
46	50			39					
41	21			37					
49	26			39					
42	41			45					
26				27					
50				33					
41				38					
38				22					
50				41					

Speed Counts - NB SB WB EB

Cars	Cars	Cars	Cars	M. Trucks	M. Trucks	H. Trucks	H. Trucks	Buses	M. Cycles
40	50	42							
37	38	44							
58	41	41							
53	40	44							
45	41								
45	40								
45	38								
43	40								
41	45								
42	35								
42	30								
41	40								

Draft

Noise Validation Data

Location (Address and County)/Site Identification	Station Number	Survey No.
Branch/Forbes Rd N of 1-4		3 of 3

Date	Calibration Begin	Calibration End	Time Begin	Time End	Measured dB(A)
4/18/24	113.98	113.92	2:04	2:14	68.6

Weather Data

Temperature	Cloud/Sun Cover	Precipitation/ Humidity	Wind Speed Direction
87°F	patchy	47%	3 mph SW

Traffic Classification - ~~NB~~ SB WB EB

Cars	Med Trucks	Heavy Trucks	Buses	Motorcycles
13	12			

Traffic Classifications - NB SB WB EB

Cars	Med Trucks	Heavy Trucks	Buses	Motorcycles
33	8	3	3	

Measurements Taken By:

Sophi Hayes / Greg White

Other Comments:

location is just south of stream

Draft

Noise Validation Vehicle Speeds

Location (Address and County)/Site Identification	Station Number	Survey No.
Branch Forbes Rd N of I-4		30f3

Speed Counts - NB SB WB EB

Cars	Cars	Cars	Cars	M. Trucks	M. Trucks	H. Trucks	H. Trucks	Buses	M. Cycles
33	41			41					
42				37					
39				22					
27				24					
25				29					
42				38					
44				34					
25				41					
23				35					
36				40					
38				37					
34				43					

Speed Counts - NB SB WB EB

Cars	Cars	Cars	Cars	M. Trucks	M. Trucks	H. Trucks	H. Trucks	Buses	M. Cycles
44	41	38		46		46		45	
34	43	39		42		43		47	
43	40	43		42		40		33	
47	37	43		45					
40	38	41		44					
40	39	42		43					
41	37	44		42					
40	44	34		46					
40	42								
40	40								
39	37								
40	38								

Draft

<Project Name?>

Draft¹

<Project Name?>

Draft¹

RESULTS: SOUND LEVELS						<Project Name?>							
Conсор						7 August 2024							
Anna Peterfreund						TNM 2.5							
						Calculated with TNM 2.5							
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:						<Project Name?>							
RUN:						Branch Forbes Validation Run 3							
BARRIER DESIGN:						INPUT HEIGHTS							
						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.							
ATMOSPHERICS:						68 deg F, 50% RH							
Receiver													
Name		No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		With Barrier				
					Calculated	Crit'n	Calculated	Crit'n	Type Impact	Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
								Sub'l Inc					
				dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
validation site		3	1	0.0	71.0	66	71.0	10	Snd Lvl	71.0	0.0	8	-8.0
Dwelling Units			# DUs	Noise Reduction									
				Min	Avg	Max							
				dB	dB	dB							
All Selected			1	0.0	0.0	0.0							
All Impacted			1	0.0	0.0	0.0							
All that meet NR Goal			0	0.0	0.0	0.0							

APPENDIX E TNM Data – Available for review at the District Office

APPENDIX F Barrier Analysis – Available for review at the District Office