

# Task A4a Engineering Report

## TAMPA INTERSTATE STUDY

State Project No. 99007-1402, WPI No. 7140004, FAP No. IR-9999(43)

Interstate 275 (I-275) from the Howard Frankland Bridge/Kennedy Boulevard ramps to the Dale Mabry Highway interchange on the east and just north of Cypress Street on Memorial Highway (S.R. 60), Hillsborough County.

### Prepared For FLORIDA DEPARTMENT OF TRANSPORTATION

Prepared By  
**GREINER, INC.**

In Association With

**KNIGHT APPRAISAL SERVICES, INC.**  
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**TASK A4a  
ENGINEERING REPORT**

**TAMPA INTERSTATE STUDY**

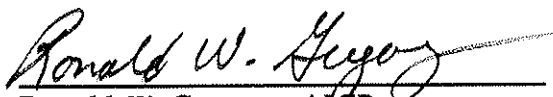
**Florida Department of Transportation**

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**SECTION 1.0**

**ABSTRACT**

## **1.0 ABSTRACT**

### **1.1 BACKGROUND OF PROPOSED ACTION**

In 1987, the Greiner Team was retained by the Florida Department of Transportation (FDOT) to perform an in-depth Master Plan (Phase I) for the Tampa Interstate System which includes I-275, I-75, and I-4 in and around the Tampa Bay area. The intent of Phase I of the Tampa Interstate Study (TIS) was to develop an overall program of the needed and justified improvements to the interstate system. The overall objective of the study was to improve traffic operations and safety, and to upgrade the interstate where needed.

Services performed in Phase I included the following:

- \* A Master Plan of improvements to I-4, I-75, and I-275 to accommodate transportation needs through the year 2010.
- \* Justification Report(s) for critical recommended new interchange locations sufficient to obtain Federal interstate funding.
- \* Conceptual designs of the recommended improvements in sufficient detail to identify structural, environmental, and right-of-way impacts.
- \* Conceptual right-of-way requirements.
- \* Development and consensus of a multi-modal transportation system to accommodate year 2010 needs.
- \* Preliminary cost estimates of all improvements, time-phased in accordance with the Master Plan.

Phase II services include performing major work activities and associated tasks to obtain location and design acceptance and Department approval for the Master Plan concepts approved in Phase I of TIS. Phase II includes the Environmental Documentation and a Drainage Master Plan.

Specifically, this Engineering Report has been prepared as part of Phase II services for an Environmental Assessment/FONSI and associated documents for the following study area boundaries: I-275 from the Howard Frankland Bridge eastward to east of the Dale Mabry Highway interchange and Memorial Highway (S.R. 60) from I-275 to just north of Cypress Street. The environmental document for this project is published separately.

The engineering elements addressed in this document include an evaluation of existing conditions; need for improvements; forecast traffic demand; construction, right-of-way and relocation costs; analysis of conceptual design alternatives; and a recommended alternative.



## **SECTION 2.0**

### **INTRODUCTION**

## **2.0 INTRODUCTION**

### **2.1 PURPOSE**

The majority of the Tampa interstate system was designed and constructed in the late 1950s and early 1960s. Realizing the need to upgrade the antiquated interstate system, the potential for High Occupancy Vehicle (HOV) improvements, and to qualify the urban interstate system in Hillsborough County for Federal interstate funds, a preliminary study was conducted by the Department in 1983. This preliminary study established year 2010 traffic for the interstate system and described potential short-term safety and geometric solutions for the existing interstate. Additionally, the study identified long-term, HOV-related improvements to accommodate year 2010 traffic volumes.

A significant conclusion from the completed study determined that efforts must be expanded to consider all transportation needs within the corridor, including any concurrent highway, rail, or transit improvements to the area which may impact the corridor, and to recommend improvements to the interstate system to accommodate those needs.

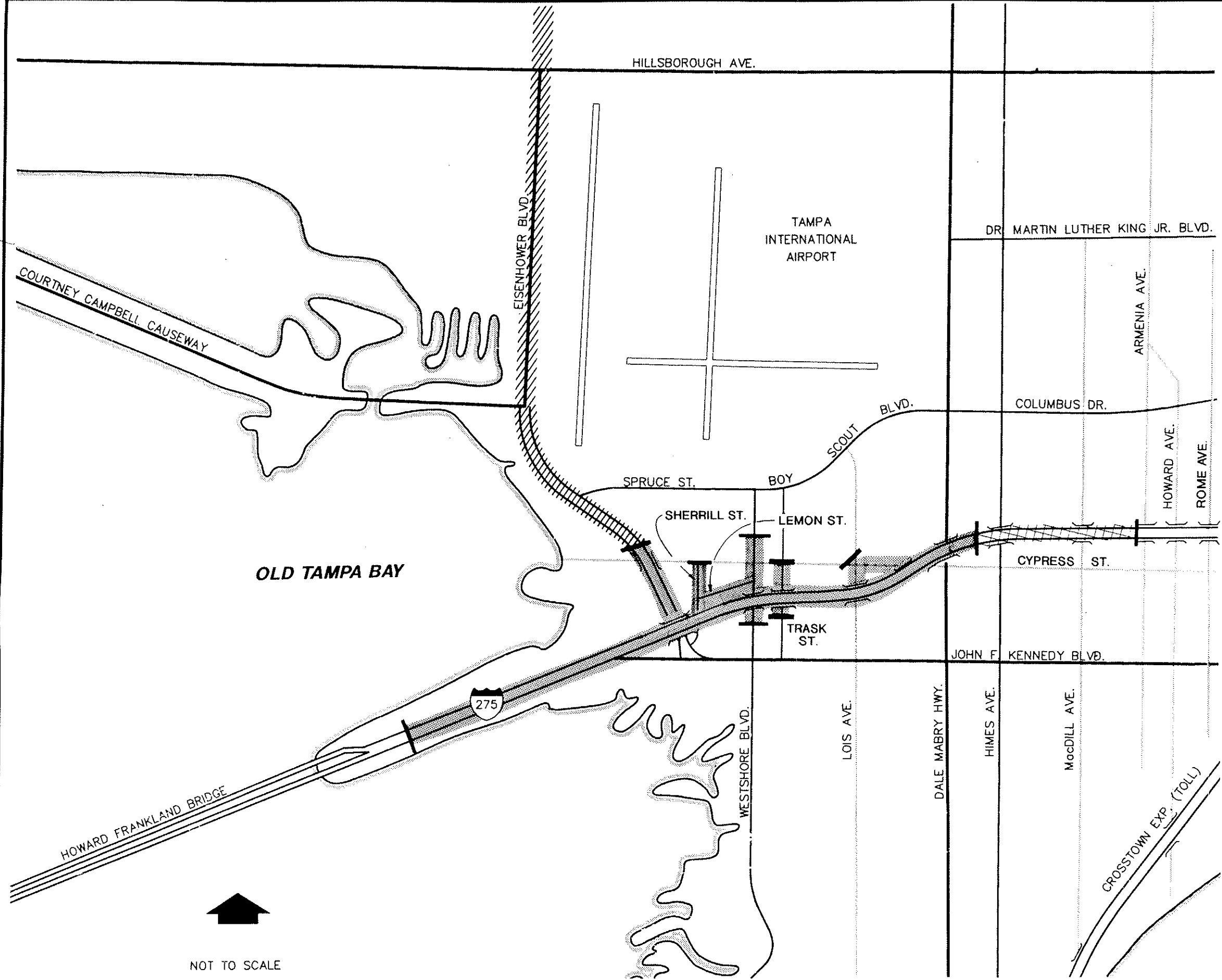
Using the 1983 justification as a documented base, the Tampa Interstate Study (TIS) began in late 1987. Generally, the purpose of the study was to produce a Master Plan, conceptual design, and environmental impact data base for improvements to I-4, I-75, and I-275. The recommended improvements are intended to serve traffic and transportation needs through the year 2010. Specifically, the objectives of the TIS are to prepare a series of reports documenting the requirements for conceptual design, including existing and predicted conditions, typical sections, right-of-way requirements, environmental constraints, and costs of recommended alternatives.

Following acceptance of the Master Plan, provisions were set forth by the FDOT to implement Phase II of the TIS. Phase II of this study is intended to satisfy the requirements necessary to fully complete environmental documentation of the recommended Master Plan. Completion of Phase II activities will enable the FDOT to proceed with final design and construction of the Tampa interstate system. This document provides the engineering evaluations for an Environmental Assessment of Design Segment 1A as identified in the Master Plan.

## **2.2 PROJECT DESCRIPTION**

The project study limits are Interstate 275 (I-275) from the Howard Frankland Bridge/Kennedy Boulevard ramps to the I-275/Dale Mabry Highway interchange on the east and just north of Cypress Street on Memorial Highway (S.R. 60) on the north. The project limits also include the Sherrill Street extension north from Memorial Highway (S.R. 60) under I-275 to Cypress Street, Westshore Boulevard from Gray Street to Laurel Street, Trask Street from Gray Street to Cypress Street, Cypress Street from I-275 to Lois Avenue, and the new Lemon Street Connector to Westshore Boulevard from Occident Street, Hillsborough County, Florida. The project limits are graphically shown on Exhibit 2.1.

Currently, I-275 provides a four-lane facility from the Howard Frankland Bridge to Memorial Highway (S.R. 60) and six lanes from Memorial Highway (S.R. 60) to east of the Dale Mabry Highway interchange. An auxiliary lane is also provided for the eastbound weaving section between the Westshore Boulevard and Lois Avenue interchanges.

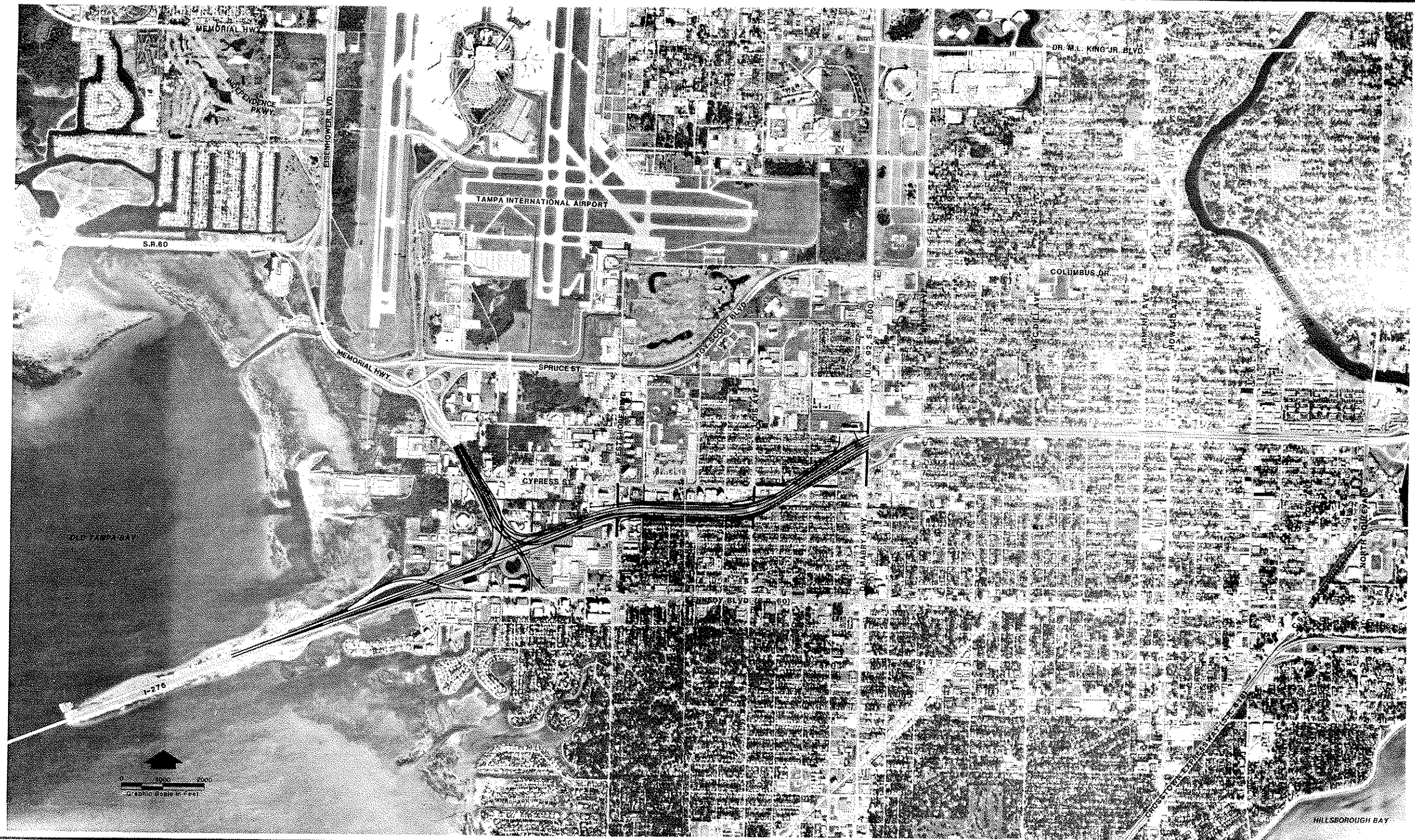


**LEGEND**

- EA Study Limits
- Proposed Veterans Expressway
- Transition Area

**FLORIDA DEPARTMENT OF TRANSPORTATION**  
ENGINEERING REPORT  
**TAMPA INTERSTATE STUDY**  
**PHASE II**  
Hillsborough County, Florida  
**PROJECT STUDY LIMITS**





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Photo Date:  
Aug. 1987

**FLORIDA DEPARTMENT OF TRANSPORTATION**  
**ENGINEERING REPORT**  
**TAMPA INTERSTATE STUDY**  
**PHASE II**  
 Hillsborough County, Florida  
**MASTER PLAN RECOMMENDED**  
**CONCEPT**

EXHIBIT 2.2

Year 2010 traffic projections indicate I-275 is anticipated to carry from 124,000 vehicles per day (vpd) west of the proposed Veterans Expressway to 157,000 vpd east of the expressway. Using the 2010 forecast traffic volumes, along with other critical factors, a "Tier Analysis" was conducted to consider, develop and evaluate various roadway design concepts for the study area. As a result of the tier evaluation process, a Master Plan concept was recommended for this facility. This Engineering Report is based upon the concept recommended in the Master Plan.

The recommended concept consists of a four-roadway system. A four-roadway system contains two (one eastbound and one westbound) roadways for interstate express lanes and two roadways for local access freeway lanes. HOV/Transitway lanes are included within the interstate alignment ending at Trask Street with an envelope reserved to carry the HOV/Transitway lanes across the Howard Frankland Bridge. HOV priority ramps will be provided to and from the east on I-275 at Trask Street. A fully directional interchange will be included for the I-275 connection to the Veterans Expressway, and direct ramping will be provided from Memorial Highway (S.R. 60) and Kennedy Boulevard to the Veterans Expressway. Existing interchange locations at Westshore Boulevard, Lois Avenue and Dale Mabry Highway will remain. New arterial improvements include the Sherrill Street extension north from Memorial Highway (S.R. 60) and Kennedy Boulevard under I-275 to Cypress Street, Westshore Boulevard from Gray Street to Laurel Street, Trask Street from Gray Street to Cypress Street, Cypress Street from I-275 to Lois Avenue, and the new Lemon Street Connector to Westshore Boulevard from Occident Street. Exhibit 2.2 shows the Master Plan recommended concept on 1"=1,000' scale aerial photography.

## **SECTION 3.0**

### **EXISTING CONDITIONS**

### **3.0 EXISTING CONDITIONS**

#### **3.1 EXISTING ROADWAY CHARACTERISTICS**

To provide a baseline analysis, existing conditions on the I-275 corridor from the east end of the Howard Frankland Bridge to just east of Dale Mabry Highway were evaluated. The existing conditions evaluation included roadway characteristics, bridges and major environmental factors. The following provides discussion on functional classification, typical sections, right-of-way, horizontal and vertical alignment, drainage, geotechnical data, accident statistics, locations and geometrics of critical signalized intersections, lighting, utilities, structural and roadway pavement conditions, and existing bridges.

##### **3.1.1 Functional Classification**

The Tampa interstate system provides key links to all of the urban area and is recognized as the most important regional highway system in the Tampa Bay area. The February 1989 white paper entitled Future Of Hillsborough Transportation Concepts prepared for the Florida House of Representatives Public Transportation Committee stated clearly the significant role played by the interstate system in the region's transportation system and identified the Tampa Interstate Study's proposed reconstruction of Interstate 275 (I-275), Interstate 4 (I-4) and Interstate 75 (I-75) as a "priority project." The Federal Aid Classification system designates I-275, I-4 and I-75 as interstate facilities.

Similar official recognition for a major reconstruction of the interstate system is found in the Tampa Urban Area Metropolitan Planning Organizations's Year 2010

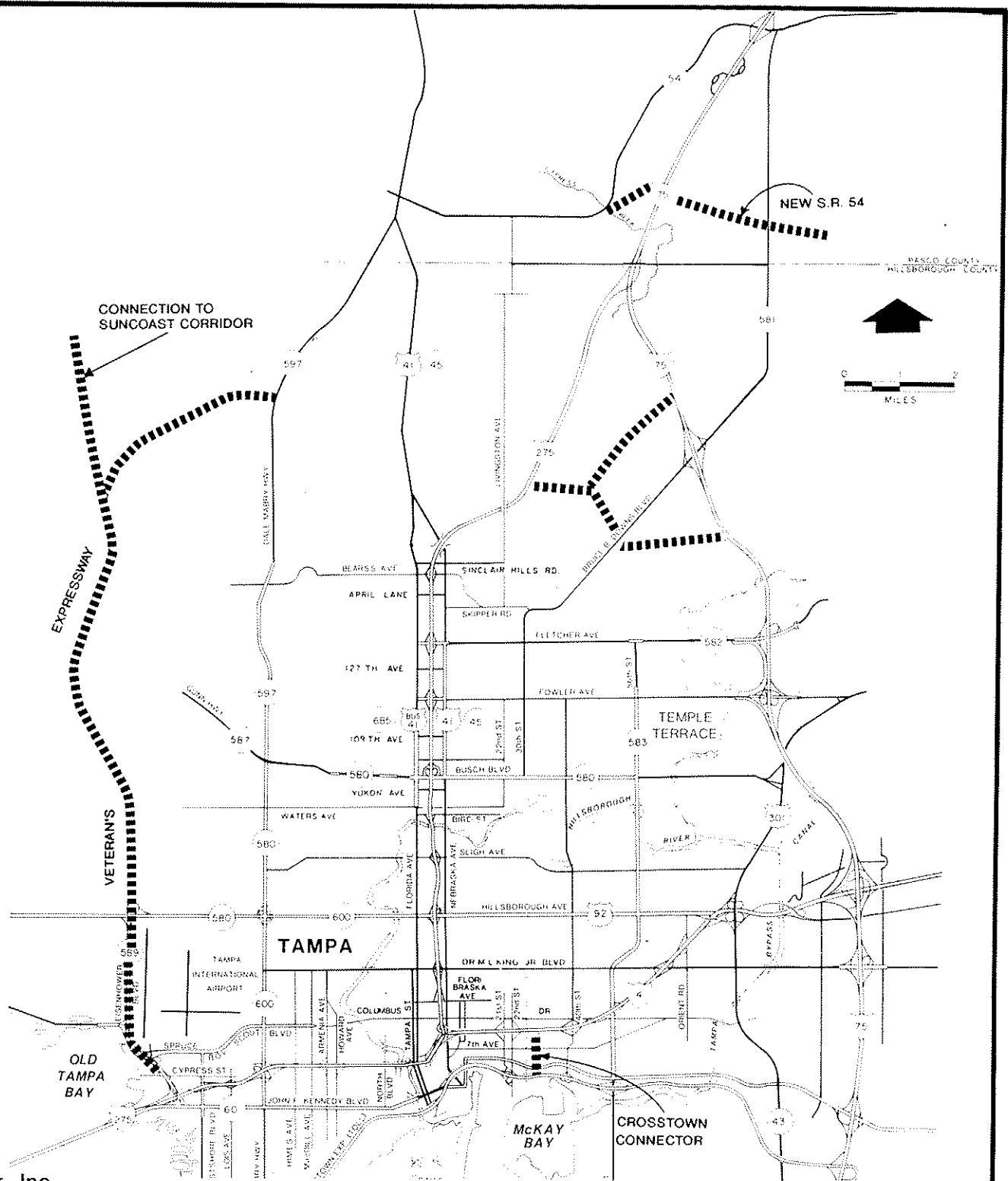


Long Range Transportation Plan for Hillsborough County. This document provides for a minimum of eight interstate freeway lanes throughout Tampa in the year 2010. The planning of interstate reconstruction has included close coordination with the Hillsborough County Rail Transit Study consultant.

Travel demand estimates for both the TIS and the Rail Transit Study were derived from the same base model and developed jointly by the respective consultant teams, thus ensuring Tampa of a truly balanced program of transportation improvements into the next century.

Future planning efforts, relating to the adopted Metropolitan Planning Organization (MPO) Long Range Transportation Plan, clearly indicate that reconstruction of the interstate system is a basic component of their plan. Without the primary interstate system, other associated freeways, expressways and arterials will fail to provide the necessary capacity and system connectivity. Previous studies have indicated that the reconstruction of the interstate system is preferable to development of new alternative freeway corridors through densely developed urban neighborhoods. The Master Plan also assumes the eventual establishment of other high capacity facilities, as provided by the MPO Plan.

Several major transportation projects that will connect to the reconstructed Tampa interstate system, or are integrated system linkages, are shown on Exhibit 3.1. These transportation improvements are integral to the overall future system and will provide travel opportunities unknown by today's Tampa traveler. The Veterans (formerly Northwest Hillsborough) Expressway, I-4/Crosstown Connector and the Gandy/Crosstown Extension will form key segments of the Florida Department of Transportation's (FDOT) proposed urban expressway loop system. Specifically, the



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## LEGEND

----- Proposed New Roads

## FLORIDA DEPARTMENT OF TRANSPORTATION

ENGINEERING REPORT

## TAMPA INTERSTATE STUDY PHASE II

Hillsborough County, Florida

## FUTURE TRANSPORTATION SYSTEM

EXHIBIT 3.1

Veterans Expressway will link up with I-275 in the vicinity of Cypress Street. As part of this project, a fully directional high capacity interchange will connect these two major facilities. In addition, the new parallel span and rehabilitation of the Howard Frankland Bridge will provide eight freeway lanes into the western limits of this project. The new bridge improvements are expected to be complete by 1995.

These key transportation improvements, and those of the currently adopted Year 2010 MPO Long Range Transportation Plan, are assumed to be part of the transportation system served by the interstate after its reconstruction. More detailed information on future improvements is provided in documentation prepared for Task E.9 - Transportation Plans Working Paper.

### **3.1.2     Typical Sections**

Varying lane configurations exist along the I-275 corridor between the Howard Frankland Bridge and Dale Mabry Highway. Interchanges within the project limits are provided at Kennedy Boulevard, Memorial Highway (S.R. 60), Westshore Boulevard, Lois Avenue and Dale Mabry Highway. A speed limit of 55 miles per hour (mph) is posted throughout the study limits.

Beginning with eastbound lanes at the Howard Frankland Bridge, a single-lane eastbound exit ramp is provided for Kennedy Boulevard, followed by a single-lane flyover exit ramp to Memorial Highway (S.R. 60), Cypress Street, and Tampa International Airport. A newly reconstructed two-lane loop ramp from southbound Memorial Highway (S.R. 60) to eastbound I-275 adds one lane to the I-275 corridor. Continuing with three lanes eastbound, I-275 crosses over Westshore Boulevard and

provides a four-lane section (three through lanes and one auxiliary lane) between the single-lane entrance ramp from Westshore Boulevard and the eastbound single-lane exit ramp for Lois Avenue.

Continuing eastbound, I-275 carries three lanes over Lois Avenue followed by the Lois Avenue single-lane entrance ramp and an overpass at Cypress Street. Beyond the Cypress Street overpass, a single-lane exit ramp is provided for southbound Dale Mabry Highway, followed by the Dale Mabry Highway overpass and a single-lane loop exit ramp for northbound Dale Mabry Highway. A single-lane entrance ramp from Dale Mabry Highway merges with the three eastbound lanes as I-275 crosses over Himes Avenue.

The westbound lane geometrics on I-275, beginning just west of the Himes Avenue overpass, provides three lanes. A single-lane exit ramp is provided for northbound Dale Mabry Highway followed by the Dale Mabry Highway overpass, the single-lane southbound Dale Mabry Highway loop exit ramp and a single-lane entrance ramp.

Three westbound lanes continue crossing over Cypress Street with a single-lane exit ramp for Lois Avenue. The Lois Avenue overpass is followed by a single-lane entrance ramp. Approaching Westshore Boulevard, a single-lane exit ramp is provided. Three westbound through lanes cross over Westshore Boulevard and expand to four lanes to provide a two-lane northbound exit ramp for Memorial Highway (S.R. 60). The two remaining lanes cross over Memorial Highway (S.R. 60) and continue westbound over the Howard Frankland Bridge.

The typical section on I-275 from approximately 800 feet east of the Howard Frankland Bridge to Memorial Highway (S.R. 60) consists of a four-lane facility which

includes 10-foot outside shoulders and an 18-foot median with a barrier wall. From east of Memorial Highway (S.R. 60) to east of Westshore Boulevard, a six-lane section is provided with 10-foot outside shoulders and a 20-foot median with a barrier wall. Between the Westshore Boulevard and Lois Avenue ramp junctions, a seven-lane typical section is provided with four eastbound lanes (three through lanes and one auxiliary lane), 10-foot outside shoulders and a 20-foot center median with a barrier wall. East of Lois Avenue, the same median and shoulder widths carry a six-lane typical section to east of the Dale Mabry Highway overpass where the median widens to approximately 34 feet. Outside shoulder widths on ramps vary from 4 to 6 feet. The posted speed throughout the I-275 mainline segment is 55 mph, with the exception of the Memorial Highway (S.R. 60) area where a 50 mph speed limit is posted.

Cross streets within the project limits include Memorial Highway (S.R. 60), Westshore Boulevard, Lois Avenue, Dale Mabry Highway and Cypress Street. In all cases, I-275 crosses over these roadways and the bridges have center piers in the roadway section.

At S.R. 60, the typical section under the structure is a freeway type segment consisting of three southbound lanes and two northbound lanes with a center median and barrier wall. Westshore Boulevard is an urban arterial that provides two lanes northbound and southbound under the structure with a southbound left turn lane for the eastbound entrance ramp. Sidewalks are provided along both sides of the roadway.

Under the Lois Avenue structure, two through lanes are provided in each direction with single left turn lanes for the eastbound and westbound entrance ramps. Sidewalks are located on both sides of the roadway. Under the Cypress Street overpass, two through lanes eastbound and westbound are provided with no sidewalks. Finally, at the Dale Mabry Highway overpass, a six-lane section is provided under the

structure with left turn storage lanes for the eastbound and westbound entrance ramps. Sidewalks are provided along both sides of the roadway.

### **3.1.3     Pedestrian and Bicycle Facilities**

Due to the nature of travel on interstates and expressways, bicycle or pedestrian traffic is prohibited on the facilities. However, sidewalks are provided on Westshore Boulevard, Lois Avenue and Dale Mabry Highway as they cross under I-275. Currently, no marked bicycle lanes or routes are designated on the cross streets. However, proposed cross street typical sections show 14-foot outside travel lanes to accommodate bicycles and 5-foot sidewalks for pedestrians on both sides of the roadway.

### **3.1.4     Right-of-Way**

Based on a review of existing mapping, right-of-way widths vary significantly within the study limits. Existing right-of-way is shown on the appended plan set.

Beginning at the west end of the project, the right-of-way width on I-275 (in the vicinity of the Kennedy Boulevard ramp and approaches to the Howard Frankland Bridge) ranges from 600 to 690 feet. Traveling eastward on I-275 from the vicinity of Reo Street to the Memorial Highway (S.R. 60) interchange, the right-of-way width ranges from 310 to 375 feet. Along the I-275 mainline between Memorial Highway (S.R. 60) and the Westshore Boulevard ramps, a right-of-way width of approximately 220 feet is provided.

Within the limits of the Westshore Boulevard interchange, right-of-way width ranges from 210 to 520 feet. Right-of-way along Westshore Boulevard varies from 100 feet south of I-275 to 75 feet north of I-275.

Between the Westshore Boulevard and Lois Avenue interchanges, the mainline right-of-way width ranges from 180 to 220 feet. The right-of-way on I-275 at the Lois Avenue interchange ranges from 200 to 470 feet, with a 75- to 80-foot right-of-way on Lois Avenue in the vicinity of the interchange ramps.

On I-275 between the Lois Avenue and Dale Mabry Highway interchanges, the mainline maintains a 260- to 270-foot right-of-way, while the Dale Mabry Highway interchange includes right-of-way ranging from 260 to 870 feet due to the loop ramps. Along Cypress Street, a right-of-way width of approximately 100 feet exists under the I-275 structure, while Dale Mabry Highway has a 200-foot right-of-way at the approaches to the interchange. The Memorial Highway (S.R. 60) portion of the study area between the I-275 interchange and Cypress Street includes a 310- to 550-foot right-of-way. Right-of-way and property lines are shown in the appended plan set.

### **3.1.5     Horizontal Alignment**

TIS Task E.2.a - Existing Alignment Inventory Working Paper was prepared to evaluate existing horizontal and vertical alignments within the study area. The existing horizontal mainline alignment generally meets current design standards. The maximum degree of curve on the mainline between the Howard Frankland Bridge and Himes Avenue is in the range of 2 degrees, 30 minutes. However, the design speed of this alignment is controlled by the vertical alignment as discussed in Section 3.1.6.

### 3.1.6 Vertical Alignment

To evaluate the existing vertical alignment, the existing profiles were plotted using Greiner's Roadway Design Aids (RDA) computer program. The existing K value for each vertical curve was determined, and the maximum and minimum design speeds associated with each K value were noted. Calculated design speeds were based on values listed in A Policy on Geometric Design of Highways and Streets, (The "Green Book"), American Association of State Highway and Transportation Officials (AASHTO), 1984. The limits of the analysis conducted extend from the east end of the Howard Frankland Bridge to North Boulevard. Most sag curves in this segment are in the 54 to 63 mph range, and most crest curves are in the 41 to 46 mph range. Design speeds for the existing vertical alignment are provided in Table 3.1.

### 3.1.7 Drainage

The project corridor is located in the Cypress/Memorial drainage basin. This 1,200-acre basin is characterized as heavily urbanized with an inadequate drainage system. The primary historical cause of flooding results from the overtaxing of the Lemon Street Canal, the outfall for the basin. The canal backs water into the open ditch and storm sewer systems. The Lemon Street Canal is tidally influenced by Tampa Bay. The existing interstate drainage system discharges to the Lemon Street Canal. A study conducted in 1989 by Post, Buckley, Schuh & Jernigan documented existing drainage problems, structure and proposed improvements for the Cypress/Memorial drainage basin.

The Lemon Street Canal from Memorial Highway (S.R. 60) to Westshore Boulevard is a chronic flood problem area. During heavy summer rainstorms, the Lemon Street Canal flows full and causes sufficient inundation of the Westshore Boulevard ramps to I-275



**TABLE 3.1**  
**EXISTING DESIGN SPEEDS**  
**Tampa Interstate Study - Phase II**

<u>Curve</u>	<u>K Value</u>	<u>Design Speed</u>
Sag	73 min. 155 max.	41 mph to 46 mph 59 mph to >70 mph
Crest	82 min. 197 max.	40 mph to 45 mph 52 mph to 61 mph

---

Note: Limits of analysis are from the Howard Frankland Bridge to North Boulevard.

Source: TIS Task E.2.a - Existing Alignment Inventory Working Paper, Greiner, Inc., January 1988.

to prevent access to the interstate. Frequent out of banks flooding also is reported in the channel segment of the Lemon Street Canal between Westshore Boulevard and Lois Avenue behind the Holiday Inn. Improvements to the Lemon Street Canal should be considered and coordinated with the City of Tampa prior to developing alternative improvements to the interstate system. This is addressed in the Master Plan.

Sixteen existing cross-drain structures and major outfalls have been located using City of Tampa drainage maps, basins studies, and other sources, as listed in Table 3.2. The cross-drain structures and major outfall locations have been field located and verified. Six of the existing cross-drain structures within the project corridor were analyzed. The remaining structures were either located outside of the project right-of-way or were to be eliminated due to the proposed interstate expansion. Four structures (CD3, CD4-1, CD4-10, and CD6) will be lengthened to accommodate the proposed interstate expansion without increasing the headloss significantly. These structures are considered Category 3 structures in accordance with the requirements set forth in FHPM 5-7-3(2), Paragraph 7. Two structures, rated as Category 4 (CD5) and 5 (CD4-8), will require upgrading to meet FDOT design criteria and to minimize adverse flood impacts. The Location Hydraulic Report, contained in Appendix A, describes in detail the cross-drain structure improvements.

#### 3.1.8 Geotechnical Data

The soils within the project limits are typically sandy soils at the surface, based on as-built interstate plans and the U.S. Soil Conservation Service Soil Survey of Hillsborough County, Florida. These sources indicate that clayey sands may be located within 5 feet of the surface. FDOT as-built bridge plans indicate that deep-foundation-bearing limerock ranges from elevation +7 to -35 with an average elevation of -9. Soil survey mapping is provided on Exhibit 3.2.

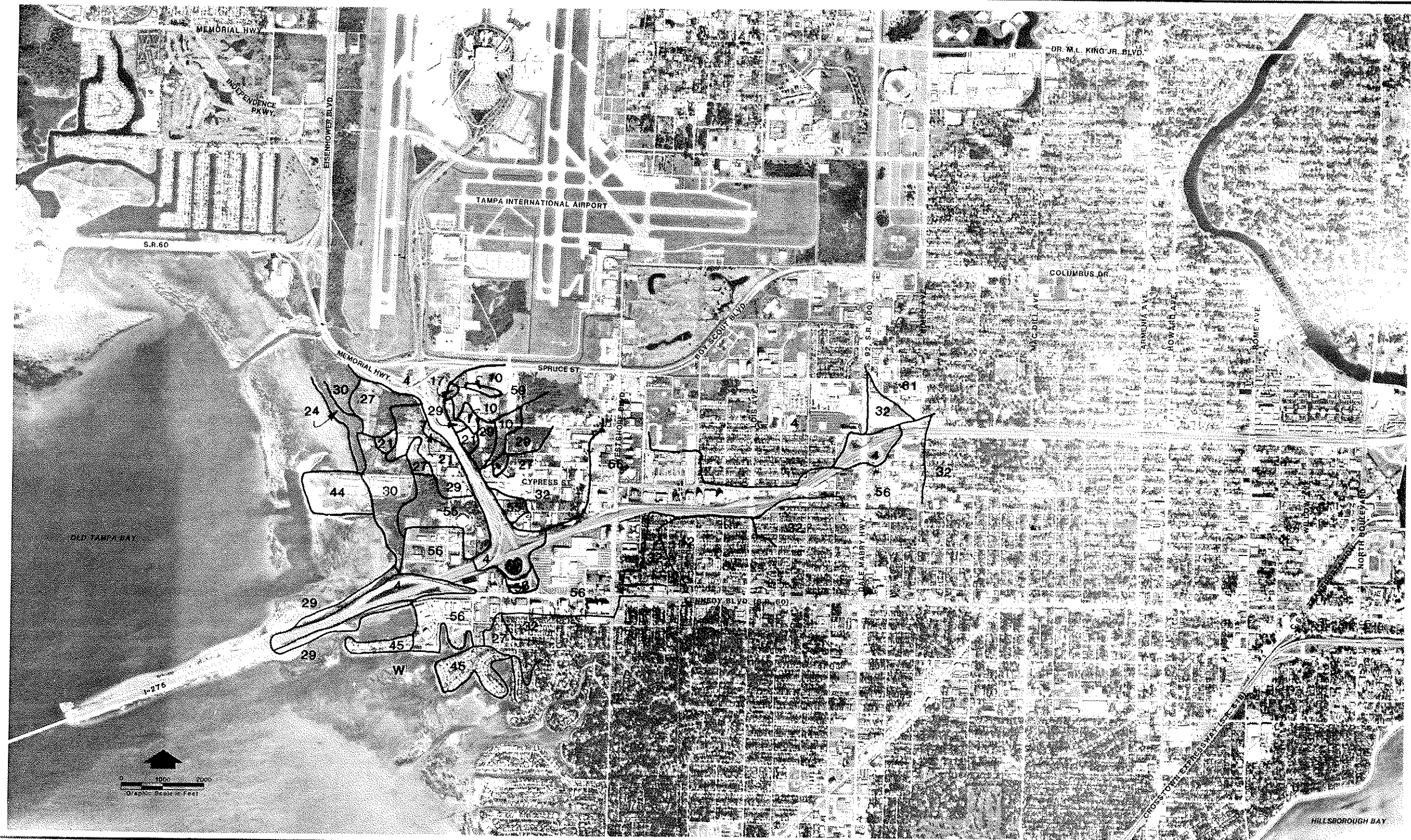
TABLE 3.2

**DRAINAGE STRUCTURE LOCATION SUMMARY**  
**Tampa Interstate Study - Phase II**

<u>Structure I.D.</u>	<u>Location</u>	<u>Size</u>	<u>Type</u>	<u>Length</u>	<u>Invert (HW/TW)</u>	<u>Source</u>
CD1-1	Memorial Hwy.	24"	RCP	190'	2.67/2.41	FDOT
CD1-2	Memorial Hwy.	24"	RCP	190'	1.74/1.60	FDOT
CD2	Westshore Blvd.	24"	RCP	240'	N/A	FDOT
CD3	West Hubert St.	36"	RCP	260'	N/A	FDOT
CD4-1	(Lemon St. Canal) Clark St.	12'x6'	CBC	270'	8.8/8.8	City of Tampa
CD4-2	North Lois Ave.	12'x6'	CBC	90'	7.6/7.6	City of Tampa
CD4-3	Behind Citibank	12'x6'	CBC	675'	6.32/5.78	City of Tampa
CD4-4	Behind Holiday Inn	2@ 84"	CMP	260'	5.20/2.30	City of Tampa
CD4-5	Westshore Blvd.	12'x6'	CBC	90'	1.78/1.75	City of Tampa
CD4-6	Austin Center	26.2'x7.2'	CBC	610'	1.75/1.35	City of Tampa
CD4-7	Occident St.	12'x6.5'	CBC	45'	2.15/1.68	City of Tampa
CD4-8	Memorial Hwy.	2@ 10'x6'	CBC	470'	0.01/0.00	City of Tampa
CD4-9	Reo St.	3@ 11'x6'	CBC	80'	-1.51/-1.55	City of Tampa
CD4-10	Cypress St.	48"	RCP	275'	N/A	FDOT
CD5	Church Ave.	24"	RCP	210'	N/A	FDOT
CD6	Dale Mabry Hwy.	60"	RCP	330'	18.44/17.99	FDOT

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NOTE: RCP = Reinforced Concrete Pipe  
CBC = Concrete Box Culvert  
CMP = Corrugated Metal Pipe  
N/A = Not Available



Greiner, Inc.

Photo Date:  
Aug. 1987

### LEGEND

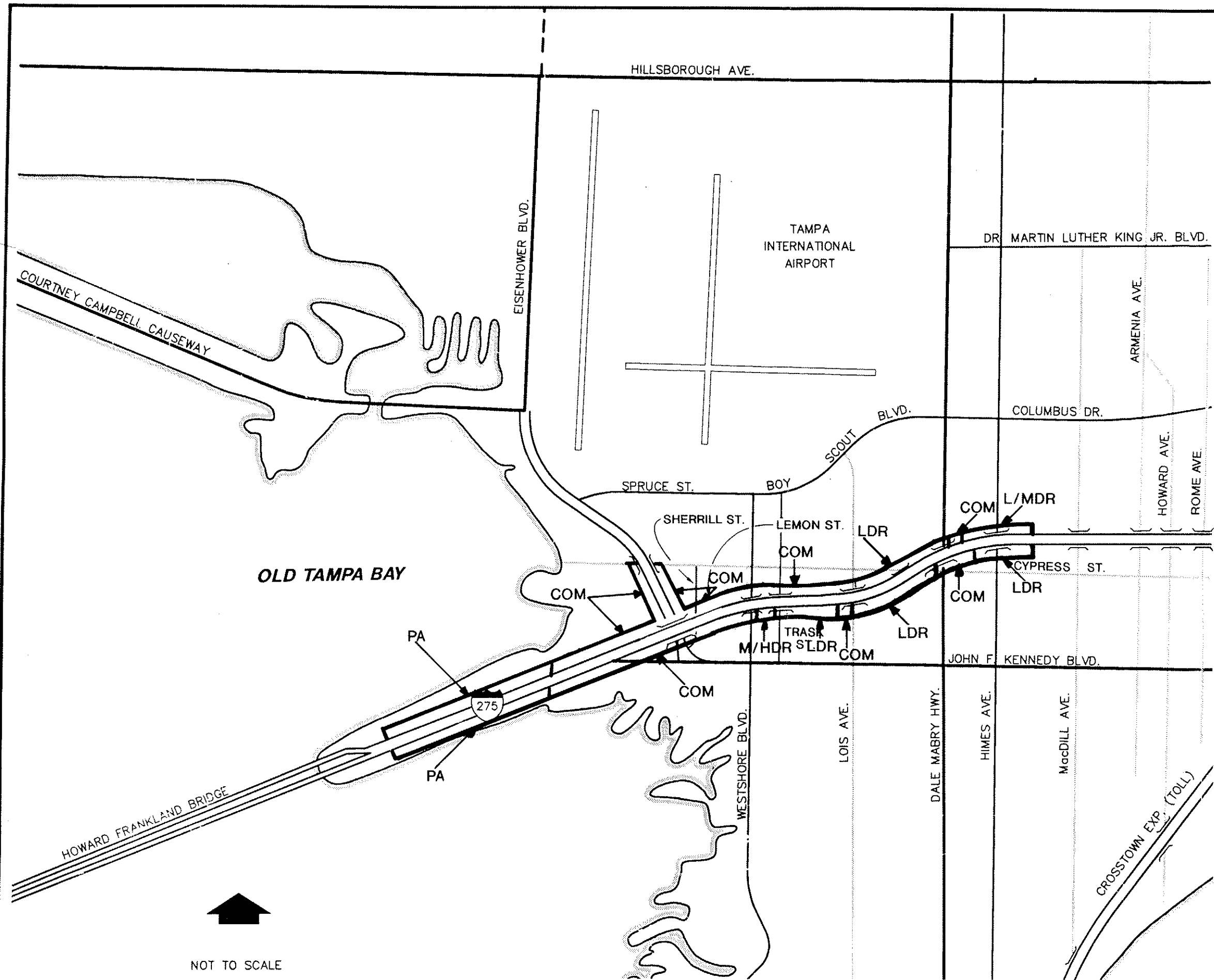
- |                                    |                                                      |                                                      |
|------------------------------------|------------------------------------------------------|------------------------------------------------------|
| 4 Arents, Nearly Level             | 29 Myakka Fine Sand                                  | 55 Truapes-Urban Land Complex, 0 to 5 Percent Slopes |
| 10 Chobee Loamy Fine Sand          | 30 Myakka Fine Sand, Frequently Flooded              | 56 Urban Land                                        |
| 17 Floridana Fine Sand             | 32 Myakka-Urban Land Complex                         | 58 Wabasso-Urban Land Complex                        |
| 21 Immokalee Fine Sand             | 42 Pomello-Urban Land Complex, 0 to 5 Percent Slopes | 61 Zolfo Fine Sand                                   |
| 24 Kesson Munk, Frequently Flooded | 44 St. Augustine Fine Sand                           | W Water                                              |
| 27 Malabar Fine Sand               | 45 St. Augustine Urban Land Complex                  |                                                      |

### FLORIDA DEPARTMENT OF TRANSPORTATION

ENGINEERING REPORT  
TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida

### SOILS MAP

EXHIBIT 3.2



**LEGEND**

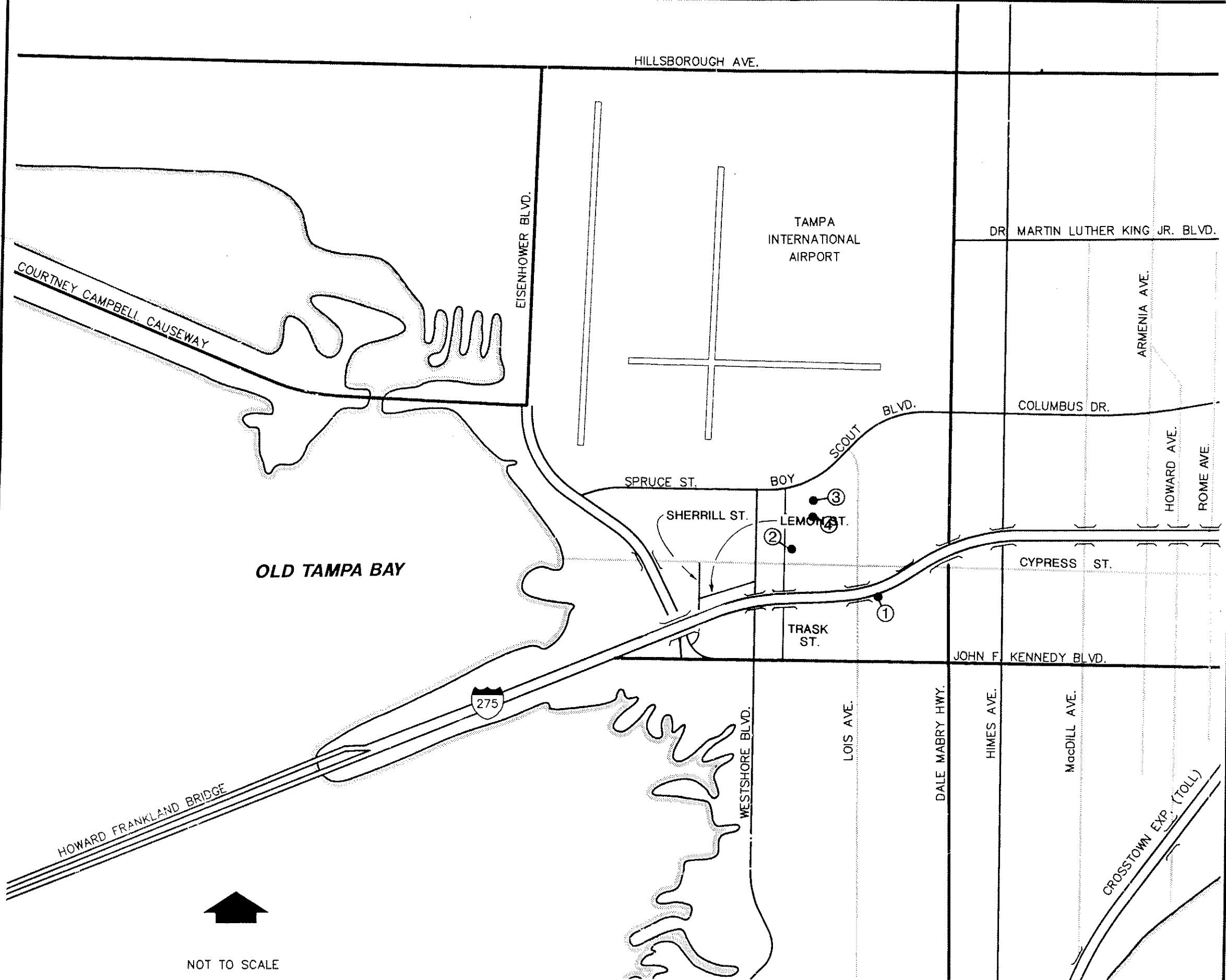
PA	Preservation Area
M/HDR	Medium/High Density Residential
LDR	Low Density Residential
L/MDR	Low/Medium Density Residential
COM	Commercial
---	Proposed New Roads

**FLORIDA DEPARTMENT OF TRANSPORTATION**  
**ENGINEERING REPORT**  
**TAMPA INTERSTATE STUDY**  
**PHASE II**  
 Hillsborough County, Florida

**GENERALIZED LAND USE**

EXHIBIT 3.3



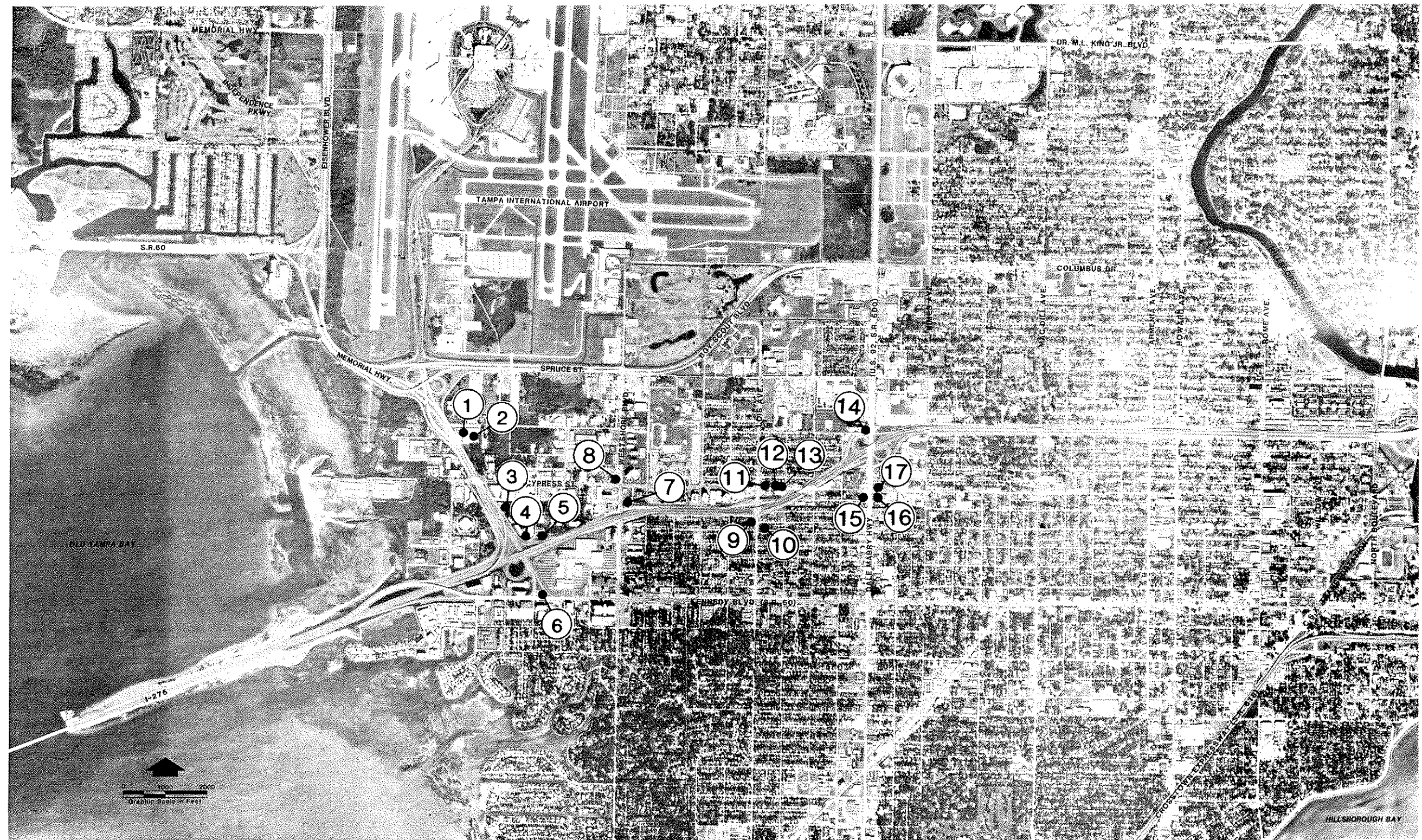


**LEGEND**

- ① Iglesia Misionera Church and House
- ② Thomas Jefferson High School
- ③ Lavoy Elementary School
- ④ Roland Park Elementary School

**FLORIDA DEPARTMENT OF TRANSPORTATION**  
ENGINEERING REPORT  
**TAMPA INTERSTATE STUDY**  
**PHASE II**  
Hillsborough County, Florida  
**EDUCATIONAL AND RELIGIOUS FACILITIES**

↑  
NOT TO SCALE



### LEGEND

- 5 Hazardous Materials Site Locations  
(See table 3.12 for site characteristics)

### FLORIDA DEPARTMENT OF TRANSPORTATION

ENGINEERING REPORT  
TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida

### HAZARDOUS MATERIALS SITES

EXHIBIT 3.5

Groundwater is typically encountered within 5 feet of the ground surface, according to FDOT bridge plans. Soil survey data indicates that the majority of the surficial soils in this area generally have a pH less than 6.0, which would classify these soils as "extremely aggressive," based on FDOT criteria. Typical subgrade LBR values between 10 and 20 might be representative, although site-specific LBR testing is recommended for determination of design LBR values.

In general, these soils appear suitable for the proposed improvements. However, surficial organics should be anticipated at random locations because up to 3 feet of muck was originally removed during road construction near the Kennedy Boulevard/Memorial Highway (S.R. 60) and the I-275/Dale Mabry Highway intersections. A detailed discussion of soils within the project limits is provided in TIS Task E.7(f)1 - Soils and Geotechnical Inventory Working Paper.

### 3.1.9 Accident Data

Accident data was obtained from the FDOT for the years 1985 through 1989. Both detailed and summary accident data were reviewed for roadway links in the project study area. Accident statistics were studied for the following roadway links:

- \* I-275 - Howard Frankland Bridge to Memorial Highway (S.R. 60).
  - Memorial Highway (S.R. 60) to Westshore Boulevard.
  - Westshore Boulevard to Lois Avenue.
  - Lois Avenue to Dale Mabry Highway.

Tables 3.3 through 3.6 summarize relevant accident data for each of the above-mentioned links for 1985 through 1989. The information provided includes the number of accidents (total accidents as well as fatalities, injuries and property damage), economic loss, actual accident rate, the critical accident rate and safety ratio



TABLE 3.3

ACCIDENT SUMMARY  
I-275 from Howard Frankland Bridge to Memorial Highway (S.R. 60)  
Tampa Interstate Study - Phase II

Year	Roadway Type	ADT <sup>a</sup>	Accidents	Actual <sup>b</sup> Accident Rate	Critical <sup>b</sup> Accident Rate	Safety Ratio	Fatalities	Injuries	Property	Economic Loss
1985	4-Lane Fwy.	69,927	74	1.351	1.549	0.872	5	80	33	\$2,064,600
1986	4-Lane Fwy.	72,101	35	0.623	1.334	0.467	1	34	14	976,500
1987	4-Lane Fwy.	72,249	33	0.578	1.371	0.421	1	26	20	920,700
1988	4-Lane Fwy.	79,236	44	0.703	2.153	0.326	0	31	27	1,227,600
1989	4-Lane Fwy.	80,059	47	0.730	2.234	0.326	0	36	26	1,311,300
TOTAL	--	--	233	0.797 <sup>c</sup>	1.728 <sup>c</sup>	0.482 <sup>c</sup>	7	207	120	\$6,500,700

Source: Data supplied by the Florida Department of Transportation

<sup>a</sup>Average Daily Traffic

<sup>b</sup>Accidents per million vehicle miles

<sup>c</sup>Five-year average

TABLE 3.4

ACCIDENT SUMMARY  
I-275 from Memorial Highway (S.R. 60) to Westshore Boulevard  
Tampa Interstate Study - Phase II

<u>Year</u>	<u>Roadway Type</u>	<u>ADT<sup>a</sup></u>	<u>Accidents</u>	<u>Actual<sup>b</sup> Accident Rate</u>	<u>Critical<sup>b</sup> Accident Rate</u>	<u>Safety Ratio</u>	<u>Fatalities</u>	<u>Injuries</u>	<u>Property</u>	<u>Economic Loss</u>
1985	6-Lane Fwy.	84,831	27	1.859	1.962	0.947	0	30	11	\$753,300
1986	6-Lane Fwy.	92,979	11	0.691	1.682	0.410	0	6	6	306,900
1987	6-Lane Fwy.	93,416	18	1.125	1.727	0.651	0	7	12	502,200
1988	6-Lane Fwy.	96,777	25	1.509	2.632	0.573	0	13	17	697,500
1989	6-Lane Fwy.	75,412	28	2.169	2.863	0.757	0	25	17	781,200
TOTAL	--	--	109	1.471 <sup>c</sup>	2.173 <sup>c</sup>	0.668 <sup>c</sup>	0	81	63	\$3,041,100

Source: Data supplied by the Florida Department of Transportation

<sup>a</sup>Average Daily Traffic

<sup>b</sup>Accidents per million vehicle miles

<sup>c</sup>Five-year average

TABLE 3.5

ACCIDENT SUMMARY  
I-275 from Westshore Boulevard to Lois Avenue  
Tampa Interstate Study - Phase II

Year	Roadway Type	ADT <sup>a</sup>	Accidents	Actual <sup>b</sup> Accident Rate	Critical <sup>b</sup> Accident Rate	Safety Ratio	Fatalities	Injuries	Property	Economic Loss
1985	6-Lane Fwy.	105,448	39	1.605	1.771	0.906	0	25	22	\$1,088,100
1986	6-Lane Fwy.	109,854	16	0.632	1.530	0.413	0	10	10	446,400
1987	6-Lane Fwy.	115,186	30	1.130	1.560	0.724	0	22	15	837,000
1988	6-Lane Fwy.	122,554	36	1.275	2.403	0.530	0	31	16	1,004,400
1989	6-Lane Fwy.	97,438	51	2.272	2.591	0.876	0	43	26	1,422,900
TOTAL	--	--	172	1.383 <sup>c</sup>	1.971 <sup>c</sup>	0.690 <sup>c</sup>	0	131	89	\$4,798,800

---

Source: Data supplied by the Florida Department of Transportation

<sup>a</sup>Average Daily Traffic

<sup>b</sup>Accidents per million vehicle miles

<sup>c</sup>Five-year average

TABLE 3.6

ACCIDENT SUMMARY  
I-275 from Lois Avenue to Dale Mabry Highway  
Tampa Interstate Study - Phase II

Year	Roadway Type	ADT <sup>a</sup>	Accidents	Actual <sup>b</sup> Accident Rate	Critical <sup>b</sup> Accident Rate	Safety Ratio	Fatalities	Injuries	Property	Economic Loss
1985	6-Lane Fwy.	111,049	30	1.276	1.782	0.716	0	23	15	\$837,000
1986	6-Lane Fwy.	114,412	25	1.032	1.543	0.668	0	11	20	697,500
1987	6-Lane Fwy.	115,186	30	1.130	1.560	0.724	0	22	15	837,000
1988	6-Lane Fwy.	141,230	44	1.471	2.382	0.617	0	47	25	1,227,600
1989	6-Lane Fwy.	106,057	32	1.425	2.591	0.549	0	10	24	892,800
TOTAL	--	--	161	1.267 <sup>c</sup>	1.972 <sup>c</sup>	0.655 <sup>c</sup>	0	113	99	\$4,491,900

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Source: Data supplied by the Florida Department of Transportation

<sup>a</sup>Average Daily Traffic

<sup>b</sup>Accidents per million vehicle miles

<sup>c</sup>Five-year average

for each roadway link. The critical accident rate is the statewide average accident rate for a similar facility. The safety ratio (the ratio of the actual accident rate to the critical accident rate) identifies safety problems and/or high accident locations. Thus, a safety ratio greater than 1.00 indicates that the roadway is experiencing more accidents than would be anticipated on this type of facility. None of the links analyzed show safety ratios approaching or greater than 1.0.

Between 1985 and 1989, 675 accidents occurred within the I-275 project corridor. This includes 7 fatalities, 532 injuries and 371 accidents involving property damage. An examination of accident types indicates that 44 percent of the accidents were rear-end collisions, 10 percent right angle, and 9 percent sideswipe accidents. Collisions with barrier walls accounted for 9 percent of the accidents recorded. Table 3.7 summarizes relevant accident data for the entire corridor for each analysis year. Table 3.8 summarizes the total number of accidents for each segment for the analysis period along with the average actual accident rate, critical accident rate and safety ratio.

#### **3.1.10 Traffic Signals, Locations and Intersection Design**

Several signalized intersections are located at or adjacent to interchanges serving the I-275 study area. Lane configurations for these intersections are shown on Exhibits 6.9 and 6.10 in Section 6.1.3 - Existing Traffic Operations. Characteristics of these intersections are described in the following paragraphs.

Beginning at the west end of the project, signalization for the Kennedy Boulevard ramps to and from the west is provided at the intersection of Hoover Street and Kennedy Boulevard. On Kennedy Boulevard, two through lanes with shared right-turn movements are provided in each direction with dual left-turn lanes at the

**TABLE 3.7**  
**ANNUAL ACCIDENT SUMMARY**  
**Tampa Interstate Study - Phase II**

<u>Year</u>	<u>Total Accidents</u>	<u>Fatalities</u>	<u>Injuries</u>	<u>Property</u>	<u>Economic Loss</u>
1985	170	5	158	81	\$4,743,000
1986	87	1	61	50	\$2,427,300
1987	111	1	77	62	\$3,096,900
1988	149	0	122	85	\$4,157,100
1989	<u>158</u>	<u>0</u>	<u>114</u>	<u>93</u>	<u>\$4,408,200</u>
TOTAL	675	7	532	371	\$18,832,500

TABLE 3.8

FIVE-YEAR (1985-1989) ACCIDENT SUMMARY  
Tampa Interstate Study - Phase II

<u>Roadway Segment</u>	<u>Roadway Type</u>	<u>Accidents</u>	<u>Actual<sup>a</sup> Accident Rate</u>	<u>Critical<sup>a</sup> Accident Rate</u>	<u>Safety<sup>a</sup> Ratio</u>	<u>Fatalities</u>	<u>Injuries</u>	<u>Property</u>	<u>Economic Loss</u>
I-275/Howard Frankland Bridge to Memorial Highway (S.R. 60)	4-Lane Fwy.	233	0.797	1.728	0.482	7	207	120	\$6,500,700
I-275/Memorial Highway (S.R. 60) to Westshore Boulevard	6-Lane Fwy.	109	1.471	2.173	0.668	0	81	63	\$3,041,100
I-275/Westshore Boulevard to Lois Avenue	6-Lane Fwy.	172	1.383	1.971	0.690	0	131	89	\$4,798,800
I-275/Lois Avenue to Dale Mabry Highway	6-Lane Fwy.	161	1.267	1.972	0.655	0	113	99	\$4,491,900

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Five-Year Average

westbound approach and a single left-turn lane at the eastbound approach. The southbound approach (Lincoln Center access driveway) provides a separate left-turn lane and a combined through/right-turn lane while the northbound approach provides a separate right-turn lane and a combined through/left-turn lane.

The Kennedy Boulevard and Memorial Highway (S.R. 60) intersection provides the nearest signalized connection to the I-275/Memorial Highway (S.R. 60) interchange. Kennedy Boulevard provides two through lanes with shared right-turn movements eastbound and westbound, dual left-turn lanes at the eastbound approach and a separate left-turn lane and channelized right-turn lane at the westbound approach. The southbound approach provides separate right-turn and left-turn lanes and a combined left/through lane, while the northbound approach provide a separate left-turn lane and a combined through/right-turn lane.

Intersection geometrics at the signalized ramp terminals of the I-275/Westshore Boulevard half-diamond interchange include two through lanes in each direction on Westshore Boulevard. The south intersection includes a separate southbound to eastbound left-turn lane and a northbound to eastbound right-turn lane. The north intersection includes westbound to southbound dual left-turn lanes and a westbound to northbound right-turn lane.

The major intersection of Westshore Boulevard and Cypress Street is located just north of the I-275/Westshore Boulevard interchange. Intersection geometrics include two through lanes with shared right-turn movements in each direction on Westshore Boulevard, dual left-turn lanes at the northbound approach, single left-turn lanes at the remaining approaches, one through lane and one right-turn lane at the eastbound approach and two through lanes with a shared right-turn movement at the westbound approach.



Lane configurations at the I-275/Lois Avenue diamond interchange include two through lanes in each direction on Lois Avenue and separate left- and right-turn lanes for all approaches to both the north and south intersections.

At the nearby signalized intersection of Lois Avenue and Cypress Street, two through lanes and separate left-turn lanes are provided at all approaches. A separate right-turn lane is provided at the eastbound approach, while the other approaches provide right-turns from the through lanes.

The I-275/Dale Mabry Highway interchange is a partial cloverleaf design which includes single-lane loop ramps in the southeast quadrant (serving the eastbound to northbound movement) and northwest quadrant (serving the westbound to southbound movement). The south signalized intersection provides three through lanes and dual left-turn lanes at the southbound approach; two through lanes, a combined through/right-turn lane and a separate right-turn lane at the northbound approach; and a separate right-turn lane at the eastbound approach. The north signalized intersection includes four through lanes and a separate left-turn lane at the northbound approach, three through lanes and a separate right-turn lane at the southbound approach, and a combined through/right-turn lane and separate right-turn lane at the westbound approach.

Just south of the I-275/Dale Mabry Highway interchange, the intersection of Dale Mabry Highway and Cypress Street includes three through lanes in each direction on Dale Mabry Highway and one through lane each way on Cypress Street. Separate left-turn lanes and shared right-turn movements from the through lanes are provided at each approach.

Just north of the Dale Mabry Highway interchange is the intersection of Dale Mabry Highway and Spruce Street. Lane geometrics include three through lanes in each direction on Dale Mabry Highway, one through lane each way with shared right-turn movements on Spruce Street, separate left-turn lanes at all approaches and separate right-turn lanes at the northbound and southbound approaches.

#### 3.1.11 Lighting

Lighting along the I-275 mainline is provided by standard type power poles located in the center of the barrier wall from the Howard Frankland Bridge to approximately 1,400 feet east of Westshore Boulevard. From this location to east of Dale Mabry Highway, the mainline lighting is provided on the outside of the roadway. The spacing of the poles ranges from approximately 200 to 270 feet apart. Lighting along Memorial Highway (S.R. 60) is provided on power poles in the center barrier wall spaced approximately 250 feet apart from I-275 to Cypress Street. Overhead sign lighting is also provided on I-275. Lighting along both I-275 and Memorial Highway (S.R. 60) is maintained by FDOT. No high mast type lighting is provided within the study limits.

#### 3.1.12 Utilities

An abundance and variety of utilities service the highly developed and urbanized area encompassed by the project limits. Companies involved with existing utilities include Tampa Electric Company, General Telephone Company, Peoples Gas System and Jones Intercable Company. The City of Tampa is responsible for water and sewer utilities. All existing utilities within the study limits are identified on maps contained in Appendix B, published separately. A discussion of the types and relative locations of existing utilities is provided in the following paragraphs.

I-275 from the Howard Frankland Bridge to Memorial Highway (S.R. 60) - Beginning at the west end of the project and on the south side of the freeway, utilities between the Howard Frankland Bridge and Memorial Highway (S.R. 60) include a 6-inch water main on the outside of the right-of-way at the Kennedy Boulevard exit ramp. Buried telephone lines and a 48-inch storm drain are also located along the south side of the Kennedy Boulevard exit ramp. Storm drains of 36 and 42 inches are located near the I-275 flyover to S.R. 60.

Memorial Highway (S.R. 60) from I-275 to Cypress Street - Water mains of 8 and 12 inches are located inside the right-of-way on both sides of Memorial Highway (S.R. 60). Utilities crossing Memorial Highway (S.R. 60) include water mains near the I-275 interchange and storm drains. Underground utilities running parallel with the north side of Cypress Street include television cable lines and a 4-inch gas main.

I-275 from Memorial Highway (S.R. 60) to Lois Avenue - Utilities located on the north side of I-275 include an 18-inch sanitary sewer line, buried telephone lines and 2- and 6-inch water mains running along Lemon Street between Westshore Boulevard and Lois Avenue. Utilities crossing I-275 include overhead electrical lines in the vicinity of Hesperides Street and Manhattan Avenue, buried telephone lines on both sides of Westshore Boulevard, storm drains along Westshore Boulevard and Lois Avenue and across I-275 at various locations, an 18-inch sanitary sewer line crossing the interstate near Westshore Mall, and water mains including a 12-inch line running parallel with Westshore Boulevard and an 8-inch line crossing I-275 near Manhattan Avenue.

I-275 from Lois Avenue to East of Dale Mabry Highway - On the south side of I-275, buried telephone lines are located west of Dale Mabry Highway running outside of the right-of-way near Cypress Street. On the north side of I-275, overhead electrical lines

are located over Dale Mabry Highway at the Laurel Street intersection. Utilities crossing I-275 include a 6-inch gas main west of the Dale Mabry Highway interchange, a 42-inch sanitary sewer line west of Cypress Street and storm drains crossing I-275 at Dale Mabry Highway and Cypress Street.

### 3.1.13 Structural and Operational Conditions

A working paper was prepared summarizing the existing pavement data collected for the project corridor as outlined in TIS Task E.7.f(2) - Pavement Analysis Working Paper. In this working paper, Greiner, Inc. performed a pavement conditions survey for the entire TIS project corridor on a smaller scale. Due to heavy traffic along the corridor, the survey was performed by visually inspecting the pavement condition from the roadway shoulder or median. The entire project roadway (excluding ramps and bridges) was given an alphabetical rating of A through E based on criteria developed during the Master Plan. In instances where one direction of the roadway was rated worse than the other direction, the poorer of the two ratings was reported on the data sheets. A summary of existing pavement conditions is provided in Table 3.9.

In general, conditions were variable over most of the study area. No single factor was determined to be responsible for some pavement being in better condition than other pavement. It is noteworthy that, in general, cut areas have performed about as well as fill areas. Similarly, areas originally containing muck have performed about as well as non-muck areas. However, the following generalities can be made based on the results of this study:

- \* The new pavement appears to be in better condition than the older pavement.

TABLE 3.9

EXISTING PAVEMENT SUMMARY  
Tampa Interstate Study - Phase II

Area	Actual 18K ESAL Through 1988	Existing Flexible Pavement		Existing Rigid Pavement	
		Section	18K ESAL	Section	18 K ESAL
Between Dale Mabry Hwy. and Howard/Armenia Aves.	47,000,000 eastbound	3.5" to 6.5" asphalt	8,000,000	9" PCC	5,000,000
	48,000,000 westbound	10.5" linerock base 12" stabilization	to 50,000,000	12" stabilization	

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<sup>1</sup>Values are based on a 20-year design life

TABLE 3.9  
EXISTING PAVEMENT SUMMARY  
Tampa Interstate Study - Phase II

<u>Area</u>	<u>Actual 18K ESAL Through 1988</u>	<u>Existing Flexible Pavement</u>		<u>Existing Rigid Pavement</u>	
		<u>Section</u>	<u>18K ESAL<sup>1</sup></u>	<u>Section</u>	<u>18 K ESAL</u>
Between Dale Mabry Hwy. and Howard/Armenia Aves.	47,000,000 eastbound	3.5" to 6.5" asphalt	8,000,000	9" PCC	5,000,000
	48,000,000 westbound	10.5" limerock base	to	12" stabilization	
		12" stabilization	50,000,000		

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<sup>1</sup>Values are based on a 20-year design life

- \* It appears that some areas of high fill (particularly approaching bridges) show more pavement distress than other pavements in the area. However, not all pavements in these high fill areas follow this pattern.
- \* Areas of pavement distress were discovered during this study. The distress in these areas likely can be attributed to local factors, such as poor construction, inadequate construction materials, drainage problems, etc.

The pavement evaluation indicates that the majority of the existing pavement within the study limits has exceeded the pavement design life. This pavement will likely require rehabilitation and/or maintenance during the next five to ten years if maintenance of traffic is placed on the existing pavement.

The extent of rehabilitation or maintenance required will depend upon the amount of traffic the pavement will carry during the maintenance of traffic operations. Another factor affecting pavement rehabilitation or maintenance will be the amount of time between the date of this study and the beginning of maintenance of traffic. The sequencing of the construction schedule will also control the ability to use the existing pavement during construction.

It is estimated that the flexible pavement will require rehabilitation and/or maintenance before it is replaced with the proposed improvements. This rehabilitation or maintenance will likely consist of milling and overlaying. The extent of milling and overlaying will be determined during the design phase of the project.

The rigid pavement will likely require rehabilitation and/or maintenance before it is replaced. As with the flexible pavement, construction sequencing and maintenance of traffic will control the extent and type of rehabilitation required. Examples of types of rehabilitation are overlaying the concrete with asphalt or replacing a portion of the slabs.

### 3.2 EXISTING BRIDGES

Several bridge structures are located within the study limits. Roadway structures on I-275 and Memorial Highway (S.R. 60) include interchange and cross street overpasses and interchange flyover ramps. There are no waterway crossings within the project limits. A description of each structure, in terms of typical section, clearances, type, condition, span arrangement, suitability for widening and other factors, is provided in Table 3.10. A description of the assessment of each structure in terms of classification is provided in Section 4.1.2 - Structural Conditions. A detailed discussion of existing structures is provided in the TIS Task E.2.b.c - Interstate Structural Inventory Working Paper.

### 3.3 EXISTING ENVIRONMENTAL CHARACTERISTICS

The following sections provide information on existing environmental conditions within the study limits. Environmental characteristics on land use, cultural features, natural and biological features, and hazardous materials site data are summarized in the following paragraphs. These items are fully documented in the Environmental Assessment, published separately.

#### 3.3.1 Land Use Data

The Westshore Business District is served by I-275 in the project area. The land uses adjacent to I-275 in this area are predominantly office and commercial for most of the study area. A major commercial and office development is located at the interchange of I-275 and Memorial Highway (S.R. 60). On the north side of the interstate and west of Memorial Highway (S.R. 60), there is substantial vacant land which could be



TABLE 3.10

EXISTING STRUCTURES INVENTORY  
Tampa Interstate Study - Phase II

Structure Location	Number	Type	Structural Rating <sup>1</sup>		Typical Section Width (Ft.)			Span Arrangement		Clearances (Ft.)		Year of Construction
			Operating	Inventory	Lanes	Shoulder <sup>2</sup>	Overall	No.	Length	Vertical	Horizontal	
Kennedy Blvd. over I-275	100087	AASHTO	HS27T	HS23T	2/24	2.2, 2.7	35'	5	45, 89, 80, 85, 70	15'-6"	(E)40, (W)42	1958
I-275 EB to Memorial Hwy. (S.R. 60) over I-275	100295	Steel	HS47T	HS21T	1/15	5.6, 5.8	29.5'	4	57, 148, 178, 148	15'-11"	(E)174, (W)145	1976
I-275 EB to Memorial Hwy (S.R. 60) over Memorial Hwy. (S.R. 60)	100296	Steel	HS50T	HS30T	1/15	5.8, 5.8	29.5'	4	73, 191, 223, 66	15'-11"	(W)215, (S)187	1976
Memorial Hwy. (S.R. 60) over Cypress St.	100297	AASHTO	HS28T	HS46T	4/48(N) 4/48(S)	8.5, 10.0 8.6, 10.0	141'	3	47, 109, 44	15'-6"	92	1976
I-275 over Memorial Hwy. (S.R. 60)	100115	AASHTO	HS23T	HS20T	4/48	8.4, 2.0 8.8, 13.8	34'	4	36, 43, 55, 36	15'-0"	(N)46, (S)46	1962 <sup>3,4</sup>
I-275 over Westshore Bld.	100117	AASHTO	HS24T	HS20T	2/24 2/24	8.0, 2.0 9.0, 2.2	36' 36'	4	37, 58, 59, 41	14'-2"	(N)44, (S)44	1962 <sup>3</sup>
I-275 over Lois Ave.	100120	AASHTO	HS27T	HS24T	2/24 2/24	9.0, 2.5 9.8, 2.5	34' 34'	4	42, 54, 54, 42	14'-6"	(N)48, (S)48	1962 <sup>3</sup>
I-275 over Cypress St.	100121	AASHTO	HS29T	HS26T	2/26 2/26	8.8, 2.0 9.2, 2.5	34' 34'	4	70, 73, 75, 68	14'-6"	(N)36, (S)36	1962 <sup>3</sup>
I-275 over Dale Mabry Hwy.	100123	AASHTO	HS33T	HS29T	3/38 3/38	8.0, 1.0 8.5, 1.5	46' 46'	4	45, 65, 65, 45	14'-11"	(N)51, (S)51	1962 <sup>3</sup>

<sup>1</sup>Source: Task E.2.b,c - Interstate Structural Inventory Working Paper, Greiner, Inc., December 1987.

<sup>2</sup>Shoulder Dimensions: Left Side, Right Side.

<sup>3</sup>Structure was modified in 1976.

<sup>4</sup>Structure was modified in 1990.

Note: For the purposes of this inventory, bridge dimensions and clearances have been rounded off.

developed for commercial use. In the southeast quadrant of the interchange is Westshore Plaza, a regional shopping mall. From Westshore Boulevard to Lois Avenue on the north side are a variety of commercial and hotel complexes. In the southeast quadrant of the Westshore Boulevard/I-275 interchange, the Guest Quarters Hotel is located adjacent to a multi-family apartment complex. Continuing along the south side of the interstate, the land use consists of predominantly single-family residences up to the Cypress Street overpass. On the north side of the interstate, between Lois Avenue and Dale Mabry Highway, are a variety of commercial and industrial properties. At the Dale Mabry Highway and I-275 interchange, commercial office and commercial/retail land use types are located in all four quadrants. On the north side of I-275, just west of Dale Mabry Highway, is the predominantly black Carver City neighborhood comprised primarily of middle income families. Existing general land uses within the project study limits are shown on Exhibit 3.3.

### **3.3.2 Cultural Features and Community Services**

The urban nature of the project area results in the improvements abutting a number of major cultural features and community services. Resources discussed in this section are historic and archaeological sites, recreational facilities, evacuation routes and emergency services, and educational and religious institutions.

#### **3.3.2.1 Archaeological and Historic Site Field Surveys**

A Cultural Resource Assessment, which included a literature search and a field survey coordinated with the State Historic Preservation Officer (SHPO), was performed for this project. The literature search for known historic and archaeological sites resulted in the identification of one historic property, located south of the proposed right-of-way, which is listed on the National Register of Historic Places. In addition, four

archaeological sites were identified in the literature search conducted within the study limits, one of which is traversed by the proposed right-of-way. These sites were previously determined not to be archaeologically significant.

The field survey of the project limits resulted in the identification and documentation of three potentially eligible historic properties and four newly discovered archaeological sites.

The FHWA, after consultation with the SHPO, has determined that no resources listed or eligible for listing on the National Register of Historic Places will be impacted by this project.

#### **3.3.2.2 Evacuation Routes and Emergency Services**

I-275 serves as an evacuation route for Hillsborough County. This corridor also functions as an emergency route for police, fire and emergency services. Improvements to I-275 will reduce response times for these services and will improve evacuation procedures.

#### **3.3.2.3 Section 4(f) Properties**

There are no historic districts, parks, recreational areas or cemeteries affected within the project limits.

#### **3.3.2.4 Educational or Religious Institutions**

The entire study area is served by the Hillsborough County School District. Approximately five privately owned school facilities exist within the study area.

These facilities have been identified and inventoried in the Phase I, Tasks E.5 and E.6 land use and cultural features study efforts. Principal impacts associated with the interstate reconstruction are possible changes in circulation patterns and relocation of students if they live within the proposed right-of-way of the interstate.

Thomas Jefferson Sr. High School is located outside the project area on Cypress Street between Trask Street and Manhattan Avenue. The individual school bus routes for Thomas Jefferson Sr. High School will not require any substantial routing changes. In addition, local circulation and access will be enhanced in many areas due to added frontage road systems and new cross corridor access. Sidewalks and bike lanes can be provided on both sides of all reconstructed local streets crossing under the interstate. Overall transportation system improvements (particularly the local surface street system) will enhance school bus operations. The positive impact on School Board operations will affect a large population of students and School Board personnel.

One religious institution, the Iglesia Misionera Church and House, is located on the west side of Clark Avenue bordered by Cass and Lemon Streets. The location of this religious institution, as well as educational facilities within the study area, is shown on Exhibit 3.4.

### 3.3.3 Natural Environment

A preliminary natural features inventory for the project corridor was conducted during the Phase I portion of this study. The purpose of the preliminary investigation was to identify potential involvement with natural features due to the proposed roadway improvements. This investigation resulted in the previously published report TIS Task E.7.k - Natural Features Inventory, June 1988, which evaluated all of the project corridors.

Since the publication of the Natural Features Inventory report, additional field reviews have been conducted specific to the study limits of this project. A brief discussion of natural and biological features is provided in the following paragraphs. For additional information pertaining to individual methodology and detailed results of the assessment, refer to the Environmental Assessment published under separate cover.

#### **3.3.3.1 Wetlands**

The project corridor contains natural and man-made wetlands. The natural systems are estuarine and are associated with Tampa Bay. The man-made systems include retention ponds and ditches. A variety of vegetation and wading birds were observed during field reviews. Some of the species which utilize this habitat are listed as either endangered, threatened or species of special concern. A discussion of listed species is provided in the Threatened or Endangered Species section of this report.

The wetlands inventory led to the identification of nine wetland areas (Sites 1 through 9) within the project corridor. The type, size and potential impact to each site is described in Section 8.15 of this report.

#### **3.3.3.2 Outstanding Florida Waters**

Based on a review of the Florida Administrative Code, Chapter 17-302.700, "Outstanding Florida Waters" (October 1990) and correspondence with the Florida Department of Environmental Regulation, it has been determined that no Outstanding Florida Waters exist within the limits of the study area (see Appendix D). Therefore, the proposed project will not involve or have any impact on such designated waters.

#### **3.3.3.3 Floral and Faunal Communities**

The project area is located in the highly urbanized portion of Tampa's Westshore area. The majority of the natural environment has been altered to accommodate intense urban development. Upland areas within the study corridor consist of landscaped lawns and highway medians. The native vegetation of these areas has been replaced by turf grasses and various ornamental trees, shrubs, and ground covers. No significant floral or faunal communities exist within the area, with the exception of the coastal areas adjacent to the Howard Frankland Bridge. These areas are comprised of mangroves and other coastal vegetation which provide suitable habitat for several species of shorebirds, including gulls, pelicans, terns, and herons.

#### **3.3.3.4 Endangered or Threatened Species**

In accordance with Section 7(c) of the Endangered Species Act of 1973 (as amended), the project corridor has been evaluated for the potential presence of threatened or endangered flora and fauna. Literature reviews, agency contacts and habitat evaluations were originally conducted in 1988 by a qualified biologist and botanist to identify threatened or endangered species which may inhabit the study area. This was accomplished by utilizing the FDOT's computer list of threatened or endangered species (SPECIES, November 1988) for Hillsborough County, a review of the Rare and Endangered Biota of Florida published series, and informal consultation with the U.S. Fish and Wildlife Service (USFWS), the Florida Game and Fresh Water Fish Commission (FGFWFC), and the Florida Natural Areas Inventory (FNAI). This resulted in the previously published report, Task E.7 - Natural Features Inventory, Tampa Interstate Study, June 1988, which evaluated all of the TIS project corridors.

Since the publication of the Natural Areas Inventory, additional reviews for the potential presence of threatened or endangered species within the project limits have been conducted. This included further agency correspondence, review of the published Natural Features Inventory, and the FDOT computer list of threatened or endangered species (SPECIES, December 1990) and field reviews in September 1990.

Based on the information obtained through the above sources, the proposed project was evaluated for the potential for involvement with threatened or endangered species. Table 3.11 lists potentially occurring and observed federal and state listed threatened or endangered species. No federal or state listed threatened or endangered species were observed during field reviews. In addition, there is no USFWS designated Critical Habitat for any threatened or endangered species within the proposed project limits.

Section 8.15.3 provides a description of federal and state listed threatened or endangered species which were evaluated for potential involvement with the proposed project.

#### **3.3.4     Hazardous Materials Site Data**

The hazardous material site investigation for the TIS has been an on-going information gathering process. The identification of hazardous material sites is one of many factors useful in selecting feasible alternative roadway designs and areas of right-of-way acquisition.

TABLE 3.11  
THREATENED OR ENDANGERED FAUNA AND FLORA  
Tampa Interstate Study - Phase II

	<u>Designated Status<sup>1</sup></u>	
	<u>USFWS<sup>2</sup></u>	<u>FGFWFC<sup>3</sup></u>
<u>Mammalian</u>		
Trichechus manatus latirostris (West Indian manatee)	E	E
<u>Avian</u>		
* Ajaja ajaja (roseate spoonbill)	---	SSC
Cistothorus palustris marianae (Marian's marsh wren)	---	SSC
Egretta caerulea (little blue heron)	---	SSC
Egretta thula (snowy egret)	---	SSC
* Egretta tricolor (tricolor heron)	---	SSC
Falco peregrinus tundris (Arctic peregrine falcon)	T	E
Falco sparverius paulus (Southeastern American kestrel)	C2	T
Haematopus palliatus (American oystercatcher)	---	SSC
Haliaeetus leucocephalus (bald eagle)	E	T
Mycteria americana (woodstork)	E	E
* Pelecanus occidentalis carolinensis (Eastern brown pelican)	---	SSC
Sterna antillarum (least tern)	---	T
<u>Amphibians and Reptiles</u>		
Alligator mississippiensis (American alligator)	T(S/A)	SSC
Caretta caretta caretta (Atlantic loggerhead turtle)	T	T
Chelonia mydas mydas linnaeus (Atlantic green turtle)	E	E
Dermochelys coriacea (leatherback turtle)	E	E
Lepidochelys kempi (Kemp's ridley sea turtle)	E	E
<u>Fish</u>		
Centropomus undecimalis (common snook)	---	SSC
<u>Flora</u>		
Verbena tampanensis (Tampa vervain)	C1	E

1 Florida Game and Freshwater Fish Commission; Official List of Endangered Fauna and Flora in Florida, 1 August, 1990.

2 USFWS - United States Fish and Wildlife Service

3 FGFWFC - Florida Game and Freshwater Fish Commission

E = Endangered

T = Threatened

T/SA - Threatened Due to Similarity of Appearance

SSC - Species of Special Concern

C1 - A candidate for federal listing, with enough substantial information on biological vulnerability and threats to support proposals for listing.

C2 - A candidate for listing, with some evidence of vulnerability, but for which not enough data exist to support listing.

\* - Observed species



The results of the survey identified 17 potential hazardous material sites in the project vicinity. Exhibit 3.5 illustrates the approximate location of each site. Site-specific information including locations and site characteristics is provided in Table 3.12.

Of the 17 sites indicated, seven are considered to have a low potential to impact the project. These seven sites use or store hazardous material, but no known environmental contamination is present or suspected at these locations. The remaining 10 sites, however, have the potential to impact the proposed project. These sites were evaluated based on their proximity to the proposed right-of-way; physical land use history; current on-site conditions; storage or production of chemicals, hazardous materials, or hazardous wastes; and any environmental violations or reported contamination on file with the Florida Department of Environmental Regulation (FDER). The TIS Task E.16 - Hazardous Material Report describes these sites in greater detail.

TABLE 3.12

INVESTIGATED HAZARDOUS MATERIAL SITES  
Tampa Interstate Study - Phase II

<u>Site Number</u>	<u>Site Name &amp; Address</u>	<u>Nature of Site</u>	<u>FDER I.D. Number</u>	<u>Potential Hazardous Materials</u>	<u>Storage Tanks</u>	<u>Regulatory Enforcement/Contamination</u>	<u>Approximate Distance From R-O-W*</u>	<u>Risk Rating**</u>
1	Color Corporation of America 5410 Laurel St. Tampa, Florida	Photographic lab	None	Solvents, ink, metals	No	None reported	70 feet	Low
2	National Car Rental Systems Inc. 5402 Laurel St. Tampa, Florida	Rental car maintenance	None	Waste oil	No	None reported	340 feet	Low
3	Former Gas Station Frontage Rd. & Lemon St. Tampa, Florida	Vacant property; former site of a gas station	None	Petroleum	Possible	None reported	50 feet	Medium
4	Pearless Pumps 505 Sherrill St. Tampa, Florida	Pump sales and service	None	Waste oil and solvents	No	None reported	Completely within	Medium
5	Automatic Data Processing 4900 Lemon St. Tampa, Florida	Offices, shipping and receiving	298838703	Petroleum	Yes	None reported	Completely within	Medium
6	Amoco #628 5109 W. Kennedy Blvd. Tampa, Florida	Gas station	298521236	Petroleum	Yes	Contamination reported; EDI #295863; eligible for state cleanup	50 feet	Medium
7	Chevron #48084 701 N. Westshore Blvd. Tampa, Florida 33609	Former gas station	298625677	Petroleum	Removed	Contamination reported; EDI #295244; eligible for state cleanup	20 feet	Medium

TABLE 3.12

**INVESTIGATED HAZARDOUS MATERIAL SITES**  
**Tampa Interstate Study - Phase II**  
**(Continued)**

<u>Site Number</u>	<u>Site Name &amp; Address</u>	<u>Nature of Site</u>	<u>FDER I.D. Number</u>	<u>Potential Hazardous Materials</u>	<u>Storage Tanks</u>	<u>Regulatory Enforcement/Contamination</u>	<u>Approximate Distance From R-O-V*</u>	<u>Risk Rating**</u>
8	Shell-Shep Service 101 N. Westshore Blvd. Tampa, Florida 33607	Gas station	298625080	Petroleum	Yes	Passed compliance inspection on 3/15/91	10 feet	Low
9	Nevada Bob's Golf & Tennis 612 Lois Ave. Tampa, Florida	Formerly Carlos Texaco gas station	None	Petroleum	Possible	None reported	Completely within	Medium
10	Marc Building 601 Lois Ave. Tampa, Florida	Formerly Lasada Mobil gas station	None	Petroleum	Possible	None reported	60 feet	Low
11	Highway Oil Co. 4138 W. Cypress St. Tampa, Florida	Gas station	298625440	Petroleum	Yes	Contamination reported; EDI #294450; eligible for state cleanup	10 feet	Medium
12	Senco Printing 4106 W. Cypress St. Tampa, Florida	Print shop	None	Solvents and inks	No	None reported	Completely within	Medium
13	Jesto Transmission 4102 W. Cypress St. Tampa, Florida	Automotive service	None	Petroleum	No	None reported	Completely within	Medium
14	Former Brake-O Facility 1406 N. Dale Mabry Hwy. Tampa, Florida	Automotive service	None	Petroleum	No	None reported	80 feet	Low
15	Ziebart 3808 W. Nassau St. Tampa, Florida	Automotive service	None	Petroleum	No	None reported	70 feet	Low

TABLE 3.12

INVESTIGATED HAZARDOUS MATERIAL SITES  
Tampa Interstate Study - Phase II  
(Continued)

Site Number	Site Name & Address	Nature of Site	FDER I.D. Number	Potential Hazardous Materials	Storage Tanks	Regulatory Enforcement/Contamination	Approximate Distance From R-O-W*	Risk Rating**
16	Mobil #02-CNH 1101 N. Dale Mabry Hwy. Tampa, Florida	Gas station	298624998	Petroleum	Yes	Contamination reported; EDI #293176; eligible for cleanup reimbursement	10 feet	Medium
17	Lease Advantage & Allstar Limousine 1200 N. Dale Mabry Hwy. Tampa, Florida	Former underground storage tank location	None	Petroleum	Possible	None reported	40 feet	Low

\* Distance from the proposed right-of-way to the potential hazardous material source.

\*\*Definition of FDOT Risk Ratings:

No: After review of all available information, there is nothing to indicate hazardous material would be a problem. It is possible that hazardous material could have been handled on the parcel; however, all information (FDER reports, monitoring wells, water and soil samples, etc.) indicate problems should not be expected.

Low: The operation has a hazardous waste generator ID number, or deals with hazardous materials; however, based on all available information, there is no reason to believe there would be any involvement with hazardous materials.

Medium: After a review of all available information, indications are found (reports, Notice of Violation, consent order, etc.) that identify known soil and/or water contamination and that the problem does not need remediation, is being remediated (i.e., air stripping or the ground water, etc.), or that continued monitoring is required.

High: After a review of all available information, there is a potential for hazardous material problems on the parcel. Further assessment will be required after alignment selection to determine the actual presence and/or levels of hazardous materials and the need for remedial action.

## **SECTION 4.0**

### **NEED FOR IMPROVEMENT**

## **4.0 NEED FOR IMPROVEMENT**

### **4.1 DEFICIENCIES**

Initial work efforts for TIS focused on the evaluation of the entire interstate roadway for its current condition. This physical evaluation was primarily designed to determine the potential life expectancy of the various design elements, such as structures, bridges and pavement surfaces. These activities resulted in the development of a Task F.2.a "Component Package," which was presented to the FDOT and the FHWA on November 12, 1987 and documented in the Task F.2.a - Component Package Presentation Summary. This presentation provided a concise overview of the existing conditions within the TIS area and the potential for rehabilitation of the interstate system. Major supporting documentation for the Component Package presentation is found in the Task E.2.a - Existing Alignment Inventory Working Paper and the Task E.2.b.c - Interstate Structural Inventory Working Paper.

The findings and recommendations resulting from these initial study efforts indicated that there is an overwhelming need to rehabilitate and/or reconstruct the existing interstate system in urban Tampa. These evaluation findings were evident in all aspects, including travel demand forecasting, structural integrity, traffic operations and safety, and compliance with the adopted plans and policies of the various local governments.

The following sections provide a summary of the supporting technical documents developed during the Phase I studies.

#### **4.1.1     Traffic Capacity Summary (Existing and Future Levels of Service)**

I-275 is a major transportation corridor in Hillsborough County. Capacity analyses of the existing conditions on I-275 indicate that some sections of this freeway are currently operating near capacity while others are operating over capacity, resulting in excessive delays and congestion. Continued growth within Hillsborough County and in adjacent Pinellas County is expected to further increase traffic on this facility. This projected growth in traffic will continue to degrade the level of service in this corridor.

To accommodate the increased travel demand, substantial improvements to the interstate system are required. The proposed improvements contained in the TIS Master Plan Concept include the widening of I-275, the provision of local access and express freeways with HOV lanes, and the modification of existing interchanges.

As documented herein, results of the capacity analyses conducted for the merge/diverge and weaving areas on I-275 within the project limits indicate that the proposed improvements included in the Master Plan will provide acceptable levels of service in the design year (2010). Signalized intersection analyses conducted for the I-275 ramp terminals indicate that all locations analyzed are projected to operate at Level of Service D or better in 2010. However, the I-275/Dale Mabry Highway ramp terminals are projected to operate with a V/C ratio of 1.04, indicating that several of the critical movements at these locations will be oversaturated.

#### **4.1.2     Structural Conditions**

A total of nine bridge structures within the study limits were reviewed and evaluated. This evaluation is documented in detail in the Task E.2.b.c - Interstate Structural

Inventory Working Paper. A description of the bridge classification procedure is provided in the following paragraphs and graphically illustrated on Exhibit 4.1. The location and assessment of each structure within the study limits are provided on Exhibit 4.2.

As shown on Exhibit 4.1, a bridge assessment procedure was developed by which each bridge was categorized into one of the following classifications:

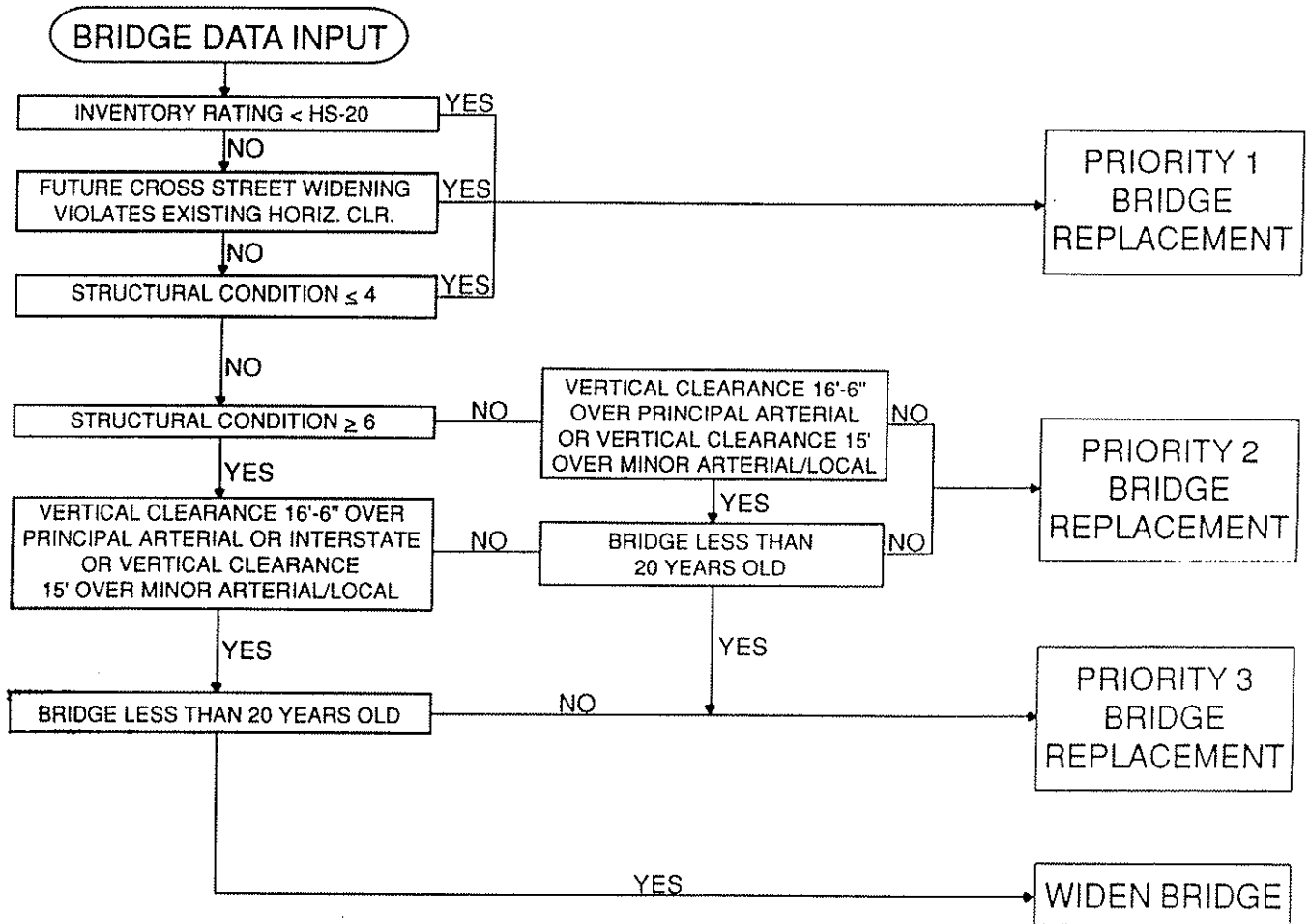
- \* Priority 1 Bridge Replacement
- \* Priority 2 Bridge Replacement
- \* Priority 3 Bridge Replacement
- \* Widen Bridge

The first category: "Priority 1 Bridge Replacement," was assigned to a bridge with any of the following conditions:

- \* an inventory rating less than HS-20,
- \* a structural condition of 4 or less, or
- \* an existing horizontal clearance less than that required to accommodate future widening of cross streets.

The inventory rating, as provided in Table 3.10, indicates the load level that the bridge can carry for an indefinite period of time. The structural condition is based on a scale of 0 through 9, where 9 indicates the best structural condition. This number is based partially on the condition of the deck, superstructure, and exposed substructure, plus the load carrying capacity.





Greiner, Inc.

**FLORIDA DEPARTMENT OF TRANSPORTATION**

ENGINEERING REPORT

**TAMPA INTERSTATE STUDY  
PHASE II**

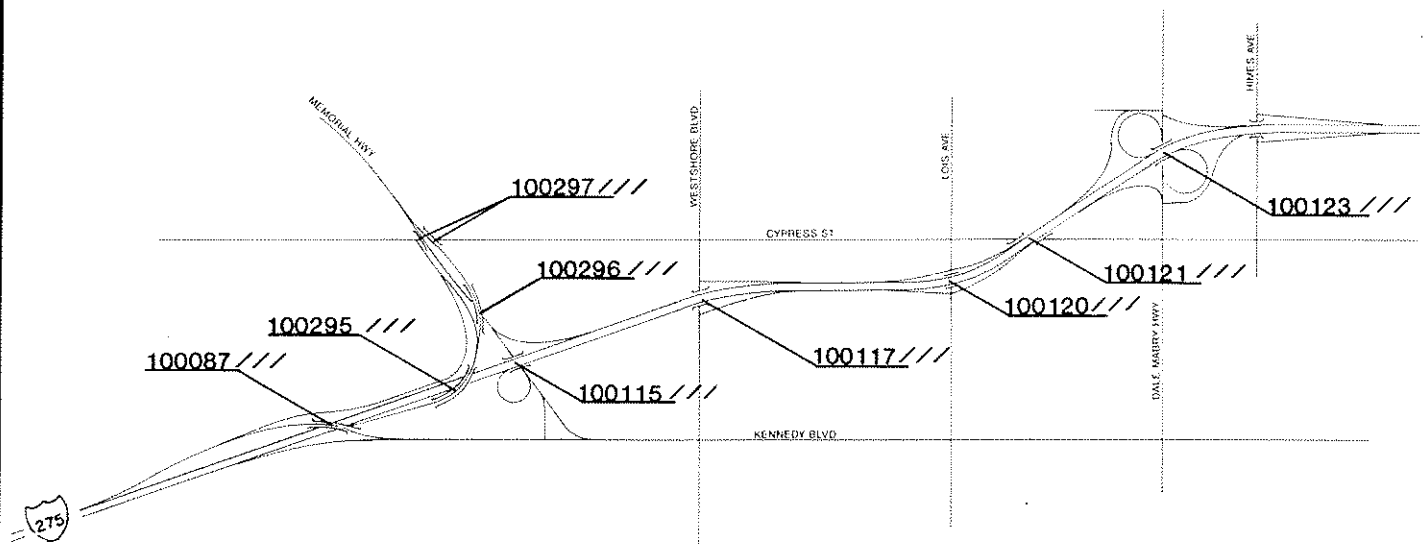
Hillsborough County, Florida

**BRIDGE ASSESSMENT FLOW CHART**

EXHIBIT 4.1



NOT TO SCALE



Greiner, Inc.

### LEGEND

- /// Priority 1 Bridge Replacement  
100296 D.O.T. Bridge Identification Number

### FLORIDA DEPARTMENT OF TRANSPORTATION

ENGINEERING REPORT

### **TAMPA INTERSTATE STUDY PHASE II**

Hillsborough County, Florida

### **STRUCTURAL BRIDGE EVALUATION**

EXHIBIT 4.2

The classification "Widen Bridge" is assigned to any bridge that does not fall into the "Priority 1 Bridge Replacement" category and meets all of the following conditions:

- \* Structural condition is greater than or equal to 6.
- \* The existing vertical clearance is 16'-6" or greater for bridges over the interstate or principal arterial roadways, or the vertical clearance is 15'-0" or greater for bridges over minor arterials or local streets.
- \* The bridge is less than 20 years old.

If two of these three conditions are met for any bridge and it is not classified under "Priority 1 Bridge Replacement," then it is categorized as "Priority 3 Bridge Replacement." If less than two of these three conditions are met and it is not classified under "Priority 1 Bridge Replacement," then the bridge is classified as "Priority 2 Bridge Replacement."

All of the bridges evaluated within the study limits fall into the "Priority 1 Bridge Replacement" classification. These bridges are included in this category because the existing horizontal clearances do not allow for future cross street widenings.

#### 4.1.3 Evacuation Routes and Emergency Services

Coordination with the City of Tampa Police Department, the Hillsborough County Sheriff's Department, Pasco County Sheriff's Department, the State of Florida Department of Highway Safety and Motor Vehicles (Florida Highway Patrol), Hillsborough County Bureau of Emergency Management, Hillsborough County Fire Department, and City of Tampa Fire Department has continued throughout the study. The following emergency medical services companies were also contacted for

comments: Emergency Medical Services (Tampa), Medic One Ambulance Service (Tampa), S.A.S. Ambulance Service (St. Petersburg), and Rural Metro Ambulance Service (Brandon).

Primary concerns of these emergency service and law enforcement agencies center on existing access patterns for regular patrol, cross corridor access for emergency response, access across physical separation barriers for emergency response, and local street continuity for pursuit and service. The increased level of traffic service and better traffic flow resulting from the interstate reconstruction will permit law enforcement and emergency vehicles to respond more quickly to emergencies. In many areas, frontage roads and other parallel roadways will be incorporated into the reconstruction of the interstate providing new alternative corridors of travel for law enforcement and emergency vehicles.

In addition to the improved interchange access of the interstate, the HOV priority access ramps at Trask Street could be used by law enforcement agencies and emergency vehicles during emergencies. The design of local street modifications has been coordinated with the law enforcement and emergency services agencies to ensure proper turning radii, cul-de-sac length and local street connections. In addition, with the initiation of Traffic Surveillance and Incident Management (see Section VII of the Master Plan), emergency response times will be greatly improved. As mentioned in Section 3.3.2.2, I-275 serves as an evacuation route and will continue to in the future.

#### 4.2 SAFETY

As discussed in Section 3.1.9, accident safety ratios for segments evaluated on I-275 are all well under the critical threshold of 1.0. However, as reported in Section 3.1.6,

design speeds for vertical sag curves are in the range of 41 to 46 miles per hour. These design speeds could likely be a contributing factor in a majority of the 675 accidents that have occurred in the last 5 years. Of these 675 accidents, 44 percent were rear end collisions that may have resulted from poor sight stopping distances on I-275.

#### 4.3 CONSISTENCY WITH TRANSPORTATION PLAN

The Tampa interstate routes provide key links to all of the urban area and are recognized as the most important regional highway system in the Tampa Bay area. The February 1989 white paper entitled Future Of Hillsborough Transportation Concepts prepared for the Florida House of Representatives Public Transportation Committee stated clearly the significant role played by the interstate system in the region's transportation system and identified the proposed TIS reconstruction of I-275, I-4 and I-75 as a "priority project."

Similar official recognition for a major reconstruction of the interstate system is found in the Tampa Urban Area Metropolitan Planning Organization's Year 2010 Long Range Transportation Plan for Hillsborough County. The Preferred Alternative Plan (Master Plan Concept) is consistent with the Adopted MPO Long-Range Plan of Hillsborough County.

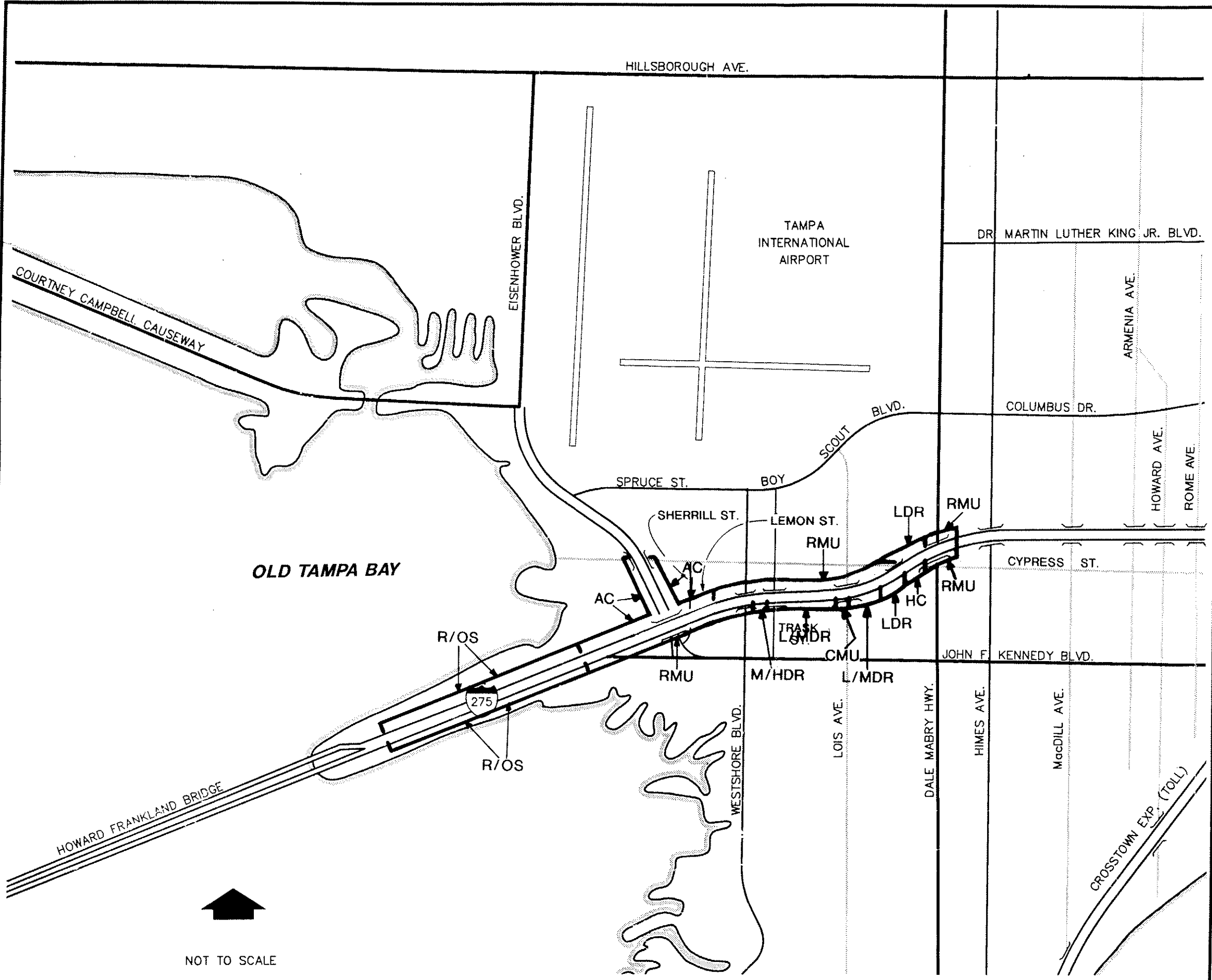
The integrated and coordinated multi-modal approach to transportation system evaluations resulting from the coordination between TIS and the Hillsborough County Rail Transit Study (RTS) is unprecedented in Tampa's transportation history, and is a reflection of the universal agreement amongst the agencies and citizens that a broad-reaching solution to urban mobility problems is essential for the Tampa Bay area.

The TIS began in September 1987. The impetus of the TIS resulted from previous studies identifying a need to improve an antiquated interstate system built in the early 1960's.

Future planning efforts, relating to the adopted MPO Long Range Transportation Plan, clearly indicate that the reconstruction of the interstate system is a basic component of their plan; without the primary interstate system the other associated freeways, expressways and arterials will fail to provide the necessary capacity and system connectivity. Previous studies have indicated that the reconstruction of the interstate system is preferable to development of new alternative freeway corridors through densely developed urban neighborhoods. The Master Plan also assumes the eventual establishment of these other high-capacity facilities, as provided by the MPO Plan.

#### **4.4 SOCIAL/ECONOMIC DEMANDS**

The existing corridor is currently densely developed and contains minimal vacant land. There is some potential for redevelopment of existing land uses as well as in-fill development. The future land use plan for the study area is basically the same as the existing land use. As with impacts to existing land use, the adverse impacts to future land uses are anticipated to be minimal. Positive impacts will result from the increased capacity available to accommodate projected travel demand at an acceptable level of service. Year 2010 future land use from the City of Tampa Comprehensive Plan is shown on Exhibit 4.3.



**LEGEND**

- RMU Regional Mixed Use
- AC Airport Compatibility
- M/HDR Medium/High Density Residential
- L/MDR Low/Medium Density Residential
- R/OS Recreation/Open space
- CMU Community Mixed Use
- LDR Low Density Residential
- HC Heavy Commercial

Source:  
Hillsborough County City-County Planning  
Commission, Tampa Comprehensive Plan.

**FLORIDA DEPARTMENT OF TRANSPORTATION**  
ENGINEERING REPORT  
**TAMPA INTERSTATE STUDY**  
PHASE II  
Hillsborough County, Florida  
**FUTURE LAND USE**

## **SECTION 5.0**

### **CORRIDOR ANALYSIS**



## **5.0 CORRIDOR ANALYSIS**

### **5.1 EVALUATION OF CORRIDOR ALTERNATIVES**

Although the TIS Master Plan studies did not specifically address alternative corridors, previous studies have indicated that the reconstruction of the interstate system is essential along with the development of alternative freeway corridors through densely developed urban neighborhoods. These studies include: Corridor Feasibility Report - I-275/I-4 to the Tampa Crosstown Expressway "Connector," prepared by Howard Needles Tammen and Bergendoff, October 1987; Study of Extensions to the Tampa Crosstown Expressway, prepared by Parsons Brinckerhoff Quade and Douglas, Inc., August 1987; and Social-Economic Feasibility Study, S.R. 600 Gandy Boulevard from Gandy Bridge to Dale Mabry Highway, prepared by Howard Needles Tammen Bergendoff, 1975.

### **5.2 CORRIDOR SELECTION**

Alternative corridors, other than the Crosstown Expressway extension, involve placing alignments in densely populated areas. Selection of an alternative freeway route would result in enormous right-of-way costs and extensive relocations of businesses and residential dwellings. By using existing corridors, right-of-way acquisition, relocations, and negative social and economic impacts are greatly reduced.

Alternative corridors, such as Kennedy Boulevard (S.R. 60), Cypress Street and Spruce Street are already operating near or at capacity. These corridors would also require substantial right-of-way and relocations to be upgraded to carry projected traffic volumes forecasted for the interstate.

## **SECTION 6.0**

### **TRAFFIC**

## **6.0 TRAFFIC**

### **6.1 EXISTING CONDITIONS**

To provide a baseline condition, the existing conditions on I-275 and the adjacent area street system were evaluated. This evaluation included an inventory of existing geometric and traffic conditions, as well as an evaluation of peak hour traffic operations. The following paragraphs discuss the evaluation of the existing conditions on I-275. A detailed discussion of traffic conditions is provided in the Traffic Memorandum, prepared for this project and published separately.

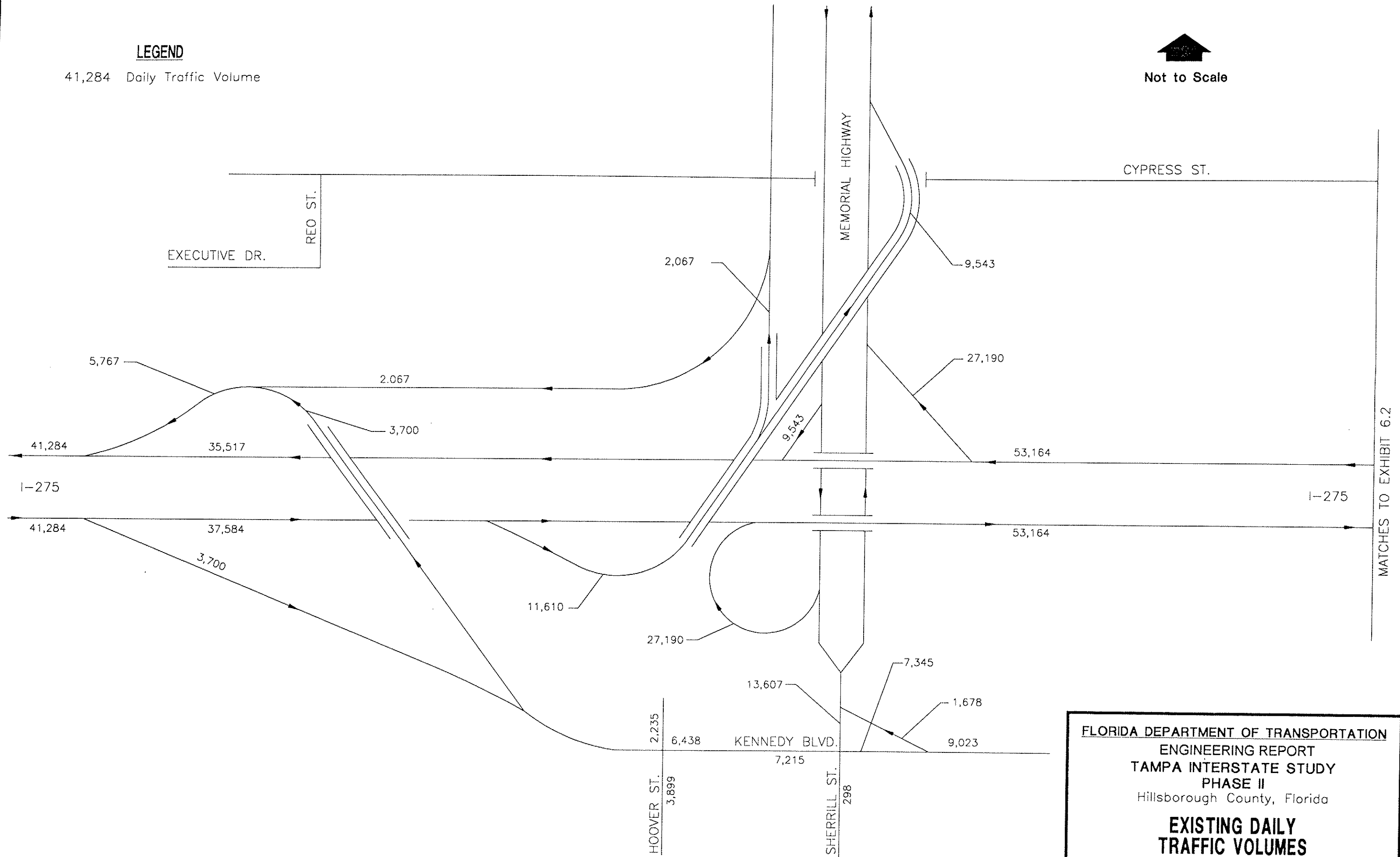
#### **6.1.1 Existing Traffic Volumes**

To evaluate existing traffic conditions, Greiner, Inc. conducted traffic counts from October 9, 1990 to November 16, 1990 and from January 9, 1991 to January 17, 1991. The traffic counts included seven day 24-hour machine counts (directional volumes in 15-minute increments) on I-275 and the adjacent arterials as well as peak hour turning movement counts at the I-275 ramp terminals and major arterial intersections adjacent to the interstate.

The raw count data is included in Appendices A1 and A2, published under separate cover. Weekly adjustment factors for traffic count stations in Hillsborough County obtained from FDOT indicated that daily traffic counts obtained during the weeks of October 8, 1990 to November 16, 1990 were only 1.5 percent lower than average, so no adjustments were made. The existing daily traffic volumes on I-275 (both mainline and ramps) are illustrated on Exhibits 6.1 and 6.2. The volumes presented on Exhibits 6.1 and 6.2 represent the average of the five weekday machine traffic counts. The

# LEGEND

41,284 Daily Traffic Volume



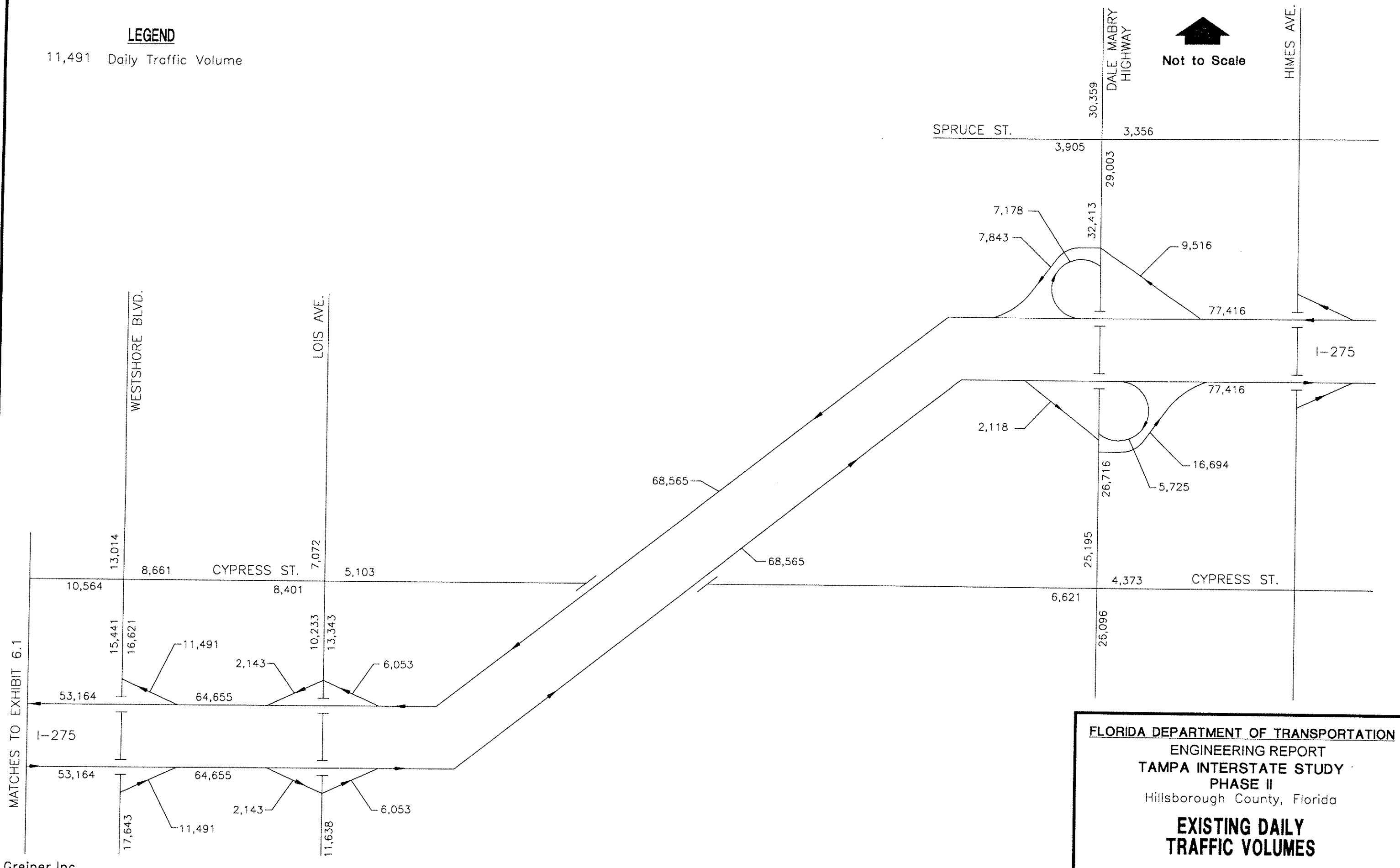
MATCHES TO EXHIBIT 6.2

FLORIDA DEPARTMENT OF TRANSPORTATION  
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TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida

**EXISTING DAILY  
TRAFFIC VOLUMES**

# LEGEND

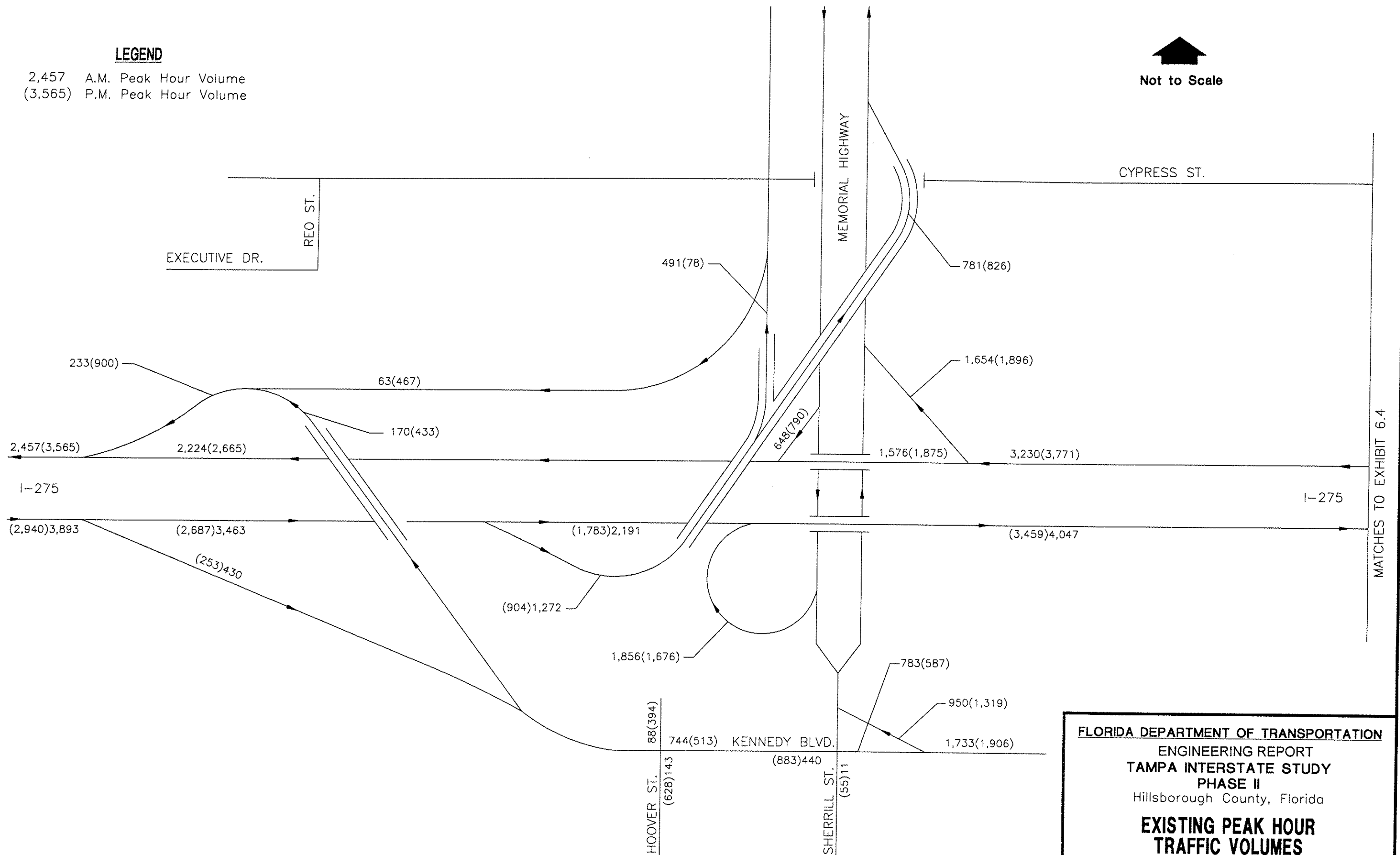
11,491 Daily Traffic Volume



FLORIDA DEPARTMENT OF TRANSPORTATION  
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 PHASE II  
 Hillsborough County, Florida  
**EXISTING DAILY  
 TRAFFIC VOLUMES**

2,457 A.M. Peak Hour Volume  
(3,565) P.M. Peak Hour Volume

**Not to Scale**



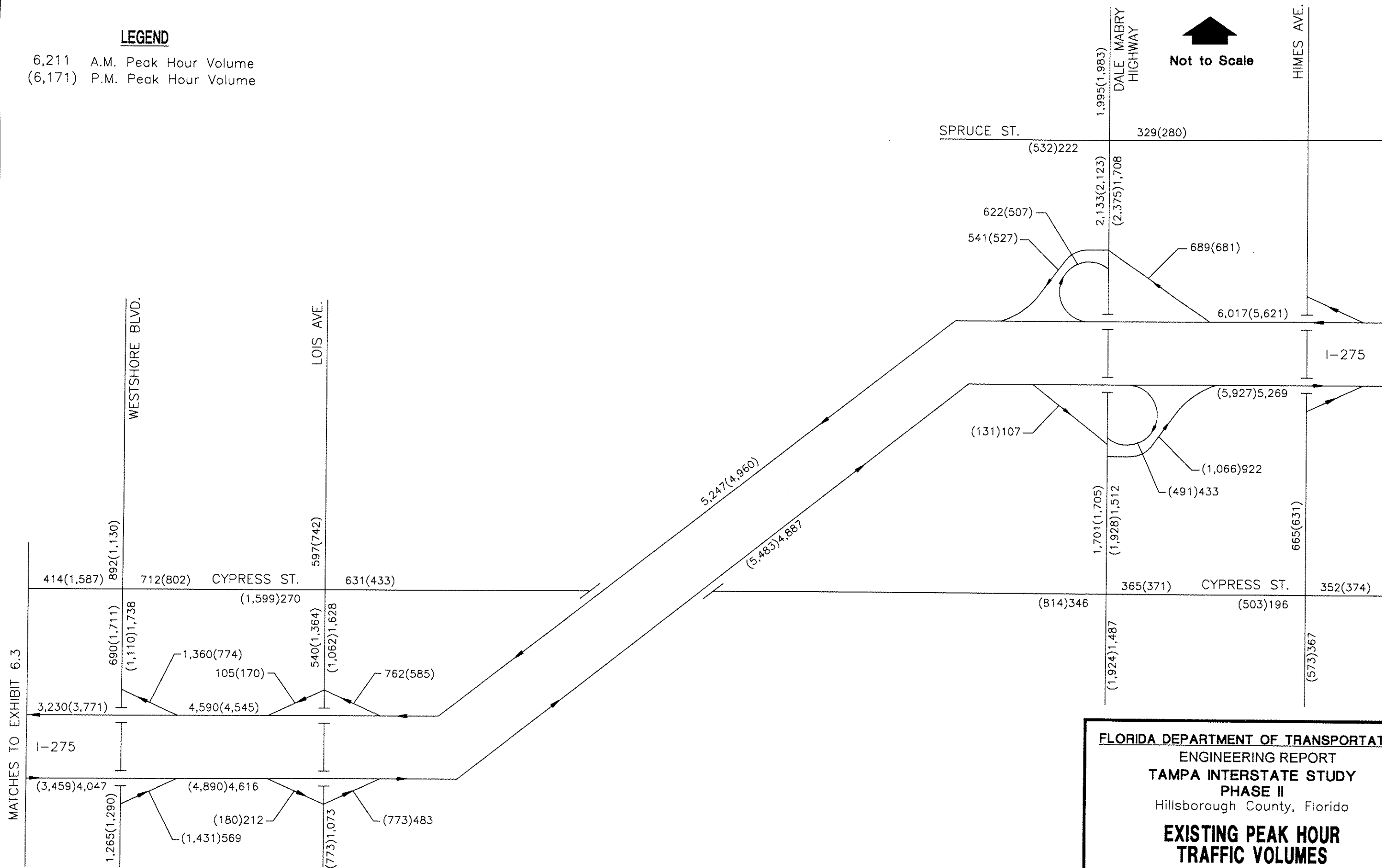
**FLORIDA DEPARTMENT OF TRANSPORTATION**  
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**PHASE II**  
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**EXISTING PEAK HOUR**  
**TRAFFIC VOLUMES**

EXHIBIT 6.3

# **LEGEND**

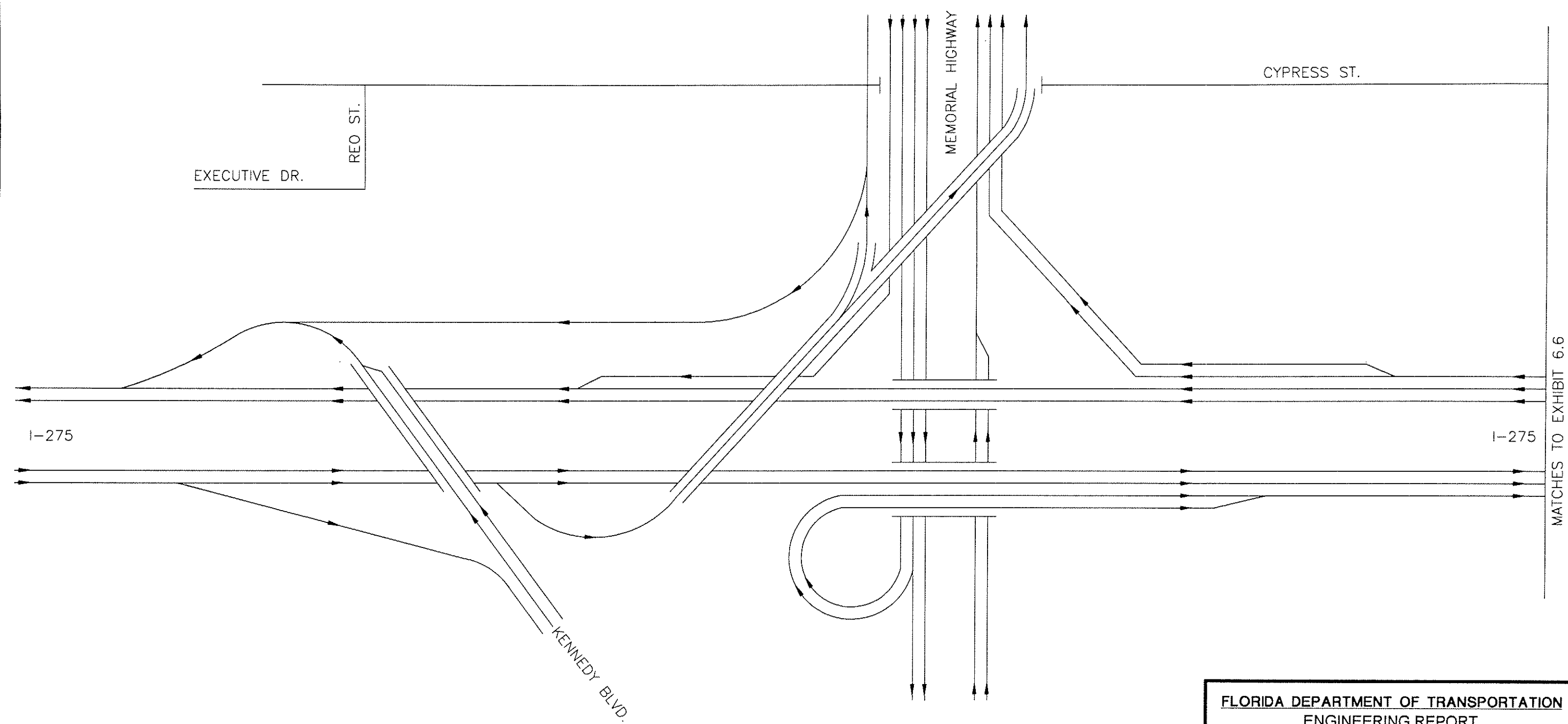
6,211 A.M. Peak Hour Volume  
(6,171) P.M. Peak Hour Volume



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Hillsborough County, Florida  
**EXISTING PEAK HOUR**  
**TRAFFIC VOLUMES**



Not to Scale



FLORIDA DEPARTMENT OF TRANSPORTATION  
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TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida

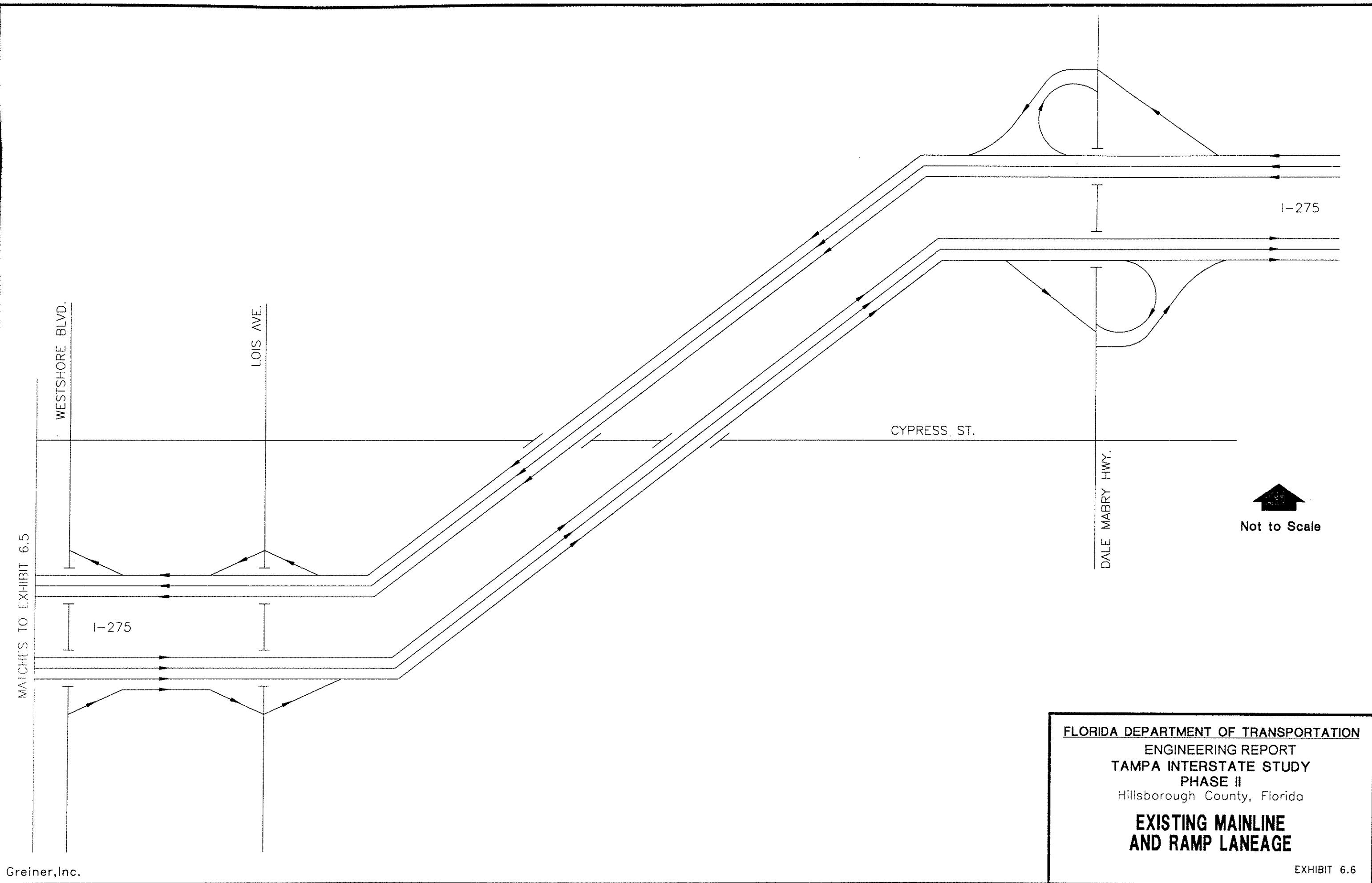
**EXISTING MAINLINE  
AND RAMP LANEAGE**

EXHIBIT 6.5

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J:\G85-14\1238015\UMR3EA.DWG/03.31.91



Greiner, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION  
ENGINEERING REPORT  
TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida  
**EXISTING MAINLINE  
AND RAMP LANEAGE**

EXHIBIT 6.6

existing average weekday a.m. and p.m. peak hour volumes for the same locations were calculated and are provided on Exhibits 6.3 and 6.4.

#### 6.1.2 Existing Traffic Characteristics

Traffic characteristics, including the "K" factors (percent of daily traffic occurring in the peak hour) and "D" factors (percent of peak hour traffic traveling in the peak direction), were calculated from the traffic count data. The existing characteristics are summarized in Table 6.1.

In the a.m. peak hour, the "K" factor for I-275 west of the Kennedy Boulevard on-/off-ramps ranges from 0.070 to 0.081 with an average of 0.076. At this same location in the p.m. peak hour, the "K" factor ranges from 0.074 to 0.088 with an average of 0.08. On I-275 between Westshore Boulevard and Lois Avenue, the "K" factor for the a.m. peak hour ranges from 0.072 to 0.077 with an average of 0.075. In the p.m. peak hour, the "K" factor for this location ranges from 0.068 to 0.075 with an average of 0.072. Overall, the average "K" factor for I-275 is 0.075 for both the a.m. and p.m. peak hours. Typically, "K" factors range from 0.08 to 0.10. The low "K" factors existing on I-275 are indicative of severe congestion in the a.m. and p.m. peak periods that extends the peak periods over several hours.

In the a.m. peak hour, the "K" factors for the adjacent arterials range from 0.062 to 0.082, with an average value of 0.074, while in the p.m. peak hour the "K" factors range from 0.082 to 0.106 with an average value of 0.092. The overall average "K" factor based on all roadway segments listed in Table 6.1 is 0.075 and 0.086 for the a.m. and p.m. peak hours, respectively. In general, the a.m. peak period occurs from 7:30 a.m. to 8:45 a.m. and the p.m. peak period occurs from 4:30 p.m. to 5:45 p.m.

TABLE 6.1

EXISTING TRAFFIC CHARACTERISTICS  
Tampa Interstate Study - Phase II

Location	Date	24-Hour Volume	Peak Hour Volumes		"K" Factor		"D" Factor	
			A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
I-275 West of Kennedy Boulevard On-/Off-Ramps	10/09/90	42,192 (EB) 42,696 (WB)	4,258 (EB) 2,618 (WB)	2,987 (EB) 3,649 (WB)	0.081	0.078	0.62 (EB)	0.55 (WB)
	10/10/90	40,672 (EB) 41,071 (WB)	3,980 (EB) 2,468 (WB)	3,077 (EB) 4,131 (WB)	0.079	0.088	0.62 (EB)	0.57 (WB)
	10/11/90	33,945 (EB) 33,708 (WB)	2,828 (EB) 1,988 (WB)	2,444 (EB) 3,148 (WB)	0.071	0.083	0.59 (EB)	0.56 (WB)
	10/12/90	46,179 (EB) 45,397 (WB)	4,009 (EB) 2,439 (WB)	3,004 (EB) 3,728 (WB)	0.070	0.074	0.62 (EB)	0.55 (WB)
	10/15/90	40,953 (EB) 42,048 (WB)	4,092 (EB) 2,573 (WB)	2,918 (EB) 3,689 (WB)	0.080	0.080	0.61 (EB)	0.56 (WB)
	AVERAGE				0.076	0.080	0.61	0.56
I-275 Between Westshore Boulevard and Lois Avenue	10/18/90	55,281 (EB) 51,751 (WB)	4,699 (EB) 3,547 (WB)	3,796 (EB) 3,611 (WB)	0.077	0.069	0.57 (EB)	0.51 (EB)
	10/19/90	60,873 (EB) 54,191 (WB)	4,842 (EB) 3,546 (WB)	3,990 (EB) 3,853 (WB)	0.073	0.068	0.58 (EB)	0.51 (EB)
	10/22/90	49,818 (EB) 51,231 (WB)	4,128 (EB) 3,408 (WB)	3,445 (EB) 3,995 (WB)	0.075	0.074	0.55 (EB)	0.54 (WB)
	10/23/90	53,119 (EB) 52,592 (WB)	4,456 (EB) 3,549 (WB)	3,730 (EB) 3,898 (WB)	0.076	0.072	0.56 (EB)	0.51 (WB)
	10/24/90	53,054 (EB) 52,788 (WB)	4,466 (EB) 3,476 (WB)	3,577 (EB) 3,938 (WB)	0.075	0.071	0.56 (EB)	0.52 (WB)
	11/12/90	60,409 (EB) 62,448 (WB)	4,784 (EB) 4,656 (WB)	4,524 (EB) 4,476 (WB)	0.077	0.073	0.51 (EB)	0.50 (EB)
	11/13/90	63,113 (EB) 64,527 (WB)	5,038 (EB) 4,743 (WB)	4,757 (EB) 4,874 (WB)	0.077	0.075	0.52 (EB)	0.51 (WB)
	11/14/90	64,466 (EB) 67,847 (WB)	5,133 (EB) 4,734 (WB)	4,959 (EB) 4,737 (WB)	0.075	0.073	0.52 (EB)	0.51 (WB)

TABLE 6.1

EXISTING TRAFFIC CHARACTERISTICS  
Tampa Interstate Study - Phase II  
(Continued)

Location	Date	24-Hour Volume	Peak Hour Volumes		K <sup>M</sup> Factor		D <sup>M</sup> Factor	
			A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
I-275 Between Westshore Boulevard and Lois Avenue (Continued)	11/15/90	65,119 (EB) 68,436 (WB)	4,897 (EB) 4,711 (WB)	4,545 (EB) 5,038 (WB)	0.072 0.072	0.072	0.51 (EB) 0.53 (WB)	
	11/16/90	65,973 (EB) 68,148 (WB)	4,998 (EB) 4,816 (WB)	4,786 (EB) 4,794 (WB)	0.073 0.071	0.071	0.51 (EB) 0.50 (WB)	
AVERAGE					0.075	0.072	0.54	0.51
OVERALL INTERSTATE AVERAGE					0.075	0.075	0.56	0.53
Westshore Boulevard Between I-275 On-/Off-Ramps	10/18/90	12,859 (NB) 21,948 (SB)	1,017 (NB) 1,363 (SB)	847 (NB) 1,995 (SB)	0.068 0.082	0.082	0.57 (SB)	0.70 (SB)
	10/19/90	13,132 (NB) 22,397 (SB)	965 (NB) 1,251 (SB)	913 (NB) 2,124 (SB)	0.062 0.085	0.085	0.56 (SB)	0.70 (SB)
	10/22/90	12,105 (NB) 20,588 (SB)	1,039 (NB) 1,284 (SB)	727 (NB) 2,117 (SB)	0.071 0.087	0.087	0.55 (SB)	0.74 (SB)
	10/23/90	11,878 (NB) 20,873 (SB)	984 (NB) 1,260 (NB)	720 (NB) 2,076 (SB)	0.069 0.085	0.085	0.56 (SB)	0.74 (SB)
	10/24/90	11,614 (NB) 20,541 (SB)	1,023 (NB) 1,337 (SB)	747 (NB) 2,147 (SB)	0.073 0.090	0.090	0.57 (SB)	0.74 (SB)
AVERAGE					0.069	0.086	0.56	0.73
Westshore Boulevard Between I-275 Off-Ramp and Cypress Street	10/18/90	17,207 (NB) 15,991 (SB)	1,798 (NB) 745 (SB)	1,128 (NB) 1,763 (SB)	0.077 0.087	0.087	0.71 (NB)	0.61 (SB)
	10/19/90	17,577 (NB) 16,268 (SB)	1,697 (NB) 695 (SB)	1,197 (NB) 1,689 (SB)	0.071 0.085	0.085	0.71 (NB)	0.59 (SB)
	10/22/90	15,946 (NB) 15,138 (SB)	1,830 (NB) 687 (SB)	904 (NB) 1,684 (SB)	0.081 0.083	0.083	0.73 (NB)	0.65 (SB)
	10/23/90	15,951 (NB) 15,121 (SB)	1,677 (NB) 667 (SB)	1,051 (NB) 1,736 (SB)	0.075 0.090	0.090	0.72 (NB)	0.62 (SB)

TABLE 6.1

EXISTING TRAFFIC CHARACTERISTICS  
Tampa Interstate Study - Phase II  
(Continued)

Location	Date	24-Hour Volume	Peak Hour Volumes		"K" Factor		"D" Factor	
			A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Westshore Boulevard Between I-275 Off-Ramp and Cypress Street (Continued)	10/24/90	16,406 (NB)	1,736 (NB)	1,123 (NB)	0.079	0.089	0.71 (NB)	0.59 (SB)
		14,685 (SB)	726 (SB)	1,641 (SB)				
AVERAGE					0.077	0.087	0.71	0.61
Lois Avenue Between Westbound I-275 On-/Off-Ramps and Cypress St.	11/12/90	7,953 (NB)	819 (NB)	565 (NB)	0.073	0.103	0.61 (NB)	0.70 (SB)
		10,913 (SB)	531 (SB)	1,348 (SB)				
	11/13/90	8,982 (NB)	1,059 (NB)	609 (NB)	0.082	0.103	0.59 (NB)	0.73 (SB)
		13,129 (SB)	745 (SB)	1,676 (SB)				
	11/14/90	9,176 (NB)	1,087 (NB)	765 (NB)	0.074	0.106	0.65 (NB)	0.68 (SB)
		13,443 (SB)	594 (SB)	1,631 (SB)				
	11/15/90	9,515 (NB)	1,095 (NB)	719 (NB)	0.079	0.103	0.60 (NB)	0.70 (SB)
		13,575 (SB)	734 (SB)	1,651 (SB)				
	11/16/90	9,656 (NB)	1,060 (NB)	609 (NB)	0.078	0.097	0.59 (NB)	0.73 (SB)
		13,703 (SB)	751 (SB)	1,659 (SB)				
AVERAGE					0.077	0.102	0.60	0.71
OVERALL ARTERIAL AVERAGE					0.074	0.092	0.63	0.68
OVERALL STUDY AREA AVERAGE					0.075	0.086		

The traffic traveling on I-275 west of the Kennedy Boulevard on-/off-ramps is predominantly oriented eastbound in the a.m. peak hour and westbound in the p.m. peak hour. In the a.m. peak hour, the "D" factors range from 0.59 to 0.62 with an average value of 0.61. In the p.m. peak hour, the "D" factors range from 0.55 to 0.57 with an average value of 0.56.

The a.m. and p.m. peak hour traffic traveling on I-275 between Westshore Boulevard and Lois Avenue is more evenly distributed. In the a.m. peak hour, the "D" factors range from 0.51 to 0.58 with an average of 0.54. In the p.m. peak hour, the "D" factors range from 0.50 to 0.54 with an average of 0.51. This directional distribution reflects the fact that major activity centers are located both to the west (Westshore Business District) and east (downtown Tampa) of this traffic count location.

For the north/south arterials crossing I-275 and having interchanges, the a.m. peak hour "D" factors range from 0.55 to 0.73 with an average of 0.63. The p.m. peak hour "D" factors range from 0.59 to 0.74 with an average of 0.68. Traffic is predominantly oriented northbound in the a.m. peak hour and southbound in the p.m. peak hour.

Vehicle classification counts were obtained from FDOT during Phase I of TIS. Based on this data, it was determined that the percentage of buses on I-275 is small compared to the percentage of trucks (less than 0.5 percent of the total heavy vehicles). A plot of design hour truck percentage and average annual daily traffic indicates that the percentage of trucks in the design hour tends to reach a limiting value of approximately 3 percent for daily traffic volumes greater than 120,000 vpd.

### 6.1.3 Existing Traffic Operations

Using the existing peak hour volumes, traffic operations analyses were conducted for I-275 from west of the Kennedy Boulevard on-/off-ramps to east of the Dale Mabry Highway interchange. The existing laneage on I-275 in this section and the configuration of the ramps are illustrated schematically on Exhibits 6.5 and 6.6.

I-275 is primarily a north-south freeway that traverses all of Hillsborough County; however, the segment between the Howard Frankland Bridge and Dale Mabry Highway runs northeast-southwest. Currently, I-275 is a four-lane facility from the Howard Frankland Bridge (the western end of the project study limits) to Memorial Highway (S.R. 60) and a six-lane facility from Memorial Highway (S.R. 60) to east of Dale Mabry Highway. An auxiliary lane is provided on eastbound I-275 between the Westshore Boulevard on-ramp and the Lois Avenue off-ramp.

The basic freeway segments, weaving areas and ramp junction merge/diverge areas were analyzed using the methodologies described in Chapter 3 - Basic Freeway Segments, Chapter 4 - Weaving Areas and Chapter 5 - Ramps and Ramp Junctions of the 1985 Highway Capacity Manual (HCM). To be consistent with the operations analyses conducted previously during Phase I of the study, the levels of service for the basic freeway segments, weaving areas and merge/diverge areas were determined using the values developed for TIS and previously approved by FHWA. Documentation of FHWA approval of these modified level of service criteria is provided in Appendices prepared for the Traffic Memorandum. Table 6.2 lists the basic freeway segment levels of service used in the operations analyses. The merge/diverge and weaving area levels of service criteria are listed in Table 6.3. The existing conditions analyses were conducted using the following parameters:

**TABLE 6.2**  
**LEVELS OF SERVICE FOR BASIC FREEWAY SEGMENTS**  
**Tampa Interstate Study - Phase II**

<u>Level of Service</u>	<u>Maximum Service Flow Rate (in pcphpl)</u>	
	<u>50 MPH Design Speed</u>	<u>60 MPH Design Speed</u>
A	--	--
B	--	1,100
C	1,470	1,540
D	1,785	1,870
E	2,100	2,200

---

Source: Tampa Interstate Study, Task F.5.c - Analysis of Service Flow Rates and Level of Service Final Working Paper, Greiner, Inc., (October 1988).



**TABLE 6.3**  
**LEVELS OF SERVICE FOR**  
**MERGE/DIVERGE VOLUMES AND SPEEDS IN WEAVING SECTIONS**  
**Tampa Interstate Study - Phase II**

**MERGE/DIVERGE AREAS**

<u>Level of Service</u>	<u>Merge Volume (in pcph)</u>	<u>Diverge Volume (in pcph)</u>
A	≤ 660	≤ 715
B	≤ 1,100	≤ 1,155
C	≤ 1,595	≤ 1,650
D	≤ 1,925	≤ 1,980
E	≤ 2,200	≤ 2,200

**WEAVING AREAS**

<u>Level of Service</u>	<u>50 mph Design Speed</u>		<u>60 mph Design Speed</u>	
	<u>Weaving Speed Sw (in mph)</u>	<u>Non-Weaving Speed S<sub>nw</sub> (in mph)</u>	<u>Weaving Speed Sw (in mph)</u>	<u>Non-Weaving Speed S<sub>nw</sub> (in mph)</u>
A	≥ 50.0	≥ 54.0	≥ 55.0	≥ 60.0
B	≥ 45.0	≥ 48.0	≥ 50.0	≥ 54.0
C	≥ 40.0	≥ 42.0	≥ 45.0	≥ 48.0
D	≥ 35.0	≥ 35.0	≥ 40.0	≥ 42.0
E	≥ 30.0	≥ 30.0	≥ 35.0	≥ 35.0
F	< 30.0	< 30.0	< 35.0	< 35.0

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Source: Tampa Interstate Study, Task F.5.e - Travel Demand Technical Report, Greiner, Inc., (April 1989).

Peak Hour Factor (PHF)	=	0.95
Design Hour Truck Percentage	=	3%
Design Hour Bus/RV Percentage	=	0%
Population Factor	=	1.0
Terrain	=	Level
Design Speed	=	50 mph

Table 6.4 summarizes the levels of service for the basic freeway segments on I-275 in the a.m. and p.m. peak hours. As illustrated in Table 6.4, only one of the four segments analyzed operates at Level of Service D or better in the a.m. peak hour. The segment of westbound I-275 west of the Kennedy Boulevard interchange is currently operating at Level of Service C. The other three segments are all currently operating at Level of Service E or F in the a.m. peak hour. The volume-to-capacity (V/C) ratios for these three segments range from 0.92 to 1.05.

Three of the four segments analyzed are currently operating at Level of Service E or F in the p.m. peak hour. The V/C ratios for these three segments range from 0.93 to 1.03. The segment of eastbound I-275 west of the Kennedy Boulevard on-/off ramps is currently operating at Level of Service D with a V/C ratio of 0.77. It should be noted that the two basic freeway segments east of the Dale Mabry Highway interchange operate at unacceptable levels of service during both the a.m. and p.m. peak hours.

Table 6.5 summarizes the existing levels of service for the merge, diverge and weaving areas on I-275 in the a.m. peak hour. As indicated in Table 6.5, 11 of the 17 locations analyzed are currently operating at acceptable levels of service (Level of Service D or better) in the a.m. peak hour. The six locations that are currently operating at Level of Service E or F are as follows:

TABLE 6.4

EXISTING FREEWAY OPERATIONS ANALYSIS SUMMARY -  
BASIC FREEWAY SEGMENTS  
Tampa Interstate Study - Phase II

Location	A.M. Peak Hour				P.M. Peak Hour			
	Volume	Number of Lanes	V/C Ratio	Level of Service	Volume	Number of Lanes	V/C Ratio	Level of Service
EB I-275 West of Kennedy Boulevard Interchange	3,893	2	1.02	F	2,940	2	0.77	D
EB I-275 East of Dale Mabry Highway Interchange	5,269	3	0.92	E	5,927	3	1.03	F
WB I-275 East of Dale Mabry Highway Interchange	6,017	3	1.05	F	5,621	3	0.98	E
WB I-275 West of Kennedy Boulevard Interchange	2,457	2	0.64	C	3,565	2	0.93	E

TABLE 6.5

EXISTING A.M. PEAK HOUR FREEWAY OPERATIONS ANALYSIS SUMMARY -  
MERGE/DIVERGE AND WEAVING AREAS  
Tampa Interstate Study - Phase II

Location	Merge Area			Diverge Area			Weaving Area			
	Ramp Volume (in vph)	Merge Volume (in pcph)	Merge Level of Service	Ramp Volume (in vph)	Diverge Volume (in pcph)	Diverge Level of Service	Weave Type/Weave Length	Weaving Speed (in mph)	Non-Weaving Speed (in mph)	Non-Weaving Level of Service
EB I-275 Off-Ramp to Kennedy Boulevard				430	2,215	F				
EB I-275 Off-Ramp to Memorial Highway				1,272	2,240	F				
EB I-275 On-Ramp from Memorial Highway	1,856	1,296 1,286	C C							
EB I-275 Between On-Ramp from Westshore Boulevard and Off-Ramp to Lois Avenue							A/1,320	46	54	B
EB I-275 On-Ramp from Lois Avenue	483	1,655	D							
EB I-275 Off-Ramp to SB Dale Mabry Highway				107	1,519	C				
EB I-275 Off-Ramp to NB Dale Mabry Highway				433	1,574	C				
EB I-275 On-Ramp from Dale Mabry Highway	922	2,040	E							
WB I-275 Off-Ramp to NB Dale Mabry Highway				689	2,409	F				
WB I-275 Off-Ramp to SB Dale Mabry Highway				622	1,835	D				
WB I-275 On-Ramp from Dale Mabry Highway	541	2,042	E							
WB I-275 Off-Ramp to Lois Avenue				762	1,948	D				

TABLE 6.5

EXISTING A.M. PEAK HOUR FREEWAY OPERATIONS ANALYSIS SUMMARY -  
MERGE/DIVERGE AND WEAVING AREAS  
Tampa Interstate Study - Phase II  
(Continued)

Location	Merge Area			Diverge Area			Weaving Area		
	Ramp Volume (in vph)	Merge Volume (in pcph)	Merge Level of Service	Ramp Volume (in vph)	Diverge Volume (in pcph)	Diverge Level of Service	Weaving Speed (in mph)	Non-Weaving Speed (in mph)	Non-Weaving Level of Service
WB I-275 On-Ramp from Lois Avenue	105	1,827	D						
WB I-275 Off-Ramp to Westshore Boulevard				1,360	2,011	E			
WB I-275 Off-Ramp to Memorial Highway				1,654	917	B			
WB I-275 On-Ramp from Memorial Highway	648	1,382	C		917	B			
WB I-275 On-Ramp from Kennedy Boulevard	233	1,227	C						

- \* Eastbound I-275 off-ramp to Kennedy Boulevard (Level of Service F);
- \* Eastbound I-275 off-ramp to Memorial Highway (S.R. 60) (Level of Service F);
- \* Eastbound I-275 on-ramp from Dale Mabry Highway (Level of Service E);
- \* Westbound I-275 off-ramp to northbound Dale Mabry Highway (Level of Service F);
- \* Westbound I-275 on-ramp from Dale Mabry Highway (Level of Service E), and
- \* Westbound I-275 off-ramp to Westshore Boulevard (Level of Service E).

The unacceptable levels of service occurring at these merge/diverge areas on I-275 are primarily the result of a lack of sufficient mainline capacity.

Table 6.6 summarizes the existing levels of service for the merge, diverge and weaving areas on I-275 in the p.m. peak hour. Twelve of the 17 locations analyzed are currently operating at Level of Service D or better in the p.m. peak hour. The five locations that are currently operating at an unacceptable level of service are as follows:

- \* Eastbound I-275 between on-ramp from Westshore Boulevard and off-ramp to Lois Avenue (Level of Service E);
- \* Eastbound I-275 on-ramp from Lois Avenue (Level of Service E);
- \* Eastbound I-275 on-ramp from Dale Mabry Highway (Level of Service F);
- \* Westbound I-275 off-ramp to northbound Dale Mabry Highway (Level of Service E), and
- \* Westbound I-275 on-ramp from Kennedy Boulevard (Level of Service E).

As is the case in the a.m. peak hour, the unacceptable levels of service occurring during the p.m. peak hour at the four merge/diverge areas listed above are primarily

TABLE 6.6

EXISTING P.M. PEAK HOUR FREEWAY OPERATIONS ANALYSIS SUMMARY -  
MERGE/DIVERGE AND WEAVING AREAS  
Tampa Interstate Study - Phase II

Location	Merge Area			Diverge Area			Weaving Area		
	Ramp Volume (in vph)	Merge Volume (in pcph)	Merge Level of Service	Ramp Volume (in vph)	Diverge Volume (in pcph)	Diverge Level of Service	Weave Type/Weave Length	Weaving Speed (in mph)	Non-Weaving Level of Service
EB I-275 Off-Ramp to Kennedy Boulevard				253	1,493	C			
EB I-275 Off-Ramp to Memorial Highway				904	1,732	D			
EB I-275 On-Ramp from Memorial Highway	1676	1096 1397	B C						
EB I-275 Between On-Ramp from Westshore Boulevard and Off-Ramp to Lois Avenue							A/1,320	39	E 49 C
EB I-275 On-Ramp from Lois Avenue	773	2,069	E						
EB I-275 Off-Ramp to SB Dale Mabry Highway				131	1,734	D			
EB I-275 Off-Ramp to NB Dale Mabry Highway				491	1,771	D			
EB I-275 On-Ramp from Dale Mabry Highway	1,066	2,346	F						
WB I-275 Off-Ramp to NB Dale Mabry Highway				681	2,020	E			
WB I-275 Off-Ramp to SB Dale Mabry Highway				507	1,654	D			
WB I-275 On-Ramp from Dale Mabry Highway	527	1,868	D						
WB I-275 Off-Ramp to Lois Avenue				585	1,778	D			

TABLE 6.6

EXISTING P.M. PEAK HOUR FREEWAY OPERATIONS ANALYSIS SUMMARY -  
MERGE/DIVERGE AND WEAVING AREAS  
Tampa Interstate Study - Phase II  
(Continued)

Location	Merge Area			Diverge Area			Weaving Area			
	Ramp Volume (in vph)	Merge Volume (in pcph)	Merge Level of Service	Ramp Volume (in vph)	Diverge Volume (in pcph)	Diverge Level of Service	Weave Type/ Weave Length	Weaving Speed (in mph)	Non-Weaving Level of Service	Non-Weaving Speed (in mph)
WB I-275 On-Ramp from Lois Avenue	170	1,596	D							
WB I-275 Off-Ramp to Westshore Boulevard				774	1,704	D				
WB I-275 Off-Ramp to Memorial Highway				1,896	1,051	B				
WB I-275 On-Ramp from Memorial Highway	790	1,634	D							
WB I-275 On-Ramp from Kennedy Boulevard	900	2,053	E							



the result of a lack of sufficient mainline capacity. The unacceptable level of service currently existing on the segment of eastbound I-275 between the Westshore Boulevard on-ramp and the Lois Avenue off-ramp is due to the relatively short length of the weaving area (approximately 1,320 feet) and the large volume of weaving traffic.

It should be noted that two of the 17 locations analyzed are operating at unacceptable levels of service during both peak hours. These locations are the eastbound I-275 on-ramp from Dale Mabry Highway and the westbound I-275 off-ramp to northbound Dale Mabry Highway.

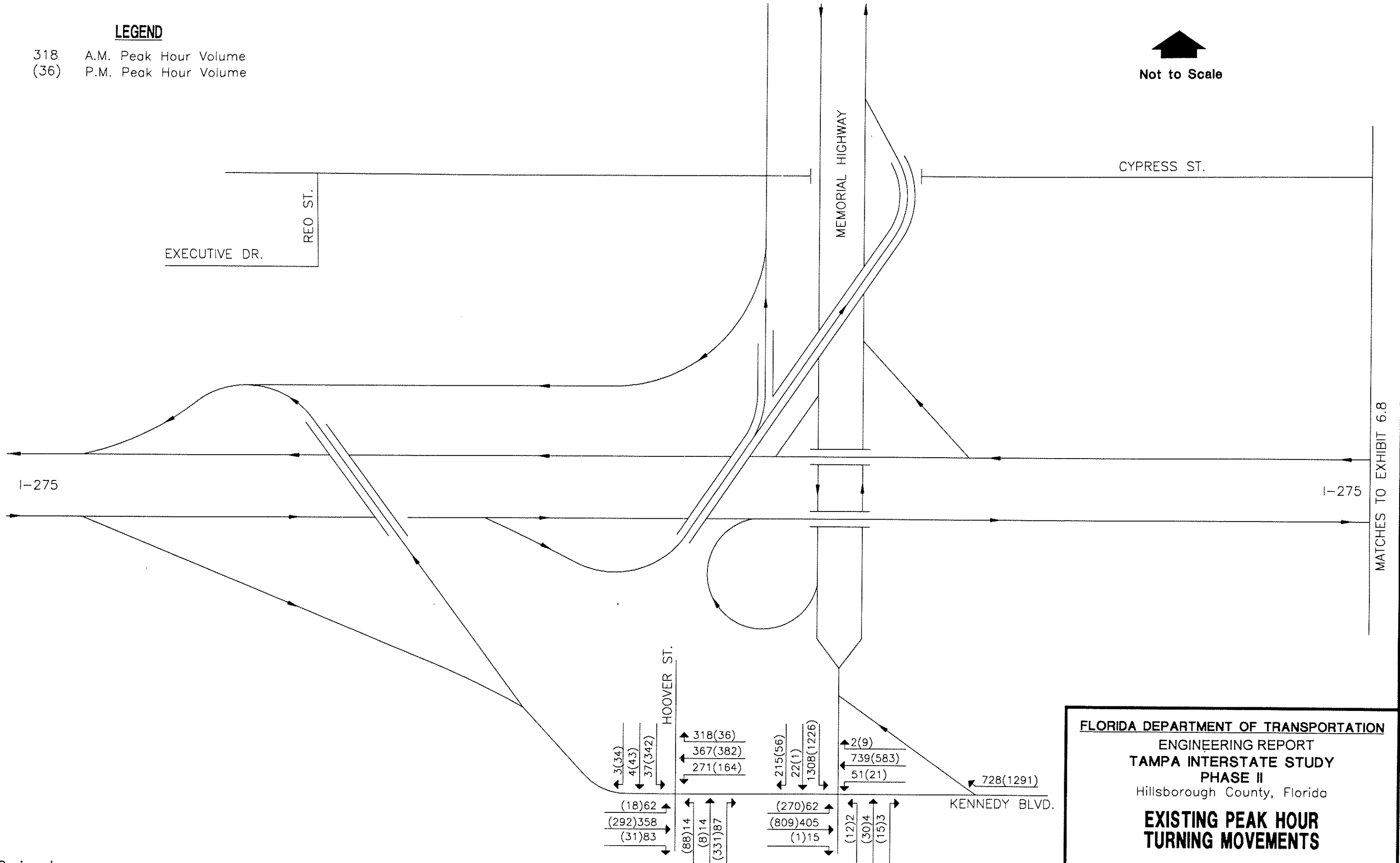
In addition to the I-275 freeway operations analyses, signalized intersection analyses were also conducted for the a.m. and p.m. peak hours at the following ramp terminal and arterial intersections:

- \* Dale Mabry Highway and westbound I-275 on-/off-ramps;
- \* Dale Mabry Highway and eastbound I-275 on-/off-ramps;
- \* Dale Mabry Highway and Spruce Street;
- \* Dale Mabry Highway and Cypress Street;
- \* Cypress Street and Himes Avenue;
- \* Lois Avenue and westbound I-275 on-/off-ramps;
- \* Lois Avenue and eastbound I-275 on-/off-ramps;
- \* Westshore Boulevard and I-275 on-/off-ramps;
- \* Westshore Boulevard and Cypress Street;
- \* Kennedy Boulevard and Memorial Highway (S.R. 60); and
- \* Kennedy Boulevard and Hoover Street.

These analyses were conducted using the methodology described in Chapter 9-Signalized Intersections of the 1985 Highway Capacity Manual. The existing a.m. and p.m. peak hour turning movements at these locations are provided on Exhibits 6.7 and 6.8. The existing intersection lane geometry is illustrated on Exhibits 6.9 and 6.10. Traffic signal phasing/timing plans were obtained from the City of Tampa and used

# **LEGEND**

318 A.M. Peak Hour Volume  
(36) P.M. Peak Hour Volume

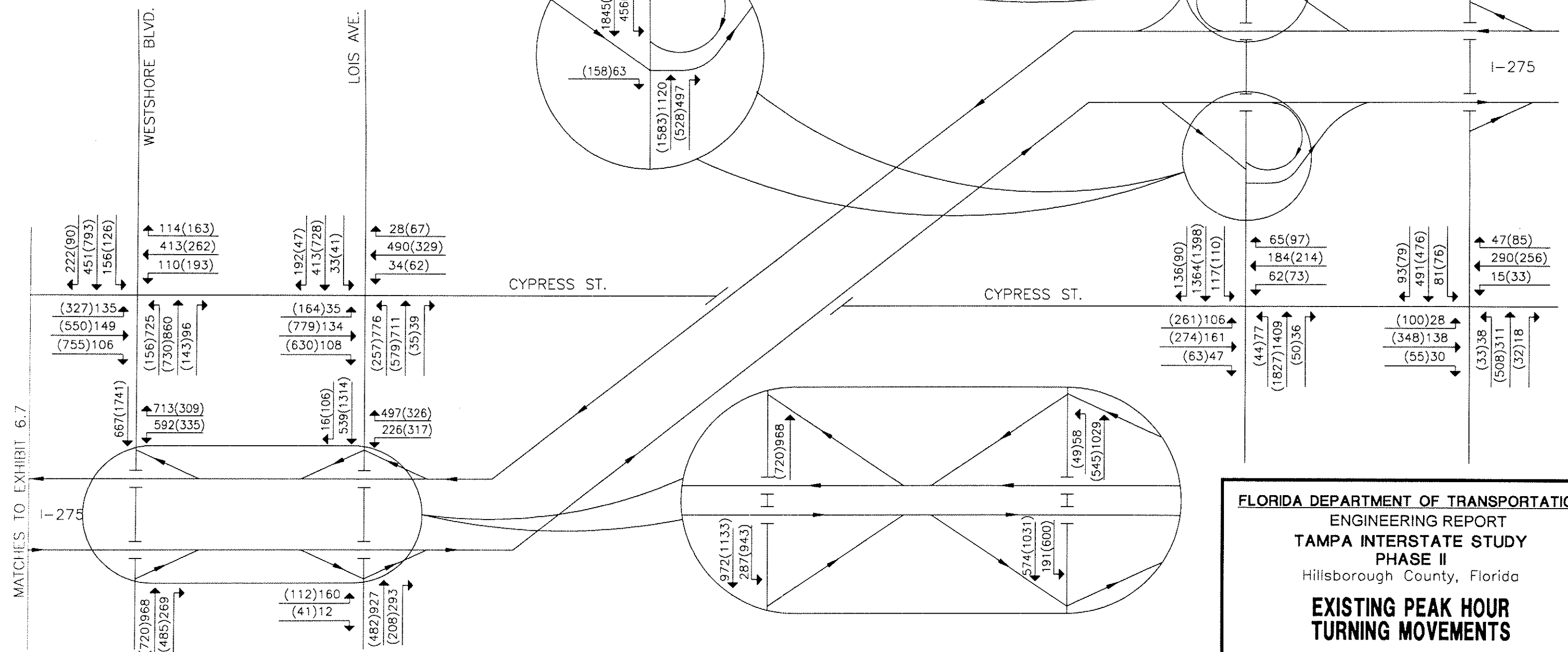


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TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida  
**EXISTING PEAK HOUR  
TURNING MOVEMENTS**

EXHIBIT 6.7

# **LEGEND**

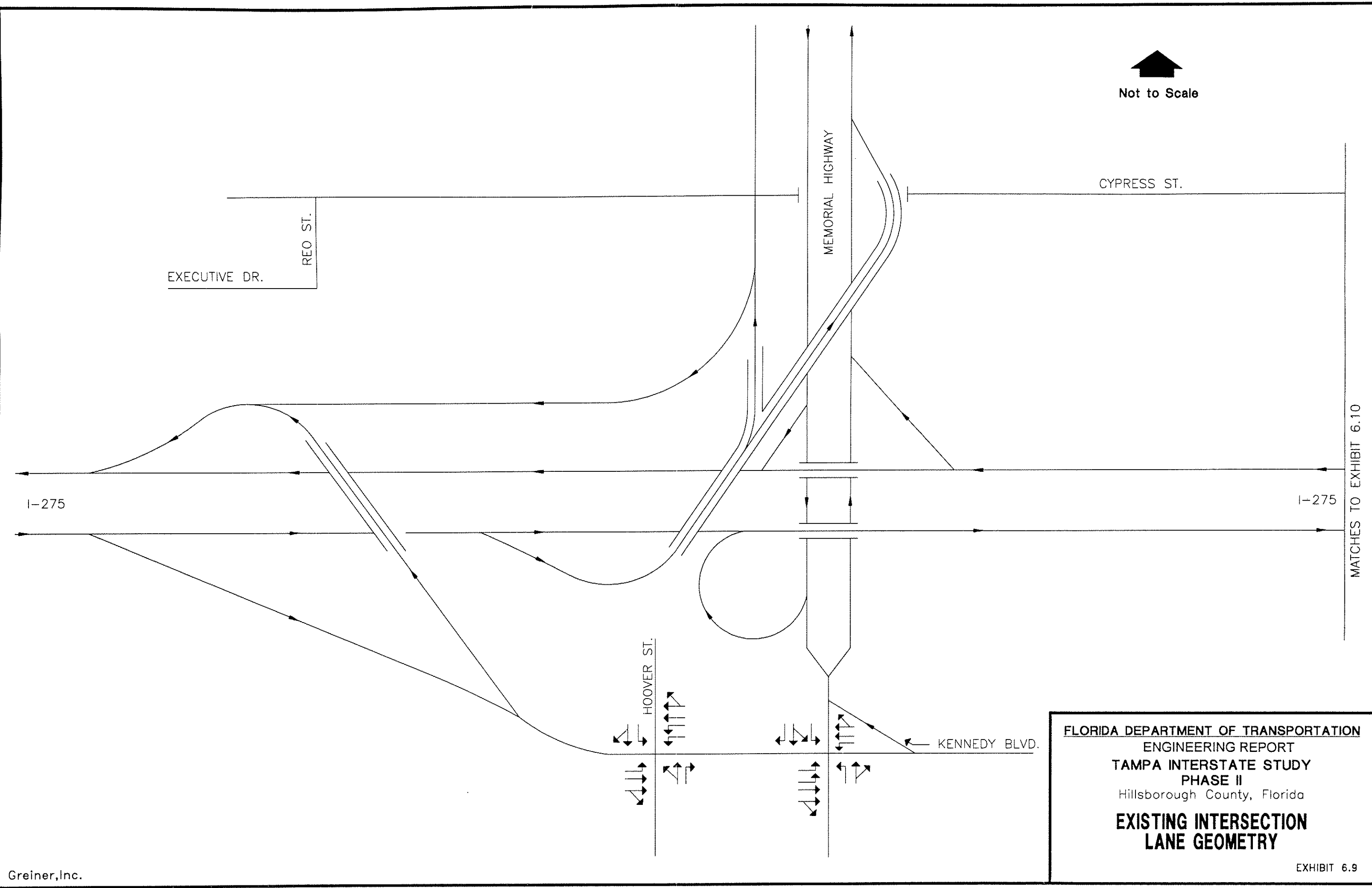
222 A.M. Peak Hour Volume  
(90) P.M. Peak Hour Volume



MATCHES TO EXHIBIT 6.7

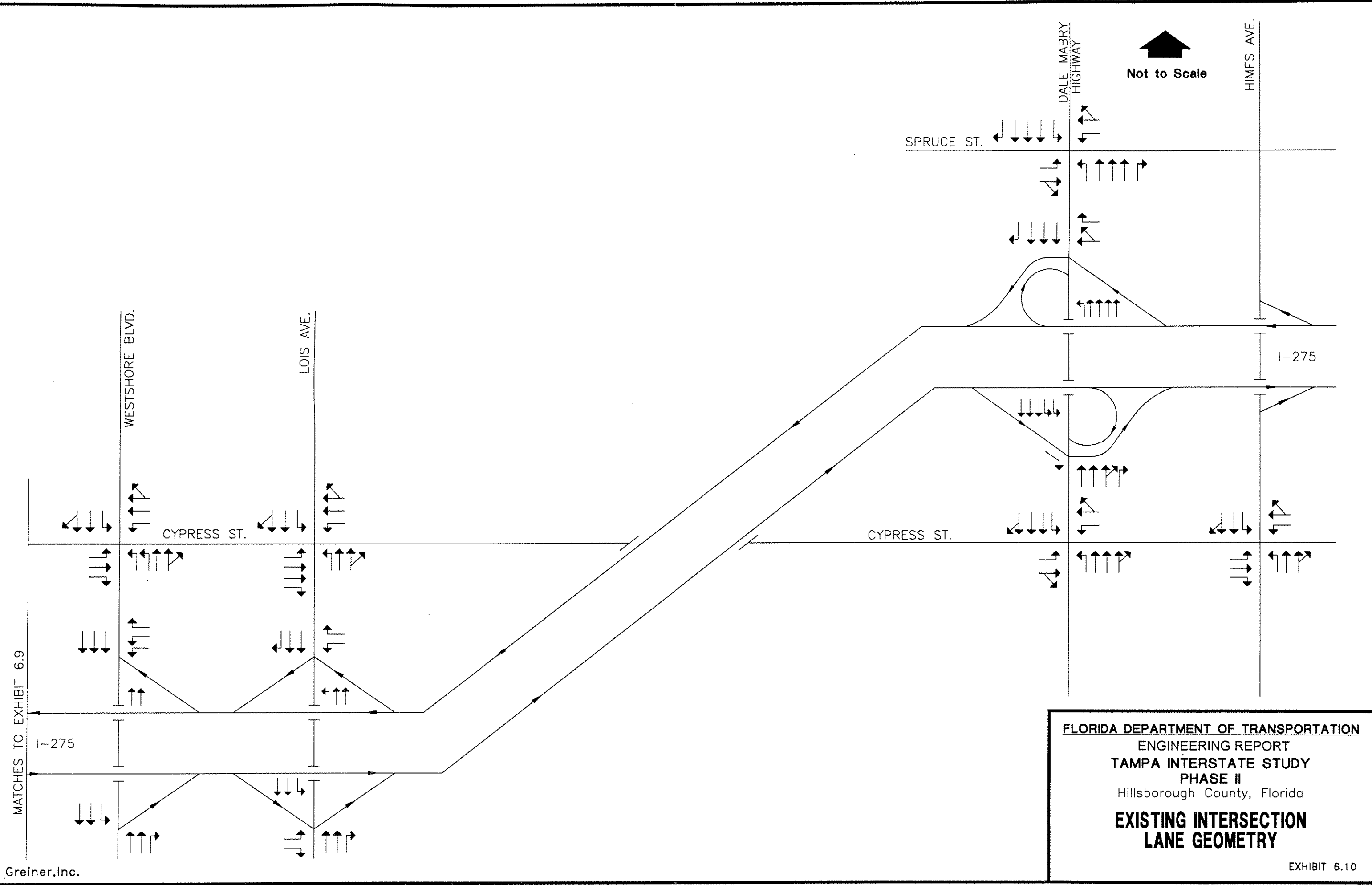
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EXHIBIT 6.8



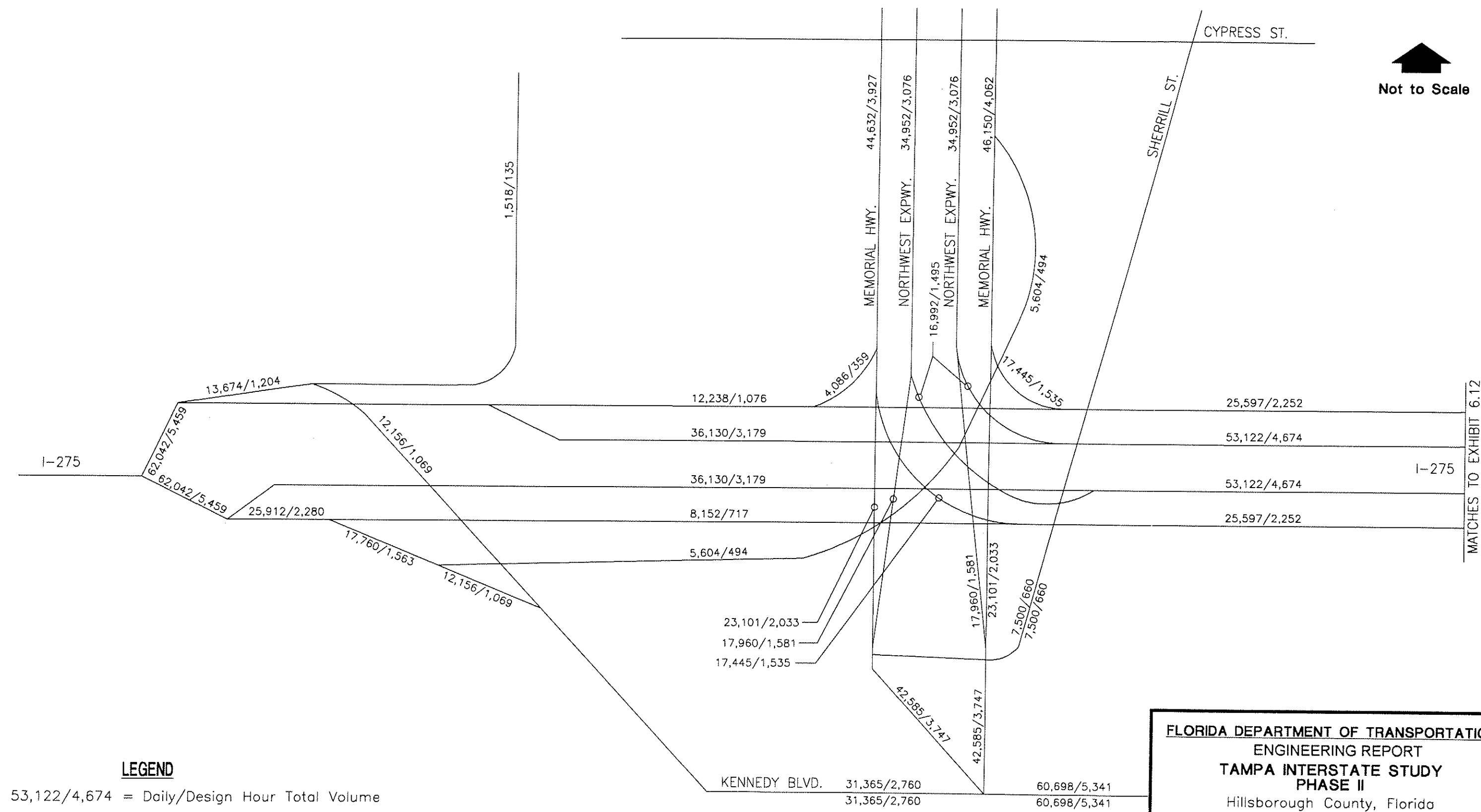
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Hillsborough County, Florida  
**EXISTING INTERSECTION  
LANE GEOMETRY**

EXHIBIT 6.9



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PHASE II  
Hillsborough County, Florida  
**EXISTING INTERSECTION  
LANE GEOMETRY**  
EXHIBIT 6.10

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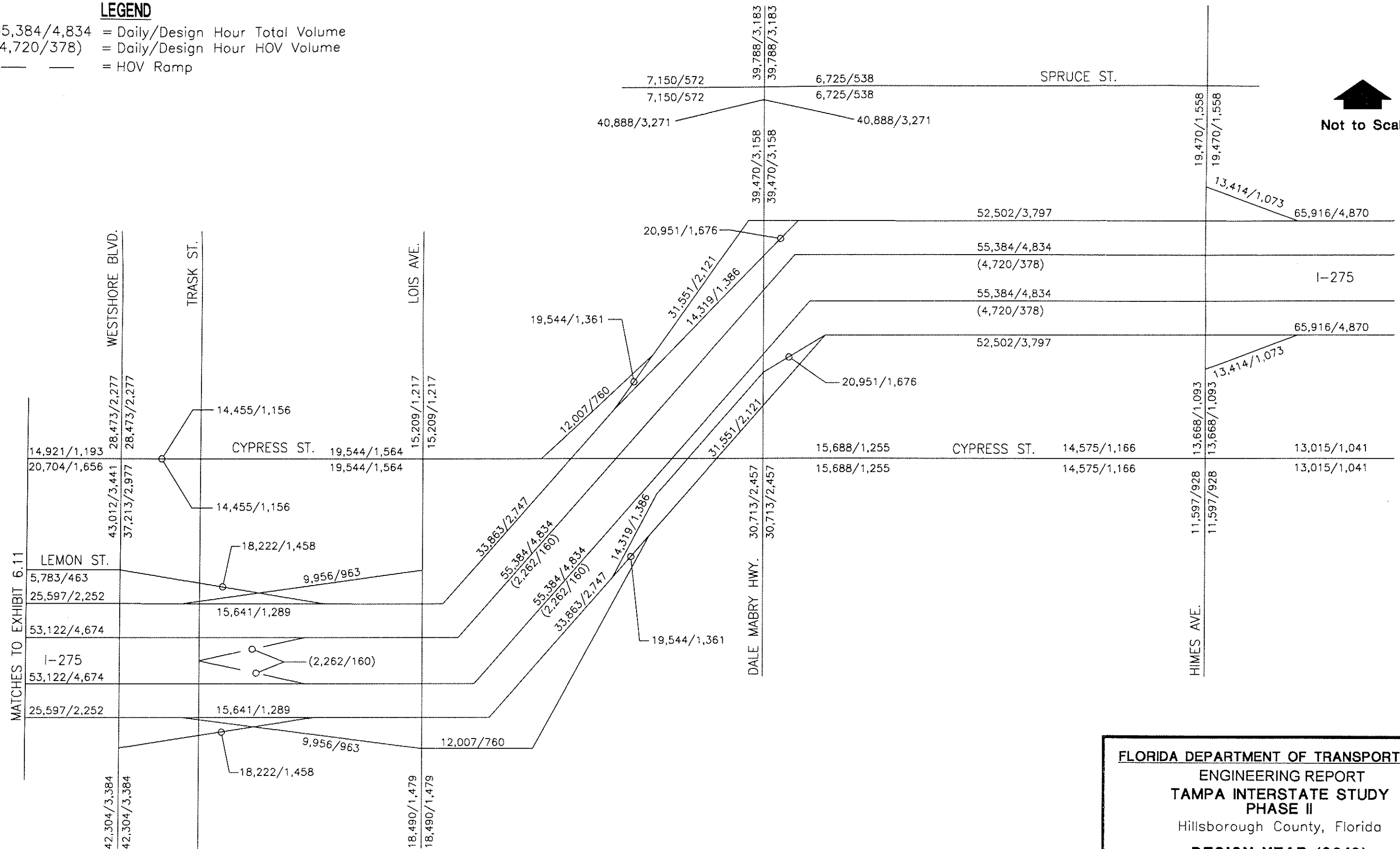


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Hillsborough County, Florida  
**DESIGN YEAR (2010)  
TRAFFIC VOLUMES**

EXHIBIT 6.11

# **LEGEND**

55,384/4,834 = Daily/Design Hour Total Volume  
 (4,720/378) = Daily/Design Hour HOV Volume  
 — = HOV Ramp



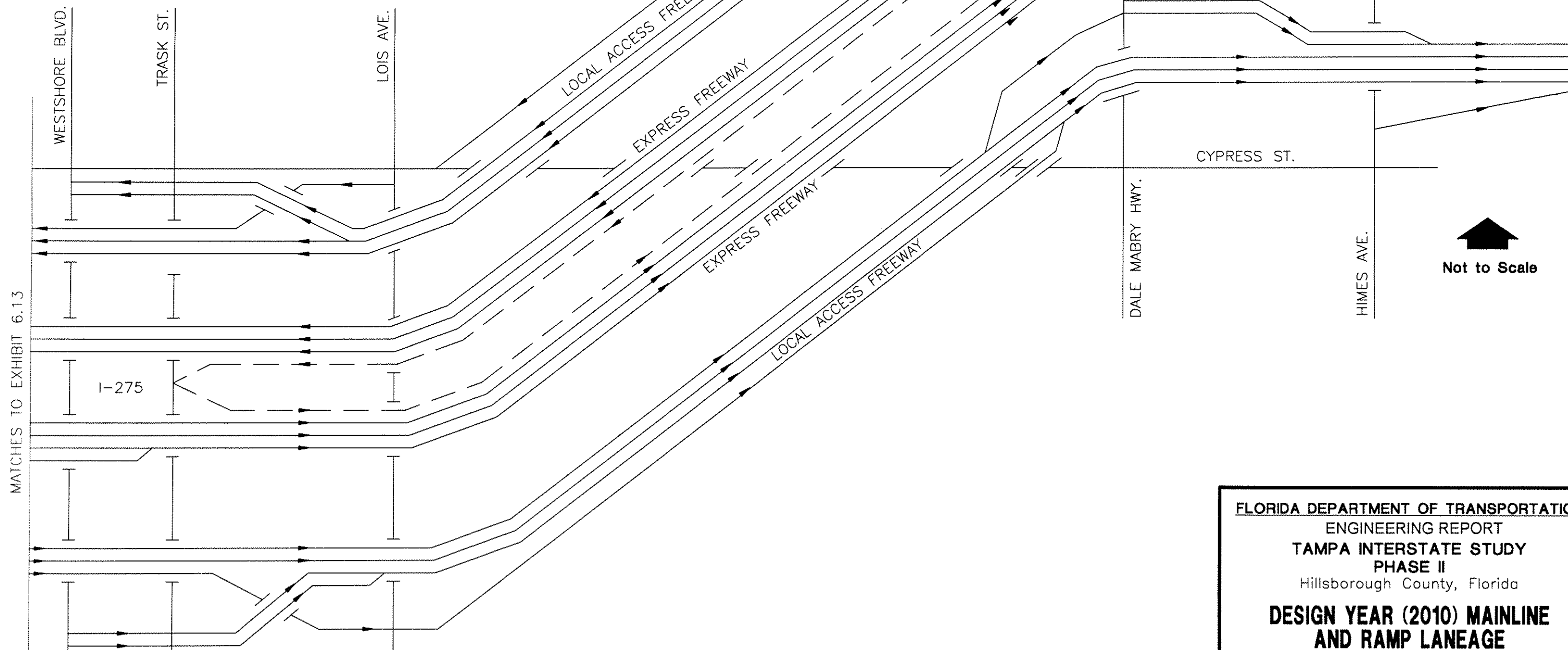
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**TAMPA INTERSTATE STUDY**  
**PHASE II**  
 Hillsborough County, Florida  
**DESIGN YEAR (2010)**  
**TRAFFIC VOLUMES**





# LEGEND

-- -- = HOV LANE



MATCHES TO EXHIBIT 6.13

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 PHASE II  
 Hillsborough County, Florida  
**DESIGN YEAR (2010) MAINLINE  
 AND RAMP LANEAGE**

EXHIBIT 6.14

in the analyses. At several locations, it was determined that improved operations could be obtained with some minor revisions to the signal timing and hence, these revisions were incorporated into the analyses. The results of these signalized intersection analyses are summarized in Table 6.7. As indicated in Table 6.7, nine of the 12 signalized intersections are currently operating at Level of Service C or better in the a.m. peak hour while the Westshore Boulevard/Cypress Street intersection is currently operating at Level of Service D. The Kennedy Boulevard/Memorial Highway (S.R. 60) intersection is currently operating at Level of Service E and the intersection of Westshore Boulevard and the I-275 on-/off-ramps is currently operating at Level of Service F.

Table 6.7 also indicates that eight of the 12 signalized intersections are currently operating at Level of Service C or better in the p.m. peak hour and one intersection (Dale Mabry Highway and Spruce Street) is currently operating at Level of Service D. The Kennedy Boulevard/Memorial Highway (S.R. 60) intersection is currently operating at Level of Service E in the p.m. peak hour while the intersections of Westshore Boulevard and the I-275 on-/off-ramps and Westshore Boulevard and Cypress Street are currently operating at Level of Service F.

## **6.2 EXISTING MULTI-MODAL TRANSPORTATION SYSTEM**

Existing multi-modal transportation serving the project area is discussed in the following paragraphs. Future plans for multi-modal transportation uses are discussed in Section 6.5.

TABLE 6.7

**EXISTING SIGNALIZED INTERSECTION  
OPERATIONS ANALYSIS SUMMARY  
Tampa Interstate Study - Phase II**

<u>Location</u>	<u>A.M. Peak Hour</u>			<u>P.M. Peak Hour</u>		
	<u>V/C<sup>1</sup></u>	<u>Average Delay<sup>2</sup></u>	<u>LOS<sup>3</sup></u>	<u>V/C<sup>1</sup></u>	<u>Average Delay<sup>2</sup></u>	<u>LOS<sup>3</sup></u>
Dale Mabry Highway and WB I-275 On-/Off-Ramps	0.71	12.5	B	0.78	13.0	B
Dale Mabry Highway and EB I-275 On-/Off-Ramps	0.48	9.0	B	0.61	9.7	B
Dale Mabry Highway and Spruce Street	0.68	21.4	C	0.90	30.4	D
Dale Mabry Highway and Cypress Street	0.55	15.3	C	0.87	23.3	C
Cypress Street and Himes Avenue	0.46	7.1	B	0.45	7.3	B
Lois Avenue and WB I-275 On-/Off-Ramps	0.75	13.9	B	0.79	21.9	C
Lois Avenue and EB I-275 On-/Off Ramps	0.56	9.8	B	0.59	7.6	B
Lois Avenue and Cypress Street	0.88	21.1	C	0.84	16.7	C
Westshore Boulevard and I-275 On-/Off-Ramps	1.06	*	F	1.16	*	F
Westshore Boulevard and Cypress Street	0.74	31.7	D	1.23	*	F
Kennedy Boulevard and Memorial Highway	0.79	58.2	E	0.85	58.2	E
Kennedy Boulevard and Hoover Street	0.48	19.9	C	0.62	20.0	C

<sup>1</sup> V/C = Volume-to-Capacity Ratio

<sup>2</sup> Average Delay in seconds per vehicle

<sup>3</sup> LOS = Level of Service

\* Average Delay is meaningless when V/C for any movement exceeds 1.2

### **6.2.1     Bus Service**

During 1990, the Hillsborough Area Regional Transit Authority (HART) operated 133 buses during peak periods on 31 local bus routes and 14 express bus routes. These routes provided service as far east as Plant City; south to Ruskin, Sun City and Wimauma; north to Lutz; and west to Clearwater in Pinellas County. Approximately 27,000 daily passengers or 8.5 million annual passengers used these bus routes in 1990.

In conjunction with express bus routes, various park-n-ride lots were established throughout the County to encourage transit usage. Some of the lots were built exclusively for transit usage; however, many are mixed-use facilities. These mixed-use lots were generally established through operating arrangements with local private businesses, institutions and public agencies. No park-n-ride lots are currently located within the project limits.

### **6.2.2     Railroad Crossings**

There are no railroad crossings located within the project study limits.

### **6.2.3     Airport**

Tampa International Airport, located northwest of the project area, is a major generator of traffic and contributes to volumes on I-275 via Memorial Highway (S.R. 60). Proposed improvements to Memorial Highway (S.R. 60) to convert this facility to the Veterans Expressway will enhance access to the airport to and from I-275.

### **6.3 FUTURE-YEAR TRAFFIC PROJECTIONS**

As stated earlier, the TIS Master Plan Concept includes a four-roadway system on I-275 from west of the Kennedy Boulevard on-/off-ramps to east of Dale Mabry Highway. The four roadway system consists of an express freeway system with High Occupancy Vehicle (HOV)/Transitway lanes in the center of the roadway and a local access freeway system on the outside of the express lanes. Interchanges are provided at the following locations:

- \* Dale Mabry Highway (to and from the east and west on the local access freeway lanes);
- \* Lois Avenue/Cypress Street (to and from the east and west on the local access freeway lanes);
- \* Westshore Boulevard (to and from the east on the local access freeway lanes);
- \* Veterans Expressway (to and from the east on the express freeway lanes);
- \* Memorial Highway (S.R. 60) (to and from the east and west on the local access freeway lanes), and
- \* Kennedy Boulevard (to and from the west on the local access freeway lanes).

To assess the impact of the proposed project, design year traffic projections were estimated. These projections were estimated using the Florida Standard Urban Transportation Model Structure (FSUTMS) for Hillsborough County, as supplied by FDOT and refined during Phase I of TIS. The design year (2010) average daily traffic volumes for the Master Plan Concept are illustrated on Exhibits 6.11 and 6.12. Both the total daily traffic volumes and the daily HOV volumes are presented for the express freeway lanes east of Trask Street. It should be noted that the total daily traffic volumes also include the HOV volumes in the area where the HOV lanes are

present. As indicated on Exhibits 6.11 and 6.12, the 2010 average daily traffic volume on I-275 increases from approximately 124,100 vpd west of the Kennedy Boulevard interchange to approximately 215,800 vpd east of the Dale Mabry Highway interchange.

Directional design hour volumes were estimated from the 2010 daily traffic volumes using the "K" and "D" factors previously approved by FDOT during the Phase I Master Plan effort of TIS. A K-factor of 8 percent and a D-factor of 55 percent were used in the analysis of the segment of I-275 from the Howard Frankland Bridge to Westshore Boulevard. A K-factor of 8 percent and a D-factor of 50 percent were used in the analysis of I-275 from Westshore Boulevard to Ashley Street. These values were previously documented in the April 1989 Travel Demand Technical Report and the Final Master Plan Report. Adjustments were made to some of the design hour volumes in the segment of I-275 between Westshore Boulevard and Ashley Street to account for the two different D-factors used in the overall study.

The directional design hour volumes are illustrated on Exhibits 6.11 and 6.12. The volumes for mainline I-275 and the on-/off-ramps illustrated on these two exhibits are the same as those contained in the Master Plan Report. As indicated on Exhibits 6.11 and 6.12, the total 2010 directional design hour volumes on I-275 ranges from 5,459 vehicles per hour (vph) west of the Kennedy Boulevard interchange to 8,631 vph east of the Dale Mabry Highway interchange.

#### **6.4 FUTURE CONDITIONS**

Evaluations of design year (2010) operating conditions for the Master Plan Concept and the No-Build Alternative were conducted using the directional design hour

volumes presented on Exhibits 6.11 and 6.12. The analyses were based upon the following assumptions:

Peak Hour Factor (PHF)	=	0.95
Design Hour Truck Percentage	=	3%
Design Hour Bus/RV Percentage	=	0%
Population Factor	=	1.0
Terrain	=	Level
Design Speed		
Express Freeway	=	60 mph
Local Access Freeway	=	50 mph

The following sections discuss the 2010 Master Plan Concept and the No-Build Alternative operations analysis results.

#### **6.4.1     Design Year (2010) Master Plan Traffic Operations**

The Master Plan Concept for I-275 within the Environmental Assessment study limits is schematically illustrated on Exhibits 6.13 and 6.14. As indicated on Exhibit 6.14 left-hand on-/off-ramps are provided at the I-275/Dale Mabry Highway interchange. These left-side ramps are provided to avoid operational problems (weaving, merging and diverging) that would otherwise result due to the close proximity of the Lois Avenue and Himes Avenue ramps. Traffic operations analyses conducted during the Tier 2 of the TIS Master Plan (Phase I) indicated that improved operations would result with the left-side on-/off-ramps. This interchange concept also eliminates the possibility of vehicles entering I-275 at Lois Avenue and exiting at Dale Mabry Highway (and the return movement) without requiring "braided" ramps to preclude these movements. The horizontal alignment of I-275 in the vicinity of Dale Mabry Highway facilitates the implementation of this type of interchange. This concept was approved by FHWA in their November 1989 acceptance of the Master Plan.

The design year (2010) traffic operations analyses for I-275 included evaluations of ramp junctions and weaving areas on the express freeway lanes and local access freeway lanes. The analyses were conducted for the Master Plan Concept during Phase I of TIS and the results are documented in the Task F.5.e.-Travel Demand Technical Report (April 1989) published separately. The merge/diverge and weaving area level of service criteria listed in the Traffic Memorandum for this project were used for these evaluations. Operations analyses were conducted for five merge areas, five diverge areas and eight weaving areas.

Table 6.8 summarizes the results of the operations analyses for I-275 from the east end of the Howard Frankland Bridge to east of Dale Mabry Highway. All 18 locations analyzed are projected to operate at Level of Service D or better. In addition, 10 of these 18 locations are projected to operate at Level of Service C or better.

In addition to the ramp merge/diverge area and weaving area analyses, signalized intersection analyses were also conducted at the following locations:

- \* Memorial Highway (S.R. 60) and Sherrill Street;
- \* Westshore Boulevard and I-275 on-/off-ramps;
- \* Trask Street and I-275 on-/off-ramps;
- \* Lois Avenue and I-275 on-/off-ramps, and
- \* Dale Mabry Highway and I-275 on-/off-ramps.

The intersections listed above were analyzed to determine the lane geometry required for these locations to operate at Level of Service D or better during the peak hours.

Exhibits 6.15 and 6.16 illustrate the 2010 a.m. and p.m. peak hour turning movements. The 2010 intersection lane geometry is provided on Exhibits 6.17 and 6.18. The results



TABLE 6.8

DESIGN YEAR (2010) FREEWAY OPERATIONS ANALYSIS SUMMARY -  
MERGE/DIVERGE AND WEAVING AREAS  
Tampa Interstate Study - Phase II

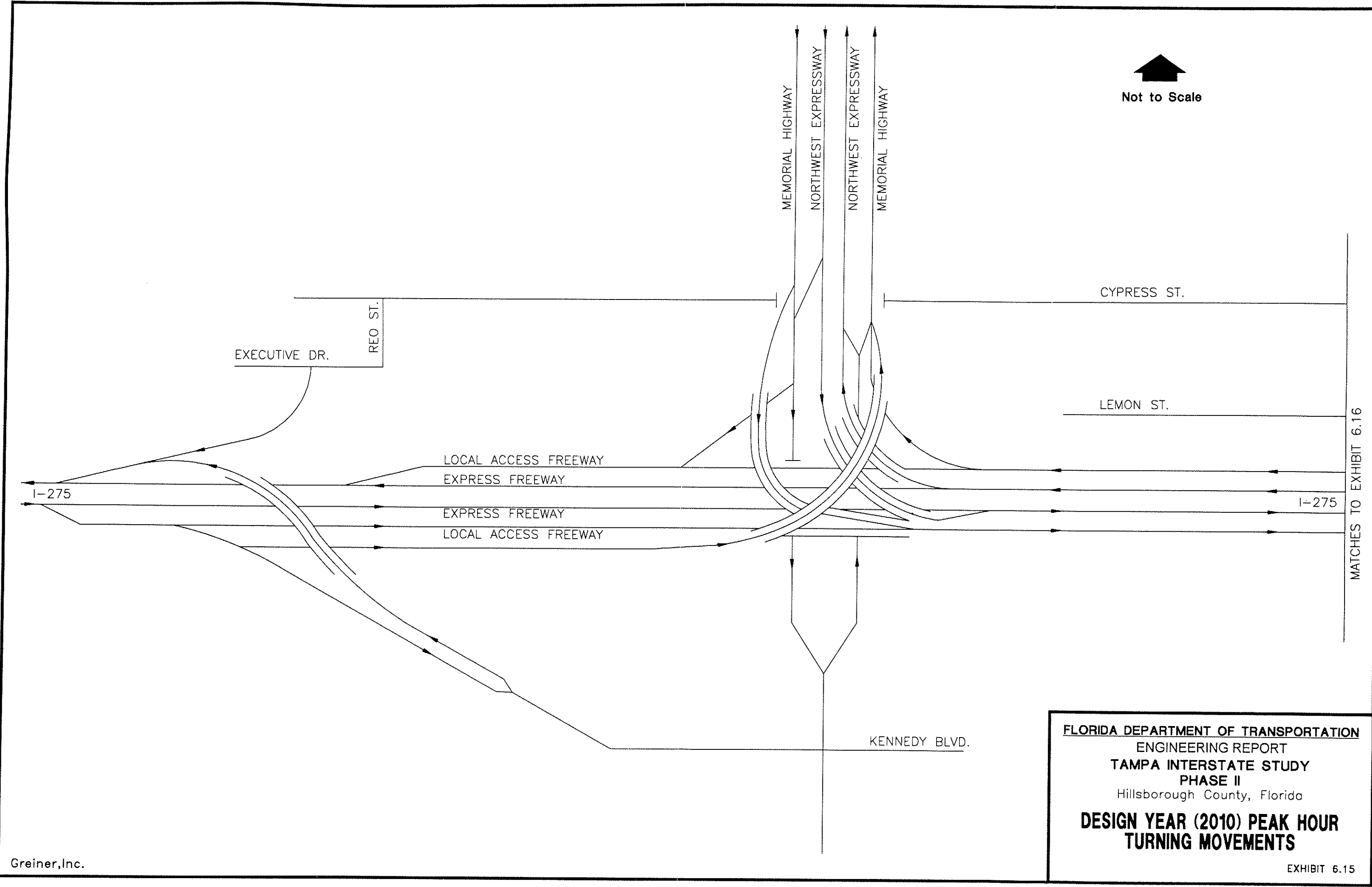
Location	Merge Area			Diverge Area			Weaving Area			
	Ramp Volume (in vph)	Merge Volume (in pcph)	Merge Level of Service	Ramp Volume (in vph)	Diverge Volume (in pcph)	Diverge Level of Service	Weave Type/ Weave Length	Weaving Speed (in mph)	Non-Weaving Level of Service	Non-Weaving Speed (in mph)
EB I-275 Off-Ramp to Local Freeway				3,179	1,925 1,888	D D				
EB I-275 Express Freeway on-ramp from Northwest Hillsborough Expressway	1,495	1,272 1,504	C C							
EB I-275 Local Freeway off-ramp to Kennedy Boulevard				1,069	1,148	B				
EB I-275 Local Freeway off-ramp to Memorial Highway				494	904	B				
EB I-275 Local Freeway between Memorial Highway and Lois Avenue							C/2,500	42.0	C	40.7
EB I-275 Local Freeway between Westshore Boulevard and Dale Mabry Highway							C/1,900	37.9	D	35.8
EB I-275 Local Freeway on-ramp from Lois Avenue	760	1,057	B							
EB I-275 Local Freeway between Dale Mabry Highway and Himes Avenue							C/3,400	40.8	C	38.5
EB I-275 Local Freeway between Himes Avenue and Armenia Avenue							B/1,600	40.8	C	40.8
WB I-275 Local Freeway between Armenia Avenue and Himes Avenue							B/1,000	40.1	C	39.2
										D

TABLE 6.8

DESIGN YEAR (2010) FREEWAY OPERATIONS ANALYSIS SUMMARY -  
MERGE/DIVERGE AND WEAVING AREAS  
Tampa Interstate Study - Phase II  
(Continued)

Location	Merge Area			Diverge Area			Weaving Area			
	Ramp Volume (in vph)	Merge Volume (in pcph)	Merge Level of Service	Ramp Volume (in vph)	Diverge Volume (in pcph)	Diverge Level of Service	Weave Type/ Weave Length	Weaving Speed (in mph)	Non-Weaving Level of Service	Non-Weaving Speed (in mph)
WB I-275 Local Freeway between Himes Avenue and Dale Mabry Highway							C/2,950	39.9	D	37.6
WB I-275 Local Freeway off-ramp to Lois Avenue				760	1,019	B				
WB I-275 Local Freeway between Dale Mabry Highway and Westshore Boulevard							B/2,100	44.1	C	47.1
WB I-275 Local Freeway between Lois Avenue and Memorial Highway							B/2,900	47.6	B	52.9
WB I-275 Local Freeway on-ramp from Memorial Highway	359	759	B							
WB I-275 Express Freeway off-ramp to Northwest Hillsborough Expressway				1,495	1,710	D				
WB I-275 Express Freeway on- ramp from I-275 Local Freeway	1,076	578	A	1,033		B				
WB I-275 Express Freeway on-ramp from Kennedy Boulevard/Northwest Hillsborough Expressway	1,204	1,684	D							

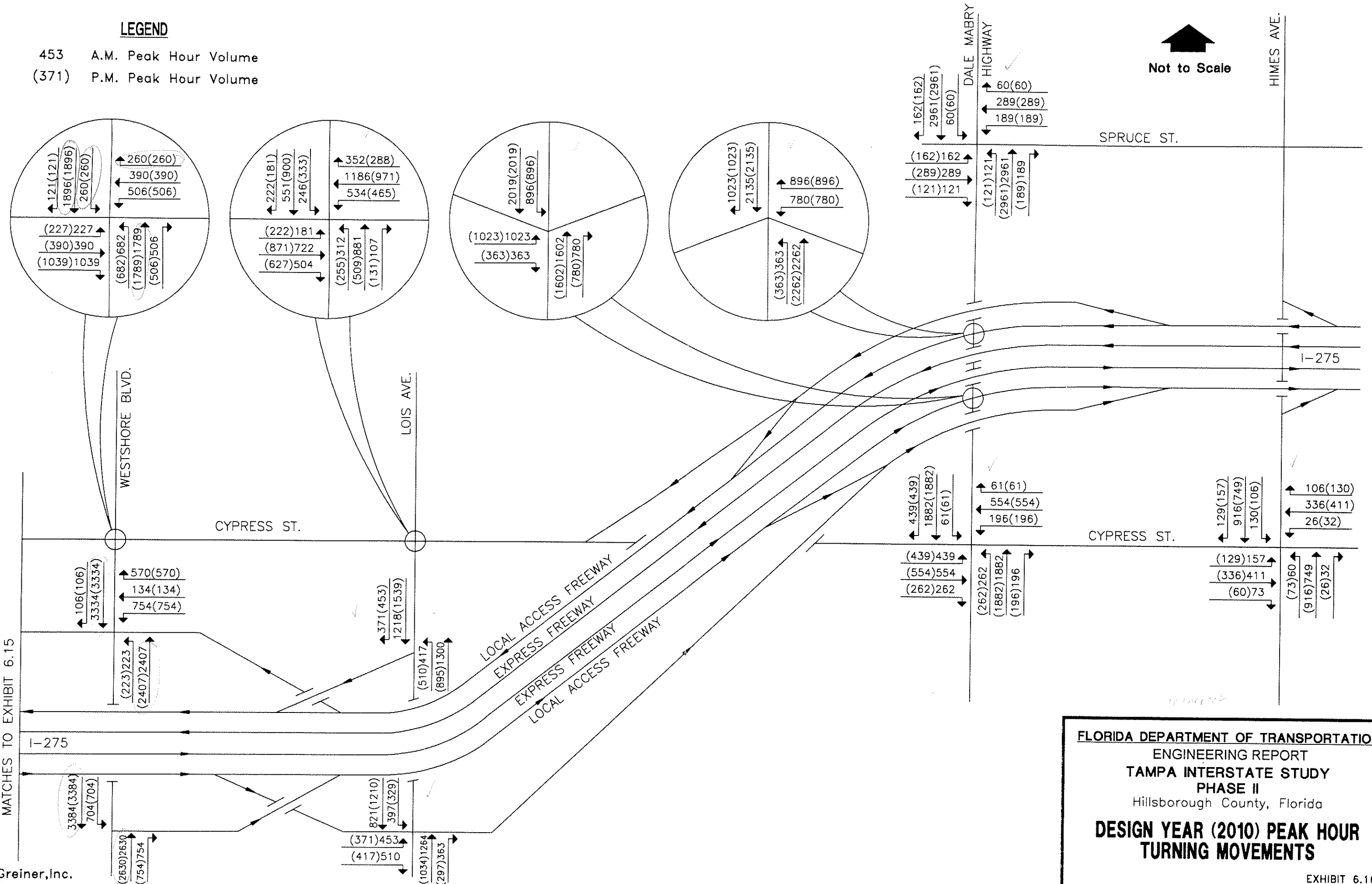
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TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida  
**DESIGN YEAR (2010) PEAK HOUR  
TURNING MOVEMENTS**

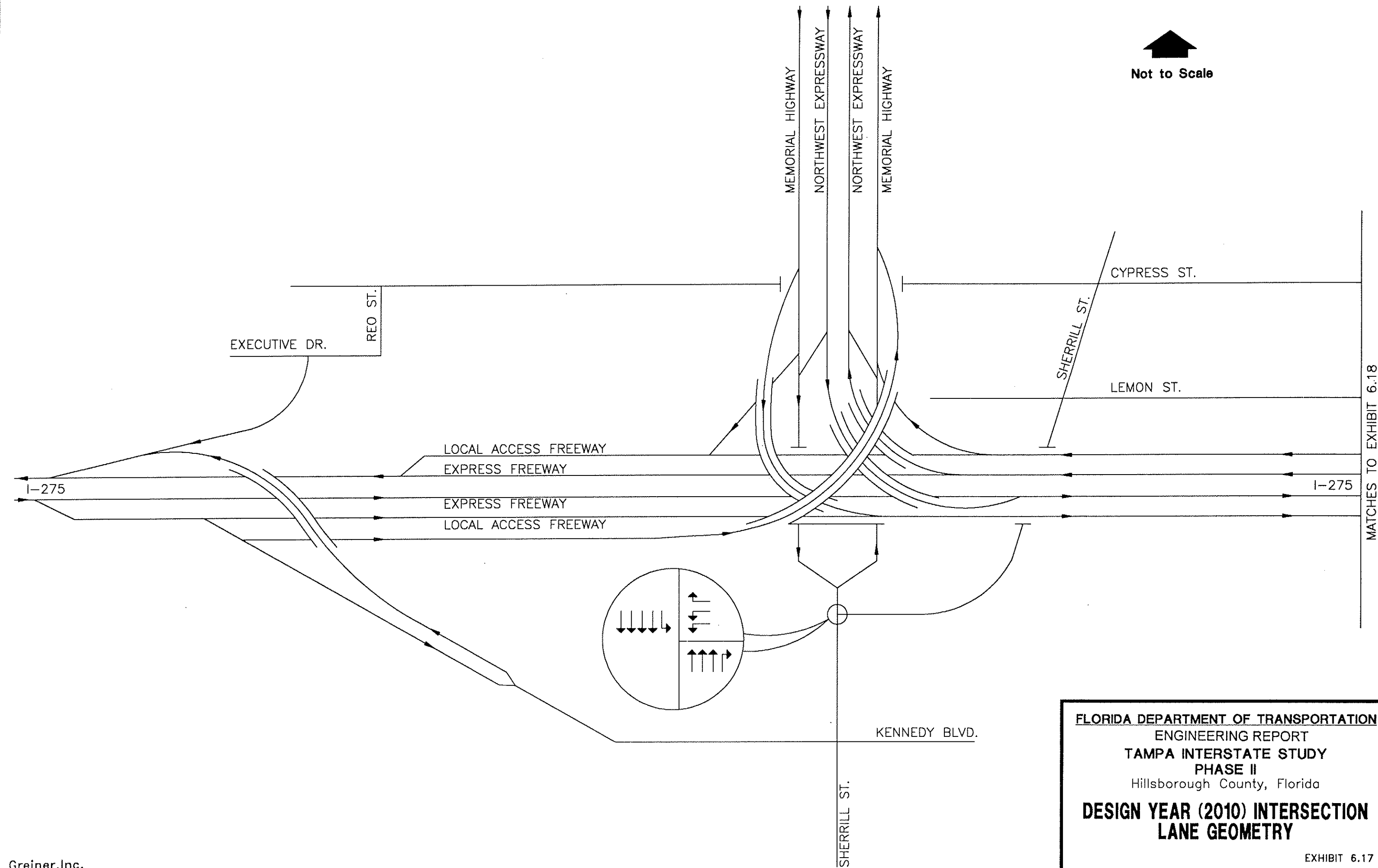
# LEGEND

453 A.M. Peak Hour Volume  
(371) P.M. Peak Hour Volume



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TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida  
**DESIGN YEAR (2010) PEAK HOUR  
TURNING MOVEMENTS**

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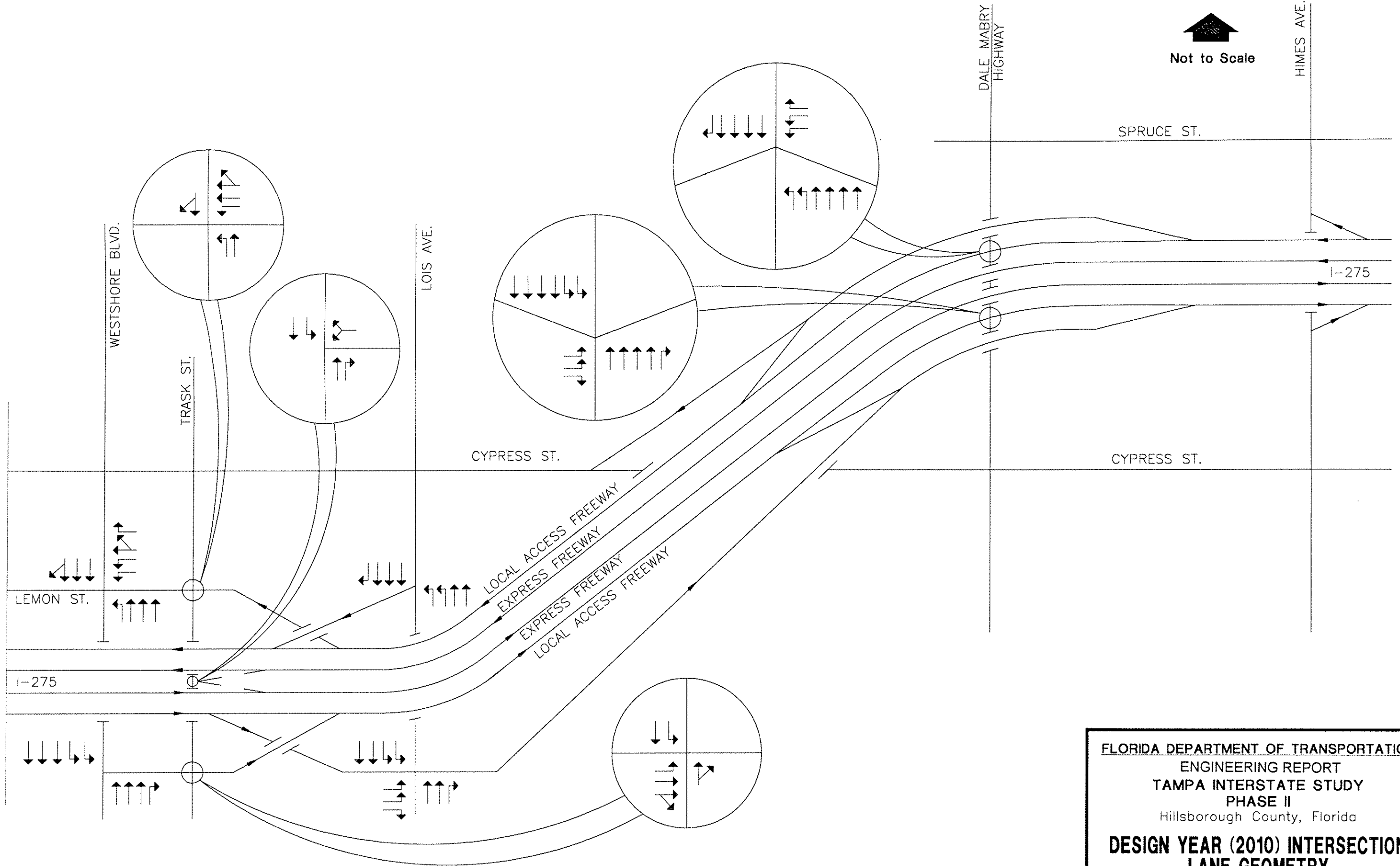


FLORIDA DEPARTMENT OF TRANSPORTATION  
ENGINEERING REPORT  
TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida  
**DESIGN YEAR (2010) INTERSECTION  
LANE GEOMETRY**

EXHIBIT 6.17

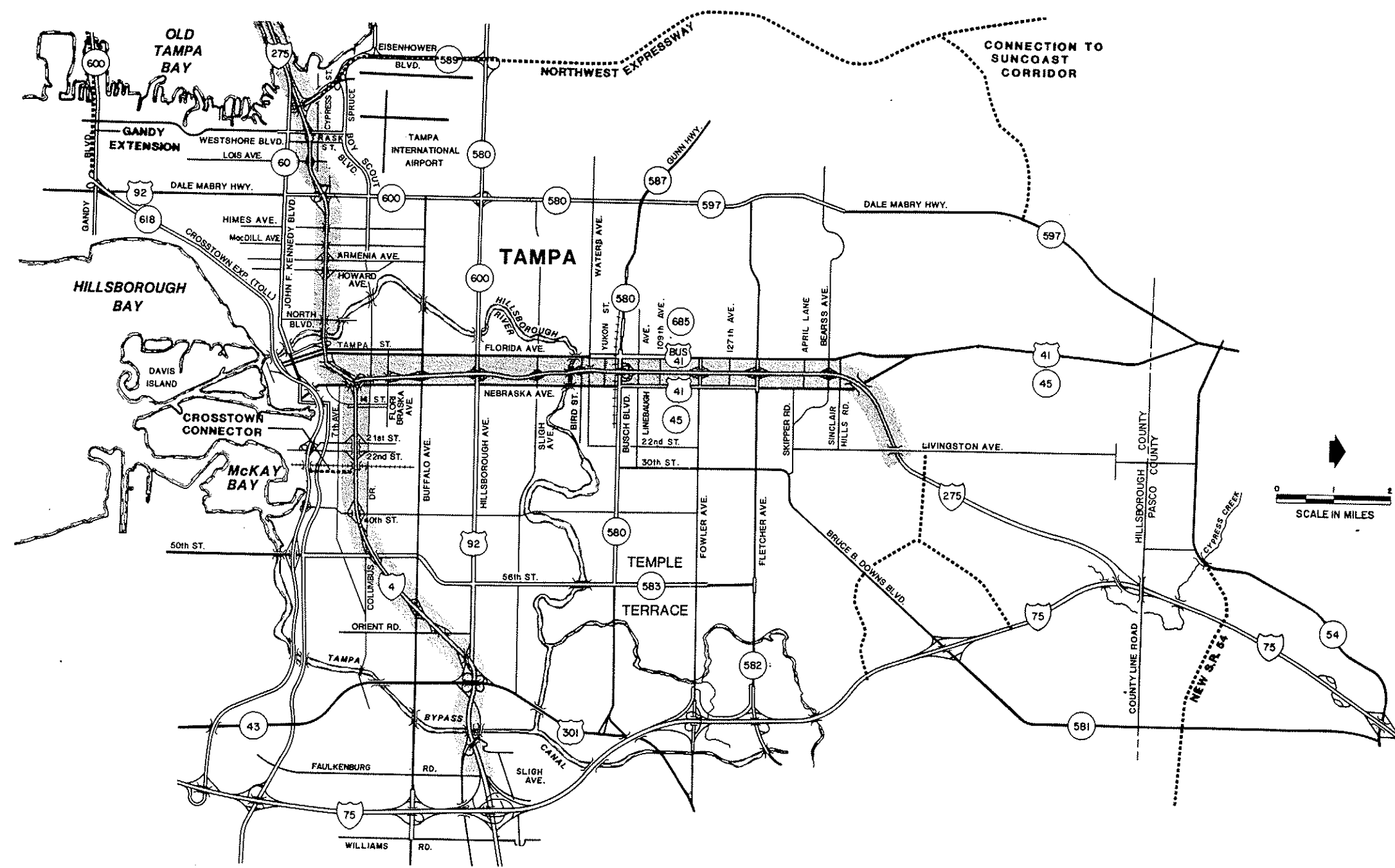
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MATCHES TO EXHIBIT 6.17



Not to Scale

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**DESIGN YEAR (2010) INTERSECTION  
LANE GEOMETRY**



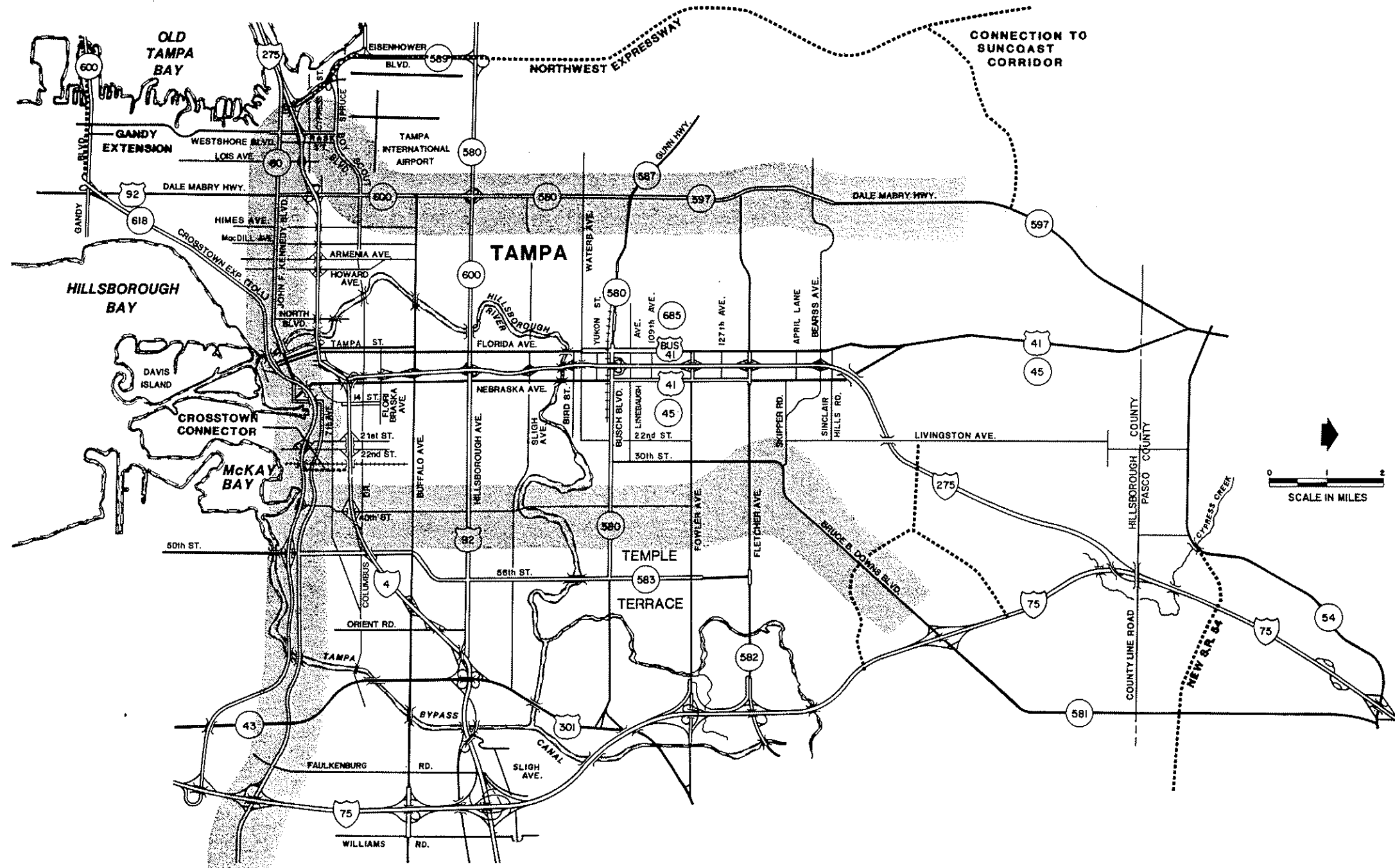
Greiner, Inc.

### LEGEND

- Proposed New Roads
- ██████ HOV Corridors

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### HOV CORRIDORS



Greiner, Inc.

### LEGEND

- Proposed New Roads
- ▬ Rail Transit Corridors

FLORIDA DEPARTMENT OF TRANSPORTATION  
ENGINEERING REPORT  
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PHASE II**  
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### RAIL TRANSIT CORRIDORS

EXHIBIT 6.21



of the 2010 a.m. and p.m. peak hour signalized intersection analyses are summarized in Table 6.9. As indicated in Table 6.9, all five of the intersections analyzed are projected to operate at Level of Service D or better in the peak hours with the lane geometry illustrated on Exhibits 6.17 and 6.18. Of the five intersections, three are projected to operate at Level of Service C or better during the a.m. and p.m. peak hours and seven are projected to operate at Level of Service D.

Although all five signalized intersections listed in Table 6.9 are projected to experience average vehicle delays of less than 40.0 seconds per vehicle, the V/C ratio for the intersection of Dale Mabry Highway and the I-275 on-/off-ramps is projected to exceed 1.00. The V/C ratio indicates the proportion of available intersection capacity that is being used by vehicles during the critical movements. If the V/C ratio exceeds 1.00, one or more of the critical movements will be oversaturated and traffic flow breakdowns are likely to occur. At the intersection of Dale Mabry Highway and the I-275 on-/off-ramps, the following movements are projected to operate at Level of Service E or F during the peak hours:

- \* Eastbound left-turn (Level of Service E);
- \* Westbound left-turn (Level of Service F);
- \* Northbound left-turn (Level of Service E);
- \* Northbound through (Level of Service E); and
- \* Southbound left-turn (Level of Service F).

It should be noted that the operational problems projected to occur at this location were previously identified in the Master Plan Report. Due to right-of-way costs, relocations, maximum geometry at the interchange and the excess capacity available at the adjacent interchange ramp terminals, no additional improvements are recommended for this location.

TABLE 6.9

**DESIGN YEAR (2010) SIGNALIZED INTERSECTION  
OPERATIONS ANALYSIS SUMMARY  
Tampa Interstate Study - Phase II**

<u>Location</u>	<u>A.M. Peak Hour</u>			<u>P.M. Peak Hour</u>		
	<u>V/C<sup>1</sup></u>	<u>Average Delay<sup>2</sup></u>	<u>LOS<sup>3</sup></u>	<u>V/C<sup>1</sup></u>	<u>Average Delay<sup>2</sup></u>	<u>LOS<sup>3</sup></u>
Memorial Highway and Sherrill Street	0.88	17.6	C	1.00	25.0	C
Westshore Boulevard and I-275 On-/Off-Ramps	0.98	35.8	D	0.98	35.8	D
Trask Street and I-275 On-/Off-Ramps	0.76	23.2	C	0.76	23.2	C
Lois Avenue and I-275 On-/Off-Ramps	0.66	14.9	B	0.75	16.1	C
Dale Mabry Highway and I-275 On-/Off-Ramps	1.04	37.8	D	1.04	37.8	D

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<sup>1</sup> V/C = Volume-to-Capacity Ratio

<sup>2</sup> Average Delay in seconds per vehicle

<sup>3</sup> LOS = Level of Service

Improvements to construct the I-275/Veterans Expressway interchange will be terminated north of the Kennedy Boulevard/Memorial Highway (S.R. 60) intersection. Although forecast volumes show the need for significant improvements, this intersection is considered to be outside of the project study limits but will be subject to further study by the Department.

## **6.5 FUTURE MULTI-MODAL TRANSPORTATION SYSTEM**

The Master Plan for the reconstruction of the interstate system was developed as a component of the 2010 highway plan as well as the future transit system for Hillsborough County. To ensure each component of the transportation plan was properly developed and accounted for the impacts of the other components, a Multi-Modal Consensus Committee was established. This committee provided technical consistency between the TIS, the Rail Transit Study (RTS), the 2010 Long Range Transportation Plan and the Hillsborough Regional Transit Authority (HART).

In developing the interstate Master Plan, consideration was given to the influence of other travel modes on the design features and capacity of the interstate system. These design features included HOV lanes, HOV/Transitways, bus and carpool exclusive access to the HOV facilities, and the rail transit system. The arterial highway system that accesses the interstate system was derived from the 2010 Long Range Transportation Plan for Hillsborough County, as adopted by the Board of the Tampa Urban Area Metropolitan Planning Organization (Tampa MPO).

The following sections of this report describe the technical consensus process used to establish the appropriate travel demand levels for each mode and the design of the interstate system and the rail transit system.

### 6.5.1 Multi-Modal Coordination

To coordinate the TIS and the RTS with the Long Range Transportation Plan for Hillsborough County, a Multi-Modal Consensus Committee was created by the FDOT.

The following participants were involved in this committee:

- \* Florida Department of Transportation,
- \* Tampa Urban Area Metropolitan Planning Organization,
- \* Hillsborough Area Regional Transit Authority,
- \* Tampa Interstate Study consultants, and
- \* Rail Transit Study consultants.

The Multi-Modal Consensus Committee met regularly to ensure the Tampa interstate and rail transit study teams included the latest developments of each study in their respective transportation plans. In this way, compatibility in the transportation program development of the two studies was achieved. This committee also met regularly with the Rail Transit Study Management Team (RTS) and the TIS consultant to discuss coordination issues. In addition, the RTS consultant and the MPO are members of the Agency Task Force (ATF) Committee of the TIS.

The primary purpose of the Multi-Modal Consensus Committee was to coordinate the technical consistency between the two studies and the Long Range Transportation Plan. The focus of this technical consistency was the travel demand estimates for each mode that reflected a balanced transportation system. Several meetings were held to discuss input data and model parameters used by each consultant in their travel demand forecasting procedures. Comparative analyses of travel demand forecasts generated by the different forecasting procedures were performed. The basic bus and rail transit information used by the TIS consultant to simulate the Tier 2 and Tier 3 alternatives, including rail transit, was provided by the RTS consultant.

This information included the basic transit route files for local bus, express bus and rail transit for peak and off-peak periods, mode of transit access files, and model parameters for transit path-finding and mode choice programs. The TIS consultant refined the basic highway network and socioeconomic data prepared by the Tampa MPO staff and updated the basic mode-specific constants to reflect an improved public perception and usage of the current transit system. Both consultants worked together to refine the results of the Direct Utility Assessment (DUA) Survey to incorporate them into the validated travel demand model for Hillsborough County. The committee reached agreement on the highway and transit networks and modal split procedures that produced consistent travel demand results on the highway and rail transit systems. All the travel demand data used for the multi-modal coordination were presented to the MPO during a special workshop on October 17, 1988.

In summary, both study teams agreed upon the basic assumptions which underline planning and engineering considerations for the development of traffic and transit ridership forecasts for these two projects. As a result of this cooperation, compatible and consistent data and results were utilized to develop the design features of the respective transportation facilities. A detailed discussion of the process used to reach this consensus is contained in an MPO technical memorandum, Multi-Modal Consensus - Travel Demand Forecasting Coordination Effort.

#### 6.5.2 HOV/Bus Transit Plan

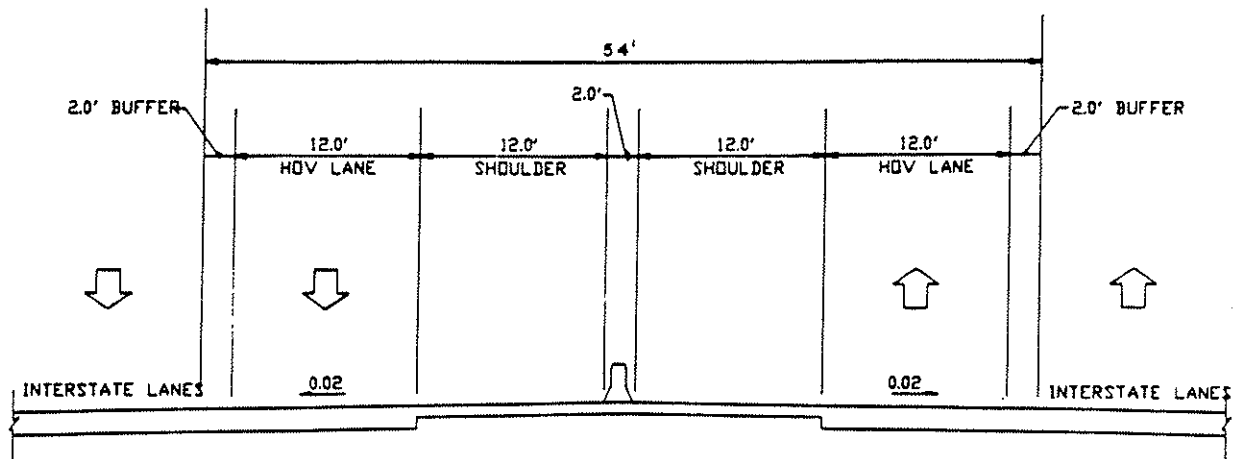
HOV and certain transit facilities were developed as part of the Master Plan for the reconstruction of the interstate system. The HOV/Bus facilities included concurrent flow and exclusive HOV lanes, HOV/Transitways, priority access ramps, and park-n-ride lots for buses and carpools. The HOV system extends from the Howard

Frankland Bridge to the vicinity of the Livingston Avenue overpass on I-275 and from I-275 to west of I-75 on I-4, as illustrated on Exhibit 6.19. The impacts of the HOV system were considered in the redesign of the interstate system. The final plan for the HOV system is presented in the following paragraphs.

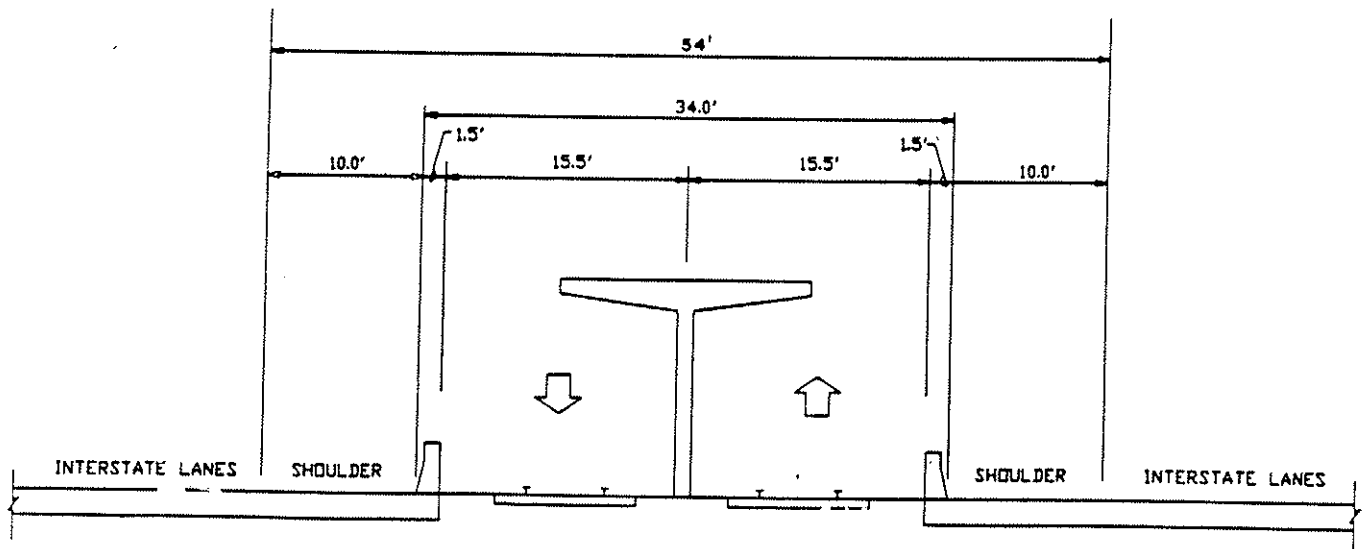
In general, concurrent flow HOV lanes adjacent to the interstate lanes are proposed. The concurrent flow concept was selected as the general HOV cross-section to minimize right-of-way requirements and maintain two-way transit operations. The 54-foot HOV envelope provides for extra-wide inside shoulders, a buffer area, and HOV lanes. It is also wide enough to accommodate the conversion of the HOV lanes to rail transit, if desired, at a future time, as illustrated on Exhibit 6.20.

Three-or-more person carpools and buses are permitted to use the HOV system. This requirement maintains LOS C or better operation in the HOV lanes, especially through the weaving areas between the downtown interchanges and to meet FHWA guidelines. When two-or-more person carpools were analyzed as part of the evaluation, it was determined that a substantial portion of the HOV system would operate at LOS D, similar to the interstate lanes, and would not encourage the use of carpools.

Access to the HOV lanes is generally accomplished by using the normal freeway ramps and then by weaving across the interstate lanes. By-pass ramps were not generally considered because of the high number of two-lane ramps already required to accommodate projected traffic. As a result, priority access ramps within the study limits are provided to and from the east at Trask Street to allow direct access to the HOV lanes.



CONCURRENT FLOW HOV



RAIL TRANSIT

Greiner, Inc.

**FLORIDA DEPARTMENT OF TRANSPORTATION**

**ENGINEERING REPORT**

**TAMPA INTERSTATE STUDY**

**PHASE II**

Hillsborough County, Florida

**CONVERSION OF CONCURRENT FLOW  
HOV LANES TO RAIL TRANSIT SECTION**

EXHIBIT 6.20

These ramps were located to provide direct service to the Westshore area. The priority HOV ramps were connected to Trask Street so that interstate traffic on Westshore Boulevard can be separated from HOV traffic and, as a result, improve cross-street operations.

In addition to priority HOV ramps, new park-n-ride lots were proposed along the interstate to supplement the existing lots. These lots were positioned near the interstate in conjunction with the priority HOV ramps to provide convenient access to the HOV lanes. The locations of these lots are as follows:

- \* Florida State Fairgrounds (new);
- \* Yukon Street (existing);
- \* Sinclair Hills Road (currently proposed);
- \* North Tampa Parkway (new); and
- \* New S.R. 54 (new).

A park-n-ride lot in the Westshore area has not yet been established.

### 6.5.3 Rail Transit Study

In 1986, the MPO initiated the Hillsborough County Mass Transit Corridor Alternatives Analysis Study (Rail Transit Study). The purpose of this study was to perform preliminary planning work leading up to the engineering, construction, and operation of a fixed guideway rail transit system for Hillsborough County. Based on earlier studies, initial work focused on the technology known as light rail. Essentially, this type of system operates mainly on the surface along its own exclusive right-of-way in which automobile and bus traffic could operate crossing or paralleling operations. Service on this light rail system was envisioned to be provided by a vehicle resembling a modern streetcar. Also, as a result of earlier studies, three



corridors were identified to have the highest potential ridership for rail transit. These corridors, as illustrated on Exhibit 6.21 and targeted for services, are:

- \* The Northwest Corridor extending from the Tampa CBD paralleling Kennedy Boulevard with a connection into Tampa International Airport (TIA) and then heading north at Dale Mabry Highway and/or Himes Avenue past Tampa Bay Center and Tampa Stadium through the Carrollwood area to Van Dyke Road.
- \* The North Central Corridor extending from the Tampa CBD east along Adamo Drive to 40th Street and then heading north to the University of South Florida and then northeast along Bruce B. Downs Boulevard to I-75.
- \* The Eastern Corridor running along Adamo Drive from the Tampa CBD to the Brandon area ending at Valrico Road.

As the study continued, the MPO and other interested parties noted light rail was not the only option for fixed guideway transit. To investigate further and better acquaint themselves with the many different rail technologies available in the market, a number of Tampa local public officials and private citizens visited several cities in North America to be briefed by the respective operators on the characteristics of their systems. Upon completion of that trip, the MPO in January 1988 resolved to expand the scope of the study so that a broader evaluation of the rail transit concept could be undertaken.

The expanded scope of services envisioned four rail transit categories as compared to a specific light rail technology. The four categories the MPO considered necessary for evaluation were:

- \* Category A - a predominantly at-grade or ground level system operating in an exclusive right-of-way on the surface except for areas with high traffic congestion or natural obstructions;

- \* Category B - a system with a greater portion of elevated or otherwise exclusive line sections based primarily on the potential interference with automobile traffic;
- \* Category C - a system envisioned to have no grade crossings with automobiles and thus would be totally exclusive but at-grade where feasible, particularly in outlying sections; and
- \* Category D - totally elevated with no at-grade line crossings.

In any case, the broader non-technology based analysis of rail transit categories was to maintain the three corridors identified by the earlier studies and by the MPO's Year 2010 Long Range Transportation Plan. Generally, the findings from the work conducted from the summer of 1988 to the present are as follows:

- \* On a daily basis, almost 68,000 people will ride the transit system;
- \* Additionally, over 53,000 transit patrons daily will access the expanded bus service of over 600 vehicles;
- \* In the a.m. peak hour, over 8 percent of all trips in Hillsborough County will be taken by mass transit in the year 2010;
- \* As a percentage of total operating costs to fare box recovery, the full rail transit system will recover over 60 percent of its cost;
- \* Over the initial 20-year investment period, the population of Hillsborough County will incur a cost of less than \$70 per person per year to finance the \$1.4 billion construction costs of a full transit system.
- \* The proposed connection to TIA is a viable and desired connection to the overall rail transit network. Further study is required, however, to determine whether a fixed guideway system or a bus circulator system is the preferred method of airport access. Such an evaluation will be based on engineering costs and travel demand; and
- \* Category C (i.e., a primarily elevated rail transit system) is the recommended rail transit system category for Hillsborough County.

The last general recommendation requires further explanation. Rail transit Category C, as noted earlier, is a primarily elevated operation with an at-grade operation anticipated only in the outlying areas of the three main corridors. While the at-grade operation of a rail transit system is less costly from a capital cost basis, mitigating circumstances require recommendation of an elevated system. Such mitigating circumstances include: 1) an at-grade rail system would severely impede cross and paralleling traffic flows; 2) an at-grade system would substantially reduce road access to homes and businesses; and 3) an at-grade system could result in excessive right-of-way acquisition costs (i.e., homes and/or businesses).

## **SECTION 7.0**

### **ALTERNATIVE ALIGNMENT ANALYSIS**

## **7.0 ALTERNATIVE ALIGNMENT ANALYSIS**

### **7.1 NO-BUILD ALTERNATIVE**

To identify the traffic operations impacts of not implementing the Master Plan in the study area, a No-Build Alternative was evaluated for the year 2010. For the purposes of this analysis, all segments of I-275 between interchanges which do not constitute a weaving area were analyzed as basic freeway segments using the 2010 design hour volumes illustrated on Exhibits 6.11 and 6.12 and the existing laneage illustrated on Exhibits 6.5 and 6.6, previously presented.

Table 7.1 summarizes the traffic operations analyses conducted for the 2010 No-Build Alternative. As indicated in Table 7.1, all 11 freeway segments analyzed are projected to operate at Level of Service F. The V/C ratios for these segments range from 1.09 (westbound I-275 between the Memorial Highway (S.R. 60) on-ramp and the Kennedy Boulevard on-ramp) to 1.47 (eastbound and westbound I-275 east of Dale Mabry Highway).

Given the severe lack of mainline capacity on I-275, traffic operations analyses were not conducted for the individual ramp merge/diverge and weaving areas. The number of basic freeway lanes required to provide Level of Service D was determined for each of these segments and these lane requirements are listed in Table 7.1. As indicated in Table 7.1, typically, two additional lanes in each direction would be required for I-275 from west of the Kennedy Boulevard interchange to east of the Dale Mabry Highway interchange to provide Level of Service D. The only exceptions are the segments of eastbound and westbound I-275 between the Kennedy Boulevard

TABLE 7.1

**NO-BUILD (2010) FREEWAY OPERATIONS ANALYSIS SUMMARY  
BASIC FREEWAY SEGMENTS  
Tampa Interstate Study - Phase II**

<u>Location</u>	<u>Directional Design Hour Volume</u>	<u>Existing Number of Lanes</u>	<u>V/C<sup>1</sup></u>	<u>LOS<sup>2</sup></u>	<u>Required Number of Lanes<sup>3</sup></u>
EB I-275 west of Kennedy Boulevard Off-Ramp	5,459	2	1.40	F	4
EB I-275 between Kennedy Boulevard Off-Ramp and Memorial Highway Off-Ramp	4,390	2	1.12	F	3
EB I-275 between Memorial Highway On-Ramp and Westshore Boulevard On-Ramp	6,926	3	1.18	F	4
EB I-275 between Lois Avenue On-Ramp and Southbound Dale Mabry Highway Off-Ramp	8,341	3	1.42	F	5
EB I-275 east of Dale Mabry Highway On-Ramp	8,631	3	1.47	F	5
WB I-275 east of Northbound Dale Mabry Highway Off-Ramp	8,631	3	1.47	F	5
WB I-275 between Dale Mabry Highway On-Ramp and Lois Avenue Off-Ramp	8,341	3	1.42	F	5
WB I-275 between Lois Avenue On-Ramp and Westshore Boulevard Off-Ramp	8,544	3	1.46	F	5
WB I-275 between Westshore Boulevard Off-Ramp and Memorial Highway Off-Ramp	6,926	3	1.18	F	4

TABLE 7.1

**NO-BUILD (2010) FREEWAY OPERATIONS ANALYSIS SUMMARY  
BASIC FREEWAY SEGMENTS  
Tampa Interstate Study - Phase II  
(Continued)**

<u>Location</u>	<u>Directional Design Hour Volume</u>	<u>Existing Number of Lanes</u>	<u>V/C<sup>1</sup></u>	<u>LOS<sup>2</sup></u>	<u>Required Number of Lanes<sup>3</sup></u>
WB I-275 between Memorial Highway On-Ramp and Kennedy Boulevard On-Ramp	4,255	2	1.09	F	3
WB I-275 west of Kennedy Boulevard On-Ramp	5,459	2	1.40	F	4

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<sup>1</sup> V/C = Volume-to-Capacity Ratio

<sup>2</sup> LOS = Level of Service

<sup>3</sup> Number of Lanes required to provide Level of Service D with revised service flow rates

on-/off-ramps and the Westshore Boulevard on-/off-ramps. These segments would require one additional lane in each direction to provide Level of Service D.

## **7.2 TRANSPORTATION SYSTEM MANAGEMENT**

Hillsborough County has, wherever possible, implemented Transportation System Management (TSM) improvements to improve existing facilities. TSM improvements involve increasing the available capacity within the existing right-of-way with minimum capital expenditures and without reconstructing the existing facility. TSM improvements to upgrade the existing I-275 corridor without total reconstruction would include adding HOV/Transitway lanes in the median or restriping existing lanes, implementing incident management systems, improving weaving sections between interchange ramps and providing ramp metering at entrance ramps.

The provision of HOV lanes will reduce the total number of vehicles in the corridor but not sufficiently to eliminate the need for additional lanes. Incident management systems will improve flow during emergencies and accidents but will not affect total demand. Ramp metering will limit the volume of traffic accessing the interstate, thus improving operations in the corridor, but will likely result in significant queues on the arterial street system. Given the fixed location of interchanges and the spacing, improving weaving areas would likely require braiding ramps and more significant reconstruction.

These types of improvements would provide some relief to operations and increase available capacity, but would still fall short of adding sufficient capacity to the system to accommodate the projected travel demand at an acceptable level of service.



Thus, the TSM alternative will not improve capacity significantly beyond the No-Build Alternative and was eliminated from further study.

### 7.3 STUDY ALTERNATIVES

Several roadway concept alternatives were developed for the design segments located within the study limits. Roadway design guidelines for developing these alternatives are provided in TIS Task F.2.b - Design Criteria Policies and Procedures Technical Memorandum. These alternatives are discussed in detail in the TIS Master Plan Report and Task F.6.a(6) - Tiers 1-3 Analysis. The following sections summarize design criteria elements and the alternatives analysis as referred to in these documents.

#### 7.3.1 Alternatives Considered

As noted in Section 7.1, the No-Build Alternative will not provide an adequate facility for future traffic demand. As a result, design criteria and alternatives were prepared to determine what system of roadway improvements best adheres to the needs of these vital transportation corridors.

##### 7.3.1.1 Design Criteria

Design criteria prepared for this project addresses various design areas, including roadway, structural, concurrent flow, HOV, and HOV/Transitway lanes. Tables 7.2, 7.3 and 7.4 provide the general design criteria for highway, HOV, and transit facilities used for improving the Tampa interstate system. Design criteria are discussed in detail in TIS Task F.2.b - Design Criteria Policies and Procedures Technical Memorandum and briefly discussed in the following sections.

**TABLE 7.2**  
**RECOMMENDED ROADWAY DESIGN STANDARDS**  
**Tampa Interstate Study - Phase II**

<u>Design Factors</u>	<u>Recommended Standards</u>
Speeds	<ul style="list-style-type: none"> <li>* Freeway - 60 mph Desirable 55 mph Minimum</li> <li>* Collector/Distributor - 45 mph Desirable 40 mph Minimum</li> <li>* Ramps - 50 mph Desirable 35 mph Minimum</li> <li>* Loops - 30 mph Minimum</li> <li>* Cross Streets - 45 mph Desirable 30 mph Minimum</li> </ul>
Pavement Widths	<ul style="list-style-type: none"> <li>* Freeway - 12' Standard Lane Width 12' HOV Lanes (w/painted Buffer) 12' Interchange Turning Lanes plus widening for curves</li> <li>Ramps - 15' Single Lane, 12' Dual Lanes</li> <li>Cross Streets - 12' Desirable, 11' Minimum</li> </ul>
Shoulder Widths	<ul style="list-style-type: none"> <li>* Freeway - 12' Outside (10' Paved) 10' Outside (w/Barrier Wall) 6'-10' Outside (If outside lane is auxiliary lane w/Barrier Wall) 10' Inside (w/Barrier Wall)</li> <li>* Ramps -</li> <li>Single Lane - 6' Outside (4' Paved) 6' Outside (w/Barrier Wall) 6' Inside (2' Paved) 6' Inside (w/Barrier Wall)</li> <li>Dual Lane - 10' Outside (8' Paved) 10' Outside (w/Barrier Wall) 8' Inside (4' Paved) 6' Inside (w/Barrier Wall)</li> </ul>
Maximum Grades	<ul style="list-style-type: none"> <li>* Freeway - 3% for 60 mph 4% for 55 mph</li> <li>* Collector/Distributor - 4% for 45 mph 5% for 40 mph</li> <li>* Ramps - Ascending-6% Descending-7%</li> </ul>

**TABLE 7.2**  
**RECOMMENDED ROADWAY DESIGN STANDARDS**  
**Tampa Interstate Study - Phase II**  
**(Continued)**

<u>Design Factors</u>	<u>Recommended Standards</u>
Maximum Degree of Curve	* Freeway & Collector/ Distributor - 60 mph 50'-15' 55 mph 60'-30' 45 mph 100'-15' 40 mph 130'-15' * Ramps - 50 mph 80'-15' 35 mph 180'-30'  * Loops - 30 mph 240'-45' (230' R)
Cross Slopes (in tangent)	* Freeway, Collector/Distributor, and Ramp 0.03 ft. per ft. maximum  * Shoulders - 0.06 ft. per ft. outside 0.05 ft. per ft. inside  * Embankments - 6:1 within clear recovery zone
Vertical Clearances	* 16'6" Minimum over freeway 16'6" Recommended; 15'0" minimum over cross road, for existing structures 17' For overhead pedestrian crossings and sign trusses

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Sources: "A Policy on Design of Highways and Streets," AASHTO, 1990

"Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways," FDOT, 1989

"Structures Design Guidelines," FDOT, 1987

**TABLE 7.3**  
**RECOMMENDED CONCURRENT FLOW HOV LANE**  
**DESIGN STANDARDS**  
**Tampa Interstate Study - Phase II**

<u>Design Factors</u>	<u>Recommended Standards</u>
Speeds	<ul style="list-style-type: none"> <li>* 60 mph desirable/55 mph minimum</li> <li>* Ramps: - 50 mph desirable/35 mph minimum</li> </ul>
Pavement Widths	<ul style="list-style-type: none"> <li>* Minimum 12' lane width</li> <li>* Interchanges and ramps per 1990 AASHTO standards, 12' minimum lane width</li> </ul>
Shoulder Widths, Safety/Refuge Areas, and Buffer Areas	<ul style="list-style-type: none"> <li>* 12' @ left shoulder for HOV and interstate vehicles with 2' buffer area between HOV lane and freeway lanes.</li> <li>* Single Ramp: - 8' left and right</li> <li>* Double Ramp: - 2' right and left, 10' center, median refuge area</li> </ul>
Vertical Alignment	<ul style="list-style-type: none"> <li>* 3% maximum desirable</li> <li>* Ramps: - 7% maximum</li> <li>* Length of crest and sag vertical curves - 1990 AASHTO Standards</li> </ul>
Horizontal Alignment	<ul style="list-style-type: none"> <li>* 60 mph desirable/55 mph minimum</li> <li>* Ramps: - 50 mph desirable/35 mph minimum</li> <li>* Ramp Transition Lanes - 1990 AASHTO Standard 600'</li> <li>* Ramp Taper Ratios - 1990 AASHTO Standard</li> </ul>
Cross Slopes - Tangent	<ul style="list-style-type: none"> <li>* 0.03 ft. per ft. maximum</li> </ul>
Vertical Clearances	<ul style="list-style-type: none"> <li>* 16.5'</li> </ul>

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**Notes:** All HOV lanes assumed to be concurrent flow lanes adjacent to freeway travel lanes.

@ Suggested minimum to provide for breakdowns and enforcement of HOV lanes adjacent to barrier wall.

**Sources:** AASHTO; Existing documentation on transitway standards and planning studies; Gannett Fleming Transportation Engineers, Inc. and Texas Transportation Institute.

TABLE 7.4

**RECOMMENDED HOV/TRANSITWAY DESIGN STANDARDS**  
**Through Downtown Tampa Interchange Area**  
**Tampa Interstate Study - Phase II**

<u>Design Factors</u>	<u>Recommended Standards</u>
Speeds	<ul style="list-style-type: none"> <li>* 60 mph desirable/55 mph minimum</li> <li>* Ramps: 50 mph desirable/35 mph minimum</li> </ul>
Pavement Widths	<ul style="list-style-type: none"> <li>* 12' lane width</li> <li>* Ramps: 12' lane width minimum</li> </ul>
Shoulder Widths	<ul style="list-style-type: none"> <li>* Single lane transitway: 8' left and right desirable</li> <li>* 2-lane 2-way transitway: 2' left and right with 10' median refuge area</li> <li>* Single Ramp: 8' left and right</li> <li>* Double Ramp: 2' left and right</li> </ul>
Median Refuge Area Width	<ul style="list-style-type: none"> <li>* 2-lane 2-way transitway: 10'</li> </ul>
Vertical Alignment	<ul style="list-style-type: none"> <li>* 3% maximum desirable</li> <li>* Ramps: 7% maximum</li> <li>* Length of crest and sag vertical curves - 1990 AASHTO Standards</li> </ul>
Horizontal Alignment	<ul style="list-style-type: none"> <li>* 60 mph desirable/55 mph minimum</li> <li>* Ramps: 50 mph desirable/35 mph minimum</li> <li>* Ramp Transition Lanes - 1990 AASHTO Standard</li> <li>* Ramp Taper Ratios - 1990 AASHTO Standard</li> </ul>
Cross Slopes - Tangent	<ul style="list-style-type: none"> <li>* 0.03 ft. per ft.</li> </ul>
Vertical Clearances	<ul style="list-style-type: none"> <li>* 16.5'</li> </ul>

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Sources: AASHTO; Existing documentation on transitway standards and planning studies; Gannett Fleming Transportation Engineers, Inc. and Texas Transportation Institute.

Pavement widths for travel lanes will be 12 feet for freeway and HOV lanes. Interchange ramp terminals for turning movements will also provide 12-foot lanes with appropriate dimensions to accommodate design vehicle turning radii. Ramp lanes will be 15 feet for single-lane ramps and 12 feet per lane for multi-lane ramps. Cross street lane widths will generally be 12 feet with 11 feet set as a minimum width.

Shoulder widths for the freeway sections vary depending on conditions. A 12-foot (10-foot paved) outside shoulder will be provided where no obstructions exist. A 10-foot outside shoulder will be used when pavement borders a barrier wall. Where auxiliary lanes are located, the shoulder width ranges from 6 feet with no obstruction to 10 feet when accompanied by a barrier wall. Inside shoulder widths will be 10 feet with a barrier wall.

Shoulder widths for single-lane ramps will be 6 feet on the outside (4 feet paved) with no obstruction and 6 feet with a barrier wall. Inside shoulder widths will be 6 feet (2 feet paved) with no obstruction and 6 feet with a barrier wall. For dual lane ramps, 10 feet (8 feet paved) is required with no obstructions and 10 feet with a barrier wall. Inside shoulder widths for dual lane ramps will be 8 feet (4 feet paved) with obstructions and 6 feet without barrier wall.

For concurrent flow HOV lanes, shoulder widths will be 12 feet for the left shoulder and a 2-foot buffer between the HOV lane and freeway lanes. HOV ramps will provide 8-foot shoulders on both sides, and dual lane HOV ramps will require 2-foot left and right shoulders with a 10-foot center median refuge area.

For HOV/Transitway lanes, shoulder widths for a single-lane transitway will be 8 feet for both the left and right sides. For two-lane, two-way transitways, a 2-foot left and

right shoulder will be provided with a 10-foot median refuge area. Ramp shoulder dimensions will be the same as noted for HOV ramps.

#### **7.3.1.2 Tier Evaluation Analysis**

The comparative analysis technique used to identify viable alternatives in the TIS is called Tier Analysis. This screening process, or tiering, allowed the study team to assemble a large array of competing design components in an easily understood matrix format for evaluation. The key factor in the success of the tier analysis process is its ability to "window down" the vast array of competing designs to the few viable alternative concepts suitable for application in Tampa's interstate corridors.

The first tier (or level) of analysis was on 1"=200' scale aerial maps and provided a process for using key factors to evaluate the reconstructed highway's impacts. This analysis both ranked alternative concepts and identified any alternatives with extreme or obvious detrimental impacts, which means it is considered to be "fatally flawed" and is eliminated from further study.

The second tier of evaluation took the 1"=200' scale alternatives which remained after the "first tier cut," and, as in the first tier, a matrix evaluation was prepared. This matrix included quantification and estimates of impacts for each of the alternatives by category of impact and resulted in a ranking of alternatives.

The third or final tier of evaluation included geometric layouts of the remaining alternatives at 1"=100' scale. Those alternatives that survived the second tier

evaluation matrix were re-evaluated with more stringent standards and detailed analyses.

The refinement and continued development of alternatives through this systematic process assisted in providing all necessary documentation as to the logical process and selection of viable alternatives. This process also provided the necessary documentation for alternatives eliminated in the evaluation process, or modifications to form "new" alternatives. Finally, this process enhanced the community's ability to better understand and follow a rather complex technical process in a step-by-step manner until the selection of reasonable and viable alternatives was reached.

#### Tier 1 Alternatives Evaluation

The Tier 1 matrix was composed of generalized and easily measured data or factors available at the initiation of the alternatives development stage. These factors were grouped into categories for ease of reference. For each alternative, a rating was assigned to each factor to measure both positive and negative impacts. The evaluation of a single factor may also have identified an alternative as "fatally flawed," thereby eliminating that alternative from any further analyses.

The following sections contain specific design segment discussions of the Tier 1 evaluation. A detailed discussion of this process is provided in TIS Task F.6.a(6) - Tier 1 Evaluation Technical Memorandum.

Eight alternatives were developed during the Tier 1 analysis. Table 7.5 provides descriptions of each of the Tier 1 alternatives.



**TABLE 7.5**  
**DESCRIPTION OF TIER 1 ALTERNATIVES**

Alternative 1A1 - 4-roadway system adhering to 50:1 FAA approach surface criterion connecting with a 4-roadway system east of Himes Avenue. A three-level urban interchange at I-275 and Dale Mabry Highway.

Alternative 1A2 - 2-roadway system from Howard Frankland Bridge to Lois Avenue, 4-roadway system east of Lois Avenue, adhering to 62.5:1 FAA approach surface criterion. A three-level urban interchange at I-275 and Dale Mabry Highway.

Alternative 1A3 - Same as Alternative 1A2 without ramps to and from the west at Lois Avenue.

Alternative 1A4 - Same as Alternative 1A1 without ramp service to and from the west at Lois Avenue.

Alternative 1A5 - Same as Alternative 1A1 with connection between Cypress Street and Himes Avenue.

Alternative 1A6 - Same as Alternative 1A1 transitioning to a 2-roadway system east of Himes Avenue.

Alternative 1A7a - Same as Alternative 1A1 locating Dale Mabry Highway ramp movements outside and above mainline (Dale Mabry) lanes. This alternative connects with a 4-roadway system east of Himes Avenue.

Alternative 1A7b - Same as Alternative 1A1 locating Dale Mabry Highway ramp movements outside and above mainline (Dale Mabry) lanes. This alternative connects with a 2-roadway system east of Himes Avenue.

Six of the eight alternatives ranked high with the same number of points. No one alternative was clearly superior to the others. Rather than continue to carry such a large number of alternatives into the second tier of analysis, it was determined additional evaluation of the alternatives would be done to determine what aspects or design components of the various alternatives resulted in positive and negative impacts. After this additional analysis, Tier 1 alternatives were re-combined and refined into three alternatives to be evaluated for Tier 2.

The Tier 1 analysis also included the development of a transit envelope with an emphasis on HOV lanes and priority ramps. In Tier 1, the interstate system contained

HOV lanes throughout the project limits, and the analysis of priority ramp locations was conducted independently of the roadway analysis. Priority access ramps were considered at Trask Street in the Westshore area. The priority ramps would have a center drop ramp in the middle of the interstate. No park-n-ride lot was identified with the HOV priority access ramps.

### **Tier 2 Alternatives Evaluation**

The Tier 2 evaluation included quantification and estimates of impacts for each of the alternatives by category of impact and resulted in a ranking of alternatives.

The following briefly discusses the evaluation. A detailed discussion of this process is provided in TIS Task F.6.a(6) - Tier 2 Evaluation Technical Memorandum.

Three alternatives, 1A8, 1A9 and 1A10, were refined during Tier 2. Table 7.6 provides a description of these alternatives.

**TABLE 7.6**

### **DESCRIPTION OF TIER 2 ALTERNATIVES**

**Alternative 1A8** - 4-roadway system adhering to 50:1 FAA approach surface criterion for TIA. Direct freeway connection to the Northwest Hillsborough expressway. Interchanges at Westshore Boulevard, Lois Avenue and Dale Mabry Highway. New Sherrill Street extension through I-275. Frontage roads between Cypress Street and Himes Avenue. HOV/Transitway lanes beginning at the Howard Frankland Bridge.

**Alternative 1A9** - Same as Alternative 1A8 with frontage roads east of Himes Avenue and HOV priority ramps to and from the east on I-275 at Trask Street.

**Alternative 1A10** - Same as Alternative 1A8 with 2-roadway system transitioning to 4-roadway system at Lois Avenue. Adherence to 62.5:1 FAA approach surface criterion for TIS. Frontage roads between Cypress Street and the Hillsborough River.

All Tier 2 concepts maintained a transit envelope within the interstate right-of-way for HOV lanes and priority access ramps. The HOV lanes extend throughout the project limits. Center-drop, priority access ramps to the HOV lanes were located at Trask Street for Alternative 1A9.

Alternative 1A9 ranked higher than the other two alternatives. Alternative 1A9 was found clearly superior to the others in terms of its minimal negative impacts on existing land uses and significant positive impacts regarding maintenance of traffic during construction, constructability, design segment continuity, and lower structures costs. Alternative 1A9 was carried forward into Tier 3 for additional evaluation to establish the aspects or design components which could be improved.

### Tier 3 Alternatives Evaluation

The third or final tier of evaluation included geometric layouts of all remaining alternatives at 1"=100' scale. Basically, Alternative 1A9 was further developed resulting in two new variations of this concept. These alternatives were evaluated with more stringent standards and detailed comparative analysis. A detailed discussion of this process is provided in TIS Task F.6.a(6) - Tier 3 Evaluation Technical Memorandum. Table 7.7 provides a description of Tier 3 alternatives.

TABLE 7.7

### DESCRIPTION OF TIER 3 ALTERNATIVES

Alternative 1A9 - 4-roadway system. HOV/Transitway lanes beginning at the Howard Frankland Bridge within the interstate alignment. Direct freeway connection to the Veterans Expressway. 50:1 FAA approach surface criterion for TIA. Interchanges at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway (two-level). Frontage roads east of Himes Avenue. New Sherrill Street extension through I-275. HOV priority ramps to and from east on I-275 at Trask Street.

Alternative 1A11 - 2-roadway system transitioning to 4-roadway system at Lois Avenue. HOV/Transitway lanes beginning at the Howard Frankland Bridge within the interstate alignment. Direct freeway connection to the Northwest hillsborough expressway. 62.5:1 FAA approach surface criterion for TIA. Interchanges at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway (two-level). No frontage roads east of Himes Avenue. New Sherrill Street extension through I-275. HOV priority ramps to and from east on I-275 at Trask Street.

Alternative 1A12 - 2-roadway system transitioning to 4-roadway system at Lois Avenue. HOV/Transitway lanes beginning at the Howard Frankland Bridge within the interstate alignment. Direct freeway connection to the Northwest hillsborough expressway. 62.5:1 FAA approach surface criterion for TIA. Interchanges at Westshore Boulevard, Lois Avenue, Dale Mabry Highway (two-level), and Himes Avenue. No frontage roads east of Himes Avenue. New Sherrill Street extension through I-275. Elevated exclusive HOV/Transitway lanes on I-275 at Trask Street; priority ramps to and from east on I-275.

The three alternatives examined in Tier 3 (1A9, 1A11 and 1A12) were reduced to one alternative (1A9) by selecting the four-roadway system due to superior operational characteristics. In addition, three modifications were recommended for Alternative 1A9 before inclusion in the Master Plan:

- \* The addition of ramps to and from the proposed Northwest hillsborough expressway to Memorial highway (S.R. 60) and Kennedy Boulevard. This gave additional local accessibility to the Northwest hillsborough expressway from the Westshore area and reduced the number of collector-distributor roadway lanes required between I-275 and the TIA interchange.
- \* The addition of a Lemon Street connector at the Westshore Boulevard/I-275 interchange. This new connector relieves potential queuing problems at the I-275/Westshore Boulevard ramps relating to the signalized movements at Westshore Boulevard and Cypress Street. A two-lane, one-way westbound facility road was recommended.
- \* Modification of the I-275/Northwest hillsborough expressway interchange to provide a 62.5:1 approach surface relating to landing flight path of TIA. This modification was developed in conjunction with TIS, FDOT and Hillsborough County Aviation Authority staffs.

## **SECTION 8.0**

### **PRELIMINARY DESIGN ANALYSIS**

## **8.0 PRELIMINARY DESIGN ANALYSIS**

### **8.1 DESCRIPTION OF RECOMMENDED MASTER PLAN CONCEPT (PREFERRED ALTERNATIVE)**

The following sections address the Preferred Alternative as recommended in the TIS Master Plan (Phase I). The Preferred Alternative includes a multitude of improvements such as major interchange connections serving the mainline freeway, a local access freeway, and frontage roadways. On November 14, 1991, the FDOT adopted an "Interstate Highway System Policy" which established the maximum number of through lanes for the interstate system within Florida. After extensive coordination with the FHWA and the FDOT's Central Office, it has been determined that the Preferred Alternative is consistent with the intent of the Policy.

A summary of the major features of the Preferred Alternative is provided in Table 8.1.

**TABLE 8.1**

#### **MAJOR FEATURES OF PREFERRED ALTERNATIVE Tampa Interstate Study - Phase II**

- \* Four-roadway system from west of Kennedy Boulevard ramps to eastern project limits
- \* HOV/Transitway lanes within the interstate alignment beginning and ending at Trask Street while maintaining the envelope to the Howard Frankland Bridge
- \* HOV priority ramps to and from the east on I-275 at Trask Street
- \* Direct I-275 connection to the Northwest Expressway
- \* Direct ramps from Memorial Highway (S.R. 60) and Kennedy Boulevard to the Northwest Expressway
- \* 62.5:1 FAA approach surface criterion for TIA.

- \* Existing interchange locations remain at Westshore Boulevard, Lois Avenue and Dale Mabry Highway
- \* New Sherrill Street extension north from Memorial Highway (S.R. 60) and Kennedy Boulevard through I-275 to Spruce Street
- \* New Lemon Street connector to Westshore Boulevard from Occident Street
- \* First priority reconstruction segment

Lane line diagrams, shown previously on Exhibits 6.13 through 6.14, provide the number of lanes for all of the proposed roadway system improvements within the study limits. The Preferred Alternative concept is shown on 1"=100' scale aerial photography contained in Appendix D. The plan set shows conceptual lane geometrics, major land use features, existing and proposed right-of-way limits, candidate pond locations and approximate limits of bridges, noise barriers and retaining walls.

Beginning at the west end of the project, I-275 carries eight lanes (four lanes in each direction) from the Howard Frankland Bridge to just west of the Kennedy Boulevard ramps where the local access freeway lanes begin eastbound and end westbound. No other ramping opportunities are available between the mainline and the local access freeway within the project limits.

The basic number of lanes on the new facility (mainline plus local access freeway) is generally the same for the eastbound and westbound movements of roadway segments and weaving sections, thus providing lane continuity throughout the freeway system. Between the Kennedy Boulevard ramps and west of Westshore Boulevard, a total of four basic lanes (excluding ramp tapers) in each direction are provided. This includes two express freeway lanes and two local access freeway lanes in each direction. From west of Westshore Boulevard to east of Trask Street, the express and local access freeway lanes increase to three in each direction.

From the vicinity of Trask Street to Lois Avenue, a total of 10 basic lanes are provided including three express freeway lanes and two local access freeway lanes in each direction. From Lois Avenue to east of Dale Mabry Highway, a total of 12 basic freeway lanes are provided including three express freeway lanes and three local access freeway lanes in each direction.

An HOV/Transitway envelope is provided in the center of the Preferred Alternative concept throughout the project study limits. In the Westshore area, HOV priority ramps are provided at Trask Street for movements to and from the east.

Several interchanges are proposed within the study limits. Beginning at the west end of the project, single-lane ramps are provided to and from the west for Kennedy Boulevard. The westbound entrance ramps connect to the I-275 mainline lanes, while the eastbound exit ramp departs the interstate from the local access freeway.

The interchange with the proposed Veterans Expressway is planned to accommodate fully directional movements. The expressway interchange also includes signing for ramping to destinations such as TIA, the Veterans Expressway and Clearwater via the Courtney Campbell Causeway (S.R. 60).

In addition, the construction of the Veterans Expressway interchange includes for a connection from Memorial Highway (S.R. 60) to Sherrill Street. This extension of Sherrill Street allows for an additional north-south arterial street to access office and business development in the Cypress Street area west of Westshore Boulevard.



At Westshore Boulevard, ramping with the I-275 local access freeway is provided to and from the east and includes an at-grade intersection at Trask Street. HOV priority ramps are located at Trask Street and access the I-275 HOV/Transitway envelope located in the center of the freeway.

The Lois Avenue interchange is a modified diamond design providing service in both directions on I-275 and the local access freeway lanes. The westbound exit ramp intersects with Cypress Street east of the intersection with Lois Avenue. The ramps to and from the west are braided with the Westshore Boulevard ramps to eliminate weaving conflicts.

The Dale Mabry Highway interchange is a diamond design providing service to all turning movements. Two-lane ramps are provided for movements to and from the east, while single-lane ramps are provided for movements to and from the west.

Value engineering review was conducted by the Department and its final design consultant team for the interstate and local street improvements identified in the Preferred Alternative concept plans. The results of this review indicated some minor modifications to the concept plans. The details of these modifications are described in a memorandum contained in Appendix C. All modifications agreed upon were revised on the plans prior to the March 22, 1993 Public Hearing and are included in the Preferred Alternative plans in Appendix D.

## **8.2 TYPICAL SECTIONS**

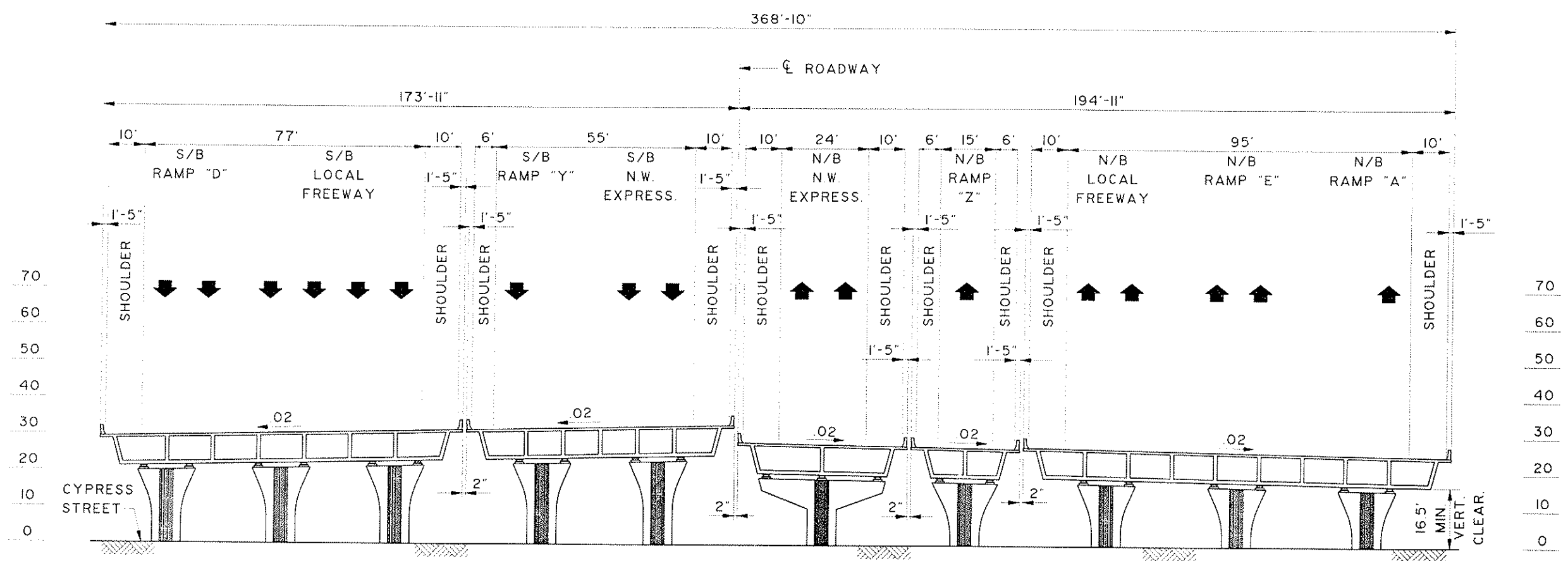
Due to the complexity of the project, and the number and location of the interchanges within the project limits, there are no "typical" sections. Several roadway cross sections were developed for the Preferred Alternative within the project study limits. These roadway cross sections are provided on Exhibits 8.1 through 8.3. They include cross sections shown on I-275 at Trask Street and Marie Avenue and on the Veterans Expressway at Cypress Street.

Typical sections for various overpass and interchange cross street treatments were also developed. These typical sections are shown on Exhibits 8.4 through 8.7. These typical sections were developed to provide the basis for the interstate bridges as well as to guide the Department in designing improvements to the cross streets. Typical sections and design criteria are discussed in detail in TIS Task F.2.b - Design Criteria Policies and Procedures Technical Memorandum. The discussion of the design criteria used is included in Section 7.3.1.1 of this report.

## **8.3 CONSISTENCY WITH FDOT INTERSTATE POLICY**

On November 14, 1991, the FDOT adopted an "Interstate Highway System Policy," establishing statewide guidelines for interstate improvements, including a provision limiting the number of through lanes.

Through extensive coordination among FDOT District VII, FDOT Central Office, and FHWA, the Preferred Alternative was deemed consistent with the FDOT Interstate Policy, provided the project is implemented with the following:

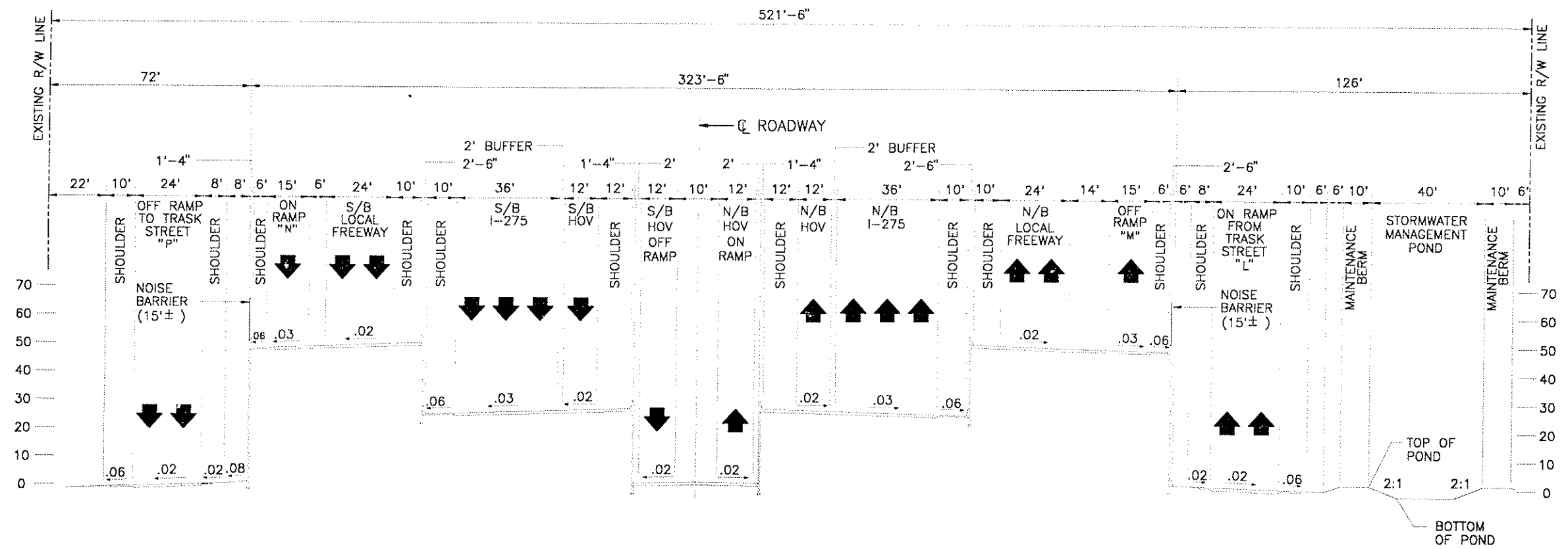


STATION 234+50

FLORIDA DEPARTMENT OF TRANSPORTATION  
ENGINEERING REPORT  
TAMPA INTERSTATE STUDY  
PHASE II  
Hillsborough County, Florida

**TYPICAL SECTION  
VETERANS EXPRESSWAY AT CYPRESS ST.**

EXHIBIT 8.1



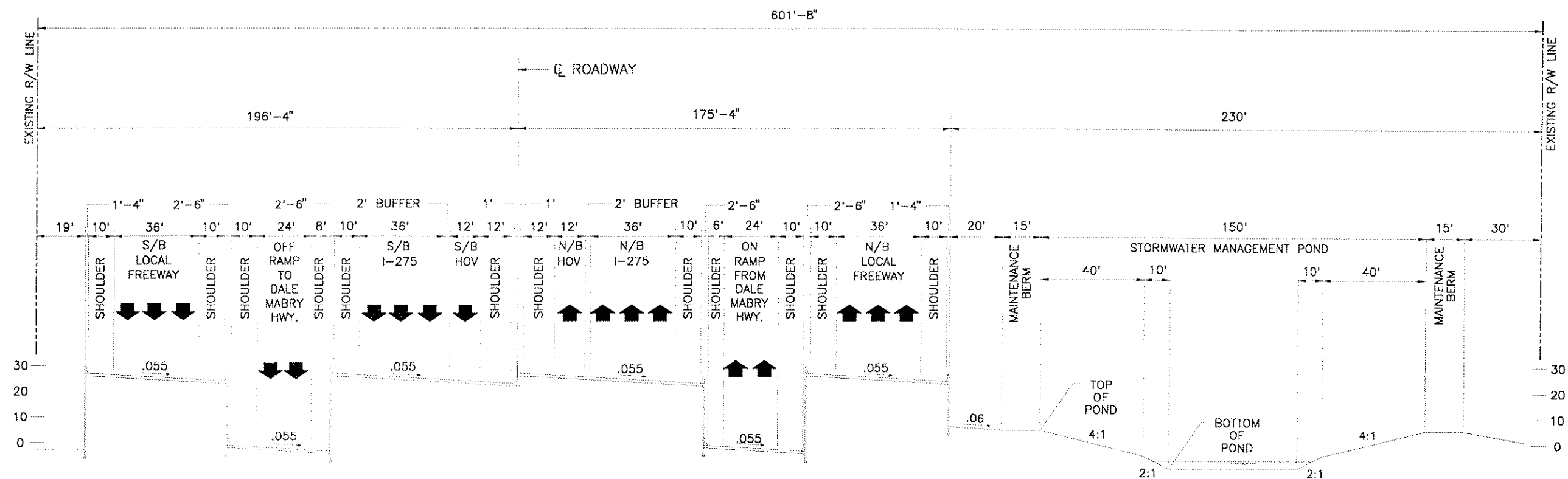
STA. 190+00

FLORIDA DEPARTMENT OF TRANSPORTATION

ENGINEERING REPORT  
TAMPA INTERSTATE STUDY  
PHASE II

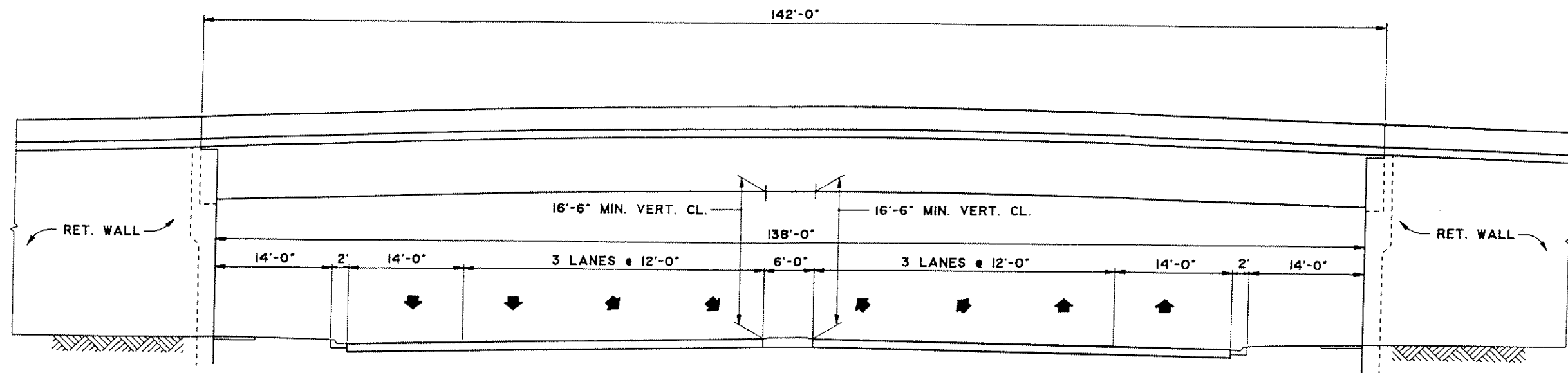
Hillsborough County, Florida

TYPICAL SECTION I-275 AT TRASK ST.

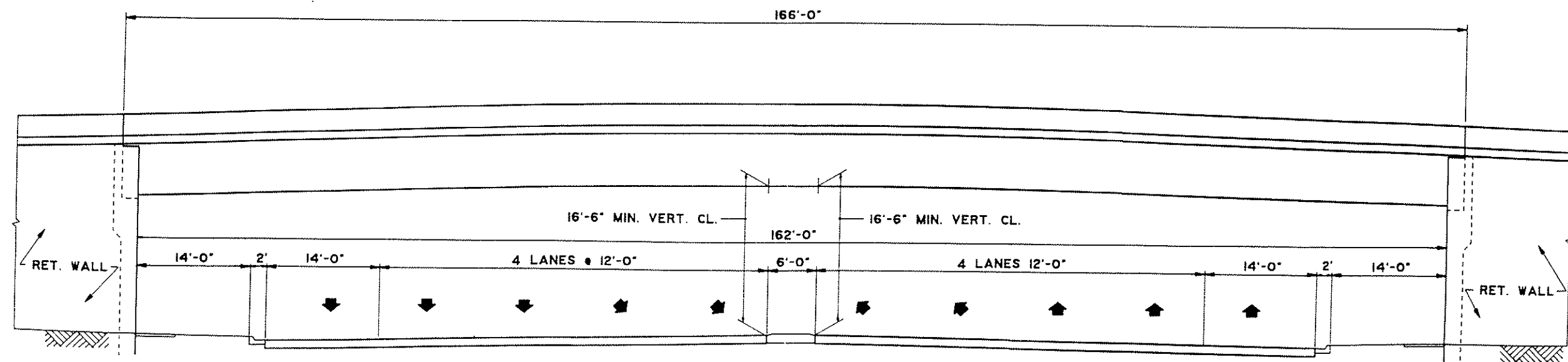


STATION 249+00

FLORIDA DEPARTMENT OF TRANSPORTATION  
 ENGINEERING REPORT  
**TAMPA INTERSTATE STUDY  
 PHASE II**  
 Hillsborough County, Florida  
**TYPICAL SECTION I-275 AT MARIE AVE.**



FOUR LANE



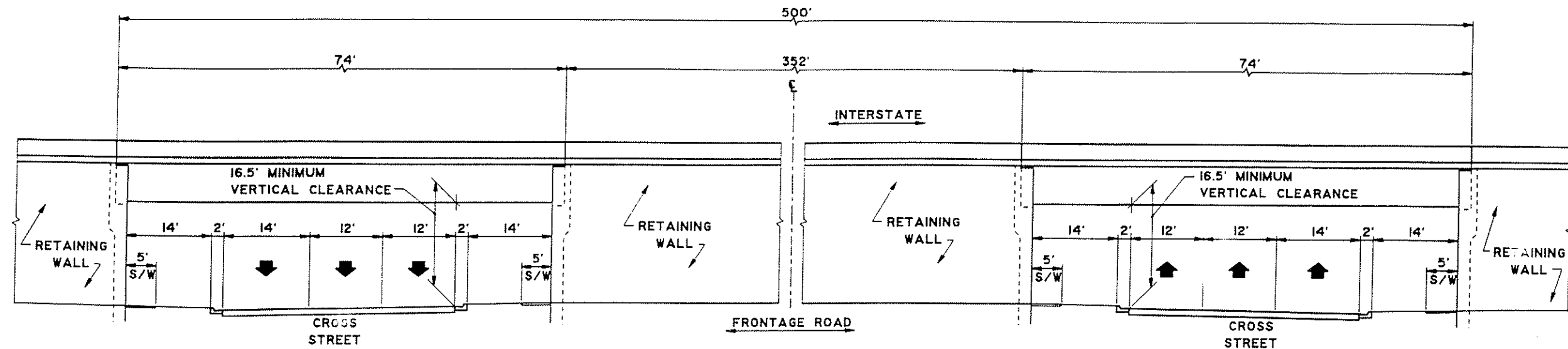
SIX LANE

**FLORIDA DEPARTMENT OF TRANSPORTATION**

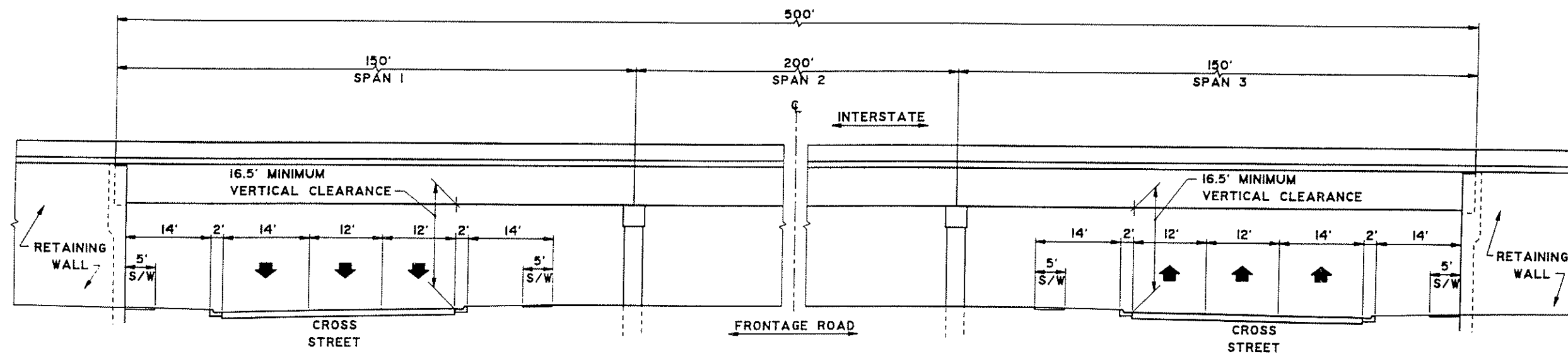
ENGINEERING REPORT  
**TAMPA INTERSTATE STUDY**  
**PHASE II**

Hillsborough County, Florida

**CROSS STREET TYPICAL SECTIONS**



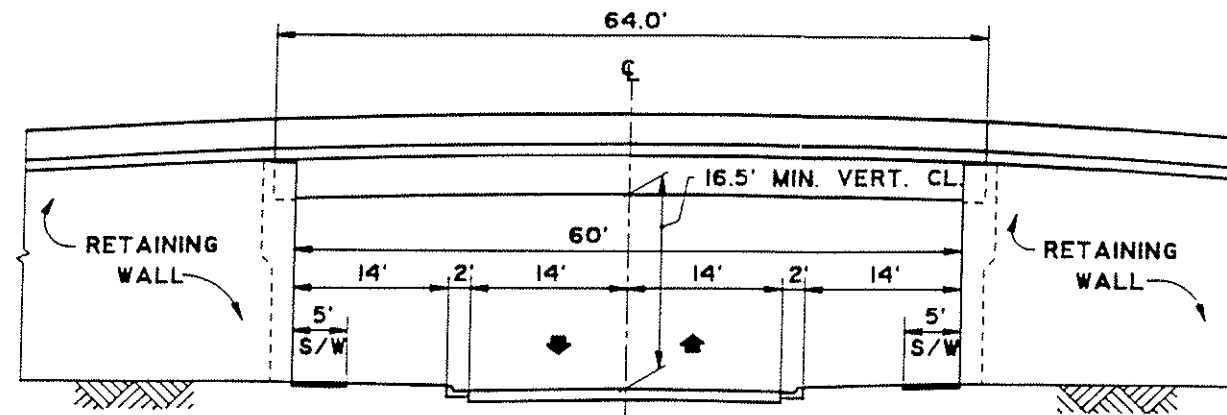
**RETAINED EARTH INTERCHANGE STRUCTURE**



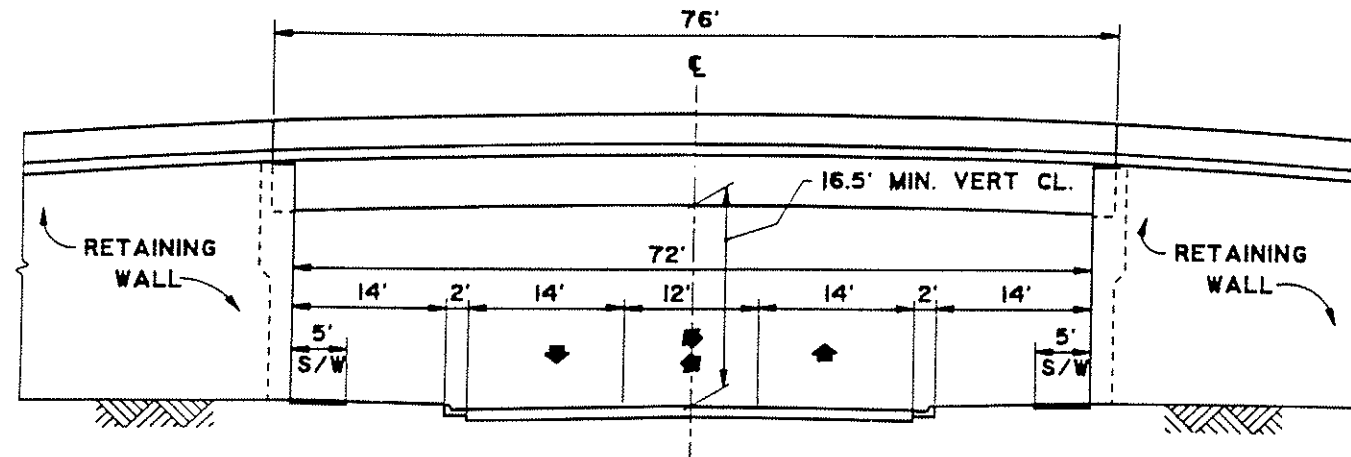
**COLUMN SUPPORTED INTERCHANGE STRUCTURE**

**FLORIDA DEPARTMENT OF TRANSPORTATION**  
**ENGINEERING REPORT**  
**TAMPA INTERSTATE STUDY**  
**PHASE II**  
Hillsborough County, Florida

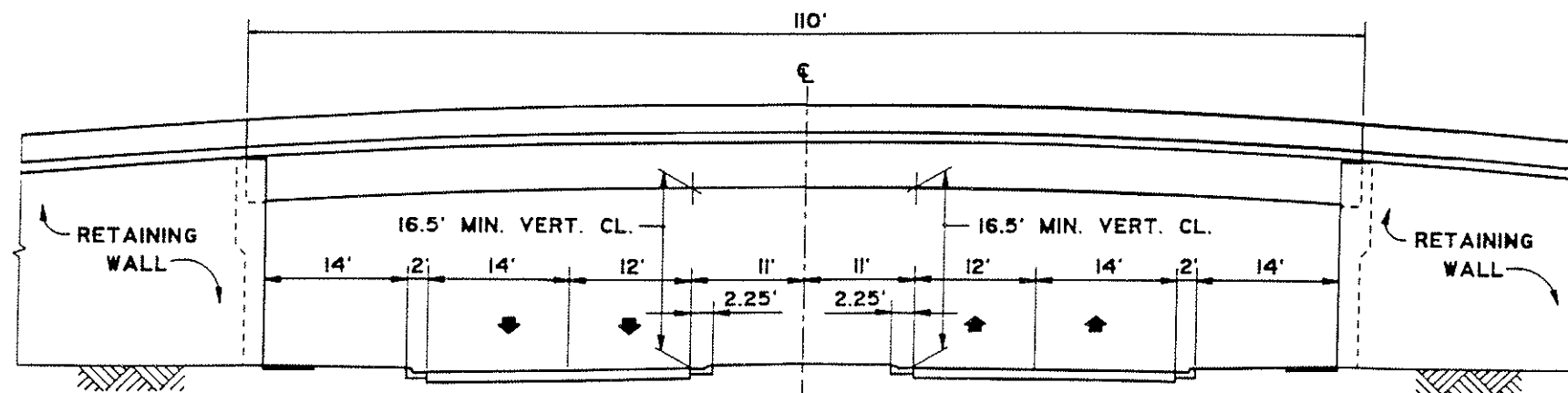
**CROSS STREET TYPICAL SECTIONS**



**TWO LANE**



**THREE LANE**



**FOUR LANE**

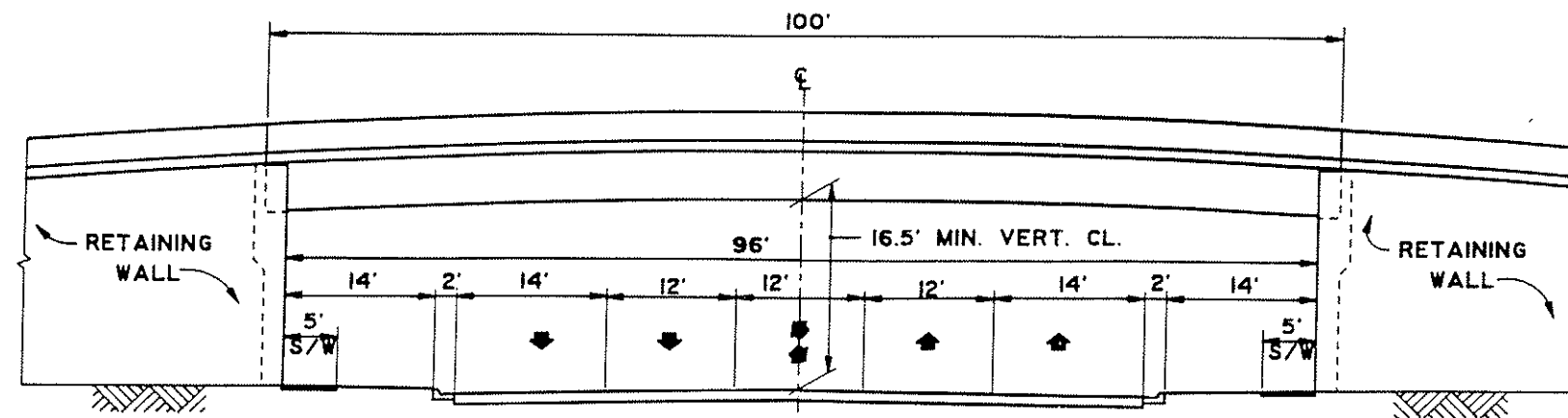
**FLORIDA DEPARTMENT OF TRANSPORTATION**

**ENGINEERING REPORT  
TAMPA INTERSTATE STUDY  
PHASE II**

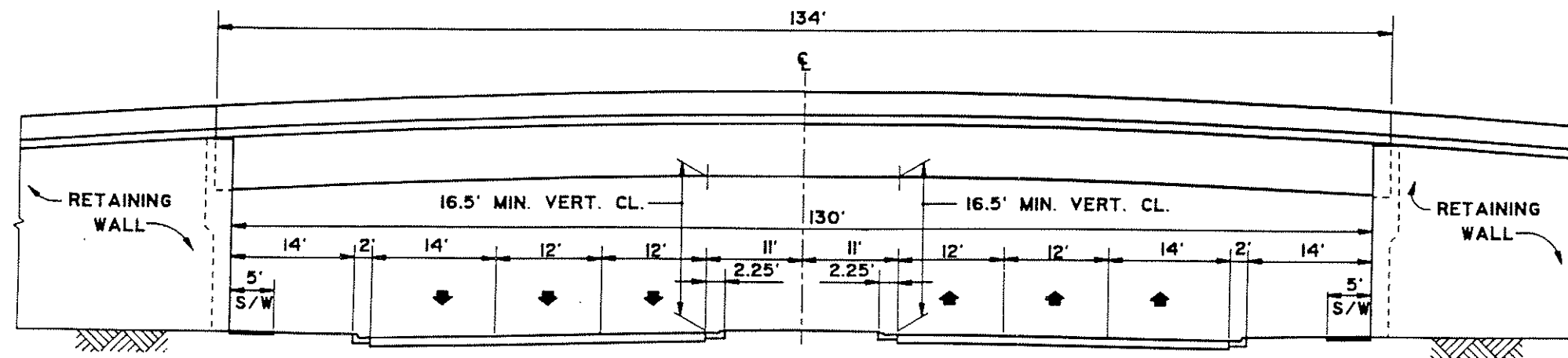
Hillsborough County, Florida

**CROSS STREET TYPICAL SECTIONS**





FIVE LANE



SIX LANE (DIVIDED)

FLORIDA DEPARTMENT OF TRANSPORTATION

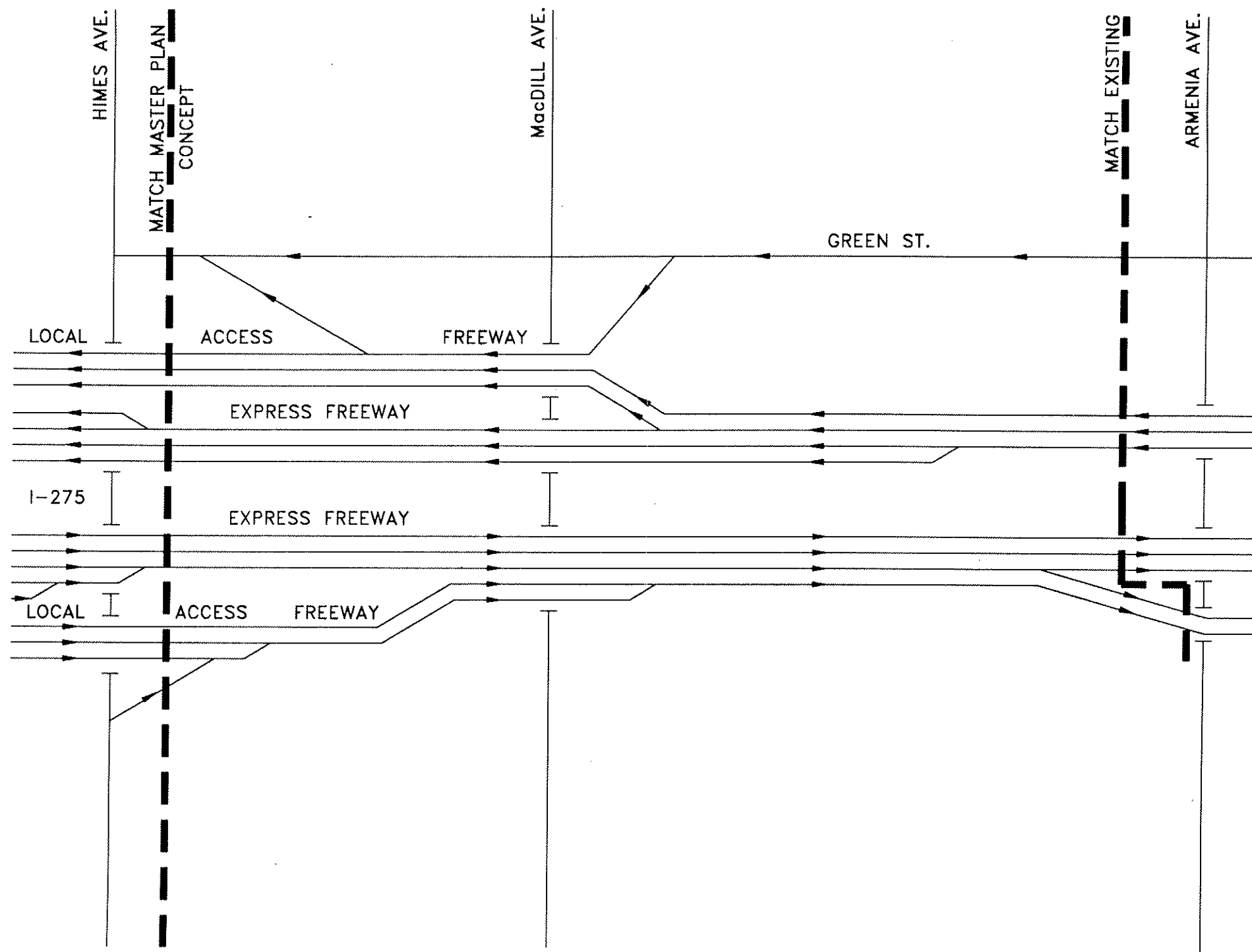
ENGINEERING REPORT

TAMPA INTERSTATE STUDY

PHASE II

Hillsborough County, Florida

CROSS STREET TYPICAL SECTION



  
 Not to Scale

FLORIDA DEPARTMENT OF TRANSPORTATION  
 ENGINEERING REPORT  
 TAMPA INTERSTATE STUDY  
 PHASE II  
 Hillsborough County, Florida  
**DESIGN YEAR (2010)**  
**TRANSITIONAL GEOMETRY**

EXHIBIT 8.8

- \* The "footprint" of the TIS Master Plan will be maintained to accommodate ultimate build-out.
- \* The Master Plan must be implemented in stages. The first stage of implementation shall have no more than six "general-use" lanes (three in each direction). All additional through lanes in the first stage will be designated as HOV lanes.
- \* Implementation of the first stage will be accomplished in such a manner that will ensure maximum salvageability when subsequent stages are constructed. This reflects guidance offered by FHWA.
- \* An implementation plan will be developed by District VII which identifies the transition, by stage, from the existing configuration to the Master Plan. This implementation plan will be consistent with the above requirements and will maximize early development of the HOV/multimodal envelope. The Environmental Assessment, Environmental Impact Statement, and other PD&E documents shall commit to the staged implementation plan.
- \* The ultimate typical section for the TIS Master Plan, as stated in the November 14, 1991, Interstate Policy, "...will include four physically separated, exclusive lanes (two in each direction) for through traffic, public transit vehicles, and other high-occupancy vehicles." These lanes will be developed in accordance with the terms of the January 17, 1992 policy letter signed by FDOT Secretary Watts.

On I-275, north of Dr. Martin Luther King, Jr. Boulevard (formerly Buffalo Avenue), District VII will fully develop the ultimate typical section for the freeway mainline and the corresponding required interchange improvements as the alternative to the current typical section in the TIS Master Plan. Development of the ultimate typical section will occur concurrently with the staged implementation plan efforts. After the ultimate typical section has been developed, FHWA, FDOT Central Office and FDOT District VII will evaluate it against the constraints of the original TIS Master Plan. District VII will prepare final environmental documentation for the agreed upon ultimate typical section.

- \* District VII will work with local agencies responsible for bus/rail systems and land use planning and regulation to create an environment which supports the use of public transportation and utilization of the multimodal aspects of the TIS Master Plan.

A copy of the FDOT Interstate Policy implementation letter is provided in Appendix C.

#### **8.4 DESIGN TRAFFIC VOLUMES**

Forecast traffic volumes for 2010 conditions are discussed in Section 6.3 and shown on Exhibits 6.11 and 6.12 for freeway segments and Exhibits 6.15 through 6.16 for intersection turning movements, previously presented.

#### **8.5 INTERSECTION CONCEPTS AND SIGNAL ANALYSIS**

Analyses of intersections affected by the improvements are discussed in Section 6.4. The results of the intersection capacity analyses with the proposed improvements are presented in Table 6.9. Intersection lane geometrics for the Preferred Alternative are schematically shown on Exhibits 6.17 and 6.18.

#### **8.6 ALIGNMENT AND RIGHT-OF-WAY NEEDS**

Additional right-of-way required to construct the Preferred Alternative varies throughout the project limits. Proposed right-of-way is shown in the plan set provided in Appendix D and discussed in the following paragraphs.

Beginning with proposed right-of-way on the south side of I-275, limits of acquisition extend from east of Westshore Boulevard to Cypress Street. From approximately 300 feet east of Westshore Boulevard to Trask Street, proposed right-of-way ranges from approximately 5 to 115 feet. Proposed right-of-way between Trask Street and Lois Avenue extends from the southern right-of-way line of I-275 to the northern right-of-way line of Carmen Street which includes right-of-way occupied by Lemon Street,

Hesperides Street, Manhattan Avenue and Hubert Avenue. From Lois Avenue to Cypress Street, proposed right-of-way acquisition varies ranging from approximately 10 to 200 feet.

On the north side of I-275, proposed right-of-way acquisitions are located throughout the project limits. Additional right-of-way width ranging from approximately 40 to 90 feet is required for ramp access to I-275 from Executive Drive which is located west of Reo Street. In the vicinity of the Veterans Expressway interchange, acquisitions in the northwest quadrant range from approximately 10 to 55 feet. In the northeast quadrant of the Veterans Expressway interchange to Westshore Boulevard, proposed right-of-way acquisition ranges from approximately 5 to 380 feet and right-of-way needed for the widening of Sherrill Street is in the range of 10 to 15 feet.

As much as 15 feet of right-of-way is needed for the widening of the west side of the Westshore Boulevard between I-275 and Cypress Street. Similar right-of-way requirements are proposed to widen both sides of Lois Avenue. Between Lois Avenue and the existing Dale Mabry Highway interchange, proposed right-of-way acquisition ranges from approximately 20 to 300 feet, excluding Cypress Street.

Proposed right-of-way acquisition for the Veterans Expressway between I-275 and Cypress Street is in the range of approximately 10 to 40 feet on the east side and approximately 5 to 50 feet on the west side.

## 8.7 RELOCATIONS

Relocation estimates have been developed for 159 affected properties for the Preferred Alternative and 68 relocations in the transition area (see Section 8.20 for discussion of Transition Area).

A detailed description of this procedure is provided in Task A.5.b.12 - Conceptual Stage Relocation Plan. Table 8.2 provides cost estimates and relocation information for the project.

Within the study limits, individual properties were identified as to land size, improvement description, improvement size, type of ownership, whether private or non-profit, public utility, quasi-government, government, etc. Once the individual properties were identified, a sales search was conducted to identify sales of similar properties for representative values for property types.

The land uses affected in the study limits include acquisitions for the interchange of the Veterans Expressway/Memorial Highway (S.R. 60) with I-275; two office buildings on the north side of I-275 between Memorial Highway (S.R. 60) and Westshore Boulevard; several single-family residences on the south side of I-275 between Trask Street and Lois Avenue, as well as multi-family relocations at the Westshore Apartment Complex; several commercial properties between Clark Avenue and Grady Avenue; several single-family residences between Grady Avenue and Church Avenue on the north side of I-275; and several commercial properties and single-family structures on the south side of I-275 adjacent to the Himes Avenue intersection. Relocation and right-of-way estimates shown on Table 8.2 reflect information provided in Task A.5.b.12 - Conceptual Stage Relocation Plan.

TABLE 8.2

RIGHT-OF-WAY AND RELOCATION COST ESTIMATES  
Tampa Interstate Study - Phase II

	<u>Preferred Alternative</u>		<u>Transition Area<sup>1</sup></u>		<u>Total</u>	
	<u>Number of</u> <u>Relocations</u>	<u>Costs</u>	<u>Number of</u> <u>Relocations</u>	<u>Costs</u>	<u>Number of</u> <u>Relocations</u>	<u>Costs</u>
<u>Right-of-Way</u>						
Acquisition Costs	N/A	\$ 1,233,000	N/A	612,000	N/A	\$ 1,845,000
Support Costs	N/A	1,370,000	N/A	\$ 680,000	N/A	2,050,000
Operations Costs	N/A	6,294,000	N/A	2,789,000	N/A	9,083,000
Land Costs	N/A	<u>51,325,780</u>	N/A	<u>13,869,900</u>	N/A	<u>65,195,680</u>
SUBTOTAL		\$60,222,780		\$17,950,900		\$78,173,680
<u>Relocations</u>						
Residential	140	\$ 2,100,000	58	\$870,000	195	\$ 2,970,000
Other	<u>19</u>	<u>1,110,000</u>	<u>10</u>	<u>564,000</u>	<u>32</u>	<u>1,674,000</u>
SUBTOTAL	159	\$ 3,210,000	68	\$ 1,434,000	227	\$ 4,644,000
TOTAL	159	\$63,432,780	68	\$19,384,900	227	\$82,817,680

<sup>1</sup>Transition Area is discussed in Section 8.20.

NOTE: Right-of-Way Land estimates are for 1993. Estimates are based on 5-21-91 dollars for Preferred Alternative and 7-1-92 dollars for Transition Area. Escalation of base estimates to 1993 values are: future value factor of 1.21 for Preferred Alternative and future value factor of 1.10 for Transition Area.

## **8.8 RIGHT-OF-WAY COSTS**

Cost ranges for right-of-way acquisition were estimated and allocated based upon direct comparisons utilizing adjustments, when necessary, for time, location, size, and any improvement dissimilarities. During this analysis, each property affected was identified as to property type and type of ownership for purposes of relocation expenses. These expenses were combined for the overall estimate of right-of-way acquisition. Cost estimates for right-of-way acquisition and relocations are provided in Table 8.2.

## **8.9 CONSTRUCTION COSTS**

The comparative cost analysis for the TIS Master Plan was conducted using FDOT's Long Range Estimates (LRE) Program, and the Master Plan design study segment concept plans.

The project study limits were entered into the system with factors and variables pertinent to this particular segment of the interstate system. Using a separate sequence for HOV/Transitway, local access freeway, on-off ramps, etc., the program was used to generate quantities and costs for comparison. The bridges were coded by type and length and width with embankment being coded into the program as an X-Pay item (items provided by Greiner but prices were provided in LRE data base) on an average depth per sequence. Barrier walls, retaining walls, and noise walls were coded in as Ex-Pay items (items and costs provided by Greiner) with a cost per item. All pavement items were entered into the system as heavy duty/defense highway.



Maintenance of traffic costs were calculated as a percentage of construction costs that were coded into the typical cross-section. The program multiplied the accumulated costs (Ex-Pay items and X-Pay items) by three percent and assigned the product to "maintenance of traffic" cost. This was added to the running total, and the result was multiplied by five percent for the mobilization factor. The amount calculated for mobilization was then added to the running total. The total segment construction cost includes roadway, drainage, interchanges, bridges, lighting, signing, signalization, retaining walls, noise walls and embankment.

The construction cost estimate for the Preferred Alternative is tabulated in Table 8.3. All estimated construction costs have been prepared based on 1991 dollars. An analysis of FDOT's Price Trends Index indicates a 2 percent total decrease in prices from 1991 to 1993. Based on this trend analysis, it was decided that no adjustments to the 1991 construction cost estimates would be made at this time.

#### **8.10 PRELIMINARY ENGINEERING COSTS**

Preliminary engineering costs were estimated as 8.0 percent of the construction costs. Similarly, Construction Engineering and Inspection (CEI) costs were estimated as 10.0 percent of the construction costs. Table 8.3 lists the preliminary engineering and CEI costs for the Preferred Alternative and transition plans.

TABLE 8.3  
ESTIMATED RIGHT-OF-WAY AND CONSTRUCTION COSTS  
Tampa Interstate Study - Phase II

<u>Item</u>	<u>Preferred Alternative</u>	<u>Transition Area<sup>1</sup></u>	<u>Total</u>
Roadway	\$ 91,510,602	\$ 16,964,017	\$108,474,619
Bridges	<u>\$110,815,269</u>	<u>\$ 3,787,200</u>	<u>\$114,602,469</u>
Subtotal	\$202,325,871	\$ 20,751,217	\$223,077,088
Contingency @ 10.0%	<u>\$ 20,232,587</u>	<u>\$ 2,075,122</u>	<u>\$ 22,307,709</u>
Subtotal	\$222,558,458	\$ 22,826,339	\$245,384,797
CE & I @ 10%	\$ 22,255,846	\$ 2,282,634	\$ 24,538,480
Engineering Design @ 8.0%	<u>\$ 17,804,677</u>	<u>\$ 1,826,107</u>	<u>\$ 19,630,784</u>
Subtotal	\$262,618,981	\$ 26,935,080	\$289,554,061
Legal and Admin. @ 4%	<u>\$ 10,504,759</u>	<u>\$ 1,077,403</u>	<u>\$ 11,582,162</u>
Subtotal	\$273,123,740	\$ 28,012,483	\$301,136,223
Utilities <sup>2</sup>	\$ 6,623,298	\$ 2,188,300	\$ 8,811,598
Right-of-Way <sup>3</sup>	\$ 60,222,780	\$ 17,950,900	\$ 78,173,680
Relocations	<u>\$ 3,210,000</u>	<u>\$ 1,434,000</u>	<u>\$ 4,644,000</u>
TOTAL	\$343,179,818	\$ 49,585,683	\$392,765,501

<sup>1</sup> Transition area is discussed in Section 8.20.

<sup>2</sup> Utilities estimates do not include some relocations of gas lines owned by Peoples Gas System.

<sup>3</sup> Right-of-Way land cost estimates are in 1993 dollars. Right-of-Way estimate originally provided for EA on 5/21/91 - future value factor of 1.21. EA Transition provided on 7/01/92 - future value factor of 1.10.

NOTES:

1. Engineering Design is calculated on the construction total.
2. CE&I is calculated on the construction total.
3. Legal & Administrative costs are calculated on the subtotal of all costs.
4. Construction contingency is included at 10.0%. This cost can be reduced as engineering progresses.
5. The EA Preferred Alternative construction costs are from the May 1991 LRE modification estimate and have not been escalated.
6. The EA Transition costs are from the Greiner, Inc. estimate dated 19-Jun-92 and have not been escalated.
7. An analysis of the FDOT Price Trends index indicates a -2.0 percent change in the composite index from 1991 base year estimates to 1993 with a recent upward trend. No inflation of construction cost estimates has been made.

## **8.11 RECYCLING OF SALVAGEABLE MATERIALS**

The existing interstate pavement will be used whenever possible. However, due to the condition of most of the existing pavement and structures, and the fact that the new vertical profile will likely be higher than the existing roadway, it is unlikely that the existing pavement can be used for the ultimate improvements.

Where possible, existing drainage systems will be extended to salvage existing facilities.

## **8.12 COST-EFFECTIVENESS ANALYSIS**

The following summarizes the results of the cost-effectiveness analysis for the TIS Master Plan improvements. These improvements include I-275 from the Howard Frankland Bridge to the I-75 interchange, the I-75 interchange to south of S.R. 54 and I-4 from the I-275 interchange to east of the I-75 interchange. The entire Master Plan was used to estimate the user benefits because the proposed improvements discussed in this report are a component of an overall plan to reconstruct the interstate system. The analysis is described in greater detail in the TIS Task G.2.b - Cost-Effectiveness Analysis Working Paper.

The analysis has been conducted to define, in economic terms, the net benefits which can be expected to result if the TIS Master Plan improvements are undertaken. The analysis compares the costs of implementing the interstate improvements with the road user benefits which can be expected to accrue from having the improvements in place. Costs include engineering design, right-of-way acquisition, construction, maintenance,

and operation of the new facility. Benefits include the reduction in road-user costs which would be expected to result from more efficient and safer traffic operations due to the improvements to the interstate network.

The methodology used in this analysis follows guidelines written in the American Association of State Highway and Transportation Officials (AASHTO) publication, A Manual on User Benefit Analysis of Highway and Bus-Transit Improvements, 1977. In the AASHTO manual methodology, periodic costs and benefits for the improvements are compared with those which will occur under a no-build scenario.

Determination of the analysis period is an important element of the study. For this study, the years 1995 through 2010 were used. Ideally, costs and benefits for investments should be analyzed over their entire economic lifetime, which ranges from several years for items such as pavement markings to more than 50 years for items such as earthwork and bridges. However, road user benefits (a very important study component) can only be computed based on available traffic volume projections which are not currently available beyond the year 2010.

The output of the cost-effectiveness analysis is a series of indicators of economic feasibility and desirability which include the following:

- \* Net Present Value (NPV) - The difference between the present value of the total periodic benefits and the present value of total periodic costs.
- \* Benefit/Cost (B/C) Ratio - The ratio of the present value of the total periodic benefits to the present value of the total periodic costs.
- \* Payback Period - The length of time required for the present value of accumulated benefits to exceed the present value of accumulated costs.
- \* Internal Rate of Return (IRR) - A measure of the profitability of the project. IRR is equal to the discount rate for which  $NPV = 0$  and  $B/C = 1.0$ .

These indicators are derived from present value calculations using the following components:

- \* User Benefits - The reduction in annual road user costs (the road user costs of the No-Build Alternative less the road user costs of the Master Plan Alternative).
- \* Project Costs - The increased investment costs due to the construction of the improvements and right-of-way acquisition.
- \* Operating and Maintenance Costs - The increase in annual maintenance and operating costs due to the construction of the improvement.
- \* Residual Value - The remaining value of the improved facility at the end of the analysis period.

These components are described in greater detail in the following sections.

#### 8.12.1 User Benefits

The travel demand model was used to estimate vehicle miles traveled and average speeds on the improved interstate and on the existing (or no-build) network for the year 2010. Using methodology in the AASHTO manual, total road user costs were determined for three cost components: vehicle operating costs, vehicle travel time costs and accident costs. The reduction in costs resulting from the Master Plan improvements is considered a benefit of that alternative.

Road user costs for the No-Build and Master Plan Alternatives are presented in Table 8.4. As shown in Table 8.4, the Master Plan improvements will reduce daily vehicle miles traveled by 563,000 miles and daily road user costs by approximately \$1.8 million in the year 2010, which is equivalent to annual benefits of \$650 million. Benefits were calculated back to the year 1997, which is the first year after completion of the first phase of anticipated construction. User benefits were

**TABLE 8.4**  
**ROAD USER BENEFITS IN YEAR 2010**  
**Tampa Interstate Study - Phase II**

<u>Alternatives</u>	<u>Daily VMT</u>	<u>Daily Highway User Cost</u>	<u>Cost/VMT</u>
No-Build	42,257,000	\$25,668,200	\$0.6074
Master Plan	<u>41,694,000</u>	<u>23,888,365</u>	<u>0.5729</u>
Savings <sup>1</sup>	563,000	\$1,779,835*	\$0.0345

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\* Daily user benefits of Master Plan improvements.

VMT = Vehicle Miles Traveled.

<sup>1</sup>Savings = Road User Benefits or Reduction in Road User Costs.

calculated based on a 3 percent annual growth in traffic and the percent of the Master Plan improvements completed in each year. Annual road user benefits in 1997 will be approximately \$122 million.

#### 8.12.2 Project Costs

Project costs include engineering design, right-of-way acquisition, and construction of the facility. For this analysis, it is assumed that construction activity would span a 12-year period beginning in 1995. A summary of the costs for the No-Build and Master Plan Alternatives is provided in Table 8.5.

The No-Build Alternative costs represent the costs of improvements required to maintain the present interstate system throughout the analysis period. These costs include roadway resurfacing and replacement of structurally deficient bridges.

Project costs for the TIS Master Plan were developed using the FDOT's Long Range Estimate (LRE) program. The LRE is a computerized program that generates items, quantities and unit prices for new construction, resurfacing and widening projects. The total estimated project costs for the TIS Master Plan by design segment are listed in Table 8.6. Utility relocation costs are not included in the table.

A construction schedule by design segment was established for the purposes of completing the cost-effectiveness analysis and is shown in Table 8.7. According to the Master Plan, Design Segments 1A, 3A, and 3B will be constructed beginning in 1995, which is the first year of the analysis period. It was assumed that 75 percent of the right-of-way will be acquired prior to 1995 and the balance during the first five years of the analysis period.

**TABLE 8.5**

**NO-BUILD AND MASTER PLAN ALTERNATIVES  
COST COMPARISON  
Tampa Interstate Study - Phase II**

<u>Item</u>	<u>No-Build</u>	<u>Master Plan</u>
Construction*	\$112,393,091	\$1,079,318,855
Right-of-Way and Relocation	0	274,853,700
Administrative and Contingencies**	<u>31,375,008</u>	<u>301,296,435</u>
Total Project Costs	\$143,768,099	\$1,655,468,990

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\* Includes roadway, bridges and bridge demolition.

\*\* Includes engineering, CEI, legal and administrative, design and change order contingencies.



TABLE 8.6  
MASTER PLAN  
ESTIMATED RIGHT-OF-WAY AND CONSTRUCTION COSTS  
Tampa Interstate Study - Phase II

<u>Design Segment</u>	<u>Roadway/ Bridges</u>	<u>Engineering/ CEI</u>	<u>Contingency/ Legal/ Administrative</u>	<u>Sub-Total</u>	<u>Right-of-Way</u>	<u>Relocation</u>	<u>Total</u>
1A	\$196,350,092	\$16,689,758	\$38,122,203	\$251,162,053	\$34,980,000	\$3,150,000	\$289,292,053
2A	\$65,455,464	\$5,563,714	\$5,458,986	\$83,727,634	\$14,850,000	\$2,280,000	\$100,857,634
2B	\$325,557,213	\$27,672,363	\$27,151,472	\$416,437,889	\$89,172,000	\$8,210,000	\$513,819,889
3A	\$68,577,681	\$5,829,103	\$5,719,379	\$87,721,431	\$28,699,800	\$6,415,000	\$122,836,231
3B	\$60,607,044	\$5,151,599	\$5,054,627	\$77,525,757	\$10,467,900	\$990,000	\$88,983,657
4A	\$38,294,852	\$3,255,062	\$3,193,791	\$48,985,022	\$10,794,900	\$105,000	\$59,884,922
4B	\$60,496,017	\$5,142,161	\$5,045,368	\$77,383,737	\$23,058,600	\$355,000	\$100,797,337
4C	\$14,930,555	\$1,269,097	\$1,245,208	\$19,098,483	\$7,417,200	\$829,200	\$27,344,883
5A	\$29,029,217	\$2,467,483	\$2,421,037	\$37,132,846	\$1,063,500	\$185,000	\$38,381,346
5B	\$24,858,659	\$2,112,986	\$2,073,212	\$37,798,059	\$5,750,700	\$495,000	\$37,043,759
5C	\$38,061,127	\$3,235,196	\$3,174,298	\$48,686,052	\$3,268,500	\$270,000	\$52,224,552
5D	\$38,067,806	\$3,235,764	\$3,174,855	\$48,694,595	\$2,509,500	\$480,000	\$51,684,095
5E	\$25,480,318	\$2,165,827	\$2,125,059	\$32,593,257	\$2,757,900	\$300,000	\$35,651,157
5F	\$17,753,188	\$1,509,021	\$1,480,616	\$22,709,066	\$2,740,650	\$195,000	\$25,644,716
5G	\$40,524,967	\$3,444,622	\$3,379,782	\$51,837,683	\$4,333,350	\$30,000	\$56,201,033
6A	\$13,012,757	\$1,106,084	\$1,085,264	\$16,645,323	\$3,915,000	\$0	\$20,560,323
6B	\$22,261,898	\$1,892,261	\$1,856,642	\$28,476,401	\$4,785,000	\$0	\$33,261,401
TOTAL	\$1,079,318,855	\$91,742,103	\$111,761,798	\$1,380,615,290	\$250,564,500	\$24,289,200	\$1,655,468,990

Source: Master Plan Report for Tampa Interstate Study, Greiner, Inc., 1989.

**TABLE 8.7**

**CONSTRUCTION SCHEDULE PER  
DESIGN SEGMENT - BUILD ALTERNATIVE  
Tampa Interstate Study - Phase II**

<u>Design Segment</u>	<u>Year Begin</u>	<u>Year Complete</u>	<u>Number of Months</u>
1A	1995	1997	24 months
3A	1995	1997	24 months
3B	1995	1997	24 months
6A	1997	1999	24 months
6B	1997	1999	24 months
2A	1999	2003	48 months
2B	1999	2003	48 months
4A	2000	2003	36 months
4B	2000	2003	36 months
4C	2000	2003	36 months
5A	2003	2005	36 months
5B	2003	2005	36 months
5C	2003	2005	36 months
5D	2003	2005	36 months
5E	2005	2007	24 months
5F	2005	2007	24 months
5G	2005	2007	24 months

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Source: Master Plan Report for Tampa Interstate Study, Greiner, Inc., 1989

### 8.12.3 Maintenance Costs

Maintenance costs include routine or periodic upkeep of the facility as well as necessary replacements. Historic annual maintenance costs for the present facility were estimated to be \$2,500/lane mile/year. For each year of the analysis period, this value was multiplied by the miles of interstate projected to be completed in that year. The result is a total annual incremental maintenance expenditure attributable to the proposed project. Based on these assumptions, incremental maintenance costs will increase from \$253,250 in 1997 to \$724,250 in 2010.

### 8.12.4 Residual Value

In the present analysis, the life of the roadway portions of the facility is estimated at 25 years; bridge elements are assumed to have a useful life of approximately 50 years. Right-of-way retains its full value less relocation expenses. The total residual value of these components in the year 2010 is approximately \$955 million.

### 8.12.5 Results of the Cost-Effectiveness Analysis

The results of the cost-effectiveness analysis based on a discount rate of 4 percent are presented in Table 8.8. Costs and benefits are expressed in constant 1989 dollars. When conducting a constant dollar analysis, AASHTO recommends using a 4 percent discount rate, which represents the real cost of capital for public investments. The table shows the incremental benefits and costs of the improvements and provides a "running computation" of NPV and B/C ratio. The payback period is the number of years required for the NPV to become positive and the B/C ratio to be greater than 1.0. The IRR is shown at the bottom of the table.

TABLE 8.8  
COST EFFECTIVENESS ANALYSIS  
NET PRESENT VALUE AND BENEFIT/COST RATIO  
(CONSTANT 1989 DOLLARS)  
Tampa Interstate Study - Phase II

Year	Compound Interest Factor (PV)	Incremental User Benefits (U)	Incremental Investment Costs (I)	Incremental Maintenance Costs (M)	Incremental Residual Value (R)	Net Present Value** (NPV)	Benefit/Cost Ratio*** (B/C)
1995	1.0000	0	384,894,737	0	0	-384,894,737	0.00
1996	0.9615	0	232,220,360	0	0	-608,183,545	0.00
1997	0.9246	122,094,949	27,162,535	253,250	0	-520,647,335	0.18
1998	0.8890	125,757,798	30,144,724	253,250	0	-435,872,799	0.34
1999	0.8548	187,725,409	59,348,113	292,000	0	-326,384,951	0.54
2000	0.8219	193,357,171	175,496,944	292,000	0	-311,945,149	0.64
2001	0.7903	199,157,886	244,766,647	292,000	0	-348,221,187	0.67
2002	0.7599	205,132,622	128,617,817	292,000	0	-290,298,120	0.75
2003	0.7307	419,932,120	28,816,892	590,250	0	-4,945,344	1.00
2004	0.7026	432,530,084	72,042,231	590,250	0	247,913,938	1.20
2005	0.6756	445,505,986	81,459,387	590,250	0	493,452,024	1.39
2006	0.6496	524,671,559	46,730,504	672,000	0	803,476,902	1.62
2007	0.6246	594,512,328	0	724,250	0	1,174,355,183	1.90
2008	0.6006	612,347,698	0	724,250	0	1,541,680,377	2.18
2009	0.5775	630,718,129	0	724,250	0	1,905,486,144	2.46
2010	0.5553	649,639,673	0	724,250	954,566,897	2,795,842,957	4.59

\* Assumes Discount Rate = 4%

\*\*  $NPV = PV(U) - [PV(I) + PV(M) - PV(R)]$

\*\*\*  $B/C = PV(U) / [PV(I) + PV(M) - PV(R)]$

NOTE: Internal Rate of Return is 23.73%

As indicated in Table 8.8, for the TIS Master Plan improvements, NPV is approximately \$2.80 billion, the B/C ratio is 4.59, payback period is ten years, and IRR is 23.73 percent. A sensitivity analysis was performed using higher discount rates of 7 and 10 percent. These rates would result in more conservative results because user benefits, which are greater in later years, are discounted more. Under these conservative assumptions, the Master Plan improvements achieve an NPV and B/C ratio of 1.86 billion and 3.22 using the 7 percent discount rate, and \$1.22 billion and 2.42 using a 10 percent discount rate.

Generally, economic desirability of a project is indicated by a NPV which is greater than zero, a B/C ratio greater than 1.0, and an IRR greater than the real cost of capital for public investments. Because the Master Plan improvements meet and exceed these criteria, even under conservative assumptions, the project is economically desirable.

### **8.13 PEDESTRIAN AND BICYCLE FACILITIES**

Due to the nature of interstate facilities, pedestrian and bicycle traffic is not permitted. Therefore, no provisions were made for accommodating bicycle traffic on the Tampa interstate. However, every cross street typical section developed includes 14-foot curb lanes to allow for bicycle passage under I-275. Provisions for 5-foot sidewalks are also recommended under each structure. Under-structure lighting related to pedestrian safety will be established during final design.

### **8.14 SAFETY**

Roadway standards for this project were developed using Department standards and AASHTO guidelines. Through most of the project limits, median and shoulder widths

for refuge areas are wider than the existing system. The vertical profile of the new freeway will dramatically improve vehicular stopping sight distance. Also, the four-roadway system will allow through traffic vehicles on the mainline to travel on the new facility with less disruption from vehicles exiting or entering the freeway. These movements will be limited to the local access freeway. Overall, the proposed improvements will decrease the accident potential in the corridor from existing conditions.

## **8.15 ECONOMIC AND COMMUNITY DEVELOPMENT**

The new Tampa interstate facility will provide access to all areas presently served as well as increase accessibility to the Westshore area with the addition of HOV ramps at Trask Street. Improved traffic capacity and accessibility should provide more economic and growth opportunities to businesses and development throughout the corridor study limits.

## **8.16 ENVIRONMENTAL IMPACTS**

Existing natural features within the right-of-way may potentially be disturbed as a result of roadway construction. Impacts associated with loss of habitat may result due to filling activities necessary to widen the existing roadway and to construct new roadway. The following discussion summarizes the potential impacts which may occur as a result of the proposed project.

### **8.16.1 Wetlands**

In compliance with Executive Order 11990, the study area has been evaluated for the presence of wetlands which have the potential to be impacted by the proposed

improvements. The identification of wetland areas was accomplished through interpretation of 1"=1,000' and 1"=100' scale aerial photographs, review of National Wetlands Inventory (NWI) Map - Gandy Bridge quadrangle, and a field review conducted on September 10, 1990. Wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) Classification System, "Classification of Wetlands and Deepwater Habitats."

Existing wetland sites within the right-of-way may potentially be disturbed as a result of roadway construction. Table 8.9 lists the type, size, and potential area of impact to each wetland site identified. These sites will be affected primarily by filling activities necessary to widen the existing roadway and to construct new roadway. In some areas, drainage systems along the corridor will be modified. Drainage structures which traverse the roadway will likely require the extension of existing culverts or the replacement by new culverts. Six retention/detention ponds are proposed for the management of surface waters and filtration of stormwater runoff. The total pond area proposed is 14.06 acres. A Wetland Evaluation Technique (WET-II) Analysis was performed on specific wetlands proposed for impact. The WET-II Analysis was used to determine the qualitative value of these wetlands. The Environmental Assessment for this project provides a discussion of the WET-II Analysis. Based on the results of the analysis, the creation of retention/detention ponds should adequately compensate for the functions performed by the impacted wetland areas.

#### **8.16.2    Floral and Faunal Communities**

The majority of the study area is highly urbanized and does not provide suitable habitat for wildlife or native flora, with the exception of species tolerant of disturbed habitats. Significant disturbance of coastal habitat near the Howard Frankland

**TABLE 8.9**  
**POTENTIAL WETLAND IMPACTS**  
**Tampa Interstate Study - Phase II**

<u>Site</u>	<u>USFWS Classification<sup>1</sup></u>	<u>Acres of System</u>	<u>Anticipated Acres of Impact</u>
1	E2SS3U	*	0.0
2	E2SS3U	*	0.0
3	E1UB3 <sub>x</sub>	3.3	1.3
4	E1UB3 <sub>x</sub>	1.2	0.7
5	PUBH <sub>x</sub>	2.0	0.2
6	PUBH <sub>x</sub>	0.5	0.5
7	R2UBH <sub>x</sub>	0.6	0.2
8	PEM1H <sub>x</sub>	0.6	0.6
9	PEM1H <sub>x</sub>	0.8	<u>0.4</u>
<b>TOTAL</b>			3.9

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<sup>1</sup> USFWS National Wetlands Inventory Map - Gandy Bridge Quadrangle, December 1982.

\* These wetlands are part of the entire Tampa Bay estuarine system.



Bridge is not anticipated. Where practicable, the loss of habitat will be replaced with in-kind mitigation.

#### **8.16.3     Threatened or Endangered Species**

The following discussion summarizes potential impacts to threatened or endangered species associated with the proposed project.

##### **Mammals**

The West Indian Manatee (Trichechus manatus latirostris) is listed as endangered by the USFWS and the Florida Game and Fresh Water Fish Commission (FGFWFC). This species may occur in the waters of Tampa Bay.

It is anticipated that the proposed project will not jeopardize the continued existence of the manatee, nor will it destroy or modify its habitat. Because construction will be limited to the causeway approaches to the Howard Frankland Bridge (no bridge work is anticipated), the manatee's passage in the vicinity of the Howard Frankland Bridge should not be disrupted. Possible hazards to the manatee during shoreline construction may include becoming trapped or entangled in turbidity barriers, or coming in contact with construction equipment, such as work boats and barges. Mitigation measures will be included as special provisions of the construction contract to ensure the protection of manatees. These measures are outlined by the Florida Department of Natural Resources and are included in the Environmental Assessment prepared for this project.

## Avian

The Arctic peregrine falcon (Falco peregrinus tundrius) may inhabit the coastal areas of Tampa Bay during winter migration. Wintering peregrines in Florida require an area that has a plentiful and dependable food supply and perches for roosting. It is unlikely that the proposed project will result in a substantial loss of habitat.

The project area contains suitable habitat for the bald eagle (Haliaeetus leucocephalus), which is federally and state listed as endangered. The bald eagle nests primarily in riparian zones, where they feed along the shore. After the nesting season, they are not as limited to shore areas, but tend to inhabit areas where food is most plentiful. Bald eagle nests are closely monitored by the FGFWFC. Contact made in 1988 with FGFWFC staff at the Brooksville office indicates that no known eagle nests exist within one mile of the proposed project corridor.

The woodstork (Mycteria americana), which is federally and state listed as endangered, may occur in the mangrove swamps along the coast of Tampa Bay. Several woodstorks were observed during field reviews in mangrove swamps outside the project study area. It is unlikely that woodstorks utilize the mangrove habitat within the study area due to the limited size of the habitat. No woodstorks were observed within the study limits during field reviews. No significant impacts to the woodstork are anticipated as a result of the proposed project, since minimal mangrove habitat removal is being proposed.

The least tern (Sterna antillarum) is listed as threatened by the FGFWFC. This shorebird inhabits the sandy and pebbly beaches along the coast of Tampa Bay. Consultation with the Florida Natural Areas Inventory (FNAI) indicates that the least

tern inhabits areas adjacent to the project area. No least terns were observed during field reviews. Additionally, their preferred habitat will not be affected by the proposed project. However, short-term negative impacts to this species, such as noise and increased human activity, may result from construction activities.

## **Reptiles**

The potential for impacts to four threatened or endangered sea turtles was reviewed. Sea turtles which may inhabit waters in the vicinity of the proposed project include the Atlantic loggerhead turtle, the Atlantic green turtle, the leatherback turtle, and the Kemp's ridley turtle. These turtles inhabit saltwater bodies and estuaries, and nest on sandy beaches. Information concerning these species was obtained through literature reviews which indicate that while the USFWS lists the entire coast of Florida and the Gulf Coast as being possible nesting habitat for these species, the probability of finding these species occurring or nesting along the shores of upper Tampa Bay is low. These turtles are known to have very small and strict nesting habitats along the Atlantic coast of Florida, the shores of Mexico and Texas in the Gulf of Mexico, and in the tropical islands south of Florida. Construction near the shoreline of the Howard Frankland Bridge could have potential involvement with these species. However, the literature reviews indicate that these four species of turtles are unlikely to occur or nest along the shorelines of the study area and no nesting sites have been recorded adjacent to the Howard Frankland Bridge. Therefore, it is unlikely that the proposed project would have an adverse impact on these species.

## **8.17 UTILITY IMPACTS**

A preliminary evaluation of utility relocations is provided in this section. Also included is a cost estimate to relocate each affected utility system, as provided by FDOT.

Beginning at the west end of the project, utility relocations on I-275 between the Howard Frankland Bridge and Westshore Boulevard, not including the Veterans Expressway, will be limited to the south side of I-275. Specifically, relocation will be required of buried telephone lines which are presently located along south side of the Kennedy Boulevard exit ramp.

Between Westshore Boulevard and Lois Avenue, utility relocations on the north side of I-275 include a 15-inch storm drain located along the outside of the Westshore Boulevard exit ramp. Utilities affected on the south side of I-275 include 15-inch and 18-inch storm drains, 2-inch and 6-inch water mains, overhead electric lines, buried telephone lines, and sanitary sewers.

On I-275 between Lois Avenue and east of Dale Mabry Highway, north side relocations include 15-, 18- and 24-inch storm drains, 2- and 8-inch water mains, and overhead electrical lines just east of Dale Mabry Highway. On the south side of I-275, utility relocations should be limited to 15- and 18-inch storm drains.

On the Veterans Expressway, between I-275 (including the interchange) and Cypress Street, relocations on the east side of the highway include 12-inch water mains, buried and overhead electrical lines, and a 36-inch storm drain. On the west side of the expressway, relocations may include 8- and 12-inch water mains, 18- and 48-inch storm

drains and buried electrical lines. Additional relocations along Cypress Street may include cable television lines, overhead electrical lines and a gas main. Preliminary cost estimates will be provided as soon as coordination activities with utility companies are complete.

With cooperation from affected utility companies and the City of Tampa, a preliminary cost estimate was tabulated for the project. These figures are tabulated with right-of-way and construction costs in Table 8.3.

#### **8.18 MAINTENANCE OF TRAFFIC**

Detailed maintenance of traffic and construction sequencing plans will be developed for each construction project in conjunction with preliminary and final plans preparation. These plans will address unique features of each construction project including diversions, detours, temporary signing, striping, etc. To assure consistency in maintaining traffic along the entire interstate system during its reconstruction, the following general guidelines should be used in developing the final maintenance of traffic plans: 1) the number of existing lanes presently operating on the interstate should not be reduced during reconstruction; 2) local streets will not be used to maintain traffic; and 3) motorists will be encouraged to carpool and utilize transit facilities during reconstruction. The Preferred Alternative has been sufficiently evaluated to ensure that the concepts presented are constructable, while maintaining traffic on the facility and the various crossroads by using FDOT and FHWA guidelines and criteria. The final design will include traffic control plans to insure maintenance of mobility within the Westshore Business District and its local streets connecting to the interstate.

#### **8.18.1     Construction Staging**

The construction staging plan for Segment I-A of I-275 recommends that the reconstruction work be performed according to the following schedule:

- \* Construct the westbound I-275 C/D and Mainline roadways west of Hoover Boulevard, and the westbound on-ramps from Kennedy Boulevard and Executive Drive.
- \* Construct the eastbound I-275 C/D and Mainline roadways west of the Kennedy Boulevard on-ramp overpass, and the eastbound off-ramp to Kennedy Boulevard.
- \* Complete the westbound I-275 Mainline roadway to Westshore Boulevard, and the ramp connecting the eastbound I-275 C/D with northbound Memorial Highway. Construct the southbound Memorial Highway roadways, the ramp connecting southbound Memorial Highway with the westbound I-275 C/D, and partially construct the ramp connecting southbound Memorial Highway to the eastbound I-275 C/D roadway.
- \* Complete construction of the eastbound I-275 C/D to Trask Street, along with completing the ramp partially constructed connecting southbound Memorial Highway with the eastbound I-275 C/D roadway.
- \* Complete the construction of the southbound Memorial Highway to the Sherrill Street extension.
- \* Construct the northbound Memorial Highway roadways, the Sherrill Street extension, and the ramp connecting the westbound I-275 Mainline with northbound Memorial Highway.
- \* Complete construction of the eastbound I-275 Mainline and westbound C/D to Westshore Boulevard, along with the ramps connecting the westbound I-275 C/D to northbound Memorial Highway, and the southbound Memorial Highway with the eastbound I-275 Mainline.

#### **8.18.2     Traffic Control Plan**

The Traffic Control Plan has been prepared to meet the requirement that the same number of traffic lanes will be kept open at all times and that there will be no long term closure of any of the main through routes. This section will be constructed in six phases. The phasing will be:

- \* Construct eastbound on-ramp at Lois Avenue.
- \* Construction eastbound Collector/Distributor (C/D) from Trask Street to Cypress Street.
- \* Construct eastbound Mainline (M/L) from Westshore Boulevard to east of Lois Avenue and construct westbound C/D from Cypress Street to east of Dale Mabry Highway.
- \* Complete construction of westbound C/D, M/L, and HOV and eastbound HOV from Westshore Boulevard to Cypress Street.
- \* Complete construction of eastbound C/D from Lois Avenue to Himes Avenue and Westbound M/L and HOV from Cypress Street to Dale Mabry Highway.
- \* Complete remainder of M/L, ramps and HOV lanes.

#### **8.19 DRAINAGE**

The proposed interstate improvements will require that the existing interstate drainage system be reconstructed as an urban or enclosed storm sewer system. It is not likely that the existing interstate storm sewer system will be salvageable under the proposed improvements due to the magnitude of the proposed interstate expansion. This will have to be determined during final design.

The state requirements for stormwater treatment will apply throughout the study area. The stormwater treatment criteria has been delegated to the Southwest Florida Water Management District by the Florida Department of Environmental Regulation in Chapter 17-25.035 F.A.C. The City of Tampa criteria are promulgated in their "Stormwater Management Technical Standards," October 1988. The criteria for the peak rate of discharge limits the post-developed 25-year rate to less than or equal to the pre-development 5-year rate. The Southwest Florida Water Management District criteria for the peak rate of discharge limits the post-development 25-year, 24-hour rate to less than or equal to the pre-development 25-year, 24-hour rate. The FDOT

requires that the critical storm be evaluated for stormwater systems discharging to FDOT systems. It is anticipated that the project will be required to meet Federal (EPA) stormwater quality requirements (NPDES permitting). At this time, it is not clear whether the project will be permitted under an EPA General NPDES permit or under the EPA Municipal NPDES permit. This will be determined during the final design of this project.

To meet regulatory criteria, peak discharges for the proposed conditions must be less than or equal to peak discharges for the existing condition within each sub-basin except for areas discharging directly to Tampa Bay. To accomplish this, volume storage in the form of excavated detention ponds will be used. Preliminary pond sizes, as described in Table 8.10, and shown in the appended plan set were determined.

The proposed detention ponds will be designed to include stormwater treatment capacity in addition to providing peak attenuation storage capacity. The proposed pond storage depths range from 2 to 4 feet, depending on soil conditions and water table levels. The proposed "wet" detention ponds will have a maximum depth of 6 to 8 feet. The total pond area includes one foot of freeboard storage and a 20-foot maintenance berm around the pond perimeter. The proposed pond areas shown are preliminary estimates only. Actual pond areas will be determined during final design and will be dependent on site availability, soil conditions and permitting requirements in effect at the time of final design.

The proposed pond locations within each sub-basin were determined from existing topography, existing land use, proximity to an existing outfall and the proximity to the existing right-of-way. The proposed ponds will be designed to function as an amenity to the TIS project in addition to providing stormwater storage and treatment



**TABLE 8.10**  
**PROPOSED DETENTION PONDS**  
**Tampa Interstate Study - Phase II**

<u>Pond Location</u>	<u>Pond Area<sup>1</sup></u> (Ac)	<u>Storage Volume</u> (Ac-Ft)
Begin Segment 1A	0.73	0.68
Memorial/I-275	1.43	0.85
Westshore Boulevard Exit	0.90	0.84
West of Lois Avenue	2.31	3.14
East of Lois Avenue	2.56	2.00
Dale Mabry Highway	6.13	9.75

---

\* Source: TIS Phase I Study

<sup>1</sup> Pond area includes one foot of freeboard and a 20-foot maintenance berm.

capacity. The ponds will also utilize landscaping, fountains, littoral zones, structural designs and other features to provide an aesthetic and functional system.

### **Floodplains and Floodways**

Within the project limits, the existing roadway transverses the Federal Emergency Management Agency (FEMA) flood zones, A, B and C. The FEMA Zone A area is associated with tidal storm surge within Tampa Bay. Although the interstate drainage system runs parallel to the project corridor, there is no longitudinal floodplain encroachment within the project corridor. No floodways are designated within the project corridor.

## **8.20 GEOMETRIC TRANSITIONS TO EXISTING FACILITIES**

The study limits of this project include a specific segment within the entire Master Plan study area. Due to the large scale of improvements required, various segments of the Master Plan are planned to have different construction schedules. The following paragraphs describe transitional roadway geometrics from the improved facility, provided within this project's study boundaries, to the existing conditions at the eastern project boundary. The geometric transitions assume that no roadway improvements on I-275 east of Dale Mabry Highway will take place prior to the construction of this project.

### **8.20.1 Description of Geometric Transition Area**

Transitional geometrics necessary to connect the eastern project boundary on the improved interstate system to existing conditions are described below. This transition

area is shown in plan view on the appended plan set and on the lane line diagram on Exhibit 8.8. The transitional geometrics were developed based on standard criteria for merging and/or dropping freeway lanes as well as adding freeway lanes without consideration of providing acceptable traffic operations.

Beginning with the eastbound express freeway lanes, three through lanes continue on the future I-275 alignment from Dale Mabry Highway to east of MacDill Avenue. The three express freeway lanes narrow down to two lanes in the vicinity of Tampania Avenue and continue on the future alignment to east of Armenia Avenue where they merge with the local access freeway lanes. The eastbound HOV lane transitions into the express freeway lanes between Dale Mabry Highway and Himes Avenue.

The eastbound lanes of the local access freeway narrow down from three to two lanes between Dale Mabry Highway and Himes Avenue. This reduction in the local access freeway lanes is accomplished by tying in the Dale Mabry Highway eastbound entrance ramp with the mainline lane rather than its future alignment which ties into the local access freeway. East of Glen Avenue, the Himes Avenue entrance ramp ties into the local access freeway. Finally, the two local access freeway lanes tie into the express freeway east of Lincoln Avenue. This two-lane ramp connection carries an auxiliary lane with the three express freeway lanes to Armenia Avenue where a two-lane exit with Armenia Avenue eliminates the additional lane.

For westbound movements on I-275, the transition area begins east of Armenia Avenue where the existing three lanes widen to four lanes on the future alignment. West of Armenia Avenue, the four westbound lanes split to form three express freeway lanes and two local access freeway lanes. The three express freeway lanes continue westbound to east of Dale Mabry Highway where they match the Preferred

Alternative and the westbound HOV lane is formed. The two westbound lanes of the local access freeway become a three-lane section with the addition of a lane from a temporary connection of the Armenia Avenue entrance ramp in the vicinity of MacDill Avenue. The three lanes continue westbound providing a single-lane exit ramp for Himes Avenue. Three lanes continue westbound matching the Preferred Alternative in the vicinity of Dale Mabry Highway. The transition of the local freeway lanes to the future alignment is accomplished by locating the Dale Mabry Highway exit ramp from the express freeway rather than the future two-lane exit planned to originate from the local access freeway.

Right-of-way and construction costs for the transition area limits are tabulated in Tables 8.2 and 8.3.

## **APPENDICES**

## **APPENDIX A**

### **LOCATION HYDRAULIC REPORT**

# **Task A.5.b.6 Location Hydraulic Report**

## **TAMPA INTERSTATE STUDY**

State Project No. 99007-1402, WPI No. 7140004, FAP No. IR-9999(43)

Interstate 275 (I-275) from the Howard Frankland Bridge/Kennedy Boulevard ramps to the Dale Mabry Highway Interchange on the east and just north of Cypress Street on Memorial Highway (S.R. 60), Hillsborough County.

*Did not  
scan  
see Phase II  
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**Prepared For The  
DA DEPARTMENT  
OF  
TRANSPORTATION**

**Prepared By  
GREINER, INC.**

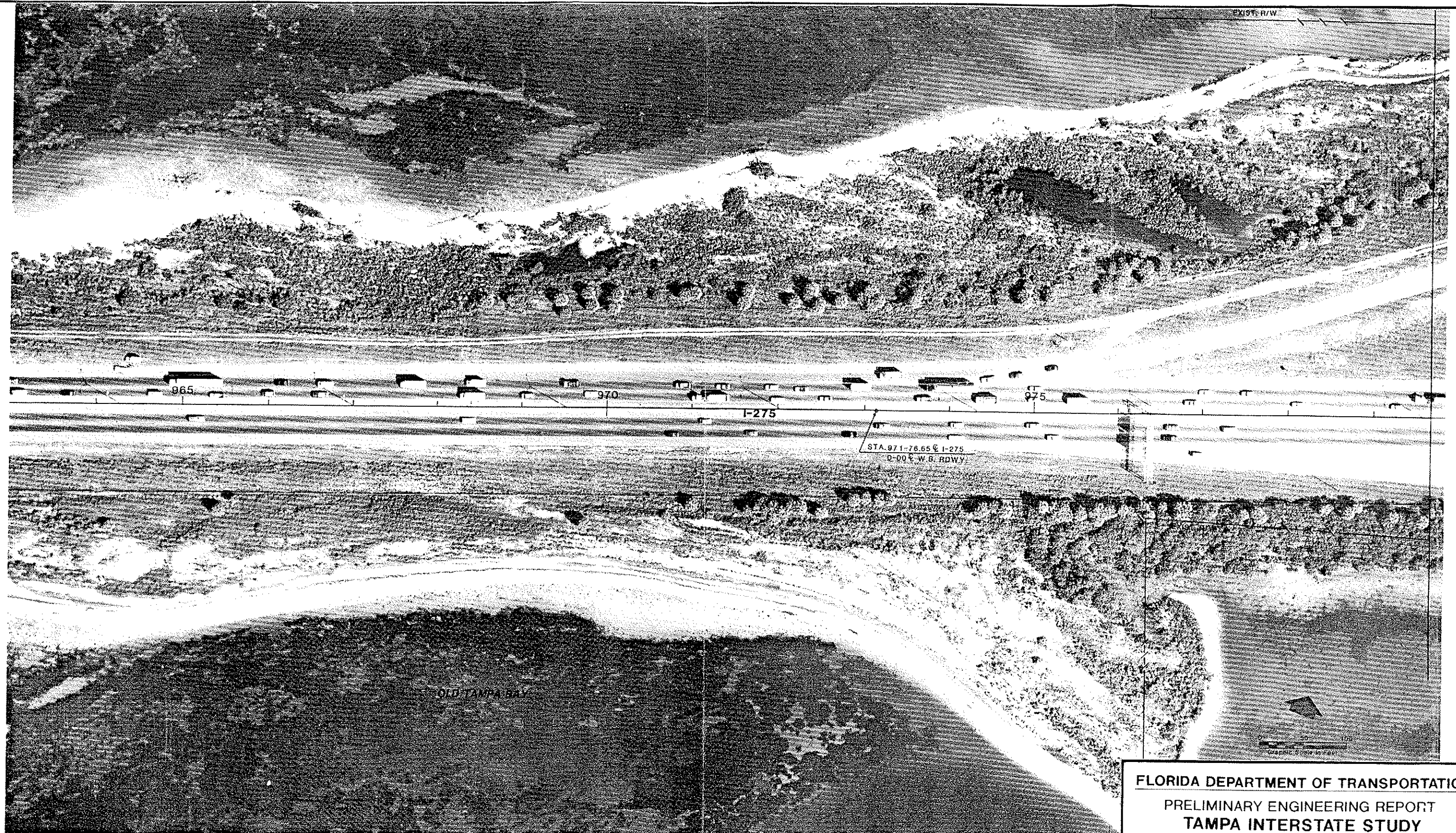
**In Association With  
KNIGHT APPRAISAL SERVICES, INC.  
PIPER ARCHAEOLOGICAL SERVICES**

**MAY 1991**

## **APPENDIX B**

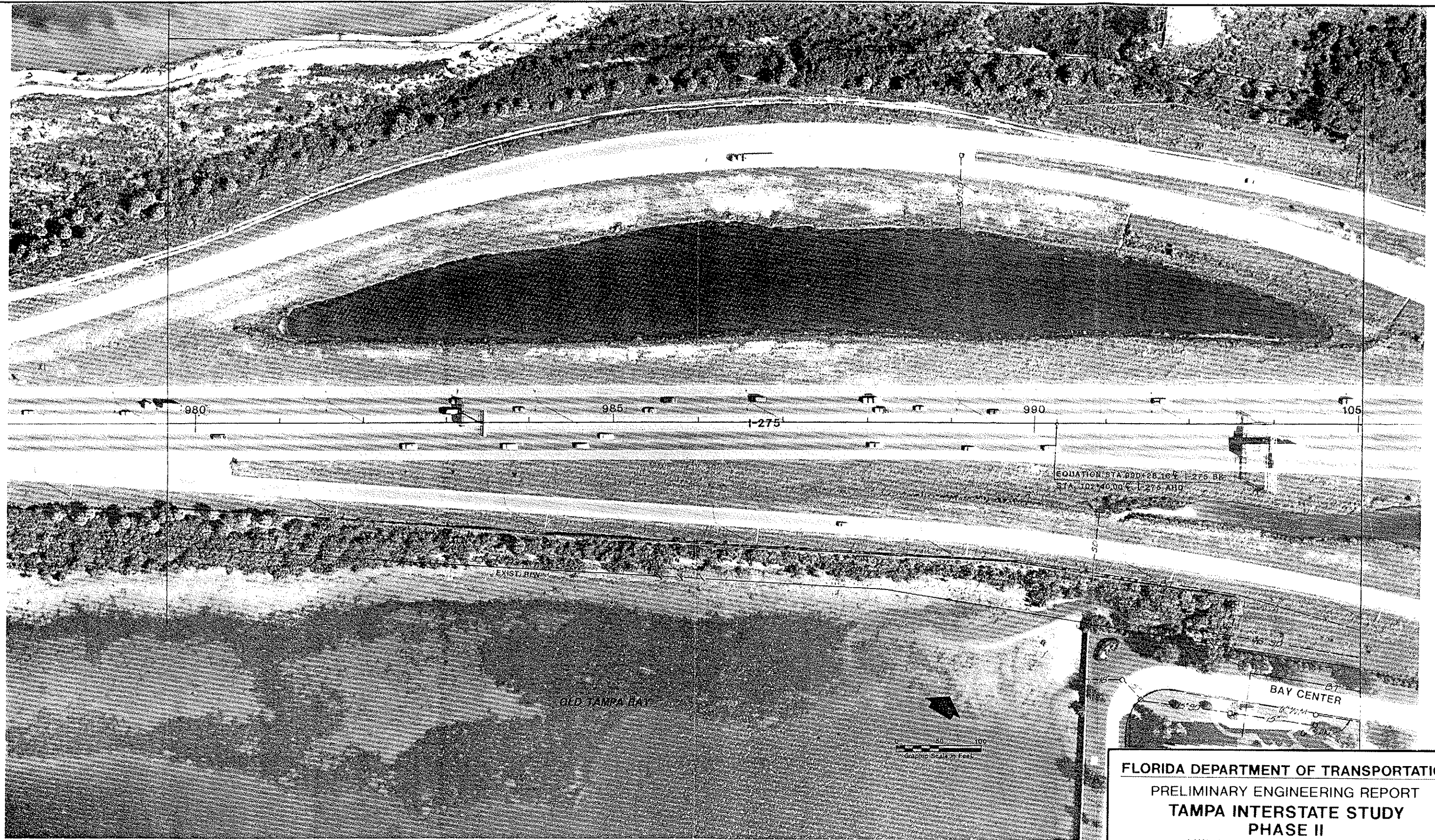
### **EXISTING UTILITIES LOCATIONS**





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**PHASE II**  
Hillsborough County, Florida  
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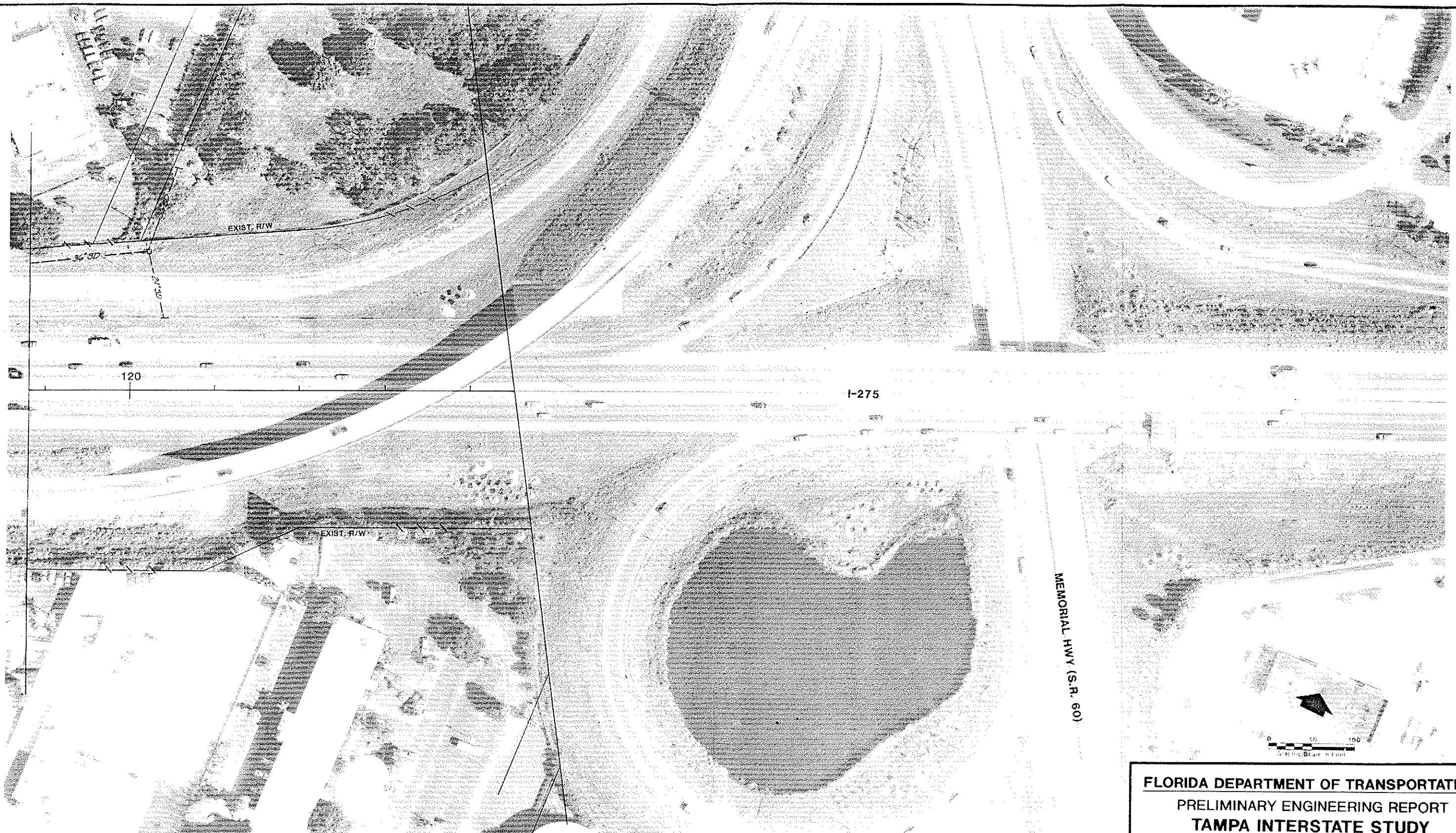


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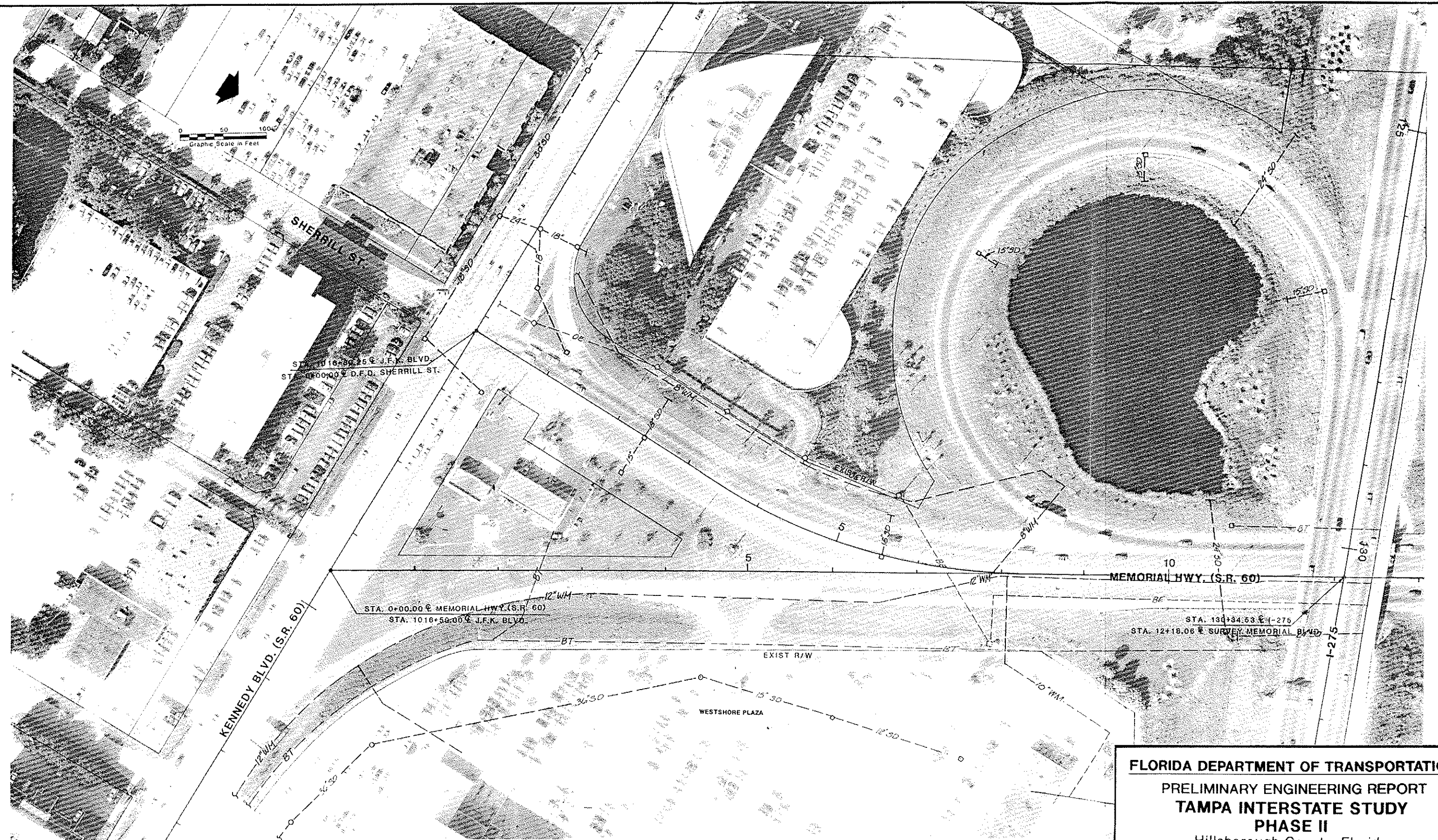






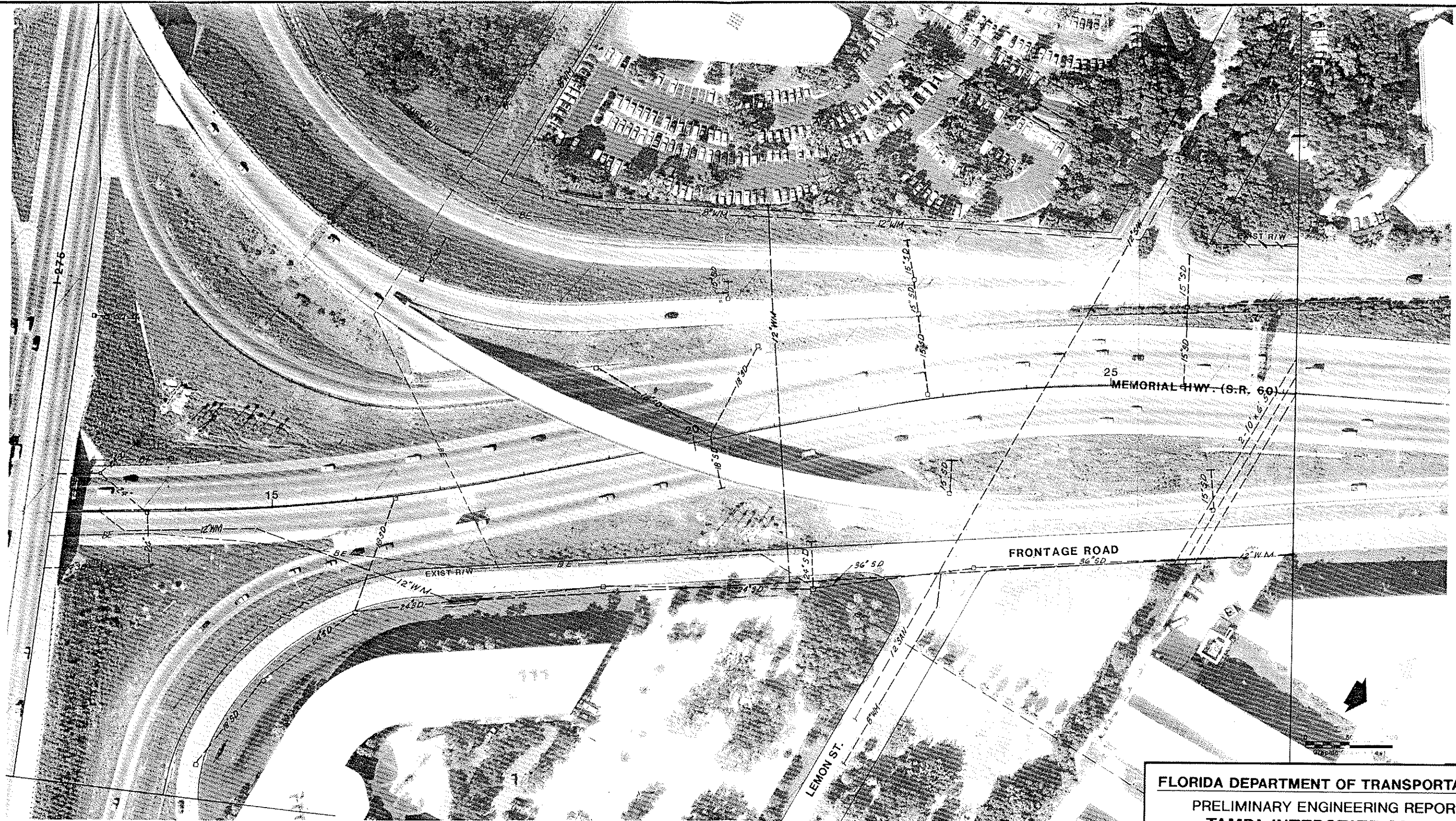
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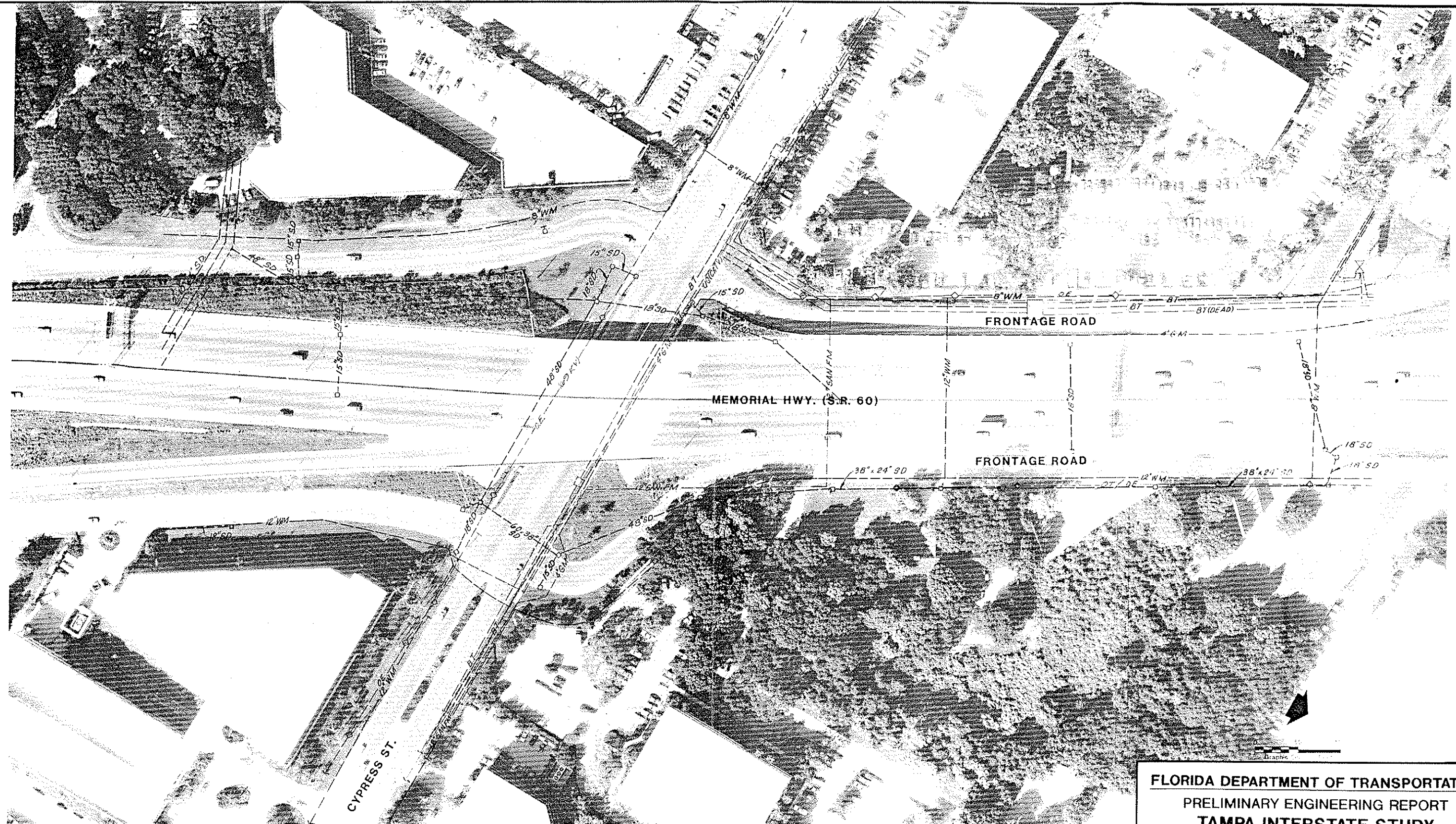
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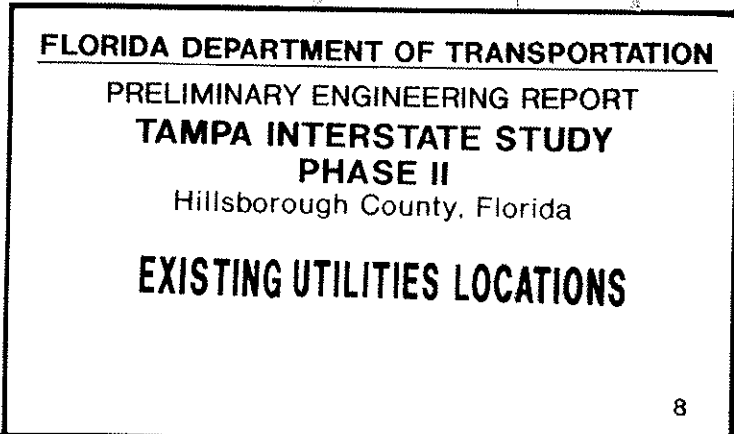


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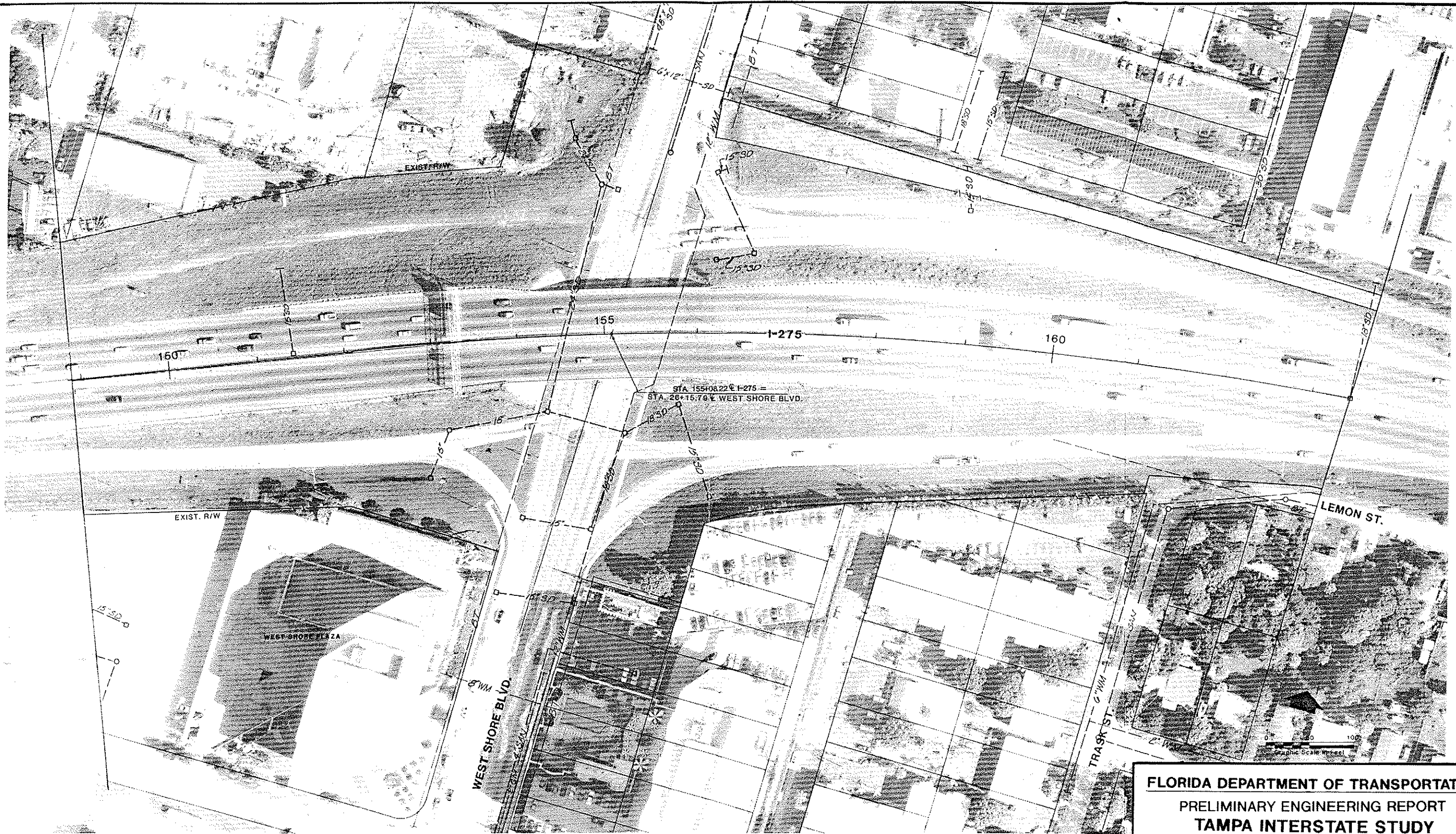




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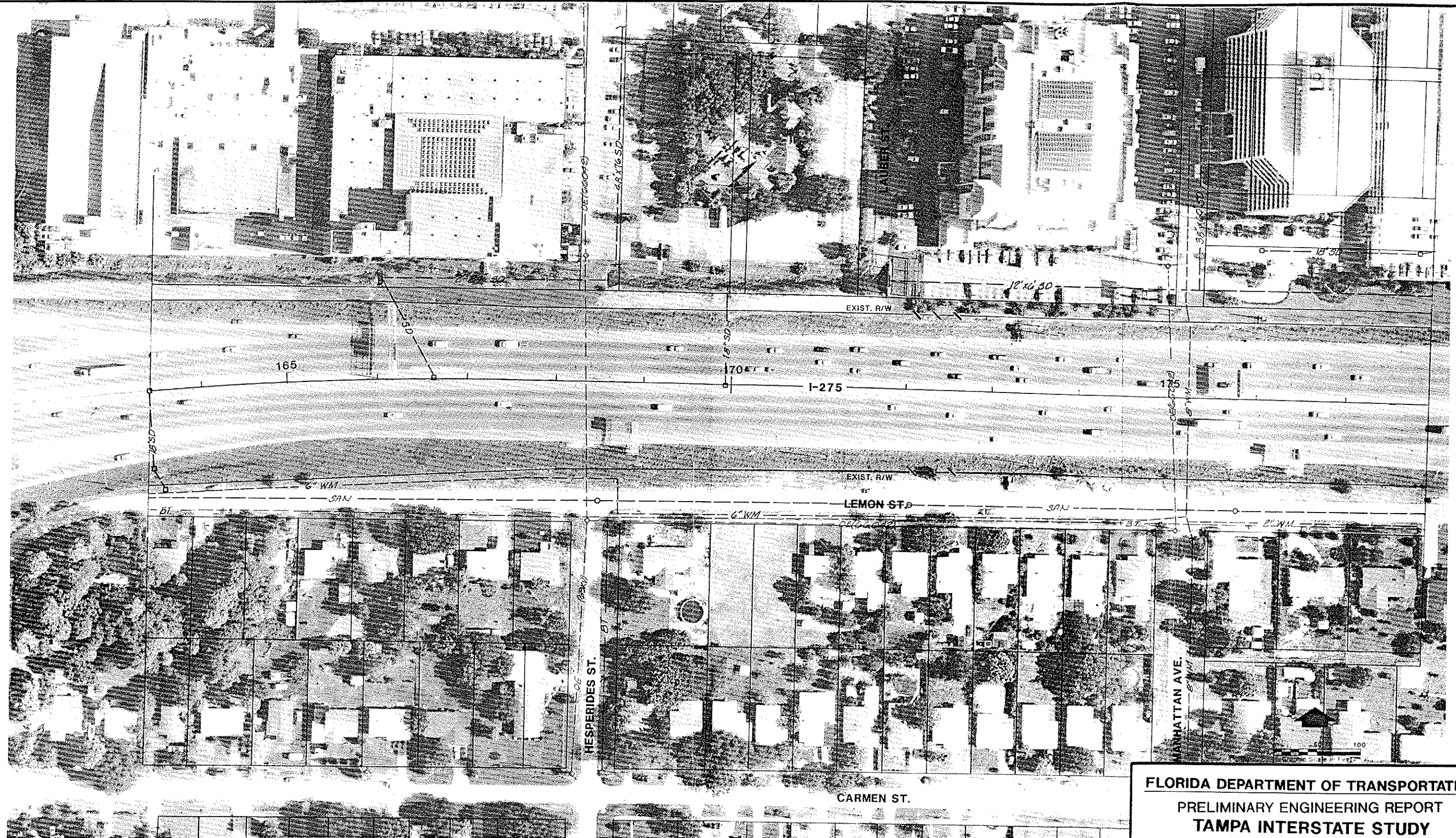






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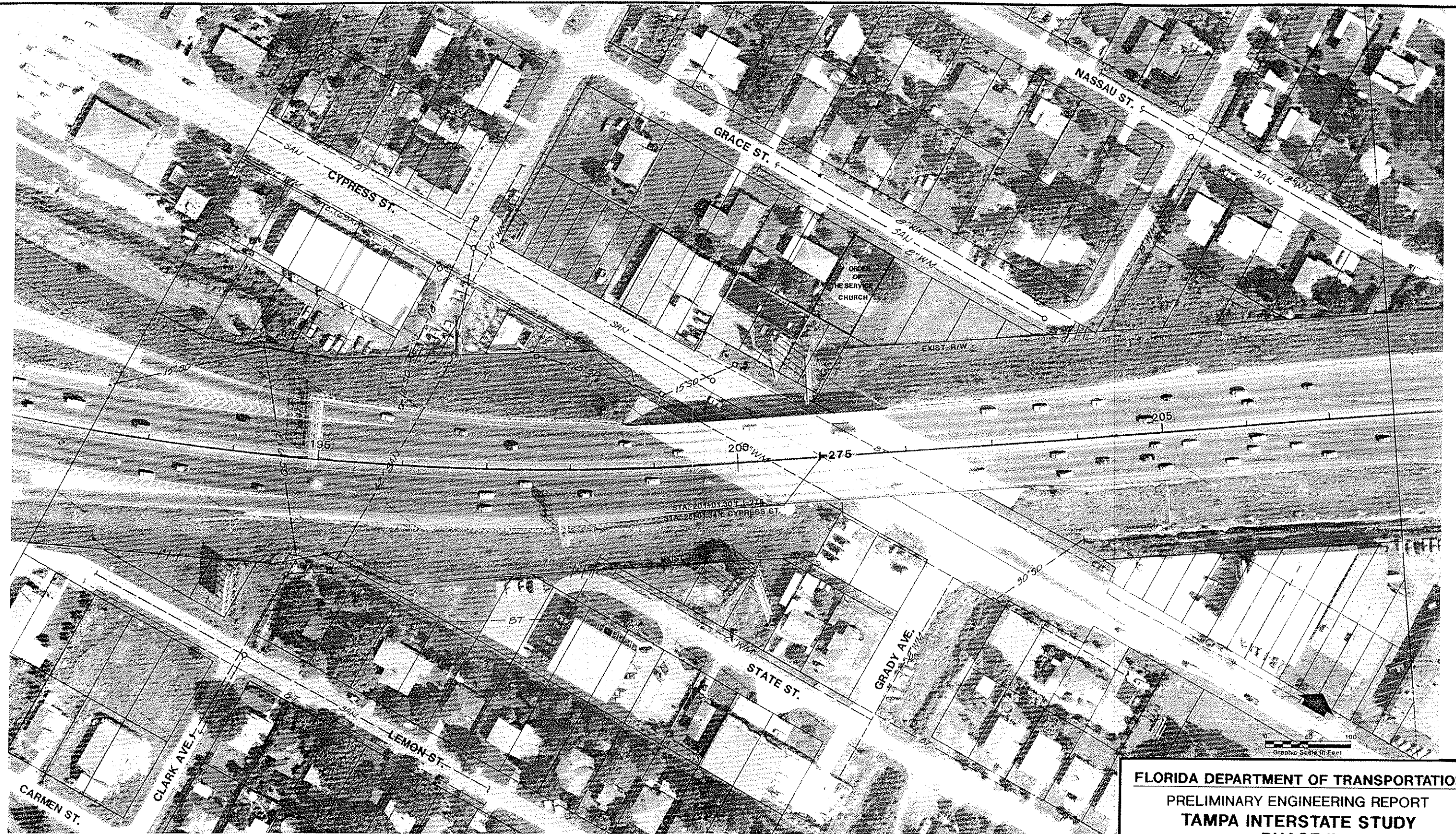
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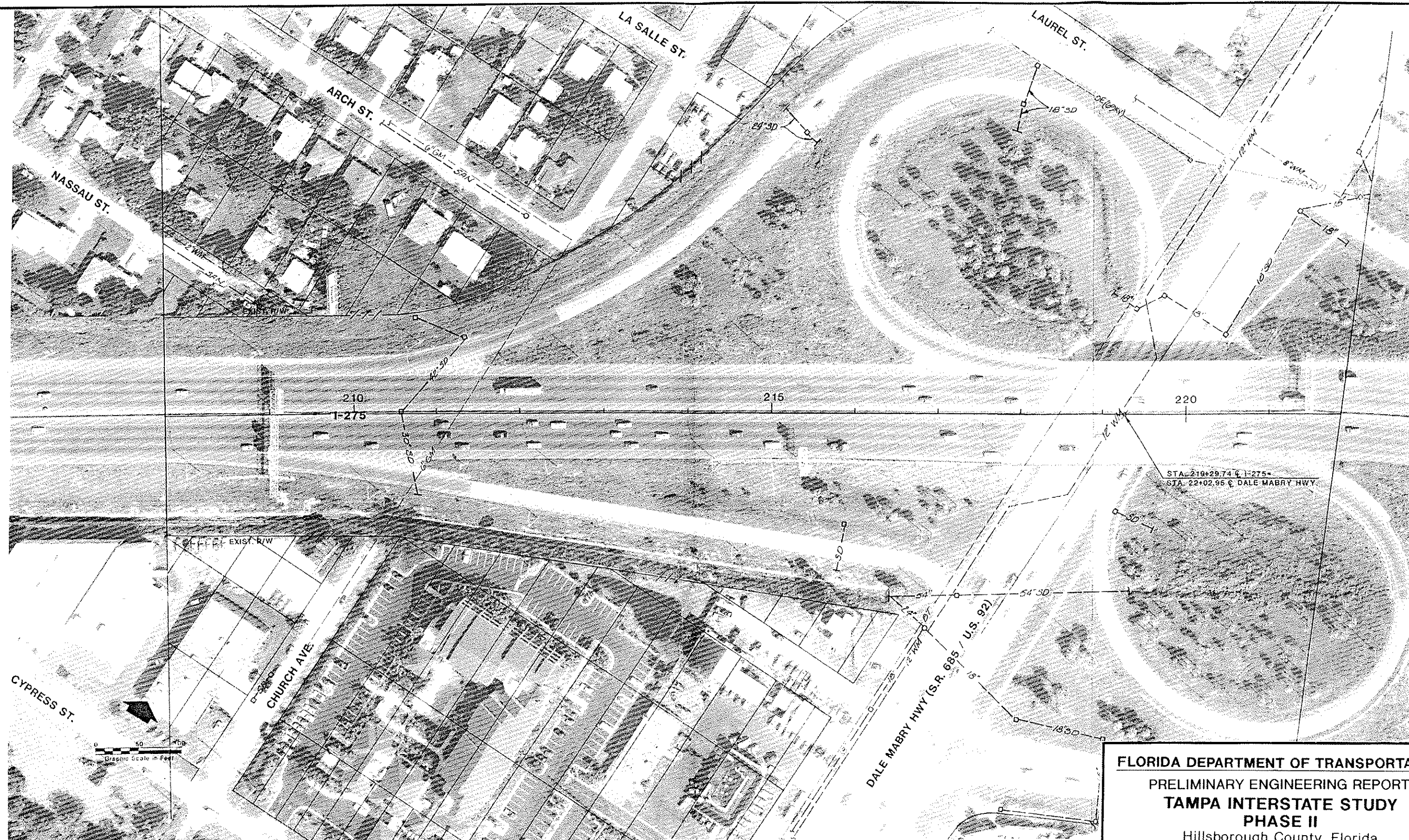
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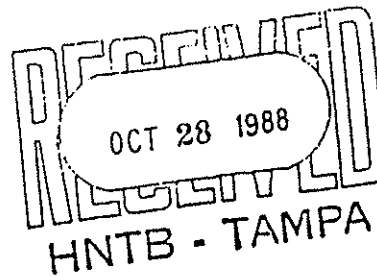


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**PHASE II**  
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**EXISTING UTILITIES LOCATIONS**

## **APPENDIX C**

### **AGENCY CORRESPONDENCE**

**Greiner**



File C2380 BE

C1104. B8,M2  
C1255.  
October 26, 1988

**MEMORANDUM**

TO: Dale Patten  
FROM: Ron Gregory *RG*  
SUBJECT: Northwest Expressway Clearances for Tampa International Airport

---

Attached is a copy of the recent FAR Part 77 surfaces and HCAA zoning ordinance review by our aviation engineering section. This review was requested by this office as part of our Northwest Expressway Phase IA Master Plan and Tampa Interstate studies. The Northwest Expressway issues are discussed on page 2, and as you can see the previously submitted Master Plan does not violate either the FAR Part 77 or HCAA zoning surfaces.

If you have any inquiries regarding this information, please do not hesitate to contact this office.

RWG/hd

Attachment

# Greiner

T9900.01  
October 14, 1988

XC: HNTB  
Jim Kennedy  
Mike Falini  
Lee Coop  
Mike Coleman  
OCT 17 1988  
GREINER, INC.  
TAMPA

## MEMORANDUM

To: Ron Gregory  
From: *fr* Frank Harris *WB*  
Subject: TIS and Northwest Expressway Clearances

At your request we have reviewed Alternatives 1A8, 1A9, and 1A10 and the Northwest Expressway for compatibility with FAR Part 77 surfaces and the HCAA zoning ordinances. The following assumptions and/or criteria were used for our review:

1. 17.0' clear height above highway
2. 12' lanes and 10' shoulders
3. 10% super elevation
4. Alternatives 1A8 and 1A9 have the same ramp plan and profiles.

TIS alternatives 1A8 and 1A9 are unacceptable for the following reasons:

1. Ramp B at Station 154+90 of the I-275/S.R. 60 Interchange penetrates the 62.5:1 surface by 21.02 feet.
2. Ramp C at Station 279+00 of the I-275/S.R. 60 Interchange penetrates the 62.5:1 surface by 17.55 feet.
3. Ramp D at Station 175+00 of the I-275/S.R. 60 Interchange penetrates the 62.5:1 surface by 21.35 feet.

50:1 clearances are contained in the calculations.

Alternative 1A10 must be closely evaluated with a more accurate horizontal location in reference to the Runway System. Particular points of possible conflict are as follows:

1. Ramp B at Station 12+30 at the I-275/S.R. 60 Interchange clears the 62.5:1 surface by 1.83 feet.
2. Ramp C at Station 151+60 of the I-275/S.R. 60 Interchange clears the 62.5:1 surface by 1.24 feet.
3. Ramp D at Station 155+05 of the I-275/S.R. 60 Interchange clears the 62.5:1 surface by 2.51 feet.



# Greiner

T9900.01  
October 14, 1988  
Page 2

The Northwest Expressway has several areas that must also be closely evaluated. These points are as follows:

1. Ramp A at Station 11+80 of the Airport Interchange <sup>VIOLATES</sup> ~~clears~~ the 62.5:1 surface by 7.52 feet.
2. Ramp C at Station 429+60 of the Airport Interchange ~~clears~~ the 62.5:1 surface by 3.08 feet.
3. Ramp D at Station 429+00 of the Causeway Interchange ~~clears~~ the 62.5:1 surface by 2.61 feet.

The above figures are arrived at by transferring data from the 1:100 and 1:500 scale aerials of the airport to the 1:200 scale aerials of the respective studies. The possibility of error in transferring the data is much too large to be definitive with tolerances as close as those that are calculated. Calculations are enclosed as Appendix A.

Appendix B contains an isometric of the approach zones.

It must be pointed out that this analysis only pertains to the roadway and the 17 foot clear area above it. Any signage or lighting would have to analyzed separately.

As regards the extension of Sherrill Street, the extension would traverse the clear zone of Runway 36R at the airport. The Federal Aviation Administration participated in the acquisition of this clear zone and would have to concur in a sale or other transfer of the required right of way. In 1980 a similar right of way (with a slightly different alignment) was proposed. FAA objected to the proposed right of way. The correspondence files are enclosed in Appendix B. Our investigation has revealed that their response at this time would be similar.

xc: Bill Conners  
Warren Schwartz  
John Chiarelli

TAMPA INTERSTATE STUDY - N/W EXPRESSWAY  
CHECK INTERCHANGES VS. HEIGHT ZONING RESTRICTIONS

GIVEN

1. Clear Zones configuration (50:1 FAA restriction) FAR Part 77  
(62.5:1 HCAA restriction) Surfaces
2. Alternates 1A8, 1A9, and 1A10 for the intersection at I-275 and S.R. 60 (TIS).
3. Alternates 1A8 and 1A9 have the same ramp, plans and profiles at the intersection in question (TIS).
4. NW Expressway - interchange @ Airport exit, S.R. 60, and Independence Parkway.
5. Assume 10% superelevation.
6. Assume a 17.0' high clear zone above the proposed highway (no allowance for a future overlay.)
7. Assume 12 foot lanes and 10' shoulders.

FIND

The purpose of these calculations is to determine if each interchange of each alternative is acceptable according to the FAR Part 77 surfaces and HCAA height zoning restrictions.

Tampa Interstate Study

Alternative 1A8 - TIS

Ramp 'B'

PG Elevation at STA. 154+90	=	118.09
roadway clear zone	=	17.00
10% superelevation (10' shoulder)	=	1.00
		<u>136.09'</u> max. elev.

Allowable Elevation

STA. 154+90 on Ramp 'B' is 6040' into the clear zone of R/W 36R

$$62.5:1 \text{ slope } \rightarrow 6040/62.5 + 17.63 = \underline{114.27'} \text{ allowable}$$

$$50:1 \text{ slope } \rightarrow 6040/50 + 17.63 = \underline{138.43'} \text{ allowable}$$

Ramp 'B' violates 62.5:1 surface = (-)21.82'

Ramp 'B' clears 50:1 surface = 2.33'

Ramp 'C'

PG Elev. at STA 279+00	=	103.02
roadway clear zone	=	17.00
10% superelevation (34', 2 lanes & shoulder)	=	3.40
		<u>123.42</u> max. elev.

Allowable Elevation

STA 279+00 is 5515' into clear zone R/W 36R

62.5:1 slope -->  $88.24 + 17.63$  = 105.87 allowable

50:1 slope -->  $110.30 + 17.63$  = 127.93 allowable

Ramp 'C' violates 62.5:1 surface = (-)17.55'  
Ramp 'C' clears 50:1 surface = 4.51'

Ramp 'D'

PG Elev. at STA 175+00	=	112.50
roadway clear zone	=	17.00
10% superelevation (10' shoulder)	=	1.00
		<u>130.50</u> max. elev.

Allowable Elevation

STA 175+00 is 5720' into clear zone R/W 36R

62.5:1 slope -->  $91.52 + 17.63$  = 109.15 allowable

50:1 slope -->  $114.40 + 17.63$  = 132.03 allowable

Ramp 'D' violates 62.5:1 surface = 21.35'  
Ramp 'D' clears 50:1 surface = 1.53'

Alternative 1A9

Alternative 1A9 is the same as 1A8 at the interchange in question. Therefore, same conclusion for 1A9.

Alternative 1A10 - TIS

Ramp 'B'

PG Elev. at Nose at D, STA 12+30	=	85.00
roadway clear zone	=	17.00
10% superelevation (10' shoulder)	=	1.00
		<u>103.00</u> max. elev.

### Allowable Elevation

STA 12+30 is 5450' into clear zone R/W 36R

62.5:1 slope -->  $87.20 + 17.63$  = 104.83 allowable

50:1 slope -->  $109.00 + 17.63$  = 126.63 allowable

Ramp 'B' clears 62.5:1 surface = 1.83'

Ramp 'B' clears 50:1 surface = 23.63'

### Ramp 'C'

PG Elev. at STA 151+60

= 80.15

roadway clear zone

= 17.00

10% superelevation (34', 2 lanes & shoulder)

= 3.40

100.55 max. elev.

### Allowable Elevation

STA 151+60 is 5260' into clear zone R/W 36R

62.5:1 slope -->  $84.16 + 17.63$  = 101.79 allowable

50:1 slope -->  $105.20 + 17.63$  = 122.83 allowable

Ramp 'C' clears 62.5:1 surface = 1.24'

Ramp 'C' clears 50:1 surface = 22.28'

### Ramp 'D'

PG Elev. at STA 155+05

= 84.80

roadway clear zone

= 17.00

10% superelevation (34', 2 lanes & shoulder)

= 3.40

105.20 max. elev.

### Allowable Elevation

STA 155+05 is 5630' into clear zone R/W 36R

62.5:1 slope -->  $90.08 + 17.63$  = 107.71 allowable

50:1 slope -->  $112.60 + 17.67$  = 130.23 allowable

Ramp 'D' clears 62.5:1 surface = 2.51'

Ramp 'D' clears 50:1 surface = 25.03'

## Northwest Expressway

### Airport Interchange

Ramp 'D' STA 48+00

PG Elev STA 48+00  
roadway clearzone  
superelevation

= 70.13  
= 17.00  
= 0.00

87.13 max. elev.

#### Allowable Elevation

STA 48+00 is 1855' into clear zone and 505' into 7:1 transitional surface

50:1 slope -->  $37.10 + 72.14 + 11.40$  = 120.64 allowable

Ramp 'D' clears 50:1 surface = 33.51'

Ramp 'D' STA 53+30

PG Elev STA 53+30  
roadway clearzone  
superelevation

= 56.80  
= 17.00  
= 0.00

73.80 max. elev.

#### Allowable Elevation

STA 53+30 is 1330' into clear zone and 500' into 7:1 slope

50:1 slope -->  $26.60 + 71.43 + 11.40$  = 109.43 allowable

Ramp 'D' clears 50:1 surface = 35.63'

CHECK AT EDGE OF CLEAR ZONE:

Ramp 'A' STA 11+80

PG Elev STA 11+80  
roadway clearzone  
superelevation (10' x .04)

= 30.40  
= 17.00  
= 0.40

47.80 max. elev.

#### Allowable Elevation

STA 11+80 is 1805' into clear zone

62.5:1 slope -->  $28.88 + 11.40$  = 40.28 allowable

50:1 slope -->  $36.10 + 11.40$  = 47.50 allowable

Ramp 'A' violates 62.5:1 surface = (-)7.52'  
Ramp 'A' violates 50:1 surface = (-)0.30'

Ramp 'C' STA 429+60

PG Elev STA 429+60

roadway clearzone  
superelevation (10' x .02)

= 18.40  
= 17.00  
= 0.20

35.60 max. elev.

Allowable Elevation

STA 429+60 is 1320' into clear zone

62.5:1 slope --> 21.12 + 11.40

= 32.52 allowable

50:1 slope --> 26.40 + 11.40

= 37.80 allowable

Ramp 'C' violates 62.5:1 surface = (-)3.08'  
Ramp 'C' clears 50:1 surface = 2.20'

SR 60 (Causeway) Interchange

NW Expressway - Mainline STA 342+00

PG Elev STA 342+00

roadway clearzone  
superelevation (50')

= 52.00  
= 17.00  
= 5.00

74.00 max. elev.

Allowable Elevation

STA 342+00 is 25' into clear zone of new R/W and 510' into 7:1 slope

50:1 slope --> .50 + 72.86 + 16.54

= 89.90 allowable

Mainline clears 50:1 surface = 15.90'

Ramp 'D' STA 429+00

PG Elev STA 429+00

roadway clearzone  
superelevation (35')

= 34.25  
= 17.00  
= 3.50

54.75 max. elev.

Allowable Elevation

STA 429+00 is 285' into 7:1 of new R/W

285/7 + 16.54 + .11

= 57.36 allowable

Ramp 'D' clears 7:1 surface = 2.61'

Ramp 'D' STA 435+00

PG Elev STA 435+00  
roadway clearzone  
superelevation

= 20.00  
= 17.00  
= 0.00  
37.00 max. elev.

Allowable Elevation

STA 435+00 is 210' into 7:1 slope of new R/W

30.00 + 16.54 + .28

= 46.82 allowable

Ramp 'D' clears 7:1 surface = 9.82'

Independence Parkway Interchange

Mainline STA 375+00

PG Elev STA 375+00  
roadway clearzone  
superelevation

= 36.25  
= 17.00  
= 0.00  
56.25 max. elev.

Allowable Elevation

STA 375+00 is 340' into 7:1 slope of new runway

--> 48.57 + 16.54 + 1.36

= 66.47 allowable

Mainline clears 7:1 surface = 10.22'

HCAA CLEARANCE CHECKS  
I-275 INTERCHANGE  
with  
MEMORIAL HIGHWAY  
September 5, 1991

Following the meeting with representatives of Greiner on Wednesday, August 28, 1991 HNTB has revisited the proposed roadway profile grades for the April 1991 Tampa Interstate Study "Preferred Alternative" at the interchange of I-275 and Memorial Highway.

The basis for the review began with HNTB's inquiry regarding the depth of structure used for the Westbound C/D where it crosses over Ramp H. At the August 28 meeting it was agreed that the structure depth shown, 2.5 feet was applicable to the wings of the box section that would be utilized east of the crossover. It was acknowledged; however, that the structure depth where the Westbound C/D passes over Ramp H would have to be much greater, since the entire roadway must pass over Ramp H. Discussions between Greiner and HNTB structural engineers led to the decision that a structure span length to depth ratio of 26:1 was appropriate for the structures in this interchange. Applying this greater depth to the critical clearance calculations at the critical clearance point between the Westbound C/D and Ramp H results in the need to adjust all profiles in the interchange. The net result is that Ramp A (Level 5) will penetrate the maximum elevation criteria established by Hillsborough County Resolution No. 86-95.

Following this review, we then worked "from the top down" in an attempt to shift P.V.I. locations sufficiently to work out the differences. This approach also failed to come up with a balance between minimum vertical clearances, structure depths and profile grades.

The steps taken and results from each evaluation are noted in the following narrative.

Preferred Alternative (Adjustment of Structure Depths)

Level 1: The proposed grades for Memorial Highway and Sherrill Street were verified from topographic mapping obtained as part of Task IB of HNTB's Scope of Services.

Level 2: The proposed grades for I-275 Main Line and Ramp H over Sherrill Street and Memorial Highway are acceptable. A structure depth of 6 feet (span = 150 feet) was used in verifying the clearance calculations at the I-275/Memorial crossing. The clearance was determined to be 17.5±. The TIS profiles indicate that a structure depth of 6.5 feet was used.

Level 3: A structure depth of 6 feet (span = 150 feet) was used to establish a revised profile grade for the Westbound C/D over Ramp H. The resultant profile grade for the Westbound C/D must be raised approximately 4 feet to provide adequate clearance (18.4 feet--this



could be fine-tuned to reduce the clearance). The TIS profiles indicate that a structure depth of 2.5 feet was used.

Level 4: The revised Westbound C/D profile grade impacts the proposed profile grades for Ramps C and D. On Ramp C, a structure depth of 9 feet (span = 230 feet) was used and on Ramp D, a structure depth of 8.5 feet (span = 220 feet) was used. The resultant increase in profile grades was 10± feet and 9± feet for Ramps C and D, respectively. The TIS profiles did not indicate what structure depths were used for Ramps C and D.

Level 5: Raising the Ramp C and D profiles in turn impacts the Ramp A profile. A structure depth of 9.5 feet (span = 250 feet) was used. The resultant increase in the Ramp A profile grade is approximately 15 feet. The TIS profile did not indicate a structure depth on Ramp A. We also noted that the maximum profile grade for Ramp A is approximately elevation 88, which is consistent with earlier maximum elevations determined by Greiner to be compatible with the HCAA criteria. However, if the profile grade for Ramp A is on the inside of the curve it appears that the outside of the ramp/bridge structure would result in a penetration of the HCAA 62.5:1 surface.

The accumulated impacts of the revised structure depths results in an increase in the maximum baseline profile grade from elevation 88± to elevation 105±. We believe that it may be possible to shave about 5 feet off this upper elevation if each profile grade was refined to provide an absolute minimum vertical clearance of 16.5 feet. This would still result in the interchange penetrating the HCAA 62.5:1 surface.

We then approached the problem from the top, in an attempt to adjust the locations of the P.V.I.'s and approach grades throughout the interchange. Structure depths remained as described above.

#### Adjusted Profile Grades

Level 5: The maximum profile elevation of 88± was assumed to be within HCAA 62.5:1 criteria.

Level 4: Ramp C and D profiles were then lowered. The TIS profile for Ramp C at the critical clearance point provided for 23± feet clearance below Ramp A (profile grade to profile grade). Since the profile grade for Ramp C is on the inside of the curve, the cross slope on Ramp C (3± feet) must be acknowledged in the clearance calculations. The result is a lowering of the Ramp C grade by 5.5± feet to provide for a structure depth of 9 feet. Ramp D's profile is also impacted; however, Ramp C is the controlling profile.

Level 3: An attempt was made to force the profiles for the Westbound C/D and Ramp H to fit between the revised Level 4 grades and the revised critical clearance point previously determined for the Westbound C/D over Ramp H. It would appear that this may not be possible without

considerable revisions to the profile grade on the Westbound C/D between Memorial Highway to the vicinity of Westshore Boulevard or further east. It may be possible to develop a "workable profile" through this area; however, it will require revising the grade on Ramp C and removing as much of the excess clearance for the I-275 Mainline over Sherrill Street as possible.

Level 2: Changes would be made as noted above.

Level 1: No changes.

The shifting of the P.V.I. and changes in grades for the Westbound C/D would result in a "hump" that would be at least four levels high outside of the main interchange.

#### Restacking of the Interchange

HNTB had previously studied the restacking of the interchange with the shifting of the Westbound C/D and Ramp E to the third level and Ramps C and D to the third level. The resultant profile grades were in excess of those presently contained in the Preferred Alternative and it was determined that this alternative would definitely conflict with the HCAA 62.5:1 surface.

#### Conclusion

The revised structure depths result in an interchange that will violate HCAA's 62.5:1 surface but do not violate FAA's 50:1 surface.

blm\i-275\4

**FLORIDA**

BOB MARTINEZ  
GOVERNOR



**DEPARTMENT OF TRANSPORTATION**

BEN G. WATTS  
SECRETARY

December 6, 1990

Director  
Florida State Clearinghouse  
Executive Office of the Governor  
Office of Planning and Budgeting  
The Capitol  
Tallahassee, Florida 32399-0001

Subject:      Work Program Item Number:      7140004  
                 State Project Number:            99007-1402  
                 Federal-Aid Project Number:      IR-9999(43)  
                 Tampa Interstate Study from the Howard Frankland Bridge/Kennedy  
                 Boulevard Ramps to the I-275/Dale Mabry Highway Interchange on the  
                 east and just north of Cypress Street on the North  
                 Hillsborough County  
                 Advance Notification Package Submittal

The attached Advance Notification Package is forwarded to your office for processing through appropriate State agencies in accordance with Executive Order 85-150. Distribution to local and Federal agencies is being made as noted.

Although more specific comments will be solicited during the permit coordination process, we request that permitting and permit reviewing agencies review the attached information and furnish us with whatever general comments they consider pertinent at this time.

This is a Federal-aid action and the Florida Department of Transportation, in consultation with the Federal Highway Administration, will determine what degree of environmental documentation will be necessary. The determination will be based upon in-house environmental evaluations and comments received through coordination with other agencies. Please provide a consistency review for this project in accordance with the State's Coastal Zone Management Program.

We are looking forward to receiving your comments on the project within 30 days. Should additional review time be required, a written request for an extension of time must be submitted to our office within the initial 30-day comment period.

Your comments should be addressed to:

Mr. David A. Twiddy, Jr. P.E.  
District VII PD&E Administrator  
Florida Department of Transportation  
4950 West Kennedy Boulevard  
Suite 500  
Tampa, Florida 33609

Letter/Director-Advance Notification  
December 6, 1990  
Page Two

With copy to:

Mr. J. C. Kraft, Chief  
Office of Environment  
Florida Department of Transportation  
605 Suwannee Street, MS. 37  
Tallahassee, Florida 32399-0450

Your expeditious handling of this notice will be appreciated.

Sincerely,

David A. Twiddy, Jr. P.E.  
District VII  
PD&E Administrator

DAT/hd

Attachment

Letter/Director-Advance Notification  
December 6, 1990  
Page 3

#### MAILING LIST

xc: Federal Highway Administration  
National Marine Fisheries-Area Supervisor  
U.S. Department of the Interior-U.S Geological Survey  
U.S. Department of the Interior-Bureau of Land Management  
U.S. Department of Housing and Urban Development  
U.S. Environmental Protection Agency  
U.S. Department of the Interior-U.S. Fish and Wildlife  
Service-Field Office  
National Marine Fisheries Office  
U.S. Army Corps of Engineers  
U.S. Department of the Interior-National Park Service  
Federal Emergency Management Agency  
National Oceanic and Atmospheric Administration  
Federal Aviation Administration-District Office Department of Energy  
U.S. Department of Health and Human Services-Centers for Disease Control  
Commander (oan) - Seventh Coast Guard District  
Marine Fisheries Commission  
Florida Department of Natural Resources-State Land Management  
Tampa Bay Regional Planning Council  
Southwest Florida Water Management District  
Federal-Aid Program Coordinator  
Chief Office of Environment  
Florida Department of Environmental Regulation-District Office

1. Need for Project: See attached text

2. Description of the Project: See attached text

3. Environmental Information: See attached text

a. Land Use: See attached text

b. Wetlands: See attached text

c. Floodplain: See attached text

d. Wildlife and Habitat: See attached text

e. Outstanding Florida Waters: See attached text

f. Aquatic Preserves: See attached text

g. Coastal Zone Consistency Determination is Required? ☒ Yes ☐ No

h. Cultural Resources: See attached text

i. Coastal Barrier Resources: See attached text

j. Hazardous Materials: See attached text

k. Other Comments: See attached text

4. Navigable Waterway Crossing? ☐ Yes ☒ No

5. List Permits Required: See attached text

1. **Need for project:** This project is consistent with, and a basic component of, the Metropolitan Planning Organization (MPO) Long Range Transportation Plan. Traffic congestion is a continuing and outstanding problem in the City of Tampa and Tampa Bay Area. Recent national surveys have shown traffic to be the most limiting factor to the quality of life of the Tampa Bay residents. Travel is expected to increase nearly 70% in the next 20 years. Estimates of the year 2010 traffic demands are as high as 120,000 vehicles per day on I-275 east of the Howard Frankland Bridge. This issue must be resolved and the proposed project is the most practical methodology for addressing this issue.

2. **Description of the project:** The study limits are: I-275 from the Kennedy Boulevard ramps to the Dale Mabry Highway interchange on the east and just north of Cypress Street on the north. A map showing the study limits is attached.

The study will develop alternatives, and make recommendations as to the preferred type and location of multi-lane improvements, potential high occupancy vehicle facilities, transit facilities, traffic management techniques, and traffic surveillance and control systems. This study will include consideration of transportation needs, social impacts, economic factors, and environmental impacts. A public involvement plan will be incorporated into the study to ensure that all interested citizens are fully informed of the study's progress. The study is expected to last 18 months.

3. **Environmental Information**

a. **Land Use:** The project area from the Kennedy Boulevard ramps eastward to the Dale Mabry Highway interchange is highly urbanized with both commercial and residential elements. Land use for the area from the I-275 Interchange to Cypress Street is urbanized commercial and industrial development.

The proposed project is not expected to alter any of the existing land use patterns described above.

b. **Wetlands:** There are limited wetlands involved in this project. The Fish Creek area which is just north of the project study limits is an estuarine system dominated by mangrove and other salt-tolerant species. Little impact is expected to occur to the limited amount of wetlands that currently exist. Thorough field work by qualified biologists will be necessary to determine the exact acreages involved with this project.

c. **Floodplain:** I-275 from Kennedy Boulevard ramps north to Cypress Street lies within the Old Tampa Bay floodplain. There are several locations where the project crosses or is tangent to the 100-year flood zone.

- d. **Wildlife and Habitat:** There are a variety of vegetative communities located within the study area. The potential for occurrence of endangered and threatened species is based on habitats known to exist in these areas. Using Official List of Endangered and Potentially Endangered Fauna and Flora in Florida, 1986, and Endangered and Threatened Wildlife and Plants, 1987, a candidate list of federal endangered and threatened species which may exist in the study area has been compiled and is shown below.

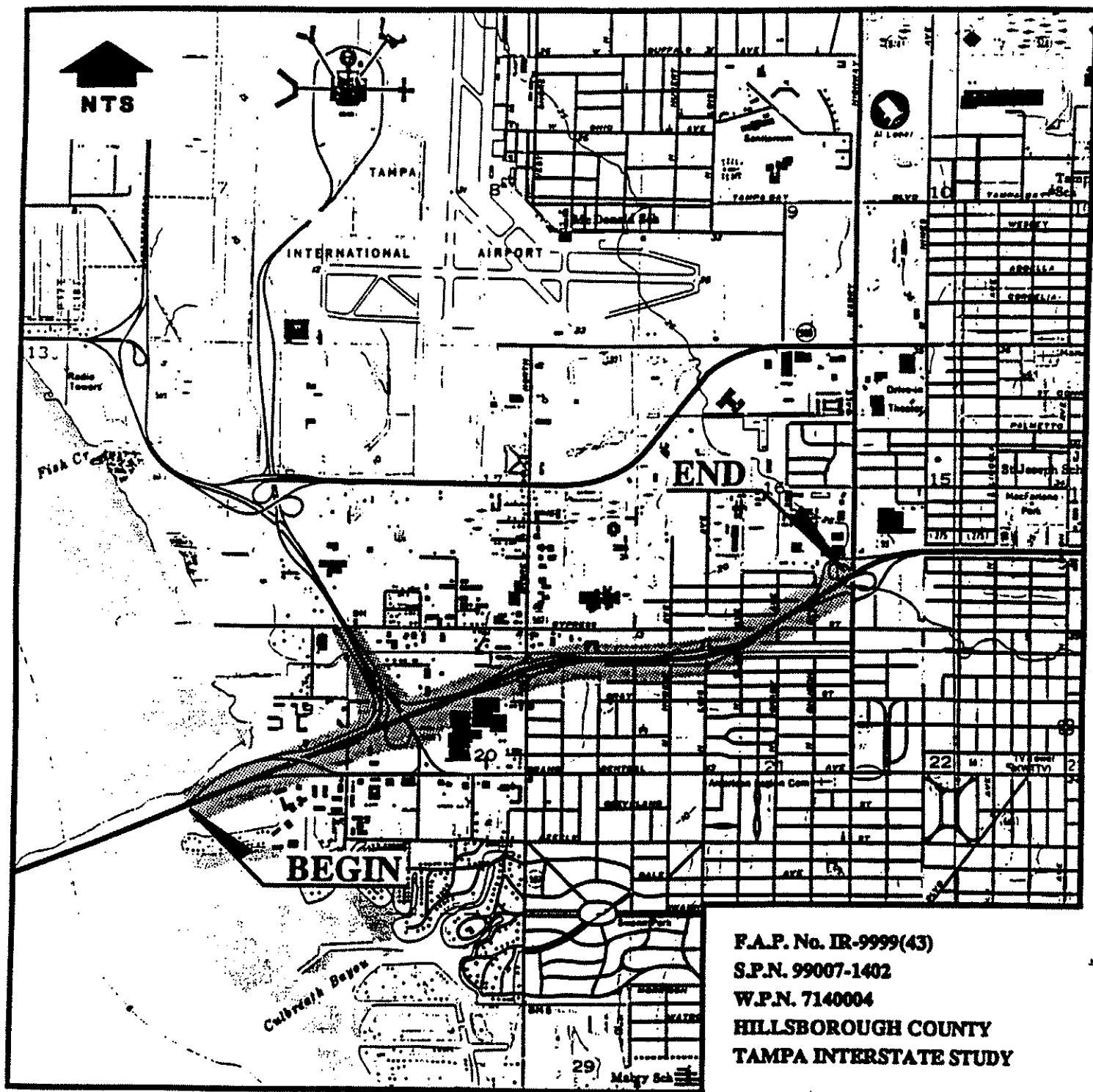
<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>
<b>AMPHIBIANS AND REPTILES</b>		
<u>Alligator mississippiensis</u>	American alligator	Threatened
<u>Drymarchon corais couperi</u>	Eastern indigo snake	Threatened
<b>BIRDS</b>		
<u>Ammodramus savannarum floridanus</u>	Florida grasshopper sparrow	Endangered
<u>Haliaeetus leucocephalus</u>	Bald eagle	Endangered
<u>Mycteria americana</u>	Wood stork	
<b>MAMMALS</b>		
<u>Trichechus manatus latirostris</u>	West Indian manatee	Endangered
<b>PLANTS</b>		
<u>Chrysopsis floridana</u>	Florida golden aster	Endangered

A field investigation will be required to determine the exact species and extent of their involvement within the project study area. There are, however, no critical habitats within the project limits.

- e. **Outstanding Florida Waters:** Outstanding Florida Waters, as defined by Section 403.061, Florida Statutes, are not found in the project study area.
- f. **Aquatic Preserves:** Aquatic preserves, as defined by Chapter 258, Florida Statutes, are not found within the project study area.
- g. **Coastal Zone Consistence:** Yes, this project is subject to a Coastal Zone Consistency Review as required by 15 CFR 930. The consistency determination will be accomplished through the Florida Department of Environmental Regulation permit review process.
- h. **Cultural Resources:** An historical and archaeological site survey will be performed. The study area will be field truthed for evidence of any historical and archaeological resources. All existing known historic districts, sites and locations will be identified and mapped.



- i. **Coastal Barrier Resources:** No portion of the proposed project will involve any coastal barrier resources jurisdictional to Governor's Executive Order 81-105.
  - j. **Hazardous Materials:** There are no known hazardous waste generators in the project area. Based upon existing land use, most potential hazardous material sites would consist of gasoline service stations and automotive repair and service facilities. A hazardous materials evaluation will be conducted for this project.
  - k. **Other Comments:** None.
4. **Navigable Waterway Crossing?** No, the proposed project will not require modification/reconstruction of any structures spanning navigable and/or tidal waters.
5. **List Permits Required:** Actions resulting from the proposed project may require permits from the following agencies:
- (1) **Federal**
    - U.S. Army Corps of Engineers
    - U.S. Coast Guard
  - (2) **State**
    - Florida Department of Environmental Regulation
  - (3) **Regional**
    - Southwest Florida Water Management District
  - (4) **Local**
    - Tampa Port Authority
    - Hillsborough County
    - Pasco County
    - City of Tampa



## PROJECT LOCATION MAP

# FEDERAL ASSISTANCE

1. TYPE OF SUBMISSION (Mark as proposed box)

☒ NOTICE OF INTENT (OPTIONAL)

☐ PREAPPLICATION

☐ APPLICATION

2. APPLICANT'S APPLICATION IDENTIFIER

a. NUMBER

7140004

b. DATE

Year month day  
1990-10-12

3. STATE APPLICATION IDENTIFIER  
NOTE TO BE ASSIGNED BY STATE

a. NUMBER

b. DATE ASSIGNED

Year month day  
19

Leave Blank

4. LEGAL APPLICANT/RECIPIENT Florida Dept. of Transportation  
a. Applicant Name Division of Pre-Construction and Design  
b. Organization Unit  
c. Street/P.O. Box 605 Suwannee Street Leon  
d. City Tallahassee a. County 32399-0450  
f. State Florida (813)871-9722  
h. Contact Person (Name & Telephone No.) David A. Twiddy, Jr., P.E.

5. EMPLOYER IDENTIFICATION NUMBER (EIN)

6. PROGRAM (From CFDA)

a. NUMBER

201205

MULTIPLE ☐

a. mHighway Research Planning & Constructio

7. TITLE OF APPLICANT'S PROJECT (Use section IV of the form to provide a summary description of the project)

State Project No. 99007-1402  
WPI No. 714 0004

8. TYPE OF APPLICANT/RECIPIENT

Individual Person  
Non-Profit Organization  
Government Agency  
Educational Institution  
Business Firm  
Other (Specify)

Enter appropriate letter ☐

9. AREA OF PROJECT IMPACT (Name of state, county, local, etc.)

Hillsborough County

10. ESTIMATED NUMBER OF PERSONS BENEFITING  
State of FL

11. TYPE OF ASSISTANCE

Individual Grant  
Non-Profit Grant  
Government Grant  
Educational Grant  
Business Grant  
Other (Specify)

Enter appropriate letter ☐

12. PROPOSED FUNDING

13. CONGRESSIONAL DISTRICTS OF:

a. FEDERAL 260,362,898  
b. APPLICANT 0.00  
c. STATE 28,929,299  
d. LOCAL 0.00  
e. OTHER 0.00  
f. Total 289,292,059

a. APPLICANT

b. PROJECT District 7

15. PROJECT START DATE Year month day

19 96 7 1

16. PROJECT DURATION

Est. 30 Months

18. DATE DUE TO FEDERAL AGENCY Year month day

19

14. TYPE OF APPLICATION

Individual  
Non-Profit  
Government  
Educational  
Business  
Other (Specify)

Enter appropriate letter ☐

17. TYPE OF CHANGE (For 1st or 2nd)

Amendment  
Continuation  
Supplement  
Other (Specify)

Enter appropriate letter ☐

19. FEDERAL AGENCY TO RECEIVE REQUEST

U.S. Department of Transportation, Washington, D.C. 20590

a. ORGANIZATIONAL UNIT (IF APPROPRIATE)

Federal Highway Administration

b. ADMINISTRATIVE CONTACT (IF KNOWN)

20. EXISTING FEDERAL GRANT IDENTIFICATION NUMBER

IR-9999(43)

c. ADDRESS

Washington, D.C. 20590

21. REMARKS ADDED

☐ Yes ☐ No

22. THE APPLICANT CERTIFIES THAT:

To the best of my knowledge and belief, data in this preproposal/application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is approved.

a. YES, THIS NOTICE OF INTENT/PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON DATE

b. NO, PROGRAM IS NOT COVERED BY E.O. 12372 ☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW ☐

23. CERTIFYING REPRESENTATIVE

a. TYPED NAME AND TITLE David A. Twiddy, Jr., P.E.  
District VII PD&E Administrator

b. SIGNATURE

24. APPLICATION RECEIVED 19

Year month day

25. FEDERAL APPLICATION IDENTIFICATION NUMBER

26. FEDERAL GRANT IDENTIFICATION

27. ACTION TAKEN

☐ a. AWARDED  
☐ b. REJECTED  
☐ c. RETURNED FOR AMENDMENT  
☐ d. RETURNED FOR E.O. 12372 SUBMISSION BY APPLICANT TO STATE  
☐ e. DEFERRED  
☐ f. WITHDRAWN

28. FUNDING

a. FEDERAL \$ .00  
b. APPLICANT .00  
c. STATE .00  
d. LOCAL .00  
e. OTHER .00  
f. TOTAL \$ .00

29. ACTION DATE Year month day

19

31. CONTACT FOR ADDITIONAL INFORMATION (Name and telephone number)

30. STARTING DATE Year month day

19

32. ENDING DATE Year month day

19

32. REMARKS ADDED

☐ Yes ☐ No

# Federal Assistance Multi-Purpose Facesheet

## Addendum for State Agencies Only

(Pursuant to Section 216.212, Florida Statutes)

### GENERAL INSTRUCTIONS

At least sixty (60) days prior to the anticipated filing date, submit five (5) completed copies of the Federal Assistance Multi-Purpose Facesheet, Standard Form 424, with Addendum, additional project narratives if necessary, and project location map if applicable, to the Intergovernmental Coordination Unit, Executive Office of the Governor, The Capitol, Tallahassee, Florida 32301. In addition, five (5) completed copies should be submitted to the appropriate Regional and/or Metropolitan Clearinghouse if the project is local in nature. Allow thirty (30) days for processing and an additional thirty (30) days if a full application is requested to be reviewed. The form must be completely filled out before the review can begin. If any section is not applicable, designate with "N/A". If any further elaboration is required on any item, attach additional sheets, with reference to item number. If you have any additional questions, call the Intergovernmental Coordination Unit at (904) 488-8114 or SUNCOM 278-8114.

1. Budget Entry Title.		2. State Program Structure No. and Title:		Total Proposed Funding Multi-Year Projects (Dates) From <u>7/1/96</u> To <u>7/1/98</u>	
3. Project included in: (a) Legislative Budget Request Yes <input type="checkbox"/> FY _____ No <input type="checkbox"/> (b) Approved Budget Yes <input type="checkbox"/> No <input type="checkbox"/> (c) Governor's Budget Yes <input type="checkbox"/> No <input type="checkbox"/>					
4. Project included in Federally Required "State Plan". Yes <input type="checkbox"/> No <input type="checkbox"/> Agency: _____		5. Legal Authority.		Federal	\$260,362,848.
6. A-25 Review. Yes <input type="checkbox"/> No <input type="checkbox"/>	7. Change in Plan Operation Yes <input type="checkbox"/> No <input type="checkbox"/>	8. Commit State Funding Yes <input type="checkbox"/> No <input type="checkbox"/> FUND CODE      AMOUNT _____ _____ _____		Applicant	-0-
				State	28,929,205.
				Local	-0-
				Other	-0-
9. New Position Required: Yes <input type="checkbox"/> No <input type="checkbox"/> Number _____		10. Matching Requirements Federal <u>90</u> % State <u>10</u> % Local/Other _____%		Total	289,292,053.
11. Indirect Cost Proposal (Overhead) Department and/or Division Overhead \$ _____ Amount _____% Statewide Allocated Overhead _____ Amount _____% Total _____ Amount _____% If "No", explain: _____				12. Type of State Match Cash <input type="checkbox"/> In Kind <input type="checkbox"/> Explain: _____	

Item 1—Enter the title of the budget entry as defined by Section 216.011(1)(d), F.S., and as included in the General Appropriations Act for the current fiscal year.

Item 2—Enter the number and title of the appropriate state reporting level program component as currently approved by the Office of Planning and Budgeting.

Item 3—Mark appropriate block:

a—If "Yes", enter the fiscal year of the Legislative Budget Request in which the project is included.

b—This item is applicable only to the state's current fiscal year.

c—This item is applicable only after publication of the Governor's Budget for the particular fiscal year for which project funds are requested.

Item 4—Mark appropriate block. If "Yes", enter the federal agency for which the plan is prepared.

Item 5—Enter the section of the Florida Statutes or Laws of Florida which authorizes the state agency to carry out the activities proposed in this project.

Item 6—Mark appropriate block to indicate if OMB Circular A-95 review is required.

Item 7—Mark appropriate block. Does the project alter the plan of operation from that included in the approved budget for the budget entry?

Item 8—Mark appropriate block. Does the project proposal commit the state to assume funding after federal funding expires?

Item 9—Enter the number of new positions (above that included in the appropriations for the new budget entry) required to carry out the project.

Item 10—Indicate, in percentage terms, the federal/state/local matching requirements specified by federal law or regulation. If non-federal match is not required in such specific terms, explain the basis for the distribution of funding.

Item 11—If the application should include overhead for which you are to receive reimbursement from the federal grantor agency in accordance with FMC 74-4, OASC-10, or other federal provisions, enter the amounts included in the approved indirect

cost rate for: (1) intra-agency, -department and/or -unit overhead; (2) statewide overhead.

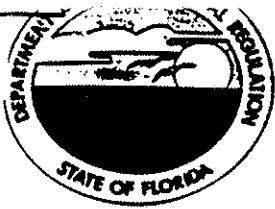
The amount allocated to the project for central state governmental services must be based on Florida's Approved Statewide Cost Allocation Plan for the project period.

If none is claimed, check the "No" block. If "No", an explanation must be given or the application will be returned without action.

Item 12—Enter the dates the total project will cover if more than one (1) year. This item applies only to multi-year projects. Information required in Section 1, Item 13 of Standard Form 424 provides information for projects with a duration of one (1) year or less. Complete that funding information here as required for Item 13, Form 424.

On occasion, local match is derived from state funds allocated to local units. If this is the case, so indicate and specify the sources of funding.

Item 13—In the case of state cash match, indicate the appropriation from which such match is to be provided. For in-kind match, explain the types of expenditures to be utilized.



# Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachmann, Secretary

John Shearer, Assistant Secretary

**RECEIVED**

JAN 11 1991

GREINER, INC.  
TAMPA

January 4, 1990

Ms. Susan Thomas  
Greiner Inc.  
7650 W. Courtney Campbell Causeway  
Tampa, Florida 33607-1462

Dear Ms. Thomas:

Attached is a list of Outstanding Florida Waters in Hillsborough County. Please refer to Chapter 17-302.700, F.A.C. for complete rule language.

This list is from a draft document entitled: Listing of Outstanding Florida Waters by County. We hope to have it ready for distribution in the next month or two. If you would like a copy, please contact us then.

Please call if you have any further questions (904/487-0505).

Sincerely,

*Janet Klemm*

Janet M. Klemm  
Environmental Specialist  
Standards & Monitoring Section

Attachment

Hillsborough

National Wildlife Refuge:  
Egmont Key

Hillsborough

State Parks, Wildlife Parks, and Recreation Areas:  
Hillsborough River State Park  
Little Manatee River St. Rec. Area

Hillsborough  
Hillsborough

EEL; CARL; LATFP; SOC;  
Bower Tract

Hillsborough

State Aquatic Preserve:  
Cockroach Bay

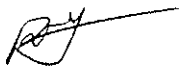
Hillsborough



C2380 B1, B10, C13A  
January 22, 1991

MEMORANDUM

TO: David Twiddy

FROM: Ron Gregory 

SUBJECT: Tampa Interstate Study, WPA #7140004, State Project #99007-1402,  
FAP #IR-99999(43) - Environmental Assessment Study Task A.2.h  
Consideration and Resolution of Engineering Items

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Transmitted with this memorandum are five (5) copies of the "13 Point Review" for that portion of the interstate system covered by the Environmental Assessment study. Please provide copies of this submittal to the appropriate FHWA and FDOT staff.

If you have any questions about the 13 Point Review, please let me know.

xc Dick Combs  
Chris DeAnnuntis  
Jan Everett  
Mike Falini

## **DESIGN MEMORANDUM**

### **State of Florida Department of Transportation Project Development and Environmental Study**

**Work Program Item Number: 99007-1402**

**State Project Number: 7140004**

**Federal-Aid Project Number: IR-9999(43)**

**Tampa Interstate Study - Interstate 275 (I-275) from the Howard Frankland Bridge/Kennedy Boulevard Ramps to the Dale Mabry Highway Interchange on the east and just north of Cypress Street on Memorial Highway (S.R. 60) Hillsborough County**

This design memorandum documents the design elements being evaluated for the Tampa Interstate Study Design Segment 1A within the project limits listed above.

### **ALTERNATIVES CONSIDERED - TIER EVALUATION ANALYSIS**

The comparative analysis technique used to identify viable alternatives in the Tampa Interstate Study (TIS) is called Tier Analysis. This screening process, or tiering, allowed the study team to assemble a large array of competing design components in an easily understood matrix format for evaluation. The key factor in the success of the tier analysis process is its ability to "window down" the vast array of competing designs to the few viable alternative concepts suitable for application in Tampa's interstate corridors.

The first tier (or level) of analysis was on 1"=200' scale aerial maps and provided a process for using key factors to evaluate the reconstructed highway's impacts. This analysis both ranked alternative concepts and identified any alternatives with extreme or obvious detrimental impacts, which means it is considered to be "fatally flawed" and is eliminated from further study.



The second tier of evaluation took the 1"=200' scale alternatives which remained after the "first tier cut," and, as in the first tier, a matrix evaluation was prepared. This matrix included quantification and estimates of impacts for each of the alternatives by category of impact and resulted in a ranking of alternatives.

The third or final tier of evaluation included geometric layouts of the remaining alternatives at 1"=100' scale. Those alternatives that survived the second tier evaluation matrix were re-evaluated with more stringent standards and detailed analyses.

The refinement and continuing development of alternatives through this systematic process assisted in providing all necessary documentation as to the logical process and selection of viable alternatives. This process also provided the necessary documentation for alternatives eliminated in the evaluation process, or modifications to form "new" alternatives. Finally, this process enhanced the community's ability to better understand and follow a rather complex technical process in a step-by-step manner until the selection of reasonable and viable alternatives was reached.

#### Tier One Alternatives Evaluation

The Tier 1 matrix was composed of generalized and easily measured data or factors available at the initiation of the alternatives development stage. These factors were grouped into categories for ease of reference. For each alternative, a rating was assigned to each factor to measure both positive and negative impacts. The evaluation of a single factor may also have identified an alternative as "fatally flawed," thereby eliminating that alternative from any further analyses.

The following contains specific design segment discussions of the Tier One evaluation. A detailed discussion of this process is provided in TIS Task F.6.a(6) - Tier 1 Evaluation Technical Memorandum.

Eight alternatives were developed during the Tier 1 analysis. Table 1 provides descriptions of each of the Tier 1 alternatives.

**TABLE 1**  
**DESCRIPTION OF TIER 1 ALTERNATIVES**

Alternative 1A1 - 4-roadway system adhering to 50:1 FAA approach surface connecting with a 4-roadway system east of Himes Avenue. A three-level urban interchange at I-275 and Dale Mabry Highway.

Alternative 1A2 - 2-roadway system from Howard Frankland Bridge to Lois Avenue, 4-roadway system east of Lois Avenue, adhering to 62.5:1 FAA approach surface criterion. A three-level urban interchange at I-275 and Dale Mabry Highway.

Alternative 1A3 - Same as Alternative 1A2 without ramps to and from the west at Lois Avenue.

Alternative 1A4 - Same as Alternative 1A1 without ramps to and from the west at Lois Avenue.

Alternative 1A5 - Same as Alternative 1A1 with connection between Cypress Street and Himes Avenue.

Alternative 1A6 - Same as Alternative 1A1 transitioning to a 2-roadway system east of Himes Avenue.

Alternative 1A7a - Same as Alternative 1A1 locating Dale Mabry Highway ramp movements outside and above mainline (Dale Mabry) lanes. This alternative connects with a 4-roadway system east of Himes Avenue.

Alternative 1A7b - Same as Alternative 1A1 locating Dale Mabry Highway ramp movements outside and above mainline (Dale Mabry) lanes. This alternative connects with a 2-roadway system east of Himes Avenue.

Six of the eight alternatives ranked high with the same number of points. No one alternative was clearly superior to the others. Rather than continue to carry such a

large number of alternatives into the second tier of analysis, it was determined additional evaluation of the alternatives would be done to determine what aspects or design components of the various alternatives resulted in positive and negative impacts. After this additional analysis, Tier 1 alternatives were re-combined and refined into three alternatives to be evaluated for Tier 2.

The Tier 1 analysis also included the development of a transit envelope with an emphasis on HOV lanes and priority ramps. In Tier 1, the interstate system contained HOV lanes throughout the project limits. In Tier 1, the analysis of priority ramp locations was conducted independently of the roadway analysis. Priority access ramps were considered at Trask Street in the Westshore area. The priority ramps would have a center drop ramp in the middle of the interstate. No park-n-ride lot was identified with the HOV priority access ramps.

### **Tier 2 Alternatives Evaluation**

The Tier 2 evaluation included quantification and estimates of impacts for each of the alternatives by category of impact and resulted in a ranking of alternatives.

The following contains specific segment discussions of evaluation. A detailed discussion of this process is provided in TIS Task F.6.a(6) - Tier 2 Evaluation Technical Memorandum.

Three alternatives, 1A8, 1A9 and 1A10, were refined during Tier 2. Table 2 provides a description of these alternatives.

TABLE 2  
DESCRIPTION OF TIER 2 ALTERNATIVES

Alternative 1A8 - 4-roadway system adhering to 50:1 FAA approach surface for TIA approaches. Direct freeway connection to the Northwest Expressway. Interchanges at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway. New Sherrill Street extension through I-275. Frontage roads between Cypress Street and Himes Avenue. HOV/Transitway lanes beginning at the Howard Frankland Bridge.

Alternative 1A9 - Same as Alternative 1A8 with frontage roads east of Himes Avenue and HOV priority ramps to and from the east on I-275 at Trask Street.

Alternative 1A10 - Same as Alternative 1A8 with 2-roadway system transitioning to 4-roadway system at Lois Avenue. Adherence to a 62.5:1 approach surface for TIA. Frontage roads between Cypress Street and the Hillsborough River.

All Tier 2 concepts maintained a transit envelope within the interstate right-of-way for HOV lanes and priority access ramps. The HOV lanes extend throughout the project limits. Center-drop, priority access ramps to the HOV lanes were located at Trask Street for Alternative A9.

Alternative 1A9 ranked higher than the other two alternatives. Alternative 1A9 was found clearly superior to the others in terms of its minimal negative impacts on existing land uses and significant positive impacts regarding maintenance of traffic during construction, constructibility, design segment continuity, and lower structural costs to the proposed design of the roadway system. Alternative 1A9 was carried forward into Tier 3 for additional evaluation to establish what aspects or design components could be improved.

## ALTERNATIVES FOUND FEASIBLE

### Tier 3 Alternatives Evaluation

The third or final tier of evaluation included geometric layouts of all remaining alternatives at 1"=100' scale. Basically, Alternative 1A9 was further developed resulting in two new variations of this concept. These alternatives were evaluated with more stringent standards and detailed comparative analysis. A detailed discussion of this process is provided in TIS Task F.6.a(6) - Tier 3 Evaluation Technical Memorandum.

Table 3 provides a description of Tier 3 alternatives.

**TABLE 3**  
**DESCRIPTION OF TIER 3 ALTERNATIVES**

Alternative 1A9 - 4-roadway system. HOV/Transitway lanes beginning at the Howard Frankland Bridge within the interstate alignment. Direct freeway connection to the Northwest Expressway. 50:1 approach surface for TIA. Interchanges at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway (two-level). Frontage roads east of Himes Avenue. New Sherrill Street extension through I-275. HOV priority ramps to and from east on I-275 at Trask Street.

Alternative 1A11 - 2-roadway system transitioning to 4-roadway system at Lois Avenue. HOV/Transitway lanes beginning at the Howard Frankland Bridge within the interstate alignment. Direct freeway connection to the Northwest Expressway. 62.5:1 approach surface for TIA. Interchanges at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway (two-level). No frontage roads east of Himes Avenue. New Sherrill Street extension through I-275. HOV priority ramps to and from east on I-275 at Trask Street.

Alternative 1A12 - 2-roadway system transitioning to 4-roadway system at Lois Avenue. HOV/Transitway lanes beginning at the Howard Frankland Bridge within the interstate alignment. Direct freeway connection to the Northwest Expressway. 62.5:1 approach surface for TIA. Interchanges at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway (two-level). No frontage roads east of Himes Avenue. New Sherrill Street extension through I-275. Elevated exclusive HOV/Transitway lanes on I-275 at Trask Street; priority ramps to and from east on I-275.

The three alternatives examined in Tier 3 (1A9, 1A11 and 1A12) were reduced to one alternative (1A9) by selecting the four-roadway system due to superior operational characteristics. In addition, three modifications were recommended for Alternative 1A9 before inclusion in the Master Plan:

- \* The addition of ramps to and from the proposed Northwest Hillsborough Expressway to Memorial Highway and Kennedy Boulevard. This gave additional local accessibility to the Northwest Hillsborough Expressway from the Westshore area and reduced the number of collector-distributor roadway lanes required between I-275 and the Tampa International Airport (TIA) interchange.
- \* The addition of a Lemon Street connector at the Westshore Boulevard/I-275 interchange. This new connector relieves potential queuing problems at the I-275/Westshore Boulevard ramps, relating to the signalized movements at Westshore Boulevard and Cypress Street. A two-lane, one-way westbound, controlled access local connector road was recommended.
- \* Modification of the I-275/Northwest Hillsborough Expressway Interchange to provide a 62.5:1 approach surface relating to the landing flight path of Tampa International Airport. This modification was developed in conjunction with TIS, FDOT and Hillsborough County Aviation Authority staffs.

#### **Recommended Master Plan Concept (Preferred Alternative)**

The following listing briefly describes the recommended Master Plan Concept for the study limits:

- \* Four-Roadway System - Interstate Express Lanes and Separated Local Access Freeway Lanes;
- \* Highway Occupancy Vehicle (HOV)/Transitway Lanes within the interstate alignment beginning and ending at the Howard Frankland Bridge;
- \* HOV priority ramps to and from the east on I-275 at Trask Street;
- \* Direct I-275 connection to the Northwest Hillsborough Expressway;
- \* Direct ramps from Memorial Highway and Kennedy Boulevard to the Northwest Hillsborough Expressway;
- \* 62.5:1 FAA approach surface for Tampa International Airport;

- \* Existing interchange access at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway remain;
- \* New Sherrill Street extension north from Memorial Highway and Kennedy Boulevard through I-275 to Spruce Street; and
- \* New Lemon Street Connector to Westshore Boulevard from the Occident Street.

## TYPICAL SECTIONS

Due to the complexity of the roadway geometrics and the number and location of interchanges, no typical sections were developed for the project limits. Several roadway sections were developed for specific locations within the study limits. The sections are shown and discussed in detail in TIS Task F.2.b - Design Criteria Policies and Procedures Technical Memorandum. A brief discussion of the design criteria used to develop these sections is provided below.

Pavement widths for travel lanes will be 12 feet for freeway and HOV lanes. Interchange ramp terminals for turning movements will also provide 12-foot lanes with appropriate dimensions to accommodate design vehicle turning radii. Ramp lanes will be 15 feet for single lane ramps and 12 feet per lane for multi-lane ramps. Cross street lane widths will generally be 12 feet with 11 feet set as a minimum width.

Shoulder widths for the freeway sections vary depending on conditions. A 12-foot (10-foot paved) outside shoulder will be provided where no obstructions exist. A 10-foot outside shoulder will be used when this pavement borders a barrier wall. Where auxiliary lanes are located, the shoulder width will range from 6 to 10 feet when accompanied by a barrier wall. Inside shoulder widths will be 10 feet with a barrier wall.

Shoulder widths for single lane ramps will be 6 feet on the outside (4 feet paved) with no obstruction and 6 feet with a barrier wall. Inside shoulder widths will be 6 feet (2 feet paved) with no obstruction and 6 feet with a barrier wall. For dual lane ramps, 10 feet (8 feet paved) is required with no obstructions and 10 feet with a barrier wall. Inside shoulder widths for dual lane ramps will be 8 feet (4 feet paved) with a obstructions and 6 feet without barrier wall.

For concurrent flow HOV lanes, shoulder widths will be 12 feet for the left shoulder and a 2-foot buffer between the HOV lane and freeway lanes. HOV ramps will provide 8-foot shoulders on both sides and dual lane HOV ramps require 2-foot left and right shoulders with a 10-foot center median refuge area.

For HOV/Transitways, shoulder widths for a single-lane transitway will be 8 feet for both the left and right sides. For two-lane, two-way transitways, a 2-foot left and right shoulder will be provided with a 10-foot median refuge area. Ramp shoulder dimensions will be the same as noted for HOV ramps.

## **GENERAL HORIZONTAL AND VERTICAL ALIGNMENT**

Basic guidelines for the design of the Tampa Interstate, including roadway, structural, High Occupancy Vehicles (HOV), Light Rail Transit (LRT) and Authorized Vehicle Lanes (AVL) were established. The basic policy which served as a background for the entire Tampa Interstate design is embodied in a March 25, 1987 memorandum from the FHWA division administrator. This memorandum stated:

"Plans and specifications of proposed federal-aid highway projects shall provide for a facility that will adequately meet the existing and probable future traffic needs and conditions in a manner conducive to safety, durability, and economy of maintenance."



These design criteria and procedures are primarily contained in A Policy on Geometric Design of Highways and Streets, 1984 by AASHTO and the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, 1986, by FDOT. These references are supplemented by other publications which are listed in the TIS Task F.2.b - Design Criteria, Policies, and Procedures, Technical Memorandum.

Tables 4 and 5 provide the general design criteria for highway and HOV/transitway facilities approved for the Master Plan for the Tampa Interstate system.

#### **PRELIMINARY RIGHT-OF-WAY AND CONSTRUCTION COST ESTIMATES**

The comparative cost analysis for the Tampa Interstate Study Master Plan was completed using FDOT's Long Range Estimating (LRE) Program and the Master Plan design study segment concept plans.

The project study limits were entered into the system with factors and variables pertinent to this particular segment of the Interstate. Using a separate sequence for HOV/Transitway, local access freeway, on-off ramps, etc., the program was utilized to generate quantities and costs. The bridges were coded by type, length and width with embankment being coded into the program as an X-Pay Item number on an average depth per sequence. Barrier wall, retaining walls, and noise walls were coded in as Ex-Pay items with a cost per item. All pavement items were entered into the system as heavy duty/defense highway. The construction cost estimate is tabulated in Table 6. Related items of work have been combined into major subdivisions as listed. Although many relatively minor incidental items have not been listed separately, the

**TABLE 4**  
**RECOMMENDED ROADWAY DESIGN STANDARDS**

<u>Design Factors</u>	<u>Recommended Standards</u>
Speeds	<ul style="list-style-type: none"> <li>* Freeway - 60 mph Desirable 55 mph Minimum</li> <li>* Collector/Distributor - 45 mph Desirable 40 mph Minimum</li> <li>* Ramps - 50 mph Desirable 35 mph Minimum</li> <li>* Loops - 30 mph Minimum</li> <li>* Cross Streets - 45 mph Desirable 30 mph Minimum</li> </ul>
Maximum Grades	<ul style="list-style-type: none"> <li>* Freeway - 3% for 60 mph 4% for 55 mph</li> <li>* Collector/Distributor - 4% for 45 mph 5% for 40 mph</li> <li>* Ramps - Ascending-6% Descending-7%</li> </ul>
Maximum Degree of Curve	<ul style="list-style-type: none"> <li>* Freeway &amp; Collector/ Distributor - 60 mph 5°-15' 55 mph 6°-30' 45 mp 10°-15' 40 mph 13°-15'</li> <li>* Ramps - 50 mph 8°-15' 35 mph 18°-30'</li> <li>* Loops - 30 mph 24°-45' (230' R)</li> </ul>
Cross Slopes (In tangent)	<ul style="list-style-type: none"> <li>* Freeway, Collector/Distributor, and Ramp - 0.03 ft. per ft. maximum</li> <li>* Shoulders - 0.06 ft. per ft. outside 0.05 ft. per ft. inside</li> <li>* Embankments - 6:1 within clear recovery zone</li> </ul>

**TABLE 4**  
**RECOMMENDED ROADWAY DESIGN STANDARDS**  
**(Continued)**

<u>Design Factors</u>	<u>Recommended Standards</u>
Vertical Clearances	<ul style="list-style-type: none"> <li>* 16'6" Minimum over freeway</li> <li>16'6" Recommended; 15'0" minimum over cross road, for existing structures</li> <li>17' For overhead pedestrian crossings and sign trusses</li> </ul>

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Sources:    "A Policy on Design of Highways and Streets," AASHTO, 1984.  
               "Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways," FDOT, 1986  
               "Structures Design Guidelines," FDOT, 1987

**TABLE 5**  
**RECOMMENDED HIGH OCCUPANCY**  
**VEHICLE LANE/TRANSITWAY**  
**DESIGN STANDARDS**

<u>Design Factors</u>	<u>Recommended Standards</u>
Speeds	<ul style="list-style-type: none"> <li>* 60 mph desirable/55 mph minimum</li> <li>* Ramps: - 50 mph desirable/35 mph minimum</li> </ul>
Vertical Alignment	<ul style="list-style-type: none"> <li>* 3% maximum desirable</li> <li>* Ramps: - 7% maximum</li> <li>* Length of crest and sag vertical curves-1984 AASHTO Standards</li> </ul>
Horizontal Alignment	<ul style="list-style-type: none"> <li>* 60 mph desirable/55 mph minimum</li> <li>* Ramps: - 50 mph desirable/35 mph minimum</li> <li>* Ramp Transition Lanes-1984 AASHTO Standard 600'</li> <li>* Ramp Taper Ratios-1984 AASHTO Standard</li> </ul>
Cross Slopes - Tangent	<ul style="list-style-type: none"> <li>* 0.03 ft. per ft. maximum</li> </ul>
Vertical Clearances	<ul style="list-style-type: none"> <li>* 16.5'</li> </ul>

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**Notes:** All HOV lanes assumed to be concurrent flow lanes adjacent to freeway travel lanes.

**Sources:** AASHTO; Existing documentation on transitway standards and planning studies; Tampa Interstate Study team.

TABLE 6

ESTIMATED RIGHT-OF-WAY AND CONSTRUCTION COSTS  
(\$000's)

Roadway	Bridges	Bridge Demolition	Engineering <sup>1</sup>	CEI	Change Order-2 Contingency	Legal And <sup>3</sup> Administrative	Design <sup>4</sup> Contingency	Sub-Total	Right-of-Way	Relocation	Total
\$87,708	\$105,526	\$3,116	\$8,836	\$7,854	\$8,522	\$8,862	\$20,738	\$251,162	\$34,980	\$3,150	\$289,292

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1 Engineering at 4.5%.

2 Change Order Contingency at 4% is for change orders incurred after the bid date.

3 Legal and Administration Contingency on actual construction only.

4 Design Contingency at 9% is utilized as an average throughout the project. It should be understood that in some areas this percentage could vary. However, the average of 9% would prevail.

selected work items and applicable unit prices are adequate to establish a representative cost estimate. All estimated construction costs have been prepared based on 1989/90 dollars.

## **MAJOR DRAINAGE AND OUTFALLS**

The project corridor extends through areas which are characterized as heavily urbanized. The existing stormwater systems within the project corridor, a combination of open ditch and enclosed storm sewer systems outfall to Tampa Bay. The majority of the stormwater outfall systems for the existing interstate system are considered to be undersized or overloaded.

The Cypress Memorial drainage basin study within the project limits has been supplied to the study team by the City of Tampa. The study documents existing drainage problem areas, existing structures and outfalls and recommend proposed improvements.

Sixteen existing cross-drain structures and major outfalls have been located using City of Tampa drainage maps, basin studies, as-built plans, and other sources. The cross-drain structures and major outfall locations have been field verified. Required cross drain structure improvements and impacts to the floodplain will be addressed in the Location Hydraulic Report.

The State requirements for stormwater treatment apply throughout the study area. The stormwater treatment criteria has been delegated to the Southwest Florida Water Management District by the Florida Department of Environmental Regulation in Chapter 17-25.035 F.A.C.

The City of Tampa criteria are promulgated in their "Stormwater Management Technical Standards," October 1988. The criteria for the peak rate of discharge limits the post-development 25-year rate to less than or equal to the pre-development 5-year rate. The Southwest Florida Water Management District criteria for the peak rate of discharge limits the post-development 25-year, 24-hour rate to less than or equal to the pre-development 25-year, 24-hour rate.

To meet regulatory criteria, peak discharges for the proposed conditions must be less than or equal to peak discharges for existing conditions within each sub-basin except for areas discharging directly to Tampa Bay. To accomplish this, volume storage in the form of excavated detention ponds will be utilized. Preliminary pond sizes were determined during Phase I of the TIS and are currently being updated as part of Phase II activities. The proposed detention ponds will be designed to include stormwater treatment capacity in addition to providing peak attenuation storage capacity.

The proposed pond storage depths range from two to four feet depending on soil conditions and water table levels. The proposed "wet" detention ponds will have a maximum depth of six to eight feet. The pond side slopes were set at 4:1 horizontal to vertical. The total pond area includes one-foot of freeboard storage and a 20-foot maintenance berm around the pond perimeter.

The proposed pond locations within each sub-basin were determined from existing topography, existing land use, proximity to an existing outfall, and the proximity to the existing right-of-way. Some of the proposed ponds could be designed to function as an amenity to the TIS project in addition to providing stormwater storage and treatment capacity. Those ponds developed as part of amenities and mitigation plan

will also utilize landscaping, fountains, littoral zones, structural designs, and other features to provide an aesthetic and functional system.

## **BRIDGE LOCATION AND TYPE**

A major component of the proposed interstate reconstruction is the highway structures. The bridges, retaining walls, noise walls and sign structures provide a key element in maximizing the use of the available space. The use of multi-level interchanges, elevated viaducts, and roadway embankments supported by retaining walls minimize right-of-way requirements, thereby achieving the functional objectives of the interstate reconstruction while balancing cost, environmental, and social impacts. New structures are proposed for all of the interchange and overpass locations within the study limits. A detailed discussion of proposed structural concepts is provided in TIS Task G.1 - Structural Conceptual Analysis and Task G.1 - Addendum.

The FDOT Structures Design guidelines (Bureau of Structures Design) provides criteria for the general determination of structural types when considering the three key factors in selection of bridge design: efficiency, economy and elegance. As described in the Guidelines (Chapter 3 Bridge Project Development), elegance is defined as "maximizing aesthetic expression." This elegance or aesthetic expression can result from the influences of efficiency and economy, or it may involve structural enhancements. A very complex or large project in a specific setting (particularly urban and suburban locations) may be directly and dramatically affected by the choice of structural elements used to build the project. These large projects have an inherent aesthetic potential due to the mass or scale associated with the design and its built environment. Lesser structures (both in length and design complexity) may require enhancements due to their location and setting in an urban context. These guidelines have been agreed to by FHWA for this project.



The Department defines the levels of aesthetic design into three groups; levels one, two and three. Level three designations occur within the study limits. Level three is defined as where the designer should create the ideal aesthetic treatment without undue concern for economy.

The primary objective of the aesthetic criteria for bridges is to provide clean uncluttered structures, and to promote uniformity and compatibility in the appearance of the structures and individual structural components throughout the entire proposed Tampa interstate system's reconstruction. It is proposed that all bridge superstructures in the study limits be limited to closed-type box girder sections.

Multi-girder structures present a somewhat cluttered appearance from below. Also, any utilities or enclosed bridge drainage systems would be visibly located between the beams or girders and thus add to this cluttered appearance. The use of multi-girder superstructures was specifically eliminated for the study area.

The closed, box girder type superstructure offers a number of features that contribute to meeting the Department's aesthetic objectives:

- \* The closed bottom provides a clean, uncluttered appearance from below.
- \* The inward slanted box girder sides visually decrease the girder depth, giving it the appearance of a thinner, lighter structure.
- \* The structural overhang recesses the box girder from the end of structure, placing it in a shadow and further reducing the appearance of the box girder depth.
- \* The interior of the box girder provides a convenient, out-of-view and protected location for utilities and bridge drainage appurtenances.
- \* The box girder is ideally suited for minimizing substructure widths, due to its compact bottom flange.

- \* Box girder superstructures have proven economically viable in complex urban situations throughout Florida, particularly where long spans and curving alignments are needed.

It is preferred that single column pier arrangements be used to lessen the congestion and clutter effect of a "forest" of columns. Standard column and pier shapes should be established to meet the various loading requirements. The use of graphic relief to visually interrupt flat concrete surfaces will be encouraged.

Candidate structural treatments were evaluated for the directional interchanges, grade separations, retaining walls, noise barrier walls and sign supports. Bridge structures will contain roadway transitions, connections for separate roadway systems, and curving alignments, all of which tend to complicate geometry requirements. Six superstructure types structurally appropriate for these conditions and consistent with aesthetic standards are:

- \* Cast-in-place concrete box girders;
- \* Precast segmental concrete box girders;
- \* Steel box girders;
- \* Steel box girders with floor beams;
- \* Cast-in-place concrete box girders with floor beams; and
- \* Precast concrete spine-wing.

## **PROPOSED INTERCHANGE LAYOUT**

Several interchanges are proposed within the study limits. Beginning at the west end of the project, single-lane ramps are provided to and from the west for Kennedy Boulevard. The westbound entrance ramps connect to the I-275 mainline lanes, while the eastbound exit ramp departs the interstate from the local access freeway.

The interchange with the proposed Northwest Hillsborough Expressway is planned to accommodate fully directional movements. The expressway interchange also includes signing for ramping to destinations such as Tampa International Airport (TIA), the Northwest Hillsborough Expressway and Clearwater via the Courtney Campbell Causeway (S.R. 60).

In addition, the construction of the Northwest Hillsborough Expressway interchange includes a connection from Memorial Highway to Sherrill Street. This extension of Sherrill Street allows for an additional north-south street to service office and business development in the Cypress Street area west of Westshore Boulevard.

At Westshore Boulevard, ramping with the I-275 local access freeway is provided to and from the east and includes an at-grade intersection at Trask Street. HOV priority ramps are located at Trask Street and will access the I-275 HOV/Transitway envelope located at the center of the freeway.

The Lois Avenue interchange is a modified diamond design providing service in both directions on I-275. Ramping to and from the west occurs with the local access freeway lanes. The westbound exit ramp intersects with Cypress Street east of the intersection with Lois Avenue. The ramps are braided with the Westshore Boulevard ramps to eliminate weaving conflicts.

The Dale Mabry Highway interchange is a diamond design providing service to all turning movements. Two-lane ramps are provided for movements to and from the east, while single-lane ramps are provided for movements to and from the west.

## **MAJOR INTERSECTION REQUIREMENTS**

Capacity analyses were performed for the major intersections for all alternatives considered. These intersections are associated with the interchanges discussed in the previous section. The results of the analyses provided the lane requirements necessary to provide an acceptable level of service at these intersections. The lane geometrics for these intersections are included in the Traffic Memorandum, published separately.

## **MAJOR UTILITY ADJUSTMENTS**

There are a variety of utilities servicing the highly developed and urbanized area encompassed by the study area. The following utilities were identified in the study area:

- \* **Water Mains:** Water main lines are located throughout the study limits. Major locations include a 6-inch line outside of the right-of-way on the south side of the Kennedy Boulevard exit ramp, a 12-inch line on Westshore Boulevard, 2-inch and 6-inch lines on Lemon Street between Westshore Boulevard, and an 8-inch line across I-275 in the vicinity of Manhattan Avenue. On S.R. 60, 8-inch and 12-inch water mains are located inside the right-of-way on both sides of S.R. 60 and across the highway near the S.R. 60/I-275 interchange.
- \* **Gas Mains:** On I-275, a 6-inch gas main is located across the mainline lanes west of the Dale Mabry Highway interchange. At S.R. 60, a 4-inch gas main is provided along the north side of Cypress Street under the overpass.
- \* **Sanitary Sewers:** Major locations on I-275 include an 18-inch water main crossing the roadway in the vicinity of Westshore Mall, along Lemon Street between Westshore Boulevard and Lois Avenue, and a 42-inch water main across I-275 west of Cypress Street.
- \* **Storm Drains:** Storm drains with manholes and catch basins are located throughout the study limits. Major locations include a 48-inch drain on the south side of the Kennedy Boulevard exit ramp and 36- to 42-inch drains near the I-275 flyover to S.R. 60, across I-275 at various locations and across Westshore Boulevard, Lois Avenue, Dale Mabry Highway, Cypress Street and S.R. 60.

- \* Overhead Electrical: Lines cross I-275 in the vicinity of Hesperides Street and Manhattan Avenue. In addition, overhead electrical lines are located over Dale Mabry Highway at the Laurel Street intersection.
- \* Buried Telephone: These lines are present throughout the study limits. Major locations include along the south side of the Kennedy Boulevard exit ramp on I-275, outside of the right-of-way along both sides of Westshore Boulevard, outside of the right-of-way along Lemon Street from Westshore Boulevard to Lois Avenue, on the west side of Dale Mabry Highway and on the south side of I-275 outside of the right-of-way near Cypress Street.
- \* Underground Cable Television: Lines are located on the north side of Cypress Street under the S.R. 60 overpass.

## MAINTENANCE OF TRAFFIC

The project is proposed to be reconstructed as a four-roadway facility. This I-275 four-roadway segment includes a major interchange with the Northwest Hillsborough Expressway at Memorial Highway (S.R. 60). The four-roadway system concept preserves the local access features of the existing facility with frequent interchanges, while preserving the integrity and capacity of the mainline interstate facility. The four-roadway concept allows the construction of the new local access freeway while maintaining traffic on the existing Interstate. The traffic will travel on the local access freeway system during construction of the express freeway and HOV lanes. Upon completion of the total interstate reconstruction, all traffic diverted to the local access freeway during the reconstruction of the interstate will be transferred to their appropriate roadways.

Detailed maintenance of traffic and construction sequencing plans will be developed for each construction project in conjunction with preliminary and final plans preparation. These plans will be responsive to the unique features of each construction project including diversions, detours, temporary signing, striping, etc. To assure consistency in maintaining traffic along the entire interstate system during its

reconstruction, the following general policies should be used in developing the final maintenance of traffic plans: 1) the number of existing lanes presently operating on the interstate should not be reduced during reconstruction; 2) local streets will not be used to maintain traffic; and 3) motorists will be encouraged to carpool and utilize transit facilities during reconstruction. The Master Plan Concept has been evaluated sufficiently to assure the concepts presented are constructable, while maintaining traffic on the facility and the various crossroads within the FDOT and FHWA guidelines and criteria.

## **RIGHT-OF-WAY REQUIREMENTS**

Right-of-way requirements and relocation estimates have been developed for affected properties. A detailed description of this procedure is provided in Task H.1 - Master Plan Right-of-Way and Relocation Estimates Working Paper.

Within the study limits, individual properties were identified by alternative as to land size, improvement description, improvement size, type of ownership, whether private or non-profit, public utility, government, et cetera.

Once the individual properties were identified, a sales search was conducted identifying sales of similar properties for representative values for property types. Cost ranges were estimated and allocated based upon direct comparisons utilizing adjustments, when necessary, for time, location size, and any improvement dissimilarities. During this analysis, each property affected was identified as to property type and type of ownership for purposes of relocation expenses. These were when combined for the overall estimate for right-of-way acquisition.

The real estate affected in the study limits includes acquisitions for the interchange of the Northwest Expressway/Memorial Highway with I-275, a warehouse office building on the north side of I-275 between Memorial and Westshore Boulevard; several single-family residences on the south side of I-275 between Trask Street and Lois Avenue; some commercial establishments on Cypress Street near I-275; several single-family residences between Clark Avenue and Church Avenue on the north side of I-275; and two warehouse facilities on the south side of I-275 near Church Avenue; and several single-family structures on the south side of I-275 between Himes Avenue and Lincoln Avenue. Relocation and right-of-way estimates, shown on Table 7, reflect information provided in Task H.1 - Master Plan Right-of-Way and Relocation Estimates Working Paper.

#### **BICYCLE ACCOMMODATIONS**

Due to the nature of Interstate facilities, no provisions were made for accommodating bicycle traffic on the Interstate. However, every cross street typical section developed includes 14-foot curb lanes to allow for bicycle passage under I-275. Provisions for sidewalks were also included under each structure.

**TABLE 7**  
**RIGHT-OF-WAY AND RELOCATION COST ESTIMATES\***

	<u>Number of Parcels</u>	<u>Dollars</u>
R-O-W Acquisition		
Residential		
Single-family	125	\$8,028,500
Multi-family	2	\$1,225,000
Vacant	16	\$757,300
Commercial		
Improved	8	\$9,033,600
Vacant	16	\$1,541,500
Industrial		
Improved	4	\$1,500,000
Vacant	2	\$549,100
Public/Semi-public		
Improved	3	\$685,000
Vacant	<u>N/A</u>	<u>N/A</u>
Subtotal	176	\$23,320,000
Acquisition Cost		<u>\$11,660,000</u>
R-O-W Subtotal:		\$34,980,000
RELOCATIONS		
Residential	160	\$2,400,000
Other	<u>15</u>	<u>\$750,000</u>
TOTAL	175	\$38,130,000

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\*All estimates are in 1988-89 dollars.



*Bill McDaniel***FLORIDA**LAWTON CHILES  
GOVERNOR**DEPARTMENT OF TRANSPORTATION**RECEIVED  
DISTRICT SECRETARY  
DISTRICT SEVENBEN D. WATTS  
SECRETARY

92 JUL 28 AM 10:26

4950 W. Kennedy Blvd., Suite 409  
Tampa, FL 33609  
July 22, 1992

*RWG*  
*File C2380/B1*

Mr. J. R. Skinner  
Division Administrator  
Federal Highway Administration  
227 North Bronough Street, Room 2015  
Tallahassee, FL 32301

RE: WPI No. 7140004  
State Project No. 99007-1402  
FAP No. IR-9999(43)  
Tampa Interstate Study (TIS)

Dear Mr. Skinner:

A meeting between Central Office and District VII was held in Tallahassee on July 15, 1992, to reach agreement on those steps necessary to ensure compatibility of District VII's TIS Master Plan with FDOT Interstate Policy of November 14, 1991. It was agreed that District VII could proceed with implementation of the TIS in accordance with the terms of the January 17, 1992, policy letter provided that they comply with the following:

- The "footprint" of TIS Master Plan will be maintained to accommodate ultimate build-out.
- The Master Plan must be implemented in stages. The first stage of implementation shall have no more than six "general-use" lanes (three in each direction). All additional through lanes in the first stage will be designated as HOV.
- Implementation of the first stage will be accomplished in such a manner that will ensure maximum salvageability when subsequent stages are constructed. This reflects guidance offered by FHWA.
- An implementation plan will be developed by District VII which identifies the transition, by stage, from the existing configuration to the Master Plan. This implementation plan will be consistent with the above requirements and will maximize early development of the HOV/multimodal envelope. Environmental Assessment, Environmental Impact Statement, and other PID&E documents shall commit to the staged implementation plan.

Mr. J. R. Skinner

July 22, 1992

Page 2

- The ultimate typical section for the TIS, as stated in the November 14, 1991, Interstate Policy, "...will include four physically separated, exclusive lanes (two in each direction) for through traffic, public transit vehicles, and other high-occupancy vehicles." These lanes will be developed in accordance with the terms of the January 17, 1992, policy letter signed by Secretary Watts.

On I-275, north of Dr. Martin Luther King, Jr. Blvd. (formerly Buffalo Ave), District VII will fully develop the ultimate typical section for the freeway mainline and the corresponding required interchange improvements as the alternative to the current typical section in the TIS. Development of the ultimate typical section will occur concurrently with the staged implementation plan efforts. After the ultimate typical section has been developed, FHWA, FDOT Central Office and FDOT District VII will evaluate it against the constraints of the original TIS Master Plan. District VII will prepare final environmental documentation for the agreed upon ultimate typical section.

- District VII will work with local agencies responsible for bus/rail systems and land use planning and regulation to create an environment which supports the use of public transportation and utilization of the multimodal aspects of TIS.

The above commitments reflect District VII's embrace of both the TIS Master Plan and the FDOT Interstate Policy. These commitments comply with the terms contained in Secretary Watts' letter of January 17, 1992, that conditionally reinstated the TIS Master Plan.

Sincerely,

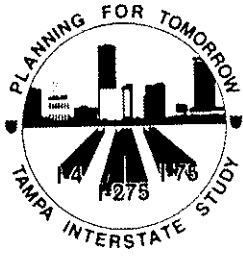


William H. McDaniel, Jr., P.E.  
District VII Secretary

WHM/DAT/ck

  
Frank Carille, Assistant Secretary

7/24/92  
Date



## **TAMPA INTERSTATE STUDY**

### **The Greiner Team**

P.O. Box 31646 (33631-3416)  
7650 West Courtney Campbell Causeway  
Tampa, Florida 33607-1462  
(813) 286-7667  
1-800-624-0074  
FAX: (813) 286-6587

C2510, C2380 B1, C4B  
March 12, 1993

## **MEMORANDUM**

**TO:** Michael Coleman, FDOT

**FROM:** Ron Gregory, GREINER *rmg*

**SUBJECT:** Tampa Interstate Study, WPA #7140004, State Project #99007-1402, FAP #IR-9999(43); Interstate Program Management, SPN No. 99007-1407, WPA No. 7140016, Contract No. C3884 - TIS/IPM EA Design Coordination

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Based upon the design coordination meeting for the EA (Design Segment 1A/Westshore) portion of the Tampa Interstate Study held in Greiner's Boardroom on Monday, February 8, 1993, we have revised specific elements of the Preferred Alternative concepts. The purpose of the meeting was to assure the Department that the two consultant teams had compatible plans and study limits; this is particularly important for right-of-way takings and limits of involvement with local City roadways. We were successful in this effort and the revised plans were provided to Mr. Ben Munns of HNTB on March 12, 1993.

The following summarizes the discussions about revisions and the final decision on what specific revisions were made for each of the plan sheets.

### **Sheets A3 & A4**

Ramp K-1 has been relocated by HNTB based on input from the FDOT Right-of-Way section. The new location was red-lined on a print of the TIS plans and provided to Greiner by NHTB. This included the geometry and right-of-way for Ramp K-1 and the impact on Ramp K tying to I-275.

**Action Taken:** Sheet A4 was revised to relocate Ramp K-1 from the western end of Executive Drive to a location approximately 500 feet east. Ramp K-1 tied to Ramp K prior to Ramp K merge with westbound I-275.



MEMORANDUM/TIS-IPM  
C2510, C2380 B1, C4B  
March 12, 1993  
Page 2 of 5

#### Sheet A5

The Veterans/I-275 interchange ramps D, E and F were repositioned due to design modifications by HNTB. Ramps D and F have shifted outward into more right-of-way in the northwest quadrant. Ramp E right-of-way is not precisely shown on the TIS aerial plans due to the flight angle of the photography used.

**Action Taken:** Greiner revised right-of-way lines for each of these ramps; however no geometric revisions were made.

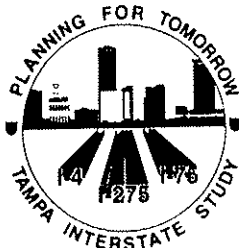
#### Sheet A8

HNTB has a different configuration of the Lemon Street Connector roadway from Westshore Boulevard west to Occident Street than the plan shown in TIS. The HNTB plan provides for a southerly shifted Lemon Street underneath the westbound CD roadway by means of a straddle bent structure. The TIS alignment of Lemon Street was outside the CD under a cantilever section. TIS noted that the HNTB Lemon Street Connector plan provided a "physically off-set" entrance to the Connector from the terminal of Ramp P at Westshore, and should be reviewed by FDOT Traffic Operations for design ramifications. Also, the limits of Lemon Street improvements shown by HNTB extended from Occident Street west to Sherrill Street and TIS felt this would involve the Department in a significant action related to local roadway, drainage and right-of-way that are clearly not part of the interstate's reconstruction. These types of local street improvements should be addressed by the City. This additional work on Lemon Street (Occident to Sherrill) is not covered by the current environmental and engineering documents.

**Action Taken:** The Department instructed TIS to not revise the Lemon Street Connector on the TIS plans. The current TIS plans will be shown at the March Public Hearing.

#### Sheet A8

HNTB plan shows Carmen Street at Trask Street as a cul-de-sac. HNTB indicated that FDOT Traffic Operations had requested this revision. TIS felt that as long as no additional right-of-way was required it would not be a significant matter. TIS indicated that HNTB should review City of Tampa regulations and codes on cul-de-sac treatments to see if the length of Carmen Street exceeded the regulations for cul-de-sac treatment.



**MEMORANDUM/TIS-IPM**  
C2510, C2380 B1, C4B  
March 12, 1993  
Page 3 of 5

**Action Taken:** TIS plans were revised to show a cul-de-sac of Carmen Street at Trask Street, with no additional right-of-way.

**Sheet A10**

HNTB plan shows Carmen Street at Lois Avenue as a cul-de-sac. HNTB indicated that FDOT Traffic Operations had requested this revision. It was pointed out that it was unusual for a street like Carmen Street to be cul-de-sac'd at both ends; this would tend to dramatically reduce traffic flow in the area. TIS indicated that HNTB should review City of Tampa regulations and codes on cul-de-sac treatments to see if this treatment of Carmen Street exceeded the regulations for cul-de-sac treatment.

**Action Taken:** The Department instructed Greiner to not revise TIS plans at the intersection of Carmen Street and Lois Avenue. Carmen Street will not be cul-de-sac'd at Lois Avenue.

**Sheet A10**

HNTB's plan for Cypress Street includes upgrading Cypress Street from I-275 west to Lois Avenue; this improvement would also extend beyond Lois to west of Westshore Boulevard under current HNTB planning. The HNTB plan indicated right-of-way takings along the north side of Cypress Street from I-275 to Lois Avenue. TIS noted that, based upon the previous FHWA reluctance to fund any such improvements, the extent of potential FDOT involvement with City of Tampa local street problems should be carefully considered by FDOT. Similar plans for Cypress Street, Lois Avenue, Westshore Boulevard and Dale Mabry Highway were presented to the FHWA and rejected by the FHWA.

**Action Taken:** The FDOT indicated that the TIS plans for Cypress Street should not be revised.

**Sheet A11**

The intersection of Arch and Church Streets has been modified by HNTB to reflect a shift necessary for the I-275 facility during final design. This modification would require more right-of-way than TIS plans. The FDOT requested that HNTB review the layout of the connection of Arch and Church Streets to cut down the right-of-way requirements. HNTB reviewed the drawing and provided a red-line markup of the TIS plans to TIS.



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C2510, C2380 B1, C4B  
March 12, 1993  
Page 4 of 5

**Action Taken:** The TIS plans were modified to reflect a revised connection between Church and Arch Streets. This modification will require the taking of one additional single family home.

#### Sheet A11

A discussion of the City of Tampa's request for a triple-left turn for the eastbound to northbound left at the I-275/Dale Mabry Highway interchange was held. The request was based on the desire to design the interchange for peak event traffic associated with sports events at the Tampa Stadium. The traffic analysis shows that the traffic associated with the design can be accommodated by the dual-left plan.

**Action Taken:** FDOT indicated that the current dual-left plan is the preferred plan. No revision to either the HNTB or TIS plans are required.

#### Sheet A11

HNTB indicated that they are considering a plan to cul-de-sac Laurel Street west of Dale Mabry Highway (current access to Jim Walters Corporate Headquarters). The plan would also remove the Laurel Street local connection to the I-275 CD westbound On-ramp (Ramp U). TIS indicated that this could have adverse impacts on the residential neighborhood south of Laurel Street and west of Dale Mabry Highway; some commercial properties would also be impacted. HNTB indicated that access to this area would be at Spruce Street, which is approximately 1,500 feet to the north of the planned access point. FDOT and TIS indicated that the Spruce Street intersection is currently under significant pressure now and will increase in the future with developments on both sides of Dale Mabry Highway under construction. HNTB provided a red-lined TIS print showing the proposed revision.

**Action Taken:** The Department decided to leave the TIS plans as shown; no revision to the Laurel place intersection with Dale Mabry Highway was made.



**MEMORANDUM/TIS-IPM**  
C2510, C2380 B1, C4B  
March 12, 1993  
Page 5 of 5

#### **Sheet A11**

The TIS and HNTB plans provide for a cul-de-sac at the west end of LaSalle Street at Himes Avenue. The TIS plan places the entire cul-de-sac on the north side of LaSalle Street and the HNTB plan places the cul-de-sac on both the north and south side of the street; this results in additional right-of-way. FDOT requested HNTB to review its plan and determine if the cul-de-sac can be placed entirely on the north side of LaSalle Street and avoid the additional right-of-way; a barrier or guardrail placement between the Ramp Y pavement and the cul-de-sac may be necessary to achieve this plan.

**Action Taken:** The TIS plans were modified to pull the LaSalle Street cul-de-sac back to the east away from Himes Street. This compromise action resulted in the taking of one additional single family home and a vacant lot.

All of these revisions will be presented at the upcoming March 22, 1993 Public Hearing for the TIS Design Study Segment 1A (Westshore area) improvements.

## **APPENDIX D**

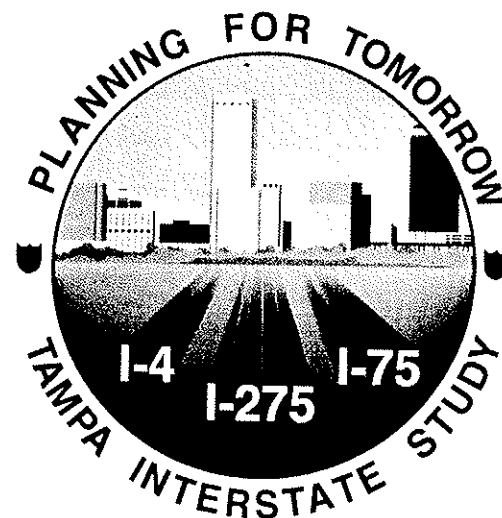
### **PREFERRED ALTERNATIVE PLANS**



# ENVIRONMENTAL ASSESSMENT PREFERRED ALTERNATIVE PROJECT DEVELOPMENT AND ENVIRONMENTAL STUDY

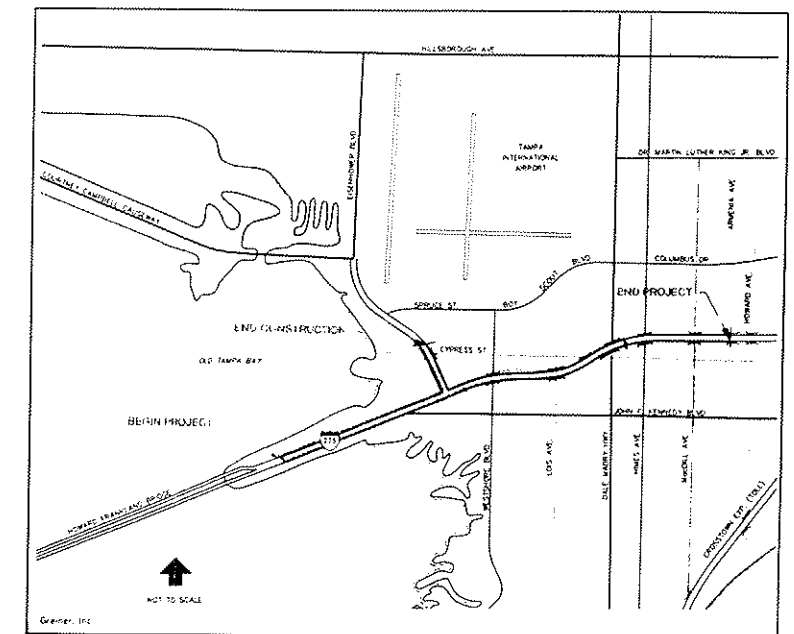
Tampa Interstate Study – Interstate 275 (I-275) from the Howard Frankland Bridge/Kennedy Boulevard Ramps to the Dale Mabry Highway Interchange on the east and just north of Cypress Street on Memorial Highway (S.R. 60) Hillsborough County

Work Project Number: 7140004    State Project Number: 99007-1402    Federal-Aid Project Number: IR-9999(43)



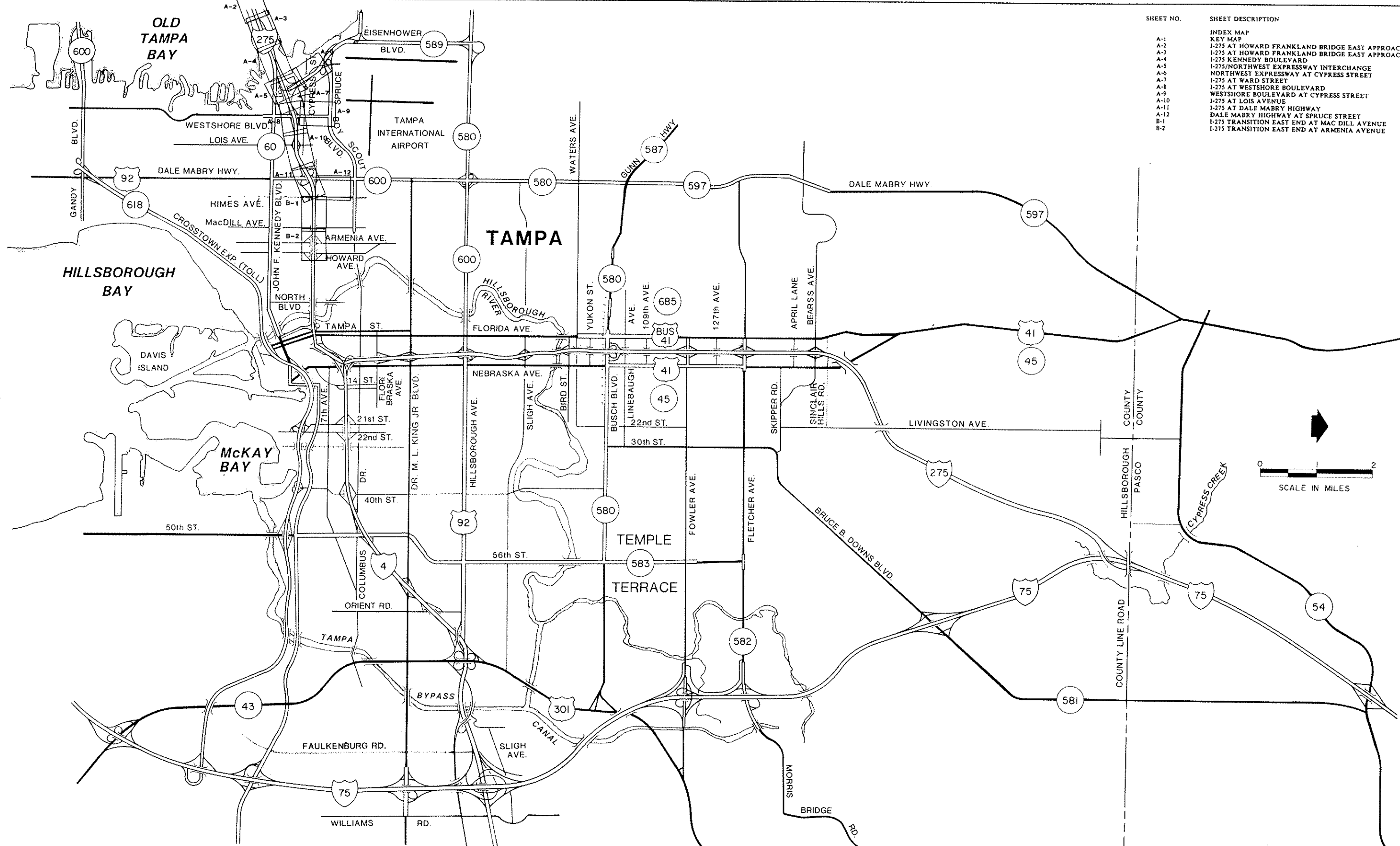
PREPARED BY  
**THE GREINER TEAM**  
GREINER, INC.  
PIPER ARCHAEOLOGICAL RESEARCH, INC.  
KNIGHT APPRAISAL SERVICES

<u>Sheet No.</u>	<u>Title</u>
A-1 THROUGH A-12	PREFERRED ALTERNATIVE CONCEPT
B-1 AND B-2	TRANSITION CONCEPT I-275 EAST END
C-1 THROUGH C-3	CROSS SECTIONS
D-1 THROUGH D-13	WORKING PROFILES
E-1 THROUGH E-4	WORKING TRANSITION PROFILES



PROJECT LOCATION MAP

PREPARED FOR  
**FLORIDA DEPARTMENT OF TRANSPORTATION**



SHEET NO.	SHEET DESCRIPTION
A-1	INDEX MAP
A-2	KEY MAP
A-3	I-275 AT HOWARD FRANKLAND BRIDGE EAST APPROACH
A-4	I-275 AT HOWARD FRANKLAND BRIDGE EAST APPROACH
A-5	I-275 KENNEDY BOULEVARD
A-6	I-275/NORTHWEST EXPRESSWAY INTERCHANGE
A-7	NORTHWEST EXPRESSWAY AT CYPRESS STREET
A-8	I-275 AT WARD STREET
A-9	I-275 AT WESTSHORE BOULEVARD
A-10	WESTSHORE BOULEVARD AT CYPRESS STREET
A-11	I-275 AT LOIS AVENUE
A-12	I-275 AT DALE MABRY HIGHWAY
B-1	DALE MABRY HIGHWAY AT SPRUCE STREET
B-2	I-275 TRANSITION EAST END AT MAC DILL AVENUE
	I-275 TRANSITION EAST END AT ARMENIA AVENUE

PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
9/90	AERIAL KEY MAP 100' SCALE E.A.
4-91	DRAFT PREFERRED ALTERNATIVE
5-93	FINAL CONCEPT PLANS



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**PREFERRED ALTERNATIVE**  
**INDEX SHEET**

**TAMPA INTERSTATE STUDY**  
FLORIDA DEPARTMENT OF TRANSPORTATION  
STATE PROJECT No. 99007-1402



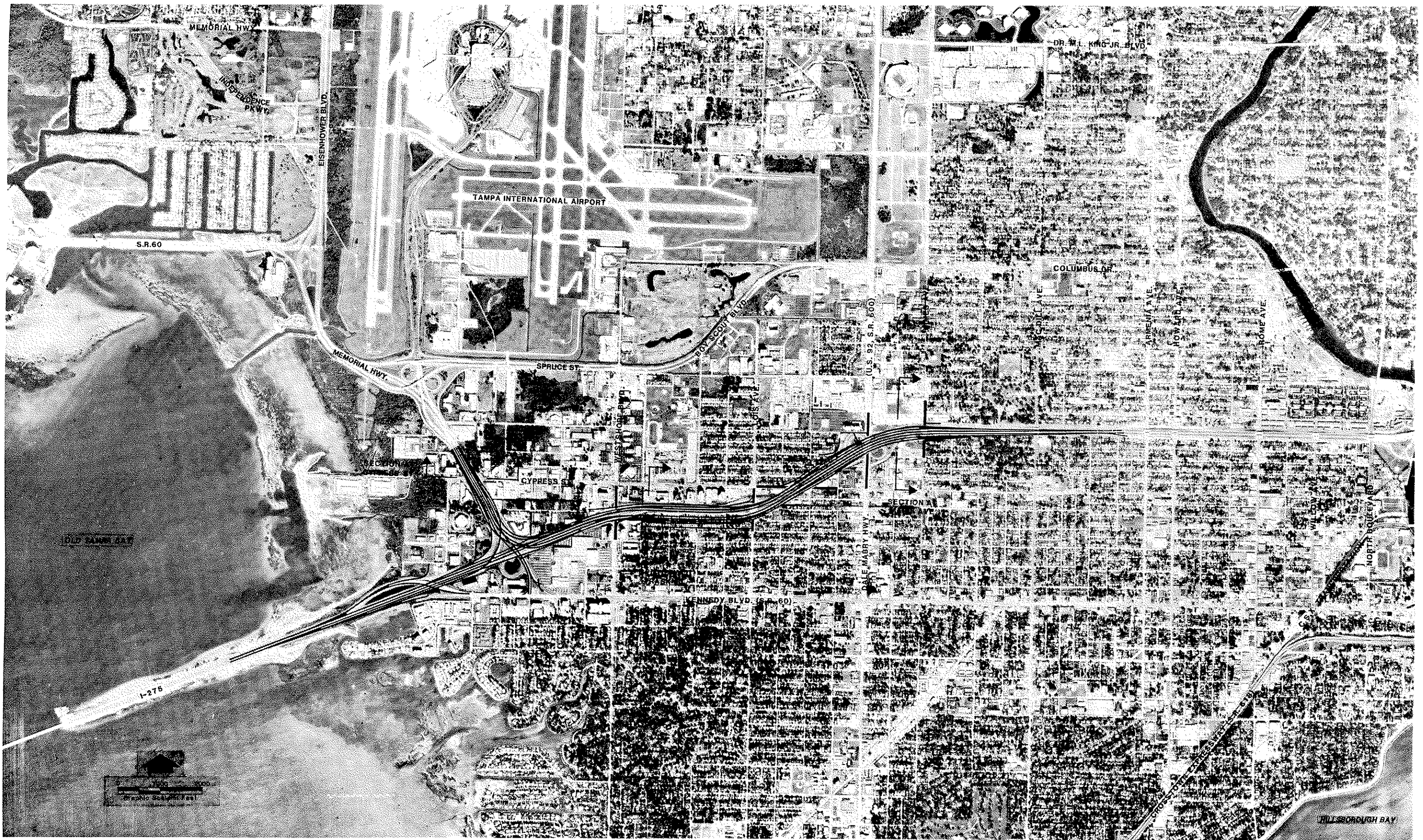


Photo Date: November 1987

PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
4-15-89	FINAL MASTER PLAN CONCEPT
4-91	DRAFT PREFERRED ALTERNATIVE
5-93	FINAL CONCEPT PLANS



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 PIPER ARCHAEOLOGICAL RESEARCH, INC.  
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**PREFERRED ALTERNATIVE**

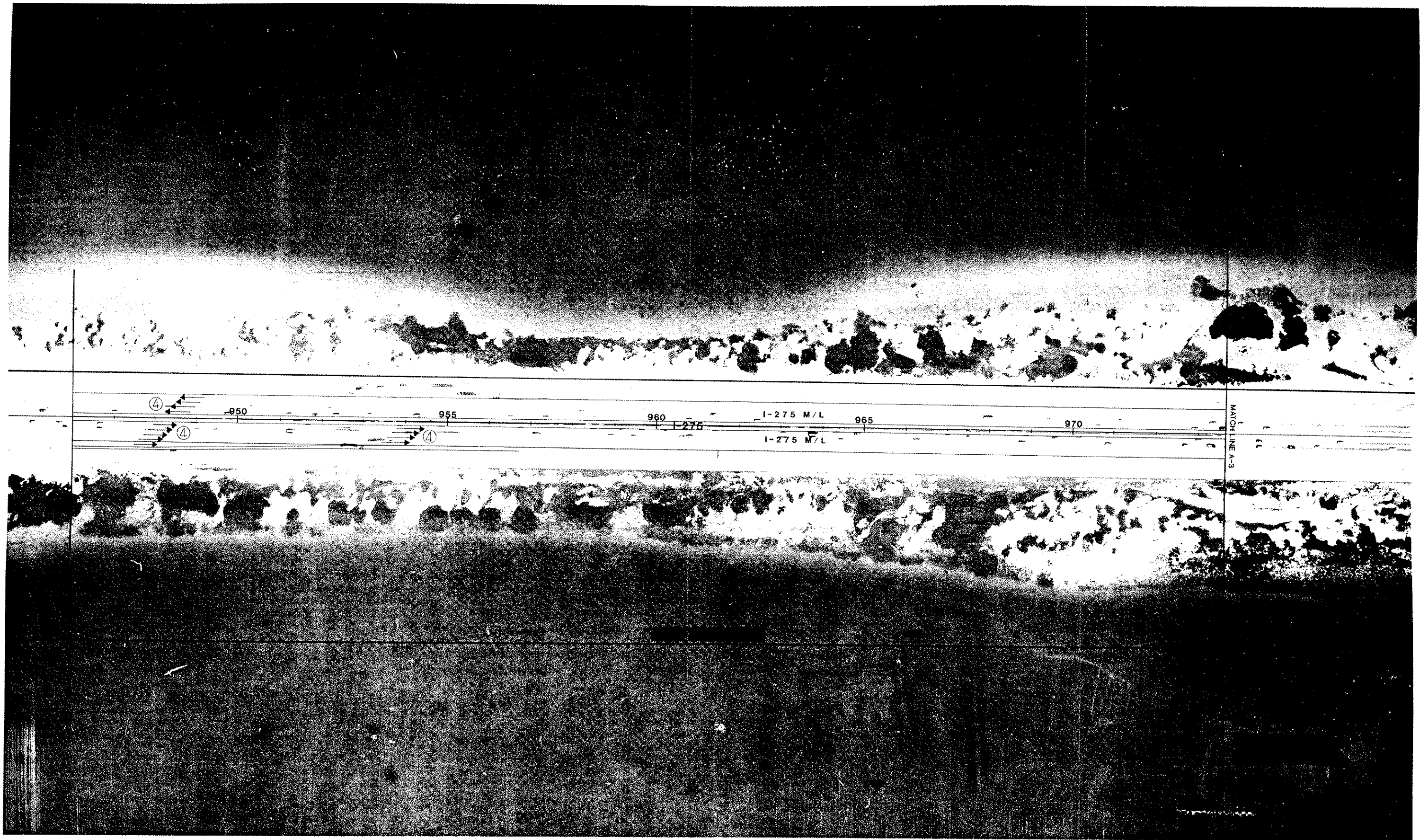
KEY MAP

**TAMPA INTERSTATE STUDY**

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 SHEET **A-1** OF 12





Printed Date: August 1997

PROJECT No. C2380			<b>THE GREINER TEAM</b> GREINER, INC. PIPER ARCHAEOLOGICAL RESEARCH, INC. KNIGHT APPRAISAL SERVICES	<b>PREFERRED ALTERNATIVE</b> I-275 AT HOWARD FRANKLAND BRIDGE EAST APPROACH	<b>TAMPA INTERSTATE STUDY</b>	
PROJECT DATES					FLORIDA DEPARTMENT OF TRANSPORTATION	
DATE	DESCRIPTION				STATE PROJECT No. 99007-1402 SHEET A-2 OF 12	
1-97	DESIGN PRELIMINARY ALTERNATIVE					
7-97	FINAL CORRECTION PLAN					













Photo Date: August 1987

PROJECT No. C2380

PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT
4-91	DRAFT PREFERRED ALTERNATIVE
5-92	PREFERRED ALTERNATIVE
2-93	IPM REVISIONS
5-93	FINAL CONCEPT PLANS



**THE GREINER TEAM**  
GREINER, INC.  
PIPER ARCHAEOLOGICAL RESEARCH, INC.  
KNIGHT APPRAISAL SERVICES

**PREFERRED ALTERNATIVE**

**I-275 AT NORTHWEST EXPRESSWAY INTERCHANGE**

**TAMPA INTERSTATE STUDY**

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 SHEET **A-5** OF 12



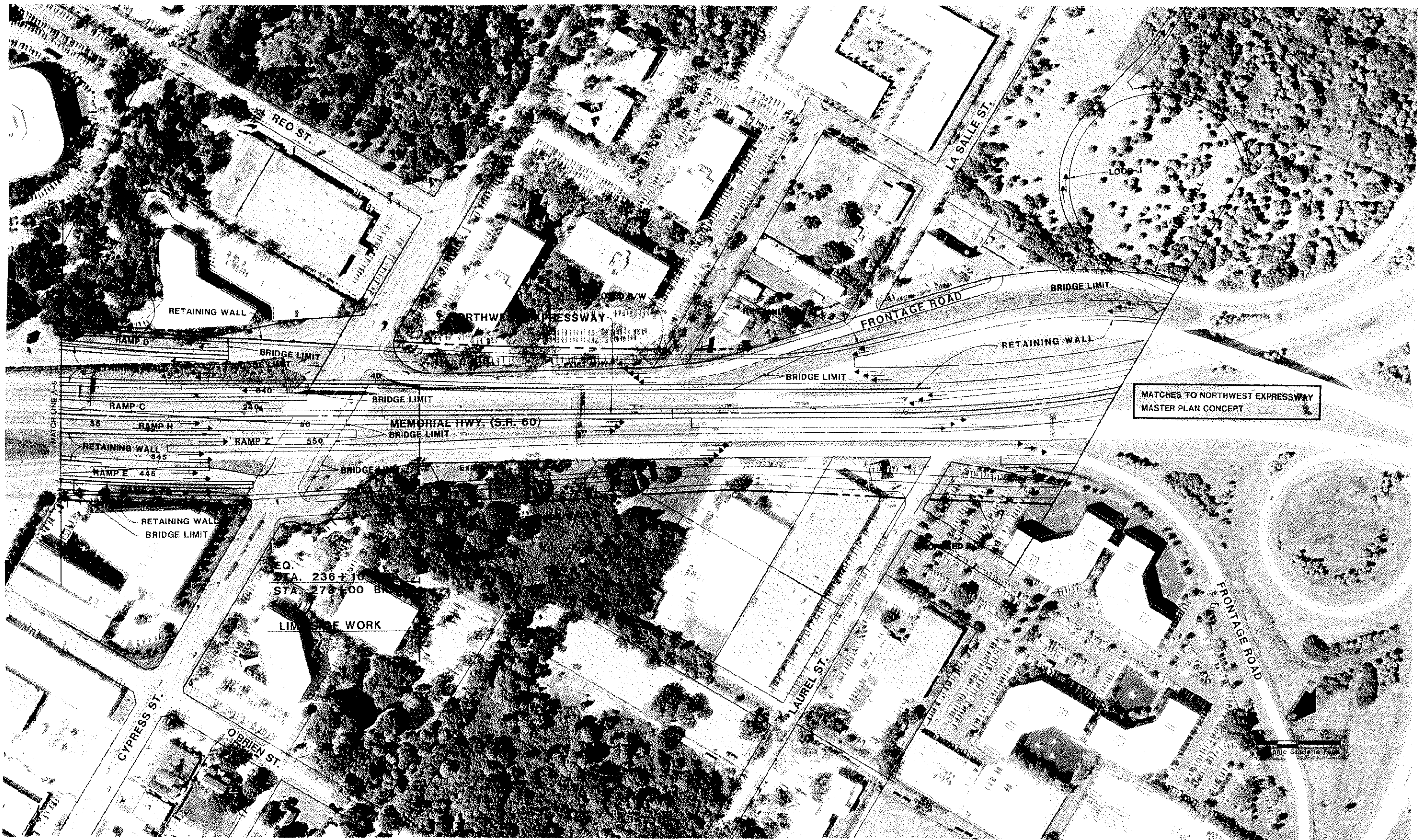


Photo Date: August 1987

PROJECT No. C2380

PROJECT DATES

DATES	DESCRIPTION
3-26-85	DRAFT MASTER PLAN CONCEPT
6-85	FINAL MASTER PLAN CONCEPT
4-86	DRAFT PREFERRED ALTERNATIVE
5-86	FINAL CONCEPT PLANS



**THE GREINER TEAM**  
GREINER, INC.

PIPER ARCHAEOLOGICAL RESEARCH, INC.  
KNIGHT APPRAISAL SERVICES

**PREFERRED ALTERNATIVE**

NORTHWEST EXPRESSWAY AT CYPRESS ST.

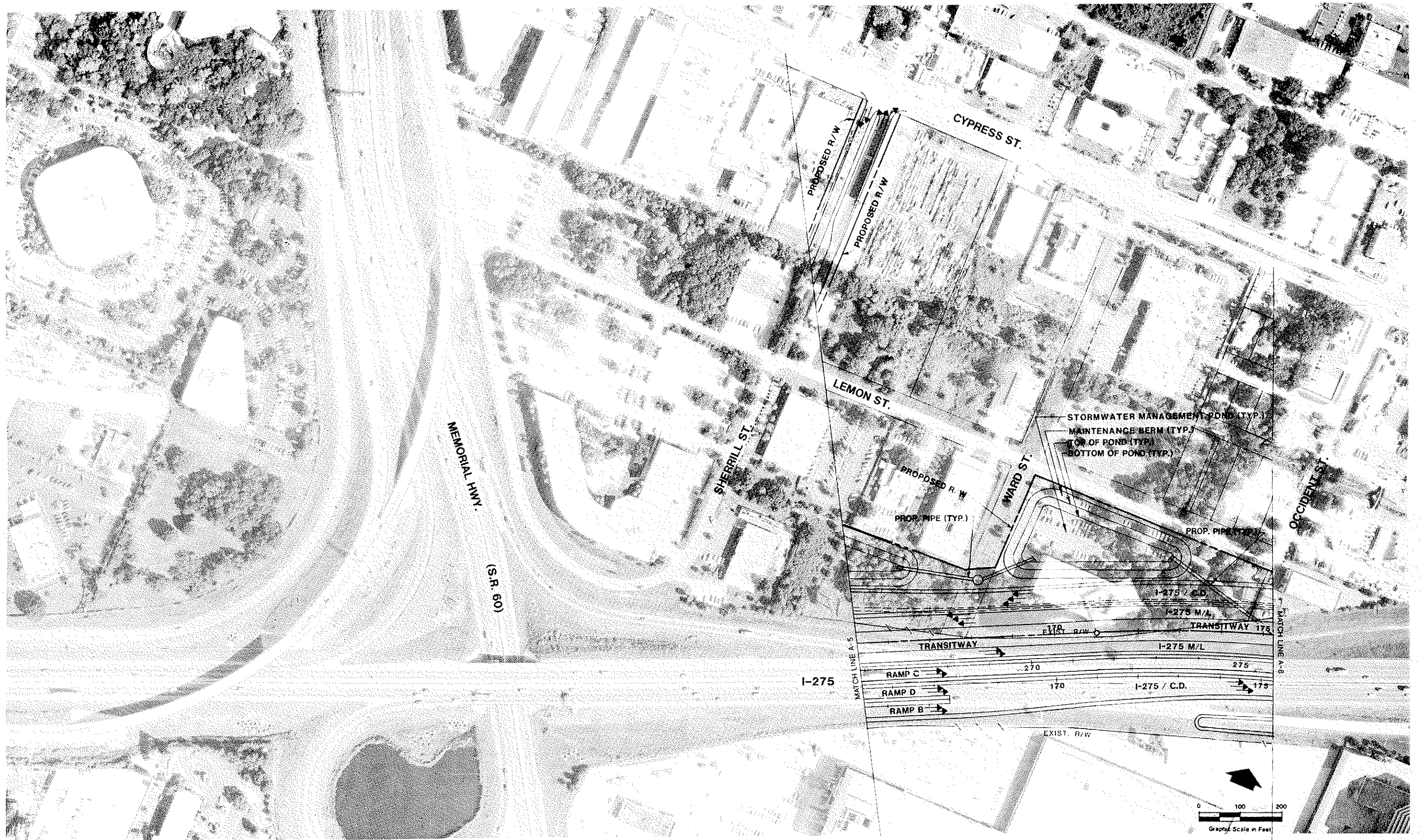
**TAMPA INTERSTATE STUDY**

FLORIDA DEPARTMENT OF TRANSPORTATION

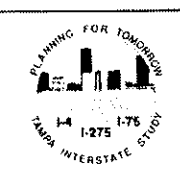
STATE PROJECT No. 99007-1402

SHEET A-6 of 12





PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
8-92	SHEET 1 REVISED
5-93	FINAL CONCEPT PLANS



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**GREINER, INC.**  
 PIPER ARCHAEOLOGICAL RESEARCH, INC.  
 KNIGHT APPRAISAL SERVICES

**PREFERRED ALTERNATIVE**  
**I-275 AT WARD ST.**

**TAMPA INTERSTATE STUDY**  
 FLORIDA DEPARTMENT OF TRANSPORTATION  
 STATE PROJECT No. 99007-1402 SHEET **A-7** OF 12



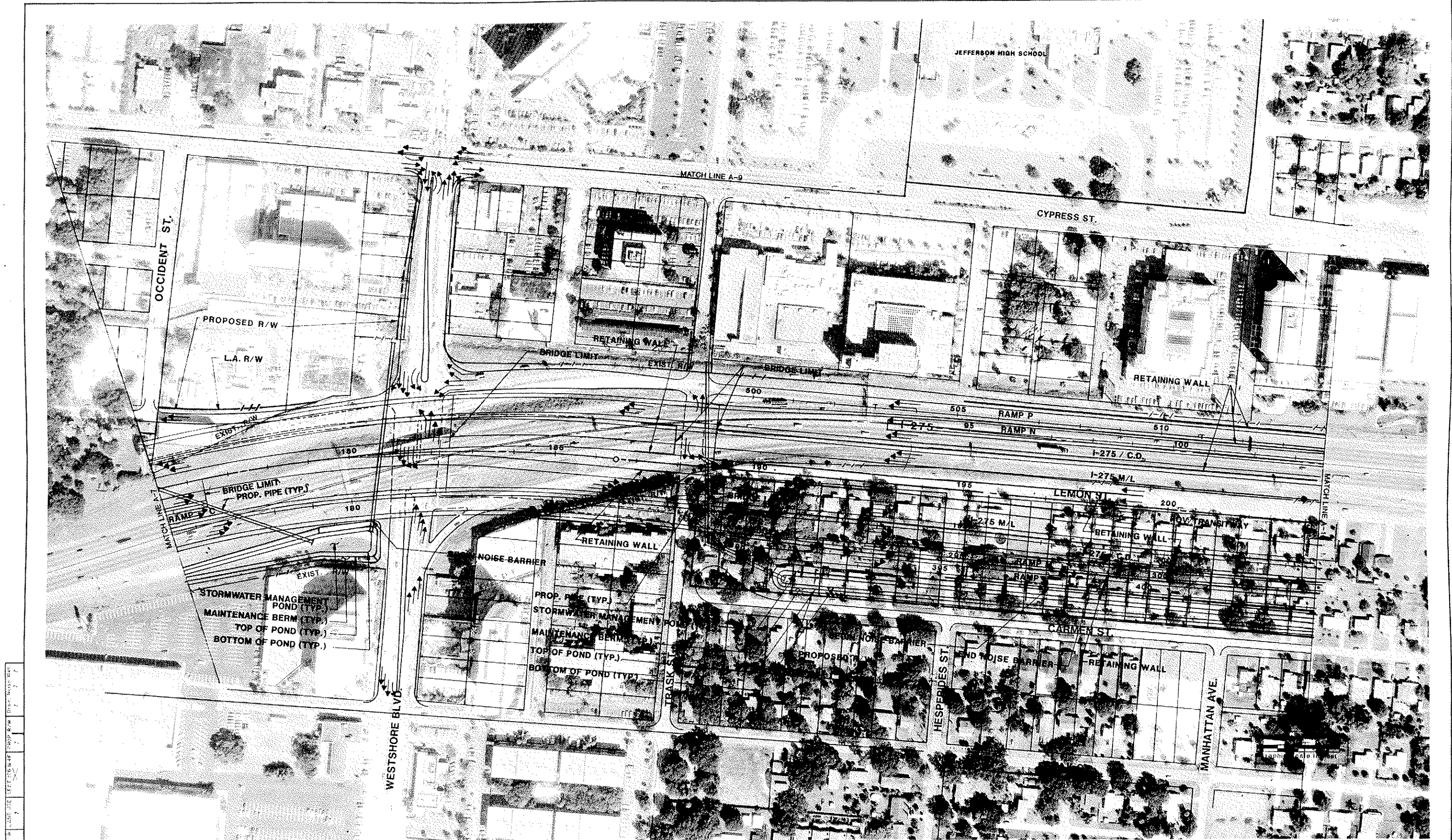


Photo Date: August 1987

EXIST. R/W L.A. R/W SEE SECT. 1004-F PROP. R/W DRAINAGE MAP 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
3-28-88	DRAFT MASTER PLAN CONCEPT
6-88	FINAL MASTER PLAN CONCEPT
4-91	DRAFT PREFERRED ALTERNATIVE
10-92	NOISE BARRIERS
2-93	IPM REVISIONS
4-93	FINAL CONCEPT PLANS



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**PREFERRED ALTERNATIVE**  
**I-275 AT WESTSHORE BLVD.**

**TAMPA INTERSTATE STUDY**  
FLORIDA DEPARTMENT OF TRANSPORTATION  
STATE PROJECT No. 99007-1402 SHEET **A-8** OF **12**



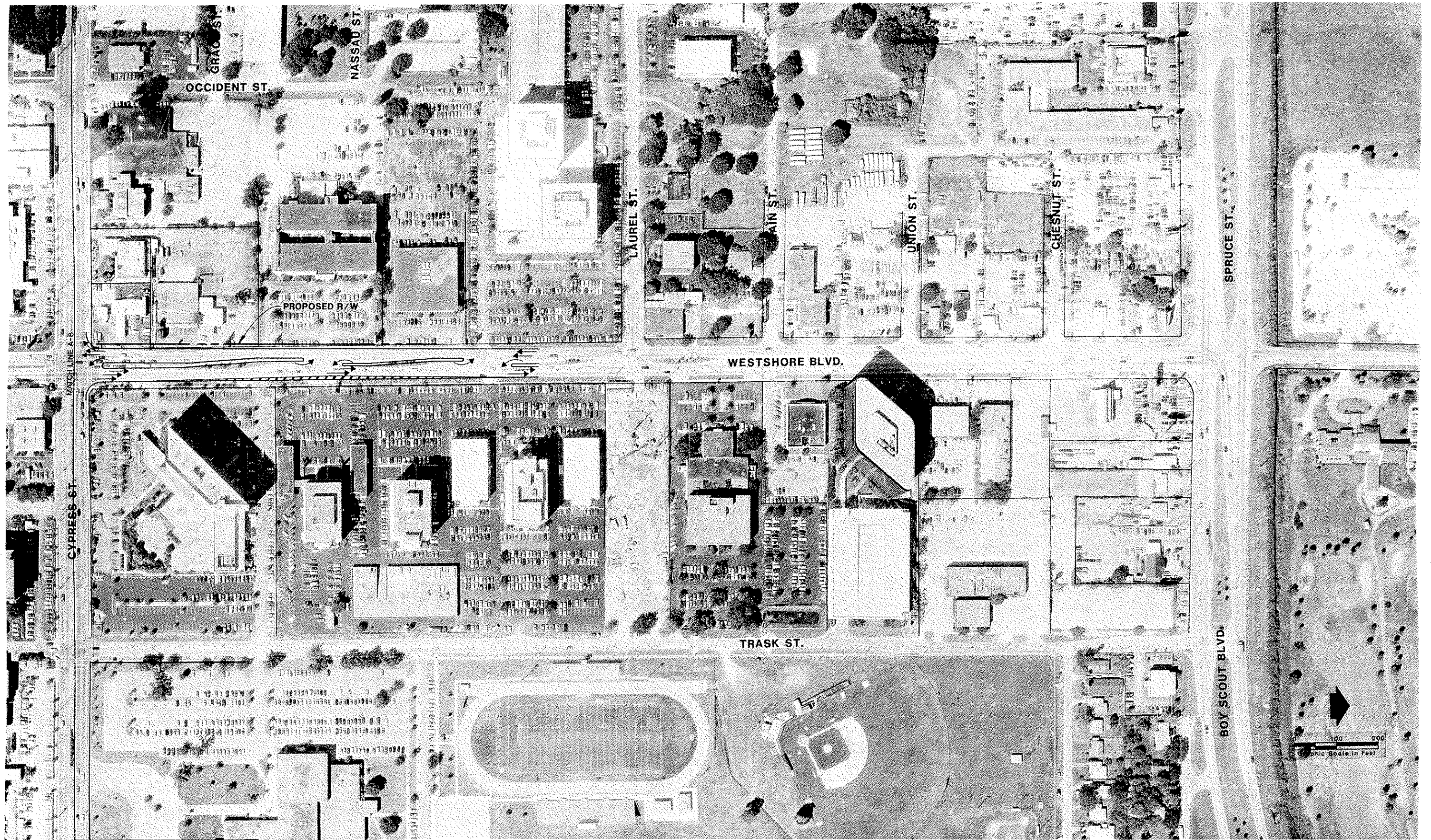


Photo Date: August 1967

PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
4-91	DRAFT PREFERRED ALTERNATIVE
5-91	FINAL CONCEPT PLANS



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**PREFERRED ALTERNATIVE**  
**WESTSHORE BOULEVARD AT CYPRESS STREET**

**TAMPA INTERSTATE STUDY**  
 FLORIDA DEPARTMENT OF TRANSPORTATION  
 STATE PROJECT No. 99007-1402 SHEET **A-9** OF **12**





Photo Date: August 1987

PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
3-25-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT
4-91	DRAFT PREFERRED ALTERNATIVE
10-92	NOISE BARRIERS
2-93	IPM REVISIONS
5-93	FINAL CONCEPT PLAN



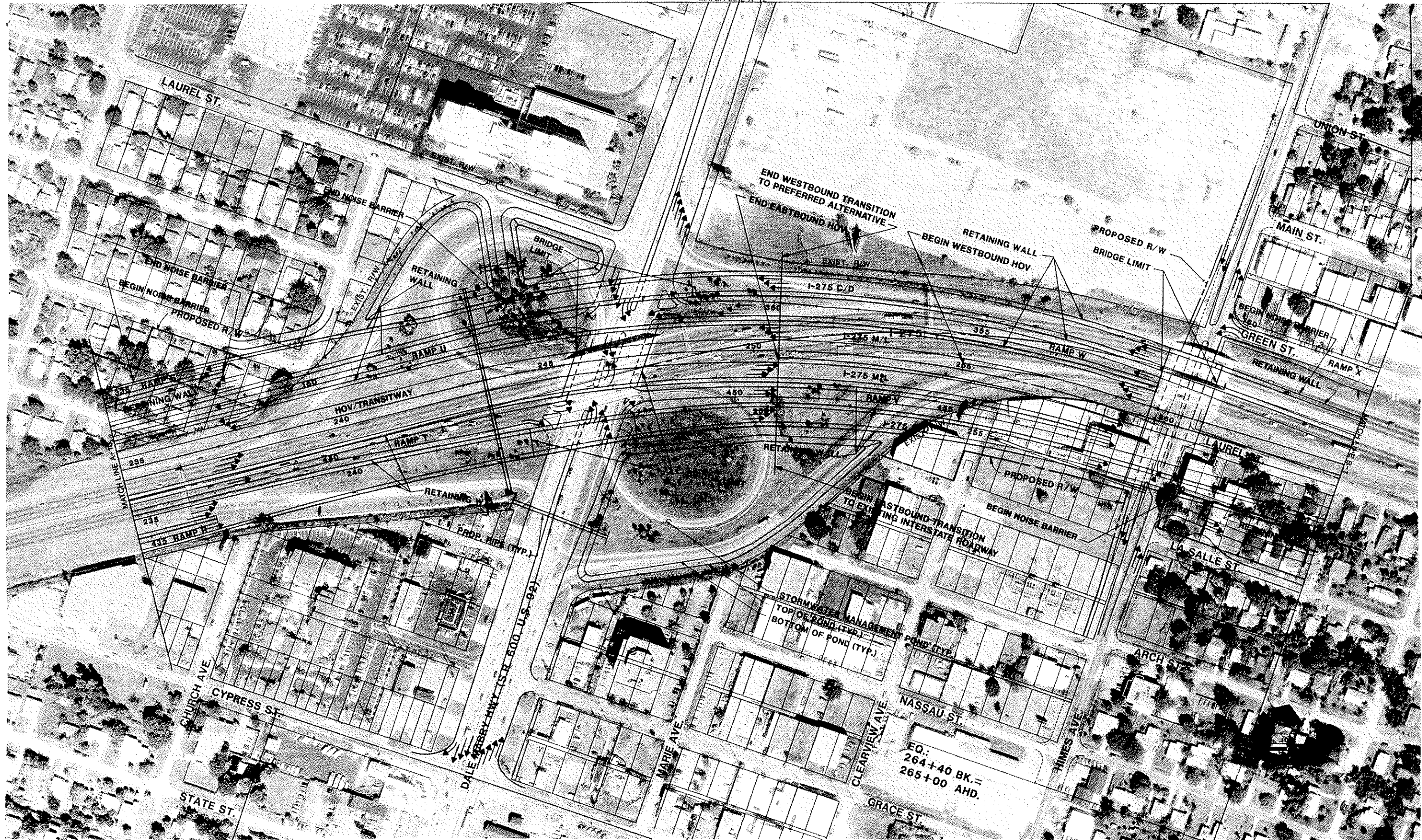
**THE GREINER TEAM**  
**GREINER, INC.**  
 PIPER ARCHAEOLOGICAL RESEARCH, INC.  
 KNIGHT APPRAISAL SERVICES

**PREFERRED ALTERNATIVE**  
**I-275 AT LOIS AVE.**

**TAMPA INTERSTATE STUDY**  
 FLORIDA DEPARTMENT OF TRANSPORTATION  
 STATE PROJECT No. 99007-1402  
 SHEET **A-10** OF **12**



MATCH LINE A-12



11  
10  
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Photo Date: August 1987

PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
1-27-89	CHART MASTER PLAN CONCEPT
6-78	FINAL MASTER PLAN CONCEPT
4-91	DRAFT PREFERRED ALTERNATIVE
6-92	GENERAL REVISIONS
10-92	NOISE BARRIERS
6-93	FINAL CONCEPT PLANS

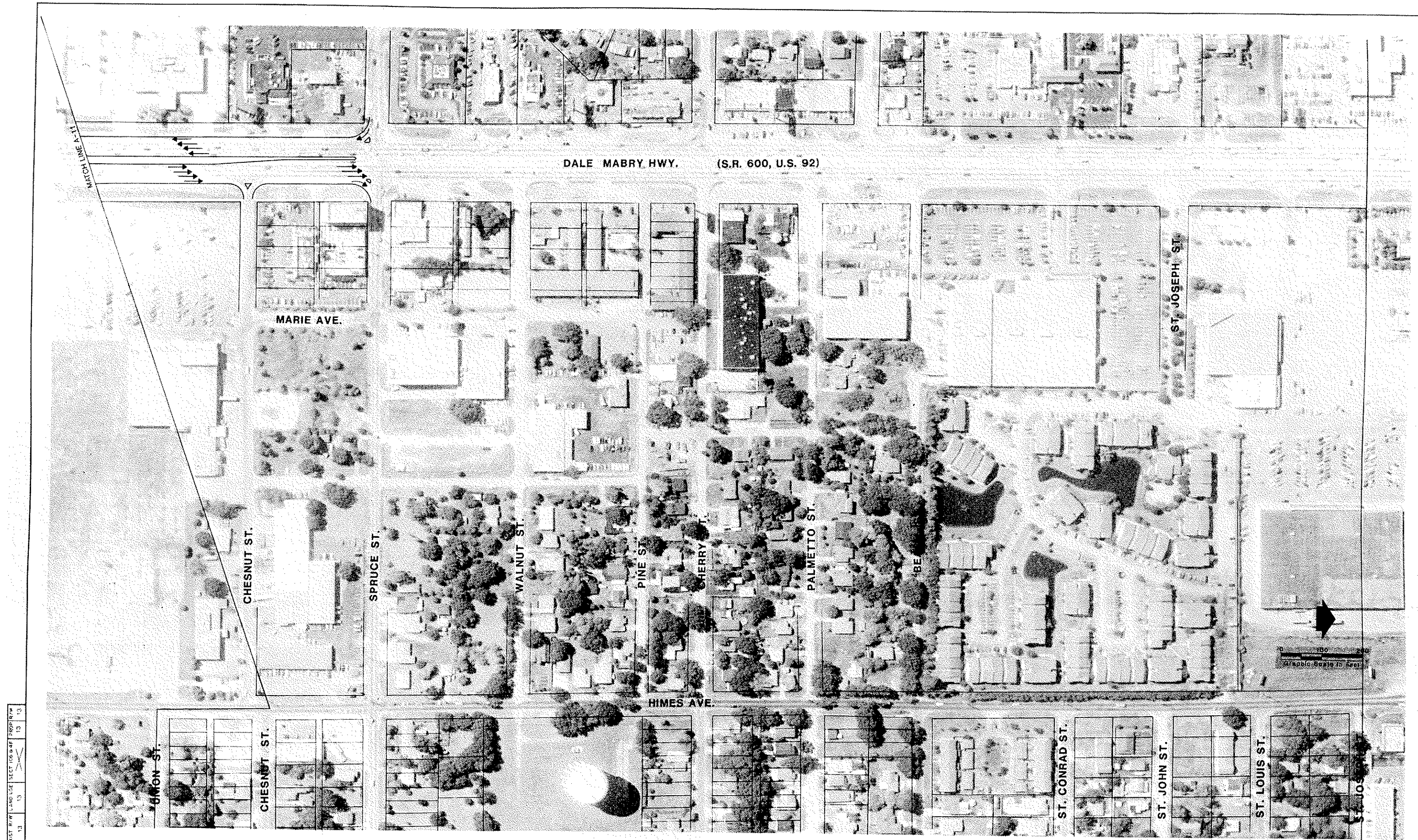


**THE GREINER TEAM**  
GREINER, INC.  
PIPER ARCHAEOLOGICAL RESEARCH, INC.  
KNIGHT APPRAISAL SERVICES

**PREFERRED ALTERNATIVE**  
I-275 AT DALE MABRY HWY.

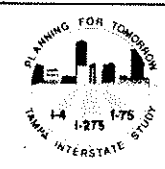
**TAMPA INTERSTATE STUDY**  
FLORIDA DEPARTMENT OF TRANSPORTATION  
STATE PROJECT No. 99007-1402  
SHEET A-11 OF 12





EXIST. R/W LAND USE SECT. 106.04F PROPR. RW  
13 13 13 13 13

PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
4-01	DRAFT PREFERRED ALTERNATIVE
5-93	FINAL CONCEPT PLANS



**THE GREINER TEAM**  
GREINER, INC.  
PIPER ARCHAEOLOGICAL RESEARCH, INC.  
KNIGHT APPRAISAL SERVICES

**PREFERRED ALTERNATIVE**  
DALE MABRY HIGHWAY AT SPRUCE STREET

**TAMPA INTERSTATE STUDY**  
FLORIDA DEPARTMENT OF TRANSPORTATION  
STATE PROJECT No. 99007-1402 SHEET A-12 OF 12

Photo Date: August 1987





Photo Date: August 1987

PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
10-91	GENERAL REVISIONS
12-92	NOISE BARRIERS
1-93	FINAL CONCEPT PLANS



**THE GREINER TEAM**  
**GREINER, INC.**  
 PIPER ARCHAEOLOGICAL RESEARCH, INC.  
 KNIGHT APPRAISAL SERVICES

**TRANSITION CONCEPT**  
 I-275 TRANSITION EAST END  
 I-275 AT MACDILL AVE.

**TAMPA INTERSTATE STUDY**  
 FLORIDA DEPARTMENT OF TRANSPORTATION  
 STATE PROJECT No. 99007-1402 SHEET B-1 OF 2



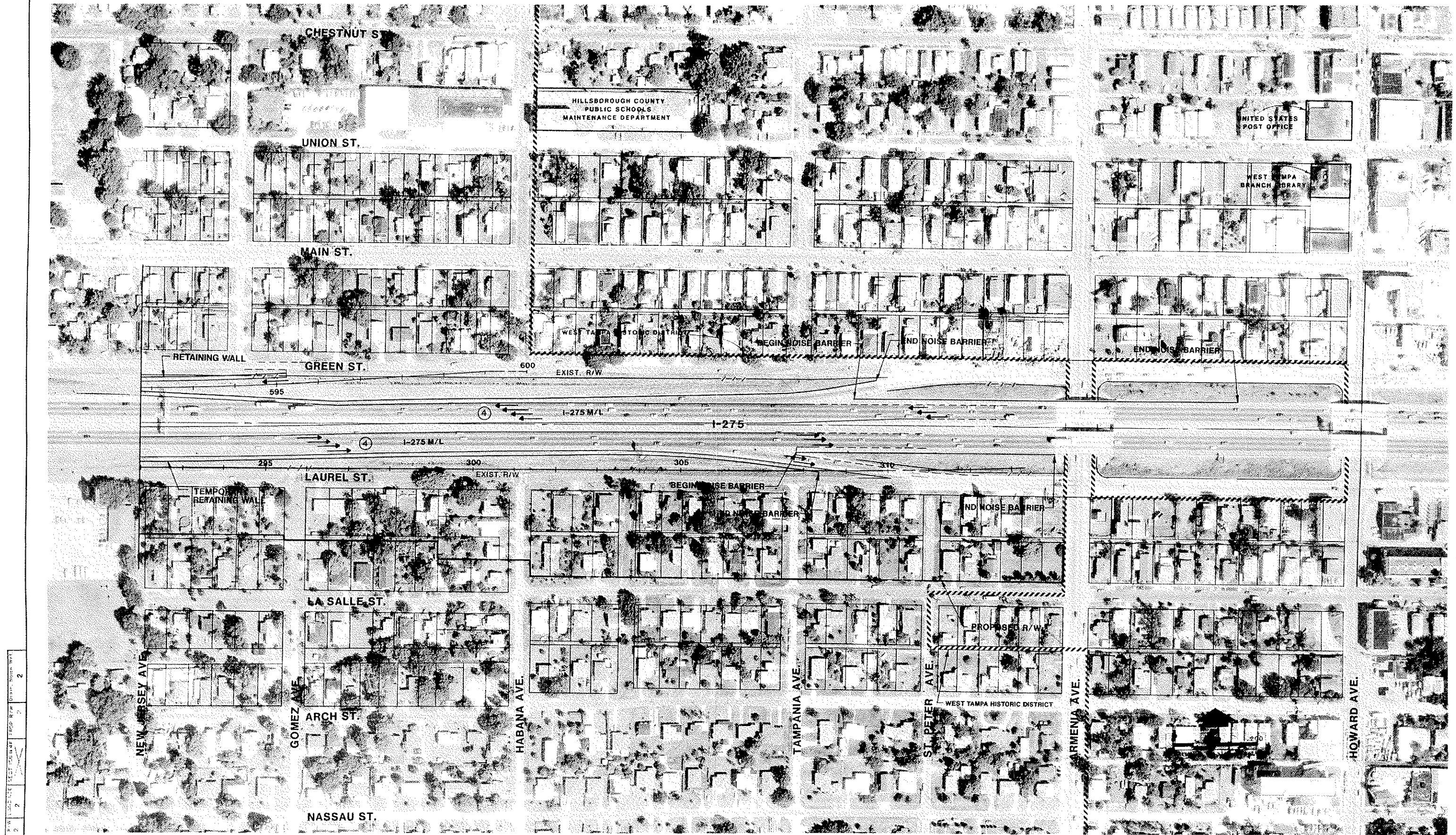


Photo Date: August 1987

PROJECT No. C2380	
PROJECT DATES	
DATES	DESCRIPTION
6-92	GENERAL REVISIONS
12-92	NOISE BARRIERS
5-93	FINAL CONCEPT PLANS



**THE GREINER TEAM**  
GREINER, INC.  
PIPER ARCHAEOLOGICAL RESEARCH, INC.  
KNIGHT APPRAISAL SERVICES

**TRANSITION CONCEPT**  
I-275 TRANSITION EAST END  
I-275 AT ARMENIA AVE.

**TAMPA INTERSTATE STUDY**  
FLORIDA DEPARTMENT OF TRANSPORTATION  
STATE PROJECT No. 99007-1402 SHEET B-2 OF 2