

2nd DRAFT 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

May 2023

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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1.0 PROJECT SUMMARY

1.1 PROJECT BACKGROUND

The Florida Department of Transportation (FDOT) is conducting a Design Change Authorization Reevaluation of a previous Environmental Assessment (EA) (Work Program Item (WPI) Segment No. 255598-1) with a Finding of No Significant Impact (FONSI) approved by the Federal Highway Administration 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 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 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 Segment No. 440749-1 is evaluating various intersection and operational improvements along Causeway Boulevard east and west of US 41 (SR 45/SR 599) 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/SR 45 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.

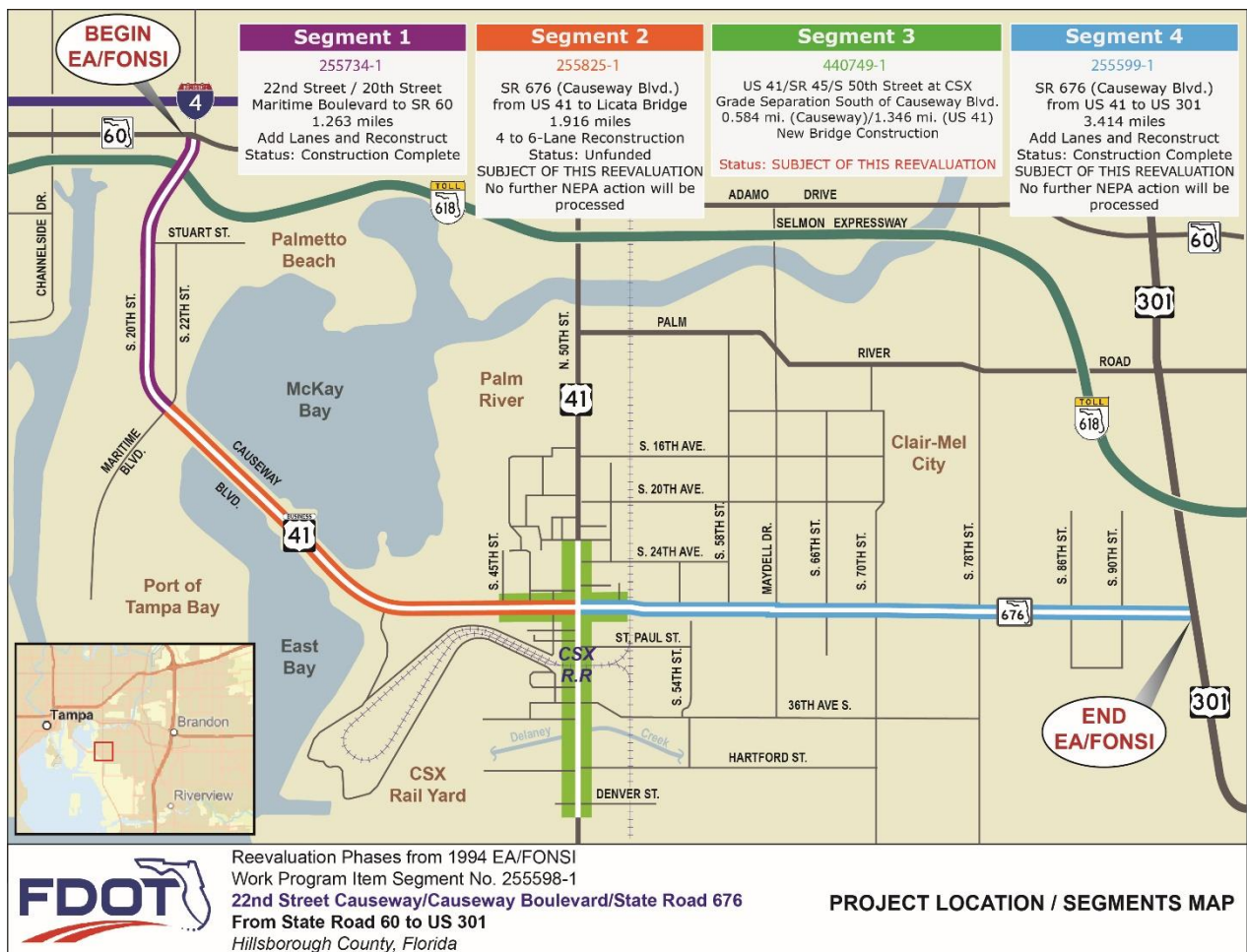


Figure 1-1 Project Location Map

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.

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/SR 45 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. This project will address traffic delays associated with the CSX railroad crossing to the south of the US 41 and Causeway Boulevard intersection and will facilitate the safe movement of vehicle traffic through the project corridor.

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. Between 2017 and 2021, there were 10 crashes involving bicyclists or pedestrians. These 10 crashes resulted in 1 fatality as well as a total of 8 injuries.

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 2022/23-2026/27 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.

1.3 EXISTING FACILITY

The improvements along Causeway Boulevard begin west of 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 by the FDOT 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 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).

Along Causeway Boulevard from S. 45th Street to Sagasta Street, the existing typical section consists of an undivided 4-lane roadway with concrete pavement, 12-foot lanes, a centered 14-foot two-way left-turn lane, curb and gutter, 4-foot bicycle lanes, and 6-foot sidewalks.

The existing typical section of Causeway Boulevard from Sagasta Street to US 41 consists of a divided 4-lane roadway with concrete pavement and 12-foot travel lanes, 4-foot bicycle lanes, and 6-foot sidewalks on both sides.

The existing typical section of Causeway Boulevard from US 41 to approximately 400 feet east of US 41 consists of a divided 4-lane roadway with concrete pavement, 12-foot outside lanes, 11-foot inside lanes, 4-foot bicycle lanes, curb and gutter and 6-foot sidewalks on both sides. It also includes dual 12-foot left turn lanes and a 12-foot right turn lane in the westbound (WB) direction.

The existing typical section of Causeway Boulevard from US 41 to the end project limits consists of a divided 4-lane roadway with asphalt pavement, 12-foot outside lanes and 11-foot inside lanes, curb and gutter, 4-foot bicycle lanes and 6-foot sidewalks on both sides.

US 41 from south of Denver Street to Causeway Boulevard is a divided 6-lane roadway with a 19-foot median, 10-foot outside travel lanes, 11-foot middle and inside travel lanes, curb and gutter, and a sidewalk on both sides. The inside northbound travel lane from north of St. Paul Street becomes one of the two left-turn lanes for the Causeway Boulevard intersection. The sidewalk on the east side is 6-foot wide and the sidewalk on the west side varies from 5-foot to 6-foot wide.

Along US 41 from north of Causeway Boulevard to just north of S. 23rd Avenue, the existing typical section consists of an undivided 6-lane roadway with asphalt pavement, 11-foot travel lanes, a centered 10-foot two-way left-turn lane, curb and gutter, and 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. 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 crossing. See **Section 2.1.4** for further details on the existing typical sections and **Section 2.1.5** for further details on the existing ROW.

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 right-of-way (ROW) impacts. A 19-foot, 6-inch median width was used for the portion within the natural 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.

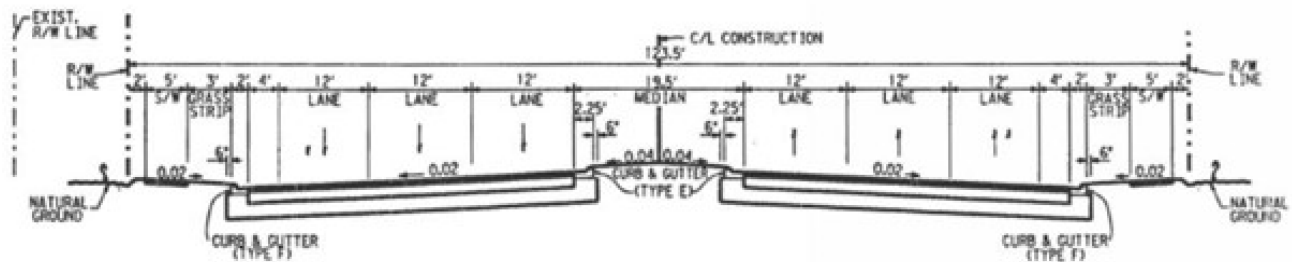


Figure 1-2 1995 EA/FONSI Typical Section

The Causeway Boulevard intersection was evaluated as a grade-separated TUDI 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

TO BE ADDED AFTER PUBLIC HEARING

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. Concrete pavement will be used where appropriate. The proposed improvements will require the acquisition of right-of-way 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, S. 36th Avenue, 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 Street
- 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 S. 36th Avenue
- 4) Local property access driveways along the east side of US 41 north of S. 36th Ave. and north of St. Paul Street
- 5) 2-lane underpass roadways (under US 41) at S. 36th Avenue and St. Paul Street.

1.6 LIST OF TECHNICAL DOCUMENTS

Typical Section Package (December 2022)
Design Variation Memo (December 2022)
Design Variation (December 2022)
Project Traffic Analysis Report (October 2019)
Project Traffic Analysis Report Supplement (March 2023)
Bridge Hydraulic Report (May 2023)
Location Hydraulic Report (March 2023)

Pond Siting Report (March 2023)
Water Quality Impact Evaluation Report (November 2022)
Base Clearance Water Elevation Report (October 2022)
Utility Assessment Report (April 2023)
Preliminary Engineering Report (May 2023)
Design Change Re-evaluation (May 2023)
Natural Resource Evaluation (March 2023)
Contamination Screening Evaluation Report - Mainline (February 2023)
Contamination Screening Evaluation Report - Ponds (February 2023)
Cultural Resource Assessment Survey (January 2023)
Pond Cultural Resource Assessment Survey Addendum (May 2023)
Noise Study Report (May 2023)
Conceptual Stage Relocation Plan (May 2023)
Public Involvement Plan (September 2018)
Public Hearing Transcript/Certification (*Pending*)
Comments and Coordination Report (*Pending*)

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 Blvd.	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.

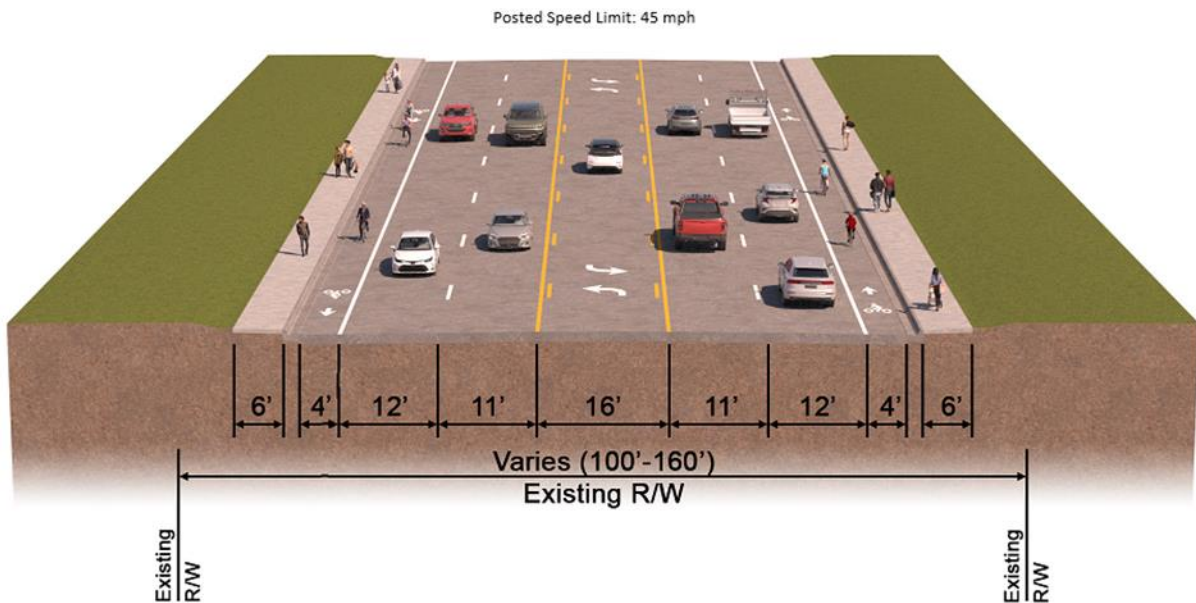


Figure 2-1 Causeway Blvd Existing Typical Section

US 41 north of Causeway Boulevard is an undivided 6-lane curbed roadway with a 10-foot two-way left-turn lane, 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

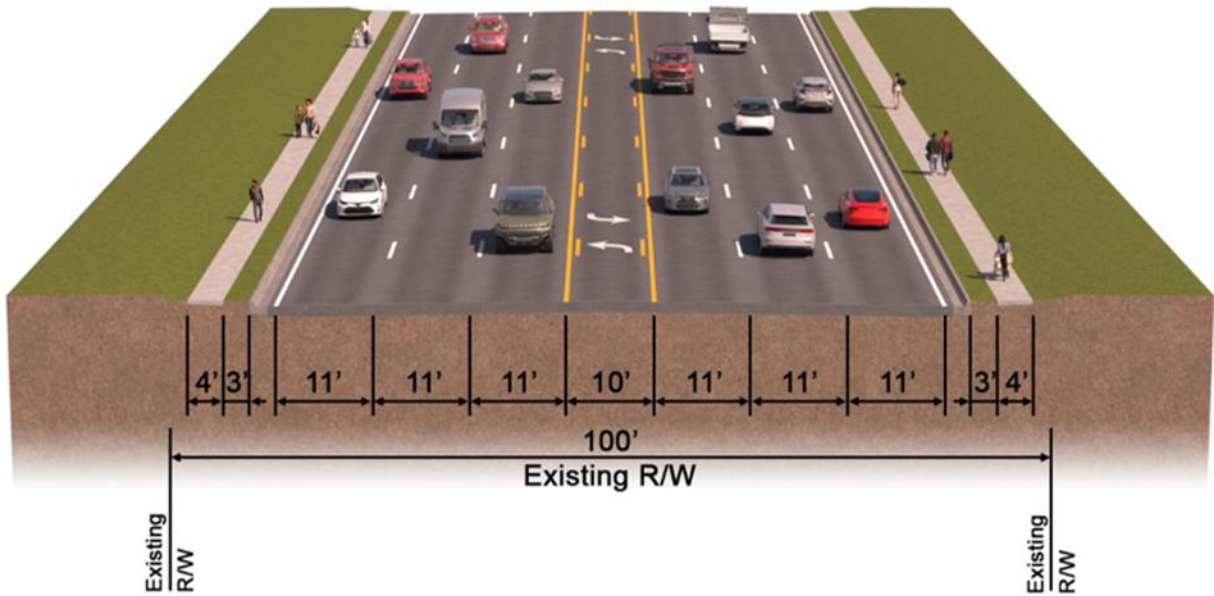


Figure 2-2 US 41 Existing Typical Section North of Causeway Blvd

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

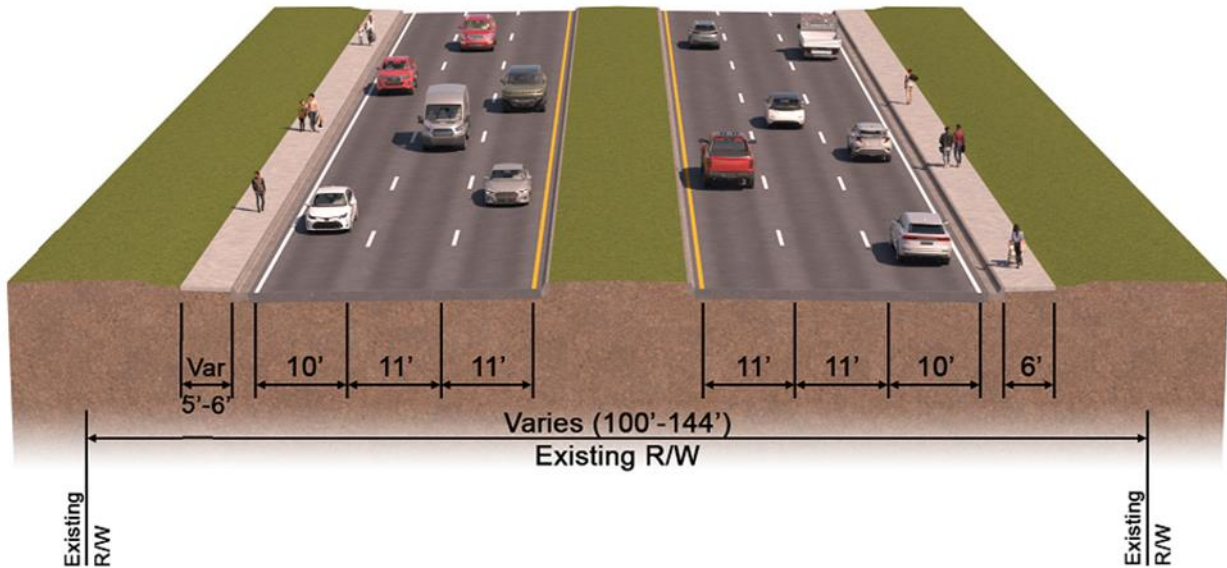


Figure 2-3 US 41 Existing Typical Section South of Causeway Blvd

2.1.5 Right-of-Way

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 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 right-of-way (ROW) information was obtained from the Right-of-Way 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 right-of-way (R/W), 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.

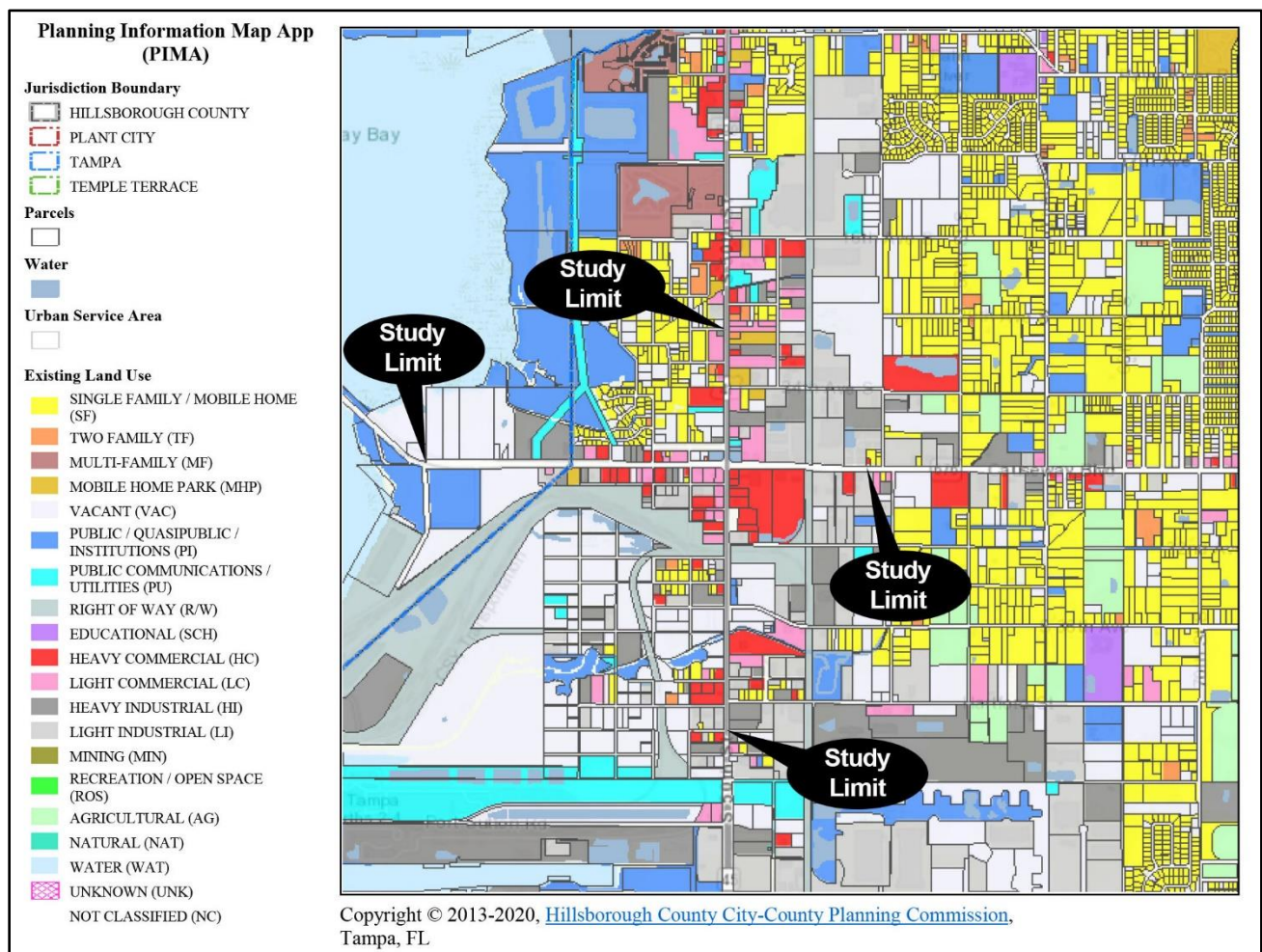


Figure 2-4 Existing Land Use Map

2.1.7 Posted Speed

The posted speed limit on US 41 from south of the project limits to north of Raleigh Street is 55 miles per hour (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 Cross Drains

There are three cross drains along US 41 summarized in **Table 2-3** that are within the study limits.

Table 2-3 Existing Cross Drains along US 41

Cross Drain Number	Station	Existing Length (ft)	Size	Barrels	Type
CD-01	71+35	119'	11'x8' CBC	3	CBC
CD-02	110+00	104'	42"	2	RCP
CD-03	130+77	119'	36"	3	RCP

There are three cross drains along Causeway Boulevard summarized in **Table 2-4** that are within the study limits.

Table 2-4 Existing Cross Drains along Causeway Blvd.

Cross Drain Number	Station	Existing Length (ft)	Size	Barrels	Type
CD-04	304+00	151'	24"X38"	1	ERCP
CD-05	264+00	129'	36"	1	RCP
CD-06	58+00	156'	36"	2	RCP

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. Then there is an existing 6-foot sidewalk and 4-foot bicycle lane on both sides of Causeway Boulevard to 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 2-5** for US 41 and **Table 2-6** 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 2-5 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 2-6 Causeway Blvd 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 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 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 2-7** 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.

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%
	Total	297	59.4	100%
	Injury Severity	Fatal	1	0.2
Incapacitating		9	1.8	3%
Non-Incapacitating		34	6.8	11%
Possible Injury		48	9.6	16%
Property Damage		205	41	69%
Total		297	59.4	100%
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%
	Total	297	59.4	100%
Surface Condition	Dry	275	55	93%
	Wet	22	4.4	7%
	Total	297	59.4	100%

Table 2-7 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%	
	Total	106	21.2	100%	
	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%	
Total	106	21.2	100%		
Lighting Condition	Dawn	5	1	5%	
	Daylight	80	16	75%	
	Dusk	5	1	5%	
	Dark - Lighted	16	3.2	15%	
Total	106	21.2	100%		
Surface Condition	Dry	99	19.8	93%	
	Wet	7	1.4	7%	
	Total	106	21.2	100%	

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%	
	Total	50	10	100%	
	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%	
Total	50	10	100%		
Lighting Condition	Dawn	2	0.4	4%	
	Daylight	37	7.4	74%	
	Dusk	2	0.4	4%	
	Dark - Lighted	9	1.8	18%	
Total	50	10	100%		
Surface Condition	Dry	45	9	90%	
	Wet	5	1	10%	
	Total	50	10	100%	

A map of all crash locations is provided in Figure 2-5. **Figure 2-6** shows the locations of pedestrian, bicycle, and fatal crashes by crash type in the study area.

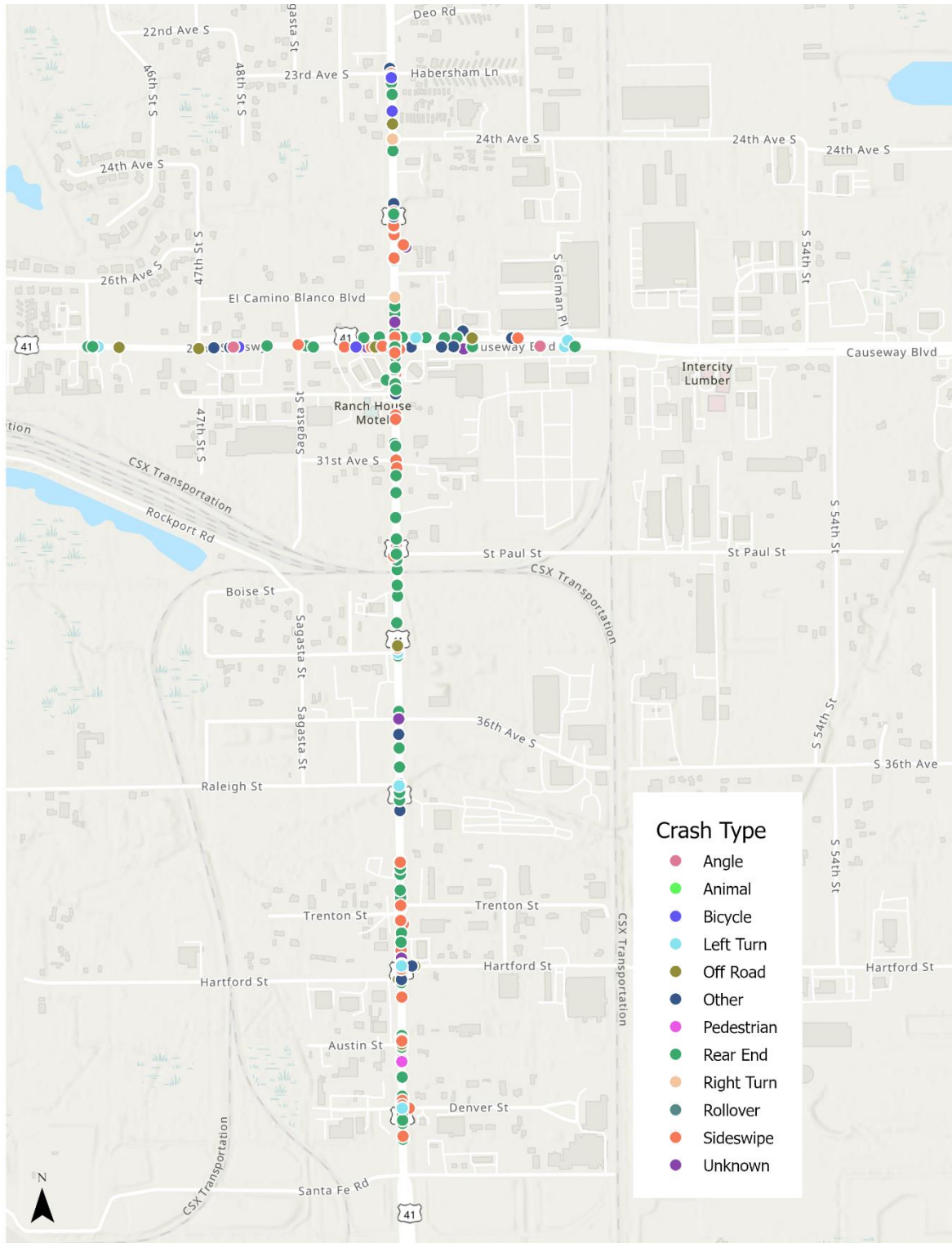


Figure 2-5 Crashes by Crash Type (2017-2021)

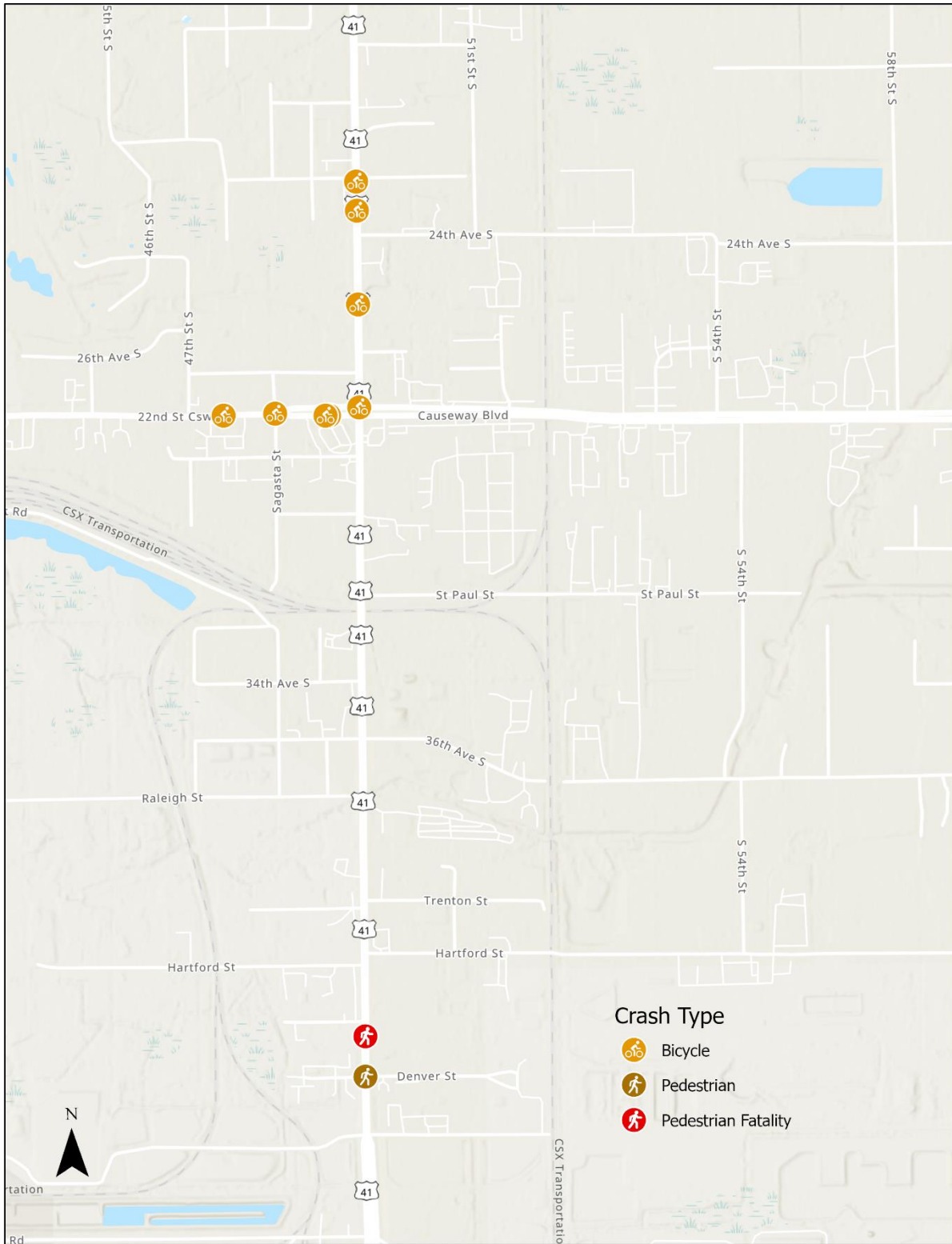


Figure 2-6 Bicycle, Pedestrian and Fatal Crashes

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 14 railroad crashes occurred with four injuries and no fatalities. **Table 2-8** lists the 10 railroad crashes on US 41 and four railroad crashes on Causeway Boulevard. **Appendix B** presents historical train-related crash data. No collisions involving trains have been identified after April 2000.

Table 2-8 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 Blvd 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

2.1.12.2 Crash Mitigation Strategies

The crash mitigation strategies offered in this section are focused on preventing the most common crash type in the study area: rear ends. As rear ends are primarily a result of congestion, the most effective countermeasure is likely to be the added roadway capacity implemented as part of the recommended Build alternative. The increased capacity would be expected to result in less congestion and therefore a lower accident probability. 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.

Countermeasures applicable to the study area that may reduce the frequency of rear end collisions include:

- Modify/close median openings
- Signing and pavement markings
- Add turn lane(s) and pavement resurfacing

These countermeasures are found in the FDOT 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 recommended Build alternative. **Table 2-9** shows the rear end crash reduction factors for the mitigating strategies suggested for this study.

Table 2-9 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)

2.1.13 Intersections and Signalization

There are 25 intersections within the study corridor, one of which is signalized, as shown in **Table 2-10** and **Table 2-11**.

Table 2-10 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/S 36 th Avenue	23.095	No
S 34 th Avenue	23.171	No
CSX Railroad	23.271	-
St Paul Street	23.291	No
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 2-11 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 31st Street and extends through the intersection at Causeway Boulevard. There is currently no lighting through the remainder of US 41 within the project limits.

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 2-12** and **Table 2-13** summarize the facilities of the twelve (12) identified utility owners within the project limits. Utility owners that have not responded are noted below.

Table 2-12 US 41 Existing Utilities

Utility Agency/Owner	Facility Type	Limits
Bright House Networks	Cable TV	1-Overhead TV crossing at Denver St. (South Side); 1-Buried TV – Denver St. to Trenton St. (West Side); 1-Overhead TV – Trenton St. to S. 21st Ave. (West Side); 1-Overhead TV crossing at Austin St. (North Side); 1-Overhead TV crossing Hartford St. from SW quadrant to northside of Hartford St.; 1-Buried TV crossing at Hartford St. east leg (North Side); 1-Overhead TV crossing at S. 36 th Ave. (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 St. (West Side); 2-Buried 2" HDPE TV (370') at Raleigh St. (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 Blvd. located in the west bound middle lane.
City of Tampa - Transportation	Traffic Signal Infrastructure	No Response.
City of Tampa - Water	Water	24" CIP – Denver St. 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 St. (North Side); 6" DIP crossing at Austin St. (North Side); 2" CAS – 210' south of Hartford St. to Hartford St. (West Side); 6" DIP at Hartford St. (west leg) connection to 2" CIP and 24" Steel; 8" CAS's at Hartford St. (east leg) on the north and south sides of Hartford St.; 2" CAS at Trenton St. (west leg) on North Side; 6" DIP at Trenton St. (east leg) on the North Side; 6" CAS – Hartford St. 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 S. 36 th Ave. (East Side); 6" CAS crossing at S. 36 th Ave. (North Side); 6" CAS – S. 36 th Ave. to S. 34 th Ave. (East Side); 2" HDPE – CSX RR to 200' north of St. Paul St. (West Side); 8" DIP crossing at St. Paul St. (South Side); 6" DIP – CSX RR to St. Paul St. (East Side); 6" DIP at S. 31 st Ave. (North Side); 6" CAS – 31st Ave. to S. 30 th Ave. (East Side); 8" DIP crossing at Causeway Blvd. (South Side).

Utility Agency/Owner	Facility Type	Limits
Frontier Communications	Cable/Fiber/Phone	<p>1-Overhead Telephone crossing Denver St. (South Side); 1-Buried Telephone in NE quadrant of Denver St.; 1- Buried Telephone – Denver St. to Hartford St. (East Side); 2- Buried Telephones – Hartford St. to St. Paul St. (East Side); 1- Buried Telephone – St. Paul St. to S. 31st Ave. (East Side); 1- Overhead Telephone – St. Paul St. to 340’ south of Causeway Blvd. (EAST Side); 1- Buried Telephone – 340’ south of Causeway Blvd. to Causeway Blvd. (East Side); 1-Buried Fiber Optic – Denver St. to S. 31st Ave. (East Side); 1-Buried Telephone – Austin St. to Hartford St. (West Side); 1-Buried Telephone crossing at 160’ north of Austin St.; 1-Buried Telephone in SE quadrant of Trenton St.; 1-Overhead Telephone crossing at Raleigh St.; 1-Overhead Telephone crossing at S. 36th Ave.; 1-Overhead Telephone crossing at 180’ north of St. Paul St.; 1- Buried Fiber Optic crossing at S. 31st Ave. (South Side); 1-Buried Telephone crossing at S. 31st Ave. (South Side); 1-Buried Telephone crossing at Causeway Blvd. (South Side).</p>
Hillsborough Co. Traffic	FOC Street Lights/Signals	No Response.
Level 3 Communications	Fiber Optic	1-Buried Fiber Optic – Denver St. to S. 21st Ave. (East Side).
Tampa Bay Pipeline Corporation	Ammonia Pipeline	6” Steel crossing at St. Paul St. (North Side)
Tampa Electric Company	Electric	<p>7.6 kV Overhead at Austin St. (North Side); 13.2 kV Overhead – Denver St. to S. 21st Ave. (West Side); 13.3 kV Overhead crossing diagonally across Hartford St. (west leg); 7.6 kV Overhead along north side of Trenton St. (west leg); 13.2 kV Overhead crossing at Trenton St.; 13.2 kV Overhead along south side of Raleigh St.; 13.3 kV Buried along south side of Raleigh St.; 13.2 kV Overhead crossing at S. 36th Ave. (South Side); 13.2 kV Overhead crossing at S. 34th Ave. (North Side); 240 V Overhead crossing at S. 34th Ave. (North Side); 13.2 kV Overhead 90’ south of CSX RR (West Side); 240 V Overhead crossing 180’ north of St. Paul St. (East Side); 7.6 kV Overhead at S. 31st Ave. (North Side); 13.2 kV Overhead in NW quadrant of S. 31st Ave.; 240 V Overhead at S. 31st Ave. (North Side); 120/240 V Overhead crossing 205’ north of S. 31st Ave.; 13.3 kV Overhead along S. 30th Ave. (North Side); 120/240 V Overhead in NW quadrant of S. 30th Ave.</p>
Tampa Port Authority	Fiber/Phone/Water/Sewer/Electric	No Response.
TECO Fiber	Fiber	7.6 kV Overhead crossing 110’ south of Raleigh St.
TECO Peoples Gas - Tampa	Gas	<p>6” Steel – Denver St. to Hartford St. (East Side); 4” Steel crossing at Trenton St.; 4” Steel – Trenton St. to S. 36th Ave. (West Side); 2” Steel crossing at Causeway Blvd. (South Side).</p>

Table 2-13 Causeway Blvd Existing Utilities

Utility Agency/Owner	Facility Type	Limits
Bright House Networks	Cable TV	1-Buried TV crossing at S. 45 th St. (West Side); 1-Overhead TV – S. 45 th St. to 430' west of S. 45 th St. (North Side); 1-Overhead TV crossing 460' west of S. 45 th St. (North Side); 1-Buried 1.5" HDPE TV (496') at S. 45 th St.
City of Tampa - Sewer	Wastewater	8" PVC FM – Sagasta St. to Causeway Center Dr. (North Side); 4" PVC FM crossing at Sagasta St.; 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 St. (South Side); 8" DIP – 300' west of Sagasta St. to Sagasta St. (South Side); 12" DIP – Sagasta St. to Causeway Center Dr. (South Side); 6" DIP crossing 800' west of S. 45 th St.; 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 St. (South Side); Buried Fiber Optic Cable (BFOC) Telephone 24 – Causeway Crescent Dr. to S. 47 th St. (South Side); BFOC Telephone 24 crossing at S. 47 th St.; BFOC Telephone 24 – S. 47 th St. to Causeway Center Dr. (North Side); BFOC Telephone 24 – 660' west of S. 45 th St. 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 St. (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 St. (North Side); 2" PVC Conduit – crossing 380' east of S. 45 th St.; 2" PVC Conduit – crossing 200' east of S. 47 th St.; 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 St. (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 St.; 13 kV Overhead crossing 260' west of S. 45 th St.; 13 kV Overhead crossing at S. 45 th St.; 13 kV Overhead crossing 240' east of S. 45 th St.; 13 kV Overhead crossing 172' west of S. 47 th St.; 69 kV Overhead crossing at Sagasta St.; 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 St.; 69 kV Overhead crossing 100' east of S. 45 th St.; 230 kV Overhead – 100' east of S. 45 th St. to Sagasta St. (North Side).
TECO Peoples Gas - Tampa	Gas	2" Steel – 1,400' west of S. 45 th St. 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 2-14** 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 2-14 Railroad Crossing Inventory

US DOT Crossing Inventory			US 41	Causeway Blvd	
Railroad Location and Classification	Roadway Milepost		23.271	2.917	
	Railroad Line Segment		904660	904650	
	Railroad Crossing ID Number		624802A	624815B	
	Railroad Milepost		882.00	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	Gates	Roadway	4	4
			Pedestrian	2	0
	Warning Devices	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 2-15**. Rail crossing data provided by the FDOT 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 2-15** summarizes the railroad crossing data collected.

Table 2-15 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

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 Segment No.: 407027-1, which began in late 2020.

2.1.17 Pavement Conditions

According to the FDOT Pavement Condition Report (dated December 2, 2019), 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 2-7** 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.

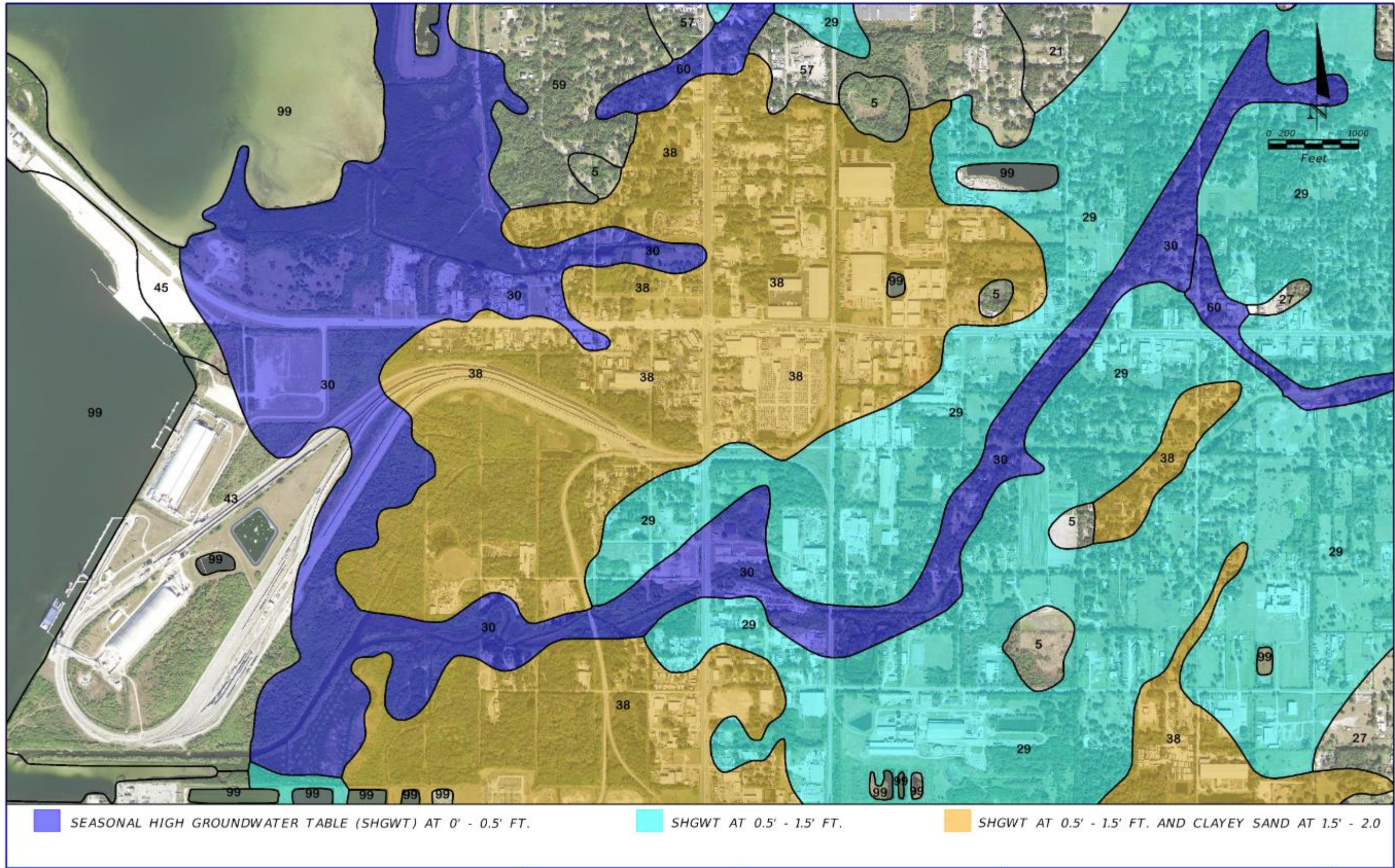


Figure 2-7 USDA Soil Survey Map

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 2-16** identifies the existing structure information.

Table 2-16 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 consist 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, dated 03/26/2021, 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 2-17** summarizes the existing bridge culvert ratings.

Table 2-17 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 Transportation Information (FTI) 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 FTI 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 2-18**. 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 2-18 Existing Year 2018 Traffic Volumes

Roadway / Segment	Collection Date	ADT	Seasonal Factor ¹	Axle Factor ¹	AADT
US 41					
North of SR 676/Causeway Blvd	8/28/2018	26,146	1.05	0.96	26,000
South of SR 676/Causeway Blvd	8/28/2018	40,083	1.05	0.93	39,000
SR 676/Causeway Blvd²					
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 recommended 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 2-19** lists the recommended K and D-Factors and daily truck percentages used for the development of the existing and future traffic volumes.

Table 2-19 Recommended Design Traffic Characteristics

Roadway / Segment	K-Factor	D-Factor	T-Factor	DHT	PHF
US 41 & SR 676/Causeway Blvd	9.0%	-	13.0%	7.0%	0.95
US 41, North of SR 676/Causeway Blvd and SR 676/Causeway Blvd, East of US 41	-	61.1%	-	-	-
US 41, South of SR 676/Causeway Blvd and SR 676/Causeway Blvd, 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 2-20**. 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 except for westbound Causeway Boulevard west of US 41 which operates at LOS F.

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 2-8**, and existing geometry. **Table 2-21** 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.

Table 2-20 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 Blvd	6	50	26,000	C	909	C	1,430	C
Northbound, North of Causeway Blvd	6	50	26,000	C	1,360	C	713	C
Southbound, South of Causeway Blvd	6	50	39,000	C	1,043	C	2,358	C
Northbound, South of Causeway Blvd	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 2-21 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 Blvd	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

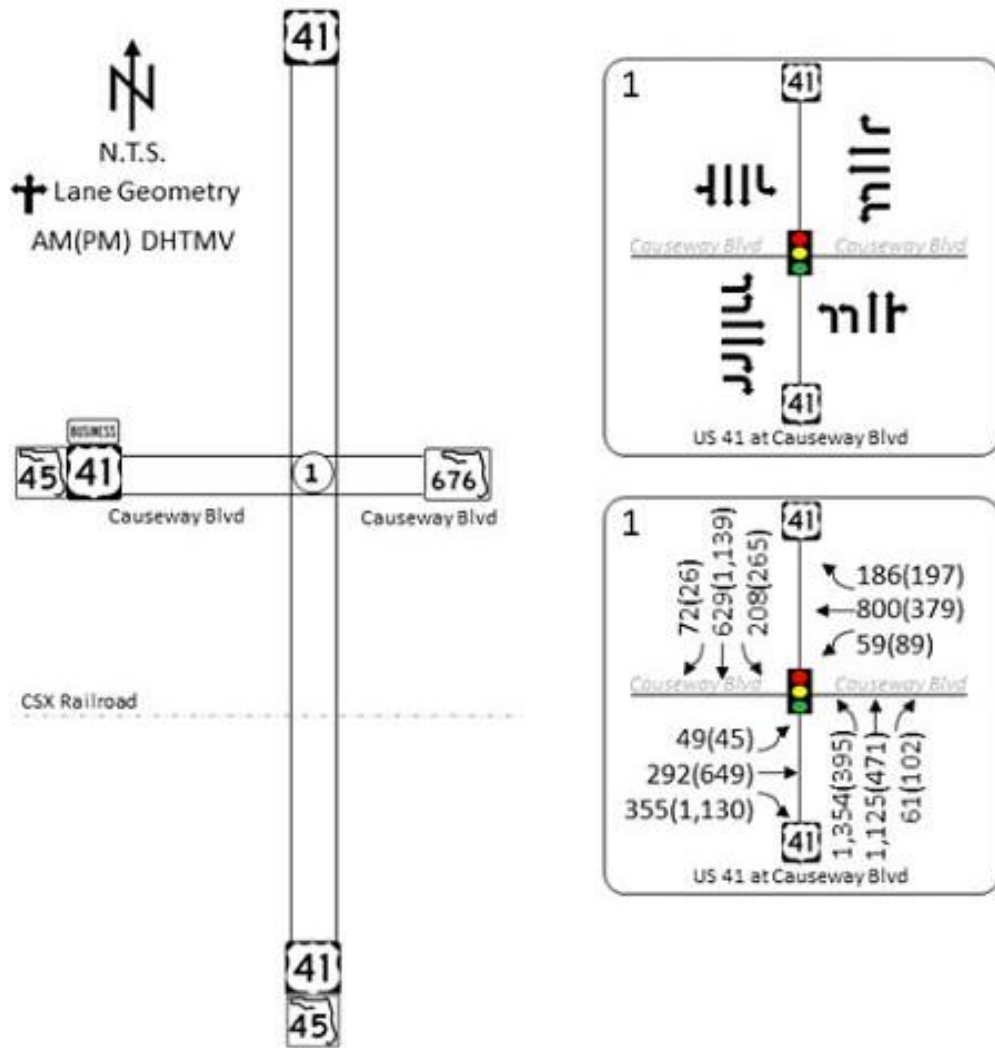


Figure 2-8 Existing Lane Configurations and DHTMV

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.

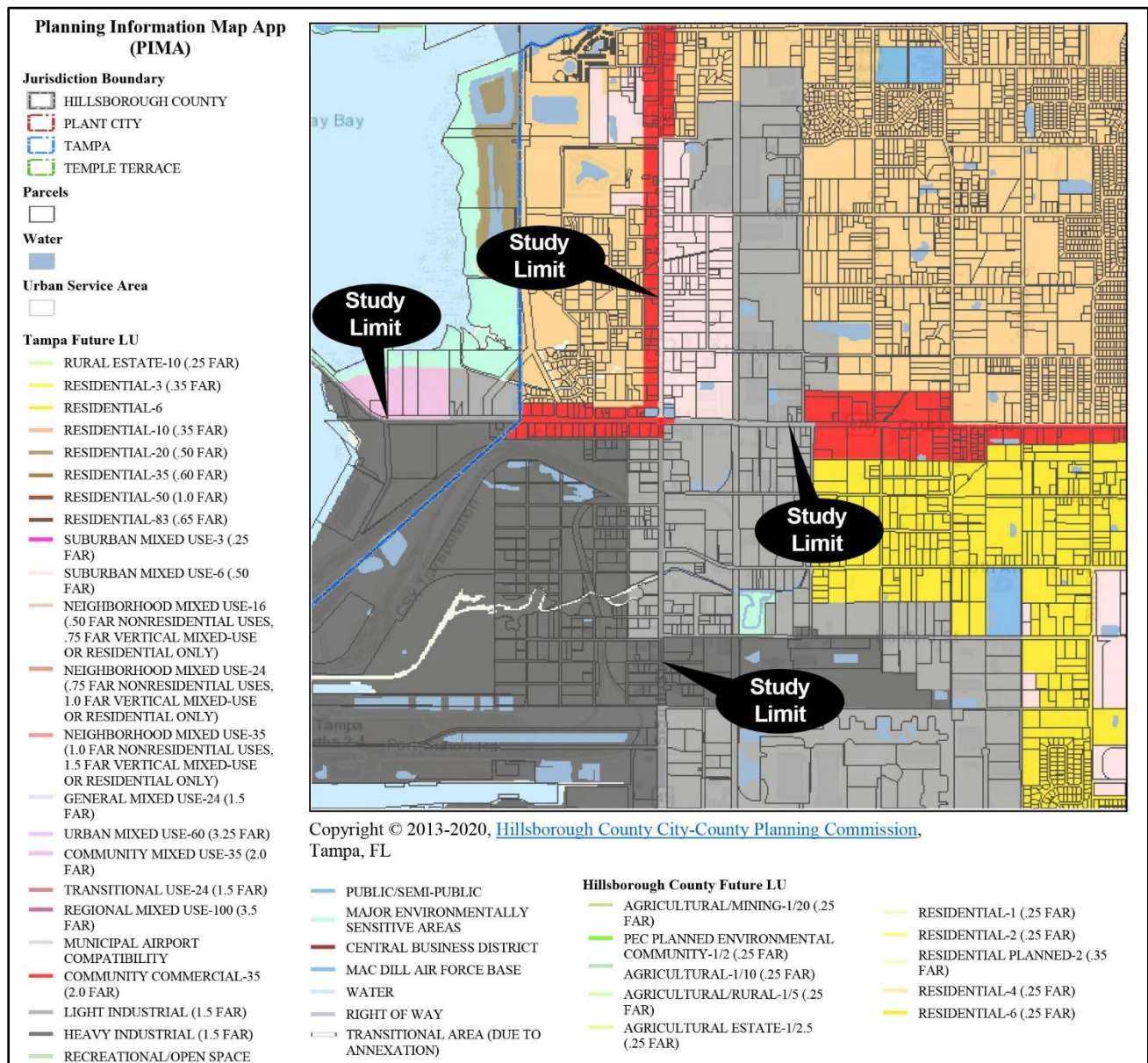


Figure 3-1 Future Land Use Map

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						
	a. Sag	96	96	64	49	Table 210.10.3	Table 211.9.2
	b. Crest	136	136	70	47		
3	Minimum Vertical Curve Lengths						
	a. Sag	200 ft	200 ft	120 ft	105 ft	Table 210.10.4	Table 211.9.3
	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						
	a. Downgrade (ft) (<2% / 6%)	(425' / 474')	(425' / 474')	(305' / 333')	(250' / 271')	Table 210.11.1	Table 211.10.2
	b. Upgrade (ft) (<2% / 6%)	(425' / 388')	(425' / 388')	(305' / 278')	(250' / 229')		

Table 4-2 Causeway Blvd Design Criteria

	Causeway Blvd. 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 Blvd. 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%	

	Causeway Blvd. Horizontal Geometry	Interchange	West of US 41	2022 FDM
	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

	Causeway Blvd. Vertical Geometry	Interchange	West of US 41	2022 FDM
	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			
	a. Sag	96	96	Table 210.10.3
	b. Crest	136	136	
4	Minimum Vertical Curve Lengths			
	a. Sag	125	125	Table 210.10.4
	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			
	a. Downgrade (<i>ft</i>) (<2% / 6%)	(360 / 400)	(360 / 400)	Table 210.11.1
	b. Upgrade (<i>ft</i>) (<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 (SR 676) from SR 60 to US 301, in Hillsborough County, Florida. The previous study evaluated anticipated conditions for a 2015 design year. The FONSI documented the 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 5-1**. 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 can also be referred to as a Single Point Urban Interchange (SPUI). 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 5-3** 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 right-of-way constraints.

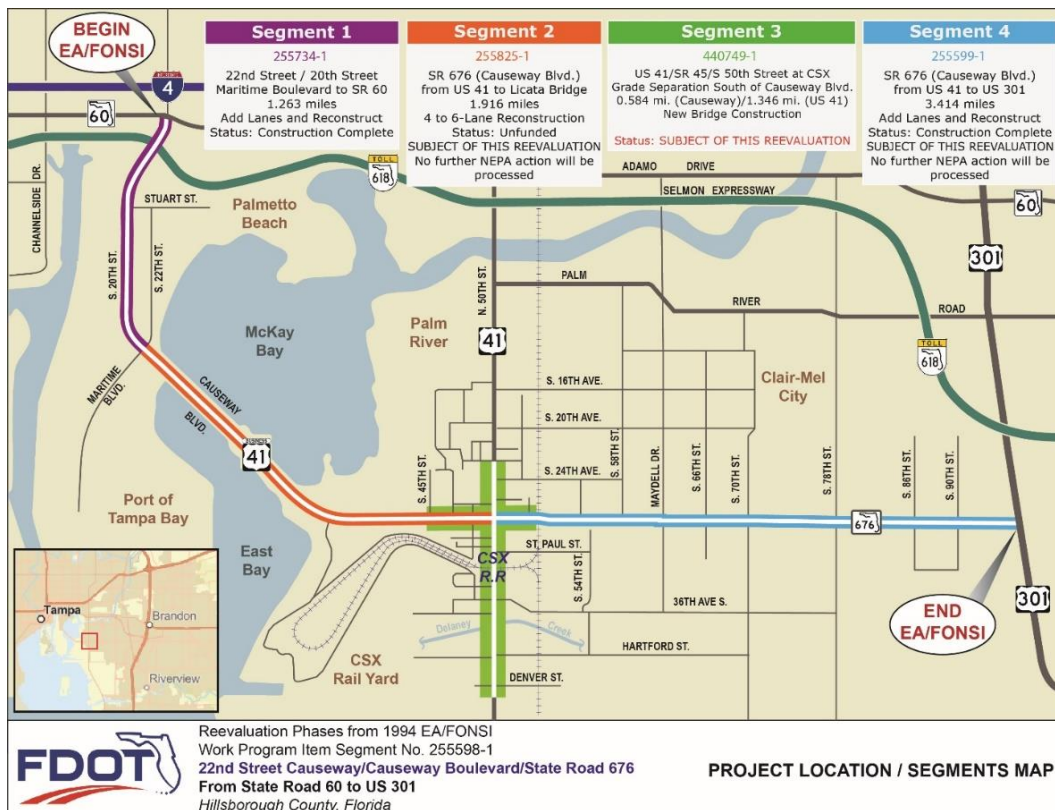


Figure 5-1 Previous EA/FONSI and Current PD&E Study Limits

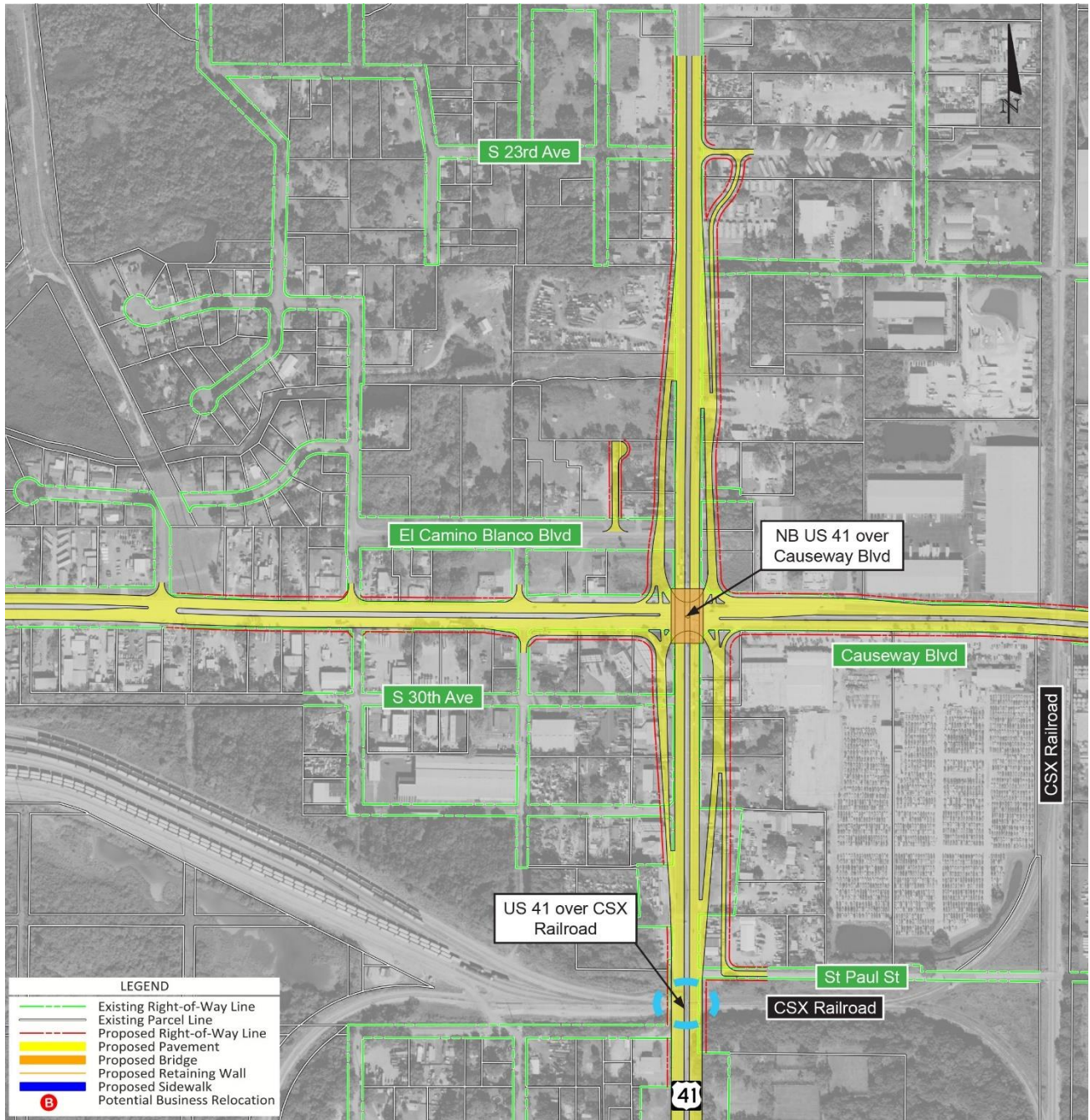


Figure 5-2 Previous EA/FONSI Preferred Alternative

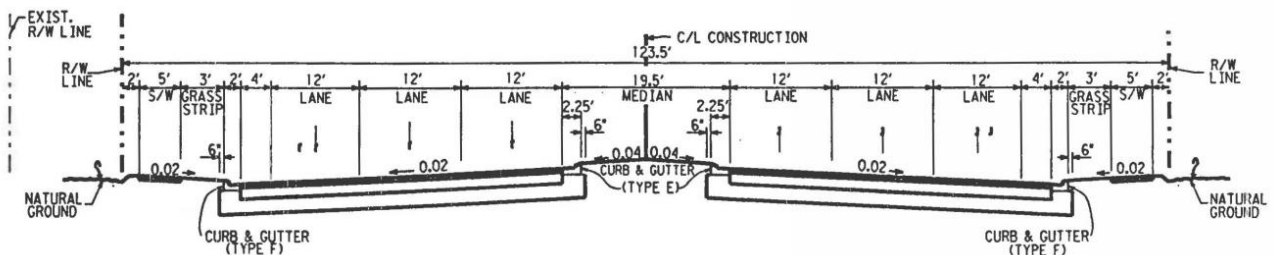


Figure 5-3 Previous EA/FONSI Typical Section

5.2 NO-BUILD ALTERNATIVE

Based on the previous PD&E Study selecting a build alternative as the Preferred Alternative, this reevaluation does not consider the No-Build as a potential alternative.

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. These strategies are designed to modify travel behavior and increase system efficiency without costly infrastructure improvements. TSM&O strategies are implemented when one or more of the following occurs:

- Insufficient funds available to meet system improvement needs;
- Increased construction costs for new roadways and transit facilities;
- Increased need to improve operational efficiency; and/or
- Changes in travel patterns.

TSM&O options generally include traffic signal and intersection improvements, intelligent transportation systems, access management, and transit improvements. 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 5-4** illustrates the Railroad Crossing Agreement boundary identified in the *Right-of-Way 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 5-4** 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.

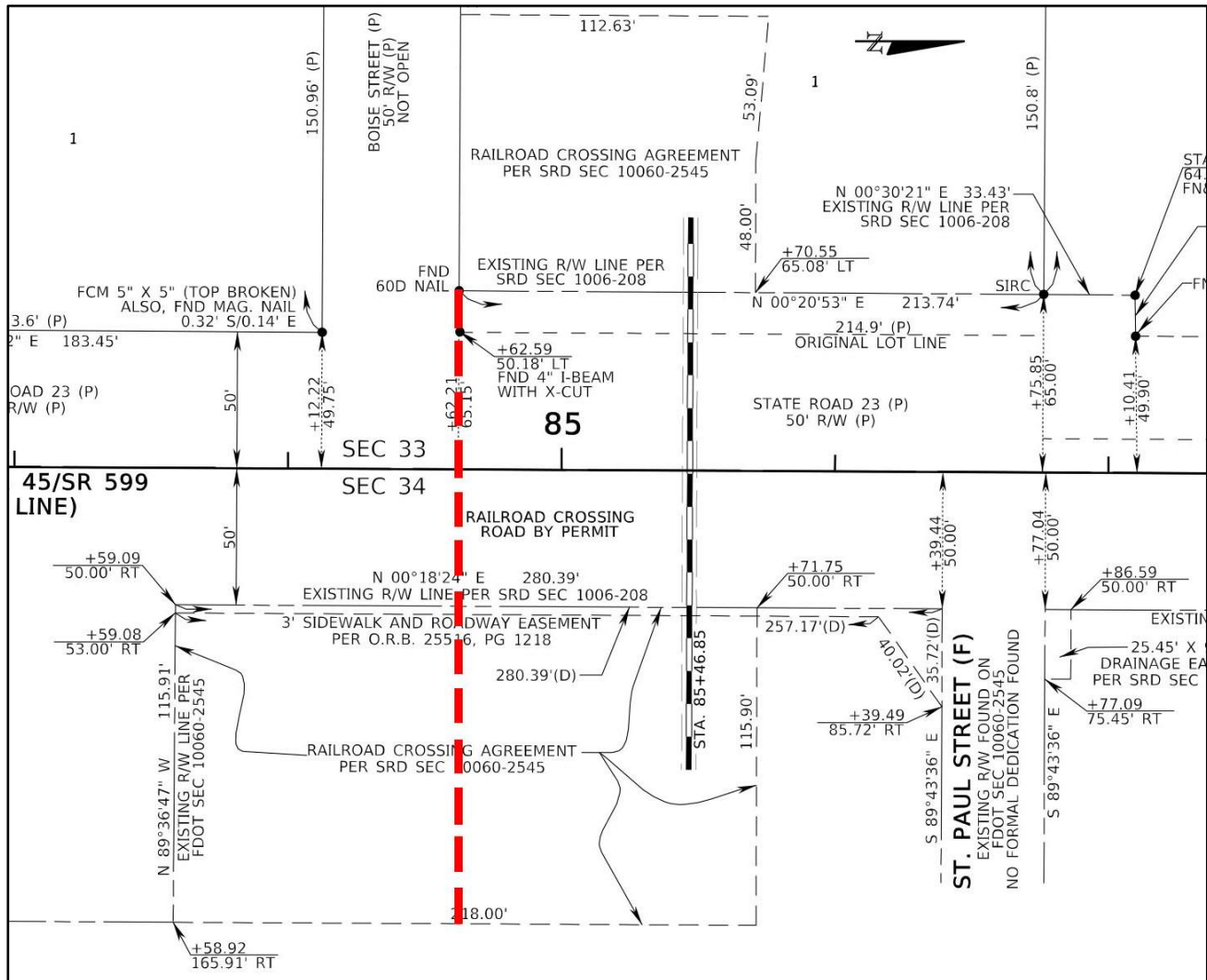


Figure 5-4 Railroad Crossing Agreement Limits

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 proposed limits of the concrete vary for each build alternative as shown in **Appendix A**. 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 and are illustrated on the concept plans in **Appendix A**.

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 wide walks 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-wide walks, and curb and gutter on both sides. **Figure 5-5** illustrates the US 41 typical section south of the frontage roads. The 10-foot-wide walks 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 wide walk or to change to the sidewalk or bicycle lane. The design speed for this typical section is 50 miles per hour (mph).

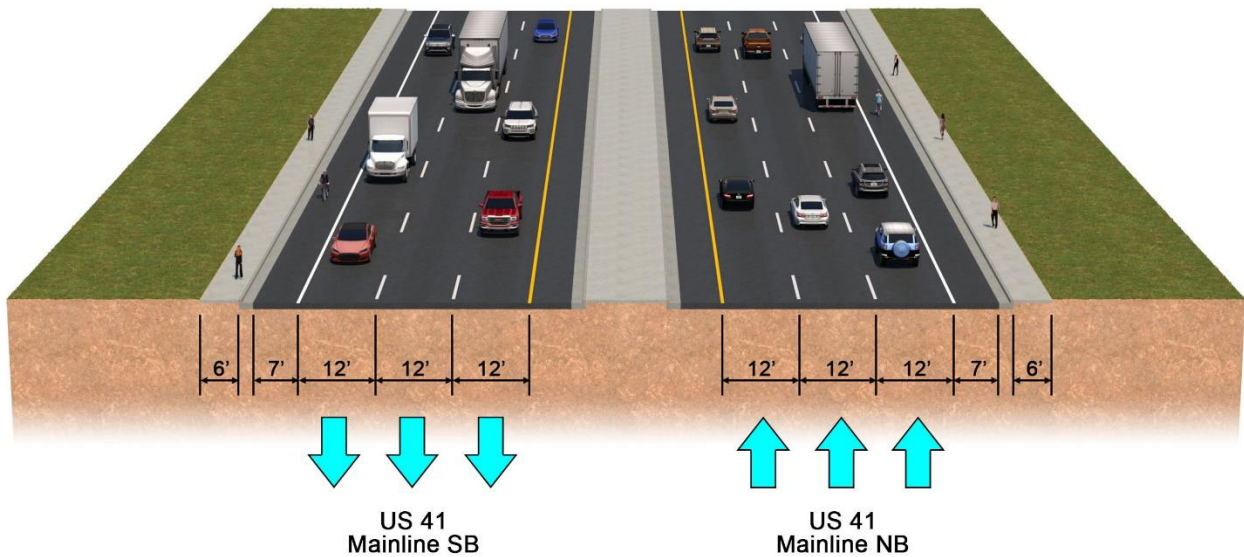


Figure 5-5 US 41 Typical Section south of Frontage Roads

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 5-6** illustrates the US 41 typical section north of Causeway Boulevard. The design speed for this typical section is 50 mph.

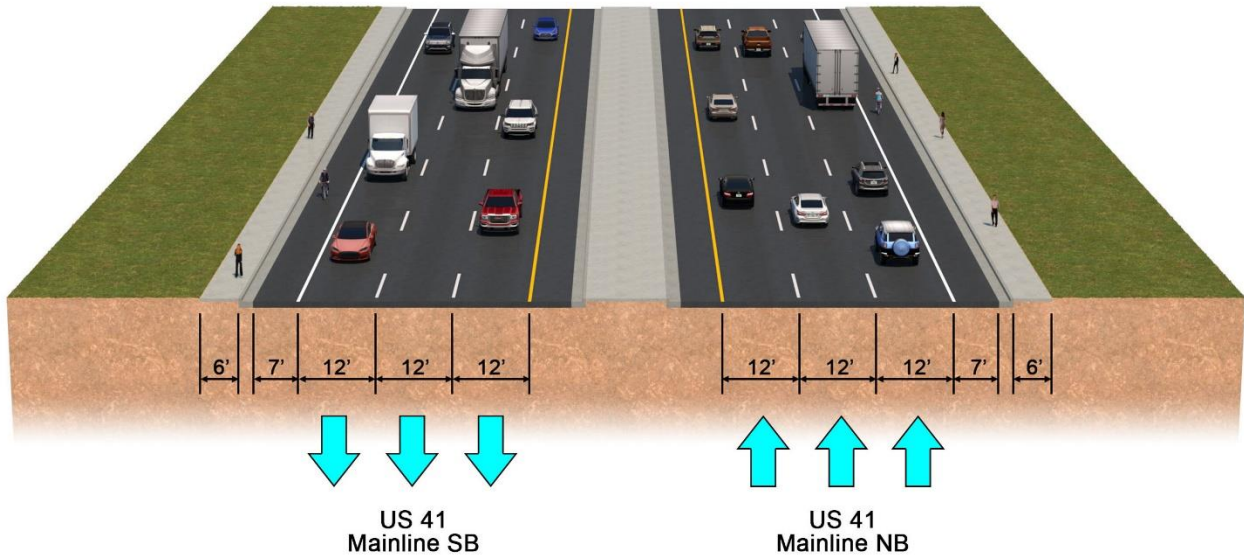


Figure 5-6 US 41 Typical Section north of Causeway Blvd

5.4.2.2 Frontage Road

The frontage road typical section consists of two 15-foot travel lanes (one in each direction), 10-foot-wide walk, 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 cyclists are accommodated on the wide walks. The design speed for this typical section is 35 mph. **Figure 5-7** illustrates the frontage road typical section.

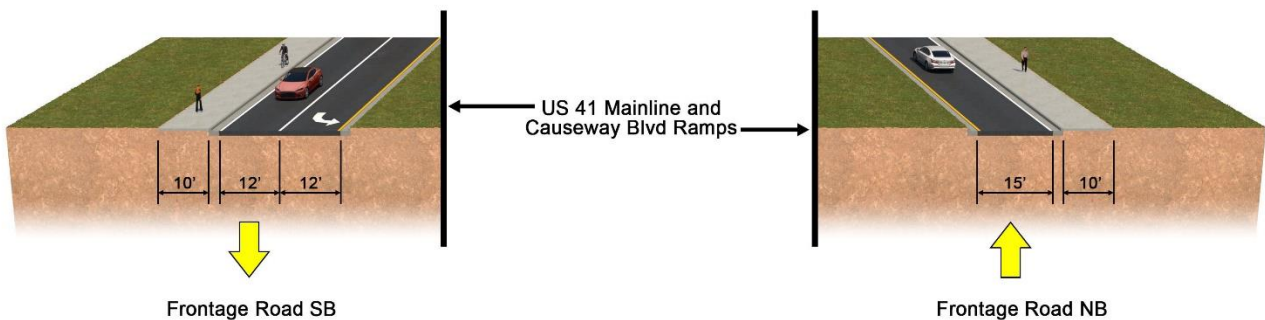


Figure 5-7 Frontage Road Typical Section

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 5-8** illustrates the Causeway Boulevard typical section. The design speed for this typical section is 45 mph.

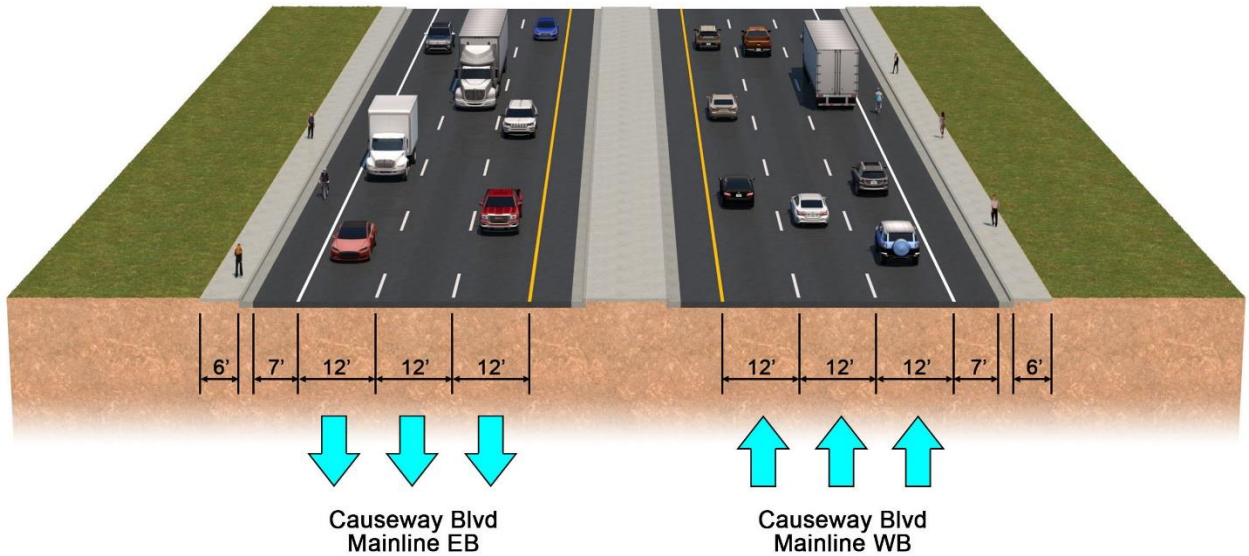


Figure 5-8 Causeway Blvd Typical Section

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 5-9**. At US 41 and Causeway Boulevard, a triple right turn is used to service the heavy PM eastbound right turn volume.

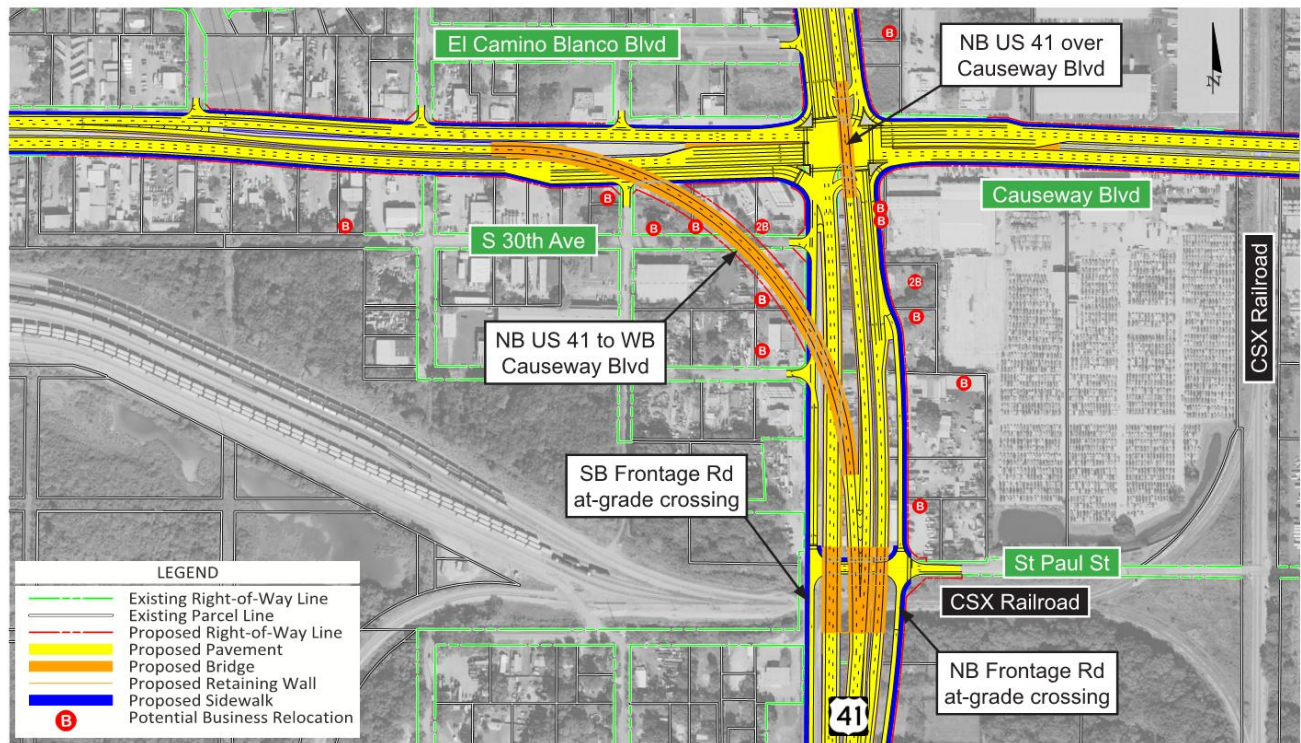


Figure 5-9 Build Alternative 1 (Flyover)

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 S 36th Avenue, 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.

The US 41 section shown in **Figure 5-10** 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 5-11** 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 5-12** illustrates the Causeway Boulevard section with the flyover ramp east of S 47th Street.

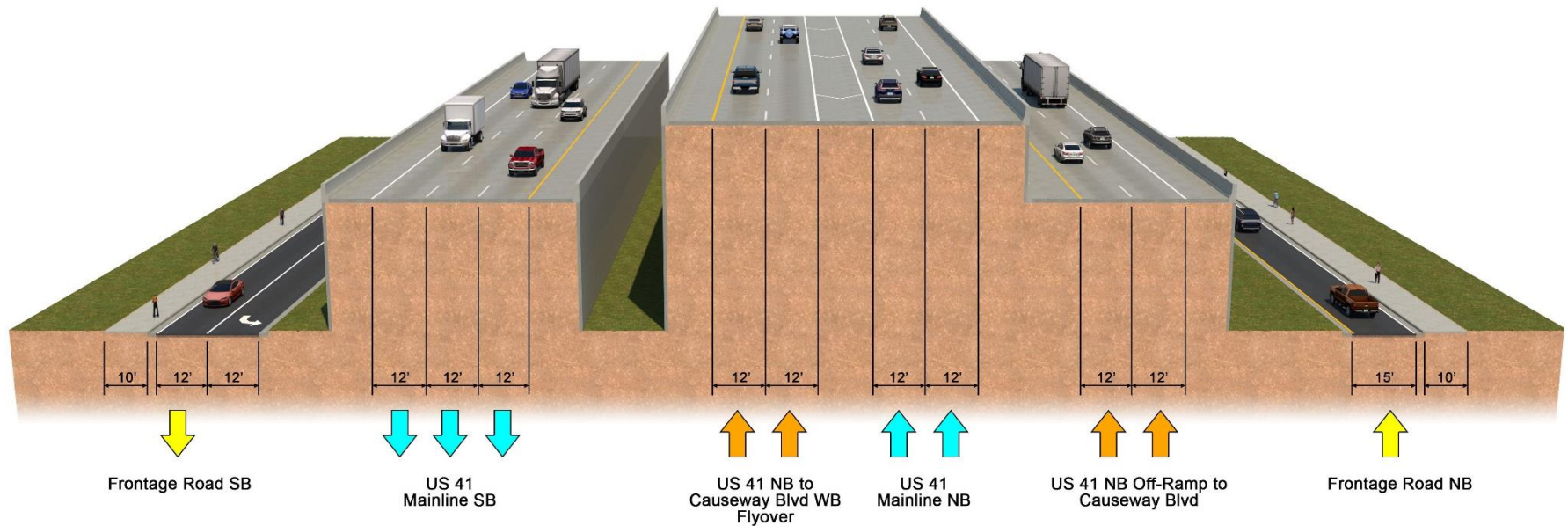


Figure 5-10 Alt 1 Section of US 41 North of CSX Railroad

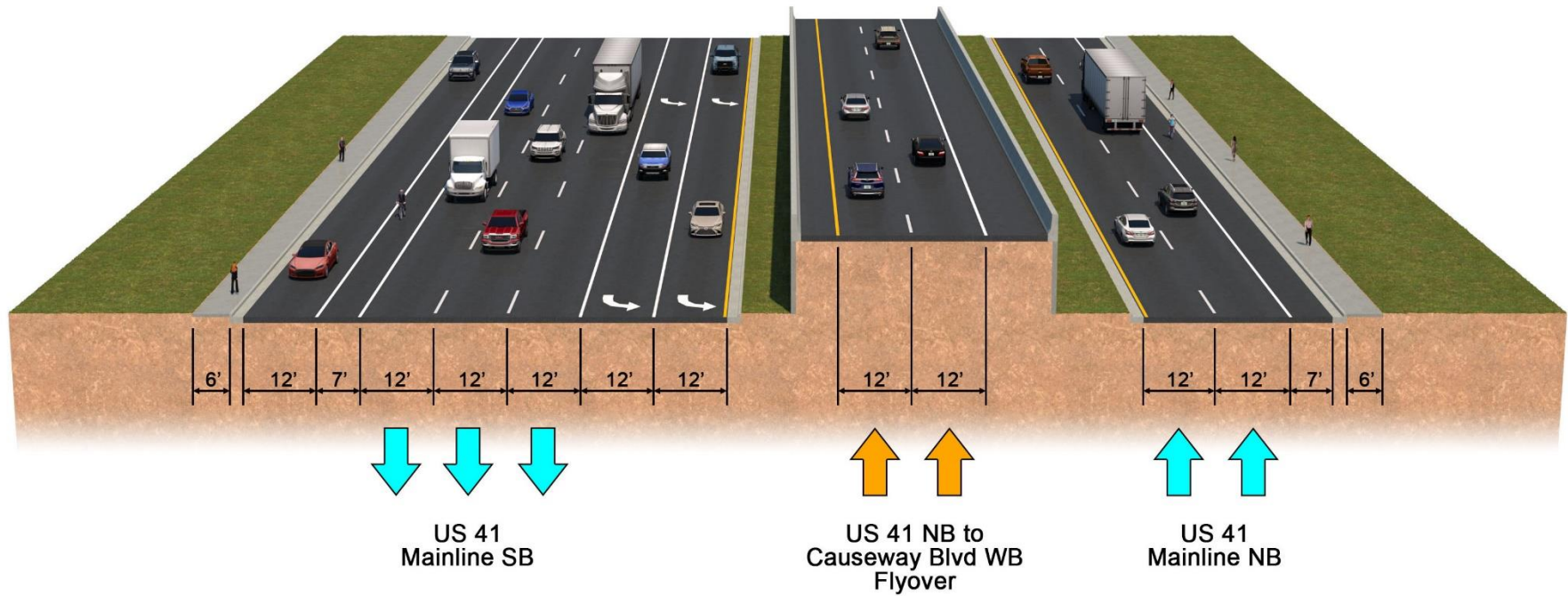


Figure 5-11 Alt 1 Section of US 41 North of Causeway Blvd

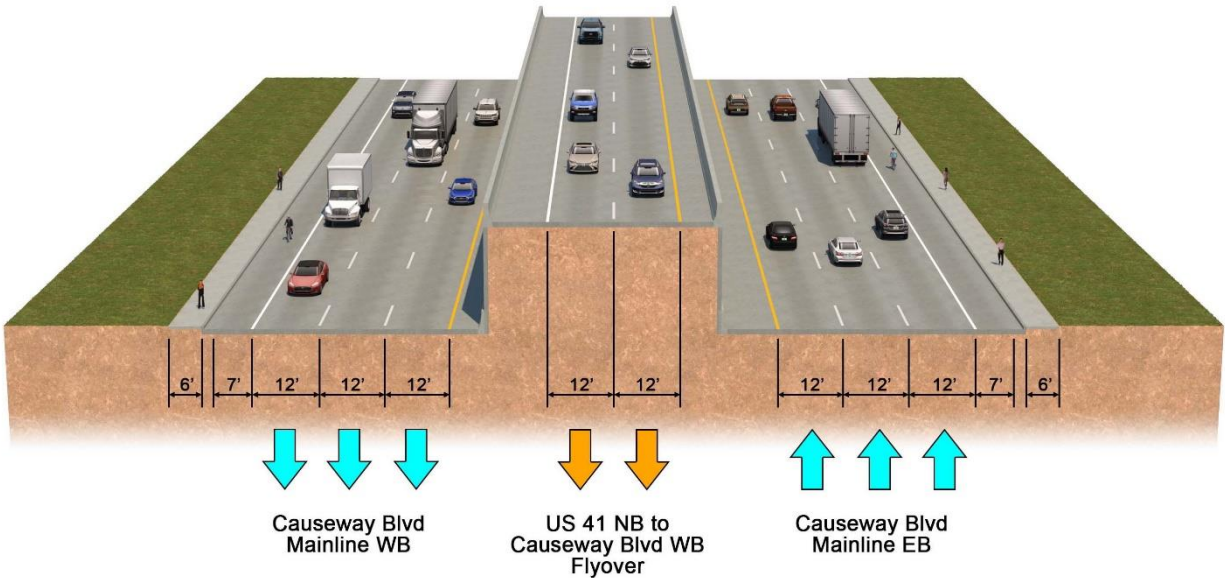


Figure 5-12 Alt 1 Causeway Blvd East of S 47th St

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 5-13** 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" wide walk 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 wide walk, 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" wide walk. Standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the wide walk 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 begin and end of bridges. **Table 5-1** contains the structure spans, lengths, and depths of all the structures in Alternative 1.

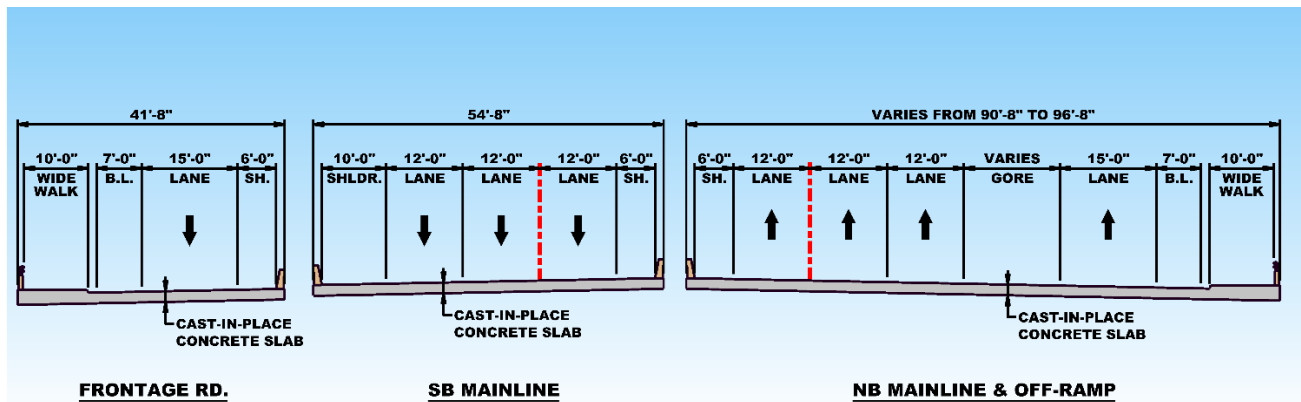


Figure 5-13 US 41 Bridges over Delany Creek

5.4.3.1.2 Structures over CSX Railroad

Alternative 1 consists of three proposed bridges shown in **Figure 5-14** 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 right-of-way 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 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.

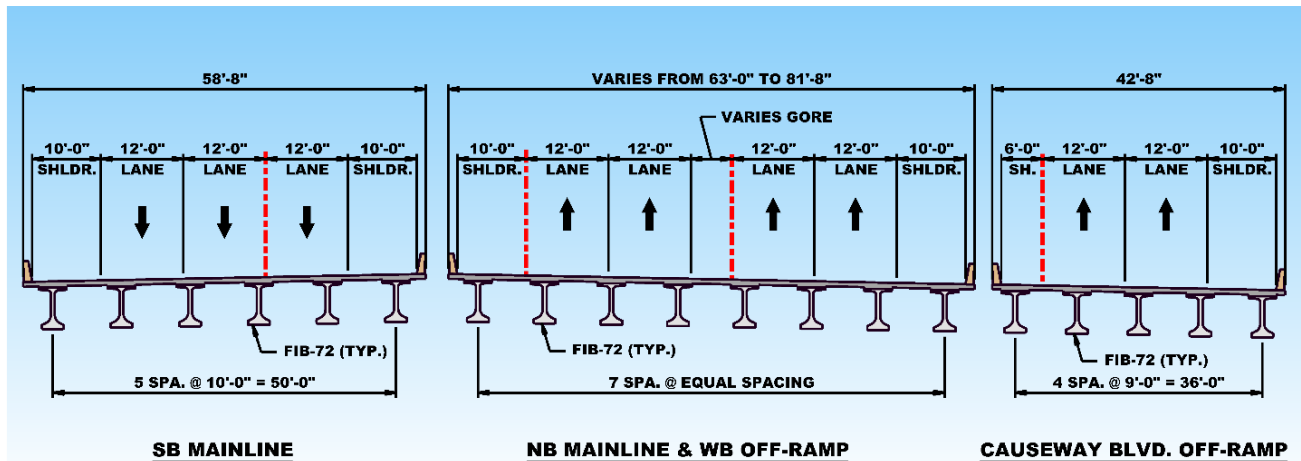


Figure 5-14 US 41 Bridges over CSX Railroad

5.4.3.1.3 Northbound to Westbound Flyover Structure

Alternative 1 consists of a flyover shown in Figure 5-15 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 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.

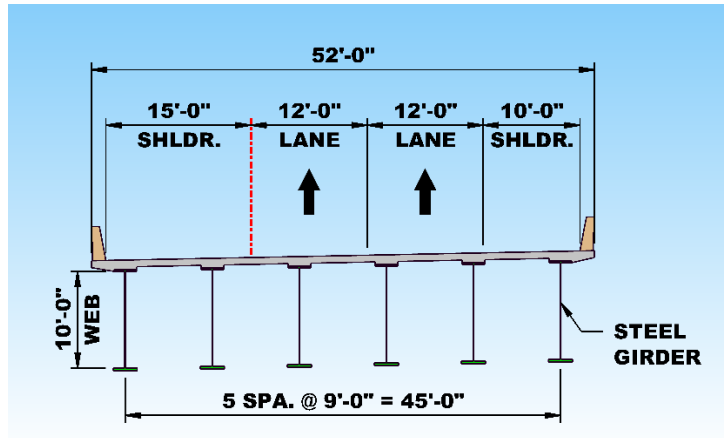


Figure 5-15 US 41 NB to Causeway Blvd WB Flyover Bridge

5.4.3.1.4 Northbound Structure over Causeway Boulevard

Alternative 1 consists of an overpass shown in Figure 5-16 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.

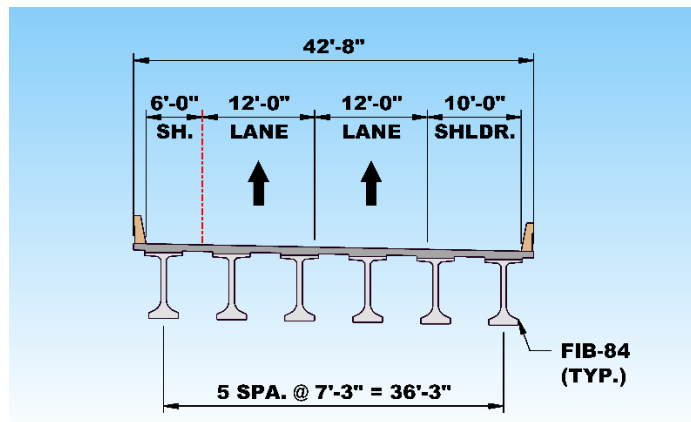


Figure 5-16 US 41 NB Bridge over Causeway Blvd

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 Blvd 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 Blvd	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.

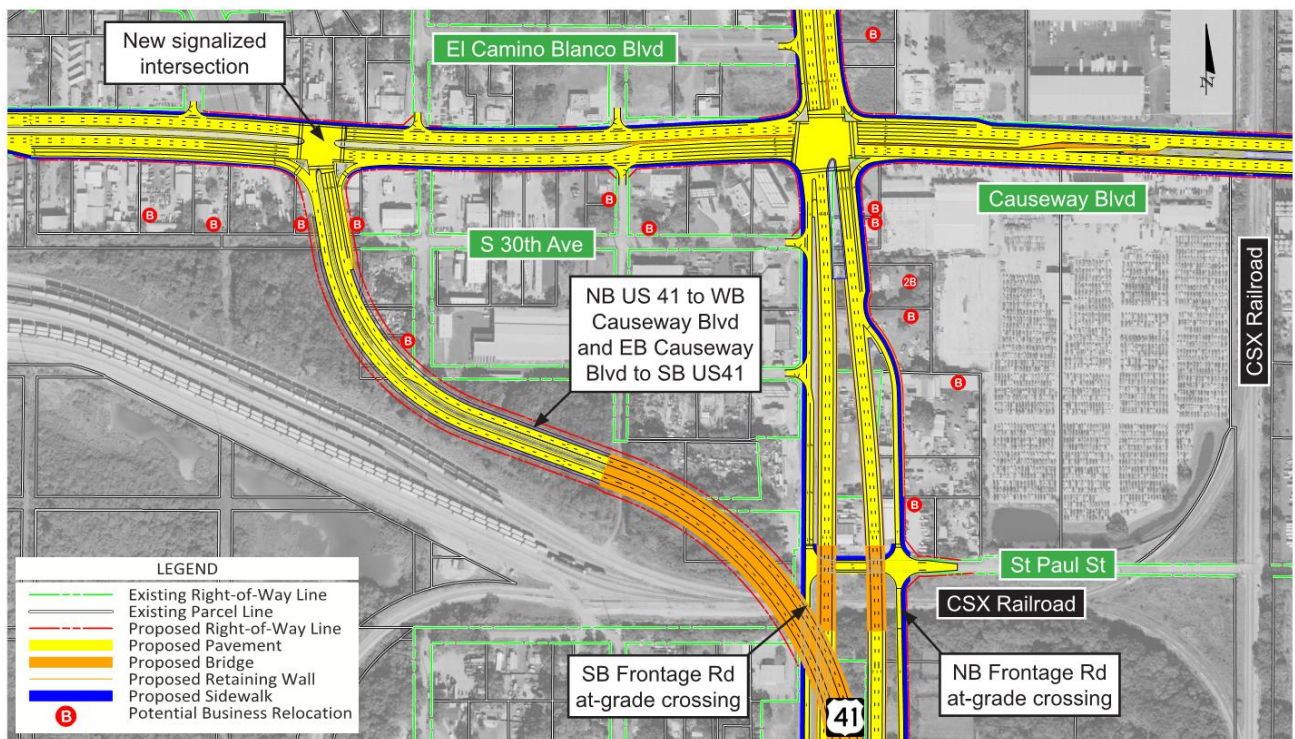


Figure 5-17 Build Alternative 2 (Quadrant)

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 S 36th Avenue, 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 5-18** 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 5-19** illustrates the US 41 section north of Causeway Boulevard with the southbound dual left-turn and right-turn lanes approaching Causeway Boulevard.

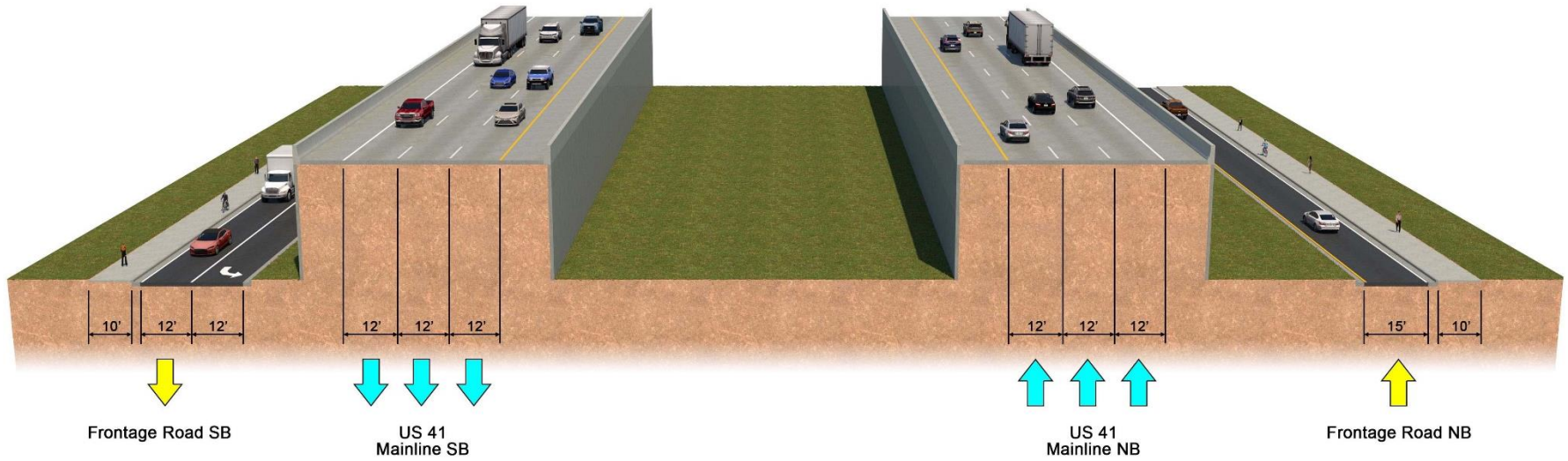


Figure 5-18 Alt 2 Section of US 41 North of CSX Railroad

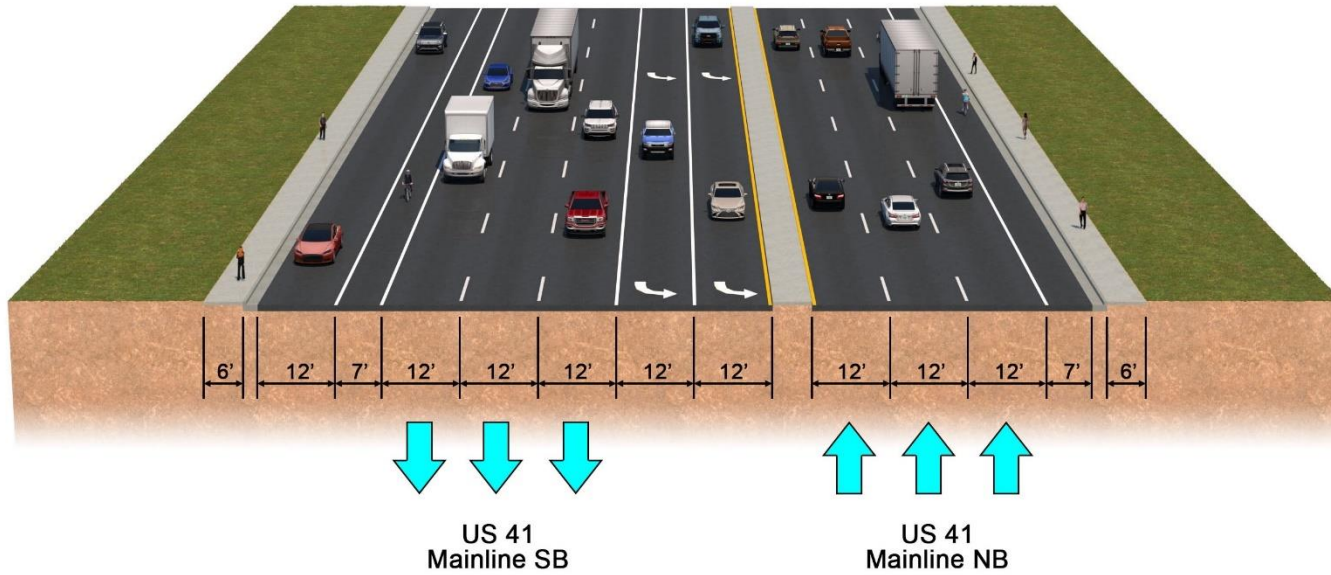


Figure 5-19 Alt 2 Section of US 41 North of Causeway Blvd

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 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 5-20** 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" wide walk 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 wide walk 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" wide walk 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 wide walk 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 begin 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.

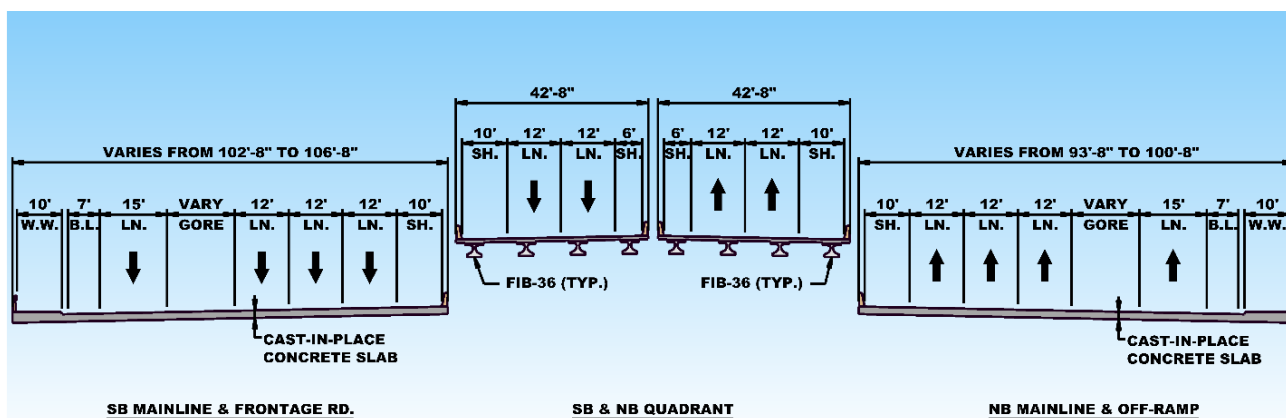


Figure 5-20 US 41 Bridges over Delaney Creek

5.4.4.1.2 Structures over CSX Railroad

Alternative 2 consists of three proposed bridges shown in **Figure 5-21** 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 section for both the northbound and southbound mainline bridges 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 southern abutment location for the two mainline structures is governed by an assumed CSX right-of-way 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 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.

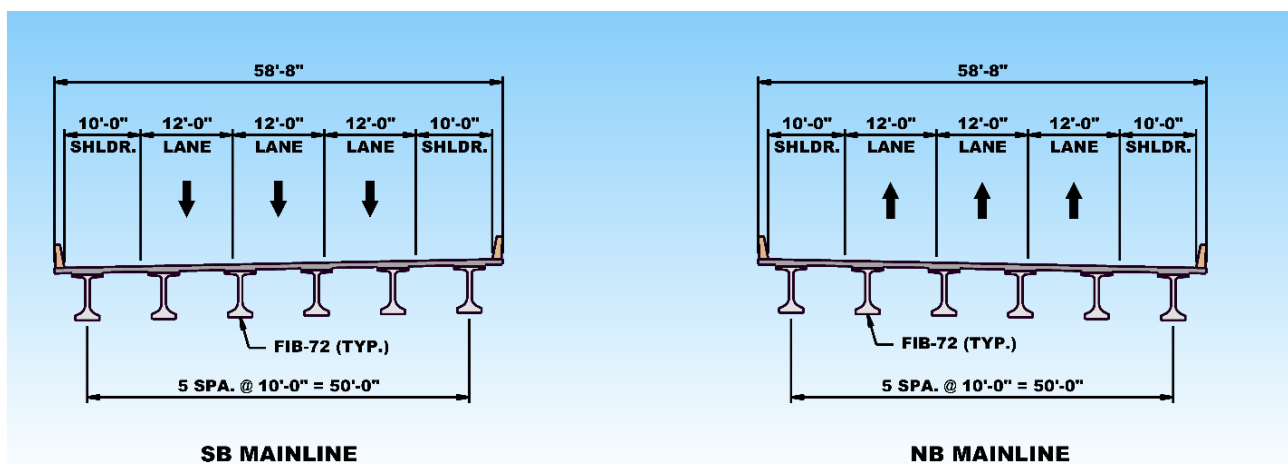


Figure 5-21 US 41 Bridge over CSX Railroad

5.4.4.1.3 Quadrant Structure

Alternative 2 proposes a flyover shown in **Figure 5-22** 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 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.

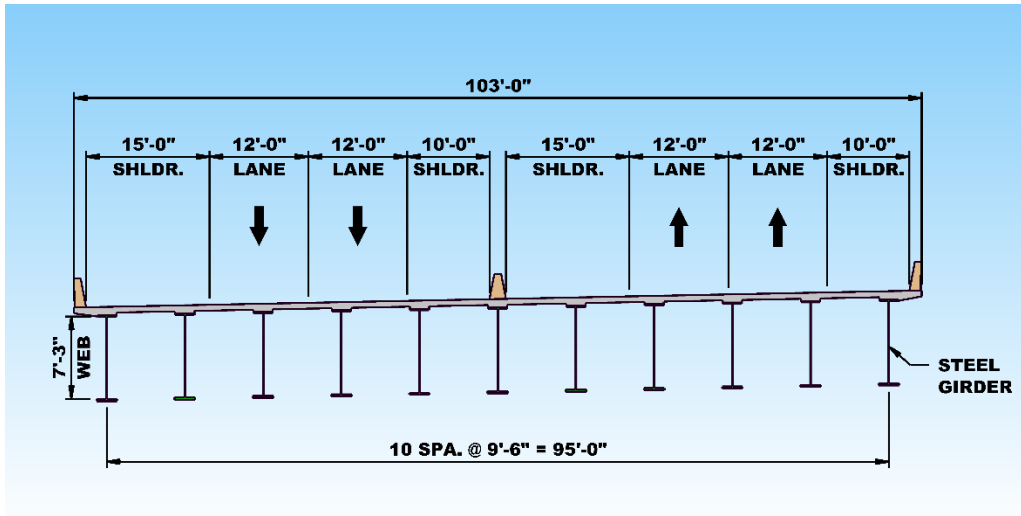


Figure 5-22 Quadrant Roadway Bridge

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 Blvd 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.

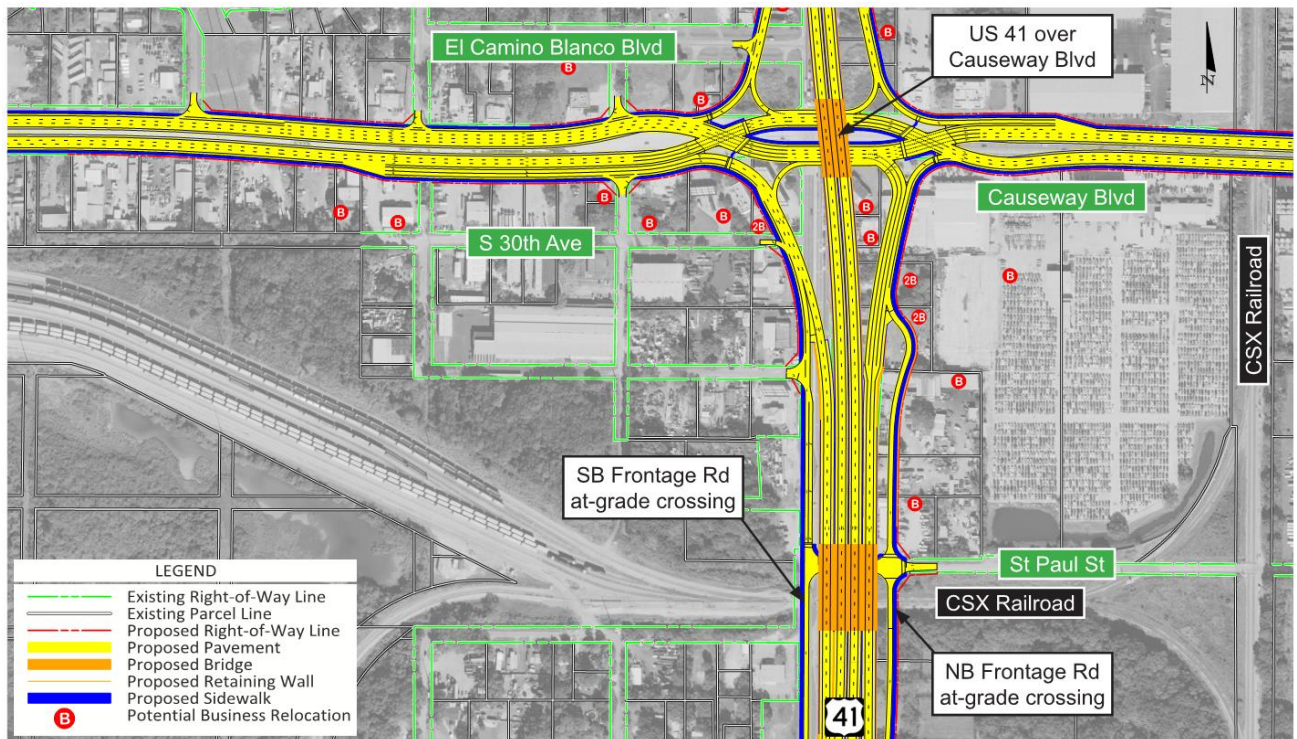


Figure 5-23 Build Alternative 3 (DDI)

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 S 36th Avenue, 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 5-24** is north of the structures that goes over CSX Railroad, St Paul Street, and the ammonia pipeline. **Figure 5-25** illustrates the US 41 section north of Causeway Boulevard within the diverging diamond interchange where both the northbound and southbound ramps are two lanes.

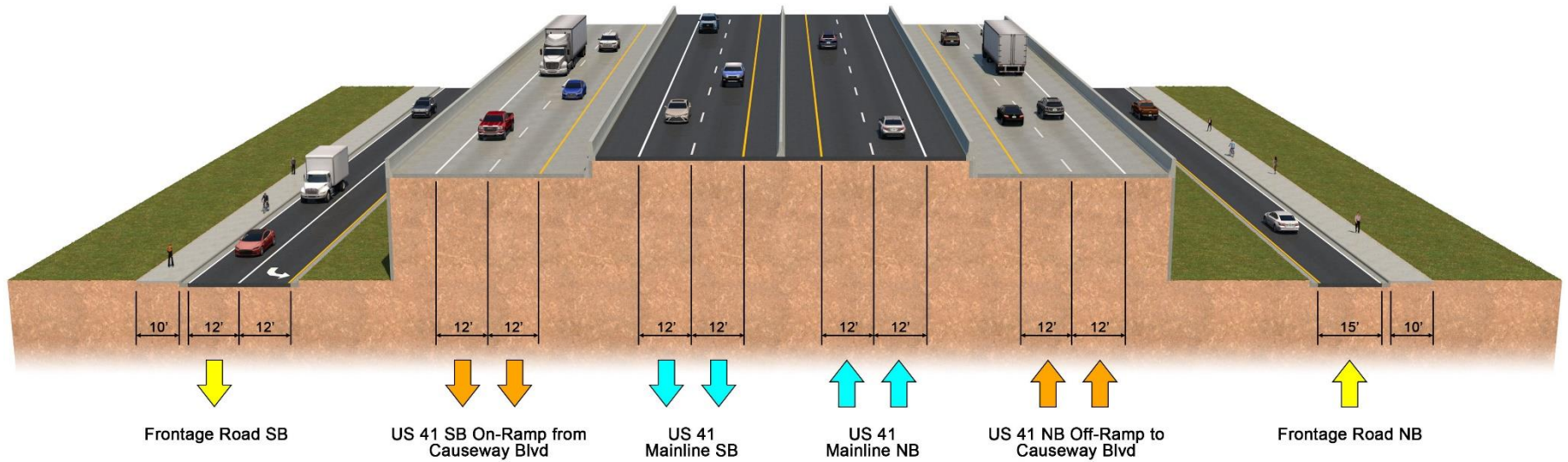


Figure 5-24 Alt 3 Section of US 41 North of CSX Railroad

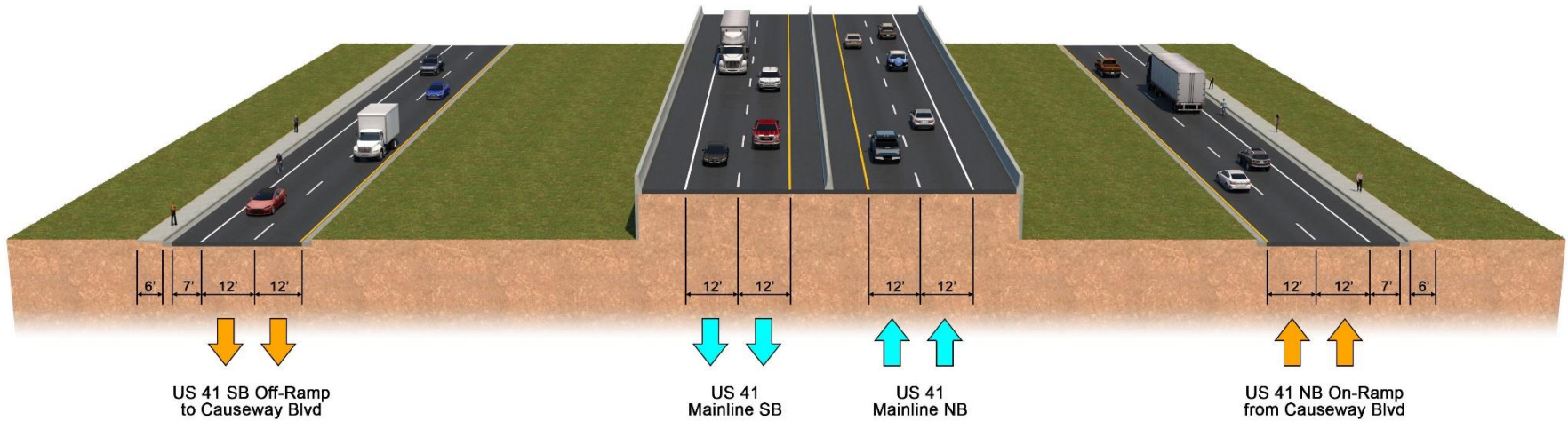


Figure 5-25 Alt 3 Section of US 41 North of Causeway Blvd

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 5-26** 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.

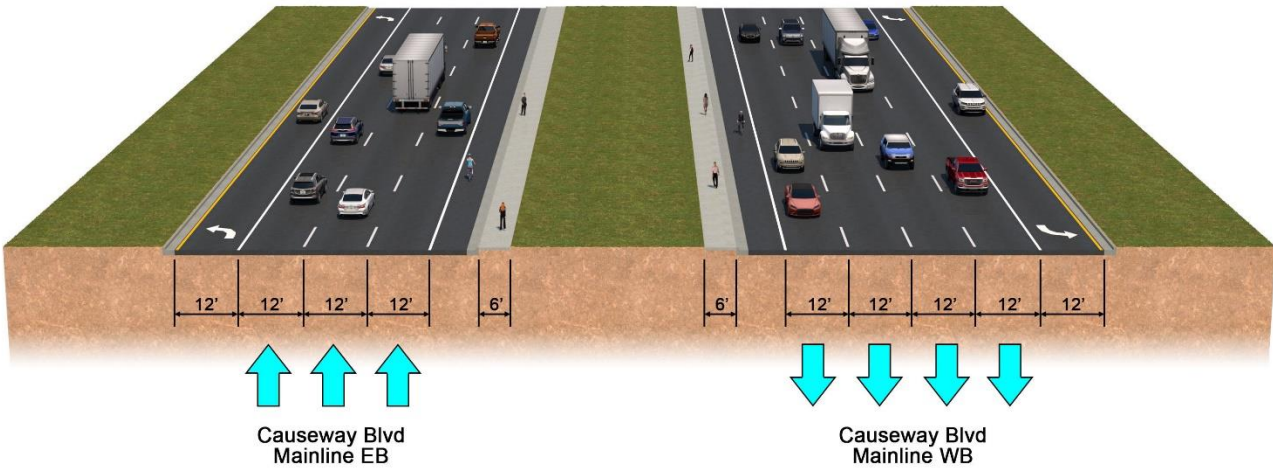


Figure 5-26 Alt 3 Section of Causeway Blvd West of US 41

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 5-27** 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" wide walk 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 wide walk 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" wide walk. Standard 36" single-slope traffic railing barrier is used

at the inside shoulder and a pedestrian concrete parapet is employed at the wide walk 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.

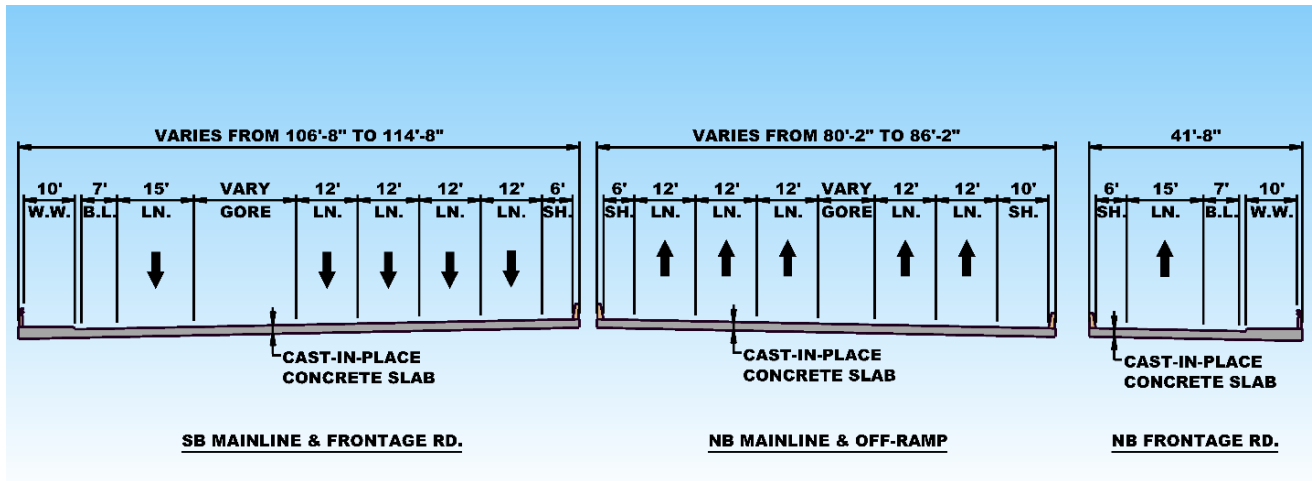


Figure 5-27 US 41 Bridges over Delaney Creek

5.4.5.1.2 Structures over CSX Railroad

Alternative 3 consists of three proposed bridges shown in **Figure 5-28** 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 Blvd 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 right-of-way 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 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.

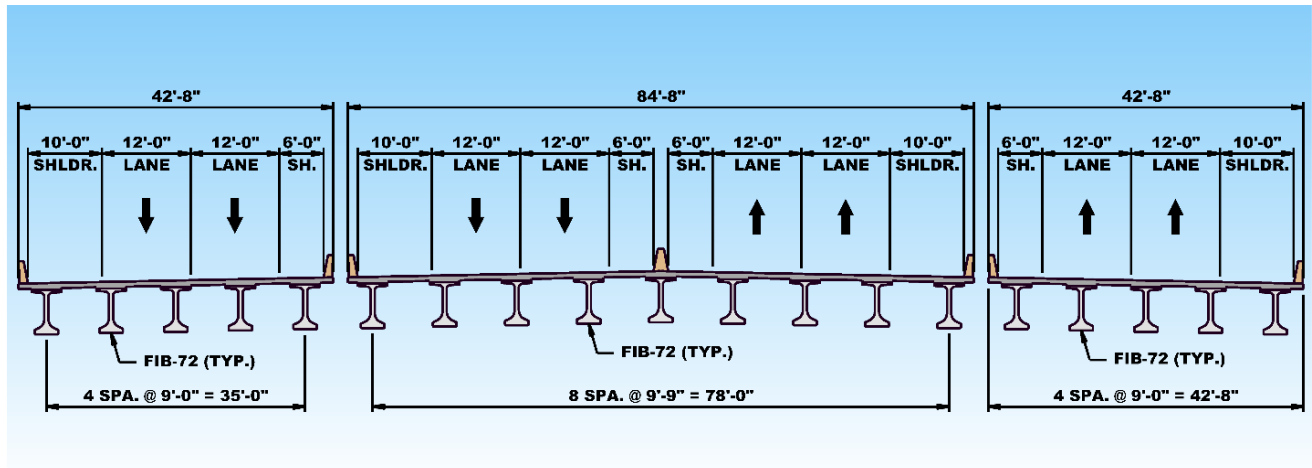


Figure 5-28 US 41 Bridge over CSX Railroad

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 5-29 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.

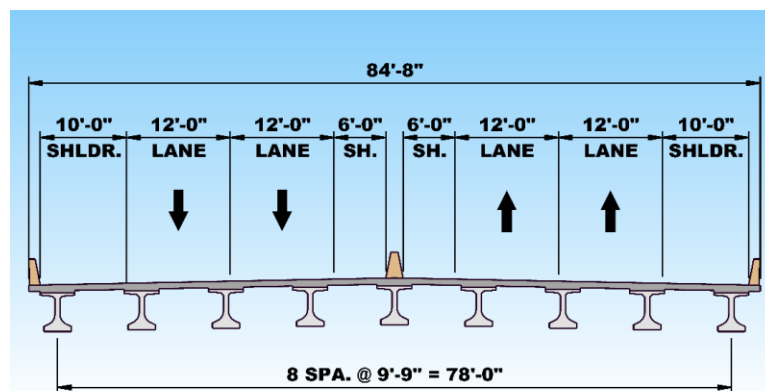


Figure 5-29 US 41 Bridge over Causeway Blvd

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 Blvd	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.

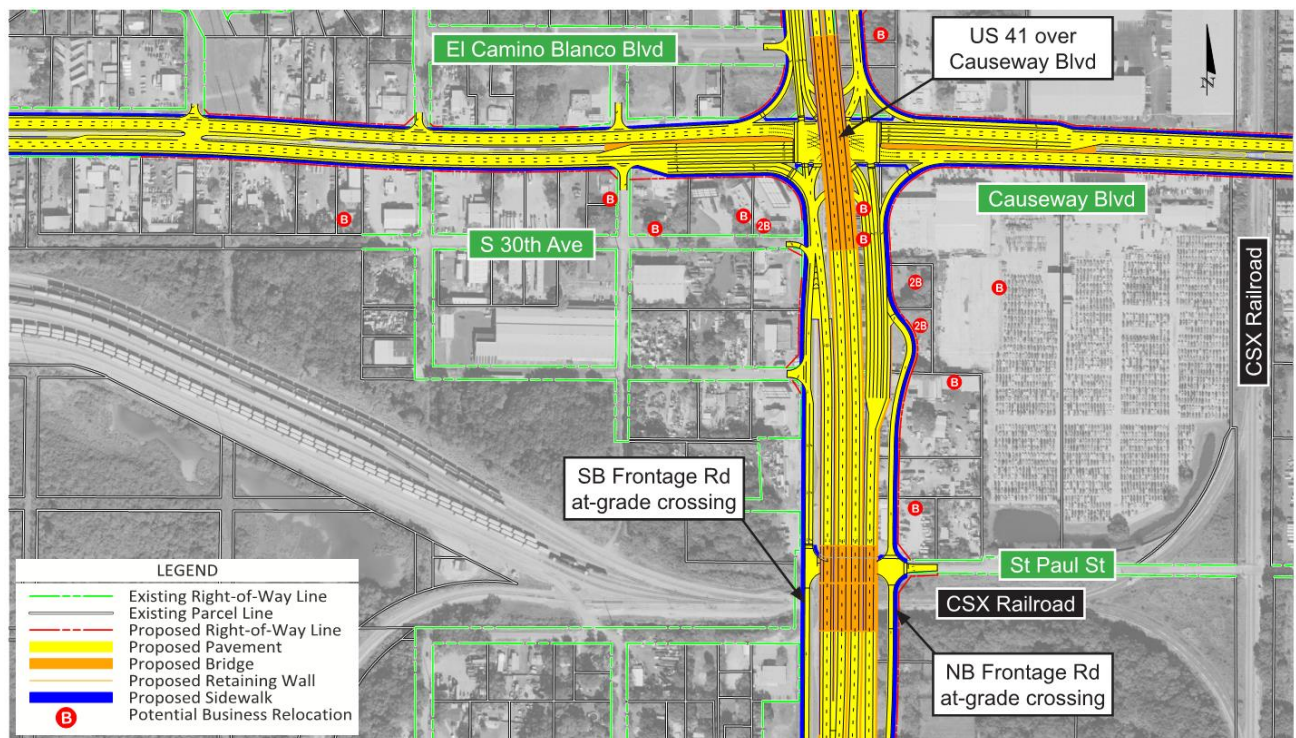


Figure 5-30 Build Alternative 4 (SPUI)

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 S 36th Avenue, 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 5-31** is north of the structures that goes over CSX Railroad, St Paul Street, and the ammonia pipeline. **Figure 5-32** 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.

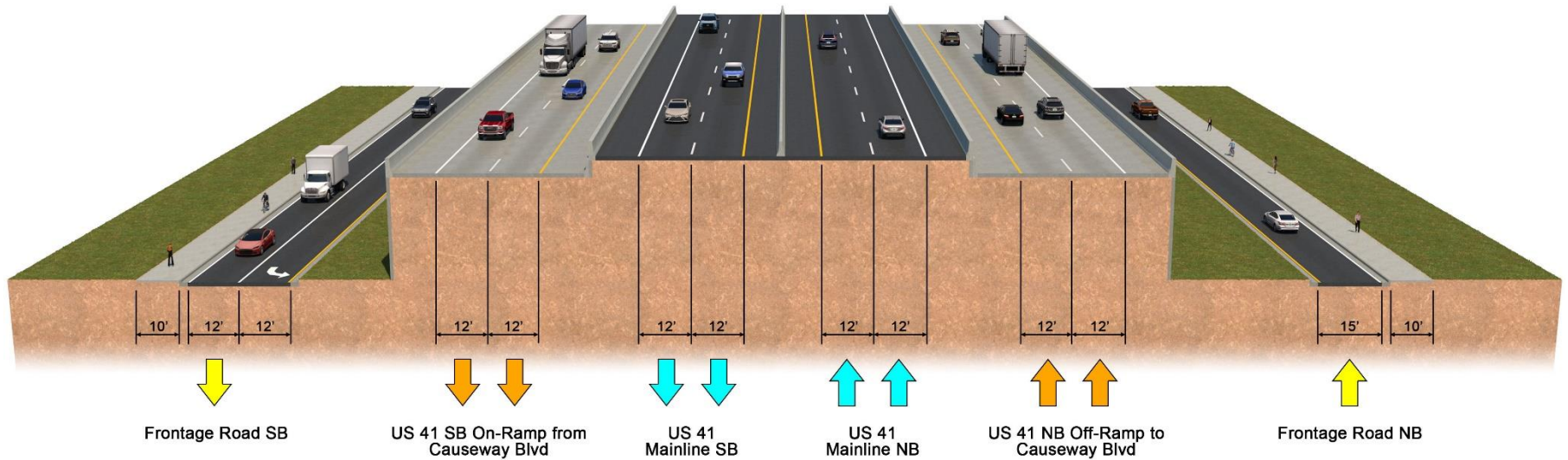


Figure 5-31 Alt 4 Section of US 41 North of CSX Railroad

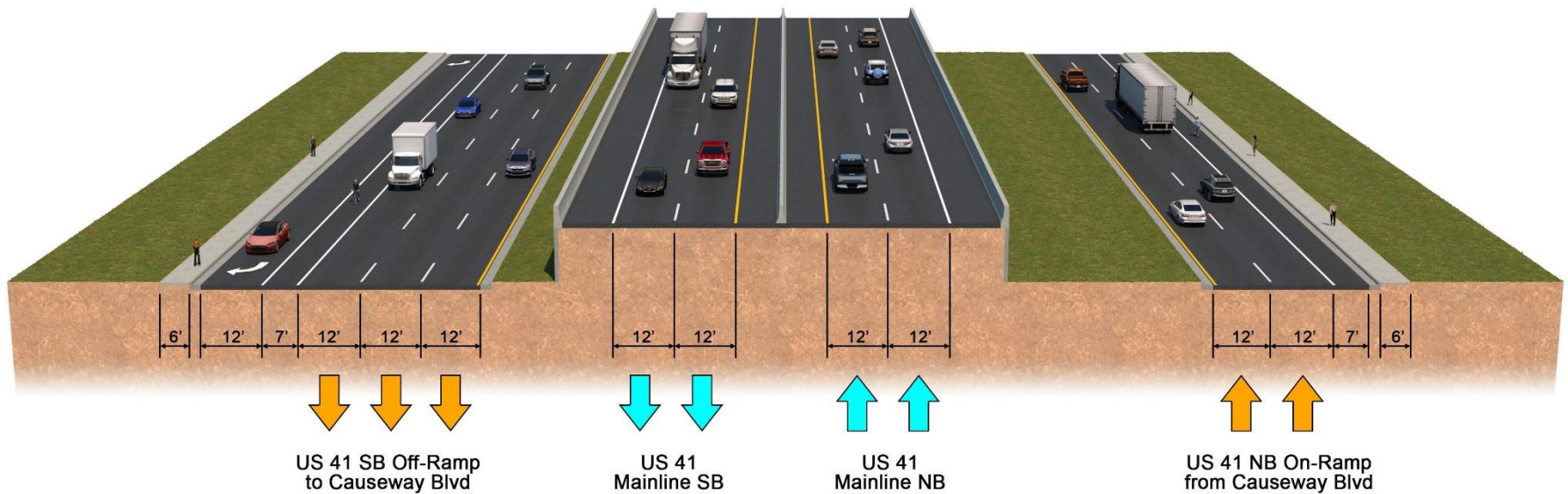


Figure 5-32 Alt 4 Section of US 41 North of Causeway Blvd

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 5-33** 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" wide walk 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 wide walk 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" wide walk. Standard 36" single-slope traffic railing barrier is used at the inside shoulder and a pedestrian concrete parapet is employed at the wide walk 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.

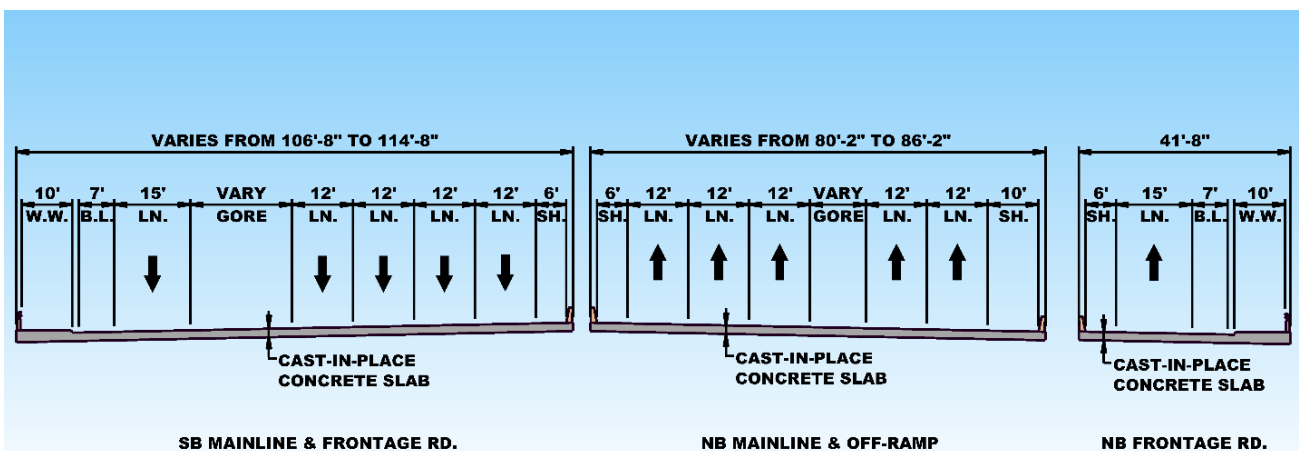


Figure 5-33 US 41 Bridges over Delaney Creek

5.4.6.1.2 Structures over CSX Railroad

Alternative 3 consists of three proposed bridges shown in **Figure 5-34** 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 right-of-way 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.

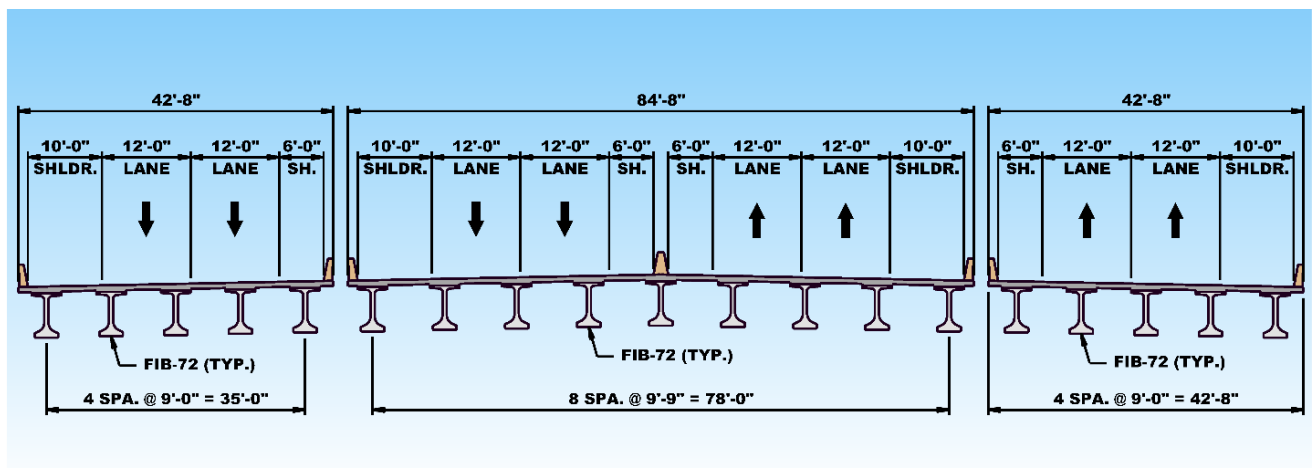


Figure 5-34 US 41 Bridge over CSX Railroad

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 5-35** 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.

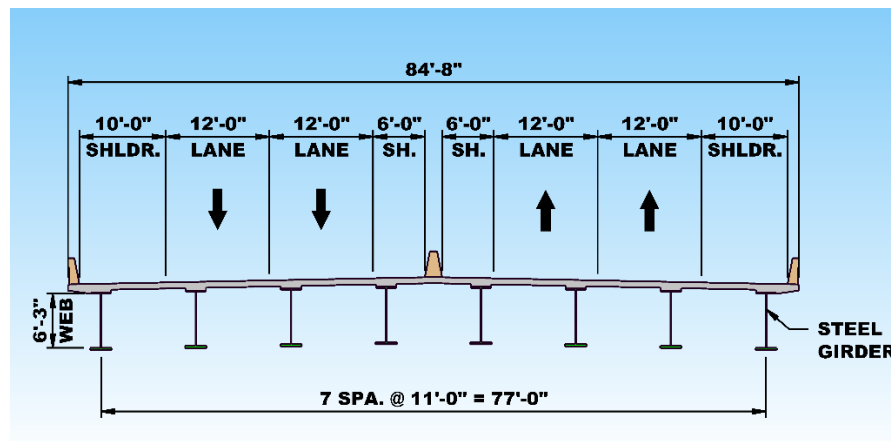


Figure 5-35 US 41 Bridge over Causeway Blvd

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 Blvd		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 on a number of 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 Right-of-Way (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 public comments received at the November 19, 2019 Public Workshop, 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**. Although comments of support were received for both Alternatives 1 and 2, there was no clear public preference expressed for any of the alternatives.

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 Blvd and enhancing the NB US 41 to WB Causeway Blvd and EB Causeway Blvd 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 Blvd intersection remains at-grade. The refined concept includes the following changes:

- US 41/Causeway Blvd intersection was changed to a conventional signalized intersection without flyovers to minimize costs and impacts.
- The Causeway Blvd alignment was shifted from the south side to the north side from S. 45th Street to US 41. This holds the existing southern ROW of Causeway Blvd west of US 41 thereby minimizing business impacts/relocations.
- The western project limit along Causeway Blvd was reduced approximately 0.43 miles to the east from the Rockport Terminal entry to S. 45th Avenue to reduce impacts.
- The existing US 41/El Camino Blanco Blvd intersection will be closed, with the eastern end of El Camino Blanco Blvd made into a cul-de-sac due to the proximity to the US 41/Causeway Blvd intersection.
- Sagasta Street between El Camino Blanco and Causeway Blvd will be closed to accommodate the proposed stormwater management ponds.
- A signal was added at the Causeway Blvd/S. 47th Ave intersection and a new portion of S. 47th Ave will be constructed south of Causeway Blvd utilizing existing county ROW to provide better access to the surrounding properties and streets.
- The NB ramp from St Paul Street to US 41 was removed to reduce business impacts/relocations.
- A bridge for US 41 over S. 36th Avenue for the conveyance of local traffic between the east and west sides of US 41 was added to improve access for the surrounding properties.
- 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 to improve access to the surrounding properties and eliminate the existing offset 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 Segment No. 446026-1-52-01) to the south.
- The northern project limit along US 41 was shifted south to north of 23rd Ave to reflect the removal of the flyovers at the US 41/Causeway Blvd intersection.

Details of the Preferred Alternative are provided in **Section 7** and the concept plan is in **Appendix A**.

5.7 TRAFFIC

This section provides a summary of the future traffic conditions within the study area and a more thorough discussion can be found in the *Project Traffic Analysis Report* and *Project Traffic Analysis Report Supplement* that have been prepared for the proposed project. Analysis was performed as a part of this study for the existing year (2018), opening year (2026), interim year (2036), and design year (2046) with the existing and the projected future traffic volumes. Future year traffic volumes were projected using the Florida Standard Urban Transportation Model Structure (FSUTMS) compliant Tampa Bay Regional Planning Model (TBRPM), version 8.2. The future year AADT's were developed using existing year AADT, linear interpolation of model results, and the National Cooperative Highway Research Program (NCHRP) Report 765 ratio and difference methodologies. The NCHRP describes methods, data sources and procedures for producing travel forecasts for highway project-level analyses.

FDOT's policy states that the target LOS for automobile modes in urbanized area is "D". The concepts were developed with this target in mind, however, in an effort to minimize right-of-way impacts as well as provide a consistent comparison among the alternatives, each was analyzed with a six-lane typical section on Causeway Boulevard. During the analysis, it was found that for some alternatives, eight-lane typical sections may be required for either or both US 41 and Causeway Boulevard to achieve segment or intersection operations of LOS D.

5.7.1 Future Year AADT, DDHV, and DHTMV

The volumes were extracted and, utilizing NCHRP's 765 ratio and difference methodologies, future year smoothed AADTs were developed for the study area. The forecasted AADTs are presented in **Table 5-6**.

DDHVs were calculated by applying the traffic design factors presented in **Section 2.3** to the forecasted AADT. Future year design hour turning movement volumes (DHTMV) used in the intersection analyses were calculated by applying the existing turning movement percentages to the DDHVs. The DHTMVs for the No-Build and Build alternatives are presented in **Figure 5-36** through **Figure 5-51**. See **Section 5.4** for more details on the initial build alternatives and **Section 7** for details on the Preferred Alternative.

Table 5-6 NCHRP 765 & AADT Forecast for Existing, Opening, Interim, and Design Year

Roadway / Segment	Smoothing Procedure							Linear Trend Growth Rate	AADT by Forecast Year			
	AADT	Model Volumes		Interpolate	2040 NCHRP 765				2018	2026	2036	2046
	2018	2010	2040	2018	Ratio	Difference	Average					
US 41												
North of Causeway Blvd	26,000	21,700	39,000	26,300	37,200	37,100	37,200	1.96%	26,000	30,100	35,200	40,300
South of Causeway Blvd	39,000	31,400	64,200	40,100	62,400	63,100	62,800	2.77%	39,000	47,700	58,500	69,300
Causeway Blvd												
East of US 41	19,000	14,000	37,000	20,100	35,000	35,900	35,500	3.95%	19,000	25,000	32,500	40,000
West of US 41	28,000	19,100	61,400	30,400	56,600	59,000	57,800	4.84%	28,000	38,800	52,400	65,900

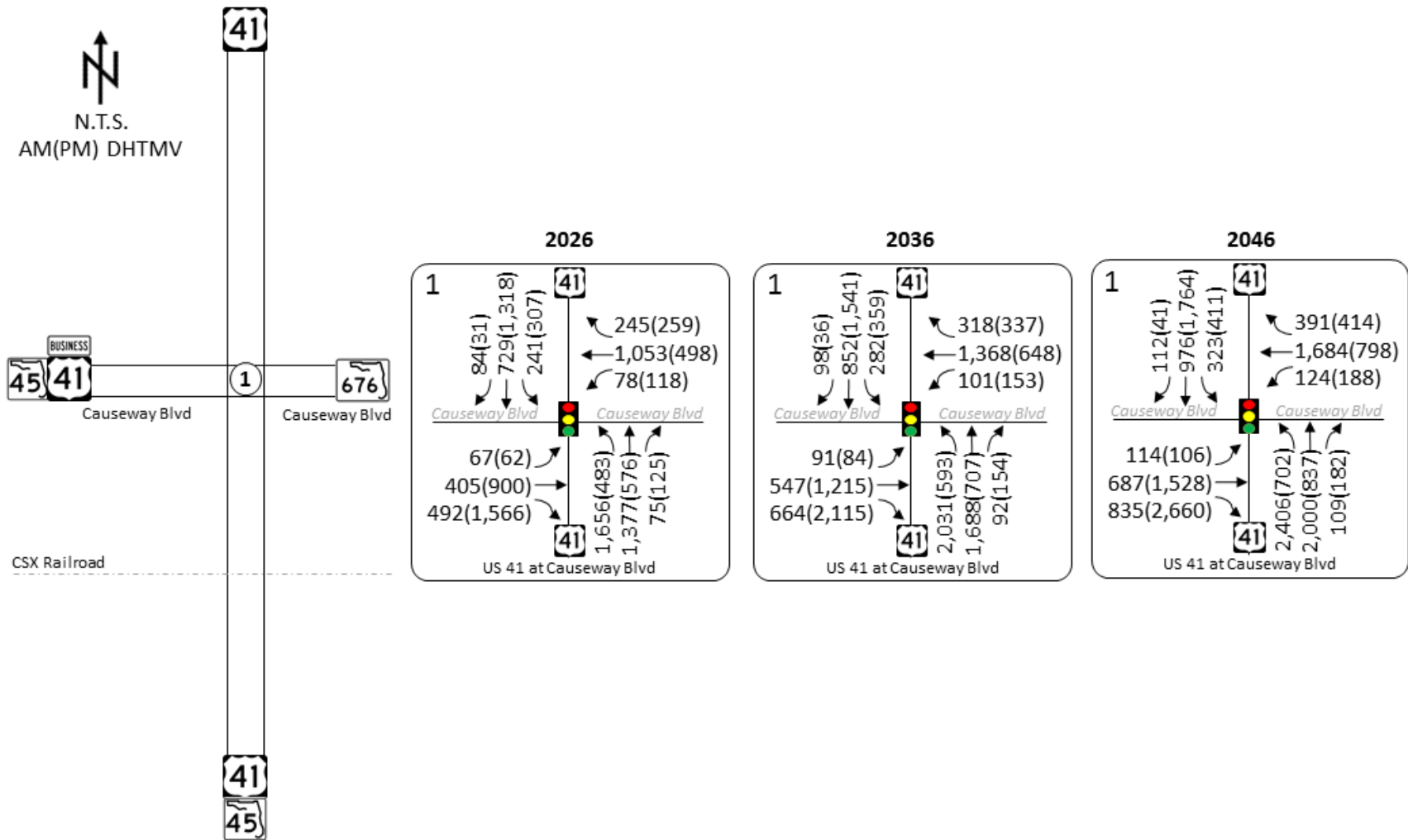


Figure 5-36 No-Build: 2026, 2036, and 2046 DHTMV

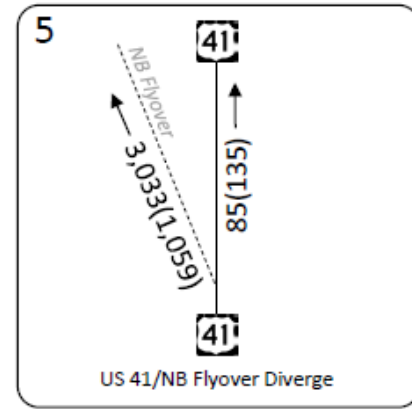
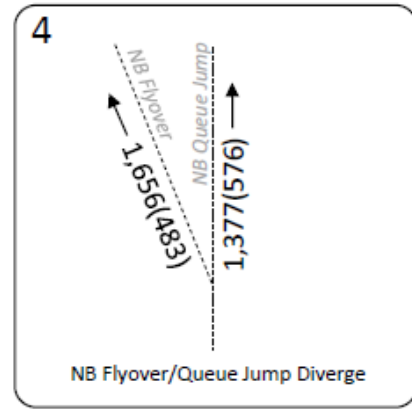
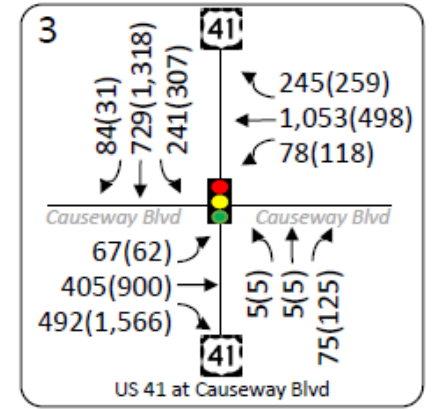
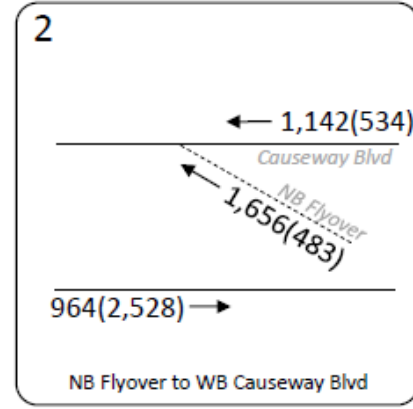
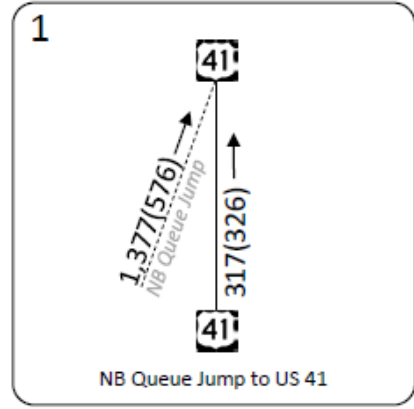
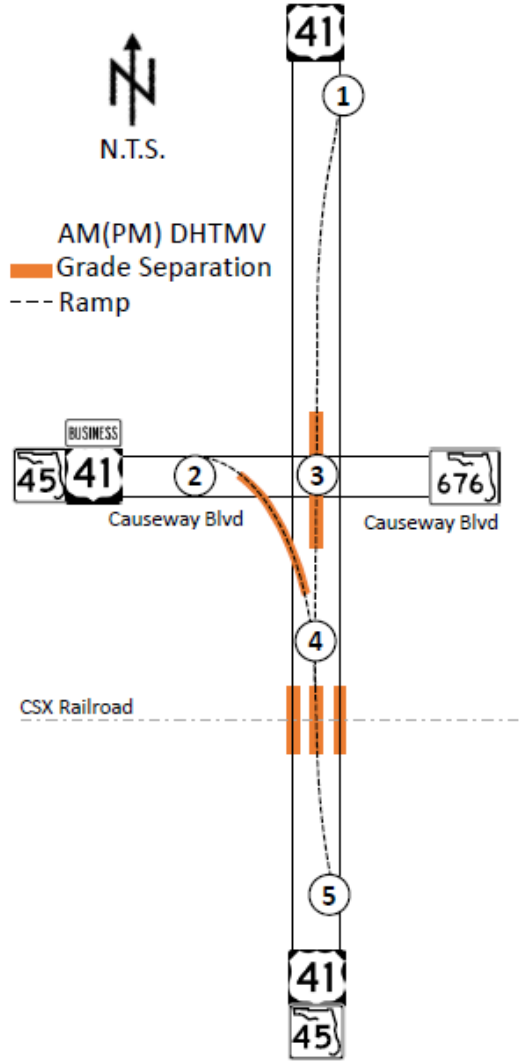


Figure 5-37 Build Alternative 1: 2026 DHTMV

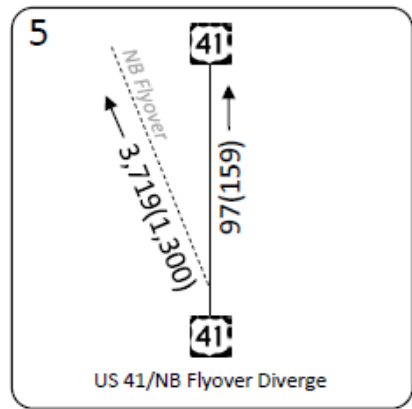
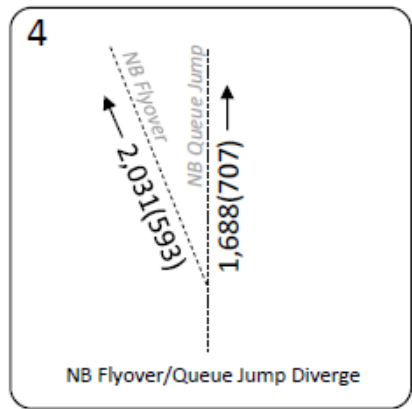
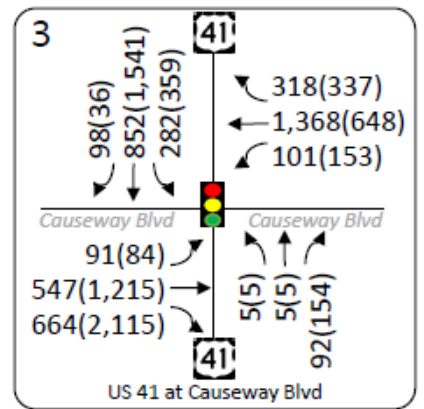
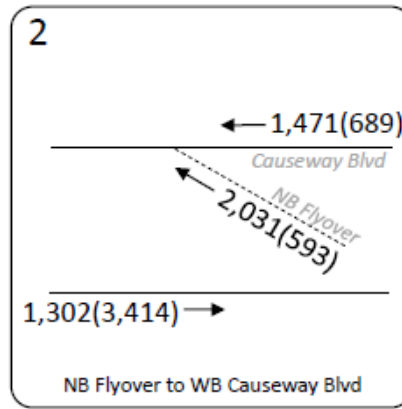
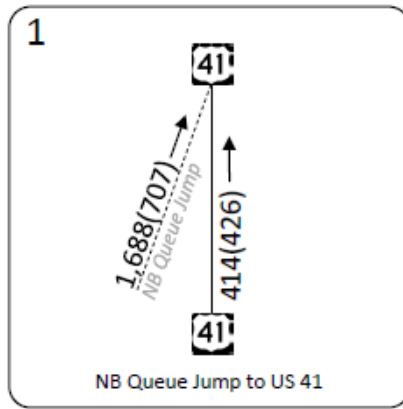
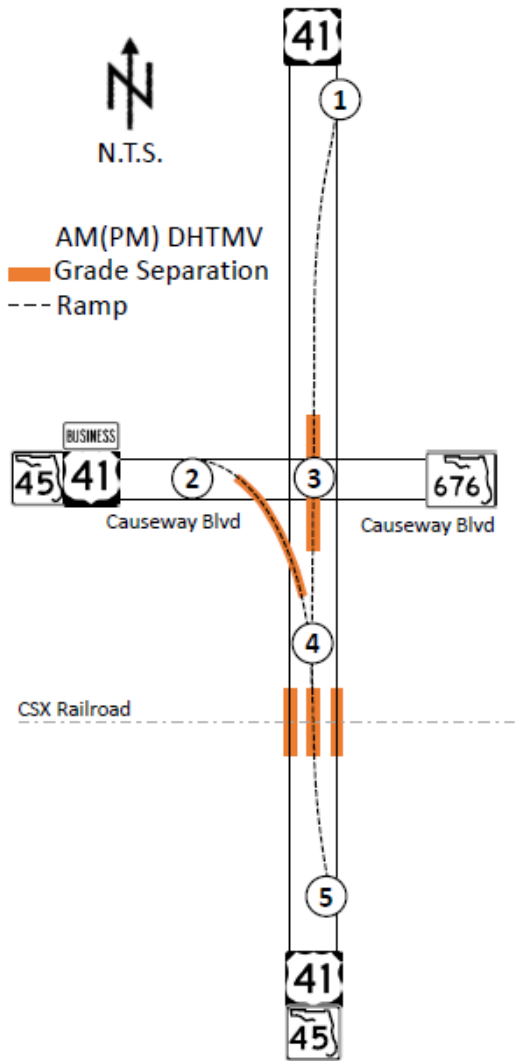


Figure 5-38 Build Alternative 1: 2036 DHTMV

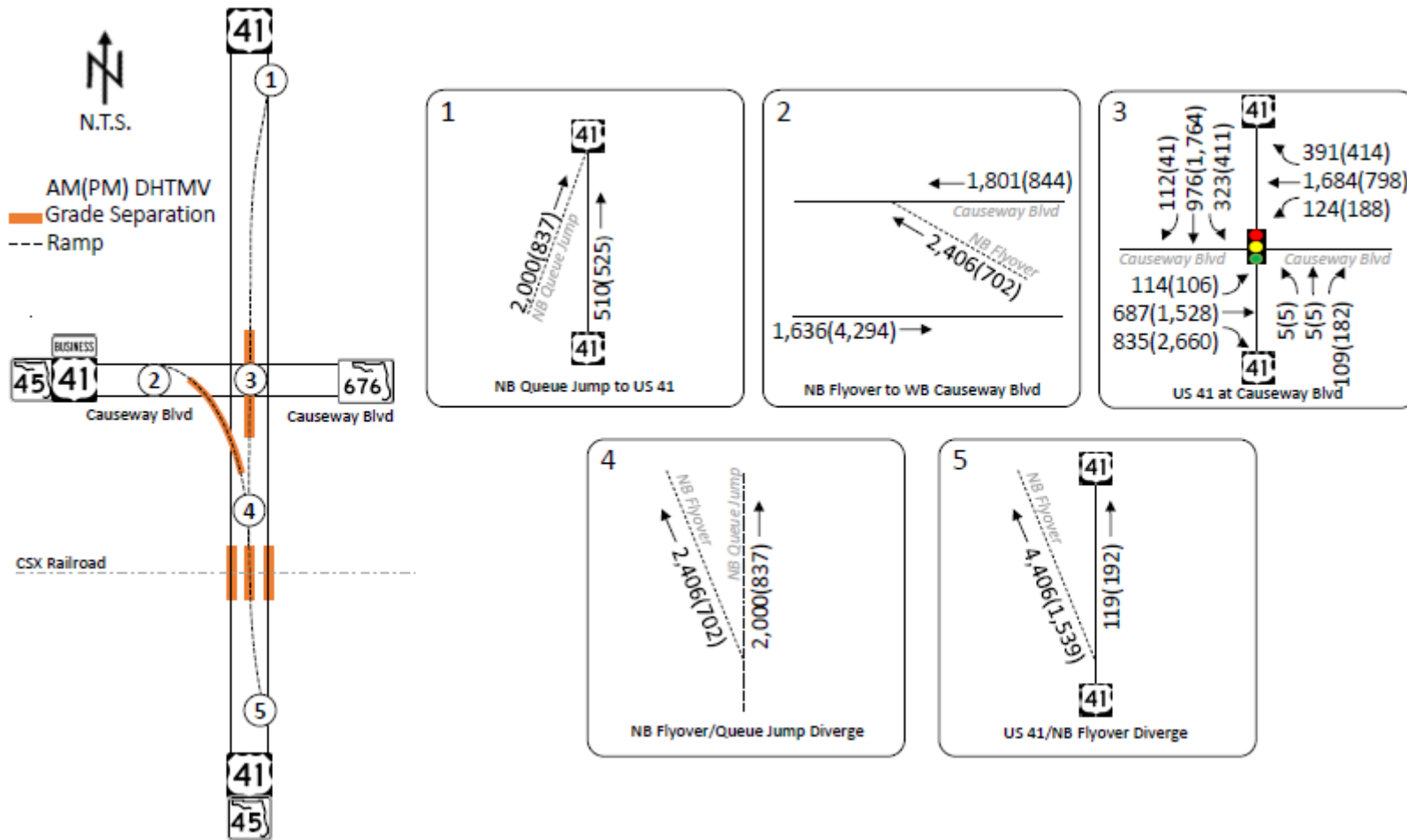


Figure 5-39 Build Alternative 1: 2046 DHTMV

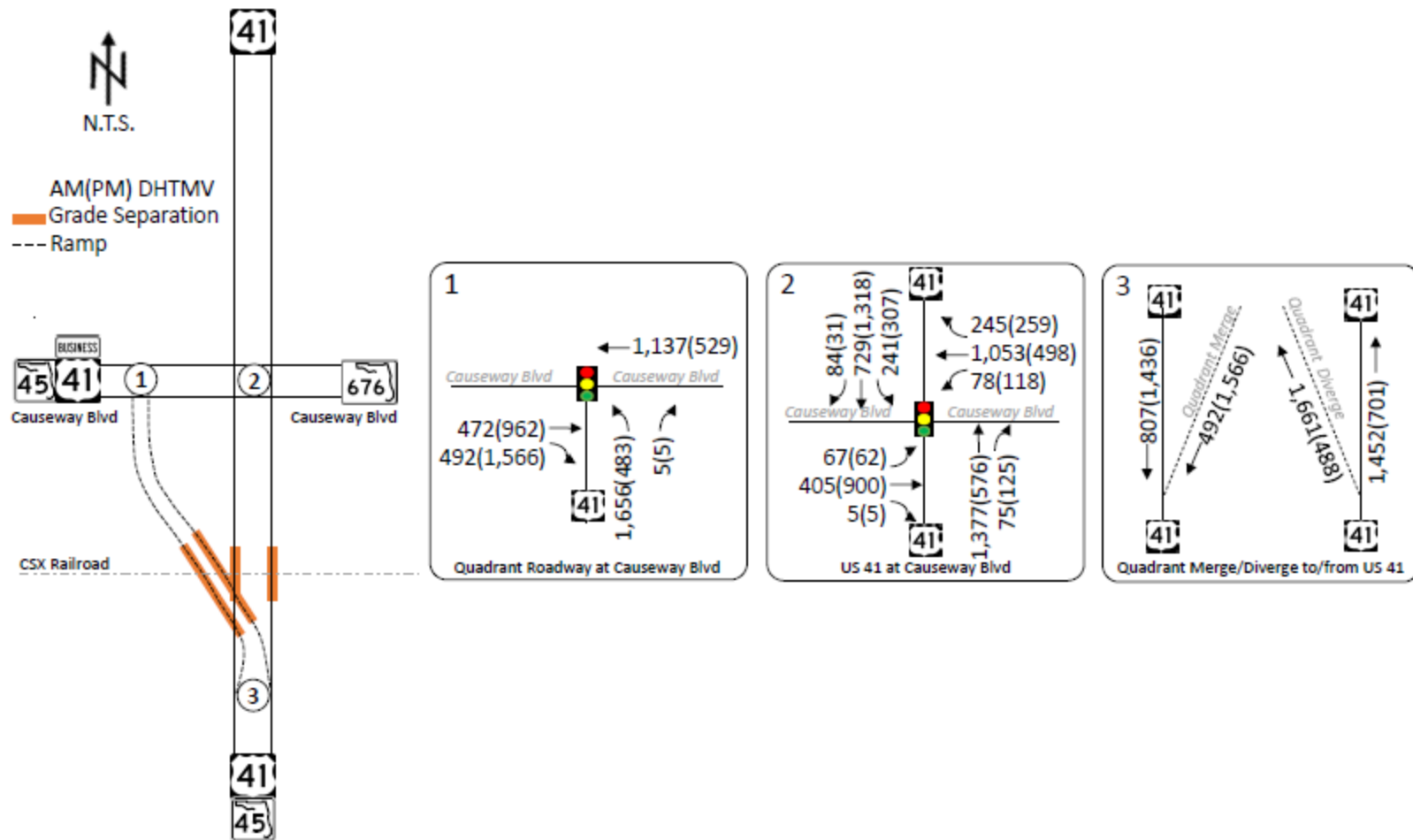


Figure 5-40 Build Alternative 2: 2026 DHTMV

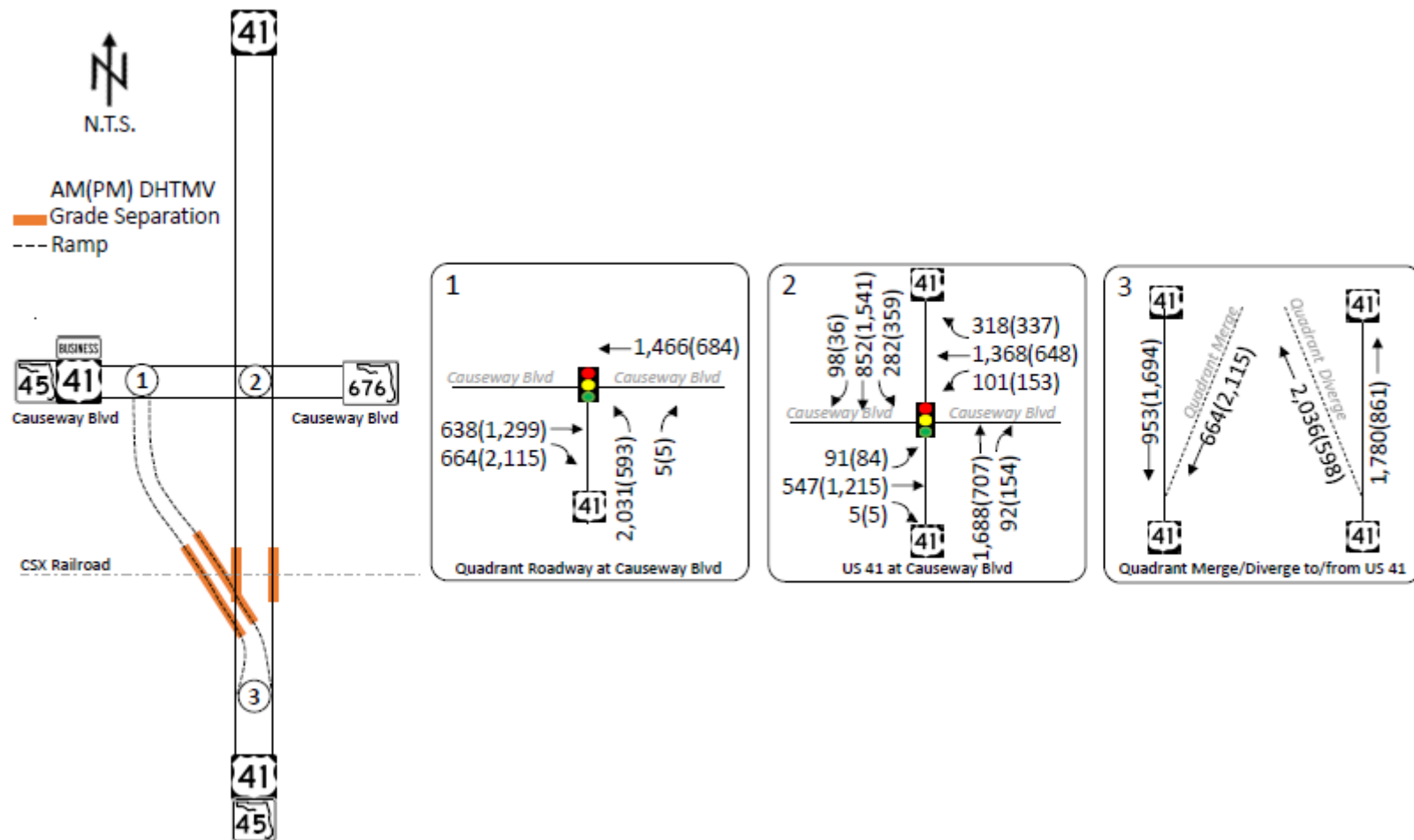


Figure 5-41 Build Alternative 2: 2036 DHTMV

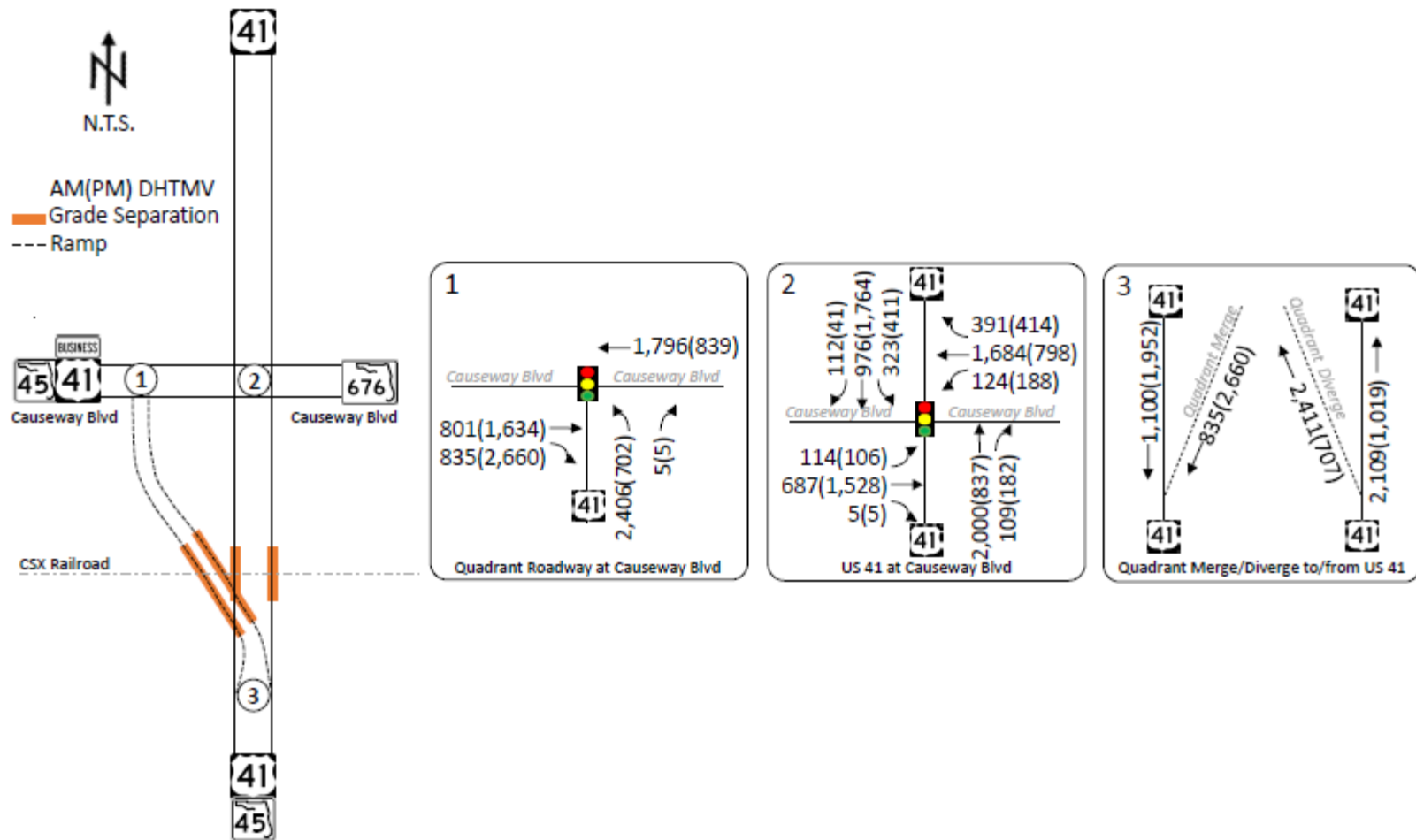


Figure 5-42 Build Alternative 2: 2046 DHTMV

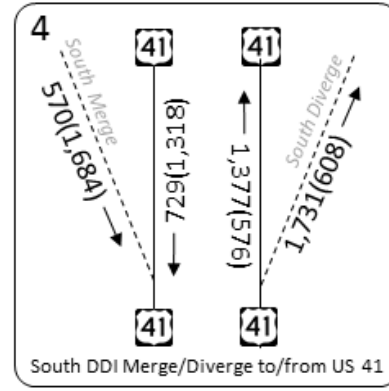
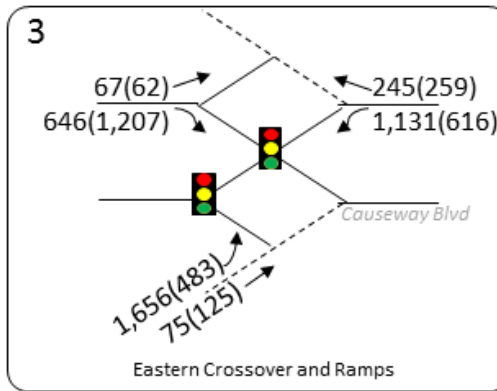
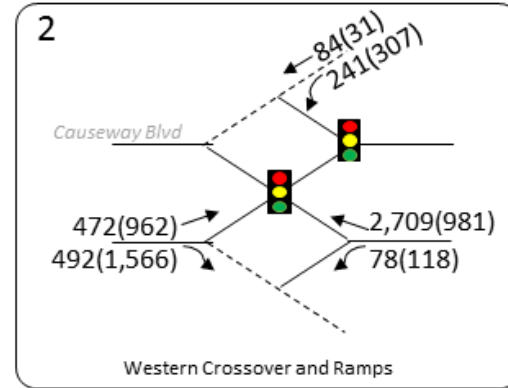
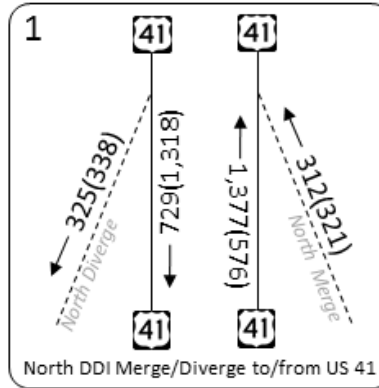
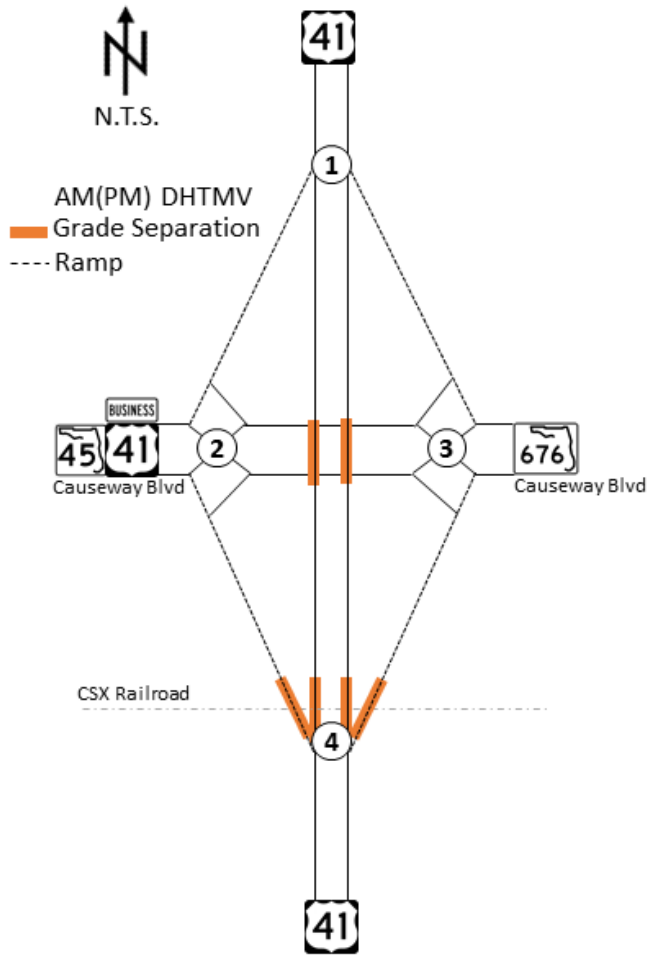


Figure 5-43 Build Alternative 3: 2026 DHTMV

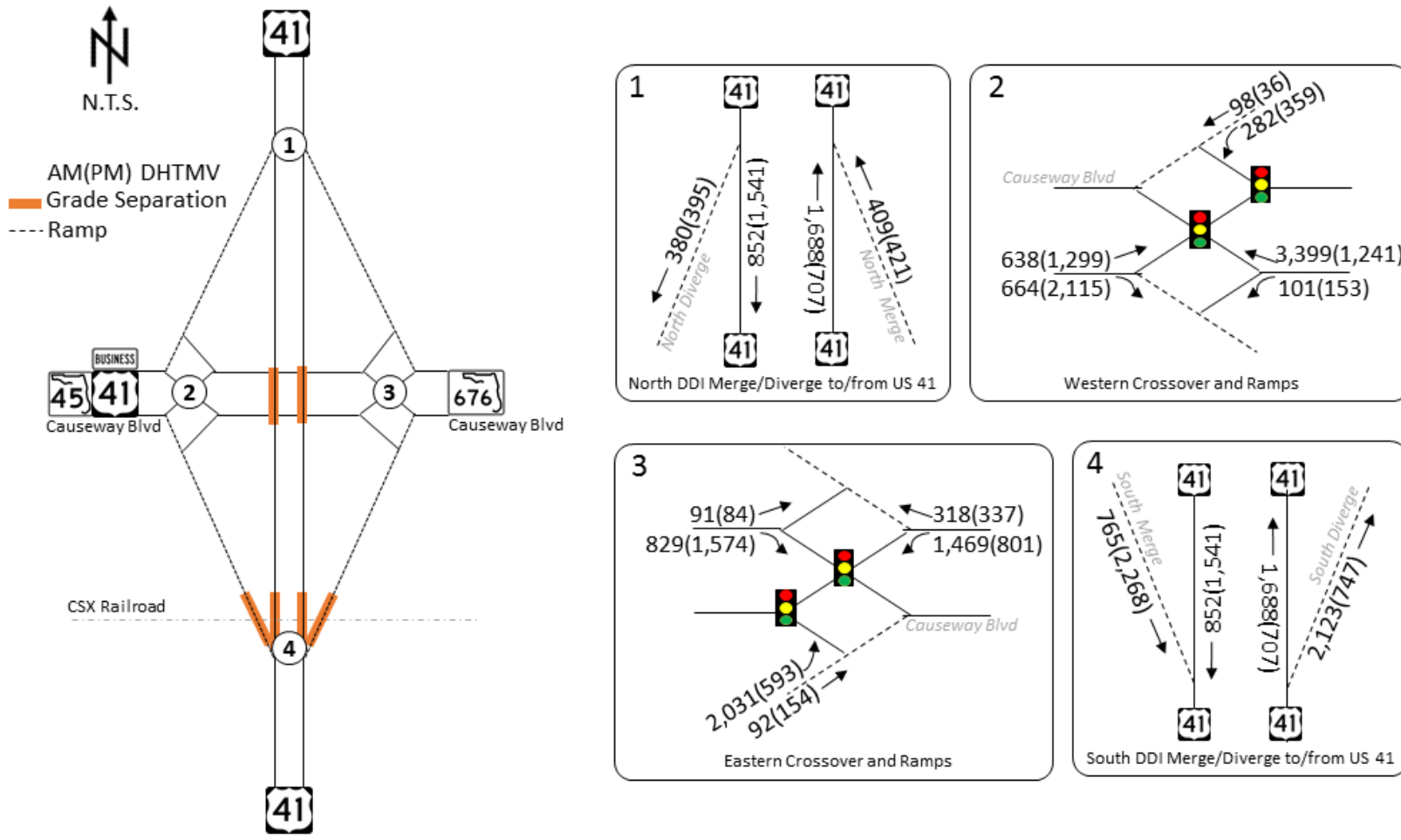


Figure 5-44 Build Alternative 3: 2036 DHTMV

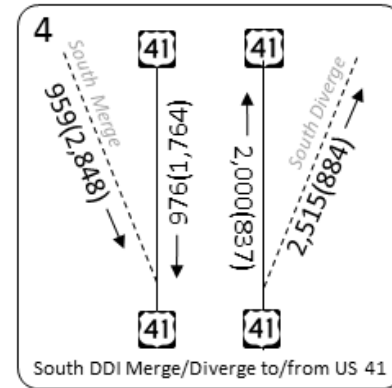
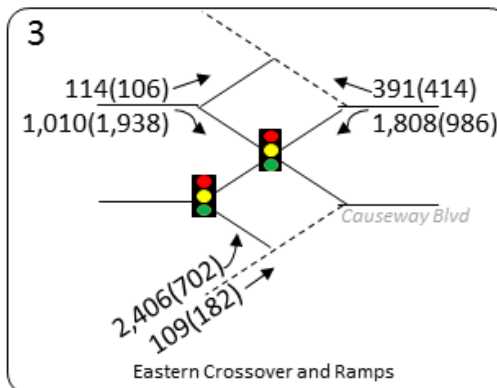
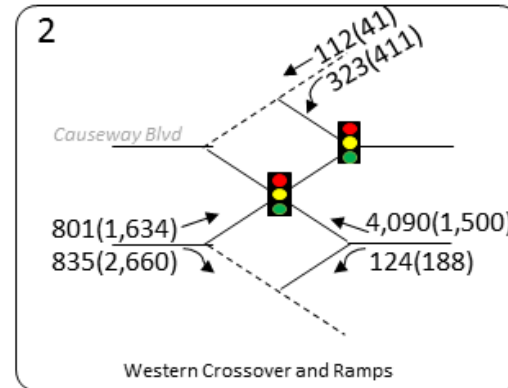
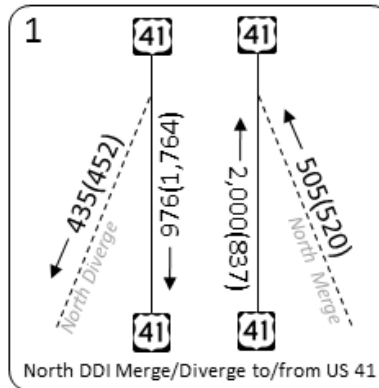
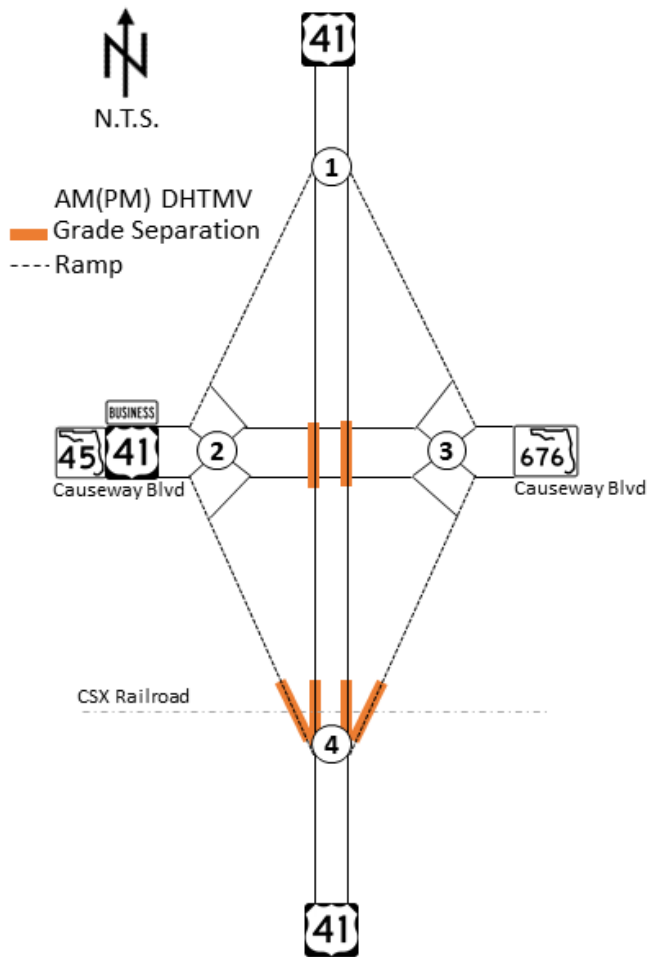


Figure 5-45 Build Alternative 3: 2046 DHTMV

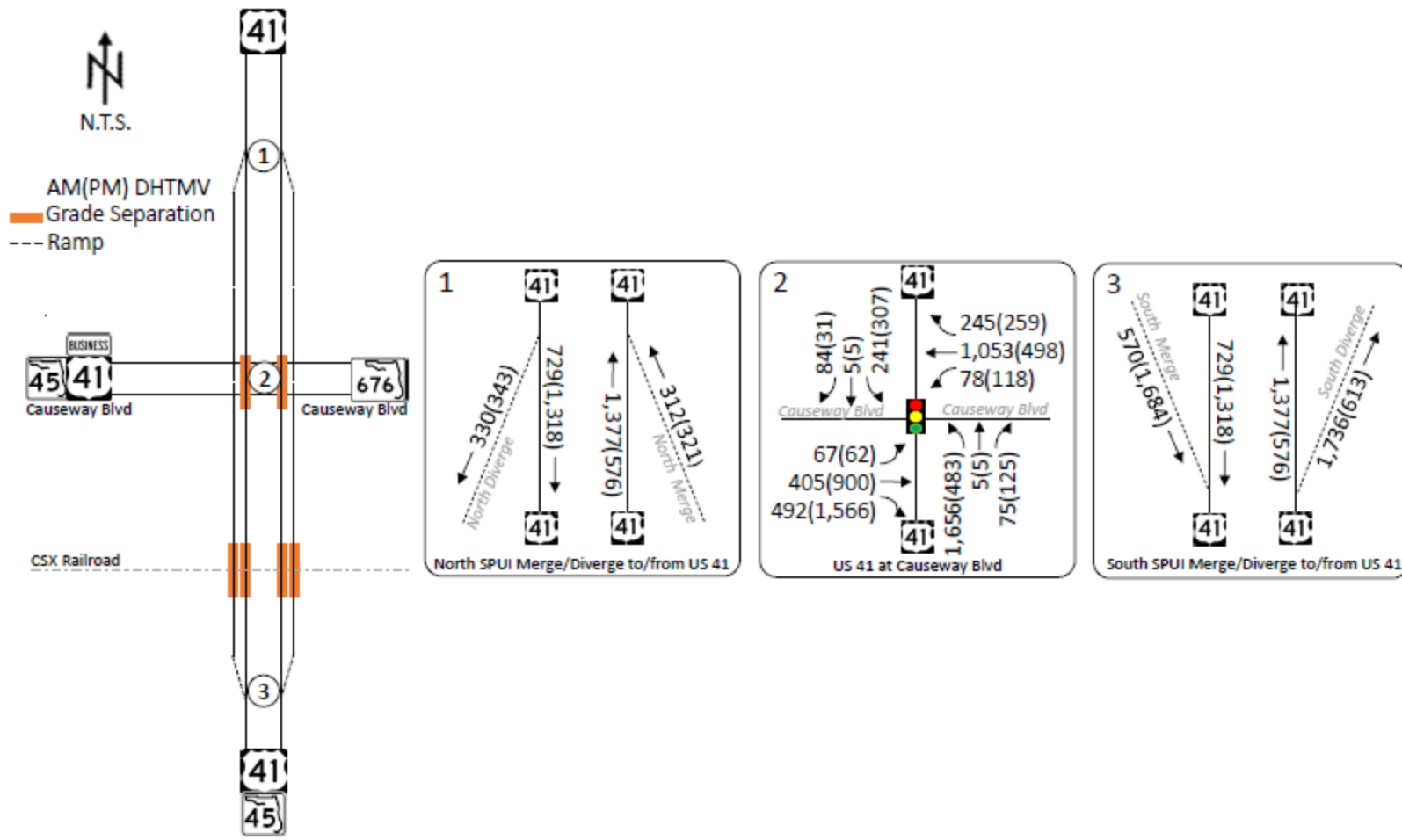


Figure 5-46 Build Alternative 4: 2026 DHTMV

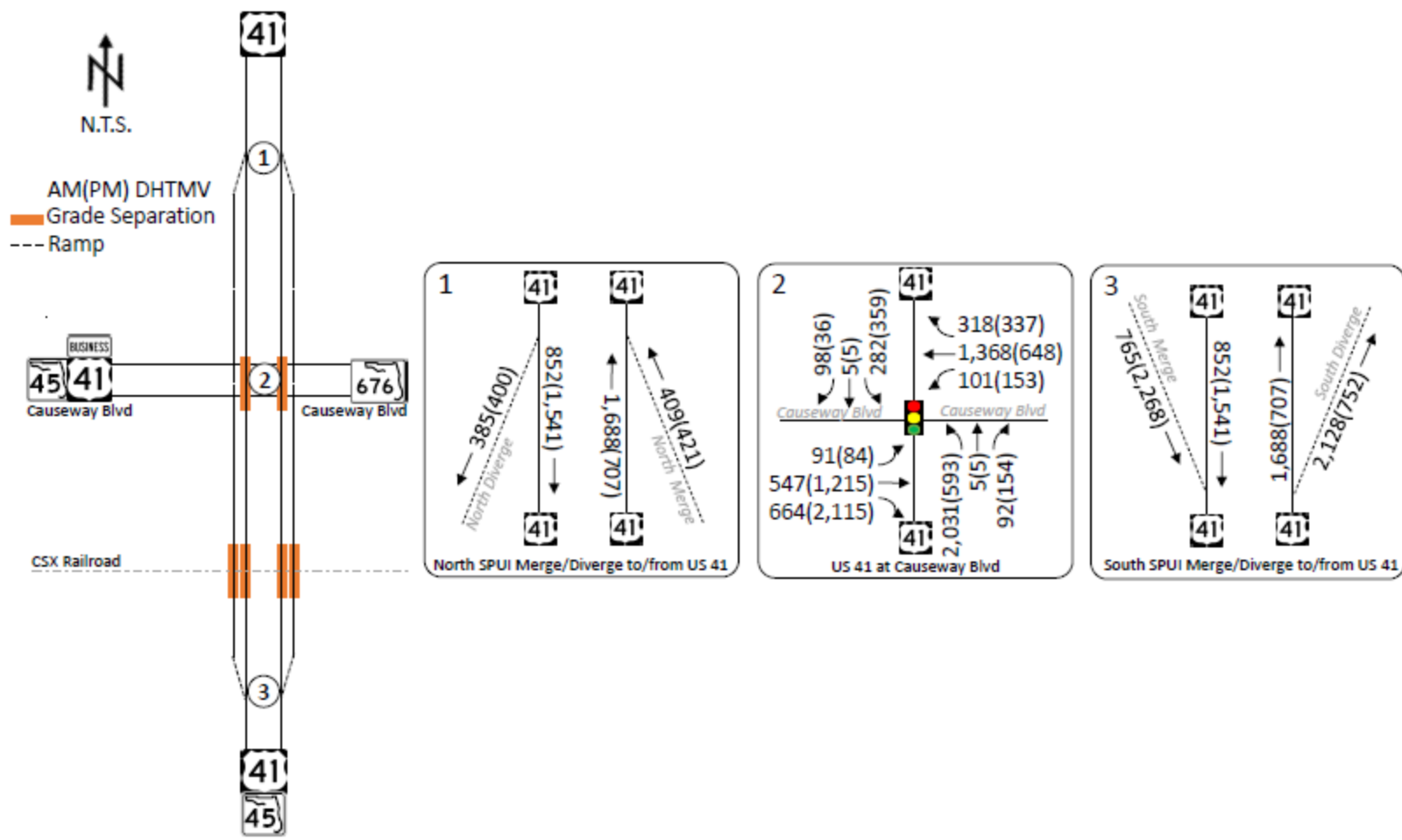


Figure 5-47 Build Alternative 4: 2036 DHTMV

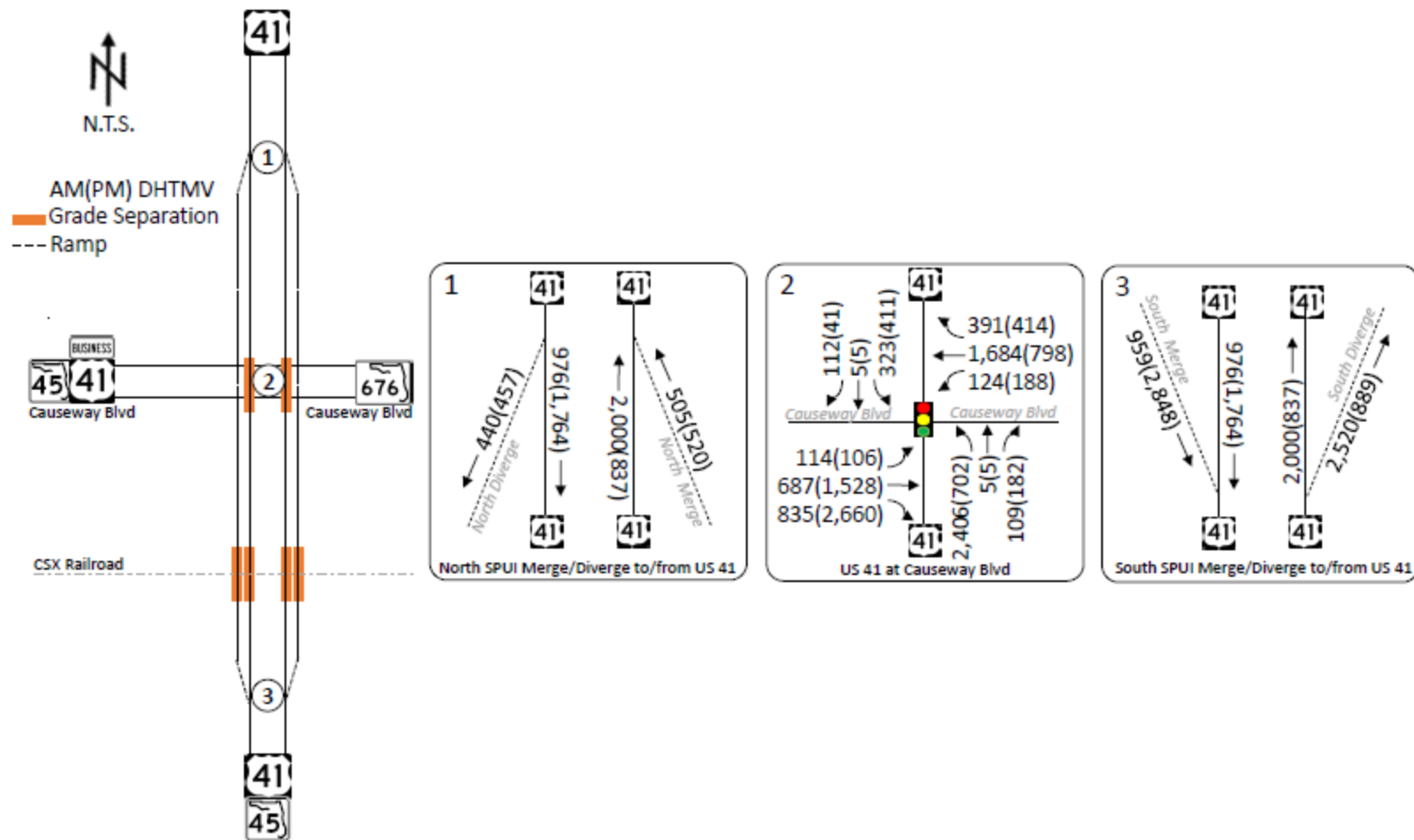


Figure 5-48 Build Alternative 4: 2046 DHTMV

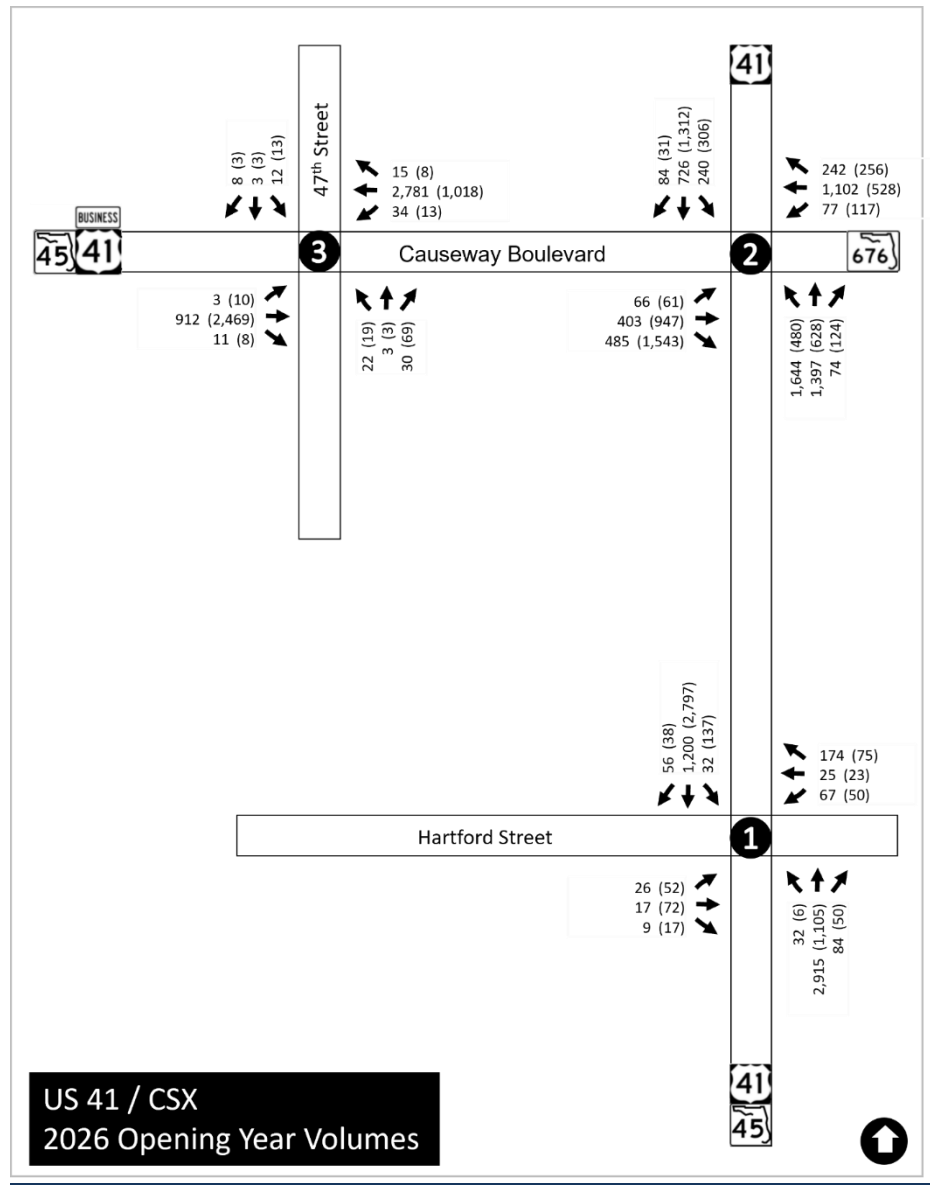


Figure 5-49 Preferred Alternative: 2026 DHTMV

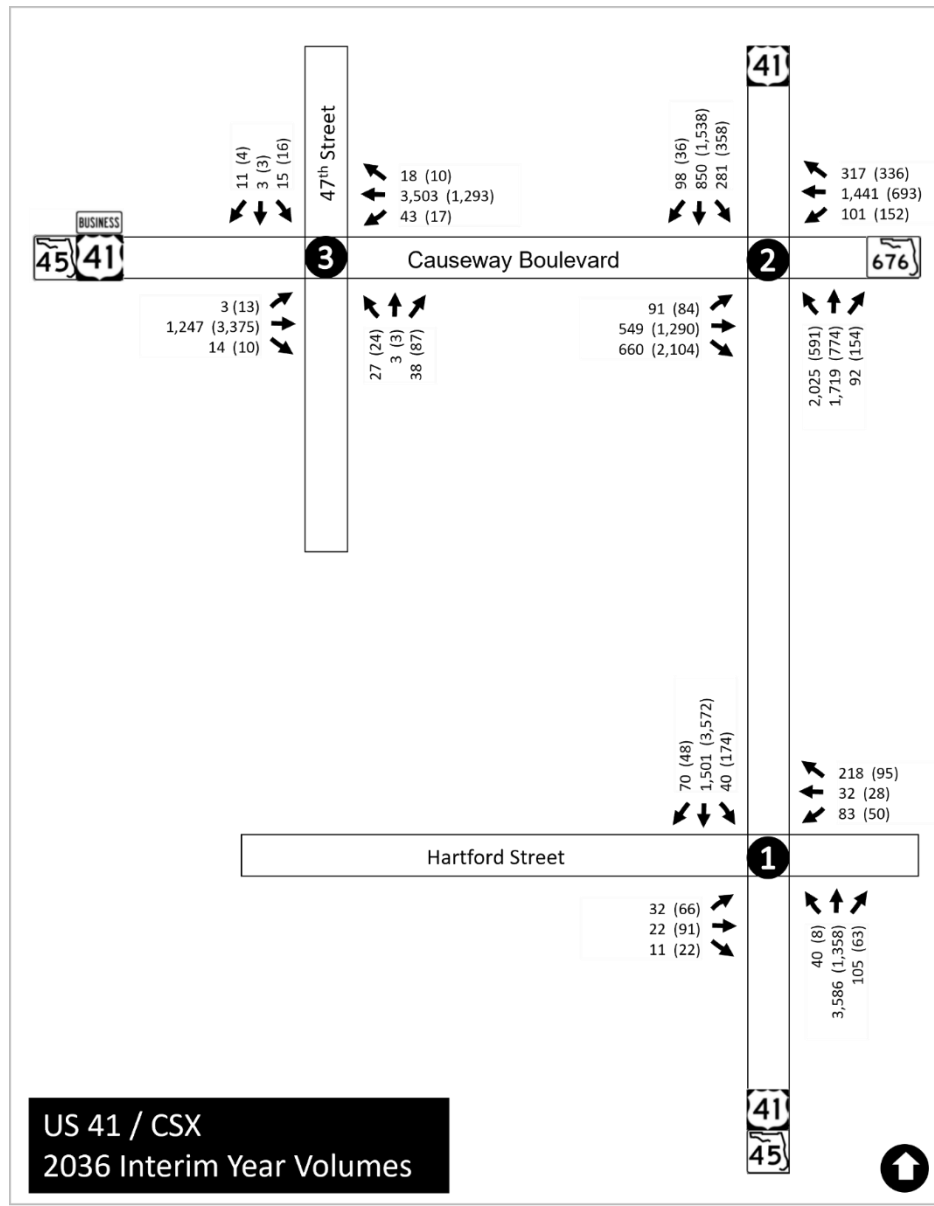


Figure 5-50 Preferred Alternative: 2036 DHTMV

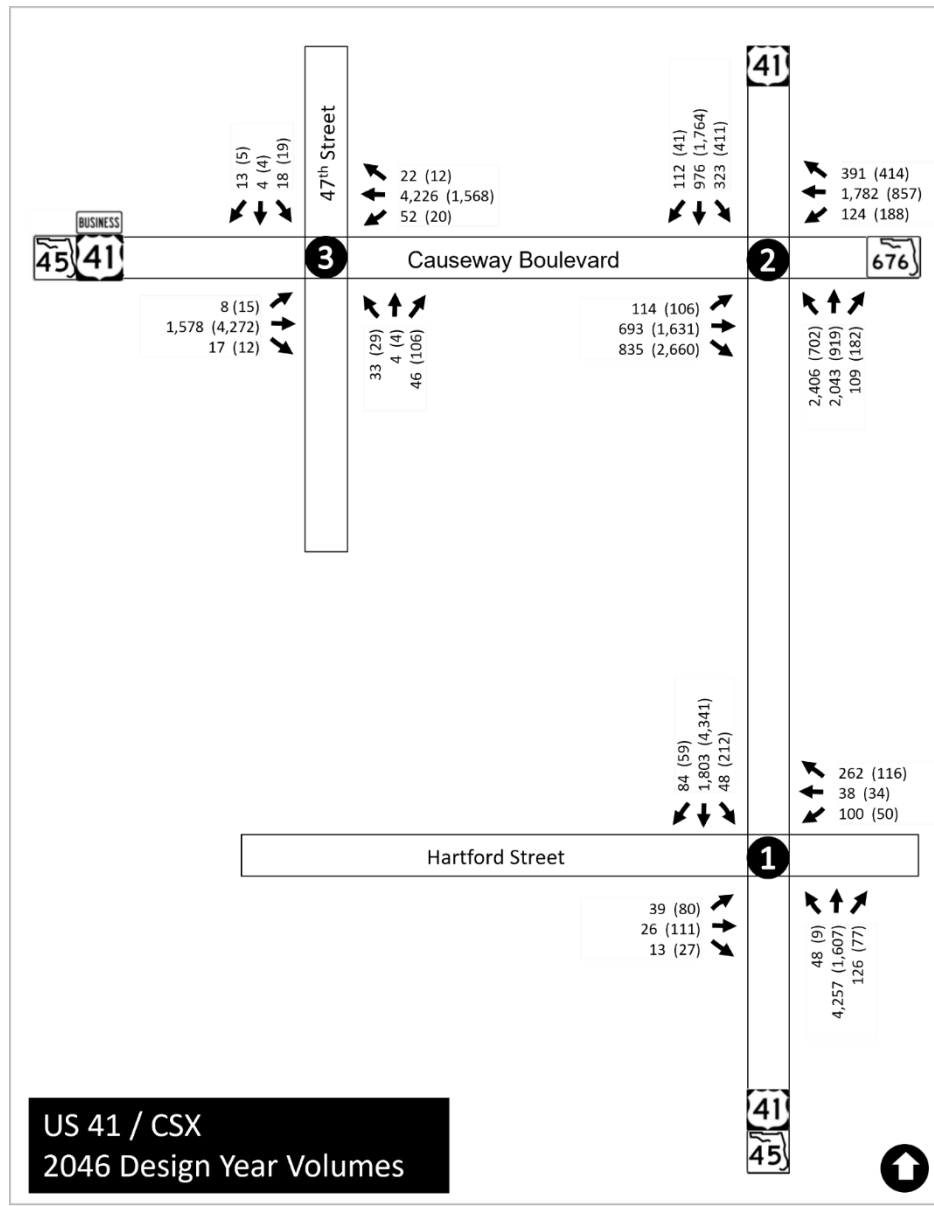


Figure 5-51 Preferred Alternative: 2046 DHTMV

5.7.2 Roadway Segment Analysis

5.7.2.1 No-Build Alternative

The roadway segment analysis for the No-Build alternative was completed using FDOT's Generalized Tables (Tables 1 and 7) to develop LOS based on AADT and DDHVs for each segment. The results of the roadway segment analysis for the No-Build alternative are presented in **Table 5-7**.

The results indicate:

- For the opening year (2026):
 - All segments operate at LOS C or D based on AADT.
 - The following segments operate at LOS F based on DDHV:
 - Northbound US 41, south of Causeway Boulevard (AM peak hour)
 - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
 - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)
- For the interim year (2036):
 - The Causeway Boulevard segment west of US 41 operates at LOS F based on AADT.
 - The following segments operate at LOS F based on DDHV:
 - Southbound US 41, south of Causeway Boulevard (PM peak hour)
 - Northbound US 41, south of Causeway Boulevard (AM peak hour)
 - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
 - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)
- For the design year (2046):
 - The following segments operate at LOS F based on AADT:
 - US 41 south of Causeway Boulevard
 - Causeway Boulevard west of US 41
 - Causeway Boulevard east of US 41
 - The following segments operate at LOS F based on DDHV:
 - Southbound US 41, south of Causeway Boulevard (PM peak hour)
 - Northbound US 41, south of Causeway Boulevard (AM peak hour)
 - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
 - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)
 - Westbound Causeway Boulevard, east of US 41 (AM peak hour)
 - Eastbound Causeway Boulevard, east of US 41 (PM peak hour)

Table 5-7 No-Build Alternative 2026, 2036, and 2046 Roadway Segment Analysis

2026								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Blvd	6	50	30,100	C	1,054	C	1,656	C
Northbound, North of Causeway Blvd	6	50	30,100	C	1,689	C	897	C
Southbound, South of Causeway Blvd	6	50	47,700	C	1,299	C	3,002	D
Northbound, South of Causeway Blvd	6	50	47,700	C	3,108	F	1,184	C
Causeway Boulevard								
Westbound, West of US 41	4	45	38,800	D	2,793	F	1,012	C
Eastbound, West of US 41	4	45	38,800	D	964	C	2,528	F
Westbound, East of US 41	4	45	25,000	C	1,376	C	875	C
Eastbound, East of US 41	4	45	25,000	C	721	C	1,332	C
2036								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Blvd	6	50	35,200	C	1,232	C	1,936	C
Northbound, North of Causeway Blvd	6	50	35,200	C	2,097	C	1,128	C
Southbound, South of Causeway Blvd	6	50	58,500	D	1,617	C	3,809	F
Northbound, South of Causeway Blvd	6	50	58,500	D	3,811	F	1,454	C
Causeway Boulevard								
Westbound, West of US 41	4	45	52,400	F	3,497	F	1,277	C
Eastbound, West of US 41	4	45	52,400	F	1,302	C	3,414	F
Westbound, East of US 41	4	45	32,500	C	1,787	C	1,138	C
Eastbound, East of US 41	4	45	32,500	C	921	C	1,728	C
2046								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Blvd	6	50	40,300	C	1,411	C	2,216	C
Northbound, North of Causeway Blvd	6	50	40,300	C	2,505	C	1,357	C
Southbound, South of Causeway Blvd	6	50	69,300	F	1,935	C	4,612	F
Northbound, South of Causeway Blvd	6	50	69,300	F	4,515	F	1,721	C
Causeway Boulevard								
Westbound, West of US 41	4	45	65,900	F	4,202	F	1,541	C
Eastbound, West of US 41	4	45	65,900	F	1,636	C	4,294	F
Westbound, East of US 41	4	45	40,000	F	2,199	F	1,400	C
Eastbound, East of US 41	4	45	40,000	F	1,119	C	2,121	F

5.7.2.2 Build Alternatives

The roadway segment analysis for Build Alternative 1 was completed using FDOT’s Generalized Tables to develop LOS based on AADT and DDHVs for each segment. Since the typical sections (for the external intersection or interchange legs), design speeds, and volumes for each Build alternative are the same, the results presented in **Table 5-8** for Build Alternative 1 can be used for Build Alternatives 2, 3, and 4.

Table 5-8 Build Alternatives 2026, 2036, and 2046 Roadway Segment Analysis

2026								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Blvd	6	50	30,100	C	1,054	C	1,656	C
Northbound, North of Causeway Blvd	6	50	30,100	C	1,689	C	897	C
Southbound, South of Causeway Blvd	6	50	47,700	C	1,299	C	3,002	D
Northbound, South of Causeway Blvd	6	50	47,700	C	3,108	F	1,184	C
Causeway Boulevard								
Westbound, West of US 41	6	50	38,800	C	2,793	C	1,012	C
Eastbound, West of US 41	6	50	38,800	C	964	C	2,528	C
Westbound, East of US 41	6	50	25,000	C	1,376	C	875	C
Eastbound, East of US 41	6	50	25,000	C	721	C	1,332	C
2036								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Blvd	6	50	35,200	C	1,232	C	1,936	C
Northbound, North of Causeway Blvd	6	50	35,200	C	2,097	C	1,128	C
Southbound, South of Causeway Blvd	6	50	58,500	D	1,617	C	3,809	F
Northbound, South of Causeway Blvd	6	50	58,500	D	3,811	F	1,454	C
Causeway Boulevard								
Westbound, West of US 41	6	50	52,400	C	3,497	F	1,277	C
Eastbound, West of US 41	6	50	52,400	C	1,302	C	3,414	F
Westbound, East of US 41	6	50	32,500	C	1,787	C	1,138	C
Eastbound, East of US 41	6	50	32,500	C	921	C	1,728	C
2046								
Roadway / Segment	Total Lanes	Posted Speed	AADT	LOS	AM Peak Hour		PM Peak Hour	
					Volume	LOS	Volume	LOS
US 41								
Southbound, North of Causeway Blvd	6	50	40,300	C	1,411	C	2,216	C
Northbound, North of Causeway Blvd	6	50	40,300	C	2,505	C	1,357	C
Southbound, South of Causeway Blvd	6	50	69,300	F	1,935	C	4,612	F
Northbound, South of Causeway Blvd	6	50	69,300	F	4,515	F	1,721	C
Causeway Boulevard								
Westbound, West of US 41	6	50	65,900	F	4,202	F	1,541	C
Eastbound, West of US 41	6	50	65,900	F	1,636	C	4,294	F
Westbound, East of US 41	6	50	40,000	C	2,199	C	1,400	C
Eastbound, East of US 41	6	50	40,000	C	1,119	C	2,121	C

The results indicate:

- For the opening year (2026):
 - All segments operate at LOS C or D based on AADT.
 - The northbound US 41 segment south of Causeway Boulevard operates at LOS F based on DDHV.
- For the interim year (2036):
 - All segments operate at LOS C or D based on AADT.
 - The following segments operate at LOS F based on DDHV:
 - Southbound US 41, south of Causeway Boulevard (PM peak hour)
 - Northbound US 41, south of Causeway Boulevard (AM peak hour)
 - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
 - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)
- For the design year (2046):
 - The following segments operate at LOS F based on AADT:
 - US 41 south of Causeway Boulevard
 - Causeway Boulevard west of US 41
 - The following segments operate at LOS F based on DDHV:
 - Southbound US 41, south of Causeway Boulevard (PM peak hour)
 - Northbound US 41, south of Causeway Boulevard (AM peak hour)
 - Westbound Causeway Boulevard, west of US 41 (AM peak hour)
 - Eastbound Causeway Boulevard, west of US 41 (PM peak hour)

5.7.3 Intersection Operational Analysis

5.7.3.1 No-Build

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for the No-Build Alternative for opening, interim, and design years are presented in **Table 5-9**.

The results indicate failing operations at the intersection of US 41 and Causeway Boulevard in each of the analysis years during both the AM and PM peak hours. During the PM peak hour of 2046, none of the movements are expected to operate at target LOS D. The v/c ratios show that the intersection exceeds capacity by 2026. The results show that the most problematic approaches under the No-Build scenario are northbound during the AM peak hour and eastbound during the PM peak hour. The No-Build queue lengths shown in **Figure 5-52** were generated using Synchro 95th percentile queues for the design year.

Table 5-9 No-Build 2026, 2036, and 2046 Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Blvd	EBL	137.3	F	0.76	92.5	F	0.63	199.8	F	1.03	79.0	E	0.53	287.5	F	1.29	86.4	F	0.67
	EBT	65.1	E	0.49	132.9	F	1.14	67.6	E	0.63	204.8	F	1.32	72.3	E	0.77	320.5	F	1.58
	EBR	9.2	A	0.32	245.2	F	1.48	10.9	B	0.45	471.4	F	1.99	12.7	B	0.57	740.5	F	2.59
	<i>EB Approach</i>	41.7	D	0.40	201.5	F	1.30	48.0	D	0.53	366.9	F	1.60	56.9	E	0.67	574.8	F	2.00
	WBL	121.3	F	0.71	153.3	F	1.00	120.2	F	0.75	253.7	F	1.30	123.5	F	0.80	375.7	F	1.60
	WBT	188.9	F	1.23	53.1	D	0.61	298.1	F	1.49	55.0	D	0.74	408.8	F	1.74	61.3	E	0.87
	WBR	73.2	E	0.64	30.9	C	0.72	78.9	E	0.78	72.1	E	0.86	92.2	F	0.91	99.1	F	1.01
	<i>WB Approach</i>	164.4	F	1.02	60.0	E	0.68	249.1	F	1.22	86.7	F	0.82	336.3	F	1.42	114.7	F	0.97
	NBL	316.6	F	1.55	79.8	E	0.90	543.7	F	2.05	265.8	F	1.42	769.8	F	2.55	571.9	F	2.10
	NBT	81.3	F	0.98	48.4	D	0.65	166.5	F	1.22	51.5	D	0.76	270.4	F	1.46	64.5	E	0.90
	NBR	82.2	F	0.98	48.6	D	0.65	174.1	F	1.24	51.6	D	0.76	281.9	F	1.49	64.7	E	0.90
	<i>NB Approach</i>	206.9	F	1.22	61.2	E	0.74	369.3	F	1.56	138.9	F	0.93	539.3	F	1.90	271.5	F	1.17
	SBL	308.3	F	1.42	127.5	F	1.05	490.3	F	1.84	467.6	F	1.85	720.9	F	2.35	708.2	F	2.39
	SBT	83.7	F	0.80	52.2	D	0.82	94.4	F	0.91	69.4	E	0.97	124.9	F	1.05	95.1	F	1.07
	SBR	91.7	F	0.81	57.3	E	0.82	106.3	F	0.92	78.8	E	0.97	138.9	F	1.05	104.2	F	1.07
	<i>SB Approach</i>	137.3	F	0.89	67.6	E	0.86	188.2	F	1.03	146.0	F	1.06	264.9	F	1.20	211.5	F	1.19
Overall		162.1	F	1.34	119.5	F	1.18	264.0	F	1.69	231.1	F	1.62	373.0	F	2.04	370.1	F	2.01

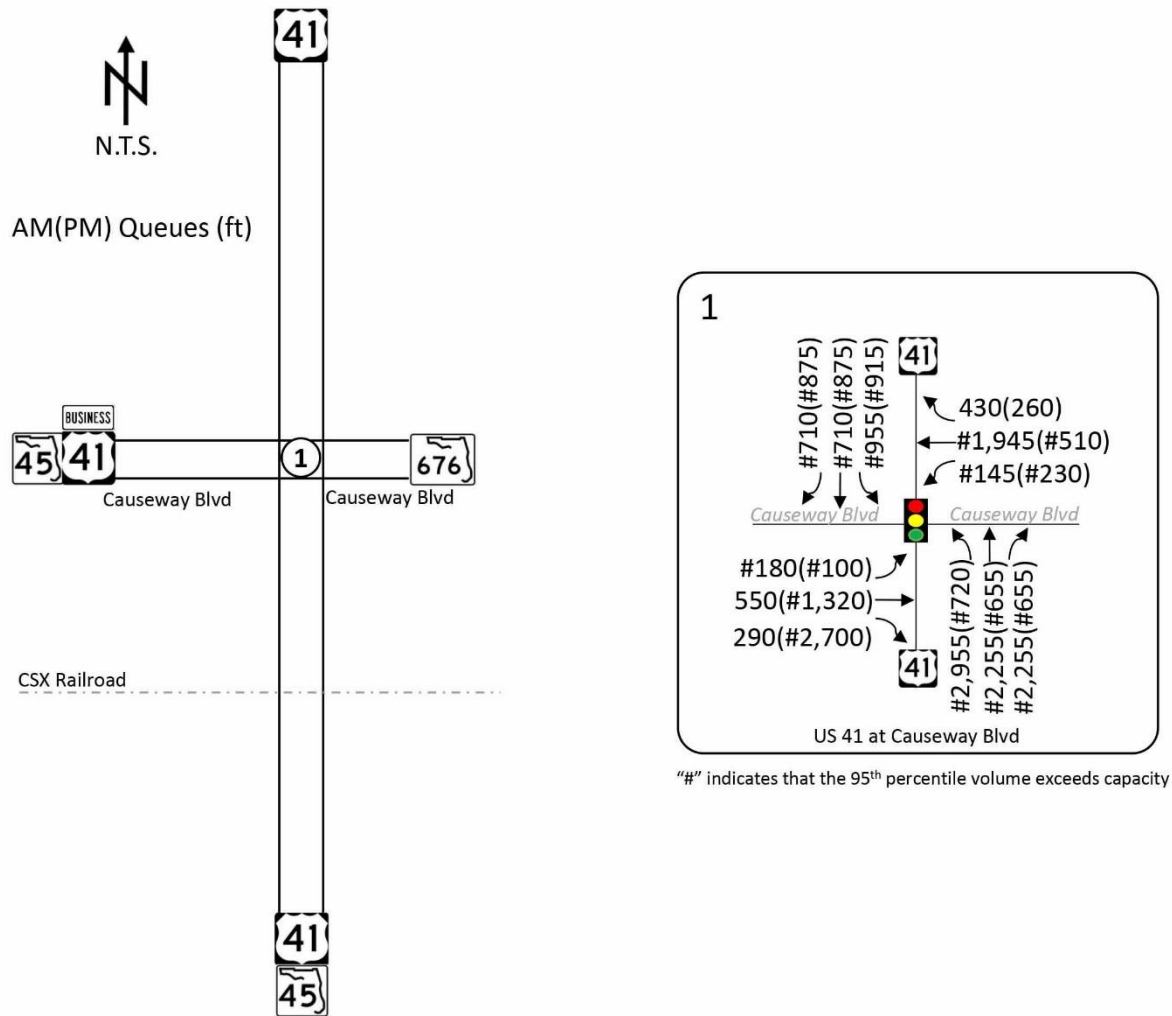


Figure 5-52 No-Build Alternative Design Year 95th Percentile Queues

5.7.3.2 Build Alternative 1

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for Build Alternative 1 for opening, interim, and design years are presented in **Table 5-10**. The signalized intersection of US 41 at Causeway Boulevard was evaluated.

The results indicate:

- For the opening year (2026):
 - During the AM peak hour:
 - US 41 at Causeway Boulevard operates at overall LOS C.
 - During the PM peak hour:
 - US 41 at Causeway Boulevard operates at overall LOS D.
 - The eastbound right movement operates at LOS F and the eastbound right is over capacity.
 - The southbound through operates at LOS E.
- For the interim year (2036):
 - During the AM peak hour:
 - US 41 at Causeway Boulevard operates at overall LOS C.
 - During the PM peak hour:
 - US 41 at Causeway Boulevard operates at overall LOS F.
 - The eastbound left and right movements operate at LOS F and the eastbound right is over capacity.
 - The westbound left operates at LOS F and is over capacity.
 - The northbound left, through, and right operate at LOS F.
 - The southbound through operates at LOS F and is over capacity while the southbound left operates at LOS E.
- For the design year (2046):
 - During the AM peak hour:
 - US 41 at Causeway Boulevard operates at overall LOS C.
 - During the PM peak hour:
 - US 41 at Causeway Boulevard operates at overall LOS F.
 - The eastbound left and right movements operate at LOS F and the eastbound right is over capacity.
 - The westbound left operates at LOS F and is over capacity.
 - The northbound left and right operate at LOS F, while the northbound through operates at LOS E.
 - The southbound left and through operate at LOS F, while the southbound through is over capacity.

The lane configurations for Build Alternative 1 are included in **Figure 5-53**. The Build Alternative 1 queue lengths shown in **Figure 5-54** were generated using *Synchro* 95th percentile queues for the design year.

Table 5-10 Build Alternative 1 2026, 2036, and 2046 Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Blvd	EBL	52.7	D	0.28	52.8	D	0.28	53.0	D	0.38	100.4	F	0.56	52.7	D	0.43	99.9	F	0.59
	EBT	19.5	B	0.19	26.1	C	0.46	20.7	C	0.26	29.7	C	0.48	21.7	C	0.33	31.0	C	0.58
	EBR	8.3	A	0.33	87.0	F	1.14	9.5	A	0.45	109.1	F	1.17	10.7	B	0.56	223.8	F	1.44
	<i>EB Approach</i>	16.1	B	0.25	64.5	E	0.72	17.3	B	0.34	80.6	F	0.76	18.3	B	0.43	152.2	F	0.92
	WBL	53.2	D	0.34	52.8	D	0.45	52.8	D	0.40	176.6	F	1.02	53.0	D	0.47	255.2	F	1.25
	WBT	23.7	C	0.50	22.3	C	0.25	26.7	C	0.65	25.2	C	0.25	31.7	C	0.80	25.7	C	0.31
	WBR	3.4	A	0.37	4.4	A	0.42	4.7	A	0.48	5.4	A	0.43	6.8	A	0.60	7.7	A	0.52
	<i>WB Approach</i>	21.8	C	0.46	21.1	C	0.30	24.3	C	0.59	39.7	D	0.33	28.4	C	0.73	51.2	D	0.40
	NBL	51.4	D	0.04	51.4	D	0.04	51.4	D	0.04	96.5	F	0.07	51.4	D	0.04	96.5	F	0.07
	NBT	49.9	D	0.03	47.2	D	0.02	49.0	D	0.03	81.7	F	0.02	48.1	D	0.03	78.6	E	0.02
	NBR	32.7	C	0.58	31.8	C	0.76	32.1	C	0.65	83.8	F	0.89	31.8	C	0.71	105.4	F	0.93
	<i>NB Approach</i>	34.7	C	0.21	33.0	C	0.28	33.8	C	0.24	84.1	F	0.37	33.2	C	0.26	104.5	F	0.38
	SBL	37.0	D	0.31	37.2	D	0.38	38.4	D	0.38	74.5	E	0.54	40.1	D	0.45	85.4	F	0.73
	SBT	41.1	D	0.60	59.6	E	0.97	43.6	D	0.70	154.4	F	1.16	47.6	D	0.81	259.0	F	1.40
	SBR	19.2	B	0.22	15.8	B	0.07	19.6	B	0.26	37.8	D	0.09	19.8	B	0.30	38.7	D	0.10
	<i>SB Approach</i>	38.4	D	0.45	54.6	D	0.64	40.5	D	0.53	137.4	F	0.80	43.7	D	0.62	222.7	F	1.00
Overall		25.6	C	0.50	53.2	D	0.86	26.9	C	0.62	90.2	F	1.13	29.4	C	0.75	152.9	F	1.38

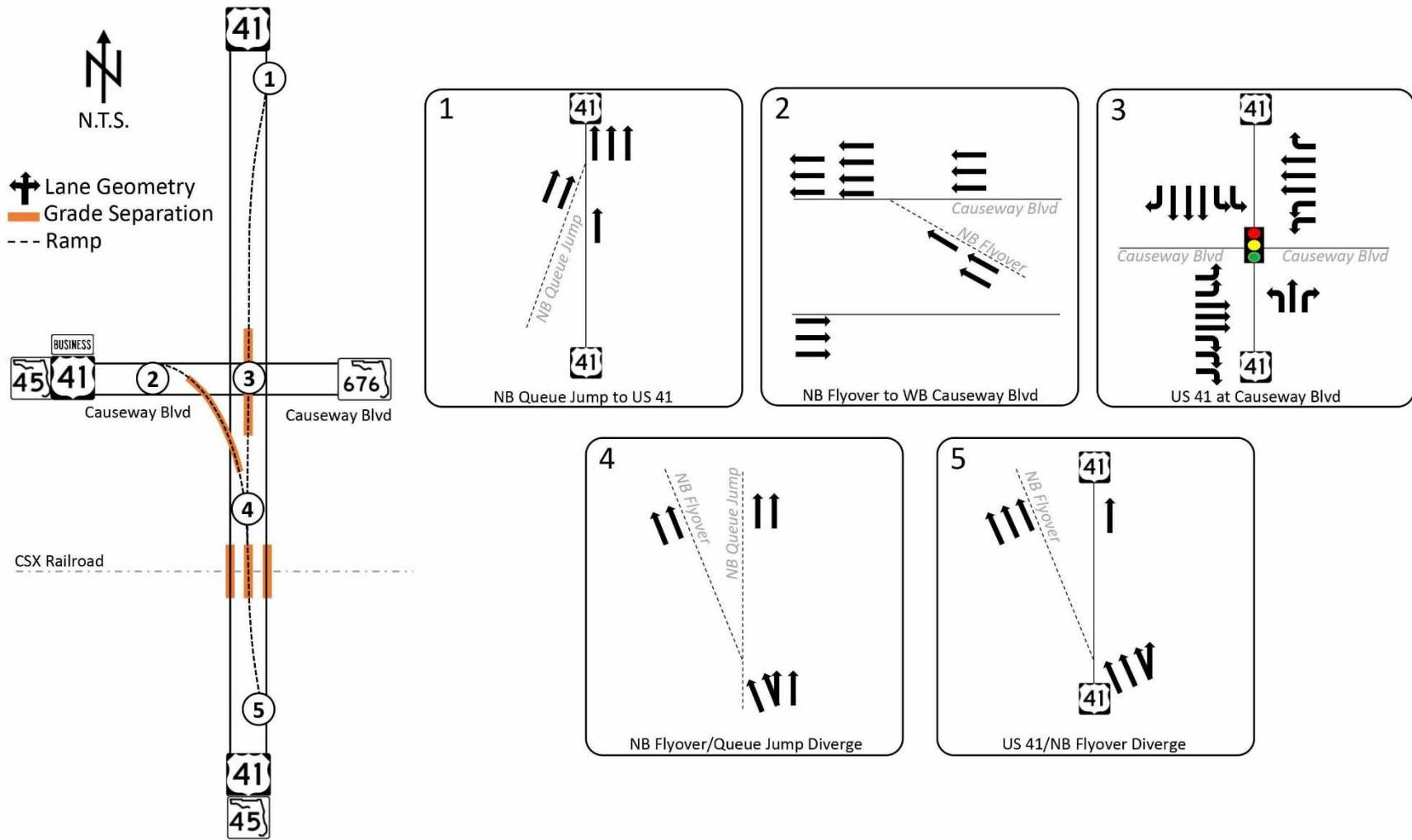


Figure 5-53 Build Alternative 1 Lane Configurations

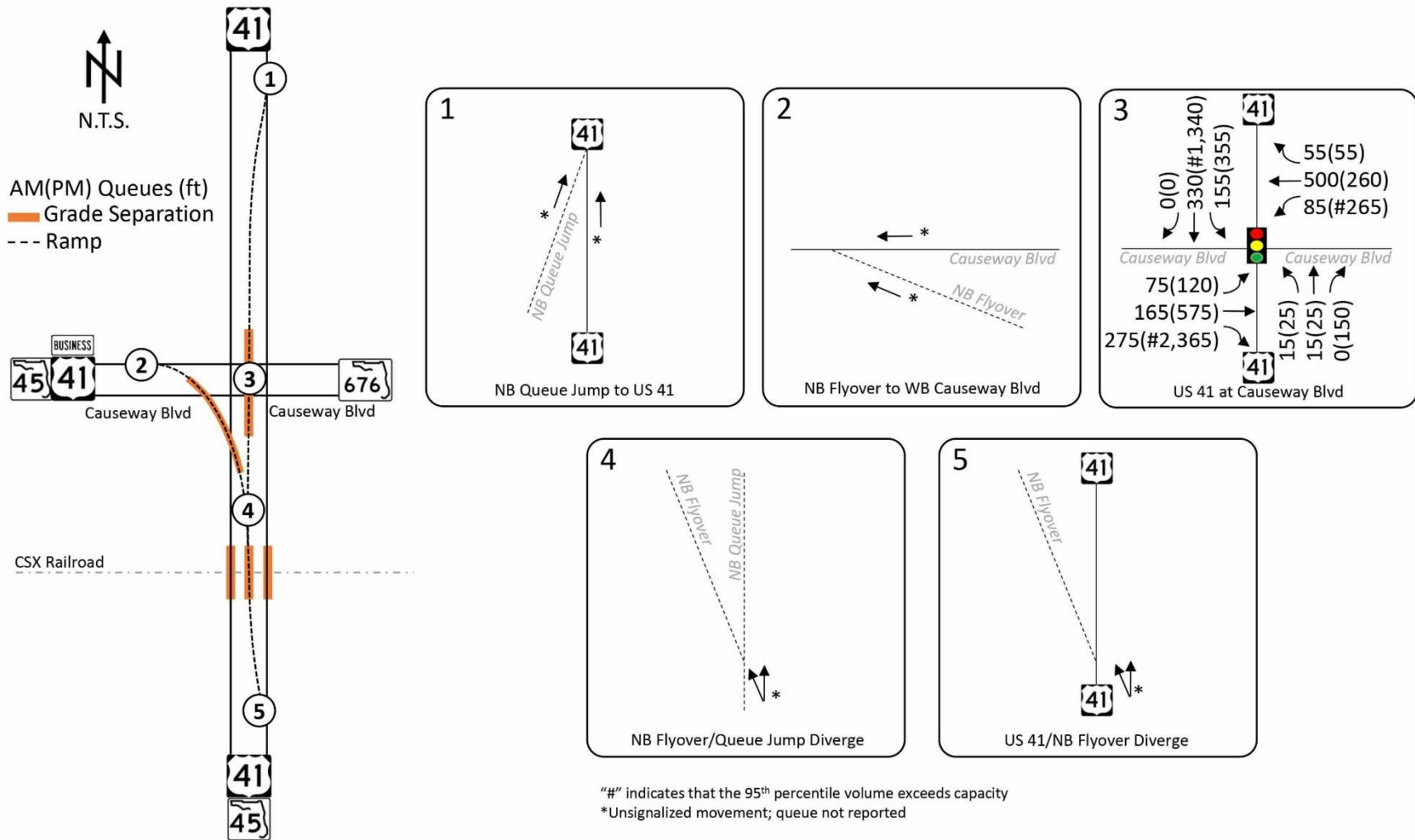


Figure 5-54 Build Alternative 1 Design Year 95th Percentile Queues

5.7.3.3 Build Alternative 2

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for Build Alternative 2 for opening, interim, and design years are presented in **Table 5-11**. The signalized intersections of US 41 at Causeway Boulevard and the Quadrant Roadway at Causeway Boulevard were evaluated.

The results indicate:

- For the opening year (2026):
 - During the AM peak hour:
 - Each intersection operates at LOS D or better.
 - At US 41 and Causeway Boulevard, the westbound left and southbound left movements operate at LOS E.
 - During the PM peak hour:
 - Each intersection operates at LOS D or better.
 - At US 41 and Causeway Boulevard, the westbound left operates at LOS E.
- For the interim year (2036):
 - During the AM peak hour:
 - Each intersection operates at LOS D or better.
 - At US 41 and Causeway Boulevard, the southbound left operates at LOS F. The westbound left operates at LOS E.
 - During the PM peak hour:
 - Each intersection operates at LOS D or better.
 - At US 41 and Causeway Boulevard, the westbound left operates at LOS E.
- For the design year (2046):
 - During the AM peak hour:
 - US 41 at Causeway Boulevard operates at LOS E.
 - At US 41 and Causeway Boulevard, several movements operate at LOS F, including the westbound through (over capacity), northbound through (over capacity), and southbound left (over capacity). The westbound left and right operate at LOS E.
 - Quadrant Roadway and Causeway Boulevard operates at LOS C.
 - During the PM peak hour:
 - Each intersection operates at LOS D or better.
 - At US 41 and Causeway Boulevard, the eastbound right, westbound left, and southbound left operate at LOS E.

The lane configurations for Build Alternative 2 are included in **Figure 5-55**. The Build Alternative 2 queue lengths shown in **Figure 5-56** were generated using *Synchro* 95th percentile queues for the design year.

Table 5-11 Build Alternative 2 2026, 2036, and 2046 Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Blvd	EBL	46.2	D	0.23	46.9	D	0.10	49.7	D	0.35	50.3	D	0.17	76.5	E	0.58	53.9	D	0.28
	EBT	16.2	B	0.27	43.7	D	0.51	17.8	B	0.37	48.7	D	0.68	22.1	C	0.44	52.9	D	0.81
	EBR	16.8	B	0.27	44.9	D	0.51	18.7	B	0.37	51.0	D	0.68	23.2	C	0.44	56.6	E	0.81
	EB Approach	20.7	C	0.26	44.3	D	0.40	22.6	C	0.37	49.6	D	0.57	30.1	C	0.46	54.2	D	0.73
	WBL	55.8	E	0.34	55.5	E	0.43	56.0	E	0.40	55.5	E	0.50	77.5	E	0.53	66.7	E	0.72
	WBT	42.0	D	0.76	36.7	D	0.40	54.9	D	0.95	33.4	C	0.44	97.0	F	1.07	30.9	C	0.48
	WBR	40.8	D	0.57	22.3	C	0.66	45.7	D	0.71	20.9	C	0.73	60.6	E	0.80	21.7	C	0.80
	WB Approach	42.6	D	0.67	35.0	C	0.45	53.3	D	0.84	32.7	C	0.51	89.4	F	0.96	33.0	C	0.57
	NBT	41.4	D	0.85	39.8	D	0.49	51.2	D	0.97	44.9	D	0.66	91.2	F	1.07	50.0	D	0.80
	NBR	13.0	B	0.15	39.3	D	0.34	11.4	B	0.17	44.1	D	0.46	16.2	B	0.19	47.8	D	0.56
	NB Approach	40.0	D	0.68	39.7	D	0.46	49.1	D	0.78	44.7	D	0.61	87.3	F	0.86	49.6	D	0.74
	SBL	55.1	E	0.61	52.0	D	0.63	81.2	F	0.89	52.9	D	0.69	127.8	F	1.02	57.6	E	0.78
	SBT	17.5	B	0.31	27.7	C	0.64	18.2	B	0.36	31.9	C	0.77	23.3	C	0.40	38.2	D	0.89
	SBR	15.7	B	0.11	19.4	B	0.05	15.9	B	0.13	20.5	C	0.06	20.0	B	0.15	20.6	C	0.07
	SB Approach	26.0	C	0.30	32.1	C	0.52	32.4	C	0.36	35.6	D	0.62	47.0	D	0.40	41.5	D	0.71
Overall	35.3	D	0.73	36.8	D	0.60	43.6	D	0.92	39.9	D	0.75	72.2	E	1.04	44.2	D	0.90	
Quadrant Roadway at Causeway Blvd	EBT	21.2	C	0.23	4.2	A	0.27	24.9	C	0.34	5.8	A	0.37	34.7	C	0.42	7.7	A	0.49
	EBR	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A	0.00
	EB Approach	21.2	C	0.23	4.2	A	0.27	24.9	C	0.34	5.8	A	0.37	34.7	C	0.42	7.7	A	0.49
	WBT	5.2	A	0.56	8.5	A	0.15	9.3	A	0.77	4.7	A	0.20	15.1	B	0.95	0.2	A	0.25
	WB Approach	5.2	A	0.56	8.5	A	0.15	9.3	A	0.77	4.7	A	0.20	15.1	B	0.95	0.2	A	0.25
	NBL	25.8	C	0.73	47.7	D	0.64	27.5	C	0.84	46.1	D	0.68	46.1	D	0.97	44.8	D	0.72
	NBR	15.4	B	0.01	42.0	D	0.02	13.5	B	0.01	39.5	D	0.02	16.7	B	0.01	37.3	D	0.02
	NB Approach	25.8	C	0.56	47.6	D	0.49	27.5	C	0.64	46.1	D	0.52	46.1	D	0.74	44.7	D	0.55
Overall	18.0	B	0.66	16.1	B	0.66	20.6	C	0.82	14.8	B	0.90	33.1	C	0.97	14.0	B	1.13	

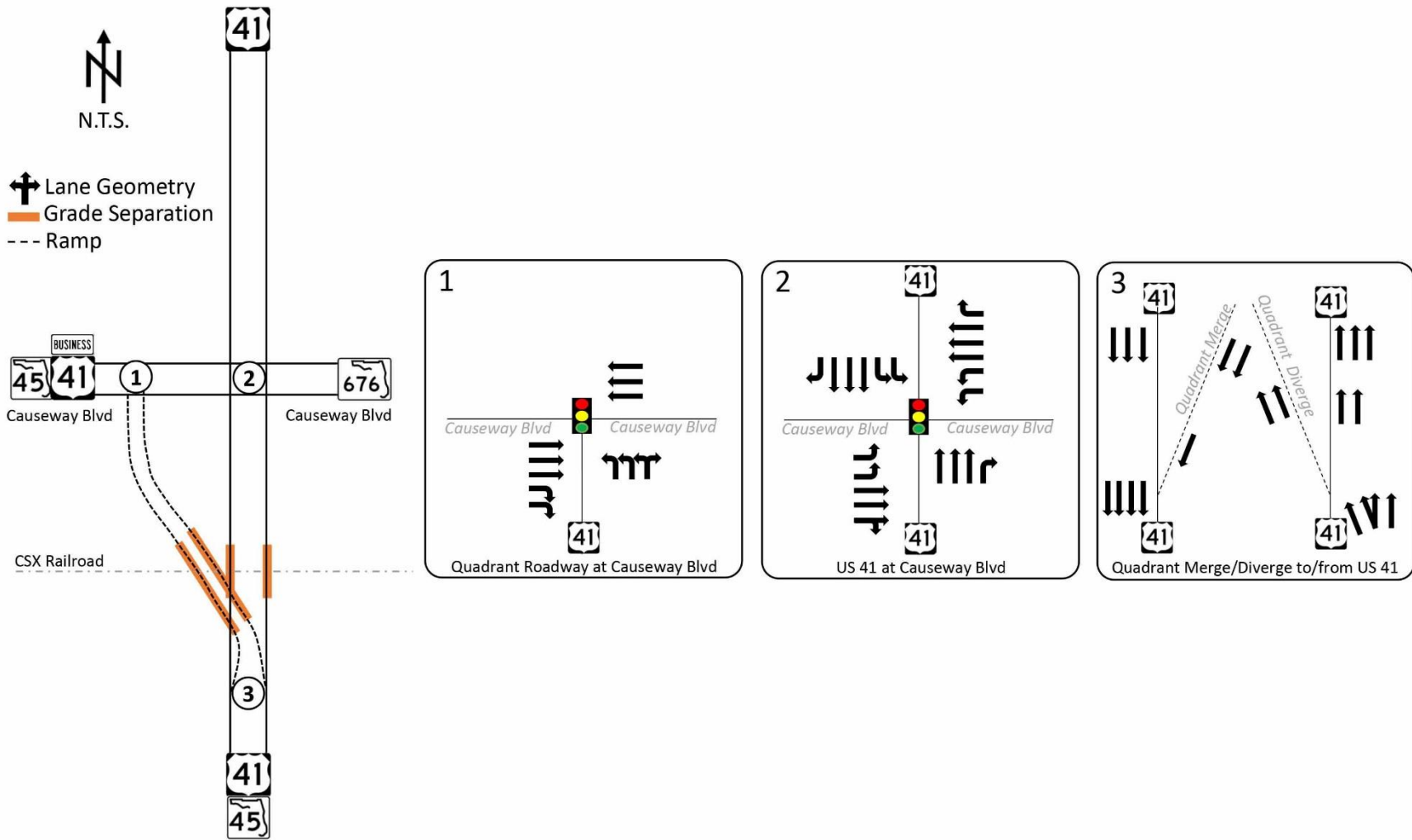


Figure 5-55 Build Alternative 2 Lane Configurations

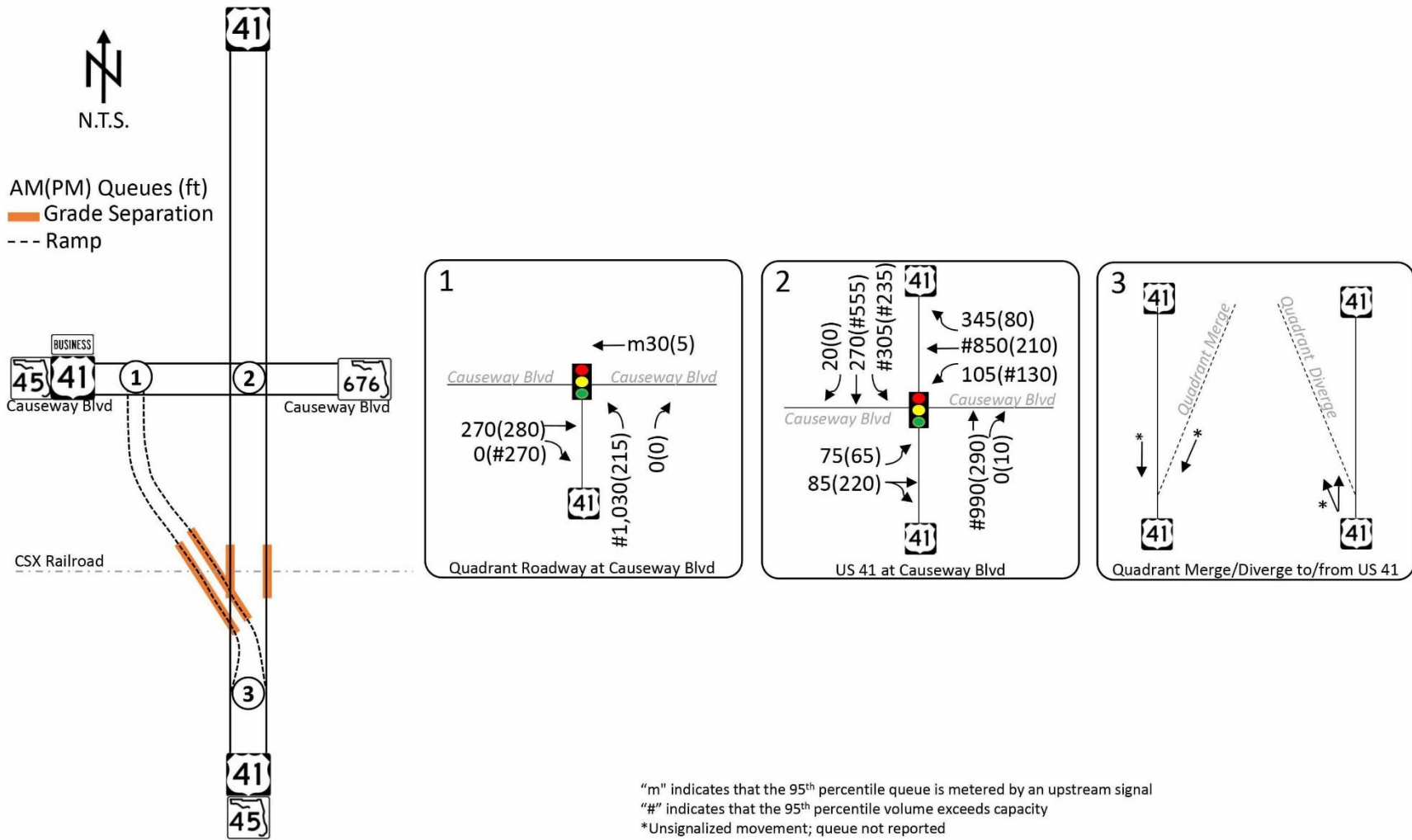


Figure 5-56 Build Alternative 2 Design Year 95th Percentile Queues

5.7.3.4 Build Alternative 3

The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for Build Alternative 3 opening, interim, and design years are presented in **Table 5-12**. The results for Build Alternative 3 have been reported using *HCM 2000* methodology as the use of clustered intersections is not permitted in *HCM 6th Edition* methodology. Unclustering the intersections also does not produce *HCM 6th Edition* results as the typical signal phases in a Diverging Diamond Interchange do not follow strict NEMA phasing. Reporting *HCM 2000* results when *HCM 6th Edition* results are not available is part of current standard practice given the limitations of *Synchro* software. The signalized intersection nodes of the Causeway Boulevard at the southbound right ramp, the western crossover, Causeway Boulevard at the southbound left ramp, Causeway Boulevard at the northbound left ramp, the eastern crossover, Causeway Boulevard at the northbound right ramp, and the eastbound right ramp at the westbound left ramp were evaluated.

The results indicate:

- For the opening year (2026):
 - During the AM peak hour, all intersections and approaches operate at LOS D or better.
 - During the PM peak hour:
 - All intersections operate at LOS D or better.
 - The westbound left movement/westbound approach at the eastbound right ramp and westbound left ramp intersection operates at LOS E.
- For the interim year (2036):
 - During the AM peak hour, all intersections and approaches operate at LOS D or better.
 - During the PM peak hour:
 - All intersections operate at LOS D or better.
 - The southbound left turn at the Causeway Boulevard and southbound left ramp intersection operates at LOS E.
 - The westbound left movement/westbound approach at the eastbound right ramp and westbound left ramp intersection operates at LOS F.
- For the design year (2046):
 - During the AM peak hour:
 - The western crossover and the eastern crossover operate at LOS E, with all other intersections operating at LOS D or better.
 - The eastbound through/approach at the western crossover operates at LOS F.
 - The southbound right/approach at Causeway Boulevard and the southbound right ramp intersection, the westbound through/approach at the western crossover, the northbound left/approach at Causeway Boulevard and the northbound left ramp intersection, and the westbound through/approach at the eastern crossover operate at LOS E.
 - During the PM peak hour:
 - All but two intersections operate at LOS D or better. The Causeway Boulevard at southbound left ramp operates at LOS F and the eastbound right ramp at westbound left ramp operates at LOS F.

- The southbound left/approach at the Causeway Boulevard at southbound left ramp, operates at LOS F and is over capacity.
- The eastbound right/approach at the eastbound right ramp operates at LOS F and is over capacity.

The lane configurations for Build Alternative 3 are included in **Figure 5-57**. The Build Alternative 3 queue lengths shown in **Figure 5-58** were generated using Synchro 95th percentile queues for the design year.

Table 5-12 Build Alternative 3 2026, 2036, and 2046 Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
Causeway Blvd at SBR Ramp	WBT/WB Approach	0.3	A	0.56	0.1	A	0.20	0.2	A	0.70	0.1	A	0.26	0.2	A	0.84	0.1	A	0.31
	SBR/SB Approach	31.8	C	0.14	14.1	B	0.02	39.6	D	0.19	9.5	A	0.02	62.4	E	0.25	20.1	C	0.03
	Overall	1.2	A	0.69	0.5	A	0.25	1.3	A	0.83	0.3	A	0.32	1.8	A	0.94	0.6	A	0.35
Western Crossover	EBT/EB Approach	35.7	D	0.54	18.1	B	0.46	48.1	D	0.74	13.6	B	0.50	91.7	F	0.96	32.0	C	0.71
	WBT/WB Approach	3.4	A	0.80	10.9	B	0.46	16.6	B	0.97	21.8	C	0.76	65.9	E	1.11	29.1	C	0.70
	Overall	8.2	A	0.81	14.5	B	0.50	21.6	C	0.99	17.6	B	0.66	70.2	E	1.13	30.6	C	0.74
Causeway Blvd at SBL Ramp	EBT/EB Approach	0.0	A	0.10	0.1	A	0.20	0.0	A	0.14	0.1	A	0.27	0.0	A	0.17	0.1	A	0.35
	SBL/SB Approach	10.0	A	0.26	29.4	C	0.62	9.4	A	0.27	76.3	E	0.98	19.7	B	0.34	568.8	F	2.08
	Overall	3.4	A	0.23	7.2	A	0.40	2.9	A	0.26	16.6	B	0.52	5.7	A	0.30	114.5	F	0.62
Causeway Blvd at NBL Ramp	WBT/WB Approach	0.1	A	0.23	0.0	A	0.13	0.1	A	0.30	0.1	A	0.17	0.0	A	0.37	0.1	A	0.20
	NBL/NB Approach	23.2	C	0.79	27.5	C	0.40	34.3	C	0.93	21.6	C	0.36	67.1	E	1.03	30.8	C	0.37
	Overall	13.8	B	0.59	12.1	B	0.24	19.9	C	0.70	9.2	A	0.28	38.3	D	0.77	12.9	B	0.30
Eastern Crossover	EBT/EB Approach	12.5	B	0.24	8.2	A	0.53	14.8	B	0.31	8.9	A	0.64	32.7	C	0.38	7.3	A	0.76
	WBT/WB Approach	30.6	C	0.74	18.8	B	0.32	42.8	D	0.90	22.8	C	0.46	75.7	E	1.01	35.9	D	0.52
	Overall	24	C	0.46	11.8	B	0.47	32.7	C	0.57	13.6	B	0.62	60.3	E	0.65	17.1	B	0.69
Causeway Blvd at NBR Ramp	EBT/EB Approach	0.1	A	0.14	0.1	A	0.26	0.1	A	0.18	0.2	A	0.33	0.1	A	0.21	0.2	A	0.41
	NBR/NB Approach	22.9	C	0.16	18.3	B	0.21	26.6	C	0.18	21.7	C	0.28	37.1	D	0.20	33.0	C	0.33
	Overall	2.4	A	0.17	1.8	A	0.32	2.7	A	0.21	2.1	A	0.41	3.7	A	0.24	3.0	A	0.46
EBR Ramp at WBL Ramp	EBR/EB Approach	3.0	A	0.20	7.7	A	0.76	2.4	A	0.29	43.5	D	1.05	7.0	A	0.35	261.9	F	1.51
	WBL/WB Approach	19.3	B	0.40	66.1	E	0.57	43.5	D	0.73	98.9	F	0.91	22.5	C	0.41	32.1	C	0.36
	Overall	5.2	A	0.24	11.8	B	0.80	7.8	A	0.35	47.2	D	1.13	9	A	0.37	246.7	F	1.18

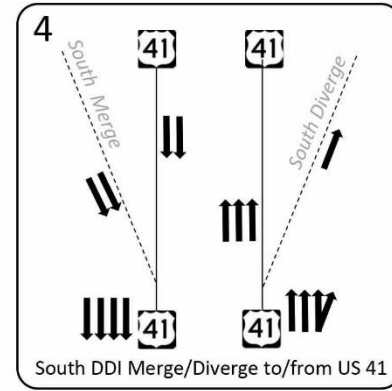
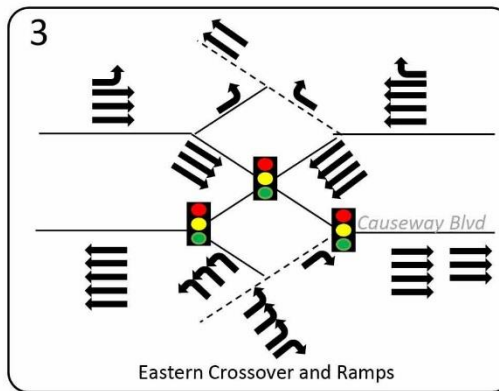
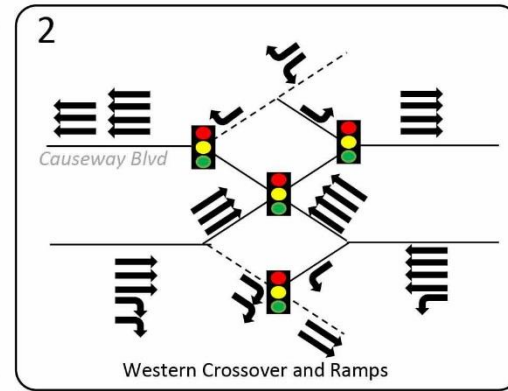
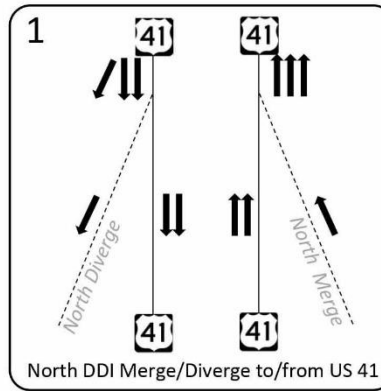
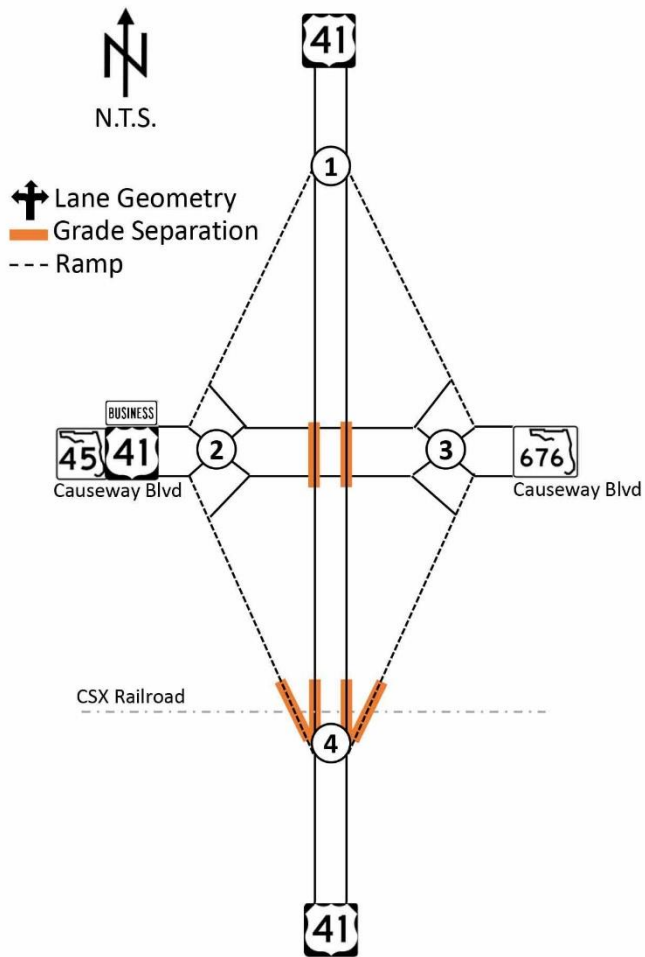
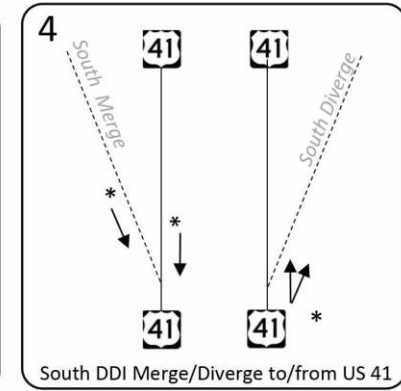
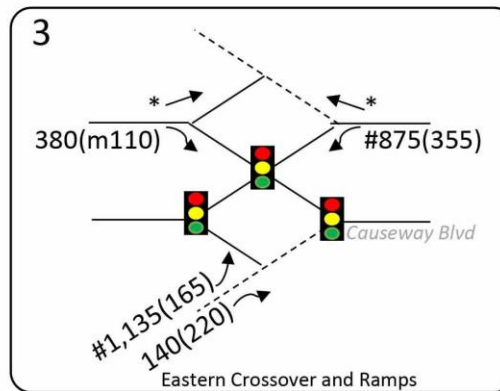
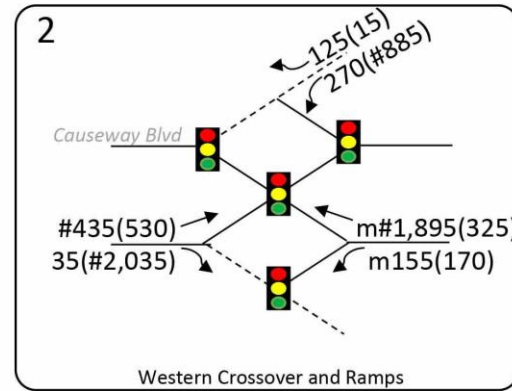
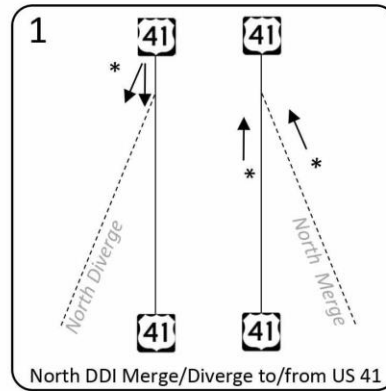
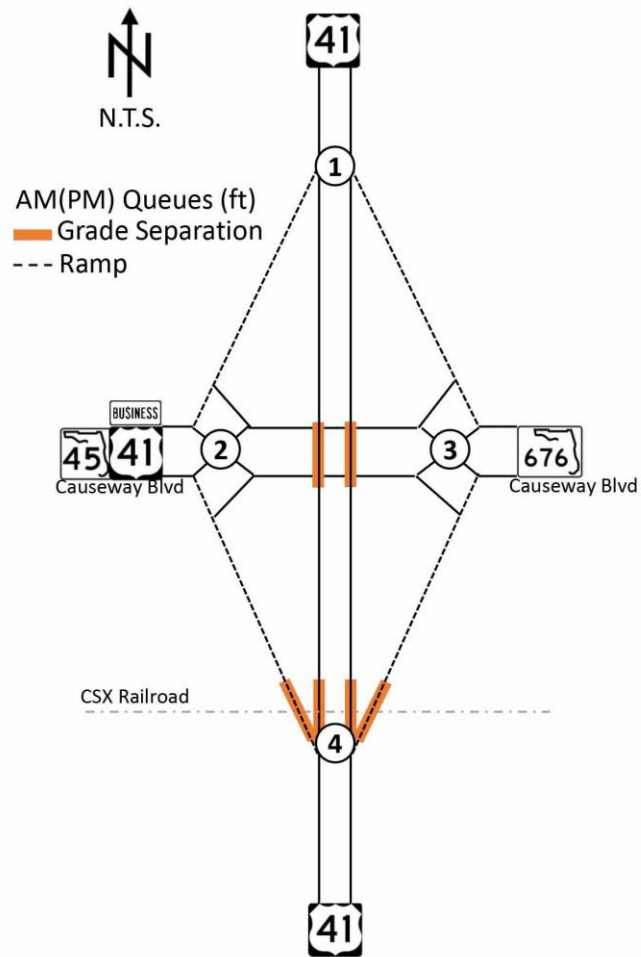


Figure 5-57 Build Alternative 3 Lane Configurations



"m" indicates that the 95th percentile queue is metered by an upstream signal
 "#" indicates that the 95th percentile volume exceeds capacity
 *Unsignalized movement; queue not reported

Figure 5-58 Build Alternative 3 Design Year 95th Percentile Queues

5.7.3.5 Build Alternative 4

With the inclusion of an additional phase to clear northbound U-turns prior to the northbound left and eastbound right overlap phase, the intersection operates with a non-NEMA phasing configuration and requires the use of *HCM 2000* methodology to display results. The use of *HCM 2000* methodology in this situation is part of current standard practice given the limitations of *Synchro* software. The operational results of the *Synchro* analysis, including delay (seconds per vehicle), LOS, and v/c ratio, for Build Alternative 4 opening, interim, and design years are presented in **Table 5-13**. The signalized intersection US 41 at Causeway Boulevard was evaluated.

The results indicate:

- For the opening year (2026):
 - During the AM peak hour:
 - The intersection operates at LOS D.
 - The eastbound left and southbound through movements operate at LOS E.
 - During the PM peak hour:
 - The intersection operates at LOS C.
 - The southbound through movement operates at LOS E.
- For the interim year (2036):
 - During the AM peak hour:
 - The intersection operates at LOS D.
 - The eastbound left, westbound left, westbound through, northbound left, northbound through, and southbound through operate at LOS E.
 - During the PM peak hour:
 - The intersection operates at LOS E.
 - The eastbound left, eastbound right, westbound left, northbound through, and southbound through operate at LOS E.
 - The eastbound through operates at LOS F.
- For the design year (2046):
 - During the AM peak hour:
 - The intersection operates at LOS F.
 - The eastbound left, westbound left, northbound through, and southbound through operate at LOS E.
 - The westbound through and northbound left operate at LOS F.
 - During the PM peak hour:
 - The intersection operates at LOS F.
 - The eastbound left, westbound left, northbound through, and southbound through operate at LOS E.
 - The eastbound through and eastbound right operate at LOS F.

The lane configurations for Build Alternative 4 are included in **Figure 5-59**. The Build Alternative 4 queue lengths shown in **Figure 5-60** were generated using *Synchro* 95th percentile queues for the design year.

Table 5-13 Build Alternative 4 2026, 2036, and 2046 Intersection Operations

Intersection	Movement/ Approach	2026						2036						2046					
		AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C	Delay (sec/veh)	LOS	V/C
US 41 at Causeway Blvd	EBL	55.8	E	0.23	50.2	D	0.20	58.9	E	0.43	63.9	E	0.27	64.0	E	0.35	64.0	E	0.33
	EBT	35.0	C	0.29	38.7	D	0.65	38.2	D	0.39	98.0	F	1.06	42.0	D	0.47	209.1	F	1.33
	EBR	10.9	B	0.20	20.4	C	0.71	11.1	B	0.26	58.1	E	1.04	11.5	B	0.33	207.2	F	1.39
	EB Approach	24.2	C	0.30	27.7	C	0.80	25.8	C	0.38	72.4	E	1.10	28.0	C	0.47	204.3	F	1.39
	WBL	53.6	D	0.23	48.4	D	0.29	58.9	E	0.46	63.8	E	0.42	64.0	E	0.37	62.8	E	0.47
	WBT	41.6	D	0.71	30.9	C	0.33	59.7	E	0.97	48.4	D	0.53	122.7	F	1.14	49.9	D	0.63
	WBR	32.4	C	0.17	29.6	C	0.18	36.4	D	0.22	44.3	D	0.24	39.3	D	0.27	44.5	D	0.29
	WB Approach	40.6	D	0.60	32.9	C	0.37	55.5	E	0.80	49.3	D	0.58	104.5	F	0.97	50.1	D	0.68
	NBL	38.9	D	0.87	24.9	C	0.27	74.3	E	1.03	22.3	C	0.27	150.0	F	1.23	24.2	C	0.32
	NBT	55.0	D	0.03	51.6	D	0.04	59.8	E	0.05	63.6	E	0.03	64.7	E	0.04	64.4	E	0.04
	NBR	31.1	C	0.05	32.4	C	0.09	32.4	C	0.06	28.4	C	0.11	33.7	C	0.08	30.0	C	0.13
	NB Approach	38.6	D	0.69	26.7	C	0.27	72.4	E	0.84	23.8	C	0.26	144.8	F	0.98	25.6	C	0.31
	SBL	27.3	C	0.20	27.4	C	0.27	29.1	C	0.23	26.4	C	0.26	31.0	C	0.26	27.6	C	0.30
	SBT	60.3	E	0.07	55.2	E	0.07	65.4	E	0.56	70.4	E	0.08	70.4	E	0.08	70.4	E	0.08
	SBR	25.6	C	0.06	24.6	C	0.02	27.1	C	0.07	23.4	C	0.03	28.5	C	0.08	24.0	C	0.03
	SB Approach	27.3	C	0.18	27.5	C	0.20	29.0	C	0.21	26.7	C	0.19	30.8	C	0.24	27.7	C	0.22
Overall		35.2	D	0.73	28.6	C	0.55	53.2	D	0.91	58.2	E	0.86	96.3	F	1.09	139.6	F	1.12

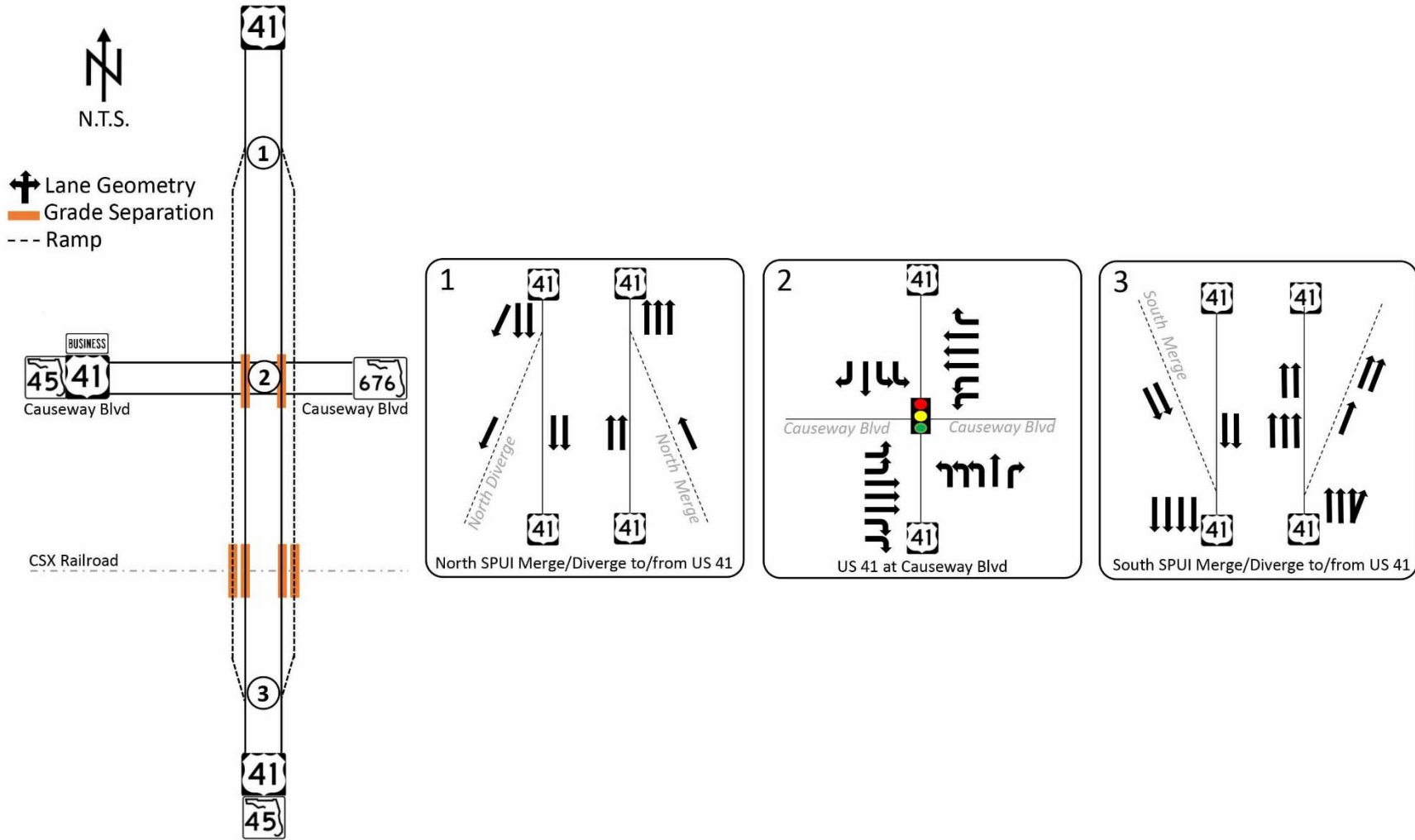


Figure 5-59 Build Alternative 4 Lane Configurations

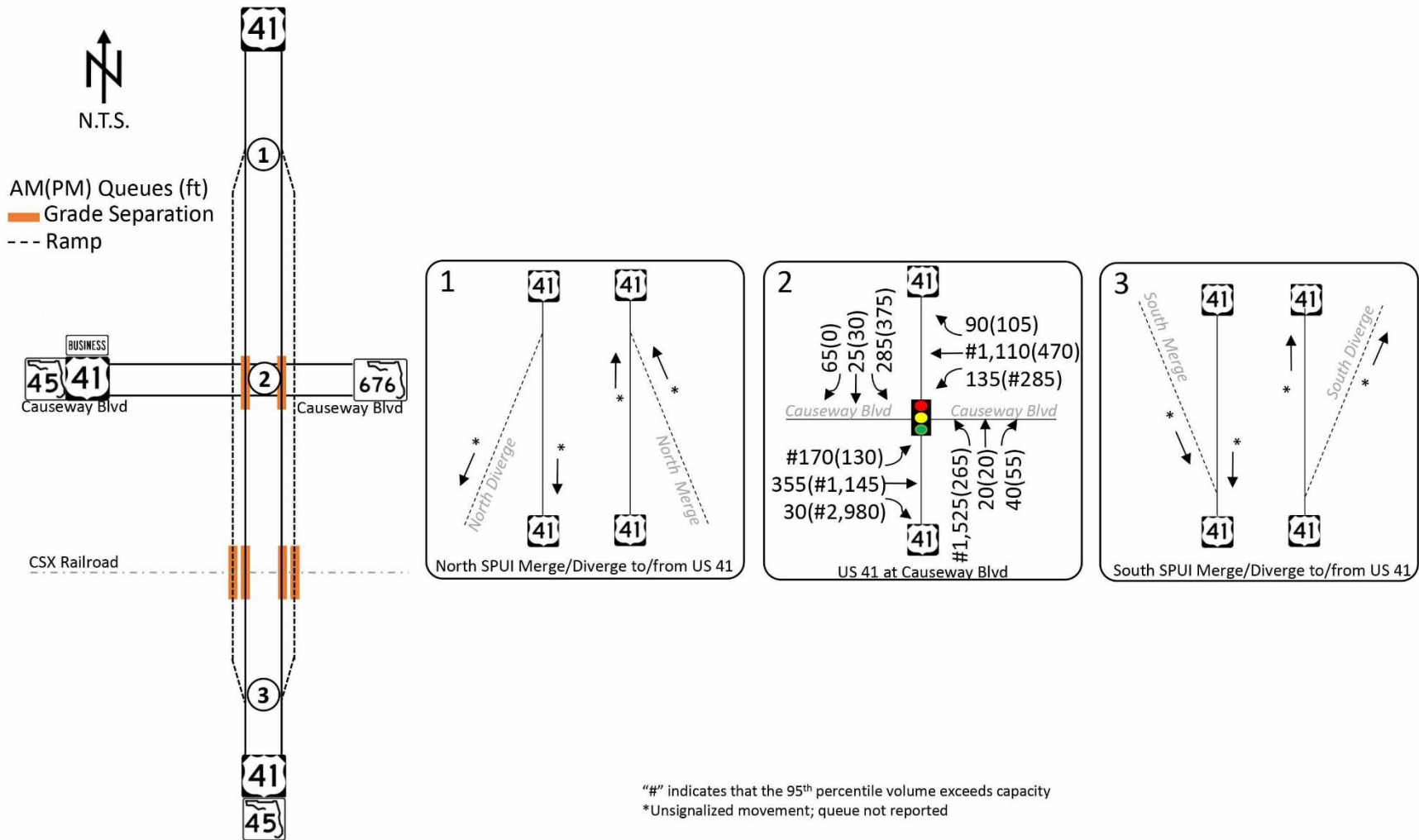


Figure 5-60 Build Alternative 4 Design Year 95th Percentile Queues

5.7.3.6 Preferred Alternative

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 5-14**. The signalized intersections of US 41 at Hartford Street, US 41 at Causeway Boulevard, and Causeway Boulevard at 47th Street were evaluated. These data are further provided in the Project Traffic Analysis Report Supplement (March 2023).

The results indicate:

- For the opening year (2026):
 - During the AM peak hour:
 - US 41 at Hartford Street operates at overall LOS C with several movements at LOS F or E.
 - US 41 at Causeway Boulevard operates at overall LOS F with several movements at LOS F or E.
 - Causeway Boulevard at 47th Street operates at overall LOS E with several movements at LOS F or E.
 - During the PM peak hour:
 - US 41 at Hartford Street operates at overall LOS C with one movement at LOS E.
 - US 41 at Causeway Boulevard operates at overall LOS E with several movements at LOS F or E.
 - Causeway Boulevard at 47th Street operates 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 operates at overall LOS F with several movements at LOS F or E.
 - US 41 at Causeway Boulevard operates at overall LOS F with several movements at LOS F or E.
 - Causeway Boulevard at 47th Street operates at overall LOS F with several movements at LOS F or E.
 - During the PM peak hour:
 - US 41 at Hartford Street operates at overall LOS F with several movements at LOS F or E.
 - US 41 at Causeway Boulevard operates at overall LOS F with several movements at LOS F or E.
 - Causeway Boulevard at 47th Street operates 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 operates at overall LOS F with several movements at LOS F or E.

- US 41 at Causeway Boulevard operates at overall LOS F with several movements at LOS F or E.
- Causeway Boulevard at 47th Street operates at overall LOS F with several movements at LOS F or E.
- During the PM peak hour:
 - US 41 at Hartford Street operates at overall LOS F with several movements at LOS F or E.
 - US 41 at Causeway Boulevard operates at overall LOS F with several movements at LOS F or E.
 - Causeway Boulevard at 47th Street operates at overall LOS F with several movements at LOS F or E.

Although the Preferred Alternative operates 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 5-61**. The Preferred Alternative queue lengths shown in **Table 5-16** were generated using Synchro 95th percentile queues for the design year. See the *Project Traffic Analysis Report Supplement* for more information on the Preferred Alternative.

Table 5-14 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	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 5-15 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	A	A		4		4	A	A				
	NBR	30	69		A		A	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	A	A		4		4	A	A				
	SBR	8	3		A		A	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	

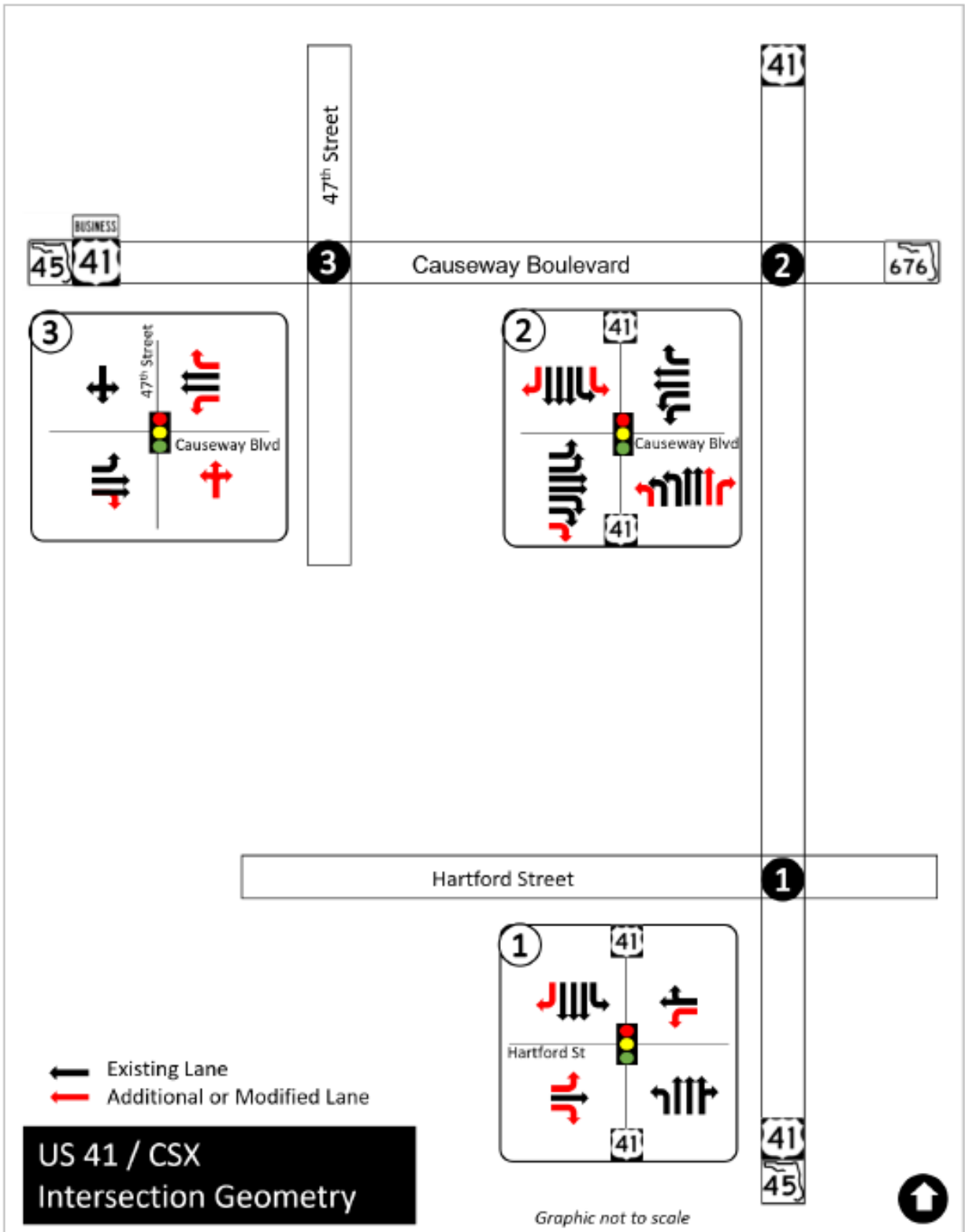


Figure 5-61 Preferred Alternative Lane Configurations

Table 5-16 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
	<i>EB Approach</i>	-	-	-	-	-	-	-
	WBL	106	74	123	81	146	82	200
	WBT	206	65	271	82	346	102	
	WBR							
	<i>WB Approach</i>	-	-	-	-	-	-	-
	NBL	68	18	83	25	97	27	290
	NBT	#1239	247	#1897	381	#2429	509	
	NBR							
	<i>NB Approach</i>	-	-	-	-	-	-	-
	SBL	#74	156	#105	218	#132	#293	360
	SBT	252	#883	408	#1468	540	#2054	
	SBR	9	0	19	4	27	9	595
	<i>SB Approach</i>	-	-	-	-	-	-	-
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
	<i>EB Approach</i>	-	-	-	-	-	-	-
	WBL	#112	#137	#153	#191	#193	#246	520
	WBT	#1123	374	#1602	510	#2080	#718	
	WBR	182	209	269	297	372	402	330
	<i>WB Approach</i>	-	-	-	-	-	-	-
	NBL	#986	234	#1344	290	#1698	349	940
	NBT	638	259	#927	332	#1243	404	
	NBR	33	83	53	116	71	149	600
	<i>NB Approach</i>	-	-	-	-	-	-	-
	SBL	205	237	232	272	266	313	680
	SBT	375	633	447	#843	#527	#1052	
	SBR	15	0	32	0	48	1	395
	<i>SB Approach</i>	-	-	-	-	-	-	-
OVERALL	-	-	-	-	-	-	-	

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

Table 5-17 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							
	<i>EB Approach</i>	-	-	-	-	-	-	-
	WBL	65	35	78	42	91	48	335
	WBT	#1754	233	#2491	367	#3277	568	0
	WBR	0	0	0	0	0	0	0
	<i>WB Approach</i>	-	-	-	-	-	-	-
	NBL	68	85	78	116	101	150	0
	NBT							
	NBR							
	<i>NB Approach</i>	-	-	-	-	-	-	-
	SBL	43	41	49	47	55	53	0
	SBT							
	SBR							
<i>SB Approach</i>	-	-	-	-	-	-	-	
OVERALL	-	-	-	-	-	-	-	

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

5.7.4 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 5-18** 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 5-18 User Delay Costs by Year and Peak Hour

Alternative	User Cost Metrics	2026		2036		2046	
		AM	PM	AM	PM	AM	PM
No Build	Weighted Intersection Delay (s/veh)	161.8	119.2	262.9	230.5	371.6	369.6
	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	\$6,958	\$4,921	\$14,144	\$12,111	\$23,996	\$23,550
Build Alternative 1	Weighted Intersection Delay (s/veh)	13.6	44.2	14.6	75.5	21.2	128.5
	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	\$585	\$1,825	\$785	\$3,965	\$1,367	\$8,189
Build Alternative 2	Weighted Intersection Delay (s/veh)	32.6	29.7	39.6	31.0	89.2	33.2
	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	\$1,404	\$1,226	\$2,133	\$1,628	\$5,760	\$2,113
Build Alternative 3	Weighted Intersection Delay (s/veh)	18.1	15.2	30.5	28.8	81.8	115.4
	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	\$780	\$627	\$1,639	\$1,512	\$5,281	\$7,353
Build Alternative 4	Weighted Intersection Delay (s/veh)	23.8	19.8	36.6	41.7	73.3	102.0
	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	\$1,023	\$819	\$1,969	\$2,191	\$4,733	\$6,498
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 5-19**.

Table 5-19 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 relevant agencies (e.g., Hillsborough County, Hillsborough Transportation Planning Organization, Port Tampa Bay/Tampa Port Authority, etc.) have been informed through various coordination including meetings, newsletters, and a project website (<https://active.fdotd7studies.com/us41/csx-to-sr676/>). This coordination will be documented in the project's Comments and Coordination Report and will be available in the project file pending completion.

State, federal, and local agency coordination for the project/segments being advanced began with the Efficient Transportation Decision Making (ETDM) process August 10, 2018 when the Advance Notification (AN) package was submitted through the Environmental Screening Tool (EST) to provide the Environmental Technical Assistance Team (ETAT) the opportunity to review the project and provide comments. Although the ETDM process did not exist at the time of the original study, the Advance Notification was reviewed under ETDM project # 14345.

Project kick-off notification e-mails were sent to State of Florida, Hillsborough County, and City of Tampa elected officials on September 26, 2018. A project kick-off newsletter was sent to adjacent property owners and the general public September 28, 2018.

An agency kick-off meeting was held on December 7, 2018, where three (3) project alternatives were presented to public officials, and agency and local utility representatives, including one Hillsborough County Commissioner, Hillsborough Planning Commission staff, City of Tampa Wastewater staff, Port Tampa Bay staff and Tampa Bay Pipeline Corporation staff.

Project update meetings were held with various local agencies to review the project's four (4) updated alternatives. FDOT made presentations to the following agencies on the following dates. The purpose of these meetings was to allow these entities to review and provide input on the four alternatives in advance of the Alternatives Public Workshop.

- 1) Hillsborough Transportation TPO's Citizen's Advisory Committee (CAC) and Bicycle and Pedestrian Advisory Committee (BPAC) – September 11, 2019
- 2) TPO Technical Advisory Committee (TAC) and Livable Roadways Committee (LRC) – September 18, 2019
- 3) Port Tampa Bay – October 16, 2019
- 4) Hillsborough County – November 13, 2019

The Alternatives Public Workshop was held on Tuesday, November 19, 2019, at Port Tampa Bay, Terminal 6, 1101 Channelside Drive, Tampa, FL 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 proposed improvements to US 41 within the project limits (4 initial alternatives).

A second round of project update meetings was held with various local agencies to review the Preferred Alternative. FDOT made presentations to the following agencies on the following dates. The purpose of these meetings was to allow these entities to review and provide input on the Preferred Alternative in advance of the Public Hearing.

- 1) Hillsborough County – April 6, 2023
- 2) TPO LRC – April 19, 2023
- 3) TPO BPAC – April 26, 2023
- 4) TPO TAC – May 1, 2023
- 5) TPO CAC – May 3, 2023
- 6) TPO Board – May 10, 2023

(Section to be completed after the hearing.) An in-person public hearing will be held on June 1, 2023 from 5:30 pm to 7:30 pm at Port Tampa Bay Terminal 6, 1331 McKay St, Tampa, FL 33602. A virtual (internet-based) hearing will be held concurrently with the in-person event. Each comment will be evaluated and incorporated into the project to the extent feasible per FDOT's design and safety standards and other project environmental considerations. A certified public hearing transcript will be prepared.

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 plans are included in **Appendix A**.

7.1 ENGINEERING DETAILS OF THE PREFERRED ALTERNATIVE

7.1.1 Typical Sections

There are multiple typical sections throughout the project limits. See **Appendix C** for the Typical Section Package.

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 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 direction and no changes in turn lanes to US 41 in the the westbound direction. Concrete pavement will be used where appropriate. The proposed improvements will require the acquisition of right-of-way varying from 10 to 37 feet along the north side only. See **Figure 7-1** for details.

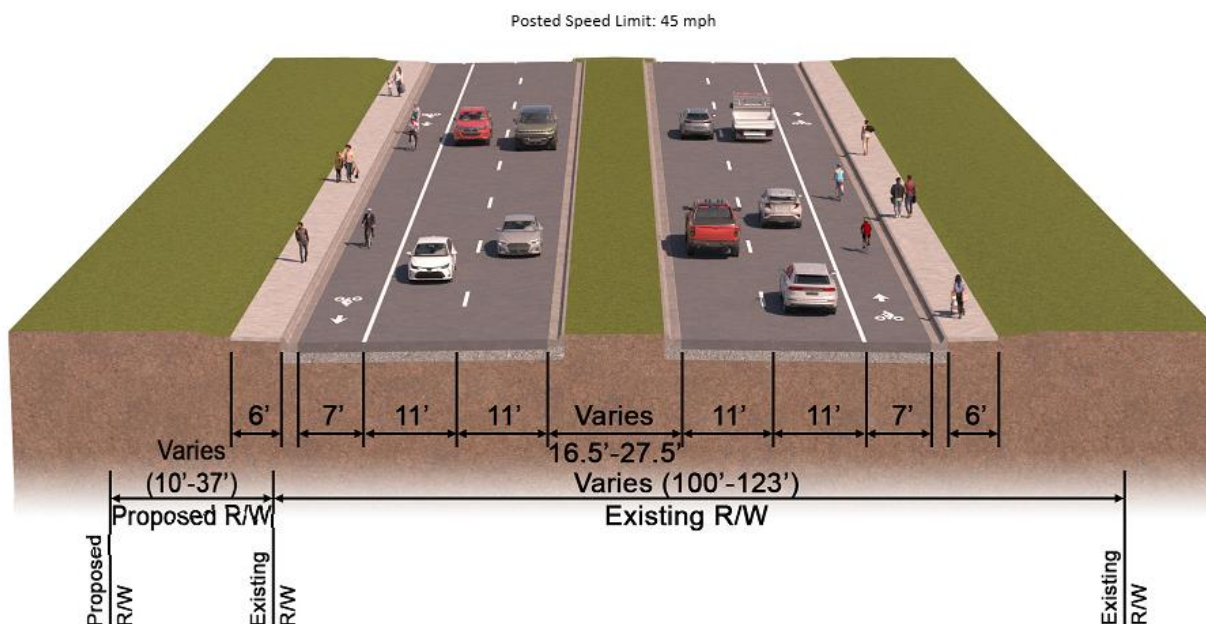


Figure 7-1 Typical Section: Causeway Boulevard from S. 45th Street to US 41

The Preferred Alternative now provides 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 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 at-grade improvements along US 41 will require the acquisition of ROW varying from 30 to 90 feet. See **Figure 7-2** for details.

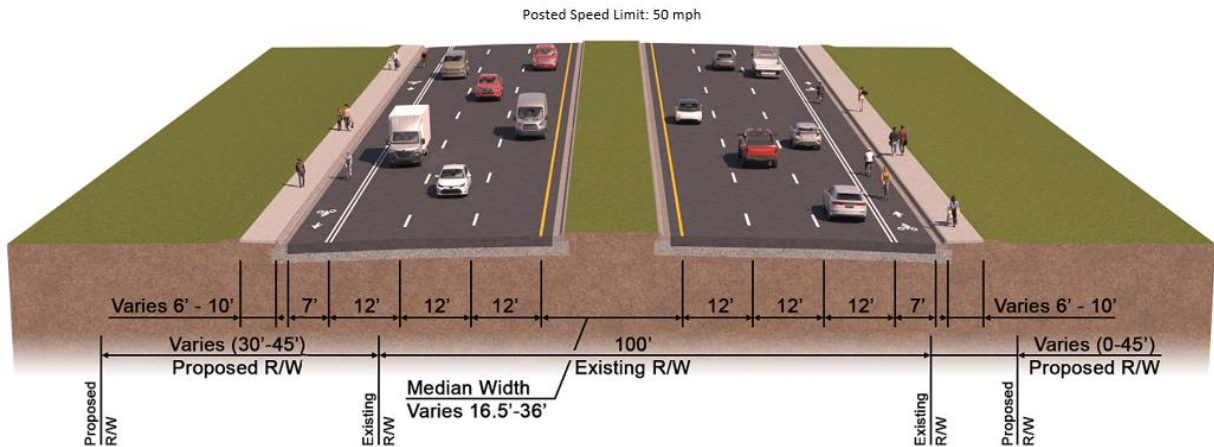


Figure 7-2 Typical Section: US 41 from S. of Denver St. to N. of Causeway Blvd. (at-grade)

Within this segment, the elevated section from north of Trenton Street to south of St. Paul Street, 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. See **Figure 7-3** for details.

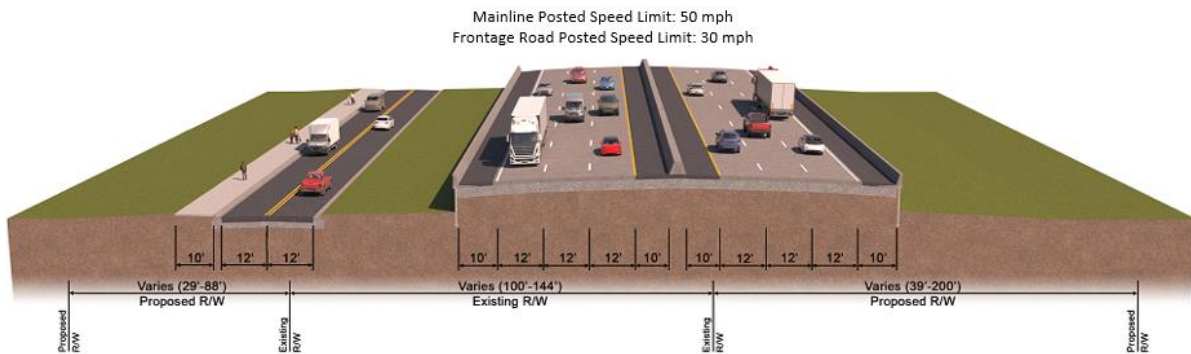


Figure 7-3 Typical Section: US 41 from N. of Trenton Street to South of St. Paul Street (elevated)

Bridge overpasses are proposed for the US 41 mainline over Delaney Creek, S. 36th Avenue, 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. See **Figure 7-4** for details.

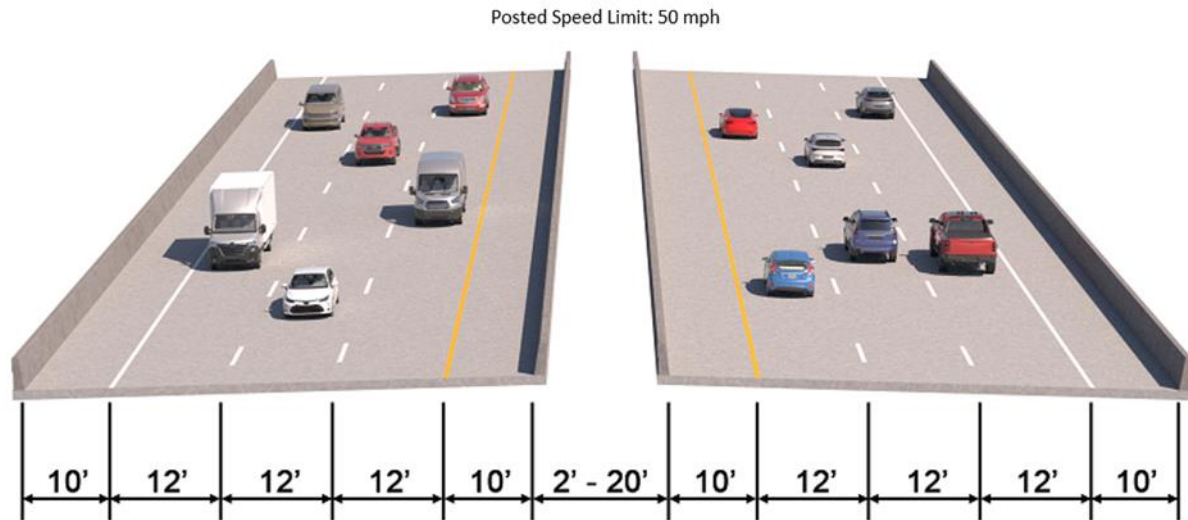


Figure 7-4 Typical Section: US 41 over Delaney Creek, S. 36th Ave., and CSX Railroad Right-of-Way/St. Paul Street (bridges)

7.1.2 Bridges and Structures

Table 7-1 contains the structure spans, length, and depths of all the structures of Preferred Alternative. Details of each structure are included in the following sections.

Table 7-1 Preferred Alternative Structures Spans, Length, and Depth

Bridge Location	Span Arrangement	Bridge Length	Approximate Superstructure Depth
Frontage Rd. over Delaney Creek	Single Span	90'-0"	4'-0"
US 41 over Delaney Creek	Single Span	99'-0"	4'-9"
Ramp A over Delaney Creek	Single Span	111'-0"	4'-9"
US 41 over 36th Avenue	Single Span	153'-0"	7'-6"
US 41 SB over CSX Railroad	153'-0" – 252'-9"	405'-9"	8'-0" (Span 1), 10'-0" (Span 2)
US 41 NB over CSX Railroad	153'-0" – 252'-9"	405'-9"	8'-0" (Span 1), 10'-0" (Span 2)

7.1.2.1 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 Florida-I beam bridges. The Preferred Alternative includes three different bridge water crossings over Delaney Creek, as shown **Figure 7-5**, 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 typical section of the mainline bridge consists of three 12'-0" traffic lanes with 10'-0" 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. There is a gore tapering to a 0'-0" width at the northbound outside shoulder due to the departure of the off-ramp lane, resulting in a varying bridge width, with a 116'-8" minimum width.

The typical section of the frontage road bridge consists of two 12'-0" traffic lanes, a 2'-6" inside shoulder, a variable width outside shoulder, and a raised 10'-0" 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 bridge width varies.

The typical section of the northbound off-ramp bridge consists of a single 15'-0" traffic lane, a 7'-0" bicycle lane, a 2'-6" inside shoulder, a 1'-4" outside shoulder, and a raised 10'-0" 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, resulting in a total bridge width of 38'-3".

Each proposed bridge consists of a single-span Florida-I beam superstructure. Bridge lengths measured along the respective baselines are 90'-0" for the frontage road bridge, 99'-0" for the mainline bridge, and 111'-0" for 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.

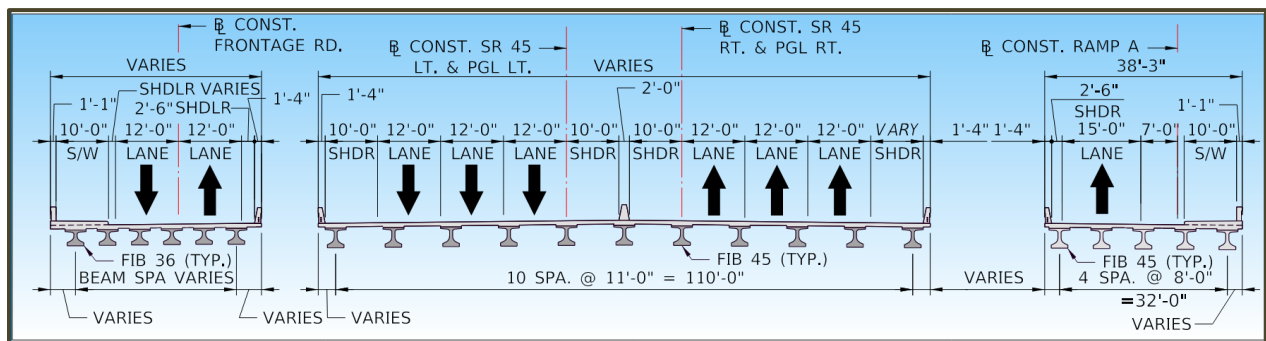


Figure 7-5 US 41 Bridges over Delaney Creek

7.1.2.2 Structure over 36th Avenue

The Preferred Alternative consists of the proposed bridge shown in **Figure 7-6** to carry the US 41 mainline over 36th Avenue. 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. 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.

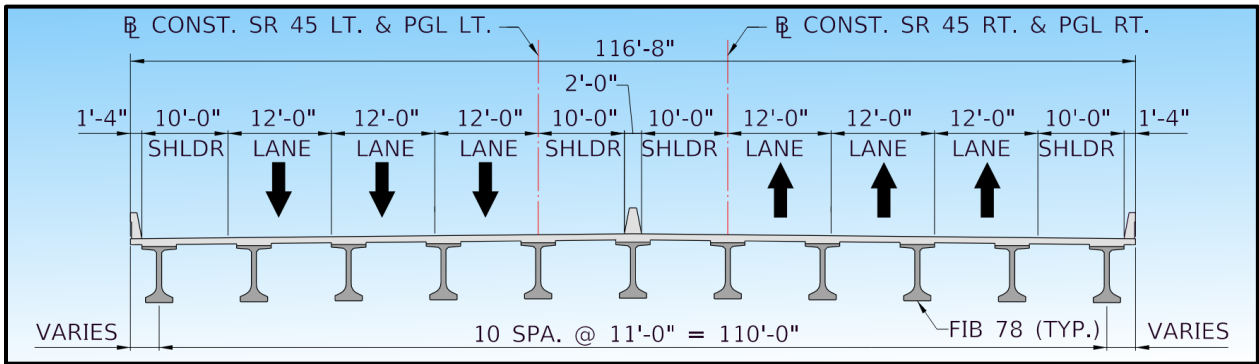


Figure 7-6 US 41 Bridge over 36th Avenue

7.1.2.3 Structures over CSX Railroad

The Preferred Alternative consists of two proposed bridges shown in **Figure 7-7** and **Figure 7-8** 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 right-of-way. 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.

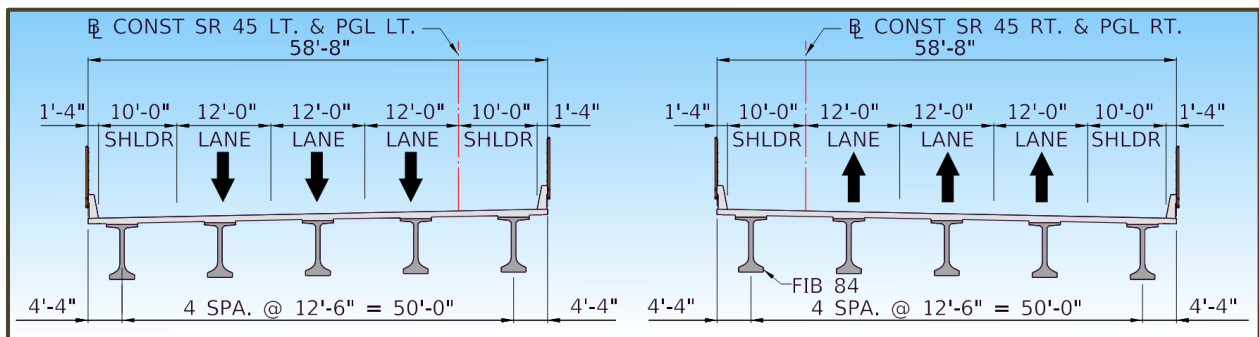


Figure 7-7 US 41 Bridges over CSX Railroad – Span 1

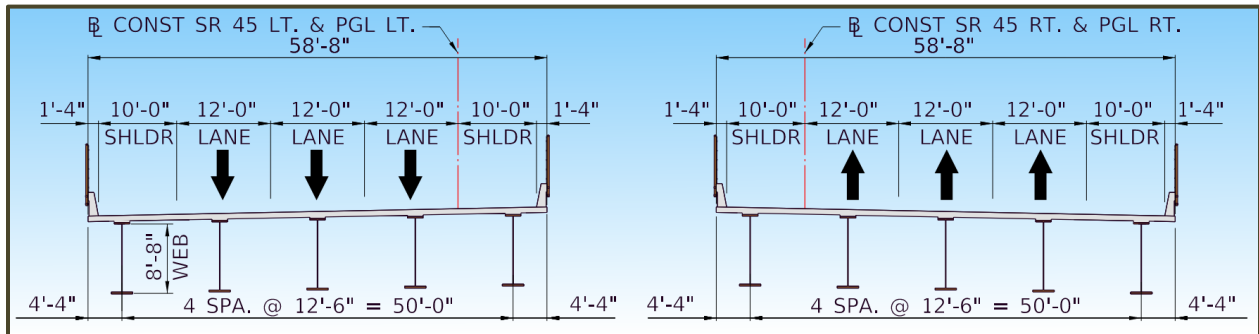


Figure 7-8 US 41 Bridges over CSX Railroad – Span 2

7.1.3 Right-of-Way 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 proposed improvements are anticipated to result in 3 residential and 28 business relocations. There are no proposed public facility displacements. To minimize the unavoidable effects of right-of-way acquisition and displacement of people, the FDOT will carry out a Right-of-Way 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 Blvd intersection – this will be evaluated more closely during the Design phase. Four percent grades are used along US 41 to raise the roadway over Delany Creek, S. 36th Avenue, and CSX Railroad. The westside frontage road has grades of 3% and 3.5% south and north of Delany Creek, respectively.

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

7.1.5 Bicycle and Pedestrian Accommodations

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 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 eastside. 36th Avenue includes a 10-foot sidewalk on the south side to allow northbound cyclists 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 Multi-Modal Accommodations

The CSX Railroad crossing of US 41 south of Causeway Boulevard will be modified so that both directions of US 41 bridge over the railroad. The westside frontage road will have an at grade crossing of the railroad with one lane in each direction.

The following design features were included to provide for local access, especially designed for freight:

- A signal was added at the Causeway Blvd/S. 47th Ave intersection and a new portion of S. 47th Ave will be constructed south of Causeway Blvd to provide better access to the surrounding properties and streets.
- A bridge for US 41 over S. 36th Avenue for the conveyance of local traffic between the east and west sides of US 41 was added to improve access for the surrounding properties.
- A jug-handle roadway was included connecting local access traffic west of US 41 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.

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 S. 36th Avenue 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 S. 36th Avenue was included to provide northbound traffic access to S. 36th Avenue 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 Blvd intersection will be closed, with the eastern end of El Camino Blanco Blvd made into a cul-de-sac due to the proximity to the US 41/Causeway Blvd intersection.
- A signal was added at the Causeway Blvd/S. 47th Ave intersection and a new portion of S. 47th Ave will be constructed south of Causeway Blvd to provide better access to the surrounding properties and streets.
- Sagasta Street between El Camino Blanco and Causeway Blvd 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 Avenue.

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

See **Section 5.7.3.6** 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

The City of Tampa requested Intelligent Transportation System (ITS) infrastructure to be included as part of this project on September 2, 2022. On November 18, 2022, Hillsborough County requested a CCTV camera (WTI positioning cameras) at every intersection. They would prefer any upgraded fiber/camera as well as advanced detection systems, if possible, noted that microwave technology (WaveTronic) systems are typically used.

The existing 72-strand fiber should be continued along the north side of Causeway Blvd to the new signal at S. 47th Avenue. 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 District 7 Traffic Operations. Coordination with the City of Tampa and Hillsborough County should continue during the Design phase to determine the ITS details.

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 within the project corridor 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
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

Expected utility conflicts identified using the documentation provided by the UAOs are summarized in **Table 7-3**. See the *Utility Assessment Report* for more information.

Table 7-3 Utility Conflict Locations

Utility Agency	Conflict Location
Century Link	Eastern US 41 ROW throughout study limits
COT Water	US 41 western ROW near Hartford St.; US 41 and Austin St. intersection; Eastern ROW and north-bound lane of US 41; US 41 and Raleigh St. intersection on west side of US 41; US 41 crossing at sta. 1020+80; US 41 and Towaway Ave. in the eastern US 41 ROW; US 41 and Trenton St. intersection; US 41 and S 34th Ave. intersection; US 41 crossing at St. Paul St.; US 41 and S 31st Ave intersection; US 41 and S 30th Ave intersection; US 41 and Causeway Blvd intersection; US 41 and S 24th Ave. intersection; US 41 and S 23rd St intersection; southern side of Causeway Blvd; Causeway Blvd and Sagasta St. intersection
TECO Gas	US 41 eastern ROW from southern project terminus to Sta. 1007; Crosses US 41 at Trenton St., continues north along the western ROW, and terminates at Towaway Ave.; Extension west from the US 41 western ROW at the north side of Towaway Ave.
Tampa Bay Pipeline	Crosses US 41 along the north side of St. Paul St.; Along southern ROW of Causeway Blvd
COT Wastewater	Crosses Causeway Blvd at Sagasta St. and continues east along the northern ROW to study limit; Crosses US 41 at CSX along the north side of the tracks
Zayo	Along the northern Causeway Blvd ROW from the eastern project terminus to US 41, and the eastern US 41 ROW from Causeway Blvd through the northern project terminus
Frontier	US 41 and Causeway Blvd ROW throughout the study limits; Crosses US 41 at multiple locations
Hillsborough County Traffic	Causeway Blvd northern ROW from US 41 to eastern study limit; US 41 western ROW from Causeway Blvd to northern study limit; Crosses US 41 at the Causeway Blvd intersection (north side)
Bright House Networks dba Charter/Spectrum	Crosses US 41 near Hartford St., S 27th Ave, sta. 1053+70, Delaney Creek, Towaway Ave, S. 23rd Ave, north of S. 27th Ave, and north of S. 23rd Ave as well as between St. Paul St. and S 31st Ave; US 41 eastern ROW near Trenton St, Raleigh St., and north of S. 24th Ave; US 41 western ROW near El Camino Blanco Blvd, between Raleigh St. and Towaway Ave.; and between S. 24th Ave and S. 23rd Ave; Crosses S 24th Ave. at the US 41 intersection (east side of US 41); Crosses Causeway Blvd near S 45th St.; Causeway Blvd northern ROW near Sagasta St.; Crosses Causeway Blvd near S 45th St.; Causeway Blvd southern ROW from sta. 3022+60 to 3042+90; Causeway Blvd southern ROW near Sagasta St.
Tampa Electric Distribution and Transmission	Overhead electric along western US 41 ROW from Denver St. to S. 21 st Ave. with crossings over US 41 at Denver St., Hartford St., Trenton St., sta. 1017+75, Towaway Ave., S. 34 th Ave., sta. 1033+40, sta. 1035+80, S 31 st Ave., sta. 1041+80, Causeway Blvd., S. 27 th Ave., sta. 1053+60, sta. 1058+10, sta. 1062+30, S. 23 rd Ave., and sta. 1068+50 Overhead electric along northern Causeway Blvd. ROW from sta. 3005+00 to sta. 3059+00 with crossings over Causeway Blvd. at sta. 3005+00, sta. 3018+00, sta. 3020+60, sta. 3023+60, sta. 3024+70, S. 4 th St., sta. 3029+80, sta. 3032+65, and sta. 3057+80

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 Florida Department of Environmental Protection (FDEP) staff, the project will not directly discharge to any verified impaired WBIDs and no enhanced treatment will be required.

The proposed stormwater management ponds are Pond 1A (3.30 acres), Pond 2B (4.23 acres), 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 be designed and constructed in accordance with the water quality and quantity requirements of the SWFWMD. 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 will likely 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.

See the *Pond Siting Report*, *Location Hydraulics Report* and *Water Quality Impact Evaluation* 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 a new transverse floodplain impact at Delaney Creek south of the 1994 concept's southern limit at S. 36th Avenue, which was not previously identified. The transverse impacts will result from the replacement and extension of the existing bridge culverts associated with the western frontage road and eastern local access ramp. 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. The encroachments will not have a significant potential for interruption or termination of transportation facilities needed for emergency vehicles or used as an evacuation route. In addition, no significant adverse impacts on natural and beneficial floodplain values are anticipated and no significant impacts to highway users are expected.

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. Minimal encroachments on a floodplain occur when there is floodplain involvement, but the impacts on human life, transportation facilities, and natural and beneficial floodplain values are not significant and can be resolved with minimal efforts. Normally, these minimal efforts to address the impacts will consist of applying the Department's drainage design standards and following the Water Management District's procedures to achieve results that will not increase or significantly change the flood elevations and/or limits.

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* for more information.

7.1.13 Transportation Management Plan

Construction can be completed in seven total phases (three for Causeway Blvd and four for US 41) as detailed 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.

Phase 1 (Causeway Blvd.):

1. Construct temporary pavement, sidewalk and drainage south of Causeway Blvd. from S. 45th St. to S. 47th St. Construct temporary pavement north of Causeway Blvd. from S. 47th St. to west of the intersection at US 41. Construct temporary pavement, sidewalk, and drainage to the south of Causeway Blvd. from east of the intersection at US 41 to project end. Construct temporary signal at the intersection of US 41 and Causeway Blvd.
2. Close westbound turn lanes east of the US 41 intersection.
3. Shift all pedestrians, bicyclists, westbound and eastbound traffic to the south on newly constructed temporary pavement and sidewalk from S. 45th St. to S. 47th St. Shift pedestrians/bicyclist, westbound and eastbound traffic to the north onto newly constructed temporary pavement from S. 47th St. to east of the intersection at US 41. Shift pedestrians/bicyclists, westbound and eastbound traffic to the south onto newly constructed temporary pavement and sidewalk from east of the intersection at US 41 to the eastern limits of construction.
4. Construct the north proposed mainline of Causeway Blvd.

Phase 2 (Causeway Blvd.):

1. Construct temporary pavement and sidewalk north of Causeway Blvd. adjacent to the newly constructed pavement east of the intersection at US 41. Adjust the temporary signal at the US 41 intersection.

2. Close westbound turn lanes east of the US 41 intersection.
3. Shift all pedestrians, bicyclist and mainline traffic north onto newly constructed pavement from project begin to project end.
4. Construct the south proposed mainline of Causeway Blvd.

Phase 3 (Causeway Blvd.):

1. Adjust the temporary signal at the US 41 intersection.
2. Continue westbound turn lane closures east of the US 41 intersection. Close eastbound turn lanes west of the US 41 intersection.
3. Shift pedestrians and eastbound traffic south onto newly constructed pavement.
4. Maintain pedestrians/bicyclists and westbound traffic as shifted in Phase 2.
5. Construct the median of the proposed mainline of Causeway Blvd.
6. All remaining work will be completed using subphases, including remaining concrete pavement work at the US 41 intersection, traffic separators, and final striping.

Phase 1 (US 41):

1. Construct temporary sidewalk, pavement, and drainage west of US 41 from project begin to Raleigh St. and from Causeway Blvd to project end. Construct temporary signal at the intersection of Hartford St. and US 41.
2. Shift all pedestrians, northbound and southbound traffic to the west utilizing the newly constructed temporary pavement and temporary sidewalk from project begin to Raleigh St.
3. Shift all pedestrians, northbound and southbound traffic to existing at Raleigh St. to Causeway Blvd.
4. Shift all pedestrians, northbound and southbound traffic north of Causeway Blvd. to the west from Causeway Blvd to project end.
5. Shift all pedestrians, northbound and southbound traffic to existing at project end.
6. Construct east proposed mainline of US 41, Ramp A, drainage, side streets and driveways (including bridges as part of mainline construction).

Phase 2 (US 41):

1. Construct temporary sidewalk, pavement, and drainage east of US 41 from project begin to Ramp A. Relocate and adjust temporary signal at Hartford St. to accommodate phase 2 traffic and pedestrians.
2. Shift southbound traffic from project begin to Hartford St. Cross all pedestrians to the east at Hartford St. intersection onto the newly constructed temporary sidewalk. Direct all pedestrians to the newly constructed proposed sidewalk along Ramp A to utilize at grade connections underneath the 36th Ave. bridges. Direct all pedestrians to the existing sidewalk adjacent to the existing northbound US 41 roadway.
3. Shift northbound traffic onto the newly constructed grade separated roadway from project begin to project end.
4. Shift southbound traffic to the east adjacent to the northbound traffic from project begin to Delaney Creek. Southbound traffic will utilize the existing northbound US 41 roadway at grade

from Delaney Creek to Causeway Blvd. Shift southbound traffic adjacent to the northbound traffic north of Causeway Blvd.

5. Construct the west proposed mainline of US 41, drainage, driveways, and side streets from project begin to Trenton St. Construct the Frontage Rd. surface street network up to Towaway Ave. (Including bridge over Delaney Creek). Construct the west proposed mainline of US 41 north of Causeway Blvd.

Phase 3 (US 41):

1. Construct temporary pavement and drainage east of US 41 from project begin to south of Delaney Creek. Construct temporary connection from the newly constructed southbound US 41 roadway to the newly constructed Frontage Rd. south of Delaney Creek. Construct temporary connection from the newly constructed Frontage Rd. to the existing southbound US 41 roadway at Towaway Ave. Relocate and adjust temporary signal at Hartford St to accommodate phase 3 traffic shift.
2. Maintain northbound traffic as shown in Phase 2.
3. Shift southbound traffic to the west from project begin to the Frontage Rd. bridge over Delaney Creek utilizing the newly constructed temporary pavement. Shift the southbound traffic onto the previously constructed Frontage Rd. from Delaney Creek to Towaway Ave utilizing the newly constructed temporary connection. Shift the southbound traffic onto the existing southbound US 41 roadway from Towaway Ave. to Causeway Blvd utilizing the newly constructed temporary connection. Shift the southbound traffic onto the newly constructed southbound US 41 roadway north of Causeway Blvd. Shift the southbound traffic to existing US 41 at project end.
4. Shift all pedestrians onto constructed sidewalks from previous phases.
5. Construct the median and west proposed mainline from Trenton St. to Causeway Blvd. Construct the remaining portion of 36th Ave. and the proposed US 41 southbound bridge going over 36th Ave. Construct the proposed median of US 41 north of Causeway Blvd. to project end.

Phase 4 (US 41):

1. Remove temporary signal at the intersection of Hartford St. and US 41.
2. Direct all pedestrians to the newly constructed sidewalk along Ramp A, under the newly constructed northbound and southbound bridges over 36th Ave.
3. Northbound traffic will be maintained as shown in Phase 3.
4. Shift southbound traffic to the west from project begin to Trenton St. utilizing the temporary pavement constructed in Phase 3. Shift southbound traffic onto newly constructed southbound mainline from Trenton St. to project end.
5. Construct the remaining proposed US 41 median from project begin to Trenton St. Construct the Frontage Rd. from Trenton St. to Causeway Blvd.
6. All remaining work will be completed using subphases, including remaining concrete pavement work at the begin project tie-in, permanent signal structures, and final striping.

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 Delany Creek, S. 36th Avenue, 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. Approved design variations are included in **Appendix C**.

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

7.1.16 Cost Estimates

See for the Preferred Alternative cost estimate. Construction costs are based on the February 2023 Long-Range Estimate (LRE) cost estimate included in **Appendix D**. 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 but are accounted for in the project unknown which are estimated at 15% of the construction cost.

Table 7-4 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	\$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

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 and is not repeated here. 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.

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-ineligible by the SHPO on February 10, 2014. An updated 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.

The FDOT determined that the project will have no effect on any historical resources that are listed, determined eligible, or potentially eligible for listing in the NRHP. The State Historic Preservation Officer provided their concurrence with the FDOT's findings on February 14, 2023.

See the *Cultural Resources Assessment Survey* 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, based on review of the USACE Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) conducted on November 9, 2022, 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* 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.

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 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, FWC and 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* 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. NOAA Fisheries 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 lost value of functions resulting 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 has 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* for more information.

7.2.7 Highway Traffic Noise

A *Noise Study Report* (NSR) (May 2023) was prepared document the noise analysis performed to support decisions related to the evaluation of the project Preferred Alternative and to summarize potential noise impacts to the project area. This NSR was conducted in accordance with the PD&E Manual and applicable State and Federal regulations and is available in the project file in support of this reevaluation.

A total of 59 receptors representing 58 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, two impacted CNEs (#'s 09 and 12) are predicted to be impacted (discussed below). Predicted noise levels will create eight (8) NAC residential land use impacts to noise sensitive receptors in CNEs 09 and 12.

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

28 noise-sensitive receptors. Future build-condition noise levels approach or exceed the applicable NAC for 8 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, right of way, 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 right of way 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/SR are identified by the FDOT to be 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 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 evaluation of potential contamination involvement for the Preferred Alternative was completed. 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. 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. Contamination remediation within the applicable parcels will be overseen by the FDOT during project construction.

7.2.8.1 Roadway/Mainline

For the roadway/mainline (the entire Preferred Alternative except the proposed stormwater management ponds) 93 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 risk ranking. ROW acquisition is proposed from each of the eight High-risk and each of the 16 Medium-risk ranked sites.

See **Table 7-5** for all Medium and High rated contamination sites for the roadway/mainline and the risk rating category assigned to each site.

See the *Contamination Screening Evaluation Report - Mainline* for more information.

7.2.8.2 Stormwater Management Ponds

An evaluation of potential contamination involvement for the project's final selected stormwater management ponds and associated outfall facilities was completed - four potential contamination sites were evaluated. Two sites were assigned a High risk ranking. Zero sites were assigned a Medium risk ranking. Two sites were assigned a Low risk ranking and zero sites were assigned a No risk ranking. See **Table 7-6** for all Medium and High rated contamination sites for stormwater management ponds and the risk rating category assigned to each site.

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.

See the *Contamination Screening Evaluation Report - Ponds* for more information.

Table 7-5 Roadway/Mainline Medium and High Rated Contamination Sites

Site Number	Site Name & Address	Risk Rating
5	<p>Lee Auto Group (formerly Interstate Uniform Services Corp.) 4027 S. 50th Street (currently 4023 S. 50th Street according to HCPA)</p>	Medium
8	<p>Butterkrust Bakery 3902 S. 50th Street</p>	Medium
9	<p>Harcros Chemicals Former Bay Engine/Mr. Phantom Express/Giant Service 3630 S. 51st Street (currently 5132 Trenton Street)</p>	Medium
14/15/16/17	<p>14-Exide Technologies/Pacific Chloride, Inc./Chloride Metals, Inc. 3507 S. 50th Street, 3521 S. Yokam Diamond Street, Corner of 36th Avenue S. and 50th Street</p> <p>15/17-Delaney Creek Brownfield Redevelopment Area – Exide Tech. West and East sides of US 41 (S. 50th Street)</p> <p>16-Chloride Metals/ Exide Technologies 3507 S. 50th Street</p>	High
19	<p>Foy’s Transport Tire Service / Former Coastal Mart #628 3411 South 50th Street</p>	High
21	<p>Torbo Truck Repair/ Ray’s Truck Rental Former Southeast Industrial and Former GTE Of FL Fleet CTR 5160 Saint Paul Street (currently 3140 S. 50th Street according to HCPA)</p>	High
26	<p>LKQ – Tampa, 22 nd Street at US 41 (City of Tampa Landfill #40/Hillsborough County Landfill 127) 5109 Causeway Blvd</p>	Medium
27	<p>Former Southeast Industrial Facilities 4513 Causeway Blvd</p>	Medium
28	<p>Florida Tank Services (former Talman Tank and Equipment) 4701 Causeway Blvd</p>	Medium
29	<p>FDOT ROW, 7-Eleven Store 2801 S 50th St & 4919 Causeway Blvd</p>	High

31	Rosier Property (Former Gas Station) 4702 Causeway Boulevard And 2750 S. 47 th Street	Medium
33	Sunoco Former United Oil #215 4714 Causeway Blvd	High
34	FDOT Right-of-Way NE Corner of Sagasta & SR 676 (Causeway Blvd) 4902 Causeway Blvd	High
41	A1 Cars Parts of Tampa 3120 S. 50 th Street and 3132 S. 50 th Street	Medium
42	Tampa Electric Company H.L. Culbreath Bayside Power Station Sprayfield (Former Gannon Station) 3602 Port Sutton Road	Medium
56	Adams Used Auto Parts 3610 S. 50 th Street	Medium
61	CSX Railroad Tracks (No address)	Medium
63	American Used Trucks & Parts 3125 S. 50 th Street	Medium
64	Global Used Parts 2923 S. 50 th Street	Medium
65	RV Depot 2930 S. 50 th Street	Medium
66	Garage On Wheels 2806 S. 50 th Street	Medium
67	Avengers Auto Body Repair Shop/DMD Motors Former CSD Truck Repairs 2802 S. 50 th Street	High
72	EZ Hollywood Tops (Former gasoline station) 4710 Causeway Boulevard	High
87	South Florida Truck & Equipment Co. 2405 S. 50 th Street	Medium

Table 7-6 Stormwater Management Ponds Medium and High Rated Contamination Sites

Pond Site	Site Name and Address	Risk Rating
3A	Site 28 - Thach Tire & Rim (4916 Causeway Boulevard)	High
	Site 15 - First Choice Cars (4902 Causeway Boulevard)	
	EDM 11 – Former Talman Tank and Equipment (4701 Causeway Boulevard) located 300 feet southwest of Pond 3A	
	EDM 12 – FDOT ROW, 7-Eleven Store (2801 S 50th Street and 4919 Causeway Boulevard) is located 160 feet south of Pond 3A	
	EDM 14 – Sunoco (Former United Oil #215) (4714 Causeway Boulevard) is located 40 feet west of Pond 3A	
	EDM 16 – Former Chevron #48098 (2718 S 50th Street) located 120 feet east of Pond 3A	
	EDM 13 - Rosier Property (Former Gas Station, TANKS 8945228) (4702 Causeway Boulevard and 2750 S. 47th Street) located 480 feet west of Pond 3A	
	EDM 17 – Richards Construction Co. (TANKS 9600925) (5010 27th Avenue) located 350 feet northeast of Pond 3A	
	EDM 18 – Chavez Auto Transport (LUST/TANKS 9502663) (2436 S. 50th Street) located 420 feet northeast of Pond 3A	
	Site 24 – Pro Tech Truck Service (4901 Causeway Boulevard) located 170 feet south of Pond 3A	
	Site 25 – Delmar Automotive (4717 Causeway Boulevard) located 180 feet southwest of Pond 3A	
	Site 27 – Allen’s Access and Gate Automation (4710 Causeway Boulevard) located 350 feet west of Pond 3A	
	Site 29 – Cubic Storage & Office Systems (2449 S. 50th Street) located 100 feet north of Pond 3A	
Site 30 – Avengers Auto Body Repair Shop/DMD Motors (former CSD Truck Repairs) (2802 S. 50th Street) located 240 feet southeast of Pond 3A		

Pond Site	Site Name and Address	Risk Rating
3B	<p>Residence (4711 E. El Camino Boulevard)</p> <p>EDM 13 - R&E Tire Plus (2750 S. 47th Street - western portion of parcel) and Caballero Auto Service (4702 Causeway Boulevard - eastern portion of parcel)</p> <p>Site 27 - Allen's Access and Gate Automation (4710 Causeway Boulevard)</p> <p>EDM 14 - Sunoco (former United Oil #215) (4714 Causeway Boulevard)</p> <p>Site 15 - First Choice Cars (4902 Causeway Boulevard) located adjoining east of Pond 3B</p> <p>Site 26 - EZ Hollywood Tops (former gasoline station) (4710 Causeway Boulevard)</p> <p>Site 24 - Pro Tech Truck Service (4901 Causeway Boulevard) located 160 feet south of Pond 3B.</p> <p>Site 25 – Delmar Automotive (4717 Causeway Boulevard) located 160 feet south of Pond 3B.</p> <p>Site 28 - Thach Tire & Rim (4916 Causeway Boulevard) located 200 feet east of Pond 3B.</p> <p>Site 29 – Cubic Storage & Office Systems (2449 S. 50th Street) located 400 feet northeast of Pond 3B.</p>	High

APPENDICES

Appendix A – Preferred Alternative Plans

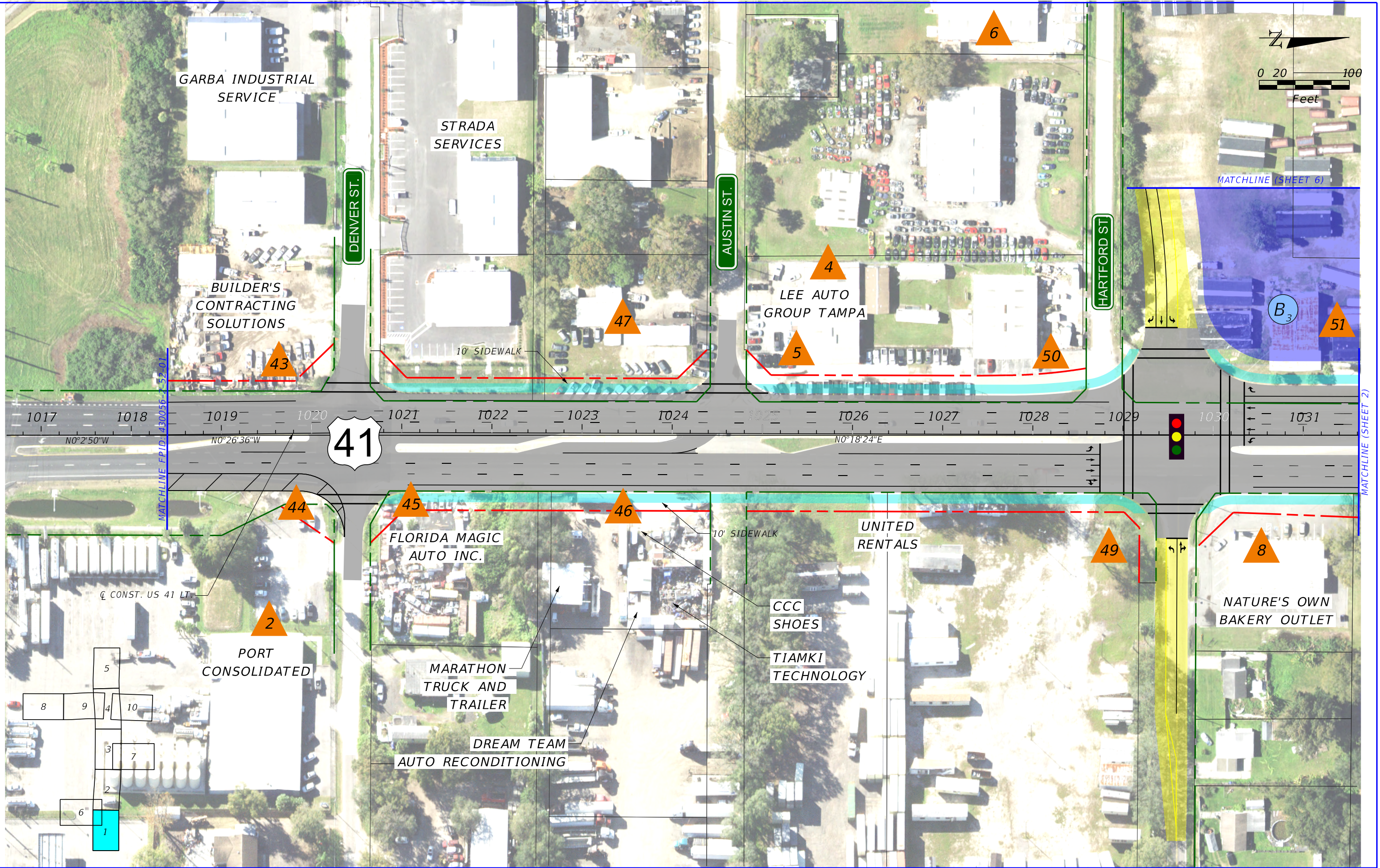
Appendix B – Historical Train-Related Crash Data

Appendix C – Typical Section Package

Appendix D – Long Range Estimate

APPENDIX A

Preferred Alternative Plans



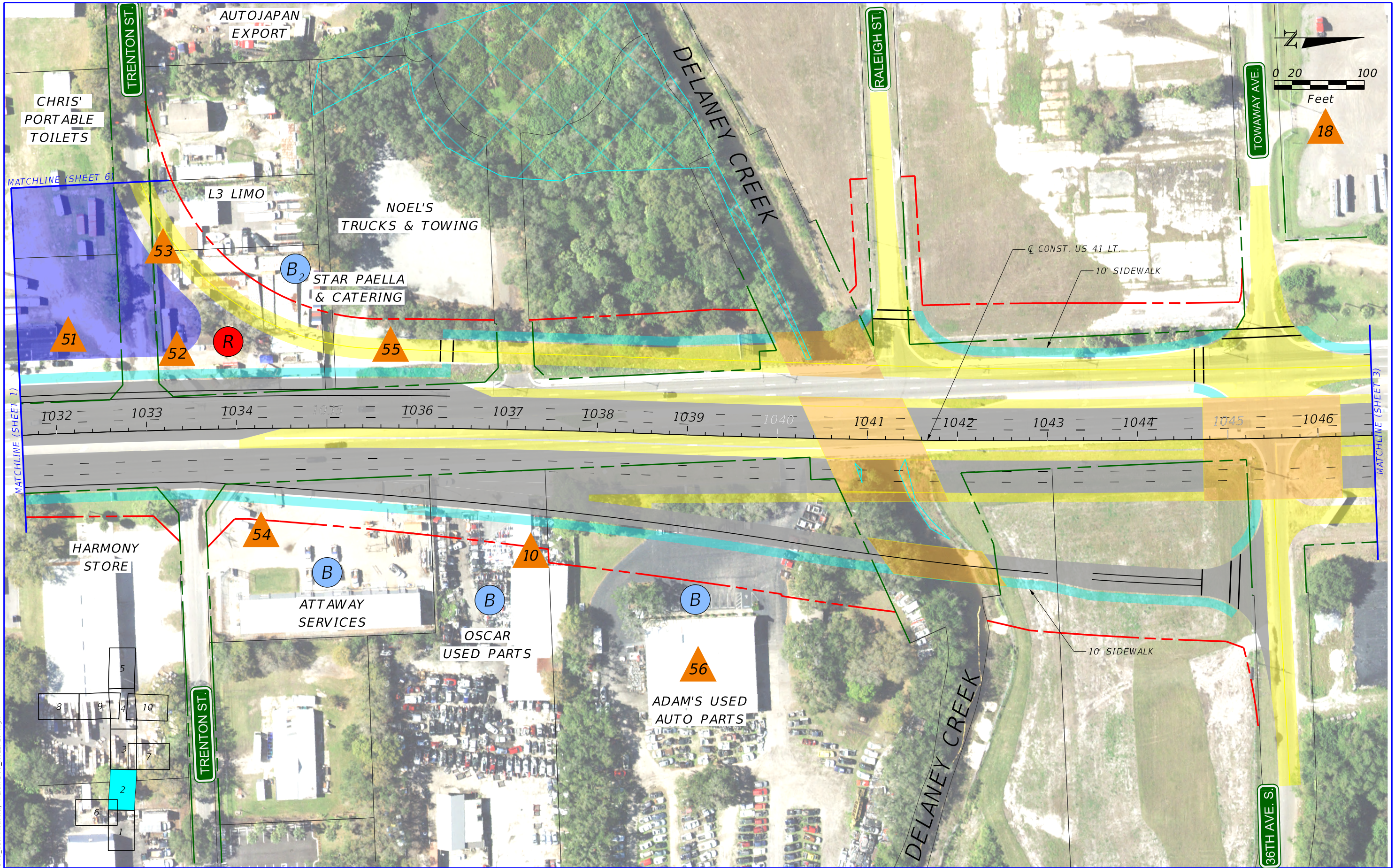
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	PROPOSED CONCRETE PAVEMENT		EXISTING R/W LINE
	PROPOSED SIDEWALK		EXISTING PARCEL LINE
	PROPOSED BRIDGE		POTENTIAL CONTAMINATION SITE
	PROPOSED POND		PROPOSED BUSINESS RELOCATION
	WETLANDS		PROPOSED RESIDENTIAL RELOCATION

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**

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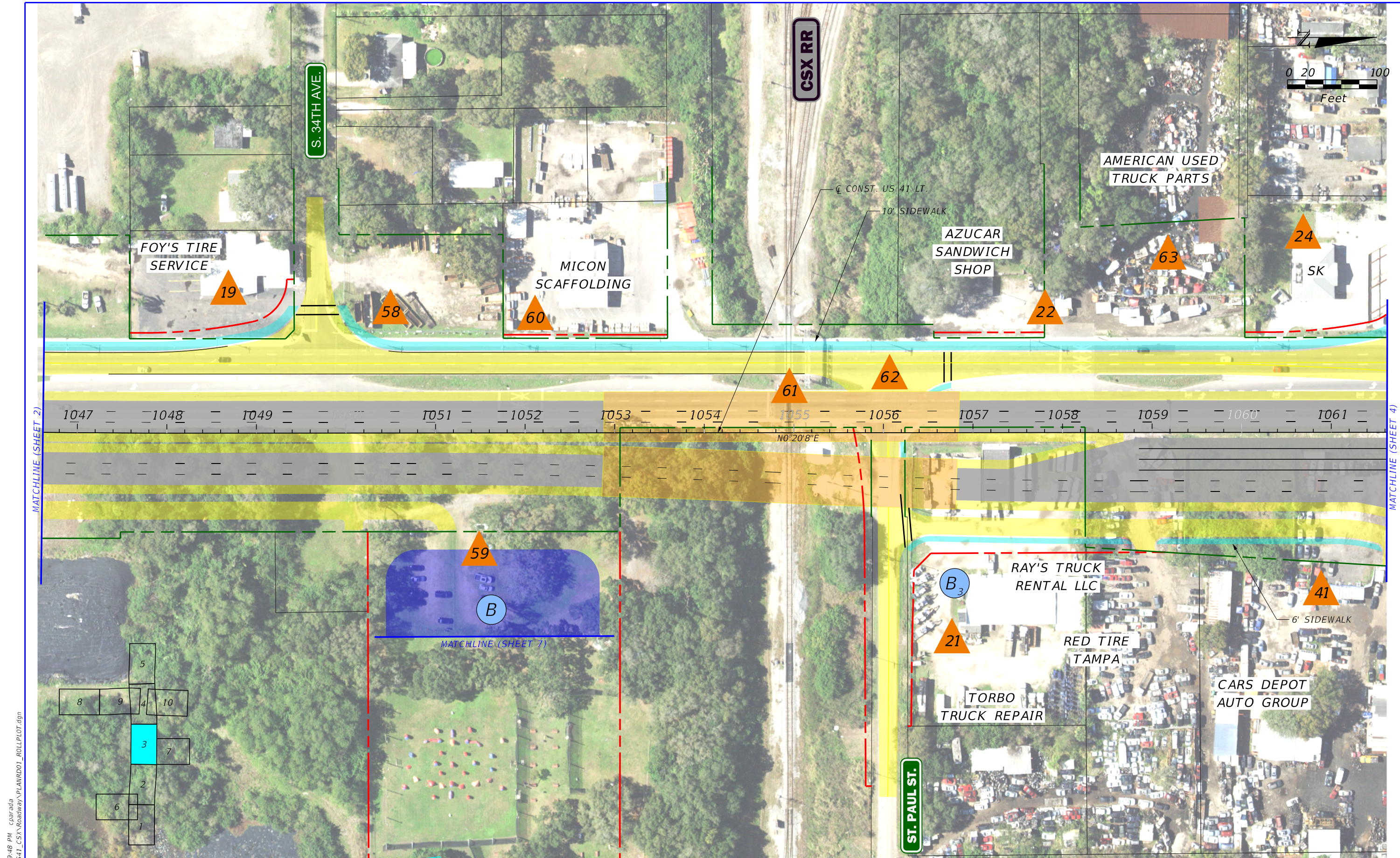
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	PROPOSED SIDEWALK		EXISTING PARCEL LINE
	PROPOSED BRIDGE		PROPOSED BUSINESS RELOCATION
	WETLANDS		PROPOSED RESIDENTIAL RELOCATION
	POTENTIAL CONTAMINATION SITE		

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

**PREFERRED ALTERNATIVE
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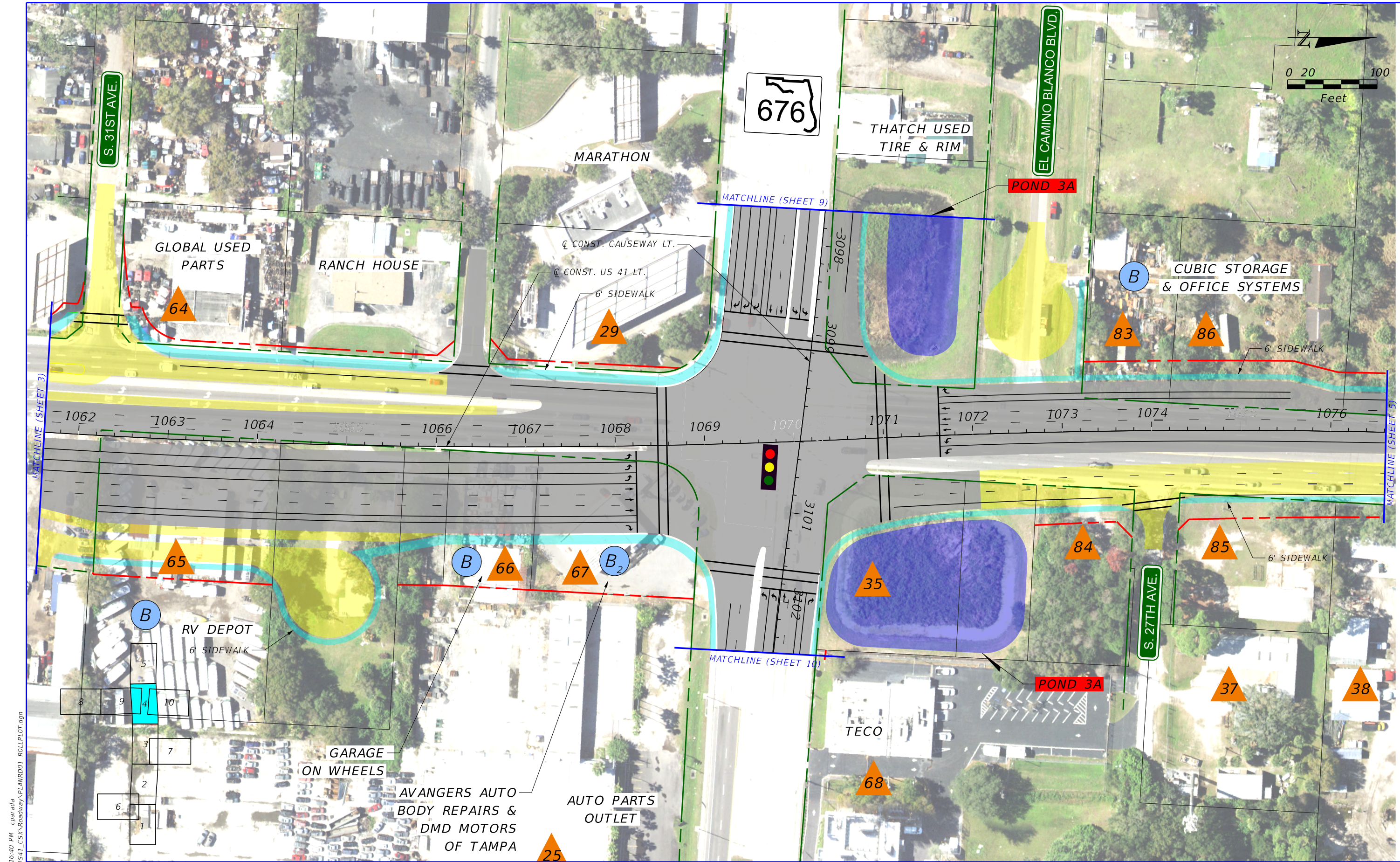
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	PROPOSED SIDEWALK		EXISTING PARCEL LINE
	PROPOSED BRIDGE		PROPOSED BUSINESS RELOCATION
	PROPOSED POND		PROPOSED RESIDENTIAL RELOCATION
	WETLANDS		POTENTIAL CONTAMINATION SITE

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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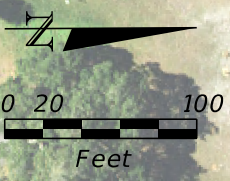
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	PROPOSED BRIDGE		PROPOSED BUSINESS RELOCATION
	PROPOSED POND		PROPOSED RESIDENTIAL RELOCATION
	WETLANDS		POTENTIAL CONTAMINATION SITE

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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	PROPOSED SIDEWALK		EXISTING PARCEL LINE
	PROPOSED BRIDGE		PROPOSED BUSINESS RELOCATION
	PROPOSED POND		PROPOSED RESIDENTIAL RELOCATION
	WETLANDS		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

**PREFERRED ALTERNATIVE
 CONCEPTUAL DESIGN**

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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

**PREFERRED ALTERNATIVE
 CONCEPTUAL DESIGN**

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 6

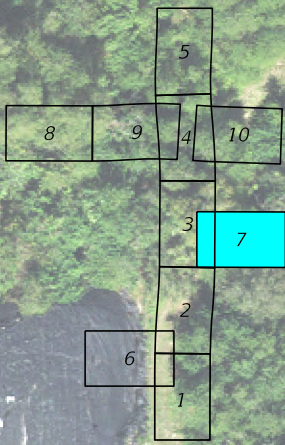
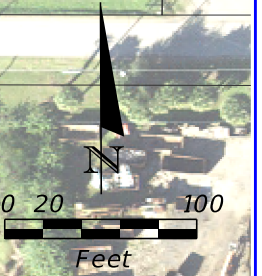
ST. PAUL ST.

CSX RR

AMERICAN
XXII LLC

B

MATCHLINE (SHEET 3)



LEGEND

- 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

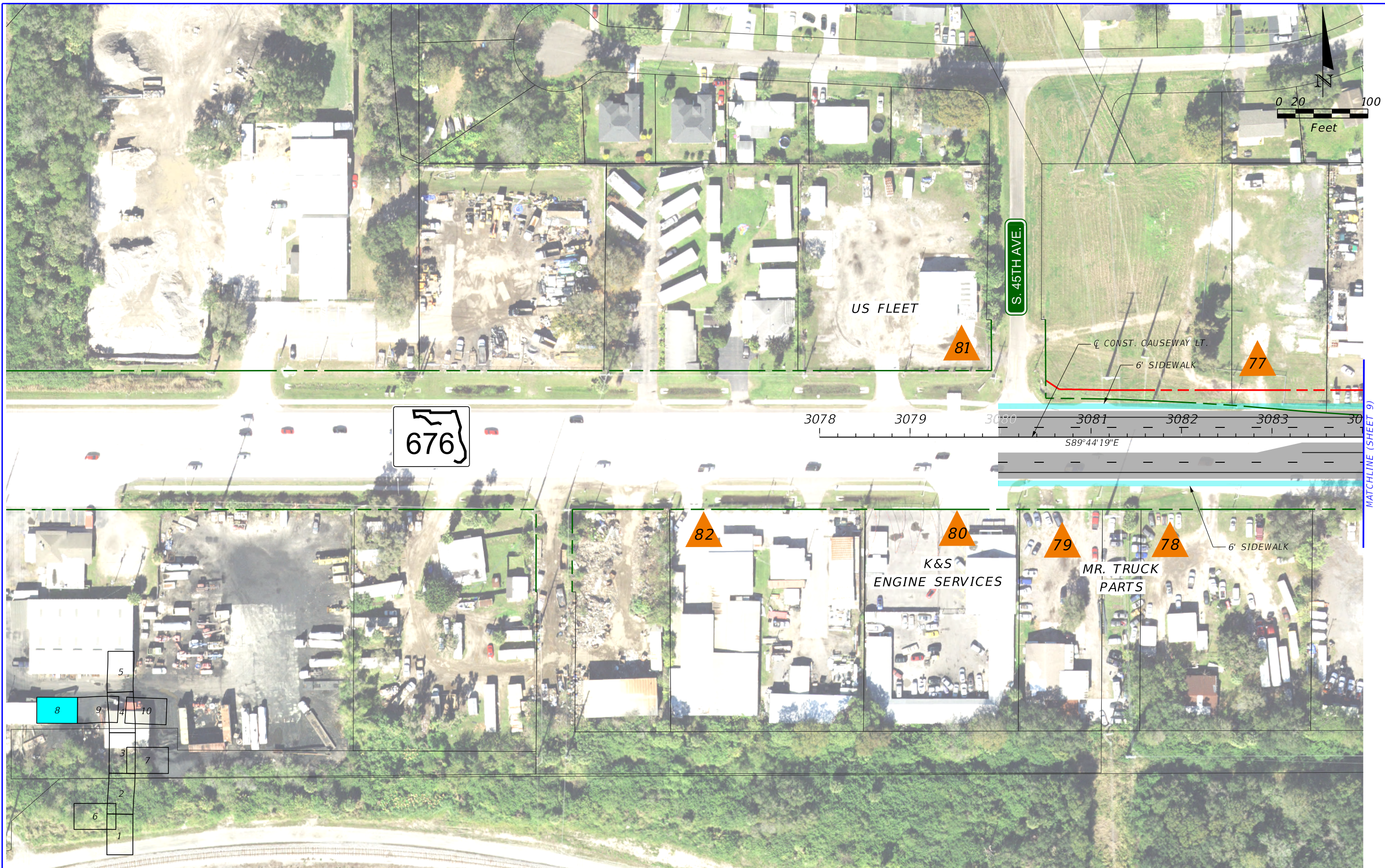
US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
 From South of Causeway Blvd to North of Causeway Blvd
 Hillsborough County, Florida

WPI Segment No. 440749-1

**PREFERRED ALTERNATIVE
 CONCEPTUAL DESIGN**

SHEET NO.

7



5/15/2023 6:03:57 PM cparada
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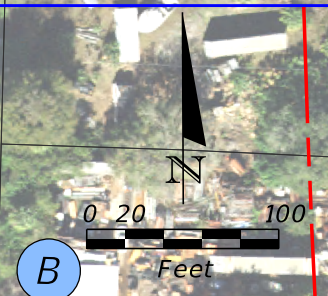
LEGEND			
	PROPOSED ASPHALT PAVEMENT		PROPOSED R/W LINE
	PROPOSED CONCRETE PAVEMENT		EXISTING R/W LINE
	PROPOSED SIDEWALK		EXISTING PARCEL LINE
	PROPOSED BRIDGE		PROPOSED BUSINESS RELOCATION
	PROPOSED POND		PROPOSED RESIDENTIAL RELOCATION
	WETLANDS		POTENTIAL CONTAMINATION SITE

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

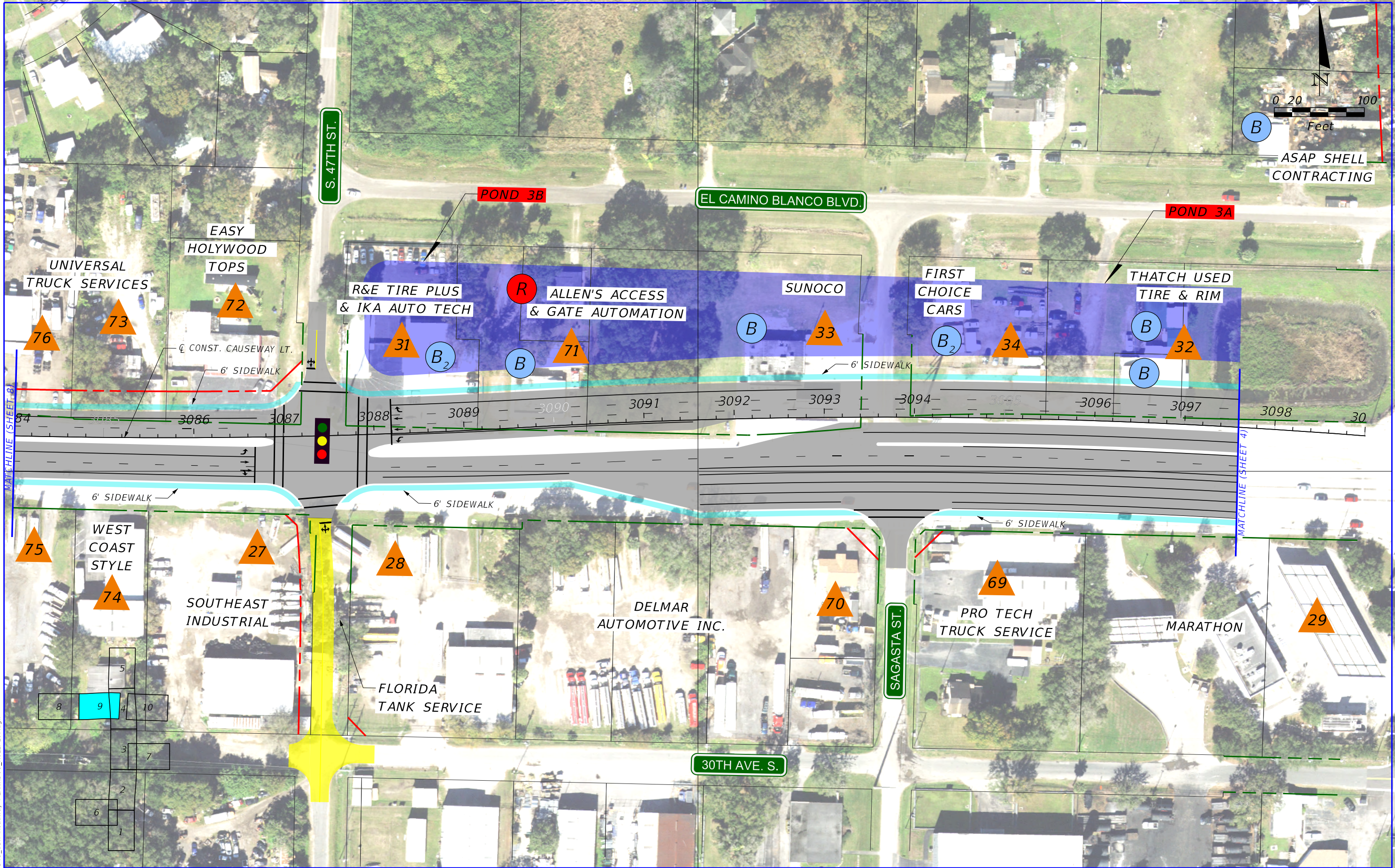
 WPI Segment No. 440749-1

**PREFERRED ALTERNATIVE
 CONCEPTUAL DESIGN**

SHEET
 NO.
 8



ASAP SHELL
CONTRACTING



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

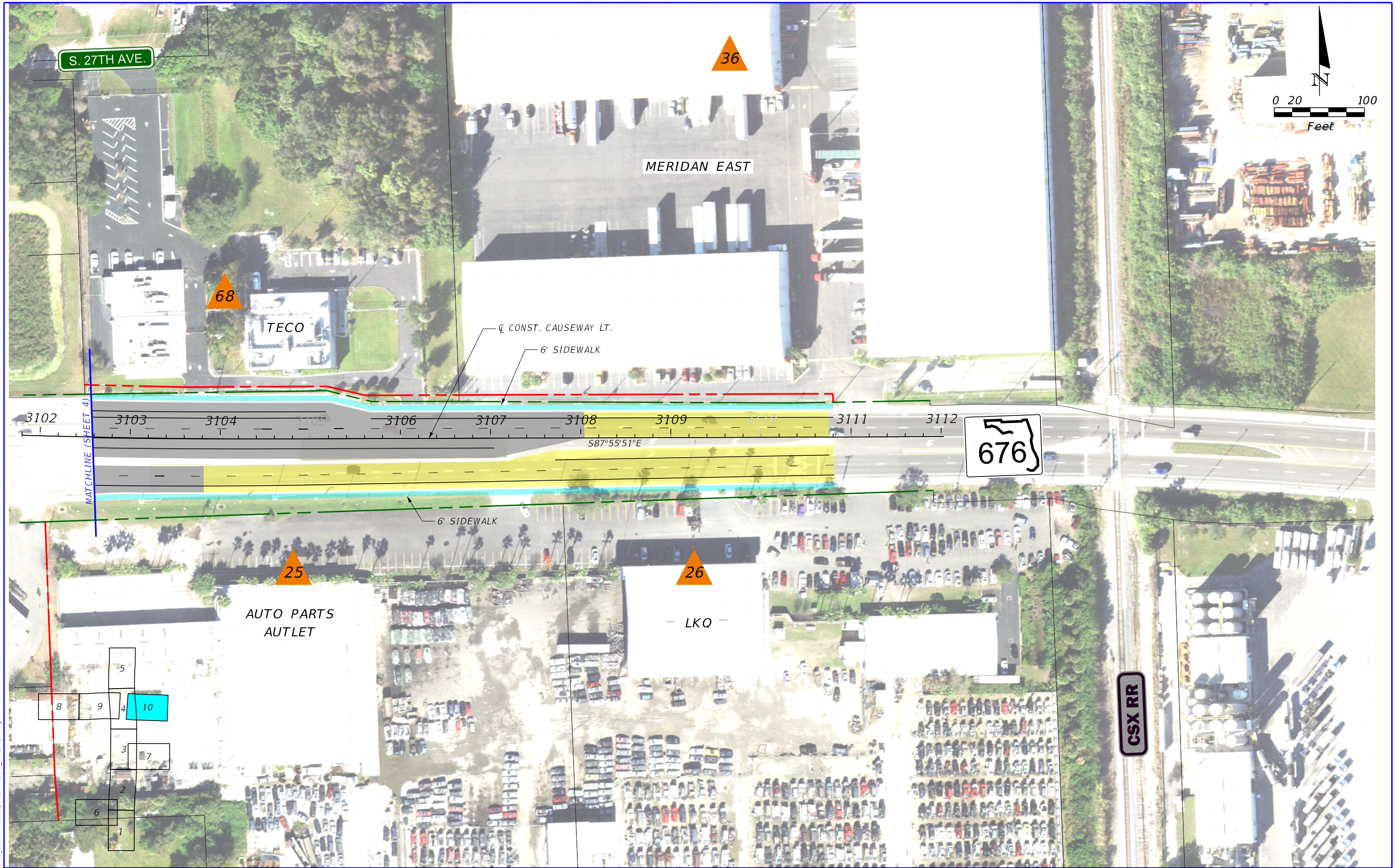
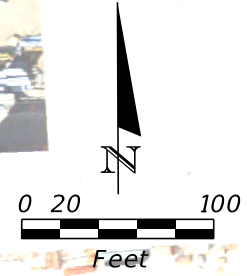
US 41/SR 45/South 50th St at CSX Grade Separation Re-Evaluation
From South of Causeway Blvd to North of Causeway Blvd
Hillsborough County, Florida

WPI Segment No. 440749-1

**PREFERRED ALTERNATIVE
CONCEPTUAL DESIGN**

SHEET NO.
9

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5/15/2023 6:15:08 PM cparada C:\work\sets\FDOT\US41_CSX_Roadway\PLMRD01_ROLLPLOT.dgn

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

**PREFERRED ALTERNATIVE
 CONCEPTUAL DESIGN**

SHEET NO.
 10

APPENDIX B

Historical Train-Related Crash Data

APPENDIX C

Typical Section Package

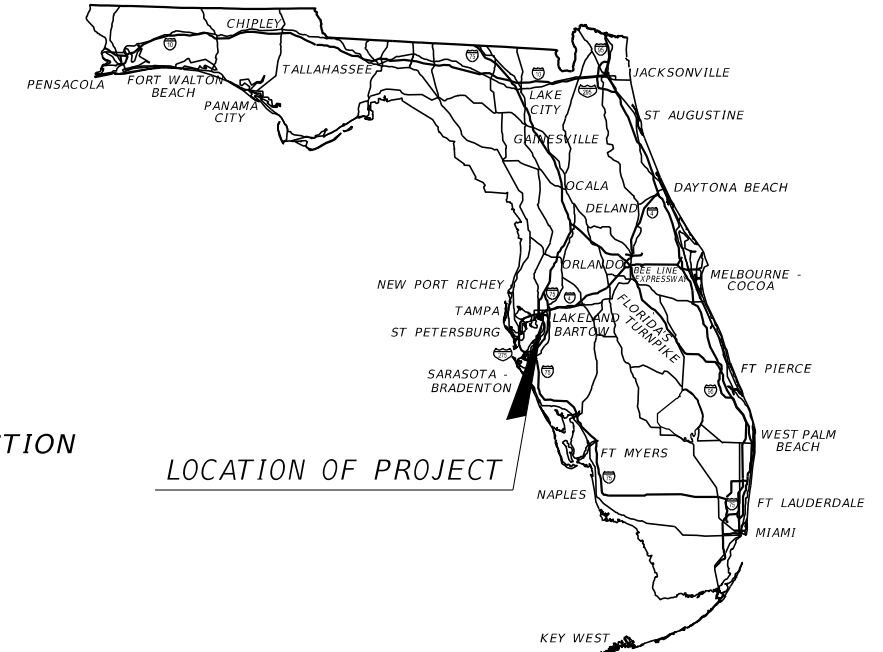
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 440749-1-52-01

HILLSBOROUGH COUNTY (1006000)

US 41/SR 45/SR 599 FROM SOUTH OF SR 676/CAUSEWAY BOULEVARD INTERSECTION
TO NORTH OF THE SR 676/CAUSEWAY BOULEVARD INTERSECTION



LOCATION OF PROJECT

FDOT DISTRICT DESIGN ENGINEER	FDOT DISTRICT TRAFFIC OPERATIONS ENGINEER
•	•
•	•
CONCURRING WITH: TYPICAL SECTION ELEMENTS TARGET SPEED DESIGN & POSTED SPEEDS	CONCURRING WITH: TARGET SPEED DESIGN & POSTED SPEEDS

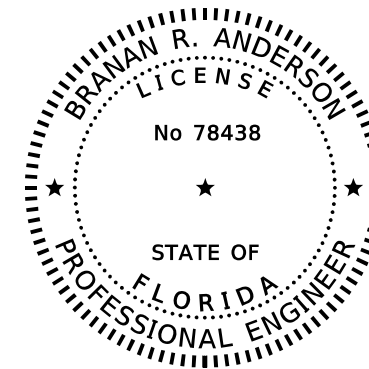
FDOT DISTRICT INTERMODAL SYSTEMS DEVELOPMENT MANAGER	FDOT DISTRICT STRUCTURES DESIGN ENGINEER
•	•
•	•
CONCURRING WITH: CONTEXT CLASSIFICATION TARGET SPEED	CONCURRING WITH: TYPICAL SECTION ELEMENTS TARGET SPEED

FHWA TRANSPORTATION ENGINEER	LOCAL TRANSPORTATION ENGINEER
•	•
•	•
CONCURRING WITH: TYPICAL SECTION ELEMENTS	CONCURRING WITH: TYPICAL SECTION ELEMENTS

NOT USED	NOT USED
•	•
•	•
CONCURRING WITH:	CONCURRING WITH:

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

APPROVED BY:



THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

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.

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

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

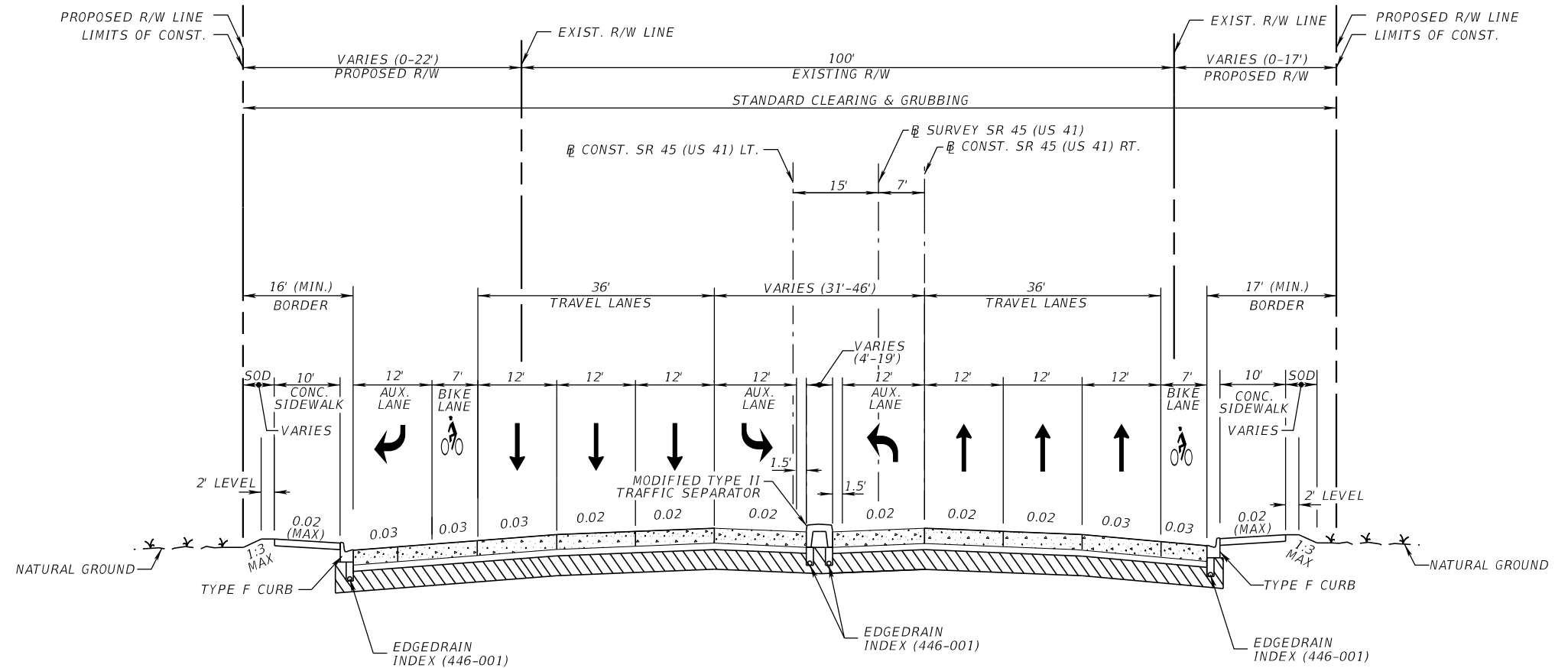
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- () RESURFACING (LA FACILITIES)
- () RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

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

TYPICAL SECTION No. 1



SR 45 (US 41)
 MP 22.578 TO MP 22.927 @ CONST. SR 45 (US 41) LT.
 MP 22.578 TO MP 22.961 @ CONST. SR 45 (US 41) RT.

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 39,000
 ESTIMATED OPENING YEAR = 2027 AADT = 47,500
 ESTIMATED DESIGN YEAR = 2047 AADT = 59,800
 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

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

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

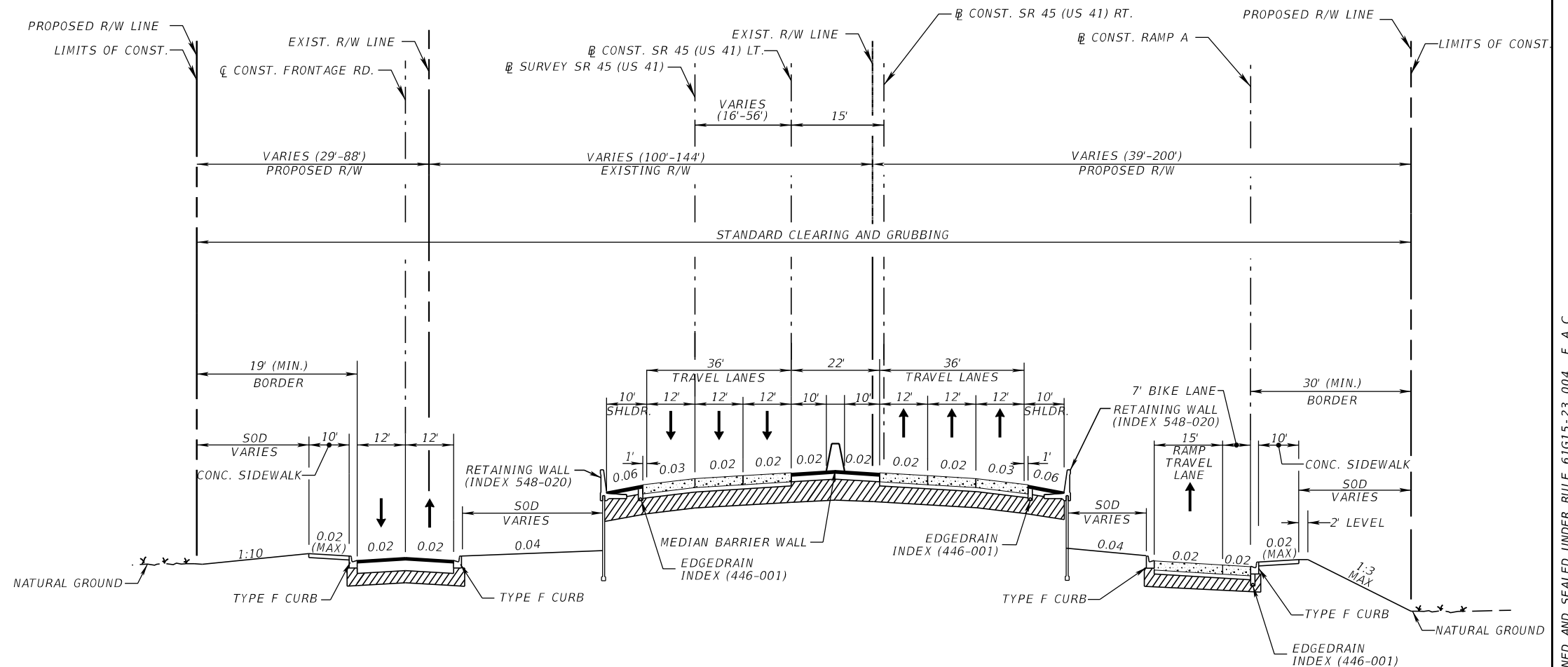
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- () RESURFACING (LA FACILITIES)
- () RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

- 1) SHOULDER CROSS SLOPE

TYPICAL SECTION No. 2



SR 45 (US 41)
 MP 22.927 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 22.961 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.

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 39,000
 ESTIMATED OPENING YEAR = 2027 AADT = 48,500
 ESTIMATED DESIGN YEAR = 2047 AADT = 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

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	3

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

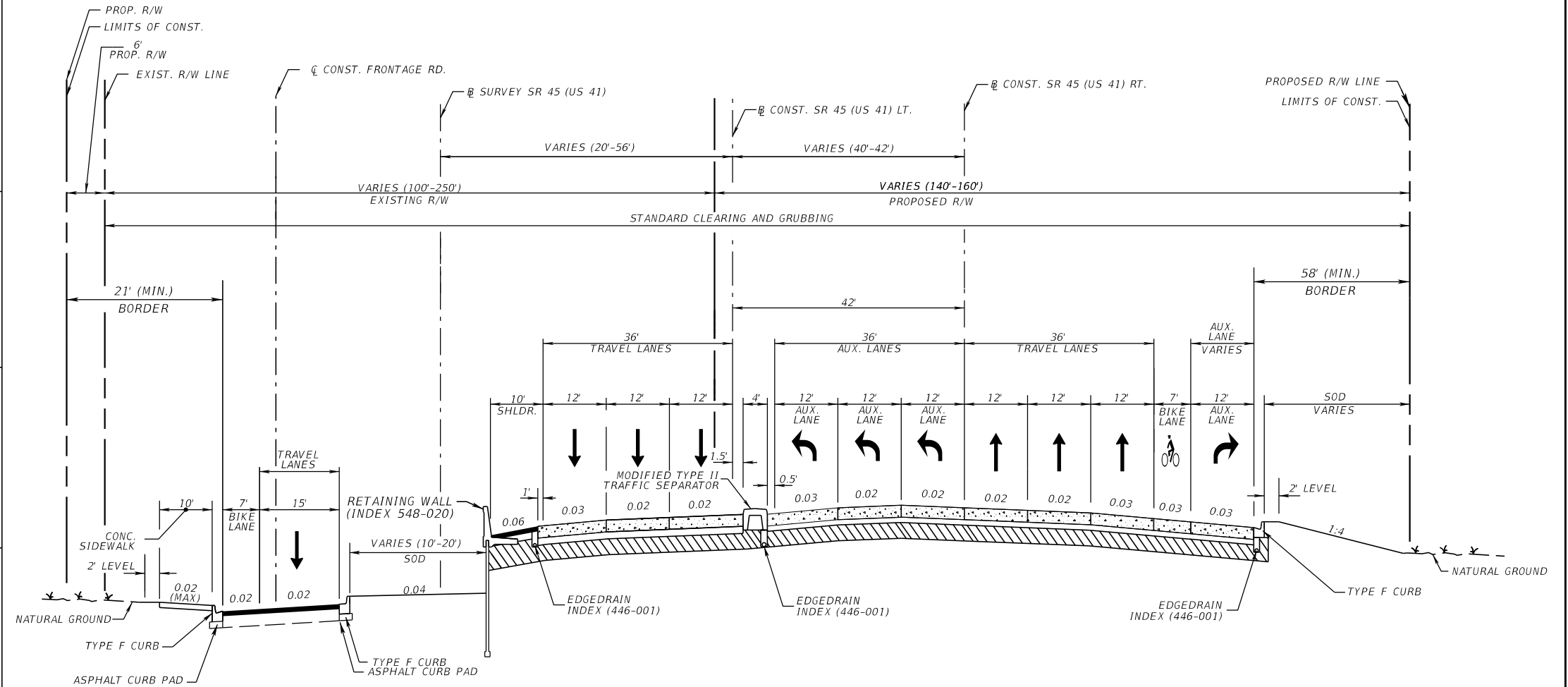
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- () RESURFACING (LA FACILITIES)
- () RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

- 1) CURB ON HIGH SPEED FACILITY

TYPICAL SECTION No. 3



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

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

TRAFFIC DATA SR 45 (US 41)

CURRENT YEAR = 2018 AADT = 39,000
 ESTIMATED OPENING YEAR = 2027 AADT = 48,500
 ESTIMATED DESIGN YEAR = 2047 AADT = 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

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

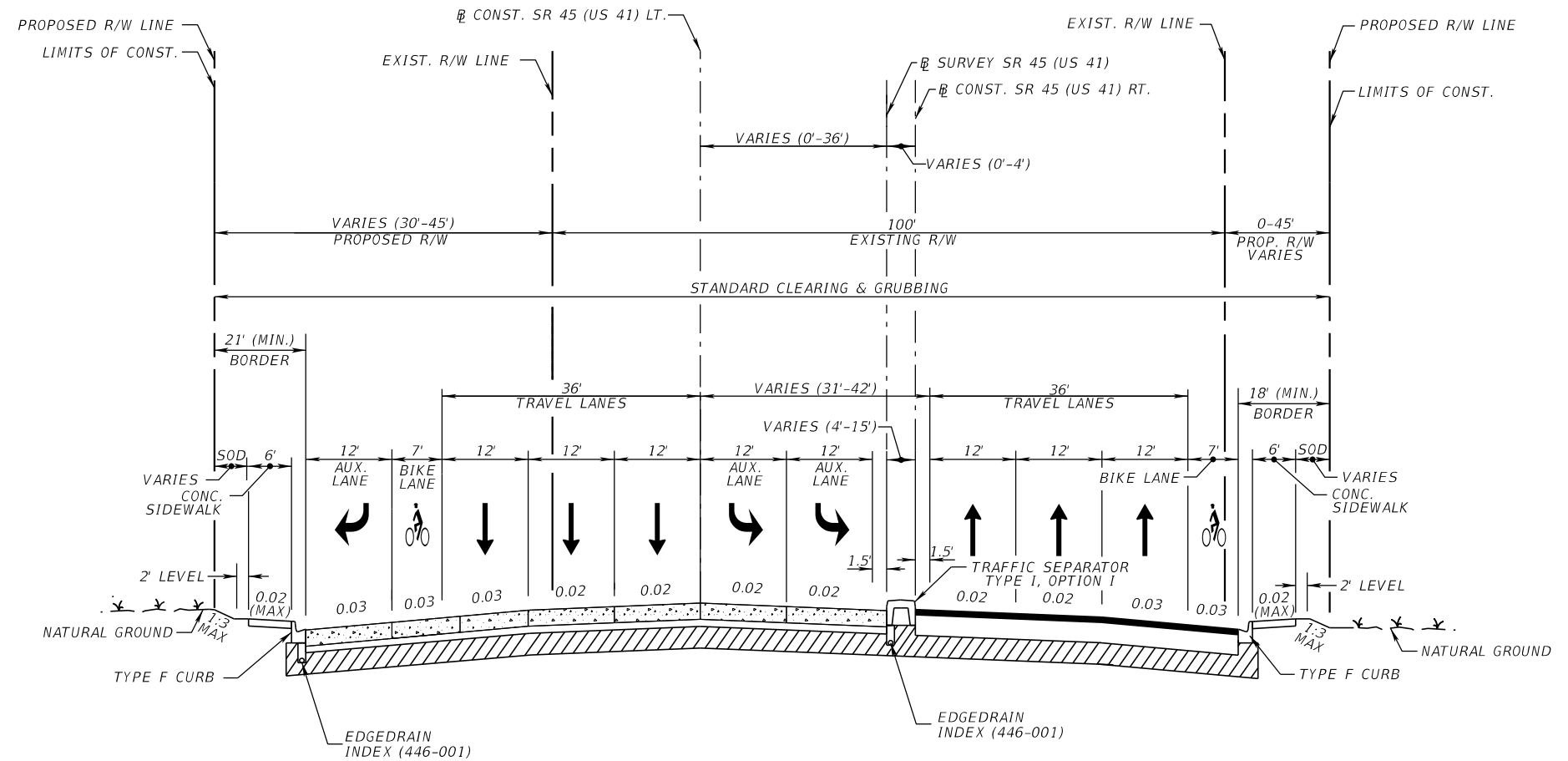
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- () RESURFACING (LA FACILITIES)
- () RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

- 1) CURB ON HIGH SPEED FACILITY

TYPICAL SECTION No. 4



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

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 39,000
 ESTIMATED OPENING YEAR = 2027 AADT = 31,800
 ESTIMATED DESIGN YEAR = 2047 AADT = 39,600
 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

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

ACCESS CLASSIFICATION

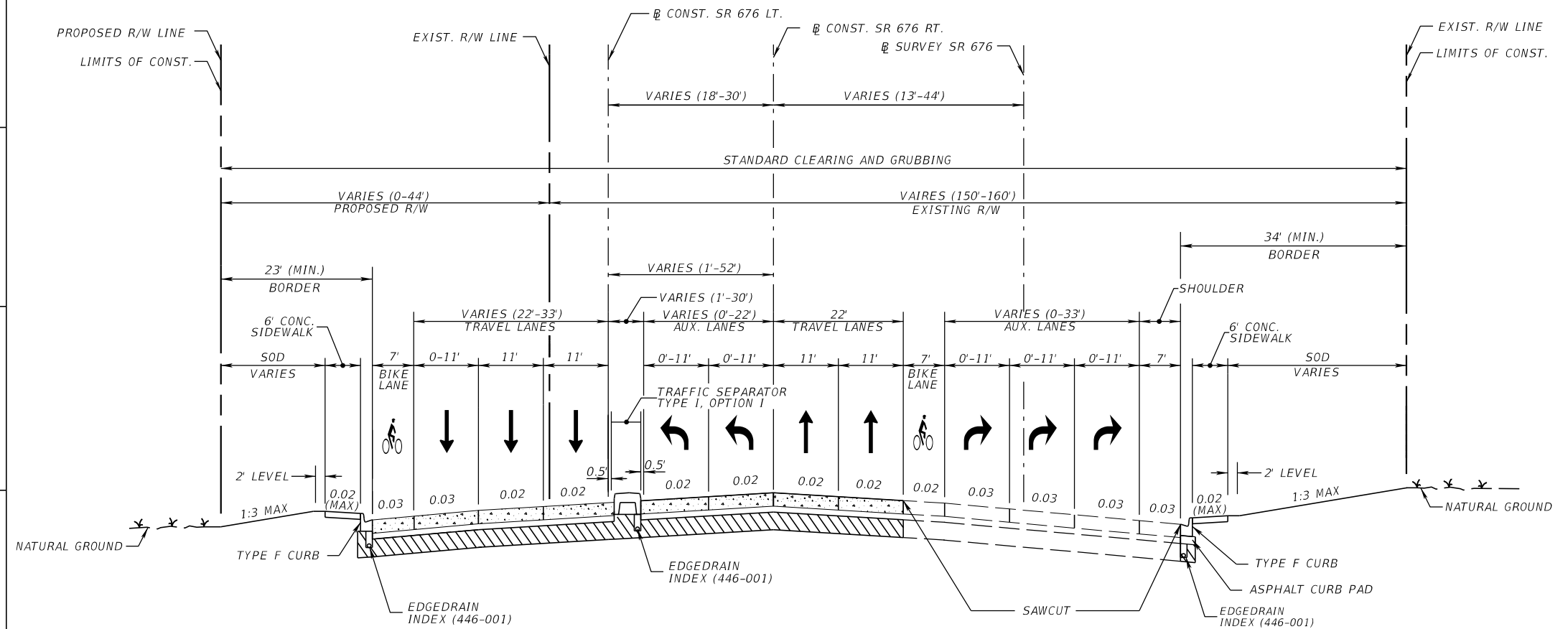
- () 1 - FREEWAY
- () 2 - RESTRICTIVE w/Service Roads
- () 3 - RESTRICTIVE w/660 ft. Connection Spacing
- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- () 7 - BOTH MEDIAN TYPES

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 5



SR 676 (CAUSEWAY BLVD.)
 MP 3.554 TO MP 3.176 @ CONST. SR 676 LT.
 MP 3.554 TO MP 3.175 @ CONST. SR 676 RT.

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 28,000
 ESTIMATED OPENING YEAR = 2027 AADT = 39,100
 ESTIMATED DESIGN YEAR = 2047 AADT = 47,100
 K = 9% D = 72.4% T = 13% (24 HOUR)
 DESIGN HOUR T = 7.0%
 DESIGN SPEED = 45 MPH
 POSTED SPEED = 45 MPH
 TARGET SPEED = N/A

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

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

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

ACCESS CLASSIFICATION

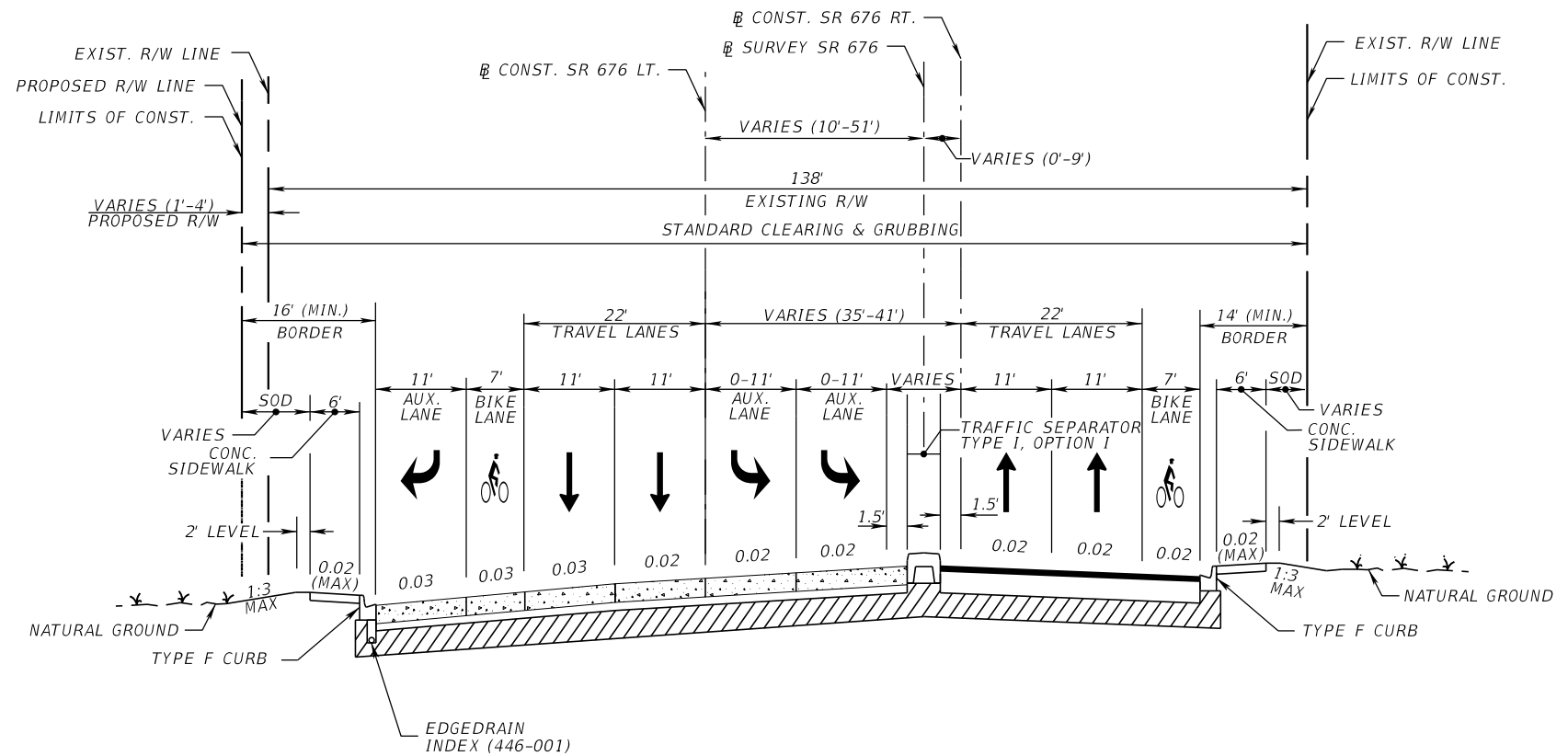
- () 1 - FREEWAY
- () 2 - RESTRICTIVE w/Service Roads
- () 3 - RESTRICTIVE w/660 ft. Connection Spacing
- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- () 7 - BOTH MEDIAN TYPES

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 6



SR 676 (CAUSEWAY BLVD.)
 MP 3.176 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 = 2018 AADT = 28,000
 ESTIMATED OPENING YEAR = 2027 AADT = 23,700
 ESTIMATED DESIGN YEAR = 2047 AADT = 28,100
 K = 9% D = 72.4% T = 13% (24 HOUR)
 DESIGN HOUR T = 7.0%
 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

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

ACCESS CLASSIFICATION

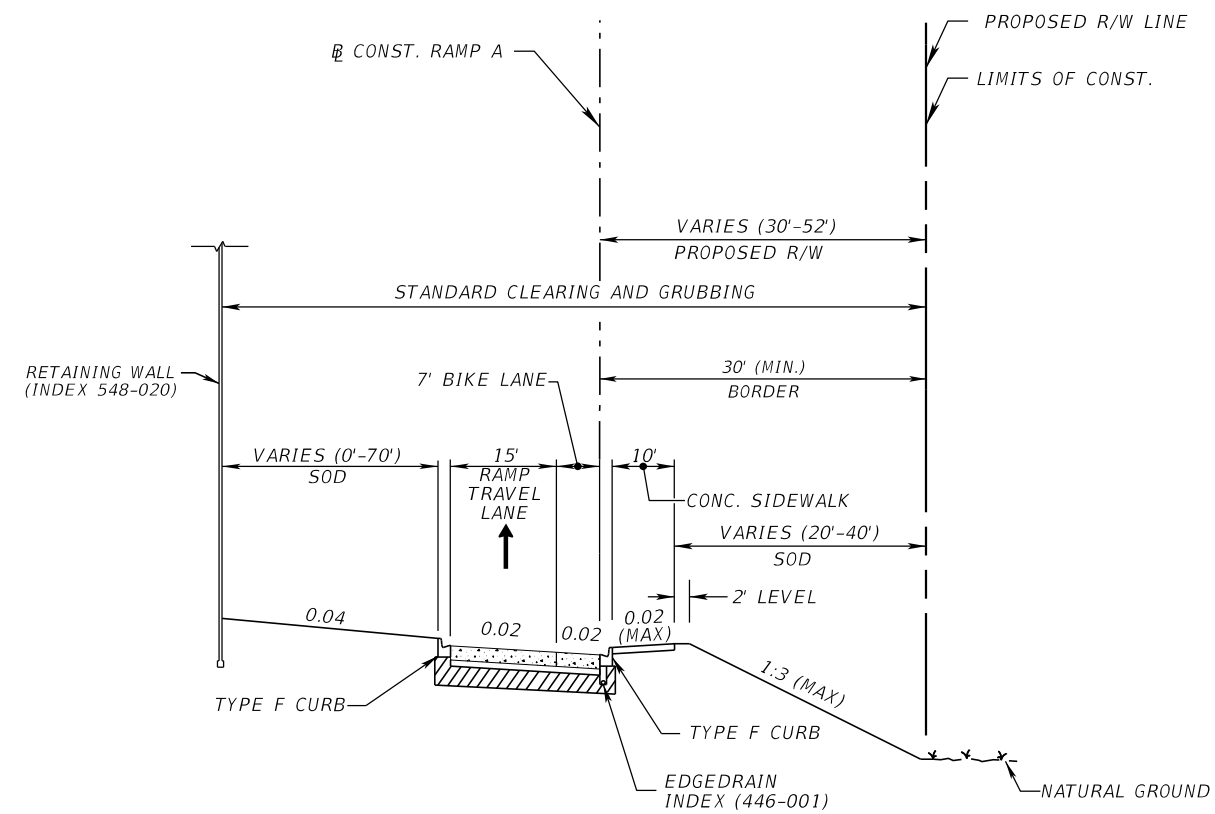
- () 1 - FREEWAY
- () 2 - RESTRICTIVE w/Service Roads
- () 3 - RESTRICTIVE w/660 ft. Connection Spacing
- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- () 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (X) 7 - BOTH MEDIAN TYPES

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 7



RAMP A - US 41 TO 36TH AVE S.
MP 0.000 TO MP 0.228 @ CONST. RAMP A

NOT TO SCALE

DESIGN SPEED = 40 MPH
POSTED SPEED = 40 MPH
TARGET SPEED = N/A

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

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
- () PRINCIPAL ARTERIAL (X) LOCAL
- () MINOR ARTERIAL

HIGHWAY SYSTEM

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

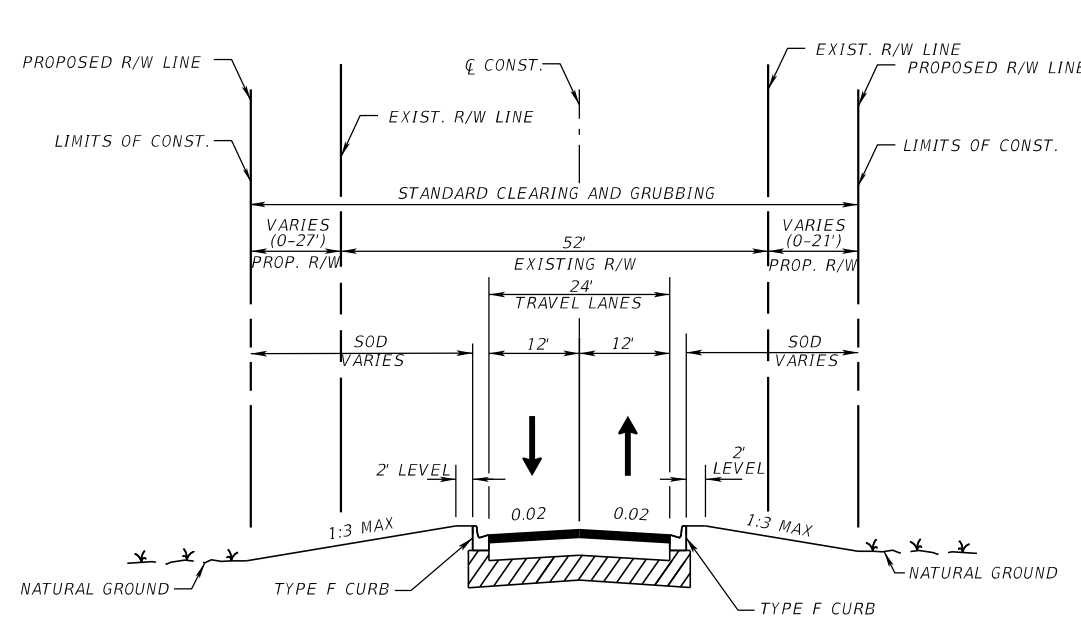
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- () RESURFACING (LA FACILITIES)
- () RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

- 1) BIKE LANE WIDTH

TYPICAL SECTION No. 8



HARTFORD ST.
MP 0.000 TO MP 0.189 Q CONST. HARTFORD ST.

TOWAWAY AVE. / 36TH AVE.
MP 0.000 TO MP 0.122 Q CONST. 36TH ST.

ST PAUL ST.
MP 0.000 TO MP 0.09 Q CONST. ST PAUL ST.

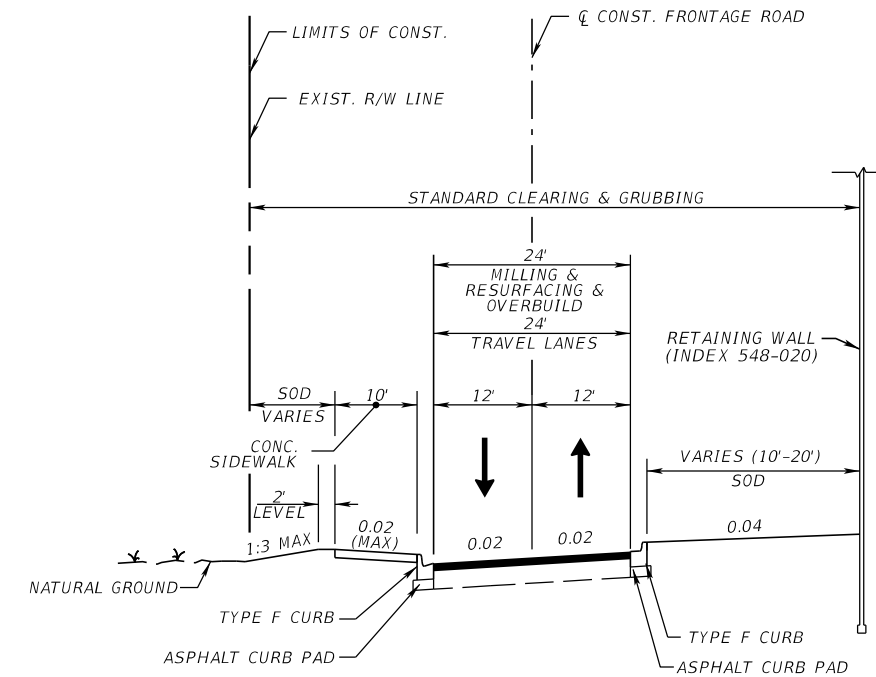
FRONTAGE RD.
MP 0.000 TO MP 0.194 Q CONST. FRONTAGE RD.

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



FRONTAGE RD.
MP 0.375 TO MP 0.758 Q CONST. FRONTAGE RD.

NOT TO SCALE

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	9

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

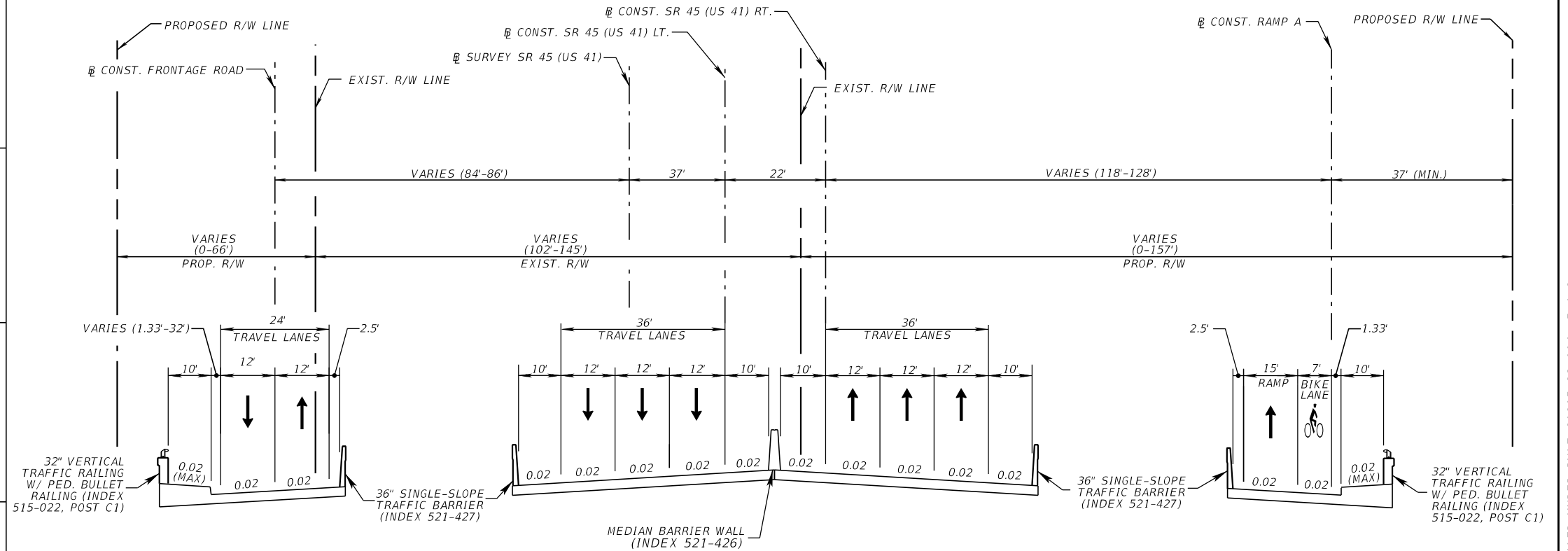
- () 1 - FREEWAY
- () 2 - RESTRICTIVE w/Service Roads
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- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- () 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (X) 7 - BOTH MEDIAN TYPES

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 9



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.

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 39,000
 ESTIMATED OPENING YEAR = 2027 AADT = 48,500
 ESTIMATED DESIGN YEAR = 2047 AADT = 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

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

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

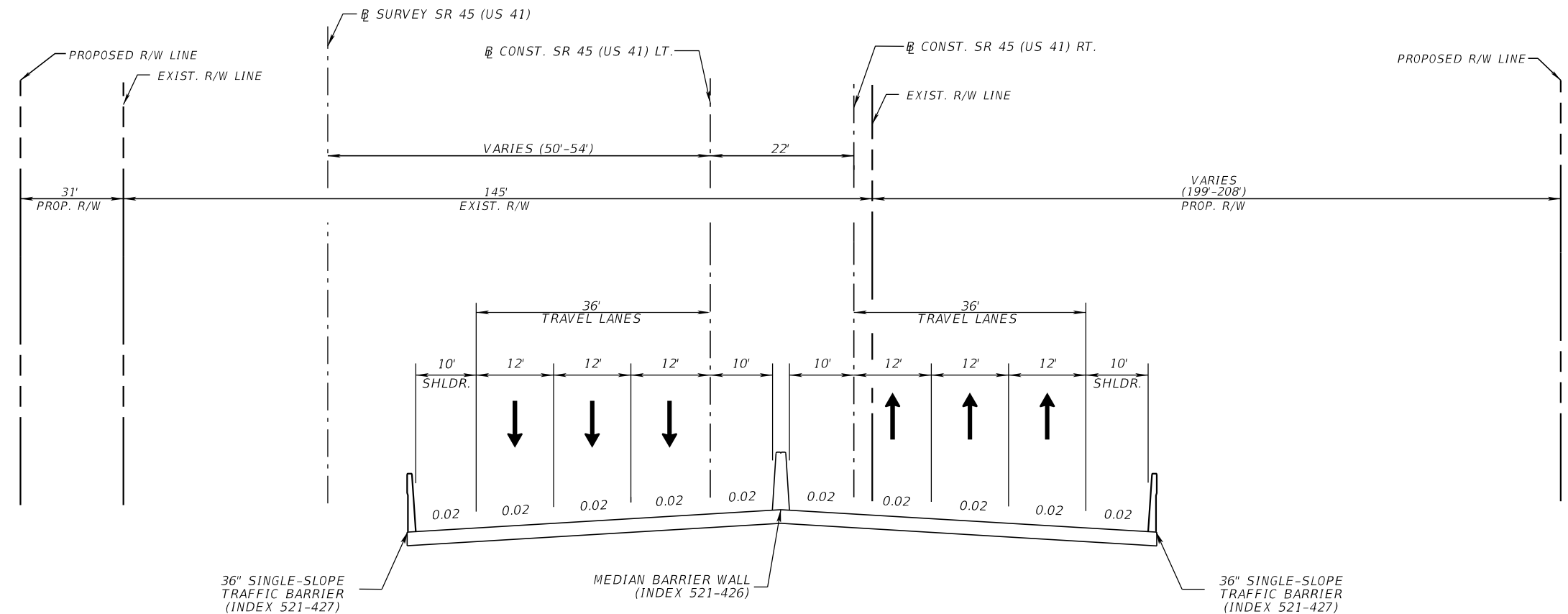
- () 1 - FREEWAY
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- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- () 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (X) 7 - BOTH MEDIAN TYPES

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 10



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

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 39,000
 ESTIMATED OPENING YEAR = 2027 AADT = 48,500
 ESTIMATED DESIGN YEAR = 2047 AADT = 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

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

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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

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

ACCESS CLASSIFICATION

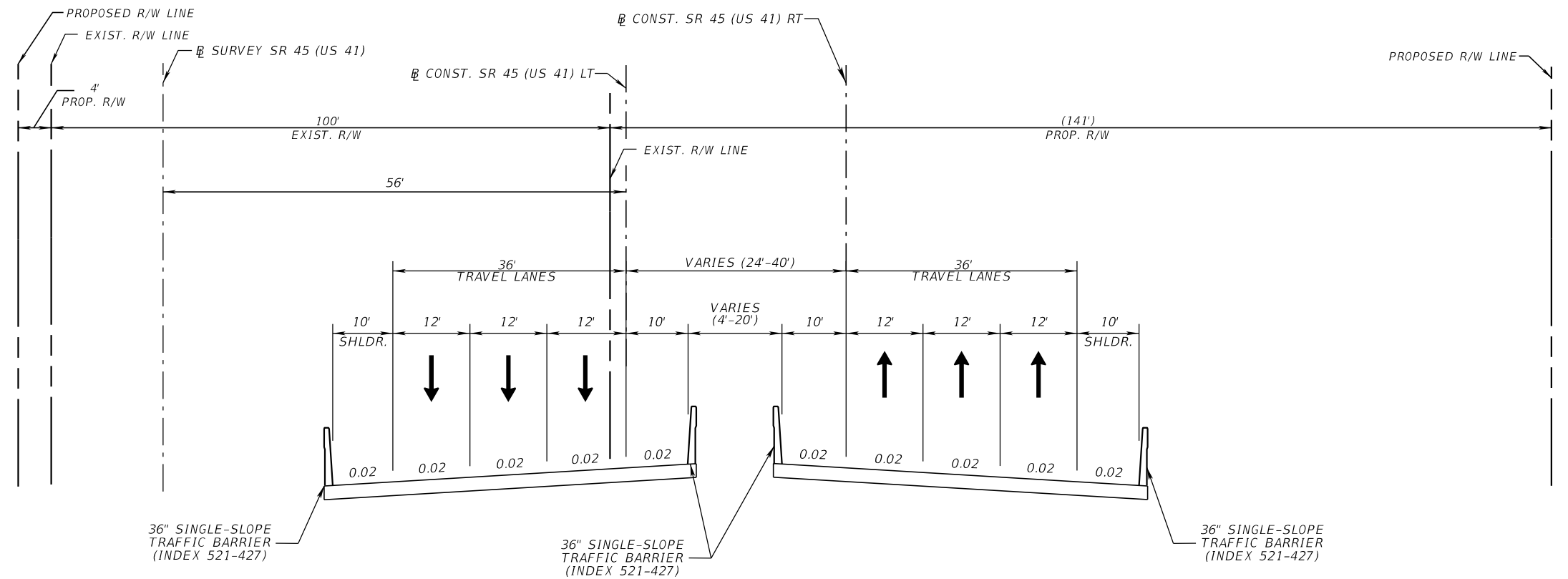
- () 1 - FREEWAY
- () 2 - RESTRICTIVE w/Service Roads
- () 3 - RESTRICTIVE w/660 ft. Connection Spacing
- () 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- () 5 - RESTRICTIVE w/440 ft. Connection Spacing
- () 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (X) 7 - BOTH MEDIAN TYPES

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 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 = 2018 AADT = 39,000
 ESTIMATED OPENING YEAR = 2027 AADT = 48,500
 ESTIMATED DESIGN YEAR = 2047 AADT = 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

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	12

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Submittal/Approval Letter

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

Date: January 16, 2023

Financial Project ID: 440749-1-52-01 New Const. RRR Other
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

Begin Project MP: 22.578 End Project MP: 23.925

FHWA Project of Division Interest: Yes No

Request for: Design Exception Design Variation Design Variation Memorandum

Community Aesthetic Feature: Conceptual Final

Re-submittal: Yes No Original Ref# _____ - _____ - _____

Requested for the following element(s):

- | | | | |
|---|--|---|--|
| <input type="checkbox"/> Design Speed | <input type="checkbox"/> Lane Width | <input type="checkbox"/> Shoulder Width | <input checked="" type="checkbox"/> Cross Slope |
| <input type="checkbox"/> Design Loading Structural Capacity | <input type="checkbox"/> Vertical Clearance | <input type="checkbox"/> Maximum Grade | <input type="checkbox"/> Stopping Sight Distance |
| <input type="checkbox"/> Superelevation | <input type="checkbox"/> Horizontal Curve Radius | <input type="checkbox"/> Other _____ | |

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.

Recommended by:

 Date 01/16/23

Name:
Vincent E. Shine, Responsible Professional Engineer

Approvals:

Digitally signed by: Allan J Urbonas
Date: 2023.03.10 09:39:53 -05'00' Date _____

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

N/A Date _____

Name:
District Structures Design Engineer

N/A Date _____

Name:
State Roadway Design Engineer

N/A Date _____

Name:
State Structures Design Engineer

N/A Date _____

Name:
Chief Engineer

N/A Date _____

Name:
FHWA Division Administrator

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
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FUNCTIONAL CLASSIFICATION

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

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

ACCESS CLASSIFICATION

- () 1 - FREEWAY
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- () 5 - RESTRICTIVE w/440 ft. Connection Spacing
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- (X) 7 - BOTH MEDIAN TYPES

CRITERIA

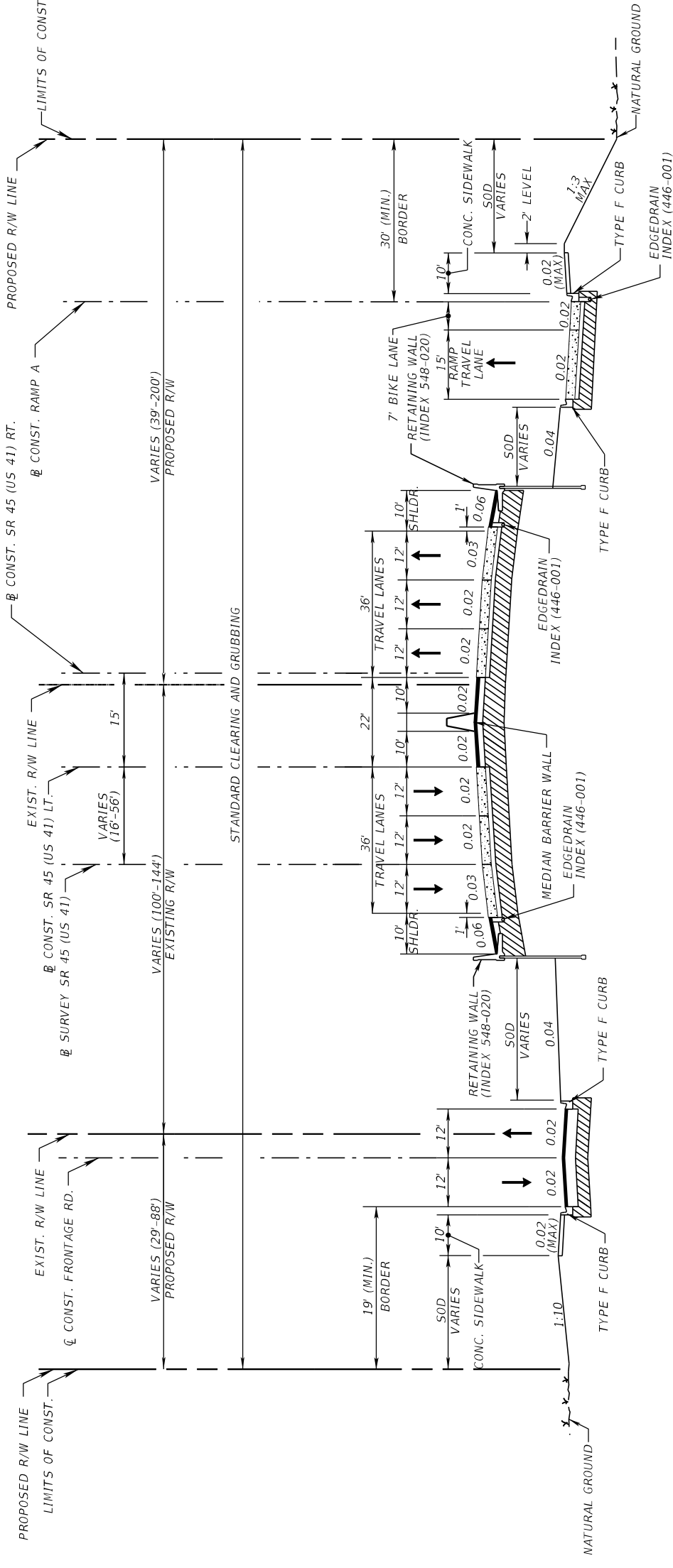
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- () RESURFACING (LA FACILITIES)
- () RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

DESIGN VARIATIONS

- 1) SHOULDER CROSS SLOPE

TYPICAL SECTION No. 2



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.

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2018 AADT = 39,000
 ESTIMATED OPENING YEAR = 2027 AADT = 48,500
 ESTIMATED DESIGN YEAR = 2047 AADT = 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

FINANCIAL PROJECT ID	SHEET NO.
440749-1-52-01	3

Appendix B: Hydroplaning Analysis Tool

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

APPENDIX D

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 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 $\frac{1}{2}$ 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 Multiplier (Number of Poles) Value 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

Sequence 2 Total \$46,121,065.32

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
Median Component Total				\$50,534.32

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

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

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	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

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	Value				
Spacing	MIN				
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 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

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

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

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**

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 CMLPT,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	Value				
Spacing	MIN				
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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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 Items					
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 $\frac{1}{2}$ 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

Multiplier (Number of Poles)

Value

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