PRELIMINARY ENGINEERING REPORT

State Project Number: 10250-1525
Federal Aid Project Number: M-1802-(1)
Work Program Number: 7113839

22nd Street Causeway/Causeway Boulevard (S.R. 676) from U.S. 301 to S. R. 60 in Hillsborough County, Florida

The proposed facility consists of a six-lane roadway beginning at State Road 60 (Adamo Drive) and extending south and then east to U.S. Highway 301 in Hillsborough County, Florida. The project length of approximately 6.8 miles and includes five bridges and an interchange/overpass at U.S. 41. The proposed improvements include widening McKay Bay Bridges to add an additional lane on each bridge, and replacing existing bridge structures over Delaney Creek and its tributary.

Post, Buckley, Schuh & Jernigan, Inc.

Prepared by

James W. [signature]
PROJECT MANAGER
(Name and Title of Engineer)

James G. Kennedy
VICE PRESIDENT
(Name and Title of Responsible Officer)

36968
(P.E. Number)

May, 1994

James W. [signature]
7/7/94

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES (continued)

LIST OF FIGURES (continued)

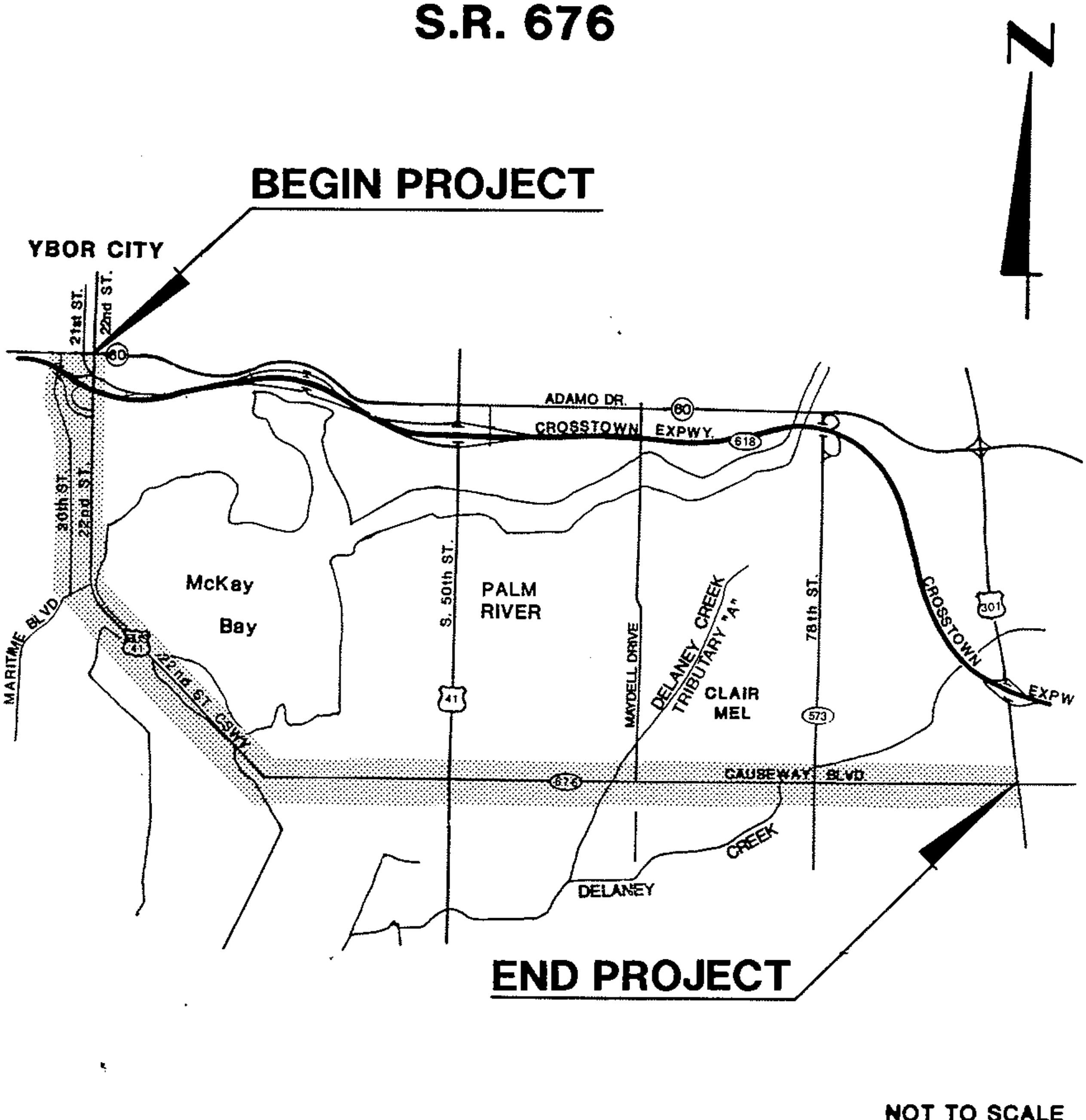
LIST OF FIGURES (continued)

SECTION 1
ABSTRACT

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) Study for the improvement of the 22nd Street Causeway/Causeway Boulevard (S.R. 676) corridor between S.R. 60 (Adamo Drive) and U.S. 301 in Tampa and Hillsborough County, Florida (the project limits are shown in Figure 1-1). The study area includes sections of 20th Street. An interchange is proposed to carry U.S. 41 traffic over Causeway Boulevard. The purpose of the study is to determine the improvements that are necessary to accommodate existing and future traffic in a safe and efficient manner, in accordance with local transportation plans.

The general objective of the PD&E study is to provide the documented information necessary for FDOT to reach a decision on the type, design and location of a multi-lane expansion of 22nd Street Causeway/Causeway Boulevard. The FDOT decision will include satisfying the requirements of the Federal Highway Administration (FHWA) for potential funding.

F.A.P. NO. M-1802 (1)
State Project No. 10250-1525
W.P.I. NO. 7113839
HILLSBOROUGH COUNTY
22ND STREET CAUSEWAY/CAUSEWAY BLVD.
S.R. 676



PROJECT LOCATION MAP | FIGURE 1

SECTION 2
INTRODUCTION

2.1 PURPOSE

The purpose of this report is to identify the deficiencies in the existing 22nd Street Causeway/Causeway Boulevard facility, and then develop feasible alternatives that will meet future transportation needs while considering social, economic, and environmental impacts. The report documents each alternative considered, identifying the most viable and documenting the rejection of others. A description of the recommended alternative is also included.

2.2 PROJECT DESCRIPTION

The project study limits extend from S.R. 60, south to the bridge over McKay Bay, then east to U.S. 301. The total length along 22nd Street Causeway/Causeway Boulevard is approximately 6.8 miles. The study also includes approximately 1 mile along U.S. 41 and 1.3 miles along 20th Street. The project is located in Hillsborough County, Florida, with the westernmost 3.2 miles of the study within Tampa city limits.

22nd Street Causeway/Causeway Boulevard is the primary roadway providing access to the Tampa Port Authority's Hookers Point facilities. Between the Crosstown Expressway and Maritime Boulevard, the roadway also serves as a local collector street for the Palmetto Beach area. In the same manner, the project corridor serves the Clair Mel residential area east of the bridge over McKay Bay.

The project has been divided into two sections for analysis, based upon physical features, density and type of development, and existing roadway characteristics. The North Section lies between S.R. 60 and the bridges over McKay Bay. The East Section extends from the McKay Bay crossing to U.S. 301. This segmentation is discussed in greater detail in Section 7 of this report.

SECTION 3
EXISTING CONDITIONS

3.1 EXISTING ROADWAY CHARACTERISTICS

3.1.1 Functional Classification

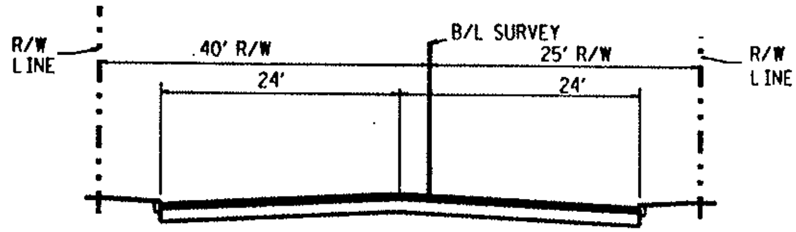
22nd Street Causeway/Causeway Boulevard (S.R. 676) is currently classified as a principal arterial from Adamo Drive (S.R. 60) to U.S. 41 by the FDOT. From U.S. 41 to U.S. 301, the roadway is classified as a minor arterial by FDOT.

3.1.2 Typical Sections

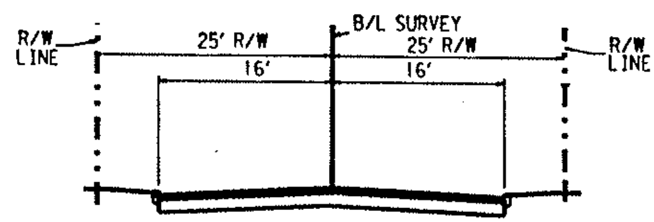
Roadway

The existing roadway and bridge typical sections are illustrated in Figures 3-1a and 3-1b. The typical section of 22nd Street between the Crosstown Expressway and Maritime Boulevard is a three lane roadway incorporating a single through lane in each direction and a two-way left turn lane. South of Maritime Boulevard, the roadway becomes a four-lane divided rural facility that approaches the twin span bridges over McKay Bay, each carrying two lanes of traffic per direction. South/east of the bridges, the four lane divided typical section resumes with a raised median and intermittent left turn lanes. Beyond the causeway, the raised median is replaced by a continuous two-way left turn lane. This typical section applies to U.S. 41. East of U.S. 41, the roadway immediately narrows to a two-lane rural roadway; this typical section continues to U.S. 301.

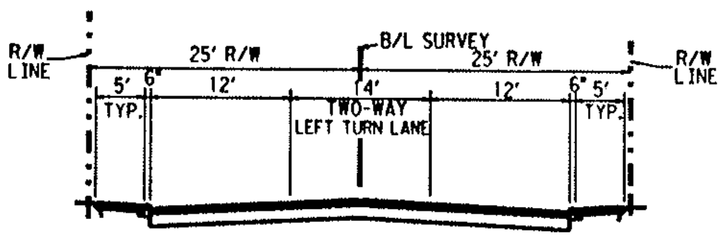
The section of 20th Street between Maritime Boulevard and Durham Street is a two lane urban roadway.



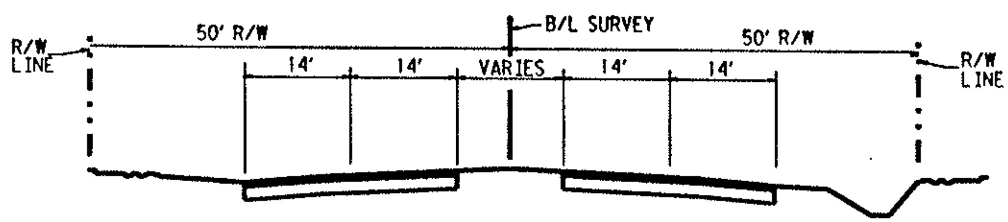
20TH STREET
DURHAM ST TO GRANT ST



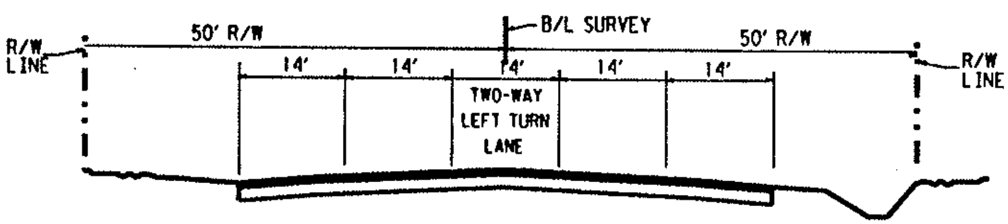
20TH STREET
GRANT ST TO MARITIME BLVD



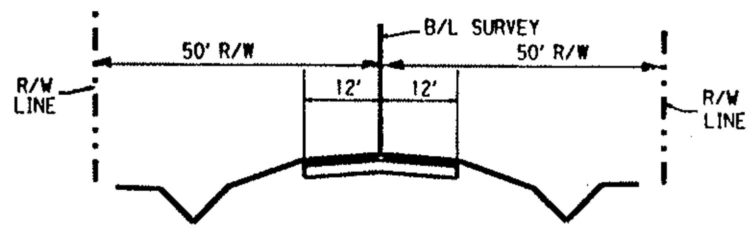
22ND STREET
CROSSTOWN EXPWY. TO MARITIME BLVD.



22ND STREET
CAUSEWAY SOUTH OF 22ND ST. BRIDGE



22ND STREET
EAST OF CAUSEWAY TO U.S. 41

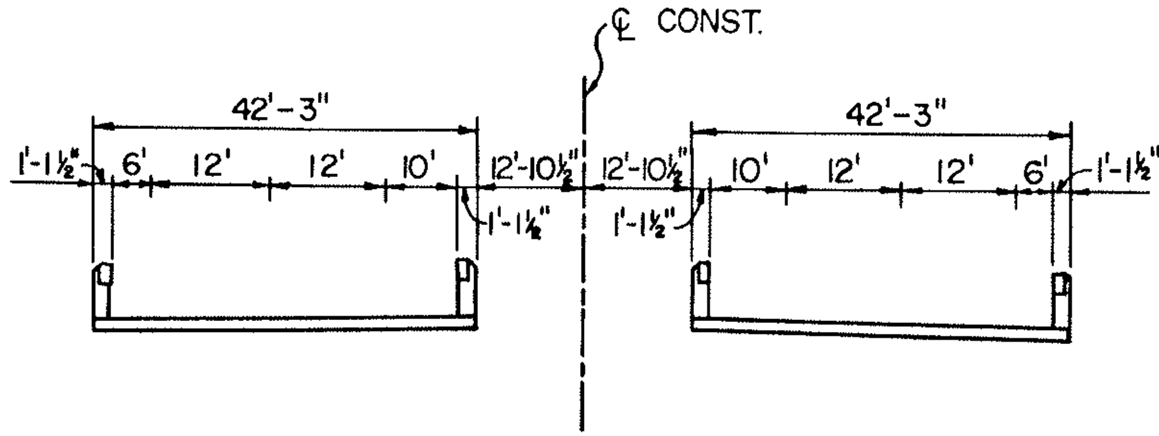


22ND STREET
U.S. 41 TO U.S. 301

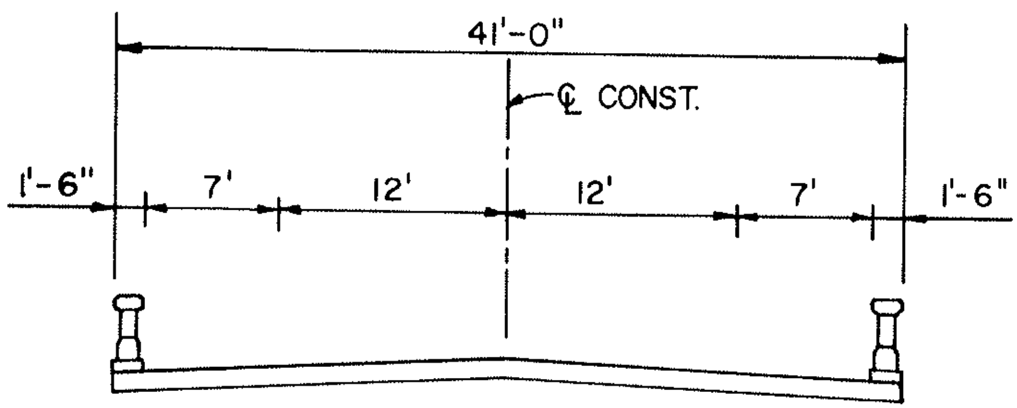
PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

EXISTING TYPICAL SECTIONS

FIGURE NO.
3–1a



22nd STREET CAUSEWAY BRIDGE OVER McKAY BAY



22nd STREET CAUSEWAY BRIDGE OVER DELANEY CREEK
AND DELANEY CREEK TRIBUTARY "A"

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY	EXISTING BRIDGE TYPICAL SECTIONS	FIGURE NO. 3-1b

Bridges

There are 3 existing bridge locations within the study area that carry 22nd Street Causeway/Causeway Boulevard traffic over water features. Twin bridges, each carrying 2 lanes of traffic, accommodate boat traffic using McKay Bay. Delaney Creek crosses Causeway Boulevard at 2 locations. These bridges, constructed in 1928, carry a single lane of traffic in each direction. These structures allow passage of water, but are not navigable (i.e., boat traffic does not have to be accommodated).

Additional existing bridge information is contained in Section 3.2 of this report.

3.1.3 Pedestrian and Bicycle Facilities

Sidewalks are located on the west side of 22nd Street between S.R. 60 and Maritime Boulevard and on the east side of 22nd Street from S.R. 60 to just south of Davis Street. A mid-block pedestrian crossing traffic signal is located between Stuart Street and Harper Street. Sidewalks can be found on the west side of 20th Street between Chapin and Flagler Streets. East of the McKay Bay bridge, pedestrian facilities are not provided. Currently there are no special provisions for bicycle traffic within project limits.

3.1.4 Right of Way

Thirty percent complete Right-of-Way Plans showing the existing right-of-way have been completed as part of the PD&E study. The plans show existing right-of-way Table 3-1 shows existing right-of-way widths within the project corridor.

3.1.5 Horizontal Alignment

The existing roadway horizontal alignment is shown in Figure 3-2. This alignment, which represents the survey baseline along the roadway centerline, shows several small

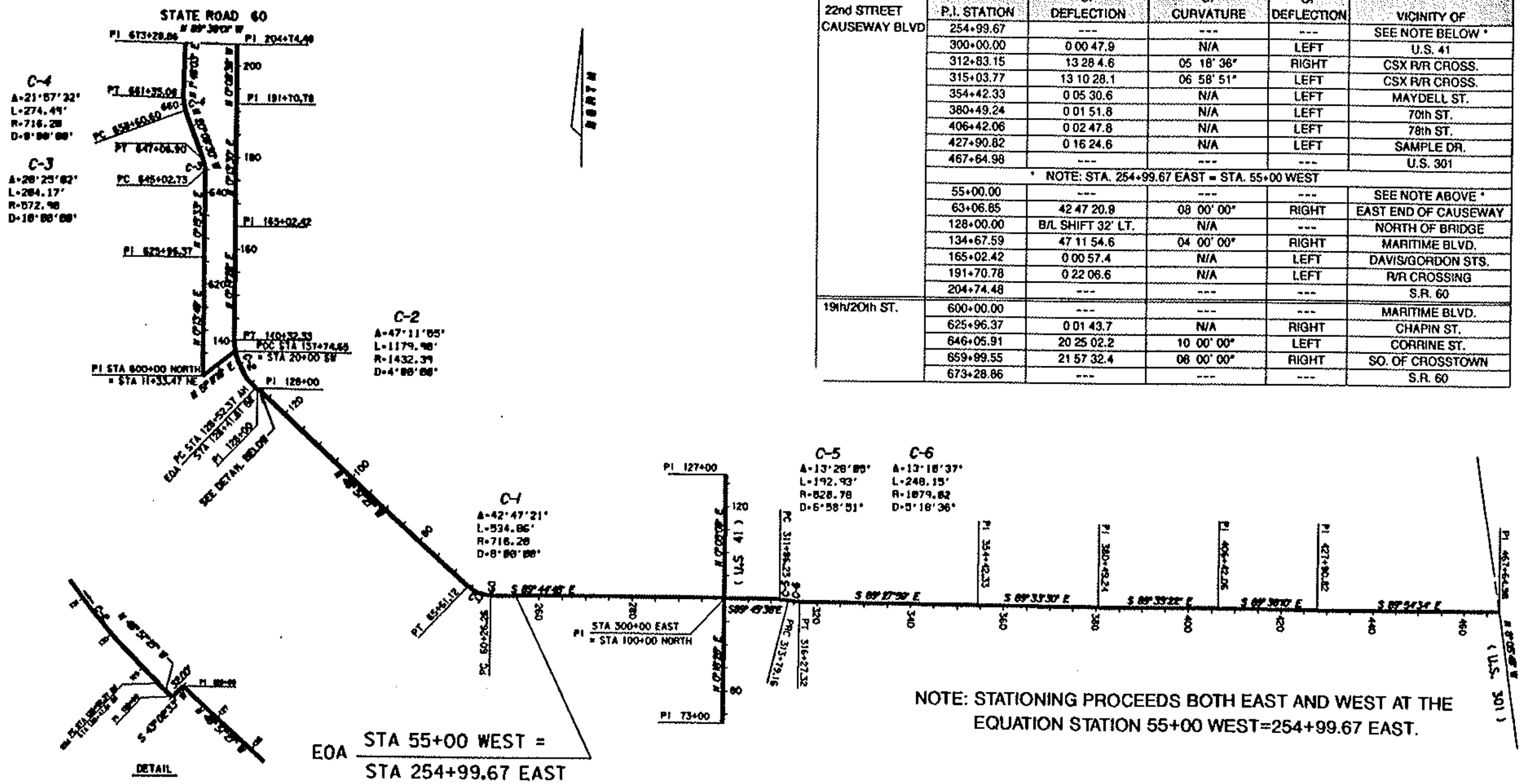
Table 3-1
Existing Right-Of-Way

Roadway	From	To	Width
22nd Street/Causeway Blvd.	S.R. 60	21st/22nd St. Int.	60'
	21st/22nd St. Int.	Railroad	116'
	Railroad	Durham St.	64'
	Durham	Oakwood	50'
	Oakwood	Maritime	Varies: 50'-118.5'
	Bridge	---	220'
	Bridge End	600' East	Varies: 200'-135'
	600' East	Causeway Crescent Rd.	135'
	Cause. Cr. Rd.	47th Street	Varies: 135'-163.5'
	47th Street	U.S. 41	Varies: 153.5'-163.5'
	U.S. 41	U.S. 301	100' Typ.
20th Street	Durham St.	Corrine St.	98'
	Corrine St.	Harper St.	Varies: 98'-60'
	Harper St.	Lindsay St.	60'
	Lindsay St.	Maritime Blvd.	50' typ.
U.S. 41	21st Ave.	36th Ave.	100' typ.

Source: 30% Right-of-Way plans for 22nd Street Causeway/Causeway Boulevard from S.R. 60 to U.S. 301.

22ND STREET CAUSEWAY/CAUSEWAY BOULEVARD
EXISTING HORIZONTAL ALIGNMENT-BASELINE SURVEY

	P.I. STATION	DEGREE OF DEFLECTION	DEGREE OF CURVATURE	DIRECTION OF DEFLECTION	VICINITY OF
22nd STREET CAUSEWAY BLVD	254+99.67	---	---	---	SEE NOTE BELOW *
	300+00.00	0 00 47.9	N/A	LEFT	U.S. 41
	312+83.15	13 28 4.6	05 18' 36"	RIGHT	CSX R/R CROSS.
	315+03.77	13 10 28.1	06 58' 51"	LEFT	CSX R/R CROSS.
	354+42.33	0 05 30.6	N/A	LEFT	MAYDELL ST.
	380+49.24	0 01 51.8	N/A	LEFT	70th ST.
	406+42.06	0 02 47.8	N/A	LEFT	78th ST.
	427+90.82	0 16 24.6	N/A	LEFT	SAMPLE DR.
	467+64.98	---	---	---	U.S. 301
	* NOTE: STA. 254+99.67 EAST = STA. 55+00 WEST				
	55+00.00	---	---	---	SEE NOTE ABOVE *
	63+06.65	42 47 20.9	08 00' 00"	RIGHT	EAST END OF CAUSEWAY
	128+00.00	B/L SHIFT 32' LT.	N/A	---	NORTH OF BRIDGE
	134+67.59	47 11 54.6	04 00' 00"	RIGHT	MARITIME BLVD.
	165+02.42	0 00 57.4	N/A	LEFT	DAVIS/GORDON STS.
	191+70.78	0 22 06.6	N/A	LEFT	R/R CROSSING
	204+74.48	---	---	---	S.R. 60
19th/20th ST.	600+00.00	---	---	---	MARITIME BLVD.
	625+96.37	0 01 43.7	N/A	RIGHT	CHAPIN ST.
	646+05.91	20 25 02.2	10 00' 00"	LEFT	CORRINE ST.
	659+89.55	21 57 32.4	08 00' 00"	RIGHT	SO. OF CROSSTOWN
	673+28.86	---	---	---	S.R. 60



PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY

EXISTING HORIZONTAL ALIGNMENT

FIGURE NO. 3-2

deflections. The straight line diagram (SLD) included in Appendix A provides similar information, albeit minor differences exist with the field survey (survey correct).

3.1.6 Vertical Alignment

There are no as-built plans for the project corridor except for the bridge over McKay Bay. To supplement the bridge plan information, spot elevations were taken from Southwest Florida Management District (SWFWMD) aerial photography with contours. Selected spot elevations were recording as a result of a 1991 field survey. The results of these data collection efforts are summarized in Table 3-2.

The existing roadway has relatively flat grades, except at the bridge crossings of McKay Bay. In order to provide adequate maritime clearance, the approaches to the McKay Bay bridge are on 4% gradients with 600 foot vertical curves at the crests. The 300 foot sag vertical curves at the bridge touchdown points, as well as the crest curves at the bridge high points, provide adequate sight distances for the study's design speed of 40/45 mph.

3.1.7 Existing Drainage

A Location Hydraulics Report (LHR) has been prepared for the 22nd Street Causeway/Causeway Boulevard PD&E Study. Sections 3.1.7.a through 3.1.7.c present a synopsis of the LHR analysis and findings.

3.1.7.a Methodology

The existing drainage patterns in the study area were determined using several sources, including USGS quadrangle maps, SWFWMD 1"=200' scale aerial photo maps with 1 foot contours, the Palmetto Beach Area Drainage Study (1985), as built plans from the FDOT, and field inspection.

Table 3-2
Existing Elevations

Station	Centerline Elev. (ft.)+/- NGVD	Approximate Location
415+00	23.00	78th Street
330+00	13.96	54th Street
90+00	8.71	U.S. 41
111+85	9.04	U.S. 41
289+20	6.80	47th Street
56+00	7.72	Rockport Terminal
80+00	6.00	Causeway
109+00	16.03	South of McKay Bay Bridge
152+00	5.29	Elmwood Street
185+00	7.57	Marconi Street
180' S. of Maritime	7.37	Guy Verger Blvd
150' W. of 20th St.	16.03	Maritime Blvd.
618+00	5.18	20th St. at Elmwood St.
653+00	6.31	20th St. at Durham St
668+20	13.5	20th St. at Crosstown Expressway

Source: As-built plans, bridge over McKay Bay; SWFWMD aerial photos with elevation contours.

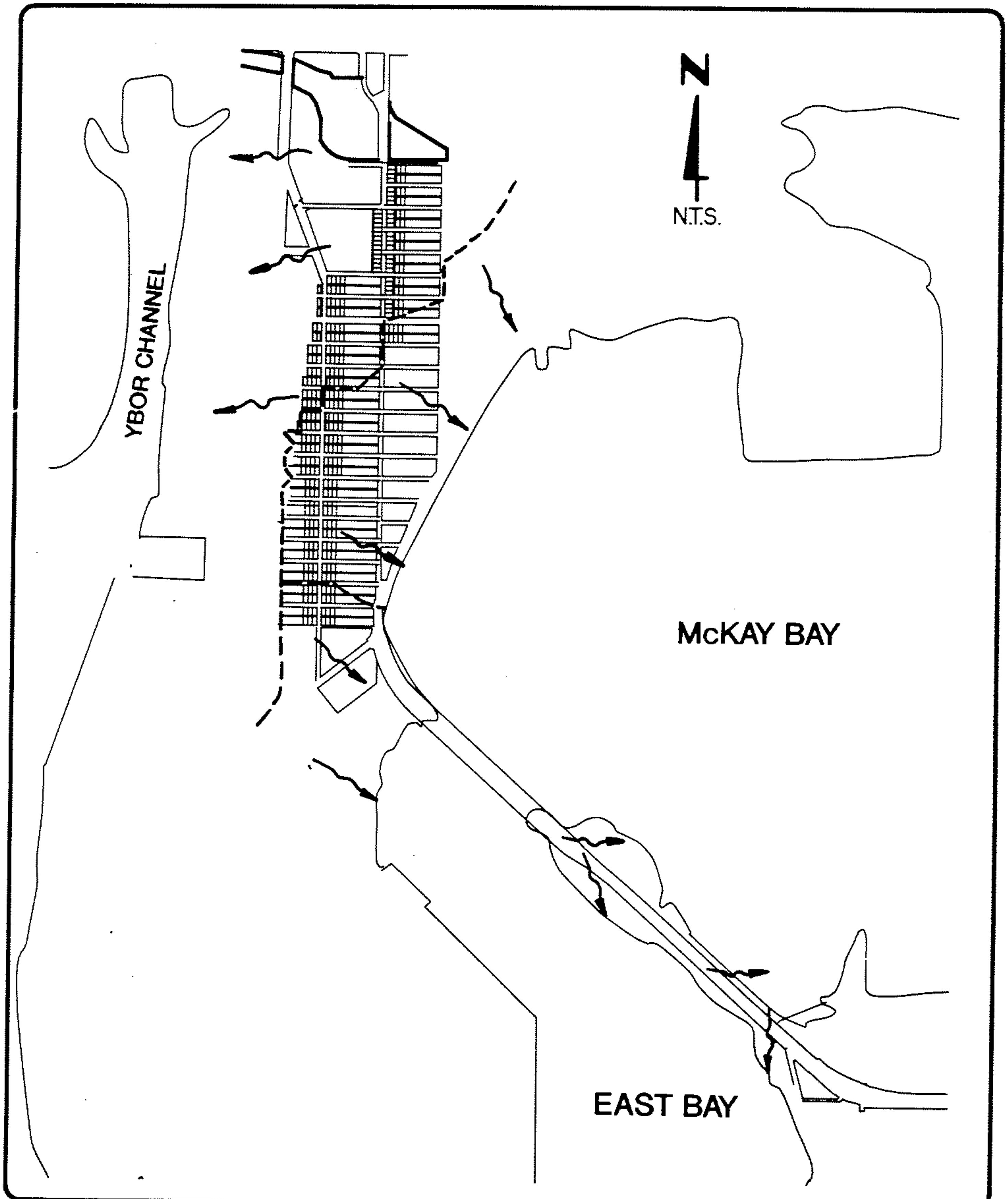
The existing drainage basins along the project limits can be broken into two major groups, tidal basins and Delaney Creek basins. The tidal basins encompass the Palmetto Beach area from Adamo Drive (S.R. 60) south to the McKay Bay bridges and east of McKay Bay to the CSX Railroad crossing lying east of U.S. 41. The Delaney Creek basins include the areas east of the CSX Railroad to U.S. 301.

3.1.7.b Tidal Basins

Most of the Palmetto Beach area is developed residential and commercial property, generally serviced by a storm sewer system. In March of 1985 the City of Tampa completed the "Master Stormwater Management Plan - Palmetto Beach Area Study." The study included an inventory of existing structures, delineation of existing drainage basins, identification of drainage problem areas and the formulation of possible drainage solutions (see Figure 2-3). This study indicates that there is minor flooding and ponding throughout the section of 22nd St. between Durham Street and Bermuda Drive, particularly at the side street intersection radius returns. This condition is the result of either undersized or non-existent storm sewer systems.

From the McKay Bay bridges south and then east to end of the causeway embankment, 22nd Street drains directly into McKay Bay to the east and Ybor Channel to the west. There are no reports of drainage conveyance problems in this section.

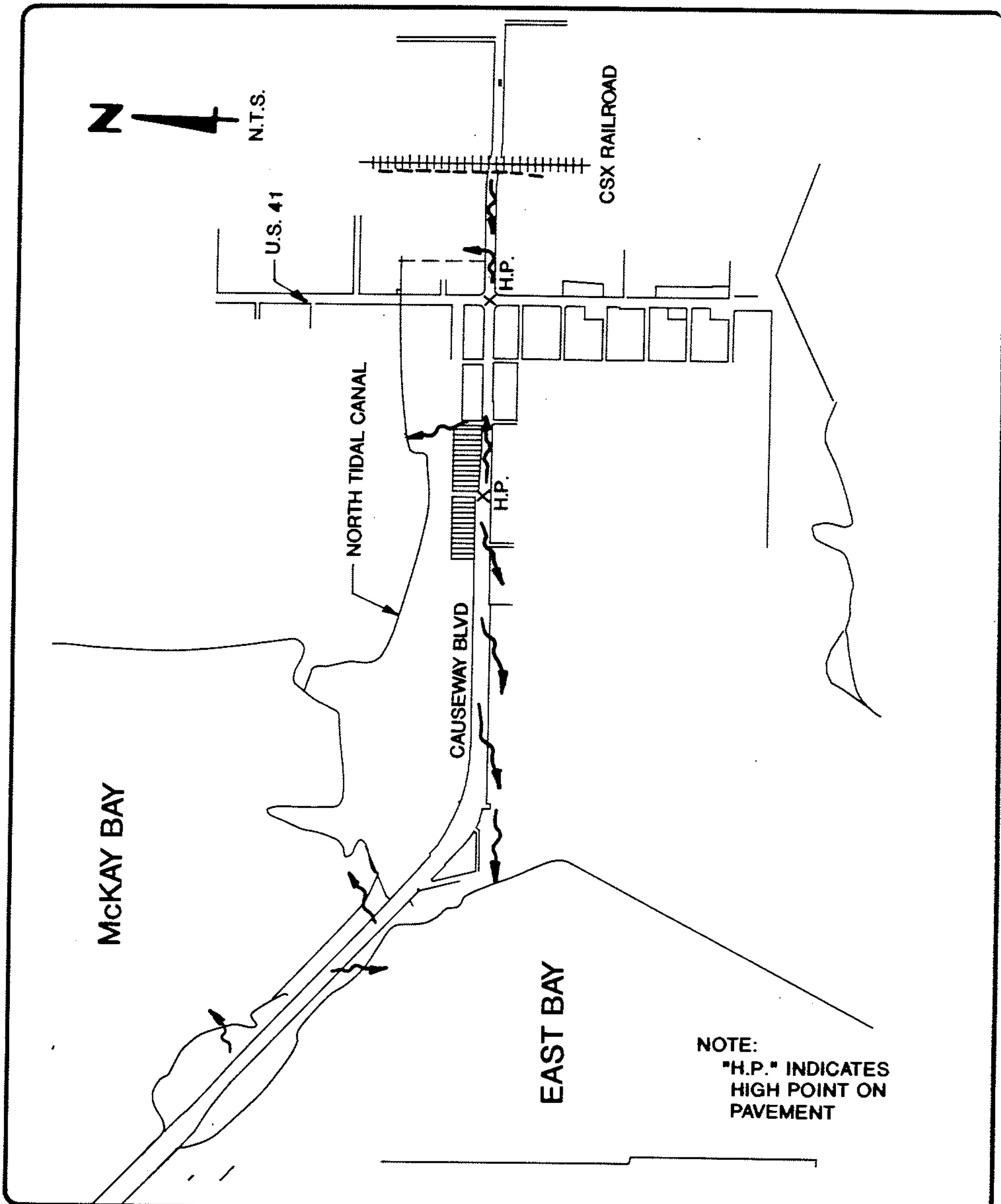
The eastern limits of the tidal basins between the McKay Bay bridges and the railroad have an open ditch drainage system (see Figure 3-4). There is a small canal that runs parallel to the south side of Causeway Boulevard from the end of the causeway to just west of U.S. 41. The remainder of the area along Causeway Boulevard from U.S. 41 to the CSX Railroad drains through a combination open/closed drainage system. It discharges into McKay Bay through a canal north of Causeway Boulevard.



PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

EXISTING DRAINAGE PATTERNS

FIGURE NO.
3-3



PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

EXISTING DRAINAGE PATTERNS

FIGURE NO.
3-4

3.1.7.c Delaney Creek Basins

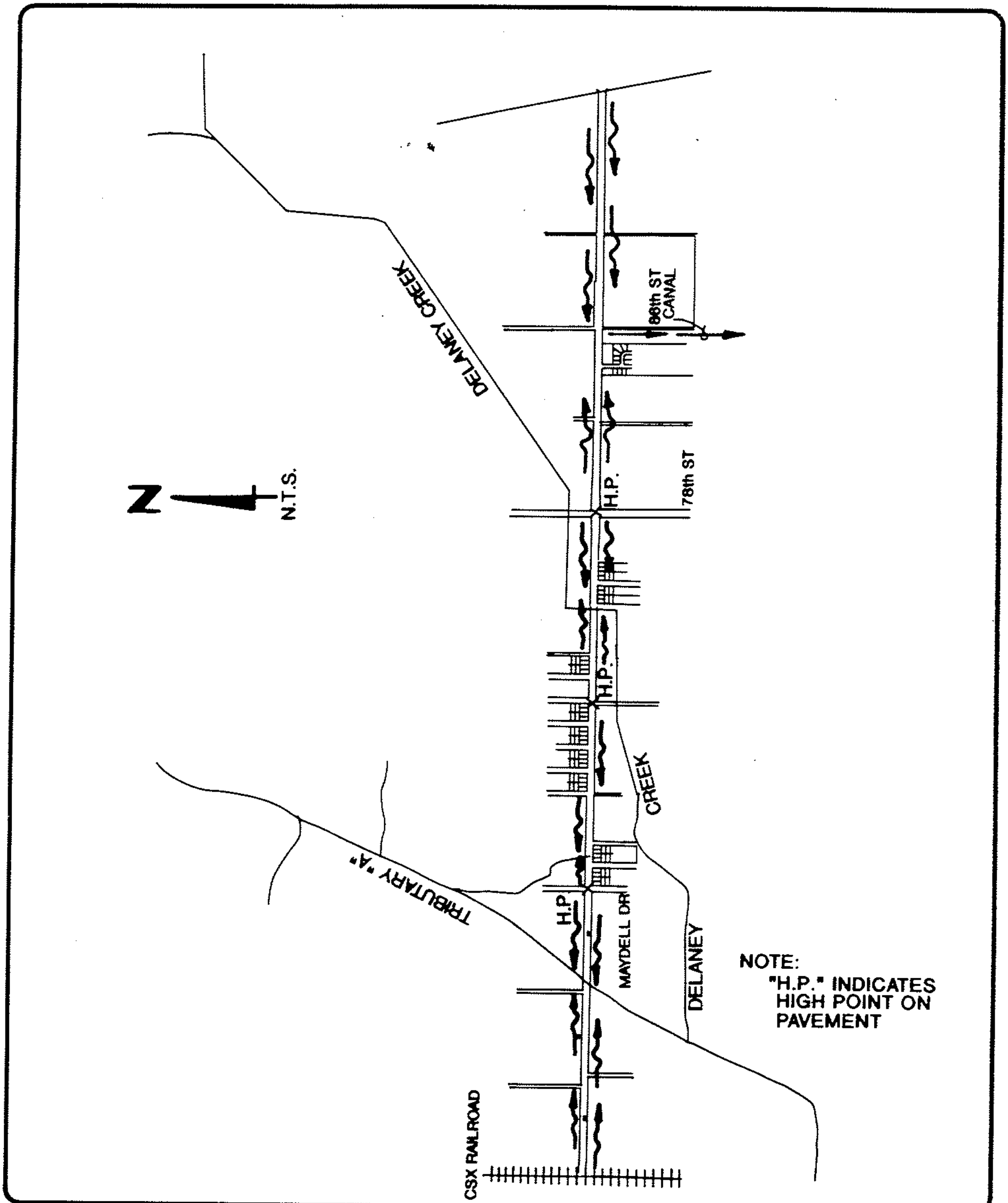
There are four existing basins which drain into Delaney Creek (see Figure 3-5). The section of Causeway Boulevard from the CSX Railroad to U.S. 301 is characterized by an open ditch system. This section of Causeway Boulevard is built on an embankment and the adjacent property generally drains away from the road. In some areas, however, the driveways and a portion of the adjacent property drain toward the roadway.

Basin DC-3 shown on Figure 3-5 extends from the CSX Railroad east to Maydell Drive. Near the center of the basin, Causeway Boulevard crosses Delaney Creek Tributary "A". The roadway is drained by an open ditch system which discharges directly to Tributary "A" at the existing bridge. There are numerous driveway and roadway cross drains along the ditch system.

Basin DC-2 is immediately east of DC-3. The limits of the basin run from Maydell Drive to just east of 70th Street. The roadway and a portion of adjacent property drain into Delaney Creek Tributary "A" through a ditch that flows northeasterly, and is piped under Maydell Drive. This basin also contains driveway and roadway cross drains.

Basin DC-1 runs from 70th Street east to 78th Street. Near the 78th Street intersection, Causeway Boulevard is curbed, and a section of the roadway drains through a closed storm sewer system. The ditch system collects roadway runoff and discharges it directly to Delaney Creek at the main channel crossing. The adjacent property either drains to the roadway or directly to Delaney Creek.

From 78th Street to U.S. 301, Causeway Boulevard drains to the 86th Street Canal and forms Basin DC-4. The 86th Street canal is hydraulically connected to Delaney Creek. This basin is extremely flat and at times may discharge to basin DC-1. The roadside ditches also contain driveway and roadway cross drains.



PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

EXISTING DRAINAGE PATTERNS

FIGURE NO. 3-5

3.1.8 <u>Geotechnical Data</u>

A Report of Geotechnical Exploration (Preliminary Geotechnical Report) was prepared in January 1993 as part of this study. It's purpose was to identify basic soil types, locate potentially problematic areas and make general recommendations concerning roadway and bridge construction. The following subsections provide a summary of the report's findings.

3.1.8.a Geology

The surficial deposits of Hillsborough County are predominately of Tertiary age and range from unconsolidated sands to well indurated limestones and dolomites. Six lithologic units are recognized in the region and include limestone, limestone/dolomite, clayey sand, sandy clay, fine sand and silt, and shell/clay.

Limestone crops out on the Interstate by Peninsula in Tampa Bay. These limestones occur in the subsurface throughout the study area. The local name for this unit of the St. Marks formation is the Tampa Limestone. The Tampa Limestone typically is a lime mud that is white or tan sandy in part with low to moderate intergranular porosity. Vuggular porosity has been noted in some of the samples from Hillsborough County.

The preponderance of this study covers the physiographic province known as the Gulf Coast Lowlands. This province occupies the area between the Eastern edge of McKay Bay and a scarp that rises relatively steeply above the 40 foot elevation contour line. That scarp marks the boundary of the Gulf Coast Lowlands and the Desoto Plain. The Gulf Coast Lowlands are generally a gently sloping plain with variations of surface lithologies. The medium to fine sands and silts become increasingly thicker above the 25 foot elevation contour. Sand, shell and clay lithologies are predominate below the 25 foot elevation contour.

Information from deeper wells drilled for lithogic studies were examined, two of which were found to be within the study area. The first was drilled near the eastern end of the corridor by Florida Geological Survey to a depth of 160 feet below land surface (BLS). The log records surficial sand to a depth of 14.5 feet that overlays the Hawthorn Group. The Hawthorn Group in this well consisted of an upper clayey sand and silty clay member that was 42.5 feet thick. The Tampa Limestone was encountered at 57 feet BLS and was 59 feet thick. This boring was terminated in the Suwanee Limestone at a total depth of 160 feet BLS. An observation well was drilled near the western end of the study area by SWFWMD to a depth of 978 feet BLS. No samples were taken of the surficial sands above 17 feet BLS. The Tampa Member was encountered in Romp TR-11-1 at a depth of 17.5 feet. The lithology recorded a poorly indurated white to gray limestone with clay cement. This member extended to a depth of 85 feet BLS. The Suwannee limestone was logged as extending from 85 feet to 350 feet BLS and consisted of a white to yellow Limestone. Minor amounts of dolomite and chert were recorded in the Suwanee Limestone. The well was terminated in the Ocala Group at a depth of 598 feet BLS. This was described as a light yellow to light gray well indurated limestone.

3.1.8.b Subsurface Conditions

Seven soil test borings were drilled along the corridor, placed near the proposed bridge structures. These borings all encountered a typical soil profile of loose to medium dense sands and silty sands underlain by clayey sands and silty clays. Each boring was terminated in limestone that was poorly to moderately indurated. The upper sands typically consisted of 15 to 20 feet of medium to fine grained sand typically becoming denser with depth. From approximately 50 feet to 80 feet the clays graded into clayey limestones and then into dense well indurated limestones.

Forty-seven hand auger borings to a depth of 5 feet below ground surface were performed on land. These were placed to encounter each soil type designated in the SCS Soil Survey of Hillsborough County. These shallow borings generally identified relatively clean fine to very fine sand to a depth of 5 feet. These sands generally encountered were A-3 "select" material as defined by the AASHTO Classification System. Fifty hand augers were scheduled; however, three were not performed due to access difficulties from land owners. Muck was not encountered in any of the hand auger borings.

3.1.8.c Groundwater

The position of the water level in the unconfined surficial aquifer was measured across the study area. These data describe water table conditions typical to relatively flat elastic soils varying in response to both seasonal and topographic condition. Borings across the area generally located the groundwater table between 2 and 5 feet BLS. However, standing water was encountered in the right-of-way around Delaney Creek. The auger borings on McKay Bay generally located the groundwater table between 1 and 4 feet BLS. It should be recognized that groundwater levels fluctuate with variations in precipitation, tidal and seasonal conditions.

In evaluating potential alternate foundations for the proposed structure, the marine environment in which these bridges will be constructed was considered. This environment does not lend itself to potential utilization of shallow foundations for the bridges. Therefore, a deep foundation system would be most advantageous at this site. The deep foundation system evaluated consisted of drilled shafts and driven square prestressed concrete piles.

Preliminary evaluation of the potential use of drilled shafts indicated that this system would probably not be economical for the McKay Bay Bridge. Relatively light loading is expected for these structures that would not make the fullest use of these higher capacity foundations.

In evaluating anticipated pile compression capacities, the analytical approach developed by the FDOT was utilized. This approach correlates SPT boring results with compression pile capacities. Graphs of estimated design pile capacity versus tip depth are presented in the aforementioned report.

Extensive analysis of tension and lateral capacities were not analyzed in this preliminary study. Tension and lateral loads generally do not affect the length of the pile required. Estimating pile lengths was one of the primary objectives of our exploration. Further analysis of tension and lateral capacities may be warranted in the design phase of the McKay Bay Bridge study. Also, scour was not considered in the pile tip depth and capacity estimates for McKay Bay, Delaney Creek, and Tributary A.

Based on a limited field data acquired for the PD&E study, it is anticipated that the current 455 specification regarding installation of driven piles will be applicable to piles installed for this project. It is not anticipated that static load tests would be needed to confirm pile capacities, however dynamic pile testing is recommended for each structure.

3.1.8.d Roadway Construction Recommendations

It does not appear that soils conditions will pose any major problems for roadway construction. The typical soil in the area is AASHTO type A-3, "select" material for roadway embarkment. Isolated deposits of unsuitable material, including muck and organics, will likely require removal. In addition, the relatively high groundwater locations encountered may require an elevated roadway profile grade or asphaltic concrete base course to either maintain the vertical clearance required from the base to high water or alleviate any base degradation problems that would occur with limerock base (FDOT Drainage Manual).

Embankment Construction

Embankment construction will consist primarily of low embankments on the order of 5 feet or less except at approaches to bridges. In the low embankment areas, embankments will be constructed in accordance with the FDOT Standard Specifications for Road and Bridge Construction. For higher embankments, some settlements may be expected to occur as a result of compression of the underlying soils, however the preliminary borings do not indicate that construction of higher embankments will constitute difficulties for construction.

3.1.9 Accident Data

Accident data for 1985 through 1989 were compiled and analyzed as part of the PD&E study process. The facilities studied and the limits of analyses are as follows:

Route	FDOT Research Limits (milepost)
22nd Street/Causeway Boulevard	0.000 to 6.850
21st Street	1.084 to 1.264

FDOT annual accident detail reports were reviewed to identify accident "hot spots". The five-year accident history for each section of the corridor is presented in the following tables.

22nd Street/Causeway Boulevard

The section of 22nd Street Causeway/Causeway Boulevard from S.R. 60 to U.S. 301 experienced a total of 170 accidents in 1985, 114 accidents in 1986, 149 accidents in 1987, 112 accidents in 1988, and 136 accidents in 1989. The general accident types are summarized in Table 3-3 for each of the five years.

The geographic areas with a minimum of ten accidents from 1985 through 1989 are shown in Table 3-4.

The most frequent accident types on 22nd Street and Causeway Boulevard are quantified in Table 3-5.

Table 3-3
Total Accidents

Year	Injury Accidents		No. of Property Damage Accidents	Fatal Accidents		
	No. of Accidents	No. of Injuries		No. of Accidents	No. of Fatalities	No. of Injuries
1985	87	152	81	2	2	0
1986	60	87	53	1	1	0
1987	77	115	72	0	0	0
1988	53	85	57	2	2	2
1989	61	89	69	6	6	8

Source: FDOT Annual Accident Detail Reports, 1985-1989

Table 3-4
Accidents By Location (1985-1989)

Intersection	Mile Post	1985	1986	1987	1988	1989	Total	Avg. Per. Year
U. S. 301	0.000	28	--	14	--	3	35	7.0
Clifford-Sample Dr.	0.758	3	6	--	--	3	12	2.4
78th Street	1.153	5	11	14	10	6	46	9.2
70th Street	1.664	4	2	3	2	4	15	3.0
Maydell Drive	2.158	7	4	5	4	6	26	5.2
CSX R.R.	2.925	2	--	3	3	3	11	2.2
U.S. 41	3.189	16	6	8	8	7	45	9.0
Maritime Blvd.	5.582	4	3	5	5	4	21	4.2
Durham Street	6.515	6	4	--	--	--	10	2.0
S.R. 60	6.845	6	2	--	--	2	10	2.0

Source: FDOT Annual Accident Detail Reports, 1985-1989; locations with 10 or more accidents

Table 3-5
Accident Type Summary

Accident Type	No. Accidents 1985	No. Accidents 1986	No. Accidents 1987	No. Accidents 1988	No. Accidents 1989
Rear End	43	26	36	28	30
Angle	34	21	17	14	27
Left Turn	37	16	43	15	24
Sideswipe	14	4	7	5	7
Head-On	7	1	2	2	2
Others	35	46	44	48	46
Total Accidents	170	114	149	112	136
Total Economic Loss	$4.43 mill.	$2.99 mill.	$3.86 mill.	$2.94 mill.	$3.55 mill.

Source: FDOT Annual Accident Detail Reports, 1985-1989

21st Street Analysis

The section of 21st Street analyzed for this project experienced a total of 30 accidents in the 5 year period from 1985 to 1989. The general accident types are summarized in Table 3-6.

The intersection with S.R. 60 (milepost 1.098) poses the greatest accident concern along 21st Street. Seventeen accidents occurred at the this location during the 5 year period evaluated, with the annual totals being 8 in 1985, 3 in 1986, 1 in 1987, 3 in 1988 and 2 in 1989.

The most frequent accident types on this section of 21st Street are summarized by year in Table 3-7.

Accident Rate Analysis

Accident rates were developed for the 22nd Street Causeway/Causeway Boulevard and 21st Street sections of the study area roadway.

The accident rates for these roadway sections were compared to national averages for similar urban facilities (freeways, and federal-aid urban arterials), considering the following rates:

- Total Accident Rate
- Injury Accident Rate
- Persons Injured Rate
- Fatal Accident Rate
- Persons Killed Rate.

Table 3-6
21st Street Accident Summary

Year	Injury Accidents		No. of Property Damage Accidents	Fatal Accidents		
	No. of Accidents	No. of Injuries		No. of Accidents	No. of Fatalities	No. of Injuries
1985	2	2	8	0	0	0
1986	2	3	4	0	0	0
1987	2	2	1	0	0	0
1988	3	3	2	0	0	0
1989	1	3	5	0	0	0

Source: FDOT Annual Accident Detail Reports, 1985-1989

Table 3-7
21st Street Accident Type Summary

Accident Type	No. of Accidents 1985	No. of Accidents 1986	No. of Accidents 1987	No. of Accidents 1988	No. of Accidents 1989
Rear End	2	0	1	1	1
Angle	3	2	0	1	2
Left Turn	0	1	1	2	1
Sideswipe	2	2	1	0	1
Others	3	1	0	1	1
Total	10	6	3	5	6
Total Economic Loss	$192,000	$115,200	$57,600	$96,000	$115,200

Source: FDOT Annual Accident Detail Reports, 1985-1989

Accident rates are summarized in Table 3-8. Table 3-9 is a summary of accident severity along the corridor. 22nd Street Causeway/Causeway Boulevard was found to have an injury rate 1.49 to 2.42 times the national average, and a persons injured rate 1.49 to 2.45 times the national average. The fatality rates exceed national average rates by 3.6 to 5.7 times. With accident injury rates significantly exceeding national averages, the 22nd Street/Causeway Boulevard corridor needs to be improved for safety reasons.

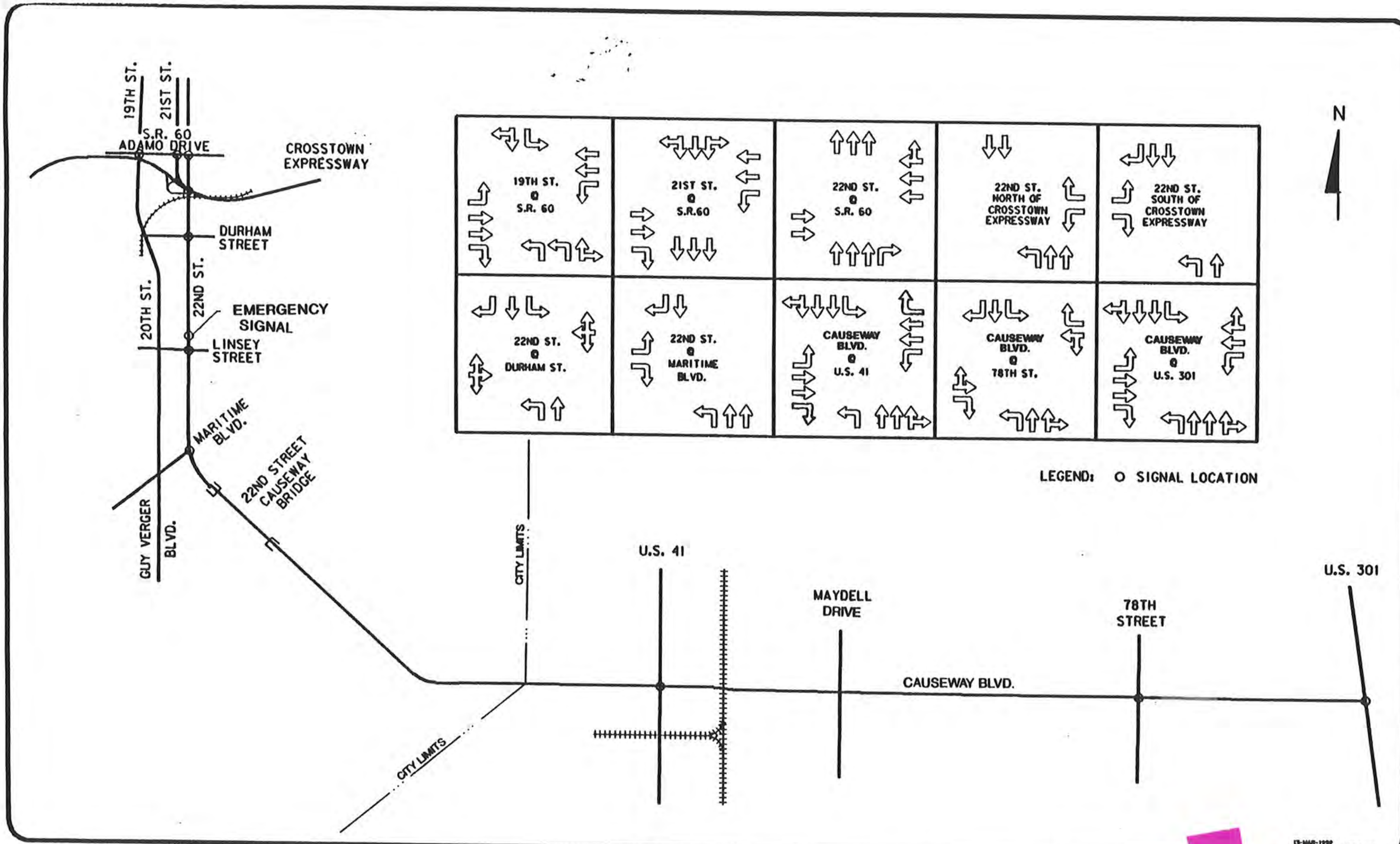
21st Street accident rates for injury accidents are 2.4 to 3.8 times the national average while the persons injured rate is 1.9 to 3.2 times the national average. There were no fatal accidents during the five-year period.

3.1.10 Traffic Signals, Locations and Intersection Design

Locations of existing traffic signals are shown in Figure 3-6. Maintenance of these signals is dependent upon location. Those within city limits are maintained by the City of Tampa, those outside the city limits are maintained by Hillsborough County. Existing intersection laneage is also shown in Figure 3-6 for signalized intersections.

3.1.11 Lighting

All of the existing roadway lighting within the study area falls within the Tampa city limits. 20th Street has twenty-one 100 watt high pressure sodium (HPS) street lights along the east side between the Crosstown Expressway and Maritime Boulevard. 22nd Street has twenty-five 100 watt HPS street lights along the east side between the Crosstown Expressway and Maritime Boulevard. This lighting is maintained by Tampa Electric Company under an agreement with the City of Tampa.



PROJECT: 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY

EXISTING SIGNAL LOCATIONS AND INTERSECTION GEOMETRY

FIGURE NO. 3-6

Table 3-8
Summary Of Accident Rates
(Per 100 million vehicle miles)

Location	Total Accidents	Injury Accidents	Persons Injured	Fatal Accidents	Fatalities
22nd Street Causeway/Causeway Boulevard • Rate (Per 100 MVM)	364	181	282	5.9	5.9
21st Street • Rate (Per 100 MVM)	857	286	371	0	0
Non-Federal Aid Urban Arterials • Rate (Per 100 MVM)	n/a	74.80	115.18	1.03	1.14
Federal Aid Urban Arterials	n/a	121.59	188.60	1.64	1.80

Source for 21st Street and 22nd Street Information: FDOT Annual Accident Detail Reports, 1985-1989
Source for Urban Arterial Information: FHWA-207 Report, 1987

Table 3-9
Accident Severity

Year	22nd Street/Causeway Boulevard Accident Severity					
	Injury Accidents		Property Damage	Fatal Accidents		
	# Accidents	# Injuries	# Accidents	# Accidents	# Fatalities	# Injuries
1985	87	152	81	2	2	0
1986	60	87	53	1	1	0
1987	77	115	72	0	0	0
1988	53	85	57	2	2	2
1989	61	89	69	6	6	8

21st Street Accident Severity						
1985	2	2	8	0	0	0
1986	2	3	4	0	0	0
1987	2	2	1	0	0	0
1988	3	3	2	0	0	0
1989	1	3	5	0	0	0

3.1.12 Utilities

There are several existing utilities within the existing 22nd Street Causeway/Causeway Boulevard and 20th Street right-of-way. Utility ownership, description and location are listed in Table 3-10. Additional coordination will be performed with the utility owners, including a determination of estimated utility relocation costs.

3.1.13 Structural and Operational Conditions

The results of the pavement condition survey conducted by FDOT are included in Table 3-11. As illustrated in the table, the existing pavement throughout the project limits is in average to poor condition. Various roadway improvements are currently scheduled to provide temporary relief to the deteriorated roadway conditions.

The operational conditions of the existing facility (traffic volumes and levels of service) are discussed in Section 6 of this report.

3.1.14 Railroad Crossings

There are three existing at-grade railroad crossings within the project study limits. The locations are as follows:

- 22nd Street between the Crosstown Expressway and Long Street
- Causeway Boulevard approximately 1400 feet east of U.S. 41
- U.S. 41 approximately 1460 feet south of Causeway Boulevard

Table 3-10
Existing Utilities

Owner	Utility	Approximate Location *		
		Side	From	To
City of Tampa Water Dept.	Proposed 36" Water Main	North	75th Street	U.S. 301
	10" Water Main	South	78th Street	82nd Street
	6" Water Main	South	82nd Street	82nd Street
	12" Water Main	South	86th Street	U.S. 301
	8" Water Main	South	West of 86th Street	U.S. 301

Notes: * All locations along 22nd Street/Causeway Blvd. unless otherwise noted
Source: Information as provided by the individual utility companies

Table 3-10
Existing Utilities

Owner	Utility	Approximate Location *		
		Side	From	To
City of Tampa Sanitary Sewer Dept.	48" San. Sewer	Center	Adamo Drive	R.R. south of Crosstown Expressway
	12" San. Sewer	Crosses	Durham Street	Corrine Street
	48" San. Sewer	East (20th Street)	Penn Street	Grant Street
	48" San. Sewer	Center (20th Street)	Corrine Street	Maritime Blvd.
	54" San. Sewer	West (20th Street)	Grant Street	Maritime Blvd.
	54" San. Sewer	Crosses	Bermuda Blvd.	Oceanview Street
	18" San. Sewer	Center/West	Saxon Street	Maritime Blvd.
	16" San. Sewer	East	Saxon Street	Maritime Blvd.
	12" San. Sewer	East (20th Street)	Corrine Street	Oceanview Street
	18" San. Sewer	East (20th Street)	Oceanview	Hemlock Street
Florida Gas Transmission Co.	6" Gas Main	Crosses 22nd Street	86th Street	

Notes: * All locations along 22nd Street/Causeway Blvd. unless otherwise noted
Source: Information as provided by the individual utility companies

Table 3-10
Existing Utilities

Owner	Utility	Approximate Location *		
		Side	From	To
GATX Central Florida Pipeline Co.	10" Petroleum	Crosses 22nd Street	S. of R.R. at Crosstown Expressway	
	6" Petroleum	Crosses 22nd Street	At Durham Street	
	6" Petroleum	East (20th Street)	Durham Street	Oceanview Street
	6" Petroleum	East (20th Street)	Thrace Street	Oceanview Street
Southern States Utilities	12" Force Main	North	86th Street	U.S. 301
	10" Force Main	Crosses	86th Street	
	8" Water Main	South	86th Street	U.S. 301
	12" Water Main	South	86th Street	U.S. 301
Intermedia Communications of Florida	Aerial Fiber Optic Cable	East	North of S.R. 60	150' South of S.R. 60
M.C.I. Telecommuni-cations	4" Buried Fiber Optic Cable	Varies	North of S.R. 60	150' South of S.R. 60
Paragon Cable	CATV	North	U.S. 41	U.S. 301
Jones Intercable	CATV	West	Long Street	Chapin Street
	CATV	East	Chapin Street	Hemlock Street

Notes: * All locations along 22nd Street/Causeway Blvd. unless otherwise noted
Source: Information as provided by the individual utility companies

Table 3-10
Existing Utilities

Owner	Utility	Approximate Location *		
		Side	From	To
Tampa Electric Co. **	Aerial 69 KV	East	S.R. 60	Chapin
	Aerial 69 KV	East (20th Street)	Corrine Street	Hemlock Street
	Aerial 138KV	East	Bermuda Blvd.	Causeway
	Aerial 69KV	East (20th Street)	South of Hemlock Street	Maritime Blvd.
	Aerial 69 KV	West	South of Hemlock Street	Maritime Blvd.
	Aerial 138 KV	North	Causeway	Causeway
	Aerial 138 KV	North	East of 45th Street	450' west of 45th Street
	230 KV	North/ South	West side of 86th Street	Sagasta Street
Tampa Bay Pipeline, Inc.	Buried Anhydrous Ammonia (NH_3)	South (Maritime Boulevard.)	Guy Verger Boulevard	22nd Street
		West/South	Maritime Boulevard	Sagasta Street
USA Utilities	No Involvement			
ATC/Microtel	No Involvement			
Hillsborough County Utilities	No Involvement			
G.T.E.	Aerial/Buried Telephone	Varies	Throughout Project Limits	
Gardinier, Inc.	No Involvement			
Cablevision Industries	No Involvement			

Notes: * All locations along 22nd Street/Causeway Blvd. unless otherwise noted
** Multiple aerial electrical lines cross 20th & 22nd Street between Hemlock & Maritime
Source: Information as provided by the individual utility companies

TABLE 3-11
Pavement Condition Survey Results

From	To	Lane Direction	Defect Rating	Ride Rating	Basic Rating
U.S. 301	E. of U.S. 41	Both	48	65	56
E. of U.S. 41	E. of Rockport Terminal	Both	90	69	79
E. of Rockport Terminal	S. of 22nd St. Bridge	Both	58	69	63
N. of 22nd Street Bridge	Hemlock Street	Both	80	72	76
Hemlock Street	N. of Durham Street	Both	80	77	78
N. of Durham Street	S.R. 60	Both	43	32	37

Rating codes are as follows:

90-100 Very Good (Excellent)
80-90 Good
70-80 Average
60-70 Below Avg. (Poor)
<60 Very Poor
Defect Rating is a measure of surface imperfections
Ride Rating is a measure of roughness experienced by driver
Basic Rating = Square Root Of (DEF x RID)

Note: 20th Street pavement condition information not available.

Source: FDOT Pavement Classification Survey; Surveyed 4/4/91, Printed 9/ /91; refer to Appendix for printout.

Each crossing is a single track with a type IV, Class III warning device consisting of flashing signals with cantilever gate for a single track. The train cargo is completely freight with average running speeds of 25 mph or less. The low speeds can be attributed to the close proximity of several rail yards and the slow acceleration characteristics of trains. Table 3-12 lists site characteristics for each crossing.

In addition to the number of crossings listed in Table 3-12, the U.S. 41 location is the site of several switching maneuvers daily in and out of the Rockport terminal. The large number of daily crossings and their duration create considerable delays for motorists at the two crossings in the vicinity of the U.S. 41/Causeway Boulevard intersection. The feasibility of grade separation at these locations is discussed in Section 8 of this document.

3.1.15 Posted Speeds

Posted speed limits within the study area vary with location, as noted below:

22nd Street

- S.R. 60 to Durham Street - 30 mph
- Durham Street to south end of McKay Bridge - 35 mph
- South end of McKay Bridge to U.S. 301 - 45 mph
- U.S. 41 within project limits - 45 mph

20th Street

- S.R. 60 to Grant Street - 35 mph
- Grant Street to Maritime Boulevard - 30 mph

Table 3-12
Railroad Crossing Data

Location	22nd St. (Causeway Blvd.) East of U.S. 41	U.S. 41 (S.R. 45) South of 22nd Street	22nd St. Between Crosstown Expressway and Long St.
National Grade Crossing No.	624815-B	624802-A	626925-T
Railroad Milepost	AZA881.88	AZA882.0	SPUR843.23
Type of Crossing	Full Depth Rubber	Concrete	Rubber w/wood shims
Condition	Excellent	NB: Good, SB: Poor	Good
Avg. No. of Trains (Daily)	24	16	4
Avg. Speed (MPH)	25	25	10
Avg. Train Length (Cars)	Varies (80-130 typ.)	Varies due to numerous switching maneuvers	90
Avg. Crossing Duration (Mins.)	10	10	5
No. School Bus Crossings/Day	57	64	56

Source: CSX Railroad, 1991

Note: Trains carry freight only. Passenger trains use other routes.

3.2 EXISTING BRIDGES

There are four existing bridges within the project limits. Two of these bridges span McKay Bridge in parallel while the other two structures are located at separate Delaney Creek crossings. An Existing Bridge Condition Report was prepared in 1991 as part of the PD&E study. The report documented the existing condition of each bridge, their inventory rating, remaining life span and suitability for improvement. These issues are discussed in the following subsections.

3.2.1 22nd Street Causeway (Licata) Bridges Nos. 100338 and 100299

These bridges are virtually identical prestressed concrete structures constructed in 1976 to carry two lanes of traffic each. They have been in use since that time with no major improvements to date. The 1990 bridge inspection reports, structure inventory and appraisal forms for the bridges indicate that the bridges are in good structural condition and require only minor cosmetic and maintenance repairs. They have an estimated remaining life of 38 years and satisfy the HS-20 inventory rating. Each bridge has a total of 26 approach spans and main span that is 118 feet long. The total structure length is 1,632 feet. A composite typical section (existing and proposed) of these bridges is illustrated in Figure 8-22.

The existing channel has a depth of approximately 7 to 11 feet, which is suitable for recreational and fishing boats only. Although large ships do not pass beneath these bridges, Port of Tampa operations sometimes result in large ships operating near the bridge structures. The navigational vertical clearance is 40 feet and the total horizontal clearance is 75 feet. There is no skew between the bridge and the channel. Barges that are moved in the adjacent channel are always made up fast to their tugs, they are never towed. There are no accident reports involving the bridge on file.

The proposed roadway improvements include the addition of one lane per direction to the existing facilities. This widening has been proven feasible due to the current condition of these bridges and their remaining life. Details of future widening will be discussed in Section 8.21.1.

3.2.2 Bridges over Delaney Creek Nos. 100065 and 100066 (Tributary A)

These low-level concrete bridges were built in 1928 to each carry one lane of traffic in each direction. Bridge No. 100065 is a two span bridge with equal length spans totalling 61 feet. Bridge No. 100066 is a 41 foot long single span. Both bridges are non-navigable and they cross 22nd Street Causeway perpendicular to the roadway. The suitability for widening these bridges was also investigated as part of the 1991 report. Unlike the bridges over McKay Bay, these bridges will require replacement to operate properly throughout the life of the proposed facility. Due to their age, the bridges were reviewed for historical significance. The review showed that the bridges could be replaced without any problems.

There are several reasons why widening the existing structures is not recommended:

- The Structure Inventory and Appraisal forms dated October 9, 1990 gave the structure an inventory rating of HS-20 and useful lives of 11 years (Bridge #100066) and 13 years (Bridge #100065). The inventory ratings are sufficient, however, the remaining life of the bridges, after completion of a widening project, would not be sufficient to justify the widening.

- At present, the existing bridges require numerous repairs. An examination of their Bridge Inspection Reports indicates that the bridges have deteriorated badly and that continued deterioration can be expected. The cost associated with the continued maintenance and repair of the existing structures is further justification for their replacement.

- The Bridge Inspection reports also indicate that there might be a potential problem due to scour and aggregation along the channel bottom. This has resulted in the recommendation that rechannelization be conducted at Bridge #100065. These problems as well as others pertaining to hydraulics of the site could be resolved with the replacement of the existing structures.

The potential long-term cost savings as well as the benefits associated with new bridges meeting present standards and satisfying the present conditions of the sites provides justification for the proposed bridge replacements.

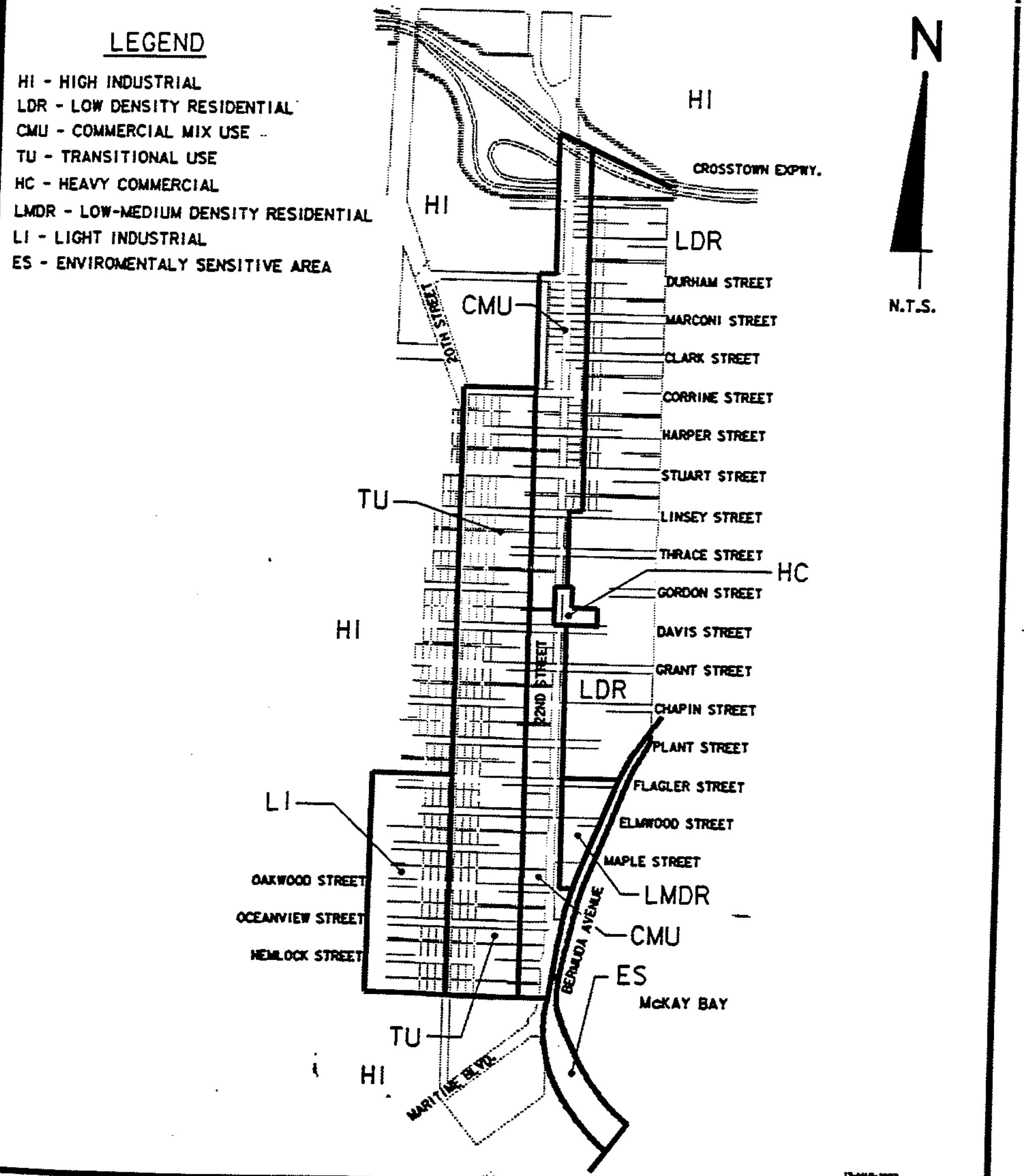
3.3 EXISTING ENVIRONMENTAL CHARACTERISTICS

3.3.1 Land Use

Northern Segment - from S.R. 60 to North End of 22nd Street Causeway Bridge

The proposed project area begins at S.R. 60 and is characterized by a mix of industrial, commercial, residential, and transportation land uses. The Tampa Crosstown Expressway and the CSX railroad tracks traverse east-west across the northern quarter-mile of the project area. The northwest portion of the Port of Tampa borders along the western perimeter of the study area and consists primarily of storage tank farms for petroleum products. The remaining portions of the Port of Tampa extend south of the survey corridor to include the southern, made-lane sections of Hookers Point peninsula.

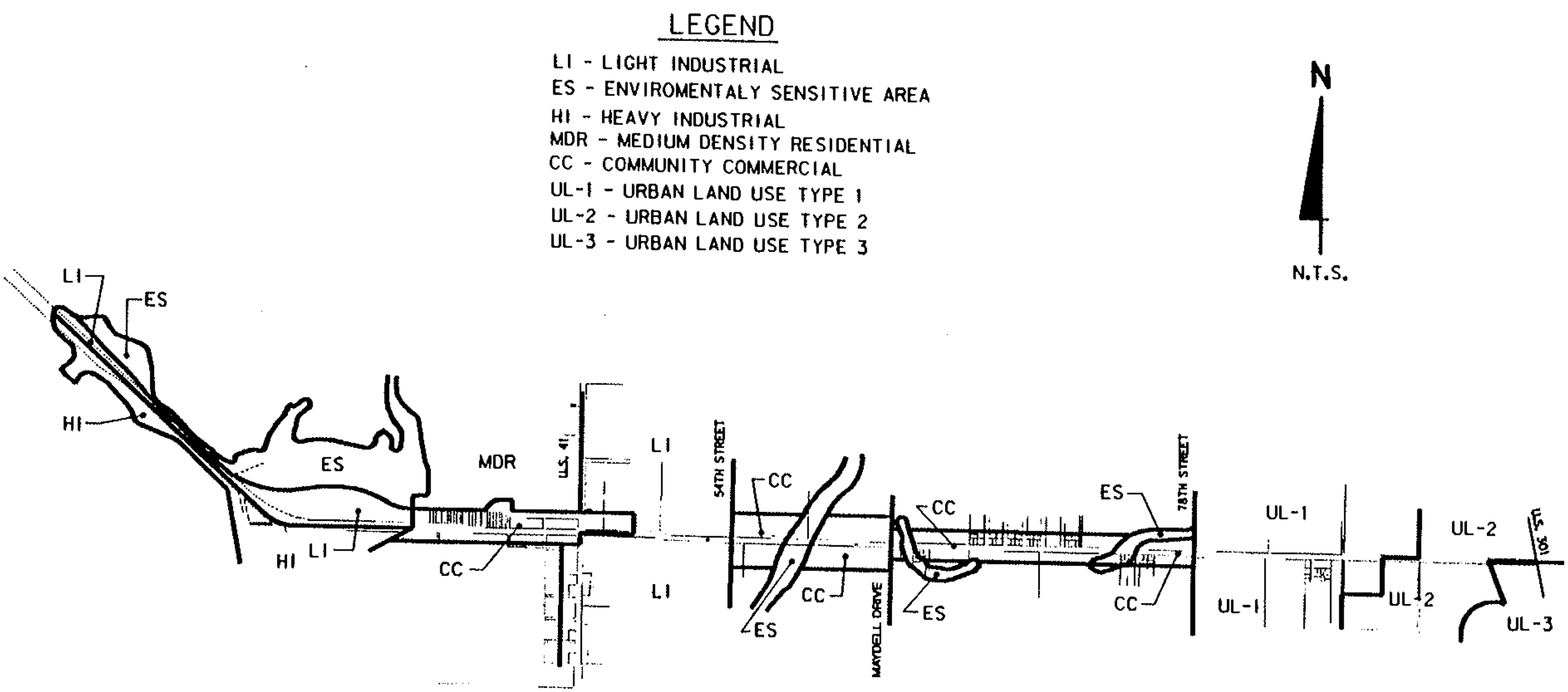
Hookers Point is the name of the peninsula on which the Northern Segment of the study area is located. The historic Palmetto Beach neighborhood is found in the northeastern quadrant of this peninsula. This area consists of the old East Tampa and Edgewater Park subdivisions and is a nearly century-old residential-cigar manufacturing community. The survey corridor roughly includes the western half of the Palmetto Beach neighborhood.



PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

EXISTING LAND USE MAP
S.R. 60 TO MARITIME BLVD.

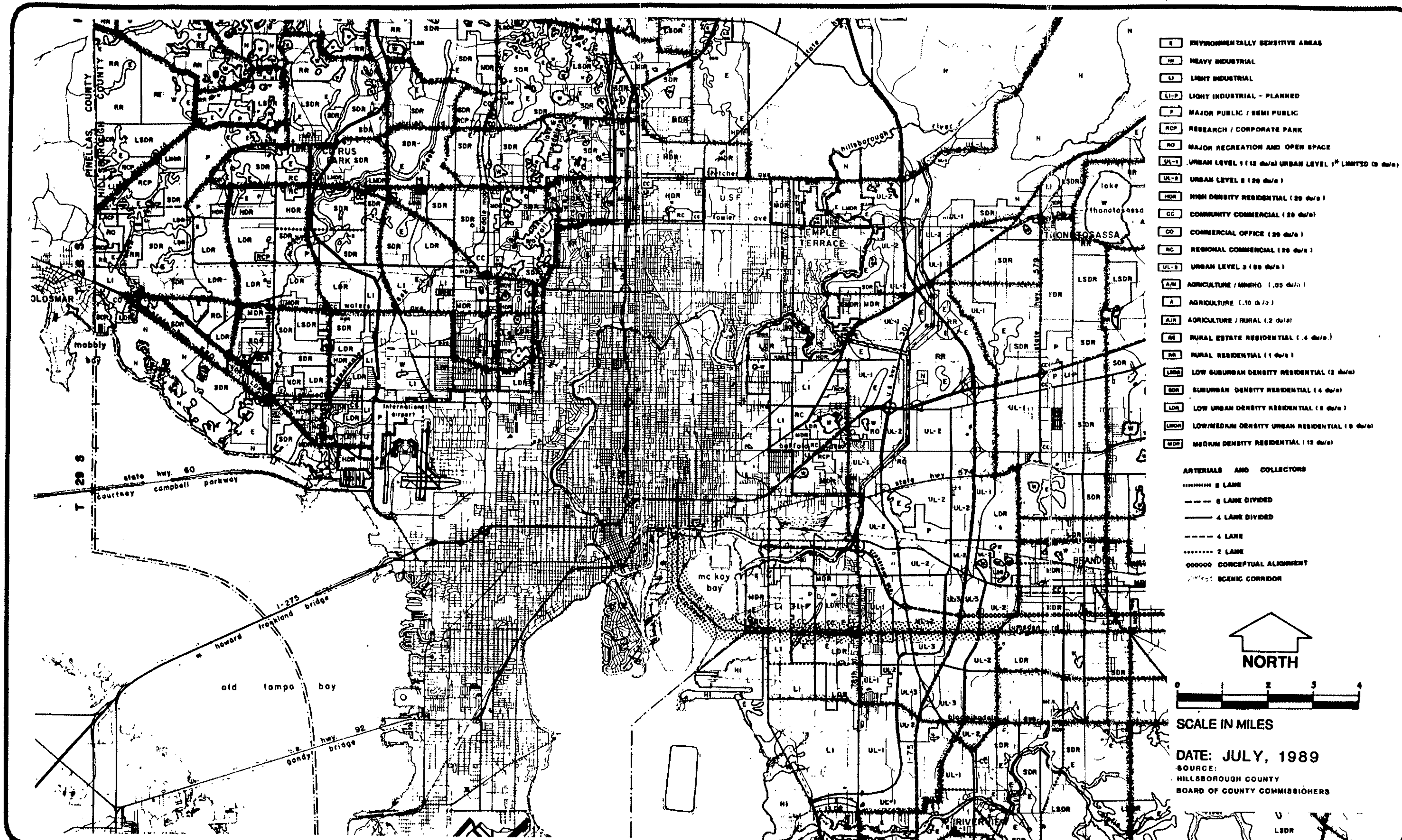
FIGURE NO.
3-7



PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

EXISTING LAND USE MAP
MARITIME BOULEVARD TO U.S. 301

FIGURE NO. 3-8

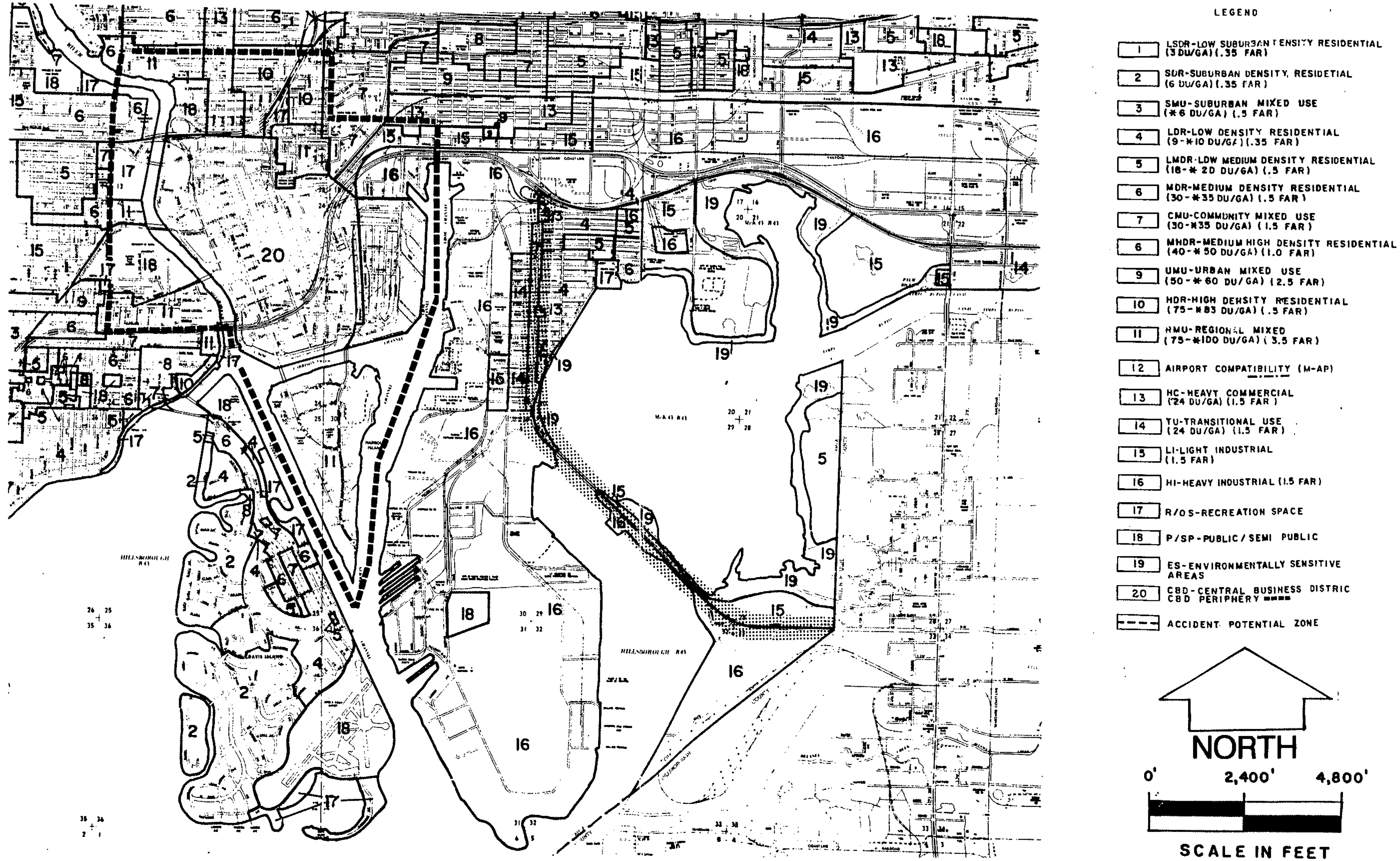


PROJECT

22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

FUTURE LAND USE MAP

FIGURE NO.
3-9



PROJECT

22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

FUTURE LAND USE MAP

FIGURE NO.

3-10

The remaining sections of the Palmetto Beach neighborhood, including historic DeSoto Park and DeSoto Elementary School are located east of the survey corridor and south of the Tampa Crosstown Expressway.

Ybor City, recently designated a National Historic Landmark District is located north of the study area.

Eastern Segment - 22nd Street Causeway Bridge to U.S. 301

The 22nd Street Causeway Bridge (Licata Bridge) divides McKay Bay and East Bay. Some small dock facilities are located at the eastern landing of the Causeway. Continuing east along 22nd Street Causeway Boulevard, individual homes, residential subdivisions, scattered commercial enterprises, and vacant man-made land areas border the survey corridor. Light industrial areas are aggregated at and adjoin the Causeway Boulevard intersection with U.S. 41. Mixed commercial, residential, and light industrial uses abut the north-south U.S. 41 portion of the survey corridor. East of U.S. 41 and extending to the eastern terminus of the survey corridor at U.S. 301, is an old rural district which is rapidly being converted to mixed residential and commercial land uses.

3.3.2 Cultural Features and Community Services

Cultural Features

A Project Development and Environment (PD&E) Study was conducted by PBS&J for the FDOT, District 7. A separate Archaeological and Historical Resource Assessment was prepared by HDR Engineering, Inc., completed in February 1992. The purpose of the survey was to locate and identify any archaeological and historical architectural sites within the project area and assess their potential for listing in the National Register of Historic Places.

The survey results determined one historic district and four individual historic structures to be potentially eligible for the National Register (NR) as follows:

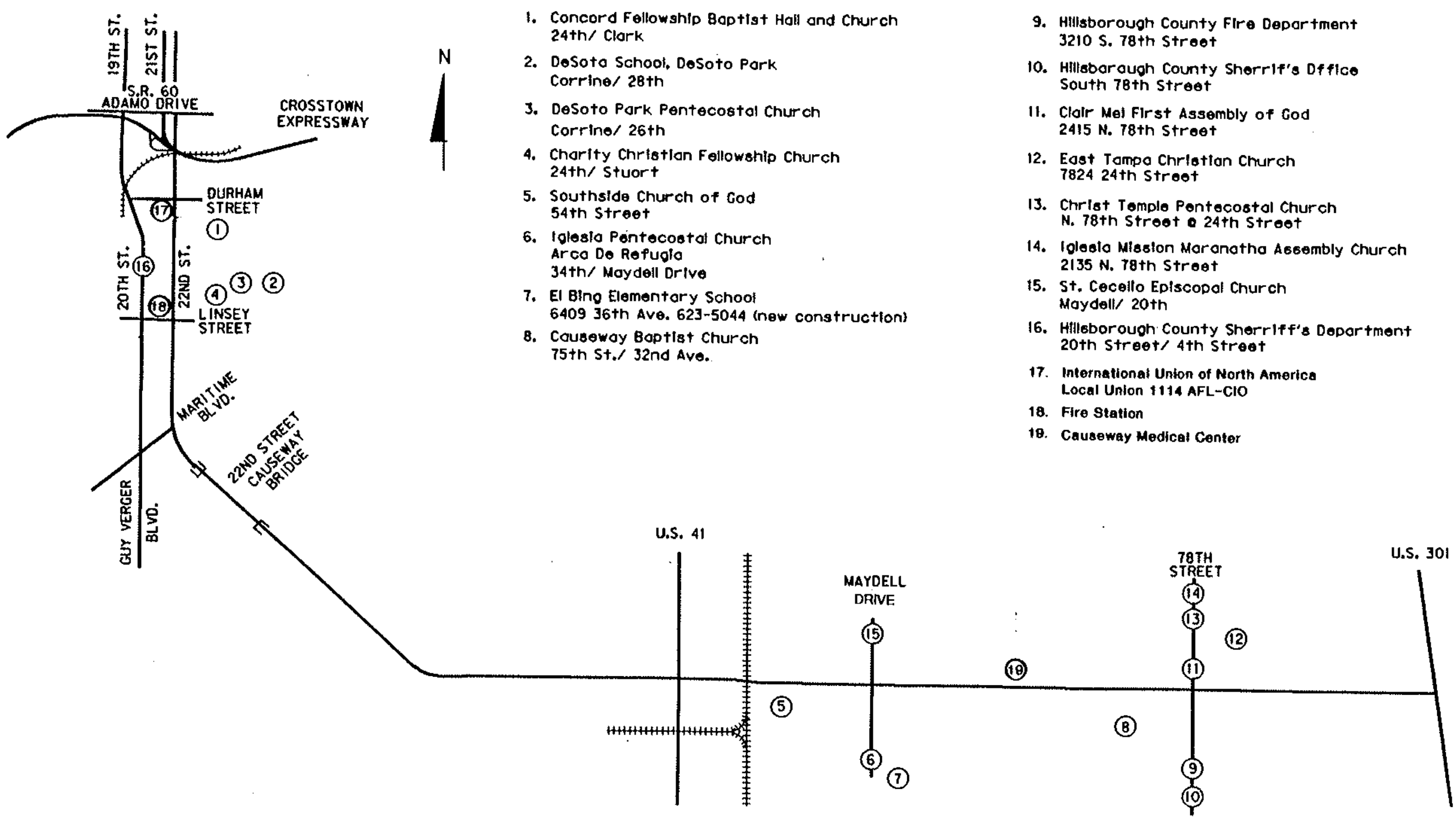
- the Palmetto Beach/22nd Street Historic District
- La Corina Cigar Factory
- the Salvador Rodriguez Cigar Factory
- the Jose Escalante House
- the Albert Kreiss House

All are located north of the 22nd Street Causeway and Bridge, in the community at Palmetto Beach. Three of the individually eligible structures are also located within the eligible historic district.

The preferred alignment of the proposed project passes west of the NR eligible historic district along 20th Street, then angles northeast to join 22nd Street north of the historic district. At the angled segment, the alignment passes adjacent to, and outside of, the northwest corner of the historic district boundaries. All individually eligible historic structure properties lie between 215 and 630 feet away from the preferred alignment's right-of-way.

Community Services

There are nineteen community service facilities located within the project study area. They are shown in Figure 3-11. Two of these facilities are adjacent to the existing roadway. Right-of-way acquisition and/or relocation may be required for the Laborers International AFL-CIO Union and the Causeway Medical Clinic.



1. Concord Fellowship Baptist Hall and Church
   24th/ Clark
2. DeSota School, DeSoto Park
   Corrine/ 28th
3. DeSoto Park Pentecostal Church
   Corrine/ 26th
4. Charity Christian Fellowship Church
   24th/ Stuart
5. Southside Church of God
   54th Street
6. Iglesia Pentecostal Church
   Arca De Refugia
   34th/ Maydell Drive
7. El Bing Elementary School
   6409 36th Ave. 623-5044 (new construction)
8. Causeway Baptist Church
   75th St./ 32nd Ave.
9. Hillsborough County Fire Department
   3210 S. 78th Street
10. Hillsborough County Sherrif's Office
    South 78th Street
11. Clair Mel First Assembly of God
    2415 N. 78th Street
12. East Tampa Christian Church
    7824 24th Street
13. Christ Temple Pentecostal Church
    N. 78th Street @ 24th Street
14. Iglesia Mission Maranatha Assembly Church
    2135 N. 78th Street
15. St. Cecelia Episcopal Church
    Maydell/ 20th
16. Hillsborough County Sherriff's Department
    20th Street/ 4th Street
17. International Union of North America
    Local Union 1114 AFL-CIO
18. Fire Station
19. Causeway Medical Center

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

COMMUNITY SERVICES

FIGURE NO.
3-11

The remaining community service facilities, including churches, County fire departments, County sheriff departments, and a City Park will not be adversely affected by the project. These facilities are listed below.

1. Concord Baptist Fellowship Hall and Church
   24th/Clark

2. DeSoto School, DeSoto Park
   Corrine/28th

3. DeSoto Park Pentecostal Church
   Corrine/26th

4. Charity Christian Fellowship Church
   24th/Stuart

5. Southside Church of God
   54th Street

6. Iglesia Pentecostal Church
   Arca De Refugio
   34th/Maydell Drive

7. El Bing Elementary School
   6409 36th Avenue 623-5044 (new construction)

8. Causeway Baptist Church
   75th Street/32nd Avenue

9. 3210 S. 78th Street
   Hillsborough County Fire Department

10. Hillsborough County Sheriff's Office
    South 78th Street

11. Claire Mel First Assembly of God Church
    2415 N. 78th Street

12. East Tampa Christian Church
    7824 24th Street

13. Christ Temple Pentecostal Church
    N. 78th Street @ 24th

14. Iglesia Mission Maranatha Assembly Church
    2135 N. 78th Street

15. St. Cecelia Episcopal Church
    Maydell/20th

16. Hillsborough County Sheriffs Department
    20th Street/4th Street

Public schools in the area will not be directly affected by this project. However, many school bus routes utilize the project facilities. Expansion of the current facility will not adversely affect these routes although some rerouting may be required. Hillsborough County School District policy dictates that children cannot be made to cross a divided highway to board their bus. This policy also applies to undivided roadways with hazardous conditions. 22nd Street is currently classified in this category.

Farmlands

Through coordination with the Soil Conservation Service it has been determined that the project area, which is located in the urbanized area of Tampa, does not meet the definition of farmland, as defined by 7 C.F.R. 658. Therefore, the provisions of the Farmland Protection Policy Act of 1984 does not apply to this project.

3.3.3 <u>Natural and Biological Features</u>

The major natural features of the project study area are defined by its geomorphic features. These natural geomorphic features include McKay Bay and the Delaney Creek drainage basin.

The causeway, which extends approximately 3,500 feet across the bay from its east side, is also an important environmental feature of the project area. The causeway has had a detrimental effect on the water quality of McKay Bay by altering and restricting the bay's circulation patterns. The causeway has also increased the total shoreline length of the bay thereby increasing the estuarine shoreline habitat of the bay.

The Delaney creek drainage basin drains the project area east of McKay Bay west to a discharge at the bay about a mile south of the 22nd Street Causeway bridge. The project crosses the creek and several of its tributaries.

Physiographically, the project is located in the Atlantic Coastal Plain below the Pimlico linear escarpment (ancient shoreline). The Pimlico is the most recent of the four relict shorelines in Hillsborough County and is located generally at, or near, 25 feet above present sea level. The subtle linear escarpment of the shoreline probably crosses the project just west of U.S. 301 near the eastern end of the project study area.

Water Quality

McKay Bay is a component of the Tampa Bay estuarine system. The 1990 Florida Water Quality Assessment prepared by FDER Standards and Monitoring Section, identifies the Hillsborough Bay/McKay Bay portion of the system as having the "worst water quality problems" within the system. The above referenced assessment attributes these water quality problems to: treated sewage wastewater discharge; industrial cooling and process wastewater discharge; vegetative denudation and associated erosion and stormwater runoff; alteration of bay circulation patterns by channels, causeways, and spoil islands; and attenuation of freshwater inflow for consumptive use.

The above referenced assessment also indicates that Delaney Creek has frequent dissolved oxygen violations and nutrient problems as well as industrial pollutant problems.

Wetlands

Lands occurring within the alternative alignments are highly urbanized and very few natural communities remain intact. There are, however, wetland communities associated with the shoreline and deepwater habitats of McKay Bay, Delaney Creek and tributaries as well as a few isolated wetlands and ditches adjacent to the existing roadway. Wetlands provide habitat for wildlife, flood storage, and contribute to water quality enhancement. Wetlands associated with ditches, function primarily as stormwater management facilities. The Wetland Evaluation/Permit Coordination Report is currently under review by the appropriate agencies.

A complete inventory of wetlands potentially impacted by the project was conducted. Wetlands were identified using the U.S. Army Corps of Engineers (USCOE) 1987 methodology which considers the characteristics of soils, plant species composition, and evidence of wetland hydrology as determinants of wetland status. Each wetland was classified using the U.S. Fish and Wildlife Services Classification of Wetlands and Deepwater Habitats of the United States (1979). The conceptual plans contained in Appendix B indicate the locations of the wetland sites in relation to the alternative alignments. Figure 8-17 shows the approximately locations of existing wetland sites within the project limits. More detailed narrative descriptions are provided below:

Wetland Number P1:

System: Palustrine
Class: Forested/Scrub-shrub
Subclass: Broad-leaved deciduous
Water Regime: Seasonally flooded
Modifier: Partially drained/ditched

Wetland site P1 is a small, forested area comprised primarily of willow oak, sabal palm, primrose willow (*Ludwigia peruviana*), cattail (*Typha sp.*), and maidencane (*Panicum hemitomon*). This wetland is an apparent hydric soil inclusion in upland soils. The area is connected, on a seasonal basis to Wetland #D1 and has a direct connection to Ybor Channel via culvert connection. Due to its relatively small size, this wetland provides low to moderate wildlife habitat value.

Wetland Number D1:

System: Palustine
Class: Aquatic Bed
Subclass: Persistent/Rooted vascular
Water Regime: Permanently Flooded
Modifier: Excavated

This freshwater ditch is extensively maintained (cleared) of erect natural vegetation with marsh pennywort (*Hydrocotyle umbellata*) dominating the rooted vascular plant community. This ditch was excavated from upland soils and drains an urbanized area. Water levels of 1-2 feet were evident during a relatively dry period. This wetland connects to the Ybor Channel via culvert connection. This ditch provides low to moderate wildlife habitat value.

Wetland Numbers E1 through E4

System: Estuarine
Subsystem: Intertidal
Class: Scrub-shrub
Subclass: Broad-leaved Evergreen
Dominant Type: Red mangrove (*Rhizophora mangle*)
Water Regime: Unknown (probably Regularly or Irregularly Flooded)

These are estuarine wetlands occurring on the shoreline of McKay Bay. The dominant vegetation includes red mangrove, black mangrove (*Avicennia racemosa*), and saltgrass (*Distichlis spicata*). Shoreline mangroves are prevalent along both sides of the 22nd Street Causeway adjoining McKay Bay. Mangrove areas on the west side of the causeway (Wetland numbers E2 and E4) have been considerably reduced as a result of the Port of Tampa development. Nuisance species including Brazilian pepper (*Schinus* *terebinthifolius*) have heavily invaded these areas. The estuarine areas surrounding McKay Bay provide suitable feeding and nursery habitat for a number of wading birds, small mammals and fish, even through they are surrounded by light-heavy industrial activities and adjacent to the 22nd Street Causeway corridor. Wetland Number E2 runs along a man-made ditch and includes a connection with a brackish water marsh. The central portion of this wetland is comprised of a variety of herbaceous vegetation including, but not limited to, bog rushes (*Juncus sp.*), maidencane (*Panicum hemitomon*), pipewort (*Lachnocaulon anceps*), and bluestems (*Andropogon sp.*). Its western edge is buffered by a narrow band of slash pine (*Pinus elliottii*), cabbage palm (*Sabal palmetto*), and saltbush (*Baccharis halimfolia*). This area is seasonally flooded and provides highly suitable habitat for wildlife.

Wetland Number D5

System:	Estuarine
Subsystem:	Subtidal
Class:	Unconsolidated bottom
Water Regime:	Irregularly Exposed
Modifier:	Excavated

This ditch drains directly into McKay Bay and will be classified as waters of the State by the Florida Department of Environmental Regulation (FDER). Vegetation present along the ditch includes saltbush, salt grass, and sea purslane (*Sesuvium sp.*). This ditch begins on the south side of the causeway and then runs parallel with the existing roadway until its termination behind Myrle's Restaurant. This ditch provides low to moderate wildlife habitat value.

Wetland Number P6

	Top of Bank:	Tributary Stream:
System:	Palustrine	Palustrine
Subsystem:	None	None
Class:	Forested	Scrub-shrub
Subclass:	Broad-leaved deciduous	Broad-leaved deciduous

Dominant Types:	Red Maple *(Acer rubrum)*	primrose willow (*Ludwigia peruviana*), buttonbush *(Cephalanthus occidentalis)*
Water Regime:	Temporarily flooded	Seasonally flooded

This wetland is a tributary branch of Delaney Creek. It is located at a bridge crossing east of 58th Street and its limits are restricted to top of bank. There are heavy silt deposits lying underneath the roadway bridge. Red maples were observed growing on the depositional areas. The dominant vegetation includes primrose willow, buttonbush, elephant ear (*Colocasia esculenta*), lizard's tail (*Saururus cernuum*), and marsh pennywort (*Hydrocotyle umbellata*). The south side of the tributary crossing is heavily infested with primrose willow and coastal-plain willow. This tributary has intermittent flow, possibly due to the Delaney Creek channelization many years ago. In addition, commercial and agricultural development occurs immediately adjacent to this tributary branch, indicating the extensive nature of disturbance taken place within its limits. This wetland provides moderate to high wildlife habitat value.

Wetland Number P7

	Top of Bank:	Tributary Stream:
System:	Palustrine	Palustrine
Subsystem:	None	None
Class:	Forested	Scrub-shrub
Subclass:	Broad-leaved deciduous	Broad-leaved deciduous
Dominant Type:	Brazilian pepper, water oak, laurel oak	Elderberry, camphor tree
Water Regime:	Temporarily flooded	Semi-permanently flooded
Modifier:	Excavated	Excavated

This wetland is a branch off a tributary of Delaney Creek. It is located east of Maydell Street and extends across the existing roadway via culvert connection. Where residential and commercial development has occurred, wetlands limits are restricted to the top of bank. The dominant canopy includes water oak, laurel oak, and slash pine. Subcanopy and herbaceous cover includes elderberry (*Sambucus canadensis*), Brazilian pepper, camphor tree (*Cinnamonum camphora*), elephant ear, swamp lily (*Crinium americana*), beggar-ticks (*Bidens alba*) and torpedograss (*Panicum repens*). Wetland P7 provides moderate to high wildlife habitat value.

Wetland Number P8

System: Palustrine
Subsystem: None
Class: Forested/Scrub-shrub
Subclass: Broad-leaved deciduous
Dominant Type: Primrose willow (*Ludwidia peruviana*), and Coastal-Plain willow (*Salix caroliniana*)
Water Regime: Seasonally flooded
Modifier: Excavated

This wetland is associated with the main channel of Delaney Creek. It is located west of 75th Street and is bordered on both sides by commercial and residential development. This creek has been channelized and species composition is indicative of disturbance. Existing roadside swales drain directly into this wetland. The wetland limits are restricted to the extent of hydrophytic vegetation in the roadside swales. The dominant vegetation is comprised of primrose willow, Coastal-Plain willow, torpedo grass, and beggar-ticks. Top of bank vegetation includes laurel oak and saw palmetto (*Serenoa repens*). Wetland P8 provides moderate to high wildlife value.

Wetland Number P9

System: Palustrine
Subsystem: None
Class: Forested
Subclass: Broad-leaved /Needle-leaved deciduous
Dominant Type: Laurel oak (*Quercus laurifolia*), cypress (*Taxodium distichum*), Cabbage palm (*Sabal palmetto*)
Water Regime: Temporarily flooded

This small, disturbed mixed hardwood community is underlain by Myakka soil, which is not listed as a hydric soil. However, the canopy includes cypress, laurel oak, cabbage palm and camphor tree, and thus, may be an indicator of a historical depressional area that may qualify as a wetland. This remnant system (less than 0.5 acre) is bordered to the west by a dirt parking lot, to the north by Causeway Boulevard, and along it's east boundary by a small ditch. Ground cover vegetation has been removed, but has been colonized weedy species such as caesar weed (*Urena lobata*) and blackberry (*Rubus sp.*). The bordering ditch on the east side of this mixed plant community, is comprised of soft rush (*Juncus sp.*), marsh pennywort (*Hydrocotyle umbellata*), cinnamon fern (*Osmunda cinnamomea*). Wetland P9 provides low to moderate wildlife habitat value.

Wetland Number D10

System: Palustrine
Subsystem: None
Class: Emergent
Subclass: Persistent
Dominant Type: Pickerelweed (*Pontedaria cordata*), marsh fern (*Blechnum serralatum*), maidencane (*Panicum hemitomon*).
Water Regime: Seasonally flooded
Modifier: Excavated

This ditch runs parallel with 86th Street and drains roadside swales along 22nd Street. Slope vegetation was either bare or grassy, interspersed with dogfennel (*Eupatorium capillifolium*), shrub verbena (*Lantana sp.*), cinnamon fern (*Osmunda cinnamomea*), Coastal-plain willow and primrose willow. Within the ditch are a variety of submerged plants including pickerelweed, marsh fern, maidencane, and duckweed (*Lemna sp.*). Trees are restricted to the upper bank and include laurel oak, live oak (*Quercus virginiana*), and slash pine. This ditch, through a series of culverted connections offsite will be considered waters of the State by the FDER. Wetland D10 provides moderate wildlife habitat value.

In addition, roadside ditches along 22nd Street Causeway are located on both sides of the roadway, extending from approximately Wetland P9 east to the 86th Street ditch (Wetland site D10) on the south side of the road. Species noted within the ditch on the south side of the road include primrose willow and marsh pennywort, species commonly invading ditches excavated below the water table. The ditch on the north side of the road is occasionally maintained for weed control and is a closed system.

Threatened and Endangered Species

The 22nd Street Causeway/Causeway Boulevard project has been evaluated for impacts on federally listed threatened and endangered species. A literature review was conducted to determine those threatened and endangered species which may inhabit the project area. The review included obtaining information from both the Florida Natural Areas Inventory and the Florida Game and Freshwater Fish Commission (FGFWFC) Non-game Program database in Tallahassee, Florida. The search resulted in preliminary findings that several federal and state listed threatened, endangered and species of special concern could potentially occur within the project area, or more specifically, within the estuarine and deepwater habitats of McKay Bay which are located in the project corridor. Consultation with the U.S. Fish and Wildlife Service (USFWS) and the FGFWFC confirmed the list of potentially occurring species and they added several more possible species to the list.

Species likely to occur in dry upland habitats or ruderal areas of the project area include the gopher tortoise, eastern indigo snake and the short-tailed snake. The short-tailed snake was recently documented near the study area and can potentially occur in remnant hardwood communities or forested suburban areas. The gopher tortoises and eastern indigo snake were not observed during field studies.

The estuarine and deepwater portions of McKay Bay provide suitable habitat for numerous species of wading birds. Little blue herons, tri-colored herons, snowy egrets, and reddish egrets have been reported foraging in the project area. They typically feed in shallow freshwater, brackish and salt-water habitats and nest in colonies in woody shrubs associated with aquatic habitats. Snowy egrets and little blue herons were observed feeding in the brackish water marsh on the north end of McKay Bay Bridge. It is likely that these species forage in other wetland areas in the project area.

Southern bald eagles are usually found near riparian habitats while nesting in proximity to water bodies. They usually feed along the shore or over extensive shallow water areas. At least one active bald eagle nest has been documented within five miles of the study area, but further identification efforts for potential nesting sites in the project area has revealed no known nests within the affected range for this species.

The West Indian manatee has been documented in estuarine habitats around McKay Bay. Although no specific surveys have been conducted for this species, manatees are not expected to occur with any regularity to the project area. Potential impacts to manatees would be limited to the construction phase of the project when boats or barges may be operating for improvements to the existing McKay Bay Bridge. Special provisions in the environmental commitment will be included in the construction contract alerting contractors of the potential occurrence of this species.

Most of the lands within the study area have been converted to urban and agricultural use. Remnant areas of native habitat, including hardwood hammocks, pine flatwoods and cypress domes, as well as improved pastures and other ruderal habitats exist within the corridor. Floral surveys of these habitat types revealed that it is unlikely that any listed plant species will be impacted by the proposed project.

Based on the above considerations, the proposed expansion of the existing facility is not expected to impact federally listed species. Consultation with the USFWS, the National Marine Fisheries Service and the FGFWFC will be maintained throughout the project implementation phases.

SECTION 4
NEED FOR IMPROVEMENT

4.1 DEFICIENCIES

4.1.1 Capacity

Growth in traffic along the 22nd Street Causeway/Causeway Boulevard corridor has continued over the past 15 years at an average annual rate of one to five percent, depending on specific location along the corridor. Traffic has increased to the point where established level of service standards are presently being met and even exceeded along sections of the project corridor. Continued development in Tampa and Hillsborough County will result in daily traffic nearly doubling by the year 2015 along some sections of the project corridor even if needed corridor capacity improvements are not implemented. This corridor is so vital to the area's roadway network that once capacity is increased, traffic along some sections of the project corridor will increase threefold by 2015. With the continued growth in traffic volumes, congestion, delay and accidents are expected to increase unless additional capacity is provided. Added congestion will cause increased travel times for motorists, resulting in increased fuel consumption, higher levels of air pollutant generation and greater delays for emergency vehicles.

The 22nd Street/Causeway Boulevard corridor is an important link in the area's roadway network. The study corridor is a major route into downtown Tampa from suburban communities south and east of the city. In addition, this corridor is the only major highway providing direct access to and from the Port of Tampa, a significant contributor to the local economy. At the north end of the corridor is Ybor City, a historic entertainment district which also provides significant economic benefits to the community.

Improvements to the 22nd Street/Causeway Boulevard corridor have the potential for providing significant capacity relief to the surrounding roadway network. Multi-lane state highways in the area, including S.R. 60, U.S. 41 and U.S. 301 should all benefit from the additional capacity proposed for 22nd Street/Causeway Boulevard.

Chapter six presents a detailed discussion of existing and future traffic volumes and capacities in the 22nd Street Causeway/Causeway Boulevard corridor as well as the surrounding roadway network.

4.1.2 Structural

The existing pavement is in average to poor condition. With the increased traffic volumes forecasted, pavement deterioration will accelerate. Pavement that is in poor condition will increase both accident potential and vehicle maintenance costs to motorists.

An Existing Bridge Condition Report was prepared as part of this PD&E Study in 1991. It concluded that the twin bridges over McKay Bay require only minor cosmetic and maintenance repairs, with estimated remaining lives of 20 years. The two bridges crossing Delaney Creek are not suitable for widening due to their minimal remaining life, their current level of deterioration and the existing hydraulic constriction caused by the bridge and channel configuration (see Location Hydraulics Report).

4.1.3 Drainage

Drainage deficiencies are discussed in Section 3.1.7. Stormwater conveyance problems in the Palmetto Beach area will increase without the proposed improvements due to sedimentation and further deterioration of the existing drainage system. The deterioration of the Delaney Creek bridges due to scour and aggregation along the channel bottom will continue and the rate of deterioration will increase.

4.2 SAFETY

A summary of the types of accidents occurring along the 22nd Street Causeway/ Causeway Boulevard corridor is included in Section 3.1.9 of this report. As the corridor nears capacity and traffic congestion increases, the number of vehicular accidents is expected to increase. Widening the roadway to provide an adequate level of service for existing and projected future traffic should result in a reduction in certain types of accidents. A safer system can further be achieved by improving intersections and providing pedestrians and bicyclists with adequate facilities.

The lack of bicycle facilities and deficiency of pedestrian provisions may also contribute to an increase in accident totals as added traffic increases accident potential.

The accident injury rate significantly exceeds national averages along the 22nd Street/Causeway Boulevard corridor. Corridor improvements are needed for safety reasons, in addition to capacity reasons.

4.3 CONSISTENCY WITH TRANSPORTATION PLAN

The Tampa Urban Area Metropolitan Planning Organization's (MPO's) adopted 2010 Needs Plan network database was a critical input to all design year traffic forecasts for the 22nd Street Causeway/Causeway Boulevard corridor. The MPO's 2010 Needs Plan assumes the following cross sections:

- 21st Street/22nd Street, north of Crosstown Expressway - 4 lane one way pair
- 20th/22nd Street, Crosstown Expressway to Maritime Boulevard - 3 lane one way pair
- Causeway Boulevard, Maritime Boulevard to U.S. 301 - 6 lane divided arterial

All project alternatives are consistent with the MPO Needs Plan recommended cross sections north of the Crosstown Expressway and south/east of Maritime Boulevard. One project design alternative (alternative "V") includes a three lane one way pair between the Crosstown Expressway and Maritime Boulevard as recommended in the MPO 2010 Needs Plan. The "no build" alternative is not consistent with the MPO's 2010 Needs Plan.

The other feasible design alternatives incorporate a six lane divided arterial on either 22nd Street (alternative "W") or 20th Street (alternative "X"). These six lane alternatives include a parallel two lane cross section on the unimproved corridor. To clarify, alternative "W" has six lanes on 22nd Street and two lanes on unimproved 20th street; alternative "X" has six lanes on unimproved 20th Street and two lanes on 22nd Street. The unimproved roadway will function as a local road serving the surrounding neighborhood.

The preferred alternative includes construction of a 6 lane divided urban arterial along the 20th Street corridor. While this deviates from the 3 lane one-way pair concept along 20th/22nd Streets, it provides appropriate vehicular capacity while minimizing socioeconomic impacts.

4.4 SOCIOECONOMIC DEMAND

The results of travel demand forecasting under the "no build" project alternative highlight the socioeconomic growth projected for areas of Hillsborough County that feed traffic to this corridor. As noted earlier, corridor traffic is projected to nearly double over the next 25 years without corridor improvements and triple once additional laneage is in place. This indicates that a significant growth in dwelling units and employment is anticipated through the design year.

Table 4-1 is a summary of 1988 and 2010 dwelling unit, population and employment level for traffic analysis zones adjacent to the project corridor. As indicated, the 22nd Street

Table 4-1
Socioeconomic Demand Summary

Traffic Analysis Zone (TAZ)	Dwelling Units		Population		Employment	
	1988	2010	1988	2010	1988	2010
164	163	172	350	301	1016	1230
165	10	11	22	22	2773	2418
166	717	673	1542	1315	595	605
529	590	968	1363	1866	1066	1884
530	95	82	212	167	984	500
532	629	926	1606	2004	488	781
534	1230	1602	3313	3868	291	410
535	320	474	836	1121	370	699
540	1133	2190	2953	4429	597	913
541	297	598	754	1180	70	1675
TOTAL	5184	7696	12,951	16,273	8250	11,115
% Increase		+48%		+26%		+35%

Source: Tampa Urban Area Metropolitan Planning Organization

Causeway Boulevard corridor will experience a 48 percent increase in dwelling units, a 26 percent increase in population and a 35 percent increase in employment through the year 2010. This growth will continue through the design year 2015.

Areas of southeast Hillsborough County, including Brandon, have experienced significant residential and commercial development. These development trends are expected to continue well into the future as evidenced by the large number of Development of Regional Impact (DRI) projects proposed for these areas. As discussed earlier, the 22nd Street/Causeway Boulevard corridor is a vital link connecting southeast Hillsborough County with downtown Tampa, the Port of Tampa and Ybor City.

SECTION 5
CORRIDOR ANALYSIS

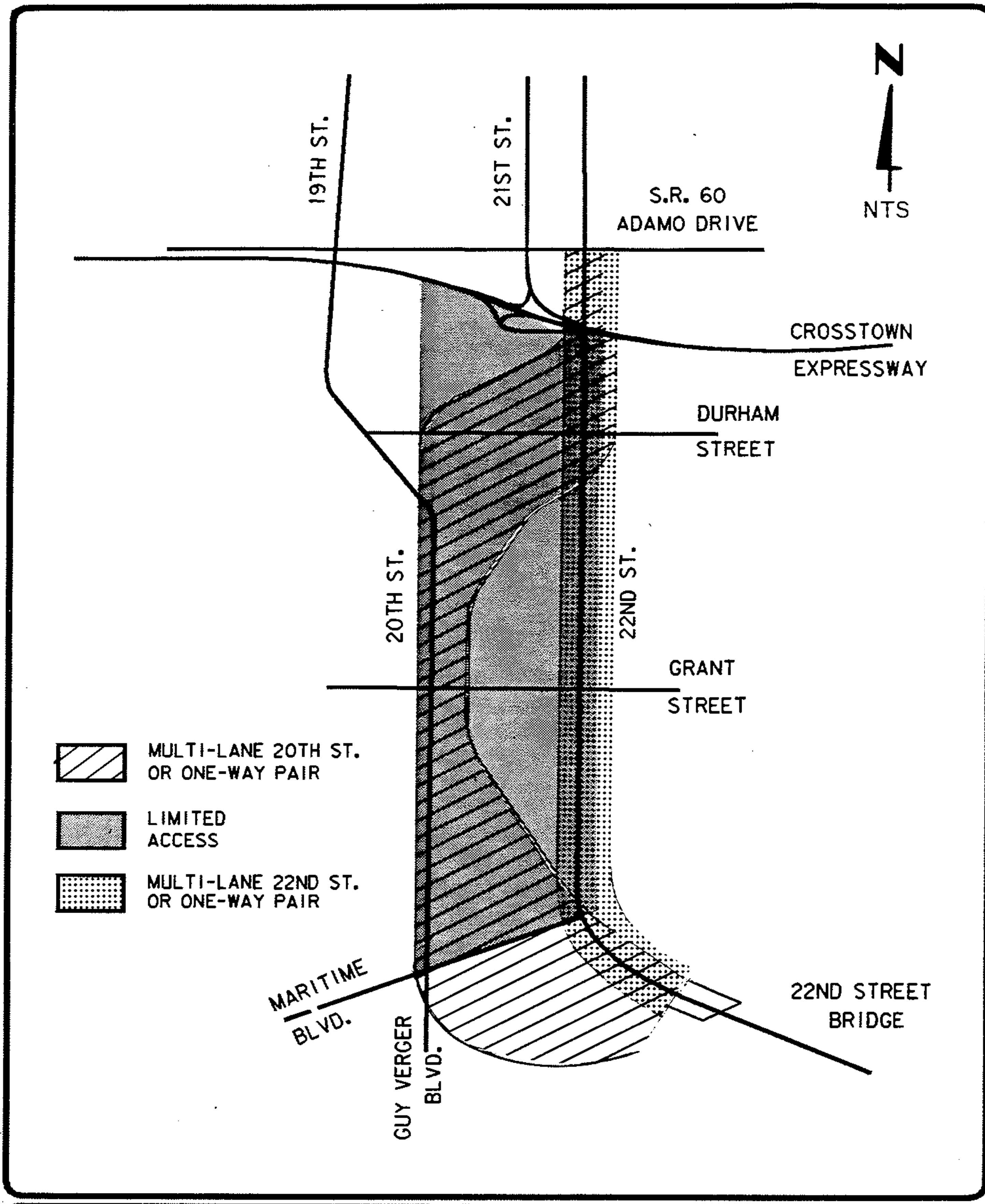
5.1 IDENTIFICATION OF ALTERNATIVE CORRIDORS

Due to existing land use patterns east of McKay Bay, as well as the geographic constraints of the existing bay crossing, there are no feasible alternative corridors east of McKay Bay. North of Maritime Boulevard, however, there are a number of corridor alternatives that merited consideration, including the existing 22nd Street alignment. These corridor alternatives are shown in Figure 5-1. The termini of the north section are S.R. 60 in the north and the northern approach of the 22nd Street Causeway bridges over McKay Bay in the south.

The first alignment alternative north of Maritime Boulevard consists of a facility along the existing 22nd Street alignment. This facility would be a multi-lane roadway through a highly developed commercial and residential area. In addition to serving local and commuter traffic, it serves as a vital link between the Crosstown Expressway and the Port of Tampa's Hookers Point facility.

The second alternative is a one-way pair facility which would utilize existing alignments on 20th and 22nd Streets. Crossovers would be required at both the northern and southern termini to connect the 20th Street segment to adjacent segments of the proposed facility.

The third alternative would provide a limited access facility as a link between the Crosstown Expressway (also limited access) and Maritime Boulevard. An interchange would be required at the Crosstown Expressway (northern) terminus. The western boundary of the limited access study corridor is the western right-of-way line of 20th



PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

ALTERNATIVE CORRIDORS

FIGURE NO.
5-1

Street; the eastern boundary is the eastern right-of-way line of 22nd Street. The entire corridor consists of a densely developed residential and commercial area.

The fourth and final alternative under consideration is a multi-lane facility located predominantly along the existing 20th Street alignment. This alternative ties back to 22nd Street at its northern and southern termini. The northern crossover is required to provide access to the Crosstown Expressway without significantly altering the configuration of the Crosstown Expressway ramps. The southern crossover allows through traffic to return to the 22nd Street alignment as at bridges over McKay Bay.

Various interchange alternatives have been considered for implementation at the Crosstown Expressway. These alternatives included:

- Rerouting/configuration of ramps
- Lengthening the existing Crosstown Expressway bridges (additional $1.6 million in construction costs)
- A split diamond interchange with one-way pair roadways.
- No significant change to the existing interchange.

The following sections present an evaluation of the alignment alternatives described above, as well as the required connection to the Crosstown Expressway.

5.2 EVALUATION OF ALTERNATIVE CORRIDORS

The first alternative, along the existing 22nd Street alignment, was the most direct routes. the proposed right-of-way width is more than double the existing width, resulting high business damage and relocation costs. Nonetheless, this alternative was developed in detail as a potentially viable alternative.

The second alternative, the one-way pair facility would require only minimal amounts of acquisition along both 20th and 22nd Streets, with lower costs and relocation impacts as compared to the first alternative. While additional right-of-way would be needed for the crossovers, some of the proposed alignments traverse undeveloped parcels.

The third alternative, the limited access facility, was the subject of a separate technical memorandum prepared by PBS&J in April 1991. The technical memorandum recommended that the limited access corridor alternative be eliminated.

The fourth alternative, which utilizes the 20th Street alignment, has several advantages over the other alignments presented. The primary benefit is the elimination of impacts to potential historic structures and/or districts located along 22nd Street. Disadvantages include a slight increase in travel distance, high business damage and relocation costs relative to other alternatives. This option merits further analysis as a potentially viable alternative.

Each of the alignment alternatives evaluated above will connect to the Crosstown Expressway in some manner while significant modifications and/or reconstruction of the existing interchange have been evaluated, extremely high construction, right-of-way, business damage and relocation costs render these options infeasible. Traffic flow on the expressway as well as on local roads would be greatly disrupted should a major rework of the interchange be required. Based upon these factors, corridor alternatives developed in subsequent sections of this report will be aligned to utilize the existing Crosstown Expressway interchange at 22nd Street.

5.3 CORRIDOR SELECTION

Due to the significant impacts associated with the limited access corridor alternative, it has been determined to be non-feasible and therefore eliminated from further consideration. The other 3 alternatives discussed herein have been retained for further consideration and comparative analysis. These selected corridors are:

- 6 lane divided roadway along 22nd Street
- 6 lane divided roadway along 20th Street
- 3 lane one-way pair using 22nd Street and 20th Street

These corridors are analyzed in detail in sections 7 and 8 of this report.

SECTION 6
TRAFFIC

6.1 EXISTING CONDITIONS

North of S.R. 60, the 21st Street/22nd Street Corridor is an existing 3 lane one-way pair. South of S.R. 60 the two one-way streets (21st Street and 22nd Street) transition to two lanes each and merge into a single two-way corridor just north of the Crosstown Expressway. South of the Crosstown Expressway and continuing to Maritime Boulevard, 22nd Street is a 3 lane roadway with a single through lane in each direction and a continuous two-way left turn lane. South of Maritime Boulevard, the corridor expands to a four lane divided roadway with a grass median and crosses McKay Bay via twin bridges and a man-made causeway. East of U.S. 41, the street name changes to Causeway Boulevard and the corridor narrows to a 2 lane undivided roadway. This two lane configuration continues east to U.S. 301.

6.2 MULTIMODAL TRANSPORTATION SYSTEM CONSIDERATIONS

The 22nd Street Causeway/Causeway Boulevard corridor provides direct access to the Port of Tampa which, in turn, provides multi-modal linkages between truck, rail and water-based transport. The Port of Tampa is a major employer and contributes significantly to the local economy through shipping and distribution of goods and services. The Port recently completed a Master Plan which calls for expansion of both their shipping and cruise ship operations. Good surface transportation access is critical to successful operation of the Port of Tampa.

The project area is currently served by 2 local bus routes: No. 9 and No. 37. The buses are operated by the Hillsborough Area Regional Transit Authority (HART). Route No. 9 originates at Hookers Point and runs up 22nd Street. Once beyond the project limits it runs north along 15th Street and Nebraska Avenue, stopping at University Square Mall and terminating at the intersection of Bearss Avenue and Florida Avenue. Route No. 37 originates in downtown Tampa, proceeds through Ybor City then down 22nd Street and along Causeway Boulevard to Brandon. Headways for both routes are between 45 minutes and 1 hour. These two routes accommodate residents within the project limits.

The MPO is studying the feasibility of implementing a fixed rail guideway transit system in the Tampa urban area. While there are no plans to run the system along the project corridor, S.R. 60 has been identified as a tentative location for the Eastern Corridor of this system. The system would extend from the Westshore area in Tampa to Brandon. Buses could be used on 22nd Street Causeway/Causeway Boulevard to provide access to this system, with transit stations at selected locations along S.R. 60. While this system could reduce the traffic demand on the subject corridor, its conceptual status does not allow for an accurate quantification of its impact on the surrounding transportation network.

6.3 TRAFFIC ANALYSIS ASSUMPTIONS

Traffic analysis for the 22nd Street Causeway/Causeway Boulevard corridor includes both a thorough inventory of existing traffic characteristics and the projection of traffic volumes for the project opening year of 1995 and design year of 2015.

The analysis of existing traffic characteristics included a review of available FDOT Average Annual Daily Traffic (AADT), comparison with base year model results, field data collection of daily traffic counts, vehicle classifications and peak period turn movement counts and identification of typical design traffic characteristics. Existing traffic volumes are described in detail in section 6.4 of this report.

The MPO's current adopted 2010 transportation network for Tampa and Hillsborough County is based on a 645 zone FSUTMS microcomputer model validated to a base year of 1980. As part of the 2010 Plan Update Project, (now underway) a new base year 1988 multi-path transit model was validated with 678 zones. Although 2010 socioeconomic data have been formally approved for the 678 zone base, the draft 2010 Needs Plan network based on this zone structure has not yet been adopted by the MPO. No interim year network or socioeconomic datasets have been developed by the MPO on either the 1980 or the 1988 zone system. Section 6.5 describes the development of future year traffic forecasts in detail.

6.4 EXISTING TRAFFIC VOLUMES

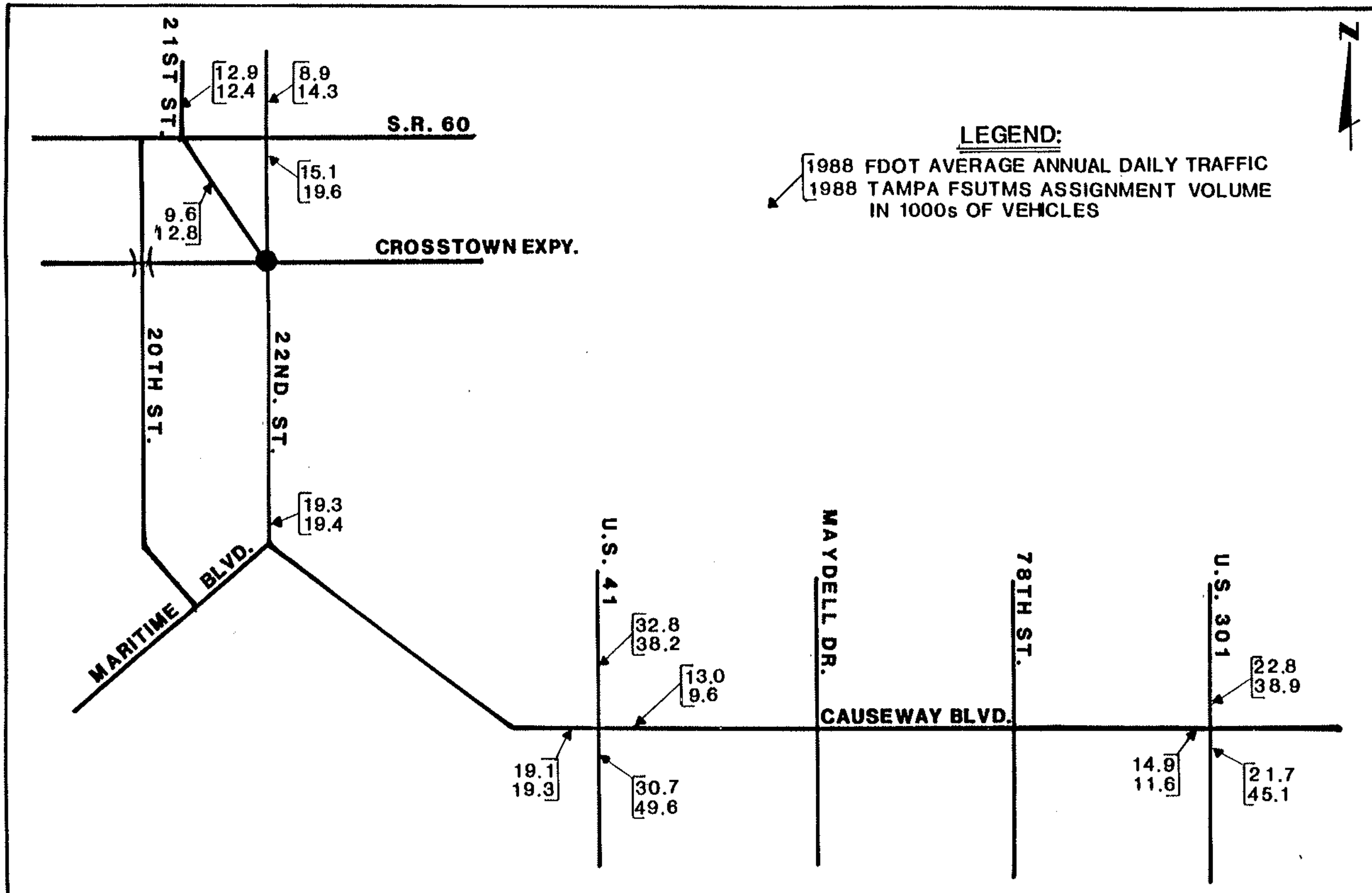
6.4.1 Existing Corridor Traffic

FDOT 1988 AADT's were obtained for several locations in the project study area to compare with FSUTMS validation results and establish an official FDOT record of daily traffic. These are depicted in Figure 6-1 along with FSUTMS volumes for 1988. South of S.R. 60, 21st Street had a 1988 AADT of 9,600 while 22nd Street carried 15,100 AADT at the same location. North and south of Maritime Boulevard, AADTs were approximately 19,000. The 1988 AADT on Causeway Boulevard was 13,000 east of U.S. 41 and 14,900 west of U.S. 301.

6.4.2 Existing Intersection Traffic

In the Spring of 1991, additional traffic data was collected in the field as part of the 22nd Street Causeway/Causeway Boulevard PD&E Study. This data collection effort consisted of the following elements:

- seven-day directional counts at three locations;
- 24-hour machine approach counts at ten intersections; and
- four-hour manual vehicle turning movement counts at nine intersections.



YEAR 1988 AADTs AND FSUTMS ESTIMATED TRAFFIC

FIGURE 6–1

The seven-day machine counts included vehicle classification. The four-hour manual turning movement counts included pedestrians and bicycles during the morning and afternoon peak travel periods.

Figure 6-2 shows the 24-hour intersection approach volumes and the average 24-hour directional volumes at the seven-day count locations. Daily and peak hour truck percentages are also depicted for the seven-day count stations. Printed summaries of the machine traffic counts are included in Appendix A of the approved Traffic Methodology Technical Memorandum. Manual turning movement counts are presented in Figures 6-3 and 6-4 for the AM and PM peak hours, respectively.

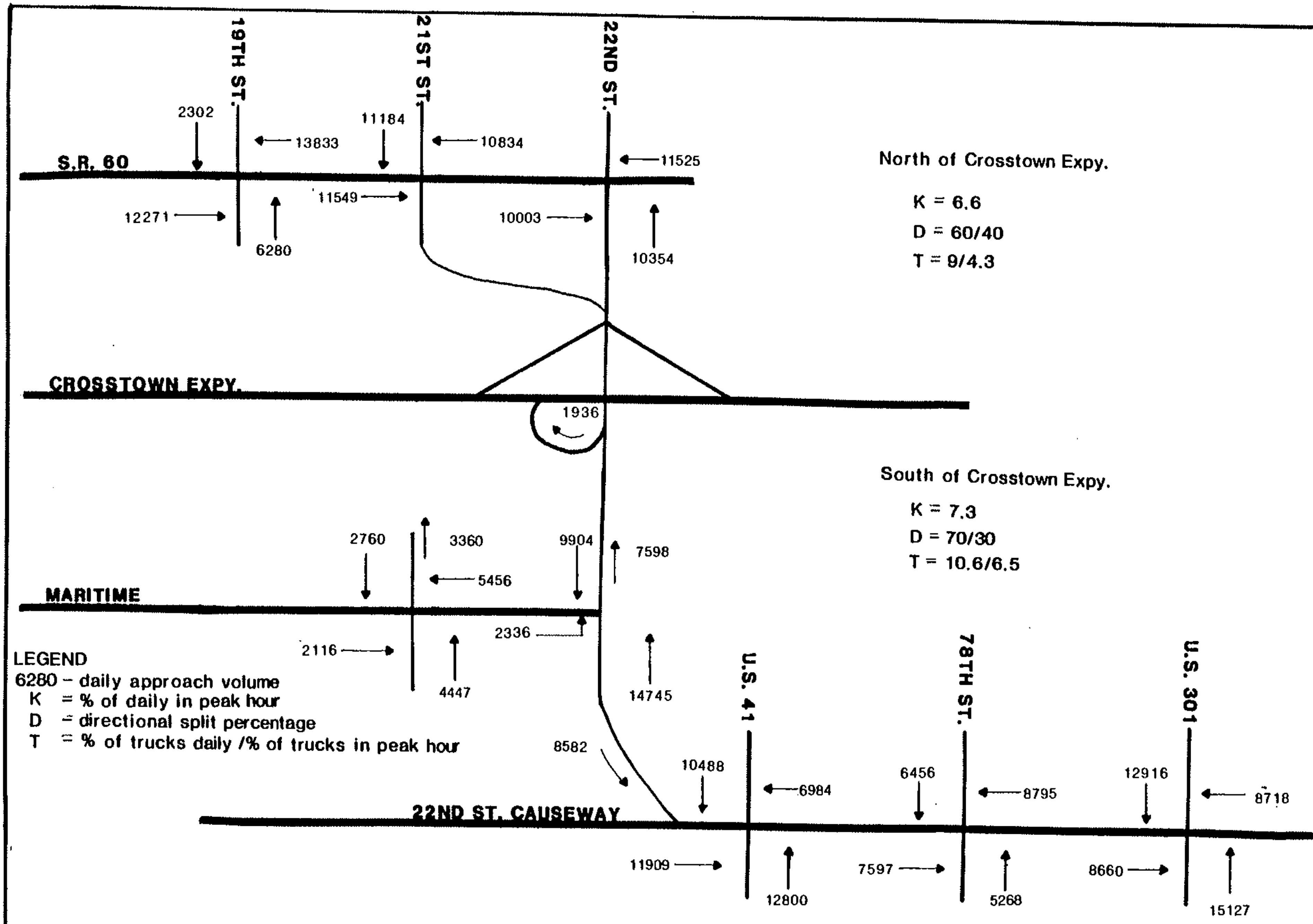
Peak hour traffic is normally identified as a portion of the total daily traffic. This portion is referred to by the term "K-factor". The average existing K is 6.6% north of the Crosstown Expressway and 7.3% south of the Crosstown Expressway. This is illustrated in Figure 6-2.

Peak hour directional distributions (D) were also tabulated based on data collection activities. The directional splits are illustrated in Figure 6-2 and are 60/40 north of the Crosstown and 70/30 south of the Crosstown.

6.5 TRAFFIC VOLUME PROJECTIONS

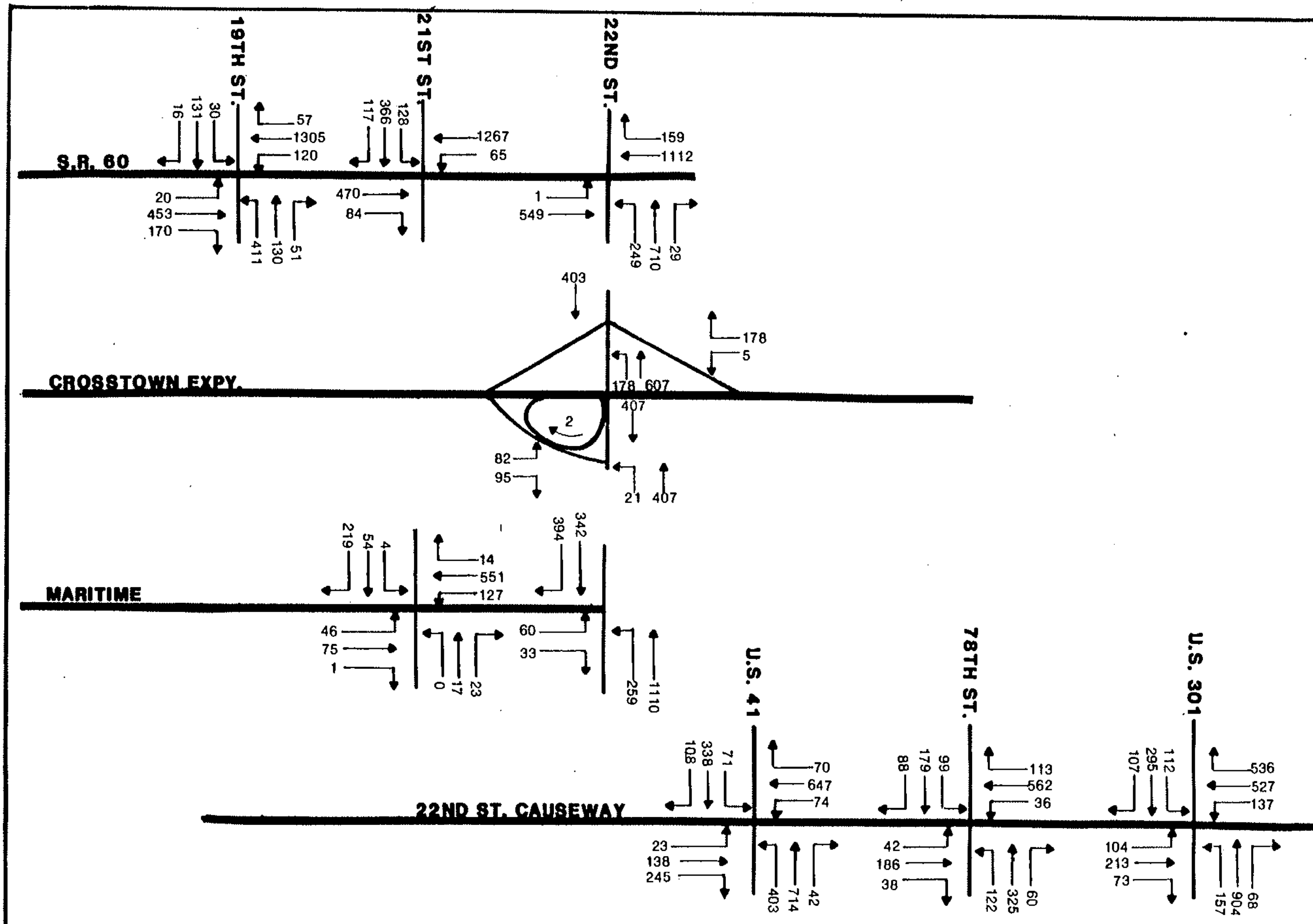
6.5.1 Forecasting Methodology

For the purposes of travel demand forecasting, the 22nd Street Causeway/Causeway Boulevard project was assumed to be open to traffic in the year 1995, resulting in a design year of 2015. Since socioeconomic data were only available for 1988 and 2010, the McTRANS ZDATA program was used to interpolate and extrapolate datasets for the years 1995 and 2015. This program assumes a straight line interpolation of growth.



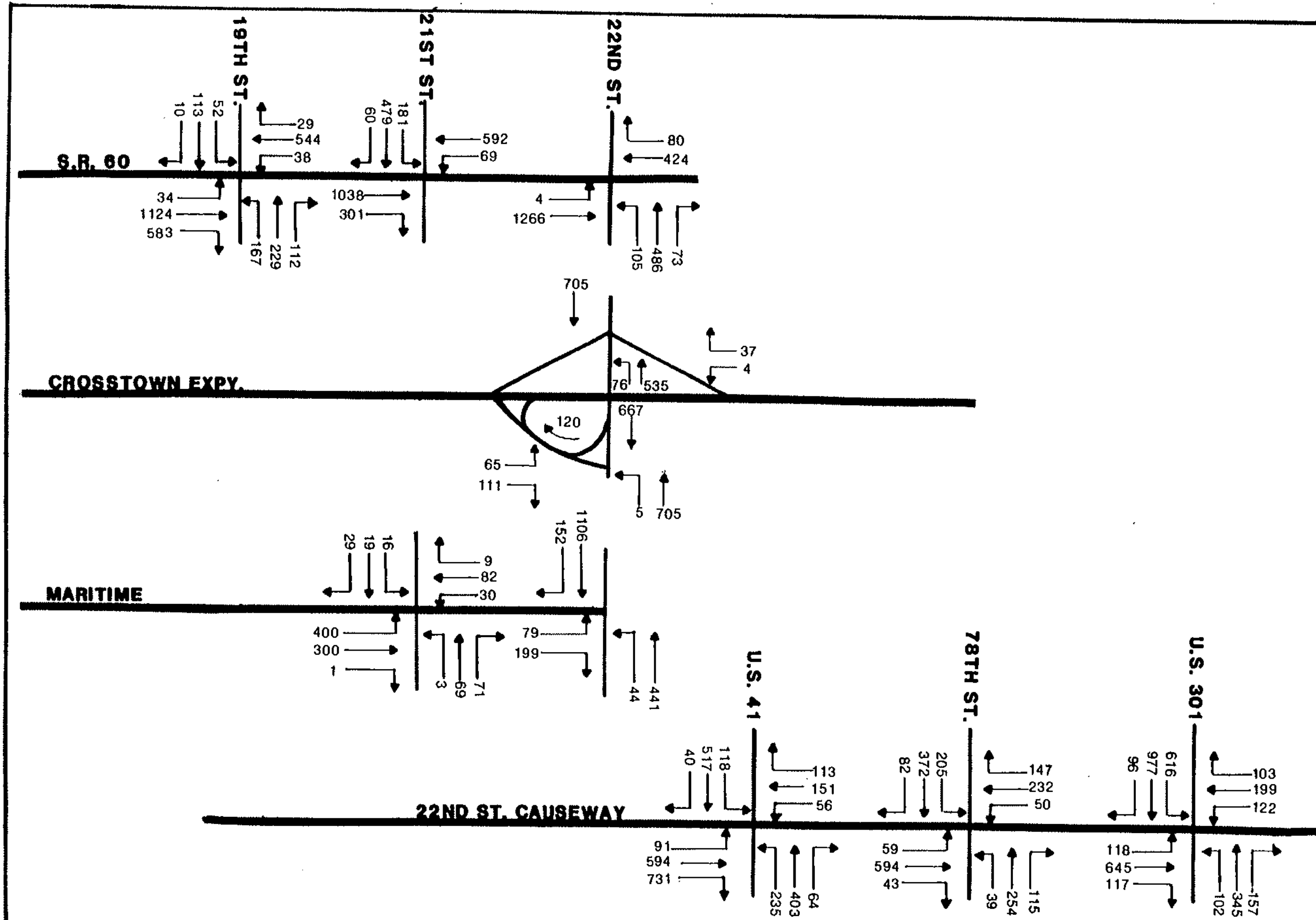
EXISTING 24 HOUR APPROACH VOLUMES

FIGURE 6–2



EXISTING AM PEAK HOUR TRAFFIC ACTIVITY

FIGURE 6–3



EXISTING PM PEAK HOUR TRAFFIC ACTIVITY

FIGURE 6–4

Application of the ZDATA program resulted in an average annual growth of 100,000 trips for Hillsborough County for the study period.

Since the MPO did not have a 1995 Network, one was created using the FDOT and the Hillsborough County Transportation Improvement Programs (TIP). Projects that were completed between the years 1988 and 1991 were added to the 1988 base year FSUTMS network. In addition, road projects in the TIP with financial commitments for construction between the years 1991 and 1995 were also added to the base year network.

Since the adopted 2010 network was not compatible with the latest socioeconomic data forecasts, MPO staff recommended the draft 2010 Needs Plan network (using 678 zones) be used for design year FSUTMS forecasts. The extrapolated 2015 zone data were assigned to the draft 2010 Needs Plan network to produce 20-year design traffic forecasts for 2015. Zone data and networks for the year 2015 were not available from FDOT or the MPO.

6.5.2 Base Year Model Accuracy

The 1988 base year FSUTMS model is accurately replicating existing corridor traffic volumes. On 22nd Street north of Maritime Boulevard, traffic estimates from the model are within one percent of existing 1988 counts. Model estimates on the bridge are 10 percent less than the existing count. The volumes on Causeway Boulevard between U.S. 41 and U.S. 301 are also within acceptable FDOT Standards with a volume-to-count ratio of 0.84. However, the differences between actual and assigned volumes on the U.S. 41 and U.S. 301 corridors may result in high estimates of design year traffic on these two roadways. Assigned 1988 FSUTMS volumes were previously depicted in Figure 6-1.

6.5.3 Future Year Demand Forecasts

Several alternative network scenarios for the proposed 22nd Street/Causeway Boulevard Corridor were evaluated. With the exception of the no-build alternative (alternative "T"), the following options all include a six lane divided arterial between Maritime Boulevard and U.S. 301:

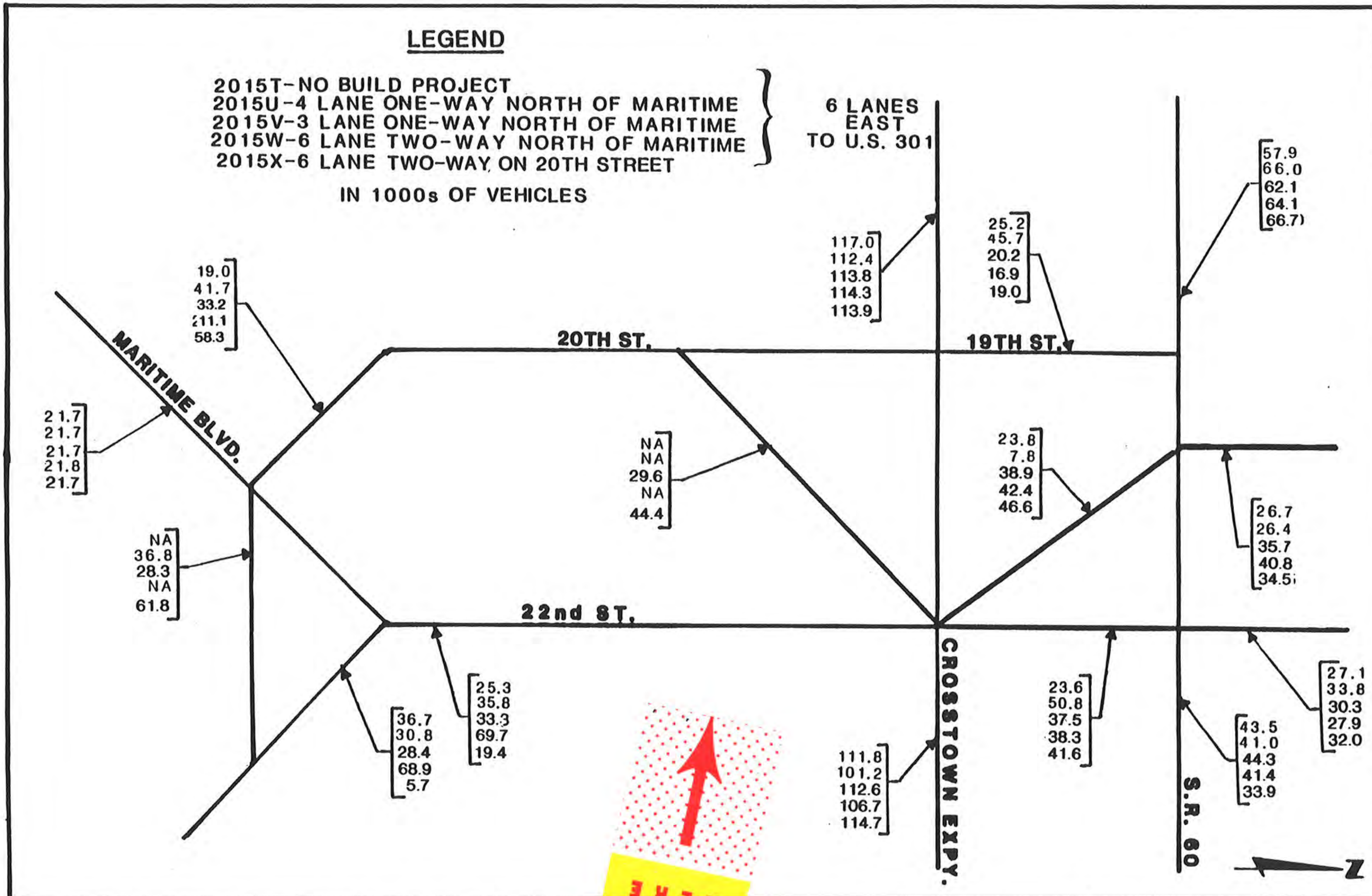
* "T" - No Build - 22nd Street Causeway/Causeway Boulevard with no improvements.
* "U" - four lane one-way pair coded on 20th and 22nd Streets north of Maritime Boulevard; one-way pair crossover is made north of the Crosstown Expressway.
* "V" - three lane one-way pair coded on 20th and 22nd Streets north of Maritime Boulevard; one-way pair crossover is made south of the Crosstown Expressway.
* "W" - six lane two-way north of Maritime Boulevard on 22nd Street
* "X" - six lane two-way north of Maritime Boulevard on 20th Street, crossing over to 22nd Street south of the Crosstown Expressway interchange.

Projected traffic volumes for design year 2015 are depicted in Figures 6-5 and 6-6. A review of these traffic volumes leads to the following conclusions:

- Traffic assignment volumes on 22nd Street appear to be "capacity driven". As capacity increases on 22nd Street more traffic is diverted from the competing facilities to the project corridor. (For example, if three lanes are coded into the traffic model, projected volumes generally indicate that four are required and if four lanes are coded, projected volumes generally reflect that five lanes are required, etc.).

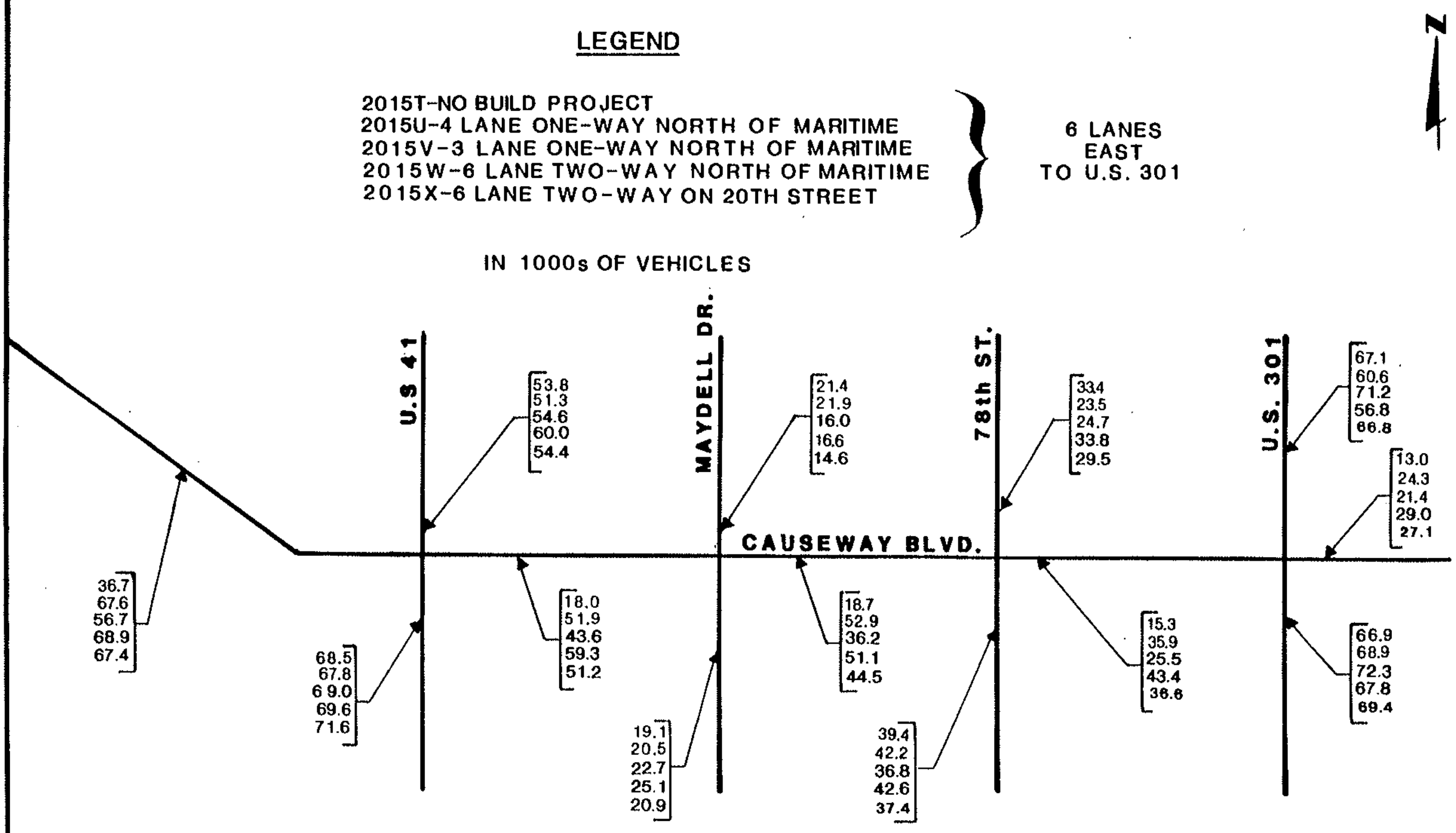
- The project corridor between S.R. 60 and the Crosstown Expressway requires a minimum of four lanes in each direction to achieve LOS "D".

- South of the Crosstown Expressway to Maritime Boulevard, the laneage required to achieve a level-of-service "D" is reduced to three lanes per direction. The MPO's draft 2010 Needs Plan is in agreement with these findings recommending a four lane one-way pair north of the Crosstown reduced to three lanes south of the Crosstown Expressway because of physical constraints.



YEAR 2015 FSUTMS TRAFFIC FORECASTS
S.R. 60 TO MARITIME BOULEVARD

FIGURE 6–5



YEAR 2015 FSUTMS TRAFFIC FORECASTS

MARITIME BOULEVARD TO U.S. 301

FIGURE 6–6

- McKay Bridge/22nd Street Causeway functions at six lanes based on HCM analysis performed at the Maritime Boulevard intersection and the U.S. 41 interchange.

- Causeway Boulevard east of U.S. 41 will also require six lanes ultimately; however this improvement could perhaps be staged with four lanes constructed initially and 6 lanes provided by the year 2015.

Under 2015 "no build" Alternative "T", 20th Street and 22nd Street north of Maritime Boulevard will carry traffic volumes which exceed current capacities. Traffic volumes on Causeway Boulevard between U.S. 41 and U.S. 301 will also exceed present capacity.

Alternative "U" was coded as a four lane one-way pair north of Maritime Boulevard with six lanes south of this point. Southbound traffic would use 20th Street between S.R. 60 and Maritime Boulevard while northbound traffic would follow 22nd Street. Under this scenario traffic exiting the Crosstown Expressway with destinations to the south must first travel north on 22nd Street then west on S.R. 60 and then south on 19th and 20th Streets. Traffic volumes on the McKay Bridge and causeway would exceed typical six lane arterial capacities. Alternative "U" was later eliminated from further consideration.

Alternative "V" was coded as a three lane one-way pair from the Crosstown Expressway south to Maritime Boulevard. In this scenario, two-way traffic is maintained under the existing Crosstown Expressway overpass. South of this point southbound traffic follows a new alignment which merges with 20th Street. Southbound traffic then travels along 20th Street south to Maritime Boulevard while 22nd Street is used for northbound traffic. This eliminates the circuitous movement from the Crosstown southbound onto 20th Street. Corridor traffic volumes are considerably lower than Alternative "U" due to a reduction in available capacity.

Alternative "W" assumes a six lane two-way roadway from the Crosstown Expressway to U.S. 301. This network generally results in the highest corridor traffic volumes of the four scenarios.

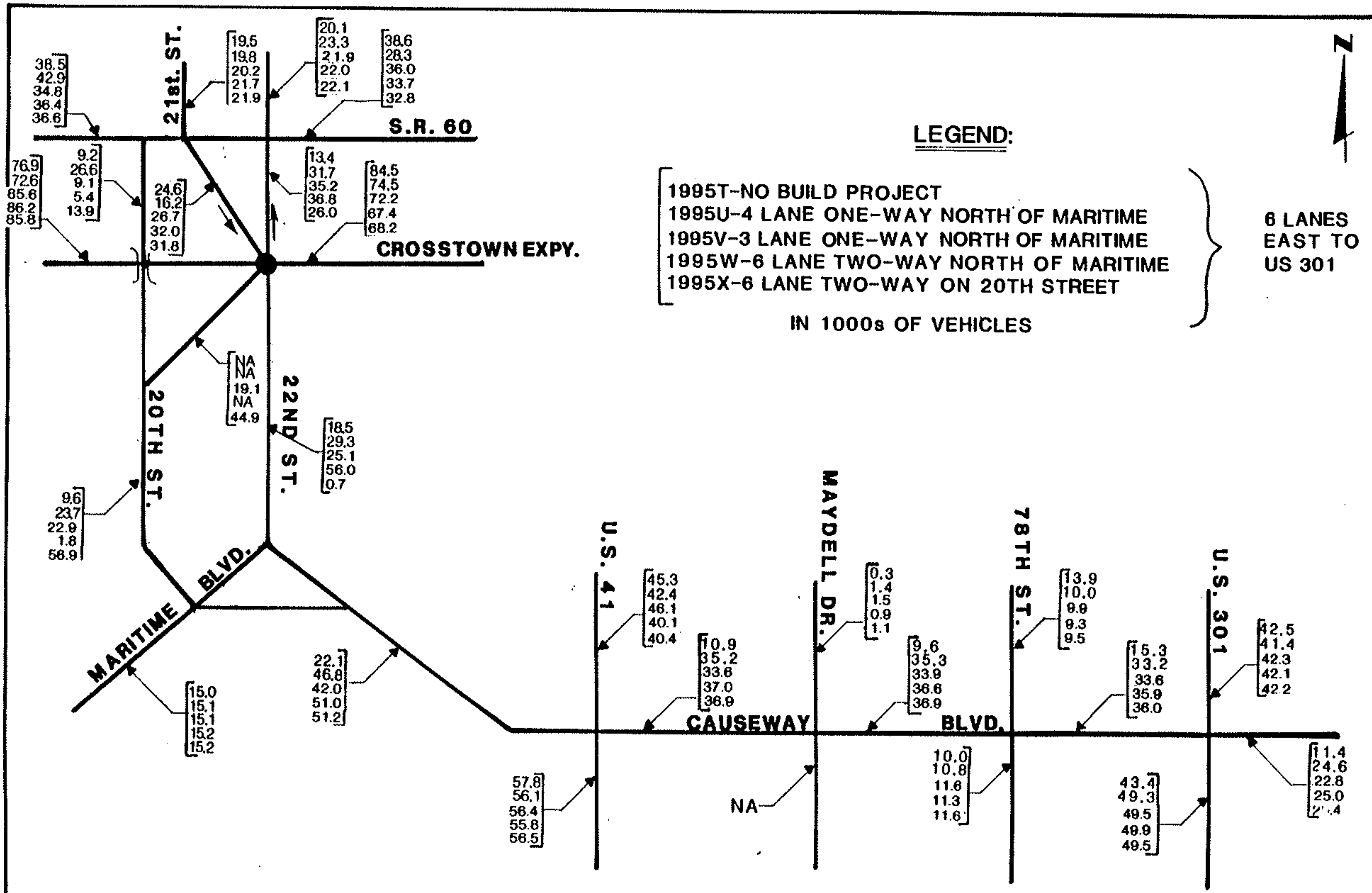
Alternative "X" also assumes a six lane two-way corridor south and east of the Crosstown Expressway. However, a new alignment immediately south of the Expressway would connect with a six lane roadway along 20th Street. With six lanes on 20th Street, the existing two lane configuration of 22nd Street would be maintained. Unfortunately, this alternative still results in volumes exceeding the present two lane capacity of 22nd Street and the proposed six lane capacity of 20th Street.

Traffic volumes are greater for the 22nd Street six lane divided scenario (W) than for the one-way pair scenarios in part because FSUTMS capacities are greater per lane for divided arterials than for one-way roadways. The one-way pair concepts are somewhat more circuitous than the six lane two-way concept on 22nd Street. Furthermore, the three lane one-way pair scenario (V) contains less lanes on the combined 20th and 22nd Street corridor than the other scenarios studied. The 20th Street six lane alternative "X" is also slightly more circuitous than the six lane 22nd Street scenario "W".

Opening year 1995 traffic was also developed for all project alternatives. These traffic volumes are depicted on Figure 6-7. Figures 6-8 through 6-11 depict daily turn volumes for the year 2015 alternatives. Figures 6-12 through 6-14 depict daily turn volumes for the year 1995 build alternatives.

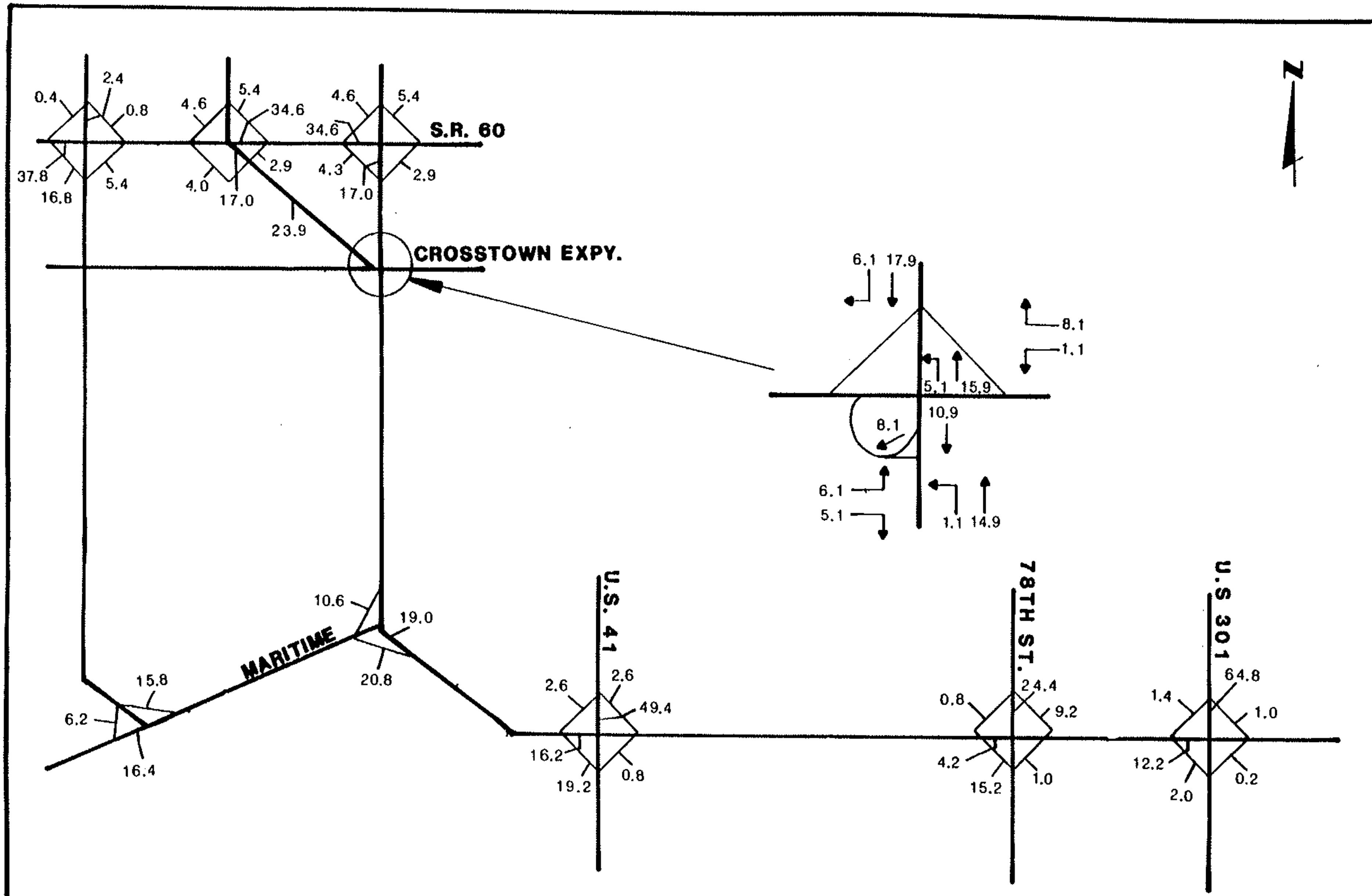
6.6 LEVEL OF SERVICE

Using FDOT's Generalized Daily Level of Service Maximum Volumes, and estimates of the signal spacing per mile, corridor level of service is summarized in Table 6-1.



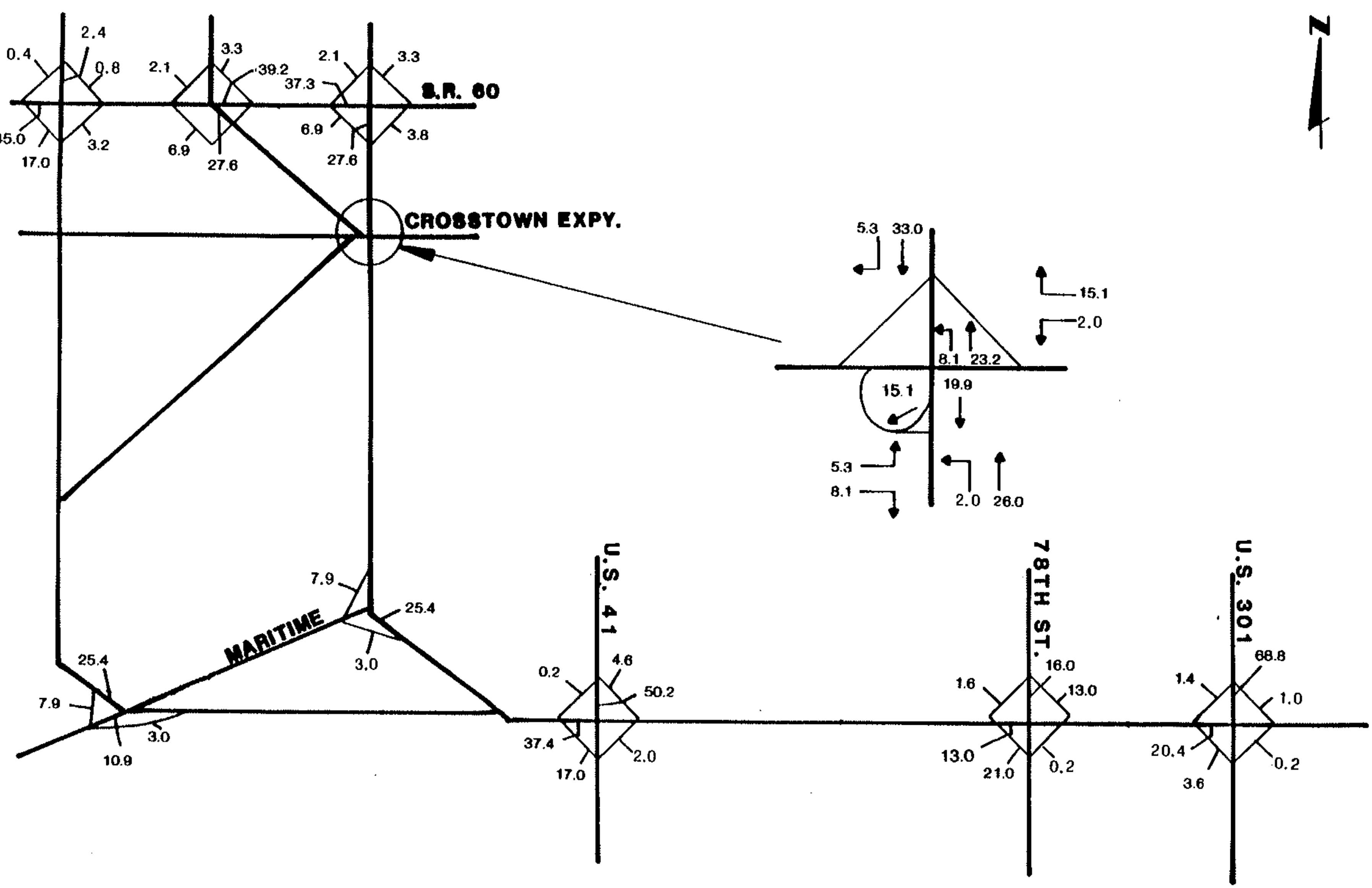
YEAR 1995 FSUTMS TRAFFIC FORECASTS

FIGURE 6–7



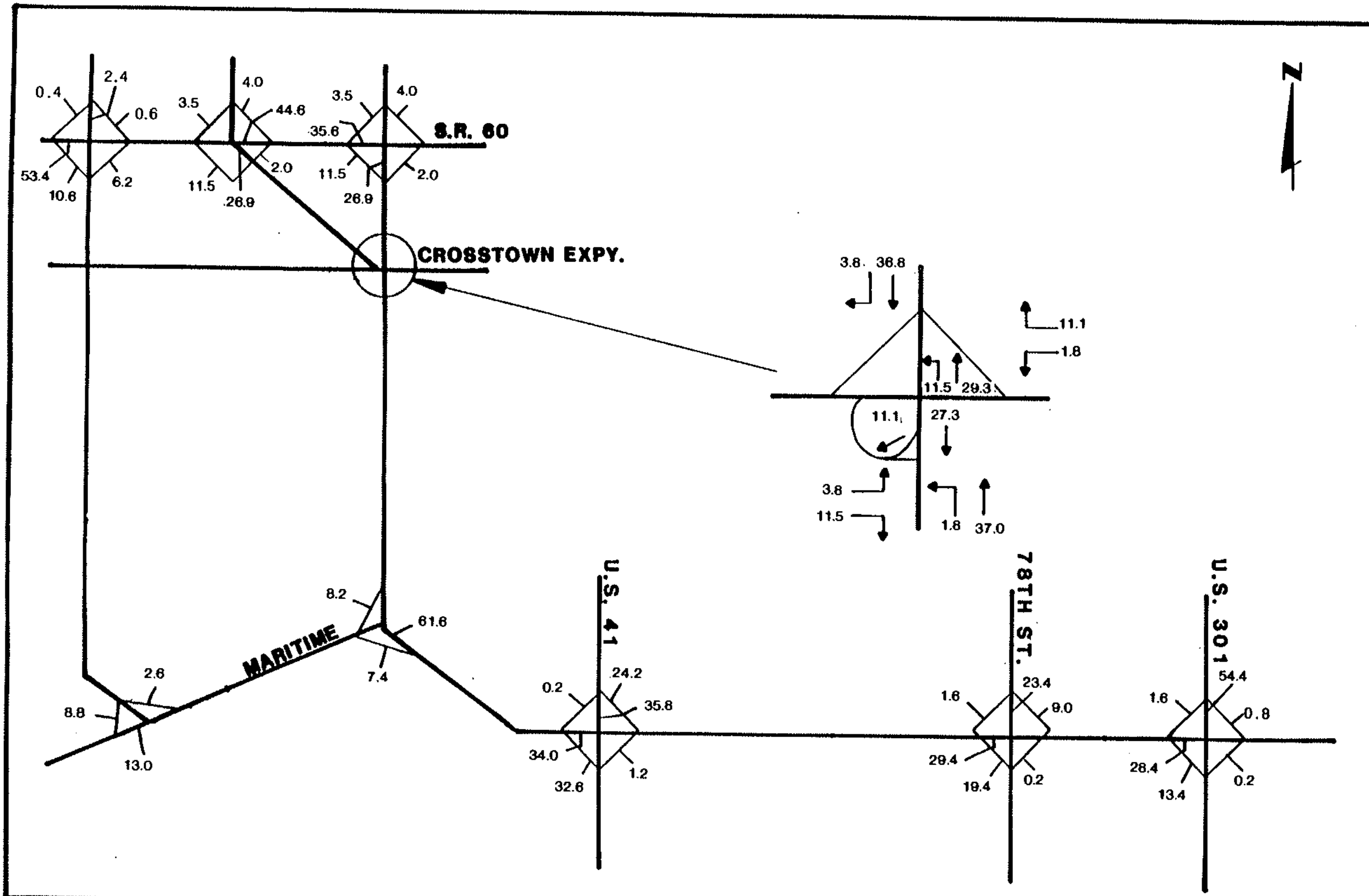
YEAR 2015 PROJECTED SYSTEMS TRAFFIC
22nd Street Causeway Alternative T

FIGURE
6–8

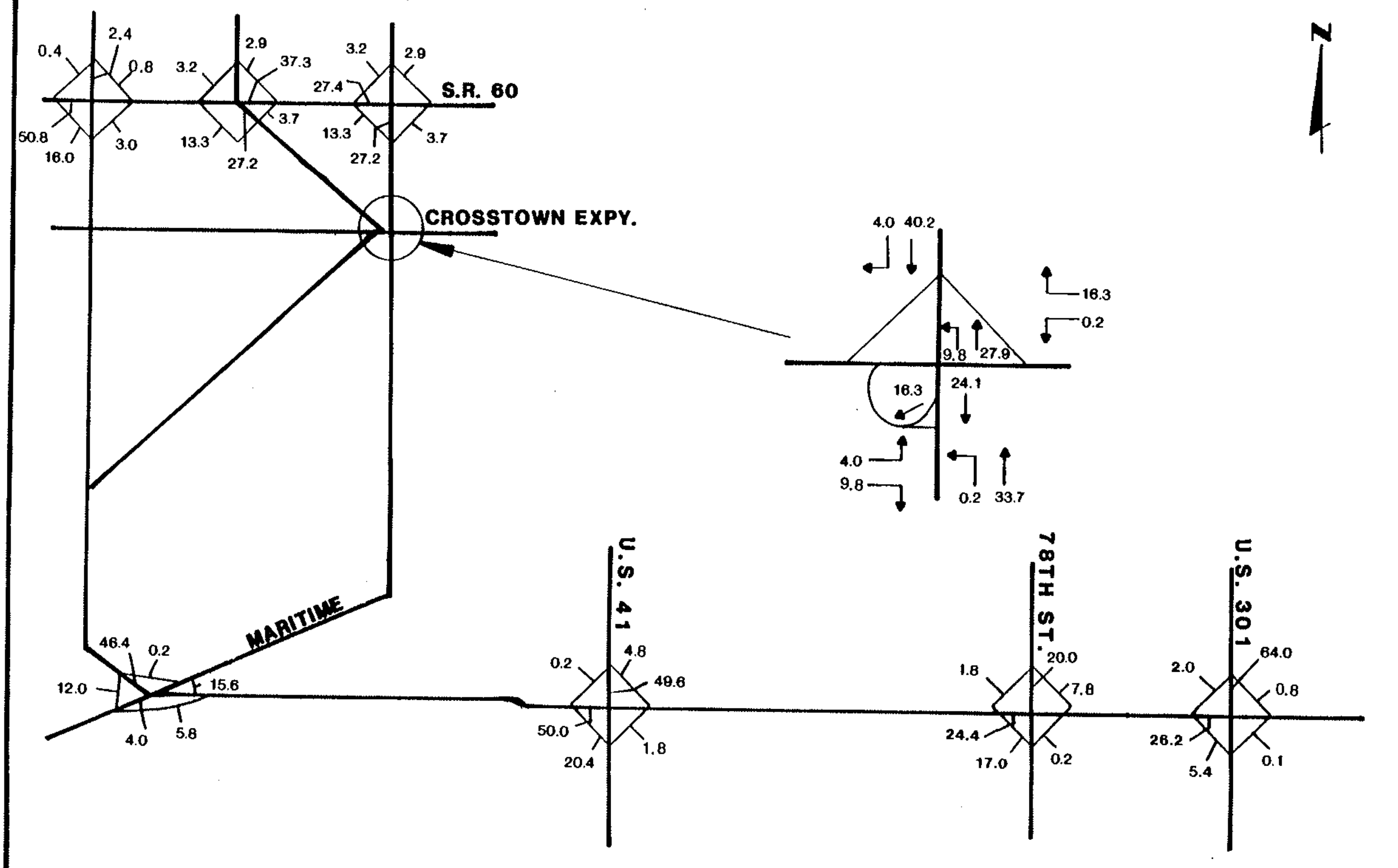


YEAR 2015 PROJECTED SYSTEMS TRAFFIC
22nd Street Causeway Alternative V

FIGURE
6-9

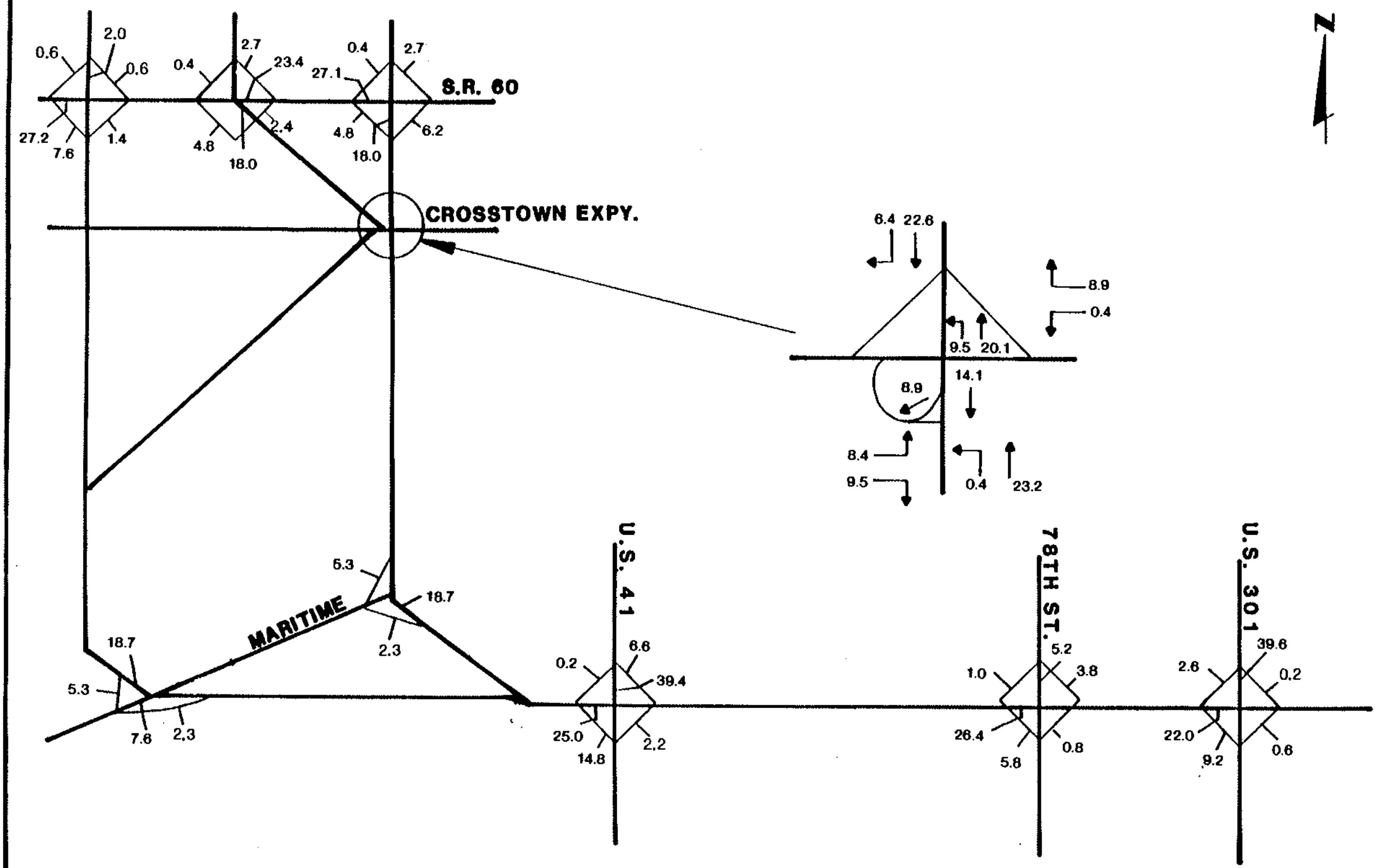


YEAR 2015 PROJECTED SYSTEMS TRAFFIC 22nd Street Causeway Alternative W	FIGURE 6–10



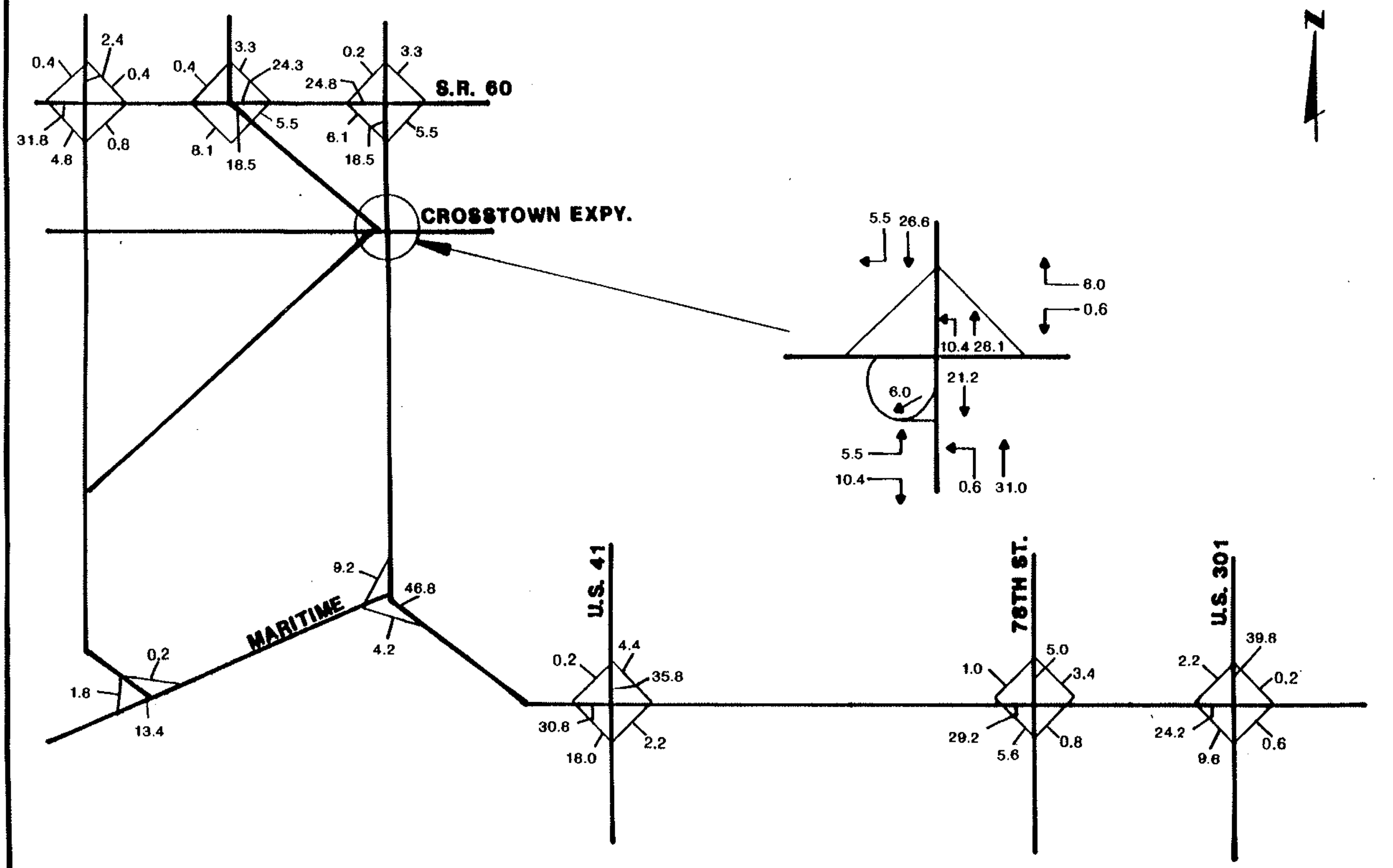
YEAR 2015 PROJECTED SYSTEMS TRAFFIC
22nd Street Causeway Alternative X

FIGURE 6–11



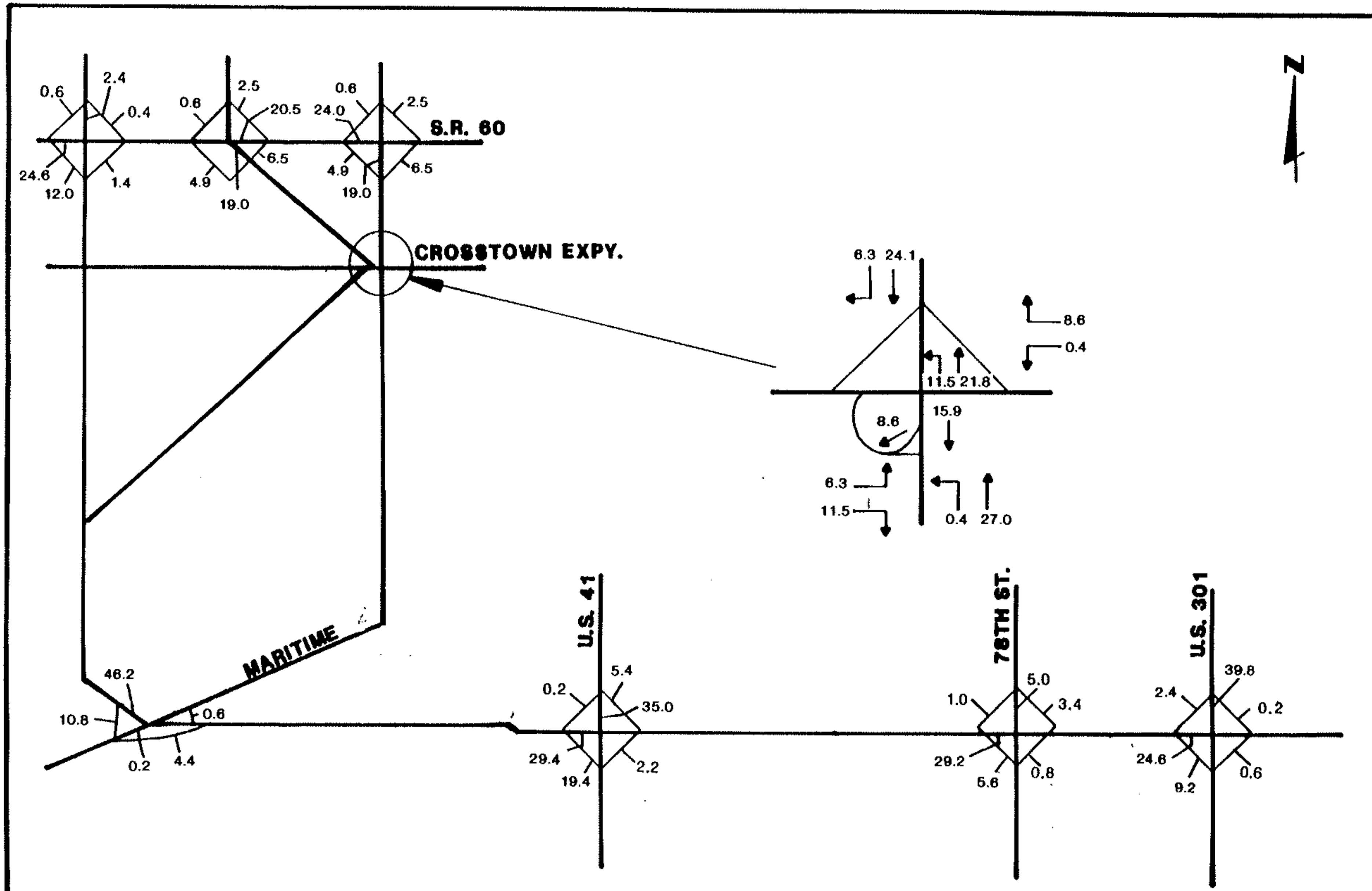
YEAR 1995 PROJECTED SYSTEMS TRAFFIC
22nd St. Causeway Alternative V

FIGURE
6–12



YEAR 1995 PROJECTED SYSTEMS TRAFFIC
22ND STREET CAUSEWAY ALTERNATIVE W

FIGURE
6–13



YEAR 1995 PROJECTED SYSTEMS TRAFFIC
22ND STREET CAUSEWAY ALTERNATIVE X

FIGURE
6–14

Table 6-1
Existing Corridor Level-Of-Service

Street Segment	LOS "D"		
	Signals Per Mi.	Service Volume	Generalized L.O.S.
21st St., S.R. 60 to Crosstown Expwy.	3.00+	16,200	B
22nd St., Crosstown Expwy. to S.R. 60	3.00+	16,200	D
22nd St., Crosstown Expwy. to Maritime Blvd.	0.96	15,300	F
McKay Bridge/Causeway	0.42	34,900	A
Causeway Blvd., U.S. 41 to U.S. 301	0.94	15,300	B-D

Source: FDOT Generalized Daily Level of Service Maximum Volumes for Florida's Urban/Urbanized Areas, FDOT, 1988.

Signalized intersection capacity analyses were performed using a computerized software package based on the 1985 Highway Capacity Manual. Based on those analyses existing intersection levels of service have been summarized in Table 6-2. Design year levels of service are shown in Table 6-3, with the computed level of service south of the Crosstown Expressway providing an acceptable level of service.

Capacity analyses were also conducted to determine the number of through lanes which will be required along each section of the 22nd Street Causeway/Causeway Boulevard corridor. The 1985 Highway Capacity Manual software was used and a summary of the analysis results is provided in Appendix C of the Traffic Methodology Technical Memorandum. Each segment of the facility was analyzed to determine the lane requirements necessary to maintain Level of Service D. The results for network Scenario V are summarized in Table 6-4.

Table 6-2
Existing Intersection Level-Of-Service

Street	Intersection Street	Level-of-Service	
		AM Peak	PM Peak
20th Street	S.R. 60	C	C
21st Street	S.R. 60	B	B
22nd Street	S.R. 60	B	B
22nd Street	Crosstown Expressway northside ramps	B	B
22nd Street	Crosstown Expressway southside ramps	A	A
20th Street	Maritime Boulevard	B	B
22nd Street	Maritime Boulevard	B	B
Causeway Blvd.	U.S. 41	C	C
Causeway Blvd.	78th Street	B	B
Causeway Blvd.	U.S. 301	C	D

Table 6-3
Design Year Intersection Level-Of-Service

Street	Intersection Street	Level-of-Service	
		AM Peak	PM Peak
20th Street	S.R. 60	C	C
21st Street	S.R. 60	D	E
22nd Street	S.R. 60	E	D
22nd Street	Crosstown Expressway northside ramps	C	D
22nd Street	Crosstown Expressway southside ramps	B	C
20th Street	Maritime Boulevard	B	B
22nd Street	Maritime Boulevard	C	C
Causeway Blvd.	U.S. 41	D	D
Causeway Blvd.	78th Street	D	D
Causeway Blvd.	U.S. 301	D	D

Table 6-4
Design Year Corridor Lane Requirements

Scenario		S.R. 60 to Crosstown	Crosstown to Maritime	Maritime to U.S. 301
		No. of Thru Lanes	No. of Thru Lanes	No. of Thru Lanes
V	3-lane one-way north of Maritime	4	3	3
W	6-lane two-way north of Maritime	4	3	3
X	6-lane two-way on 20th street north of Maritime	4	3	3

SECTION 7
ALTERNATIVE ALIGNMENT ANALYSIS

To develop an improved roadway facility for the 22nd Street Causeway/Causeway Boulevard corridor that is in the best overall public interest, engineering, environmental, and economic factors as well as urban development conditions must be taken into consideration. The improved facility should be designed to safely and efficiently accommodate bicycle and pedestrian traffic as well as projected future year motor vehicle traffic. The design and alignment of the improved facility must consider sensitive environmental conditions and areas. In addition, historic structures and/or districts, as well as potential hazardous waste/material sites, should be avoided where possible. The alignment should be placed so as to optimize the possibilities for construction staging and maintenance of traffic. Access control techniques to promote safe and efficient operation should be used. These criteria have a direct bearing on the selection of the preferred design concepts.

Included in the following sections are the roadways and structure alternative concepts developed for the improvement of 22nd Street Causeway/Causeway Boulevard, preceded by the "No Project" alternative.

7.1 NO PROJECT ALTERNATIVE

The "No Project" alternative, is included to provide a basis of comparison to build alternatives as well as evaluate the effect of widening the 22nd Street Causeway/Causeway Boulevard corridor. Certain advantages and disadvantages would be associated with the implementation of the No Project alternative.

The advantages of the No Project alternative include:

- No new construction costs.
- No disruption to the existing land uses due to construction activities.
- No right-of-way acquisitions or relocations.
- No new environmental impacts.
- No impact on the Palmetto Beach area, including the proposed historic district.

The disadvantages of the No Project alternative include:

- Unacceptable levels of service on the existing roadway network.
- Increased traffic congestion causing increased road user costs due to travel delay.
- Decreased economic development, including to the Port of Tampa - a facility with significant regional impact.
- No enhancement in emergency service response time
- Deterioration of air quality caused by traffic congestion and delays

Postponement of the project may jeopardize its future economic feasibility due to the current escalation of construction and right-of-way costs. Delays in project construction allow for land development to occur within the project area which in turn can escalate land values and increase potential business damages. The upgrading of existing parallel facilities would be more costly due to the greater level of development in those corridors. Also, the Port of Tampa would receive little or no benefit from enhancements outside of the 22nd Street project corridor.

7.2 STUDY ALTERNATIVES

The purpose of this study, as stated in Section 1, is to determine the improvements necessary to accommodate existing and future traffic in a safe and efficient manner. This section develops and evaluates the recommended alternatives presented in the Corridor Analysis section of this report.

7.2.1 Project Segmentation

Several factors, including the physical layout of the project corridor, allow for segmenting the project into North and East Sections. The separation of this project into two segments allows for simplified analysis of the facility. Unique typical sections based upon different design speeds have been developed for the two sections and will be described in sections that follow.

The North Section lies between S.R. 60 and the north end of the 22nd Street Causeway bridge over McKay Bay, with traffic running in a north-south direction. The surrounding area is primarily residential, with some commercial and light industrial businesses interspersed along 22nd Street. This section would be characterized as urban with existing curb and gutter and posted speeds of 30-35 mph. Also, due to right-of-way constraints in the North Section, a proposed one-way pair alternative has been evaluated. Consideration of this option is unique to the North Section.

The North Section is further subdivided for ease of analysis into two segments as follows:

N-Segment 1 - S.R. 60 to Durham Street
N-Segment 2 - Durham Street to north side of McKay Bay Bridge

N-Segment 1 is common to all alignment alternatives. N-Segment 2 offers three different alignments with a common northern terminus at the intersection of Durham and 22nd Streets.

The area between the McKay Bay Bridge (inclusive) and U.S. 301 will be referred to as the East Section throughout the remainder of this report. The density of development decreases in this area and the roadway becomes rural in nature with roadside ditches and the posted speed of 45 mph.

The East Section is also subdivided according to geographic features and the levels of development on adjacent properties. The East Section is divided into the following segments:

E-Segment 1 - McKay Bay Bridge to 45th Street
E-Segment 2 - 45th Street to 54th Street
E-Segment 3 - 54th Street to Maydell Drive
E-Segment 4 - Maydell Drive to U.S. 301

E-Segment 1 will require no additional right-of-way. E-Segment 2 is located through a highly constrained corridor centered about U.S. 41. E-Segments 3 and 4 are located in less constrained areas with varying intensities of development.

7.2.2 Design Speed

Design speed is the maximum safe speed that can be maintained over a specified section of highway when conditions are so favorable that the design features of the highway govern.[1] At the onset of a roadway design project, the engineer must select a value

[1] AASHTO Pg 63

compatible with existing topography, land use and highway classification to ensure safe and efficient travel. Posted speeds are typically 5 to 10 mph lower than design speeds.

The North Section of the project is a highly urbanized area with a very narrow right-of-way width. The building setback distance (from right-of-way line to face of structure) is often under ten feet and sometimes down to zero. A design speed of 40 mph has been established for this section of the project, allowing for a 35 mph posted speed. The eastern section of the project is less developed and has more available right-of-way. A design speed of 45 mph has been established for this section of the project, the maximum for urban typical section design. The higher design speed is consistent with driver expectation.

7.2.3 Alternative Typical Sections

The primary considerations used in developing proposed typical section alternatives for 22nd Street Causeway/Causeway Boulevard were:

- existing typical section features
- existing right-of-way and land use types
- adherence to acceptable design standards and laneage provisions to meet future demands.
- minimizing right-of-way impacts
- accommodations for bicyclists and pedestrians.

Alternative typical sections were developed for each of the two project study sections. All typical sections presented meet or exceed FDOT's minimum roadway design standards. Refinements to these typical sections may be required during the design phase because variations in topography may necessitate the acquisition of additional land in which to grade to meet the existing ground.

North Section

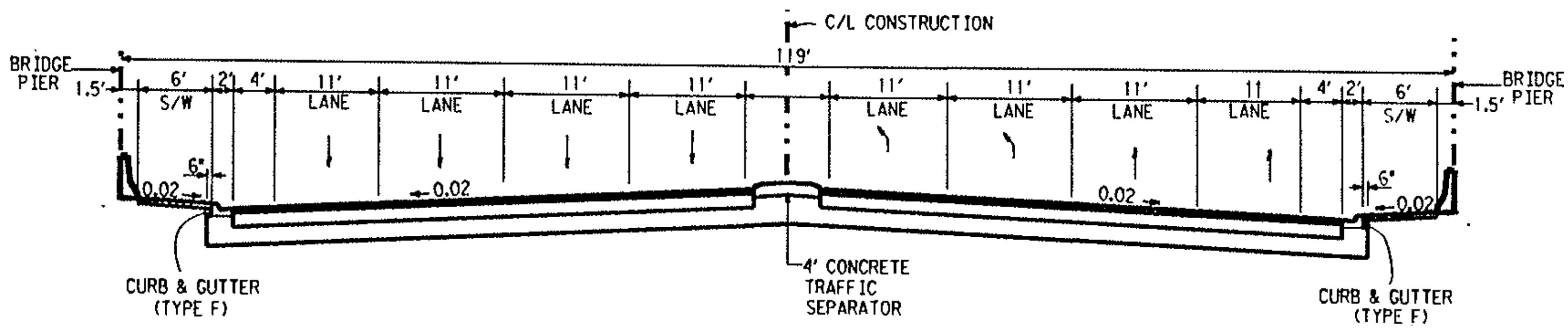
Although the roadway cross-section beneath the Crosstown Expressway is atypical, it must be addressed to demonstrate the sufficiency of the existing Expressway Bridge over 22nd Street.

Future traffic demands have indicated that four lanes in each direction, some of which may be exclusive turn lanes, are required from the Crosstown Expressway to S.R. 60. The existing right-of-way in this area is 116 feet. The useable width from pier to pier (inside face) is approximately 119 feet, therefore 119 feet was used in developing the specific cross-section. As shown in Figure 7-1, all lanes would be decreased in width to 11 feet each to reduce the overall section width. 4 foot outside lanes will be provided to accommodate bicycle traffic. Due to the proximity of the existing bridge piers, a barrier wall would be provided at the back of the sidewalk/face of pier. The pier-pier distance would require additional widening of 21 feet in order to provide 12-foot-wide lanes and a desirable 16 foot clear distance to the bridge piers. An order of magnitude cost estimate has determined the additional cost to be $1.6 million, therefore, eliminating this option as it would not be cost effective.

As a result of the above analysis, two basic typical section options have been developed for the North Section of the project:

- a six-lane divided facility, and
- a three-lane one-way pair.

The six-lane divided typical section alternative (Figure 7-2) retains most of the elements developed for the one-way pair options. The six-lane option utilizes a 22-foot-wide raised median between three-lane roadway sections. Advantages of a 22-foot-wide raised median include:



TYPICAL SECTION @ CROSSTOWN EXPRESSWAY

6-LANE DIVIDED

N.T.S.

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY	TYPICAL SECTION - CROSSTOWN EXPRESSWAY	FIGURE NO. 7-1

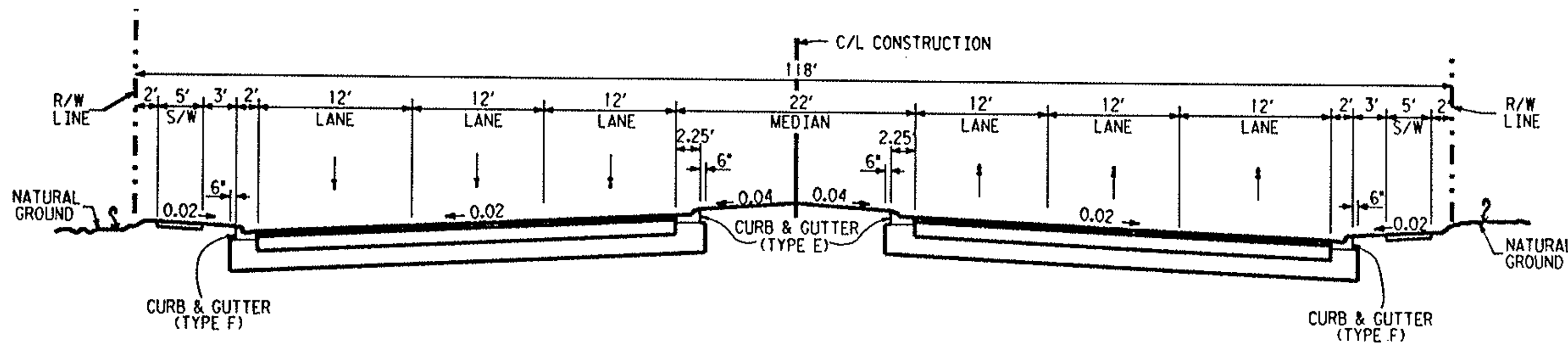
- Access management can be facilitated
- The raised median can be replaced with an exclusive left turn lane and 8-foot traffic separator where necessary
- Adequate refuge is provided for a pedestrian crossing the roadway.
- Landscaping can be added for beautification.
- Passenger cars can also use the median (where paved) for refuge in crossing maneuvers.

The three-lane one-way pair option (Figure 7-2) consists of two standard 12-foot-wide lanes and a 14-foot-wide outside lane to accommodate bicycle traffic. Six-foot-wide sidewalks are adjacent to the two foot curb and gutter. A two-foot utility and grading strip is provided behind the sidewalk, bringing the total right-of-way width to 58 feet. The one-way pair concept has been developed in an effort to minimize right-of-way requirements along a very narrow corridor (22nd Street) with a typical right-of-way width of 50 feet.

Note: This option was eliminated from consideration prior to issuance of FDOT Design Bulletin 93-3, therefore it does not include exclusive 4 foot bicycle lanes.

McKay Bay Bridge

The Existing Conditions Bridge Report (1991) prepared as part of this PD&E study established the suitability for widening of the 22nd Street Causeway Bridge over McKay Bay. The proposed bridge typical section for each of the twin spans consists of 36 feet of travel lanes with eight-foot-wide shoulders on each side for disabled vehicles. Bicyclists will be able to utilize the eight-foot outside shoulder for their travel needs. Beyond the outside shoulder, roadway elements shall include a single sided barrier wall, a five-foot wide sidewalk and a barrier with pedestrian handrail. Sidewalks are required on the bridge as this is a curb and gutter project and sidewalks are included in adjacent section of this project. Pedestrian handrails, which prevent sidewalk users from falling



6-LANE DIVIDED OPTION

N.T.S.

*NOTE: BICYCLE LANES PROVIDED ON PARALLEL FACILITY (22ND ST.)

PROJECT

22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

TYPICAL SECTION
S.R. 60 TO MARITIME BOULEVARD

FIGURE NO.
7-2

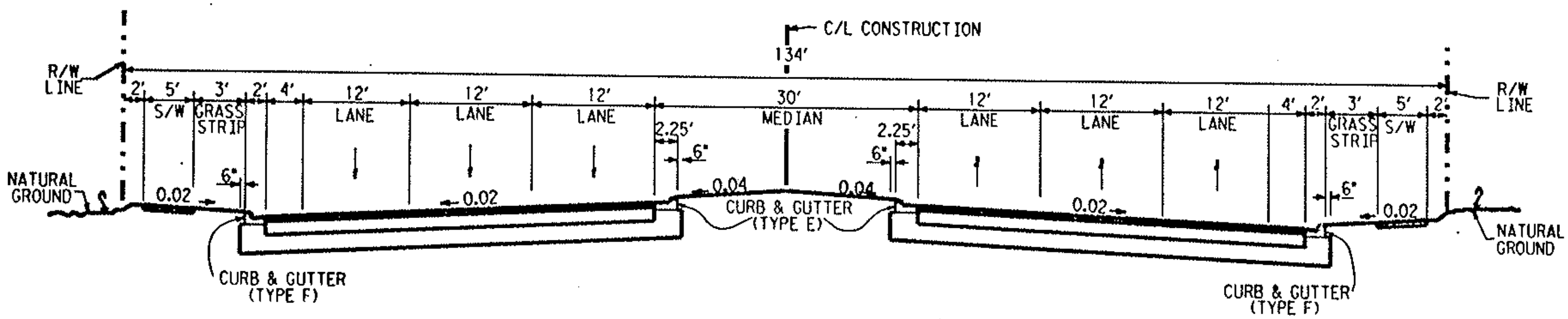
off the structure may be either the one or two-rail type. One rail is used if fishing is allowed from the bridge.

A detailed discussion of all proposed bridges including typical sections can be found in Section 8.21.

East Section

The East Section typicals are subject to different constraints as the design speed is higher and this section is less constrained by adjacent land uses. The East Section typicals include three-foot-wide grass strips between the curb and sidewalk. This provides additional clearance protection for pedestrians from vehicles traveling at higher speeds. It also provided an expanded area for utility construction and relocation. Median widths vary and sidewalk widths are five feet, the FDOT standard when the sidewalk is not adjacent to the curb. The typical sections developed for the East Section are presented in Figure 7-3.

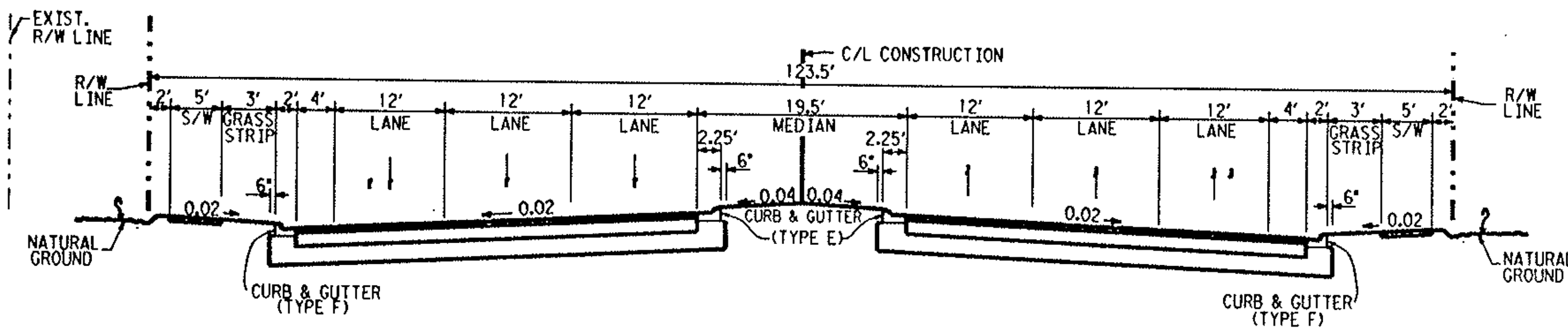
A six-lane divided section continues south of the existing bridge. Approximately 3/4 mile of roadway lies on a narrow strip of fill, surrounded on both sides by McKay Bay, with wetlands along the shorelines. The proposed typical section (Figure 7-3) has been constrained in this area to minimize adverse impacts. This width reduction has been facilitated by using a 19.5 foot median instead of a 30-foot median. Other features include a four-foot bike lane, a three-foot grass strip between curb and a five-foot-wide sidewalk as well as a two-foot area behind the sidewalk. The total right-of-way width is 123.5 feet, and the typical is intended for use in areas where sizeable, high quality wetlands are impacted. Additional land may be needed to accommodate special design features, including retaining wall and/or the inclusion of rip-rap for shoreline stabilization. These issues are addressed in detail in the drainage section of this report. Existing right-of-way between the bridge and 45th Street is sufficient for the proposed roadway. From 45th Street to U.S. 301, the existing right-of-way is typically 100 feet wide.



22ND ST. BRIDGE TO U.S. 301

6-LANE DIVIDED
N.T.S.

EXCEPTIONS: 1. CAUSEWAY SECTION
2. 45TH ST. TO 54TH ST.



CAUSEWAY, SOUTH OF 22ND STREET BRIDGE (WETLAND CONSTRAINED)
45TH ST. TO 54TH ST.

6-LANE DIVIDED
N.T.S.

PROJECT		FIGURE NO.
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY	TYPICAL SECTIONS - EAST SECTION	7-3

Beyond the wetland limits, the typical section widens to 134 feet, which is due to a desirable widened median of 30 feet (Figure 7-3). The wider median provides a greater physical separation between opposing travel lanes and it can accommodate dual left turn lanes should they be required in the future. This typical section extends to the project limits at U.S. 301, except for the segment between 45th Street and 54th Street. This segment is constrained by extensive commercial development as well as the need for additional turn lanes at the U.S. 41 interchange. The proposed typical section for this segment will be identical to the section on the causeway.

7.2.4 Development of Preliminary Alignment Alternatives

The development of preliminary alignment alternatives is dependent upon three basic issues: environmental impacts, socioeconomic considerations and engineering design constraints. These issues are strongly interrelated, resulting in a developmental process that requires several iterations. Major environmental considerations include relative impacts to:

- Wetlands
- Floodplains
- Wildlife/Threatened and Endangered Species
- Natural and Cultural Features, including Historical Areas
- Community Services
- Farmlands
- Potential Contamination
- Air Quality
- Noise Impacts
- Water Quality

Engineering issues of importance include:

- Highway Design Geometric Criteria
- Drainage and Stormwater Management
- Access Management
- Interchange Types and Locations
- Maintenance of Traffic and Constructability
- Geotechnical Considerations

Socioeconomic Considerations included:

- Business and residential impacts, including relocations
- Construction Costs
- Right-of-way Costs
- Sensitivity to Utility Relocation Costs

As discussed in Section 5, the following three alternatives have been developed for the North Section of the project:

- A six-lane divided roadway on 22nd Street
- A six-lane divided roadway on 20th Street
- A three-lane one-way pair on 20th and 22nd Streets

These three alternatives have been further subdivided by evaluating east, center and west alignments. The east alignment, for example would acquire all right-of-way along the east side of the corridor only. East and west options are typically evaluated to minimize the costs associated with right-of-way acquisition. This is especially applicable in a densely developed area such as Palmetto Beach, where relatively narrow individual lot widths result in a large number of affected parcels. The center alignment also merits investigation in most instances as it may substantially reduce the number of relocations and/or the amount of business damages.

The East Section of the project has only two typical sections, consisting of a six lane divided roadway along the existing roadway corridor with a median width of either 19.5 or 30 feet. Existing right-of-way of 130 feet or greater is adequate to accommodate six lanes from the 22nd Street Bridge to 45th Street. Beyond that point, existing right-of-way is typically 100 feet wide. Therefore, north, center and south alignments have been analyzed to optimize the location of right-of-way acquisition.

7.2.5 Evaluation and Reduction of Preliminary Alignment Alternatives

An analysis of the first-cut preliminary alignments was conducted to determine if any of these initial alternatives exhibited characteristics that would eliminate them from further consideration. The level of detail applied was that of a "fatal flaw analysis," which involves a review of existing data to identify any major alignment characteristics or parameters that do not meet acceptable criteria.

The alignments for each design scenario were examined for major deficiencies. This analysis resulted in the elimination of alignments in each of the three sections of the project. A summary of these deletions follows.

The N-Segment 1 of the project begins at S.R. 60 and follows an alignment beneath the Crosstown Expressway to Durham Street. As noted in Section 7.2.3, the only cost effective alternative is to utilize the existing Expressway Bridge over 22nd Street.

N-Segment 2 begins at Durham Street and continues to the north end of McKay Bay Bridge. South of Durham Street, two alternative alignments which were analyzed and eliminated used the existing 20th Street corridor. The 20th Street west or center alignments would involve acquiring land from gasoline tank farms located on the west side of the street. Relocating the tank farms would add at least $10 million to the project due to environmental considerations and extremely high business damage costs. This high cost resulted in the elimination of these two alignments as feasible alternatives (right-of-way cost estimated by FDOT District 7).

The use of the existing Crosstown Expressway interchange at 22nd Street, in conjunction with the 20th Street corridor requires that crossovers be used between streets. A possible corridor for the northern crossover is located between 22nd and 20th Streets south of Durham Street, where a relatively undeveloped parcel exists.

To the south, beyond the proposed historic district, the proposed facility must swing back towards 22nd Street and its connection to the McKay Bay Bridge. A potential location for this southern connection, which was eliminated, considered a crossover centered around Elmwood Street leaving the Port of Tampa entrance/Maritime Boulevard configuration intact. However, a high number of relocations as well as a significant severance of community cohesion caused this alignment to be considered "fatally flawed" and resulted in it being eliminated from further consideration.

The remaining viable alternative alignments connect to 22nd Street in the vicinity of Maritime Boulevard. Since these alignments are at the southern end of the Palmetto Beach neighborhood, the character and cohesion of the community is only minimally impacted. In designing the Maritime Boulevard intersections at both 20th and 22nd Streets, consideration has been given to the business on the northside of Maritime Boulevard. Location and visibility are critical for this business site which is impacted to varying degrees depending on the design alternative proposed. Although each crossover alternative necessitates modifications to this site, the resultant parcel size is comparable in all cases.

The E-Segment 1, from the McKay Bay Bridge to 45th Street has an existing right-of-way which is adequate for planned widening. Several major electric transmission poles exist along the north/east side of the right-of-way. In addition, the wetland encroachments are considerably longer and of higher quality on the north/east side of the causeway. For these reasons, the single alignment under consideration in this area has been shifted to the south/west side of the existing corridor.

E-Segment 2 between 45th and 54th Streets is a highly constrained area. North and south options would require numerous relocations, severe business damages and possible hazardous materials or petroleum involvement. The center option would not necessitate any relocations outside of the U.S. 41 interchange footprint, thereby justifying the elimination of the north and south options.

The alternative alignments to be considered further are summarized below and depicted on Figures 7-4 through 7-6.

Figure 7-4: (N-Segment 2) six-lane divided roadways, Durham to McKay Bay

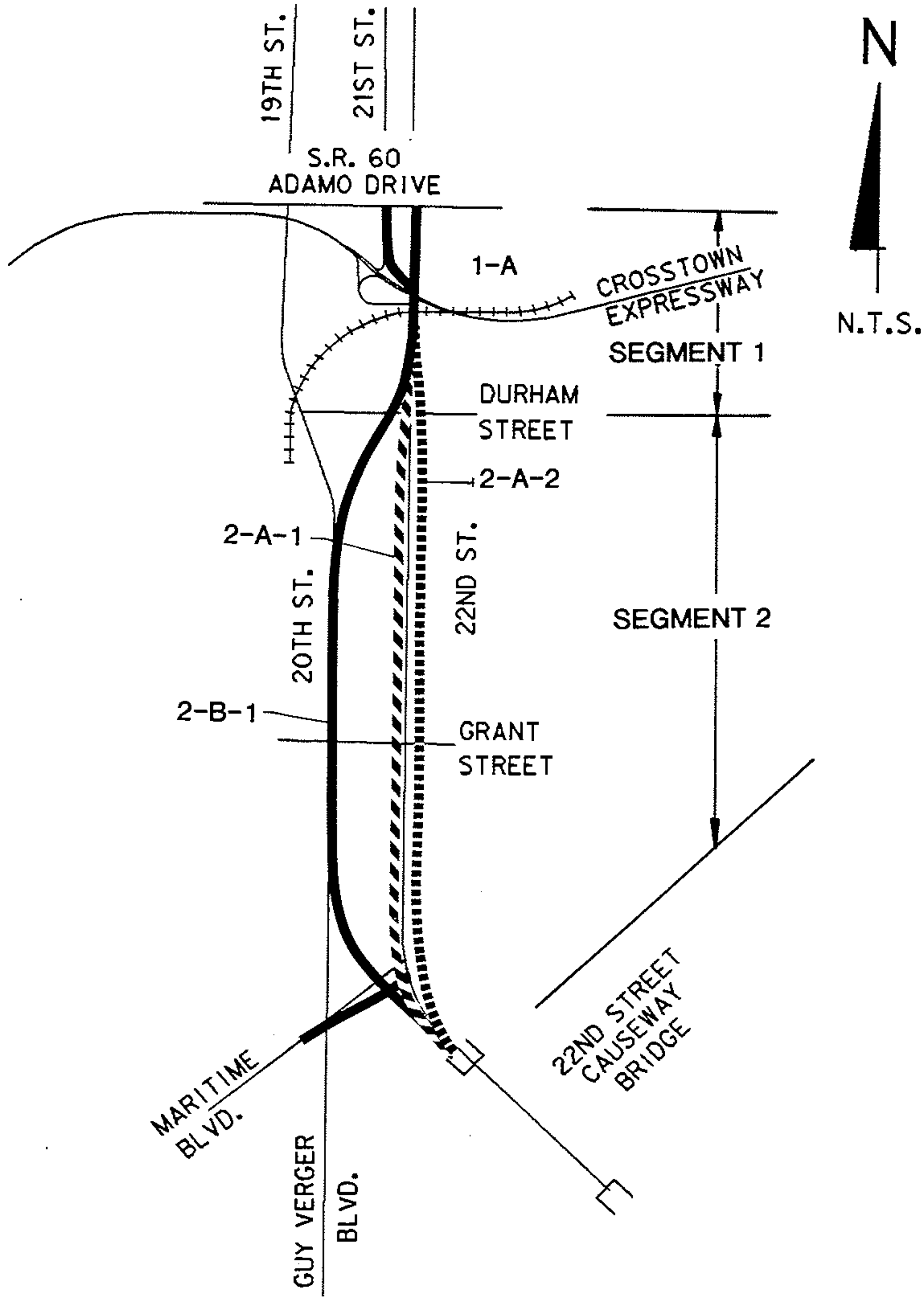
- 22nd Street, west option (2-A-1), east option (2-A-2)
- 20th Street, east option only (2-B-1)

Figure 7-5: (N-Segment 2) three-lane one-way pair, Durham to McKay Bay

- 22nd Street, west option (2-C-1a), center option (2-C-1b), east option (2-C-1c),
- 20th Street, east option only (2-C-2a)

Figure 7-6: (E-Segment) six-lane divided roadways, McKay Bay to U.S. 301

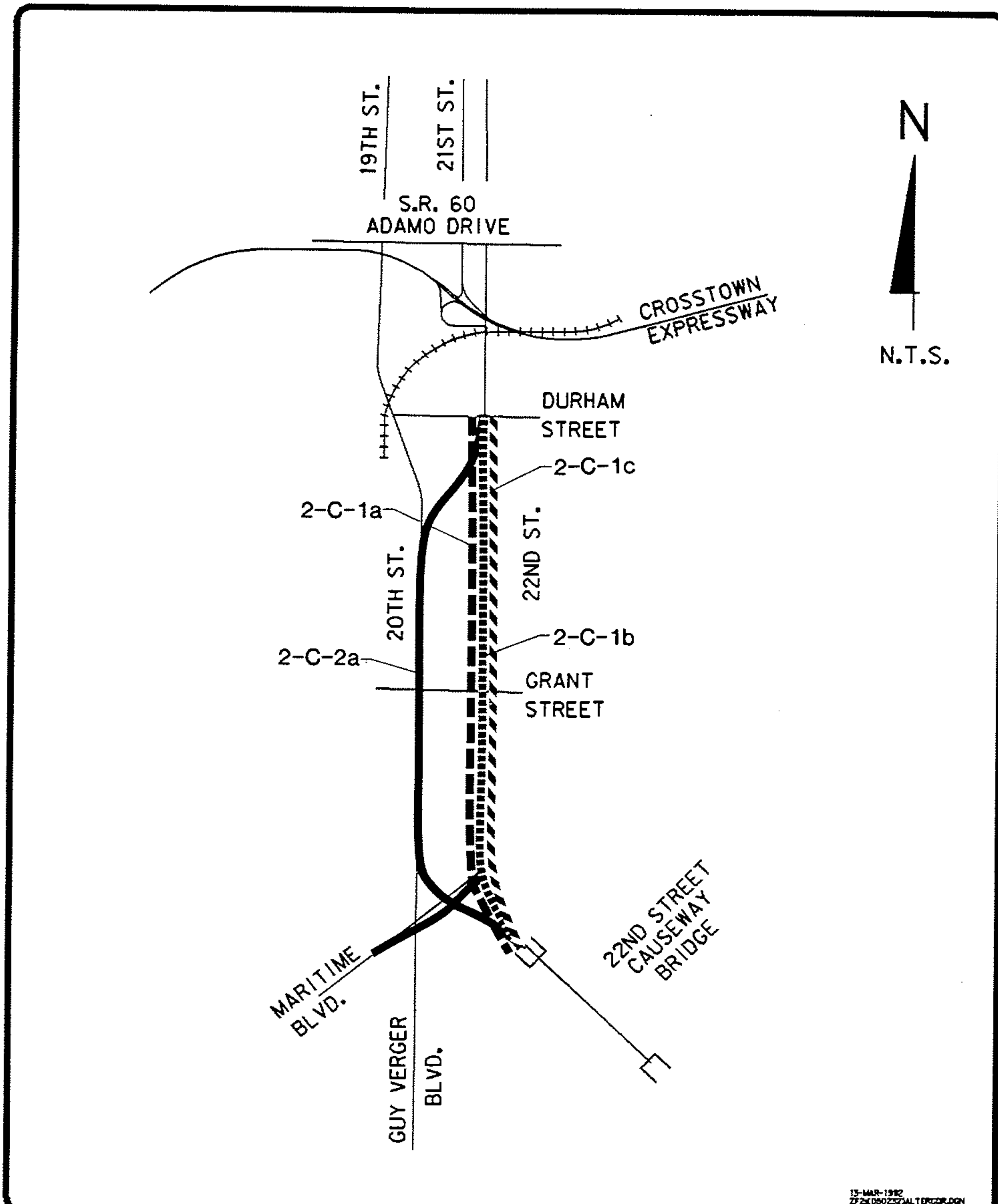
- McKay Bay to 54th Street, center option only
- 54th Street to U.S. 301, north option (3-A and 4-A), center option (3-B and 4-B), south option (3-C and 4-C)



PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

ALTERNATIVE ALIGNMENTS
NORTH SECTION
6-LANE DIVIDED

FIGURE NO.
7-4



PROJECT

22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD

(S.R. 676)

PD&E STUDY

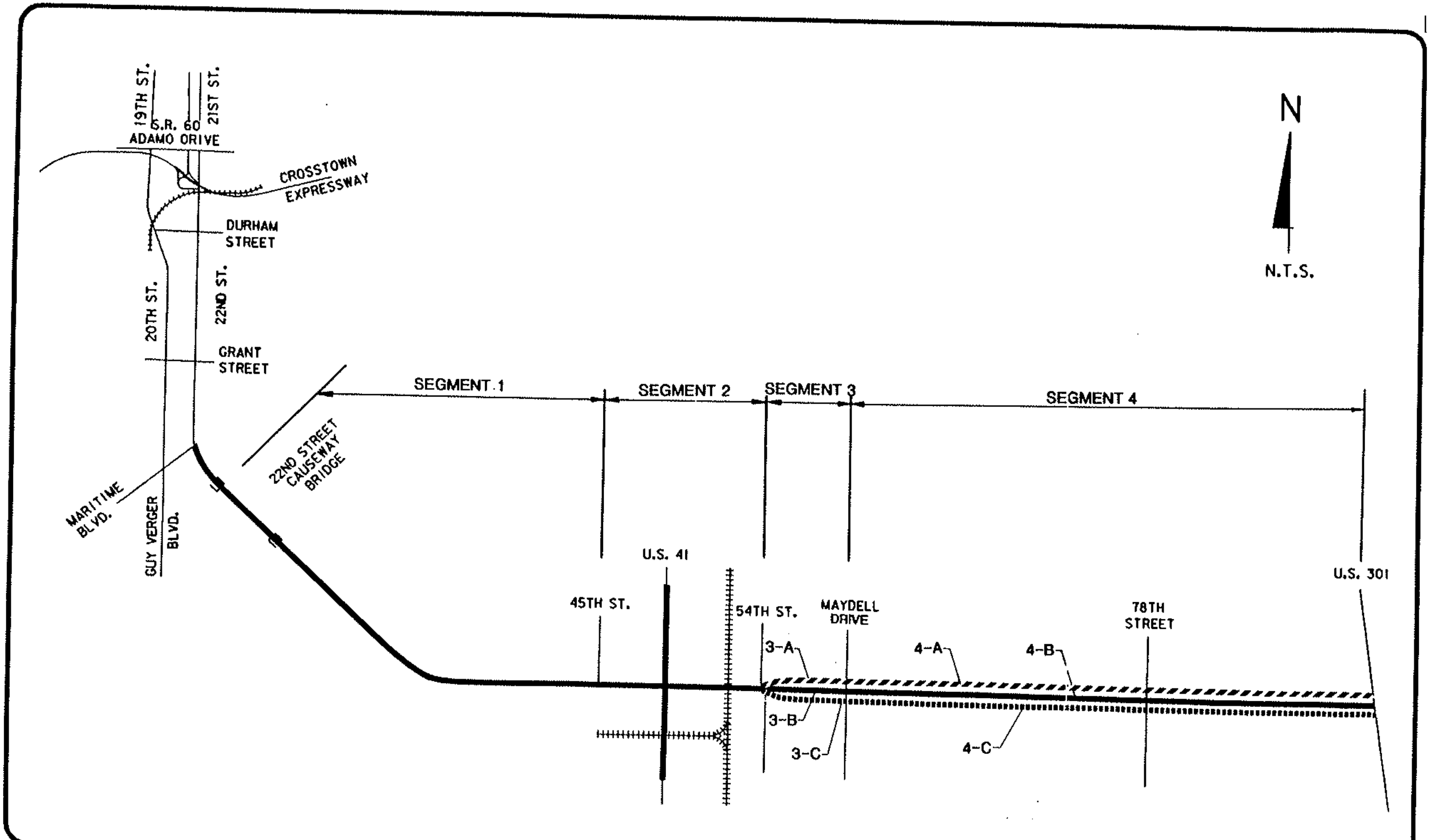
ALTERNATIVE ALIGNMENTS

NORTH SECTION

3-LANE 1-WAY PAIRS

FIGURE NO.

7-5



PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY

ALTERNATIVE ALIGNMENTS
EAST SECTION
6-LANE DIVIDED

FIGURE NO. 7-6

7.3 ALTERNATIVES EVALUATION MATRIX

An evaluation matrix was developed to provide a relative means of comparing the preliminary alignment alternatives previously described and shown on Figures 7-4 through 7-6 (see Table 7-1). In developing the matrix, it was necessary to select a finite number of evaluation criteria that would address a cross section of pertinent environmental and engineering categories. The left column of the matrix identifies the project segmentation and the viable alternative alignments that are being analyzed. A brief description of these criteria is given below:

7.3.1 Length of Alignment

This element involved calculating the centerline length of an alignment in miles. It is a major contributing factor in determining the overall cost of an alignment.

7.3.2 Right-of-Way Requirements

Roadway right-of-way required was tabulated for the proposed typical section widths, turning radii for side street connections as well as land needed to provide adequate motorist sight distance.

The drainage and mitigation right-of-way required was estimated and tabulated for the pond facilities, wetland mitigation sites and floodplain compensatory storage sites.

7.3.3 Cost Estimates

Preliminary construction cost estimates were developed for the various alignments using the unit costs presented in Appendix F. Costs were prepared using the FDOT Long Range Estimates Manual as a guide. FDOT estimating software will be utilized for estimates presented in subsequent drafts of this report.

TABLE 7-1

PRELIMINARY EVALUATION MATRIX
22nd STREET CAUSEWAY / CAUSEWAY BOULEVARD PD&E STUDY
HILLSBOROUGH COUNTY
W.P.I. No. 7113839
STATE PROJECT No. 10250-1525
F.A.P. No. M-1802-(1)

ALIGNMENT ALTERNATIVE	LENGTH (MILES)	REQ'D R.O.W. (ACRES)	DRAINAGE/ MITIGATION R.O.W. (ACRES)	COST ESTIMATE ($ THOUSANDS) CONST.	RIGHT-OF-WAY	PRELIM. ENG.	BUSINESS DAMAGES	RELO-CATION	TOTAL	NO. OF AFFECTED PROPERTY OWNERS	NUMBER OF REQUIRED RELOCATIONS RES.	BUS.	TOTAL	WETLAND IMPACTS (ACRES)	FLOOD-PLAIN CROSSING (MILES)	WILDLIFE IMPACTS	THREATENED OR ENDANGERED SPECIES	4(f) LAND IMPACTS HISTORIC STRUCT-URES	HISTORIC DISTRICT CONTRIB STR'S.	NOISE SENSITIVE SITES	CULTURAL IMPACTS	CONTAM-INATION IMPACTS
NORTHERN SEGMENT #1: S.R. 60 TO DURHAM STREET																						
A. 8 Lanes total on 21st / 22nd St	0.47	1.22	INC BELOW	$1,591.20	$413.00	$159.12	$0.00	$0.00	$2,163.32	6	0	0	0	0	0.34	NONE	NONE	0	0	0	NONE	NONE
NORTHERN SEGMENT #2: DURHAM ST TO NORTH END OF McKAY BAY BRIDGE																						
A. 6 Lane divided on 22nd Street																						
1. Western option	1.15	6.85	6.26	$3,537.90	$6,743.00	$353.79	$200.00	$580.00	$11,414.69	43	25	16	41	1.94	0.95	NONE	NONE	0	12	6	MOD	MOD
2. Eastern option	1.15	6.47	7.22	$3,537.90	$6,636.00	$353.79	$300.00	$701.00	$11,528.69	46	17	15	32	2.26	0.95	NONE	NONE	2	9	6	MOD	LOW
B. 6 Lane divided on 20th Street																						
1. Eastern option	1.22	12.98	6.86	$3,744.10	$5,927.00	$374.41	$700.00	$760.00	$11,505.51	46	11	6	17	2.14	0.98	NONE	NONE	0	0	5	LOW	LOW
C. 3-Lane One-Way Pairs																						
1. 22nd Street (Northbound leg)																						
a. Western option	1.15	1.85	4.10	$2,106.50	$4,425.00	$210.65	$1,200.00	$481.00	$8,423.15	39	15	6	21	1.22	0.95	NONE	NONE	0	11	9	MOD	MOD
b. Center option	1.15	1.12	4.10	$2,106.50	$3,226.00	$210.65	$600.00	$222.00	$6,365.15	70	3	3	6	1.22	0.95	NONE	NONE	1	8	9	MOD	HIGH
c. Eastern option	1.15	1.50	4.10	$2,106.50	$3,609.00	$210.65	$700.00	$488.00	$7,114.15	41	15	9	24	1.22	0.95	NONE	NONE	2	6	9	MOD	LOW
2. 20th Street (Southbound leg)																						
a. Eastern option	1.22	6.71	6.86	$2,230.20	$783.20	$223.02	$100.00	$100.00	$3,436.42	27	3	0	3	2.14	0.98	NONE	NONE	0	0		LOW	LOW
TOTAL, NORTHERN SECTION	1.62 to 2.84	7.69 to 14.20	6.26 to 10.96	$5,129.10 to $5,927.90	$4,422.20 to $7,186.00	$512.91 to $592.79	$200.00 to $1,300.00	$322.00 to $760.00	$11,964.89 to $13,692.01	49 to 103	6 to 25	3 to 16	9 to 41	1.94 to 3.36	1.29 to 2.27	NONE to NONE	NONE to NONE	0 to 2	0 to 12	5 to 12	LOW to MOD	LOW to HIGH
EASTERN SEGMENT #1: McKAY BAY BRIDGE TO 45th STREET																						
A. 6 Lane divided, center	1.77		6.63	$6,093.30	$0.00	$809.33	$0.00	$0.00	$6,902.63	0	0	0	0	2.49	1.84	MOD	LOW	0	0	14	NONE	MOD
EASTERN SEGMENT #2: 45TH STREET TO 54th STREET INCLUDING US 41 INTERCHANGE							* LENGTH ALONG 22nd STREET															
A. 6 Lane divided, center	*0.90		0.83	$14,102.20	$12,128.00	$1,410.22	$300.00	$0.00	$27,940.42	66	7	9	16	0	0.63	NONE	NONE	0	0	3	NONE	LOW
EASTERN SEGMENT #3: 54th STREET TO MAYDELL DRIVE																						
A. 6 Lane divided, northern option	0.53	1.79	1.82	$1,762.30	$1,049.00	$176.23	$100.00	$0.00	$3,087.53	9	0	0	0	0.24	0.04	LOW	LOW	0	0	0	NONE	MOD
B. 6 Lane divided, center option	0.53	1.79	1.82	$1,762.30	$1,174.00	$176.23	$100.00	$0.00	$3,212.53	15	0	0	0	0.24	0.04	LOW	LOW	0	0	0	NONE	HIGH
C. 6 Lane divided, southern option	0.53	1.79	1.82	$1,762.30	$881.00	$176.23	$0.00	$0.00	$2,819.53	6	0	0	0	0.24	0.04	LOW	LOW	0	0	0	NONE	MOD
EASTERN SEGMENT #4: MAYDELL DRIVE TO US 301																						
A. 6 Lane divided, northern option	2.14	7.17	6.82	$6,349.30	$4,280.00	$634.93	$700.00	$72.00	$12,036.23	39	2	2	4	1.15	0.76	LOW	LOW	0	0	7	NONE	MOD
B. 6 Lane divided, center option	2.14	7.17	6.82	$6,349.30	$6,558.00	$634.93	$300.00	$57.00	$13,899.23	94	4	1	5	1.15	1.33	LOW	LOW	0	0	7	NONE	HIGH
C. 6 Lane divided, southern option	2.14	7.17	6.50	$6,349.30	$7,095.00	$634.93	$900.00	$233.00	$15,212.23	52	15	10	25	1.71	1.33	LOW	LOW	0	0	7	NONE	MOD
TOTAL, EASTERN SECTION	5.34 to 5.34	8.96 to 8.96	18.10 to 19.78	$30,307.10 to $30,307.10	$17,289.00 to $20,397.00	$3,030.71 to $3,030.71	$600.00 to $1,300.00	$57.00 to $233.00	$51,283.81 to $55,287.81	116 to 116	9 to 9	11 to 11	20 to 20	3.66 to 3.66	3.27 to 3.27	NONE to MOD	NONE to LOW	0 to 0	0 to 0	24	NONE	LOW to HIGH
PROJECT TOTAL	6.96 to 8.18	16.65 to 23.16	24.36 to 30.74	$35,436.20 to $38,235.00	$21,711.20 to $27,553.00	$3,543.62 to $3,623.50	$800.00 to $2,600.00	$379.00 to $993.00	$63,246.70 to $68,959.82	165 to 219	15 to 34	14 to 27	29 to 61	5.82 to 7.24	4.56 to 5.54	NONE to MOD	NONE to LOW	0 to 2	0 to 12	29 to 36	LOW to MOD	LOW to HIGH

NOTE: IT HAS BEEN DETERMINED THAT THERE ARE NO AIR IMPACT SITES ON THIS PROJECT.

file:\BOM47\22MATRIX.WK1

Preliminary engineering costs were estimated as ten percent of the construction costs.

Right-of-way cost estimates were based on a per parcel cost method with segment costs determined as a summation of individual values. The "right-of-way" column contains the costs for all land, improvements and costs-to-cure/damages for all parcels, as well as costs related to the right-of-way acquisition process.

7.3.4 Business and Residential Damages and Relocation Costs

Estimated business damages were computed for eligible properties. These values are a summation of per parcel estimates.

Business and residential relocation costs were based on the number of each that appear to be within the alignment right-of-way. These costs were computed using the guidelines and amounts set forth in the Uniform Relocation Act (1989). Business and residential relocations were subject to different criteria in accordance with this Act. A relocatee, by definition, is any person or persons who because of the right-of-way acquisition, is unable to remain.

7.3.5 Number of Affected Property Owners

This element indicates the number of property owners that will require compensation for a parcel of land. The minimum cost expenditure per parcel was estimated to be greater than $20,000, exclusive of right-of-way taking. This cost is included in the right-of-way cost column.

7.3.6 <u>Wetland and Floodplain Impacts</u>

The total acreage of wetlands and the total estimated length (miles) of floodplain encroachment that falls within the right-of-way limits of each alignment alternative was determined and provided in the matrix.

7.3.7 <u>Section 4(f) Impacts</u>

The only potential 4(f) involvement on this project concerns involvement with structures that may be historically significant. The number of individual structures and structures contributing to an Historic District, associated with the alternative alignments, was quantified.

7.3.8 <u>Air Impact Sites</u>

The FDOT Screening Test and CALINE computer model were used to analyze air quality for project alternatives. State and federal standards will be applied with the results in the form of yes or no. A yes response constitutes non-compliance.

7.3.9 <u>Noise Impact Sites</u>

This element indicates the number of sites where noise levels would exceed 65 dB and 67 dB or increase by 15 dB in the year 2015. Values are derived using the STAMINA noise model. While several sites have been identified as noise sensitive, analyses have indicated that no reasonable abatement solution exists to mitigate these impacts. A detailed analyses is found in the "Noise Study Report" for 22nd Street/Causeway Boulevard.

7.3.10 Wildlife Impacts

This item provides an indication of the potential impact to listed wildlife species within an alignment right-of-way. These would include threatened, endangered, or species of special concern. A rating of low, moderate, or high was assigned.

7.3.11 Cultural Impacts

This element identifies the amount of impacts to cultural aspects in the project area, including ethnic groups and/or minorities as well as the overall community cohesion. Impacts are tabulated as low, moderate, or high. This project has been developed in accordance with the Civil Rights Act of 1964, as amended by the Civil Rights Act of 1968.

7.3.12 Hazardous Materials and Petroleum Impacts

This item provides an indication of the potential for hazardous materials and/or petroleum products to occur within an alignment right-of-way. A rating of low, medium, or high was assigned. Avoidance of such sites minimizes efforts to clean-up the sites prior to construction of the project, protect the health of construction workers in the vicinity of these sites, and dispose of disturbed soil.

7.4 SELECTION OF THE PREFERRED ALTERNATIVE

As a result of the comparative analysis, Alternative B, the six-lane divided roadway along the existing 20th Street alignment has been identified as the preferred alternative. Although this alternative requires more additional right-of-way than the other alternatives, it results in the fewest number of residential relocations and fewer business relocation than the alternative that uses the existing 22nd Street alignment. The construction cost of the preferred alternative is slightly more than the 22nd Street alternative but still much less than the one-way pair option. The total costs of all alternatives, including construction, right-of-way, business damages, and relocations were almost equivalent.

The preferred northern alternative avoids physically encroaching the proposed Palmetto Beach Historic District and two individually NR eligible structures.

The typical section of the preferred alternative provides a 22-foot-wide median, three lanes in each direction, and six-foot-wide sidewalks on each side. The outside travel lane in each direction is 14-feet-wide to provide an added margin of safety for bicyclists.

The additional right-of-way necessary for the roadway expansion would be acquired from the east side of the existing right-of-way to avoid environmental and business damage impacts associated with several port facilities located adjacent to the west side of the existing roadway.

SECTION 8
PRELIMINARY DESIGN ANALYSIS

8.1 DESIGN TRAFFIC VOLUMES

Design year traffic characteristics were developed on a link-by-link basis to coincide with anticipated growth and activity throughout the study area. It is generally accepted that corridors with higher daily volumes exhibit different peak period traffic characteristics than those sections of roadway with lower daily volumes.

Several key traffic characteristics must be identified to develop design hour traffic from the systems level total daily two-way traffic (AADT). These characteristics are summarized below.

- K-Factor (K): Percent of the total daily two-way traffic (AADT) during the peak hour or design hour.
- Directional distribution (D): The directional split between total two-way volumes during the peak hour.
- Peak hour factor (PHF): A measure of the traffic flow peaking characteristics within the peak hour. The PHF is always less than or equal to 1.0.
- Truck factor (T): The percent trucks or heavy vehicles during the peak hour.

8.1.1 K-Factor

Existing K-factors along the corridor reflect a low peak hour volume relative to daily volume when compared to many other urban arterials. Under existing conditions the average K-factor along the corridor is 6.9 percent. However, the use of a K-factor of 6.9 percent is not recommended because it is considered to be too low to use for design purposes. Therefore, it is recommended that a more typical value of 8.0 be used to estimate the peak hour volume.

8.1.2 Directional Distribution (D)

Existing directional distribution data were presented previously. It was found that the directional distribution is presently very unbalanced in both the AM and PM peak hours. It is anticipated that as development of land parcels along the corridor continues, the directional flow will become more balanced. It is also anticipated that Year 2015 conditions will continue to reflect an influx of travel from the east into the Tampa urban core. Therefore, it is recommended that a directional split of 55/45 be used for the corridor north of the Crosstown expressway (existing D equals 60/40) and that a directional split of 65/35 be used south of the Crosstown (existing average value is approximately 70/30).

8.1.3 Peak Hour Factor

Peak hour factors have a significant impact on roadway design. Peak hour factors should be based on "typical" design considerations. Based upon data contained in the 1985 "Highway Capacity Manual," peak hour factors on high traffic volume facilities generally range from 0.80 to 0.98. In addition, the Manual states that peak hour factors greater than 0.95 are often indicative of capacity constraints on flow during the peak hour. A peak hour factor of 0.95 is considered to be the maximum point at which stable operations within the peak hour exist. A peak hour factor of 0.95 indicates a relatively high degree of uniformity of flow. The design hour volumes projected for this facility are quite high and it is anticipated that the facility will display this characteristic. Therefore, a peak hour factor of 0.95 is recommended.

8.1.4 Truck Factor

An estimate must be made regarding the percentage of total vehicles on the corridor which will be trucks or heavy vehicles. During April 1991, truck classification counts were taken along the corridor. The results of the counts revealed the following average truck percentages:

- North of Crosstown Expressway, 24-hour @ 9.0 percent and design hour @ 4.3 percent.
- South of Crosstown Expressway, 24-hour @ 10.6 percent and design hour @ 6.5 percent.

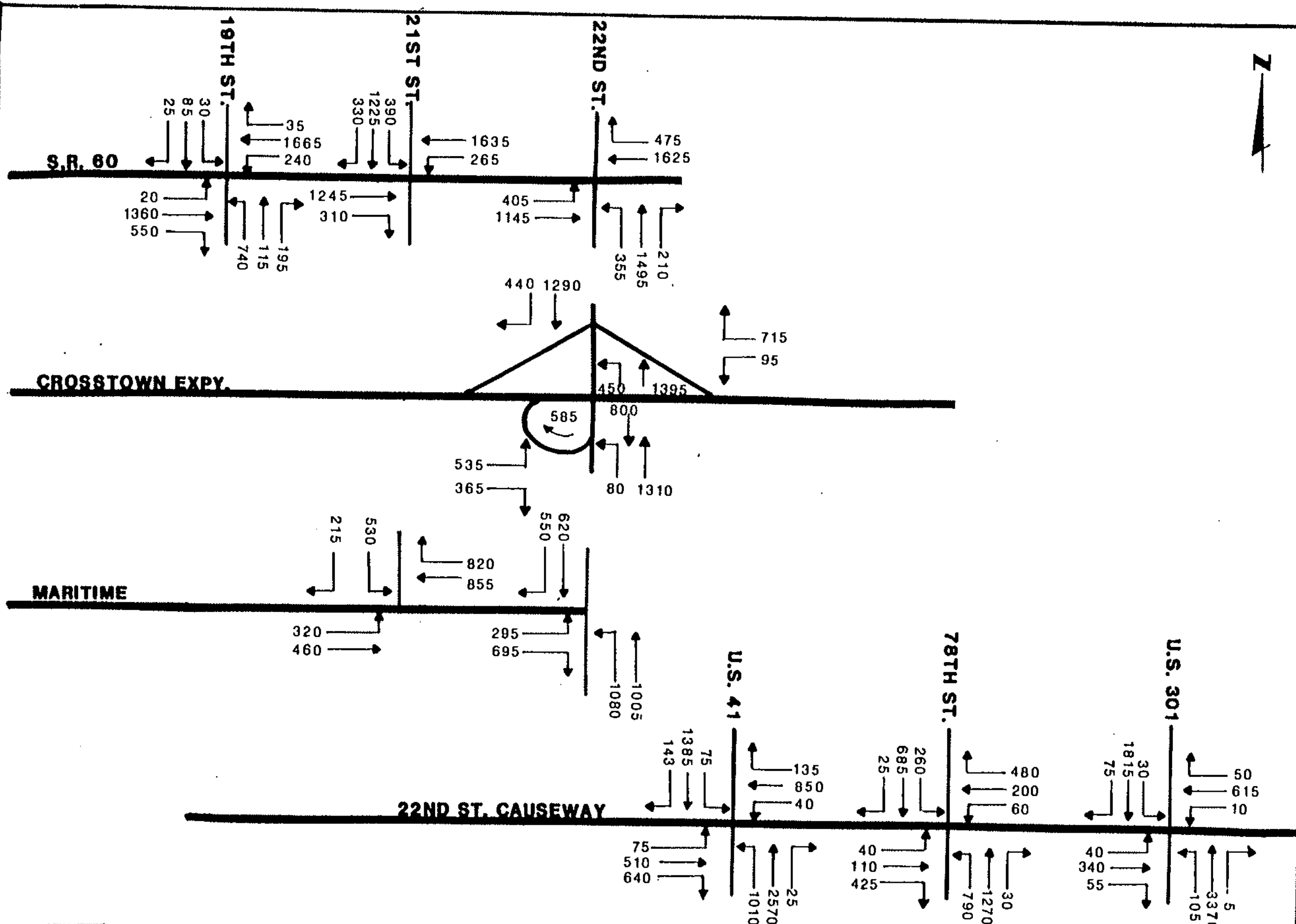
8.1.5 Design Hour Volumes

Design hour traffic can be calculated by applying the three traffic characteristics (K-factor, directional distribution factor and peak hour factor) to the systems traffic volumes. First, the forecast AADT is factored by K to arrive at design hour two-way traffic. Next, the directional distribution factor is applied to achieve directional design hour volumes. Finally, the peak hour factor is applied during the capacity analysis to evaluate rates of flow.

Design hour volumes are summarized graphically for both AM and PM peak periods in Figures 8-1 through 8-14 for all four 2015 network scenarios and the 1995 "build" scenarios. These volumes were calculated by application of corridor traffic characteristics to projected systems traffic.

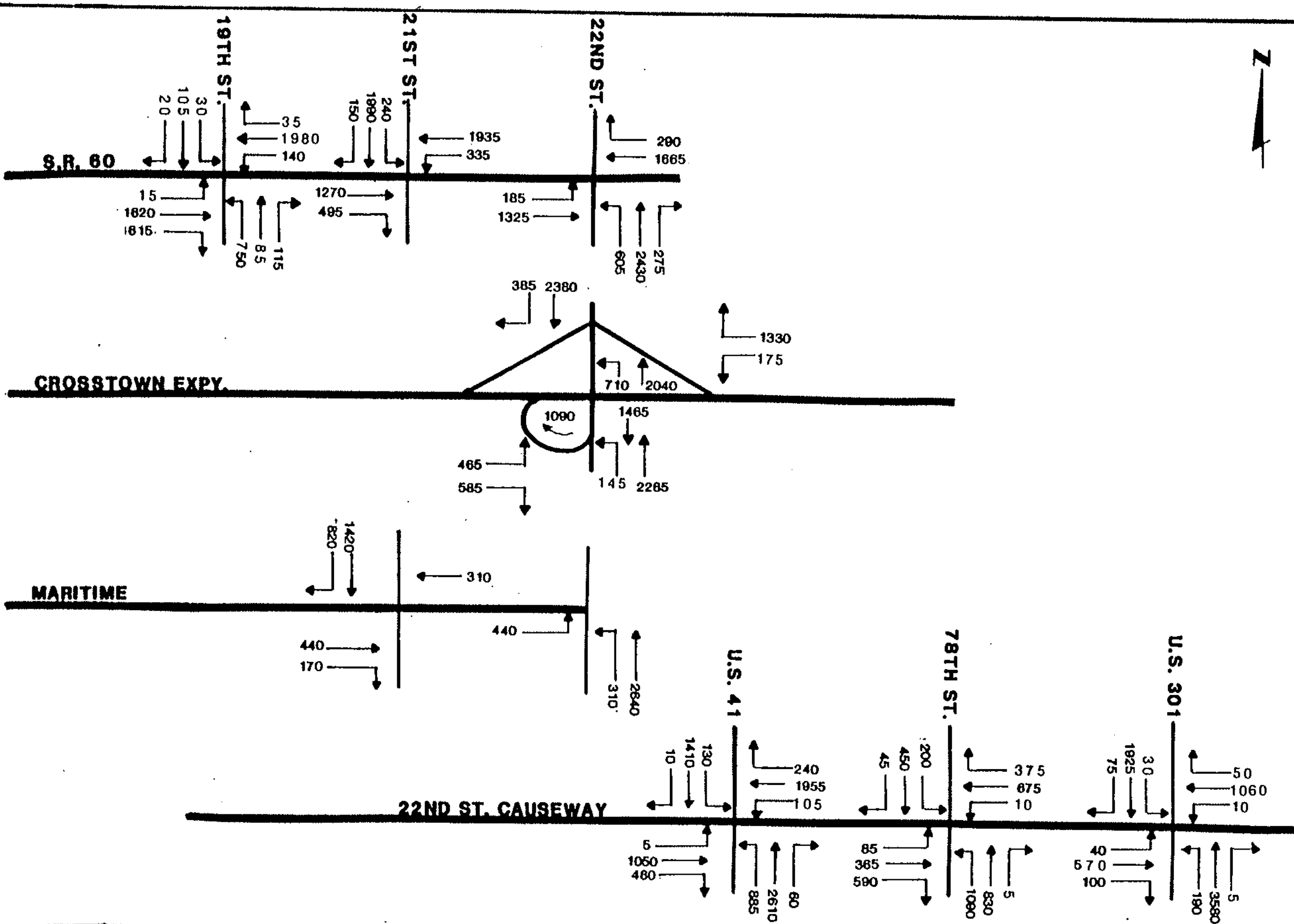
8.1.6 Recommendations

The design year forecasts indicate a need for four lanes in each direction between the Crosstown Expressway and S.R. 60 in order to achieve LOS "D". This is consistent with



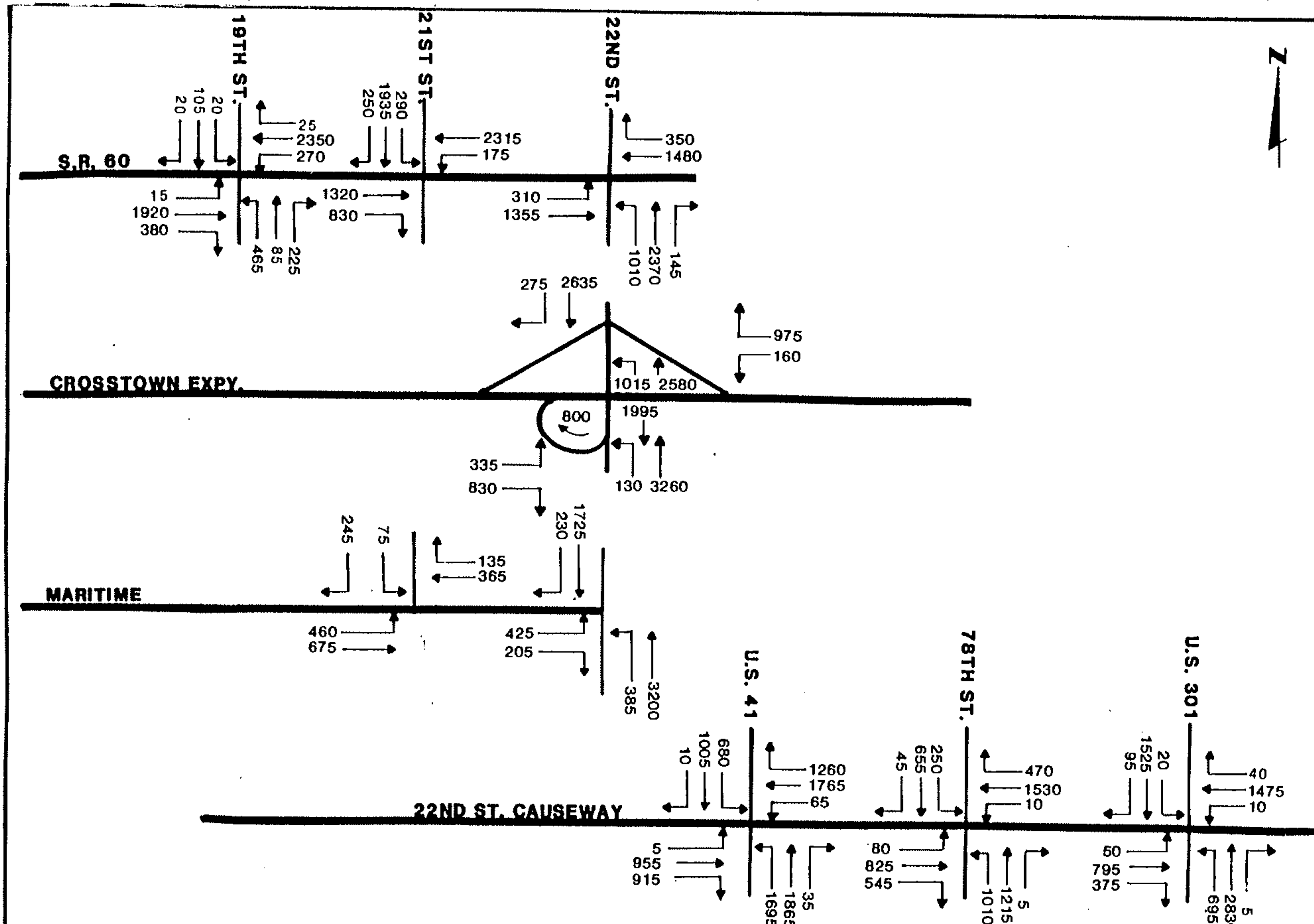
YEAR 2015 DESIGN HOUR TRAFFIC VOLUMES
Alternative T AM Peak Hour

FIGURE 8–1



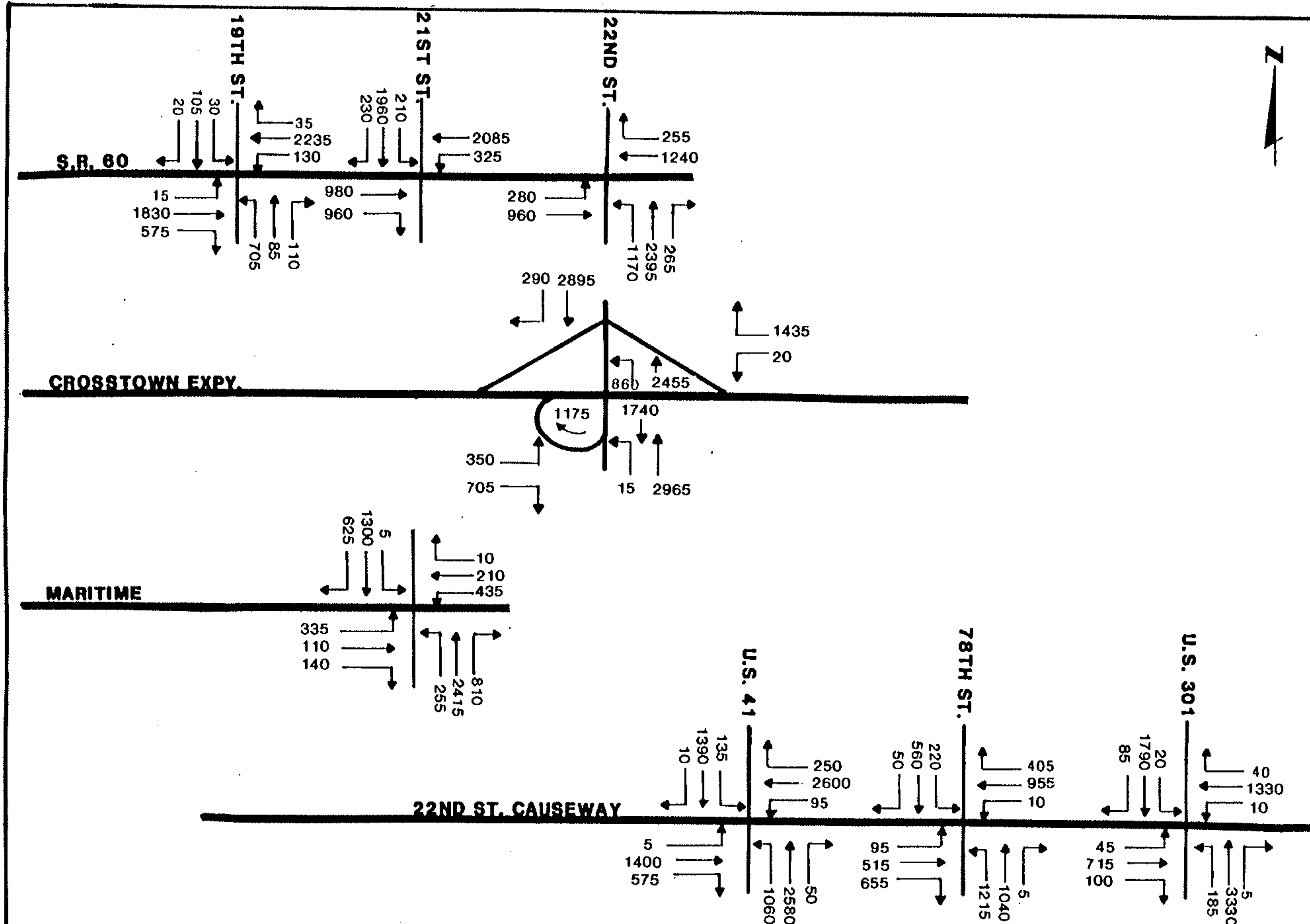
YEAR 2015 DESIGN HOUR TRAFFIC VOLUMES
Alternative V AM Peak Hour

FIGURE 8-2



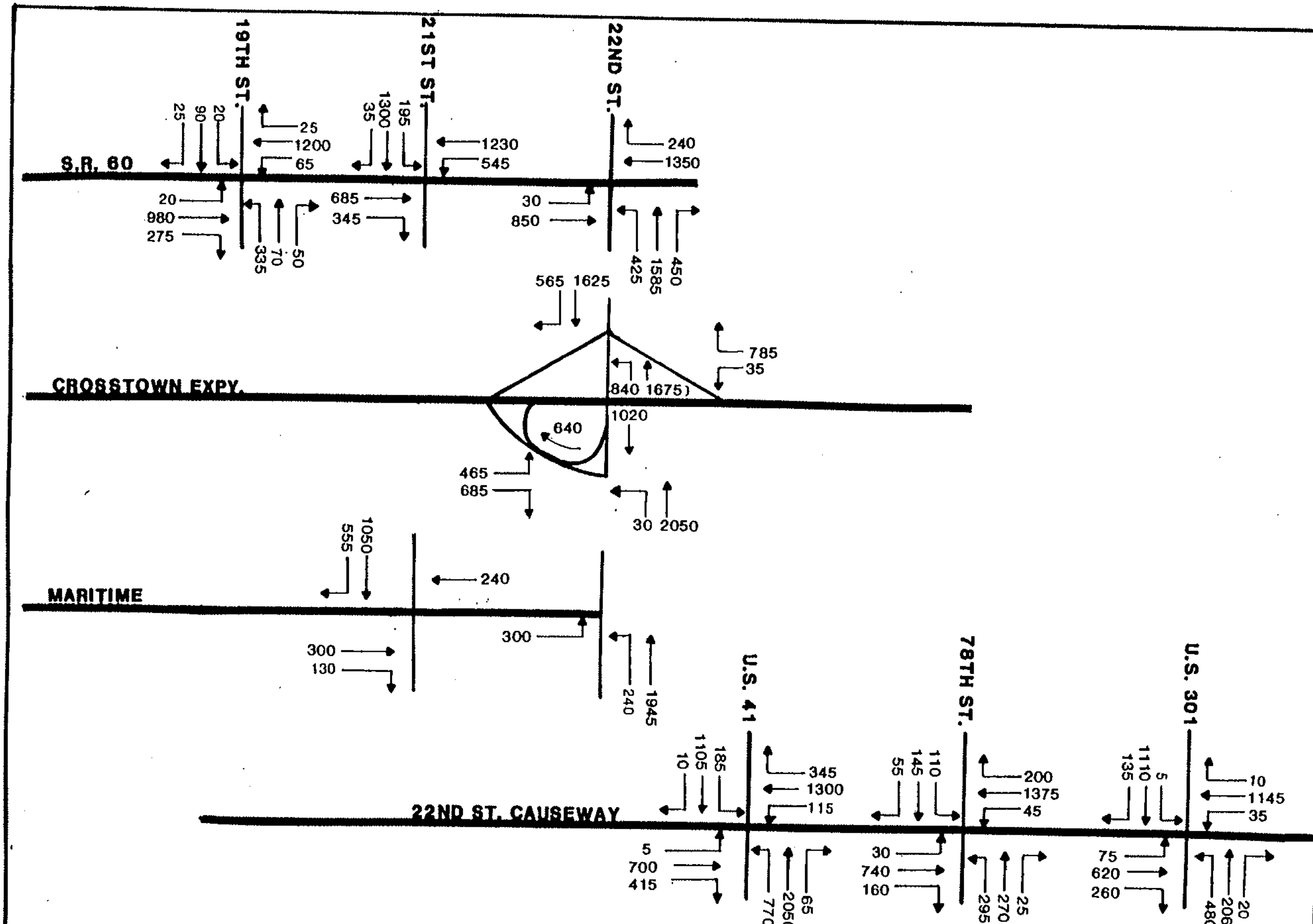
YEAR 2015 DESIGN HOUR TRAFFIC VOLUMES
Alternative W AM Peak Hour

FIGURE
8–3



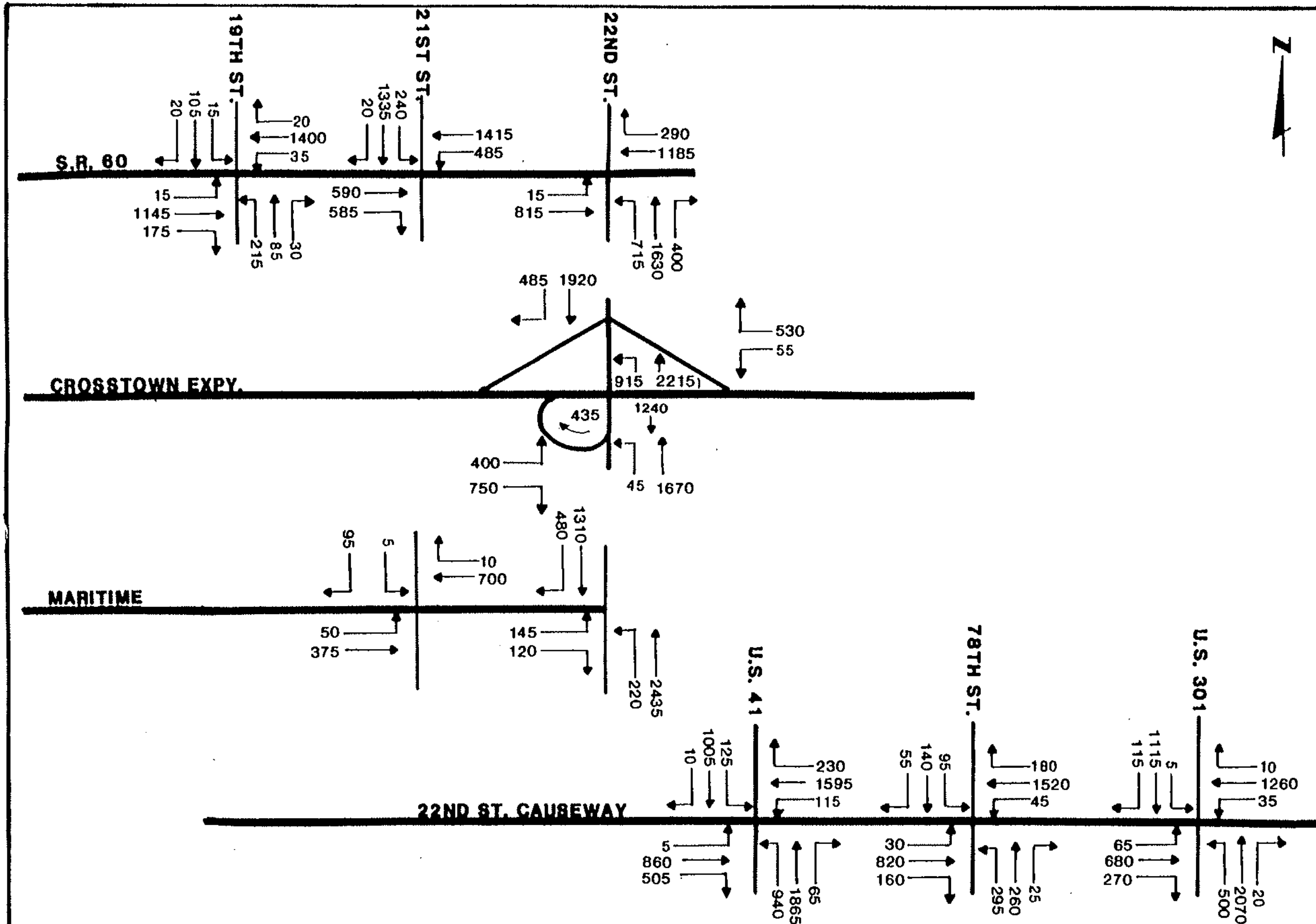
YEAR 2015 DESIGN HOUR TRAFFIC VOLUMES
Alternative X AM Peak Hour

FIGURE 8-4



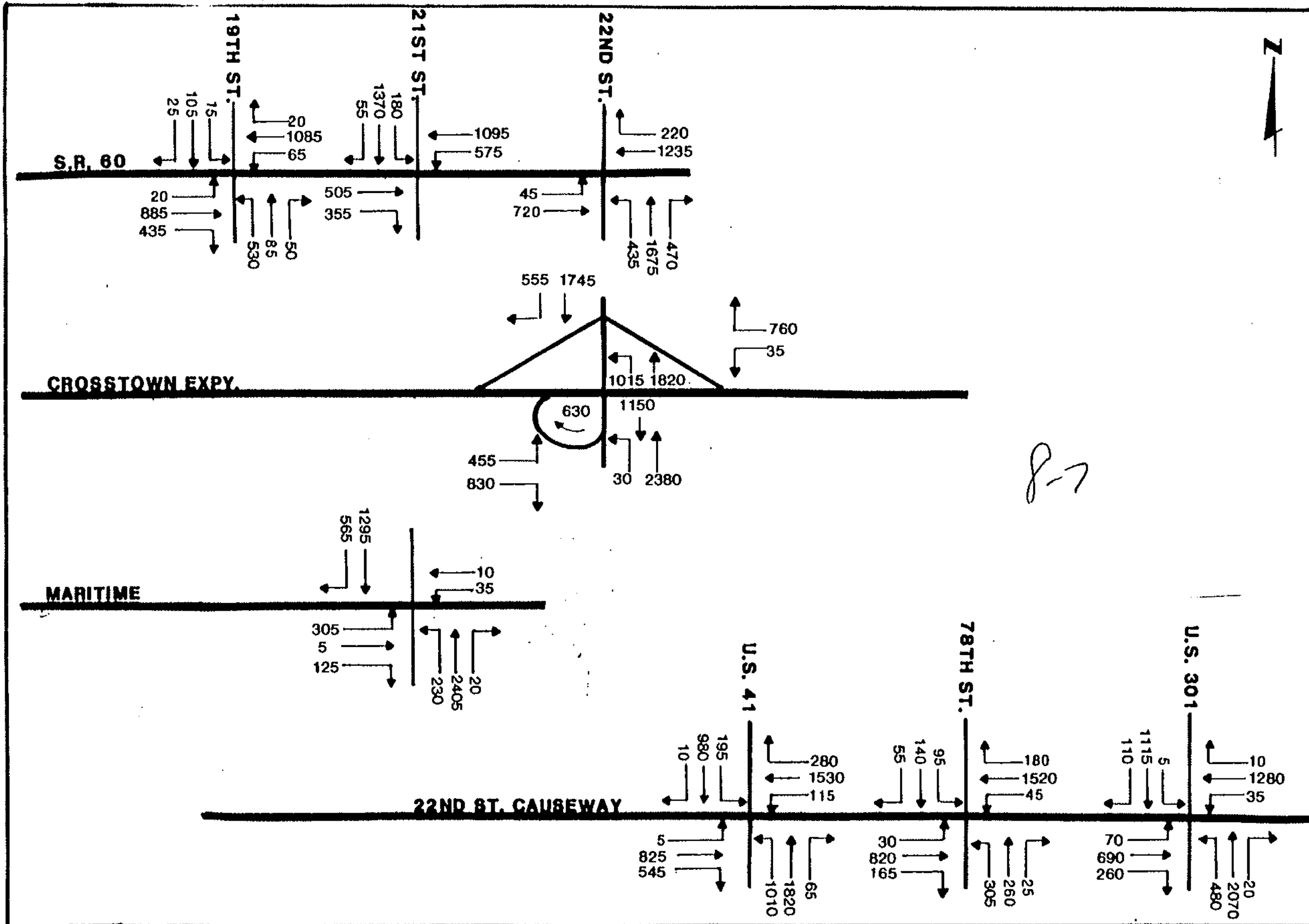
YEAR 1995 DESIGN HOUR TRAFFIC VOLUMES
Alternative V AM Peak Hour

FIGURE 8–5



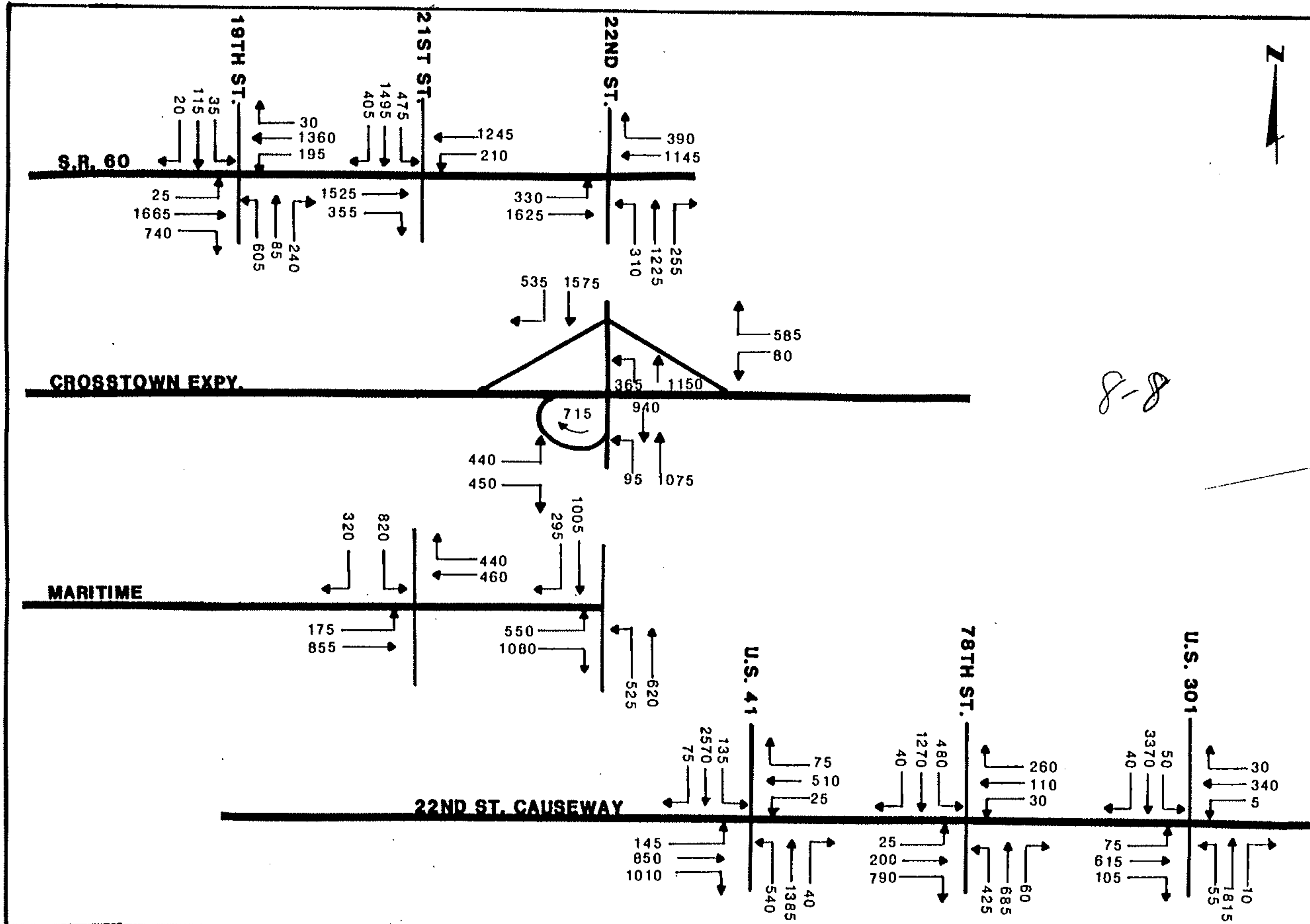
YEAR 1995 DESIGN HOUR TRAFFIC VOLUMES
ALTERNATIVE W AM PEAK HOUR

FIGURE 8-6



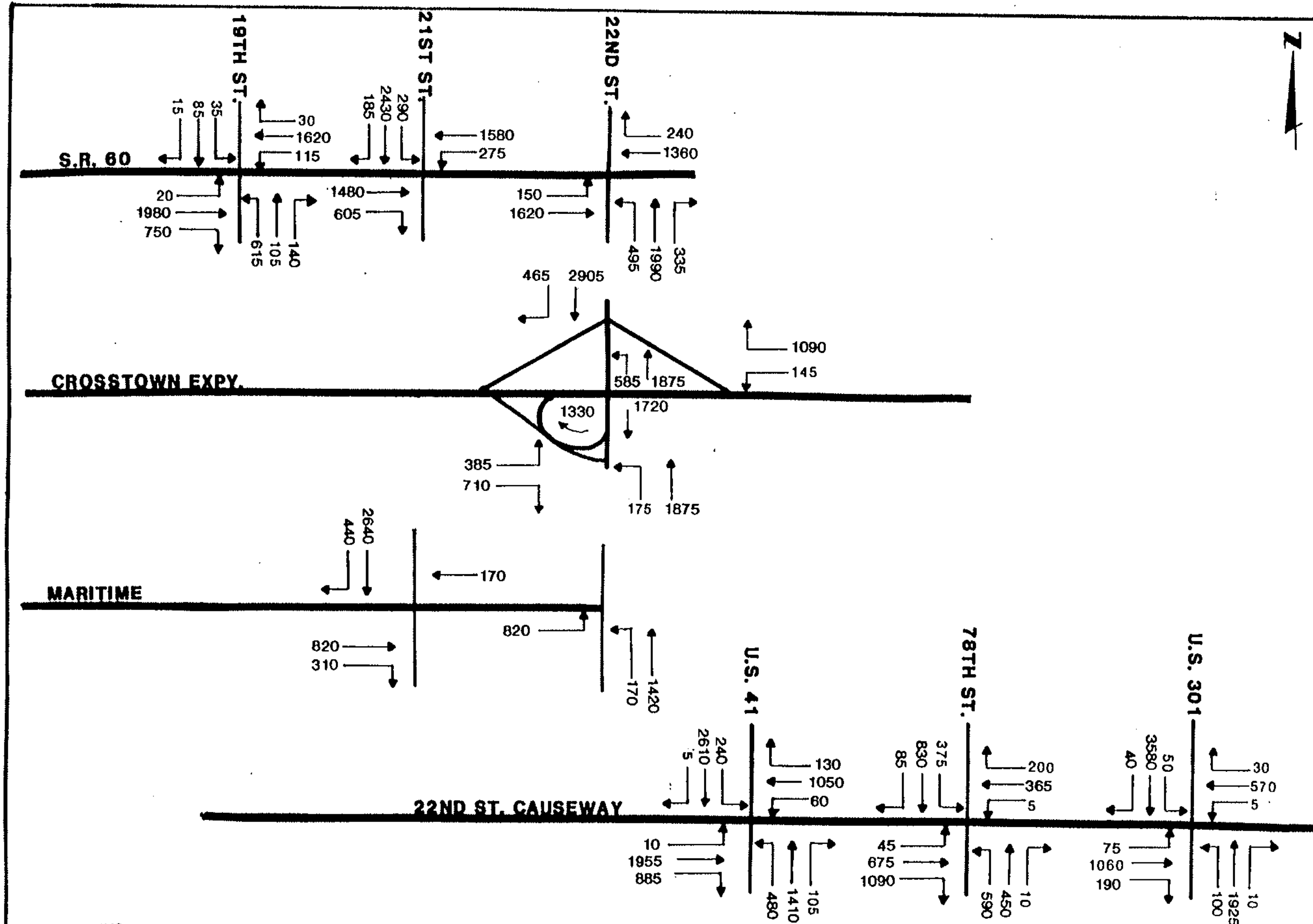
YEAR 1995 DESIGN HOUR TRAFFIC VOLUMES
ALTERNATIVE X AM PEAK HOUR

FIGURE 8-7



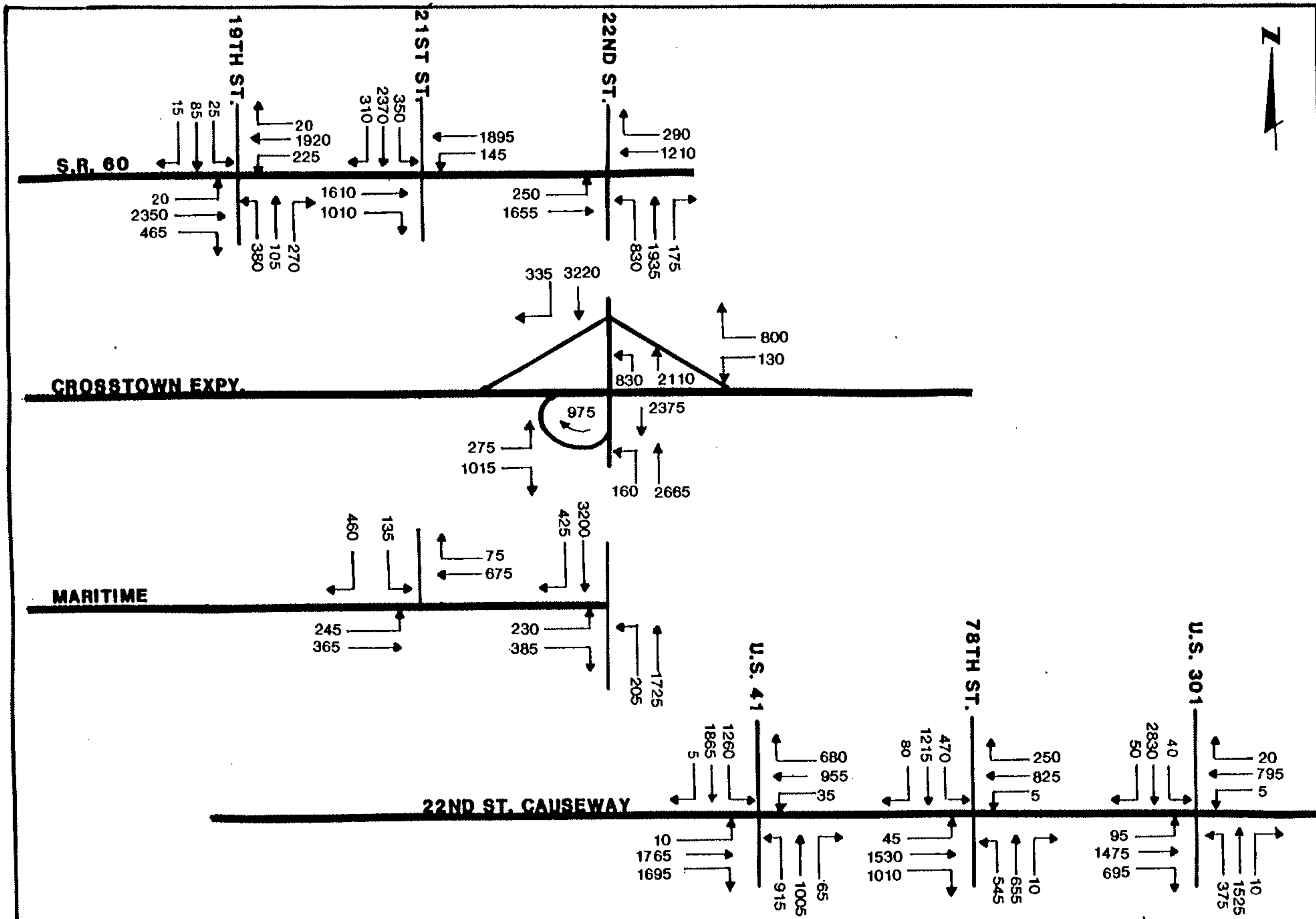
YEAR 2015 DESIGN HOUR TRAFFIC VOLUMES
Alternative T PM Peak Hour

FIGURE 8-8



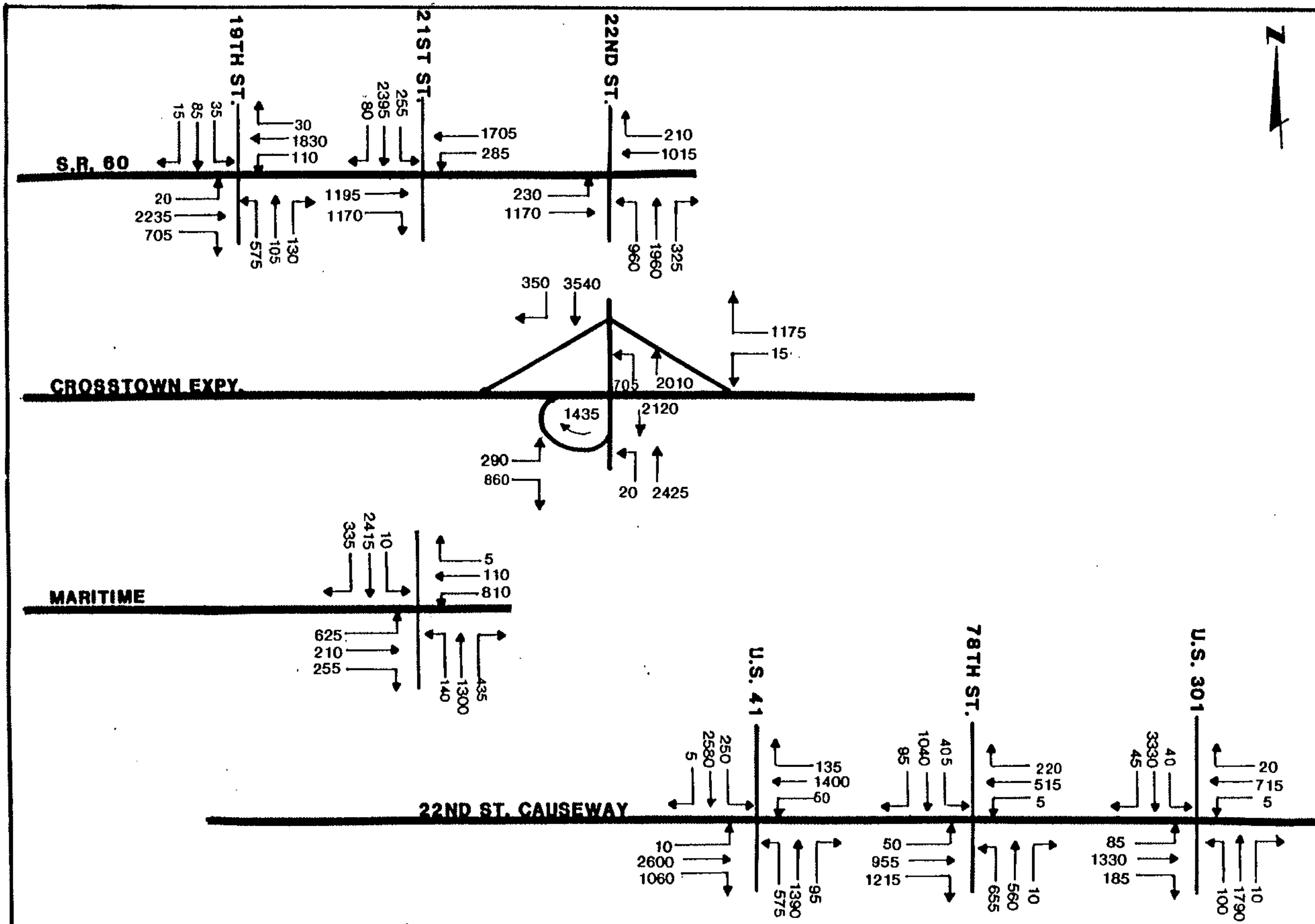
YEAR 2015 DESIGN HOUR TRAFFIC VOLUMES
Alternative V PM Peak Hour

FIGURE 8-9



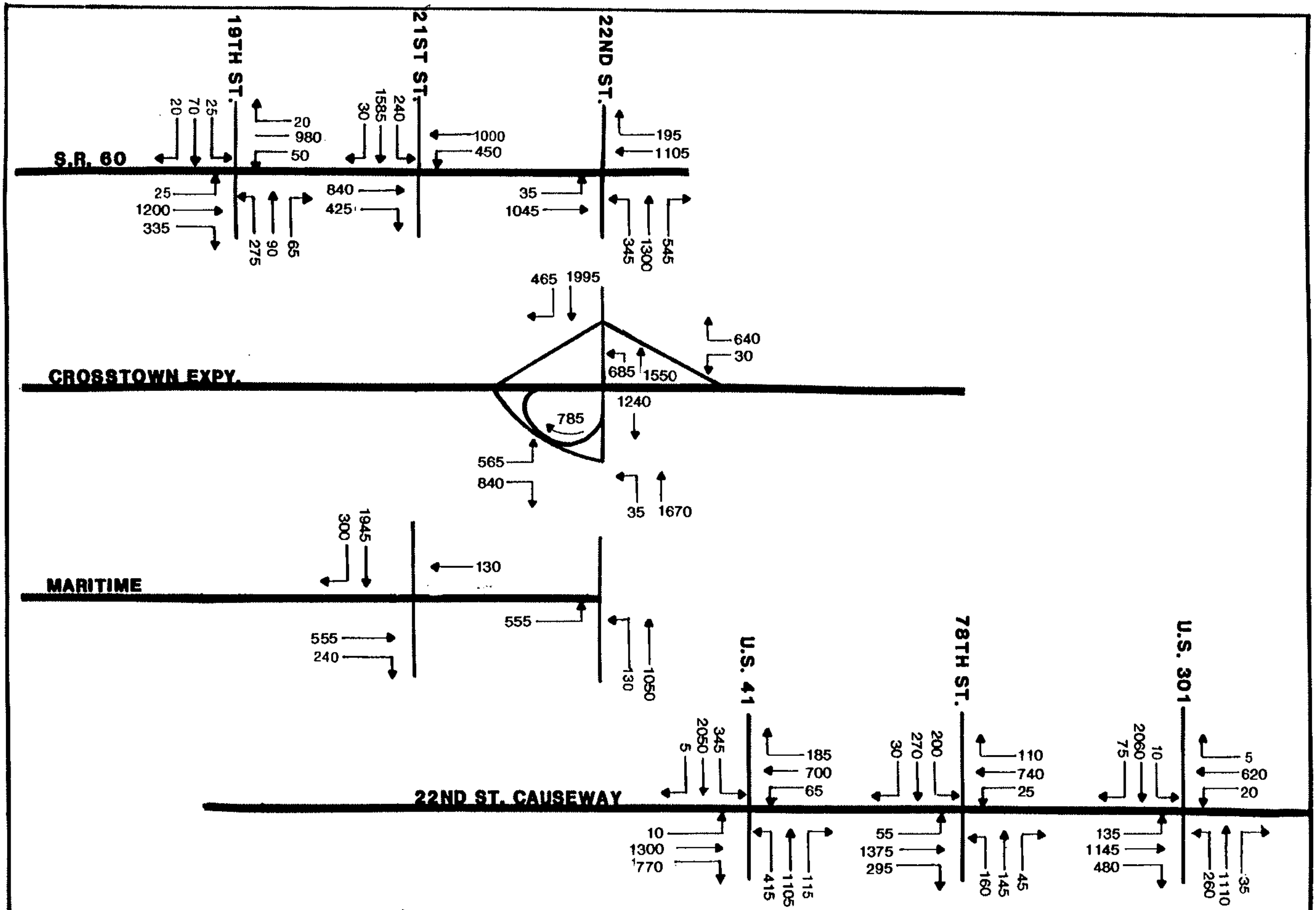
YEAR 2015 DESIGN HOUR TRAFFIC VOLUMES
Alternative W PM Peak Hour

FIGURE 8–10



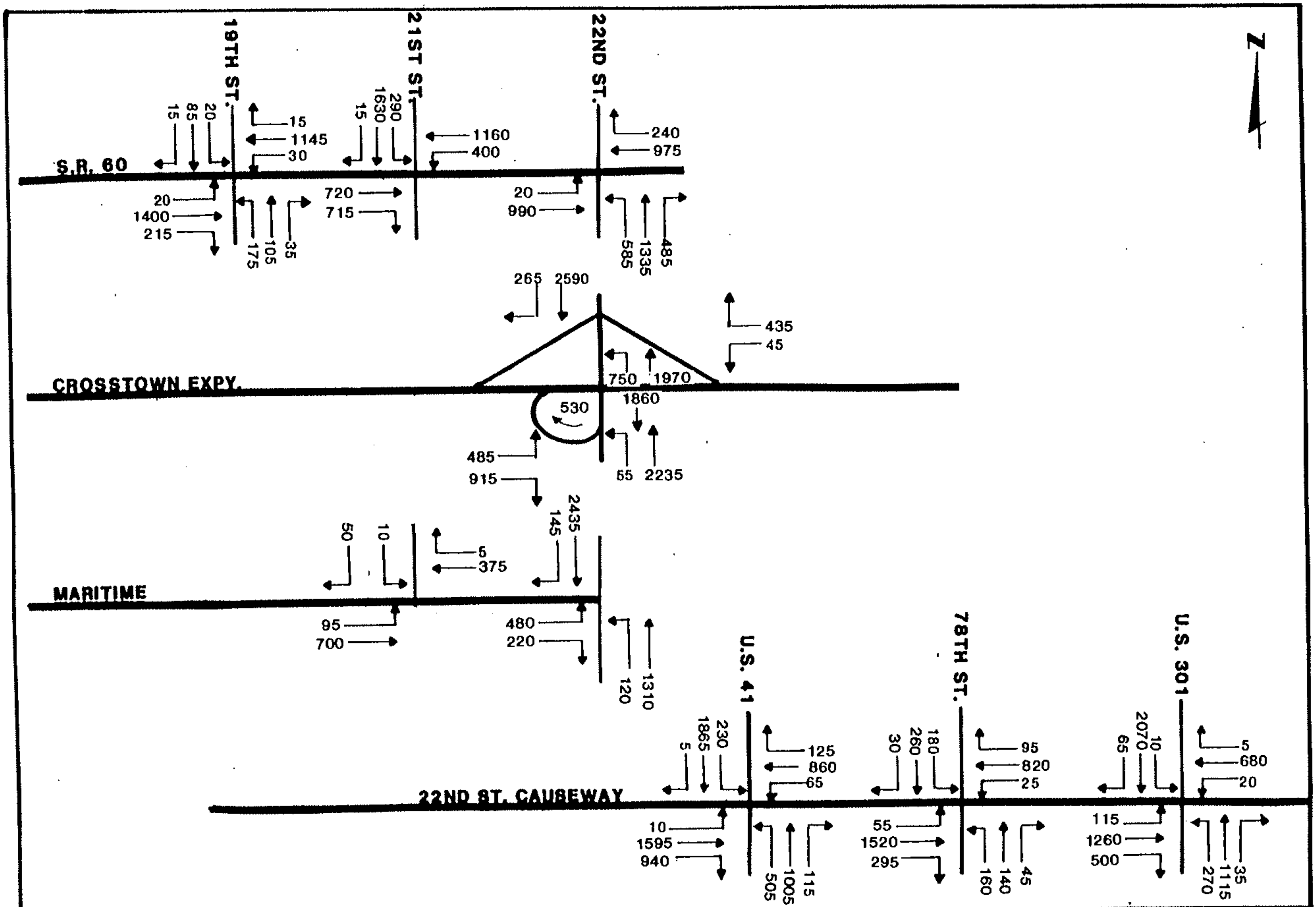
YEAR 2015 DESIGN HOUR TRAFFIC VOLUMES
Alternative X PM Peak Hour

FIGURE 8–11



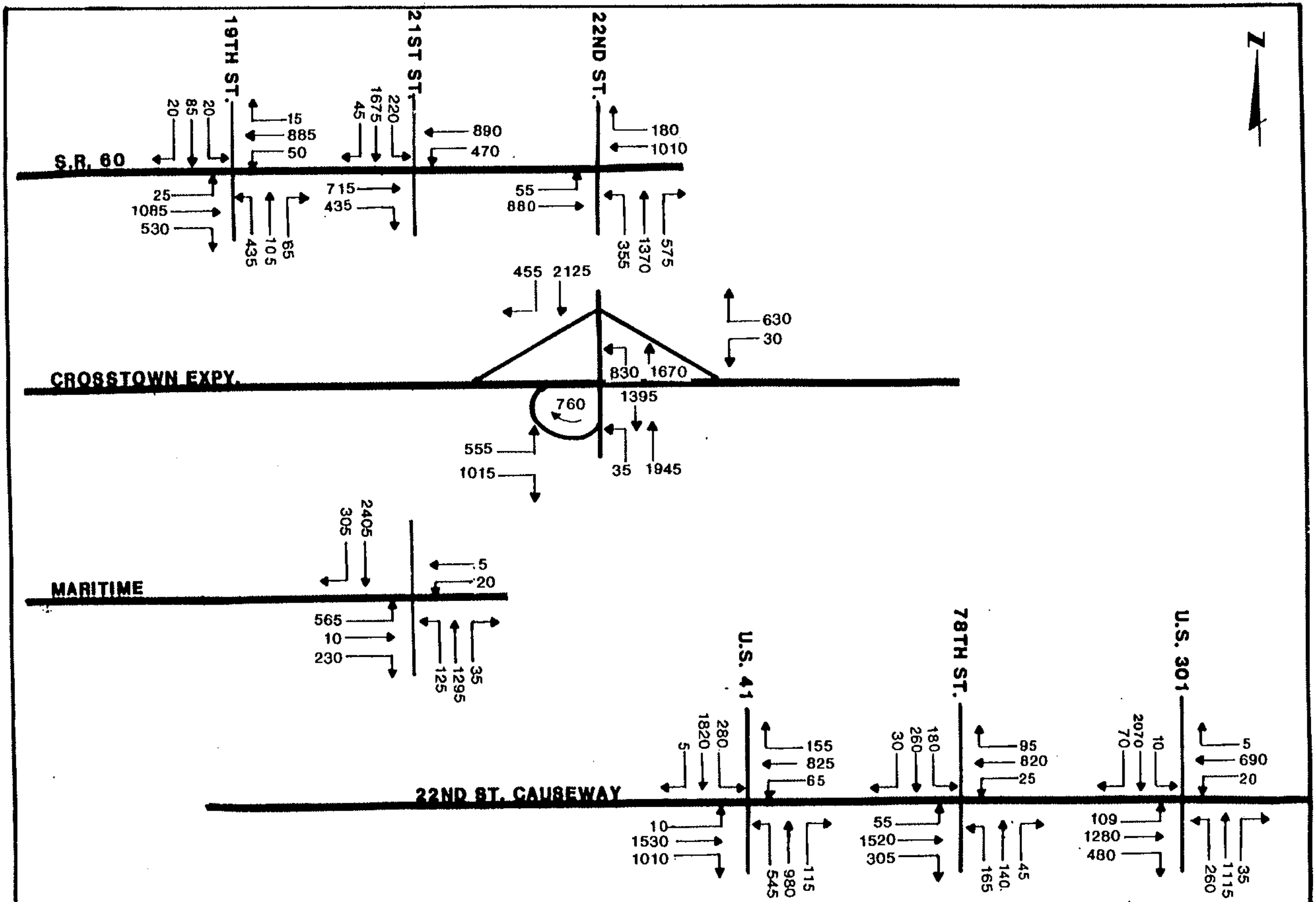
YEAR 1995 DESIGN HOUR TRAFFIC VOLUME
Alternative V PM Peak Hour

FIGURE 8–12



YEAR 1995 DESIGN HOUR TRAFFIC VOLUMES
ALTERNATIVE W PM PEAK HOUR

FIGURE 8–13



YEAR 1995 DESIGN HOUR TRAFFIC VOLUMES
ALTERNATIVE X PM PEAK HOUR

FIGURE 8–14

the MPO draft 2010 Needs Plan which recommends a four lane one-way pair north of the Crosstown Expressway.

South of this point to the eastern terminus of the project, three lanes in each direction will be sufficient to achieve LOS "D". Network scenarios V, W, and X would each provide adequate laneage for the corridor between the Crosstown Expressway and Maritime Boulevard. A six lane divided arterial is recommended for Causeway Boulevard between Maritime Boulevard and U.S. 301. It appears that grade separations may be required at the U.S. 41 and U.S. 301 intersections. However, a grade separation at the Causeway Boulevard/U.S. 301 intersection is beyond the scope of this study.

8.2 DESIGN ALTERNATIVES

Several viable alternative design concepts were developed for improving 22nd Street Causeway/Causeway Boulevard. These alternative concepts were subsequently evaluated and analyzed in order to determine the most feasible build alternative. The alternative typical section concepts developed for this project are presented in Section 7 of this report. The items presented in this section are discussed in regard to the preferred alternative design concepts.

8.3 TYPICAL SECTIONS

The recommended typical sections have been presented in Section 7 for each of the viable design alternatives. These alternatives involve both 6-lane divided and 3-lane one way pair options. The widths of the cross-sectional elements are generally the desirable minimums as specified by State and Federal standards. Along the causeway, where environmental impacts would be considerable, the absolute minimum median width of 19.5' for a design speed of 45 mph would be utilized.

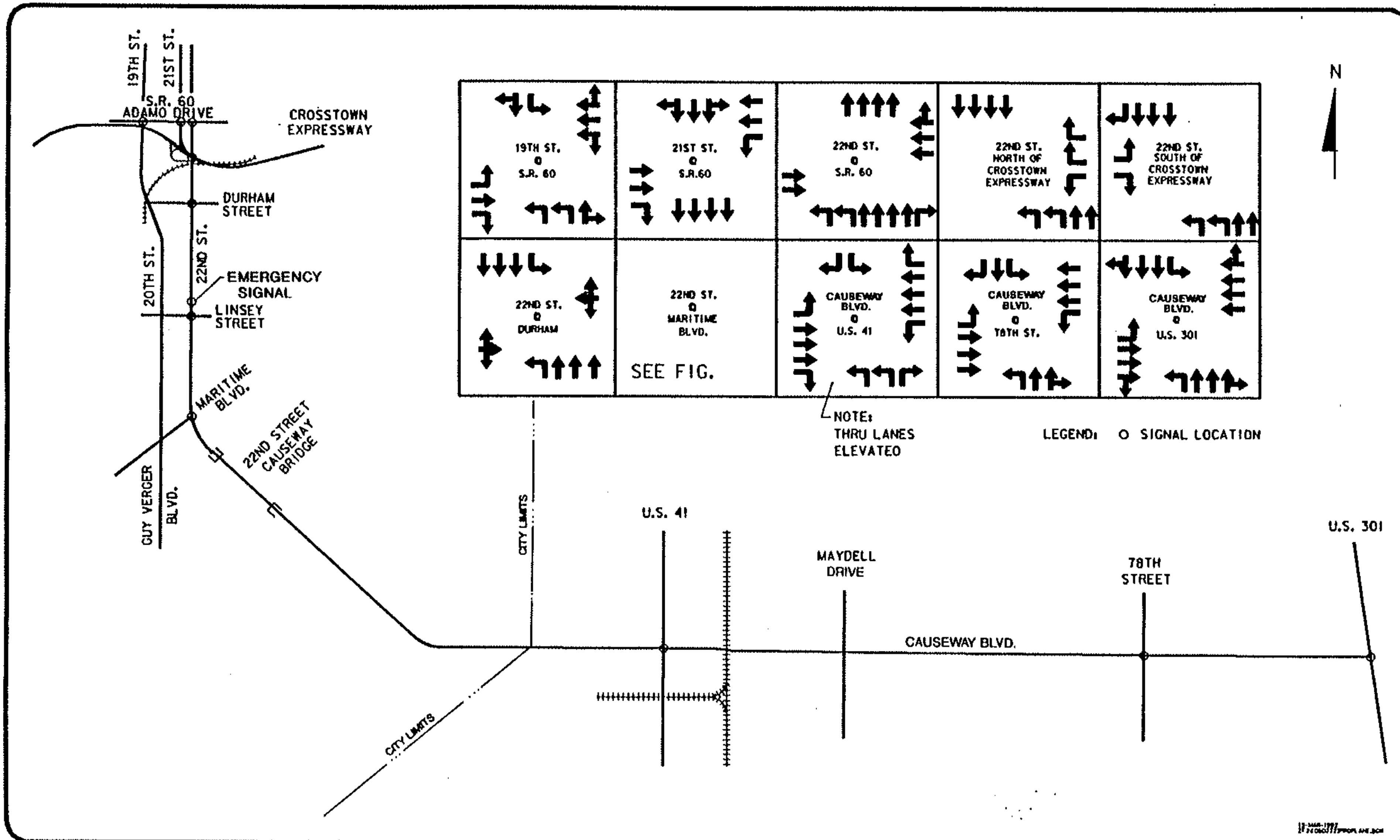
8.4 INTERSECTION CONCEPTS AND SIGNAL ANALYSIS

In developing the viable design concepts, consideration was given to improving the intersections along the subject facility. The proposed geometric improvements for each signalized intersection are illustrated in Figure 8-15. These locations were evaluated to assure that adequate capacity would be provided in design year 2015. Capacity analyses were performed using the 1985 Highway Capacity Software programs for signalized intersections. The results of these analyses can be found in Appendix C of this report. The level of service at each of the signalized intersections is expected to be LOS D or better in design year 2015, as shown on Table 6-3 of this report.

Throughout the project, intersection channelization, signalization and geometrics will be provided to accommodate future traffic demands. Maritime Boulevard intersections (at 20th Street as well as the one-way pair crossover) would be the only location(s) where signalization would be provided at a currently unsignalized location. The three intersections that result from the Maritime Boulevard realignment (Figure 8-16 scenario) have also been analyzed as at grade intersections. An at grade intersection will function properly at this location (i.e. no grade separation required). A summary of the results of the intersection capacity analyses is provided in Table 8-1. These intersections will operate at an acceptable level of service.

8.5 ALIGNMENT AND RIGHT-OF-WAY NEEDS

The preferred horizontal alignment will generally follow the existing alignment although additional right-of-way is needed throughout most of the project. From Durham to Maritime, the new alignment along 20th Street will require new right-of-way. As noted in earlier sections of this report, widening will be attained through land acquisition to the right, left or centered on the existing corridor. Total right-of-way requirements range from 47.2 acres to 53.7 acres, depending upon the alternative.

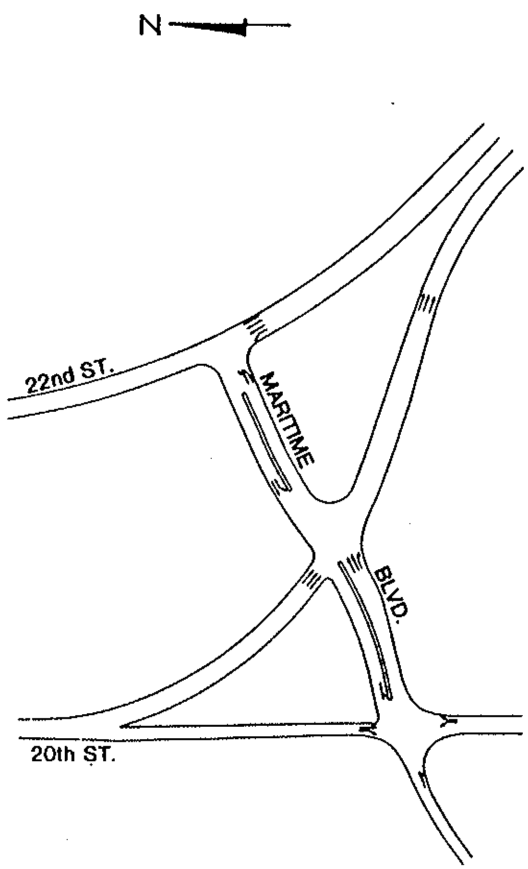


PROJECT

22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

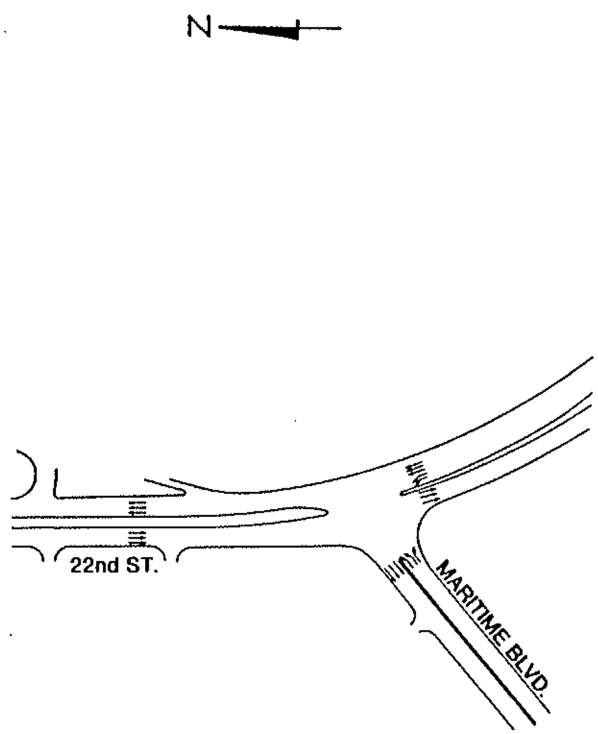
PROPOSED SIGNAL LOCATIONS AND INTERSECTION GEOMETRY

FIGURE NO.
8-15



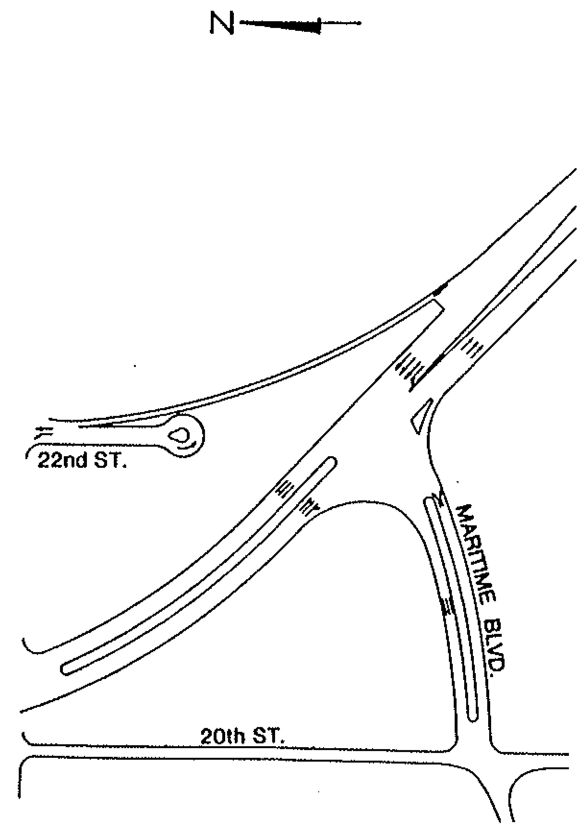
SCENARIO V

3 - LANE ONE-WAY PAIR
20th ST./ 22nd ST.



SCENARIO W

6 - LANE DIVIDED 22nd ST.



SCENARIO X

6 - LANE DIVIDED 20th ST.

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

PROPOSED MARITIME BOULEVARD INTERSECTION GEOMETRY

FIGURE NO. 8-16

Table 8-1
Maritime Boulevard Intersection Analysis
For One-Way Pair Scenario

	Level of Service		Delay (sec/veh)	
Intersection	**A.M.**	**P.M.**	**A.M.**	**P.M.**
Maritime/Guy Verger	B	C	6.9	15.7
Maritime/ 20th Street	C	B	17.5	13.5
Maritime/ 22nd Street	C	C	16.6	15.7

The preferred alignment require crossovers at their north and south termini to tie back into the 22nd Street alignment. Right-of-way needs are substantial, but the corridor is relatively undeveloped necessitating relatively few relocations. The existing McKay Bay Bridge is the southern extension of the 22nd Street alignment. Use of the existing bridge requires tying the 20th Street options back into 22nd Street which necessitates significant right-of-way acquisition. The one-way pair crossover utilizes 7^0 30' reverse curves separated by a tangent. This alignment entails some business damages to the A.R. Savage company as well as the Port of Tampa property. However, the Port would benefit by improved access and a more desirable entrance alignment. The six-lane 20th Street option, due to its wide cross-section requires long tangent sections in which to attain superelevation transition. The most feasible alignment, using a simple 4^0 curve on 20th Street, virtually bisects the A.R. Savage property. Because location is critical to this business, coordination on alternative site plans has been ongoing. From Maritime Boulevard to U.S. 301 the alignment generally mirrors the existing centerline, with minor adjustments to meet current design standards, and to develop offsets to optimize right-of-way acquisition.

The proposed vertical alignment will follow the existing grade in general, with the following exceptions:

- U.S. 41/Causeway Boulevard Interchange
- U.S. 41 railroad crossing south of 22nd Street/Causeway Boulevard
- Causeway Boulevard railroad crossing east of U.S. 41

Through in-depth data collection and analyses, these locations have been proven to merit grade separations. The benefit cost computations to justify the grade separations at the railroad crossings are included as Appendix D of this report.

The interchange at U.S. 41 was modeled using the HCM software. The substantial design year volumes on both Causeway Boulevard and U.S. 41 precluded the intersection from operating effectively in its current at grade configuration. Additional analyses were run to determine the required interchange type. It was determined that a single point diamond will function at an appropriate level of service.

In choosing which roadway to elevate (U.S. 41 or Causeway Boulevard), several factors were evaluated including existing traffic patterns, availability of right-of-way and levels of commercial development along the respective roadways. U.S. 41 was chosen as the most feasible roadway to elevate.

Section 3.1.14 presented the statistics on the railroad crossings located on U.S. 41 south of Causeway Boulevard, and east of U.S. 41 on Causeway Boulevard. When considering the high number of daily crossings and a typical delay of ten minutes, motorist delays are considerable when choosing to travel on these routes. A benefit-cost analysis was performed on a proposed Causeway Boulevard/railroad crossing grade separation, using the *1977 AASHTO Manual on User Benefit Analysis of Highway and Bus-Transit Improvements*. Each feasible traffic scenario (V,W, X) that was identified in chapter six has been included in the Benefit/Cost computation. The Benefit Cost Analysis, which can be found in Appendix D, yields Benefit Cost values between 0.54 and 0.63. These relatively low values are largely due to incremental right-of-way costs in excess of 5 million dollars. These values do not justify the construction of a grade separation at the Causeway Boulevard/CSX Railroad location.

The proposed roadway/railroad grade separation on U.S. 41 south of 22nd Street/Causeway Boulevard was also subjected to a benefit/cost analysis. Right-of-way at this crossing is considerably less expensive while design year traffic is higher than the previously analyzed location. Benefit Cost values for this crossing range between 2.84 and 2.86. These values do support the use of grade separation at the U.S. 41/CSX railroad location. The proposed bridge utilized for this grade separation will be the subject of continued discussion in Section 8.21 of this report.

8.6 RELOCATIONS

A Conceptual Stage Relocation Plan (CSRP) was prepared as part of the 22nd Street Causeway/Causeway Boulevard PD&E study. The land use density and minimal building setbacks in the Palmetto Beach area are contributing factors towards the high number of projected relocations for options along 22nd Street north of Maritime. In the North Section, the 3-lane one way pair alternative with the northbound center option would require 9 total relocations, 47% less than the next higher option (20th Street 6-lane). Among 6-lane divided alternatives, the 20th Street east option would require 17 relocations, while the least number of relocations among the 22nd Street 6-lane alternatives would be 32.

The U.S. 41 interchange will require the relocation of 10 businesses with the alignment centered on the existing right-of-way. If the center option is not utilized, relocations increase dramatically. The 10 relocations are a function of the area required to construct the interchange and associated frontage roads. The use of retaining walls would reduce the land area required, but relocations would not be reduced. At the same time, construction costs would not justify the use of walls along the U.S. 41 through lanes.

The southern option between 54th Street, which lies just east of U.S 41, and U.S. 301 would require 25 relocations. The north and center options fare much better with 4 and 5 relocations respectively.

The relocations are summarized as part of the evaluation matrix contained in Section 7 of this report.

8.7 RIGHT OF WAY COSTS

The preliminary estimated total right-of-way acquisition cost for the viable alternatives, varies between $24.4 million and $30.2 million, depending upon the alignment selected. This cost includes raw land costs as well as business damages and relocation information. The right-of-way costs are summarized in the evaluation matrix.

8.8 CONSTRUCTION COSTS

The preliminary construction cost estimates range from $32.6 to 33.4 million for the various design alternatives. These figures were computed from approximate construction item quantities and unit prices taken from the FDOT Historical Price Index. These costs will be validated by using the FDOT Long Range Estimating Software which estimates costs using a historical price database.

8.9 PRELIMINARY ENGINEERING COSTS

Engineering costs to design the improvements to the 22nd Street Causeway/Causeway Boulevard corridor are estimated to be $3.3 million. This figure will be the same for any of the alternatives presently under consideration. The preliminary engineering cost was estimated to be 10 percent of the total construction cost.

8.10 RECYCLING OF SALVAGEABLE MATERIALS

In developing design alternatives, consideration was given to the re-use of existing pavement. As noted in Section 3, the existing pavement throughout the project is in average to poor condition. It may be possible to reuse some of the old pavement. The possibilities of utilizing the existing pavement as part of the reconstruction should be examined further during the design phase. The proposed improvements to 22nd Street Causeway/Causeway Boulevard will utilize new asphaltic concrete pavement.

8.11 USER BENEFITS

Numerous benefits will be realized by motorists utilizing an improved 22nd Street/Causeway Boulevard as compared to the existing roadway. The proposed improvement will result in reduced delay, reduced vehicle operating expenses and a drop in accident rates that will lower total accident costs. Reduced response times for emergency services are also expected. Pedestrians and bicyclists will gain from the inclusion of facilities for their use.

The economic growth of the immediate area will be enhanced due to improved access and reduced traffic congestion that will result from improving the 22nd Street Causeway/Causeway Boulevard. The Port of Tampa will benefit from the roadway improvements as ingress and egress to its facilities will be enhanced.

8.12 PEDESTRIAN AND BICYCLE FACILITIES

Sidewalks will be provided along both sides of 22nd Street Causeway/Causeway Boulevard throughout the project limits. The proposed typical section includes a 5-foot sidewalk with a 3-foot grass strip between the curb and sidewalk. Pedestrian crosswalks will be located during the design phase of the project.

Bicycle facilities are provided throughout the corridor in the form of 4-foot bicycle lanes. This provision is consistent with the current Tampa MPO Comprehensive Bicycle Plan (1985). It has 22nd Street shown as a Supplemental Corridor which connects Primary Bicycle corridors. The plan states that the Supplemental Corridors shall be given the same considerations as the high potential bicycle usage corridors. Bicycle facilities in the Palmetto Beach area are rerouted onto 22nd Street. With this option, cyclists are subjected to substantially lower traffic volumes as well as a shorter travel distance through the area.

Both pedestrians and bicyclists will benefit from the addition of bicycle facilities as cyclists will be encouraged to leave the sidewalks and ride on the "bicycle friendly" outside lanes. Crosswalks, pedestrian signal flashers and other safety provisions will be included at the major signalized intersections.

8.13 SAFETY

The proposed improvements will offer provisions for a safe and efficient transportation facility. The added roadway capacity is expected to result in less congestion, and therefore a lower accident probability. The retrofitting of safety parapets on the McKay Bay Bridge will add to the safety of those structures. The use of a grade separation over the U.S. 41 railroad crossings will decrease the chances for a train-motor vehicle collision.

Another notable safety provision is the consideration of motorist sight distance. The highly developed Palmetto Beach area currently has locations with sub-standard sight distance. The proposed alignments have been located to satisfy the FDOT "green book" intersection sight distance requirements.

The design and alignment of the roadway will meet applicable safety standards. Adherence to the design speed as it applies to establishing and setting minimum values on critical roadway design features will be closely followed. Roadway design elements such as horizontal curvature, lane width, clearance, and clear zone and sight distance, will meet or exceed FDOT's minimum roadway design standards. Access control techniques to promote safe and efficient operation will also be used. FDOT rules 14-96 and 14-97 have been implemented to control access within the project corridor.

8.14 ECONOMIC AND COMMUNITY DEVELOPMENT

As previously discussed in Section 4.4, the proposed roadway improvements are expected to facilitate future expansion of facilities for several major traffic, revenue, and employment generators located on or near 22nd Street Causeway/Causeway Boulevard. Potential facilities include the Port of Tampa. Maintaining access to project corridor facilities, as well as increasing the traffic carrying capability of the roadway, will further enhance the economic and community development of the area.

8.15 ENVIRONMENTAL IMPACTS

8.15.1 Land Use

The proposed project will not alter existing community development patterns. Secondary impacts of the project will contribute to the future land use pattern planned by the City of Tampa and Hillsborough County, as illustrated in Figures 3-9 and 3-10. Improvement of the 20th Street/22nd Street corridor will contribute to the overall mobility and accessibility of the surrounding commercial enterprises and residential communities. As a designated hurricane evacuation route, the improved 22nd Street corridor will benefit the disaster preparedness and safe evacuation of Hillsborough County residents.

8.15.2 Community Cohesion

The proposed roadway improvement alternatives from the 22nd Street Causeway to U.S. 301, is located on, or adjacent to the existing Causeway Boulevard alignment. There is, therefore, no potential for the project to adversely affect community cohesion by splitting neighborhoods or by social isolations of identifiable groups of elderly, handicapped, non-drivers, minorities, or transit dependent through this section of the project study area.

The roadway improvement alternatives from S.R. 60 to 22nd Street Causeway, as outlined in section 7 and illustrated in Figures 7-5 through 7-7, generally follow the existing alignments of 20th and 22nd Streets. There is no potential for the separation of residences from community facilities due to these alternatives, as to identifiable groups of elderly, handicapped, non-drivers, minorities or transit dependent. It is expected that there is a moderate potential for adverse impacts on minorities and elderly persons on an individual basis due to the relocations necessary of the roadway improvements. Travel patterns of the community residents will possibly be altered due to the roadway improvements, but pedestrian and motorized traffic will continue to gain access through the neighborhood and to community facilities. It is expected that the roadway improvements will result in an increased quality of neighborhood and community access through the project corridor. The crossovers required for the 20th Street alternatives will be located so that community disruption is avoided.

This project has been developed in accordance with the Civil Rights Act of 1964, as amended by the Civil Rights Act of 1968.

8.15.3 Wetland Impacts

The potential impacts on wetlands are estimated for each of the alternative alignments based upon approximate wetland limits established during the field evaluations. The total wetland acreage potentially affected by the roadway alignments is presented in Table 7-1. Existing wetlands within the project limits are located in Figure 8-17.

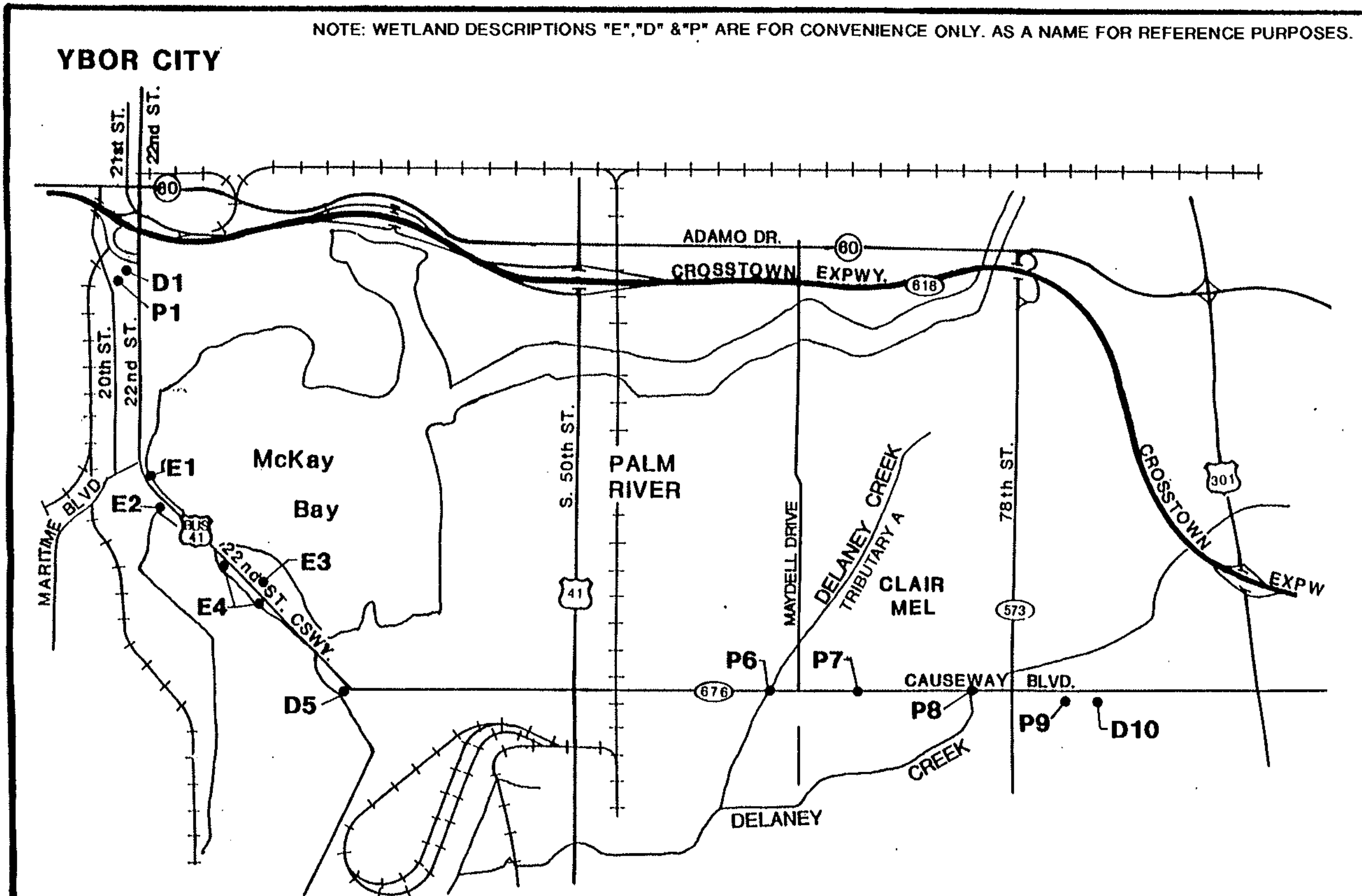
The potential wetland impacts resulting from the project will require permits from the USCOE and the SWFWMD. Impacts to shoreline wetlands (E1-E4, and D-5) and roadside ditches which outfall into state waters will also require permits from the FDER. The Wetland Evaluation/Permit Coordination Report is currently under review by the appropriate agencies. The Florida Department of Natural Resources within the area of this projects limits has delegated their jurisdiction to the Port Authority. Coordination on submerged land leases should be handled through this agency.

Northern Section

In this area, located north and west of McKay Bay Bridge, there are three six-lane divided options and three one-way pair options. Each wetland and the acreage affected is described below.

6-Lane Divided

Impacts may occur to either Wetland E1 or E2 depending on whether the eastern option or the western option on 22nd Street is selected. Wetland E1 is a fringe mangrove system on McKay Bay. The eastern option on 22nd Street is the only option which would affect wetland E1, and would affect the greatest wetland acreage (approximately 1.16 acres) of all the six-lane options in this northern section of the project. The western option may affect 0.63 acres of wetlands in Wetland E2. Much of the wetland acreage affected by the western option includes an adjacent roadside swale and a disturbed mangrove wetland that is heavily invaded by Brazilian pepper. A very small portion of this impact (<0.05 acres) may affect a brackish water emergent marsh located in the center of Wetland E2. It is the central portion of Wetland E2 which provides the greatest wetland functions and values for this particular wetland.



WETLAND LOCATION MAP

FIGURE 8-17

The six-lane divided option on 20th Street would affect 0.58 acres of Wetland E2. This impact would occur primarily in the central portion of E2 and in the adjacent roadside swale of 22nd Street. It avoids any impacts which may occur to the remnant mangrove wetland associated with E2. In addition, this option has the potential to impact 0.26 acres of Wetland D1. Both of these wetlands are found in highly urbanized areas of this project and have low to moderate wetland value.

3-Lane One-Way Pairs

No significant differences in wetland impacts were found among the various three lane one-way pair options. The only difference in wetland impacts for the western, center, or eastern options are impacts to Wetland E1. The eastern option would affect 0.26 acres of this wetland compared to 0.18 and 0.20 acres for the western and center options, respectively. For all one-way pair alignment options, 0.10 acres of Wetland E2 and would be affected. In addition, all 3-lane one-way pair options affect 0.19 acres of Wetlands P1 and 0.11 acres of D1.

Eastern Section

The remaining segments of the proposed project contain six lane divided options from the south side of McKay Bay to U.S. 301. They are located in the south and east sections of the project. There is one six-lane divided option proposed for a segment from the McKay Bay Bridge to 45th Street. This centered option would affect 0.72 acres of fringe mangrove wetlands E3 and E4. In addition, a roadside ditch (Wetlands D5) which is connected to McKay Bay would be affected minimally (0.17 acres). This ditch is occupied by wetland vegetation and is within the jurisdiction of the FDER.

There is very little difference in the total wetland acreage affected by the proposed alignments north, center, or south of 22nd Street from 54th Street to U.S. 301. The northern alignment would have the most impact (0.97 acres) on areas traversing Delaney

Creek and its tributaries (Wetlands P6, P7 and P8). The southern alignment would potentially impact 0.78 acres at the Delaney Creek crossings. The impacts on the 86th Street Ditch (denoted as D10) is relatively insignificant, ranging from 0.03 to 0.06 acres of impact depending on the alignment option.

Preferred Alternative

Based upon analysis of impacts, comments received at the public information workshop and comments received on the draft environmental document, the alternative described below has been selected as the preferred alternative. This alternative will be presented at the 22nd Street Causeway/Causeway Boulevard public hearing to be held in the fall of 1993.

General

A six-lane urban arterial is the preferred typical section from Durham Street to U.S. 301. The median width is generally 30 feet, with the causeway section median constrained to 19 feet. 6 inches wide to minimize environmental impacts. Continuous sidewalks along both sides of the road will facilitate safe pedestrian movement, while dedicated four-feet wide bicycle lanes along both sides of the pavement will accommodate bicyclists.

1. From S.R. 60 to Durham Street

   A divided urban roadway providing four-lanes in each direction (including turn lanes) is the preferred typical section. Retaining the existing bridge carrying crosstown Expressway traffic over 20th and 22nd Streets requires the use of 11-foot lanes (with four-feet wide dedicated bicycle lanes also provided).

2. From Durham Street to North Side of McKay Bay Bridge

A six-lane divided urban roadway within a 118-foot wide right-of-way corridor is the preferred typical section. No bicycle lanes are required, since bicycle traffic is expected to be diverted to 22nd Street.

The facility will be rerouted from 22nd Street to 20th Street south of the Crosstown Expressway. At Maritime Boulevard, the alignment will curve the typical section width, and then will transition to match the existing McKay Bay Bridge approach. Additional right-of-way required for the six-lane facility will be acquired from the east side of the 20th Street corridor. Bicycle lanes will commence at Maritime Boulevard, and run throughout the remainder of the project to the terminus at U.S. 401.

The cultural resources surveys conducted as part of the 22nd Street Causeway PD&E study resulted in the State Historic Preservation Office designating an area along 22nd Street a historic district. Any alternative that required expansion of the existing 22nd Street pavement impact structures that contributed to the historic district. In consultation with the SHPO it was determined an alternative along 22nd Street would cause an adverse Section 106 effect. The rerouting of 22nd Street along the current 20th Street corridor provided an acceptable and preferred alternative.

3. McKay Bay Bridge

The existing parallel bridges each carry two lanes of traffic across McKay Bay. These structures are in good condition, and suitable for widening. Each bridge will be widened to the outside, with the resultant width sufficient for three 12-feet wide lanes, sidewalk, and shoulders. Bicyclists will be accommodated on the (8-feet wide) bridge shoulders.

4. From McKay Bay Bridge to Maydell Drive

A six-lane divided urban roadway following the existing right-of-way centerline is the preferred alternative. Additional right-of-way will be acquired where necessary from both sides of the existing roadway corridor. The decision to follow the centerline of the existing right-of-way was based upon initial comparative analyses that showed reduced social and environmental impacts when compared to acquisition along only one side of the road. The preferred alignment was the only alignment presented at the public information workshop.

The primary variable in the typical section between the McKay Bay Bridge and Maydell Drive is the median width. The causeway section incorporates a 19-feet, 6-inch raised median into the 123-feet, 6-inch wide corridor to minimize environmental impacts. East of the causeway, the median reverts to a 30-feet width, resulting in a 134-feet wide right-of-way. Sidewalks and bike lanes will be constructed along both sides of the facility thereby accommodating movement of pedestrians and bicyclists. Between 45th Street and 54th Street, the typical section is again constrained to reduce impacts. A median width of 19-feet, 6-inches is used, resulting in a typical section width of 123-feet, 6-inches. East of 54th Street, a median width of 30-feet will be used, expanding the typical section to 134-feet in width. A bridge will be constructed to carry the new facility over Delaney Creek Tributary 'A'. It will maintain the 30' median provided by the approaching roadway segments. To minimize bridge costs, border width reductions have been made resulting in a bridge typical section width of 12-feet.

5. From Maydell Drive to U.S. 301

A six-lane divided urban roadway that includes sidewalks and dedicated bicycle lanes is the preferred typical section. The typical cross-section width will be 134 feet. A bridge will also be constructed to carry the new facility over Delaney Creek. It too will have a typical section width of 125 feet.

Comparative analysis of the alignment alternative showed that locating the improved facility to acquire all necessary additional right-of-way from the north side of Causeway Boulevard minimized environmental, social and economic impacts. Therefore, the norther alignment option, wherein the existing southerly right-of-way line is held and corridor expansion pushed to the north, is preferred facility location.

8.15.4 Mitigation of Wetland Impacts

In order to obtain the required permits for construction activities in wetlands, it will be necessary to develop measures to mitigate these impacts. Mitigative actions are defined by the National Environmental Policy Act as measures to avoid, minimize, rectify over time, and/or compensate for impacts by substitute resources. The USCOE wetlands permitting policy is currently one of "no net loss" of wetlands and requires compensatory mitigation on at least a one-to-one basis. Permitting guidelines for SWFWMD contain recommended compensatory mitigation which varies based upon the type of wetland impacted. For forested wetlands a minimum ratio of 2.5 to 1 is recommended. For non-forested wetlands a minimum ratio of 1.5 to 1 has been established. The FDER will require compensatory mitigation on a case-by-case basis depending on the type of wetland impacted, degree of disturbance, and quality of the wetland. Mitigation requirements are typically determined during the permitting process once it has been found that the project would be rendered unpermittable without such compensation.

In order to meet the current Environmental Protection Agency (EPA) and USCOE "no net loss" policy, wetlands creation at a minimum 1 to 1 ratio will be required for successful permitting of the project. Additional creation or mitigation proposals may be required in order to meet the minimum ratios of SWFWMD and the FDER.

Actions to minimize impacts of the expanded facility can take several forms. The most common of these are bridging of wetlands and alignment shifts to avoid wetland encroachments. Other design considerations to minimize wetland impacts include the steepening of fill slopes or the use of retaining walls to eliminate fill slopes.

Mitigating wetland loss can take several forms after all avoidance and minimization measures have been considered and/or exhausted. The most common of these is the re-creation of wetland habitats of similar type and/or the enhancement of "lower" quality wetlands through measures such as re-establishing natural hydroperiods, improving circulation to enhance water quality, and/or removing nuisance exotic species to improve wetland functions and values.

The Palmetto Beach Drainage Study completed for the City of Tampa in 1986 concludes that McKay Bay's water quality problem can be attributed to both the land use of the watershed and the construction of causeway land mass across the bay that severely restricts the natural circulation and flushing action of McKay Bay. During discussion with FDER staff, it was suggested that the natural circulation of McKay Bay could be somewhat restored through the installation of several box culverts along the causeway section of Causeway Boulevard.

Wetlands creation can be implemented "on-site". There is sufficient area within or adjacent to the existing right-of-way to meet this criteria. There are no apparent physical or biological constraints to implementing successful wetlands creation in these areas. Much of the adjacent uplands have been converted to agricultural uses or are cleared and show no signs of intended urban use. This factor should allow for wetlands creation to take place without the problem of destroying valuable, natural upland habitat.

A separate Conceptual Mitigation Plan will be prepared and submitted to all permit and permit review agencies. The proposed plan will be consistent with comments received during the review of the Permit Coordination/Wetland Evaluation Report and with all other comments received during the course of the PD&E study.

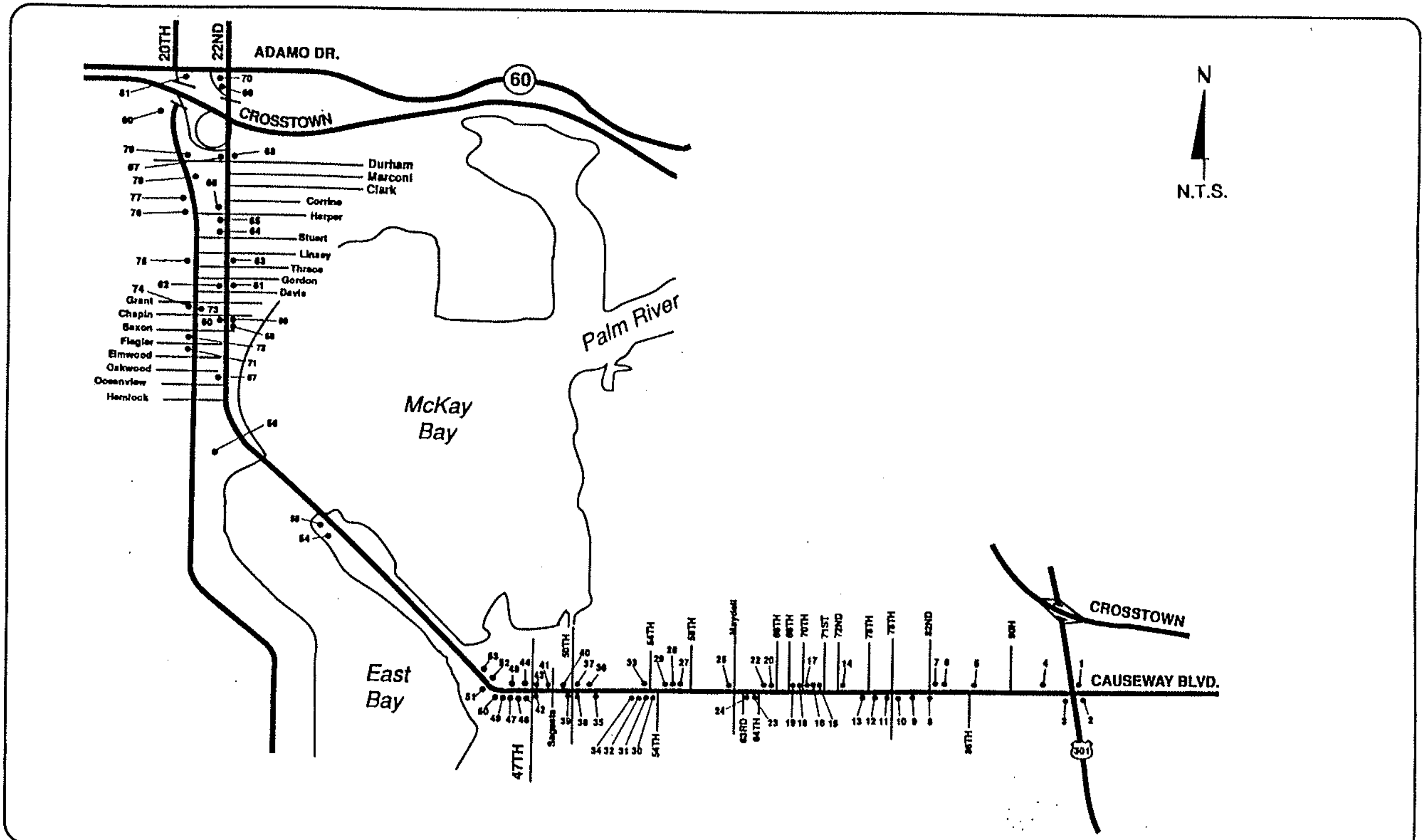
8.15.5 Threatened and Endangered Species

Although the proposed project is not expected to significantly impact any threatened or endangered species, the potential for impact cannot be underestimated. Informal consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Division and the Florida Game and Fresh Water Fish Commission is ongoing. Any information or comments from these agencies with regard to whether the proposed project "may affect" a listed species, in accordance with the Section 7 of the Endangered Species Act (as amended) and the Florida Endangered Species Act, will be addressed in the project environmental documents.

8.15.6 Contamination Impacts

A contamination assessment was performed to locate and define areas along the existing roadway where contamination of soil and/or groundwater by petroleum or hazardous materials has occurred in the past, where contamination or deleterious conditions presently exist, or where the potential for contamination exists due to the present land use.

The contamination assessment for the 22nd Street/Causeway Boulevard project identified a total of eighty-one sites for evaluation. One of these sites, No. 55, has been evaluated as having a "high" rating. Priority Pollutant Chemical and Resource Conservation and Recovery Act (RCRA) metals investigation is recommended for this site. Thirty-four of the sites have been evaluated as having a "medium" rating. The locations of the sites rated "high" and "medium" are shown in Figure 8-18. The business and location can be found in Table 8-2. Thirteen of the sites rated "medium" are Early Detection Incentive (EDI) sites. Level II soil and groundwater investigations are recommended for these sites. Level II testing may include soil borings with screening with an organic vapor analyzer, soil sampling, and water sampling. Ten of the sites rated "medium" are suspect gas station sites. Geophysical radar is recommended at these sites. Three sites exhibit poor housekeeping practices. Precautionary hand auger investigation are recommended at these sites.



PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

POTENTIAL HAZARDOUS MATERIAL & PETROLEUM SITES

FIGURE NO. 8-18

The Preliminary Geotechnical Report provided additional evidence of contamination within the project limits. Boring B-2, which was taken near site 38, had a strong petroleum odor. Additional study is recommended for the site (former gas station).

8.16 UTILITY IMPACTS

As previously noted in Section 3.1.12 of this report, there are numerous underground and overhead utilities along the 22nd Street Causeway/Causeway Boulevard corridor. The final design of this project will be coordinated with the utility owners to minimize relocation adjustments and disruptions of service to the public. Utilities located within public right-of-way are typically relocated at the owner's expense during roadway widening projects.

Noteworthy utilities include aerial 138KV and larger electrical transmission lines, a 36 inch water main, various underground petroleum and natural gas lines and various fiber optic cables. A telephone switching station in the northeast quadrant of the 22nd Street Causeway/U.S. 41 intersection will also be impacted. During the conceptual design phase, it was determined that the major electric transmission poles along the causeway could be avoided without additional right-of-way takings. Existing storm sewer will be replaced. The 36 inch water main was deliberately buried deep to minimize the potential conflicts. An order-of-magnitude utility relocation cost estimate for the preferred alternative will be requested from all utilities.

Table 8-2
Potential Sites Of Hazardous Materials And/Or Petroleum Impacts

Site No.	Business	Location
1	Shell Gas Station	U.S. 301 and Causeway Boulevard
2	Circle K	2820 U.S. 301 South
3	Fina Gas Station	9427 Causeway Boulevard
4	Certified Auto	Causeway Boulevard
7	Vacant Old Gas Station	8210 Causeway Boulevard
10	Vacant Old Gas Station	7801 Causeway Boulevard
11	Seven-Eleven Gas Station	7711 22nd Street
13	Causeway Gas Station	7511 Causeway Boulevard
16	Auto Parts/Old Gas Station	7002 Causeway Boulevard
17	Vacant/Old Gas Station	6940 Causeway Boulevard
18	Git N Go Gas Station	6912 Causeway Boulevard
24	Vacant/Old Gas Station	6301 Causeway Boulevard
25	Circle K Gas Station	6110 Causeway Boulevard
30	Vacant/Old Gas Station	5309 Causeway Boulevard
35	Gopher Auto Salvage	5015 Causeway Boulevard
38	Auto Air Muffler/Brake	2802 50th Street
39	Amoco Gas Station	2801 50th Street
40	Boat Repair Shop	4916 Causeway Boulevard
41	Citgo Gas Station	4714 Causeway Boulevard
43	American Auto/Old Gas Station	4702 Causeway Boulevard
44	Restaurant/Old Gas Station	4518 Causeway Boulevard
53	Ethanol Eastern Corp.	3701 Causeway Boulevard
55	**Diversified Marine Tech**	**2531 Causeway Boulevard**
57	McClendon Oil Co.	1409 22nd Street
58	Majik Market Gas Station	908 22nd Street
59	Vacant/Old Gas Station	904 22nd Street

60	Fina Gas Station	901 22nd Street
62	J&G Auto Parts	607 22nd Street
63	Coin Laundry	406 22nd Street
65	Convenience Gas Station	301 22nd Street
66	Clemson Transmission	111 33rd Street
70	Exxon Gas Station	2105 East Adamo Drive
75	Marathon Oil Co.	725 20th Street
79	Radiant Oil Co.	2004 Durham Street
81	Union 76 Gas Station	1909 S.R. 60

8.17 MAINTENANCE OF TRAFFIC

The ability to maintain the existing level of service during all phases of construction is a critical consideration when designing an upgraded urban facility. The conceptual approach to the Maintenance of Traffic (MOT) during construction presented in the following sections places major emphasis on maintaining the present number of lanes throughout construction. Furthermore, in an effort to reduce MOT costs, the use of existing pavement should be incorporated into the MOT plan.

Maintenance of traffic schemes are presented for the following roadway sections:

- General roadway widening/new construction
- McKay Bay Bridge Widening
- Delaney Creek bridges
- U.S. 41 Interchange

The proposed MOT concepts will be discussed in the following subsections.

8.17.1 Maintenance of Traffic for Roadway Widening/Reconstruction

The maintenance of traffic for the North Section poses different issues for each of the two design scenarios: the 6-lane divided and the one-way pair. The 6-lane options, which require substantial right-of-way acquisition from one side of the roadway, would be constructed for one direction of travel while traffic is maintained on the existing facility. Phase II traffic could then be diverted to the newly constructed lanes, allowing the travel lanes for the other direction to be built.

The 3-lane one-way pairs would require a different concept than the 6-lane roadway. Since 22nd Street is a three lane roadway and 20th Street is a wide two lane facility, two way traffic would be shifted to one side of the existing facility, thereby eliminating the two-way left turn lane. This would likely require temporary pavement. One side of each one way pair would then be constructed, traffic shifted and the other side completed. Existing through laneage would be maintained with this plan.

The East Section of the project could be constructed in a different manner. The outside lanes of the proposed facility would be built first with traffic maintained on the existing roadway. Upon completion of that phase, traffic would be diverted to the new pavement for completion of the inside lanes and median.

Each of the above MOT plans would require close coordination between roadway construction and the drainage/stormwater management system elements. The maintenance of existing laneage is also critical as existing levels of service are generally poor without the constraints of the adjacent construction. In all cases, access to adjacent properties must be maintained throughout the construction period.

8.17.2 McKay Bay Bridge Widening Maintenance of Traffic

The recommended widening is to the outside only, with replacement of the inside parapets being the only interior construction. Traffic would initially be shifted to the inside 22 foot of the existing bridges, utilizing the existing shoulders for travel. The widening construction would take place, traffic moved outward, and the inside parapets reconstructed to complete construction.

8.17.3 Delaney Creek Bridge Replacement Maintenance of Traffic

The MOT concept is simplified when six lanes are replacing two. Depending upon the chosen alignment, the outside lanes in one or both directions could be constructed in the first phase. The second phase would divert traffic to the new newly constructed bridge deck area, while the construction of the remaining section of the new bridge is completed.

8.17.4 U.S. 41 Interchange Maintenance of Traffic for U.S. 41 Interchange and Adjacent Railroad Overpass

The complexity of the proposed Causeway Boulevard interchange at U.S. 41 allows several construction phasing schemes to be evaluated, including:

- Phased overpass construction
- Construction and use of ramps/frontage roads for U.S. 41 traffic during bridge construction

The most likely MOT scheme for the interchange would involve construction of the frontage roads in the first phase of construction. Existing traffic could then be directed to the frontage roads, opening up the interchange overpass area for bridge construction. This phasing would include installation of temporary traffic signals, and could require periodic reduction in the number of lanes available for through traffic.

8.18 RESULTS OF PUBLIC WORKSHOPS AND ADVANCE NOTIFICATION RESPONSES

A public information workshop was be held on April 9, 1992, giving residents and interested parties the opportunity to review the project and make comments. The results of the workshop is documented in an Appendix to this report.

At the onset of the project, an Advance Notification Package was distributed to all governmental agencies with a possible interest in the project. Responses received to date are included in Appendix E.

8.19 VALUE ENGINEERING

The Value Engineering (VE) review for the project was performed between May 5 and December 21, 1992, by the FDOT staff. The following three (3) recommendations were developed by the value engineering team:

1. Since roadway west of U.S. 41 drains into tidal waters, thus requiring treatment only for added pavement area drainage, the number of retention ponds may be reduced from seven to two;

   Savings: $5,549,600

2. Substitute an at-grade crossing of the Causeway Boulevard with the CSX railroad east of U.S. 41 in lieu of the overpass;

   Savings: $7,572,600

3. Construct 2-lane one-way pair roadways in lieu of 3-lane along 20th and 22nd Streets, from Durham Street to Maritime Boulevard:

   Savings: $776,800

These three recommendations represented a total savings of approximately $13,899,000.

In response to item #1, the referenced ponds sites were relabeled potential pond sites with the possibility for elimination of some of the sites during the construction phase. The overpass elimination recommended in item #2 was consistent with the findings of a revised Benefit/Cost analysis, which was performed concurrent with the VE study. Recommendation #3 was not incorporated into the study as design traffic volumes could not be accommodated with fewer lanes while maintaining an acceptable level of Service. In addition, a 4-lane roadway is not consistent with the MPO 2010 Needs Plan. FDOT has approved these responses to the VE recommendations.

8.20 DRAINAGE

In the proposed conditions the existing drainage basins will be slightly modified as existing roadway profile grade high points may move during final roadway design. Existing drainage patterns along 22nd Street will be maintained. The design requirements for each basin will be a product of the basins individual outfall. Each basin's design requirements will be determined with regard to stormwater quality and quantity. Attenuation and/or treatment facilities have been preliminarily sized for each basins design criteria.

Required stormwater runoff water quality treatment volumes are based on the net increase of impervious area for each basin. Attenuation volumes are calculated for non tidal basins. Stormwater treatment and attenuation volumes may increase if the permitting agency's policies change.

Parcels have been identified for possible pond locations. For each basin, a method of stormwater treatment has been recommended. A conceptual drainage design for the 22nd Street Causeway/ Causeway Boulevard project is described below.

8.20.1 Tidal Basins

Palmetto Beach Pond #2 (PBP#2)

The Palmetto Beach Pond #2 (Figure 8-19) would provide treatment for the area of improvements from Adamo Drive (S.R. 60) south to Gordon Street. A wet detention treatment system is recommended due to the high water table. Stormwater attenuation is not proposed at this pond site. Pond PBP#2 will discharge into the tidal waters of Ybor Channel via a closed pipe network and an open ditch near the CSX railroad. Pond PBP#2 should be located on a presently vacant 2 acre parcel bordered on the south by Corrine Street, on the north by Durham Street and on the east and west by 22nd Street and 20th

Street respectively. The required volume for PBP#2 will be approximately 0.30 acre feet. The pond should be located on the existing parcel in the most efficient manner. Remnant parcels should be used if possible.

Palmetto Beach Pond #1 (PBP#1)

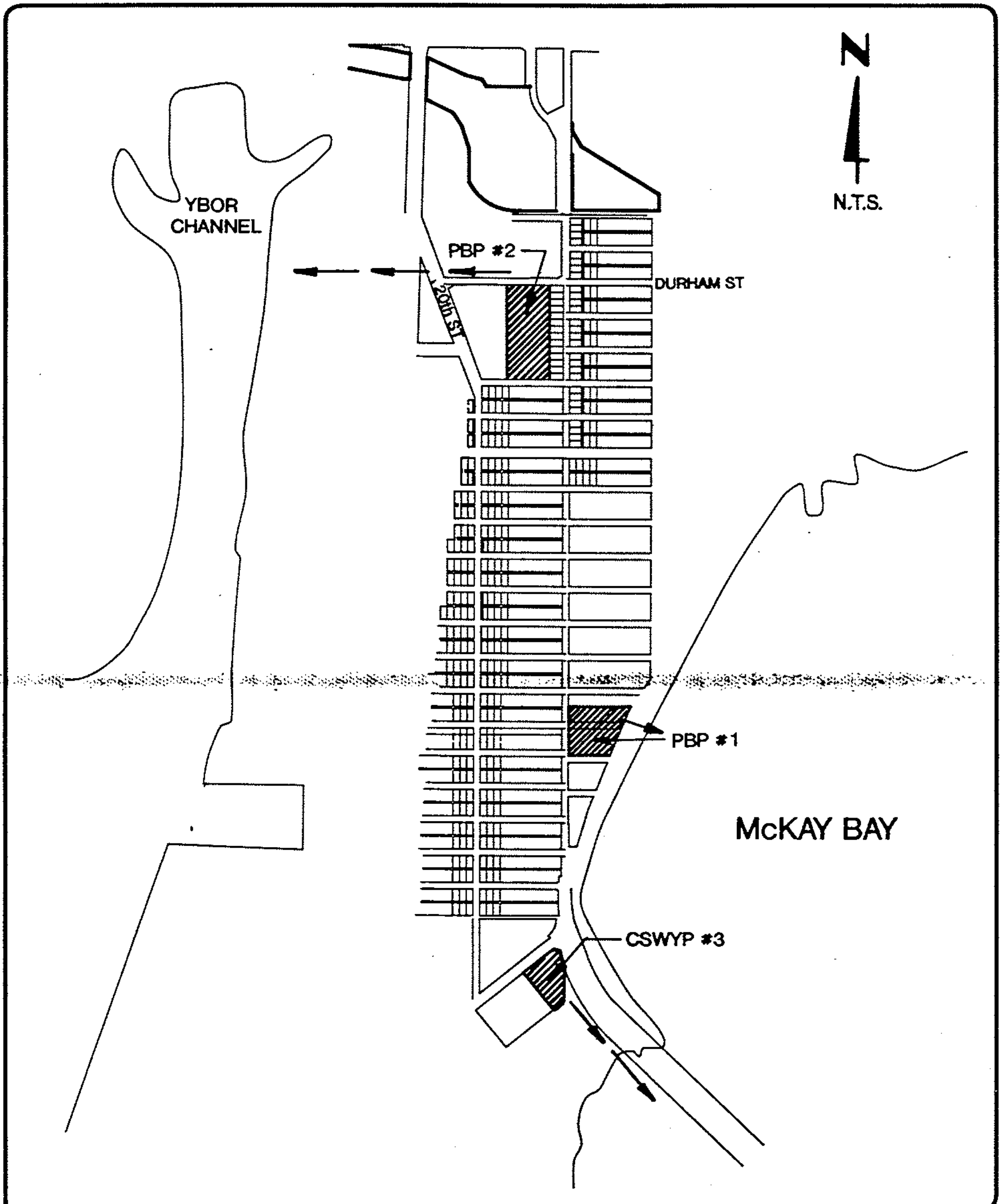
Treatment for the project improvements from Gordon Street south to the north end of the McKay Bay bridge will be provided at PBP#1 (Figure 8-19). The method of treatment recommended at this pond site is also wet detention. Stormwater attenuation is not proposed at this site. Pond PBP#1 will discharge into McKay Bay. A 2 acre site has been located adjacent to 22nd Street and Bermuda Drive. The required volume for pond PBP#1 will be approximately 0.14 ac-ft to 0.30 ac-ft depending on the selected alignment alternative. Depending on the alignment and remnant parcels, other pond sites may be available.

Causeway Pond #3 (CSWYP#3)

Causeway Pond #3 (Figure 8-19) will be located along 22nd Street and Maritime Boulevard. It will provide stormwater treatment for the project from Bermuda Drive to the high point on the McKay Bay bridge. The required treatment volume is 0.40 ac-ft to 0.50 ac-ft depending on the alignment selected. Wet detention is the recommended method of stormwater treatment at CSWYP#3. Stormwater attenuation is not required at this location. The pond should be located on vacant property in the vicinity of Maritime Boulevard. The pond will discharge along the west side of 22nd Street to East Bay. Avoidance of existing wetland sites should be considered when locating pond CSWYP#3.

Causeway Pond #1 (CSWYP#1)

The improvements to 22nd St Causeway from the high point on the McKay Bay bridge east to a high point on the causeway will be treated at CSWYP#1 (Figure 8-20). The



PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

PROPOSED POND LOCATIONS

FIGURE NO.
8-19

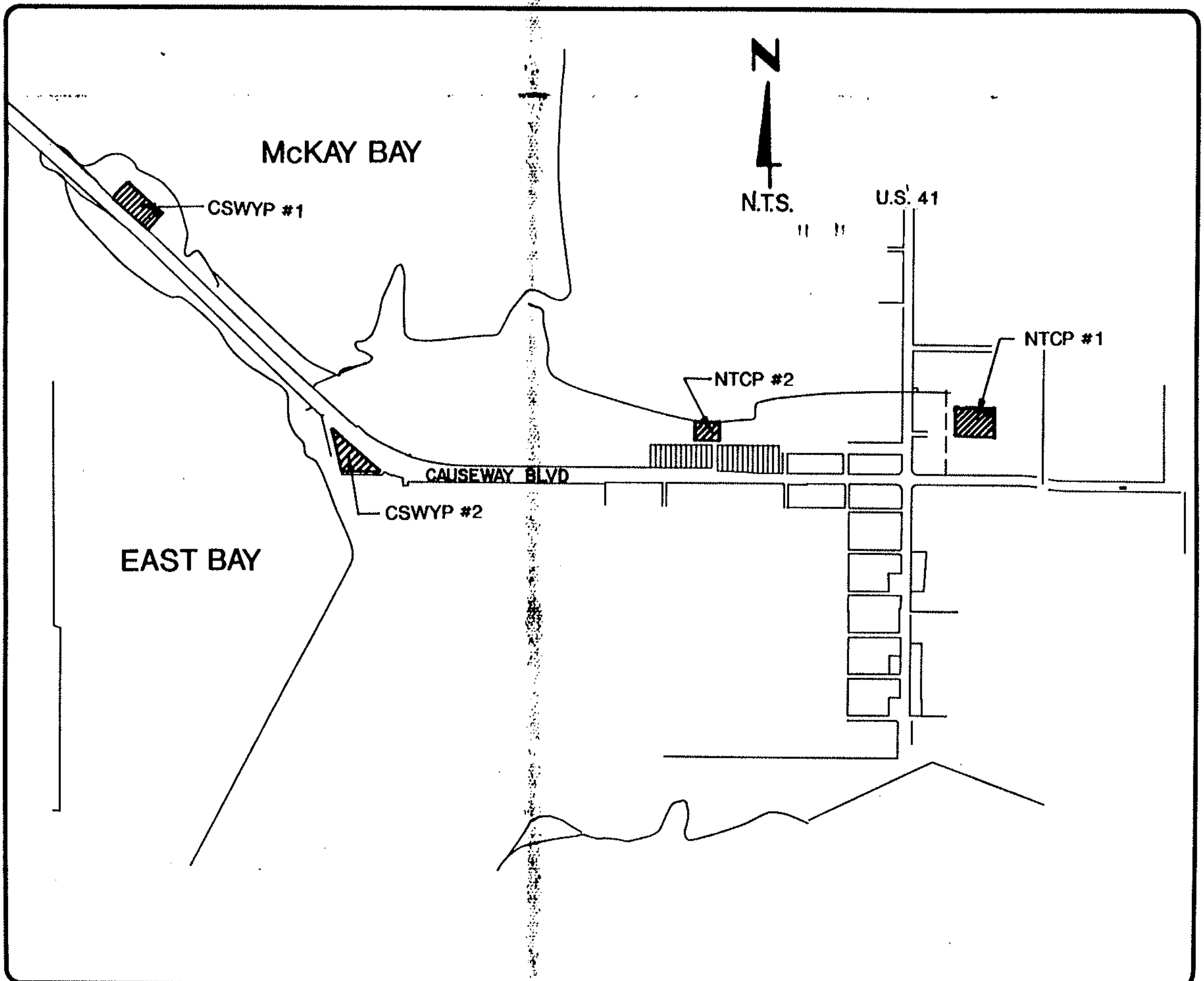
required treatment volume for this section of the project is 0.16 ac-ft. Wet detention is the recommended method of treatment. A site located across the road from the Tampa Shrimp Docks could be used for CSWYP#1. The pond will discharge to McKay Bay. Stormwater attenuation is not proposed at this site. It may be possible, and more cost effective, to eliminate the need for CSWYP#1 by providing compensatory treatment at another site.

Causeway Pond #2 (CSWYP#2)

Causeway Pond #2 (Figure 8-20) will provide stormwater treatment for the improvements along 22nd Street Causeway/ Causeway Boulevard from a high point on the causeway to around 47th Street. A 2.5 acre vacant parcel at the south/east end of the causeway could be used for CSWYP#2. The required treatment volume is 0.60 ac-ft. A wet detention facility is recommended at this pond site due to the high water table. CSWYP#2 may be the best location to provide the compensatory treatment that would allow the elimination of CSWYP#1. Stormwater attenuation is not proposed at this pond location. The proposed pond will outfall into East Bay.

North Tidal Canal Pond #2 (NTCP#2)

The North Tidal Canal Pond (Figure 8-20) will provide treatment for the improvements along Causeway Boulevard from 47th Street to the U.S. 41 intersection. The required treatment volume at NTCP#2 is 0.07 ac-ft. There are several vacant parcels in the area that could be used for NTCP#2. The preferred site is a vacant residential lot that is adjacent to the canal. Other sites include commercially zoned parcels on 26th Avenue & El Camino Blanco Boulevard. Wet detention is the recommended treatment method. Stormwater attenuation is not required at this pond location. The ponds outfall would be a tidal canal north of 26th Avenue.



PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

PROPOSED POND LOCATIONS

FIGURE NO.
8-20

North Tidal Canal Pond #1 (NTCP#1)

The improvements to Causeway Boulevard from U.S. 41 to the CSX Railroad will be treated in the North Tidal Canal Pond #1 (Figure 8-20). The required treatment volume at NTCP#1 is 0.76 ac-ft. Much of the land in this area of the project has been previously developed. A vacant parcel north of the General Telephone Building may be the best location for NTCP#1. Stormwater attenuation is not proposed at this pond location. NTCP#1 would discharge to a tidal canal north of Causeway Boulevard. It may be possible to eliminate NTCP#1 by directly discharging into the canal north of the U.S. 41 intersection and providing additional treatment at NTCP#2.

8.20.2 Delaney Creek Basins

It is anticipated that the design and construction of this project will occur after improvements to Delaney Creek, proposed by Hillsborough County, have been completed. Therefore, attenuation volumes are based on 25 year 24 hour design event and do not include current basin design criteria as required by Hillsborough County and the Southwest Florida Water Management District.

Delaney Creek Pond #3 (DCP#3)

The Delaney Creek Pond #3 (Figure 8-21) would provide stormwater treatment and attenuation for the project from the CSX Railroad crossing to around 70th Street. The total volume required for stormwater quality and quantity is 1.10 ac-ft. A vacant 2 acre parcel located near 58th Street and Causeway Boulevard could be used for DCP#3. Remnant parcels near the basins outfall at Delaney Creek Tributary "A" could be used to reduce right-of-way acquisition.

Delaney Creek Pond #1 (DCP#1)

The stormwater treatment and attenuation facilities for Causeway Boulevard from 70th Street to 78th Street will be located at DCP#1 (Figure 8-21). A vacant parcel located on 75th Street can provide the total 1.41 ac-ft. volume required. Pond DCP#1 will outfall to the main channel of Delaney Creek.

Delaney Creek Pond #4 (DCP#4)

The Delaney Creek Pond #4 (Figure 8-21) is proposed to treat and attenuate the stormwater generated from Causeway Boulevard improvements from 78th Street to U.S. 301. Parcels have been preliminarily identified for the construction of DCP#4. Utilizing the existing power line easement may be a viable alternative. Other vacant parcels are zoned residential and commercial. The outfall for DCP#4 is the 86th Street canal. The canal in turn discharges into Delaney Creek.

8.21 PROPOSED BRIDGES AND BRIDGE IMPROVEMENTS

Several locations through the project limits will require the construction of new bridges or the widening of existing structures. They are as follows:

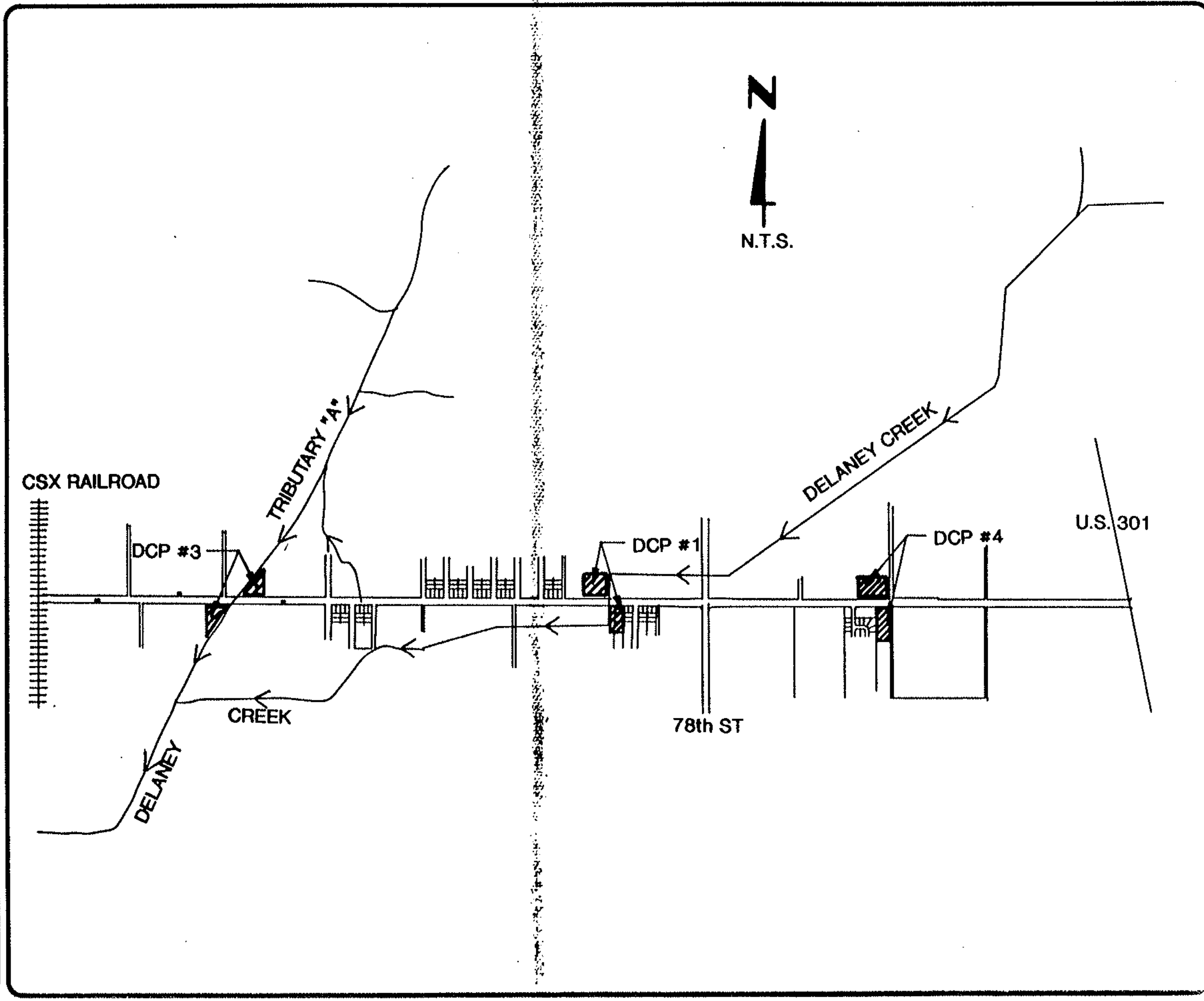
- 22nd Street over McKay Bay (widening)
- Causeway Boulevard over Delaney Creek (replacement)
- Causeway Boulevard over Tributary A (replacement)
- U.S. 41 over CSX R.R. (new structure)
- U.S. 41 over 22nd Street Causeway (new structure)

This section will present the recommended bridge concept at each location. The recommendations will be based on vertical and horizontal clearance requirements, aesthetic considerations, utilities accommodation, loading and hydraulic requirements,

PROJECT
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

PROPOSED POND LOCATIONS

FIGURE NO.
8-21



maintainability, proposed maintenance of traffic concepts and economy among other considerations. In addition, the need for retaining walls will be investigated later in this section.

8.21.1 22nd Street Causeway Over McKay Bay

Overview & Proposed Improvements

As noted in Section 3.2 of this report, the parallel 22nd Street Causeway bridges over McKay Bay were constructed in 1976 to carry 2 lanes each in opposing directions. The bridges have been in use since their time of construction without any major improvements; however, the need for an additional lane on each bridge is now required. The existing bridge condition report recommends that the bridges be widened and proposes two alternatives:

1. Widen to both the inside and outside of the existing structures.
2. Widen to the outside of the existing structures.

An investigation of the two alternatives indicated that widening to the outside along with a replacement of the nonstandard traffic railing on the inside (to comply with federal funding requirements) is the most beneficial alternative.

Widening to the outside is a more economical alternative as it requires less substructure and foundation improvements to accomplish; however, it results in a reduction of the existing vertical clearance by approximately 6 inches. This encroachment is not considered significant due to the existing 40'-0" M.H.W. vertical clearance.

The bridge inspection reports gave the Fender System a satisfactory/good rating. It is recommended that the portion of the fenders parallel to the channel be upgraded to correct the identified deficiencies. Furthermore, the fender wings should be removed and the fender extended to accommodate the widening.

The following is a discussion of the various aspects of the recommended widening. Figures 8-22 through 8-24 show detailed information on the proposed bridge widening.

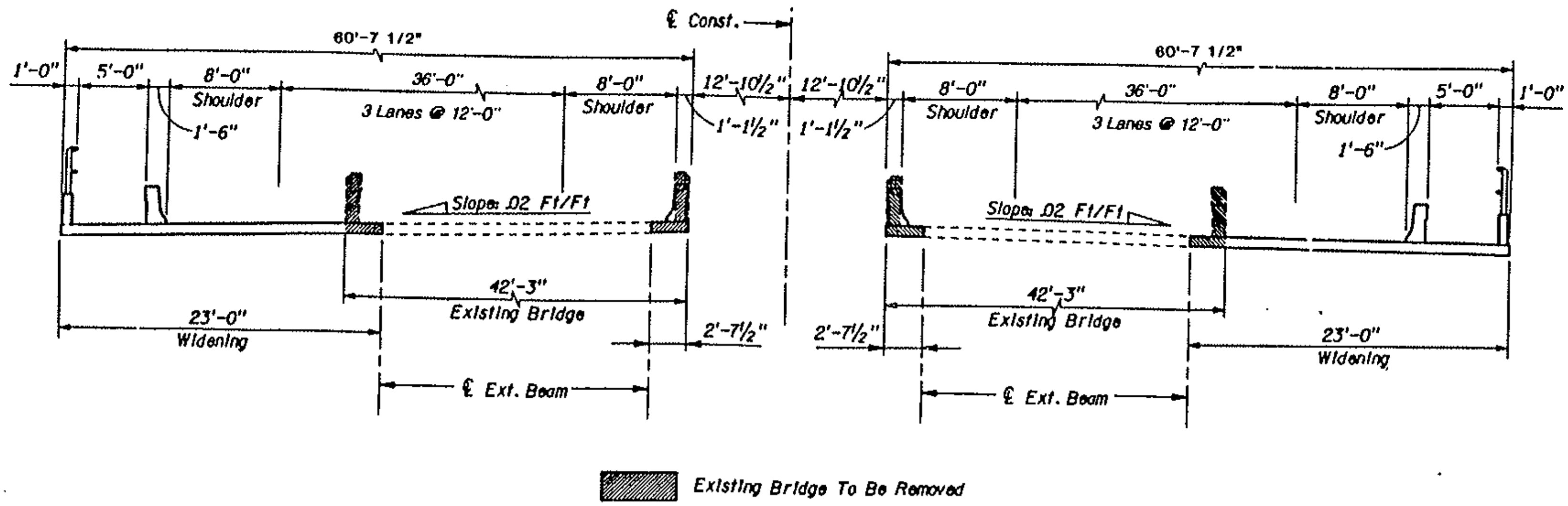
Superstructure

The widening will increase the overall width of each bridge from 42.25' to 60.625' and will match the beams used in the existing spans, however it will effect an increase in slab thickness from the present 7" slab to an 8" slab.

The widening of the superstructure will require that the existing traffic railing barriers be replaced to ensure compliance with federal funding requirements. The widening will result in the provision of a sidewalk as well as an additional lane to the outside of the bridge for a total of 3 lanes on each bridge.

Substructure

The substructure of the proposed widening would occur in the same locations as the existing structures and would be similar in design and appearance. The substructure would also be designed for ship impact. For the purposes of this report it has been assumed that the provisions made on the existing structure were sufficient, and as such, may be duplicated. However, information has been requested from a number of sources including the USCOE and the Coast Guard. Any necessary revisions to the ship impact protection system will be incorporated into future report editions.

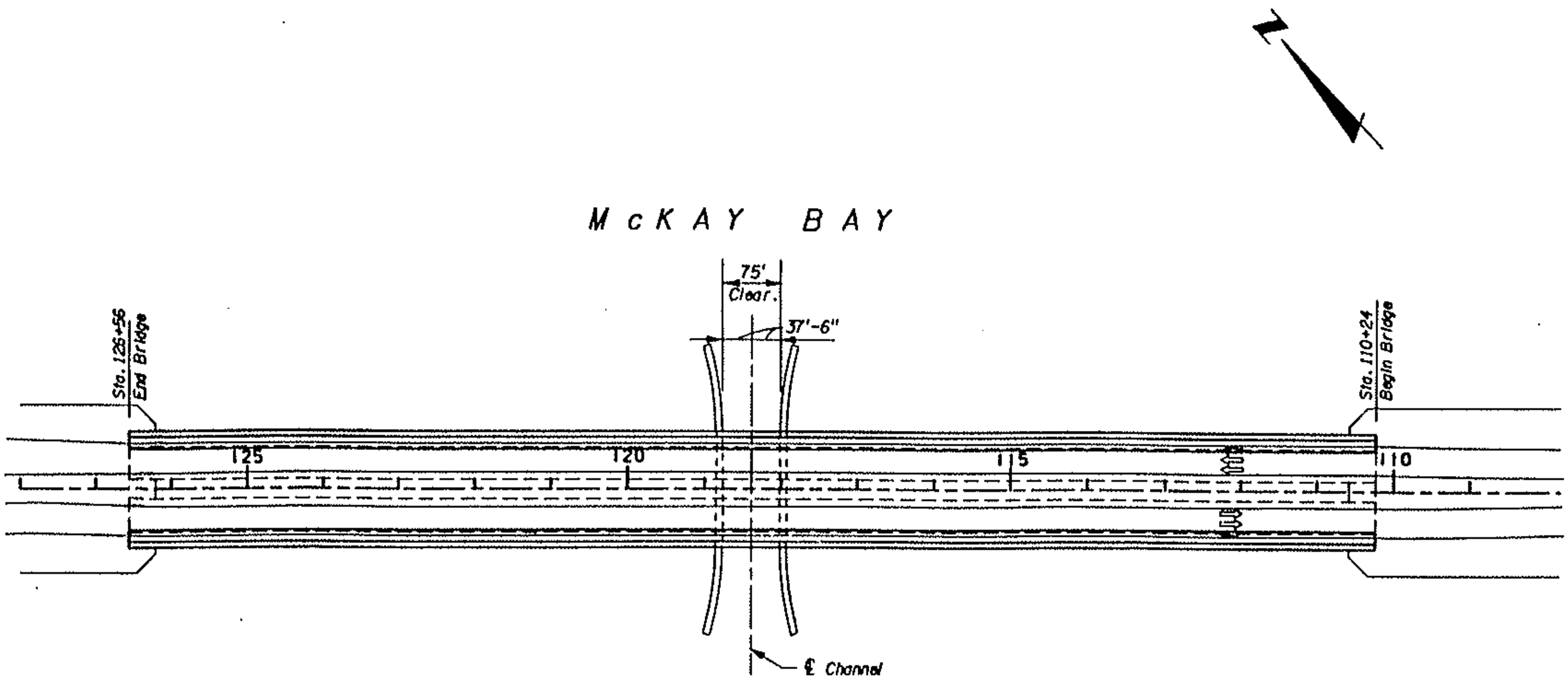


TYPICAL SECTION

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY

22nd STREET CAUSEWAY OVER McKAY BAY

FIGURE NO. 8-22

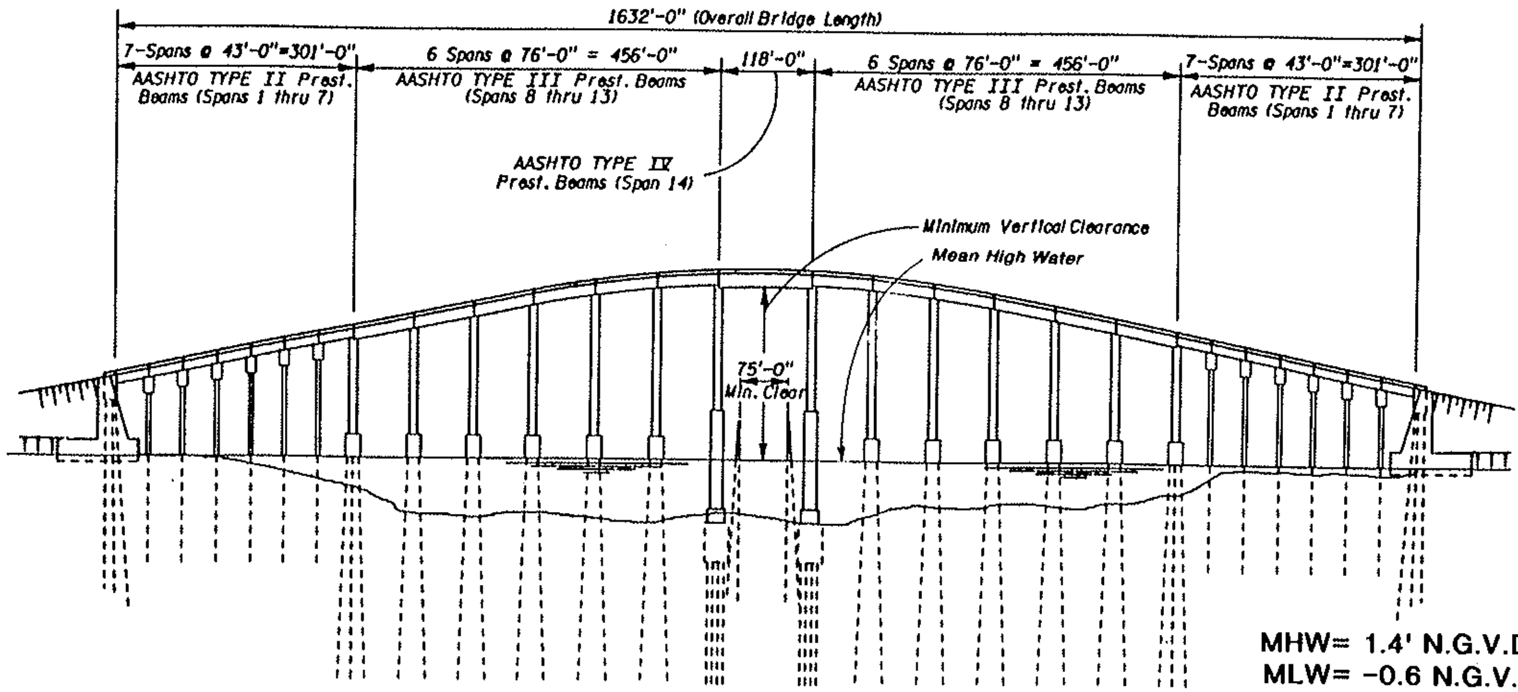


PLAN

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY

22nd STREET CAUSEWAY OVER McKAY BAY

FIGURE NO. 8-23



MHW= 1.4' N.G.V.D.
MLW= -0.6 N.G.V.D.
8726685 - TIDAL STATION
22nd ST. CSWY./McKAY

ELEVATION

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY	22nd STREET CAUSEWAY OVER McKAY BAY	FIGURE NO. 8-24

Utility Considerations

To this date one 6" Anhydrous Ammonia pipeline (NH_3), six 4" GTE ducts and a 6" to 8" pipe (unknown) have been identified hanging from the bridge. These utilities, and other which may exist, must be addressed before the proposed widening.

Estimated Construction Costs

The estimated cost for widening the 22nd Street Causeway bridge over McKay Bay is $5,445,500. See Appendix F for details.

8.21.2 Causeway Boulevard Over Delaney Creek

Overview & Proposed Improvements

The Causeway Boulevard bridge over Delaney Creek was built in 1928 to carry two lanes of traffic, one in each direction. The Existing Condition Report recommends that the bridge be replaced to accommodate the proposed improvements. The proposed improvements will result in a six-lane structure, 3 lanes in each direction, with sidewalks on both sides.

The replacement of the existing bridge required that an analysis be done to ensure that the new bridge would not disrupt the hydraulics of the waterway below. The channel section was also upgraded to conform to current standards and sand cement riprap was added for slope protection. A utility strip was not provided below the bridge as called for in Figure 13-3 of the FDOT Detailing Manual as it was not considered practical at this location due to vertical constraints.

The low chord bridge member was raised from the elevation of 16.5' to 17.5' to accommodate the hydraulics. The bridge was lengthened from approximately 61.0' to 100.0' to accommodate the current standards for stream crossings.

Various aspects of the recommended structure are discussed below, followed by conceptual plans of the proposed bridge (Figures 8-25 through 8-27).

Superstructure

The bridge will be a one span, single structure with an 8" slab supported on AASHTO Type IV prestressed beams.

The bridge will carry a total of six lanes, three in each direction, as well as two sidewalks and a raised median. A single structure with a raised median maintains the continuity of the roadway section and is preferred to dual structures with traffic railing barriers.

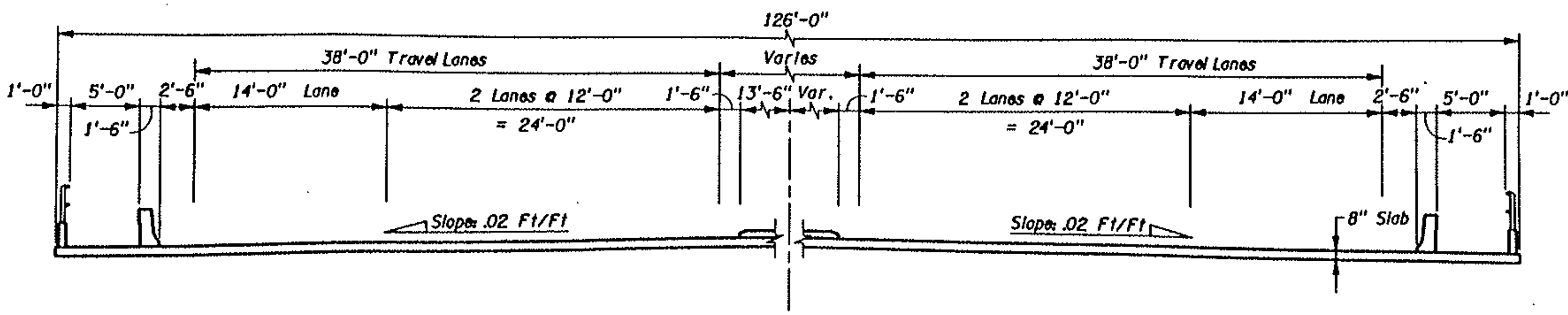
Substructure

The substructure will consist of pile-supported endbents. The foundation of these endbents would be protected from scour and erosion by sand-cement riprap.

The constraints imposed by the right-of-way may require that side retaining walls be used to avoid encroachment by the embankment slopes.

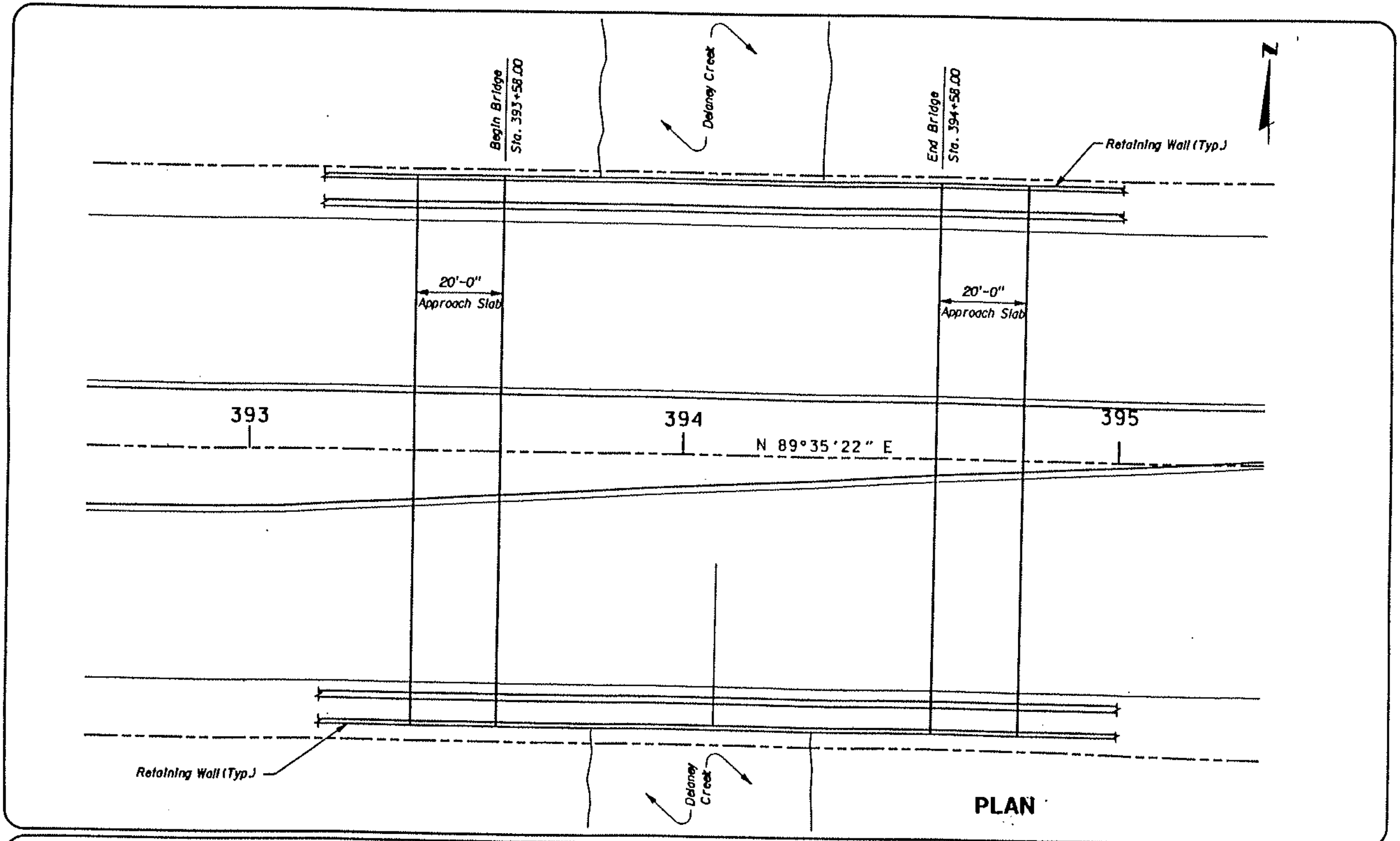
Utility Consideration

Two 2" GTE conduits have been identified on the south side of the existing Delaney Creek bridge. These utilities, and others which may exist, will have to be addressed before bridge replacement.



TYPICAL SECTION

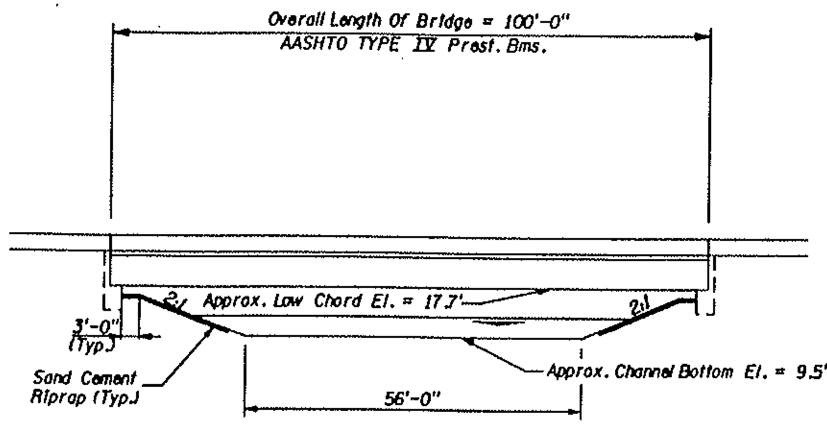
SEE FIG. 8-28



PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

22nd STREET CAUSEWAY OVER DELANEY CREEK

FIGURE NO. 8-26



ELEVATION

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

22nd STREET CAUSEWAY OVER DELANEY CREEK

FIGURE NO.
8-27

Estimated Construction Costs

The approximate cost for the Causeway Boulevard bridge over Delaney Creek is $553,600. See Appendix F for additional information.

8.21.3 <u>Causeway Boulevard Over Tributary A</u>

Overview & Proposed Improvements

The Causeway Boulevard bridge over Tributary A was built in 1928 to carry two lanes, one in each direction. The Existing Condition Report recommends that the bridge be replaced to accommodate the proposed improvements.

The proposed improvements will result in a six-lane structure, 3 lanes in each direction, with sidewalks on both sides.

The replacement of the existing bridge required that an analysis be done to ensure that the new bridge would not disrupt the hydraulics of the waterway below. The channel section was also upgraded to conform to standards and sand cement riprap was added for slope protection. A utility strip was not provided below the bridge as called for in Figure 13-3 of the FDOT Detailing Manual as it was not considered practical at this location due to vertical constraints.

The low chord bridge member was raised from the existing elevation of 8.57' to 8.9' to accommodate the hydraulics. The bridge was lengthened from approximately 41.0' to 77.5' to accommodate the new standards for stream crossings and was skewed 15 to approximate the natural flow of the channel. Various aspects of the recommended structure are discussed below. Figures 8-28 through 8-30 present the typical section, plan and elevation for the proposed bridge.

Superstructure

The bridge will be a one span single structure with an 8" slab supported on AASHTO Type III prestressed beams.

The bridge will carry a total of six lanes, three in each direction, as well as two sidewalks and a raised median. A single structure with a raised median maintains the continuity of the roadway section and is preferred to dual structures with traffic railing barriers.

Substructure

The substructure will consist of pile-supported endbents. The foundation of these endbents would be protected from scour and erosion by sand-cement riprap.

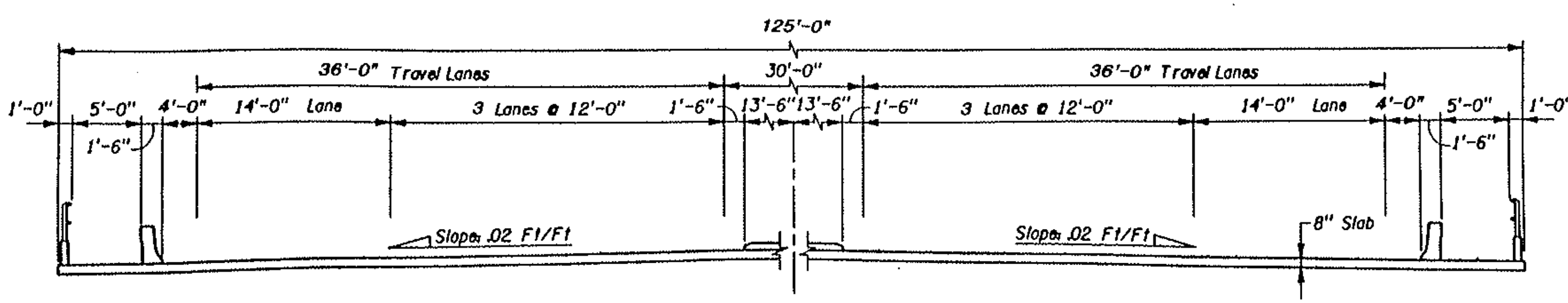
The constraints imposed by the right-of-way may require that side retaining walls be used to avoid encroachment of the embankment slopes.

Utility Considerations

One 2" GTE conduit and a 6" conduit (use/owner unknown) have been identified on the south side of the Tributary A bridge. These utilities, and others which may exist, will have to be addressed before bridge replacement.

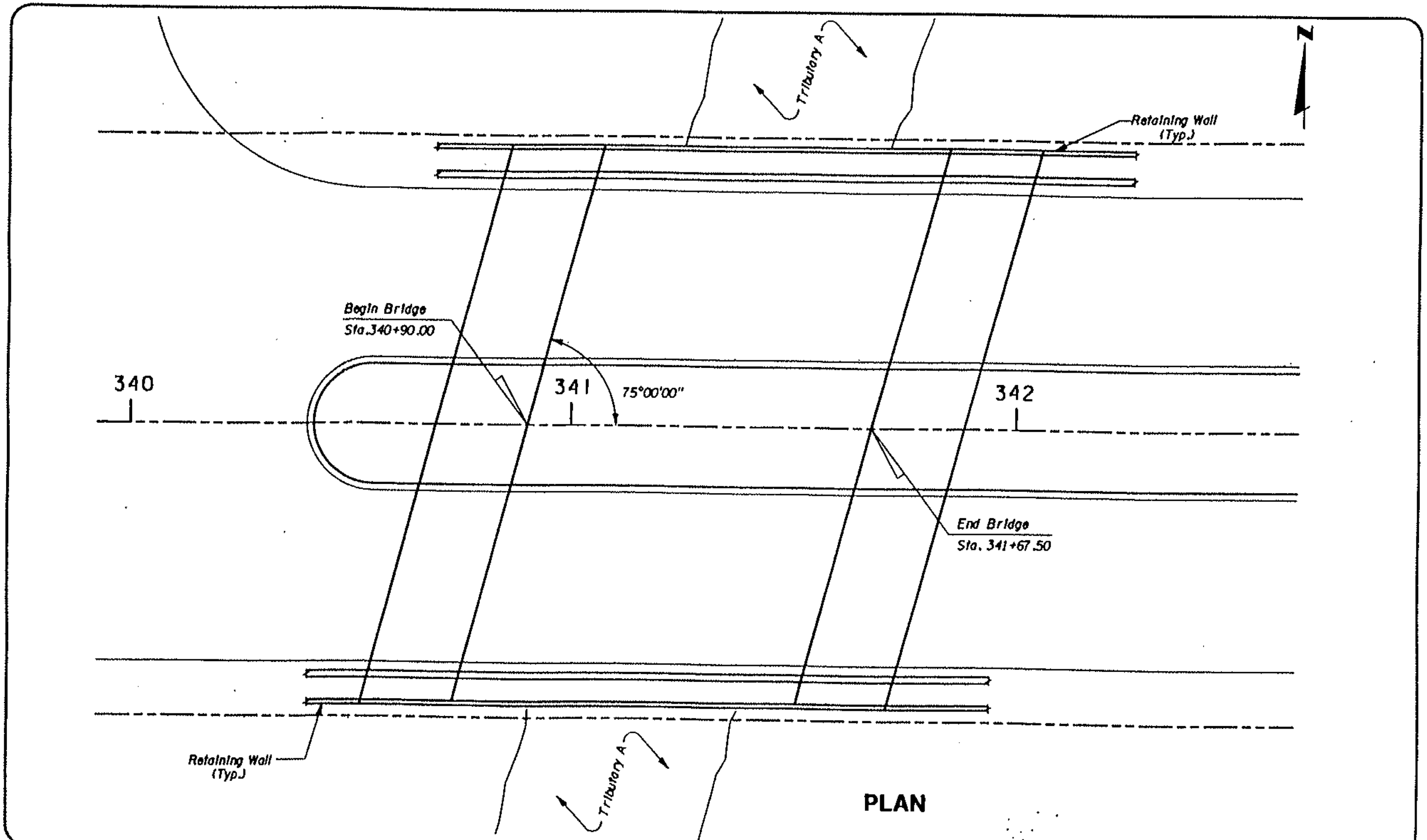
Estimated Construction Costs

The cost estimate for the 22nd Street Causeway bridge over Tributary A is $383,200. See Appendix F for details.



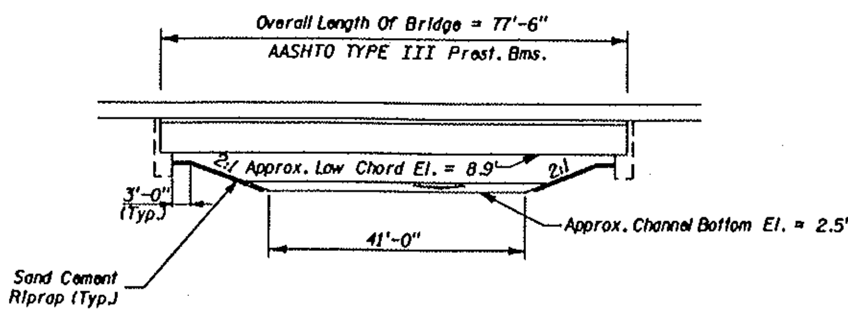
TYPICAL SECTION

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY	22nd STREET CAUSEWAY OVER TRIBUTARY "A"	FIGURE NO. 8-28



PLAN

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY	22nd STREET CAUSEWAY OVER TRIBUTARY "A"	FIGURE NO: 8-29



ELEVATION

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY	22nd STREET CAUSEWAY OVER TRIBUTARY "A"	FIGURE NO. 8-30

8.21.4 U.S. 41 Over CSX Railroad

Overview Proposed Improvements

At present an at grade intersection exists at the railroad crossing on U.S. 41; however, as part of the proposed improvements U.S. 41 will overpass the railroad crossing.

The proposed bridge will carry six lanes, three in each direction, and portions of interchange ramp tapers on both roadways. The northeast quadrant of this crossing will have a frontage road to maintain access to St. Paul Street.

The proposed bridge layout meets all of the FDOT's vertical and horizontal clearance requirements; however, the layout will require coordination with the CSX Railroad.

To follow is a discussion of the various aspects of the recommended structure. This discussion may be supplemented by the Figures 8-31 through 8-33 and computations provided in Appendix F.

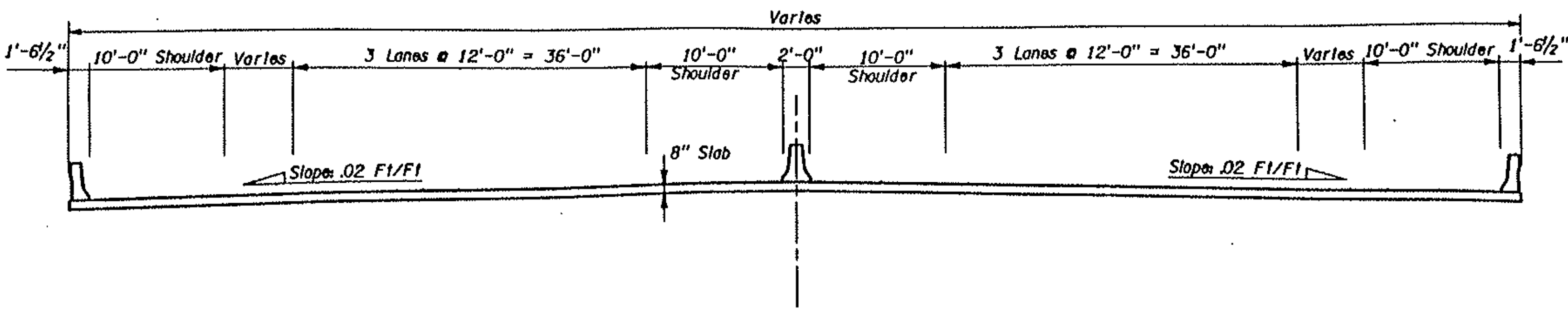
Superstructure

The bridge will be a one span single structure with an 8" slab supported on AASHTO Type V prestressed beams.

The bridge will carry a total of six lanes, three in each direction, with median and shoulder barriers. Pedestrian accommodations are not being planned for this bridge.

Substructure

The substructure will consist of pile-supported endbents. The constraints imposed by the frontage roads as well as the height of structure needed for the railroad's vertical

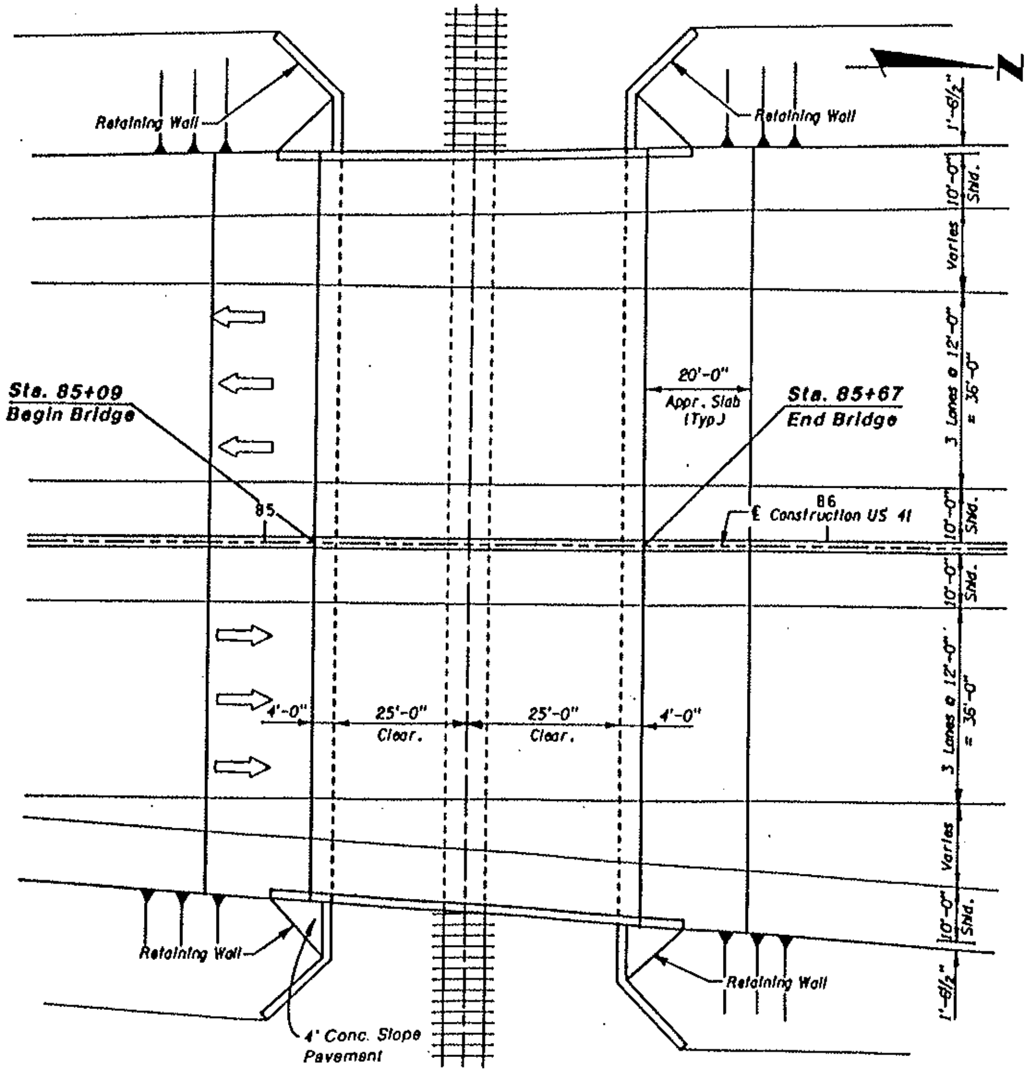


TYPICAL SECTION

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY

U.S. 41 OVER CSX RAILROAD

FIGURE NO. 8-31



PLAN

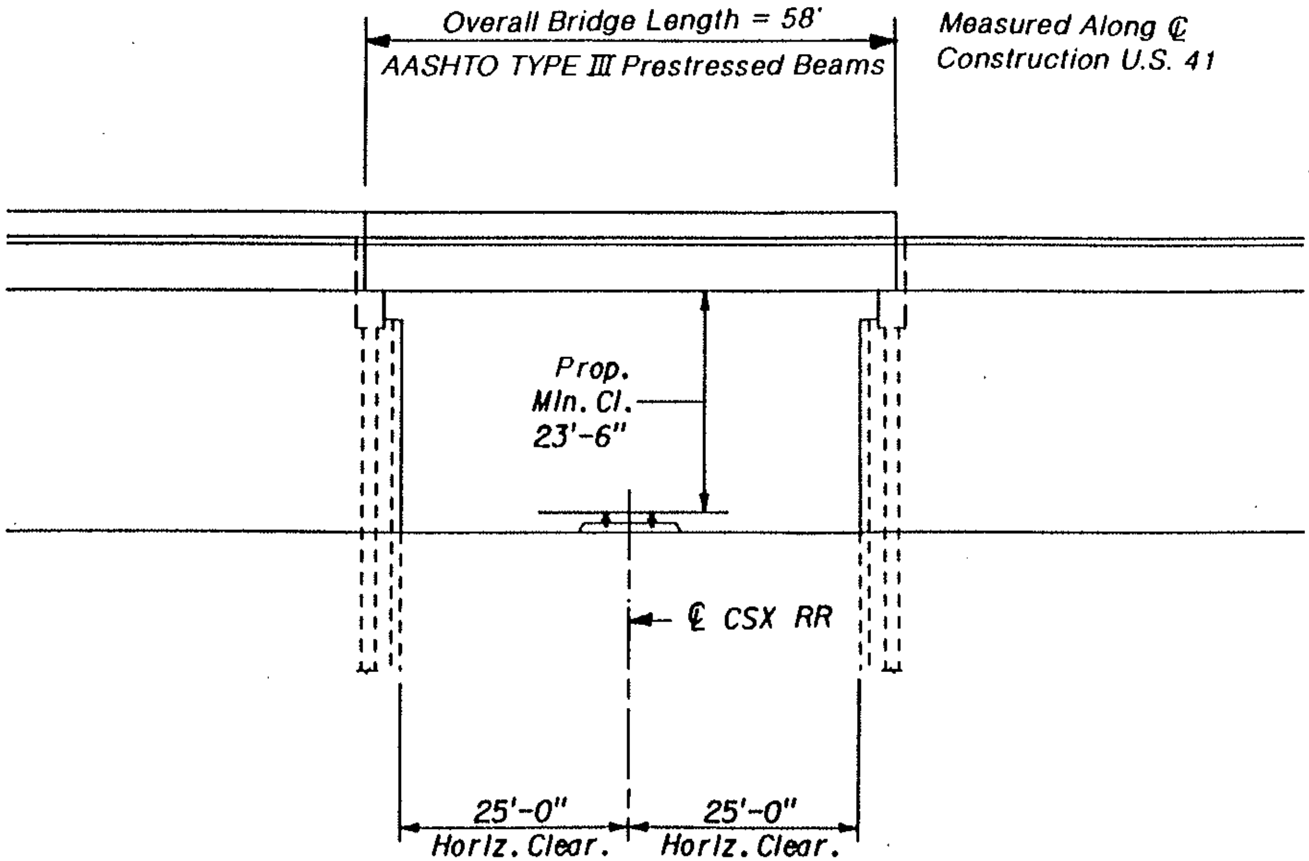
PROJECT

22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

U.S. 41
OVER CSX RAILROAD

FIGURE NO.

8-32



ELEVATION

PROJECT

22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

U.S. 41
OVER CSX RAILROAD

FIGURE NO.

8-33

clearance requirement will require that retaining walls be used to avoid encroachment of the embankment slopes.

Utility Considerations

To this date no utilities have been identified within the proximity of the proposed bridge.

Estimated Construction Cost

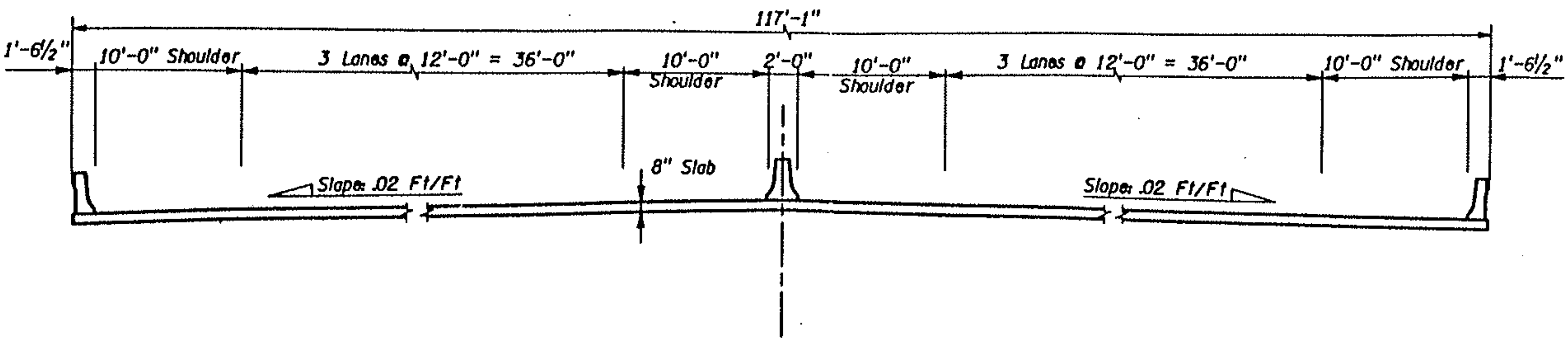
An approximate cost estimate for the U.S. 41 bridge over CSX railroad is $587,600. See Appendix F for details.

8.21.5 U.S. 41 Interchange With Causeway Boulevard

Overview & Proposed Improvements

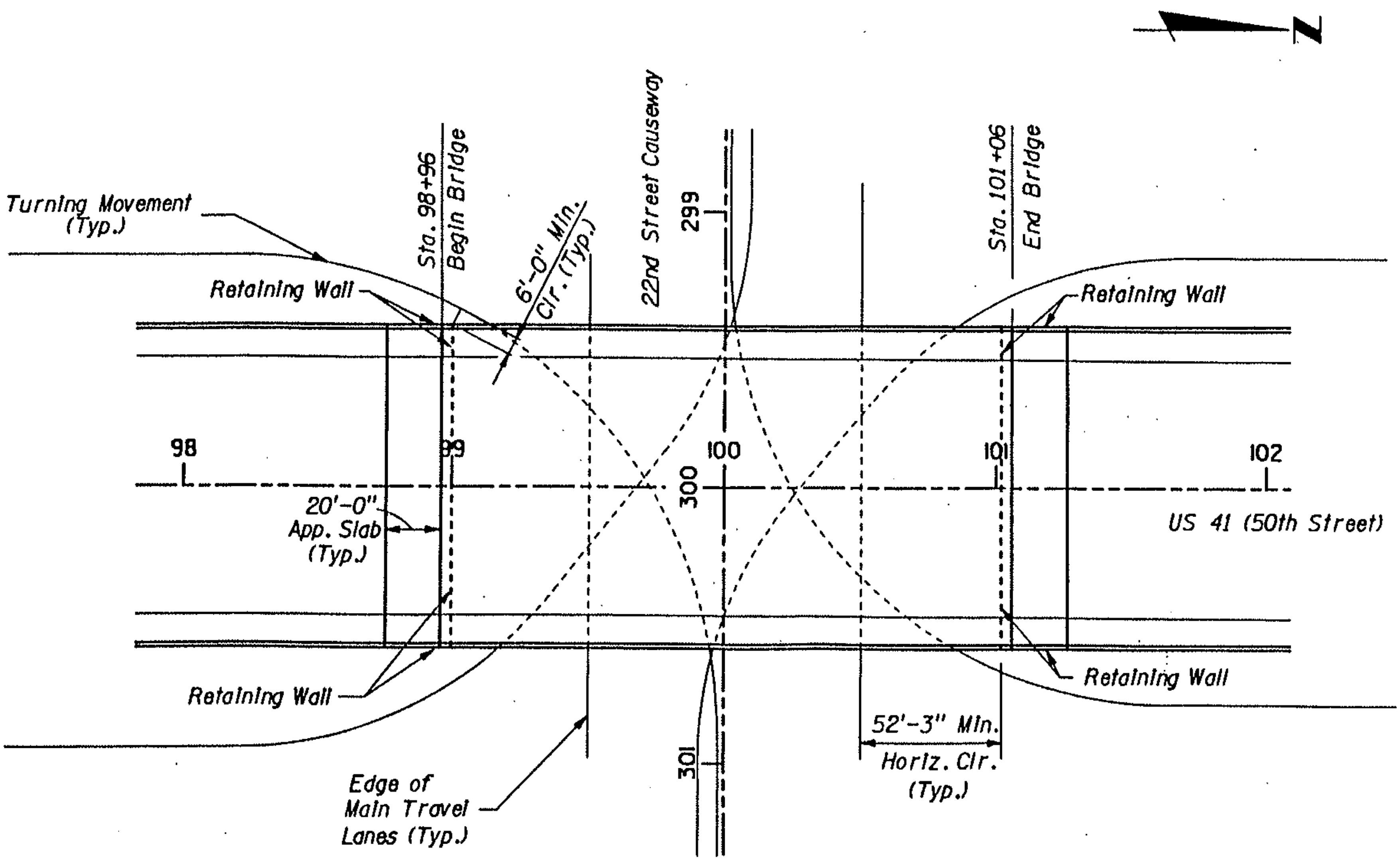
At present, an at grade intersection exists at U.S. 41 and 22nd Street Causeway; however, as part of the proposed improvements U.S. 41 will overpass 22nd Street Causeway. The proposed bridge will carry six lanes, three in each direction, with a median barrier for traffic separation. Frontage roads in the northeast, northwest and southeast quadrants will maintain access to existing businesses on and adjacent to U.S. 41. The proximity of the frontage roads to the bridge will require that side retaining walls be used, this is to avoid impacting the frontage roads with the embankment slope.

The following is a discussion of the various aspects of the recommended structures. This discussion may be supplemented by the drawings and computations provided in the Appendix.



TYPICAL SECTION

PROJECT		FIGURE NO.
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY	U.S 41 OVER 22nd STREET CAUSEWAY	8-34



PLAN

PROJECT

22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD

(S.R. 676)

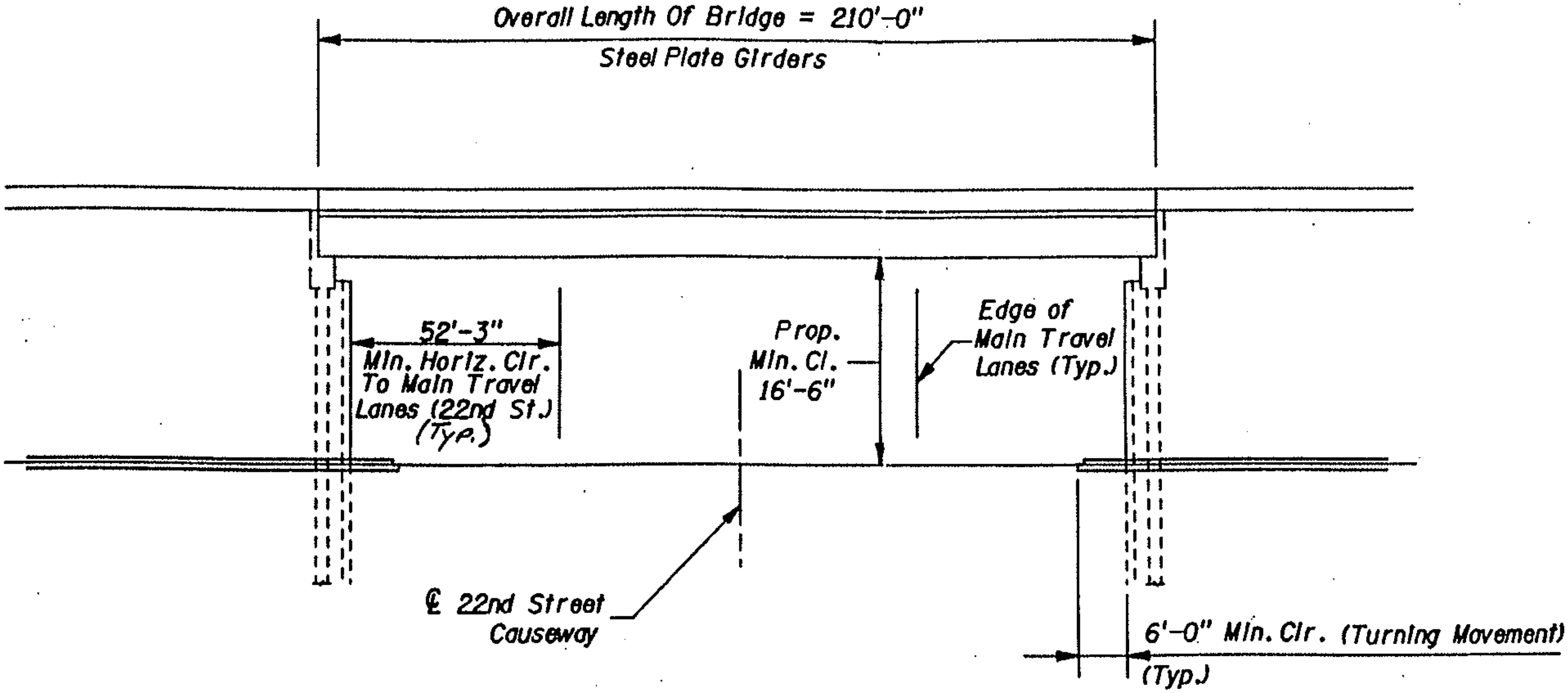
PD&E STUDY

U.S 41

OVER 22nd STREET CAUSEWAY

FIGURE NO.

8-35



ELEVATION

PROJECT		FIGURE NO.
22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD (S.R. 676) PD&E STUDY	U.S 41 OVER 22nd STREET CAUSEWAY	8-36

Superstructure

The bridge will be a one span single structure with an 8' slab supported steel plate girders with an approximate web depth of 84".

The length of span required that steel plate girders or steel box girders be considered for the bridge.

Generally, steel box girders require slightly less steel than plate girders; however, the increased costs associated costs with the fabrication of steel box girders (approximately 15%) overcomes any material savings incurred. It is for this reason that steel plate girders are recommended for this bridge.

Substructure

The substructure will consist of pile-supported endbents. Mechanically stabilized earth (MSE) wall abutments are proposed for this bridge. The use of MSE walls reduce the length of the bridge and provide considerable cost savings.

Utility Considerations

A 24" water main is located on U.S. 41 within the existing right-of-way along with several GTE ducts. Relocation of these utilities is necessary prior to construction of the interchange. The possible relocation of an 8" water main on Causeway Boulevard will also need to be addressed. A GTE switching station is located in the northeast quadrant of the interchange. Impacts to this facility should be avoided if at all possible.

Estimated Construction Cost

An appropriate cost estimate for the U.S. 41 bridge over 22nd Street Causeway is $271,200. See Appendix for details.

8.22 SPECIAL FEATURES

8.22.1 Retaining Wall Considerations

Retaining walls will be required on the bridges proposed as part of the 22nd Street Causeway/Causeway Boulevard improvements. The discussion to follow will outline the process by which this determination was made as well as provide recommendations as to the type of retaining wall to be used under various circumstances.

Retaining Wall Parameters

The principal rationale for using retaining walls in lieu of side slopes along the corridor is based on lateral constraints and/or right-of-way constraints.

At those locations where a side slope and/or a swale/retention area at the toe of the slope would be required but cannot be provided due to right-of-way encroachments, retaining walls have been identified as the appropriate alternate. Previous studies have indicated that it is more economical to provide a wall than to acquire the additional right-of-way.

At those locations where retaining walls are required, three retaining wall types will be considered. If the height of the retained materials is less than five feet, a gravity wall (FDOT Roadway Index No. 520) is the most efficient structure. However, if the height exceeds five feet, then a conventional cantilever or proprietary retaining wall is the more feasible structure. The relative merits of each type will be discussed in the subsequent sections.

Retaining Wall Alternatives

Proprietary Walls

Proprietary walls are earth retaining structures whose design is based on the application of the concept of soil reinforcement. These retaining walls are of the massive gravity-type. Although composite and flexible, they form a continuous, homogeneous block. The block transfers the effects of surcharges and earth pressures to the foundation, and distributes them evenly over the entire width of its base.

Soil reinforcement is accomplished by the interplacing of soil and strap reinforcements which then develops friction at the points of contact between the two, resulting in a permanent and predictable bond and creating a composite construction material.

Due to this unique construction technique, proprietary walls offer significant advantages. The flexibility of the reinforced soil block makes it possible to build directly on compressible foundation soils. The system exhibits a very high resistance to both static and dynamic loads. The use of completely prefabricated facings and reinforcing elements contributes to the ease of installation. Thus, considerable savings in both construction time and materials may be realized.

The soil reinforcement straps should be as short as possible for economy, but long enough to provide adequate stability against overturning, sliding, and to reduce the soil pressure to the allowable value. Generally, the ratio of the length of the reinforcement straps to the overall height of the wall is equal to or greater than 0.7.

Conventional Retaining Walls

Conventional retaining walls are structures that provide lateral support for a mass of soil and that owes its stability primarily to its own weight and to the weight of any soil located directly above its base. The most common types used for highway structures are gravity or cantilever walls.

The stability of a gravity wall depends entirely on the weight of the concrete section and of any soil resting on its backslopes. No reinforcement is provided except where a nominal amount of steel is placed near the exposed faces to prevent surface cracking due to temperature changes. Due to their inherent section requirements for stability, gravity walls are generally relegated to retain five (5) feet or less of soil.

The cantilever wall consists of a concrete stem and a concrete base slab, both relatively thin and fully reinforced to resist moments and shears to which they are subjected. Cantilever walls generally have the advantage of lowest first cost and are widely used in connection with highways. However, because of the relatively small thickness of the concrete sections they may be vulnerable to the effects of expansion and contraction, and concrete deterioration.

The base of the ordinary cantilever retaining wall should be as narrow as possible for economy, but at the same time it must be wide enough to provide adequate stability against overturning and sliding, and to reduce the soil pressure to a tolerable value. The ratio of the width of the base to the overall height of the wall commonly varies from 0.40 to 0.65. The thickness of the base is a function of the shears and moments at sections located at the front and back faces of the stem. If the stem is located so that the projection of the toe from the front face of the wall is approximately 1/3 the width of the base, the thickness of the base commonly lies in the range of 1/12 to 1/8 the height of the wall.

The thickness of the stem must be sufficient to resist safely the shears and moments due to the earth pressure against the back of the wall. The thickness at the top of the wall typically ranges between 9 to 13 inches depending on the height of the wall. The critical section for shear and moment is at the junction of the stem with the base. Typically, the thickness of the stem increases with depth by 3/8 inch per feet to provide adequate strength.

Estimated Construction Cost

A cost comparison was performed based on the following unit costs:

Concrete	=	$(300-350)/CY
Steel	=	$0.45/lb
Proprietary	=	$25/SF

The unit costs are based on discussions with FDOT project managers, contractors, and wall manufacturers.

Calculations indicate that for wall heights greater than 10 feet, the proprietary wall option is the more economical solution.

However, if conventional walls are to be used within this range, an additional cost may be incurred. The additional cost may consist of a number of surface treatments, architectural effects, etc., that may be required to give the appearance of a continuous and aesthetically acceptable wall system. Due to the additional cost, it may be optimal to use proprietary walls throughout. Any aesthetic criteria that may be established can be controlled and executed in a more consistent manner.

Aesthetic Considerations

The use of proprietary walls necessitates that particular attention be directed to the overall appearance of the walls. The possibility exists that different suppliers may be contracted to install the walls. The inadvertent result is that different panel geometries may be used. The most common geometries currently used are cruciform and hexagonal. Inasmuch as the strongest aesthetic features of these walls is the joint between panels, the varied geometries present to the public two aesthetically different wall systems. Therefore, in order to affect a unified and integrated appearance of walls for the entire project, a similar precast surface treatment should be used for both proprietary wall types. The intent is to obscure as much as possible the joints between panels which delineate the individual panel geometries. Advantageously proprietary walls can be accommodated with a number of different surface treatment and finishes.

Summary and Recommendations

Three retaining wall types have been considered at those locations where an earth retaining structure is required. The height of the wall determines the type of wall to be used. Gravity walls are to be used where wall heights are five feet or less. Otherwise, a conventional cantilever or proprietary wall can be used.

Estimates of construction costs indicate that the proprietary wall is the more economical solution for wall heights in excess of ten feet. Conventional retaining walls resulted more economical for wall heights in the range of five to ten feet. However, closer inspection reveals that conventional walls are only marginally more cost efficient. In fact, any possible cost savings may be offset by the cost of surface treatments in order to attain a compatible appearance between the two wall types.

Therefore, it is recommended that proprietary walls be solely used for all wall heights in excess of five feet. Gravity walls should be used for retained heights of five feet or less. There is no need for a conventional wall alternate.

8.22.2 <u>Street Lighting</u>

It is recommended that street lighting be re-installed through the North Section in conjunction with the proposed roadway improvements. The design engineer should coordinate with the Department, the City of Tampa, and the Tampa Electric Company to determine responsibilities for capital costs and maintenance.

Based upon FDOT "Green Book" criteria for the provision of street lights, lighting is not recommended for the East Section. The U.S. 41 interchange would be an exception to this determination, the high volumes with frequent turning movements would merit consideration for the provision of lighting.

1. Structures Design Guidelines, FDOT, 1987, through revision"g".

2. Standard Specifications for Highway Bridges, AASHTO, 1989, with 1991 Interim.

Summary of Estimated Construction Costs

Bridge	Total Cost	Cost/SF
22nd Street Causeway over McKay Bay	$5,446,000	$65.11
22nd Street Causeway over Delaney Creek	$554,000	$43.93
22nd Street Causeway over Tributary A	$303,000	$39.24
U.S. 41 over CSX Railroad	$588,000	$35.39
U.S. 41 over 22nd Street Causeway	$1,729,000	$70.33

8.23 CONSTRUCTION PHASING

In determining the construction segmentation for the project, consideration was given to the Level of Service (LOS) for the existing roadway. The roadway segment between S.R. 60 and Maritime Boulevard, which currently operates at LOS F south of the Crosstown

Expressway, has the greatest need for improvement. This phase would be constructed first. The segment between U.S. 41 and U.S. 301, currently a two-lane facility would then be upgraded to a six-lane roadway. This segment would also include the interchange at U.S. 41. The final segment extends from the McKay Bay Bridge widening to U.S. 41. It currently operates at LOS B, therefore, its need for improvement would not be immediate. In summary, the construction phasing is:

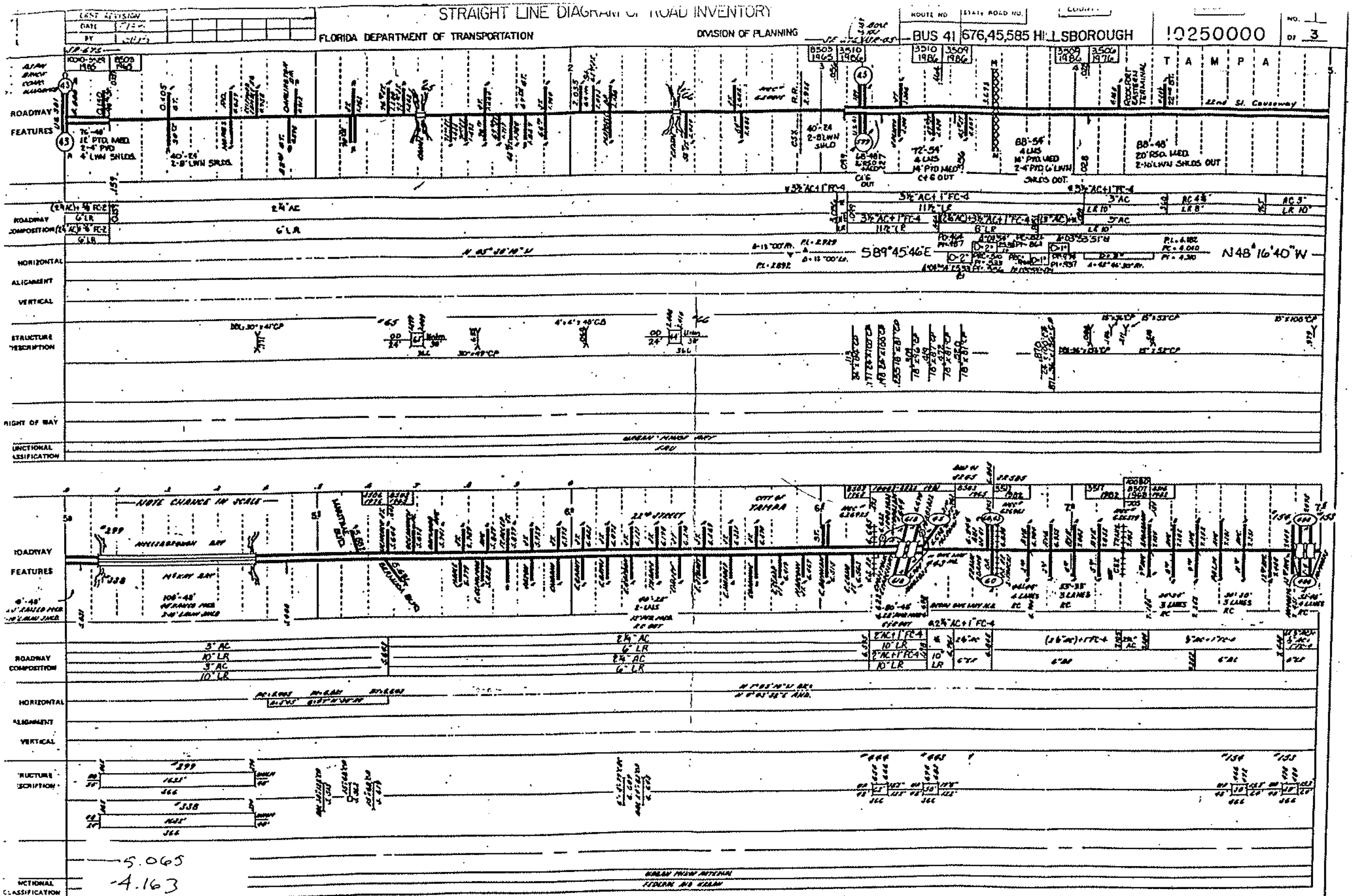
1. S.R. 60 to beyond Maritime Boulevard
2. U.S. 41 Interchange to U.S. 301
3. McKay Bay Bridge to U.S. 41

The U.S. 41/Causeway Boulevard interchange is a Federal demonstration project. The interchange is likely to be the first portion of the improvements described in this report to be constructed.

APPENDICES

APPENDIX A

Horizontal Alignment Information


STRAIGHT LINE DIAGRAM OF ROAD INVENTORY
FLORIDA DEPARTMENT OF TRANSPORTATION
DIVISION OF PLANNING
BUS 41
676,45,585
HILLSBOROUGH
10250000
NO. 1
OF 3
T A M P A
ROADWAY FEATURES
ROADWAY COMPOSITION
HORIZONTAL ALIGNMENT
VERTICAL
STRUCTURE DESCRIPTION
RIGHT OF WAY
FUNCTIONAL CLASSIFICATION
22nd St. Causeway
S89°45'46"E
N48°16'40"W
NOTE CHANGE IN SCALE
HILLSBOROUGH BAY
McKAY BAY
22nd STREET
CITY OF TAMPA
5.065
4.163

2-23-83
ERB

FLORIDA DEPARTMENT OF TRANSPORTATION

DIVISION OF PLANNING

585	HILLSBOROUGH	10250000	NO. 2 OF 3

NOTE SCALE

CITY OF TAMPA

22ND STREET

ROADWAY FEATURES

ROADWAY COMPOSITION

HORIZONTAL ALIGNMENT

VERTICAL

STRUCTURE DESCRIPTION

RIGHT OF WAY

FUNCTIONAL CLASSIFICATION

URBAN MINOR ARTERIAL

FEDERAL AID URBAN

ROADWAY FEATURES

ROADWAY COMPOSITION

HORIZONTAL ALIGNMENT

VERTICAL

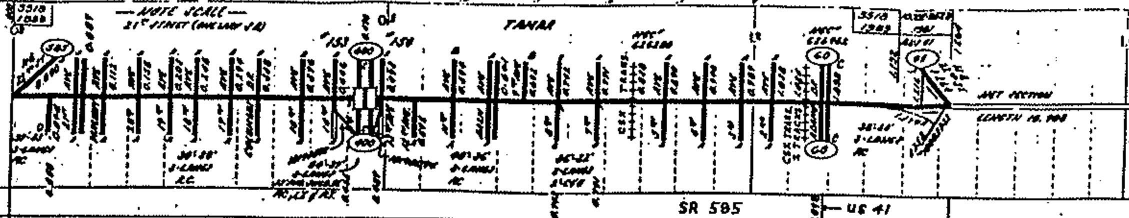
STRUCTURE DESCRIPTION

RIGHT OF WAY

FUNCTIONAL CLASSIFICATION

NOTE SCALE

ROADWAY FEATURES



ROADWAY COMPOSITION

(EXISTING) + 1" FC-4

HORIZONTAL ALIGNMENT

VERTICAL

STRUCTURE DESCRIPTION

RIGHT OF WAY

FUNCTIONAL CLASSIFICATION

URBAN MINOR ARTERIAL

FEDERAL AID URBAN

ROADWAY FEATURES

ROADWAY COMPOSITION

HORIZONTAL ALIGNMENT

VERTICAL

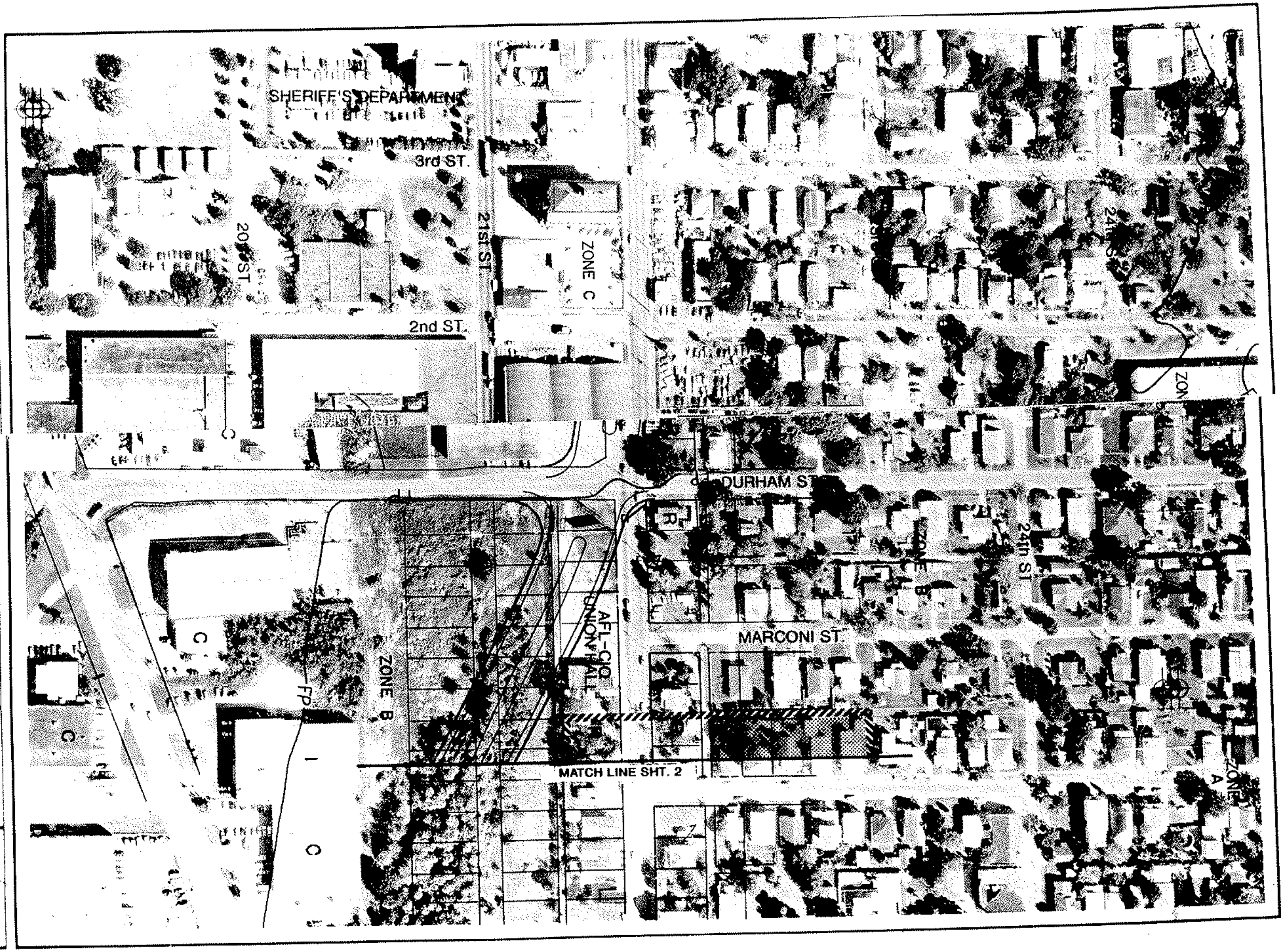
STRUCTURE DESCRIPTION

RIGHT OF WAY

FUNCTIONAL CLASSIFICATION

APPENDIX B

Conceptual Design Plans



LEGEND

POTENTIAL DISTRICT CONTRIBUTING STRUCTURE

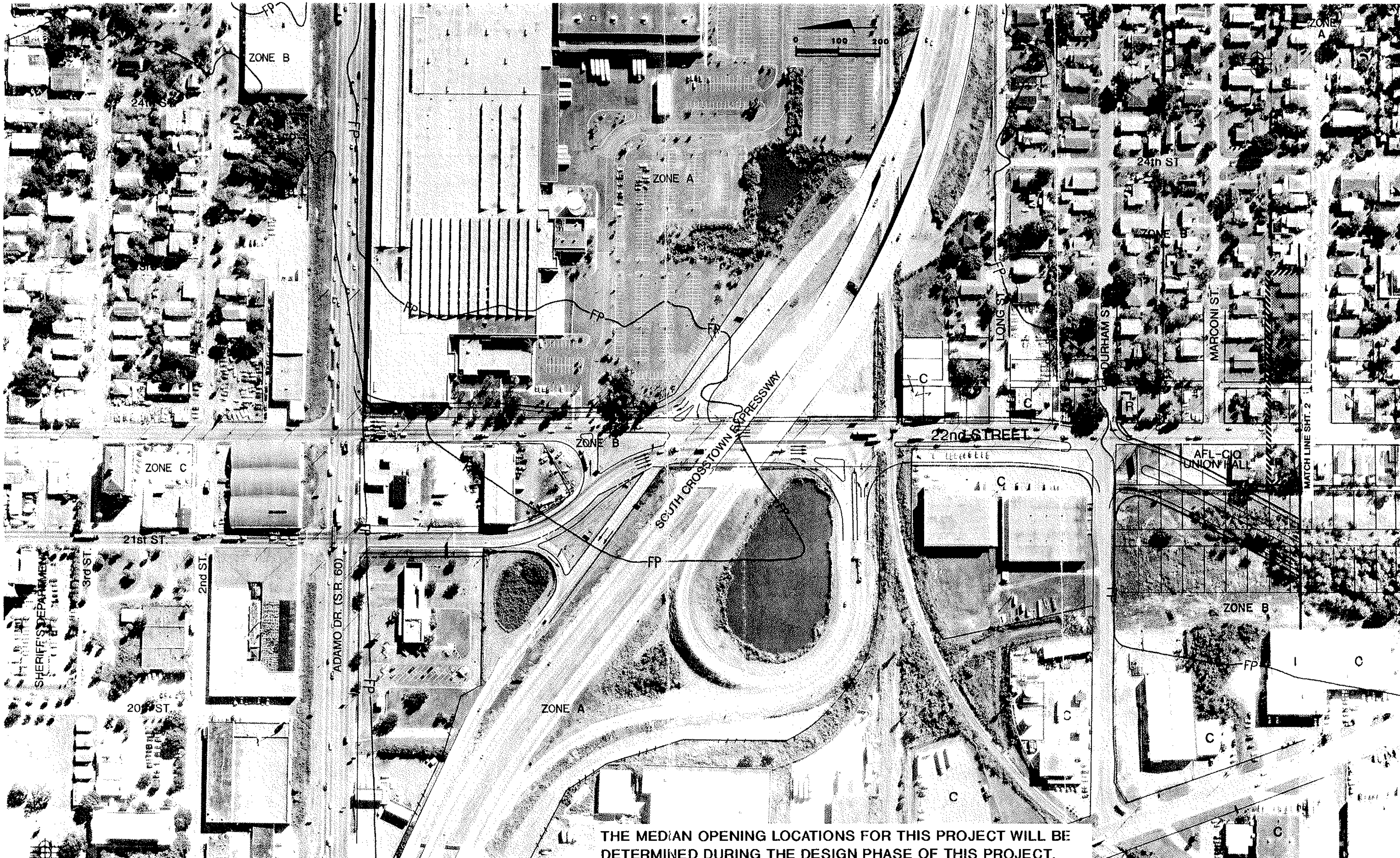
INDIVIDUALLY ELIGIBLE HISTORIC STRUCTURE

HISTORIC BOUNDARIES

DRAWN
DESIGNED
CHECKED

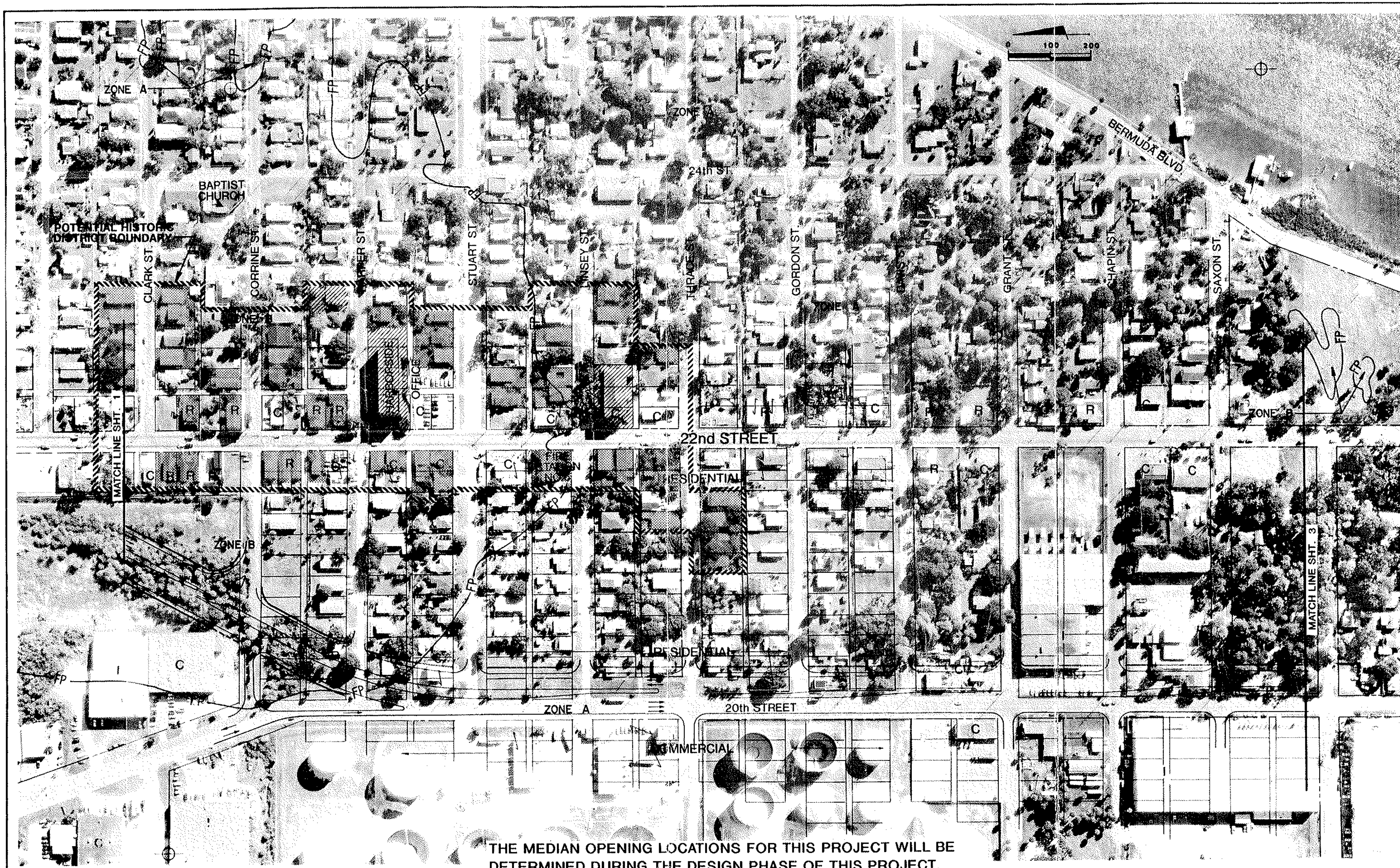
6-620.00

SHEET 1 OF 16

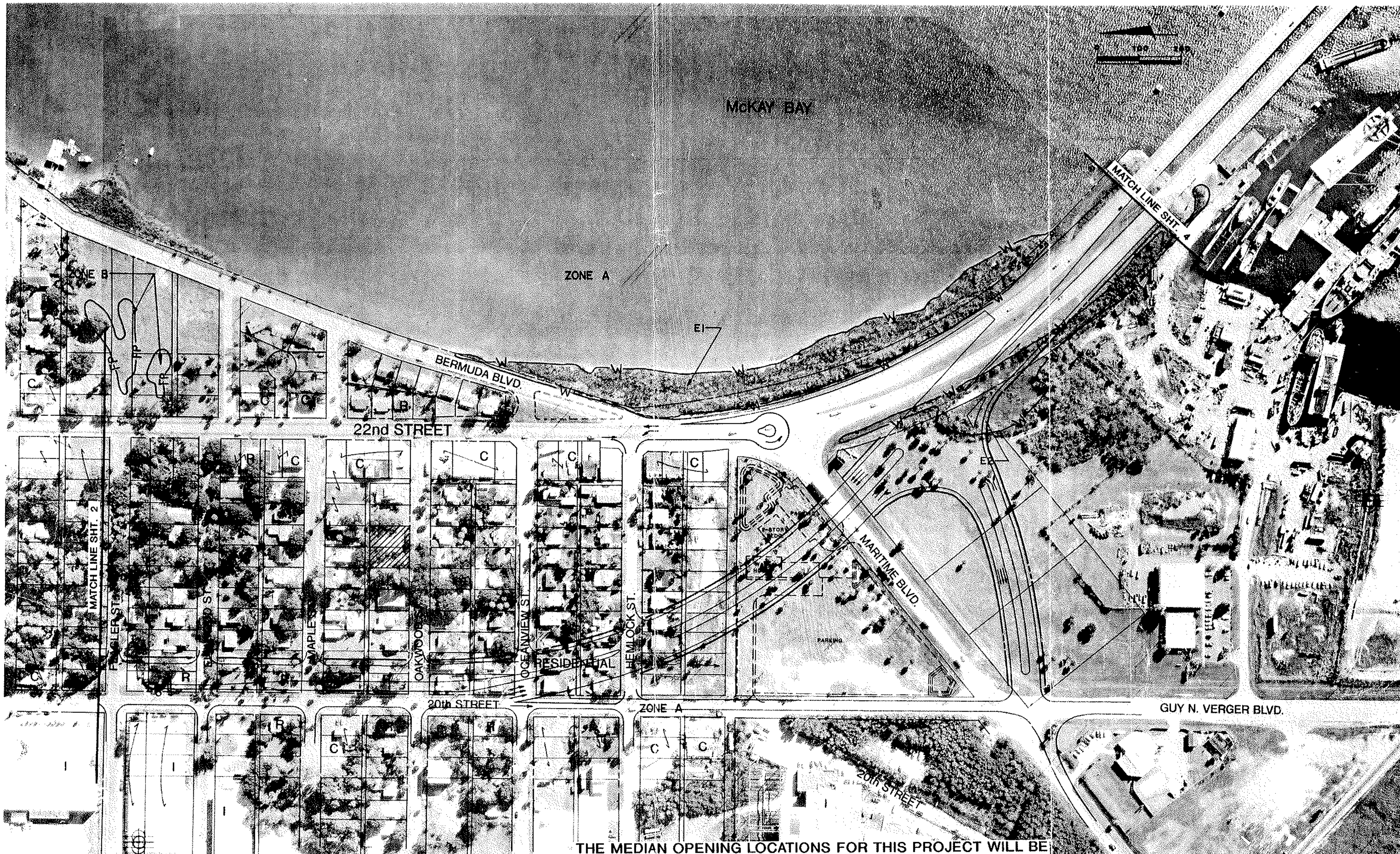


THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

LEGEND POTENTIAL DISTRICT CONTRIBUTING STRUCTURE INDIVIDUALLY ELIGIBLE HISTORIC STRUCTURE //// HISTORIC BOUNDARIES	FLORIDA DEPARTMENT OF TRANSPORTATION FAP No. M-1802-(1) WPA No. 7113839 STATE PROJECT No. 10250-1525	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60 PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	CORRIDOR ANALYSIS / CONCEPTUAL PLANS PHOTO DATE: 10/29/90	ORIGINAL REVISIONS 1 6 2 7 3 8 4 9 5 10 11 12	JOB NO. 10-620.00 DRAWN DESIGNED CHECKED QC. SHEET 1 OF 16



LEGEND	FLORIDA DEPARTMENT OF TRANSPORTATION	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676)	CORRIDOR ANALYSIS / CONCEPTUAL PLANS		
POTENTIAL DISTRICT CONTRIBUTING STRUCTURE	FAP No. M-1802-(1)	FROM U.S. 301 TO SR. 60			DRAWN
INDIVIDUALLY ELIGIBLE HISTORIC STRUCTURE	WPA No. 7113839				
HISTORIC BOUNDARIES	STATE PROJECT No. 10250-1525	PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	PHOTO DATE: 10/29/90		SHEET 2 OF 16



THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

LEGEND

- POTENTIAL DISTRICT CONTRIBUTING STRUCTURE
- INDIVIDUALLY ELIGIBLE HISTORIC STRUCTURE
- HISTORIC BOUNDARIES

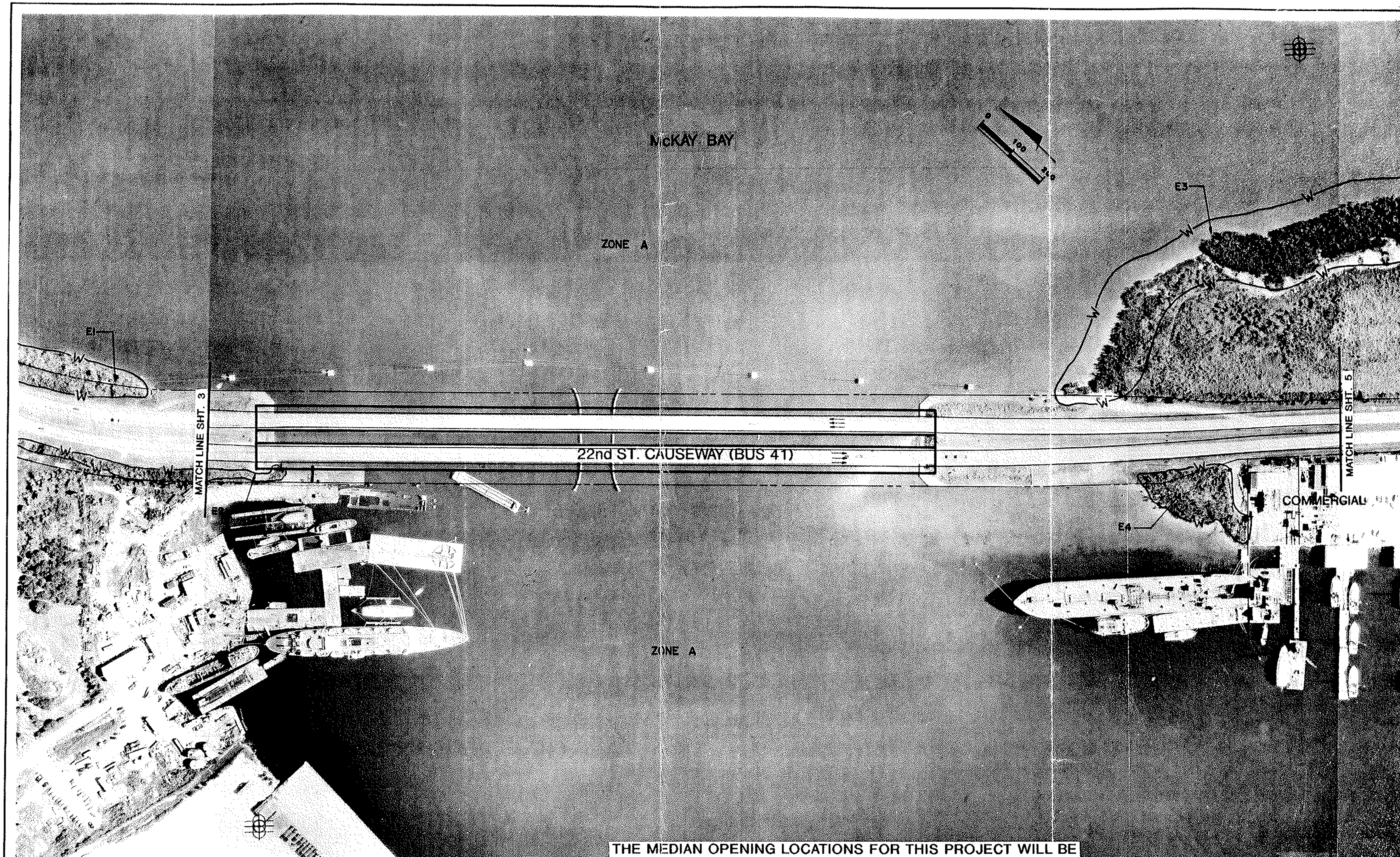
FLORIDA DEPARTMENT OF TRANSPORTATION
FAP No. M-1802-(1)
WPA No. 7113839
STATE PROJECT No. 10250-1525

22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676)
FROM U.S. 301 TO SR. 60
PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY

CORRIDOR ANALYSIS / CONCEPTUAL PLANS

PHOTO DATE: 10/29/90

SHEET 3 OF 16



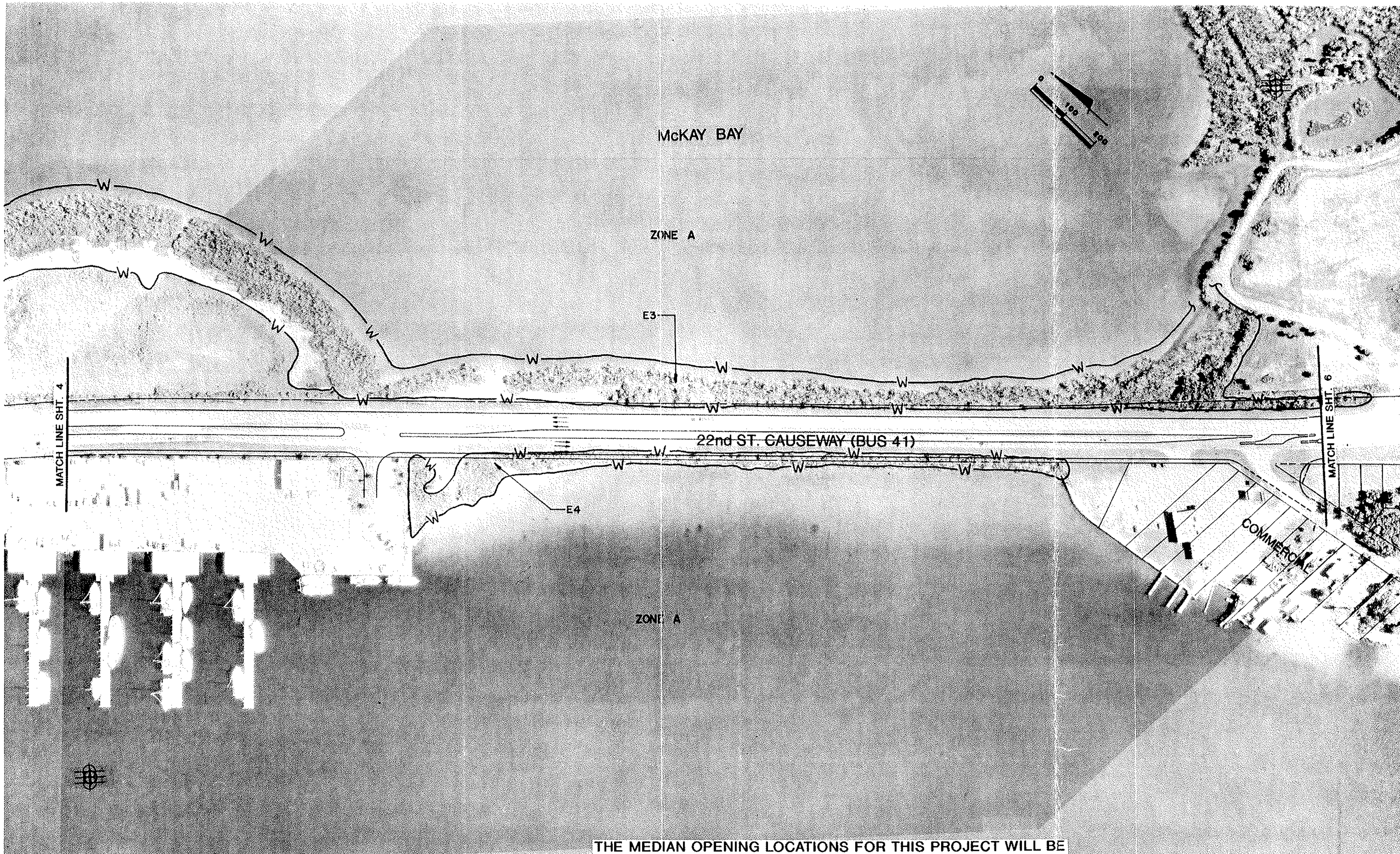
THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

FLORIDA DEPARTMENT OF TRANSPORTATION	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676)	CORRIDOR ANALYSIS / CONCEPTUAL PLANS
FAP No. M-1802-(1)	FROM U.S. 301 TO SR. 60	
WPA No. 7113839		
STATE PROJECT No. 10250-1525	PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	PHOTO DATE: 10/29/90

ORIGINAL
REVISIONS

DRAWN
DESIGNED
CHECKED

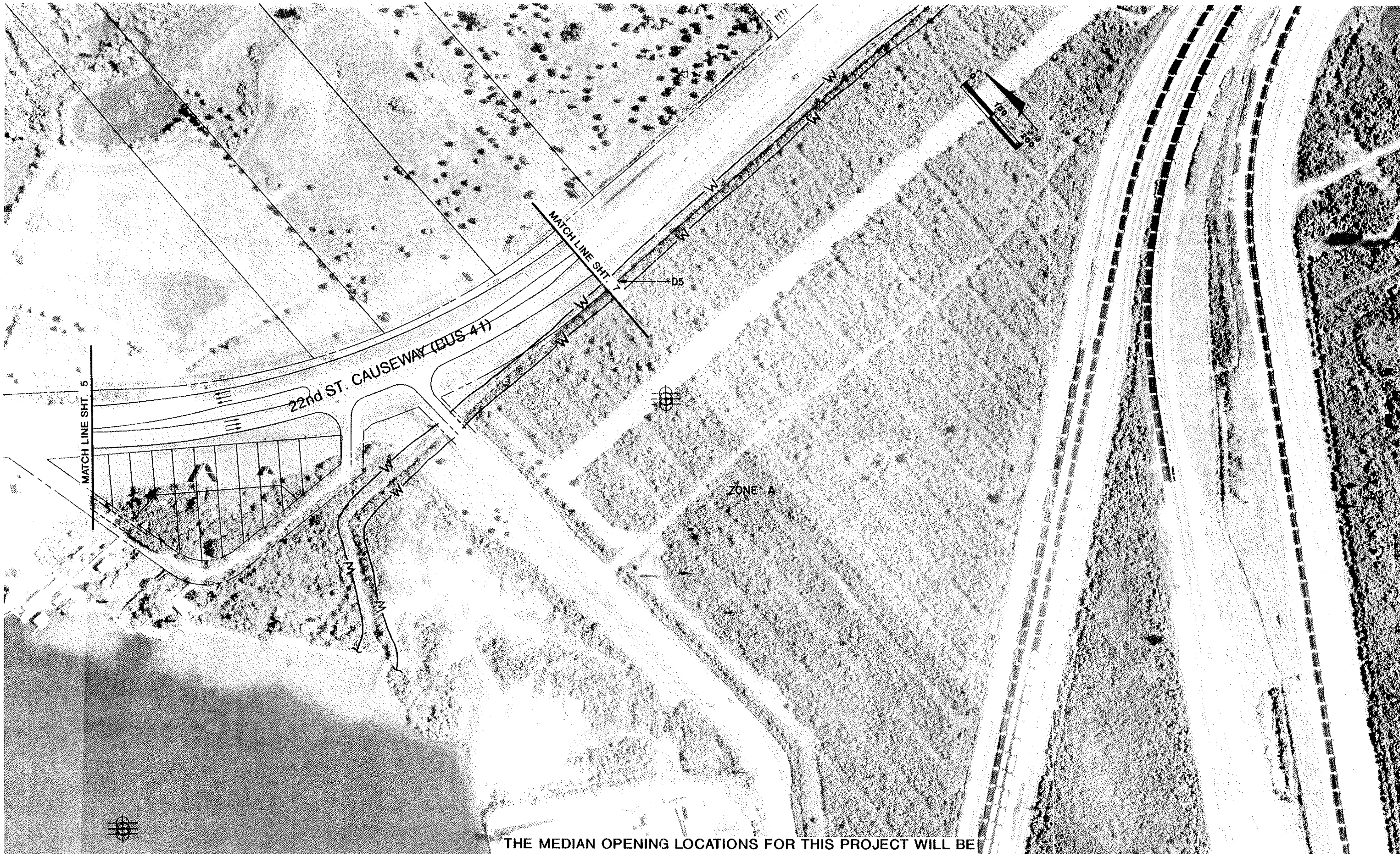
SHEET 4 OF 16



THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

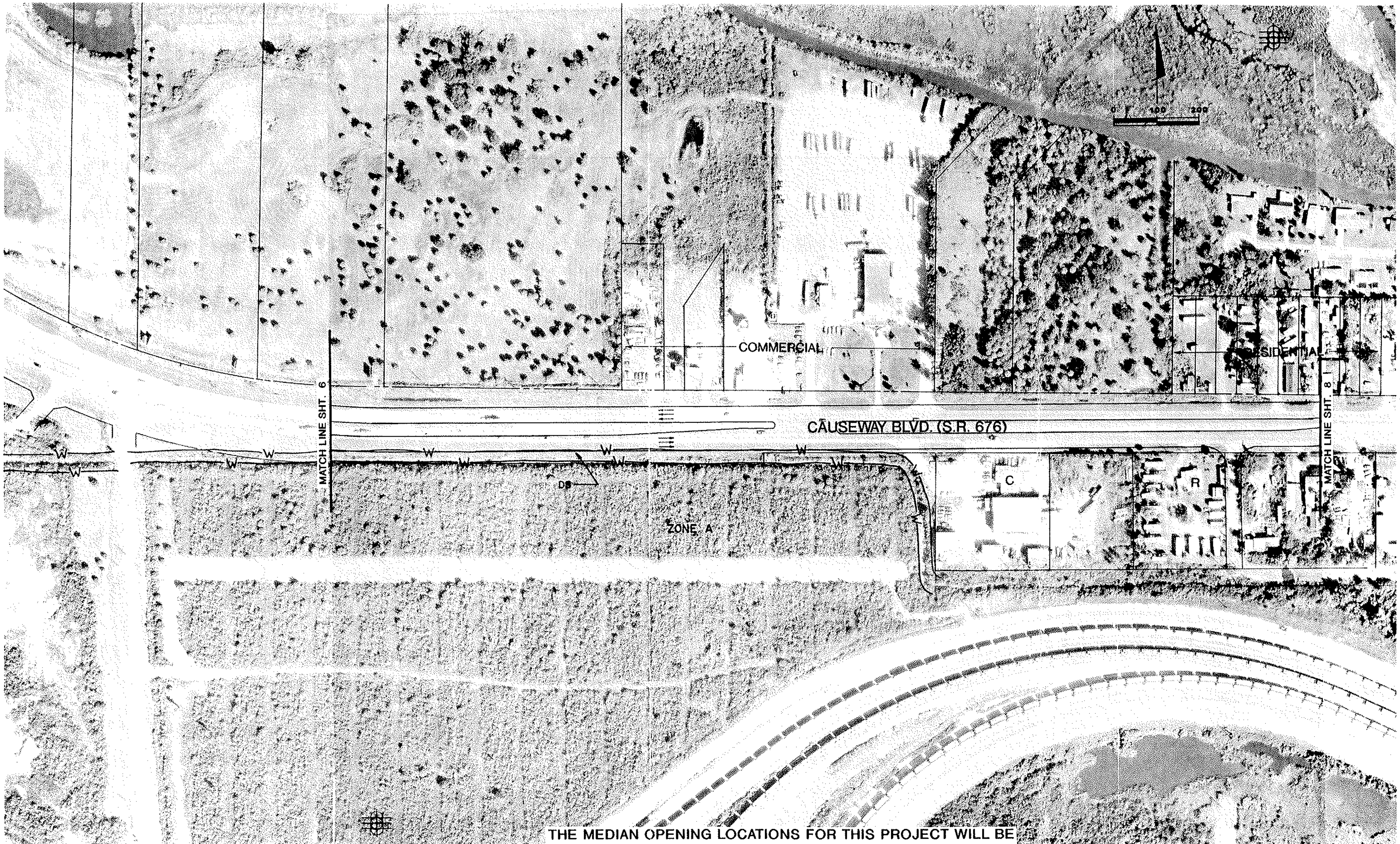
FLORIDA DEPARTMENT OF TRANSPORTATION	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676)	CORRIDOR ANALYSIS / CONCEPTUAL PLANS
FAP No. M-1802-(1)	FROM U.S. 301 TO SR. 60	
WPA No. 7113839		
STATE PROJECT No. 10250-1525	PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	PHOTO DATE: 10/29/90

SHEET 5 OF 16



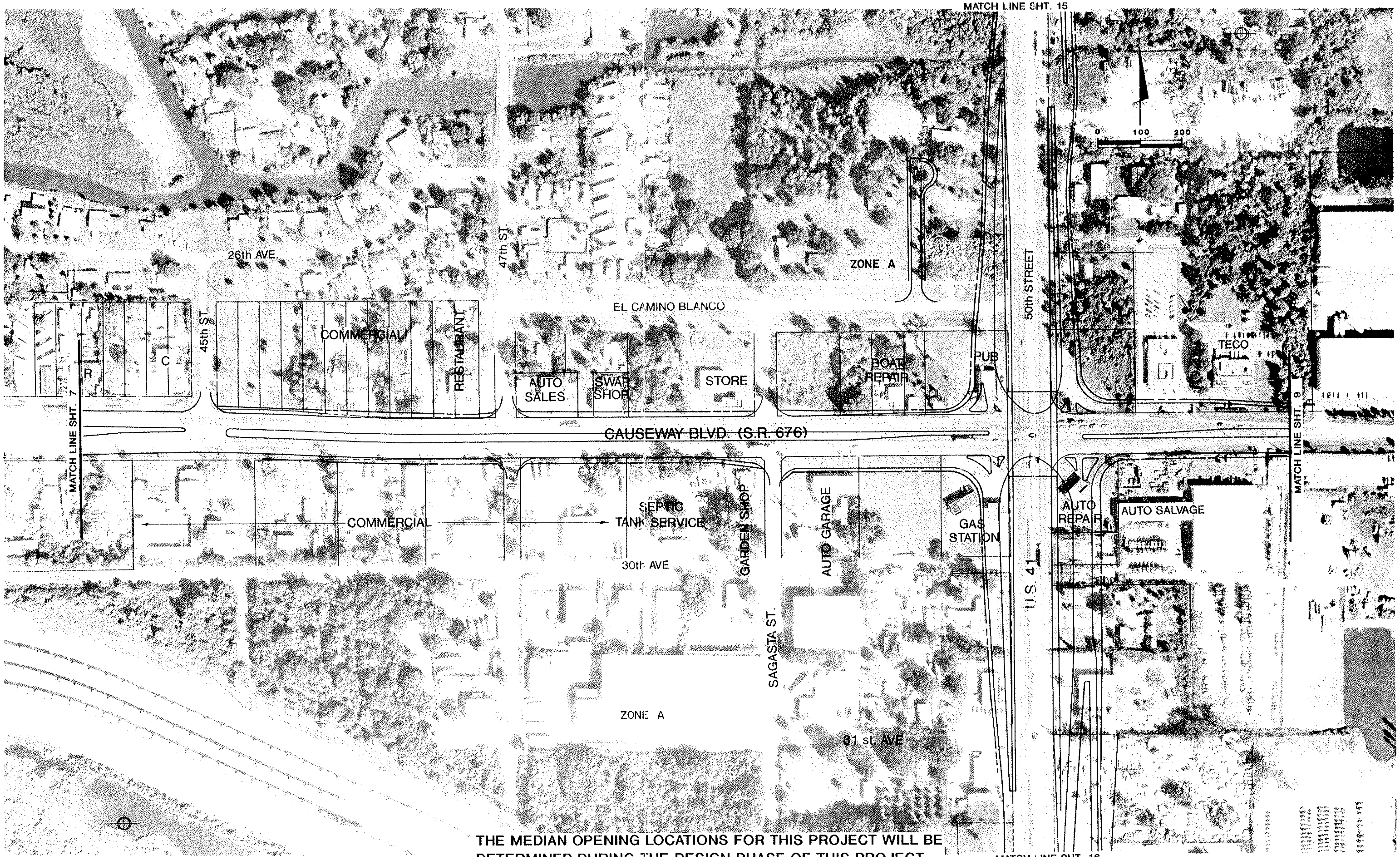
THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

FLORIDA DEPARTMENT OF TRANSPORTATION FAP No. M-1802-(1) WPA No. 7113839 STATE PROJECT No. 10250-1525	**22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60** PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	**CORRIDOR ANALYSIS / CONCEPTUAL PLANS** PHOTO DATE: 10/29/90	ORIGINAL REVISIONS	620.00 DRAWN DESIGNED CHECKED QC SHEET 6 OF 16



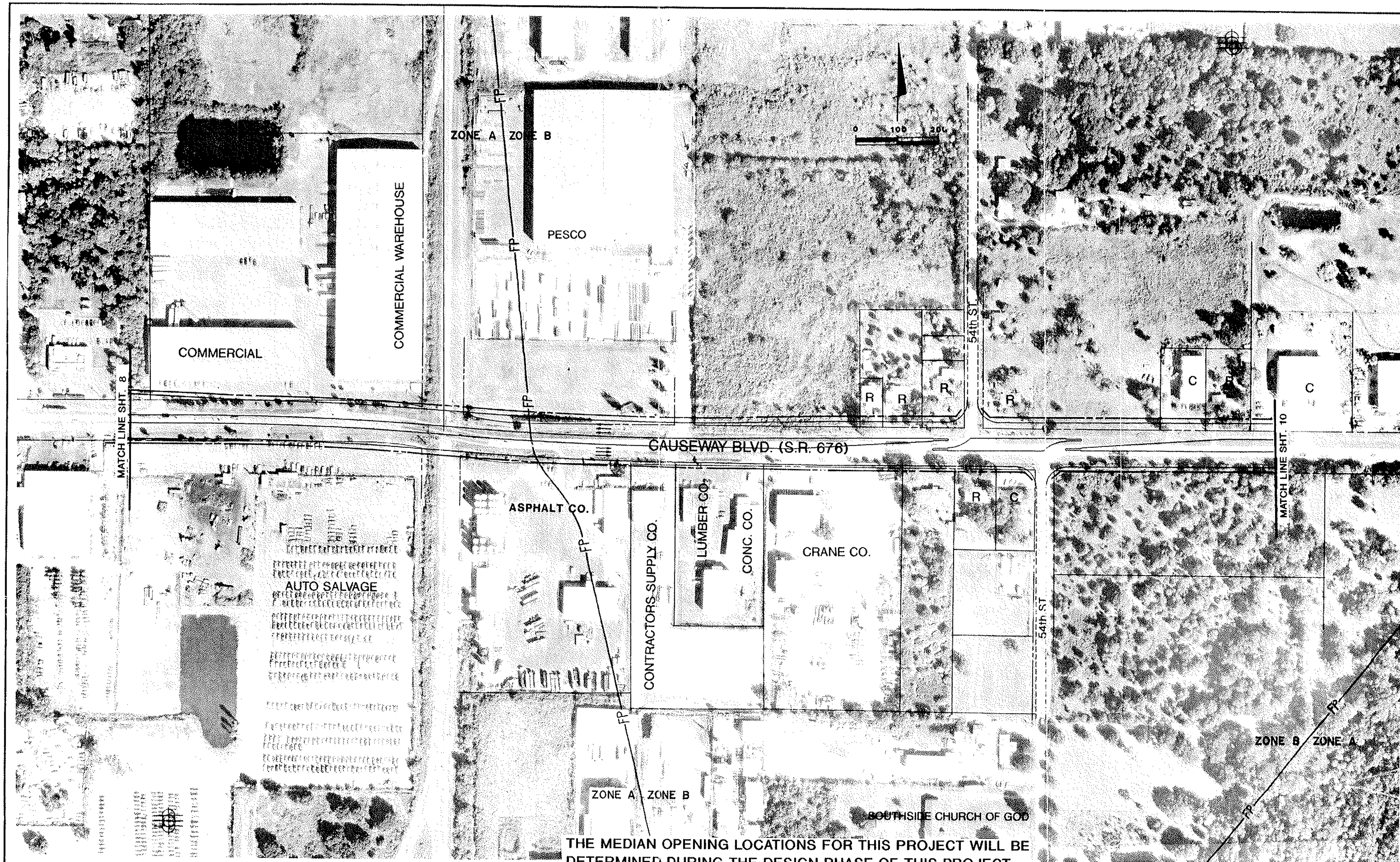
THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

FLORIDA DEPARTMENT OF TRANSPORTATION FAP No. M-1802-(1) WPA No. 7113839 STATE PROJECT No. 10250-1525	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60 PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	CORRIDOR ANALYSIS / CONCEPTUAL PLANS PHOTO DATE: 10/29/90	SHEET 7 OF 16

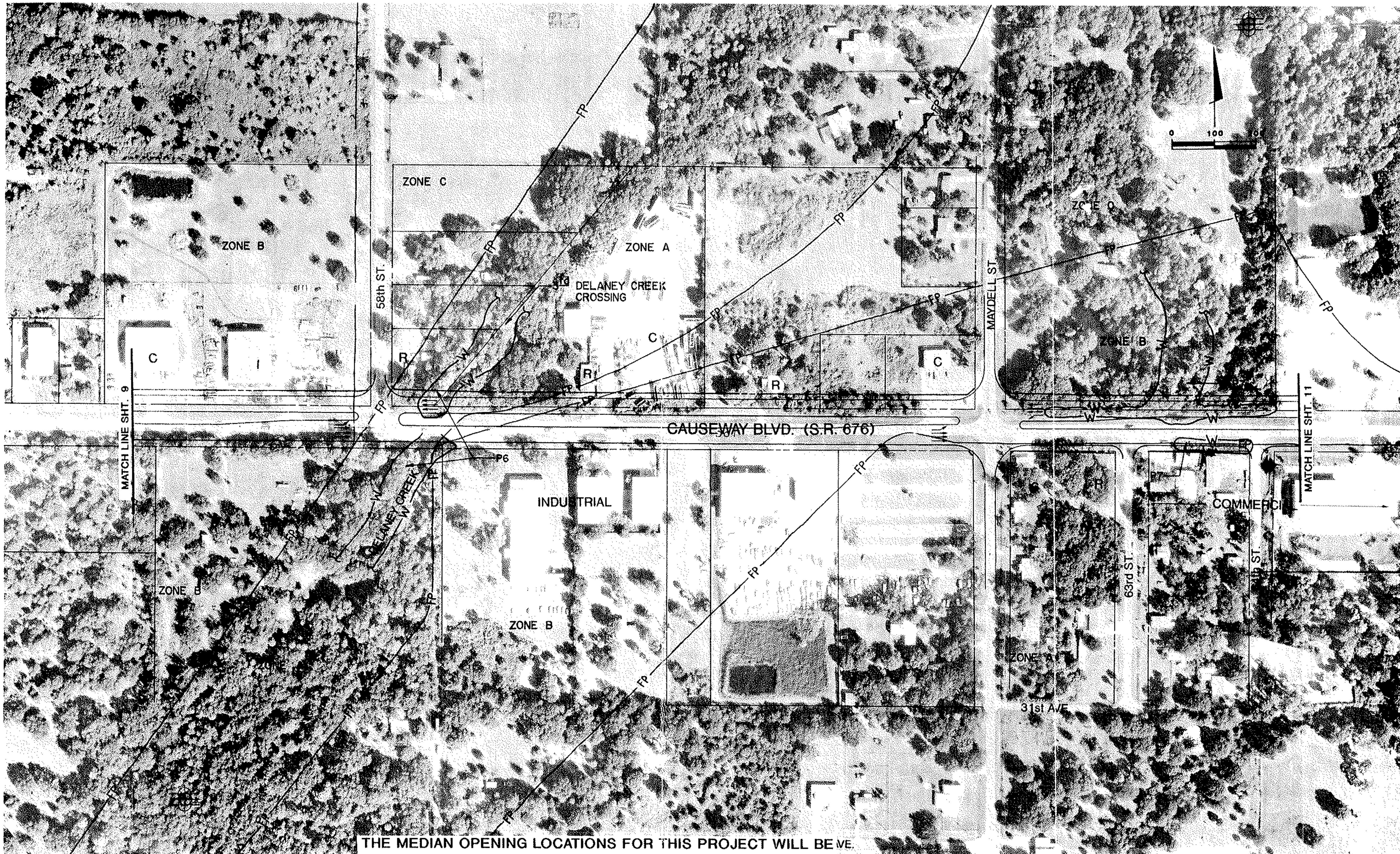


THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

FLORIDA DEPARTMENT OF TRANSPORTATION FAP No. M-1802-(1) WPA No. 7113839 STATE PROJECT No. 10250-1525	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60 PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	CORRIDOR ANALYSIS / CONCEPTUAL PLANS PHOTO DATE: 10/29/90	SHEET 8 OF 16



EAST SECTION US 41 TO US 301	FLORIDA DEPARTMENT OF TRANSPORTATION FAP No. M-1802-(1) WPA No. 7113839 STATE PROJECT No. 10250-1525	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60 PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	CORRIDOR ANALYSIS / CONCEPTUAL PLANS PHOTO DATE: 10/29/90	SHEET 9 OF 16



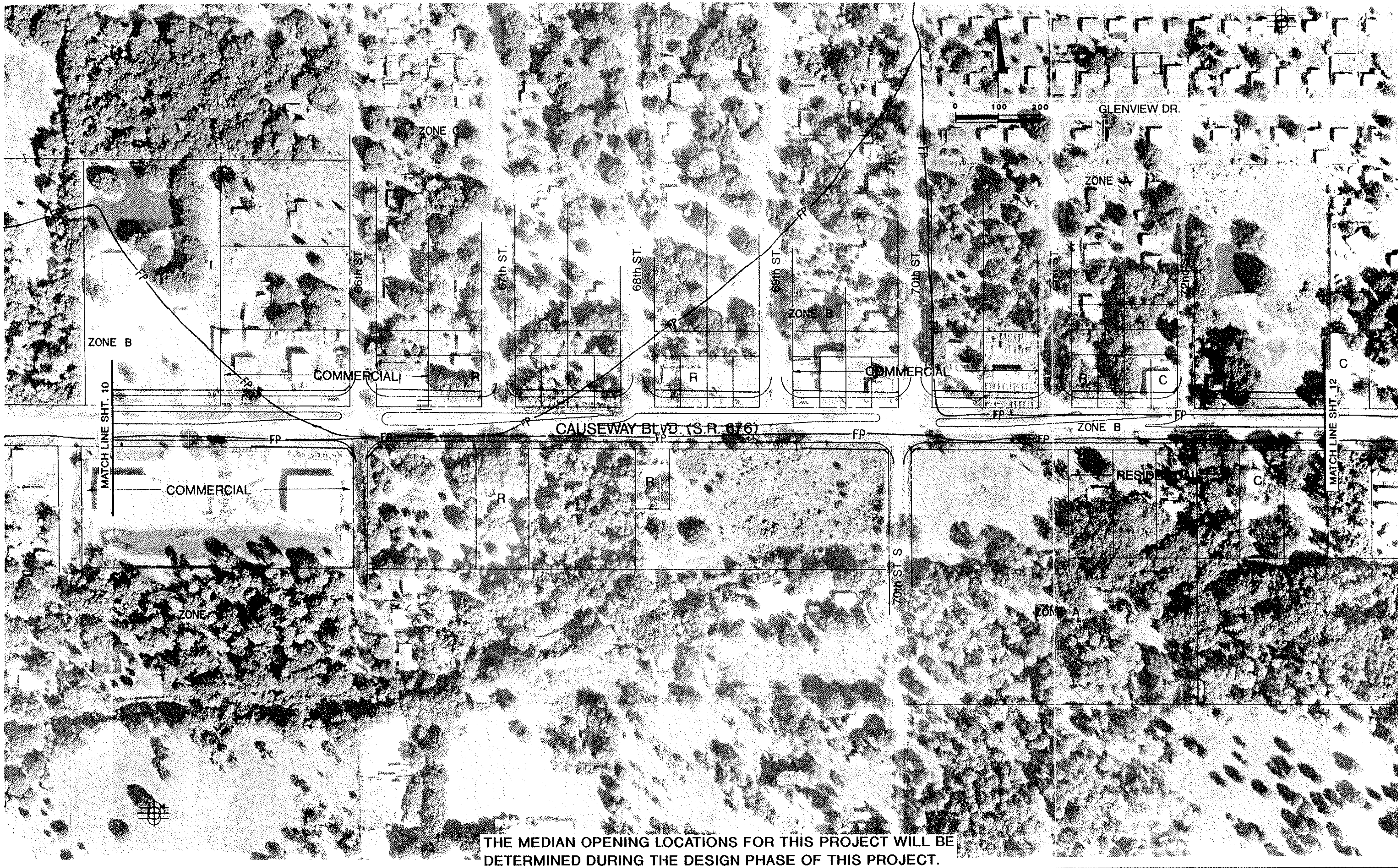
THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE
DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

FLORIDA DEPARTMENT OF TRANSPORTATION	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676)	CORRIDOR ANALYSIS / CONCEPTUAL PLANS
FAP No. M-1802-(1)	FROM U.S. 301 TO SR. 60	
WPA No. 7113839	PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	PHOTO DATE: 10/29/90
STATE PROJECT No. 10250-1525		

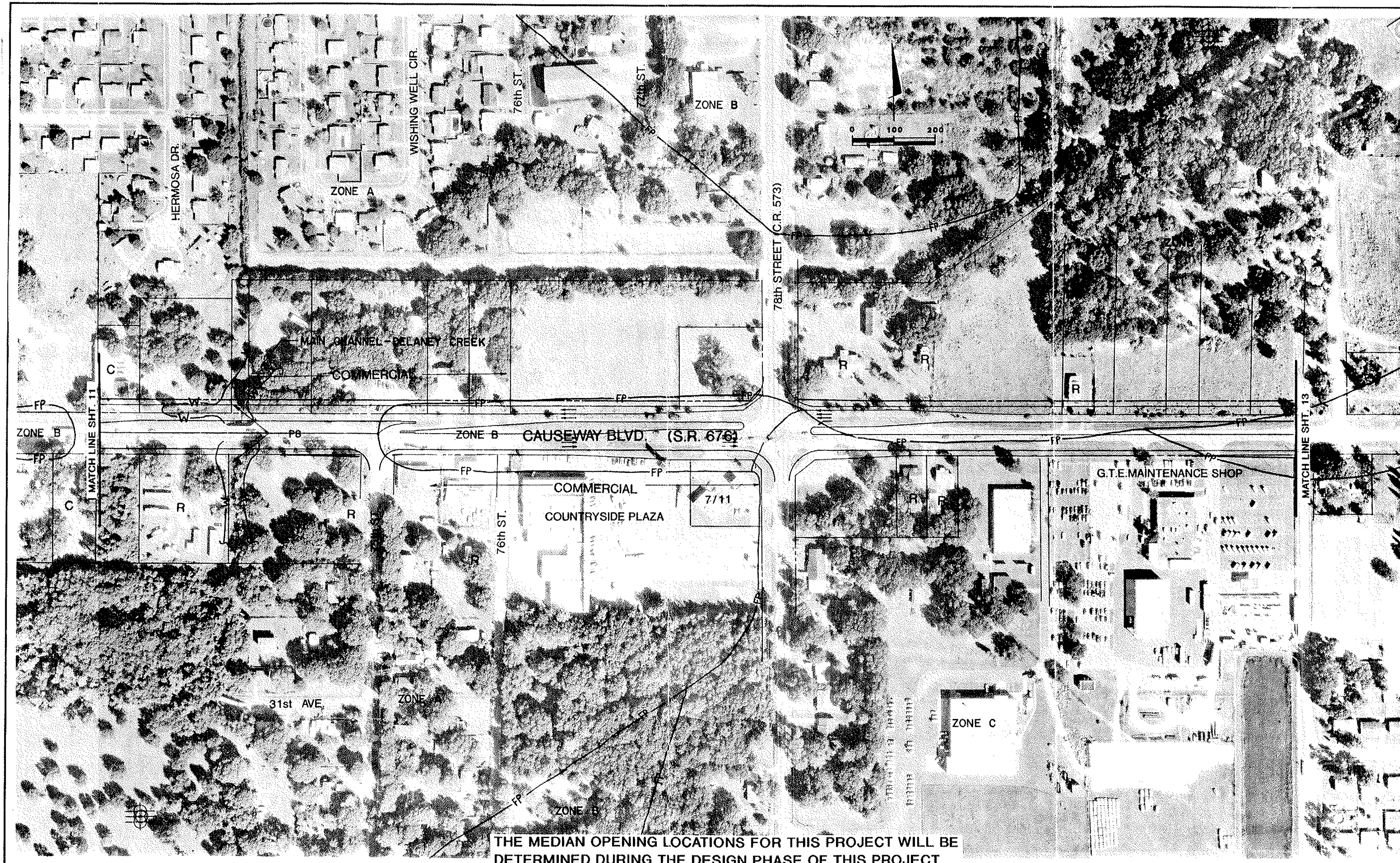
ORIGINAL REVISIONS

DRAWN
DESIGNED
CHECKED

SHEET 10 OF 16

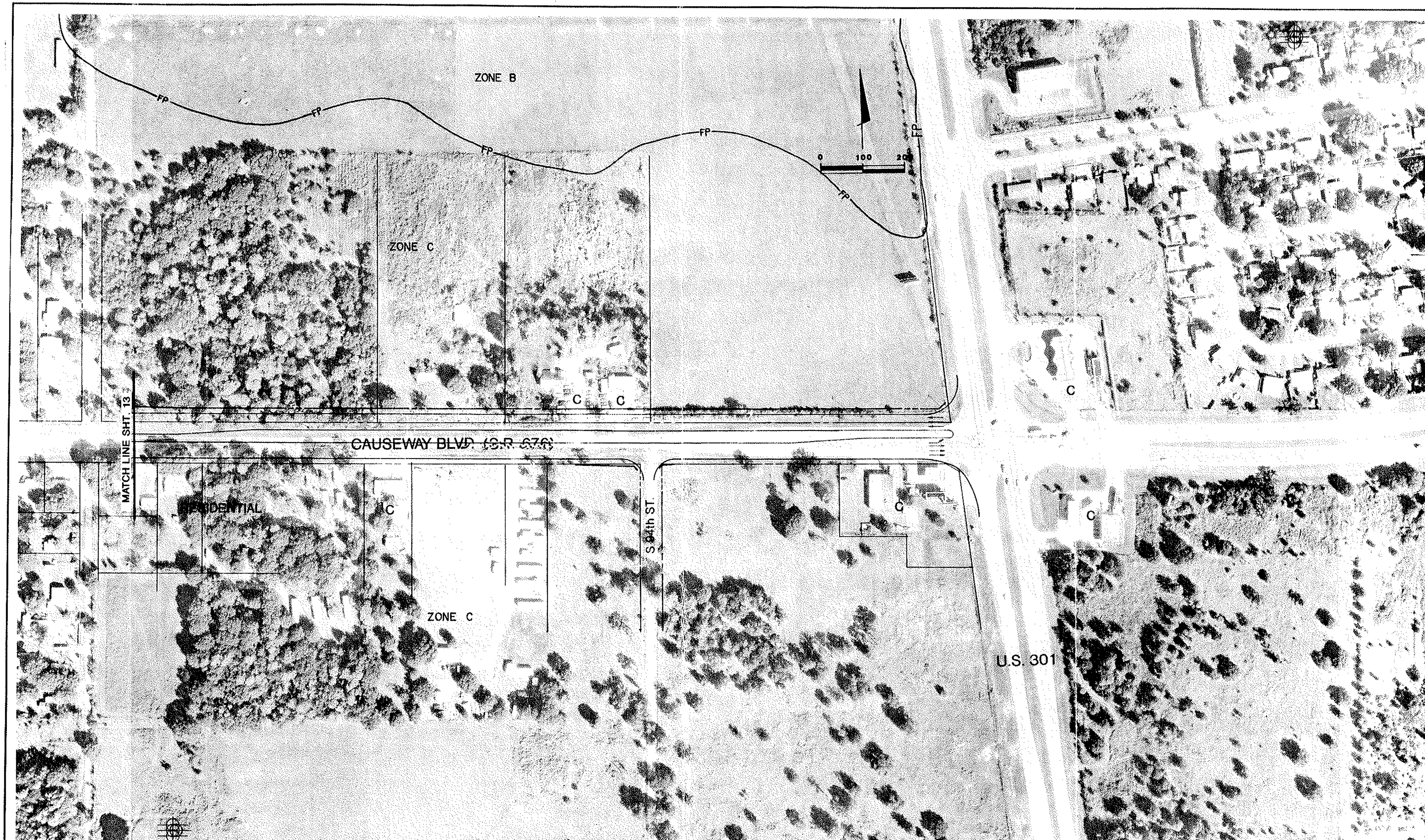


EAST SECTION U.S. 41 TO U.S. 301	FLORIDA DEPARTMENT OF TRANSPORTATION FAP No. M-1802-(1) WPA No. 7113839 STATE PROJECT No. 10250-1525	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60 PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	CORRIDOR ANALYSIS / CONCEPTUAL PLANS PHOTO DATE: 10/29/90	SHEET 11 OF 16



FLORIDA DEPARTMENT OF TRANSPORTATION FAP No. M-1802-(1) WPA No. 7113839 STATE PROJECT No. 10250-1525	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60 PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	CORRIDOR ANALYSIS / CONCEPTUAL PLANS PHOTO DATE: 10/29/90	SHEET 12 OF 16

FLORIDA DEPARTMENT OF TRANSPORTATION **FAP No. M-1802-(1)** **WPA No. 7113839** **STATE PROJECT No. 10250-1525**	**22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60** **PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY**	**CORRIDOR ANALYSIS / CONCEPTUAL PLANS** **PHOTO DATE:** 10/29/90	SHEET 13 OF 16



THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

FLORIDA DEPARTMENT OF TRANSPORTATION FAP No. M-1802-(1) WPA No. 7113839 STATE PROJECT No. 10250-1525	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60 PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	CORRIDOR ANALYSIS / CONCEPTUAL PLANS PHOTO DATE: 10/29/90	SHEET 14 OF 16

THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

FLORIDA DEPARTMENT OF TRANSPORTATION **FAP No. M-1802-(1)** **WPA No. 7113839** **STATE PROJECT No. 10250-1525**	**22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60** **PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY**	**CORRIDOR ANALYSIS / CONCEPTUAL PLANS** **PHOTO DATE:** 10/29/90	ORIGINAL REVISIONS	DRAWN DESIGNED CHECKED **SHEET 15 OF 16**

THE MEDIAN OPENING LOCATIONS FOR THIS PROJECT WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT.

FLORIDA DEPARTMENT OF TRANSPORTATION FAP No. M-1802-(1) WPA No. 7113839 STATE PROJECT No. 10250-1525	22nd STREET CAUSEWAY / CAUSEWAY BLVD (SR. 676) FROM U.S. 301 TO SR. 60 PROJECT DEVELOPMENT & ENVIRONMENTAL STUDY	CORRIDOR ANALYSIS / CONCEPTUAL PLANS PHOTO DATE: 10/29/90	SHEET 16 OF 16

APPENDIX C

Intersection Capacity Analysis

HCM: SIGNALIZED INTERSECTION SUMMARY

Center For Microcomputers In Transportation

Streets: (E-W) 19th St (N-S) S.R. 60
Analyst: MLH File Name: 19THSTA.HC9
Area Type: Other 6-4-91 AM
Comment: Existing Volumes

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		> 2	1	1	2 <		1	1 <		1	1 <	
Volumes	20	453	170	120	1305	57	411	130	51	30	131	16
Lane Width		12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vols			0			0			0			0

Signal Operations

Phase combination	1	2	3	4			5	6	7	8
EB Left		*			NB	Left	*	*		
Thru		*				Thru		*		
Right		*				Right		*		
Peds						Peds				
WB Left	*	*			SB	Left	*	*		
Thru	*	*				Thru		*		
Right	*	*				Right		*		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	8A	23A				Green	12A	15A		
Yellow/A-R	4	4				Yellow/A-R	4	4		
Lost Time	3.0	3.0				Lost Time	3.0	3.0		

Cycle Length: 74 secs Phase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	DfL	291	94	0.22	0.32	14.0	B	19.0	C
	T	1746	566	0.84	0.32	21.6	C		
	R	1484	481	0.37	0.32	12.6	B		
WB	L	1659	202	0.42	0.49	10.2	B	14.7	B
	TR	3470	1688	0.89	0.49	15.1	C		
NB	L	1659	291	0.92	0.43	38.8	D	32.3	D
	TR	1672	362	0.53	0.22	17.6	C		
SB	L	1659	291	0.07	0.43	9.4	B	15.3	C
	TR	1717	371	0.42	0.22	16.5	C		

Intersection Delay = 19.2 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) S.R. 60 (N-S) 21st St
Analyst: MLH File Name: 21STA.HC9
Area Type: Other 6-3-91 AM
Comment: Existing volumes

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		2	1	1	2					>	3	<
Volumes		470	84	65	1267					128	366	117
Lane Width		12.0	12.0	12.0	12.0						12.0	
RTOR Vols			0			0						0

Signal Operations

Phase combination	1	2	3	4			5	6	7	8
EB Left					NB	Left				
Thru	*					Thru				
Right	*					Right				
Peds						Peds				
WB Left	*				SB	Left	*			
Thru	*					Thru	*			
Right						Right	*			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	25A				Green		20A			
Yellow/A-R	4				Yellow/A-R		4			
Lost Time	3.0				Lost Time		3.0			

Cycle Length: 53 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	3528	1731	0.30	0.49	5.2	B	5.2	B
	R	1499	735	0.12	0.49	4.7	A		
WB	L	911	447	0.15	0.49	5.7	B	9.0	B
	T	3528	1731	0.81	0.49	9.2	B		
SB	LTR	4978	1972	0.36	0.40	7.3	B	7.3	B

Intersection Delay = 7.7 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) S.R. 60 (N-S) 22nd St
Analyst: MLH File Name: 22NDA.HC9
Area Type: Other 6-3-91 AM
Comment: Existing volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	2			2	1		> 3	1			
Volumes	1	549			1112	159	249	710	29			
Lane Width	12.0	12.0			12.0	12.0		12.0	12.0			
RTOR Vols			0			0			0			

Signal Operations

Phase combination	1	2	3	4		Phase combination	5	6	7	8
EB Left	*					NB Left	*			
Thru	*					Thru	*			
Right						Right	*			
Peds						Peds				
WB Left						SB Left				
Thru	*					Thru				
Right	*					Right				
Peds						Peds				
NB Right						EB Right				
SB Right						WB Right				
Green	25A					Green	20A			
Yellow/A-R	4					Yellow/A-R	4			
Lost Time	3.0					Lost Time	3.0			

Cycle Length: 53 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	295	145	0.01	0.49	5.2	B	5.4	B
	T	3528	1731	0.35	0.49	5.4	B		
WB	T	3528	1731	0.71	0.49	7.6	B	7.3	B
	R	1499	735	0.23	0.49	5.0	B		
NB	LT	5086	2015	0.55	0.40	8.2	B	8.1	B
	R	1499	594	0.05	0.40	6.4	B		

Intersection Delay = 7.3 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Crosstown (N-S) North Ramp
Analyst: MLH File Name: NORTHXA.HC9
Area Type: Other 6-4-91 PM

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes				1		1	1	2			2	
Volumes				5		178	178	607			403	
Lane Width				12.0		12.0	12.0	12.0			12.0	
RTOR Vols						0			0			0

Signal Operations

Phase combination	1	2	3	4
EB Left				
Thru				
Right				
Peds				
WB Left	*			
Thru				
Right	*			
Peds				
NB Right				
SB Right				
Green	8A			
Yellow/A-R	4			
Lost Time	2.0			

	5	6	7	8
NB Left	*			
Thru	*	*		
Right				
Peds				
SB Left				
Thru		*		
Right				
Peds				
EB Right				
WB Right				
Green	8A	12A		
Yellow/A-R	4	4		
Lost Time	2.0	2.0		

Cycle Length: 40 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	Approach: LOS
WB	L	1484	371	0.01	0.25	8.6	B	9.1	B
	R	1484	371	0.50	0.25	9.1	B		
NB	L	1659	415	0.45	0.25	10.2	B	3.8	A
	T	3492	2270	0.30	0.65	2.0	A		
SB	T	3492	1222	0.36	0.35	6.3	B	6.3	B

Intersection Delay = 5.2 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Crosstown (N-S) 22nd Street
Analyst: MLH File Name: SOUTHXA.HC9
Area Type: Other 6-4-91 AM
Comment: Existing Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1		1					> 2			2	2
Volumes	82		95				21	407			407	2
Lane Width	12.0		12.0					12.0			12.0	12.0
RTOR Vols			0						0			0

Signal Operations

Phase combination	1	2	3	4		5	6	7	8
EB Left	*				NB Left	*			
Thru					Thru	*			
Right	*				Right				
Peds					Peds				
WB Left					SB Left				
Thru					Thru	*			
Right					Right	*			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	8A				Green	20A			
Yellow/A-R	4				Yellow/A-R	4			
Lost Time	2.0				Lost Time	2.0			

Cycle Length: 36 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	1484	412	0.21	0.28	7.6	B	7.0	B
	R	1484	412	0.24	0.28	6.6	B		
NB	LT	3492	2134	0.22	0.61	2.0	A	2.0	A
SB	T	3492	2134	0.21	0.61	2.0	A	2.0	A
	R	2619	1600	0.00	0.61	1.8	A		

Intersection Delay = 2.9 (sec/veh) Intersection LOS = A

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime (N-S) 20th St
Analyst: MLH File Name: 19@MARA.HC9
Area Type: Other 6-3-91 AM
Comment: Existing Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	1	<	>	1	<	>	1	<	>	1	<
Volumes	46	75	1	127	551	14	1	17	23	4	54	219
Lane Width	12.0	12.0			12.0			12.0			12.0	
RTOR Vols			0			0			0			0

Signal Operations

Phase combination		1	2	3	4
EB	Left	*			
	Thru	*			
	Right	*			
	Peds				
WB	Left	*			
	Thru	*			
	Right	*			
	Peds				
NB	Right				
SB	Right				
Green		35A			
Yellow/A-R		4			
Lost Time		3.0			

		5	6	7	8
NB	Left	*			
	Thru	*			
	Right	*			
	Peds				
SB	Left	*			
	Thru	*			
	Right	*			
	Peds				
EB	Right				
WB	Right				
Green		15A			
Yellow/A-R		4			
Lost Time		3.0			

Cycle Length: 58 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	715	444	0.11	0.62	3.4	A	3.0	A
	TR	1743	1082	0.07	0.62	2.8	A		
WB	LTR	1567	973	0.75	0.62	7.0	B	7.0	B
NB	LTR	1440	397	0.11	0.28	10.1	B	10.1	B
SB	LTR	1385	382	0.76	0.28	17.6	C	17.6	C

Intersection Delay = 9.3 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime	(N-S) 22nd St
Analyst: MLH	File Name: 22@MARA.HC9
Area Type: Other	6-3-91 AM
Comment: Existing Volumes	

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1		1				1	1			2 <	
Volumes	60		33				259	1110			342	394
Lane Width	12.0		12.0				12.0	12.0			12.0	
RTOR Vols			0						0			0

Signal Operations

Phase combination	1	2	3	4		5	6	7	8
EB Left	*				NB Left	*	*		
Thru					Thru	*	*		
Right	*				Right				
Peds					Peds				
WB Left					SB Left				
Thru					Thru		*		
Right					Right		*		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	10A				Green	13A	20A		
Yellow/A-R	4				Yellow/A-R	4	4		
Lost Time	3.0				Lost Time	3.0	3.0		

Cycle Length: 55 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	1484	297	0.21	0.20	14.0	B	13.2	B
	R	1484	297	0.12	0.20	11.7	B		
NB	L	1659	422	0.49	0.69	3.8	A	14.5	B
	T	1746	1206	0.97	0.69	17.0	C		
SB	TR	3212	1226	0.66	0.38	9.9	B	9.9	B

Intersection Delay = 12.8 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY

Center For Microcomputers In Transportation

Streets: (E-W) Causeway	(N-S) U.S. 41
Analyst: MLH	File Name: US41A.HC9
Area Type: Other	6-3-91 PM
Comment: Existing volumes	

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	<	1	2	1	1	2	1	1	2	<
Volumes	23	138	245	74	647	70	403	714	42	71	338	108
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
RTOR Vols			0			0			0			0

Signal Operations

Phase combination		1	2	3	4
EB	Left	*			
	Thru	*			
	Right	*			
	Peds				
WB	Left	*			
	Thru	*			
	Right	*			
	Peds				
NB	Right				
SB	Right				
Green		30A			
Yellow/A-R		4			
Lost Time		3.0			

		5	6	7	8
NB	Left	*	*	*	
	Thru		*	*	
	Right		*	*	
	Peds				
SB	Left	*		*	
	Thru			*	
	Right			*	
	Peds				
EB	Right				
WB	Right				
Green		10A	10A	18P	
Yellow/A-R		4	4	4	
Lost Time		3.0	3.0	3.0	

Cycle Length: 84 secs Phase combination order: #1 #5 #6 #7

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	567	209	0.11	0.37	13.3	B	14.7	B
	TR	3157	1165	0.36	0.37	14.8	B		
WB	L	984	363	0.21	0.37	13.8	B	15.9	C
	T	3492	1289	0.55	0.37	16.4	C		
	R	1484	548	0.14	0.37	13.4	B		
NB	L	1659	435	0.79	0.52	18.8	C	16.6	C
	T	3492	1372	0.58	0.39	15.7	C		
	R	1484	583	0.08	0.39	12.1	B		
SB	L	1659	217	0.25	0.36	14.6	B	22.6	C
	TR	3365	761	0.65	0.23	23.8	C		

Intersection Delay = 17.2 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Causeway (N-S) 78th ST
Analyst: MLH File Name: 78THA.HC9
Area Type: Other 6-3-91 AM
Comment: Existing volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes		> 1	1		> 1	1	1	2 <		1	1	1
Volumes	42	186	38	36	562	113	122	325	60	99	179	88
Lane Width		12.0	12.0		12.0	12.0	12.0	12.0		12.0	12.0	12.0
RTOR Vols			0			0			0			0

Signal Operations

Phase combination	1	2	3	4		5	6	7	8
EB Left	*				NB Left		*		
Thru	*				Thru		*		
Right	*				Right		*		
Peds					Peds				
WB Left	*				SB Left	*	*		
Thru	*				Thru	*	*		
Right	*				Right	*	*		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	35A				Green	10A	15A		
Yellow/A-R	4				Yellow/A-R	4	4		
Lost Time	3.0				Lost Time	3.0	3.0		

Cycle Length: 72 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	LT	847	424	0.57	0.50	9.2	B	8.8	B
	R	1484	742	0.05	0.50	6.0	B		
WB	LT	1736	868	0.73	0.50	10.9	B	10.2	B
	R	1484	742	0.16	0.50	6.3	B		
NB	L	819	182	0.70	0.22	27.4	D	19.2	C
	TR	3411	758	0.56	0.22	16.7	C		
SB	L	1659	253	0.28	0.42	10.7	B	9.3	B
	T	1746	728	0.26	0.42	8.9	B		
	R	1484	618	0.15	0.42	8.5	B		

Intersection Delay = 12.3 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Causeway (N-S) U.S. 301
Analyst: MLH File Name: US301A.HC9
Area Type: Other 6-4-91 AM
Comment: Existing volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	2 <		1	2	1	1	2	1	1	2	1
Volumes	104	213	73	137	527	536	157	904	68	112	295	107
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols			0			0			0			0

Signal Operations

Phase combination		1	2	3	4
EB	Left	*	*		
	Thru		*		
	Right		*		
	Peds				
WB	Left	*	*		
	Thru		*		
	Right	*	*		
	Peds				
NB	Right				
SB	Right				
Green		6A	28A		
Yellow/A-R		4	4		
Lost Time		2.0	2.0		

		5	6	7	8
NB	Left	*	*	*	
	Thru		*	*	
	Right		*	*	
	Peds				
SB	Left	*		*	
	Thru			*	
	Right			*	
	Peds				
EB	Right				
WB	Right	*			
Green		14A	18A	20A	
Yellow/A-R		4	4	4	
Lost Time		2.0	2.0	3.0	

Cycle Length: 106 secs Phase combination order: #1 #2 #5 #6 #7

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	1659	125	0.43	0.38	20.1	C	19.7	C
	TR	3358	950	0.33	0.28	19.5	C		
WB	L	1659	125	0.39	0.38	19.4	C	18.2	C
	T	3492	988	0.59	0.28	21.7	C		
	R	1484	784	0.72	0.53	14.2	B		
NB	L	1659	563	0.24	0.57	8.8	B	15.8	C
	T	3492	1450	0.69	0.42	17.3	C		
	R	1484	616	0.12	0.42	12.3	B		
SB	L	1659	250	0.37	0.35	20.1	C	23.6	C
	T	3492	692	0.47	0.20	24.6	C		
	R	1484	294	0.38	0.20	24.2	C		

Intersection Delay = 18.4 (sec/veh) Intersection LOS = C

APPENDIX C

FUTURE CAPACITY ANALYSIS

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) 19th St	(N-S) S.R. 60
Analyst: MLH	File Name: F19THST.HC9
Area Type: Other	6-4-91 AM
Comment: 2015 Volumes	

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	1	1	3	<	2	1	<	1	1	<
Volumes	15	1700	640	120	1980	35	785	85	100	30	105	20
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vols			0			0			0			0

Signal Operations

Phase combination	1	2	3	4
EB Left		*		
Thru		*		
Right		*		
Peds				
WB Left	*	*		
Thru	*	*		
Right	*	*		
Peds				
NB Right				
SB Right				
Green	10A	35P		
Yellow/A-R	4	4		
Lost Time	3.0	3.0		

	5	6	7	8
NB Left	*	*		
Thru	*	*		
Right	*	*		
Peds				
SB Left		*		
Thru		*		
Right		*		
Peds				
EB Right	*			
WB Right				
Green	25A	8A		
Yellow/A-R	4	4		
Lost Time	3.0	3.0		

Cycle Length: 94 secs Phase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	196	75	0.21	0.38	15.0	C	26.0	D
	T	5292	2027	0.97	0.38	32.0	D		
	R	1499	989	0.68	0.66	8.9	B		
WB	L	1676	196	0.46	0.53	11.7	B	15.4	C
	TR	5276	2806	0.83	0.53	15.6	C		
NB	L	3246	898	0.89	0.40	27.6	D	25.2	D
	TR	1621	655	0.30	0.40	14.5	B		
SB	L	784	75	0.43	0.10	32.8	D	44.7	E
	TR	1722	165	0.80	0.10	47.5	E		

Intersection Delay = 22.3 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY

Center For Microcomputers In Transportation

Streets: (E-W) S.R. 60 (N-S) 21st St

Analyst: MLH File Name: F21STA.HC9

Area Type: Other 6-3-91 AM

Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes		2	1	2	2					2	4	1
Volumes		1455	430	390	1890					230	2095	160
Lane Width		12.0	12.0	12.0	12.0					12.0	12.0	12.0
RTOR Vols			0			0						0

Signal Operations

Phase combination	1	2	3	4
EB Left				
Thru		*		
Right		*		
Peds				
WB Left	*			
Thru	*	*		
Right				
Peds				
NB Right				
SB Right				
Green	10A	40A		
Yellow/A-R	4	4		
Lost Time	2.0	3.0		

	5	6	7	8
NB Left				
Thru				
Right				
Peds				
SB Left	*			
Thru	*			
Right	*			
Peds				
EB Right				
WB Right				
Green	35A			
Yellow/A-R	4			
Lost Time	2.0			

Cycle Length: 97 secs Phase combination order: #1 #2 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	3528	1491	1.08	0.42	55.6	E	47.1	E
	R	1499	634	0.71	0.42	17.2	C		
WB	L	3246	402	1.08	0.12	92.0	F	42.3	E
	T	3528	2037	1.03	0.58	32.0	D		
SB	L	2646	1009	0.25	0.38	15.6	C	20.2	C
	T	7056	2691	0.90	0.38	21.2	C		
	R	1499	572	0.29	0.38	13.6	B		

Intersection Delay = 35.2 (sec/veh) Intersection LOS = D

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) S.R. 60 (N-S) 22nd Street
Analyst: MLH File Name: F22ND@60.HC9
Area Type: Other 6-6-91 AM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	2			2	2	2	4	1			
Volumes	180	1475			1770	280	530	2625	335			
Lane Width	12.0	12.0			12.0	12.0	12.0	12.0	12.0			
RTOR Vols			0			0			0			

Signal Operations

Phase combination	1	2	3	4
EB Left	*	*		
Thru	*	*		
Right				
Peds				
WB Left				
Thru		*		
Right	*	*		
Peds				
NB Right	*	*		
SB Right				
Green	6A	42A		
Yellow/A-R	4	4		
Lost Time	2.0	2.0		

	5	6	7	8
NB Left	*			
Thru	*			
Right	*			
Peds				
SB Left				
Thru				
Right				
Peds				
EB Right				
WB Right	*			
Green	35A			
Yellow/A-R	4			
Lost Time	2.0			

Cycle Length: 95 secs Phase combination order: #1 #2 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	1676	141	0.87	0.57	41.1	E	15.2	C
	T	3528	2005	0.81	0.57	12.2	B		
WB	T	3528	1634	1.20	0.46	108.7	F	93.9	F
	R	2646	2535	0.12	0.96	0.1	A		
NB	L	2646	1031	0.57	0.39	17.8	C	50.8	E
	T	7056	2748	1.11	0.39	63.0	F		
	R	1499	1436	0.25	0.96	0.1	A		

Intersection Delay = 54.9 (sec/veh) Intersection LOS = E

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Crosstown (N-S) North Ramp
Analyst: MLH File Name: FNORTHX.HC9
Area Type: Other 6-4-91 AM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes				1		1	2	2			3	
Volumes				175		1150	635	2425			2505	
Lane Width				12.0		12.0	11.0	11.0			11.0	
RTOR Vols						0			0			0

Signal Operations

Phase combination	1	2	3	4
EB Left				
Thru				
Right				
Peds				
WB Left	*			
Thru				
Right	*			
Peds				
NB Right				
SB Right				
Green	13A			
Yellow/A-R	4			
Lost Time	2.0			

	5	6	7	8
NB Left	*			
Thru	*	*		
Right				
Peds				
SB Left				
Thru		*		
Right				
Peds				
EB Right				
WB Right	*	*		
Green	25A	68A		
Yellow/A-R	4	4		
Lost Time	2.0	2.0		

Cycle Length: 118 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
WB	L	1499	191	0.97	0.13	79.7	F	13.0	B
	R	1499	1446	0.84	0.97	2.9	A		
NB	L	3148	720	0.97	0.23	54.4	E	18.1	C
	T	3422	2871	0.93	0.84	5.6	B		
SB	T	5133	3045	0.95	0.59	19.6	C	19.6	C

Intersection Delay = 17.7 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Crosstown (N-S) South Ramps
Analyst: MLH File Name: FSOUTHX.HC9
Area Type: Other 6-4-91 AM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1		1				1	3			3	1
Volumes	390		520				145	2670			1685	995
Lane Width	12.0		12.0				11.0	11.0			11.0	11.0
RTOR Vols			0						0			0

Signal Operations

Phase combination	1	2	3	4
EB Left	*			
Thru				
Right	*			
Peds				
WB Left				
Thru				
Right				
Peds				
NB Right				
SB Right	*			
Green	30A			
Yellow/A-R	4			
Lost Time	2.0			

Phase combination	5	6	7	8
NB Left	*	*		
Thru	*	*		
Right				
Peds				
SB Left				
Thru		*		
Right		*		
Peds				
EB Right	*	*		
WB Right				
Green	10A	63A		
Yellow/A-R	4	4		
Lost Time	2.0	2.0		

Cycle Length: 115 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	1484	413	1.00	0.28	64.3	F	27.7	D
	R	1484	1432	0.38	0.97	0.1	A		
NB	L	1609	168	0.66	0.69	14.1	B	11.3	B
	T	5081	3490	0.89	0.69	11.2	B		
SB	T	5081	2872	0.68	0.57	11.8	B	10.2	B
	R	1440	1215	0.86	0.84	7.3	B		

Intersection Delay = 13.1 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY

Center For Microcomputers In Transportation

Streets: (E-W) Maritime (N-S) 20th ST

Analyst: MLH File Name: F20@MART.HC9

Area Type: Other 6-3-91 AM Peak

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes		2	<	>	2						> 3	1
Volumes		300	150	10	560					10	1510	785
Lane Width		12.0			12.0						12.0	12.0
RTOR Vols			0			0						0

Signal Operations

Phase combination	1	2	3	4
EB Left				
Thru	*			
Right	*			
Peds				
WB Left	*			
Thru	*			
Right				
Peds				
NB Right				
SB Right				
Green	25A			
Yellow/A-R	4			
Lost Time	3.0			

	5	6	7	8
NB Left				
Thru				
Right				
Peds				
SB Left	*			
Thru	*			
Right	*			
Peds				
EB Right	*			
WB Right				
Green	47A			
Yellow/A-R	4			
Lost Time	3.0			

Cycle Length: 80 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	TR	3319	1079	0.46	0.32	14.0	B	14.0	B
WB	LT	3492	1135	0.56	0.32	14.8	B	14.8	B
SB	LT	5233	3140	0.56	0.60	6.4	B	10.4	B
	R	1484	890	0.93	0.60	18.9	C		

Intersection Delay = 11.6 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime (N-S) 22nd St
Analyst: MLH File Name: F22@MAR.HC9
Area Type: Other 6-3-91 AM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	2						1	2				
Volumes	405						350	2370				
Lane Width	12.0						12.0	12.0				
RTOR Vols			0						0			

Signal Operations

Phase combination	1	2	3	4		5	6	7	8
EB Left	*				NB Left	*			
Thru					Thru	*			
Right					Right				
Peds					Peds				
WB Left					SB Left				
Thru					Thru				
Right					Right				
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	13A				Green	50A			
Yellow/A-R	4				Yellow/A-R	4			
Lost Time	2.0				Lost Time	2.0			

Cycle Length: 71 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	Approach: LOS
EB	L	2619	553	0.81	0.21	26.3	D	26.3	D
NB	L	1484	1087	0.34	0.73	2.6	A	20.7	C
	T	3492	2558	1.02	0.73	23.3	C		

Intersection Delay = 21.4 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Causeway (N-S) U.S. 41
Analyst: MLH File Name: FUS41.HC9
Area Type: Other 6-3-91 AM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	2	1	3	1	2	4	1	1	4	1
Volumes	40	1100	490	105	1855	220	805	2495	55	120	1345	60
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols			0			0			0			0

Signal Operations

Phase combination	1	2	3	4		5	6	7	8
EB Left		*			NB Left	*	*	*	
Thru		*			Thru		*	*	
Right		*			Right		*	*	
Peds					Peds				
WB Left	*	*			SB Left	*		*	
Thru	*	*			Thru			*	
Right	*	*			Right			*	
Peds					Peds				
NB Right					EB Right	*			
SB Right					WB Right				
Green	8A	30A			Green	10A	20A	25A	
Yellow/A-R	4	4			Yellow/A-R	4	4	4	
Lost Time	2.0	3.0			Lost Time	2.0	2.0	3.0	

Cycle Length: 113 secs Phase combination order: #1 #2 #5 #6 #7

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	225	62	0.68	0.27	44.5	E	26.7	D
	T	5238	1437	0.89	0.27	29.7	D		
	R	2619	997	0.54	0.38	18.1	C		
WB	L	1659	147	0.52	0.38	23.3	C	44.7	E
	T	5238	2040	1.05	0.39	48.9	E		
	R	1484	578	0.40	0.39	16.3	C		
NB	L	3213	967	0.86	0.56	22.0	C	21.6	C
	T	6984	3152	0.92	0.45	21.7	C		
	R	1484	670	0.09	0.45	11.4	B		
SB	L	1659	176	0.53	0.34	25.3	D	36.4	D
	T	6984	1607	0.97	0.23	37.9	D		
	R	1484	341	0.18	0.23	22.6	C		

Intersection Delay = 31.0 (sec/veh) Intersection LOS = D

HCM: SIGNALIZED INTERSECTION SUMMARY

Post, Buckley, Schuh & Jernigan

Streets: (E-W) Causeway (N-S) 78th ST
Analyst: MM File Name: 78THA.HC9
Area Type: Other 10-12-93 AM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	1	1	3	1	2	2 <		1	2	1
Volumes	125	500	595	10	925	375	1100	840	5	200	455	70
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0
RTOR Vols			0			0			0			0

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	*	*			NB Left	*	*	*	
Thru	*	*			Thru		*	*	
Right	*	*			Right		*	*	
Peds					Peds				
WB Left		*			SB Left	*		*	
Thru		*			Thru			*	
Right		*			Right			*	
Peds					Peds				
NB Right					EB Right	*	*		
SB Right	*				WB Right				
Green	6A	36A			Green	10A	25A	25A	
Yellow/A-R	4	4			Yellow/A-R	4	4	4	
Lost Time	3.0	3.0			Lost Time	3.0	3.0	3.0	

Cycle Length: 122 secs Phase combination order: #1 #2 #5 #6 #7

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	95	1659	0.98	0.39	91.3	F	18.7	C
	T	2018	5238	0.29	0.39	16.8	C		
	R	1095	1484	0.57	0.74	5.2	B		
WB	L	85	279	0.13	0.30	23.5	C	27.9	D
	T	1589	5238	0.67	0.30	24.7	C		
	R	450	1484	0.88	0.30	36.5	D		
NB	L	1053	3213	1.06	0.57	61.7	F	41.6	E
	TR	1572	3487	0.59	0.45	16.6	C		
SB	L	150	1659	1.02	0.30	94.4	F	46.3	E
	T	744	3492	0.68	0.21	30.0	D		
	R	438	1484	0.17	0.30	20.6	C		

Intersection Delay = 33.3 sec/veh Intersection LOS = D

Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.857

HCM: SIGNALIZED INTERSECTION SUMMARY

Post, Buckley, Schuh & Jernigan

Streets: (E-W) Causeway (N-S) U.S. 301

Analyst: MM File Name: FUS301AM.HC9

Area Type: Other 10-12-93 AM

Comment: 2015 Volumes

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	1	1	3	<	1	4	<	1	4	<
Volumes	55	570	95	10	1060	50	175	3600	5	30	1940	105
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vols			0			0			0			0

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left		*			NB Left	*	*		
Thru		*			Thru		*		
Right		*			Right		*		
Peds					Peds				
WB Left	*	*			SB Left	*	*		
Thru	*	*			Thru		*		
Right	*	*			Right		*		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	10A	23A			Green	6A	65A		
Yellow/A-R	4	4			Yellow/A-R	4	4		
Lost Time	2.0	2.0			Lost Time	2.0	2.0		

Cycle Length: 120 secs Phase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	58	279	1.00	0.21	126.0	F	35.0	D
	T	1091	5238	0.60	0.21	28.4	D		
	R	316	1515	0.32	0.21	26.2	D		
WB	L	166	1659	0.05	0.32	21.1	C	24.7	C
	TR	1690	5199	0.76	0.32	24.7	C		
NB	L	113	1693	1.10	0.64	125.4	F	42.8	E
	TR	3980	7128	1.05	0.56	39.2	D		
SB	L	113	1693	0.19	0.64	6.7	B	11.5	B
	TR	3950	7075	0.60	0.56	11.5	B		

Intersection Delay = 31.0 sec/veh Intersection LOS = D

Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.937

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

===

Streets: (E-W) 19th St (N-S) S.R. 60
Analyst: MLH File Name: F19THST.HC9
Area Type: Other 6-4-91 PM
Comment: 2015 Volumes

===

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	1	1	3	<	2	1	<	1	1	<
Volumes	20	2010	785	95	1600	30	640	105	120	35	85	15
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vols			0			0			0			0

Signal Operations

Phase combination	1	2	3	4
EB Left	*			
Thru	*			
Right	*			
Peds				
WB Left	*			
Thru	*			
Right	*			
Peds				
NB Right				
SB Right				
Green	40A			
Yellow/A-R	4			
Lost Time	3.0			

	5	6	7	8
NB Left	*			
Thru	*	*		
Right	*	*		
Peds				
SB Left		*		
Thru		*		
Right		*		
Peds				
EB Right	*			
WB Right				
Green	25A	8A		
Yellow/A-R	4	4		
Lost Time	3.0	3.0		

Cycle Length: 85 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	173	83	0.25	0.48	10.2	B	13.2	B
	T	5292	2553	0.91	0.48	16.6	C		
	R	1499	1182	0.70	0.79	3.8	A		
WB	L	173	83	1.20	0.48	198.7	F	21.6	C
	TR	5276	2545	0.74	0.48	12.2	B		
NB	L	3246	993	0.71	0.31	21.6	C	18.7	C
	TR	1624	726	0.33	0.45	9.9	B		
SB	L	784	83	0.45	0.11	29.6	D	27.0	D
	TR	1724	183	0.58	0.11	26.1	D		

Intersection Delay = 17.0 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) S.R. 60 (N-S) 21st St
Analyst: MLH File Name: F21ST.HC9
Area Type: Other 6-3-91 PM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes		2	1	2	2					2	4	1
Volumes		1750	510	305	1505					280	2575	180
Lane Width		12.0	12.0	12.0	12.0					12.0	12.0	12.0
RTOR Vols			0			0						0

Signal Operations

Phase combination	1	2	3	4
EB Left				
Thru		*		
Right		*		
Peds				
WB Left	*	*		
Thru	*	*		
Right				
Peds				
NB Right				
SB Right				
Green	6A	45A		
Yellow/A-R	4	4		
Lost Time	2.0	3.0		

	5	6	7	8
NB Left				
Thru				
Right				
Peds				
SB Left	*			
Thru	*			
Right	*			
Peds				
EB Right	*			
WB Right				
Green	35A			
Yellow/A-R	4			
Lost Time	2.0			

Cycle Length: 98 secs Phase combination order: #1 #2 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	Approach: LOS
EB	T	3528	1656	1.17	0.47	93.2	F	73.3	F
	R	1499	1270	0.42	0.85	1.3	A		
WB	L	3246	265	1.00	0.57	57.4	E	19.7	C
	T	3528	2052	0.81	0.58	12.0	B		
SB	L	2646	999	0.31	0.38	16.4	C	62.1	F
	T	7056	2664	1.12	0.38	69.9	F		
	R	1499	566	0.33	0.38	14.1	B		

Intersection Delay = 54.9 (sec/veh) Intersection LOS = E

HCM: SIGNALIZED INTERSECTION SUMMARY

Center For Microcomputers In Transportation

Streets: (E-W) S.R. 60 (N-S) 22nd Street
Analyst: MLH File Name: F22ND.HC9
Area Type: Other 6-6-91 PM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	2			2	2	1	4 <				
Volumes	145	1820			1425	230	430	2130	370			
Lane Width	12.0	12.0			12.0	12.0	11.0	11.0				
RTOR Vols			0			0			0			

Signal Operations

Phase combination	1	2	3	4
EB Left	*	*		
Thru	*	*		
Right				
Peds				
WB Left				
Thru		*		
Right	*	*		
Peds				
NB Right	*	*		
SB Right				
Green	8A	40A		
Yellow/A-R	4	4		
Lost Time	2.0	2.0		

	5	6	7	8
NB Left	*			
Thru	*			
Right	*			
Peds				
SB Left				
Thru				
Right				
Peds				
EB Right				
WB Right	*			
Green	38A			
Yellow/A-R	4			
Lost Time	2.0			

Cycle Length: 98 secs Phase combination order: #1 #2 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	1676	171	0.63	0.55	16.3	C	34.5	D
	T	3528	1944	1.03	0.55	35.9	D		
WB	T	3528	1512	1.04	0.43	43.3	E	37.3	D
	R	2646	2538	0.10	0.96	0.1	A		
NB	L	1454	593	0.76	0.41	23.0	C	42.7	E
	TR	6690	2731	1.06	0.41	45.8	E		

Intersection Delay = 38.9 (sec/veh) Intersection LOS = D

HCM: SIGNALIZED INTERSECTION SUMMARY

Center For Microcomputers In Transportation

==

Streets: (E-W) Crosstown (N-S) North Ramp

Analyst: MLH File Name: FNORTHX.HC9

Area Type: Other 6-4-91 PM

Comment: 2015 Volumes

==

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes				1		1	2	2			3	
Volumes				145		995	520	2020			3060	
Lane Width				12.0		12.0	11.0	11.0			11.0	
RTOR Vols						0			0			0

Signal Operations

Phase combination	1	2	3	4
EB Left				
Thru				
Right				
Peds				
WB Left	*			
Thru				
Right	*			
Peds				
NB Right				
SB Right				
Green	11A			
Yellow/A-R	4			
Lost Time	2.0			

	5	6	7	8
NB Left	*			
Thru	*	*		
Right				
Peds				
SB Left				
Thru		*		
Right				
Peds				
EB Right				
WB Right	*	*		
Green	25A	70A		
Yellow/A-R	4	4		
Lost Time	2.0	2.0		

Cycle Length: 118 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
WB	L	1499	165	0.93	0.11	74.4	F	10.6	B
	R	1499	1448	0.72	0.97	1.2	A		
NB	L	3148	720	0.80	0.23	37.0	D	10.0	B
	T	3422	2929	0.76	0.86	3.0	A		
SB	T	5133	3132	1.13	0.61	71.9	F	71.9	F

Intersection Delay = 39.1 (sec/veh) Intersection LOS = D

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime (N-S) 22nd St
Analyst: MLH File Name: F22@MAR.HC9
Area Type: Other 6-3-91 PM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	2						1	2				
Volumes	785						150	1510				
Lane Width	12.0						12.0	12.0				
RTOR Vols			0						0			

Signal Operations

Phase combination	1	2	3	4			5	6	7	8
EB Left	*				NB	Left	*			
Thru						Thru	*			
Right						Right				
Peds						Peds				
WB Left					SB	Left				
Thru						Thru				
Right						Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	30A				Green		30A			
Yellow/A-R	4				Yellow/A-R		4			
Lost Time	2.0				Lost Time		2.0			

Cycle Length: 68 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	2619	1232	0.70	0.47	12.1	B	12.1	B
NB	L	1484	698	0.23	0.47	8.1	B	27.5	D
	T	3492	1643	1.02	0.47	29.3	D		

Intersection Delay = 22.5 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY

Center For Microcomputers In Transportation

Streets: (E-W) Causeway (N-S) U.S. 41
Analyst: MLH File Name: FUS41.HC9
Area Type: Other 6-3-91 PM
Comment: 2015 Volumes

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	2	1	3	1	2	4	1	1	4	1
Volumes	60	1855	805	55	1100	120	490	1345	105	220	2495	40
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vols			0			0			0			0

Signal Operations

Phase combination	1	2	3	4
EB Left	*			
Thru	*			
Right	*			
Peds				
WB Left	*			
Thru	*			
Right	*			
Peds				
NB Right				
SB Right				
Green	41A			
Yellow/A-R	4			
Lost Time	3.0			

	5	6	7	8
NB Left	*	*		
Thru		*		
Right		*		
Peds				
SB Left	*	*		
Thru		*		
Right		*		
Peds				
EB Right	*			
WB Right				
Green	14A	47A		
Yellow/A-R	4	4		
Lost Time	3.0	3.0		

Cycle Length: 114 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	219	81	0.78	0.37	48.6	E	55.5	E
	T	5238	1930	1.11	0.37	72.5	F		
	R	2619	1310	0.68	0.50	14.8	B		
WB	L	167	62	0.94	0.37	94.3	F	22.5	C
	T	5238	1930	0.66	0.37	19.9	C		
	R	1484	547	0.23	0.37	16.1	C		
NB	L	3213	423	1.13	0.58	106.5	F	38.1	D
	T	6984	2941	0.53	0.42	16.0	C		
	R	1484	625	0.18	0.42	13.4	B		
SB	L	1659	218	0.82	0.58	29.6	D	29.0	D
	T	6984	2941	0.98	0.42	29.2	D		
	R	1484	625	0.07	0.42	12.7	B		

Intersection Delay = 38.3 (sec/veh) Intersection LOS = D

```
HCM: SIGNALIZED INTERSECTION SUMMARY
                         Post, Buckley, Schuh & Jernigan
=====================================================================
Streets: (E-W) Causeway                     (N-S) 78th ST
Analyst: MM                                 File Name: F78TH.HC9
Area Type: Other                            10-12-93 PM
Comment: 2015 Volumes
=====================================================================
          |  Eastbound    |  Westbound    |  Northbound   |  Southbound
          | L    T    R   | L    T    R   | L    T    R   | L    T    R
          |---- ---- ----|---- ---- ----|---- ---- ----|---- ---- ----
No. Lanes | 1    3    1   | 1    3    1   | 2    2  <     | 1    2    1
Volumes   |  70  925 1100|   5  500  200| 595  455   10| 375  840  125
Lane Width|12.0 12.0 12.0|12.0 12.0 12.0|12.0 12.0     |12.0 12.0 12.0
RTOR Vols |             0|             0|             0|              0
---------------------------------------------------------------------
                          Signal Operations
Phase Combination 1    2    3    4 |           5    6    7    8
EB  Left          *    *           |NB  Left    *    *
    Thru          *    *           |    Thru         *
    Right         *    *           |    Right        *
    Peds                           |    Peds
WB  Left               *           |SB  Left    *    *
    Thru               *           |    Thru         *
    Right              *           |    Right        *
    Peds                           |    Peds
NB  Right                          |EB  Right   *    *
SB  Right         *                |WB  Right
Green            8A   30A          |Green      18A  28A
Yellow/A-R        4    4           |Yellow/A-R  4    4
Lost Time       3.0  3.0           |Lost Time 3.0  3.0
Cycle Length: 100 secs  Phase combination order: #1 #2 #5 #6
---------------------------------------------------------------------
                    Intersection Performance Summary
     Lane  Group:   Adj Sat   v/c    g/C                   Approach:
     Mvmts   Cap     Flow    Ratio  Ratio   Delay   LOS   Delay  LOS
     -----  ----   -------   -----  -----   -----   ---   -----  ---
EB   L       149     1659    0.00   0.43     0.0     A     7.3    B
     T      2252     5238    0.48   0.43    13.3     B
     R      1439     1484    0.80   0.97     2.2     A
WB   L        70      226    0.07   0.31    18.5     C    17.6    C
     T      1624     5238    0.36   0.31    17.3     C
     R       460     1484    0.46   0.31    18.4     C
NB   L       610     3213    0.91   0.51    29.4     D    24.9    C
     TR     1010     3482    0.51   0.29    19.4     C
SB   L       315     1659    1.02   0.51    65.3     F    37.9    D
     T      1013     3492    0.92   0.29    29.9     D
     R       608     1484    0.22   0.41    12.4     B
                Intersection Delay =  20.1 sec/veh Intersection LOS = C
Lost Time/Cycle, L =   0.0 sec   Critical v/c(x)    = 0.780
---------------------------------------------------------------------
```

HCM: SIGNALIZED INTERSECTION SUMMARY
Post, Buckley, Schuh & Jernigan

Streets: (E-W) Causeway (N-S) U.S. 301
Analyst: MM File Name: FUS301OC.HC9
Area Type: Other 10-12-93 PM
Comment: 2015 Volumes

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	1	1	3	<	1	4	<	1	4	<
Volumes	105	1060	175	5	570	30	95	1940	10	50	3600	55
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vols			0			0			0			0

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	*	*			NB Left	*	*		
Thru	*	*			Thru		*		
Right	*	*			Right		*		
Peds					Peds				
WB Left		*			SB Left	*	*		
Thru		*			Thru		*		
Right		*			Right		*		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	10A	20A			Green	6A	65A		
Yellow/A-R	4	4			Yellow/A-R	4	4		
Lost Time	2.0	2.0			Lost Time	2.0	2.0		

Cycle Length: 117 secs Phase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	170	1659	0.48	0.31	26.7	D	24.6	C
	T	1612	5238	0.76	0.31	25.0	C		
	R	466	1515	0.39	0.31	20.9	C		
WB	L	60	317	0.08	0.19	29.8	D	30.2	D
	TR	978	5199	0.71	0.19	30.2	D		
NB	L	116	1693	0.56	0.66	12.7	B	10.3	B
	TR	4076	7117	0.55	0.57	10.2	B		
SB	L	116	1693	0.30	0.66	7.0	B	35.0	D
	TR	4070	7107	1.04	0.57	35.4	D		

Intersection Delay = 26.3 sec/veh Intersection LOS = D

Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.899

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime (N-S) 20th St
Analyst: MLH File Name: 20@MARF.HC9
Area Type: Other 10-13-91 AM Peak
Comment: Alternative V at grade

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes		2	1		> 2						> 3	
Volumes		560	350	10	300					10	2270	
Lane Width		12.0	12.0		12.0						12.0	
RTOR Vols			0			0						0

Signal Operations

Phase combination	1	2	3	4		Phase combination	5	6	7	8
EB Left						NB Left				
Thru	*					Thru				
Right	*					Right				
Peds						Peds				
WB Left	*					SB Left	*			
Thru	*					Thru	*			
Right						Right				
Peds						Peds				
NB Right						EB Right				
SB Right						WB Right				
Green	37P					Green	55P			
Yellow/A-R	4					Yellow/A-R	4			
Lost Time	3.0					Lost Time	3.0			

Cycle Length: 100 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	3564	1354	0.46	0.38	17.3	C	19.0	C
	R	1515	576	0.64	0.38	21.0	C		
WB	LT	2747	1044	0.33	0.38	16.8	C	16.8	C
SB	LT	5342	2992	0.88	0.56	17.1	C	17.1	C

Intersection Delay = 17.5 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime (N-S) 20th St.
Analyst: MLH File Name: 20@MARP.HC9
Area Type: Other 10-13-91 PM Peak
Comment: Alternative V at grade

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes		2	1		> 2						3	
Volumes		300	150	10	560					10	1510	
Lane Width		12.0	12.0		12.0						12.0	
RTOR Vols			0			0						0

Signal Operations

Phase combination	1	2	3	4
EB Left				
Thru	*			
Right	*			
Peds				
WB Left	*			
Thru	*			
Right				
Peds				
NB Right				
SB Right				
Green	37P			
Yellow/A-R	4			
Lost Time	3.0			

	5	6	7	8
NB Left				
Thru				
Right				
Peds				
SB Left	*			
Thru	*			
Right				
Peds				
EB Right				
WB Right				
Green	55P			
Yellow/A-R	4			
Lost Time	3.0			

Cycle Length: 100 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	3564	1354	0.25	0.38	16.1	C	16.2	C
	R	1515	576	0.27	0.38	16.4	C		
WB	LT	3540	1345	0.47	0.38	18.0	C	18.0	C
SB	LT	5340	2990	0.59	0.56	11.2	B	11.2	B

Intersection Delay = 13.5 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime (N-S) Guy Verger
Analyst: MLH File Name: GUY&MARA.HC9
Area Type: Other 10-13-91 PM Peak
Comment: Alternative V at grade

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes		1	<	1	1		1		1		1	1
Volumes		380	20	10	550		50		50		85	700
Lane Width		12.0		12.0	12.0		12.0		12.0		12.0	12.0
RTOR Vols			0			0			0			0

Signal Operations

Phase combination	1	2	3	4		5	6	7	8
EB Left					NB Left	*			
Thru	*				Thru				
Right	*				Right	*			
Peds					Peds				
WB Left	*				SB Left				
Thru	*				Thru	*			
Right					Right	*			
Peds					Peds				
NB Right					EB Right				
SB Right	*				WB Right				
Green	65P				Green	30P			
Yellow/A-R	4				Yellow/A-R	4			
Lost Time	3.0				Lost Time	3.0			

Cycle Length: 103 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	Approach: LOS
EB	TR	1592	1020	0.41	0.64	7.0	B	7.0	B
WB	L	911	584	0.02	0.64	5.1	B	7.7	B
	T	1782	1142	0.51	0.64	7.8	B		
NB	L	230	69	0.77	0.30	49.9	E	34.9	D
	R	1515	456	0.12	0.30	19.8	C		
SB	T	1782	536	0.17	0.30	20.1	C	2.6	A
	R	1515	1427	0.52	0.94	0.5	A		

Intersection Delay = 6.9 (sec/veh) Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime [illegible] (N-S) Guy Verger
Analyst: MLH File Name: GUYEMARP.HC9
Area Type: Other 10-13-91 PM Peak
Comment: Alternative V at grade

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes		1		1	1		1		1		1	1
Volumes		880	30	25	275		50		50		100	405
Lane Width		12.0		12.0	12.0		12.0		12.0		12.0	12.0
RTOR Vols			0			0			0			0

Signal Operations

Phase combination	1	2	3	4
EB Left				
Thru	*			
Right	*			
Peds				
WB Left	*			
Thru	*			
Right				
Peds				
NB Right				
SB Right	*			
Green	65P			
Yellow/A-R	4			
Lost Time	3.0			

Phase combination	5	6	7	8
NB Left	*			
Thru				
Right	*			
Peds				
SB Left				
Thru	*			
Right	*			
Peds				
EB Right				
WB Right				
Green	30P			
Yellow/A-R	4			
Lost Time	3.0			

Cycle Length: 103 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	Approach: LOS
EB	TR	1596	1023	0.94	0.64	23.8	C	23.8	C
WB	L	266	170	0.15	0.64	5.6	B	6.0	B
	T	1782	1142	0.25	0.64	6.1	B		
NB	L	254	76	0.69	0.30	39.3	D	29.6	D
	R	1515	456	0.12	0.30	17.8	C		
SB	T	1782	536	0.20	0.30	20.3	C	4.2	A
	R	1515	1427	0.30	0.74	0.2	A		

Intersection Delay = 15.7 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime (N-S) 22nd St
Analyst: MLH File Name: 22@MARP.HC9
Area Type: Other 10-13-91 AM Peak
Comment: Alternative V at grade

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	2						2	3				
Volumes	405						350	2370				
Lane Width	12.0						12.0	12.0				
RTOR Vols			0						0			

Signal Operations

Phase combination	1	2	3	4			5	6	7	8
EB Left	*				NB	Left	*			
Thru						Thru	*			
Right						Right				
Peds						Peds				
WB Left					SB	Left				
Thru						Thru				
Right						Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	36P				Green		56P			
Yellow/A-R	4				Yellow/A-R		4			
Lost Time	3.0				Lost Time		3.0			

Cycle Length: 100 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	2673	989	0.45	0.37	18.3	C	18.3	C
NB	L	2673	1524	0.25	0.57	8.2	B	16.3	C
	T	5346	3047	0.90	0.57	17.5	C		

Intersection Delay = 16.6 (sec/veh) Intersection LOS = C

HCM: SIGNALIZED INTERSECTION SUMMARY
Center For Microcomputers In Transportation

Streets: (E-W) Maritime (N-S) 22nd St
Analyst: MLH File Name: 22@MARP.HC9
Area Type: Other 10-13-91 PM Peak
Comment: Alternative V at grade

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	2						2	3				
Volumes	785						150	1510				
Lane Width	12.0						12.0	12.0				
RTOR Vols			0						0			

Signal Operations

Phase combination	1	2	3	4		5	6	7	8
EB Left	*				NB Left	*			
Thru					Thru	*			
Right					Right				
Peds					Peds				
WB Left					SB Left				
Thru					Thru				
Right					Right				
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	42P				Green	50P			
Yellow/A-R	4				Yellow/A-R	4			
Lost Time	3.0				Lost Time	3.0			

Cycle Length: 100 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/c Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	2673	1149	0.75	0.43	20.3	C	20.3	C
NB	L	2673	1363	0.12	0.51	9.7	B	13.6	B
	T	5346	2726	0.64	0.51	13.9	B		

Intersection Delay = 15.7 (sec/veh) Intersection LOS = C

APPENDIX D

Benefit-Cost Analysis At Railroad Crossings

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY: SCM
CHK. BY:
DATE: 1992
SHEET NO.: 1
JOB NO.:

SUBJECT: Benefit/Cost Analysis for prop. Grade Separation – Causeway Blvd E. of U.S 41

Assumptions:

1. Train schedules to remain constant through year 20
   - growth projections unavailable to predict anything to the contrary.
   - R/R crossing information in Appendix A
2. Average queue discharge rate = 2 sec (lost time) + 2 sec/veh
3. 20 year analysis period – year 1 : 1995
   year 20 : 2015
4. "No-build" case includes construction of 6-lane roadway "at-grade".
   "Build" case includes grade separation over railroad. For simplicity of analysis, construction of the overpass would be completed prior to year #1
5. 7% discount rate used
6. Only ½ delay is encountered on weekends ∴ 313 days/year used in analysis
7. Posted speed/Operating speed of new facility = 40 mph

Sources:

1. A Manual on User Benefit Analysis of Highway and Bus-Transit Improvements (1977) AASHTO (AASHTO RED BOOK)
2. Motor Vehicle Manufacturers Assoc. Facts & Figures '91

Motorist Benefits include the following costs eliminated by the construction of an overpass:

1. Travel Time Delay
2. Vehicle Idling Cost
3. Stopping / Resuming original speed due to train movements.

Unit Costs for these factors are computed on the following pages. The AASHTO Red Book provides computation methodology for updating its 1975 unit costs to year 1 of the analysis (1995). The Consumer Price Index (C.P.I.) provides a historical overview of consumer costs. The next page contains a graph of historical indices from which a general cost update factor can be obtained.

Once the unit costs have been completed, LOTUS spreadsheets are used in conjunction with existing traffic count information to determine

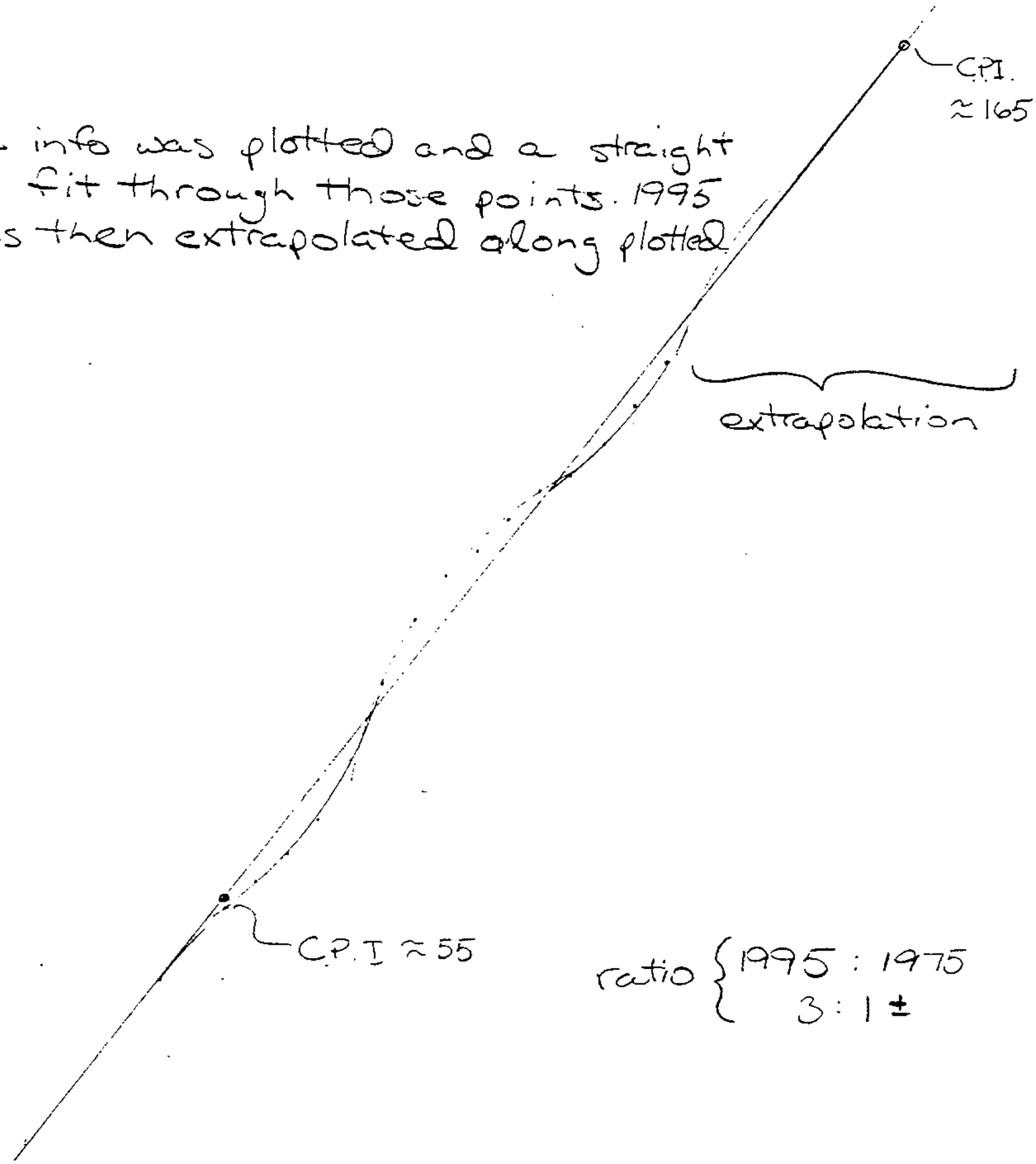
PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

Unit Cost Computation

SUBJECT: Consumer Price Index
Update Factor
(All Items)

COMP. BY: SCK
CHK. BY:
DATE: 7/25/91
SHEET NO.: 3
JOB NO.: 10.620.00

Historical info was plotted and a straight line was fit through those points. 1995 data was then extrapolated along plotted line.



ratio { 1995 : 1975
3 : 1 ±

from Florida Abstract 1990

75 85 95

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

SUBJECT: Unit Value of Travel Time

COMP. BY:
CHK. BY:
DATE:
SHEET NO.: 4
JOB NO.:

1975 Value of Time (Delay)

Pass Cars $3/HR[1]
Trucks $7.50[2]

Source: AASHTO Red Book (1975)
Notes: 1. p. 17
2. p. 19 Assumes 50·50 split between SU and larger trucks.

1995 Updated Value of Time - All Vehicles

$T_{24HR} = 10.6\%$ ∴ passenger vehicles = 89.4%

Consumer Price Index Update Factor = 3.0[1]

1975 Value

$3/HR × 3.0 × 0.894 = $8.05

7.50/HR × 3.0 × 0.106 = $2.38

1995 Vehicle Delay Unit Cost: $\boxed{\$10.43/HR}$

1 see C.P.I. update derivation. This general factor was used to update travel time delay costs as this cost is primarily related to motorist salaries which, in turn correspond to the overall C.P.I.

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY:
CHK. BY:
DATE:
SHEET NO.: 5
JOB NO.:

SUBJECT: Motor Vehicle Idling Cost Update Factor

Factors contributing to Motor Vehicle Idling Cost:

	1975	1991	FACTOR (1991/1975)
① Fuel ② Lubricating Oil	4.82¢/mi	6.70¢/mi	1.39
③ Maintenance	0.97¢/mi.	2.20¢/mi	2.27
④ Depreciation	$2543/yr	$773/yr	3.29

source: MVMA Motor Veh Manuf. Assoc. Facts & Figs '91, p.41

1975 Motor Vehicle Idling Costs:

From Table D-6 AASHTO Red Book: p.171

	1975	Escalation Factors	1991
Fuel (Dollars/1000 hrs)	260.00	1.39	361.4
Oil ($/1000 hrs)	5.22	1.39	7.26
Maint ($/1000 hrs)	14.25	2.27	32.35
Depreciation ($/1000 hrs)	33.17	3.29	109.13
	$312.64/1000 hrs or 31¢/hr		$510.14 per 1000 hrs or 51¢/hr (1991)

1995 Passenger Vehicle Idling Cost:

$$31¢ + (51¢ - 31¢)\frac{20 \text{ yrs}}{16 \text{ yrs}} = 56.0¢/hr$$

To compute 1995 Truck Idling Cost

1. USE factor for pass. car conversion $\frac{56¢}{31¢} = 1.81$
2. mult. by avg truck idling cost 1975 (table D-6)

[assuming a 50-50 split of SU & combination trucks] $\frac{27.7 + 19.3}{2} = 23.5¢/hr$

$1.81 \times 23.5¢/hr = 42.5¢/hr$

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

SUBJECT: Idling Cost cont & Stopping Cost Calc

COMP. BY:
CHK. BY:
DATE:
SHEET NO. 6
JOB NO.:

1995 Vehicle Idling Unit Cost:

		Truck factor	
passenger cars	56¢/hr	.894	50.1
trucks (SU & COMBINATION)	42.5¢/hr	.106	4.5
			$\boxed{54.6¢/hr}$

Stopping Cost Above cost of continuing at initial speed. Source: AASHTO Red Book tables B-10, B-11 & B-12

1975 Costs:

PASSENGER 2.1¢/STOP

SU VEHICLE 4.85¢/STOP
HEAVY TRUCKS 16.4¢/STOP } 10.6¢/STOP

Factors affected by stopping/starting

1. Fuel: 1.39 times greater than 1975
2. Tires*: 1975 = 0.66¢/mi, 1991 = 0.90¢/mi ⇒ 1.5 ratio
3. Maintenance: 2.27 times greater
4. Wholesale/Consumer Prices** 2.24 ratio

* p41 MVMA facts & figures (passenger vehicles only) - comparable increase assumed for trucks.

** p42 New & Used Cars

$$CPI_{1990} = \frac{117.6 + 121}{2} = 119$$

$$CPI_{75} \quad \frac{43.8 + 62.9}{2} = 53.35$$

$$\text{ratio}_{1990-1975} = 2.24$$

Note: Without specific Wholesale-Price Indices for obtaining proper multipliers as listed in tables B-13 thru B-15, it appears that for stopping & resuming, tires & fuel are quite heavily weighted. Therefore for stopping & proceeding, the update ratio of 1.8 will be utilized. Value also used for idling.

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY:
CHK. BY:
DATE:
SHEET NO.: 7
JOB NO.:

SUBJECT: Stopping Cost Computation cont

Cost per stop/go cycle

	1975	1995	Truck Factor	
Passenger	2.1¢	3.8¢	.894	3.4
Truck (avg)	10.6¢	19.1¢	.106	2.0
				$\boxed{5.4¢}$/vehicle-cycle

COMPUTERIZED TRAFFIC DATA, INC. 904-287-2916
445-26 S.R. 13 SUITE 275 JACKSONVILLE, FL. 32259
Volume Program with Midnight Totals

****

Data File : 04039101.TRF   Position : 4
Station : 12   Ident : 228
Start Date : Apr 1 ,1991   End Date : Apr 2 ,1991
Start Time : 14:14   End Time : 24:00
Location : CAUSEWAY EAST OF US 41 WESTBOUND

****

Apr 1   ** Lane 1 **

Begin	00	01	02	03	04	05	06	07	08	09	10	11
00												
15												
30												
45												
Hr Total												

Begin	12	13	14	15	16	17	18	19	20	21	22	23
00			0	102	85	86	70	55	42	29	23	25
15			89	78	81	60	47	40	29	34	26	23
30			105	113	73	67	58	51	46	31	34	25
45			107	104	69	73	67	47	39	33	16	12
Hr Total			302	397	308	286	242	193	156	127	99	85

Total volume : 2195
PM peak hour begins : 14:15   PM peak volume : 404   Peak hour factor : 0.94

****

Apr 2   A.M. PERIOD 1   ** Lane 1 **   MID-DAY 2 PERIOD

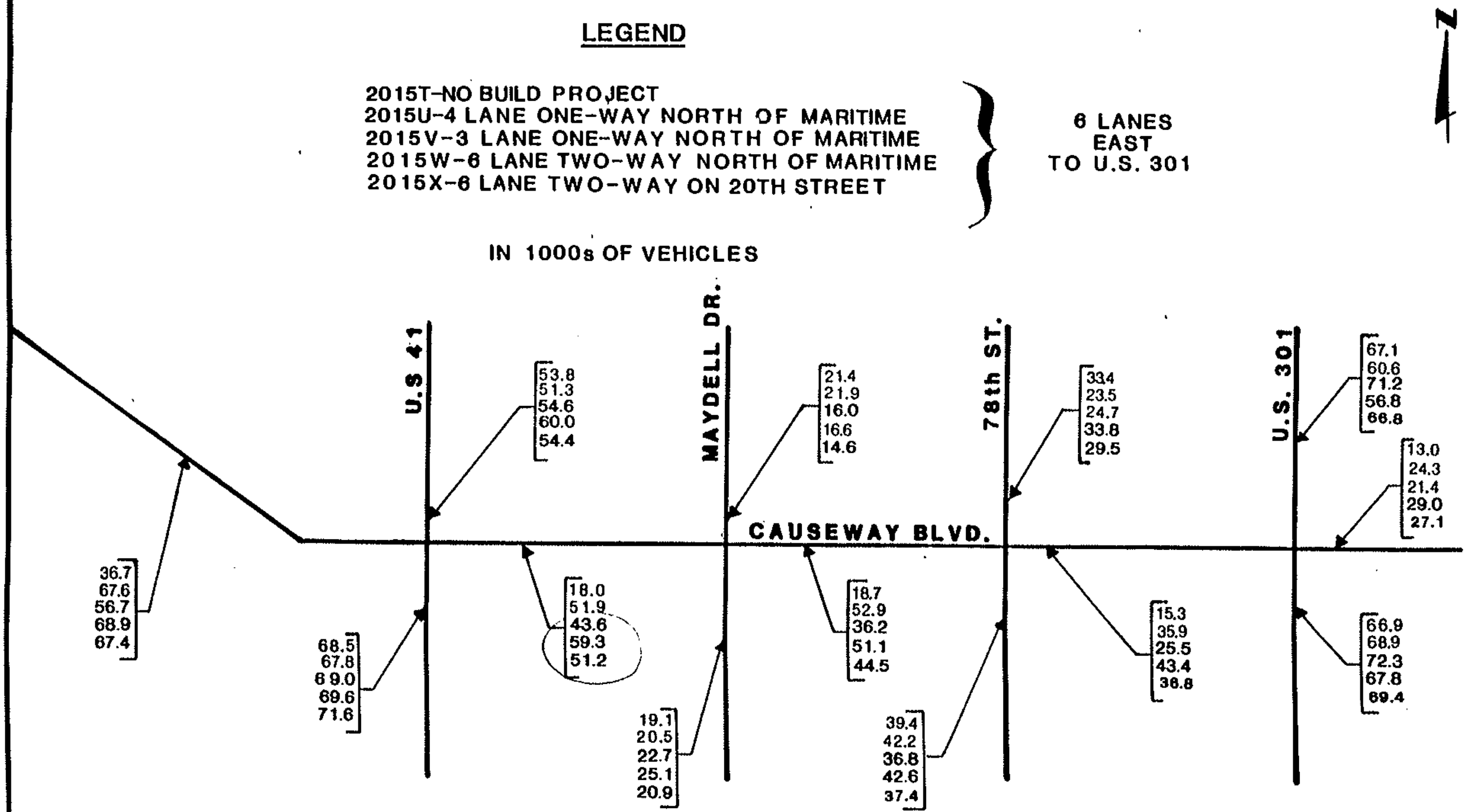
Begin	00	01	02	03	04	05	06	07	08	09	10	11
00	19	16	11	14	10	32	113	216	160	79	92	83
15	11	4	17	20	25	6	152	197	172	102	94	97
30	20	12	8	32	17	97	205	201	121	100	90	108
45	20	16	12	15	27	72	192	204	90	123	120	70
Hr Total	70	48	48	81	79	207	662	818	543	404	396	358

Begin	12	13	14	15	16	17	18	19	20	21	22	23
00	142	107	107	118	89	64	61	64	56	39	34	22
15	70	105	102	124	99	82	61	50	32	40	27	28
30	132	98	94	111	88	69	57	49	35	24	25	17
45	90	110	102	101	73	57	60	51	34	23	29	22
Hr Total	434	420	405	454	339	272	239	214	157	126	115	95

2   P.M. PERIOD 3

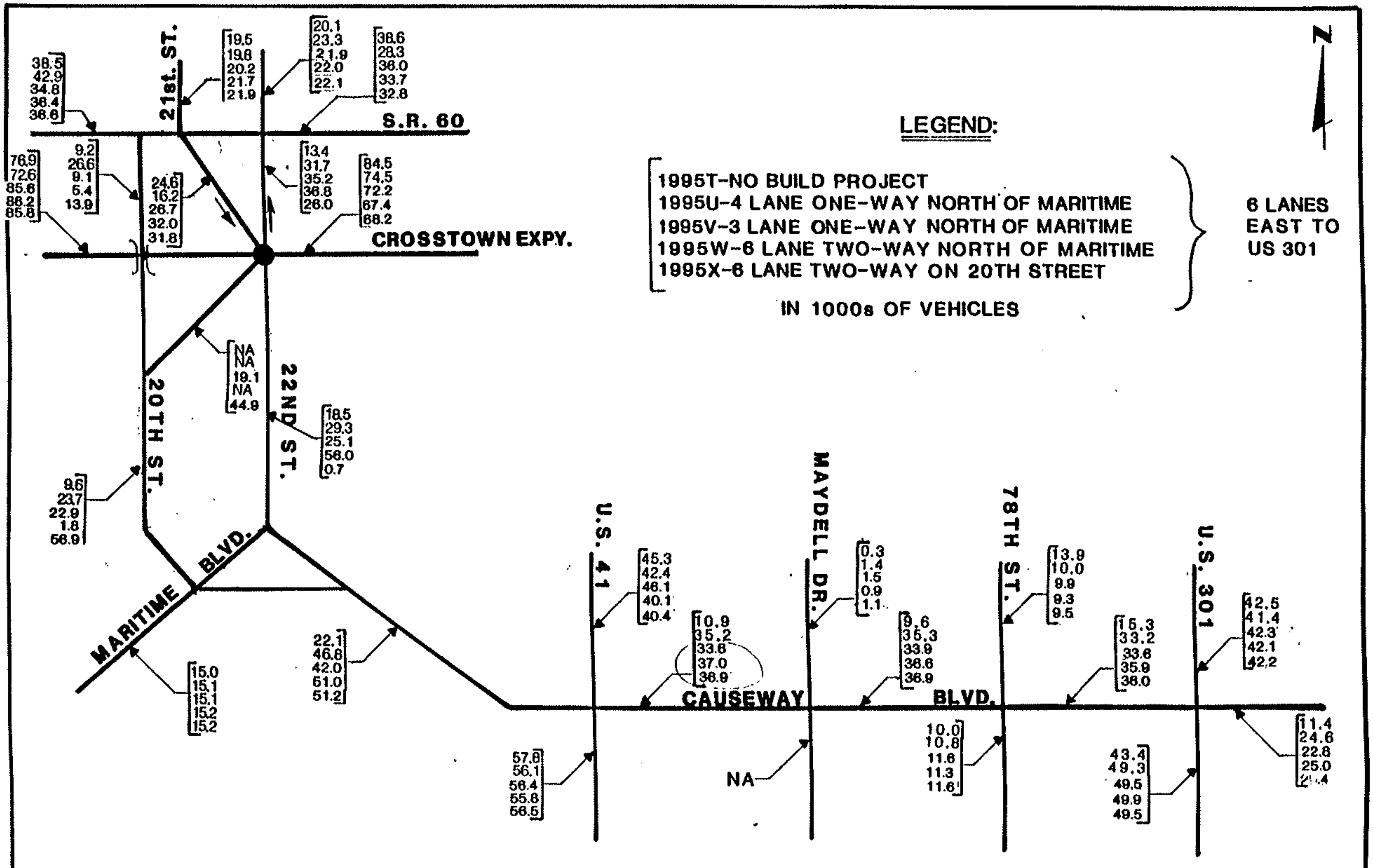
Total volume : 6384
AM peak hour begins : 07:00   AM peak volume : 818   Peak hour factor : 0.95
PM peak hour begins : 14:45   PM peak volume : 455   Peak hour factor : 0.92

****



YEAR 2015 FSUTMS TRAFFIC FORECASTS

FIGURE 7



YEAR 1995 FSUTMS TRAFFIC FORECASTS

FIGURE 8

22ND ST PD&E STUDY
BENEFIT/COST ANALYSIS FOR PROPOSED CAUSEWAY BLVD OVERPASS
ALTERNATIVE V

DESIGN YEAR:	2015
CONSTRUCTION YR:	1995
TRAFFIC COUNT YR:	1988
ADT(YEAR 20):	43600
ADT(YEAR 1):	33600
# LANES/DIRECTION:	3

TRAFFIC ARRIVAL RATES:

PERIOD	# HOURS IN PERIOD	1991 COUNT % OF TOTAL	ADT	TOTAL VOLUME	AVERAGE HOURLY VOLUME	2015 AVG ARRIVAL RATE	1995 AVG ARRIVAL RATE
12AM-5AM	5	4.67%	43600	2036	407	6.8	5.2
5AM-8PM	15	88.27%	43600	38486	2566	42.8	33.0
8PM-12AM	4	7.06%	43600	3078	770	12.8	9.9

DELAY COMPUTATION NOTE: TIMES SHOWN IN MINS. UNLESS NOTED

	YEAR 1 (1995) A.M.	MID-DAY	P.M.	YEAR 20 (2015) A.M.	MID-DAY	P.M.
AVG ARRIVAL RATE	5.2	33.0	9.9	6.8	42.8	12.8
AVG CROSSING TIME	5.5	5.5	5.5	5.5	5.5	5.5
#ARRIVALS/CROSSING	28.8	181.2	54.4	37.3	235.2	70.5
#ARRIVALS/PERIOD	115.1	2175.0	217.4	149.3	2822.3	282.2
TOTAL ARRIVALS/DAY		2507.5			3253.8	
TOTAL ARRIVALS/YR		784844.2			1018428.8	
#ARRIVALS/LANE	4.8	30.2	9.1	6.2	39.2	11.8
TIME TO DISSIPATE QUEUES	0.2	1.0	0.3	0.2	1.3	0.4
TOTAL DELAY DURATION	5.7	6.5	5.8	5.7	6.8	5.9
DELAY TO 1ST VEHICLE	4.0	4.0	4.0	4.0	4.0	4.0
DELAY TO LAST VEHICLE	0.2	1.0	0.3	0.2	1.3	0.4
AVG DELAY/VEHICLE	2.1	2.5	2.2	2.1	2.7	2.2
TOTAL DELAY/CROSSING	60.3	456.8	117.8	79.2	628.0	156.1
CROSSINGS/PERIOD	4.0	12.0	4.0	4.0	12.0	4.0
DELAY/PERIOD (MIN)	241.3	5481.2	471.4	316.6	7535.4	624.3
TOTAL DELAY/DAY (HRS)		103			141	
x DAYS/YR	313			313		
TOTAL DELAY/YEAR (HRS)	32311			44218		

SCM48:ALTV22BC.WK1

22ND ST PD&E STUDY
BENEFIT/COST ANALYSIS FOR PROPOSED CAUSEWAY BLVD OVERPASS
ALTERNATIVE W

DESIGN YEAR:	2015
CONSTRUCTION YR:	1995
TRAFFIC COUNT YR:	1988
ADT(YEAR 20):	59300
ADT(YEAR 1):	37000
# LANES/DIRECTION:	3

TRAFFIC ARRIVAL RATES:

PERIOD	# HOURS IN PERIOD	1991 COUNT % OF TOTAL	ADT	TOTAL VOLUME	AVERAGE HOURLY VOLUME	2015 AVG ARRIVAL RATE	1995 AVG ARRIVAL RATE
12AM-5AM	5	4.67%	59300	2769	554	9.2	5.8
5AM-8PM	15	88.27%	59300	52344	3490	58.2	36.3
8PM-12AM	4	7.06%	59300	4187	1047	17.4	10.9

DELAY COMPUTATION NOTE: TIMES SHOWN IN MINS. UNLESS NOTED

	YEAR 1 (1995)			YEAR 20 (2015)		
	A.M.	MID-DAY	P.M.	A.M.	MID-DAY	P.M.
AVG ARRIVAL RATE	5.8	36.3	10.9	9.2	58.2	17.4
AVG CROSSING TIME	5.5	5.5	5.5	5.5	5.5	5.5
#ARRIVALS/CROSSING	31.7	199.6	59.9	50.8	319.9	95.9
#ARRIVALS/PERIOD	126.7	2395.1	239.5	203.1	3838.6	383.8
TOTAL ARRIVALS/DAY		2761.2			4425.4	
TOTAL ARRIVALS/YR		864263.0			1385156.7	
#ARRIVALS/LANE	5.3	33.3	10.0	8.5	53.3	16.0
TIME TO DISSIPATE QUEUES	0.2	1.1	0.4	0.3	1.8	0.6
TOTAL DELAY DURATION	5.7	6.6	5.9	5.8	7.3	6.1
DELAY TO 1ST VEHICLE	4.0	4.0	4.0	4.0	4.0	4.0
DELAY TO LAST VEHICLE	0.2	1.1	0.4	0.3	1.8	0.6
AVG DELAY/VEHICLE	2.1	2.6	2.2	2.2	2.9	2.3
TOTAL DELAY/CROSSING	66.7	513.2	130.7	109.5	929.3	219.1
CROSSINGS/PERIOD	4.0	12.0	4.0	4.0	12.0	4.0
DELAY/PERIOD (MIN)	266.7	6157.9	522.7	438.2	11151.9	876.2
TOTAL DELAY/DAY (HRS)		116			208	
x DAYS/YR	313			313		
TOTAL DELAY/YEAR (HRS)	36242			65033		

SCM48:ALTW22BC.WK1

22ND ST PD&E STUDY
BENEFIT/COST ANALYSIS FOR PROPOSED CAUSEWAY BLVD OVERPASS
ALTERNATIVE X

DESIGN YEAR:	2015
CONSTRUCTION YR:	1995
TRAFFIC COUNT YR:	1988
ADT(YEAR 20):	51200
ADT(YEAR 1):	36900
# LANES/DIRECTION:	3

TRAFFIC ARRIVAL RATES:

PERIOD	# HOURS IN PERIOD	1991 COUNT % OF TOTAL	ADT	TOTAL VOLUME	AVERAGE HOURLY VOLUME	2015 AVG ARRIVAL RATE	1995 AVG ARRIVAL RATE
12AM-5AM	5	4.67%	51200	2391	478	8.0	5.7
5AM-8PM	15	88.27%	51200	45194	3013	50.2	36.2
8PM-12AM	4	7.06%	51200	3615	904	15.1	10.9

DELAY COMPUTATION NOTE: TIMES SHOWN IN MINS. UNLESS NOTED

	YEAR 1 (1995) A.M.	YEAR 1 (1995) MID-DAY	YEAR 1 (1995) P.M.	YEAR 20 (2015) A.M.	YEAR 20 (2015) MID-DAY	YEAR 20 (2015) P.M.
AVG ARRIVAL RATE	5.7	36.2	10.9	8.0	50.2	15.1
AVG CROSSING TIME	5.5	5.5	5.5	5.5	5.5	5.5
#ARRIVALS/CROSSING	31.6	199.0	59.7	43.8	276.2	82.8
#ARRIVALS/PERIOD	126.4	2388.6	238.8	175.3	3314.2	331.3
TOTAL ARRIVALS/DAY		2753.8			3820.9	
TOTAL ARRIVALS/YR		861927.2			1195953.1	
#ARRIVALS/LANE	5.3	33.2	10.0	7.3	46.0	13.8
TIME TO DISSIPATE QUEUES	0.2	1.1	0.4	0.3	1.6	0.5
TOTAL DELAY DURATION	5.7	6.6	5.9	5.8	7.1	6.0
DELAY TO 1ST VEHICLE	4.0	4.0	4.0	4.0	4.0	4.0
DELAY TO LAST VEHICLE	0.2	1.1	0.4	0.3	1.6	0.5
AVG DELAY/VEHICLE	2.1	2.6	2.2	2.1	2.8	2.2
TOTAL DELAY/CROSSING	66.5	511.5	130.3	93.7	768.9	186.1
CROSSINGS/PERIOD	4.0	12.0	4.0	4.0	12.0	4.0
DELAY/PERIOD (MIN)	265.9	6137.7	521.2	375.0	9226.4	744.5
TOTAL DELAY/DAY (HRS)		115			172	
x DAYS/YR	313			313		
TOTAL DELAY/YEAR (HRS)	36124			53971		

SCM48:ALTX22BC.WK1

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY:
CHK. BY:
DATE:
SHEET NO. 14
JOB NO.:

SUBJECT: Motorist Benefit Computation "No-Build" Costs

I. Cost of Delay[1] @ $10.43/HR

		HRS/YR	$/YR
1995 ALT	V	32311	$337,000
	W	36242	$378,000
	X	36124	$376,800
2015	V	44218	$461,200
	W	65033	$678,300
	X	53971	$562,900

1. From Lotus spreadsheet

II Cost of Idling @ $0.546 per hour

$/YR		
$17600	V	1995
$19800	W	
$19700	X	
$24100	V	2015
$35500	W	
$29500	X	

III. Cost of Stopping & Resuming Speed due to Train Crossing. (Incremental Cost Above normal uninterrupted traffic flow)

Cost/Stop = $.054/stop

		# VEHICLES STOPPED/YR.	$/YR
1995 Alt	V	784844	$42400
	W	864263	$46700
	X	861927	$46500
2015 Alt	V	1018428	$55000
	W	1385157	$74800
	X	1195953	$64600

NOTE: The costs listed above are actually benefits as motorists realize these savings if the proposed improvements are made.

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY:

CHK. BY:

DATE:

SHEET NO.: 15

JOB NO.:

SUBJECT: Motorist Benefit/No-Build Cost Summary

YR	ALT	Delay	Idling	Stopping	Total ($/yr)
1995	V	337000	17600	42400	397000
	W	378000	19800	46700	444500
	X	376800	19700	46500	443000
2015	V	461200	24100	55000	540300
	W	678300	35500	74800	788600
	X	562900	29500	64600	657000

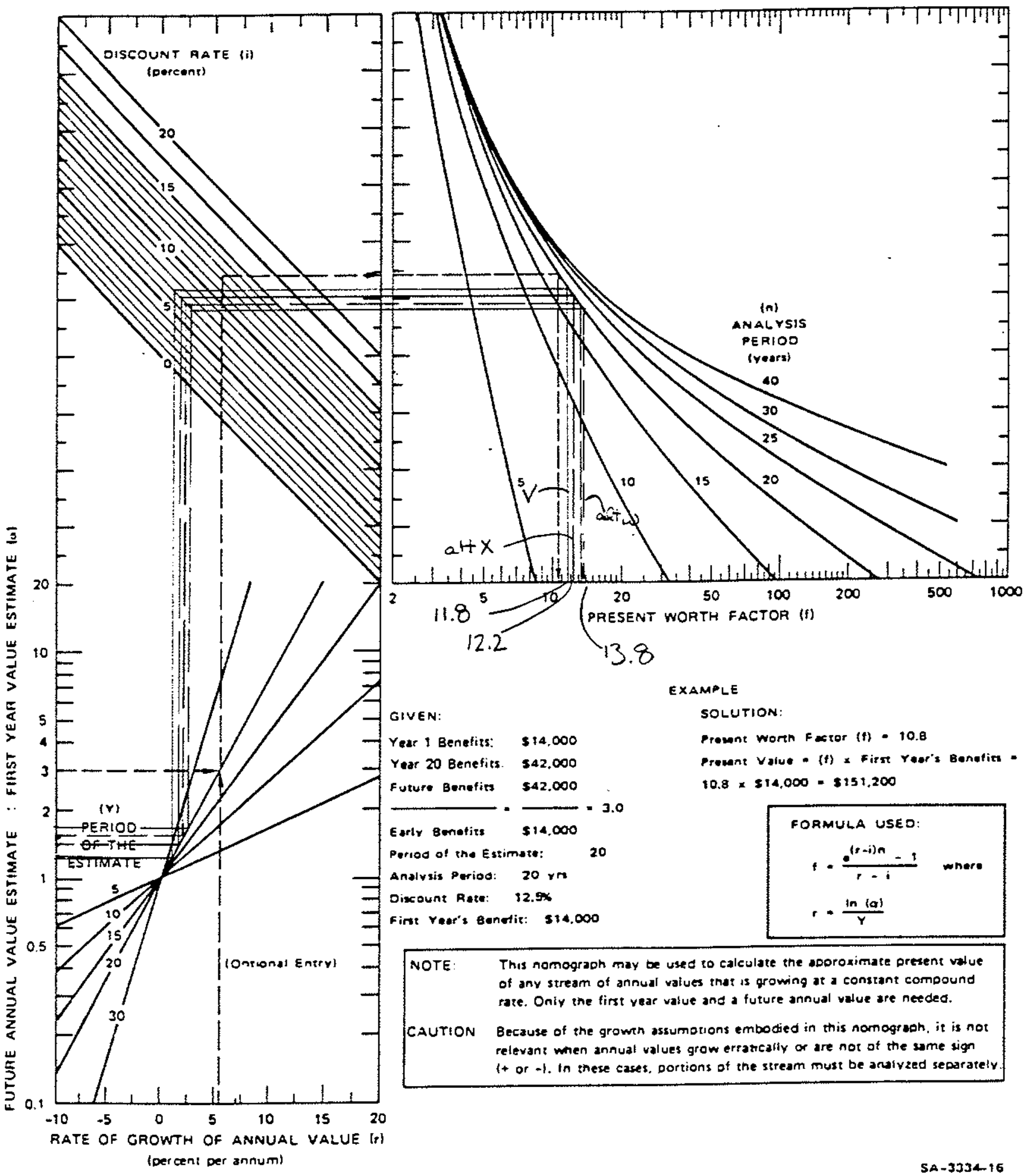
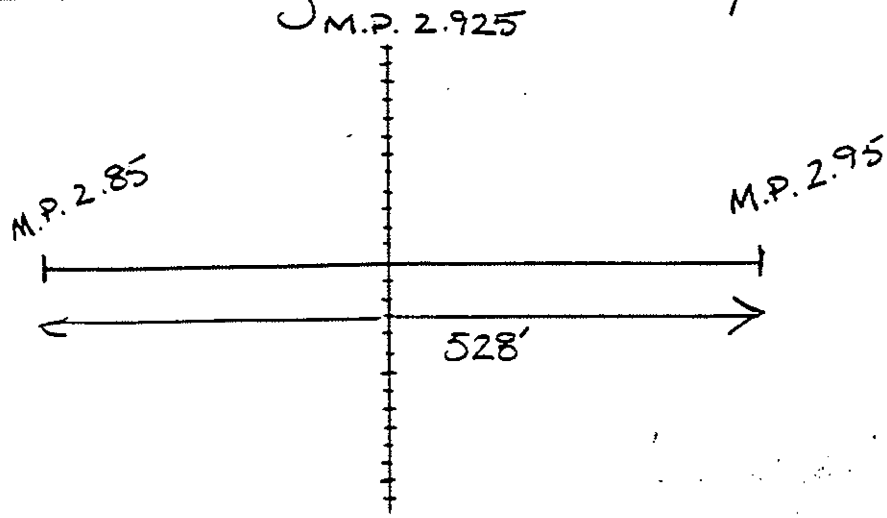


FIGURE 5 NOMOGRAPH FOR CALCULATING PRESENT VALUE FROM TWO ANNUAL VALUE ESTIMATES

the present value of the entire stream. An example of the use of Figure 5 is provided as part of the figure.

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

SUBJECT: Accident Costs @ Location of R.R. crossing on 22nd St C'way



ECON. LOSS - FROM FDOT ACCIDENT DATA

1985	84,000
1986	28,000
1987	196,000
1988	168,000
1989	140,000
1990	28,000
AVG	107,333 ← 1991 dollars

7% discount rate

$140,690 (1995)

using P.W. factor of 12 ±*

± 1,688,300

* Approximation of Previously Computed P.W.F's in this analysis. See Fig 5 nomograph

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY:
CHK. BY:
DATE:
SHEET NO.: 18
JOB NO.:

SUBJECT: Calculation of present value (PV) from two annual value (benefit) estimates.

using B/c methodology p 31 red book & nomograph

Future Benefits

Early

Alt. V ratio $= \frac{540300}{397000} = 1.36$

discount rate = 7%

analysis period = 20 yrs

from nomograph f = 11.8

Alt W. ratio = 1.77 ⇒ f = 13.8

Alt. X ratio $= \frac{657}{443} = 1.48 \Rightarrow f = 12.2$

Present Value = (f) × FIRST YEAR BENEFITS

P.V. alt V = (11.8)(397,000) = $4,684,600
W = (13.8)(444500) = $6,134,100
X = (12.2)(443000) = $5,404,600

} DELAY IDLING & STOPPING

Potential Accident Cost (Benefits) Savings $1,688,300

TOTALS
$6,372,900 (V)
$7,822,400 (W)
$7,092,900 (X)

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY: SCA
CHK. BY:
DATE:
SHEET NO.: 19
JOB NO.:

SUBJECT: "Build Cost"
Increased User Costs due to Grades

NOTE: Unit costs are incremental - the difference between running on tangent and on grade.

Assume running speed = 40mph

Cost factor Worksheet

$\angle$ grade PI-PI = 1100 ft, = .208mi
2200' or .417mi for upgrade & downgrade

Avg cost on tangent (1975 $'s)

cars $72.03/1,000 table B-1

trucks $\frac{139.58 + 151.33}{2}$ table B-2 & B-3 $145.46/1,000

Avg Cost on Grades (above tangent cost)

4% UPGRADE

cars 87.63/1000

trucks $\frac{268.23 + 390^*}{2}$/1,000 = 329/1,000

*EXTRAPOLATED FROM TABLE B-6

4% DOWNGRADE

cars: 56.67/1,000

trucks: $\left(\frac{98.82 + {}^*99}{2}\right)$/1000 = 99/1000

Alternative	Year #	Year	Veh Type	ADT #veh/d	% of ADT	# Days/Year	Length (mi.)	Cost Factors $/veh·mi +grade -level	-grade -level	Σ	1995 Cost Factor	Cost
V	1	1995	P	33600	89.4	313	~~.208~~	.01560	-.01536	.00024	3	$2800
			T	33600	10.6	313	~~.208~~	.18354	-.04646	.13708	3	$190800 ~~95400~~
	20	2015	P	43600	89.4	313	~~.208~~			.00024	3	$3600 ~~1800~~
			T	43600	10.6	313	~~.208~~			.13708	3	$247400 ~~123700~~
W	1	1995	P	37000	89.4	313	~~.208~~			.00024	3	$3200 ~~1600~~
			T	37000	10.6	313	~~.208~~			.13708	3	$210000 ~~105,000~~
	20	2015	P	59300	89.4	313	~~.208~~			.00024	3	$5000 ~~2500~~
			T	59300	10.6	313	~~.208~~			.13708	3	$336600 ~~168300~~
X	1	1995	P	36900	89.4	313	~~.208~~			.00024	3	$3000 ~~1500~~
			T	36900	10.6	313	~~.208~~			.13708	3	$209400 ~~104700~~
	20	2015	P	51200	89.4	313	~~.208~~			.00024	3	$4200 ~~2100~~
			T	51200	10.6	313	~~.208~~			.13708	3	$290600 ~~145300~~

.417

NO. 17 GRADE SEPARATION DATA AND COST SHEET FOR RETRO-FIT

NO.	ITEM	UNIT	UNIT PRICE	MODEL 17 TOTAL QUANTITIES	MODEL 17 COST	Cost for Add't'l Lanes(2)	Misc Costs
1	CLEAR & GRUB	AC					
2	SUBSOIL EXC - 6"	CY					
3	EMBANKMENT	CY	5.38	145,000	780,100	78,000 [2]	
4	STABILIZATION - 12"	SY	1.06	22,000	23,320	11,660	
5	ROADWAY PAVT & BASE 14"	SY					
6	ROADWAY PAVT & BASE 10"	SY	9.53	12,000	114,360	57,180	
7	SHOULDER PAVT & BASE 7"	SY	6.47	10,000	64,700	32,350	
8	FRONTAGE ~~ENDWALL~~ ROADS	EA					205,000
9	INLET	EA	1,850.00	16	29,600		
10	CONC PIPE CULV - 24"	LF	34.01	5,200	176,852	6,000	
11	BCM PIPE - 15"	LF					
12	CURB / CURB GUTTER	LF					
13	SHOULDER GUTTER	LF	9.00	5,200	46,800		
14	SIDEWALK - 6"	SY					
15	SEED & MULCH	SY	.91	11,000	10,010		
16	SOD	SY	2.09	10,000	20,900		
17	FENCE	LF					
18	GUARDRAIL	LF	13.50	1,860	25,110		
19	BARRIER WALL	LF					
20	RETAINING WALL	SF	30.00	65,160 [1]			1954800
21	IMPACT ATTENUATOR	EA					
22	APPROACH SLAB	EA	8,200.00	4	32,800		
23	BRIDGE	SF	40.00	16,000	640,000		278,200 [3]
	GRAND TOTAL				1,964,552	185,190	2438000

REMARKS

PAVT & BASE 14"
11 1/2" limerock
1 1/2" ac - type s
1" FC (FC - 1 OR FC - 4)

ROADWAY PAVT & BASE 10"
8" limerock
1" ac - type s
1" FC (FC - 1 OR FC - 4)

SHOULDER PAVT & BASE
6" limerock
1" ac - type s

SEED & MULCH / SOD INCLUDES:

RURAL AREAS
ADDITIONAL .45 ¢ FINAL DRESSING
ADDITIONAL .36 ¢ TOPSOIL
ADDITIONAL .55 ¢ EROSION CONTROL *

URBAN
ADDITIONAL .40 ¢ FINAL DRESSING
ADDITIONAL $1.18 TOPSOIL
ADDITIONAL .21 ¢ EROSION CONTROL *

GUARDRAIL INCLUDES:
ADDITIONAL $ 2.50 PER FOOT MISC. ASPHALT
ADDITIONAL 6.00 PER FOOT FOR THE END ANCHORAGE (POST INCLUDED IN THE COST OF THE GUARDRAIL.

FENCE INCLUDES:
ADDITIONAL .40¢ PER FOOT FOR PULL AND END POSTS (LINE POSTS INCLUDED IN THE COST OF THE FENCE

* ARTIFICIAL COVERING

TOTAL COST COLUMN ROUNDED
$4587,800 (1991 dollars)
7% discount rate
$6,010,000 (1995)

additional information pertaining to grade separation model 17

1. retaining wall (4) quadrants - area obtained from conceptual profile sheets A=(4)(16290) = 65160 S.F.
2. Additional lanes add approx. 25% more embankment, however retaining wall reduces that value to 10% ±
3. Computed bridge cost as noted in P.E. report - line 23 cost 918,200 - 640,000 = 278,200

20

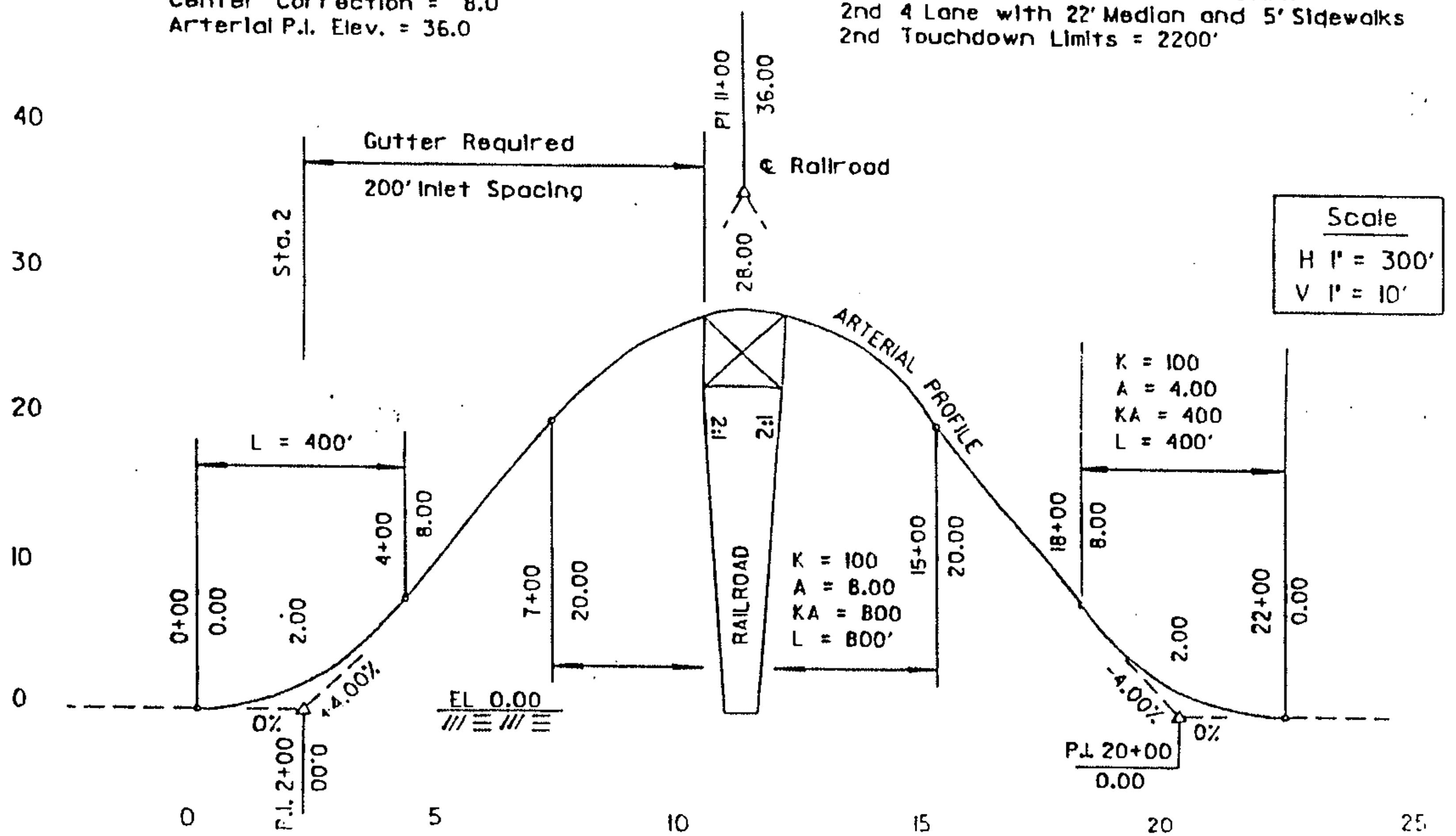
17

VERTICAL CONTROLS

Railroad Elevation = 0.0
Vertical Clearance = 23.0
Low Member Elev. = 23.0
Structure Depth(III) = 5.0
Arterial P.G. Elev. = 28.0
Center Correction = 8.0
Arterial P.I. Elev. = 36.0

HORIZONTAL CONTROLS

LEVEL	
1st	Railroad (RR) Assume 2 Tracks
1st	Clearance Opening = 65.0'
2nd	Bridge Length = 50 + 70 + 50 = 170'
2nd	Bridge Area = 92.5 X 170 = 15,725 sf
2nd	Urban Arterial (UA) DS = 45MPH
2nd	4 Lane with 22' Median and 5' Sidewalks
2nd	Touchdown Limits = 2200'



PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY: SCR
CHK. BY:
DATE: 9/1/92
SHEET NO. 22
JOB NO.:

SUBJECT: Incremental Cost Due to Grades & Const Costs

SUMMARY

	Year	Cost (P. + Trucks)		Present Worth Factor *	
AH V	1 (1995)	$96,800 (2)	ratio = 1.30	11.7	$1,132,600 (2)
	20 (2015)	$125,500 (2)			= $2,265,200
W	1	$106,600 (2)	ratio = 1.60	13.0	$1,385,800 (2)
	20	$170,800 (2)			= $2,771,600
X	1	$106200 (2)	ratio = 1.39	12.0	$1,274,400 (2)
	20	$147400 (2)			= $2548800

previous calcs. accounted for ½ length of overpass

* FROM FIG. 5

Incremental Const. Costs

$6,010,000 → overpass — touchdown limits
−1,703,500 → at-grade ** — 2200′ (attached spreadsheet-LRE)
$4,306,500

** FDOT DIST 7 1989 COSTS - WALT ZEBROWSKI
ITEM 28 - 6 LANE URBAN NEW CONST DIVIDED
HILLS CO. $2,724,151

BASED ON LRE

$$(2{,}724{,}151)\left(\frac{2200 \text{ ft}}{5280 \text{ ft/mi}}\right) = 1{,}135{,}100 \text{ rounded}$$

$$(\$1{,}135{,}100_{1989})(1.51) = \$1{,}703{,}500$$

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY: SCh
CHK. BY:
DATE:
SHEET NO.: 23
JOB NO.:

SUBJECT: Right-of-Way Benefit-Cost Analysis Breakdown*
given estimates dated 6/4/92, 7/16/92 & 11/24/92

DATE	AREA	# PARCELS	COST	
6/4/92	TOTAL (at-grade)	61	$8,720,000	
7/16/92	US 41 [36th Ave - Causeway] (at-grade)	13	$4,433,000	
	Causeway [US41-54th] (at-grade)	14	$1,091,000	
11/24/92	US 41 [36th-Causeway] (grade-separated)	16	$5,362,000	
	Causeway [US41-54th St] (grade-separated)	15	$6,683,000	SOUTH
			6,135,000	CENTER
			6,064,000	NORTH
			$6,294,000	AVG

INCREMENTAL COSTS [grade separated - at-grade cost]

Causeway Blvd (U.S. 41 – 54th St) =
6,294,000 - 1,091,000 = $5,203,000

U.S. 41 (36th Ave to Causeway Blvd) =
5,362,000 - 4,433,000 = $929,000

* APPENDIX B

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

COMP. BY:
CHK. BY:
DATE:
SHEET NO. 24
JOB NO.:

SUBJECT: Summary Sheet
Causeway Blvd Overpass B/C

Build Costs (Type)	Amount
Incremental R.O.W.:	$5,203,000
Costs Due to Grades:	$2265,200 (v)
	$2,771,600 (w)
	$2,548,800 (x)
Incremental Const. Cost	$4,306,500
totals	$11,774,700 (v)
	$12,281,100 (w)
	$12,058,300 (x)

No-Build Costs (Benefits)	$6,372,900 (v)
	$7,822,400 (w)
	$7,092,900 (x)

B/C 0.54 (v)
0.63 (w)
0.59 (x)

Overpass not feasible using B/C criteria

APPENDIX A 1/4

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

ENGINEERING
PLANNING
ARCHITECTURE

PBS&J MEMORANDUM

TO: File 10-620.01

FROM: Steve Malecki SM

DATE: June 2, 1992

SUBJECT: **WPI No. 7113839**
State Project No. 10250-1525
22nd Street Causeway/Causeway Boulevard (SR 676) PD&E Study
Hillsborough County
Meeting Minutes, Proposed railroad crossings at Causeway Boulevard and at U.S. 41

The subject meeting was held at the CSX Transportation office on June 2, 1992 at 2:00 p.m. Attendees were as follows:

FDOT: Messrs. Don Skelton and James Andrews

CSX: Messrs. Raymond Hedgecock and Hap Hutchinson

PBS&J: Steve Malecki

The purpose of the meeting was to discuss the proposed railroad crossings as shown in the conceptual plans and to verify railroad crossing data for the two subject crossings. The following items were addressed.

1. Mr. Hutchinson stated that if the two proposed frontage road at-grade railroad crossings along U.S. 41 are built, CSX will not be obligated to participate in overpass funding. They become obligated when at-grade crossings are eliminated and not replaced or relocated.

2. Mr. Hutchinson also noted that the westernmost at-grade crossing on U.S. 41 crosses an existing railroad turnout.

5300 W. CYPRESS STREET, SUITE 300, TAMPA, FLORIDA 33607
TEL: (813) 877-7275 • FAX: (813) 873-0179

The existence of a rail switch at the proposed frontage road railroad crossing would be very undesirable as it would require extensive maintenance and provide a rough ride to motorists. It was then agreed that the elimination of the western frontage road crossing would solve the problem of the switch location. Adverse impact to the railroad could be avoided if the outside edge of roadway were located 2' - 3' inside of the point of switch, assuming curb and gutter is used.

3. The R/R crossing for the eastern frontage road poses no significant problems for CSX.

4. It was noted that the southwest quadrant of the U.S. 41/Causeway Boulevard intersection needs south-bound access onto U.S. 41. Elimination of the western crossing would create adverse travel to said quadrant. Mr. Hedgecock felt that removal of the western at-grade crossing would be beneficial to all, considering the high number of switching movements through that location. He stated that need for the proposed U.S. 41 overpass has been recognized by authorities for several years.

5. Concerning train traffic at the subject crossings, Mr. Hedgecock stated that an average of 17 daily crossings occur with 8 trains on a cyclical schedule, which is consistent with the August 14, 1992 correspondence. Mr. Hedgecock noted that the number of crossings varies between 10-35 depending on the market situation. In addition, 15-25 switching movements occur daily, causing considerable delay to motorists. Although the U.S. 41 crossing is a 10 mph track, many trains operate at a crawl as a train must be stopped prior to a switching movement. It was noted that a 135 car train on a 25 mph track has a crossing duration of approximately 3.5 minutes. A similar train on a 10 mph track would result in an 8.75 minute crossing. An 8 minute average would account for some of the shorter trains.

6. Mr. Hedgecock noted that the period from noon to 5:00 p.m. was a particularly busy time for the railroad. When asked if any switching movements occurred between 3:00 and 5:00 p.m., he responded that only departing trains are scheduled for that time frame.

7. It was also noted that CSX has recently taken an aggressive marketing stance, expecting to recoup some of the market currently utilizing trucks. Mr. Hedgecock will supply 5 year growth projections to PBS&J.

June 2, 1992
Memo to File 10-620.01
Page 3

8. The Causeway Boulevard railroad crossing was said to have a number of daily crossings comparable to the U.S. 41 crossings, excluding switching movements. PBS&J will utilize previously provided information (August 16, 1992 letter attached) for its analysis. Crossing durations on Causeway Boulevard typically last between 3.5 to 7.5 minutes.

Should you have any comments or corrections, please notify Steve Malecki at (813) 877-7275 by June 17, 1992.

cc: Attendees
Jack Freeman
Jim Bishop

SCM:MTG#12.kbc

Railroad Crossing Analysis

	# Crossings	Time of Day A.M.	MID-DAY	P.M.
Causeway Blvd[1]	16 + 4 = 20	4	12	4
U.S. 41[2]				
THRU CROSSINGS	17	4	9	4
SWITCHING MOVEMENTS	20	3	11	6[3]
SWITCHERS ON DUTY (AVG)[1]		1	3	2
TOTALS A + B		5	12	6

1 Information from paragraphs 2-4, August 14, 1992 letter from CSX Transportation - next sheet

2 Meeting Minutes item #5

3 Meeting Minutes item #5: 15-25 SWITCHES/DAY ⇒ 20/DAY USED
TIME BREAKDOWN WAS BASED ON THE NUMBER OF SWITCHERS/SHIFT - 8/14/92 Letter, paragraph 4. & Length of time period.

APPENDIX A 4/4

CSX TRANSPORTATION

CSX RAIL TRANSPORT

August 14, 1991

R/W: Road Crossings - Tampa

RECEIVED
AUG 16 1991
P B S & J
TAMPA

BISHOP
MALECKI
WRIGHT

FILE 10-620.00

Mr. Steve Malecki
Project Engineer
Post, Buckley, Schuh & Jernigan, Inc.
5300 W. Cypress Street Suite 300
Tampa, Florida 33607-1066

Dear Mr. Malecki:

In reference to your letter of August 2nd, please find below, information concerning frequency of Railroad traffic over Causeway Blvd. Trains do not operate over this crossing at exact times, however I have indicated the approximate times when it would most probably be utilized.

There are 8 daily trains which originate at points south of the Causeway, and make round trips to the Mulberry phosphate area. These trains generally will consist of 80 to 130 cars in each direction and might take up to 10 minutes to clear the crossing. Four of these trains run northward (towards Mulberry) between 0230 and 0600 hours, and return around 1030 to 1330 hours. The other 4 trains depart between 1400 and 1700 hours and return around 2100 to 0100 hours.

There is a daily train which originates in our rail yard at Adamo Drive and makes a round trip to Bradenton handling 40 to 75 cars in each direction. The southward trip between 0600 and 0900, returning between 1300 and 1600. Sunday through Thursday there is another train which departs from the rail yard at Adamo Drive and works industrial customers between Adamo Drive and Alafia River, crossing Causeway Boulevard going south between 1900 and 2000 hours and north between 2300 and 0100 hours.

At our Rockport Phosphate Rail Yard just west of US 41, there are 3 local Road Switchers on duty during the daylight first shift, 2 on the second shift and 1 on the third shift. While the majority of their work is done south of the causeway, they are subject from time to time to use this crossing enroute to and from the yard at Adamo Drive. There is no pattern to this traffic except that about once a week one of these trains will move a 75 car coal train from the Adamo Drive yard to the TECO Gannon Plant at Sutton. The empty train is reverse routed 24 hours later. These loaded coal trains are subject to movement at all times. It is our pattern however, to attempt to return the empty coal cars between 0100 and 0600.

There are no passenger trains which operate over Causeway Blvd.

Please feel free to contact me or Trainmaster J. R. Hedgecock for any further information by leaving a message at (813) 664-6206.

Sincerely,

C. L. Kurtz
Assistant Trainmaster

CSX Distribution Services, CSX Equipment, CSX Rail Transport and American Commercial Lines are business units of the CSX Transportation Group.

APPENDIX B 1 of 10

RECEIVED
JUL 16 1992
PBSJ, INC.
TAMPA
BISHOP
MALECKI
FILE 10-620.00

MEMORANDUM

DATE: July 16, 1992

TO: ~~Steve Malecki~~
Post, Buckley, Schuh, & Jernigan, Inc.

FROM: A.S. Johnson, Senior Appraiser

COPIES: Richard Phagan, Ron Crew, Harry Oller, T. Bronza, Reading File.

SUBJECT: **Cost Estimates - SR 45 (US 41) from @ SR 676 South to 36th Ave. & SR 676 (Causeway Blvd.) from SR 45 to 54th St., at grade.**

WPI #	:	7113839
Sec/Job	:	10250-1525
FAP #	:	M-1802-(1)
County	:	Hillsborough
S.R. #	:	45
Descr.	:	At Intersection with SR 676

Attached are a right-of-way cost estimates for the above mentioned project. The amount of to be acquired for each parcel is derived from available figures and measurements on conceptual maps furnished. All areas are approximate, dated 5/92.

Several parcels have been deleted from the estimate since right-of-way has already been acquired from these parcels by FDOT.

No water retention parcels are included in the estimates.

These estimates are prepared to help determine the financial feasibility regarding the construction of railroad overpasses.

If you have any questions, please feel free to contact me.

Attachment
/asj

A:\SR45/676.EM

D7-12/91

FLORIDA STATE DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY COST ESTIMATE

W[illegible] : 7113839	PROJECT NO.: 10250-1525	DISTRICT :	VII APPRAISAL SECTION
COUNTY : Hills.	FAP NO. : M – 1802 – (1)	DATE :	07/15/92
S. R. # : 45	"AT GRADE R.R. CROSSING"	C.E. SEQUENCE NO.:	N/A
FROM : SR 676 Intersection		TO :	36th Ave.

Parcels:	Gross	Net
Business	11	11
Residential	0	0
Unimproved	2	2
Total Parcels	13	13

Est. Relocatees:	
Business	6
Residential	0
Signs	8
Special	0
Total Relocatees	14

R/W SUPPORT COSTS (PHASE 30)

				Amount	FEDERAL AID
1. Direct Labor Cost	(Parcels	13	5,000 Rate)	65,000	PARTICIPATING
2. Indirect Overhead	(Parcels	13	5,000 Rate)	65,000	NON-PARTIC.

3. (PARTICIPATING 65,000) + (NON-PARTIC. 65,000) = TOTAL PHASE 30 $130,000

R/W OPS (PHASE 32)

				Amount	
4. Appraisal Fees	13	Parcels X	8,000	104,000	PARTICIPATING
5. Business Damage CPA Fees	8	Claims X	6,000	48,000	NON-PARTIC.
6. Court Reporter & Witness Fees	Anticipated Dep.	X	10%	141,600	PARTICIPATING
7. Demolition Contracts	7	Parcels X	15,000	105,000	PARTICIPATING
8. Move Cost Estimate Fees	14	Relos. X	500	7,000	PARTICIPATING
9. Attorney Fees (Outside Counsel)	3.9	Parcels X	25,000	97,500	PARTICIPATING
10. Title Search	13	Parcels X	500	6,500	PARTICIPATING
11. Hazardous Waste Investigations	4	Parcels X	25,000	100,000	PARTICIPATING

12. (PARTICIPATING 562,000) + (NON-PARTIC. 48,000) = TOTAL PHASE 32 $610,000

R/W LAND COSTS (PHASE 31)

				Amount	Subtotal	
13. Land Improvements & Severance Damages				1,348,356		PARTICIPATING
14. Water Retention	(0 parcels w/o R/W acquisition)			0		NON-PARTIC.
15.	SUBTOTAL (Lines 13 and 14)				1,348,400	
16. Admin. Settlements	(Factor	30% X	35% of Line 15)	141,600		PARTICIPATING
17. Litigation Awards	(Factor	70% X	50% of Line 15)	471,900		PARTICIPATING
18. Business Damages	(Number	8 X	)	900,000		NON-PARTIC.
19. Owner Appr. Fees	(Number	7 X	8,000)	56,000		NON-PARTIC.
20. Owner CPA Fees	(Number	8 X	10,000)	80,000		NON-PARTIC.
21. Defend. Atty Fees	(Anticipated Dep. X		26%)	368,100		NON-PARTIC.
22. Other Condm Costs	(Anticipated Dep. X		10%)	141,600		PARTICIPATING
23.	SUBTOTAL (lines 16 thru 22)				2,159,200	

24. (PARTICIPATING 2,103,900) + (NON-PARTIC. 1,404,100) = TOTAL PHASE 31 $3,508,000

A:\7113839.WK3

FEDERAL AID

R/W ACQUISITION CONSULTANT (PHASE 33)

25. **TOTAL PHASE 33** PARTICIPATING $(

RELOCATION COSTS (PHASE 38)

Replacement Housing	Number	Amount
26. Owner	0	0
27. Tenant	0	0
Move Costs		
28. Residential	0	0
29. Business/Farm	6	150,000
30. Personal Property	8	35,000

31. (LINES 26 THRU 30) **TOTAL PHASE 38** PARTICIPATING $185,00(

32. Relocation Services Cost · $18,500 (Not in Phase Total)

33. 1,517,100 NON-PARTIC.

34. 2,915,900 PARTICIPATING

35. **TOTAL ESTIMATE (ALL PHASES)** $4,433,00(

				Confidence
Appraisal :	Andrew Johnson	Signed:	Date:	
Bus. Dam. :	Tim Bronza	Signed:	Date:	
Relocation :	Ed Johnson	Signed:	Date:	
OVERALL REVIEW:	Harry Oller	Signed:	Date:	

Cost Est. Sequence No.: N/A

Supersedes Est. Dated:

In the Amount of: $00,000,000 Data Input Completion Date:

REMARKS:

No water potential water retention sites are included in this estimate.

NOTE: THIS ESTIMATE IS NOT AN APPRAISAL

The accuracy of this estimate is subject to the completeness and accuracy of the information upon which it is based. The confidence ratings listed below are assigned to estimates based on: 1) the completeness and accuracy of the data utilized, 2) the time allowed to perform the estimate and 3) the quantity and quality of the market data utilized.

The following indicates the estimator's confidence in the above estimate:

________ Type A – indicates the most confidence

________ Type B – indicates above average confidence

________ Type C – indicates below average confidence

________ Type D – indicates the least or no confidence

Future Value Factors @	10.0%
One Year:	1.1000
Two Years:	1.2100
Three Years:	1.3310
Four Years:	1.4641
Five Years:	1.6105

APPENDIX B 4 of 10

D7-12/91

FLORIDA STATE DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY COST ESTIMATE

W.P.I. :	7113839	PROJECT NO.: 10250-1525		DISTRICT :	VII APPRAISAL SECTION
COUNTY :	Hills.	FAP NO. :	M - 1802 - (1)	DATE :	07/15/92
S. R. # :	676	"AT GRADE R.R. CROSSING"		C.E. SEQUENCE NO.:	N/A
FROM :	50th St. Intersection			TO :	54th St.

Parcels:	Gross	Net	Est. Relocatees:	
Business	9	9	Business	0
Residential	4	4	Residential	0
Unimproved	1	1	Signs	6
			Special	0
Total Parcels	14	14	Total Relocatees	6

R/W SUPPORT COSTS (PHASE 30)

				Amount	FEDERAL AID
1. Direct Labor Cost	(Parcels	14	5,000 Rate)	70,000	PARTICIPATING
2. Indirect Overhead	(Parcels	14	5,000 Rate)	70,000	NON-PARTIC.

3. (PARTICIPATING 70,000) + (NON-PARTIC. 70,000) = TOTAL PHASE 30 $140,000

R/W OPS (PHASE 32)

				Amount	
4. Appraisal Fees	14	Parcels X	8,000	112,000	PARTICIPATING
5. Business Damage CPA Fees	2	Claims X	6,000	12,000	NON-PARTIC.
6. Court Reporter & Witness Fees	Anticipated Dep.	X	10%	33,400	PARTICIPATING
7. Demolition Contracts	0	Parcels X	15,000	0	PARTICIPATING
8. Move Cost Estimate Fees	6	Relos. X	500	3,000	PARTICIPATING
9. Attorney Fees (Outside Counsel)	4.2	Parcels X	25,000	105,000	PARTICIPATING
10. Title Search	14	Parcels X	500	7,000	PARTICIPATING
11. Hazardous Waste Investigations	0	Parcels X	25,000	0	PARTICIPATING

12. (PARTICIPATING 260,000) + (NON-PARTIC. 12,000) = TOTAL PHASE 32 $272,000

R/W LAND COSTS (PHASE 31)

				Amount	Subtotal	
13. Land Improvements & Severance Damages				318,118		PARTICIPATING
14. Water Retention	(0 parcels w/o R/W acquisition)			0		NON-PARTIC.
15.	SUBTOTAL (Lines 13 and 14)				318,100	
16. Admin. Settlements	(Factor	30% X	35% of Line 15)	33,400		PARTICIPATING
17. Litigation Awards	(Factor	70% X	50% of Line 15)	111,300		PARTICIPATING
18. Business Damages	(Number	2 X	)	150,000		NON-PARTIC.
19. Owner Appr. Fees	(Number	7 X	8,000)	56,000		NON-PARTIC.
20. Owner CPA Fees	(Number	2 X	10,000)	20,000		NON-PARTIC.
21. Defend. Atty Fees	(Anticipated Dep. X		26%)	86,800		NON-PARTIC.
22. Other Condm Costs	(Anticipated Dep. X		10%)	33,400		PARTICIPATING
23.	SUBTOTAL (lines 16 thru 22)				340,900	

24. (PARTICIPATING 496,200) + (NON-PARTIC. 162,800) = TOTAL PHASE 31 $659,000

A:\7113839.WK2

FEDERAL AID

R/W ACQUISITION CONSULTANT (PHASE 33)

25.		TOTAL PHASE 33	PARTICIPATING	$0

RELOCATION COSTS (PHASE 38)

Replacement Housing	Number	Amount		
26. Owner	0	0		
27. Tenant	0	0		
Move Costs				
28. Residential	0	0		
29. Business/Farm	0	0		
30. Personal Property	6	19,500		
31. (LINES 26 THRU 30)	TOTAL PHASE 38		PARTICIPATING	$20,000
32. Relocation Services Cost	$2,000 (Not in Phase Total)			

33.	244,800	NON-PARTIC.	
34.	846,200	PARTICIPATING	
35.	TOTAL ESTIMATE (ALL PHASES)		$1,091,000

				Confidence
Appraisal :	Andrew Johnson	Signed:	Date:	
Bus. Dam. :	Tim Bronza	Signed:	Date:	
Relocation :	Ed Johnson	Signed:	Date:	
OVERALL REVIEW:	Harry Oiler	Signed:	Date:	

Cost Est. Sequence No.: N/A
Supersedes Est. Dated:
In the Amount of: $00,000,000 Data Input Completion Date:

REMARKS:

No water retention parcels are included in this estimate.

NOTE: THIS ESTIMATE IS NOT AN APPRAISAL

The accuracy of this estimate is subject to the completeness and accuracy of the information upon which it is based. The confidence ratings listed below are assigned to estimates based on: 1) the completeness and accuracy of the data utilized, 2) the time allowed to perform the estimate and 3) the quantity and quality of the market data utilized.

The following indicates the estimator's confidence in the above estimate:

______ Type A – indicates the most confidence
______ Type B – indicates above average confidence
______ Type C – indicates below average confidence
Type D – indicates the least or no confidence

Future Value Factors @	10.0%
One Year:	1.1000
Two Years:	1.2100
Three Years:	1.3310
Four Years:	1.4641
Five Years:	1.6105

A:\7113839.WK2

APPENDIX B 6-10

PBS&J POST, BUCKLEY, SCHUH & JERNIGAN, INC.

ENGINEERING
PLANNING

MEMORANDUM

TO: Don Skelton, Project Engineer

FROM: Paul C. Tidwell, Senior Cost Estimator

DATE: November 24, 1992

RE: **Cost Estimate - Intersection of US 41 and 22nd St. Causeway**

WPI #: 7113839
Sec/Job: 10250-1525
FAP #: M-1802-(1)
County: Hillsborough
S.R. #: 676
Descr.: SR 60 to US 301 (22ND STREET CAUSEWAY)

COPY: Mike Coleman, Ron Crew, Mary Arend, Jerry Karp, Ed Johnson, Tim Bronza, Ed Jensen, Steve Malecki, Jim Bishop, File

At your request I have estimated the R/W Costs of the above referenced project at the intersection of US 41 and SR 676. Values were based on listings in the immediate area and recent sales. There are three estimates of the frontage road area from 50th Street to 54th Street. There is one estimate of the area south of the intersection which will have frontage roads also. These are all done with the concept of a railroad overpass south and east of the intersection. "At grade" estimates have been done previously.

DOT Frontage Road Format was used for the three alternatives on the eastern segment . The southern segment utilized the regular format since most of the parcels were whole takings and damages were at a minimum.

If you have any further questions do not hesitate to call me at 877-7275.

/pct

APPENDIX B 7 6 10

D7-11/92

FLORIDA STATE DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY COST ESTIMATE

W :	7113839	PROJECT NO.:	10250-1525	DISTRICT :	SEVEN
COUNTY :	Hills.	FAP NO. :	M-1802-(1)	DATE :	11/20/92
S. R. # :	45	SEGMENT :	Int. US41 & SR676	C.E. SEQUENCE NO.:	N/A
FROM :	SR 676			TO :	36th Avenue

Parcels:	Gross	Net	Est. Relocatees:	
Business	12	12	Business	11
Residential	0	0	Residential	0
Unimproved	4	4	Signs	10
			Special	0
Total Parcels	16	16	Total Relocatees	21

R/W SUPPORT COSTS (PHASE 30)

					Amount	FEDERAL AID
1. Direct Labor Cost	(Parcels	16	5,000	Rate)	80,000	PARTICIPATING
2. Indirect Overhead	(Parcels	16	5,000	Rate)	80,000	NON-PARTIC.

3. (PARTICIPATING 80,000) + (NON-PARTIC. 80,000) = TOTAL PHASE 30 $160,000

R/W OPS (PHASE 32)

				Amount	
4. Appraisal Fees	16	Parcels X	8,000	128,000	PARTICIPATING
5. Business Damage CPA Fees	3	Claims X	6,000	18,000	NON-PARTIC.
6. Court Reporter & Witness Fees	Anticipated Dep.	X	10%	216,400	PARTICIPATING
7. Demolition Contracts	10	Parcels X	15,000	150,000	PARTICIPATING
8. Move Cost Estimate Fees	21	Relos. X	500	10,500	PARTICIPATING
9. Attorney Fees (Outside Counsel)	4.8	Parcels X	25,000	120,000	PARTICIPATING
10. Title Search	16	Parcels X	500	8,000	PARTICIPATING
11. Hazardous Waste Investigations	4	Parcels X	25,000	100,000	PARTICIPATING

12. (PARTICIPATING 723,100) + (NON-PARTIC. 27,900) = TOTAL PHASE 32 $751,000

R/W LAND COSTS (PHASE 31)

		Amount	Subtotal	
13. Land Improvements & Severance Damages		$1,965,966		PARTICIPATING
14. Water Retention	(0 parcels w/o R/W acquisition)	$94,698		NON-PARTIC.
15.	SUBTOTAL (Lines 13 and 14)		2,060,700	
16. Admin. Settlements	(Factor 30% X 35% of Line 15)	216,400		PARTICIPATING
17. Litigation Awards	(Factor 70% X 50% of Line 15)	721,200		PARTICIPATING
18. Business Damages	Number: 3 Amount:	$300,000		NON-PARTIC.
19. Owner Appr. Fees	(Number 8 X 8,000)	64,000		NON-PARTIC.
20. Owner CPA Fees	(Number 3 X 10,000)	30,000		NON-PARTIC.
21. Defend. Atty Fees	(Anticipated Dep. X 26%)	562,600		NON-PARTIC.
Other Condm Costs	(Anticipated Dep. X 10%)	216,400		PARTICIPATING
23.	SUBTOTAL (lines 16 thru 22)		2,110,600	

24. (PARTICIPATING 4,171,000) + (NON-PARTIC.) = TOTAL PHASE 31 $4,171,000

B:\CEFORM5M.WK1

D7/11-92

FLORIDA STATE DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY COST ESTIMATE

WPI :	71133839	PROJECT NO.:	10250-1525	DISTRICT:	SEVEN
COUNTY :	Hills.	FAP NO. :	M-1802-(1)	DATE :	11/23/92
STATE ROAD:	676	ALIGNMENT:	SOUTH	C.E. SEQUENCE NO.:	N/A
FROM :	50th Street			TO :	54th Street

Parcels:	Gross	Net	Est. Relocatees:	
Business	9	9	Business	0
Residential	5	5	Residential	0
Unimproved	1	1	Signs	6
			Special	0
Total Parcels	15	15	Total Relocatees	6

R/W SUPPORT COSTS (PHASE 30)

				Amount	
1. Direct Labor Cost	(Parcels 15 X	5,500 Rate)		82,500	
2. Indirect Overhead	(Parcels 15 X	6,500 Rate)		97,500	
3.	(NON-PARTICIPATING	97,500)		TOTAL PHASE 30	$180,000

R/W OPS (PHASE 32)

				Amount	
4. Appraisal Fees	15	Parcels X	16,000	240,000	
5. Business Damage CPA Fees	9	Claims X	3,500	31,500	
6. Court Reporter & Witness Fees	Anticipated Dep.	X	14%	551,900	
7. Demolition Contracts	0	Parcels X	15,000	0	
8. Move Cost Estimate Fees	6	Relos. X	500	3,000	
9. Misc. Fees (DOT)	7.5	Parcels X	15,000	112,500	
10. Title Search	15	Parcels X	500	7,500	
11. Hazardous Waste Investigations	0	Parcels X	25,000	0	
12. (NON-PARTICIPATING	32,000)			TOTAL PHASE 32	$946,000

R/W LAND COSTS (PHASE 31)

				Amount	Subtotal	
13. Land Improvements & Severance Damages				1,444,009		
14. Water Retention	(0 parcels w/o R/W acquisition)			0		
15.	SUBTOTAL (Lines 13 and 14)				1,444,000	
16. Admin. Settlements	(Factor 20% X	60% of Line 15)		173,300		
17. Litigation Awards	(Factor 82% X	150% of Line 15)		1,776,100		
18. Business Damages	Number: 9		Amount:	525,000		
19. Owner Appr. Fees	(Number 12 X	6,000)		72,000		
20. Owner CPA Fees	(Number 9 X	5,000)		45,000		
21. Defend. Atty Fees	(Anticipated Dep. X	25%)		985,500		
22. Other Condm Costs	(Anticipated Dep. X	13%)		512,500		
23.	SUBTOTAL (lines 16 thru 22)				4,089,400	
24. (NON-PARTICIPATING	1,628,000)			TOTAL PHASE 31		$5,533,000

c:\123\ceformhp.wk1

APPENDIX B 9-10

D7/11-92

FLORIDA STATE DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY COST ESTIMATE

W[illegible] :	71133839	PROJECT NO.:	10250-1525	DISTRICT:	SEVEN
COUNTY :	Hills.	FAP NO. :	M-1802-(1)	DATE :	11/23/92
STATE ROAD:	676	ALIGNMENT:	NORTH	C.E. SEQUENCE NO.:	N/A
FROM :	50th Street			TO :	54th Street

Parcels:	Gross	Net	Est. Relocatees:	
Business	9	9	Business	0
Residential	5	5	Residential	0
Unimproved	1	1	Signs	6
			Special	0
Total Parcels	15	15	Total Relocatees	6

R/W SUPPORT COSTS (PHASE 30)

		Amount	
1. Direct Labor Cost	(Parcels 15 X 5,500 Rate)	82,500	
2. Indirect Overhead	(Parcels 15 X 6,500 Rate)	97,500	
3.	(NON-PARTICIPATING 97,500)	TOTAL PHASE 30	$180,000

R/W OPS (PHASE 32)

				Amount	
4. Appraisal Fees	15	Parcels X	16,000	240,000	
5. Business Damage CPA Fees	8	Claims X	3,500	28,000	
6. Court Reporter & Witness Fees	Anticipated Dep.	X	14%	495,000	
7. Demolition Contracts	0	Parcels X	15,000	0	
8. Move Cost Estimate Fees	6	Relos. X	500	3,000	
9. Misc. Fees (DOT)	7.5	Parcels X	15,000	112,500	
10. Title Search	15	Parcels X	500	7,500	
11. Hazardous Waste Investigations	0	Parcels X	25,000	0	
12. (NON-PARTICIPATING 28,000)				TOTAL PHASE 32	$886,000

R/W LAND COSTS (PHASE 31)

		Amount	Subtotal	
13. Land Improvements & Severance Damages		1,295,046		
14. Water Retention	(0 parcels w/o R/W acquisition)	0		
15.	SUBTOTAL (Lines 13 and 14)		1,295,000	
16. Admin. Settlements	(Factor 20% X 60% of Line 15)	155,400		
17. Litigation Awards	(Factor 82% X 150% of Line 15)	1,592,900		
18. Business Damages	Number: 8 Amount:	475,000		
19. Owner Appr. Fees	(Number 12 X 6,000)	72,000		
20. Owner CPA Fees	(Number 8 X 5,000)	40,000		
21. Defend. Atty Fees	(Anticipated Dep. X 25%)	883,900		
22. Other Condm Costs	(Anticipated Dep. X 13%)	459,600		
23.	SUBTOTAL (lines 16 thru 22)		3,678,800	
24.	(NON-PARTICIPATING 1,471,000)	TOTAL PHASE 31		$4,974,000

c:\123\ceformhp.wkl

APPENDIX B 10 of 10

D7/11-92

FLORIDA STATE DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY COST ESTIMATE

W[illegible] :	71133839	PROJECT NO.:	10250-1525	DISTRICT:	SEVEN
COUNTY :	Hills.	FAP NO.:	M-1802-(1)	DATE :	11/23/92
STATE ROAD:	676	ALIGNMENT:	CENTER	C.E. SEQUENCE NO.:	N/A
FROM :	50th Street			TO :	54th Street

Parcels:	Gross	Net	Est. Relocatees:	
Business	9	9	Business	0
Residential	5	5	Residential	0
Unimproved	1	1	Signs	6
			Special	0
Total Parcels	15	15	Total Relocatees	6

R/W SUPPORT COSTS (PHASE 30)

		Amount	
1. Direct Labor Cost	(Parcels 15 X 5,500 Rate)	82,500	
2. Indirect Overhead	(Parcels 15 X 6,500 Rate)	97,500	
3.	(NON-PARTICIPATING 97,500)	TOTAL PHASE 30	$180,000

R/W OPS (PHASE 32)

					Amount	
4. Appraisal Fees	15	Parcels X	16,000		240,000	
5. Business Damage CPA Fees	8	Claims X	3,500		28,000	
6. Court Reporter & Witness Fees	Anticipated Dep.	X	14%		502,200	
7. Demolition Contracts	0	Parcels X	15,000		0	
8. Move Cost Estimate Fees	6	Relos. X	500		3,000	
9. Misc. Fees (DOT)	7.5	Parcels X	15,000		112,500	
10. Title Search	15	Parcels X	500		7,500	
11. Hazardous Waste Investigations	0	Parcels X	25,000		0	
12. (NON-PARTICIPATING 28,000)				TOTAL PHASE 32		$893,000

R/W LAND COSTS (PHASE 31)

		Amount	Subtotal	
13. Land Improvements & Severance Damages		1,313,984		
14. Water Retention	(0 parcels w/o R/W acquisition)	0		
15.	SUBTOTAL (Lines 13 and 14)		1,314,000	
16. Admin. Settlements	(Factor 20% X 60% of Line 15)	157,700		
17. Litigation Awards	(Factor 82% X 150% of Line 15)	1,616,200		
18. Business Damages	Number: 8 Amount:	475,000		
19. Owner Appr. Fees	(Number 12 X 6,000)	72,000		
20. Owner CPA Fees	(Number 8 X 5,000)	40,000		
21. Defend. Atty Fees	(Anticipated Dep. X 25%)	896,800		
22. Other Condm Costs	(Anticipated Dep. X 13%)	466,300		
23.	SUBTOTAL (lines 16 thru 22)		3,724,000	
24.	(NON-PARTICIPATING 1,484,000)	TOTAL PHASE 31		$5,038,000

c:\123\ceformhp.wk1

APPENDIX E

Advance Notification Responses

Tom Gardner, Executive Director

FLORIDA DEPARTMENT OF NATURAL RESOURCES

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Lawton Chiles
Governor
Jim Smith
Secretary of State
Bob Butterworth
Attorney General
Gerald Lewis
State Comptroller
Tom Gallagher
State Treasurer
Bob Crawford
Commissioner of Agriculture
Betty Castor
Commissioner of Education

January 15, 1991

Mr. David A. Twiddy, Jr., P.E.
Project Development & Environmental
Engineer
Department of Transportation
4950 West Kennedy Boulevard
Suite 500
Tampa, Florida 33609

Dear Mr. Twiddy:

RE: Advance Notification
22nd Street Causeway/Causeway Boulevard PD&E Study
WPI No. 7113839
State Project No. 10250-1525

The subject project does not appear to affect uplands where title is vested in the Board of Trustees of the Internal Improvement Trust Fund. Should use of any such lands be identified during the more specific permitting process, an easement will be required pursuant to Chapter 18-2, Florida Administrative Code.

Please call me at Suncom 278-2291 or (904) 488-2291 if you have any questions.

Sincerely,

Tracy Peters

Tracy Peters, Planner IV
Bureau of Land Management Services
Division of State Lands

TP/tc
Attachments
cc: Mr. J.C. Kraft

Exhibit 1

Project Development District 7 JAN 2 2 1991

U.S. Department of Transportation
United States Coast Guard

Commander
Seventh Coast Guard District

909 S.E. First Avenue
Brickell Plaza Federal Bldg
Miami, FL 33131-3050
Phone: 536-5621
Staff Symbol: (oan)

16591/2430
Serial: 0268
17 JAN 1991

Mr. David A. Twiddy, Jr. P.E.
Project Development & Environmental Engineer
Florida Department of Transportation
4950 West Kennedy Boulevard
Tampa, FL 33609

Dear Mr. Twiddy:

This responds to your advance notification package of December 21, 1990 about the proposed widening of the 22nd Street Causeway (SR 676) bridges across McKay Bay and Delaney Creek, Hillsborough County, Florida. (State Project No. 10250-1525).

A Title 23 determination needs to be made by the Federal Highway Administration at the SR 676 bridge across Delaney Creek as soon as possible so that we can address our involvement at the bridge site. The tributary canals of Delaney Creek are non-tidal, therefore, are not considered navigable waters of the United States for bridge permitting purposes.

A Coast Guard bridge permit will be required for the proposed bridge widening project across McKay Bay. You should plan on navigational clearances no less than those provided by the existing fixed bridge across McKay Bay.

To determine if the reasonable needs of navigation might require greater clearances, we recommend you consult with waterway users early in your design process. This needs analysis should reduce the likelihood of your bridge permit being delayed for navigational considerations.

The Coast Guard decision on navigational adequacy is necessarily part of the permit approval process. We will consider any information you provide, the comments responding to the public notice we issue after receiving your application, and all other available information in making this decision.

Since there are federal funds involved in the proposed bridge replacement/modification project, we wish to be designated a cooperating agency for processing of the environmental documentation unlesss the Federal Highway Administration determines the project qualifies for a Categorical Exclusion.

Enclosed for your use in applying for a Coast Guard bridge permit is a Bridge Permit Application Guide and an Environmental Assessment Outline.

Exhibit 2

16591/2430
Serial: 0268
17 JAN 1991

If you should have any questions concerning this matter, please contact Mr. Brodie Rich at (305)536-4103.

Sincerely,

J. W. WINSLOW
Chief, Bridge Section
Aids to Navigation Branch
Seventh Coast Guard District
By direction of the District Commander

Encl: (1) Bridge Permit Application Guide
(2) Environmental Assessment Outline

Copy: FDOT Tallahassee, Mr. J. C. Kraft, Manager, Env. Office

BOARD OF COUNTY COMMISSIONERS
HILLSBOROUGH COUNTY, FLORIDA

Office of the County Administrator

Frederick B. Karl
County Administrator
(Interim Appointment)

P.O. Box 1110
Tampa, Florida 33601

January 18, 1991

Mr. David A. Twiddy, Jr., P.E.
Project Development and Environmental Engineer
Florida Department of Transportation
4950 West Kennedy Boulevard, Suite 500
Tampa, Florida 33609

RE: Advance Notification - Work Program Item No. 7113839
State Project No. 10250-1525
Federal-Aid Project No. M-1802-(1)
22nd Street Causeway/Causeway Boulevard PD&E Study
Hillsborough County, Florida
Administrative Referral No. 16841

Dear Mr. Twiddy:

We are in receipt of the subject information sent to Phyllis Busansky, the Chairperson of the Hillsborough County Board of County Commissioners. Stormwater Design Staff advise that the portion of 22nd Street Causeway located in unincorporated Hillsborough County crosses significant stormwater conveyance systems.

Of particular concern is Delaney Creek and the Delaney Creek pop off canal. While these areas have a history of flooding, the County, along with the Southwest Florida Water Management District (SWFWMD), has completed a study that identifies problems within the system and offers solutions to alleviate the problems. Staff have also begun a preliminary design phase and initial environmental testing of the downstream reaches in Delaney Creek. This information should be useful to you when this project reaches a design phase.

Please contact Walid Hatoum, P.E., Manager of the Stormwater Design Section, at 272-5912, Ext. 3602, for information regarding

Exhibit 3

An Affirmative Action/Equal Opportunity Employer

the studies. It would also be greatly appreciated if you would coordinate your efforts with Mr. Hatoum to avoid potential conflicts with County stormwater projects.

Sincerely,

Michael B. McCarthy, P.E.
Director, Engineering Services Department

MBM:FD:gms

cc: Commissioner Phyllis Busansky
Frederick B. Karl, County Administrator
James M. Bourey, Assistant County Administrator
Walid M. Hatoum, P.E., Manager, Stormwater Design Section

APPENDIX F

Bridge Information

COST ESTIMATE

BRIDGE: U.S. 41 OVER
22ND ST. CAUSEWAY

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	TOTAL QUANTITY	TOTAL PRICE
110-3-	REMOVAL OF EXISTING STRUCTURE	SF	$10.00		$0
400-4-4	CLASS IV CONCRETE SUPERSTRUCTURE	CY	$320.00	607	$194,240
400-4-5	CLASS IV CONCRETE SUBSTRUCTURE	CY	$380.00	134	$50,920
400-4-20	CLASS IV CONCRETE (SEAL)	CY	$250.00		$0
400-7	BRIDGE FLOOR GROOVING	SY	$3.50	2613	$9,146
400-148-1	TRAFFIC RAILING BARRIER	LF	$36.00	420	$15,120
400-5-3	PEDESTRIAN / BICYCLE RAILING	LF	$45.00		$0
400-400-	REMOVE CONCRETE HANDRAIL (BARRIER)	LF	$20.00		$0
415-1-4	REINFORCING STEEL (SUPERSTRUCTURE)	LB	$0.45	121400	$54,630
415-1-5	REINFORCING STEEL (SUBSTRUCTURE)	LB	$0.45	20145	$9,065
455-15	PREFORMED PILE HOLES	EA	$300.00	5	$1,500
455-17-2	PILE SPLICES (18")	EA	$350.00		$0
455-17-3	PILE SPLICES (20")	EA	$400.00	5	$2,000
455-17-13	PILE SPLICES (HP 12 X 53)	EA	$500.00		$0
455-3-2	PRESTRESSED CONCRETE	LF	$30.00		$0
455-4-2	PILING (18" DIA.)	LF	$4.00		$0
455-3-3	PRESTRESSED CONCRETE	LF	$33.00	3360	$110,880
455-4-3	PILING (20" DIA.)	LF	$5.00	3360	$16,800
455-8-4	STEEL PILING	LF	$1.50		$0
455-7-4	(HP 12 X 53)	LF	$32.00		$0
450-1-1	PRESTRESSED CONCRETE BEAMS TYPE II	LF	$58.00		$0
450-1-2	PRESTRESSED CONCRETE BEAMS TYPE III	LF	$61.00		$0
450-1-3	PRESTRESSED CONCRETE BEAMS TYPE IV	LF	$100.00		$0
450-1-4	PRESTRESSED CONCRETE BEAMS TYPE V	LF	$130.00		$0
450-1-5	PRESTRESSED CONCRETE BEAMS TYPE VI	LF	$150.00		$0
460-113-111	MULTI-ROTATIONAL BRNG. ASSM. (FIXED)	EA	$3,000.00	13	$39,000
460-114-111	MULTI-ROTATIONAL BRNG. ASSM. (EXPANSION)	EA	$3,500.00	13	$45,500
460-2-2	STRUCTURAL STEEL (LOW ALLOY)	LB	$1.00	1,172,000	$1,172,000
530-1-2	RIP-RAP (SAND-CEMENT TYPE)	CY	$165.00		$0
521-72-1	CONCRETE BARRIER WALL (BRIDGES)	LF	$40.00	210	$8,400
	TOTAL COST				$1,729,201
	TOTAL COST W/20% DEGREE OF DIFFICULTY INCREASE				

	SQUARE FOOTAGE				24,587
	TOTAL COST / SF				$70.33

NOTES:
- Costs are from FDOT average unit prices
- Increase for widening over water included at 20% on all widenings
- Pricing exclude contingency, mobilization, and maintenance of traffic

prepared by: DJC checked by: WJP 30-Jul-92 file 22NDBR.WK3

COST ESTIMATE

BRIDGE: 22ND STREET CAUSEWAY OVER CSX RR

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL PRICE
110-3-	REMOVAL OF EXISTING STRUCTURE	SF	$10.00		$0
400-4-4	CLASS IV CONCRETE SUPERSTRUCTURE	CY	$320.00	638	$204,160
400-4-5	CLASS IV CONCRETE SUBSTRUCTURE	CY	$380.00	532	$202,160
400-4-20	CLASS IV CONCRETE (SEAL)	CY	$250.00		$0
400-7	BRIDGE FLOOR GROOVING	SY	$3.50	1886	$6,601
400-148-1	TRAFFIC RAILING BARRIER	LF	$36.00	404	$14,544
400-5-3	PEDESTRIAN / BICYCLE RAILING	LF	$45.00	404	$18,180
400-400-	REMOVE CONCRETE HANDRAIL (BARRIER)	LF	$20.00		$0
415-1-4	REINFORCING STEEL (SUPERSTRUCTURE)	LB	$0.45	108443	$48,799
415-1-5	REINFORCING STEEL (SUBSTRUCTURE)	LB	$0.45	79703	$35,866
455-15	PREFORMED PILE HOLES	EA	$300.00	6	$1,800
455-17-2	PILE SPLICES (18")	EA	$350.00	6	$2,100
455-17-3	PILE SPLICES (20")	EA	$400.00		$0
455-17-13	PILE SPLICES (HP 12 X 53)	EA	$500.00		$0
455-3-2	PRESTRESSED CONCRETE	LF	$30.00	3490	$104,700
455-4-2	PILING (18" DIA.)	LF	$4.00	3490	$13,960
455-3-3	PRESTRESSED CONCRETE	LF	$33.00		$0
455-4-3	PILING (20" DIA.)	LF	$5.00		$0
455-8-4	STEEL PILING	LF	$1.50		$0
55-7-4	(HP 12 X 53)	LF	$32.00		$0
450-1-1	PRESTRESSED CONCRETE BEAMS TYPE II	LF	$58.00		$0
450-1-2	PRESTRESSED CONCRETE BEAMS TYPE III	LF	$61.00	792	$48,312
450-1-3	PRESTRESSED CONCRETE BEAMS TYPE IV	LF	$100.00		$0
450-1-4	PRESTRESSED CONCRETE BEAMS TYPE V	LF	$130.00		$0
450-1-5	PRESTRESSED CONCRETE BEAMS TYPE VI	LF	$150.00	2036	$305,400
460-113-111	MULTI-ROTATIONAL BRNG. ASSM. (FIXED)	EA	$3,000.00		$0
460-114-111	MULTI-ROTATIONAL BRNG. ASSM. (EXPANSION)	EA	$3,500.00		$0
460-2-2	STRUCTURAL STEEL (LOW ALLOY)	LB	$1.00		
530-1-2	RIP-RAP (SAND-CEMENT TYPE)	CY	$165.00		$0
521-72-1	CONCRETE BARRIER WALL (BRIDGES)	LF	$40.00		$0
	TOTAL COST TOTAL COST W/20% DEGREE OF DIFFICULTY INCREASE				$1,006,583

	SQUARE FOOTAGE				23,331
	TOTAL COST / SF				$43.14

NOTES: – Costs are from FDOT average unit prices
– Increase for widening over water included at 20% on all widenings
– Pricing exclude contingency, mobilization, and maintenance of traffic

prepared by: DJC checked by: WJP 30-Jul-92 file 22NDBR.WK3

COST ESTIMATE

BRIDGE: 22ND STREET CAUSEWAY OVER DELANEY CREEK

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL PRICE
110-3-	REMOVAL OF EXISTING STRUCTURE	SF	$10.00	2562	$25,620
400-4-4	CLASS IV CONCRETE SUPERSTRUCTURE	CY	$320.00	344	$110,080
400-4-5	CLASS IV CONCRETE SUBSTRUCTURE	CY	$380.00	120	$45,600
400-4-20	CLASS IV CONCRETE (SEAL)	CY	$250.00		$0
400-7	BRIDGE FLOOR GROOVING	SY	$3.50	1006	$3,521
400-148-1	TRAFFIC RAILING BARRIER	LF	$36.00	200	$7,200
400-5-3	PEDESTRIAN / BICYCLE RAILING	LF	$45.00	200	$9,000
400-400-	REMOVE CONCRETE HANDRAIL (BARRIER)	LF	$20.00		$0
415-1-4	REINFORCING STEEL (SUPERSTRUCTURE)	LB	$0.45	58395	$26,278
415-1-5	REINFORCING STEEL (SUBSTRUCTURE)	LB	$0.45	17970	$8,087
455-15	PREFORMED PILE HOLES	EA	$300.00	4	$1,200
455-17-2	PILE SPLICES (18")	EA	$350.00	4	$1,400
455-17-3	PILE SPLICES (20")	EA	$400.00		$0
455-17-13	PILE SPLICES (HP 12 X 53)	EA	$500.00		$0
455-3-2	PRESTRESSED CONCRETE	LF	$30.00	2660	$79,800
455-4-2	PILING (18" DIA.)	LF	$4.00	2660	$10,640
455-3-3	PRESTRESSED CONCRETE	LF	$33.00		$0
455-4-3	PILING (20" DIA.)	LF	$5.00		$0
455-8-4	STEEL PILING	LF	$1.50		$0
455-7-4	(HP 12 X 53)	LF	$32.00		$0
450-1-1	PRESTRESSED CONCRETE BEAMS TYPE II	LF	$58.00		$0
450-1-2	PRESTRESSED CONCRETE BEAMS TYPE III	LF	$61.00		$0
450-1-3	PRESTRESSED CONCRETE BEAMS TYPE IV	LF	$100.00	1900	$190,000
450-1-4	PRESTRESSED CONCRETE BEAMS TYPE V	LF	$130.00		$0
450-1-5	PRESTRESSED CONCRETE BEAMS TYPE VI	LF	$150.00		$0
460-113-111	MULTI-ROTATIONAL BRNG. ASSM. (FIXED)	EA	$3,000.00		$0
460-114-111	MULTI-ROTATIONAL BRNG. ASSM. (EXPANSION)	EA	$3,500.00		$0
460-2-2	STRUCTURAL STEEL (LOW ALLOY)	LB	$1.00		$0
530-1-2	RIP-RAP (SAND-CEMENT TYPE)	CY	$165.00	213	$35,145
521-72-1	CONCRETE BARRIER WALL (BRIDGES)	LF	$40.00		$0
	TOTAL COST				$553,570
	TOTAL COST W/20% DEGREE OF DIFFICULTY INCREASE				

	SQUARE FOOTAGE				12,600
	TOTAL COST / SF				$43.93

NOTES:
- Costs are from FDOT average unit prices
- Increase for widening over water included at 20% on all widenings
- Pricing exclude contingency, mobilization, and maintenance of traffic

prepared by: DJC checked by: WJP

30-Jul-92 file 22NDBR.WK3

COST ESTIMATE

BRIDGE: U.S. 41 OVER 22ND ST. CAUSEWAY

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	TOTAL QUANTITY	TOTAL PRICE
110-3-	REMOVAL OF EXISTING STRUCTURE	SF	$10.00		$0
400-4-4	CLASS IV CONCRETE SUPERSTRUCTURE	CY	$320.00	607	$194,240
400-4-5	CLASS IV CONCRETE SUBSTRUCTURE	CY	$380.00	134	$50,920
400-4-20	CLASS IV CONCRETE (SEAL)	CY	$250.00		$0
400-7	BRIDGE FLOOR GROOVING	SY	$3.50	2613	$9,146
400-148-1	TRAFFIC RAILING BARRIER	LF	$36.00	420	$15,120
400-5-3	PEDESTRIAN / BICYCLE RAILING	LF	$45.00		$0
400-400-	REMOVE CONCRETE HANDRAIL (BARRIER)	LF	$20.00		$0
415-1-4	REINFORCING STEEL (SUPERSTRUCTURE)	LB	$0.45	121400	$54,630
415-1-5	REINFORCING STEEL (SUBSTRUCTURE)	LB	$0.45	20145	$9,065
455-15	PREFORMED PILE HOLES	EA	$300.00	5	$1,500
455-17-2	PILE SPLICES (18")	EA	$350.00		$0
455-17-3	PILE SPLICES (20")	EA	$400.00	5	$2,000
455-17-13	PILE SPLICES (HP 12 X 53)	EA	$500.00		$0
455-3-2	PRESTRESSED CONCRETE	LF	$30.00		$0
455-4-2	PILING (18" DIA.)	LF	$4.00		$0
455-3-3	PRESTRESSED CONCRETE	LF	$33.00	3360	$110,880
455-4-3	PILING (20" DIA.)	LF	$5.00	3360	$16,800
455-8-4	STEEL PILING	LF	$1.50		$0
455-7-4	(HP 12 X 53)	LF	$32.00		$0
450-1-1	PRESTRESSED CONCRETE BEAMS TYPE II	LF	$58.00		$0
450-1-2	PRESTRESSED CONCRETE BEAMS TYPE III	LF	$61.00		$0
450-1-3	PRESTRESSED CONCRETE BEAMS TYPE IV	LF	$100.00		$0
450-1-4	PRESTRESSED CONCRETE BEAMS TYPE V	LF	$130.00		$0
450-1-5	PRESTRESSED CONCRETE BEAMS TYPE VI	LF	$150.00		$0
460-113-111	MULTI-ROTATIONAL BRNG. ASSM. (FIXED)	EA	$3,000.00	13	$39,000
460-114-111	MULTI-ROTATIONAL BRNG. ASSM. (EXPANSION)	EA	$3,500.00	13	$45,500
460-2-2	STRUCTURAL STEEL (LOW ALLOY)	LB	$1.00	1,172,000	$1,172,000
530-1-2	RIP-RAP (SAND-CEMENT TYPE)	CY	$165.00		$0
521-72-1	CONCRETE BARRIER WALL (BRIDGES)	LF	$40.00	210	$8,400
	TOTAL COST				$1,729,201
	TOTAL COST W/20% DEGREE OF DIFFICULTY INCREASE				

	SQUARE FOOTAGE				24,587
	TOTAL COST / SF				$70.33

NOTES:
- Costs are from FDOT average unit prices
- Increase for widening over water included at 20% on all widenings
- Pricing exclude contingency, mobilization, and maintenance of traffic

prepared by: DJC checked by: WJP 30-Jul-92 file 22NDBR.WK3

COST ESTIMATE

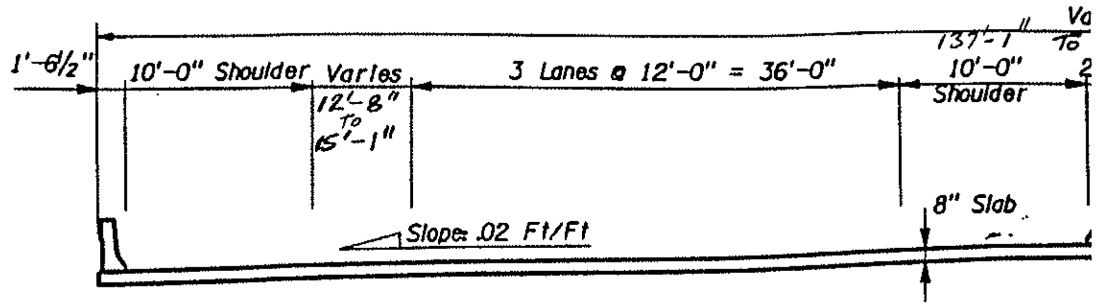
BRIDGE: 22ND STREET CAUSEWAY OVER McKAY BAY

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	TOTAL QUANTITY	TOTAL PRICE
110-3-	REMOVAL OF EXISTING STRUCTURE	SF	$10.00	17136	$171,360
400-4-4	CLASS IV CONCRETE SUPERSTRUCTURE	CY	$320.00	2065	$660,800
400-4-5	CLASS IV CONCRETE SUBSTRUCTURE	CY	$380.00	2242	$851,960
400-4-20	CLASS IV CONCRETE (SEAL)	CY	$250.00	671	$167,750
400-7	BRIDGE FLOOR GROOVING	SY	$3.50	19584	$68,544
400-148-1	TRAFFIC RAILING BARRIER	LF	$36.00	6528	$235,008
400-5-3	PEDESTRIAN / BICYCLE RAILING	LF	$45.00	3264	$146,880
400-400-	REMOVE CONCRETE HANDRAIL (BARRIER)	LF	$20.00	6528	$130,560
415-1-4	REINFORCING STEEL (SUPERSTRUCTURE)	LB	$0.45	351050	$157,973
415-1-5	REINFORCING STEEL (SUBSTRUCTURE)	LB	$0.45	336315	$151,342
455-15	PREFORMED PILE HOLES	EA	$300.00	43	$12,900
455-17-2	PILE SPLICES (18")	EA	$350.00	9	$3,150
455-17-3	PILE SPLICES (20")	EA	$400.00	14	$5,600
455-17-13	PILE SPLICES (HP 12 X 53)	EA	$500.00	20	$10,000
455-3-2	PRESTRESSED CONCRETE	LF	$30.00	5880	$176,400
455-4-2	PILING (18" DIA.)	LF	$4.00	5880	$23,520
455-3-3	PRESTRESSED CONCRETE	LF	$33.00	9800	$323,400
455-4-3	PILING (20" DIA.)	LF	$5.00	9800	$49,000
455-8-4	STEEL PILING	LF	$1.50	17920	$26,880
455-7-4	(HP 12 X 53)	LF	$32.00	17920	$573,440
450-1-1	PRESTRESSED CONCRETE BEAMS TYPE II	LF	$58.00	2408	$139,664
450-1-2	PRESTRESSED CONCRETE BEAMS TYPE III	LF	$61.00	5472	$333,792
450-1-3	PRESTRESSED CONCRETE BEAMS TYPE IV	LF	$100.00	1180	$118,000
450-1-4	PRESTRESSED CONCRETE BEAMS TYPE V	LF	$130.00	0	$0
450-1-5	PRESTRESSED CONCRETE BEAMS TYPE VI	LF	$150.00	0	$0
460-113-111	MULTI-ROTATIONAL BRNG. ASSM. (FIXED)	EA	$3,000.00	0	$0
460-114-111	MULTI-ROTATIONAL BRNG. ASSM. (EXPANSION)	EA	$3,500.00	0	$0
460-2-2	STRUCTURAL STEEL (LOW ALLOY)	LB	$1.00	0	$0
530-1-2	RIP-RAP (SAND-CEMENT TYPE)	CY	$165.00	0	$0
521-72-1	CONCRETE BARRIER WALL (BRIDGES)	LF	$40.00	0	$0
	TOTAL COST				$4,537,922
	TOTAL COST W/20% DEGREE OF DIFFICULTY INCREASE				$5,445,507

	SQUARE FOOTAGE				83,640
	TOTAL COST / SF				$65.11

NOTES:
- Costs are from FDOT average unit prices
- Increase for widening over water included at 20% on all widenings
- Pricing exclude contingency, mobilization, and maintenance of traffic

prepared by: DJC checked by: WJP 30-Jul-92 file 22NDBR.WK3



TYPICAL

PROJECT 22ND STREET CAUSEWAY/ CAUSEWAY BOULEVARD
(S.R. 676)
PD&E STUDY

COST ESTIMATE

BRIDGE: 22ND STREET CAUSEWAY OVER TRIBUTARY "A"

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	TOTAL QUANTITY	TOTAL PRICE
110-3-	REMOVAL OF EXISTING STRUCTURE	SF	$10.00	1722	$17,220
400-4-4	CLASS IV CONCRETE SUPERSTRUCTURE	CY	$320.00	280	$89,600
400-4-5	CLASS IV CONCRETE SUBSTRUCTURE	CY	$380.00	113	$42,940
400-4-20	CLASS IV CONCRETE (SEAL)	CY	$250.00		$0
400-7	BRIDGE FLOOR GROOVING	SY	$3.50	723	$2,531
400-148-1	TRAFFIC RAILING BARRIER	LF	$36.00	155	$5,580
400-5-3	PEDESTRIAN / BICYCLE RAILING	LF	$45.00	155	$6,975
400-400-	REMOVE CONCRETE HANDRAIL (BARRIER)	LF	$20.00		$0
415-1-4	REINFORCING STEEL (SUPERSTRUCTURE)	LB	$0.45	47600	$21,420
415-1-5	REINFORCING STEEL (SUBSTRUCTURE)	LB	$0.45	16920	$7,614
455-15	PREFORMED PILE HOLES	EA	$300.00	4	$1,200
455-17-2	PILE SPLICES (18")	EA	$350.00	4	$1,400
455-17-3	PILE SPLICES (20")	EA	$400.00		$0
455-17-13	PILE SPLICES (HP 12 X 53)	EA	$500.00		$0
455-3-2	PRESTRESSED CONCRETE	LF	$30.00	2800	$84,000
455-4-2	PILING (18" DIA.)	LF	$4.00	2800	$11,200
455-3-3	PRESTRESSED CONCRETE	LF	$33.00		$0
455-4-3	PILING (20" DIA.)	LF	$5.00		$0
455-8-4	STEEL PILING	LF	$1.50		$0
455-7-4	(HP 12 X 53)	LF	$32.00		$0
450-1-1	PRESTRESSED CONCRETE BEAMS TYPE II	LF	$58.00		$0
450-1-2	PRESTRESSED CONCRETE BEAMS TYPE III	LF	$61.00	1240	$75,640
450-1-3	PRESTRESSED CONCRETE BEAMS TYPE IV	LF	$100.00		$0
450-1-4	PRESTRESSED CONCRETE BEAMS TYPE V	LF	$130.00		$0
450-1-5	PRESTRESSED CONCRETE BEAMS TYPE VI	LF	$150.00		$0
460-113-111	MULTI-ROTATIONAL BRNG. ASSM. (FIXED)	EA	$3,000.00		$0
460-114-111	MULTI-ROTATIONAL BRNG. ASSM. (EXPANSION)	EA	$3,500.00		$0
460-2-2	STRUCTURAL STEEL (LOW ALLOY)	LB	$1.00		
530-1-2	RIP-RAP (SAND-CEMENT TYPE)	CY	$165.00	96	$15,840
521-72-1	CONCRETE BARRIER WALL (BRIDGES)	LF	$40.00		$0
	TOTAL COST TOTAL COST W/20% DEGREE OF DIFFICULTY INCREASE				$383,160

	SQUARE FOOTAGE				9,765
	TOTAL COST / SF				$39.24

NOTES:
- Costs are from FDOT average unit prices
- Increase for widening over water included at 20% on all widenings
- Pricing exclude contingency, mobilization, and maintenance of traffic

prepared by: DJC checked by: WJP

30-Jul-92 file 22NDBR.WK3

COST ESTIMATE

BRIDGE: U.S. 41
OVER CSX RR

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL PRICE
110-3-	REMOVAL OF EXISTING STRUCTURE	SF	$10.00		$0
400-4-4	CLASS IV CONCRETE SUPERSTRUCTURE	CY	$320.00	200	$64000
400-4-5	CLASS IV CONCRETE SUBSTRUCTURE	CY	$380.00	160	$60800
400-4-20	CLASS IV CONCRETE (SEAL)	CY	$250.00		$0
400-7	BRIDGE FLOOR GROOVING	SY	$3.50	865	$3028
400-148-1	TRAFFIC RAILING BARRIER	LF	$36.00	116	$4176
400-5-3	PEDESTRIAN / BICYCLE RAILING	LF	$45.00		$0
400-400-	REMOVE CONCRETE HANDRAIL (BARRIER)	LF	$20.00		$0
415-1-4	REINFORCING STEEL (SUPERSTRUCTURE)	LB	$0.45	40000	$18000
415-1-5	REINFORCING STEEL (SUBSTRUCTURE)	LB	$0.45	24000	$10800
455-15	PREFORMED PILE HOLES	EA	$300.00	3	$900
455-17-2	PILE SPLICES (18")	EA	$350.00	3	$1050
455-17-3	PILE SPLICES (20")	EA	$400.00		$0
455-17-13	PILE SPLICES (HP 12 X 53)	EA	$500.00		$0
455-3-2	PRESTRESSED CONCRETE	LF	$30.00	1560	$46800
455-4-2	PILING (18" DIA.)	LF	$4.00	1560	$6240
455-3-3	PRESTRESSED CONCRETE	LF	$33.00		$0
455-4-3	PILING (20" DIA.)	LF	$5.00		$0
455-8-4	STEEL PILING	LF	$1.50		$0
455-7-4	(HP 12 X 53)	LF	$32.00		$0
450-1-1	PRESTRESSED CONCRETE BEAMS TYPE II	LF	$58.00		$0
450-1-2	PRESTRESSED CONCRETE BEAMS TYPE III	LF	$61.00	870	$53070
450-1-3	PRESTRESSED CONCRETE BEAMS TYPE IV	LF	$100.00		$0
450-1-4	PRESTRESSED CONCRETE BEAMS TYPE V	LF	$130.00		
450-1-5	PRESTRESSED CONCRETE BEAMS TYPE VI	LF	$150.00		$0
460-113-111	MULTI-ROTATIONAL BRNG. ASSM. (FIXED)	EA	$3,000.00		$0
460-114-111	MULTI-ROTATIONAL BRNG. ASSM. (EXPANSION)	EA	$3,500.00		$0
460-2-2	STRUCTURAL STEEL (LOW ALLOY)	LB	$1.00		
530-1-2	RIP-RAP (SAND-CEMENT TYPE)	CY	$165.00		$0
521-72-1	CONCRETE BARRIER WALL (BRIDGES)	LF	$40.00	58	$2320
	TOTAL COST				$271184
	TOTAL COST W/20% DEGREE OF DIFFICULTY INCREASE				

	SQUARE FOOTAGE				8081.314
	TOTAL COST / SF				$33.56

NOTES:
- Costs are from FDOT average unit prices
- Increase for widening over water included at 20% on all widenings
- Pricing exclude contingency, mobilization, and maintenance of traffic

prepared by: DJC checked by: WJP 30-Jul-92 file 22NDBR.WK3

NATIONAL BRIDGE INVENTORY - - - - - - - STRUCTURE INVENTORY AND APPRAISAL 10/27/93

```
      ********** IDENTIFICATION ***********************
(1)   STATE NAME - FLORIDA                    CODE  124
(8)   STRUCTURE NUMBER              #          100065
(5)   INVENTORY ROUTE (ON/UNDER) - ON   =   131006760
(2)   STATE HIGHWAY DEPARTMENT DISTRICT              07
(3)   COUNTY CODE     C57    (4) PLACE CODE       71000
(6)   FEATURES INTERSECTED - DELANEY CREEK
(7)   FACILITY CARRIED       - SR 676
(9)   LOCATION               - 1.39 MI W OF US 301
(11)  MILEPOINT                                 001.397
(16)  LATITUDE  00 D 00.0' (17) LONGITUDE  000 D 00.0'
(98)  BORDER BRIDGE STATE CODE   000    % SHARE   00 %
(99)  BORDER BRIDGE STRUCTURE NO.    #

      ********** STRUCTURE TYPE AND MATERIAL *********
(43)  STRUCTURE TYPE MAIN:  MATERIAL - CONCRETE
          TYPE - STRINGER/MULTI-BEAM OR GIR    CODE 102
(44)  STRUCTURE TYPE APPR:  MATERIAL - OTHER
          TYPE - OTHER                        CODE 000
(45)  NUMBER OF SPANS IN MAIN UNIT                  002
(46)  NUMBER OF APPROACH SPANS                     0000
(107) DECK STRUCTURE TYPE - CIP COMPOSITE CONC  CODE 1
(108) WEARING SURFACE / PROTECTIVE SYSTEM:
   A) TYPE OF WEARING SURFACE - BITUMINOUS       CODE 6
   B) TYPE OF MEMBRANE            - NONE         CODE 0
   C) TYPE OF DECK PROTECTION - NONE             CODE 0

      ********** AGE AND SERVICE *********************
(27)  YEAR BUILT                                   1928
(106) YEAR RECONSTRUCTED                           0000
(42)  TYPE OF SERVICE:  ON - HIGHWAY
          UNDER - WATERWAY                     CODE  15
(28)  LANES:  ON STRUCTURE   02    UNDER STRUCTURE  00
(29)  AVERAGE DAILY TRAFFIC                      015084
(30)  YEAR OF ADT    1992     (109) TRUCK ADT      05 %
(19)  BYPASS, DETOUR LENGTH                       04 MI

      ********** GEOMETRIC DATA **********************
(48)  LENGTH OF MAXIMUM SPAN                    0030 FT
(49)  STRUCTURE LENGTH                        000061 FT
(50)  CURB OR SIDEWALK:   LEFT 00.0 FT   RIGHT 00.0 FT
(51)  BRIDGE ROADWAY WIDTH CURB TO CURB        038.3 FT
(52)  DECK WIDTH OUT TO OUT                    041.3 FT
(32)  APPROACH ROADWAY WIDTH (W/SHOULDERS)       040 FT
(33)  BRIDGE MEDIAN - NO MEDIAN                 CODE  0
(34)  SKEW        00 DEG      (35) STRUCTURE FLARED  NO
(10)  INVENTORY ROUTE MIN VERT CLEAR       99 FT 99 IN
(47)  INVENTORY ROUTE TOTAL HORIZ CLEAR         38.5 FT
(53)  MIN VERT CLEAR OVER BRIDGE ROWY      99 FT 99 IN
(54)  MIN VERT UNDERCLEAR REF -  NOT A HI  00 FT 00 IN
(55)  MIN LAT UNDERCLEAR RT   REF - NOT A HI    99.9 FT
(56)  MIN LAT UNDERCLEAR LT                     00.0 FT

      ********** NAVIGATION DATA *********************
(38)  NAVIGATION CONTROL - BRIDGE HAS NO NA     CODE  0
(111) PIER PROTECTION - NAVIGATION PROTECTI     CODE  1
(39)  NAVIGATION VERTICAL CLEARANCE              000 FT
(116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR        000 FT
(40)  NAVIGATION HORIZONTAL CLEARANCE           0000 FT
```

```
      ********************************************************

      SUFFICIENCY RATING = *092.4
      STATUS = NO SIGNIFICANT DEFICIENCY

      ********** CLASSIFICATION ****************    CODE
(112) NBIS BRIDGE LENGTH                              YES
(104) HIGHWAY SYSTEM     - STRUCTURE IS NOT ON NHS      0
(26)  FUNCTIONAL CLASS   - URBAN MINOR ARTERIAL        16
(100) DEFENSE HIGHWAY    - NOT A DEFENSE HIGHWAY        0
(101) PARALLEL STRUCTURE   - NONE EXISTS                N
(102) DIRECTION OF TRAFFIC - TWO WAY TRAFFIC            2
(103) TEMPORARY STRUCTURE  - NOT APPLICABLE             N
(110) DESIGNATED NATIONAL NETWORK - NOT PART OF N       0
(20)  TOLL        - ON FREE ROAD                        3
(21)  MAINTAIN  - STATE HIGHWAY AGENCY                 01
(22)  OWNER       - STATE HIGHWAY AGENCY               01
(37)  HISTORICAL SIGNIFICANCE - NOT ELIGIBLE FOR        5

      ********** CONDITION ********************    CODE
(58)  DECK                                              7
(59)  SUPERSTRUCTURE                                    7
(60)  SUBSTRUCTURE                                      7
(61)  CHANNEL & CHANNEL PROTECTION                      6
(62)  CULVERTS                                          N

      ********** LOAD RATING AND POSTING ******** CODE
(31)  DESIGN LOAD       -               UNKNOWN         0
(64)  OPERATING RATING -                HS-20 TRU     260
(66)  INVENTORY RATING -                HS-20 TRU     236
(70)  BRIDGE POSTING     - EQ OR GT LEGAL LOAD NO P     5
(41)  STRUCTURE OPEN, POSTED OR CLOSED -                A
          DESCRIPTION - OPEN, NO RESTRICTION

      ********** APPRAISAL ********************    CODE
(67)  STRUCTURAL EVALUATION                             *
(68)  DECK GEOMETRY                                     5
(69)  UNDERCLEARANCES, VERTICAL & HORIZONTAL            N
(71)  WATERWAY ADEQUACY                                 7
(72)  APPROACH ROADWAY ALIGNMENT                        8
(36)  TRAFFIC SAFETY FEATURES                        1000
(113) SCOUR CRITICAL BRIDGES                            6

      ********** PROPOSED IMPROVEMENTS ****************
(75)  TYPE OF WORK - WIDEN DECK W NC REHAB    CODE  331
(76)  LENGTH OF STRUCTURE IMPROVEMENT         000061 FT
(94)  BRIDGE IMPROVEMENT COST             $     85,000
(95)  ROADWAY IMPROVEMENT COST            $      9,000
(96)  TOTAL PROJECT COST                  $ 12,231,000
(97)  YEAR OF IMPROVEMENT COST ESTIMATE                20
(114) FUTURE ADT                                  029436
(115) YEAR OF FUTURE ADT                            2011

      ********** INSPECTIONS ****************************
(90)  INSPECTION DATE    92/09    (91) FREQUENCY  24 MO
(92)  CRITICAL FEATURE INSPECTION:         (93) CFI DATE
   A) FRACTURE CRIT DETAIL  -  NO    -- MO    A)
   B) UNDERWATER INSP       -  NO    -- MO    B)
   C) OTHER SPECIAL INSP    -  NO    -- MO    C)
```

NATIONAL BRIDGE INVENTORY - - - - - - - STRUCTURE INVENTORY AND APPRAISAL 10/27/93

********** IDENTIFICATION **********************
(1) STATE NAME - FLORIDA CODE 124
(8) STRUCTURE NUMBER # 100066
(5) INVENTORY ROUTE (ON/UNDER) - ON = 131006760
(2) STATE HIGHWAY DEPARTMENT DISTRICT C7
(3) COUNTY CODE 057 (4) PLACE CODE 71000
(6) FEATURES INTERSECTED - DELANEY CREEK TRIBUTARY
(7) FACILITY CARRIED - SR 676
(9) LOCATION - 2.39 MI W OF US 301
(11) MILEPOINT 002.406
(16) LATITUDE 00 D 00.0' (17) LONGITUDE 000 D 00.0'
(98) BORDER BRIDGE STATE CODE 000 % SHARE 00 %
(99) BORDER BRIDGE STRUCTURE NO. #

********** STRUCTURE TYPE AND MATERIAL *********
(43) STRUCTURE TYPE MAIN: MATERIAL - CONCRETE
TYPE - STRINGER/MULTI-BEAM OR GIR CODE 102
(44) STRUCTURE TYPE APPR: MATERIAL - OTHER
TYPE - OTHER CODE 000
(45) NUMBER OF SPANS IN MAIN UNIT 001
(46) NUMBER OF APPROACH SPANS 0000
(107) DECK STRUCTURE TYPE - CIP COMPOSITE CONC CODE 1
(108) WEARING SURFACE / PROTECTIVE SYSTEM:
A) TYPE OF WEARING SURFACE - BITUMINOUS CODE 6
B) TYPE OF MEMBRANE - NONE CODE 0
C) TYPE OF DECK PROTECTION - NONE CODE 0

********** AGE AND SERVICE *********************
(27) YEAR BUILT 1944
(106) YEAR RECONSTRUCTED 0000
(42) TYPE OF SERVICE: ON - HIGHWAY
UNDER - WATERWAY CODE 15
(28) LANES: ON STRUCTURE 02 UNDER STRUCTURE 00
(29) AVERAGE DAILY TRAFFIC 015084
(30) YEAR OF ADT 1992 (109) TRUCK ADT 10 %
(19) BYPASS, DETOUR LENGTH 04 MI

********** GEOMETRIC DATA **********************
(48) LENGTH OF MAXIMUM SPAN 0041 FT
(49) STRUCTURE LENGTH 000042 FT
(50) CURB OR SIDEWALK: LEFT 00.0 FT RIGHT 00.0 FT
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 038.5 FT
(52) DECK WIDTH OUT TO OUT 041.3 FT
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 040 FT
(33) BRIDGE MEDIAN - NO MEDIAN CODE 0
(34) SKEW 00 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99 FT 99 IN
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 38.5 FT
(53) MIN VERT CLEAR OVER BRIDGE RDWY 99 FT 99 IN
(54) MIN VERT UNDERCLEAR REF - NOT A HI 00 FT 00 IN
(55) MIN LAT UNDERCLEAR RT REF - NOT A HI 99.9 FT
(56) MIN LAT UNDERCLEAR LT 00.0 FT

********** NAVIGATION DATA *********************
(38) NAVIGATION CONTROL - BRIDGE HAS NAVIG CODE 1
(111) PIER PROTECTION - NAVIGATION PROTECTI CODE 1
(39) NAVIGATION VERTICAL CLEARANCE 000 FT
(116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR 000 FT
(40) NAVIGATION HORIZONTAL CLEARANCE 0000 FT

****

SUFFICIENCY RATING = *092.4
STATUS = NO SIGNIFICANT DEFICIENCY

********** CLASSIFICATION ****************** CODE
(112) NBIS BRIDGE LENGTH YES
(104) HIGHWAY SYSTEM - STRUCTURE IS NOT ON NHS 0
(26) FUNCTIONAL CLASS - URBAN MINOR ARTERIAL 16
(100) DEFENSE HIGHWAY - NOT A DEFENSE HIGHWAY 0
(101) PARALLEL STRUCTURE - NONE EXISTS N
(102) DIRECTION OF TRAFFIC - TWO WAY TRAFFIC 2
(103) TEMPORARY STRUCTURE - NOT APPLICABLE N
(110) DESIGNATED NATIONAL NETWORK -
(20) TOLL - ON FREE ROAD 3
(21) MAINTAIN - STATE HIGHWAY AGENCY 01
(22) OWNER - STATE HIGHWAY AGENCY 01
(37) HISTORICAL SIGNIFICANCE - NOT DETERMINABLE 4

********** CONDITION ********************** CODE
(58) DECK 7
(59) SUPERSTRUCTURE 8
(60) SUBSTRUCTURE 6
(61) CHANNEL & CHANNEL PROTECTION 8
(62) CULVERTS N

********** LOAD RATING AND POSTING ******** CODE
(31) DESIGN LOAD - UNKNOWN 0
(64) OPERATING RATING - HS-20 TRU 260
(66) INVENTORY RATING - HS-20 TRU 236
(70) BRIDGE POSTING - EQ OR GT LEGAL LOAD NO P 5
(41) STRUCTURE OPEN, POSTED OR CLOSED - A
DESCRIPTION - OPEN, NO RESTRICTION

********** APPRAISAL ********************** CODE
(67) STRUCTURAL EVALUATION *
(68) DECK GEOMETRY 5
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATERWAY ADEQUACY 7
(72) APPROACH ROADWAY ALIGNMENT 8
(36) TRAFFIC SAFETY FEATURES 1000
(113) SCOUR CRITICAL BRIDGES 6

********** PROPOSED IMPROVEMENTS ****************
(75) TYPE OF WORK - WIDEN DECK W NO REHAB CODE 331
(76) LENGTH OF STRUCTURE IMPROVEMENT 000042 FT
(94) BRIDGE IMPROVEMENT COST $ 59,000
(95) ROADWAY IMPROVEMENT COST $ 6,000
(96) TOTAL PROJECT COST $ 12,231,000
(97) YEAR OF IMPROVEMENT COST ESTIMATE 20
(114) FUTURE ADT 029436
(115) YEAR OF FUTURE ADT 2011

********** INSPECTIONS ************************
(90) INSPECTION DATE 92/09 (91) FREQUENCY 24 MO
(92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
A) FRACTURE CRIT DETAIL - NO -- MO A)
B) UNDERWATER INSP - NO -- MO B)
C) OTHER SPECIAL INSP - NA -- MO C)

NATIONAL BRIDGE INVENTORY - - - - - - - STRUCTURE INVENTORY AND APPRAISAL 10/27/93

```
          ********** IDENTIFICATION ***********************
(1)   STATE NAME - FLORIDA                          CODE  124
(8)   STRUCTURE NUMBER                      #          100299
(5)   INVENTORY ROUTE (ON/UNDER) - ON         =     126000410
(2)   STATE HIGHWAY DEPARTMENT DISTRICT                    07
(3)   COUNTY CODE       057      (4) PLACE CODE         71000
(6)   FEATURES INTERSECTED - MCKAY BAY            0338
(7)   FACILITY CARRIED     - BUS-41/22ND ST SB
(9)   LOCATION             - 1.8 M S OF SR-60
(11)  MILEPOINT                                       005.065
(16)  LATITUDE   00 D 00.0' (17) LONGITUDE   000 D 00.0'
(98)  BORDER BRIDGE STATE CODE   000     % SHARE      00 %
(99)  BORDER BRIDGE STRUCTURE NO.     #

          ********** STRUCTURE TYPE AND MATERIAL *********
(43)  STRUCTURE TYPE MAIN:  MATERIAL - CONCRETE
         TYPE - GIRDER & FLOORBEAM SYSTEM         CODE 103
(44)  STRUCTURE TYPE APPR:  MATERIAL - PRESTRESS CONCR
         TYPE - STRINGER/MULTI-BEAM OR GIR        CODE 502
(45)  NUMBER OF SPANS IN MAIN UNIT                     001
(46)  NUMBER OF APPROACH SPANS                        0026
(107) DECK STRUCTURE TYPE - CIP COMPOSITE CONC    CODE 1
(108) WEARING SURFACE / PROTECTIVE SYSTEM:
  A)  TYPE OF WEARING SURFACE - CONCRETE          CODE 1
  B)  TYPE OF MEMBRANE        - NONE              CODE 0
  C)  TYPE OF DECK PROTECTION - NONE              CODE 0

          ********** AGE AND SERVICE ********************
(27)  YEAR BUILT                                      1975
(106) YEAR RECONSTRUCTED                              0000
(42)  TYPE OF SERVICE:  ON - HIGHWAY
         UNDER - WATERWAY                         CODE  15
(28)  LANES:  ON STRUCTURE   02    UNDER STRUCTURE      00
(29)  AVERAGE DAILY TRAFFIC                         009777
(30)  YEAR OF ADT     1991      (109) TRUCK ADT       00 %
(19)  BYPASS, DETOUR LENGTH                          01 MI

          ********** GEOMETRIC DATA **********************
(48)  LENGTH OF MAXIMUM SPAN                       0118 FT
(49)  STRUCTURE LENGTH                           001632 FT
(50)  CURB OR SIDEWALK:    LEFT 00.0 FT    RIGHT 00.0 FT
(51)  BRIDGE ROADWAY WIDTH CURB TO CURB            040.1 FT
(52)  DECK WIDTH OUT TO OUT                        042.2 FT
(32)  APPROACH ROADWAY WIDTH (W/SHOULDERS)           045 FT
(33)  BRIDGE MEDIAN - NO MEDIAN                    CODE  0
(34)  SKEW      00 DEG       (35) STRUCTURE FLARED      NO
(10)  INVENTORY ROUTE MIN VERT CLEAR          99 FT 99 IN
(47)  INVENTORY ROUTE TOTAL HORIZ CLEAR             40.1 FT
(53)  MIN VERT CLEAR OVER BRIDGE RDWY         99 FT 99 IN
(54)  MIN VERT UNDERCLEAR REF -   NOT A HI    00 FT 00 IN
(55)  MIN LAT UNDERCLEAR RT  REF - NOT A HI        00.0 FT
(56)  MIN LAT UNDERCLEAR LT                        00.0 FT

          ********** NAVIGATION DATA ********************
(38)  NAVIGATION CONTROL - BRIDGE HAS NAVIG       CODE  1
(111) PIER PROTECTION - NOT APPLICABLE            CODE  N
(39)  NAVIGATION VERTICAL CLEARANCE                040 FT
(116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR          000 FT
(40)  NAVIGATION HORIZONTAL CLEARANCE             0075 FT
```

```
      ***********************************************
      SUFFICIENCY RATING = *094.2
      STATUS = NO SIGNIFICANT DEFICIENCY

      ********** CLASSIFICATION ***************** CODE
(112) NBIS BRIDGE LENGTH                              YES
(104) HIGHWAY SYSTEM     - STRUCTURE IS NOT ON NHS      0
(26)  FUNCTIONAL CLASS  - URBAN MINOR ARTERIAL         16
(100) DEFENSE HIGHWAY   - NOT A DEFENSE HIGHWAY         0
(101) PARALLEL STRUCTURE   - LEFT STRUCTURE             L
(102) DIRECTION OF TRAFFIC - ONE WAY TRAFFIC            1
(103) TEMPORARY STRUCTURE  - NOT APPLICABLE             N
(110) DESIGNATED NATIONAL NETWORK -
(20)  TOLL       - ON FREE ROAD                         3
(21)  MAINTAIN   - STATE HIGHWAY AGENCY                01
(22)  OWNER      - STATE HIGHWAY AGENCY                01
(37)  HISTORICAL SIGNIFICANCE - NOT ELIGIBLE FOR        5

      ********** CONDITION ********************** CODE
(58)  DECK                                              7
(59)  SUPERSTRUCTURE                                    8
(60)  SUBSTRUCTURE                                      7
(61)  CHANNEL & CHANNEL PROTECTION                      8
(62)  CULVERTS                                          N

      ********** LOAD RATING AND POSTING ******** CODE
(31)  DESIGN LOAD        -                   UNKNOWN    0
(64)  OPERATING RATING -                 HS-20 TRU    252
(66)  INVENTORY RATING -                 HS-20 TRU    245
(70)  BRIDGE POSTING     - EQ OR GT LEGAL LOAD NC P     5
(41)  STRUCTURE OPEN, POSTED OR CLOSED -                A
         DESCRIPTION - OPEN, NO RESTRICTION

      ********** APPRAISAL ********************** CODE
(67)  STRUCTURAL EVALUATION                             *
(68)  DECK GEOMETRY                                     7
(69)  UNDERCLEARANCES, VERTICAL & HORIZONTAL            N
(71)  WATERWAY ADEQUACY                                 8
(72)  APPROACH ROADWAY ALIGNMENT                        8
(36)  TRAFFIC SAFETY FEATURES                        1111
(113) SCOUR CRITICAL BRIDGES                            6

      ********** PROPOSED IMPROVEMENTS ****************
(75)  TYPE OF WORK - NO IMPROVEMENT PLANNED   CODE  001
(76)  LENGTH OF STRUCTURE IMPROVEMENT         001632 FT
(94)  BRIDGE IMPROVEMENT COST            $      252,000
(95)  ROADWAY IMPROVEMENT COST           $         ,000
(96)  TOTAL PROJECT COST                 $      311,000
(97)  YEAR OF IMPROVEMENT COST ESTIMATE              20
(114) FUTURE ADT                                 018253
(115) YEAR OF FUTURE ADT                           2011

      ********** INSPECTIONS **************************
(90)  INSPECTION DATE    92/02    (91) FREQUENCY  24 MO
(92)  CRITICAL FEATURE INSPECTION:         (93) CFI DATE
  A)  FRACTURE CRIT DETAIL - NO         MO   A)
  B)  UNDERWATER INSP      - YES    24  MO   B)   88 10
  C)  OTHER SPECIAL INSP   - NO         MO   C)
```

```
NATIONAL BRIDGE INVENTORY - - - - - - - STRUCTURE INVENTORY AND APPRAISAL        10/27/93

      ********** IDENTIFICATION ************************
 (1) STATE NAME - FLORIDA                       CODE  124
 (8) STRUCTURE NUMBER                   #         100338
 (5) INVENTORY ROUTE (ON/UNDER) - ON        =  126000410
 (2) STATE HIGHWAY DEPARTMENT DISTRICT                07
 (3) COUNTY CODE     057     (4) PLACE CODE        71000
 (6) FEATURES INTERSECTED - MACKAY BAY
 (7) FACILITY CARRIED     - BUS-41/22NDST
 (9) LOCATION             - 1.8 MI S OF SR-60
(11) MILEPOINT                                   005.065
(16) LATITUDE  27 D 58.3' (17) LONGITUDE  082 D 23.7'
(98) BORDER BRIDGE STATE CODE   000    % SHARE    00 %
(99) BORDER BRIDGE STRUCTURE NO.     #

      ********** STRUCTURE TYPE AND MATERIAL *********
(43) STRUCTURE TYPE MAIN:  MATERIAL - CONCRETE
        TYPE - GIRDER & FLOORBEAM SYSTEM       CODE 103
(44) STRUCTURE TYPE APPR:  MATERIAL - PRESTRESS CONCR
        TYPE - STRINGER/MULTI-BEAM OR GIR      CODE 502
(45) NUMBER OF SPANS IN MAIN UNIT                    001
(46) NUMBER OF APPROACH SPANS                       0026
(107) DECK STRUCTURE TYPE - CIP COMPOSITE CONC  CODE 1
(108) WEARING SURFACE / PROTECTIVE SYSTEM:
   A) TYPE OF WEARING SURFACE - CONCRETE          CODE 1
   B) TYPE OF MEMBRANE        - NONE              CODE 0
   C) TYPE OF DECK PROTECTION - NONE              CODE 0

      ********** AGE AND SERVICE ********************
(27) YEAR BUILT                                     1976
(106) YEAR RECONSTRUCTED                            0000
(42) TYPE OF SERVICE:  ON - HIGHWAY
        UNDER - WATERWAY                         CODE  15
(28) LANES:  ON STRUCTURE   02    UNDER STRUCTURE    00
(29) AVERAGE DAILY TRAFFIC                        009777
(30) YEAR OF ADT     1991     (109) TRUCK ADT       00 %
(19) BYPASS, DETOUR LENGTH                         01 MI

      ********** GEOMETRIC DATA ************************
(48) LENGTH OF MAXIMUM SPAN                      0118 FT
(49) STRUCTURE LENGTH                          001632 FT
(50) CURB OR SIDEWALK:     LEFT 00.0 FT   RIGHT 00.0 FT
(51) BRIDGE ROADWAY WIDTH CURB TO CURB           040.1 FT
(52) DECK WIDTH OUT TO OUT                       042.2 FT
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS)          045 FT
(33) BRIDGE MEDIAN - OPEN MEDIAN                   CODE 1
(34) SKEW      00 DEG      (35) STRUCTURE FLARED      NO
(10) INVENTORY ROUTE MIN VERT CLEAR         99 FT 99 IN
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR            40.1 FT
(53) MIN VERT CLEAR OVER BRIDGE RDWY         99 FT 99 IN
(54) MIN VERT UNDERCLEAR REF -  NOT A HI     00 FT 00 IN
(55) MIN LAT UNDERCLEAR RT  REF - NOT A HI        00.0 FT
(56) MIN LAT UNDERCLEAR LT                        00.0 FT

      ********** NAVIGATION DATA **********************
(38) NAVIGATION CONTROL - BRIDGE HAS NAVIG        CODE 1
(111) PIER PROTECTION - IN PLACE W DETERIOR        CODE 3
(39) NAVIGATION VERTICAL CLEARANCE                040 FT
(116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR          000 FT
(40) NAVIGATION HORIZONTAL CLEARANCE              0075 FT

      ******************************************************

      SUFFICIENCY RATING = *094.2
      STATUS = NO SIGNIFICANT DEFICIENCY

      ********** CLASSIFICATION *****************  CODE
(112) NBIS BRIDGE LENGTH                               YES
(104) HIGHWAY SYSTEM     - STRUCTURE IS NOT ON NHS       0
(26) FUNCTIONAL CLASS    - URBAN MINOR ARTERIAL         16
(100) DEFENSE HIGHWAY    - NOT A DEFENSE HIGHWAY         0
(101) PARALLEL STRUCTURE    - RIGHT STRUCTURE            R
(102) DIRECTION OF TRAFFIC - ONE WAY TRAFFIC             1
(103) TEMPORARY STRUCTURE  - NOT APPLICABLE              N
(110) DESIGNATED NATIONAL NETWORK - NOT PART OF N        0
(20) TOLL      - ON FREE ROAD                            3
(21) MAINTAIN  - STATE HIGHWAY AGENCY                   01
(22) OWNER     - STATE HIGHWAY AGENCY                   01
(37) HISTORICAL SIGNIFICANCE - NOT ELIGIBLE FOR          5

      ********** CONDITION ************************ CODE
(58) DECK                                                7
(59) SUPERSTRUCTURE                                      8
(60) SUBSTRUCTURE                                        7
(61) CHANNEL & CHANNEL PROTECTION                        7
(62) CULVERTS                                            N

      ********** LOAD RATING AND POSTING ******** CODE
(31) DESIGN LOAD        -                   UNKNOWN      0
(64) OPERATING RATING -                  HS-20 TRU    252
(66) INVENTORY RATING -                  HS-20 TRU    245
(70) BRIDGE POSTING     - EQ OR GT LEGAL LOAD NO P       5
(41) STRUCTURE OPEN, POSTED OR CLOSED -                  A
        DESCRIPTION - OPEN, NO RESTRICTION

      ********** APPRAISAL ********************** CODE
(67) STRUCTURAL EVALUATION                               *
(68) DECK GEOMETRY                                       7
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL              N
(71) WATERWAY ADEQUACY                                   8
(72) APPROACH ROADWAY ALIGNMENT                          8
(36) TRAFFIC SAFETY FEATURES                          1111
(113) SCOUR CRITICAL BRIDGES                             6

      ********** PROPOSED IMPROVEMENTS **************
(75) TYPE OF WORK - NO IMPROVEMENT PLANNED   CODE  001
(76) LENGTH OF STRUCTURE IMPROVEMENT         001632 FT
(94) BRIDGE IMPROVEMENT COST              $     252,000
(95) ROADWAY IMPROVEMENT COST             $        ,000
(96) TOTAL PROJECT COST                   $     311,000
(97) YEAR OF IMPROVEMENT COST ESTIMATE               20
(114) FUTURE ADT                                  019518
(115) YEAR OF FUTURE ADT                            2011

      ********** INSPECTIONS ************************
(90) INSPECTION DATE    92/02    (91) FREQUENCY   24 MO
(92) CRITICAL FEATURE INSPECTION:          (93) CFI DATE
   A) FRACTURE CRIT DETAIL - NO        MO   A)
   B) UNDERWATER INSP      - YES    24 MO   B)    88 10
   C) OTHER SPECIAL INSP   - NO     __ MO   C)
```