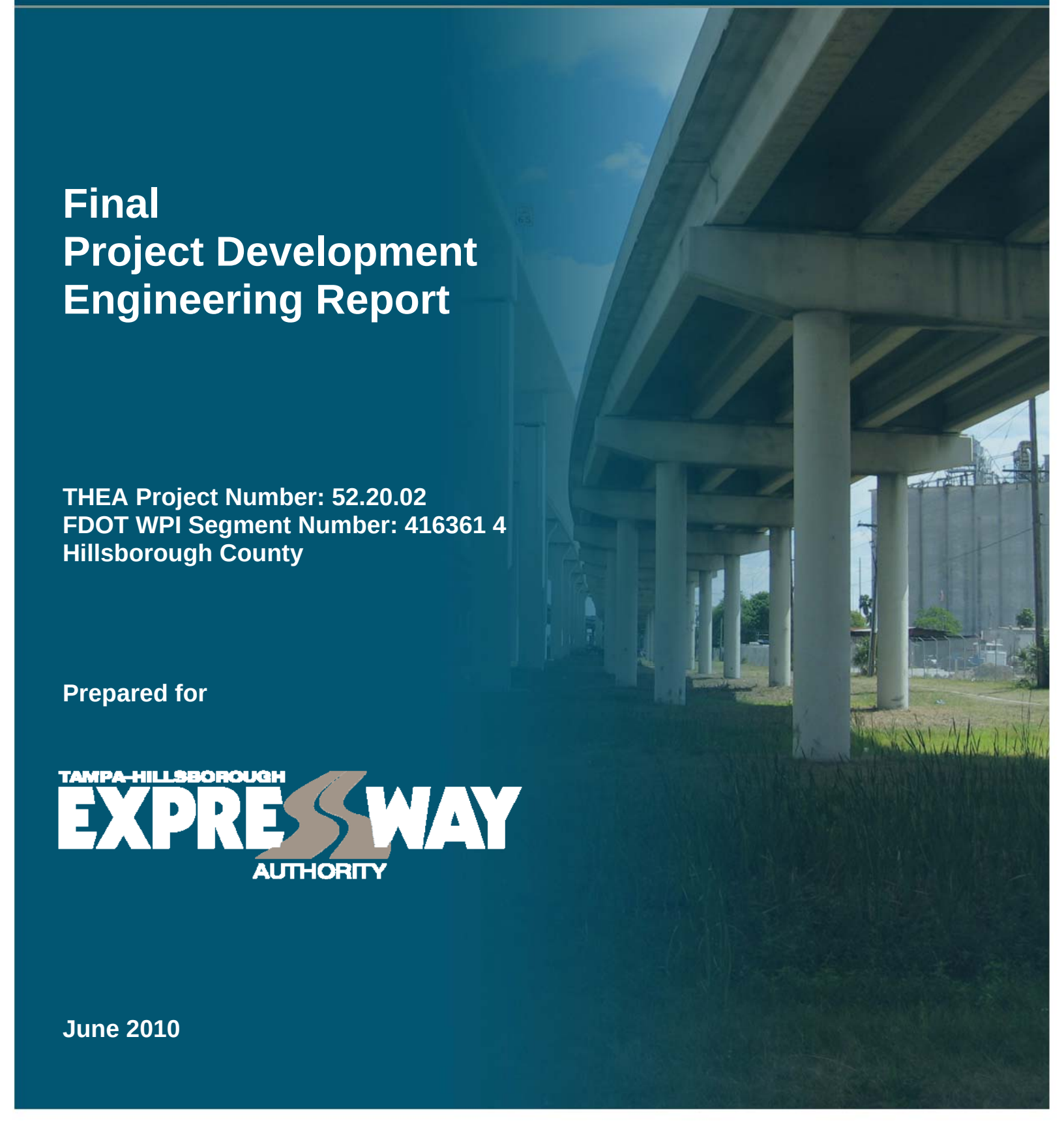
Project Development & Environment Study

Selmon Expressway (SR 618) Downtown Viaduct Improvements
From Florida Avenue to South 22nd Street



Final
Project Development
Engineering Report

THEA Project Number: 52.20.02
FDOT WPI Segment Number: 416361 4
Hillsborough County

Prepared for

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

June 2010

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Prepared for:

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

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June 2010

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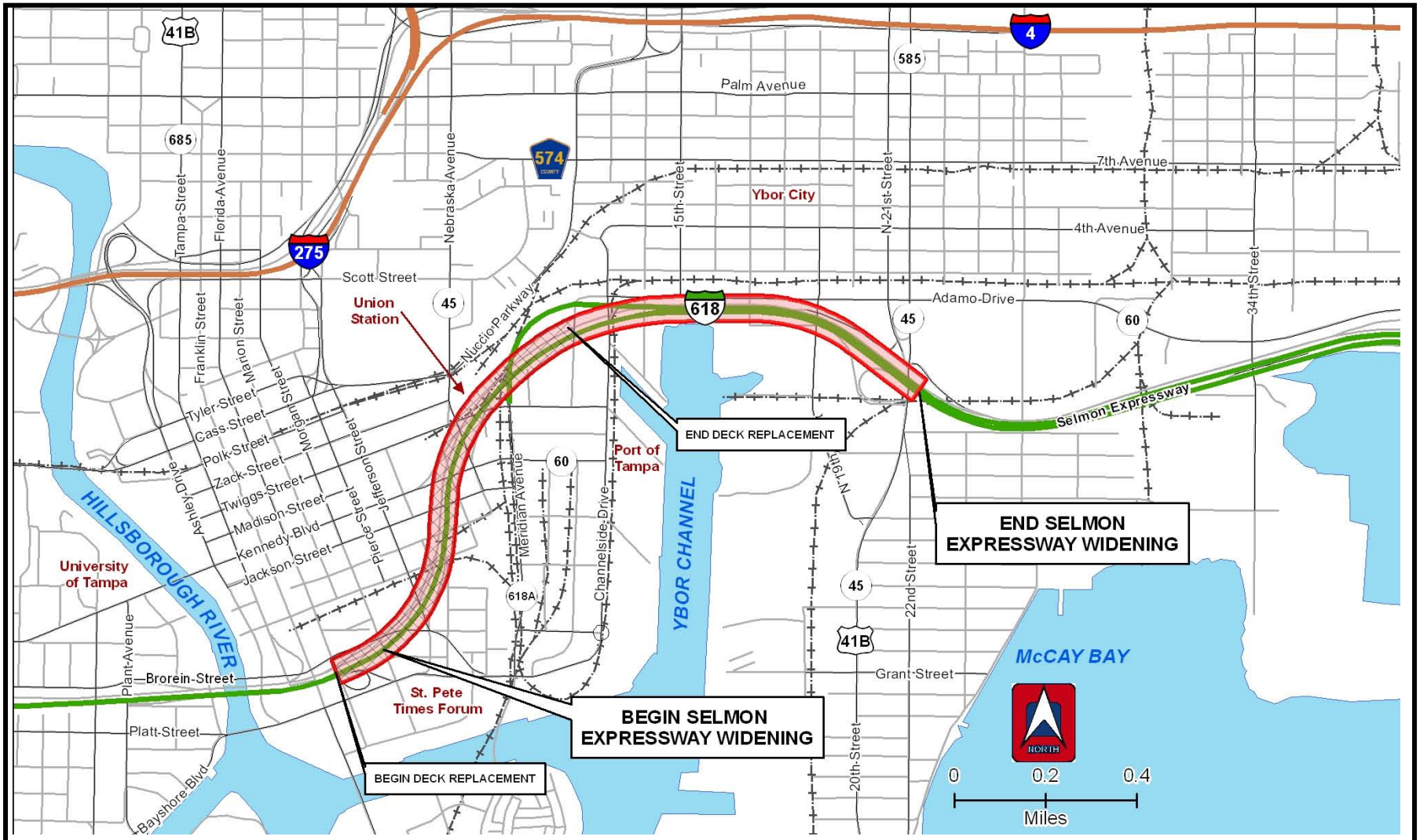
Section 1– INTRODUCTION

The Tampa Hillsborough County Expressway Authority (THEA) conducted a Project Development and Environment (PD&E) Study to identify and analyze various alternative design concepts to meet the future traffic needs on the Selmon Expressway (SR 618) from Florida Avenue to South 22nd Street in Hillsborough County (**Figure 1-1**). The total project length is approximately 1.7 miles and is located within the Tampa city limits. Proposed improvements include the widening of the existing structures to the inside to provide a divided 6-lane roadway. The build alternative and any related stormwater improvements will be situated within the existing right-of-way (ROW). The design year for this project is 2035. A separate project within the limits of this study is the proposed re-decking of an approximately one mile segment of the existing viaduct structures, to be constructed by the Florida Department of Transportation (FDOT). The proposed re-decking will extend from Florida Avenue to North 12th Street.

This PD&E Study was conducted by THEA in cooperation with the FDOT District Seven. The objective of this study was to reach a decision on the type, location and conceptual design for the necessary improvements for the Selmon Expressway to safely and efficiently accommodate future travel demand. This Study documented the need for the improvements as well as the procedures utilized to develop and evaluate various improvements including elements such as proposed typical sections and preliminary horizontal alignments. The social, physical, and natural environmental effects and costs of these improvements have been identified. The alternatives were evaluated and compared based on a variety of parameters utilizing a matrix format. This process identified the Recommended Alternative that will best balance the benefits (such as improved traffic operations and safety) with the impacts (such as environmental effects and construction costs). In addition, full consideration was given to a "No-Build" alternative.



Selmon Expressway (SR 618)
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from Florida Ave to South 22nd St
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Figure 1-1 Project Location Map

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

1.1 Description of Proposed Action

The Tampa Hillsborough County Expressway Authority (THEA) conducted a Project Development and Environment (PD&E) Study to evaluate possible capacity improvements along approximately 1.7 miles of the Selmon Expressway (SR 618), currently a four-lane, continuous elevated structure through downtown Tampa. The study limits for this project are from Florida Avenue to South 22nd Street in Hillsborough County, Florida. The design year for the improvements is 2035.

Evaluated alternative capacity and related stormwater improvements included: 1) widening the existing structures to the inside to provide a divided six-lane roadway and 2) constructing a westbound (WB), one-lane ramp from the nearby expressway Reversible Express Lanes (REL) structure that will tie to the downtown viaduct. The WB, one-lane ramp alternative included a one–lane widening of the eastbound (EB) viaduct structure to the outside for a total of three EB lanes. A separate project within the limits of this study is the proposed re-decking of an approximately one mile segment of the existing viaduct structures, to be constructed by the Florida Department of Transportation (FDOT). The proposed re-decking will extend from Florida Avenue to North 12th Street.

The PD&E Study was prepared and funded by THEA in cooperation with the FDOT District Seven and is in the FDOT Work Program as Work Program Item (WPI) Segment No.: 416361-4.

The western terminus of the project is Florida Avenue; this terminus was selected because it incorporates the deck replacement limits, and enables the four high volume, downtown exit and entrance ramps of the expressway to be contained within the project limits. These four ramps receive and apply approximately one-third (12,000 of the 37,000 daily trips) of the total am and pm peak hour traffic along the Selmon Expressway entering downtown from the east (refer to the *Design Traffic Technical Memorandum*

(DTTM), November 2009). Downtown ramps that are located west of the project limits experience relatively low traffic volumes.

The majority of downtown traffic on the Selmon Expressway enters and leaves from the east. This volume is expected to increase by approximately 10 percent with the opening of the I-4 Connector (refer to *DTTM* for future traffic volumes).

The eastern project terminus meets the four-lane to six-lane transition that will be constructed as part of the I-4 Connector. This will allow for a continuous six-lane section for the expressway in this area, and is thus the logical terminus both geometrically and for traffic.

The sections, township and ranges where the project is located are summarized in **Table 1-1**. Based on long-range planning, projected population and employment growth, and projected traffic volumes, the Hillsborough County Metropolitan Planning Organization (MPO) has included this project in their Cost Feasible Long-Range Transportation Plan (LRTP) that was adopted on December 9, 2009. This project will also be included in the transportation element of the Hillsborough County Comprehensive Plan for consistency.

Table 1-1 Project Sections, Township, Ranges

Hillsborough County		
Sections	**Township**	**Ranges**
24	29 S	18 E
17, 18, 19	29 S	19 E

In addition, full consideration was given to a "No-Build" alternative. Study objectives included the following: determine proposed typical sections, and develop preliminary horizontal and vertical geometry for the bridges and roadway approaches, while minimizing impacts to the environment and ensuring project compliance with all applicable federal and state laws. Improvement alternatives were identified which will improve safety and meet future transportation demand.

Based on comments received during the preliminary planning for this project through FDOT's Efficient Transportation Decision Making (ETDM) Process (*Programming Screen #11840*) a *State Environmental Impact Report (SEIR)* is the class of action established for this project.

1.2 Project Purpose and Need

The Selmon Expressway will need capacity improvements to maintain the required level-of-service (LOS) based on projected traffic volumes, particularly as a result of the FDOT's nearby I-4 Connector Project. The purpose of this PD&E Study is to develop and evaluate build alternatives that will accomplish this need, by expanding this divided four-lane facility into the equivalent of a divided six-lane facility.

The Selmon Expressway experienced higher than anticipated traffic growth after the REL Project was opened to traffic in August 2006. The original Tampa Interstate Study (TIS) and LRTP planning for the capacity improvement on the Selmon Expressway within the downtown area did not anticipate construction of the I-4 Connector until approximately 2025. However, the FDOT will be constructing the I-4 Connector Project (WPI Segment No.: 258415-1) starting in year 2010. Based on the *DTTM*, November 2009 by HNTB, the I-4 Connector will contribute approximately 10 percent of the total volume to the study area of the Selmon Expressway. Thus, additional capacity on the downtown portion of the Selmon Expressway is being evaluated sooner than originally planned.

The Selmon Expressway is an evacuation route designated by the Hillsborough County Emergency Management Office (HCEMO). The HCEMO submitted an emergency plan to FDOT's Central Office for the Selmon Expressway to operate in a contraflow condition, providing four-lanes for evacuation purposes from Gandy Boulevard eastward to 50th Street when necessary.

Since the Selmon Expressway is mainly a commuter facility, the traffic is expected to grow correspondingly with the increase in population and employment of the Tampa

area. The population of Hillsborough County, according to the 2000 Census, was 998,948. This reflected an average annual increase of 16,489 persons, or about 2 percent per year, since the 1990 Census. The Hillsborough County MPO's 2025 LRTP is based on a future population estimate of 1,532,000. Based on the 2000 Census, employment was 672,400 and is projected to be 1,120,000 in 2025. This represents an increase in employment of approximately 67 percent. These socioeconomic projections are used in the Tampa Bay Regional Planning Model (TBRPM) to estimate travel demand in the future.

Current (2008) Directional Design Hourly Volumes (DDHV) on the Selmon Expressway range from 1,490 vehicles per hour (VPH) to 2,380 VPH. Projected DDHV on the Selmon Expressway with the implementation of the I-4 Connector range from 2,250 VPH to 3,580 VPH in 2015; from 3,270 VPH to 5,260 VPH in 2025; and from 4,290 VPH to 6,980 VPH in 2035. These volumes result in a LOS E of the Selmon Expressway at the WB off ramp to Kennedy Boulevard in 2025 PM peak period and LOS F in 2035 PM peak period with the No-Build alternative. The Selmon Expressway at the WB off ramp to Morgan Street is LOS D and LOS E for 2025 and 2035 PM peak period, respectively.

A critical crash rate analysis and a safety ratio were analyzed for this project from 2004 to 2009. The critical crash rate is a function of roadway segment length, traffic volume, and the average crash rate for the category of highway being tested. The critical crash rate was obtained from the Statewide Average Crash Rates for Urban Segments (toll roads) received from the FDOT. The critical and actual crash rates are measured in number of crashes per million vehicle miles traveled. The safety ratio is the ratio between the actual and critical crash rates for a given segment for a given year. It identifies safety issues or high crash segments along roads. A safety ratio greater than 1.0 indicates that the segment is experiencing more crashes than would be expected for this type of a segment in other parts of the state. From the crash analysis, the safety ratio for the study segment of SR 618 is 1.446, 2.133, 1.326 and 1.021 during the years 2005 to 2008 respectively. For the year 2004 it is 0.756, and year 2009 it is 0.518 (only for 4 months). The Selmon Expressway within the study segment did exhibit a greater than average crash rate during

the years 2005 to 2008. The construction of the Selmon Expressway REL took place from 2003 to 2007 with two realigned sections of the EB lanes opened in spring 2005. The construction and phased opening of the Selmon Expressway REL may have contributed to some of the crashes during that period.

Currently there are six express bus routes that utilize the expressway for the Hillsborough Area Regional Transit (HART), and one for the Pinellas Suncoast Transit Authority (PSTA). Areas served by these routes include Pinellas County, downtown Tampa, Brandon, Dover, Fishhawk, Riverview, MacDill Air Force Base, Southshore, South Brandon and Eastern Hillsborough County.

The Selmon Expressway is connected to the Port of Tampa and Cruise Terminal via South 22nd Street. As previously mentioned, the expressway also has direct ramp connections to I-75, US 41, and US 301 that benefit freight movements.

Bicycle and pedestrian facilities cannot be accommodated on the expressway due to high vehicle speeds and limited access, though at-grade trails are planned by the City of Tampa along the less urbanized area adjacent to the expressway. Along the limits of this project the expressway is elevated and standard sidewalks and other amenities are provided by others along the urban streets below.

1.3 Other Programmed Projects

Also included in this project is the proposed re-decking of an approximately one mile segment of the existing viaduct structure located within the project area (WPI Segment No.: 416361-2). The proposed re-decking will extend from Florida Avenue to North 12th Street. The proposed downtown viaduct capacity project is needed as a result of the proposed I-4 Connector project and can be timed with the re-decking project to reduce costs, unnecessary disruption to the traveling public, and optimize the number of travel lanes open during construction of the re-decking.

The I-4 /Selmon Expressway Interchange (Connector) is a limited-access interchange that extends from the Selmon Expressway north along the west side of 31st Street to I-4 in Hillsborough County (WPI Segment No.: 258415-1). This proposed facility is an elevated roadway that includes a series of separate ramps intended to improve the regional movement of traffic throughout the Tampa Bay area. It will also provide trucks a direct access route to the Port of Tampa. This project completes an important regional link in the Tampa Interstate System and provides an alternative route for commuters traveling south and downtown. This project is being partially funded through the American Recovery and Reinvestment Act of 2009. A summary of other programmed projects within the study limits is shown in **Table 1-2**.

Table 1-2 Other Programmed Projects within Study Limits

Hillsborough County				
Work Description	**Item No.**	**Project Limits**	**Length (mi)**	**Fiscal Year(s)**
I-4 / Selmon Expressway - Construction	258415-1	From south of Selmon Expressway to I-4 Interchange	0.913	2010 to 2014
SR 618 (Selmon Expressway) – Deck - Replacement, Bridge-Repair / Rehabilitation Design-Build	416361-2	From west of Morgan Street to Channelside Drive	1.0	2010 to 2012

Source: FDOT's Work Program Fiscal Year 2010-2014 (updated 7/13/09)

Section 2 – EXISTING CONDITIONS

2.1 Functional Classification

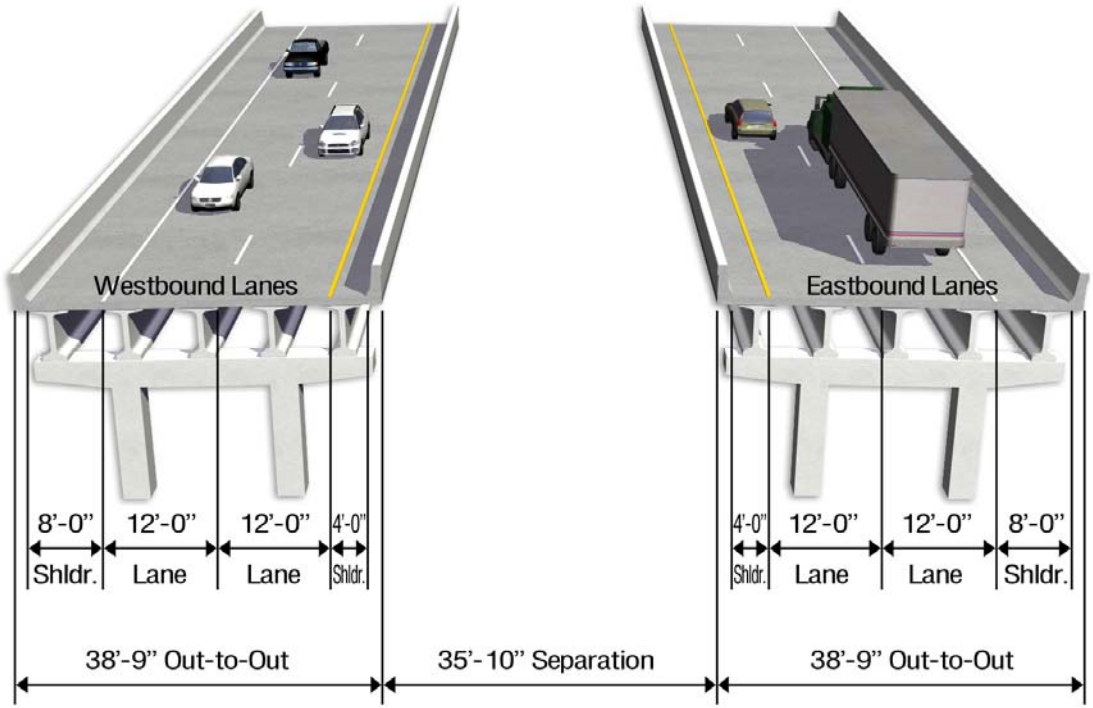
The Selmon Expressway is primarily an east/west facility, which in its entirety, extends from a western terminus at Gandy Boulevard (US 92/SR 600) to an eastern terminus at Brandon Parkway in Hillsborough County. The Selmon Expressway corridor is functionally classified as Urban Arterial – Freeways and Expressways. It is part of the Florida Intrastate Highway System (FIHS), which is comprised of interconnected limited and controlled access roadways including interstate highways, Florida's Turnpike, selected urban expressways and major arterial highways. The FIHS is the highway component of the Strategic Intermodal System (SIS), which is a statewide network of highways, railways, waterways and transportation hubs that handle the bulk of Florida's passenger and freight traffic. As an SIS/FIHS facility and part of the regional roadway network, the Selmon Expressway corridor is included in the MPO's LRTP that was adopted on December 9, 2009.

2.2 Typical Sections

The existing typical section of the Selmon Expressway from Florida Avenue to west of Channelside Drive is primarily a set of twin viaduct bridges carrying two elevated lanes in each direction. A separate three-lane bridge carrying the REL from east of Channelside Drive to South 22nd Street is situated within the proximity of the Selmon viaduct structure at the eastern portion of the study area. The existing typical sections are shown in **Figures 2-1** and **2-2**.

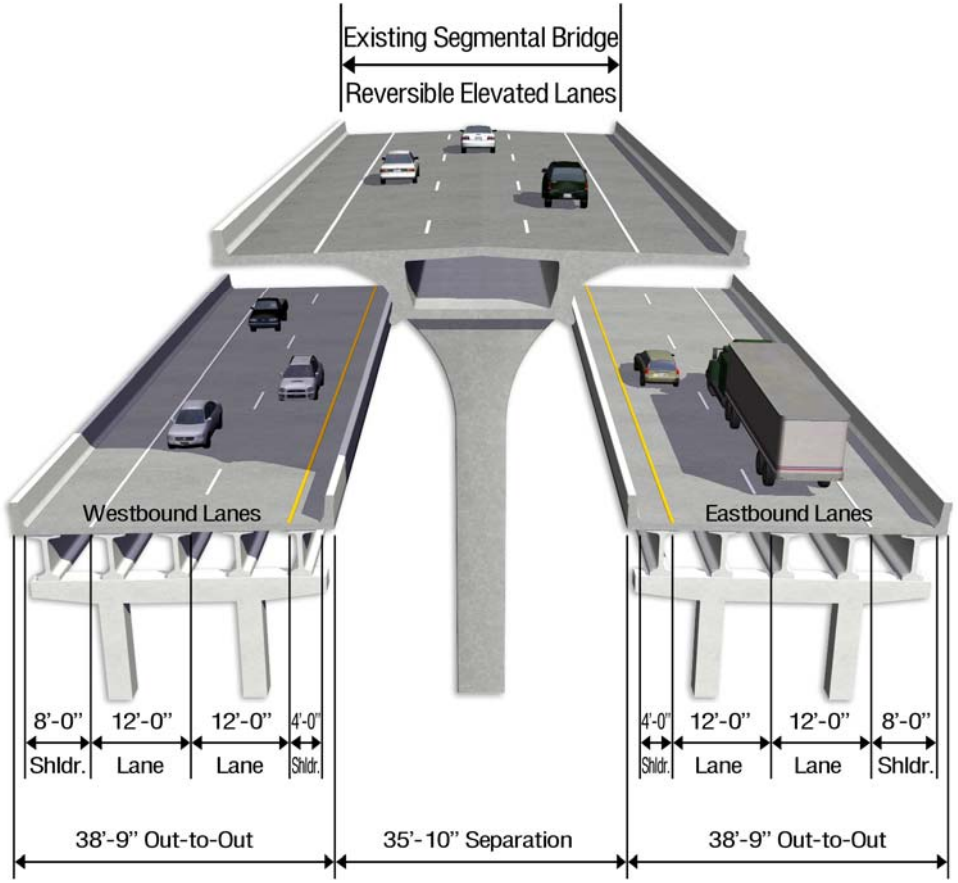
2.3 Pedestrian Facilities

Pedestrian facilities cannot be accommodated on the Selmon Expressway due to high vehicle speeds and limited access, though at-grade trails are planned by the City of Tampa along the less urbanized area adjacent to the expressway. Along the limits of this project the expressway is elevated. Standard sidewalks and other amenities are provided by others along the urban streets below.



Typical Section I
From Florida Avenue to West of Channelside Drive

Selmon Expressway (SR 618) **Downtown Viaduct** **Improvements PD&E Study** ***from Florida Ave to South 22nd St*** Hillsborough County	**Figure 2-1 Existing Typical Section I**	TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY



Typical Section II
From East of Channelside Drive to South 22nd Street

Selmon Expressway (SR 618) **Downtown Viaduct** **Improvements PD&E Study** ***from Florida Ave to South 22nd St*** Hillsborough County	**Figure 2-2 Existing Typical Section II**	TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

2.4 Bicycle Facilities

Bicycle facilities cannot be accommodated on the Selmon Expressway due to high vehicle speeds and limited access, though at-grade trails are planned by the City of Tampa along the less urbanized area adjacent to the expressway.

2.5 Right- of-Way

The existing Selmon Expressway is generally an elevated roadway structure which is proposed to be widened on the inside within the existing ROW. The existing ground ROW changes and varies along the project limits from Florida Avenue to South 22nd Street. (Refer to plans in **Appendix F**)

2.6 Geometric Elements

2.6.1 Cross Sections

See Section 2.2 for typical section information.

2.6.2 Horizontal Alignment

There are four horizontal curves within the project limits on the Selmon Expressway. Existing horizontal curves are summarized in **Table 2-1.**

2.6.3 Vertical Alignment

Existing vertical curves are summarized in **Table 2-1.**

2.6.4 Horizontal and Vertical Clearances

Horizontal and vertical clearances associated with bridge structures are discussed in Section 2.6.4 of this *PDER*.

Table 2-1 Existing Curve Data

Vertical Curves							
Project Number	**Vertical Curve Location (VPI Station)**	**Design Speed (mph)**	**Crest (C) or Sag (S)**	**Curve Length (ft)**	**Grade In (%)**	**Grade Out (%)**	**K Value (L/A)**
Downtown Viaduct Eastbound and Westbound Roadway (SR 618 Toll)							
SPN 10002-3522	**567+93.91 WB	50	S	460	-1.600	3.000	100
	**568+34.60 EB	50	S	400	-1.012	3.000	100
	574+00.00	50	C	400	3.000	0.400	154
(Profile same in EB	584+00.00	50	C	500	0.400	-1.200	313
and WB directions	589+00.00	50	S	300	-1.200	-0.400	375
unless noted	600+00.00	50	S	300	-0.400	1.200	188
otherwise)	*608+00.00	50	C	400	1.200	-2.046	123
	614+25.00	50	S	400	-2.046	0.346	167
SPN 10002-3523	640+25.00	60	C	600	0.346	-1.367	350
	655+65.00	60	S	500	-1.367	1.665	165
Reversible Elevated Lanes (SR 618A Toll)							
THEA 51.40.01	1608+45.39	40 WB	S	260	0.300	-3.442	69

Horizontal Curves								
Project Number	**Horizontal Curve Location (PI Station)**	**Design Speed (mph)**	**Curve Direction**	**Curve Radius (ft)**	**Degree of Curve**	**Δ (Deflection Angle)**	**Curve Length (ft)**	**Superelevation (ft/ft)**
Downtown Viaduct Eastbound and Westbound Roadway (SR 618 Toll)								
SPN 10002-3522	577+96.09	50	L	1762.947	3° 15’ 00"	60° 37’ 35”	1865.427	0.063
	595+96.93	50	R	1909.859	3° 00’ 00"	30° 11’ 33”	1006.417	0.059
	616+02.90	50	R	2864.789	2° 00’ 00"	55° 44’ 05”	2786.736	0.042
SPN 10002-3523	644+60.91	60	R	1909.86	3° 00’ 00"	38° 13’ 11.1”	1273.99	0.079
Reversible Elevated Lanes (SR 618A Toll)								
THEA 51.40.01	1613+35.53	40 WB	808	808	7° 05’ 28"	96° 20’ 56”	1358.74	0.079

Source: (1) 1979 Plans for State Project Number 10002-3522 and 10002-3523
(2) 2002 Plans for THEA Project Number 51.40.01

Notes:

*Does not meet current FDOT minimum standards for 50 mph design speed

**Consists of two compound vertical curves combined

2.6.5 Posted Speeds

The posted speed is 55 miles per hour (mph) on the Selmon Expressway. The as-built plans from 1979 indicate a design speed of 50 mph.

2.7 Drainage and Floodplains

2.7.1 Overview

This portion of the study focuses on the existing drainage conveyance systems that would be affected by proposed Selmon Expressway improvements. **Figure 2-3** provides an overview of the drainage basins within the project area.

The City of Tampa's stormwater system is divided into drainage sub-basins. Each basin is named for the street that contains the main line of that basin. The proposed improvements to the Selmon Expressway will affect seven different drainage sub-basins. These sub-basins are the Brorein (East/S) Basin, the Whiting Street Basin, the Meridian/R.R. Basin, the Jackson Basin, the 14th Street Basin, the 15th Street Basin, and the Garden Street Outfall (O/F) Basin. Nearly all basins discharge directly through City owned and maintained pipes and box culverts into receiving waters which include the Hillsborough River, Garrison Channel, and Ybor Channel. There are no existing stormwater attenuation or treatment facilities for these sub-basins.

The following is a description of each basin.

2.7.2 Brorein (East/S) Basin & Whiting Street Basin

Improvements starting at Station 567+65 (+/-) and ending near Station 572+50 (+/-) are within the Brorein (East/S) and Whiting Street Basins. The basin areas are approximately 23 and 22 acres, respectively. Runoff from this portion of the viaduct is collected by 6" down spouts and piped to the city-owned and maintained storm sewer system. Starting at the intersections of E. Brorein Street with S. Morgan Street and E. Cumberland Avenue, the stormwater flows in a southwest direction within the E. Brorein Street ROW. At the intersection of Brorein Street and S. Florida Avenue the stormwater system branches into two directions. The main system continues southwest within the E. Brorein Street ROW,

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Figure 2-3 Basin Overview Map

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while the secondary system runs north within S. Florida Avenue ROW and connects to the Whiting Street sub basin. **Figure 2-4** provides an overall view of the E. Brorein Street and Whiting Street basins and how they relate to the Selmon Expressway. **Figure 2-5** presents the Brorein (East/S) and Whiting Street Basins map obtained from the City of Tampa Drainage Atlas.

From the S. Florida Avenue intersection, the main stormwater sewer system flows westward within the E. Brorein Street ROW via a 24" round concrete pipe (RCP). At S. Franklin Street the pipe increases to a 36" RCP. From this point, the sewer system turns and flows south within the S. Franklin Street ROW before making an abrupt turn to the northwest within the E. Brorein Street ROW. At S. Ashley Drive the system branches again. The main system discharges into the Hillsborough River via a 36" RCP. The secondary system flows south and then west, emptying into the river via a 42" RCP.

The stormwater sewer system interconnection within the Whiting Street basin provides additional capacity and a secondary outfall for both systems. From the intersection of E. Brorein Street and S. Florida Avenue, the Whiting Street stormwater sewer system flows in a northwest direction within the S. Florida Avenue ROW. At Whiting Street the system turns ninety degrees towards the west and continues southwest via a series of 24" pipes until it reaches S. Tampa Street. At this point the pipe size increases to a 38"x24" elliptical and then again to a 36" RCP before discharging into the Hillsborough River.

Rainfall that currently falls between the EB and WB lanes of the viaduct lands on a paved parking lot where it is collected by a series of catch basins and piped to the city-owned and maintained stormwater sewer system located within the E. Brorein Street ROW.

According to conversations held with the City of Tampa's Stormwater Department, there are no major drainage issues within these basins. See Section 2.7.8 and **Appendix A** for a summary of this coordination.

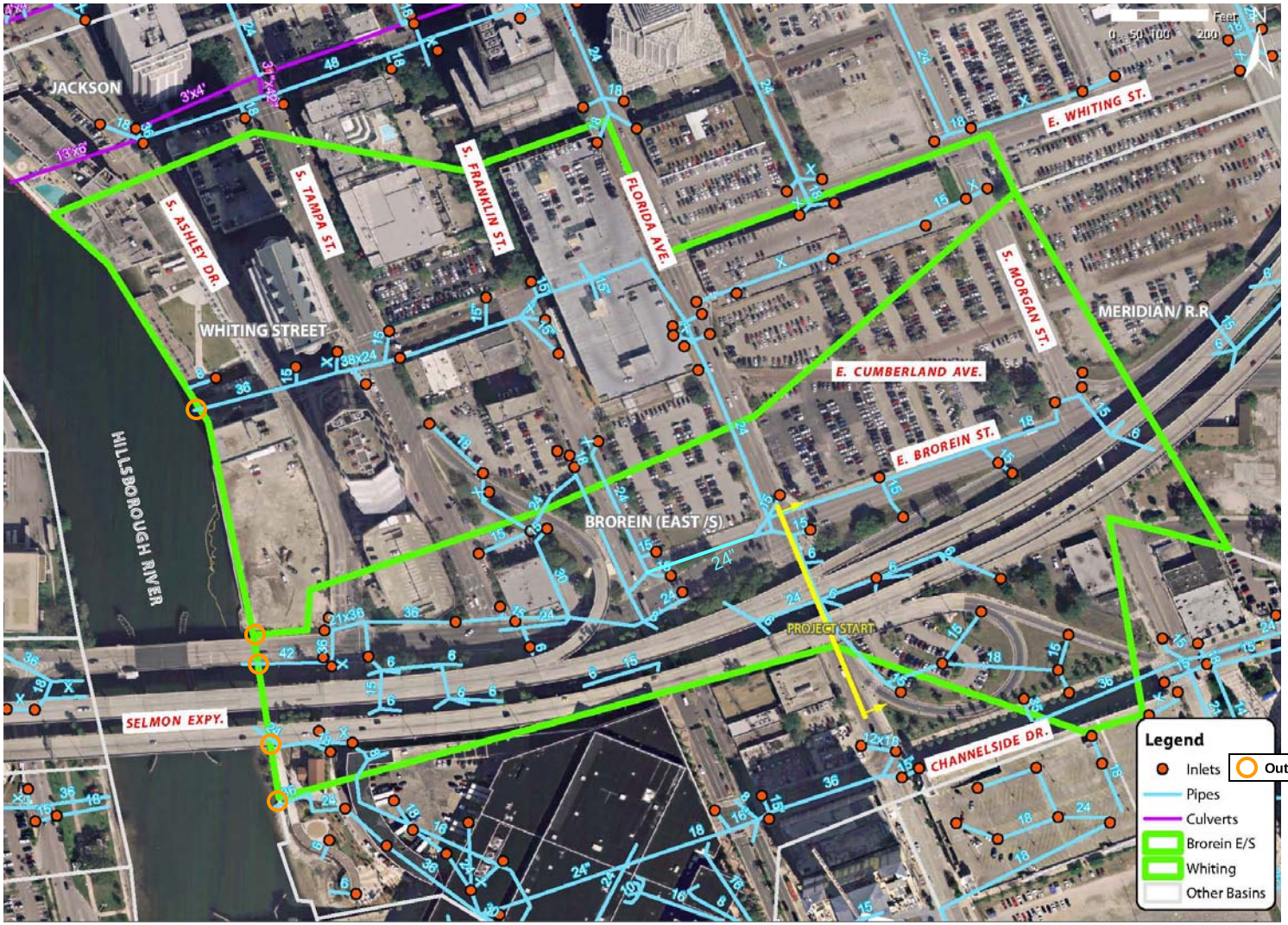

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Figure 2-4 Brorein & Whiting Street Basin Details

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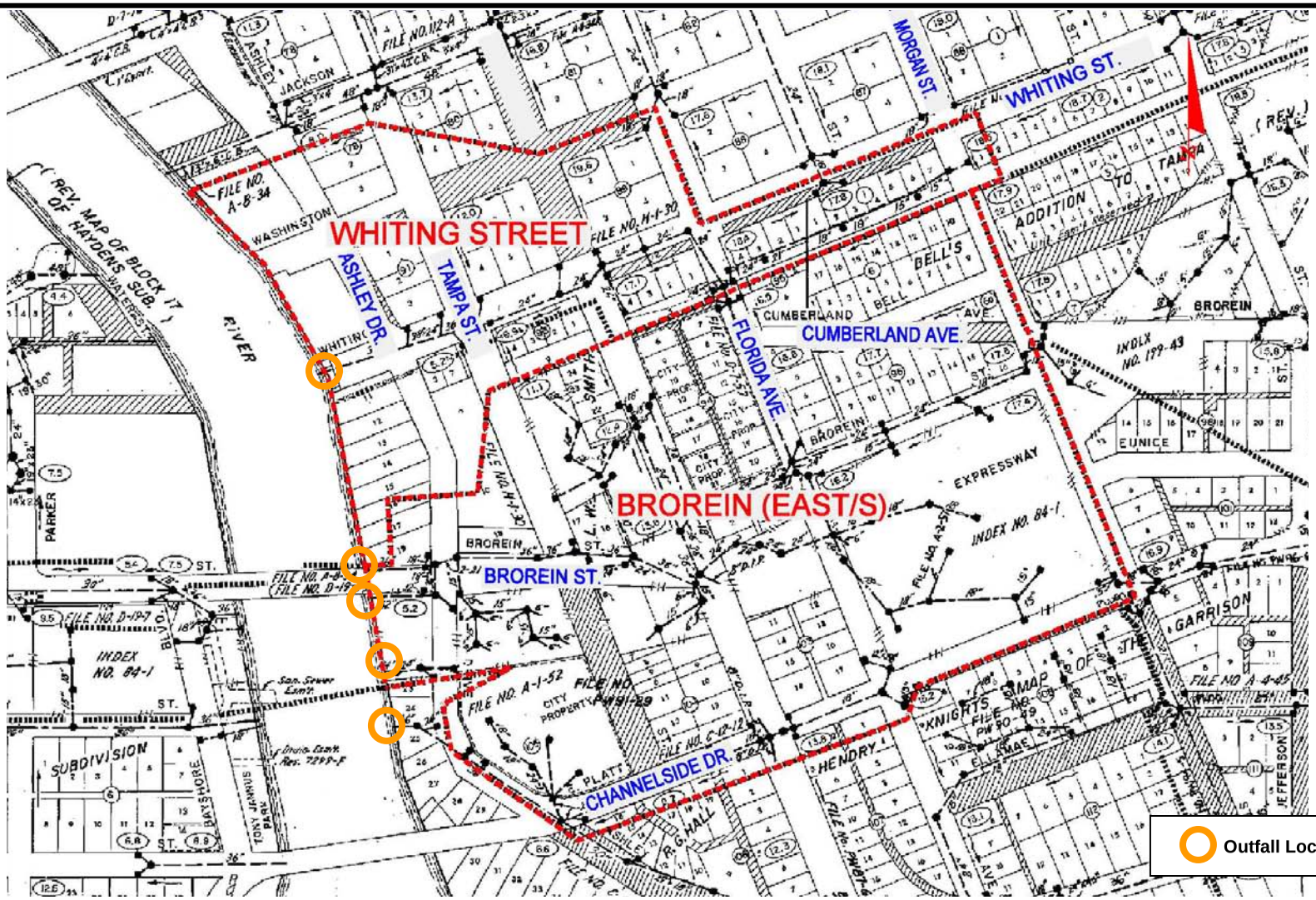

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Figure 2-5 Brorein & Whiting Street Basins

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2.7.3 Meridian / R.R. Basin

Selmon Expressway improvements starting at Station 572+50 (+/-) and ending near Station 582+00 (+/-) are within the 50 acre Meridian/R.R. basin. Runoff from this portion of the viaduct is currently collected by 6" down spouts and piped to the city-owned and maintained stormwater sewer system. The upstream end of the system includes two branches. The primary branch collects runoff from the viaduct and flows to the intersection of N. Nebraska Avenue and E. Finley Street, east to S. Caesar Street and then south to E. Platt Street / Channelside Drive. The secondary branch starts at the intersection of E. Brorein Street and S. Jefferson Street and flows in a southeast direction within the E. Brorein Street ROW. The branches join together at the intersection of E. Platt Street / Channelside Drive and Ice Palace Drive and flow south to combine with a stormwater sewer system from the west and ultimately outfall into the Garrison Channel.

Figure 2-6 provides an overall view of the Meridian/R.R. sub-basin and how it relates to the Selmon Expressway. **Figure 2-7** presents the Meridian/R.R. basin map obtained from the City of Tampa Drainage Atlas.

The primary system conveys runoff from the viaduct via an 18" RCP that flows north and then east along E. Finley Street to S. Caesar Street. At S. Caesar Street, the stormwater sewer system turns and flows south as the pipe size increases to a 27" RCP. At E. Cumberland Drive, the pipe size increases to a 30" RCP and then to a 36" RCP before turning to the west at E. Platt Street / Channelside Drive via a 42" RCP. From the intersection of E. Brorein Street and S. Jefferson Street, the secondary branch conveys runoff to the southeast via a 24" RCP. At the intersection of E. Platt Street/ Channelside Drive and Ice Palace Drive, the systems combine with a system that conveys runoff from the west along Platt Street and flows south along Ice Palace Drive via 60" RCP, 66" RCP and 58"x91" ERCP. After combining with a system that conveys runoff from the west along Ice Palace Drive/St. Pete Times Forum Drive, the Meridian/R.R. Basin drainage system discharges into the Garrison Channel via an 8'x5' concrete box culvert.

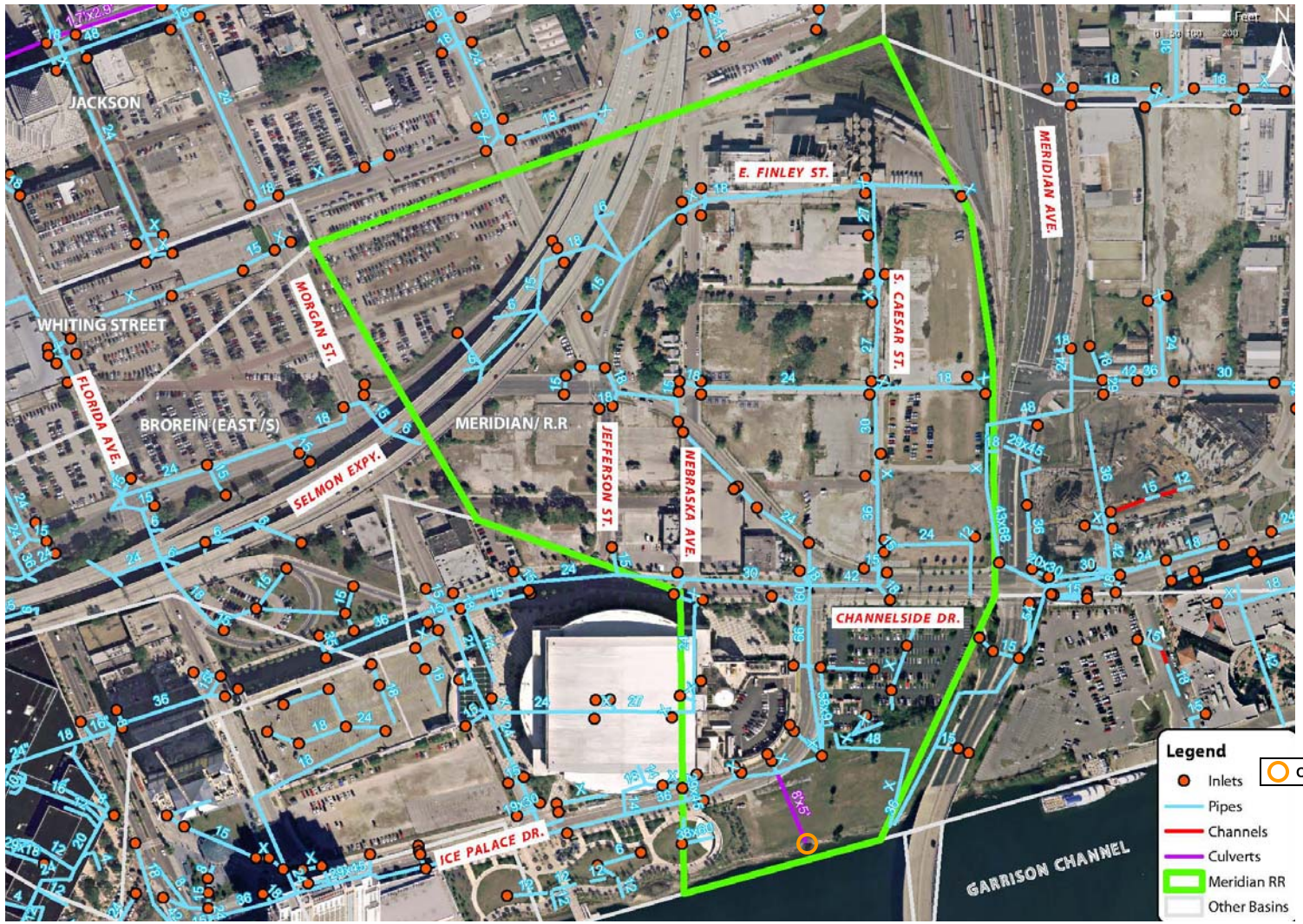

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Figure 2-6 Meridian / R.R. Basin Details

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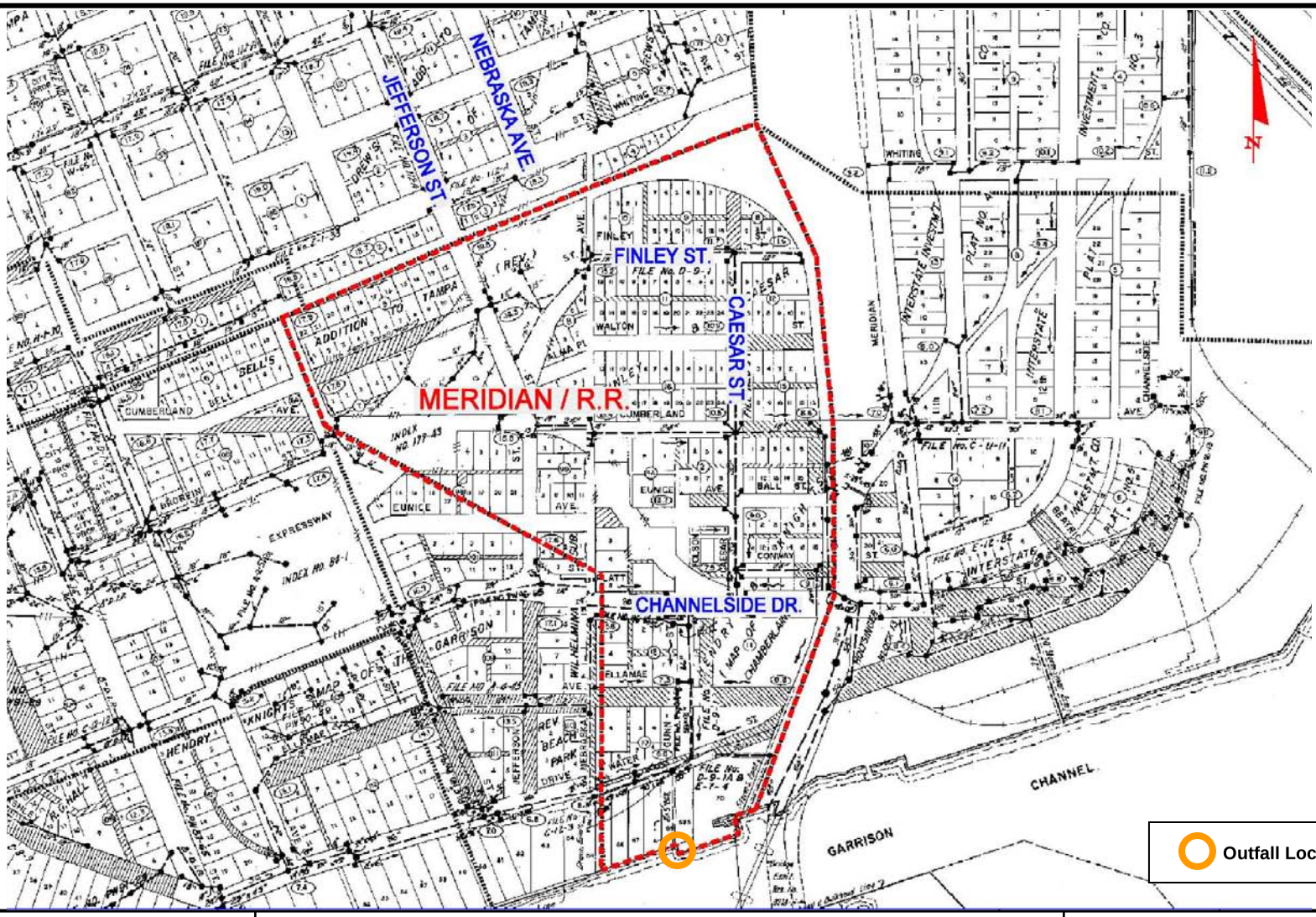

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Figure 2-7 Meridian / R.R. Basins

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Rainfall that currently falls between the EB and WB lanes of the viaduct lands on a paved parking lot, where it is collected by a series of catch basins and piped to the city-owned and maintained stormwater sewer systems located along E. Brorein Street and S. Caesar Street.

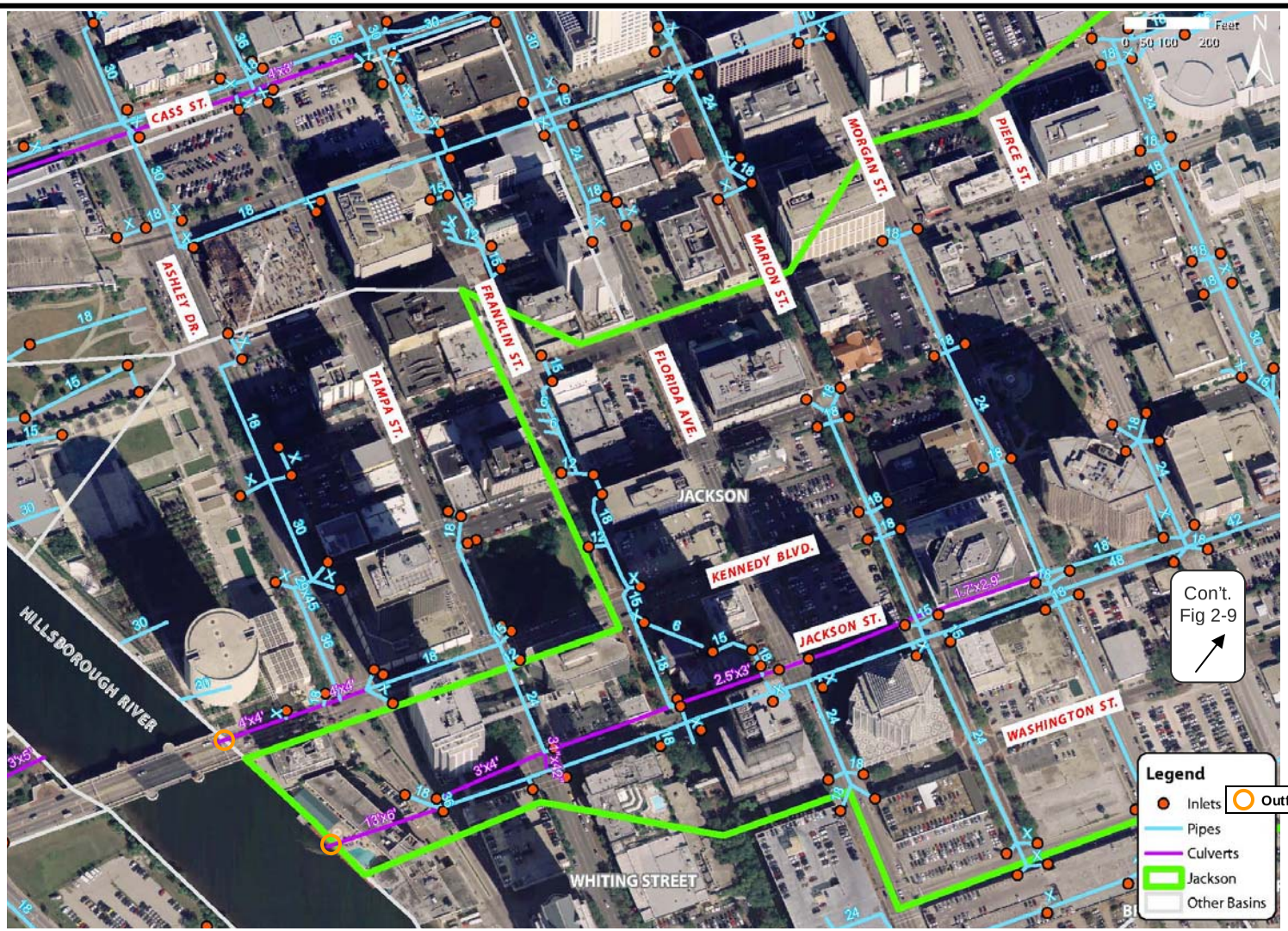
According to conversations held with the City of Tampa's Stormwater Department, there are no major drainage issues within these basins. See Section 2.7.8 for a summary of this coordination.

2.7.4 Jackson Basin

Selmon Expressway improvements starting at Station 582+00 (+/-) and ending near Station 598+00 (+/-) are within the 110 acre Jackson Basin. Runoff from this portion of the viaduct is collected by 6" down spouts and piped to the city-owned and maintained stormwater sewer system. The Selmon Expressway lies at the easternmost extent of the Jackson Basin, where stormwater is collected by 6" down spouts and flows southward via a 24" RCP within the N Nebraska Avenue ROW. Starting at the intersection of Jackson Avenue and N. Meridian Avenue, the stormwater flows in a southeast direction within the Jackson Street ROW. At the intersection of Jackson Street and N. Pierce Street the stormwater sewer system branches into two directions. One system continues southeast within the Jackson Street ROW along the north side, while the other system runs along the south side of the Jackson Street ROW; and finally connects to the 13'x6' box culvert at Ashley Drive.

Figures 2-8 and **2-9** provides an overall view of the Jackson Street basin and how it relates to the Selmon Expressway. **Figure 2-10** presents the Jackson Basin map obtained from the City of Tampa Drainage Atlas.

Starting from the N. Meridian Avenue intersection, the main system flows eastward within the Jackson Street ROW via a 3.5'x4.5' box culvert. At N. Brush Street the pipe decreases to a 30" RCP. A 36" RCP runs eastward from the Selmon Expressway to



Selmon Expressway (SR 618)
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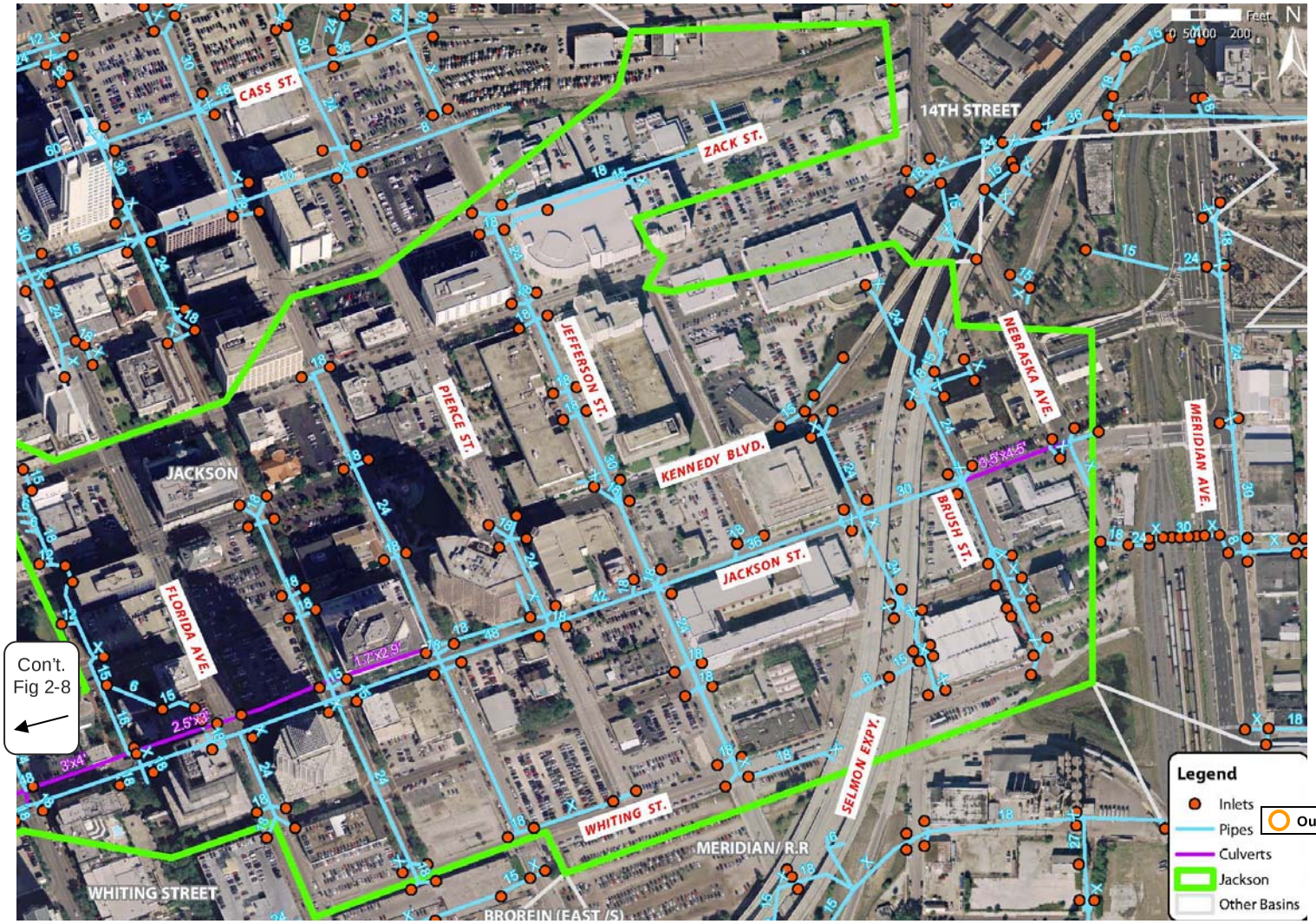
Figure 2-8 Jackson Basin Details (I)

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY



Selmon Expressway (SR 618)
Downtown Viaduct
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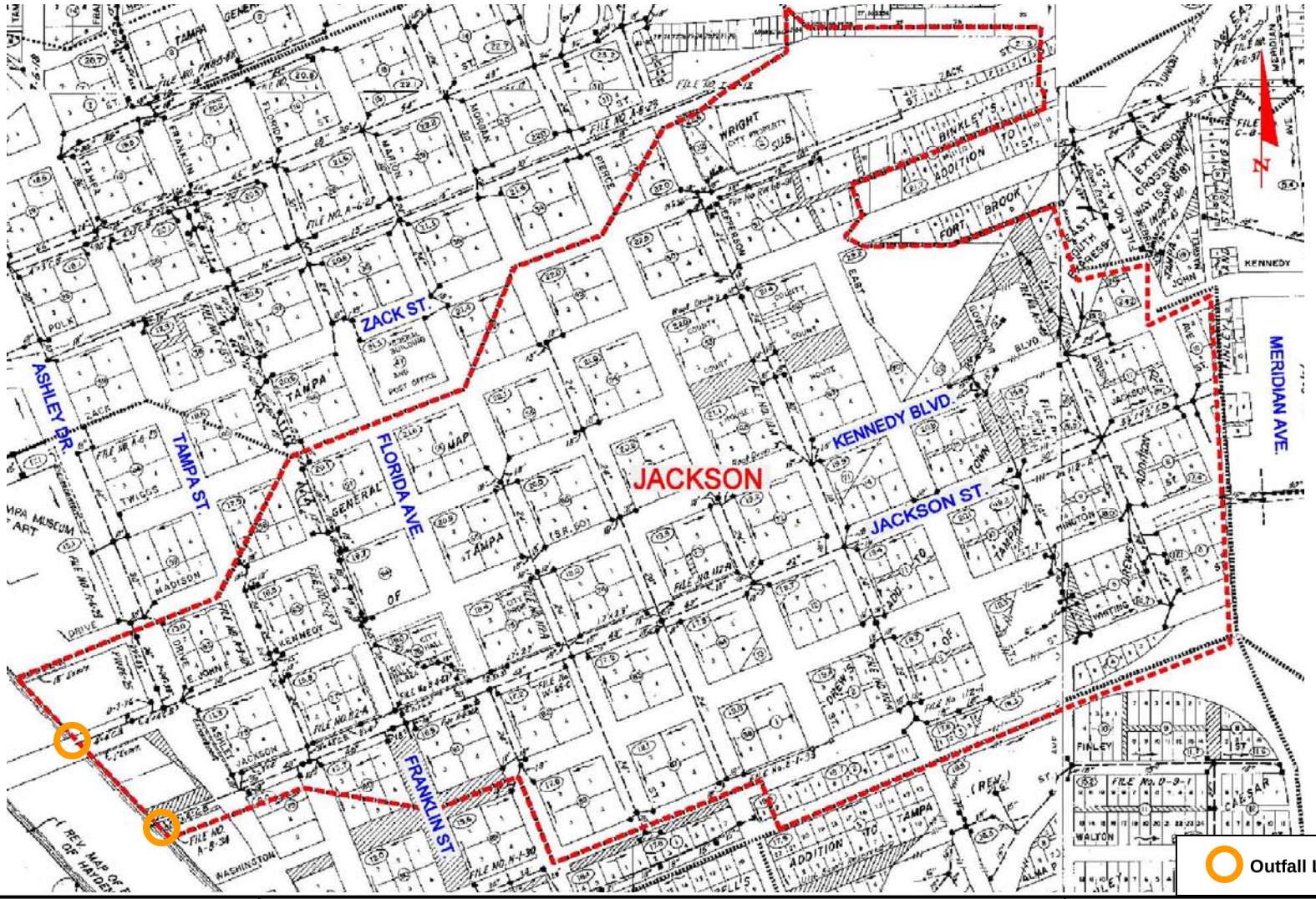
Figure 2-9 Jackson Basin Details (II)

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY



Selmon Expressway (SR 618)
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Figure 2-10 Jackson Basin

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

N. Jefferson Street. From N. Jefferson Street to N. Pierce Street, the pipe increases to a 42" RCP. From this point, a 48" RCP conveys stormwater along the south side of Jackson Street to Ashley Drive where it connects to the 13'X6' box culvert. Another stormwater sewer system flows along the north side of the Jackson Street ROW. A 1.7'x2.9' box culvert runs from N. Pierce Street to N. Florida Avenue. At N. Florida Avenue the culvert increases to a 3'x4' box culvert and meets the 13'x6' box culvert at Ashley Drive. This 13'x6' box culvert finally discharges the stormwater into the Hillsborough River.

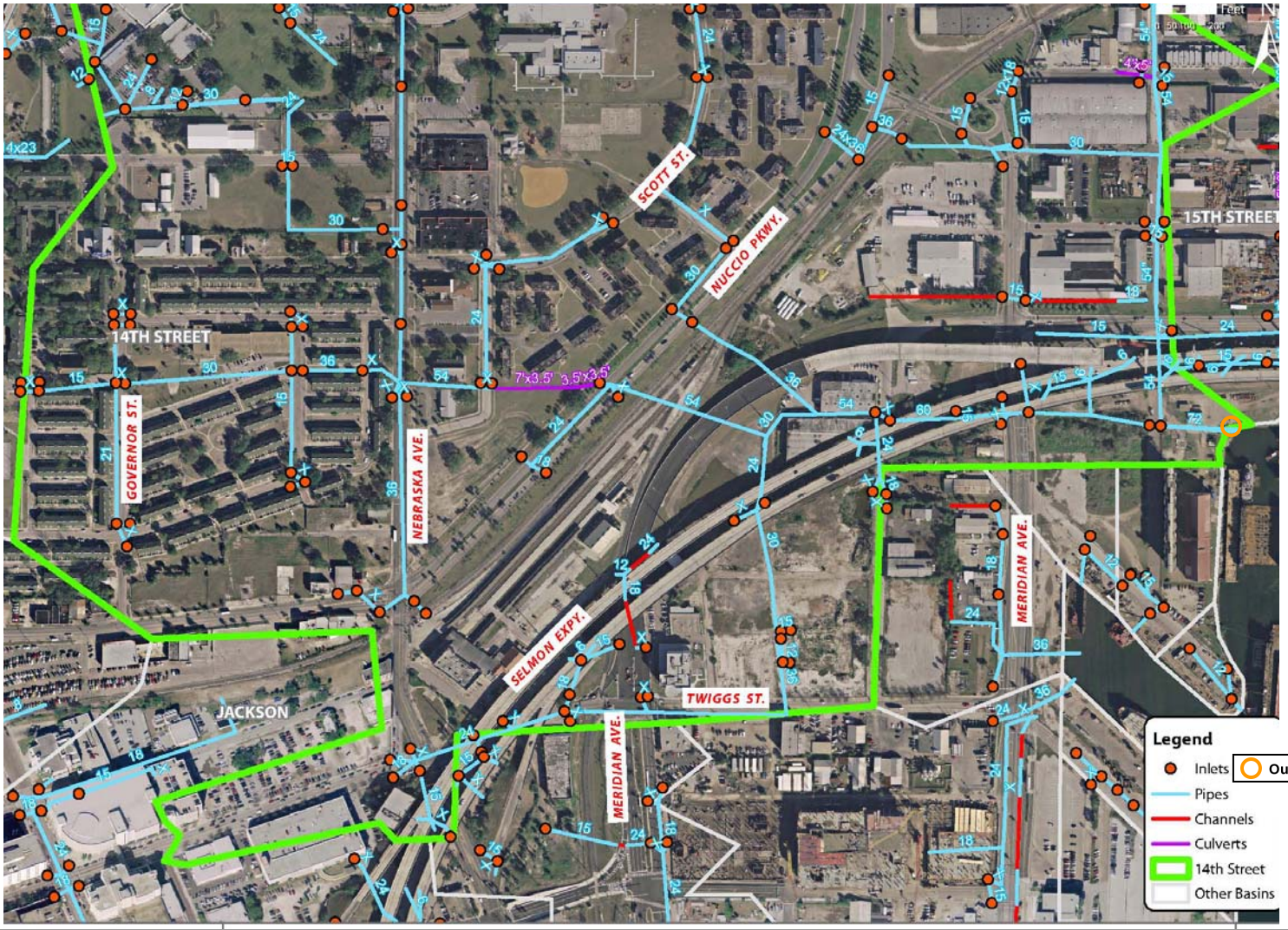
Rainfall that currently falls between the northbound (NB) and southbound (SB) lanes of the viaduct lands on a paved parking lot where it is collected by a series of catch basins and piped to the city-owned and maintained stormwater sewer system located within Jackson Basin.

According to conversations held with the City of Tampa's Stormwater Department, there are no major drainage issues within these basins. See Section 2.7.8 and **Appendix A** for a summary of this coordination.

2.7.5 14th Street Basin

Selmon Expressway improvements starting at Station 598+00 (+/-) and ending near Station 625+85 (+/-) are within the 14th Street Basin. This large basin, approximately 391 acres is bounded to the north by Columbus Avenue, to the west by the I-275 and I-75 interchange, and to the east by the Nuccio Parkway. The viaduct is located at the downstream-most end of the basin. Runoff from the viaduct is collected by 6" down spouts and piped to the City of Tampa's stormwater sewer system at several locations.

Figure 2-11 provides an overall view of the 14th Street basin and how it relates to the downtown viaduct. **Figure 2-12** resents the 14th Street Basin map obtained from the City of Tampa Drainage Atlas.



Selmon Expressway (SR 618)
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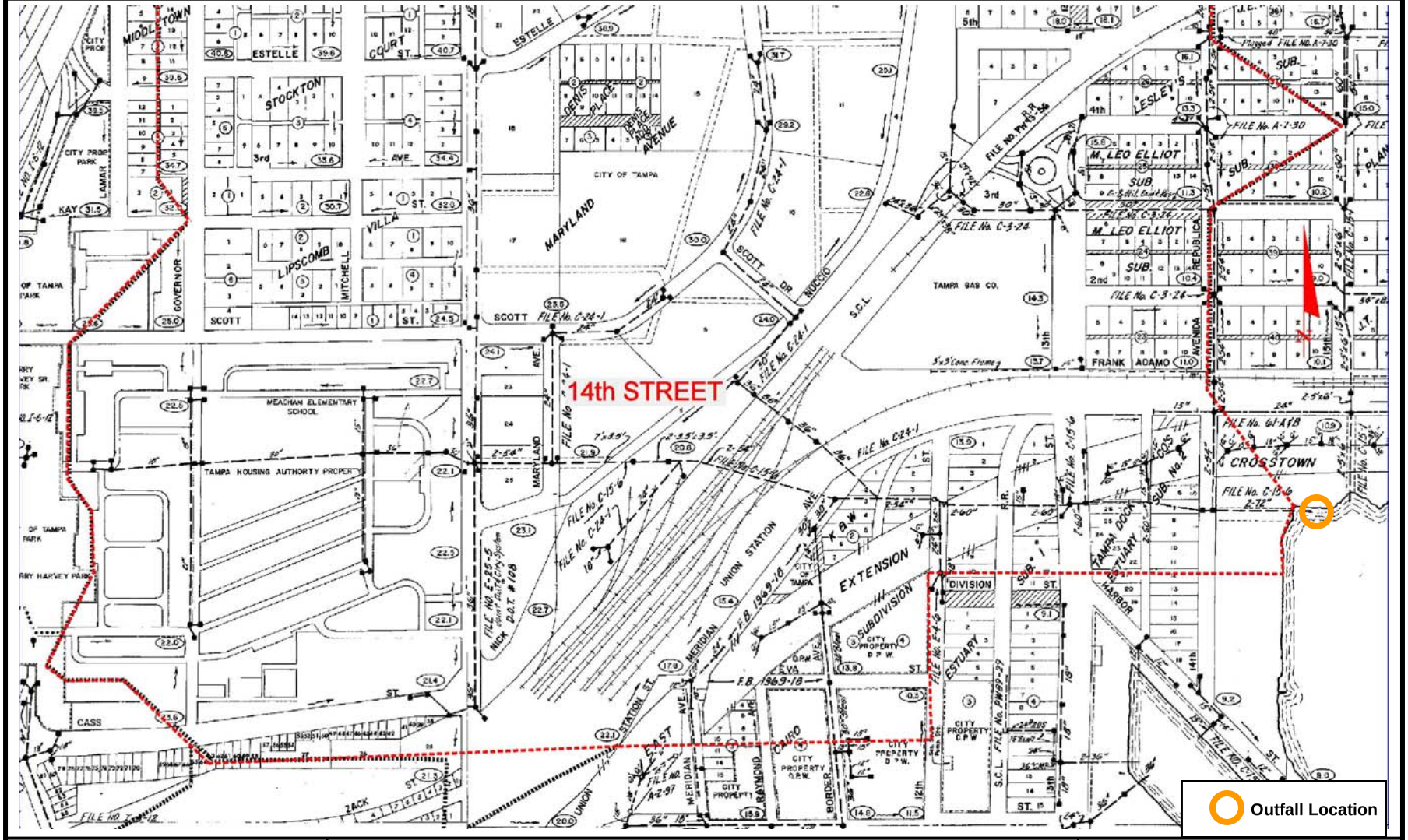
Figure 2-11 14th Street Basin Details

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY



Selmon Expressway (SR 618)
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Figure 2-12 14th Street Basin

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

The City's stormwater sewer system receives flow from several 6" down spouts near the intersection of Nebraska Avenue and E. Twiggs Street. From this location the system flows in an eastward direction passing through the E. Twiggs Street / N. Meridian Avenue intersection and continuing east within the E. Twiggs Street ROW. Per record drawings for the Seaport Channelside Apartments project, the stormwater sewer system within the Border Avenue ROW was relocated to N. Raymond Avenue. The pipes were also upsized from a 30" RCP to 29"x45" Elliptical Reinforced Concrete Pipe (ERCP).

The N. Raymond Avenue stormwater sewer pipe was extended towards the northeast and now intersects with the Border Avenue ROW immediately south of the Selmon Expressway ROW. At this location the upsized stormwater sewer pipe reconnects to the old Border Avenue, dropping from the elliptical 36" equivalents to a 30" RCP. Approximately 200 feet north of this location the system drops in pipe diameter again to a 24" RCP. This restriction is located directly under the elevated viaduct and reportedly is the cause of some upstream flooding at the Seaport Channelside Apartment complex. The viaduct downspouts at this location appear to have been broken off just below the deck of the expressway. Runoff pours directly onto the ground below causing sediment to wash into the N. Raymond Avenue stormwater sewer system.

Immediately north of the viaduct, the stormwater sewer system increases to a 30" RCP before connecting to the double 54" RCP trunk line. At approximately this same location, a newly constructed pond connects to the system via a control structure. This pond serves the newly built THEA building and Meridian Avenue on-ramp. The trunk line flows east through easements increasing to double 60" RCPs at N. 12th Street. Additional downspouts from the viaduct feed into the system at this location. At N. 14th Street the trunk line intersects with twin 54" RCPs coming from the north. The system continues to flow east emptying into the Ybor Channel via twin 72' RCPs.

According to the City of Tampa's Stormwater Department, some minor flooding problems are prevalent within this basin. As indicated above, the flooding issues are

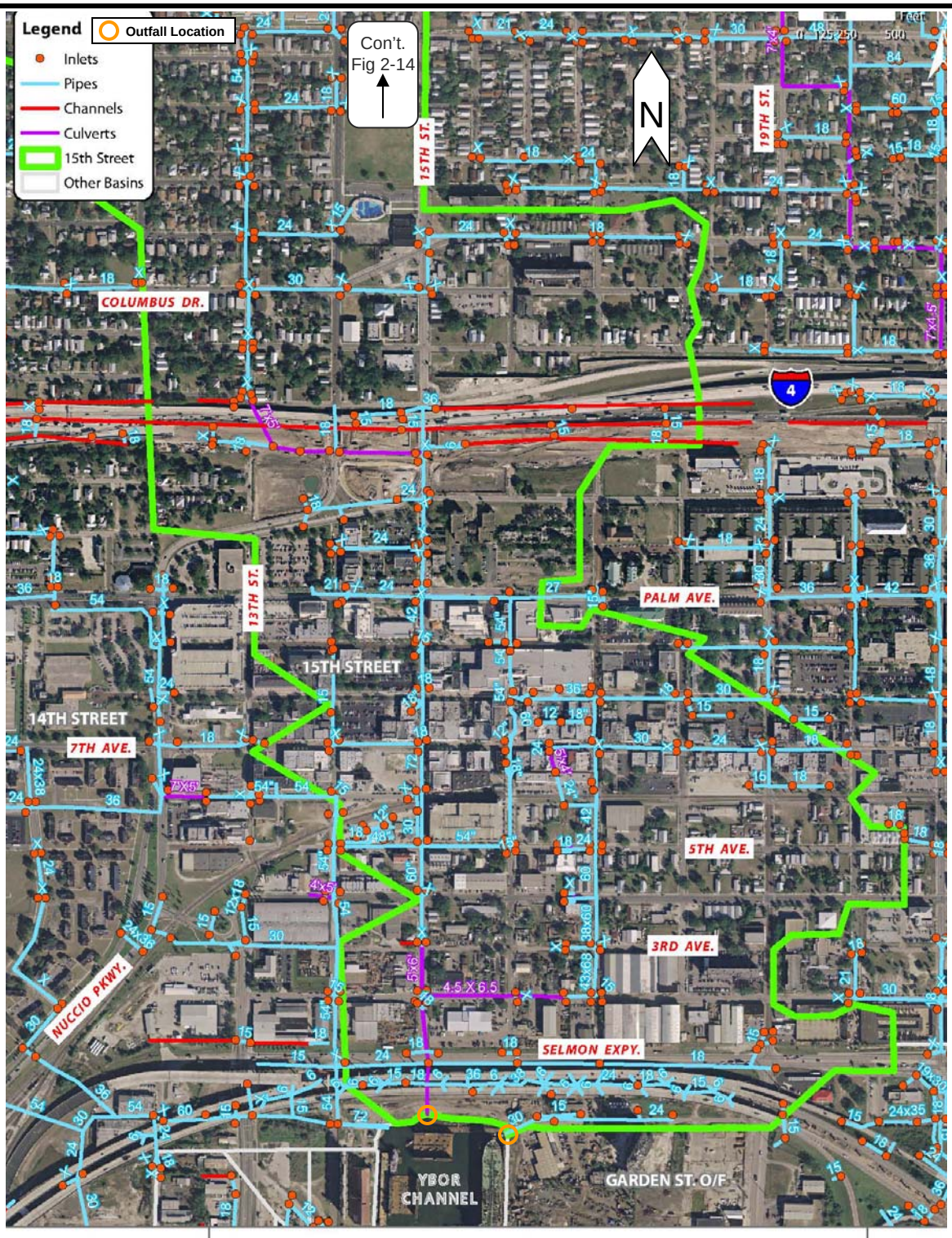
occurring at the Seaport Channelside Apartment complex. See Section 2.7.8 and **Appendix A** for a summary of this coordination.

2.7.6 15th Street Basin

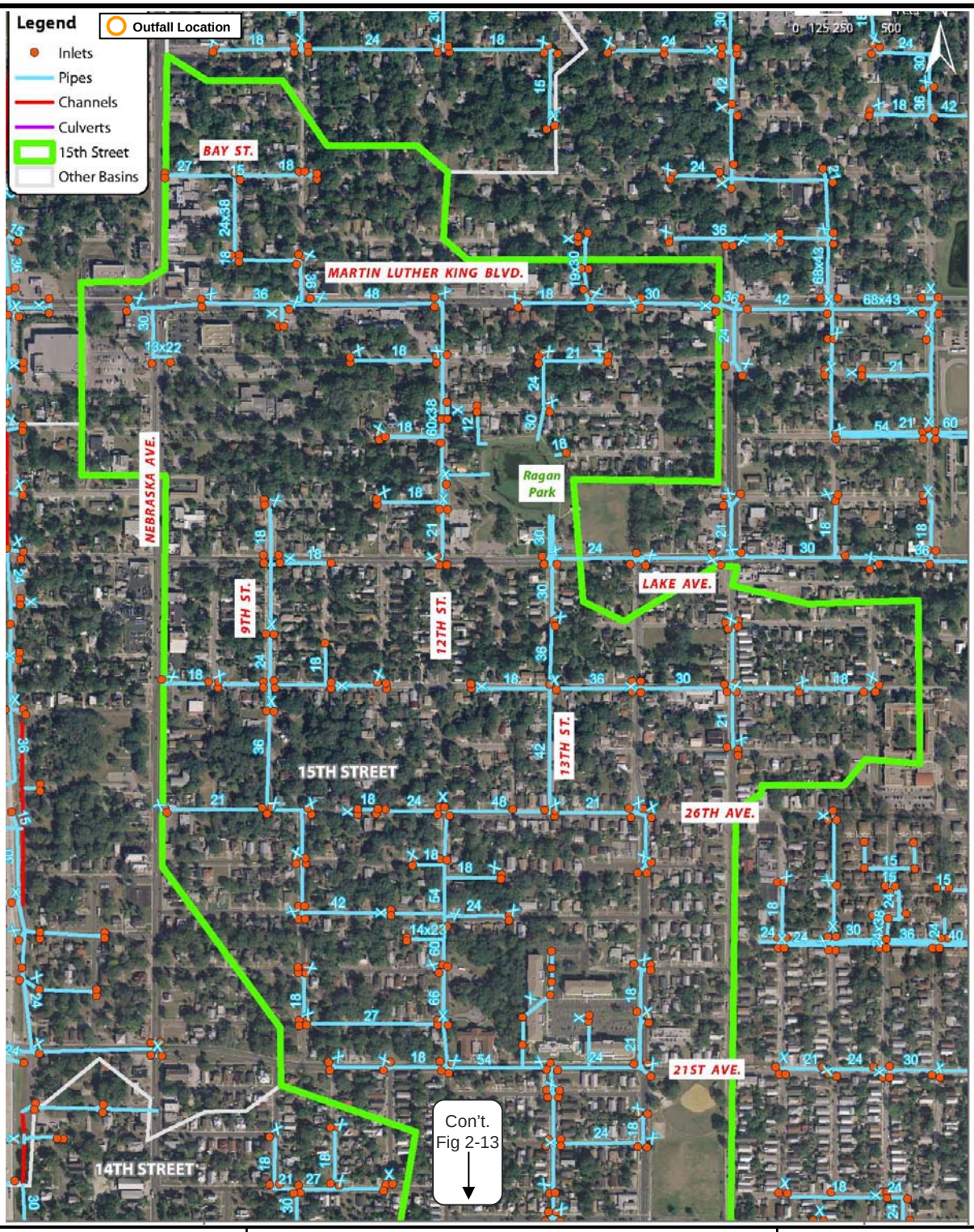
Selmon Expressway improvements starting at Station 625+85 (+/-) and ending near Station 646+40 (+/-) are within the 15th Street Basin located north of the Garden Street Basin and east of the 14th Street Basin. The surface area contributing to this basin is approximately 568 acres. Runoff from this portion of the viaduct is collected by 6" down spouts and piped to the city-owned and maintained stormwater sewer system. Starting at the intersections of N. Nebraska Avenue and E. Bay Street, the system flows in a southeast direction and discharges into the Ybor Channel.

Figures 2-13 and 2-14 provides an overall view of the 15th Street basin and how it relates to the Selmon Expressway. **Figure 2-15** presents the 15th Street Basin map obtained from the City of Tampa Drainage Atlas.

The main system starts from the intersection of N. Nebraska Avenue with a 27" RCP that conveys stormwater eastward to the intersection of E. Bay Street and N. 9th Street. From this intersection, the stormwater sewer system flows southward through a 24"x38" ERCP to E. Ida Street and continues E. Buffalo Avenue through a 36" RCP. At E. Buffalo Avenue, the pipe size increases to 48" RCP flowing east. From the intersection of E. Buffalo Avenue and N. 12th Street, a 60"x38" ERCP conveys stormwater southward along N. 12th Street and discharges into Ragan Park's surface water storage body. With the help of outfall structure within the Ragan Park pond, stormwater flows southwards within a 30" RCP. The 30" RCP along N. 13th Street gradually increases from a 36" RCP to a 42" RCP at E. 26th Avenue. From this point, a 48" RCP conveys stormwater westward along E. 26th Avenue up to N. 12th Street. From the intersection of N. 12th Street and E. 26th Avenue to the intersection of N. 12th Street and E. 21st Avenue, the pipe gradually increases from a 54" RCP to a 60" RCP, and finally to a 66" RCP. Stormwater is conveyed through a 54" RCP that flows eastward along E. 21st Avenue up to N. 13th Street. A long stretch of 54" RCP flows from the intersection of E. 21st Avenue and N.



Selmon Expressway (SR 618) Downtown Viaduct Improvements PD&E Study ***from Florida Ave to South 22nd St*** Hillsborough County	**Figure 2-13:** **15th Street Basin Details (I)**	TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY



Selmon Expressway (SR 618) Downtown Viaduct Improvements PD&E Study
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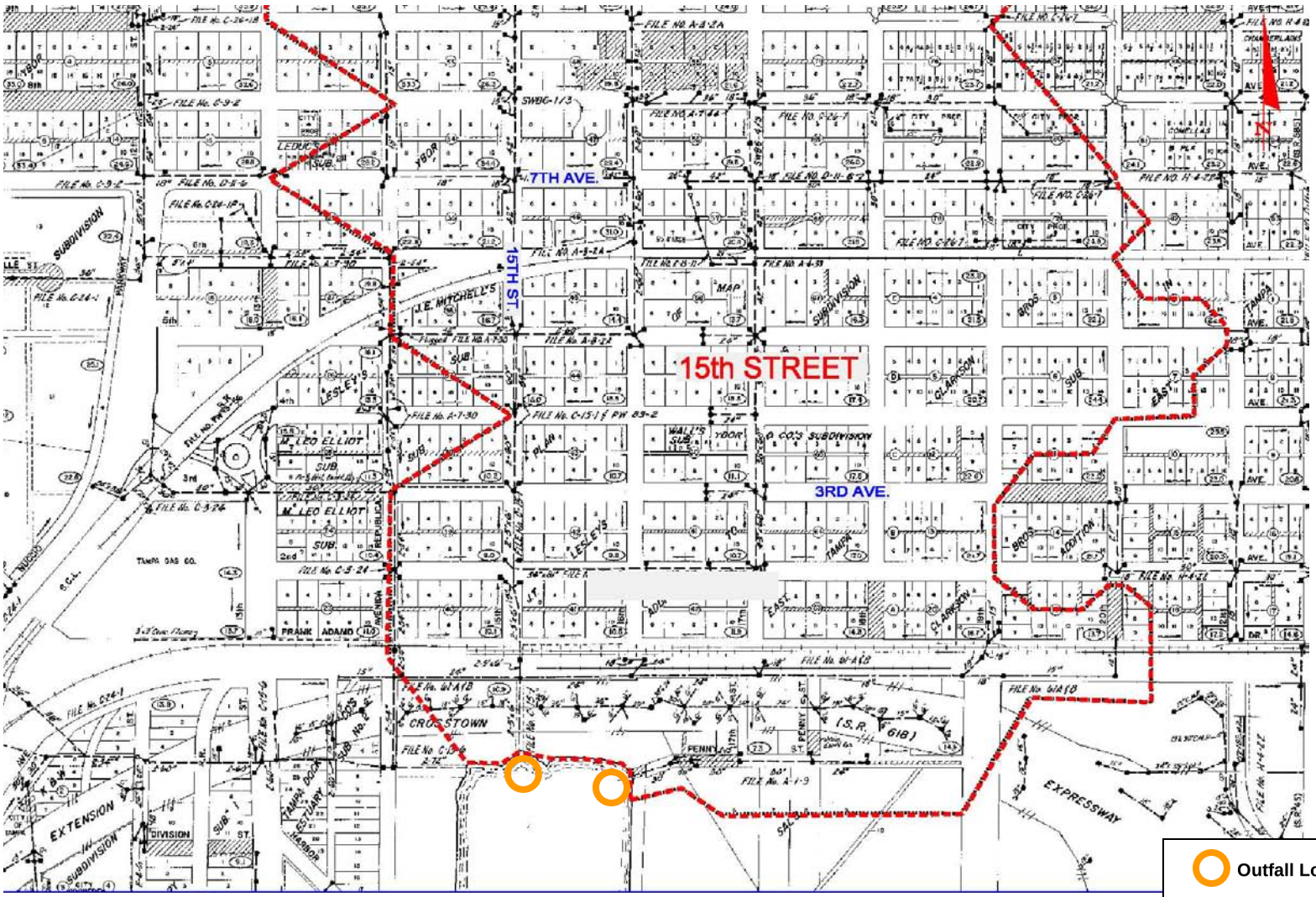
Figure 2-14

15th Street Basin Details (II)

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY



Selmon Expressway (SR 618)
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Figure 2-15 15th Street Basin

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

13th Street to I-4. A 7'x5' box culvert crosses I-4 and flows eastward to meet the stormwater system along N. 15th Street. From the intersection of N. 15th Street and E. 12th Street to the intersection of N. 15th Street and E. 7th Avenue, several stormwater pipes drain southward to a 72" RCP which carries stormwater to N. 3rd Avenue. A 5'x6' box culvert conveys stormwater southward from N. 3rd Avenue and finally discharges into the Ybor Channel, which ultimately discharges into Tampa Bay. Rainfall that currently falls between the EB and WB lanes of the viaduct lands on a paved parking lot where it is collected by a series of catch basins and piped to the city-owned and maintained stormwater system located in the basin area.

According to the City of Tampa's Stormwater Department, two drainage issues have been recorded within this basin. **Figure 2-16** illustrates those areas of concern. Reported flooding issue areas, shown in red, are located 0.2 to 0.3 miles north of the Selmon Expressway. See Section 2.7.8 and **Appendix A** for a summary of this coordination.

2.7.7 Garden Street Outfall (O/F) Basin

Viaduct improvements starting at Station 646+40 (+/-) and ending near Station 656+60 (+/-) are within the 203 acre Garden Street O/F Basin. Runoff from this portion of the viaduct is collected by 6" down spouts and piped to the city-owned and maintained stormwater sewer system. Some of the viaduct runoff enters the pipe network that begins at the intersection of N. 21st Street and Adamo Drive / SR 60 which flows south along N. 21st Street and empties into the Garden Street ditch system north of the railroad tracks. The stormwater continues west and finally discharges into Ybor Channel. The remainder of the viaduct runoff is routed through the pond at the northwest corner of N. 20th Street and the railroad tracks. The pond outfalls into a pipe system that flows westward to the Garden Street ditch and finally discharges into the Ybor Channel. Outside of the project limits, the Garden Street drainage system collects runoff along Adamo Drive from N. 22nd Street to N. 28th Street and ultimately reaches the Garden Street ditch system.

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Figure 2-16 15th Street Basin Flooding Areas

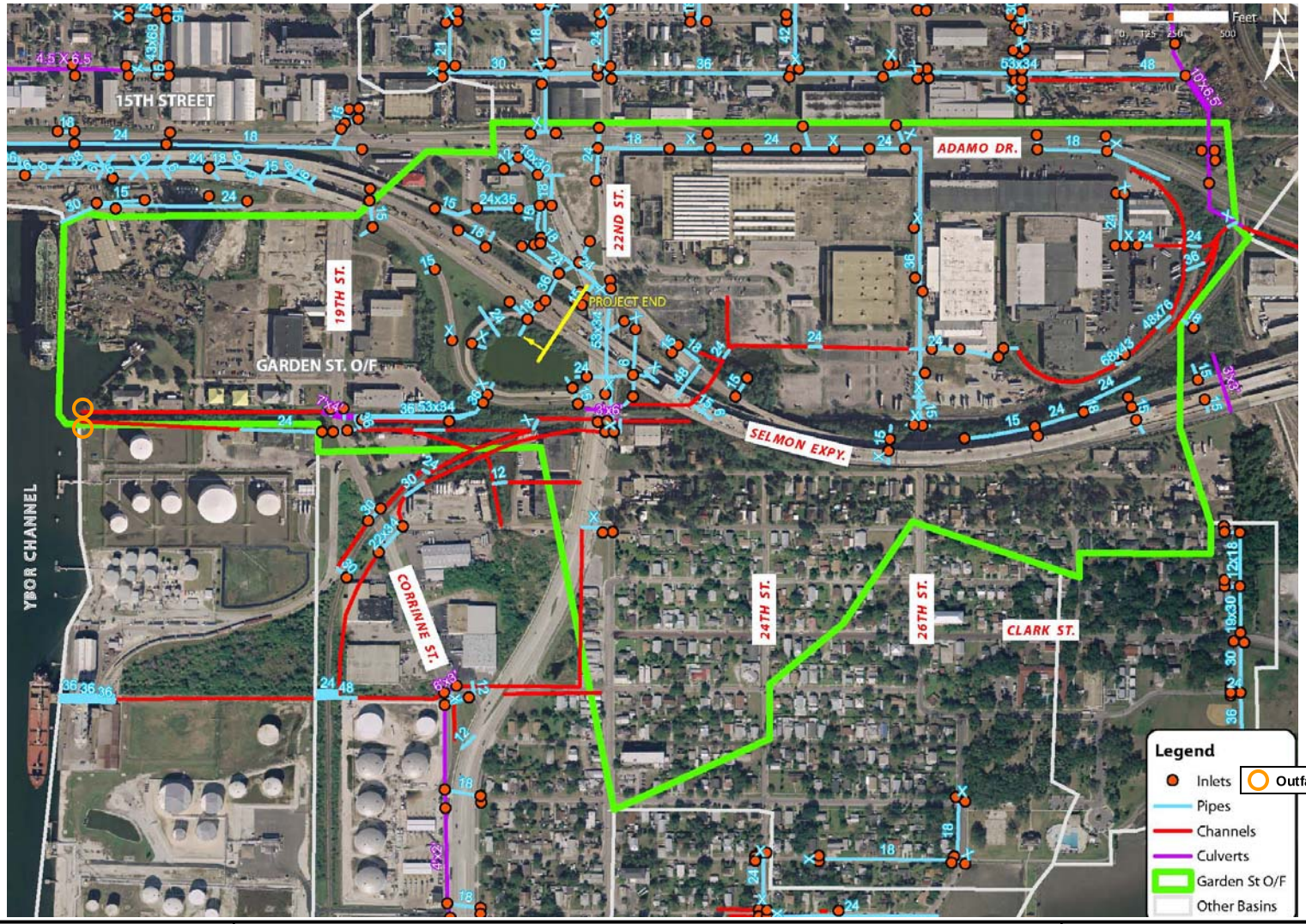
TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

Figure 2-17 provides an overall view of the Garden Street O/F basin and how it relates to the downtown viaduct. **Figure 2-18** presents the Garden Street O/F Basin map obtained from the City of Tampa Drainage Atlas.

Runoff from the WB lane of the viaduct and from the intersection of Adamo Drive and N. 21st Street is conveyed to the south via a 19"x30" ERCP which changes to a 24" RCP north of the viaduct. North of the railroad tracks, the stormwater flows to the west via a 3'x6' box culvert under N. 20th Street. It then enters a ditch and flows to the west, discharging into the Ybor Channel. Runoff from the EB lane of the viaduct is collected by a 6" downspout near Station 646+40 (+/-), which flows to a ditch that runs alongside the N. 22nd Street off-ramp. A 29"x45" ERCP conveys stormwater flow from the ditch to the west. Past N. 19th Street, the stormwater enters the Garden Street ditch, flowing to the west and eventually discharging into the Ybor Channel. Runoff from the EB lane is also collected by a 6" downspout near Station 655+00 (+/-), which discharges into the pond located at the northwest corner of N. 20th Street and the railroad tracks. The pond outfalls to the stormwater sewer system, which runs along N. 20th Street and then ultimately discharges into the Ybor Channel.

Rainfall that currently falls between the EB and WB lanes of the viaduct lands on the REL for a portion of Selmon Expressway where it is collected by a series of downspouts and piped to the city-owned and maintained stormwater sewer system described above.

According to conversations held with the City of Tampa's Stormwater Department, there are no major drainage issues within this basin. See Section 2.7.8 and **Appendix A** for a summary of this coordination.



Selmon Expressway (SR 618)
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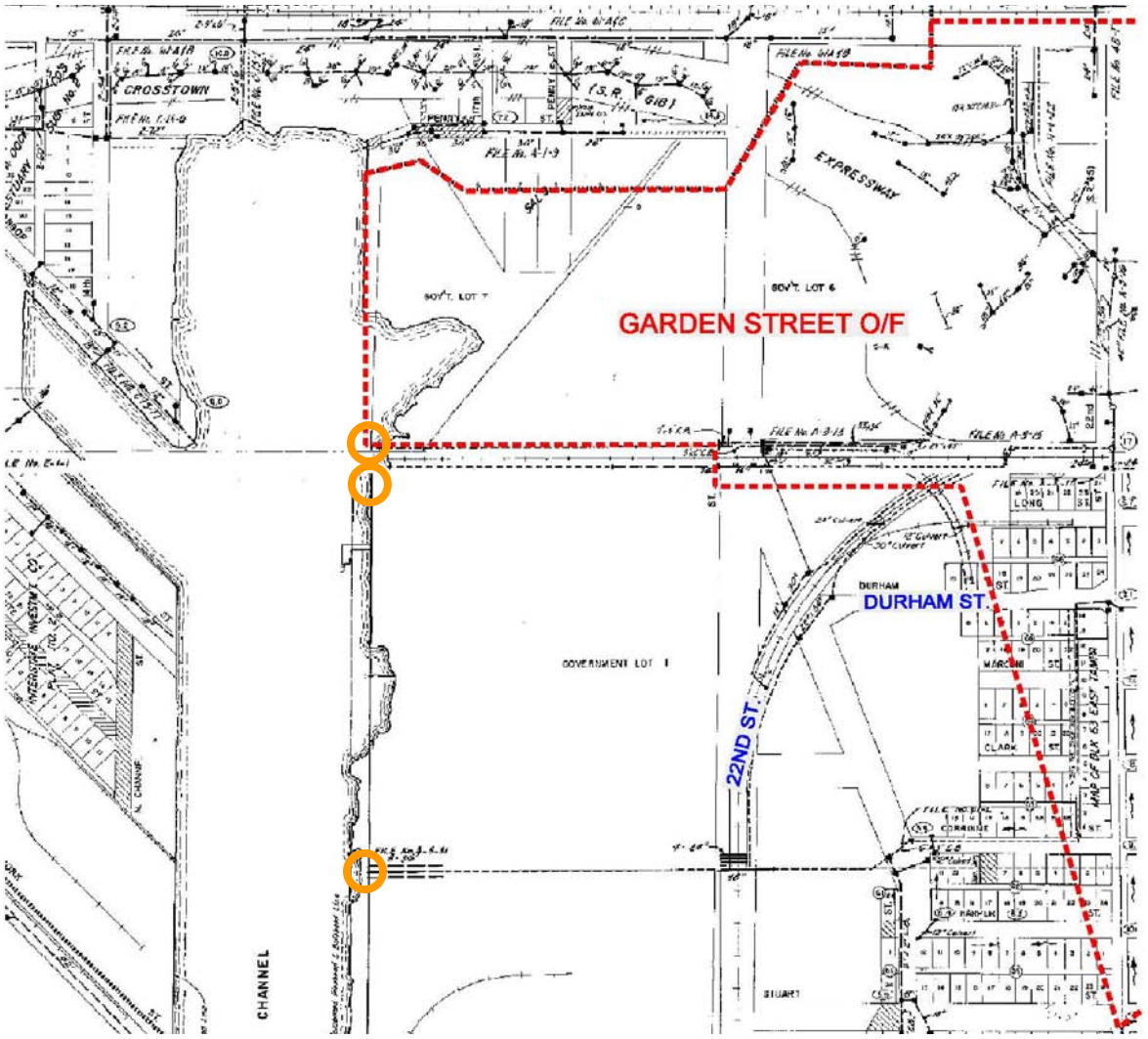
Figure 2-17 Garden Street O/F Basin Details

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY



Outfall Location

Selmon Expressway (SR 618)
Downtown Viaduct
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from Florida Ave to South 22nd St
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Figure 2-18 Garden Street O/F Basin

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

2.7.8 Coordination with City of Tampa's Stormwater Department

The City of Tampa's Stormwater Department provided the log shown in **Appendix A** that lists the calls for service (received 2004-2009) within the sub-basins previously described. Calls related to "flooding" and "standing water" problems are highlighted, and of those, none are directly related to the Selmon expressway's existing drainage system (based on the addresses provided).

2.7.9 Downspout Inventory

On Thursday, September 3, 2009, a field review was conducted to determine the number, location and problems that exist for the bridge downspouts within the project limits (i.e., from Florida Avenue to N. 22nd Street). **Table 2-2** provides an inventory of the information collected in the field and **Appendix B** contains photos of some existing downspouts and their conditions. According to the information provided in the table, there are 105 downspouts within the project limits. Each downspout is 6-inches in diameter and made of PVC pipe. These downspouts collect run-off from the bridge deck through a series of scupper drain inlets to a PVC pipe that typically runs through the pier structure. However, there are some pipes that convey stormwater on the outside of the pier structure. The stormwater runs through the pipes to an underground drainage system. Based upon the field review, it was difficult to determine where the underground drainage system existed. Of the 105 downspouts observed, seven were either broken or missing pipe sections. There were two cases where the cleanout caps were broken.

Based on the proposed widening of Selmon Expressway, some of the existing scupper drains and downspouts will be affected by the proposed widening. **Table 2-3** presents the downspouts that could be affected by the proposed changes to the Selmon Expressway. According to the information presented in the table, there are approximately 56 six-inch downspouts that could be affected. (Note: *THEA's Asset Maintenance Contractor has requested that if downspouts are rebuilt as part of the SR 618 deck replacement and widening, then 45° bends should be used instead of 90° bends due to the occurrence of frequent flooding.)*

Table 2-2 Downspout Inventory

PIER / STRUCTURE IDENTIFICATION NO.	GENERAL VICINITY (NEAREST STREET, INTERSECTION)	DOWNSPOUT LOCATION (NORTHSIDE, SOUTHSIDE)	SIZE	DISCHARGE METHOD	COMMENTS? (NOTE PROBLEMS)
24 - EB Direction	East of Florida Ave.	Northside / North Pier	6"	Underground	
24 - WB Direction	East of Florida Ave.	Northside / North Pier	6"	Underground	
25 - WB Direction	East of Florida Ave.	Northside / North Pier	6"	Underground	
25 - EB Direction	East of Florida Ave.	Northside / North Pier	6"	Underground	
26 - EB Direction	East of Florida Ave.	Northside / North Pier	6"	Underground	
27 - EB Direction	East of Florida Ave.	Northside / North Pier	6"	Underground	
28 - WB Direction	East of Florida Ave.	Northside / North Pier	6"	Underground	
28 - EB Direction	East of Florida Ave.	Northside / North Pier	6"	Underground	
31 - WB Direction	West of Morgan St.	Northside / North Pier	6"	Underground	PVC Pipe Broken - Pic #1
31 - EB Direction	West of Morgan St.	Northside / North Pier	6"	Underground	
34 - WB Direction	East of Morgan St.	Northside / North Pier	6"	Drains to Basin	PVC Pipe to Cast Iron Pipe
34 - EB Direction	East of Morgan St.	Northside / North Pier	6"	Underground	
35 - WB Direction	Norhteast of Brorein St.	Northside / North Pier	6"	Underground	
38 - WB Direction	West of Jefferson St.	Northside / North Pier	6"	Underground	
37 - EB Direction	Norhteast of Brorein St.	Northside / North Pier	6"	Underground	
40 - EB Direction	West of Jefferson St.	Northside / North Pier	6"	Underground	
3 - WB Direction (Off Ramp)	West of Jefferson St.	Northside / One Wide Pier	6"	Drains to Manhole	
41 - WB Direction	East of Jefferson St.	Northside / North Pier	6"	Underground	
42 - EB Direction	East of Jefferson St.	Northside / North Pier	6"	Underground	
44 - WB Direction	East of Jefferson St.	Northside / North Pier	6"	Underground	
45 - EB Direction	East of Jefferson St.	Northside / North Pier	6"	Underground	
48 - WB Direction	Between Whiting St. & Washington St.	Northwest Side / Northwest Pier	6"	Underground	
51 - EB Direction	Between Whiting St. & Washington St.	Northwest Side / Northwest Pier	6"	Underground	PVC Pipe Broken - Pic #2
51 - WB Direction	North of Washington St.	Northwest Side / Northwest Pier	6"	Underground	
55 - EB Direction	North of Washington St.	Northwest Side / Northwest Pier	6"	Underground	
53 - WB Direction	North of Washington St.	Southeast Side / Southeast Pier	6"	Underground	PVC Pipe Missing - Pic #3
57 - EB Direction	South of Jackson St.	Southeast Side / Southeast Pier	6"	Underground	
56 - WB Direction	North of Jackson St.	Southeast Side / Southeast Pier	6"	Underground	
59 - EB Direction	North of Jackson St.	Southeast Side / Southeast Pier	6"	Underground	PVC Pipe Missing - Pic #4
58 - WB Direction	South of Kennedy Blvd.	Southeast Side / Southeast Pier	6"	Underground	
61 - EB Direction	South of Kennedy Blvd.	Southeast Side / Southeast Pier	6"	Underground	Cleanout Cap Broken - Pic #5
60 - WB Direction	North of Kennedy Blvd.	Southeast Side / Southeast Pier	6"	Underground	
62 - EB Direction	North of Kennedy Blvd.	Southeast Side / Southeast Pier	6"	Underground	PVC Pipe Broken - Pic #6
64 - EB Direction	North of Kennedy Blvd.	Southeast Side / Southeast Pier	6"	Underground	
62 - WB Direction	North of Kennedy Blvd.	Southeast Side / Southeast Pier	6"	Underground	Cleanout Cap Broken - Pic #7
3 - WB Direction (Off Ramp)	North of Kennedy Blvd.	Northside / One Wide Pier	6"	Underground	
64 - WB Direction	West of Nebraska Ave.	Northside / North Pier	6"	Underground	

Table 2-2 Downspout Inventory

PIER / STRUCTURE IDENTIFICATION NO.	GENERAL VICINITY (NEAREST STREET, INTERSECTION)	DOWNSPOUT LOCATION (NORTHSIDE, SOUTHSIDE)	SIZE	DISCHARGE METHOD	COMMENTS? (NOTE PROBLEMS)
65 - WB Direction	West of Nebraska Ave.	Southside / South Pier	6"	Underground	
66 - EB Direction	West of Nebraska Ave.	Southside / South Pier	6"	Underground	
68 - EB Direction	East of Nebraska Ave.	Southside / South Pier	6"	Underground	
66 - WB Direction	East of Nebraska Ave.	Southside / South Pier	6"	Underground	
70 - EB Direction	South of Twiggs St.	Southside / South Pier	6"	Underground	
3 - EB Direction (On Ramp)	South of Twiggs St.	Southeast / One Wide Pier	6"	Underground	
69 - WB Direction	North of Twiggs St.	Southeast Side / Southeast Pier	6"	Underground	
73 - WB Direction	North of Twiggs St.	Southside / South Pier	6"	Underground	
76 - EB Direction	North of Twiggs St.	Southside / South Pier	6"	Underground	
84 - EB Direction	North of Twiggs St.	Southside / South Pier	6"	Drains to Ground	Downspout on Ground - Pic #8
81 - WB Direction	North of Twiggs St.	Southside / South Pier	6"	Underground	
88 - EB Direction	North of Twiggs St.	Southside / South Pier	6"	Underground	
85 - WB Direction	North of Twiggs St.	Southside / South Pier	6"	Underground	PVC Pipe Missing - Pic #9
92 - EB Direction	West of 12th St.	Southside / South Pier	6"	Drains to Ground	PVC Pipe Missing - Pic #10
90 - WB Direction	West of 12th St.	Southside / South Pier	6"	Drains to Ground	Pic #11
93 - WB Direction	West of Channelside Dr.	Southside / South Pier	6"	Underground	
94 - WB Direction	West of Channelside Dr.	Southside / South Pier	6"	Underground	
95 - WB Direction	West of Channelside Dr.	Southside / South Pier	6"	Underground	
96 - WB Direction	West of Channelside Dr.	Southside / South Pier	6"	Underground	
97 - EB Direction	West of Channelside Dr.	Southside / South Pier	6"	Underground	
99 - EB Direction	East of Channelside Dr.	Southside / South Pier	6"	Underground	
97 - WB Direction	East of Channelside Dr.	Southside / South Pier	6"	Underground	
98 - WB Direction	East of Channelside Dr.	Southside / South Pier	6"	Underground to Culvert 15' Away	Pic #12 to #14
99 - WB Direction	South of SR 60 / West of 14th St.	Southside / South Pier	6"	Underground to Culvert	
101 - EB Direction	South of SR 60 / West of 14th St.	Southside / South Pier	6"	Underground to Culvert	
100 - WB Direction	South of SR 60 / West of 14th St.	Southside / South Pier	6"	Underground to Culvert	
101 - WB Direction	South of SR 60 / West of 14th St.	Southside / South Pier	6"	Underground to Culvert	
104 - EB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	6"	Underground to Culvert	
102 - WB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	6"	Underground to Culvert	
103 - WB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	6"	Underground to Culvert	
104 - WB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	6"	Underground to Culvert	
105 - WB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	6"	Underground to Culvert	
107 - EB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	6"	Underground to Culvert	
106 - WB Direction	West of 15th St.	Southside / South Pier	6"	Underground to Culvert	
107 - WB Direction	West of 15th St.	Southside / South Pier	6"	Underground to Culvert	
110 - EB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
108 - WB Direction	East of 15th St.	Southside / South Pier	6"	Underground	

Table 2-2 Downspout Inventory

PIER / STRUCTURE IDENTIFICATION NO.	GENERAL VICINITY (NEAREST STREET, INTERSECTION)	DOWNSPOUT LOCATION (NORTHSIDE, SOUTHSIDE)	SIZE	DISCHARGE METHOD	COMMENTS? (NOTE PROBLEMS)
111 - EB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
109 - WB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
112 - EB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
110 - WB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
113 - EB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
111 - WB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
114 - EB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
112 - WB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
115 - EB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
113 - WB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
117 - EB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
114 - WB Direction	East of 15th St.	Southside / South Pier	6"	Underground	
118 - EB Direction	West of 17th St.	Southside / South Pier	6"	Underground	
119 - EB Direction	West of 17th St.	Southside / South Pier	6"	Underground	
120 - EB Direction	West of 17th St.	Southside / South Pier	6"	Underground	
115 - WB Direction	West of 17th St.	Southside / South Pier	6"	Underground	
116 - WB Direction	West of 17th St.	Southside / South Pier	6"	Underground	
117 - WB Direction	West of 17th St.	Southside / South Pier	6"	Underground	
121 - EB Direction	East of 17th St.	Southside / South Pier	6"	Underground	
118 - WB Direction	East of 17th St.	Southside / South Pier	6"	Underground	
120 - WB Direction	East of 17th St.	Southside / South Pier	6"	Underground	
121 - WB Direction	East of 17th St.	Southside / South Pier	6"	Underground	
124 - EB Direction	East of 17th St.	Southside / South Pier	6"	Underground	
122 - WB Direction	East of 17th St.	Southside / South Pier	6"	Underground	
127 - EB Direction	West of 19th St.	Southside / South Pier	6"	Underground	
130 - EB Direction	West of 19th St.	Southside / South Pier	6"	Underground	
123 - WB Direction	West of 19th St.	Southside / South Pier	6"	Underground	
124 - WB Direction	West of 19th St.	Southside / South Pier	6"	Underground	
125 - WB Direction	West of 19th St.	Southside / South Pier	6"	Underground	
126 - WB Direction	West of 19th St.	Southside / South Pier	6"	Underground	
127 - WB Direction	West of 19th St.	Southside / South Pier	6"	Underground	

Notes:

(1) For the pier / structure identification number column, the direction indicates which bridge structure serves the motorists.

(2) For the downspout location column, it should be noted that the downtown viaduct was assumed to be aligned in the east-west direction.

(3) There were 105 downspouts identified within the project limits. Seven pipes were either broken or missing and two cleanout caps were broken.

(4) Picture number in Appendix A

Table 2-3 Downspouts Within Project Limits

PIER / STRUCTURE IDENTIFICATION NO.	GENERAL VICINITY (NEAREST STREET, INTERSECTION)	DOWNSPOUT LOCATION (NORTHSIDE, SOUTHSIDE)	AFFECTED (YES OR NO?)
24 - EB Direction	East of Florida Ave.	Northside / North Pier	Yes
24 - WB Direction	East of Florida Ave.	Northside / North Pier	No
25 - WB Direction	East of Florida Ave.	Northside / North Pier	No
25 - EB Direction	East of Florida Ave.	Northside / North Pier	Yes
26 - EB Direction	East of Florida Ave.	Northside / North Pier	Yes
27 - EB Direction	East of Florida Ave.	Northside / North Pier	Yes
28 - WB Direction	East of Florida Ave.	Northside / North Pier	No
28 - EB Direction	East of Florida Ave.	Northside / North Pier	Yes
31 - WB Direction	West of Morgan St.	Northside / North Pier	No
31 - EB Direction	West of Morgan St.	Northside / North Pier	Yes
34 - WB Direction	East of Morgan St.	Northside / North Pier	No
34 - EB Direction	East of Morgan St.	Northside / North Pier	Yes
35 - WB Direction	Norhteast of Brorein St.	Northside / North Pier	No
38 - WB Direction	West of Jefferson St.	Northside / North Pier	No
37 - EB Direction	Norhteast of Brorein St.	Northside / North Pier	Yes
40 - EB Direction	West of Jefferson St.	Northside / North Pier	Yes
3 - WB Direction (Off Ramp)	West of Jefferson St.	Northside / One Wide Pier	No
41 - WB Direction	East of Jefferson St.	Northside / North Pier	No
42 - EB Direction	East of Jefferson St.	Northside / North Pier	Yes
44 - WB Direction	East of Jefferson St.	Northside / North Pier	No
45 - EB Direction	East of Jefferson St.	Northside / North Pier	Yes
48 - WB Direction	Between Whiting St. & Washington St.	Northwest Side / Northwest Pier	No
51 - EB Direction	Between Whiting St. & Washington St.	Northwest Side / Northwest Pier	Yes
51 - WB Direction	North of Washington St.	Northwest Side / Northwest Pier	No
55 - EB Direction	North of Washington St.	Northwest Side / Northwest Pier	Yes
53 - WB Direction	North of Washington St.	Southeast Side / Southeast Pier	Yes
57 - EB Direction	South of Jackson St.	Southeast Side / Southeast Pier	No
56 - WB Direction	North of Jackson St.	Southeast Side / Southeast Pier	Yes
59 - EB Direction	North of Jackson St.	Southeast Side / Southeast Pier	No
58 - WB Direction	South of Kennedy Blvd.	Southeast Side / Southeast Pier	Yes
61 - EB Direction	South of Kennedy Blvd.	Southeast Side / Southeast Pier	No
60 - WB Direction	North of Kennedy Blvd.	Southeast Side / Southeast Pier	Yes
62 - EB Direction	North of Kennedy Blvd.	Southeast Side / Southeast Pier	No
64 - EB Direction	North of Kennedy Blvd.	Southeast Side / Southeast Pier	No
62 - WB Direction	North of Kennedy Blvd.	Southeast Side / Southeast Pier	Yes
3 - WB Direction (Off Ramp)	North of Kennedy Blvd.	Northside / One Wide Pier	No
64 - WB Direction	West of Nebraska Ave.	Northside / North Pier	No

Table 2-3 Downspouts Within Project Limits

PIER / STRUCTURE IDENTIFICATION NO.	GENERAL VICINITY (NEAREST STREET, INTERSECTION)	DOWNSPOUT LOCATION (NORTHSIDE, SOUTHSIDE)	AFFECTED (YES OR NO?)
65 - WB Direction	West of Nebraska Ave.	Southside / South Pier	Yes
66 - EB Direction	West of Nebraska Ave.	Southside / South Pier	No
68 - EB Direction	East of Nebraska Ave.	Southside / South Pier	No
66 - WB Direction	East of Nebraska Ave.	Southside / South Pier	Yes
70 - EB Direction	South of Twiggs St.	Southside / South Pier	No
3 - EB Direction (On Ramp)	South of Twiggs St.	Southeast / One Wide Pier	No
69 - WB Direction	North of Twiggs St.	Southeast Side / Southeast Pier	Yes
73 - WB Direction	North of Twiggs St.	Southside / South Pier	Yes
76 - EB Direction	North of Twiggs St.	Southside / South Pier	No
84 - EB Direction	North of Twiggs St.	Southside / South Pier	No
81 - WB Direction	North of Twiggs St.	Southside / South Pier	Yes
88 - EB Direction	North of Twiggs St.	Southside / South Pier	No
85 - WB Direction	North of Twiggs St.	Southside / South Pier	Yes
92 - EB Direction	West of 12th St.	Southside / South Pier	No
90 - WB Direction	West of 12th St.	Southside / South Pier	Yes
93 - WB Direction	West of Channelside Dr.	Southside / South Pier	Yes
94 - WB Direction	West of Channelside Dr.	Southside / South Pier	Yes
95 - WB Direction	West of Channelside Dr.	Southside / South Pier	Yes
96 - WB Direction	West of Channelside Dr.	Southside / South Pier	Yes
97 - EB Direction	West of Channelside Dr.	Southside / South Pier	No
99 - EB Direction	East of Channelside Dr.	Southside / South Pier	No
97 - WB Direction	East of Channelside Dr.	Southside / South Pier	Yes
98 - WB Direction	East of Channelside Dr.	Southside / South Pier	Yes
99 - WB Direction	South of SR 60 / West of 14th St.	Southside / South Pier	No
101 - EB Direction	South of SR 60 / West of 14th St.	Southside / South Pier	Yes
100 - WB Direction	South of SR 60 / West of 14th St.	Southside / South Pier	No
101 - WB Direction	South of SR 60 / West of 14th St.	Southside / South Pier	No
104 - EB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	Yes
102 - WB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	No
103 - WB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	No
104 - WB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	No
105 - WB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	No
107 - EB Direction	South of SR 60 / East of 14th St.	Southside / South Pier	Yes
106 - WB Direction	West of 15th St.	Southside / South Pier	No
107 - WB Direction	West of 15th St.	Southside / South Pier	No

Table 2-3 Downspouts Within Project Limits

PIER / STRUCTURE IDENTIFICATION NO.	GENERAL VICINITY (NEAREST STREET, INTERSECTION)	DOWNSPOUT LOCATION (NORTHSIDE, SOUTHSIDE)	AFFECTED (YES OR NO?)
110 - EB Direction	East of 15th St.	Southside / South Pier	Yes
108 - WB Direction	East of 15th St.	Southside / South Pier	No
111 - EB Direction	East of 15th St.	Southside / South Pier	Yes
109 - WB Direction	East of 15th St.	Southside / South Pier	No
112 - EB Direction	East of 15th St.	Southside / South Pier	Yes
110 - WB Direction	East of 15th St.	Southside / South Pier	No
113 - EB Direction	East of 15th St.	Southside / South Pier	Yes
111 - WB Direction	East of 15th St.	Southside / South Pier	No
114 - EB Direction	East of 15th St.	Southside / South Pier	Yes
112 - WB Direction	East of 15th St.	Southside / South Pier	No
115 - EB Direction	East of 15th St.	Southside / South Pier	Yes
113 - WB Direction	East of 15th St.	Southside / South Pier	No
117 - EB Direction	East of 15th St.	Southside / South Pier	Yes
114 - WB Direction	East of 15th St.	Southside / South Pier	No
118 - EB Direction	West of 17th St.	Southside / South Pier	Yes
119 - EB Direction	West of 17th St.	Southside / South Pier	Yes
120 - EB Direction	West of 17th St.	Southside / South Pier	Yes
115 - WB Direction	West of 17th St.	Southside / South Pier	Yes
116 - WB Direction	West of 17th St.	Southside / South Pier	Yes
117 - WB Direction	West of 17th St.	Southside / South Pier	Yes
121 - EB Direction	East of 17th St.	Southside / South Pier	No
118 - WB Direction	East of 17th St.	Southside / South Pier	Yes
120 - WB Direction	East of 17th St.	Southside / South Pier	Yes
121 - WB Direction	East of 17th St.	Southside / South Pier	Yes
124 - EB Direction	East of 17th St.	Southside / South Pier	No
122 - WB Direction	East of 17th St.	Southside / South Pier	Yes
127 - EB Direction	West of 19th St.	Southside / South Pier	No
130 - EB Direction	West of 19th St.	Southside / South Pier	No
123 - WB Direction	West of 19th St.	Southside / South Pier	Yes
124 - WB Direction	West of 19th St.	Southside / South Pier	Yes
125 - WB Direction	West of 19th St.	Southside / South Pier	Yes
126 - WB Direction	West of 19th St.	Southside / South Pier	Yes
127 - WB Direction	West of 19th St.	Southside / South Pier	Yes

Notes:

(1) There are approximately 56 downspouts that could be affected by the proposed widening.

Based on comparison of the existing design plans and the field inventory mentioned above, it appears that inlets and downspouts were added to supplement the viaduct's deck drainage system from the original design. During the final design, a detailed analysis of the proposed spread conditions that accounts for the deck widening will be performed to address the adequacy of the inlets to handle the additional runoff from the widening.

2.7.10 Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Hillsborough County, Florida, community panel numbers 12057C0354H and 12057C0358H (dated August 28, 2008) indicate that the portion of the project generally east of Channelside Drive is in the 100-year base floodplain that is designated Zone AE with a Base Flood Elevation of 10 feet NAVD 1988. The remainder or the project area is either in Zone X, which corresponds to the 500-year floodplain or outside (above) the 500-year floodplain. Since the floodplain is due to tidal surge, no compensation is required. More information on floodplains is included in the *Location Hydraulic Report* dated February, 2010, prepared by American Consulting Engineers of Florida, LLC.

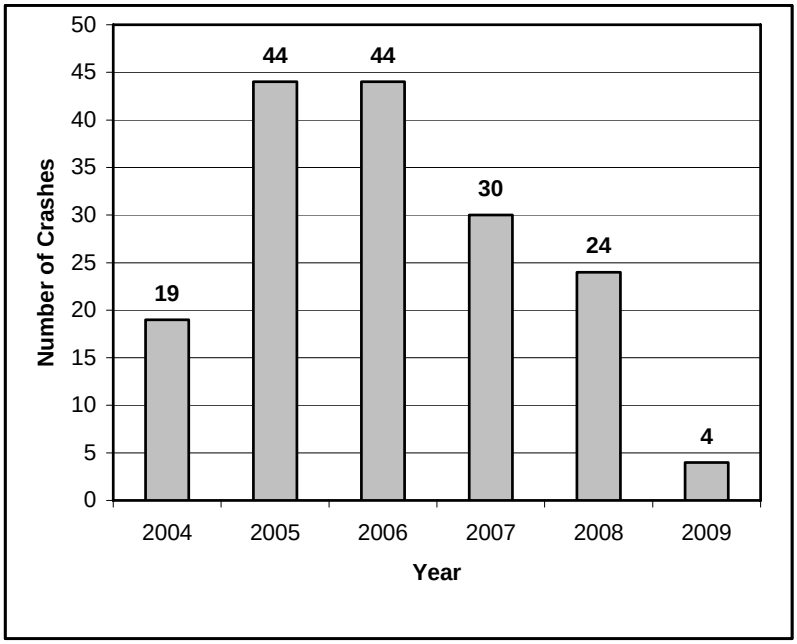
2.8 Crash Data

Crash data was collected from the FDOT Crash Data Management System for the Selmon Expressway from January 2004 through April 2009. The mile post (MP) limits used to extract the crash data are from MP 5.00 (Hillsborough River) to MP 7.00 (22nd Street/SR 45). The reversible lanes located above the Selmon Expressway are from Meridian Avenue (MP 6.00) and continue to Town Center Boulevard in Brandon. The REL project was opened to the public on July 2006.

Information from the crash data included the crash location, type of crash, time of day, influence of drug and alcohol, lighting conditions, road conditions, vehicle types and other data.

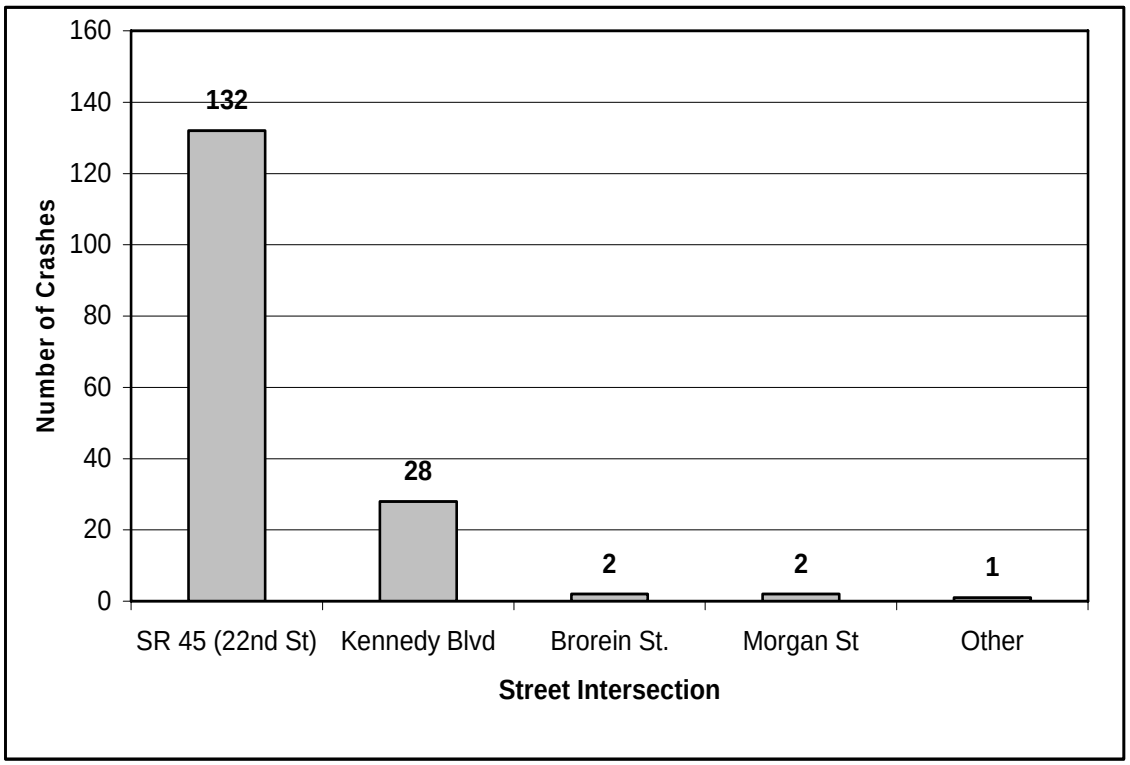
A total of 165 traffic crashes were reported within the limits of the study. This translates to an average of 32 crashes per year for this approximately 2 mile study segment. Traffic crashes by year are summarized in **Figure 2-19**. The 165 crashes involved one fatality, and 32 reported injuries. Crashes during 2005 and 2006 appeared higher than in other years and may have been attributed to construction of the REL project.

Figure 2-19 Summary of Traffic Crashes by Year



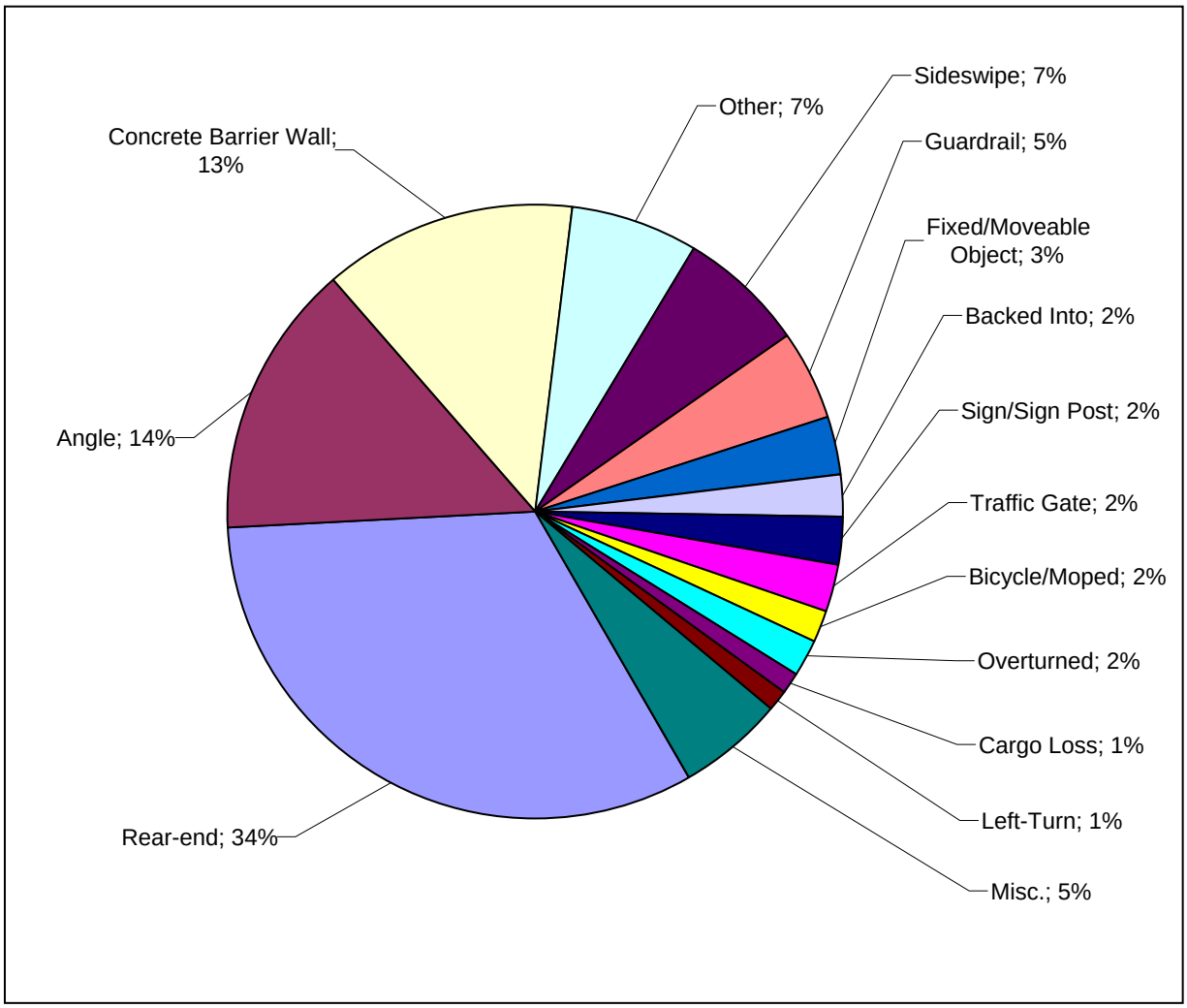
Reviewing the crashes based upon the street location revealed that most crashes (45 percent) occurred at the Selmon Expressway and 22nd Street intersection. A closer look at the location of the crashes revealed that most crashes occurred within a half mile influence of a street intersection than over any other location. For example, 80 percent of total crashes occurred within the Selmon Expressway and 22nd Street intersection and 17 percent of total crashes occurred within the Selmon Expressway and Kennedy Boulevard. Street intersections with Selmon Expressway are summarized in **Figure 2-20**.

Figure 2-20 Number of Crashes by Street Intersections



A breakdown of the type of crashes was reviewed. The results show that 34 percent of the crashes are rear-ends and 14 percent are angles. The type of crashes is summarized in **Figure 2-21**.

Figure 2- 21 Summary of Crashes by Type



A critical crash rate analysis and a safety ratio were also analyzed and summarized in **Table 2-4.** The critical crash rate is a function of roadway segment length, traffic volume, and the average crash rate for the category of highway being tested. The critical crash rate was obtained from the Statewide Average Crash Rates for Urban Segments (Toll Roads) received from the FDOT. The critical and actual crash rates are measured in number of crashes per million vehicle miles traveled. The safety ratio is the ratio between the actual and critical crash rates for a given segment for a given year. It identifies safety issues or high crash segments along roads. A safety ratio greater than 1.0 indicates that the segment is experiencing more crashes than would be expected for this type of a segment in other parts of the state. From a review of **Table 2-4**, the safety ratio for the study

segment of the Selmon Expressway is greater than 1.0 during the years 2005 to 2008 and less than 1.0 for 2004 and 2009 (only for 4 months). The construction of the Selmon Expressway REL took place from 2003 to 2007 with two realigned sections of the EB lanes opened in spring 2005. The construction and phased opening of the Selmon Expressway REL may have contributed to some of the crashes during that period. The Selmon Expressway within the study segment did exhibit a greater than average crash rate during the years 2005 to 2008.

Table 2-4 Summary of Crash Analysis along Selmon

Statistics	2004	2005	2006	2007	2008	2009*
Total Crashes	19	44	44	30	24	4
AADT (vehicles/year)	55,333	61,667	45,000	51,500	51,500	51,500**
Actual Crash Rate	0.470	0.977	1.339	0.798	0.638	0.324
Segment Length (mile)	2.000	2.000	2.000	2.000	2.000	2.000
Critical Crash Rate (1)	*0.622*	*0.676*	*0.628*	*0.602*	*0.625*	*0.625*
Safety Ratio	0.756	1.446	2.133	1.326	1.021	0.518
* Time period for 2009 is 4 months from January 2009 to April 2009.						
** AADT for 2009 was not available so the value for the previous year was used.						
(1) From Florida Statewide Average Crash Rate (Toll Roads)						

2.9 Lighting

The existing conditions within the project limits consist of a separated raised concrete roadway deck generally running east and WB, and lies within an urbanized area with both sections currently having conventional roadway lighting.

The existing lighting mounting height varies throughout the project between 35 and 45 feet. The luminaires are consistent at 250 watts with a 480 volt service to them. The light pole spacing along the main corridor is approximately 198 feet. The pole spacing for the on and off ramps at the toll plazas is approximately 219 feet. The luminaire is a GE Cobra Head mounted on an aluminum davit arm. The pole is Aluminum Bridge mounted on pilasters.

2.10 Utilities

Based on Sunshine One call design tickets dated August 2009, 21 utility agencies were identified along the project corridor as listed in **Table 2-5.** The locations of existing utilities are shown in **Figure 2-22.**

2.11 Pavement Conditions

The deck within the limits from Florida Avenue to North 12th Street is currently undergoing high maintenance and has public safety concerns resulting from original construction techniques.

The deck replacement project by FDOT from Florida Avenue to 12th Street will repair the driving surface in that area. A portion of the roadway section from 19th Street to 22nd Street will be milled and resurfaced as part of the I-4 Crosstown Connector project. Refer to Section 2.12.

2.12 Existing Bridges

The Selmon Expressway consists of Bridge No. 100332 (WB) and Bridge No. 100333 (EB) that were constructed in 1975 (**Figure 2-23**). Each structure carries two lanes of traffic with a 4'-0" inside shoulder, 8'-0" outside shoulder and traffic barriers for a total structure width of 38'-9". The structures are separated by 35'-10" between the inside barriers; refer to **Figures 2-24** and **2-25** for the existing structure typical sections. Overall, the viaduct begins on the west side of the Hillsborough River and extends to the east side of 19th Street, a distance of approximately 1.7 miles. In the area of the REL, which extends from Meridian Street to the Brandon Parkway, the Selmon Expressway lanes generally run parallel to REL with the same separation.

Table 2-5 Existing Utility Owners

UTILITY AGENCY OWNER	ADDRESS	PHONE	CELL	FAX	CONTACT	E-MAIL	MARKUPS RECEIVED FROM UTILITY OWNERS
AT&T COMM., INC.	6015 Benjamin Road, Suite 306 Tampa, FL 33634	813-342-0512			Greg Jacobson		No Facilities within Limits
BRIGHTHOUSE NETWORKS	4145 South Falkenburg Rd., Suite 4 Riverview, FL 33578	813-684-6100 x 32163	813-918-5735	813-436-2288	Barry Beatty	barry.beatty@mybrighthouse.com	Shown in Figure 2-22
CITY OF TAMPA TRAFFIC DEPT	306 E. Jackson Street Tampa, FL 33602	813-274-8105		813-274-8901	Mike Scanlon	mike.scanlon@tampagov.net	Shown in Figure 2-22
CITY OF TAMPA WATER DEPT	306 E. Jackson St. MC 400A5E Tampa, FL 33602	813-274-7096		813-274-8778	Janice Davis	janice.davis@ci.tampa.fl.us	Shown in Figure 2-22
CITY OF TAMPA WASTEWATER DEPT	306 E. Jackson St., 6E Tampa, FL 33602	813-274-8053		813-274-8880	Anthony Kasper		Shown in Figure 2-22
DELTACOM	1530 Deltacom Way Anniston, AL 36207	256-241-6438		256-241-4178	John McGruffey		No Response
FPL FIBERNET	9250 W. Flagler St., Mail Stop FN/GO Miami, FL 33174	305-552-2024		305-552-2411	Israel Lopez		Shown in Figure 2-22
FIBERLIGHT, LLC	4023 N. Armenia Ave, Suite 200 Tampa, FL 33607	813-877-7183	727-243-5251	813-877-7491	Tim Green	tim.green@fiberlight.com	Shown in Figure 2-22
GLOBAL CROSSING TELECOMMUNICATIONS, INC	225 Kenneth Drive Rochester, NY 14623	585-255-1027		585-899-6253	Luis Garcia		Shown in Figure 2-22
HILLSBOROUGH COUNTY ITS	601 E. Kennedy Blvd. Tampa, Florida 33602	813-276-2412		813-635-1606	Richard Aulicino		Shown in Figure 2-22
HILLSBROUGH COUNTY TRAFFIC SERVICES	8420 Sable Industiral Blvd. Tampa FL 33619	813-612-7900	813-927-6751	813-744-5788	George Aubel	aubelg@hillsboroughcounty.org	Shown in Figure 2-22
KINDER MORGAN/CENTRAL FLORIDA PIPELINE	2101 GATX Drive Tampa, FL 33605	813-241-1119		813-247-4274	Calvin Lockhart		No Facilities within Limits
LEVEL 3 COMMUNICATIONS, LLC	1122 S. Capital of Texas Hwy. West Lake Hills, TX 78746-7175	512-742-1479		512-742-1558	John Boedeker		No Response
VERIZON BUSINESS	2400 N. Glenville Richardson, TX 75082	972-729-6016		972-656-6022	Investigations		Shown in Figure 2-22
NUVOX COMMUNICATIONS	2301 Lucien Way, Suite 200 Maitland, FL 32751	407-835-0341 x 0341		407-447-4026	Mike Pickle		No Facilities within Limits
SPRINT NEXTEL	1101 North Keller Road, Suite G2 Orlando, FL 32810	407-838-5602	321-287-9942	407-838-5614	Mark Caldwell	mark.d.caldwell@sprint.com	Shown in Figure 2-22
TAMPA ELECTRIC COMPANY	P.O. Box 11 Tampa, FL 33601	813-275-3428	813-309-9299	813-275-3409	Arlene Brown	albrown@tecoenergy.com	Shown in Figure 2-22
TAMPA PORT AUTHORITY	1101 Channelside Drive Tampa, FL 33602	813-905-5001		813-905-5029	Bruce Laurion		No Facilities within Limits
TECO/PEOPLES GAS SYSTEMS, INC.	1400 Channelside Drive Tampa, FL 33605	813-275-3743			Luis Castellano		Shown in Figure 2-22
TIME WARNER TELECOM	3030 North Rocky Point Dr. Suite 850 Tampa, FL 33607	813-316-7792		813-281-0125	Kevin McManus		No Facilities within Limits
VERIZON FLORIDA LLC	1909 US Hwy. 301 N. Tampa, FL 33619	813-627-8343			David Wynns		Shown in Figure 2-22
XO COMMUNICATIONS	5904-A Hampton Oaks Parkway Tampa, FL 33610	813-301-4026		813-864-4126	Gary Walker	gary.l.walker@xo.com	Shown in Figure 2-22

ATTACHED TO WB BRIDGE BARRIER WALL

ATTACHED TO PIER CAP

TWIGGS ST

ATTACHED TO EB BRIDGE BARRIER WALL

END VIADUCT DECK REPLACEMENT (BY OTHERS)

REVERSIBLE ELEVATED LANES (REL)

TOLL 618A

ADAMO DR

15TH ST

17TH ST

PENNY ST

19TH ST

TOLL 618

ADAMO DR 60

21ST ST

22ND ST

END SELMON VIADUCT WIDENING PROJECT

12TH ST

CHANNELSIDE DRIVE

ATTACHED TO WB BRIDGE BARRIER WALL

MERIDIAN AVE

KENNEDY BLVD

JACKSON ST

JEFFERSON ST

N NEBRASKA AVE

WASHINGTON ST

BRUSH ST

WHITING ST

TOLL 618

S NEBRASKA AVE

MORGAN ST

BELL ST

FLORIDA AVE

BROREIN ST

BEGIN SELMON VIADUCT WIDENING PROJECT

BEGIN VIADUCT DECK REPLACEMENT (BY OTHERS)

ATTACHED TO EB BRIDGE BARRIER WALL

LEGEND

BTV	BRIGHTHOUSE
AGC	COT TRAFFIC DEPARTMENT
WM	COT WATER
SAN	COT WASTEWATER
BFO	FPL FIBERNEXT/XO
BFO	FIBERLIGHT
BFO	GLOBAL CROSSING
AGC / BFO	HILLSBOROUGH ITS/TRAFFIC SERVICES
BFO	VERIZON BUSINESS
BFO	SPRINT
OE / BE	TECO
GAS	TECO PEOPLES GAS
BFO	VERIZON
BFO	FPL FIBERNEXT/XO

NOTE: AGC IS ABOVE-GROUND CONDUIT ATTACHED TO BRIDGE STRUCTURE.

SOURCE: MARKUPS RECEIVED FROM UTILITY OWNERS BETWEEN 8/01/2009 AND 10/09/2009.

N

0 100 500

Feet

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

Downtown Viaduct PD&E Study

from the vicinity of Florida Ave to South 22nd Street

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 618	HILLSBOROUGH	416361-4

EXISTING UTILITIES

FIGURE NO. 2-22

Figure 2-23 Existing Viaduct

Figure 2-24 Typical Section of Eastbound and Westbound Viaduct

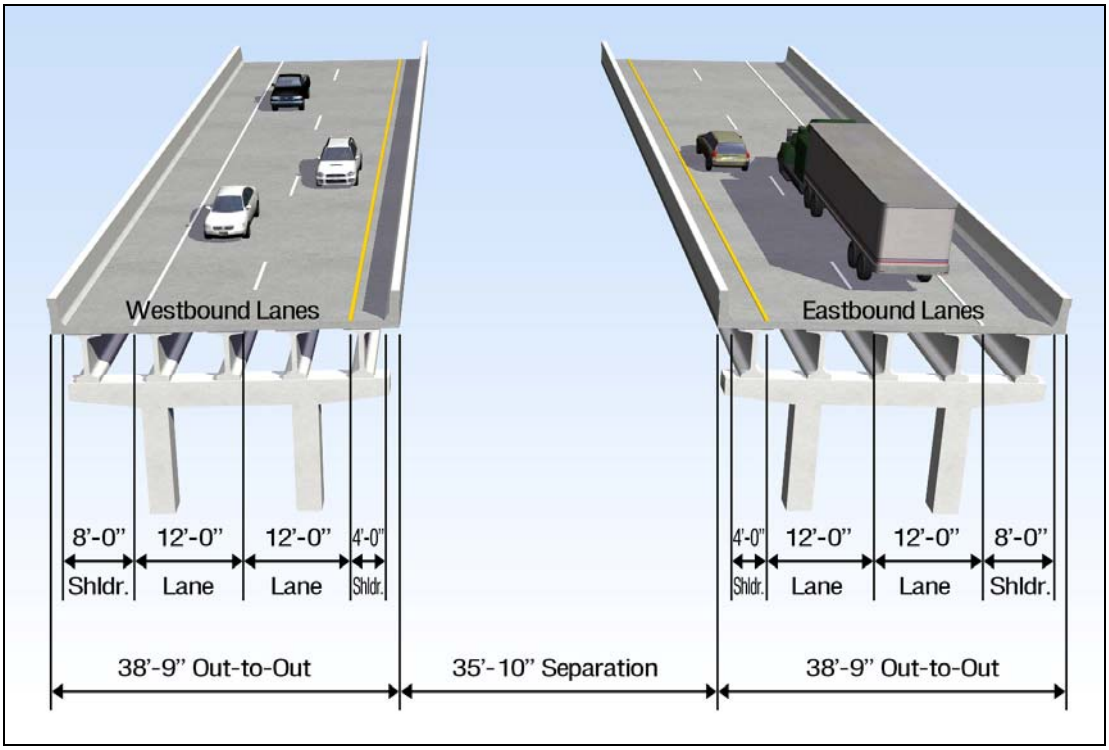
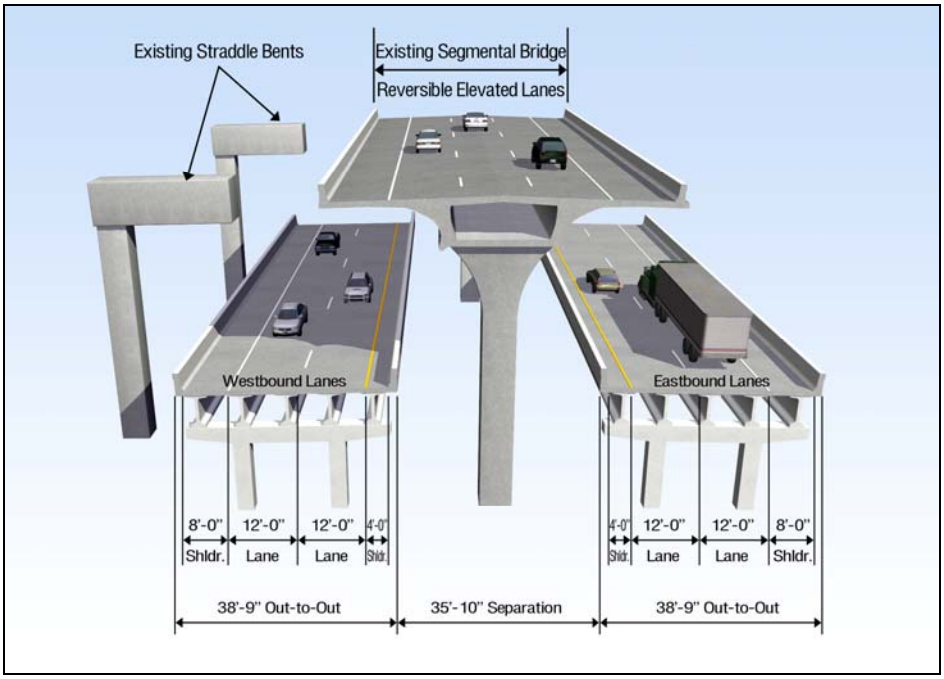


Figure 2-25 Typical Section of Eastbound and Westbound Viaduct through the REL



Structure Type & Span Arrangements

The bridges were designed in accordance with American Association of State Highway Transportation Officials (AASHTO) Standard Specifications for Highway Bridges 1977 Edition with approved revisions. HS20-44 was used for the live load design with modifications for military loading as required. The design allowances also allow for a 15 lbs/ft² future wearing surface and stay-in-place forms.

The superstructures are generally comprised of precast concrete deck panels from east of Florida Avenue to Channelside Drive and a cast-in-place concrete deck from Channelside Drive to 19th Street supported on AASHTO Beams ranging from Type II to Type VI with a few containing steel girders for the long spans over Brorein Street & 13th Street (WB) and Brush Avenue/Kennedy Street (EB). Beam spacing varies from 4'-1 ½" (±) to 11'-0" (±) while span lengths range from approximately 50'-0" (±) for the smaller AASHTO Type II Beams to over 186'-9" (±) (for the steel girder) measured along the centerline of the Selmon Expressway.

The bridge piers contain hammerhead caps with one to three columns for support. The majority of the piers are skewed in order to avoid many of the roads in which the viaduct lanes cross. The piers are supported by buried square footings with 18" square prestressed concrete piles. **Figures 2-26** through **2-28** show the different types of piers present within the system.

Figure 2-26 Typical Three-Column Pier

Figure 2-27 Typical Two-Column Pier

Figure 2-28 Typical Single-Column Pier

The existing vertical clearances of the structures generally meet current requirements (16'-6") over roadways with one exception, WB viaduct over Brorein Street (16'-1 ¼" (±)). The existing EB and WB clearances range from 16'-6" (±) over Brush Avenue/Kennedy Boulevard to 27'-6" over SCLRR Railroad (23'-6" required).

Current Structural Condition

The structures were last inspected on August 30, 2007 and were given a sufficiency rating of 79.2 (WB) and 91.6 (EB). Sufficiency ratings are based on a scale of 0 to 100 and are used to determine eligibility for Federal funding. The ratings include factors such as structural condition, geometry and traffic considerations. Structures with sufficiency ratings less than 80 are eligible for Federal bridge rehabilitation funds while structures with sufficiency ratings less than 50 are eligible for Federal replacement funds.

There are several bridge deck deficiencies noted in the 2007 inspection reports consisting mainly of spalled concrete areas; a few with exposed reinforcing steel which required repair. Other noted deficiencies included missing or blocked drains/pipes (required repair), minor spalling on a few substructure columns (not requiring repair), spalling on a

few pier caps & beam seats with some exposed rebar (required repair) and nuts/bolts missing on the elastomeric bearings (not requiring repair).

The "Health Index" is a tool used within the inspection of the structures to measure the overall condition of the bridge and includes 10 to 12 different elements. Similar to the Sufficiency Rating, the Health Index uses a scale of 0 to 100. A health index below 85 generally indicates that some repairs are needed; however the bridge is not unsafe. The Health Indices of the structures are 87.85 (WB) and 88.46 (EB).

Both structures are also classified as "Functionally Obsolete" meaning that they have features that do not meet current standards, such as the narrow shoulder widths; however it does not mean that the structures are inherently unsafe.

2.13 Geotechnical Data

The Soil Survey for Hillsborough County, Florida (1989) provides general descriptions of subsurface conditions within the county. Hillsborough County is located in the Floridian section of the Atlantic Coastal Plain. The project is located in the Coastal Lowlands, which are low, nearly level plains that lie next to the coast. The Soil Survey for Hillsborough County indicates that there is one soil type that exists within and adjacent to the corridor: urban land (56). A description of the soil unit is listed below. A soils map is provided in **Figure 2-29**.

- **Urban Land** – Consists of areas covered by concrete, asphalt, buildings or other impervious surfaces that obscure or alter the soils so that identification is not feasible. Slopes are usually less than 2 percent but can range up to 5 percent. In this map unit, 85 percent of the surface is covered by impervious area (streets, buildings, parking lots, etc.). Most Urban Land map units are artificially drained by some type of manmade conveyance system.

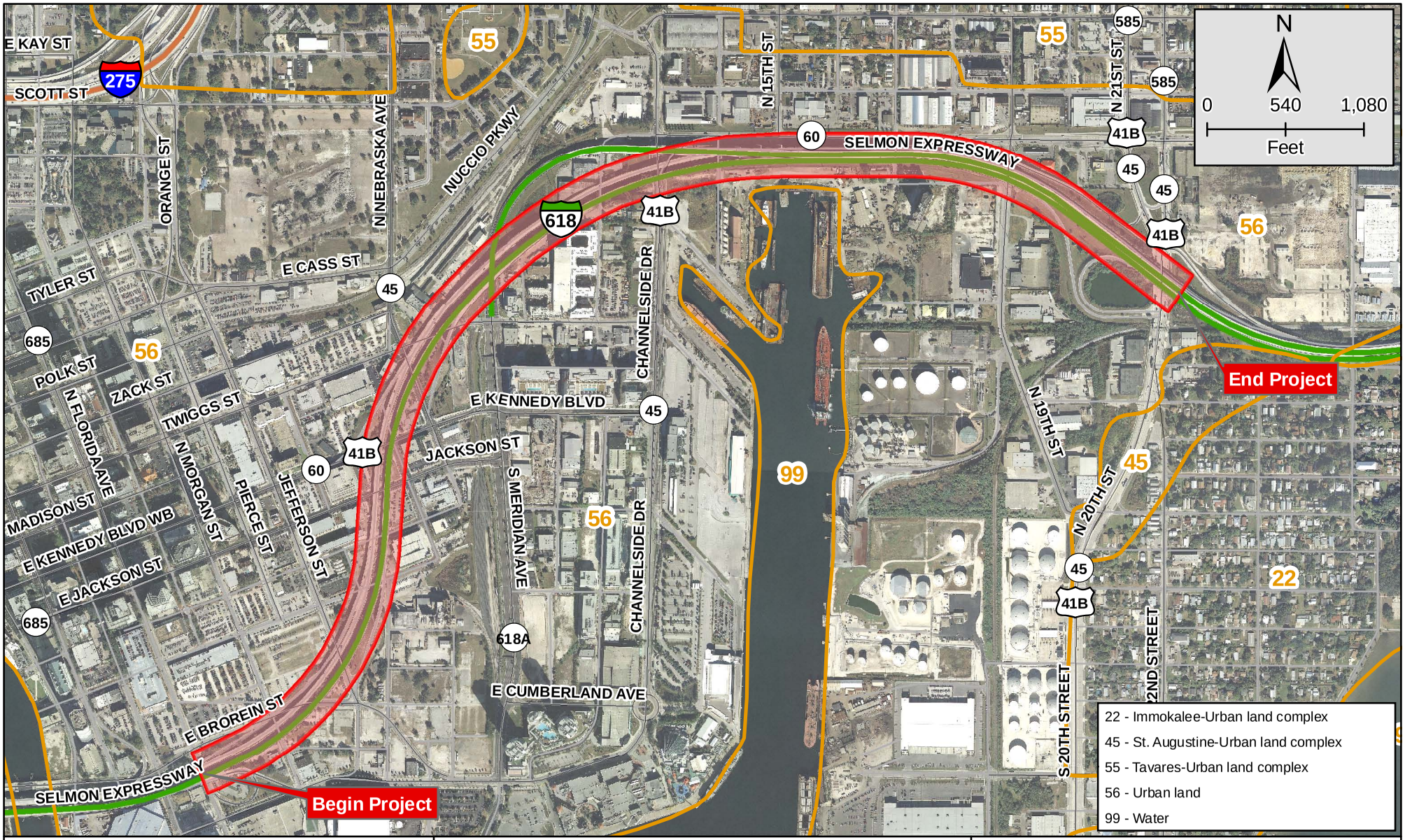


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Figure 2-29: NRCS Soils Map

Source: FGDL, NRCS

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2.14 Existing Traffic and Level of Service

A separate *Design Traffic Technical Memorandum (DTTM)*, prepared by HNTB dated November 2009, was prepared for this Study. The corridor study area includes access to and from the Selmon Expressway at the following cross streets:

- Florida Avenue
- Channelside Drive
- Jefferson Street
- Morgan Street
- Kennedy Boulevard
- Nebraska Avenue
- South 22nd Street

Figure 2-30 illustrates the existing laneage for the Selmon Expressway and other facilities within the study area.

Traffic count information was collected from a variety of sources including:

- Ramp counts collected by THEA as part of their annual program
- City of Tampa Traffic Count Program
- FDOT 2008 Florida Traffic Information CD

The traffic count information collected from these sources was adjusted to reflect 2008 year conditions. These were considered as the base year for the analysis performed as part of this report. For the purpose of the traffic analysis, seasonal factors (obtained from the 2008 Florida Traffic Information CD-ROM) were applied to the traffic count information collected along the corridor.

Capacity Analysis

Operational analyses- were conducted utilizing the Highway Capacity Software (HCS) 2000 for the existing year conditions. The mainline LOS for Selmon Expressway was determined using the Freeways Module of the HCS software package, while ramp merge/diverge operations were evaluated using the Ramps module of the HCS software package. These analyses were based on the adjusted AM and PM peak hour volumes.

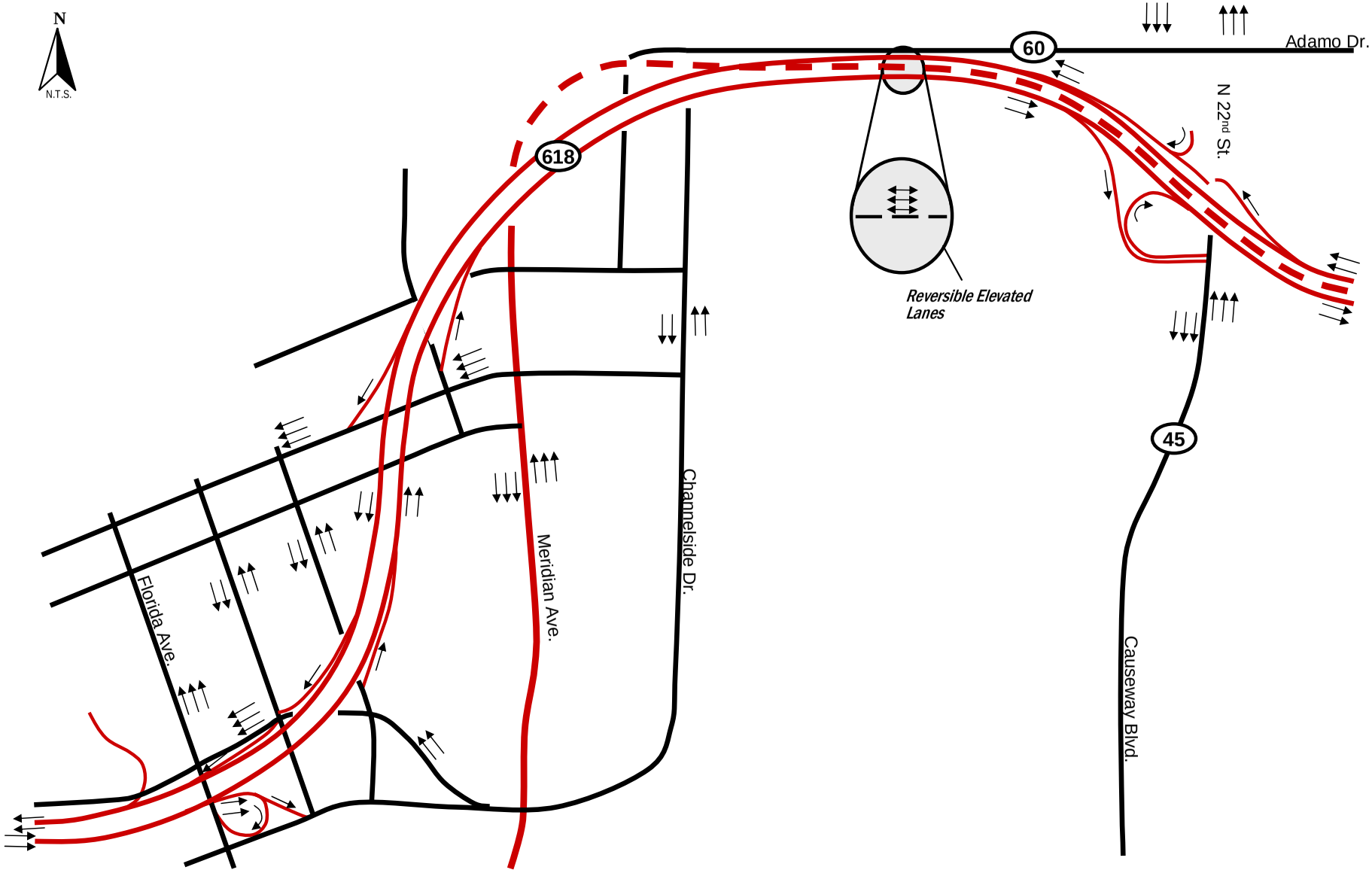

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Figure 2-30: Existing Geometry

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Ramp Capacity Analysis - LOS analyses were conducted for the 10 ramps located along the length of the corridor, for the AM and PM peak hours utilizing the HCS 2000 Ramps analysis.

According to Exhibit 25-4 (page 25-5) of the *Highway Capacity Manual (HCM 2000)*, a vehicle density exceeding 35 pc/mi/ln is considered LOS E condition. LOS F conditions exist when the total flow departing from the conflict area exceeds the capacity of the downtown freeway segment. Density is defined as the number of vehicles on a roadway segment averaged over space. A summary of the HCS LOS analysis for the ramps is included in **Table 2-6**. The capacity analysis worksheets for the existing conditions are included in Appendix A of the *DTTM*.

Table 2-6 Base Year (2008) Hour Ramp Levels of Service

RAMP LOCATION	PERIOD	DENSITY (pc/mi/ln)	LOS
EB off ramp to 22nd Street	AM	17.8	B
	PM	21.9	C
EB on ramp from 22nd Street	AM	20.9	C
	PM	25.1	C
WB off ramp to 22nd Street	AM	22.9	C
	PM	18.7	B
WB on ramp from 22nd Street	AM	25.1	C
	PM	20.9	C
EB on ramp from Nebraska Avenue	AM	18.5	B
	PM	26.4	C
WB off ramp to Kennedy Boulevard	AM	21.9	C
	PM	17.8	B
EB off ramp to Channelside Drive	AM	15.8	B
	PM	19.3	B
EB on ramp from Jefferson Street	AM	16.8	B
	PM	20.0	B
WB off ramp to Morgan Street	AM	17.3	B
	PM	14.1	B
WB on ramp from Florida Avenue	AM	23.6	B
	PM	19.7	B

The overall ramp LOS data indicate that the ramps currently operate at an overall LOS of LOS C or better during both the AM and PM peak hours.

Mainline Capacity Analysis - Mainline LOS analyses along the Selmon Expressway were conducted using the Freeways module of the HCS software program that performs LOS analyses. For the mainline LOS analysis, the freeway segment boundaries were selected from one interchange to the next and extending to the sections east and west of the project limits. Therefore, the Selmon Expressway was divided into four freeway segments. The Freeway HCS worksheets for the mainline segment LOS analysis are included in Appendix B of the *DTTM* and the results are summarized in **Table 2-7**.

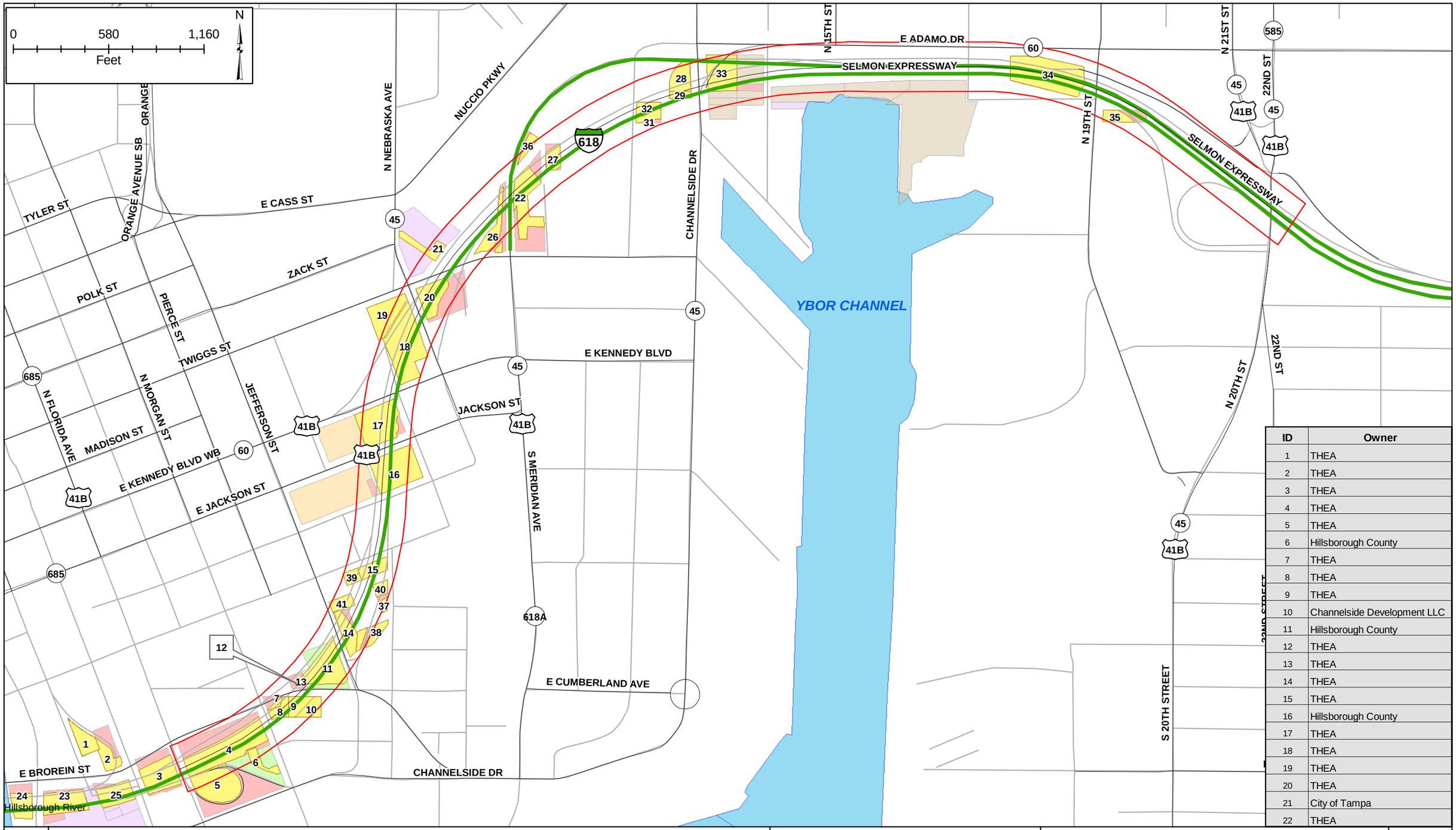
Table 2-7: Base Year (2008) Peak Hour Mainline Levels of Service

SEGMENT	DENSITY (PC/MI/LN)	LOS
34th Street to 22nd Street	22.6	C
22nd Street to Kennedy Boulevard	21.7	C
Kennedy Boulevard to Florida Avenue	17.4	B
Florida Avenue to Tampa Street	12.4	B

The freeway LOS analysis indicates that, under the existing conditions, the entire Selmon Expressway corridor, operates at an overall average LOS C or better during the AM and PM peak hours in both directions.

2.15 Parking Facilities

Underneath the viaduct structures of the Selmon Expressway there are approximately 22 parking lots within the project limits. Seventeen (17) of these are owned by THEA, three are owned by Hillsborough County, one is owned by the City of Tampa and one is owned by Channelside Development, LLC (refer to **Figure 2-31** and **Appendix C**). These parking lots are designed around the existing piers and have access along the side streets.



ID	Owner
1	THEA
2	THEA
3	THEA
4	THEA
5	THEA
6	Hillsborough County
7	THEA
8	THEA
9	THEA
10	Channelside Development LLC
11	Hillsborough County
12	THEA
13	THEA
14	THEA
15	THEA
16	Hillsborough County
17	THEA
18	THEA
19	THEA
20	THEA
21	City of Tampa
22	THEA

LEGEND

- CHANNELSIDE DEVELOPMENT LLC
- CITY OF TAMPA
- HILLSBOROUGH COUNTY
- SCHOOL BOARD OF HILLSBOROUGH COUNTY
- TAMPA HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY
- TRANS-CONTINENTAL MARINE REPAIR AND DRYDOCK CORP
- Parking
- Approximate Project Area

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from the vicinity of Florida Ave to south 22nd Street

Parking Property Layout

Figure 2-31

Section 3 – CORRIDOR ANALYSIS

This Selmon Expressway project is on an existing alignment for which alternate corridors are not under consideration and hence the development and analysis of an interconnected multimodal transportation system is not feasible. Based on Part 1, Chapter 4 of the *PD&E Manual*, the Selmon Expressway is considered a Level I Analysis, and no corridor report is necessary.

Section 4 – PROJECT DESIGN STANDARDS

Access Management standards for Interstate and other state highways are defined in Florida Statute 335.18, Florida Administrative Code FDOT Rule 14-97, in addition to the FDOT's adopted Median Opening and Access Management Decision Process (Topic No. 625-010-021). The Selmon Expressway corridor is functionally classified as Urban Arterial – Freeways and Expressways and is part of the FIHS. The FIHS is the highway component of the SIS, which is a statewide network of highways, railways, waterways and transportation hubs that handle the bulk of Florida's passenger and freight traffic. It is classified as "Access Classification 1". General Design criteria are shown in **Table 4-1.**

Table 4-1 Design Controls and Standards for Selmon Expressway

Design Element	Control Standards	Reference
Existing Functional Class.	Urban Other Principal Arterial Highway	
Access Classification	Access Class I-Area Type 1	
Number of Lanes	6 (Proposed)	
Speed:		
-Posted	55 mph	
-Minimum Design	50 mph	PPM Table 1.9.2
Design Vehicle	WB-62FL	PPM Figure 1.12.1
Horizontal Alignment		
- Max curvature	6° 30' 00"	PPM Table 2.8.3
- Max curvature with NC	0° 30' 00"	PPM Table 2.8.4
- Max superelevation	0.10 ft/ft	PPM Table 2.8.3
- Slope rates	1:180, 100' min. (for 6-lane)	PPM Table 2.9.3
- Min curve length in full super.	100'	PPM Table 2.8.2a
- Max deflection w/o curve	0° 45' 00"	PPM Table 2.8.1a
- Length of curve	825'	PPM Table 2.8.2a
Vertical Alignment		
- Max Grade	5%	PPM Table 2.6.1
- Max change in grade w/o curve	0.5%	PPM Table 2.6.2
- Min. stopping sight distance [(1)]	495'	PPM Table 2.7.1
- Min. "K" for crest curve	185	PPM Table 2.8.5
- Min. "K" for sag curve	115	PPM Table 2.8.6
- Min. crest curve length	350'	PPM Table 2.8.5
- Min sag curve length	250'	PPM Table 2.8.6
Cross Section Elements		
- Travel lane width	12'	PPM Table 2.1.1
- Auxiliary lane	12'	PPM Table 2.1.1
- Outside shoulder width (mainline)	12' (10' paved)	PPM Table 2.3.1
- Outside shoulder width (bridge)	10'	PPM Figure 2.0.1
- Inside shoulder width (mainline)	12' (10' paved)	PPM Table 2.3.1
- Inside shoulder width (bridge)	10'	PPM Figure 2.0.1
- Median - Open space between bridges	<10' use full deck	PPM Section 2.2.3
- Median width w/ barrier wall	26'	PPM Table 2.2.1
- Travel lane cross slope	2.0% (3.0% max)	PPM Figure 2.1.1
- Roadway Outside shoulder cross slope	6.0%	PPM Table 2.3.1
- Roadway Inside shoulder cross slope	5.0%	PPM Table 2.3.1
- Max rollover at ramp terminal	5.0%	PPM Table 2.1.4
- Max rollover between travel lanes	4.0%	PPM Table 2.1.1
Roadside Slopes		
- Front slopes	1:6 for 0-5' height	PPM Table 2.4.1
	1:6 to CZ then 1:4 for 5-10' ht.	PPM Table 2.4.1
	1:6 to CZ then 1:3 for 10-20' ht.	PPM Table 2.4.1
	1:2 with guardrail for ht.over 20'	PPM Table 2.4.1
- Back slopes	1:4 desir. (1:3 min w/1:6 front slope)	PPM Table 2.4.1
- Transverse slopes	1:10	PPM Table 2.4.1
Clear Zone/Horizontal Clearance		
- Travel lane	30'	PPM Table 2.11.11
- Auxiliary lane	18'	
Vertical Clearance		
- Overhead signs [(2)]	17.5'	PPM Table 2.10.2
- Dynamic message sign [(2)]	19.5'	PPM Table 2.10.4
- Roadway Bridge over Roadway	16.5'	PPM Table 2.10.1
- Roadway Bridge over Railroad	23.5'	PPM Table 2.10.1
Auxiliary Lanes		
- Taper Rate, lane addition	15:1	AASHTO Greenbook pg. 715-716
- Lane Reduction/Taper-type Ramp Entrance	50:1 min, 70:1 desirable	AASHTO Greenbook pg. 818, 845
- Parallel Ramp Entrance Length	300' min.	AASHTO Greenbook pg. 845
- Parallel Ramp Entrance Downstream Taper	300'	AASHTO Greenbook pg. 845
Structural Capacity		
- Existing	HS20-44 modified for military loading	AASHTO Specs for Highway Bridges 1977
- Proposed	HS-93	AASHTO LRFD Design Specs 4th Edition, 2007 Section 3.6.1.2

[(1)] Lengths to be adjusted for grades of 2.0% or less (PPM, Table 2.7.1)

[(2)] Clearance over the entire width of pavement and shoulder to the lowest sign component

Section 5 – ALTERNATIVE ANALYSIS

5.1 No-Build Alternative

The No-Build Alternative assumed that the existing conditions would remain within the project limits for Selmon Expressway beyond the design year 2035, with only routine maintenance activities.

The No-Build projected year 2035 Annual Average Daily Traffic (AADT) volumes on the Selmon Expressway from Florida Avenue to South 22nd Street range from 93,500 vpd to 122,300 vpd.

The No-Build traffic analysis indicates that overall the Selmon Expressway study area will operate at LOS F under the higher volume conditions in the design year (2035) as compared to LOS B and LOS C in the existing conditions, and at least some mainline improvements will be required by the year 2035. Distinct advantages and limitations associated with the No-Build Alternative are outlined below:

Advantages:

- No additional inconvenience to the traveling public and property owners during construction
- No additional design, ROW acquisition, and construction costs
- No additional impacts to the adjacent natural, physical and human environment

Disadvantages:

- Increase in traffic congestion and user costs associated with increased travel times
- Incompatibility with the Hillsborough County MPO's Cost Feasible LRTP that was adopted on December 9, 2009,
- Increase in carbon monoxide and other pollutants due to increased traffic congestion

- Increased costs in the movement of goods and services

5.2 Transportation Systems Management

Transportation Systems Management (TSM) alternatives involve improvements designed to maximize the utilization and efficiency of the existing facility through improved system and demand management. The various TSM options generally include traffic signal and intersection improvements, Intelligent Transportation System implementation/improvement and transit improvements. The additional capacity required to meet the projected traffic volumes along the Selmon Expressway in the design year cannot be provided solely through the implementation of TSM improvements.

5.3 Build Alternatives

In addition to the No-Build and TSM alternatives, various alternatives to improve Selmon Expressway from Florida Avenue to South 22nd Street were developed. The basic philosophy followed in developing alternative design concepts is to provide capacity improvements to maintain the required LOS based on projected traffic volumes.

5.3.1 Build Alternative Evaluation

Build Alternatives evaluated include Alternatives 1 (the Recommended Alternative), 2A, 2B and 2C.

Alternative 1 (Recommended Alternative) consists of widening the Selmon Expressway from west of Morgan Street to west of 22nd Street from two to three lanes in each direction (**Figure 5-1**). Most of the widening would be done to the inside, while inside and outside widening would be required in the vicinity of the straddle bent piers for the REL.

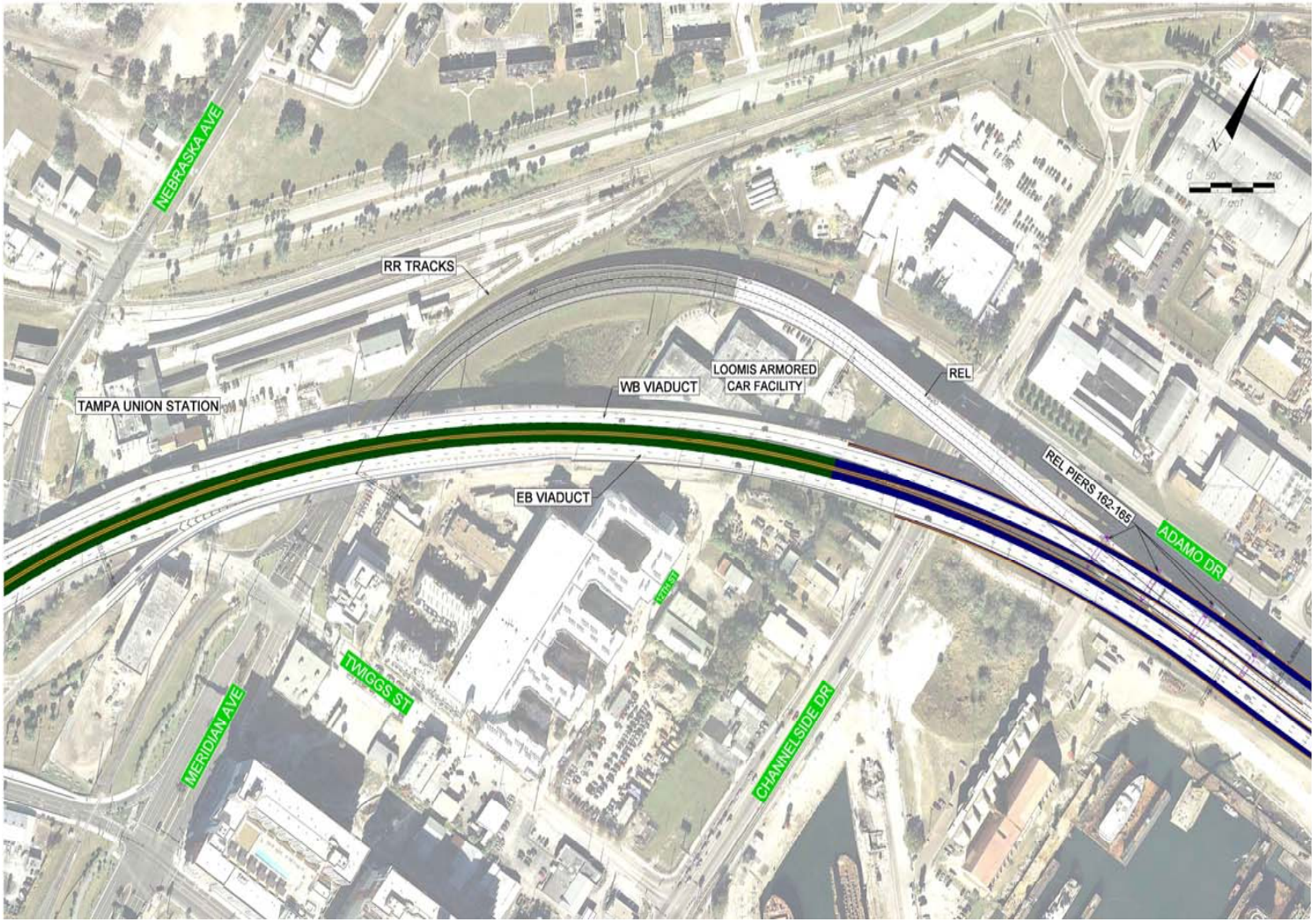

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Figure 5-1 Alternative 1 (Preferred Alternative) (Central Segment)

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Alternative 2 consists of three ramp locations that would provide a WB ramp connection from the REL to the WB Selmon Expressway viaduct bridge. This single lane, structure-to-structure connection will be a complex bridge with moderately long spans, tight radii of curvature, and significant width variations.

The new ramp could be a separate structure or be connected to the existing REL; each option poses its own challenges. If the new ramp is constructed as a separate structure, a longitudinal joint would be required running the entire length that the ramp is adjacent to the REL. This joint would need to be designed for both longitudinal and transverse movement due to the difference in ages of the concrete and the tendency for newer concrete to "creep" and "shrink" at a faster rate in the first few years of existence than older concrete. The new structure would also require expansion joint locations in the same location as the REL so that the REL is not subject to additional longitudinal movement and load.

Connecting to the REL offers another challenge in that the existing transverse post tensioning in the segmental units cannot be impacted; therefore the actual connection to the unit will be difficult. There will also be a multitude of new/different forces in the units themselves if they are widened which were likely not accounted for in the original design. The "creep" and "shrinkage" rate of the new and existing concrete will also present forces that will need to be accommodated.

The combination of span lengths, tight curvature and width variations limits the types of superstructure types for the proposed ramp. The most appropriate location for a connection from the REL to the viaduct is where the straddle bent piers are located for the REL. Due to the complexity of modifying the REL straddle bents (piers 162-165), it was considered infeasible to widen the REL in this area.

The following location alternatives look at connecting a ramp to the east and west of these straddle bents:

- *Alternative 2A – Western exit from the REL on the north side of the REL, beginning west of REL straddle bents* **(Figure 5-2):**

For Alternative 2A, the ramp connects to the REL on the west side of the straddle bents and on the northern or left side of the REL lanes. The horizontal alignment of the ramp follows the curve of the reversible lanes as they tie down to Meridian Street. The ramp would be between the reversible lanes and the adjacent north/south railroad tracks.

To avoid directly impacting the Tampa Union Train Station (historic site), a radius of 477' was used to connect to the viaduct with a 9.8 percent superelevation, utilizing a 40 mph design speed.

As the alignments of Meridian Avenue, the elevated Selmon Expressway, and the railroad track converge, four straddle bents are required to carry the proposed ramp at the third level. Two of the straddle bents have one column inside of railroad property. A crash wall would be required at these straddle bent locations running parallel to the railroad which would continue north until the clearance between the centerline of the railroad and face of the piers reached 25 feet. The ramp curves back to the right after the straddle bents to follow the alignment of the Selmon Expressway.

- *Alternative 2B- Western exit from the REL on the south side of the REL, beginning west of REL straddle bents* (**Figure 5-3**)*:*

Alternative 2B provides a WB left exit off the REL, to the west of the straddle bents. Since the ramp can only depart the REL lanes when the western most straddle is cleared, there is limited distance to provide an adequate radius in order to maintain a 50-55 mph design speed. Hence, a 40 mph design speed is provided by having two 477' radii at 9.8 percent superelevation. This ramp would have to pass over a corner of the Loomis Armored Car Facility building.

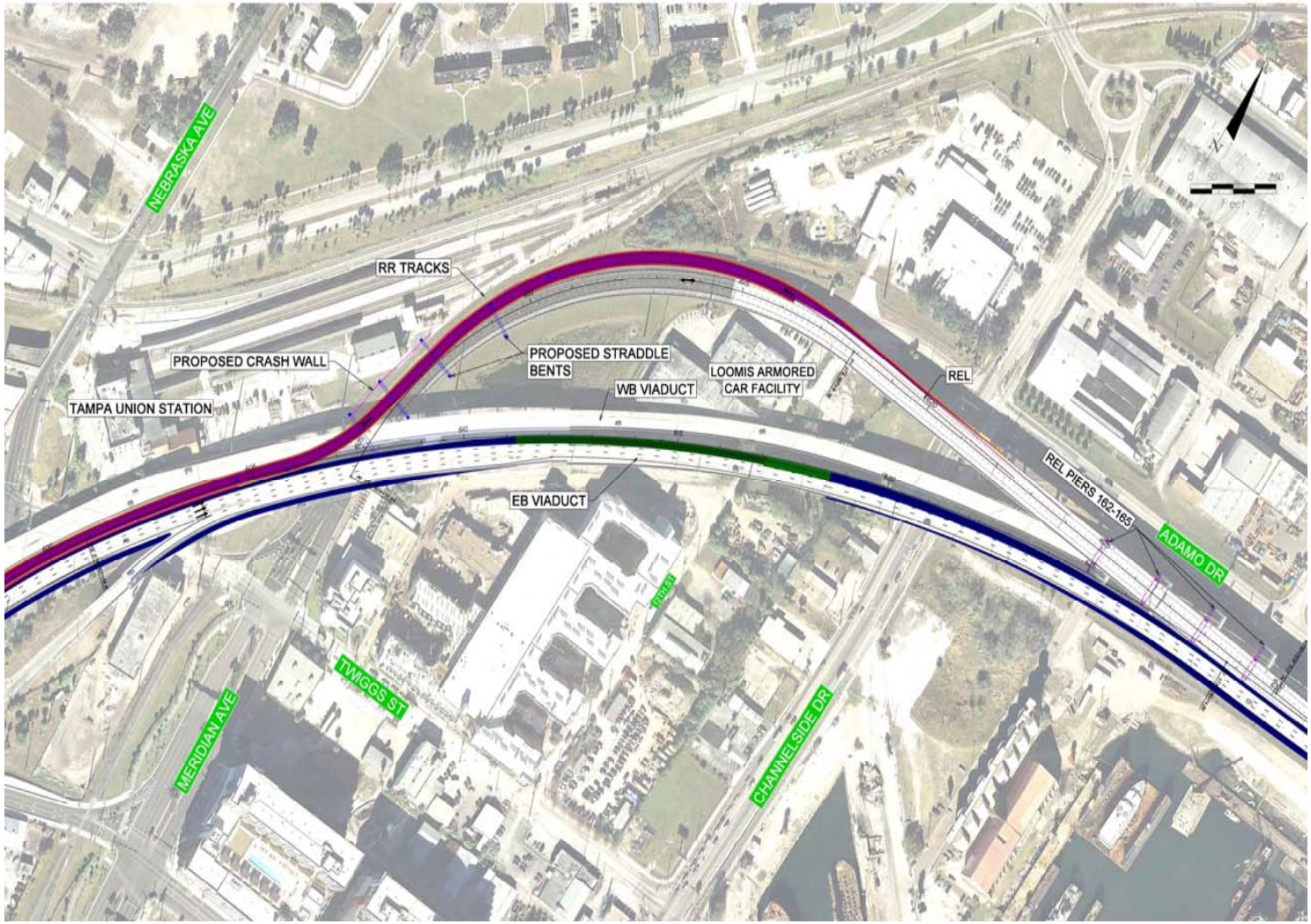

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Figure 5-2 Alternative 2A

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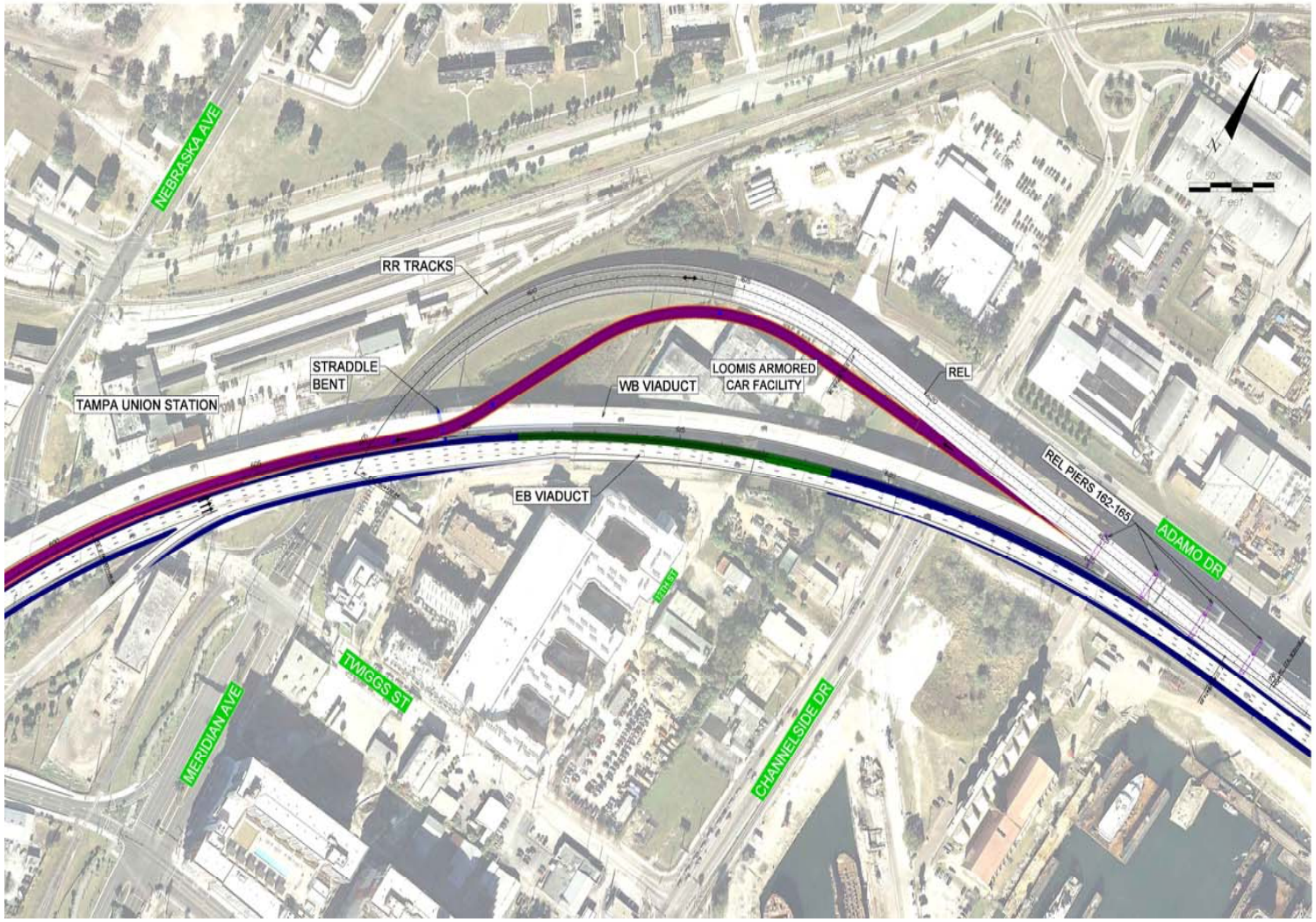

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Figure 5-3 Alternative 2B

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Horizontally, this alternate poses less severe challenges than Alternative 2A. Pier locations are relatively unencumbered until the ramp reaches the crossing of the WB lanes of the Selmon Expressway and Meridian Avenue. One straddle bent is required to carry the ramp at the 3rd level at this location. A span length of 185' is required to cross Meridian Avenue.

- *Alternative 2C - Western exit from the REL on the south side of the REL, and beginning east of REL straddle bents* (**Figure 5-4**):
  Alternative 2C connects to the REL east of the four straddle bents providing a left exit off the REL. This option would allow for curves with a 55 mph design speed. The easterly location of the beginning of this ramp also requires that the ramp be at the third level directly over the existing EB lanes of the Selmon Expressway. Ten straddle bents will be required in this area.

Alternative Typical Sections

By examining the existing typical sections throughout the project limits, which includes the REL, several proposed typical section options were developed for the ultimate year. Factors included utilizing the existing viaduct structures only and a combination of the existing viaduct structures and ramp locations that would provide a WB ramp connection from the REL to the WB viaduct bridge.

Alternative 1: Typical I (**Figure 5-5**)

Typical I consists of inside bridge widening within the proposed Redecking Project limits from east of Morgan Street to 12th Street. It includes three 12-foot lanes with a 6-foot inside shoulder and a 10-foot outside shoulder for both the EB and WB lanes with a minimum separation of 3'- 6".

Alternative 1: Typical II (**Figure 5-6**)

Typical II consists of inside and outside bridge widening through the REL straddle bents from 12th Street to west of 17th Street. It also includes three 12-foot lanes with a 6-foot inside shoulder and a 10-foot outside shoulder.

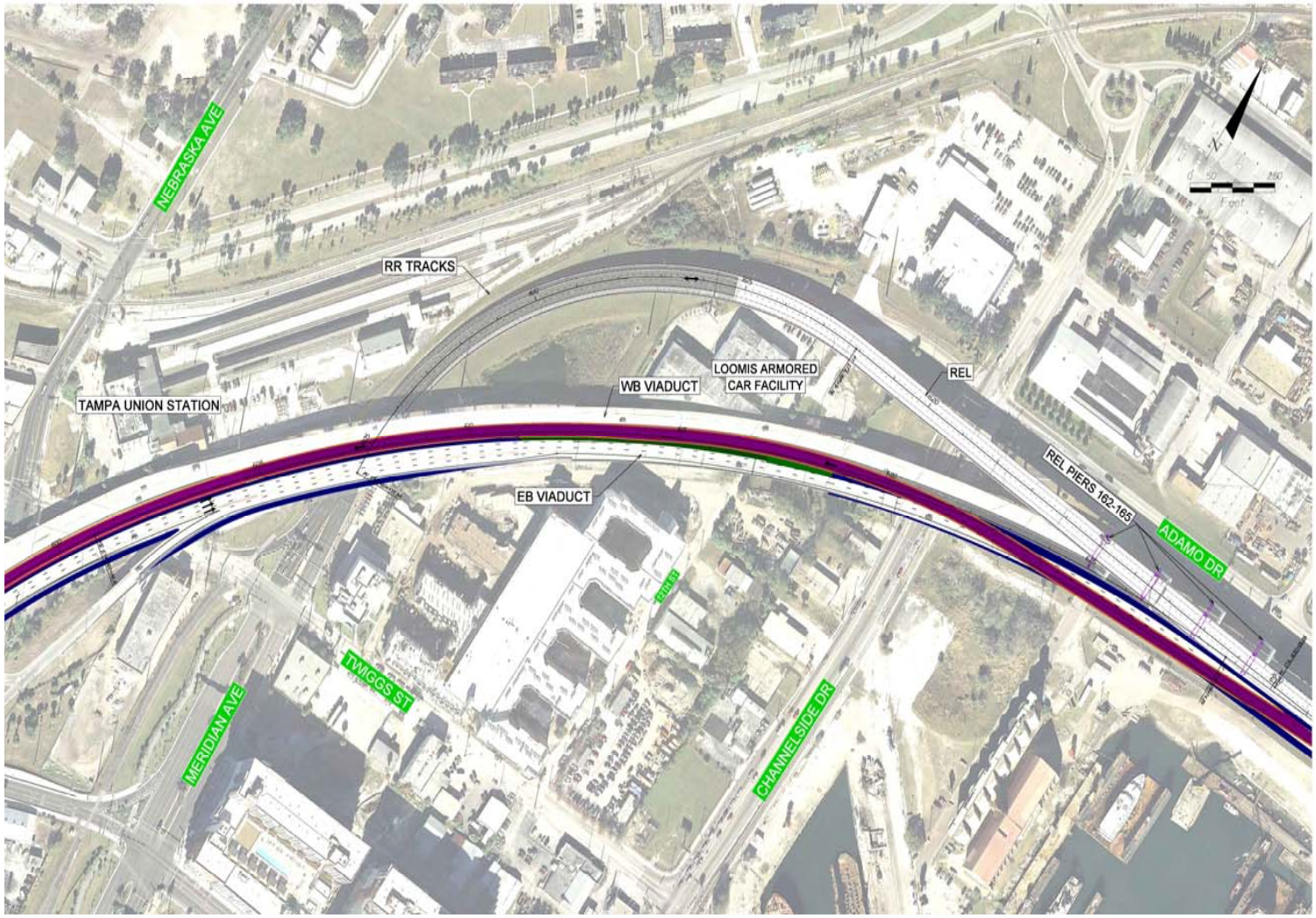

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Figure 5-4 Alternative 2C

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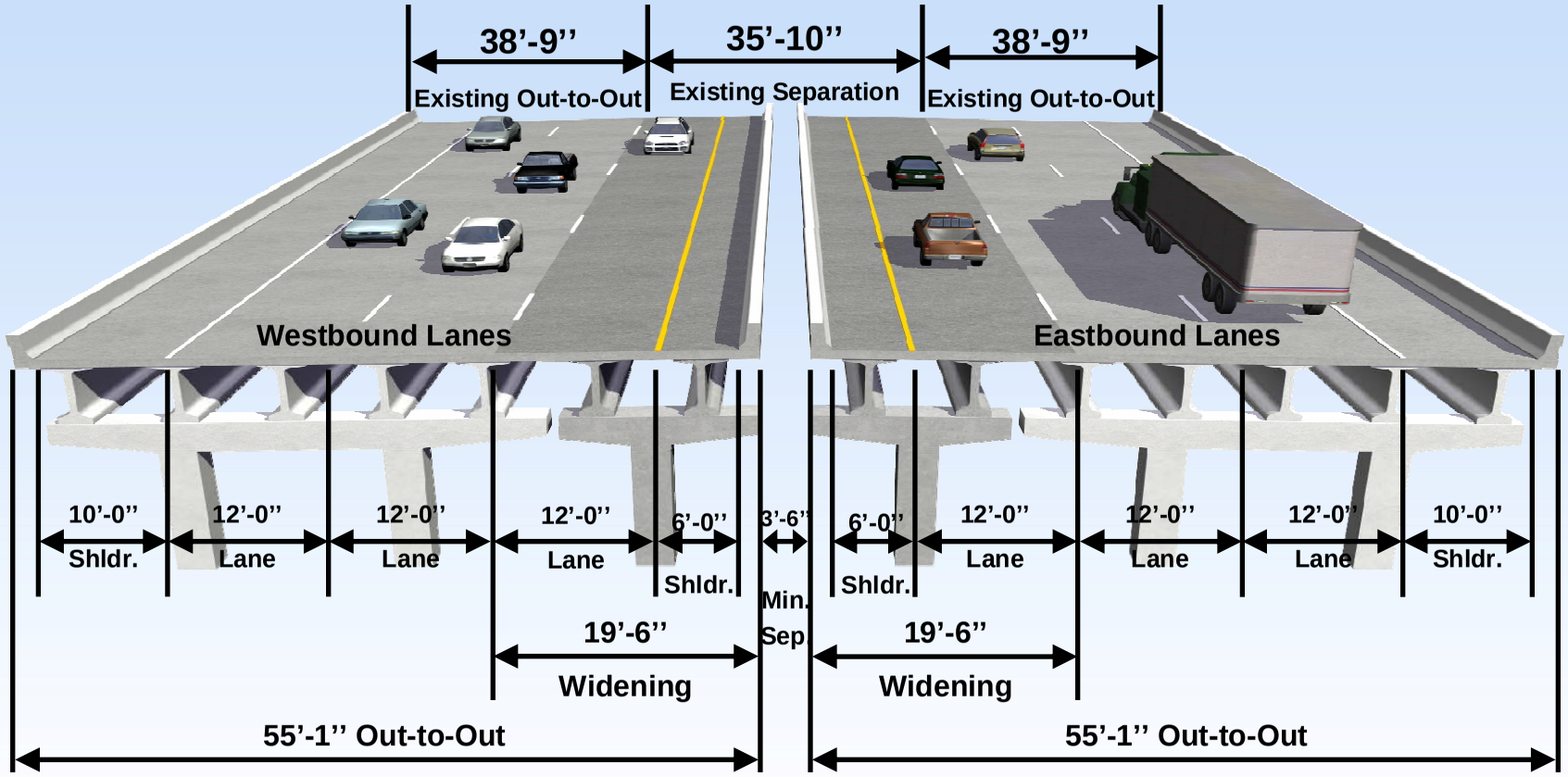

Typical Section I
Inside Bridge Widening
From East of Morgan Street to 12th Street

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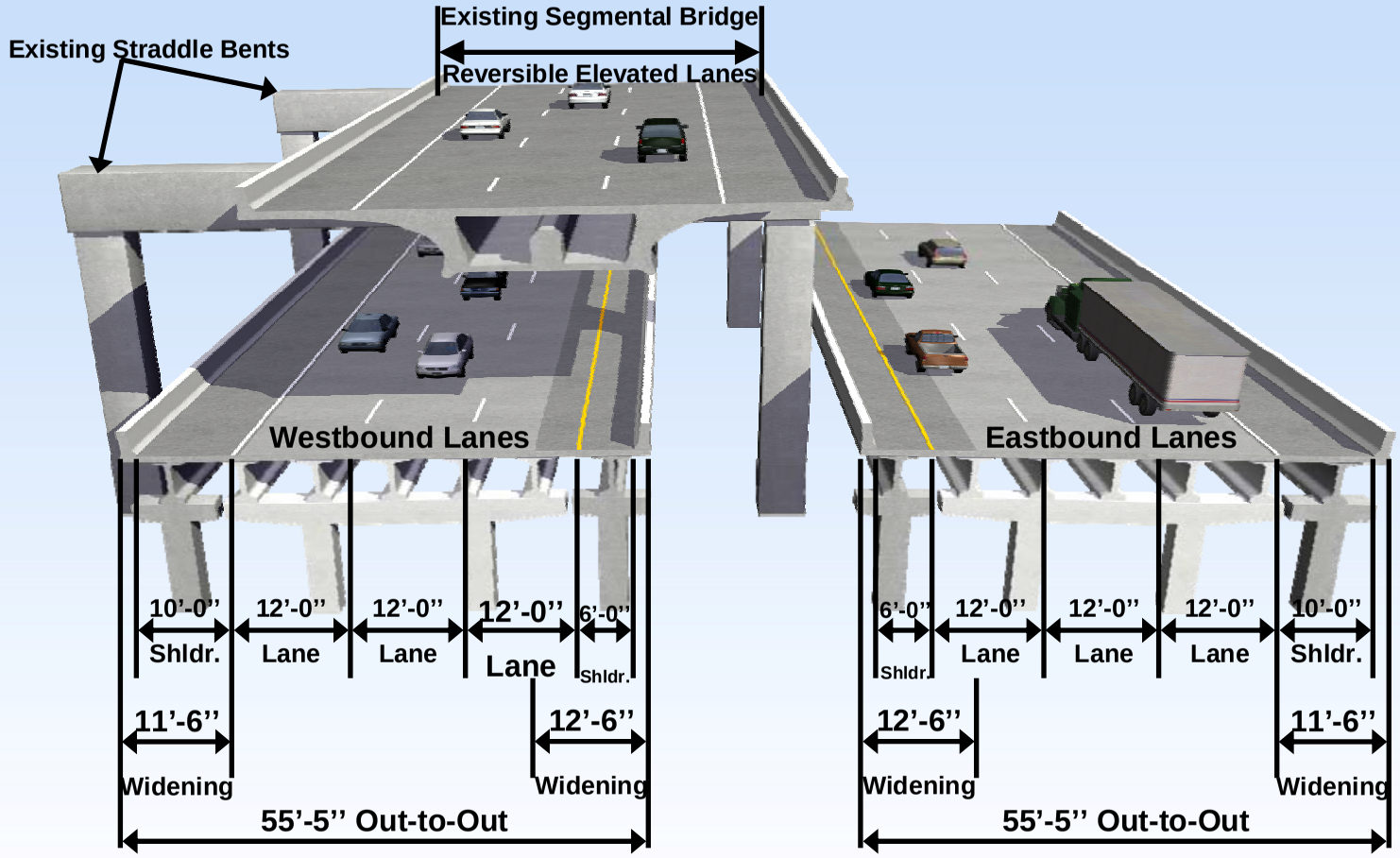

Typical Section II
Inside and Outside Bridge Widening through REL Straddle Bents
From 12th Street to West of 17th Street

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Alternative 1: Typical III (**Figure 5-7**)

Typical III consists of inside and outside bridge widening from west of 17th Street to 19th Street. The existing EB typical is widened by 17'-6" to provide three 12-foot lanes (including an exit lane) with a 4-foot inside shoulder and an 8-foot outside shoulder. The existing WB typical is widened by 22'-6" to provide three 12-foot lanes (including an entrance lane), a 4-foot inside shoulder and a 10-foot outside shoulder.

Alternative 1: Typical IV (**Figure 5-8**)

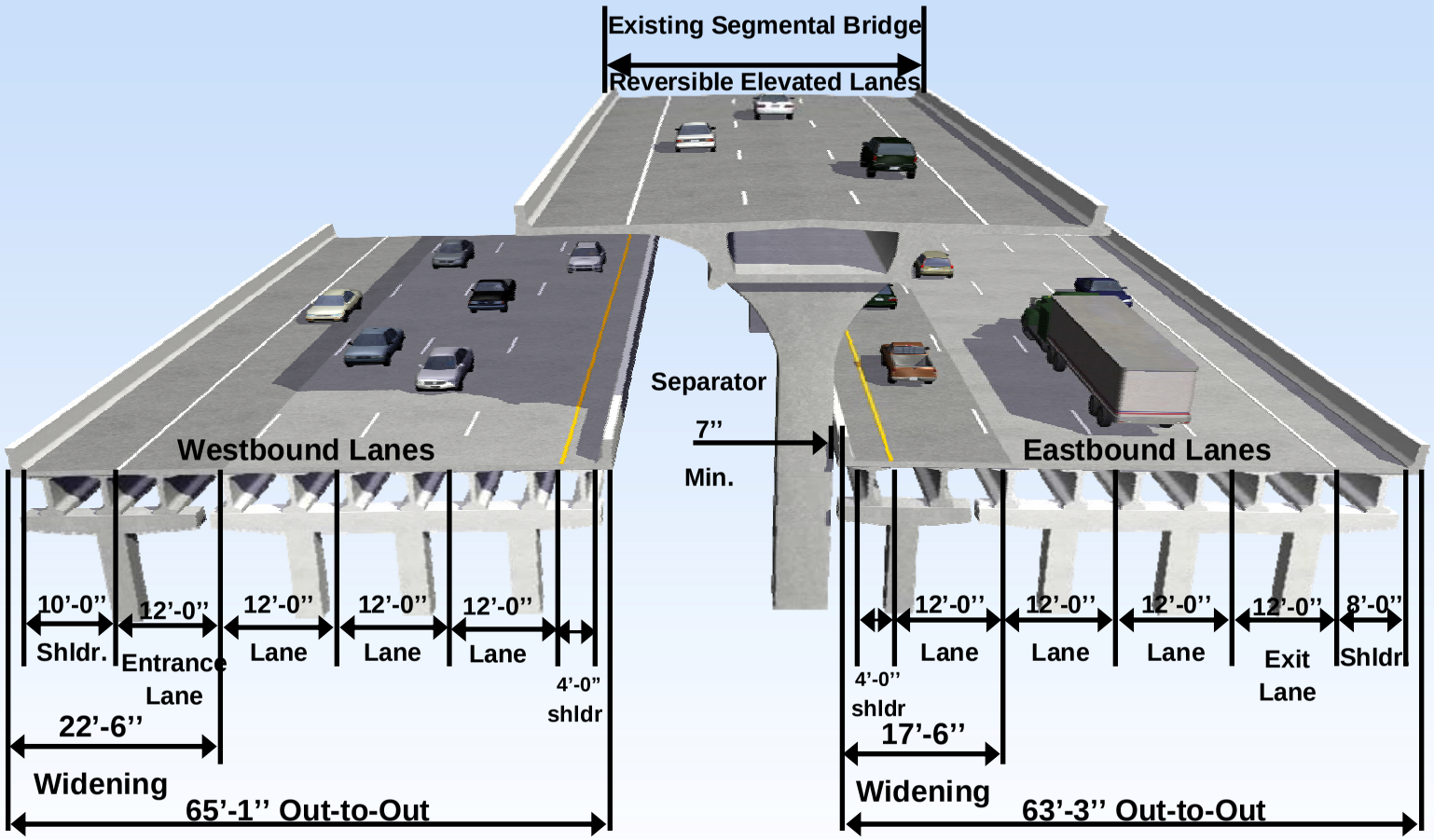
Typical IV consists of the roadway portion widening from 19th Street to South 22nd Street. The existing EB typical is widened by 18' to provide three 12-foot lanes with a 6-foot inside shoulder and an 8-foot outside shoulder. The existing WB typical, however, is widened by 22' to provide three 12-foot lanes with 10-foot inside and outside shoulders.

Alternative 2: Typical IV (**Figure 5-9**)

Alternative 2, Typical IV is at the ramp connection to WB viaduct and consists of inside widening of the WB lane providing a 12-foot ramp lane with 6-foot shoulders separated from the two 12-foot WB lanes by a 2-foot barrier wall.

Alternative 2: Typical VI (**Figure 5-9**)

Typical VI consists of a 15-foot ramp lane and 6-foot shoulders.



Typical Section III
Inside and Outside Bridge Widening
From West of 17th Street to 19th Street

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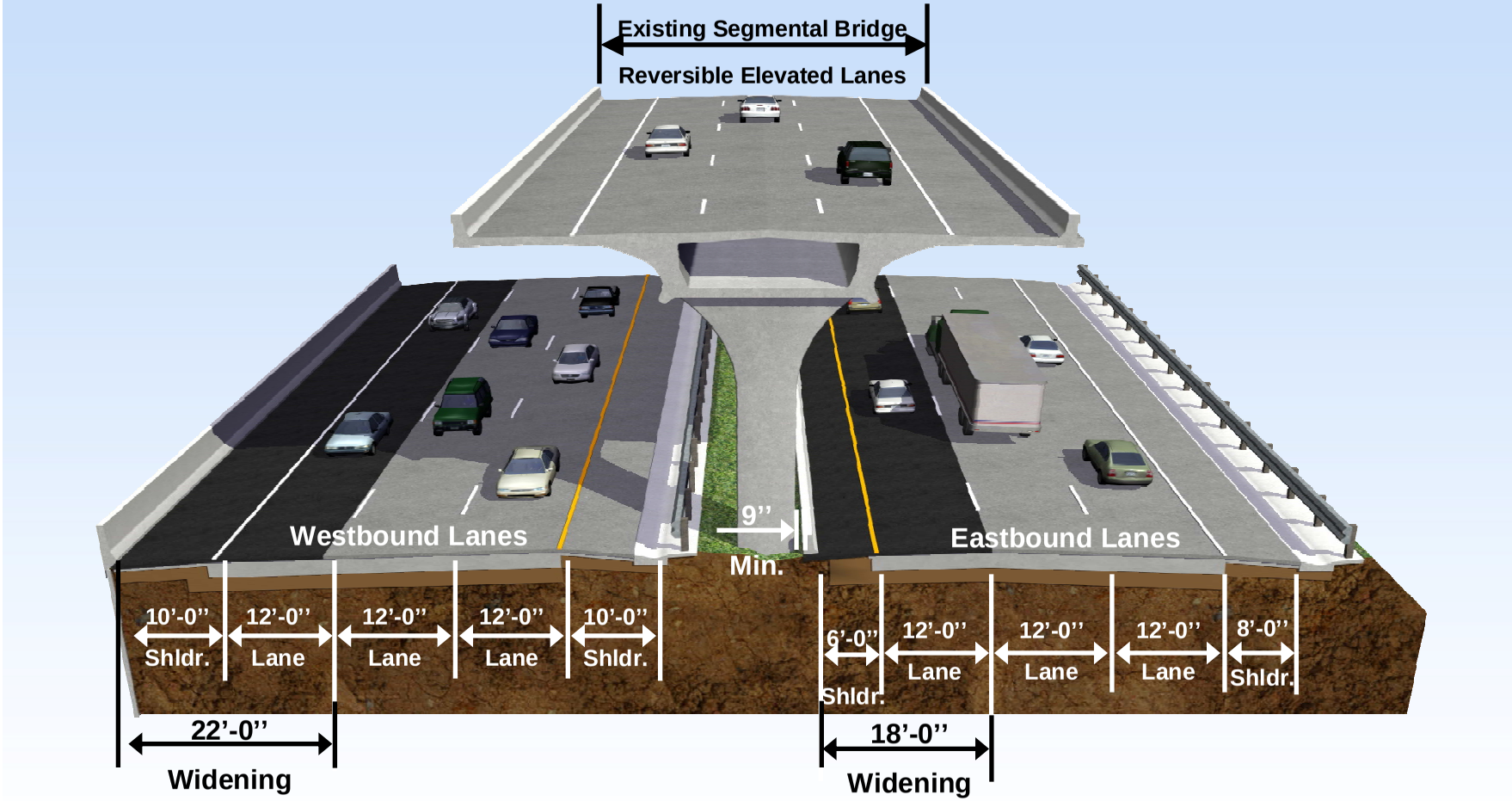
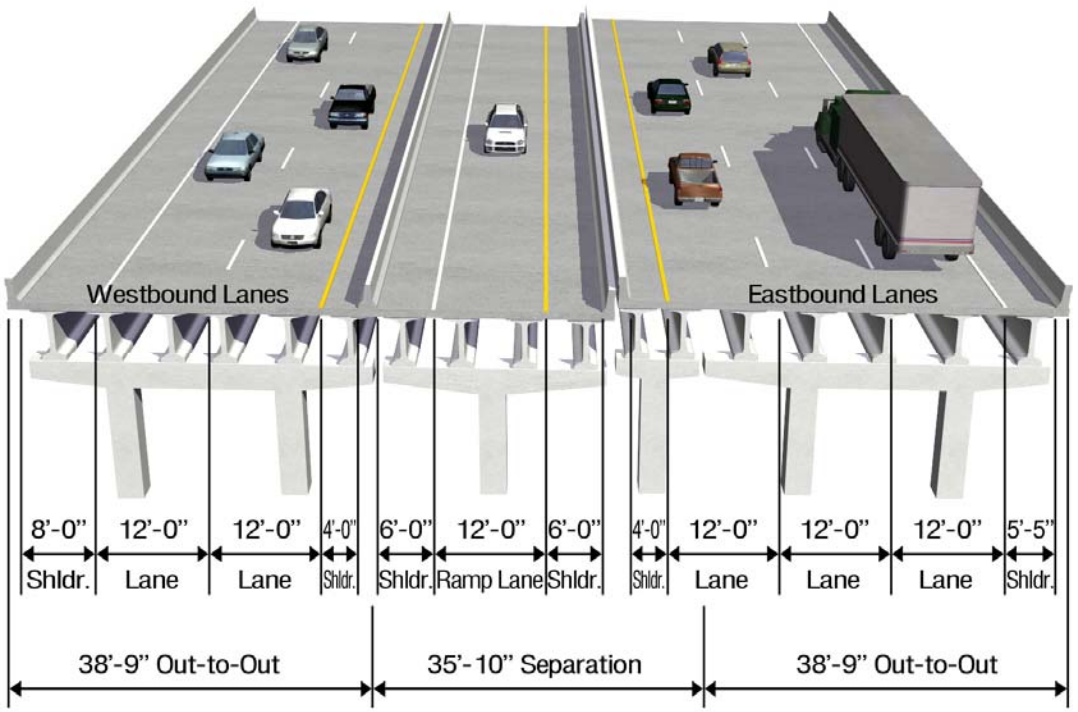


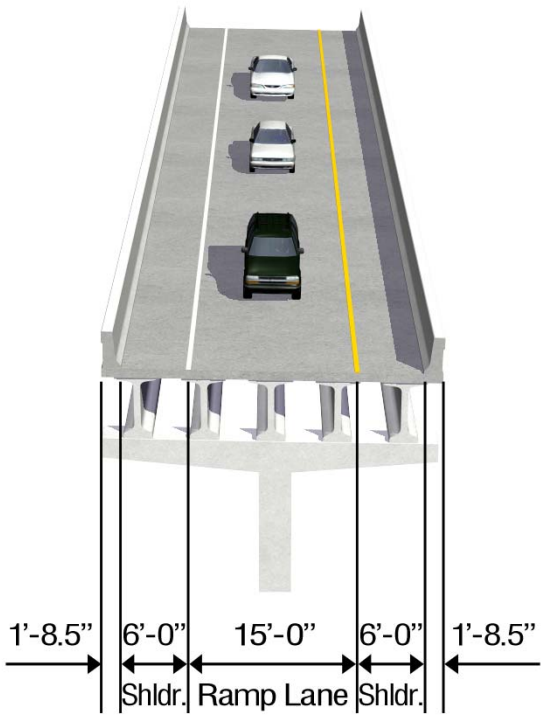
Typical Section IV- Roadway Widening
From 19th Street to South 22nd Street

Selmon Expressway (SR 618) **Downtown Viaduct** **Improvements PD&E Study** ***from Florida Ave to South 22nd St*** Hillsborough County	**Figure 5-8 Alternative 1- Typical Section IV**	TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY



Typical Section V

From Kennedy Boulevard to Meridian Avenue



Typical Section VI

From Meridian Avenue to

Reversible Elevated Lanes

Selmon Expressway (SR 618) **Downtown Viaduct** **Improvements PD&E Study** ***from Florida Ave to South 22nd St*** Hillsborough County	**Figure 5-9 Alternative 2-Typical Sections V & VI**	TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

5.3.2 Projected Traffic Volumes

The development of traffic projections for the Selmon Expressway proposed improvements requires the examination of historical growth, proposed development levels within the corridor vicinity, and a basic understanding of local traffic circulation patterns and travel characteristics of the corridor.

Estimates of the future 2035 traffic volumes were developed using the 2035 socio-economic data and the adopted 2025 cost-feasible, long range transportation network. Using these data sets and the validated TBRPM (25A) model, 2035 traffic assignments were made to the area highway network. Traffic projections were made for two scenarios: (1) No Build that assumes no improvements to the Selmon Expressway and (2) a Build Scenario that assumes the addition of a third lane in each direction between Florida Avenue and South 22nd Street. The results of the 2035 AADT projections are presented in **Table 5-1**.

The Build Geometry is shown in **Figure 5-10** and the Build AADT and DDHV are shown in **Figures 5-11** and **5-12** respectively.

More detailed traffic data can be found in the *DTTM* dated November 2009.

5.3.3 Proposed Stormwater Management and Criteria

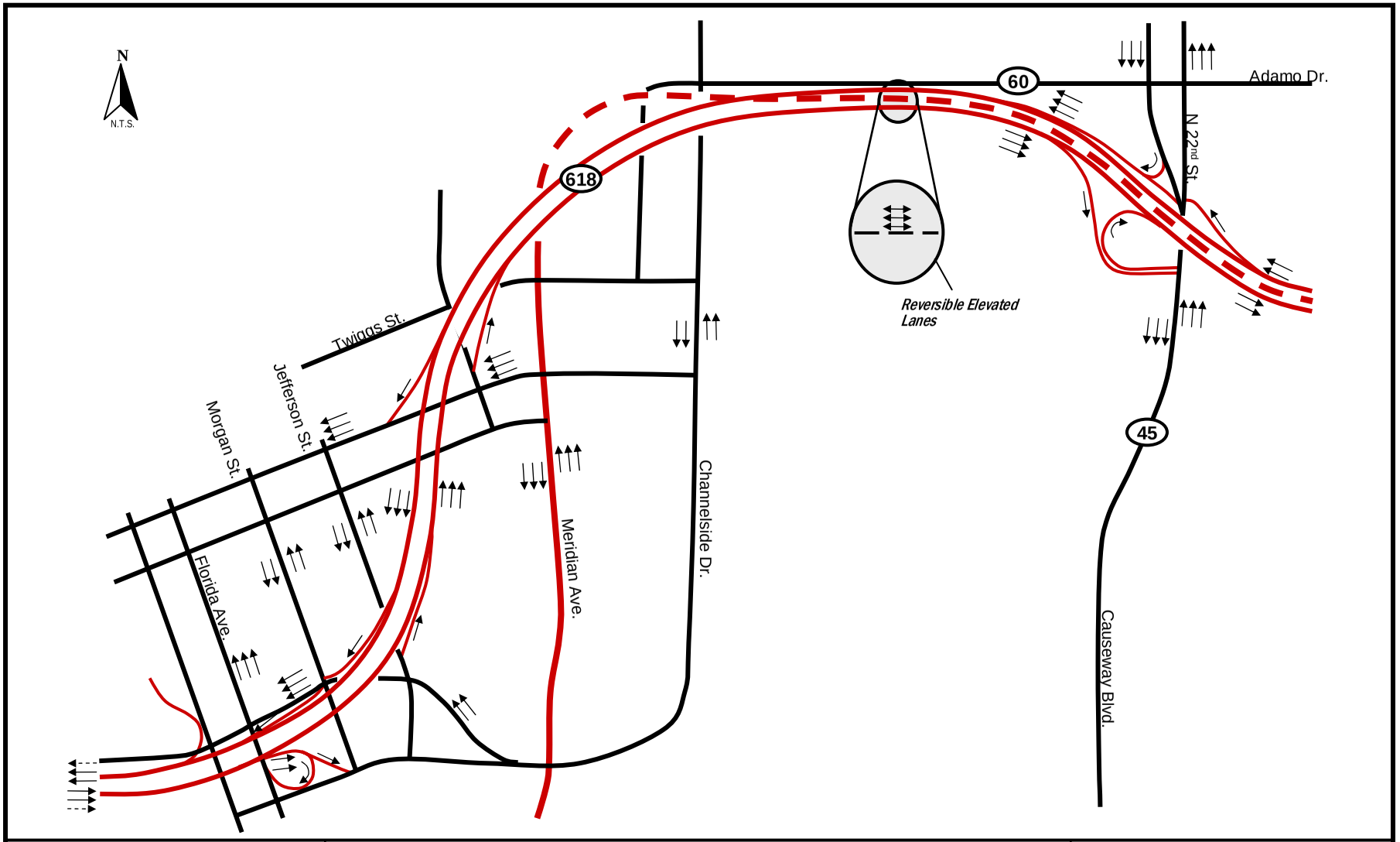
The proposed stormwater management and criteria for the proposed improvements have been evaluated as part of this study. Of the seven basins present in the area of the proposed project and described in the existing drainage conditions under Section 2.7 of this *PDER*, stormwater management facility options were evaluated for the first four. These four basins have been labeled as the Brorein (East/S) and Whiting Street, Meridian/R.R., Jackson, and the 14th Street Basins. The surrounding areas are developed and even the land under the existing viaduct is used for parking. This is due to the highly urbanized nature of these sub-basins and their location being within the area of downtown Tampa. For the remaining three sub-basins, the surrounding land uses are also urbanized; however, the areas under the Selmon Expressway are vacant/grassed, where stormwater management either exists or is adequate for proposed stormwater treatment

Table 5-1 2035 AADT Projections and Levels of Service

			2008 Existing Condition	2008 LOS	2035 No Build Condition	2035 No Build LOS	2035 Build Condition	2035 Build LOS
Road	**From**	**To**	**AADT**		**AADT**		**AADT**	
SR 618/X-TOWN EXPWY [1]	26th St	22nd St	48,000	D	102,200	F	105,800	D
	22nd St	Kennedy Blvd	46,000	C	122,300	F	136,000	F
	Kennedy Blvd	Florida Ave	37,000	C	93,500	F	104,900	D
	Florida Ave	Tampa St	41,000	B	84,600	F	93,500	D
22nd St [1]	South of X-Town Expwy		29,500	B	49,400	C	53,400	D
	North of X-Town Expwy (NB)		21,500	B	24,800	B	26,800	B
	North of X-Town Expwy (SB)		16,000	B	29,200	C	28,100	C
Kennedy Blvd [1]	East of X-Town Expwy		12,000	C	25,200	D	22,900	C
	West of X-Town Expwy		21,000	C	31,900	D	31,200	D
Brorein St [2]	East of X-Town Expwy		11,500	C	17,700	D	17,000	D
	West of X-Town Expwy		14,500	C	32,700	D	30,500	C
Florida Ave [2]	South of X-Town Expwy		13,600	C	16,200	C	16,300	C
	North of X-Town Expwy		13,700	C	29,400	D	28,600	D
SR 60 / Adamo Dr [1]	28th St	22nd St	29,000	D	42,100	F	43,400	F
	22nd St	21st St	25,000	D	36,500	F	36,600	F
	21st St	Channelside Dr	26,500	E	55,500	F	53,600	F
ChannelSide Dr [2]	SR 60	Twiggs St	28,800	D	65,100	F	64,600	F
	Twiggs St	Kennedy Blvd	26,400	D	50,500	F	51,400	F
	Kennedy Blvd	Jefferson St	13,700	C	22,700	C	21,600	C
	Jefferson St	Florida Ave	12,900	C	25,800	D	25,400	D

(1) Florida Traffic Information 2008 CD

(2) City of Tampa 2008 Traffic Count Program



Selmon Expressway (SR 618)
Downtown Viaduct
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Figure 5-10 Build Geometry

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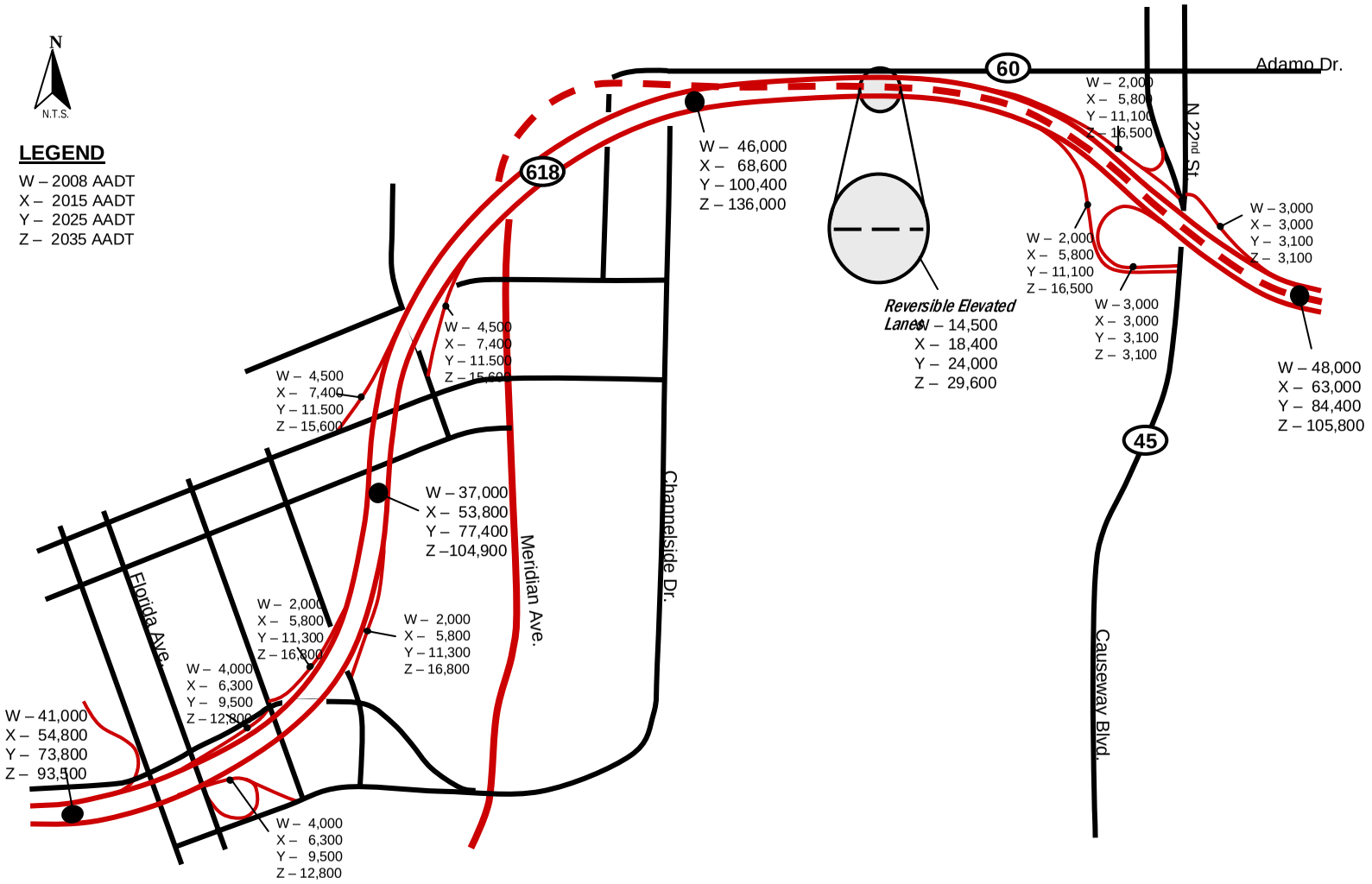

Selmon Expressway (SR 618)
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Figure 5-11 Build Annual Average Daily Traffic

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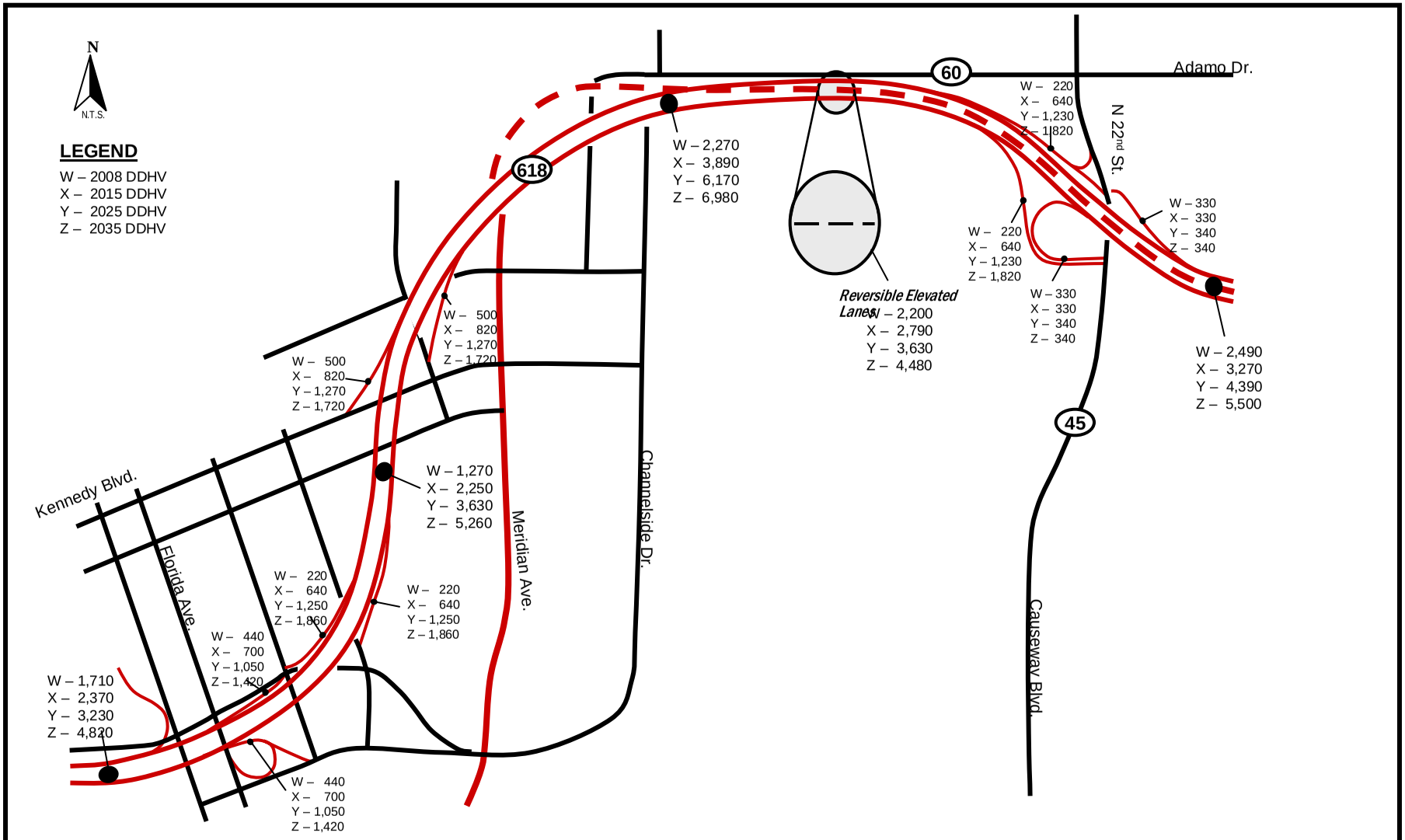

Selmon Expressway (SR 618)
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Figure 5-12 Build Directional Design Hourly Volumes

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

purposes. Existing stormwater management facilities function within the Selmon Expressway's or REL's shadow is to remain.

This portion of the study focuses on the evaluation of the option of providing the water quality treatment requirements for the proposed viaduct improvements basins "1 through 4" through the use of either (a) traditional stormwater management facilities or (b) reconstruction of existing parking areas under the viaduct alignment using a pervious pavement system to provide the required treatment volume.

5. 3.3.1 Criteria

As part of this PD&E Study, coordination meetings were held with the City of Tampa and the Southwest Florida Water Management District (SWFWMD) to discuss the design criteria that would be applicable for the design phase, to initiate communication in regards to the use of porous concrete for this project, and to coordinate the latest information on current research, as applicable. Minutes for these meetings, held in 2009 on July 2nd, August 3rd, August 17th, and September 3rd, are included in **Appendix D**. A SWFWMD General Construction permit is anticipated to be required for the proposed improvements considered by this study, as noted in the September 3rd, 2009 Pre-Application meeting minutes (provided by the SWFWMD). Plans review by the City of Tampa's Construction Services office will include review by the City's Stormwater Department in regards to applicable storm drain system connections.

SWFWMD Pre-Application meeting minutes as noted in the documentation of coordination with the City of Tampa (see **Appendix D**), the following criteria are anticipated for the proposed Selmon Expressway improvements:

SWFWMD: Provide water quality treatment retention for ½-inch of runoff over the new impervious area of the proposed widening and directly connected impervious area consistent with Section 5.8 of *Basis of Review* for Environmental Resource Permit Applications. If a wet detention system is proposed, the required treatment volume will be greater. Therefore, for this analysis, the entire directly connected impervious area

contributing to each system was used, except where the proposed widening is completely "shadowed" by the existing higher level Selmon Expressway's REL structure (existing treatment facilities to remain).

As the project discharges to an impaired water body; a net improvement for the parameters of concern must be demonstrated by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use. Compensatory treatment for currently untreated runoff will be allowed. The impaired receiving water bodies are the Hillsborough River and Ybor Channel (City Drain). The constituents are dissolved oxygen/nutrients and nutrients/fecal coliform respectively. The Florida Department of Environmental Protection (FDEP) 303(d) list identifies documented impairments per water body and is included in **Appendix E**.

Water quantity attenuation requirements will require demonstration that discharges from the proposed project will not adversely impact off-site areas for a 25-year/24-hour storm event. It was noted by the SWFWMD that for the majority of the proposed Selmon Expressway improvements, the existing ground surface below is impervious, which would minimize the need for attenuation as proposed discharges will not be substantially different.

City of Tampa: The City of Tampa's Stormwater Department's LOS criteria requires that there is no adverse impact to their storm drain systems for a 5-year storm event as compared to the existing condition. In areas where the City reported existing drainage issues, as noted in Section 2.7, consideration of the "head" being introduced to the existing storm drain systems due to the elevation of the Selmon Expressway will also need to be considered during the design phase. Further coordination with the City of Tampa's Stormwater Department will be needed to address potential hydraulic grade-line issues.

5.3.3.2 Option A – Traditional Stormwater Management Facilities

For the traditional Stormwater Management Facility (SMF) option (A), it was assumed that one facility would be needed that would require 3.16 acres of land for open dry retention and wet detention, which together would comprise a "treatment train" approach. This SMF area accounts for the required treatment volume for the proposed improvements per SWFWMD criteria discussed in Section 5.4.1 Given that this is a typical system, the existing land use would need to be revised, appropriate drainage easements acquired, and operation and maintenance activities be accommodated by the THEA. This change in existing land use would result in the loss of existing parking lot use and the associated revenues. In addition to this loss of parking area for ponds, where other existing parking areas would require revised layouts to accommodate proposed piers for the median widening, it is anticipated that some loss of parking spaces would occur. If the option to provide ponds is carried forward into design, the actual number of stormwater ponds would be determined by the design-build team, the sum area of which could require greater area than the single pond that was evaluated for comparison with the porous pavement alternative.

5.3.3.3 Option B – Porous Pavement

For the porous pavement option (B), it was assumed that existing parking facilities located directly under the existing viaduct's alignment would be redeveloped by constructing a porous pavement storage and infiltration system in the same areas. **Figure 5-13** shows the general location of the 10 sub-basins within the first four drainage basins described above in the existing drainage conditions section. **Table 5-2** shows the estimated land areas required to satisfy the pervious pavement storage needs, as well as the parcel information for this option. The locations noted allow the existing land use to remain as is, as well as make aesthetic improvements to the parking lots. Other benefits may include the improvement in hydrology as compared to an existing impervious surface, thereby allowing percolation into the underlying soils and reducing runoff and discharge and benefitting groundwater recharge.

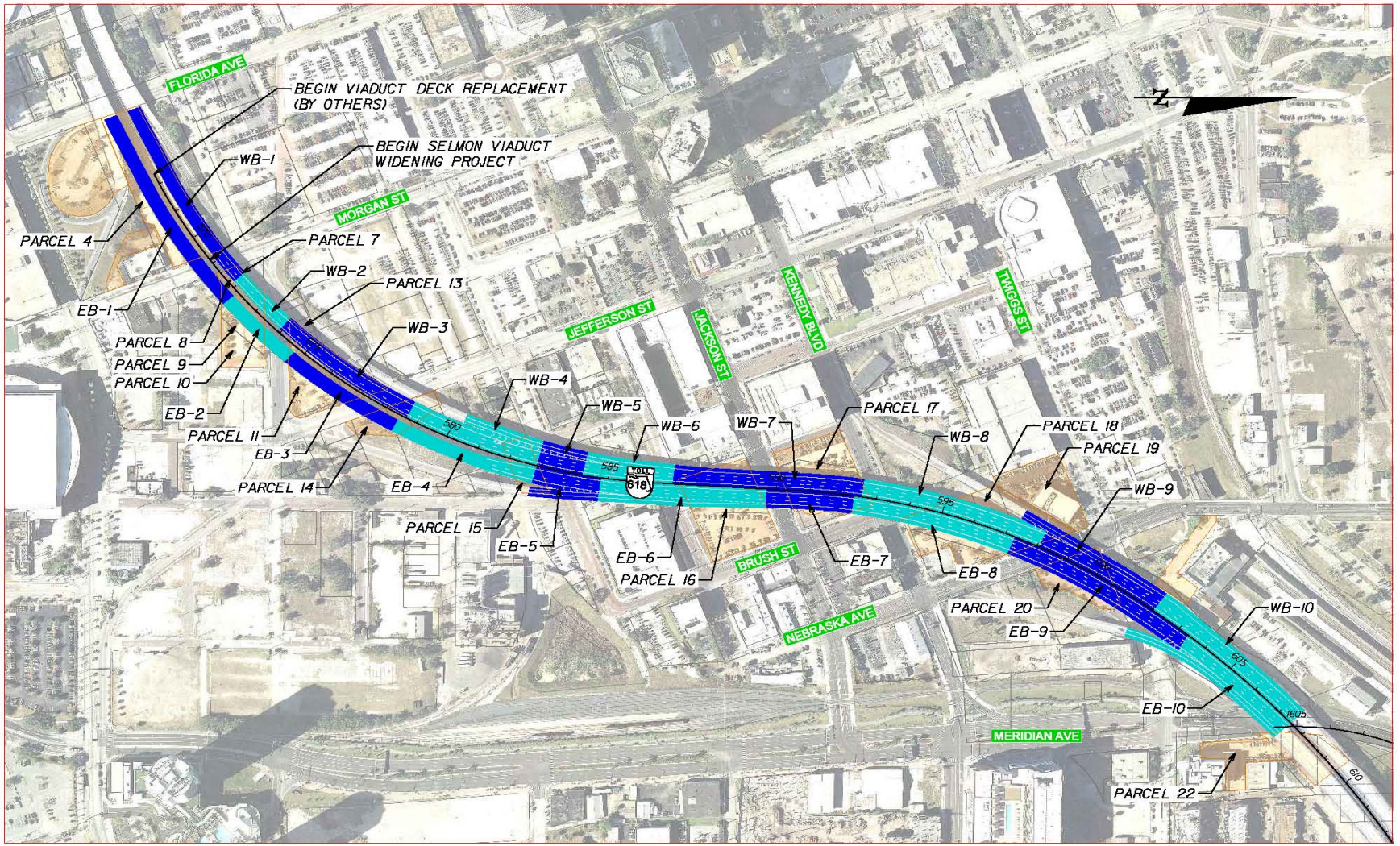

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Figure 5-13 Proposed Drainage Sub-Basins

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

Table 5-2 Proposed Drainage Sub-Basins

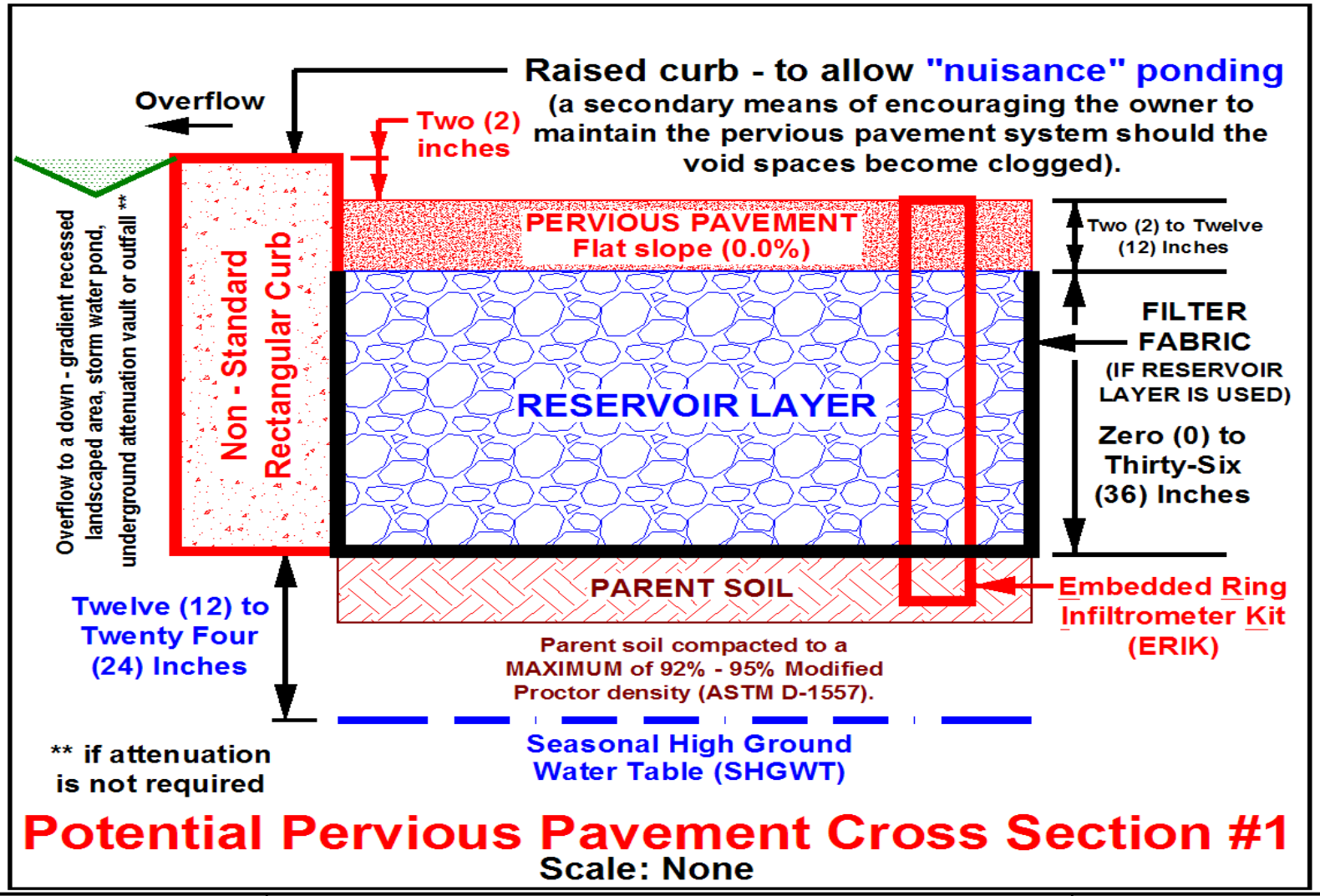
Sub-Basin		Parcel		Estimated Pervious	Site Address	Owner	Current Use	Controller
ID	Area (ac)	ID	Area (ac)	Pavement Area (ac)				
WB-1 & EB-1	1.17	4	1.62	0.16	301 S MORGAN ST	THEA	CT II - paved parking	City of Tampa
WB-2 & EB-2	0.43	9	0.57	0.06	607 E BROREIN ST	THEA	CT III - paved parking	City of Tampa
		8			605 E BROREIN ST	THEA	CT III - paved parking	City of Tampa
		7			601 E BROREIN ST	THEA	CT III - paved parking	City of Tampa
WB-3 & EB-3	0.84	11	1.05	0.12	319 S JEFFERSON ST	Hillsborough County	CT IV - paved parking	City of Tampa
		13			614 E BROREIN ST	THEA	CT IV - paved parking	City of Tampa
		12			612 E BROREIN ST	THEA	CT IV - paved parking	City of Tampa
WB-4 & EB-4	1.09	14	0.45	0.15	114 S JEFFERSON ST	THEA	CT V - paved parking	City of Tampa
		14			114 S JEFFERSON ST	THEA	CT V - paved parking	City of Tampa
WB-5 & EB-5	0.62	15	2.43	0.09	B/W WASHINGTON ST & WHITING S	Not Known	Parking	Not Known
WB-6 & EB-6	1.14	16	1.34	0.16	1002 E WASHINGTON ST	Hillsborough County	Unpaved parking	Hillsborough School Dist
WB-7 & EB-7	1.05	17	1.20	0.15	1010 E JACKSON ST	THEA	Paved parking	Hillsborough School Dist
WB-8 & EB-8	1.32	18	1.67	0.18	N BRUSH & KENNEDY	THEA	CT Health - paved parking	City of Tampa
WB-9 & EB-9	1.45	20	0.62	0.20	1013 E TWIGGS ST	THEA	CT Courthouse - paved parkin	City of Tampa
WB-10 & EB-10	1.37	22	1.74	0.19	N OF TWIGGS ST	Not Known	Parking	Not Known

CT = Crosstown Parking Lot

THEA = Tampa Hillsborough County Expressway Authority

Also, industry literature cites that properly constructed pervious concrete parking areas will last 20-40 years with minimal maintenance and is "widely recognized as the lowest life cycle option available for paving." Pervious pavements have been recognized by the United States Environmental Protection Agency (EPA) as a best management practice (BMP) for stormwater management. The following is a summary of the design considerations that would need to be addressed in the final design of these porous pavement areas:

- Applicable criteria are being developed by the SWFWMD and the University of Central Florida's "Stormwater Management Academy". A significant benefit of these systems is to be able to retain the entire water quality volume in the proposed parking areas under the viaduct, while still being able to use the same areas for parking. Another benefit of this retention is the reduction in runoff discharge (lower CN and "C" coefficient of runoff), which can be used to address the attenuation requirements, if needed.
- The preliminary analysis performed for this study was done using the following assumptions (also see **Figure 5-14**):
    - 2-inch thick "Flexi-pave" (available in colors for aesthetic consideration)
    - 1 ft – 4 inch thick "Reservoir Layer" assumed to be No. 57 Stone
    - 2 ft depth of "Parent Soil" (Max. compaction of 92-95% Modified Proctor Density per ASTM D-1557) providing a 3.5 ft depth to the Seasonal High Water Table (SHWT).
    - Perimeter Curb will be needed and overflow to down-gradient storage or outfall will require additional area outside the pervious pavement system.
- 2-inches (max.) of ponding depth and a maximum slope of 1/8-inch per ft over the pervious pavement are recommended.
- A mounding analysis will be required to demonstrate that the required treatment volume will recover to the bottom of the reservoir layer within 72 hours (safety factor equal to two).



Potential Pervious Pavement Cross Section #1

Scale: None

Selmon Expressway (SR 618) Downtown Viaduct Improvements PD&E Study *from Florida Ave to South 22nd St* Hillsborough County	Figure 5-14 Pervious Pavement Cross Section	TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY

Given the on-going research in the construction, operation, and maintenance of porous pavement, the following points are provided based on current findings:

- Specialized construction contractor crews, materials, and specifications should be utilized.
- A higher level of maintenance is required (sweeping/vacuuming of silts and sands).
- Limited vehicle use to "light-duty" is recommended, noting the desire to minimize heavy wheel loads and provide appropriate signage in the applicable parking areas.
- Angled parking layouts are beneficial to lower the likelihood of frequent turning movements.
- Off-site sediment input to be minimized through the use of short perimeter barriers, vegetated buffers, or other grading variations.
- Favorable soil conditions will be necessary, similar to that of "dry" stormwater facility design.
- Accurate soils data will be needed to assess the SHWT and the horizontal and vertical conductivity rates at correct depths.

5.3.3.4 Stormwater Management Recommendations

Option B (Porous Pavement) is recommended based on the desire to maintain the existing parking/facility land uses. Also, the City of Tampa and SWFWMD are in support of this option.

5.3.4 Parking Lots Evaluation

Existing parking lots and bridge piers are discussed in Section 2.15 of this document. As a result of the proposed widening of the Selmon Expressway from two to three lanes in either direction, additional piers will be required to support the extra viaduct structures.

Of the 75 proposed piers, approximately 20 of them will have some impacts with the existing overall number of parking spaces. The number and actual area impacted will depend on the number and type of columns. A preliminary field review and evaluation

was carried out. Approximately 20 parking spaces along the project limits will be affected by the proposed piers.

Access to have some of these parking lots will be affected somewhat, but not to the extent to make them useless. During the design phase, further evaluation will be carried out to quantify more accurately the number of parking spaces and access affected.

5.4 Evaluation Matrix

An evaluation matrix was developed for the alternatives considered. The results are summarized in **Table 5-3**.

Table 5-3: Summary Evaluation Matrix

EVALUATION CRITERIA	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVES			
		ALTERNATIVE 1	ALTERNATIVE 2A	ALTERNATIVE 2B	ALTERNATIVE 2C
CAPACITY					
2035 Projected Traffic (LOS)	F	D	No Effective Relief	No Effective Relief	No Effective Relief
BUSINESS IMPACTS					
Number of Potential Business Relocations	0	0	0	0	0
RESIDENTIAL IMPACTS					
Number of Potential Residential Relocations	0	0	0	0	0
RIGHT OF WAY (ROW) IMPACTS (Acres)					
Area of ROW Anticipated to be Aquired	0	0	0.97 AC	.60 AC	0
ENVIRONMENTAL IMPACTS					
Archaeological/Historical Sites (Potential)	None	Low	Low	Low	Low
Section 4(f) (Potential)	None	None	Low	Low	Low
Noise (Potential Sites Affected)	None	3	2	2	2
Wetlands (Acres)	0	0	0	0	0
Floodplains (Acres)	0	0	0	0	0
Surface Waters (Acres)	0	0	0	0	0
Threatened & Endangered Species (Potential)	None	Low	Low	Low	Low
Petroleum of Hazardous Materials Sites	0	18	8	8	11
ESTIMATED TOTAL PROJECT COSTS (In Millions)					
ROW Acquisition Costs	$0.0	$0.0	$0.3	$0.1	$0.0
Wetland Mitigation Costs	$0.0	$0.0	$0.0	$0.0	$0.0
Roadway & Bridge Construction Costs	$0.0	$55.1	$67.1	$67.7	$77.6
Engineering Design Costs (10% of Construction)	$0.0	$5.5	$6.7	$6.8	$7.8
Construction Engineering & Inspection Costs (10% of Construction)	$0.0	$5.5	$6.7	$6.8	$7.8
TOTAL COSTS	$0.0	$66.1	$80.8	$81.3	$93.1

5.5 Selection of Recommended Alternative

The following describes a comparison of key factors among the Alternatives:

- Based on the traffic analysis for the proposed slip ramp between REL and the general use lanes, it is projected to carry approximately 1,500 vpd in the year 2035, of which 450 are expected to use this ramp during the AM peak period. From the resulting 450 vehicles approximately 180 vehicles are expected to complete a weave maneuver across three lanes of traffic between the left access REL Slip Ramp and the right hand exit on to Morgan Street. Therefore, *Alternatives 2A, 2B & 2C* are less desirable than *Alternative 1*, the *Recommended Alternative* from a capacity standpoint.

- *Alternatives 2A, 2B & 2C* have substantially higher (24% to 44%) overall construction costs than the *Recommended Alternative*.

- *Alternatives 2A, 2B & 2C* connect to WB viaduct from the left, and require a merge movement to the right. *Alternatives 2B & 2C* also have left hand exits from the REL. Left hand entrance and exit ramps are contrary to driver expectancy and creates a weaving problem to downstream ramps, hence, they are not usually recommended for high-speed free-flow ramp terminals per AASHTO (2004, page 841).

- *Alternatives 2A, 2B & 2C* would require widening to the inside and outside for approximately 4300 feet of the EB viaduct bridge, including the adjustment of two EB on ramps. The existing separation between the EB and WB viaduct structures is 35’-10” and does not provide enough room for the ramp typical section with barrier walls and the addition of an additional lane in the EB direction. This increases Maintenance of Traffic costs due to additional construction phases.

- *Alternative 2A* has a less desirable design speed of 40 mph, requires four straddle bents and has potential ROW impacts to the existing railroad property which is contiguous to the historic Union Station Facility building. It also requires a crash wall to protect the proposed piers at an additional cost of approximately $295,000.00. *Alternative 2A* results in a cost that is nearly 24 percent higher than the *Recommended Alternative*.

- *Alternative 2B* also has a less desirable design speed of 40 mph, and passes over the Loomis Armored Car Facility building, thus requiring acquisition of air-rights. *Alternative 2B* results in a cost that is over 25 percent higher than the *Recommended Alternative*.

- *Alternative 2C* has a desirable design speed of 55 mph; however it requires 10 straddle bents with very challenging foundation requirements. The southern foundations of these straddle bents lie between the existing viaduct structures. Restricted horizontal clearances and the need to maintain the integrity of existing foundations will greatly complicate these straddle bent foundations. The northern foundations of these straddle bents lie directly below the existing reversible lanes. Low overhead clearances and proximity to the reversible lane foundations adds significant complexity to foundation construction. A cast-in-place beam for the new straddles would need to be constructed over the existing REL lanes which generate several challenges related to the maintenance of traffic. The new ramp will have long spans resulting in a fairly large beam with transverse post tensioning for the piers. The beam will need to be constructed in a single phase over the existing viaduct since a joint cannot be present with the post tensioning. This will require traffic to be shut down on the EB viaduct during this process. *Alternative 2C* results in a cost that is over 44 percent higher than the *Recommended Alternative*.

From the Summary Evaluation Matrix:

- Alternatives 2A & 2B has some right-of-way acquisition while Alternative 1 do not have any right-of-way acquisition
- Alternative 1 have more potential Hazardous sites that all the other Alternatives
- *Alternatives 2A, 2B & 2C* have substantially higher (24% to 44%) overall construction costs and constructability challenges than *Alternative 1*.

Based on the above comparisons, Alternative 1 was chosen as the Recommended Alternative. Based on comments from the Public Hearing and coordination with FDOT, Alternative 1 is recommended. For this Study, one Design Exception and six Design Variations are required. The Design Exception and Variations have been prepared by the FDOT.

During the review process of these variations, and exception, it was decided to make the following revisions to the concept plans:

- The EB widening was originally all to the inside form east of the straddle bents to 19th Street. The vertical clearance in this case did not meet the minimum required 16’ 6” to the bottom edge of the REL piers from Sta. 1636+37 to Sta. 1644+89 (REL piers 151 to 157).
- The EB widening was subsequently adjusted from the radius that passes by the straddle bents to 19th Street, resulting in 8’ 6” maximum inside widening and 12’ maximum outside widening.
- This new alignment now provides the minimum vertical clearance from inside the shoulder to the REL piers and bridge located in the median of the viaducts.
- This change occurred after the Public Hearing was held.

The Recommended Alternative is more fully described in the *Project Development Summary Report (PDSR).*

Section 6 – TECHNICAL REPORTS COMPLETED FOR THIS PROJECT

Separate reports prepared include:

Location Hydraulic Report

Design Traffic Technical Memorandum (HNTB)

Wetland Evaluation and Biological Assessment Report

Contamination Screening Evaluation Report

Cultural Resource Assessment Survey

Noise Study Report

Air Quality Memorandum

ETDM Programming Summary Report

Project Development Summary Report

Comments and Coordination Report

Section 7 – APPENDICES

A. Coordination with the City of Tampa's Stormwater Department

B. Drainage Photos

C. Parking Property Layouts

D. Drainage Meeting Notes

E. Florida Department of Environmental Protection's (FDEP's) Water Body Impairment Back-up Information

F. Preliminary Conceptual Design Plans*

G. Straight-Line Diagram

**separately bound volume*