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PRELIMINARY ENGINEERING REPORT

Florida Department of Transportation

District Seven

Project Development and Environment (PD&E) Study Design Change Reevaluation

Limits of Project: US 41/SR 45 at Grade Separation from S of SR 676 to N of SR 676

Hillsborough County, Florida

Financial Management Number: 440749-1

ETDM Number: 14345

Date: February 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.

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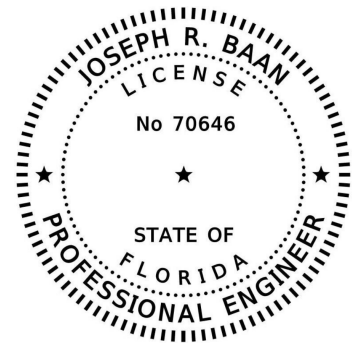
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Final Preliminary Engineering Report

US 41/SR 45 AT CSX GRADE SEPARATION

FROM S OF SR 676 TO N OF SR 676

Project Development & Environment (PD&E) Study

Design Change Reevaluation



Florida Department of Transportation

District 7

Work Program Item Segment No. 440749-1

Federal Aid Project No.: D719-029-B

ETDM Project No. 14345

Hillsborough County, Florida

February 2024

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Appendix A – Preferred Alternative Plans

Appendix B – Approved Typical Section Package and Design Variations

Appendix C – Long Range Estimate

1.0 PROJECT SUMMARY

1.1 PROJECT BACKGROUND

The Florida Department of Transportation (FDOT) is conducting a Design Change Reevaluation of a previous Environmental Assessment (EA) with a Finding of No Significant Impact (FONSI) (Work Program Item/WPI Segment No. 255598-1) approved by the Federal Highway Administration (FHWA) on May 24, 1994. **Figure 1-1** shows the limits of the previous PD&E study completed along 22nd Street Causeway/Causeway Boulevard (State Road 676) from State Road (SR) 60 to US 301, in Hillsborough County, Florida. The segment currently being evaluated/advanced is shown as Segment 3 on **Figure 1-1**.

The previous study evaluated anticipated conditions for a 2015 Design Year. The FONSI documented the need for a six-lane roadway to replace the existing 2- to 4-lane roadway beginning at SR 60 and extending approximately 7 miles east at US 301. Since the completion of the 1994 PD&E Study, Causeway Boulevard has been widened to four-lanes.

The project included a new interchange at US 41/Causeway Boulevard intersection for which the approved concept was a “compressed diamond” interchange with US 41 elevated over Causeway Boulevard. This interchange is also known as a Single Point Urban Interchange (SPUI). The study identified that the US 41 interchange bridge would carry three lanes of traffic in each direction with a barrier wall separating opposing traffic. The study recommended an additional grade separation of US 41 over the CSX railroad crossing south of Causeway Boulevard while the CSX railroad crossing east of US 41 would remain at-grade with Causeway Boulevard. The concept showed the SPUI ramps oriented along US 41 and one-way, one-lane frontage roads were provided in the southeast and northeast quadrants to provide local property access. Five-foot sidewalks and 4-foot bicycle lanes were proposed along both sides of Causeway Boulevard.

The current study effort being conducted under WPI Seg. No. 440749-1 is evaluating various intersection and operational improvements along Causeway Boulevard east and west of US 41 (SR 45/SR 599) along with US 41 from south of the Causeway Boulevard intersection to north of the Causeway Boulevard intersection. These improvements include the construction of a grade separation of US 41 at the CSX railroad crossing located approximately 1,400' south of the Causeway Boulevard intersection. Bicycle and pedestrian facility improvements along US 41 and Causeway Boulevard are also provided.

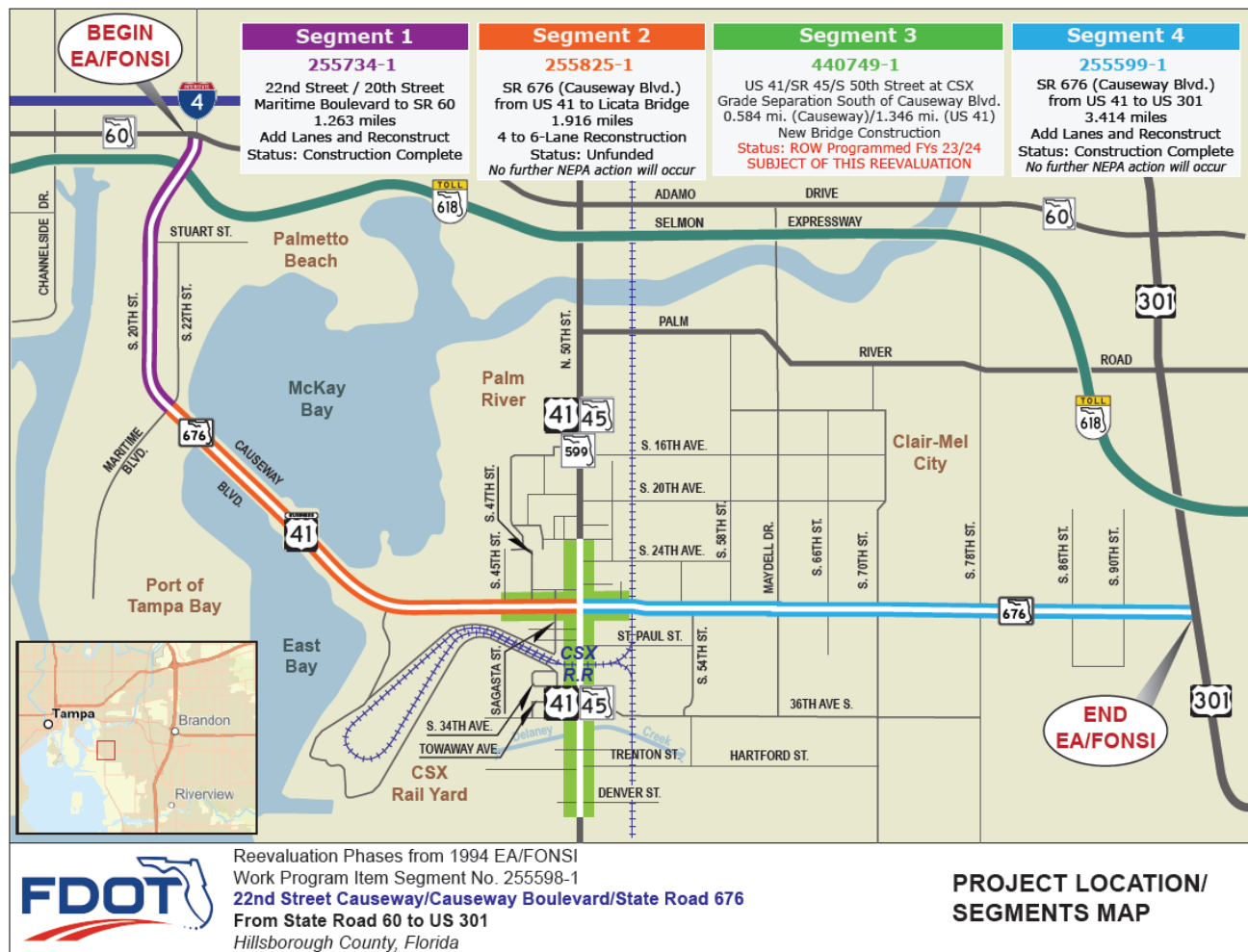


Figure 1-1 Project Location Map

1.2 PROJECT PURPOSE AND NEED

Purpose

The purpose of this project is to reduce traffic delays associated with the CSX railroad crossing, support the safe movement of vehicle traffic, including trucks and freight, and enhance connectivity and safety for bicyclists and pedestrians.

Need

As expressed in the original 1994 EA/FONSI, the need for the 22nd Street Causeway/Causeway Boulevard improvements was based on the following criteria: System Linkage; Capacity; Transportation Demand; Federal, State, or Local Government Authority; Socioeconomic Demand; Modal Interrelationships; Safety; and Navigation.

Reduce Traffic Delays

For the current segment, US 41 and Causeway Boulevard are vital arterial highways which serve the City of Tampa and Hillsborough County. The US 41 and Causeway Boulevard intersection experiences traffic delays during the AM and PM peak periods with heavy truck traffic (approximately 13% of the daily volume) traversing through the intersection.

The presence of CSX railroad crossings to the south and east of the intersection also further contribute to these traffic delays. The CSX railroad crossing located to the south of the intersection causes traffic delays particularly during the AM peak period. Based on rail crossing data, the US 41/CSX crossing is closed an average of 28 times per day, 4 of which are during the AM peak period. This project will address traffic delays associated with the CSX railroad crossing to the south of the US 41 and Causeway Boulevard intersection.

Safety

Vehicle crashes that included vehicles, trains, bicycles and pedestrians have been evaluated. The study crash rate for the US 41 and Causeway Boulevard intersection is 0.7204. This is higher than the statewide crash rate for similar facilities of 0.6676 (2012-2016). The project will address safety concerns in order to facilitate the safe movement of vehicle traffic through the project corridor. Detailed information regarding the safety evaluation is available in **Section 2.1.12**.

Multimodal

In addition, this project will also address multimodal connectivity and safety within the area. Although there are sidewalks and dedicated bicycle lanes along both sides of Causeway Boulevard within the project limits, there are only sidewalks and no dedicated bicycle facilities along US 41 within the project limits. Proposed facilities will include enhanced safety for users crossing US 41 (i.e., signal-protected and underpass locations). There are no existing bus/transit facilities within the project study area.

Status

The proposed improvements have been identified in the Hillsborough County Transportation Planning Organization's (TPO) 2045 Adopted Long Range Transportation Plan, the TPO's Fiscal Year 2023/24-2027/28 Transportation Improvement Program, as well as the FDOT's Statewide Transportation Improvement Plan and Strategic Intermodal System (SIS) Adopted 1st 5-Year Program. US 41 has also been identified as a Goods Movement Roadway Corridor from I-4 to the Manatee County Line and is a priority project for the National Highway Freight Program. The table below summarizes the current statuses of Segments 1-4 of the 1994 EA/FONSI:

Segment #	WPI Seg. No.	Status of Design Segments	
1	255734-1	22 ND /20 TH ST FROM MARITIME BLVD TO SR 60	Construction Complete
2	255825-1	SR 676 (22ND ST) FROM US 41 TO LICATTA BRIDGE	Design not yet underway
3	440749-1	US 41/SR 45 AT CSX GRADE SEPARATION FR S OF SR 676 TO N OF SR 676	This segment is the subject of this Design Change Re-evaluation
4	255599-1	CAUSEWAY BLVD FROM 1/4 MI W OF US 41 TO 1/4 E OF US 301	4-Lane construction completed

1.3 EXISTING FACILITY

The proposed improvements along Causeway Boulevard begin west of S. 45th Street (MP 3.554) and extend east of the Causeway Boulevard intersection terminating prior to the CSX crossing (624815B; MP 2.971). The project limits identified along US 41 begin south of Denver Street (MP 22.578) and extend north of the

Causeway Boulevard intersection to S. 23rd Avenue (MP 23.925). Causeway Boulevard is currently four lanes and US 41 is currently a six-lane roadway throughout the project limits. US 41 and Causeway Boulevard are functionally classified as urban principal arterials. Causeway Boulevard west of US 41 and US 41 south of Causeway Boulevard are part of FDOT's Strategic Intermodal System (SIS), designated as a SIS Connector. The CSX railroad crossing east of US 41 is a designated SIS Railway Corridor and the CSX railroad crossing south of Causeway Boulevard (#624802A) is designated as a SIS Railway Connector. There is one bridge culvert south of Causeway Boulevard for US 41 over Delaney Creek (MP 23.003). The design speed limit for both US 41 and Causeway Boulevard is 45 miles per hour (mph).

Along Causeway Boulevard, the existing typical section consists of a divided 4-lane curb and gutter roadway with 12-foot outside lanes and 11- to 12-foot inside lanes with, 4-foot bicycle lanes, and 6-foot sidewalks in each direction. The median consists of 14-foot center two-way left turn lane from S. 45th Street to Sagasta Street and is a raised curb and gutter for the remainder of the project. The roadway is concrete pavement from the beginning of the project to 400 feet east of US 41 and is asphalt pavement for the remainder of the project.

The existing typical section for US 41 from south of Denver Street to Causeway Boulevard is a divided 6-lane curb and gutter roadway with a 19-foot raised median, 10-foot outside travel lanes, 11-foot middle and inside travel lanes, and a 5- to 6-foot sidewalk on both sides.

Along US 41 from north of Causeway Boulevard to just north of S. 23rd Avenue, the existing typical section consists of a divided 6-lane curb and gutter roadway, 11-foot travel lanes, a 10-foot center two-way left-turn lane with a 4-foot sidewalk along both sides of the roadway.

The majority of the existing right-of-way (ROW) along US 41 is 100 feet wide. In the vicinity of the CSX railroad, the ROW width varies from 100 to 332 feet. CSX Transportation owns a large portion of the adjacent property along both sides of US 41 where the CSX railroad crosses at grade. The Causeway Boulevard ROW is 150 feet wide or greater west of S. 45th Street and reduces to 100 feet wide around S. 47th Street.

1994 EA/FONSI Approved Typical Sections

The original study used a 2015 design year. In the original study, the Causeway Boulevard section between S. 45th Street and S. 54th Street incorporated a roadway typical section consisting of three 12-foot lanes, a 5-foot sidewalk and 4-foot shoulders with curb and gutter in both the eastbound (EB) and WB directions. This typical section (shown below) was centered on the existing roadway centerline for Causeway Boulevard to minimize ROW impacts. A 19-foot, 6-inch median width was used for the portion within the current segment limits to avoid additional ROW impacts, resulting in an overall 123-foot, 6-inch typical section within a variable 135-foot to 163.5-foot ROW. No typical section was provided for US 41.

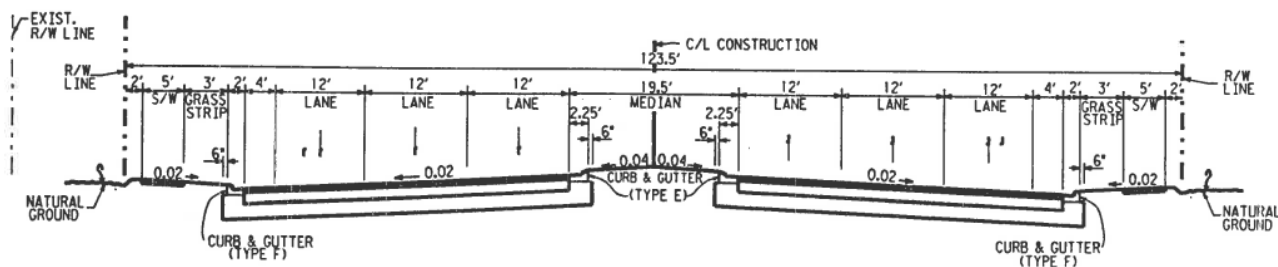


Figure 1-2 1995 EA/FONSI Typical Section

The Causeway Boulevard intersection was evaluated as a SPUI interchange, with US 41 as a 6-lane facility over Causeway Boulevard. The proposed bridge would carry six travel lanes (3 lanes in both the NB and SB directions) and portions of interchange ramp tapers on both roadways. The original study also proposed a second bridge carrying US 41 over the existing CSX Railroad crossing (No. 624802A) south of Causeway Boulevard. The bridge would carry three 12-foot lanes in each direction, with a 22-foot median (two 10-foot shoulders and a median barrier) and outside shoulder barriers. The northeast quadrant of the CSX crossing would have a frontage road to maintain access to St. Paul Street. Dedicated bicycle and pedestrian accommodations were not proposed on either bridge.

1.4 COMMITMENTS

Original 1994 EA/FONSI Commitments

During the development of the PD&E study, several issues were raised that will require resolution and/or implementation during the subsequent design and construction phases of the project. These issues are discussed in detail below.

1. Approximately 2.7 acres of wetlands will be impacted due to the construction of the proposed improvements. These impacts will be mitigated through development and implementation of a plan that will include a wetland creation component to assure "no net loss" of wetland areas. Coordination with the affected environmental agencies will be undertaken during the design phase. The roadway typical section shall be compressed to minimum standards across the causeway section to minimize impacts to the wetlands. The possibility of constructing culverts in the causeway section to aid in circulation of water between the north and south sides of the causeway will also be investigated as part of the overall mitigation design.

Status: Wetland impacts resulting from construction of the Preferred Alternative will occur. Including the combined direct, secondary, and wetland-cut ditch impacts, the project is anticipated to impact approximately 0.167 acre of wetlands, resulting in an estimated Unified Mitigation Assessment Method (UMAM) functional loss of 0.08 unit. An additional 1.55 acres of impacts to other surface waters are also anticipated. Wetland and other surface water boundaries delineated and UMAM functional assessments will be field verified with resource agency staff during the project's environmental permitting phase. All wetland impacts will occur within estuarine systems.

The project anticipates using commercially available mitigation credits from agency-approved banks with an appropriate geographic service area to provide compensatory mitigation sufficient to offset unavoidable project impacts to wetlands and wetland-dependent species habitat. The mitigation banks within the Tampa Bay Basin include the Mangrove Point Mitigation Bank (MB), the Nature Coast MB, and the Tampa Bay MB. Although credit availability among these banks will likely change in the time between this assessment and the project's future environmental permitting efforts, based on review of the USACE Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) conducted on June 1, 2023, sufficient mitigation credits are available to offset the impacts from the proposed improvements. With

compensatory mitigation completed within the same watershed where the impacts are incurred, the project will not result in cumulative impacts.

2. The West Indian Manatee has been documented in the estuarine habitats around McKay Bay. Due to potential impacts to manatees during the construction phase, specific protection measures are to be implemented. These measures are also intended to protect sea turtles. A continuous Manatee and Sea Turtle Watch Program (MWP) is to be implemented for the bridge demolition and construction phase for the crossings of McKay Bay. The 19 components of the MWP are included in section 4.19 of the Environmental Assessment. The MWP will be included in the construction documents as a special provision.

Status: The segment being advanced does not include bridge work within McKay Bay or East Bay and sea turtle impacts are not anticipated and U.S. Fish and Wildlife Service/National Marine Fisheries Service (USFWS/NMFS) protection measures for sea turtles are not required. However, the USFWS has determined that the project action area falls within an Important Manatee Area. As such, the FDOT commits to the implementation of the USFWS' Standard Manatee Conditions for In Water Work.

3. The location of traffic signals and median openings was the subject of numerous public hearing inquiries. The location of these components is to be resolved during the design phase in accordance with FDOT Access Management Rules 14-96 and 14-97. The Comments and Coordination section of the Environmental Assessment documents the specific questions raised and the FDOT response. The design phase of the project shall include coordination with the Palmetto Beach Community Association and other impacted property owners prior to the finalization of traffic signal locations and median openings.

Status: The locations of traffic signals and median openings has been determined by the design standards, traffic operations and user safety requirements necessary for the Preferred Alternative and the local roadway network and bicycle/pedestrian facilities. These design elements were shown at the June 1, 2023 public hearing. Additional discussions on property access will be completed during the ROW acquisition/cost-to-cure coordination process. Any changes in either signal or median access will be documented in a future reevaluation. The Palmetto Beach Community Association is not within or adjacent to the segment being advanced.

4. An initial contamination screening was performed and documented in a report dated October 1991 entitled "Hazardous Waste and Petroleum Contamination Site Assessment Report." This document identified 81 potential sites of hazardous materials and/or petroleum impacts. A Level II soil and groundwater investigation will be performed for recommended sites located along the preferred alternative.

Status: An updated review for potential contamination involvement was conducted for this study and the results are documented in a Mainline *Contamination Screening Evaluation Report*

(CSER) and a Pond CSER available in the project file. A total of 94 potential contamination sites were evaluated. Eight sites were assigned a High-risk ranking. Sixteen sites were assigned a Medium risk ranking. Fifty-eight sites were assigned a Low risk ranking and eight sites were assigned a No risk ranking. Based on similarity of site location, type and proximity, Sites 14, 15, 16 and 17 were mingled and assigned a single High-risk ranking.

For the sites rated with a Low or No contamination risk ranking, no further action is currently required, as they have been determined not to have a significant contamination risk to the project study area at this time.

The sites with High and Medium risk rankings include various existing and former land uses including: gas stations; automotive junkyard/salvage facilities; automobile, tractor trailer, heavy equipment and recreational vehicle service/repair facilities; industrial chemical sales/storage; industrial battery production/storage; and railroad corridors. More detailed information regarding the locations, history and applicable pollutants of concern for each applicable site is provided in Table 1 of the Mainline CSER and Pond CSER documents available in the project file.

ROW acquisition for roadway improvements is proposed from 8 High-risk and 16 Medium-risk ranked sites and Ponds 3A and 3B will require ROW acquisition from 2 High-risk ranked sites. Where construction activities may disturb or be impacted by the High and Medium risk sites (soil excavation, utilities/structure installation, dewatering, etc.), Level II testing will be evaluated and conducted as determined necessary by the District Contamination Impact Coordinator. This testing will be conducted during the Design phase so that final plan sheets can include appropriate plan notes/strategies to manage confirmed contamination. The FDOT will oversee contamination remediation within the applicable parcels during project construction.

New Commitments

1. The FDOT will implement the *Construction Special Provisions Gulf Sturgeon Protection Guidelines* during construction over, in, or adjacent to potential Gulf sturgeon habitat to avoid and minimize adverse impacts to the Gulf sturgeon.
2. FDOT will complete Endangered Species Act Section 7 consultation with the National Marine Fisheries Service for the smalltooth sawfish when sufficient information regarding project design, construction methodology and compensatory mitigation are provided for project impacts at Delaney Creek and the unnamed tributary to McKay Bay.
3. The FDOT will implement the NMFS Southeast Regional Office (SERO) *Protected Species Construction Conditions* and FDOT Supplemental Standard Specification 7-1.4.1 *Additional Requirements for Smalltooth Sawfish* during construction over, in, or adjacent to potential smalltooth sawfish habitat to avoid and minimize adverse impacts to the species.
4. The FDOT will implement the most current version of the USFWS' *Standard Protection Measures for the Eastern Indigo Snake*.

5. The FDOT will further evaluate the need for installing manatee exclusion grates (as per FDOT Standard Index 430-001) on drainage outfall pipes which discharge to Delaney Creek and the unnamed tributary to McKay Bay.
6. The FDOT will utilize the most recent version of the *Standard Manatee Conditions for In-Water Work* and FDOT Supplemental Specification 7-1.4.1 *Additional Requirements for Manatees* during construction over, in, or adjacent to potential manatee habitat.

1.5 DESCRIPTION OF PREFERRED ALTERNATIVE

There are multiple typical sections throughout the project limits. The proposed improvements for Causeway Boulevard from S. 45th Street to west of the CSX railroad crossing widens the existing 4-lane divided urban section to include 7-foot buffered bicycle lanes and 6-foot sidewalks along the outside. There are now two barrier-separated left turn lanes and three right turn lanes to US 41 proposed for the eastbound (EB) direction and no changes in turn lanes to US 41 in the westbound (WB) direction as shown in the plans provided in **Appendix A**. Concrete pavement will be used where appropriate. The proposed improvements will require the acquisition of ROW varying from 10 to 37 feet along the north side only.

The proposed at-grade improvements along US 41 from just south of Denver Street to north of Causeway Boulevard, include reconstructing US 41 with concrete pavement to accommodate a 6-lane divided urban curbed section with 12-foot lanes, 7-foot buffered bicycle lanes, and 10-foot sidewalks on both sides. The median width varies from 16.5 to 36 feet to provide turn lanes. The proposed improvements along US 41 will require the acquisition of ROW varying from 30 to 90 feet.

Within this segment, the elevated section from north of Trenton Street to south of Causeway Boulevard, US 41 is grade separated over the CSX Railroad crossing and includes a two-lane, undivided frontage road on the west side for local access to neighboring properties. The proposed frontage road is an urban curbed section with 12-foot travel lanes, and a 10-foot sidewalk on the west side. The proposed improvements along US 41 will require the acquisition of ROW varying from 29 to 200 feet. Bridge overpasses are proposed for the US 41 mainline over Delaney Creek, 36th Avenue S., and the at-grade CSX Railroad crossing. The proposed bridge typical section includes three 12-foot travel lanes and 10-foot paved inside and outside shoulders in each direction.

The project will implement frontage roads and ramps to facilitate east-west connectivity in areas of grade separation. The Preferred Alternative concept includes the following:

- 1) One-way (southbound/SB) frontage access along west side of US 41 between Causeway Boulevard and S. 30th Avenue
- 2) A two-lane northbound (NB)/SB frontage road from S. 30th Avenue to Hartford Street
- 3) Ramp access from NB US 41 at Trenton Street to 36th Avenue S.
- 4) Local property access driveways along the east side of US 41 north of 36th Avenue S. and north of St. Paul Street
- 5) 2-lane underpass roadways (under US 41) at 36th Avenue S. and St. Paul Street.

1.6 LIST OF TECHNICAL DOCUMENTS

In addition to this PER, the following technical documents are available in the project file.

Typical Section Package – July 2023
Project Traffic Analysis Report (PTAR) – November 2023
Project Traffic Analysis Report Supplement (PTAR Supplement) – November 2023
Bridge Hydraulics Report (BHR) – November 2023
Location Hydraulics Report (LHR) – November 2023
Pond Siting Report (PSR) – November 2023
Water Quality Impact Evaluation Report (WQIE) – November 2023
Utility Assessment Report (UAR) – November 2023
Design Change Re-evaluation – November 2023
Natural Resource Evaluation (NRE) – February 2023
Contamination Screening Evaluation Report – Mainline (Mainline CSER) – November 2023
Contamination Screening Evaluation Report – Ponds (Pond CSER) – November 2023
Cultural Resource Assessment Survey (CRAS) – January 2023
Cultural Resources Assessment Survey Addendum (Pond CRAS) – May 2023
Noise Study Report (NSR) – November 2023
Conceptual Stage Relocation Plan (CSRP) – February 2024
Public Involvement Plan (PIP) – dated October 2018
Public Hearing Transcript – July 2023
Comments and Coordination (C&C) Report – November 2023

2.0 EXISTING CONDITIONS

2.1 EXISTING ROADWAY CONDITIONS

2.1.1 Roadway Context Classification

This corridor experiences high pedestrian and vehicle traffic. There are commercial and residential areas north of Causeway Boulevard and there is bicycle and pedestrian use. The existing land use is a majority of industrial and commercial for areas south of Causeway Boulevard with pockets of residential areas. **Table 2-1** lists the context classification for both US 41 and Causeway Boulevard.

Table 2-1 Context Classification

Roadway	Classification
US 41	C3C
Causeway Boulevard	C3C

2.1.2 Functional and other Classifications

The functional classification for both US 41 and Causeway Boulevard is an Urban Principal Arterial -Other. Both facilities are on the State Highway System and only US 41 is on the National Highway System. A portion of the project limits is designated a Strategic Intermodal System (SIS) connector along US 41 from south of the project limits to Causeway Boulevard and along Causeway Boulevard from US 41 to west of the project limits.

2.1.3 Access Classification and Management Standards

Causeway Boulevard is designated as a Class 5 access classification and US 41 has an access classification of Class 7. **Table 2-2** provides spacing standards for each access class.

Table 2-2 Access Management Classification Spacing Standards

Access Class	Median Type	Connection Spacing (feet)	Median Opening Spacing (feet)		Signal Spacing (feet)
			Directional	Full	
2	Restrictive with Service Roads	1,320*/660**	1,320	2,640	2,640
3	Restrictive	660*/440**	1,320	2,640	2,640
4	Non-Restrictive	660*/440**			2,640
5	Restrictive	440*/245**	660	2,640*/1,320**	2,640*/1,320**
6	Non-Restrictive	440*/245**			1,320
7	Both Median Types	125	330	660	1,320

* For design speeds greater than 45 mph

** For design speeds less than or equal to 45 mph

Connections and median openings located within 1,320 feet of interchange ramps require the following spacing (measured from the ramp furthest from the interchange):

- 440 feet for design speeds less than or equal to 45 mph
- 660 feet for design speeds greater than 45 mph

2.1.4 Typical Sections

Along Causeway Boulevard, the existing typical section consists of an undivided 4-lane roadway with 12-foot outside travel lanes and 11-foot inside travel lanes with a 16-foot two-way left-turn lane in the middle, curb and gutter, 4-foot bicycle lanes, and 6-foot sidewalks. **Figure 2-1** shows the existing Causeway Boulevard typical section within the project limits.

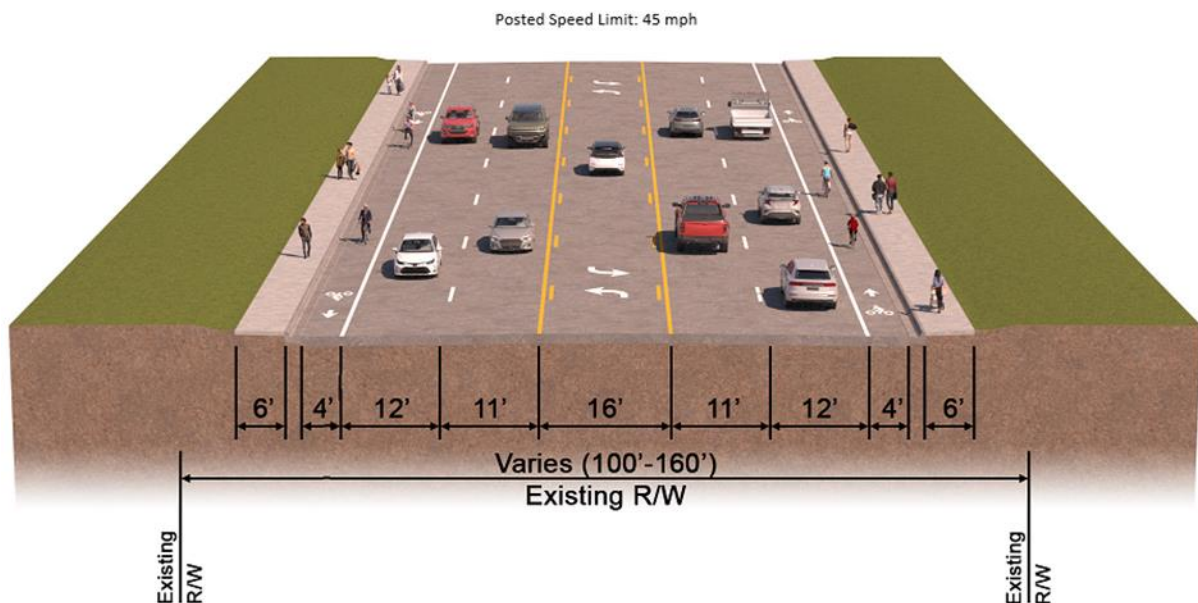


Figure 2-1 Causeway Boulevard Existing Typical Section

US 41 north of Causeway Boulevard is an undivided 6-lane curbed roadway with 11-foot travel lanes with a 10-foot two-way left-turn lane in the middle, curb and gutter, and a 3-foot grassy shoulder and 4-foot sidewalk on both sides. **Figure 2-2** shows the US 41 existing typical section in this area.

Posted Speed Limit: 50 mph

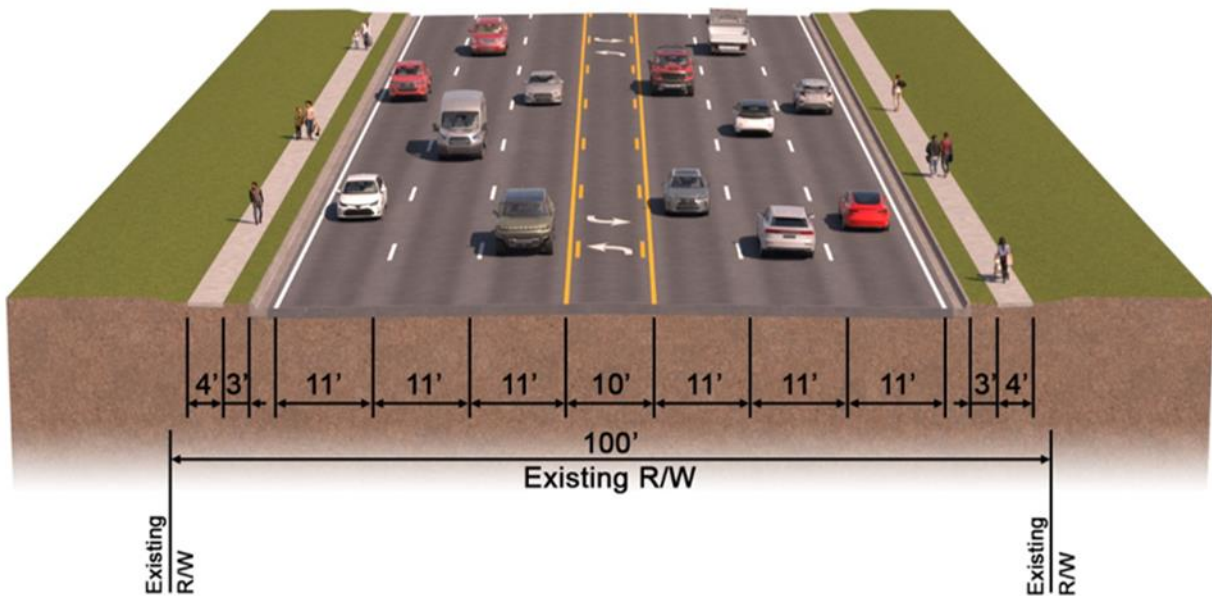


Figure 2-2 US 41 Existing Typical Section North of Causeway Boulevard

The existing US 41 south of Causeway Boulevard typical section consists of a divided 6-lane curbed roadway with a grassy median of variable width. The travel lanes consist of a 10-foot outside, and 11-foot middle and inside lanes and curb and gutter. The sidewalk on west side of the roadway varies between 5-foot to 6-foot wide and the sidewalk on the east side is 6-foot wide. **Figure 2-3** shows the US 41 existing typical section in this area.

Posted Speed Limit: 50-55 mph

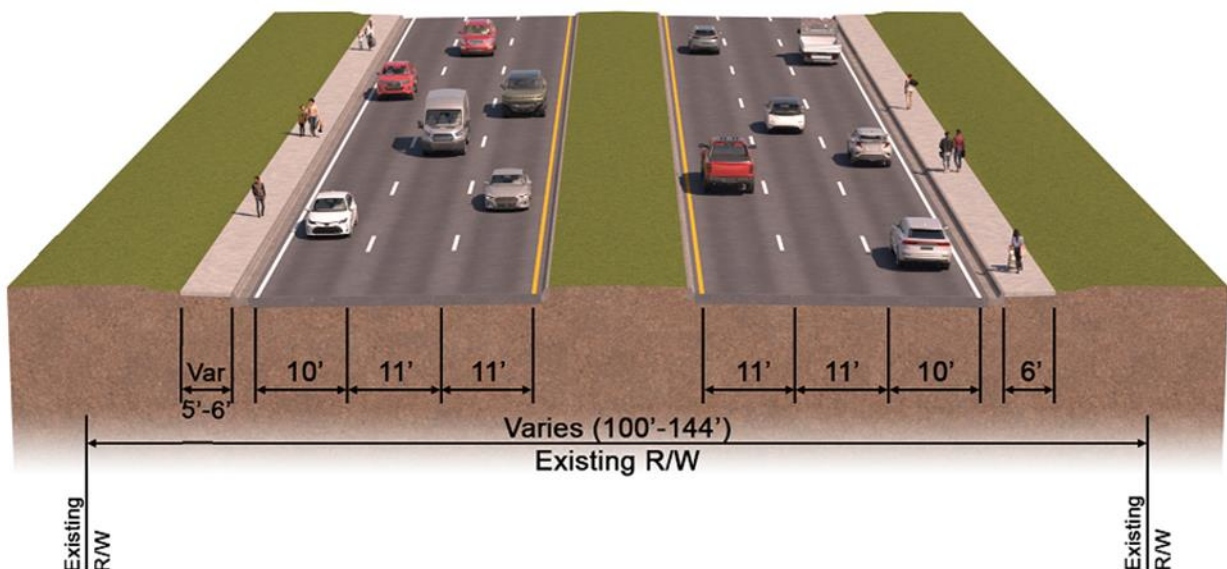


Figure 2-3 US 41 Existing Typical Section South of Causeway Boulevard

2.1.5 ROW

The ROW for Causeway Boulevard is 150 feet wide or greater west of S. 45th Street and reduces to 100 feet wide around S. 47th Street. The ROW increases around the US 41 intersection along Causeway Boulevard then reduces to 100 feet wide before the CSX Railroad. The majority of the existing ROW along US 41 is 100 feet wide. There are areas along US 41, south of Causeway Boulevard, where the ROW increases to one side by over 100 additional feet wide and two areas around the CSX Railroad where it increases on both sides. CSX Railroad crosses US 41 where the existing ROW width is 115 feet wide which is owned by FDOT. CSX Transportation owns existing ROW on both sides of US 41. The existing ROW information was obtained from the ROW Control Survey completed for this project. The existing ROW is illustrated on the preferred alternative plans provided in **Appendix A**.

2.1.6 Land Use

Plan Hillsborough's Planning Information Map Application (PIMA) existing land uses in the project vicinity are shown as: railroad ROW, public/quasi-public/institution (PI); public communications/utilities (PU); vacant (VAC); light industrial (LI); heavy industrial (HI); light commercial (LC); heavy commercial (HC); mobile home park (MHP); single family/mobile home (SF), and two-family/duplex residences (TF). **Figure 2-4** illustrates the existing land use.

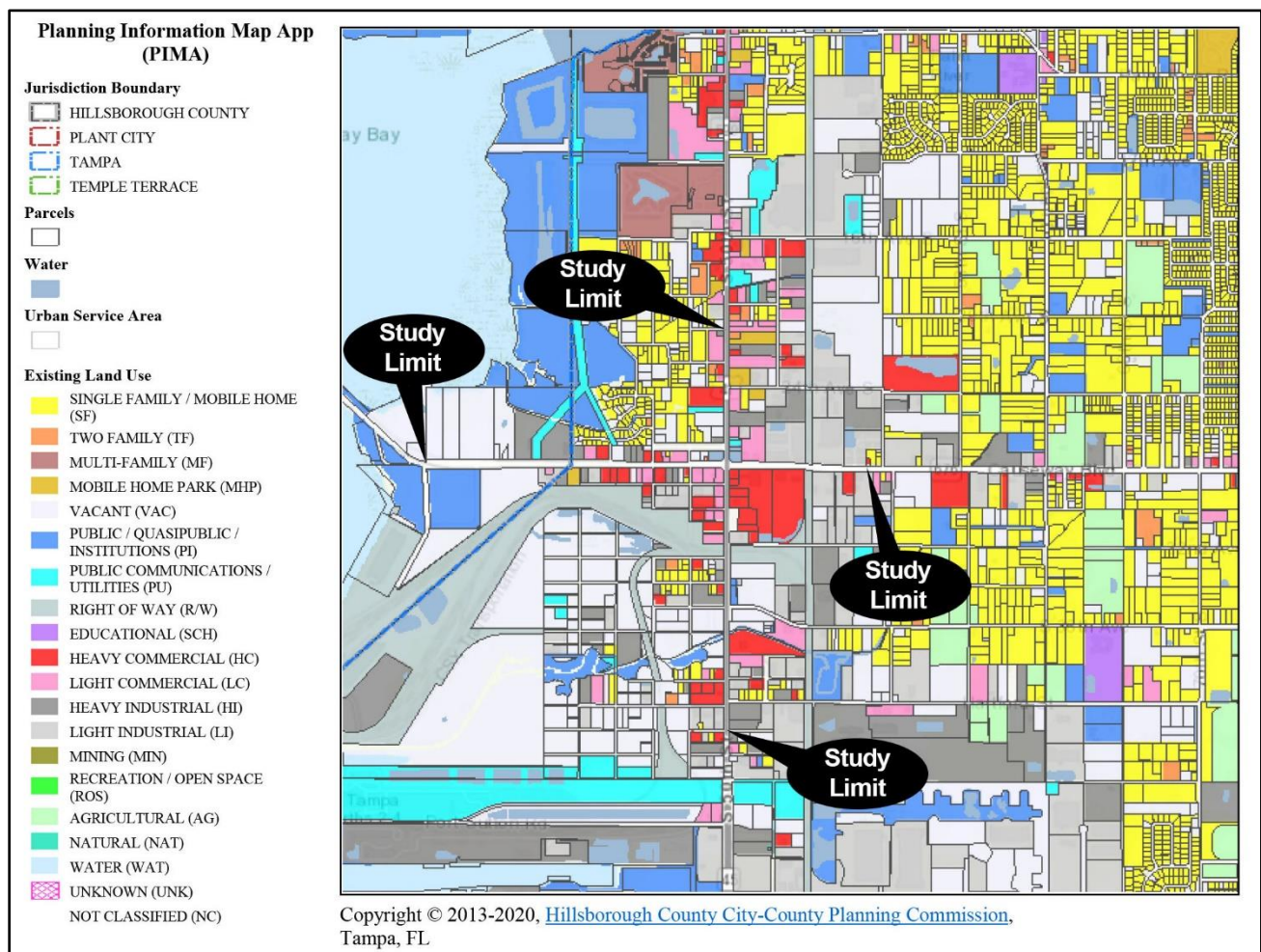


Figure 2-4 Existing Land Use Map

2.1.7 Posted Speed

The design speed limit for both US 41 and Causeway Boulevard is 45 miles per hour (mph). The posted speed limit on US 41 from south of the project limits to north of Raleigh Street is 55 mph and 50 mph from north of Raleigh Street to north of the project limits. The posted speed limit on Causeway Boulevard is 45 mph throughout the project limits.

2.1.8 Existing Drainage Conditions

The project study area is located in the Tampa Bay Watershed within the Coastal Hillsborough Bay Tributary Planning Unit. The project is split between WBID 1605D (Delaney Creek Tidal) and WBID 1615 (Drainage to McKay Bay). Both WBIDs are verified as impaired for Enterococci. WBID 1605D is also impaired for lead, copper, and iron. The project does not directly discharge to WBIDs 1584B (McKay Bay) and 1584C (East Bay). These WBIDS are directly connected to Tampa Bay which is designated as a Category 4b water body and does not meet water quality standard for nitrogen. Meetings were held with the Southwest Florida Water Management District (SWFWMD) and Florida Department of Environmental Protection (FDEP) to determine if net reduction of nitrogen would be required for the project. Based on the proposed discharge locations that are significantly upstream from the Bay and no direct discharges to WBIDs 1584B and 1584C, it was determined that the nutrient loading analysis would not be required for this project. The project does not discharge to an Outstanding Florida Water (OFW) and therefore additional 50% of treatment volume will not be required. Along US 41, the stormwater runoff is collected by curb and gutter and conveyed either to Delaney Creek or the Unnamed Creek located south and north of Causeway Boulevard respectively. Formal water quality is not currently provided along US 41. Causeway Boulevard from the begin project area to east of 47th Street sheet flows to the existing roadside ditches and outfalls directly to East Bay with no formal water quality treatment. Causeway Boulevard from east of 47th Street to the end of the project area is collected by curb and gutter and conveyed to existing FDOT stormwater management facilities (SMFs) is located at the northwest and northeast corners of US 41 and Causeway Blvd. intersection.

The project traverses two subwatersheds within the Delaney Creek Watershed. The northern portion of the project is within the Palm River Coastal subwatershed and the southern portion of the project is within the Delaney Creek subwatershed. The Palm River Coastal subwatershed begins north of the project limits and drains southwest to an existing channel south of 24th Avenue and outfalls at McKay Bay. The southern boundary of the subwatershed is Causeway Boulevard. The Delaney Creek Subwatershed begins at Causeway Boulevard and drains southwest to Delaney Creek and outfalls to East Bay. The southern boundary of the subwatershed is Santa Fe Road. Both subwatersheds ultimately outfall to Hillsborough Bay.

The Straight Line Diagram (SLD) for US 41 and Causeway Blvd., existing plans (FPID 439038-1-52-01), The Delaney /Archie Creek Watershed Masterplan, and field reconnaissance were used to identify existing cross drains within the corridor. Runoff crosses US 41 from the east to the west through two existing cross drains (CD-01 and CD-02) and from south to north along Causeway Blvd through one existing cross drain (CD-03). The existing cross drain locations are shown in **Table 2-3** . CD-02 was not identified in the SLD. It was within a section not inventoried due to ongoing construction. The locations of the existing cross drains are shown in the Existing Drainage Map in **Figure 2-5** .

Table 2-3 Existing Cross Drains

Cross Drain Number	Station	Existing Length (ft)	Size	Type	Road
CD-01	71+35	119'	(3) 11' X 8'	RCBC	US 41
CD-02	110+00	103'	(2) 42"	RCP	US 41
CD-03	304+00	151'	24"X 38"	RCP	Causeway Blvd

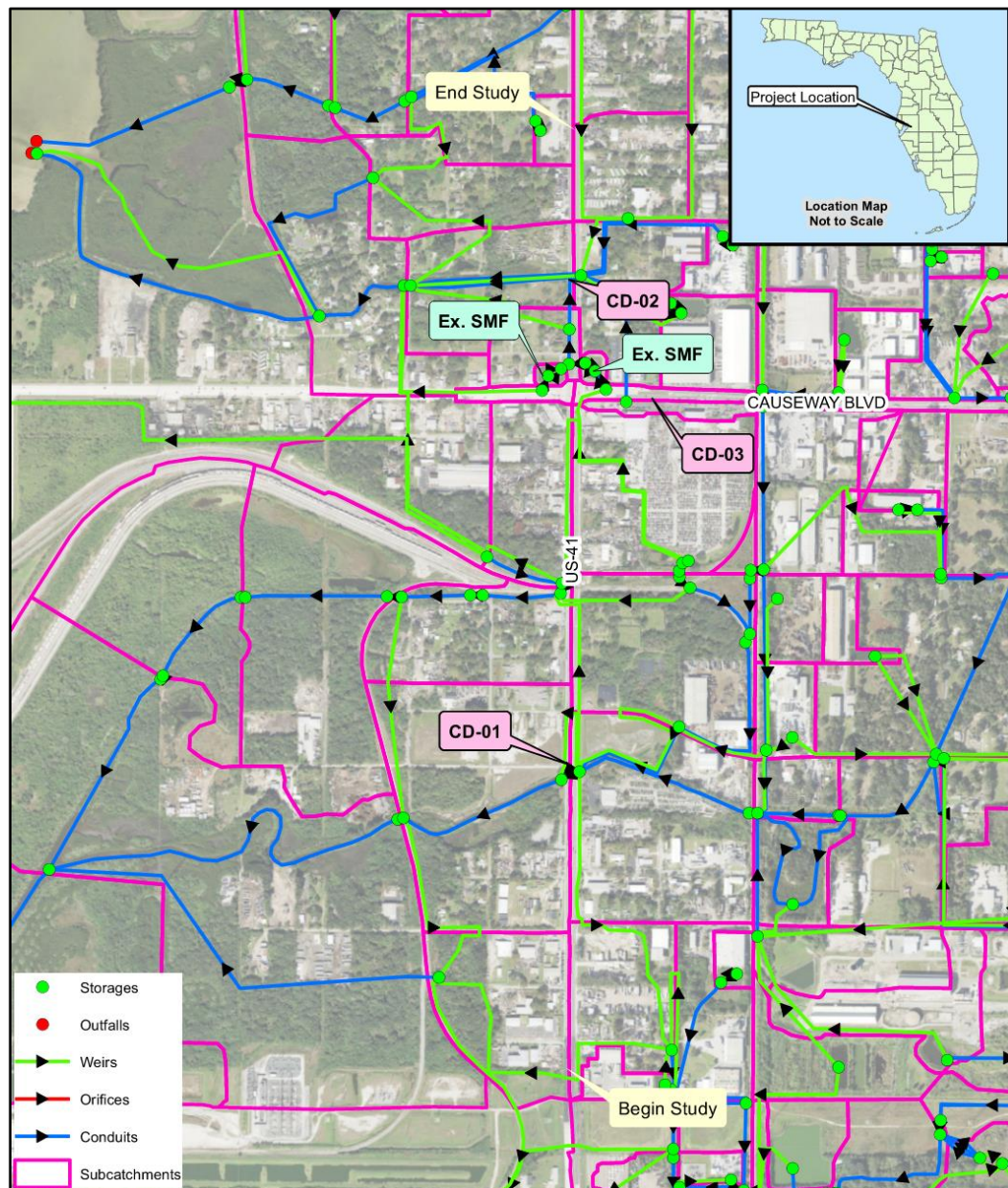


Figure 2-5 Existing Drainage Map

2.1.9 Pedestrian and Bicycle Facilities

There is an existing sidewalk that varies from 5-foot to 6-foot wide along both sides of US 41 south of Causeway Boulevard and an existing 4-foot sidewalk along both sides of US 41 north of the Causeway Boulevard through the northern limits of the project. There is an existing 5-foot sidewalk and a bicycle lane on the 5-foot paved shoulder on both sides of Causeway Boulevard from east of S. 45th Street. There is an existing 6-foot sidewalk and 4-foot bicycle lane on both sides of Causeway Boulevard to the east of the project limits.

2.1.10 Transit Facilities

A review of the Hillsborough Area Regional Transit (HART) system map shows no bus/mass transit routes currently serving either Causeway Boulevard or US 41 within the project limits. However, there are four existing bus pads along Causeway Boulevard on the far-side of the S. 45th Street and US 41 intersections. The last two locations at US 41 have benches adjacent to the bus pads.

2.1.11 Horizontal and Vertical Alignments

The horizontal alignment for this project is summarized in **Table 2-4** for US 41 and **Table 2-5** for Causeway Boulevard. The existing survey information for US 41 is from north of Denver Street to north of Bristol Bay Way and Causeway Boulevard from west of Rockport East Terminal Entrance to west of the CSX Railroad crossing. The existing baseline survey information was obtained from the survey performed for this project.

Table 2-4 US 41 Existing Horizontal Alignment

PI Station	Bearing	
	Back	Ahead
220+91.89 (BK) = 51+43.00 (AH)	N 0° 20' 43" E	N 0° 18' 24" E
100+00.00	N 0° 18' 24" E	N 0° 20' 00" E
110+39.87	N 0° 20' 00" E	N 0° 02' 00" W

Table 2-5 Causeway Boulevard Existing Horizontal Alignment

PI Station	Bearing	
	Back	Ahead
55+00.00 (West) = 254+99.52 (East)	N 89° 44' 50" W	S 89° 44' 50" E
100+98.08	S 89° 44' 50" E	S 89° 45' 54" E
311+83.19	S 89° 45' 54" E	-

The vertical alignment along US 41 varies between elevation 7.2 feet to 8.5 feet. US 41 just north of Denver Street is at elevation 7.4 feet, the intersection of Causeway Boulevard is at elevation 7.9 feet, and the CSX Railroad crossing is at elevation 8.3 feet. The Causeway Boulevard vertical alignment varies between elevation 5.2 to 9.4 feet. Causeway Boulevard has a low point elevation 5.2 feet west of S. 47th Street and rises up to elevation 7.9 feet at the US 41 intersection with the high point elevation 9.4 feet east of the intersection. The survey data for this project provided by FDOT and surveyed for this project uses the North American Datum of 1988 (NAVD88) for the vertical datum.

2.1.12 Crash Data and Safety Analysis

Crash records were collected from Signal Four Analytics to conduct the safety analysis. Crash data for the period of 1/1/2017 to 12/31/2021 was downloaded on 10/4/2022. The download date for Signal Four Analytics data is important to note as this site is continually updated and may contain unreported data that was not available or uploaded at the time the data was collected such that subsequent inquiries may vary slightly. The Signal Four Analytics database was used instead of the FDOT's Crash Analysis Reporting System (CARS) for the ability to gather more recent data and ability to geo-reference the data.

The data shows 412 crashes occurring within the study area during the 5-year period. The majority of crashes in the study area were rear ends (173), followed by sideswipe (79) and left turn (48) crashes. Pedestrians were involved in two crashes and bicycles in eight crashes. There were 1 fatal crash, 16 incapacitating injury crashes, 44 non-incapacitating injury crashes, 72 possible injury crashes, and 279 crashes with property damage only.

The data shows that 297 crashes occurred on US 41, 106 crashes occurred on Causeway Boulevard, and 50 crashes occurred within the intersection (i.e., past the stop bar prior to entering another leg) of US 41 and Causeway Boulevard. This gives an approximate crash frequency of 59 crashes per year along US 41, 21 per year along Causeway Boulevard, and 10 per year in the intersection. **Table 2-6** shows the US 41 and Causeway Boulevard segment crash summaries and the US 41 at Causeway Boulevard intersection crash summaries.

Most crashes in the study area occurred during daylight hours, peaking between 8:00 and 9:00 AM and between 3:00 and 6:00 PM. The one fatal crash occurred at night on US 41 south of Austin Street and involved a pedestrian. Of the ten total crashes involving pedestrians or bicycles, three occurred at night. Seven of the eight bicycle crashes resulted in injuries: two possible injuries, three non-incapacitating injuries, and two incapacitating injuries. One of the pedestrian collisions resulted in a fatality and one of them resulted in an incapacitating injury. The crash data indicated that the fatal collisions and the bicycle and pedestrian collisions were spread throughout the study area and not localized to a particular problem spot.

The crash rates for US 41 within the study limits are 4.7945 from Denver Street to Hartford Street, 4.2788 from Hartford Street to Causeway Boulevard, 0.7204 at the US 41 and Causeway Boulevard intersection and 3.5866 from Causeway Boulevard to 23rd Avenue. For US 41, the statewide crash rate for similar facilities is 4.4315, and for the US 41/Causeway Boulevard intersection it is 0.6676. Except for the portions from Hartford Street to Causeway Boulevard and from Causeway Boulevard to 23rd Avenue, the segment-specific crash rates are higher than the statewide average for similar facilities.

US 41		Total Crashes	Average/Year	% of Total
Crash Type	Angle	13	2.6	4%
	Animal	1	0.2	0%
	Bicycle	4	0.8	1%
	Left Turn	41	8.2	14%
	Off Road	9	1.8	3%
	Other	23	4.6	8%
	Pedestrian	1	0.2	0%
	Rear End	124	24.8	42%
	Right Turn	4	0.8	1%
	Rollover	1	0.2	0%
	Sideswipe	66	13.2	22%
	Unknown	10	2	3%
	<i>Total</i>	<i>297</i>	<i>59.4</i>	<i>100%</i>
Injury Severity	Fatal	1	0.2	0%
	Incapacitating	9	1.8	3%
	Non-Incapacitating	34	6.8	11%
	Possible Injury	48	9.6	16%
	Property Damage	205	41	69%
	<i>Total</i>	<i>297</i>	<i>59.4</i>	<i>100%</i>
Lighting Condition	Dawn	8	1.6	3%
	Daylight	238	47.6	80%
	Dusk	12	2.4	4%
	Dark - Lighted	28	5.6	9%
	Dark - Not Lighted	10	2	3%
	Dark - Unknown	1	0.2	0%
	<i>Total</i>	<i>297</i>	<i>59.4</i>	<i>100%</i>
Surface Condition	Dry	275	55	93%
	Wet	22	4.4	7%
	<i>Total</i>	<i>297</i>	<i>59.4</i>	<i>100%</i>

Table 2-6 US 41, Causeway Boulevard, and Intersection Crash Summaries

Causeway Boulevard		Total Crashes	Average/Year	% of Total
Crash Type	Angle	8	1.6	8%
	Bicycle	4	0.8	4%
	Left Turn	7	1.4	7%
	Off Road	7	1.4	7%
	Other	14	2.8	13%
	Rear End	47	9.4	44%
	Right Turn	2	0.4	2%
	Rollover	1	0.2	1%
	Sideswipe	11	2.2	10%
	Unknown	5	1	5%
	<i>Total</i>	<i>106</i>	<i>21.2</i>	<i>100%</i>
Injury Severity	Fatal	0	0	0%
	Incapacitating	6	1.2	6%
	Non-Incapacitating	9	1.8	8%
	Possible Injury	23	4.6	22%
	Property Damage	68	13.6	64%
	<i>Total</i>	<i>106</i>	<i>21.2</i>	<i>100%</i>
Lighting Condition	Dawn	5	1	5%
	Daylight	80	16	75%
	Dusk	5	1	5%
	Dark - Lighted	16	3.2	15%
	<i>Total</i>	<i>106</i>	<i>21.2</i>	<i>100%</i>
Surface Condition	Dry	99	19.8	93%
	Wet	7	1.4	7%
	<i>Total</i>	<i>106</i>	<i>21.2</i>	<i>100%</i>

Within Intersection of US 41 and Causeway Boulevard		Total Crashes	Average/Year	% of Total
Crash Type	Angle	4	0.8	8%
	Left Turn	6	1.2	12%
	Off Road	1	0.2	2%
	Other	2	0.4	4%
	Rear End	28	5.6	56%
	Right Turn	2	0.4	4%
	Sideswipe	5	1	10%
	Unknown	2	0.4	4%
	<i>Total</i>	<i>50</i>	<i>10</i>	<i>100%</i>
Injury Severity	Fatal	0	0	0%
	Incapacitating	3	0.6	6%
	Non-Incapacitating	9	1.8	18%
	Possible Injury	5	1	10%
	Property Damage	33	6.6	66%
	<i>Total</i>	<i>50</i>	<i>10</i>	<i>100%</i>
Lighting Condition	Dawn	2	0.4	4%
	Daylight	37	7.4	74%
	Dusk	2	0.4	4%
	Dark - Lighted	9	1.8	18%
	<i>Total</i>	<i>50</i>	<i>10</i>	<i>100%</i>
Surface Condition	Dry	45	9	90%
	Wet	5	1	10%
	<i>Total</i>	<i>50</i>	<i>10</i>	<i>100%</i>

A map of all crash locations is provided in **Figure 2-6**. **Figure 2-7** shows the locations of pedestrian, bicycle, and fatal crashes by crash type in the study area.

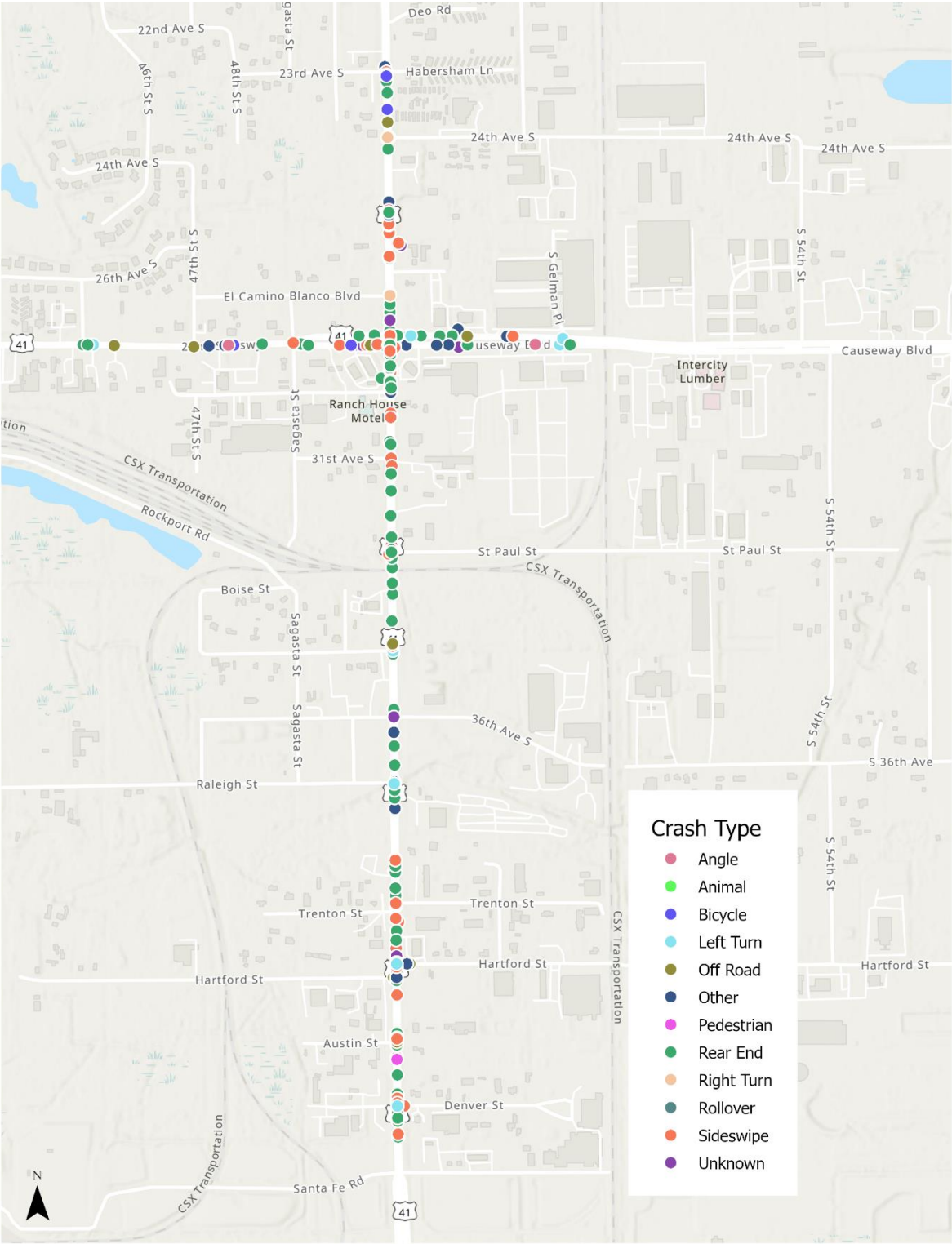


Figure 2-6 Crashes by Crash Type (2017-2021)

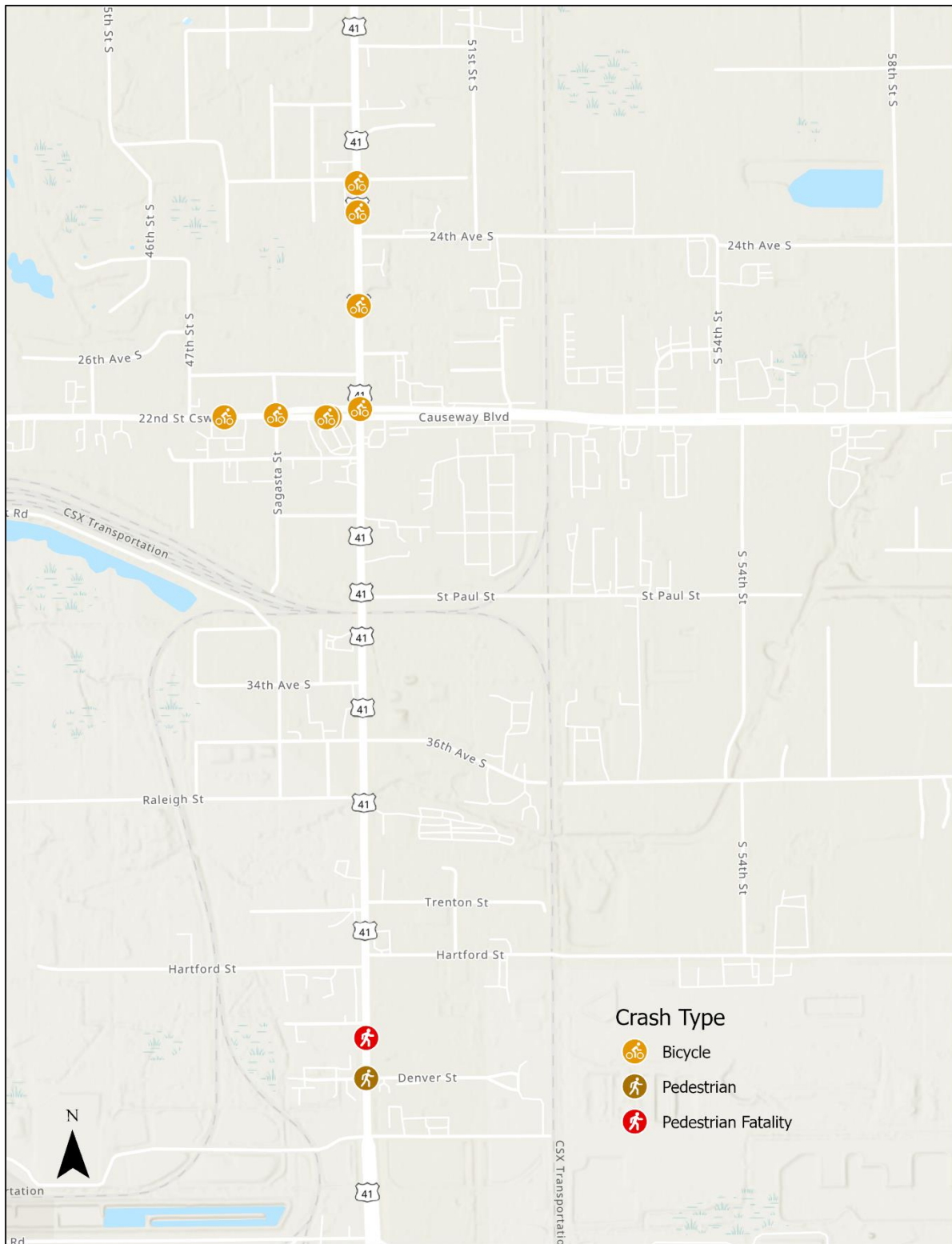


Figure 2-7 Bicycle, Pedestrian and Fatal Crashes

2.1.12.1 Train-Related Crashes

Railroad crash records were downloaded on 3/6/23 from the Federal Railroad Administration Office of Safety Analysis. Crash data was collected for the US 41 railroad crossing (crossing #624802A) south of the study intersection and the Causeway Boulevard railroad crossing (crossing #624815B) east of the study intersection. The data shows that between February 1976 and April 2000, 14 railroad crashes occurred with four injuries and no fatalities. **Table 2-7** lists the 10 railroad crashes on US 41 and four railroad crashes on Causeway Boulevard. No collisions involving trains have been identified after April 2000.

Table 2-7 Railroad Crashes

Date	Time	Roadway Vehicle	Roadway Vehicle Action	Circumstance	Injury	Lighting Condition
US 41 Railroad Crossing ID Number 624802A						
02/09/1976	10:00 AM	Truck	Did not stop	Vehicle struck Train	0	Day
08/11/1976	9:05 PM	Auto	Stopped and then proceeded	Vehicle struck Train	0	Dark
04/05/1978	6:30 PM	Auto	Stopped and then proceeded	Vehicle struck Train	0	Dusk
04/25/1980	2:25 PM	Truck-trailer	Stopped on Crossing	Train struck Vehicle	0	Day
12/04/1981	9:15 AM	Auto	Did not stop	Vehicle struck Train	0	Day
10/02/1988	6:34 AM	Auto	Drove around or thru gate	Vehicle struck Train	0	Dark
10/06/1988	10:45 AM	Truck-trailer	Drove around or thru gate	Vehicle struck Train	0	Day
09/06/1989	5:35 AM	Truck	Drove around or thru gate	Vehicle struck Train	0	Dark
11/27/1990	12:50 PM	Motorcycle	Drove around or thru gate	Train struck Vehicle	0	Day
04/13/2000	9:05 PM	Auto	Drove around or thru gate	Train struck Vehicle	2	Dark
Causeway Boulevard Railroad Crossing ID Number 624815B						
05/21/1975	2:12 PM	Truck-trailer	Did not stop	Train struck Vehicle	1	Day
08/22/1975	3:00 PM	Truck-trailer	Did not stop	Train struck Vehicle	0	Day
09/18/1977	12:05 AM	Truck-trailer	Did not stop	Vehicle struck Train	0	Dark
11/20/1985	3:20 AM	Truck	Drove around or thru gate	Train struck Vehicle	1	Dark

2.1.13 Intersections and Signalization

There are 25 intersections within the study corridor, one of which is signalized (US 41/Causeway Boulevard), as shown in **Table 2-8** and **Table 2-9**. At the US 41/Causeway Boulevard intersection, northbound US 41 consists of two left turn lanes, one through lane, and one through/right turn lane. Southbound US 41 consists of three through lanes and one left turn lane. Eastbound Causeway Boulevard at this intersection includes two dedicated left turn lanes, two through lanes, a bicycle keyhole, and two right turn lanes. Westbound Causeway Boulevard includes two left turn lanes, two through lanes, a bicycle keyhole, and one right turn lane.

Table 2-8 US 41 Existing Intersections

Intersecting Street	Milepost	Signalized
Denver Street	22.617	No
Austin Street	22.695	No
Hartford Street	22.775	No
Trenton Street	22.854	No
Raleigh Street	23.009	No
Towaway Avenue/36 th Avenue S.	23.095	No
S. 34 th Avenue	23.171	No
CSX Railroad	23.271	-
St. Paul Street	23.291	No

Intersecting Street	Milepost	Signalized
S. 31 st Avenue	23.406	No
S. 30 th Avenue	23.483	No
Causeway Boulevard	23.547	Yes
El Camino Blanco Boulevard	23.605	No
S. 27 th Avenue	23.632	No
S. 24 th Avenue	23.798	No
S. 23 rd Avenue/Habersham Lane	23.832	No
Deo Road	23.936	No
S. 21 st Avenue	23.982	No

Table 2-9 Causeway Boulevard Existing Intersections

Intersecting Street	Milepost	Signalized
S. 54 th Street	2.643	No
S. 54 th Street	2.674	No
Causeway Center Drive	2.766	No
CSX Railroad	2.917	-
Gelman Place	2.968	No
US 41	3.189	Yes
Sagasta Street	3.304	No
S. 47 th Street	3.422	No
S. 45 th Street	3.554	No

2.1.14 Lighting

There is existing lighting along Causeway Boulevard located on the south side of the roadway. There is lighting on US 41 that begins north of S. 31st Avenue and extends through the intersection at Causeway Boulevard. There is currently no lighting through the remainder of US 41 within the project limits. The need for lighting will be evaluated further during the project's Design phase.

2.1.15 Utilities

Utility identification was conducted with the use of as-built plans, field reconnaissance, comments from the utility agencies/owner, Sunshine 811, and Subsurface Utility Engineering (SUE) Quality Level 'B' data in some portions of the project limits. **Table 2-10** and **Table 2-11** summarize the facilities of the twelve (12) identified utility owners within the project limits. Utility owners that have not responded are noted below. Additional details regarding utility owners and their facilities are provided in the *Utility Assessment Report* (April 2023) in the project file.

Table 2-10 US 41 Existing Utilities

Utility Agency/Owner	Facility Type	Limits
Bright House Networks	Cable TV	1-Overhead TV crossing at Denver Street (South Side); 1-Buried TV – Denver Street to Trenton Street (West Side); 1-Overhead TV – Trenton Street to S. 21st Ave. (West Side); 1-Overhead TV crossing at Austin Street (North Side); 1-Overhead TV crossing Hartford Street from SW quadrant to northside of Hartford Street; 1-Buried TV crossing at Hartford Street east leg (North Side); 1-Overhead TV crossing at 36 th Ave. S. (South Side); 1-Overhead TV along S. 34 th Ave. (North Side); 1-Overhead TV along S. 31 st Ave. (North Side); 1-Overhead TV along S. 30 th Ave. (North Side); 1-Overhead TV crossing at Raleigh Street (West Side); 2-Buried 2" HDPE TV (370') at Raleigh Street (West Side crosses over to East Side); 1-Buried 2" HDPE TV (151') at S. 30 th Ave.
Century Link	Fiber	12-1/5" HDPE Conduit runs along the eastern US 41 ROW throughout the project extent
City of Tampa - Sewer	Wastewater	8" HDPE FM crossing at the CSX RR (North Side); 10" PVC FM crossing at Causeway Boulevard located in the west bound middle lane.
City of Tampa - Transportation	Traffic Signal Infrastructure	No Response.
City of Tampa - Water	Water	24" CIP – Denver Street to 30 th Ave. S. (West Side in southbound outside lane) and 30 th Ave. S. to S. 21 st Ave. (within the median); 8" DIP crossing at Denver Street (North Side); 6" DIP crossing at Austin Street (North Side); 2" CAS – 210' south of Hartford Street to Hartford Street (West Side); 6" DIP at Hartford Street (west leg) connection to 2" CIP and 24" Steel; 8" CAS's at Hartford Street (east leg) on the north and south sides of Hartford Street; 2" CAS at Trenton Street (west leg) on North Side; 6" DIP at Trenton Street (east leg) on the North Side; 6" CAS – Hartford Street to just south of Delaney Creek (East Side) where it then crosses and connects to the 24" Steel on the west side of US 41; 6" DIP – Delaney Creek to 36 th Ave. S. (East Side); 6" CAS crossing at 36 th Ave. S. (North Side); 6" CAS – 36 th Ave. S. to S. 34 th Ave. (East Side); 2" HDPE – CSX RR to 200' north of St. Paul Street (West Side); 8" DIP crossing at St. Paul Street (South Side); 6" DIP – CSX RR to St. Paul Street (East Side); 6" DIP at S. 31 st Ave. (North Side); 6" CAS – 31 st Ave. to S. 30 th Ave. (East Side); 8" DIP crossing at Causeway Boulevard (South Side).
Frontier Communications	Cable/Fiber/Phone	1-Overhead Telephone crossing Denver Street (South Side); 1-Buried Telephone in NE quadrant of Denver Street; 1- Buried Telephone – Denver Street to Hartford Street (East Side); 2- Buried Telephones – Hartford Street to St. Paul Street (East Side); 1- Buried Telephone – St. Paul Street to S. 31 st Ave. (East Side); 1- Overhead Telephone – St. Paul Street to 340' south of Causeway Boulevard (East Side); 1- Buried Telephone – 340' south of Causeway Boulevard to Causeway Boulevard (East Side); 1-Buried Fiber Optic – Denver Street to S. 31 st Ave. (East Side); 1-Buried Telephone – Austin Street to Hartford Street (West Side); 1-Buried Telephone crossing at 160' north of Austin Street; 1- Buried Telephone in SE quadrant of Trenton Street; 1-Overhead Telephone crossing at Raleigh Street; 1-Overhead Telephone crossing at 36 th Ave. S.; 1-Overhead Telephone crossing at 180' north of St. Paul Street; 1- Buried Fiber Optic crossing at S. 31 st Ave. (South Side); 1-Buried Telephone crossing at S. 31 st Ave. (South Side); 1-Buried Telephone crossing at Causeway Boulevard (South Side).
Hillsborough Co. Traffic	FOC Street Lights/Signals	No Response.
Level 3 Communications	Fiber Optic	1-Buried Fiber Optic – Denver Street to S. 21st Ave. (East Side).

Utility Agency/Owner	Facility Type	Limits
Tampa Bay Pipeline Corporation	Ammonia Pipeline	6" Steel crossing at St. Paul Street (North Side)
Tampa Electric Company	Electric	7.6 kV Overhead at Austin Street (North Side); 13.2 kV Overhead – Denver Street to S. 21st Ave. (West Side); 13.3 kV Overhead crossing diagonally across Hartford Street (west leg); 7.6 kV Overhead along north side of Trenton Street (west leg); 13.2 kV Overhead crossing at Trenton Street; 13.2 kV Overhead along south side of Raleigh Street; 13.3 kV Buried along south side of Raleigh Street; 13.2 kV Overhead crossing at 36 th Ave. S. (South Side); 13.2 kV Overhead crossing at S. 34 th Ave. (North Side); 240 V Overhead crossing at S. 34 th Ave. (North Side); 13.2 kV Overhead 90' south of CSX RR (West Side); 240 V Overhead crossing 180' north of St. Paul Street (East Side); 7.6 kV Overhead at S. 31 st Ave. (North Side); 13.2 kV Overhead in NW quadrant of S. 31 st Ave.; 240 V Overhead at S. 31 st Ave. (North Side); 120/240 V Overhead crossing 205' north of S. 31 st Ave.; 13.3 kV Overhead along S. 30 th Ave. (North Side); 120/240 V Overhead in NW quadrant of S. 30 th Ave.
Tampa Port Authority	Fiber/Phone/ Water/Sewer/ Electric	No Response.
TECO Fiber	Fiber	7.6 kV Overhead crossing 110' south of Raleigh Street
TECO Peoples Gas - Tampa	Gas	6" Steel – Denver Street to Hartford Street (East Side); 4" Steel crossing at Trenton Street; 4" Steel – Trenton Street to 36 th Ave. S. (West Side); 2" Steel crossing at Causeway Boulevard (South Side).

Table 2-11 Causeway Boulevard Existing Utilities

Utility Agency/Owner	Facility Type	Limits
Bright House Networks	Cable TV	1-Buried TV crossing at S. 45 th Street (West Side); 1-Overhead TV – S. 45 th Street to 430' west of S. 45 th Street (North Side); 1-Overhead TV crossing 460' west of S. 45 th Street (North Side); 1-Buried 1.5" HDPE TV (496') at S. 45 th Street
City of Tampa - Sewer	Wastewater	8' PVC FM – Sagasta Street to Causeway Center Dr. (North Side); 4" PVC FM crossing at Sagasta Street; 4" PVC FM crossing 200' west of US 41.
City of Tampa - Transportation	Traffic Signal Infrastructure	No Response.
City of Tampa - Water	Water	8" Enam CJ – Causeway Crescent Dr. to 300' west of Sagasta Street (South Side); 8" DIP – 300' west of Sagasta Street to Sagasta Street (South Side); 12" DIP – Sagasta Street to Causeway Center Dr. (South Side); 6" DIP crossing 800' west of S. 45 th Street; 8" DIP crossing 300' west of US 41.
Frontier Communications	Cable/Fiber/Phone	400 PR Buried Telephone – Causeway Crescent Dr. to 1,780' east of CSX terminal entrance (South Side); 600 PR Buried Telephone – 1,780' east of CSX terminal entrance to Sagasta Street (South Side); Buried Fiber Optic Cable (BFOC) Telephone 24 – Causeway Crescent Dr. to S. 47 th Street (South Side); BFOC Telephone 24 crossing at S. 47 th Street; BFOC Telephone 24 – S. 47 th Street to Causeway Center Dr. (North Side); BFOC Telephone 24 – 660' west of S. 45 th Street to 720' west (North Side); 100 PR Buried Telephone at CSX Terminal Entrance (South Side); 2-Way Buried Telephone – Causeway Crescent Dr. to 220' west of S. 45 th Street (North Side).
Hillsborough Co. Traffic	FOC Street Lights/Signals	2" PVC Conduit – Causeway Crescent Dr. to Causeway Center Dr. (South Side); 2" PVC Conduit – Causeway Crescent Dr. to 660' east of S. 45 th Street (North Side); 2" PVC Conduit – crossing 380' east of S. 45 th Street; 2" PVC Conduit – crossing 200' east of S. 47 th Street; 2" PVC Conduit – crossing 120' west of US 41.
Level 3 Communications	Fiber Optic	No Response.
Tampa Bay Pipeline Corporation	Ammonia Pipeline	6" Wrapped Steel – Causeway Crescent Dr. to Sagasta Street (South Side).
Tampa Electric Company	Distribution - Electric	13 kV Overhead – Causeway Crescent Dr. to Causeway Center Dr. (North Side); 13 kV Overhead crossing 260' east of the CSX Terminal Entrance; 7.6 kV Overhead crossing 670' west of the S. 45 th Street; 13 kV Overhead crossing 260' west of S. 45 th Street; 13 kV Overhead crossing at S. 45 th Street; 13 kV Overhead crossing 240' east of S. 45 th Street; 13 kV Overhead crossing 172' west of S. 47 th Street; 69 kV Overhead crossing at Sagasta Street; 13 kV Overhead crossing 100' west of US 41.
Tampa Electric Company	Transmission - Electric	138 kV Overhead – Causeway Crescent Dr. to TECO easement crossing 1,140' east of the CSX Terminal Entrance (South Side); 138 kV Overhead – Causeway Crescent Dr. to TECO easement crossing 1,140' east of the CSX Terminal Entrance (North Side); 230 kV Overhead crossing 100' east of S. 45 th Street; 69 kV Overhead crossing 100' east of S. 45 th Street; 230 kV Overhead – 100' east of S. 45 th Street to Sagasta Street (North Side).
TECO Peoples Gas - Tampa	Gas	2" Steel – 1,400' west of S. 45 th Street to Causeway Center Dr. (South Side).

2.1.16 Railroads

CSX Railroad crosses at two locations within the project area. It crosses US 41 approximately 1,500 feet south of Causeway Boulevard (#624802A) and crosses Causeway Boulevard approximately 1,400 feet east of US 41 (#624815B). **Table 2-12** includes railroad inventory data collected from the Federal Railroad Administration Office of Safety Analysis. Both railroad crossing locations consist of a single track, but the US 41 crossing has a switch on both sides to access additional tracks. The first switches are approximately 35 feet west and 410 feet east of the existing US 41 ROW. The switch on the east side of US 41 opens to two tracks allowing a northern and southern turn to the main north/south track. The first switch on the west side is the entry to the yard which has over 20 tracks within the yard for operations.

Table 2-12 Railroad Crossing Inventory

US DOT Crossing Inventory			US 41	Causeway Boulevard
Railroad Location and Classification	Roadway Milepost		23.271	2.917
	Railroad Line Segment		904660	904650
	Railroad Crossing ID Number		624802A	624815B
	Railroad Milepost		AZA 882.00	AZA 881.86
	Number of Tracks		1	1
	Type of Tracks		Yard	Main
	Type of Train		Freight	Freight
Railroad Information	Year of Count Data		2019	2017
	Maximum Timetable Speed (mph)		10	40
	Total Day Thru Trains		0	4
	Total Night Thru Trains		0	4
	Total Switching Trains		2	9
Railroad Warning Devices	Pavement Markings	Stop Lines	Yes	Yes
		Xing Symbols	Yes	Yes
		Dynamic Envelop	No	No
	Type of Train Activated Warning Devices	Gates	Roadway	4
			Pedestrian	0
		Bells	2	2
		Total Count of Flashing Light Pairs	13	8

Rail crossing data for the CSX railroad crossing south of the US 41/Causeway Boulevard intersection is shown in **Table 2-13**. The FDOT's rail crossing data includes number of trains, average time the gate is down, and delay clear up times after the railroad crossing gate closure. During the AM peak period there is a significant queue clear time (43.9 minutes) for the NB approach after a train passes through the crossing. **Table 2-13** summarizes the railroad crossing data collected.

Table 2-13 US 41 Railroad Crossing Data

Time of Day	Average Number of Times Gate Closes	Average Queue Clear Time	
		NB Approach (min)	SB Approach (min)
Daily	28	-	-
AM Peak	4	43.9	0.8
PM Peak	1	2.2	0.6

Between February 1976 and April 2000, there were 10 vehicle-train accidents at the US 41 southern crossing (#624802A), resulting in 2 additional injuries. No crashes with trains have been reported at this crossing since 2000. Based on FDOT's Operation STRIDE (Statewide Traffic and Railroad Initiative Using Dynamic Envelopes) rail safety measure, the dynamic envelopes were added to both railroad crossings under contract WPI Seg. No.: 407027-1, which began in late 2020.

2.1.17 Pavement Conditions

According to Pavement Condition Report, the US 41 pavement has cracking values ranging from 7.0 to 10.0 and ride values ranging from 7.5 to 7.7. Causeway Boulevard has cracking values ranging from 9.3 to 10.0 and ride values ranging from 7.0 to 8.0. Ride values less than or equal to 6.4 are considered to be deficient therefore, there are no existing pavement deficiencies within the project limits. The Asphalt Pavement Cores taken on October 10, 2019 identified cracks in the shoulder along Causeway Boulevard with some patches. The evaluation identified alligator cracking and small gouges along US 41.

2.1.18 Soils and Geotechnical

The United States Department of Agriculture (USDA) Soil Survey indicates that the subsurface conditions within the project limits primarily consist of sands to silty sands (A-3/A-2-4) with occasional intervals of clayey sands (A-2-6) at depths of 1.5 to 2 feet. Organic soils (A-8) are not reported. If shallow plastic and organic soils are encountered during the Design phase, these soils will be addressed in accordance with FDOT Standard Plans Index requirements.

The pre-development seasonal high groundwater table (SHGWT) levels within the project limits are reported to be within 1½ foot of the natural ground surface. Roadway base clearance to SHGWT will need to be analyzed further during the Design phase. Drainage design will need to incorporate the high groundwater conditions. **Figure 2-8** represents the USDA Map and highlights areas with SGWT levels and clayey sands reported to be within 1½ feet of the natural ground surface.

Based on the anticipated subsurface soil conditions and distances to nearby structures, foundation alternatives for the proposed bridge structure(s) include drilled shafts and driven piling utilizing preforming, if required. Design considerations will need to address vibration impacts on adjacent structures associated with driven piles. Due to the relatively close proximity of the Bay area waters to the project site, the site proposed for the bridge over the CSX railroad will be considered extremely aggressive.

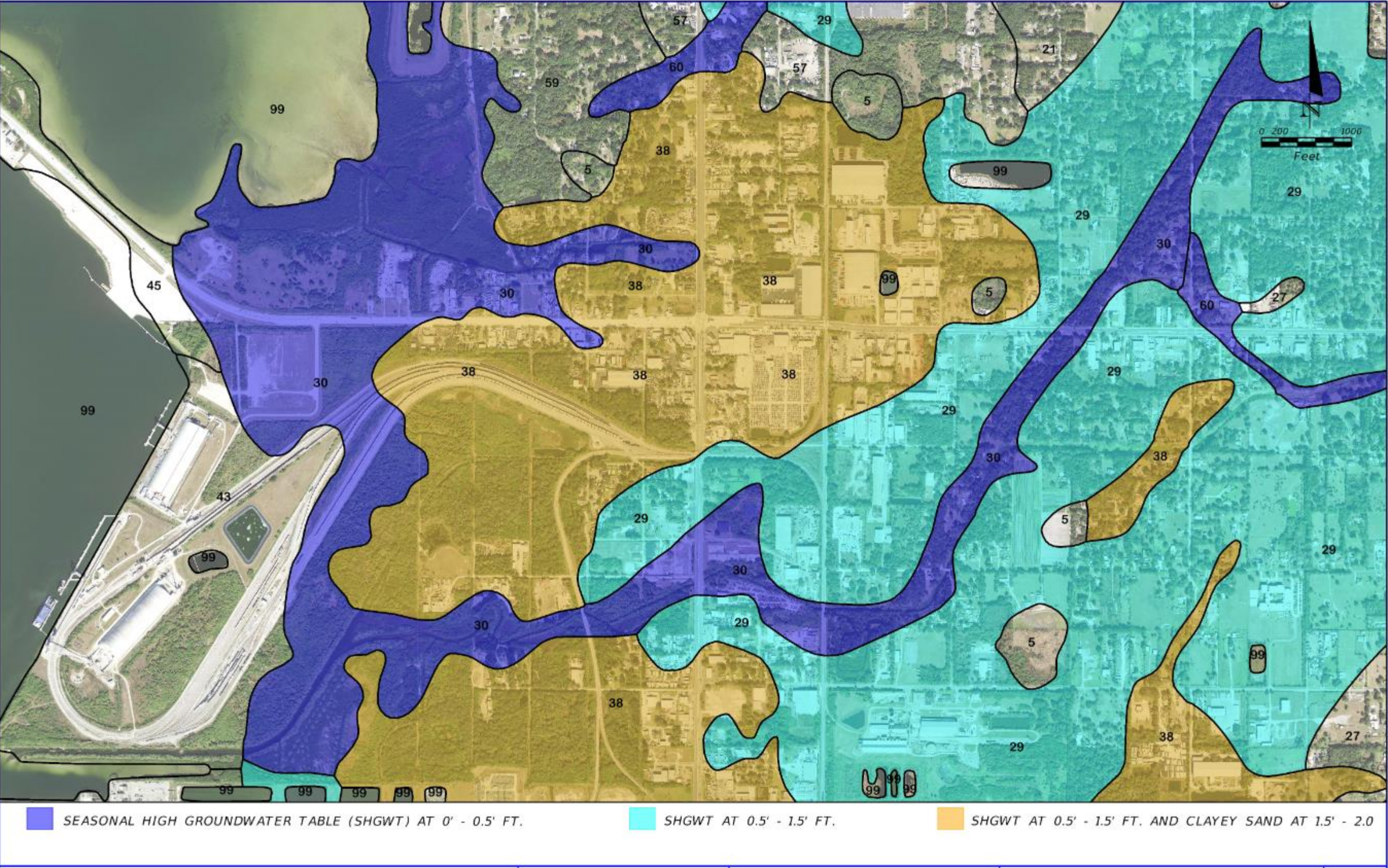


Figure 2-8 USDA Soil Survey Map

2.2 EXISTING STRUCTURES

There is one existing bridge within the study limits. US 41 currently traverses over Delaney Creek utilizing an existing reinforced concrete culvert (Bridge No. 100048). This bridge structure was built in 1959 and consists of three 11-foot-wide x 8-foot-high cells for an approximate bridge width of 38 feet. This bridge culvert has a length of approximately 120 feet, and it is located along Delaney Creek oriented at a skew angle of 22 degrees with respect to US 41. **Table 2-14** identifies the existing structure information.

Table 2-14 Existing Structure

Bridge No.	Facility Crossed	Structure Type	Year Built	Year Reconstructed	NBI Rating	Age as of 2020 (Years)
100048	Delaney Creek	Bridge Culvert	1959	N/A	-	61

2.2.1 Existing Typical Section

This bridge culvert carries the existing US 41 mainline traffic which consists of three SB lanes, one left turn lane, and three NB lanes. An existing 6-foot sidewalk on both sides of US 41 and standard guardrail is utilized as barriers on top of the existing bridge concrete culvert.

2.2.2 Existing Condition

According to the latest bridge inspection report, this structure has a sufficiency rating of 69.2 and a health index 35.16. The culvert exhibits some cracks and spalls and requires repair. Based on the latest load rating, dated 05/20/1992, the bridge does not require posting. The channel presents accumulation of debris and some minor erosion but are otherwise intact and in need of only minor repairs. **Table 2-15** summarizes the existing bridge culvert ratings.

Table 2-15 Existing Structure Rating

Bridge No. 100048	
Date Constructed	1959
Channel (0-9)	7
Culvert (0-9)	5
Performance Rating	Fair
Sufficiency Rating (0-100)	69.2
Health Index (0-100)	35.16

2.3 EXISTING TRAFFIC VOLUMES AND TRAFFIC CHARACTERISTICS

This section provides a summary of the existing traffic conditions within the study area and a more thorough discussion can be found in the *Project Traffic Analysis Report* that has been prepared for the proposed project.

Traffic counts were collected during August 21-23 and August 28-30, 2018 to account for schools being in session, and the end of the summer tourist season. The counts consisted of one 4-hour turning movement count (TMC) (taking place from 7:00 to 9:00 AM and 4:00 to 6:00 PM), two 72-hour bi-directional volume counts, and two 72-hour vehicle classification counts. The 2018 AADT volumes were calculated using the seasonal and axle adjustment factors from the FDOT's 2017 Florida Traffic Online (FTO) database category 1000 for Hillsborough County. For the period collected, the seasonal correction factor varied from 1.02 to 1.05 with application being identified for the week collected, and the axle adjustment factor for the corridor ranged between 0.96 and 0.93. The 2017 factors from the FTO database were applied to the 2018 volumes to render a comparable 2018 existing traffic AADT. An overview of the counts collected, the collection date, the seasonal correction factor, seasonal adjustment, and calculated AADT is presented in **Table 2-16**. AM and PM peak periods were determined by analyzing the 15-minute hourly totals of the turning movement counts obtained by traffic counts. Directionality was determined by examining the hourly movement of traffic through the intersections. The highest volumes of traffic travel north on US 41 and west on Causeway Boulevard in the AM. These directions reverse in the evening. The peak times were determined to be 7:30-8:30 AM and 4:45-5:45 PM.

Table 2-16 Existing Year 2018 Traffic Volumes

Roadway / Segment	Collection Date	ADT	Seasonal Factor ¹	Axle Factor ¹	AADT
US 41					
North of Causeway Boulevard	8/28/2018	26,146	1.05	0.96	26,000
South of Causeway Boulevard	8/28/2018	40,083	1.05	0.93	39,000
Causeway Boulevard²					
East of US 41	8/21/2018	18,586	1.02	1.00	19,000
West of US 41	8/21/2018	27,046	1.02	1.00	28,000

Notes:

1. Most Recent Seasonal and Axle Adjustment factors were obtained from FDOT 2017 Florida Traffic Online website
2. Vehicle classification counts were collected on Causeway Boulevard and thus no Axle CF

Recommended design hour traffic factors for the US 41 at CSX Grade Separation study include a standard K-Factor of 9.0% per the 2014 Project Traffic Forecasting Handbook along US 41 and all side streets. The daily truck percentage (T24) along the study corridor is 13.0% with a recommended design hour truck factor of 7.0%. **Table 2-17** lists the recommended K and D-Factors and daily truck percentages used for the development of the existing and future traffic volumes.

Table 2-17 Recommended Design Traffic Characteristics

Roadway / Segment	K-Factor	D-Factor	T-Factor	DHT	PHF
US 41 & Causeway Boulevard	9.0%	-	13.0%	7.0%	0.95
US 41, North of Causeway Boulevard and Causeway Boulevard, East of US 41	-	61.1%	-	-	-
US 41, South of Causeway Boulevard and Causeway Boulevard, West of US 41	-	72.4%	-	-	-

The AADT and directional design hour volumes (DDHV) were compared to FDOT's 2012 Generalized Service Volume Tables (Generalized Tables) for Urbanized Areas Table 1 and Table 7, respectively and the results are shown in **Table 2-18**. Under the existing conditions, each of the study segments operates at LOS C based on AADT. Based on peak hour directional volumes, the segments operate at LOS C. The FDOT's LOS target policy states the automobile mode LOS targets for the State Highway System during peak travel hours are "D" in urbanized areas. Westbound Causeway Boulevard west of US 41 operates at LOS F, which does not meet the LOS target policy.

Intersection capacity analyses were conducted utilizing the HCM 6th Edition methodologies incorporated within Synchro software to assess the existing LOS at the intersection in the study area using the existing design hour turning movement volumes (DHTMV), shown in **Figure 2-9**, and existing geometry. **Table 2-19** shows the results of the existing intersection analysis. The study intersection was found to operate at LOS F and LOS E during AM and PM peak hour conditions, respectively, neither of which meet the FDOT's LOS target policy (LOS D) for urban facilities.

Table 2-18 Existing Year (2018) Segment Analysis Results

Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					DDHV	LOS	DDHV	LOS
US 41								
Southbound, North of Causeway Boulevard	6	50	26,000	C	909	C	1,430	C
Northbound, North of Causeway Boulevard	6	50	26,000	C	1,360	C	713	C
Southbound, South of Causeway Boulevard	6	50	39,000	C	1,043	C	2,358	C
Northbound, South of Causeway Boulevard	6	50	39,000	C	2,540	C	968	C
Causeway Boulevard								
Eastbound, West of US 41	4	45	28,000	C	696	C	1,824	C
Westbound, West of US 41	4	45	28,000	C	2,226	F	800	C
Eastbound, East of US 41	4	45	19,000	C	561	C	1,016	C
Westbound, East of US 41	4	45	19,000	C	1,045	C	665	C

Table 2-19 Existing Year (2018) intersection Delay, LOS, and v/c

Intersection	Movement/ Approach	AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Boulevard	EBL	122.8	F	0.64	85.5	F	0.49
	EBT	60.1	E	0.34	65.0	E	0.84
	EBR	12.4	B	0.21	124.2	F	1.15
	<i>EB Approach</i>	<i>40.2</i>	<i>D</i>	<i>0.26</i>	<i>102.2</i>	<i>F</i>	<i>0.99</i>
	WBL	121.6	F	0.66	88.8	F	0.67
	WBT	85.4	F	0.91	49.4	D	0.47
	WBR	65.3	E	0.48	29.9	C	0.32
	<i>WB Approach</i>	<i>83.9</i>	<i>F</i>	<i>0.77</i>	<i>48.9</i>	<i>D</i>	<i>0.43</i>
	NBL	97.2	F	1.05	76.1	E	0.84
	NBT	69.1	E	0.88	43.3	D	0.52
	NBR	68.9	E	0.88	43.4	D	0.53
	<i>NB Approach</i>	<i>84.1</i>	<i>F</i>	<i>0.96</i>	<i>56.7</i>	<i>E</i>	<i>0.62</i>
	SBL	207.7	F	1.17	96.9	F	0.93
	SBT	263.7	F	1.35	43.0	D	0.67
	SBR	284.2	F	1.37	45.4	D	0.67
	<i>SB Approach</i>	<i>256.3</i>	<i>F</i>	<i>1.31</i>	<i>53.7</i>	<i>D</i>	<i>0.70</i>
	Overall	108.3	F	0.71	71.7	E	0.70

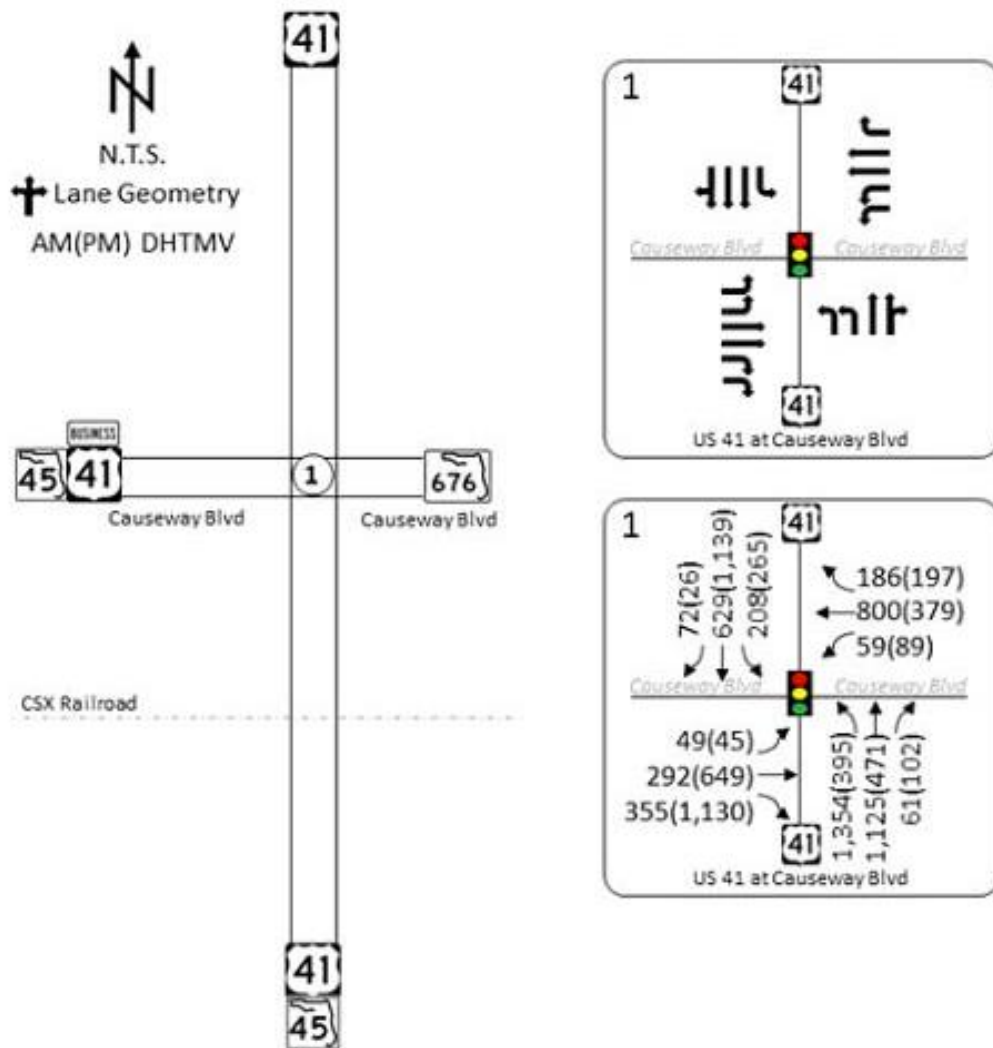


Figure 2-9 Existing Lane Configurations and DHTMV

3.0 FUTURE CONDITIONS

3.1 LAND USE

Review of the Plan Hillsborough's PIMA, future land uses in the project vicinity are now shown as: heavy industrial (HI); light industrial (LI); community mixed use (CMU-35); office commercial (OC-20), residential-9 (R9); residential-6 and suburban mixed use (SMU-6). Environmentally sensitive/natural areas are shown adjacent to the east side of McKay Bay (north of Causeway Boulevard) and Hillsborough County's Delaney Creek restoration project (5208 Hartford Street), neither of which will be impacted by the proposed improvements. **Figure 3-1** illustrates the future land use.

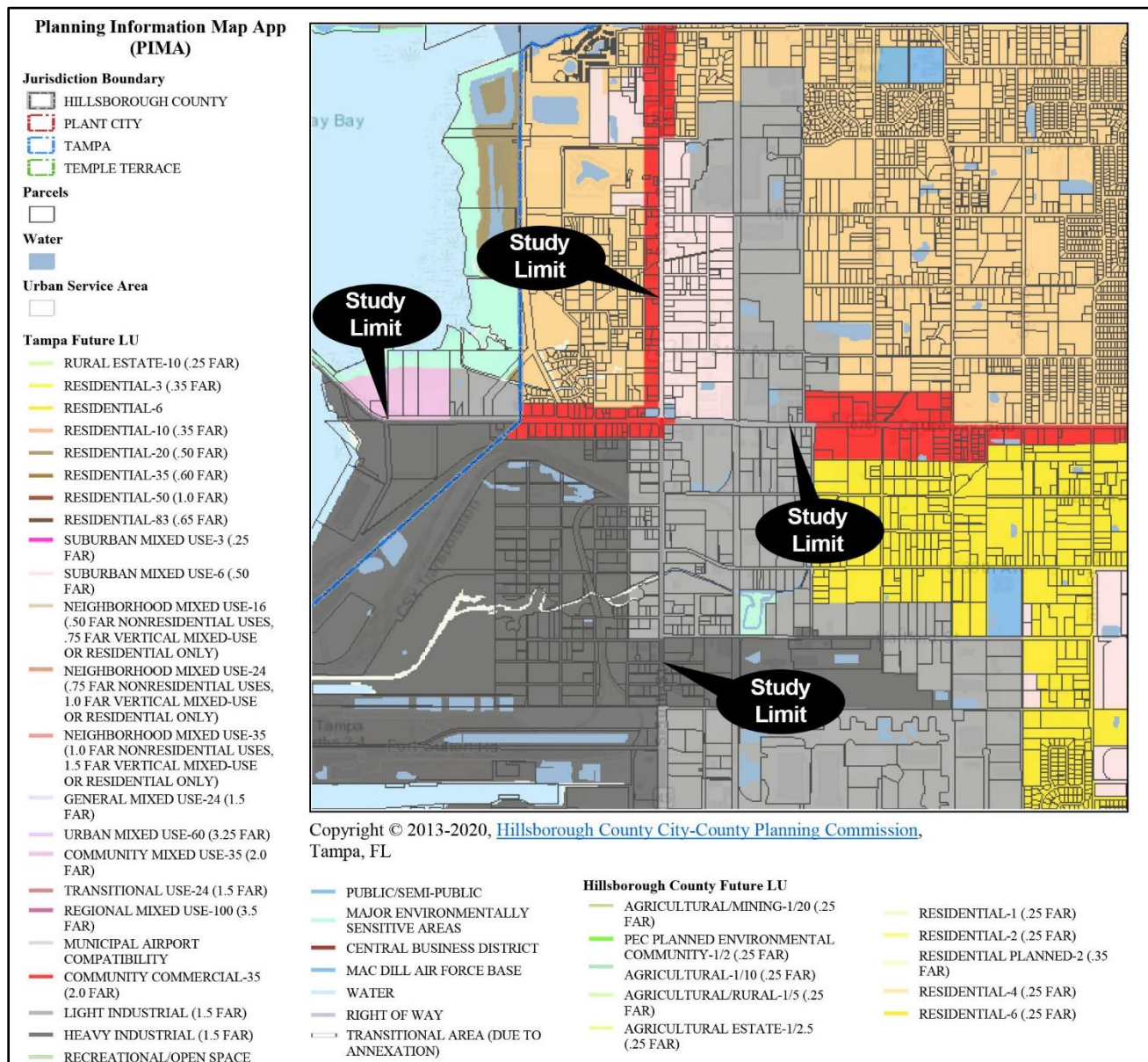


Figure 3-1 Future Land Use Map

3.2 CONTEXT CLASSIFICATION

The future context classification is the same as the existing context classification, C3C.

4.0 DESIGN CRITERIA

The design criteria used to develop the build alternatives are based on the 2022 FDOT Design Manual (FDM). The design criteria for US 41 (including ramps, side streets, and frontage roads) and Causeway Boulevard are located in **Table 4-1** and **Table 4-2**, respectively.

Table 4-1 US 41 Design Criteria

	US 41 Facility Parameters	Interchange	North/South of Causeway	Ramps	Frontage Road	2022 FDM	2022 FDM Ramps
	Parameter	Determination	Determination	Determination	Determination	Documentation	Documentation
1	Functional Classification	Urban Principal Arterial	Urban Principal Arterial	Urban Principal Arterial	Urban Principal Arterial	FDOT Straight Line Diagram	FDOT Straight Line Diagram
2	Context Classification	C3C - Suburb. Comm. (35 - 55 mph)	C3C - Suburb. Comm. (35 - 55 mph)	C3C - Suburb. Comm. (35 - 55 mph)	C3C - Suburb. Comm. (35 - 55 mph)	FDOT Memo	FDOT Memo
3	Minimum Design Speed (SIS)	50 mph	50 mph	50 mph	N/A	Table 201.5.1	Table 201.5.2
4	Posted Speed	50 mph	50 mph	N/A	TBD	N/A	N/A
5	Proposed Design Speed	50 mph	50 mph	40 mph	35 mph	Table 201.5.1	Table 201.5.2

	US 41 Typical Section Parameters	Interchange	North/South of Causeway	Ramps	Frontage Road	2022 FDM	2022 FDM Ramps
	Parameter	Required (Ft.)	Required (Ft.)	Required (Ft.)	Required (Ft.)	Documentation	Documentation
1	Type of Shoulder	High Speed Curbed	High Speed Curbed	Curbed	Curbed	Section 210.5	N/A
2	Minimum Lane Width (Travel / Auxiliary)	(12 / 12)	(12 / 12)	15 (1-Lane)	(11 / 11)	Table 210.2.1	Table 211.2.1
3	Minimum Median Width (Without Barrier)	30	30	N/A	22	Table 210.3.1	N/A
4	Minimum Shoulder Width					Table 210.4.1 Section 210.4	Table 211.4.1
	a. Outside (Full / Paved)	(10/5)	(10/5)	(10/5)	(10/5)		
	b. Inside (Full / Paved)	(10/4)	(10/4)	N/A - Curbed	N/A - Curbed		
5	Minimum Border Width	29	29	12	12	Table 210.7.1	Table 210.7.1
6	Minimum Clear Zone Width (Travel / Auxiliary)	(24 / 14)	(24 / 14)	(24 / 14)	(14 / 10)	Table 215.2.1	Table 215.2.1
7	Minimum Sidewalk Width	6	6	6	6	Table 222.1.1	Table 222.1.1
8	Minimum Bicycle Lane Width	7	7	7	7	Section 223.2.1.1	Section 223.2.1.1
9	Maximum Tangent Travel Lane Cross Slopes	3.00%	3.00%	2.00%	2%	Figure 210.2.1	Figure 210.2.1
10	Maximum Tangent Shoulder Cross Slopes					Section 210.4.1	Section 210.4.1
	a. Outside Shoulder	6.00%	6.00%	Match Travel Lane	Match Travel Lane		
	b. Inside Shoulder	5.00%	5.00%	Match Travel Lane	Match Travel Lane		

	US 41 Horizontal Geometry	Interchange	North/South of Causeway	Ramps	Frontage Road	2022 FDM	2022 FDM Ramps
	Parameter	Required (Ft.)	Required (Ft.)	Required (Ft.)	Required (Ft.)	Documentation	Documentation
1	Maximum Deflection (<i>Without Horiz. Curve</i>)	0°45'00"	0°45'00"	2°00'00"	2°00'00"	Section 210.8.1	Section 211.7.1
2	Desired Horizontal Curve Length (<i>400 ft Min.</i>)	750	750	600	525	Table 210.8.1	Table 211.7.1
3	Minimum Horizontal Curve Radius	694	694	432	402	Table 210.8.2	Table 210.8.2
4	Maximum Super-Elevation Rate [e]	0.10	0.10	0.10	0.05	Section 210.9	Section 210.9
5	Maximum Curvature						
	a. (e = NC / e max = 0.10)	8337 / 694	8337 / 694	5,560 / 432	N/A	Table 210.9.1	Table 210.9.1
	b. (e = NC / e max = 0.05)	N/A	N/A	N/A	1,146 / 402	Table 210.9.2	Table 210.9.2
6	Superelevation Transition	1:160	1:160	1:175	1:100	Table 210.9.3	Table 210.9.3

	US 41 Vertical Geometry	Interchange	North/South of Causeway	Ramps	Frontage Road	2022 FDM	2022 FDM Ramps
	Parameter	Required (Ft.)	Required (Ft.)	Required (Ft.)	Required (Ft.)	Documentation	Documentation
1	Maximum Grade	6.00%	6.00%	6.00%	7.00%	Table 210.10.1	Table 211.9.1
2	Minimum K-Values					Table 210.10.3	Table 211.9.2
	a. Sag	96	96	64	49		
	b. Crest	136	136	70	47		
3	Minimum Vertical Curve Lengths					Table 210.10.4	Table 211.9.3
	a. Sag	200 ft	200 ft	120 ft	105 ft		
	b. Crest	300 ft	300 ft	120 ft	105 ft		
4	Minimum Vertical Clearance						
	a. Base over BCWE (ft)	3 ft	3 ft	2 ft	2 ft	Section 210.10.3	Section 210.10.3
	b. Sign over Roadway (ft)	17.5 ft	17.5 ft	17.5 ft	17.5 ft		
	c. Roadway over Roadway (ft)	16.5 ft	16.5 ft	16.5 ft	16.5 ft	Table 260.6.1	Table 260.6.1
	d. Roadway over Railroad (ft)	23.5 ft	23.5 ft	23.5 ft	23.5 ft		
5	Minimum Stopping Sight Distance					Table 210.11.1	Table 211.10.2
	a. Downgrade (ft) (<2% / 6%)	(425' / 474')	(425' / 474')	(305' / 333')	(250' / 271')		
	b. Upgrade (ft) (<2% / 6%)	(425' / 388')	(425' / 388')	(305' / 278')	(250' / 229')		

Table 4-2 Causeway Boulevard Design Criteria

	Causeway Boulevard Facility Parameters	Interchange	US 41	2022 FDM
	Parameter	Determination	Determination	Documentation
1	Functional Classification	Urban Principal Arterial	Urban Principal Arterial	FDOT Straight Line Diagram
2	Context Classification	C3C - Suburb. Comm. (35 - 55 mph)	C3C - Suburb. Comm. (35 - 55 mph)	FDOT Memo
3	Minimum Design Speed (SIS)	50 mph	50 mph	Table 201.5.1
4	Posted Speed	45 mph	45 mph	N/A
5	Proposed Design Speed	45 mph	45 mph	Table 201.5.1

	Causeway Boulevard Typical Section Parameters	Interchange	West of US 41	2022 FDM
	Parameter	Required (Ft.)	Required (Ft.)	Documentation
1	Type of Shoulder	High Speed Curbed	High Speed Curbed	Section 210.5
2	Minimum Lane Width (Travel / Auxiliary)	(11/11)	(11/11)	Table 210.2.1
3	Minimum Median Width (Without Barrier)	22	22	Table 210.3.1
4	Minimum Shoulder Width (3 Travel Lanes)			Table 210.4.1
	a. Outside (Full / Paved)	(10/5)	(10/5)	
	b. Inside (Full / Paved)	(10/0)	(10/0)	
4	Minimum Shoulder Width (2 Travel Lanes)			Table 210.4.1
	a. Inside (Full / Paved)	(10/5)	(10/5)	
	b. Inside (Paved / Full)	(8/0)	(8/0)	
5	Minimum Border Width	14	14	Table 210.7.1
6	Minimum Clear Zone Width (Travel / Auxiliary)	(24/14)	(24 / 14)	Table 215.2.1
7	Minimum Sidewalk Width	6	6	Table 222.1.1
8	Minimum Bicycle Lane Width	7	7	Section 223.2.1.1
9	Maximum Tangent Travel Lane Cross Slopes	3.00%	3.00%	Figure 210.2.1
10	Maximum Tangent Shoulder Cross Slopes			Section 210.4.1
	a. Outside Shoulder	6.00%	6.00%	
	b. Inside Shoulder	5.00%	5.00%	

	<i>Causeway Boulevard Horizontal Geometry</i>	<i>Interchange</i>	<i>West of US 41</i>	<i>2022 FDM</i>
	Parameter	Required (Ft.)	Required (Ft.)	Documentation
1	Maximum Deflection (<i>Without Horiz. Curve</i>)	1°00'00"	1°00'00"	Section 210.8.1
2	Desired Horizontal Curve Length (<i>400 ft Min.</i>)	675	675	Table 210.8.1
3	Minimum Horizontal Curve Radius	559	559	Table 210.8.2
4	Maximum Super-Elevation Rate [e]	0.10	0.10	Section 210.9
5	Maximum Curvature			
	a. (e = NC / e max = 0.10)	6878 / 559	6878 / 559	Table 210.9.1
	Superelevation Transition	1:160	1:160	Table 210.9.3

	<i>Causeway Boulevard Vertical Geometry</i>	<i>Interchange</i>	<i>West of US 41</i>	<i>2022 FDM</i>
	Parameter	Required (Ft.)	Required (Ft.)	Documentation
1	Maximum Grade	6.00%	6.00%	Table 210.10.1
2	Maximum Grade Change (<i>Without Vertical Curve</i>)	0.70%	0.70%	Table 210.10.2
3	Minimum K-Values			Table 210.10.3
	a. Sag	96	96	
	b. Crest	136	136	Table 210.10.4
4	Minimum Vertical Curve Lengths			
	a. Sag	125	125	
	b. Crest	125	125	
5	Minimum Vertical Clearance			
	a. Base over BCWE (<i>ft</i>)	3 ft	3 ft	Section 210.10.3
	b. Sign over Roadway (<i>ft</i>)	17.5 ft	17.5 ft	
	c. Roadway over Roadway (<i>ft</i>)	16.5 ft	16.5 ft	Table 260.6.1
	d. Roadway over Railroad (<i>ft</i>)	23.5 ft	23.5 ft	
6	Minimum Stopping Sight Distance			Table 210.11.1
	a. Downgrade (<i>ft</i>) ($\leq 2\%$ / 6%)	(360 / 400)	(360 / 400)	
	b. Upgrade (<i>ft</i>) ($\leq 2\%$ / 6%)	(360 / 331)	(360 / 331)	

5.0 ALTERNATIVES ANALYSIS

5.1 1994 EA/FONSI PREFERRED ALTERNATIVE

The previous PD&E study was completed for 22nd Street Causeway/Causeway Boulevard from SR 60 to US 301, in Hillsborough County, Florida. The previous study evaluated anticipated conditions for a 2015 design year. The FONSI evaluated the proposed construction of a six-lane roadway to replace the existing 2 to 4-lane roadway beginning at SR 60 and extending approximately 7 miles east at U.S. 301. Project limits are shown in **Figure 1-1** in **Section 1.1**. **Figure 5-1** illustrates the typical section for Causeway Boulevard from S. 45th Street to S. 54th Street. Although the EA/FONSI approved concept along the project portion of Causeway Boulevard called for 6 lanes, prior improvements were only made to a 4-lane roadway due to ROW constraints. The project included a new interchange at US 41/Causeway Boulevard intersection for which the approved concept was a Single Point Urban Interchange (SPUI) with US 41 elevated over Causeway Boulevard. The study identified the US 41 interchange bridge would carry three lanes of traffic in each direction with a barrier wall separating opposing traffic. The study recommended an additional grade separation of US 41 over the CSX railroad crossing south of Causeway Boulevard while the CSX railroad crossing east of US 41 would remain at grade with Causeway Boulevard. **Figure 5-2** illustrates the SPUI ramps oriented along US 41 and one-way, one-lane frontage roads were provided in the southeast and northeast quadrants to provide local property access. Five-foot sidewalks and 4-foot bicycle lanes were proposed along both sides of Causeway Boulevard.

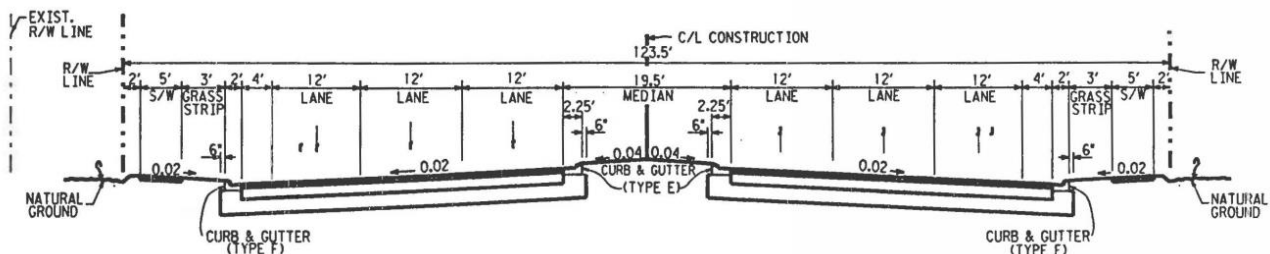


Figure 5-1 Previous EA/FONSI Causeway Boulevard Typical Section

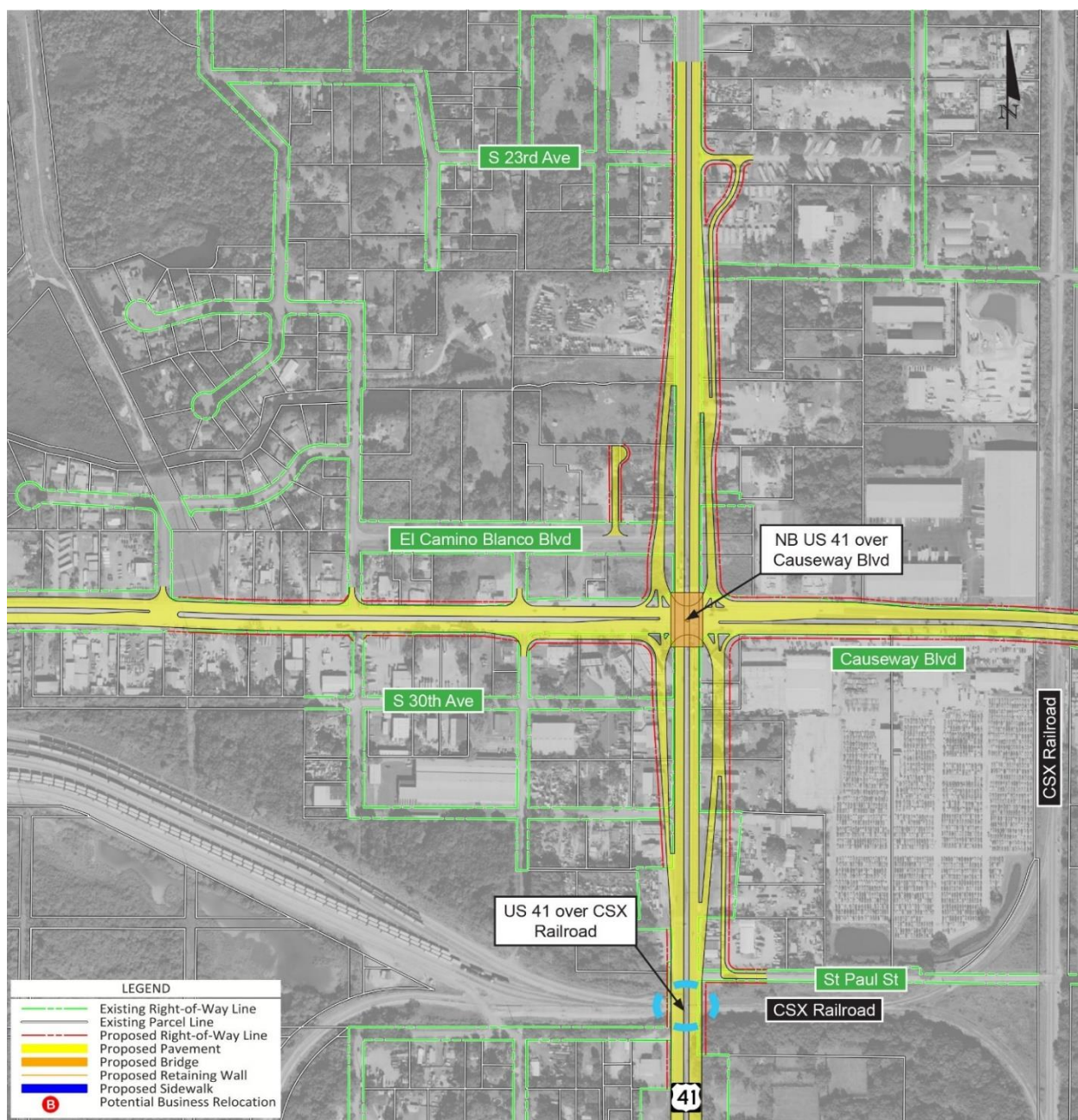


Figure 5-2 Previous EA/FONSI Preferred Alternative

5.2 NO-BUILD ALTERNATIVE

The no-build alternative will be considered throughout the project development process.

5.3 TRANSPORTATION SYSTEM MANAGEMENT & OPERATIONS (TSM&O)

The objective of Transportation System Management & Operations (TSM&O) is to identify strategies that reduce existing traffic congestion and prevent its occurrence in areas that are currently congested. The TSM&O Alternative includes strategies with the operational objective of preserving the capacity and improving the security, safety, and reliability of the transportation system, while minimizing all environmental

impacts. These strategies may include upgrades or additions to the existing facility, such as ramp signals, arterial traffic management systems, traffic incident management, work zone traffic management, road weather management, traveler information services, congestion pricing, parking management, traffic control, commercial vehicle operations, transit priority signals systems, and freight management. Prior to evaluating build alternatives, engineering analysis must demonstrate that maximization of the existing system through various TSM&O strategies will not meet the purpose and need for the project.

Upon analysis it was determined, the additional capacity required to meet the projected traffic volumes along US 41 and Causeway Boulevard in the 2046 design year cannot be provided solely through the implementation of TSM&O improvements. Nor would TSM&O improvements address the issues associated with the at-grade crossing of the CSX Railroad on US 41.

5.4 BUILD ALTERNATIVES

This PD&E Design Change Reevaluation study, with a 2046 design year, evaluated operational improvements along US 41 from south of the Causeway Boulevard intersection to north of the Causeway Boulevard intersection. These improvements include the construction of a grade separation of US 41 at the CSX railroad crossing located approximately 1,400' south of the US 41/Causeway Boulevard intersection. Intersection and operational improvements along US 41 and Causeway Boulevard are also planned.

Four initial build alternatives were developed for the November 2019 Alternatives Public Workshop. These four initial build alternatives are the focus of this section.

All four alternatives maintain the two-way operations of St. Paul Street which has a connection to frontage roads on each side of US 41.

5.4.1 Build Alternative Considerations

5.4.1.1 Grade Separation of CSX Railroad

The proposed build alternatives were developed to provide a grade separation for US 41 mainline over CSX Railroad, St. Paul Street, and the buried ammonia pipeline on the north side of St. Paul Street. There is one railroad track crossing US 41 with the railroad yard on the west side. The existing railroad crossing agreement boundary on the north and south sides of the railroad tracks have different offsets on the west and east side of US 41. **Figure 5-3** illustrates the Railroad Crossing Agreement boundary identified in the *ROW Control Survey* completed for this project. The offset to the boundary on the north side of the railroad tracks is similar on both the west side and east side of US 41 with 23.70 feet and 24.90 feet, respectively. However, the offset to the boundary on the south side of the railroad tracks are not similar on the west side and east side of US 41 with 84.26 feet and 187.76 feet, respectively. Since the difference of the offset to the boundary on the south side is over 100 feet, the 84.26 feet offset was utilized for the development of the proposed build alternatives. This offset is shown in **Figure 5-3** as a large dashed red line. This offset was used to calculate the location of the southern abutments of the structures for the grade separations while the northern location of the abutments used the location of the ammonia pipeline and/or stopping sight distance for the St. Paul Street and Frontage Road intersection.

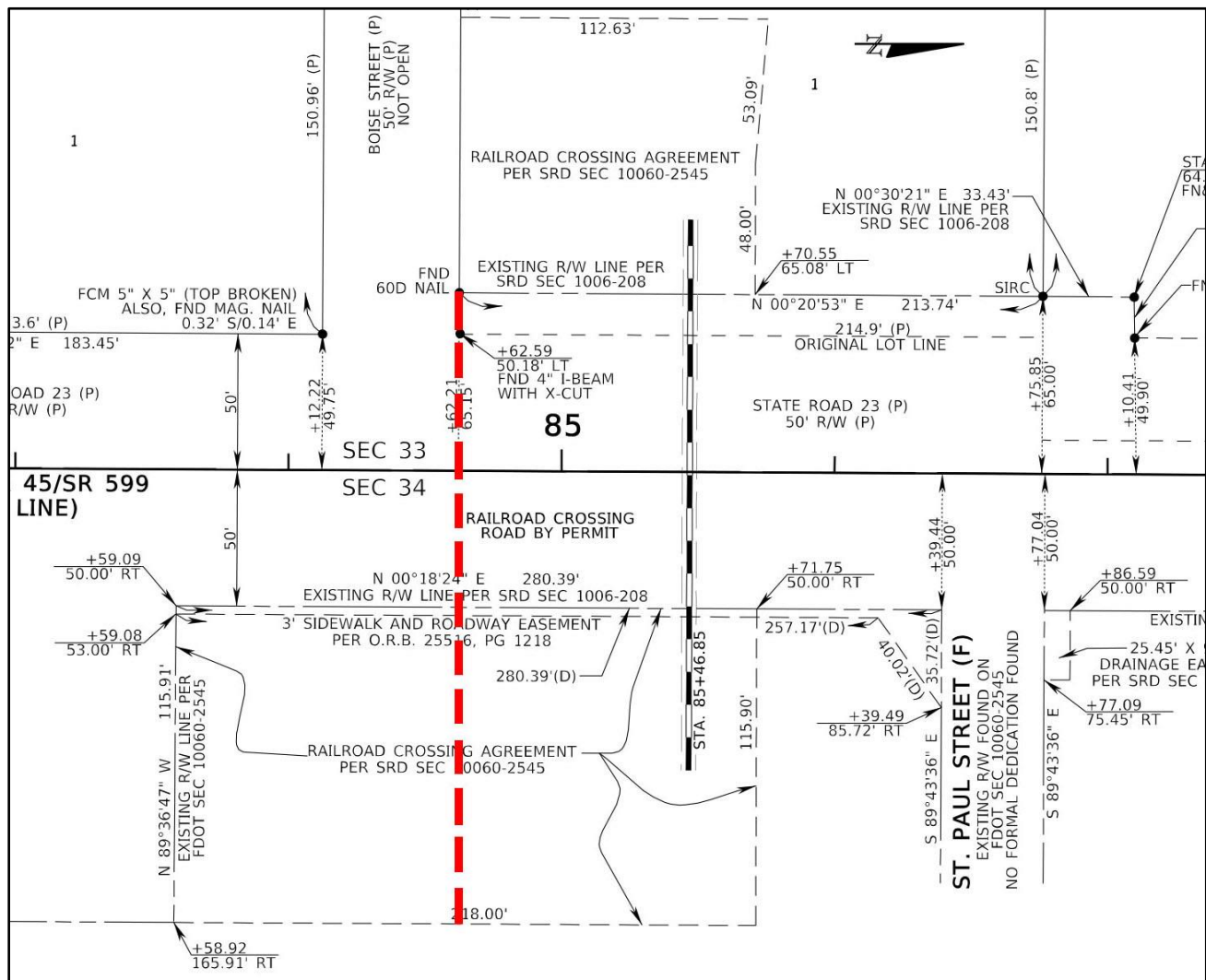


Figure 5-3 Railroad Crossing Agreement Limits

5.4.1.2 CSX Railroad Track Switch

There is one railroad track crossing US 41 with the railroad yard on the west side. There are railroad track switches on both sides of US 41. The switch on the west side of US 41 is approximately 35 feet from the western US 41 existing ROW line and on the east side of US 41 the switch is approximately 420 feet from the eastern US 41 existing ROW line. The switch on the west side is the first of many within the existing railroad yard therefore, it was identified that the existing western ROW line for US 41 in this area would be maintained as much as possible to minimize impacts to the railroad yard.

5.4.1.3 Concrete Pavement

The proposed limits of the concrete pavement are to be utilized for the high-volume truck routes which are US 41 south of Causeway Boulevard and Causeway Boulevard west of US 41. The existing concrete pavement along Causeway Boulevard from east of US 41 to west of the project limits will be maintained as much as possible with each of the build alternatives.

5.4.2 Typical Section

The following typical sections are utilized in all four build alternatives for US 41, Causeway Boulevard, and the frontage roads. The typical sections for the project indicate the travel lanes and pedestrian facilities with no proposed ROW widths identified. The proposed ROW widths vary for each of the alternatives considered. These are illustrated further on the concept plans located in the project file.

5.4.2.1 US 41

The US 41 typical section utilized south of the frontage roads to the southern limits of the project provides both sidewalks and bicycle lanes. The southern US 41 typical section consists of six 12-foot travel lanes (three in each direction), 7-foot bicycle lanes, 10-foot-sidewalks, and curb and gutter on both sides. **Figure 5-4** illustrates the US 41 typical section south of the frontage roads. The 10-foot-sidewalks are extended south of the frontage road to the next full median opening to allow for users to choose to cross US 41 to the other sidewalk or to change to the sidewalk or bicycle lane. The design speed for this typical section is 50 miles per hour (mph).

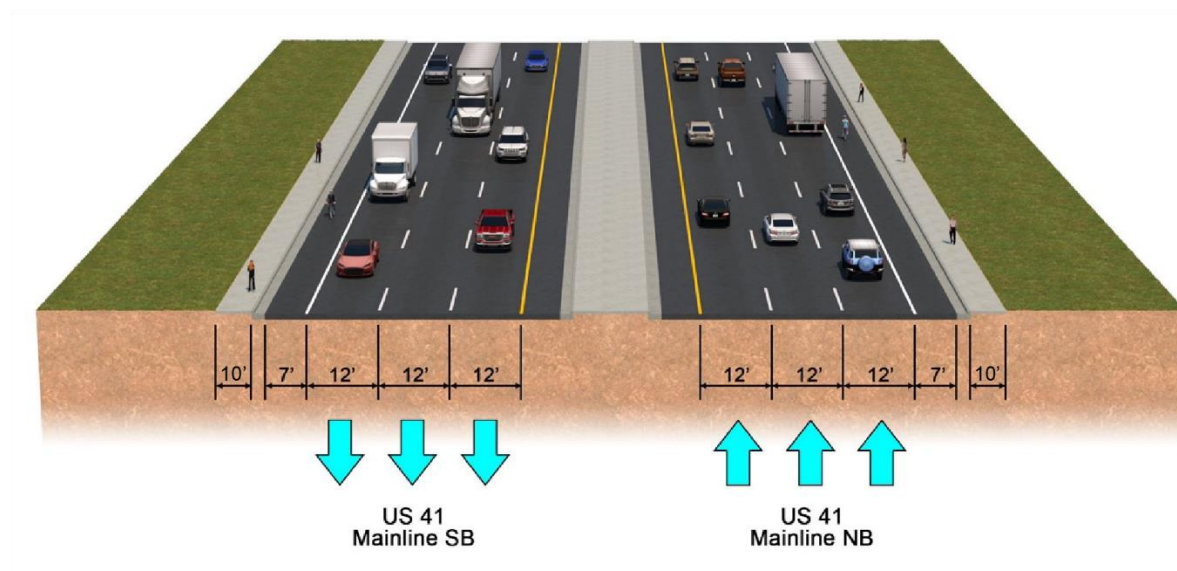


Figure 5-4 US 41 Typical Section south of Frontage Roads

The US 41 typical section north of Causeway Boulevard provides a sidewalk and bicycle lane. The northern US 41 typical section consists of six 12-foot travel lanes (three in each direction), 7-foot bicycle lanes, 6-foot sidewalks, and curb and gutter on both sides. **Figure 5-5** illustrates the US 41 typical section north of Causeway Boulevard. The design speed for this typical section is 50 mph.

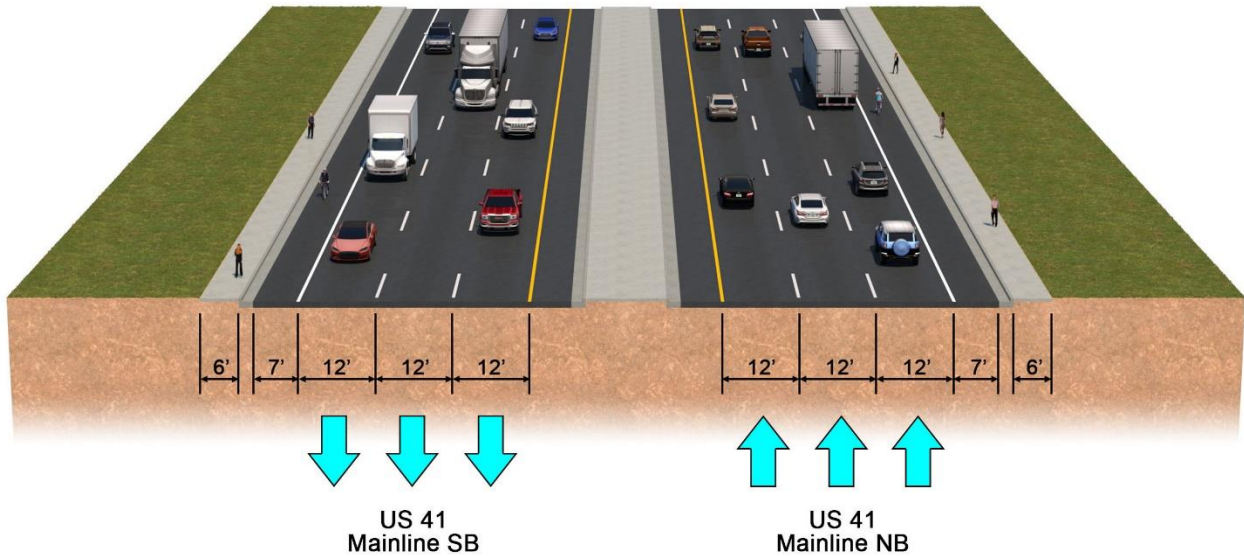


Figure 5-5 US 41 Typical Section north of Causeway Boulevard

5.4.2.2 Frontage Road

The frontage road typical section consists of two 15-foot travel lanes (one in each direction), 10-foot-sidewalk, and curb and gutter on both sides. In locations with turn lanes the 15-foot travel lane is reduced to a 12-foot travel lane. There are no bicycle lanes as bicyclists are accommodated on the sidewalks. The design speed for this typical section is 35 mph. **Figure 5-6** illustrates the frontage road typical section.

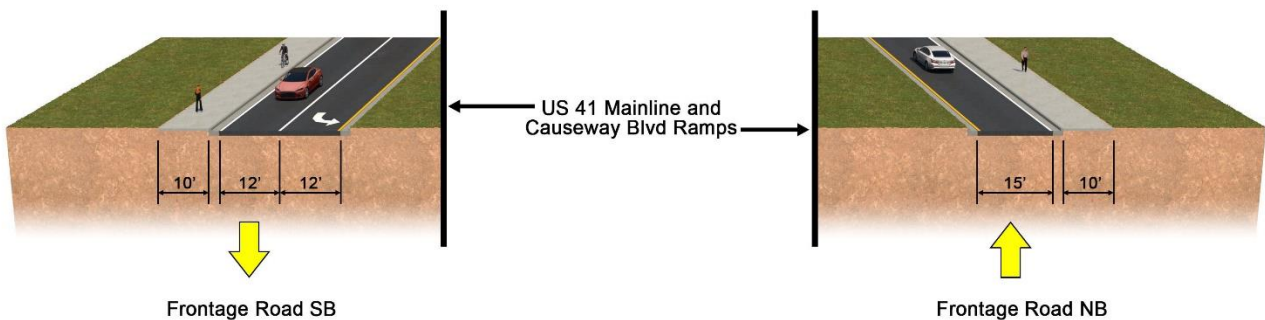


Figure 5-6 Frontage Road Typical Section

5.4.2.3 Causeway Boulevard

The Causeway Boulevard typical section consists of six 12-foot travel lanes (three in each direction), 7-foot designated buffered bicycle lanes, 6-foot sidewalks, and curb and gutter on both sides. **Figure 5-7** illustrates the Causeway Boulevard typical section. The design speed for this typical section is 45 mph.

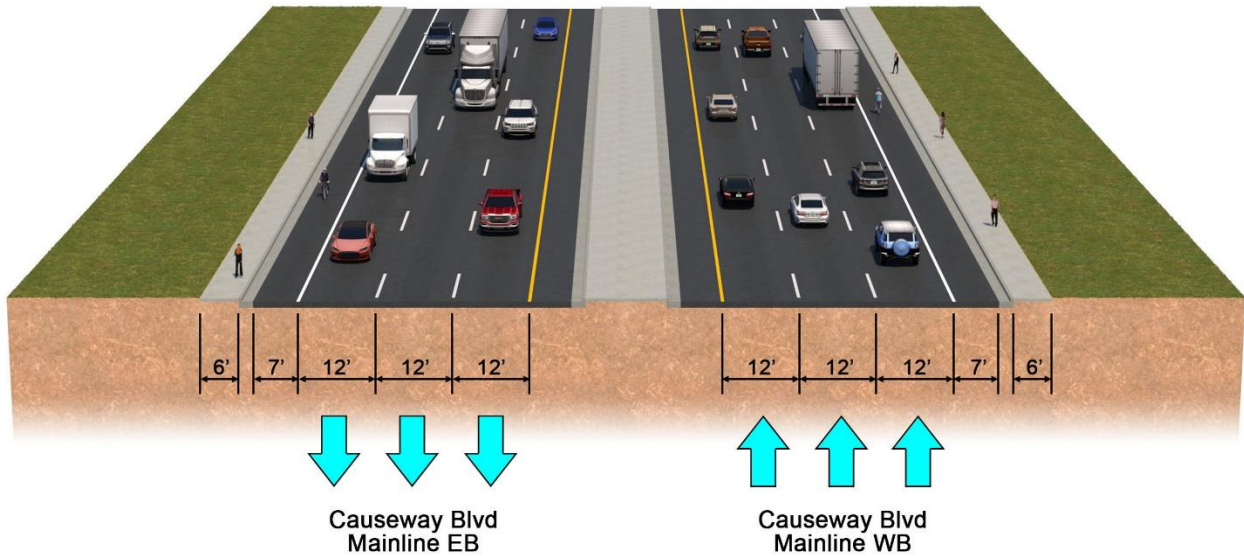


Figure 5-7 Causeway Boulevard Typical Section

5.4.3 Build Alternative 1 (Flyover)

Build Alternative 1 includes the construction of a grade-separated, northbound-to-westbound (US 41 NB to Causeway Boulevard WB), two-lane flyover originating south of the CSX Railroad crossing south of Causeway Boulevard. The flyover ends with a one-lane merge to the inside of westbound Causeway Boulevard. Build Alternative 1 also includes a two-lane, grade-separated northbound overpass or “queue jump” over the intersection of US 41 and Causeway Boulevard, which removes most northbound through traffic from the intersection. The grade separations for Build Alternative 1 are shown in **Figure 5-8**. At US 41 and Causeway Boulevard, a triple right turn is used to service the heavy PM eastbound right turn volume.

Traveling northbound from the southern limits of the project, the first off-ramp would be connection to the northbound frontage road which provides access to 36th Avenue S., St. Paul Street, and connection to the US 41 northbound off-ramp to Causeway Boulevard as well as local driveway connections. By turning left onto St. Paul Street this would allow access to the local streets and driveways south of St. Paul Street on the west side of US 41. The second northbound off-ramp would allow access from US 41 to Causeway Boulevard and the third off-ramp, which is on the left side, would be the northbound to westbound flyover ramp.

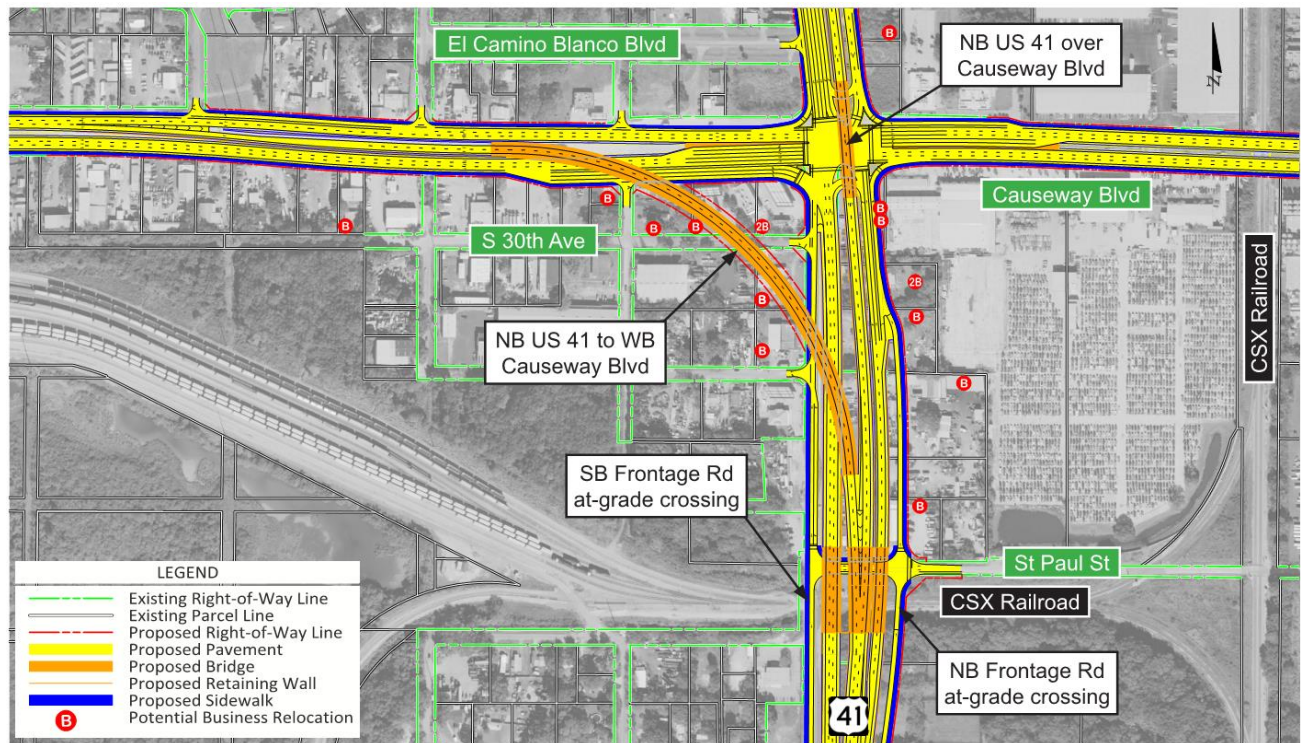


Figure 5-8 Build Alternative 1 (Flyover)

The US 41 section shown in **Figure 5-9** is north of the structure that goes over CSX Railroad, St. Paul Street, and the ammonia pipeline. This section is at the gore of the third ramp which separates the flyover ramp and the US 41 northbound mainline lanes. **Figure 5-10** illustrates the US 41 section north of Causeway Boulevard when the US 41 northbound mainline lanes are still elevated after going over Causeway Boulevard. This section also shows the southbound dual left-turn and right-turn lanes approaching Causeway Boulevard.

The travel lanes for both westbound and eastbound Causeway Boulevard west of US 41 are shifted to the outside to allow the US 41 northbound to westbound flyover ramp to reduce from two lanes to one lane and to add an on-ramp that will merge with westbound Causeway Boulevard. **Figure 5-11** illustrates the Causeway Boulevard section with the flyover ramp east of S. 47th Street.

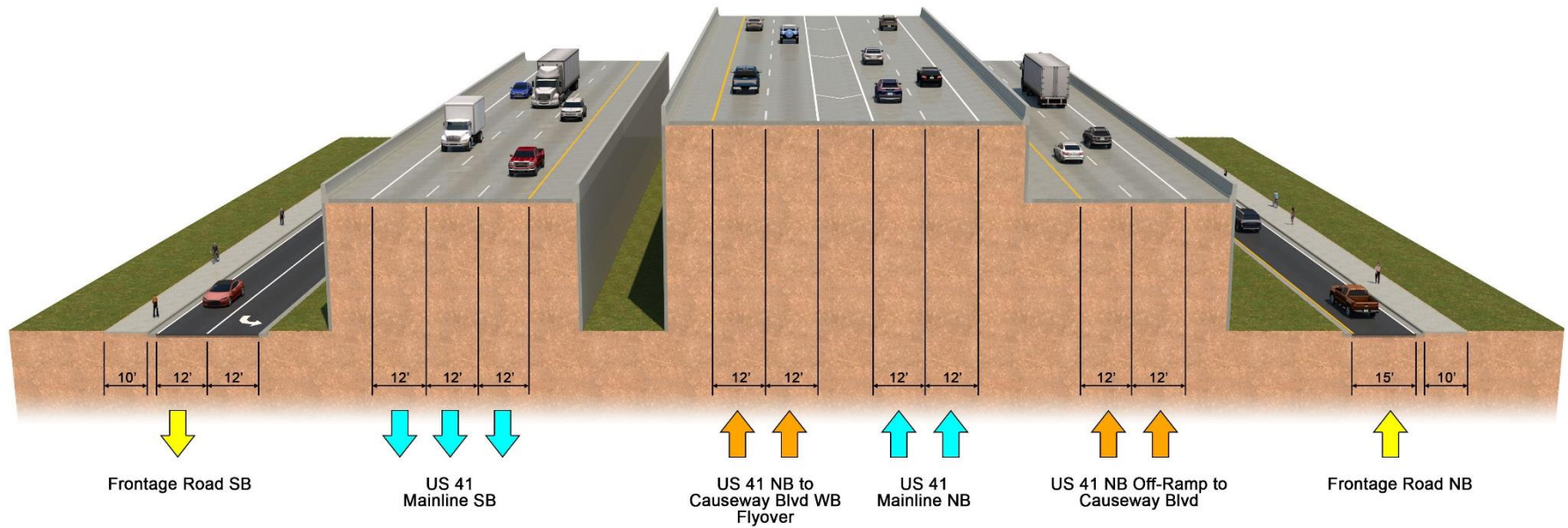


Figure 5-9 Alt 1 Section of US 41 North of CSX Railroad

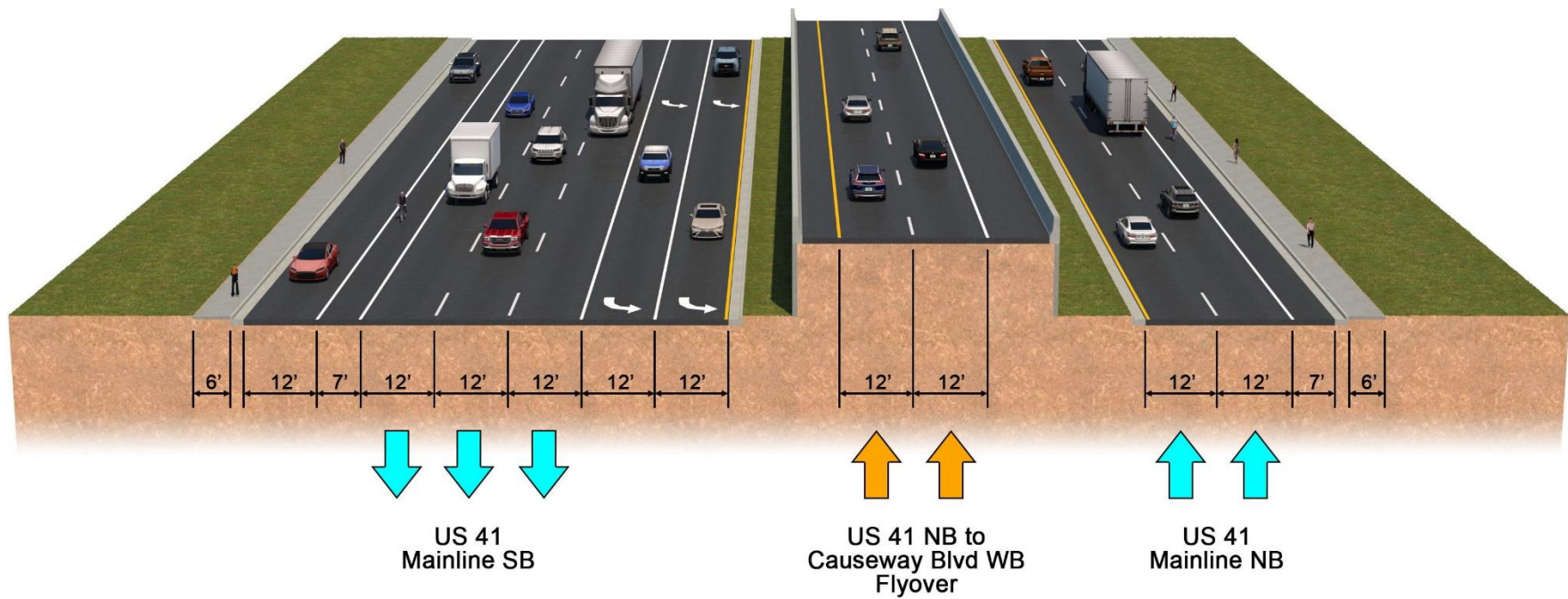


Figure 5-10 Alt 1 Section of US 41 North of Causeway Boulevard

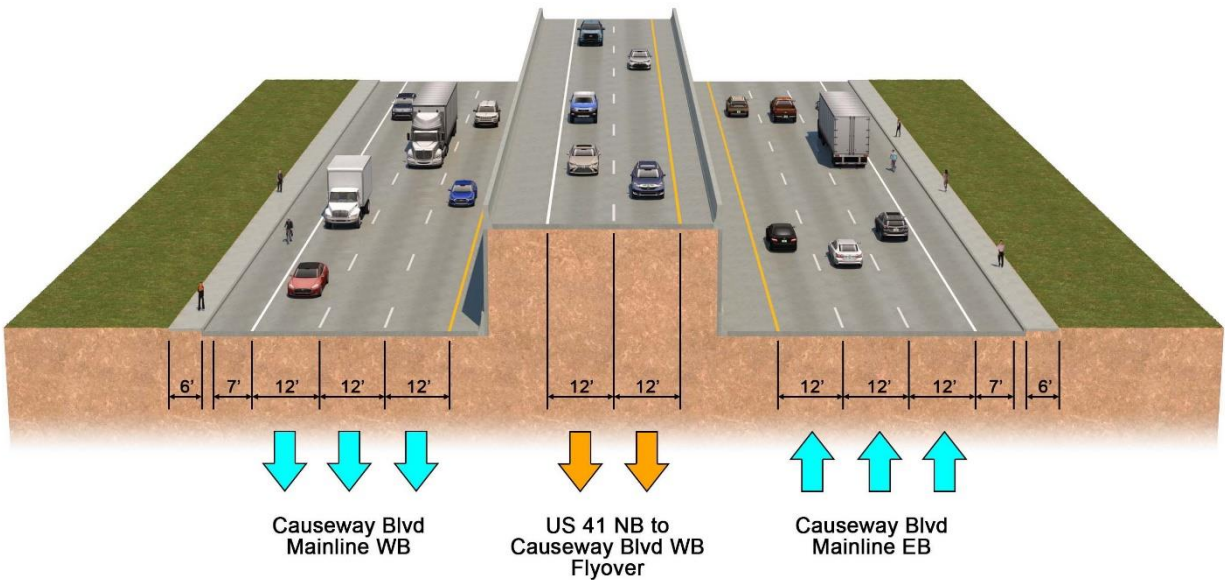


Figure 5-11 Alt 1 Causeway Boulevard East of S. 47th Street

5.4.3.1 Structures

5.4.3.1.1 Structures over Delaney Creek

The existing concrete bridge culvert, Bridge Number 100048, is utilized to traverse US 41 over Delaney Creek. This existing bridge culvert was built in 1959 and will be replaced to accommodate the proposed alignment configuration due to age and deterioration. The replacement structures will be concrete flat slab bridges. Alternative 1 consists of three different bridge water crossings shown in **Figure 5-12** to accommodate the southbound mainline, northbound mainline and off-ramp, and a frontage road on the west side of US 41.

The typical section for the southbound mainline bridge consists of three 12'-0" traffic lanes, a 6'-0" inside shoulder, and a 10'-0" outside shoulder. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 54'-8".

The typical section of the northbound mainline and off-ramp bridge consists of three 12'-0" traffic lanes to accommodate the northbound traffic and one 15'-0" lane for the off-ramp traffic. The lanes are separated by a varying width gore. A 6'-0" inside shoulder is employed for the mainline traffic and a designated bicycle lane combined with a raised 10'-0" sidewalk is employed for the off-ramp section. Standard 36" single-slope traffic railing barrier is used at the inside shoulders and a pedestrian concrete parapet is employed at the off-ramp sidewalk, resulting in a total bridge width that varies from 90'-8" to 96'-8".

The typical section for the frontage road bridge consists of one 15'-0" traffic lane, a 6'-0" inside shoulder, a designated bicycle lane and a raised 10'-0" sidewalk. Standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the sidewalk resulting in a bridge width of 41'-8".

The superstructure of each proposed bridge consists of a two-span flat slab structure with an overall length of approximately 80 feet. A flat slab bridge provides an economical solution while maintaining a shallower

superstructure depth compared to a beam bridge. Each span is approximately 40 feet long founded on pile bents. End bents with sloped embankment is anticipated at the beginning and end of bridges.

Table 5-1 contains the structure spans, lengths, and depths of all the structures in Alternative 1.

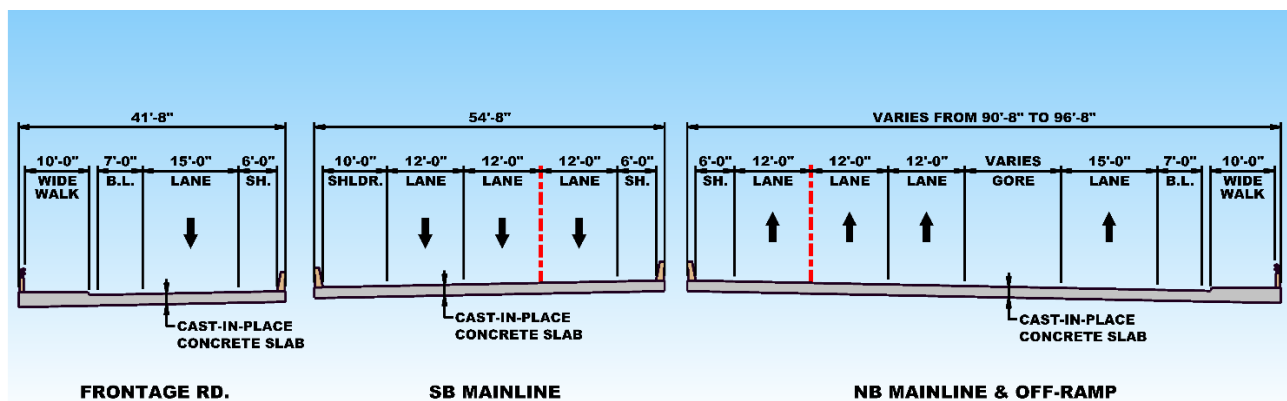


Figure 5-12 US 41 Bridges over Delaney Creek

5.4.3.1.2 Structures over CSX Railroad

Alternative 1 consists of three proposed bridges shown in **Figure 5-13** to span over CSX Railroad, an existing ammonia line, and St. Paul Street. These proposed structures accommodate the southbound mainline, northbound mainline and westbound off-ramp, and an off-ramp to Causeway Boulevard.

The typical section for the southbound mainline bridge consists of three 12'-0" traffic lanes and 10'-0" inside and outside shoulders. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 58'-8".

The typical section for the northbound mainline transitions from three 12'-0" traffic lanes to four 12'-0" lanes to accommodate the westbound off-ramp on the proposed structure. This transition results in two 12'-0" traffic lanes to accommodate the northbound traffic and two 12'-0" traffic lanes to accommodate the westbound off-ramp separated by a varying width gore. A 10'-0" inside shoulder is employed for the mainline traffic and a 10'-0" outside shoulder is employed for the off-ramp traffic. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width that varies from 63'-0" to 81'-8".

The typical section for the Causeway Boulevard off-ramp bridge consists of two 12'-0" traffic lanes, a 6'-0" inside shoulder, and a 10'-0" outside shoulder. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 42'-8".

The begin bridge location for all three structures is governed by an assumed CSX ROW which is approximately 84 feet south from the centerline of the existing CSX rails. The end bridge location is governed by the west frontage road and St. Paul Street. Lastly, the intermediate support location is controlled by crash wall requirements and by a horizontal clearance to allow for a future train track. Preliminary analysis results in total bridge length of approximately 270 feet with a span arrangement of 150 feet – 120 feet. The profiles for

the mainline bridges and the off-ramp bridge are controlled by the required vertical clearance at CSX which is 23'-6" and St. Paul Street which is 16'-6".

Given the proposed span arrangement, it is anticipated that 72-inch Florida I-Beams will provide an economical solution for the superstructure. Typical end bents with wrap-around MSE walls are proposed at the begin and end bridge locations, while a multicolumn pier is proposed for the intermediate support.

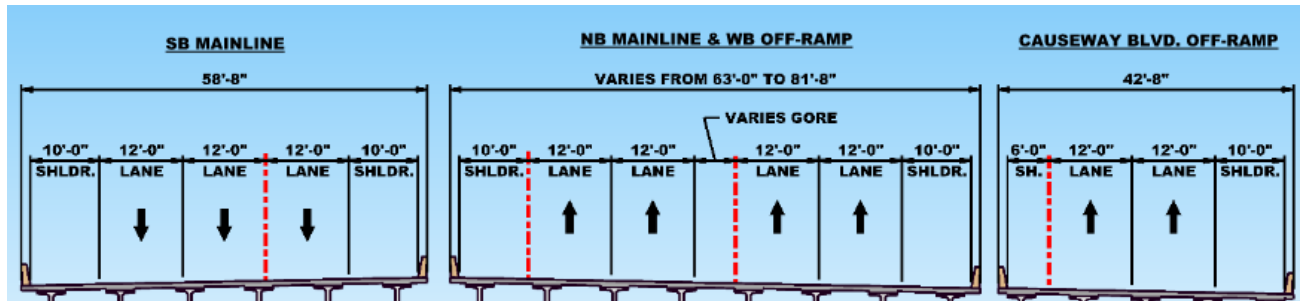


Figure 5-13 US 41 Bridges over CSX Railroad

5.4.3.1.3 Northbound to Westbound Flyover Structure

Alternative 1 consists of a flyover shown in **Figure 5-14** to allow US 41 northbound traffic to travel to westbound Causeway Boulevard. The typical section for this flyover consists of two 12'-0" traffic lanes, a 10'-0" outside shoulder, and a 15'-0" inside shoulder required for stopping sight distance. Standard 42" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 52'-0".

The bridge is set on a horizontal curve with a radius of 1,072 feet. End bents and intermediate support locations are controlled by vertical clearance over SB US 41 and EB Causeway Boulevard and span arrangement optimization.

The superstructure considered is steel plate girders for various units and span arrangements. Preliminary analysis results in total bridge length of approximately 1,770 feet involving a four-span unit and three span unit. Unit 1 results in a span arrangement of 150 feet – 237 feet – 250 feet – 214 feet. while unit 2 results in a span arrangement of 275 feet – 365 feet – 279 feet. Based on the span lengths required for this flyover, the total superstructure depth will be approximately 11'-6". End bents with wrap-around MSE walls are proposed at the begin and end bridge locations, while hammerhead piers are proposed for the intermediate supports.

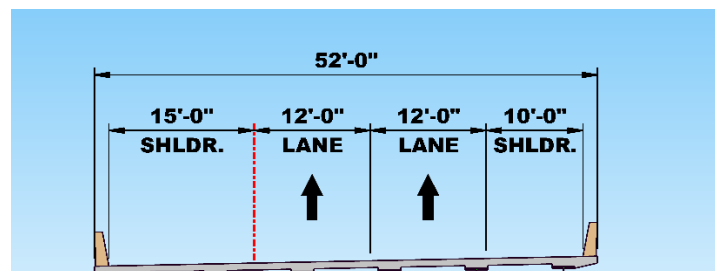


Figure 5-14 US 41 NB to Causeway Boulevard WB Flyover Bridge

5.4.3.1.4 Northbound Structure over Causeway Boulevard

Alternative 1 consists of an overpass shown in **Figure 5-15** for the US 41 NB traffic to go over Causeway Boulevard. The typical section for this bridge consists of two 12'-0" traffic lanes, a 6'-0" inside shoulder, and

a 10'-0" outside shoulder. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 42'-8".

The bridge is set on a quasi-straight alignment with a minimum vertical clearance of 16'-6" over Causeway Boulevard. Begin bridge, intermediate piers, and end bridge locations are controlled by required lateral offset from travel lanes.

Preliminary analysis results in total bridge length of approximately 380 feet with a span arrangement of 95 feet - 180 feet - 105 feet. Given the proposed span arrangement, 84-inch Florida I-Beams provide a cost-effective solution for the superstructure. Typical end bents with wrap-around MSE walls are proposed at the begin and end bridge locations, while hammerhead piers are proposed for the intermediate supports.

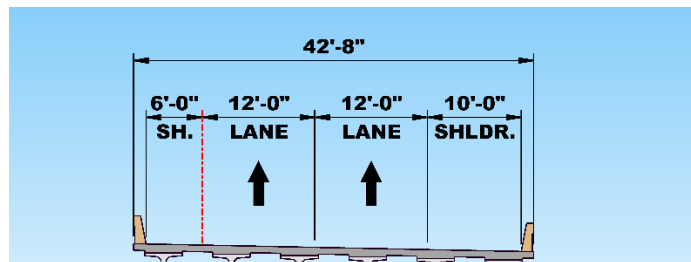


Figure 5-15 US 41 NB Bridge over Causeway Boulevard

Table 5-1 Alternative 1 Structures Spans, Length, and Depth

Alternative	Description of Bridge	Span Arrangement	Total Length	Superstructure Depth
1	US 41 over Delaney Creek	80'	80'	1'-9"
1	US 41 NB or SB to Causeway Boulevard over CSX Railroad	150'-120'	270'	7'-0"
1	US 41 NB over CSX Railroad	150'-120'	270'	7'-0"
1	US 41 NB Flyover	150'-237'-250'-214' 275'-365'-279'	1,770'	11'-6"
1	US 41 NB over Causeway Boulevard	95'-180'-105'	380'	7'-0"

5.4.4 Build Alternative 2 (Quadrant)

Build Alternative 2 includes grade-separation of US 41 in each direction at the CSX Railroad crossing south of Causeway Boulevard. A southwestern quadrant roadway originates with free-flowing ramp connections to US 41 south of the CSX Railroad crossing and is grade-separated over US 41 and the railroad. The roadway meets at-grade west of US 41 to intersect Causeway Boulevard, forming a new signalized T intersection. The majority of eastbound right turns (heaviest during the PM peak hour) and northbound left turns (heaviest during the AM peak hour) are removed from the intersection of US 41 at Causeway Boulevard and utilize the new quadrant intersection. Free-flowing dual eastbound right turns are provided at the quadrant intersection to further improve LOS.

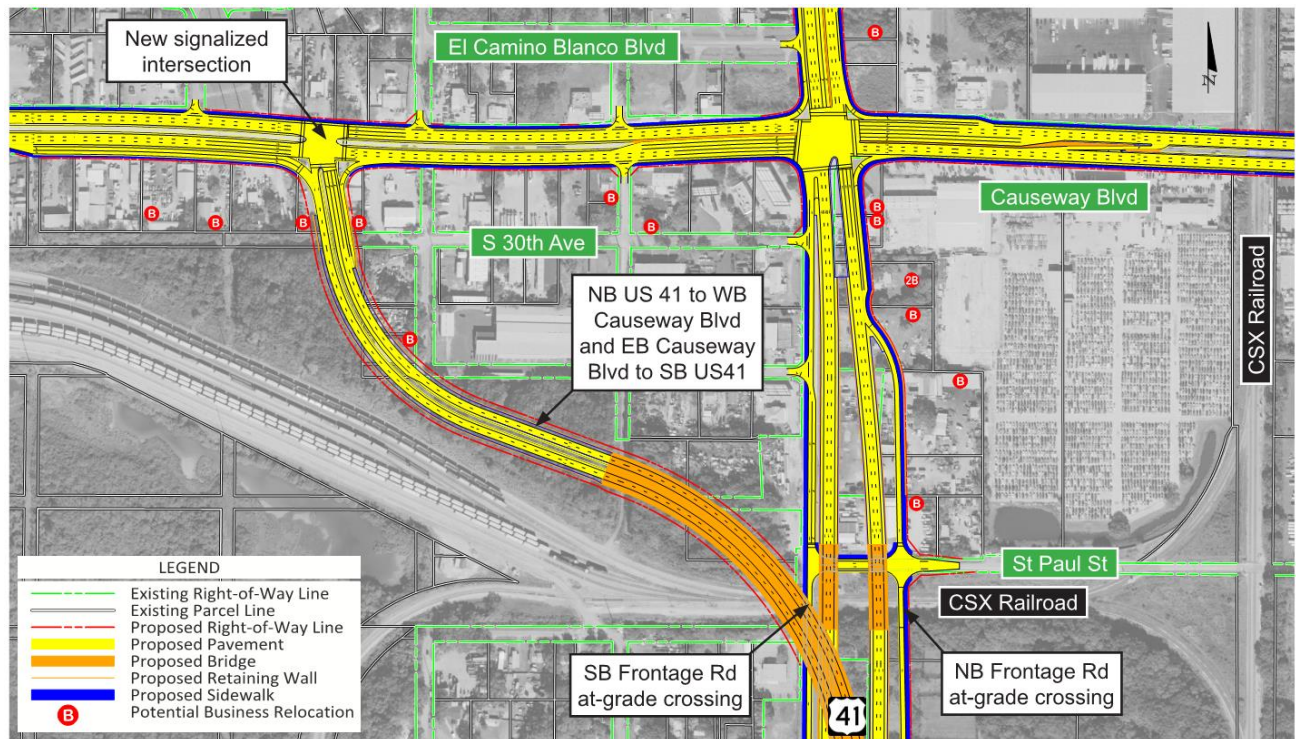


Figure 5-16 Build Alternative 2 (Quadrant)

Traveling northbound from the southern limits of the project, the first off-ramp would be on the left side for the quadrant roadway. This alternative begins further south than the other build alternatives due to the development of the additional northbound US 41 travel lane and the vertical profile for the quadrant roadway. The second off-ramp would be a connection to the northbound frontage road which provides access to 36th Avenue S., and St. Paul Street as well as local driveway connections. By turning left onto St. Paul Street this would allow access to the local streets and driveways south of St. Paul Street on the west side of US 41.

The US 41 section shown in **Figure 5-17** is north of the US 41 mainline structures that go over CSX Railroad, St. Paul Street, and the ammonia pipeline. This section is at the gore of the third ramp which separates the flyover ramp and the US 41 northbound mainline lanes. **Figure 5-18** illustrates the US 41 section north of Causeway Boulevard with the southbound dual left-turn and right-turn lanes approaching Causeway Boulevard.

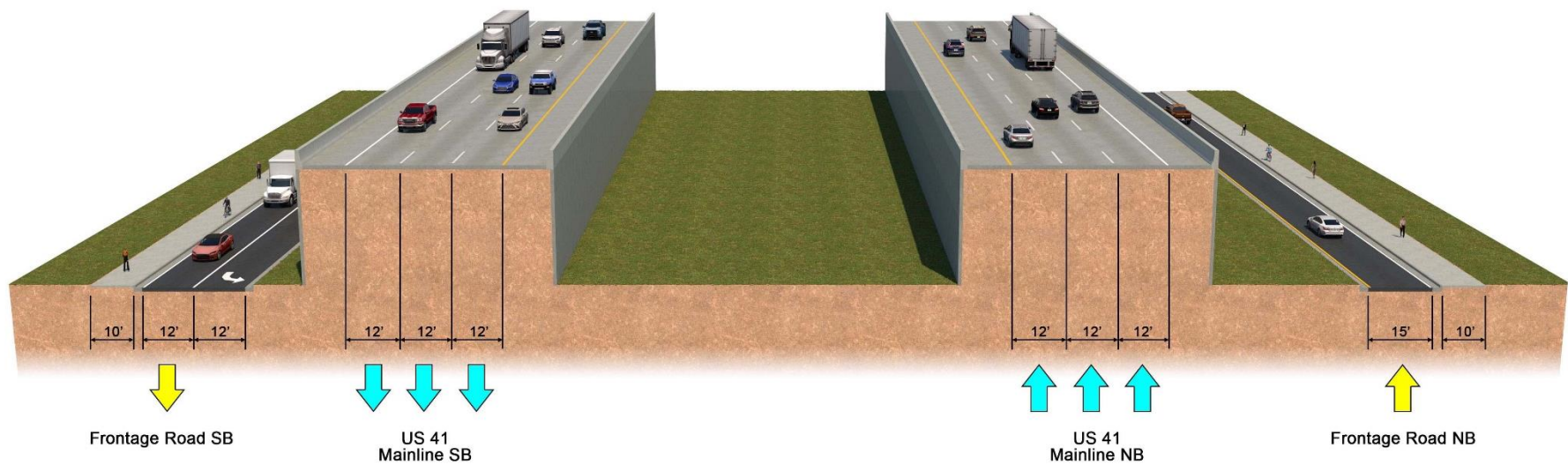


Figure 5-17 Alt 2 Section of US 41 North of CSX Railroad

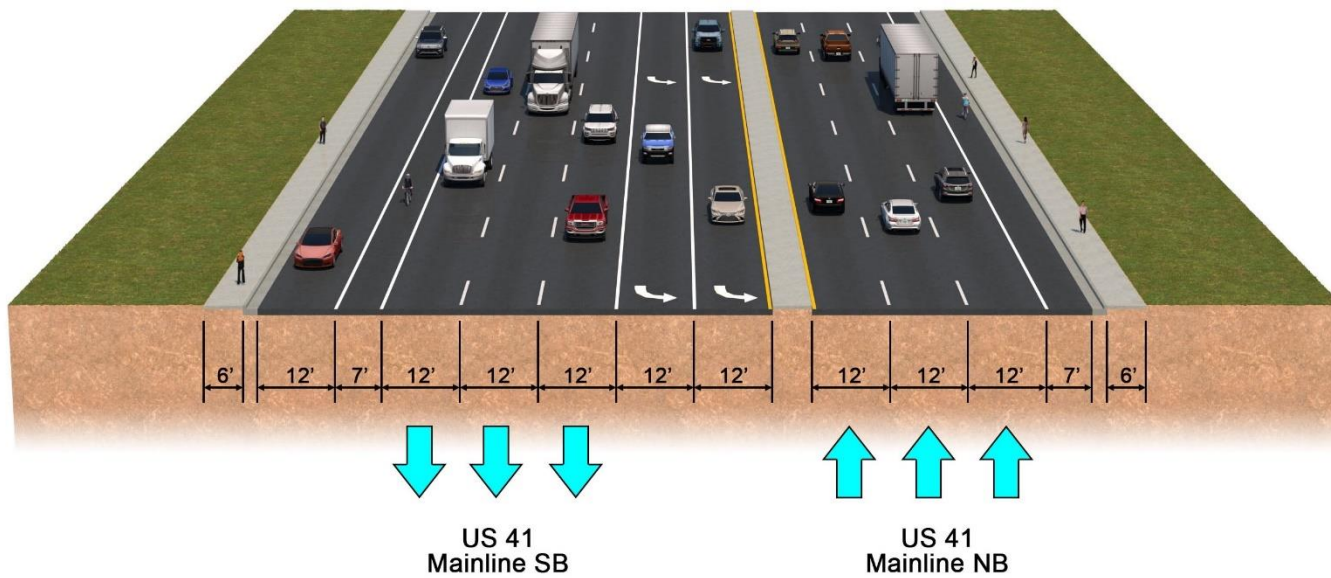


Figure 5-18 Alt 2 Section of US 41 North of Causeway Boulevard

5.4.4.1 Structures

5.4.4.1.1 Structures over Delaney Creek

The existing concrete bridge culvert, Bridge Number 100048, is utilized to traverse US 41 over Delaney Creek. This existing bridge culvert was built in 1959 and will be replaced to accommodate the proposed alignment configuration due to age, deterioration, and proposed vertical alignment of Alternative 2. There are four proposed structures at the water crossings shown in **Figure 5-19** to accommodate the southbound mainline and a frontage road, southbound and northbound ramps, and northbound mainline and off-ramp.

The typical section for the southbound mainline and frontage road on-ramp bridge consists of three 12'-0" traffic lanes to accommodate southbound traffic and one 15'-0" lane to accommodate the frontage road traffic. The lanes are separated by a varying width gore. A 10'-0" inside shoulder is employed for the mainline traffic and a bicycle lane combined with a raised 10'-0" sidewalk is employed for the frontage road. Standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the sidewalk resulting in a bridge width that varies from 102'-8" to 106'-8".

The typical section of the northbound and southbound quadrant ramp bridges consists of two 12'-0" traffic lanes, a 6'-0" inside shoulder, and a 10'-0" outside shoulder. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 42'-8" each.

The typical section for the northbound mainline and frontage road off-ramp bridge consists of three 12'-0" traffic lanes to accommodate northbound traffic and one 15'-0" lane to accommodate the off-ramp traffic. The lanes are separated by a varying width gore. A 10'-0" inside shoulder is employed for the mainline traffic and a bicycle lane combined with a raised 10'-0" sidewalk is employed for the frontage road off-ramp. Standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the sidewalk resulting in a bridge width that varies from 93'-8" to 100'-8".

The superstructure of each mainline bridge consists of a two-span flat slab structure with an overall length of approximately 80 feet. A flat slab bridge provides an economical solution while maintaining a shallower superstructure depth compared to a beam bridge. Each span is approximately 40 feet long founded on pile bents. End bents with sloped embankment is anticipated at the beginning and end of bridges. **Table 5-2** contains the structure spans, lengths, and depths of all the structures in Alternative 2.

The superstructure for the northbound and southbound quadrant ramps consists of 36-inch Florida I-beams. The profiles of these bridges are controlled by the proximity to the flyover bridge and therefore can be of greater superstructure depth than the mainlines. Using FIB type beams allows the ramp bridges to be single span and eliminates intermediate piers for ease of construction. Due to the higher profile, however, wrap around MSE walls are anticipated at begin and end of bridges.

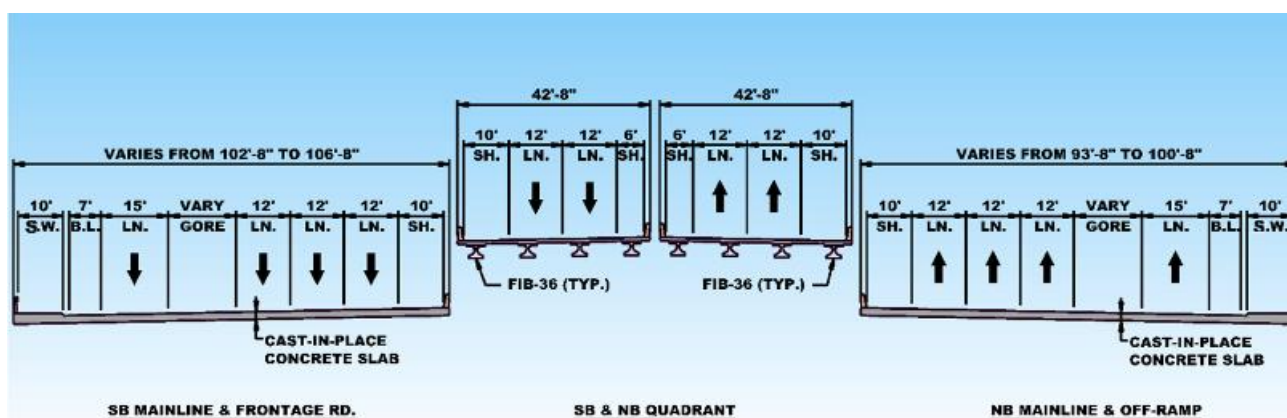


Figure 5-19 US 41 Bridges over Delaney Creek

5.4.4.1.2 Structures over CSX Railroad

Alternative 2 consists of three proposed bridges shown in **Figure 5-20** to span over CSX Railroad, an existing ammonia line, and St. Paul Street. The quadrant roadway bridge will be discussed in the next section. The other two proposed structures accommodate the southbound mainline and northbound mainline.

The typical sections for both the northbound and southbound mainline bridges consist of three 12'-0" traffic lanes and 10'-0" inside and outside shoulders. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 58'-8".

The southern abutment location for the two mainline structures is governed by an assumed CSX ROW which is approximately 84 feet south from the centerline of the existing CSX rails. The northern abutment location is governed by the west frontage road and St. Paul Street. Lastly, the intermediate support location is controlled by crash wall requirements and by a horizontal clearance to allow for a future train track. Preliminary analysis results in total bridge length of approximately 270 feet with a span arrangement of 150 feet – 120 feet. The profiles for the mainline bridges are controlled by the required vertical clearance at CSX which is 23'-6" and St. Paul Street which is 16'-6".

Given the proposed span arrangement, it is anticipated that 72-inch Florida I-Beams will provide an economical solution for the superstructure. Typical end bents with wrap-around MSE walls are proposed at the southern and northern abutments, while hammerhead piers are proposed for the intermediate support.

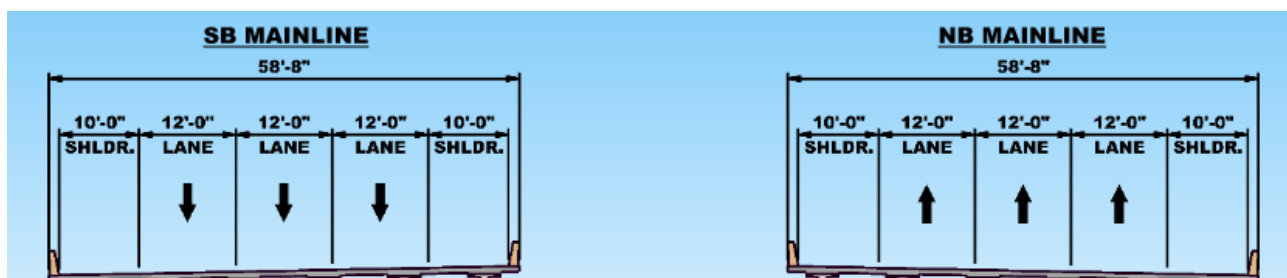


Figure 5-20 US 41 Bridge over CSX Railroad

5.4.4.1.3 Quadrant Structure

Alternative 2 proposes a flyover shown in **Figure 5-21** for the southwest quadrant roadway from the southern study limits of US 41 to Causeway Boulevard east of S. 45th Street. The typical section for this quadrant roadway bridge consists of two 12'-0" traffic lanes in each direction. The northbound lanes have a 10'-0" outside shoulder and a 15'-0" inside shoulder required for stopping sight distance. Similarly, the southbound lanes have a 10'-0" inside shoulder and a 15'-0" outside shoulder required for stopping sight distance. The inside shoulders are separated by a 36" single-slope median barrier and standard 42" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 103'-0".

The bridge is set on a horizontal curve with a radius of 1,111 feet. End bents and intermediate support locations are controlled by vertical clearance over southbound US 41 mainline, southbound frontage road, utilities, span arrangement optimization, and Sagasta Street. This third level structure is a result of the vertical clearance of 16'-6" over southbound US mainline and the 23'-6" vertical clearance of US 41 over CSX.

The superstructure considered is steel plate girders for various units and span arrangements. Preliminary analysis results in total bridge length of approximately 1,420 feet involving a four-span unit and three span unit. Unit 1 results in a span arrangement of 200 feet – 250 feet – 250 feet – 200 feet. while unit 2 results in a span arrangement of 160 feet – 200 feet – 160 feet. Based on the span lengths required for this flyover, the total superstructure depth will be approximately 8'-6". End bents with wrap-around MSE walls are proposed at the begin and end bridge locations, while hammerhead piers are proposed for the intermediate supports.

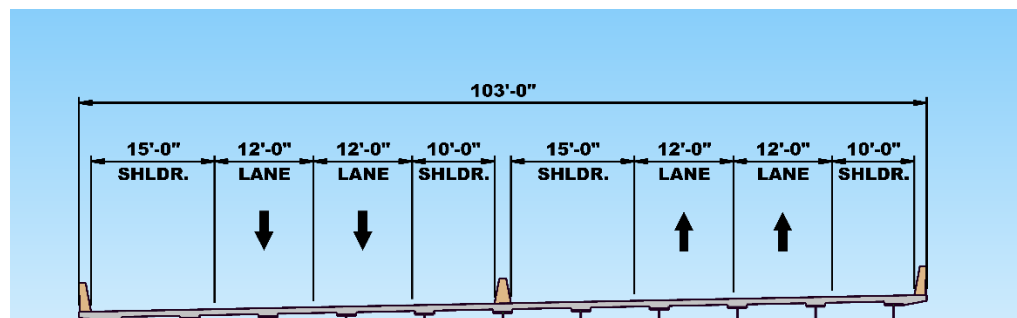


Figure 5-21 Quadrant Roadway Bridge

Table 5-2 Alternative 2 Structures Spans, Length, and Depth

Alternative	Description of Bridge	Span Arrangement	Total Length	Superstructure Depth
2	US 41 over Delaney Creek	80'	80'	1'-9"
2	US 41 NB or SB to Causeway Boulevard over CSX Railroad	150'-120'	270'	7'-0"
2	Quadrant	200'-250'-250'-200' 160'-200'-160'	1,420'	8'-6"

5.4.5 Build Alternative 3 (Diverging Diamond Interchange)

A Diverging Diamond Interchange (DDI) with an east-west oriented which includes a grade-separation of US 41 over the interchange. Causeway Boulevard traffic approaching the interchange will cross over to the left

side, travel through the interchange on the left side, and cross back to the right side after the interchange. This configuration does not allow for northbound or southbound through movements from the ramps. The traffic traveling on the ramps that would like to go north of south would turn onto Causeway Boulevard, travel to the next median opening, make a U-turn, then travel back to US 41 and make a right turn. Due to the heavy traffic volumes and pedestrian activity, the eastbound to southbound right-turn lane was proposed as dual right-turn lanes under signal control.

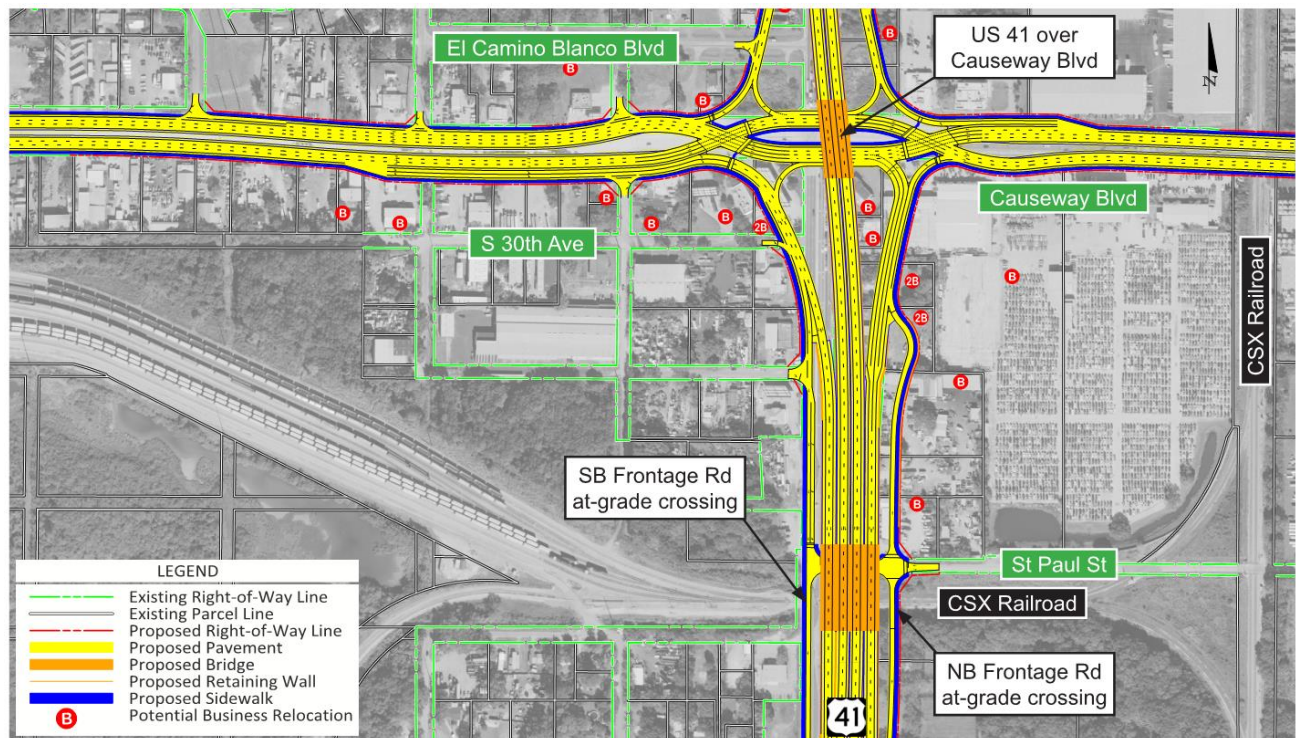


Figure 5-22 Build Alternative 3 (DDI)

Traveling northbound from the southern limits of the project, the first off-ramp would be connection to the northbound frontage road which provides access to 36th Avenue S., St. Paul Street, and connection to the US 41 northbound off-ramp to Causeway Boulevard as well as local driveway connections. By turning left onto St. Paul Street this would allow access to the local streets and driveways south of St. Paul Street on the west side of US 41. The second northbound off-ramp would allow access from US 41 to Causeway Boulevard.

The US 41 section shown in **Figure 5-23** is north of the structures that goes over CSX Railroad, St. Paul Street, and the ammonia pipeline. **Figure 5-24** illustrates the US 41 section north of Causeway Boulevard within the diverging diamond interchange where both the northbound and southbound ramps are two lanes.

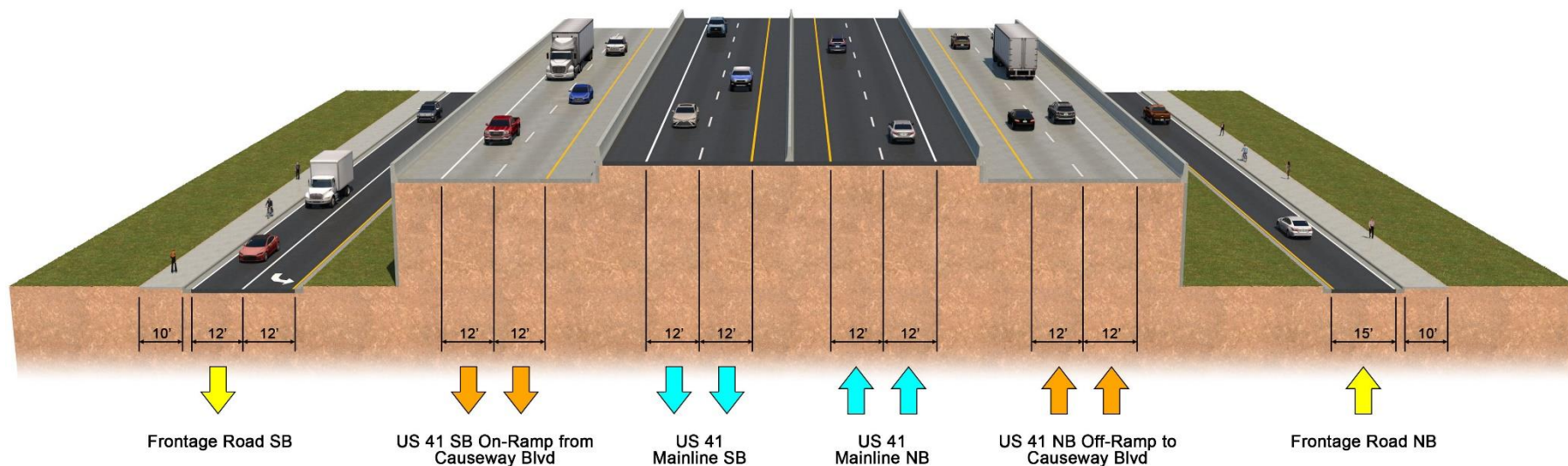


Figure 5-23 Alt 3 Section of US 41 North of CSX Railroad

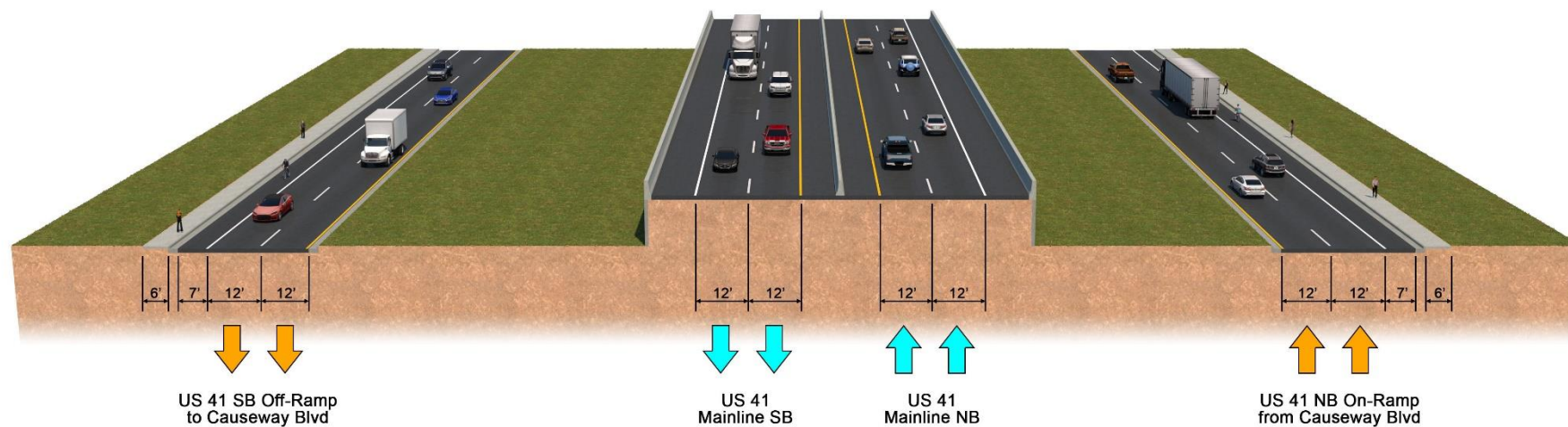


Figure 5-24 Alt 3 Section of US 41 North of Causeway Boulevard

This alternative was developed with the two signals on Causeway Boulevard separated by approximately 600 feet to allow for the cross over movement to operate and minimize potential queuing into the other signalized intersection. **Figure 5-25** shows a typical section of Causeway Boulevard under US 41 where the traffic has crossed over and the bicycle lanes and sidewalks are on the inside.

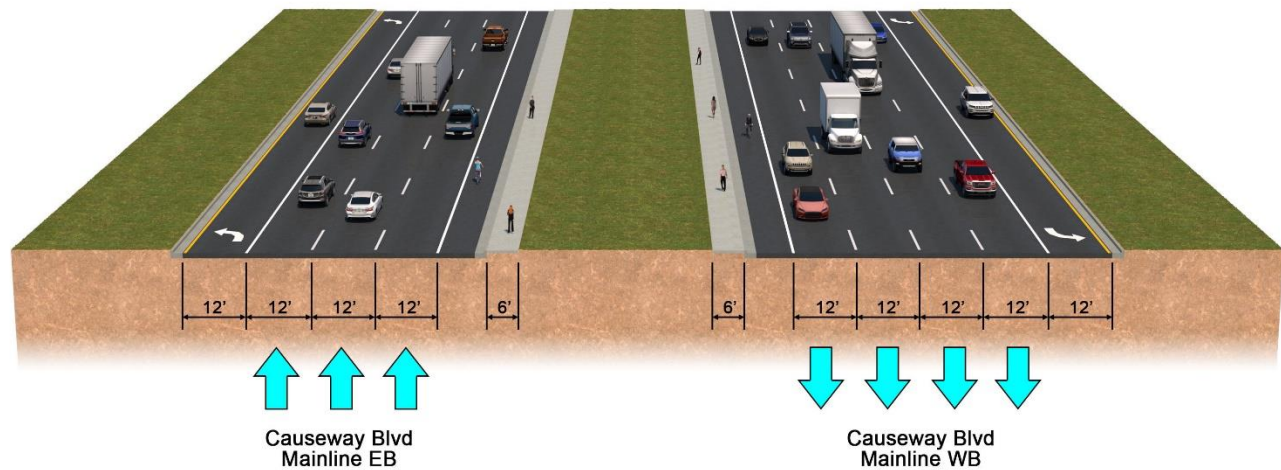


Figure 5-25 Alt 3 Section of Causeway Boulevard West of US 41

5.4.5.1 Structures

5.4.5.1.1 Structures over Delaney Creek

The existing concrete bridge culvert, Bridge Number 100048, is utilized to traverse US 41 over Delaney Creek. This existing bridge culvert was built in 1959 and will be replaced to accommodate proposed alignment configuration due to age and deterioration. There will be three proposed structures shown in **Figure 5-26** at the water crossings to accommodate the southbound mainline and a frontage road on-ramp, northbound mainline and northbound off-ramp, and a northbound frontage road.

The typical section for the southbound mainline and frontage road on-ramp bridge consists of four 12'-0" traffic lanes to accommodate southbound traffic and one 15'-0" lane to accommodate the frontage road traffic. The lanes are separated by a varying width gore. A 6'-0" inside shoulder is employed for the mainline traffic and a designated bicycle lane combined with a raised 10'-0" sidewalk is employed for the frontage road. Standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the sidewalk resulting in a bridge width that varies from 106'-8" to 114'-8".

The typical section of the northbound mainline and northbound off-ramp bridge consists of three 12'-0" traffic lanes to accommodate the northbound traffic and two 12'-0" lanes for the off-ramp traffic. The lanes are separated by a varying width gore. A 6'-0" inside shoulder is employed for the mainline traffic and a 10'-0" outside shoulder is used adjacent to the off-ramp section. Standard 36" single-slope traffic railing barriers are used at the shoulders resulting in a total bridge width that varies from 80'-2" to 86'-2".

The typical section for the frontage road bridge consists of one 15'-0" traffic lane, a 6'-0" inside shoulder, a designated bicycle lane and a raised 10'-0" sidewalk. Standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the sidewalk resulting in a bridge width of 41'-8".

Similar to the flat slab bridges described in Alternative 1, the superstructure of each bridge will consist of two spans, 40 feet long for an overall length of approximately 80 feet. Each span is founded on pile bents with sloped embankment is anticipated at the begin and end of the bridges. **Table 5-3** contains the structure spans, lengths, and depths of all the structures in Alternative 3.

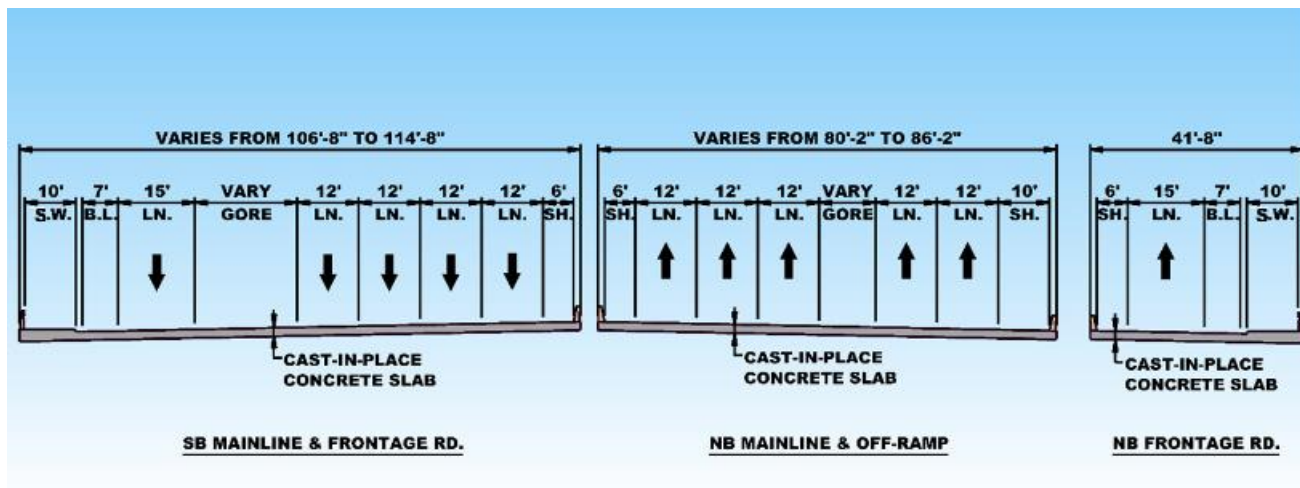


Figure 5-26 US 41 Bridges over Delaney Creek

5.4.5.1.2 Structures over CSX Railroad

Alternative 3 consists of three proposed bridges shown in **Figure 5-27** to span over CSX, an existing ammonia line, and St. Paul Street. These proposed structures accommodate the northbound and southbound mainline, the Causeway Boulevard northbound off-ramp and the southbound on-ramp.

The typical section for the northbound and southbound mainline bridge consists of two 12'-0" traffic lanes in each direction with 6'-0" inside shoulders and 10'-0" outside shoulders separated by a standard 36" single-slope median barrier. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 84'-8".

The typical section for the Causeway Boulevard on- and off-ramp bridges consists of two 12'-0" traffic lanes, a 6'-0" inside shoulder, and a 10'-0" outside shoulder. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 42'-8" each.

Similar to Alternatives 1 and 2, the southern abutment location for all three structures is governed by an assumed CSX ROW which is approximately 84 feet south from the centerline of the existing CSX rails. The northern abutment location is governed by the west frontage road and St. Paul Street. Lastly, the intermediate support location is controlled by crash wall requirements and by a horizontal clearance to allow for a future train track. The total bridge length is therefore the same 270 feet with a span arrangement of 150 feet – 120 feet. The profiles for the bridges are controlled by the required vertical clearance at CSX which is 23'-6" and St. Paul Street which is 16'-6".

Given the proposed span arrangement, it is anticipated that 72-inch Florida I-Beams will provide an economical solution for the superstructure. Typical end bents with wrap-around MSE walls are proposed at the southern and northern abutments, while hammerhead and multicolumn piers are proposed for the intermediate supports.

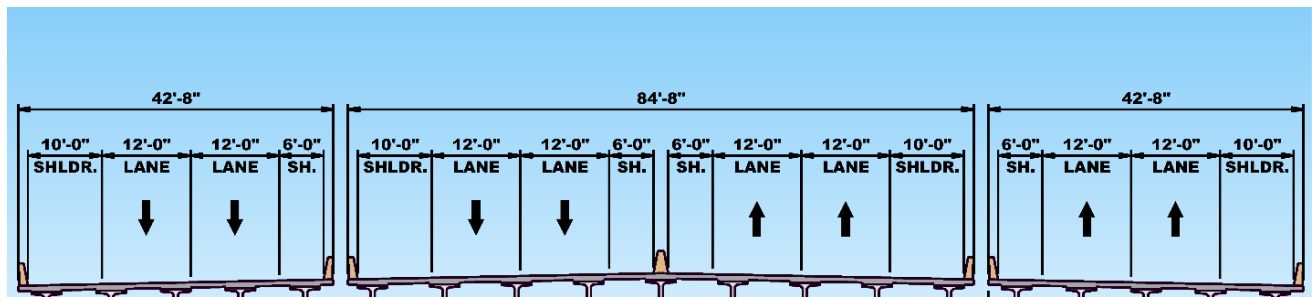


Figure 5-27 US 41 Bridge over CSX Railroad

5.4.5.1.3 Structure over Causeway Boulevard

The diverging diamond interchange with US 41 over Causeway Boulevard will require a two-span bridge. The typical section for this bridge shown in **Figure 5-28** consists of two 12'-0" traffic lanes in each direction with 6'-0" inside shoulders and 10'-0" outside shoulders separated by a standard 36" single-slope median barrier. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 84'-8".

The bridge is set on a reverse horizontal curve alignment with a minimum vertical clearance of 16'-6" over Causeway Boulevard. Begin bridge, intermediate piers, and end bridge locations are controlled by required lateral offset from travel lanes.

Preliminary analysis results in total bridge length of approximately 228 feet with a span arrangement of 120 feet - 108 feet. Given the proposed span arrangement, 54-inch Florida I-Beams provide a cost-effective solution for the superstructure. Typical end bents with wrap-around MSE walls are proposed at the begin and end bridge locations, while a multi-column pier is proposed for the intermediate support.

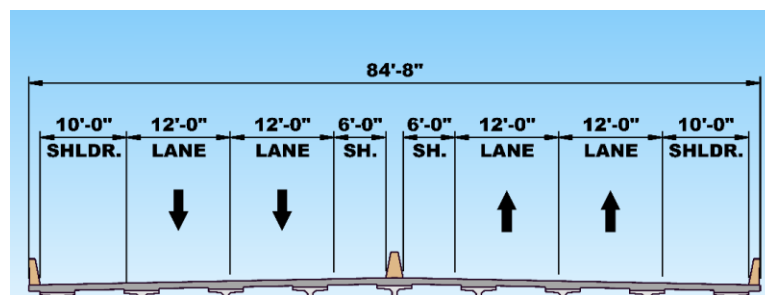


Figure 5-28 US 41 Bridge over Causeway Boulevard

Table 5-3 Alternative 3 Structures Spans, Length, and Depth

Alternative	Description of Bridge	Span Arrangement	Total Length	Superstructure Depth
3	US 41 over Delaney Creek	80'	80'	1'-9"
3	US 41 over Causeway Boulevard	120'-108'	228'	4'-9"
3	US 41 over CSX Railroad	150'-120'	270'	7'-0"
3	US 41 ramps over CSX Railroad	150'-120"	270'	7'-0"

5.4.6 Build Alternative 4 (Single Point Urban Interchange)

A Single Point Urban Interchange (SPUI) with a grade-separation of US 41 over Causeway Boulevard. Opposing left-turns can both turn at the same time in the signalized intersection. Due to the heavy traffic volumes and pedestrian activity, the eastbound to southbound right-turn lane was proposed as dual right-turn lanes under signal control. The SPUI includes through movements from the northbound and southbound ramps to allow access to adjacent parcels via frontage roads or ramps.

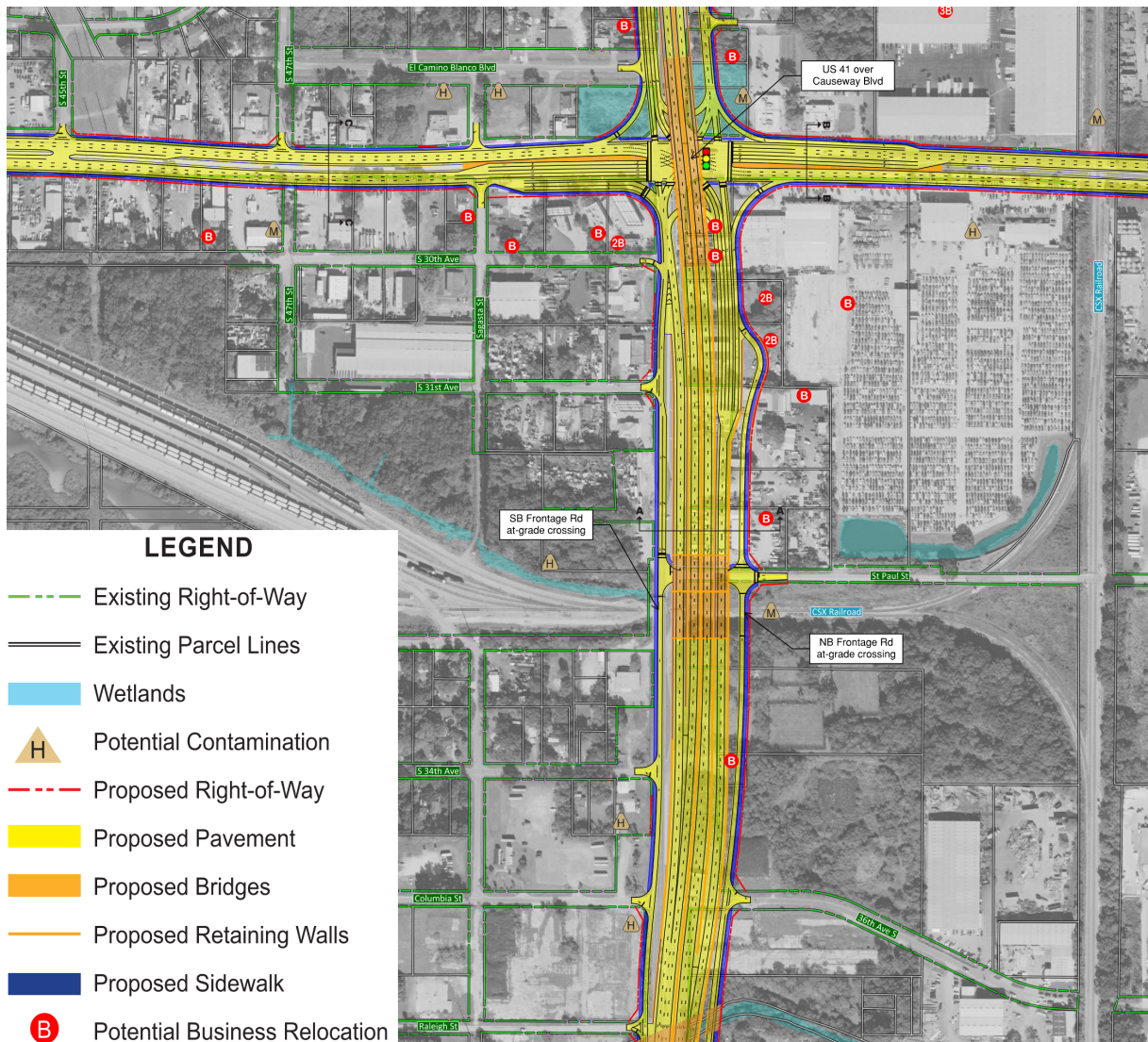


Figure 5-29 Build Alternative 4 (SPUI)

Traveling northbound from the southern limits of the project, the first off-ramp would be connection to the northbound frontage road which provides access to 36th Avenue S., St. Paul Street, and connection to the US 41 northbound off-ramp to Causeway Boulevard as well as local driveway connections. By turning left onto St. Paul Street this would allow access to the local streets and driveways south of St. Paul Street on the west side of US 41. The second northbound off-ramp would allow access from US 41 to Causeway Boulevard.

The US 41 section shown in **Figure 5-30** is north of the structures that goes over CSX Railroad, St. Paul Street, and the ammonia pipeline. **Figure 5-31** illustrates the US 41 section north of Causeway Boulevard within the single point urban interchange where the northbound ramp is two lanes and southbound ramp is four lanes.

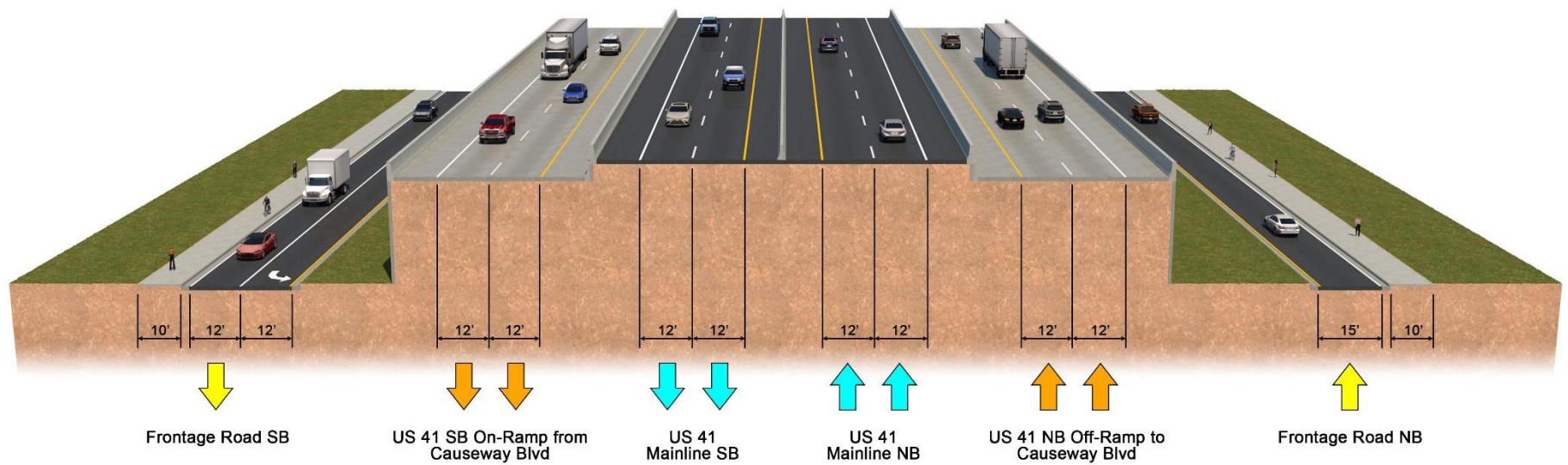


Figure 5-30 Alt 4 Section of US 41 North of CSX Railroad

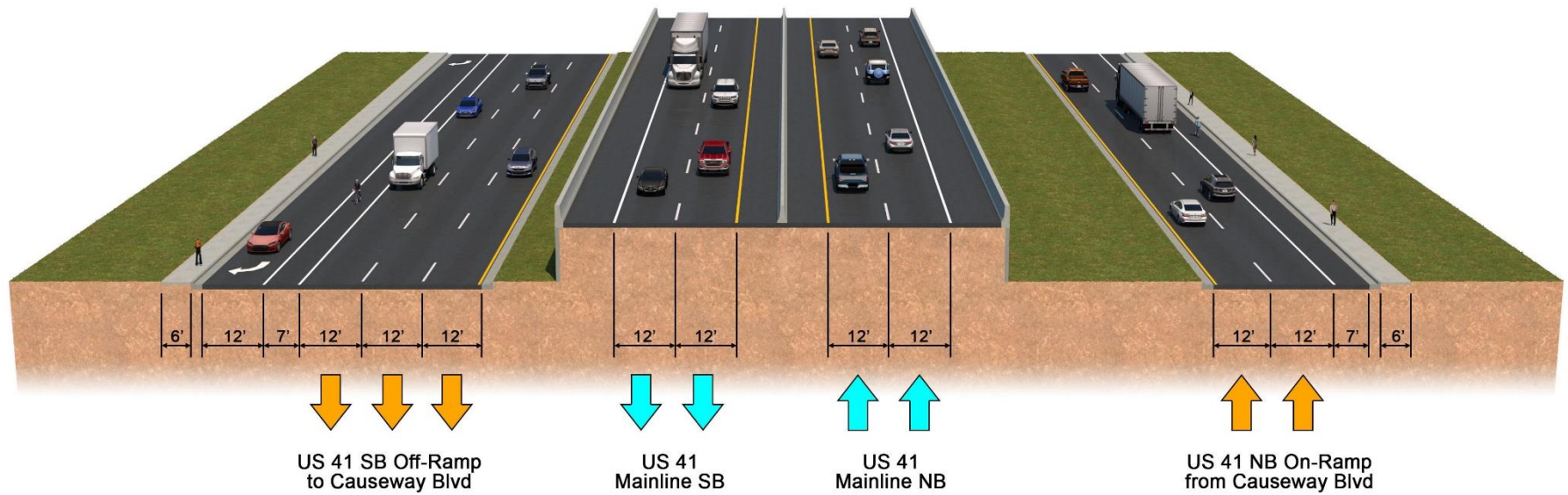


Figure 5-31 Alt 4 Section of US 41 North of Causeway Boulevard

5.4.6.1 Structures

5.4.6.1.1 Structures over Delaney Creek

The existing concrete bridge culvert, Bridge Number 100048, is utilized to traverse US 41 over Delaney Creek. This existing bridge culvert was built in 1959 and will be replaced to accommodate proposed alignment configuration due to age and deterioration. There will be three proposed structures at the water crossings shown in **Figure 5-32** to accommodate the southbound mainline and a frontage road on-ramp, northbound mainline and northbound off-ramp, and a northbound frontage road.

The typical section for the southbound mainline and frontage road on-ramp bridge consists of four 12'-0" traffic lanes to accommodate southbound traffic and one 15'-0" lane to accommodate the frontage road traffic. The lanes are separated by a varying width gore. A 6'-0" inside shoulder is employed for the mainline traffic and a designated bicycle lane combined with a raised 10'-0" sidewalk is employed for the frontage road. Standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the sidewalk resulting in a bridge width that varies from 106'-8" to 114'-8".

The typical section for the northbound mainline and northbound off-ramp bridge consists of three 12'-0" traffic lanes to accommodate the northbound traffic and two 12'-0" lanes for the off-ramp traffic. The lanes are separated by a varying width gore. A 6'-0" inside shoulder is employed for the mainline traffic and a 10'-0" outside shoulder is used adjacent to the off-ramp section. Standard 36" single-slope traffic railing barriers are used at the shoulders resulting in a total bridge width that varies from 80'-2" to 86'-2".

The typical section for the frontage road bridge consists of one 15'-0" traffic lane, a 6'-0" inside shoulder, a designated bicycle lane and a raised 10'-0" sidewalk. Standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the sidewalk resulting in a bridge width of 41'-8".

Similar to the flat slab bridges described in Alternative 1, the superstructure of each bridge will consist of two spans, 40 feet long for an overall length of approximately 80 feet. Each span is founded on pile bents with sloped embankment is anticipated at the begin and end of the bridges. **Table 5-4** contains the structure spans, lengths, and depths of all the structures in Alternative 4.

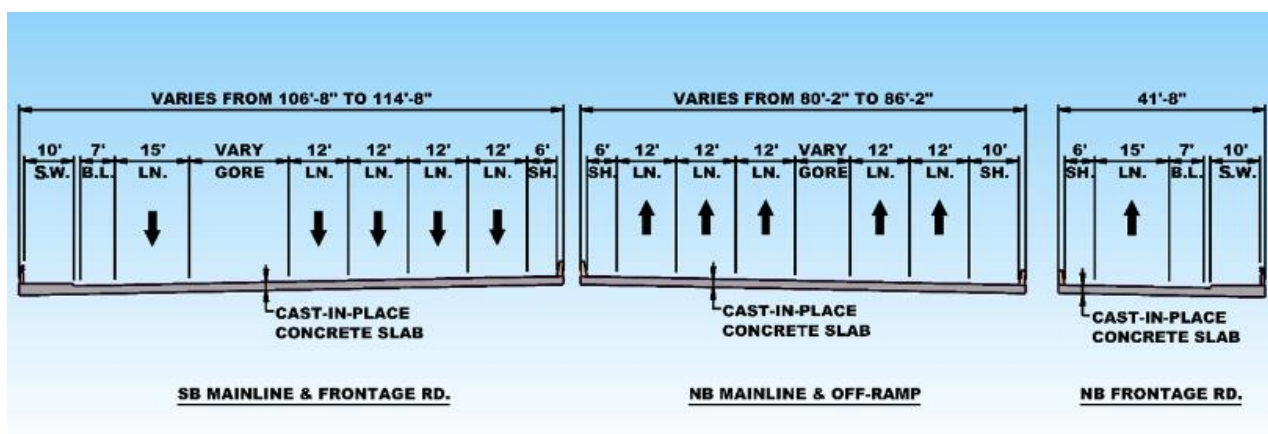


Figure 5-32 US 41 Bridges over Delaney Creek

5.4.6.1.2 Structures over CSX Railroad

Alternative 3 consists of three proposed bridges shown in **Figure 5-33** to span over CSX, an existing ammonia line, and St. Paul Street. These proposed structures accommodate the northbound and southbound mainline, the Causeway Boulevard northbound off-ramp and the southbound on-ramp.

The typical section for the northbound and southbound mainline bridge consists of two 12'-0" traffic lanes in each direction with 6'-0" inside shoulders and 10'-0" outside shoulders separated by a standard 36" single-slope median barrier. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 84'-8".

The typical section for the Causeway Boulevard on- and off-ramp bridges consists of two 12'-0" traffic lanes, a 6'-0" inside shoulder, and a 10'-0" outside shoulder. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 42'-8" each.

Similar to Alternatives 1, 2, and 3, the southern abutment location for all three structures is governed by an assumed CSX ROW which is approximately 84 feet south from the centerline of the existing CSX rails. The northern abutment location is governed by the west frontage road and St. Paul Street. Lastly, the intermediate support location is controlled by crash wall requirements and by a horizontal clearance to allow for a future train track. The total bridge length is therefore the same 270 feet with a span arrangement of 150 feet – 120 feet. The profiles for the bridges are controlled by the required vertical clearance at CSX which is 23'-6" and St. Paul Street which is 16'-6".

Given the proposed span arrangement, it is anticipated that 72-inch Florida I-Beams will provide an economical solution for the superstructure. Typical end bents with wrap-around MSE walls are proposed at the southern and northern abutments, while hammerhead and multicolumn piers are proposed for the intermediate supports.

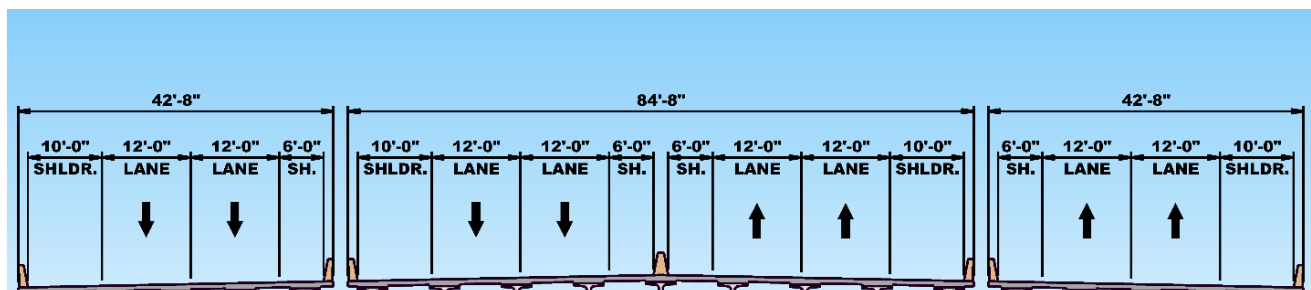


Figure 5-33 US 41 Bridge over CSX Railroad

5.4.6.1.3 Structure over Causeway Boulevard

The single point urban interchange with US 41 over Causeway Boulevard will require a three-span bridge. The typical section for this bridge shown in **Figure 5-34** consists of two 12'-0" traffic lanes in each direction with 6'-0" inside shoulders and 10'-0" outside shoulders separated by a standard 36" single-slope median barrier. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in a total bridge width of 84'-8".

The bridge is set on a reverse horizontal curve alignment with a minimum vertical clearance of 16'-6" over Causeway Boulevard. Begin bridge, intermediate piers, and end bridge locations are controlled by required lateral offset from travel lanes.

Preliminary analysis results in total bridge length of approximately 620 feet with a span arrangement of 190 feet - 240 feet - 190 feet. Given the proposed span arrangement, the superstructure considered is steel plate girders. Based on the span lengths required for this structure, the total superstructure depth will be approximately 7'-6". Typical end bents with wrap-around MSE walls are proposed at the begin and end bridge locations, while a multi-column pier is proposed for the intermediate supports.

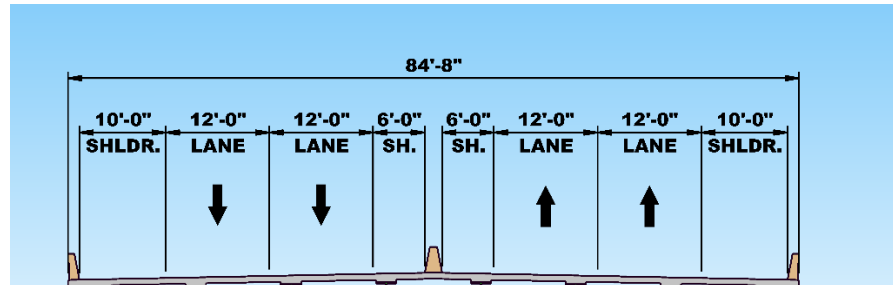


Figure 5-34 US 41 Bridge over Causeway Boulevard

Table 5-4 Alternative 4 Structures Spans, Length, and Depth

Alternative	Description of Bridge	Span Arrangement	Total Length	Superstructure Depth
4	US 41 over Delaney Creek	80'	80'	1'-9"
4	US 41 over Causeway Boulevard		620'	7'-6"
4	US 41 over CSX Railroad	153' – 117'	270'	7'-0"
4	US 41 ramps over CSX Railroad	153' – 117'	270'	7'-0"

5.5 ALTERNATIVES EVALUATION MATRIX

The four initial build alternatives were evaluated based on several elements including cost, impacts to the natural and social environment, cultural resources, and property impacts. The findings are summarized in **Table 5-5** that was displayed at the November 19, 2019, Alternatives Public Workshop.

Table 5-5 Alternatives Public Workshop (November 19, 2019) Evaluation Matrix

Evaluation Criteria	Previously Approved Alternative ¹	Alternative 1	Alternative 2	Alternative 3	Alternative 4
		Flyover	Quadrant	Diverging Diamond (DDI)	Single Point Urban (SPUI)
Potential ROW Effects					
ROW to be acquired for roadway (acres)	11.21	19.1	26.4	23.6	20.7
ROW to be acquired for stormwater facilities (acres)	0.83	7.9	9.7	9.6	11.8
Potential Relocations					
Number of business relocations	9	28	26	38	35
Number of residential relocations	7	0	0	0	0
Potential Environmental Effects					
Archaeological probability / Historical sites identified	None / 0	Moderate / 2	Moderate / 2	Moderate / 2	Moderate / 2
Section 4(f) sites	None	None	None	None	None
Wetlands (acres)	0.00	0.69	0.71	1.94	1.23
Threatened and endangered species likelihood of occurrence	None	Low	Low	Low	Low
Noise sensitive sites within 66 dBA	3	TBD	TBD	TBD	TBD
Petroleum and hazardous material sites (ranked as high / medium)	NQ	11 / 9	10 / 10	11 / 10	11 / 10
Estimated Project Costs (Year 2019 Cost)					
Wetland Mitigation²		\$90,200	\$92,800	\$253,600	\$160,800
ROW acquisition for roadway		\$45,642,100	\$52,281,400	\$68,771,600	\$57,668,000
ROW acquisition for stormwater facilities		TBD	TBD	TBD	TBD
Total ROW Costs		\$45,642,100	\$52,281,400	\$68,771,600	\$57,668,000
Construction cost for roadway		\$97,995,000	\$115,436,000	\$84,526,000	\$85,448,000
Construction cost for stormwater facilities		\$3,961,000	\$4,735,000	\$4,735,000	\$5,634,000
Total Construction Costs		\$101,956,000	\$120,171,000	\$89,261,000	\$91,082,000
Design (10% of Total Construction Cost)		\$10,195,600	\$12,017,100	\$8,926,100	\$9,108,200
Construction Engineering & Inspection (10% of Total Construction Cost)		\$10,195,600	\$12,017,100	\$8,926,100	\$9,108,200
Preliminary Estimate of Total Project Costs		\$168,079,500	\$196,579,400	\$176,138,400	\$167,127,200

1. Impacts taken from 1994 EA/FONSI Evaluation Matrix. The contamination sites were not quantified (NQ). The estimated project costs are not shown.

2. Mitigation cost based on \$130,747 per acre for Fiscal Year 2023/24 from FDOT Work Program Instructions

5.6 PREFERRED ALTERNATIVE

Based on engineering and environmental factors along with public comments received, Alternative 4 (SPUI) was initially suggested as the Preferred Alternative due to a balance of operational improvements and impacts to the human and natural environment as shown in **Table 5-5**.

Following the public workshop, a more focused consideration of the project's intent to improve freight movement through the corridor (i.e., grade separation over the CSX railroad south of Causeway Boulevard and enhancing the NB US 41 to WB Causeway Boulevard and EB Causeway Boulevard to SB US 41 movements) and emphasis on reducing property and access impacts led to the Preferred Alternative being refined.

With the refined Preferred Alternative, the concept proposes the grade separation of US 41 over the CSX Railroad while maintaining the existing mainline lane counts and adds frontage roads and ramps that provide east-west connectivity. The US 41/Causeway Boulevard intersection remains at-grade. The refined concept includes the following changes:

- US 41/Causeway Boulevard intersection is an at-grade intersection.
- The Causeway Boulevard alignment was shifted to the north side from S. 45th Street to US 41.
- The western project limit along Causeway Boulevard was reduced approximately 0.43 miles to the east from the Rockport Terminal entry to S. 45th Street
- The existing US 41/El Camino Blanco Boulevard intersection will be closed, with the eastern end of El Camino Blanco Boulevard made into a cul-de-sac due to the proximity to the US 41/Causeway Boulevard intersection.
- Sagasta Street between El Camino Blanco and Causeway Boulevard will be closed to accommodate the proposed stormwater management ponds.
- The Causeway Boulevard/S. 47th Street intersection will be signalized and a new portion of S. 47th Street will be constructed south of Causeway Boulevard utilizing existing county ROW.
- The NB ramp from St. Paul Street to US 41 was removed.
- A bridge for US 41 over 36th Avenue S. was added.
- A jug-handle roadway was added connecting local access traffic west of US 41 to a re-aligned Hartford Street and US 41 via a new signalized intersection.
- The project limits along US 41 were extended south of Denver Street to tie into the limits of the adjacent on-going Design project segment (WPI Seg. No. 446026-1-52-01) to the south.
- The northern project limit along US 41 was shifted south to north of 23rd Avenue.

The Preferred Alternative is shown in **Figure 5-35** and details of the Preferred Alternative are provided in **Section 7.0** and the concept plan is in **Appendix A**.

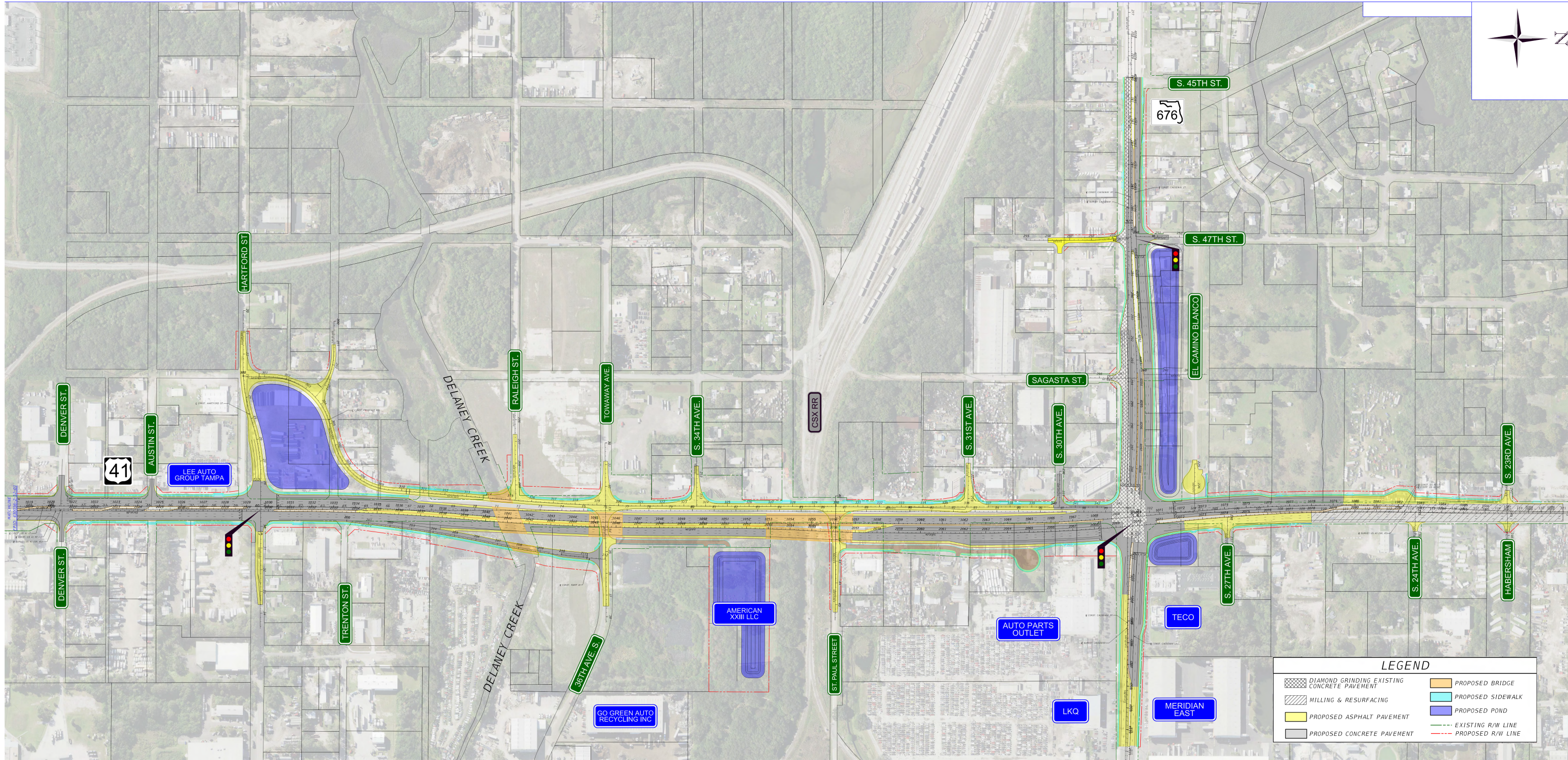


Figure 5-35 Preferred Alternative

5.6.1 Value Engineering

A Value Engineering (VE) study was conducted for the project in October 2019. As documented in the final decision matrix (dated November 22, 2019), recommendations were made for both Causeway Boulevard/US 41 intersection improvements and the US 41 grade separation (bridge) over CSX Railroad crossing #624802A. The Final VE Report and decision matrix are available in the project file.

Two intersection alternatives, Alternative # 1 (tight urban diamond with US 41 over Causeway Boulevard) and Alternative Number 3 (standard diamond interchange overlaid on a DDI footprint) were recommended. Alternative #3 was approved.

Four grade separation bridge alternatives were recommended, including:

- 1) 7A (reducing the proposed bridge length by only spanning over the CSX railroad track and the existing St. Paul Street);
- 2) 7B (reducing the proposed bridge length by only spanning over the CSX railroad track and the existing St. Paul Street, and keeping the existing signalized intersection (as-is) at Causeway Boulevard and US 41;
- 3) 9A (reducing the proposed bridge length by only spanning over the CSX railroad track);
- 4) 9B (reduce proposed bridge length by only spanning over the CSX railroad track and keeping the existing signalized intersection at Causeway Boulevard and US 41.

Bridge Alternative 9A was approved, with Bridge Alternative 7A approved as a second alternative if 9A could not be implemented. For the bridge alternatives, further recommendation was made to not construct a culvert of the existing ammonia line (embankment is acceptable). Both bridge alternatives would require coordination with and acceptance by CSX.

Additional coordination and engineering analysis following the VE Study resulted in the development of the Preferred Alternative, which shows the Causeway Boulevard/US 41 intersection at-grade and US 41 bridging both the CSX railroad track and St. Paul Street.

5.6.2 Crash Mitigation Strategies

The crash mitigation strategies offered in this section are focused on preventing rear end crashes, which are the most common crash type in the study area.

Table 5-6 shows the rear end crash reduction factors for the mitigating strategies suggested for this study.

Table 5-6 Rear End Crash Reduction Factors

Improvement	Total CRF (%)
Modify/close median openings*	6%
Signing and pavement markings*	10%
Add turn lane(s) and pavement resurfacing*	49%

*Source FDOT Crash Reduction Factors CRF.xlsm (2/14/2014)

These countermeasures are found in the FDOT's Crash Reduction Factors Table (2/14/2014) and were developed using five or more projects. The countermeasures above are also likely to be incorporated with the construction of the Preferred Alternative.

The second most common crash type in the study area, sideswipe collisions, is more likely to be corrected by changes in driver behavior rather than roadway improvements.

5.7 TRAFFIC

A traffic analysis was performed consistent with the Florida DOT Traffic Analysis Handbook and the PD&E Manual, using Synchro Version 10.1, Build 2. The traffic analysis for the existing (2018) conditions showed that the intersection of US 41 at Causeway Boulevard operates at LOS F during the AM peak hour and LOS E during the PM peak hour. FDOT's 2012 Generalized Service Volume Tables ("Generalized Tables") were used to determine that all but one roadway segment in the analysis area operate at LOS C based on peak hour volumes. Westbound Causeway Boulevard west of US 41 operates at LOS F during the AM peak hour.

The Tampa Bay Regional Planning Model (TBRPM) Version 8.2 was utilized in the development of future year annual average daily traffic (AADT). The National Cooperative Highway Research Program (NCHRP) Report 765 ratio and difference methods were used to process the model results. Linear growth rates developed from the NCHRP procedure were applied to the 2018 AADT to develop opening (2026), interim (2036), and design (2046) year AADT. Directional design hour volumes (DDHV) and design hour turning movement volumes (DHTMV) for future years were developed using existing traffic design characteristics and turning movement percentages.

A more thorough discussion, including a full methodology discussion and comparative analyses of roadway geometry, signal timing, access management, roadway segment analysis, intersection operational analysis, Design year queuing analysis for the No-Build Alternative and each of the four original Build Alternatives 1-4 (discussed previously in Sections 5.2 and 5.4) can be found in the *Project Traffic Analysis Report* (October 2019) available in the project file.

5.7.1 Preferred Alternative

The additional methodology and comparative analysis for the Preferred Alternative is provided in the *Project Traffic Analysis Report Supplement* (March 2023), also available in the project file.

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for the Preferred Alternative for opening, interim, and design years are presented in **Table 5-7**. The signalized intersections of US 41 at Hartford Street, US 41 at Causeway Boulevard, and Causeway Boulevard at S. 47th Street were evaluated.

The results indicate:

- For the opening year (2026):
 - During the AM peak hour:
 - US 41 at Hartford Street is expected to operate at overall LOS C with several movements at LOS F or E.

- US 41 at Causeway Boulevard is expected to operate at overall LOS F with several movements at LOS F or E.
 - Causeway Boulevard at S. 47th Street is expected to operate at overall LOS E with several movements at LOS F or E.
- During the PM peak hour:
 - US 41 at Hartford Street is expected to operate at overall LOS C with one movement at LOS E.
 - US 41 at Causeway Boulevard is expected to operate at overall LOS E with several movements at LOS F or E.
 - Causeway Boulevard at S. 47th Street is expected to operate at overall LOS D with several movements at LOS E.
- For the interim year (2036):
 - During the AM peak hour:
 - US 41 at Hartford Street is expected to operate at overall LOS F with several movements at LOS F or E.
 - US 41 at Causeway Boulevard is expected to operate at overall LOS F with several movements at LOS F or E.
 - Causeway Boulevard at S. 47th Street is expected to operate at overall LOS F with several movements at LOS F or E.
 - During the PM peak hour:
 - US 41 at Hartford Street is expected to operate at overall LOS F with several movements at LOS F or E.
 - US 41 at Causeway Boulevard is expected to operate at overall LOS F with several movements at LOS F or E.
 - Causeway Boulevard at S. 47th Street is expected to operate at overall LOS F with several movements at LOS F or E.
- For the design year (2046):
 - During the AM peak hour:
 - US 41 at Hartford Street is expected to operate at overall LOS F with several movements at LOS F or E.
 - US 41 at Causeway Boulevard is expected to operate at overall LOS F with several movements at LOS F or E.
 - Causeway Boulevard at S. 47th Street is expected to operate at overall LOS F with several movements at LOS F or E.
 - During the PM peak hour:
 - US 41 at Hartford Street is expected to operate at overall LOS F with several movements at LOS F or E.
 - US 41 at Causeway Boulevard is expected to operate at overall LOS F with several movements at LOS F or E.
 - Causeway Boulevard at S. 47th Street is expected to operate at overall LOS F with several movements at LOS F or E.

Although the Preferred Alternative is expected to operate at LOS F during the AM and PM peak hours in the design year, it has less delay (approximately 130 seconds/vehicle less) at the US 41 at Causeway Boulevard intersection than the no-build alternative.

The lane configurations for the Preferred Alternative are included in **Figure 5-36**. The Preferred Alternative queue lengths shown in **Table 5-9** were generated using Synchro 95th percentile queues for the design year.

Table 5-7 Preferred Alternative 2026, 2036, and 2046 Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		Volume (vph)		AM Peak Hour		PM Peak Hour		Volume (vph)		AM Peak Hour		PM Peak Hour		Volume (vph)		AM Peak Hour		PM Peak Hour	
		AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
US 41 at Hartford St (Signalized)	EBL	26	52	65.5	E	47.5	D	32	66	69.2	E	58	E	39	80	75.5	E	59.7	E
	EBT	17	72	47.3	D	41.1	D	22	91	45.5	D	47.7	D	26	111	44.5	D	46.7	D
	EBR	9	17	47.1	D	39.2	D	11	22	45.3	D	45.3	D	13	27	44.2	D	44.0	D
	EB Approach	52	141	56.3	E	43.2	D	65	179	57.1	E	51.2	D	78	218	59.9	E	51.1	D
	WBL	67	50	50.9	D	44.8	D	83	50	49.8	D	52.7	D	100	50	49.5	D	52.1	D
	WBT	25	23	59.9	A	43.2	A	32	28	64.8	A	50.3	A	38	34	73.3	A	49.4	A
	WBR	174	75		E		D	218	95		E		D	262	116		E		D
	WB Approach	266	148	57.6	E	43.7	D	333	173	61.1	E	51	D	400	200	67.4	E	50.1	D
	NBL	32	6	86.4	F	73.1	E	40	8	90.5	F	81.1	F	48	9	90.0	F	82.3	F
	NBT	2,915	1,105	36.5	D	14.2	B	3,586	1,358	149.9	F	19.3	B	4,257	1,607	290.4	F	27.2	C
	NBR	84	50	46.3	D	14.9	B	105	63	161.1	F	20.3	C	126	77	302.8	F	29.4	C
	NB Approach	3,031	1,161	40.5	D	14.7	B	3,731	1,429	153.2	F	20	B	4,431	1,693	292.6	F	28.2	C
	SBL	32	137	86.4	F	53.9	D	40	174	102.6	F	64.2	E	48	212	115.5	F	76.2	E
	SBT	1,200	2,797	12.0	B	21.9	C	1,501	3,572	16.9	B	97.1	F	1,803	4,341	22.8	C	233.7	F
	SBR	56	38	9.1	A	6.6	A	70	48	11.7	B	7.5	A	84	59	14.2	B	9	A
	SB Approach	1,288	2,972	13.7	B	23.1	C	1,611	3,794	18.8	B	94.5	F	1,935	4,612	24.7	C	223.6	F
	OVERALL	4,637	4,422	34.2	C	22.3	C	5,740	5,575	109.0	F	72.7	E	6,844	6,723	201	F	163.6	F
US 41 at Causeway Blvd (Signalized)	EBL	66	61	130.1	F	111.9	F	91	84	197.0	F	119.4	F	114	106	285.6	F	161.1	F
	EBT	403	947	61.5	E	145.0	F	549	1,290	66.6	E	323.3	F	693	1,631	75	E	502.8	F
	EBR	485	1,543	20.6	C	79.3	E	660	2,104	22.1	C	234.1	F	835	2,660	23.9	C	397.9	F
	EB Approach	954	2,551	45.4	D	104.5	F	1,300	3,478	53.2	D	264.4	F	1,642	4,397	63.6	E	431.1	F
	WBL	77	117	149.7	F	115.7	F	101	152	223.1	F	167.1	F	124	188	320.8	F	252.5	F
	WBT	1,102	528	219.0	F	59.7	E	1,441	693	397.4	F	68.9	E	1,782	857	579.1	F	92.4	F
	WBR	242	256	50.5	D	42.7	D	317	336	53.2	D	45.5	D	391	414	57	E	48	D
	WB Approach	1,421	901	186.5	F	62.1	E	1,859	1,181	329.2	F	74.9	E	2,297	1,459	476.2	F	100.4	F
	NBL	1,644	480	136.7	F	66.5	E	2,025	591	251.0	F	69.6	E	2,406	702	368.8	F	74.2	E
	NBT	1,397	628	42.9	D	37.9	D	1,719	774	52.4	D	41.8	D	2,043	919	85.6	F	46.3	D
	NBR	74	124	27.7	C	30.8	C	92	154	29.6	C	33.7	C	109	182	31.6	C	36.8	D
	NB Approach	3,115	1,232	92.0	F	48.3	D	3,836	1,519	156.7	F	51.8	D	4,558	1,803	233.8	F	56.2	E
	SBL	240	306	99.2	F	89.8	F	281	358	97.8	F	88.7	F	323	411	97.2	F	88.5	F
	SBT	726	1,312	69.7	E	64.4	E	850	1,538	74.2	E	89.5	F	976	1,764	82.7	F	146.9	F
	SBR	84	31	56.7	E	38.9	D	98	36	57.5	E	38.3	D	112	41	58.5	E	38.6	D
	SB Approach	1,050	1,649	75.4	E	68.6	E	1,229	1,932	78.3	E	88.4	F	1,411	2,216	84.1	F	134.1	F
	OVERALL	6,540	6,333	103.1	F	78.2	E	8,224	8,110	167.6	F	155.1	F	9,908	9,875	240.5	F	247.1	F

Table 5-8 Preferred Alternative 2026, 2036, and 2046 Intersection Operations (Continued)

Intersection	Movement/Approach	2026						2036						2046					
		Volume (vph)		AM Peak Hour		PM Peak Hour		Volume (vph)		AM Peak Hour		PM Peak Hour		Volume (vph)		AM Peak Hour		PM Peak Hour	
		AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	AM	PM	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Causeway Blvd at 47th St (Signalized)	EBL	3	10	60.7	E	66.4	E	3	13	61.4	E	69.6	E	4	15	62.7	E	72.6	E
	EBT	912	2,469	6.3	A	47.8	D	1,247	3,375	8.5	A	211.6	F	1,578	4,272	12.3	B	397.2	F
	EBR	11	8	6.2	A	47.5	D	14	10	8.4	A	212.0	F	17	12	12.2	B	397.9	F
	EB Approach	926	2,487	6.4	A	47.7	D	1,264	3,398	8.6	A	211.3	F	1,599	4,299	12.4	B	396.4	F
	WBL	34	13	83.8	F	68.1	E	43	17	89.1	F	72.1	E	52	20	90.7	F	76.3	E
	WBT	2,781	1,018	83.6	F	7.5	A	3,503	1,293	221.0	F	9.9	A	4,226	1,568	365.3	F	13.4	B
	WBR	15	8	4.0	A	4.8	A	18	10	4.3	A	5.4	A	22	12	4.7	A	6.1	A
	WB Approach	2,830	1,039	83.2	F	8.3	A	3,564	1,320	218.3	F	10.6	B	4,300	1,600	360.1	F	14.1	B
	NBL	22	19	63.5	E	64.3	E	27	24	63.5	E	64.5	E	33	29	63.6	E	64.7	E
	NBT	3	3		A		A	3	3		A		A	4	4		A		A
	NBR	30	69		A		A	38	87		A		A	46	106		A		A
	NB Approach	55	91	63.5	E	64.3	E	68	114	63.5	E	64.5	E	83	139	63.6	E	64.7	E
	SBL	12	13	59.6	E	57.5	E	15	16	59.3	E	56.8	E	18	19	58.9	E	56.0	E
	SBT	3	3		A		A	3	3		A		A	4	4		A		A
	SBR	8	3		A		A	11	4		A		A	13	5		A		A
	SB Approach	23	19	59.6	E	57.5	E	29	23	59.3	E	56.8	E	35	28	58.9	E	56.0	E
	OVERALL	3,834	3,636	64.2	E	36.9	D	4,925	4,855	161.4	F	152.5	F	6,017	6,066	261.9	F	286.4	F

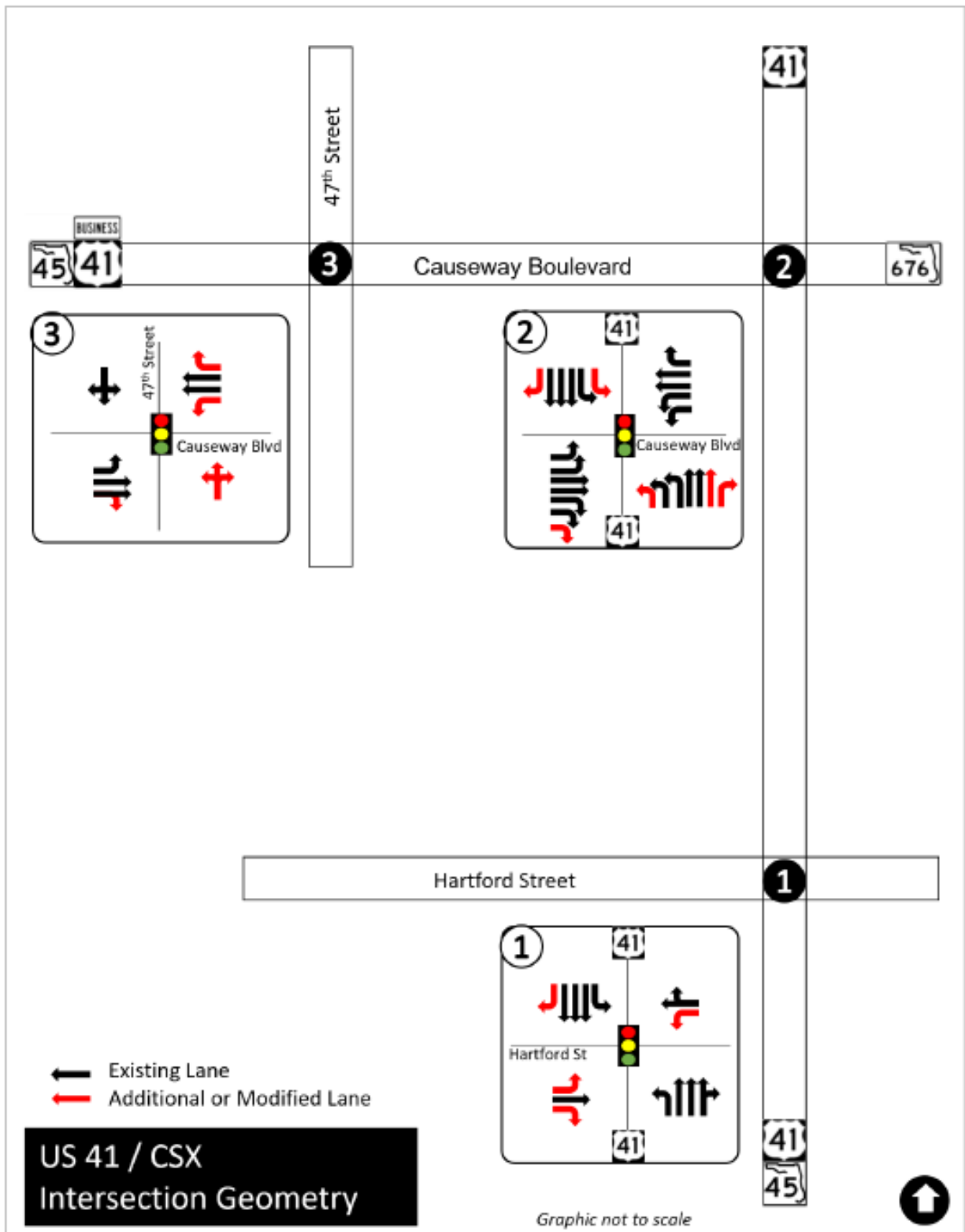


Figure 5-36 Preferred Alternative Lane Configurations

Table 5-9 Preferred Alternative Design Year (2046) 95th Percentile Queues

Intersection	Movement/ Approach	Synchro 95th Percentile Queue (ft.)						Recommended Storage (ft)
		2026		2036		2046		
		AM	PM	AM	PM	AM	PM	
US 41 at Hartford St (Signalized)	EBL	53	77	65	104	82	127	200
	EBT	37	95	44	129	49	152	
	EBR	0	0	0	0	0	0	200
	EB Approach	-	-	-	-	-	-	-
	WBL	106	74	123	81	146	82	200
	WBT	206	65	271	82	346	102	
	WBR							
	WB Approach	-	-	-	-	-	-	-
	NBL	68	18	83	25	97	27	290
	NBT	#1239	247	#1897	381	#2429	509	
	NBR							
	NB Approach	-	-	-	-	-	-	-
	SBL	#74	156	#105	218	#132	#293	360
	SBT	252	#883	408	#1468	540	#2054	
	SBR	9	0	19	4	27	9	595
	SB Approach	-	-	-	-	-	-	-
	OVERALL	-	-	-	-	-	-	-
US 41 at Causeway Blvd (Signalized)	EBL	#92	69	#137	#105	#176	#143	580
	EBT	298	#868	416	#1331	543	#1787	
	EBR	150	#899	211	#1550	280	#2156	715
	EB Approach	-	-	-	-	-	-	-
	WBL	#112	#137	#153	#191	#193	#246	520
	WBT	#1123	374	#1602	510	#2080	#718	
	WBR	182	209	269	297	372	402	330
	WB Approach	-	-	-	-	-	-	-
	NBL	#986	234	#1344	290	#1698	349	940
	NBT	638	259	#927	332	#1243	404	
	NBR	33	83	53	116	71	149	600
	NB Approach	-	-	-	-	-	-	-
	SBL	205	237	232	272	266	313	680
	SBT	375	633	447	#843	#527	#1052	
	SBR	15	0	32	0	48	1	395
	SB Approach	-	-	-	-	-	-	-
	OVERALL	-	-	-	-	-	-	-

95th percentile volume exceeds capacity, queue may be longer.

Table 5-10 Preferred Alternative Design Year (2046) 95th Percentile Queues (Continued)

Intersection	Movement/ Approach	Synchro 95th Percentile Queue (ft.)						Recommended Storage (ft)
		2026		2036		2046		
		AM	PM	AM	PM	AM	PM	
Causeway Blvd at 47th St (Signalized)	EBL	14	31	14	38	17	42	335
	EBT	246	#1564	410	#2559	675	#3585	0
	EBR							
	EB Approach	-	-	-	-	-	-	-
	WBL	65	35	78	42	91	48	335
	WBT	#1754	233	#2491	367	#3277	568	0
	WBR	0	0	0	0	0	0	0
	WB Approach	-	-	-	-	-	-	-
	NBL	68	85	78	116	101	150	0
	NBT							
	NBR							
	NB Approach	-	-	-	-	-	-	-
	SBL	43	41	49	47	55	53	0
	SBT							
	SBR							
	SB Approach	-	-	-	-	-	-	-
OVERALL	-	-	-	-	-	-	-	

95th percentile volume exceeds capacity, queue may be longer.

5.7.2 User Delay Cost

User delay costs for each alternative were also calculated. Weighted delay was calculated using the flow rate for the equivalent No-Build movements and the total delay for that flow rate from Synchro outputs. **Table 5-11** summarizes the user costs by year and peak hour for each alternative. User costs were calculated using a cost per vehicle per hour of delay of \$20.17 for personal vehicles and \$55.24 for commercial vehicles (source: 2021 Texas A&M Transportation Institute Urban Mobility Report).

Table 5-11 User Delay Costs by Year and Peak Hour

Alternative	User Cost Metrics	2026		2036		2046	
		AM	PM	AM	PM	AM	PM
No Build	Intersection Delay (s/veh)	162.1	119.5	264.0	231.1	373.0	370.1
	Vehicles per hour	6,843	6,570	8,561	8,359	10,276	10,139
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	\$9,262	\$6,555	\$18,871	\$16,129	\$32,003	\$31,331
Build Alternative 1	Intersection Delay (s/veh)	39.0	69.0	39.1	121.0	46.7	189.9
	Vehicles per hour	3,661	5,466	4,656	7,001	5,648	8,529
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	\$1,192	\$3,149	\$1,520	\$7,073	\$2,202	\$13,523
Build Alternative 2	Intersection Delay (s/veh)	33.9	33.9	47.2	38.3	82.2	47.1
	Vehicles per hour	8,019	6,492	10,077	8,220	12,131	9,942
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	\$2,269	\$1,840	\$3,969	\$2,630	\$8,326	\$3,909
Build Alternative 3	Intersection Delay (s/veh)	6.8	6.9	9.3	10.7	16.0	20.9
	Vehicles per hour	13,032	10,538	16,558	13,870	20,123	17,114
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	\$743	\$610	\$1,290	\$1,244	\$2,688	\$2,984
Build Alternative 4	Intersection Delay (s/veh)	44.0	33.9	68.5	58.1	122.0	102.7
	Vehicles per hour	4,627	4,577	5,887	5,993	7,144	7,401
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	\$1,700	\$1,296	\$3,367	\$2,907	\$7,277	\$6,346
Preferred Alternative	Intersection Delay (s/veh)	103.1	78.2	167.6	155.1	240.5	247.1
	Vehicles per Hour	6,540	6,333	8,224	8,110	9,908	9,875
	Percent Heavy Vehicles	7%	7%	7%	7%	7%	7%
	User Cost per hour	\$4,238	\$3,112	\$8,663	\$7,903	\$14,975	\$15,338

These costs were used to develop a total peak hour project user delay cost from 2026 to 2046 for each alternative. The total project peak hour delay costs are summarized in **Table 5-12**.

Table 5-12 Total Project User Delay Cost (2026 to 2046)

Total Peak Hour Delay Cost			
Alternative	AM Peak Hour	PM Peak Hour	Total
No Build	\$102,708,953	\$91,188,964	\$193,897,917
Alternative 1	\$8,364,850	\$40,064,249	\$48,429,099
Alternative 2	\$24,091,909	\$14,310,952	\$38,402,861
Alternative 3	\$7,813,304	\$7,905,272	\$15,718,576
Alternative 4	\$20,424,495	\$17,493,308	\$37,917,803
Preferred Alternative	\$47,500,535	\$44,533,399	\$92,033,933

6.0 PUBLIC INVOLVEMENT

The public and interested/permitting agencies have been informed through various coordination including meetings, newsletters, and a project website (<https://active.fdotd7studies.com/us41/csx-to-sr676/>). A *Comments and Coordination Report* (October 2023) was developed to document the public and agency coordination during the project's development.

Project coordination for the current re-evaluation effort began in March 2018. The Advance Notification (AN) package was submitted to federal, state, and local agencies on August 10, 2018 through the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST). The AN provided the Environmental Technical Advisory Team (ETAT) the opportunity to review the project and provide comments. Although the project was not screened in ETDM under the previous NEPA study, a decision was made for the study by the Federal Highway Administration (FHWA) that the AN package would be reviewed under ETDM project #14345.

A Public Involvement Plan (PIP) was approved for the project on September 25, 2018. Project kick-off notification e-mails were sent to elected officials on September 26, 2018. A project kick-off newsletter was placed on the study website and sent to adjacent property owners and interested parties on September 28, 2018.

Throughout the project, the project team and FDOT District Seven (D7) met with the below stakeholders:

Table 6-1 Stakeholder Meetings

March 7, 2018	Presentation of 3 alternatives to Port Tampa Bay, Hillsborough County, local utility representatives
October 16, 2019	Presentation of 4 alternatives to Port Tampa Bay staff
March 12, 2020	Reviewed project and proposed drainage/stormwater management criteria/approach for the previously recommended alternative with Southwest Florida Water Management District (SWFWMD)
November 19, 2020	Reviewed project and proposed drainage/stormwater management criteria/approach for the current Preferred Alternative with SWFWMD.
October 3, 2021	Reviewed revised project concept (current Preferred Alternative) with CSX Railroad staff.
November 18, 2022	Met with Hillsborough County to discuss the County's preferences/desires for Intelligent Transportation Systems facilities/configuration associated with the Preferred Alternative.
December 1, 2022	Drainage/Environmental Resource Permit preapplication meeting with SWFWMD to discuss Preferred Alternative's drainage/stormwater management approach and anticipated impacts to and mitigation for environmental resources (wetlands and protected species)
December 14, 2022	FDEP coordination meeting to discuss updates to the project concept plans and SWFWMD treatments for the proposed impervious area.
March 29, 2023	Reviewed revised project concept (current Preferred Alternative) with CSX Railroad staff.

The project team and FDOT D7 also provided project updates to the following public agencies:

Table 6-2 Public Agencies Meetings

September 11, 2019	Hillsborough TPO Citizens Advisory Committee (CAC)
September 11, 2019	Hillsborough TPO Bicycle Pedestrian Advisory (BPAC) Committee
September 16, 2019	Hillsborough TPO Technical Advisory (TAC) Committee
September 18, 2019	Hillsborough Metropolitan Planning Organization (MPO) Livable Roadways Committee (LRC)
October 17, 2019	Pre-workshop presentation of 4 alternatives to Hillsborough County staff
April 6, 2023	Hillsborough County Pre-Hearing Meeting
April 19, 2023	Hillsborough County TPO LRC
April 26, 2023	Hillsborough County TPO BPAC
May 1, 2023	Hillsborough County TPO TAC
May 10, 2023	Hillsborough County TPO Board Meeting
June 7, 2023	Hillsborough County TPO CAC

The presentations and summaries from these meetings are available in the Comments and Coordination Report

An agency kick-off meeting was held on December 7, 2018, where three (3) project alternatives were presented to ten agency representatives. Topics discussed included local context classification, review of bicyclist/pedestrian accidents and fatalities, the need for enhanced bicyclist/pedestrian amenities, roadway design speeds relative to bicyclist/pedestrian safety concerns, potential utility conflicts and the list of interested property owners.

The Alternatives Public Workshop was held on Tuesday, November 19, 2019, at Port Tampa Bay, Terminal 6, 1101 Channelside Drive, Tampa, Florida 33619, at 5:30 p.m. The purpose of the workshop was to provide an opportunity for the public to provide comments regarding the location and conceptual design of the potential improvements (Alternatives 1-4) to Causeway Boulevard and US 41 within the project limits. Twenty-five (25) members of the public and 24 FDOT and project team representatives signed in at the workshop. Three comments were received during the meeting and four were received during the 10-day comment period (ending November 29, 2019). Comments received generally addressed: access to specific properties; truck routes for local businesses and north-south routes through the project corridor; u-turns and directional movements for large trucks; ROW impacts to specific properties; project drainage/stormwater management and pond site location; maintaining connectivity for vehicles, bicyclists and pedestrians across Causeway Boulevard and US 41; local roadway/side street maintenance and connectivity to Causeway Boulevard and US 41.

An in-person public hearing was held on June 1, 2023, from 5:30 pm to 7:30 pm at Port Tampa Bay Terminal 6, 1331 McKay St, Tampa, Florida 33602. A virtual (internet-based) hearing was held concurrently with the in-person event. Ten members of the public signed in at the hearing venue, while five people signed into the virtual hearing component. Twenty-four FDOT staff and project team representatives participated. No written comments were received at the in-person public hearing, by mail, or electronically during the public comment period, which was open until June 15, 2023. On the virtual platform, two attendees had questions regarding ROW acquisition; however, no formal comments were received.

A more detailed summary of the project's public involvement efforts is provided in the *Comments and Coordination Report* (October 2023).

7.0 DETAILS OF THE PREFERRED ALTERNATIVE

This section includes a description of design features of the Preferred Alternative. See **Section 5.6** for details on the selection of the Preferred Alternative. The Preferred Alternative conceptual design plans are included in **Appendix A** and the approved typical section package is included in **Appendix B**.

7.1 ENGINEERING DETAILS OF THE PREFERRED ALTERNATIVE

7.1.1 Typical Sections

There are multiple typical sections throughout the project limits.

The proposed typical section for Causeway Boulevard from S. 45th Street to west of the CSX railroad crossing widens the existing 4-lane divided urban section to include 7-foot buffered bicycle lanes, curb and gutter, and 6-foot sidewalks along the outside. Two barrier-separated left turn lanes and three right turn lanes to US 41 are proposed for the eastbound direction and no changes in turn lanes to US 41 in the westbound direction. Concrete pavement will be used where appropriate. The proposed improvements will require the acquisition of ROW varying from 10 to 37 feet along the north side only. See **Figure 7-1** for details.

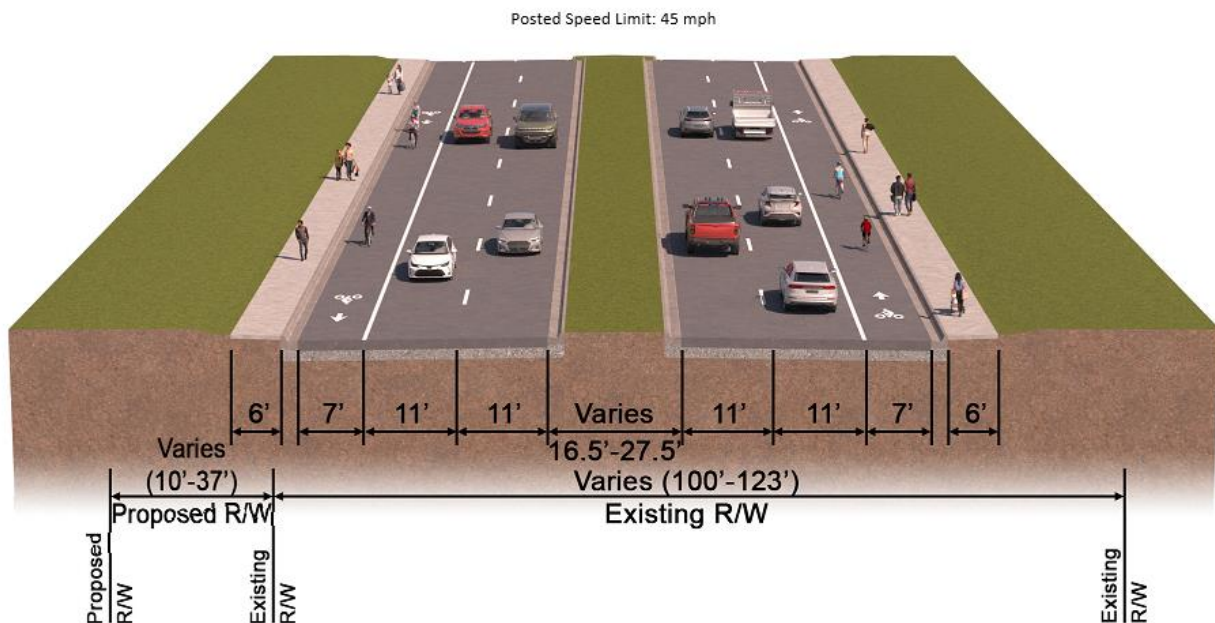


Figure 7-1 SR 676 (Causeway Blvd.) from S. 45th Street to E. of US 41

There are three typical sections for US 41, including at-grade, elevated and bridge sections. The proposed at-grade improvements along US 41 from just south of Denver Street to north of Trenton Street and from south of Causeway Boulevard to north of Causeway Boulevard, include reconstructing US 41 with concrete pavement to accommodate a 6-lane divided urban curbed section with 12-foot lanes, 7-foot buffered bicycle lanes, curb and gutter, and 10-foot sidewalks on both sides. The median width varies from 16.5 to 36 feet to provide turn lanes. The proposed at-grade improvements along US 41 will require the acquisition of ROW varying from 30 to 90 feet. See **Figure 7-2** for details.

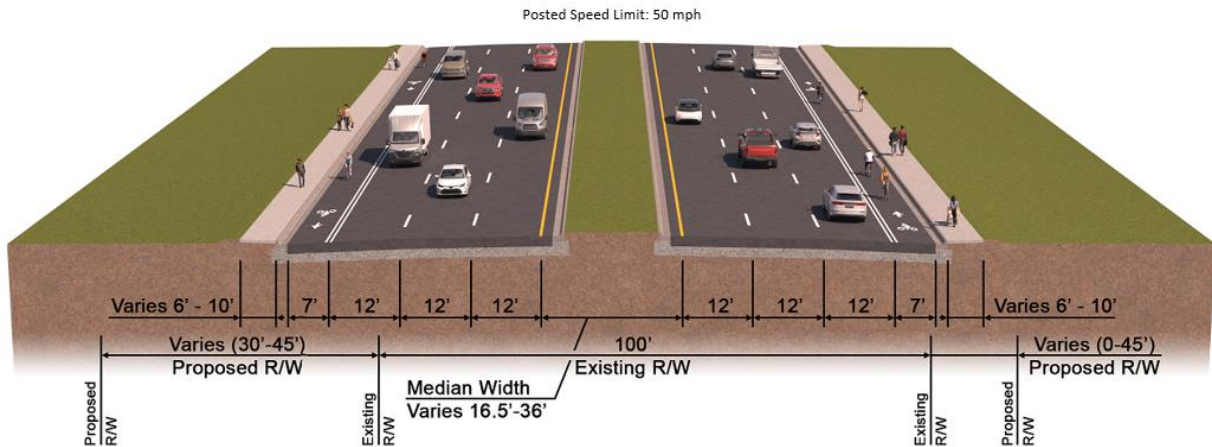


Figure 7-2 Typical Section: US 41 (SR 45) from S. of Denver Street to N. of Trenton Street and from S. of Causeway Blvd. to N. of Causeway Blvd. (at-grade)

The proposed elevated section along US 41 from north of Trenton Street to south of Causeway Boulevard, includes a grade separation of US 41 over the CSX Railroad crossing and a two-lane, two-way, undivided frontage road on the west side for local access to neighboring properties. The proposed frontage road is an urban curbed section with 12-foot travel lanes, and a 10-foot sidewalk on the west side. The proposed improvements along US 41 will require the acquisition of ROW varying from 29 to 200 feet. See **Figure 7-3** for details.

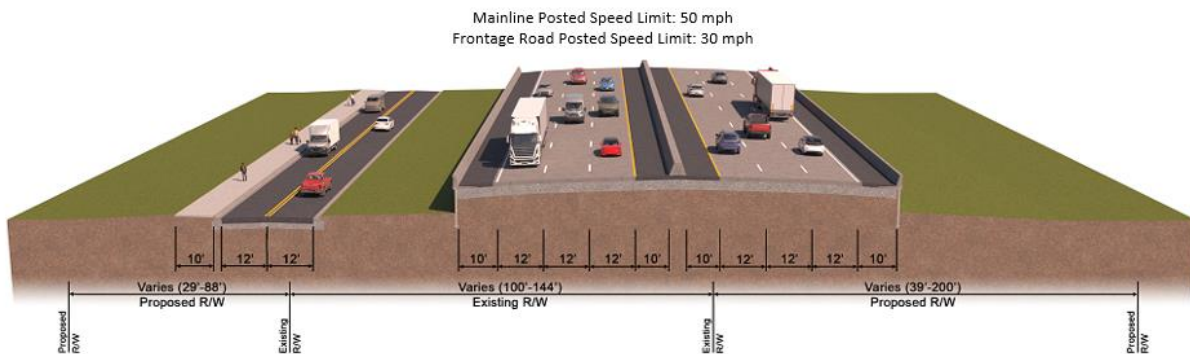


Figure 7-3 Typical Section: US 41 from N. of Trenton Street to S. of Causeway Blvd. (elevated)

Bridge overpasses are proposed for the US 41 mainline over Delaney Creek, 36th Avenue S., and the CSX Railroad crossing. The proposed bridge typical section includes three 12-foot travel lanes and 10-foot paved inside and outside shoulders in each direction. See **Figure 7-4** for details.

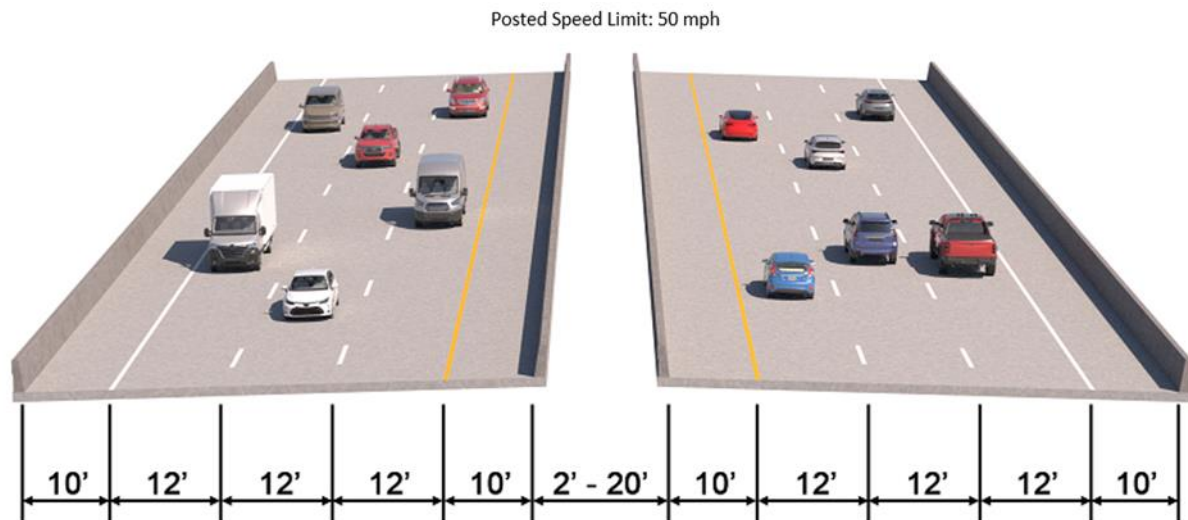


Figure 7-4 Typical Section: US 41 over Delaney Creek, 36th Ave. S., and CSX Railroad ROW/St. Paul Street (bridges)

7.1.2 Bridges and Structures

Table 7-1 contains the structure spans and lengths of all the structures of Preferred Alternative. Details of each structure are included in the following sections. Please see **Appendices A** and **B** for further information.

Table 7-1 Preferred Alternative Structures Spans and Lengths

Bridge Location	Span Arrangement	Bridge Length
Frontage Rd. over Delaney Creek	Single Span	90'
US 41 over Delaney Creek	Single Span	99'
Ramp A over Delaney Creek	Single Span	111'
US 41 over 36th Avenue S.	Single Span	153'
US 41 SB over CSX Railroad	Two spans (153'–253')	406'
US 41 NB over CSX Railroad	Two spans (153'–253')	406'

7.1.2.1 Structures over Delaney Creek

The proposed structures will be Florida-I beam bridges. The Preferred Alternative includes three different bridge water crossings over Delaney Creek to accommodate the mainline, a frontage road on the west side of US 41, and an off-ramp to the east side of US 41.

The proposed US 41 mainline bridge has a minimum width of 116'-8". This includes three 12' traffic lanes with 10' inside and outside shoulders in each direction, separated by a median barrier. Standard 36" single-slope traffic railing barriers are employed at the outside shoulders.

The proposed two-way frontage road bridge has an approximate minimum width of 48'. This includes two 12' traffic lanes, a 2'-6" inside shoulder, a variable width outside shoulder, and a raised 10' sidewalk. A standard

36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the sidewalk.

The proposed northbound off-ramp bridge has a minimum width of 38'-3". This includes a single 15' traffic lane, a 7' bicycle lane, a 2'-6" inside shoulder, a 1'-4" outside shoulder, and a raised 10' sidewalk. A standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the sidewalk.

Each proposed bridge consists of a single-span Florida-I beam superstructure. Bridge lengths measured along the respective baselines are 99' for the US 41 mainline bridge, 90' for the frontage road bridge, and 111' for the off-ramp bridge. The concrete beam bridges provide an economical solution while maintaining the required drift clearances over Delaney Creek compared to shallower Florida Slab beam structures. End bents with sloped embankment and riprap protection are typically anticipated at the bridge ends. At the end of the mainline bridge, wrap-around MSE wall is proposed.

7.1.2.2 Structure over 36th Avenue S.

The Preferred Alternative consists of a proposed bridge to carry the US 41 mainline over 36th Avenue S. The typical section consists of three 12'-0" traffic lanes with 10'-0" inside and outside shoulders in each direction. Standard 36" single-slope traffic railing barriers are employed at the outside shoulders, resulting in a total bridge width of 116'-8".

The proposed bridge is on a curved horizontal alignment with a minimum vertical clearance of 16'-6" over 36th Avenue S. The proposed bridge consists of a single-span Florida-I beam superstructure with a 153'-0" bridge length. Given the proposed span length, 78-inch Florida-I Beams provide a cost-effective solution for the superstructure. End bents with wrap-around MSE walls are proposed at the begin and end bridge locations.

7.1.2.3 Structures over CSX Railroad

The Preferred Alternative consists of two proposed bridges to span over CSX Railroad and St. Paul Street. These proposed structures accommodate the respective southbound and northbound mainline directions.

The southbound and northbound bridges have the same typical section. The typical sections consist of three 12'-0" traffic lanes and 10'-0" inside and outside shoulders. Standard 36" single-slope traffic railing barriers are employed at the shoulders, resulting in bridge widths of 58'-8".

The begin bridge location for the structures is governed by the CSX ROW. The end bridge location is governed by the St. Paul Street. Lastly, the intermediate support location is controlled by a horizontal clearance to allow for a future train track. Preliminary analysis results in total bridge lengths of 405'-9" with span arrangements of 153'-0" – 252'-9". The profiles are controlled by the required vertical clearance at CSX which is 23'-6" and exceed the minimum vertical clearance of 16'-6" required over St. Paul Street.

Given the proposed span arrangement, it is anticipated that a hybrid superstructure made of both concrete beams and steel plate girders will provide an economical solution for the superstructure. Typical end bents with wrap-around MSE walls are proposed at the begin and end bridge locations, while a multi-column pier is proposed for the intermediate supports.

7.1.3 ROW and Relocations

The Preferred Alternative requires the acquisition of approximately 13.72 acres of ROW to accommodate the proposed roadway footprint along Causeway Boulevard and US 41, as well as the local access/frontage roads. In addition, approximately 10.65 acres of additional ROW acquisition will be needed for three stormwater management pond facilities. The pond ROW is as follows: Pond 1A - 3.30 acres, Pond 2B - 4.23 acres and Pond 3A/3B - 3.12 acres.

The Preferred Alternative impacts 75 total properties. As documented in the *Conceptual Stage Relocation Plan*, the Preferred Alternative is anticipated to result in the potential relocations of three (3) residences and impact 25 businesses on 28 total parcels. Of the 25 businesses impacted, 14 are anticipated to be full takes and 11 are anticipated to be partial takes. However, these may subject to change during the acquisition/cost-to-cure process. There are no proposed public facility displacements. To minimize the unavoidable effects of ROW acquisition and displacement of people, the FDOT will carry out a ROW Relocation Program in accordance with Florida Statute 339.09 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646 as amended by Public Law 100-17).

7.1.4 Horizontal and Vertical Geometry

The proposed roadways are approximately one foot above the existing grade to allow for sufficient base clearance through the majority of the study area. Minimum base clearance may not be obtained at the US 41/Causeway Boulevard intersection – this will be evaluated more closely during the Design phase. Four percent grades are used along US 41 to raise the roadway over Delaney Creek, 36th Avenue S., and CSX Railroad. The westside frontage road has grades of 3% and 3.5% south and north of Delaney Creek, respectively.

The proposed horizontal and vertical geometry is shown in **Appendix A**.

7.1.5 Bicycle and Pedestrian Accommodations

The Preferred Alternative will address bicycle and pedestrian connectivity within the area. Although there are sidewalks and dedicated bicycle lanes along both sides of Causeway Boulevard within the project limits, there are only sidewalks and no dedicated bicycle facilities along US 41 within the project limits. Proposed facilities will enhance safety for users crossing US 41 by providing signal-protected and underpass locations.

From Denver Street to north of Trenton Street, US 41 includes 7-foot buffered bicycle lanes, and 10-foot sidewalks on both sides. North of Trenton Street, the sidewalks and bicycle facilities transition to the frontage roads until reaching Causeway Boulevard. A northbound exit ramp connects to 36th Avenue S. with a T-intersection configuration on the east side of US 41. The proposed ramp includes a 7-foot buffered bicycle lane and a 10-foot sidewalk on the east side. 36th Avenue S. includes a 10-foot sidewalk on the south side to allow northbound bicyclists and pedestrians to cross under US 41 and continue north along the westside frontage road.

The proposed westside frontage road is an urban curbed section with one 12-foot travel lane in each direction and a 10-foot sidewalk on the west side from North of Trenton Street to S. 31st Avenue. From S. 31st Avenue to Causeway Boulevard, the westside frontage road includes one 15-foot southbound lane, a 7-foot buffered

bicycle lane on the outside, and 10-foot sidewalk. St. Paul Street includes a 6' sidewalk on the north side to side to allow pedestrians to cross under US 41 and continue north to Causeway Boulevard via a sidewalk along a proposed eastside frontage road.

North of Causeway Boulevard US 41 includes 7-foot buffered bicycle lanes, and 6-foot sidewalks on both sides.

Causeway Boulevard includes 7-foot buffered bicycle lanes, and 6-foot sidewalks on both sides.

7.1.6 Additional Multi-Modal Accommodations

Although Hillsborough Area Regional Transit (HART) formerly had Route 37 and associated bus stops along Causeway Boulevard, these facilities (4 bus pads) are no longer in service. The roadway improvements will accommodate any future transit along this corridor by providing sidewalks and enhancing pedestrian crossings closely spaced to connect transit users. The proposed improvements have been designed so as not to preclude future transit improvements along Causeway Boulevard or US 41. The improvements will also improve freight movement by reducing delays at the southern CSX crossing and the Causeway Boulevard/US 41 intersection.

7.1.7 Access Management

No changes to access management classification are proposed on US 41 (Access Class 7) or Causeway Boulevard (Access Class 5) within the study limits. The Preferred Alternative includes a frontage road system south of Causeway Boulevard to provide access to/from all adjacent properties from both directions of travel on US 41.

The following design features that modify the existing access management configuration are included in the Preferred Alternative:

- A westside frontage road was added between Hartford Street and US 41 to provide access to the surrounding properties. The frontage road is two-way south of S. 31st Avenue.
 - A jug-handle roadway was added connecting local access traffic on the westside frontage road to a re-aligned Hartford Street and US 41 via a new signalized intersection to improve access to the surrounding properties and eliminate the existing offset intersection.
- A bridge for US 41 over 36th Avenue S. for the conveyance of local traffic between the east and west sides of US 41 was added to provide access for the surrounding properties.
 - A ramp from northbound US 41 to 36th Avenue S. was included to provide northbound traffic access to 36th Avenue S. and the new frontage road network.
- A bridge for US 41 over St. Paul Street for the conveyance of local traffic between the east and west sides of US 41 was added to provide access for the surrounding properties.
 - An eastside frontage road was added between St. Paul Street and south of Causeway Boulevard to provide access to the surrounding properties.
- The existing US 41/El Camino Blanco Boulevard intersection will be closed, with the eastern end of El Camino Blanco Boulevard made into a cul-de-sac due to the proximity to the US 41/Causeway Boulevard intersection.
- A signal was added at the Causeway Boulevard/S. 47th Street intersection and a new portion of S. 47th Street will be constructed south of Causeway Boulevard to provide better access to the surrounding properties and streets.

- Sagasta Street between El Camino Blanco and Causeway Boulevard will be closed to accommodate the proposed stormwater management ponds.

These access management changes are captured on the Preferred Alternative concept plans in **Appendix A**.

7.1.8 Intersection and Interchange Concepts

Signalized intersections are included at US 41/Hartford Street, US 41/Causeway Boulevard, and Causeway Boulevard/S. 47th Street.

A ramp from northbound US 41 to 36th Avenue S. was included to provide northbound traffic access to 36th Avenue S. and the new frontage road network.

See **Section 5.7.11** for details on the Preferred Alternative intersection lane configurations and operations. The proposed intersections are shown in **Appendix A**.

7.1.9 Intelligent Transportation System and TSMO Strategies

Intelligent Transportation System (ITS) infrastructure and CCTV camera (WTI positioning cameras) at every intersection were recommended from City of Tampa (COT) and Hillsborough County respectively as part of the coordination for this project. Some of the recommendations included upgraded fiber/camera, advanced detection, and microwave technology (WaveTronic) system.

The existing 72-strand fiber should be continued along the north side of Causeway Boulevard to the new signal at S. 47th Street. 144-strand fiber should be installed along US 41. ITS pull boxes should remain within 600' feet of each other due to the County's limitations. Bluetooth-enabled solar facilities, with cellular connections, for traffic data collection should be coordinated with D7 Traffic Operations. Coordination with the City of Tampa and Hillsborough County should continue during the Design phase to determine the ITS details.

Based on the TSM&O discussion previously provided in Section 5.3, there are no interim TSM&O strategies recommended for incorporation into this project.

7.1.10 Utilities

The preliminary utility coordination and investigation effort was conducted through written and verbal communications with the existing utility owners. A Sunshine State 811 of the Florida Design Ticket System listing of existing utility owners was acquired on January 31, 2023.

Utility owners were provided aerial based utility plans depicting US 41 within the study area. Using these aerial plans as a base map, each utility owner was asked to indicate their existing and proposed utilities as well as any easements that may affect their reimbursement rights for potential relocations of their facilities. In response, most utility owners replied via written communications. There was no response from the contacted utilities where they mentioned any easements or reimbursable impacts on this project. The utility owners provided the requested information concerning their facilities using either the utility plans or reference documentation (i.e., "As Built" or GIS maps). The list of utility agencies owners (UAO) known to operate utilities in the project vicinity and contact information are included in **Table 7-2**. See **Section 2.1.15** for details on all existing utilities.

Table 7-2 Utility Contact Information

Utility Agency	Utility Contact Name	Utility Contact Phone #	Utility Contact Email
CenturyLink	Bradley Morseth	612-805-9479	bradley.morseth@centurylink.com
City of Tampa Water	Kimani Thomas	813-460-3731	kimani.thomas@tampagov.net
City of Tampa Wastewater	Richard Rivera	813-274-8957	richard.rivera@tampagov.net
City of Tampa Transportation	Vik Bhide	813-274-8066	Vik.bhide@tampagov.net
Hillsborough County Traffic	Darryle Norton	813-627-1326	nortond@hillsboroughcounty.org
Hillsborough County Water Resources	Warren Gilbreath	813-209-3075	GilbreathW@HillsboroughCounty.org
Tampa Bay Pipeline	Greg Lipscomb	813-623-2431	greg.lipscomb@panamericanpipelines.com
TECO Peoples Gas	James Hamilton	813-309-8531	jkhamilton@tecoenergy.com
Verizon	Andrew Cole	813-847-4037	andrew.cole2@verizon.com
Zayo	Mark Mathis	813-277-4392	Mark.mathis@zayo.com
Bright House Networks dba Charter/Spectrum	Paul Bustamante	813-538-2924	Paul.Bustamante@charter.com
Frontier	Randy Thomas	813-892-9692	randall.james@ftr.com
Tampa Electric Distribution & Transmission	Jason Payne	813-765-2494	jtpayne@tecoenergy.com

Tampa Bay Pipeline owns/operates an existing 6-inch ammonia pipeline with coated steel that runs east to west crossing US 41 and continuing east underneath St. Paul Street. The preferred alternative concept horizontal/vertical geometry was established to avoid impacts with the pipeline considering the challenges/cost associated with relocation. The utility runs parallel underneath the northerly side of St. Paul Street where the proposed US 41 bridges will span over the existing CSX crossing and St. Paul Street with the northern bridge abutment located with sufficient clearance to avoid direct impacts to St. Paul Street and the pipeline. Utility coordination with Tampa Bay Pipeline will continue throughout the design phase of this project to avoid and minimize conflicts to the greatest extent possible.

See the *Utility Assessment Report* (April 2023) for more information.

7.1.11 Drainage and Stormwater Management Facilities

The project will discharge to two water body IDs (WBIDs), 1615 (Drainage to McKay Bay) and 1605D (Delaney Creek- tidal). WBID 1615 is on the FDEP's Comprehensive Verified List for *Enterococci* bacteria and on the study list for Dissolved Oxygen. WBID 1605D is on the FDEP's Comprehensive Verified List for *Enterococci* bacteria, copper, iron and lead and on the study list for Dissolved Oxygen. Although McKay Bay (1548B) and East Bay (1548C) are included within the Tampa Bay Nitrogen Management Consortium, based on the project's distance from these WBIDs and subsequent coordination with Southwest Florida Water Management District and FDEP staff, the project will not directly discharge to any verified impaired WBIDs and no enhanced treatment will be required.

Based on the updated project design, the proposed stormwater management pond footprints (i.e., top of berm acreages) needed for the project are expected to include Pond 1A (2.84 acres), Pond 2B (2.46 acres), Pond 3A (1.36 acres) and Pond 3B (1.71 acres). The ponds will require ROW as follows: Pond 1A - 3.30 acres, Pond 2B - 4.23 acres and Pond 3A/3B - 3.12 acres. Although the project will add new impervious surface for which treatment will be provided, compensating treatment of runoff over currently untreated existing pavement will also be provided. This is expected to provide a net water quality benefit. The project will have no involvement with Sole Source Aquifers or stormwater discharge thereto. See **Appendix A** for the locations of the proposed stormwater management ponds.

Given the locally high contamination remaining from historic development and industrial land use, each of the proposed ponds is expected to have some level of contamination involvement. This involvement will be fully determined after Level II contamination testing is completed, which will be completed prior to construction commencement. As remediation activities may be necessary, these remediation activities are anticipated to remove contamination that may currently find its way into Delaney Creek and the unnamed McKay Bay tributary, providing an additional water quality benefit.

The project will be designed and constructed in accordance with the water quality and quantity requirements of the SWFWMD. Project construction will minimize water quality impacts through the implementation of a Stormwater Runoff Control Concept (SRCC), adherence to environmental permit conditions and the FDOT's *Standard Specifications for Road and Bridge Construction*.

See the *Pond Siting Report* (March 2023), *Location Hydraulics Report* (March 2023), and *Water Quality Impact Evaluation* (November 2022) in the project file for more information.

7.1.12 Floodplain Analysis

The coastal floodplain encompasses the entire project area for the Preferred Alternative. Consistent with the 1994 EA/FONSI concept, the Preferred Alternative will continue to have transverse and longitudinal impacts to the existing floodplain. However, the Preferred Alternative will result in an additional transverse floodplain impact at Delaney Creek. This impact was not previously identified, as this portion of Delaney Creek is south of the 1994 EA/FONSI concept's southern limit at 36th Avenue S. The transverse impacts will result from the replacement and extension of the existing bridge culverts associated with the western two-way frontage road and eastern local access ramp. Additionally, the proposed bridge design will have sloping abutments that will be lined with rip rap for almost the entire length and widths of the bridges. This will alter the existing cross section of Delaney Creek. These impacts cannot be avoided as the entire project is within the floodplain.

Neither Delaney Creek or the unnamed tributary to McKay Bay are designated floodways, so a FEMA "no-rise" certification is not required for the project. There is no significant change in flood "risk" associated with this project.

Based on preliminary modeling efforts, there are no rises to the flood stages associated with the Preferred Alternative. There will be minimal impacts to Delaney Creek and the unnamed McKay Bay tributary due to the replacement and extension of the existing cross drains.

The proposed structures will perform hydraulically in a manner equal to or greater than the existing structures, and backwater surface elevations are not expected to increase. Thus, there will be no significant or adverse impacts on natural and beneficial floodplain values. There will be no significant change in flood risk, and there will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

See the *Location Hydraulics Report* (March 2023) for more information.

7.1.13 Transportation Management Plan

The Transportation Management Plan (TMP) involves strategies to manage the work zone impacts of a project and may include the following three components:

- Temporary Traffic Control Plan
- Transportation Operations Plan
- Construction-phase Public Involvement

Temporary Traffic Control Plan (TTCP)

Construction can be completed in seven total phases (three for Causeway Boulevard and four for US 41) as discussed below. In general, traffic will be shifted to one side or the other to allow work to proceed on the other side. Temporary signalization will be required, and pedestrians will be accommodated at all phases of construction.

Causeway Boulevard - Phase 1

Temporary pavement, sidewalk and drainage will be constructed south of Causeway Boulevard from S. 45th Street to S. 47th Street. Temporary pavement will be constructed north of Causeway Boulevard from S. 47th Street to the west of the intersection at US 41. Temporary pavement, sidewalk, and drainage will be constructed to the south of Causeway Boulevard from east of the intersection at US 41 to the end project limit. A temporary signal will be constructed at the US 41/Causeway Boulevard intersection. Westbound turn lanes will be closed east of the US 41 intersection. All pedestrians, bicyclist, WB and EB traffic will be shifted to the south on newly constructed temporary pavement and sidewalk from S. 45th Street to S. 47th Street. Pedestrian, bicyclist, WB and EB traffic will be shifted to the north onto newly constructed temporary pavement from S. 47th Street to east of the intersection at US 41. Pedestrian, bicyclist, WB and EB traffic will be shifted to the south onto newly constructed temporary pavement and sidewalk from east of the intersection at US 41 to the eastern limits of construction. The north proposed mainline of Causeway Boulevard will be constructed.

Causeway Boulevard - Phase 2

Temporary pavement and sidewalk will be constructed north of Causeway Boulevard adjacent to the newly constructed pavement east of the intersection at US 41. Westbound turn lanes will be closed east of the US 41 intersection. All pedestrian, bicyclist, and mainline traffic will be shifted north onto newly constructed pavement between the begin and end project limits. The south proposed mainline of Causeway Boulevard will be constructed.

Causeway Boulevard - Phase 3

Westbound turn lanes east of the US 41 intersection and EB turn lanes west of the US 41 intersection will be closed. Pedestrians and EB traffic will be shifted south onto the newly constructed pavement. The median of the proposed mainline of Causeway Boulevard will be constructed. Remaining work will be complete including concrete pavement at the US 41 intersection, traffic separators, and final striping.

US 41 – Phase 1

Temporary sidewalk, pavement, and drainage will be constructed west of US 41 from the begin project limit to Raleigh Street and from Causeway Boulevard to the end project limit. A temporary signal will be constructed at the US 41/Hartford Street intersection. All pedestrians and NB and SB traffic will be shifted to the west utilizing the newly constructed temporary pavement and temporary sidewalk from the begin project limit to Raleigh Street. All pedestrians and NB and SB traffic will be shifted to existing facilities at Raleigh Street to Causeway Boulevard. All pedestrians and NB and SB traffic will be shifted north of Causeway Boulevard to the west from Causeway Boulevard to the end project limit. All pedestrians and NB and SB traffic will be shifted to existing facilities at the end project limit. The east proposed mainline of US 41 (including bridges as part of mainline construction), Ramp A, drainage, side streets and driveways will be constructed.

US 41 – Phase 2

Temporary sidewalk, pavement, and drainage will be constructed east of US 41 from the begin project limit to Ramp A. The temporary signal at Hartford Street will be relocated and adjusted to accommodate Phase 2 traffic and pedestrians. Southbound traffic will be shifted from the begin project limit to Hartford Street. All pedestrians will cross onto the newly constructed temporary sidewalk to the east at the Hartford Street intersection. All pedestrians will be directed to the newly constructed proposed sidewalk along Ramp A to utilize at grade connections underneath the 36th Avenue bridges. All pedestrians will be directed to the existing sidewalk adjacent to the existing NB US 41 roadway. Northbound traffic will be shifted onto the newly constructed grade separated roadway between the begin and end project limits. Southbound traffic will be shifted to the east adjacent to the NB traffic from the begin project limit to Delaney Creek. Southbound traffic will utilize the existing NB US 41 roadway at grade from Delaney Creek to Causeway Boulevard. Southbound traffic will be shifted adjacent to the NB traffic north of Causeway Boulevard. The west proposed mainline of US 41, drainage, driveways, and side streets will be constructed from the begin project limit to Trenton Street. The Frontage Rd. surface street network up to Towaway Ave. (including the bridge over Delaney Creek) will be constructed. The west proposed mainline of US 41 north of Causeway Boulevard will also be constructed.

US 41 – Phase 3

Temporary pavement and drainage east of US 41 will be constructed from the begin project limit to south of Delaney Creek. A temporary connection will be constructed from the newly constructed SB US 41 roadway to the newly constructed Frontage Rd. south of Delaney Creek. A temporary connection will also be constructed from the newly constructed Frontage Rd. to the existing SB US 41 roadway at Towaway Ave. The temporary signal at Hartford Street will be relocated and adjusted to accommodate the Phase 3 traffic shift. Southbound traffic will be shifted to the west from the begin project limit to the Frontage Rd. bridge over Delaney Creek utilizing the newly constructed temporary pavement. The SB traffic will be shifted onto the previously constructed Frontage Rd. from Delaney Creek to Towaway Ave utilizing the newly constructed temporary connection. The SB traffic will be shifted onto the existing SB US 41 roadway from Towaway Ave. to Causeway Boulevard utilizing the newly constructed temporary connection. The SB traffic will be shifted onto the newly constructed SB US 41 roadway north of Causeway Boulevard. The SB traffic will be shifted to existing US 41 at the end project limit. All pedestrians will be shifted onto sidewalks constructed during the previous phases. The median and west proposed mainline from Trenton Street to Causeway Boulevard, the remaining portion of 36th Avenue and the proposed US 41 southbound bridge going over 36th Avenue will be constructed. The proposed median of US 41 north of Causeway Boulevard to the end project limit will also be constructed.

US 41 – Phase 4

The temporary signal at the US 41/Hartford Street intersection will be removed. All pedestrians will be directed to the newly constructed sidewalk along Ramp A, under the newly constructed NB and SB bridges over 36th Ave. Southbound traffic will be shifted to the west from the begin project limit to Trenton Street utilizing the temporary pavement constructed in Phase 3. Southbound traffic will be shifted onto the newly constructed SB mainline from Trenton Street to the end project limit. The remaining proposed US 41 median will be constructed from the begin project limit to Trenton Street. The Frontage Rd. will be constructed from Trenton Street to Causeway Boulevard. All remaining work will be completed, including remaining concrete pavement at the begin project tie-in, permanent signal structures, and final striping.

Transportation Operations Plan (TOP)

The TOP examines strategies to improve mobility, work zone access, and safety. The strategies typically fall within four categories, demand management, corridor/network management, work zone traffic management and safety management and enforcement. Given the nature of the corridor, the two categories that the strategies are anticipated to fall into are work zone traffic management and safety management and enforcement. These strategies can range from utilizing messaging signs to inform of public of construction activities/impacts to messaging signs with speed displays to warning lights.

Construction-phase Public Involvement

The construction-phase public involvement would have similarities to the one prepared for this re-evaluation. FDOT's Public Information Office will notify the public of important construction elements such as lane closures and detours.

7.1.14 Special Features

Retaining walls are proposed on the outside of the US 41 mainline from north of Trenton Street to S. 30th Avenue to minimize ROW impacts. In addition, wrap-around MSE walls are proposed at the end of the mainline bridges over Delaney Creek, 36th Avenue S., CSX Railroad.

No noise barriers are proposed.

7.1.15 Design Variations and Design Exceptions

No design exceptions are required. The Preferred Alternative will require several design variations listed below. Most of the project's design variations will be obtained later in the project design.

1. Shoulder cross slope to allow inside paved shoulder to be at the same cross slope as the adjacent travel lanes on US 41
2. Omission of bicycle lanes along the frontage road system within the project limits
3. Substandard border widths along portions of US 41 and Causeway Boulevard
4. Substandard median widths along portions of US 41 and Causeway Boulevard
5. Use of curbed shoulders on US 41 as a high-speed facility
6. Clear zone width
7. Bicycle lane widths
8. Intersection sight distance
9. Curve length
10. Mast arm length

See **Appendix C** for additional details.

7.1.16 Cost Estimates

See **Table 7-3** for the Preferred Alternative cost estimate. Construction costs are based on the February 2023 Long-Range Estimate (LRE) cost estimate included in **Appendix C**. ROW costs are based on the December 2021 roadway mainline and December 2022 stormwater management pond estimates. Utility (no reimbursable impacts noted by UAOs) and contamination remediation costs are not included as these costs are not known at this time.

Table 7-3 Preferred Alternative Cost Estimate

Estimated Project Costs (Year 2023 Cost)	Preferred Alternative
Wetland Mitigation¹	\$0.08 M
ROW acquisition for roadway	\$44.98 M
ROW acquisition for stormwater facilities	\$4.88 M
Total ROW Costs	\$49.86 M
Construction cost for roadway	\$106.73 M
Construction cost for stormwater facilities	\$15.05 M
Total Construction Costs (including MOT, MOB and project unknowns)	\$121.78 M
Design	\$5.52 M
Construction Engineering & Inspection (10% of Total Construction Cost)	\$12.18 M
Preliminary Estimate of Total Project Costs	\$189.42 M

¹ = Mitigation cost based on \$130,747 per acre for Fiscal Year 2023/24 from FDOT Work Program Instructions

7.2 SUMMARY OF ENVIRONMENTAL IMPACTS OF THE PREFERRED ALTERNATIVE

This section provides a summary of issues and features that affected development of the Preferred Alternative.

7.2.1 Future Land Use

Future land use in the project vicinity was discussed previously in **Section 3.1**. Though ROW acquisition will be needed and there will be conversion of portions of existing land uses to transportation ROW, the proposed improvements will support both the existing and future land uses.

7.2.2 Section 4(f)

No Section 4(f) protected recreational resources are present in the study area.

7.2.3 Cultural Resources

No newly or previously recorded archaeological resources were identified within the archaeological Area of Potential Effect (APE). Background research, subsurface testing, and the pedestrian survey determined the archaeological APE exhibits low potential for intact archaeological deposits.

Thirty-five (35) historic resources were identified within the project APE, including 17 previously recorded resources and 18 newly identified resources (8HI15323-8HI15339, 8HI15375). The survey also noted that three previously recorded historic resources (8HI12102, 8HI12104, and 8HI12115) were no longer extant within the APE.

The previously recorded historic resources in the APE consist of one roadway segment (8HI12129), one railway spur (8HI15054), one bridge (8HI12023), two building complexes (8HI12127 and 8HI12128), and 12 buildings (8HI12103, 8HI12105-8HI12114, and 8HI12116). The portion of US 41 (8HI12129) located within the APE south of Causeway Boulevard was previously determined National Register of Historic Places (National Register)-ineligible by the State Historic Preservation Officer (SHPO) on February 10, 2014. An updated Florida Master

Site File (FMSF) form was prepared for the previously unevaluated portion of US 41 (8HI12129) within the APE, which extends north from the intersection of US 41 and Causeway Boulevard to the northern end of the APE. This segment of US 41 exhibits similar characteristics to the National Register-ineligible segment to the south, and therefore, is also considered to be National Register-ineligible. The previously recorded rail spur (8HI15054), historic bridge (8HI12023), building complexes (8HI12127 and 8HI12128), and structures (8HI12103, 8HI12105-8HI12114, and 8HI12116) in the historic resources APE have been previously determined National Register-ineligible by the SHPO, and the results of the current survey support these previous determinations.

The newly identified historic resources in the APE consist of 17 structures (8HI15324-8HI15339, 8HI15375) and one mobile home park (8HI15323). These 18 resources (8HI15323-8HI15339) are considered National Register-ineligible under Criteria A, B, C, or D, both individually or as part of a historic district.

It was determined that the project will have no effect on any historical resources that are listed, determined eligible, or potentially eligible for listing in the National Register. The SHPO provided their concurrence with these findings on February 14, 2023.

See the *Cultural Resources Assessment Survey* (January 2023) and *Pond Cultural Resources Assessment Survey* (May 2023) for more information.

7.2.4 Wetlands

Wetland impacts resulting from construction of the Preferred Alternative will occur. Including the combined direct, secondary, and wetland-cut ditch impacts, the project is anticipated to impact approximately 0.167 acre of wetlands, resulting in an estimated Unified Mitigation Assessment Method (UMAM) functional loss of 0.08 unit. An additional 1.55 acres of impacts to other surface waters are also anticipated. Wetland and other surface water boundaries delineated and UMAM functional assessments will be field verified with resource agency staff during the project's environmental permitting phase. All wetland impacts will be to estuarine systems.

The project anticipates using commercially available mitigation credits from agency-approved banks with an appropriate geographic service area to provide compensatory mitigation sufficient to offset unavoidable project impacts to wetlands and wetland-dependent species habitat. The mitigation banks within the Tampa Bay Basin include the Mangrove Point Mitigation Bank (MB), the Nature Coast MB, and the Tampa Bay MB. Although credit availability among these banks will likely change in the time between this PD&E study's conclusion and the project's future environmental permitting efforts, a review of the USACE Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) indicates that sufficient mitigation credits are available to offset the impacts from the proposed improvements. With compensatory mitigation completed within the same watershed where the impacts are incurred, the project will not result in cumulative impacts.

See the *Natural Resource Evaluation* (February 2023) for more information.

7.2.5 Protected Species and Habitat

The Preferred Alternative was evaluated for the presence of federal and/or state protected species and their suitable habitat. Based on this evaluation the proposed project “*may affect, not likely to adversely affect*” the

Gulf sturgeon, smalltooth sawfish, eastern indigo snake, eastern black rail, wood stork, and West Indian manatee. The project is anticipated to have “*no effect*” on the Florida bonamia, Florida golden aster, pygmy fringe tree, giant manta ray, green sea turtle, Kemp’s Ridley Sea turtle, loggerhead sea turtle, Florida grasshopper sparrow, Florida scrub-jay, piping plover, and red knot. The whooping crane is listed as an Experimental Population, Non-essential (EXPN). The USFWS has determined that a non-essential population is not necessary for the continued existence of the species. No consultation is required for the whooping crane with a listing status of EXPN.

For state-listed species, there is “*no adverse effect anticipated*” for the gopher tortoise, Florida pine snake, Florida sandhill crane, little blue heron, reddish egret, roseate spoonbill, southeastern American kestrel, and tricolored heron. There is “*no effect anticipated*” for the giant orchid/non-crested eulophia, incised groove-bur, many-flowered grass pink, nodding/scrub pinweed, sand butterfly pea, short-tailed snake, American oystercatcher, and least tern.

Multiple protection measures are to be employed to avoid and minimize any potential effects to these species. Some of the measures employed are anticipated to include agency coordination during the project’s Design/permitting phase, the use of Best Management Practices (BMPs), and species-specific standard protection measures (e.g., eastern indigo snake, Gulf sturgeon, smalltooth sawfish and manatee) during construction. During the Design and permitting phases the FDOT will reassess the project action area for potential involvement with federal and state-protected species and coordinate further with the USFWS, NMFS, Florida Fish and Wildlife Conservation (FWC) and Florida Department of Agriculture and Consumer Services (FDACS), if necessary, as part of the permitting process. The NRE was submitted to the USFWS, NMFS, FWC, and FDACS via the ETDM Environmental Screening Tool on March 24, 2023. The USFWS provided their concurrence on April 24, 2023. Responses were also received from the SWFWMD (on April 18, 2023) and NMFS (on March 27, 2023). SWFWMD provided comments for consideration during the project’s permitting. The NMFS stated that Section 7 Consultation will be conducted during future project phases when sufficient bridge design and construction methodologies can be provided to NMFS.

See the *Natural Resource Evaluation* (February 2023) for more information.

7.2.6 Essential Fish Habitat

The proposed project is located within an area designated as EFH for three Fishery Management Plans (FMP): Gulf of Mexico, Coastal Migratory Pelagic, and Highly Migratory Species management plans. The National Oceanic and Atmospheric Administration (NOAA) NMFS has identified and described EFH for 56 managed species within the project study area. These include 4 managed shrimp species, the red drum, 43 managed reef species, 3 managed coastal migratory pelagic species, and 5 managed highly migratory species. The project will result in direct impacts to estuarine shrub/scrub, estuarine water column, and sand-shell substrates.

These direct impacts will total 0.19 acre. It is intended that the offset of EFH impacts can be accomplished in conjunction with the completion of compensatory mitigation for the project's unavoidable wetland impacts. These EFH impacts occur within the service areas of Mangrove Point MB, the Nature Coast MB, and the Tampa Bay MB. Credit availability from all mitigation banks which service the project area will be reassessed during the permitting phase of the project. The exact number of mitigation credits required to fully offset the

functional loss from the project's EFH impacts will be determined during future coordination with the NMFS. The negligible/incidental impacts to the estuarine water column will be minimized through the adherence to agency-issued permits and the implementation of industry-standard stormwater/turbidity control BMPs. The FDOT determined that the project will have "minimal" potential adverse effects on EFH. After reviewing the NRE, NMFS responded with agreement to the project's "minimal" potential adverse effects on EFH.

See the *Natural Resource Evaluation* (February 2023) for more information.

7.2.7 Highway Traffic Noise

A *Noise Study Report* (NSR) (November 2023) was prepared for the Preferred Alternative and is included in the project file. Existing and future highway traffic noise with and without the Preferred Alternative were evaluated to summarize potential noise impacts to the project area.

A total of 58 receptors representing 54 properties for which the land use has a Noise Abatement Criteria (NAC) were evaluated within 13 Common Noise Environments (CNEs). The evaluated properties represent 51 residences, one active sports area, one restaurant and one motel. Based on the evaluation completed for the subject design and ROW changes, two impacted CNEs (#'s 09 and 12) are predicted to be impacted (discussed below).

CNE #09, located on the northbound side of US 41 (S. 50th St) north of S. 24th Avenue, represents the J & L Family Park mobile homes. These residences, analyzed as NAC B, have multiple driveway accesses directly to US 41. Existing and 2046 future no-build and build-condition hourly equivalent sound levels were predicted at 29 noise-sensitive receptors. Future build-condition noise levels approach or exceed the applicable NAC for 7 sites; no receptors are impacted by a substantial increase. For this CNE, a potential noise barrier was considered; however, preliminary findings determined that factors such as access, ROW, utilities, constructability, and maintenance issues would significantly impact feasibility. More specifically, FDOT maintenance requirements call for a least 5 to 7 feet of buffer behind a noise barrier; a potential barrier at CNE 09 would require ROW acquisitions; a potential barrier would completely block ingress and egress access of the residences to US 41; and overhead power lines present at the location of the potential barrier would cause constructability issues. A reasonableness analysis showed that a noise barrier would meet the reasonableness criteria. A 14-foot high, 197-foot-long noise barrier would meet the noise reduction design goal and remained under the cost effectiveness goal. However, a noise barrier must meet both the feasible and reasonableness criteria to be recommended for further consideration. Since this noise barrier cannot be built due to construction, utility, access, maintenance and safety concerns, there are no feasible solutions available to mitigate the noise impacts for CNE 09. Therefore, a noise barrier is not recommended for further consideration.

CNE #12 represents a single-family residence located along eastbound El Camino Blanco Boulevard, west of US 41 and is evaluated as NAC B. Existing and 2046 future no-build and build-condition hourly equivalent sound levels were predicted at one noise-sensitive receptor. Future build-condition noise levels approach or exceed the applicable NAC for one site; no receptors are impacted by a substantial increase. Impacted receptor 12-B-01 is an isolated impacted receptor. Abatement would not be feasible because under FDOT policy, noise abatement must provide a benefit at a minimum of two impacted receptors. Therefore, based

on the noise analyses performed to date, there are no feasible solutions available to mitigate the noise impact for CNE 12.

The FDOT is committed to the construction of feasible and reasonable noise abatement measures where recommended. However, based on the noise analyses performed to date, there are no feasible and reasonable solutions available to mitigate the noise impacts at CNEs 09 and 12. Although noise barriers are not currently identified as feasible or cost-reasonable noise abatement measures, this will be subject to a detailed review in Design and documented in subsequent re-evaluations.

Some land uses adjacent to US 41 are noise- and vibration-sensitive uses (e.g., residential use). Construction of the proposed roadway improvements is not expected to have a significant noise or vibration effect. Additionally, the application of the FDOT's *Standard Specifications for Road and Bridge Construction* may minimize or eliminate potential issues. Should unanticipated noise or vibration issues arise during the construction process, the Project Engineer, in coordination with the District Noise Specialist and the Contractor, will investigate additional methods of controlling impacts.

7.2.8 Contamination

An updated Level I assessment for potential contamination involvement was conducted for this study. A total of 91 potential contamination sites were evaluated. Nine sites were assigned a High-risk ranking. Sixteen sites were assigned a Medium risk ranking. Fifty-eight sites were assigned a Low risk ranking and eight sites were assigned a No risk ranking.

Effective July 1, 2014, the Delaney Creek Brownfield Redevelopment Area (contamination brownfield area) has been designated by Hillsborough County and the FDEP adjacent to the east and west sides of US 41 between S. 34th Avenue and Delaney Creek and between Towaway Avenue and Delaney Creek, respectively. This was tied to a former Exide Technologies battery/hazardous waste disposal facility.

For the sites rated with a Low or No contamination risk ranking, no further action is currently required, as they have been determined not to have a significant contamination risk to the project study area at this time.

The sites with High and Medium risk rankings are listed on the following page and include various existing and former land uses including gas stations; automotive junkyard/salvage facilities; automobile, tractor trailer, heavy equipment and recreational vehicle service/repair facilities; industrial chemical sales/storage; industrial battery production/ storage; and railroad corridors. More detailed information regarding the locations, history and applicable pollutants of concern for each applicable site are provided in the *Mainline Contamination Screening Evaluation Report* (February 2023) and a *Pond Contamination Screening Evaluation Report* (February 2023) available in the project file.

High-risk sites (Note: Based on similarity of site location, type and proximity, Sites 14, 15, 16 and 17 were combined and assigned a single High-risk ranking.)

- Site No. 14 – Exide Technologies/Pacific Chloride, Inc./Chloride Metals, Inc.; 3507 S. 50th Street; 3521 S. Yokam Diamond Street, Corner of 36th Ave. S. and S. 50th Street
- Site Nos. 15 & 17 – Delaney Creek Brownfield Redevelopment Area-Exide Tech., west and east sides of US 41 (S. 50th Street)

- Site No. 16 – Chloride Metals/Exide Technologies, 3507 S. 50th Street
- Site No. 19 – Foy’s Transport Tire Service/ Former Coastal Mart #628, 3411 S. 50th Street
- Site No. 21 – Torbo Truck Repair/Ray’s Truck Rental, 5160 St. Paul Street
- Site No. 28 – Thach Tire & Rim, 4916 Causeway Boulevard)
- Site No. 29 – FDOT ROW adjacent to 7-Eleven Store, 2801 S. 50th Street
- Site No. 33 – Sunoco, 4714 Causeway Boulevard
- Site Nos. 34A/34B – FDOT ROW, NE corner of Sagasta Street and Causeway Boulevard and First Choice Cars (4902 Causeway Boulevard)
- Site No. 67 – Avengers Auto Body Repair Shop/DMD Motors, 2802 S. 50th Street
- Site No. 72 – EZ Hollywood Tops, 4710 Causeway Boulevard

Medium-risk sites

- Site No. 5 – Lee Auto Group, 4027 S. 50th Street
- Site No. 8 – Butterkrust Bakery, 3902 S. 50th Street
- Site No. 9 – Harcros Chemicals, 3630 S. 51st Street
- Site No. 26 – LKQ – Tampa, 5109 Causeway Boulevard
- Site No. 27 – Former Southeast Industrial Facilities, 4513 Causeway Boulevard
- Site No. 28 – Florida Tank Services, 4701 Causeway Boulevard
- Site No. 31 – Rosier Property, 4702 Causeway Boulevard
- Site No. 41 – A1 Car Parts of Tampa, 3120 S. 50th Street
- Site No. 42 – Tampa Electric Company H.L. Culbreath Bayside Power Station Sprayfield, 3602 Port Sutton Rd.
- Site No. 56 – Adams Used Auto Parts, 3610 S. 50th Street
- Site No. 61 – CSX Railroad Tracks
- Site No. 63 – American Used Trucks and Parts, 3125 S. 50th Street
- Site No. 64 – Global Used Auto Parts, 2923 S. 50th Street
- Site No. 65 – RV Depot, 2930 S. 50th Street
- Site No. 66 – Garage on Wheels, 2806 S. 50th Street
- Site No. 87 – South Florida Truck and Equipment, 2405 S. 50th Street

Where construction activities may disturb or be impacted by the High and Medium risk sites (soil excavation, utilities/structure installation, dewatering, etc.), Level II testing will be evaluated and conducted as determined necessary by the District Contamination Impact Coordinator. This testing will be conducted during the Design phase so that final plan sheets can include appropriate strategies to manage confirmed contamination. The FDOT will oversee contamination remediation within the applicable parcels during project construction.

APPENDICES

Appendix A – Preferred Alternative Plans

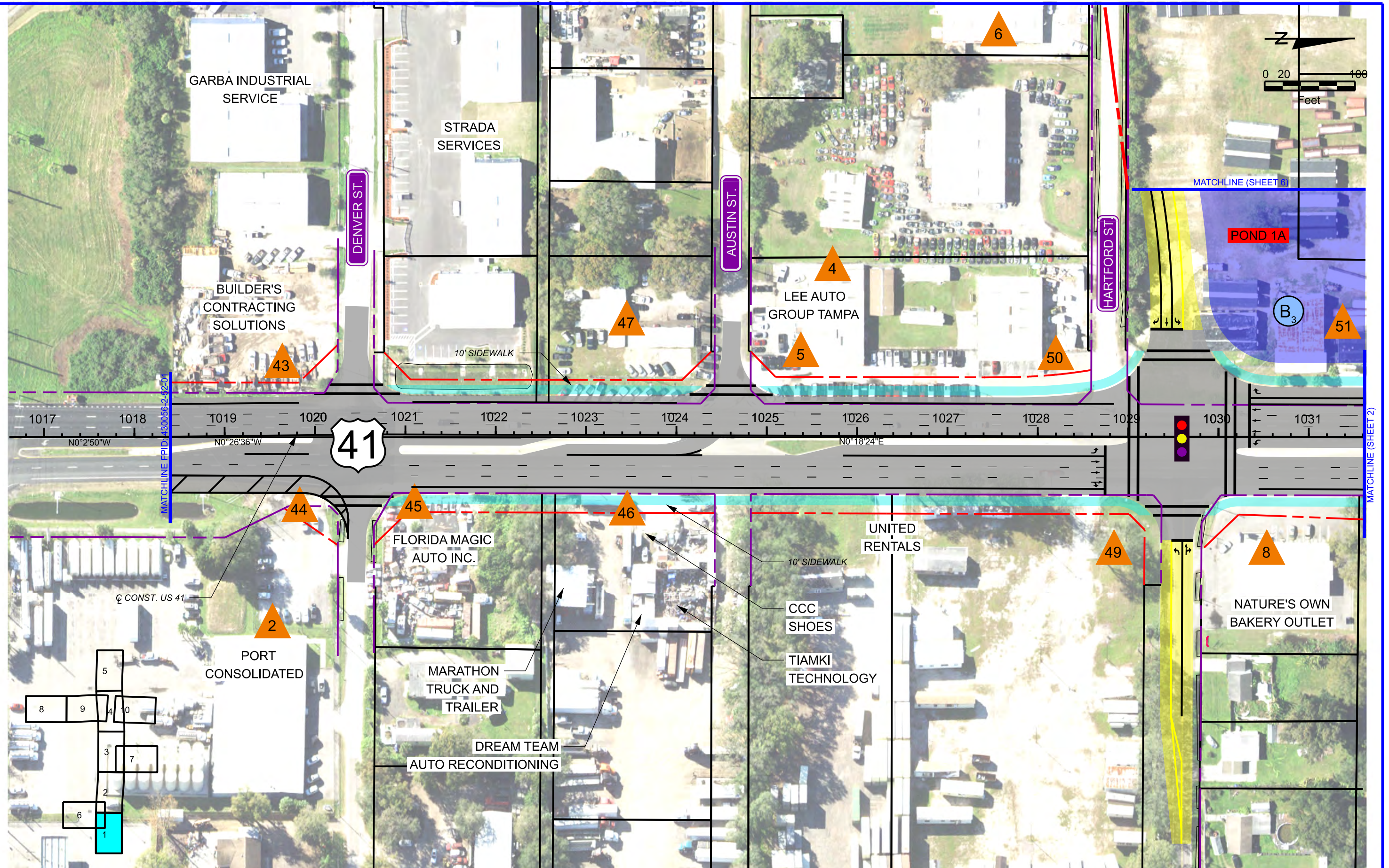
Appendix B – Approved Typical Section Package and Design Variations

Appendix C – Long Range Estimate

APPENDIX A

Preferred Alternative Plans

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| PROPOSED ASPHALT PAVEMENT | PROPOSED POND | PROPOSED R/W LINE |
| PROPOSED CONCRETE PAVEMENT | WETLANDS | EXISTING R/W LINE |
| PROPOSED SIDEWALK | PROPOSED BUSINESS RELOCATION | EXISTING PARCEL LINE |
| PROPOSED BRIDGE | PROPOSED RESIDENTIAL RELOCATION | POTENTIAL CONTAMINATION SITE |

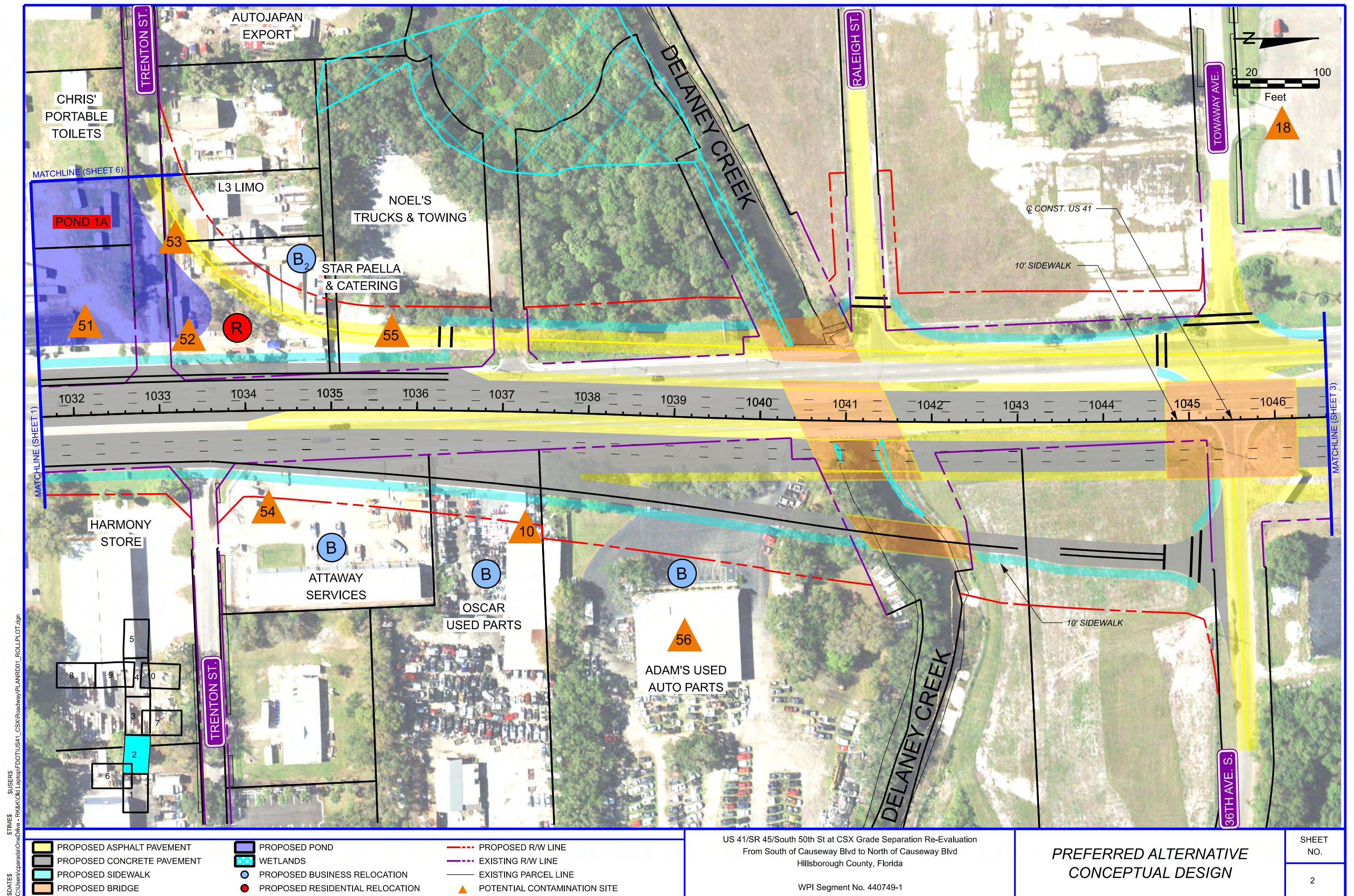
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From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

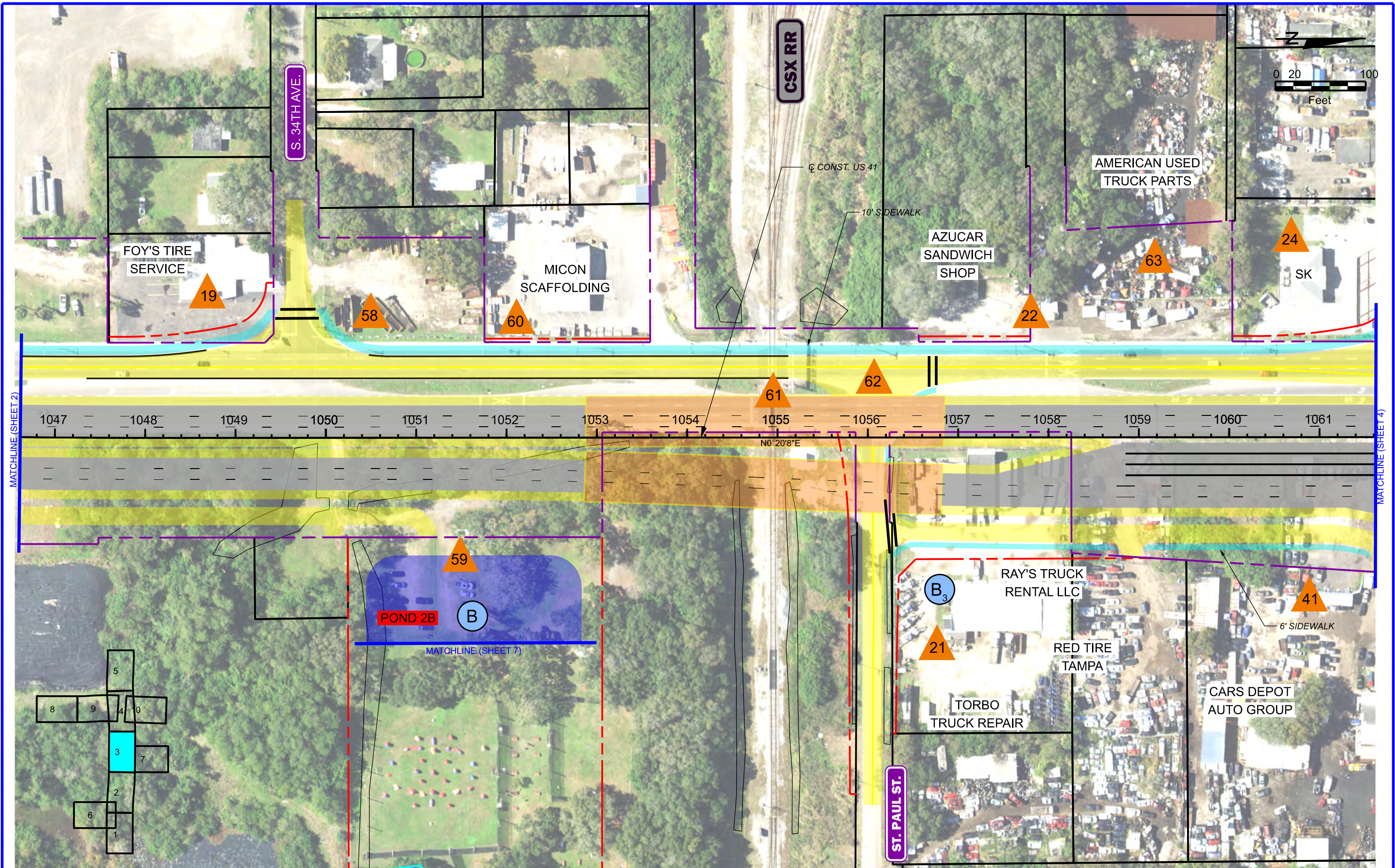
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	PROPOSED CONCRETE PAVEMENT		WETLANDS		EXISTING R/W LINE
	PROPOSED SIDEWALK		PROPOSED BUSINESS RELOCATION		EXISTING PARCEL LINE
	PROPOSED BRIDGE		PROPOSED RESIDENTIAL RELOCATION		POTENTIAL CONTAMINATION SITE

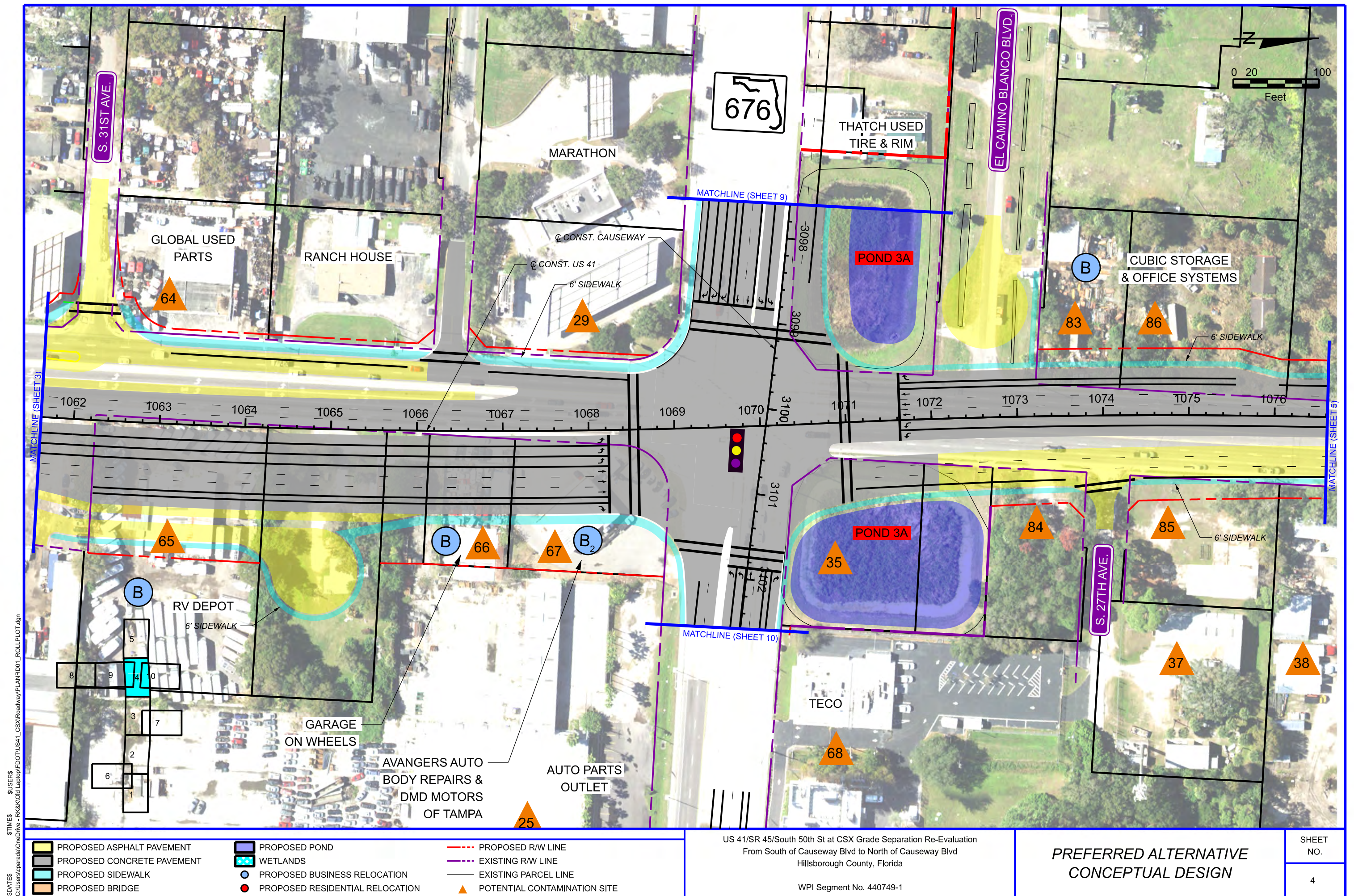
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Hillsborough County, Florida

WPI Segment No. 440749-1

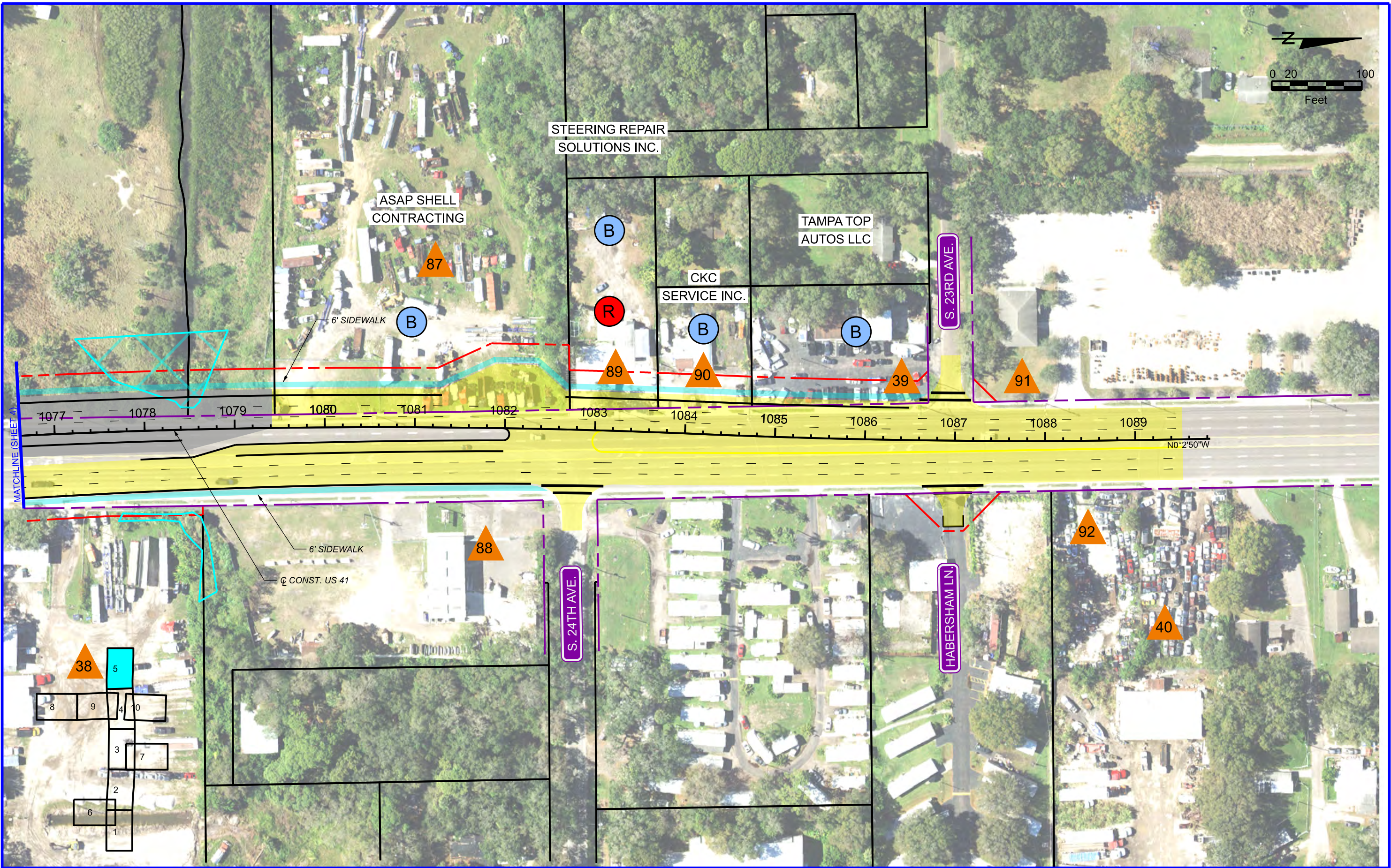
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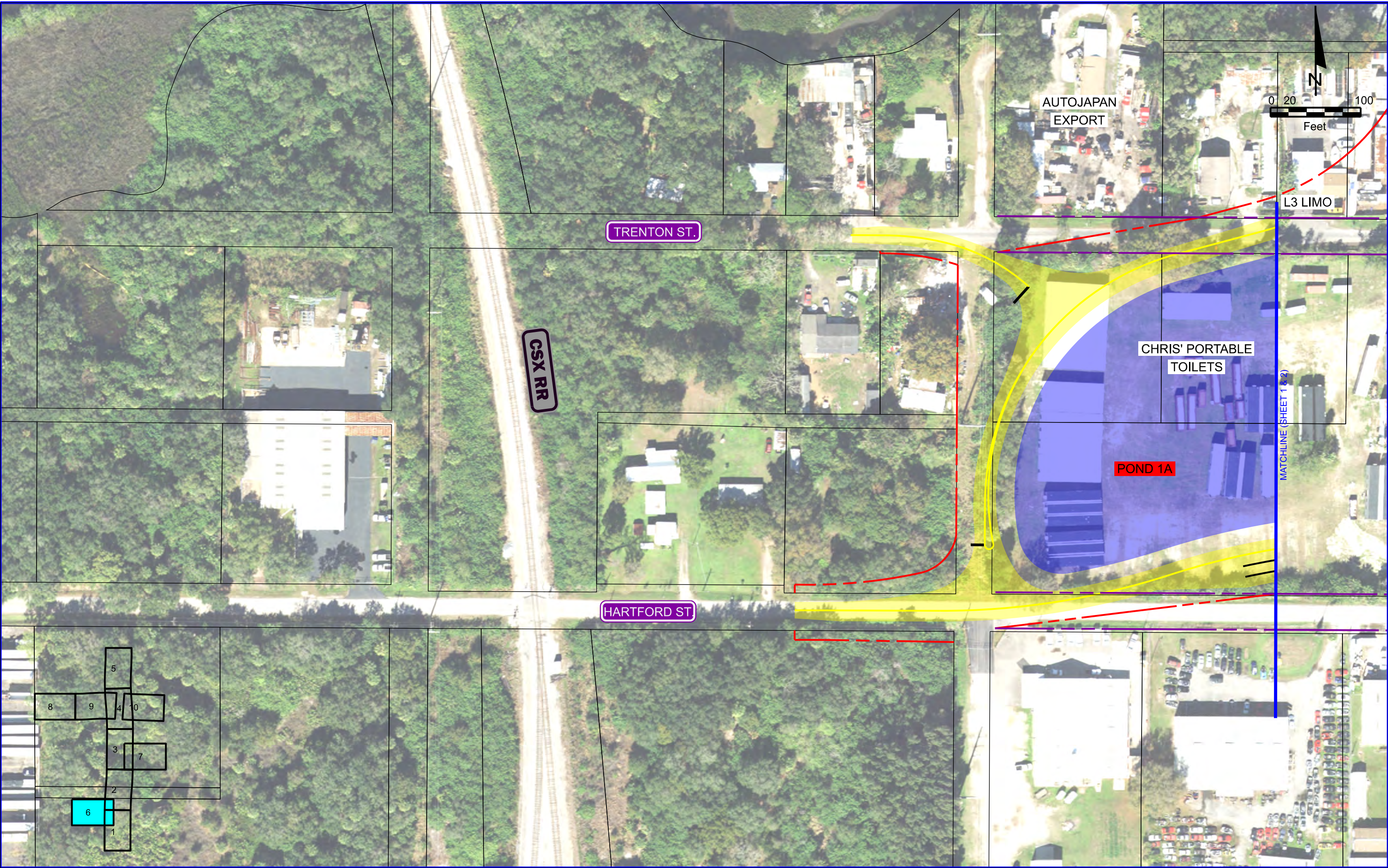
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PROPOSED CONCRETE PAVEMENT	WETLANDS	EXISTING R/W LINE
PROPOSED SIDEWALK	PROPOSED BUSINESS RELOCATION	EXISTING PARCEL LINE
PROPOSED BRIDGE	PROPOSED RESIDENTIAL RELOCATION	POTENTIAL CONTAMINATION SITE

US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida
WPI Segment No. 440749-1

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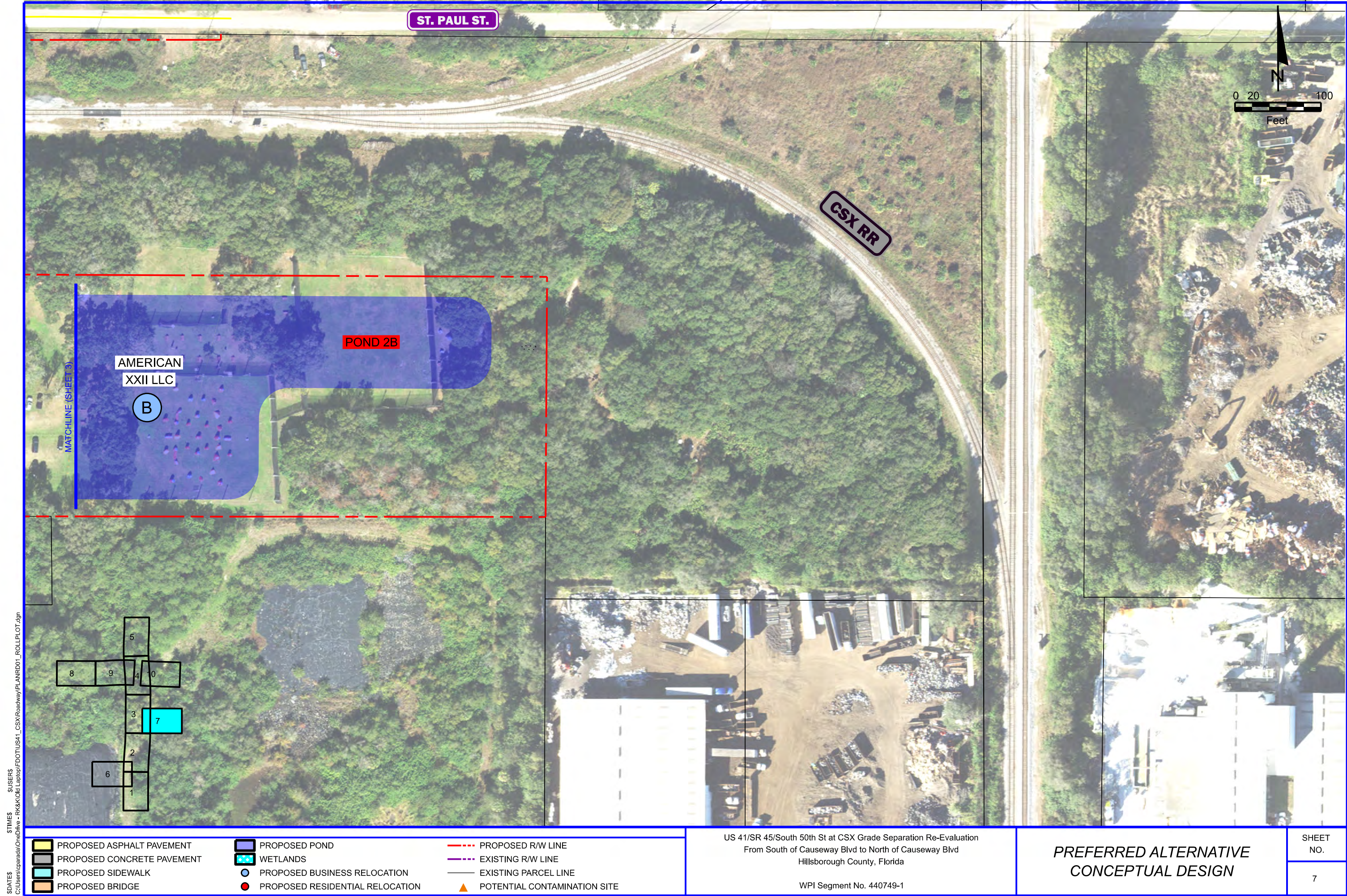
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From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

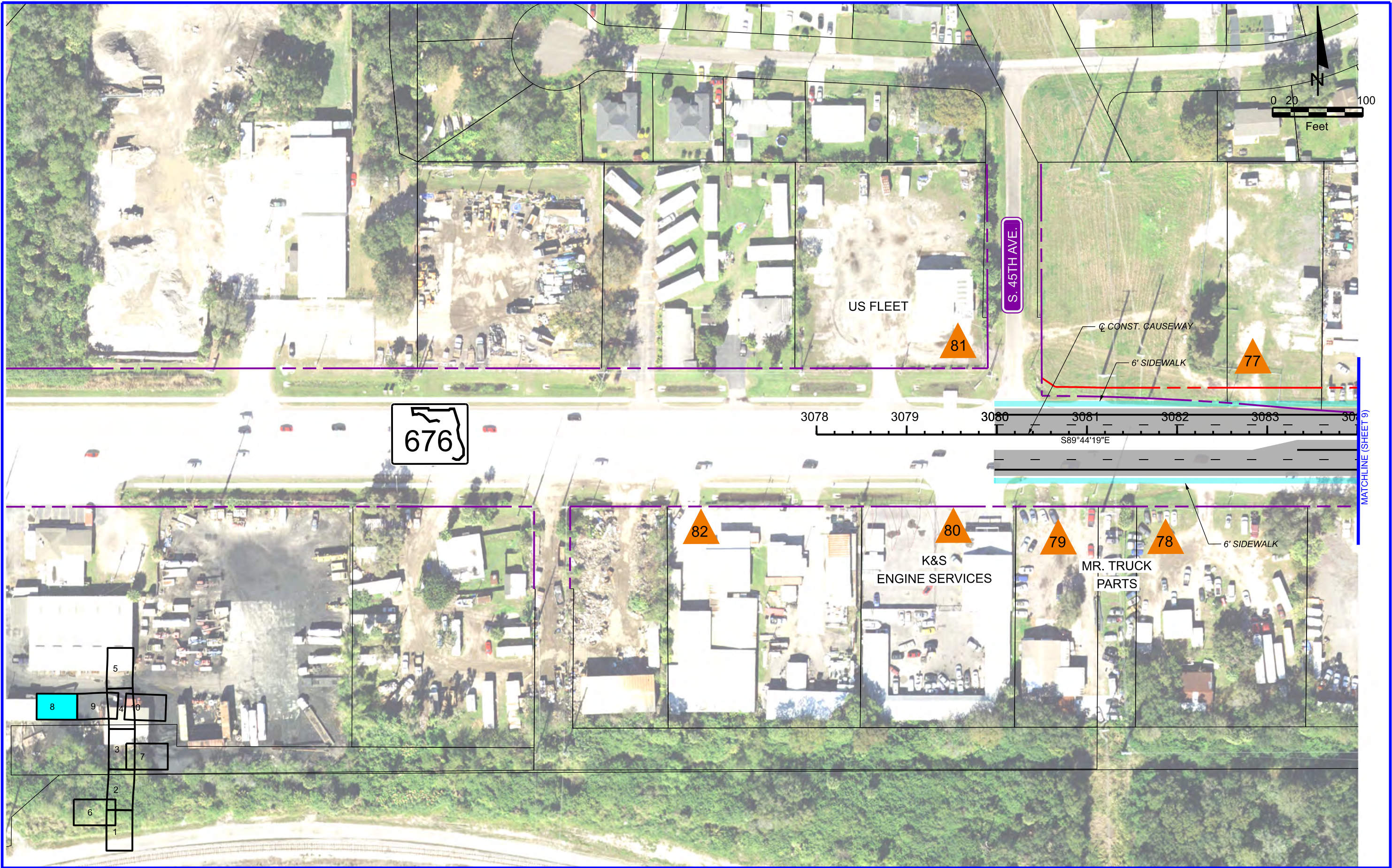
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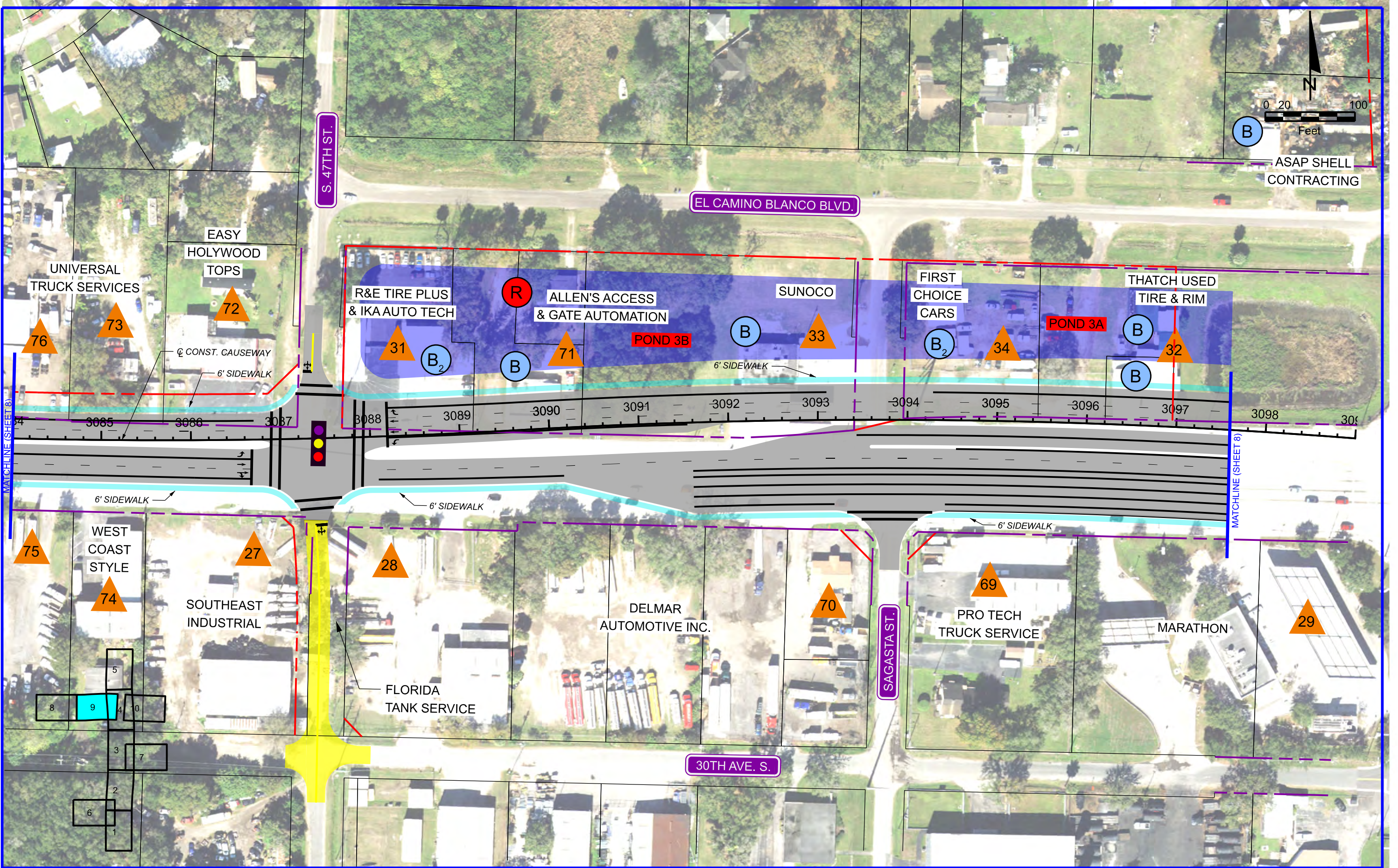


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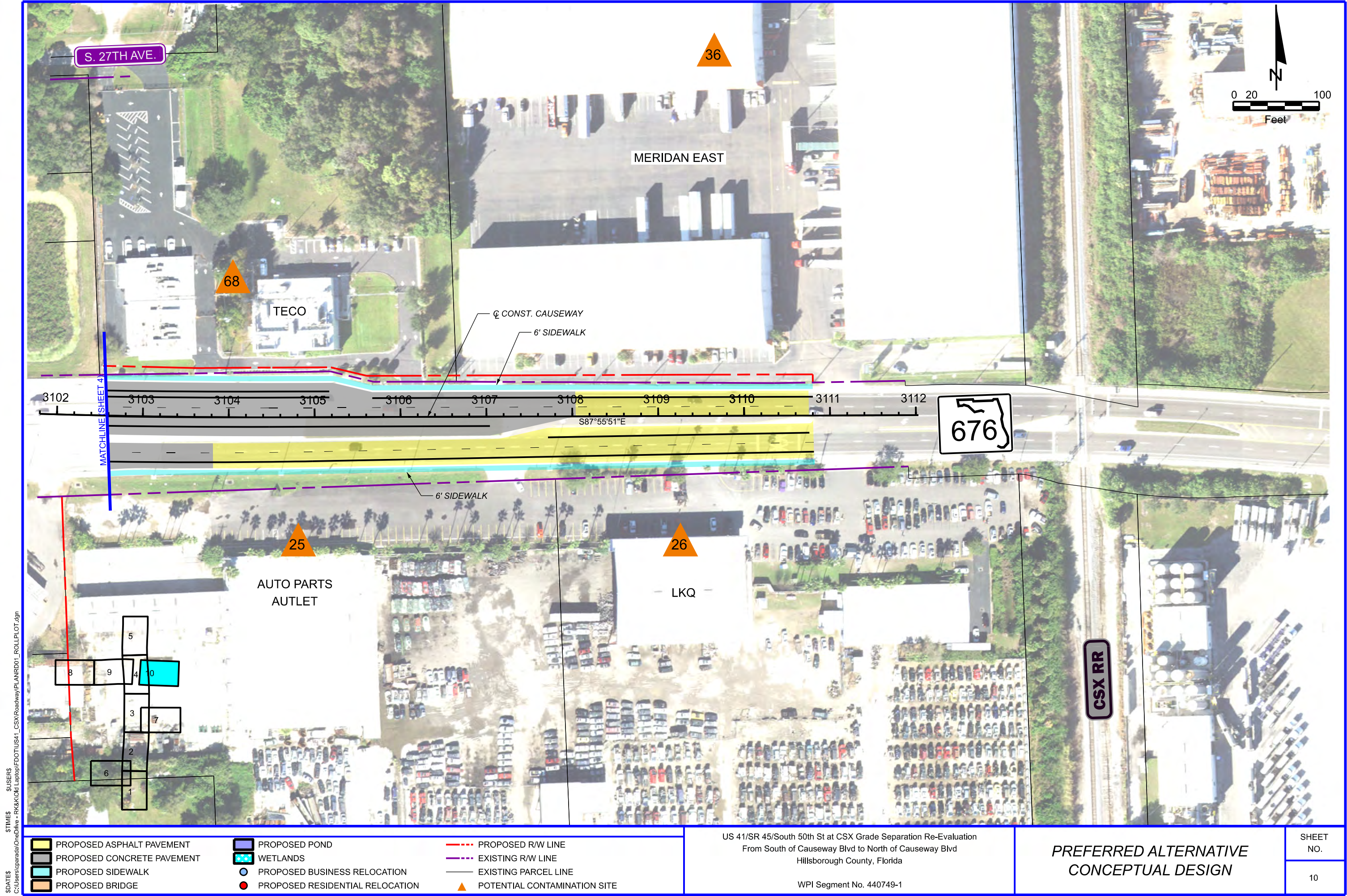


PROPOSED ASPHALT PAVEMENT PROPOSED CONCRETE PAVEMENT PROPOSED SIDEWALK PROPOSED BRIDGE PROPOSED POND WETLANDS PROPOSED BUSINESS RELOCATION PROPOSED RESIDENTIAL RELOCATION PROPOSED R/W LINE EXISTING R/W LINE EXISTING PARCEL LINE POTENTIAL CONTAMINATION SITE <td data-cs="2" data-kind="parent"> US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation From South of Causeway Blvd to North of Causeway Blvd Hillsborough County, Florida WPI Segment No. 440749-1 </td> <td data-cs="2" data-kind="parent"> PREFERRED ALTERNATIVE CONCEPTUAL DESIGN </td> <td> SHEET NO. 8 </td>	US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation From South of Causeway Blvd to North of Causeway Blvd Hillsborough County, Florida WPI Segment No. 440749-1	PREFERRED ALTERNATIVE CONCEPTUAL DESIGN	SHEET NO. 8
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APPENDIX B

Approved Typical Section Package and Design Variations

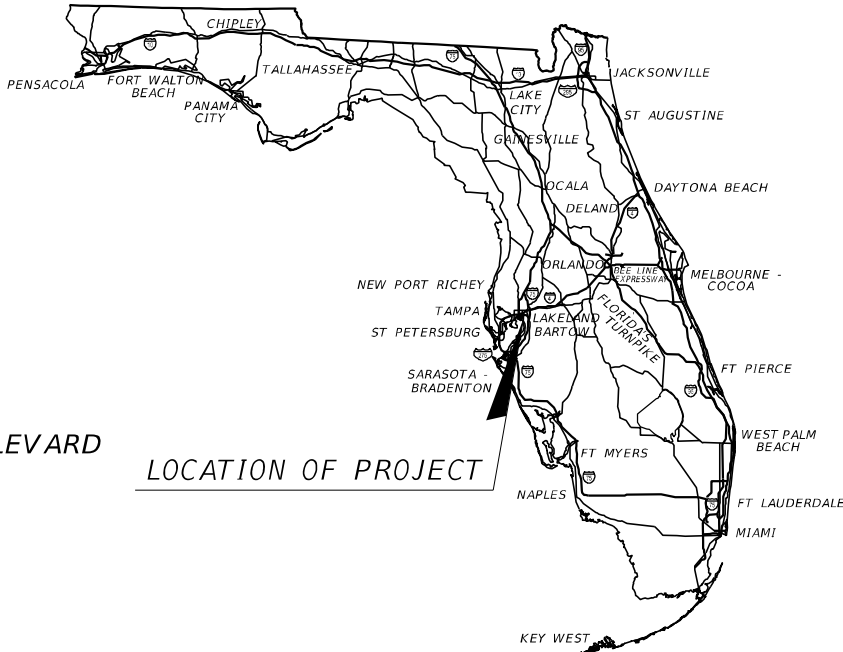
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 440749-1-52-01

HILLSBOROUGH COUNTY (1006000 & 10250)

US 41/SR 45 AT CSX GRADE SEPARATION FROM SOUTH OF SR 676/CAUSEWAY BOULEVARD
TO NORTH OF THE SR 676/CAUSEWAY BOULEVARD



LOCATION OF PROJECT

FDOT DISTRICT DESIGN ENGINEER

Digitally signed by: Allan J Urbonas
Date: 2023.07.07 15:06:09 -04'00'

CONCURRING WITH:
TYPICAL SECTION ELEMENTS
TARGET SPEED
DESIGN & POSTED SPEEDS

FDOT DISTRICT TRAFFIC OPERATIONS
ENGINEER

Digitally signed by: Ronald A Chin
DN: CN = Ronald A Chin C = US
O = FLORIDA DEPARTMENT OF
TRANSPORTATION
Date: 2023.07.21 15:08:54 -04'00'

Ronald A
Chin

CONCURRING WITH:
TARGET SPEED
DESIGN & POSTED SPEEDS

PROJECT LOCATION URL:	https://tinyurl.com/2bushcz6
PROJECT LIMITS:	BEGIN MP 22.578 TO END MP 23.925
EXCEPTIONS:	NONE
BRIDGE LIMITS:	BR#1 MP 22.999 TO MP 23.015 BR#2 MP 23.076 TO MP 23.104 BR#3 MP 23.228 TO MP 23.306
RAILROAD CROSSING:	CSX CROSSING: 624802A - MP 23.271

FDOT DISTRICT INTERMODAL SYSTEMS
DEVELOPMENT MANAGER

Digitally signed by: Richard
Moss
DN: CN = Richard Moss email
= Richard.moss@dot.state.fl.
us C = US O = FDOT OU =
PLEMO
Date: 2023.07.05 11:52:44 -
04'00'

Richar
d Moss

CONCURRING WITH:
CONTEXT CLASSIFICATION
TARGET SPEED

FDOT DISTRICT STRUCTURES
DESIGN ENGINEER

Digitally signed
by Gautom Dey
Date: 2023.07.21
14:50:19 -04'00'

Gautom
Dey

CONCURRING WITH:
TYPICAL SECTION ELEMENTS

FHWA TRANSPORTATION ENGINEER

CONCURRING WITH:
TYPICAL SECTION ELEMENTS

NOT USED

CONCURRING WITH:

LOCAL TRANSPORTATION ENGINEER

Digitally signed
by Michael J.
Williams
Date: 2023.07.21
16:42:01 -04'00'

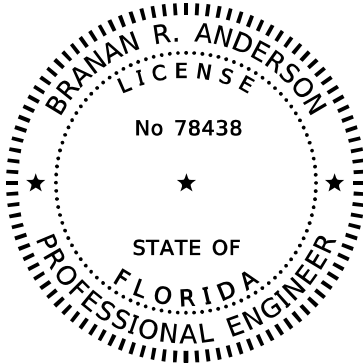
Michael J.
Williams

CONCURRING WITH:
TYPICAL SECTION ELEMENTS

NOT USED

CONCURRING WITH:

APPROVED BY:



THIS ITEM HAS BEEN DIGITALLY
SIGNED AND SEALED BY

Digitally signed by
Branan R Anderson
Date: 2023.06.09
14:14:28 -04'00'

Branan R
Anderson

ON THE DATE ADJACENT TO THE SEAL

PRINTED COPIES OF THIS DOCUMENT ARE
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ON ANY ELECTRONIC COPIES.

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE
FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

INDEX OF SHEETS

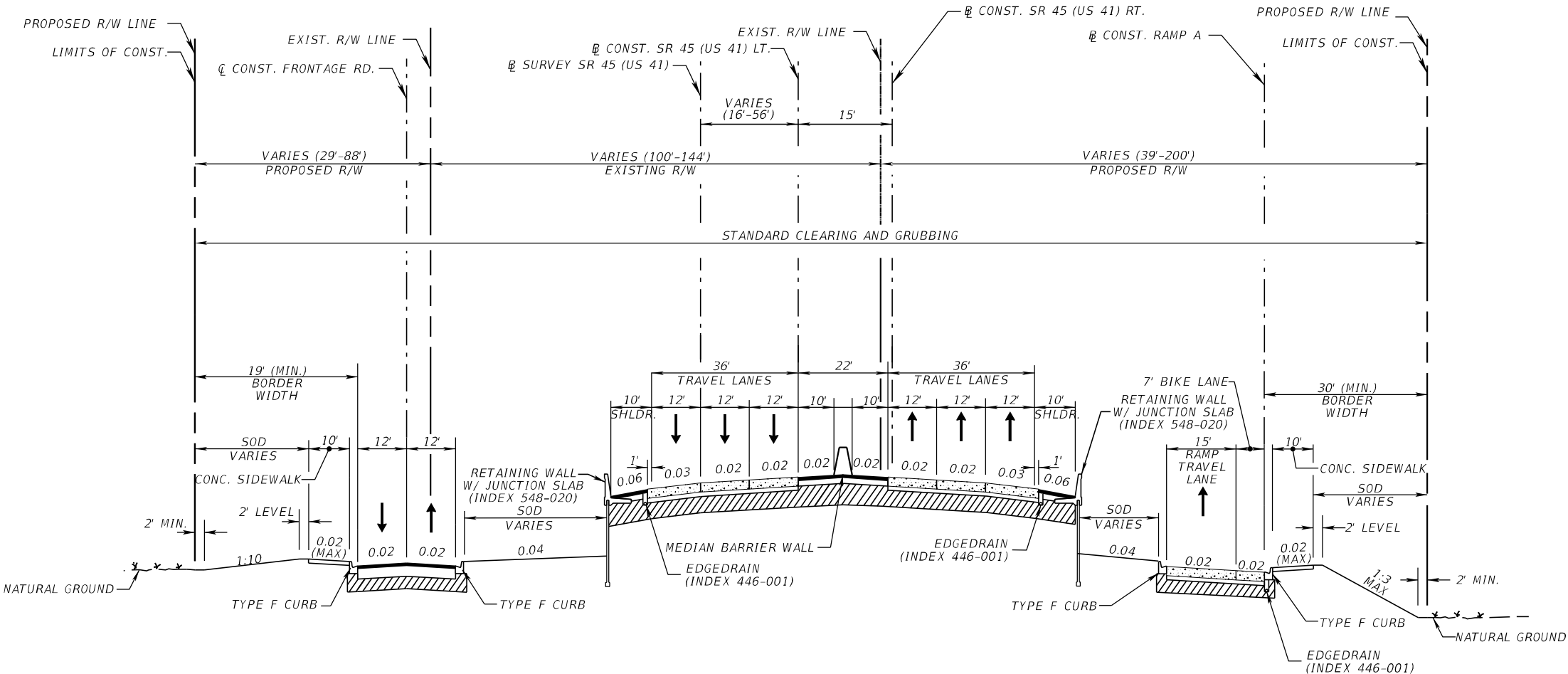
SHEET NO	SHEET DESCRIPTION
1	COVER SHEET
2	TYPICAL SECTION NO. 1
3	TYPICAL SECTION NO. 2
4	TYPICAL SECTION NO. 3
5	TYPICAL SECTION NO. 4
6	TYPICAL SECTION NO. 5
7	TYPICAL SECTION NO. 6
8	TYPICAL SECTION NO. 7
9	TYPICAL SECTION NO. 8
10	TYPICAL SECTION NO. 9
11	TYPICAL SECTION NO. 10
12	TYPICAL SECTION NO. 11
13	TYPICAL SECTION NO. 12

SHEET
NO.

1

PROJECT CONTROLS	
CONTEXT CLASSIFICATION C1 : NATURAL C2 : RURAL C2T : RURAL TOWN C3R : SUBURBAN RES. N/A : L.A. FACILITY C3C : SUBURBAN COMM. C4 : URBAN GENERAL C5 : URBAN CENTER C6 : URBAN CORE	
FUNCTIONAL CLASSIFICATION INTERSTATE FREEWAY/EXPWY. PRINCIPAL ARTERIAL MINOR ARTERIAL MAJOR COLLECTOR MINOR COLLECTOR LOCAL	
HIGHWAY SYSTEM NATIONAL HIGHWAY SYSTEM STRATEGIC INTERMODAL SYSTEM STATE HIGHWAY SYSTEM OFF-STATE HIGHWAY SYSTEM	
ACCESS CLASSIFICATION 1 - FREEWAY 2 - RESTRICTIVE w/Service Roads 3 - RESTRICTIVE w/660 ft. Connection Spacing 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing 5 - RESTRICTIVE w/440 ft. Connection Spacing 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing 7 - BOTH MEDIAN TYPES	
CRITERIA NEW CONSTRUCTION / RECONSTRUCTION RESURFACING (LA FACILITIES) RRR (ARTERIALS & COLLECTORS)	
POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION: DESIGN VARIATIONS 1) CURB ON HIGH SPEED FACILITY 2) BORDER WIDTH 3) MEDIAN WIDTH	
TYPICAL SECTION No. 1 PROPOSED R/W LINE LIMITS OF CONST. VARIES (0-22') PROPOSED R/W EXIST. R/W LINE 100' EXISTING R/W VARIES (0-17') PROPOSED R/W PROPOSED R/W LINE LIMITS OF CONST. STANDARD CLEARING & GRUBBING CONST. SR 45 (US 41) LT. SURVEY SR 45 (US 41) CONST. SR 45 (US 41) RT. 35' (MIN.) BORDER WIDTH 36' TRAVEL LANES 22' 36' TRAVEL LANES 17' (MIN.) BORDER WIDTH SOD 10' CONC. SIDEWALK VARIES 12' AUX. LANE 7' BIKE LANE 12' 12' 12' 12' AUX. LANE 7' 12' AUX. LANE 12' 12' 12' 7' BIKE LANE 10' CONC. SIDEWALK VARIES SOD 2' LEVEL 2' MIN. 0.02 (MAX) 1:3 MAX TYPE F CURB EDGEDRAIN (INDEX 446-001) 0.03 0.03 0.03 0.02 0.02 0.02 1.5' 0.02 0.02 0.02 0.03 0.03 0.02 (MAX) 1:3 MAX TYPE F CURB EDGEDRAIN (INDEX 446-001) 0.02 2' LEVEL 2' MIN. NATURAL GROUND SR 45 (US 41) MP 22.578 TO MP 22.883 CONST. SR 45 (US 41) LT. MP 22.578 TO MP 22.874 CONST. SR 45 (US 41) RT.	
TRAFFIC DATA CURRENT YEAR = 2021 AADT = 38,000 ESTIMATED OPENING YEAR = 2026 AADT = 40,500 ESTIMATED DESIGN YEAR = 2046 AADT = 50,700 K = 9% D = 56.9% T = 19.70% (24 HOUR) DESIGN HOUR T = 9.85% DESIGN SPEED = 50 MPH POSTED SPEED = 50 MPH TARGET SPEED = 50 MPH	
NOT TO SCALE	
FINANCIAL PROJECT ID 440749-1-52-01 SHEET NO. 2	

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PROJECT CONTROLS		TYPICAL SECTION No. 2		
CONTEXT CLASSIFICATION C1 : NATURAL C2 : RURAL C2T : RURAL TOWN C3R : SUBURBAN RES. N/A : L.A. FACILITY C3C : SUBURBAN COMM. C4 : URBAN GENERAL C5 : URBAN CENTER C6 : URBAN CORE				
FUNCTIONAL CLASSIFICATION INTERSTATE FREEWAY/EXPWY. PRINCIPAL ARTERIAL MINOR ARTERIAL MAJOR COLLECTOR MINOR COLLECTOR LOCAL				
HIGHWAY SYSTEM NATIONAL HIGHWAY SYSTEM STRATEGIC INTERMODAL SYSTEM STATE HIGHWAY SYSTEM OFF-STATE HIGHWAY SYSTEM				
ACCESS CLASSIFICATION 1 - FREEWAY 2 - RESTRICTIVE w/Service Roads 3 - RESTRICTIVE w/660 ft. Connection Spacing 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing 5 - RESTRICTIVE w/440 ft. Connection Spacing 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing 7 - BOTH MEDIAN TYPES		SR 45 (US 41) MP 22.883 TO MP 22.999 @ CONST. SR 45 (US 41) LT. MP 23.015 TO MP 23.076 @ CONST. SR 45 (US 41) LT. MP 23.104 TO MP 23.228 @ CONST. SR 45 (US 41) LT. MP 22.874 TO MP 23.001 @ CONST. SR 45 (US 41) RT. MP 23.017 TO MP 23.076 @ CONST. SR 45 (US 41) RT. MP 23.104 TO MP 23.228 @ CONST. SR 45 (US 41) RT.		
CRITERIA NEW CONSTRUCTION / RECONSTRUCTION RESURFACING (LA FACILITIES) RRR (ARTERIALS & COLLECTORS)				
POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION: DESIGN VARIATIONS 1) SHOULDER CROSS SLOPE 2) BIKE LANE WIDTH		TRAFFIC DATA CURRENT YEAR = 2021 AADT = 38,000 ESTIMATED OPENING YEAR = 2026 AADT = 40,500 ESTIMATED DESIGN YEAR = 2046 AADT = 50,700 K = 9% D = 56.9% T = 19.70% (24 HOUR) DESIGN HOUR T = 9.85% DESIGN SPEED = 50 MPH POSTED SPEED = 50 MPH TARGET SPEED = 50 MPH RAMP A DESIGN SPEED = 40 MPH POSTED SPEED = 40 MPH TARGET SPEED = N/A	TRAFFIC DATA (FRONTAGE RD.) CURRENT YEAR = N/A AADT = 0 ESTIMATED OPENING YEAR = 2026 AADT = 1,400 ESTIMATED DESIGN YEAR = 2046 AADT = 2,100 K = 9% D = 56.9% T = 11.6% (24 HOUR) DESIGN HOUR T = 5.8% DESIGN SPEED = 30 MPH POSTED SPEED = 30 MPH	NOT TO SCALE FINANCIAL PROJECT ID 440749-1-52-01 SHEET NO. 3

PROJECT CONTROLS

CONTEXT CLASSIFICATION

<u>FUNCTIONAL CLASSIFICATION</u>	
() INTERSTATE	() MAJOR COLLECTOR
() FREEWAY/EXPWY.	() MINOR COLLECTOR
(X) PRINCIPAL ARTERIAL	() LOCAL
() MINOR ARTERIAL	

- ## HIGHWAY SYSTEM
- (X) NATIONAL HIGHWAY SYSTEM
 - (X) STRATEGIC INTERMODAL SYSTEM
 - (X) STATE HIGHWAY SYSTEM
 - () OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- () 1 - FREEWAY
- () 2 - RESTRICTIVE w/Service Roads
- () 3 - RESTRICTIVE w/660 ft. Connection Spacing
- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- () 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (X) 7 - BOTH MEDIAN TYPES

- | <u><i>CRITERIA</i></u> | |
|------------------------|--|
| <i>(X)</i> | <i>NEW CONSTRUCTION / RECONSTRUCTION</i> |
| <i>()</i> | <i>RESURFACING (LA FACILITIES)</i> |
| <i>()</i> | <i>RRR (ARTERIALS & COLLECTORS)</i> |

*POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:*

DESIGN VARIATIONS

1) CURB ON HIGH SPEED FACILITY

TYPICAL SECTION No. 3

PROP. R/W
LIMITS OF CONST.
PROP. R/W VARIES (6'-20')
EXIST. R/W LINE

CL CONST. FRONTAGE RD.

SURVEY SR 45 (US 41)

CONST. SR 45 (US 41) LT.

CONST. SR 45 (US 41) RT.

VARIES (20'-56')

VARIES (40'-42')

VARIES (100'-250') EXISTING R/W

VARIES (140'-160') PROPOSED R/W

STANDARD CLEARING AND GRUBBING

21' (MIN.) BORDER WIDTH

VARIES 56' - 61'

TRAVEL LANE

BIKE LANE

CONC. SIDEWALK

NATURAL GROUND

TYPE F CURB

RETAINING WALL W/ JUNCTION SLAB (INDEX 548-020)

VARIES (10'-20')

SOD

0.02

0.02

0.04

10' SHLDR.

12' 12' 12'

TRAFFIC SEPARATOR TYPE II (INDEX 520-020)

0.03 0.02 0.02

0.06

EDGEDRAIN (INDEX 446-001)

VARIES

12' 12' 12'

AUX. LANE

0.03 0.02 0.02

EDGEDRAIN (INDEX 446-001)

VARIES 43' - 53'

36' TRAVEL LANES

12' 12' 12'

0.02 0.02 0.03

58' (MIN.) BORDER WIDTH

AUX. LANE VARIES

7' BIKE LANE

12' AUX. LANE

0.03 0.03

EDGEDRAIN (INDEX 446-001)

TYPE F CURB

10' CONCRETE SIDEWALK

SOD VARIES

2' LEVEL

1'-4"

2' MIN.

NATURAL GROUND

SR 45 (US 41)
MP 23.306 TO MP 23.555 CL CONST. SR 45 (US 41) LT.
MP 23.306 TO MP 23.555 CL CONST. SR 45 (US 41) RT.

FRONTAGE RD.
MP 0.194 TO MP 0.375 CL CONST. FRONTAGE RD.

TRAFFIC DATA	
CURRENT YEAR = 2021 AADT = 38,000	
ESTIMATED OPENING YEAR = 2026 AADT = 40,500	
ESTIMATED DESIGN YEAR = 2046 AADT = 50,700	
K = 9% D = 56.90% T = 19.70% (24 HOUR)	
DESIGN HOUR T = 9.85%	
DESIGN SPEED = 50 MPH	
POSTED SPEED = 50 MPH	
TARGET SPEED = 50 MPH	
NOT TO SCALE	

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	4

FINANCIAL PROJECT ID
440749-1-52-01

6/6/2023 12:26:12 PM

PROJECT CONTROLS

CONTEXT CLASSIFICATION

<u>FUNCTIONAL CLASSIFICATION</u>	
() INTERSTATE	() MAJOR COLLECTOR
() FREEWAY/EXPWY.	() MINOR COLLECTOR
(X) PRINCIPAL ARTERIAL	() LOCAL
() MINOR ARTERIAL	

HIGHWAY SYSTEM

(X) NATIONAL HIGHWAY SYSTEM

() STRATEGIC INTERMODAL SYSTEM

(X) STATE HIGHWAY SYSTEM

() OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

()	1 - FREEWAY
()	2 - RESTRICTIVE w/Service Roads
()	3 - RESTRICTIVE w/660 ft. Connection Spacing
()	4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
()	5 - RESTRICTIVE w/440 ft. Connection Spacing
()	6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
(X)	7 - BOTH MEDIAN TYPES

<u>CRITERIA</u>	
(X)	NEW CONSTRUCTION / RECONSTRUCTION
()	RESURFACING (LA FACILITIES)
()	RRR (ARTERIALS & COLLECTORS)

*POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:*

DESIGN VARIATIONS

1) CURB ON HIGH SPEED FACILITY

[illegible]

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

() C1 : NATURAL	(X) C3C : SUBURBAN COMM.
() C2 : RURAL	() C4 : URBAN GENERAL
() C2T : RURAL TOWN	() C5 : URBAN CENTER
() C3R : SUBURBAN RES.	() C6 : URBAN CORE
() N/A : L.A. FACILITY	

FUNCTIONAL CLASSIFICATION

()	INTERSTATE	()	MAJOR COLLECTOR
()	FREEWAY/EXPWY.	()	MINOR COLLECTOR
(X)	PRINCIPAL ARTERIAL	()	LOCAL
()	MINOR ARTERIAL		

HIGHWAY SYSTEM

- () NATIONAL HIGHWAY SYSTEM
- (X) STRATEGIC INTERMODAL SYSTEM
- (X) STATE HIGHWAY SYSTEM
- () OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

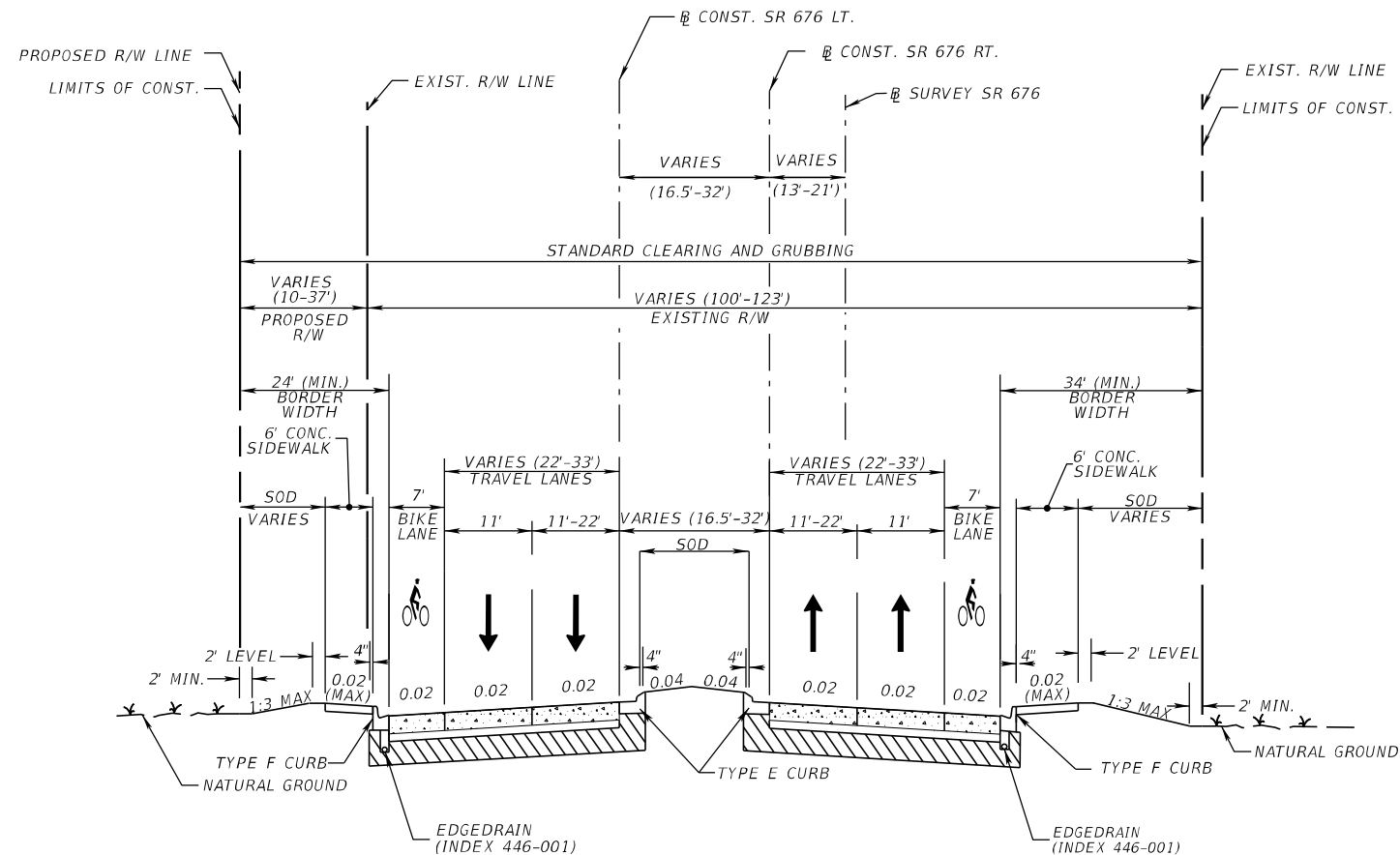
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- () 2 - RESTRICTIVE w/Service Roads
- () 3 - RESTRICTIVE w/660 ft. Connection Spacing
- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- () 7 - BOTH MEDIAN TYPES

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
() RESURFACING (LA FACILITIES)
() RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 5



SR 676 (CAUSEWAY BLVD.)
MP 3.554 TO MP 3.375 ~~B~~ CONST. SR 676 LT.
MP 3.554 TO MP 3.375 ~~B~~ CONST. SR 676 RT.

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 31,500
ESTIMATED OPENING YEAR = 2026 AADT = 32,700
ESTIMATED DESIGN YEAR = 2046 AADT = 37,600
K = 9% D = 56.90% T = 11.60% (24 HOUR)
DESIGN HOUR T = 5.80%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH
TARGET SPEED = N/A

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	6

PROJECT CONTROLS

CONTEXT CLASSIFICATION

() C1 : NATURAL	(X) C3C : SUBURBAN COMM.
() C2 : RURAL	() C4 : URBAN GENERAL
() C2T : RURAL TOWN	() C5 : URBAN CENTER
() C3R : SUBURBAN RES.	() C6 : URBAN CORE
() N/A : L.A. FACILITY	

FUNCTIONAL CLASSIFICATION

() INTERSTATE	() MAJOR COLLECTOR
() FREEWAY/EXPWY.	() MINOR COLLECTOR
(X) PRINCIPAL ARTERIAL	() LOCAL
() MINOR ARTERIAL	

HIGHWAY SYSTEM

() NATIONAL HIGHWAY SYSTEM
(X) STRATEGIC INTERMODAL SYSTEM
(X) STATE HIGHWAY SYSTEM
() OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- () 1 - FREEWAY
- () 2 - RESTRICTIVE w/Service Roads
- () 3 - RESTRICTIVE w/660 ft. Connection Spacing
- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- () 7 - BOTH MEDIAN TYPES

CRITERIA

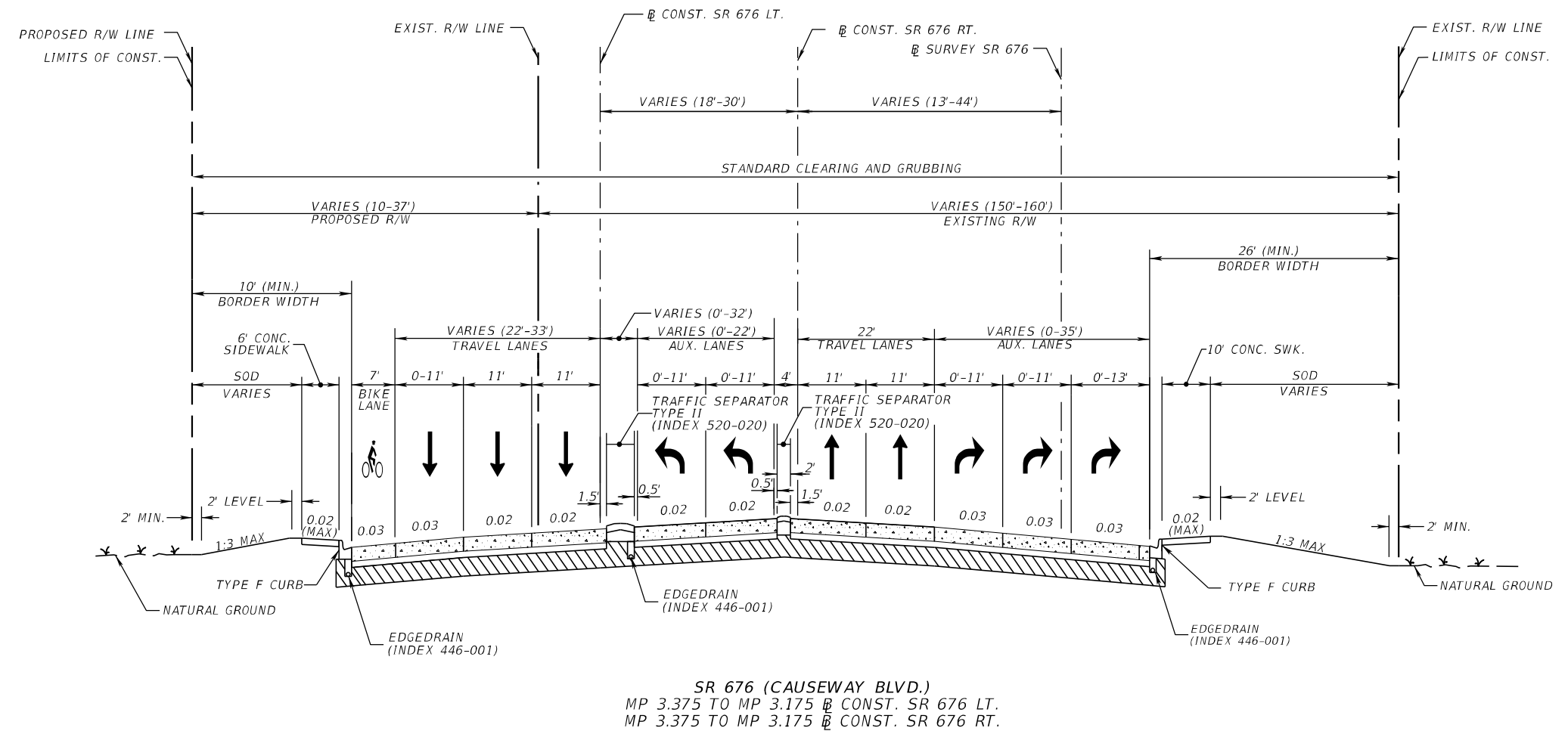
(X) NEW CONSTRUCTION / RECONSTRUCTION
() RESURFACING (LA FACILITIES)
() RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

1) BIKE LANE WIDTH

TYPICAL SECTION No. 6



NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 31,500
ESTIMATED OPENING YEAR = 2026 AADT = 32,700
ESTIMATED DESIGN YEAR = 2046 AADT = 37,600
K = 9% D = 56.90% T = 11.60% (24 HOUR)
DESIGN HOUR T = 5.8%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH
TARGET SPEED = N/A

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	7

PROJECT CONTROLS

CONTEXT CLASSIFICATION

() C1 : NATURAL	(X) C3C : SUBURBAN COMM.
() C2 : RURAL	() C4 : URBAN GENERAL
() C2T : RURAL TOWN	() C5 : URBAN CENTER
() C3R : SUBURBAN RES.	() C6 : URBAN CORE
() N/A : L.A. FACILITY	

FUNCTIONAL CLASSIFICATION

() INTERSTATE	() MAJOR COLLECTOR
() FREEWAY/EXPWY.	() MINOR COLLECTOR
(X) PRINCIPAL ARTERIAL	() LOCAL
() MINOR ARTERIAL	

HIGHWAY SYSTEM

() NATIONAL HIGHWAY SYSTEM
() STRATEGIC INTERMODAL SYSTEM
(X) STATE HIGHWAY SYSTEM
() OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

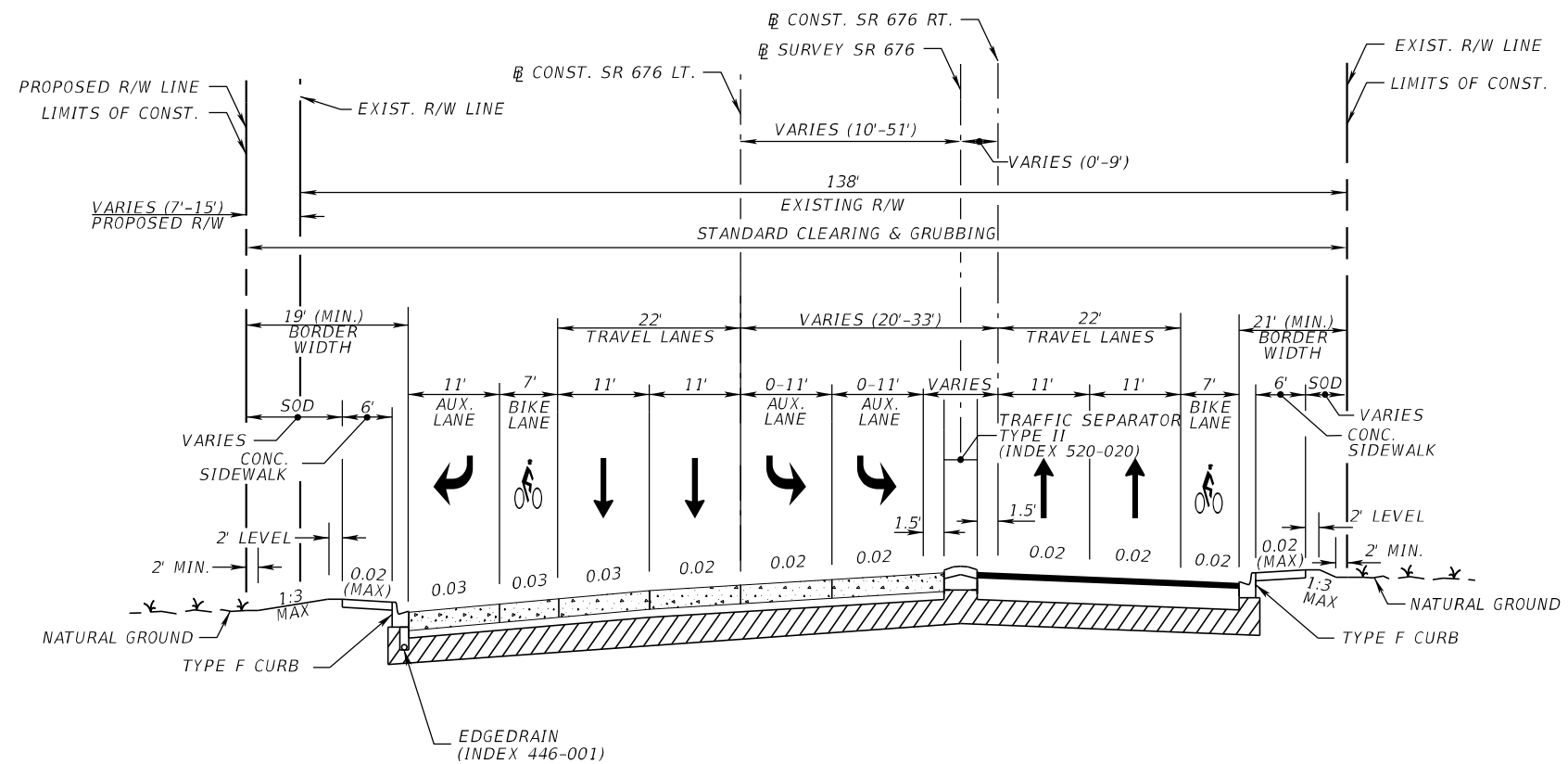
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- () 2 - RESTRICTIVE w/Service Roads
- () 3 - RESTRICTIVE w/660 ft. Connection Spacing
- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- () 7 - BOTH MEDIAN TYPES

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
() RESURFACING (LA FACILITIES)
() RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 7



SR 676 (CAUSEWAY BLVD.)
MP 3.175 TO MP 2.971 @ CONST. SR 676 LT.
MP 3.175 TO MP 2.971 @ CONST. SR 676 RT.

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 31,000
ESTIMATED OPENING YEAR = 2026 AADT = 32,700
ESTIMATED DESIGN YEAR = 2046 AADT = 37,600
K = 9% D = 56.90% T = 11.60% (24 HOUR)
DESIGN HOUR T = 5.80%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH
TARGET SPEED = N/A

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	8

PROJECT CONTROLS CONTEXT CLASSIFICATION C1 : NATURAL C2 : RURAL C2T : RURAL TOWN C3R : SUBURBAN RES. N/A : L.A. FACILITY C3C : SUBURBAN COMM. C4 : URBAN GENERAL C5 : URBAN CENTER C6 : URBAN CORE FUNCTIONAL CLASSIFICATION INTERSTATE FREEWAY/EXPWY. X PRINCIPAL ARTERIAL MINOR ARTERIAL MAJOR COLLECTOR MINOR COLLECTOR LOCAL

HIGHWAY SYSTEM

NATIONAL HIGHWAY SYSTEM

STRATEGIC INTERMODAL SYSTEM

X

STATE HIGHWAY SYSTEM

OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

1 - FREEWAY

2 - RESTRICTIVE w/Service Roads

3 - RESTRICTIVE w/660 ft. Connection Spacing

4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing

5 - RESTRICTIVE w/440 ft. Connection Spacing

6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing

X

7 - BOTH MEDIAN TYPES

CRITERIA

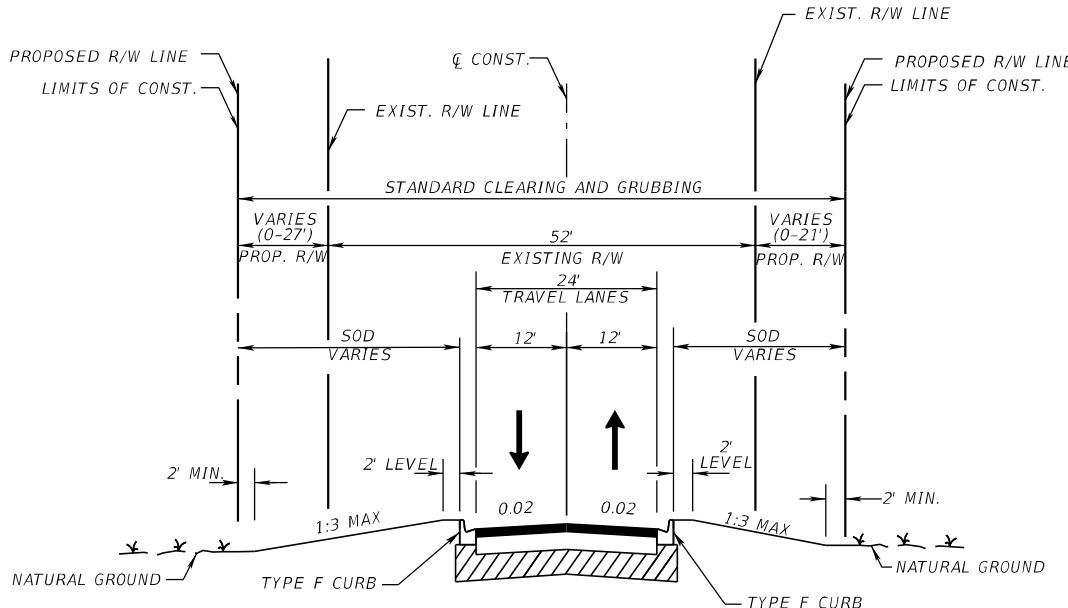
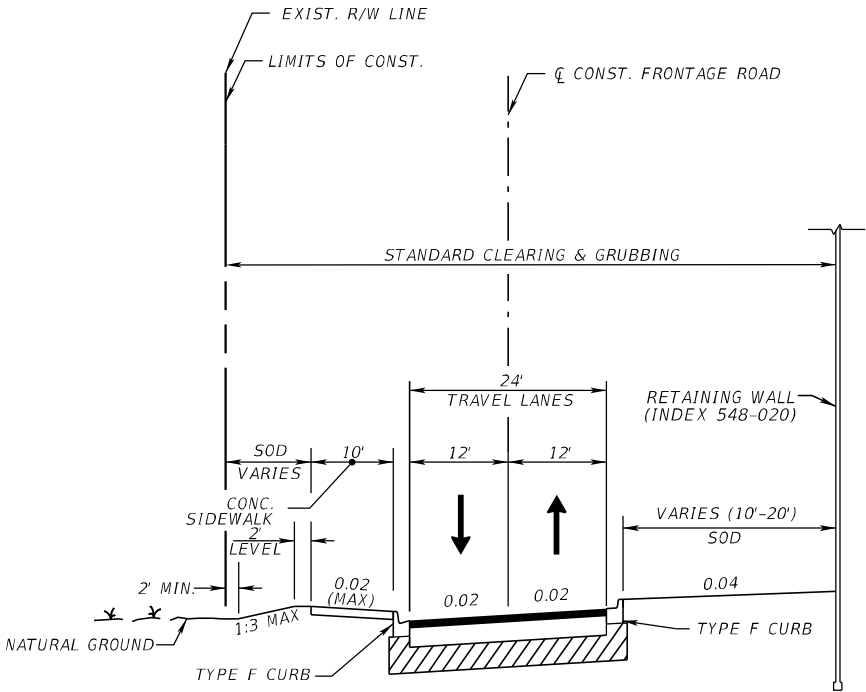
NEW CONSTRUCTION / RECONSTRUCTION

RESURFACING (LA FACILITIES)

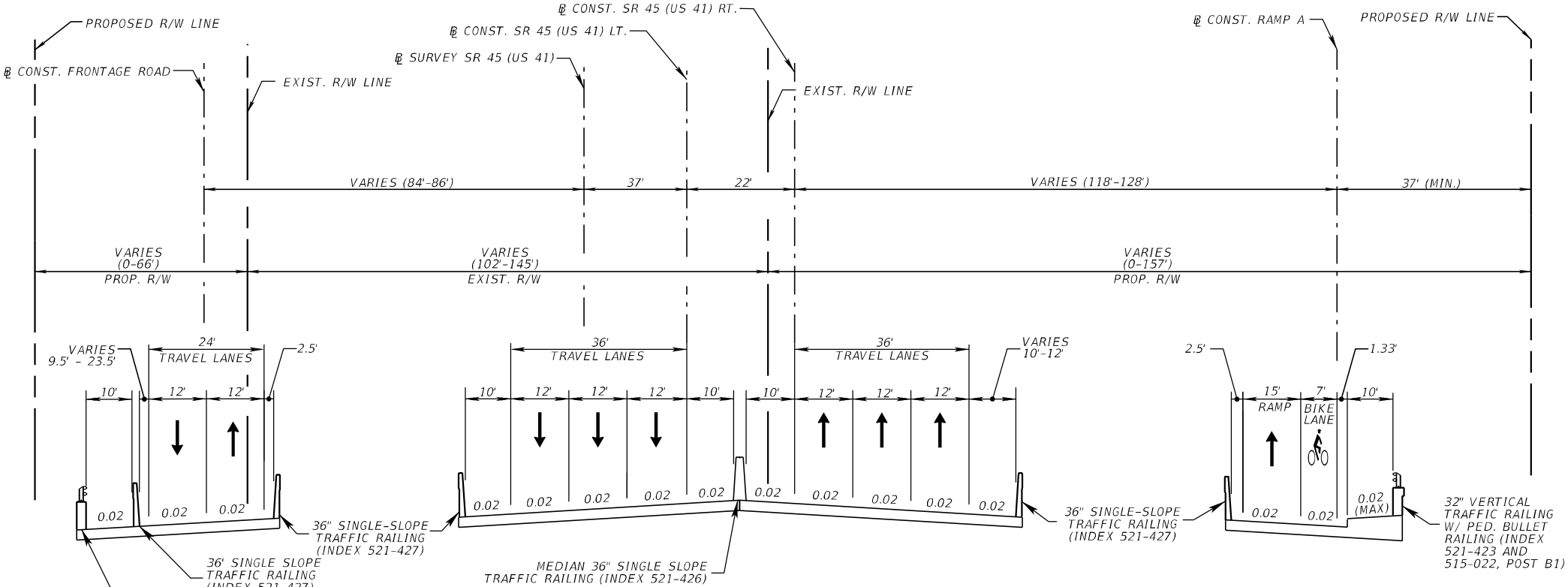
RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

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PROJECT CONTROLS		TYPICAL SECTION No. 9					
CONTEXT CLASSIFICATION C1 : NATURAL C2 : RURAL C2T : RURAL TOWN C3R : SUBURBAN RES. N/A : L.A. FACILITY C3C : SUBURBAN COMM. C4 : URBAN GENERAL C5 : URBAN CENTER C6 : URBAN CORE		 HARTFORD ST. MP 0.000 TO MP 0.189 $\varnothing$ CONST. HARTFORD ST. TOWAWAY AVE. / 36TH AVE. MP 0.000 TO MP 0.122 $\varnothing$ CONST. 36TH ST. ST. PAUL ST. MP 0.000 TO MP 0.09 $\varnothing$ CONST. ST. PAUL ST. FRONTAGE RD. MP 0.000 TO MP 0.194 $\varnothing$ CONST. FRONTAGE RD.					
FUNCTIONAL CLASSIFICATION INTERSTATE FREEWAY/EXPWY. PRINCIPAL ARTERIAL MINOR ARTERIAL MAJOR COLLECTOR MINOR COLLECTOR LOCAL		 FRONTAGE RD. MP 0.375 TO MP 0.758 $\varnothing$ CONST. FRONTAGE RD.					
HIGHWAY SYSTEM NATIONAL HIGHWAY SYSTEM STRATEGIC INTERMODAL SYSTEM STATE HIGHWAY SYSTEM OFF-STATE HIGHWAY SYSTEM							
ACCESS CLASSIFICATION 1 - FREEWAY 2 - RESTRICTIVE w/Service Roads 3 - RESTRICTIVE w/660 ft. Connection Spacing 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing 5 - RESTRICTIVE w/440 ft. Connection Spacing 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing 7 - BOTH MEDIAN TYPES							
CRITERIA NEW CONSTRUCTION / RECONSTRUCTION RESURFACING (LA FACILITIES) RRR (ARTERIALS & COLLECTORS)							
POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION: DESIGN VARIATIONS 1) BIKE LANE WIDTH		HARTFORD ST. DESIGN SPEED = 30 MPH POSTED SPEED = 30 MPH TARGET SPEED = N/A TOWAWAY AVE. / 36TH ST. DESIGN SPEED = 30 MPH POSTED SPEED = 30 MPH TARGET SPEED = N/A ST. PAUL ST. DESIGN SPEED = 30 MPH POSTED SPEED = 30 MPH TARGET SPEED = N/A FRONTAGE RD. DESIGN SPEED = 30 MPH POSTED SPEED = 30 MPH TARGET SPEED = N/A NOT TO SCALE <table><tr><td>FINANCIAL PROJECT ID</td><td>SHEET NO.</td></tr><tr><td>440749-1-52-01</td><td>10</td></tr></table>		FINANCIAL PROJECT ID	SHEET NO.	440749-1-52-01	10
FINANCIAL PROJECT ID	SHEET NO.						
440749-1-52-01	10						

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

PROJECT CONTROLS	TYPICAL SECTION No. 10				
CONTEXT CLASSIFICATION C1 : NATURAL C2 : RURAL C2T : RURAL TOWN C3R : SUBURBAN RES. N/A : L.A. FACILITY C3C : SUBURBAN COMM. C4 : URBAN GENERAL C5 : URBAN CENTER C6 : URBAN CORE					
FUNCTIONAL CLASSIFICATION INTERSTATE FREEWAY/EXPWY. PRINCIPAL ARTERIAL MINOR ARTERIAL MAJOR COLLECTOR MINOR COLLECTOR LOCAL					
HIGHWAY SYSTEM NATIONAL HIGHWAY SYSTEM STRATEGIC INTERMODAL SYSTEM STATE HIGHWAY SYSTEM OFF-STATE HIGHWAY SYSTEM					
ACCESS CLASSIFICATION 1 - FREEWAY 2 - RESTRICTIVE w/Service Roads 3 - RESTRICTIVE w/660 ft. Connection Spacing 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing 5 - RESTRICTIVE w/440 ft. Connection Spacing 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing 7 - BOTH MEDIAN TYPES	SR 45 (US 41) OVER DELANEY CREEK MP 22.999 TO MP 23.015 @ CONST. SR 45 (US 41) LT. MP 23.001 TO MP 23.017 @ CONST. SR 45 (US 41) RT.				
CRITERIA NEW CONSTRUCTION / RECONSTRUCTION RESURFACING (LA FACILITIES) RRR (ARTERIALS & COLLECTORS)					
POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:	NOT TO SCALE TRAFFIC DATA CURRENT YEAR = 2021 AADT = 38,000 ESTIMATED OPENING YEAR = 2026 AADT = 40,500 ESTIMATED DESIGN YEAR = 2046 AADT = 50,700 K = 9% D = 56.9% T = 19.70% (24 HOUR) DESIGN HOUR T = 9.85% DESIGN SPEED = 50 MPH POSTED SPEED = 50 MPH TARGET SPEED = 50 MPH <table><tr><td>FINANCIAL PROJECT ID</td><td>SHEET NO.</td></tr><tr><td>440749-1-52-01</td><td>11</td></tr></table>	FINANCIAL PROJECT ID	SHEET NO.	440749-1-52-01	11
FINANCIAL PROJECT ID	SHEET NO.				
440749-1-52-01	11				

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

PROJECT CONTROLS

CONTEXT CLASSIFICATION

()	C1 : NATURAL	(X)	C3C : SUBURBAN COMM.
()	C2 : RURAL	()	C4 : URBAN GENERAL
()	C2T : RURAL TOWN	()	C5 : URBAN CENTER
()	C3R : SUBURBAN RES.	()	C6 : URBAN CORE
()	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

() INTERSTATE	() MAJOR COLLECTOR
() FREEWAY/EXPWY.	() MINOR COLLECTOR
(X) PRINCIPAL ARTERIAL	() LOCAL
() MINOR ARTERIAL	

HIGHWAY SYSTEM

(X) NATIONAL HIGHWAY SYSTEM
(X) STRATEGIC INTERMODAL SYSTEM
(X) STATE HIGHWAY SYSTEM
() OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

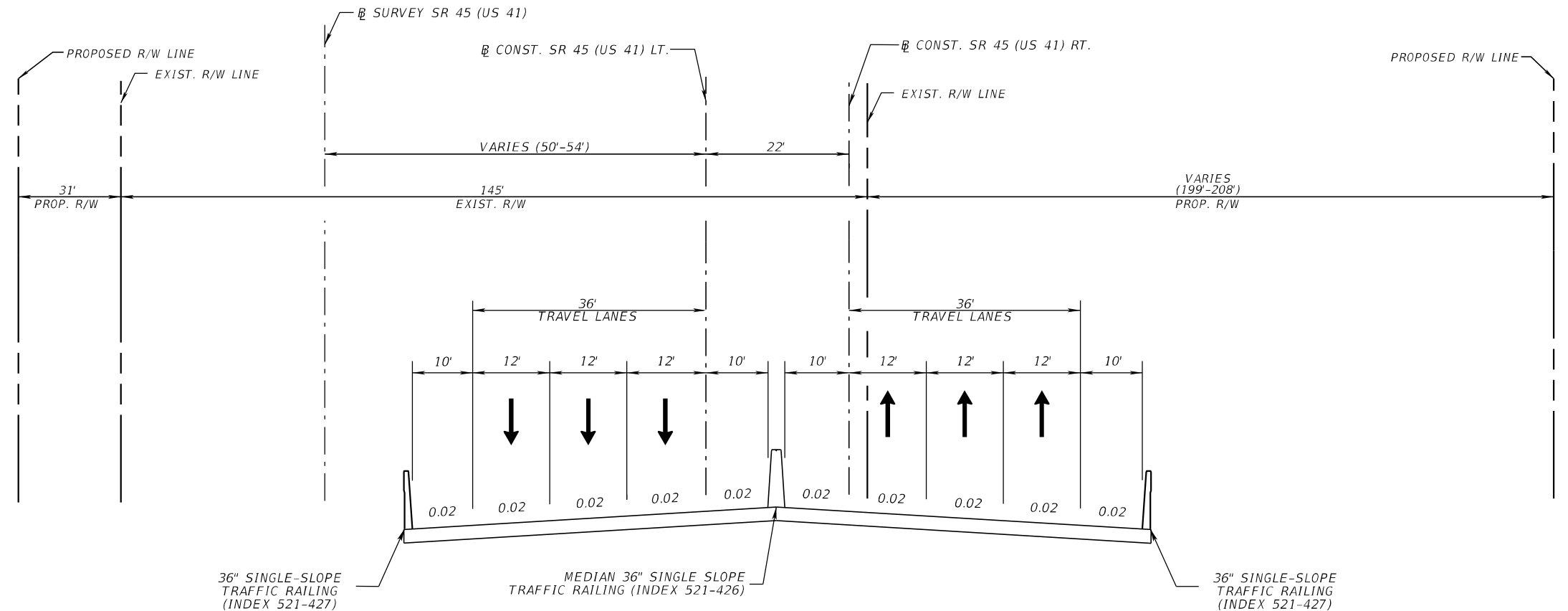
- () 1 - FREEWAY
- () 2 - RESTRICTIVE w/Service Roads
- () 3 - RESTRICTIVE w/660 ft. Connection Spacing
- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- () 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (X) 7 - BOTH MEDIAN TYPES

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
() RESURFACING (LA FACILITIES)
() RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 11



SR 45 (US 41) OVER 36TH AVE. S.
MP 23.076 TO MP 23.104 ~~B~~ CONST. SR 45 (US 41) LT.
MP 23.076 TO MP 23.104 ~~B~~ CONST. SR 45 (US 41) RT.

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 38,000
ESTIMATED OPENING YEAR = 2026 AADT = 40,500
ESTIMATED DESIGN YEAR = 2046 AADT = 50,700
K = 9% D = 56.9% T = 19.70% (24 HOUR)
DESIGN HOUR T = 9.85%
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH
TARGET SPEED = 50 MPH

<i>FINANCIAL PROJECT ID</i>	<i>SHEET NO.</i>
<i>440749-1-52-01</i>	<i>12</i>

PROJECT CONTROLS

CONTEXT CLASSIFICATION

<u>FUNCTIONAL CLASSIFICATION</u>	
() INTERSTATE	() MAJOR COLLECTOR
() FREEWAY/EXPWY.	() MINOR COLLECTOR
(X) PRINCIPAL ARTERIAL	() LOCAL
() MINOR ARTERIAL	

- ## HIGHWAY SYSTEM
- (X) NATIONAL HIGHWAY SYSTEM
 - (X) STRATEGIC INTERMODAL SYSTEM
 - (X) STATE HIGHWAY SYSTEM
 - () OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- () 1 - *FREEWAY*
- () 2 - *RESTRICTIVE w/Service Roads*
- () 3 - *RESTRICTIVE w/660 ft. Connection Spacing*
- () 4 - *NON-RESTRICTIVE w/2640 ft. Signal Spacing*
- () 5 - *RESTRICTIVE w/440 ft. Connection Spacing*
- () 6 - *NON-RESTRICTIVE w/1320 ft. Signal Spacing*
- (X) 7 - *BOTH MEDIAN TYPES*

- | <u><i>CRITERIA</i></u> | |
|------------------------|--|
| <i>(X)</i> | <i>NEW CONSTRUCTION / RECONSTRUCTION</i> |
| <i>()</i> | <i>RESURFACING (LA FACILITIES)</i> |
| <i>()</i> | <i>RRR (ARTERIALS & COLLECTORS)</i> |

*POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:*

POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 12

SR 45 (US 41) OVER CSX
 MP 23.228 TO MP 23.306 CONST. US 41 LT.
 MP 23.228 TO MP 23.306 CONST. US 41 RT.

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 38,000
 ESTIMATED OPENING YEAR = 2026 AADT = 40,500
 ESTIMATED DESIGN YEAR = 2046 AADT = 50,700
 K = 9% D = 56.9% T = 19.70% (24 HOUR)
 DESIGN HOUR T = 9.85%
 DESIGN SPEED = 50 MPH
 POSTED SPEED = 50 MPH
 TARGET SPEED = 50 MPH

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	13

NOT TO SCALE

CURRENT YEAR = 2021 AADT = 38,000
ESTIMATED OPENING YEAR = 2026 AADT = 40,500
ESTIMATED DESIGN YEAR = 2046 AADT = 50,700
K = 9% D = 56.9% T = 19.70% (24 HOUR)
DESIGN HOUR T = 9.85%
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH
TARGET SPEED = 50 MPH

CURRENT YEAR = 2021 AADT = 38,000
ESTIMATED OPENING YEAR = 2026 AADT = 40,500
ESTIMATED DESIGN YEAR = 2046 AADT = 50,700
K = 9% D = 56.9% T = 19.70% (24 HOUR)
DESIGN HOUR T = 9.85%
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH
TARGET SPEED = 50 MPH

<i>FINANCIAL PROJECT ID</i>	<i>SHEET NO.</i>
<i>440749-1-52-01</i>	<i>13</i>

#

PROJECT DESCRIPTION:

This project is located along SR 45 (US 41) in Hillsborough County, Florida. The limits of this project are from south of Denver Street (MP 22.578) and extend north of the Causeway Boulevard intersection to 23rd Avenue (MP 23.925). SR 45 (US 41) is an existing 6-lane, urban principle arterial, with a context classification of C3C. It is also part of FDOT's Strategic Intermodal System (SIS), designated as a SIS Connector and has a mainline design speed and proposed posted speed of 50 MPH.

This project will reconstruct 1.347 miles of mainline SR 45 (US 41) to include the construction of a grade separation of SR 45 (US 41) at the CSX railroad crossing located approximately 1,400' south of the Causeway Boulevard intersection. Intersection and operational improvements at US 41/SR 45 and Causeway Boulevard will also be provided.

The proposed typical section for SR 45 (US 41) grade separates US 41 to a concrete paved typical section to south of Causeway Blvd. The proposed typical section mainly consists of a concrete 6-lane divided urban section with 12-foot lanes, 7-foot buffered bicycle lanes, and 10-foot sidewalk on both sides

We are requesting a design variation for shoulder cross slope at the specified locations identified in the corresponding report.

DESIGN CRITERIA VERSUS PROPOSED DESIGN:

- **FDOT Design Manual Criteria (2022 FDM):** According to Chapter 210, Section 210.4.1 requires the standard cross slope to be 0.06 on the outside shoulder and 0.05 on the median (or left) side. For projects constructed with concrete pavement, the first one foot of the outside shoulder is cast with the outside travel lane and will have the same cross slope (and superelevation) as the outside lane.
- **AASHTO Criteria:** According to A Policy on the Geometric Design of Highways and Streets (2018), (AASHTO), Chapter 4, Section 4.4.3, Page 4-13 lists 0.02 to 0.06 as acceptable values for cross slope of bituminous shoulders.
- **Proposed Design:** The proposed design reconstructs the inside paved shoulder at the same cross slope as the adjacent travel lanes.

LIMITS APPLICABLE:

Location	Station (Milepost)	Shoulder	Design / Posted Speed	FDM Design Criteria	AASHTO Design Criteria	Proposed
SR 45 SB	1034+55.71 (22.883) to 1040+67.68 (22.999)	Inside	50	5%	2% - 6%	2%
SR 45 NB	2034+06.44 (22.874) to 2040+77.74 (23.001)	Inside	50	5%	2% - 6%	2%
SR 45 SB	1041+50.29 (23.015) to 1044+72.50 (23.076)	Inside	50	5%	2% - 6%	2%
SR 45 NB	2041+60.31 (23.017) to 2044+71.83 (23.076)	Inside	50	5%	2% - 6%	2%
SR 45 SB	1046+22.01 (23.104) to 1052+78.38 (23.228)	Inside	50	5%	2% - 6%	2%
SR 45 NB	2046+21.63 (23.104) to 2052+74.95 (23.228)	Inside	50	5%	2% - 6%	2%

REASON THE DESIGN CRITERIA ARE NOT APPROPRIATE:

- Along this section of SR 45 (US 41), there are 6 localized pockets where the proposed inside shoulder cross slope does not meet FDOT criteria.
- Meeting FDOT criteria will require additional drainage and roadway cost without substantially improving the operational conditions, capacity, and safety of corridor.
- There are no anticipated Right-of-Way impacts for the proposed design.
- There are a series of bridge structures within the variation limits requiring multiple shoulder cross slope transitions to match the 0.02 cross slope on the bridges creating short distances of standard 0.05 shoulder cross slopes within the roadway sections. These short distances of 0.05 cross slope are impractical and do not function as intended for standard typical section design.

SAFETY IMPACTS/ REVIEW OF CRASH HISTORY:

- Crash data from 2015 to 2019 (certified) and 2020 to present (uncertified) were reviewed.
- There were 341 crashes, 5 fatalities, and 90 potential injuries within the limits of the deficiency.
- The predominant crash types related to this variation are hydroplaning and off-road crashes.
- A review of the long forms within the limits of the deficient shoulder cross slopes identified none of those crashes have the potential to be related to the Design Variation being recommended.
- Out of the 38 (10%) crashes associated with wet conditions, 14 (37%) listed causes such as “operated motor vehicle in careless or negligent manner” or “drove too fast for conditions”.
- There were no fatal crashes attributed to the deficiency.
- The cost to mitigate the variation is not warranted as there are no crash related costs associated with the shoulder cross slope deficiency.
- The entire roadway within the variation limits will be reconstructed and grade separated changing the roadway characteristics in its entirety including the addition of paved shoulders with new drainage features providing adequate spread and flow away from the travel lanes.
- The hydroplaning analysis indicates that the possibility of hydroplaning exists for speeds greater than 50 mph at a rainfall intensity of 2.00 in/hr. and for 1.00 in/hr. at locations within the deficiency. However, the analysis shows the risk is eliminated within the limits of the deficiency when the speed drops to 50 mph.
- Considering the urban nature of the corridor, the existing conditions and the small percentage of crashes that could be attributed to hydroplaning, it is not anticipated that the new configuration would have an adverse effect on safety.

JUSTIFICATION FOR PROPOSED CRITERIA:

- The proposed criteria does not meet the FDM’s governing criteria, however, it does meet AASHTO’s new construction criteria for this controlling design element, so an exception is not needed.
- The proposed outside shoulder is 10 feet paved bordered with barrier wall for the variation limits which will provide adequate spread and flow to the proposed drainage structures given the proposed longitudinal grades (> 0.03).
- The entire roadway within the variation limits will be reconstructed and grade separated changing the roadway characteristics in its entirety including the addition of paved shoulders with new drainage features providing adequate spread and flow away from the travel lanes.
- Hydroplaning Risk analysis showed no hydroplaning concerns at 50 MPH with the proposed inside shoulder cross slope.
- The inside shoulder sloping towards the three travel lanes in one direction within this variation are accepted standard of practice for the design and construction of roadways. This common practice is employed to simplify construction.
- Providing standard inside shoulder cross slopes within the variation limits will require multiple shoulder cross slope transitions to match the 0.02 cross slope on the bridges creating short distances of standard 0.05 shoulder cross slopes within the roadway sections making standard practice impractical.
- Mitigating strategies being implemented as part of this deficiency include longitudinal grooving of the proposed concrete pavement.

CONCLUSION AND RECOMMENDATION:

- The AASHTO requirement for shoulder cross slope criteria is met.
- The hydroplaning analysis indicates that the possibility of hydroplaning exists for speeds greater than 50 mph at a rainfall intensity of 2.00 in/hr. and for 1.00 in/hr. at locations within the deficiency. However, the analysis shows the risk is eliminated within the limits of the deficiency when the speed drops to 50 mph.
- Crash history for the latest 5-year period (2015 to 2019) was reviewed and there were no hydroplaning crashes related to deficient cross slope. Crash data from 2020 to present was also reviewed and it shows no trend related to deficient cross slope.
- The entire roadway within the variation limits will be reconstructed and grade separated changing the roadway characteristics in its entirety including the addition of paved shoulders with new drainage features providing adequate spread and flow away from the travel lanes.
- Mitigating strategies being implemented as part of this deficiency include longitudinal grooving of the concrete pavement.
- We request approval of the Design Variation for shoulder cross slope for the limits identified.

Appendices: Yes ☒ No ☐

Appendix A – Proposed Typical Section

Appendix B – Hydroplaning Analysis Tool

Appendix C – Crash Data

Recommended By:

Vincent Shine
Digitally signed by Vincent
Shine
Date: 2023.01.16 10:14:08
-05'00'

Date _____

Vincent E. Shine, P.E. 67387
Kisinger Campo & Associates Corp.
201 N. Franklin St., Suite 400
Tampa, Florida 33602
Phone: (813) 871-5331
Email: VShine@kcaeng.com

Vincent E. Shine, P.E. State of Florida Professional Engineer, License No. 67387

This item has been digitally signed and sealed by Vincent E. Shine, PE on the date indicated here.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Appendix A: Proposed Typical Section

PROJECT CONTROLS

CONTEXT CLASSIFICATION

- | | | | |
|-----|---------------------|-----|----------------------|
| () | C1 : NATURAL | (X) | C3C : SUBURBAN COMM. |
| () | C2 : RURAL | () | C4 : URBAN GENERAL |
| () | C2T : RURAL TOWN | () | C5 : URBAN CENTER |
| () | C3R : SUBURBAN RES. | () | C6 : URBAN CORE |
| () | N/A : L.A. FACILITY | | |

FUNCTIONAL CLASSIFICATION

- | | | | |
|-----|--------------------|-----|-----------------|
| () | INTERSTATE | () | MAJOR COLLECTOR |
| () | FREEWAY/EXPWY. | () | MINOR COLLECTOR |
| (X) | PRINCIPAL ARTERIAL | () | LOCAL |
| () | MINOR ARTERIAL | | |

HIGHWAY SYSTEM

- | | |
|-----|-----------------------------|
| (X) | NATIONAL HIGHWAY SYSTEM |
| (X) | STRATEGIC INTERMODAL SYSTEM |
| (X) | STATE HIGHWAY SYSTEM |
| () | OFF-STATE HIGHWAY SYSTEM |

ACCESS CLASSIFICATION

- | | |
|-----|---|
| () | 1 - FREEWAY |
| () | 2 - RESTRICTIVE w/Service Roads |
| () | 3 - RESTRICTIVE w/660 ft. Connection Spacing |
| () | 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing |
| () | 5 - RESTRICTIVE w/440 ft. Connection Spacing |
| () | 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing |
| (X) | 7 - BOTH MEDIAN TYPES |

CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
() RESURFACING (LA FACILITIES)
() RRR (ARTERIALS & COLLECTORS)

**POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:**

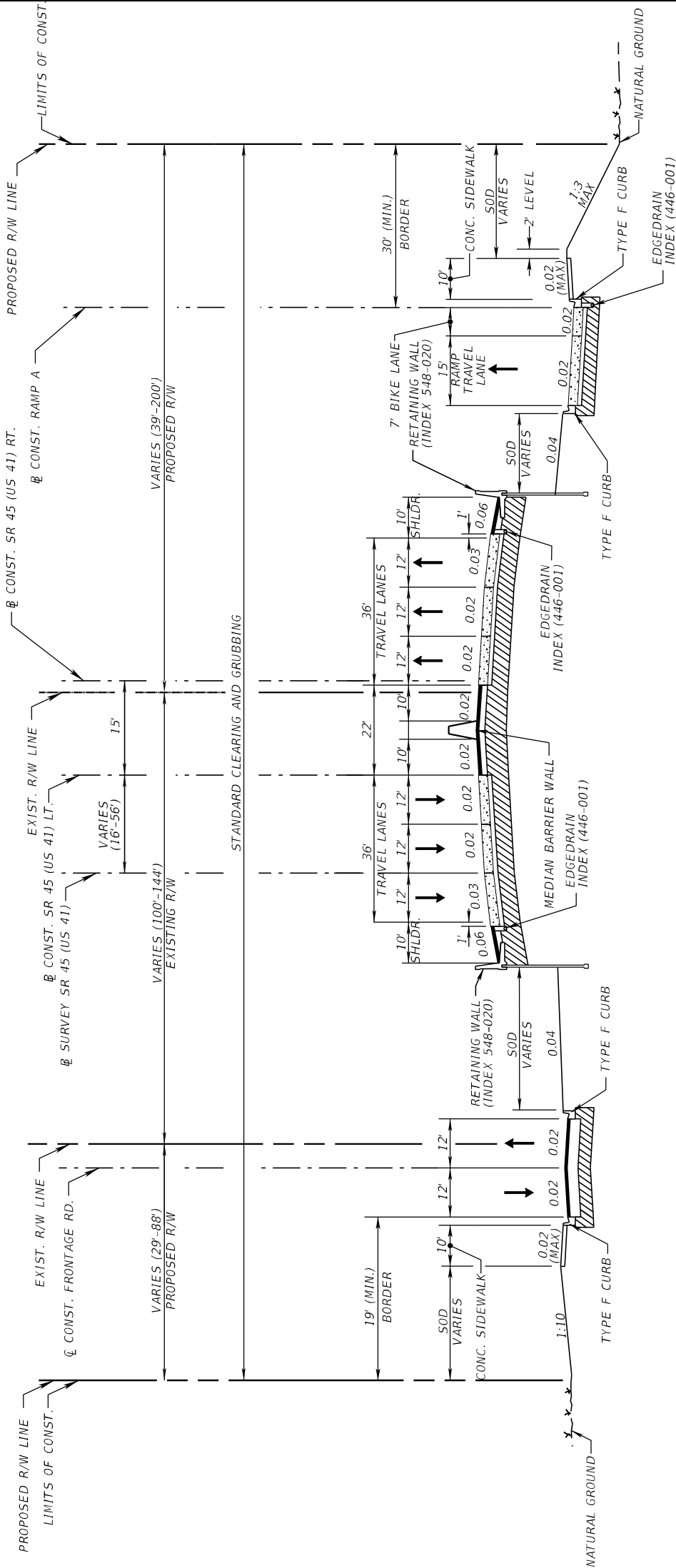
DESIGN VARIATIONS

- ### 1) SHOULDER CROSS SLOPE

TRAFFIC DATA

CURRENT YEAR = 2018 ADT = 39,000
ESTIMATED OPENING YEAR = 2027 ADT = 48,500
ESTIMATED DESIGN YEAR = 2047 ADT = 60,400
K = 9% D = 72.4% T = 13% (24 HOUR)
DESIGN HOUR T = 7.0%
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH
TARGET SPEED = 50 MPH

TYPICAL SECTION No. 2



SR 45 (US 41)

- | | | | | | | | | | | | |
|----|--------|----|----|--------|---|--------|----|----|-----|-----|-----|
| MP | 22.883 | TO | MP | 22.999 | 6 | CONST. | SR | 45 | (US | 41) | LT. |
| MP | 23.015 | TO | MP | 23.076 | 6 | CONST. | SR | 45 | (US | 41) | LT. |
| MP | 23.104 | TO | MP | 23.228 | 6 | CONST. | SR | 45 | (US | 41) | LT. |
| MP | 22.874 | TO | MP | 23.001 | 6 | CONST. | SR | 45 | (US | 41) | RT. |
| MP | 23.017 | TO | MP | 23.001 | 6 | CONST. | SR | 45 | (US | 41) | RT. |
| MP | 23.104 | TO | MP | 23.228 | 6 | CONST. | SR | 45 | (US | 41) | RT. |

NOT TO SCALE

<i>FINANCIAL PROJECT ID</i>	<i>SHEET NO.</i>
440749-1-52-01	3

Appendix B: Hydroplaning Analysis Tool



Hydroplaning Analysis Tool

General Inputs

FPID	440749-1-52-01	Roadway Section Number	10060000
District No.	7	Milepost	22.578 to 23.925
County	Hillsborough	(Please Select Milepost or Station above)	
		Direction	North

Analysis Options

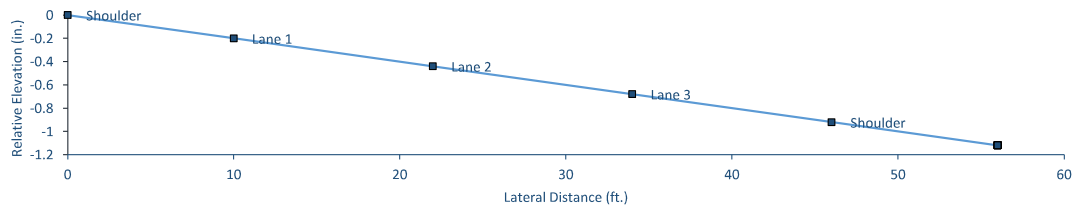
Select Analysis Option	Deterministic (Default)	: Show intermediate outputs? (e.g., Drainage Path Length)	Yes
Risk Analysis? (Per FDOT's Design Guidance)	Yes		

Pavement Inputs

Deterministic Analysis

Longitudinal Grade (%)	3.5	Pavement Texture (Please Select MTD or MPD below)	
Surface Type	PCC (LGD)	Mean Texture Depth (in.)	0.035
Permeability (in/hr)	0		

Plane Number	1	2	3	4	5	6	7	8	9	10	11	12
Description	Shoulder	Lane 1	Lane 2	Lane 3	Shoulder							
Design Speed (mph)		50	50	50								
Cross Slope (%)	2	2	2	2	2							
Width (ft.)	10	12	12	12	10							



Risk Analysis Results

(Based on Gallaway WFT and PAVDRN HPS Models)

Predicted Water Film Thickness (in.)

Plane Number	1	2	3	4	5	6	7	8	9	10	11	12
Intensity (in/hr)	Shoulder	Lane 1	Lane 2	Lane 3	Shoulder							
0.1		-0.020	-0.016	-0.012								
0.25		-0.009	-0.003	0.003								
0.5		0.003	0.013	0.021								
1		0.021	0.036	0.048								
2		0.048	0.069	0.087								
3		0.070	0.096	0.118								
4		0.088	0.119	0.145								

Predicted Driver Speed (mph)

Plane Number	1	2	3	4	5	6	7	8	9	10	11	12
Intensity (in/hr)	Shoulder	Lane 1	Lane 2	Lane 3	Shoulder							
0.1		50.0	50.0	50.0								
0.25		50.0	50.0	50.0								
0.5		45.0	45.0	45.0								
1		45.0	45.0	45.0								
2		45.0	45.0	45.0								
3		45.0	45.0	45.0								
4		45.0	45.0	45.0								

Predicted Hydroplaning Speed (mph)

Plane Number	1	2	3	4	5	6	7	8	9	10	11	12
Intensity (in/hr)	Shoulder	Lane 1	Lane 2	Lane 3	Shoulder							
0.1		999.0	999.0	999.0								
0.25		999.0	999.0	117.5								
0.5		115.0	80.3	70.8								
1		70.4	61.7	57.2								
2		57.1	52.0	49.0								
3		51.9	49.3	48.5								
4		48.9	48.5	47.7								

Appendix C: Crash Data

2015 - 2019 (FDOT)

Event ID	Event On Street	Event Roadway ID	Event Mile Post	Lighting	Event Weather Condition	Manner of Collision	Road Surface Condition
87174073	US. 41	10060000	23.528	Daylight	Rain	Sideswipe	Wet
88189856	US 41 SB (STATE ROAD 45/S 50TH ST)	10060000	22.873	Daylight	Rain	Rear End	Wet
88142419	50TH ST (US 41)	10060000	22.873	Dusk	Cloudy	Rear End	Wet
89130478	SR 599 (50TH ST S)	10060000	23.24	Daylight	Rain	Rear End	Wet
88110658	US 41 (SR 45)	10060000	23.452	Daylight	Rain	Hit Fixed Object	Wet
88053351	US-41	10060000	22.791	Daylight	Rain	Rear End	Wet
88037683	NB US 41 (50TH STREET)	10060000	23.594	Dawn	Rain	Sideswipe	Wet
87270523	SB US 41	10060000	22.863	Daylight	Cloudy	Rear End	Wet
87713072	(US HW 41) 50TH ST S	10060000	23.528	Daylight	Rain	Sideswipe	Wet
81962225	3597 US-41	10060000	23.018	Daylight	Rain	Hit Non-Fixed Object	Wet
87370335	SR-45 (41 HW S/50TH ST S)	10060000	23.483	Daylight	Rain	Angle	Wet
85588278	S 50TH STREET	10060000	23.31	Daylight	Rain	Single Vehicle	Wet
85511684	US 41 (STATE ROAD 45)	10060000	23.297	Daylight	Rain	Rear End	Wet
86916840	HW 41 S (50TH ST S)	10060000	23.541	Daylight	Rain	Rear End	Wet
85472287	NB US-41 (50TH)	10060000	23.538	Dawn	Rain	Head On	Wet
85184344	US 41	10060000	23.542	Dawn	Rain	Sideswipe	Wet
83738303	50TH ST	10060000	23.53	Dawn	Cloudy	Rear End	Wet
86559106	ST S (US HW 41/S.R. 45)	10060000	23.847	Dusk	Rain	Sideswipe	Wet
85328979	NB US 41 (50TH STREET)	10060000	23.095	Daylight	Rain	Left Turn	Wet
83713339	SOUTH 50TH STRET	10060000	23.41	Daylight	Cloudy	Rear End	Wet
85315609	US-41	10060000	22.714	Dark-Unknown Lighting	Cloudy	Sideswipe	Wet
85318475	US HIGHWAY 41 (50TH STREET)	10060000	23.509	Daylight	Rain	Rear End	Wet
86205949	ST ST (41 HW S/SR-45)	10060000	23.302	Daylight	Rain	Rear End	Wet
85280698	SR 45	10060000	23.509	Dark-Lighted	Rain	Hit Fixed Object	Wet
85099619	ST	10060000	22.775	Daylight	Rain	Rear End	Wet
85184186	US 41 OR SR 45 OR 50TH ST	10060000	23.009	Dark-Not Lighted	Cloudy	Angle	Wet
85144432	US 41 (STATE ROAD 599)	10060000	23.605	Daylight	Rain	Angle	Wet
85887828	HW S (SR-45/50TH ST S)	10060000	22.78	Daylight	Clear	Rear End	Wet
85131363	SB US-41	10060000	22.775	Daylight	Rain	Left Turn	Wet
85886841	DENVER ST	10060000	22.617	Daylight	Cloudy	Hit Fixed Object	Wet
84888563	US HIGHWAY 41 (STATE ROAD 45)	10060000	23.547	Dark-Lighted	Rain	Angle	Wet
81986886	US41	10060000	23.533	Daylight	Rain	Rear End	Wet
84545245	SB US 41 (50TH ST)	10060000	23.483	Dark-Lighted	Rain	Sideswipe	Wet

2020 - Present (Signal Four Analytics)

Event ID	Event On Street	Event Roadway ID	Event Mile Post	Lighting	Event Weather Condition	Manner of Collision	Road Surface Condition
25020207	US-41 (SR-45)	10060000	23.547	Daylight	Cloudy	Angle	Wet
24959501	US-41 (50TH ST)	10060000	23.528	Daylight	Rain	Rear End	Wet
24955106	US-41 (50TH STREET)	10060000	23.551	Dark-Lighted	Cloudy	Rear End	Wet
24904516	US 41 (SR 45/S 50TH ST)	10060000	23.528	Dark-Lighted	Rain	Hit Fixed Object	Wet
88514895	US-41 (SOUTH TAMiami TRAIL)	10060000	23.642	Daylight	Rain	Rear End	Wet
88358303	US-41	10060000	23.547	Dark-Lighted	Rain	Angle	Wet

Project Design Variation Memorandum

To: Allan Urbonas, P.E.
District Design Engineer

Date: June 23, 2023

Financial Project ID: 440749-1-52-01

New Construction (☒) RRR (☐)

Federal Aid Number: TBD

Project Name: US 41/SR 45 at CSX Grade Separation from South of the SR 676 Intersection to North of the SR 676 Intersection

State Road Number: SR 45

Co./Sec./Sub.: Hillsborough/10-060-000 & 10-250-000

Begin Project MP: 22.578

End Project MP: 23.925

Requested for: Design Variation

Project Description:

This project is located along SR 45 (US 41) in Hillsborough County, Florida. The limits of this project are from south of Denver Street (MP 22.578) and extend north of the Causeway Boulevard intersection to 23rd Avenue (MP 23.925). SR 45 (US 41) is an existing 6-lane, urban principle arterial, with a context classification of C3C. It is also part of FDOT's Strategic Intermodal System (SIS), designated as a SIS Connector and has a mainline design and posted speed of 50 MPH.

This project will reconstruct 1.347 miles of mainline to include the construction of a grade separated overpass along US 41 at the CSX railroad crossing (624802A) located approximately 1,400 ft. south of the Causeway Boulevard intersection. US 41 is a major arterial and designated freight corridor servicing the Port of Tampa Bay and greater Tampa Bay area. Given the existing and future truck traffic demand, US 41 and Causeway Boulevard will be reconstructed with concrete pavement. Intersection and operational improvements at US 41 and Causeway Boulevard will also be provided.

The following design variations included herein are requested for this project:

Design Element	MP: Beg-End	Existing	Proposed	Required	Attr. Crashes	Approved	Denied	Addl. Docum.
1. <u>Bicycle Facilities</u>			See Table Below		☐	☒	☐	☐

Justification: A design variation is requested to not implement bicycle facilities along the US 41 frontage road system, the keyhole locations along the triple right turn auxiliary lanes on eastbound Causeway Blvd, and along portions of US 41. The 2023 FDOT Design Manual (FDM), Section 223.1, states that bicycle lanes are required on all SHS facilities, with a standard 7 ft. buffered bicycle lane. The FDM further requires, in section 223.2.1.3, at least a 5 ft. keyhole bicycle lane on roads approaching intersections. The 2018 AASHTO Greenbook, Section 7.3.9.1, Page 7-54, suggests the usage of "separate facilities such as bike lanes, separated bike lanes, and shared-use paths in order to preserve capacity for motor vehicles while reducing potential conflicts with bicyclists." The AASHTO 2012 Guide for Development of Bicycle Facilities, page 4-15, suggests a 5 ft. minimum on roadways where the bicycle lane will be adjacent to curbs, guardrails, or other vertical surfaces. Currently, within the project limits, there are no designated bicycle facilities along US 41, however, designated bicycle lanes are provided along Causeway Blvd. The proposed design will transition bicyclists from the US 41 high speed mainline to the US 41 frontage road system using 10 ft. concrete sidewalks. Similarly, northbound on US 41, bicyclists will transition at the 27th Ave intersection from the proposed bicycle lane onto the existing 6 ft. sidewalk. Bicyclists will be transitioned off the eastbound Causeway Blvd. roadway to the 10 ft. sidewalk along the outside of the triple right turn lanes approaching the US 41 intersection. Omitting the designated bicycle facilities along the frontage roads and the keyhole lane along the right turn lanes on eastbound Causeway Blvd will address the safety concerns associated with the large truck traffic servicing adjacent properties. Crash data from year 2015 to 2019 (certified) as well as 2020-present (non-certified) was reviewed. There were a total of 129 crashes within the deficiency limits and three pedestrian/bicycle crashes. One incapacitating collision was due to the bicyclist failing to yield in the travel lanes where there are currently no designated bicycle lanes, a second incapacitating collision was due to a driver failing to stop at a stop sign. The third collision, which was non-incapacitating, was due to a vehicle failing

to yield right of way to a bicycle crossing as the intersection of US 41 and Causeway Blvd. A review of the long forms identified the crashes were not attributable to the Design Variation being recommended. The cost to mitigate this design variation is not warranted as there are no attributable crashes associated with this deficiency. To meet FDM criteria, additional right of way and utility relocations will be required. Furthermore, the required criteria is not applicable to site-specific conditions since there are no current bicycle facilities on either end of the US 41 project limits. It is requested not to implement bicycle facilities, at the locations identified, be approved.

Facility	Station (Milepost)	Side	Posted/Design Speed	FDM Design Criteria	AASHTO Design Criteria	Existing	Proposed
SR 45 (US 41) SB	1036+86.06 (22.774) to 1069+51.65 (23.483)	LT.	50 mph	7 ft.	5 ft.	0 ft.	0 ft.
SR 45 (US 41) SB	1086+99.40 (23.876) to 1089+56.36 (23.925)	LT.	50 mph	7 ft.	5 ft.	0 ft.	0 ft.
SR 45 (US 41) NB	2074+17.55 (23.632) to 2089+58.21 (23.925)	RT.	50 mph	7 ft.	5 ft.	0 ft.	0 ft.
Hartford St.	20+94.19 (0.000) to 33+60.99 (0.189)	N/A	30 mph	7 ft.	5 ft.	0 ft.	0 ft.
Frontage Rd.	300+00.00 (0.000) to 337+21.12 (0.758)	N/A	30 mph	7 ft.	5 ft.	0 ft.	0 ft.
Causeway Blvd. EB	4107+80.19 (3.068) to 4110+78.63 (2.971)	RT.	45 mph	7 ft..	5 ft.	0 ft.	5 ft.
Causeway Blvd. WB	3105+74.89 (3.018) to 3110+79.84 (2.971)	LT.	45 mph	7 ft.	5 ft.	0 ft.	5 ft.
Causeway Blvd. EB	4093+00.00 (3.361) to 4100+00.73 (3.175)	RT.	45 mph	7 ft.	5 ft.	0 ft.	0 ft.

Design Element **MP: Beg-End** **Existing** **Proposed** **Required** **Attr. Crashes** **Approved** **Denied** **Addl. Docum.**

2. Border Width

See Table Below



Justification: A design variation is requested for border width along SR 45 (US 41). The 2023 FDOT Design Manual (FDM), Table 210.7.1 states that the border width for C3C classified roads at 50 mph is 29 ft. The 2018 AASHTO Greenbook, Section 7.3.3.8, Page 7-47 states that the minimum border width should be 8 ft. wide and often 12 ft. or more depending on user needs. To meet FDM criteria, additional R/W acquisition would be required throughout the project limits. However, lateral offset criteria will be met with the proposed border width. Crash data from year 2015 to 2019 (certified) as well as 2020-present (non-certified) and a total of 128 crashes, zero fatalities and one injury occurred within the deficiency limits. Of the 128 crashes, two crashes involved vehicles leaving the roadway and colliding with objects outside of the R/W. Utility poles and sign collisions were removed from the consideration because these items are allowed within the border width. A review of the long forms identified that none of those crashes have the potential to be related to the reduced border width. The cost to mitigate the variation is not warranted as there are no crash related costs associated with the border width deficiency. It is requested that the design variation for border width is approved.

Facility	Station (Milepost)	Side	Posted/Design Speed	FDM Design Criteria	AASHTO Design Criteria	Proposed
SR 45 (US 41) SB	1018+43.96 (22.578) to 1020+09.20 (22.609)	LT.	50 mph	29 ft.	8 ft.	24 ft.
SR 45 (US 41) SB	1084+63.73 (23.832) to 1089+56.36 (23.886)	LT.	50 mph	29 ft.	8 ft.	*8 ft. – 24 ft.
SR 45 (US 41) NB	2022+55.37 (22.656) to 2024+34.28 (22.689)	RT.	50 mph	29 ft.	8 ft.	28 ft.
SR 45 (US 41) NB	2072+73.20 (23.567) to 2089+58.21 (23.886)	RT.	50 mph	29 ft.	8 ft.	*13 ft. – 24 ft.

*Does Not Meet FDOT 2023 FDM minimum clear zone width requirements, requires a separate design variation.

Design Element	MP: Beg-End	Existing	Proposed	Required	Attr. Crashes	Approved	Denied	Addl. Docum.
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3. Median Width	See Table Below				☒	☒	☐	☐
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Justification: A design variation is requested to construct substandard median widths along portions of SR 45 (US 41) and SR 676 (Causeway Blvd.). The 2023 FDOT Design Manual (FDM), Table 210.3.1 states that the required median width for C3C classified roads at 45 mph is 22 ft. and 50 mph is 30 ft. The 2018 AASHTO Greenbook, Section 7.3.3.5, Page 7-41 states that the minimum median width should be 10 ft. wide to accommodate left-turn movements. A large portion of the reduced median width includes areas at the project termini where the proposed typical section ties to the existing median width which is less than the FDM requirement. The proposed design includes a reduced median width of 22 ft. along US 41 to avoid R/W impacts to adjacent properties, including CSX, and the typical section is grade separated and access to adjacent properties is not possible. The median within this area is barrier separated to prevent cross-over related crashes. To meet the FDM criteria additional R/W acquisition is required. Crash data from year 2015 to 2019 (certified) as well as 2020-present (non-certified) was reviewed against the deficiency. A total of 102 crashes, zero fatalities and zero injuries occurred within the deficiency limits. A review of the long forms indicated that five crashes may be attributable to the deficiency. The predominant crash types related to substandard median width are head-on crashes and opposing direction sideswipes with a focus on vehicles that traversed the median. A B/C analysis was conducted, and the analysis resulted in a B/C Ratio of 0.44. Efforts to modify the access management with modifications to the raised median have been incorporated to reduce additional conflict points within the variation limits for improved safety. Therefore, it is requested that the design variation for median width be approved.

Facility	Station (Milepost)	Posted/Design Speed	FDM Design Criteria	AASHTO Criteria	Existing Width	Proposed Width
SR 45 (US 41)	218+43.95 (22.578) to 64+85.48 (22.879)	50 mph	30 ft.	10 ft.	19 ft.	22 ft.
SR 45 (US 41)	110+60.00 (23.728) to 121+00.00 (23.925)	50 mph	30 ft.	10 ft.	19 ft.	22 ft.
SR 676 (Causeway Blvd)	279+97.69 (3.554) to 286+85.44 (3.424)	45 mph	22 ft.	10 ft.	14 ft.	16.5 ft.
SR 676 (Causeway Blvd)	309+33.00 (2.998) to 310+77.21 (2.971)	45 mph	22 ft.	10 ft.	14 ft.	16.5 ft.

Design Element	MP: Beg-End	Existing	Proposed	Required	Attr. Crashes	Approved	Denied	Addl. Docum.
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4. Curb on High Speed Facility	See Table Below				☐	☒	☐	☐
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Justification: A design variation is requested for not meeting offsets and curb type requirements for median and outside shoulders along SR 45 (US 41). The 2023 FDOT Design Manual (FDM), Section 210.5.1 states that curbs may be used on roadways where the anticipated operating speeds require a design speed of 50-55 mph, curbs are necessary to control drainage or where R/W is constrained. Additionally, the criteria requires Type E curb and a 6.5 ft. offset to the median and outside curbs from travel edge. Offsets are not required for left turn lanes adjacent to traffic separators or Type E curbs. The 2018 AASHTO Greenbook, Section 7.3.3.3, Page 7-40, states that in urban and suburban areas, the outside edges of shoulders are often curbed, and a closed drainage system provided to minimize the amount of right of way needed. Type F Curb will be proposed on the outside to maintain continuity with the existing roadway features and adjacent segments. Crash data from year 2015 to 2019 (certified) as well as 2020-present (non-certified) was reviewed and no crashes were related to the existing curb condition on SR 45. The cost to mitigate the variation is not warranted as there are no crash related costs associated with the deficiency. An additional 7 ft. paved outside shoulder will be provided to further increase safety. It is requested that utilizing Type F Curb and a reduced shoulder width of 1.5 ft. adjacent to traffic separators in the median be approved.

Facility	Station (Milepost)	Posted/ Design Speed	Location	Proposed/Existing Curb Type	FDM Design Criteria Curb / Shoulder Width	Existing Conditions	Proposed Width
SR 45 (US 41) SB & NB	2018+43.96 (22.578) to 2089+58.21 (23.925)	50 mph	Outside Paved Shoulder	Type F / Type F	Type E Curb / 6.5 ft.	1.5 ft.	7 ft. (outside)
SR 45 (US 41) SB & NB	2018+43.96 (22.578) to 2034+06.44 (22.874)	50 mph	Inside Paved Shoulder	Type F / Type F	Type E Curb / 6.5 ft.	N/A	1.5 ft. (inside)
SR 45 (US 41) SB	1058+70.92 (23.333) to 1068+87.04 (23.525)	50 mph	Inside Paved Shoulder	Type F / Type F	Type E Curb / 6.5 ft.	N/A	1.5 ft. (inside)
SR 599 (US 41) NB	2070+51.09 (23.574) to 2078+41.61 (23.724)	50 mph	Inside Paved Shoulder	Type F / Type F	Type E Curb / 6.5 ft.	N/A	1.5 ft. (inside)
SR 599 (US 41) SB	1079+24.11 (23.730) to 1082+08.86 (23.784)	50 mph	Inside Paved Shoulder	Type F / Type F	Type E Curb / 6.5 ft.	N/A	1.5 ft. (inside)

Design Element **MP: Beg-End** **Existing** **Proposed** **Required** **Attr. Crashes** **Approved** **Denied** **Addl. Docum.**

5. Intersection Sight Distance See Table Below



Justification: A design variation is requested for the Intersection Sight Distance at the intersection of Raleigh Street and Frontage Road. The 2023 FDOT Design Manual (FDM), exhibit 212-4, "Intersection Sight Distance: 2 Lane Undivided Combination Vehicle" table states that the minimum sight distance "d" for a 30 mph road is 510 ft. The 2018 AASHTO Greenbook, section 9.5.3.2.1, page 9-43, introduces the time gap Table 9-6 and equation (9-1) to calculate the Intersection Sight Distance from a Left Turn from Stop. Using equation (9-1) and 11.5 second for the time gap, the AASHTO Greenbook recommends 510 ft. The proposed Intersection Sight Distance, at the stop line, behind the pedestrian cross walk, is approximately 43 ft. due to the barrier wall. Vehicles turning left, from Raleigh Street will stop at the stop bar, watch for pedestrians, then continue towards Frontage Road. Left turning vehicles will obtain a 510 ft. sight distance to the right at a 14.5 ft. offset from the edge of pavement on the Frontage Road (see Appendix G). A barrier wall is required to eliminate the canal hazard and protect pedestrians from Frontage Road traffic. Although this is a new condition, crash data from year 2015 to 2019 (certified) as well as 2020-present (non-certified) was reviewed and there were no crashes that were attributable to limited sight distance at the deficient location. To provide the safest pedestrian facility and to allow for the most adequate sight distance, it is requested that the proposed intersection be approved.

Facility	Station (Milepost)	Posted/Design Speed	FDM Design Criteria	AASHTO Design Criteria	Proposed
Frontage Rd.	310+07.56 (22.9124) to 315+25.80 (23.009)	30 mph	510 ft.	510 ft.	43 ft. – 510 ft.

Design Element **MP: Beg-End** **Existing** **Proposed** **Required** **Attr. Crashes** **Approved** **Denied** **Addl. Docum.**

6. Horizontal Geometry See Table Below



Justification: A design variation is requested for the Horizontal Curve Lengths along the proposed Hartford St. and new Frontage Rd. alignments. The 2023 FDOT Design Manual (FDM), states that for a 30 mph design speed, the desired minimum curve length is 450 ft. However, note 2 of Table 210.8.1 allows for 400 ft. There are four locations where the horizontal curve lengths do not meet FDOT criteria, two locations along the proposed Hartford St. and two along the proposed Frontage Rd. The horizontal curves are located in areas approaching or within close proximity to stop-

controlled intersections. In order to provide the minimum FDOT requirements, without encroaching into the proposed stormwater facility, a significant increase in right of way acquisition will be required, including potential residential/business relocations. The proposed condition warrants no superelevation for Hartford St. and satisfies the minimum length for full superelevation at 0.05 for Frontage Rd. The proposed condition also satisfies sight distance requirements for both roads making the proposed condition feasible. This variation is a new condition so there is no crash data. In order to provide a smooth transition from the proposed Frontage Rd. and Hartford St. alignments, while minimizing the impacts to surrounding parcels and stormwater facilities, it is requested that the proposed horizontal geometry variation be approved.

Facility	Station	Posted/Design Speed	FDM Minimum Design Criteria	AAHSSTO Design Criteria	Existing	Proposed	e
Hartford St. - Curve 1	22+55.52 (0.031) to 25+14.25 (0.080)	30 mph	400 ft.	N/A	N/A	258.73 ft.	NC
Hartford St. - Curve 2	25+14.25 (0.080) to 27+75.23 (0.129)	30 mph	400 ft.	N/A	N/A	260.98 ft.	NC
Frontage Rd. – Curve 1	300+95.56 (0.018) to 304+80.59 (0.091)	30 mph	400 ft.	N/A	N/A	385.03 ft.	0.05
Frontage Rd. – Curve 2	306+00.59 (0.114) to 309+42.76 (0.179)	30 mph	400 ft.	N/A	N/A	342.17 ft.	0.05

Design Element **MP: Beg-End** **Existing** **Proposed** **Required** **Attr. Crashes** **Approved** **Denied** **Addl. Docum.**

7. Clear Zone Width See Table Below ☐ ☒ ☐ ☐

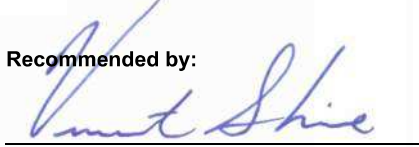
Justification: A design variation is requested for reduced clear zone width at two (2) locations along SR 45 (US 41). The 2023 FDOT Design Manual (FDM), Table 215.2.1, states that for a 50 mph design speed, the required clear zone width is 24 ft. The 2018 AASHTO Greenbook, Section 7.3.4.1, page 7-49, refers to the 2011 AASHTO Roadside Design Guide for clear zone requirements. The 2011 AASHTO Roadside Design Guide, Table 3.1 states that with a design speed of 50 mph, an ADT over 6,000 and a 1V:4H foreslope, the recommended clear zone is 24 – 28 ft. Clear zone is not one of the 10 controlling elements, and a design exception is not required. The limits of reduced clear zone width are located where existing Type F curb, sidewalk, and closely abutting properties are present due to the urban nature of the corridor. The proposed design is replacing the curb in kind to harmonize existing cross slopes with the required pavement reconstruction. The existing R/W at these locations will be maintained to avoid impacts to adjacent properties, including potential residential relocations. Crash data from year 2015 to 2019 (certified) as well as 2020-present (non-certified) was reviewed. The predominant crash type related to this variation is roadway departure and/or a collision with a fixed object. A total of 64 crashes, zero fatalities and 15 injuries occurred within the deficiency limits. Of the 64 crashes, five crashes involved vehicles leaving the roadway and colliding with objects outside of the right of way. A review of the long forms identified that none of those crashes have the potential to be related to a deficient clear zone width. The cost to mitigate the variation is not warranted as there are no crash related costs associated with the clear zone width deficiency. It is requested that the design variation for reduced clear zone width be approved.

Facility	Station (Milepost)	Side	Posted/Design Speed	FDM Design Criteria	AASHTO Design Criteria	Proposed
SR 45 (US 41) SB	1084+63.73 (23.832) to 1089+56.36 (23.886)	LT.	50 mph	24 ft.	24 ft. – 28 ft.	7 ft. – 10 ft.
SR 45 (US 41) NB	2078+67.38 (23.679) to 2084+48.89 (23.788)	RT.	50 mph	24 ft.	24 ft. – 28 ft.	13 ft. – 18 ft.

Appendices: Yes ☒ No ☐

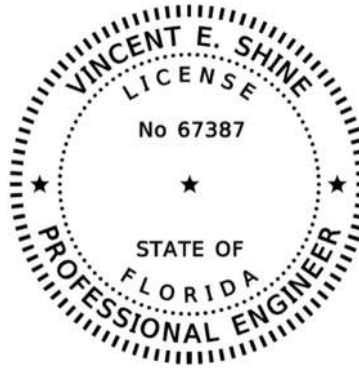
Appendix A – Typical Sections
 Appendix B – Long Form for Bicycle Crash
 Appendix C – Long Forms for Border Width Deficiency Crashes
 Appendix D – Long Forms for Median Width Deficiency Crashes
 Appendix E – Benefit/Cost Analysis for Median Width
 Appendix F – Crash Data
 Appendix G – Intersection Sight Distance Exhibit

Recommended by:



Name: Vincent E. Shine, P.E.
 Responsible Professional Engineer

Date: 06/23/23



This item has been digitally signed and sealed by

Vincent Shine
Digitally signed by Vincent Shine
 Date: 2023.06.23 15:16:21 -04'00'

on the date adjacent to the seal

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Kisinger Campo & Associates, Corp.
 201 N. Franklin Street, Suite 400
 Tampa, Florida 33602
 Vincent E. Shine, P.E. No 67387

Approvals:

N/A Date: _____

Name: Ronald Chin, P.E.
 District Traffic Operations Engineer

Digitally signed by: Allan J Urbonas
 Date: 2023.07.25 13:55:21 -04'00'

 Date: _____

Name: Allan Urbonas, P.E.
 District Design Engineer

Appendix A: Typical Sections

PROJECT CONTROLS

CONTEXT CLASSIFICATION

- | | | |
|-----|---------------------|----------------------|
| () | C1 : NATURAL | (X) |
| () | C2 : RURAL | () |
| () | C2T : RURAL TOWN | () |
| () | C3R : SUBURBAN RES. | () |
| () | N/A : L.A. FACILITY | |
| | | C3C : SUBURBAN COMM. |
| | | C4 : URBAN GENERAL |
| | | C5 : URBAN CENTER |
| | | C6 : URBAN CORE |

FUNCTIONAL CLASSIFICATION

- | | | | |
|-----|--------------------|-----|-----------------|
| () | INTERSTATE | () | MAJOR COLLECTOR |
| () | FREEWAY/EXPWY. | () | MINOR COLLECTOR |
| (X) | PRINCIPAL ARTERIAL | () | LOCAL |
| () | MINOR ARTERIAL | | |

HIGHWAY SYSTEM

- | | |
|-----|-----------------------------|
| (X) | NATIONAL HIGHWAY SYSTEM |
| (X) | STRATEGIC INTERMODAL SYSTEM |
| (X) | STATE HIGHWAY SYSTEM |
| () | OFF-STATE HIGHWAY SYSTEM |

ACCESS CLASSIFICATION

- | | |
|-----|---|
| () | 1 - FREEWAY |
| () | 2 - RESTRICTIVE w/Service Roads |
| () | 3 - RESTRICTIVE w/660 ft. Connection Spacing |
| () | 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing |
| () | 5 - RESTRICTIVE w/440 ft. Connection Spacing |
| () | 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing |
| (X) | 7 - BOTH MEDIAN TYPES |

CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
() RESURFACING (LA FACILITIES)
() RRR (ARTERIALS & COLLECTORS)

**POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:**

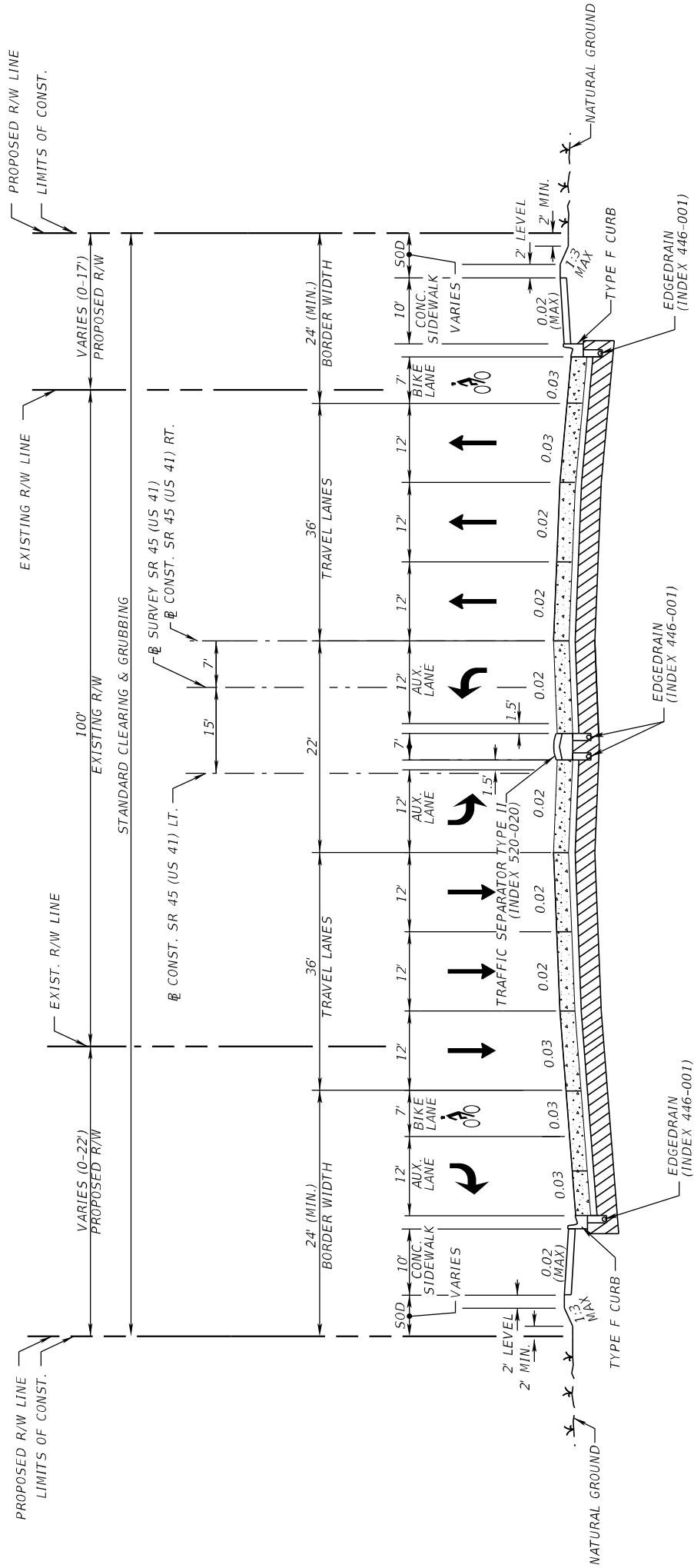
DESIGN VARIATIONS

- 1) CURB ON HIGH SPEED FACILITY
2) BORDER WIDTH
3) MEDIAN WIDTH

TRAFFIC DATA

CURRENT YEAR = 2021 ADT = 38,000
ESTIMATED OPENING YEAR = 2026 ADT = 40,500
ESTIMATED DESIGN YEAR = 2046 ADT = 50,700
K = 9% D = 56.9% T = 19.70% (24 HOUR)
DESIGN HOUR T = 9.85%
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH
TARGET SPEED = 50 MPH

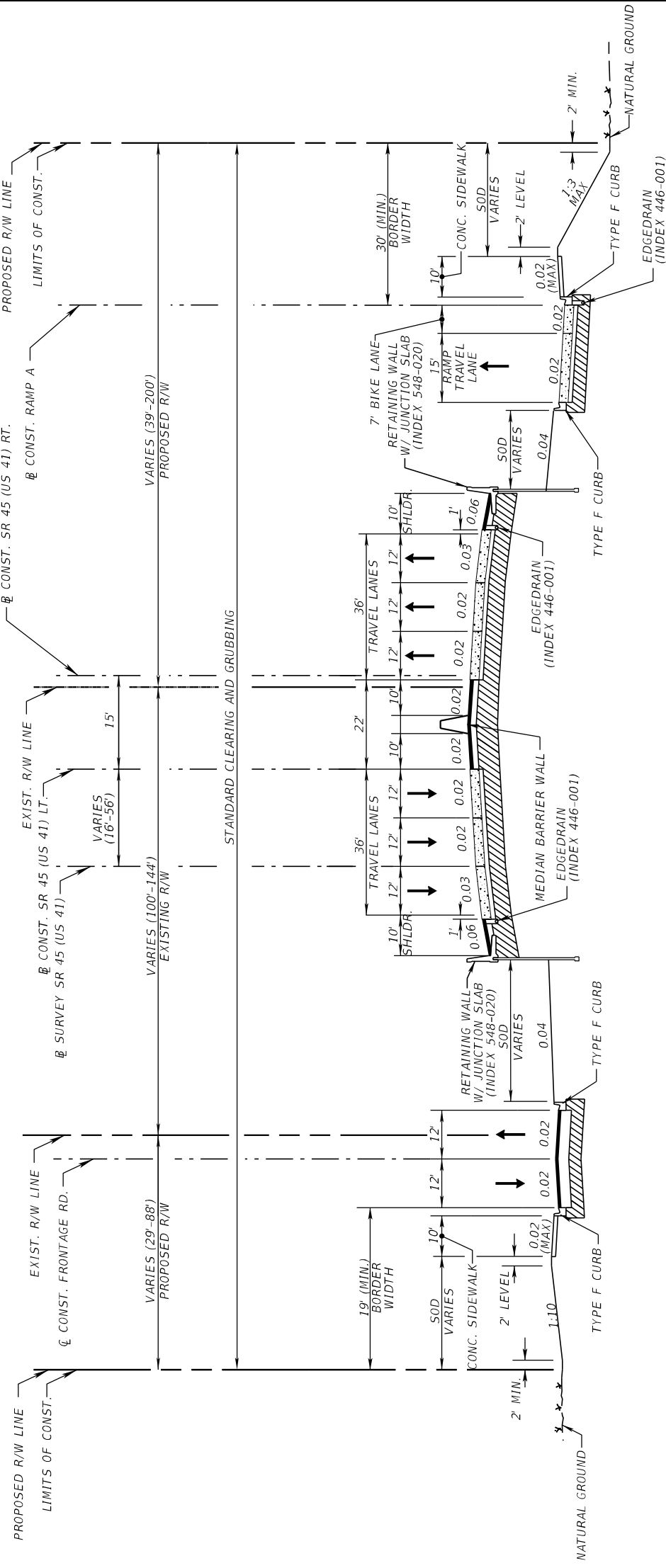
TYPICAL SECTION No. 1

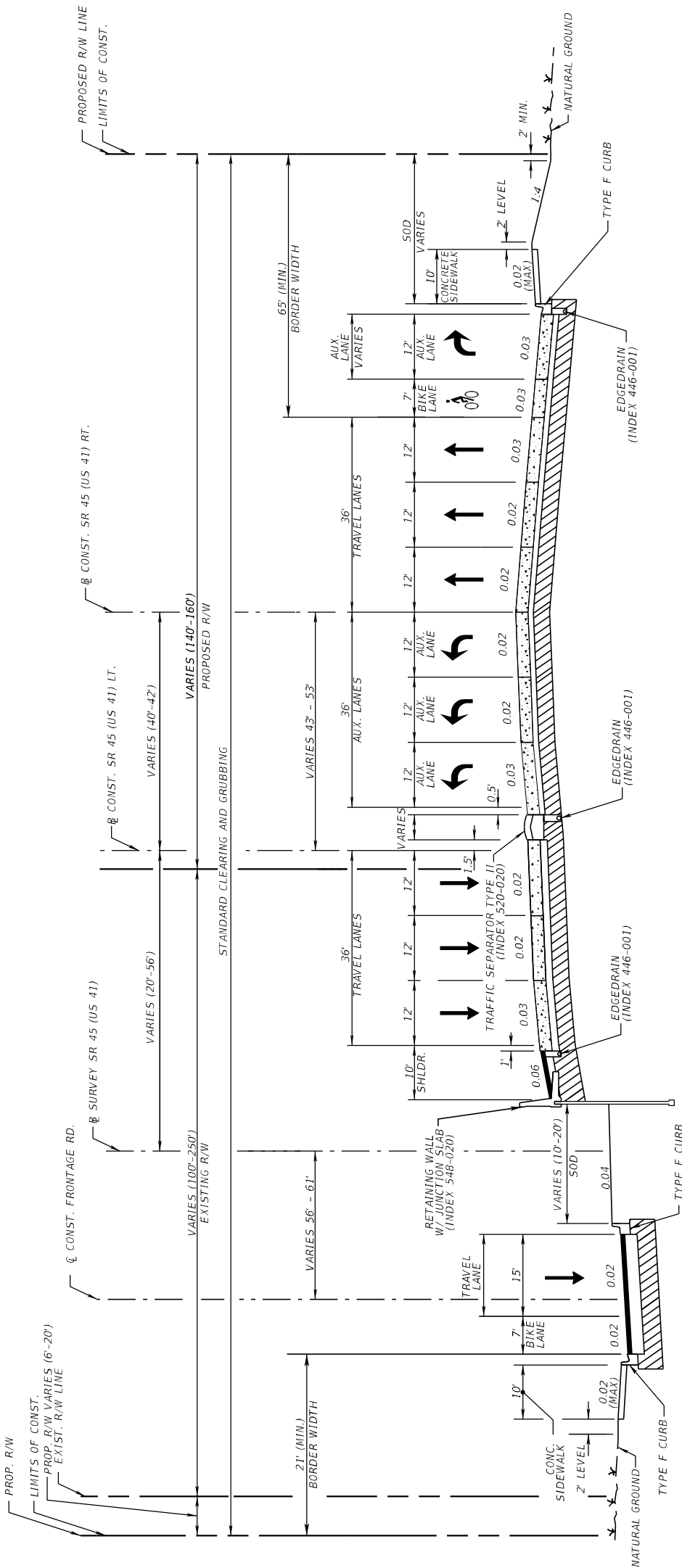


MP 22.578 TO MP 22.883 Φ CONST. SR 45 (US 41) LT.
MP 22.578 TO MP 22.874 Φ CONST. SR 45 (US 41) RT.

NOT TO SCALE

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	2

PROJECT CONTROLS		TYPICAL SECTION No. 2	
CONTEXT CLASSIFICATION C1 : NATURAL C2 : RURAL C2T : RURAL TOWN C3R : SUBURBAN RES. N/A : L.A. FACILITY C3C : SUBURBAN COMM. C4 : URBAN GENERAL C5 : URBAN CENTER C6 : URBAN CORE			
FUNCTIONAL CLASSIFICATION INTERSTATE FREEWAY/EXPWY. X PRINCIPAL ARTERIAL MINOR ARTERIAL MAJOR COLLECTOR MINOR COLLECTOR LOCAL		HIGHWAY SYSTEM NATIONAL HIGHWAY SYSTEM STRATEGIC INTERMODAL SYSTEM STATE HIGHWAY SYSTEM OFF-STATE HIGHWAY SYSTEM	
ACCESS CLASSIFICATION 1 - FREEWAY 2 - RESTRICTIVE w/Service Roads 3 - RESTRICTIVE w/660 ft. Connection Spacing 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing 5 - RESTRICTIVE w/440 ft. Connection Spacing 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing X 7 - BOTH MEDIAN TYPES		CRITERIA NEW CONSTRUCTION / RECONSTRUCTION RESURFACING (LA FACILITIES) RRR (ARTERIALS & COLLECTORS)	
POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION: DESIGN VARIATIONS 1) SHOULDER CROSS SLOPE 2) BIKE LANE WIDTH		TRAFFIC DATA CURRENT YEAR = 2021 AADT = 38,000 ESTIMATED OPENING YEAR = 2026 AADT = 40,500 ESTIMATED DESIGN YEAR = 2046 AADT = 50,700 K = 9% D = 56.9% T = 19.70% (24 HOUR) DESIGN HOUR T = 9.85% DESIGN SPEED = 50 MPH POSTED SPEED = 50 MPH TARGET SPEED = 50 MPH RAMP A DESIGN SPEED = 40 MPH POSTED SPEED = 40 MPH TARGET SPEED = N/A TRAFFIC DATA (FRONTAGE RD.) CURRENT YEAR = N/A AADT = 0 ESTIMATED OPENING YEAR = 2026 AADT = 1,400 ESTIMATED DESIGN YEAR = 2046 AADT = 2,100 K = 9% D = 56.9% T = 11.6% (24 HOUR) DESIGN HOUR T = 5.8% DESIGN SPEED = 30 MPH POSTED SPEED = 30 MPH	
NOT TO SCALE		FINANCIAL PROJECT ID 440749-1-52-01	
SHEET NO.		3	

PROJECT CONTROLS		TYPICAL SECTION No. 3	
CONTEXT CLASSIFICATION C1 : NATURAL C2 : RURAL C2T : RURAL TOWN C3R : SUBURBAN RES. N/A : L.A. FACILITY C3C : SUBURBAN COMM. C4 : URBAN GENERAL C5 : URBAN CENTER C6 : URBAN CORE			
FUNCTIONAL CLASSIFICATION INTERSTATE () MAJOR COLLECTOR FREEWAY/EXPWY. () MINOR COLLECTOR PRINCIPAL ARTERIAL LOCAL MINOR ARTERIAL ()		HIGHWAY SYSTEM NATIONAL HIGHWAY SYSTEM STRATEGIC INTERMODAL SYSTEM STATE HIGHWAY SYSTEM OFF-STATE HIGHWAY SYSTEM	
ACCESS CLASSIFICATION 1 - FREEWAY 2 - RESTRICTIVE w/Service Roads 3 - RESTRICTIVE w/660 ft. Connection Spacing 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing 5 - RESTRICTIVE w/440 ft. Connection Spacing 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing 7 - BOTH MEDIAN TYPES		CRITERIA NEW CONSTRUCTION / RECONSTRUCTION RESURFACING (LA FACILITIES) RRR (ARTERIALS & COLLECTORS)	
POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION: DESIGN VARIATIONS 1) CURB ON HIGH SPEED FACILITY		TRAFFIC DATA CURRENT YEAR = 2021 AADT = 38,000 ESTIMATED OPENING YEAR = 2026 AADT = 40,500 ESTIMATED DESIGN YEAR = 2046 AADT = 50,700 K = 9% D = 56.90% T = 19.70% (24 HOUR) DESIGN HOUR T = 9.85% DESIGN SPEED = 50 MPH POSTED SPEED = 50 MPH TARGET SPEED = 50 MPH FRONTAGE RD. DESIGN SPEED = 30 MPH POSTED SPEED = 30 MPH TARGET SPEED = N/A	
		NOT TO SCALE	
		FINANCIAL PROJECT ID	SHEET NO.
		440749-1-52-01	4

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

PROJECT CONTROLS

CONTEXT CLASSIFICATION

- | | | | |
|-----|---------------------|-----|----------------------|
| () | C1 : NATURAL | (X) | C3C : SUBURBAN COMM. |
| () | C2 : RURAL | () | C4 : URBAN GENERAL |
| () | C2T : RURAL TOWN | () | C5 : URBAN CENTER |
| () | C3R : SUBURBAN RES. | () | C6 : URBAN CORE |
| () | N/A : L.A. FACILITY | | |

FUNCTIONAL CLASSIFICATION

- | | | | |
|-----|--------------------|-----|-----------------|
| () | INTERSTATE | () | MAJOR COLLECTOR |
| () | FREEWAY/EXPWY. | () | MINOR COLLECTOR |
| (X) | PRINCIPAL ARTERIAL | () | LOCAL |
| () | MINOR ARTERIAL | | |

HIGHWAY SYSTEM

- (X) NATIONAL HIGHWAY SYSTEM
() STRATEGIC INTERMODAL SYSTEM
(X) STATE HIGHWAY SYSTEM
() OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- | | |
|-----|---|
| () | 1 - FREEWAY |
| () | 2 - RESTRICTIVE w/Service Roads |
| () | 3 - RESTRICTIVE w/660 ft. Connection Spacing |
| () | 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing |
| () | 5 - RESTRICTIVE w/440 ft. Connection Spacing |
| () | 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing |
| (X) | 7 - BOTH MEDIAN TYPES |

CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
() RESURFACING (LA FACILITIES)
() RRR (ARTERIALS & COLLECTORS)

**POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:**

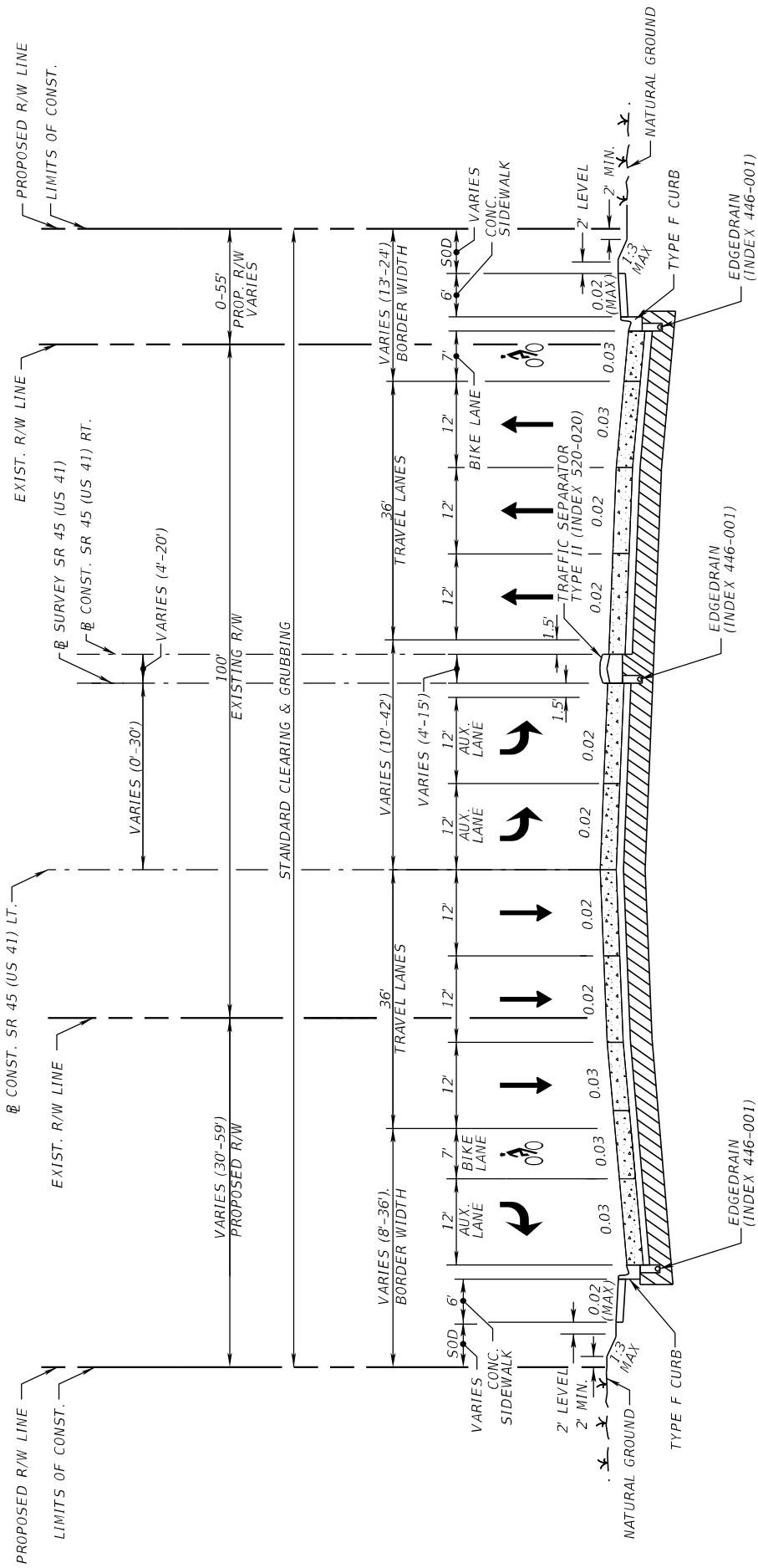
DESIGN VARIATIONS

- ### 1) CURB ON HIGH SPEED FACILITY

TRAFFIC DATA

CURRENT YEAR = 2021 ADT = 38,000
ESTIMATED OPENING YEAR = 2026 ADT = 40,500
ESTIMATED DESIGN YEAR = 2046 ADT = 50,700
K = 9% D = 56.90% T = 19.70% (24 HOUR)
DESIGN HOUR T = 9.85%
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH
TARGET SPEED = 50 MPH

TYPICAL SECTION No. 4



MP 23.555 TO MP 23.925 ~~6~~ CONST. SR 45 (US 41) LT.
MP 23.555 TO MP 23.925 ~~6~~ CONST. SR 45 (US 41) RT.

NOT TO SCALE

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	5

PROJECT CONTROLS

CONTEXT CLASSIFICATION

- | | | | |
|-----|---------------------|-----|----------------------|
| () | C1 : NATURAL | (X) | C3C : SUBURBAN COMM. |
| () | C2 : RURAL | () | C4 : URBAN GENERAL |
| () | C2T : RURAL TOWN | () | C5 : URBAN CENTER |
| () | C3R : SUBURBAN RES. | () | C6 : URBAN CORE |
| () | N/A : L.A. FACILITY | | |

FUNCTIONAL CLASSIFICATION

- | | | | |
|-----|--------------------|-----|-----------------|
| () | INTERSTATE | () | MAJOR COLLECTOR |
| () | FREEWAY/EXPWY. | () | MINOR COLLECTOR |
| (X) | PRINCIPAL ARTERIAL | () | LOCAL |
| () | MINOR ARTERIAL | | |

HIGHWAY SYSTEM

- | | |
|-----|-----------------------------|
| () | NATIONAL HIGHWAY SYSTEM |
| () | STRATEGIC INTERMODAL SYSTEM |
| (X) | STATE HIGHWAY SYSTEM |
| () | OFF-STATE HIGHWAY SYSTEM |

ACCESS CLASSIFICATION

- | | |
|-----|---|
| () | 1 – FREEWAY |
| () | 2 – RESTRICTIVE w/Service Roads |
| () | 3 – RESTRICTIVE w/660 ft. Connection Spacing |
| () | 4 – NON-RESTRICTIVE w/2640 ft. Signal Spacing |
| (X) | 5 – RESTRICTIVE w/440 ft. Connection Spacing |
| () | 6 – NON-RESTRICTIVE w/1320 ft. Signal Spacing |
| () | 7 – BOTH MEDIAN TYPES |

CRITERIA

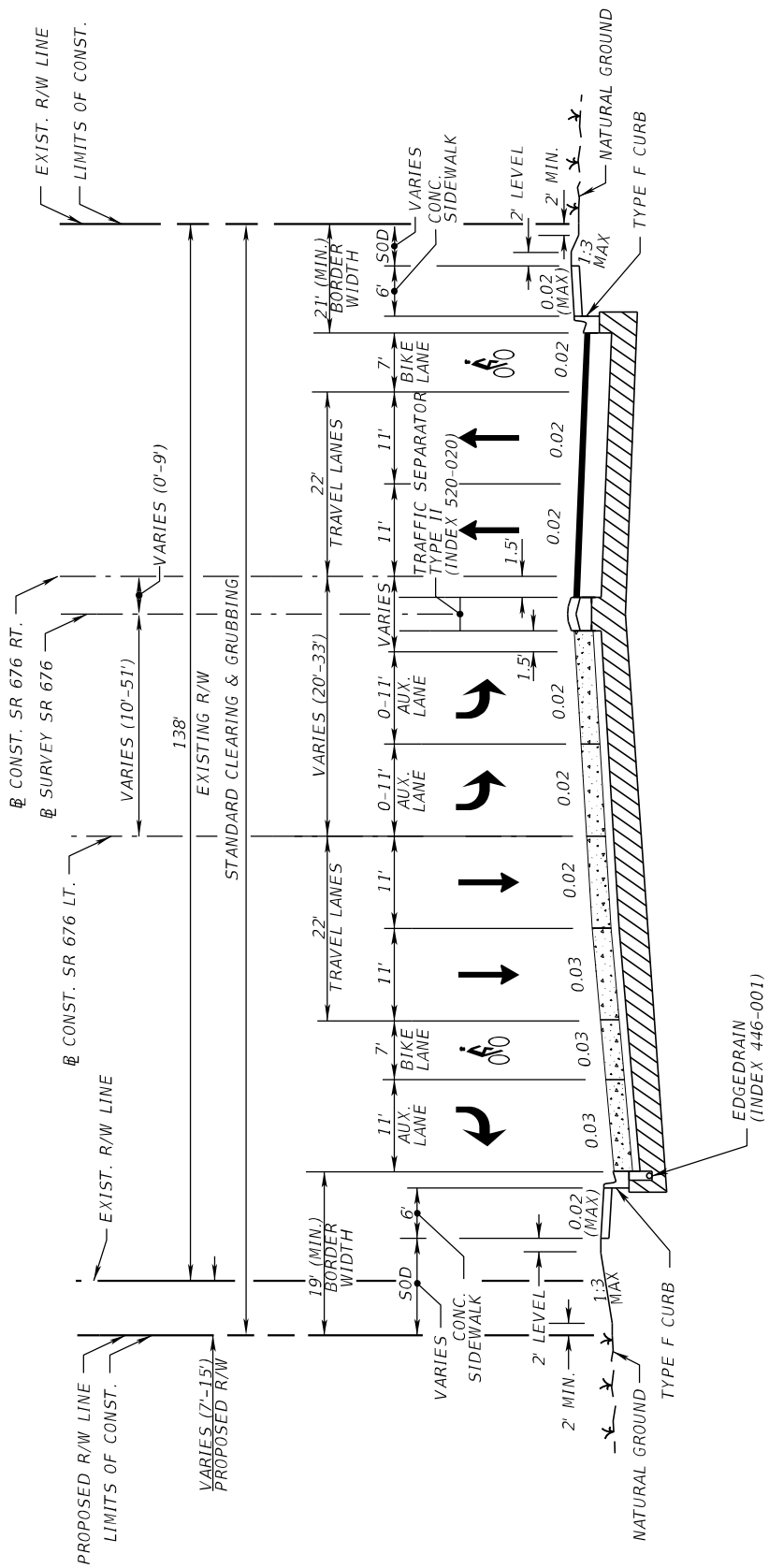
- | | |
|-----|-----------------------------------|
| (X) | NEW CONSTRUCTION / RECONSTRUCTION |
| () | RESURFACING (LA FACILITIES) |
| () | RRR (ARTERIALS & COLLECTORS) |

**POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:**

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 31,000
ESTIMATED OPENING YEAR = 2026 AADT = 32,700
ESTIMATED DESIGN YEAR = 2046 AADT = 37,600
K = 9% D = 56.90% T = 11.60% (24 HOUR)
DESIGN HOUR T = 5.80%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH
TARGET SPEED = N/A

TYPICAL SECTION No. 7



SR 676 (CAUSEWAY BLVD.)
MP 3.175 TO MP 2.971 ~~6~~ CONST. SR 676 LT.
MP 3.175 TO MP 2.971 ~~6~~ CONST. SR 676 RT.

NOT TO SCALE

<i>FINANCIAL PROJECT ID</i>	<i>440749-1-52-01</i>
<i>SHEET NO.</i>	8

PROJECT CONTROLS

CONTEXT CLASSIFICATION

- | | | |
|-----|---------------------|----------------------|
| () | C1 : NATURAL | (X) |
| () | C2 : RURAL | () |
| () | C2T : RURAL TOWN | () |
| () | C3R : SUBURBAN RES. | () |
| () | N/A : L.A. FACILITY | |
| | | C3C : SUBURBAN COMM. |
| | | C4 : URBAN GENERAL |
| | | C5 : URBAN CENTER |
| | | C6 : URBAN CORE |

FUNCTIONAL CLASSIFICATION

- | () | INTERSTATE | () | MAJOR COLLECTOR |
|-----|--------------------|-----|-----------------|
| () | FREEWAY/EXPWY. | () | MINOR COLLECTOR |
| (X) | PRINCIPAL ARTERIAL | () | LOCAL |
| () | MINOR ARTERIAL | | |

HIGHWAY SYSTEM

- | | |
|-----|-----------------------------|
| (X) | NATIONAL HIGHWAY SYSTEM |
| (X) | STRATEGIC INTERMODAL SYSTEM |
| (X) | STATE HIGHWAY SYSTEM |
| () | OFF-STATE HIGHWAY SYSTEM |

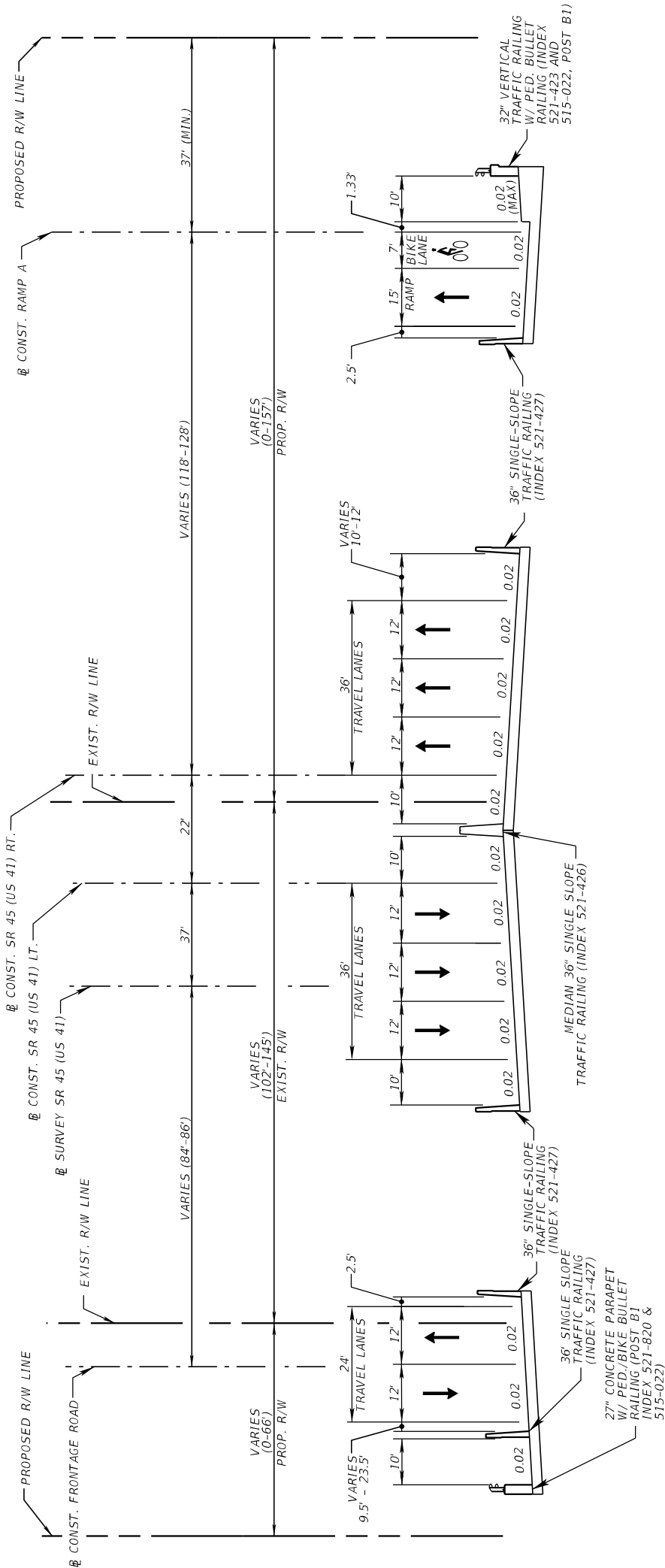
ACCESS CLASSIFICATION

- | | |
|-----|---|
| () | 1 - FREEWAY |
| () | 2 - RESTRICTIVE w/Service Roads |
| () | 3 - RESTRICTIVE w/660 ft. Connection Spacing |
| () | 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing |
| () | 5 - RESTRICTIVE w/440 ft. Connection Spacing |
| () | 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing |
| (X) | 7 - BOTH MEDIAN TYPES |

CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
() RESURFACING (LA FACILITIES)
() RRR (ARTERIALS & COLLECTORS)

**POTENTIAL EXCEPTIONS AND VARIATIONS
RELATED TO TYPICAL SECTION:**



SR 45 (US 41) OVER DELANEY CREEK
MP 22.999 TO MP 23.015 ~~B~~ CONST. SR 45 (US 41) LT.
MP 23.001 TO MP 23.017 ~~B~~ CONST. SR 45 (US 41) RT.

TRAFFIC DATA

CURRENT YEAR = 2021 ADT = 38,000
ESTIMATED OPENING YEAR = 2026 ADT = 40,500
ESTIMATED DESIGN YEAR = 2046 ADT = 50,700
K = 9% D = 56.9% T = 19.70% (24 HOUR)
DESIGN HOUR T = 9.85%
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH
TARGET SPEED = 50 MPH

NOT TO SCALE

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	11

Appendix B: Long Form for Bicycle Crash

Appendix C: Long Forms for Border Width Deficiency Crashes

Appendix D: Long Forms for Median Width Deficiency Crashes

Appendix E: Benefit/Cost Analysis for Median Width



Benefit-Cost Analysis

District: **Seven**

County: **10 - Hillsborough**

Date Prepared: **04/28/23**

Location: **US 41 x Causeway Blvd - Grade Separation over CSX**

Section : **10250000**

Beg. Milepost : **22.578**

End Milepost : **23.925**

Rdway Type: **6+ Lanes Urban Divided**

Control Element: **Other (describe in box below)**

The proposed median width is insufficient based on FDOT Standards. The benefit/cost analysis evaluates full reconstruction to meet current standards.

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Capital Recovery Factor	Total
ROW	\$ 2,000,000.00	100	0.0408	\$ 81,600.00
P.E.C.E.I.		15	0.0899	\$ -
Structure		30	0.0578	\$ -
Roadway	\$ 565,020.04	20	0.0736	\$ 41,585.47
Drainage*		20	0.0736	\$ -
Signal*		20	0.0736	\$ -
Other		20	0.0736	\$ -
Sub-Total	\$ 2,565,020.04			\$ 123,185.47
Annual Cost =				\$ 123,185.47

* Included in Roadway Cost Per Mile

Total number of crashes = 102
 # of correctable crashes, PC = 5
 # of years of crash data, YD = 8
 PC/YD = 0.63
 Crash reduction factor, CRF = 70.77%
 CRF x (PC/YD) = 0.44
 Cost per crash, CPC = \$123,598.00
 Benefit = \$54,669

Primary crash reduction factor (%): 70.77

See Description Below

Additional crash reduction factor:

Additional crash reduction factor:

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$54,668.94}{\$123,185.47} = 0.44$$

Applied CRF from CMF Clearinghouse. Install Raised Median CMF ID: 2219

Prepared by: **Jacob Stone, E.I.**

Appendix F: Crash Data

BICYCLE CRASH DATA 2015-2022

Crash Number	Street	FDOT Roadway ID	FDOT Mile Post	Crash Type	Lighting Condition	Weather Condition	Crash Severity	Fatalities	Road Surface Condition	Driver1 C Cause
24944975	US-41 (S 50TH ST)	10060000	23.406	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
24928652	N/B U.S. HIGHWAY 41 (STATE ROAD 45)	10060000	22.888	Rear End	Daylight	Cloudy	Incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
24910433	STATE ROAD 676 CAUSEWAY BLVD	10250000	3.189	Bike	Daylight	Clear	Non-incapacitating	0	Dry	Other Contributing Actions
87714042	SR45	10060000	23.402	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Other Contributing Actions
89429934	ST	10060000	23.305	Left Turn	Dark-Lighted	Clear	Incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
88342203	US-41 (50TH STREET)	10060000	23.311	U-Turn	Daylight	Clear	Possible	0	Dry	Failed to Keep in Proper Lane
86918545	US HWY 41 S (SR45 / 50TH ST S)	10060000	23.171	Angle	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
89134841	HWY 41(50TH ST)	10060000	23.033	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
89128768	ST S	10060000	22.854	Angle	Daylight	Clear	Non-incapacitating	0	Dry	Failed to Yield Right-of-Way
88101237	50TH ST	10060000	23.452	Sideswipe	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
89134245	SR-45 (41 HW S/50TH ST S)	10060000	23.283	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
88179669	U.S.41 SB	10060000	22.776	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
88166406	US 41	10060000	22.852	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Improper Backing
89130478	SR 599 (50TH ST S)	10060000	23.24	Rear End	Daylight	Rain	Incapacitating	0	Wet	Operated MV in Careless or Negligent Manner
89128202	SR 45 (50TH ST S)	10060000	23.095	Angle	Daylight	Clear	Incapacitating	0	Dry	Failed to Yield Right-of-Way
88110658	US 41 (SR 45)	10060000	23.452	Hit Fixed Object	Daylight	Rain	Possible	0	Wet	Operated MV in Careless or Negligent Manner
88092122	E/B STATE ROAD 676(CAUSEWAY BLVD)	10250000	3.203	Rear End	Daylight	Cloudy	Possible	0	Dry	Operated MV in Careless or Negligent Manner
88691217	CAUSEWAY BL	10250000	3.197	Rear End	Daylight	Cloudy	Possible	0	Dry	Operated MV in Careless or Negligent Manner
88004856	US 41 (SR 45)	10060000	22.784	Sideswipe	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
88685646	SR 41 (50TH ST S)	10060000	23.095	Left Turn	Daylight	Clear	Non-incapacitating	0	Dry	No Contributing Action
88685116	SR-45 (41 HW S/50TH ST S)	10060000	23.294	Rear End	Daylight	Cloudy	Incapacitating	0	Dry	Failed to Yield Right-of-Way
87291480	US 41	10060000	22.784	Sideswipe	Daylight	Clear	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
87271537	STATE ROAD 45 S 50TH ST	10060000	23.48	Rear End	Dark-Lighted	Clear	Possible	0	Dry	Swerved or Avoided : Due to Wind, Slippery Surface, MV, Object, Non-Motorist in Roadway, etc
87270523	SB US 41	10060000	22.863	Rear End	Daylight	Cloudy	Possible	0	Wet	Operated MV in Careless or Negligent Manner
87272090	EB CAUSEWAY BLVD	10250000	3.189	Angle	Dark-Lighted	Cloudy	Possible	0	Dry	Failed to Yield Right-of-Way
87251745	US-41	10060000	23.167	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
87253742	US 41 (SR 45)	10060000	23.01	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Improper Turn
87712235	SR 45 (50TH ST S)	10060000	22.775	Left Turn	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
87187544	STATE ROAD 676 CAUSEWAY BLVD	10250000	3.304	Angle	Daylight	Clear	Incapacitating	0	Dry	Other Contributing Actions
87709729	CAUSEWAY BL	10250000	3.304	Bike	Daylight	Cloudy	Incapacitating	0	Dry	Ran Stop Sign
87143136	US41 STATE ROAD 45	10060000	22.775	Left Turn	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
87148429	US HIGHWAY 41 (SOUTH 50TH STREET)	10060000	22.99	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
85478097	US 41 (SR 45)	10060000	23.282	Rear End	Dark-Not Lighted	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
81962225	3597 US-41	10060000	23.018	Hit Non-Fixed Object	Daylight	Rain	Non-incapacitating	0	Wet	No Contributing Action
87373878	ST S	10060000	23.434	Hit Fixed Object	Daylight	Clear	Possible	0	Dry	Failed to Keep in Proper Lane
87106549	US 41 (S 50TH ST)	10060000	23.095	Rear End	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
87371333	ST S	10060000	23.27	Hit Fixed Object	Daylight	Clear	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
87371345	SR676 (CAUSEWAY BL)	10250000	3.208	Sideswipe	Dark-Lighted	Clear	None	0	Dry	Failed to Yield Right-of-Way
85580685	US41 STATE ROAD 45	10060000	23.154	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
86918318	ST S	10060000	23.152	Rear End	Daylight	Clear	None	0	Dry	Followed too Closely
87370335	SR-45 (41 HW S/50TH ST S)	10060000	23.483	Angle	Daylight	Rain	None	0	Wet	Failed to Yield Right-of-Way
85206539	SR 676 CAUSEWAY BLVD	10250000	3.187	Rear End	Daylight	Cloudy	Possible	0	Dry	Operated MV in Careless or Negligent Manner
85602649	N/B U.S. HIGHWAY 41 (STATE ROAD 45)	10060000	22.777	Sideswipe	Daylight	Cloudy	Possible	0	Dry	Failed to Yield Right-of-Way
87370258	HW 41 S (50TH ST S)	10060000	23.103	Rear End	Daylight	Clear	None	0	Dry	Followed too Closely
85584116	US HIGHWAY 41	10060000	23.253	Rear End	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85569483	US HIGHWAY 41 (STATE ROAD 45)	10060000	22.835	Sideswipe	Daylight	Clear	None	0	Dry	Failed to Keep in Proper Lane
85570427	US-41	10060000	23.005	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
85604235	US HWY 41 (SR 45)	10060000	22.79	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Improper Turn
85429276	US 41 (SR 45)	10060000	22.994	Rear End	Dark-Not Lighted	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85588278	S 50TH STREET	10060000	23.31	Single Vehicle	Daylight	Rain	Non-incapacitating	0	Wet	Drove Too Fast for Conditions
85565524	NB US-41 (S. 50TH STREET)	10060000	23.162	Sideswipe	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85206630	US-41	10060000	23.291	Left Turn	Daylight	Cloudy	None	0	Dry	Improper Turn
85553025	US-41 (SR-45)	10060000	23.104	Rear End	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85535739	SB US 41 (SR 45)	10060000	23.297	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
85523966	STATE ROAD 45 (CAUSEWAY BLVD)	10250000	3.246	Rear End	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85549937	US HIGHWAY 41 (SR-45)	10060000	23.253	Rear End	Daylight	Cloudy	Incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
85511684	US 41 (STATE ROAD 45)	10060000	23.297	Rear End	Daylight	Rain	None	0	Wet	Operated MV in Careless or Negligent Manner
86917012	HWY 41 S (50TH ST S)	10060000	23.414	Rear End	Daylight	Cloudy	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
86916839	HARTFORD ST	10060000	22.791	Rear End	Daylight	Cloudy	None	0	Dry	Improper Backing
86916702	US 41 (50TH ST S)	10060000	23.291	Angle	Daylight	Clear	Non-incapacitating	0	Dry	Failed to Yield Right-of-Way
85519985	U.S. HWY 41	10060000	22.775	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
85504523	US-41 STATE ROAD 45	10060000	23.114	Rear End	Daylight	Cloudy	None	0	Dry	Operated MV in Careless or Negligent Manner
85523848	US HIGHWAY 41 / 50TH STREET	10060000	22.791	Angle	Daylight	Clear	None	0	Dry	Improper Turn
85466865	US41 STATE ROAD 45	10060000	23.196	Sideswipe	Dark-Lighted	Clear	Possible	0	Dry	Other Contributing Actions
86915238	U.S. HWY 41 S (STATE ROAD 45) (50TH ST S)	10060000	22.775	Sideswipe	Daylight	Clear	None	0	Dry	
86915093	ST S (41 HW S/SR-45)	10060000	23.076	Unknown	Daylight	Clear	None	0	Dry	Other Contributing Actions
85452155	US 41 (S 50TH ST)	10060000	23.291	Sideswipe	Daylight	Clear	Incapacitating	0	Dry	Other Contributing Actions
85265434	US41 STATE ROAD 45	10060000	23.329	Rear End	Daylight	Clear	Incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
85470175	US HIGHWAY 41	10060000	23.104	Rear End	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85453815	US 41 (STATE ROAD 45)	10060000	23.347	Head On	Daylight	Clear	None	0	Dry	Improper Backing
85422496	US HIGHWAY 41 (STATE ROAD 45)	10060000	23.452	Rear End	Daylight	Cloudy	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
85391037	US HIGHWAY 41 SB	10060000	23.452	Sideswipe	Dark-Lighted	Clear	Possible	0	Dry	Other Contributing Actions
85377623	US-41 (50TH ST)	10060000	23.004	Bike	Dark-Not Lighted	Clear	Incapacitating	0	Dry	No Contributing Action
85406818	N/B U.S. HIGHWAY 41 (STATE ROAD 45)	10060000	22.856	Rear End	Daylight	Cloudy	None	0	Dry	No Contributing Action
85422972	U.S. HIGHWAY 41	10060000	23.171	Angle	Dark-Not Lighted	Clear	Incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
85391009	US HIGHWAY 41	10060000	23.471	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
85377000	US-41	10060000	22.775	Angle	Daylight	Clear	None	0	Dry	Ran Stop Sign
85360209	STATE ROAD 676 (CAUSEWAY BLVD)	10250000	3.015	Sideswipe	Daylight	Cloudy	Possible	0	Dry	Failed to Keep in Proper Lane
85361262	WB SR-676 (CAUSEWAY BLVD)	10250000	3.037	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
84529401	(NB) US HIGHWAY 41	10060000	23.292	Angle	Daylight	Cloudy	None	0	Dry	Other Contributing Actions
85194225	3745 SR-45	10060000	22.845	Rear End	Dark-Lighted	Clear	Fatal	1	Dry	No Contributing Action
85344586	50TH STREET	10060000	23.447	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
85314097	US 41 (S 50TH STREET)	10060000	23.297	Sideswipe	Daylight	Clear	None	0	Dry	Other Contributing Actions
85328979	NB US 41 (50TH STREET)	10060000	23.095	Left Turn	Daylight	Rain	Non-incapacitating	0	Wet	Failed to Yield Right-of-Way
85338441	(SB) US HIGHWAY 41 (SOUTH 50TH STREET)	10060000	23.095	Angle	Daylight	Cloudy	None	0	Dry	Other Contributing Actions
85294635	BRANCH US 41 (STATE ROAD 45)	10060000	23.347	Rear End	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85302724	SR 676 (CAUSEWAY BLVD)	10250000	3.189	Angle	Dark-Lighted	Cloudy	None	0	Wet	Ran Red Light
83713339	SOUTH 50TH STRET	10060000	23.41	Rear End	Daylight	Cloudy	Non-incapacitating	0	Wet	Operated MV in Careless or Negligent Manner
85306801	US-41 (50TH ST)	10060000	22.832	Rear End	Dark-Not Lighted	Cloudy	Possible	0	Dry	Operated MV in Careless or Negligent Manner
85287202	US 41 (STATE ROAD 45)	10060000	23.471	Rear End	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85318490	US HIGHWAY 41 (50TH STREET)	10060000	23.104	Sideswipe	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
85287186	US 41 (STATE ROAD 45)	10060000	22.775	Angle	Daylight	Clear	Incapacitating	0	Dry	Failed to Yield Right-of-Way
85312372	N/B U.S. HIGHWAY 41 (50TH STREET)	10060000	23.095	Angle	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
85287179	STATE ROAD 45 (CAUSEWAY BLVD)	10250000	3.323	Rear End	Daylight	Clear	None	0	Dry	Other Contributing Actions
86205064	CAUSEWAY BL	10250000	3.047	Sideswipe	Daylight	Clear	None	0	Dry	No Contributing Action
85309036	N 50TH ST	10060000	23.291	Angle	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
85309077	US HWY 41 (SR 45)	10060000	23.095	Angle	Dark-Not Lighted	Clear	Fatal	1	Dry	Failed to Yield Right-of-Way
86205949	ST ST (41 HW S/SR-45)	10060000	23.302	Rear End	Daylight	Rain	Non-incapacitating	0	Wet	Operated MV in Careless or Negligent Manner
86206225	ST S (SR 45)	10060000	22.854	Left Turn	Dark-Lighted	Clear	None	0	Dry	Failed to Yield Right-of-Way
86200221	HARTFORD ST	10060000	22.775	Head On	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85275649	ST PAUL	10060000	23.291	Angle	Daylight	Cloudy	None	0	Dry	Improper Turn
85261889	US 41 (50TH STREET)	10060000	23.272	Sideswipe	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
85246118	SR-676 (CAUSEWAY BLVD) WB	10250000	3.037	Single Vehicle	Daylight	Cloudy	Possible	0	Dry	Operated MV in Careless or Negligent Manner
85260640	(WB) CAUSEWAY BOULEVARD (SR-676)	10250000	3.186	Rear End	Daylight	Cloudy	Possible	0	Wet	Operated MV in Careless or Negligent Manner
85201286	US HIGHWAY 41 (50TH ST)	10060000	23.004	Rear End	Dark-Lighted	Clear	Non-incapacitating	0	Dry	Failed to Keep in Proper Lane
85201284	US HIGHWAY 41	10060000	23.286	Rear End	Dark-Lighted	Clear	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
85221815	U.S. HWY 41	10060000	23.247	Rear End	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85235960	US HWY 41 SB	10060000	23.347	Rear End	Dark-Lighted	Clear	None	0	Dry	
85099619	ST	10060000	22.775	Rear End	Daylight	Rain	Non-incapacitating	0	Wet	Followed too Closely
85184186	US 41 OR SR 45 OR 50TH ST	10060000	23.009	Angle	Dark-Not Lighted	Cloudy	Fatal	1	Wet	No Contributing Action
86198418	ST S	10060000	23.87	Hit Fixed Object	Dark-Lighted	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85798991	ST	10250000	3.189	Angle	Dark-Lighted	Clear	Possible	0	Dry	No Contributing Action
86200367	ST S. (S.R. 45)	10060000	22.854	Rear End	Daylight	Clear	Possible	0	Dry	Failed to Keep in Proper Lane
85169032	US 41 (STATE ROAD 45)	10060000	23.247	Unknown	Daylight	Clear	None			

MEDIAN WIDTH CRASH DATA 2015-2022

Crash Number	Street	FDOT Roadway ID	FDOT Mile Post	Crash Type	Lighting Condition	Weather Condition	Crash Severity	Fatalities	Road Surface Conditions	Driver1 C Cause
88267129	US-41 (S 50TH ST)	10060000	22.791	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
89429113	US 41 (50TH ST S)	10060000	23.827	Bike	Daylight	Clear	Non-incapacitating	0	Dry	No Contributing Action
88242523	US-41 (S 50TH ST)	10060000	22.694	Angle	Daylight	Clear	None	0	Dry	Other Contributing Actions
89427387	CAUSEWAY BL	10250000	3.542	Left Turn	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
88228783	US-41 50TH ST	10060000	22.775	Left Turn	Dawn	Clear	None	0	Dry	Failed to Yield Right-of-Way
88207336	US-41 NB	10060000	22.759	Sideswipe	Dusk	Clear	None	0	Dry	Improper Passing
88211685	US 41 (SR 45)	10060000	22.617	Sideswipe	Daylight	Clear	Possible	0	Dry	Other Contributing Actions
88176003	US 41 (SR 45)	10060000	22.617	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
89128768	ST S	10060000	22.854	Angle	Daylight	Clear	Non-incapacitating	0	Dry	Failed to Yield Right-of-Way
88146815	SR-45 (S. 50TH ST)	10060000	22.776	Angle	Dark-Unknown Lighting	Clear	None	0	Dry	Other Contributing Actions
88203131	U.S. HIGHWAY 41	10060000	22.772	Sideswipe	Daylight	Clear	Possible	0	Dry	Improper Passing
88189856	US 41 SB (STATE ROAD 45/S	10060000	22.873	Rear End	Daylight	Rain	None	0	Wet	Other Contributing Actions
88073624	US HWY 41 (50TH ST)	10060000	22.775	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
88179669	U.S.41 SB	10060000	22.776	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
88166406	US 41	10060000	22.852	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Improper Backing
88142419	50TH ST (US 41)	10060000	22.873	Rear End	Dusk	Cloudy	None	0	Wet	Operated MV in Careless or Negligent Manner
89128194	HARTFORD DR	10060000	22.775	Rear End	Daylight	Clear	None	0	Dry	Other Contributing Actions
88160330	US 41 (SR 45)	10060000	22.617	Left Turn	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
88147372	US-41 SB	10060000	22.655	Rear End	Daylight	Cloudy	None	0	Dry	Operated MV in Careless or Negligent Manner
89128765	ST S	10060000	22.775	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
89127229	ST S	10060000	22.777	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
88147845	SB US-41 (50TH STREET)	10060000	23.829	Sideswipe	Dark-Lighted	Cloudy	Possible	0	Dry	No Contributing Action
88126524	US 41	10060000	22.791	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
88095937	SB US 41	10060000	22.584	Sideswipe	Daylight	Clear	None	0	Dry	No Contributing Action
88058622	US 41 SB (SR 45/S 50TH ST)	10060000	22.854	Sideswipe	Dusk	Clear	None	0	Dry	Failed to Yield Right-of-Way
88053351	US-41	10060000	22.791	Rear End	Daylight	Rain	None	0	Wet	Improper Passing
88078141	US 41 (SR 45)	10060000	22.631	Rear End	Daylight	Clear	None	0	Dry	No Contributing Action
88057203	SB US-41	10060000	22.698	Sideswipe	Dark-Not Lighted	Clear	None	0	Dry	Failed to Yield Right-of-Way
88057197	SB S 50TH STREET	10060000	22.771	Sideswipe	Dusk	Clear	None	0	Dry	Failed to Yield Right-of-Way
88045119	US HIGHWAY 41	10060000	22.626	Sideswipe	Daylight	Clear	None	0	Dry	Other Contributing Actions
88044861	US 41	10060000	22.794	Sideswipe	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
88004856	US 41 (SR 45)	10060000	22.784	Sideswipe	Daylight	Clear	Possible	0	Dry	No Contributing Action
87531932	50TH ST N	10060000	23.796	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
87371075	SR 45 (50TH ST S)	10060000	22.655	Rear End	Daylight	Clear	Possible	0	Dry	Other Contributing Actions
87291480	US 41	10060000	22.784	Sideswipe	Daylight	Clear	Non-incapacitating	0	Dry	Swerved or Avoided : Due to Wind, Slippery Surface, MV,
87270523	SB US 41	10060000	22.863	Rear End	Daylight	Cloudy	Possible	0	Wet	Operated MV in Careless or Negligent Manner
87271236	US 41 (SR 45)	10060000	22.873	Rear End	Daylight	Clear	None	0	Dry	Other Contributing Actions
87371932	STATE ROAD 45 (50TH	10060000	23.817	Sideswipe	Daylight	Clear	Possible	0	Dry	Other Contributing Actions
87527196	50TH ST N	10060000	23.798	Rear End	Daylight	Clear	None	0	Dry	Other Contributing Actions
87714080	SR 45 (50TH ST S)	10060000	22.602	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
87712235	SR 45 (50TH ST S)	10060000	22.775	Left Turn	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
87710519	SR45 (50TH ST S)	10060000	22.617	Left Turn	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
87173853	SB 50TH ST	10060000	22.695	Left Turn	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
87143148	US41 STATE ROAD 45	10060000	22.695	Angle	Daylight	Cloudy	None	0	Dry	Failed to Yield Right-of-Way
87143136	US41 STATE ROAD 45	10060000	22.775	Left Turn	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
87709265	US 41 (50TH ST S)	10060000	22.667	Hit Fixed Object	Daylight	Clear	None	0	Dry	Other Contributing Actions
87143119	US-41 STATE ROAD 45	10060000	22.854	Left Turn	Daylight	Cloudy	None	0	Dry	Failed to Yield Right-of-Way
87146471	US-41	10060000	22.782	Hit Fixed Object	Dark-Not Lighted	Clear	None	0	Dry	Improper Turn
87373161	SR 599 (50TH ST S)	10060000	23.798	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
87373879	ST S	10060000	23.812	Sideswipe	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
87123639	SB US-41	10060000	23.804	Rear End	Daylight	Cloudy	None	0	Dry	Improper Turn
85602649	N/B U.S. HIGHWAY 41(STATE	10060000	22.777	Sideswipe	Daylight	Cloudy	Possible	0	Dry	Failed to Yield Right-of-Way
85583792	US 41 (STATE ROAD 599)	10060000	23.747	Rear End	Daylight	Cloudy	None	0	Dry	Other Contributing Actions
85569483	US HIGHWAY 41 (STATE	10060000	22.835	Sideswipe	Daylight	Clear	None	0	Dry	Failed to Keep in Proper Lane
85604235	US HWY 41 (SR 45)	10060000	22.79	Rear End	Daylight	Clear	Non-incapacitating	0	Dry	Improper Turn
85583768	US HWY 41(STATE ROAD 45)	10060000	22.695	Unknown	Daylight	Clear	None	0	Dry	No Contributing Action
86920098	SR 43 (50TH ST S)	10060000	23.828	Rear End	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
86916839	HARTFORD ST	10060000	22.791	Rear End	Daylight	Cloudy	None	0	Dry	Improper Backing
85519985	U.S. HWY 41	10060000	22.775	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
85523848	US HIGHWAY 41 / 50TH	10060000	22.791	Angle	Daylight	Clear	None	0	Dry	Improper Turn
86912367	US 41 (50TH ST S)	10060000	23.832	Bike	Daylight	Clear	Non-incapacitating	0	Dry	No Contributing Action
86915238	U.S. HWY 41 S (STATE ROAD	10060000	22.775	Sideswipe	Daylight	Clear	None	0	Dry	
86913520	US 41	10060000	23.817	Hit Fixed Object	Dark-Lighted	Clear	None	0	Dry	Other Contributing Actions
86915021	DENVER ST	10060000	22.617	Pedestrian	Daylight	Clear	Incapacitating	0	Dry	Other Contributing Actions
85475035	US 41 (SR 45)	10060000	22.695	Rear End	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
85452153	US 41 (STATE ROAD 45)	10060000	22.772	Angle	Daylight	Cloudy	None	0	Dry	Failed to Yield Right-of-Way
86563414	(SR 60) 50TH ST S	10060000	22.863	Rear End	Daylight	Clear	None	0	Dry	Followed too Closely
85469814	2396 US-41	10060000	23.798	Run Off Road	Daylight	Clear	None	0	Dry	No Contributing Action
85130468	US41 STATE ROAD 45	10060000	23.798	Hit Fixed Object	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85457147	US HIGHWAY 41	10060000	22.674	Pedestrian	Dark-Lighted	Cloudy	Fatal	1	Dry	No Contributing Action
85406818	N/B U.S. HIGHWAY 41(STATE	10060000	22.856	Rear End	Daylight	Cloudy	None	0	Dry	No Contributing Action
85412032	US HIGHWAY 41	10060000	23.798	Angle	Daylight	Clear	Non-incapacitating	0	Dry	Failed to Yield Right-of-Way
85384552	NB 50TH ST (SR-45)	10060000	22.695	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
86564180	US HWY 41 S (SR-45)	10060000	23.798	Left Turn	Dark-Lighted	Clear	Non-incapacitating	0	Dry	Failed to Yield Right-of-Way
85377000	US-41	10060000	22.775	Angle	Daylight	Clear	None	0	Dry	Ran Stop Sign
86563128	ST S (US HWY 41S/SR-45)	10060000	22.771	Sideswipe	Daylight	Clear	Possible	0	Dry	Failed to Yield Right-of-Way
86154959	26TH AVE E	10060000	23.86	Hit Fixed Object	Daylight	Clear	Incapacitating	0	Dry	Ran off Roadway
85194225	3745 SR-45	10060000	22.845	Rear End	Dark-Lighted	Clear	Fatal	1	Dry	No Contributing Action
85340324	US-41	10060000	23.747	Unknown	Dark-Lighted	Clear	Non-incapacitating	0	Dry	Failed to Yield Right-of-Way
86559106	ST S (US HW 41/S.R. 45)	10060000	23.847	Sideswipe	Dusk	Rain	None	0	Wet	Wrong Side of Wrong Way
85306801	US-41 (50TH ST)	10060000	22.832	Rear End	Dark-Not Lighted	Cloudy	Possible	0	Dry	Operated MV in Careless or Negligent Manner
85315609	US-41	10060000	22.714	Sideswipe	Dark-Unknown Lighting	Cloudy	None	0	Wet	Failed to Yield Right-of-Way
85295839	US-41 (50TH ST)	10060000	23.794	Angle	Daylight	Clear	Non-incapacitating	0	Dry	Failed to Yield Right-of-Way
85284252	US HIGHWAY 41 (50TH	10060000	22.617	Left Turn	Dark-Lighted	Clear	None	0	Dry	Failed to Yield Right-of-Way
85287186	US 41 (STATE ROAD 45)	10060000	22.775	Angle	Daylight	Clear	Incapacitating	0	Dry	Failed to Yield Right-of-Way
85293723	STATE ROAD 45	10250000	3.545	Rear End	Daylight	Clear	Possible	0	Dry	Operated MV in Careless or Negligent Manner
86206225	ST S (SR 45)	10060000	22.854	Left Turn	Dark-Lighted	Clear	None	0	Dry	Failed to Yield Right-of-Way
86200221	HARTFORD ST	10060000	22.775	Head On	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85243921	U.S.41 (50TH STREET)	10060000	23.775	Rear End	Dawn	Clear	Non-incapacitating	0	Dry	Operated MV in Careless or Negligent Manner
85099619	ST	10060000	22.775	Rear End	Daylight	Rain	Non-incapacitating	0	Wet	Followed too Closely
86198418	ST S	10060000	23.87	Hit Fixed Object	Dark-Lighted	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner
85798992	ST	10060000	23.798	Run Off Road	Dark-Lighted	Clear	None	0	Dry	Improper Turn
86200367	ST S. (S.R. 45)	10060000	22.854	Rear End	Daylight	Clear	Possible	0	Dry	Failed to Keep in Proper Lane
85111081	US HIGHWAY 41	10060000	22.595	Hit Fixed Object	Daylight	Clear	None	0	Dry	Failed to Keep in Proper Lane
86198573	US 41 HW S (SR 599) (50TH	10060000	23.798	Angle	Daylight	Clear	None	0	Dry	Failed to Yield Right-of-Way
85887828	HW S (SR-45/50TH ST S)	10060000	22.78	Rear End	Daylight	Clear	Non-incapacitating	0	Wet	No Contributing Action
85131363	SB US-41	10060000	22.775	Left Turn	Daylight	Rain	None	0	Wet	
85886841	DENVER ST	10060000	22.617	Hit Fixed Object	Daylight	Cloudy	None	0	Wet	Operated MV in Careless or Negligent Manner
85125559	U.S. HWY 41	10060000	22.775	Angle	Daylight	Cloudy	Non-incapacitating	0	Dry	Failed to Yield Right-of-Way
85885048	HW S (SR-45/50TH ST S)	10060000	22.695	Left Turn	Daylight	Clear	Fatal	1	Dry	Failed to Yield Right-of-Way
84861804	US-41	10060000	22.636	Bike	Dark-Not Lighted	Clear	Non-incapacitating	0	Dry	No Contributing Action
84865119	HARTFORD ST	10060000	22.775	Angle	Daylight	Clear	None	0	Dry	Operated MV in Careless or Negligent Manner

NOTE: Highlighted items mark a possible attributable crash

Appendix G: Intersection Sight Distance Exhibit

APPENDIX C

Long Range Estimate

FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 440749-1-52-01

Letting Date: 08/2031

Description: US 41/SR 45 AT CSX GRADE SEPARATION FR S OF SR 676 TO N OF SR 676

District: 07 County: 10 HILLSBOROUGH

Market Area: 08 Units: English

Contract Class: 1 Lump Sum Project: N

Design/Build: N Project Length: 1.930 MI

Project Manager: PRD-KIL

Version 23 Project Grand Total

\$121,781,024.56

Description: 2023 WPUC

Sequence: 1 NDU - New Construction, Divided, Urban

Net Length:

0.392 MI

2,070 LF

Description: US41 from south of Denver St. to south of Causeway Blvd. with concrete pavement.

Special

Conditions: This section does not include the elevated portion of US41. See Sequence 2.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	69.50 / 69.50
Incidental Clearing and Grubbing Area	1.32
Alignment Number	1
Distance	0.392
Top of Structural Course For Begin Section	103.00
Top of Structural Course For End Section	103.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	2.00 % / 2.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	6.60 AC	\$46,574.73	\$307,393.22
110-1-1	CLEARING & GRUBBING	1.32 AC	\$46,574.73	\$61,478.64
120-6	EMBANKMENT	17,366.05 CY	\$36.34	\$631,082.26
Earthwork Component Total				\$999,954.12

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Roadway Pavement Width L/R	43.00 / 43.00
Structural Spread Rate	440
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	22,151.03 SY	\$18.27	\$404,699.32
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	4,351.10 TN	\$172.57	\$750,869.33
350-3-7	PLAIN CEMENT CONC PAVT, 9"	19,777.71 SY	\$89.10	\$1,762,193.96

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
350-3-7	PLAIN CEMENT CONC PAVT, 9" Comment: Adjustments for turn lanes, median openings, and turnouts.	4,394.00 SY	\$89.10	\$391,505.40
350-5	CLEANING & SEALING JOINTS - CONC PVMT	50,761.00 LF	\$3.10	\$157,359.10
352-70	GRINDING CONCRETE PAVT	24,172.00 SY	\$6.16	\$148,899.52

Turnouts/Crossovers Subcomponent

Description	Value
Asphalt Adjustment	20.00
Stabilization Code	Y
Base Code	Y
Friction Course Code	N

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	4,430.21 SY	\$18.27	\$80,939.94
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	870.22 TN	\$172.57	\$150,173.87

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Concrete
Solid Stripe No. of Paint Applications	0
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	0
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	265.00 EA	\$4.21	\$1,115.65
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	1.57 GM	\$4,585.55	\$7,199.31
713-103-131	PERMANENT TAPE, WHITE,SKIP/D,6" FOR CONC	1.57 GM	\$10,022.91	\$15,735.97

Roadway Component Total

\$3,870,691.37

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	12.75 / 12.75
Total Outside Shoulder Perf. Turf Width L/R	0.50 / 0.50
Sidewalk Width L/R	10.00 / 10.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
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520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,069.76 LF	\$43.51	\$90,055.26
520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,069.76 LF	\$43.51	\$90,055.26
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	4,599.47 SY	\$62.03	\$285,305.12
570-1-2	PERFORMANCE TURF, SOD	229.97 SY	\$4.68	\$1,076.26

Erosion Control

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	4,139.52 LF	\$2.22	\$9,189.73
104-11	FLOATING TURBIDITY BARRIER	98.00 LF	\$12.32	\$1,207.36
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	98.00 LF	\$6.76	\$662.48
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$3,371.00	\$3,371.00
104-18	INLET PROTECTION SYSTEM	20.00 EA	\$121.81	\$2,436.20
107-1	LITTER REMOVAL	9.98 AC	\$42.58	\$424.95
107-2	MOWING	9.98 AC	\$64.00	\$638.72
Shoulder Component Total				\$484,422.34

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	0.00
Performance Turf Width	0.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-5-21	TRAF SEP CONC - TYPE II, 4' WIDE	964.00 LF	\$51.54	\$49,684.56
521-1-11	MEDIAN CONC BARRIER, 38" HEIGHT	192.00 LF	\$172.38	\$33,096.96
Median Component Total				\$82,781.52

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	15.00 EA	\$7,565.41	\$113,481.15
425-1-451	INLETS, CURB, TYPE J-5, <10'	4.00 EA	\$11,291.94	\$45,167.76
425-1-521	INLETS, DT BOT, TYPE C, <10'	2.00 EA	\$4,857.48	\$9,714.96
425-2-41	MANHOLES, P-7, <10'	2.00 EA	\$8,568.89	\$17,137.78
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	1,040.00 LF	\$172.79	\$179,701.60
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	96.00 LF	\$220.03	\$21,122.88
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	1,960.00 LF	\$430.26	\$843,309.60
570-1-1	PERFORMANCE TURF	119.17 SY	\$5.00	\$595.85

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
446-1-1	EDGEDRAIN DRAINCRETE, STANDARD	4,140.00 LF	\$31.14	\$128,919.60

Retention Basin 1

Description	Value
Size	1.5 AC
Multiplier	2
Depth	8.00
Description	Pond south of Delaney Creek.

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	3.00 AC	\$46,574.73	\$139,724.19
120-1	REGULAR EXCAVATION	38,720.00 CY	\$36.39	\$1,409,020.80
425-1-541	INLETS, DT BOT, TYPE D, <10'	2.00 EA	\$5,583.10	\$11,166.20
425-2-71	MANHOLES, J-7, <10'	2.00 EA	\$9,708.17	\$19,416.34
430-175-142	PIPE CULV, OPT MATL, ROUND, 42"S/CD	112.00 LF	\$304.66	\$34,121.92
430-175-160	PIPE CULV, OPT MATL, ROUND, 60"S/CD	400.00 LF	\$827.50	\$331,000.00
550-10-220	FENCING, TYPE B, 5.1-6.0', STANDARD	2,050.00 LF	\$25.27	\$51,803.50
550-60-234	FENCE GATE,TYP B,SLIDE/CANT,18.1-20'OPEN	2.00 EA	\$4,635.92	\$9,271.84
570-1-1	PERFORMANCE TURF	14,520.00 SY	\$5.00	\$72,600.00
Drainage Component Total				\$3,437,275.97

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	10.00 AS	\$421.92	\$4,219.20
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00 AS	\$1,492.54	\$1,492.54
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00 AS	\$8,419.19	\$8,419.19
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	1.00 AS	\$11,878.28	\$11,878.28

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-3-205	SIGN PANEL, F&I OM, 51-100 SF	1.00 EA	\$4,118.56	\$4,118.56
700-4-125	OH STATIC SIGN STR, F&I, S 51-100 FT	1.00 EA	\$209,174.61	\$209,174.61
Signing Component Total				\$239,302.38

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	6 Lane Mast Arm
Multiplier	1
Description	US41 and Hartford St.

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	700.00 LF	\$15.69	\$10,983.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	300.00 LF	\$29.31	\$8,793.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00 PI	\$8,809.89	\$8,809.89
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	22.00 EA	\$904.99	\$19,909.78
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00 AS	\$3,475.94	\$3,475.94
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00 LF	\$8.42	\$505.20
641-2-11	PREST CNC POLE,F&I,TYP P-II,PEDESTAL	1.00 EA	\$1,672.69	\$1,672.69
649-21-21	STEEL MAST ARM ASSEMBLY, F&I, 78'	6.00 EA	\$106,949.35	\$641,696.10
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	20.00 AS	\$1,165.22	\$23,304.40
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00 AS	\$760.18	\$6,081.44
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	20.00 EA	\$362.84	\$7,256.80
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	20.00 AS	\$1,214.98	\$24,299.60
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00 EA	\$301.16	\$2,409.28
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00 AS	\$41,825.40	\$41,825.40
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00 EA	\$277.65	\$1,110.60
Signalizations Component Total				\$802,133.12

LIGHTING COMPONENT**Conventional Lighting Subcomponent**

Description		Value		
Spacing		MIN		
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,069.76 LF	\$15.69	\$32,474.53
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	410.82 LF	\$29.31	\$12,041.13
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	14.00 EA	\$904.99	\$12,669.86
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	7,559.33 LF	\$3.33	\$25,172.57
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	14.00 EA	\$686.03	\$9,604.42
Subcomponent Total				\$91,962.52

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
715-7-12	LOAD CENTER, F&I, PRIMARY VOLTAGE	1.00 EA	\$13,426.59	\$13,426.59
715-61-321	LIGHT POLE CMPLT,STD,F&I, 40'MH,10'ARM L	14.00 EA	\$8,746.77	\$122,454.78

Lighting Component Total

\$227,843.88

Sequence 1 Total

\$10,144,404.70

Sequence: 2 NDR - New Construction, Divided, Rural

Net Length: 0.570 MI
3,010 LF

Description: US41 from south of Delaney Creek to north of 30th Ave. with concrete pavement.

Special This section includes the elevated portion of US41 over Delaney Creek, 36th Ave. and CSX/St.

Conditions: Paul St.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	77.00 / 77.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.570
Top of Structural Course For Begin Section	120.00
Top of Structural Course For End Section	120.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	0 to 1 / 0 to 1
Median Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	5.00 % / 5.00 %
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	10.64	AC	\$46,574.73	\$495,555.13
120-6	EMBANKMENT	244,684.94	CY	\$36.34	\$8,891,850.72
Earthwork Component Total					\$9,387,405.85

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Roadway Pavement Width L/R	36.00 / 36.00
Structural Spread Rate	440
Friction Course Spread Rate	80

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	38,790.40	SY	\$18.27	\$708,700.61
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	5,296.90	TN	\$172.57	\$914,086.03
350-3-7	PLAIN CEMENT CONC PAVT, 9"	24,076.80	SY	\$89.10	\$2,145,242.88

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
350-3-7	PLAIN CEMENT CONC PAVT, 9"	4,747.00	SY	\$89.10	\$422,957.70
	Comment: Adjustment for turn lane				
350-5	CLEANING & SEALING JOINTS - CONC PVMT	60,530.00	LF	\$3.10	\$187,643.00
352-70	GRINDING CONCRETE PAVT	28,824.00	SY	\$6.16	\$177,555.84

Turnouts/Crossovers Subcomponent

Description	Value
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Asphalt Adjustment	20.00
Stabilization Code	Y
Base Code	Y
Friction Course Code	N

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	7,758.08 SY	\$18.27	\$141,740.12
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,059.38 TN	\$172.57	\$182,817.21

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Concrete
Solid Stripe No. of Paint Applications	0
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	0
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	385.00 EA	\$4.21	\$1,620.85
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	2.28 GM	\$4,585.55	\$10,455.05
713-103-131	PERMANENT TAPE, WHITE,SKIP/D,6" FOR CONC	2.28 GM	\$10,022.91	\$22,852.23

Roadway Component Total

\$4,915,671.52

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	10.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	10.00 / 10.00
Structural Spread Rate	165
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips 1/2 No. of Sides	0

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	6,908.70 SY	\$89.97	\$621,575.74
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	551.76 TN	\$172.57	\$95,217.22
337-7-25	ASPH CONC FC,INC BIT,FC- 5,PG76-22	551.76 TN	\$201.89	\$111,394.83

Erosion Control

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	7,824.96 LF	\$2.22	\$17,371.41
104-11	FLOATING TURBIDITY BARRIER	142.50 LF	\$12.32	\$1,755.60
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	142.50 LF	\$6.76	\$963.30

104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$3,371.00	\$3,371.00
104-18	INLET PROTECTION SYSTEM	4.00 EA	\$121.81	\$487.24
107-1	LITTER REMOVAL	13.82 AC	\$42.58	\$588.46
107-2	MOWING	13.82 AC	\$64.00	\$884.48
Shoulder Component Total				\$853,609.28

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	26.00
Performance Turf Width	0.00
Total Median Shoulder Width L/R	12.00 / 12.00
Paved Median Shoulder Width L/R	12.00 / 12.00
Structural Spread Rate	165
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips 1/2 No. of Sides	0

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	8,246.30 SY	\$89.97	\$741,919.61
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	662.11 TN	\$172.57	\$114,260.32
337-7-25	ASPH CONC FC,INC BIT,FC- 5,PG76-22	662.11 TN	\$201.89	\$133,673.39
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	970.00 LF	\$60.02	\$58,219.40
521-1-11	MEDIAN CONC BARRIER, 38" HEIGHT	1,672.00 LF	\$172.38	\$288,219.36
Median Component Total				\$1,336,292.08

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-551	INLETS, DT BOT, TYPE E, <10'	4.00 EA	\$5,692.40	\$22,769.60
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	456.00 LF	\$127.84	\$58,295.04
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	200.00 LF	\$172.79	\$34,558.00
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	168.00 LF	\$220.03	\$36,965.04
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	23.00 EA	\$2,174.11	\$50,004.53
524-1-1	CONCRETE DITCH PAVT, NR, 3"	1,140.00 SY	\$121.28	\$138,259.20
570-1-1	PERFORMANCE TURF	401.28 SY	\$5.00	\$2,006.40

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
446-1-1	EDGEDRAIN DRAINCRETE, STANDARD	4,900.00 LF	\$31.14	\$152,586.00

Retention Basin 1

Description	Value
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Size	2.5 AC
Multiplier	1
Depth	12.00
Description	Pond north of Delaney Creek.

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.50 AC	\$46,574.73	\$116,436.82
120-1	REGULAR EXCAVATION	48,400.00 CY	\$36.39	\$1,761,276.00
425-1-361	INLETS, CURB, TYPE P-6, <10'	1.00 EA	\$7,287.77	\$7,287.77
425-2-71	MANHOLES, J-7, <10'	1.00 EA	\$9,708.17	\$9,708.17
430-175-142	PIPE CULV, OPT MATL, ROUND, 42"S/CD	56.00 LF	\$304.66	\$17,060.96
430-175-160	PIPE CULV, OPT MATL, ROUND, 60"S/CD	200.00 LF	\$827.50	\$165,500.00
550-10-220	FENCING, TYPE B, 5.1-6.0', STANDARD	1,335.00 LF	\$25.27	\$33,735.45
550-60-234	FENCE GATE,TYP B,SLIDE/CANT,18.1-20'OPEN	1.00 EA	\$4,635.92	\$4,635.92
570-1-1	PERFORMANCE TURF	12,100.00 SY	\$5.00	\$60,500.00
Drainage Component Total				\$2,671,584.91

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	2.00 AS	\$421.92	\$843.84
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	14.00 AS	\$1,492.54	\$20,895.56
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	2.00 AS	\$5,499.75	\$10,999.50
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	4.00 AS	\$8,419.19	\$33,676.76
Signing Component Total				\$66,415.66

LIGHTING COMPONENT

Rural Lighting Subcomponent

Description	Value
Multiplier (Number of Poles)	22

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	4,400.00 LF	\$15.69	\$69,036.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	22.00 EA	\$904.99	\$19,909.78
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	13,200.00 LF	\$3.33	\$43,956.00
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	22.00 EA	\$686.03	\$15,092.66
Subcomponent Total				\$147,994.44

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
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715-61-421	LIGHT POLE CMPLT,STD,F&I, 45'MH,10'ARM L	22.00 EA	\$10,945.07	\$240,791.54
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Lighting Component Total				\$388,785.98
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BRIDGES COMPONENT

Bridge 1

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	99.00
Width (LF)	117.08
Type	Low Level
Cost Factor	1.50
Structure No.	
Removal of Existing Structures area	4,440.00
Default Cost per SF	\$112.00
Factored Cost per SF	\$168.00
Final Cost per SF	\$236.37
Basic Bridge Cost	\$1,947,274.56
Description	US41 OVER DELANEY CREEK.

Bridge Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-3	REMOVAL OF EXISTING STRUCTURES/BRIDGES	4,440.00 SF	\$55.00	\$244,200.00
400-2-10	CONC CLASS II, APPROACH SLABS	260.18 CY	\$859.80	\$223,702.76
415-1-9	REINF STEEL- APPROACH SLABS	45,531.50 LB	\$1.13	\$51,450.60

Bridge X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-3	REMOVAL OF EXISTING STRUCTURES/BRIDGES Comment: Culvert Removal	4,440.00 SF	\$55.00	\$244,200.00
400-2-10	CONC CLASS II, APPROACH SLABS Comment: Additional calculation not included.	244.72 CY	\$859.80	\$210,410.26
415-1-9	REINF STEEL- APPROACH SLABS Comment: Additional calculation not included.	55,448.50 LB	\$1.13	\$62,656.80

Bridge 1 Total				\$2,983,894.99
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Bridge 2

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	153.00
Width (LF)	116.67
Type	Overpass Bridge
Cost Factor	1.40
Structure No.	
Removal of Existing Structures area	0.00
Default Cost per SF	\$120.00
Factored Cost per SF	\$168.00
Final Cost per SF	\$184.68
Basic Bridge Cost	\$2,998,885.68

Description

US41 OVER 36TH AVE.

Bridge Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	259.27 CY	\$859.80	\$222,920.35
415-1-9	REINF STEEL- APPROACH SLABS	45,372.25 LB	\$1.13	\$51,270.64

Bridge X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	14.93 CY	\$859.80	\$12,836.81
	Comment: Additional calculation not included.			
415-1-9	REINF STEEL- APPROACH SLABS	9,467.75 LB	\$1.13	\$10,698.56
	Comment: Additional calculation not included.			

Bridge 2 Total

\$3,296,612.04

Bridge 3

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	405.75
Width (LF)	58.67
Type	Overpass Bridge
Cost Factor	2.09
Structure No.	
Removal of Existing Structures area	0.00
Default Cost per SF	\$120.00
Factored Cost per SF	\$250.80
Final Cost per SF	\$257.27
Basic Bridge Cost	\$5,970,382.41

Description

US41 SOUTHBOUND OVER CSX/ST. PAUL ST.

Bridge Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	130.38 CY	\$859.80	\$112,100.72
415-1-9	REINF STEEL- APPROACH SLABS	22,816.50 LB	\$1.13	\$25,782.64

Bridge X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	11.42 CY	\$859.80	\$9,818.92
	Comment: Additional calculation not included.			
415-1-9	REINF STEEL- APPROACH SLABS	5,543.50 LB	\$1.13	\$6,264.16
	Comment: Additional calculation not included.			

Bridge 3 Total

\$6,124,348.86

Bridge 4

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	405.75
Width (LF)	58.67
Type	Overpass Bridge

Cost Factor	2.09
Structure No.	
Removal of Existing Structures area	0.00
Default Cost per SF	\$120.00
Factored Cost per SF	\$250.80
Final Cost per SF	\$257.27
Basic Bridge Cost	\$5,970,382.41
Description	US41 NORTHBOUND OVER CSX/ST. PAUL ST.

Bridge Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	130.38 CY	\$859.80	\$112,100.72
415-1-9	REINF STEEL- APPROACH SLABS	22,816.50 LB	\$1.13	\$25,782.64

Bridge X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	11.42 CY	\$859.80	\$9,818.92
	Comment: Additional calculation not included.			
415-1-9	REINF STEEL- APPROACH SLABS	5,543.50 LB	\$1.13	\$6,264.16
	Comment: Additional calculation not included.			

Bridge 4 Total \$6,124,348.86

Bridges Component Total \$18,529,204.75

RETAINING WALLS COMPONENT

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
521-8-7	CONC BARRIER, W/JUNCT SL, 36 SS	4,296.00 LF	\$313.14	\$1,345,249.44
	Comment: 770 LF Wall 1 1590 LF Wall 2 1936 LF Wall 3			

Retaining Wall 1

Description	Value
Length	770.00
Begin height	15.00
End Height	25.00
Multiplier	1

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	15,400.00 SF	\$44.24	\$681,296.00

Retaining Wall 2

Description	Value
Length	1,590.00
Begin height	30.00
End Height	39.00
Multiplier	1

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
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548-12	RET WALL SYSTEM, PERM, EX BARRIER	54,855.00 SF	\$44.24	\$2,426,785.20
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Retaining Wall 3

Description	Value
Length	1,936.00
Begin height	14.00
End Height	30.00
Multiplier	1

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	42,592.00 SF	\$44.24	\$1,884,270.08

Retaining Wall 4

Description	Value
Length	30.00
Begin height	12.00
End Height	12.00
Multiplier	1

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-13	RETAINING WALL SYSTEM,TEMP, EXC BAR.	360.00 SF	\$27.67	\$9,961.20

Retaining Wall 5

Description	Value
Length	30.00
Begin height	12.00
End Height	12.00
Multiplier	1

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-13	RETAINING WALL SYSTEM,TEMP, EXC BAR.	360.00 SF	\$27.67	\$9,961.20

Retaining Wall 6

Description	Value
Length	163.00
Begin height	17.00
End Height	17.00
Multiplier	1

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-13	RETAINING WALL SYSTEM,TEMP, EXC BAR.	2,771.00 SF	\$27.67	\$76,673.57

Retaining Wall 7

Description	Value
Length	291.00
Begin height	20.00
End Height	20.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-13	RETAINING WALL SYSTEM,TEMP, EXC BAR.	5,820.00	SF	\$27.67	\$161,039.40

Retaining Wall 8

Description	Value
Length	677.00
Begin height	36.00
End Height	36.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-13	RETAINING WALL SYSTEM,TEMP, EXC BAR.	24,372.00	SF	\$27.67	\$674,373.24

Retaining Wall 9

Description	Value
Length	1,154.00
Begin height	22.00
End Height	22.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-13	RETAINING WALL SYSTEM,TEMP, EXC BAR.	25,388.00	SF	\$27.67	\$702,485.96

Retaining Walls Component Total	\$7,972,095.29
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Sequence 2 Total	\$46,121,065.32
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Sequence: 3 NDU - New Construction, Divided, Urban

Net Length: 0.098 MI
517 LF

Description: US41 from north of Causeway Blvd. to north of 27th Ave. with concrete pavement.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	84.00 / 84.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.098
Top of Structural Course For Begin Section	103.00
Top of Structural Course For End Section	103.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	2.00 % / 2.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.00	AC	\$46,574.73	\$93,149.46
120-6	EMBANKMENT	7,190.50	CY	\$36.34	\$261,302.77
Earthwork Component Total					\$354,452.23

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Roadway Pavement Width L/R	79.00 / 43.00
Structural Spread Rate	440
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	7,607.52	SY	\$18.27	\$138,989.39
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,543.12	TN	\$172.57	\$266,296.22
350-3-7	PLAIN CEMENT CONC PAVT, 9"	7,014.19	SY	\$89.10	\$624,964.33

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
350-5	CLEANING & SEALING JOINTS - CONC PVMT	14,730.00	LF	\$3.10	\$45,663.00
352-70	GRINDING CONCRETE PAVT	7,014.00	SY	\$6.16	\$43,206.24

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Concrete
Solid Stripe No. of Paint Applications	0
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	66.00	EA	\$4.21	\$277.86
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	0.39	GM	\$4,585.55	\$1,788.36
713-103-131	PERMANENT TAPE, WHITE,SKIP/D,6" FOR CONC	0.39	GM	\$10,022.91	\$3,908.93
Roadway Component Total					\$1,125,094.33

SHOULDER COMPONENT**User Input Data**

Description	Value
Total Outside Shoulder Width L/R	13.00 / 13.00
Total Outside Shoulder Perf. Turf Width L/R	0.75 / 0.75
Sidewalk Width L/R	10.00 / 10.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	517.44	LF	\$43.51	\$22,513.81
520-1-10	CONCRETE CURB & GUTTER, TYPE F	517.44	LF	\$43.51	\$22,513.81
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	1,149.87	SY	\$62.03	\$71,326.44
570-1-2	PERFORMANCE TURF, SOD	86.24	SY	\$4.68	\$403.60

Erosion Control**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	1,034.88	LF	\$2.22	\$2,297.43
104-11	FLOATING TURBIDITY BARRIER	24.50	LF	\$12.32	\$301.84
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	24.50	LF	\$6.76	\$165.62
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	\$3,371.00	\$3,371.00
104-18	INLET PROTECTION SYSTEM	5.00	EA	\$121.81	\$609.05
107-1	LITTER REMOVAL	2.49	AC	\$42.58	\$106.02
107-2	MOWING	2.49	AC	\$64.00	\$159.36
Shoulder Component Total					\$123,767.98

MEDIAN COMPONENT**User Input Data**

Description	Value
Total Median Width	40.00
Performance Turf Width	35.50

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	1,034.88	LF	\$38.97	\$40,329.27

570-1-1	PERFORMANCE TURF	2,041.01 SY	\$5.00	\$10,205.05
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Median Component Total				\$50,534.32
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DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	4.00	EA	\$7,565.41	\$30,261.64
425-1-451	INLETS, CURB, TYPE J-5, <10'	1.00	EA	\$11,291.94	\$11,291.94
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00	EA	\$4,857.48	\$4,857.48
425-2-41	MANHOLES, P-7, <10'	1.00	EA	\$8,568.89	\$8,568.89
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	264.00	LF	\$172.79	\$45,616.56
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	24.00	LF	\$220.03	\$5,280.72
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	496.00	LF	\$430.26	\$213,408.96
570-1-1	PERFORMANCE TURF	29.79	SY	\$5.00	\$148.95

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
446-1-1	EDGEDRAIN DRAINCRETE, STANDARD	1,034.00	LF	\$31.14	\$32,198.76

Drainage Component Total				\$351,633.90
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SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	3.00	AS	\$421.92	\$1,265.76
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	\$1,492.54	\$1,492.54
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00	AS	\$8,419.19	\$8,419.19
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	1.00	AS	\$11,878.28	\$11,878.28

Signing Component Total				\$23,055.77
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LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description

Spacing

Value

MIN

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	517.44	LF	\$15.69	\$8,118.63
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	102.70	LF	\$29.31	\$3,010.14
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	4.00	EA	\$904.99	\$3,619.96
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	1,889.83	LF	\$3.33	\$6,293.13

715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	4.00 EA	\$686.03	\$2,744.12
	Subcomponent Total			\$23,785.98

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
715-7-12	LOAD CENTER, F&I, PRIMARY VOLTAGE	1.00	EA	\$13,426.59	\$13,426.59
715-61-321	LIGHT POLE CMPLT,STD,F&I, 40'MH,10'ARM L	4.00	EA	\$8,746.77	\$34,987.08
	Lighting Component Total				\$72,199.65

Sequence 3 Total					\$2,100,738.18
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Sequence: 4 NDU - New Construction, Divided, Urban

Net Length: 0.134 MI
708 LF

Description: US41 from north of 27th Ave. to north of 24th Ave. with asphalt pavement.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	75.00 / 75.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.134
Top of Structural Course For Begin Section	103.00
Top of Structural Course For End Section	103.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	2.00 % / 2.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.44	AC	\$46,574.73	\$113,642.34
120-6	EMBANKMENT	8,968.73	CY	\$36.34	\$325,923.65
Earthwork Component Total					\$439,565.99

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Roadway Pavement Width L/R	43.00 / 43.00
Structural Spread Rate	385
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	7,577.69	SY	\$18.27	\$138,444.40
285-709	OPTIONAL BASE,BASE GROUP 09	6,765.79	SY	\$58.97	\$398,978.64
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,302.41	TN	\$172.57	\$224,756.89
337-7-83	ASPH CONC FC,TRAFFIC C,FC- 12.5,PG 76-22	558.18	TN	\$192.45	\$107,421.74

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
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706-1-3	RAISED PAVMT MARK, TYPE B	91.00 EA	\$4.21	\$383.11
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	0.54 GM	\$4,585.55	\$2,476.20
713-103-131	PERMANENT TAPE, WHITE,SKIP/D,6" FOR CONC	0.54 GM	\$10,022.91	\$5,412.37
Roadway Component Total				\$877,873.35

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	13.25 / 13.25
Total Outside Shoulder Perf. Turf Width L/R	1.00 / 1.00
Sidewalk Width L/R	10.00 / 10.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	708.05 LF	\$43.51	\$30,807.26
520-1-10	CONCRETE CURB & GUTTER, TYPE F	708.05 LF	\$43.51	\$30,807.26
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	1,573.44 SY	\$62.03	\$97,600.48
570-1-2	PERFORMANCE TURF, SOD	157.34 SY	\$4.68	\$736.35

Erosion Control

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	1,416.10 LF	\$2.22	\$3,143.74
104-11	FLOATING TURBIDITY BARRIER	33.52 LF	\$12.32	\$412.97
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	33.52 LF	\$6.76	\$226.60
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$3,371.00	\$3,371.00
104-18	INLET PROTECTION SYSTEM	7.00 EA	\$121.81	\$852.67
107-1	LITTER REMOVAL	3.41 AC	\$42.58	\$145.20
107-2	MOWING	3.41 AC	\$64.00	\$218.24

Shoulder Component Total **\$168,321.77**

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	30.00
Performance Turf Width	25.50

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	1,416.10 LF	\$38.97	\$55,185.42
570-1-1	PERFORMANCE TURF	2,006.14 SY	\$5.00	\$10,030.70

Median Component Total **\$65,216.12**

DRAINAGE COMPONENT**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	5.00 EA	\$7,565.41	\$37,827.05
425-1-451	INLETS, CURB, TYPE J-5, <10'	2.00 EA	\$11,291.94	\$22,583.88
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00 EA	\$4,857.48	\$4,857.48
425-2-41	MANHOLES, P-7, <10'	1.00 EA	\$8,568.89	\$8,568.89
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	360.00 LF	\$172.79	\$62,204.40
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	32.00 LF	\$220.03	\$7,040.96
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	672.00 LF	\$430.26	\$289,134.72
570-1-1	PERFORMANCE TURF	40.77 SY	\$5.00	\$203.85
Drainage Component Total				\$432,421.23

SIGNING COMPONENT**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	4.00 AS	\$421.92	\$1,687.68
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00 AS	\$1,492.54	\$1,492.54
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00 AS	\$8,419.19	\$8,419.19
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	1.00 AS	\$11,878.28	\$11,878.28
Signing Component Total				\$23,477.69

LIGHTING COMPONENT**Conventional Lighting Subcomponent****Description**

Spacing

Value

MIN

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	708.05 LF	\$15.69	\$11,109.30
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	140.54 LF	\$29.31	\$4,119.23
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	5.00 EA	\$904.99	\$4,524.95
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	2,585.98 LF	\$3.33	\$8,611.31
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	5.00 EA	\$686.03	\$3,430.15
Subcomponent Total				\$31,794.95

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
715-7-12	LOAD CENTER, F&I, PRIMARY VOLTAGE	1.00 EA	\$13,426.59	\$13,426.59
715-61-321	LIGHT POLE CMPLT,STD,F&I, 40'MH,10'ARM L	5.00 EA	\$8,746.77	\$43,733.85

Lighting Component Total

\$88,955.38

Sequence 4 Total

\$2,095,831.53

Sequence: 5 RSU - Resurfacing, Undivided

Net Length: 0.101 MI
535 LF

Description: US41 from north of 24th Ave. to north of 23rd Ave. milling and resurfacing.

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Roadway Pavement Width L/R	41.00 / 41.00
Structural Spread Rate	275
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
327-70-7	MILLING EXIST ASPH PAVT, 4" AVG DEPTH	4,873.21 SY	\$4.82	\$23,488.87
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	670.07 TN	\$172.57	\$115,633.98
337-7-83	ASPH CONC FC, TRAFFIC C, FC-12.5, PG 76-22	402.04 TN	\$192.45	\$77,372.60

Turnouts/Crossovers Subcomponent

Description	Value
Asphalt Adjustment	10.00
Milling Code	Y
Friction Course Code	Y

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
327-70-7	MILLING EXIST ASPH PAVT, 4" AVG DEPTH	487.32 SY	\$4.82	\$2,348.88
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	67.01 TN	\$172.57	\$11,563.92
337-7-83	ASPH CONC FC, TRAFFIC C, FC-12.5, PG 76-22	40.20 TN	\$192.45	\$7,736.49

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	5

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	96.00 EA	\$4.21	\$404.16
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	0.41 GM	\$4,585.55	\$1,880.08
711-16-231	THERMOPLASTIC, STD-OTH, YELLOW, SKIP, 6"	0.51 GM	\$1,811.80	\$924.02

Roadway Component Total

\$241,353.00

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 0.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	0.00 / 0.00
Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips 1/2 No. of Sides	0

Erosion Control

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-11	FLOATING TURBIDITY BARRIER	10.13 LF	\$12.32	\$124.80
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	10.13 LF	\$6.76	\$68.48
104-18	INLET PROTECTION SYSTEM	1.00 EA	\$121.81	\$121.81
107-1	LITTER REMOVAL	0.25 AC	\$42.58	\$10.65
107-2	MOWING	0.25 AC	\$64.00	\$16.00
Shoulder Component Total				\$341.74

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	2.00 AS	\$421.92	\$843.84
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00 AS	\$1,492.54	\$2,985.08
700-1-50	SINGLE POST SIGN, RELOCATE	1.00 AS	\$280.00	\$280.00
700-1-60	SINGLE POST SIGN, REMOVE	2.00 AS	\$39.50	\$79.00
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00 AS	\$5,499.75	\$5,499.75
700-2-60	MULTI- POST SIGN, REMOVE	1.00 AS	\$831.18	\$831.18
Signing Component Total				\$10,518.85

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MIN

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	534.86 LF	\$15.69	\$8,391.95
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	106.16 LF	\$29.31	\$3,111.55
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	4.00 EA	\$904.99	\$3,619.96
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	1,953.47 LF	\$3.33	\$6,505.06

715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	4.00 EA	\$686.03	\$2,744.12
	Subcomponent Total			\$24,372.64

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
715-61-321	LIGHT POLE CMPLT,STD,F&I, 40'MH,10'ARM L	4.00	EA	\$8,746.77	\$34,987.08
	Lighting Component Total				\$59,359.72

Sequence 5 Total					\$311,573.31
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Sequence: 6 NDU - New Construction, Divided, Urban

Net Length: 0.411 MI
2,170 LF

Description: Causeway Blvd. from 45th St. to east of US41 with concrete pavement.

Special Conditions: Includes the intersection of US41 and Causeway Blvd.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	75.00 / 75.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.411
Top of Structural Course For Begin Section	103.00
Top of Structural Course For End Section	103.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	2.00 % / 2.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	7.47 AC	\$46,574.73	\$347,913.23
120-6	EMBANKMENT	32,004.66 CY	\$36.34	\$1,163,049.34

Earthwork Component Total	\$1,510,962.57
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ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	29.00 / 29.00
Structural Spread Rate	440
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	16,473.32 SY	\$18.27	\$300,967.56
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	3,076.69 TN	\$172.57	\$530,944.39
350-3-11	PLAIN CEMENT CONC PAVT, 11"	13,984.96 SY	\$108.09	\$1,511,634.33

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
350-3-11	PLAIN CEMENT CONC PAVT, 11"	5,883.00 SY	\$108.09	\$635,893.47
	Comment: Adjustments for turn lanes, median openings, and turnouts.			
350-5	CLEANING & SEALING JOINTS - CONC PVMT	64,126.00 LF	\$3.10	\$198,790.60
352-70	GRINDING CONCRETE PAVT	30,536.00 SY	\$6.16	\$188,101.76
	Comment: New Concrete: 20,832 SY Exist. Concrete: 9,704 SY			

Turnouts/Crossovers Subcomponent

Description	Value
Asphalt Adjustment	0.00
Stabilization Code	N
Base Code	N
Friction Course Code	N

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Concrete
Solid Stripe No. of Paint Applications	0
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	0
Skip Stripe No. of Stripes	2

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	166.00 EA	\$4.21	\$698.86
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	1.64 GM	\$4,585.55	\$7,520.30
713-103-131	PERMANENT TAPE, WHITE,SKIP/D,6" FOR CONC	0.82 GM	\$10,022.91	\$8,218.79
Roadway Component Total				\$3,382,770.06

SHOULDER COMPONENT**User Input Data**

Description	Value
Total Outside Shoulder Width L/R	27.25 / 27.25
Total Outside Shoulder Perf. Turf Width L/R	15.00 / 15.00
Sidewalk Width L/R	10.00 / 10.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,170.08 LF	\$43.51	\$94,420.18
520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,170.08 LF	\$43.51	\$94,420.18
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	4,822.40 SY	\$62.03	\$299,133.47
570-1-2	PERFORMANCE TURF, SOD	7,233.60 SY	\$4.68	\$33,853.25

Erosion Control**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	4,340.16 LF	\$2.22	\$9,635.16
104-11	FLOATING TURBIDITY BARRIER	102.75 LF	\$12.32	\$1,265.88
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	102.75 LF	\$6.76	\$694.59
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$3,371.00	\$3,371.00
104-18	INLET PROTECTION SYSTEM	21.00 EA	\$121.81	\$2,558.01
107-1	LITTER REMOVAL	10.46 AC	\$42.58	\$445.39
107-2	MOWING	10.46 AC	\$64.00	\$669.44

Shoulder Component Total

\$540,466.55

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	22.00
Performance Turf Width	17.50

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	4,340.16 LF	\$38.97	\$169,136.04
570-1-1	PERFORMANCE TURF	4,219.60 SY	\$5.00	\$21,098.00
Median Component Total				\$190,234.04

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	15.00 EA	\$7,565.41	\$113,481.15
425-1-451	INLETS, CURB, TYPE J-5, <10'	5.00 EA	\$11,291.94	\$56,459.70
425-1-521	INLETS, DT BOT, TYPE C, <10'	3.00 EA	\$4,857.48	\$14,572.44
425-2-41	MANHOLES, P-7, <10'	3.00 EA	\$8,568.89	\$25,706.67
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	1,088.00 LF	\$172.79	\$187,995.52
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	96.00 LF	\$220.03	\$21,122.88
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	2,056.00 LF	\$430.26	\$884,614.56
570-1-1	PERFORMANCE TURF	124.94 SY	\$5.00	\$624.70

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
446-1-1	EDGEDRAIN DRAINCRETE, STANDARD	4,340.00 LF	\$31.14	\$135,147.60

Retention Basin 1

Description	Value
Size	2 AC
Multiplier	2
Depth	6.00
Description	Pond north of Causeway Blvd.

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	4.00 AC	\$46,574.73	\$186,298.92
120-1	REGULAR EXCAVATION	38,720.00 CY	\$36.39	\$1,409,020.80
425-1-541	INLETS, DT BOT, TYPE D, <10'	2.00 EA	\$5,583.10	\$11,166.20
425-2-71	MANHOLES, J-7, <10'	2.00 EA	\$9,708.17	\$19,416.34
430-175-142	PIPE CULV, OPT MATL, ROUND, 42"S/CD	112.00 LF	\$304.66	\$34,121.92
430-175-160	PIPE CULV, OPT MATL, ROUND, 60"S/CD	400.00 LF	\$827.50	\$331,000.00

550-10-220	FENCING, TYPE B, 5.1-6.0', STANDARD	2,360.00 LF	\$25.27	\$59,637.20
550-60-234	FENCE GATE,TYP B,SLIDE/CANT,18.1-20'OPEN	2.00 EA	\$4,635.92	\$9,271.84
570-1-1	PERFORMANCE TURF	19,360.00 SY	\$5.00	\$96,800.00
Drainage Component Total				\$3,596,458.44

SIGNING COMPONENT

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	10.00 AS	\$421.92	\$4,219.20
700-1-12	SINGLE POST SIGN, F&I GM, 12- 20 SF	1.00 AS	\$1,492.54	\$1,492.54
700-2-15	MULTI- POST SIGN, F&I GM, 51- 100 SF	1.00 AS	\$8,419.19	\$8,419.19
700-2-16	MULTI- POST SIGN, F&I GM, 101- 200 SF	1.00 AS	\$11,878.28	\$11,878.28
Signing Component Total				\$26,009.21

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	6 Lane Mast Arm
Multiplier	1
Description	Causeway Blvd. and 47th St.

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	700.00 LF	\$15.69	\$10,983.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	300.00 LF	\$29.31	\$8,793.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00 PI	\$8,809.89	\$8,809.89
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	22.00 EA	\$904.99	\$19,909.78
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00 AS	\$3,475.94	\$3,475.94
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00 LF	\$8.42	\$505.20
641-2-11	PREST CNC POLE,F&I,TYP P- II,PEDESTAL	1.00 EA	\$1,672.69	\$1,672.69
649-21-21	STEEL MAST ARM ASSEMBLY, F&I, 78'	6.00 EA	\$106,949.35	\$641,696.10
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	20.00 AS	\$1,165.22	\$23,304.40
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00 AS	\$760.18	\$6,081.44
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	20.00 EA	\$362.84	\$7,256.80
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	20.00 AS	\$1,214.98	\$24,299.60
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00 EA	\$301.16	\$2,409.28
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00 AS	\$41,825.40	\$41,825.40

700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00 EA	\$277.65	\$1,110.60
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Signalization 2

Description	Value
Type	6 Lane Mast Arm
Multiplier	2
Description	Causeway Blvd. at US 41

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,400.00 LF	\$15.69	\$21,966.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	600.00 LF	\$29.31	\$17,586.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	2.00 PI	\$8,809.89	\$17,619.78
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	44.00 EA	\$904.99	\$39,819.56
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	2.00 AS	\$3,475.94	\$6,951.88
639-2-1	ELECTRICAL SERVICE WIRE, F&I	120.00 LF	\$8.42	\$1,010.40
641-2-11	PREST CNC POLE,F&I,TYP P-II,PEDESTAL	2.00 EA	\$1,672.69	\$3,345.38
649-21-21	STEEL MAST ARM ASSEMBLY, F&I, 78'	12.00 EA	\$106,949.35	\$1,283,392.20
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	40.00 AS	\$1,165.22	\$46,608.80
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	16.00 AS	\$760.18	\$12,162.88
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	40.00 EA	\$362.84	\$14,513.60
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	40.00 AS	\$1,214.98	\$48,599.20
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	16.00 EA	\$301.16	\$4,818.56
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	2.00 AS	\$41,825.40	\$83,650.80
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	8.00 EA	\$277.65	\$2,221.20
Signalizations Component Total				\$2,406,399.36

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description				Value
Spacing				MIN
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,170.08 LF	\$15.69	\$34,048.56
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	430.73 LF	\$29.31	\$12,624.70
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	15.00 EA	\$904.99	\$13,574.85
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	7,925.72 LF	\$3.33	\$26,392.65
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	15.00 EA	\$686.03	\$10,290.45
Subcomponent Total				\$96,931.20

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
715-7-12	LOAD CENTER, F&I, PRIMARY VOLTAGE	1.00	EA	\$13,426.59	\$13,426.59
715-61-321	LIGHT POLE CMPLT,STD,F&I, 40'MH,10'ARM L	15.00	EA	\$8,746.77	\$131,201.55
Lighting Component Total					\$241,559.35

Sequence 6 Total	\$11,894,859.58
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Sequence: 7 NDU - New Construction, Divided, Urban

Net Length: 0.178 MI
940 LF

Description: Causeway Blvd. from east of US41 to west of CSX with asphalt pavement.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	57.00 / 57.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.098
Top of Structural Course For Begin Section	103.00
Top of Structural Course For End Section	103.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	2.00 % / 2.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.46	AC	\$46,574.73	\$114,573.84
120-6	EMBANKMENT	6,458.42	CY	\$36.34	\$234,698.98
Earthwork Component Total					\$349,272.82

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	29.00 / 29.00
Structural Spread Rate	330
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	7,134.43	SY	\$18.27	\$130,346.04
285-709	OPTIONAL BASE,BASE GROUP 09	6,056.75	SY	\$58.97	\$357,166.55
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	999.36	TN	\$172.57	\$172,459.56
337-7-83	ASPH CONC FC,TRAFFIC C,FC- 12.5,PG 76-22	499.68	TN	\$192.45	\$96,163.42

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
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706-1-3	RAISED PAVMT MARK, TYPE B	72.00 EA	\$4.21	\$303.12
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	0.71 GM	\$4,585.55	\$3,255.74
713-103-131	PERMANENT TAPE, WHITE,SKIP/D,6" FOR CONC	0.36 GM	\$10,022.91	\$3,608.25
Roadway Component Total				\$763,302.68

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	18.25 / 18.25
Total Outside Shoulder Perf. Turf Width L/R	6.00 / 6.00
Sidewalk Width L/R	10.00 / 10.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	939.84 LF	\$43.51	\$40,892.44
520-1-10	CONCRETE CURB & GUTTER, TYPE F	939.84 LF	\$43.51	\$40,892.44
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	2,088.53 SY	\$62.03	\$129,551.52
570-1-2	PERFORMANCE TURF, SOD	1,253.12 SY	\$4.68	\$5,864.60

Erosion Control

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	1,879.68 LF	\$2.22	\$4,172.89
104-11	FLOATING TURBIDITY BARRIER	44.50 LF	\$12.32	\$548.24
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	44.50 LF	\$6.76	\$300.82
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$3,371.00	\$3,371.00
104-18	INLET PROTECTION SYSTEM	10.00 EA	\$121.81	\$1,218.10
107-1	LITTER REMOVAL	4.53 AC	\$42.58	\$192.89
107-2	MOWING	4.53 AC	\$64.00	\$289.92

Shoulder Component Total **\$227,294.86**

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	22.00
Performance Turf Width	17.50

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	1,879.68 LF	\$38.97	\$73,251.13
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	100.00 LF	\$60.02	\$6,002.00
570-1-1	PERFORMANCE TURF	1,827.47 SY	\$5.00	\$9,137.35

Median Component Total **\$88,390.48**

DRAINAGE COMPONENT**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	7.00 EA	\$7,565.41	\$52,957.87
425-1-451	INLETS, CURB, TYPE J-5, <10'	2.00 EA	\$11,291.94	\$22,583.88
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00 EA	\$4,857.48	\$4,857.48
425-2-41	MANHOLES, P-7, <10'	1.00 EA	\$8,568.89	\$8,568.89
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	472.00 LF	\$172.79	\$81,556.88
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	48.00 LF	\$220.03	\$10,561.44
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	896.00 LF	\$430.26	\$385,512.96
570-1-1	PERFORMANCE TURF	54.11 SY	\$5.00	\$270.55
Drainage Component Total				\$566,869.95

SIGNING COMPONENT**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	5.00 AS	\$421.92	\$2,109.60
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00 AS	\$1,492.54	\$1,492.54
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00 AS	\$8,419.19	\$8,419.19
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	1.00 AS	\$11,878.28	\$11,878.28
Signing Component Total				\$23,899.61

LIGHTING COMPONENT**Conventional Lighting Subcomponent**

Description				Value	
Spacing				MIN	
Pay Items					
Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	939.84	LF	\$15.69	\$14,746.09
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	186.54	LF	\$29.31	\$5,467.49
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	7.00	EA	\$904.99	\$6,334.93
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	3,432.55	LF	\$3.33	\$11,430.39
715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	7.00	EA	\$9,368.84	\$65,581.88
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	7.00	EA	\$686.03	\$4,802.21
Subcomponent Total					\$108,362.99

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
715-7-12	LOAD CENTER, F&I, PRIMARY VOLTAGE	1.00 EA	\$13,426.59	\$13,426.59

Lighting Component Total

\$121,789.58

Sequence 7 Total

\$2,140,819.98

Sequence: 8 NUU - New Construction, Undivided, Urban

Net Length: 0.213 MI
1,125 LF

Description: Northbound US41 exit ramp to 36th Ave. with concrete pavement.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	50.00 / 50.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.213
Top of Structural Course For Begin Section	104.00
Top of Structural Course For End Section	104.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.58	AC	\$46,574.73	\$120,162.80
120-6	EMBANKMENT	20,053.16	CY	\$36.34	\$728,731.83
Earthwork Component Total					\$848,894.63

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	15.00 / 7.00
Structural Spread Rate	440
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	3,395.51	SY	\$18.27	\$62,035.97
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	605.09	TN	\$172.57	\$104,420.38
350-3-7	PLAIN CEMENT CONC PAVT, 9"	2,750.41	SY	\$89.10	\$245,061.53

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
350-3-7	PLAIN CEMENT CONC PAVT, 9"	679.00	SY	\$89.10	\$60,498.90
350-5	CLEANING & SEALING JOINTS - CONC PVMT	7,202.00	LF	\$3.10	\$22,326.20
352-70	GRINDING CONCRETE PAVT	2,750.41	SY	\$6.16	\$16,942.53

Turnouts/Crossovers Subcomponent

Description	Value
Asphalt Adjustment	20.00
Stabilization Code	Y
Base Code	Y
Friction Course Code	N

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	679.10 SY	\$18.27	\$12,407.16
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	121.02 TN	\$172.57	\$20,884.42

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Concrete
Solid Stripe No. of Paint Applications	0
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	0
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	0.43 GM	\$4,585.55	\$1,971.79

Roadway Component Total

\$546,548.88

SHOULDER COMPONENT**User Input Data**

Description	Value
Total Outside Shoulder Width L/R	26.25 / 36.25
Total Outside Shoulder Perf. Turf Width L/R	24.00 / 24.00
Sidewalk Width L/R	0.00 / 10.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	1,125.17 LF	\$43.51	\$48,956.15
520-1-10	CONCRETE CURB & GUTTER, TYPE F	1,125.17 LF	\$43.51	\$48,956.15
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	1,250.19 SY	\$62.03	\$77,549.29
570-1-2	PERFORMANCE TURF, SOD	6,000.90 SY	\$4.68	\$28,084.21

Erosion Control**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	2,250.34 LF	\$2.22	\$4,995.75
104-11	FLOATING TURBIDITY BARRIER	53.28 LF	\$12.32	\$656.41
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	53.28 LF	\$6.76	\$360.17
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$3,371.00	\$3,371.00
104-18	INLET PROTECTION SYSTEM	11.00 EA	\$121.81	\$1,339.91
107-1	LITTER REMOVAL	2.58 AC	\$42.58	\$109.86
107-2	MOWING	2.58 AC	\$64.00	\$165.12

Shoulder Component Total

\$214,544.02

DRAINAGE COMPONENT**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	8.00 EA	\$7,565.41	\$60,523.28
425-1-451	INLETS, CURB, TYPE J-5, <10'	3.00 EA	\$11,291.94	\$33,875.82
425-1-521	INLETS, DT BOT, TYPE C, <10'	2.00 EA	\$4,857.48	\$9,714.96
425-2-41	MANHOLES, P-7, <10'	2.00 EA	\$8,568.89	\$17,137.78
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	496.00 LF	\$172.79	\$85,703.84
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	48.00 LF	\$220.03	\$10,561.44
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	1,072.00 LF	\$430.26	\$461,238.72
570-1-1	PERFORMANCE TURF	64.78 SY	\$5.00	\$323.90

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
446-1-1	EDGEDRAIN DRAINCRETE, STANDARD	1,125.00 LF	\$31.14	\$35,032.50

Drainage Component Total

\$714,112.24

SIGNING COMPONENT**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	5.00 AS	\$421.92	\$2,109.60
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00 AS	\$1,492.54	\$1,492.54
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00 AS	\$8,419.19	\$8,419.19

Signing Component Total

\$12,021.33

LIGHTING COMPONENT**Conventional Lighting Subcomponent****Description**

Spacing

Value

MIN

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,125.17 LF	\$15.69	\$17,653.92
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	223.33 LF	\$29.31	\$6,545.80
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	8.00 EA	\$904.99	\$7,239.92
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	4,109.42 LF	\$3.33	\$13,684.37
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	8.00 EA	\$686.03	\$5,488.24
Subcomponent Total				\$50,612.25

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
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715-61-321	LIGHT POLE CMPLT,STD,F&I, 40'MH,10'ARM L	8.00 EA	\$8,746.77	\$69,974.16
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Lighting Component Total				\$120,586.41
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BRIDGES COMPONENT

Bridge 5

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	111.00
Width (LF)	38.25
Type	Low Level
Cost Factor	1.80
Structure No.	
Removal of Existing Structures area	0.00
Default Cost per SF	\$112.00
Factored Cost per SF	\$201.60
Final Cost per SF	\$242.24
Basic Bridge Cost	\$855,943.20
Description	RAMP A BRIDGE OVER DELANEY CREEK.

Bridge Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	85.00	CY	\$859.80	\$73,083.00
415-1-9	REINF STEEL- APPROACH SLABS	14,875.00	LB	\$1.13	\$16,808.75

Bridge X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	73.90	CY	\$859.80	\$63,539.22
	Comment: Additional calculation not included.				
415-1-9	REINF STEEL- APPROACH SLABS	16,905.00	LB	\$1.13	\$19,102.65
	Comment: Additional calculation not included.				

Bridge 5 Total				\$1,028,476.82
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Bridges Component Total				\$1,028,476.82
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Sequence 8 Total				\$3,485,184.33
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Sequence: 9 NUU - New Construction, Undivided, Urban

Net Length: 0.753 MI
3,974 LF

Description: Frontage Road along the west side of US41 from Hartford St. to north of Towaway Ave. with asphalt pavement.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	30.00 / 30.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.753
Top of Structural Course For Begin Section	103.00
Top of Structural Course For End Section	103.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	5.48	AC	\$46,574.73	\$255,229.52
120-6	EMBANKMENT	34,987.39	CY	\$36.34	\$1,271,441.75
Earthwork Component Total					\$1,526,671.27

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	2
Roadway Pavement Width L/R	12.00 / 12.00
Structural Spread Rate	385
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	12,876.59	SY	\$18.27	\$235,255.30
285-709	OPTIONAL BASE,BASE GROUP 09	10,598.02	SY	\$58.97	\$624,965.24
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	2,040.12	TN	\$172.57	\$352,063.51
337-7-83	ASPH CONC FC,TRAFFIC C,FC- 12.5,PG 76-22	874.34	TN	\$192.45	\$168,266.73

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
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706-1-3	RAISED PAVMT MARK, TYPE B	102.00 EA	\$4.21	\$429.42
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	3.01 GM	\$4,585.55	\$13,802.51
Roadway Component Total				\$1,394,782.71

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	18.25 / 18.25
Total Outside Shoulder Perf. Turf Width L/R	16.00 / 16.00
Sidewalk Width L/R	0.00 / 0.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	3,974.26 LF	\$43.51	\$172,920.05
520-1-10	CONCRETE CURB & GUTTER, TYPE F	3,974.26 LF	\$43.51	\$172,920.05
570-1-2	PERFORMANCE TURF, SOD	14,130.69 SY	\$4.68	\$66,131.63

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	1,078.00 SY	\$62.03	\$66,868.34

Erosion Control

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	7,948.51 LF	\$2.22	\$17,645.69
104-11	FLOATING TURBIDITY BARRIER	188.18 LF	\$12.32	\$2,318.38
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	188.18 LF	\$6.76	\$1,272.10
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$3,371.00	\$3,371.00
104-18	INLET PROTECTION SYSTEM	39.00 EA	\$121.81	\$4,750.59
107-1	LITTER REMOVAL	9.12 AC	\$42.58	\$388.33
107-2	MOWING	9.12 AC	\$64.00	\$583.68

Shoulder Component Total **\$509,169.84**

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	28.00 EA	\$7,565.41	\$211,831.48
425-1-451	INLETS, CURB, TYPE J-5, <10'	8.00 EA	\$11,291.94	\$90,335.52
425-1-521	INLETS, DT BOT, TYPE C, <10'	4.00 EA	\$4,857.48	\$19,429.92
425-2-41	MANHOLES, P-7, <10'	4.00 EA	\$8,568.89	\$34,275.56
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	1,752.00 LF	\$172.79	\$302,728.08
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	160.00 LF	\$220.03	\$35,204.80
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	3,768.00 LF	\$430.26	\$1,621,219.68

570-1-1	PERFORMANCE TURF	228.82 SY	\$5.00	\$1,144.10
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Drainage Component Total				\$2,316,169.14
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SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	16.00	AS	\$421.92	\$6,750.72
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	\$1,492.54	\$2,985.08
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	2.00	AS	\$8,419.19	\$16,838.38
Signing Component Total					\$26,574.18

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value				
Spacing	MIN				
Pay Items					
Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	3,974.26	LF	\$15.69	\$62,356.14
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	788.83	LF	\$29.31	\$23,120.61
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	27.00	EA	\$904.99	\$24,434.73
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	14,515.07	LF	\$3.33	\$48,335.18
715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	27.00	EA	\$9,368.84	\$252,958.68
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	27.00	EA	\$686.03	\$18,522.81
Subcomponent Total					\$429,728.15
Lighting Component Total					\$429,728.15

BRIDGES COMPONENT

Bridge 6

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	90.00
Width (LF)	51.54
Type	Low Level
Cost Factor	1.50
Structure No.	
Removal of Existing Structures area	0.00
Default Cost per SF	\$112.00
Factored Cost per SF	\$168.00
Final Cost per SF	\$227.95
Basic Bridge Cost	\$779,284.80
Description	FRONTAGE ROAD BRIDGE OVER DELANEY CREEK.

Bridge Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	114.53 CY	\$859.80	\$98,472.89
415-1-9	REINF STEEL- APPROACH SLABS	20,042.75 LB	\$1.13	\$22,648.31
Bridge X-Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	165.40 CY	\$859.80	\$142,210.92
	Comment: Additional calculation not included.			
415-1-9	REINF STEEL- APPROACH SLABS	13,037.25 LB	\$1.13	\$14,732.09
	Comment: Additional calculation not included.			
Bridge 6 Total				\$1,057,349.01
Bridges Component Total				\$1,057,349.01
Sequence 9 Total				\$7,260,444.30

Sequence: 10 NUU - New Construction, Undivided, Urban

Net Length: 0.239 MI
1,260 LF

Description: Hartford St. with asphalt pavement.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	33.00 / 33.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.239
Top of Structural Course For Begin Section	103.00
Top of Structural Course For End Section	103.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.91	AC	\$46,574.73	\$88,957.73
120-6	EMBANKMENT	12,238.75	CY	\$36.34	\$444,756.18
Earthwork Component Total					\$533,713.91

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	2
Roadway Pavement Width L/R	12.00 / 12.00
Structural Spread Rate	385
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	4,081.78	SY	\$18.27	\$74,574.12
285-709	OPTIONAL BASE,BASE GROUP 09	3,359.49	SY	\$58.97	\$198,109.13
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	646.70	TN	\$172.57	\$111,601.02
337-7-83	ASPH CONC FC,TRAFFIC C,FC- 12.5,PG 76-22	277.16	TN	\$192.45	\$53,339.44

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	32.00	EA	\$4.21	\$134.72

711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	0.95 GM	\$4,585.55	\$4,356.27
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Roadway Component Total

\$442,114.70

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	21.25 / 21.25
Total Outside Shoulder Perf. Turf Width L/R	19.00 / 19.00
Sidewalk Width L/R	0.00 / 0.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	1,259.81 LF	\$43.51	\$54,814.33
520-1-10	CONCRETE CURB & GUTTER, TYPE F	1,259.81 LF	\$43.51	\$54,814.33
570-1-2	PERFORMANCE TURF, SOD	5,319.19 SY	\$4.68	\$24,893.81

Erosion Control

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	2,519.62 LF	\$2.22	\$5,593.56
104-11	FLOATING TURBIDITY BARRIER	59.65 LF	\$12.32	\$734.89
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	59.65 LF	\$6.76	\$403.23
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$3,371.00	\$3,371.00
104-18	INLET PROTECTION SYSTEM	13.00 EA	\$121.81	\$1,583.53
107-1	LITTER REMOVAL	2.89 AC	\$42.58	\$123.06
107-2	MOWING	2.89 AC	\$64.00	\$184.96

Shoulder Component Total

\$146,516.70

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	9.00 EA	\$7,565.41	\$68,088.69
425-1-451	INLETS, CURB, TYPE J-5, <10'	3.00 EA	\$11,291.94	\$33,875.82
425-1-521	INLETS, DT BOT, TYPE C, <10'	2.00 EA	\$4,857.48	\$9,714.96
425-2-41	MANHOLES, P-7, <10'	2.00 EA	\$8,568.89	\$17,137.78
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	560.00 LF	\$172.79	\$96,762.40
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	48.00 LF	\$220.03	\$10,561.44
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	1,200.00 LF	\$430.26	\$516,312.00
570-1-1	PERFORMANCE TURF	72.53 SY	\$5.00	\$362.65

Drainage Component Total

\$752,815.74

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	5.00	AS	\$421.92	\$2,109.60
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	\$1,492.54	\$1,492.54
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00	AS	\$8,419.19	\$8,419.19
Signing Component Total					\$12,021.33

LIGHTING COMPONENT**Conventional Lighting Subcomponent**

Description					Value
Spacing					MIN
Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,259.81	LF	\$15.69	\$19,766.42
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	250.05	LF	\$29.31	\$7,328.97
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	9.00	EA	\$904.99	\$8,144.91
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	4,601.16	LF	\$3.33	\$15,321.86
715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	9.00	EA	\$9,368.84	\$84,319.56
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	9.00	EA	\$686.03	\$6,174.27
Subcomponent Total					\$141,055.99

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
715-7-12	LOAD CENTER, F&I, PRIMARY VOLTAGE	1.00	EA	\$13,426.59	\$13,426.59
Lighting Component Total					\$154,482.58

Sequence 10 Total**\$2,041,664.96**

Sequence: 11 NUR - New Construction, Undivided, Rural

Net Length: 0.924 MI
4,880 LF

Description: Side streets with asphalt pavement: (See locations below)

Special Conditions: Trenton St. 264ft Denver St. 200ft Austin St. 100ft Raleigh St. 245ft 36th Ave. 666ft Towaway Ave. 610ft Service Rd. 1 525ft St. Paul St. 475ft Service Rd. 2 900ft 31st St. 190ft 30th St. 140ft Camino St. 150ft 27th St. 52ft 24th St. 42ft 23rd St. 100ft 47th Ave. 500ft Sagasta St. 100ft

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	25.00 / 25.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.924
Top of Structural Course For Begin Section	103.00
Top of Structural Course For End Section	103.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	5.60	AC	\$46,574.73	\$260,818.49
120-6	EMBANKMENT	18,615.03	CY	\$36.34	\$676,470.19
Earthwork Component Total					\$937,288.68

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	2
Roadway Pavement Width L/R	12.00 / 12.00
Structural Spread Rate	385
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	18,434.71	SY	\$18.27	\$336,802.15
285-709	OPTIONAL BASE,BASE GROUP 09	13,370.59	SY	\$58.97	\$788,463.69
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	2,504.95	TN	\$172.57	\$432,279.22
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	1,073.55	TN	\$192.45	\$206,604.70

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	125.00	EA	\$4.21	\$526.25
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	3.70	GM	\$1,182.49	\$4,375.21
710-11-231	PAINTED PAVT MARK,STD,YELLOW,SKIP,6"	0.92	GM	\$488.57	\$449.48
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	3.70	GM	\$4,585.55	\$16,966.54
713-103-131	PERMANENT TAPE, WHITE,SKIP/D,6" FOR CONC	0.92	GM	\$10,022.91	\$9,221.08
Roadway Component Total					\$1,795,688.32

SHOULDER COMPONENT**User Input Data**

Description	Value
Total Outside Shoulder Width L/R	5.00 / 5.00
Total Outside Shoulder Perf. Turf Width L/R	5.00 / 5.00
Paved Outside Shoulder Width L/R	0.00 / 0.00
Structural Spread Rate	110
Friction Course Spread Rate	165
Total Width (T) / 8" Overlap (O)	T
Rumble Strips ½ No. of Sides	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
570-1-2	PERFORMANCE TURF, SOD	5,421.97	SY	\$4.68	\$25,374.82

Erosion Control**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	12,687.42	LF	\$2.22	\$28,166.07
104-11	FLOATING TURBIDITY BARRIER	231.05	LF	\$12.32	\$2,846.54
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	231.05	LF	\$6.76	\$1,561.90
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	\$3,371.00	\$3,371.00
107-1	LITTER REMOVAL	11.20	AC	\$42.58	\$476.90
107-2	MOWING	11.20	AC	\$64.00	\$716.80
Shoulder Component Total					\$62,514.03

DRAINAGE COMPONENT**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	744.00	LF	\$127.84	\$95,112.96
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	160.00	LF	\$220.03	\$35,204.80
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	37.00	EA	\$2,174.11	\$80,442.07
570-1-1	PERFORMANCE TURF	650.64	SY	\$5.00	\$3,253.20
Drainage Component Total					\$214,013.03

SIGNING COMPONENT**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	2.00	AS	\$421.92	\$843.84
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	19.00	AS	\$1,492.54	\$28,358.26
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	2.00	AS	\$5,499.75	\$10,999.50
Signing Component Total					\$40,201.60

LIGHTING COMPONENT**Rural Lighting Subcomponent****Description****Value**

Multiplier (Number of Poles)

1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	200.00	LF	\$15.69	\$3,138.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	1.00	EA	\$904.99	\$904.99
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	600.00	LF	\$3.33	\$1,998.00
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	1.00	EA	\$686.03	\$686.03
Subcomponent Total					\$6,727.02

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
715-7-12	LOAD CENTER, F&I, PRIMARY VOLTAGE	1.00	EA	\$13,426.59	\$13,426.59
715-61-421	LIGHT POLE CMPLT,STD,F&I, 45'MH,10'ARM L	1.00	EA	\$10,945.07	\$10,945.07
Lighting Component Total					\$31,098.68

Sequence 11 Total\$3,080,804.34

FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 440749-1-52-01

Letting Date: 08/2031

Description: US 41/SR 45 AT CSX GRADE SEPARATION FR S OF SR 676 TO N OF SR 676

District: 07

County: 10 HILLSBOROUGH

Market Area: 08

Units: English

Contract Class: 1 Lump Sum Project: N

Design/Build: N

Project Length: 1.930 MI

Project Manager: PRD-KIL

Version 23 Project Grand Total

\$121,781,024.56

Description: 2023 WPUC

Project Sequences Subtotal**\$90,677,390.53**

102-1 Maintenance of Traffic

8.00 %

\$7,254,191.24

101-1 Mobilization

8.00 %

\$7,834,526.54

Project Sequences Total**\$105,766,108.31**

Project Unknowns

15.00 %

\$15,864,916.25

Design/Build

0.00 %

\$0.00

Non-Bid Components:

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)		LS	\$150,000.00	\$150,000.00
Project Non-Bid Subtotal					\$150,000.00

Version 23 Project Grand Total**\$121,781,024.56**