MASTER PLAN REPORT



FLORIDA DEPARTMENT OF TRANSPORTATION

THE GREINER TEAM


PLANNING FOR TOMORROW
I-4
I-75
I-275
TAMPA INTERSTATE STUDY

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J-6 PAVEMENT CONDITION SURVEY DESIGN SEGMENTS 5F, 5G AND 6A
J-7 PAVEMENT CONDITION SURVEY DESIGN SEGMENTS 6A AND 6B
J-8 PAVEMENT CONDITION SURVEY DESIGN SEGMENT 6B
J-9 SOIL SURVEY LEGEND AND NOTES
J-10 SOIL SURVEY KEY MAP
J-11 SOIL SURVEY DESIGN SEGMENTS 1A AND 2A
J-12 SOIL SURVEY DESIGN SEGMENTS 2B, 3A, 3B, 5S AND 5A
J-13 SOIL SURVEY DESIGN SEGMENTS 4A, 4B AND 4C
J-14 SOIL SURVEY DESIGN SEGMENTS 5A, 5B, 5C, 5D, 5E AND 5F
J-15 SOIL SURVEY DESIGN SEGMENTS 5F, 5G AND 6A
J-16 SOIL SURVEY DESIGN SEGMENTS 6A AND 6B
J-17 SOIL SURVEY DESIGN SEGMENT 6B

I. EXECUTIVE SUMMARY

Introduction

The Tampa Interstate System, shown on Exhibit I-1, is the cornerstone of the Tampa Bay Area's surface transportation system, now and in the future. A majority of inter-urban automobile and truck travel is carried on the interstate system. A balanced transportation system, particularly an integrated system encompassing aviation, marine, rail, transit and highway, is an integral element of a region's economic viability. This is particularly true of Tampa and the Tampa Bay Area. The Tampa interstate routes provide key links to all of the urban areas and are recognized as the most important regional highway system in the Tampa Bay Area.

The February 1989 white paper entitled Future Of Hillsborough Transportation Concepts prepared for the Florida House of Representatives Public Transportation Committee stated clearly the significant role played by the interstate system in the region's transportation system and identified the Tampa Interstate Study's proposed reconstruction of Interstate 275 (I-275), Interstate 4 (I-4) and Interstate 75 (I-75) as a "priority project."

Similar official recognition for a major reconstruction of the interstate system is found in the Tampa Urban Area Metropolitan Planning Organization's Year 2010 Long Range Transportation Plan for Hillsborough County. This document provides for a minimum of eight interstate freeway lanes throughout Tampa in the year 2010.

The planning of interstate reconstruction has included close coordination with the Hillsborough County Rail Transit Study consultant. Travel demand estimates for both the Tampa Interstate Study and the Rail Transit Study were derived from the same base model and developed jointly by the respective consultant teams; thus insuring Tampa of a truly balanced program of transportation improvements into the next century.

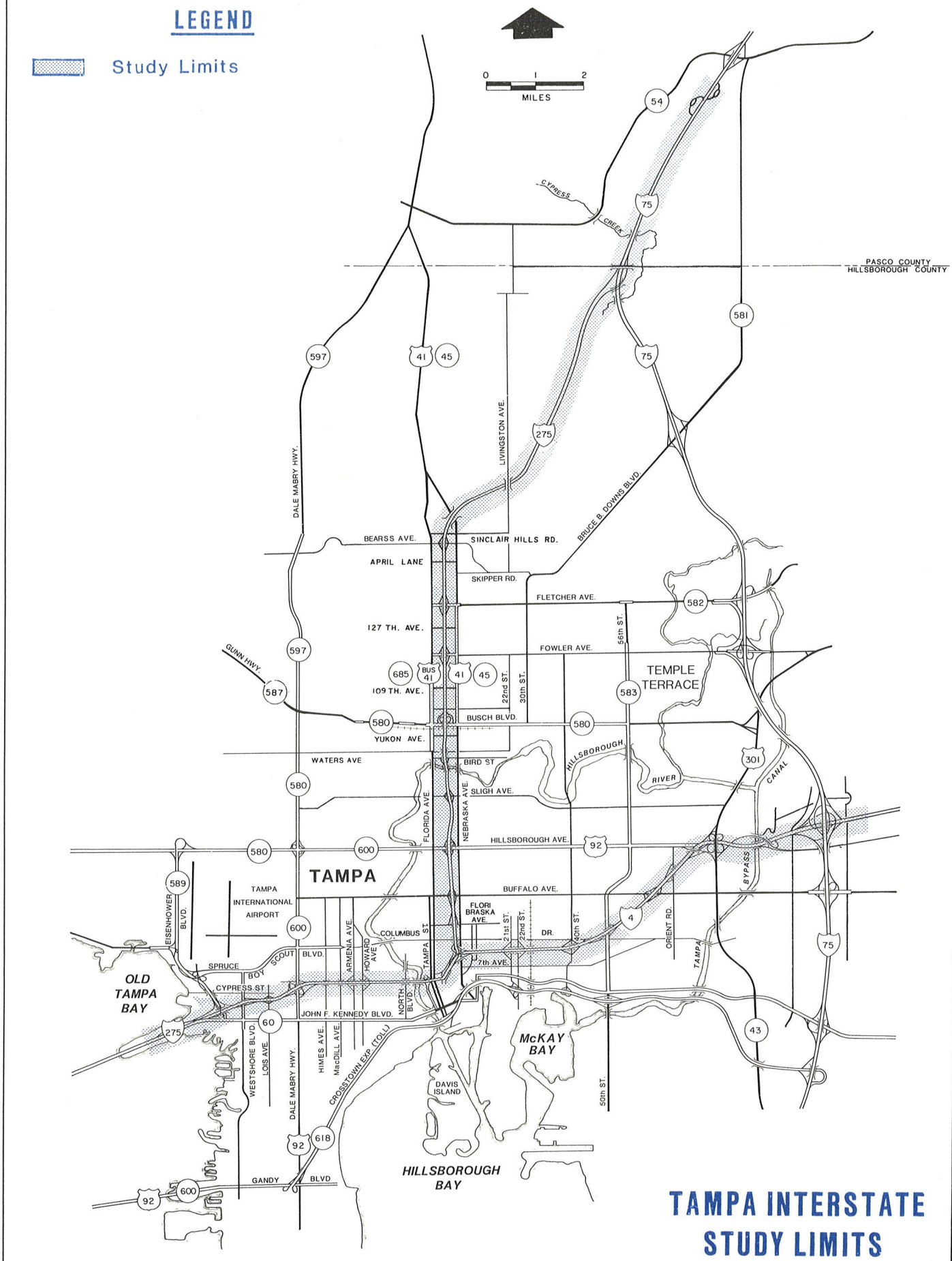
This integrated and coordinated multi-modal approach to transportation system evaluations is unprecedented in Tampa's transportation history, and is a reflection of the universal agreement amongst the agencies and citizens that a broad reaching solution to urban mobility problems is essential for Tampa and the Bay Area.

The Tampa Interstate Study (TIS) began in September 1987. The impetus of the TIS results from previous studies identifying a need to improve an antiquated interstate system built in the early 1960's.

The TIS instituted one of the most intensive public involvement programs associated with such a study. Features of the TIS public involvement program included a specific project office and public information phone service, a speakers bureau, a Citizens Advisory Committee, an Agency Task Force, a city/county/regional officials presentation plan, a comprehensive print/radio/media plan, numerous local meetings with special interest groups, and three major informational workshops which provided a means of public input.

The Agency Task Force provided the opportunity for diverse public interests to participate in the Phase I Master Plan. Further participation in Phase II Environmental and Preliminary Engineering studies by these agencies provides the opportunity for discussion of treatment of local infrastructure problems through joint project agreements concerning local streets, drainage, utilities and other issues.

In addition to the Master Plan and its associated concepts, the TIS has produced some 30 Working Papers, 11 Technical Reports, six Technical Memorandums and three Concept Reports. These documents are associated with the project's study elements, and have provided extensive engineering and planning data that was previously non-existent. This data has led to new definitions concerning the way engineers and planners have looked



TAMPA INTERSTATE STUDY LIMITS

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EXHIBIT I-1

at this specific interstate system and will most likely serve as a framework for the means to arrive at a logical approach for reconstruction of similar systems throughout Florida and the United States.

Because Phase I, the Master Planning process, has ended, it is extremely important that Phase II (Environmental Documentation) be initiated to ensure continued public consensus and momentum gained during Phase I. Phase II will be an 18 month process that will produce documents which will fully address, in detail, all impacts associated with reconstruction of the 36.6 miles of freeway presented in this Master Plan. Additionally, and equally as important, these documents will serve as a source of Federal Highway Administration (FHWA) approval to release funds to design, purchase rights-of-way and construct the concepts presented in this Master Plan.

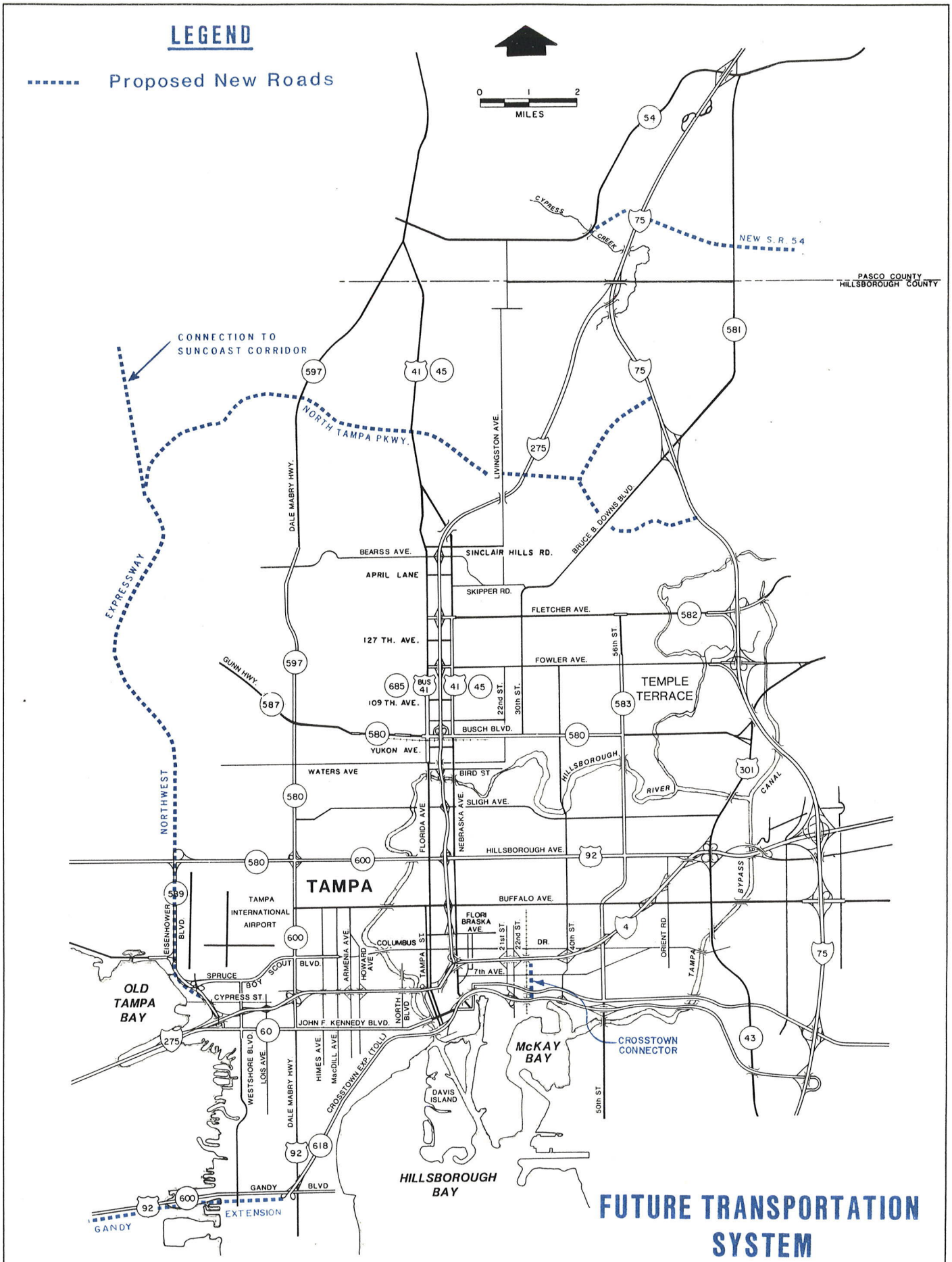
Future planning efforts, relating to the adopted Metropolitan Planning Organization (MPO) Long Range Transportation Plan, clearly indicate that the reconstruction of the interstate system is a basic component of their plan; without the primary interstate system the other associated freeways, expressways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

Several major transportation projects that will connect to the reconstructed Tampa Interstate System, or are integrated system linkages, are shown on Exhibit I-2. These transportation improvements are integral to the overall future system and will provide travel opportunities unknown by today's Tampa traveler. The Northwest Expressway, North Tampa Parkway, I-4/Crosstown Connector and the Gandy/Crosstown Extension will form key segments of the Florida Department of Transportation's (FDOT) proposed urban expressway loop system. The rail transit corridors will provide peak travel opportunities for the overburdened surface highway system in the 21st century.

These key transportation improvements, and those of the currently adopted Year 2010 MPO Long Range Transportation Plan are assumed to be part of the transportation system served by the interstate after its reconstruction.

Master Plan Concept

At the initiation of the TIS, several hundred alternatives were possible as a result of various alignment shifts, geometric variations and combinations of two-roadway and four-roadway systems. In order to effectively deal with what could be an overwhelming number of alternatives, TIS utilized a unique process known as Tier Analysis. Section V, Tier Evaluation Process, discusses in detail the alternatives that were refined and screened in a logical process to reach a final Master Plan Concept. The following listing describes in detail the recommended Master Plan selected by the tier evaluation process. Exhibits I-3 through I-11, following the Master Plan listing, show the conceptual geometry on 1"=1,000' scale aerial photography. The entire Master Plan Concept is presented at 1"=100' scale in the Attached Plans and Illustrations appended to this report.



FUTURE TRANSPORTATION SYSTEM

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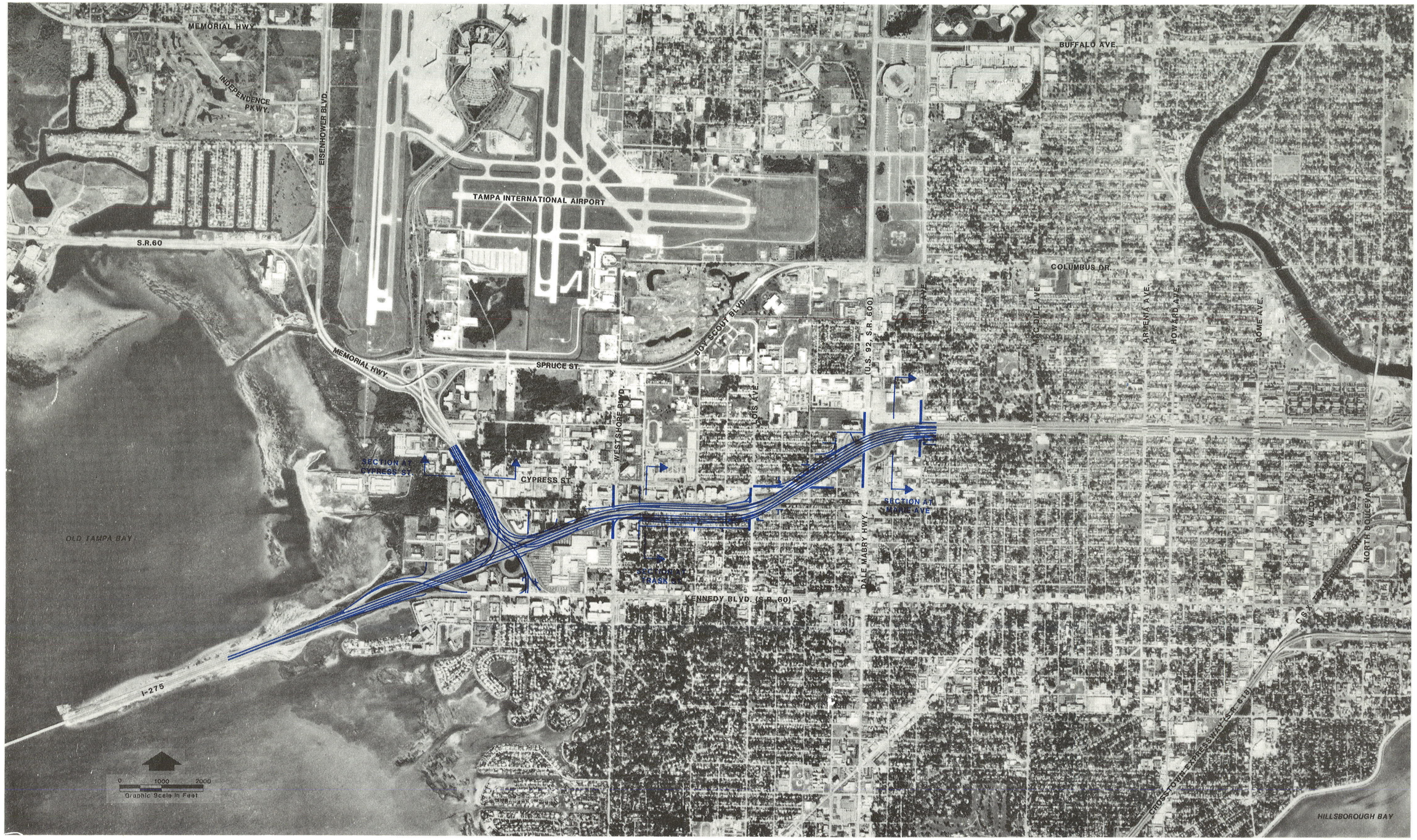
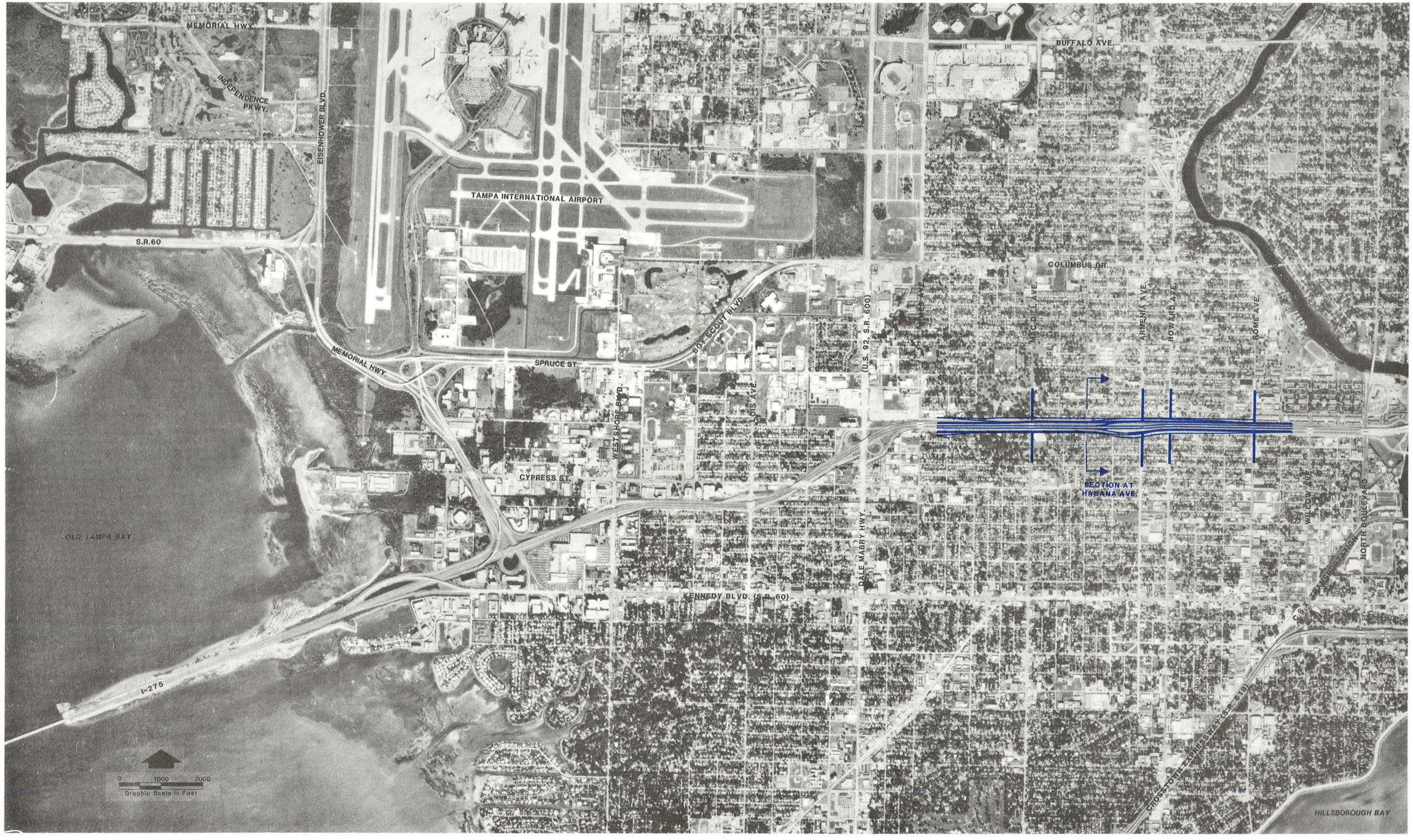
EXHIBIT I-2



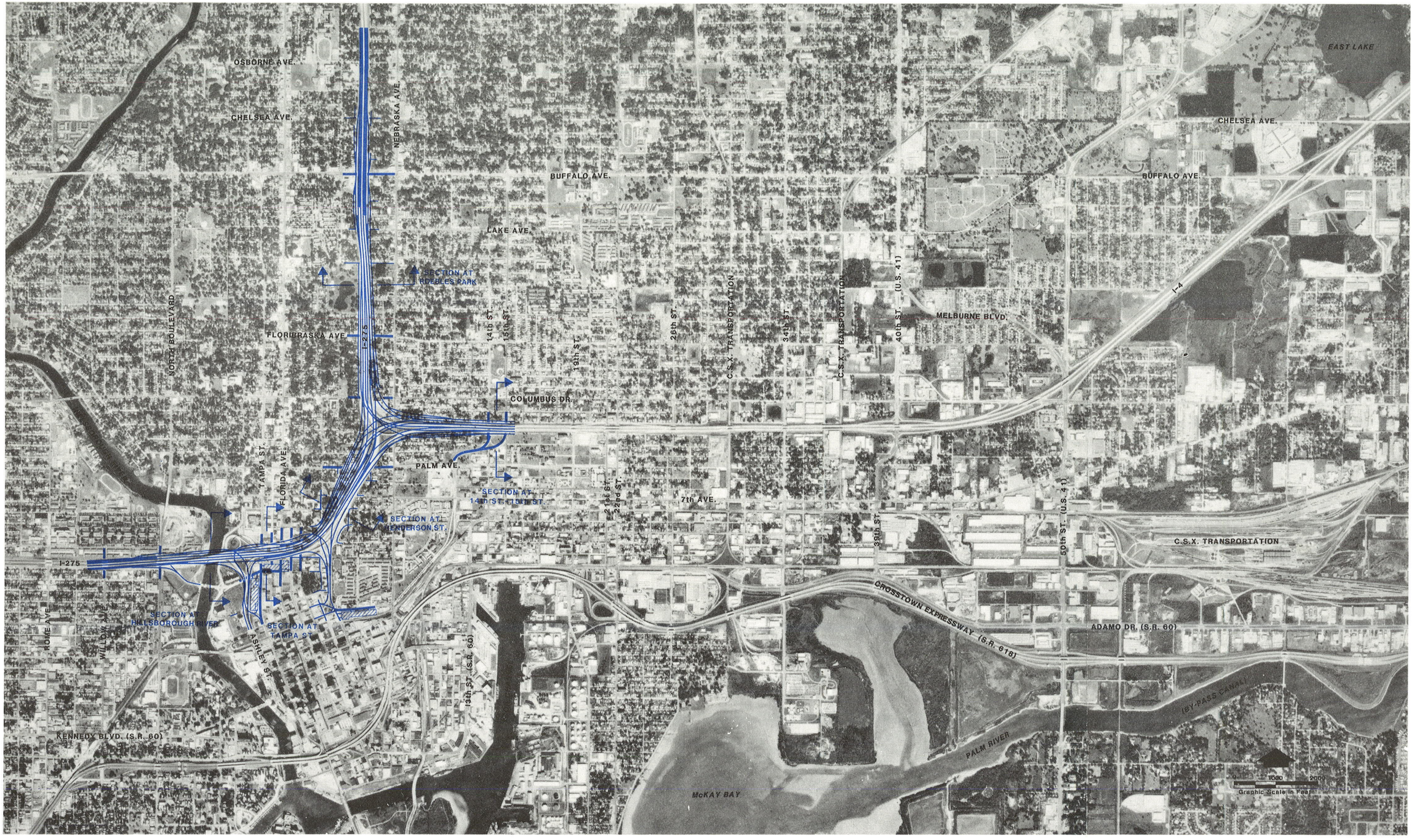
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A

EXHIBIT I-3



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2A

EXHIBIT I-4



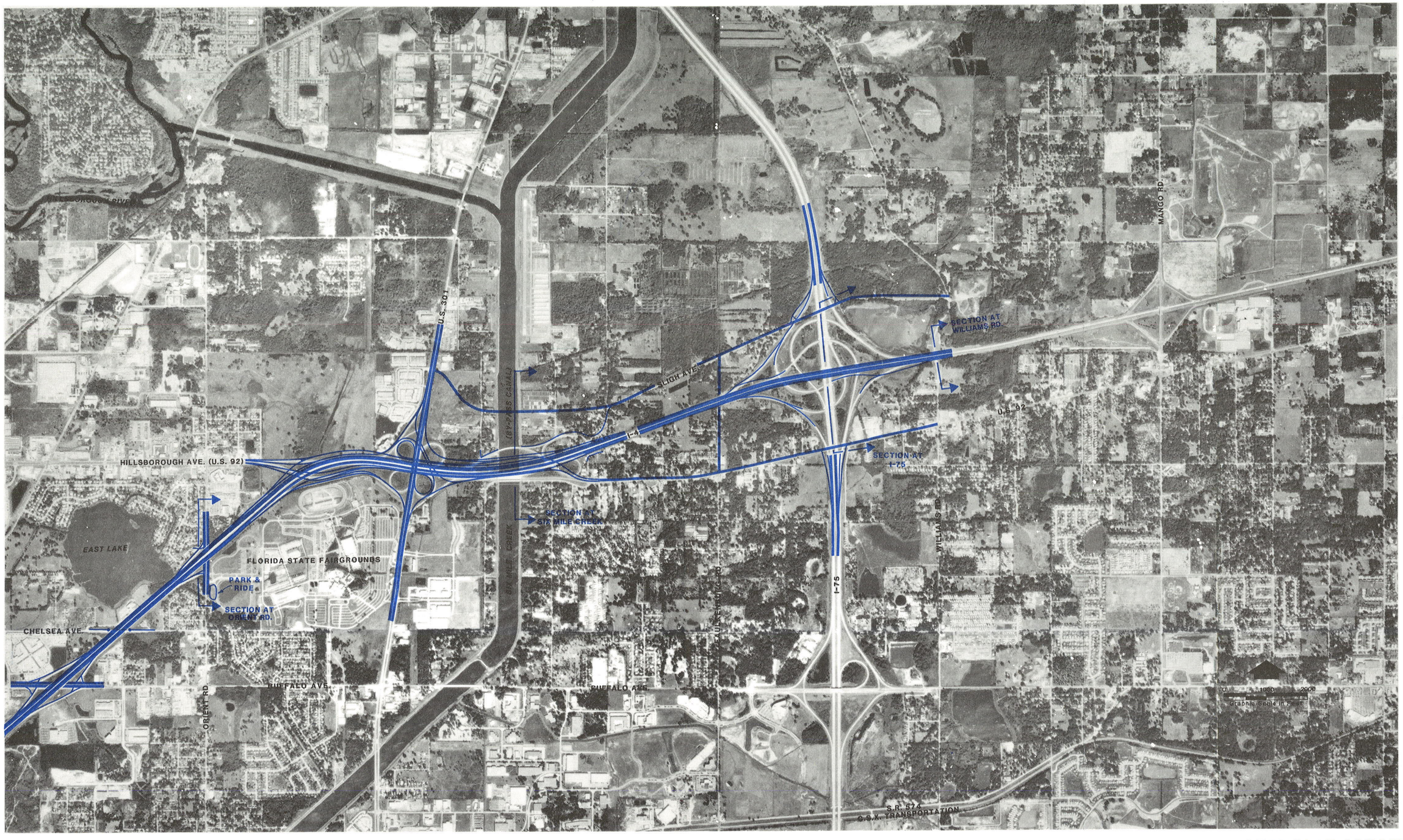
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B

EXHIBIT I-5



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENTS 3A AND 3B

EXHIBIT I-6



MASTER PLAN CONCEPT DESIGN STUDY SEGMENTS 4A, 4B, AND 4C

EXHIBIT I-7

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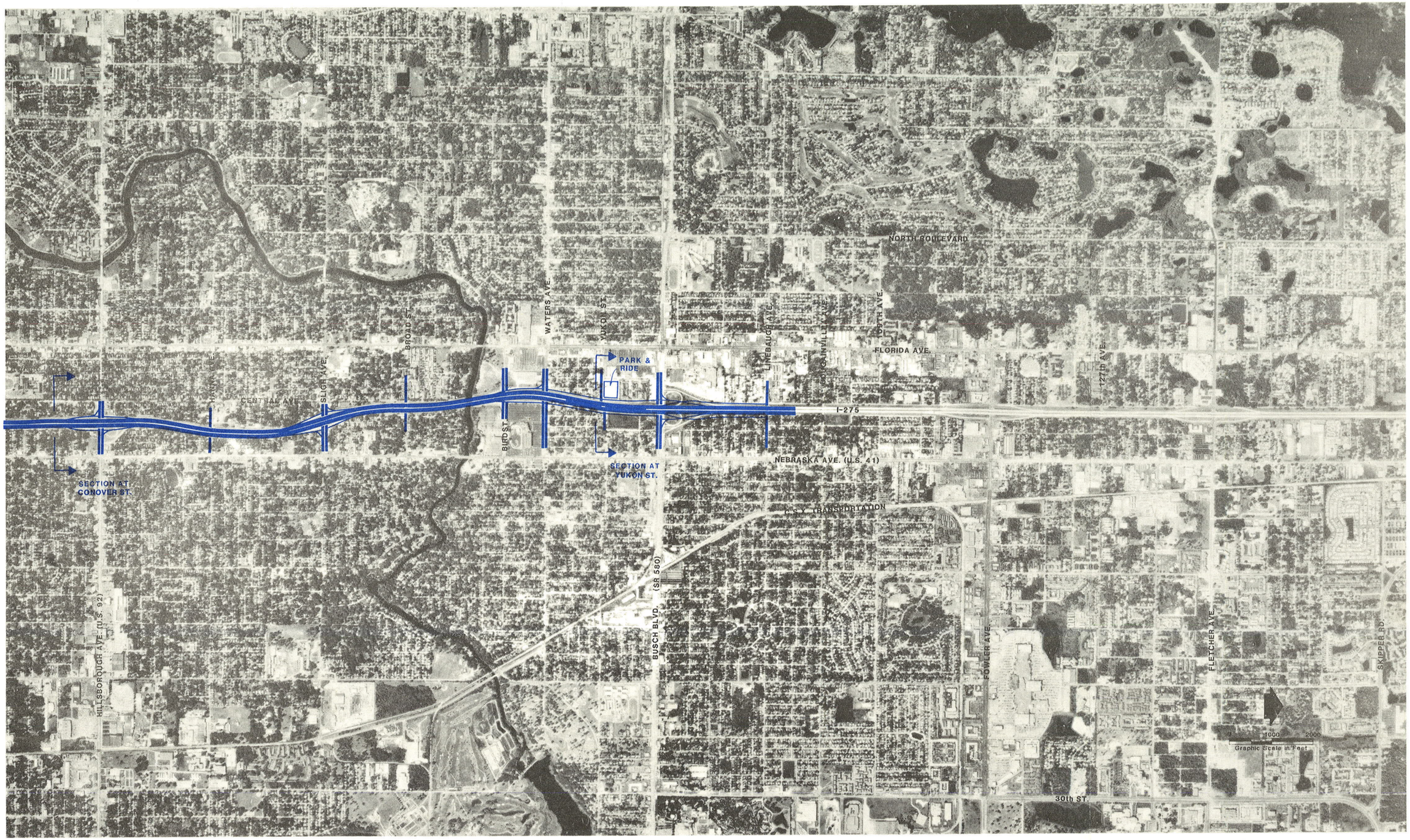
TAMPA INTERSTATE STUDY THE GREINER TEAM



MASTER PLAN CONCEPT DESIGN STUDY SEGMENTS 5A,5B,5C AND 5D

EXHIBIT I-8

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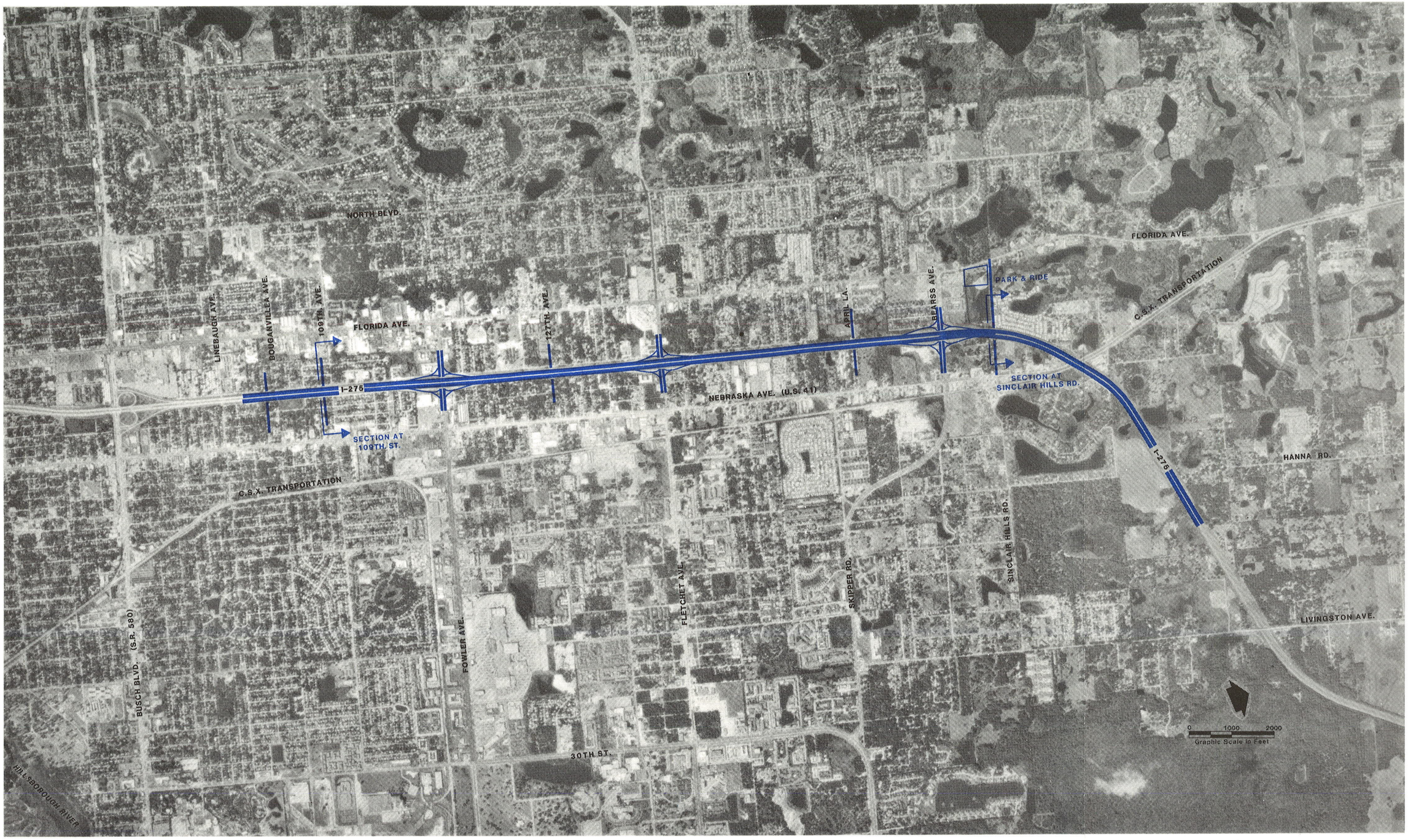
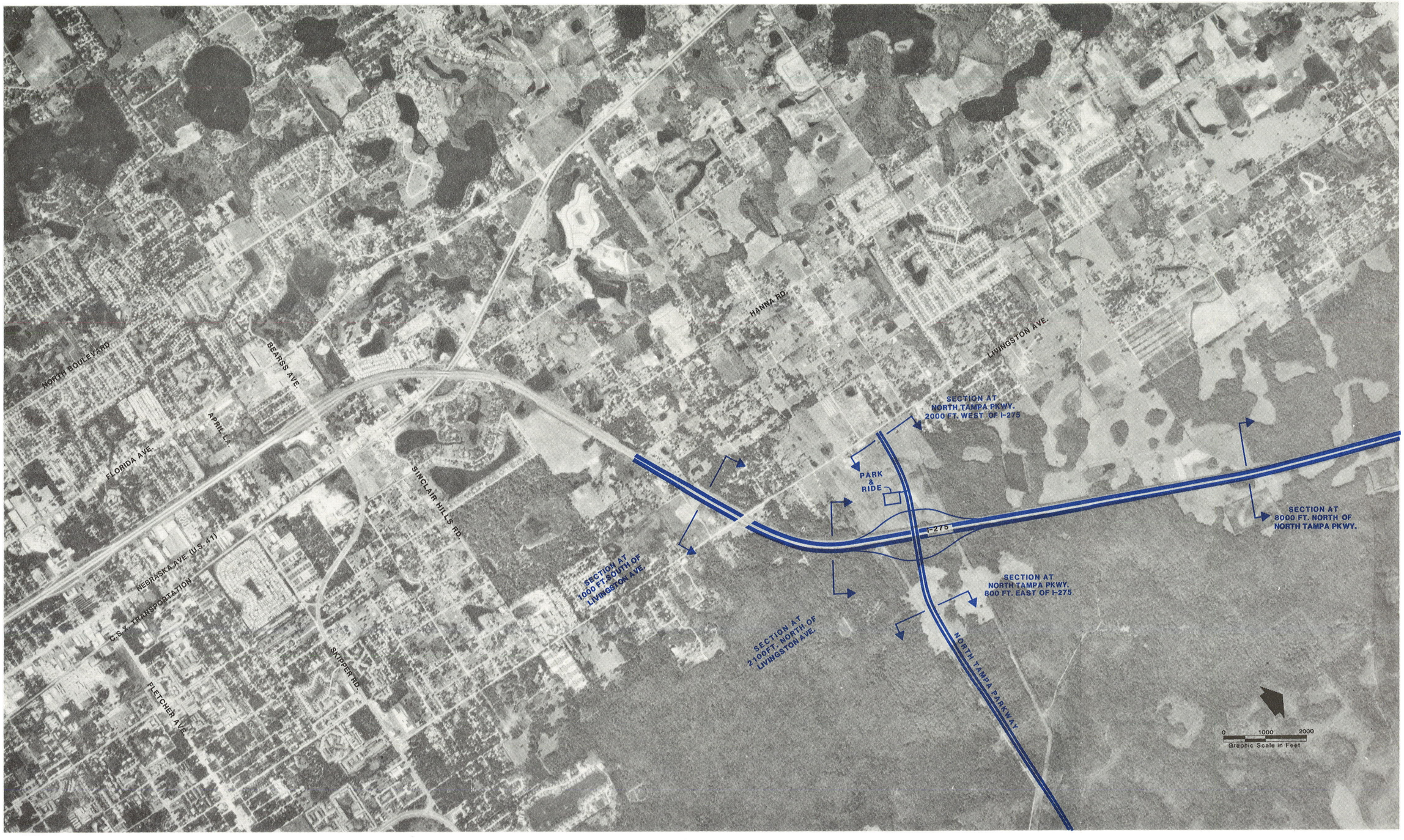


MASTER PLAN CONCEPT
DESIGN STUDY SEGMENTS 5E,5F AND 5G

EXHIBIT I-9



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A

EXHIBIT I-10 (1 of 2)

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TAMPA INTERSTATE STUDY THE GREINER TEAM



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A

EXHIBIT 1-10 (2 of 2)

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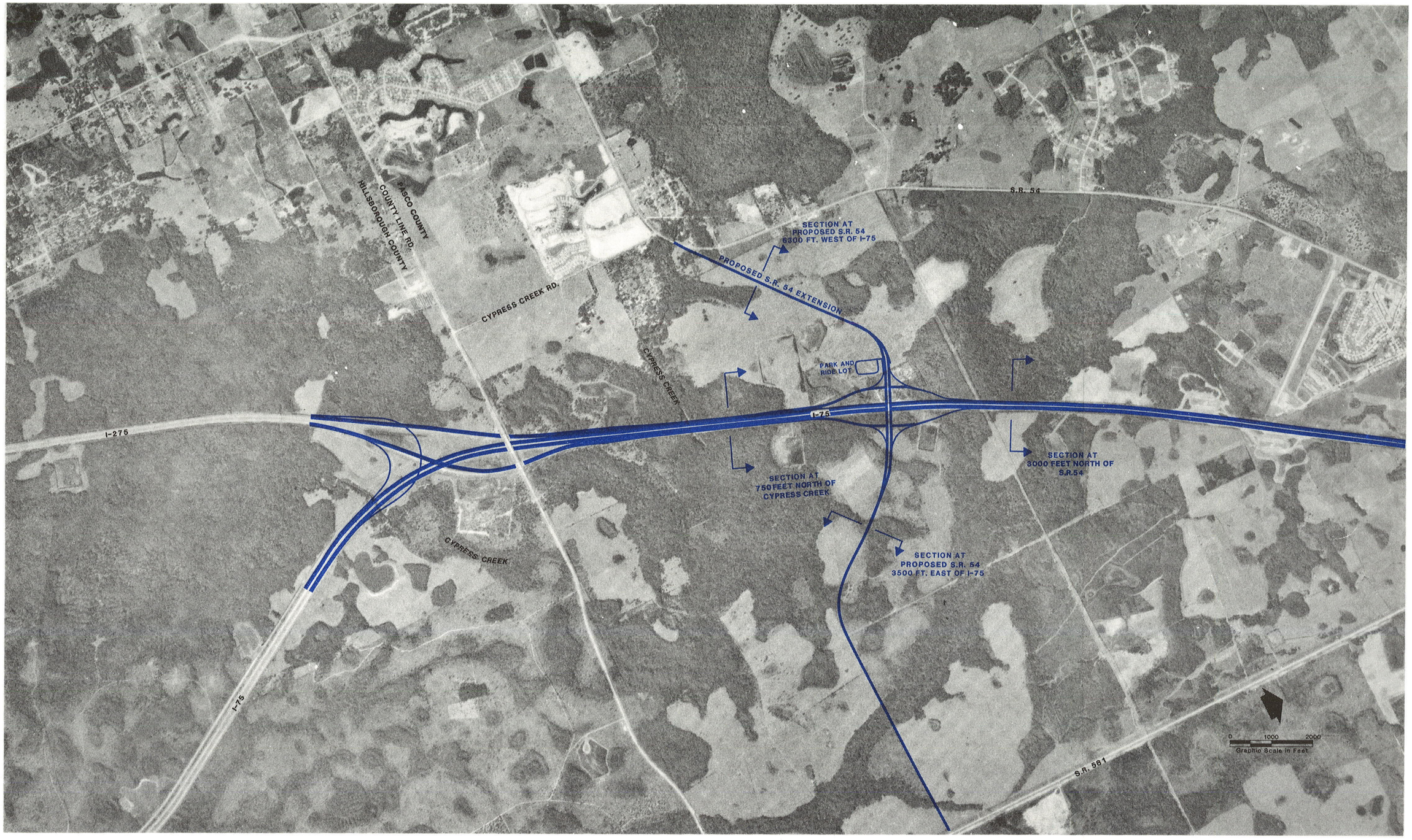
TAMPA INTERSTATE STUDY THE GREINER TEAM



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B

EXHIBIT I-11 (1 of 2)

A Florida Department of Transportation Project



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B

EXHIBIT I-11 (2 of 2)

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY THE GREINER TEAM

Design Segment 1A - 3.8 Miles

Interstate 275 from Howard Frankland Bridge to East of Himes Avenue
(Westshore Area)

* Four-roadway system - interstate express lanes and separated local access freeway lanes
* High Occupancy Vehicle (HOV)/Transitway Lanes within the interstate alignment beginning at the Howard Frankland Bridge
* HOV priority ramps to and from the east on I-275 at Trask Street
* Direct I-275 connection to the Northwest Expressway
* Direct ramps from Memorial Highway and Kennedy Boulevard to the Northwest Expressway
* 62.5:1 FAA flight path clearance for Tampa International Airport
* Existing interchange locations at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway remain
* New interchange providing ramps to and from the east on I-275 at Himes Avenue
* New Sherrill Street extension north from Memorial Highway and Kennedy Boulevard through I-275 to Spruce Street
* New Lemon Street Connector to Westshore Boulevard from Occident Street
* First Priority Reconstruction Segment

Design Segment 2A - 1.6 Miles

Interstate 275 from east of Himes Avenue to east of Rome Avenue
(West Tampa Area)

* Four-roadway system - interstate express lanes and separated local access freeway lanes
* Alignment shifted south of existing centerline to avoid McFarland Park and West Tampa Historic District
* High Occupancy Vehicle (HOV)/Transitway Lanes within the interstate alignment
* Split interchange ramps at Howard Avenue and Armenia Avenue remain
* New interchange ramps at Himes Avenue to and from the east on I-275
* Maintain northside frontage road between Himes Avenue and Rome Avenue
* Second Priority Reconstruction Segment

Design Segment 2B - 3.9 Miles

Interstate 275 from east of Rome Avenue to north of Buffalo Avenue
Interstate 4 from the Interstate 275 Junction east to 14th Street
(Central Business District)

* Four-roadway system transition to two-roadway system north of Buffalo Avenue on I-275
* Four-roadway system east of 14th Street on I-4
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* Westside Central Business District distributor interchange at Ashley/Tampa Streets serving all movements

* Eastside Central Business District distributor interchange at Jefferson/Orange Streets serving all movements
* New West Bank Central Business District interchange ramps to and from the west on I-275 at North Boulevard
* New Ybor City/Eastside Central Business District interchange on I-4 at 14th and 15th Streets
* Remove interchange ramps at Scott and Kay Streets to and from the west on I-275
* Relocate planned Marion Street Transit Parkway North Terminal to a location on Marion Street south of Scott Street
* Second Priority Reconstruction Segment

Design Segments 3A and 3B - 3.3 Miles

Interstate 4 from 14th Street to east of 50th Street
(Ybor City Area)

* Four-roadway system transitioning to two-roadway system at 50th Street
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* New Ybor City/Eastside Central Business District interchange on I-4 at 14th and 15th Streets
* Extension of 14th and 15th Street ramps as parallel local frontage roads to 21st and 22nd Streets
* Remove I-4 interchange ramps at 21st and 22nd Streets
* Remove I-4 overpass of 19th Street
* New directional freeway to freeway interchange with Crosstown Expressway Connector on I-4 at 30th Street
* Remove I-4 interchange ramps at 40th Street
* Reconfigure split interchange at Columbus Avenue and 50th Street on I-4
* First Priority Reconstruction Segment

Design Segments 4A through 4C - 5.5 Miles

Interstate 4 from east of 50th Street to east of Interstate 75 interchange
(East Tampa Area)

* Two-roadway system on I-4 beginning east of 50th Street
* High Occupancy Vehicle (HOV)/Transitway Lanes beginning and ending west of I-75
* HOV priority ramps to and from the west on I-4 at Orient Road with access to new HOV park-n-ride lot
* Existing interchange locations at Buffalo Avenue, Orient Road, U.S. 92, U.S. 301 and I-75 remain
* Remove Chelsea Avenue overpass
* Partial cloverleaf interchange at U.S. 301 with flyover ramps for south to west and north to east movements
* U.S. 92 on separate alignment with ramps to I-4 and U.S. 301
* Retain Garden Lane Road Bridge across By Pass Canal

* New extension of Faulkenburg Road across I-4 between U.S. 92 and Sligh Avenue
* New extension of Sligh Avenue from Williams Road west to U.S. 301 across By Pass Canal
* New interchange ramps at Sligh Avenue to and from north on I-75
* New interchange ramps at U.S. 92 to and from south on I-75
* Third Priority Reconstruction Segment

Design Segments 5A through 5D - 3.8 Miles

Interstate 275 from north of Buffalo Avenue to north of Linebaugh Avenue (Seminole Heights, Sulphur Springs Areas)

* Two-roadway system on I-275 beginning north of Buffalo Avenue
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* HOV priority ramps to and from the north and south on I-275 at Yukon Street accessing existing park-n-ride lot
* Existing interchange locations at Hillsborough Avenue, Sligh Avenue, and Busch Boulevard remain
* One-way Frontage Roads from Bird Street to Busch Boulevard parallel to I-275
* Relocation of Bird Street interchange ramps to Waters Avenue to and from the south on I-275
* New interchange ramps at Linebaugh Avenue to and from the south on I-275
* Third Priority Reconstruction Segment

Design Segments 5E through 5G - 4.7 Miles

Interstate 275 from north of Linebaugh Avenue to north of Livingston Avenue (University North Area)

* Two-roadway system on I-275
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* HOV priority ramp to and from south on I-275 via Sinclair Hills Road with access to new HOV park-n-ride lot
* Interchange locations at Fowler Avenue, Fletcher Avenue and Bearss Avenue remain
* New underpasses through I-275 at 109th Avenue, April Lane and Sinclair Hills Road
* Third Priority Reconstruction Segment

Design Segment 6A - 4.5 Miles

Interstate 275 from north of Livingston Avenue to the Hillsborough/Pasco County Line

* Two-roadway system on I-275
* I-275 reconstructed as six-lane roadway

* High Occupancy Vehicle (HOV)/Transitway Lanes beginning and ending north of Livingston Avenue on I-275
* New interchange at North Tampa Parkway
* New HOV park-n-ride lot at North Tampa Parkway interchange
* Third Priority Reconstruction Segment

Design Segment 6B - 5.5 Miles

Interstate 75 from Hillsborough/Pasco County Line to south of S.R. 54 in Pasco County

* Two-roadway system on I-275
* I-275 six-lane roadway joining I-75 six-lane roadway
* Transition from twelve lanes to ten lanes between County Line Road and New S.R. 54. Eight lanes north of New S.R. 54, and six lanes north of existing S.R. 54
* Directional flyover ramps from I-275 northbound to I-75 southbound and I-75 northbound to I-275 southbound
* New interchange at New S.R. 54 on I-75
* New HOV park-n-ride lot at New S.R. 54 interchange
* First Priority Reconstruction Segment

Priority Reconstruction Sequence

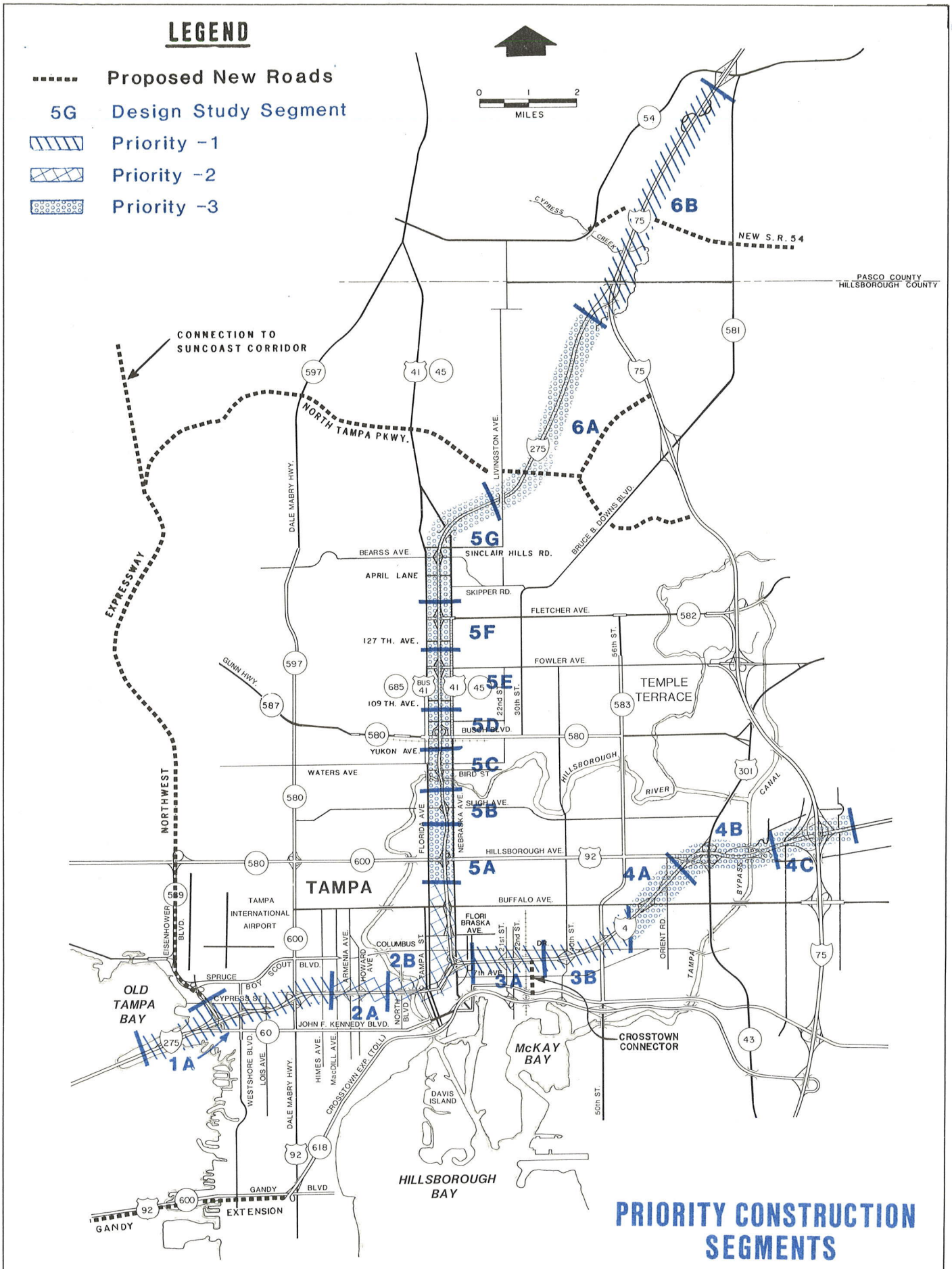
Early in the TIS a logical series of planning and design segments were identified. These segments will be used during and after the study process to accomplish the objectives of the Master Plan as well as establish funding and construction staging.

The project limits have been divided into six major study segments. Each of these study segments represent individual segments for which logical termini have been established. These six study segments were further subdivided into individual design segments.

Preliminary evaluations to determine the rank or priority of the six study segments were initiated early in the study. The primary purpose of segment prioritization was to determine planning, design, funding and construction sequencing. By prioritizing these segments, timely and efficient allocation of manpower and financial resources can occur, thereby maximizing improvements to the existing transportation system. Key considerations in determining priority staging included estimated cost, construction complexity, environmental impacts, and the ability of each segment to connect to existing or proposed roadways adjacent to the project in order to divert and maintain traffic during construction.

Three priority rankings were established and are presented on Exhibit I-12. Priority One includes the areas of the I-4 and Crosstown Connector (Segments 3A and 3B); the I-275/Northwest Expressway interchange (Segment 1A); and the New S.R. 54/I-75 interchange (Segment 6B). These priority areas have been established on a needs basis and provide an effective means to give motorists a choice to avoid reconstruction as it begins on the remaining segments.

Priority Two reconstruction encompasses the Tampa Central Business District (CBD) area and the downtown interchange of I-4 and I-275 (Segments 2A and 2B). Although the need for immediate improvements in



PRIORITY CONSTRUCTION SEGMENTS

A Florida Department of Transportation Project

EXHIBIT I-12

this area is recognized, it is necessary to complete those improvements in the priority one segments in order to allow motorists an alternative route when traveling through this area during reconstruction.

Priority Three includes the remaining segments of I-275 north of the downtown interchange to the apex of I-275 and I-75 (Segments 5A, 5B, 5C, 5D, 5E, 5F, 5G, and 6A), and I-4 east of 50th Street to the interchange of I-4 and I-75 (Segments 4A, 4B, and 4C).

There are significant transportation system benefits from the reconstruction priorities presented on Exhibit I-14. The primary benefit for interstate system travelers will be the direct connection of I-4 with the Crosstown Expressway in the Ybor City area (Design Segments 3A and 3B), and the direct connection of the Northwest Expressway with I-275 in the Westshore area (Design Segment 1A). These expressway network linkages, coupled with the new corridor connections of S.R. 54 (Desgin Segment 6B) and the North Tampa Parkway (Design Segment 6A), have the potential for allowing up to 100,000 trips per day to bypass the I-275/I-4 CBD interchange. This ability to divert significant traffic from the existing interstate corridors near the CBD interchange is part of the plan to maintain travel in the urban core during the reconstruction process for Priority Two segments (Design Segments 2A and 2B).

Utilization of these priority segments as a planning tool for construction sequencing and funding should assist in allowing an efficient and timely method of reconstruction to the interstate system through the Tampa area. This process will be developed further in Phase II activities.

Financial Analysis

A critical component of the Tampa Interstate Study is the evaluation of the project's economic desirability and financial viability. The financial analysis structures the process for implementation and identifies the degree and form of public participation and private sector involvement necessary in the project.

The first step in the process involves estimating project costs and timing. Costs include engineering, design, right-of-way acquisition, and construction of the facility. The timing of construction determines FDOT's annual cash requirements. Once project costs and the construction schedule are established, two analytical techniques are used to assess financial feasibility:

* Cost-Effectiveness Analysis
* Cash Flow Analysis

In the cost-effectiveness analysis, the social profitability, or economic desirability of the Master Plan improvements will be determined by comparing road user benefits with the project's costs. Financial viability is assessed in the cash flow analysis, where the timing of capital outlays and cash receipts are determined to assure sufficient funding is available to cover outflow requirements.

The components of the financial analysis, cost-effectiveness analysis, and cash flow analysis are discussed in the following sections.

Cost-Effectiveness Analysis

In this section of the report, a summary of the results of the cost-effectiveness analysis of the Master Plan improvements is presented. The analysis is described in greater detail in the TIS Task G.2.b. Cost-Effectiveness Analysis Working Paper.

The analysis has been conducted in order to define, in economic terms, the net benefits which can be expected to result if the TIS Master Plan improvements are undertaken. The analysis compares the costs of implementing the interstate improvements with the road user benefits which can be expected to accrue from having the improvements in place. Costs include engineering, design, right-of-way acquisition, construction, maintenance, and operation of the new facility. Benefits include the reduction in road-user costs which would be expected to result from more efficient and safer traffic operations due to the improvements to the interstate network.

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

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

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

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

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

* User Benefits - The reduction in annual road user costs (the road user costs of the "No-Build" alternative less the road user costs of the Master Plan alternative).
* Project Costs - The difference between the investment costs of the Master Plan improvements and any improvement costs required for the "No-Build" scenario.
* Operating and Maintenance Costs - The change in annual maintenance and operating costs due to the construction of the improvement.
* Residual Value - The remaining value of the improved facility at the end of the analysis period.

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

User Benefits

A travel demand model was used to estimate vehicle miles traveled and average speeds on the improved interstate and on the existing (or "No-Build") network for the year 2010. Using AASHTO's methodology, total road users costs were determined for three cost components - vehicle operating costs, vehicle travel time costs

and accident costs. The benefits of the Master Plan improvements are equal to the reductions in road user costs attributable to the project. These benefits represent the opportunity costs that would be incurred by road users if the improvements are not made. In other words, the improvements provide an opportunity for road users to reduce travel costs by operating on a safer and more efficient roadway. As long as road users travel on the unimproved network, opportunity costs continue to increase.

Road user costs for the "No-Build" and Master Plan alternatives are presented in Table I-1. As shown in the table, the Master Plan improvements will reduce daily vehicle miles traveled by 563,000 miles and daily road user costs by approximately $1.8 million in the year 2010, which is equivalent to annual benefits of $650 million. Benefits were calculated back to the year 1997, which is assumed to be the opening year after completion of the first phase of the project, based on a three (3) percent annual growth in traffic and the percentage of the Master Plan improvements completed in each year. Based on these assumptions, annual road user benefits in 1997 will be approximately $122 million.

TABLE I-1

ROAD USER BENEFITS IN YEAR 2010
Tampa Interstate Study

	Daily Vehicle Miles Traveled	Daily Highway User Cost	Cost/VMT
"No-Build"	42,257,000	$25,668,200	$0.6074
Master Plan	41,694,000	23,888,365	0.5729
Savings	563,000	$1,779,835*	0.0345

*Daily User Benefits of Master Plan Improvement

Project Costs

Project costs include engineering, design, right-of-way acquisition, and construction of the facility. For this analysis, it is assumed that construction activity would span a 12 year period beginning in 1995. A summary of the costs for the "No-Build" and Master Plan alternatives is provided in Table I-2.

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

Master Plan project costs for the TIS were developed using the FDOT's Long Range Estimate (LRE) program. The LRE is a computerized program that generates items, quantities and unit prices for new construction, resurfacing and widening projects. The total estimated project costs for the TIS by Design Segment are listed in Table I-3. Utility relocation costs are not included in the table, but will be developed during Phase II studies.

TABLE I-2

NO BUILD AND MASTER PLAN COST COMPARISON
Tampa Interstate Study

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

* Includes roadway, bridges and bridge demolition.
** Includes engineering, CEI, legal and administrative, design and change order contingencies.

TABLE I-3

MASTER PLAN
ESTIMATED RIGHT-OF-WAY AND CONSTRUCTION COSTS
Tampa Interstate Study

Design Segment	Roadway/ Bridges	Engineering/ CEI	Contingency/ Legal/ Administrative	Sub-Total	Right-of-Way	Relocation	Total
1A	$196,350,092	$16,689,758	$38,122,203	$251,162,053	$34,980,000	$3,150,000	$289,292,053
2A	$65,455,464	$5,563,714	$5,458,986	$83,727,634	$14,850,000	$2,280,000	$100,857,634
2B	$325,557,213	$27,672,363	$27,151,472	$416,437,889	$89,172,000	$8,210,000	$513,819,889
3A	$68,577,681	$5,829,103	$5,719,379	$87,721,431	$28,699,800	$6,415,000	$122,836,231
3B	$60,607,044	$5,151,599	$5,054,627	$77,525,757	$10,467,900	$990,000	$88,983,657
4A	$38,294,852	$3,255,062	$3,193,791	$48,985,022	$10,794,900	$105,000	$59,884,922
4B	$60,496,017	$5,142,161	$5,045,368	$77,383,737	$23,058,600	$355,000	$100,797,337
4C	$14,930,555	$1,269,097	$1,245,208	$19,098,483	$7,417,200	$829,200	$27,344,883
5A	$29,029,217	$2,467,483	$2,421,037	$37,132,846	$1,063,500	$185,000	$38,381,346
5B	$24,858,659	$2,112,986	$2,073,212	$31,798,059	$5,750,700	$495,000	$38,043,759
5C	$38,061,127	$3,235,196	$3,174,298	$48,686,052	$3,268,500	$270,000	$52,224,552
5D	$38,067,806	$3,235,764	$3,174,855	$48,694,595	$2,509,500	$480,000	$51,684,095
5E	$25,480,318	$2,165,827	$2,125,059	$32,593,257	$2,757,900	$300,000	$35,651,157
5F	$17,753,188	$1,509,021	$1,480,616	$22,709,066	$2,740,650	$195,000	$25,644,716
5G	$40,524,967	$3,444,622	$3,379,782	$51,837,683	$4,333,350	$30,000	$56,201,033
6A	$13,012,757	$1,106,084	$1,085,264	$16,645,323	$3,915,000	$0	$20,560,323
6B	$22,261,898	$1,892,261	$1,856,642	$28,476,401	$4,785,000	$0	$33,261,401
TOTAL	$1,079,318,855	$91,742,103	$111,761,798	$1,380,615,290	$250,564,500	$24,289,200	$1,655,468,990

A construction schedule by design segment has been established for the project and is shown in Table I-4. Design Segments 1A, 3A, and 3B will be constructed beginning in 1995, which is the first year of the analysis period. It was assumed that 75 percent of the right-of-way will be acquired prior to 1995 and the balance during the first five years of the analysis period.

TABLE I-4

CONSTRUCTION SCHEDULE BY DESIGN SEGMENT
Tampa Interstate Study

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

Maintenance Costs

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

Residual Value

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

Results of the Cost-Effectiveness Analysis

The results of the cost-effectiveness analysis based on a discount rate of four percent are presented in Table I-5. Costs and benefits are expressed in constant 1989 dollars. When conducting a constant dollar analysis, AASHTO recommends using a four percent discount rate, which represents the real cost of capital for public investments. The table shows the incremental benefits and costs of the improvements and provides a "running computation" of NPV and B/C ratio. The payback period is the number of years required for the NPV to become positive and the B/C ratio to be greater than 1.0. The IRR is shown at the bottom of the table.

TABLE I-5

TIS MASTER PLAN
COST EFFECTIVENESS ANALYSIS
NET PRESENT VALUE AND BENEFIT/COST RATIO
(CONSTANT 1989 DOLLARS)

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

*ASSUMES DISCOUNT RATE = 4%
**NPV=PV(U)-[PV(I)+PV(M)-PV(R)]
***B/C=PV(U)/[PV(I)+PV(M)-PV(R)]

NOTE: INTERNAL RATE OF RETURN IS 23.73%

As indicated in Table I-5 for the TIS Master Plan improvements, NPV is approximately $2.80 billion, the B/C ratio is 4.59, payback period is ten (10) years, and IRR is 23.73 percent. A sensitivity analysis was performed using higher discount rates of seven and ten percent. These rates would result in more conservative results since user benefits, which are greater in later years, are discounted more. Under these conservative assumptions, the Master Plan improvements achieve an NPV and B/C ratio of $1.86 billion and 3.22 using the seven percent discount rate, and $1.22 billion and 2.42 using ten percent.

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

Cash Flow Analysis

While the cost-effectiveness analysis discussed in the previous section will determine whether the project is socially profitable, adequate cash flow must exist for the project to be financially viable. User benefits, as computed in the cost-effectiveness analysis, represent benefits to society in the form of reduced road user costs. These benefits cannot be interpreted as revenue to be used to fund project costs.

The cash flow analysis recognizes the timing of capital outlays and cash inflows to determine if sufficient cash is available to cover outflow requirements. Cash outflows consist of the project costs identified in the first section of this chapter. Cash inflows are provided by a variety of sources: federal, state and local grants, debt financing, special assessments, private sector contributions or other innovative financing techniques. The cash flow analysis will be completed in Phase II, after an evaluation of financing alternatives is performed.

II. PURPOSE OF STUDY

The majority of the Tampa interstate system was designed and constructed in the late 1950s and early 1960s. The east-west portion of the interstate through Tampa was initially designated I-4. I-4 began at Central Avenue in St. Petersburg and continued east-northeast through Tampa, Lakeland, and Orlando to I-95 in Daytona Beach. The north-south leg was designated I-75 north of the interchange with I-4 in the vicinity of Columbus Drive. The Ashley Street connector, which ties into the interstate immediately east of the Hillsborough River south of Fortune Street, was initially constructed by the City of Tampa.

The interstate system in St. Petersburg (originally I-4) was extended across the Sunshine Skyway Bridge; and the segment from the I-4/I-75 interchange in Tampa, west and south, through west Tampa to St. Petersburg and across the Sunshine Skyway Bridge was redesignated as I-75.

The I-75 bypass around the east side of Tampa was subsequently approved and added to the interstate system. This bypass route carried the I-75 designation and the section of I-75 south of the Hillsborough-Pasco County line was redesignated as I-275 through Hillsborough and Pinellas counties, across the Sunshine Skyway Bridge to its southern connection with the I-75 bypass in Manatee County.

The original east-west portion of the interstate (designated I-4 at the time) was completed and opened to traffic service in October 1964, when the bridge across the Hillsborough River was completed. The section of I-75 (now I-275) in north Tampa and northern Hillsborough County was completed in the late 1960s.

The design for the interstate system in Tampa was based upon traffic projections for calendar year 1975. The design was based on AASHTO (American Association of State Highway and Transportation Officials) criteria in effect during the late 1950s, as well as applicable Bureau of Public Roads (now the Federal Highway Administration) criteria applicable at the time. The applicable Bureau of Public Roads criteria did not provide for shoulders on bridges longer than 150 feet. This criterion relative to shoulders on bridges was subsequently changed prior to the construction of some of the bridges north of Columbus Drive.

There have been several construction projects which have modified the original interstate system through Tampa. The original interchange between I-4 and I-75, in the vicinity of Columbus Drive and Nebraska Avenue, provided only one lane for westbound I-4 traffic. This was later reconstructed to provide two lanes for westbound I-4 traffic.

A later construction project added one lane in each direction from the Dale Mabry Highway interchange westerly to the State Road 60 (S.R. 60) interchange along I-275 (originally I-4). The interstate interchange at S.R. 60 was totally reconstructed to provide a major connector to the new terminal complex at Tampa International Airport (TIA). In addition, a number of safety projects were implemented during the last 25 years which added guard rails and closed in the original grass median in certain segments, including the section of the freeway westerly of the Hillsborough River and northerly from Columbus Drive.

Realizing the need to upgrade the antiquated interstate system, the Florida Department of Transportation (FDOT) began a study in 1983 to justify reconstruction and High Occupancy Vehicle (HOV) improvements to qualify the urban interstate system in Hillsborough County for Federal interstate funds. The study established year 2010 traffic for the interstate system and described some potential short-term safety and geometric

solutions for the existing interstate. Additionally, the study identified long-term, HOV- related improvements to accommodate year 2010 traffic volumes.

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

Utilizing the 1983 justification as a documented base, the Tampa Interstate Study (TIS) began in late 1987. Generally, the purpose of the Study was to produce a Master Plan, conceptual design, and environmental impact data base for improvements to I-4, I-75, and I-275. Those improvements recommended are intended to serve traffic and transportation needs through the year 2010. Specifically, the objectives of the TIS are to prepare a series of reports documenting the requirements for conceptual design, including existing and predicted conditions, typical sections, right-of-way requirements, environmental constraints, and costs of recommended alternatives. These efforts are a part of Phase I of the TIS and can be further defined as the following goals to be achieved in the Phase I work effort:

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

Following acceptance of the Master Plan, provisions have been set forth by the FDOT to implement Phase II of the TIS. Phase II of this Study is intended to satisfy those requirements necessary to fully complete environmental documentation of the recommended Master Plan. Completion of Phase II activities will enable the FDOT to proceed with final design and construction of the Tampa interstate system.

III. DESIGN CRITERIA, POLICIES AND PROCEDURES

In November 1987, Greiner, Inc. made a presentation to the Florida Department of Transportation (FDOT) and the Federal Highway Administration (FHWA) as a part of the Tampa Interstate Study (TIS), Task F2a, Design Component Element. The purpose of this Task was to establish the major design components upon which the design alternatives were to be based. Proposed design criteria were presented as a baseline for discussion of their relative design components. Key issues in the various major design component areas were raised in order to focus discussion on critical areas affecting future study efforts. The key issues were horizontal and vertical alignment, design speed, two-roadway versus four-roadway systems, structural evaluations, transit, safety and constructibility. Based upon the presentation, discussion and feedback, decisions were made as to the actual direction the Tampa interstate Study (TIS) would take.

Based upon the Task F2a, Design Component Element efforts, the Task F2b, Draft Design Criteria, Policies, and Procedures, Technical Memorandum sought to establish basic guidelines for the design of the Tampa interstate. The draft issued in January 1988 addressed various design areas, including roadway, structural, High Occupancy Vehicles (HOV), Light Rail Transit (LRT) and Authorized Vehicle Lanes (AVL). Task F2b has since been refined as the Tampa Interstate design has developed and taken shape through the Tier Analysis process.

A basic policy which served as a background for the entire Tampa interstate design is embodied in a March 25, 1987 memorandum from the FHWA division administrator. This memorandum stated:

> "Plans and specifications of proposed federal-aid highway projects shall provide for a facility that will adequately meet the existing and probable future traffic needs and conditions in a manner conducive to safety, durability, and economy of maintenance."

This policy could only be carried out through the adoption and use of appropriate design criteria and procedures. These design criteria and procedures are primarily contained in A Policy on Geometric Design of Highways and Streets, 1984, by AASHTO and the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, 1986, by FDOT. These references are supplemented by other publications which are listed in the TIS Task F2b, Design Criteria, Policies, and Procedures, Technical Memorandum.

The study area is composed of six basic segments. These segments are subdivided into 17 smaller segments. Therefore, in final design, it is conceivable that from six to 17 different designers may be working on the design of the Tampa interstate. With this in mind, it is readily understandable why one of the basic goals of the Master Plan for the Tampa interstate was to standardize the design throughout the study area. Such standardization was absolutely essential in developing the safest, most cost-effective and aesthetically-pleasing interstate design possible. However, the design criteria must always be flexible enough to provide room for both change and improvement based upon the particular design situation being addressed.

In order to provide the necessary flexibility, the design criteria present various guidelines for the designers' use which may be adjusted, depending upon applicable AASHTO and FDOT standards, characteristics of a particular location, cost-effective design/construction experience, industry practices and application of sound engineering judgement.

The Task F2b Technical Memorandum also contains various typical sections for the two-roadway and four-roadway systems. These sections were not developed with a specific location in mind but, rather, to show the relationship between the various elements in the different roadway systems. The typical sections also show treatment for various interchange and overpass situations. Throughout the design process for the Tampa interstate, there are provisions for noise walls. These walls may be attached to either bridge structures or retaining walls. Typical details for the attachment of noise walls to both bridge structures and retaining walls have also been included.

The Task F2b Technical Memorandum was not meant to and could not cover every possible design situation that would be encountered during the design of the Tampa interstate. However, ample reference is provided to the various design materials that will assist the designer in these various situations and should be consulted for further details on design standards. The Technical Memorandum addresses a number of particular elements in the interstate design and, in these areas, objectives, guidelines or observations have been included to explain the elements in the context of the overall design of the Tampa interstate. The Technical Memorandum also provides guidance in the area of HOV/Transitway and Park-n-Ride facilities. This guidance includes criteria, policies, typical sections, and treatments. Tables III-1, III-2, and III-3 provide the general design criteria for highway, HOV, and transit facilities used in the Master Plan for the Tampa interstate system.

Another factor in design is the concept of service flow rates as indicated by Levels of Service (LOS). Level of Service is defined as a qualitative measure describing operational conditions within a traffic stream, and its perception by motorists and/or passengers. A level of service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility for which analysis procedures are available. These levels are designated A to F, with Level of Service A representing the best operating conditions and Level of Service F the worst.

For each type of facility, levels of service are defined based on one or more operational parameters which best describe operating quality for the specific facility type. For freeways, the following parameters are used to characterize level of service:

Facility Type	Operational Parameter
Basic Freeway Segments	Density (in passenger cars per mile per lane)
Weaving Sections	Average Travel Speed (in miles per hour)
Ramp Junctions	Service Flow Rates (in passenger cars per hour)

Level of service criteria for basic freeway segments are included in the 1985 Highway Capacity Manual (HCM) and are listed in Table III-4 for 60 mph and 50 mph design speeds. The average travel speeds and maximum service flow rates shown in the table are expected to exist under ideal conditions for the given densities.

As an indication of the quality of traffic flow on I-275, I-4 and I-75, a comparison of existing hourly traffic volumes, average travel speeds and vehicle spacing was conducted at the following four locations:

I-4 west of 50th Street;

TABLE III-1

RECOMMENDED ROADWAY DESIGN STANDARDS
Tampa Interstate Study

Design Factors	Recommended Standards
Speeds	* Freeway - 60 mph Desirable 55 mph Minimum
	* Collector/Distributor - 45 mph Desirable 40 mph Minimum
	* Ramps - 50 mph Desirable 35 mph Minimum
	* Loops - 30 mph Minimum
	* Cross Streets - 45 mph Desirable 30 mph Minimum
Pavement Widths	* Freeway - 12' Standard Lane Width 12' HOV Lanes (w/painted Buffer) 12' Interchange Turning Lanes plus widening for curves
	* Ramps - 15' Single Lane, 12' Dual Lanes
	* Cross Streets - 12' Desirable, 11' Minimum
Shoulder Widths	* Freeway - 12' Outside (10' Paved) 10' Outside (w/Barrier Wall) 6'-10' Outside (If outside lane is auxiliary lane w/Barrier Wall) 10' Inside (w/Barrier Wall)
	* Ramps - Single Lane - 6' Outside (4' Paved) 6' Outside (w/Barrier Wall) 6' Inside (2' Paved) 6' Inside (w/Barrier Wall) Dual Lane - 10' Outside (8' Paved) 10' Outside (w/Barrier Wall) 8' Inside (4' Paved) 6' Inside (w/Barrier Wall)
Maximum Grades	* Freeway - 3% for 60 mph 4% for 55 mph
	* Collector/Distributor - 4% for 45 mph 5% for 40 mph
	* Ramps - Ascending-6% Descending-7%
Maximum Degree of Curve	* Freeway and Collector/ Distributor - 60 mph 5°-15' 55 mph 6°-30' 45 mp 10°-15' 40 mph 13°-15'
	* Ramps - 50 mph 8°-15' 35 mph 18°-30'
	* Loops - 30 mph 24°-45' (230' R)
Cross Slopes (In tangent)	*Freeway, Collector/Distributor, and Ramp 0.03 ft. per ft. maximum
	* Shoulders - 0.06 ft. per ft. outside 0.05 ft. per ft. inside
	* Embankments - 6:1 within clear recovery zone
Vertical Clearances	* 16'6" Minimum over freeway 16'6" Recommended; 15'0" minimum over cross road, for existing structures 17" For overhead pedestrian crossings and sign trusses

Sources: "A Policy on Design of Highways and Streets," AASHTO, 1984
"Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways," FDOT, 1986
"Structures Design Guidelines," FDOT, 1987

TABLE III-2

RECOMMENDED CONCURRENT FLOW HIGH OCCUPANCY VEHICLE LANE DESIGN STANDARDS
Tampa Interstate Study

Design Factors	Recommended Standards
Speeds	* 60 mph desirable/55 mph minimum * Ramps - 50 mph desirable/35 mph minimum
Pavement Widths	* Minimum 12' lane width * Interchanges and ramps per 1984 AASHTO standards, 12' minimum lane width
Shoulder Widths, Safety/Refuge Areas, and Buffer Areas	* 12' @ left shoulder for HOV and interstate vehicles with 2' buffer area between HOV lane and freeway lanes * Single Ramp - 8' left and right * Double Ramp - 2' right and left, 10' center, median refuge area
Vertical Alignment	* 3% maximum desirable * Ramps - 7% maximum * Length of crest and sag vertical curves-1984 AASHTO Standards
Horizontal Alignment	* 60 mph desirable/55 mph minimum * Ramps - 50 mph desirable/35 mph minimum * Ramp Transition Lanes-1984 AASHTO Standard 600' * Ramp Taper Ratios-1984 AASHTO Standard
Cross Slopes - Tangent	* 0.03 ft. per ft. maximum
Vertical Clearances	* 16.5'

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

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

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

TABLE III-3

RECOMMENDED HOV/TRANSITWAY DESIGN STANDARDS
Through Downtown Tampa Interchange Area
Tampa Interstate Study

Design Factors	Recommended Standards
Speeds	* 60 mph desirable/55 mph minimum * Ramps: 50 mph desirable/35 mph minimum
Pavement Widths	* 12' lane width * Ramps: 12' lane width minimum
Shoulder Widths	* Single lane transitway: 8' left and right desirable * 2-lane 2-way transitway: 2' left and right with 10' median refuge area * Single Ramp: 8' left and right * Double Ramp: 2' left and right
Median Refuge Area Width	* 2-lane 2-way transitway: 10'
Vertical Alignment	* 3% maximum desirable * Ramps: 7% maximum * Length of crest and sag vertical curves - 1984 AASHTO Standards
Horizontal Alignment	* 60 mph desirable/55 mph minimum * Ramps: 50 mph desirable/35 mph minimum * Ramp Transition Lanes - 1984 AASHTO Standard * Ramp Taper Ratios - 1984 AASHTO Standard
Cross Slopes - Tangent	* 0.03 ft. per ft.
Vertical Clearances	* 16.5'

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

TABLE III-4

1985 HIGHWAY CAPACITY MANUAL
LEVEL OF SERVICE CRITERIA FOR BASIC FREEWAY SEGMENTS
Tampa Interstate Study

		60 mph Design Speed			50 mph Design Speed		
LOS	Density (pc/mi/ln)	Average Travel Speed (mph)	V/C	Maximum Service Flow Rate (pcphpl)	Average Travel Speed (mph)	V/C	Maximum Service Flow Rate (pcphpl)
A	≤12	--	--	--	--	--	--
B	≤20	≥50	0.49	1,000	--	--	--
C	≤30	≥47	0.69	1,400	≥43	0.67	1,300
D	≤42	≥42	0.84	1,700	≥40	0.83	1,600
E	≤67	≥30	1.00	2,000	≥28	1.00	1,900
F	>67	<30	*	*	<28	*	*

* = Highly variable, unstable.
Source: 1985 Highway Capacity Manual

I-4 west of 21st Street;
I-275 east of Dale Mabry Highway; and
I-275 at the Hillsborough River.

Travel time/travel speed studies were conducted by the study team on I-275 from Bearss Avenue to Westshore Boulevard and on I-4 from I-75 to its junction with I-275. These studies were conducted from Monday afternoon, October 19, 1987 to Friday morning, October 23, 1987 for the a.m. peak period (6:00-9:00 a.m.) and the p.m. peak period (4:00-7:00 p.m.). The results were tabulated in 15-minute increments for each peak direction. Simultaneously, 7-day, 24-hour directional traffic counts were also conducted in 15-minute increments at nine locations on I-275 and I-4. (Additional discussion of the traffic counts is presented in Section IV, "Need For Improvements," of this report.)

The results of the travel time/travel speed study indicated that the a.m. and p.m. peak period traffic at all four locations is flowing at an average speed in excess of the minimum average travel speed associated with Level of Service C (47 mph assuming a 60 mph design speed). In most cases, the average travel speed is in the 50 to 55 mph range. The majority of the interstate system has a design speed of less than 50 mph. According to the HCM, average travel speeds in excess of 47 mph are theoretically unobtainable, even under ideal conditions, given a 50 mph design speed.

TABLE III-5

SUMMARY OF EXISTING PEAK PERIOD FREEWAY OPERATING CONDITIONS
Tampa Interstate Study

Location	Time of Day	Average Flow Rate (pcphpl)	Average Speed (mph)	Average Headway (sec/veh)	Average Spacing (ft/veh)	Level of Service HCM Flow Rate	Level of Service HCM Average Speed
I-4 west of 50th Street							
Eastbound	7:00-8:00 a.m.	1,698	60.9	2.1	169	D	B
	4:00-5:00 p.m.	2,205	57.8	1.6	108	F	B
Westbound	7:00-8:00 a.m.	2,077	31.3	1.7	60	F	E
	4:00-5:00 p.m.	1,685	60.3	2.1	169	D	B
I-4 west of 21st Street							
Eastbound	7:00-8:00 a.m.	2,371	55.8	1.5	104	F	B
	4:00-5:00 p.m.	2,198	55.1	1.6	112	F	B
Westbound	7:00-8:00 a.m.	2,231	35.9	1.6	65	F	E
	4:00-5:00 p.m.	2,399	54.8	1.5	101	F	B
I-275 east of Dale Mabry Highway							
Eastbound	7:00-8:00 a.m.	2,219	55.3	1.6	112	F	B
	4:00-5:00 p.m.	2,181	53.1	1.7	109	F	B
Westbound	7:00-8:00 a.m.	2,014	50.4	1.8	112	F	B
	4:00-5:00 p.m.	2,204	53.3	1.6	108	F	B
I-275 at the Hillsborough River							
Eastbound	7:00-8:00 a.m.	1,347	52.0	2.7	184	C	B
	4:00-5:00 p.m.	1,975	46.8	1.8	105	E	D
Westbound	7:00-8:00 a.m.	1,947	52.2	1.8	121	E	B
	4:00-5:00 p.m.	2,003	61.4	1.8	116	E	B

A comparison of existing hourly traffic volumes with maximum hourly service flow rates for various levels of service was also conducted to help determine the most appropriate service flow rate to use in the conceptual design. Table III-5 lists the average flow rates and average travel speeds that occurred at these four locations from 7:00 to 8:00 a.m. and 4:00 to 5:00 p.m. In addition, Table III-5 also lists the average headways and average spacings that result from the average flow rates and travel speeds. Based on the data collected, the following conclusions were made:

* Flow rates well in excess of the theoretical maximum flow rate for 60 mph design speed (2,000 pcphpl), as defined in the HCM, are occurring at numerous locations on I-275 and I-4 for extended periods throughout the day.
* High average travel speeds (greater than or equal to 50 mph) are being maintained with flow rates exceeding theoretical maximum values.
* Average vehicle spacings indicate that high average travel speeds are maintained during periods of high flow and under stable, rather than forced-flow, conditions.

In addition, a comparison of the levels of service, based on average flow rate and average speed, indicated in 80 percent of the cases, the level of service based on average speed is two or more levels higher than the level of service based on flow rate.

As indicated in the HCM, capacity values used for analysis can be modified to reflect local conditions. The previous analysis indicated the operating conditions on the interstate system serving the Tampa area warrant a modification to the default capacity values contained in the HCM.

Table III-6 compares the range of the maximum hourly traffic volumes exceeding the theoretical capacity at six locations as well as the average of these maximum values. At four of these six locations, the highest hourly traffic volume observed was greater than 2,300 pcphpl. A comparison between the average maximum

TABLE III-6

COMPARISON OF OBSERVED AND THEORETICAL CAPACITIES
Tampa Interstate Study

Location	Design Speed (in mph)	Theoretical Capacity (in pcphpl)	Range of Maximum Hourly Traffic Volumes Exceeding Theoretical Capacity (in pcphpl)	Average Hourly Traffic Volume (in pcphpl)	Ratio of Average Hourly Traffic Volume/ Theoretical Capacity
East End of Howard Frankland Bridge	60	2,000	2,196-2,438	2,272	1.136
East of Dale Mabry Highway	50	1,900	2,054-2,300	2,200	1.158
West of Hillsborough River	50	1,900	1,910-2,179	1,993	1.049
West of 21st Street	50	1,900	2,023-2,389	2,237	1.177
West of 50th Street	50	1,900	1,965-2,372	2,193	1.154
South of Floribraska Avenue	50	1,900	2,056-2,290	2,177	1.146
AVERAGE					**1.137**

pcphpl - passenger car per hour per lane.

flow rates and the theoretical capacities shows the theoretical capacity is exceeded, on the average, by 13.7 percent.

Based on the data presented, a recommendation was made to the FHWA to modify the LOS E flow rate for a 60 mph design speed facility from 2,000 pcphpl to 2,200 pcphpl. This value represents a 10 percent increase over the value contained in the HCM. A similar recommendation was also made to FHWA to modify the LOS E flow rate for a 50 mph design speed facility from 1,900 pcphpl to 2,100 pcphpl. This value represents a 10.5 percent increase over the value contained in the HCM. Using the recommended values for LOS E, the corresponding flow rates for LOS C and D were developed. The flow rates for LOS C, D and E are listed in Table III-7 along with the HCM flow rates. The recommended flow rates for LOS C and D were established as 70 and 85 percent, respectively, of the recommended LOS E values. This is consistent with the Volume-to-Capacity (V/C) ratios documented in the HCM. For design purposes, a value less than the maximum value for LOS D is appropriate. A V/C ratio of 0.80 represents an appropriate design value to maintain a satisfactory LOS. This is consistent with both the HCM and the AASHTO Green Book. Using a V/C ratio of 0.80 and converting from pcphpl to vphpl resulted in recommended desirable service flow rates of 1,650 vphpl and 1,560 vphpl for 60 mph and 50 mph design speeds, respectively. The 1,650 vphpl flow rate was recommended for use with the freeway mainline and represents 73 percent of the 60 mph design speed LOS D range as defined in the HCM. The 1,560 vphpl flow rate was recommended for use with the local access freeway and represents 81 percent of the 50 mph design speed LOS D range as defined in the HCM.

On September 28, 1988, the FHWA concurred with these recommendations and granted formal approval for the use of these values in the design of the Master Plan Concept.

A detailed discussion of the service flow rates is contained in the Task F5.e, Analysis of Service Flow Rates and Levels of Service Working Paper.

TABLE III-7

MAXIMUM SERVICE FLOW RATES AND LEVEL OF SERVICE
Tampa Interstate Study

	60 MPH Design Speed		50 MPH Design Speed	
Level of Service	HCM Value (in pcphpl)	Recommended Value (in pcphpl)	HCM Value (in pcphpl)	Recommended Value (in pcphpl)
C	1,400	1,540	1,300	1,470
D	1,700	1,870	1,600	1,785
E	2,000	2,200	1,900	2,100

HCM - 1985 Highway Capacity Manual
pcphpl - passenger car per hour per lane.

IV. NEED FOR IMPROVEMENTS

Introduction

Initial work efforts for the Tampa Interstate Study (TIS) were focused on the evaluation of the entire interstate roadway for its current condition. This physical evaluation was primarily designed to determine the potential life expectancy of the various design elements, such as structures, bridges and pavement surfaces. These activities, undertaken as part of Task E (Data Collection), resulted in the development of a Task F.2.a, "Component Package," which was presented to the Florida Department of Transportation and the Federal Highway Administration on November 12, 1987. The presentation summary is documented in the Task F.2.a, Component Package Presentation Summary. This presentation provided a concise overview of the existing conditions and potential for rehabilitation within the TIS area. Major supporting documentation for the Component Package Presentation is found in the TIS Task E.2.a, Existing Alignment Inventory Working Paper, and the Task E.2.b.c, Interstate Structural Inventory Working Paper.

The Component Package Presentation also established the preliminary study design criteria, or the standards by which the TIS efforts would be directed. These design criteria were subsequently published in the TIS Task F.2.b, Draft Design Criteria, Policies and Procedures Technical Memorandum. The final Task F2b report will be published with the final Master Plan and will be used in Phase II studies and subsequent engineering design studies.

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

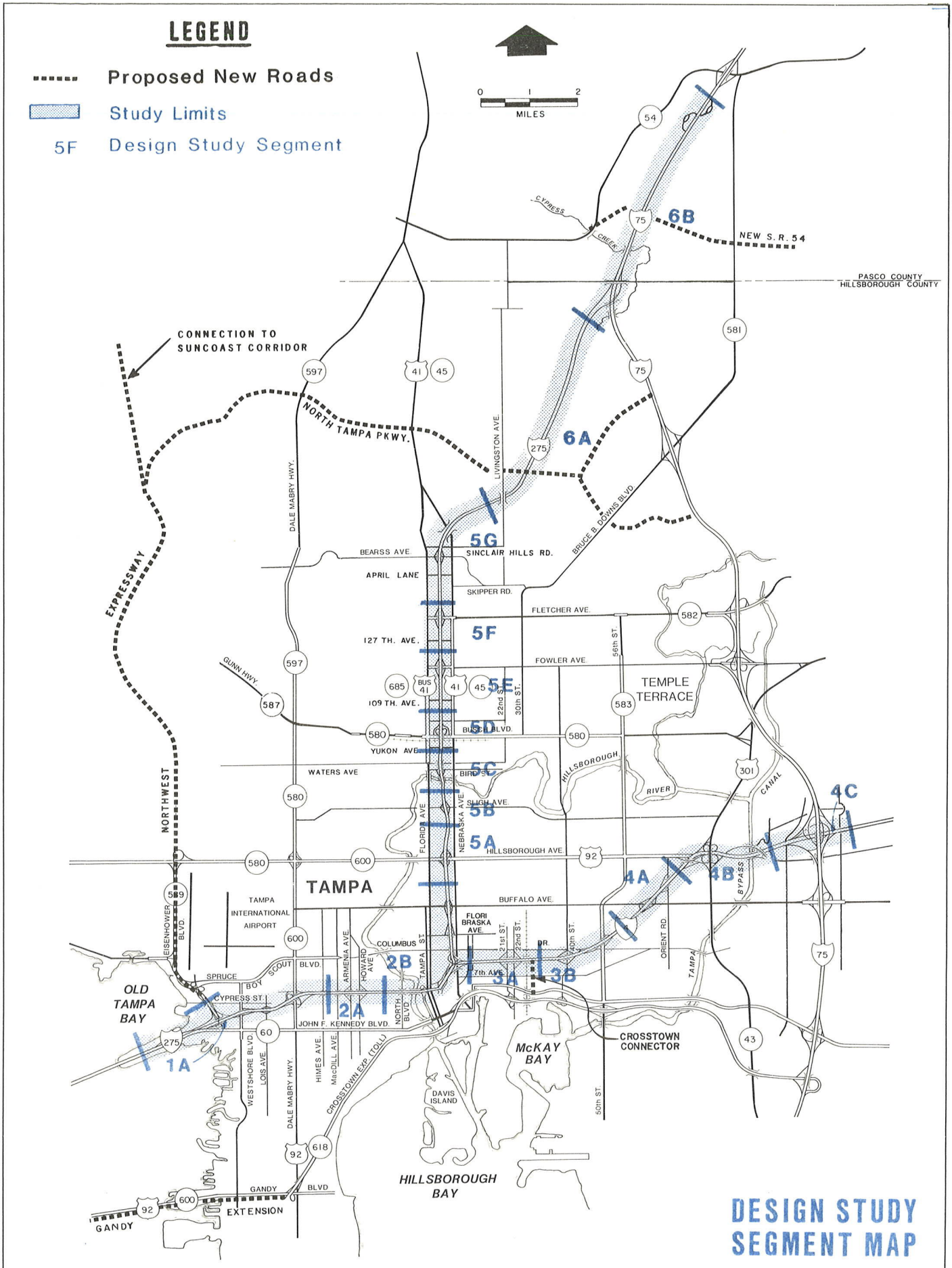
This section of the Master Plan Report provides a summary of the supporting technical documents developed during the past two years of intensive study of the Tampa interstate system.

Roadway And Structure Inventory

Existing roadway and bridge structure characteristics within the TIS area were inventoried to determine the extent of suitable infrastructure to be utilized in the redesign and upgrading of the Tampa interstate system.

Roadway Inventory

Typical roadway sections were inventoried by study segment as illustrated on Exhibit IV-1. However, some existing median widths, lane widths, and shoulder widths were found to be inadequate.



DESIGN STUDY SEGMENT MAP

EXHIBIT IV-1

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Most study segments exhibited acceptable cross section geometry. Median widths varied between 44 feet and 64 feet for all study segments. Since the 64-foot medians are only located in the rural areas of the study area (Segments 6A and 6B), existing median widths are acceptable. All lane widths were 12 feet. Shoulder widths in some portions of Segments 2B, 3A, 5A, 5B, 5C and 5D were limited to 8.5-foot outside shoulders with curb and gutter and 4-foot inside shoulders. Shoulder widths in Segment 3B were found to be 8-foot inside and outside; whereas Segments 4A, 4B, 4C, 5E, 5F, 5G, 6A, and 6B included 10-foot outside shoulders and 4-foot inside shoulders. Segments 1A and 2A typically exhibited desirable cross-section dimensions.

An evaluation was also conducted for the existing horizontal and vertical roadway alignments with respect to the latest design criteria as published in the American Association of State Highway and Transportation Officials' (AASHTO) A Policy on Geometric Design of Highways and Streets, 1984 (the "Green Book"). In order to consider the possible use of the existing roadway, an initial assumption was made that, except for the Central Business District (CBD) interchange the existing horizontal alignment would not be altered considerably from its present alignment. The current route placement of the interstate facilities would remain and no new alternative corridors would be considered.

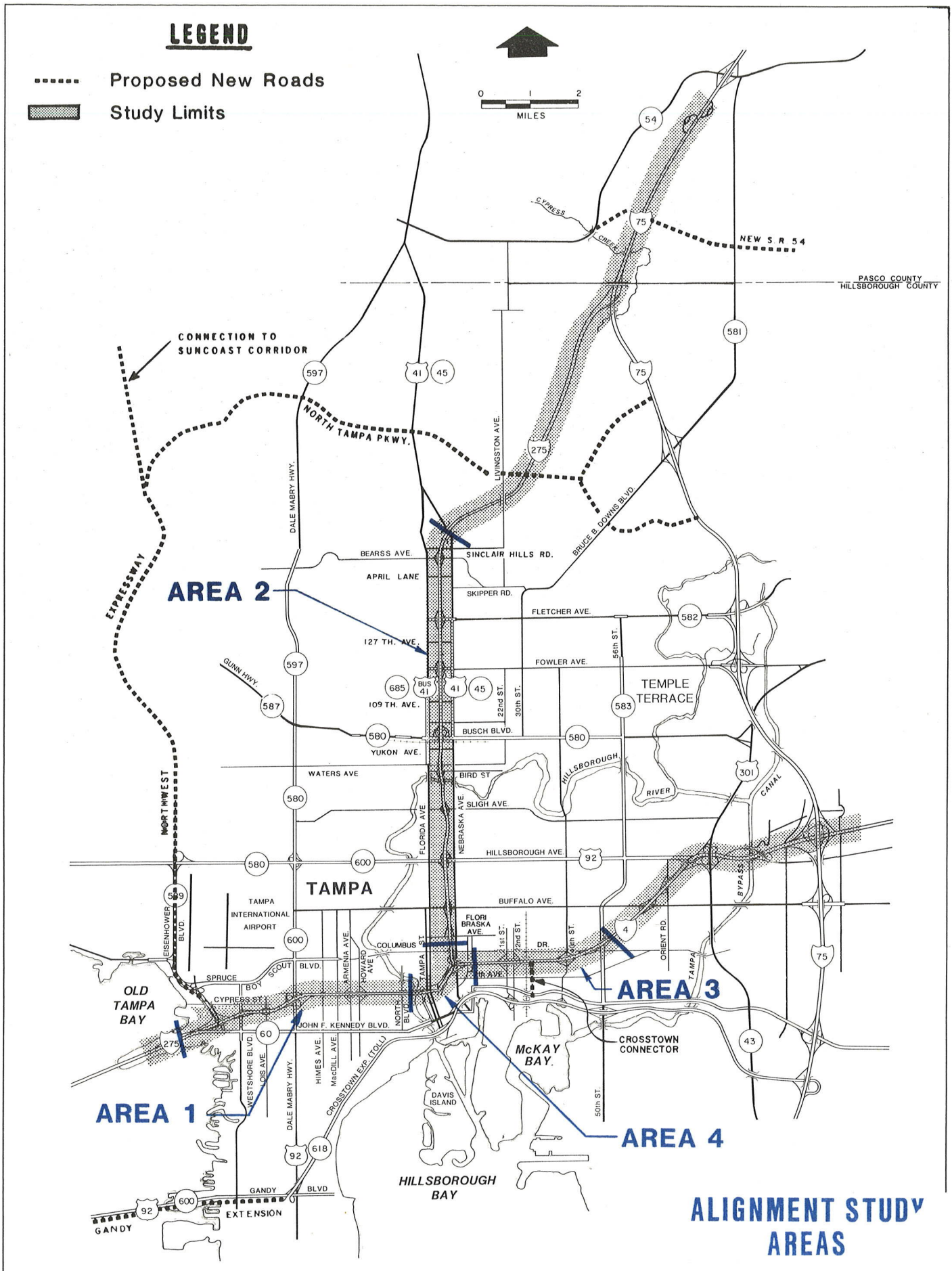
Pertinent construction plans were reviewed and categorized into four geographical areas as shown on Exhibit IV-2 and described as follows:

* Area 1 - I-275 West, from Howard Frankland Bridge to east of North Boulevard (west of Hillsborough River).
* Area 2 - I-275 North, from south of Floribraska Avenue to south of Broad Street and from south of Linebaugh Avenue to north of Bearss Avenue.
* Area 3 - I-4 East, from west of 14th Street to east of 50th Street.
* Area 4 - CBD, from west of the Hillsborough River (North Boulevard) to south of Floribraska Avenue to the north and to the west of 14th Street on the east.

Existing vertical profiles were plotted and design speeds were calculated based on values listed in the 1984 AASHTO "Green Book". No existing profiles were plotted for Area 4 (the CBD), since reconstruction in this area would substantially alter the existing configuration and profiles.

The desirable freeway design speed is 60 miles per hour. The resulting design speeds by area and by type of curve found to exist are indicated in Table IV-1. Given the existing cross-street locations (i.e., required vertical clearances) and horizontal geometry of the freeway and freeway ramp terminals, upper range 60 mph mainline profiles (with maximum K values) and lower range 50 mph mainline profiles (with minimum K values) were developed. This evaluation was performed to further determine the extent of suitable existing infrastructure based on impact of other design components and comparison between the existing and proposed vertical-alignments.

The existing freeway profile achieves neither the lower range of acceptable design speed (50 mph), nor a desired vertical clearance of 16.5 feet. There are only several short sections of roadway between grade separations that meet proposed TIS design criteria. These minor sections could be overlayed and widened, if the horizontal alignment is not substantially different from tne existing alignment. In the three areas evaluated, 33 grade separations would be replaced and additional fill between 5 feet and 20 feet would be required.



ALIGNMENT STUDY AREAS

EXHIBIT

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TAMPA INTERSTATE STUDY / THE GREINER TEAM

TABLE IV-1

EXISTING DESIGN SPEEDS
Tampa Interstate Study

Area	Design Speed* (Crest Curve)	(Sag Curve)
1	41 - 46 mph	54 - 63 mph
2	41 - 47 mph	50 - 58 mph
3	52 - 60 mph	43 - 56 mph

Note: Refer to Exhibit IV-2 for delineation of Areas 1, 2, and 3.

* Based on A Policy on Geometric Design of Highways and Streets, 1984

Bridge Inventory

A total of 124 bridge structures (highway and waterway) within the study area were reviewed and evaluated. The location of each of these bridge sites is shown by bridge number in Exhibit IV-3. A data sheet was completed for each bridge which summarized existing characteristics. These data sheets are contained in the Task E.2.b.c. Interstate Structural Inventory Working Paper.

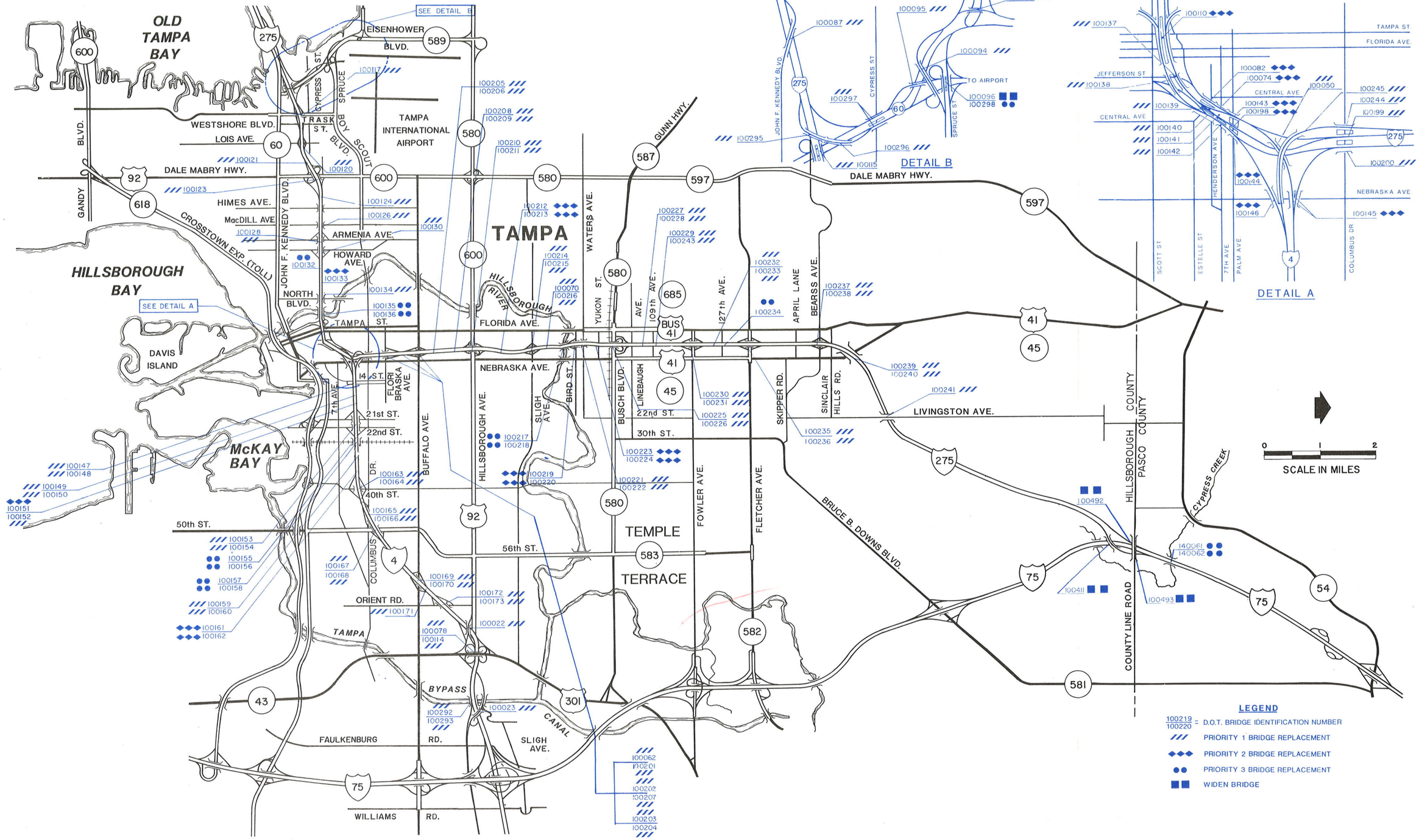
As shown in Exhibit IV-4, a bridge assessment procedure was developed by which each bridge was categorized into one of the following classifications:

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

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

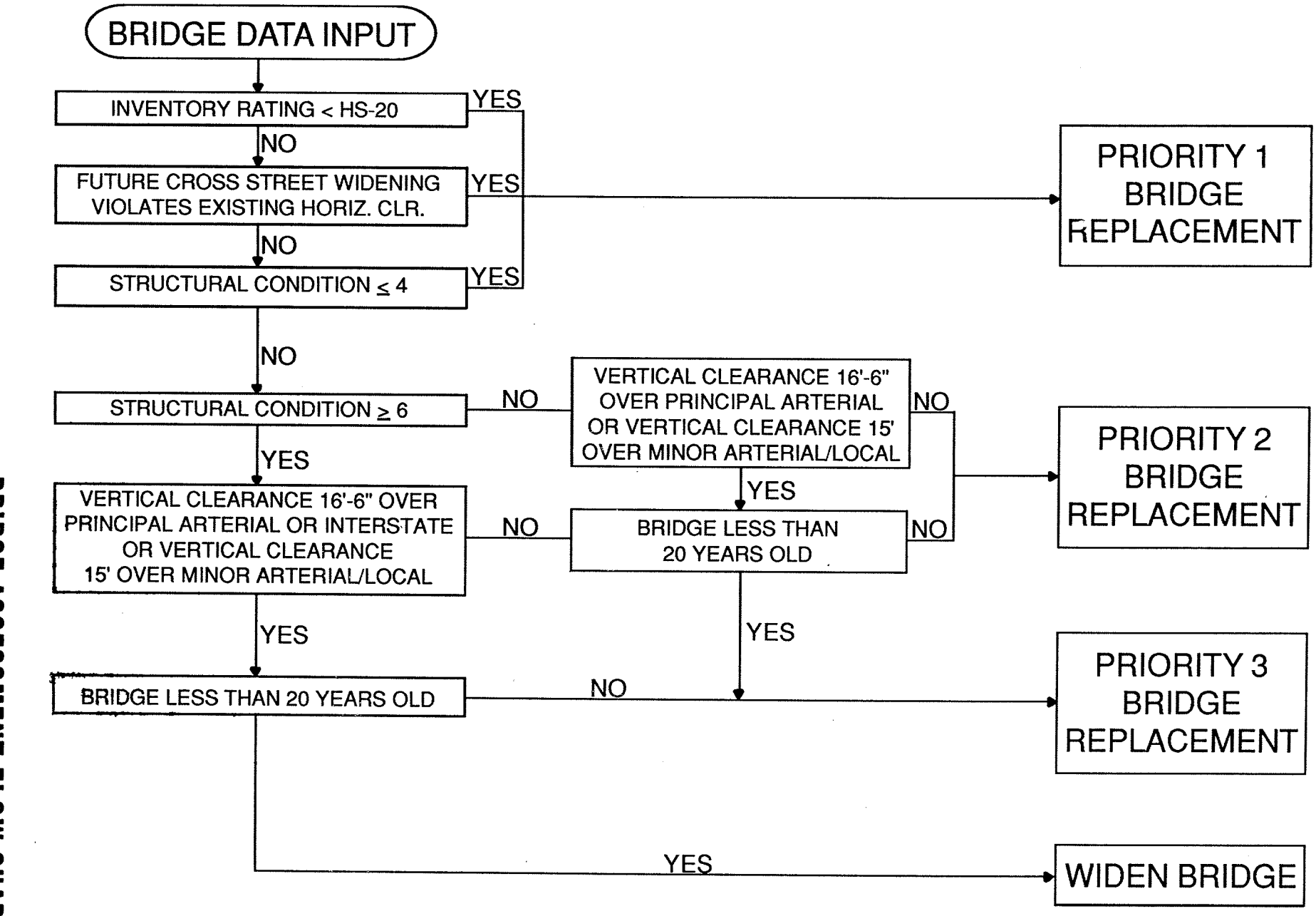
* an inventory rating less than HS-20;
* a structural condition of four (4) or less; or
* an existing horizontal clearance less than that required to accommodate future widening of cross-streets.

The inventory rating indicates the load level which the bridge can carry for an indefinite period of time. The structural condition is based on a scale of 0-9, where nine indicates the best structural condition. This



STRUCTURAL BRIDGE EVALUATION

EXHIBIT IV-3



BRIDGE ASSESSMENT FLOW CHART

EXHIBIT IV-4

number is based partially on the condition of the deck, the superstructure, the exposed substructure, and the load carrying capacity.

At the other extreme is the classification "Widen Bridge," which is any bridge that does not fall into the "Priority 1 Bridge Replacement" category and meets all of the following conditions:

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

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

In conclusion, 89 of the 124 bridges fall into the "Priority 1 Bridge Replacement" classification. Of these 89 bridges, 45 are included because of an inadequate inventory rating, and 44 because the existing horizontal clearances do not allow for future cross-street widenings. Of the 35 bridges not in the "Priority 1 Bridge Replacement" classification, 18 fall into the "Priority 2 Bridge Replacement" classification, 13 fall into the "Priority 3 Bridge Replacement" classification, and only four fall into the "Widen Bridge" category. The 20 bridges at the I-75/I-4 interchange in eastern Hillsborough County were not evaluated; they are all assumed to have the potential to be widened, if necessary. The detailed discussion of the categorization by structure and location is contained in the Task E.2.b.c. Interstate Structural Inventory Working Paper.

Summary

The existing interstate roadway and bridge structures exhibit functionally obsolete design characteristics. Most significantly, existing vertical roadway profiles do not achieve the desirable design speed nor a desired vertical clearance at all 33 grade separation locations within the study area. Additionally, of the 124 existing bridge structures, all but four would have to be replaced (in varying degrees of priority) under the TIS criteria.

Traffic

To determine existing traffic conditions in the study corridor, several types of traffic data were collected. These data included traffic volume counts (at selected mainline and ramp locations), travel times and travel speeds. To estimate future demand for travel on the Tampa interstate system in the year 2010, various alternative roadway networks were simulated using computer travel demand models.

A discussion of the existing traffic volumes on I-275, I-4 and I-75 is presented first, followed by a discussion of the future year (2010) traffic forecasts. A comparison of future traffic volumes with current traffic volumes is also presented and basic lane requirements are discussed. A more detailed documentation of both existing and future travel demand on the interstate system is contained in the Task F.5.e. Travel Demand Technical Report.

Existing Conditions

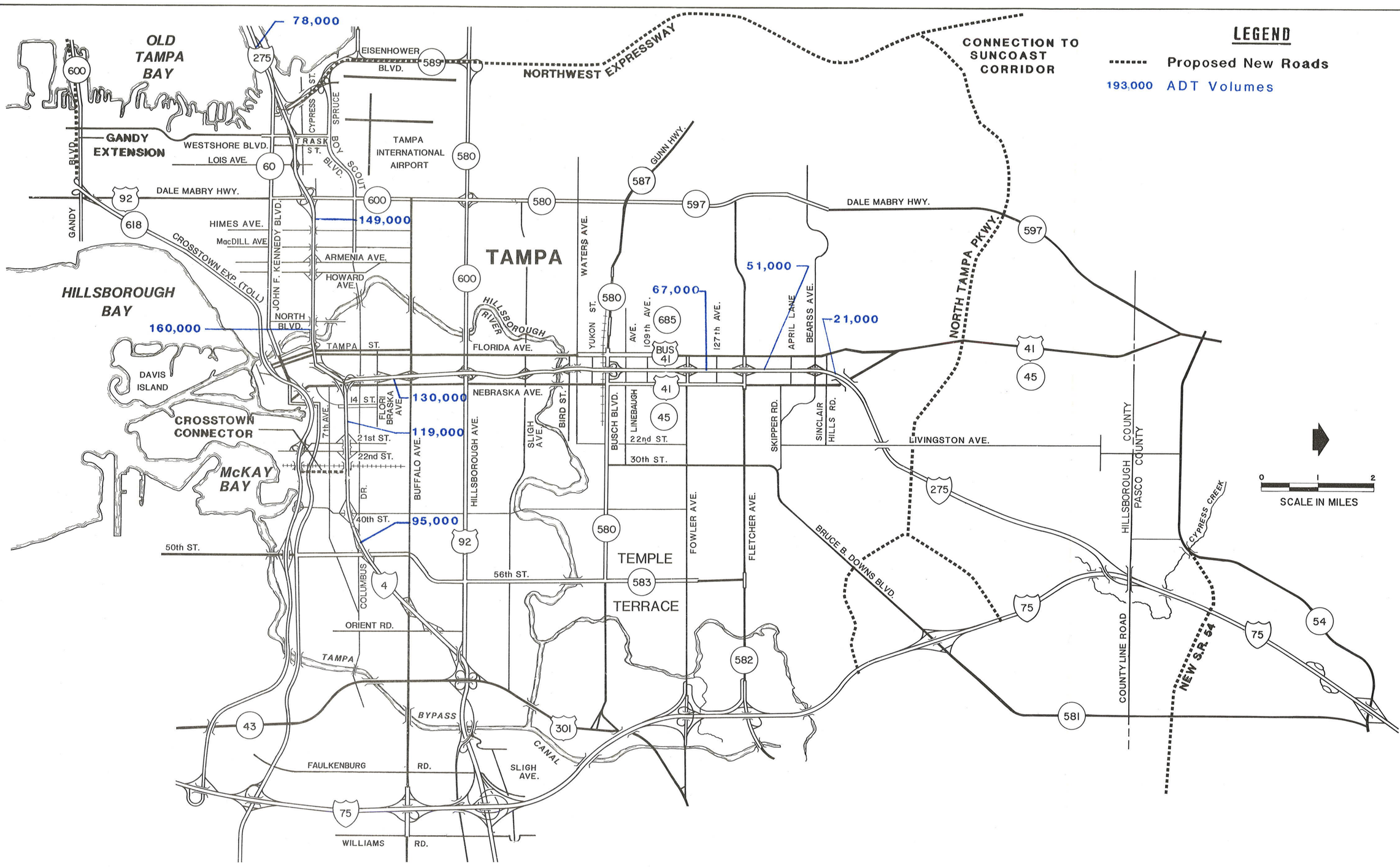
To ensure on-going traffic volume data retrieval, potential Maintenance of Traffic (MOT), Incident Management input, and to provide current traffic counts, 80 permanent loop detectors were installed in the pavement on I-275, I-4 and I-75. To augment the data collected from the loop detectors, seven-day machine traffic counts (directional volumes in 15-minute increments) were also conducted at nine locations on I-275 and I-4. The specific locations are identified in Exhibit IV-5 and Table IV-2 along with the Average Daily Traffic (ADT) volumes at each location. Traffic volumes on the western section of I-275 range from 78,000 vehicles per day at the east end of the Howard Frankland Bridge to 160,000 vehicles per day over the Hillsborough River. Traffic volumes on the section of I-275 north of the CBD range from 21,000 vehicles per day just south of the I-275/I-75 interchange to 130,000 vehicles per day just south of Floribraska Avenue. On I-4, traffic volumes range from 95,000 vehicles per day west of 50th Street to 119,000 vehicles per day west of 21st Street.

Table IV-2 also lists the existing traffic characteristics. The proportion of the ADT volume occurring during the peak hour was determined along with the proportion of the peak hour traffic occurring in the peak direction. Table IV-2 shows the a.m. peak hour volume ranges from 7.3 to 7.8 percent of the daily volume, while the p.m. peak hour volume ranges from 7.4 to 8.2 percent of the daily volume. In general, the a.m.

TABLE IV-2

EXISTING TRAFFIC CHARACTERISTICS
Tampa Interstate Study

Location	Non-Directional ADT	Direction	A.M. Peak Volume	Percent of ADT	Percent in Peak Direction	P.M. Peak Volume	Percent of ADT	Percent in Peak Direction
Howard Frankland Bridge	78,440	EB	3,510	7.4	60.5	2,550	7.6	
		WB	2,290			3,450		57.5
Dale Mabry Highway	148,610	EB	5,385	7.6		5,680	7.6	50.6
		WB	5,965		52.5	5,555		
Hillsborough River	159,960	EB	6,095	7.7		6,360	7.9	50.5
		WB	6,215		50.5	6,230		
21st Street	118,930	EB	4,120	7.4		4,460	7.4	50.6
		WB	4,645		53.0	4,360		
50th Street	95,450	EB	3,180	7.3		4,110	7.7	56.1
		WB	3,790		54.4	3,215		
Floribraska Avenue	129,800	NB	3,365	7.3		6,195	8.2	58.4
		SB	6,115		64.5	4,415		
Fowler Avenue/ Fletcher Avenue	67,140	NB	1,585	7.4		3,165	7.8	60.7
		SB	3,380		68.1	2,045		
Fletcher Avenue/ Bearss Avenue	51,120	NB	1,155	7.8		2,520	8.0	61.3
		SB	2,810		70.0	1,590		
Bearss Avenue/ I-275/I-75 Apex	20,810	NB	590	7.5		955	7.8	58.8
		SB	965		62.1	670		



1988 ADT VOLUMES

EXHIBIT IV-5

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TAMPA INTERSTATE STUDY / THE GREINER TEAM

peak hour occurs between 7:15 a.m. and 8:15 a.m., while the p.m. peak hour occurs between 4:45 p.m. and 5:45 p.m. The percentage of the peak hour traffic occurring in the peak direction, as well as the orientation of the peak direction, is also shown in Table IV-2.

Vehicle classification counts were obtained from FDOT and a plot of design hour truck percentage versus Average Annual Daily Traffic (AADT) volume indicated the percentage of trucks in the design hour tends to reach a limiting value of approximately three percent of AADT when volumes greater than 120,000 vehicles per day are attained.

Future Traffic Volumes

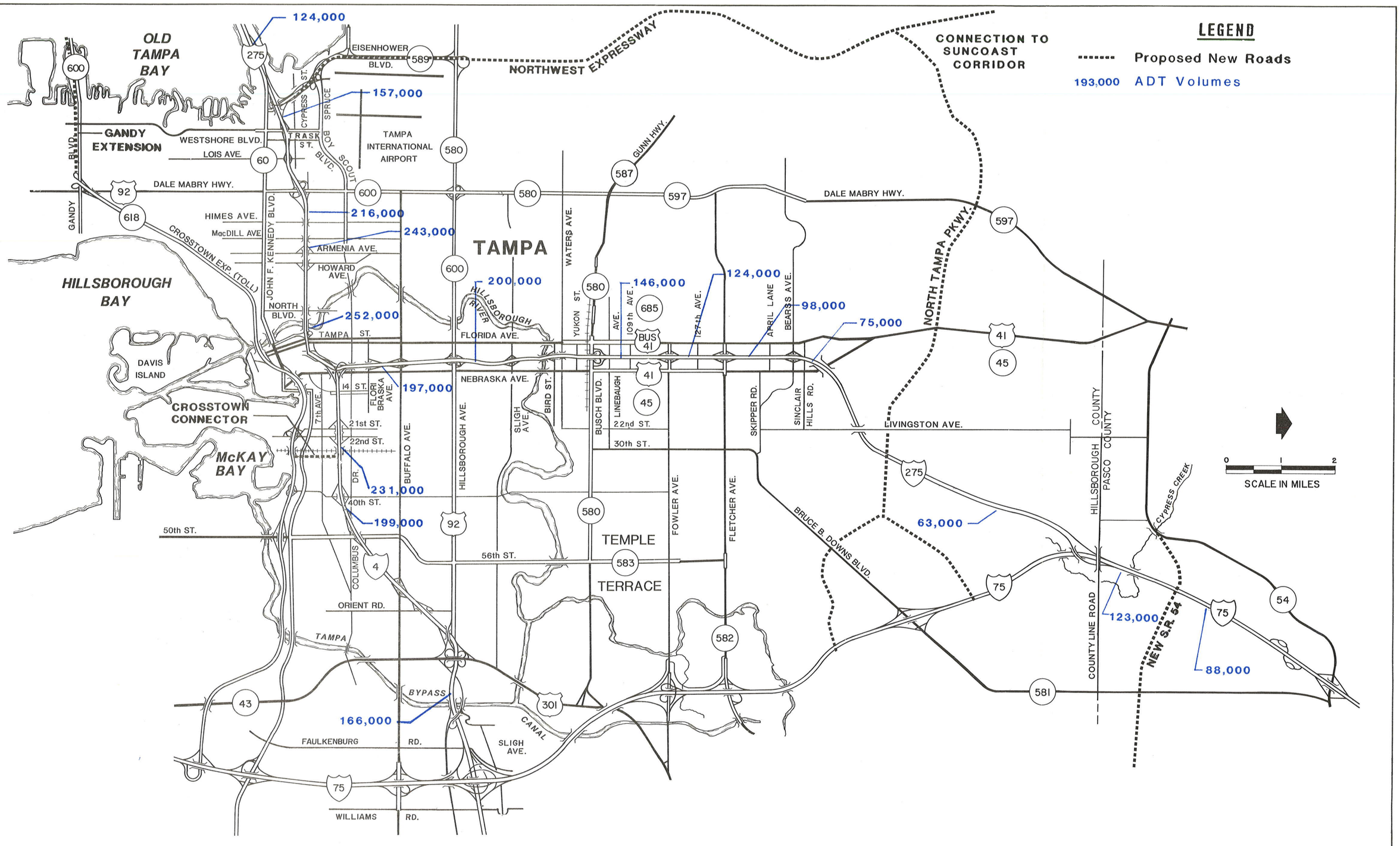
The ADT volumes for the design year 2010 were forecasted using the validated Florida Standard Urban Transportation Model Structure (FSUTMS) for Hillsborough County, as supplied by FDOT. A High Occupancy Vehicle (HOV) assignment technique was developed and added to this model by the Tampa Interstate Study Team. The input data for this model, consisting of 2010 highway network and socio-economic data, were supplied by the Hillsborough County Metropolitan Planning Organization (MPO) and FDOT. For the simulation of the various design concepts, the 2010 highway networks were adjusted by coding distinct links for each direction on I-275, I-4 and I-75. The socio-economic data provided by the MPO were adjusted by adding additional zones to include the portion of Pasco County within the study area. This area included the portion of Pasco County south of State Road 52 between U.S. 41 and U.S. 301. The zonal system used for Pasco County was consistent with the zonal system defined for the State Road 54 Project Development and Environmental (PD&E) Study.

The external trips to and from Pinellas County were adjusted to simulate the results of the May 1988 Howard Frankland Bridge Traffic Forecasts and Lane Requirements Study. A rail transit system and feeder bus network were also incorporated into the 2010 highway network. Both the rail transit system and feeder bus network were provided to the study team by the MPO's Rail Transit Study consultant. The data required to estimate rail transit trips were also provided by the Rail Transit Study consultant and were adjusted by TIS to simulate the same level of transit usage as predicted by the Rail Transit Study consultant. A further discussion of this issue is presented in Section VI, "Multi-Modal Transportation Elements."

A summary of the traffic assignments, at selected locations in the study area for the various tiers and Master Plan Concept, is presented in Table IV-3. Individual differences between the Tier volumes at the same location resulted from factors such as specific HOV treatment, location of the two-roadway and four-roadway systems, specific interchange locations, number and location of park-n-ride lots, express bus routes and the rail transit assignment. The ADT volumes used in the evaluation of the Master Plan Concept are shown in Exhibit IV-6.

Table IV-4 contains a comparison between the existing (1988) ADT volumes and the Tier 3 (Master Plan) 2010 ADT volumes at nine locations. The increase in daily traffic projected to occur over the next 22 years (1988 to 2010) ranges from a low of 45 percent east of Dale Mabry Highway to a high of 261 percent south of the I-275/I-75 Interchange.

Also included in this table are the existing number of lanes at these locations, the number of lanes required to provide LOS D with the existing daily volumes, and the number of lanes required to provide LOS D with the 2010 daily volumes. From Table IV-4 it can be determined that additional lanes will be required at several locations to provide an acceptable LOS for the current traffic demand. To provide LOS D for the



ADT VOLUMES 2010

EXHIBIT IV-6

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TAMPA INTERSTATE STUDY / THE GREINER TEAM

TABLE IV-3

SUMMARY OF 2010 TAMPA INTERSTATE TRAFFIC
Tampa Interstate Study

Location	Level of Geometry Development Tier 2	Tier 3	Master Plan
I-275/East of Howard Frankland Bridge	130,000	124,000	124,000
I-275/West of Westshore Boulevard	160,000	151,000	157,000
I-275/East of Dale Mabry Highway	195,000	225,000	216,000
I-275/West of Armenia Avenue	231,000	257,000	243,000
I-275/over Hillsborough River	250,000	271,000	252,000
I-4/East of 22nd Street	220,000	235,000	231,000
I-4/East of Crosstown Connector	195,000	201,000	199,000
I-4/East of U.S. 301	155,000	170,000	166,000
I-275/North of Floribraska Avenue	165,000	200,000	197,000
I-275/North of Hillsborough Avenue	160,000	206,000	200,000
I-275/North of Linebaugh Avenue	145,000	157,000	146,000
I-275/North of Fowler Avenue	142,000	134,000	124,000
I-275/North of Fletcher Avenue	105,000	105,000	98,000
I-275/North of Bearss Avenue	75,000	78,000	75,000
I-275/North of North Tampa Parkway	65,000	63,000	63,000
I-275/North of Hillsborough County Line	118,000	124,000	123,000
I-75/North of New S.R. 54	105,000	89,000	88,000

Tier 1 Traffic provided by 1986 Project Development Report - Reconstruction and High Occupancy Vehicle Improvements, I-275 and I-4

TABLE IV-4

INTERSTATE TRAVEL DEMAND AND LANE REQUIREMENTS
Tampa Interstate Study

Location	Existing ADT	Existing No. of Lanes	Required No. of Lanes for LOS D[1]	2010 ADT	Required No. of Lanes for LOS D[1]
Howard Frankland Bridge	78,400	4	6	124,000	8
Dale Mabry Highway	148,600	6	8	216,000	12
Hillsborough River	160,000	8	8	252,000	14
21st Street	118,900	6	8	231,000	14
50th Street	95,500	4	6	199,000	12
Floribraska Avenue	129,800	8	8	197,000	12
Fowler Avenue/ Fletcher Avenue	67,100	4	4	124,000	8
Fletcher Avenue/ Bearss Avenue	51,100	4	4	98,000	6
Bearss Avenue/ I-275/I-75 Apex	20,800	4	4	75,000	6

[1] Basic freeway lanes only. (This does not include any auxiliary lanes needed for merging/diverging or weaving.) Based on a per lane flow rate of 1,650 vehicles per hour with a K-factor of 0.08 and a D-factor of 0.55 (except between Dale Mabry Highway and the Hillsborough River where a value of 0.50 was used).

2010 daily travel demand, as many as 14 freeway lanes will be required on I-275 (at the Hillsborough River) and I-4 (at 21st Street).

Accidents

Another component of the TIS review of existing conditions involved the identification of high accident locations. This was accomplished by an analysis of FDOT accident data for the years 1983 through 1985 and provided in TIS Task E.9, Transportation Plans Working Paper. The study area was divided into 54 sections ranging from approximately 0.5 miles to 2.5 miles. Each section typically included an interchange, a potential interchange location, or a mainline interstate segment. The two primary parameters of interest in this analysis were accident ratios and accident typology. The accident ratio is defined and calculated as follows:

$$\text{Accident Ratio} = \frac{\text{Actual Accident Rate}}{\text{Critical Accident Rate}}$$

In general, any location with accident ratios greater than or equal to one is highly hazardous. For this analysis, a section was determined to warrant concern if its accident ratio was greater than 0.90. The inclusion of sections with ratios between 0.90 and 1.00 allowed an investigation of those sections with potential safety problems.

Eleven of the 54 sections, or 20.4 percent, had accident ratios greater than or equal to 0.90. These sections comprise 7.2 miles, or 19.7 percent, of the total TIS highway mileage. The accident ratios for these 11 sections ranged from a high of 2.32 at the Ashley Street interchange to a low of 0.94 at the Columbus Drive/ 50th Street interchange. The total cost of highway accidents in the study corridor for the three year period of 1983 through 1985 was approximately $32.2 million.

The second criteria used in identifying sections for possible further investigation was accident typology. If the review of the specific accident history showed an atypical number of accidents of a type that may have been related to geometric design elements (such as super elevation, sight distance, length of acceleration/ deceleration lanes, etc.), it was classified as a hazardous section. The accident types identified as strongly correlated with geometric design features included the following:

* Collision with fixed object above the road;
* Collision with motor vehicle or attenuator at a merge or diverge;
* Motor vehicle overturned or truck jackknifed;
* Motor vehicle hit bridge abutment/rail/pier;
* Motor vehicle ran-off road and hit fixed object/ran into water or culvert.

Accident thresholds (i.e., number of total accidents) were established for each of the accident types identified, and the total number of accidents occurring between 1983 and 1985 were tabulated. If, for each of the specific accident types, the number of actual accidents in a study section equaled or exceeded the corresponding threshold, it was considered to be a section where accident typology may be related to geometric design deficiencies.

Thirty-four of the 54 sections in the study area had accidents that equaled or exceeded one or more of the accident thresholds. These sections comprise 26.45 miles, 72.3 percent, of the total highway mileage. All 11 of the sections that had accident ratios greater than 0.90 also satisfied this criteria. In addition, 20 of the 54 sections in the study area had total accidents that equaled or exceeded at least two of the accident thresholds.

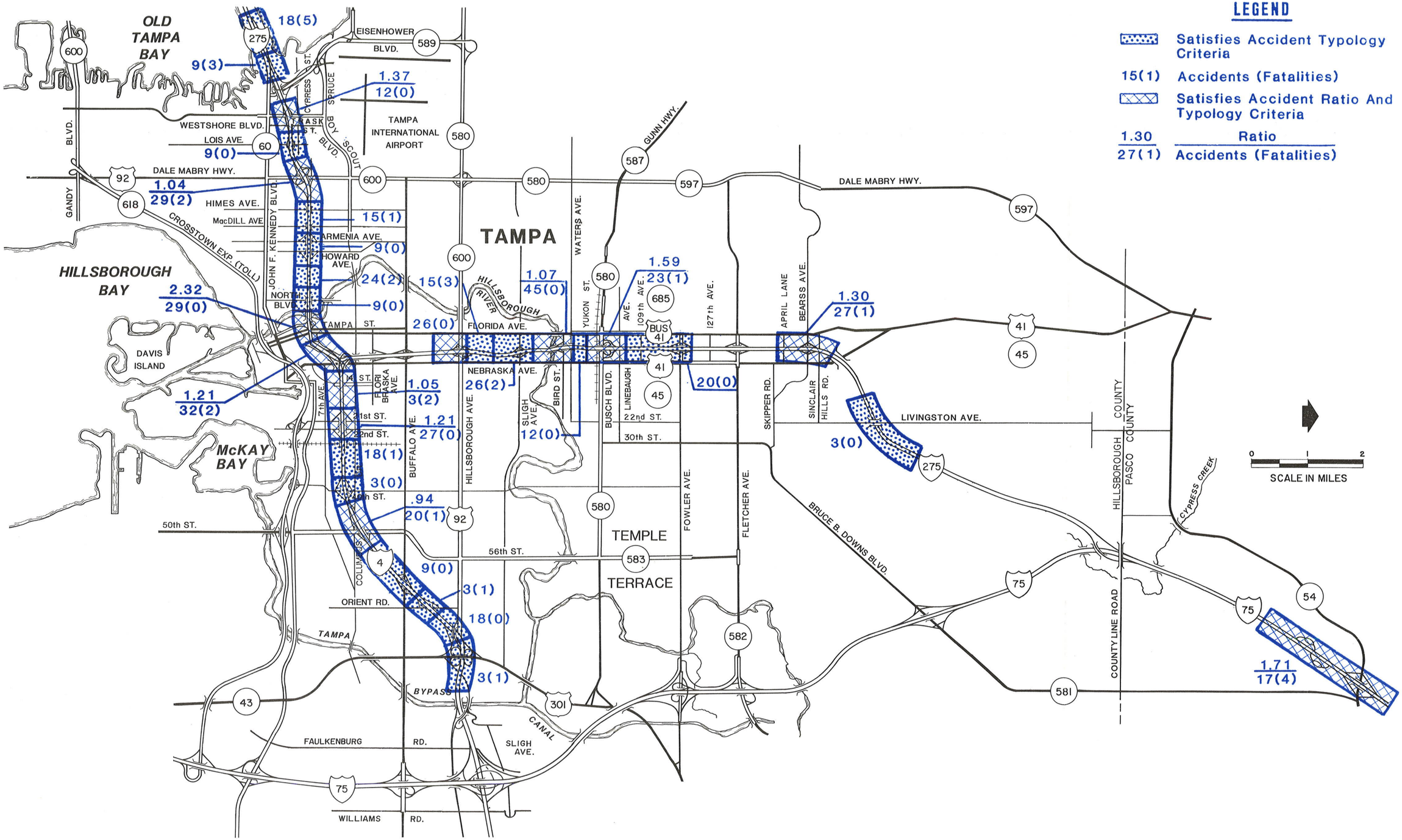
These analyses point out the high accident frequency recently occurring over a substantial portion of the TIS corridor. These accidents are primarily due to a combination of high traffic volumes and geometric design deficiencies. Exhibit IV-7 illustrates the segments which exceed the accident ratio and typology criteria. With over 70 percent of the interstate experiencing problems, improvements are necessary. The growth in traffic projected for the interstate system will further increase the accident potential and safety problems in the corridor.

Reconstruction Versus Rehabilitation

The existing Tampa interstate system was examined extensively during the initial Task E Data Collection activities and summarized as part of the Task F2 Component Analysis presentation to the FDOT and FHWA. The existing vertical and horizontal alignment was a key element in the design evaluation conducted in Tasks E and F.2. Existing structural analysis also provided important information on the need for structural replacement or rehabilitation throughout the TIS area. Pavement analysis was conducted to determine the life expectancy of the various pavement sections. This information was utilized in the evaluation. Right-of-way constraints, or the availability of right-of-way, was a major factor in the older, established, urban areas of the study. Additional consideration was given to the complexity of proposed designs, which could require extensive revisions to the roadway alignment or configuration.

Design segments 1A, 2A, 2B, 3A and 3B are considered reconstruction areas due to the complexity of the design involved in the four-roadway system, the restricted right-of-way, and revisions to the existing vertical alignment. Design segment 4B is a reconstruction area due to the complexity of the design resulting from the total reconfiguration of the U.S. 301 and U.S. 92 (Hillsborough Avenue) interchanges with I-4. This reconfiguration results in a collector-distributor (i.e., four-roadway) system. Design segments 5A, 5B and a portion of 5C are reconstruction projects due to the dramatic change in vertical profiles required to accommodate the Master Plan Concept in this area.

The remaining portions of the TIS are considered rehabilitation actions. This type of design and construction is reflective of the basic two-roadway system to be implemented. I-4 rehabilitation in design segments 4A and 4C are considered basic widening projects, except for the reconstruction of the Orient Road interchange to accommodate the HOV priority access ramps. The degree of I-275 design complexity is highest in design segments 5C and 5D (Bird Street to Busch Boulevard) due to the reconfiguration of access and ramping in this area. North of Busch Boulevard (Design Segments 5E through 5G), the I-275 vertical alignment is basically consistent with the proposed Master Plan design criteria. Design segments 6A and 6B are rural and will entail basic widening projects, except for the new interchange areas.



ACCIDENT ANALYSIS 1983-1985
HIGH ACCIDENT SECTIONS

EXHIBIT IV-7

A Florida Department of Transportation Project

V. TIER EVALUATION PROCESS

Introduction

The comparative analysis technique used to identify viable alternatives in the Tampa Interstate Study (TIS) is called Tier Analysis. This screening process, or tiering, allowed the study team to assemble a large array of competing design components in an easily understood matrix format for evaluation. Exhibit V-1 depicts this process. The key factor in the success of the tier analysis process is its ability to "window down" the vast array of competing designs to the few viable alternative concepts suitable for application in Tampa's interstate corridors.

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

The second tier of analysis used the 1"=200' scale alternatives remaining after the "first tier cut," and, as in the first tier, a matrix evaluation was prepared. This matrix included all factors considered relevant by the study team for this level of analysis. The matrix also included quantification and estimates of impacts for each of the alternatives by category of impact. This resulted in a ranking of the alternatives.

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

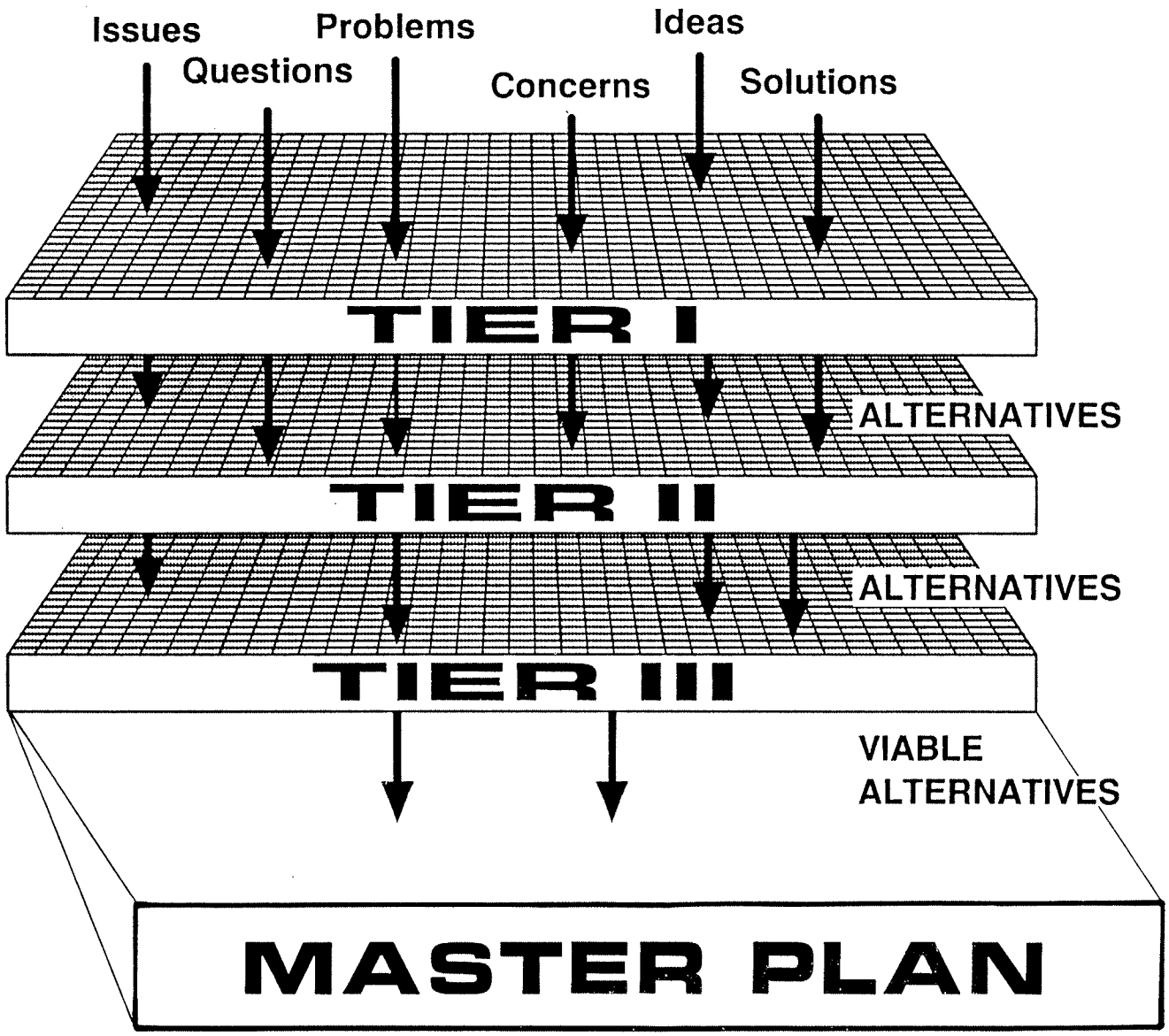
The refinement and continued development of alternatives throughout this systematic process assisted the team in providing all the necessary documentation for the logical process and selection of viable alternatives. This process also provided the necessary documentation for alternatives eliminations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

Throughout the tier analysis, public information workshops were held to display the most promising alternatives to the public and to the elected officials. These large public meetings were supplemented by dozens of smaller local and special interest group meetings. The tier analysis process was an integral component of the public involvement program.

Tier One Alternatives Evaluation

The tier one matrix was composed of generalized and easily measured data or factors available at the time of analysis. These factors were grouped into categories for ease in reference. Table V-1 contains a factor definition or description of those measurement units which were used to determine the alternatives' impacts.

For each alternative, a rating was assigned to each factor to measure both positive and negative impacts. A value of three (3) was assigned when there were no impacts, minimal negative impacts and/or significant



TIER EVALUATION PROCESS

EXHIBIT V-1

TABLE V-1

TIER 1 MATRIX EVALUATION FACTORS AND METHODS OF MEASUREMENT

Physical Environment

1. **Noise Sensitive Sites** - The greater the number of noise sensitive sites within 800 feet of the right-of-way, the greater the negative impact.
2. **Wetlands** - The greater the number of acres of wetlands required for right-of-way, the greater the negative impact.
3. **Permit Difficulty** - The greater the value (based on vegetative type) of the acreage of wetlands required for right-of-way, the greater the negative impact.

Land Use

1. **Major Community Facilities** - The greater the number of community facilities (not 4f) within the proposed right-of-way, the greater the negative impact.
2. **4f and Section 106** - The greater the number of park and recreation sites, historical sites or districts, or archaeological sites within the right-of-way, the greater the negative impact.
3. **Accessibility and Circulation** - The larger the number of local streets terminated, the greater the negative impact. The larger the number of frontage roads, additional overpasses or interchanges allowing cross corridor travel, the greater the positive impacts.
4. **Right-of-Way/Relocations** - The larger the number of relocations required, the greater the negative impact.

Roadway/Transit

1. **Maintenance of Traffic** - The greater the ability of the alternative to maintain traffic operations during construction, the more positive the rating; the more restrictive the construction was on traffic operations, the more negative the rating. If an alternative did not allow for maintenance of traffic, it was fatally flawed.
2. **Design Segment Continuity** - The greater the flexibility the alternative allows for a variety of alternative concepts for upstream and downstream design segments, the more positive the rating.
3. **Operational Characteristics** - The more relief (better LOS) an alternative provided for system mainline traffic and the immediate access area, the more positive the rating.

Structural

1. **New Bridges and Bridge Replacement** - The greater the number of new or replaced structures, the greater the negative impact.
2. **Reconstructed Bridges** - The greater the number of bridges requiring widening or reconstruction, the greater the negative impact.
3. **Construction** - The greater the difficulty of structural construction (bridge type), the greater the negative impact.

Drainage System

1. **System Contained within the Existing Right-of-Way** - The greater the acreage required for drainage outside the existing right-of-way or under an elevated structure, the greater the negative impact.
2. **Maintenance** - The greater the regular maintenance needs of the drainage system, the greater the negative impact.
3. **Permit Difficulty** - The greater the floodplain encroachment, the greater the negative impact.
4. **Design Flexibility** - The greater the complexity of the drainage system, the greater the negative impact.

Cost

1. **Structural** - The greater the additive cost for each new or reconstructed typical structure, the greater the negative benefits.
2. **Roadway/Transit** - The greater the cost per mile of improvement, the greater the negative impact.

positive impacts. A value of two (2) was assigned when the evaluation indicated moderate negative and/or moderate positive impacts. A value of one (1) was assigned when the alternative had a significant negative impact and minimal or no positive impacts. A value was assigned for each factor, for each alternative, within a design segment. The evaluation of a single factor may also have identified an alternative as "fatally flawed," thereby eliminating that alternative from any further analyses.

A graphic overview of the study area showing the design segment limits was presented previously on Exhibit IV-1. For ease of reference, the following section of this report contains specific design segment discussions of evaluation. The 1"=200' scale aerial photography showing the alternatives and the TIS Task F.6.a(6), Tier 1 Evaluation Technical Memorandum are appended by reference.

Design Segment 1A

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

The design components of the alternatives which were identified as causing significant negative impacts and which were not continued into Tier 2 are listed below:

* A two-roadway system east of Lois Avenue (traffic volumes too great).
* 60 mph design speeds and resulting structural configuration at Interstate 275 (I-275) and Memorial Highway interchange (would require the acquisition of Westshore Plaza parking or Centre Pointe building).
* The removal of the Lois Avenue interchange (loss of access to Westshore area).

Several design components were identified for which no determination was made as to positive or negative impacts. It was determined more analysis was needed in Tier 2. These design components included:

* The Tampa International Airport aviation related height restrictions at I-275 and Memorial Highway.
* A four-roadway versus two-roadway system west of Lois Avenue.
* The location and length of frontage roads parallel to I-275.
* Type of access to Cypress Street.
* Type of interchange at Dale Mabry Highway.

Design components which always resulted in positive impacts and were therefore carried forward to Tier 2 were identified as:

* The Sherrill Street extension north-south through I-275.
* A direct freeway connection to the Northwest Expressway from I-275.
* Cantilevered structures at I-275 and Memorial Highway.
* Interchanges at Westshore Boulevard (to/from the east), Lois Avenue, Dale Mabry Highway, and Himes Avenue (to/from the east).

Consequently, the Tier 1 Alternatives Evaluation in Design Segment 1A resulted in the definition of three new alternatives from the refinement and combination of the previous eight alternatives. The alternatives to be evaluated in Tier 2 were numbered 1A8, 1A9 and 1A10.

Design Segment 2A

Four alternatives were developed within Segment 2A during the Tier 1 Analysis. Alternative 2A1 had a significantly higher score than the other three alternatives and was carried forward to the Tier 2 analysis. As a result of the design segment continuity analysis of Design Segments 2A and 2B, it was determined an additional four-roadway alternative (2A5), which transitions to a six-roadway in the CBD area, needed to be developed.

The Tier 1 analysis identified the problems and benefits of a two-roadway system. The two-roadway alternative without frontage roads (Alternative 2A3) had traffic operational problems in the Dale Mabry area but benefits in areas east of Armenia Avenue. This resulted in the development of a new alternative (2A6) in Tier 2, which was a mix of the four-roadway and two-roadway systems.

Alternative 2A4, Double Deck Alternative, had a significantly lower score than the three other alternatives, it was not carried further in the process. The four-roadway, double deck alternative was not suitable for Design Segment 2A because of the complex roadway systems at Dale Mabry Highway and the CBD. The use of cantilever structures (or partial decking) for other alternatives in Design Segment 2A was to be evaluated further in Tier 2.

Design Segment 2B

Four alternatives were developed within Segment 2B during the Tier 1 Analysis. Alternative 2B2 scored higher than any other alternative and was carried forward to Tier 2. This alternative scored high because of the cantilevered roadway which has less right-of-way and land use impacts. The HOV option in the middle allows for peripheral parking to occur on either side of the interstate.

It was also determined that another elevated alternative with HOV on a separate alignment, Alternative 2B5, (similar to 2B3) would be developed to the north. This alternative would have full interchange access at the Jefferson/Orange Street interchange.

Alternative 2B4 had a high score but did not have an HOV lane; therefore, it did not meet the multimodal (transit) goals of the study and was eliminated. The six-roadway system had positive operational characteristics and was carried forward as a new Tier 2 alternative with a HOV component (Alternative 2B6).

Design Segments 3A and 3B

Ten alternatives were developed within Segments 3A and 3B during the Tier 1 Analysis. Six of the alternatives were determined to be fatally flawed and not carried into Tier 2. Alternatives 3A2, 3A3, 3A5 and 3A6 were collectively defined as having all right-of-way acquisition occur completely to the north or to the south of Interstate 4 (I-4). This caused a fatal flaw in design segment continuity, as it required the entire I-4/I-275 CBD junction to be moved in the applicable direction. The tremendous negative impacts on land

use in the CBD made these alternatives fatally flawed. Alternatives 3A7 and 3A7.1 were also fatally flawed because traffic traveling east in the express lanes was required to cross over the HOV lanes to access the slip ramp to the local freeway lanes. The westbound traffic in the local freeway lanes had to cross the HOV lanes to access the express freeway causing significant operational problems.

The remaining alternatives (3A1 and 3A4) varied only in the design radius of the Crosstown Connector and received similar total scores; however, both received low scores on design segment continuity. Ramp movements to and from 22nd Street conflicted with the Crosstown Connector traffic. The braided ramps negatively impacted the redevelopment of the Ybor City historic area because of the significant amount of right-of-way required. As a result, a new alternative (3A8) was developed; it included the design concepts of 3A1 and 3A4, but with a split interchange at 14th/15th Streets. Assessment of the land use impacts and access to the Ybor City historic area led to the development of another new alternative (3A9) with braided ramps providing access to the area to and from the west at 21st Street.

Alternatives 3B1 and 3B2 were found to have very similar totals with 3B1 having a slightly higher score because of less land use impacts. Alternative 3B1 was selected for the Tier 2 analysis. Analysis of the abutting Design Segment 4A led to incorporating a two-roadway transition area within Design Segment 3B, which led to the development of a new alternative (3B3). The split diamond interchange at 50th Street was a viable alternative and improved the access to 40th Street traffic; it was incorporated into Alternative 3B3.

Design Segments 4A, 4B and 4C

Eight alternatives were developed within Segments 4A, 4B, and 4C during the Tier 1 Analysis. In Design Segment 4A, only one alternative was proposed and the Tier 1 evaluation found no overriding significant negative impacts. For operational benefits, an additional alternative was developed to include a four-roadway system extension to Buffalo Avenue (Alternative 4A2).

Design Segment 4B had five alternatives in Tier 1. Alternatives 4B5, 4B6, and 4B7 were fatally flawed because no connection was provided to U.S. Highways 92 and/or 301. This lack of connection was significant due to the necessary access with the expansion of Vandenberg General Aviation Airport and the role of both U.S. 92 and U.S. 301 as regional highways. The design components of alternatives 4B2 and 4B3 were carried forward; I-4/U.S. 92 access was added and they were renumbered as alternatives 4B8 and 4B9.

Design Segment 4C contained two Tier 1 alternatives, neither of which were carried into the Tier 2 analysis. They required the reconstruction of the new I-75/I-4 interchange. Traffic projections indicated only a two-roadway system was needed on I-4 through the interchange. Additional I-75 ramp connections to Sligh Avenue and U.S. 92, as well as the improvement of the two roads through I-75 and the extension of Faulkenburg Road through the I-4 corridor to improve access to Vandenberg Airport were incorporated. The areas between U.S. 301 and I-75 were identified as new design components during the analysis process. This became the new Tier 2 Alternative 4C3. A four-roadway system west of the I-75 interchange, without the ramp connections to Sligh Avenue and U.S. 92, was developed as Alternative 4C4.

Design Segments 5A, 5B, 5C and 5D

Eight alternatives were developed within Segments 5A, 5B, 5C, and 5D during the Tier 1 Analysis. Alternatives 5A1 through 5C1 and 5A2 through 5C2 had similar scores for nearly all factors; the only real

difference being in the amount of right-of-way required. Both groups of alternatives were carried into Tier 2 for further analysis.

Design Segment 5D had six Tier 1 alternatives. The alternatives with the highest score for each type of roadway (5D2 and 5D5) were carried into Tier 2. Both alternatives included the braided ramps at Busch Boulevard and Linebaugh Avenue and a frontage road between Busch Boulevard and Waters Avenue. The frontage road, in conjunction with proper signing, will provide another outlet to the at-grade railroad crossing at Busch Boulevard. The Linebaugh Avenue ramps in Alternatives 5D2 and 5D5 supplement the Busch Boulevard ramps for I-275 southern movements.

Design Segments 5E, 5F and 5G

Two alternatives were developed within Segments 5E, 5F, and 5G during the Tier 1 Analysis. The 5E1, 5F1, 5G1 series of alternatives received higher scores; they were carried into the Tier 2 analysis. During the analysis, another set of alternatives (5E3, 5F3, 5G3) were developed as a two-roadway system; Nebraska and Florida Avenues were designated as one-way pairs. Two new streets (109th and April Lane) were overpassed by the interstate system.

Design Segments 6A and 6B

Ten alternatives were developed within Segments 6A and 6B during the Tier 1 Analysis. Concepts for Design Segment 6 were initially developed for the entire segment (Alternatives 6-1 through 6-10). Due to the complexities of alternatives north of I-75, this Design Segment was divided into two, Tier 2 Segments 6A and 6B.

There was only one alternative in Design Segment 6A; this alternative (6A10) was carried forward into Tier 2. In Design Segment 6B, in order to increase access in an environmentally sensitive but rapidly urbanizing area, a rural highway with an eight-lane and six-lane rural cross-section was necessary (New S.R. 54). During the Tier 1 Analysis, the superior design components of the nine various alternatives were combined into Alternative 6B11. This alternative included a new diamond interchange at New S.R. 54, directional flyovers at the I-75/I-275 junction, and interchange ramps to and from the south at County Line Road. Another Tier 2 alternative, 6B12, was also identified with the same combination of design components minus the County Line Road interchange ramps.

Tier One - Transit Alternatives

The Tier 1 Analysis also included the development of a transit envelope with an emphasis on HOV lanes and priority ramps. In Tier 1, the interstate system contained HOV lanes on I-275 from south of the Livingston Avenue overpass to the Howard Frankland Bridge and on I-4 west of I-75. In Tier 1, the analysis of priority ramp locations was conducted independently of the roadway analysis. The Tier 1 HOV analysis was divided into four geographical areas: I-275 North (Buffalo Avenue to Livingston Avenue), I-275 West (North Boulevard to the Howard Frankland Bridge, I-4 (14th Street to I-75) and the Tampa CBD (Buffalo Avenue to 14th Street to North Boulevard). HOV priority ramps were developed to allow carpools and buses to directly enter/exit the HOV lanes and avoid the weave across several general use highway lanes.

I-275 North Special HOV Access Ramps

Along I-275 North, priority HOV access ramps were considered at the following locations:

* Hillsborough Avenue/Osborne Avenue;
* Yukon Street;
* Bearss Avenue; and
* Livingston Avenue.

At Hillsborough Avenue or Osborne Avenue, an alternative was developed for priority access to the HOV lanes in the center of I-275. At Yukon Street exclusive center drop ramps were developed for priority access to the HOV lanes in the center of I-275. These ramps provide direct access to the HOV lanes from Yukon Street in the vicinity of an existing Hillsborough County park-n-ride lot used by HART. At Bearss Avenue, two priority ramp alternatives were considered. Bearss Avenue provides direct access from the site of a future HART park-n-ride lot to the HOV lanes. This park-n-ride site is located just north and west of Bearss Avenue on land presently owned by the FDOT.

At Livingston Avenue, a possible park-n-ride lot was considered with direct access to the HOV lanes. A "flyover" alternative was considered at this location similar to the Bearss Avenue design. The Tier 1 analysis indicated a North Tampa Parkway interchange with I-275 would better serve the developments in north Tampa. As a result, the North Tampa Parkway park-n-ride lot and the New S.R. 54 park-n-ride lot were selected to be developed as a part of the Tier 2 alternatives. The ramps at Livingston Avenue were eliminated.

I-275 West Special HOV Access Ramps

Along I-275 West, priority access ramps were considered at Trask Street in the Westshore area. The priority ramps would have a center drop ramp in the middle of the interstate. No park-n-ride lot was identified with this HOV priority access ramp.

I-4 Special HOV Access Ramps

Along I-4, priority HOV access ramps were considered in the vicinity of the Florida State Fairgrounds. Two ramping alternatives were investigated at this location. The first was located adjacent to the race track on the north end of the fairgrounds and was serviced by direct flyover ramps. The second access was at Orient Road. This served a lot near the Fairground's Orient Road entrance.

Tampa Central Business District (CBD)

In the vicinity of the Tampa CBD, the HOV roadway transitions from concurrent flow lanes into an exclusive HOV/Transitway. This transition is required to limit the amount of weaving and merging through the complicated downtown interchanges and to allow direct access to the CBD from the HOV lanes.

Transit Conclusion

The Tier 1 analyses determined that park-n-ride lots, without priority ramps, would be provided at the North Tampa Parkway (Segment 6A) and New S.R. 54 (Segment 6B) for buses and carpools; the priority ramps at Hillsborough Avenue/Osborne Avenue would not be carried into Tier 2 because of its close proximity to the Tampa CBD and because the HART "limited" bus routes are to be express from Busch Boulevard instead of Hillsborough Avenue; the priority ramps at Livingston Avenue would not be necessary as traffic would be served by the park-n-ride lot at the North Tampa Parkway; priority HOV ramps would be provided at Trask Street (Segment 1A), CBD area (Segment 2B), Orient Road (Segment 4A), Yukon Street (Segment 5C) and Bearss Avenue (Segment 5G).

Summary - Tier One

The Tier 1 alternatives, by design segment, carried into Tier 2 were as follows:

* 1A8, 1A9, 1A10;
* 2A1, 2A5, 2A6;
* 2B2, 2B5, 2B6;
* 3A8, 3A9;
* 3B1, 3B3;
* 4A2, 4B8, 4C3 (two-roadway);
* 4A1, 4B8, 4C3 (four-roadway);
* 4A2, 4B9, 4C4 (two-roadway);
* 5A1, 5B1, 5C1, 5D2 (two-roadway);
* 5A2, 5B2, 5C2, 5D5 (four-roadway);
* 5E1, 5F1, 5G1 (off-interstate parallel road intersection improvement);
* 5E3, 5F3, 5G3 (one-way pair and new cross streets);
* 6A11; and
* 6B11, 6B12.

In addition, the Tier 1 analysis determined priority HOV ramps would be carried into Tier 2 at the following locations:

* Trask Street (Segment 1A);
* Tampa CBD (Segment 2B);
* Orient Road (Segment 4A);
* Yukon Street (Segment 5C); and
* Bearss Avenue (Segment 5G).

Tier Two Alternatives Evaluation

The Tier 2 evaluation documents the second of the three stages of tier analysis. The second tier evaluation matrix includes all the factors considered relevant by the study team for this second level of

analysis. This matrix also included quantification and estimates of impacts for each of the alternatives by category of impact and resulted in the ranking of the alternatives.

A graphic overview of the study area showing the design segment limits is presented in Exhibit IV-1. For ease of reference, the following section of this report contains specific segment discussions of evaluation. The 1"=200' scale aerial photography showing the alternatives and the TIS Task F.6.a(6), Tier 2 Evaluation Technical Memorandum are appended by reference.

The same factors previously presented in Table V-1 for Tier 1 were used with the following exceptions:

* Constructibility was added under the Roadway/Transit category. The greater the ability for the alternative to be constructed, the more positive the rating; the less likely the alternative can be constructed, the more negative the rating. If an alternative cannot be constructed, it is fatally flawed.
* The Structural category was deleted.

Design Segment 1A

Three alternatives, 1A8, 1A9 and 1A10, were refined within Segment 1A during Tier 2. Alternative 1A9 ranked higher than the other two alternatives. Alternative 1A9 was found clearly superior to the others in terms of its minimal negative impacts on existing land uses and significant positive impacts to the proposed design of the roadway system. Alternative 1A9 was carried forward into Tier 3.

During the Tier 2 evaluation process, several design component issues were unresolved or not completely addressed in Alternative 1A9. These design components included:

* The Tampa International Airport aviation related height restrictions.
* A four-roadway versus two-roadway system west of Lois Avenue.
* Frontage Roads east of Himes Avenue.
* Elevated exclusive HOV/Transitway Lanes.
* The Sherrill Street extension through I-275.
* A direct freeway connection to the Northwest Expressway.
* Cantilevered structures at I-275 and Memorial Highway.
* Interchanges at Westshore Boulevard (to/from east), Lois Avenue (to/from west), Dale Mabry Highway, and Himes Avenue.

The Tier 2 Alternatives Evaluation in Design Segment 1A resulted in the definition of two new alternatives from the continued evaluation and refinement of the design components listed above. The alternatives carried into Tier 3 were numbered 1A9, 1A11, and 1A12.

Design Segment 2A

Three alternatives were evaluated within this segment during Tier 2: 2A1, 2A5, and 2A6. The alternatives ranked very similar. Since no one alternative was clearly superior to the other, additional analysis was deemed necessary. Frontage road concepts were modified to improve accessibility and circulation.

Alternative 2A5 was not carried into Tier 3 because of problems associated with the continuation of a six-roadway system through North Boulevard into Segment 2B and the negative impacts to existing land uses.

The initial alternatives resulting from the further analysis were numbered 2A7, 2A8, and 2A10. Four alternatives were carried into Tier 3, Alternatives 2A6, 2A7, 2A8, and 2A10.

Design Segment 2B

Three alternatives were evaluated and refined within the segment during Tier 2: 2B2, 2B5, and 2B6. Alternative 2B2 had more positive benefits than any other alternative. This alternative continued to score high because of the cantilevered roadway, which has less right-of-way and land use impact. More evaluation was necessary to explore the possibilities of adding full interchange access at both Ashley/Tampa and Jefferson/ Orange Streets.

Examination of Design Segment 2B alternatives also revealed the need to develop a four-roadway system east of 14th Street. Alternatives 2B5 and 2B6 still did not sufficiently meet the multi-modal (transit) goals of the study. Additional alternatives were needed to consider the impacts of HOV/Transitway lanes within the interstate and on separate interstate alignments. Tier 2 alternatives were refined to reflect these concerns and renumbered 2B7, 2B8, and 2B9 for Tier 3.

Design Segments 3A and 3B

Two basic alternatives were refined within Segments 3A and 3B during Tier 2. Alternatives 3A8 and 3B3 were ranked slightly higher than 3A9 and 3B1 because of the less land use impacts to the Ybor City historic area. While Alternative 3A9 was developed with braided ramps to provide access to the area west of 21st Street, it still did not meet sufficient accessibility and circulation goals. Alternatives 3A8 and 3B3 provided better access to Ybor City and were carried into the Tier 3 analysis.

Design Segments 4A, 4B and 4C

The principal difference between Tier 2 Alternatives 4A1 and 4A2 is the use of a four-roadway system in Alternative 4A1 through the Buffalo Avenue interchange; Alternative 4A2 utilized a two-roadway system in that area. The additional geometric and transit difference was that Alternative 4A1 provided exclusive HOV/Transitway center drop ramps to and from the west at Orient Road to serve the proposed new park-n-ride lot in the interchange area.

After reviewing the operational characteristics in the area from 50th Street to Orient Road and the overall lane requirements, the four-roadway alternative was eliminated and the exclusive HOV center drop ramps were added; thus essentially combining Alternatives 4A1 and 4A2.

Design Segment 4B had two alternatives, 4B8 and 4B9. Both contained positive design components with minimal negative impacts. These alternatives were combined and renumbered to form Alternative 4B10. The most significant change was the elimination of the "clover-leaf" interchange at U.S. 301/U.S. 92/I-4 in Alternative 4B9.

Design Segment 4C contained Alternatives 4C3 and 4C4. Alternative 4C4 was dropped from further evaluation in Tier 2 because the four-roadway system west of the I-75 interchange without ramp connections to Sligh and Hillsborough Avenues from I-75 conflicted with the HOV/Transitway Lanes within the I-4

alignment. Alternative 4C3 was seen as a far more viable alternative during the analysis process and was carried into Tier 3.

Design Segments 5A, 5B, 5C and 5D

There were two basic alternative sets in Design Segments 5A through 5D: the two-roadway system (5A1, 5B1, 5C1, and 5D2) and the four-roadway system (5A2, 5B2, 5C2, and 5D5). The Tier 2 analysis indicated the four-roadway system right-of-way impacts were greater than its operational benefits, so it was not carried forward. The two-roadway system in Alternatives 5A1, 5B1, 5C1 and 5D2 was combined with Nebraska Avenue and Florida Avenue as a one-way pair operation and renumbered 5A3, 5B3, 5C3, and 5D6 for Tier 3 analysis.

Design Segments 5E, 5F and 5G

Two basic alternative sets were refined within this segment during Tier 2: 5E1, 5F1, 5G1, and 5E2, 5F2, 5G2. The principal difference in Segments 5E and 5F was the operational plan for Florida and Nebraska Avenues. Segment 5G also provided different HOV priority ramping to the Bearss Avenue park-n-ride lot.

The 5E1, 5F1, and 5G1 series of alternatives received higher scores. They were carried into the Tier 3 analysis. Alternative 5G1 was modified and renumbered 5G4 for Tier 3 analysis to reflect intersection improvements at Florida Avenue and Nebraska Avenue with interchanging cross streets. Alternatives 5E3, 5F3, and 5G3 were developed from 5E2, 5F2 and 5G2 with the addition of Nebraska and Florida Avenues designated as a one-way pair and carried into Tier 3.

Design Segments 6A and 6B

There was only one alternative in Design Segment 6A, and it was determined this alternative (6A11) would be carried forward into Tier 3. In Design Segment 6B, in order to increase access in an environmentally sensitive but rapidly urbanizing area, a rural highway with an eight-lane and six-lane rural cross section was necessary. During the Tier 1 analysis, the design components of the Alternatives 6B1 through 6B9 were combined into one Alternative 6B11 with a new diamond interchange at S.R. 54, directional flyovers at the I-75/I-275 junction, and ramps to and from the south at County Line Road. For the Tier 2 analysis, a new Alternative 6B12 was also identified with the same combination of design components, but without the County Line Road ramps. Both Alternatives 6B11 and 6B12 were carried into the Tier 3 analysis.

Tier Two - Transit Alternatives

The Tier 2 concepts maintained a transit envelope within the interstate right-of-way for HOV lanes and priority access ramps. The HOV lanes extended along I-275 from the Howard Frankland Bridge to the Livingston Avenue overpass and along I-4 from just west of I-75 to its junction with I-275 in the Tampa CBD. Center-drop, priority access ramps to the HOV lanes were located at Trask Street, Orient Road, and Yukon Street. A flyover, priority access ramp was located near Bearss Avenue. In downtown Tampa, center-drop, priority access ramps were located at Tampa Street and Morgan Street to serve the Central Business District.

Computer simulations of the urban area transportation network were made based on the previously defined Tier 1 geometry concepts. These network simulations determined systems traffic and were structured to analyze the interstate system with and without HOV facilities.

The potential HOV volumes for two or more person carpools ranged from 15,000 to 28,000 vehicles per day (vpd) along I-275 north, I-275 west, and I-4 east. In the vicinity of the Tampa CBD, where I-4 and I-275 merge, the HOV volumes increase to 38,000 vpd. This demand on the HOV lanes can be compared with the maximum daily service volumes of a two-lane principal arterial and a two-lane exclusive roadway to determine if the HOV lanes are warranted. For Level of Service (LOS) C, the maximum daily service volume for a two-lane principal arterial is approximately 15,800 vpd. For a two-lane exclusive roadway, the maximum daily service volume at LOS C is approximately 22,500 vpd. Since the demand on the HOV lanes approaches or exceeds these service flow rates, the HOV lanes are warranted, assuming two or more person carpools use the HOV lanes. These volumes also indicate that the HOV lanes would be utilized all day.

The next phase of this tier analysis process (i.e. Tier 3) was designed to determine the following impacts of the HOV lanes and transit facilities on the interstate system:

* Impact of two or more person carpools versus three on more person carpools.
* Impact of concurrent flow HOV lanes versus exclusive HOV lanes.
* Impact of a rail transit system.

Each of these issues were analyzed in Tier 3 to assess their applicability to the Master Plan. These transit related factors assisted the study team in determining how extensive a role transit and HOV will play in meeting interstate travel demands.

Summary - Tier Two

The preceding discussion explains by design study segment the Tier 2 alternatives and the process used to determine the desirable components within each segment carried forth to the development of the Tier 3 alternatives.

As stated previously, the transit alternatives to be evaluated for Tier 3 are:

* Impact of two or more person carpools versus three or more person carpools.
* Impact of concurrent flow HOV lanes versus exclusive HOV lanes.
* Impact of a rail transit system on the interstate system.

The Tier 2 roadway alternatives, by design segment, carried into Tier 3 were:

* 1A9, 1A11, 1A12;
* 2A6 (modified), 2A7 (modified), 2A8, 2A10 (modified);
* 2B7, 2B8, 2B9;
* 3A8, 3B3;
* 4A3, 4B10, 4C3;
* 5A1, 5B1, 5C1, 5D2 (off interstate intersection improvements on Florida and Nebraska Avenues);
* 5A3, 5B3, 5C3, 5D6 (one-way pair of Florida and Nebraska Avenues);
* 5E1, 5F1, 5G4 (off interstate intersection improvements on Florida and Nebraska Avenues);

* 5E3, 5F3, 5G3 (one-way pair of Florida and Nebraska Avenues and new cross streets);
* 6A11;
* 6B11; and
* 6B12.

Due to the public comments received as a result of the July 13, 1988 Public Workshop and the community impacts/relocation evaluation for Tier 2, the study team recommended a modified LOS D be evaluated in Tier 3 for the general use freeway lanes. This recommendation was presented to the FDOT and FHWA. It was supported by the Tampa Urban Area Metropolitan Planning Organization, due to the community concern expressed over right-of-way impacts to businesses and neighborhoods.

The most significant influence, in all the Tier 2 evaluations as they relate to the further selection of concepts for development as Tier 3 alternatives, was the decision of the FDOT and the FHWA to reduce the level of service for the TIS from LOS C to LOS D. This had a dramatic impact on the lane requirements in specific segments of the corridor. The selection of roadway configurations was directly impacted by the level of service decision as the study progressed from Tier 2 to Tier 3.

Tier Three Alternatives Evaluation

The third and final tier of evaluation included geometric layouts of all remaining alternatives at 1"=100' scale. Basically, those alternatives that survived the second tier evaluation were reevaluated with even more stringent standards and detailed comparison analysis. The following discussion summarizes those issues and refinements, by segment, that were made during the Tier 3 analysis.

A graphic overview of the study area showing the design segment limits was presented previously on Exhibit I-1. For ease of reference, the following section of this report contains specific design segment discussions of evaluation. The 1"=100' scale aerial photography showing the alternatives and the TIS Task F.6.a(6), Tier 3 Evaluation Technical Memorandum are appended by reference.

Design Segment 1A

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

* The addition of ramps to and from the proposed Northwest Hillsborough Expressway to Memorial Highway and Kennedy Boulevard. This gave additional local accessibility to the Northwest Hillsborough Expressway from the Westshore area and reduced the number of collector-distributor roadway lanes required between I-275 and the Tampa International Airport (TIA) interchange.
* The addition of a Lemon Street connector at the Westshore Boulevard/I-275 interchange. This new connector relieves potential queuing problems at the I-275/Westshore Boulevard ramps, relating to the signalized movements at Westshore Boulevard and Cypress Street. A two-lane, one-way westbound, controlled access local connector road was recommended.

* Modification of the I-275/Northwest Hillsborough Expressway Interchange to provide a 62.5:1 vertical clearance relating to the landing flight path of Tampa International Airport. This modification was developed in conjunction with TIS, FDOT and Hillsborough County Aviation Authority staffs.

Design Segment 2A

The three alternatives for segment 2A, previously examined in Tier 2, were reexamined during the Tier 3 process due to extensive public involvement. Primary concerns were directed toward the amount of right-of-way required in the West Tampa Historic District and adjacent residential areas. The Tier 3 alternatives reflected this concern by creation of geometric options that emphasized location of the roadway either north or south of the existing centerline of I-275; Alternative 2A10 provided a centered approach.

After intensive reevaluations of all options, and both public and agency input, the TIS Study Team recommended the four-roadway alternative (based on traffic operations characteristics), which was reflected in Alternative 2A8. Further reevaluation of the centerline placement, as it affected the adjacent neighborhoods, resulted in the selection of a southern alignment shift between Himes Avenue and Rome Avenue. This geometric combination was carried forth into the Master Plan.

Design Segment 2B

The Tier 3 alternatives (2B7, 2B8 and 2B9) were reevaluated based on the parallel decisions arrived at in the adjacent segments, particularly Segment 2A. Additional concerns over excessive right-of-way for the exclusive HOV/Transitway alignment in Alternative 2B8; operational and traffic service concerns with a two-roadway system on the west in Alternatives 2B7 and 2B9; overloading of the Ashley Street interchange; and the lack of west bank CBD accessibility caused the study team to combine several of the most beneficial features of the three alternatives into one Master Plan Concept. These key design features were:

* Four-roadway system.
* Full interchanges both east and west of the CBD.
* Access ramps to the West Bank of the CBD.
* Provision of HOV/Transitway facilities within interstate alignment, including priority ramping.
* Provision of major stormwater management facilities under the interstate to reduce land acquisition in CBD.

Design Segment 3A and 3B

The initial Tier 3 alternatives in Segments 3A and 3B attempted to reduce right-of-way takings in the minority neigborhoods to the north of I-4. As a result of the widespread dissatisfaction with the lack of replacement access to the 21st/22nd Street commercial corridor expressed by the Ybor City business community and the City of Tampa, modifications were developed for the Master Plan Concept. The principal changes to the previous Tier 3 concepts in Segments 3A and 3B are:

* Extension of interchange ramps at 14th and 15th Streets serving Ybor City by means of one-way local frontage roads parallel to I-4 from 14th Street east to 22nd Street.
* Shifted I-4 alignment to the north to accommodate the new parallel local frontage roads from 14th Street to 22nd Street.
* Elimination of the 19th Street overpass and reconfiguration of interstate roadway profile and ramp tie-ins.
* Addition of one interstate lane eastbound and westbound to provide a minimum of three lanes per direction on I-4 from 14th Street to 50th Street.

Design Segments 4A, 4B, and 4C

No significant changes were made within these design segments during Tier 3 evaluation. A shift in the placement of the directional flyover ramps in the U.S. 301/U.S. 92/I-4 interchange was provided to reduce costs.

Design Segments 5A, 5B, 5C, and 5D

No significant changes were made to the I-275 roadway within this design segment during the Tier 3 evaluation. However, the issue of one-way pair operations for Florida and Nebraska Avenues was resolved in Segments 5A-D and 5E-G. The study team recommended eliminating the one-way pair for maintenance of traffic during I-275 construction. The final decision on the long-term use of a one-way pair was that it was not practical; the TIS Task F.6.i. Florida and Nebraska Avenues Operational Analysis Working Paper provides a complete evaluation of this issue.

Design Segments 5E, 5F, and 5G

Only one significant change was made to the I-275 roadway within this design segment during the Tier 3 evaluation. Segment 5G was modified to revise the method of HOV priority ramp access. The following refinements were made to this alternative:

* HOV priority access ramps to and from the park-n-ride lot north of Bearss Avenue on Florida Avenue is provided with median drop lanes at a new extension of Sinclair Hills Road through the interstate.
* Extension of Sinclair Hills Road through I-275 to connect Nebraska and Florida Avenues; access to park-n-ride lot and I-275 HOV priority ramps provided by this extension.

As stated previously, the Florida and Nebraska Avenues one-way pair concept was eliminated in favor of the current two-way operation. (See TIS Task F.6.i. Florida and Nebraska Avenues Operational Analysis Working Paper.)

Design Segments 6A and 6B

No significant revisions to Alternative 6A11 were recommended as a result of the Tier 3 analysis. The 6A11 concept was carried forward to the Master Plan.

The Tier 3 evaluations of Segment 6B resulted in the elimination of Alternative 6B11. This alternative provided a partial interchange to and from the south from County Line Road to I-75 and I-275. Alternative 6B12, which did not include any County Line Road interchange, was carried forth to the Master Plan. Traffic operations analyses indicated that the interstate mainline segment from the I-75/I-275 junction north to the proposed New S.R. 54 interchange would require one additional lane in each direction to maintain lane continuity. This same modification was made to the segment north of the New S.R. 54 interchange to existing S.R. 54. Therefore, the I-75 mainline was recommended to be a minimum of 10 lanes between the I-275 interchange and the New S.R. 54 interchange, and eight lanes between the New S.R. 54 interchange and the existing S.R. 54 interchange.

Summary - Tier Three Evaluation

Based on evaluations, the following alternatives (by design segment) were included in the Master Plan Concept:

* 1A9 (modified);
* 2A8;
* 2B7 and 2B8 (combined);
* 3A8, 3B3 (modified);
* 4A3, 4B10, 4C3;
* 5A3, 5B3, 5C3, 5D6;
* 5E3, 5F3, 5G3; and
* 6A11, 6B12.

Recommended Master Plan Concept

The following listing briefly describes the recommended Master Plan Concept for each design study segment. Reconstruction priority was also developed as part of the Master Plan, and is included in the design segment descriptions.

Design Segment 1A

Interstate 275 from Howard Frankland Bridge to East of Himes Avenue
(Westshore Area)

* Four-Roadway System - Interstate Express Lanes and Separated Local Access Freeway Lanes
* High Occupancy Vehicle (HOV)/Transitway Lanes within the interstate alignment beginning and ending at the Howard Frankland Bridge
* HOV priority ramps to and from the east on I-275 at Trask Street
* Direct I-275 connection to the Northwest Hillsborough Expressway
* Direct ramps from Memorial Highway and Kennedy Boulevard to the Northwest Hillsborough Expressway

* 62.5:1 FAA Flight Path Clearance for Tampa International Airport
* Existing interchange locations at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway remain
* New interchange providing ramps to and from the east on I-275 at Himes Avenue
* New Sherrill Street extension north from Memorial Highway and Kennedy Boulevard through I-275 to Spruce Street
* New Lemon Street Connector to Westshore Boulevard from Occident Street
* First Priority Reconstruction Segment

Design Segment 2A

Interstate 275 from east of Himes Avenue to east of Rome Avenue
(West Tampa Area)

* Four-Roadway System - Interstate Express Lanes and Separated Local Access Freeway Lanes
* Alignment shifted south of existing centerline to avoid McFarland Park and West Tampa Historic District
* High Occupancy Vehicle (HOV)/Transitway Lanes within the interstate alignment
* Split interchange ramps at Howard Avenue and Armenia Avenue remain
* New interchange ramps at Himes Avenue to and from the east on I-275
* Maintain northside frontage road between Himes Avenue and Rome Avenue
* Second Priority Reconstruction Segment

Design Segment 2B

Interstate 275 from east of Rome Avenue to north of Buffalo Avenue
Interstate 4 from the Interstate 275 Junction east to 14th Street
(Central Business District)

* Four-Roadway System transition to Two-Roadway System north of Buffalo Avenue on I-275
* Four-Roadway System east of 14th Street on I-4
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* Westside Central Business District distributor interchange at Ashley/Tampa Streets serving all movements
* Eastside Central Business District distributor interchange at Jefferson/Orange Streets serving all movements
* New West Bank Central Business District interchange ramps to and from the west on I-275 at North Boulevard
* New Ybor City/Eastside Central Business District split interchange on I-4 at 14th and 15th Streets
* Removal of interchange ramps at Scott and Kay Streets to and from the west on I-275

* Relocation of the planned Marion Street Transit Parkway North Terminal to a location on Marion Street south of Scott Street
* Second Priority Reconstruction Segment

Design Segments 3A and 3B

Interstate 4 from 14th Street to east of 50th Street
(Ybor City Area)

* Four-Roadway System transitioning to Two-Roadway System at 50th Street
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* New Ybor City/Eastside Central Business District split interchange on I-4 at 14th and 15th Streets
* Extension of 14th and 15th Street ramps as parallel local frontage roads to 21st and 22nd Streets
* Removal of the I-4 interchange ramps at 21st and 22nd Streets
* Removal of the I-4 overpass at 19th Street
* New directional freeway to freeway interchange with Crosstown Expressway Connector on I-4 at 30th Street
* Reconfiguration of the split interchange at Columbus Avenue and 50th Street on I-4
* Removal of the I-4 interchange ramps at 40th Street
* First Priority Reconstruction Segment

Design Segments 4A - 4C

Interstate 4 from east of 50th Street to east of Interstate 75 interchange
(East Tampa Area)

* Two-Roadway System on I-4 beginning east of 50th Street
* High Occupancy Vehicle (HOV)/Transitway Lanes beginning and ending west of I-75
* HOV priority access to and from the west at Orient Road serving new HOV Park-n-Ride Lot
* Existing interchange locations at Buffalo Avenue, Orient Road, U.S. 92, U.S. 301 and I-75 remain
* Removal of the I-4 overpass at Chelsea Avenue
* Partial cloverleaf interchange at U.S. 301 with flyover ramps for north to west and south to east movements
* U.S. 92 on separate alignment with ramps to I-4 and U.S. 301
* Retain Garden Lane Road Bridge across By Pass Canal
* New extension of Faulkenburg Road across I-4 between U.S. 92 and Sligh Avenue
* New extension of Sligh Avenue from Williams Road west to U.S. 301 across By Pass Canal
* New interchange ramps at Sligh Avenue to and from the north on I-75
* New interchange ramps at U.S. 92 to and from the south on I-75
* Third Priority Reconstruction Segment

Design Segments 5A - 5D

Interstate 275 from north of Buffalo Avenue to north of Linebaugh Avenue (Seminole Heights, Sulphur Springs Areas)

* Two-Roadway System on I-275 beginning north of Buffalo Avenue
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* HOV priority ramps to and from the north and south at Yukon Street accessing existing Park-n-Ride Lot
* Existing interchange locations at Hillsborough Avenue, Sligh Avenue, and Busch Boulevard remain
* One-way Frontage Roads from Bird Street to Busch Boulevard parallel to I-275
* Relocation of Bird Street interchange ramps to Waters Avenue to and from the south on I-275
* New interchange ramps at Linebaugh Avenue to and from the south on I-275
* Third Priority Reconstruction Segment

Design Segments 5E - 5G

Interstate 275 from north of Linebaugh Avenue to north of Livingston Avenue (University North Area)

* Two-Roadway System on I-275
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* HOV priority ramp to and from south on I-275 via Sinclair Hills Road with access to new HOV Park-n-Ride Lot
* Interchange locations at Fowler Avenue, Fletcher Avenue and Bearss Avenue remain
* New underpasses of I-275 at 109th Avenue, April Lane and Sinclair Hills Road
* Third Priority Reconstruction Segment

Design Segment 6A

Interstate 275 from north of Livingston Avenue to the Hillsborough/Pasco County Line

* Two-Roadway System on I-275
* I-275 reconstructed as six-lane roadway
* High Occupancy Vehicle (HOV)/Transitway Lanes beginning and ending north of Livingston Avenue on I-275
* New HOV Park-n-Ride Lot at North Tampa Parkway interchange
* New interchange at North Tampa Parkway on I-275
* Third Priority Reconstruction Segment

Design Segment 6B

Interstate 75 from Hillsborough/Pasco County Line to south of S.R. 54 in Pasco County

* Two-Roadway System on I-275
* I-275 six-lane roadway joining I-75 six-lane roadway
* Transition from twelve lanes to ten lanes between County Line Road and New S.R. 54, eight lanes north of New S.R. 54, and six lanes north of Existing S.R. 54
* Directional flyover ramps from I-275 northbound to I-75 southbound and I-75 northbound to I-275 southbound
* New interchange at New S.R. 54 on I-75
* New HOV Park-n-Ride lot at New S.R. 54 interchange
* First Priority Reconstruction Segment

VI. MULTI-MODAL TRANSPORTATION ELEMENTS

Introduction

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

In developing the interstate Master Plan, consideration was given to the influence of other travel modes on the design features and capacity of the interstate system. These design features included: high occupancy vehicle (HOV) lanes; HOV transitways; bus and carpool exclusive access to the HOV facilities; HOV access to and circulation in the Central Business District (CBD) and the rail transit system. The arterial highway system that feeds the interstate system was derived from the 2010 Long Range Transportation Plan for Hillsborough County, as adopted by the Board of the Tampa Urban Area Metropolitan Planning Organization (Tampa MPO).

The following sections describe the technical consensus process used to establish the appropriate travel demand levels for each mode, the design of the interstate system, and the rail transit system. A description of the HOV system, the CBD access and circulation plan, and the rail transit study are presented.

Multi-Modal Coordination

To coordinate the Tampa Interstate Study (TIS) and the Rail Transit Study (RTS) with the Long Range Transportation Plan for Hillsborough County, a Multi-Modal Consensus Committee was created by the Florida Department of Transportation (FDOT). The following participants were included in this committee:

* Florida Department of Transportation
* Tampa Urban Area Metropolitan Planning Organization
* Hillsborough Area Regional Transit Authority
* Tampa Interstate Study consultants
* Rail Transit Study consultants

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

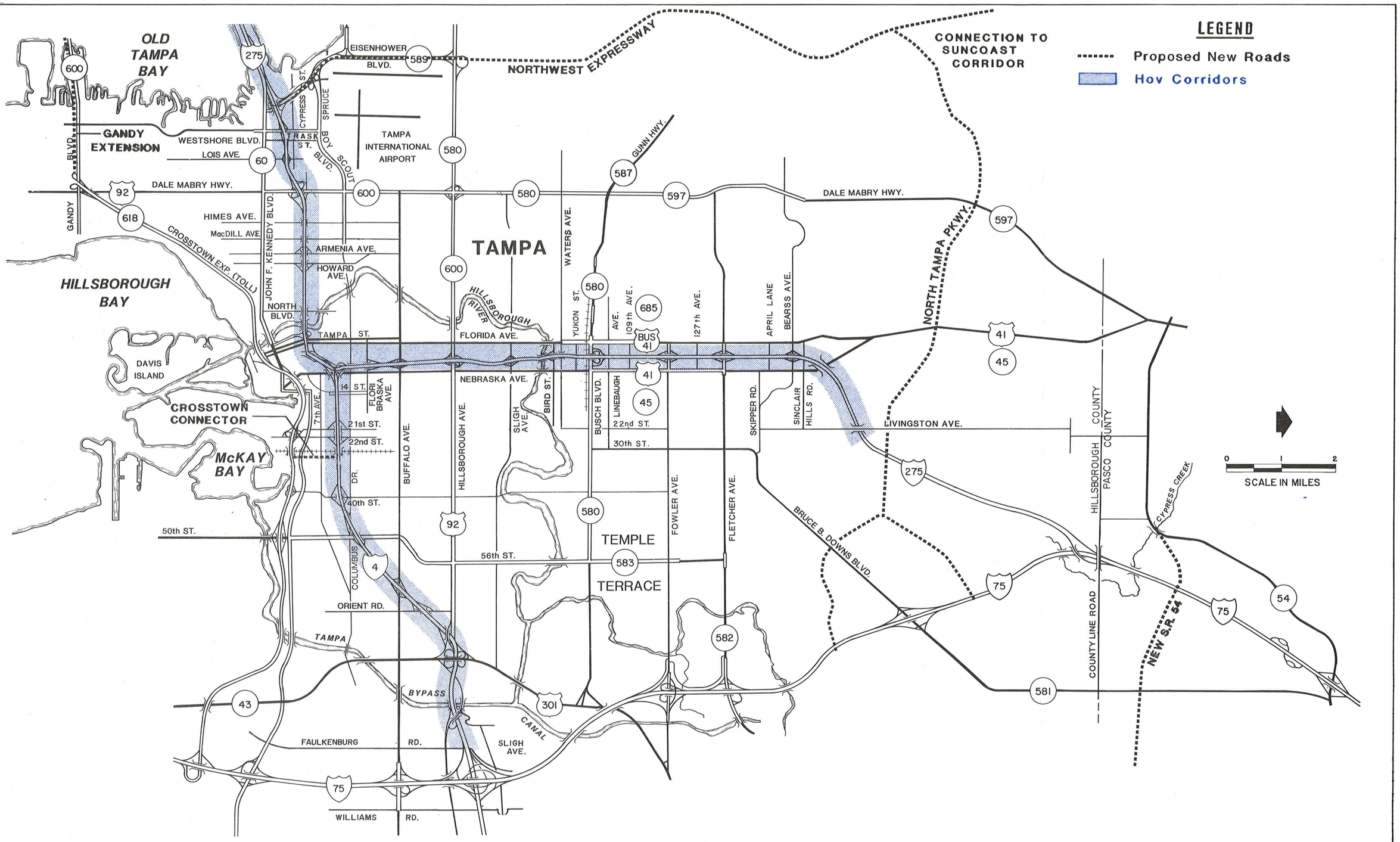
The primary purpose of the Multi-Modal Consensus Committee was to coordinate the technical consistency between the two studies and the Long Range Transportation Plan. The focus of this technical consistency was the travel demand estimates for each mode that reflected a balanced transportation system. Several meetings were held to discuss input data and model parameters used by each consultant in their travel demand forecasting procedures. Comparative analyses of travel demand forecasts generated by the different forecasting procedures were performed. The basic bus and rail transit information used by the TIS consultant to simulate the Tier 2 and Tier 3 alternatives, including rail transit, was provided by the RTS consultant. This information included the basic transit route files for local bus, express bus and rail transit for peak and off-peak periods, mode of transit access files, and model parameters for transit path-finding and mode choice programs. The TIS consultant refined the basic highway network and socio-economic data prepared by the Tampa MPO staff. They updated the basic mode specific constants to reflect an improved public perception and usage of the current transit system. Both consultants worked together to refine the results of the Direct Utility Assessment (DUA) Survey to incorporate it into the validated travel demand model for Hillsborough County. The committee reached agreement on the highway and transit networks and modal split procedures that produced consistent travel demand results on the highway and rail transit systems. All the travel demand data used for the multi-modal coordination were presented to the MPO during a special workshop on October 17, 1988.

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

HOV/Bus Transit Plan

HOV and certain transit facilities were developed as part of the Master Plan for the reconstruction of the interstate system. The HOV/Bus facilities included concurrent flow and exclusive HOV lanes, HOV transitways, priority access ramps, and park-n-ride lots for buses and carpools. The HOV system extends from the Howard Frankland Bridge to the vicinity of the Livingston Avenue overpass on I-275 and from the west of I-75 to I-275 on I-4, as illustrated on Exhibit VI-1. The impacts of the HOV system were considered in the redesign of the interstate system. The final plan for the HOV system included in the Master Plan is presented below.

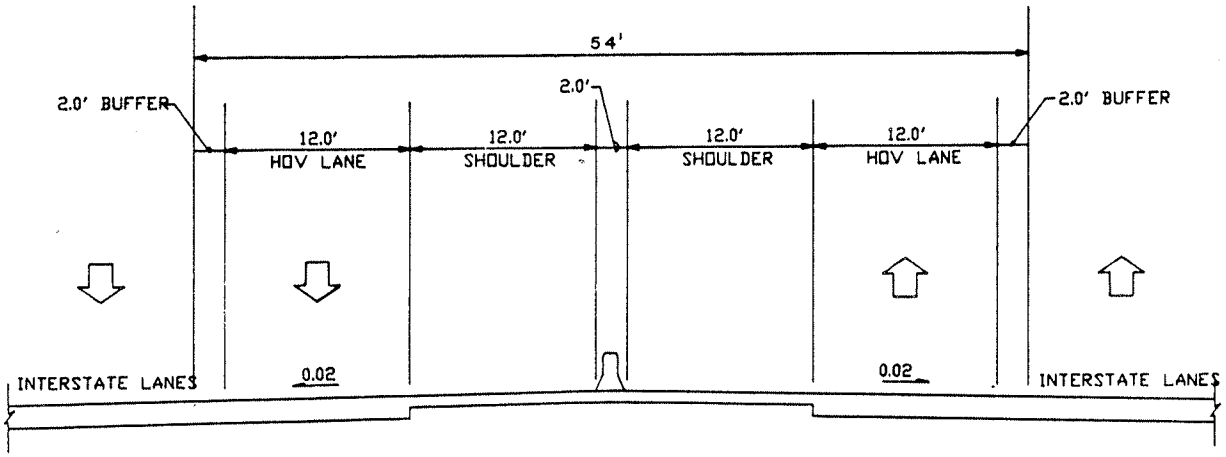
In general, concurrent flow HOV lanes adjacent to the interstate lanes are proposed, except in the vicinity of the Tampa CBD. In the CBD area, from North Boulevard to south of Floribraska Avenue on I-275 and west of 14th Street on I-4, an exclusive HOV transitway is proposed to minimize weaving sections, to maintain operations at Level of Service C or better, and to allow the interstate profile and HOV profile to separate through the I-275/I-4 interchange. The concurrent flow concept was selected as the general HOV cross-section in order to minimize right-of-way requirements and maintain two-way transit operations. The 54-foot area provides for extra-wide inside shoulders, a buffer area, and HOV lanes. It is also wide enough to accommodate the conversion of the HOV lanes to rail transit, if desired at a future time, as illustrated on Exhibit VI-2.



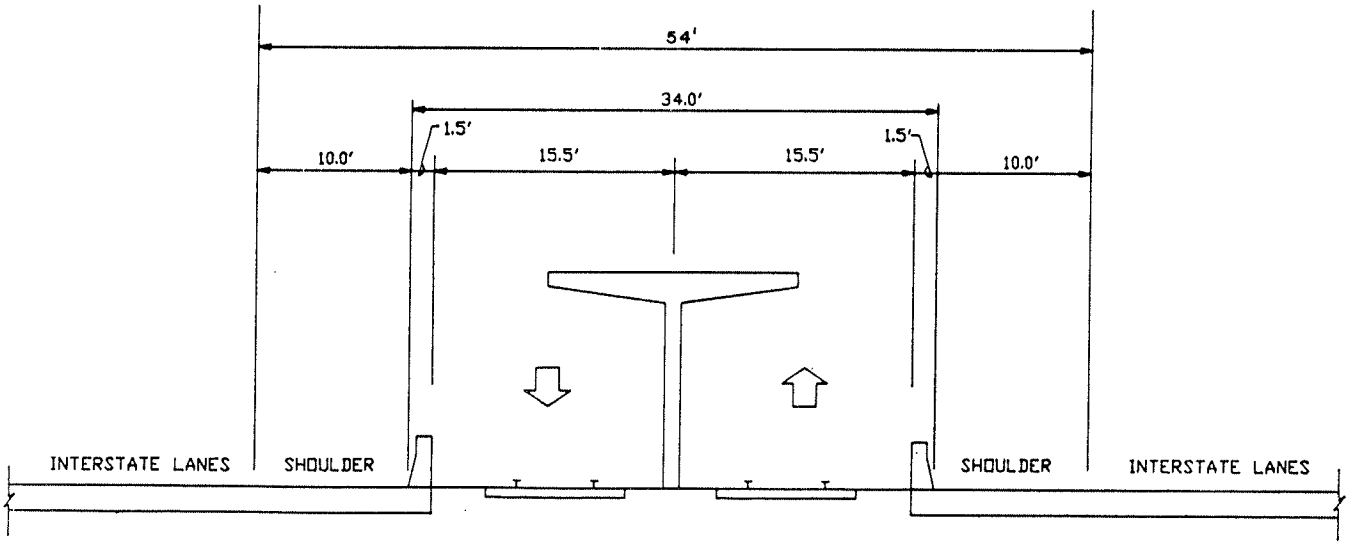
HOV CORRIDORS

EXHIBIT VI-1

A Florida Department of Transportation Project



CONCURRENT FLOW HOV



RAIL TRANSIT

CONVERSION OF CONCURRENT FLOW HOV LANES TO RAIL TRANSIT SECTION

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

Access to the HOV lanes is generally accomplished by using the normal freeway ramps and then by weaving across the interstate lanes. By-pass ramps were not generally considered because of the high number of two-lane ramps already required to accommodate projected traffic. As a result, priority access ramps were designed in certain areas to provide direct access to the HOV lanes. The location of these priority ramps, as shown on Exhibit VI-3, are:

* Trask Street (to and from the east);
* Orient Road (to and from the west);
* Yukon Street (to and from the north and south);
* Bearss Avenue (to and from the south);
* Tampa Street (to and from the west); and
* Morgan Street (to and from the east).

These ramps were located to provide direct service to major traffic generators/attractors, such as the Tampa CBD, the Westshore area, the Florida State Fairgrounds, the University area, and the north Tampa area. These priority HOV ramps were connected to streets with low volume freeway ramps or to streets that did not have interchanges with the interstate. In this way, interstate traffic on cross-streets can be separated from HOV traffic and, as a result, improve cross-street operations.

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

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

A park-n-ride lot in the Westshore area has not yet been established. Discussions with HART and local commercial establishments will be conducted as part of the Environmental Impact Statement (EIS) process to determine a possible location, if required.

CBD Access And Circulation Plan

The purpose of this evaluation was to study access to Tampa's Central Business District (CBD) and the circulation within the CBD after the re-design of the interstate system. The traffic forecasting approach for this study considered only CBD destined trips and utilized the process that includes the analysis of the impact of downtown parking location capacities on trips made by the regional auto users to downtown. The evaluation utilized the traffic forecasting network approach to develop the recommended CBD plan. The purpose

of this plan was to reduce the traffic demand on the interstate and to provide for a balanced distribution of traffic through the various access points to the CBD, given the proposed parking areas in the northern CBD area.

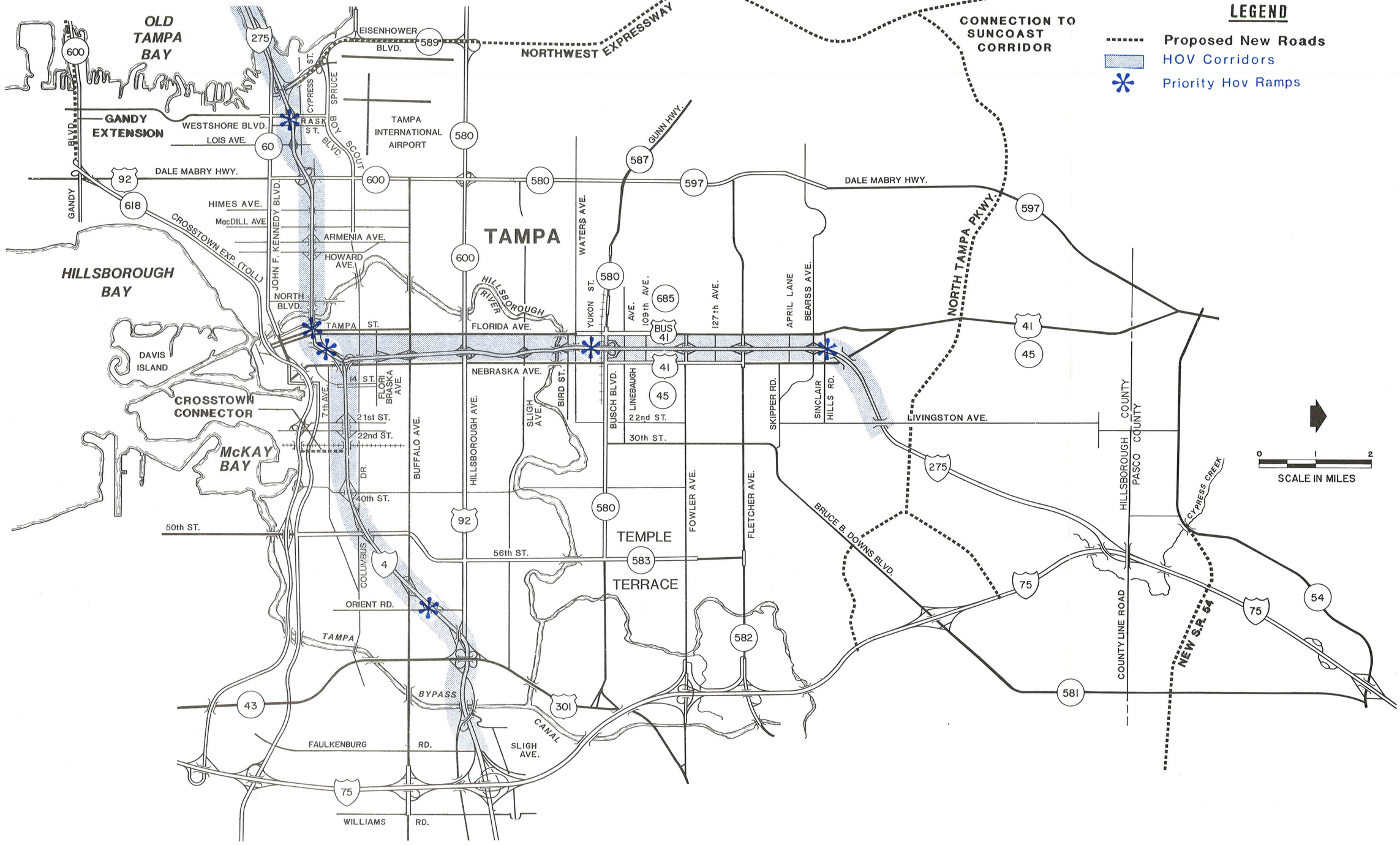
The recommended CBD access plan includes various transit elements as well as recommendations for additional capacity and changes in direction on various CBD roadways. The plan includes the proposed Downtown People Mover (DPM), Bus Circulation Shuttle and Rail Transit. These transit elements are illustrated on Exhibit VI-4, CBD Transportation Elements. For increased access, the plan recommends the widening of Laurel Place from North Boulevard to Morgan Street; Nick Nuccio Parkway from 14th/15th Streets to Nebraska Avenue; and Nebraska Avenue from Cass Street to Whiting Street. To complement the re-design of the interstate access and the capacity improvements, the directions of several roadways were revised. These direction revisions along with all other revisions are illustrated on Exhibit VI-5, Recommended CBD Plan, and outlined on Table VI-1, Recommended CBD Plan. The plan is designed to complement the proposed interstate improvements and should be phased with those improvements. To improve access during the construction of the I-275 interchanges at Ashley Street and Jefferson Street, the interstate access improvements at North Boulevard and 14th/15th Streets should already be in place. All other capacity improvements and roadway direction reversals should be made as dictated by demand. The TIS Task F6g(e)(c) Tampa CBD Access and Downtown Circulation Evaluation Technical Memorandum, provides a more detailed report of how the downtown area can be enhanced from both a circulation standpoint and increased access.

Rail Transit Study

In 1986, the MPO initiated the Hillsborough County Mass Transit Corridor Alternatives Analysis Study (Rail Transit Study). The purpose of this study was to perform preliminary planning work leading up to the engineering, construction, and operation of a fixed guideway rail transit system for Hillsborough County. Based on earlier studies, initial work focused on the technology known as light rail. Essentially, this type of system operates mainly on the surface along its own exclusive right-of-way in which automobile and bus traffic could operate crossing or paralleling operations. Service on this light rail system was envisioned to be provided by a vehicle resembling a modern streetcar. Also, as a result of earlier studies, three corridors were identified to have the highest potential ridership for rail transit. These corridors, as illustrated on Exhibit VI-6 and targeted for services, are:

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

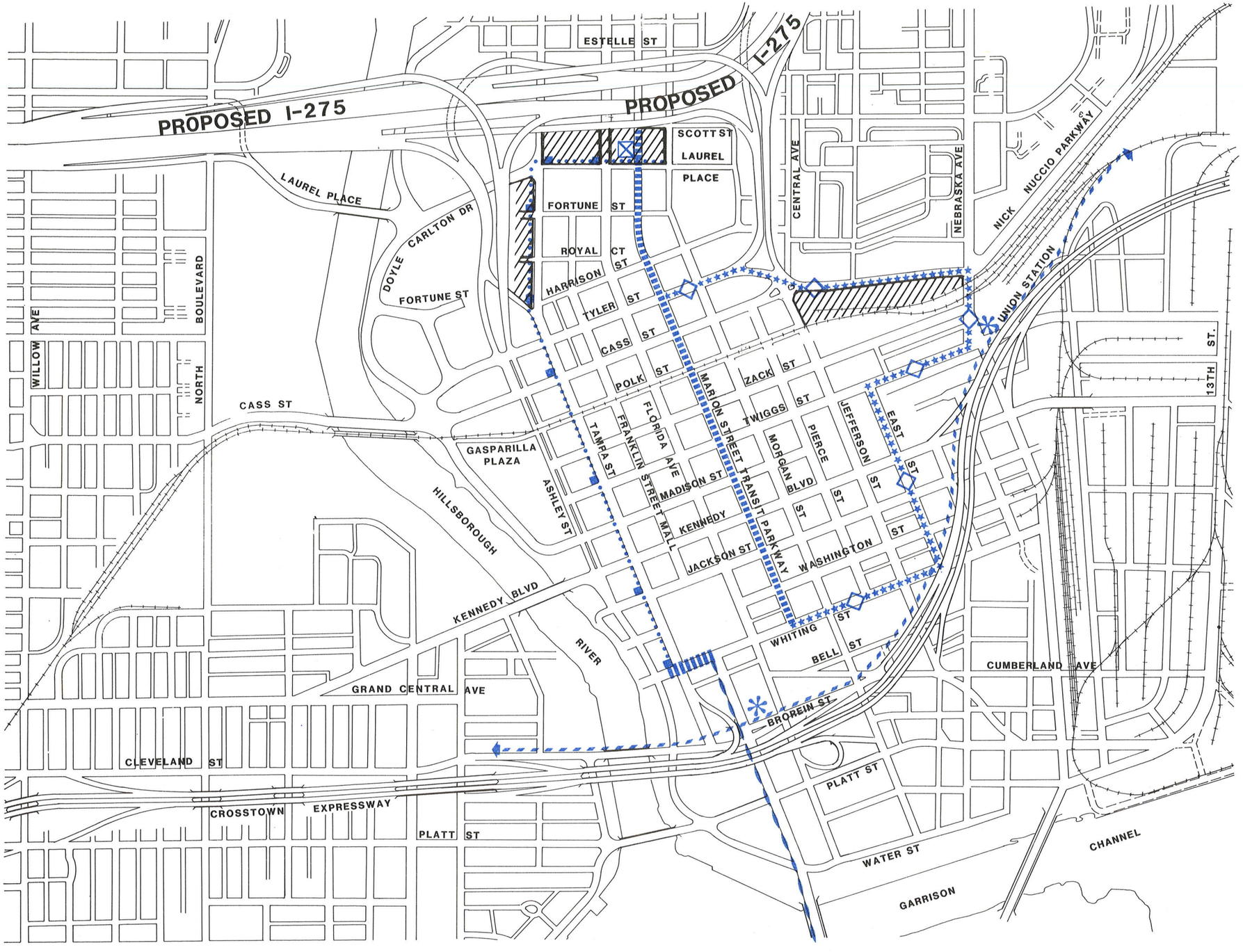
As the study continued, the MPO and other interested parties noted light rail was not the only option for fixed guideway transit. To investigate further and better acquaint themselves with the many different rail



PRIORITY HOV RAMPS

EXHIBIT VI-3

A Florida Department of Transportation Project



LEGEND

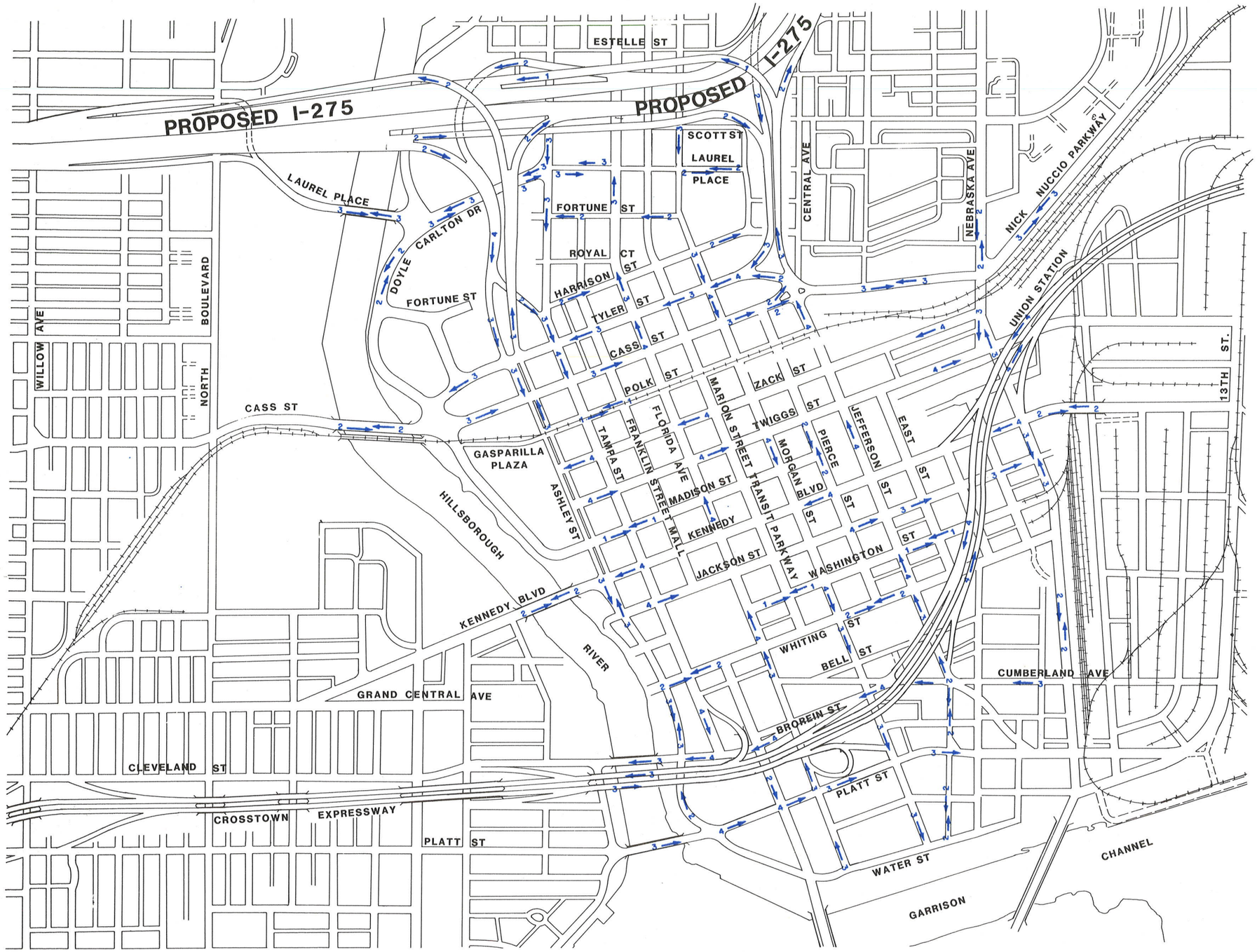
- Proposed Parking Area
- Harbour Island AGT
- Conceptual Downtown People Mover (DPM)
- Conceptual DPM Station
- Marion Street Transit Parkway
- Rail Transit
- Rail Transit Station
- Multi Modal Terminal
- Bus Circulation Shuttle
- Bus Shuttle Stop
- Pedestrian Walkway

CBD TRANSPORTATION ELEMENTS

EXHIBIT VI-4

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY THE GREINER TEAM

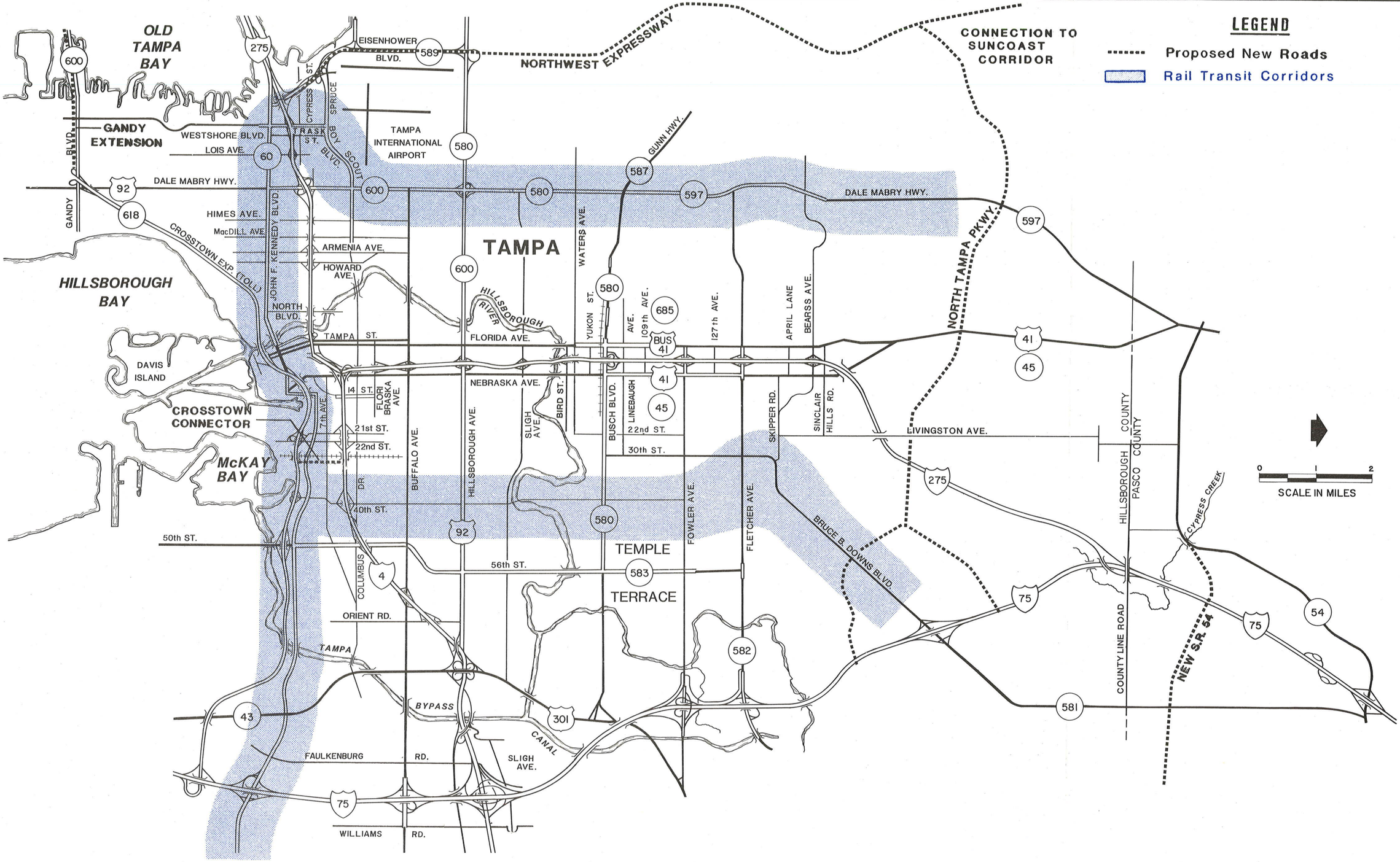


RECOMMENDED CBD PLAN

EXHIBIT VI-5

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY THE GREINER TEAM



RAIL TRANSIT CORRIDORS

EXHIBIT VI-6

TABLE VI-1

RECOMMENDED CBD PLAN

North/South Roadways			
Ashley Street			
I-275 Ramps to South	6 lanes	2-way	
Tampa Street			
Estelle Street to Tyler Street	3 lanes	1-way	southbound
Tyler Street to Brorein Street	4 lanes	1-way	southbound
Brorein Street to Platt Street	3 lanes	1-way	southbound
Franklin Street			
Developed as a pedestrian mall			
Florida Avenue			
Estelle Street to Tyler Street	3 lanes	1-way	northbound
Tyler Street to Whiting Street	4 lanes	1-way	northbound
Whiting Street to Water Street	3 lanes	1-way	northbound
Marion Street			
Developed as the Marion Street Transit Parkway			
Morgan Street			
Estelle Street to Tyler Street	3 lanes	1-way	southbound
Tyler Street to Whiting Street	4 lanes	1-way	southbound
Whiting Street to Water Street	3 lanes	1-way	southbound
Pierce Street			
Cass Street to Whiting Street	4 lanes	2-way	
Jefferson Street			
I-275 Ramps to Whiting Street	4 lanes	1-way	northbound
Whiting Street to Cumberland Street	3 lanes	1-way	northbound
Cumberland Street to Water Street	4 lanes	2-way	
Nebraska Avenue			
North of Cass Street	4 lanes	2-way	
Cass Street to Whiting Street	6 lanes	2-way	
Whiting Street to tie-to Benifical Boulevard	4 lanes	2-way	
Nick Nuccio Parkway			
14th/15th Street to Cass Street	6 lanes	2-way	
East/West Roadways			
Estelle Street			
Tampa Street to I-275	3 lanes	1-way	westbound
Scott Street			
Tampa Street to Jefferson Street	4 lanes	2-way	
Laurel Place			
North Boulevard to Morgan Street	6 lanes	2-way	
Morgan Street to Jefferson Street	4 lanes	2-way	
Fortune Street			
Tampa Street to Morgan Street	2 lanes	1-way	westbound
Harrison Street			
Tampa Street to Jefferson Street	2 lanes	1-way	eastbound
Tyler Street			
Cass Street to Morgan Street	3 lanes	1-way	westbound
Morgan Street to I-275 Ramp	4 lanes	1-way	westbound

TABLE VI-1

RECOMMENDED CBD PLAN
(Continued)

Cass Street			
North Boulevard to Doyle Carlton Drive	4 lanes	2-way	
Doyle Carlton Drive to Jefferson Street	3 lanes	1-way	eastbound
Jefferson Street to Nebraska Avenue	6 lanes	2-way	
Polk Street			
Ashley Street to Jefferson Street	2 lanes	2-way	
Zack Street			
Ashley Street to Jefferson Street	4 lanes	1-way	westbound
Twiggs Street			
Ashley Street to Nebraska Avenue	4 lanes	1-way	eastbound
Madison Street			
Ashley Street to Pierce Street	2 lanes	2-way	
Kennedy Boulevard			
North Boulevard to Ashley Street	4 lanes	2-way	
Ashley Street to Nebraska Avenue	4 lanes	1-way	westbound
Jackson Street			
Ashley Street to Jefferson Street	4 lanes	1-way	eastbound
Jefferson Street to Nebraska Avenue	3 lanes	1-way	eastbound
Washington Street			
Ashley Street to Tampa Street	2 lanes	2-way	
Florida Avenue to Nebraska Avenue	2 lanes	2-way	
Whiting Street			
Ashley Street to Nebraska Avenue	4 lanes	2-way	
Brorein Street/Cumberland Street			
North Boulevard to Ashley Street	3 lanes	1-way	westbound
Ashley Street to Jefferson Street	4 lanes	1-way	westbound
Jefferson Street to Nebraska Avenue	3 lanes	1-way	westbound
Platt Street			
North Boulevard to Ashley Street	3 lanes	1-way	eastbound
Ashley Street to Florida Avenue	4 lanes	1-way	eastbound
Florida Avenue to Nebraska Avenue	3 lanes	1-way	eastbound

technologies available in the market, a number of Tampa local public officials and private citizens visited several cities in North America to be briefed by the respective operators on the characteristics of their systems. Upon completion of that trip, the MPO in January, 1988 resolved to expand the scope of the study to broaden the evaluation of the rail transit concept.

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

* Category A - a predominantly at-grade or ground level system operating in an exclusive right-of-way on the surface except for areas with high traffic congestion or natural obstructions.
* Category B - a system with a greater portion of elevated or otherwise exclusive line sections based primarily on the potential interference with automobile traffic.

* Category C - a system envisioned to have no grade crossings with automobiles and thus would be totally exclusive but at-grade where feasible, particularly in outlying sections.
* Category D - totally elevated with no at-grade line crossings.

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

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

The last general recommendation requires further explanation. Rail transit Category C, as noted earlier, is a primarily elevated operation with at-grade operation anticipated only in the outlying areas of the three main corridors. While the at-grade operation of a rail transit system is less costly from a capital cost basis, mitigating circumstances require recommendation of an elevated system. Such mitigating circumstances include: 1) an at-grade rail system would severely impede cross and paralleling traffic flows; 2) an at-grade system would substantially reduce road access to homes and businesses; and 3) an at-grade system could result in excessive right-of-way acquisition costs (i.e., homes and/or businesses). Because of these reasons, the at-grade scenario would not be an acceptable alternative for the three major corridors studied in this effort.

As a result, the recommendation for a Category C system with a primarily elevated profile is the basic study finding. Within the recommendation for a Category C system, four phases of construction are envisioned:

* Phase I (20.8 miles) - the initial line segment would extend from Adamo Drive at I-75 through downtown and continue along Kennedy Boulevard to the Westshore area. Heading north from the Westshore area, the line would continue north to Linebaugh Avenue. This section would also include a link to TIA.
* Phase II - construction in the North Central Corridor from Adamo Drive north on 40th Street to the University of South Florida area.
* Phase III - completion of the Northwest and Eastern corridors from Linebaugh Avenue to Van Dyke Road and from I-75 to Valrico Road, respectively.
* Phase IV - completion of the North Central Corridor from the University of South Florida area to the intersection of I-75 and Bruce B. Downs Boulevard.

Phasing of the above noted sections of the rail transit system was based on a cost per rider basis. These are shown to be the most cost-effective portions of the system to be implemented. Such a recommendation is based on capital cost as well as travel time considerations and environmental impacts. In consideration of the implementation of the initial line segment, the following steps are necessary for operation of the 20.8-mile rail transit system.

* Planning - 1 year.
* Final design and environmental approval - 2 to 3 years (this includes additional financing options to be discussed).
* Vehicle procurement and delivery - 3 years.
* First construction - 6 to 7 years (assumes construction concurrent with vehicle procurement).

VII. MASTER PLAN DESIGN ELEMENTS

Typical Sections

In order to convey a fuller understanding of the Master Plan concept, cross-sections were drawn at various locations in the Tampa interstate area. Due to the wide variety of roadway compositions, a total of 30 cross-sections were developed.

Four of these cross-sections were developed to illustrate the priority HOV ramps at Trask Street, Orient Road, Yukon Street and Sinclair Hills Road. The rest of the cross-sections not only cover the usual aspects of a segment but also unusual aspects that set one segment apart from the others.

Following is a listing of cross-sections that have been drawn in the indicated segments of the study area:

Segment 1A

* Cypress Street
* Trask Street
* Marie Avenue between Dale Mabry Highway and Himes Avenue

Segment 2A

* Habana Avenue

Segment 2B

* Hillsborough River
* Tampa Street
* Henderson Street
* Between 14th and 15th Streets
* Roebles Park

Segment 3A

* 24th Street
* Crosstown Connector

Segment 3B

* CSX Transportation
* 26th Avenue

Segments 4A, 4B and 4C

* Orient Road
* Six Mile Creek
* I-75/I-4 Interchange
* Williams Road

Segment 5A

* Conover Street between Buffalo and Hillsborough Avenue

Segment 5C

* Yukon Street

Segment 5E

* 109th Street

Segment 5G

* Sinclair Hills Road

Segment 6A

* North Tampa Parkway East
* North Tampa Parkway West
* 1,000 feet South of Livingston Avenue
* 2,100 feet North of Livingston Avenue
* 8,000 feet North of North Tampa Parkway

Segment 6B

* 750 feet North of Cypress Creek
* 3,000 feet North of New S.R. 54
* New S.R. 54 East
* New S.R. 54 West

Any of these cross-sections could be referenced in order to obtain more exact information concerning the actual horizontal and vertical alignment at a particular location.

Highway Structures

A major component of the proposed interstate reconstruction is the highway structures. The bridges, retaining walls, noise walls and sign structures provide a key element in maximizing the use of the available space. The use of multi-level interchanges, elevated viaducts, and roadway embankments supported by retaining walls will minimize right-of-way requirements; thereby helping to achieve the functional objectives of the interstate reconstruction while balancing cost, environmental, and social impacts. This section of the Master Plan will discuss the following elements related to the structural components of the proposed interstate reconstruction:

* Overall structural character/uniformity;
* Candidate structural treatments; and
* Basis for structural cost estimating.

Overall Structural Character/Uniformity

One key to the success of the proposed Tampa interstate reconstruction will be how well the system is accepted, both by users and by the various communities it traverses. The generally recognized aesthetic qualities of pleasing and appropriate form, color and texture contribute to the beauty, uniformity and continuity of an urban environment. It is for this reason these aesthetic qualities are being considered an integral part of the structural designs proposed for the Tampa interstate reconstruction.

Bridges

The primary objective of the aesthetic criteria for bridges is to provide clean uncluttered structures, and to promote uniformity and compatibility in the appearance of the structures and individual structural components throughout the entire proposed Tampa interstate system's reconstruction. It is proposed all bridge superstructures, with the exception of a few remote and rural locations in Design Segment 6, shall be limited to closed-type box girder sections.

Multi-girder structures present a somewhat cluttered appearance from below. Also, any utilities or enclosed bridge drainage systems would be visibly located between the beams or girders and thus add to this cluttered appearance. For these reasons, the use of multi-girder superstructures was specifically eliminated for future utilization over most of the Tampa Interstate Study (TIS) area.

In comparison, the closed, box girder type superstructure offers a number of features that contribute to meeting the aesthetic objectives:

* The closed bottom provides a clean, uncluttered appearance from below.
* The inward slanted box girder sides visually decrease the girder depth, giving it the appearance of a thinner, lighter structure.
* The structural overhang recesses the box girder from the end of structure, placing it in a shadow and further reducing the appearance of the box girder depth.
* The interior of the box girder provides a convenient, out-of-view and protected location for utilities and bridge drainage appurtenances.
* The box girder is ideally suited for minimizing substructure widths, due to its compact bottom flange.

* Box girder superstructures have proven economically viable in complex urban situations throughout Florida, particularly where long spans and curving alignments are needed.

It is also preferred that single column pier arrangements be used to lessen the congestion and clutter effect of a "forest" of columns. Standard column and pier shapes will also be established to meet the various loading requirements. Also, the use of graphic relief to visually interrupt flat concrete surfaces will be encouraged.

Retaining Walls

Due to right-of-way restrictions, certain locations will require large expanses of vertical retaining walls. In general, graphic relief may be cast into the wall face to visually soften the impact of the walls. Colored concrete may also be employed in certain areas to further enhance the wall's appearance. Where right-of-way limits permit, and where proper landscape maintenance can be arranged, "green walls" may be used for a garden-like appearance. These walls would be terraced with native plantings.

Noise Barrier Walls

These walls will be visually blended into adjacent structures and into the structures to which they are attached where possible. Noise barrier walls will also utilize a texture similar to those of the adjacent retaining walls. It is further recommended the application of noise barrier walls on bridge superstructures be limited as much as possible, since a significant cost will be incurred in the bridge's structure to provide for the additional loads imposed by the noise walls.

Sign Support Structures

It is proposed for the Tampa interstate reconstruction that an aesthetically pleasing design for the sign supports be prepared for the contract plans. Redesigns by the Contractor should not be permitted.

It is recommended that a single plane tubular truss supported by concrete columns be utilized. The column faces may include a vertical relief, or other aesthetic treatment. Basic truss configuration and column shapes will be established as a standard. These standards should be used throughout the entire project.

Candidate Structural Treatments

Candidate structural treatments were evaluated for: (1) directional interchanges, (2) grade separations, (3) retaining walls, (4) noise barrier walls, and (5) sign supports.

Directional interchanges will occur at three locations (I-275/Northwest Expressway, I-275/I-4, and I-4/ Crosstown Expressway Connector). These bridge structures will contain roadway transitions, connections for separate roadway systems, and curving alignments, all of which tend to complicate geometry requirements. Six superstructure types structurally appropriate for these conditions and consistent with aesthetic standards are:

* Cast-in-place concrete box girders;
* Precast segmental concrete box girders;
* Steel box girders;
* Steel box girders with floor beams;
* Cast-in-place concrete box girders with floor beams; and
* Precast concrete spine-wing.

Typical sections for each treatment are illustrated in Exhibits VII-1 through VII-10. Each alternative treatment has a particular advantage under the various geometry requirements that will exist. Foundation alternatives considered feasible for these interchanges include:

* Driven piles;
* Drilled shafts; and
* Spread foundations.

The most economical alternative, considering any staged construction requirements, will be determined during the PD&E phase for both superstructures and foundations.

Grade separation structures are prevalent in all design segments, occurring in both two-roadway and four-roadway systems. Unlike the directional interchange structures, roadway widths are more constant and, therefore, superstructure framing geometry is generally less complex. The superstructure and foundation types proposed for the directional interchange structures are all equally applicable for these bridge structures. Several additional structural types will be considered exclusively for the rural locations such as AASHTO girders and steel plate girders.

A total length of approximately 60 miles of retaining walls will be required throughout this proposed interstate reconstruction project. The extensive use of these retaining walls is justified by consideration of the reduction of required right-of-way for fill slopes and reduction in bridge lengths. Wall types envisioned for this project include the following:

* Cast-in-place cantilevered walls;
* Cast-in-place gravity walls;
* Precast proprietary retaining walls; and
* Precast concrete crib walls (green walls).

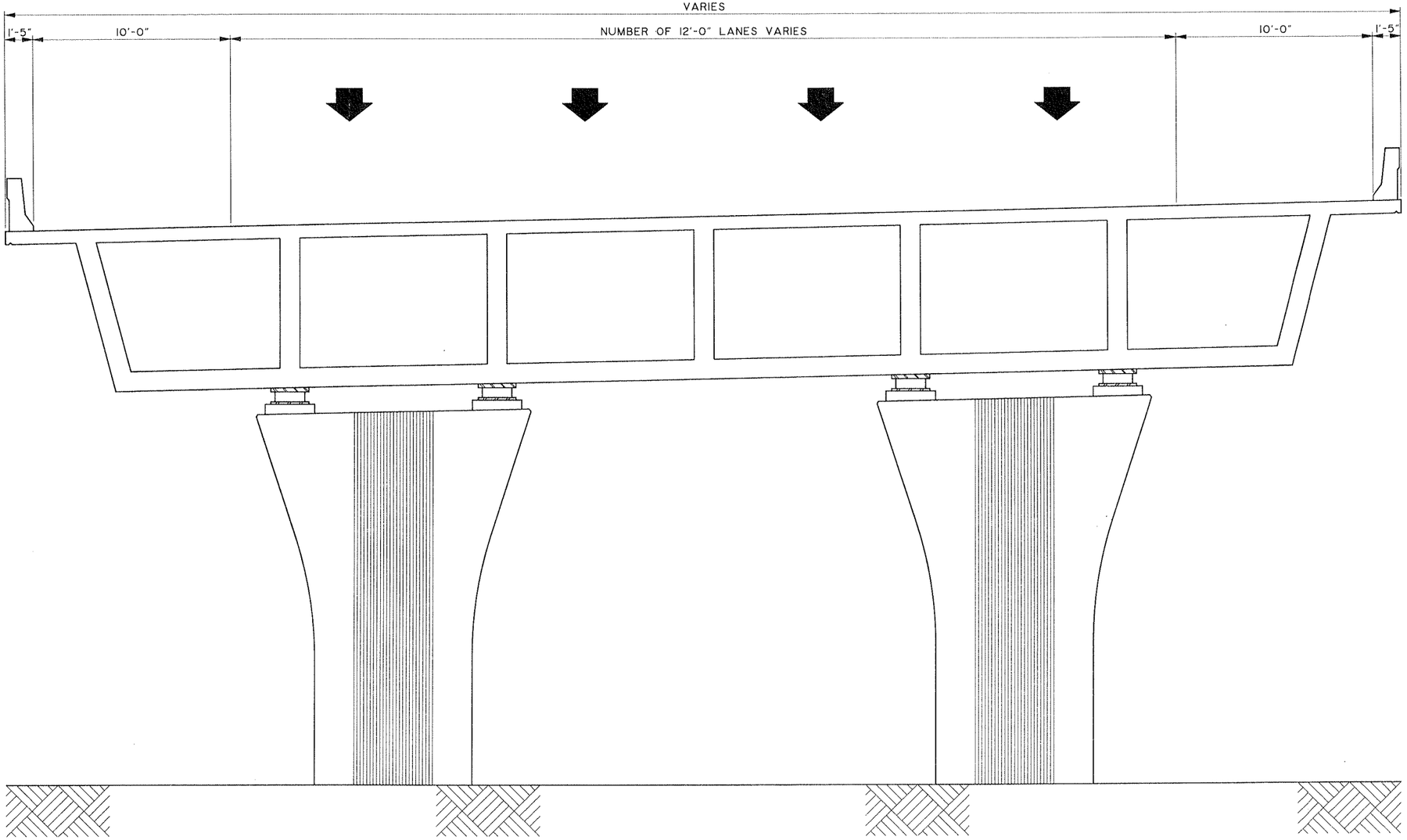
Selection of wall types within each design segment will be based on foundation conditions, aesthetics, and economy. Additionally, PD&E phase evaluations which identify economic retaining wall solutions will be extended to determine the economical height at which to terminate the retaining wall and roadway section and to begin the bridge structure section.

Noise attenuation walls, where required, will be located atop earthen berms, adjacent to shoulder areas, atop retaining walls and on bridge superstructures. Noise wall height on walls and bridge superstructures are anticipated to range between eight to 12 feet. Also, localized strengthening of bridge superstructures to accommodate noise barrier walls is anticipated.

Extensive interstate-level signing, including variable message signs, is anticipated throughout the project area to direct motorists between the two- and four-roadway systems and for traffic-incident management. In order to obtain uniformity and maintain the desired aesthetic characteristics of the system, a uniform, overhead sign truss configuration should be maintained. A single plane steel truss with top and bottom chords constructed in a closed box configuration is proposed. Column support is proposed of standardized rectangular concrete poles with an architectural reveal, and the structure's paint color will also be standardized to further ensure uniformity.

Basis For Structural Cost Estimating

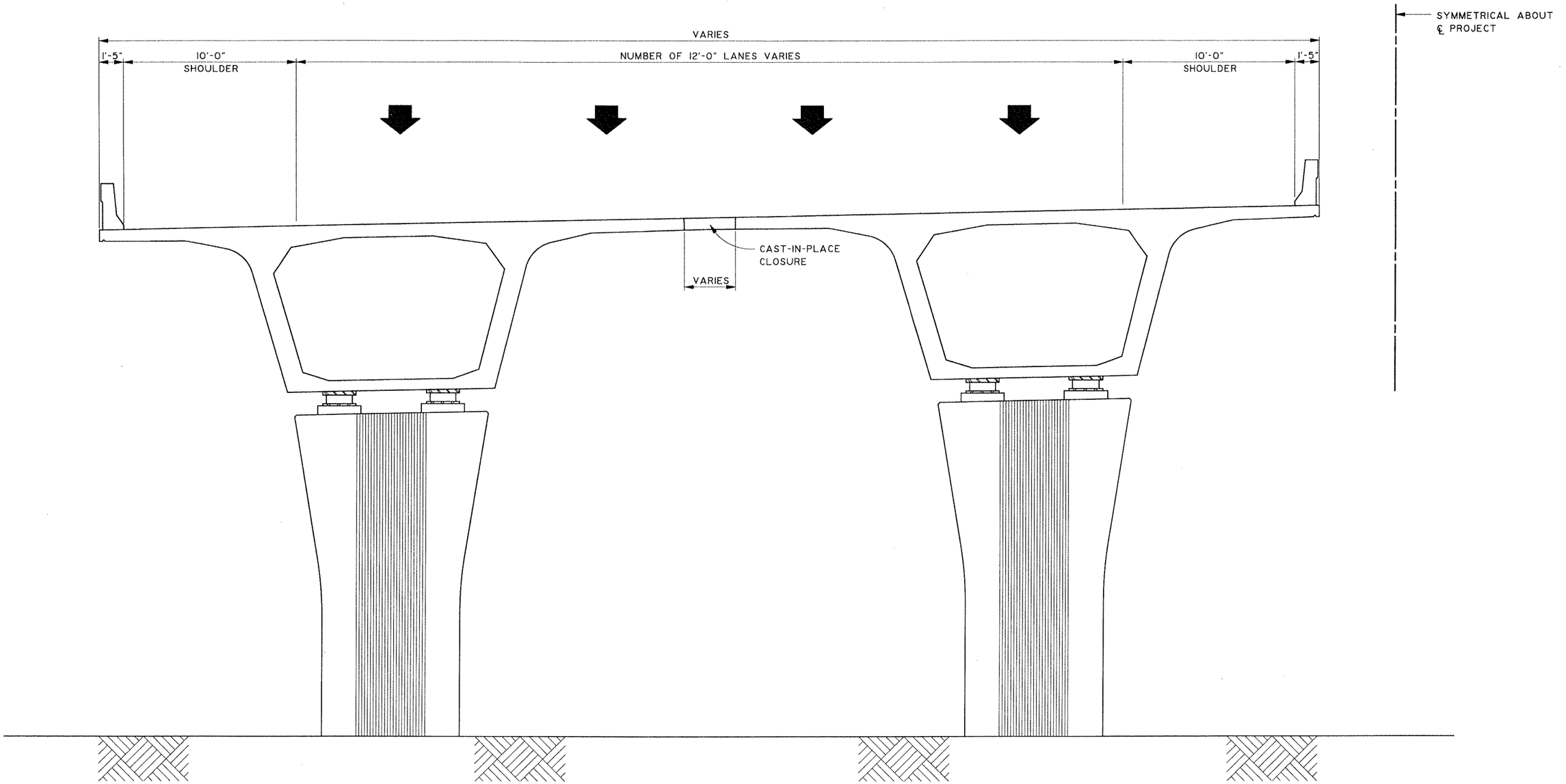
Bridge construction costs were developed from square foot costs applied to the gross bridge superstructure area. Retaining wall construction costs were developed from square foot costs applied to the wall area projected from its top to the proposed finished grade.



SYMMETRICAL ABOUT
℄ PROJECT

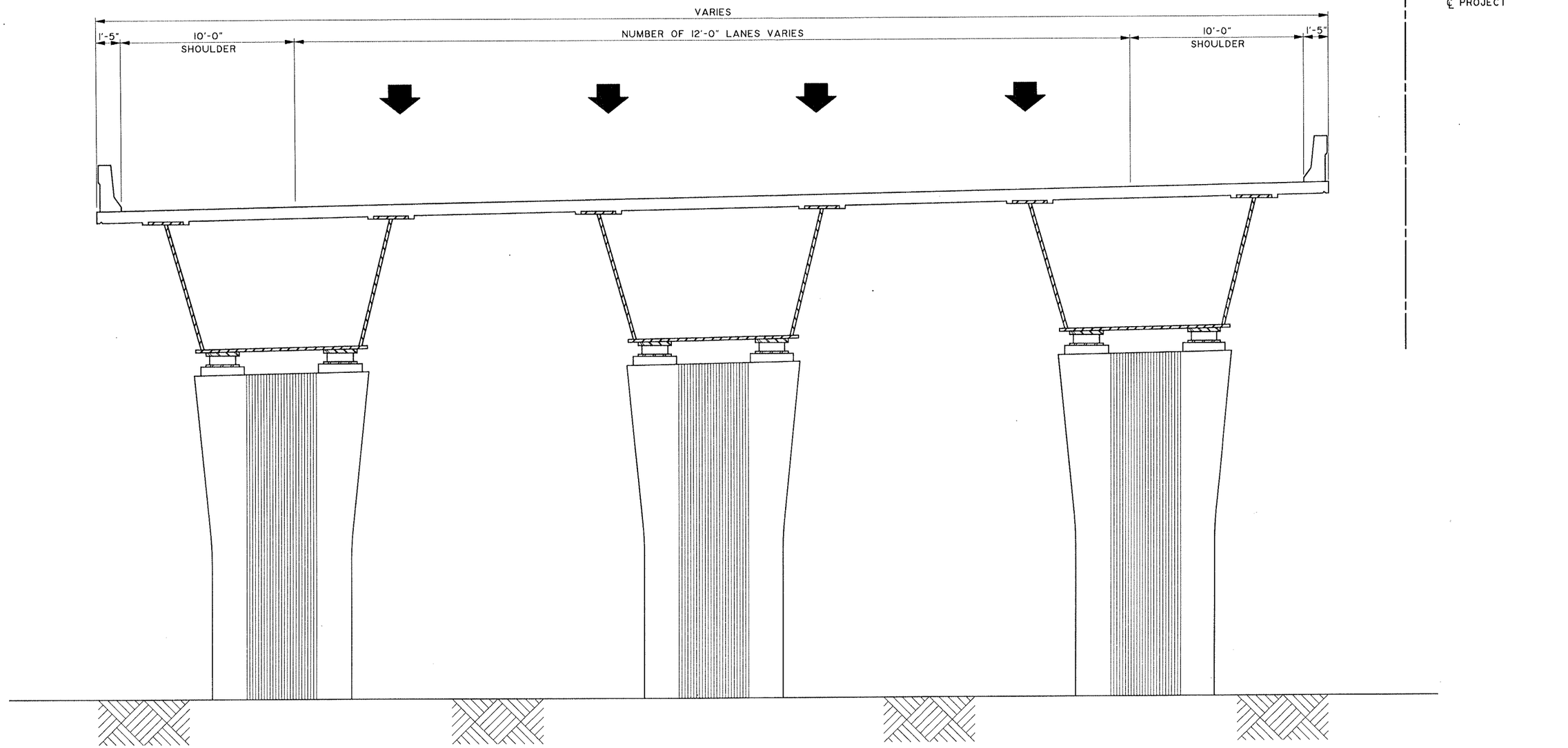
MAINLINE TYPICAL SECTION
CAST-IN-PLACE
CONCRETE BOX GIRDERS

EXHIBIT VII-1



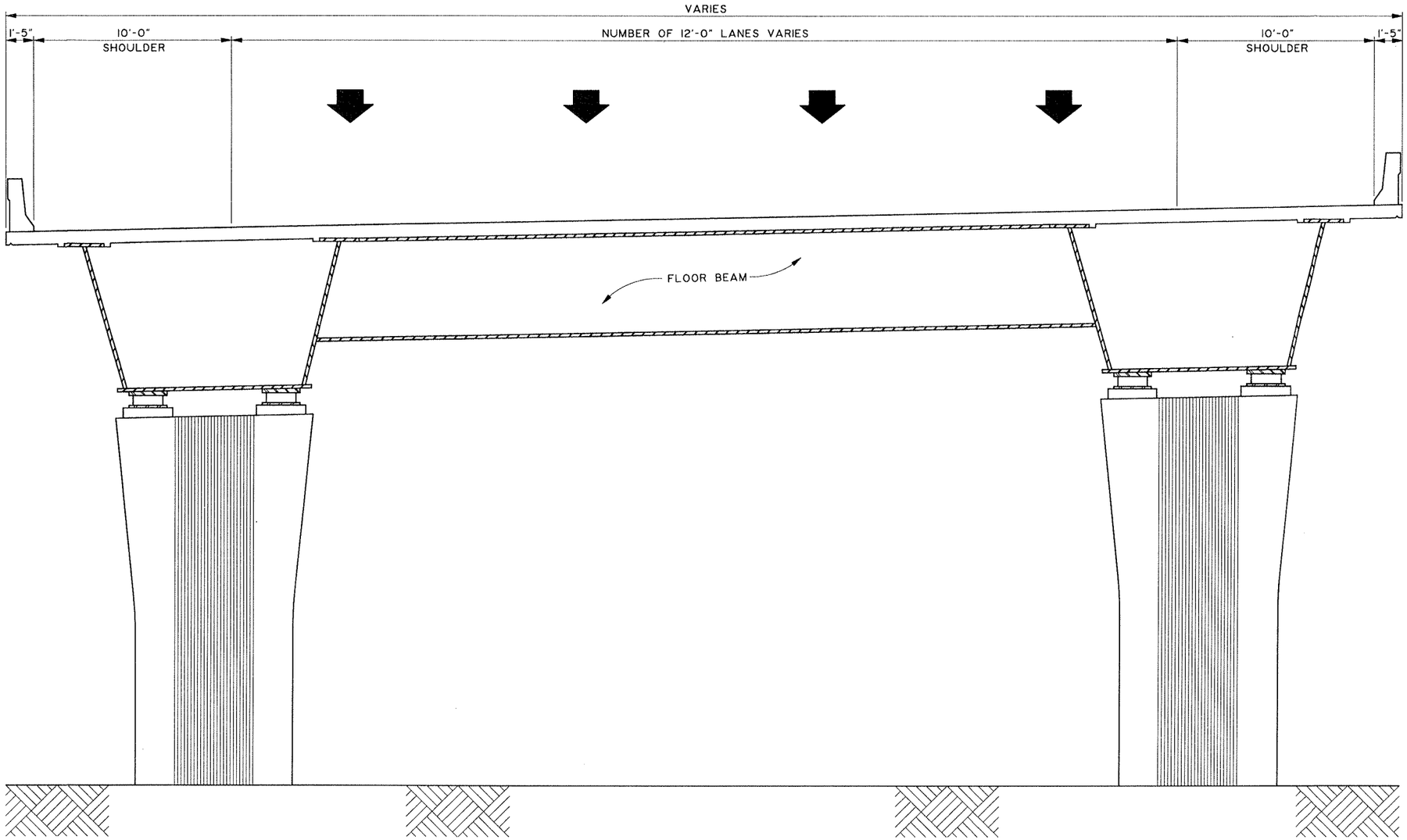
MAINLINE TYPICAL SECTION
PRECAST SEGMENTAL
CONCRETE BOX GIRDERS

EXHIBIT VII-2



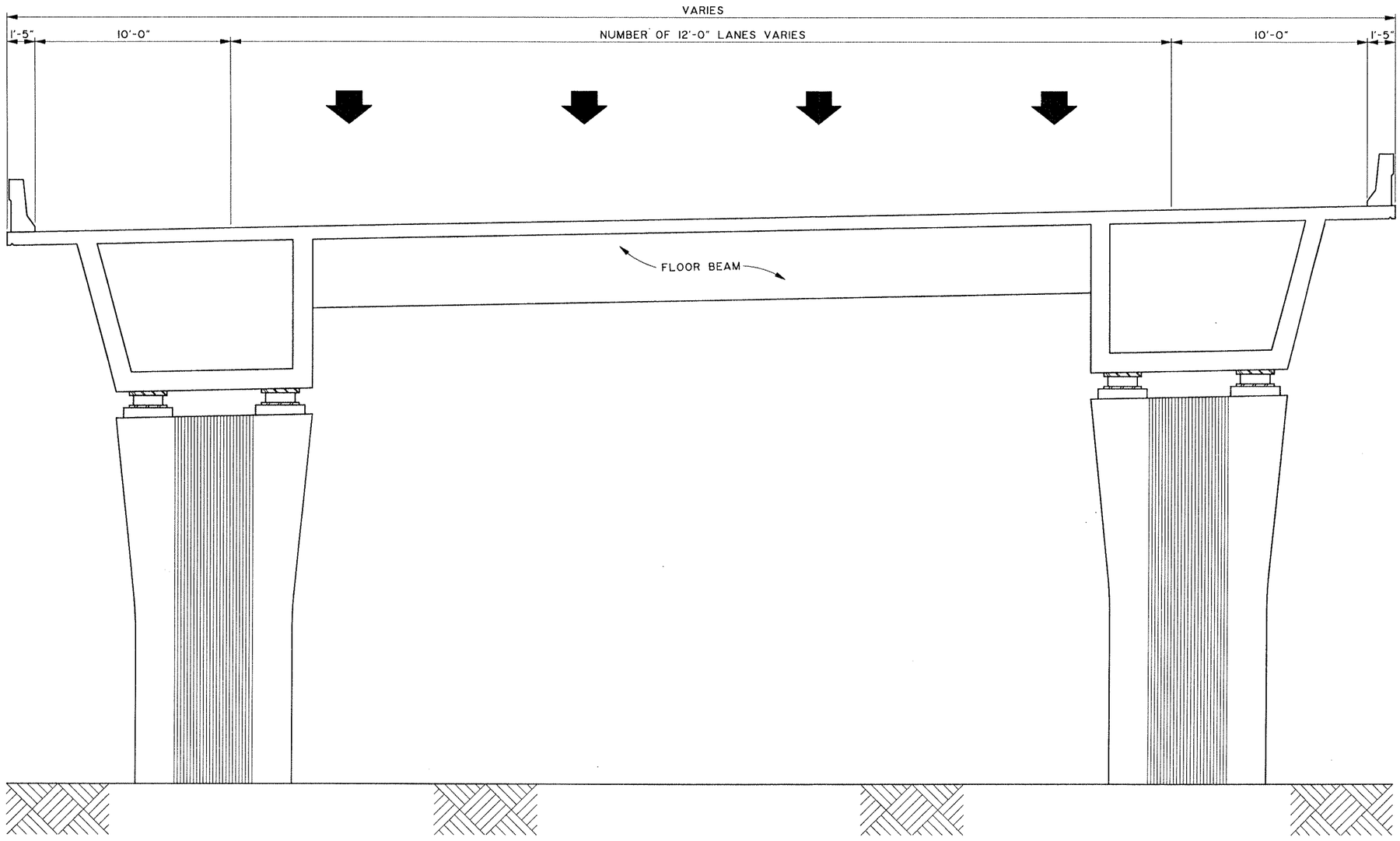
MAINLINE TYPICAL SECTION
STEEL BOX GIRDERS

EXHIBIT VII-3

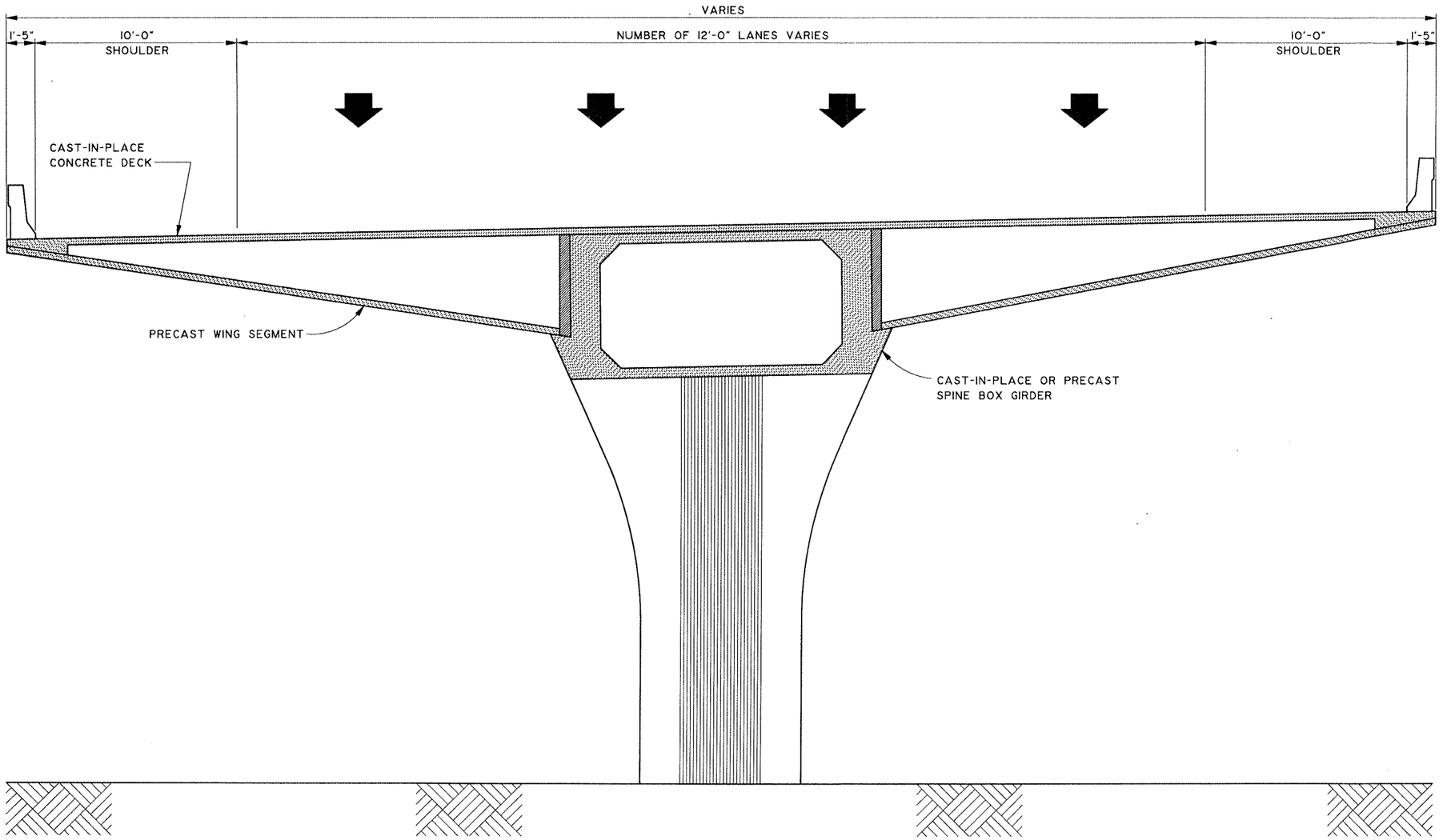


SYMMETRICAL ABOUT
℄ PROJECT

MAINLINE TYPICAL SECTION
STEEL BOX GIRDERS
WITH FLOOR BEAMS

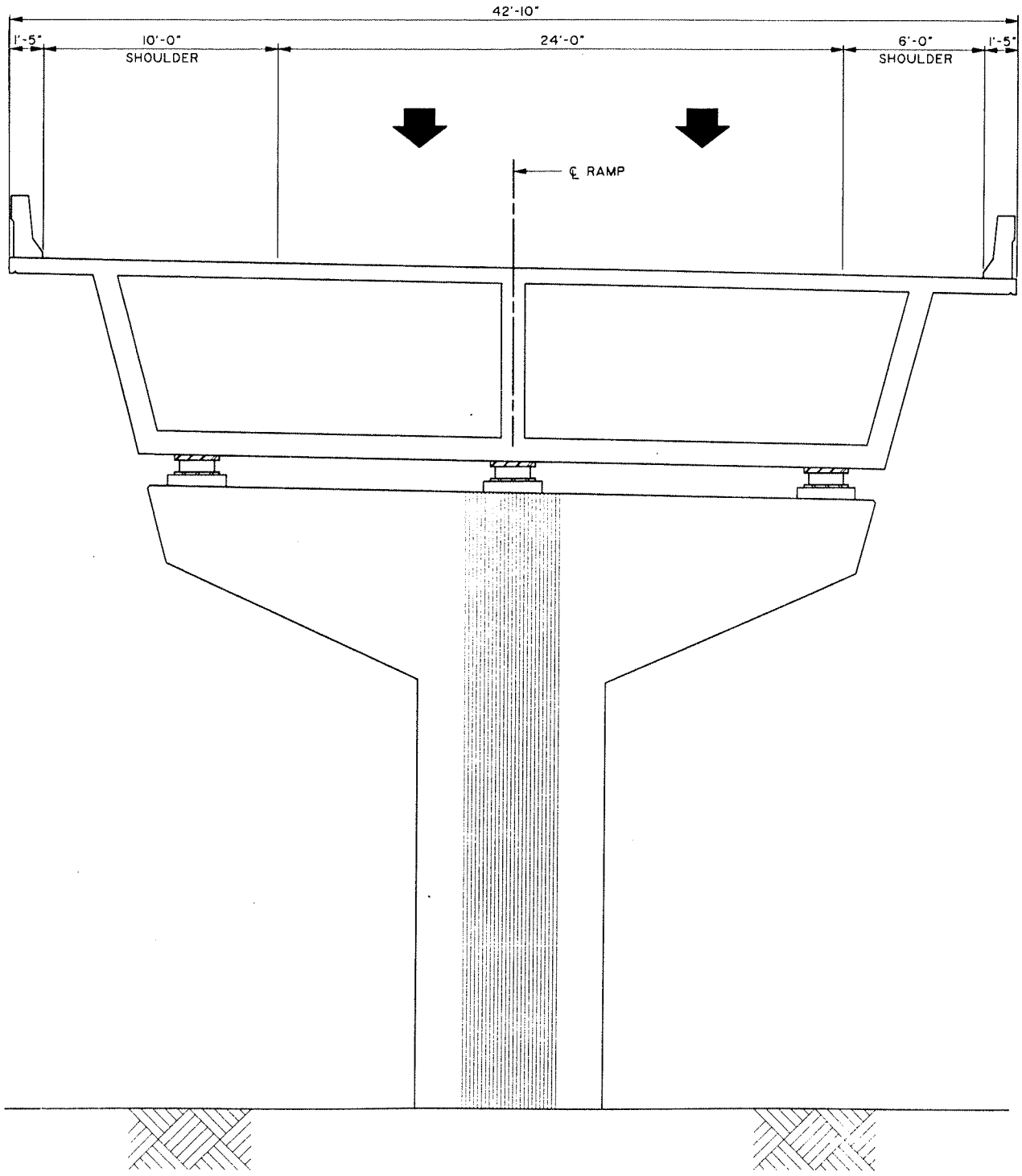


MAINLINE TYPICAL SECTION
CAST-IN-PLACE
CONCRETE BOX GIRDER
WITH FLOOR BEAMS



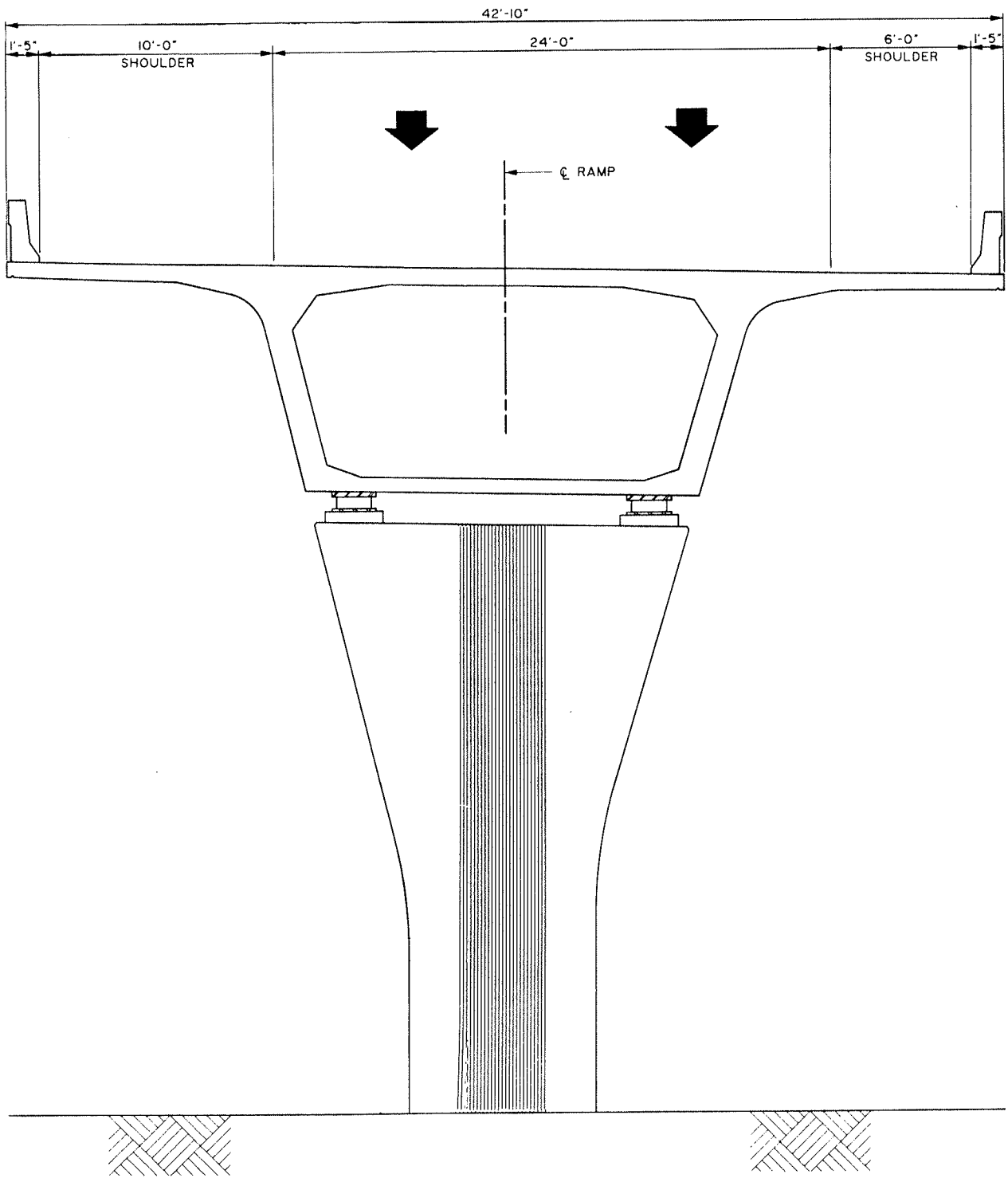
MAINLINE TYPICAL SECTION
PRECAST CONCRETE SPINE WING

EXHIBIT VII-6



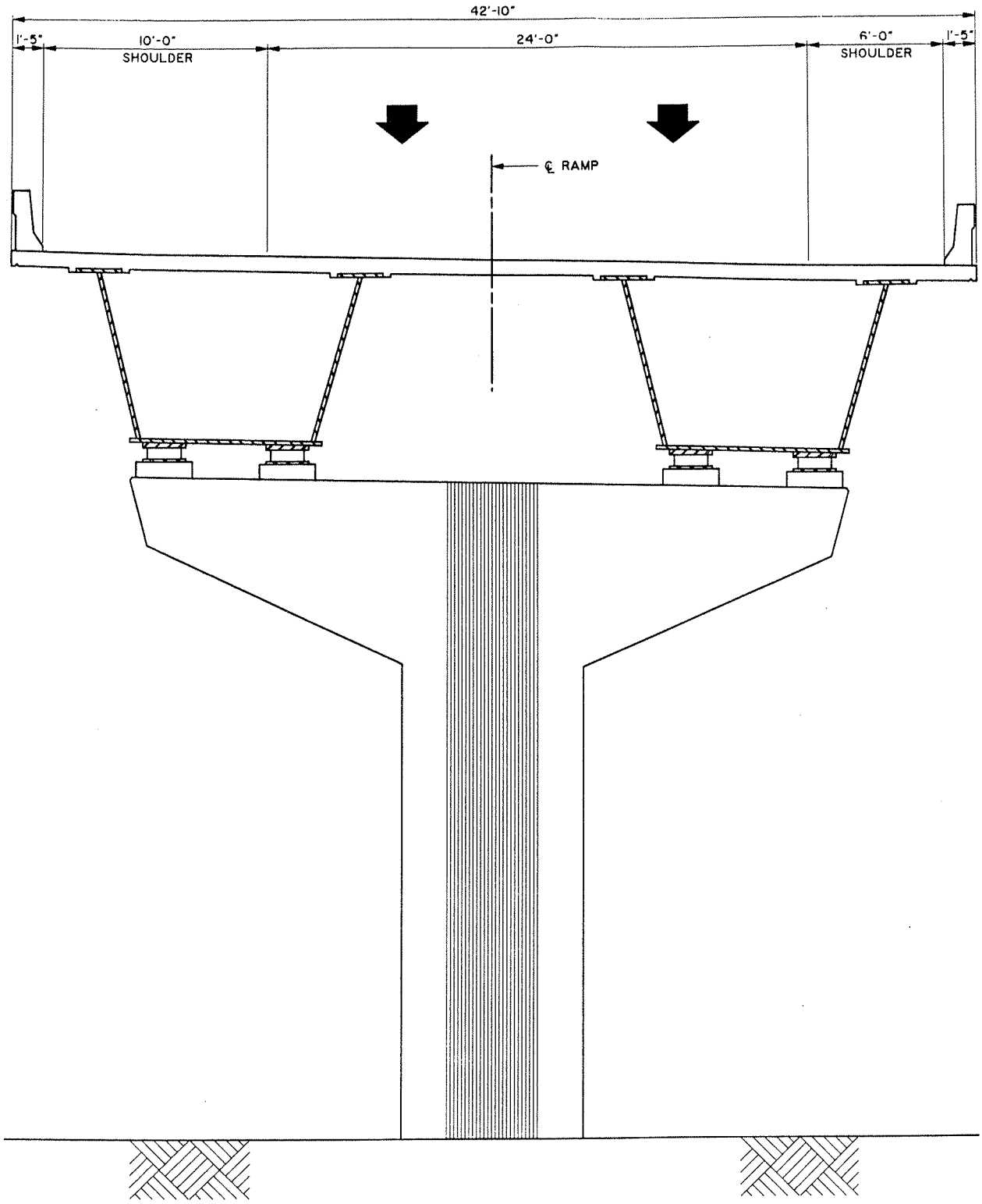
RAMP TYPICAL SECTION CAST-IN-PLACE CONCRETE BOX GIRDER

EXHIBIT VII-7



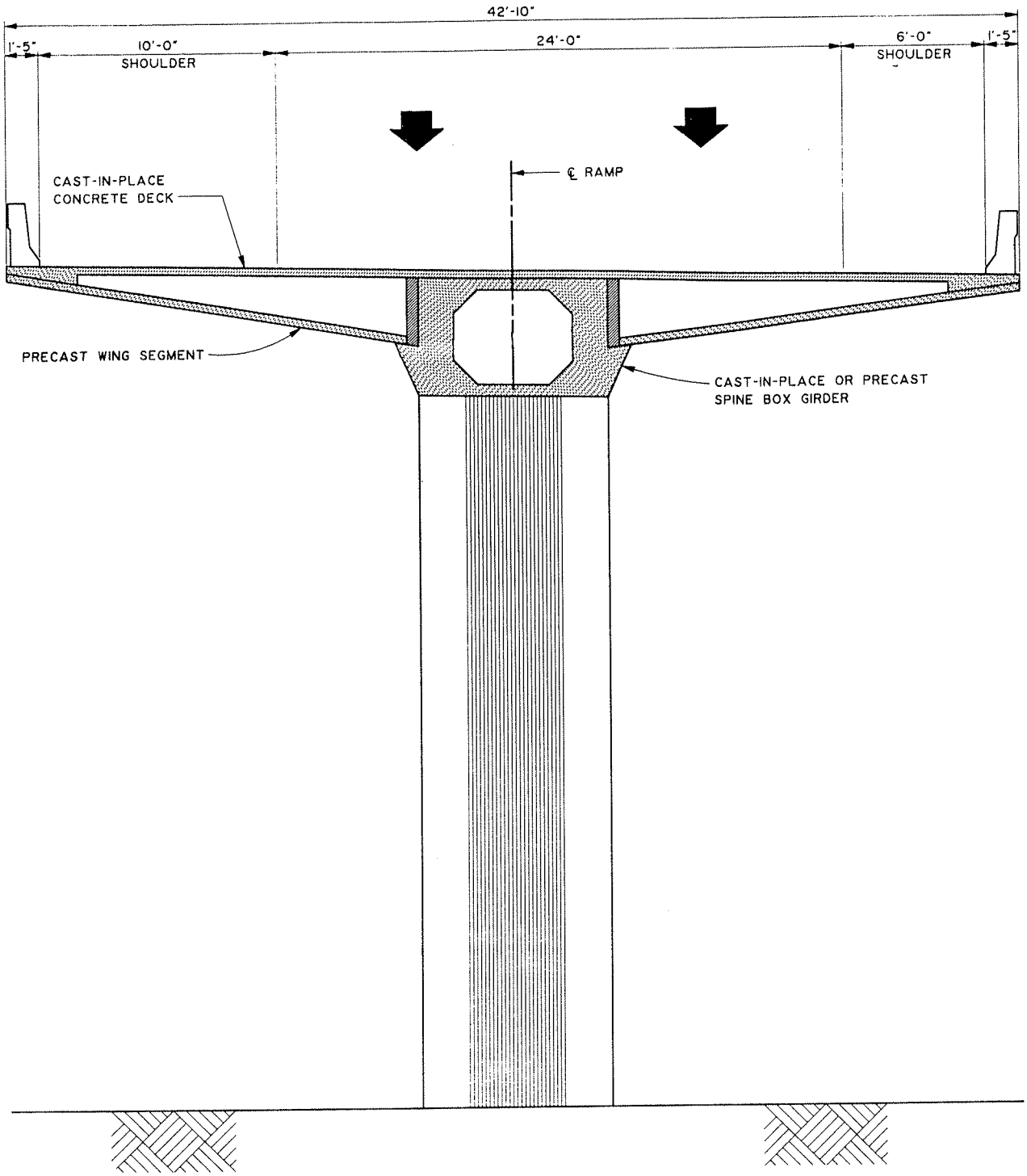
RAMP TYPICAL SECTION PRECAST SEGMENTAL CONCEPT BOX GIRDER

EXHIBIT VII-8



RAMP TYPICAL SECTION
STEEL BOX GIRDERS

EXHIBIT VII-9



RAMP TYPICAL SECTION
PRECAST CONCRETE SPINE WING

EXHIBIT VII-10

Bridge widening prices ranged from $55 per square foot (AASHTO girders) to $65 per square foot (steel structures). For new construction, prices varied by superstructure type and span lengths from $40 per square foot (130-foot maximum AASHTO beams) to $75 per square foot (250-foot spans for concrete or steel box girders). Retaining walls were priced at $35 per square foot with $5 per square foot additional price included for curved alignments, for each level above a second level, for box girders, or for variable width sections.

Based on the preferred alternative for each design section, an individual evaluation of each bridge structure was performed to establish estimated bridge length, span and pier layouts and to compute the estimated construction costs. Retaining wall locations were identified and estimated lengths, heights and costs were computed. The detailed work sheets for each bridge structure site are included in Task G1, Structural Conceptual Analysis. The total estimated construction costs for bridges and retaining walls for the entire project is approximately $641 million (1988 dollars).

Utilities

As would be expected, there is a great abundance and variety of utilities servicing the highly developed and urbanized area encompassed by the TIS. Study segments which contain the major amount of utilities have been inventoried. This inventory, which is contained in the Master Plan Concept, covers the following segments: 1A, 2A, 2B, 3A, 3B, 4B, 5A, 5B, 5C, 5D, 5E, 5F, and 5G.

The following utilities were identified in the study area:

* Water Main
* Gas Main
* Sanitary Sewer
* Sanitary Force Main
* Storm Drain
* Buried Electrical
* Overhead Electrical
* Underground Cable Television
* Manholes
* Catch Basins
* Power Poles
* Telephone Poles
* Joint Use Poles

The inventory did not compare the existing utility system to the selected alternative in each of the segments. Therefore, the extent and location of utility impacts could not be determined at this time. For a complete review of inventoried utilities see the TIS Task E8, Utilities Conflict and Inventory Working Paper, and appended 1" = 50' scale inventory plan sheets. During the Project Development and Environmental studies for each segment, utility impacts will be defined.

Results of the inventory found that water mains are located throughout the study area except in Segment 4B. The size of water mains ranged from one inch to 36 inches in diameter. For this facility, as well as others, it will be determined whether or not there are plans to replace or add to any part of the existing system.

Gas mains in the study area are one inch to 16 inches in diameter. Generally, the existing gas main is servicing residences adjacent to the existing interstate.

Sanitary sewer ranges from four inches to 54 inches in diameter. Only a small percentage of this sewer is force main.

By far, the most extensive utility in the study area is storm drains. In circular pipe, storm drains range from 12 inches to 84 inches in diameter. Either elliptical pipe or box culvert in varying sizes exists in the study area.

Most electrical lines in the study area are overhead rather than buried and carry 69 kilovolts (kV), 138 kV or 230 kV. However, telephone lines are both buried and overhead in approximately equal percentages.

Finally, the small amount of underground and overhead cable television lines found are located in Segments 5E through 5G.

Soils And Geotechnical

From October 1987 to February 1988, an inventory of existing soils and geotechnical data was assembled. These data were presented in the TIS Task E.7.f(1), Soils and Geotechnical Inventory Working Paper.

This inventory was derived from information contained in the original as-built roadway construction plans, as-built bridge plans, and soil surveys of Hillsborough and Pasco counties (as prepared by the USDA Soil Conservation Service). The TIS area was divided into 200-foot segments and the soils data were recorded for each of these sections. Soil information included limits, depths, and thicknesses of muck, predominant soil types, and cut or fill limits. Each set of structure (bridge) borings produced data such as water table depth and typical ground elevation, elevation range of refusal material, average refusal elevation, and type of refusal material.

The results of the Task E.7.f(1) inventory indicate the general stratigraphy of the TIS area typically consists of a surficial layer of clean to clayey fine sands atop Hawthorne formation clayey sands to clays which transition into limestone strata. Thicknesses and depths of these strata vary greatly and the stratigraphy does not always follow this pattern. Isolated areas of surficial muck are located throughout the project's alignment. Indications of limestone solution activity and active sinkholes were also evident throughout the alignment, but were most common along I-275 between Sligh Avenue and Bearss Avenue. The water table varied from one to 40 feet below the ground surface in the inventory borings.

The underlying limestone is the usual bearing stratum for deep foundations in this area; however, the TIS inventory indicated existing deep foundations bear in sand and clay stratas as well. Based on the structural borings in the inventory, refusal soils ranged from elevation +27 to -108 (although some borings did not encounter refusal materials) with typical refusal elevations between +20 and -20. The refusal elevations generally trended deeper from west to east through the project area.

The collected geotechnical data is useful for comparison correlation between geotechnical features and pavement condition. Geotechnical features (such as cut/fill, predominant soil type, etc.) can be compared with pavement condition/longevity for utilization with design phase pavement evaluation/design. This data inventory will be used throughout the planning phases and preliminary design of the Tampa interstate system. The soils information is available for use in preparing geotechnical testing scopes for proposed roadways, embankment, and structures. Areas of potential muck or undesirable soils may be anticipated. Types and sizes of foundations may be examined during planning phases.

Pavements

From February 1988 to October 1988, an analysis of the Tampa interstate pavement was performed. This analysis was presented in the Task E.7.f(2) Pavement Analysis Working Paper. This analysis was based on a pavement inventory. This pavement inventory consisted of three major features:

* The existing pavement section, which was determined from the original roadway as-built construction plans and from the FDOT Straight Line Diagram maps;
* The existing pavement condition, which was determined from the most recent FDOT Rigid Pavement and Flexible Pavement Condition Surveys; and
* A roadside visual pavement condition survey conducted by the study team.

This pavement inventory was used in conjunction with the soils and geotechnical inventory to investigate correlations between geotechnical features and pavement performance. The pavement inventory was also used with traffic data (historical and future, supplied by the study team) to examine:

* Past performance;
* Proposed pavement sections for planning purposes; and
* Pavement rehabilitation prior to and during construction.

The pavement inventory and results of the pavement analysis may be used for future planning purposes in order to estimate rehabilitation for the periods prior to construction.

The pavement analysis indicates the existing pavements within the TIS area (with the exception of the flexible pavement on I-275 north of Bearss Avenue) have already exceeded the design life. It is anticipated that the existing pavements will require more strengthening/rehabilitation maintenance with time. As the segment construction dates become known, the strengthening or rehabilitation required prior to reconstruction can be more closely estimated.

The interstate reconstruction will be phased, due to funding and construction restraints. The priority areas for reconstruction are Segments 3A and 3B (Ybor City), Segment 1A (Westshore), and Segment 6B (New S.R. 54). The transitional pavements adjacent to the priority reconstruction areas will likely require rehabilitation, the magnitude of which may be better determined as construction dates are known. It is possible the rural portions of I-275 (Segments 6A and 6B) will be widened and resurfaced; the extent of resurfacing will depend on the amount of traffic and existing pavement experiences prior to reconstruction. As projected construction dates are known, the resurfacing/rehabilitation magnitudes can be better estimated.

Drainage

In order to meet regulatory criteria, stormwater management systems within the TIS project limits must be designed to include stormwater treatment and peak discharge attenuation capacity. Although alternative stormwater storage and treatment systems will be considered during final design, the stormwater storage and treatment systems analyzed in the Master Plan were detention pond systems. The detention ponds will be either wet or dry depending on soil conditions, water table levels, and percolation rates.

Hydrologic Analysis

In order to determine stormwater impacts associated with the proposed TIS improvements, a hydrologic analysis of each drainage sub-basin within the TIS project limits was completed. The hydrologic analysis included determinations of drainage basin areas, pervious/impervious areas, and peak flow rates. Information obtained from the hydrologic analysis will be used to determine stormwater storage requirements for the project.

The initial step in the hydrologic analysis was the delineation of the drainage sub-basins within the TIS project limits. Drainage sub-basin boundaries were delineated by utilizing City of Tampa Drainage Atlas Sheets, 1" = 200' scale, Southwest Florida Water Management District (SWFWMD) aerials, existing drainage studies, and FDOT drainage maps. The proposed TIS right-of-way limits were also used as the lateral sub-basin boundaries.

The next step in the hydrologic analysis was the determination of existing and proposed pervious/impervious areas within each drainage sub-basin. Pervious/impervious areas within the TIS right-of-way were determined from existing FDOT plans and the proposed TIS alternative alignment plans.

Runoff curve numbers (CN) were calculated for each sub-basin for existing and proposed conditions and were based on hydrologic soil group, land use, soil moisture conditions and land slope. Time of Concentrations (TC) for sub-basins within the TIS project limits were calculated using a combination of overland flow techniques and Manning's Equation. Both the Soil Conservation Service (SCS) and FDOT overland flow charts were utilized.

The storm event to be analyzed in the hydrologic analysis was dependent on the sub-basin location within the TIS project limits. For most sub-basins, the 25-year, 24-hour storm event was utilized in the hydrologic analysis. However, for the areas determined to be "volume sensitive" (i.e., Curiosity Creek, etc.) the 100-year, 24-hour storm event was utilized. It should also be noted that for sub-basins discharging directly to "more than adequate outfalls" or major waterbodies (i.e., Tampa Bay, Hillsborough River, etc.), no peak discharge attenuation was provided.

In determining peak discharge rates for each sub-basin for existing and proposed conditions, rainfall volumes from the SWFWMD Manual (1987) of 8.0, 10.0, and 11.0 inches for the 25-, 50-, and 100-year design storms were used. The rainfall distribution utilized was the SCS Type II modified for Florida distribution. Due to the flat watershed slope, a slope factor of 256 was used in developing the synthetic unit hydrographs for each sub-basin.

Peak discharges for each sub-basin within the TIS project limits were calculated for existing and proposed conditions using the previously listed input data and the Soil Conservation Service Unit Hydrograph Method (SCSUNIT) computer model developed by Advanced Technologies, Inc.

Pond Sizing

To meet regulatory criteria, peak discharges for the proposed conditions must be less than or equal to peak discharges for existing conditions within each sub-basin. To accomplish this, volume storage in the form of excavated detention ponds will be utilized. In addition to providing peak attenuation storage capacity, the proposed detention ponds will be designed to include stormwater treatment capacity.

To estimate required detention pond volumes for each sub-basin within the TIS project limits, the Soil Conservation Service (SCS) TR-55 (1986) basin routing charts and equations were utilized. Table VII-1 provides a listing of the proposed pond locations, pond areas and storage volumes within each segment of the

TABLE VII-1

TIS PROPOSED DETENTION PONDS

Segment	Pond Location	Pond Area (Ac)	Storage Volume (Ac-Ft)
1A	Begin Segment 1A	0.73	0.68
	Memorial/I-275	1.43	0.85
	Westshore Boulevard Exit	0.90	0.84
	West of Lois Avenue	2.31	3.14
	East of Lois Avenue	2.56	2.00
	Dale Mabry Highway	6.13	9.75
2A	No ponds in this Segment	--	--
2B	West of Hillsborough River	0.96	1.00
	Ashley Street Ramp	1.20	1.30
	East of I-275/I-4	4.80	14.20
	Robles Park	3.20	8.90
	Chelsea Avenue	2.60	6.70
3A	15th Street	3.60	7.80
	24th Street	2.60	5.70
	26th Street	1.90	3.50
	32nd Street	3.10	6.60
	4th Avenue	1.00	1.40
3B	35th Street	2.30	4.60
	45th Street	2.60	5.10
	Columbus Drive	1.60	2.70
	Melburne Boulevard	1.30	2.26
	14th Street	0.80	1.00
	East of 50th Street	2.80	5.60
4A	Buffalo Avenue	0.50	0.50
4B	Hillsborough Avenue	1.70	3.10
	U.S. 301 East of Bypass Canal	2.70	5.60
4C	Roadside Swales	--	--
5A	Hillsborough Avenue	2.58	7.16
5B	South of Hillsborough River	0.90	0.87
5C	North of Hillsborough River	1.22	1.00
5D	Bougainvilla Avenue	1.47	2.60
5E	Fowler Avenue	2.54	6.61
	129th Avenue	1.03	1.59
5F	South of Fletcher Avenue	0.80	1.07
	North of Fletcher Avenue	0.70	0.87
5G	South of Bearss Avenue	1.21	1.97
	North of Bearss Avenue	1.34	2.26
6A	Proposed North Tampa Parkway	4.08	7.00
6B	I-75/I-275	12.94	21.82
	New S.R. 54	4.08	7.00

TIS project limits. It should be noted several areas within the TIS project limits will utilize rural or roadside ditch cross-sections for stormwater conveyance, storage and treatment. These areas are located in Segments 4A, 4B, 4C, 6A, and 6B.

The proposed pond storage depths range from two to four feet depending on soil conditions and water table levels. The proposed "wet" detention ponds will have a maximum depth of six to eight feet. The pond side slopes were set at 4:1 horizontal to vertical. The total pond area includes one-foot of freeboard storage and a 20-foot maintenance berm around the pond perimeter.

The proposed pond locations within each sub-basin were determined from existing topography, existing land use, proximity to an existing outfall, and the proximity to the existing right-of-way. The proposed ponds will be designed to function as an amenity to the TIS project in addition to providing stormwater storage and treatment capacity. The ponds will also utilize landscaping, fountains, littoral zones, structural designs, and other features to provide an aesthetic and functional system.

Traffic Operations

Prior to the determination of the number of lanes required on I-275, I-4 and I-75, Directional Design Hour Volumes (DDHV's) were developed using the 2010 Average Daily Traffic (ADT) volumes presented earlier in Section IV, "Need For Improvements." DDHV's were calculated using a K-factor (percentage of daily traffic on the roadway during the peak hour) of 0.08 and the following directional distribution factors (D-factors):

D = 0.50 for I-275 between Westshore Boulevard and Ashley Street;

D = 0.55 for all remaining areas of the project.

The DDHV's for each design segment are presented in the TIS Task F.5.e. Travel Demand Technical Report.

As discussed earlier in Section III, "Design Criteria, Policies and Procedures" of this report, based on current traffic flow characteristics in the TIS corridor, the Level of Service (LOS) E flow rate for a 60 mph design speed facility was increased by 10 percent from 2,000 pcphpl to 2,200 pcphpl. Similarly, the LOS E flow rate for a 50 mph design speed facility was increased by 10.5 percent from 1,900 pcphpl to 2,100 pcphpl. Assuming these values of LOS E and the relationship of LOS D to LOS E in the Highway Capacity Manual (HCM), the maximum LOS D flow rates are 1,740 and 1,650 pcphpl for design speeds of 60 mph and 50 mph, respectively. Using these values as the maximum limits for LOS D, service flow rates of 1,650 vph and 1,560 vph were determined to be the most appropriate design values for the express freeway and local access freeway lanes, respectively.

These desirable LOS D values, in conjunction with the DDHV's were used as the basis for the development and analysis of the Master Plan Concept. Using the HCM procedures contained in Chapter 3 - "Basic Freeway Segments," Chapter 4 - "Weaving Areas," and Chapter 5 - "Ramps and Ramp Junctions," operational analyses were conducted on the Master Plan Concept to determine the corresponding levels of service. Prior to these analyses, modifications were made to the maximum level of service values for the merge, diverge and weaving maneuvers.

To be consistent with the previous modifications made to the LOS E flow rates for basic freeway segments, the LOS E merge and diverge volumes were increased from 2,000 passenger cars per hour (pcph) to 2,200 pcph. This value represents a 10 percent increase over the value contained in the HCM. Using this recommended value

for LOS E, the corresponding flow rates for LOS A, B, C, and D were subsequently developed. These are listed in Table VII-2 along with the HCM flow rates.

TABLE VII-2

MAXIMUM MERGE AND DIVERGE VOLUMES AND LEVEL OF SERVICE
Tampa Interstate Study

	Merge Volume		Diverge Volume	
Level of Service	HCM Value (in pcph)	Recommended Value (in pcph)	HCM Value (in pcph)	Recommended Value (in pcph)
A	600	660	650	715
B	1,000	1,100	1,050	1,155
C	1,450	1,595	1,500	1,650
D	1,750	1,925	1,800	1,980
E	2,000	2,200	2,000	2,200

pcph = passenger cars per hour

The level of service of a weaving section is determined by the operating speed of the weaving and non-weaving vehicles. The HCM weaving and non-weaving speeds for LOS A through E were used to determine the levels of service for the weaving sections on the express freeways. These values are listed in Table VII-3. The HCM weaving and non-weaving speeds for each level of service were adjusted to reflect the lower design speed on the local access freeway lanes. The speeds for each level of service on the local access freeways were determined to correspond to the next lower level of service on the express freeways. Table VII-3 also lists the weaving and non-weaving speeds and the corresponding levels of service used in the evaluation of the local access freeway weaving sections.

Critical movement analyses for the ramp terminals at the interchanges within the study limits were also conducted. To determine the level of service at these locations, the following values were used:

Volume-to-Capacity Ratio (V/C)	Level of Service (LOS)
≤ 0.70	B
≤ 0.80	C
≤ 0.90	D
≤ 1.00	E
> 1.00	F

A value of 1,500 vehicles per hour was used for the capacity (LOS E) at the ramp terminals.

The results of the operations analyses are presented in Tables VII-4 through VII-13, while the specific calculations are included in the Task F.5.e. Travel Demand Technical Report. Tables VII-4 through VII-12

TABLE VII-3

MAXIMUM RECOMMENDED WEAVING AND NON-WEAVING SPEEDS AND LEVEL OF SERVICE
Tampa Interstate Study

Express Freeway
60 MPH Design Speed

Level Of Service	Weaving Speed (in mph)	Non-Weaving Speed (in mph)
A	≥ 55.0	≥ 60.0
B	≥ 50.0	≥ 54.0
C	≥ 45.0	≥ 48.0
D	≥ 40.0	≥ 42.0
E	≥ 35.0	≥ 35.0
F	≥ 35.0	≥ 35.0

Local Access Freeway and Collector/Distributor Roads
50 MPH Design Speed

Level Of Service	Weaving Speed (in mph)	Non-Weaving Speed (in mph)
A	≥ 50.0	≥ 54.0
B	≥ 45.0	≥ 48.0
C	≥ 40.0	≥ 42.0
D	≥ 35.0	≥ 35.0
E	≥ 30.0	≥ 30.0
F	< 30.0	< 30.0

TABLE VII-4

DESIGN SEGMENT 1A OPERATIONS ANALYSIS SUMMARY

	LEVEL OF SERVICE			
	Merge Area	Diverge Area	Weaving Area	
			Weaving Traffic	Non-Weaving Traffic
Location				
EB I-275 off-ramp Local Freeway	--	D/D	--	--
EB I-275 Express Freeway on-ramp from Northwest Hillsborough Expressway	C/C	--	--	--
EB I-275 Local Freeway off-ramp to Kennedy Boulevard	--	B	--	--
EB I-275 Local Freeway off-ramp to Memorial Highway	--	B	--	--
EB I-275 Local Freeway between Memorial Highway and Lois Avenue	--	--	C	D
EB I-275 Local Freeway between Westshore Boulevard and Dale Mabry Highway	--	--	D	D
EB I-275 Local Freeway on-ramp from Lois Avenue	B	--	--	--
WB I-275 Local Freeway off-ramp to Lois Avenue	--	B	--	--
WB I-275 Local Freeway between Dale Mabry Highway and Westshore Boulevard	--	--	C	C
WB I-275 Local Freeway between Lois Avenue on-ramp and Memorial Highway off-ramp	--	--	B	B
WB I-275 Local Freeway on-ramp from Memorial Highway	B	--	--	--
WB I-275 Express Freeway on-ramp from Kennedy Boulevard/Northwest Hillsborough Expressway	D	--	--	--
WB I-275 Express Freeway off-ramp to Northwest Hillsborough Expressway	--	D/B	--	--

TABLE VII-5

DESIGN SEGMENT 2A OPERATIONS ANALYSIS SUMMARY

	LEVEL OF SERVICE			
	Merge Area	Diverge Area	Weaving Area	
			Weaving Traffic	Non-Weaving Traffic
Location				
EB I-275 Local Freeway between Dale Mabry Highway and Himes Avenue	--	--	C	D
EB I-275 Local Freeway between Himes Avenue and Armenia Avenue	--	--	C	C
EB I-275 Express Freeway off-ramp to I-275 Local Freeway	--	C/D	--	--
EB I-275 Local Freeway between I-275 Express Freeway and Howard Avenue	--	--	D	E
EB I-275 Local Freeway between Howard Avenue and North Boulevard	--	--	D	B
EB I-275 Local Freeway between North Boulevard and I-275 Express Freeway	--	--	D	E
EB I-275 Local Freeway between I-275 Express Freeway and Ashley Street/Jefferson Street	--	--	E	E
WB I-275 Local Freeway between Ashley Street and North Boulevard	--	--	D	E
WB I-275 Local Freeway between North Boulevard and Howard Avenue	--	--	D	E
WB I-275 Local Freeway between Howard Avenue and I-275 Express Freeway	--	--	E	E
WB I-275 Express Freeway On-Ramp from I-275 Local Freeway	C/C	--	--	--
WB I-275 Local Freeway between Armenia Avenue and Himes Avenue	--	--	C	D
WB I-275 Local Freeway between Himes Avenue and Dale Mabry Highway	--	--	D	D

TABLE VII-6

DESIGN SEGMENT 2B OPERATIONS ANALYSIS SUMMARY

Location	LEVEL OF SERVICE			
	Merge Area	Diverge Area	Weaving Area	
			Weaving Traffic	Non-Weaving Traffic
SB I-275 Local Freeway between Buffalo Avenue on-ramp and off-ramp to I-4 Local Freeway	--	--	D	D
SB I-275 Local Freeway between off-ramp to I-4 Local Freeway and off-ramp to Jefferson Street	--	--	D	D
SB I-275 Local Freeway on-ramp from 14th Street	D	--	--	--
SB I-275 Express Freeway diverge between WB I-275 Express Freeway and EB I-4 Express Freeway	--	B	--	--
SB I-275 Local Freeway between WB I-4 Local Freeway and Ashley Street	--	--	C	C
WB I-275 Local Freeway on-ramp from Jefferson Street	C	--	--	--
NB I-275 Local Freeway between Ashley Street on-ramp and NB I-275/EB I-4 diverge	--	--	D	D
SB I-275 Express Freeway diverge to SB I-275 Local Freeway	--	C/C	--	--
SB I-275 Express Freeway between WB I-4 Express Freeway and WB I-275 Local Freeway	--	--	D	D
NB I-275 Local Freeway between 14th Street/WB I-4 Local Freeway on-ramp and Buffalo Avenue off-ramp	--	--	C	C
EB I-275 Express Freeway between NB I-275 Local Freeway and EB I-4 Express Freeway	--	--	C	C
NB I-275 Express Freeway Merge with WB I-4 Express Freeway	B/C	--	--	--
NB I-275 Express Freeway Merge with NB I-275 Local Freeway	C	--	--	--
EB I-4 Local Freeway off-ramp to 14th Street	--	C	--	--
EB I-4 Local Freeway on-ramp from Jefferson Street	C	--	--	--
NB I-275 Local Freeway between Jefferson Street and I-4 Local Freeway	--	--	D	D
WB I-4 Local Freeway off-ramp to NB I-275 Local Freeway	--	C	--	--
WB I-4 Local Freeway off-ramp to Jefferson Street	--	B	--	--

TABLE VII-7

DESIGN SEGMENTS 3A AND 3B OPERATIONS ANALYSIS SUMMARY

	LEVEL OF SERVICE			
	Merge Area	Diverge Area	Weaving Area	
			Weaving Traffic	Non-Weaving Traffic
Location				
EB I-4 Express Freeway between SB I-275 Express Freeway and Crosstown Connector	--	--	D	D
EB I-4 Express Freeway to 50th Street	--	D	--	--
EB I-4 Local Freeway between SB I-275 Local Freeway and 15th Street	--	--	C	C
EB I-4 Local Freeway between 15th Street and Crosstown Connector	--	--	C	C
EB I-4 Local Freeway between Crosstown Connector and 50th Street	--	--	D	D
EB I-4 Express Freeway between I-4 Local Freeway and 50th Street	--	--	D	D
WB I-4 Express Freeway between 50th Street and I-4 Local Freeway	--	--	D	C
WB I-4 Local Freeway between 50th Street and Crosstown Connector	--	--	C	D
WB I-4 Local Freeway between Crosstown Connector and 15th Street	--	--	C	C
WB I-4 Express Freeway on-ramp from 50th Street	D	--	--	--
WB I-4 Express Freeway between Crosstown Connector and NB I-275 Express Freeway	--	--	C	C

TABLE VII-8

DESIGN SEGMENT 4A OPERATIONS ANALYSIS SUMMARY

Location	LEVEL OF SERVICE			
	Merge Area[1]	Diverge Area[1]	Weaving Area	
			Weaving Traffic	Non-Weaving Traffic
EB I-4 between 50th Street and Buffalo Avenue	--	--	D	D
EB I-4 between Buffalo Avenue and Orient Road	--	--	C	B
WB I-4 between Orient Road and Buffalo Avenue	--	--	C	B
WB I-4 between Buffalo Avenue and 50th Street	--	--	D	C

[1]There are no merge or diverge areas in Design Segment 4A.

TABLE VII-9

DESIGN SEGMENT 4B OPERATIONS ANALYSIS SUMMARY

Location	LEVEL OF SERVICE			
	Merge Area	Diverge Area	Weaving Area	
			Weaving Traffic	Non-Weaving Traffic
EB I-4 between Orient Road and U.S. 301	--	--	B	D
EB C/D road on-ramp from I-4	C/C	--	--	--
EB C/D road on-ramp from Hillsborough Avenue	A	--	--	--
EB C/D road off-ramp to NB U.S. 301	--	A/C	--	--
EB C/D road between NB/SB U.S. 301 and I-4	--	--	C	C
EB I-4 between CD road and NB/SB I-75 off-ramp	--	--	D	D
WB I-4 between NB/SB I-75 on-ramp and off-ramp to C/D road	--	--	D	D
WB C/D road off-ramp to NB U.S. 301	--	C	--	--
WB C/D road between I-4 and SB U.S. 301	--	--	C	C
WB C/D road off-ramp to WB I-4 Express Freeway	--	C	--	--
WB C/D road between NB/SB U.S. 301 and I-4	--	--	B	B
WB I-4 on-ramp from U.S. 301 interchange	C/D	--	--	--

TABLE VII-10

DESIGN SEGMENT 4C OPERATIONS ANALYSIS SUMMARY

Location	LEVEL OF SERVICE			
	Merge Area	Diverge Area	Weaving Area[1]	
			Weaving Traffic	Non-Weaving Traffic
SW Quadrant of I-4/I-75 Interchange				
SB I-75 on-ramp from EB I-4/U.S. 92	C	--	--	--
SB I-75 on-ramp from WB I-4	D	--	--	--
SE Quadrant of I-4/I-75 Interchange				
NB I-75 off-ramp	--	D/C	--	--
NB I-75 off-ramp to U.S. 92	--	C	--	--
EB I-4 on-ramp from NB/SB I-75	C/C	--	--	--
NE Quadrant of I-4/I-75 Interchange				
WB I-4 off-ramp	--	D/C	--	--
NB I-75 on-ramp from WB I-4/ Sligh Avenue	C	--	--	--
NB I-75 on-ramp from EB I-4	C	--	--	--
NW Quadrant of I-4/I-75 Interchange				
SB I-75 off-ramp	--	C/C	--	--
SB I-75 off-ramp to Sligh Avenue	--	B	--	--

[1] There are no weaving areas in Design Segment 4C

TABLE VII-11

DESIGN SEGMENTS 5A THROUGH 5G OPERATIONS ANALYSIS SUMMARY

	LEVEL OF SERVICE			
	Merge Area	Diverge Area	Weaving Area	
			Weaving Traffic	Non-Weaving Traffic
Location				
SB I-275 off-ramp to Bearss Avenue	--	C	--	--
SB I-275 between Bearss Avenue and Fletcher Avenue	--	--	C	C
SB I-275 between Fletcher Avenue and Fowler Avenue	--	--	D	D
SB I-275 between Fowler Avenue and Busch Boulevard	--	--	C	C
SB I-275 on-ramp from Linebaugh Avenue	D	--	--	--
SB I-275 between Waters Avenue and Sligh Avenue	--	--	D	D
SB I-275 between Sligh Avenue and Hillsborough Avenue	--	--	D	D
SB I-275 between Hillsborough Avenue and Buffalo Avenue	--	--	D	D
NB I-275 between Buffalo Avenue and Hillsborough Avenue	--	--	D	D
NB I-275 between Hillsborough Avenue and Sligh Avenue	--	--	D	D
NB I-275 between Sligh Avenue and Waters Avenue	--	--	D	D
NB I-275 off-ramp to Linebaugh Avenue	--	C	--	--
NB I-275 between Busch Boulevard and Fowler Avenue	--	--	C	C
NB I-275 between Fowler Avenue and Fletcher Avenue	--	--	D	D
NB I-275 between Fletcher Avenue and Bearss Avenue	--	--	C	C
NB I-275 on-ramp from Bearss Avenue	C	--	--	--

TABLE VII-12

DESIGN SEGMENTS 6A and 6B OPERATIONS ANALYSIS SUMMARY

	LEVEL OF SERVICE			
	Merge Area	Diverge Area	Weaving Area[1]	
			Weaving Traffic	Non-Weaving Traffic
Location				
NB I-275 off-ramp to North Tampa Parkway	--	C	--	--
NB I-275 on-ramp from North Tampa Parkway	B	--	--	--
NB I-275 off-ramp to SB I-75	--	B	--	--
NB I-275 merge with NB I-75	C	--	--	--
NB I-75 off-ramp to New S.R. 54	--	C/B	--	--
NB I-75 on-ramp from New S.R. 54	B	--	--	--
NB I-75 off-ramp to SB I-275	--	B	--	--
SB I-75 off-ramp to New S.R. 54	--	B	--	--
SB I-75 on-ramp from New S.R. 54	C/D	--	--	--
SB I-275 diverge from SB I-75	--	C	--	--
SB I-75 on-ramp from NB I-275	B	--	--	--
SB I-275 on-ramp from NB I-75	B	--	--	--
SB I-275 off-ramp to North Tampa Parkway	--	B	--	--
SB I-275 on-ramp from North Tampa Parkway	C	--	--	--

[1]There are no weaving areas in Design Segments 6A and 6B.

TABLE VII-13

RAMP TERMINALS OPERATIONS ANALYSIS SUMMARY

Intersection	A.M. Peak Hour V/C	A.M. Peak Hour LOS	P.M. Peak Hour V/C	P.M. Peak Hour LOS
I-275 eastbound on-ramp and Westshore Blvd.	0.84	D	0.78	C
I-275 westbound off-ramp and Westshore Blvd.	0.73	C	0.89	D
I-275 eastbound on/off-ramps and Lois Ave.	0.78	C	0.76	C
I-275 westbound on/off-ramps and Lois Ave.	0.52	B	0.50	B
I-275 on/off-ramps and Dale Mabry Hwy.	1.11	F	1.04	F
I-275 eastbound on-ramp and Himes Ave.	0.73	C	0.66	B
I-275 westbound off-ramp and Himes Ave.	0.64	B	0.77	C
I-275 eastbound off-ramp and Armenia Ave.	0.51	B	0.45	B
I-275 eastbound on-ramp and Howard Ave.	0.69	B	0.58	B
I-275 westbound off-ramp and Howard Ave.	0.55	B	0.65	B
I-275 westbound on-ramp and Armenia Ave.	0.49	B	0.51	B
I-275 eastbound off-ramp and North Blvd.	0.78	C	0.79	C
I-275 westbound on-ramp and North Blvd.	0.65	B	0.75	C
I-275 northbound on/off-ramps and Buffalo Ave.	0.80	C	0.80	C
I-275 southbound on/off-ramps and Buffalo Ave.	0.81	D	0.81	D
I-4 eastbound off-ramp and 14th St.	0.74	C	0.81	D
I-4 eastbound on-ramp and 15th St.	0.72	C	0.83	D
I-4 westbound off-ramp and 15th St.	0.86	D	0.70	B
I-4 westbound on-ramp and 14th St.	0.81	D	0.70	B
I-4 eastbound off-ramp and Columbus Dr.	0.73	C	0.74	C
I-4 eastbound on-ramp and 50th St.	0.74	C	0.89	D
I-4 westbound off-ramp and 50th St.	0.86	D	0.77	C
I-4 westbound on-ramp and Columbus Dr.	0.90	D	0.70	C
I-4 eastbound on/off-ramps and Buffalo Ave.	0.90	D	0.85	D
I-4 westbound on/off-ramps and Buffalo Ave.	0.88	D	0.86	D
I-4 eastbound off-ramp and Orient Rd.	0.21	B	0.23	B
I-4 westbound on-ramp and Orient Rd.	0.25	B	0.25	B
I-275 northbound on/off-ramps and Hillsborough Ave.	0.76	C	0.82	D
I-275 southbound on/off-ramps and Hillsborough Ave.	0.79	C	0.76	C
I-275 northbound on/off-ramps and Sligh Ave.	0.62	B	0.72	C
I-275 southbound on/off-ramps and Sligh Ave.	0.73	C	0.63	B
I-275 northbound off-ramp and Waters Ave.	0.61	B	0.65	B
I-275 southbound on-ramp and Waters Ave.	0.86	D	0.70	C
I-275 northbound on-ramp and Busch Blvd.	0.74	C	0.74	C
I-275 southbound off-ramp and Busch Blvd.	0.79	C	0.75	C
I-275 northbound off-ramp and Linebaugh Ave.	0.50	B	0.51	B
I-275 southbound on-ramp and Linebaugh Ave.	0.64	B	0.61	B
I-275 ramps and Fowler Ave. (urban interchange)	0.84	D	0.80	C
I-275 ramps and Fletcher Ave. (urban interchange)	0.81	D	0.84	D
I-275 ramps and Bearss Ave. (urban interchange)	0.90	D	0.75	C
I-275 northbound on/off-ramps and North Tampa Parkway	0.64	B	0.78	C
I-275 southbound on/off-ramps and North Tampa Parkway	0.58	B	0.67	B
I-275 northbound on/off-ramps and S.R. 54	0.68	B	0.68	B
I-275 southbound on/off-ramps and S.R. 54	0.87	D	0.72	C

summarize the merge, diverge and weaving analyses, while Table VII-3 summarizes the critical movement analyses conducted at the ramp terminals.

Tables VII-4 through VII-12 indicate that all of the interstate express lanes will operate at an acceptable level of service (LOS D or better) for the design year 2010 using the criteria presented in Tables VII-2 and VII-3.

On the local access lanes, there are two sections which are projected to operate at less than an adequate level of service. These sections are as follows:

* I-275 eastbound local access lanes from the I-275 express ramp to Ashley Street (a four-part multiple weaving section)
* I-275 westbound local access lanes from Ashley Street to the I-275 express ramp (a three-part multiple weaving section).

These sections are on the local access lanes in multiple weaving sections. It should be noted, however, that in all sections, the weaving and non-weaving speeds exceed 31.5 miles per hour. The Florida Department of Transportation (FDOT) has requested an exception from the Federal Highway Administration (FHWA) for the previously listed segments of the local access lanes.

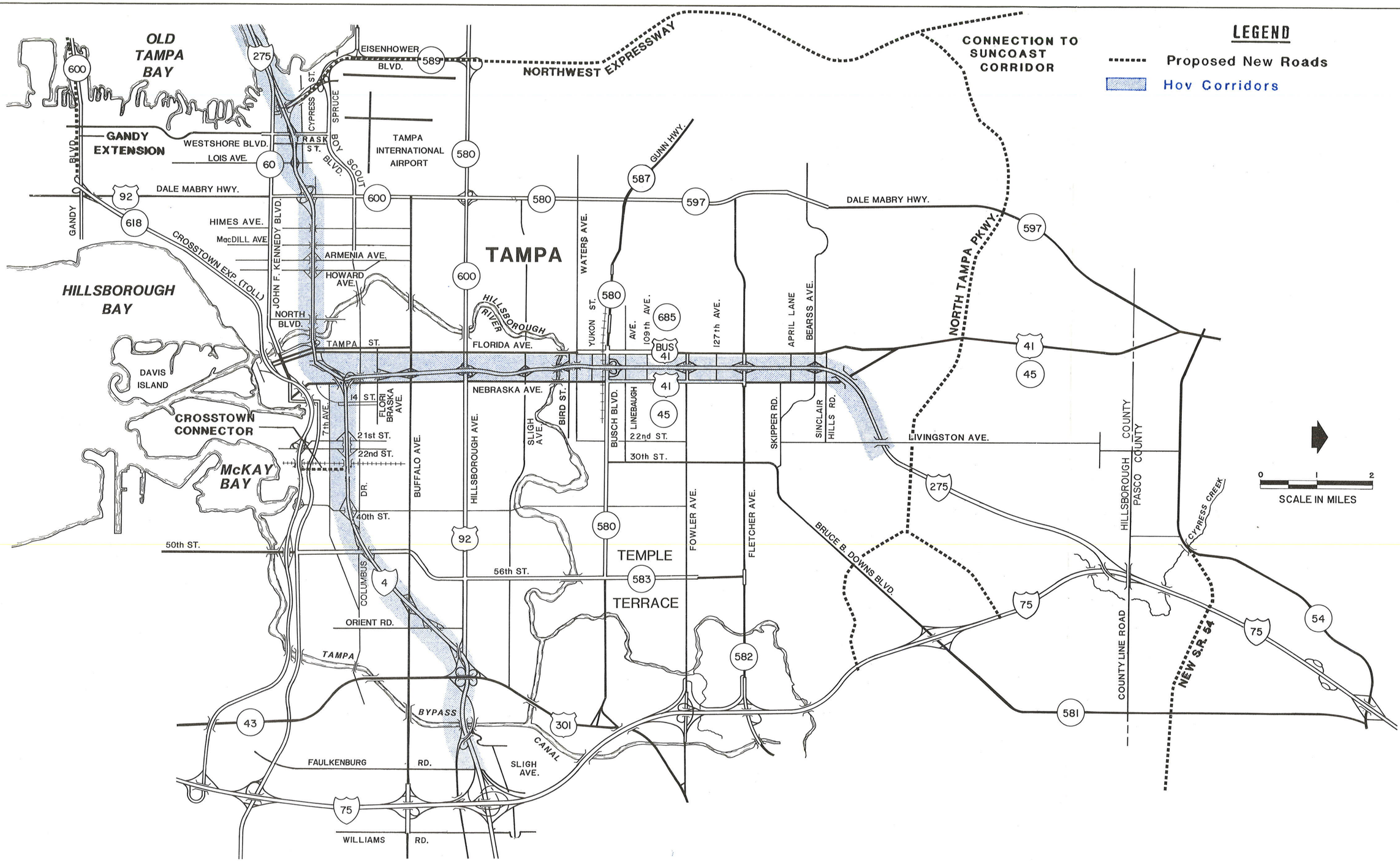
Table VII-13 indicates that all the interstate ramp terminals except one will operate at LOS D or better during the a.m. and p.m. peak hours. The one exception is at I-275 and Dale Mabry Highway. Due to right-of-way costs, relocations, maximum geometry at the interchange and the excess capacity available at the adjacent interchange ramp terminals, FDOT has also requested an exception for the ramp terminals at this interchange.

HOV/Transit

Two important elements of the balanced transportation plan for Hillsborough County are HOV facilities and improved transit service. A typical HOV lane, which permits three or more person carpools, can satisfy approximately three times the travel demand of a general use freeway lane with single occupant vehicles. Likewise, bus and rail transit have much greater capacity than a single lane for automobiles. These two elements of the Master Plan and their affect on the interstate system are presented here.

HOV Lanes

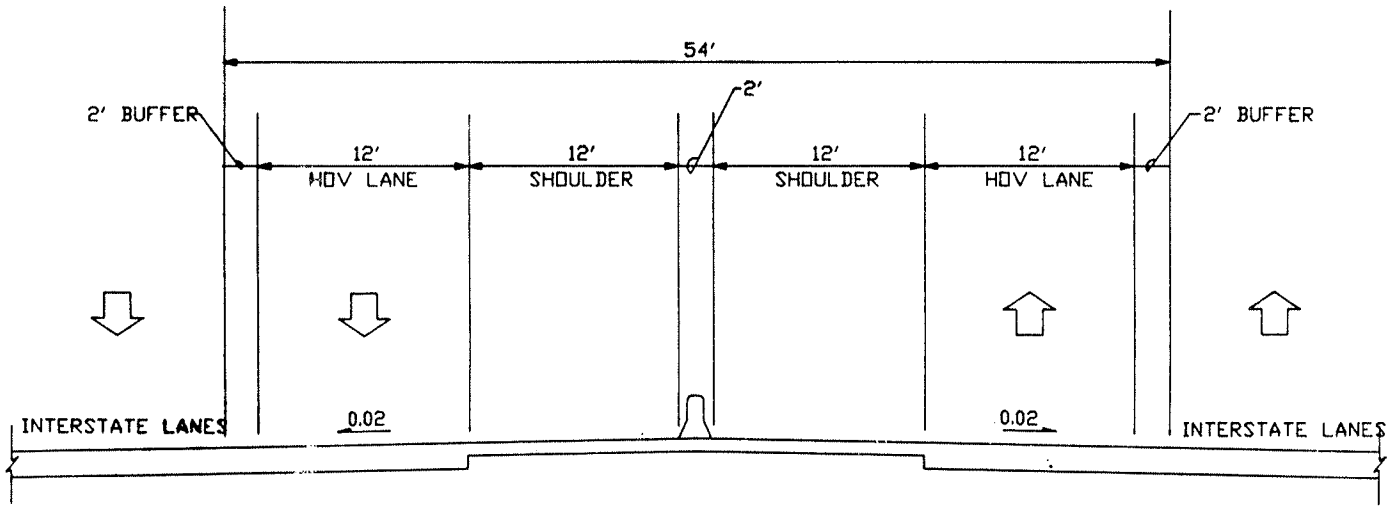
HOV facilities are incorporated into the improvement plans for I-275 and I-4. The HOV lanes, as shown on Exhibit VII-11, extend along I-275, from the Howard Frankland Bridge to the vicinity of the Livingston Avenue overpass in northern Hillsborough County, and along I-4, from I-75 to the Tampa CBD interchange with I-275. Both concurrent flow HOV lanes and exclusive HOV transitways are incorporated into the interstate Master Plan design. The basic HOV concept is concurrent flow HOV lanes, as shown in Exhibit VII-12. This concept positions the HOV lanes on the centerline of the interstate and adjacent to the general use freeway lanes. From this location, travelers have easy access to and from the HOV lanes. A two-foot buffer is used to delineate the HOV lanes from the general use lanes. A 12-foot inside shoulder is located next to the median barrier and is a wider than normal design to increase safety and for HOV enforcement personnel. This concurrent flow HOV lane concept is used throughout the interstate system except through downtown Tampa.



HOV CORRIDORS

EXHIBIT VII-11

A Florida Department of Transportation Project



CONCURRENT FLOW HOV LANES

Along I-275 and I-4 through the Tampa CBD, an HOV transitway is used to separate HOV traffic from the general interstate traffic. Through this area, three different types of HOV transitways are used. Along I-275, a one-way, one-lane HOV transitway, as shown on Exhibit VII-13, is used I-275 to provide through HOV movements. Along I-4 a two-way, two-lane HOV transitway, as shown on Exhibit VII-14, is used. Where I-275 and I-4 merge, a two-way, four-lane exclusive HOV transitway, as shown on Exhibit VII-15, is used. In the latter two types of HOV transitways, the HOV lanes are separated by a ten-foot median/buffer area, for use in emergency situations and to by-pass stalled vehicles. The general HOV plan throughout this area is illustrated on Exhibits VII-16 and VII-17. Various cross-sections presenting the HOV concepts used through this area are shown on Exhibits VII-18 and VII-19.

Priority HOV Access

Access to the HOV lanes is generally accomplished by weaving to or from the general use interstate lanes. In addition, priority HOV ramps are provided along the interstate system. These priority ramps are provided to serve nearby park-n-ride lots and to eliminate the need for carpools and buses to weave across several heavily traveled general use freeway lanes. Moreover, these priority ramps are provided to separate HOV and general use traffic flows. These priority ramps are also provided at major traffic generators and near proposed and existing park-n-ride lots. The special HOV ramps are provided at the following locations:

* Trask Street (to and from the east);
* Orient Road (to and from the west);
* Yukon Street (to and from the north and south);
* Sinclair Hills Road (to and from the south);
* Tampa Street (to and from the west); and
* Morgan Street (to and from the east and north).

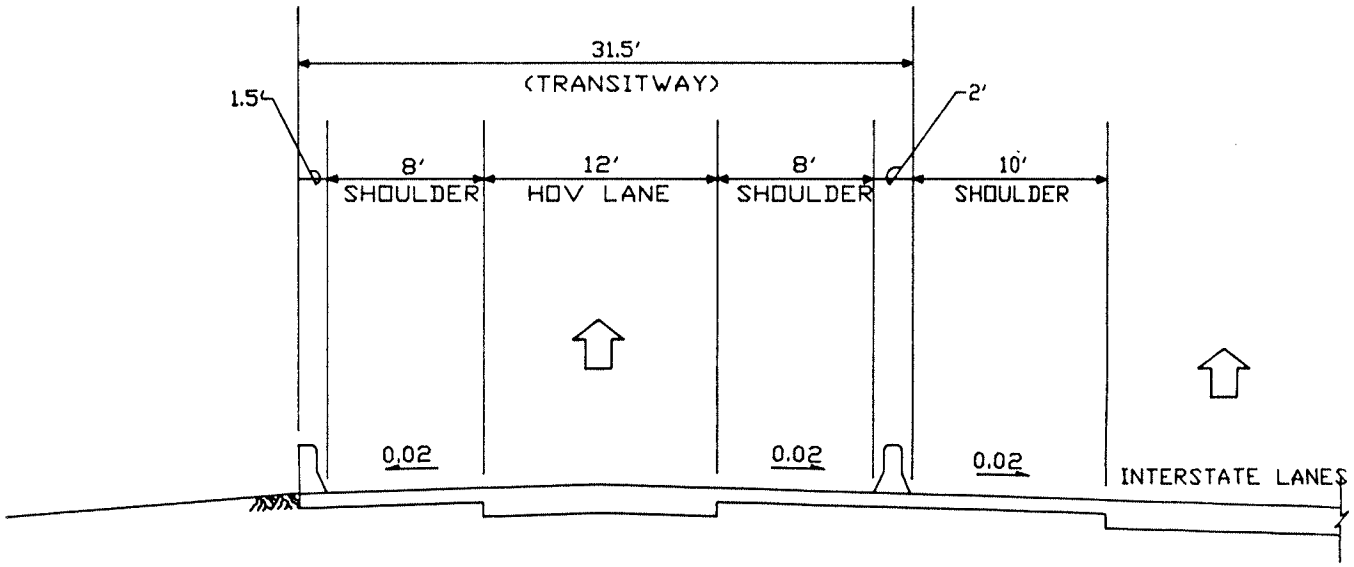
The HOV ramp concept adopted for this project is a center-drop, two-way ramp, as illustrated on Exhibits VII-20 and VII-21. A 10-foot median/refuge area is used to separate the HOV lanes. All priority ramps to and from the HOV lanes are provided through left-hand entrances and exits.

Park-n-Ride Lots

Park-n-ride lots for the formation of carpools and for express bus service are also incorporated into the design for this project. The existing and proposed park-n-ride lots along the project corridor are located in the vicinity of:

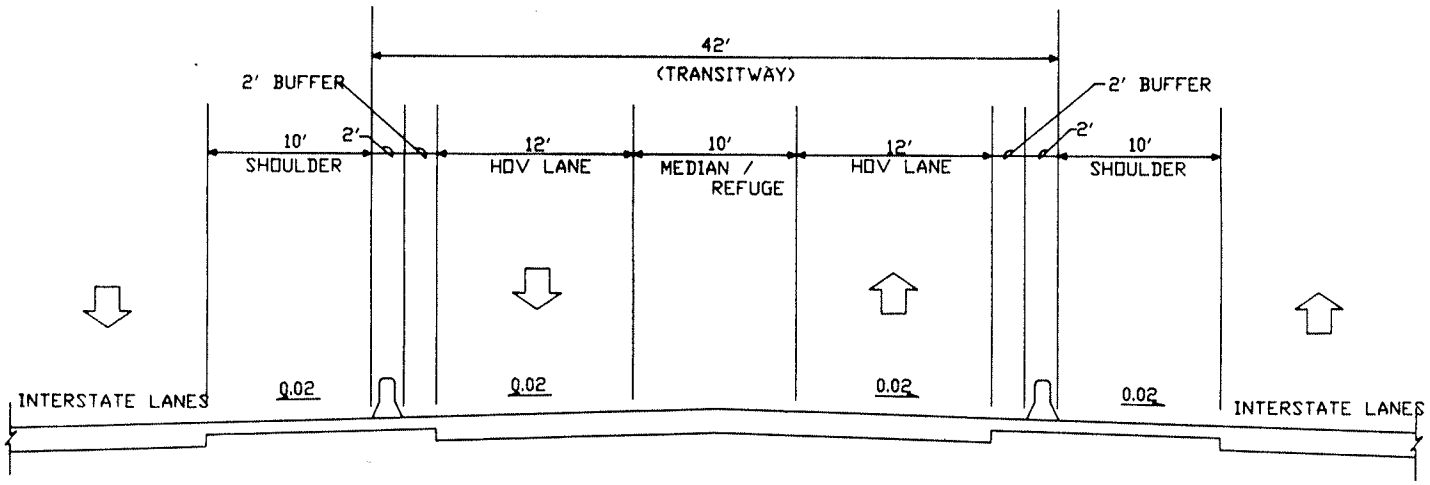
* Yukon Street;
* Sinclair Hills Road;
* Trask Street;
* Florida State Fairgrounds;
* North Tampa Parkway; and
* New S.R. 54.

The Hillsborough County park-n-ride lot at Yukon Street near I-275 is an existing facility serviced by HART's express buses. At Yukon Street, an HOV ramp is proposed in conjunction with the existing underpass of I-275 to provide access to the existing park-n-ride lot. In addition, the FDOT and HART are presently



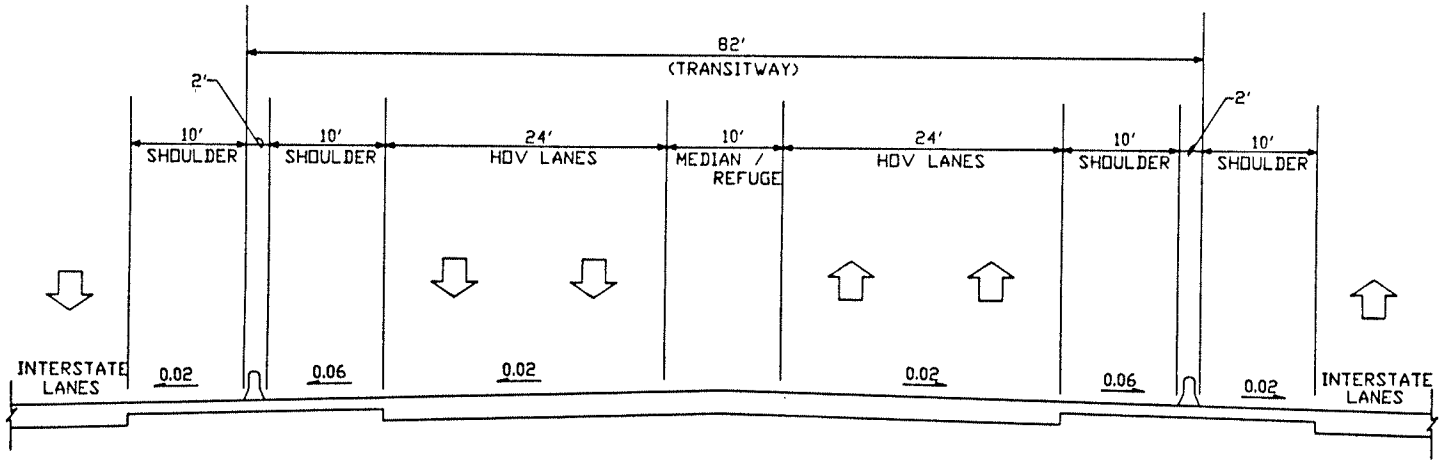
ONE-WAY, ONE-LANE HOV TRANSITWAY CBD INTERCHANGES

EXHIBIT VII-13



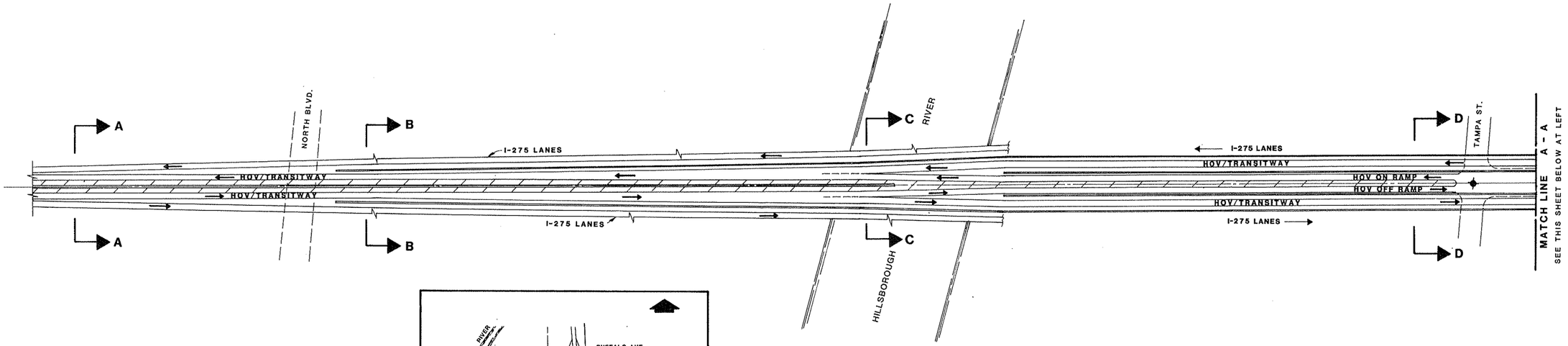
TWO-WAY, TWO-LANE HOV TRANSITWAY CBD INTERCHANGES

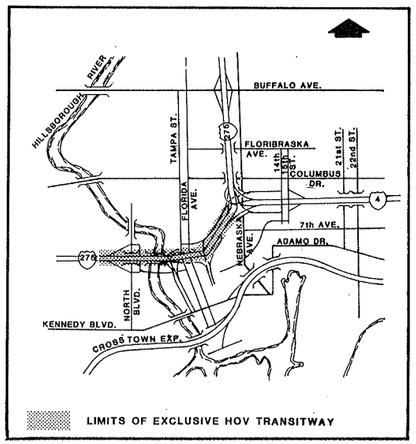
EXHIBIT VII-14

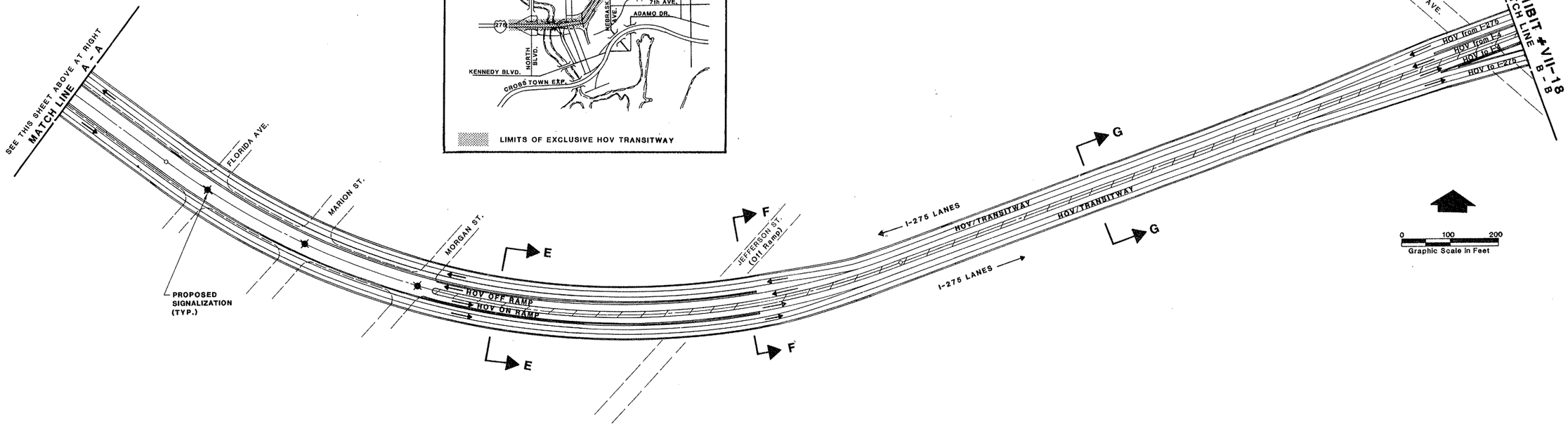


TWO-WAY, FOUR-LANE HOV TRANSITWAY CBD INTERCHANGES

EXHIBIT VII-15





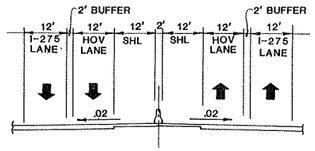


LEGEND

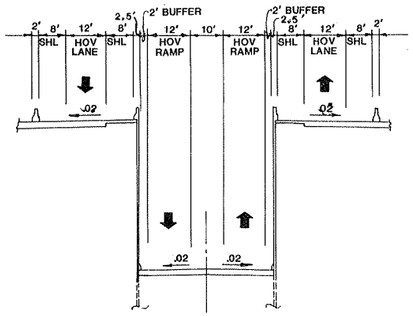
A A Transit Cross Sections
See Exhibit VII-17

HOV CONCEPT-DESIGN SEGMENT 2B
NORTH BLVD. TO PALM AVE.

EXHIBIT VII-16



SECTION A - A



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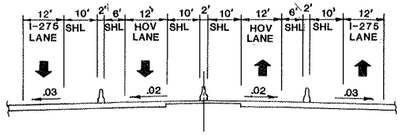
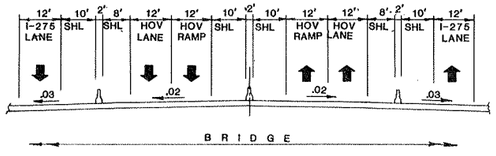
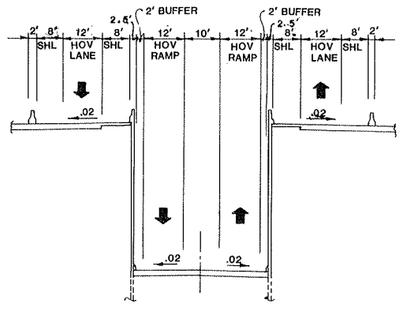


SECTION B - B



SECTION C - C



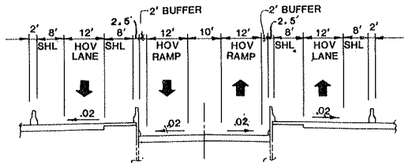
SECTION E - E

ABBREVIATIONS:

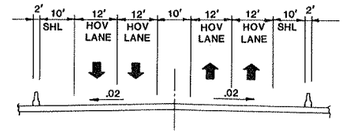
HOV : HIGH OCCUPANCY VEHICLE
SHL : SHOULDER

Horiz. 0 20 40 Graphic Scale in Feet

Vert. 0 10 20 Graphic Scale in Feet



SECTION F - F

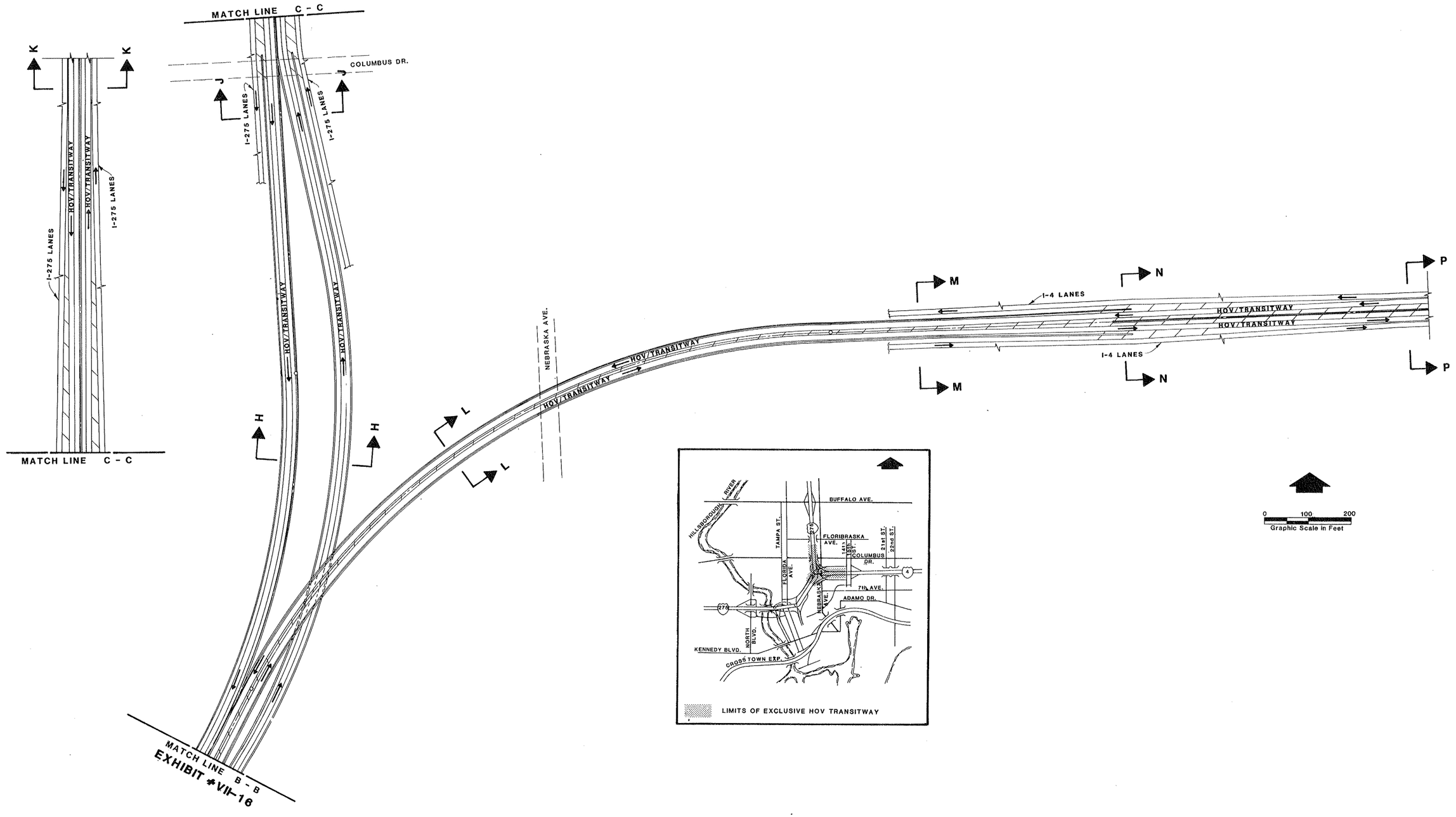


SECTION G -G

NOTE: See Exhibit VII-16 For Locations

HOV CONCEPT-DESIGN SEGMENT 2B
I-275 CROSS SECTIONS

EXHIBIT VII-17



0 100 200
Graphic Scale in Feet

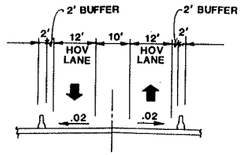
Transit Cross Sections
See Exhibit VII-16
Matchline

HOV CONCEPT-DESIGN SEGMENT 2B PALM AVE. TO FLORIBRASKA AVE. AND 14TH ST.

EXHIBIT VII-18



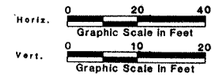
SECTION H - H

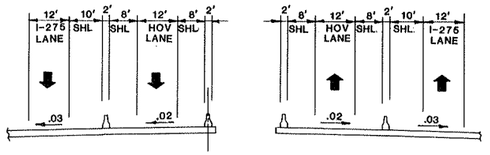


SECTION L - L

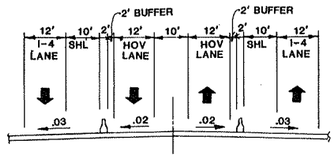
ABBREVIATIONS:

HOV : HIGH OCCUPANCY VEHICLE
SHL ; SHOULDER

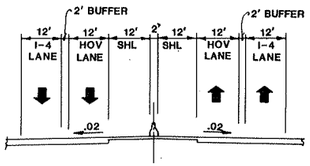




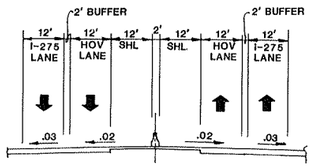
SECTION J - J



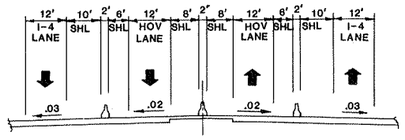
SECTION M -M



SECTION P - P



SECTION K - K

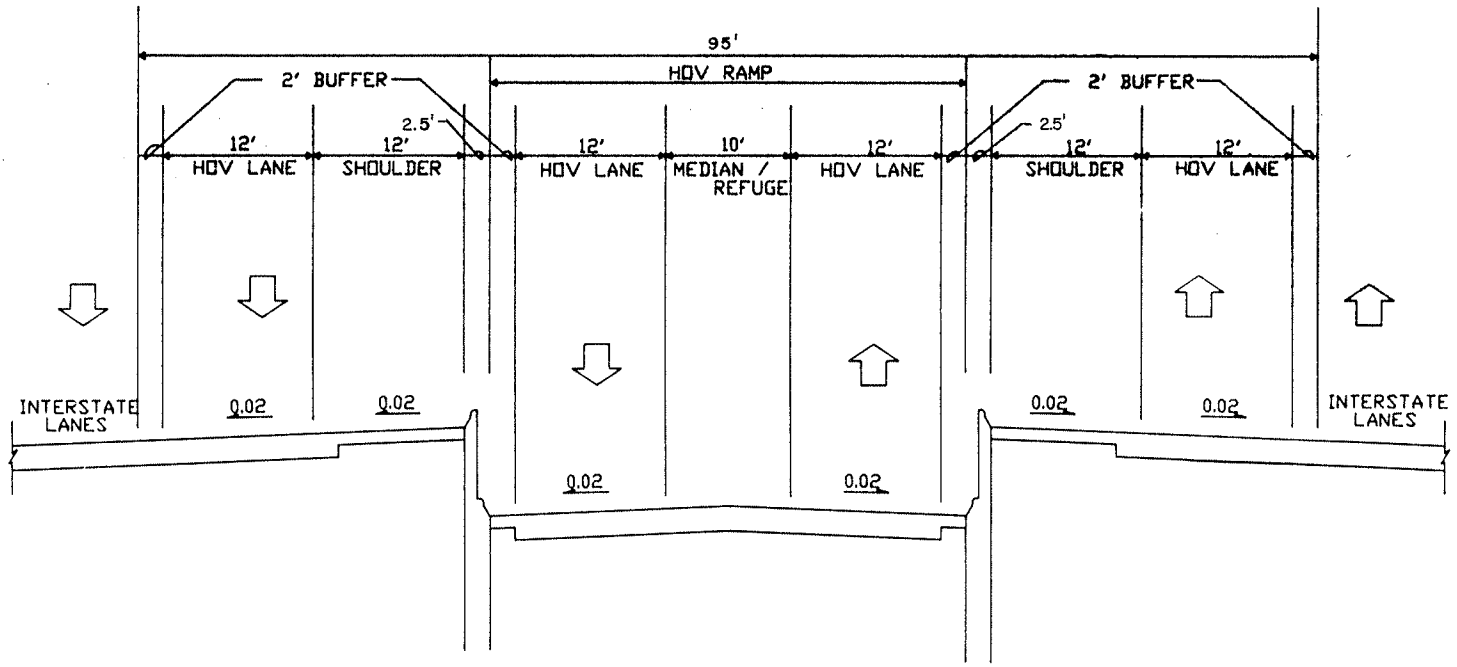


SECTION N - N

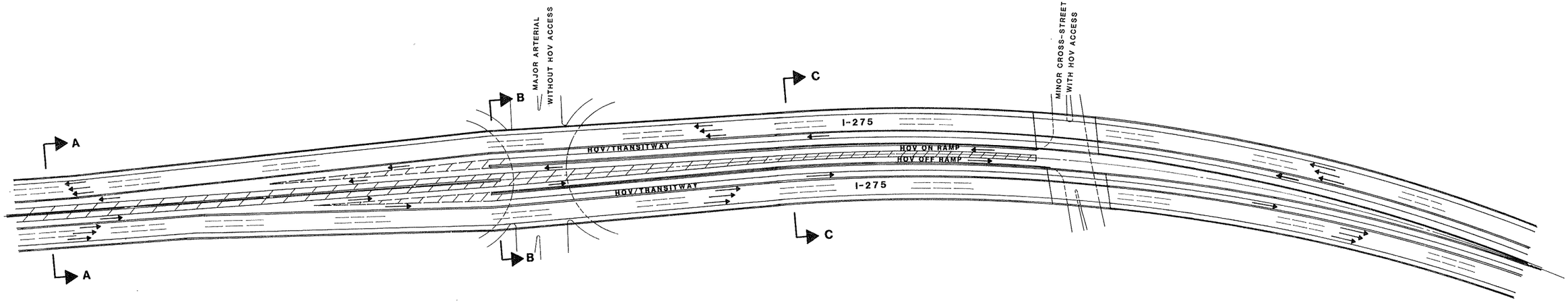
NOTE: See Exhibit VII-18 For Locations

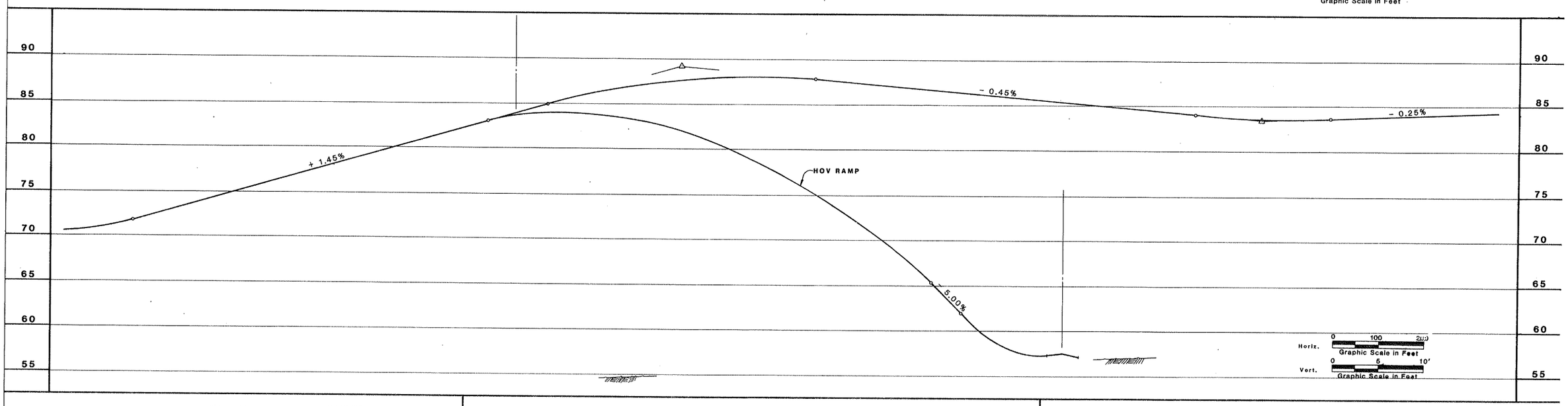
HOV CONCEPT-DESIGN SEGMENT 2B
I-275 & I-4 CROSS SECTIONS

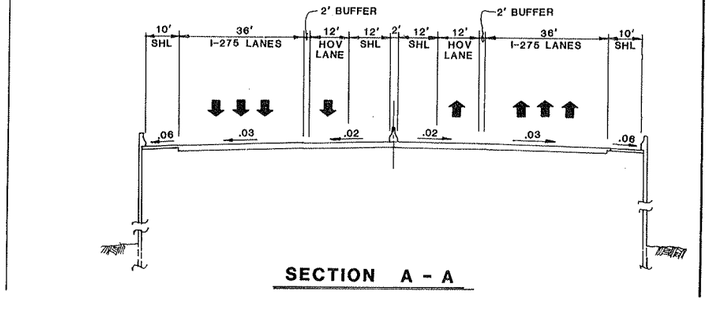
EXHIBIT VII-19



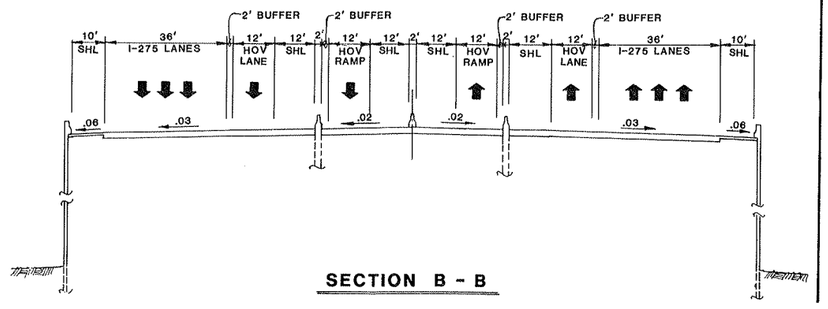
TWO-WAY, TWO-LANE HOV PRIORITY RAMP



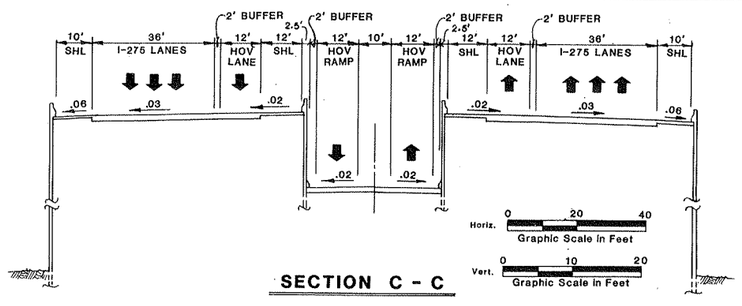




SECTION A - A



SECTION B - B



SECTION C - C

PRIORITY HOV RAMP CONCEPT

EXHIBIT VII-21

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developing a similar park-n-ride lot at Sinclair Hills Road and Florida Avenue, north of Bearss Avenue. Similarly, at Sinclair Hills Road, a new underpass is planned with an HOV ramp to provide easy access to and from the proposed park-n-ride lot.

As part of this project, a park-n-ride lot is tentatively proposed at the Florida State Fairgrounds, south of the Orient Road entrance. A conceptual plan of this site is shown on Exhibit VII-22. Direct access to the HOV lanes is provided by priority ramps to and from the west on I-4.

Additional park-n-ride lots are proposed at the North Tampa Parkway interchange with I-275 and at the New S.R. 54 interchange with I-75. A conceptual plan for these sites is also shown on Exhibit VII-22. Both of the highway facilities are proposed to serve the growing areas of north Hillsborough County and south Pasco County. Since the HOV lanes are planned to begin south of these new roadways, carpools and buses will use the proposed interchanges and travel in the general use interstate lanes of I-275 until the HOV lanes begin south of Livingston Avenue.

The Trask Street priority ramp will be utilized for access to and from the Westshore area, which has a significant demand for HOV traffic. The need for and location of a park-n-ride lot that can utilize this HOV ramp will be determined during the Phase II of the interstate reconstruction project.

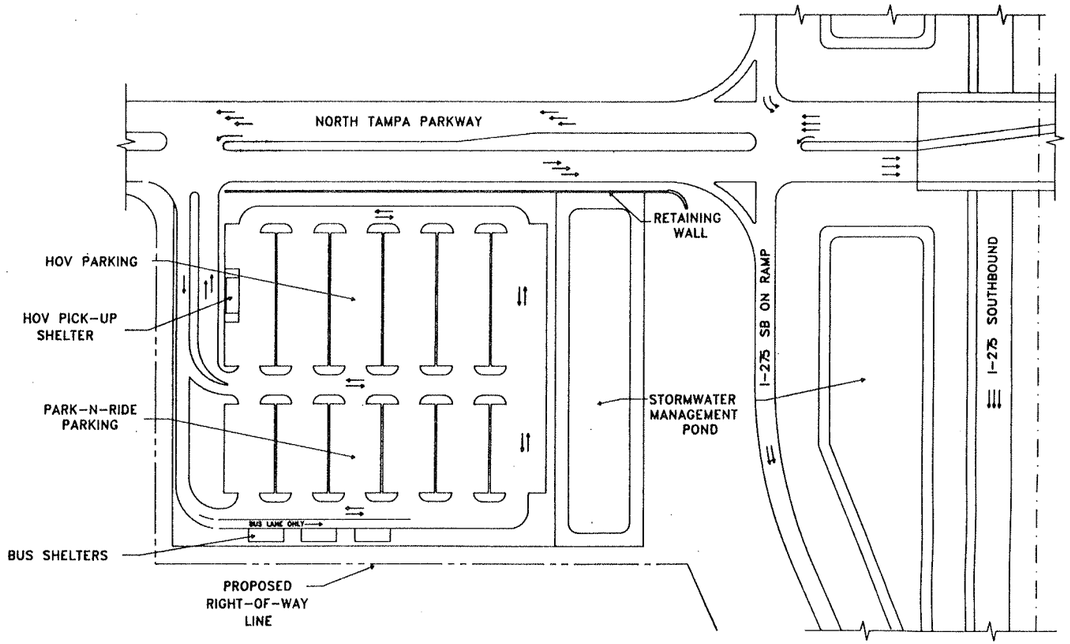
Transit

The transit elements used in the analyses of the interstate system were previously presented in the "Multi-Modal Transportation Elements" section of this Master Plan. In summary, the Tampa MPO and HART are presently investigating rail transit service in three corridors outside the I-275 and I-4 rights-of-way. The 46-mile rail system with 26 stations is expected to carry approximately 68,000 riders per day in the year 2010. A modified bus system that will serve as a feeder system for the rail transit network, which will provide express service in those corridors not served by rail transit, is also being analyzed. This 600-bus system will provide local and express bus service throughout Hillsborough County. Together, this transit system is expected to carry approximately 120,000 riders per day in the year 2010.

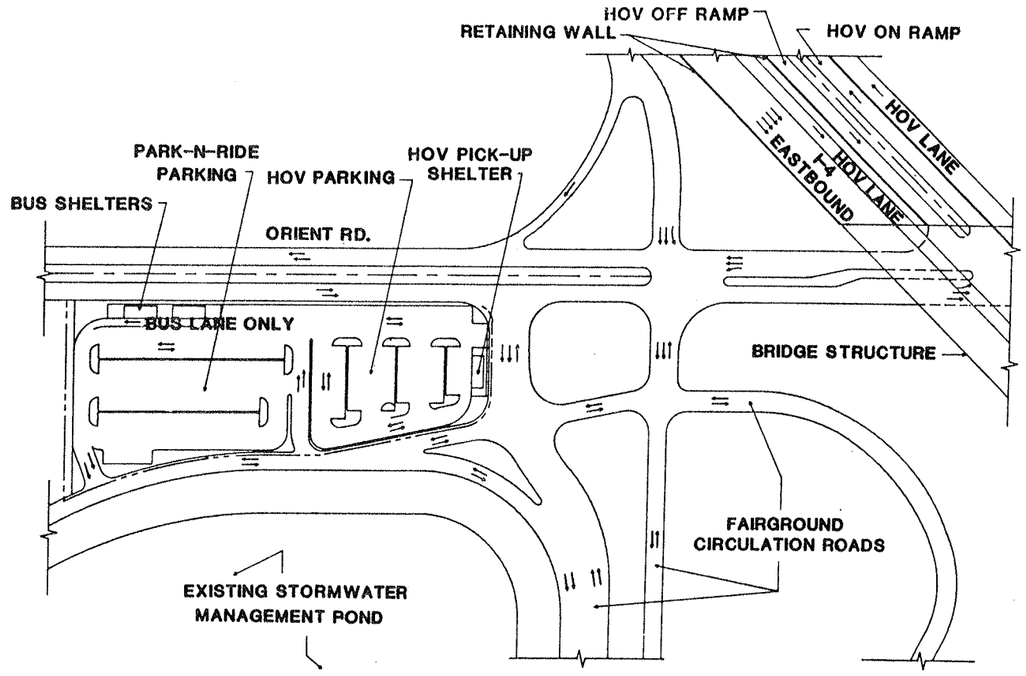
Incident Management

The proposed Traffic Management Plan for the TIS is composed of a collection of traffic management strategies that are designed to reduce traffic congestion, increase operational efficiency and improve safety. The achievement of these goals results in improved traffic flow, reduced energy consumption, improved air quality, and reduced costs to the motorists. The TIS Task F.6.f. Freeway Traffic Management Plan Technical Report, provides a complete program of traffic and incident management techniques for the Tampa interstate system. As the freeway will be designed and constructed in segments, incident management plans will be developed for each segment. These interim plans, for each segment, will be required to operate independently until the adjacent segments are constructed. The interim segment plans will be compatible with the overall Incident Management Plan so that at the completion of construction all of the segments will be operational consistent with the Incident Management Plan. The configuration and location of the proposed traffic management elements are shown on Exhibits VII-23 through VII-31.

There are two types of traffic congestion: 1) Recurring congestion, which is caused by overloading the freeways with high traffic demands that exceed the capacity of the freeway; and 2) Non-recurring congestion,



NORTH TAMPA PARKWAY LOT



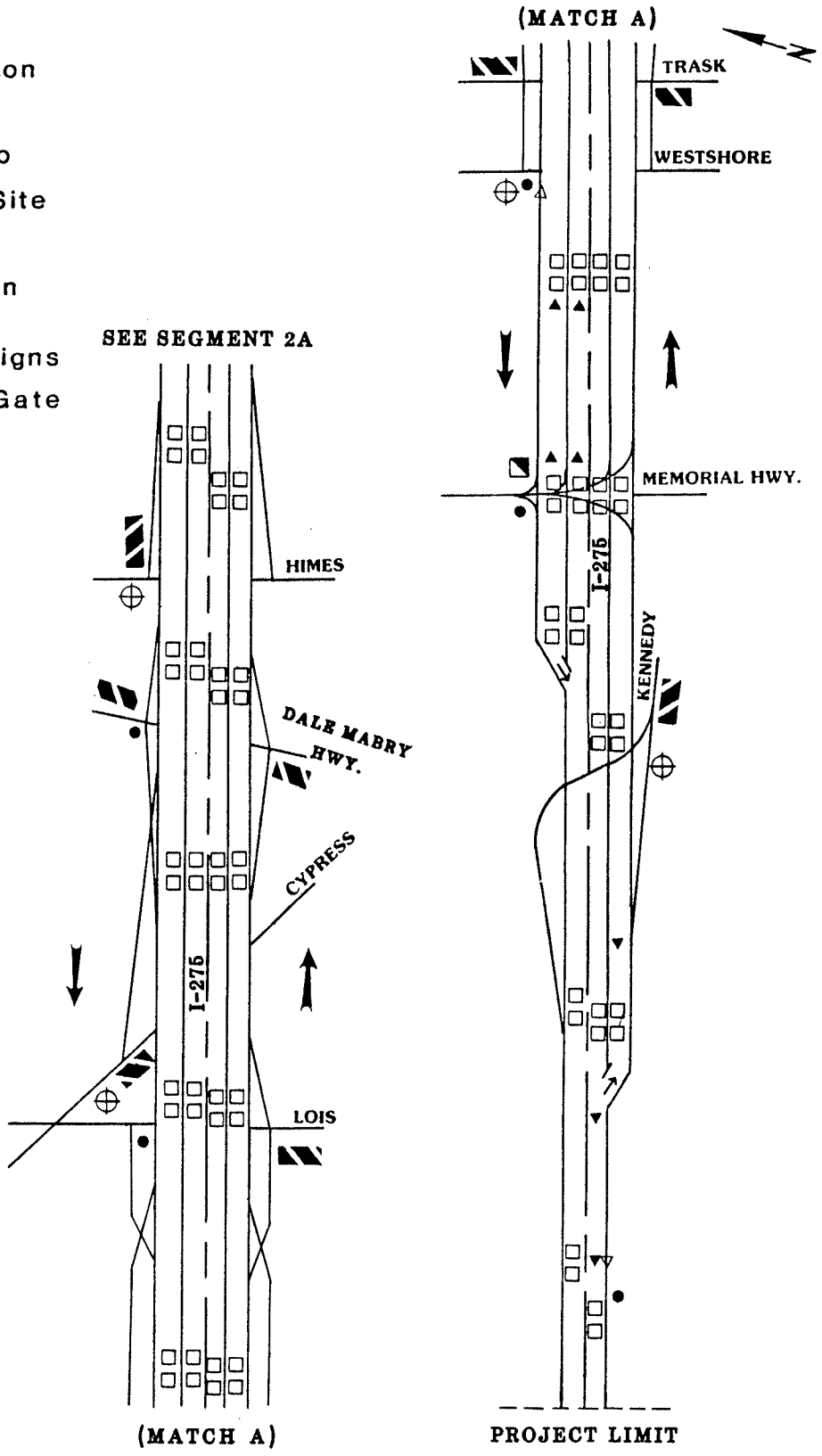
ORIENT ROAD AT FAIRGROUNDS LOT

PARK-N-RIDE LOT CONCEPTS

EXHIBIT VII-22

LEGEND

- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover



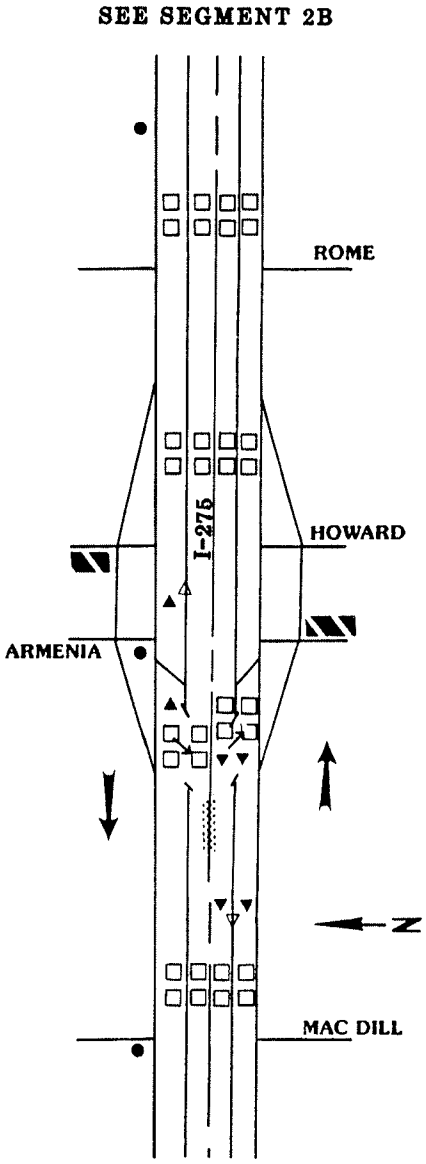
TRAFFIC MANAGEMENT PLAN
DESIGN SEGMENT 1A

A Florida Department of Transportation Project

EXHIBIT VII-23

LEGEND

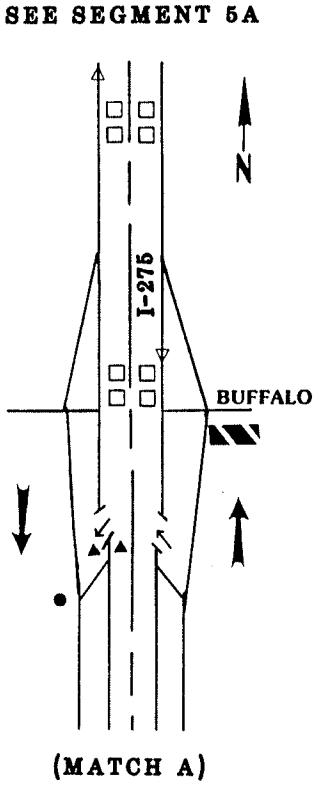
- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover

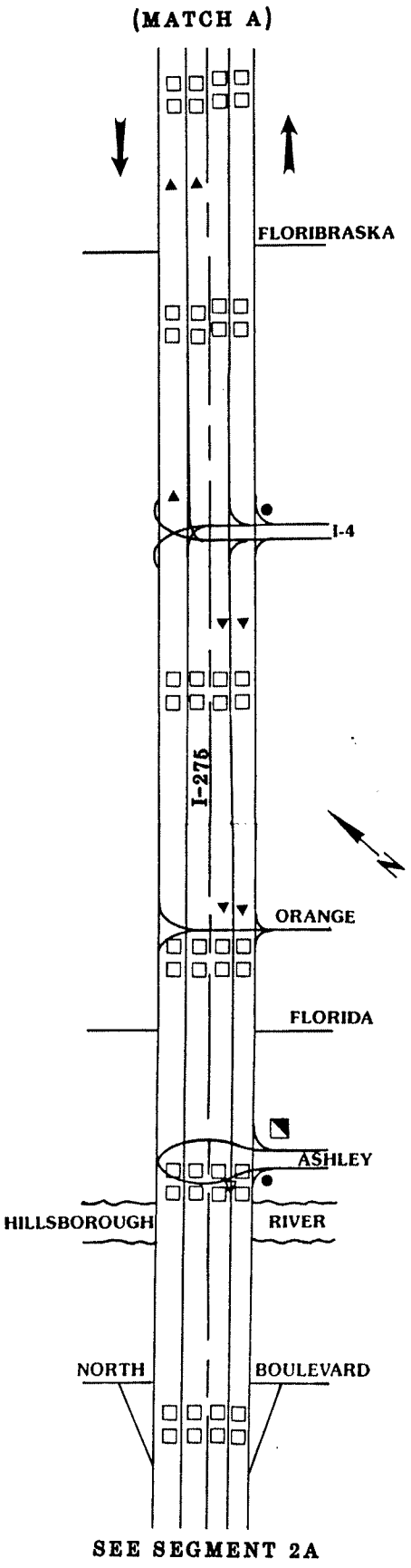


TRAFFIC MANAGEMENT PLAN
DESIGN SEGMENT 2A

LEGEND

- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover

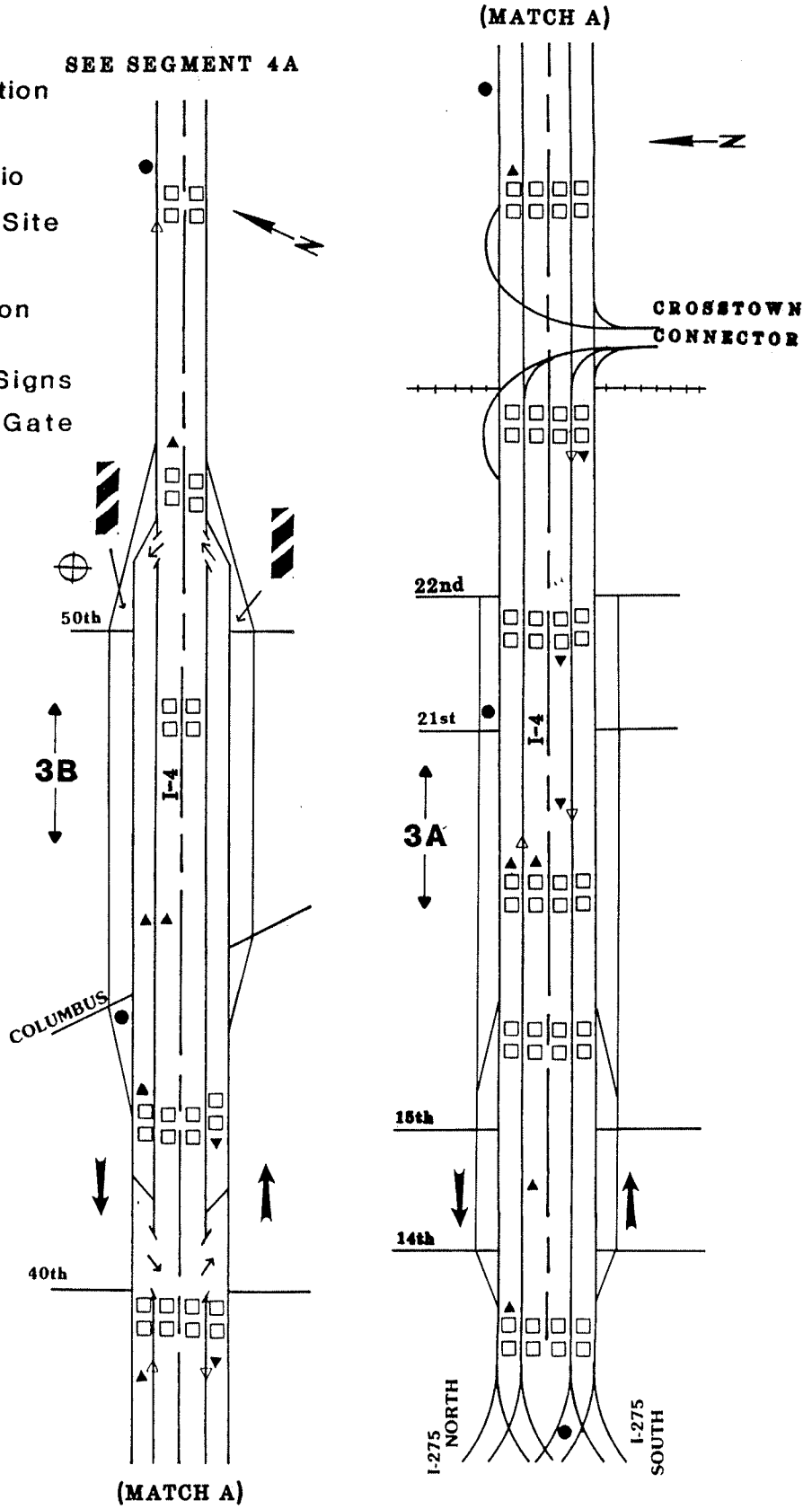




TRAFFIC MANAGEMENT PLAN
DESIGN SEGMENT 2B

LEGEND

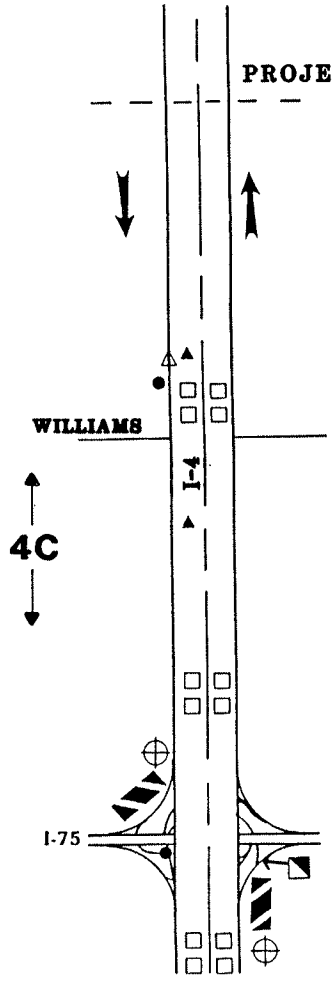
- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover



TRAFFIC MANAGEMENT PLAN
DESIGN SEGMENTS 3A & 3B

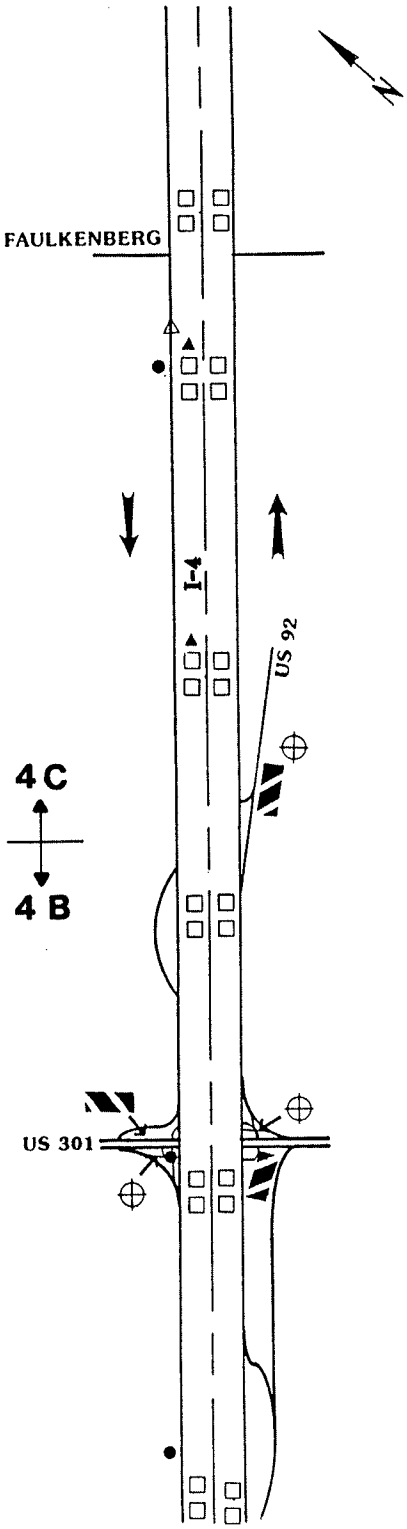
LEGEND

- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover

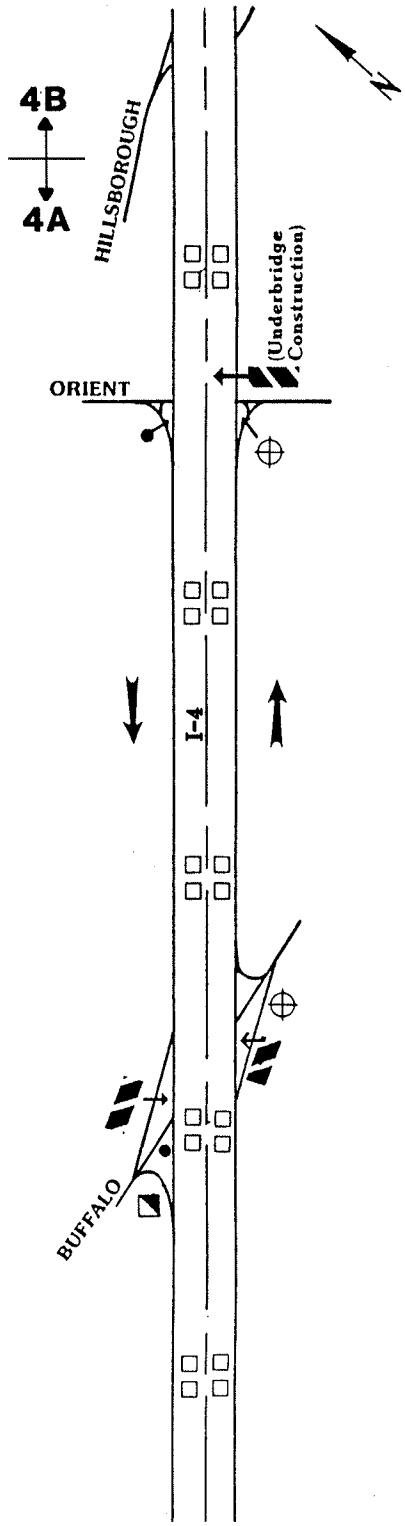


(MATCH B)

(MATCH B)



(MATCH A)

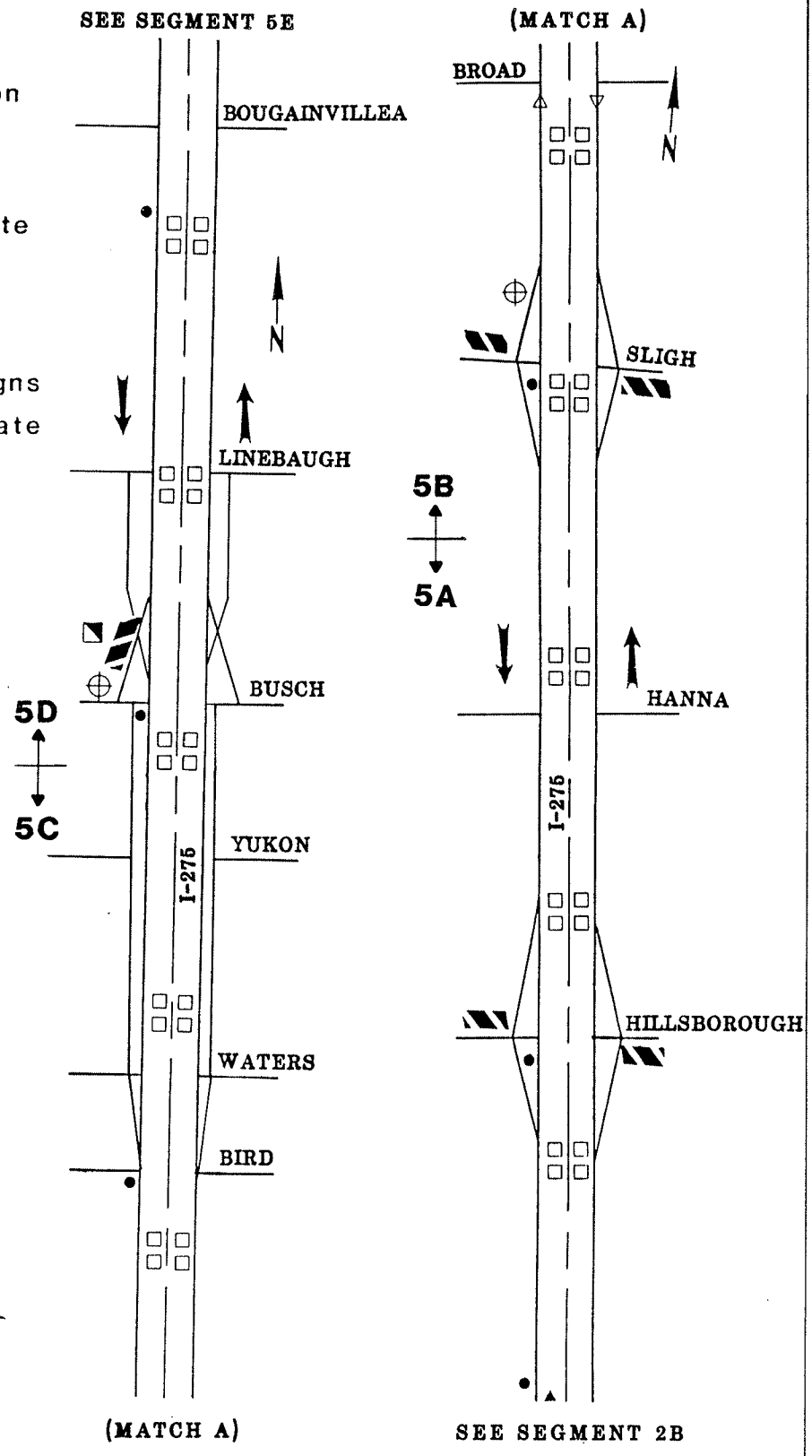


SEE SEGMENT 3B

TRAFFIC MANAGEMENT PLAN
DESIGN SEGMENTS 4A,4B & 4C

LEGEND

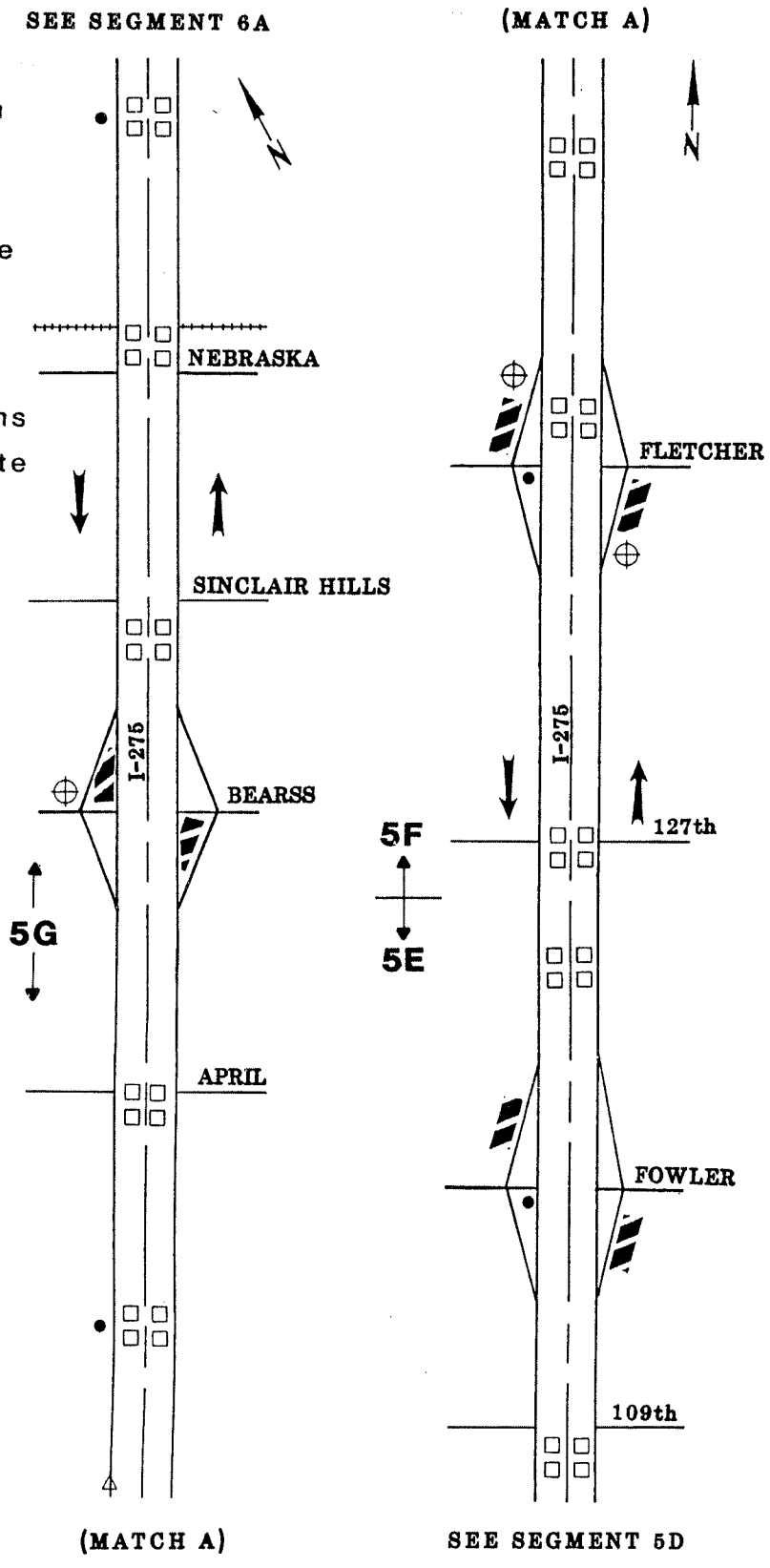
- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover



TRAFFIC MANAGEMENT PLAN
DESIGN SEGMENTS 5A,5B,5C & 5D

LEGEND

- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover



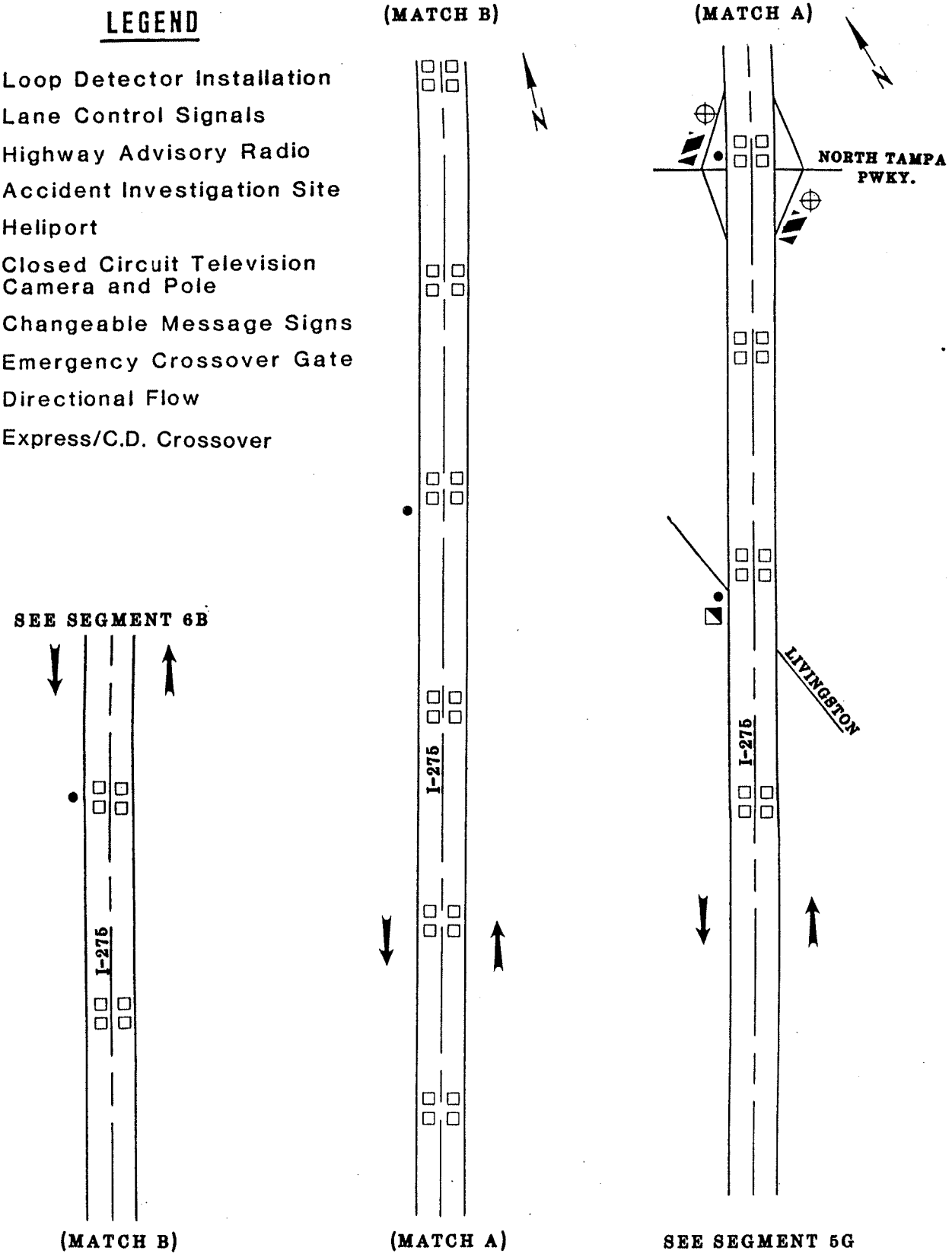
TRAFFIC MANAGEMENT PLAN
DESIGN SEGMENTS 5E,5F, & 5G

A Florida Department of Transportation Project

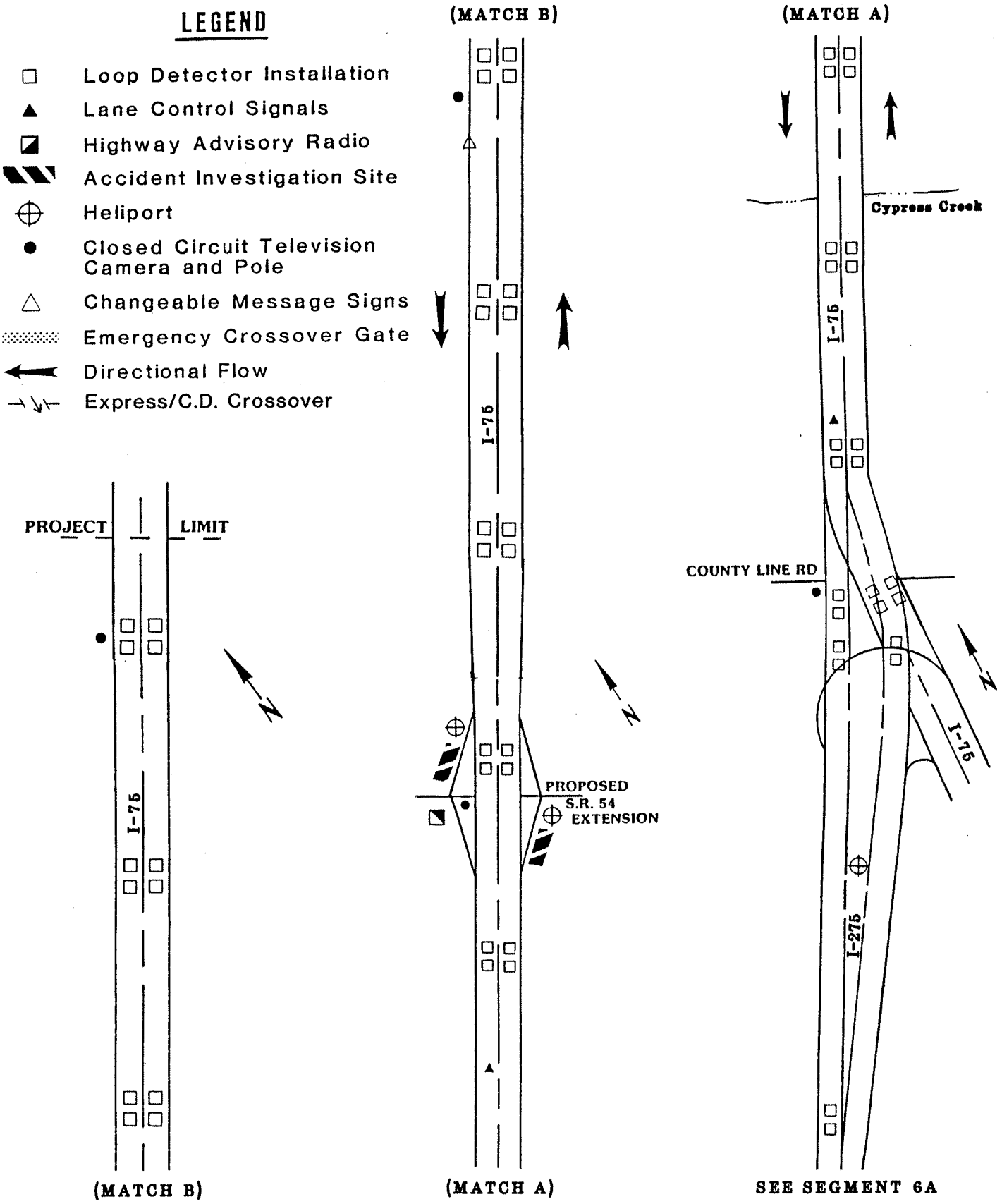
EXHIBIT VII-29

LEGEND

- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover



TRAFFIC MANAGEMENT PLAN
DESIGN SEGMENT 6A



TRAFFIC MANAGEMENT PLAN
DESIGN SEGMENT 6B

which is caused by a reduction in the capacity of the freeway when an incident, such as a traffic accident or disabled vehicle, occurs on the roadway.

Recurring congestion develops during specific times of the morning and afternoon peak periods with predictable patterns, while non-recurring congestion develops randomly as a consequence of the occurrence of incidents. The location and severity of an incident, and the volume of the traffic at the time of an incident, greatly affects the development of non-recurring congestion. It is estimated that incident-related congestion constitutes more than half of the total congestion in an urban area. An FHWA study estimates that, by the year 2005, the cost of congestion to the users of the Tampa interstate system will be $170 million per year.

The proposed Tampa interstate Traffic Management Plan consists of the following major elements:

* traffic surveillance;
* motorist information;
* traffic control; and
* incident management.

Traffic surveillance is accomplished in two ways: electronically, through an extensive system of vehicle detectors in the roadway monitored by a computer system; visually, by a closed circuit television system monitored by traffic operators.

Motorist information is a two-way communication system. Data collected from the surveillance systems is processed at a central facility. Information on traffic and roadway conditions, special travel advisories, and traffic controls are transmitted to the motorists in various ways. For the Tampa area, two major communication techniques are proposed:

* Changeable Message Signs that can display a number of different messages will be positioned at critical locations along the interstate system.
* Highway Advisory Radio that uses a low-powered broadcast signal on a frequency that can be received by motorists on their car radio. This type of radio system is now being used in the Tampa area on 1610 AM for information concerning Tampa International Airport.

Traffic control is applied to urban freeways to adjust traffic demands to roadway capacities. The Changeable Message Signs will advise motorists of controls that are in effect and Lane Control Signals will be used to close freeway ramps, connections or roadways. These controls will be used in response to incidents that block the lanes of the freeway. Another control technique is ramp metering that regulates the number of vehicles that enter freeways. This technique, which addresses the recurring congestion problem, could be applied during peak periods when traffic conditions warrant.

Incident management will be addressed in three major areas:

* detection and location;
* response; and
* clearance.

Detection and location of incidents will be accomplished by a combination of systems and strategies that are proposed for the Tampa interstate system:

* An electronic detection system to indicate locations of traffic disruptions;
* Video surveillance to verify the location, type, and severity of the incident;
* Freeway patrol vehicles to serve in the detection as well as the response procedures; and
* Roadside emergency telephone systems to request assistance and to report other incidents.

Rapid response to incidents means a quick return of the freeway to normal conditions. Freeway service patrols and stationary tow trucks will be available to be dispatched as soon as the detection and location of the incident is verified.

The clearance of the roadway will depend on the nature of the incident. For most situations, disabled vehicles and minor accidents can be cleared quickly by the first emergency vehicle to arrive. The vehicles involved in an incident will be moved to special parking areas called "Accident Investigation Sites" that will be provided at locations out of sight of the freeway traffic.

For major incidents, special traffic control plans for diverting traffic away from the scene will be activated by the Motorist Information and Traffic Control Systems. Heliports will be located along the interstate for Life Flight operations. A major incident response team will assist in the implementation of traffic diversion plans and will operate emergency access gates provided at critical locations along the interstate system.

The implementation and operation of the recommended Traffic Management Plan in a coordinated manner requires: 1) a data communications system; and 2) a central commuter control facility. A state-owned communication system of twisted wire pairs and coaxial or fiber optic cable placed in the right-of-way of the interstate is proposed. A Traffic Management Center for housing the computers, video monitors, and traffic controls, as well as a roadside emergency telephone dispatching system, is proposed for early implementation.

The total cost of the electronic installations and the Traffic Management Center is estimated to be $12 million in 1988 dollars. An estimated annual cost of $3.4 million will be required to operate the systems and to provide incident response capability. Based on the assumptions of the cost of traffic congestion for the year 2005, the proposed traffic management systems are expected to produce benefits that yield a benefit-cost ratio of 12.5 to 1.

Maintenance Of Traffic

Detailed maintenance of traffic and construction sequencing plans will be developed for each construction project in conjunction with preliminary and final plans preparation. These plans will be responsive to the unique features of each project including diversions, detours, temporary signing, striping, etc. In order to assure consistency in maintaining traffic along the entire interstate system during its reconstruction, the following general policies should be used in developing the final maintenance of traffic plans: 1) the number of existing lanes presently operating on the interstate will not be reduced during reconstruction; 2) local streets will not be used to maintain traffic; and 3) motorists will be encouraged to carpool and utilitize transit facilities during reconstruction. Interstate reconstruction priorities by design segment are shown on Exhibit I-14. Although detailed maintenance of traffic plans are not part of this Master Plan, they will be prepared during final plans preparation. The Master Plan Concept has been evaluated sufficiently to assure the concepts presented are constructable, while maintaining traffic on the facility and the various crossroads within the FDOT and FHWA guidelines and criteria. The periodic geometric evaluations during the three tiers of concept development have caused numerous refinements that are reflected in the Master Plan Concept.

For the segments on I-275 north of Bearss Avenue (Design Segments 6A and 6B) and on I-4 east of U.S. 301 (Design Segment 4C) where the proposed improvement is primarily lane additions to the existing two-roadway interstate (without significant change in grade), traffic can be diverted slightly to the outside or inside of the existing facility, using temporary barriers to separate the traveling public and the construction operation. Upon completion of new lane construction, the barriers are removed and resurfacing of the original pavement

and final striping is completed under traffic using traffic cones, barricades, and flashing arrow boards for traffic control. Exhibit VII-32 provides a schematic representation of this lane addition construction sequence on a two-roadway interstate.

Those portions of I-275 from north of Buffalo Avenue to north of Bearss Avenue (Design Segments 5A-5G), and I-4 from west of 50th Street to west of U.S. 301 (Design Segments 4A and 4B), involve not only lane additions, but also require significant changes in the roadway grade in order to provide improved highway geometry. This improved geometry will meet current standards, and improve crossroad horizontal and vertical clearance. These improvements will require complex sequencing plans, shifting traffic left and right along the facility, as depicted in Exhibit VII-33. The requirement to maintain operation of the existing number of interstate lanes in the peak direction (except in off-peak direction) and to provide access between the interstate and the various crossroads while rebuilding the interchanges on these portions of I-275 and I-4 is one of the more difficult aspects of this project.

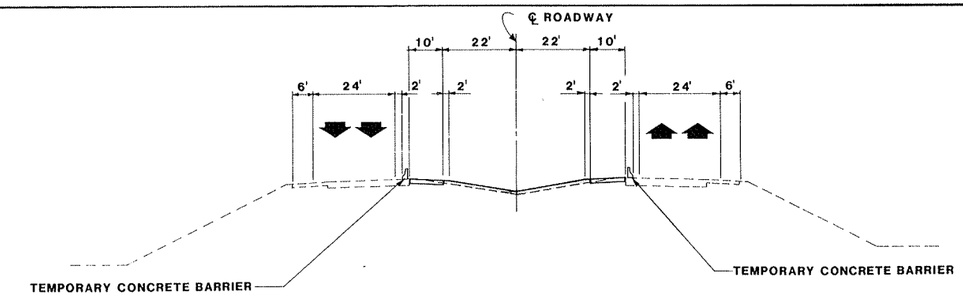
The remainder of the Tampa interstate, from the Howard Frankland Bridge to north of Buffalo Avenue on I-275 (Design Segments 1A, 2A and 2B) and from the Downtown CBD interchange to west of 50th Street on I-4 (Design Segments 3A and 3B), are proposed to be reconstructed as a four-roadway facility. These four-roadway segments include major interchanges with the Northwest Hillsborough Expressway and I-275 in the Westshore area (Segment 1A) and with the proposed Crosstown Expressway Connector in the vicinity of 30th Street on I-4 (Segment 3A). Also included is the complete reconstruction of the downtown I-275/I-4 interchange in Tampa. The four-roadway system is in essence a long distance facility for I-275 or I-4 combined with a local access freeway in the same corridor. This four-roadway concept preserves the local access features of the existing facility with frequent interchanges, while preserving the integrity and capacity of the mainline interstate facility. The four-roadway concept allows the construction of the new local access freeway while maintaining traffic on the existing interstate. Upon completion of the total interstate reconstruction, all traffic diverted to the local access freeway during the reconstruction of the interstate will be transferred to their appropriate roadways. This four-roadway reconstruction sequence is depicted on Exhibit VII-34.

Project Cost Estimates

The comparative cost analysis for the Tampa Interstate Study Master Plan was conducted using FDOT's Long Range Estimates (LRE) Program, and the Master Plan design study segment plans produced for the January 1989 workshop. The FDOT, Bureau of Estimates has developed the LRE Program to be used as a tool in estimating construction costs on projects such as the Tampa Interstate Study. The system is flexible and can be used to produce an estimate for virtually any roadway construction project.

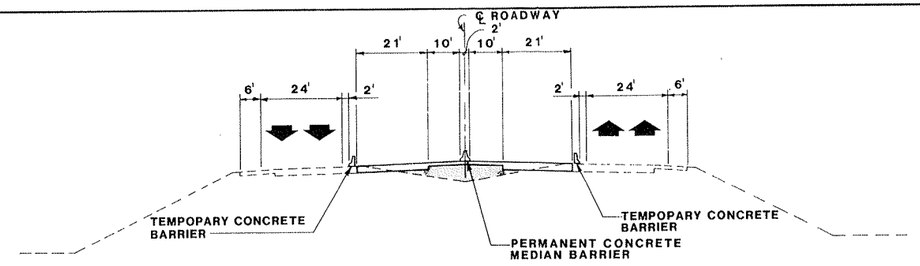
The LRE is a computerized program that generates items, quantities and unit prices for new construction, resurfacing and widening projects. The LRE concept involves a series of typical cross-section models. Basically, the typical section for each design study segment is described in as complete detail as is known at the time of coding. This involves making selections from eight typicals available in the program. Each of these typical sections were altered at the option of the estimator to generate quantities and costs for each segment.

The variables on these sections included length and width of both shoulders and roadway, surface thickness, as well as base, stabilization and friction course. Sod, curbing, sidewalks, signing, lighting and signalization was also incorporated into the program to provide a more complete representation of the costs for the project at today's prices.



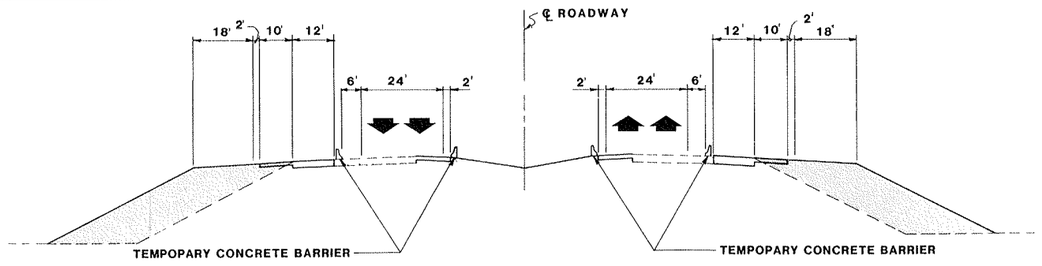
- SHIFT TRAFFIC TO OUTSIDE UTILIZING EXISTING PAVED SHOULDER.
- PLACE TEMPORARY CONCRETE BARRIER AT THE INSIDE EDGE OF EXISTING ROADWAY PAVEMENT.
- REGRADE MEDIAN AND CONSTRUCT PROPOSED MEDIAN PAVED SHOULDERS.

PHASE I



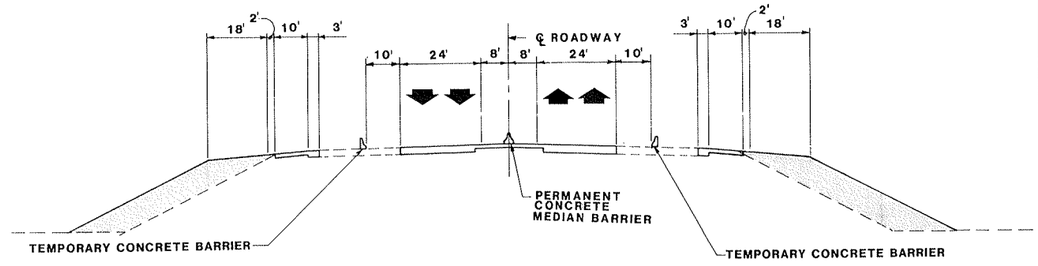
- SHIFT TRAFFIC TO OUTSIDE UTILIZING EXISTING PAVED SHOULDER.
- PLACE TEMPORARY CONCRETE BARRIER AT THE INSIDE EDGE OF EXISTING ROADWAY PAVEMENT.
- REGRADE MEDIAN AND CONSTRUCT PROPOSED PAVED SHOULDERS ROADWAY LANES AND PERMANENT CONCRETE MEDIAN BARRIER.

PHASE I



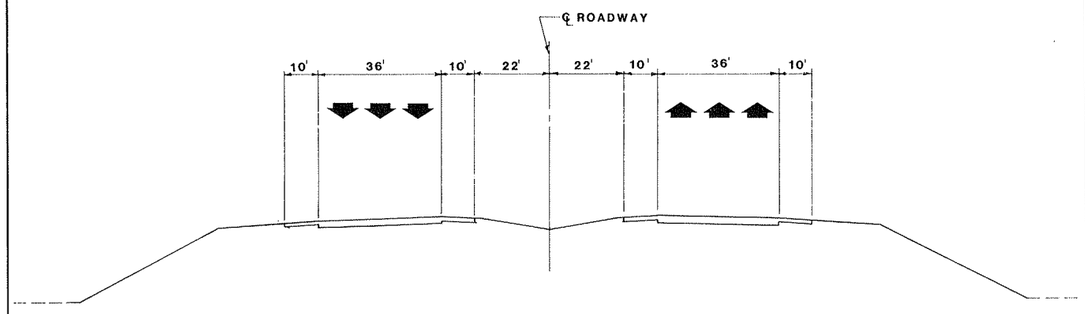
- SHIFT TRAFFIC TO THE INSIDE UTILIZING NEWLY CONSTRUCTED PAVED SHOULDER.
- PLACE TEMPORARY CONCRETE BARRIER AT THE OUTSIDE EDGE OF EXISTING ROADWAY PAVEMENT.
- CONSTRUCT EMBANKMENT AND THE PROPOSED ADDITIONAL ROADWAY LANE AND PAVED SHOULDER.

PHASE II



- SHIFT TRAFFIC TO THE INSIDE UTILIZING NEWLY CONSTRUCTED ROADWAY PAVEMENT AND SHOULDER.
- PLACE TEMPORARY CONCRETE BARRIER AT THE LOCATION SHOWN TO PROVIDE FOR 2 LANES PLUS SHOULDER.
- CONSTRUCT EMBANKMENT AND THE PROPOSED ADDITIONAL ROADWAY LANE AND PAVED SHOULDER.

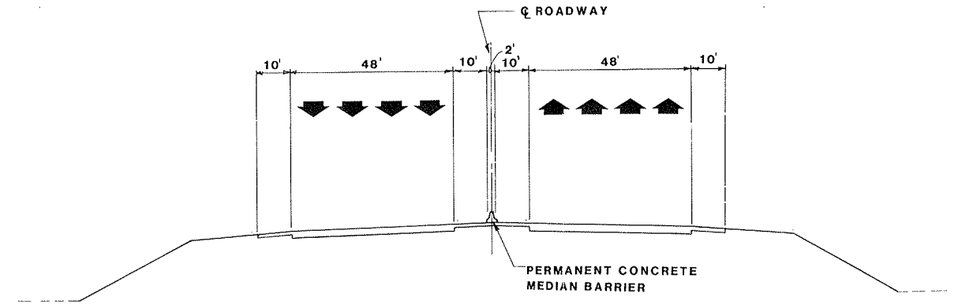
PHASE II



- REMOVE TEMPORARY CONCRETE BARRIERS.
- PLACE TRAFFIC IN FINAL LOCATION.
- RESURFACING AND FINAL WEARING COURSE CAN BE PLACED BY SHIFTING TRAFFIC LANE TO LANE.

COMPLETED SECTION PHASE III

2 ROADWAY SYSTEM-CONVERSION FROM FOUR LANES TO SIX LANES



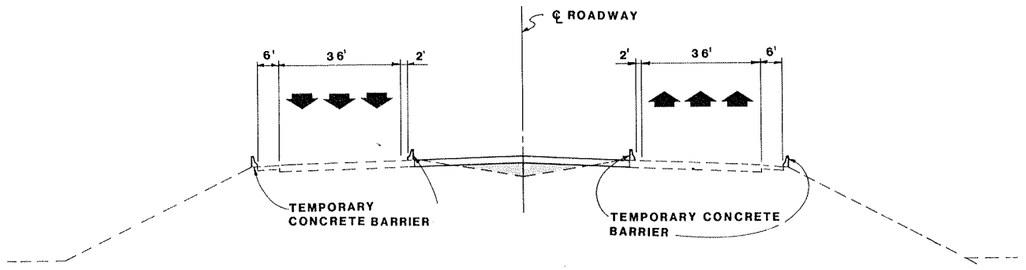
- REMOVE TEMPORARY CONCRETE BARRIERS
- OPEN ALL LANES TO TRAFFIC.
- RESURFACING AND FINAL WEARING COURSE CAN BE PLACED BY SHIFTING TRAFFIC LANE TO LANE.

COMPLETED SECTION PHASE III

2 ROADWAY SYSTEM-CONVERSION FROM FOUR LANES TO EIGHT LANES

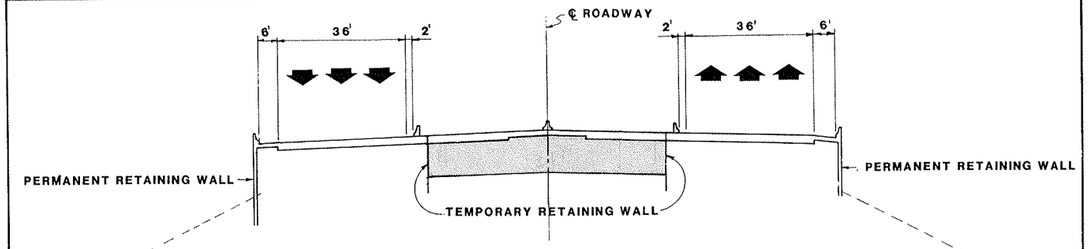
TWO-ROADWAY LANE ADDITIONS

EXHIBIT VII-32



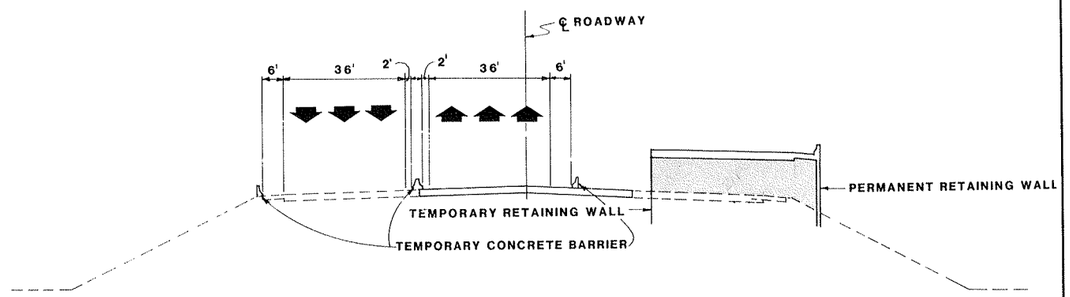
- PLACE TEMPORARY CONCRETE BARRIERS
- SHIFT TRAFFIC TO THE OUTSIDE UTILIZING EXISTING SHOULDERS
- CONSTRUCT TEMPORARY PAVEMENT IN MEDIAN

PHASE I



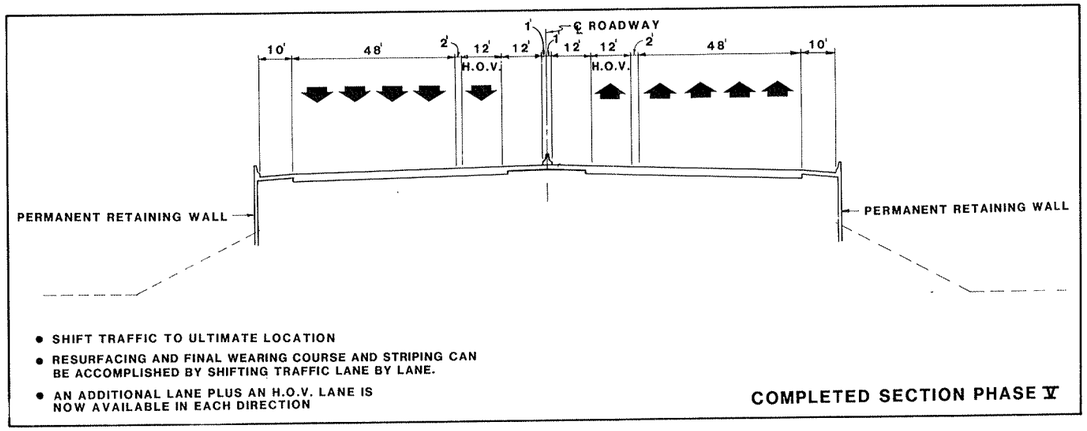
- SHIFT WESTBOUND TRAFFIC ONTO THE NEWLY CONSTRUCTED PORTION OF WESTBOUND ROADWAY.
- CONSTRUCT MEDIAN EMBANKMENT AND ROADWAY PAVEMENT.

PHASE IV



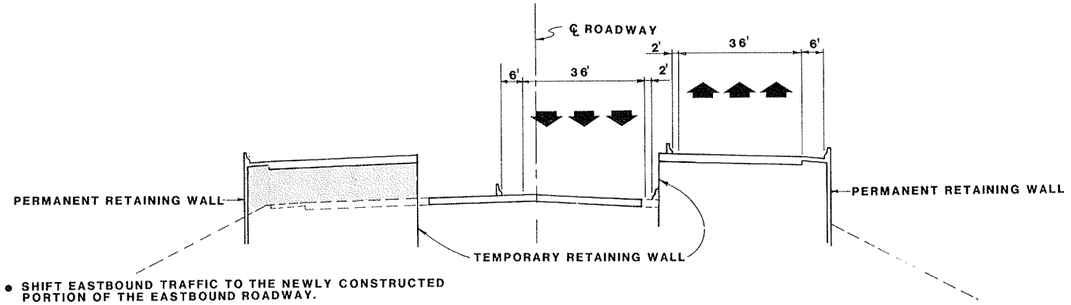
- SHIFT EASTBOUND TRAFFIC ONTO TEMPORARY PAVEMENT IN MEDIAN
- CONSTRUCT RETAINING WALL AND A PORTION OF EASTBOUND EMBANKMENT AND ROADWAY PAVEMENT

PHASE II



- SHIFT TRAFFIC TO ULTIMATE LOCATION
- RESURFACING AND FINAL WEARING COURSE AND STRIPING CAN BE ACCOMPLISHED BY SHIFTING TRAFFIC LANE BY LANE.
- AN ADDITIONAL LANE PLUS AN H.O.V. LANE IS NOW AVAILABLE IN EACH DIRECTION

COMPLETED SECTION PHASE V



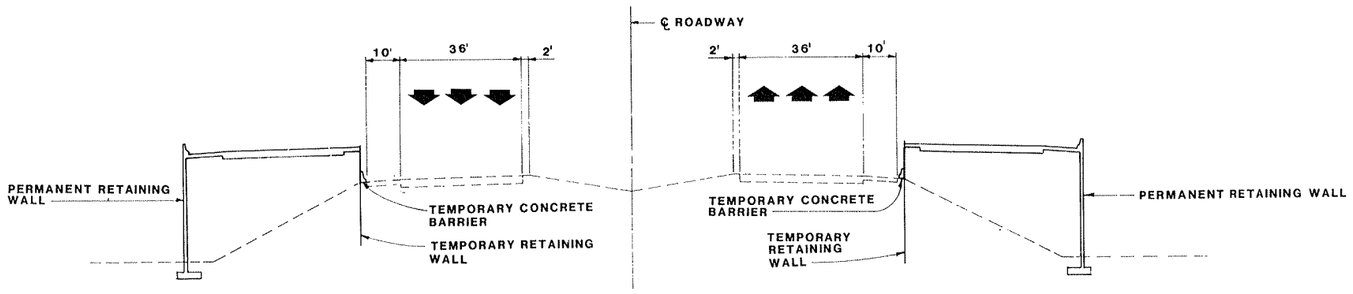
- SHIFT EASTBOUND TRAFFIC TO THE NEWLY CONSTRUCTED PORTION OF THE EASTBOUND ROADWAY.
- SHIFT WESTBOUND TRAFFIC TO THE TEMPORARY MEDIAN PAVEMENT.
- CONSTRUCT RETAINING WALL AND A PORTION OF WESTBOUND EMBANKMENT AND ROADWAY PAVEMENT.

PHASE III

TWO-ROADWAY LANE RECONSTRUCTION SEQUENCE

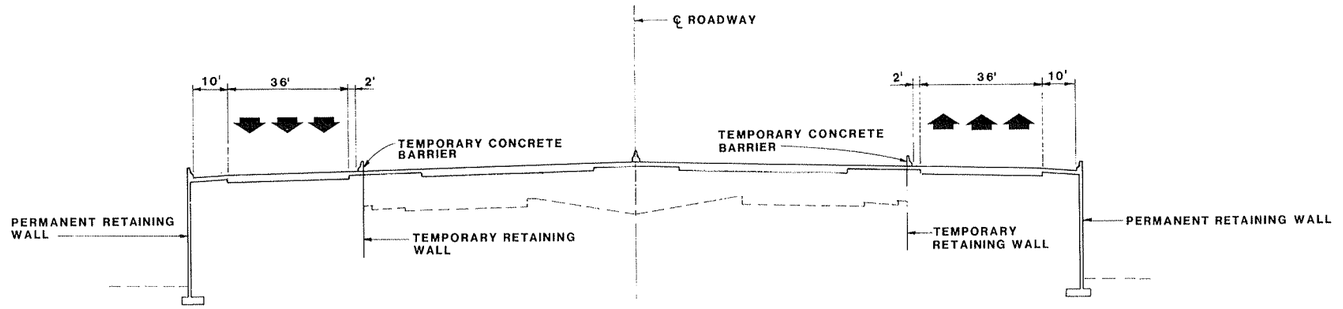
EXHIBIT VII-33

- MAINTAIN TRAFFIC IN ORIGINAL POSITION.
- PLACE TEMPORARY RETAINING WALLS ON THE OUTSIDE EDGES OF EXISTING PAVEMENT.
- PLACE TEMPORARY CONCRETE BARRIERS ON THE OUTSIDE OF EXISTING SHOULDERS.
- CONSTRUCT RETAINING WALLS, EMBANKMENTS AND A PORTION OF THE C/D ROADWAY PAVEMENTS.
- IN SOME AREAS IT MAY BECOME NECESSARY TO BUILD ONE C/D ROADWAY AT A TIME AND THEN SHIFT TRAFFIC. THE HORTIZONTAL LOCATION OF THE C/D ROADWAY SYSTEM MAY OVERLAP THE EXISTING PAVEMENT.



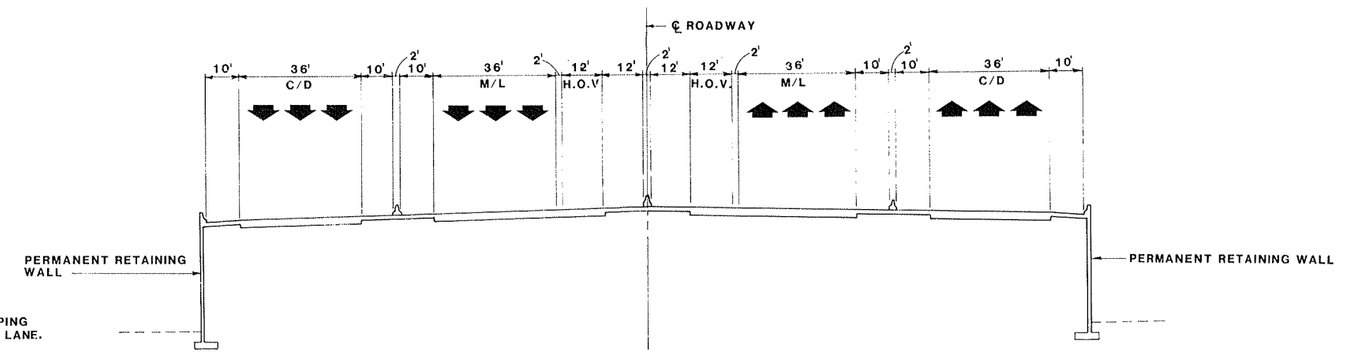
PHASE I

- PLACE TEMPORARY CONCRETE BARRIERS ON THE INSIDE EDGE OF NEWLY CONSTRUCTED C/D ROADWAY PAVEMENT.
- SHIFT TRAFFIC TO THE NEWLY CONSTRUCTED PORTIONS OF C/D ROADWAY.
- CONSTRUCT INTERIOR PORTIONS OF C/D, MAINLINE AND H.O.V. ROADWAYS.



PHASE II

- SHIFT TRAFFIC TO ULTIMATE LOCATION.
- RESURFACING AND FINAL WEARING COURSE AND STRIPING CAN BE ACCOMPLISHED BY SHIFTING TRAFFIC LANE BY LANE.
- ADDITIONAL LANES PLUS H.O.V. LANES ARE NOW AVAILABLE.



COMPLETED SECTION PHASE III

4 ROADWAY SYSTEM

FOUR-ROADWAY LANE RECONSTRUCTION SEQUENCE

EXHIBIT VII-34

In addition to the precoded variables, the LRE also has features for including items not covered under the typical sections, such as bridges, interchanges, grade separations, rest areas, scenic overlooks and transitions. Bridges, coded by length and width, allowed the LRE to generate a total bridge cost by calculating the square footage of the bridge, and multiplying by the cost-per-square-foot for the type of bridge indicated.

Using one or more of eighteen models available in the program, interchanges, grade separation, park-n-ride lots, scenic overlooks and transitions were coded under new construction cross-sections. They were coded by type and identification number, and a factor was applied to "tailor" the cost to each segment. Borrow and embankment adjustments as well as guardrail, retaining walls and barrier walls were calculated by coding "X-Pay and Ex-Pay" items for each section.

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

Each of the design study segments were entered into the system with factors and variables pertinent to that particular segment. Using a separate sequence for HOV/transitway, collector/distributor, on-off ramps, etc., the program was utilized to generate quantities and cost for comparison. The bridges were coded by type and length and width with embankment being coded into the program as an X-Pay item number on an average depth per sequence. Barrier walls, retaining walls, and noise walls were coded in as Ex-Pay items with a cost per item. All pavement items were entered into the system as heavy duty/defense highway. The construction cost estimate tabulated in Table VII-14 has been separated into proposed construction segments. Related items of work have been combined into major subdivisions as listed. Although many relatively minor incidental items have not been listed separately, the selected work items and applicable unit prices are adequate to establish a representative cost estimate. All estimated construction costs have been prepared based on 1989/90 dollars.

A summary sheet for each segment alternative was generated to simplify the cost for roadway and bridges, adding contingency, engineering, legal and administrative percentages. An amount equal to approximately 13.0 percent of the estimated construction cost has been included to provide funds to meet unpredictable situations that may be expected to occur during the design and construction phases. An amount equal to approximately 4.5 percent of the estimated construction cost has been added for engineering and an amount equal to approximately 4.0 percent of the total construction cost and the right-of-way cost has been added for legal and administrative cost. Utility relocation is not a part of the cost estimate. The cost of the utility relocation is the responsibility of the utility affected. Detailed utility relocation cost will be developed as a part of the Phase II efforts.

TABLE VII-14

MASTER PLAN
ESTIMATED RIGHT-OF-WAY AND CONSTRUCTION COSTS
Tampa Interstate Study
($000's)

Design Segment	Roadway	Bridges	Bridge Demolition	Engineering[1]	CEI	Change Order[2] Contingency	Legal And[3] Administrative	Design[4] Contingency	Sub-Total	Right-of-Way	Relocation	Total
1A	$87,708	$105,526	$3,116	$8,836	$7,854	$8,522	$8,862	$20,738	$251,162	$34,980	$3,150	$289,292
2A	$50,413	$14,207	$836	$2,945	$2,618	$2,841	$2,954	$6,913	$83,728	$14,850	$2,280	$100,858
2B	$130,384	$190,817	$4,357	$14,650	$13,022	$14,129	$14,694	$34,385	$416,438	$89,172	$8,210	$513,820
3A	$41,471	$25,530	$1,576	$3,086	$2,743	$2,976	$3,095	$7,243	$87,721	$28,700	$6,415	$122,836
3B	$46,583	$13,373	$652	$2,727	$2,424	$2,630	$2,736	$6,401	$77,526	$10,468	$990	$88,984
4A	$31,927	$5,835	$533	$1,723	$1,532	$1,662	$1,728	$4,045	$48,985	$10,795	$105	$59,885
4B	$35,244	$24,597	$655	$2,722	$2,420	$2,626	$2,731	$6,389	$77,384	$23,059	$355	$100,797
4C	$12,205	$2,726	$0	$672	$597	$648	$674	$1,577	$19,098	$7,417	$829	$27,345
5A	$23,581	$4,628	$820	$1,306	$1,161	$1,260	$1,310	$3,066	$37,133	$1,064	$185	$38,381
5B	$20,270	$4,348	$240	$1,119	$994	$1,079	$1,122	$2,626	$31,798	$5,751	$495	$38,044
5C	$21,984	$15,117	$960	$1,713	$1,522	$1,652	$1,718	$4,020	$48,686	$3,269	$270	$52,225
5D	$22,462	$15,128	$478	$1,713	$1,523	$1,652	$1,718	$4,021	$48,695	$2,510	$480	$51,685
5E	$18,262	$6,916	$302	$1,147	$1,019	$1,106	$1,150	$2,691	$32,593	$2,758	$300	$35,651
5F	$10,680	$6,775	$298	$799	$710	$770	$801	$1,875	$22,709	$2,741	$195	$25,645
5G	$29,799	$10,369	$356	$1,824	$1,621	$1,759	$1,829	$4,280	$51,838	$4,333	$30	$56,201
6A	$8,545	$4,356	$112	$586	$521	$565	$587	$1,374	$16,645	$3,915	$0	$20,560
6B	$14,196	$8,066	$0	$1,002	$890	$966	$1,005	$2,351	$28,476	$4,785	$0	$33,261
TOTAL	$605,715	$458,314	$15,290	$48,569	$43,173	$46,842	$48,716	$113,996	$1,380,615	$250,565	$24,289	$1,655,469

[1]Engineering at 4.5% assumes that all requirements under the Master Plan Scope of Services are met.

[2]Change Order Contingency at 4% is for change orders incurred after the bid date.

[3]Legal and Administration Contingency on actual construction only.

[4]Design Contingency at 9% is utilized as an average throughout the project. It should be understood that in some areas this percentage could vary. However, the average of 9% would prevail.

VIII. DESIGN AMENITIES

Introduction And Purpose

The purpose of any construction project is to improve an existing situation, whether functionally or aesthetically. One of the challenges faced by the Tampa Interstate Study (TIS) design team was to address the aesthetic implications of reconstructing a major thoroughfare to accommodate significantly increased demand. With this challenge came the opportunity to influence the appearance of the interstate system from the point of view of motorists as well as neighbors and, in so doing, to create a positive image for the Tampa-Hillsborough County area.

Good design is difficult to describe in words since it evokes an emotional response. The most prominent local example of good design in a transportation facility is Tampa International Airport (TIA), which is annually chosen America's best airport by the Airline Passengers' Association. Since it opened in 1971, the airport has become a symbol of Tampa. It is the intention of this study that Tampa's new interstate system be the positive image for surface transportation as the airport is for air transportation.

Experience has shown that when aesthetics are considered early in the planning process, a successful project is likely to result.

The intent of the Design Amenities Program was not to produce a final detailed design for the system as a whole or for any part of the system. The objective was, rather, to study methods to improve the overall aesthetics and unity of the project, identify areas which required special visual emphasis or de-emphasis, and develop a palette of man-made and natural design elements to be used in the final design phase to implement the program.

Design Objectives

Once the mission of the Design Amenities team was defined, the following list of specific goals was developed in concert with the Citizens Advisory Committee, the Agency Task Force, and the Staff Liaison Group, which consisted of interested staff members from local agencies:

* To create a strong positive image of the Tampa-Hillsborough County area.
* To provide continuity of design components within the interstate system.
* To design the interstate system to be in harmony with surrounding land uses as well as with the character of the Tampa area.
* To make using the interstate system a safer and more pleasant experience.

System-Wide Design Philosophy

To accomplish the four basic objectives, the design team first studied the aesthetic implications of the system as a whole to identify which areas needed special emphasis that could be carried through the entire project. These three areas are discussed in the following sections.

Gateways And Portals

Gateways

One effective method to enhance the image of an area is to create a delineated "gateway," areas where motorists first sense their arrival in a community. Strong aesthetic treatment in these gateways, which is then carried as an overall theme through the interstate system, provides a strong and positive first impression.

The three major gateways to the study area are listed below and shown on Exhibit VIII-1.

* Near the intersection of I-4 and I-75, when arriving from the east.
* At the east end of the Howard Frankland Bridge, when arriving from the west.
* At the Pasco-Hillsborough County line, when arriving from the north.

Portals

Another major design element is a "portal," a term which refers, in this context, to entrances and exits from the interstate system, although cross-streets which do not intersect with the interstate can also be considered portals. It is desirable to help motorists sense their location while traversing the interstate system. This can be accomplished by providing special emphasis to those portals which provide access to major destination points. To this end, destination points frequented by local residents and visitors were mapped by route to determine the interchanges most often used. From this information, a hierarchy of portals and levels of aesthetic treatment was established. The map of the destination points is shown on Exhibit VIII-2, and the portal/destination point matrix is shown on Exhibit VIII-3.

Aesthetic treatment at portals also provides an opportunity to physically and visually extend the interstate system and its Design Amenities into the community, at street-level, where people can best experience the effect. Community participation in improvements at portals and along adjacent street areas can further improve the overall image of the system and the individual neighborhoods, as well.

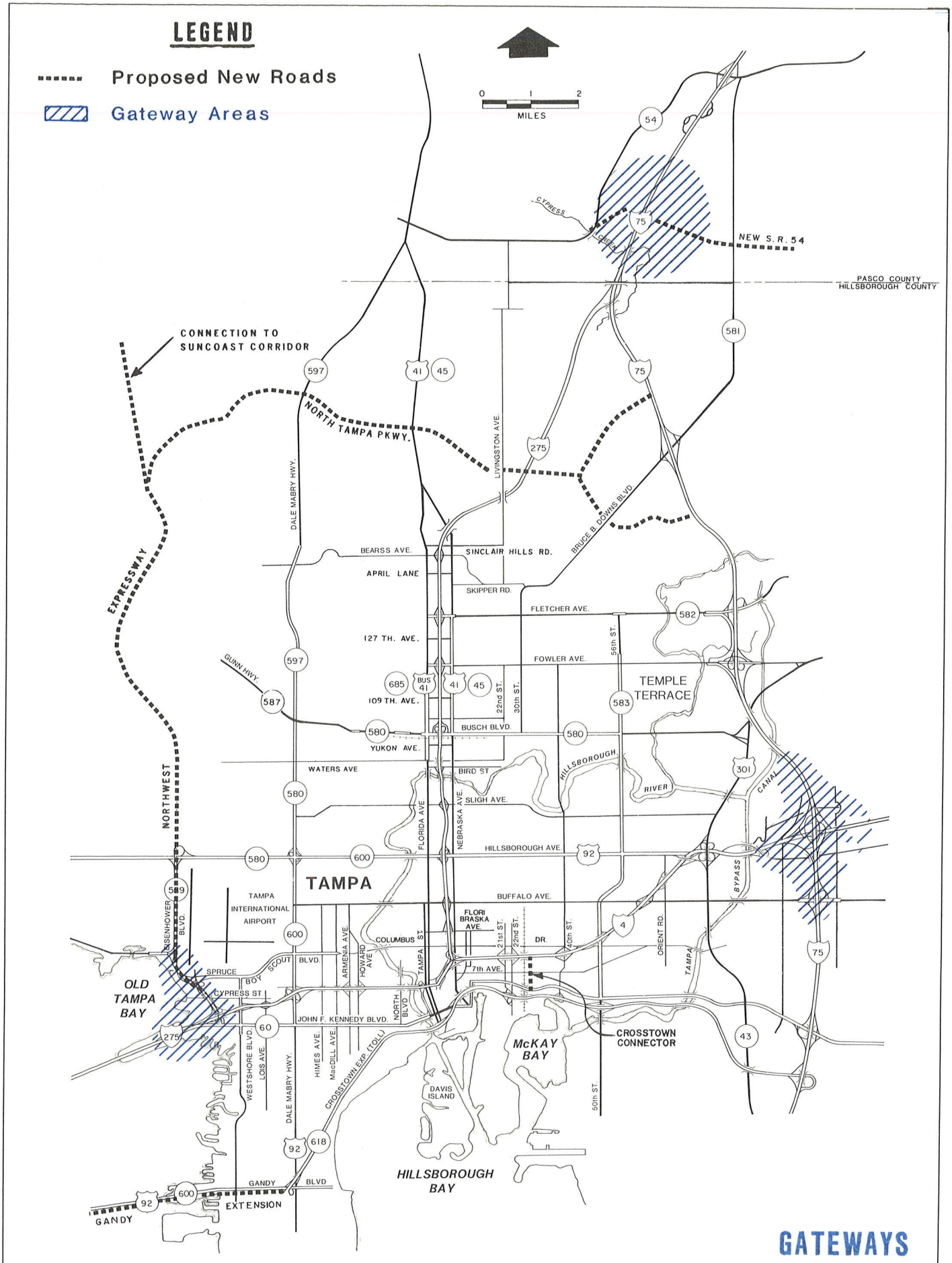
Unique Neighborhoods

Gateways can also be created to instill a sense of arrival at specific neighborhoods within the urban area. In Tampa's case, these neighborhoods are Ybor City, the Westshore area, Downtown, West Tampa, and the University North area, as seen on Exhibit VIII-4. Each of these neighborhoods has a unique character which should be complemented by any aesthetic treatment planned for the interstate system, at least on a localized basis.

Design Components

Man-Made Elements

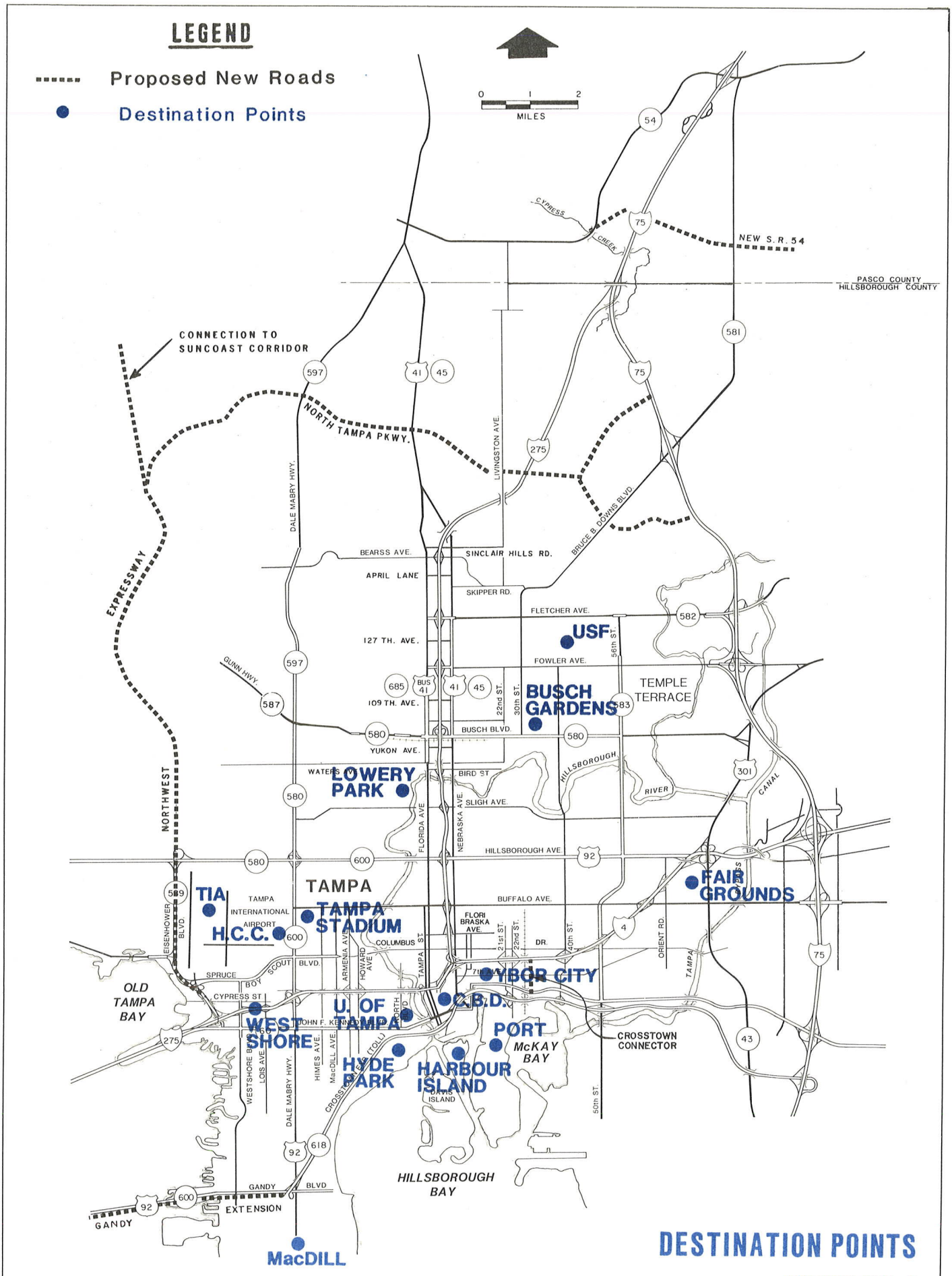
One of the challenges inherent in designing an interstate highway through an existing urban area involves providing (purchasing) sufficient right-of-way to comply with roadway design criteria and setback requirements,



GATEWAYS

EXHIBIT VIII-1

A Florida Department of Transportation Project



DESTINATION POINTS

EXHIBIT VIII-2

A Florida Department of Transportation Project

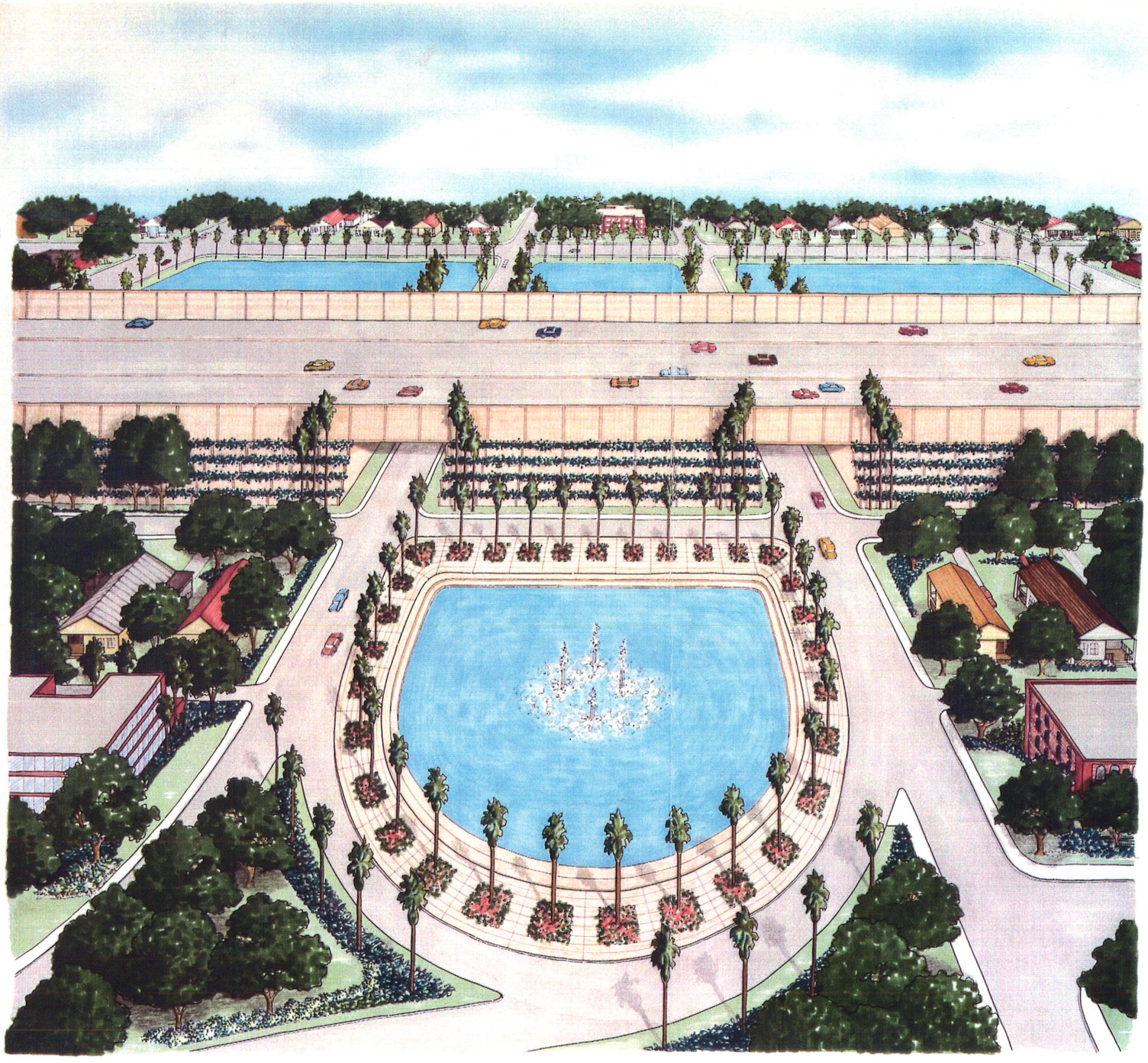
EVALUATION MATRIX
HIERARCHY OF DESTINATION POINTS

INTERCHANGES ⇒ / DESTINATION POINTS ⇓	CR 54/ I-75	BEARSS/ I-275	FLETCHER/ I-275	FOWLER/ I-275	BUSCH/ I-275	BIRD/ I-275	SLIGH/ I-275	HILLSBOROUGH/ I-275	BUFFALO/ I-275	FLORIBRASKA/ I-275	JEFFERSON/ I-275	ASHLEY/ I-275	HOWARD/ I-275	ARMENIA/ I-275	DALE MABRY/ I-275	LOIS/ I-275	WESTSHORE/ I-275	TIA/SR 60/ I-275	21st ST./ 22nd ST./ I-4	40th ST./ I-4	50th ST./ I-4	BUFFALO/ I-4	ORIENT RD./ I-4	US 301/ I-4	I-75/ I-4
USF		●	●	●	●																				
BUSCH GARDENS					●																				
LOWRY PARK							●																		
TAMPA GREYHOUND					●	●																			
MUSEUM OF SCIENCE & INDUSTRY			●	●	●																				
SUN DOME			●	●	●																				
UNIVERSITY SQUARE MALL			●	●	●																				
TAMPA TECHNOLOGICAL PARK		●	●	●																					
HIDDEN RIVER RESEARCH PARK		●	●																						
ST. JOSEPH'S HOSPITAL N.		●	●																						
VETS ADMINISTRATION HOSPITAL			●	●																					
UNIVERSITY COMMUNITY HOSPITAL		●	●	●																					
CARROLLWOOD COMMUNITY HOSPITAL					●		●								●										
TOWN N COUNTRY HOSPITAL								●										●							
USF MEDICAL COMPLEX		●	●	●	●																				
MEMORIAL HOSPITAL													●	●	●										
TAMPA STADIUM									●				●	●	●	●						●			
TIA																●	●	●							
HCC (MAIN CAMPUS)								●							●										
WESTSHORE AREA															●	●	●	●							
MACDILL AIR FORCE BASE															●	●	●								
HYDE PARK													●	●											
JAI-LAI															●		●								
WESTSHORE PLAZA																●	●	●							
BAYSHORE BLVD.												●	●												
TAMPA GENERAL HOSPITAL												●													
ST. JOSEPH'S HOSPITAL									●				●	●	●										
TAMPA BAY CENTER									●						●										
HUMANA WOMEN'S HOSPITAL									●						●										
UNIVERSITY OF TAMPA												●	●	●											
HARBOUR ISLAND											●	●													
UNION STATION										●	●	●													
PERFORMING ARTS CENTER												●													
CURTIS HIXON / NEW CENTER												●													
PORT OF TAMPA																			●						
CBD											●	●							●						
YBOR CITY										●									●						
FLORIDA STATE FAIRGROUNDS																						●	●	●	
BRANDON TOWN CENTER																									●
HUMANA BRANDON																									●

● ACCESS POINTS

PORTAL/DESTINATION POINT MATRIX

EXHIBIT VIII-3



GATEWAY TO YBOR CITY AT 14TH AND 15TH STREETS

EXHIBIT VIII–4

while disrupting as little as possible established land uses, especially residential or historically significant neighborhoods.

The interstate's influence area is essentially flat, and has a water table relatively close to the surface. To achieve grade-separation between the interstate and local streets, the interstate is to be elevated, either with fill or on structure.

Walls and Embankments

Depending on right-of-way availability, the sides of those sections of the interstate elevated on fill will either be sloped embankments or retaining walls. In certain sections where right-of-way is limited, retaining walls could be up to 25 feet high.

Noise barrier walls may be required adjacent to noise-sensitive areas and, in some cases, may need to be placed on top of retaining walls or bridge structures. Some noise walls could be from 12 to 18 feet high.

Traffic separation walls, also called "Jersey" or "G.M." barriers, will also be required, but these are typically less than three (3) feet high.

Structures

Various types of bridge structures will be required for elevated sections of the interstate, at all places where the interstate crosses surface streets, and at major multi-level intersections, such as the junction of I-275 and I-4.

Ancillary Elements

These components include access control fencing, sign supports, guard rails, lighting, traffic signals, sidewalk pavement, and "street furniture."

Natural Elements

Landscape Design

Landscaping of the completed project and its blending into the adjacent land uses will significantly affect the final visual impact of the interstate system.

The study area has several distinct zones of native vegetation. Oak and pine predominate at the northern and eastern extremities of the project influence area, while tropical and sub-tropical vegetation, such as palms, appear more frequently at the area's western and southern borders.

Landscape treatment can serve to enhance the visual impact of special emphasis areas, such as gateways and portals, and can be used to screen or soften areas of potential adverse visual impact.

Water Resources

One of the challenges of the overall engineering of the re-built interstate system is how to collect and retain rainfall runoff associated with the project. Interestingly, this challenge creates an opportunity to amplify the association of the Tampa Bay area with its coastal location through incorporating the water-management elements into unique "water features" in pedestrian areas.

Unifying Considerations

There are several factors which affect the cohesiveness of any design: color, texture, shape, and balance. To begin a discussion of how these factors relate to the design of an interstate highway, it is first necessary to define the construction parameters; that is, the predominant construction material(s).

In the Tampa interstate project, the predominant construction material will be concrete. It is by far the most cost-effective and most widely used product in this region of the country for the type of construction anticipated.

The use of concrete offers many opportunities for the designer. It can be cast-in-place (made at the construction site) or precast (cast at a manufacturing facility and assembled at the site). It is "plastic," meaning that it can be molded and shaped. It can be colored with an internal coloring agent, or it can be coated or stained after it is in place. It can be treated with mildew-inhibiting agents and, when necessary, it can be cleaned with high-pressure hoses, although this loosens some coatings.

Precast concrete is available in an infinite variety of shapes and sizes, ranging from standard concrete block to interlocking shapes used to build retaining walls. Special shapes can be made to order by any local precast plant.

Large expanses of cast-in-place concrete can be made to appear like they were constructed of small units. This often produces a beneficial psychological effect since people can relate to the size and shape of concrete blocks.

It is likely that some of the complicated long-span bridges, especially at multi-level interchanges, will need to be made of steel rather than concrete. Careful attention to the interface between steel and concrete elements is necessary.

There are several other components whose impact on overall design continuity of a major project is often overlooked. These are fences, guard rails, light poles, and signage. Careful attention to the design of these components is important to developing a unique amenities package for the Tampa interstate system.

Aesthetic Enhancement

As discussed earlier in this section, walls, embankments and bridge structures necessary for the engineering component of the design program will constitute a significant portion of the project. The potential for adverse visual impact associated with extensive use of hard man-made materials exists. The Design Amenities team has studied methods to turn these potential adverse impacts into positive design solutions. This portion of the amenities discussion deals with the resulting design opportunities.

General Theme

Before discussing opportunities associated with specific design elements, it is necessary to discuss the system as a whole. Each element of the project should be in balance with the other elements in terms of function and emphasis within the system-wide hierarchy. This means that the function of each element can be expressed provided that the element is in balance with its surroundings. Specific elements are discussed in the following sections.

Walls and Embankments

As discussed earlier, retaining walls and noise barrier walls could be significant design elements, especially in developed areas and in areas with restricted rights-of-way. There are several methods of minimizing the perceived heights (and thereby the adverse visual impact) of such walls.

One method to reduce the perceived height of the walls is to terrace the wall. This has the effect of creating several shorter walls. With such treatment comes the added benefit of creating spaces in which to place landscape materials which further diminishes the perceived height of the wall and provides visual relief. Examples of such terraced walls are shown on Exhibits VIII-5 and VIII-6.

Another way to give interest to a vertical surface when terracing, which is not feasible due to space constraints, is through the use of texture. The texture could take an abstract architectural form, or could be representative of some object unique to the Tampa Bay area. Examples of textured wall treatment are shown on Exhibit VIII-7.

Use of modular components for construction instead of cast-in place concrete can also provide visual interest. Some components are designed to support the growth of vegetation on vertical or near vertical surfaces. Walls constructed of these materials were shown previously on Exhibit VIII-5.

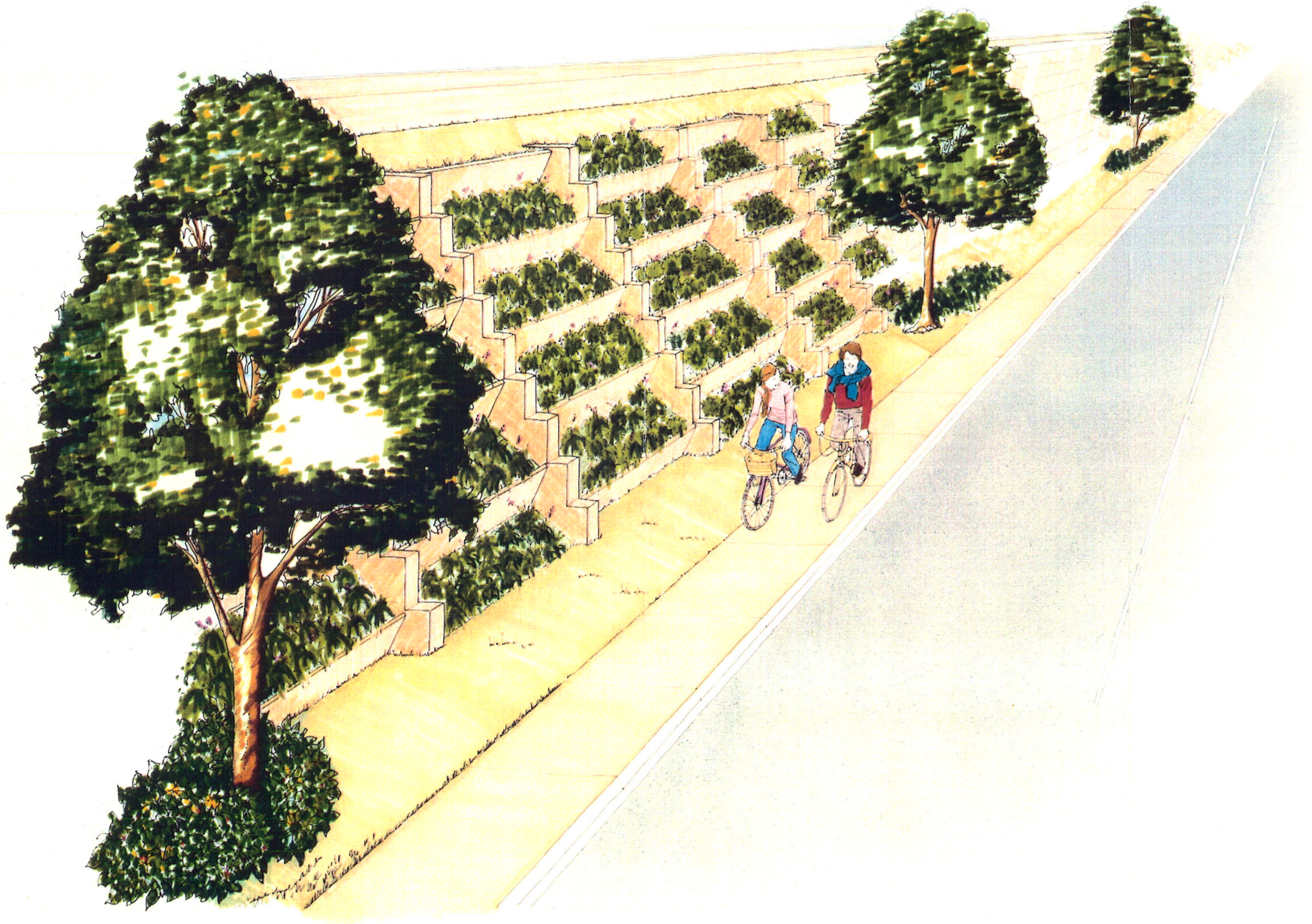
Noise barrier walls present special design challenges. The successful abatement of traffic-generated noise levels is both a function of physical and aesthetic design parameters. Many sound barriers have been constructed that meet or exceed the acoustic goals but fall short of aesthetic needs. Sound barrier installations for the Tampa interstate must meet both sets of design criteria to be successful. Material selection should reflect construction materials, color and texture of the surroundings and the overall design. When possible, imaginative use of grading should be incorporated into the final design to reduce the perceived height of sound barriers by both drivers and adjacent residents. Further noise attenuation through barriers can be achieved by judicious use of plant material, effective reduction of barrier mass, and by melding permanent structures to the surrounding landscape with minimal obtrusiveness. Exhibit VIII-8 presents several possible sound barrier treatments.

Noise barrier walls can be constructed of cast-in-place or precast concrete panels. Use of precast panels which are attached to one another at the construction site is a viable option for noise walls. The panels, as shown on Exhibit VIII-8, are an alternative to cast-in-place concrete and can be attached to one another in an infinite variety of configurations. The inherent stability and light weight of this system lessens the need for footings. The panels can be cast with the same color and texture as cast-in-place elements of the project.

Where space permits, earthen berms can be used to add a vertical dimension and to screen the interstate from adjacent land uses. Noise walls, in particular, can benefit from berming, especially when they are free-standing and not attached to retaining walls or bridge structures. By constructing the wall at the top of a berm, the full noise suppressing benefit of the wall can be achieved, while minimizing the perceived height of the wall itself. The berms can also be used to enhance the display of plant material. This is discussed further in the description of landscape elements.

Bridge Structures

The aesthetics of the interstate's bridge structures has been the subject of intensive research. Standardization of such critical elements as girders, abutments, and piers can assist in establishing the unity of the 36.6-mile-long project. Where feasible from an engineering standpoint, all places where the interstate crosses over a surface street will be of the same general appearance. Precast concrete box girders are, from an aesthetic

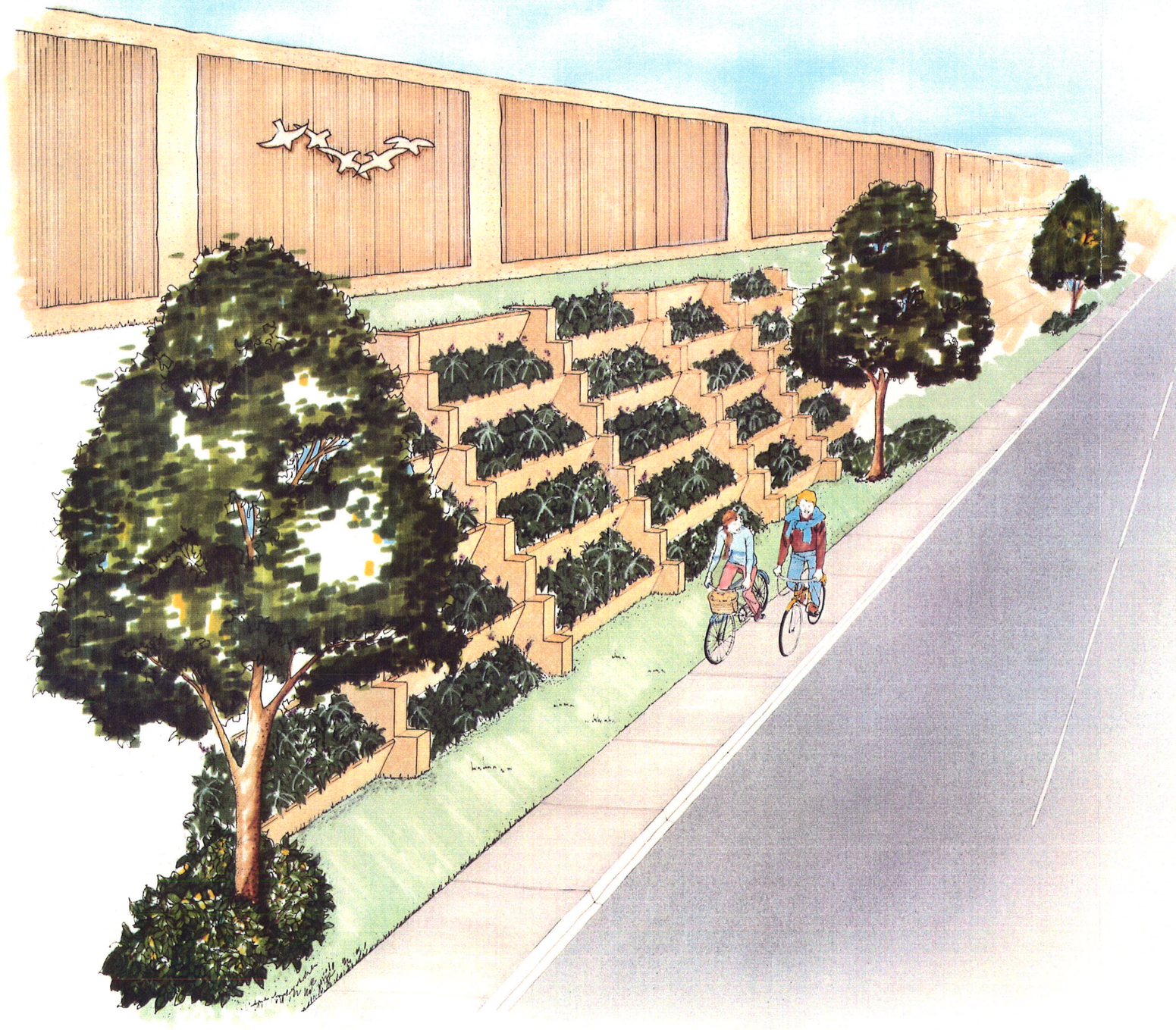


GREEN WALL

EXHIBIT VIII–5

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY THE GREINER TEAM

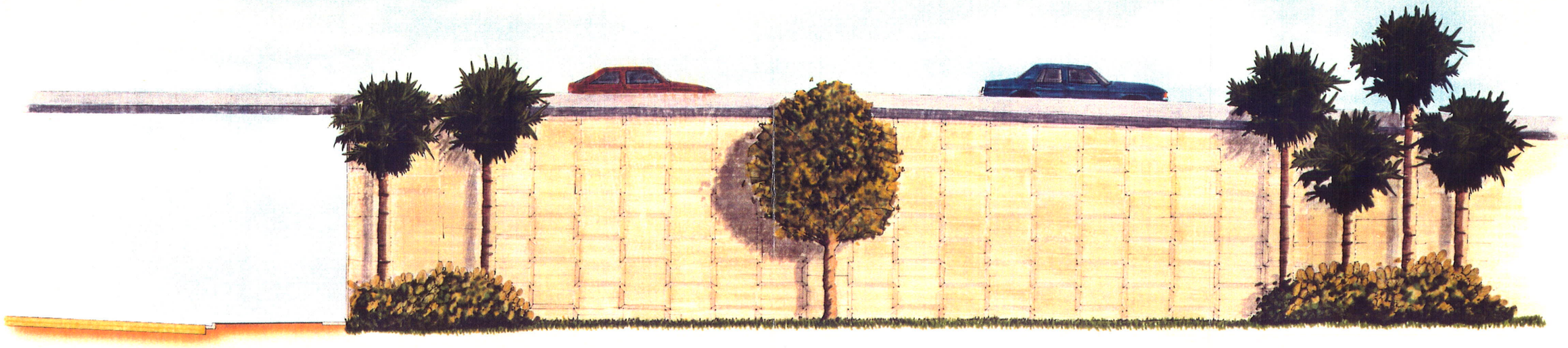


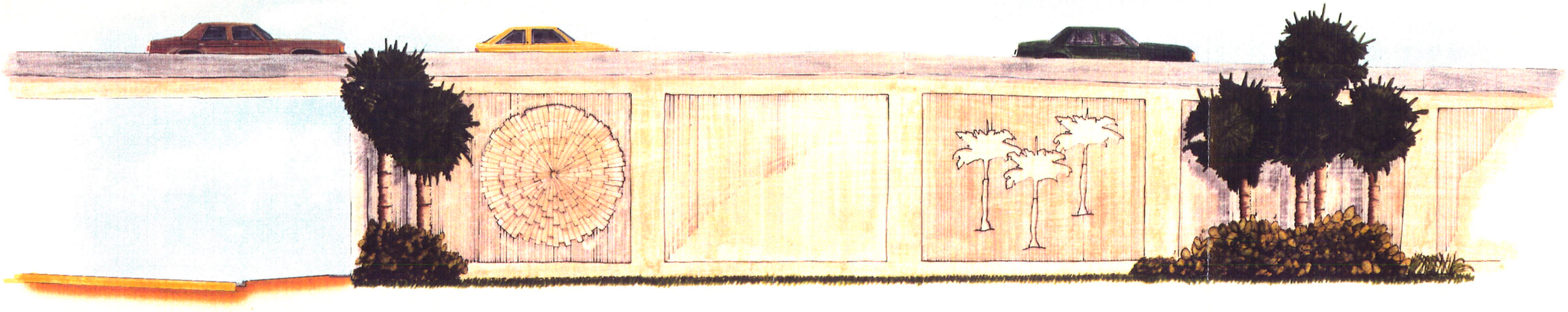
GREENWALL WITH NOISE BARRIER

EXHIBIT VIII-6

TAMPA INTERSTATE STUDY THE GREINER TEAM

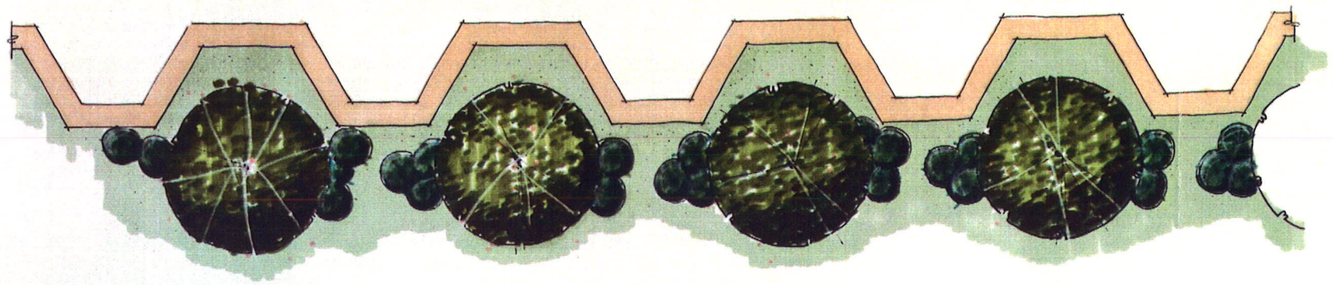
A Florida Department of Transportation Project



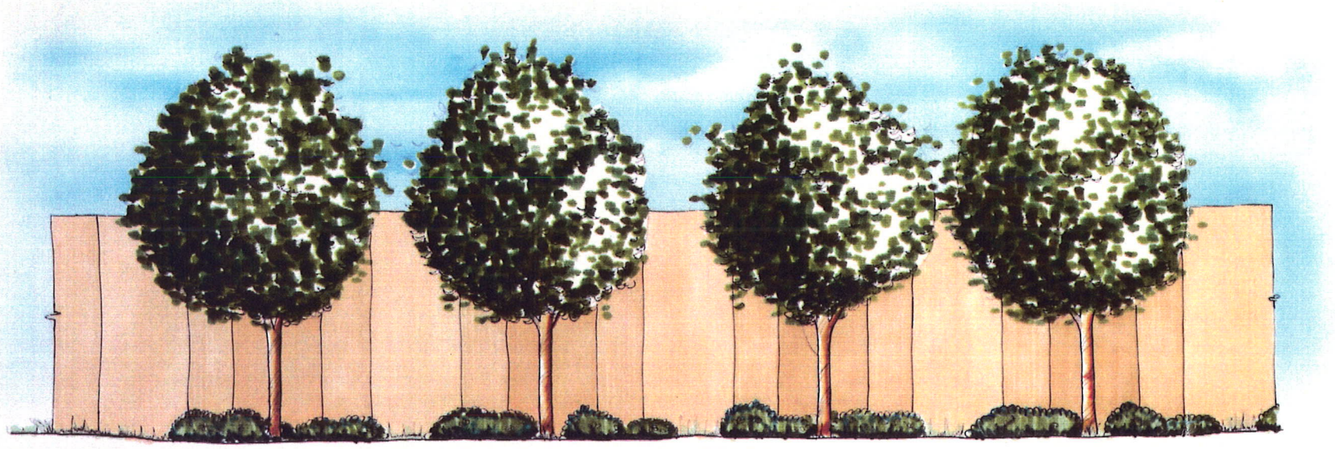


TEXTURED WALL TREATMENT

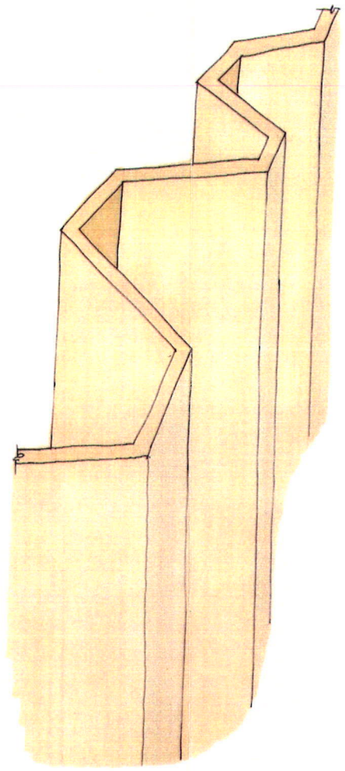
EXHIBIT VIII–7



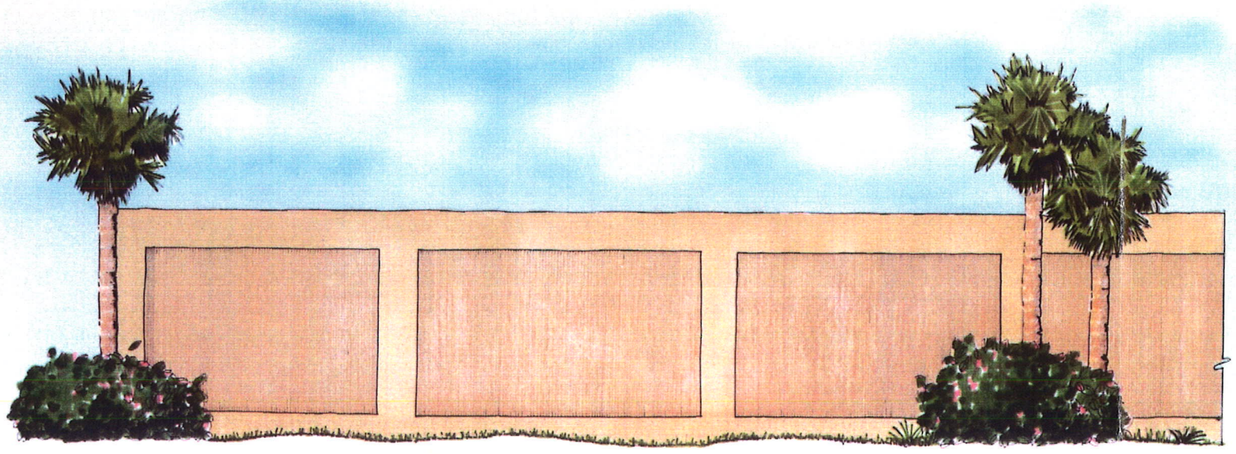
PLAN – FAN WALL



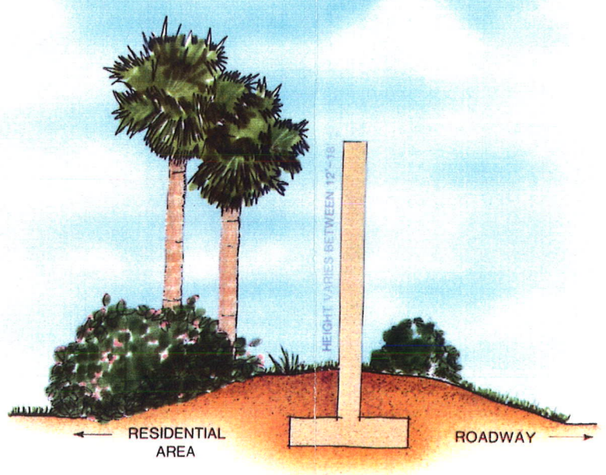
ELEVATION – FAN WALL



ISOMETRIC – FAN WALL



ELEVATION – CAST IN PLACE CONCRETE WALL



SECTION – CAST IN PLACE CONCRETE WALL

NOISE BARRIER TREATMENT

EXHIBIT VIII–8

standpoint, far preferable to standard American Association of State Highway and Transportation Officials (AASHTO) girders. Patterns similar of those used on adjacent retaining walls can be incorporated into the formwork when casting these members.

Where feasible, overpasses should consist of a single span, without intermediate supports. At those areas where significant portions of the roadway must be on structure, piers should be kept to a minimum to avoid the perception of a "forest" of supports.

Certain places such as river crossings and major interchanges provide an opportunity to utilize the ground plane for purposes such as parking and stormwater retention. Such multiple use of right-of-way can also create the opportunity to incorporate interesting public spaces into the overall design.

Ancillary Elements

The final type of man-made components of the system are supplementary to the major construction elements, although they provide important functions. Taken together, they can be thought of as the details and accessories which pull the overall design together.

Many of these ancillary elements, fences, guard rails, sign supports and light poles/fixtures, are commonly constructed of metal. It is imperative to the success of the overall design that all metal elements used in the project have similar characteristics, including elements which reach past the bounds of the project into adjacent streets. This does not preclude some degree of flexibility in choosing elements for pedestrian areas. For example: all roadway light poles and fixtures should be identical in appearance on the interstate itself; it would be inappropriate, however, to use the same pedestrian fixtures in the Westshore area or in Ybor City. Examples of pedestrian and accent lighting for these two areas are shown on Exhibit VIII- 9. While differing significantly in shape, requiring them to be the same color would maintain design continuity.

Fences

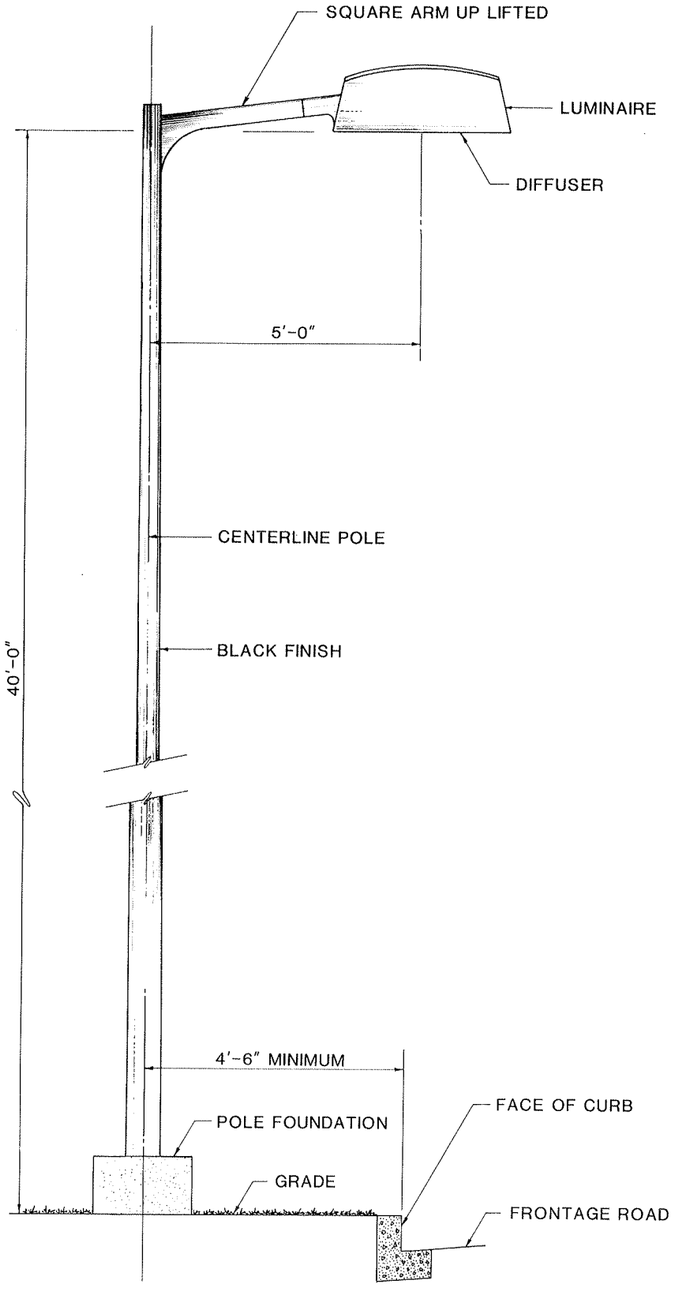
It will be necessary to construct access control fences at certain locations along the roadway. Typically, chain-link fence is used for such purposes. It is strongly recommended that alternatives to chain-link fencing be explored. One candidate alternative would be an aluminum fence consisting of vertical rails. This produces a residential "feel" as opposed to the almost prison-like ambience ascribed to chain-link fencing.

Guard Rails

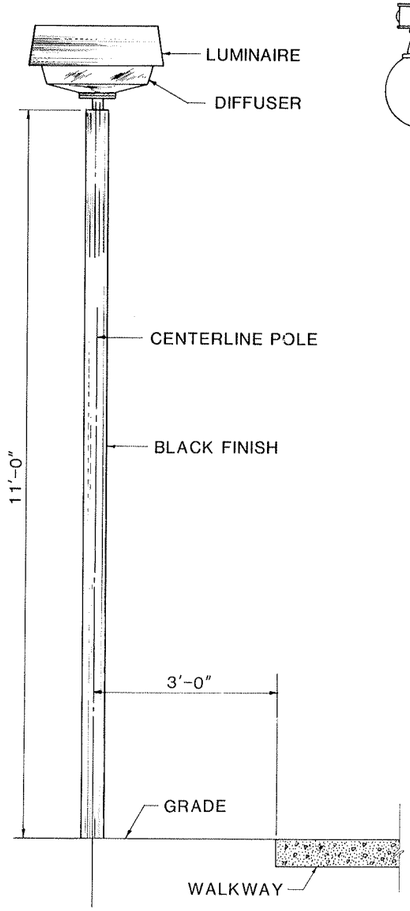
Metal guard rails mounted atop bridges must conform to state and federal design standards, but there is still some design latitude even if the aesthetic "treatment" were to consist solely of color.

Signage

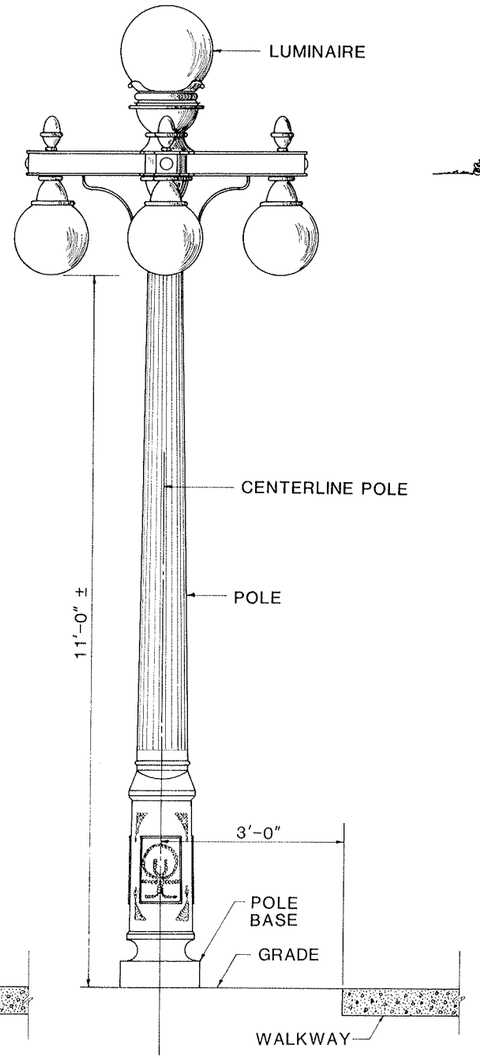
Overhead sign supports on interstate highways are typically constructed of galvanized steel trusses. Economics of scale make it possible to design special supports for all signage on Tampa's interstate. These are important and significant visual features of the overall interstate design.



FRONTAGE ROAD LIGHTING

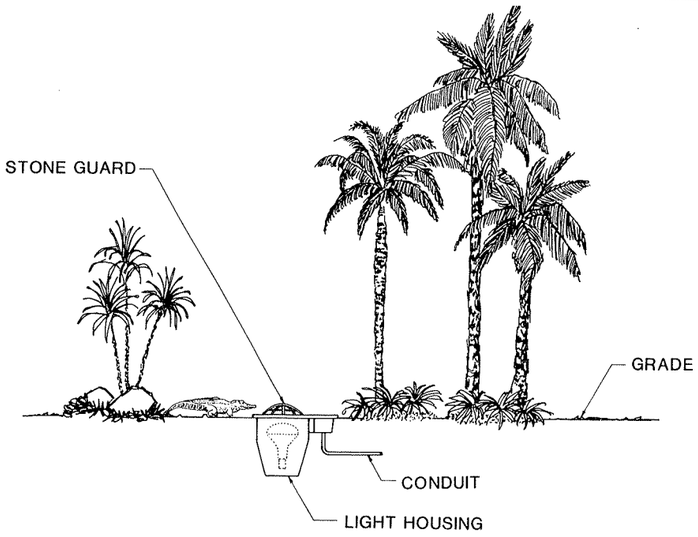


DOWNTOWN AND WESTSHORE AREAS

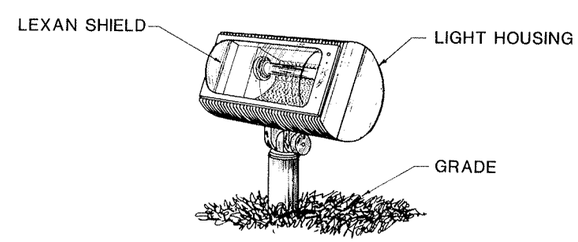


YBOR CITY AREA

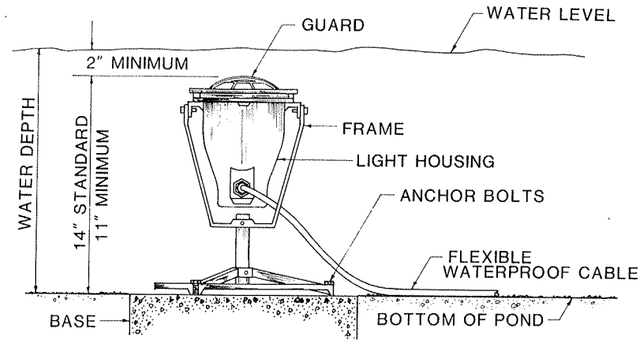
PEDESTRIAN LIGHTING



DIRECT BURIAL LIGHTING



FLOOD LIGHTING



UNDERWATER FOUNTAIN LIGHTING

PEDESTRIAN AND ACCENT LIGHTING

Vertical sign supports should be concrete and of standardized design which complements vertical bridge supports. Metal horizontal members (usually tresses) should be the same color and finish as metal elements used throughout the project.

Pedestrian Pavement

Pedestrian linkages should be added, or maintained where existing, at all overpass locations. At designated portals or special areas, decorative pavement treatments for walks, paved plazas and crosswalks are encouraged.

Natural Elements and Landscape Design

For purposes of this study, the "natural elements" of the Design Amenities program consist of plant materials and water features. Landscape design is the process which blends these two features to their best advantage with the man-made elements on the interstate system and out into adjacent communities.

The landscape design and planting scheme developed for the Tampa interstate is of primary importance for the dual roles of humanizing the potential harshness of the paved roadway environment and providing a mechanism for blending the roadway into the surrounding land uses it must traverse.

The landscape theme suggested for the Tampa interstate is one reflective of the character of the Tampa Bay area, and based principally on a hardy, drought-resistant palette of native or indigenous vegetation. The primary goals of the landscape design for the interstate is to provide the following:

* Appropriateness of roadway landscape through the use of optimum plant material for functional qualities such as buffering, screening, erosion control, and maintainability.
* To enhance the unity of the project.

A list of recommended plants for proposed planting and for existing plants to be preserved is shown on Table VIII-1.

Existing plant material should be incorporated into the proposed improvements to the greatest extent possible by protecting or relocating appropriate plant material found within the right-of-way. Provisions for the inventory of existing plant material and for its protection or relocation to holding areas should be incorporated into preliminary design phases of the interstate reconstruction.

The landscape design criteria has been developed as an integral part of the roadway improvements package within the master planning process. This comprehensive approach is imperative for the achievement of the optimum integration of landscape areas into the roadway design, and for the preservation of valuable existing plant material.

It is important to realize that appropriate landscape design provides not only the visual amenity which it is most recognized for, but also psychological relief, scale modulation, and climate mediation. Attention to all these elements will be crucial to a successful roadway environment.

Water Features

As discussed earlier, engineering studies have indicated that a series of stormwater retention areas will need to be constructed along the interstate system. The Design Amenities team proposes that certain of these

TABLE VIII-1

LIST OF RECOMMENDED PLANTS FOR GENERAL ROADWAY
Tampa Interstate Study

Scientific Name	Common Name
Trees & Palms:	
Quercus laurifolia	Laurel oak
Quercus virginiana	Live oak
Ilex opaca	American holly
Ilex cassine	Dahoon holly
Pinus elliotti	Slash pine
Acer rubrum	Red maple
Sabal palmetto	Cabbage palm
Washingtonia robusta	Washingtonia palm
Myrica cerifera	Southern waxmyrtle
Juniperus silicicola	Southern red cedar
Shrubs:	
Prunus angustifolia	Chickasaw plum
Anisatum floridanum	Florida anise
Myrica cerifera	Southern waxmyrtle
Ilex cassine	Dahoon holly
Ilex vomitoria	Yaupon holly
Zamia pumila	Coontie
Viburnum obovatum	Blackhaw
Hypericum fasciculatum (at ponds)	St. John's wort
Pittosporum tobira variegatum	Variegated pittosporum
Ground Cover:	
Helianthus debilis	Beach sunflower
Gaillardia pulchella	Gaillardia
Ascepias tuberosa	Butterfly-weed
Liriope muscari "Evergreen Giant"	Giant liriope
Juniperuus chinensis parsonii	Parsons juniper
Aspidistra elatior	Cast iron plant
Vines:	
Gelsemium sempervirens	Carolina yellow jessamine
Smilax glauca	Smilax

retention areas be used to incorporate water features into the urban landscape. This is especially crucial in the downtown area where the interstate will be elevated on structures above the surface streets. The retention areas could occupy some space below the structure, thus minimizing right-of-way requirements. Such places could become pleasant urban parks, complete with shade and the soothing sound of fountains.

Other retention areas will need to be located along the side of the roadway. Here, aquatic plants could be used on side slopes where there was sufficient space. The aquatic plants would be visually pleasing to observe, and would serve as a biological filtration system for water quality treatment.

The Hillsborough River is another important water feature of the area that should be tied into the amenities program. For example, views of the river from the interstate will be developed within the parameters of engineering considerations. Parks will be located beneath the interstate where it crosses the river.

Conclusions And Recommendations

The potential exists for the interstate to be truly seen as an amenity for the Tampa-Hillsborough County area. For this concept to become a reality, the interstate must become a part of the fabric of the area by serving more than just the transportation needs of the population and its visitors. It must become a welcome, inseparable, component of the neighborhoods which it traverses, offering them opportunities to enhance their identity rather than "walling them off."

This expanded urban role is a major challenge for the interstate and the community alike, and one which will require the promotion of interaction beyond just the necessary public hearings. The result of this interaction will be to provide innovative solutions to urban problems and to recognize the potential of the interstate as a major unifying community element, which brings with it opportunities as well as challenges.

IX. URBAN AND COMMUNITY ENVIRONMENT

Land Use

Currently, the City of Tampa and Hillsborough County Comprehensive Land Use Plan required by the State of Florida's Local Government Comprehensive Planning and Land Development Regulation Act of 1986 is under review by the Florida Department of Community Affairs and other appropriate agencies. Upon approval by the Department of Community Affairs, the Comprehensive Land Use Plan will be adopted and serve as the policy in guiding development in Hillsborough County.

The Tampa Interstate Study has established no land use policies for the study area. Land use policy relating to the areas adjacent to the Tampa interstate are controlled by the City and County comprehensive plans. The Tampa Interstate Study recognizes the need for well ordered plans for future development and redevelopment, and encourages the cooperative study of specific land use policy issues for segments of the interstate corridor.

Essential to the successful development of any transportation system are transportation and land use planning. Land uses encroach upon road rights-of-way, increasing traffic congestion. This, in turn, makes it very costly to acquire land for right-of-way that will be used to increase the road capacity to serve the land uses that increase the traffic congestion in the first place. Master planning can save money for both local governments and the state.

A strong coordinated approach to land use and transportation planning is needed. Policy decisions at local levels are interpreted and implemented in different ways over time. Therefore, any approach to coordinating land use and transportation planning must be done through specific procedures. The local comprehensive plans provide an ideal vehicle for this type of coordinated planning.

Transportation systems are affected by land use development in many ways; location and accessibility intimately tie land use and transportation concerns. One of the key issues that could benefit from improved coordination between land use and transportation concerns is the protection of adequate rights-of-way for future road expansions. Intensely developed lands are virtually cost prohibitive to acquire for roadway expansion, yet it is the location and accessibility created by the road that attracted the intense land uses. This situation is most prevalent in the urban areas. Policies in the local comprehensive plans that may help to improve land use/transportation coordination include clustering neighborhoods serving commercial uses around intersections. This can be done in such a manner as to discourage commercial strip development; consolidating existing curb cuts and minimizing future ones; setbacks of adjacent land uses further from the roadway to allow for future corridor expansion. Mutual benefits can be realized for land use and transportation concerns.

Local governments can further orderly growth through the development of corridor studies, such as the I-75 Corridor Study conducted in unincorporated Hillsborough County. Land use and transportation policy can be combined to provide for intense, well planned development that will take advantage of the location and accessibility the corridor has to offer. This can preserve the integrity of the corridor as an inter-regional transportation route. Corridor studies could be incorporated into the plan, and mechanisms appropriate for

the corridor (e.g. performance standards) could be developed. This would ensure the balance needed between land use and transportation concerns.

The policies dealing with transportation issues within the land use elements of the comprehensive plans for unincorporated Hillsborough County and Tampa provide a sound foundation to foster more coordination between the transportation and land use planning efforts. These efforts are enhanced by the Tampa Interstate Study Master Plan.

Intergovernmental Coordination

Policy A-11 of the Hillsborough Comprehensive Plan states the County and the Hillsborough County City County Planning Commission shall coordinate closely with the appropriate jurisdictional authorities in the initial design stages of any interstate highway or other major road system project to coordinate future land use, and to protect existing neighborhoods.

The Comprehensive Plan's Land Use Policy for Limited Access Highways provides guidance for future interstate land planning. In discussing land use policy for limited access highways, two areas must be considered separately: the actual interchange and the areas bordering the highways.

At interchange locations, non-residential uses or higher density residential uses with appropriate buffering are appropriate. Surrounding neighborhood character, access potential and future plans for specific interchange areas will have influence on any land use considerations.

The areas bordering limited access highways are different than the interchange areas. The major problem with residential land use along limited access highways is the ability to effectively mitigate the adverse impacts of the roadways. Many urban communities have limited access highways traversing some of their more affluent residential neighborhoods. The City of Tampa is a case in point as many residential areas presently exist along the interstates in Tampa. Many areas continue to be viable neighborhoods that border the roadway. In-fill housing is presently occurring in some vacant lots bordering the interstate in West Tampa. The issue, rather than not encouraging residential land use, is to mitigate the negative roadway impacts through vegetative plantings to buffer visual problems and sound and barrier walls where appropriate, with proper aesthetic design consideration. The Florida Department of Transportation's Master Plan for rebuilding the interstate system through Tampa includes within this report, ideas to buffer impacts through visual design of the interstate itself. Any Comprehensive Plan policies should be closely coordinated with the Florida Department of Transportation in the initial design stages of the interstate project to coordinate future land use and existing neighborhood protection. Actual land use should be related to the interstate only in terms of access, decisions related to impacts of limited access highways should be dealt with through buffering, landscaping, noise and visual barriers and distance.

The Tampa interstate corridor traverses an array of diverse land uses. The following discussion provides a general overview of the different types of land uses within each design study segment. Exhibits I-3 through I-13 provide aerial views of the proposed interstate improvements and the areas adjacent to the interstate. For a complete review of all concepts at 1"=100' scale see the Attached Plans and Illustrations.

Design Study Segment 1A

The Westshore Business District is served by Interstate 275 (I-275) in Segment 1A. The land uses adjacent to I-275 in this area are predominately office and commercial for most of the design segment.

At the interchange of I-275 and Memorial Highway is commercial office development. On the north side of the interstate and west of Memorial Highway there is still much vacant land which could be developed for commercial use. In the southeast quadrant of the interchange is Westshore Plaza, a large shopping mall.

From Westshore Boulevard to Lois Avenue on the north side, is a variety of commercial and hotel complexes. In the southeast quadrant of the Westshore I-275 interchange, is the Guest Quarters Hotel adjacent to a multi-family apartment complex. Continuing along the south side of the interstate, the land use consists of predominantly single-family residences up to the Cypress Street overpass. On the north side of the interstate, between Lois Avenue and Dale Mabry are a variety of commercial and industrial properties. At the Dale Mabry Highway and I-275 interchange, commercial office and commercial retail land use types can be found in all four quadrants. On the north side of I-275, just west of Dale Mabry Highway is the predominately black Carver City neighborhood comprised primarily of middle income families.

Design Study Segment 2A

From Himes Avenue to Rome Avenue are predominantly single-family residences on the north and south side of the interstate. A mix of small scale retail commercial businesses are clustered along the north side of I-275 from MacDill Avenue to Rome Avenue. MacFarland Park, one of the oldest parks in Tampa, is located on the north side of the interstate just west of MacDill Avenue. On the southeast corner of MacDill Avenue and I-275 is the Boys and Girls Club of Greater Tampa.

Segment 2A traverses the West Tampa Historic District, which is discussed in detail elsewhere in this section. Between Armenia Avenue and Rome Avenue there are several commercial properties adjacent to the interstate disbursed among the single family residences. At the northeast corner of Green Street and Freemont Avenue is the Hillsborough County School Board Book Depository and Custodian Operations.

Design Study Segment 2B

Design Study Segment 2B encompasses the Tampa Central Business District area. On the north side of the interstate, between Rome Avenue and North Boulevard is a large multi-family complex owned by the City of Tampa Housing Authority. Continuing on the north side of the interstate, just east of North Boulevard, the Presbyterian Villas multi-family complex is adjacent to Riverfront Park and the Hillsborough River.

On the south side of I-275, at the southeast corner of Laurel Street and Willow Avenue is the George W. Carver Day Care Center. On the south side of the interstate from Rome Avenue to North Boulevard are several single-family residences, a few commercial properties and the Bethel A. M. E. Church.

Riverfront Park continues on the south side of the interstate to Cypress Street between North Boulevard and the Hillsborough River. East of the Hillsborough River on the south side of the interstate is the Ashley Towers multi-family complex. East of the Ashley Towers are several commercial office uses. The Hillsborough County Jail lies between Morgan Street and Pierce Street on the south side of the interstate.

On the north side of the interstate, between Doyle Carlton Drive and Tampa Street adjacent to the Kay Street on-ramp, is the City of Tampa Police Department. Continuing east, there are several different types of developments between Tampa Street and Morgan Street, including some commercial properties, the Salvation Army Educational Center and a Tampa Electric Company sub-station. From Morgan Street north along I-275 to the I-4/I-275 interchange is a predominantly single-family residential area. There are several religious facilities disbursed among these residences including the Baptist Fellowship Bible College of Tampa, the Friendly Missionary Baptist Church, and the Faith Temple Missionary Baptist Church.

On the south side of the interstate, between Jefferson and Orange Streets, is the Greater Bethel Baptist Church, the Kid Mason Fondall Community Center and Perry Harvey Park. Adjacent to the park, is the Boys and Girls Club of Greater Tampa and a low-income, subsidized housing project. North of Perry Harvey Park, to the I-4/I-275 interchange on the east and south sides are predominantly single-family residential area, which is considered to be mostly sub-standard housing. From the I-4/I-275 interchange east to 15th Avenue is a low-income, single-family, residential neighborhood on the north side of the interstate. In the northeast quadrant of the I-4/I-275 interchange is the Hillsborough County Schools' Industrial Service Center.

Continuing north along I-275 in Segment 2B is predominantly a single-family residential area from Columbus Drive to Osborne Avenue. There are several land uses within this area that should be noted. On the east side of the interstate, south of Floribraska Avenue on the northeast corner of Mathews Avenue and Taliaferro Avenue, is the City of Tampa Fire Department Communications Division. In the southeast quadrant of the I-275 and Buffalo Avenue interchange is the Hillsborough County Adult High School. Several commercial land uses surround the Buffalo Avenue interchange.

On the west side of the interstate between Adalee Street and Emily Street is Robles Park. On the southeast corner of Osborne Avenue and I-275 is the City Recreational Department (Angus Goss Memorial Pool), the Seminole Branch of the Hillsborough County Public Library and the Church of Jesus Christ Latter Day Saints.

Design Study Segment 3A and 3B

Ybor City and the commercial/industrial area east of Ybor City is served by I-4 in Segments 3A and 3B. From 15th Street to the 21st/22nd Streets interchange on the north side of I-4, is predominantly low-income single-family residential. On the south side of I-4 from 15th Street to the 21st/22nd Streets interchange is vacant property, with the exception of an industrial warehouse complex at 19th Street and the U.S. Post Office at the corner of 21st Street and the interstate. There are several small commercial properties surrounding the 21st/22nd Streets interchange, on the north and south side. From 22nd Street to the CSX Railroad transportation corridor the land use on both the north and south side of the I-4 corridor is predominantly low-income, single-family residential. On the north side of I-4, on the corner of 14th Avenue and 29th Street, is the American Legion complex. South of I-4, just west of the CSX Transportation Railroad corridor, is a Tampa Electric Company sub-station.

From the proposed I-4/Crosstown Connector corridor east of 30th Street, the variety of land uses includes residential, commercial, a Florida Department of Transportation drainage area and several large industrial complexes. On the south side of I-4 at 38th Street is the Tampa Electric Company's maintenance yard. There are several commercial properties surrounding the 39th Street/40th Street interchange. The area

between the 39th/40th Streets interchange extending past the 50th Street/Columbus Drive interchange is comprised of many different types of land uses including commercial, industrial, multi-family residential, single-family residential and some vacant land east of 50th Street.

The area immediately surrounding the Columbus Drive/50th Street/I-4 interchange consists of motel complexes. The area surrounding 14th Avenue (the new Columbus Drive relocated) west of 50th Street is residential adjacent to the interstate. The Oak Park Elementary School is located on the southeast corner of 14th Avenue and 50th Street south of a motel complex. The area east of 50th Street (which will be affected) is comprised of a fast food restaurant, a mobile home park and several single-family residences.

Design Study Segment 4A, 4B and 4C

Just east of 50th Street at the beginning of Segment 4A on the south side of I-4 is a large vacant parcel comprised of borrow pits and wetlands. This parcel is located between 21st Avenue and Buffalo Avenue on the south side of I-4. On the north side of I-4, between Chelsea Avenue and Hillsborough Avenue, is a large single-family residential development, the East Lake Subdivision. At the I-4/Buffalo Avenue interchange on Chelsea Avenue is the Belz Factory Outlet Mall; there is predominantly vacant land north of Chelsea Avenue, including a large piece of property owned by the Hillsborough County School Board.

Between the Buffalo Avenue interchange and the Orient Road interchange on the south side of I-4 is a large commercial development and single-family residences. Between the Orient Road interchange and U.S. 92 (Hillsborough Avenue), on the north side of I-4, is the Seminole Indian Tribe Trading Post and vacant land. There is agricultural land on the north side of I-4 from the Hillsborough Avenue overpass to the U.S. 301 interchange. On the south side between these two interchanges is the Florida State Fairgrounds. In the northeast and southeast quadrants of the U.S. 301 interchange are agricultural lands with some single-family residences adjacent to the Tampa By Pass Canal. Between the Tampa By Pass Canal and I-75 are several single-family residential areas.

Design Study Segment 5A, 5B, 5C and 5D

The land uses in study segments 5A-5D are predominantly single-family residential. Commercial usage can be found around the interchange areas. There are several land uses which should be noted within this segment. The Hillsborough County Seminole Branch Library is located at the southwest corner of Osborne Avenue and I-275. In the southeast quadrant of the Hillsborough Avenue interchange at I-275 is the Seminole Heights Baptist Church and School. At the northwest corner of Hanna Avenue and I-275 is the Seminole Heights School. On the east side of the interstate, south of Sligh Avenue at Knollwood Street and Nebraska Avenue, is the Sulphur Springs Station of the U.S. Post Office. On the east side of I-275 at Hanna Avenue is the Seminole Heights United Methodist Church and the Seminole Heights Elementary School. There are several commercial land uses at the Sligh Avenue interchange.

North of Sligh Avenue, east of I-275, is the Grover Cleveland School. On the west side of I-275 between Broad Street and the Hillsborough River is the large multi-family residential complex Riverview Terrace. North of the Hillsborough River between Waters Avenue and Bird Avenue on the east side of the interstate is the Tampa Dog Track. At the southwest corner of Waters Avenue and I-275 is a shopping center. The Yukon Street Park-n-Ride lot is located north of Yukon Street on the west side of the interstate.

Land use between Waters Avenue and Busch Boulevard is predominantly single-family residential with the exception of the multi-family residential complex, the Westchester Manor Condominiums, at the southwest corner of Busch Boulevard and I-275. In the northwest quadrant of the Busch Boulevard and I-275 interchange is the Floriland Shopping Mall. In the northeast quadrant of the interchange between Nebraska Avenue and I-275 is the Ramada Inn.

The area north of Busch Boulevard to Linebaugh Avenue is predominantly residential including single-family, multi-family and a mobile home park. The Most Holy Redeemer Church and School is on the west side of I-275 at Linebaugh Avenue and Central Avenue.

Design Study Segment 5E, 5F and 5G

The area between Bougainvillea Avenue to Fowler Avenue is predominately single-family residential. On the west side of I-275 north of 109th Avenue on Central Avenue is the University Academy Pre-School and the University Church of God. There are two stormwater management ponds, one at the northeast corner of Bougainvillea Avenue and I-275 and one on the west side of I-275, south of Fowler Avenue.

The retail center, Save-n-Pack, is located on the southeast corner of the Fowler Avenue/I-275 interchange. There are also several commercial properties surrounding this interchange, many are motel complexes. On the west side of I-275, between 122nd Avenue and 124th Avenue, is the Miles Elementary School. There are several commercial properties on the east side of the Fletcher Avenue/I-275 interchange and in the southwest quadrant of the interchange. The northwest quadrant of this interchange is predominantly vacant. There is a mobile home park located north of the Fletcher Avenue interchange on the east side. North of the mobile home park is Goodwill Industries and Levitz Furniture. On the east side of I-275, north of Fletcher Avenue is a private recreational area - the Malibu Grande Prix Race Track and Miniature Golf Center. There is a mobile home park and a multi-family complex between Nebraska Avenue and I-275 south of April Lane. There are some commercial property uses located around the Bearss Avenue interchange area.

Design Study Segments 6A and 6B

This study segment traverses mostly vacant and agricultural land. There are several single-family residences scattered along the interstate in this study segment. There are several developments proposed in the surrounding area of this study segment. A discussion of these proposed developments follows.

Proposed Developments

Although the majority of the interstate study area traverses a developed, urbanized area, the outlying areas of the interstate near the Pasco County line and east near U.S. 301 and I-75 are experiencing tremendous growth. There are many proposed developments in these areas, which may or may not become a reality. Through the public involvement program, many of these proposed developments were identified and are discussed below. This discussion is not all inclusive of every development in the formative stages of planning. The County Comprehensive Plan provides developmental guidelines for the new developments.

East Tampa

In the southeast quadrant of the I-4/U.S. 301 interchange, a 61 acre corporate office and office motel complex is planned by Arvida. The Arvida Corporate Park development has received Development of Regional Impact (DRI) approval.

The Vandenburg Airport, located north of I-4 and east of U.S. 301, has plans for adding an additional runway in approximately three years. This will enable the airport to expand their service.

North Tampa

This area is the fastest developing area in Tampa. The forerunner of these developments is Tampa Palms, located between I-275 and I-75 north of Fletcher Avenue. Tampa Palms, a multi-use satellite community, continues to expand their residential and commercial aspects. Tampa Palms is the largest single development in the area.

The Saddlebrook development, located north of the Pasco County line on I-75 near S.R. 54, will include a 2,600 acre residential/resort development with an accompanying 3.1 million-square-foot corporate center.

The 500 acre Hidden River Corporate Park on Fletcher Avenue and I-75 will offer 4,200,000 square feet of office space, 145,000 square feet of retail use and two hotels.

Hunter's Green is a predominately residential community located at County Road 581 near I-75. When completed the development will cover 1,900 acres and provide more than 4,500 residences and 200,000 square feet of commercial uses.

There are many other developments planned for the North Tampa area; this will continue to increase the demand for supporting transportation facilities.

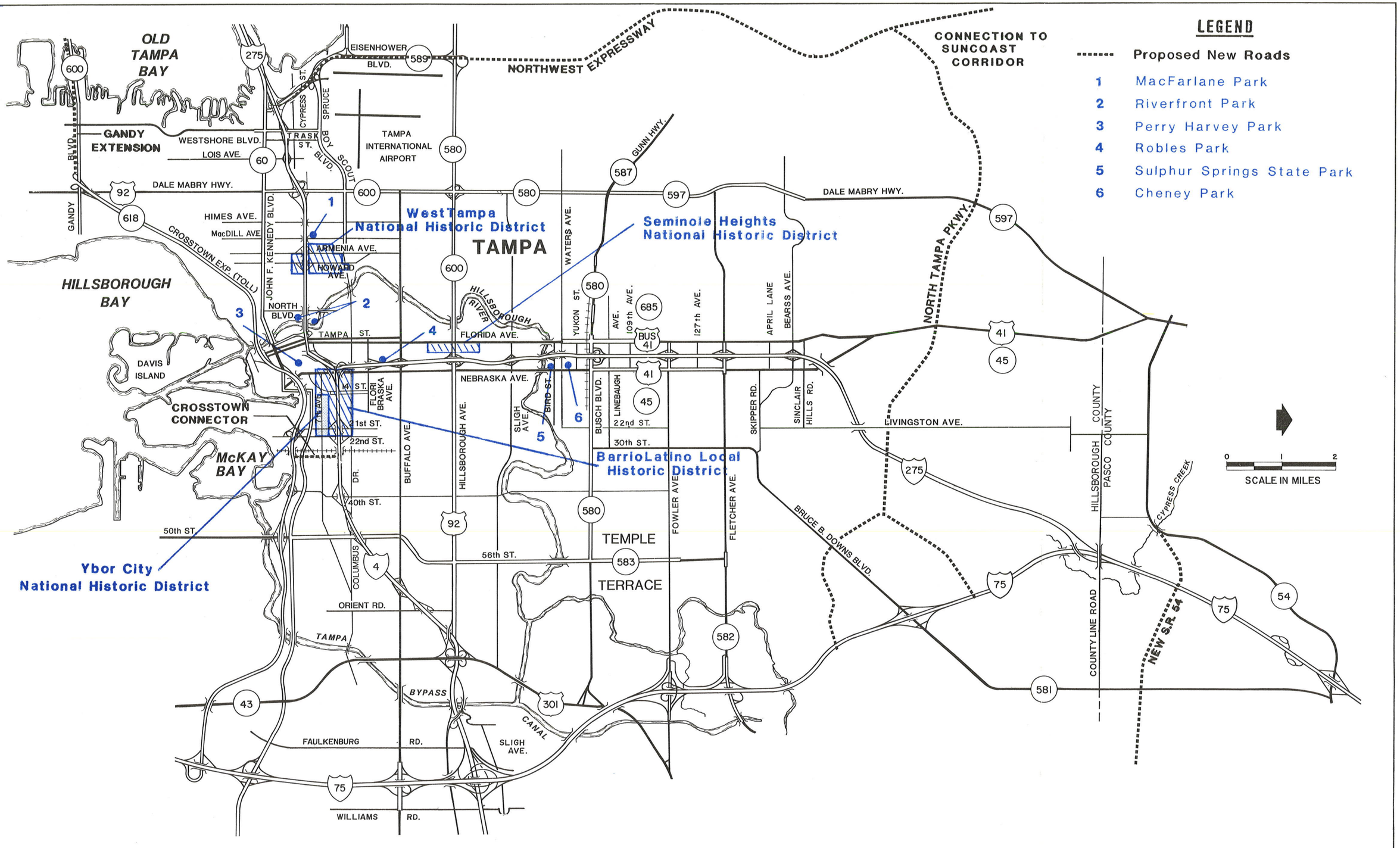
Cultural Features

The urban nature of the Tampa Interstate Study area results in the improvements abutting a number of major cultural features. The three resources discussed in this section are historic districts, archaeological sites and recreational facilities. These features are shown on Exhibit IX-1.

Historic Districts

The initial construction of the Tampa Interstate System divided the West Tampa and Ybor City neighborhoods. These were later designated as Historic Districts and listed on the National Register of Historic Places.

West Tampa, which was a 200 acre marsh area, was developed as a separate city in 1892 by Hugh Campbell MacFarlane. The city was planned as an industrial community with nearby worker housing. Although ethnically diverse, it had a Latin flavor and contained a concentration of cigar manufacturing. The area was incorporated into the City of Tampa in 1925. Many of the cigar manufacturing structures and the surrounding housing remain. The original interstate construction bisected the community and resulted in the Historic District extending on both sides of the interstate. The proposed improvements in Design Segment 2A impact structures within the Historic District, primarily south of the interstate.



HISTORIC DISTRICTS AND RECREATIONAL FACILITIES

EXHIBIT IX-1

A Florida Department of Transportation Project

Ybor City, Tampa's former Latin Quarter, was once the world's center for handmade cigars. The area began developing prior to the turn of the century; although much of the area's construction occurred in the 1920's and 1930's. Urban Renewal resulted in the destruction of the area directly south of I-4 in the 1960's. The nationally designated Ybor City Historic District as shown on Exhibit IX-1 is limited in area, but the locally designated Barrio Latino Historic District covers a larger area on both sides of I-4. The improvements to I-4 do not extend into the Nationally listed Ybor City Historic District, but will impact the locally designated Barrio Latino Historic District, which extends into Segments 2B and 3A.

The National Park Service is currently preparing a Statement of Significance to request National Historic Landmark designation for the locally designated Barrio Latino Historic District. The Statement of Significance will be submitted to the National Park Service Advisory Council on Historic Landmarks in May 1989. If approved by the Council, the Statement of Significance will then be submitted to the U.S. Department of the Interior for approval by the Secretary.

The Seminole Heights historic area in Segment 5A is located between Idlewild Avenue (north), Cayuga Street (south), Suwannee Avenue (west) and mid-block between Central Avenue and I-275. There are approximately 11 contributing structures adjacent to the interstate. The proposed TIS Master Plan improvements do not significantly affect this district; however, there are some localized right-of-way takings adjacent to the historic area.

Impacts

As part of the evaluation process, a great deal of attention was given to impacts on historical neighborhoods and the use of design amenities to mitigate those impacts. (See Section VIII for more detail on design amenities.) The identification of feasible alternatives included the evaluation of horizontal and vertical alignment shifts to assess impacts. The proposed improvements in Design Segments 2A, 2B and 3A have minimal impact on the historic districts. No structures are removed in the Ybor City Historical District; however, a number of structures will be removed north of I-4 which are located in the locally designated Barrio Latino Historic District. All impacts in West Tampa occur in the district south of I-275 between Armenia Avenue and Freemont Avenue. A Section 4(f) determination of the Department of Transportation Act of 1966 will be made during Phase II, Environmental Documentation, and the appropriate documents will be prepared for both areas.

Archaeological Sites

As a part of the Advance Notification Process, the State Historic Preservation Office (SHPO) was notified of the Tampa Interstate Study initiation. The study team received confirmation that no detailed archaeological study of the area had been done. It is anticipated no significant undisturbed archaeological sites occur along the interstate because of previous construction and urban development. A detailed archaeological survey will be conducted as a part of the Phase II Environmental Documentation.

Parks and Recreation

There are six parks that are in proximity to the Tampa Interstate as shown on Exhibit IX-1. MacFarlane Park (Segment 2A), Riverfront Park (Segment 2B), Perry Harvey Park (Segment 2B), Robles Park (Segment 2B), Sulphur Springs State Park (Segment 5C) and Cheney Park (Segment 5C). The only parks that will be directly impacted by the expansion of the interstate will be Riverfront Park and Robles Park. Right-of-way for roadway expansion will be needed from Riverfront Park. Additional right-of-way for stormwater management via expansion of the existing stormwater facility will be necessary in Robles Park. The appropriate Section 4(f) documents and Section 106 Consultation Process for these parks will occur during the Phase II Environmental Documentation.

Community Services

A principal goal of the Tampa Interstate Study is to ameliorate or soften the potential adverse impacts which could be created by a large-scale reconstruction project such as the interstate project. It is realized that a reconstruction project of this magnitude will inevitably result in impacts to the surrounding community. The purpose of the study is not only the inventory of possible impacts, but to blend the interstate improvements into its environment. To accomplish this goal, and to lessen the extent of any possible impacts, a wide range of existing community-level services and facilities were examined during the study. Impacts related to public and quasi-public land uses and residential communities are assessed in this section of the Master Plan report.

Schools

The majority of the study area is served by the Hillsborough County School District. A small portion in the northern study area is served by the Pasco County School District.

There are approximately 20 Hillsborough County Public School facilities identified in the Tampa Interstate Study area. Approximately five privately owned school facilities exist within the study area. These facilities have been identified and inventoried in the Tasks E5 and E6 land use and cultural features study efforts. Principal impacts associated with the interstate reconstruction are possible relocations of students and changes in circulation patterns.

Inventories of potential residential relocations were made based on the additional right-of-way requirements. Approximately 1,121 single and multi-family relocations are expected to occur from the reconstruction of the interstate. It is not known how many school age children would be affected by these relocations; however, it is possible for those families with students to relocate within their same school's draw area.

The individual school bus routes for each of the affected schools will not require any substantial routing changes. In addition, local circulation and access will be enhanced in many areas due to added frontage road systems and new cross corridor access. Sidewalks and bike lanes will be provided on both sides of all reconstructed local streets crossing under the interstate. Overall transportation system improvements (particularly the local surface street system) will enhance school bus operations. This positive impact on School Board operations will affect a large population of students and School Board personnel.

Several Hillsborough County Public Schools administrative facilities will be affected by the reconstruction of the interstate including the following: Hillsborough County School Board of Public Instruction facilities (Department of Student Services, Department of Education for Exceptional Students and the Industrial Service Center), the George W. Carver Adult Day Care Center and the J.W. Rhodes Education Building. The Oak Park Elementary School recreation area will also be impacted by the rerouting of Columbus Drive. Coordination has continued throughout the study with the School Board facilities management staff so that they may make plans for relocation of their facilities.

Libraries

Three public libraries are within the immediate area of the interstate. The West Tampa Branch Library, the Ybor City Branch Library and the Hillsborough County Seminole Branch Library. These facilities will not be directly impacted by the reconstruction of the interstate.

Non-Profit Organizations

Churches

Approximately eighty churches were identified in the Tampa Interstate Study area. Of these eighty churches the following churches will be directly impacted or relocated by the reconstruction of the interstate:

* Agape Fellowship (Segment 2A);
* Bethel A.M.E. Church (Segment 2B);
* Greater Bethel Baptist Church (Segment 2B);
* Baptist Fellowship Bible College of Tampa (Segment 2B);
* Friendly Missionary Baptist Church (Segment 2B);
* Faith Temple Missionary Baptist Church (Segment 2B);
* First Born Pentecostal Church of Jesus (Segment 2B); and
* Pentecostal Christian Fellowship Church (Parking Only) (Segment 4B).

Currently, the Master Plan impacts the Greater Bethel Baptist Church on Orange Street in Segment 2B. Right-of-way needed for the Orange Street ramps was acquired from the church to avoid impacts to the Perry Harvey Park. However, during the Phase II Environmental Documentation, a review will be conducted by the State Historic Preservation Office to determine if the Greater Bethel Baptist Church may have historical significance. If historical significance is determined, the right-of-way could be shifted and taken from the Perry Harvey Park; a comparative analysis will be undertaken.

Coordination has continued throughout the study with the majority of the churches that will be impacted. A tentative schedule for right-of-way acquisition has been provided to the churches so they can make relocation plans for their facility, if that is required.

The Boys and Girls Clubs of Greater Tampa

The Boys and Girls Clubs of Greater Tampa are located at the southeast corner of MacDill Avenue and I-275 (Segment 2A). The reconstruction of the interstate will necessitate the relocation of this facility. There may be sufficient property left in the remainder of the parcel to rebuild the facility.

Salvation Army

The Salvation Army Educational Center, located at the northwest corner of Kay Street and Florida Avenue, will be impacted by the reconstruction of the interstate. Coordination with the Salvation Army has continued throughout the study.

Police, Fire and Emergency Medical Services

Coordination with the City of Tampa Police Department, the Hillsborough County Sheriff's Department, Pasco County Sheriff's Department, the State of Florida Department of Highway Safety and Motor Vehicles (Florida Highway Patrol), Hillsborough County Bureau of Emergency Management, Hillsborough County Fire Department, and City of Tampa Fire Department has continued throughout the study. The following emergency medical services companies were also contacted for comments: Emergency Medical Services (Tampa), Medic One Ambulance Service (Tampa), S.A.S. Ambulance Service (St. Petersburg), and Rural Metro Ambulance Service (Brandon).

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

Additional non-interchanging cross corridor access has been provided for better local circulation at Sherrill Street (Segment 1A), Faulkenburg Road (Segment 4C), 109th Avenue (Segment 5E), April Lane (Segment 5G), and Sinclair Hills Road (Segment 5G). In addition to the improved interchange access of the interstate, the High Occupancy Vehicle (HOV) priority access ramps at Trask Street, Tampa and Morgan Streets, Orient Road, Yukon Street, and Sinclair Hills Road could be used by law enforcement agencies and emergency vehicles during emergencies. The design of local street modifications has been coordinated with the law enforcement and emergency services agencies to ensure proper turning radii, cul-de-sac length and local street connections.

With the initiation of Traffic Surveillance and Incident Management (see Section VII), emergency response times will be greatly improved. The possibility of using movable barriers for emergency access will be investigated further in the Phase II studies for the Tampa interstate.

Only one emergency service facility will be relocated by the reconstruction of the interstate, the City of Tampa Fire Department Communications Division at the corner of Mathews Avenue and Taliaferro Avenue.

Public Transit

Coordination and consultation with Hillsborough Area Regional Transit Authority (HART) occurred throughout the study in conjunction with the transit element of this study (see Section VI). Bus services to the community can be greatly improved by reduced travel times resulting from the interstate reconstruction. This is accomplished with the exclusive High Occupancy Vehicle Lanes (HOV), HOV priority access ramps

and additional cross corridor access. The development of new park-n-ride lots and the enhanced accessibility to existing park-n-ride lots will further decrease transit travel times and enhance the desirability of bus service. See Section VII for the locations of park-n-ride lots.

City Sanitation

The Hillsborough County Department of Solid Waste and the City of Tampa Sanitation Department, as well as private sanitation companies, were contacted for comments. Local streets, cul-de-sacs and alley connections were designed to meet the operating criteria for the various sanitation service vehicles. Although every effort was made in the planning of local streets, some modifications in routing patterns were necessary. No significant adverse impact to sanitation services has been identified. It is anticipated that improved traffic circulation will enhance these public services.

Noise

A preliminary noise evaluation was conducted for the project which was aimed at the identification of noise sensitive sites in the study area, the prediction of future noise levels in representative locations, and the examination of the feasibility of noise abatement measures to mitigate noise impacts.

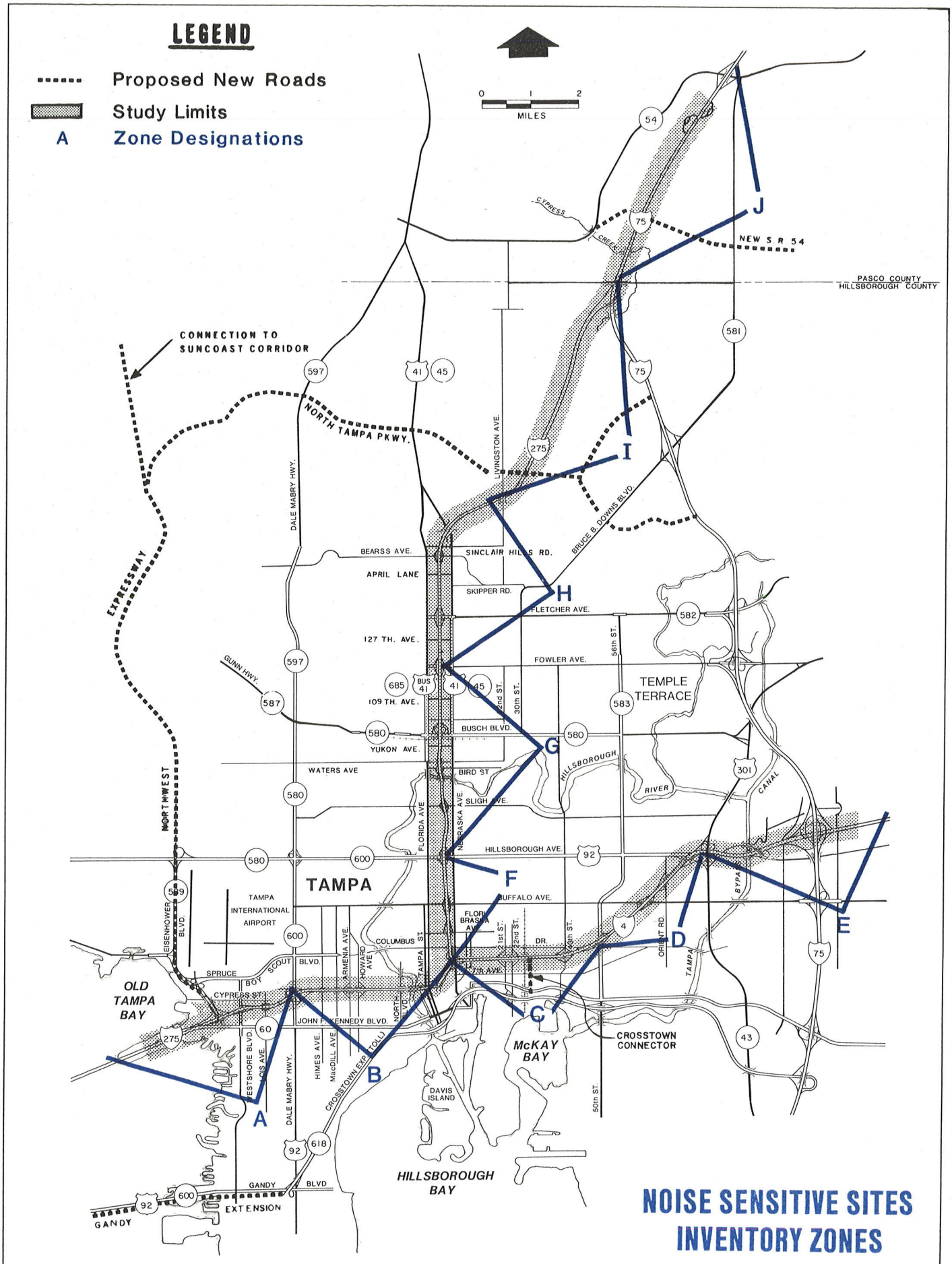
Noise Sensitive Sites

An inventory of noise sensitive sites in the study area was developed through the interpretation of aerial photographs, land use maps, and field observations. Sensitive sites were grouped into ten geographic zones within the study area, designated as A through J (Exhibit IX-2). Table IX-1 summarizes the sensitive sites inventory by zone. Noise sensitive areas found close to the study area were mainly neighborhoods with single family homes and apartment buildings. Other sensitive areas included mobile homes, schools, libraries, churches, motels, and parks. In many areas along the interstate, noise sensitive sites were found on both sides of the roadway directly adjacent to the right-of-way. Most of these were older neighborhoods which remained after the initial construction of the interstate over 20 years ago.

The Federal Highway Administration (FHWA) has developed criteria which, when exceeded, requires the examination of various noise mitigation measures. These criteria consider the land use and projected noise levels. Table IX-2 provides the FHWA noise abatement criteria. Most of the sensitive areas adjacent to the roadway were considered to be activity Category B, for which the criteria noise level is 67 dBA (Leq1) exterior.

Noise Measurements

Noise monitoring was conducted in the project area to validate the computer model used in noise prediction analysis. The procedures for noise monitoring were based on the methodologies described in the FHWA reports, Fundamentals and Abatement of Highway Traffic Noise and Sound Procedures for Measuring Highway Noise. The measure utilized for monitoring and subsequent prediction analyses was the hourly



NOISE SENSITIVE SITES INVENTORY ZONES

EXHIBIT IX-2

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY / THE GREINER TEAM

TABLE IX-1

NOISE SENSITIVE SITES INVENTORY SUMMARY
Tampa Interstate Study

Zone	Single Family Neighborhoods	Multi-Family Complexes	Mobile Home Parks	Schools	Churches	Historic Sites	Recreational Facilities	Funeral Homes	Motels	Cemeteries	Libraries	Music Facilities	Total Sensitive Sites
A	4	1	0	0	6	0	1	0	3	0	0	0	15
B	4	21	0	14	29	1	9	3	6	1	1	0	89
C	9	14	0	8	18	4	8	0	6	0	1	0	68
D	5	11	0	2	7	0	3	0	2	0	0	1	31
E	7	0	9	1	6	0	1	0	2	0	0	0	26
F	2	3	0	2	5	0	1	2	0	0	1	0	16
G	11	9	9	6	18	0	4	1	16	0	0	1	75
H	11	7	9	3	7	0	1	0	9	0	0	0	47
I	2	1	0	0	2	0	0	0	0	0	0	0	5
J	2	1	0	0	2	0	0	0	1	0	0	0	6
Total	57	68	27	36	100	5	28	6	45	1	3	2	378

TABLE IX-2

FHWA NOISE ABATEMENT CRITERIA
Tampa Interstate Study

Activity Category	Leq (h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D		Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

References: 27 CFR, Part 772

equivalent sound level (Leq1). Hourly Leq is the equivalent steady state sound level which in an hour would contain the same acoustic energy as the time-varying sound level during the same period. Leq is measured in A-weighted decibels (dBA) which closely approximates human frequency response.

Noise measurements were taken at eleven sites in the study area. Traffic data, including volume, speed, and vehicle mix were obtained during the measurement period. The FHWA's STAMINA computer model was used in the prediction analysis and was validated by running the program with the traffic data gathered during noise monitoring and comparing the model's results with the measured results. The model's results were found to be within an acceptable difference of 3 dBA of the actual measured results. Based on this comparison, the STAMINA model was considered to be a reliable tool for the prediction of noise levels for this project.

Noise Level Predictions

The future noise levels within the study area were evaluated by modeling representative locations within each design segment with the STAMINA model. Locations were selected which were reasonably representative in terms of typical section, vehicle operating characteristics, and physical configuration within the

design segments. For worst-case conditions, the modeling assumed peak hour vehicle volumes travelling at the posted speed limit in the year 2010.

The results of the analysis were expressed in terms of isopleths, which relate the approximate distance, in feet from the roadway centerline, where a level of 67 dBA (Leq_1) could be expected to occur. As discussed earlier, 67 dBA (Leq_1) is the noise level for activity Category B land uses such as single family homes, apartments, parks, and hotels. Table IX-3 provides the 67 dBA isopleths for representative locations within each design segment.

Areas of possible noise impact were determined by placing the calculated isopleth lines on conceptual design plans, examining land use, and determining if the noise abatement criteria would be exceeded. It was found that in most portions of the study corridor, the sensitive areas located near the interstate system would experience noise levels which exceed the FHWA noise abatement criteria.

TABLE IX-3

67 dBA NOISE ISOPLETHS
Tampa Interstate Study

Design Segment	Segment Description	Approximate Distance from the Roadway Centerline Where 67 dBA (Leq_1) Would Occur (ft)
1	I-275 from Howard Frankland Bridge to east of Himes Ave.	850
2	I-275 from east of Himes Ave. to north of Buffalo Ave. and I-4 from the I-275 Junction to 14th St.	900
3	I-4 from 14th St. to east of 50th St.	620
4	I-4 from east of 50th St. to east of I-75 Interchange	710
5	I-275 from north of Buffalo Ave. to north of Linebaugh Ave.	1400
6	I-275 from south of Livingston Ave. to Hillsborough/Pasco County Line	1075

Noise Abatement Measures

A variety of noise abatement measures were evaluated. Noise barriers and land use controls effectively minimize the noise impacts of the proposed improvements. Measures determined not to be prudent or effective included the reduction of speed limits, restrictions on trucks, and time restrictions.

A preliminary noise barrier analysis was accomplished by modeling barriers of various heights and locations in representative areas with the OPTIMA model. In each case, the barriers evaluated were designed to shield sensitive locations from the interstate at the right-of-way in areas outside the influence of interchanges. Table IX-4 summarizes the effectiveness of barriers at various heights at representative locations. As shown, the higher the barrier, the greater the noise reduction.

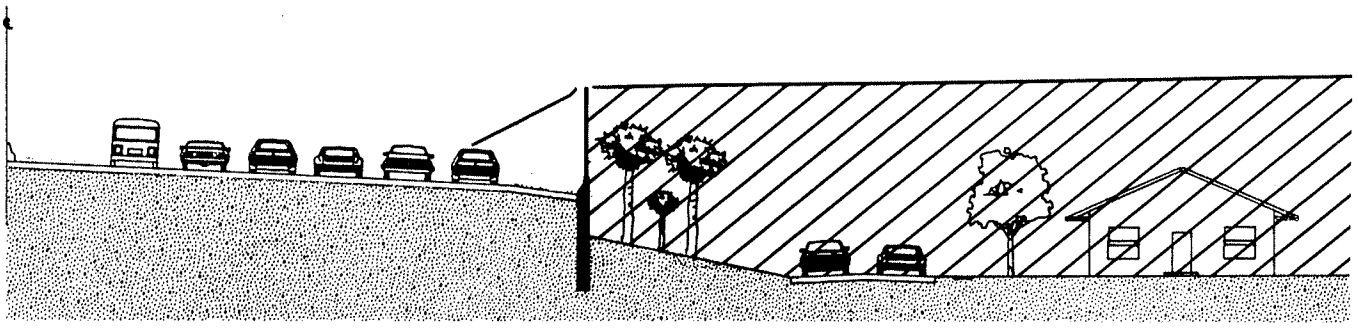
Using the information obtained in modeling at representative sites, a process of qualitatively selecting candidate noise barrier locations was performed. Candidate locations were selected which were anticipated to exceed the FHWA noise abatement criteria with the improvements; occurred in areas where barriers were physically feasible; and were in areas of sufficient density to allow cost-effective barriers.

In the urban portions of the study area, the limited amount of available right-of-way, numerous grade separations (interchanges and overpasses), and frequent bridge structures make it necessary to make special considerations in order to construct effective noise barriers. For the most part, the limited right-of-way and elevated roadway characteristics do not make it feasible to use earthen berms as barriers. In most cases, barriers would have to be constructed as space efficient walls of any of a variety of materials depending upon the roadway design and aesthetic considerations. Along retaining wall sections, at grade sections, and access ramps, concrete walls would be appropriate. On overpass bridges and flyover ramps, lighter weight materials such as wood, plastic, glass, or composite materials may be necessary. At interchanges, a dual set of walls may be necessary on one or both sides of the roadway to shield the interstate as well as access ramps. In some situations, the use of sound absorbing materials may be desirable to reduce reflected sound between the parallel barriers on one side of the roadway. This may include the application of special acoustic materials to the wall face or the use of earth/concrete/vegetative composite walls. Exhibit IX-3 illustrates examples of possible noise barriers in urban areas.

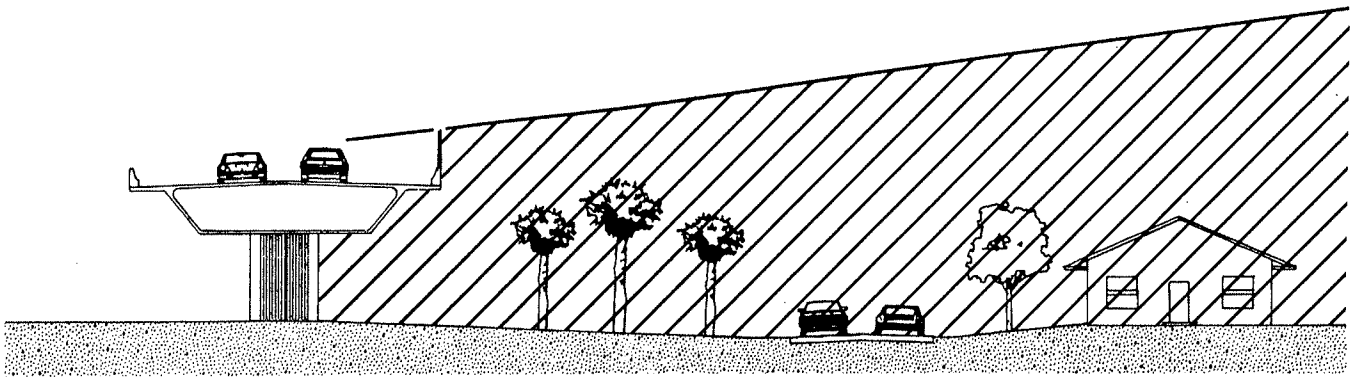
In the rural portions of the study area where more right-of-way may be available, noise barriers may be constructed as earthen berms, concrete walls, or combinations of the two. These barriers could be enhanced visually through the use of pattern, color, texture, and vegetative plantings. Exhibit IX-4 illustrates examples of barriers in rural areas.

The use of land use controls by local agencies with zoning jurisdiction is recommended in order to minimize the development of noise sensitive uses adjacent to the interstate. The appropriate local agencies will be provided guidance by the FDOT regarding the suitability of various land uses with respect to projected noise levels from the interstate system. The local agencies should subsequently use this information to zone undeveloped areas for uses which are compatible with the projected noise levels.

The noise analyses accomplished to date are preliminary in nature. In Phase II of the project study, detailed evaluations of existing and future noise conditions will be performed. At that time, detailed noise barrier evaluations will provide the approximate heights and locations of cost-effective noise barriers. The actual design of the barriers will involve the opinion of the community regarding location, barrier type, and appearance.



BARRIER ON RETAINING WALL



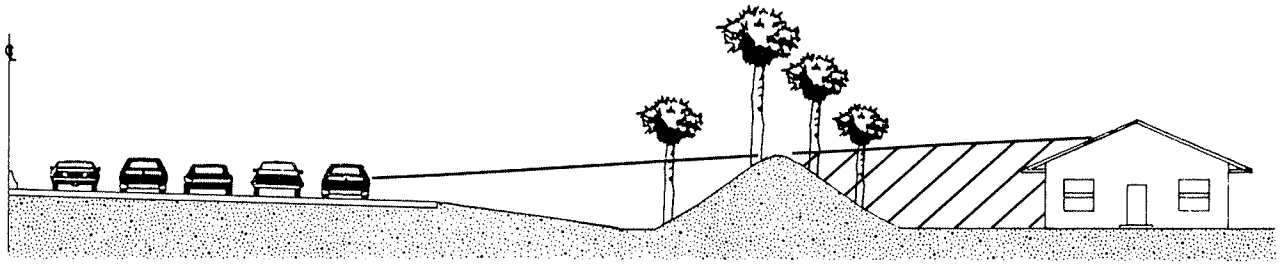
BARRIER ON BRIDGE

LEGEND

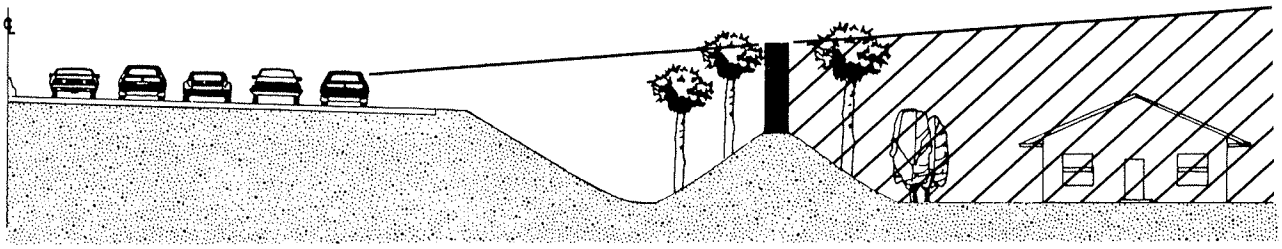
AREA OF NOISE REDUCTION

EXAMPLE NOISE BARRIERS IN URBAN AREAS

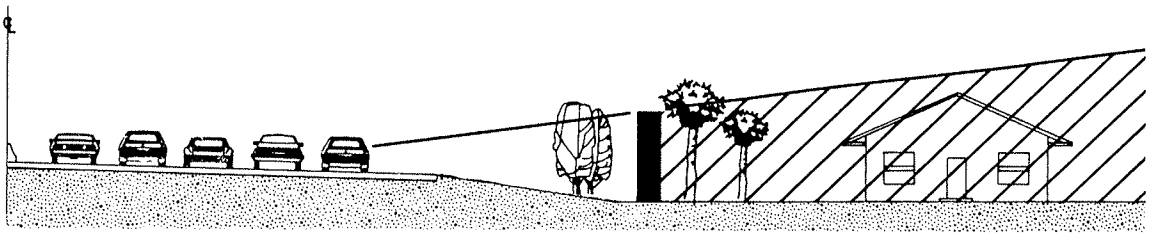
EXHIBIT IX-3



EARTHEN BERM



FREESTANDING WALL ON EARTHEN BERM



FREESTANDING WALL

LEGEND

AREA OF NOISE REDUCTION

EXAMPLE NOISE BARRIERS IN SUBURBAN AND RURAL SECTIONS

EXHIBIT IX-4

TABLE IX-4

NOISE BARRIER EFFECTIVENESS SUMMARY
Tampa Interstate Study

Design Segment	No Barrier	Hourly LEQ (dBA) 500' from Interstate Centerline with Concrete Noise Barrier				
		9' High	12' High	15' High	18' High	21' High
1	68	62	60	59	58	57
2	70	63	61	59	58	57
3	67	62	61	59	58	56
4	69	65	64	62	61	59
5	69	65	64	62	61	59
1988 Cost Estimate ($/Linear Ft): Wood		77	112	151	216	282
Concrete		109	155	206	245	285
Steel		163	232	302	436	569

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Construction Noise

The construction and development of the proposed improvements would result in temporary noise increases within the study area. The noise would be generated primarily from traffic detours and heavy equipment used in hauling materials and building the roadway. Sensitive areas located close to the construction alignment may temporarily experience increased noise levels. Construction noise will be minimized to the greatest extent practicable through the adherence to controls listed in the latest edition of FDOT's Standard Specifications for Road and Bridge Construction.

Air Quality

This section briefly describes what is known about the existing air quality in the vicinity of the study area, identifies project-related sources of air emissions, and generally quantifies the impact of the proposed improvements on regional air quality.

Existing Conditions

Because this project is located within portions of both Hillsborough and Pasco counties, the Florida Department of Environmental Regulation (FDER) and the Hillsborough County Environmental Protection Commission (HCEPC) share responsibility for managing the air quality within the study area.

Meteorological conditions and topography play an important role in the formation and transport of air pollutants. Overall, Hillsborough and Pasco counties are characterized meteorologically by persistent light winds, moderate to high temperatures, high relative humidity, and intense sunshine. The topography of the study area is largely characterized by flat terrain with low-rise development and scattered parcels of open space. There are no physical barriers such as valleys, mountains, or urban canyons which create microclimates or further entrap air pollutants.

Monitoring is the most reliable means of determining ambient air quality conditions. Presently, the HCEPC operates several air monitoring stations in or near the study area, and a general profile of existing air quality conditions was derived from this information.

A synopsis of the most recent air monitoring data obtainable is presented in Table IX-5. This information was summarized in terms of monitoring station location, distance and direction from the study area, pollutant(s) measured, and maximum recorded concentration. Comparison of these data with the Ambient Air Quality Standards (AAQS) was also made.

Based upon the available air monitoring information, ozone (O_3) is the air pollutant of primary concern in the vicinity of the study area. In past years, violations of the O_3 standard have occurred. However, these violations are considered regional in nature and therefore not restricted to the study area. Notably, the closest air monitoring station to the study area (Seminole School) has recorded both particulate matter (PM) and carbon monoxide (CO) concentrations that are within acceptable levels.

According to the Clean Air Act Amendments of 1977, all areas within the state are to be designated with respect to the AAQS as either attainment, non-attainment, or unclassifiable. Areas that meet the AAQS are designated as attainment. Conversely, areas that violate the AAQS are designated as non-attainment. Finally,

TABLE IX-5

AIR MONITORING DATA IN THE VICINITY OF THE TAMPA INTERSTATE STUDY AREA

Station Number	Monitoring Station Location[a]	Distance and Direction from the Study Area	Pollutant(s) Measured	Maximum Recorded Concentration[b]	Air Quality Standard[c]	Duration	Exceeds Standard
1	Downtown Tampa	0.8 miles, S	Particulates	115 ug/m³	150 ug/m³	24-hour max	No
				59 ug/m³	75 ug/m³	Geometric mean	No
2	Palma Ceia	1.3 miles, S	Particulates	90 ug/m³	150 ug/m³	24-hour max	No
				45 ug/m³	75 ug/m³	Geometric mean	No
3	Davis Island	1.6 miles, S	Particulates	94 ug/m³	150 ug/m³	24-hour max	No
				49 ug/m³	75 ug/m³	Geometric mean	No
			Sulphur dioxide	25 ug/m³	80 ug/m³	Arithmetic mean	No
				91 ug/m³	365 ug/m³	24-hour average	No
				369 ug/m³	1300 ug/m³	3-hour average	No
			Ozone	.127 ppm	.120 ppm	1-hour average	Yes
4	Hookers Point	1.3 miles, S	Particulates	108 ug/m³	150 ug/m³	24-hour max	No
				46 ug/m³	75 ug/m³	Geometric mean	No
5	HCC	1.6 miles, S	Carbon monoxide	14 ppm	35 ppm	1-hour average	No
				5 ppm	9 ppm	8-hour average	No
6	Beach Park	0.9 miles, S	Ozone	.164 ppm	.120 ppm	1-hour average	Yes
7	Ybor City	0.2 miles, S	Sulphur dioxide	25 ug/m³	80 ug/m³	Arithmetic mean	No
				136 ug/m³	365 ug/m³	24-hour average	No
				585 ug/m³	1300 mg/m³	3-hour average	No
			Nitrogen dioxide	45 ug/m³	100 mg/m³	Arithmetic mean	No
			Carbon monoxide	8 ppm	35 ppm	1-hour average	No
				5 ppm	9 ppm	8-hour average	No
8	Seminole School	50 feet, W	Particulates	99 ug/m³	150 ug/m³	24-hour max	No
				56 ug/m³	75 ug/m³	Geometric mean	No
			Carbon monoxide	14 ppm	35 ppm	1-hour average	No
				7 ppm	9 ppm	8-hour average	No

[a]Monitoring Station address:

1. 1105 E. Kennedy Blvd.
2. 1400 Church Ave.
3. 155 Columbia Dr.
4. 311 S. 22nd St.
5. N. Dale Mabry Hwy./Tampa Bay St.
6. Bay Way St.
7. 1900 9th Ave.
8. 6201 Central Ave.

[b]Florida Department of Environmental Regulation, ALLSUM Report, 1987

[c]Ambient Air Quality Standards established by the EPA.
ppm = parts per million
ug/m³ = micrograms per cubic meter

areas where data are insufficient for classification as either attainment or non-attainment are designated as unclassified. For those areas designated as non-attainment, a State Implementation Plan (SIP) is developed to bring the area into compliance with the AAQS. The current attainment, non-attainment and unclassifiable designations for Hillsborough and Pasco counties are shown in Table IX-6.

As shown in Table IX-6, the U.S. Environmental Protection Agency (EPA) has designated Pasco County as an attainment area for all AAQS pollutants. By comparison, Hillsborough County has been designated as an attainment area for CO, nitrogen dioxide (NO_2), and lead (Pb); a non-attainment area for O_3 and PM; and unclassified for sulfur dioxide (SO_2).

TABLE IX-6

ATTAINMENT/NON-ATTAINMENT DESIGNATIONS[a] FOR HILLSBOROUGH AND PASCO COUNTIES
Tampa Interstate Study

	Designations	
Pollutant	Hillsborough	Pasco
Carbon monoxide	Attainment	Attainment
Nitrogen dioxide	Attainment	Attainment
Sulfur dioxide	Unclassified	Attainment
Ozone	Non-attainment	Attainment
Lead	Attainment	Attainment
Particulate matter	Non-attainment	Attainment

[a]Source: Section 17-2, (410), (420), and (430) of the Florida Administrative Code.

Designations:
- Attainment: areas within which the AAQS are not being violated.
- Non-attainment: areas within which the AAQS are being violated.
- Unclassified: areas which cannot be classified as attainment or non-attainment.

As a result of these designations, Hillsborough County is currently subject to the guidelines of a SIP which call for the reduction and control of PM and hydrocarbon (HC) emissions, which are a precursor of O_3. As previously stated, violations of the O_3 standard are considered regional in nature. As such, all of Hillsborough County is designated as a non-attainment area for this pollutant. However, violations of the PM standard are considered on a smaller scale; therefore, the non-attainment area for PM is restricted to that portion of Hillsborough County surrounding the intersection of U.S. 41 and S.R. 60.

Project-Related Sources of Air Emissions

The primary source of air emissions associated with the proposed Tampa interstate improvements are those attributable to motor vehicles using the roadway corridor. Essentially, air emissions from motor

vehicles are the by-products of fossil fuel combustion and can vary greatly depending on the volume of traffic, travel distance, roadway operating conditions, fleet characteristics, and local climatology.

Exhaust gases from motor vehicle engines consist mainly of emissions of CO, nitrous oxides (NOx), and HC. Emissions of SO_2 and PM also occur, but to a lesser extent. Emissions can vary greatly because engine performance is less than optimum at power settings other than cruise. For example, from low to high operating speeds, emissions of CO and HC decrease while emissions of NOx increase. In addition, conditions such as over-capacity roadways, stop-and-go driving, and delay periods contribute to significantly increased motor vehicle emissions. (Construction activities which could have a short-term impact on local air quality are discussed later in this section of the report.)

Air Emissions Inventory

As a means of evaluating the effect of the proposed Tampa interstate improvements on regional air quality, an inventory of motor vehicle emissions was conducted. The air emissions inventory was based on the future-year (2010) average daily traffic volume and roadway operating conditions. For comparative purposes, the 2010 condition was evaluated with and without the proposed Tampa interstate improvements. Motor vehicle emission rates were obtained from the EPA-approved MOBILE3 motor vehicle emissions model and the EPA publication AP-42. Future-year roadway operational and design data were obtained from the Task F5e, Travel Demand Technical Report. Table IX-7 presents the results of the emissions inventory.

As shown in Table IX-7, by the year 2010, the proposed improvements associated with the Tampa interstate could result in an estimated 40 percent reduction in CO emissions generated by motor vehicles and an estimated 20 percent reduction in HC emissions, compared to the unimproved condition. These predicted reductions with the proposed improvements were a result of less roadway congestion, fewer periods of stop-and-go driving, and increased motor vehicle operating speeds throughout the project corridor. Emissions of NOx, SO_2 and PM were predicted to remain essentially the same, with or without the proposed improvements.

TABLE IX-7

FUTURE-YEAR (2010) EMISSIONS INVENTORY
Tampa Interstate Study

	Total Emissions (tons/day)				
Scenario	Carbon Monoxide	Nitrogen Oxides	Hydrocarbons	Sulfur Oxides	Particulate Matter
With Improvements	40	13	7	2	4
Without Improvements	66	13	9	2	4

Construction Impacts

Construction activities can have a short-term impact on local air quality, primarily during periods of site preparation, with particulate matter (dust) having the greatest impact. This impact would occur in association with excavation and earth moving; cement, asphalt, and aggregate handling; heavy equipment operation; use of haul roads; and wind erosion of exposed areas and materials storage piles.

The effects of dust would be temporary and would vary in scale depending on local weather conditions, level of construction activity, and the nature of the operation. Where excess dust is likely to become a problem, effective dust control measures can be implemented. These measures include:

* minimization of exposed erodible earth area to the extent possible;
* stabilization of exposed earth with grass, mulch, pavement, or other cover as early as possible;
* periodic sweeping, or application of water or stabilizing agents to the working and haulage areas;
* covering, shielding, or stabilizing of stockpiled material as necessary; and
* the use of covered haul trucks.

Community Cohesion

The reconstruction of the interstate system will not adversely affect community cohesion. The initial construction of the interstate severed many neighborhoods; however, these areas have been reestablished as cohesive neighborhoods. The local street modifications have been planned to maintain local circulation. In several areas, the addition of non-interchanging cross corridor access will enhance community cohesion. These new through streets are Sherrill Street, April Lane, 109th Avenue, Sinclair Hills Road and Faulkenburg Road.

In addition, the upgrade and extension of Sligh Avenue between U.S. 301 and I-75 will provide better neighborhood circulation in the Vandenburg Airport area. The extension of Lemon Street from Westshore Boulevard to Occident Street will enhance local access and circulation in the Westshore area.

Relocation

One of the unavoidable repercussions of interstate reconstruction is the necessity for relocations. Although every effort was made to reduce the impacts of right-of-way acquisition, there were numerous residential and commercial relocations. Limited industrial relocations will result. The availability of housing and vacant land for relocation within each Design Study Segment has not been inventoried; however, a thorough investigation of available relocation properties will be conducted in the Phase II Environmental Documentation.

The consultant team developed base-line right-of-way and relocation data during initial Task E Data Collection activities. The TIS team conducted primary data collection for all property ownerships located within 300 feet of the existing interstate right-of-way as part of Tasks E13 and H1.

The evaluation of the various Master Plan Concepts included an emphasis on real estate affected by all proposed alternatives and included the identification of major community facilities, park, recreational, or historical sites. Estimating the cost of identifiable properties in order to weigh the impact, either positive or negative, assisted the study team in evaluating the various concepts. The identification of these ownerships established the base list for the TIS relocation program. From this list, a print out was produced which identified the individual ownerships by property type. This assisted in estimating relocations, including residential, commercial, and industrial, as well as those non-profit and public ownerships located within the study area. Refinement of right-of-way lines was achieved by applying established design parameters developed as part of Task F2a and F2b to the various concepts.

The evaluation of concepts included preliminary right-of-way and relocation data. The Tier 2 alternatives were based on a high level of service (LOS) C. Lane requirements for this service level were deemed to be excessive and were reduced to a modified LOS D during Tier 3. This Tier 3 revision reduced right-of-way and relocation throughout the corridor. The right-of-way analysis assisted in the "windowing down" of alternative concepts, with particular emphasis in identifying extreme or obvious detrimental impacts based on the ownerships. This would make certain alternatives "fatally flawed" and thereby eliminate them from further consideration. Those alternatives that survived the Tier 3 evaluations were then evaluated as to right-of-way and relocation costs. Those alternatives selected for the third Tier of Evaluation within Task F (Conceptual Design Analysis) were presented in geometric layouts on 1"=100' scale aerials. In addition, existing right-of-way lines were also included on the 1"=100' scale aerials, thereby, graphically displaying those properties affected by alternatives. These right-of-way limits are shown on the 1"=100' scale aerial layouts provided in the Attached Plans and Illustrations appended to this report.

Within each of the Design Study Segment areas, individual properties were identified as to land size, improvement description, and improvement size, and type of ownership, private, non-profit, public utility, quasi-government, government, et cetera. Table IX-8 gives the number of properties affected by property type and also shows the number of relocations in each Design Study Segment.

The following discussion provides a general overview of the relocations required by Design Study Segment.

Design Study Segment 1A

In Segment 1A, the relocations include several single family residences on the south side of Interstate 275 between Trask Street and Lois Avenue, some commercial establishments on Cypress Street near the interstate, together with several single family residences between Clark Avenue and Church Avenue on the north side of I-275; two warehouse facilities on the south side of the interstate near Church Avenue, and several single family structures on the south side of I-275 between Himes Avenue and Lincoln Avenue.

Design Study Segment 2A

Properties affected are predominately single family residential. The Boys and Girls Clubs of Greater Tampa at the southeast corner of MacDill Avenue and the interstate will be displaced by the reconstruction. Other properties include the Agape Fellowship Church, the City of Tampa Public Housing and some commercial uses located at the Howard/Armenia Avenue interchange with the interstate system.

TABLE IX-8

RELOCATIONS AND PARCEL TAKINGS BY LAND USE TYPE
Tampa Interstate Study

	Design Study Segments							
	1A	2A	2B	3A and 3B	4A, 4B, and 4C	5A, 5B, 5C, and 5D	5E, 5F, and 5G	6A and 6B
RIGHT-OF-WAY								
Residential								
Single family	125	100	223	246	63	75	15	--
Multi family	2	5	12	38	4	1	--	--
Vacant	16	10	50	79	13	43	45	13
Commercial								
Improved	8	7	30	21	20	8	6	--
Vacant	16	1	7	15	38	14	24	--
Industrial								
Improved	4	2	--	18	7	--	--	--
Vacant	2	--	--	15	2	--	--	--
Public/Semi Public								
Improved	3	3	28	8	5	--	--	--
Vacant	--	--	4	16	1	--	--	--
Right-Of-Way								
Total	176	128	354	456	153	141	90	13
RELOCATIONS								
Residential	160	112	354	337	59	92	15	--
Other	15	12	58	47	9	1	6	--
Relocation Total	175	124	412	384	57	93	21	--

Design Study Segment 2B

The properties affected include: the City of Tampa Public Housing project; Tampa Presbyterian Villas; five Hillsborough County School Board facilities, including the George W. Carver Day Care Center; the Department of Student Services, and the Department of Education for Exceptional Students; the J.W. Rhodes Education Building; and the Industrial Service Center; the Hillsborough County Jail parking; the off-street parking for the multi-story state office building located in downtown Tampa; Tampa Electric company sub-station; and several multi-family and single family residential structures located along the west side of the I-275/I-4 interchange.

Other properties affected include: single family and multi-family residences on the north and south sides of I-4 between Nebraska Avenue and 15th Street; single-family residences along the east side of I-275 between Columbus Drive and Buffalo Avenue; and the City of Tampa Fire Department Communications Division. Several churches are affected by the interstate reconstruction (as discussed in the Community Services Section) including:

* the Bethel A.M.E. Church;
* the Greater Bethel Baptist Church;
* the Baptist Fellowship Bible College of Tampa;
* the Friendly Missionary Baptist Church;

* the Faith Temple Missionary Baptist Church; and
* the First Born Pentecostal Church of Jesus.

Design Study Segment 3A and 3B

The properties affected in this segment include single family and multi-family residences on the north side of I-4 from 15th Street to 22nd Street and on the north and south sides from 22nd Street to 34th Street. There are some commercial properties affected near the 21st/22nd Street interchange.

Industrial properties and a Tampa Electric Company sub-station are impacted by the I-4/Crosstown Connector between the CSX Transportation railroad right-of-way and 31st Street. Some single family and multi-family residential structures will also be affected.

Single family residential and several industrial properties, as well as the recreation area for a Hillsborough County Public School (Oak Park Elementary) are affected between 42nd and 50th Streets. A fast food franchise, a mobile home park and some vacant lands are affected east of 50th Street.

Design Study Segments 4A, 4B and 4C

There are a few single family residences affected near the I-4/Orient Road interchange and the I-4/I-75 interchange. The parking area for the Pentecostal Christian Fellowship Church will be impacted. The Sligh Avenue widening and extension affects residential structures and agricultural land. The extension of Faulkenburg Road impacts a mobile home park and some residential properties.

Design Study Segment 5A, 5B, 5C and 5D

The properties affected are predominately single family residential south of the Hillsborough River. The proposed rehabilitation or reconstruction of the interstate affects a shopping center at Waters Avenue, the access road to a condominium project near Busch Boulevard, and a mobile home park at Linebaugh Avenue.

Design Study Segment 5E, 5F and 5G

The properties affected within these Design Study Segments are predominately single family residential with some commercial properties at the major interchanges. The All State Homes model center south of Fowler Avenue on the west side is affected. Commercial relocations all occur at the interchanges with Fowler, Fletcher and Bearss Avenues.

Design Study Segment 6A and 6B

Design Study Segments 6A and 6B are essentially vacant large ownership tracts. There are no relocations.

X. NATURAL AND PHYSICAL ENVIRONMENT

Natural And Biological Features

A preliminary natural features inventory was conducted for the project corridor. The purpose of the preliminary investigation was to identify potential involvement with natural features due to the proposed roadway improvements. Further and more detailed studies will need to be completed during Phase II of the project and the permitting stages to more accurately assess potential involvement with natural features.

Natural features, which were assessed in the preliminary inventory, included wetland systems, floral and faunal (biotic) communities, and endangered and threatened species. Each of these features were assessed on a general basis. The methodology which was utilized ranged from some on-foot inspection to informal coordination with agencies, literature reviews and interpretation of aerial photography. For additional information pertaining to individual methodology and detailed results of the assessment refer to the Task E.7.k., Natural Features Inventory, published separately.

The project corridor is mainly located within highly urbanized areas with some extensions into rural areas. These rural areas in which there is involvement with natural biotic communities mainly include Segment 4 and Segment 6. Additional involvement is in portions of Segment 1, Segment 3 and Segment 5. The only natural biotic community existent within Segment 2 is the Hillsborough River. The river in this region is considered a deepwater habitat and offers minimal habitat value due to being seawalled and partially polluted.

Wetlands which occur within the project corridor vary from estuarine systems to mixed hardwood swamp systems. A wetlands analysis was completed using National Wetlands Inventory (NWI) maps provided by the U.S. Fish and Wildlife Service and a survey of the hydric soils of the project corridor. A delineation of these wetlands can be found on the 1"=1,000' scale aerial photographs of the Tier 1 Wetlands Inventory.

Natural wetland systems are concentrated primarily in Segment 4 and Segment 6, which are the most rural of the six segments. With the exception of the estuarine systems in Segment 1, all wetland systems are freshwater. In the urban areas, the wetland systems usually consist of borrow areas, stormwater retention ponds and roadside ditches. Natural systems which have the potential to be impacted include freshwater marshes, cypress domes, creek and slough systems, along with mixed hardwood swamps.

Potential impacts to wetlands systems have been calculated from the 1"=100' Master Plan aerial photographs. Impacts were primarily calculated up to 100 feet from the edge of proposed pavement. These impacts were then planimetered and can be found on a per Segment basis in Table X-1. Some of the wetland impacts may be offset by the 25.5 acres of potential littoral zone from the proposed stormwater management ponds. Impacts will be more accurately calculated in Phase II of this project. Agency correspondence will also be initiated at that time to discuss impacts, permitting, and mitigation, as well as reviewing the roughly 326 acres of proposed candidate mitigation areas included on the 1"=100' scale Master Plan aerials.

Floral and faunal communities were inventoried on a general basis through interpretation of aerial photography. Due to the heavily urbanized nature of the project corridor, natural biotic communities are only concentrated in Segment 4 and Segment 6. The biotic communities which exist within the project corridor

TABLE X-1

SUMMARY OF ANTICIPATED WETLAND IMPACTS
Tampa Interstate Study

Master Plan Analysis
Hillsborough and Pasco County, Florida

Segment	Number of Wetlands	Total Acreage of Impacts	Total Acreage of Wetland Systems	% of Total Systems Impacted	Areas of Littoral Zone of S.W.M.P.[1]
1	8	12.3	28.8	43.0%	3.6
2	--	--	--	--	3.5
3	3	0.8	6.7	12.0%	6.0
4	44	38.5	470.1	8.1%	1.4
5	7	2.2	28.0	8.0%	3.6
6	34	44.5	1296.7	4.0%	7.4
TOTAL	96	98.3	2593.4	3.8%	25.5

[1] Littoral zones for the stormwater management ponds have been calculated using 35% of the total surface area of the ponds.

include a range from sandhill communities and pasture lands to various wetland communities (refer to the discussion of wetlands).

Actual upland biotic communities which exist within the study corridor include pine flatwoods and sandhill communities as well as pasture lands and hardwood mixed forests. While these communities provide good habitat value for flora and fauna, their extent within the study corridor is minimal. This is due to the urbanized nature of the study corridor and the minimal amount of right-of-way acquisitions in the rural areas.

Impacts to both upland and wetland communities are limited to those areas either within the existing right-of-way or the proposed right-of-way. Substantial impacts will occur within the new interchange areas of Segment 6 and the improved interchange of I-4 and U.S. 301 in Segment 4. Complete impacts will be assessed during Phase II of this project.

A preliminary investigation of the potential for occurrence of endangered and threatened species has been completed for the project corridor. This investigation included a review of literature, the FDOT computer list of endangered and threatened species and informal consultation with the U.S. Fish and Wildlife Service (USFWS), as well as the Florida Game and Fresh Water Fish Commission (FGFWFC). Furthermore, critical habitat was assessed as to the relationship of the project to USFWS designated "critical habitat." A review

of the literature led to a determination there would be no involvement with "critical habitat."

Information obtained in the investigation resulted in a determination there may be potential involvement with several state and federally listed endangered and threatened species. A list of these species, as well as a discussion of potential impacts to those species which are federally listed, can be found in the Task E.7.k., Natural Features Inventory, published separately. Some of these species include the West Indian manatee, Florida scrub jay, bald eagle, woodstork, American alligator, sea turtles and the Florida golden aster.

In Phase II of this project, these species will be better evaluated and the actual potential impacts will be assessed. In addition, further consultation with agencies may be done to assist in the evaluation of potential impacts to these species.

Hazardous Materials Inventory

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

The most recent count of 111 potential hazardous material sites in the vicinity of the project corridor was decreased to 73 sites after right-of-way acquisitions were considered. Of these 73 sites, 57 are considered to have a low potential to impact the project. These 57 sites use or store hazardous material, but no known environmental contamination is present or suspected at these locations. The TIS Task E.16, Hazardous Material Report describes these 57 sites in greater detail. The remaining 16 sites, however, have the potential to impact the proposed project. These 16 sites were evaluated based on their proximity to the proposed right-of-way; physical land use history; current on-site conditions; storage of production chemicals, hazardous materials, or hazardous wastes; and any environmental violations or reported contamination on file with the Florida Department of Environmental Regulation (FDER). The following is a brief description of these 16 sites:

* **Jesto Transmission - 4102 West Cypress Street**
  - near Lois Avenue and Cypress Street
  - adjacent to proposed stormwater pond
  - concrete and soil staining
* **Salemi's Body Shop - 1602 North Armenia Avenue**
  - northwest corner of Armenia Avenue and Green Street
  - adjacent to existing right-of-way
  - Small Quantity Hazardous Waste Generator
  - October 1987, fined $3,000.00 by FDER for improper disposal of hazardous wastes.
* **Phillips 66 - 1414 North Armenia Avenue**
  - southeast corner of Armenia Avenue and Laurel Street
  - partially within proposed right-of-way
  - known petroleum contamination, has not been recovered
* **Tampa Blueprint - 1319 Florida Avenue**
  - southwest corner of Florida Avenue and Scott Street

- completely within proposed right-of-way
- solvent and ink storage

* **Vacant Gas Station - Orange Street and Scott Street**
  - completely within proposed right-of-way
  - known petroleum contamination, has not been recovered.
* **Royal Gas - 14th Avenue and 21st Street**
  - partially within proposed right-of-way
  - oil stained pavement and strong petroleum odor
  - not in compliance with FDER's stationary tank inventory system
* **Fina - 22nd Street and 14th Avenue**
  - partially within proposed right-of-way
  - known petroleum contamination, has not been recovered
* **Red-Strip - 2402 35th Street**
  - partially within proposed stormwater retention pond
  - Small Quantity Hazardous Waste Generator
  - metal stripping operation
  - not in compliance with FDER requirements for waste disposal
* **Industrial Supply Corporation - 2620 North 35th Street**
  - partially within proposed right-of-way
  - vacant warehouse that previously stored various industrial chemicals and supplies
* **All-American Custom Chrome - 3013 4th Avenue**
  - completely within proposed right-of-way
  - stained dirty property with numerous 55-gallon drums
* **DisposALL, Inc. - 4th Avenue**
  - completely within proposed right-of-way
  - waste disposal company
* **Carver's Roofing - 3014 5th Avenue**
  - completely within proposed right-of-way
  - property covered with 55-gallon drums and other discards
* **Florida Auto Parts - 3008 East 7th Avenue**
  - completely within proposed right-of-way
  - property contains auto parts, above ground tanks, 55-gallon drums
  - property oil stained
* **Petro Systems - 9th Avenue**
  - completely within proposed right-of-way
  - numerous above and below ground petroleum storage tanks
  - not in compliance with FDER's stationary tank inventory system
* **Tampa Electro Plating Company - 3005 10th Avenue East**
  - completely within proposed right-of-way
  - chrome plating of bumpers
* **Clorox - 3601 East Columbus Avenue**
  - partially within proposed right-of-way
  - chemical manufacturing plant

* **Starvin Marvin #90 - 2602 N. 50th Street**
  - adjacent to proposed right-of-way
  - known petroleum contamination, has not been recovered
* **United 500 Petroleum - 2500 50th Street**
  - partially within proposed right-of-way
  - known petroleum contamination, has not been recovered
* **Radiant Tire - Amoco - 2605 N. 50th Street**
  - adjacent to existing right-of-way
  - known contamination, has not been recovered

In consideration of potential construction delays and remediation costs associated with contamination sites, it is recommended right-of-way acquisition of these sites be avoided or minimized wherever possible. However, if right-of-way acquisition at these sites cannot be avoided, it is recommended further investigations be conducted. Initially, FDOT should request the FDER to conduct field investigations useful in further evaluating the potential for hazardous material use and disposal at these sites. If this information does not conclude whether or not contamination is present, or the extent of contamination, then subsurface investigations should be performed in areas designated for right-of-way acquisition. If contamination is found, FDOT should encourage the owner or operator of the site to begin clean-up before right-of-way acquisition.

These recommendations are based on preliminary information only and are not meant to replace the results of more detailed studies which deal with subsurface field investigations. Rather, this information should be used only as a guide in identifying potential hazardous material sites that may require technical studies to determine the existence of contamination prior to right-of-way acquisition. Finally, it should be noted that hazardous material sites may extend beyond those identified in this survey because of illegal dumping practices and a possible lack of compliance with FDER's stationary tank inventory system.

Drainage And Hydrology

Introduction

The TIS project corridor extends through areas which are characterized as heavily urbanized to rural areas. The majority of the existing stormwater systems within the project corridor outfall to one of the major waterbodies in the area which include Tampa Bay, Hillsborough River, Tampa By Pass Canal, Cypress Creek, and Curiosity Creek.

The existing drainage system within the project corridor consists of a combination of open ditch and enclosed storm sewer systems. The majority of the stormwater outfall systems for the existing interstate system are considered to be undersized or overloaded. In addition, several areas of the interstate currently drain to basins which are considered "volume-sensitive" or are without an adequate outfall. Currently, there are only two existing detention areas which serve the existing interstate within the project corridor.

Existing Basin Studies

Various drainage basin studies within the TIS project limits have been supplied to the study team by

SWFWMD and the City of Tampa. Basins corresponding to each of those studies are discussed here and are shown on Exhibit X-1.

Cleveland Street Basin

The Cleveland Street Basin includes areas adjacent to and south of I-275 from Memorial Avenue east to Manhattan Avenue. The Westshore Plaza Mall is drained by this system. The outfall is at the southwest end of the basin crossing Azeele Street to an inlet known as Culbreath Bayou.

Cypress Memorial Basin

I-275 from just west of Memorial Highway (S.R. 60) east to approximately Habana Avenue is drained by the Cypress Memorial Basin. The outfall of this basin is the Lemon Street Ditch, which is recognized by both the FDOT Maintenance Department and the City of Tampa as being undersized.

Sunshine Park Basin

The I-275 corridor between just north of Lake Avenue north to approximately Osbourne Avenue is included in the Sunshine Park Basin. This basin drains from east to west and outfalls into the Hillsborough River.

Hillsborough Avenue Basin

I-275 from Osbourne Avenue north to approximately Idlewild Avenue is included in the Hillsborough Avenue Basin. This area drains towards Hillsborough Avenue and then west to the Hillsborough River. The City of Tampa has indicated the outfall culvert along Hillsborough Avenue is presently undersized.

Curiosity Creek Basin

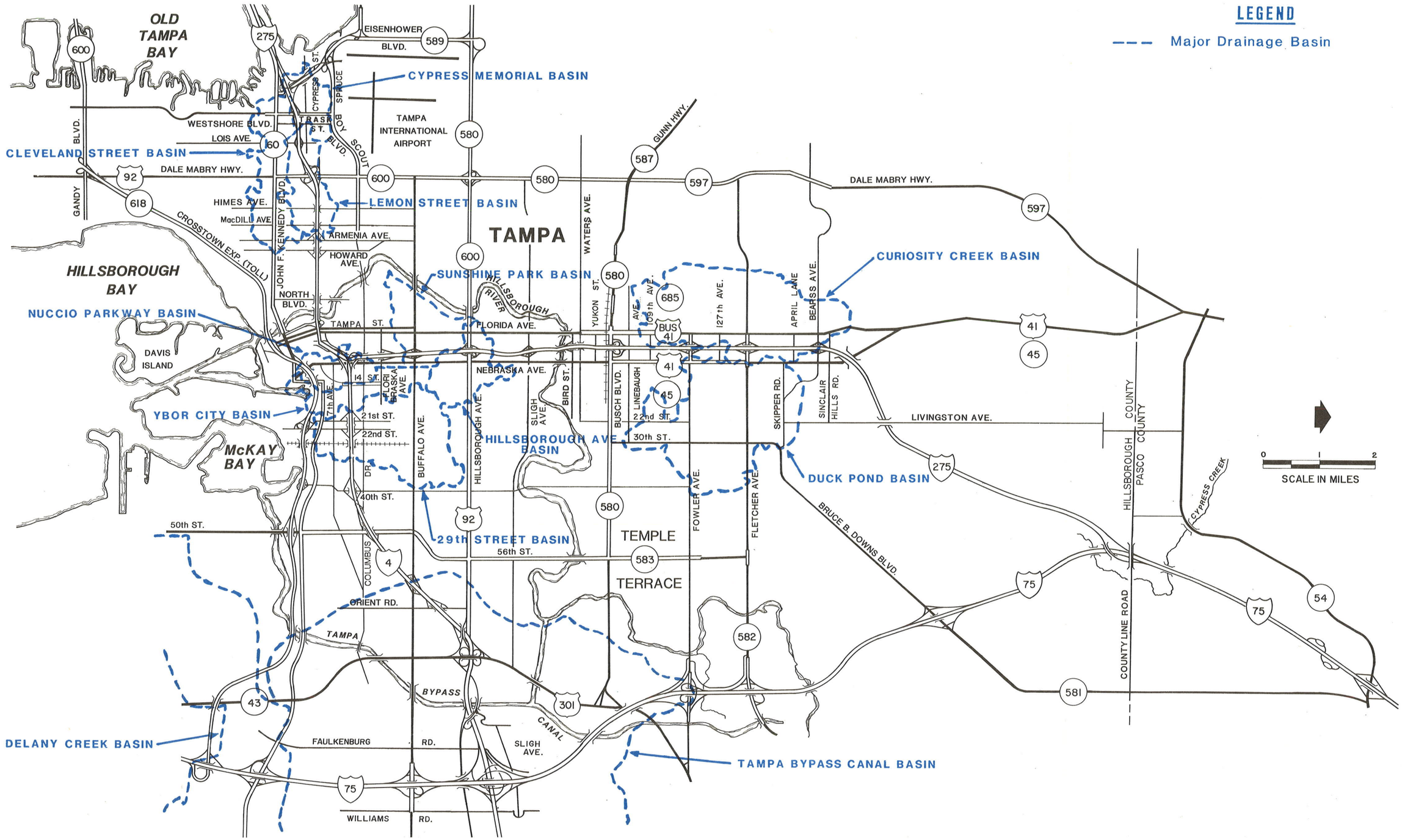
The I-275 Corridor from just south of Atlantic Boulevard north to Bearss Avenue is included in the Curiosity Creek Basin. This basin is of particular importance since it has been designated as "volume sensitive" by the Hillsborough County Drainage Department. This basin has no positive outfall and the normal runoff from the area exits through infiltration into an area known as Blue Sink. For this reason, additional concern may be directed toward water quality of stormwater runoff.

Duck Pond Basin

The western edge of the Duck Pond Basin is adjacent to I-275 between just north of Fletcher Avenue and just south of Skipper Road. A portion of the interstate may presently outfall to this basin. The Duck Pond Basin has also been designated "volume sensitive." The Duck Pond Basin drains from north to south and does have a positive outfall to the Hillsborough River.

Cypress Creek and Trout Creek

The Cypress and Trout Creek drainage basins and floodways have been studied by the Southwest Florida Water Management District. The area drains from northwest to southeast and outfalls into the Hillsborough River.



MAJOR DRAINAGE BASINS

EXHIBIT X-1

Nuccio Parkway Basin

A portion of I-275 adjacent to the I-4 interchange and I-4 from Nebraska Avenue east to near 13th Street is included in the Nuccio Parkway Basin. The area north of I-4 outfalls through a cross drain of I-4. This cross drain culvert is considered undersized and contributes to flooding in the area.

Ybor City Basin

The Ybor City Basin includes a portion of I-4 from west of 13th Street east to 19th Street. The area north of I-4 drains south through a cross drain at 13th Street. This cross drain is also considered undersized and contributes to flooding north of the interstate.

29th Street Basin

I-4 between 19th Street and 32nd Street is drained by the 29th Street Basin. This area drains from north to south into McKay Bay.

Tampa Bypass Canal Basin

I-4 from the Buffalo Avenue interchange east to the limits of the study area is included in the Tampa By Pass Canal Basin. The area drains from north to south through the Tampa By Pass Canal, previously known as Six Mile Creek and Palm River. The Tampa By Pass Canal is a project of the Army Corps of Engineers, Jacksonville District. Design criteria are specified in a detailed design memorandum published in May 1974. The By Pass Canal is operated by the Southwest Florida Water Management District following a regulation manual published in April 1983.

Existing Drainage Problem Areas

A telephone conversation with the Tampa office of the FDOT Maintenance Department revealed the following historic maintenance problems involving drainage or flooding within the project corridor.

The first problem mentioned, and the most serious, is 15-inch culverts are too small and are easily blocked. The most common blockage is 15-inch diameter hubcaps which cover the culvert opening and block the culvert flow. The recommended solution is a minimum culvert size of 18-inch diameter.

Also discussed were the following site specific drainage problems.

* The entrance ramps at Westshore Boulevard and I-275 interchange are frequently flooded due to inadequate outfall conveyance in the Lemon Street drainage ditch.
* The bridge in the northbound lane of I-275 over the sinkhole just north of 127th Avenue no longer drains at the rate previously observed. It should be pointed out that due to concerns about the quality of stormwater entering the groundwater table, regulatory agencies may limit the use of this sinkhole as an outfall for stormwater runoff from the roadway. The area in question is rather small, currently only two lanes of roadway for approximately 150 feet drain into the sink hole.
* North of the Bearss Avenue interchange to S.R. 54 the existing cross drains are in questionable condition. Many of the cross drains may need to be replaced when the roadway is improved.

* The intersection of 40th Street and I-4 is drained through an outfall ditch across private property. The Maintenance Department mentioned they have been trying to contact the owner of the property to coordinate a solution to this problem. They recommended a drainage easement across the property to allow the FDOT access to clean the ditch as needed. The ditch currently is blocked by vegetative growth due to lack of maintenance.
* East of 50th Street on I-4 a cross drain concrete pipe culvert is leaking. The physical evidence of this leakage is the cracking of the interstate pavement.
* On I-4 between Orient Road and the intersection with I-75, the median area stays wet a significant portion of the time. It was apparent that this was indicative of poor drainage in the median area in this section of the roadway.

Stormwater Management System Design Criteria

This section of the report divides the interstate corridor into segments pertaining to the design criteria for stormwater management. In each segment, the controlling criteria will be identified with possible solutions and recommendations. Exhibit X-2 provides a stormwater management matrix which indicates the regulatory agencies involved with permitting within the TIS project limits.

The State requirements for stormwater treatment will apply throughout the study area. The stormwater treatment criteria has been delegated to the Southwest Florida Water Management District (SWFWMD) by the FDER in Chapter 17-25.035 F.A.C. The requirements for public highway stormwater treatment are specified in the SWFWMD Permit Information Manual (1988) under Paragraph 3.2.2.8, which specifies the following two criteria: (1) For an off-line treatment system, the volume required is one-half inch of runoff for the new pavement only; (2) For an in-line treatment system the required volume will be for the runoff from one inch of rainfall, which for the typical roadway system can easily be considered as one inch of runoff. Therefore, there is a significant advantage to designing off-line treatment systems. Various stormwater treatment concepts can be seen on Exhibit X-3.

The Hillsborough County Engineering Department has indicated meeting the SWFWMD criteria will be sufficient, except in "peak sensitive" and "volume sensitive" areas. For areas declared as "peak sensitive," the Department promulgates a policy which includes the following: (1) the 25-year post-development discharge rate cannot exceed the 10-year pre-development rate; (2) the post-development flow rate is not to exceed the area weighted capacity of the outfall. For areas considered "volume sensitive": (1) the difference between the pre-developed and post-developed runoff volumes due to the 100-year, 24-hour rainfall event must be stored on-site, or (2) the total post-development runoff volume due to a 100-year, 24-hour rainfall event must be stored on-site. The retention volume must bleed-down at a rate of at least one-inch of runoff within a 24-hour period. These policies are included in the Hillsborough County Stormwater Management Technical Manual (1988).

The City of Tampa criteria are promulgated in the "Stormwater Management Technical Standards," October 1988. The criteria for the peak rate of discharge limits the post-development 25-year rate to less than the pre-development 5-year rate. For basins with no positive outfall (Curiosity Creek) the post-development discharge rate for the 50-year storm is used. In addition to the Criteria Manual, the City Council has passed an ordinance to allow an exemption to areas of Ybor City adjacent to the Bay.

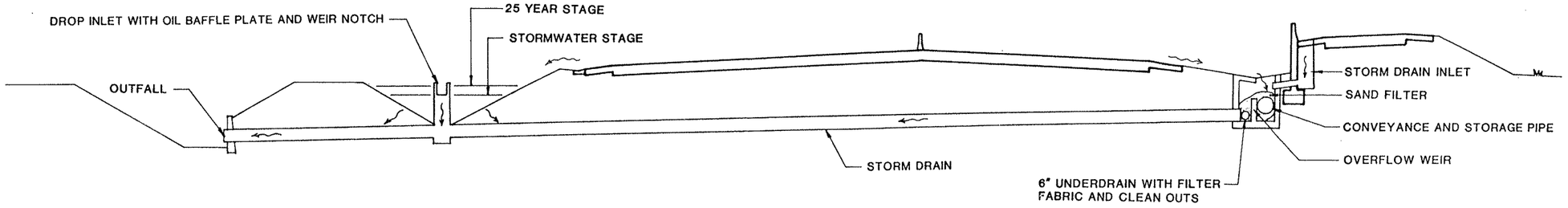
STORMWATER MANAGEMENT DESIGN CRITERIA MATRIX

AGENCY

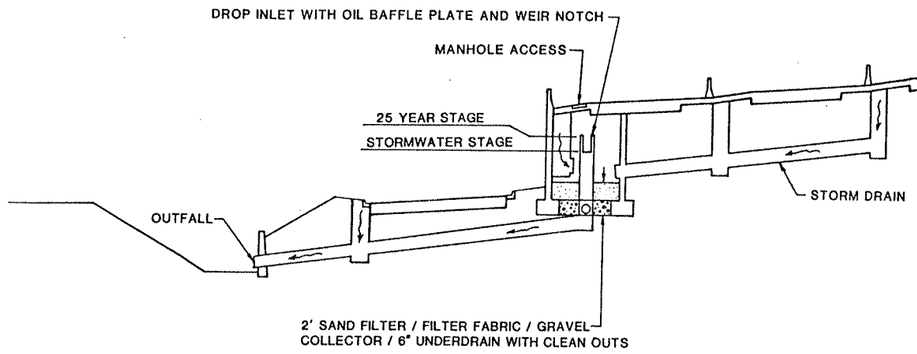
CRITERIA	CITY OF TAMPA	HILLSBOROUGH COUNTY	S.W.F.W.M.D.	F.D.E.R.	F.D.O.T. DRAINAGE	F.H.W.A.	U.S.A.C.O.E.	PASCO COUNTY	E.P.A.
RULE	STORMWATER MANAGEMENT TECHNICAL STANDARDS OCTOBER, 1988	HILLSBOROUGH COUNTY STORMWATER MANAGEMENT TECHNICAL MANUAL MAY, 1988	RULES OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT PERMIT INFORMATION MANUAL 1988 400-4 SURFACE WATER MANAGEMENT 409.4.301 GENERAL SURFACE WATER MANAGEMENT PERMITS	REGULATION OF STORMWATER DISCHARGE CHAPTER 17-25, AUGUST 1988	RULES OF THE DEPARTMENT OF TRANSPORTATION CHAPTER 14-86 DRAINAGE CONNECTIONS "HANDBOOK FOR DRAINAGE CONNECTION PERMIT" FEBUARY 1987	FEDERAL HIGHWAY PROGRAM MANUAL # 6732 APRIL 24, 1984	TAMPA BYPASS CANAL DETAIL DESIGN MEMORANDA CANAL 1.35	SUBDIVISION ORDINANCE	CODE OF FEDERAL REGULATIONS TITLE 40 PARTS 122,123,124 AND 504 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT APPLICATION REGULATIONS FOR STORM WATER DISCHARGES. (CURRENTLY PENDING)
AREA WHERE APPLICABLE	TAMPA CITY LIMITS	HILLSBOROUGH COUNTY	400-4.041 PERMITS REQUIRED Permits required within S.W.F.W.M.D. jurisdiction prior to construction, alteration, operation, or abandonment of any dam, impoundment, reservoir, appurtenant work or works.	17-25.02(10) "NEW STORMWATER DISCHARGE FACILITY" means coming into existence after Feb. 1, 1982. (can also mean modified) 17-25.090 Delegated to S.W.F.W.M.D. 40E-4.011 unless dredge and fill permit needed. (17-25.09(2)	14-86.003(2) PERMIT. All improvements that are not exempted in Rule Section 14-86.003(1) require a drainage connection permit whether or not the work is done in conjunction with a vehicular connection. 14-86.007(4) "Drainage Connection" means any structure which conveys stormwater runoff or other surface water discharge from the adjacent property to the Department Facility.	Par. 5 The provisions of this directive shall apply to all encroachments and to all actions which affect base flood plains. Par. 4b BASE FLOOD- the flood or tide having a one-percent chance of being exceeded in any given year. in the 100 year flood plain (FIRM)	I-4 Crossing of Bypass Canal	PASCO COUNTY EXCEPTION: CORPORATE LIMITS OF MUNICIPALITIES	
POLICY	1.B Prevent damage, provide access , preserve quality.	1.2 Protect Life, Health, and Welfare. Minimize private and public property damage. Provide efficient/cost effective drainage design. Maintain/enhance quantity/ quality of ground water supply.	400-4.011 Regulate and control the management and storage of all surface waters.	17-25.001 Prevent Pollution of Waters of State by Discharges of Stormwater.	14-86.001 Ensure Safe Conditions for F.D.O.T. Facilities.	Par. 3a Prevent hazardous use of flood plains.		Reasonable regulations and minimum standards to preserve Health, Saftey and Welfare of citizens.	
DESIGN STORM EVENTS TO BE ANALYZED	POST 50 YEAR POST 25 YEAR PRE/POST 5 YEAR	PRE 10 YEAR PRE/POST 25 YEAR PRE/POST 50 YEAR	PRE/POST 25 YEAR STORM PRE/POST 100 YEAR STORM (Closed Basin) ONE INCH RAINFALL (Water Quality)	ONE INCH RAINFALL	2-100 YR., 1 HR.-10 DAY CRITICAL STORM ANALYSIS	Par. 9a(9) DESIGN STANDARDS Base Flood (100 year) Overtopping flood Greatest flood if no Overtopping	STANDARD PROJECT FLOOD	25 yr. for drainage area > 640 acres. 10 yr. for drainage area < 640 acres.	
DISCHARGE RATE (POSITIVE OUTFALL)	III.E.1 Runoff determination by Rational Method. III.E.2 Conduit System Design based on 5 yr., F.D.O.T. Zone 6. III.E.7 Detention/Retention ponds create an asset to Community. III.D.2 Detention Ponds-positive outfall. Volume detained is difference between pre 5 yr.-24 hr. Zone 6 storm. Drawdown time is 72 hours. Retention Ponds-nonpositive outfall. Volume retained is difference between pre 5 yr.-24 hr. Zone 6 and post 50 yr.-24 hr. Zone 6 storm. Percolation drawdown in 72 hrs.	3.1.B. Outfall Conditions 1. More than adequate outfall. -no limit (eg. Tampa Bay) -connecting facilities designed for 100 year storm. 2. Adequate/Peak Sensitive Outfalls Peak discharge for post 25 yr.-24 hr. less than/equal to pre 10 yr.-24 hr..	3.2.1.2b Discharge computed from S.W.F.W.M.D. 25 yr.-24 hr. rainfall maps, SCS type II Florida modified 24 hr. distribution, AMC II. 3.2.1.2 Offsite discharge cannot cause any adverse offsite impacts. 3.2.2.2 Total detention volume for quantity shall be available within 36 hours. Treatment can be counted as part of storage volume required under quantity requirments.	25.025(1) Detention Ponds -volume drawdown in 72 hours. -volume detained, 1 inch of rainfall. (1/2 inch for < 100 acres)	14-86.003 Discharge limited By One of: STORMWATER MANAGEMENT PLAN APPLICABLE LOCAL REGULATION WAIVER FROM DISTRICT DEPUTY ASSISTANT SECRETARY Detention Ponds: Attenuate post improved peak rate to the pre improved peak rate for all frequencies (2yr.-100 yr.) for critical duration (1 hr.-10 day).				
DISCHARGE RATE (CLOSED BASIN OR VOLUME SENSITIVE)		3.1.B.4 VOLUME SENSITIVE Retention ponds storage equal difference of pre and post development runoff volume for 100 yr.-24 hr. storm. 100% volume drawdown in 72 hours.	3.2.1.2.c Closed Basin Retention Volume is the difference between post and pre runoff volume computed using S.W.F.W.M.D. 100 yr.-24 hr. rainfall map, SCS type II modified distribution, AMC III.	25.025(4) Retention Ponds -volume drawdown (by percolation, evaporation, evapotranspiration in 72 hours).	14-86.003 Volume or Discharge Limited By One of: STORMWATER MANAGEMENT PLAN 100 YR.-CRITICAL DURATION (up to 10 days) WAIVER FROM DISTRICT DEPUTY ASST. SECRETARY Non Positive Outfall Retention Volume = Post minus pre improved runoff volume for 100 year - critical duration storm. 50% volume drawdown = 7 days 100% volume drawdown = 30 days		VELOCITY EQUAL TO OR LESS THAN 2.5 FPS		
SPECIAL BASINS AND SPECIAL CONCERNS		Henry Street Curiousity Creek I-4 and Buffalo Avenue I-4 and S.R. 579 Duck Pond	TAMPA BYPASS CANAL CURIOUSITY CREEK						
WATER QUALITY	III.A.5 Approval of S.W.F.W.M.D. and F.D.E.R..	7.2.B.4 Credit for water quality storage volume for the portion of pollution abatement volume which can be bled down within 72 hours. -minimum orifice/rectangular opening is 3 inches. -no V-notch weirs are permitted.	3.2.2.1 Meet applicable state water quality standards in Chapter 17-3 and Section 17-4.242, F.A.C.. 3.2.2.2 TREATMENT VOLUME a. Wet Detention - 1 inch runoff. b. Detention with effluent filtration - runoff from 1 inch of rainfall or 1/2 inch runoff if less than 100 acres. c. Retention, filtration - 1/2 inch runoff. d. On line treatment (same as b.). e. Off line treatment (same as b.). f. Discharge into O.F.W. treat 50% more than required amount.	17-25.025 1. 100% volume drawdown in 72 hours. 3. Filtration system saftey factor = 2.0 unless proved appropriate otherwise (req'd volume drawdown in 36 hours). 8. Stormwater discharge facilities with potential oil/grease pollution beyond standards, use baffles, skimmers, grease traps (etc.) to meet standards. 9. If discharged into O.F.W. treat additional 50% of required volume.				Design criteria should encourage removal of oils, suspended solids etc..	
FLOOD PLAIN ENCROACHMENT		3.2 No development allowed in conveyance portion of 100 yr. floodplain unless conveyance reduction is compensated. No development allowed in 100 yr. floodplain unless storage volume is compensated. If development is a causeway type encroachment may allow a small increase (± .1 ft.) in upstream offsite elevation.	3.2.1.4 No net encroachment in 100 yr. floodplain which causes adverse effects to conveyance, storage, water quality or adjacent lands.			FHWA 6732 Par. 7. LOCATION HYDRAULIC STUDIES required for encroachment into the floodplain. 8. ONLY PRACTICABLE FINDING is required for encroachment design alternate. 9. DESIGN STANDARDS a. Analysis of (1) Risk analysis of design flood. (2) Interstate roadway not exceeded by 50 year. (3) Freeboard provided on bridges. (5) Consistant with FEMA b. Rest area out of 100 year floodplain. c. Design meets DAM criteria if roadway is levied for 50 acre-feet of storage or 25 feet deep.			
DESIGN GEOMETRY	III.E.6 DITCHES -Mannings Formula -Trapezoidal or V-shaped -Side slope 4:1 (2:1 maximum) -Bottom width = 2 ft. wider than storm system serving as outfall. -Minimum freeboard = 1 ft., Minimum maintenance access = 15 ft. berm (for ditches ≤ 15' width)	7. Detention/Retention Pond -unobstructed 20 ft. wide maintenance area on both sides of county maintained ditches/channels. 10. Ditches -maximum side slope 4:1. -minimum 1 ft. freeboard in channels. -maximum side slope 4:1 (ditches and ponds) depth of ditches 2 ≤ D ≤ 3.5 ft. unless approved otherwise by County Administrator. -minimum bottom width = 3.0 ft..	3.2.4.4.1 WET PONDS a. Width greater than 100 ft. b. Berm width 20 ft. (minimum). c. Maximum side slope 4:1 3.2.2.2.4 Wet detention treatment volume drawdown greater than or equal to 120 hours. 50% wet detention treatment volume drawdown ≥ 60 hours.	25.025(6) Ditches (swales) -design to percolate 80% of runoff for 3 yr. - 1 hr. storm in 72 hours. Retention/Detention ponds restricted from public access (ie. fenced). Side slope maximum 4:1 for the first 2.0 feet below control elevation.	1 INCH OF RAINFALL If connecting to a Department System must meet minimum Department WQ Standards of System.			Roadway Swales maximum slope 4:1 minimum shoulder width 8 ft. on both sides. Grassed ditches may be used except where velocities exceed 3 fps.	

STORMWATER MANAGEMENT DESIGN CRITERIA MATRIX

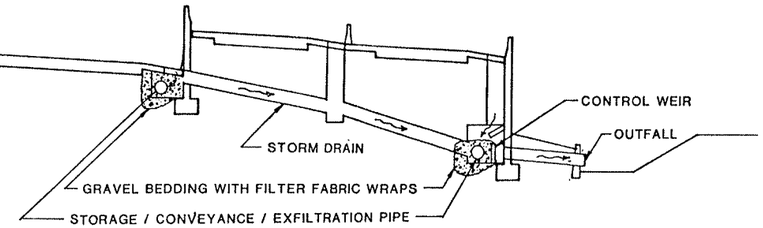
EXHIBIT X-2



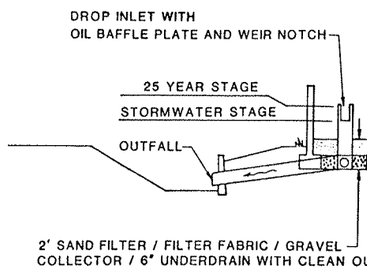
DRY SWALE WITH PERCOLATION



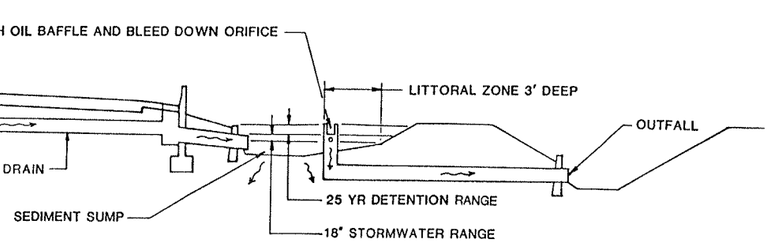
STORMWATER STORAGE PIPE WITH UNDERDRAIN



STORMWATER VAULT WITH SAND FILTER



STORMWATER STORAGE PIPE WITH EXFILTRATION



OPEN STORMWATER BASIN WITH SAND FILTER

WET DETENTION WITH ORIFICE BLEED DOWN

URBAN STORMWATER TREATMENT CONCEPTS

EXHIBIT X-3

The City Council is expected to pass an ordinance for the Westshore Development of Regional Impact which would include by reference a stormwater management policy for re-development in the Westshore area. The policy would require that, for re-development projects with improvements greater than 50 percent of the original value, the stormwater system would be designed for the entire project (not just the increase).

The Interstate corridor segment from the Howard Frankland Bridge east to Habana Avenue can be considered the first segment. As mentioned previously, the area from Westshore Boulevard east to Habana Avenue is drained to the west by the Lemon Street ditch which is considered undersized by the City of Tampa. The proximity to Tampa Bay may provide an alternative to detention ponds for peak discharge reduction. Since Tampa Bay is a "more than adequate outfall", if sufficient conveyance can be provided, then peak reduction may not be required.

The I-275 corridor from approximately Habana Avenue east to the Hillsborough River drains east to the river. A stormwater management basin study has not been completed for this area. Because of the proximity to the Hillsborough River and Tampa Bay, an opportunity exists to provide adequate conveyance to minimize the requirement for detention ponds.

The crossing of the Hillsborough River will require a bridge hydraulics report. The crossing of this floodway will also need to meet U.S. Coast Guard requirements for adequate navigational clearance. A permit from the Tampa Port Authority is not required according to a memorandum from H. Reynolds Sampson, General Counsel, dated April 3, 1979.

The downtown urban section of the interstate from the Hillsborough River north and east to the interchange with I-4 drains west to the river. This short section of roadway will also share in the advantage of having a more than adequate outfall. Therefore, if sufficient conveyance is provided, no peak attenuation should be required.

The interchange area is drained by two or three drainage basin systems. The Nuccio Parkway Basin is the only basin in the area which has been studied. Since the Nuccio Basin is considered to have an inadequate outfall, the City would require peak attenuation from the post 25-year to the pre-development 5-year runoff rates.

From Columbus Drive north on I-275 to Lake Avenue, the I-275 roadway drains to the Robles Park Pond. As previously mentioned, Robles Park is within the 100-year floodplain. The outfall from the Robles Park Pond is a pumped system. The City has indicated this system is at, or over, capacity. Therefore, this section of the roadway would also be required to meet the City's peak reduction requirements from the 25-year post- to the 5-year pre-development rates. An opportunity for an alternative drainage system for this section of I-275 from Lake Avenue south through the interchange is worth investigation. If this area could be drained south to the Hillsborough River, then the requirements for detention systems could be minimized.

As previously mentioned, the segment of I-275 between Lake Avenue and Osbourne Avenue is within the Sunshine Park Basin. The area from Osbourne Avenue north to Idlewild Avenue is within the Hillsborough Avenue Basin. These areas would be required to meet the City's detention basin requirements. The City has indicated the outfall of the Hillsborough Avenue Basin is currently inadequate. This is the segment of I-275 where the opportunity of coordination between two FDOT projects could possibly minimize the requirement for detention ponds within the interstate corridor.

From Idlewild Avenue north to the Hillsborough River, the existing drainage system parallels the interstate corridor. This provides the opportunity to increase the conveyance of the drainage system to take advantage of the more than adequate outfall of the Hillsborough River.

The I-275 crossing of the Hillsborough River at Sulphur Springs will require a bridge hydraulics report. This crossing of the Hillsborough River will need to meet the same design criteria as the existing bridge.

The I-275 corridor from the Hillsborough River north to Linebaugh Avenue drains south to the Hillsborough River. Once again, this section of roadway will need to meet the City's peak attenuation criteria, but has the opportunity of discharging to a more than adequate outfall.

The I-275 roadway between Linebaugh Avenue and 109th Avenue drains to a retention pond located at the northeast corner of Bougainvilla Boulevard and I-275. This apparently is a retention pond with no positive outfall.

The I-275 corridor from approximately 109th Avenue north to Atlantic Boulevard is adjacent to the Curiosity Creek Basin and drains into a retention pond on the west side of the interstate at 114th Avenue. There is a stormwater discharge force main in the northwest corner of the pond leading from the sink hole two blocks west of the retention pond on 115th Avenue. The stormwater system for this segment of the roadway will be required to meet the City's requirements for peak attenuation. There is no positive outfall for the retention pond.

The segment of I-275 from Atlantic Avenue north to Bearss Avenue drains into the Curiosity Creek Basin. This basin is of special concern to both the City and Hillsborough County. Hillsborough County has designated the Curiosity Creek basin to be "volume sensitive." Since there is no positive outfall for the drainage system in this area, additional peak attenuation and/or storage volume will be required.

The segment of I-275 from Bearss Avenue north to near the Livingston Avenue overpass is drained by various small ponds each of which are considered "volume sensitive" by Hillsborough County.

From the Nebraska Avenue overpass north to the S.R. 54 interchange, the I-275 corridor passes through various 100-year floodplain areas. The design requirements for these areas are specified by SWFWMD and the FHWA. The SWFWMD requirement (Permit Information Manual, Section 3.2.1.4 Floodplain Encroachment) requires there be no encroachment in the 100-year floodplain which causes adverse affects to conveyance, storage, or quality of adjacent lands. If encroachment into the 100-year floodplain is unavoidable, compensatory storage may be required to offset the floodplain encroachment. The FHWA criteria (FHPM #6732 April 24, 1984) specifies a location hydraulic study considering various alternatives will be required if encroachment into the floodplain occurs. For an encroachment design alternatives, the study must contain a finding that the encroachment is the only practicable alternative.

The I-4 corridor from the interchange with I-275 east to 32nd Street is a segment of the interstate where the design criteria is the City's peak reduction requirement. This segment of I-4 lies within the three basins: the Nuccio Parkway Basin, the Ybor City Basin, and the 29th Street Basin. With the design alternatives of an interchange between I-4 and the Crosstown Expressway, an opportunity exists to participate in cost sharing with the City to minimize the requirements for detention ponds.

The segment of I-4 between 32nd Street and 56th Street will need to meet the City's stormwater peak reduction criteria. The City has pointed out the subdivision area bounded by Buffalo Avenue, 50th Street, and I-4 has an inadequate outfall. The outfall for this area is the cross drain culvert, which the FDOT Maintenance Department indicated is leaking.

The segment of I-4 from the City limits at 56th Street east to the intersection with Hillsborough Avenue is drained by outfalls which have been designated as "volume sensitive" by the Hillsborough County Drainage Department. It is recommended a design alternative be considered which would provide sufficient conveyance from this area to the Tampa By Pass Canal in order to remove the "volume sensitive" designation.

The segment of roadway between the Hillsborough Avenue intersection and the intersection with U.S. 301 traverses a small area of 100-year floodplain. Therefore, the design in this area will need to meet the criteria of no net encroachment into the 100-year floodplain.

Just east of the U.S. 301 interchange is the bridge crossing of the Tampa By Pass Canal. As mentioned previously, this is a controlled floodway. A bridge hydraulics report will be required for this bridge. The controlling criteria will be the Army Corps of Engineers Design Criteria specified in the detail design memoranda mentioned previously. The remaining segment of I-4 east to the interchange with I-75 is within the Tampa By Pass Canal Basin. If sufficient conveyance can be provided to the Tampa By Pass Canal, then the requirement for detention ponds can be minimized since the Tampa By Pass Canal can be shown to be a more than adequate outfall.

Floodplains And Floodways

The Tampa interstate corridor does cross several floodplains specified by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). Floodplain areas adjacent to the interstate corridor are shown on Exhibit X-4.

The interstate corridor from the Howard Frankland Bridge east to Westshore Boulevard is in floodplain area Zone A10. This zone has a flood elevation of 10 feet. This area is mostly affected by storm surge.

The interstate crossing of the Hillsborough River south of the I-4 interchange crosses the floodplain of the Hillsborough River. The Hillsborough River is Zone A10 with a floodplain elevation of 11 feet.

Robles Park, which is adjacent to the interstate, is also designated as a floodplain area.

The Hillsborough River at Sulphur Springs, at the I-275 crossing, is Zone A10 with an elevation of 11 feet.

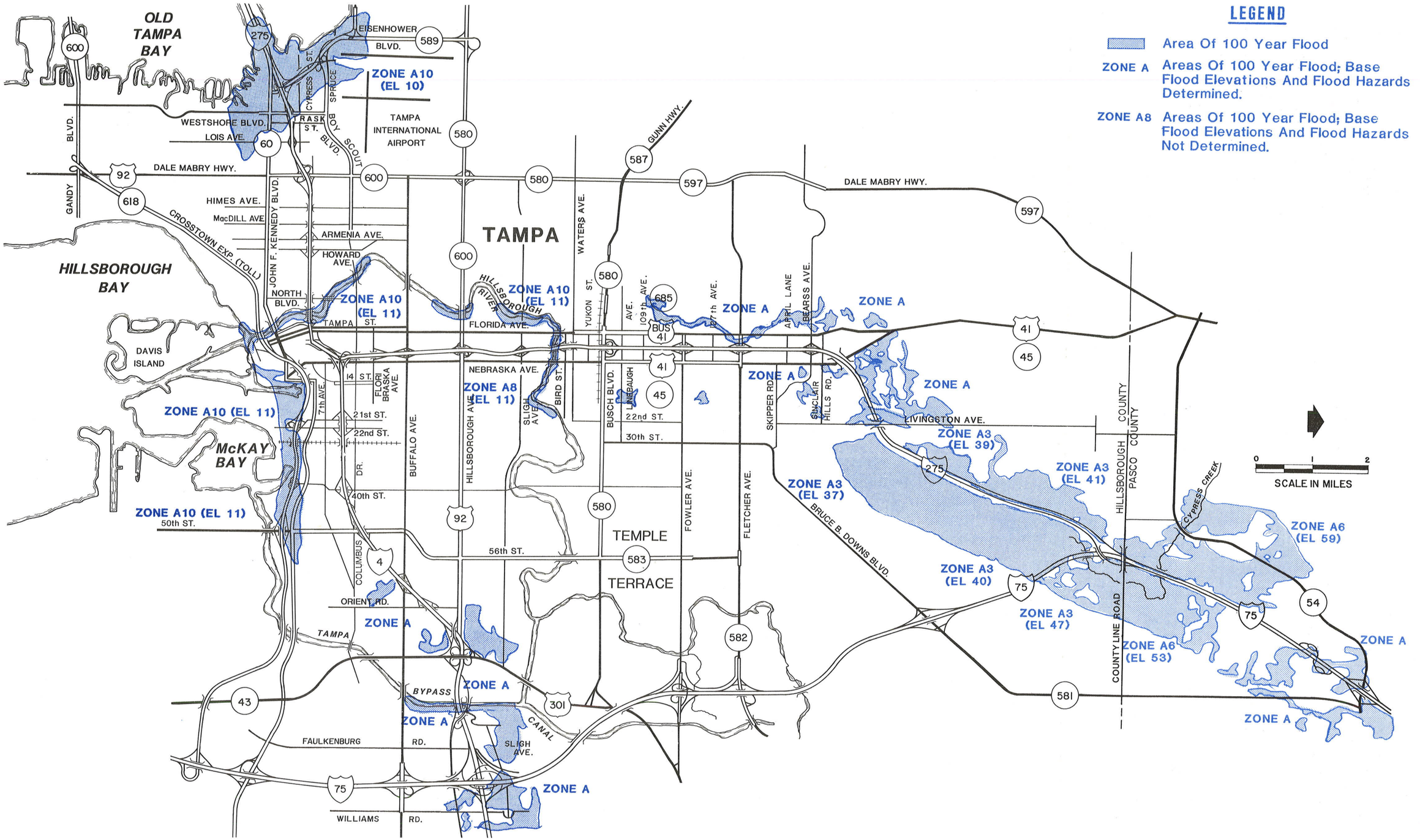
The interstate corridor north from the Nebraska Avenue overpass to the interchange with S.R. 54 in Pasco County passes through Zone A floodplains. The interstate intermittently passes through areas that are not in the Zone A designation, but the majority of the right-of-way is in the floodplain. Traveling north, the floodplain elevation varies from 36 feet to above 54 feet. Typically, the floodplain elevation is one to two feet above the natural surrounding ground elevation.

The I-4 corridor crosses two Zone A floodplains in the Ybor City area at 10th Street and 13th Street. These floodplains are caused by inadequate stormwater drainage systems.

The I-4 corridor also passes through a Zone A floodplain at the overpass of Hillsborough Avenue west of the U.S. 301 interchange. East of the U.S. 301 interchange, the interstate crosses the Tampa By Pass Canal which is designated Zone A. There are additional Zone A floodplains farther east in the vicinity of Williams Road.

In the Ybor City area south of I-4, the Crosstown Expressway passes through Zone A10 floodplain with an elevation of 11 feet. The floodplain reaches its most northerly point in the vicinity of the CSX Railroad at 30th Street. A connector between I-4 and the Crosstown Expressway may pass through this floodplain.

The most significant floodplain area with natural and beneficial values is the floodplain area north of the Nebraska Avenue overpass, which is in the Cypress Creek Basin. This area provides both stormwater retention for major storm events and is a large area of wildlife habitat.



F.E.M.A. ZONE "A" FLOODPLAIN

EXHIBIT X– 4

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY / THE GREINER TEAM

There are three floodways in the study area. There are two crossings of the Hillsborough River, one west of downtown and one at Sulphur Springs just south of Bird Street. The third floodway crossing is the I-4 bridge over the Tampa By Pass Canal.

One additional location should possibly be considered a floodway. The interstate corridor traverses the Cypress Creek floodplain, as noted in the previous section, in the northern portion of the study area. A copy of the "Floodplain Information on Cypress Creek," June 1986, was supplied by the Southwest Florida Water Management District. It is recommended the crossings of Cypress Creek and Trout Creek be considered as floodway crossings. Bridge Hydraulic Recommendation Sheets were completed for these crossings at I-75 near the I-275/I-75 interchange.

XI. PUBLIC INVOLVEMENT

An extensive public involvement program was developed as an integral part of the Tampa Interstate Study (TIS). The program was used to ensure that local residents, organizations and elected officials were aware of the study and could participate in the identification and the review of alternatives. The public involvement program consisted of five major components:

* Project Study Office;
* Speakers Bureau;
* Citizen Advisory Committee;
* Agency Task Force; and
* Public Information Meetings.

At the study's initiation and periodically throughout the study, media representatives from newspapers, radio and television were provided with news releases and graphics, as well as opportunities to meet with the study team. Members of the media were given a phone hotline number, where knowledgeable staff could provide an immediate response to questions or concerns.

The success of the media program can be measured by the positive newspaper coverage. Special benefit to the study were the newspaper graphics showing two-roadway and four-roadway systems and design amenity features.

Project Office

A special project office was established for the TIS. It housed the key study team members and provided a location for members of the public to visit or call for study information.

The project office included areas for study displays and graphics as well as a conference room for group meetings and presentations. Key staff members were available each day during working hours to provide visitors information and explanations and to answer phone calls. The number of visitors to the project office was greater than originally anticipated, particularly after the public workshops. Persons, who had either been unable to attend the workshop or learned of the study from publicity following the workshops, visited the office to obtain information and view the impacts of the alternative concepts. Owners of property near the interstate and members of the real estate community were the primary office visitors. Many directors and staffs of community services also visited in order to better plan their future delivery of services.

Phone Service

All media displays and study team members promoted the use of a local access, toll-free phone number for use in Hillsborough, Pinellas and Pasco Counties. Staff was on hand during working hours to respond to calls, and a phone recording service was available after hours to take messages.

In general, phone calls increased just prior to and immediately after public workshops. Members of the public were able to confirm workshop locations, times and information availability prior to the meetings.

They were able to clarify issues, obtain additional information and determine the study process and schedule after the public meetings.

Special forms were devised to record in-coming phone calls and to ensure a follow through for the provision of information. It is estimated that approximately 3,000 phone calls were received during the 18-month study.

Computerized Mailing List

A computerized mailing list of agencies, public officials, community service organizations, special interest groups, interested residents, and property owners within 300 feet of the interstate was prepared prior to the study's initiation. The mailing list now has approximately 5,000 names.

Requests to be added to the mailing list were received by phone, in the mail and from office visits. This was a direct result of the forms provided at the public meetings. The mailing list was used to distribute the three newsletters and for notification of the three public meetings.

Newsletters

The study team produced three issues of the Tampa Interstate Newsletter. These eight-page booklets contained text, maps and graphics describing the study process and progress. Each issue announced the next public workshop, included a study limits map and described how to contact the study team. Special topics about the project were also found in each issue including traffic demand, design amenities and roadway types. Copies of the three newsletters can be found in the Appendix.

Citizen Advisory Committee

This 13-member Citizen Advisory Committee (CAC) was created to encourage interaction between study team members and corridor users, land owners, businesses, and residents. The committee met nearly every month during the study.

The CAC functioned as a conduit of information to major organizations and resident groups working and living along the interstate corridor. They reviewed and discussed all alternative concepts prior to a public presentation and attended the workshops to hear citizen comments. They assisted the study team in building community consensus by identifying the important issues, recommending solutions and by meeting with members of the community. CAC members also sponsored speakers' bureaus and met with their constituents to discuss program elements. A list of CAC members and the groups they represent is found in the Appendix. The CAC will continue to function as an integral part of the Phase II efforts.

Agency Task Force

The Agency Task Force (ATF), composed of local, state and federal agencies, met nearly every month of the study. Membership was more fluid than the CAC, as different staff members of the various agencies

attended. Participation fluctuated with a specific agency's staff attending when an area of specific concern was discussed. For instance, the law enforcement agencies had particular interest in the Transportation Systems Management component of the study while local transportation staffs focused on roadway impacts to local arterial streets.

The ATF acts now and will continue through the next study phases to function as a liaison between study team members and the agencies they represent. Their involvement will increase as Phase I is completed and the federal and state mandated agency reviews occur.

The ATF has facilitated the flow of information between the study team and their respective agencies. The ATF has been especially helpful in the coordination of Transportation System Management Components, future land use, transportation planning, and natural systems mitigation.

Speakers Bureau

The Project Manager and Project Coordinator were available throughout the study to make presentations to community, civic, and special interest groups. Presentations generally occurred at breakfast or luncheon meetings; however, several presentations also occurred during the day and after 5:00 p.m. The meetings normally consisted of a 10 to 15 minute presentation followed by 20 to 30 minutes of questions or comments. The study team members displayed project graphics and provided informational brochures. Presentations were made to 39 groups with approximately 20 people attending each Speakers Bureau. A complete list of Speakers Bureau Engagements, dates and the number of attendees is contained in the Appendix.

Public Meetings

Over 3,000 people attended the three public workshops held as a part of the TIS process. All three workshops took place in the Gasparilla Room of the Curtis Hixon Convention Center.

The workshops were held on July 13, 1988, November 7, 1988, and January 26, 1989. They were all informal opportunities for the public to examine displays and conceptual alternatives drawn on aerial photographs, and to obtain information from team members and Florida Department of Transportation (FDOT) staff about the study.

The workshops were organized as informal informational meetings. Members of the public entered the hall to a display of general concepts including design amenity components and potential noise barriers. They were then encouraged to view the 12 minute slide show to receive a study overview and geographic orientation. Slide shows were run continuously throughout the workshop.

They were then assisted in determining which study segment or segments were of interest to them and directed to specific locations around the hall. The study team members and FDOT staff were stationed near aerial photographs to explain the concepts. If residents had questions regarding relocation or the property acquisition process, FDOT right-of-way staff was available to provide information and answer their questions.

Attendees were encouraged to comment on the study and each meeting's concepts, either on comment sheets provided or through the court reporters available to receive their verbal comments. After the public

meetings, the comments received at the workshop and within 45 days following the meeting, were summarized in a report. The three documents are entitled: Public Meeting No. 1 Comments Summary Working Paper, Public Meeting No. 2 Comments Summary Working Paper, and Public Meeting No. 3 Comments Summary Working Paper. The comments received were used to review and refine each level of analysis. Copies of the three reports are available for review at the project office.

The success of the TIS Public Involvement Program can be measured by the large number of participants and the community wide consensus on the need for improvements. While public involvement will continue as the concepts are refined in the next stage, the Phase II, in many areas consensus on the type of improvement has been reached. The program has also helped identify the issues the community considers the most significant: noise impacts, aesthetics, neighborhood impacts and the role of transit. The process has been initiated to identify solutions to those issues and will continue through subsequent stages of the study.

APPENDIX

LIST OF TAMPA INTERSTATE STUDY SUPPORT DOCUMENTS

Task	Title	Type
B	Public Involvement Plan	Working Paper
B.1.g(2)	Mailing List Contact Document	Working Paper
B.2.b	LRT Liaison	Review Briefs
E.13 & F.6.c(3)	Tier 3 Right-of-Way and Relocation Estimates	Working Paper
E.14.b	Noise Sensitive Sites Inventory	Technical Report
E.16	Hazardous Waste Site Inventory	Technical Report
E.18	Public Meeting Site Inventory	Review Briefs
E.2.a	Existing Alignment Inventory	Working Paper
E.2.b,c	Interstate Structural Inventory	Working Paper
E.7.e	Drainage Basin and Structure Summary	Working Paper
E.7.f(1)	Soil and Geotechnical Inventory	Working Paper
E.7.f(2)	Pavement Analysis	Working Paper
E.7.a,b,h,i,k	Natural Features Inventory	Working Paper
E.8	Utilities Inventory	Working Paper
E.9	Transportation Plans	Working Paper
F.2.a	Component Package Presentation Summary	Technical Report
F.2.b	Design Criteria, Policies and Procedures	Technical Memorandum
F.3 & F.4	Study Design Segments and Priority Study Segment Inventory	Working Paper
F.5.b	Develop/Validate Model	Technical Memorandum
F.5.d	Tiers 1-3 Alternative Simulations	Working Paper (3)
F.5.e	Analysis of Service Flow Rates and Level of Service	Working Paper
F.5.e	Travel Demand	Technical Report
F.5.f	Transit Model Refinement	Working Paper
F.6	Design Amenities	Working Paper
F.6.a(6)	Tiers 1-3 Analyses	Technical Memorandum
F.6.f	Freeway Traffic Management Plan	Technical Report
F.6.g(1)(d)	Conceptual Stormwater and Quality	Technical Report
F.6.g(2)(a)	LRT Study Documentation	Working Paper
F.6.g(3)(a)	Bus Alternatives	Technical Report
F.6.g(3)(c)	Tampa CBD Access and Downtown	Technical Memorandum
F.6.g(4)(d)	HOV Alternatives	Technical Report
F.6.i	Florida and Nebraska Avenues Operational Analyses	Working Paper
G.1	Structural Conceptual Analysis	Technical Report
G.2	Cost Effectiveness Analysis	Working Report
H.1	Master Plan Right-of-Way and Relocation Estimates	Working Paper
I.1	Public Meeting No. 1-3 Comments Summary	Working Paper

CITIZENS ADVISORY COMMITTEE MEMBERS

Member	Organization
Dr. Mel Anderson	University of South Florida
Ms. Fran Davin	Tampa Parkway Association
Representative James Hargrett, Jr.	Florida State Legislature
Ms. Pam Iorio	Hillsborough County Commission
Ms. Joan Jennewein	Ybor City Chamber of Commerce
Mr. William McBride, Jr.	Holland & Knight
Mr. Ronald Rotella	Westshore Alliance
Mr. Mike Salmon	City of Tampa
Mr. Bruce Samson	University of Tampa
Mr. John Temple	Florida DOT
Mr. Jeff Thaxter	Tampa Downtown Partnership
Mr. Thomas Thomson	Tampa Urban Area MPO
Mr. Scott Trundle	Tampa Tribune

AGENCY TASK FORCE MEMBERS

Member	Organization
Mr. Jeff Arey	Harlan Bartholomew & Associates
Ms. Sheila Benz	Tampa Bay Regional Planning Council
Mr. Paul Desmarais	SWFMD
Mr. Victor Gagliardo, P.E.	Tampa Permitting Department
Mr. John Gallagher	County Administrator Pasco County
Dr. Rick Garrity	Florida Dept. Environmental Regulation
Lt. James Gillum	Pasco County Department of Police
Mr. Cliff Hayden, Jr.	Hillsborough Area Regional Transit
Sheriff Walter Heinrich	Hillsborough County Sheriff's Dept.
Mr. William Howell	Florida Dept. Natural Resources
Mr. Robert Hunter	Hillsborough County City-County Planning Commission
Sheriff Johnson	Pasco County Dept. of Police
Mr. Emmett Lee, Jr.	Tampa Port Authority
Mr. Lemcke	Betchel Civil Engineers
Mr. Melton Martin, Jr.	Hillsborough County School Board
Mr. Michael McCarthy	Hillsborough County Dept. Public Works
Mr. Ray Miklos	
Mr. Rud Mueller	Hillsborough County Aviation Authority
Captain F. D. Pedrick	State of Florida Dept. Highway Safety and Motor Vehicles
Mr. Hubert Pascoe, Jr.	Pinellas County MPO
Mr. James Randall	Deputy Superintendent for Administration and Operations Hillsborough Co. Schools
Mr. Allan Schrader	Tampa Port Authority
Mr. J. E. Skinner	FHWA
Mr. Ray Speer	Hillsborough County Expressway Authority
Lt. James Tagliarini	Hillsborough County Sheriff's Department
Mr. John Temple	Fl. Department of Transportation
Mr. Thomas Thomson	Tampa Urban Area MPO
Ms. Dawn Turner	SWFMD
Mr. Robert Wallace	City of Tampa, Dept. of Public Works
Lt. Albert White	Hillsborough County District III

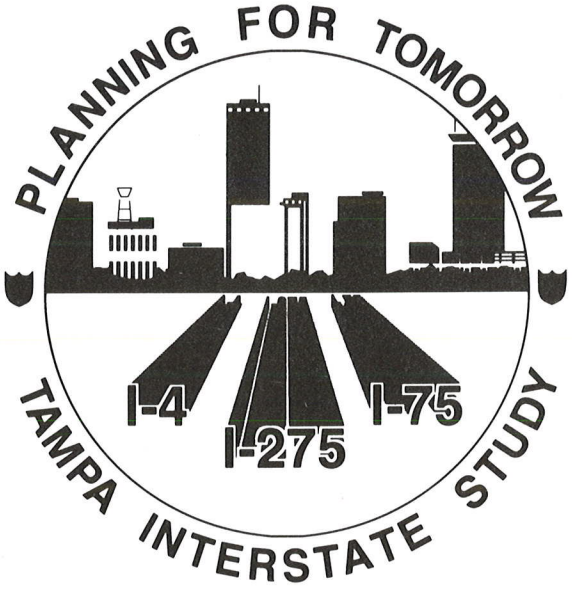
TAMPA INTERSTATE STUDY
SPEAKERS' BUREAU MEETINGS

Date	Organization
August 31, 1987	Kiwanis Club of Tampa
September 17, 1987	American Society of Civil Engineers
October 1, 1987	Downtown Partnership
October 19, 1987	Chamber of Commerce-Comprehensive Plng.
November 5, 1987	Dowtown Merchants
November 18, 1987	Optimist Club of Tampa
November 19, 1987	BOMA
December 18, 1987	Westshore Development Group
January 17, 1988	New Auto Dealers
February 13, 1988	Daughters of the American Revolution
March 8, 1988	North Tampa Kiwanis
April 28, 1988	Inner Bay Speakers Bureau
July 11, 1988	Tampa Bay Commercial Brokers
July 20, 1988	Temple Terrace Chamber of Commerce
July 27, 1988	Ybor City Redevelopment
July 28, 1988	Transportaion Committe/Tampa Downtown Partnership
August 2, 1988	Kiwanis Club
August 5, 1988	Tampa Downtown Partnershi[
August 9, 1988	Westshore Allience
September 9, 1988	Ybor Redevelopment Association
September 30, 1988	American Society of Civil Engineers
December 7, 1988	Chamber of Commerce Aviation Council
December 14, 1988	Barrio Latino
January 5, 1989	East Lake Park Homeowners Association
January 25, 1989	Ybor City Rotary
February 1, 1989	Sertoma Club
February 6, 1989	Bay Area Breakfast Club
February 8, 1989	Greater Tampa Utility Group
February 9, 1989	Flounle Villa Neighborhood
February 14, 1989	Ybor Development Agency
February 15, 1989	Bethel Baptist Church
February 21, 1989	Ybor City Chamber of Commerce
February 21, 1989	Buella Baptist Church
February 22, 1989	Barrio Latino
February 24, 1989	Pinellas MPO
February 27, 1989	Westchester Condominium Association
March 2, 1989	Tampa Merchants Association
March 16, 1989	Chamber of Commerce - Planning & Growth
March 16, 1989	Leadership Tampa Bay
March 17, 1989	Tampa Palms
March 22, 1989	Barrio Latino Commission
April 10, 1989	Hillsborough County Planning Commission
April 12, 1989	Downtown Partnership Transportation Committee
April 18, 1989	Hillsborough County Commissioners
April 27, 1989	Westshore Alliance
April 27, 1989	Three Oaks Realty
May 3, 1989	Hillsborough County Board of Commissioners
May 18, 1989	Tampa City Council
July 31, 1989	Westshore Alliance

TAMPA INTERSTATE NEWS

A Florida Department of Transportation Project

January/1989



Master Plan Concepts Selected

Phase I of the Tampa Interstate Study, preparation of the Master Plan, will be completed in April 1989, with Phase II beginning immediately thereafter. The Phase I Recommended Master Plan Concepts identified to date are the preferred type and location of multi-lane improvements, high-occupancy vehicle (HOV)/transit facilities, traffic management techniques, and traffic surveillance and control systems.

The third and final workshop in Phase I will be held on January 26, 1989 to present the Recommended Master Plan Concepts to be evaluated and refined in Phase II of the Tampa Interstate Study.

This is the third newsletter to be produced during Phase I of the study. This newsletter summarizes what has been accomplished and describes what will occur in the future. Topics addressed in this newsletter include:

- What's Next?,
- Analysis of Alternatives,
- Priority Segments Identified,
- Multi-Modal Consensus,
- Noise Abatement and Design Amenities Overview,
- Summary of November Public Workshop,
- the Interstate Project Office, and
- the January 26th Public Workshop.❐

What's Next?

Phase II of the Tampa Interstate Study will begin in April 1989 and last for approximately 12 months. Phase II, the environmental documentation, will evaluate environmental, social and economic impacts in greater detail and refine the Master Plan Concepts. This process, under the guidance of the Florida Department of Transportation, will complete the Project Development and Environmental (PD&E) Study. The documents produced for the PD&E Study are intended to meet requirements of the National Environmental Policy Act (NEPA), the Federal Highway Administration (FHWA) and other related local, state and federal laws, rules and regulations.

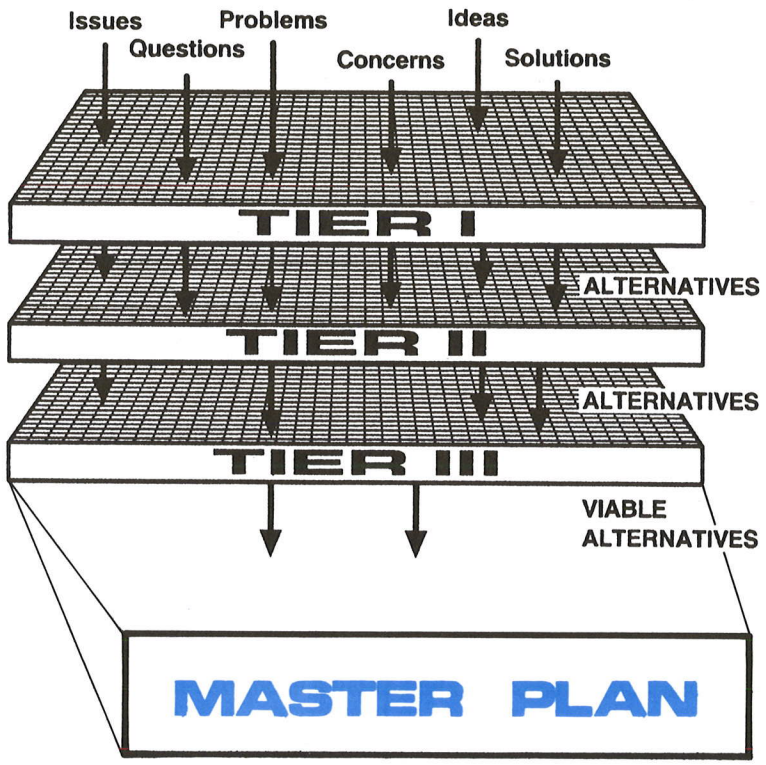
Preliminary engineering design will be conducted concurrently with the environmental documentation. Upon completion of the environmental documentation and preliminary engineering design, the Phase III final design of the roadway will begin. Because the roadway reconstruction will occur in stages, Phase IV (right-of-way acquisition and construction) will begin immediately following final design of the priority segments. The first priority segments are the Westshore Business District, the Ybor City area and the area north of the I-275/I-75 interchange.

Public involvement will continue to play a major role in refining the concepts. To encourage involvement, additional public workshops and a public hearing will be held in Phase II of the study.❐

Analysis of Alternatives

The development of alternatives has been underway for ten months. A unique analysis technique, known as "Tier Analysis," has been used to evaluate improvement alternatives. There were three levels or tiers of analysis within the Tampa Interstate Study process. This screening process, or tiering, has allowed the study team to assemble a large array of competing designs in an easily understood format for evaluation and then reduce the large number of complex designs to viable alternative concepts.

The study team has completed the third tier of analysis and identified the Recommended Master Plan Concepts. The factors used in the third tier of analysis include right-of-way costs, relocations, environmental and socio-economic impacts, roadway and structural costs, drainage impacts and permit requirements, traffic operations, maintenance of traffic, utilities, community cohesion and local traffic circulation and public input. The evaluation of alternatives has been conducted by a team of professional engineers and planners, the Citizens Advisory Committee and the Agency Task Force. Documentation summarizing the evaluation process was produced at the end of each tier.❐



Workshop Scheduled

The third Tampa Interstate Study Public Workshop will be held on January 26, 1989 at the Curtis-Hixon Hall. The convention center is located at 600 Ashley Street in downtown Tampa. The workshop will be held from 4:00 to 8:00 p.m.

The Recommended Master Plan Concepts will be presented for your review and comment at the January 26th public workshop.❐

Aviso De La Tercera Asamblea

Nos complace anunciar que latercera asamblea "Tampa Interstate Study" con participación pública esta programado para el próximo 26 de Enero de 1989 entre las 4:00 y las 8:00 de la noche en los salones del centro de convenciones del Curtis-Hixon Hall, 600 Ashley Street Tampa.

Esta asamblea tiene el propósito de prensentar al público interesado los conceptos recomendados por el Plan Maestro y al mismo tiempo recibir las sugerencias y comentarios del público. Personal de habla hispana estará presente para ayudarles a comunicar sus ideas e inquietudes al personal encargado del proyecto.❐

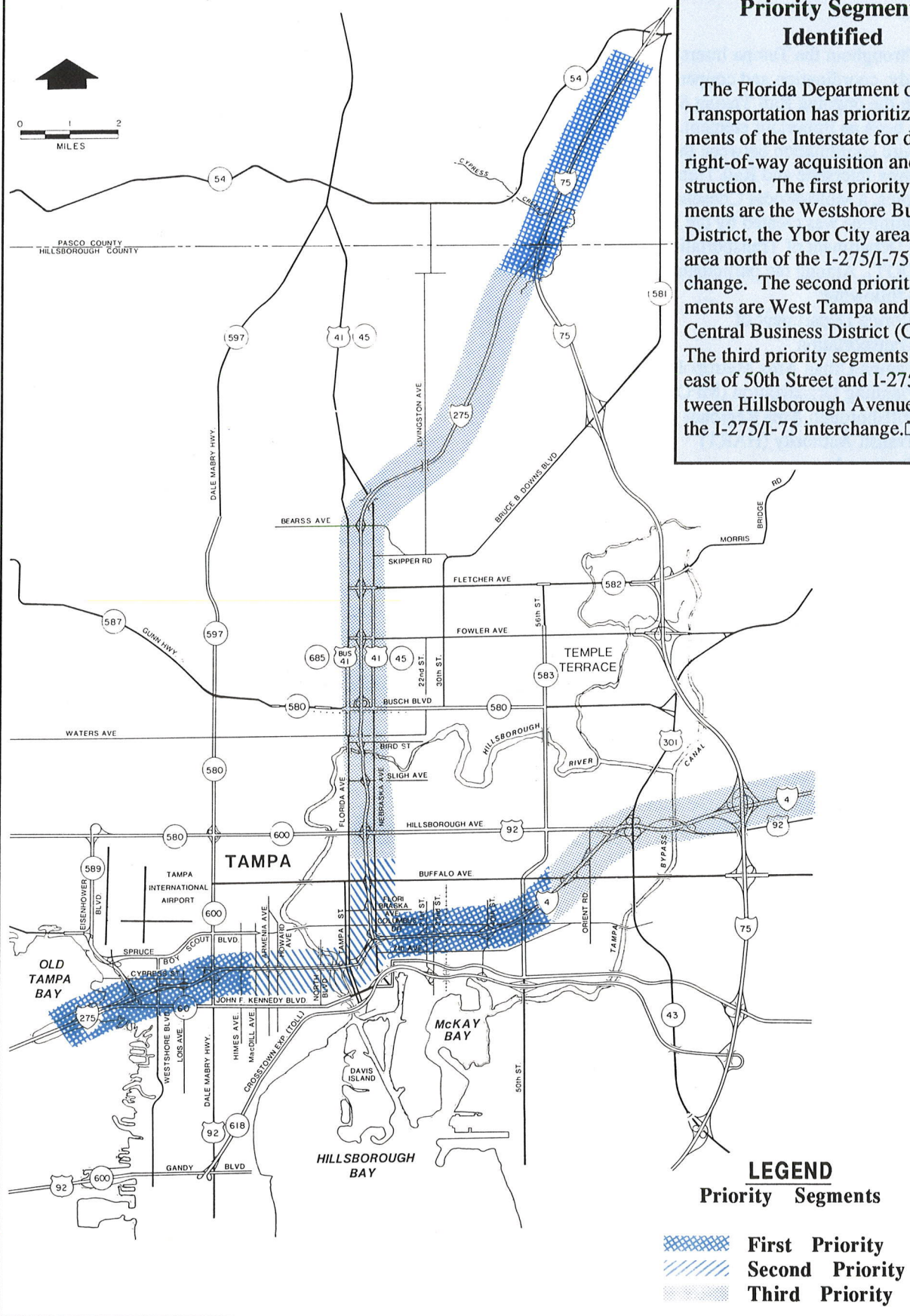
Commonly Used Acronyms in this Study

ATF - Agency Task Force
CAC - Citizen Advisory Committee
CBD - Central Business District
FHWA - Federal Highway Administration
FDOT - Florida Department of Transportation
HART - Hillsborough Area Regional Transit Authority
HOV - High Occupancy Vehicle
MPO - Metropolitan Planning Organization
PD&E - Project Development and Environmental Study
SMT - Rail Transit Study Management Team
TIS - Tampa Interstate Study

The Recommended Master Plan Concepts will be available for public review on January 26th.

Priority Segments Identified

The Florida Department of Transportation has prioritized segments of the Interstate for design, right-of-way acquisition and construction. The first priority segments are the Westshore Business District, the Ybor City area and the area north of the I-275/I-75 interchange. The second priority segments are West Tampa and the Central Business District (CBD). The third priority segments are I-4 east of 50th Street and I-275 between Hillsborough Avenue and the I-275/I-75 interchange.❐



Multi-Modal Consensus

Throughout the Tampa Interstate Study, coordination and cooperation with the ongoing Rail Transit Study has been an important element. To ensure coordination between the Tampa Interstate and Rail Transit studies, a Multi-Modal Consensus Committee was created by the Florida Department of Transportation (FDOT). Among the participants are the following:

- Florida Department of Transportation
- Tampa Urban Area Metropolitan Planning Organization (MPO)
- Hillsborough Area Regional Transit Authority (HART)
- Greiner, Inc.
- Gannett Fleming Transportation Engineers, Inc.
- Bechtel, Inc.
- Parsons, Brinckerhoff, Quade and Douglas, Inc.

The Multi-Modal Consensus Committee has met during the study to ensure compatibility in transportation program development. This committee also meets regularly with the Rail Transit Study Management Team (SMT) and the Tampa Interstate Study Team to discuss coordination issues. In addition, the Rail Transit consultant and MPO are members of the Tampa Interstate Study's Agency Task Force.

The rail study has identified possible corridors, all of which are outside the Interstate system. The Tampa Interstate and Rail Transit studies have jointly estimated travel demands during the past year and are in agreement on the traffic values used to estimate transportation improvements for the year 2010. The identification of rail corridors and the agreement as to the amount of rail use is referred to as "multi-modal consensus." This consensus ensures a balanced transportation system for Tampa's future. This multi-modal consensus was reached during a special MPO workshop on October 17, 1988.

Master Plan Concepts for the Tampa Interstate contain a 54-foot transit envelope suitable for high occupancy vehicle/transitway lanes for buses and carpools. These transit concepts include high occupancy vehicle lanes and park-and-ride lots with priority ramps at selected locations.❐

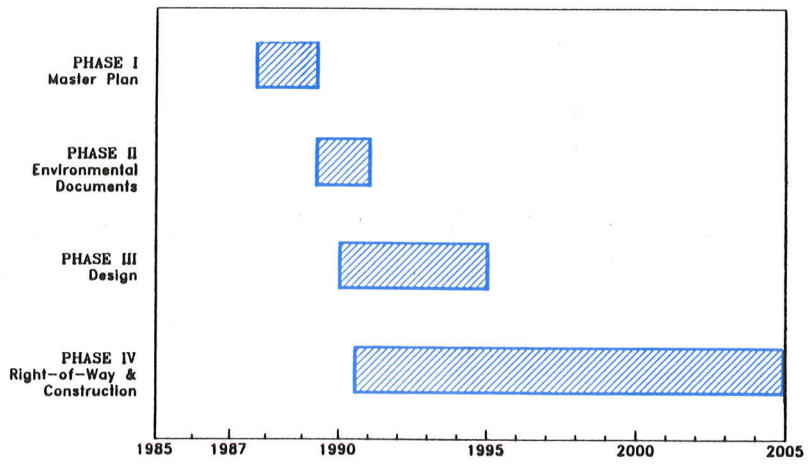
Arrange a Speaker's Bureau for Your Group

Neighborhood groups, civic organizations or agencies can arrange a presentation by the Tampa Interstate Study Team throughout the study phases of this project. For the most effective presentation, it is suggested that smaller groups combine to hold a joint meeting. The organization(s) sponsoring the meeting will be responsible for arranging a meeting site and notifying participants. To schedule your meeting, please contact Kris Cella at 286-7667 or 1-800-624-0074.❐

Interstate Project Office

The Tampa Interstate Study has a project office devoted exclusively to the study. Greiner staff members, Ron Gregory and Kris Cella, are available between 8:00 a.m. to 5:00 p.m., Monday through Friday, to meet with members of the public who wish to obtain additional information about the study. The project office contains all the maps displayed at the public workshops and the reports prepared as a part of the study. Appointments can be made or information obtained by calling either of the study's phone numbers: 1-800-624-0074 or 286-7667. The project office is located in Suite 104, 5601 Mariner Street, Tampa, Florida 33630-3416.❐

Interstate reconstruction will take between 10 and 15 years.



Noise Abatement and Design Amenities Overview

One of the major factors considered during the study of roadway improvements is the effect of the Interstate expansion upon noise levels. Throughout the entire Tampa Interstate Study, noise analyses and documentation will be completed in accordance with State and Federal guidelines.

Noise abatement measures determined to be effective in some areas include noise barriers and land use controls. The feasibility of noise barriers depends on a number of factors such as safety, appearance, roadway access, noise reduction capability, available space, cost-effectiveness and public acceptance. Noise sensitive areas where barriers may be feasible were presented at the November 7th Public Workshop. Several types of noise barriers currently being considered for these areas include earthen berms, retaining walls and concrete structures. The appearance of these barriers will be enhanced where possible by the Design Amenities Program.

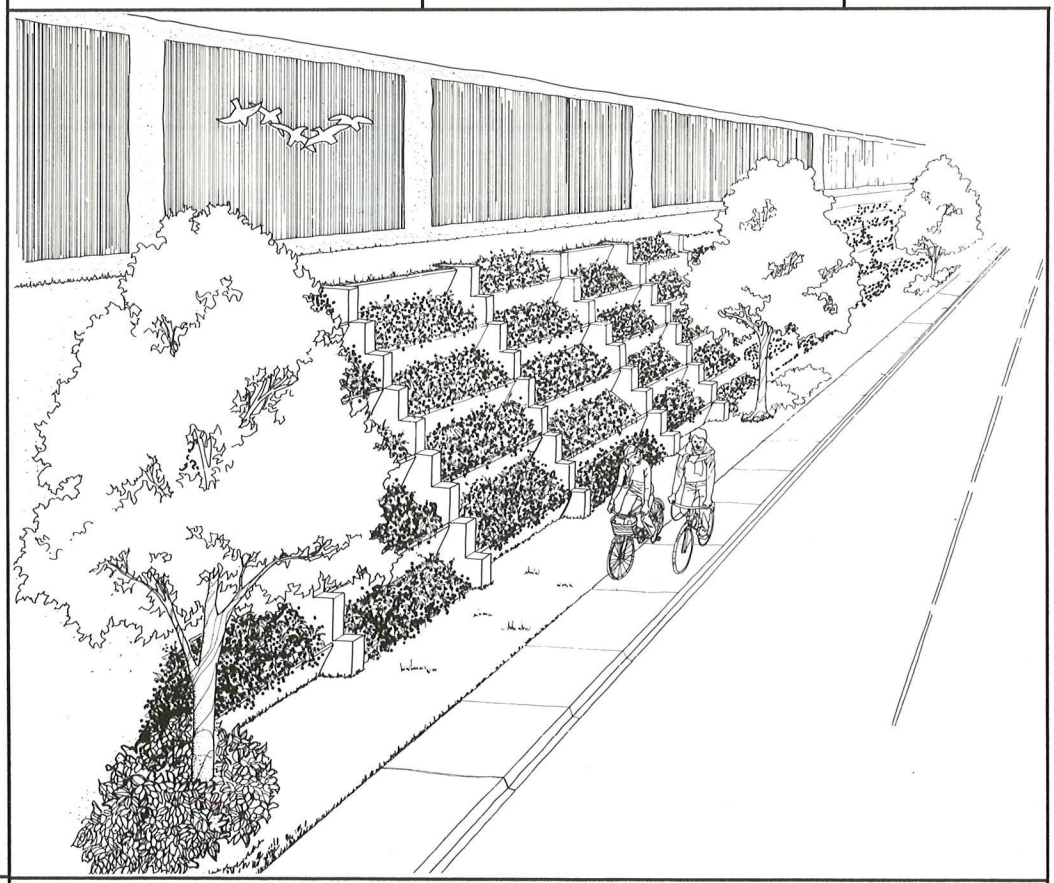
The Design Amenities Program is a program in which the planning team examines methods to provide a sense of visual unity to the Tampa Interstate system as well as generate an aesthetically pleasing design for the facility.

The process of developing the Amenities Package for the Tampa Interstate Study is evolving continually. Possible architectural and landscaping treatments were displayed at the November 7th Public Workshop.

The study team is in the process of identifying areas requiring special design emphasis, construction methods and materials. The following items have been identified as elements to be addressed in the Design Amenities Package:

- Bridges and Piers
- Overhead and Roadside Signage
- Roadway and Accent Lighting
- Noise Barriers and Retaining Walls
- Landscape Materials
- Urban Art
- Stormwater Management Areas
- Urban Parks
- Multi-Level Interchanges
- Water Crossings
- Control of Access

As the study progresses, landscape architects and planners will be working with local groups to establish a palette of colors, textures, shapes, materials, construction techniques and landscape elements for specific locations and neighborhoods. The public will have the opportunity to view the possible aesthetic treatments in Phase II of the study.❐



Landscaping treatment of retaining wall known as a "green wall" with a textured noise barrier extending from the retaining wall.

Summary of November Public Workshop

The second in a series of Public Workshops for the Tampa Interstate Study was held on November 7th at the Curtis Hixon Convention Center. Over 1,200 people attended the four-hour informal workshop to examine conceptual layouts of the Tier 3 alternatives and view a slide presentation explaining the study.

Aerial photographs depicting the refined alternatives within each design segment were displayed at the workshop. Study team personnel were available to answer questions or provide further explanation. The slide presentation was shown continuously and featured the goals and objectives of the Tampa Interstate Study.

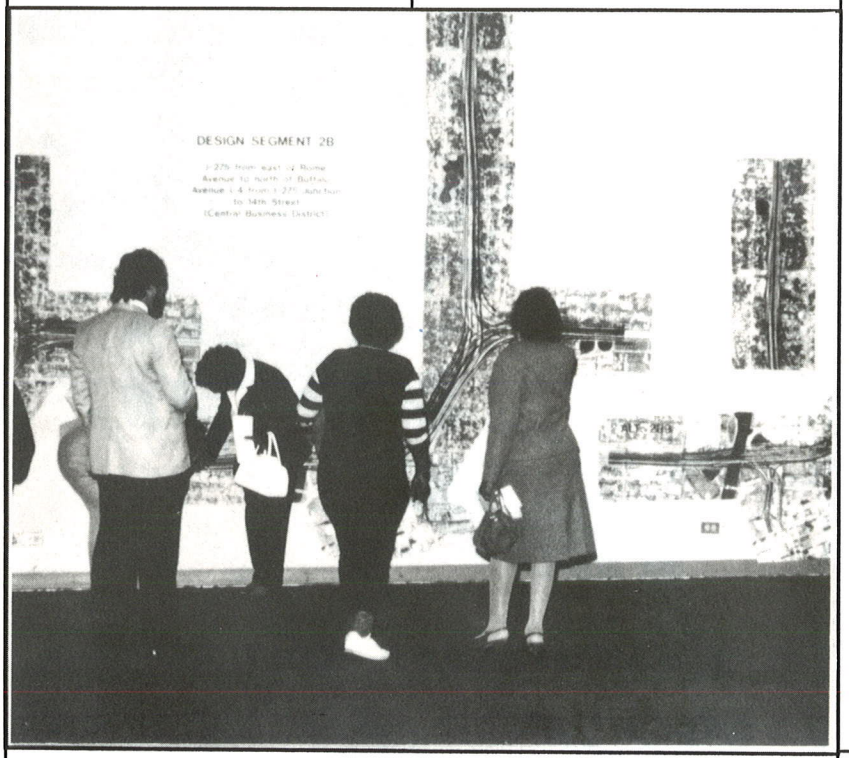
During the workshop, the public was offered the opportunity to comment about the study through court reporters or on forms provided to each attendee. Many of the comments expressed concern over noise barrier locations, relocation impacts, pollution, design amenities and the proximity of the roadways to existing neighborhoods. Other concerns included the preservation of historic areas, the maintenance of traffic during construction, access, the effectiveness of the improvements beyond the design year 2010 and the further development of mass transit options.

The workshop began a review period during which individuals, governmental agencies, and civic and neighborhood organizations were encouraged to comment on the Tier 3 alternatives. Review of comments received during this period in conjunction with the Tier 3 evaluation enabled the study team to eliminate alternatives which did not meet the projected needs, had major design problems, or had significant land use impacts. This review process also enabled the study team to select the Recommended Master Plan Concepts.

Every effort is being made to address the concerns of individuals, organizations, and governmental agencies. Additional workshops are scheduled throughout the study process to provide opportunities for public review and comment. The next public workshop will be held on January 26th.❐

NOTICE TO PROPERTY OWNERS

The Florida Department of Transportation has not begun any right-of-way acquisition for this project. Please be advised that there may be land speculators representing themselves as DOT right-of-way agents. You should request identification of any person or persons who might indicate they represent the DOT. Again, there are no authorized persons in the project area who are acquiring right-of-way at this time for the Tampa Interstate reconstruction.❐



Over 1,200 people attended the November 7th Public Workshop.

You are invited to participate...

Name: _____

Address: _____

_____ Zip Code: _____

If you have a Neighborhood or Civic Organization which can be placed on the mailing list, please provide the name and mailing address: _____

_____

Comments: _____

_____

_____

_____

Persons wishing to receive additional information or comment about the study may call Kris Cella at 286-7667 or 1-800-624-0074; or write The Greiner Team, Tampa Interstate Study, Post Office Box 23646, 5601 Mariner Street, Suite 104, Tampa, Florida 33630-3416.

A computerized mailing list of public officials, neighborhood organizations, civic groups, and interested persons has been initiated. The list, which will be continually updated, will be used to send newsletters and meeting notices to interested parties. A form is provided above for persons and organizations wishing to be added to the mailing list.

If you are not receiving the newsletter and wish to do so, please complete the attached form and return it to Kris Cella at the above address.❐

Se ha iniciado una lista computarizada de personas que desean recibir noticias sobre el Tampa Interstate Study. La lista contiene las agencias gubernamentales, los oficiales locales, los grupos cívicos, asociaciónes de vecinos y particulares de toda índole, interesados en el proyecto. Por medio de la lista se avisa de reuniones y acontecimientos.

Para inscribirse en la lista, favor de llenar el formulario anexo y enviarlo a Kris Cella, a la dirección dada en el formulario.❐

A Florida Department of Transportation Project

The Greiner Team
Tampa Interstate Study
Post Office Box 23646
5601 Mariner Street, Suite 104
Tampa, Florida 33630-3416

TAMPA INTERSTATE NEWS

A Florida Department of Transportation Project

October/1988



Study Schedule Accelerated

The Tampa Interstate Study began in September 1987. It is being directed by the Florida Department of Transportation with sponsorship by the Federal Highway Administration. The Greiner, Inc. consultant team is conducting the study. The purpose of the study is to develop a Master Plan that identifies possible improvements which will enable I-4, I-75 and I-275 to accommodate anticipated travel demand in the year 2010.

Phase I of the study, preparation of a Master Plan, was originally scheduled for completion in September 1989. The schedule has been accelerated in order to complete the Master Plan by April 1989 and then begin Phase II immediately, the preparation of the environmental documentation necessary for State and Federal approvals and funding. Phase I, the Master Plan, will identify alternatives and make recommendations regarding the preferred type and location of multi-lane improvements, potential high-occupancy vehicle (HOV) facilities, transit facilities, traffic management techniques, and traffic surveillance and control systems. Phase II, the environmental documentation, will evaluate the environmental, social and economic impacts in greater detail and refine the alternatives. Phase III involves the final design of the roadway, and Phase IV includes both acquisition of right-of-way and roadway reconstruction.

Three public workshops with opportunities for public review and comment will be held during Phase I of the study. The first public workshop was held on July 13th. The second public workshop will be held November 7th. The third workshop will be held in early 1989. Additional workshops and a public hearing will be held during Phase II of the study.

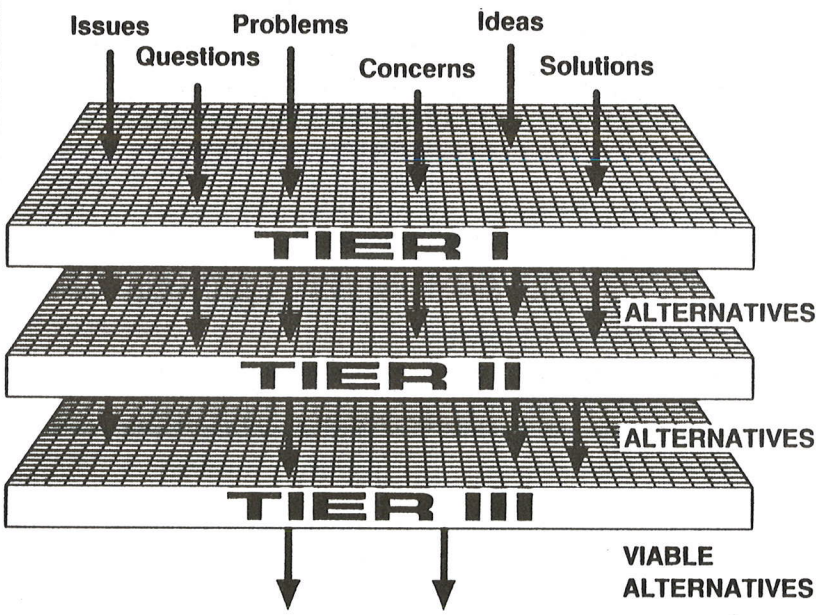
This is the second newsletter to be produced during Phase I of the study. Additional newsletters will be sent to the public periodically during the remaining study phases. This newsletter provides a summary of what has been accomplished and an indication of what will occur in the future. Topics addressed in this newsletter include:

- analysis of alternatives,
- level of service analysis,
- noise monitoring, impacts and mitigation overview,
- the July public workshop summary,
- the Interstate Project Office, and
- the November 7th Public Workshop.❐

Alternative Analysis

The development of alternatives has been underway for eight months. A unique analysis technique, known as "Tier Analysis," is used to evaluate improvement alternatives. There are three levels or tiers of analysis within the Tampa Interstate Study process. This screening process, or tiering, allows the study team to assemble a large array of competing designs in an easily understood format for evaluation and then reduce the large number of complex designs to a few viable alternative concepts.

The study team has completed the second tier of analysis and progressed to the third tier. The factors used in the third tier of analysis include right-of-way and relocation impacts, roadway and structural costs, drainage impacts and permit requirements, traffic operations, maintenance of traffic, utilities, community cohesion and local traffic circulation. The evaluation of alternatives is conducted by a team of professional engineers and planners, the Citizens Advisory Committee and the Agency Task Force. A document summarizing the evaluation process is produced at the end of each tier.❐



Tier 3 alternatives will be available for public review on November 7th.

Workshop Scheduled

The second Tampa Interstate Study Public Workshop will be held on November 7th at the Curtis-Hixon Hall. The convention center is located at 600 Ashley Street in downtown Tampa. The workshop will be held from 4:00 to 8:00 p.m.

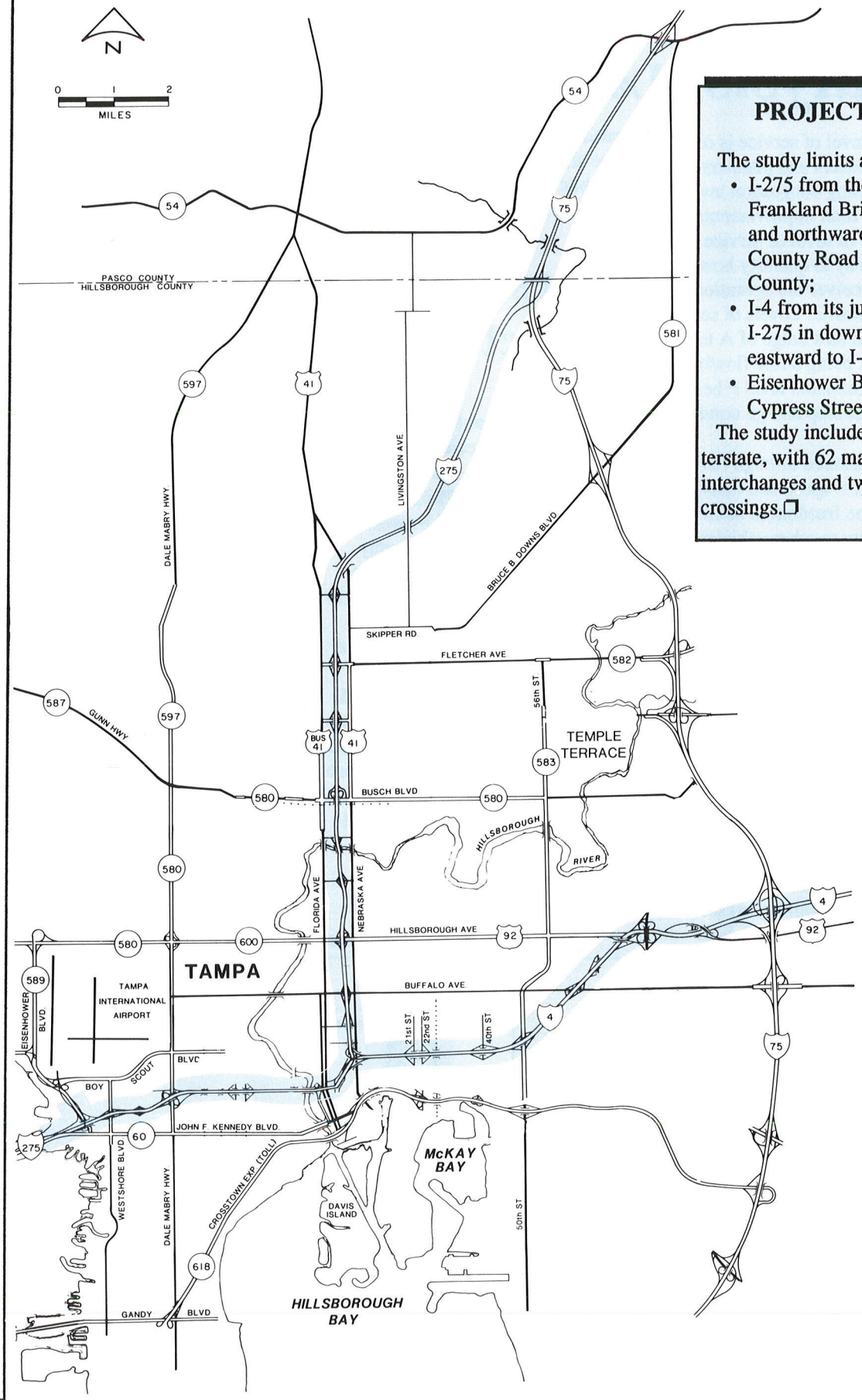
The Tier 3 alternatives will be presented for your review and comment at the November 7th public workshop. Throughout this process it is possible that additional alternatives or refinement of alternatives may be suggested by citizen involvement.❐

Aviso Del Segundo Taller

Nos complace anunciar que el segundo Taller, con la participación del público, sobre el "Tampa Interstate Study" está programado para la fecha 7 de Noviembre próximo, entre las 4:00 y las 8:00 p.m., en los salones del centro de convenciones Curtis-Hixon Hall, 600 Ashley Street, en pleno centro de Tampa.

El taller tiene el fin de presentar al público las alternativas de tercer nivel (Tier 3) y recibir del público sus sugerencias y comentarios. Habrá personal de habla hispana para ayudar al público comunicar sus ideas y sus inquietudes al personal del proyecto.

A lo largo del proceso queda siempre la posibilidad de afectar el producto final, basado en las sugerencias del público para modificar los diseños propuestos. Invitamos y agradecemos su participación.❐



PROJECT LIMITS

The study limits are:

- I-275 from the Howard Frankland Bridge eastward and northward to south of County Road 54 in Pasco County;
- I-4 from its junction with I-275 in downtown Tampa eastward to I-75; and
- Eisenhower Boulevard from Cypress Street to I-275.

The study includes 35 miles of Interstate, with 62 major bridges, 24 interchanges and two river crossings.❐

Level of Service Analysis - Lanes Reduced

The term level of service is often used by engineers and planners when discussing congestion levels or needs for road improvements. The concept of level of service (LOS) is a way to quantify how a motorist perceives the operation of a stream of traffic. Levels of service are measured as a range of A to F, with level A being a free flowing traffic condition and level F being a breakdown or stop and go condition.

LOS is measured through two characteristics: speed and density. Density is the freedom to maneuver and proximity to other vehicles. The definition of LOS, that is, the speed and density of traffic for each level of service, varies from community to community and depends on driver experience and habits. As part of this study, data on driver characteristics for the existing Tampa Interstate System were gathered. These data were compared to national and other cities' characteristics to assist the study team in developing appropriate traffic flow rates for Tampa's Interstate System.

The Tier 2 alternatives presented at the July 13th public workshop were developed for a peak hour LOS "C." As a result of the Tier 2 evaluation and comments received from the public and elected officials, it was decided to develop Tier 3 alternatives at a peak hour LOS "D." This decision reflects an attempt to balance the need for an improved transportation system with negative social and economic impacts. The use of LOS "D" for the freeway design in Tampa is in agreement with the adopted policies of the Metropolitan Planning Organization and the Florida Department of Transportation.

The use of LOS "D" for the Tier 3 alternatives has resulted in a reduction of the number of future lanes needed in much of the study area. These alternatives can be viewed at the public workshop scheduled for November 7th.❐

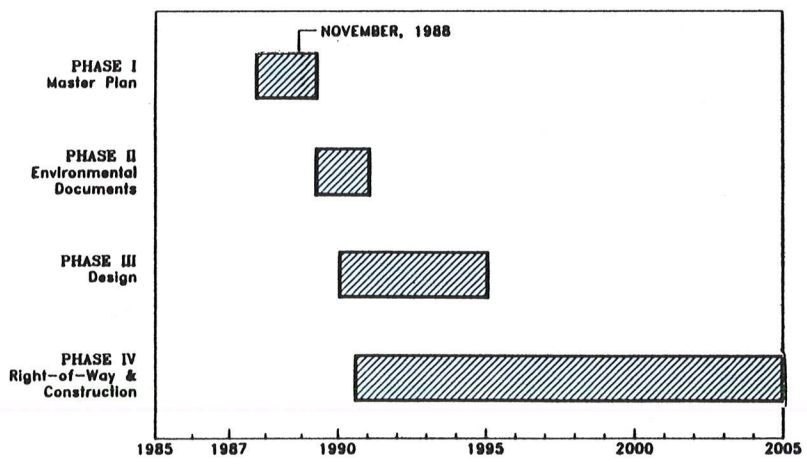
Interstate Project Office

The Tampa Interstate Study has a project office devoted exclusively to the study. Greiner staff members, Ron Gregory, Sharon Phillips and Kris Cella, are available between 8:00 a.m. and 5:00 p.m., Monday through Friday, to meet with members of the public who wish to obtain additional information about the study. The project office contains all the maps displayed at the public workshops and the reports prepared as a part of the study. Appointments can be made or information obtained by calling either of the study's phone numbers: 1-800-624-0074 or 286-7667. The project office is located in Suite 104, 5601 Mariner Street, Tampa, Florida 33630-3416.❐

PUBLIC INVOLVEMENT

You are invited to participate in the study's extensive public involvement program. The program includes a Project Office dedicated exclusively to the study, an informational phone service with an area-wide local access number (1-800-624-0074), a speaker's bureau available for presentations to interested community groups, and a computerized mailing list. A Citizens Advisory Committee and an Agency Task Force have been created to help the study staff identify community concerns.❐

Interstate reconstruction will take between 10 and 15 years.



Noise Analysis Overview

One of the major factors considered during the study of roadway improvements is the effect of the alternatives upon noise levels. Throughout the entire Tampa Interstate Study, noise analyses and documentation will be completed in accordance with State and Federal guidelines. This article has been prepared to provide a better understanding of the study's noise analysis process.

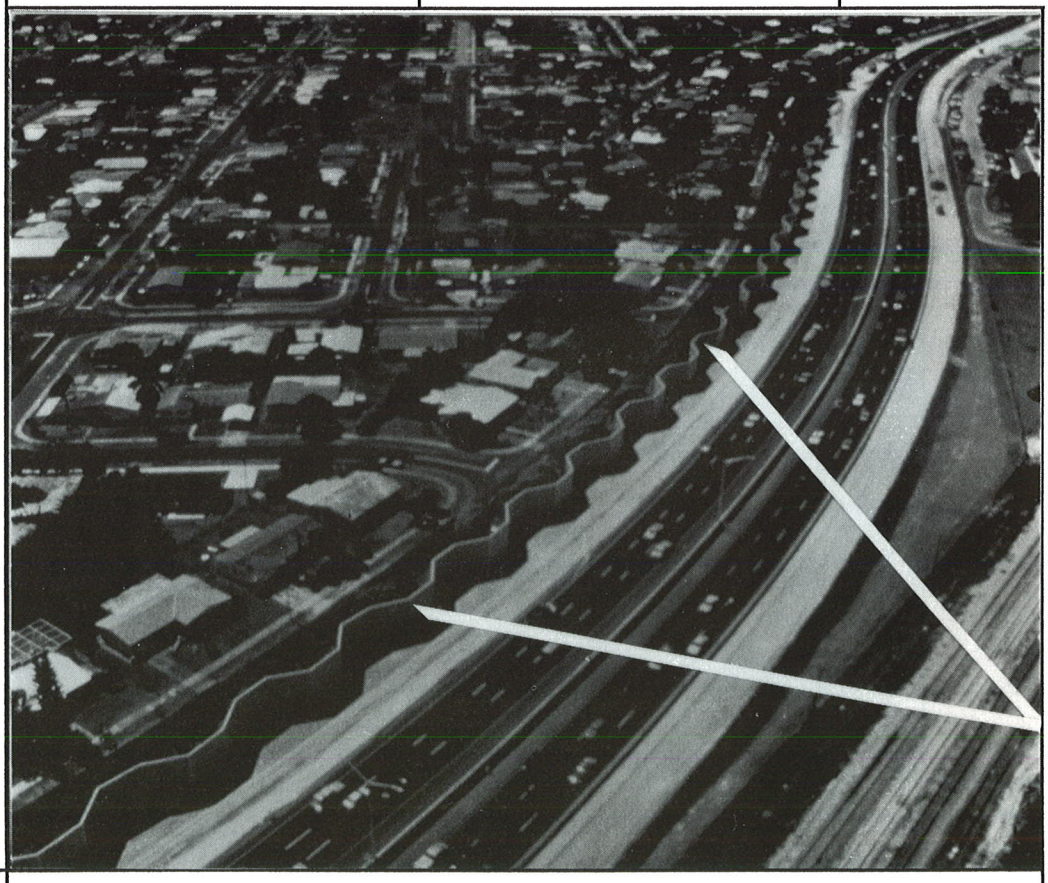
Early in the study, noise sensitive areas were identified and evaluated as to type and location. Noise sensitive areas which have been identified include homes, schools, parks, churches, libraries, and historic areas.

To determine existing noise levels, sound levels were measured at representative locations throughout the study area using electronic sound level analyzers. Measuring sound levels at these locations enabled the comparison of existing levels with future predicted noise levels.

Once Tier 3 alternatives were selected, state-of-the-art computer models were used to predict future conditions with each alternative. These models consider factors such as roadway geometry, vehicle characteristics (number, type and speed), and sensitive site locations.

Existing and predicted levels at noise sensitive areas were compared with accepted noise abatement criteria. The noise abatement criteria establish noise levels for various types of land uses. If these levels were approached or exceeded, a variety of noise abatement measures were considered.

Noise abatement measures determined to be effective in some areas include noise barriers and land use controls. The feasibility of noise barriers depends on a number of factors such as safety, appearance, roadway access, noise reduction capability, available space, cost effectiveness and public acceptance. Noise sensitive areas where barriers may be feasible have been identified and will be presented at the November 7th Public Workshop. Several types of noise barriers currently being considered for these areas include earthen berms, retaining walls and concrete structures. The appearance of these barriers will be enhanced where possible by the Design Amenities Program. The goal of this program is to use color, texture and landscaping for an aesthetically pleasing design.❐



Free-standing noise wall recently built along I-595 in Miami.

Summary of July Public Workshop

The first in a series of Public Workshops for the Tampa Interstate Study was held on July 13th at the Curtis Hixon Convention Center. Over 1,200 people attended the five-hour informal workshop to examine conceptual layouts of the Tier 2 alternatives and view a slide presentation explaining the study.

Aerial photographs depicting the viable alternatives within each design segment were displayed at the workshop. Study team personnel were available to answer questions or provide further explanation. The slide presentation was shown continuously and featured the goals and objectives of the Tampa Interstate Study.

During the workshop, the public was offered the opportunity to comment about the study through court reporters or on forms provided to each attendee. Many of the comments expressed concern over increased noise levels, relocation impacts, pollution and the proximity of the roadways to existing neighborhoods. Other concerns included the preservation of historic areas, the maintenance of traffic during construction, the effectiveness of the improvements beyond the design year 2010 and the further development of mass transit options.

The workshop began a 45-day period over which individuals, governmental agencies, and civic and neighborhood organizations were encouraged to comment on the Tier 2 alternatives. Review of comments received during this period in conjunction with the Tier 2 evaluation enabled the study team to eliminate alternatives which did not meet the projected needs, had major design problems, or had significant land use impacts. Alternatives still considered viable were carried into the third tier of analysis.

Every effort is being made to address the concerns of individuals, organizations, and governmental agencies. Additional workshops are scheduled throughout the study process to provide opportunities for public review and comment. The next public workshop will be held on November 7th.❐



Over 1,200 people attended the July 13th Public Workshop.

You are invited to participate...

Name: _____

Address: _____

_____ Zip Code: _____

If you have a Neighborhood or Civic Organization which can be placed on the mailing list, please provide the name and mailing address: _____

_____

Comments: _____

_____

_____

_____

Persons wishing to receive additional information or comment about the study may call Ron Gregory at 286-7667 or 1-800-624-0074; or write The Greiner Team, Tampa Interstate Study, Post Office Box 23646, 5601 Mariner Street, Suite 104, Tampa, Florida 33630-3416.

A computerized mailing list of public officials, neighborhood organizations, civic groups, and interested persons has been initiated. The list, which will be continually updated, will be used to send newsletters and meeting notices to interested parties. A form is provided above for persons and organizations wishing to be added to the mailing list.

If you are not receiving the newsletter and wish to do so, please complete the attached form and return it to Ron Gregory at the above address.❐

Se ha iniciado una lista computarizada de personas que desean recibir noticias sobre el Tampa Interstate Study. La lista contiene las agencias gubernamentales, los oficiales locales, los grupos cívicos, asociaciónes de vecinos y particulares de toda índole, interesados en el proyecto. Por medio de la lista se avisa de reuniones y acontecimientos.

Para inscribirse en la lista, favor de llenar el formulario anexo y enviarlo a Ron Gregory, a la dirección dada en el formulario.❐

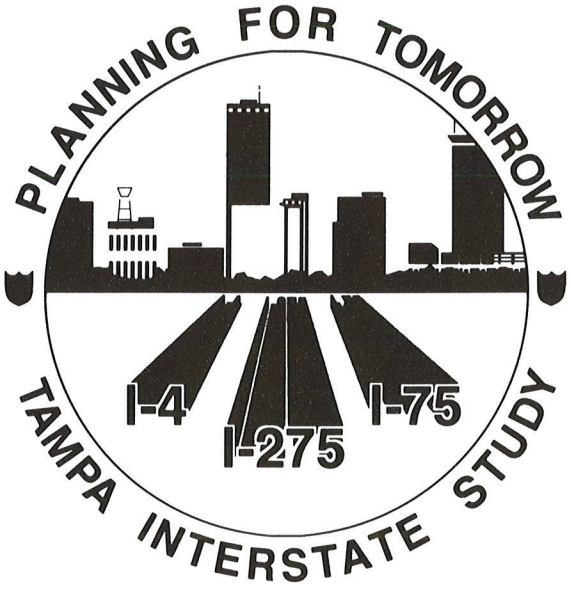
A Florida Department of Transportation Project

The Greiner Team
Tampa Interstate Study
Post Office Box 23646
5601 Mariner Street, Suite 104
Tampa, Florida 33630-3416

TAMPA INTERSTATE NEWS

A Florida Department of Transportation Project

June/1988



Study Underway

The Tampa Interstate Study began in September 1987. The purpose of the Tampa Interstate Study is to develop a Master Plan that identifies possible improvements which will enable I-4, I-75, and I-275 to accommodate anticipated traffic and transportation needs through the year 2010.

This newsletter will be produced periodically throughout the study to provide you information about the proposed improvements.

This first newsletter provides a description of the study, a summary of what has been accomplished, and an indication of what will occur in the future. Topics addressed in this newsletter include:

- analysis of alternatives,
- data collection,
- traffic counts and projections,
- the design amenities program, and
- public involvement.

You will be invited, through the newsletter and other announcements, to review and comment on proposals as the study progresses.

The Tampa Interstate Study will last 24 months. It is being directed by the Florida Department of Transportation with sponsorship by the Federal Highway Administration. The Greiner Inc. Consultant Team is conducting the study.

The study will develop alternatives and make recommendations regarding the preferred type and location of multi-lane improvements, potential high-occupancy-vehicle (HOV) facilities (carpools, buses), transit facilities, traffic management techniques, and traffic surveillance and control systems.

This is the first step of several leading to the reconstruction of the interstate system in Tampa. This study will develop the alternative concepts for further study. The next stage will refine the concepts further and evaluate the environmental, social, and economic impacts of the alternatives in detail. This study has additional public workshops and hearings and provides the documentation stage for approvals for State and Federal funding of the design, right-of-way acquisition and construction phases that follow. The overall program for the reconstruction of the interstate system in Tampa is expected to take 15 years.■

Alternatives Analysis

The development of alternatives has been underway for four months. A unique analysis technique, known as "tier analysis," is used to evaluate improvement alternatives. There will be three levels of analysis in the Tampa Interstate Study process. This screening process, or tiering, allows the study team to assemble a large array of competing designs in an easily understood format for evaluation, then to reduce the large number of complex designs to a few viable alternative concepts, eliminating those which do not meet the projected need, have major design problems, or significant land use impacts.

The study team has completed the first tier analysis of alternatives and progressed to the second tier. The Tier 1 alternatives and evaluation of those alternatives will be summarized for public review at a July 13 public meeting.

Typical factors used in this type of analysis include right-of-way and relocation impacts, roadway and structural costs, drainage impacts and permit requirements, traffic operations, maintenance of traffic, utilities, relocations, community cohesion and local traffic circulation. The evaluation of alternatives is conducted by a team of professional engineers and planners, the Citizens Advisory Committee and the Agency Task Force.

At the July 13 public meeting, Tier 2 conceptual layouts drawn on aerial photographs (those which are viable after the first evaluation process) will be available for your review and comment. With comments received from the July public meeting and study team review, an evaluation of the Tier 2 alternatives will be made.

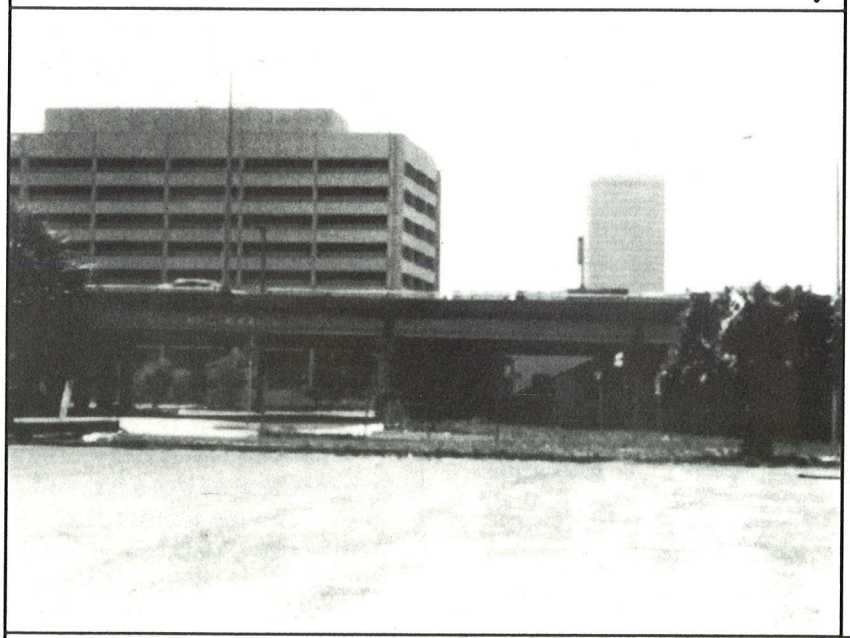
The next newsletter will summarize the public and study team evaluation of these alternatives and describe the viable alternatives to be carried into the third tier. **Throughout this process, it is possible that additional alternatives or refinement of alternatives may be suggested by citizen involvement.** ■

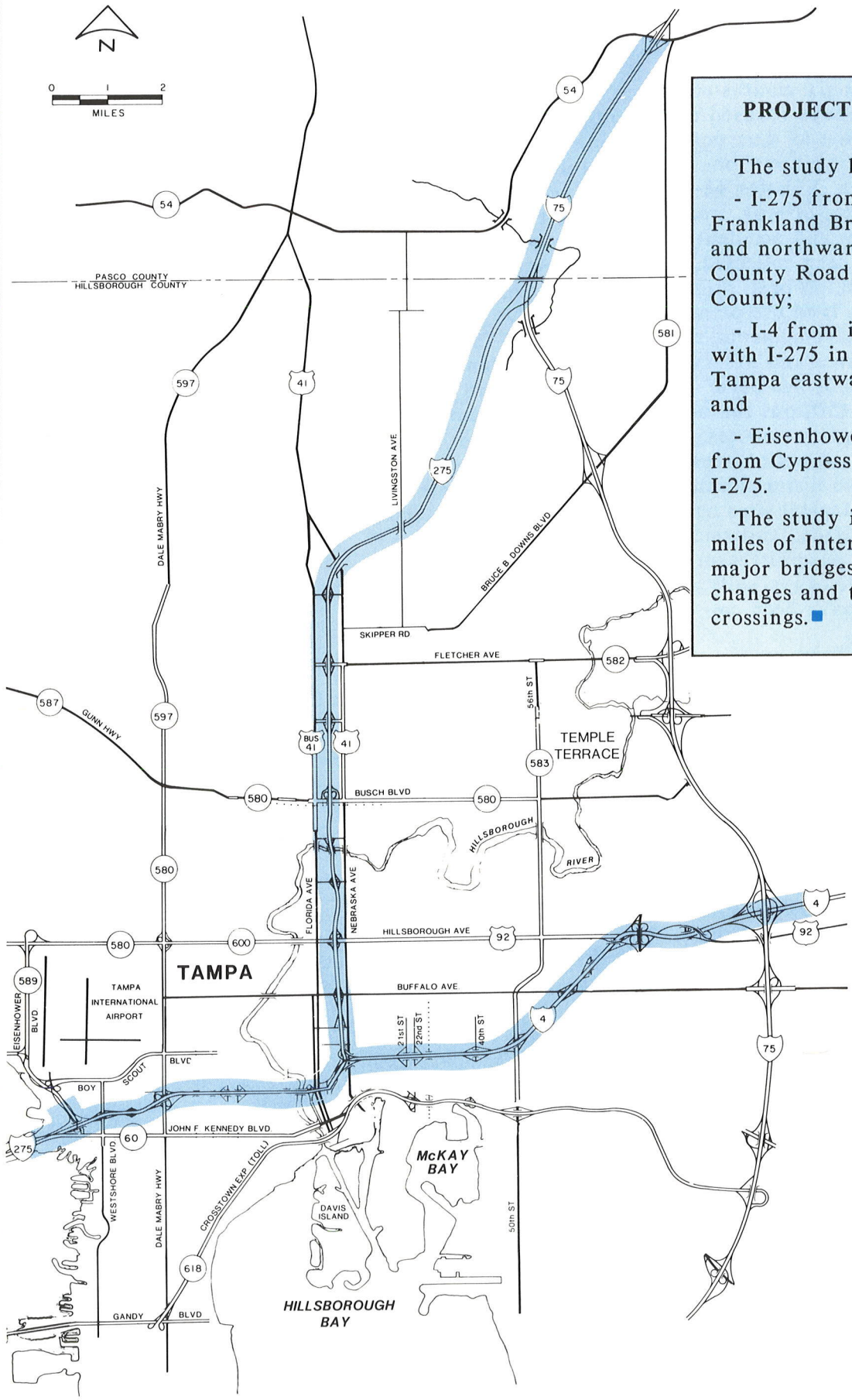
Workshop Schedule

The Tampa Interstate Study has a series of public meetings scheduled. The first meeting will be a workshop scheduled for July 13, to be held at the Curtis-Hixon Hall. The convention center is located at 600 Ashley Street in downtown Tampa. The workshop will be held from 4:00 to 9:00 P.M.

Future workshops for the entire study area will be held in November 1988 and April 1989. Sub-area meetings will be held in four different locations as the study progresses. More information about these workshops and meetings will be announced and publicized in future newsletters. ■

A view of I-275 today.





PROJECT LIMITS

The study limits are:

- I-275 from the Howard Frankland Bridge eastward and northward to south of County Road 54 in Pasco County;

- I-4 from its junction with I-275 in downtown Tampa eastward to I-75; and

- Eisenhower Boulevard from Cypress Street to I-275.

The study includes 35 miles of Interstate, with 62 major bridges, 24 interchanges and two river crossings. ■

Data Collection

The first six months of the study have focused on the collection of data pertinent to the roadway improvements. Existing geometry, right-of-way, traffic volumes and accident data have been collected. Information on past, present and future land use plans, proposed developments, zoning guidelines and observed growth trends has been gathered. Cultural features and community services, parks and recreation areas, and possible historical and/or archaeological sites have been identified. Information about natural features such as floodways, soils and farmland have been collected.

This information has been overlayed on large scale aerial photography to assist planners in assessing impacts and to aid in avoiding sensitive areas during the development of the alternative improvements to the interstate system.

The data collection phase has identified several important factors affecting possible roadway improvements.

1. The current vertical alignment of the roadway causes a "roller coaster" effect along many areas on the roadway which needs to be "leveled-out" in order to make improvements meet current design standards.

2. A survey to assess structural conditions and the potential for widening of bridges and overpasses indicates the vast majority of the structures must be replaced if the roadway is widened.

The need to replace the bridge is based on a combination of the age of the structure, the condition of the structure and insufficient vertical clearance for roads running under the interstate system.

3. The most environmentally sensitive lands are located along I-75 in Pasco County and along Eisenhower Boulevard in western Hillsborough County.

4. A significant number of parks, historic districts, churches and schools directly abut the existing interstate system.

5. The existing roadway drainage system does not meet all current state standards.

All of the factors listed above emphasize the difficulty of designing a new interstate system which provides for efficient, cost-effective movement of traffic while minimizing the impacts to local citizens and adjacent land uses. ■

PUBLIC INVOLVEMENT

You are invited to participate in the study's extensive public involvement program. The program includes a Project Office dedicated exclusively to the study, an informational phone service with an area-wide local access number (1-800-624-0074), a speaker's bureau available for presentations to interested community groups, and a computerized mailing list. A Citizens Advisory Committee and an Agency Task Force has been created to help study staff identify community concerns. ■

Citizen Advisory Committee at work.



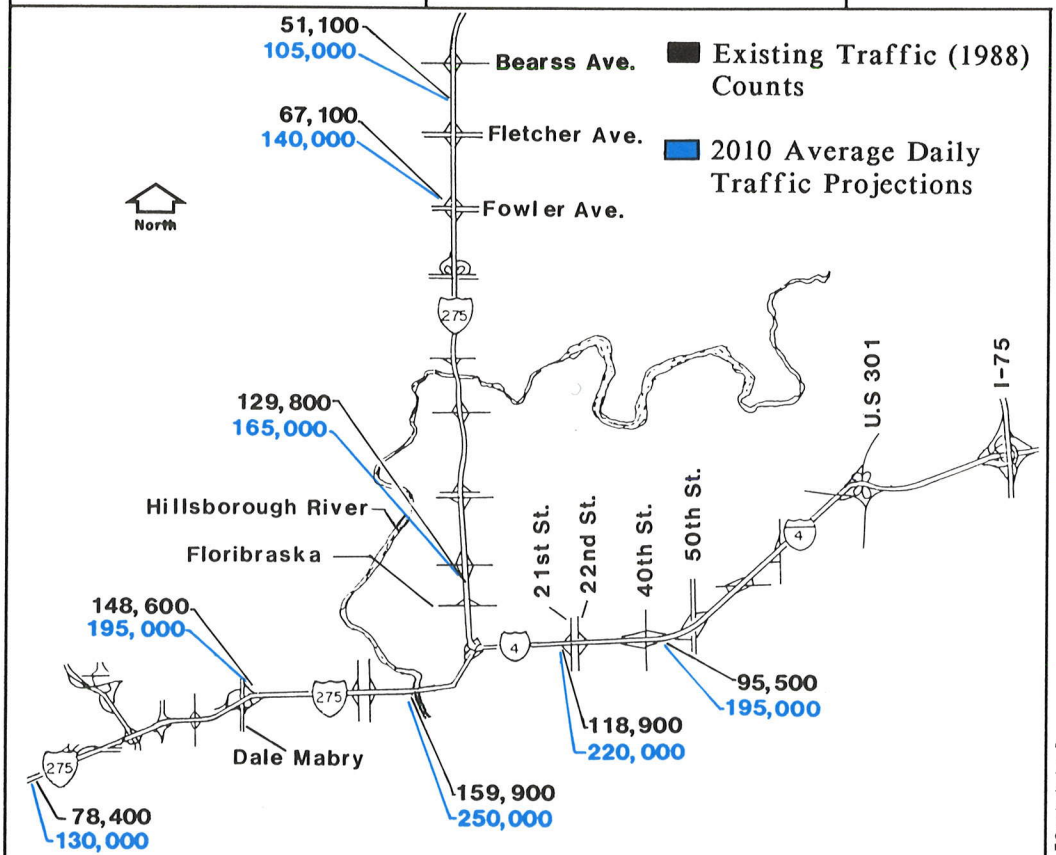
Traffic Counts & Projections

The data collection phase included taking of new traffic counts along the interstate system in order to assess how traffic volumes and patterns had changed since the last count program in 1983. The traffic count program showed significant increases in traffic over the five-year period. For example, counts showed traffic volumes in 1988 are 160,000 vehicles per day on I-275 west of Hillsborough River, an increase of 22% since 1983. Along I-4 east of 21st Street 119,000 vehicles per day were counted, showing an increase of 8% since 1983.

In order to determine what the year 2010 transportation system needs will be, computer simulations of future traffic patterns have been run for different roadway alternatives and access points throughout the study. Initial traffic projections show volumes as high as 250,000 vehicles per day on I-275 west of the Hillsborough River (56% increase) and 220,000 vehicles per day on I-4 east of 21st Street (85% increase). Additional traffic simulations to refine projections will be conducted as the study progresses. ■

Master Plan

The study will result in a Master Plan depicting all the viable project alternatives. The report will include sketches of intersections/interchanges, preliminary structure concepts and locations, aesthetics and amenities packages, possible noise abatement, and staged implementation and maintenance-of-traffic plans. During Phase II of the Tampa Interstate Study, preparation of the Federal Environmental Impact Statements will be undertaken. ■



Traffic Projected to Increase Significantly.

Design Amenities Program

A unique opportunity to design an attractive roadway into and through Tampa.

The planners of the Tampa Interstate system are faced with a unique opportunity; within the next 10 to 15 years, major sections of the interstate system will be rebuilt to accommodate additional traffic. The "Amenities Package" is a program in which the planning team will examine methods to provide a sense of visual unity to the Tampa Interstate system as well as to generate an aesthetically pleasing design for the facility.

The process of developing the Amenities Package for the Tampa Interstate Study is continually evolving. The study is in its initial phase - identifying goals, beneficiaries, areas requiring special design emphasis, and construction methods and materials to be considered.

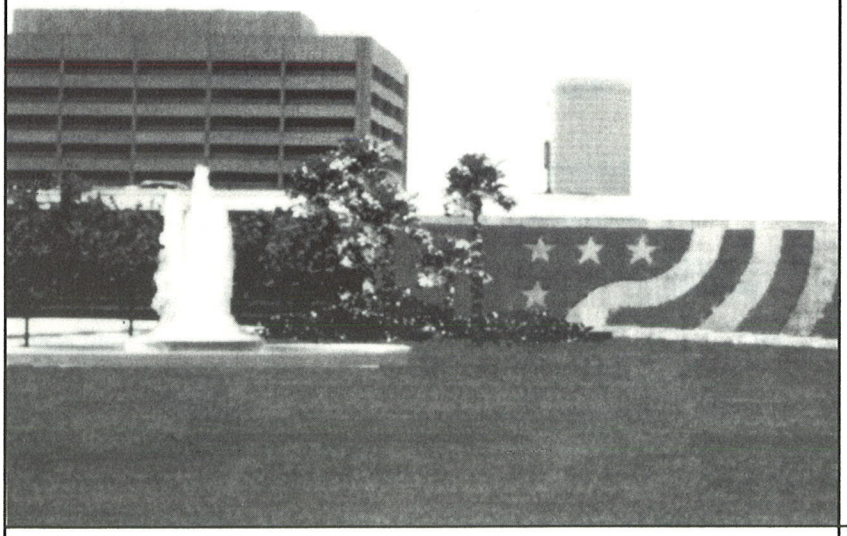
...Welcome to Tampa...

The goals of the Amenitites Package are:

1. To say "Welcome to Tampa" and give motorists a sense that they are using an ordered, integrated multi-modal transportation system.
2. To define design concepts which serve to unify the Tampa Interstate system.
3. To ensure that each element of the Tampa Interstate system appears to be in balance and harmony with its setting.
4. To ensure compatibility in materials (landscape and other) with the requirements of local ordinances.
5. To help the Tampa Interstate system to be a good neighbor.
6. To enhance the feeling of safety for motorists.
7. To establish a palette of colors, textures, shapes, materials, construction techniques, and landscape elements which the final designers of the Tampa Interstate will incorporate into final design contracts.

Planners are now in the process of determining which locations within the study area should have a priority focus. As the study progresses, graphic displays will be prepared showing the types of amenities which can be included in the reconstruction of the interstate system. ■

What I-275 could look like in the future.



You are invited to participate...

Name: _____

Address: _____

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MASTER PLAN REPORT

EXECUTIVE SUMMARY



FLORIDA DEPARTMENT OF TRANSPORTATION

THE GREINER TEAM


PLANNING FOR TOMORROW
I-4
I-75
I-275
TAMPA INTERSTATE STUDY

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I. INTRODUCTION

The Tampa Interstate System, shown on Exhibit 1, is the cornerstone of the Tampa Bay Area's surface transportation system, now and in the future. A majority of inter-urban automobile and truck travel is carried on the interstate system. A balanced transportation system, particularly an integrated system encompassing aviation, marine, rail, transit and highway, is an integral element of a region's economic viability. This is particularly true of Tampa and the Tampa Bay Area. The Tampa interstate routes provide key links to all of the urban areas and are recognized as the most important regional highway system in the Tampa Bay Area.

The February 1989 white paper entitled Future of Hillsborough Transportation Concepts prepared for the Florida House of Representatives Public Transportation Committee stated clearly the significant role played by the interstate system in the region's transportation system and identified the Tampa Interstate Study's proposed reconstruction of Interstate 275 (I-275), Interstate 4 (I-4) and Interstate 75 (I-75) as a "priority project."

Similar official recognition for a major reconstruction of the interstate system is found in the Tampa Urban Area Metropolitan Planning Organization's Year 2010 Long Range Transportation Plan for Hillsborough County. This document provides for a minimum of eight interstate freeway lanes throughout Tampa in the year 2010.

The planning of interstate reconstruction has included close coordination with the Hillsborough County Rail Transit Study consultant. Travel demand estimates for both the Tampa Interstate Study and the Rail Transit Study were derived from the same base model and developed jointly by the respective consultant teams; thus insuring Tampa of a truly balanced program of transportation improvements into the next century.

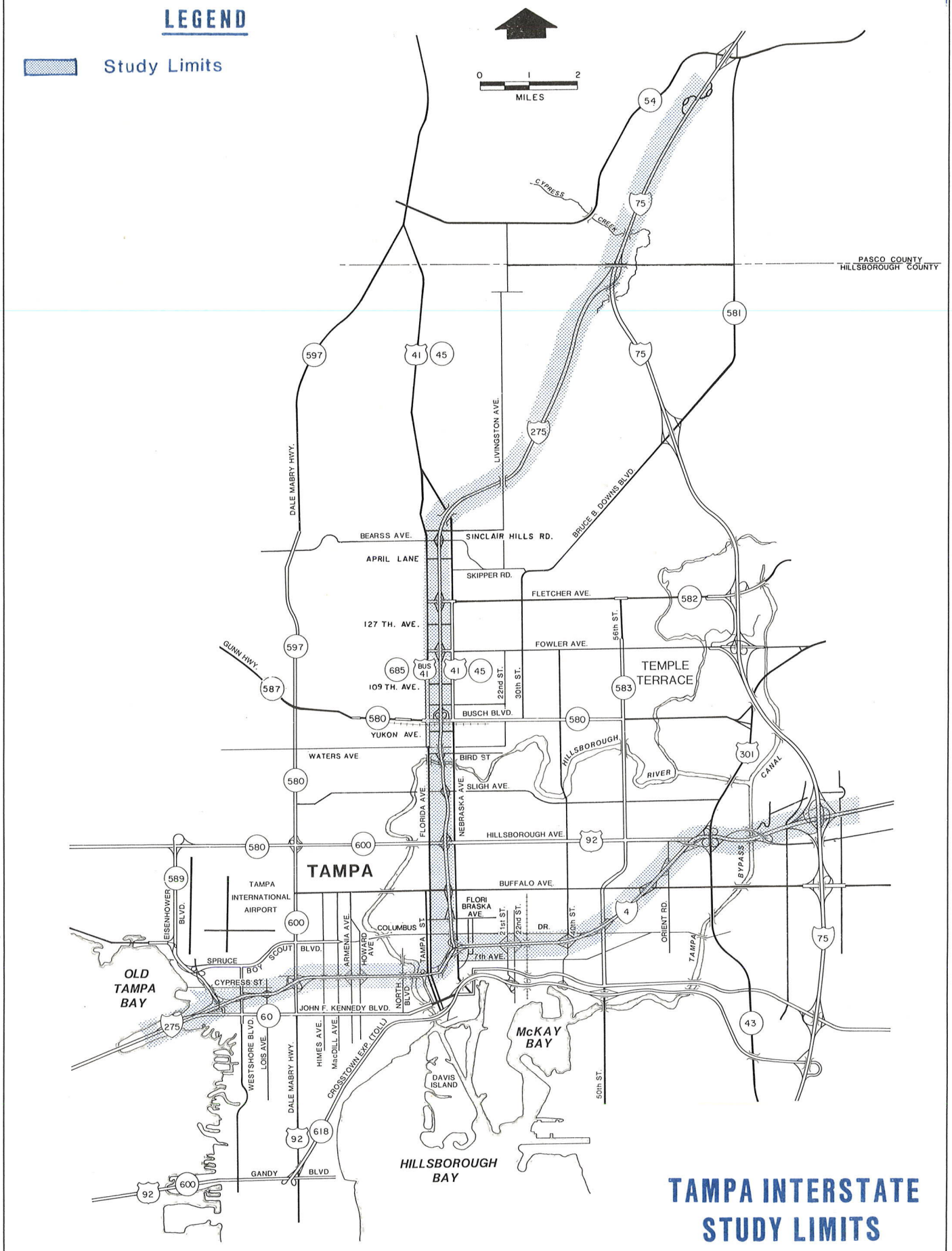
The integrated and coordinated multi-modal approach to transportation system evaluations is unprecedented in Tampa's transportation history and is a reflection of the universal agreement amongst the agencies and citizens that a broad reaching solution to urban mobility problems is essential for Tampa and the Bay Area.

The Tampa Interstate Study (TIS) instituted one of the most intensive public involvement programs associated with such a study. Features of the TIS public involvement program included a specific project office and public information phone service, a speakers bureau, a Citizens Advisory Committee, an Agency Task Force, a city/county/regional officials presentation plan, a comprehensive print/radio/media plan, numerous local meetings with special interest groups, and three major informational workshops which provided a means of public input.

The Agency Task Force provided the opportunity for diverse public interests to participate in the Phase I Master Plan. Further participation in Phase II Environmental and Preliminary Engineering studies by these agencies provides the opportunity for discussion of treatment of local infrastructure problems through joint project agreements concerning local streets, drainage, utilities and other issues.

In addition to the Master Plan and its associated concepts, the TIS has produced some 30 Working Papers, 11 Technical Reports, six Technical Memorandums and three Concept Reports. These documents are associated with the project's study elements and have provided extensive engineering and planning data that was previously non-existent. This data has led to new definitions concerning the way engineers and planners have looked at this specific interstate system and will most likely serve as framework for the means to arrive at a logical approach for reconstruction of similar systems throughout Florida and the United States.

Realizing the need to upgrade the antiquated interstate system, the Florida Department of Transportation (FDOT) began a study in 1983 to justify reconstruction and High Occupancy Vehicle (HOV) improvements to



TAMPA INTERSTATE STUDY LIMITS

EXHIBIT 1

A Florida Department of Transportation Project

qualify the urban interstate system in Hillsborough County for Federal interstate funds. The study established year 2010 traffic for the interstate system and described some potential short-term safety and geometric solutions for the existing interstate. Additionally, the study identified long-term, HOV-related improvements to accommodate year 2010 traffic volumes.

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

Utilizing the 1983 justification as a documented base, the TIS began in September 1987. Generally, the purpose of the study was to produce a Master Plan, conceptual design, and environmental impact data base for improvements to I-4, I-75, and I-275. Those improvements recommended are intended to serve traffic and transportation needs through the year 2010. Specifically, the objectives of the TIS are to prepare a series of reports documenting the requirements for conceptual design, including existing and predicted conditions, typical sections, right-of-way requirements, environmental constraints, and costs of recommended alternatives. These efforts are a part of Phase I of the TIS and can be further defined as the following goals to be achieved in the Phase I work effort:

* A Master Plan of improvements to I-4, I-75, and I-275 to accommodate transportation needs through the year 2010.
* Consensus and development of a multi-modal transportation system to accommodate year 2010 needs.
* Justification Reports for the recommended improvements sufficient to obtain Federal interstate funding.
* Conceptual designs of the recommended improvements in sufficient detail to identify structural, environmental, and right-of-way requirements.
* Conceptual right-of-way improvements.
* Preliminary cost estimates of all improvements, time phased in accordance with the Master Plan.

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

The Task F.2.a Component Package Presentation also established the preliminary study design criteria, or the standards by which the TIS efforts would be directed. These design criteria were subsequently published in the TIS Task F.2.b. Draft Design Criteria, Policies and Procedures Technical Memorandum. The final Task F.2.b. report will be published concurrent with the final Master Plan and subsequent engineering design studies.

The findings and recommendations resulting from these initial study efforts indicated that there was an overwhelming need to rehabilitate and/or reconstruct the existing interstate system in Urban Tampa. These

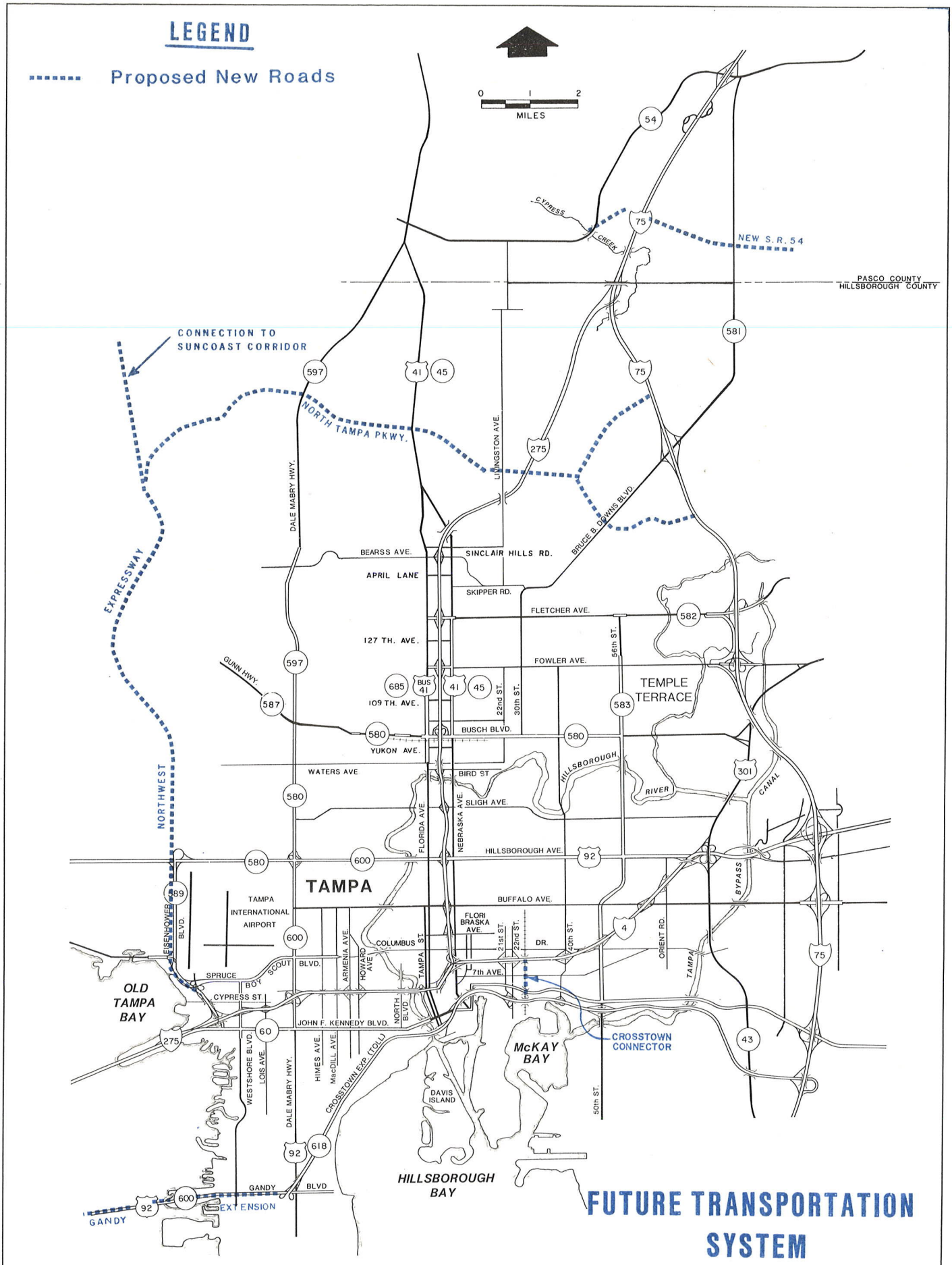
evaluation findings were evident in all aspects, including travel demand forecasting, structural integrity, traffic operations and safety, and compliance with the adopted plans and policies of the various local governments.

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

Several major transportation projects that will connect to the reconstructed Tampa Interstate System, or are integrated system linkages, are shown on Exhibit 2. These transportation improvements are integral to the overall future system and will provide travel opportunities unknown by today's Tampa traveler. The Northwest Expressway, North Tampa Parkway, I-4/Crosstown Connector and the Gandy/Crosstown Extension will form key segments of the FDOT's proposed urban expressway loop system. The rail transit corridors will provide peak travel opportunities for the overburdened surface highway system in the 21st century.

These key transportation improvements, and those of the currently adopted Year 2010 MPO Long Range Transportation Plan, are assumed to be part of the transportation system served by the interstate after its reconstruction.

Because the Phase I Master Planning process has ended, it is extremely important that Phase II (Environmental Documentation) be initiated to ensure continued public consensus and momentum gained during Phase I. Phase II will be an 18 month process that will produce documents which will fully address, in detail, all impacts associated with reconstruction of the 36.6 miles of freeway presented in this Master Plan. Additionally, and equally as important, these documents will serve as a source of FHWA approval to release funds to design, purchase rights-of-way and construct the concepts presented in this Master Plan.



A Florida Department of Transportation Project

EXHIBIT 2

TAMPA INTERSTATE STUDY / THE GREINER TEAM

II. PUBLIC INVOLVEMENT

An extensive public involvement program was developed as an integral part of the Tampa Interstate Study (TIS). The program was used to ensure that local residents, organizations and elected officials were aware of the study and could participate in the identification and the review of alternatives. The public involvement program consisted of five major components:

* Project Study Office;
* Speakers Bureau;
* Citizen Advisory Committee;
* Agency Task Force; and
* Public Information Meetings.

At the study's initiation and periodically throughout the study, media representatives from newspapers, radio and television were provided with news releases and graphics, as well as opportunities to meet with the study team. Members of the media were given a phone hotline number, where knowledgeable staff could provide an immediate response to questions or concerns.

The success of the media program can be measured by the positive newspaper coverage. Special benefit to the study were the newspaper graphics showing two-roadway and four-roadway systems and design amenity features.

Project Office

A special project office was established for the TIS. It housed the key study team members and provided a location for members of the public to visit or call for study information.

The project office included areas for study displays and graphics as well as a conference room for group meetings and presentations. Key staff members were available each day during working hours to provide visitors information and explanations and answer phone calls. Persons, who had either been able to attend the workshop or learned of the study from publicity following the workshops, visited the office to obtain information and view the impacts of the alternative concepts. Owners of property near the interstate and members of the real estate community were the primary office visitors. Many directors and staffs of community services also visited in order to better plan their future delivery of services.

Phone Service

All media displays and study team members promoted the use of a local access, toll-free phone number for use in Hillsborough, Pinellas and Pasco counties. Staff was on hand during working hours to respond to calls, and a phone recording service was available after hours to take messages.

In general, phone calls increased just prior to and immediately after public workshops. Members of the public were able to confirm workshop locations, times and information availability prior to the meetings.

They were able to clarify issues, obtain additional information and determine the study process and schedule after the public meetings.

Special forms were devised to record in-coming phone calls and to ensure a follow through for the provision of information. It is estimated that approximately 3,000 phone calls were received during the 18-month study.

Computerized Mailing List

A computerized mailing list of agencies, public officials, community service organizations, special interest groups, interested residents, and property owners within 300 feet of the interstate was prepared prior to the study's initiation. The mailing list now has approximately 5,000 names.

Requests to be added to the mailing list were received by phone, in the mail and from office visits. This was a direct result of the forms provided at the public meetings. The mailing list was used to distribute the three newsletters and for notification of the three public meetings.

Newsletters

The study team produced three issues of the Tampa Interstate Newsletter. These eight-page booklets contained text, maps and graphics describing the study process and progress. Each issue announced the next public workshop, included a study limits map and described how to contact the study team. Special topics about the study were also found in each issue including traffic demand, design amenities and roadway types. Copies of the three newsletters can be found in the Appendix.

Citizen Advisory Committee

This 13-member Citizen Advisory Committee (CAC) was created to encourage interaction between study team members and corridor users, land owners, businesses, and residents. The committee met nearly every month during the study.

The CAC functioned as a conduit of information to major organizations and resident groups working and living along the interstate corridor. They reviewed and discussed all alternative concepts prior to a public presentation and attended the workshop to hear citizen comments. They assisted the study team in building community consensus by identifying the important issues, recommending solutions and by meeting with members of the community. CAC members also sponsored speakers' bureaus and met with their constituents to discuss program elements. A list of CAC members and the groups they represent is found in the Appendix of the Master Plan Report. The CAC will continue to function as an integral part of the Phase II efforts.

Agency Task Force

The Agency Task Force (ATF), composed of local, state and federal agencies, met nearly every month of the study. Membership was more fluid than the CAC, as different staff members of the various agencies attended. Participation fluctuated with a specific agency's staff attending when an area of specific concern was discussed. For instance, the law enforcement agencies had particular interest in the Transportation

Systems Management component of the study while local transportation staffs focused on roadway impacts to local arterial streets.

The ATF acts now and will continue through the next study phases to function as a liaison between study team members and the agencies they represent. Their involvement will increase as Phase I is completed and the federal and state mandated agency reviews occur.

The ATF has facilitated the flow of information between the study team and their respective agencies. The ATF has been especially helpful in the coordination of Transportation System Management components, future land use, transportation planning, drainage and natural systems mitigation.

Speakers Bureau

The Project Manager and Project Coordinator were available throughout the study to make presentations to community, civic, and special interest groups. Presentations generally occurred at breakfast or luncheon meetings; however, several presentations also occurred during the day and after 5:00 p.m. The meetings normally consisted of a 10 to 15 minute presentation followed by 20 to 30 minutes of questions or comments. The study team members displayed project graphics and provided informational brochures. Presentations were made to 39 groups with approximately 20 people attending each Speakers Bureau. A complete list of Speakers Bureau Engagements, dates and the number of attendees is contained in the Appendix of the Master Plan Report.

Public Meetings

Over 3,000 people attended the three public workshops held as a part of the TIS process. All three workshops took place in the Gasparilla Room of the Curtis Hixon Convention Center.

The workshops were held on July 13, 1988, November 7, 1988, and January 26, 1989. They were all informal opportunities for the public to examine displays and conceptual alternatives drawn on aerial photographs, and to obtain information from team members and Florida Department of Transportation (FDOT) staff about the study.

The workshops were organized as informal informational meetings. Members of the public entered the hall to a display of general concepts including design amenity components and potential noise barriers. They were then encouraged to view the 12 minute slide slow to receive a study overview and geographic orientation. Slide shows were run continuously throughout the workshop.

They were then assisted in determining which study segment or segments were of interest to them and directed to specific locations around the hall. The study team members and FDOT staff were stationed near aerial photographs to explain the concepts. If residents had questions regarding relocation or the property acquisition process, FDOT right-of-way staff was available to provide information and answer their questions.

Attendees were encouraged to comment on the study and each meeting's concepts, either on comment sheets provided or through the court reporters available to receive their verbal comments. After the public meetings, the comments received at the workshop and within 45 days following the meeting were summarized in a report. The three documents were entitled: Public Meeting No. 1 Comments Summary Working Paper,

Public Meeting No. 2 Comments Summary Working Paper, and Public Meeting No. 3 Comments Summary Working Paper. The comments received were used to review and refine each level of analysis. Copies of the three reports are available for review at the project office.

The success of the TIS Public Involvement Program can be measured by the large number of participants and the community-wide consensus on the need for improvements. While public involvement will continue as the concepts are refined in Phase II, in many areas consensus on the type of improvement has been reached. The program has also helped identify the issues the community considers the most significant: noise impacts, aesthetics, neighborhood impacts and the role of transit. The process has been initiated to identify solutions to those issues and will continue through subsequent stages of the study.

III. MASTER PLAN CONCEPT

At the initiation of the Tampa Interstate Study (TIS), several hundred alternatives were possible as a result of various alignment shifts, geometric variations and combinations of two-roadway and four-roadway systems. In order to effectively deal with what could be an overwhelming number of alternatives, TIS utilized a unique process known as Tier Analysis. This screening process, or tiering, allowed the study team to assemble a large array of competing design components in an easily understood matrix format for evaluation. Figure 1 depicts this process. The key factor in the success of the tier analysis process is its ability to "window down" the vast array of competing designs to the few viable alternative concepts suitable for application in Tampa's interstate corridors.

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

The second tier of analysis used the 1"=200' scale alternatives remaining after the "first tier cut" and, as in the first tier, a matrix evaluation was prepared. This matrix included all factors considered relevant by the study team for this level of analysis. The matrix also included quantification and estimates of impacts for each of the alternatives by category of impact. This resulted in ranking of the alternatives.

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

The refinement and continued development of alternatives throughout this systematic process assisted the team in providing all the necessary documentation for the logical process and selection of viable alternatives. This process also provided the necessary documentation for an alternative's elimination in the evaluation process, or modifications to form "new" alternatives. Finally, this process enhanced the community's ability to better understand and follow a complex and technical process in a step-by-step manner until the selection of reasonable and viable alternatives was reached. The following listing describes in detail the recommended Master Plan selected by the tier evaluation process. Exhibits 3 through 11, following the Master Plan listing, show the conceptual geometry on 1"=1,000' scale aerial photography. The entire Master Plan Concept is presented in the Attached Plans and Illustrations appended to the Master Plan Report.

Design Segment 1A - 3.8 Miles

Interstate 275 from Howard Frankland Bridge to East of Himes Avenue (Westshore Area)

* Four-roadway system - interstate express lanes and separated local access freeway lanes
* High Occupancy Vehicle (HOV)/Transitway Lanes within the interstate alignment beginning at the Howard Frankland Bridge

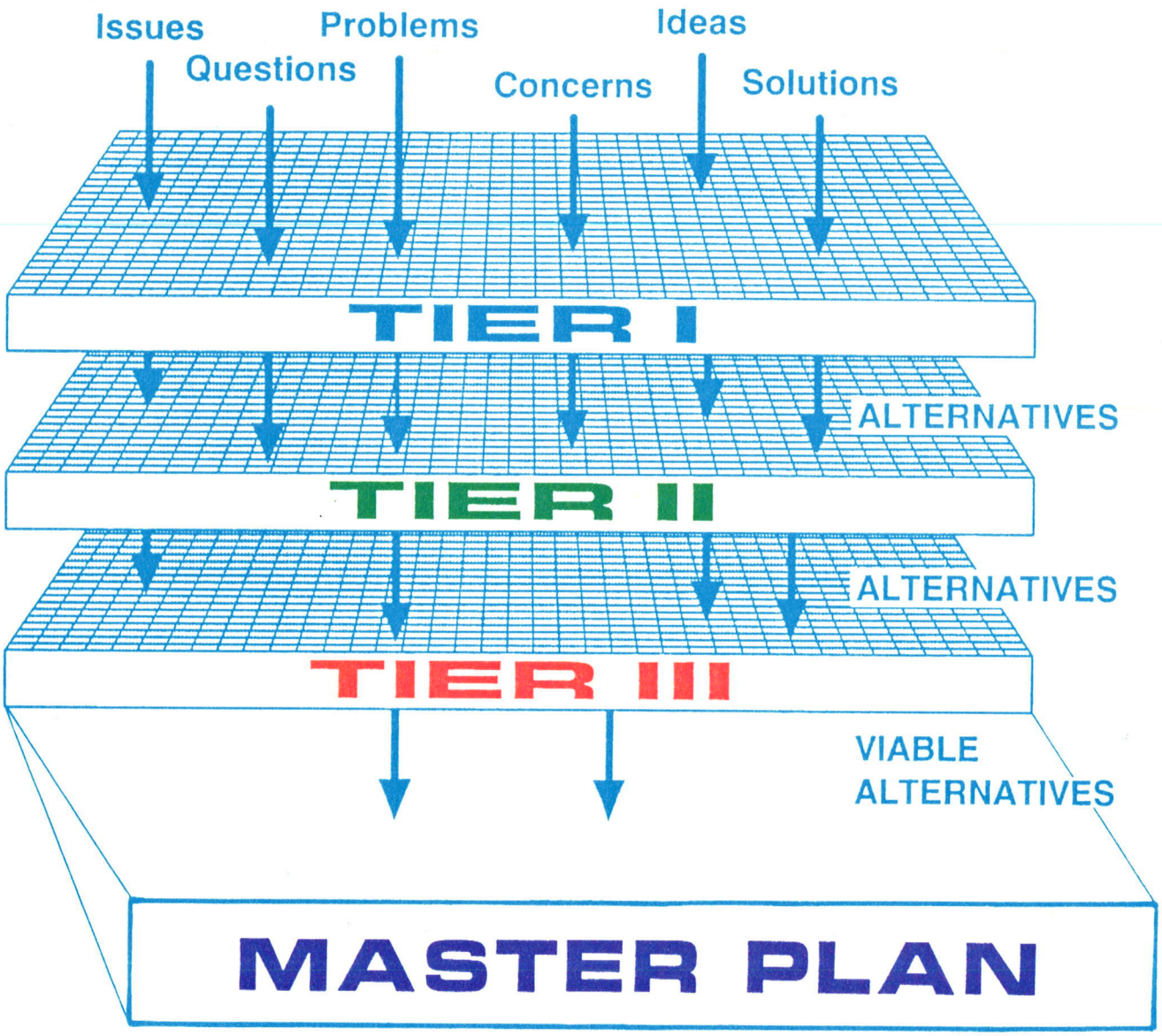
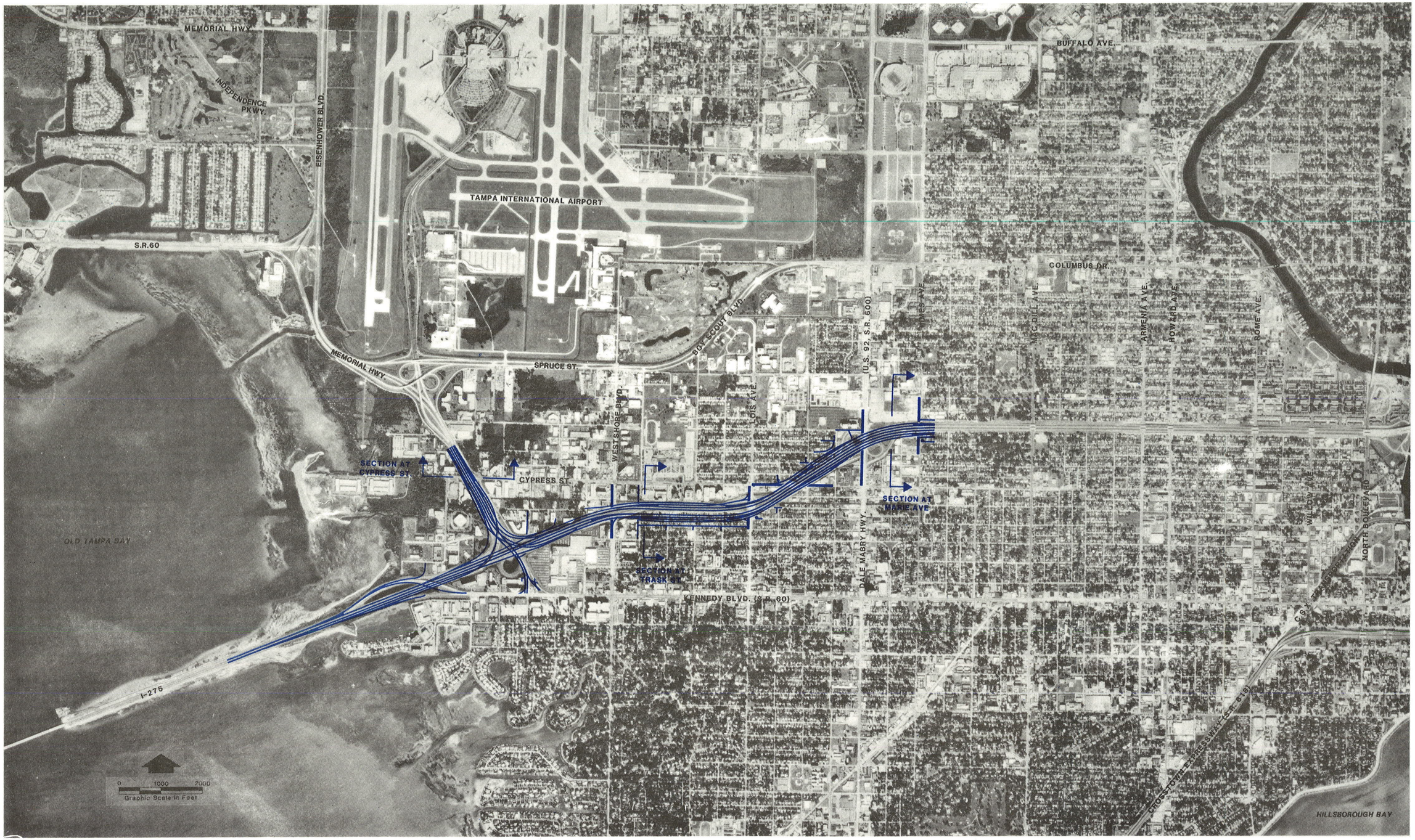

Issues
Questions
Problems
Concerns
Ideas
Solutions
TIER I
ALTERNATIVES
TIER II
ALTERNATIVES
TIER III
VIABLE
ALTERNATIVES
MASTER PLAN

FIGURE 1

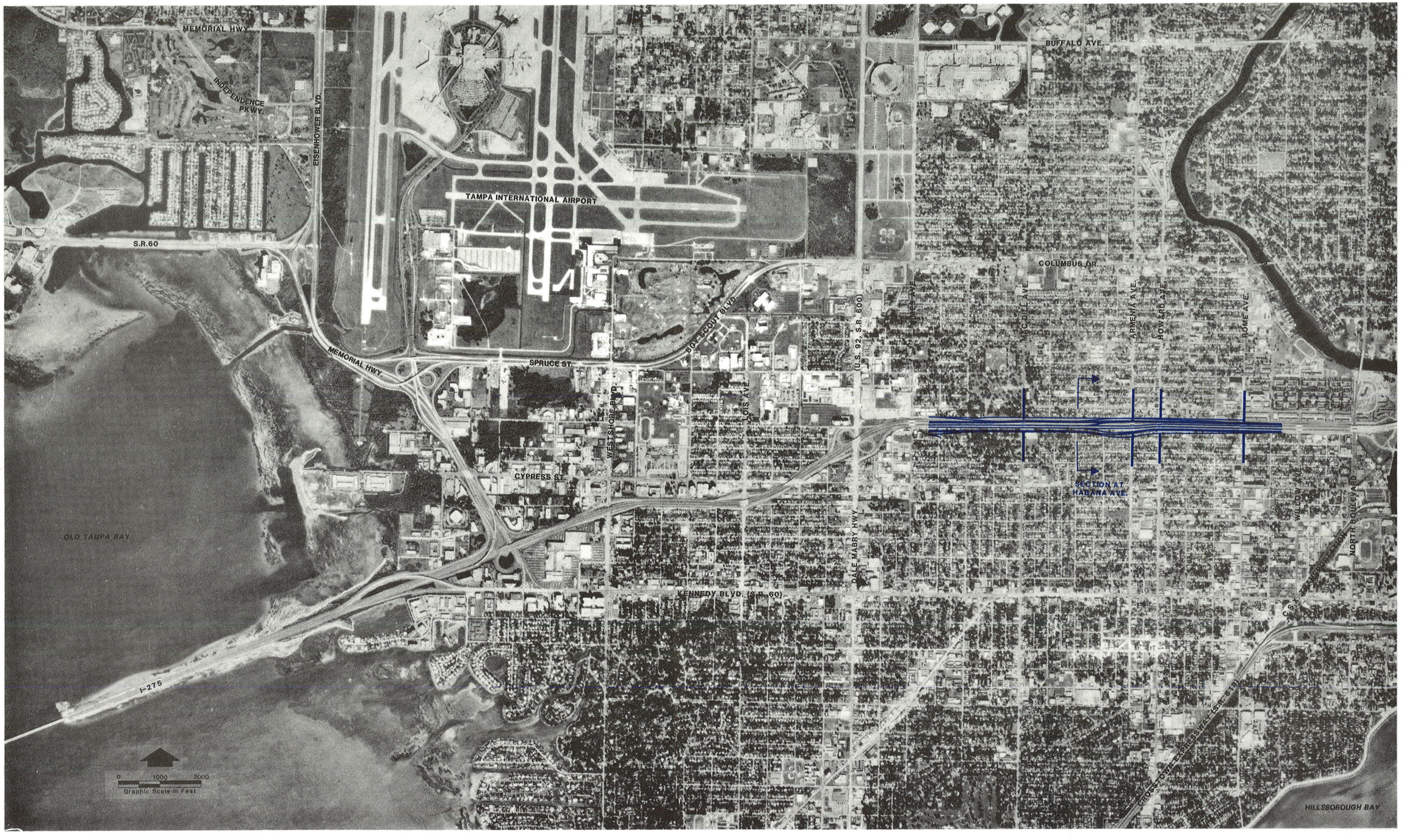


MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A

EXHIBIT 3

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY THE GREINER TEAM



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2A

EXHIBIT 4

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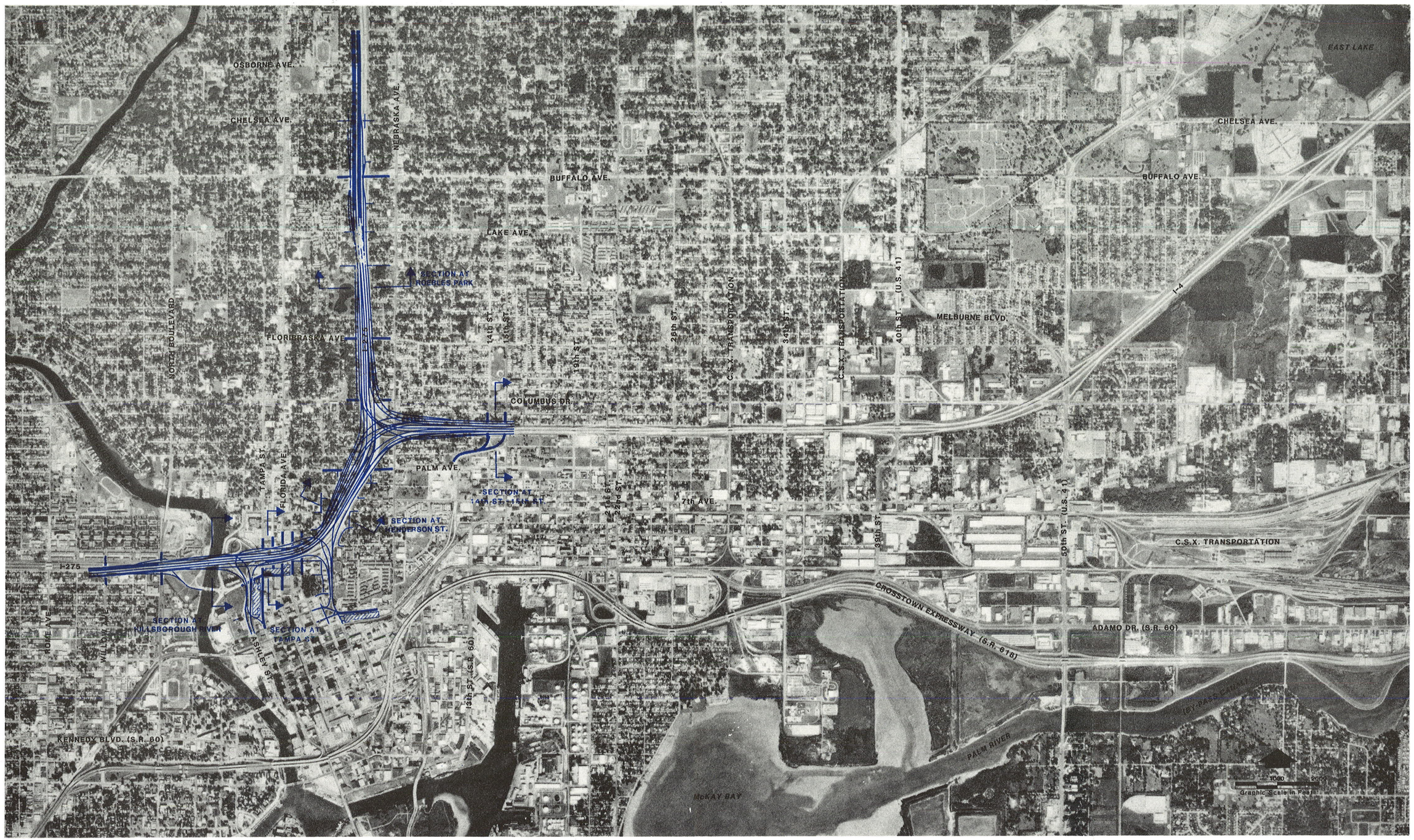
TAMPA INTERSTATE STUDY THE GREINER TEAM



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B

EXHIBIT 5

TAMPA INTERSTATE STUDY THE GREINER TEAM

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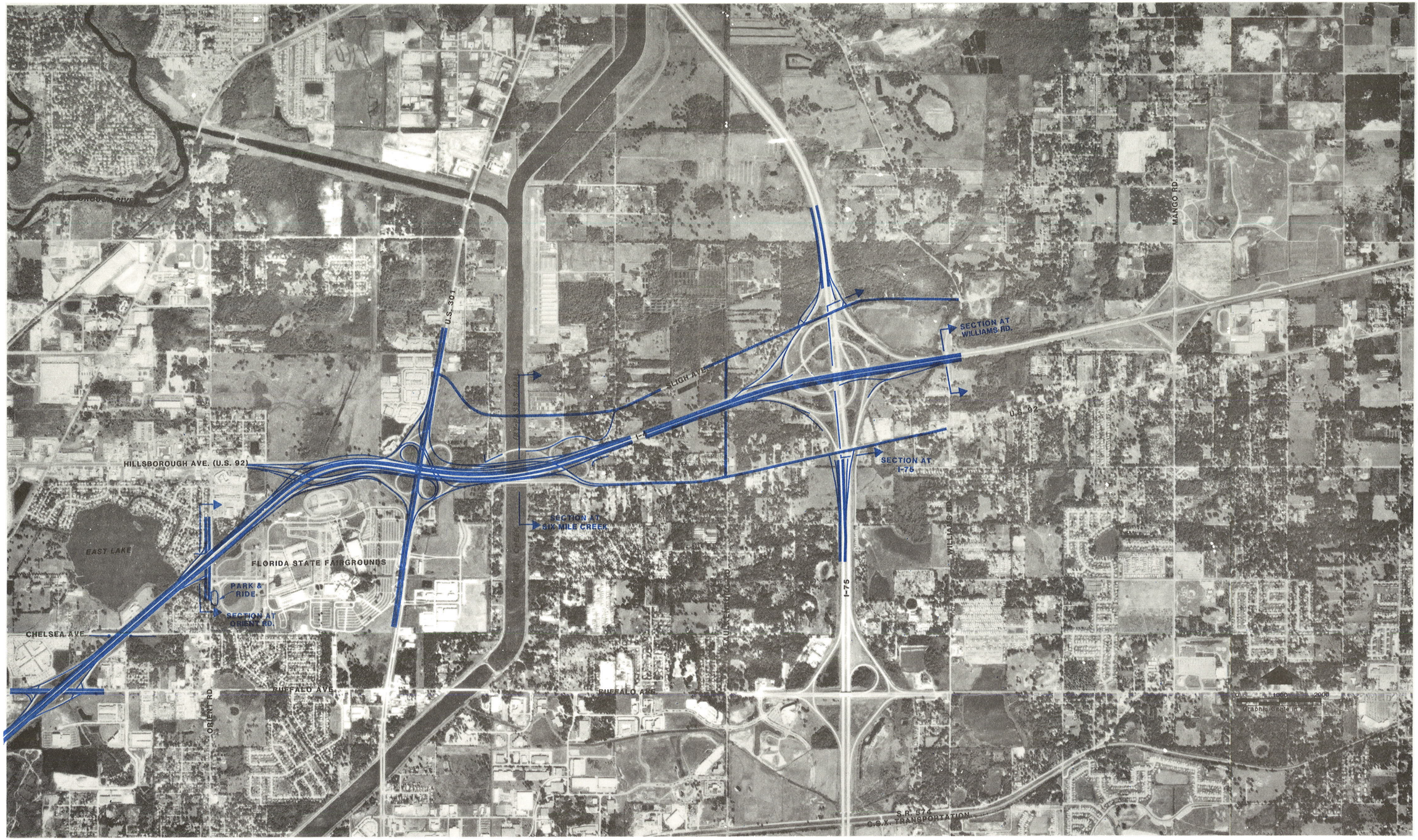
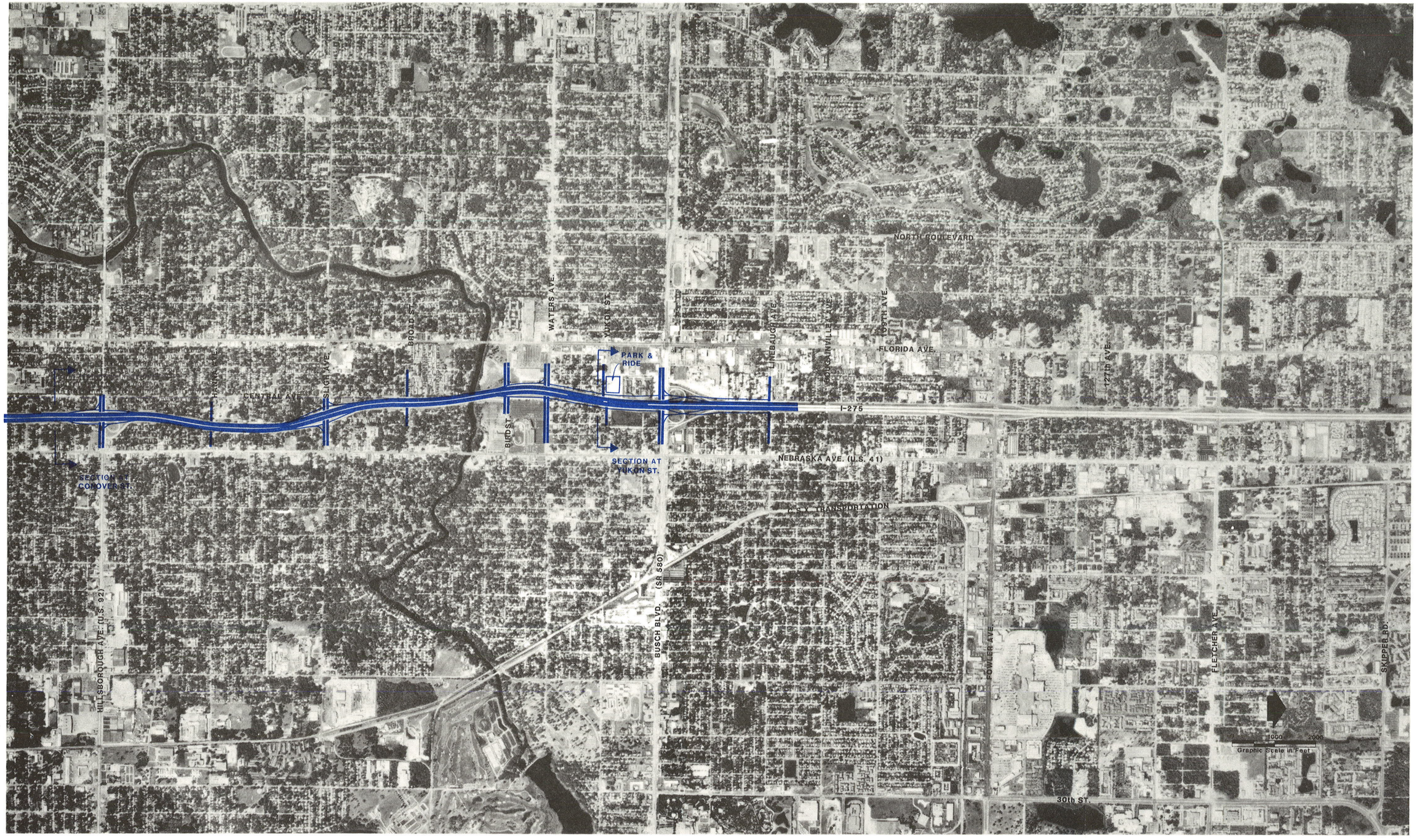
MASTER PLAN CONCEPT DESIGN
STUDY SEGMENTS 3A AND 3B

EXHIBIT 6



MASTER PLAN CONCEPT DESIGN
STUDY SEGMENTS 4A, 4B AND 4C

EXHIBIT 7



MASTER PLAN CONCEPT DESIGN
STUDY SEGMENTS 5A, 5B, 5C AND 5D

EXHIBIT 8

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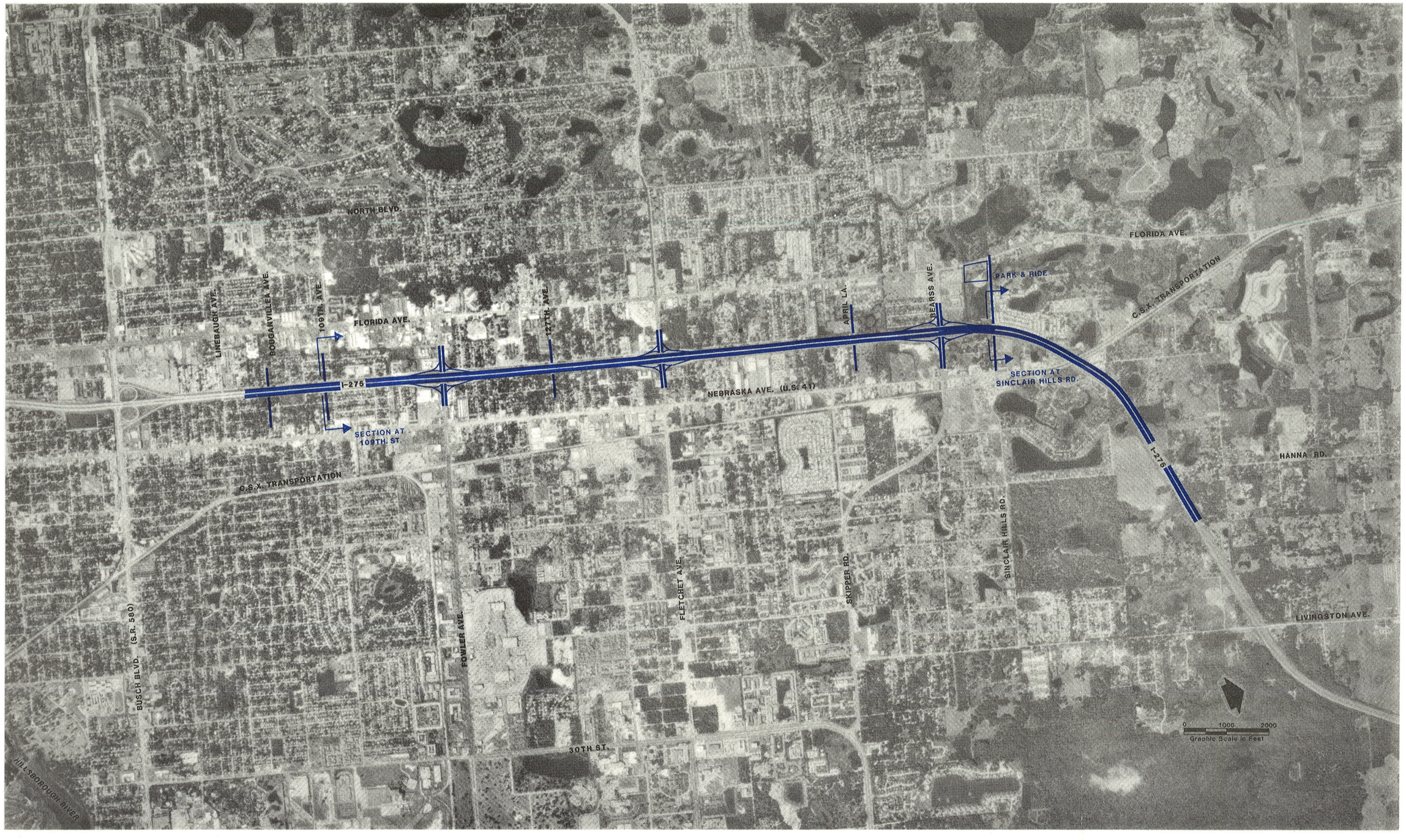
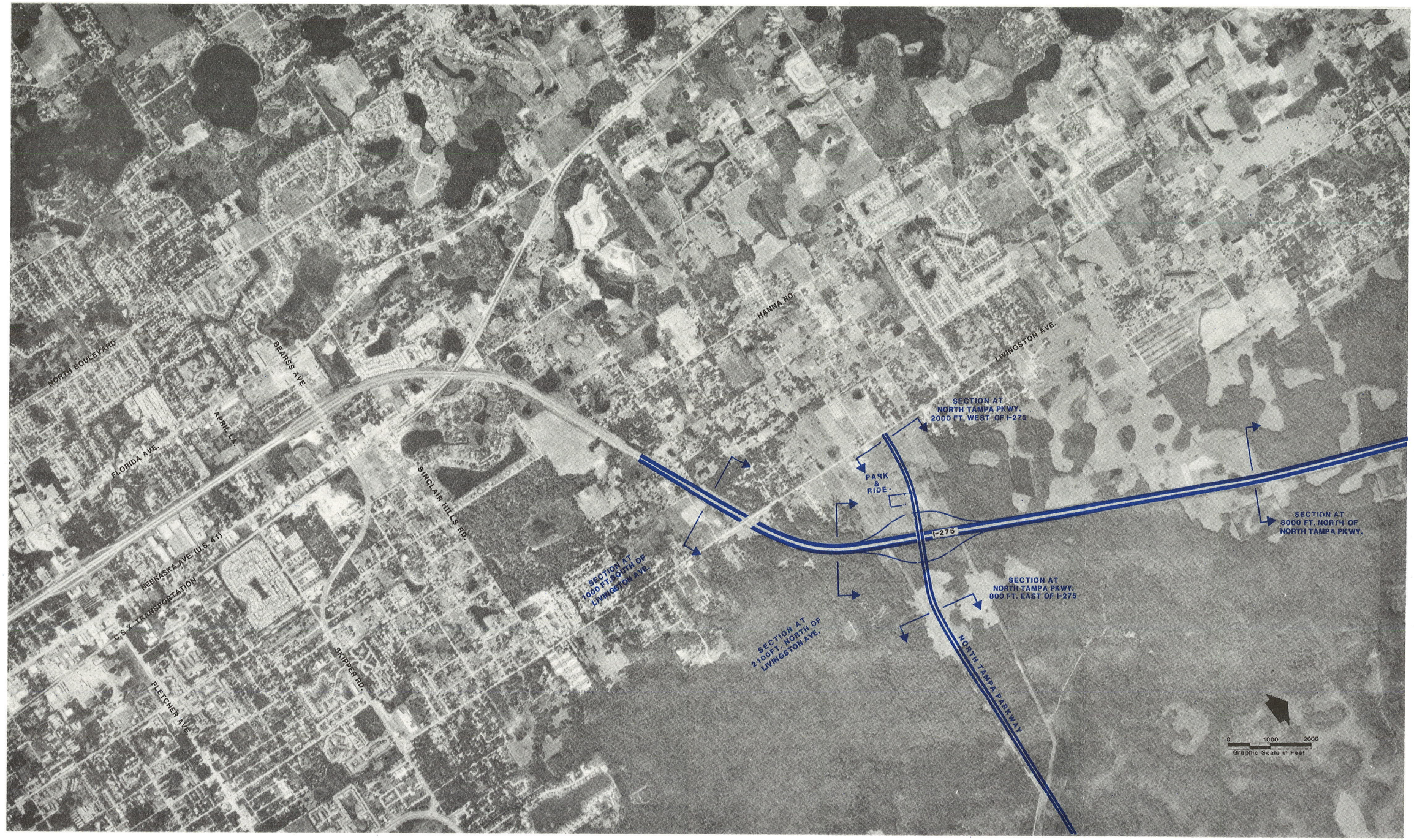


MASTER PLAN CONCEPT DESIGN
STUDY SEGMENTS 5E, 5F AND 5G

EXHIBIT 9

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY THE GREINER TEAM



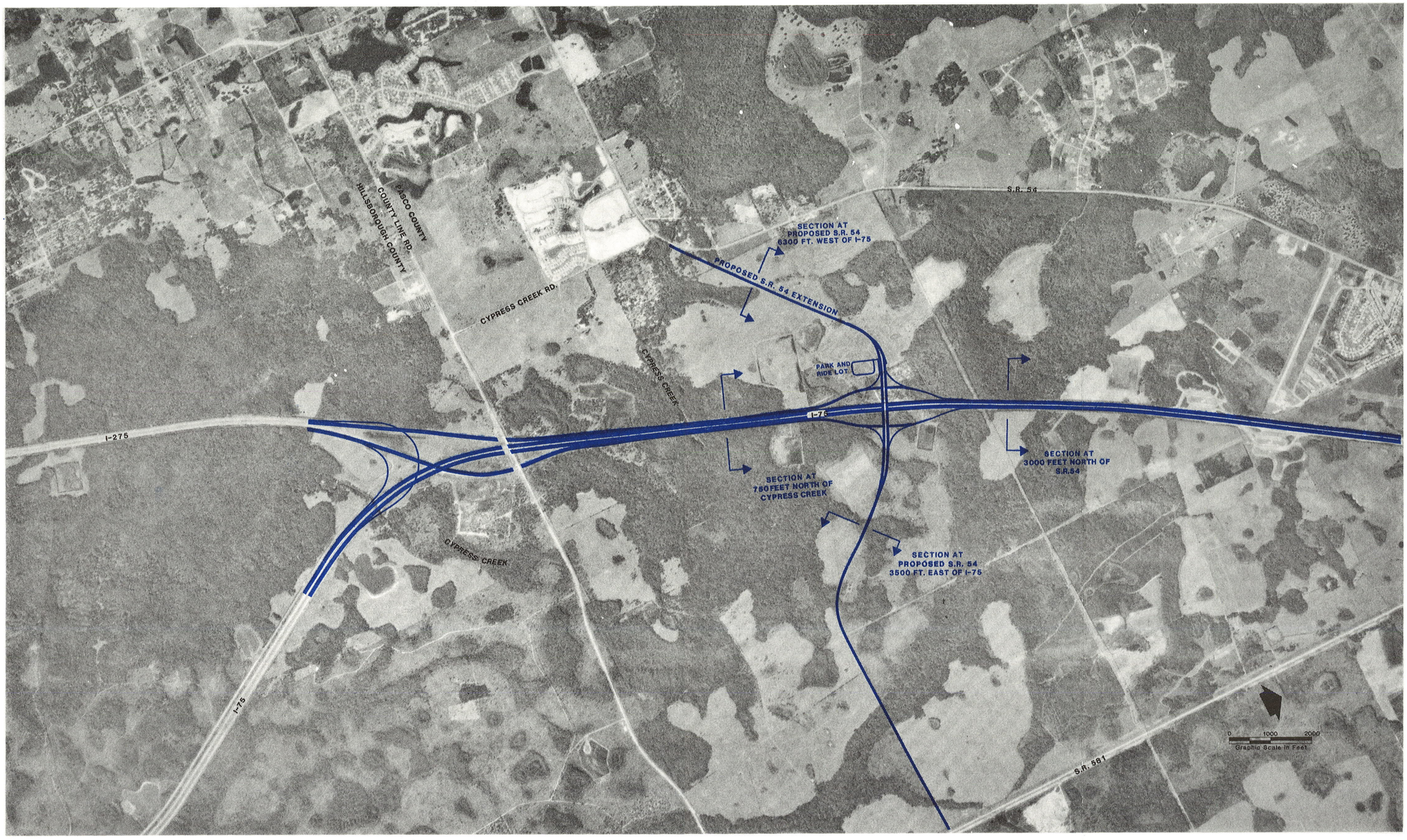
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A

EXHIBIT 10 (1 of 2)



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A

EXHIBIT 10 (2 of 2)



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B

EXHIBIT 11 (1 of 2)

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY THE GREINER TEAM



MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B

EXHIBIT 11 (2 of 2)

* HOV priority ramps to and from the east on I-275 at Trask Street
* Direct I-275 connection to the Northwest Expressway
* Direct ramps from Memorial Highway and Kennedy Boulevard to the Northwest Expressway
* 62.5:1 FAA flight path clearance for Tampa International Airport
* Existing interchange locations at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway remain
* New interchange providing ramps to and from the east on I-275 at Himes Avenue
* New Sherrill Street extension north from Memorial Highway and Kennedy Boulevard through I-275 to Spruce Street
* New Lemon Street Connector to Westshore Boulevard from Occident Street
* First Priority Reconstruction Segment

Design Segment 2A - 1.6 Miles

Interstate 275 from east of Himes Avenue to east of Rome Avenue
(West Tampa Area)

* Four-roadway system - interstate express lanes and separated local access freeway lanes
* Alignment shifted south of existing centerline to avoid McFarland Park and West Tampa Historic District
* High Occupancy Vehicle (HOV)/Transitway Lanes within the interstate alignment
* Split interchange ramps at Howard Avenue and Armenia Avenue remain
* New interchange ramps at Himes Avenue to and from the east on I-275
* Maintain northside frontage road between Himes Avenue and Rome Avenue
* Second Priority Reconstruction Segment

Design Segment 2B - 3.9 Miles

Interstate 275 from east of Rome Avenue to north of Buffalo Avenue
Interstate 4 from the Interstate 275 Junction east to 14th Street
(Central Business District)

* Four-roadway system transition to two-roadway system north of Buffalo Avenue on I-275
* Four-roadway system east of 14th Street on I-4
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* Westside Central Business District distributor interchange at Ashley/Tampa Streets serving all movements
* Eastside Central Business District distributor interchange at Jefferson/Orange Streets serving all movements
* New West Bank Central Business District interchange ramps to and from the west on I-275 at North Boulevard
* New Ybor City/Eastside Central Business District interchange on I-4 at 14th and 15th Streets

* Remove interchange ramps at Scott and Kay Streets to and from the west on I-275
* Relocate planned Marion Street Transit Parkway North Terminal to a location on Marion Street south of Scott Street
* Second Priority Reconstruction Segment

Design Segments 3A and 3B - 3.3 Miles

Interstate 4 from 14th Street to east of 50th Street
(Ybor City Area)

* Four-roadway system transitioning to two-roadway system at 50th Street
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* New Ybor City/Eastside Central Business District interchange on I-4 at 14th and 15th Streets
* Extension of 14th and 15th Street ramps as parallel local frontage roads to 21st and 22nd Streets
* Remove I-4 interchange ramps at 21st and 22nd Streets
* Remove I-4 overpass of 19th Street
* New directional freeway to freeway interchange with Crosstown Expressway Connector on I-4 at 30th Street
* Remove I-4 interchange ramps at 40th Street
* Reconfigure split interchange at Columbus Avenue and 50th Street on I-4
* First Priority Reconstruction Segment

Design Segments 4A through 4C - 5.5 Miles

Interstate 4 from east of 50th Street to east of Interstate 75 interchange
(East Tampa Area)

* Two-roadway system on I-4 beginning east of 50th Street
* High Occupancy Vehicle (HOV)/Transitway Lanes beginning and ending west of I-75
* HOV priority ramps to and from the west on I-4 at Orient Road with access to new HOV park-n-ride lot
* Existing interchange locations at Buffalo Avenue, Orient Road, U.S. 92, U.S. 301 and I-75 remain
* Remove Chelsea Avenue overpass
* Partial cloverleaf interchange at U.S. 301 with flyover ramps for south to west and north to east movements
* U.S. 92 on separate alignment with ramps to I-4 and U.S. 301
* Retain Garden Lane Road Bridge across By Pass Canal
* New extension of Faulkenburg Road across I-4 between U.S. 92 and Sligh Avenue
* New extension of Sligh Avenue from Williams Road west to U.S. 301 across By Pass Canal
* New interchange ramps at Sligh Avenue to and from north on I-75

* New interchange ramps at U.S. 92 to and from south on I-75
* Third Priority Reconstruction Segment

Design Segments 5A through 5D - 3.8 Miles

Interstate 275 from north of Buffalo Avenue to north of Linebaugh Avenue (Seminole Heights, Sulphur Springs Areas)

* Two-roadway system on I-275 beginning north of Buffalo Avenue
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* HOV priority ramps to and from the north and south on I-275 at Yukon Street accessing existing park-n-ride lot
* Existing interchange locations at Hillsborough Avenue, Sligh Avenue, and Busch Boulevard remain
* One-way Frontage Roads from Bird Street to Busch Boulevard parallel to I-275
* Relocation of Bird Street interchange ramps to Waters Avenue to and from the south on I-275
* New interchange ramps at Linebaugh Avenue to and from the south on I-275
* Third Priority Reconstruction Segment

Design Segments 5E through 5G - 4.7 Miles

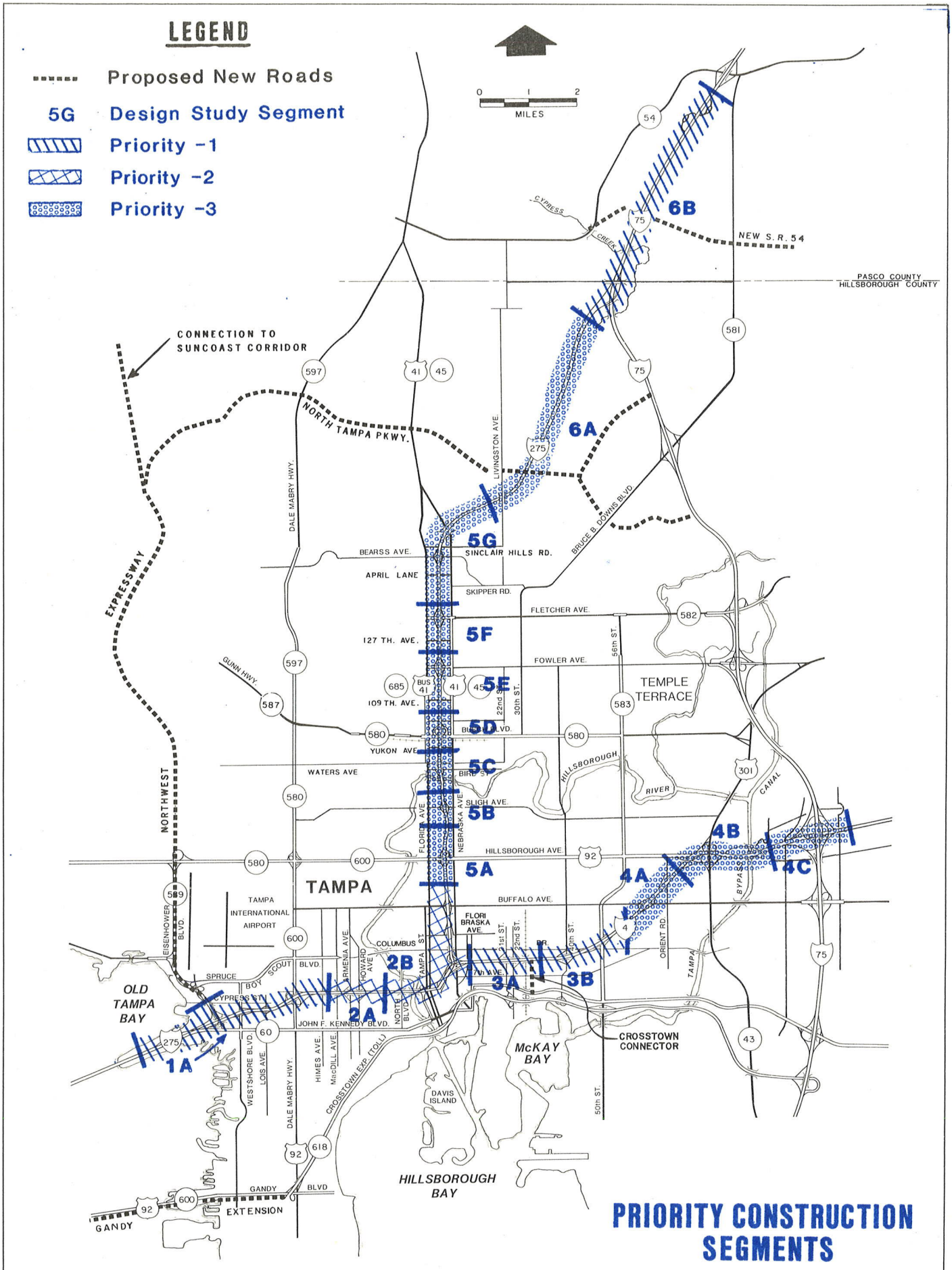
Interstate 275 from north of Linebaugh Avenue to north of Livingston Avenue (University North Area)

* Two-roadway system on I-275
* High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
* HOV priority ramp to and from south on I-275 via Sinclair Hills Road with access to new HOV park-n-ride lot
* Interchange locations at Fowler Avenue, Fletcher Avenue and Bearss Avenue remain
* New underpasses through I-275 at 109th Avenue, April Lane and Sinclair Hills Road
* Third Priority Reconstruction Segment

Design Segment 6A - 4.5 Miles

Interstate 275 from north of Livingston Avenue to the Hillsborough/Pasco County Line

* Two-roadway system on I-275
* I-275 reconstructed as six-lane roadway
* High Occupancy Vehicle (HOV)/Transitway Lanes beginning and ending north of Livingston Avenue on I-275
* New interchange at North Tampa Parkway
* New HOV park-n-ride lot at North Tampa Parkway interchange
* Third Priority Reconstruction Segment



PRIORITY CONSTRUCTION SEGMENTS

A Florida Department of Transportation Project

EXHIBIT 12

TAMPA INTERSTATE STUDY / THE GREINER TEAM

Design Segment 6B - 5.5 Miles

Interstate 75 from Hillsborough/Pasco County Line to south of S.R. 54 in Pasco County

* Two-roadway system on I-275 and I-75
* I-275 six-lane roadway joining I-75 six-lane roadway
* Transition from twelve lanes to ten lanes between County Line Road and New S.R. 54. Eight lanes north of New S.R. 54, and six lanes north of existing S.R. 54
* Directional flyover ramps from I-275 northbound to I-75 southbound and I-75 northbound to I-275 southbound
* New interchange at New S.R. 54 on I-75
* New HOV park-n-ride lot at New S.R. 54 interchange
* First Priority Reconstruction Segment

Priority Reconstruction Sequence

Early in the TIS, a logical series of planning and design segments were identified. These segments will be used during and after the study process to accomplish the objectives of the Master Plan as well as establish funding and construction staging.

The project limits have been divided into six major study segments. East of these study segments represent individual segments for which logical termini have been established. These six study segments were further subdivided into individual design segments.

Preliminary evaluations to determine the rank or priority of the six study segments was initiated early in the study. The primary purpose of segment prioritization was to determine planning, design, funding and construction sequencing. By prioritizing these segments, timely and efficient allocation of manpower and financial resources can occur, thereby maximizing improvements to the existing transportation system. Key considerations in determining priority staging included estimated cost, construction complexity, environmental impacts, and the ability of each segment to connect to existing or proposed roadways adjacent to the project in order to divert and maintain traffic during construction.

Three priority rankings were established and are presented on Exhibit 12. Priority One includes the areas of the I-4 and Crosstown Connector (Segments 3A and 3B) the I-275/Northwest Expressway interchange (Segment 1A); and the New S.R. 54/I-75 interchange (Segment 6B). These priority areas have been established on a needs basis and provide an effective means to give motorists a choice to avoid reconstruction as it begins on the remaining segments.

Priority Two reconstruction encompasses the Tampa Central Business District (CBD) area and the downtown interchange of I-4 and I-275 (Segments 2A and 2B). Although the need for immediate improvements in this area is recognized, it is necessary to complete those improvements in the Priority One segments in order to allow motorists an alternative route when traveling through this area during reconstruction.

Priority Three includes the remaining segments of I-275 north of the downtown interchange to the apex of I-275 and I-75 (Segments 5A, 5B, 5C, 5D, 5E, 5F, 5G, and 6A), and I-4 east of 50th Street to the interchange of I-4 and I-75 (Segments 4A, 4B and 4C).

There are significant transportation system benefits from the reconstruction priorities presented on Exhibit 12. The primary benefit for interstate system travelers will be the direct connection of I-4 with the Crosstown Expressway in the Ybor City area (Design Segments 3A and 3B), and the direct connection of the Northwest Expressway with I-275 in the Westshore area (Design Segment 1A). These expressway network linkages, coupled with the new corridor connections of S.R. 54 (Design Segment 6B) and the North Tampa Parkway (Design Segment 6A), have the potential for allowing up to 100,000 trips per day to bypass the I-275/I-4 CBD interchange. This ability to divert significant traffic from the existing interstate corridors near the CBD interchange is part of the plan to maintain travel in the urban core during the reconstruction process for Priority Two segments (Design Segments 2A and 2B).

Utilization of these priority segments as a planning tool for construction sequencing and funding should assist in allowing an efficient and timely method of reconstruction to the interstate system through the Tampa area. This process will be developed further in Phase II activities.

IV. DESIGN AMENITIES

Introduction and Purpose

The purpose of any construction project is to improve an existing situation, whether functionally or aesthetically. One of the challenges faced by the Tampa Interstate Study (TIS) design team was to address the aesthetic implications of reconstructing a major thoroughfare to accommodate significantly increased demand. With this challenge came the opportunity to influence the appearance of the interstate system from the point of view of motorists as well as neighbors and, in so doing, to create a positive image for the Tampa-Hillsborough County area.

Good design is difficult to describe in words since it evokes an emotional response. The most prominent local example of good design in transportation facility if Tampa International Airport (TIA), which is annually chosen America's best airport by the Airline Passenger's Association. Since it opened in 1971, the airport has become a symbol of Tampa. It is the intention of this study that Tampa's new interstate system be the positive image for surface transportation as the airport is for air transportation.

Experience has shown that when aesthetics are considered early in the planning process, a successful project is likely to result.

The intent of the Design Amenities Program was not to produce a final detailed design for the system as a whole or for any part of the system. The objective was, rather, to study methods to improve the overall aesthetics and unity of the project, identify areas which required special visual emphasis or de- emphasis, and develop a palette of man-made and natural design elements to be used in the final design phase to implement the program.

Design Objectives

Once the mission of the Design Amenities team was defined, the following list of specific goals was developed in concert with the Citizens Advisory Committee, the Agency Task Force, and the Staff Liaison Group, which consisted of interested staff members from local agencies:

* To create a strong positive image of the Tampa-Hillsborough County Area.
* To provide continuity of design components within the interstate system.
* To design the interstate system to be in harmony with the surrounding land uses as well as with the character of the Tampa area.

Gateways

One effective method to enhance the image of an area is to create a delineated "gateway," areas where motorists first sense their arrival in a community. Strong aesthetic treatment in these gateways, which is then carried as an overall theme through the interstate system, provides a strong and positive first impression.

The three major gateways to the study area are listed below:

* Near the intersection of I-4 and I-75, when arriving from the east.
* At the east end of the Howard Franklin Bridge, when arriving from the west.
* At the Pasco-Hillsborough County line, when arriving from the north.

Portals

Another major design element is a "portal," a term which refers, in this context, to entrances and exits from the interstate system, although cross-streets which do not intersect with the interstate can also be considered portals. It is desirable to help motorists sense their location while traversing the interstate system. This can be accomplished by providing special emphasis to those portals which provide access to major destination points.

Aesthetic treatment at portals also provides an opportunity to physically and visually extend the interstate system and its Design Amenities into the community, at street-level, where people can best experience the effect. Community participation in improvements at portals and along adjacent street areas can further improve the overall image of the system and the individual neighborhoods, as well.

Unique Neighborhoods

Gateways can also be created to instill a sense of arrival at specific neighborhoods within the urban area. In Tampa's case, these neighborhoods are Ybor City, the Westshore area, Downtown, West Tampa, and the University North area. An example of this type treatment is shown on Exhibit 13. Each of these neighborhoods has a unique character which should be complemented by any aesthetic treatment planned for the interstate system, at least on a localized basis.

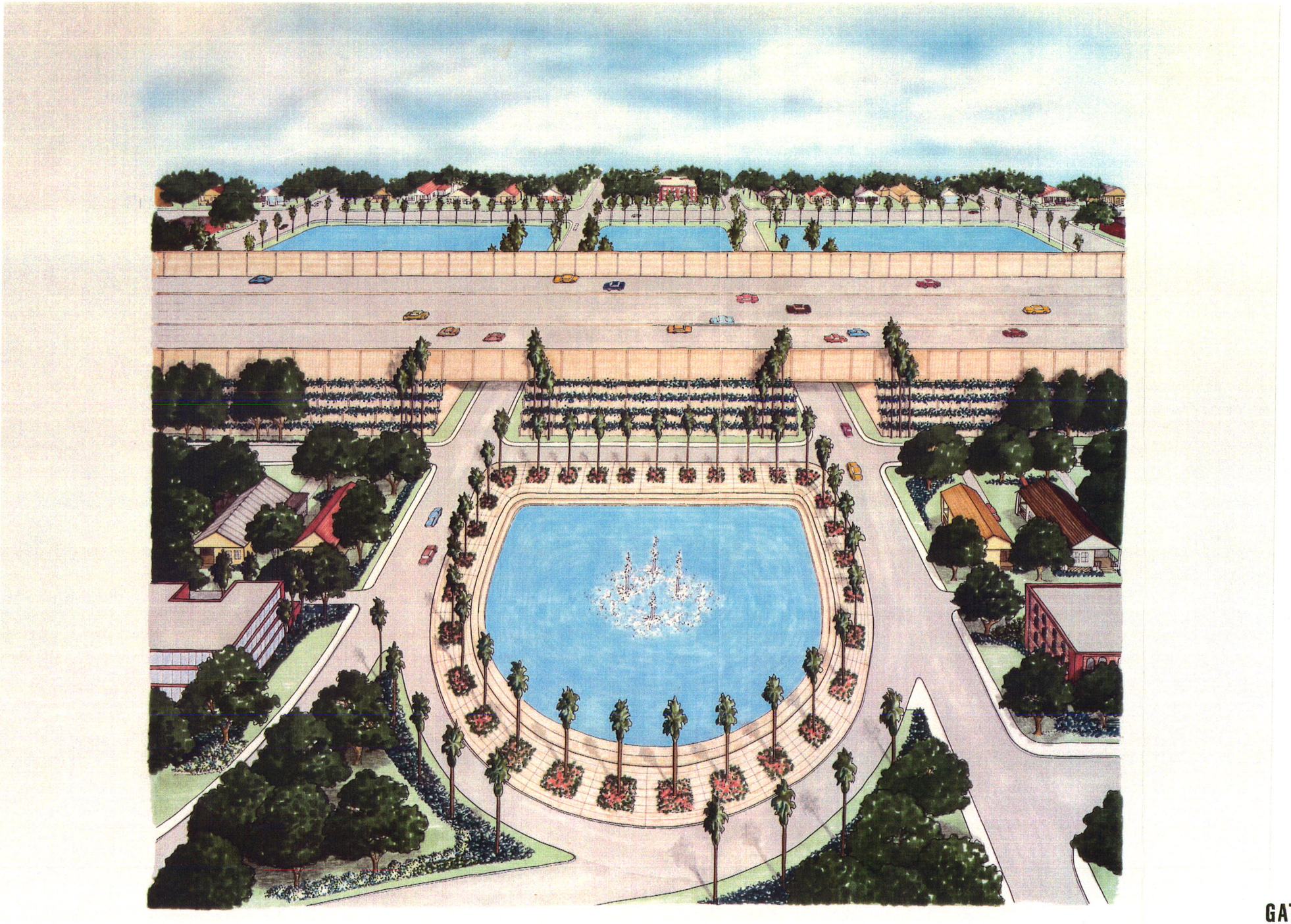
Unifying Considerations

There are several factors which affect the cohesiveness of any design: color, texture, shape, and balance. To begin a discussion of how these factors relate to the design of an interstate highway, it is first necessary to define the construction parameters; that is, the predominant construction material(s).

In the Tampa interstate project, the predominant construction material will be concrete. It is by far the most cost-effective and most widely used product in this region of the country for the type of construction anticipated.

The use of concrete offers many opportunities for the designer. It can be cast-in-place (made at the construction site) or precast (cast at a manufacturing facility and assembled at the site), It is "plastic," meaning that it can be molded and shaped. It can be colored with an internal coloring agent, or it can be coated or stained after it is in place. It can be related with mildew-inhibiting agents and, when necessary, it can be cleaned with high-pressure hoses, although this loosens some coatings.

Precast concrete is available in an infinite variety of shapes and sizes, ranging from standard concrete block to interlocking shapes used to build retaining walls. Special shapes can be made to order by any local precast plant.



GATEWAY TO YBOR CITY AT 14TH AND 15TH STREETS

EXHIBIT 13

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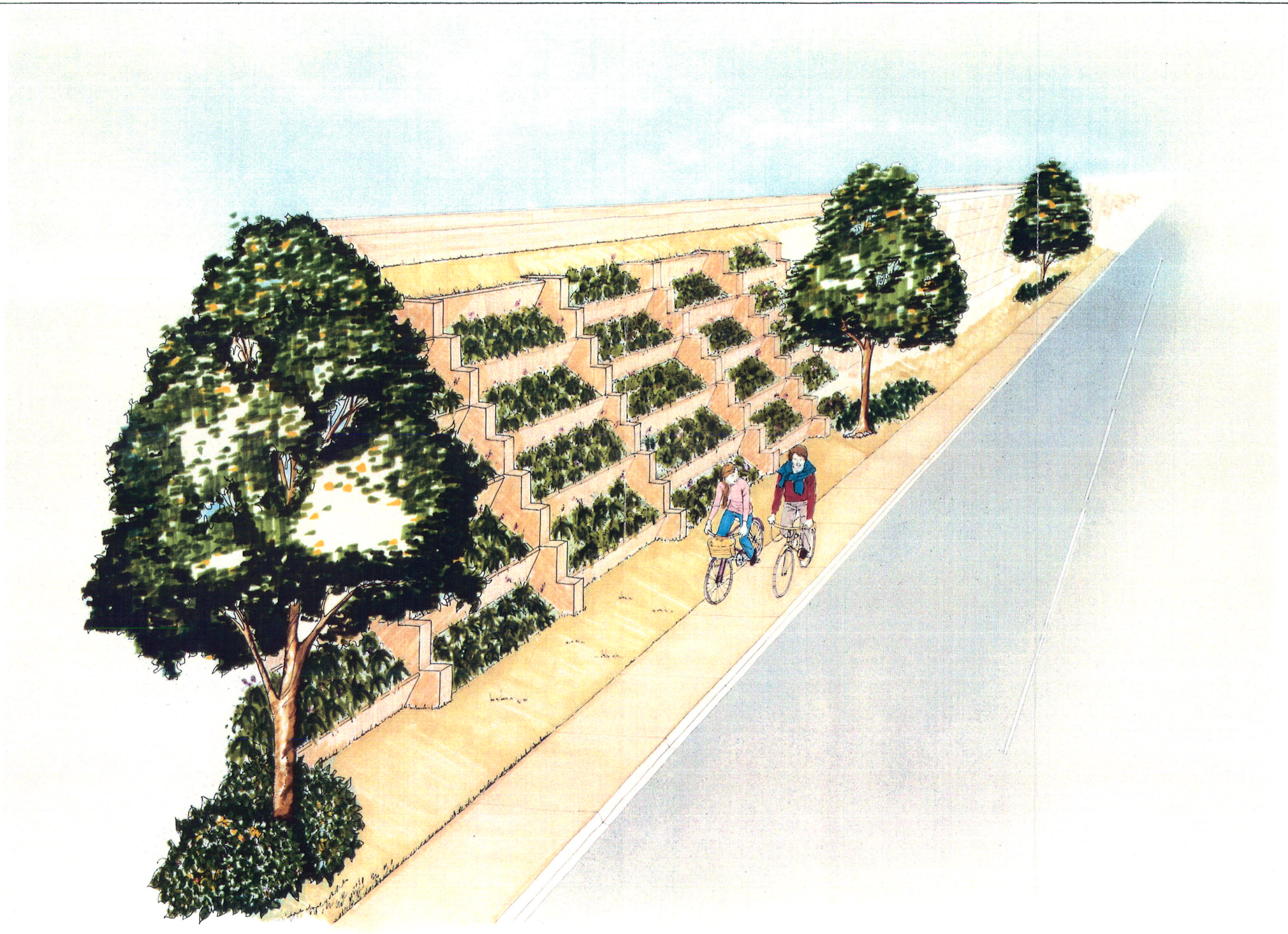
TAMPA INTERSTATE STUDY THE GREINER TEAM



GREEN WALL

EXHIBIT 14

Large expanses of cast-in-place concrete can be made to appear like they were constructed of small units. This often produces a beneficial psychological effect since people can relate to the size and shape of concrete blocks.

It is likely that some of the complicated long-span bridges, especially at multi-level interchanges, will need to be made of steel rather than concrete. Careful attention to the interface between steel and concrete elements is necessary.

There are several other components whose impact on overall design continuity of a major project is often overlooked. These are fences, guard rails, light poles, and signage. Careful attention to the design of these components is important to developing a unique amenities package for the Tampa interstate system.

Aesthetic Enhancement

Walls, embankments and bridge structures necessary for the engineering component of the design program will constitute a significant portion of the project. The potential for adverse visual impact associated with extensive use of hard man-made materials exists. The Design Amenities team has studied methods to turn these potential adverse impacts into positive design solutions. This portion of the amenities discussion deals with the resulting design opportunities.

General Theme

Before discussing opportunities associated with specific design elements, it is necessary to discuss the system as a whole. Each element of the project should be in a balance with the other elements in terms of function and emphasis within the system-wide hierarchy. This means that the function of each element can be expressed provided that the element is in balance with its surroundings. Specific elements are discussed in the following sections.

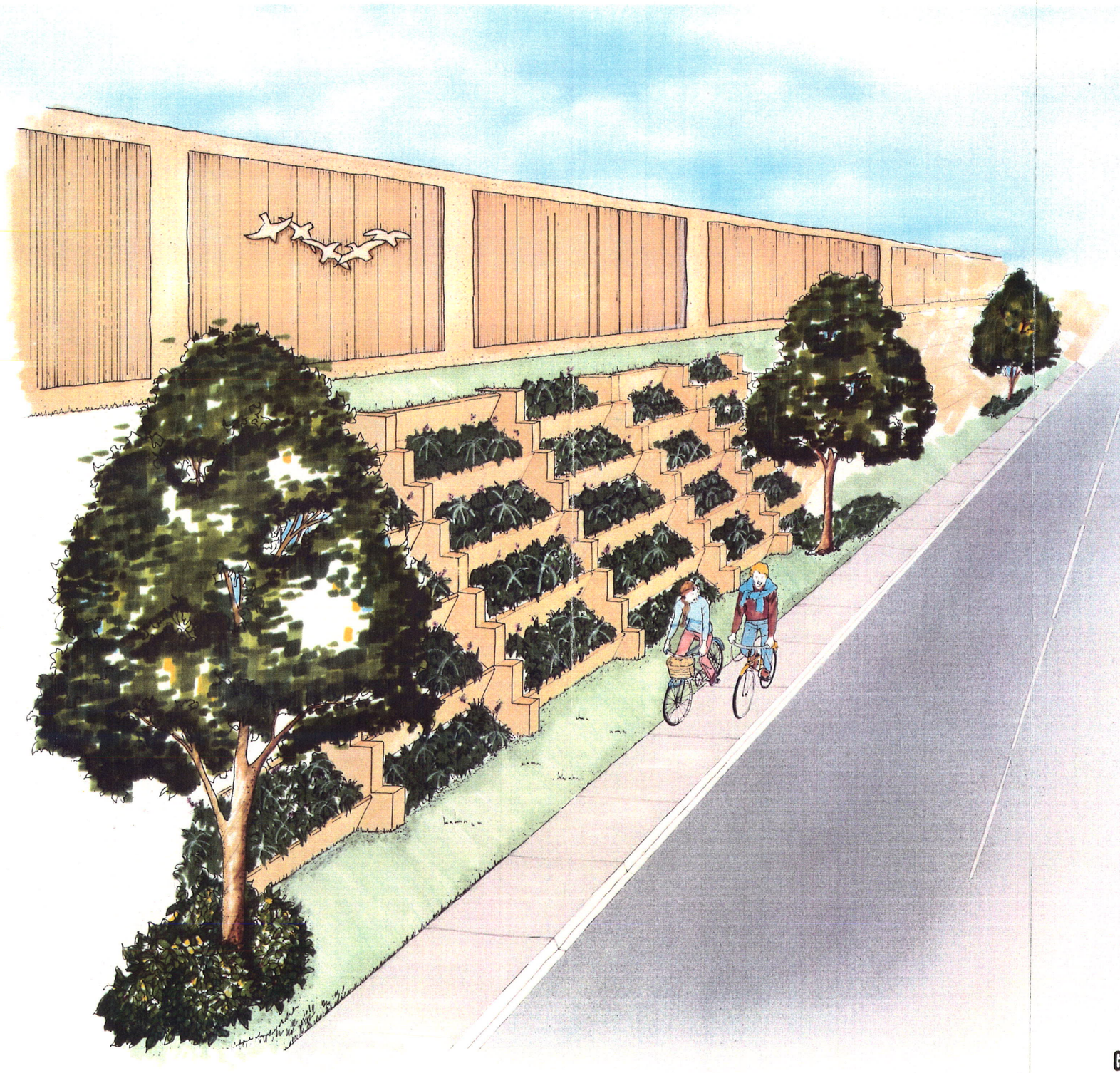
Walls and Embankments

As discussed earlier, retaining walls and noise barrier walls could be significant design elements, especially in developed areas and in areas with restricted rights-of-way. There are several methods of minimizing the perceived heights (and thereby the adverse visual impact) of such walls.

One method to reduce the perceived height of the walls is to terrace the wall. This has the effect of creating several shorter walls. With such treatment comes the added benefit of creating spaces in which to place landscape materials which further diminishes the perceived height of the wall and provides visual relief. Examples of such terraced walls are shown on Exhibits 14 and 15.

Another way to give interest to a vertical surface when terracing, which is not feasible due to space constraints, is through the use of texture. The texture could take an abstract architectural form, or could be representative of some object unique to the Tampa Bay area. Examples of textured wall treatment are shown on Exhibit 16.

Use of modular components for construction instead of cast-in place concrete can also provide visual interest. Some components are designed to support the growth of vegetation on vertical or near vertical surfaces. Walls constructed of these materials were shown previously on Exhibit 14.

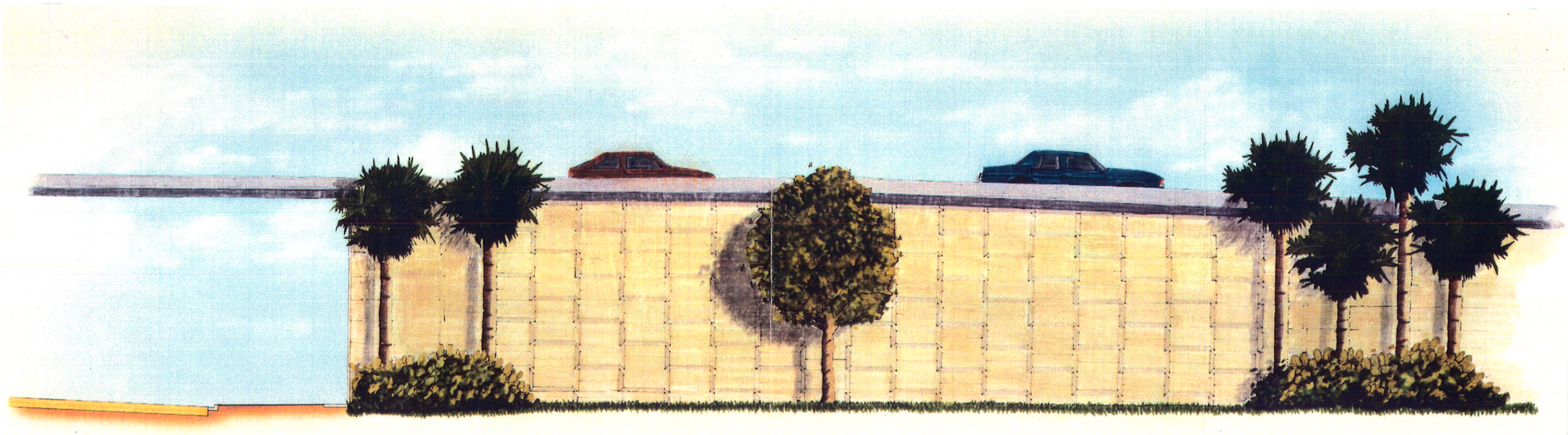


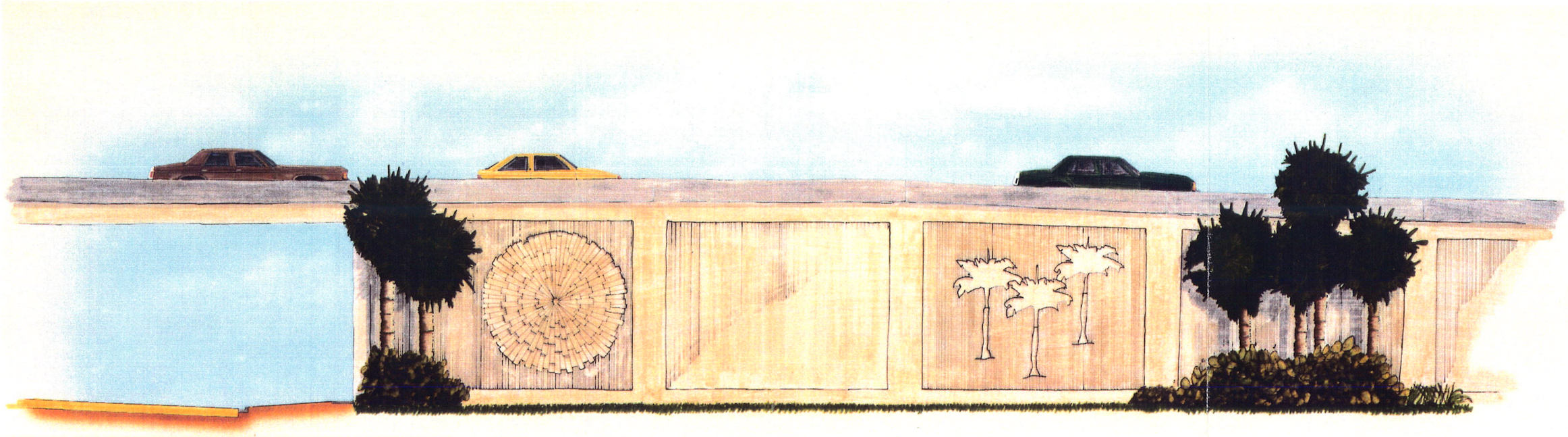
GREENWALL WITH NOISE BARRIER

EXHIBIT 15

TAMPA INTERSTATE STUDY THE GREINER TEAM

A Florida Department of Transportation Project





TEXTURED WALL TREATMENT

EXHIBIT 16

A Florida Department of Transportation Project

TAMPA INTERSTATE STUDY THE GREINER TEAM

Noise barrier walls present special design challenges. The successful abatement of traffic-generated noise levels is both a function of physical and aesthetic design parameters. Many sound barriers have been constructed that meet or exceed the acoustic goals but fall short of aesthetic needs. Sound barrier installations for the Tampa interstate must meet both sets of design criteria to be successful. Material selection should reflect construction materials, color and texture of the surroundings and the overall design. When possible, imaginative use of grading should be incorporated into the final design to reduce the perceived height of sound barriers by both drivers and adjacent residents. Further noise attenuation through barriers can be achieved by judicious use of plant material, effective reduction of barrier mass, and by melding permanent structures to the surrounding landscape with minimal obtrusiveness. Exhibit 17 presents several possible sound barrier treatments.

Noise barrier walls can be constructed of cast-in-place or precast concrete panels. Use of precast panels which are attached to one another at the construction site is a viable option for noise walls. The panels, as shown on Exhibit 17, are an alternative to cast-in-place concrete and can be attached to one another in an infinite variety of configurations. The inherent stability and light weight of this system lessens the need for footings. The panels can be cast with the same color and texture as cast-in-place elements of the project.

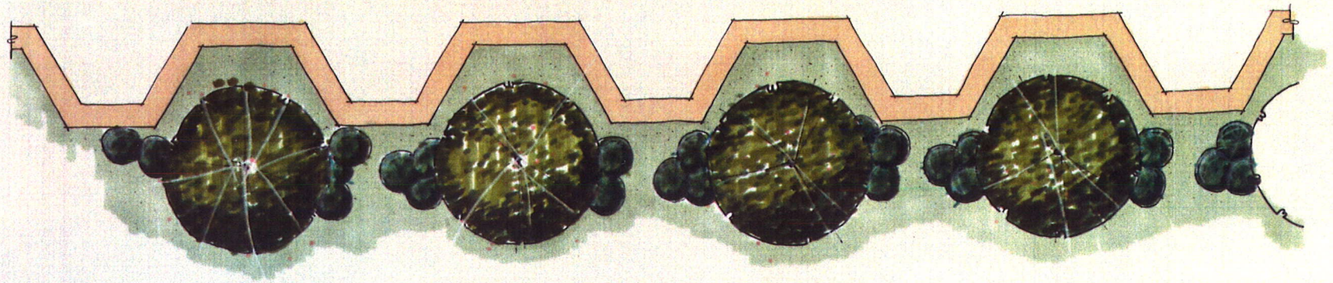
Where space permits, earthen berms can be used to add a vertical dimension and to screen the interstate from adjacent land uses. Noise walls, in particular, can benefit from berming, especially when they are freestanding and not attached to retaining walls, in particular, can benefit from berming, especially when they are freestanding and not attached to retaining walls or bridge structures. By constructing the wall at the top of a berm, the full noise suppressing benefit of the wall can be achieved, while minimizing the perceived height of the wall itself. The berms can also be used to enhance the display of plant material. This is discussed further in the description of landscape elements.

Bridge Structures

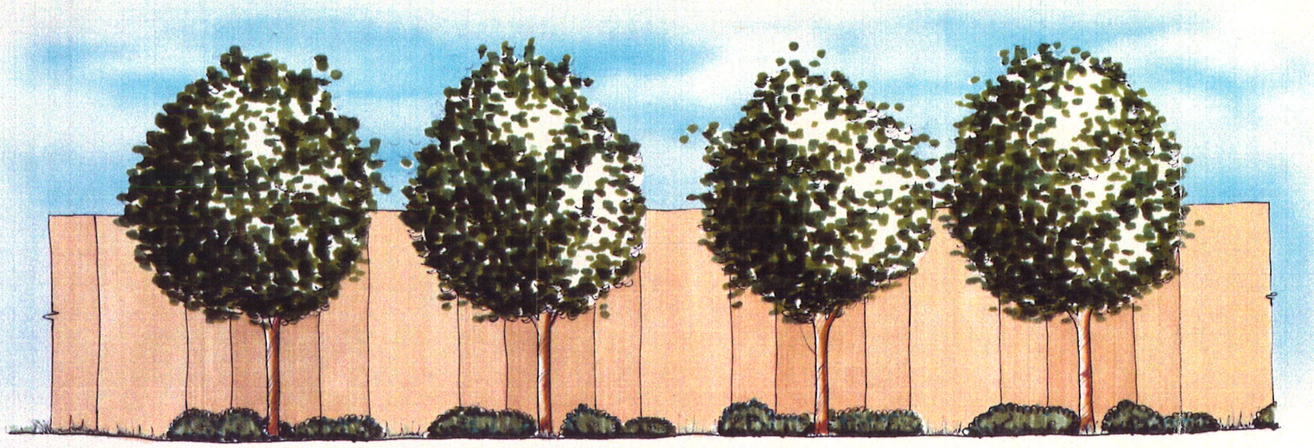
The aesthetics of the interstate's bridge structures has been the subject of intensive research. Standardization of such critical elements as girders, abutments, and piers can assist in establishing the unity of the 36.6 mile- long project. Where feasible from an engineering standpoint, all places where the interstate crosses over a surface street will be of the same general appearance. Precast concrete box girders are, from an aesthetic standpoint, far preferable to standard American Association of State Highway and Transportation Officials (AASHTO) girders. Patterns similar of those used on adjacent retaining walls can be incorporated into the formwork when casting these members.

Where feasible, overpasses should consist of a single span, without intermediate supports. At those areas where significant portions of the roadway must be on structure, piers should be kept to a minimum to avoid the perception of a "forest" of supports.

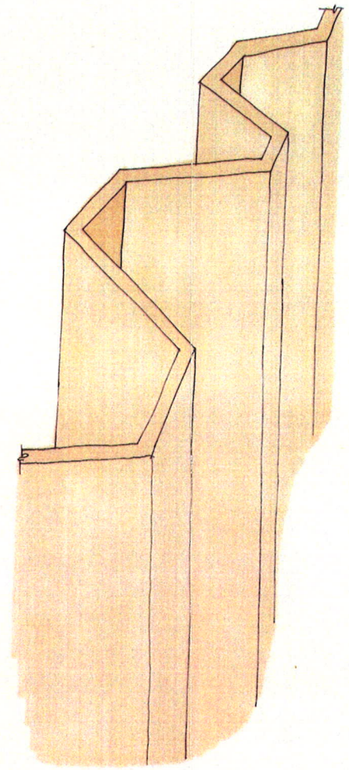
Certain places such as river crossings and major interchanges provide an opportunity to utilize the ground plane for purposes such as parking and stormwater retention. Such multiple use of right-of-way can also create the opportunity to incorporate interesting public spaces into the overall design.



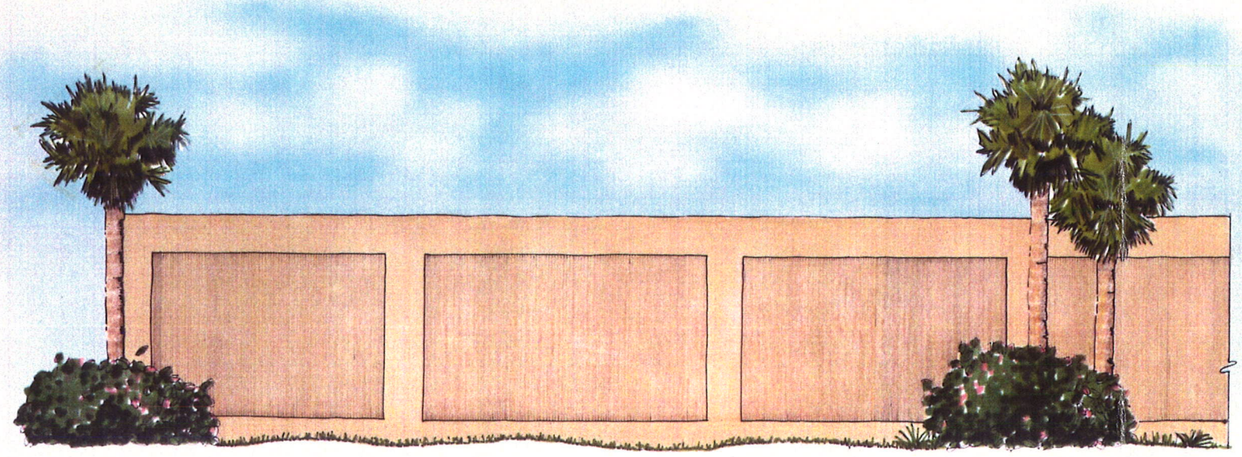
PLAN – FAN WALL



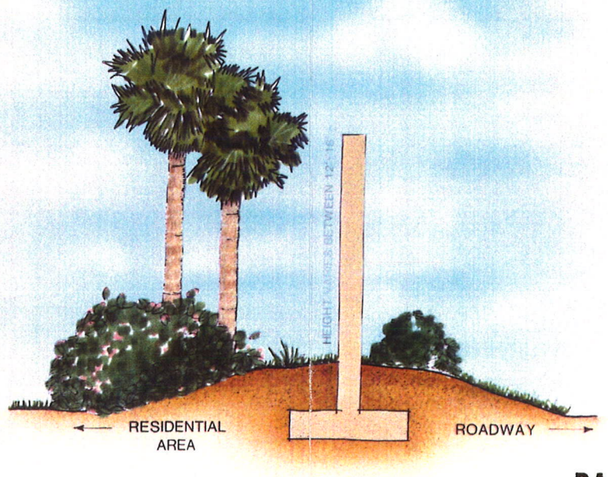
ELEVATION – FAN WALL



ISOMETRIC – FAN WALL



ELEVATION – CAST IN PLACE CONCRETE WALL



SECTION – CAST IN PLACE CONCRETE WALL

NOISE BARRIER TREATMENT

EXHIBIT 17

Ancillary Elements

The final type of man-made components of the system are supplementary to the major construction elements, although they provide important functions. Taken together, they can be thought of as the details and accessories which pull the overall design together.

Many of these ancillary elements, fences, guard rails, sign supports and light poles/fixtures, are commonly constructed of metal. It is imperative to the success of the overall design that all metal elements used in the project have similar characteristics, including elements which reach past the bounds of the project into adjacent streets. This does not preclude some degree of flexibility in choosing elements for pedestrian areas. For example: all roadway light poles and fixtures should be identical in appearance on the interstate itself; it would be inappropriate, however, to use the same pedestrian fixtures in the Westshore area or in Ybor City. While differing significantly in shape, requiring them to be the same color would maintain design continuity.

It will be necessary to construct access control fences at certain locations along the roadway. Typically, chain-link fence is used for such purposes. It is strongly recommended that alternatives to chain-link fencing be explored. One candidate alternative would be an aluminum fence consisting of vertical rails. This produces a residential "feel" as opposed to the almost prison-like ambience ascribed to chain-link fencing.

Natural Elements and Landscape Design

For purposes of this study, the "natural elements" of the Design Amenities program consist of plant materials and water features. Landscape design is the process which blends these two features to their best advantage with the man-made elements on the interstate system and out into adjacent communities.

The landscape design and planting scheme developed for the Tampa interstate is of primary importance for the dual roles of humanizing the potential harshness of the paved roadway environment and providing a mechanism for blending the roadway into the surrounding land uses it must traverse.

The landscape theme suggested for the Tampa interstate is one reflective of the character of the Tampa Bay area, and based principally on a hardy, drought-resistant palette of native or indigenous vegetation. The primary goals of the landscape design for this interstate is to provide the following:

* Appropriateness of roadway landscape through the use of optimum plant material for functional qualities such as buffering, screening, erosion control, and maintainability.
* To enhance the unity of the project.

Existing plant material should be incorporated into the proposed improvements to the greatest extent possible by protecting or relocating appropriate plant material found within the right-of-way. Provisions for the inventory of existing plant material and for its protection or relocation to holding areas should be incorporated into preliminary design phases of the interstate reconstruction.

The landscape design criteria has been developed as an integral part of the roadway improvements package within the master planning process. This comprehensive approach is imperative for the achievement of the optimum integration of landscape areas into the roadway design, and for the preservation of valuable existing plant material.

It is important to realize that appropriate landscape design provides not only the visual amenity which it is most recognized for, but also psychological relief, scale modulation, and climate mediation. Attention to all these elements will be crucial to a successful roadway environment.

Water Features

As discussed earlier, engineering studies have indicated that a series of stormwater retention areas will need to be constructed along the interstate system. The Design Amenities team proposes that certain of these retention areas be used to incorporate water features into the urban landscape. This is especially crucial in the downtown area where the interstate will be elevated on structures above the surface streets. The retention areas could occupy some space below the structure, thus minimizing right-of-way requirements. Such places could become pleasant urban parks, complete with shade and the soothing sound of fountains.

Other retention areas will need to be located along the side of the roadway. Here, aquatic plants could be used on side slopes where there was sufficient space. The aquatic plants would be visually pleasing to observe, and would serve as a biological filtration system for water quality treatment.

The Hillsborough River is another important water feature of the area that should be tied into the amenities program. For example, views of the river from the interstate will be developed within the parameters of engineering considerations. Parks could be located beneath the interstate where it crosses the river.

Conclusions And Recommendations

The potential exists for the interstate to be truly seen as an amenity for the Tampa-Hillsborough County area. For this concept to become a reality, the interstate must become a part of the fabric of the area by serving more than just the transportation needs of the population and its visitors. It must become a welcome, inseparable, component of the neighborhoods which it traverses, offering them opportunities to enhance their identity rather than "walling them off."

This expanded urban role is a major challenge for the interstate and the community alike, and one which will require the promotion of interaction beyond just the necessary public hearings. The result of this interaction will be to provide innovative solutions to urban problems and to recognize the potential of the interstate as a major unifying community element, which brings with it opportunities as well as challenges.

V. URBAN AND COMMUNITY ENVIRONMENT

Land Use

Currently, the City of Tampa and Hillsborough County Comprehensive Land Use Plan required by the State of Florida's Local Government Comprehensive Planning and Land Development Regulation Act of 1986 is under review by the Florida Department of Community Affairs and other appropriate agencies. Upon approval by the Department of Community Affairs, the Comprehensive Land Use Plan will be adopted and serve as the policy in guiding development in Hillsborough County.

The Tampa Interstate Study has established no land use policies for the study area. Land use policy relating to the areas adjacent to the Tampa interstate are controlled by the City and County comprehensive plans. The Tampa Interstate Study (TIS) recognizes the need for well ordered plans for future development and redevelopment, and encourages the cooperative study of specific land use policy issues for segments of the interstate corridor.

Essential to the successful development of any transportation system are transportation and land use planning. Land uses encroach upon road rights-of-way, increasing traffic congestion. This, in turn, makes it very costly to acquire land for right-of-way that will be used to increase the road capacity to serve the land uses that increase the traffic congestion in the first lace. Master planning can save money for both local governments and the state.

A strong coordinated approach to land use and transportation planning is needed. Policy decisions at local levels are interpreted and implemented in different ways over time. Therefore, any approach to coordinating land use and transportation planning must be done through specific procedures. The local comprehensive plans provide an ideal vehicle for this type of coordinated planning.

Transportation systems are affected by land use development in many ways; location and accessibility intimately tie land use and transportation concerns. One of the key issues that could benefit from improved coordination between land use and transportation concerns is the protection of adequate rights-of-way for future road expansions. Intensely developed lands are virtually cost prohibitive to acquire for roadway expansion, yet it is the location and accessibility created by the road that attracted the intense land uses. This situation is more prevalent in the urban areas. Policies in the local comprehensive plans that may help to improve land use/transportation coordination include clustering neighborhoods serving commercial uses around intersections. This can be done in such a manner as to discourage commercial strip development; consolidating existing curb cuts and minimizing future ones; and establish setbacks of adjacent land uses farther from the roadway to allow for future corridor expansion. Mutual benefits can be realized for land use and transportation concerns.

Local governments can further orderly growth through the development of corridor studies, such as the I-75 Corridor Study conducted in unincorporated Hillsborough County. Land use and transportation policy can be combined to provide for intense, well planned development that will take advantage of the location and accessibility the corridor has to offer. This can preserve the integrity of the corridor as an inter-regional

transportation route. Corridor studies could be incorporated into the plan, and mechanisms appropriate for the corridor (e.g., performance standards) could be developed. This would ensure the balance needed between land use and transportation concerns.

The policies with transportation issues within the land use elements of the comprehensive plans for unincorporated Hillsborough County and Tampa provide a sound foundation to foster more coordination between the transportation and land use planning efforts. These efforts are enhanced by the Tampa Interstate Study Master Plan.

Cultural Features

The urban nature of the study area results in the interstate's improvements abutting a number of major cultural features. The three resources discussed in this section are historic districts, archaeological sites and recreational facilities.

Historic Districts

The initial construction of the Tampa Interstate System divided the West Tampa and Ybor City neighborhoods. These were later designated as Historic Districts and listed on the National Register of Historic Places.

West Tampa, which was a 200 acre marsh area, was developed as a separate city in 1892 by Hugh Campbell MacFarlane. The city was planned as an industrial community with nearby worker housing. Although ethnically diverse, it had a Latin flavor and contained a concentration of cigar manufacturing. The area was incorporated into the City of Tampa in 1925. Many of the cigar manufacturing structures and the surrounding housing remain. The original interstate construction bisected the community and resulted in the Historic District extending on both sides of the interstate. The proposed improvements in Design Segment 2A impact structures within the Historic District, primarily south of the interstate.

Ybor City, Tampa's former Latin Quarter, was once the world's center for handmade cigars. The area began developing prior to the turn of the century; although much of the area's construction occurred in the 1920's and 1930's. Urban Renewal resulted in the destruction of the area directly south of I-4 in the 1960's. The nationally designated Ybor City Historic District is limited in area, but the locally designated Barrio Latino Historic District covers a larger area on both sides of I-4. The improvements to I-4 do not extend into the Nationally listed Ybor City Historic District, but will impact the locally designated Barrio Latino Historic District, which extends into Segments 2B and 3A.

The National Park Service is currently preparing a Statement of Significance to request National Historic Landmark designation for the locally designated Barrio Latino Historic District. The Statement of Significance was submitted to the National Park Service Advisory Council on Historic Landmarks in May 1989. If approved by the Council, the Statement of Significance will then be submitted to the U.S. Department of the Interior for approval by the Secretary.

The Seminole Heights historic area in Segment 5A is located between Idlewild Avenue (north), Cayuga Street (south), Suwannee Avenue (west) and mid-block between Central Avenue and I-275. There are approximately 11 contributing structures adjacent to the interstate. The proposed TIS Master Plan improve-

ments do not significantly affect this district; however, there is some localized right-of-way required adjacent to the historic area.

Archaeological Sites

As part of the Advance Notification Process, the State Historic Preservation Office (SHPO) was notified of the Tampa Interstate Study initiation. The study team received confirmation that no detailed archaeological study of the area had been done. It is anticipated no significant undisturbed archaeological sites occur along the interstate because of previous construction and urban development. A detailed archaeological survey will be conducted as a part of the Phase II Environmental Documentation.

Parks and Recreation

There are six parks that are in the proximity to the Tampa Interstate. MacFarlane Park (Segment 2A), Riverfront Park (Segment 2B), Perry Harvey Park (Segment 2B), Robles Park (Segment 2B), Sulphur Springs State Park (Segment 5C) and Cheney Park (Segment 5C). The only parks that will be directly impacted by the expansion of the interstate will be Riverfront Park and Robles Park. Right-of-way for roadway expansion will be needed from Riverfront Park. Additional right-of-way for stormwater management via expansion of the existing stormwater facility will be necessary in Robles Park. The appropriate Section 4(f) documents and Section 106 Consultation Process for these parks will occur during the Phase II Environmental Documentation.

Community Services

A principal goal of the TIS is to ameliorate or soften the potential adverse impacts which could be created by a large-scale reconstruction project such as the interstate project. It is realized that a reconstruction project of this magnitude will inevitably result in impacts to the surrounding community. The purpose of the study is not only the inventory of possible impacts, but to blend the interstate improvements into its environment. To accomplish this goal, and to lessen the extent of any possible impacts, a wide range of existing community-level services and facilities were examined during the study. Impacts related to public and quasi-public land uses and residential communities are assessed in the following paragraphs.

Schools

The majority of the study area is served by the Hillsborough County School district. A small portion in the northern study area is served by the Pasco County School District.

There are approximately 20 Hillsborough County Public School facilities identified in the study area. Approximately five privately owned school facilities exist within the study area. These facilities have been identified and inventoried in the Tasks E.5 and E.6 land use and cultural features study efforts. Principal impacts associated with the interstate reconstruction are possible relocations of students and changes in circulation patterns.

Libraries

Three public libraries are within the immediate area of the interstate. The West Tampa Branch Library, the Ybor City Branch Library and the Hillsborough County Seminole Branch Library. These facilities will not be directly impacted by the reconstruction of the interstate.

Non-Profit Organizations

Churches

Approximately eighty churches were identified in the study area. Of these eighty churches, the following churches will be directly impacted or relocated by the reconstruction of the interstate:

* Agape Fellowship (Segment 2A);
* Bethel A.M.E. Church (Segment 2B);
* Greater Bethel Baptist Church (Segment 2B);
* Baptist Fellowship Bible College of Tampa (Segment 2B);
* Friendly Missionary Baptist Church (Segment 2B);
* Faith Temple Missionary Baptist Church (Segment 2B);
* First Born Pentecostal Church of Jesus (Segment 2B); and
* Pentecostal Christian Fellowship Church (Parking Only)(Segment 4B).

Currently, the Master Plan impacts the Greater Bethel Baptist Church on Orange Street in Segment 2B. Right-of-way needed for the Orange Street ramps will have to be acquired from the church to avoid impacts to the Perry Harvey Park. However, during the Phase II Environmental Documentation, a review will be conducted by the State Historic Preservation Office to determine if the Greater Bethel Baptist Church may have historical significance. If historical significance is determined, the right-of-way could be shifted and taken from the Perry Harvey Park; a comparative analysis will be undertaken.

Coordination has continued throughout the study with the majority of the churches that will be impacted. A tentative schedule for right-of-way acquisition has been provided to the churches so they can make relocation plans for their facility, if that is required.

The Boys and Girls Clubs of Greater Tampa

The Boys and Girls Clubs of Greater Tampa are located at the southeast corner of MacDill Avenue and I-275 (Segment 2A). The reconstruction of the interstate will necessitate the relocation of this facility. There may be sufficient property left in the remainder of the parcel to rebuild the facility.

Salvation Army

The Salvation Army Educational Center, located at the northwest corner of Kay Street and Florida Avenue, will be impacted by the reconstruction of the interstate. Coordination with the Salvation Army has continued throughout the study.

Police, Fire and Emergency Medical Services

Coordination with the City of Tampa Police Department, the Hillsborough County Sheriff's Department, Pasco County Sheriff's Department, the State of Florida Department of Highway Safety and Motor Vehicles (Florida Highway Patrol), Hillsborough County Bureau of Emergency Management, Hillsborough County Fire Department, and City of Tampa Fire Department has continued throughout the study. The following emergency medical services companies were also contacted for comments: Emergency Medical Services (Tampa), Medic One Ambulance Service (Tampa), S.A.S. Ambulance Service (St. Petersburg), and Rural Metro Ambulance Service (Brandon).

With the initiation of Traffic Surveillance and Incident Management, emergency response times will be greatly improved. The possibility of using movable barriers for emergency access will be investigated further in the Phase II studies for the Tampa interstate.

Only one emergency service facility will be relocated by the reconstruction of the interstate, the City of Tampa Fire Department Communications Division at the corner of Mathews Avenue and Taliaferro Avenue.

Public Transit

Coordination and consultation with Hillsborough Area Regional Transit Authority (HART) occurred throughout the study in conjunction with the transit element of this study. Bus service in the community can be greatly improved by reduced travel times resulting from the interstate reconstruction. This will be accomplished with the exclusive High Occupancy Vehicle Lanes (HOV), HOV priority access ramps and additional cross corridor access. The development of new park-n-ride lots and the enhanced accessibility to existing park-n-ride lots will further decrease transit travel times and enhance the desirability of bus service.

City Sanitation

The Hillsborough County Department of Solid Waste and the City of Tampa Sanitation Department, as well as private sanitation companies were contacted for comments. Local streets, cul-de-sacs and alley connections were designed to meet the operating criteria for the various sanitation service vehicles. Although every effort was made in the planning of local streets, some modifications in routing patterns were necessary. No significant adverse impact to sanitation services has been identified. It is anticipated that improved traffic circulation will enhance these public services.

Noise

A preliminary noise evaluation was conducted for the project which was aimed at the identification of noise sensitive sites in the study area, the prediction of future noise levels in representative locations, and the examination of the feasibility of noise abatement measures to mitigate noise impacts.

Noise Sensitive Sites

An inventory of noise sensitive sites in the study area was developed through the interpretation of aerial photographs, land use maps, and field observations. Sensitive sites were grouped into ten geographic zones

within the study area. Table 1 summarizes the sensitive sites inventory by zone. Noise sensitive areas found close to the study area were neighborhoods with single family homes and apartment buildings. Other sensitive areas included mobile homes, schools, libraries, churches, motels, and parks. In many areas along the interstate, noise sensitive sites were found on both sides of the roadway directly adjacent to the right-of-way. Most of these were older neighborhoods which remained after the initial construction of the interstate over 20 years ago.

The Federal Highway Administration (FHWA) has developed criteria which, when exceeded, requires the examination of various noise mitigation measures. These criteria consider the land use and projected noise levels. Most of the sensitive areas adjacent to the roadway were considered to be activity Category B, for which the criteria noise level is 67 dBA (Leq1) exterior.

Noise Level Predictions

The future noise levels within the study area were evaluated by modeling representative locations within each design segment. Locations were selected which were reasonably representative in terms of typical section, vehicle operating characteristics, and physical configuration within the design segments. For worst-case conditions, the modeling assumed peak hour vehicle volumes travelling at the posted speed limit in the year 2010.

The results of the analysis were expressed in terms of isopleths, which relate the approximate distance in feet from the roadway centerline, where a level of 67 dBA (Leq1) could be expected to occur. As discussed earlier, 67 dBA (Leq1) is the noise level for activity Category B land uses such as single family homes, apartments, parks, and hotels. Table 2 provides the 67 dBA isopleths for representative locations within each design segment.

Areas of possible noise impact were determined by placing the calculated isopleth lines on conceptual design plans, examining land use, and determining if the noise abatement criteria would be exceeded. It was found that in most portions of the study corridor, the sensitive areas located near the interstate system would experience noise levels which exceed the FHWA noise abatement criteria.

Noise Abatement Measures

A variety of noise abatement measures were evaluated. Noise barriers and land use controls effectively minimize the noise impacts of the proposed improvements. Measures determined not to be prudent or effective included the reduction of speed limits, restrictions on trucks, and time restrictions.

A preliminary noise barrier analysis was accomplished by modeling barriers of various heights and locations in representative areas with the OPTIMA model. In each case, the barriers evaluated were designed to shield sensitive locations from the interstate at the right-of-way in areas outside the influence of interchanges. Table 3 summarizes the effectiveness of barriers at various heights at representative locations. As shown, the higher the barrier, the greater the noise reduction.

TABLE 1

NOISE SENSITIVE SITES INVENTORY SUMMARY
Tampa Interstate Study

Zone	Single Family Neighborhoods	Multi-Family Complexes	Mobile Home Parks	Schools	Churches	Historic Sites	Recreational Facilities	Funeral Homes	Motels	Cemeteries	Libraries	Music Facilities	Total Sensitive Sites
A	4	1	0	0	6	0	1	0	3	0	0	0	15
B	4	21	0	14	29	1	9	3	6	1	1	0	89
C	9	14	0	8	18	4	8	0	6	0	1	0	68
D	5	11	0	2	7	0	3	0	2	0	0	1	31
E	7	0	9	1	6	0	1	0	2	0	0	0	26
F	2	3	0	2	5	0	1	2	0	0	1	0	16
G	11	9	9	6	18	0	4	1	16	0	0	1	75
H	11	7	9	3	7	0	1	0	9	0	0	0	47
I	2	1	0	0	2	0	0	0	0	0	0	0	5
J	2	1	0	0	2	0	0	0	1	0	0	0	6
Total	57	68	27	36	100	5	28	6	45	1	3	2	378

TABLE 2

67 dBA NOISE ISOPLETHS
Tampa Interstate Study

Design Segment	Segment Description	Approximate Distance from the Roadway Centerline Where 67 dBA (Leq_1) Would Occur (ft)
1	I-275 from Howard Frankland Bridge to east of Himes Ave.	850
2	I-275 from east of Himes Ave. to north of Buffalo Ave. and I-4 from the I-275 Junction to 14th St.	900
3	I-4 from 14th St. to east of 50th St.	620
4	I-4 from east of 50th St. to east of I-75 Interchange	710
5	I-275 from north of Buffalo Ave. to north of Linebaugh Ave.	1400
6	I-275 from south of Livingston Ave. to Hillsborough/Pasco County Line	1075

Air Quality

As a means of evaluating the effect of the proposed Tampa interstate improvements on regional air quality, an inventory of motor vehicle emissions was conducted. The air emissions inventory was based on the future-year (2010) average daily traffic volume and roadway operating conditions. For comparative purposes, the 2010 condition was evaluated with and without the proposed Tampa interstate improvements. Motor vehicle emission rates were obtained from the EPA-approved MOBILE3 motor vehicle emissions model and the EPA publication AP-42. Future-year roadway operational and design data were obtained from the Task F.5.e. Travel Demand Technical Report. Table 4 presents the results of the emissions inventory.

As shown in Table 4, by the year 2010, the proposed improvements associated with the Tampa interstate could result in an estimated 40 percent reduction in CO emissions generated by motor vehicles and an estimated 20 percent reduction in HC emissions, compared to the unimproved condition. These predicted reductions with the proposed improvements were a result of less roadway congestion, fewer periods of stop-

TABLE 3

NOISE BARRIER EFFECTIVENESS SUMMARY
Tampa Interstate Study

Design Segment		Hourly LEQ (dBA) 500' from Interstate Centerline				
	No Barrier	with Concrete Noise Barrier				
		9' High	12' High	15' High	18' High	21' High
1	68	62	60	59	58	57
2	70	63	61	59	58	57
3	67	62	61	59	58	56
4	69	65	64	62	61	59
5	69	65	64	62	61	59
1988 Cost Estimate ($/Linear Ft): Wood		77	112	151	216	282
Concrete		109	155	206	245	285
Steel		163	232	302	436	569

TABLE 4

FUTURE-YEAR (2010) EMISSIONS INVENTORY
Tampa Interstate Study

Scenario	Total Emissions (tons/day) Carbon Monoxide	Nitrogen Oxides	Hydrocarbons	Sulfur Oxides	Particulate Matter
With Improvements	40	13	7	2	4
Without Improvements	66	13	9	2	4

and-go driving, and increased motor vehicle operating speeds throughout the project corridor. Emissions of NOx, SO2 and PM were predicted to remain essentially the same, with or without the proposed improvements.

Community Cohesion

The reconstruction of the interstate system will not adversely affect community cohesion. The initial construction of the interstate severed many neighborhoods; however, these areas have been reestablished as cohesive neighborhoods. The local street modifications have been planned to maintain local circulation. In several areas, the addition of non-interchanging cross corridor access will enhance community cohesion. These new through streets are Sherrill Street, April Lane, 109th Avenue, Sinclair Hills Road and Faulkenburg Road.

In addition, the upgrade and extension of Sligh Avenue between U.S. 301 and I-75 will provide better neighborhood circulation in the Vandenberg Airport area. The extension of Lemon Street from Westshore Boulevard to Occident Street will enhance local access and circulation in the Westshore area.

Relocation

One of the unavoidable repercussions of interstate reconstruction is the necessity for relocations. Although every effort was made to reduce the impacts of right-of-way acquisition, there were numerous residential and commercial relocations. Limited industrial relocations will result. The availability of housing and vacant land for relocation within each design study segment has not been inventoried; however, a thorough investigation of available relocation properties will be conducted in the Phase II Environmental Documentation.

The consultant team developed base-line right-of-way and relocation data during initial Task E Data Collection activities. The TIS team conducted primary data collection for all property ownerships located within 300 feet of the existing interstate right-of-way as part of Tasks E.13 and H.1.

The evaluation of the various Master Plan Concepts included an emphasis on real estate affected by all proposed alternatives and included the identification of major community facilities, park, recreational, or historical sites. Estimating the cost of identifiable properties in order to weigh the impact, either positive or negative, assisted the study team in evaluating the various concepts. The identification of these ownerships established the base list for the TIS relocation program. From this list, a print out was produced which identified the individual ownerships by property type. This assisted in estimating relocations, including residential, commercial, and industrial, as well as those non-profit and public ownerships located within the study area. Refinement of right-of-way lines was achieved by applying established design parameters developed as part of Task F.2.a and F.2.b to the various concepts.

The evaluation of concepts included preliminary right-of-way and relocation data. The Tier 2 alternatives were based on high level of service (LOS) C. Lane requirements for this service level were deemed to be excessive and were reduced to a modified LOS D during Tier 3. This Tier 3 revision reduced right-of-way and relocation throughout the corridor. The right-of-way analysis assisted in the ''windowing down'' of alternative concepts, with particular emphasis in identifying extreme or obvious detrimental impacts based on the ownerships, this would make certain alternatives ''fatally flawed'' and thereby eliminate them from further consideration. Those alternatives that survived the Tier 3 evaluations were then evaluated as to right-of-way and relocation costs. Those alternatives selected for the third tier of evaluation within Task F (Conceptual Design Analysis) were presented in geometric layouts on 1"=100' scale aerials. In addition, existing right-of-way lines were also included on the 1'=100' scale aerials, thereby graphically displaying those properties affected by alternatives. These right-of-way limits are shown on the aerial layouts provided in the Attached Plans and Illustrations appended to the Master Plan Report.

Within each of the design study segment areas, individual properties were identified as to land size, improvement description, and improvement size, and type of ownership, private, non-profit, public utility, quasi-government, government, et cetera. Table 5 gives the number of properties affected by property type and also shows the number of relocations in each design study segment.

TABLE 5

RELOCATIONS AND PARCEL TAKINGS BY LAND USE TYPE
Tampa Interstate Study

	Design Study Segments							
	1A	2A	2B	3A and 3B	4A, 4B, and 4C	5A, 5B, 5C, and 5D	5E, 5F, and 5G	6A and 6B
RIGHT-OF-WAY								
Residential								
Single family	125	100	223	246	63	75	15	--
Multi family	2	5	12	38	4	1	--	--
Vacant	16	10	50	79	13	43	45	13
Commercial								
Improved	8	7	30	21	20	8	6	--
Vacant	16	1	7	15	38	14	24	--
Industrial								
Improved	4	2	--	18	7	--	--	--
Vacant	2	--	--	15	2	--	--	--
Public/Semi Public								
Improved	3	3	28	8	5	--	--	--
Vacant	--	--	4	16	1	--	--	--
Right-Of-Way Total	176	128	354	456	153	141	90	13
RELOCATIONS								
Residential	160	112	354	337	59	92	15	--
Other	15	12	58	47	9	1	6	--
Relocation Total	175	124	412	384	57	93	21	--

VI. NATURAL AND PHYSICAL ENVIRONMENT

Natural and Biological Features

A preliminary natural features inventory was conducted for the project corridor. The purpose of the preliminary investigation was to identify potential involvement with natural features due to the proposed roadway improvements. Further and more detailed studies will need to be completed during Phase II of the study and the permitting stages to more accurately assess potential involvement with natural features.

Natural features, which were assessed in the preliminary inventory, included wetland systems, floral and faunal (biotic) communities, and endangered and threatened species. Each of these features were assessed on a general basis. The methodology which was utilized ranged from some on-foot inspection to informal coordination with agencies, literature reviews and interpretation of aerial photography. For additional information pertaining to individual methodology and detailed results of the assessment, refer to the Task E.7.k. Natural Features Inventory, published separately.

The project corridor is mainly located within highly urbanized areas with some extensions into rural areas. These rural areas in which there is involvement with natural biotic communities mainly include Segment 4 and Segment 6. Additional involvement is in portions of Segment 1, Segment 3 and Segment 5. The only natural biotic community existent within Segment 2 is the Hillsborough River. The river in this region is considered a deepwater habitat and offers minimal habitat value due to being seawalled and partially polluted.

Wetlands which occur within the project corridor vary from estuarine systems to mixed hardwood swamp systems. A wetlands analysis was completed using National Wetlands Inventory (NWI) maps provided by the U.S. Fish and Wildlife Service and a survey of the hydric soils of the project corridor. A delineation of these wetlands can be found on the 1"=1,000' scale aerial photographs of the Tier 1 Wetlands Inventory.

Natural wetland systems are concentrated primarily in Segment 4 and Segment 6, which are the most rural of the six segments. With the exception of the estuarine systems in Segment 1, all wetland systems are freshwater. In the urban areas, the wetland systems usually consist of borrow areas, stormwater retention ponds and roadside ditches. Natural systems which have the potential to be impacted include freshwater marshes, cypress domes, creek and slough systems, along with mixed hardwood swamps.

Potential impacts to wetlands systems have been calculated from the 1"=100' Master Plan aerial photographs. Impacts were primarily calculated up to 100 feet from the edge of proposed pavement. These impacts were were then planimetered and can be found on a per segment basis in Table 6. Some of the wetland impacts may be offset by the 25.5 acres of potential littoral zone from the proposed stormwater management ponds. Impacts will be more accurately calculated in Phase II of the study. Agency correspondence will also be initiated at that time to discuss impacts, permitting, and mitigation, as well as review approximately 326 acres of proposed candidate mitigation areas included on the 1"=100' scale Master Plan aerials.

Floral and faunal communities were inventoried on a general basis through interpretation of aerial photography. Due to the heavily urbanized nature of the project corridor, natural biotic communities are only

TABLE 6

SUMMARY OF ANTICIPATED WETLAND IMPACTS
Tampa Interstate Study

Master Plan Analysis
Hillsborough and Pasco County, Florida

Segment	Number of Wetlands	Total Acreage of Impacts	Total Acreage of Wetland Systems	% of Total Systems Impacted	Areas of Littoral Zone of S.W.M.P.[1]
1	8	12.3	28.8	43.0%	3.6
2	--	--	--	--	3.5
3	3	0.8	6.7	12.0%	6.0
4	44	38.5	470.1	8.1%	1.4
5	7	2.2	28.0	8.0%	3.6
6	34	44.5	1296.7	4.0%	7.4
TOTAL	96	98.3	2593.4	3.8%	25.5

[1] Littoral zones for the stormwater management ponds have been calculated using 35% of the total surface area of the ponds.

concentrated in Segment 4 and Segment 6. The biotic communities which exist within the project corridor include a range from sandhill communities and pasture lands to various wetland communities.

Actual upland biotic communities which exist within the study corridor include pine flatwoods and sandhill communities as well as pasture lands and hardwood mixed forests. While these communities provide good habitat value for flora and fauna, their extent within the study corridor is minimal. This is due to the urbanized nature of the study corridor and the minimal amount of right-of-way acquisitions in the rural areas.

Impacts to both upland and wetland communities are limited to those areas either within the existing right-of-way or the proposed right-of-way. Substantial impacts will occur within the new interchange areas of Segment 6 and the improved interchange of I-4 and U.S. 301 in Segment 4. Complete impacts will be assessed during Phase II of this study.

A preliminary investigation of the potential of occurrence of endangered and threatened species has been completed for the project corridor. This investigation included a review of literature, the FDOT computer list of endangered and threatened species and informal consultation with the U.S. Fish and Wildlife Service (USFWS), as well as the Florida Game and Fresh Water Fish Commission (FGFWFE). Furthermore, critical

habitat was assessed as to the relationship of the project to USFWS designated "critical habitat." A review of the literature led to a determination there would be no involvement with "critical habitat."

Information obtained in the investigation resulted in a determination there may be potential involvement with several state and federally listed endangered and threatened species. A list of these species, as well as a discussion of potential impacts to those species which are federally listed, can be found in the Task E.7.k. Natural Features Inventory, published separately. Some of these species include the West Indian manatee, Florida scrub jay, bald eagle, woodstork, American alligator, sea turtles and the Florida golden aster.

In Phase II of this study, these species will be better evaluated and the actual potential impacts will be assessed. In addition, further consultation with agencies may be done to assist in the evaluation of potential impacts to these species.

Hazardous Materials Inventory

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

The most recent count of 111 potential hazardous material sites in the vicinity of the project corridor was decreased to 73 sites after right-of-way acquisitions were considered. Of these 73 sites, 57 are considered to have a low potential to impact the project. These 57 sites use or store hazardous material, but no known environmental contamination is present or suspected at these locations. The TIS Task E.16. Hazardous Material Report describes these 57 sites in greater detail. The remaining 16 sites, however, have the potential to impact the proposed project. These 16 sites were evaluated based on their proximity to the proposed right-of-way; physical land use history; current on-site conditions; storage of production chemicals, hazardous materials, or hazardous wastes; and any environmental violations or reported contamination on file with the Florida Department of Environmental Regulation (FDER).

In consideration of potential construction delays and remediation costs associated with contamination sites, it is recommended right-of-way acquisition of these sites be avoided or minimized wherever possible. However, if right-of-way acquisition at these sites cannot be avoided, it is recommended further investigations be conducted. Initially, FDOT should request the FDER to conduct field investigations useful in further evaluating the potential for hazardous material use and disposal at these sites. If this information does not conclude whether or not contamination is present, or the extent of contamination, then subsurface investigations should be performed in areas designated for right-of-way acquisition. If contamination is found, FDOT should encourage the owner or operator of the site to begin clean-up before right-of-way acquisition.

These recommendations are based on preliminary information only and are not meant to replace the results of more detailed studies which deal with subsurface field investigations. Rather, this information should be used only as a guide in identifying potential hazardous material sites that may require technical studies to determine the existence of contamination prior to right-of-way acquisition. Finally, it should be noted that hazardous material sites may extend beyond those identified in this survey because of illegal dumping practices and a possible lack of compliance with FDER's stationary tank inventory system.

Drainage and Hydrology

The TIS project corridor extends through areas which are characterized as heavily urbanized to rural areas. The majority of the existing stormwater systems within the project corridor outfall to one of the major waterbodies in the area which include Tampa Bay, Hillsborough River, Tampa By Pass Canal, Cypress Creek, and Curiosity Creek.

The existing drainage system within the project corridor consists of a combination of open ditch and enclosed storm sewer systems. The majority of the storm water outfall systems for the existing interstate system are considered to be undersized or overloaded. In addition, several areas of the interstate currently drain to basins which are considered "volume-sensitive" or are without an adequate outfall. Currently, there are only two existing detention areas which serve the existing interstate within the project corridor.

Existing Drainage Problem Areas

A telephone conversation with the Tampa office of the FDOT Maintenance Department revealed the following historic maintenance problems involving drainage or flooding within the project corridor.

The first problem mentioned, and the most serious, is 15-inch culverts are too small and are easily blocked. The most common blockage is 15-inch diameter hubcaps which cover the culvert opening and block the culvert flow. The recommended solution is a minimum culvert size of 18-inch diameter.

Also discussed were the following site specific drainage problems.

* The entrance ramps at Westshore Boulevard and I-275 interchange are frequently flooded due to inadequate outfall conveyance in the Lemon Street drainage ditch.
* The bridge in the northbound lane of I-275 over the sinkhole just north of 127th Avenue no longer drains at the rate previously observed. It should be pointed out that due to concerns about the quality of stormwater entering the groundwater table, regulatory agencies may limit the use of this sinkhole as an outfall for stormwater runoff from the roadway. The area in question is rather small, currently only two lanes of roadway for approximately 150 feet drain into the sinkhole.
* North of the Bearss Avenue interchange to S.R. 54, the existing cross drains are in questionable condition. Many of the cross drains may need to be replaced when the roadway is improved.
* The intersection of 40th Street and I-4 is drained through an outfall ditch across private property. The Maintenance Department mentioned they have been trying to contact the owner of the property to coordinate a solution to this problem. They recommended a drainage easement across the property to allow the FDOT access to clean the ditch as needed. The ditch currently is blocked by vegetative growth due to lack of maintenance.
* East of 50th Street on I-4 a cross drain concrete pipe culvert is leaking. The physical evidence of this leakage is the cracking of the interstate pavement.
* On I-4 between Orient Road and the intersection with I-75, the median area stays wet a significant portion of the time. It was apparent that this was indicative of poor drainage in the median area in this section of the roadway.

Phase II study activities will provide for a comprehensive master drainage plan for stormwater management. In each segment of the interstate, the controlling criteria will be identified with possible solutions and recommendations.

VII. FINANCIAL ANALYSIS

A critical component of the Tampa Interstate Study (TIS) is the evaluation of the project's economic desirability and financial viability. The financial analysis structures the process for implementation and identifies the degree and form of public participation and private sector involvement necessary in the project.

The first step in the process involves estimating project costs and timing. Costs include engineering, design, right-of-way acquisition, and construction of the facility. The timing of construction determines FDOT's annual cash requirements. Once project costs and the construction schedule are established, two analytical techniques are used to assess financial feasibility:

* Cost-Effectiveness Analysis
* Cash Flow Analysis

In the cost-effectiveness analysis, the social profitability, or economic desirability of the Master Plan improvements will be determined by comparing road user benefits with the project's costs. Financial viability is assessed in the cash flow analysis, where the timing of capital outlays and cash receipts are determined to ensure sufficient funding is available to cover outflow requirements.

The components of the financial analysis, cost-effectiveness analysis, and cash flow analysis are discussed in the following sections.

Cost-Effectiveness Analysis

In this section of the report, a summary of the results of the cost-effectiveness analysis of the Master Plan improvements is presented. The analysis is described in greater detail in the TIS Task G.2.b. Cost-Effectiveness Analysis Working Paper.

The analysis has been conducted in order to define, in economic terms, the net benefits which can be expected to result if the TIS Master Plan improvements are undertaken. The analysis compares the costs of implementing the interstate improvements with the road user benefits which can be expected to accrue from having the improvements in place. Costs include engineering, design, right-of-way acquisition, construction, maintenance, and operation of the new facility. Benefits include the reduction in road-user costs which would be expected to result from more efficient and safer traffic operations due to the improvements to the interstate network.

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

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

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

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

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

* User Benefits - The reduction in annual road user costs (the road user costs of the "No-Build" alternative less the road user costs of the Master Plan alternative).
* Project Costs - The difference between the investment costs of the Master Plan improvements and any improvement costs required for the "No-Build" scenario.
* Operating and Maintenance Costs - The change in annual maintenance and operating costs due to the construction of the improvement.
* Residual Value - The remaining value of the improved facility at the end of the analysis period.

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

User Benefits

A travel demand model was used to estimate vehicle miles traveled and average speeds on the improved interstate and on the existing (or "No-Build") network for the year 2010. Using AASHTO's methodology, total road users costs were determined for three cost components - vehicle operating costs, vehicle travel time costs and accident costs. The benefits of the Master Plan improvements are equal to the reductions in road user costs attributable to the project. These benefits represent the opportunity costs that would be incurred by road users if the improvements are not made. In other words, the improvements provide an opportunity for road users to reduce travel costs by operating on a safer and more efficient roadway. As long as road users travel on the unimproved network, opportunity costs continue to increase.

Road user costs for the "No-Build" and Master Plan alternatives are presented in Table 7. As shown in the table, the Master Plan improvements will reduce daily vehicle miles traveled by 563,000 miles and daily road user costs by approximately $1.8 million in the year 2010, which is equivalent to annual benefits of $650 million. Benefits were calculated back to the year 1997, which is assumed to be the opening year after completion of the first phase of the project, based on a three (3) percent annual growth in traffic and the percentage of the Master Plan improvements completed in each year. Based on these assumptions, annual road user benefits in 1997 will be approximately $122 million.

TABLE 7

ROAD USER BENEFITS IN YEAR 2010
Tampa Interstate Study

	Daily Vehicle Miles Traveled	Daily Highway User Cost	Cost/VMT
"No-Build"	42,257,000	$25,668,200	$0.6074
Master Plan	41,694,000	23,888,365	0.5729
Savings	563,000	$1,779,835*	0.0345

*Daily User Benefits of Master Plan Improvement

Project Costs

Project costs include engineering, design, right-of-way acquisition, and construction of the facility. For this analysis, it is assumed that construction activity would span a 12 year period beginning in 1995. A summary of the costs for the "No-Build" and Master Plan alternatives is provided in Table 8.

TABLE 8

NO BUILD AND MASTER PLAN COST COMPARISON
Tampa Interstate Study

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

* Includes roadway, bridges and bridge demolition.
** Includes engineering, CEI, legal and administrative, design and change order contingencies.

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

Master Plan project costs for the TIS were developed using the FDOT's Long Range Estimate (LRE) program. The LRE is a computerized program that generates items, quantities and unit prices for new construc-

tion, resurfacing and widening projects. The total estimated project costs for the TIS by design segment are listed in Table 9. Utility relocation costs are not included in the table, but will be developed during Phase II studies.

TABLE 9

MASTER PLAN
ESTIMATED RIGHT-OF-WAY AND CONSTRUCTION COSTS
Tampa Interstate Study

Design Segment	Roadway/ Bridges	Engineering/ CEI	Contingency/ Legal/ Administrative	Sub-Total	Right-of-Way	Relocation	Total
1A	$196,350,092	$16,689,758	$38,122,203	$251,162,053	$34,980,000	$3,150,000	$289,292,053
2A	$65,455,464	$5,563,714	$5,458,986	$83,727,634	$14,850,000	$2,280,000	$100,857,634
2B	$325,557,213	$27,672,363	$27,151,472	$416,437,889	$89,172,000	$8,210,000	$513,819,889
3A	$68,577,681	$5,829,103	$5,719,379	$87,721,431	$28,699,800	$6,415,000	$122,836,231
3B	$60,607,044	$5,151,599	$5,054,627	$77,525,757	$10,467,900	$990,000	$88,983,657
4A	$38,294,852	$3,255,062	$3,193,791	$48,985,022	$10,794,900	$105,000	$59,884,922
4B	$60,496,017	$5,142,161	$5,045,368	$77,383,737	$23,058,600	$355,000	$100,797,337
4C	$14,930,555	$1,269,097	$1,245,208	$19,098,483	$7,417,200	$829,200	$27,344,883
5A	$29,029,217	$2,467,483	$2,421,037	$37,132,846	$1,063,500	$185,000	$38,381,346
5B	$24,858,659	$2,112,986	$2,073,212	$31,798,059	$5,750,700	$495,000	$38,043,759
5C	$38,061,127	$3,235,196	$3,174,298	$48,686,052	$3,268,500	$270,000	$52,224,552
5D	$38,067,806	$3,235,764	$3,174,855	$48,694,595	$2,509,500	$480,000	$51,684,095
5E	$25,480,318	$2,165,827	$2,125,059	$32,593,257	$2,757,900	$300,000	$35,651,157
5F	$17,753,188	$1,509,021	$1,480,616	$22,709,066	$2,740,650	$195,000	$25,644,716
5G	$40,524,967	$3,444,622	$3,379,782	$51,837,683	$4,333,350	$30,000	$56,201,033
6A	$13,012,757	$1,106,084	$1,085,264	$16,645,323	$3,915,000	$0	$20,560,323
6B	$22,261,898	$1,892,261	$1,856,642	$28,476,401	$4,785,000	$0	$33,261,401
TOTAL	$1,079,318,855	$91,742,103	$111,761,798	$1,380,615,290	$250,564,500	$24,289,200	$1,655,468,990

A construction schedule by design segment has been established for the project and is shown in Table 10. Design Segments 1A, 3A, and 3B will be constructed beginning in 1995, which is the first year of the analysis period. It was assumed that 75 percent of the right-of-way will be acquired prior to 1995 and the balance during the first five years of the analysis period.

Maintenance Costs

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

TABLE 10

CONSTRUCTION SCHEDULE BY DESIGN SEGMENT
Tampa Interstate Study

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

Residual Value

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

Results of the Cost-Effectiveness Analysis

The results of the cost-effectiveness analysis based on a discount rate of four percent are presented in Table 11. Costs and benefits are expressed in constant 1989 dollars. When conducting a constant dollar analysis, AASHTO recommends using a four percent discount rate, which represents the real cost of capital for public investments. The table shows the incremental benefits and costs of the improvements and provides a "running computation" of NPV and B/C ratio. The payback period is the number of years required for the NPV to become positive and the B/C ratio to be greater than 1.0. The IRR is shown at the bottom of the table.

As indicated in Table 11 for the TIS Master Plan improvements, NPV is approximately $2.80 billion, the B/C ratio is 4.59, payback period is ten (10) years, and IRR is 23.73 percent. A sensitivity analysis was performed using higher discount rates of seven and ten percent. These rates would result in more conservative results since user benefits, which are greater in later years, are discounted more. Under these conservative assumptions, the Master Plan improvements achieve an NPV and B/C ratio of $1.86 billion and 3.22 using the seven percent discount rate, and $1.22 billion and 2.42 using ten percent.

TABLE 11

TIS MASTER PLAN
COST EFFECTIVENESS ANALYSIS
NET PRESENT VALUE AND BENEFIT/COST RATIO
(CONSTANT 1989 DOLLARS)

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

*ASSUMES DISCOUNT RATE = 4%
**NPV=PV(U)-[PV(I)+PV(M)-PV(R)]
***B/C=PV(U)/[PV(I)+PV(M)-PV(R)]

NOTE: INTERNAL RATE OF RETURN IS 23.73%

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

APPENDIX

LIST OF TAMPA INTERSTATE STUDY SUPPORT DOCUMENTS

Task	Title	Type
B	Public Involvement Plan	Working Paper
B.1.g(2)	Mailing List Contact Document	Working Paper
B.2.b	LRT Liaison	Review Briefs
E.13 & F.6.c(3)	Tier 3 Right-of-Way and Relocation Estimates	Working Paper
E.14.b	Noise Sensitive Sites Inventory	Technical Report
E.16	Hazardous Waste Site Inventory	Technical Report
E.18	Public Meeting Site Inventory	Review Briefs
E.2.a	Existing Alignment Inventory	Working Paper
E.2.b,c	Interstate Structural Inventory	Working Paper
E.7.e	Drainage Basin and Structure Summary	Working Paper
E.7.f(1)	Soil and Geotechnical Inventory	Working Paper
E.7.f(2)	Pavement Analysis	Working Paper
E.7.a,b,h,i,k	Natural Features Inventory	Working Paper
E.8	Utilities Inventory	Working Paper
E.9	Transportation Plans	Working Paper
F.2.a	Component Package Presentation Summary	Technical Report
F.2.b	Design Criteria, Policies and Procedures	Technical Memorandum
F.3 & F.4	Study Design Segments and Priority Study Segment Inventory	Working Paper
F.5.b	Develop/Validate Model	Technical Memorandum
F.5.d	Tiers 1-3 Alternative Simulations	Working Paper (3)
F.5.e	Analysis of Service Flow Rates and Level of Service	Working Paper
F.5.e	Travel Demand	Technical Report
F.5.f	Transit Model Refinement	Working Paper
F.6	Design Amenities	Working Paper
F.6.a(6)	Tiers 1-3 Analyses	Technical Memorandum
F.6.f	Freeway Traffic Management Plan	Technical Report
F.6.g(1)(d)	Conceptual Stormwater and Quality	Technical Report
F.6.g(2)(a)	LRT Study Documentation	Working Paper
F.6.g(3)(a)	Bus Alternatives	Technical Report
F.6.g(3)(c)	Tampa CBD Access and Downtown	Technical Memorandum
F.6.g(4)(d)	HOV Alternatives	Technical Report
F.6.i	Florida and Nebraska Avenues Operational Analyses	Working Paper
G.1	Structural Conceptual Analysis	Technical Report
G.2	Cost Effectiveness Analysis	Working Report
H.1	Master Plan Right-of-Way and Relocation Estimates	Working Paper
I.1	Public Meeting No. 1-3 Comments Summary	Working Paper

CITIZENS ADVISORY COMMITTEE MEMBERS

Member	Organization
Dr. Mel Anderson	University of South Florida
Ms. Fran Davin	Tampa Parkway Association
Representative James Hargrett, Jr.	Florida State Legislature
Ms. Pam Iorio	Hillsborough County Commission
Ms. Joan Jennewein	Ybor City Chamber of Commerce
Mr. William McBride, Jr.	Holland & Knight
Mr. Ronald Rotella	Westshore Alliance
Mr. Mike Salmon	City of Tampa
Mr. Bruce Samson	University of Tampa
Mr. John Temple	Florida DOT
Mr. Jeff Thaxter	Tampa Downtown Partnership
Mr. Thomas Thomson	Tampa Urban Area MPO
Mr. Scott Trundle	Tampa Tribune

AGENCY TASK FORCE MEMBERS

Member	Organization
Mr. Jeff Arey	Harlan Bartholomew & Associates
Ms. Sheila Benz	Tampa Bay Regional Planning Council
Mr. Paul Desmarais	SWFMD
Mr. Victor Gagliardo, P.E.	Tampa Permitting Department
Mr. John Gallagher	County Administrator Pasco County
Dr. Rick Garrity	Florida Dept. Environmental Regulation
Lt. James Gillum	Pasco County Department of Police
Mr. Cliff Hayden, Jr.	Hillsborough Area Regional Transit
Sheriff Walter Heinrich	Hillsborough County Sheriff's Dept.
Mr. William Howell	Florida Dept. Natural Resources
Mr. Robert Hunter	Hillsborough County City-County Planning Commission
Sheriff Johnson	Pasco County Dept. of Police
Mr. Emmett Lee, Jr.	Tampa Port Authority
Mr. Lemcke	Betchel Civil Engineers
Mr. Melton Martin, Jr.	Hillsborough County School Board
Mr. Michael McCarthy	Hillsborough County Dept. Public Works
Mr. Ray Miklos	
Mr. Rud Mueller	Hillsborough County Aviation Authority
Captain F. D. Pedrick	State of Florida Dept. Highway Safety and Motor Vehicles
Mr. Hubert Pascoe, Jr.	Pinellas County MPO
Mr. James Randall	Deputy Superintendent for Administration and Operations Hillsborough Co. Schools
Mr. Allan Schrader	Tampa Port Authority
Mr. J. E. Skinner	FHWA
Mr. Ray Speer	Hillsborough County Expressway Authority
Lt. James Tagliarini	Hillsborough County Sheriff's Department
Mr. John Temple	Fl. Department of Transportation
Mr. Thomas Thomson	Tampa Urban Area MPO
Ms. Dawn Turner	SWFMD
Mr. Robert Wallace	City of Tampa, Dept. of Public Works
Lt. Albert White	Hillsborough County District III

TAMPA INTERSTATE STUDY
SPEAKERS' BUREAU MEETINGS

Date	Organization
August 31, 1987	Kiwanis Club of Tampa
September 17, 1987	American Society of Civil Engineers
October 1, 1987	Downtown Partnership
October 19, 1987	Chamber of Commerce-Comprehensive Plng.
November 5, 1987	Dowtown Merchants
November 18, 1987	Optimist Club of Tampa
November 19, 1987	BOMA
December 18, 1987	Westshore Development Group
January 17, 1988	New Auto Dealers
February 13, 1988	Daughters of the American Revolution
March 8, 1988	North Tampa Kiwanis
April 28, 1988	Inner Bay Speakers Bureau
July 11, 1988	Tampa Bay Commercial Brokers
July 20, 1988	Temple Terrace Chamber of Commerce
July 27, 1988	Ybor City Redevelopment
July 28, 1988	Transportaion Committe/Tampa Downtown Partnership
August 2, 1988	Kiwanis Club
August 5, 1988	Tampa Downtown Partnershi[
August 9, 1988	Westshore Allience
September 9, 1988	Ybor Redevelopment Association
September 30, 1988	American Society of Civil Engineers
December 7, 1988	Chamber of Commerce Aviation Council
December 14, 1988	Barrio Latino
January 5, 1989	East Lake Park Homeowners Association
January 25, 1989	Ybor City Rotary
February 1, 1989	Sertoma Club
February 6, 1989	Bay Area Breakfast Club
February 8, 1989	Greater Tampa Utility Group
February 9, 1989	Flounle Villa Neighborhood
February 14, 1989	Ybor Development Agency
February 15, 1989	Bethel Baptist Church
February 21, 1989	Ybor City Chamber of Commerce
February 21, 1989	Buella Baptist Church
February 22, 1989	Barrio Latino
February 24, 1989	Pinellas MPO
February 27, 1989	Westchester Condominium Association
March 2, 1989	Tampa Merchants Association
March 16, 1989	Chamber of Commerce - Planning & Growth
March 16, 1989	Leadership Tampa Bay
March 17, 1989	Tampa Palms
March 22, 1989	Barrio Latino Commission
April 10, 1989	Hillsborough County Planning Commission
April 12, 1989	Downtown Partnership Transportation Committee
April 18, 1989	Hillsborough County Commissioners
April 27, 1989	Westshore Alliance
April 27, 1989	Three Oaks Realty
May 3, 1989	Hillsborough County Board of Commissioners
May 18, 1989	Tampa City Council
July 31, 1989	Westshore Alliance

TAMPA INTERSTATE STUDY

MASTER PLAN REPORT
ATTACHED PLANS AND ILLUSTRATIONS



PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

JULY 1989

MASTER PLAN CONCEPT

SECTION A



PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
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GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

DESIGN SEGMENT 1A

I-275 from Howard Frankland Bridge to East of Himes Avenue (Westshore Area)

- 4 Roadway System - Interstate Express Lanes and Separated Local Access Freeway Lanes
- High Occupancy Vehicle (HOV)/Transitway Lanes within the interstate alignment beginning at the Howard Frankland Bridge
- HOV priority ramps to and from east on Interstate 275 at Trask Street
- Direct Interstate 275 connection to the Northwest Expressway
- 62.5:1 FAA Flight Path Clearance for Tampa International Airport
- Existing interchange locations at Westshore Boulevard, Lois Avenue, and Dale Mabry Highway remain.
- New interchange providing ramps to and from east on Interstate 275 at Himes Avenue
- New Sherrill Street extension through Interstate 275
- New Lemon Street Connector to Westshore Boulevard

SHEET NO.	SHEET DESCRIPTION
	DESIGN STUDY SEGMENT 1A DIVIDER SHEET
	DESIGN STUDY SEGMENT 1A INDEX SHEET
A-1	DESIGN STUDY SEGMENT 1A KEY MAP
A-2	NORTHWEST EXPRESSWAY CROSS SECTION AT CYPRESS STREET
A-3	I-275 CROSS SECTION AT TRASK STREET
A-4	I-275 CROSS SECTION AT MARIE AVENUE
A-5	I-275 HOWARD FRANKLAND BRIDGE EAST APPROACH
A-6	I-275 AT KENNEDY BOULEVARD
A-7	I-275/NORTHWEST EXPRESSWAY INTERCHANGE
A-8	NORTHWEST EXPRESSWAY AT CYPRESS STREET
A-9	I-275 AT WARD STREET
A-10	I-275 AT WESTSHORE BOULEVARD
A-11	I-275 AT LOIS AVENUE
A-12	I-275 AT DALE MABRY HIGHWAY

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
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GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
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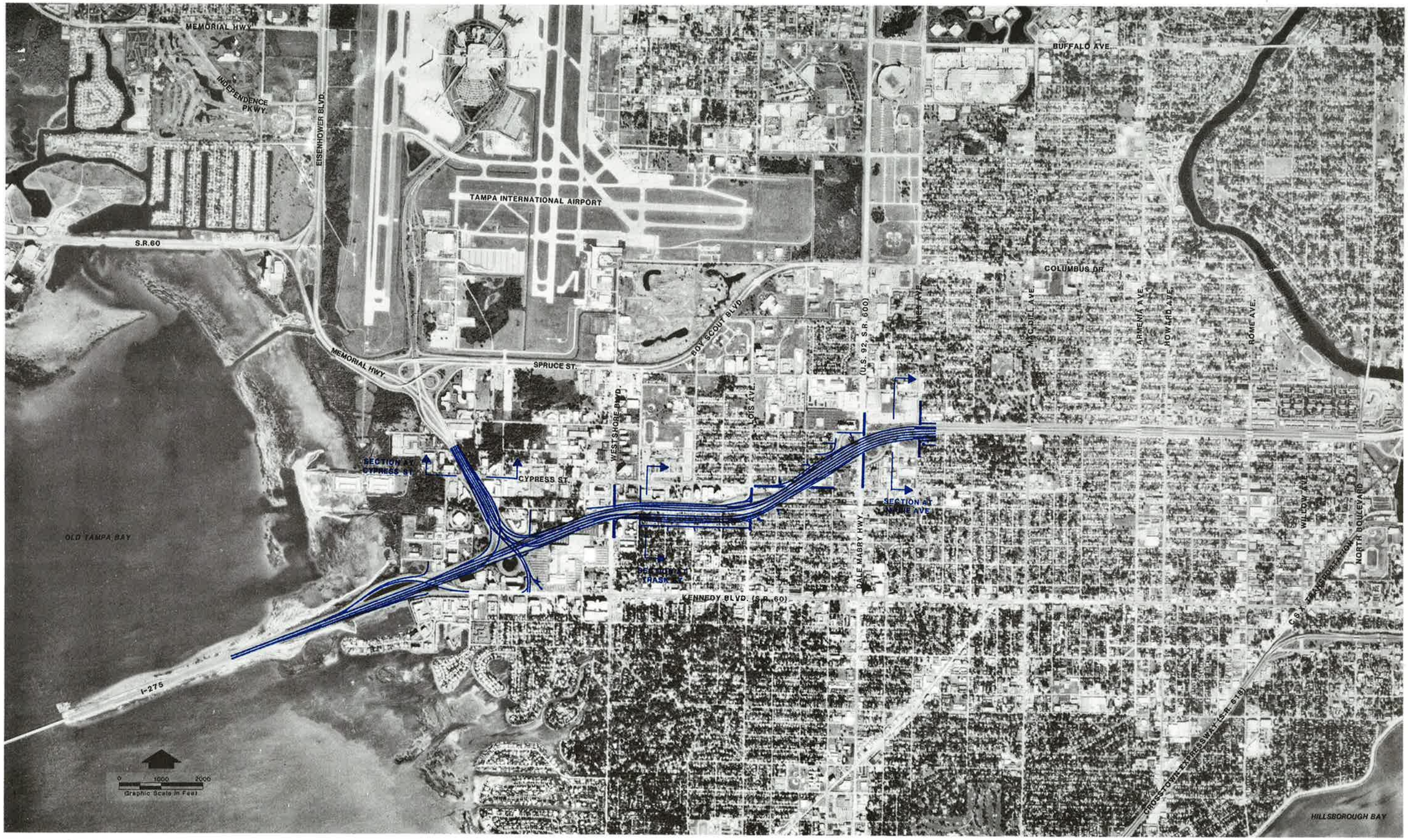
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
INDEX SHEET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

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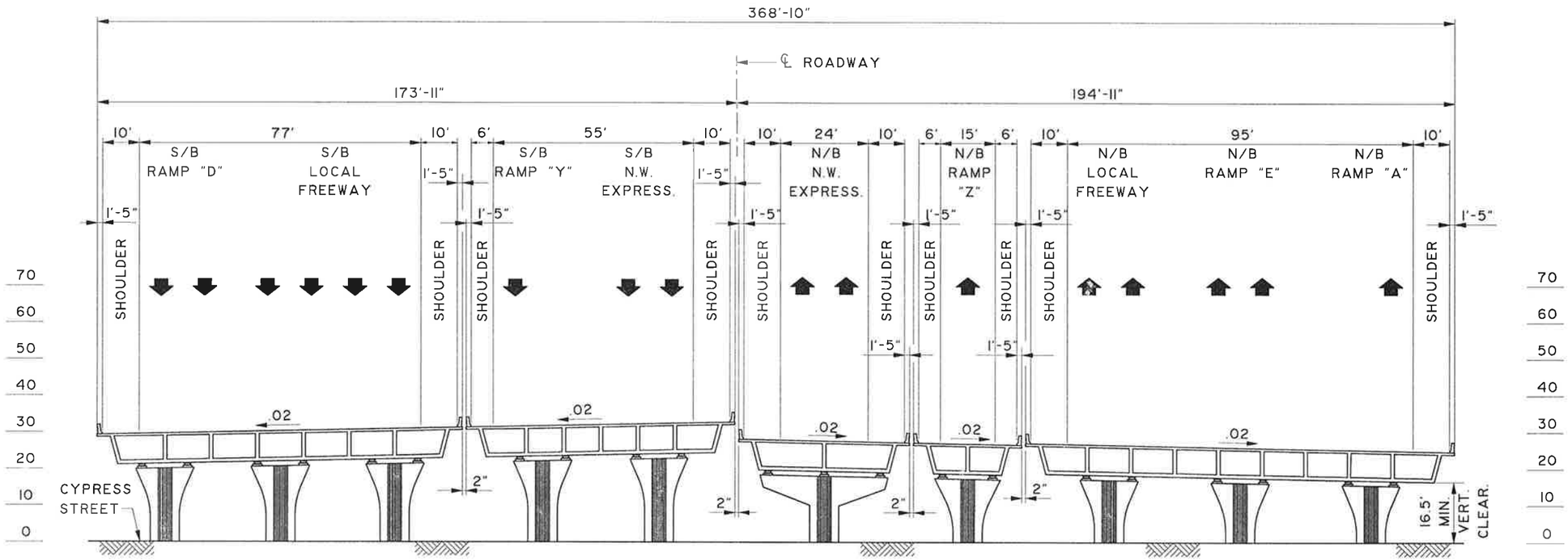
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-1 OF 135



STATION 234+50

PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

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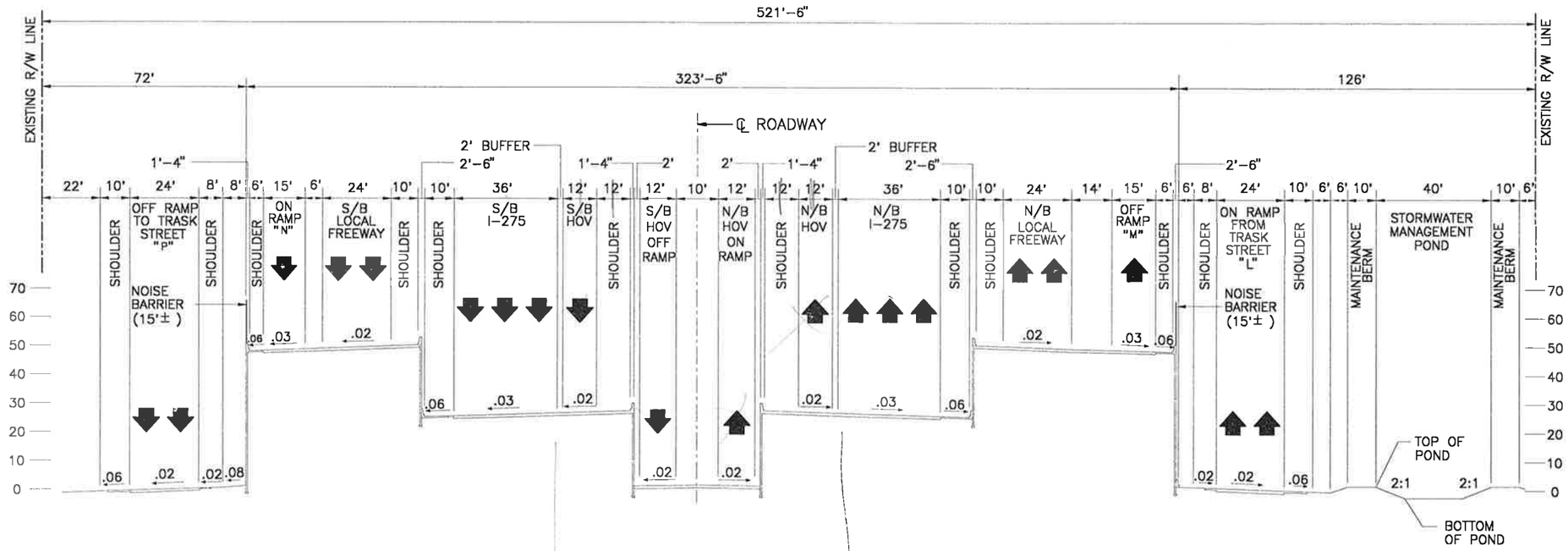
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
NORTHWEST EXPRESSWAY CROSS SECTION
AT CYPRESS ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-2 OF 135



STA. 190+00

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

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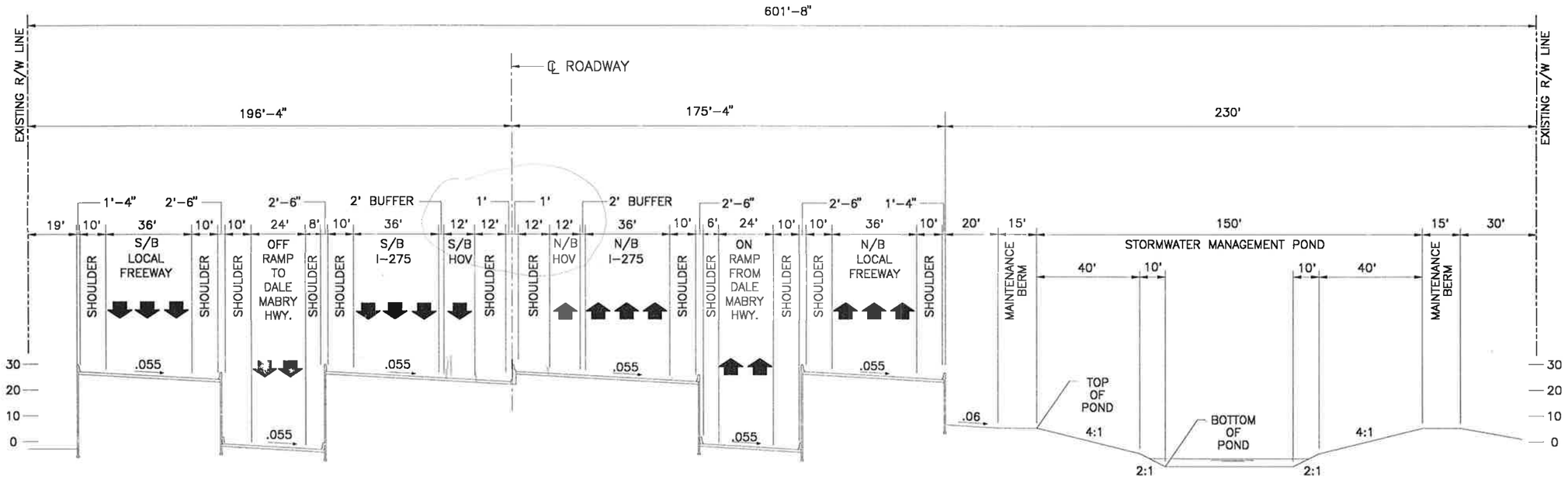
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
I-275 CROSS SECTION AT
TRASK ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-3 OF 135



STATION 249+00

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

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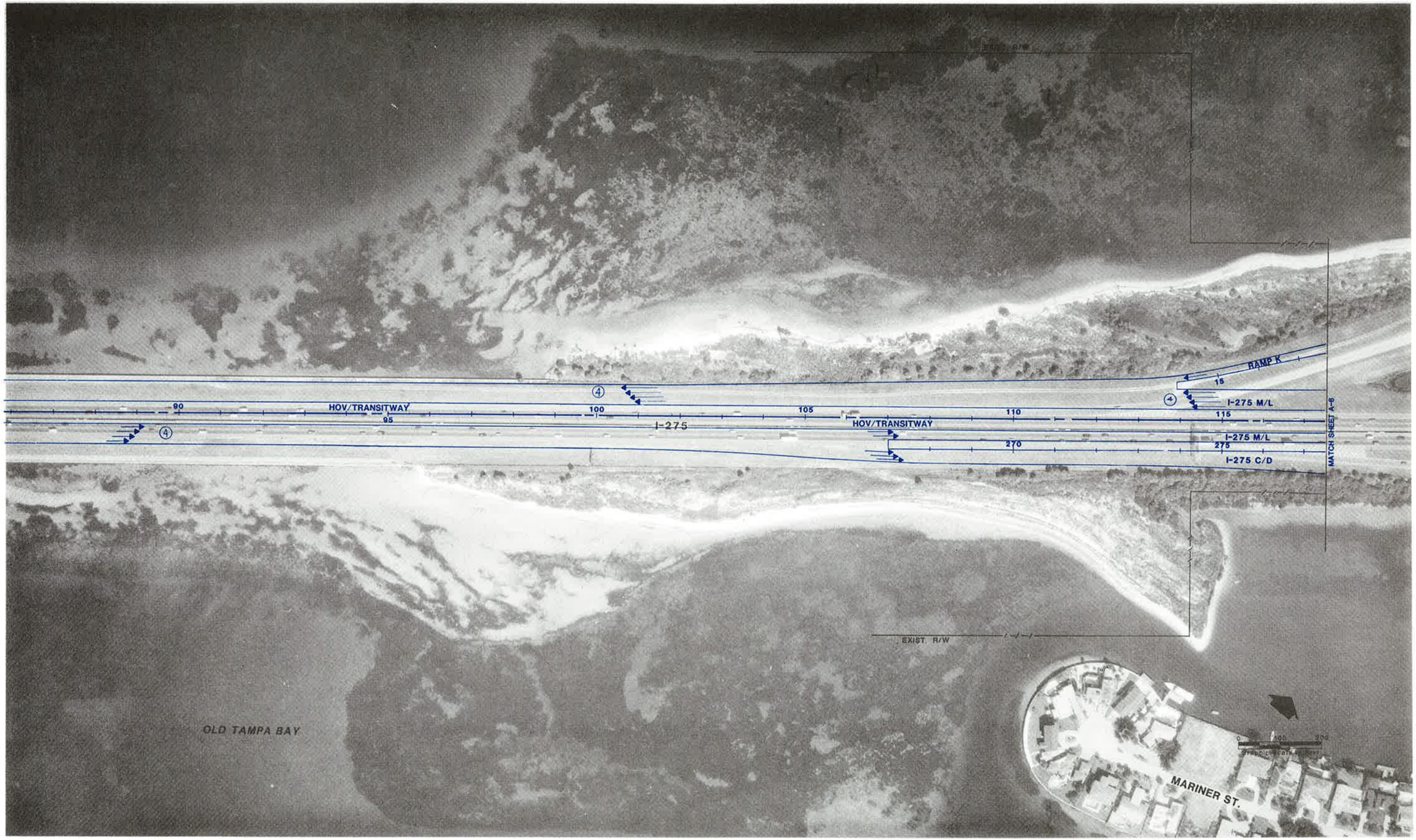
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
I-275 CROSS SECTION AT
MARIE AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-4 OF 135

3-30
SYTIMA



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

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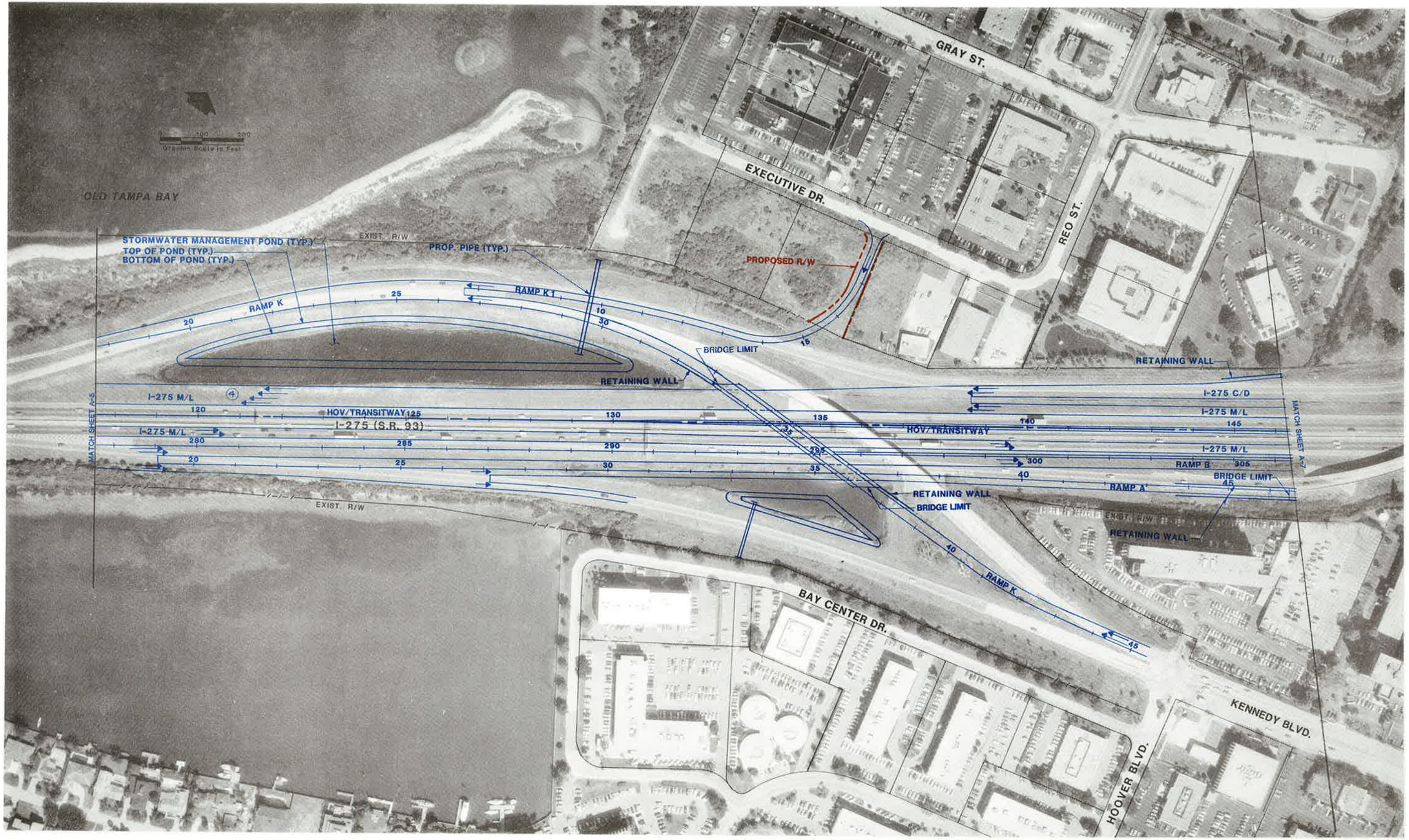
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
I-275 AT HOWARD FRANKLAND BRIDGE EAST APPROACH

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-5 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
9-26-89	DRAFT MASTER PLAN CONCEPT
0-89	FINAL MASTER PLAN CONCEPT

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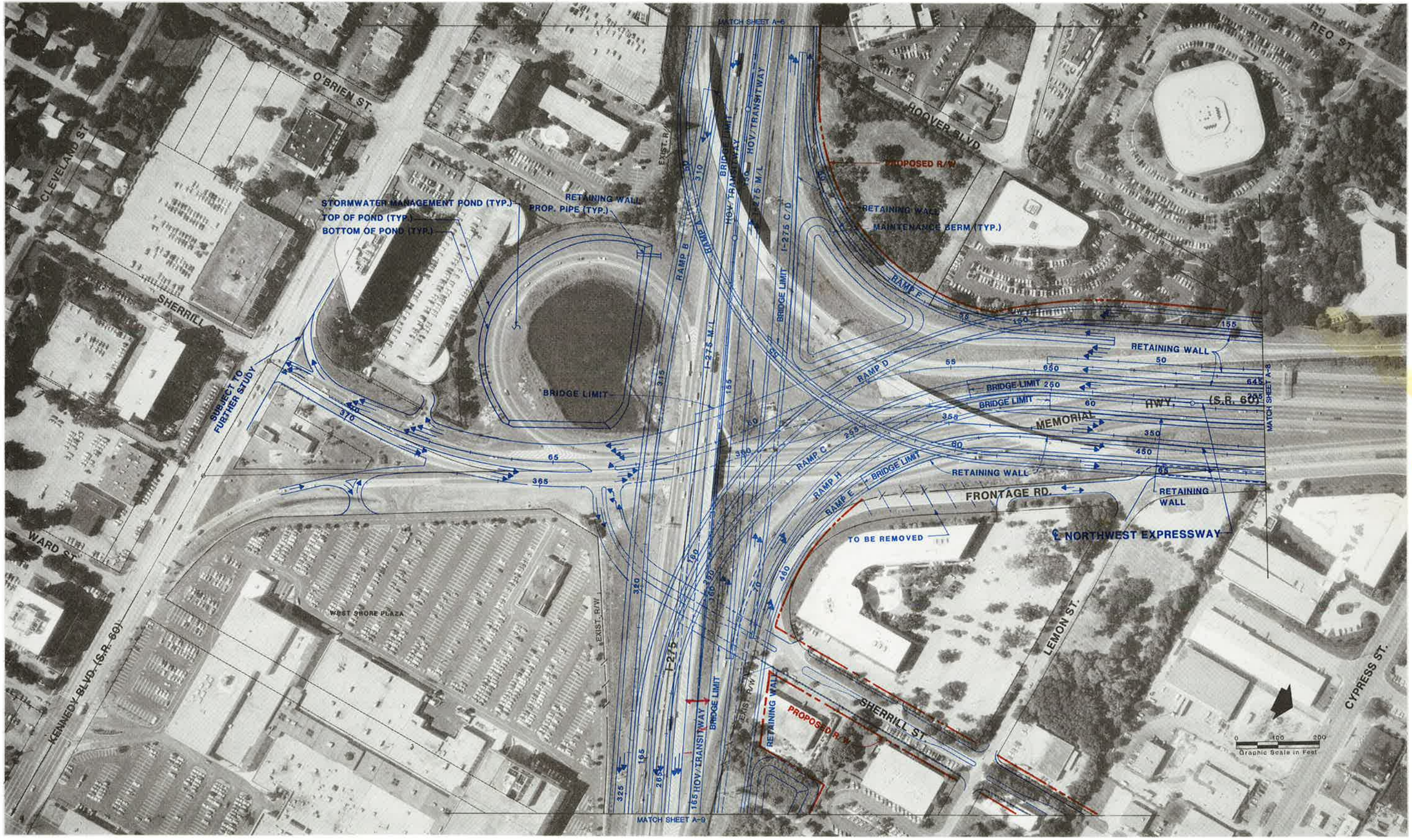
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 1A
I-275 AT KENNEDY BLVD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-6 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

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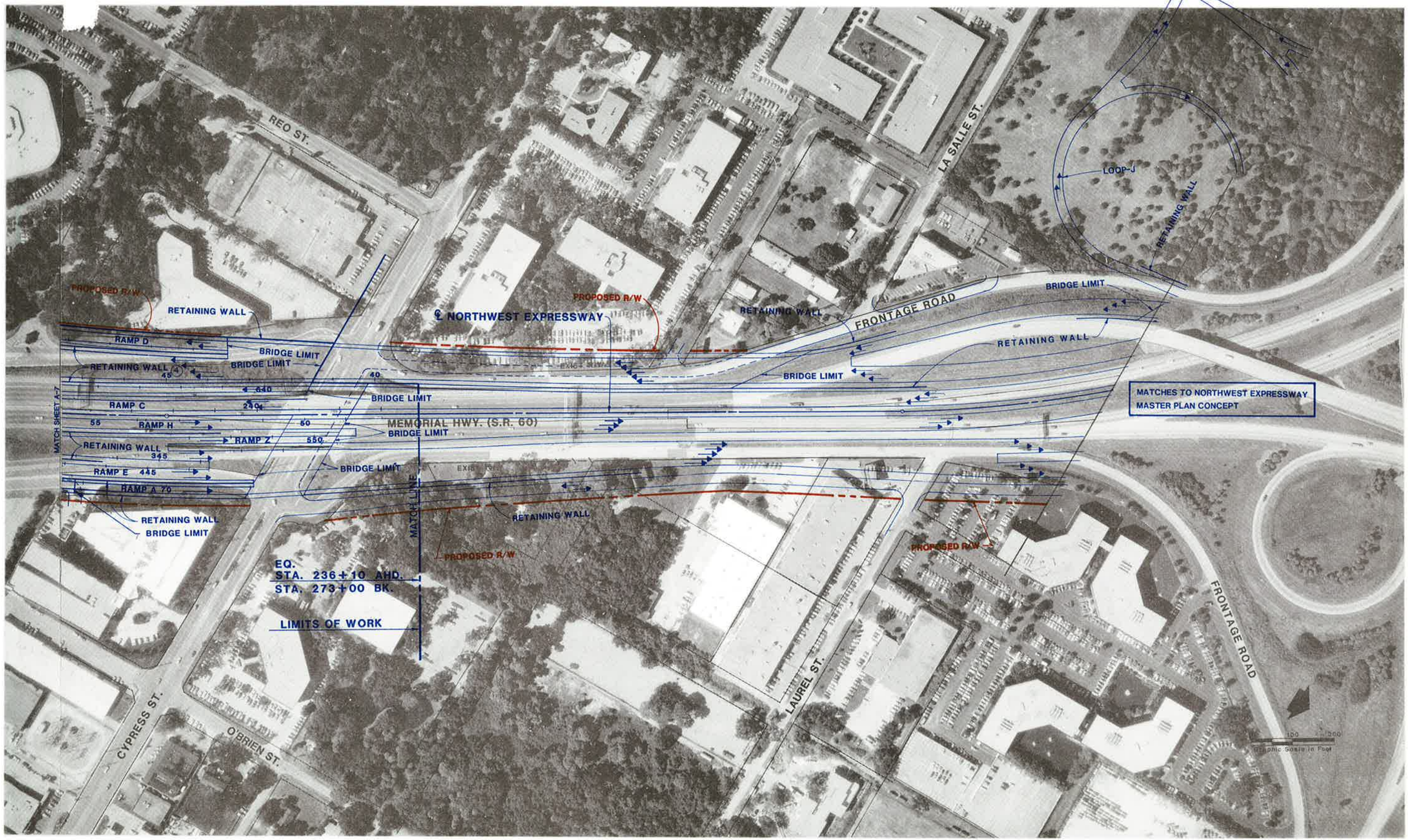
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 1A
I-275 AT NORTHWEST EXPRESSWAY INTERCHANGE

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-7 OF 135



PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-28-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

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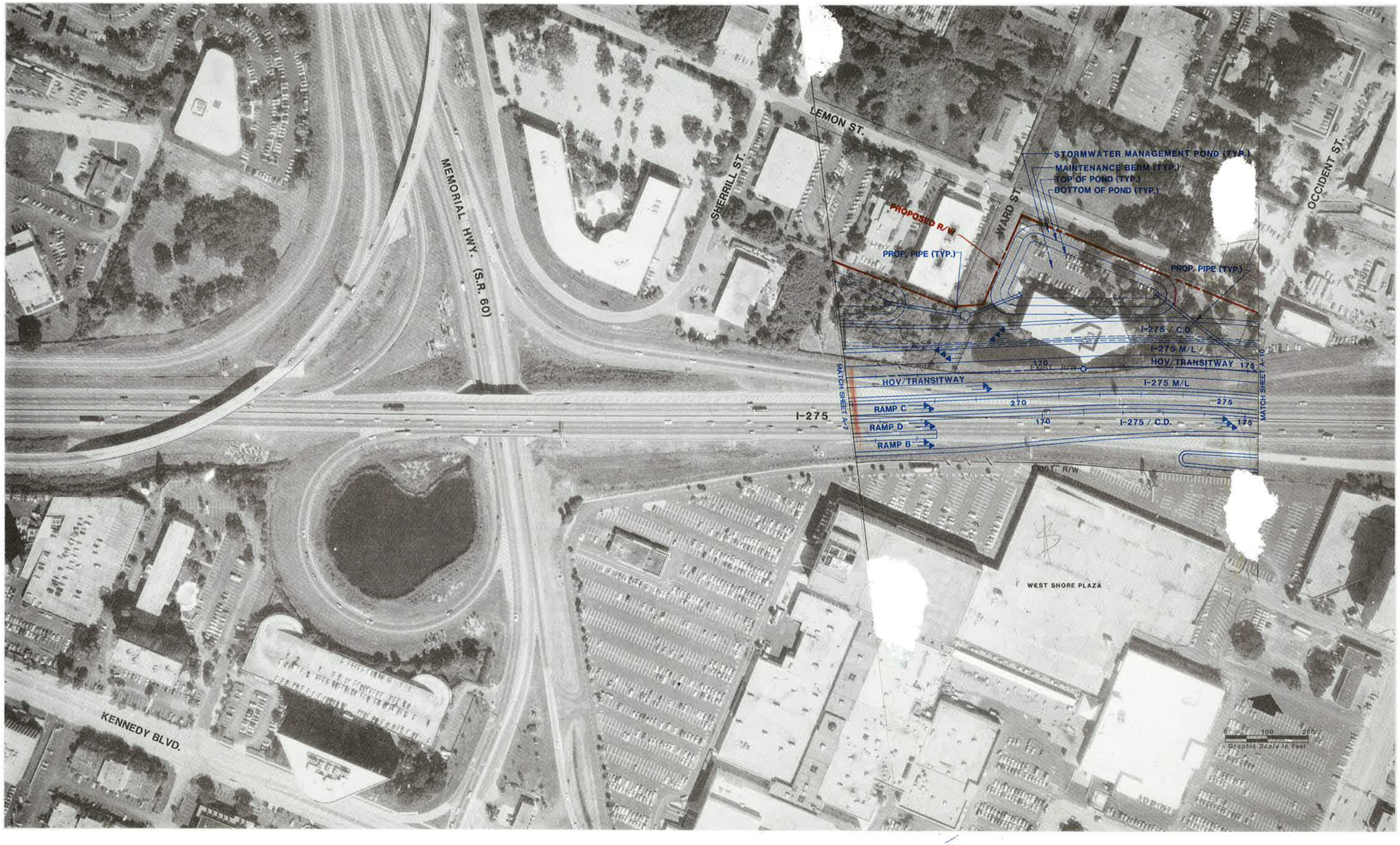
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
NORTHWEST EXPRESSWAY AT CYPRESS ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-8 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-86	DRAFT MASTER PLAN CONCEPT
6-86	FINAL MASTER PLAN CONCEPT

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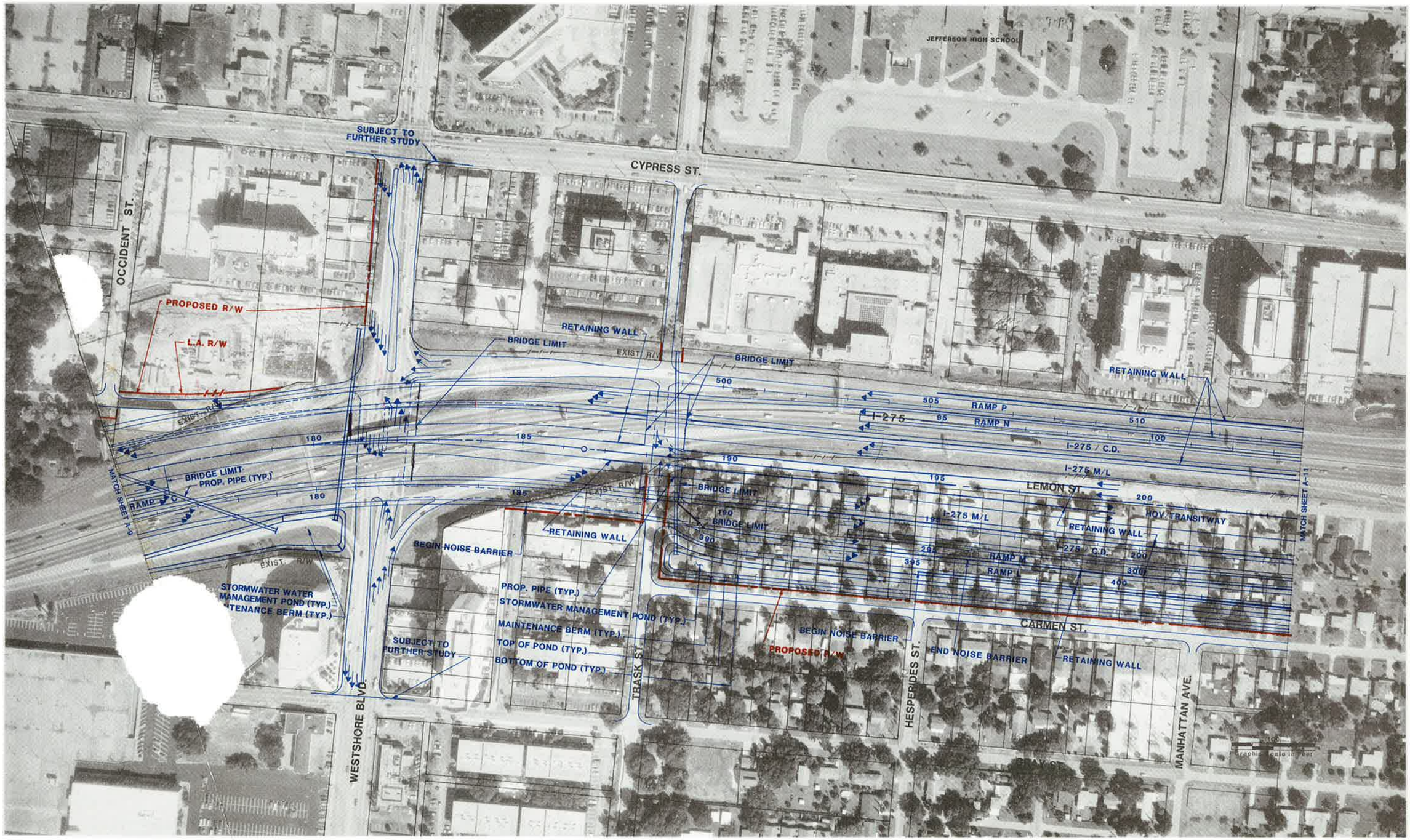
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
I-275 AT WARD ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-9 OF 135



PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

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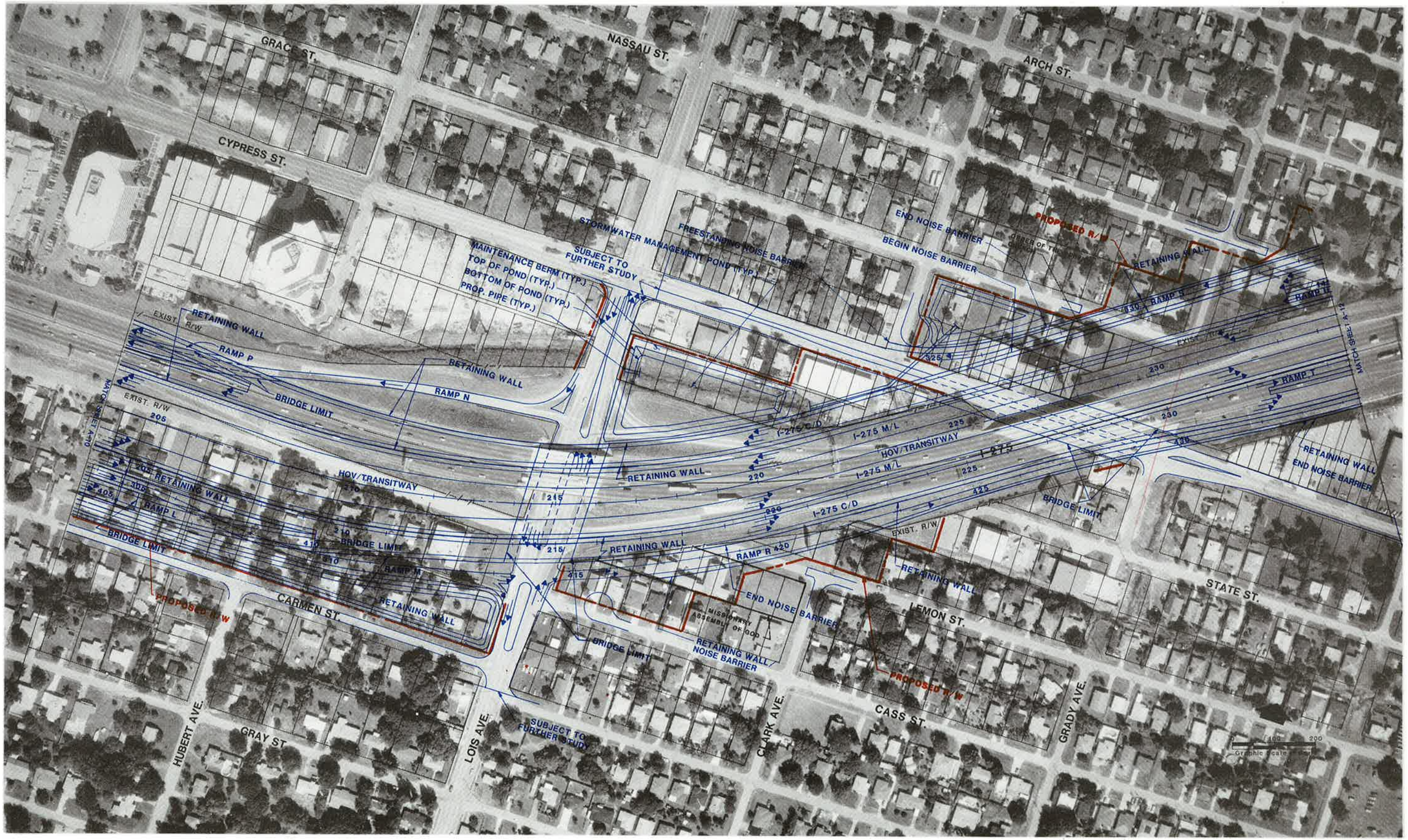
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
I-275 AT WESTSHORE BLVD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-10 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

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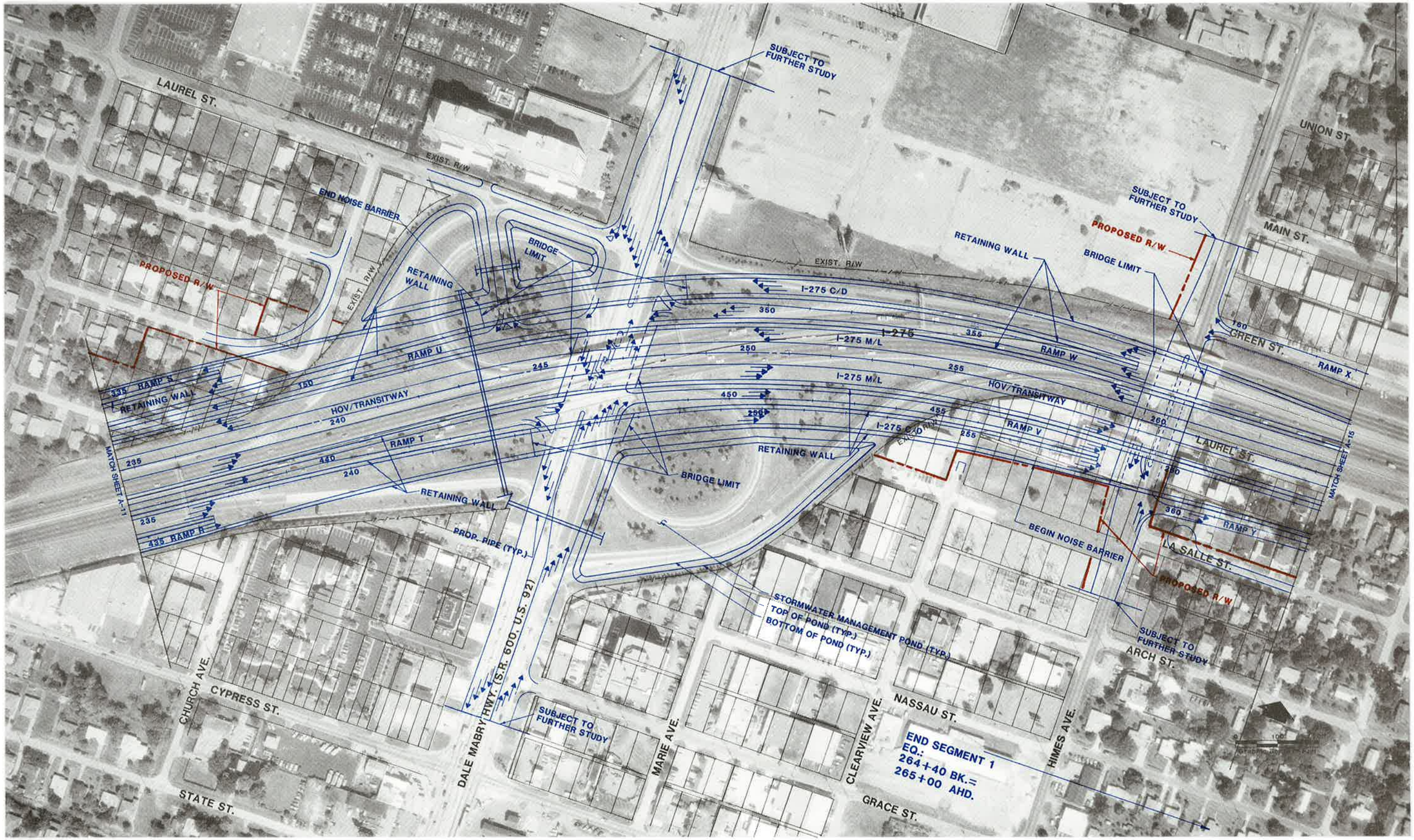
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
I-275 AT LOIS AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-11 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
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MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 1A
I-275 AT DALE MABRY HWY.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-12 OF 135

DESIGN SEGMENT 2A

I-275 from East of Himes Avenue to East of Rome Avenue (West Tampa Area)

- 4 Roadway System - Interstate Express Lanes and Separated Local Access Freeway Lanes
- Alignment shifted south to avoid McFarland Park
- High Occupancy Vehicle (HOV)/Transitway Lanes within the interstate alignment
- Split interchange ramps at Howard Avenue and Armenia Avenue remain
- New interchange ramps at Himes Avenue to and from the east on Interstate 275
- Maintain northside frontage road between Himes Avenue and Rome Avenue

SHEET NO.	SHEET DESCRIPTION
	DESIGN STUDY SEGMENT 2A DIVIDER SHEET
	DESIGN STUDY SEGMENT 2A INDEX SHEET
A-13	DESIGN STUDY SEGMENT 2A KEY MAP
A-14	I-275 CROSS SECTION AT HABANA AVENUE
A-15	I-275 AT MAC DILL AVENUE
A-16	I-275 AT ARMENIA AVENUE
A-17	I-275 AT ROME AVENUE

OLD TAMPA BAY
HILLSBOROUGH BAY
McKAY BAY
DAVIS ISLAND
TAMPA
TEMPLE TERRACE
2A
A-15
A-16
A-17
NORTHWEST EXPWY.
CONNECTION TO SUNCOAST CORRIDOR
EISENHOWER BLVD.
WESTSHORE BLVD.
LOIS AVE.
GANDY CONNECTOR
DALE MABRY HWY.
GANDY BLVD.
HIMES AVE.
MacDILL AVE.
ARMENIA AVE.
HOWARD AVE
NORTH BLVD.
CROSSTOWN EXP. (TOLL)
JOHN F. KENNEDY BLVD.
CYPRESS ST.
SPRUCE ST.
BOY SCOUT BLVD.
TAMPA INTERNATIONAL AIRPORT
WATERS AVE.
GUNN HWY.
HILLSBOROUGH RIVER
TAMPA ST.
FLORIDA AVE.
NEBRASKA AVE.
YUKON ST.
109th AVE.
127th AVE.
APRIL LANE
BEARSS AVE.
NORTH TAMPA PKWY.
14 ST.
FLORIBRASKA AVE.
7th AVE.
21st ST.
22nd ST.
30th ST.
BUFFALO AVE.
HILLSBOROUGH AVE.
SLIGH AVE.
BIRD ST.
BUSCH BLVD.
LINEBAUGH
SKIPPER RD.
SINCLAIR HILLS RD.
LIVINGSTON AVE.
COUNTY
COUNTY
HILLSBOROUGH
PASCO
CYPRESS CREEK
40th ST.
CROSSTOWN CONNECTOR
50th ST.
56th ST.
COLUMBUS DR.
ORIENT RD.
TAMPA BYPASS CANAL
SLIGH AVE.
FAULKENBURG RD.
WILLIAMS RD.
FOWLER AVE.
FLETCHER AVE.
BRUCE B. DOWNS BLVD.
COUNTY LINE ROAD
NEW S.R. 54
MORRIS BRIDGE RD.
SCALE IN MILES
0 1 2

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM
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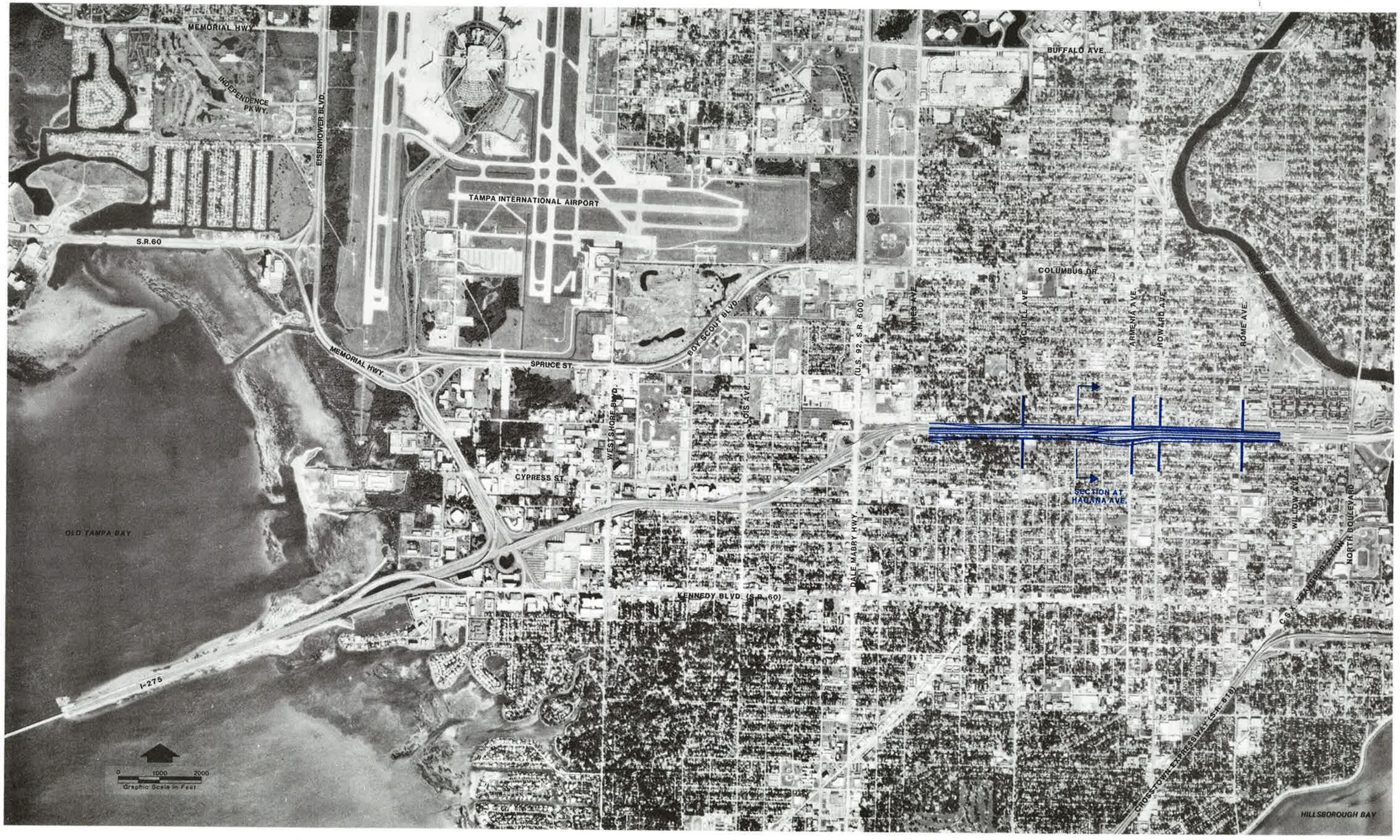
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2A
INDEX SHEET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402



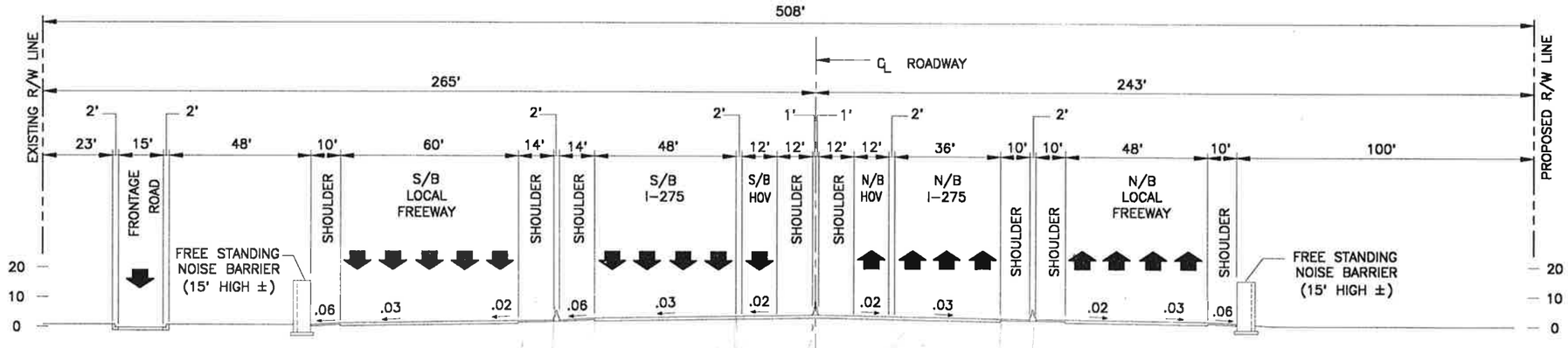
PROJECT No. C1104				
PROJECT DATES				
DATES	DESCRIPTION			
3-26-89	DRAFT MASTER PLAN CONCEPT			
6-89	FINAL MASTER PLAN CONCEPT			

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2A
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-13 OF 135



STATION 300+00

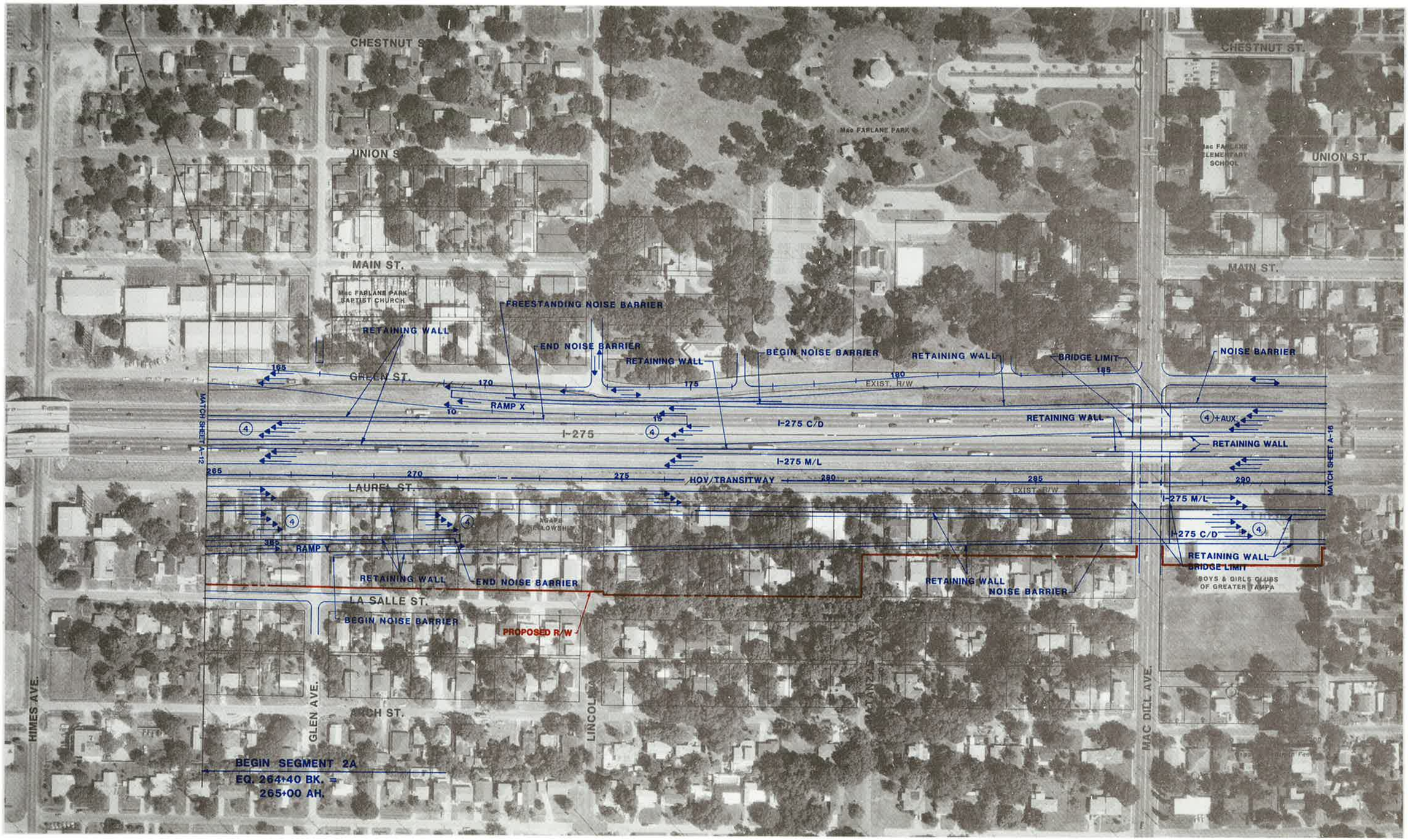
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2A
I-275 CROSS SECTION AT
HABANA AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-14 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

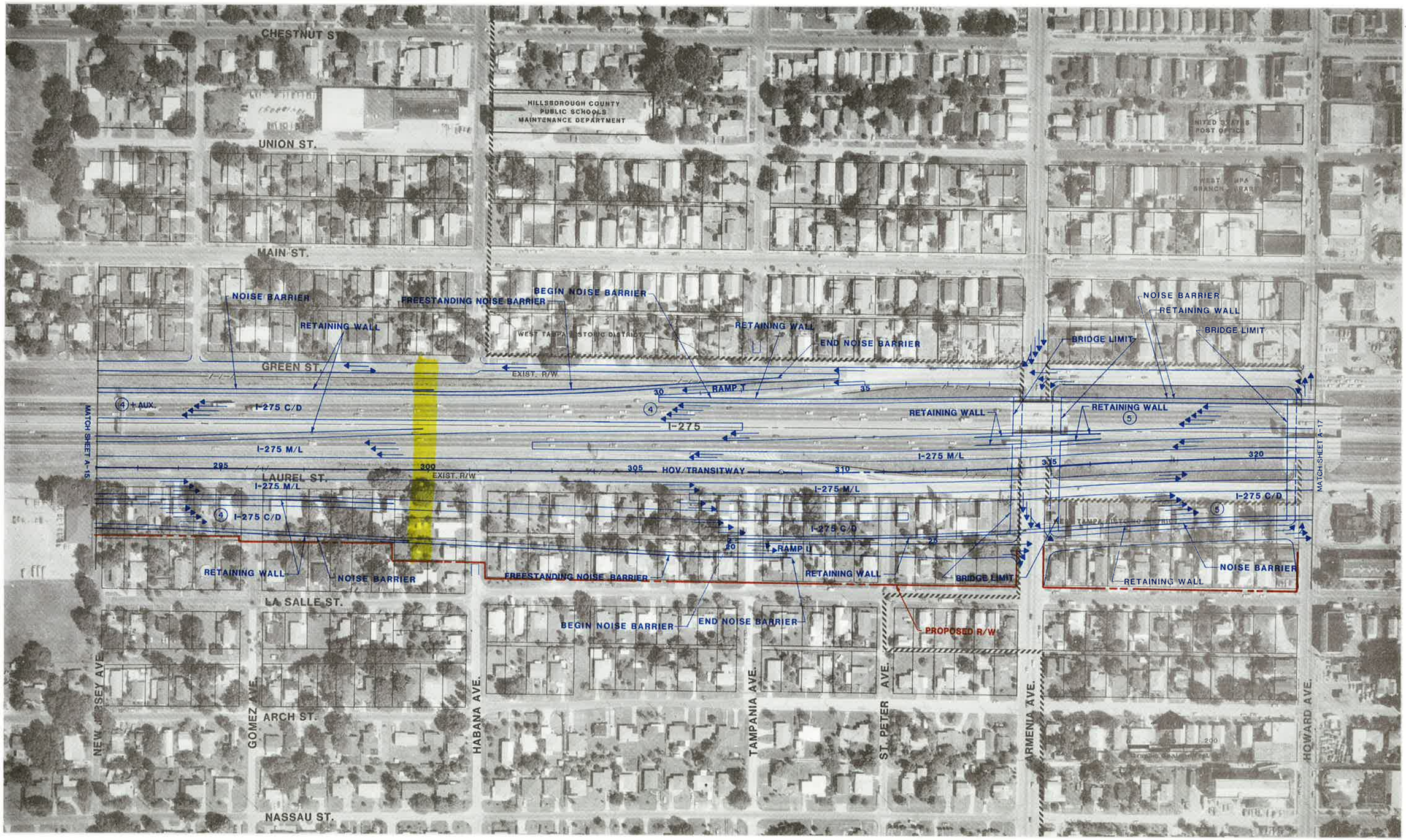
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 2A
I-275 AT MAC DILL AVE.

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-15 OF 135



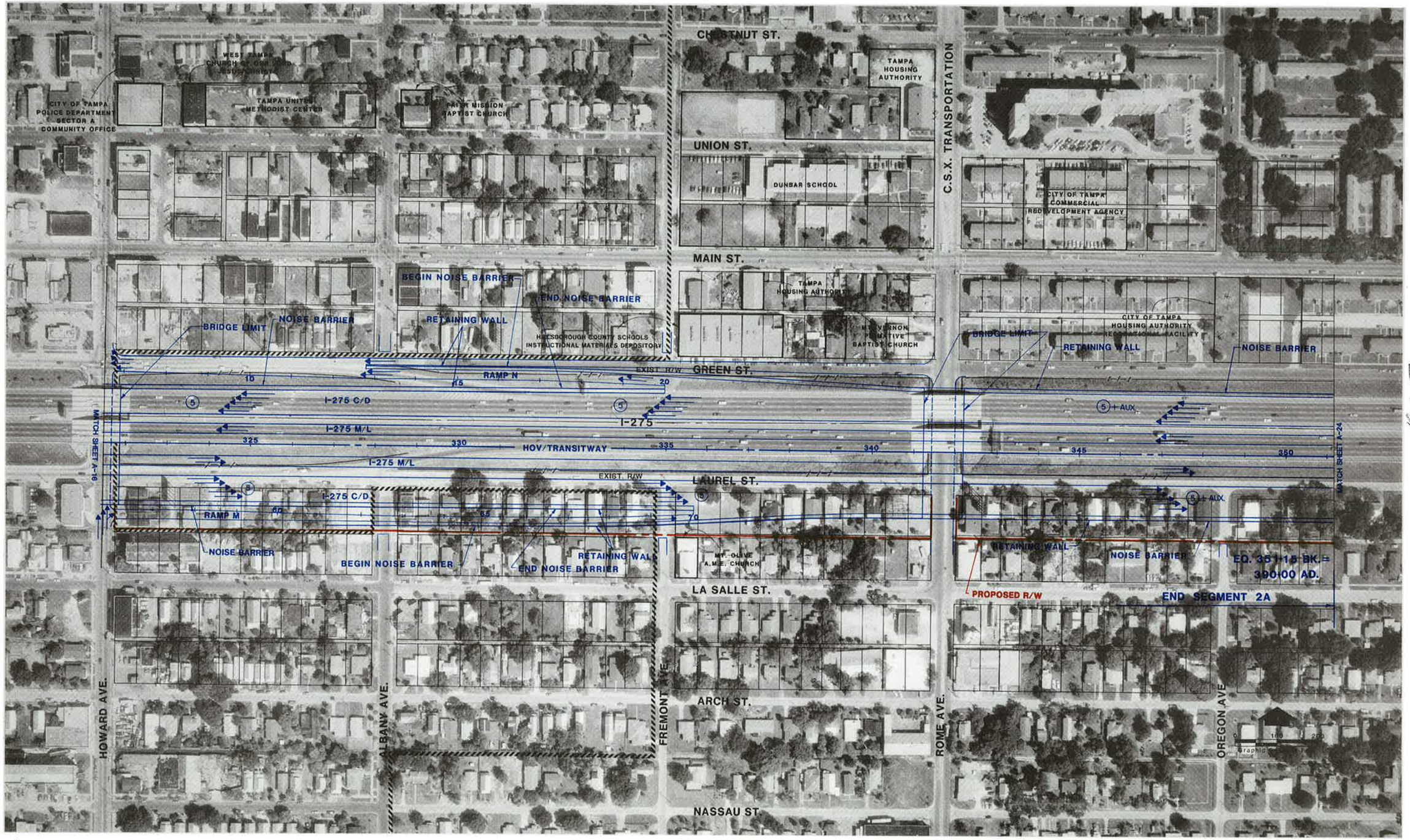
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2A
I-275 AT ARMENIA AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-16 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2A
I-275 AT ROME AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-17 OF 135

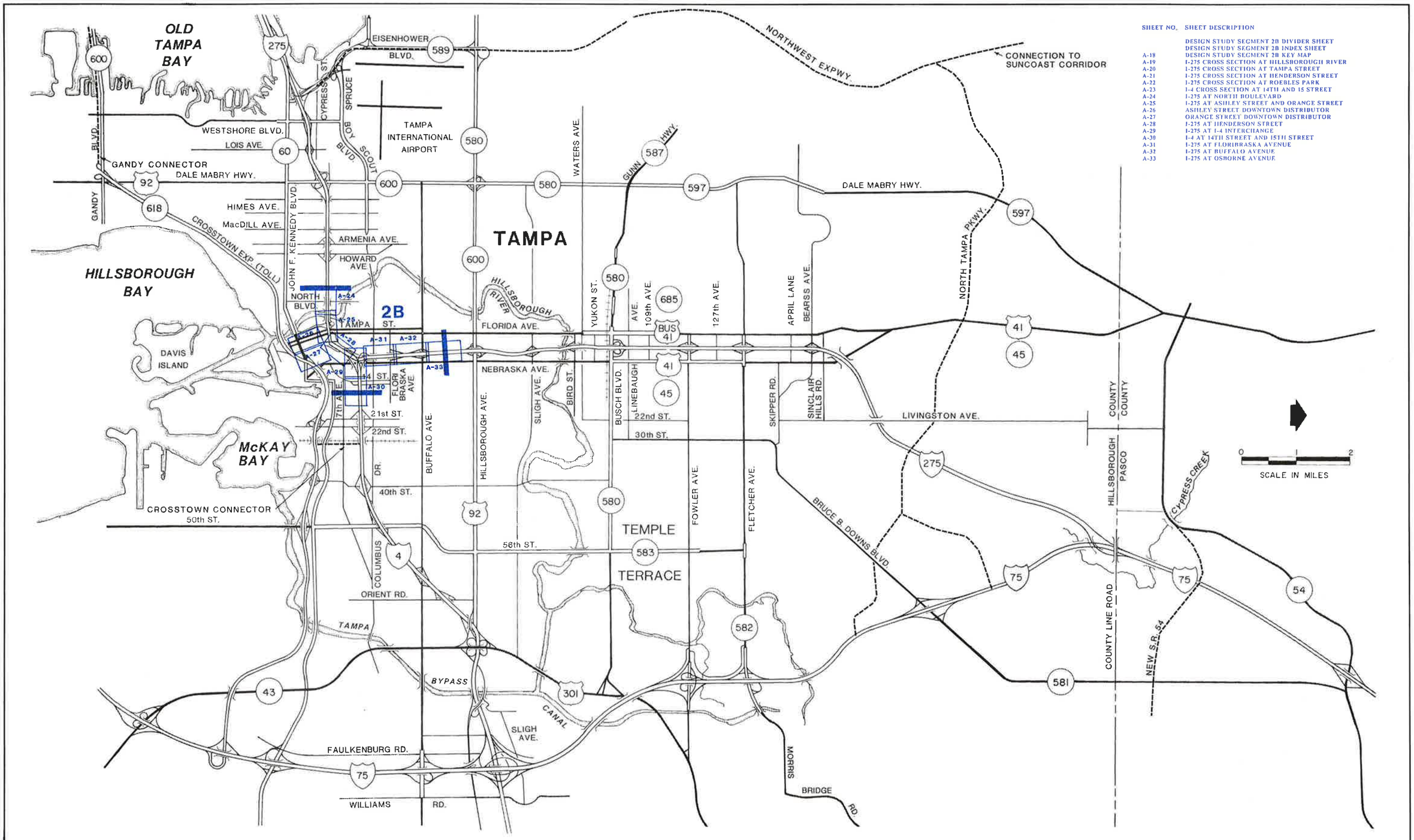
DESIGN SEGMENT 2B

I-275 from East of Rome Avenue to North of Buffalo Avenue

I-4 from the I-275 Junction to 14th Street

(Central Business District)

- 4 Roadway System transition to 2 Roadway System north of Buffalo Avenue on Interstate 275
- 4 Roadway System east of 14th Street on Interstate 4
- High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
- Westside Central Business District interchange at Ashley/Tampa Streets serving all movements
- Eastside Central Business District interchange at Jefferson/Orange Streets serving all movements
- New West Bank Central Business District interchange ramps to and from the west on Interstate 275 at North Boulevard
- New Ybor City/Eastside Central Business District interchange on Interstate 4 at 14th and 15th Streets
- Remove interchange ramps at Scott and Kay Streets to and from west on Interstate 275
- Relocate planned Marion Street Transit Parkway North Terminal to a location on Marion Street south of Scott Street



SHEET NO.	SHEET DESCRIPTION
	DESIGN STUDY SEGMENT 2B DIVIDER SHEET
	DESIGN STUDY SEGMENT 2B INDEX SHEET
A-18	DESIGN STUDY SEGMENT 2B KEY MAP
A-19	I-275 CROSS SECTION AT HILLSBOROUGH RIVER
A-20	I-275 CROSS SECTION AT TAMPA STREET
A-21	I-275 CROSS SECTION AT HENDERSON STREET
A-22	I-275 CROSS SECTION AT ROEBLES PARK
A-23	I-4 CROSS SECTION AT 14TH AND 15 STREET
A-24	I-275 AT NORTH BOULEVARD
A-25	I-275 AT ASHLEY STREET AND ORANGE STREET
A-26	ASHLEY STREET DOWNTOWN DISTRIBUTOR
A-27	ORANGE STREET DOWNTOWN DISTRIBUTOR
A-28	I-275 AT HENDERSON STREET
A-29	I-275 AT I-4 INTERCHANGE
A-30	I-4 AT 14TH STREET AND 15TH STREET
A-31	I-275 AT FLORIBRASKA AVENUE
A-32	I-275 AT BUFFALO AVENUE
A-33	I-275 AT OSBORNE AVENUE

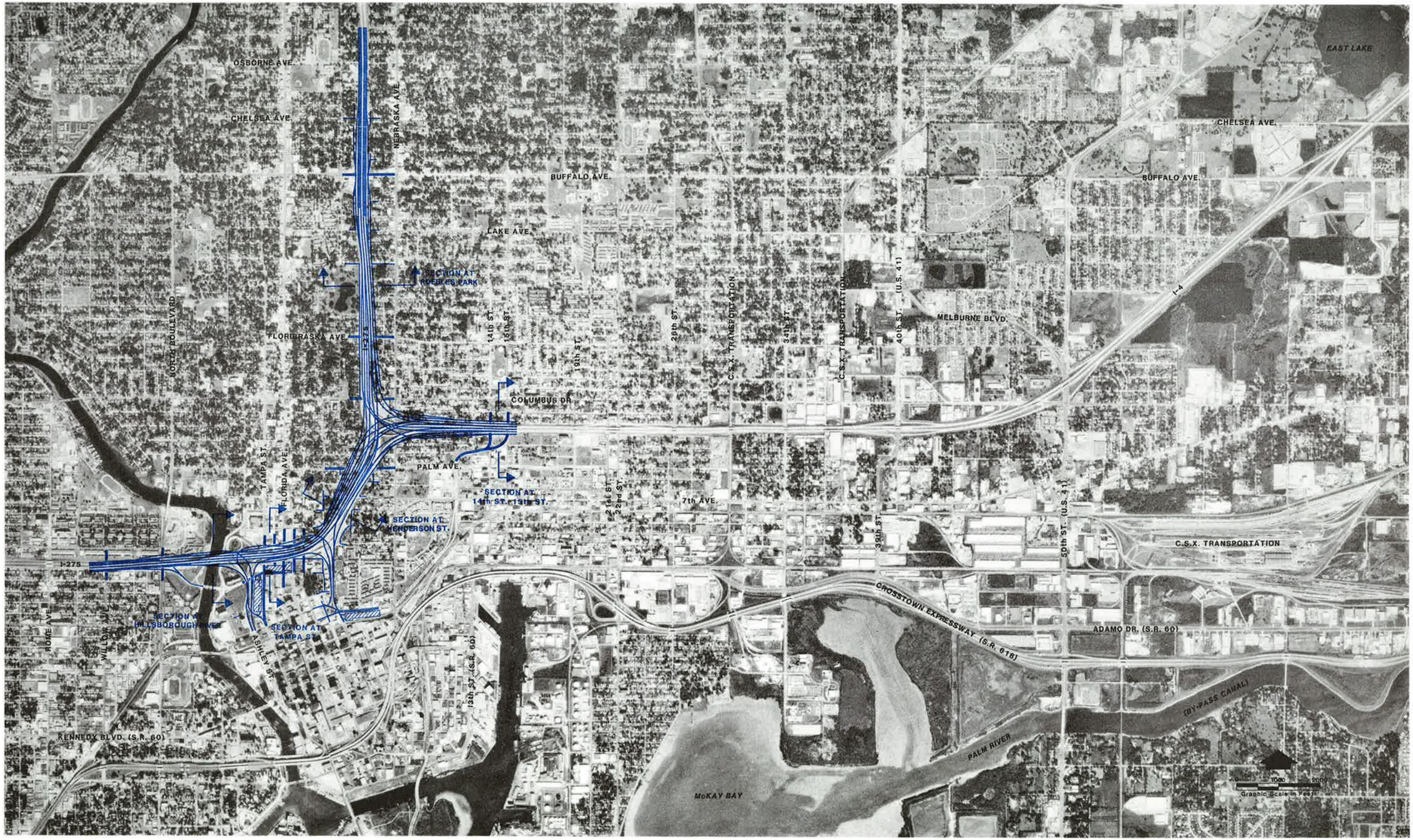
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
INDEX SHEET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

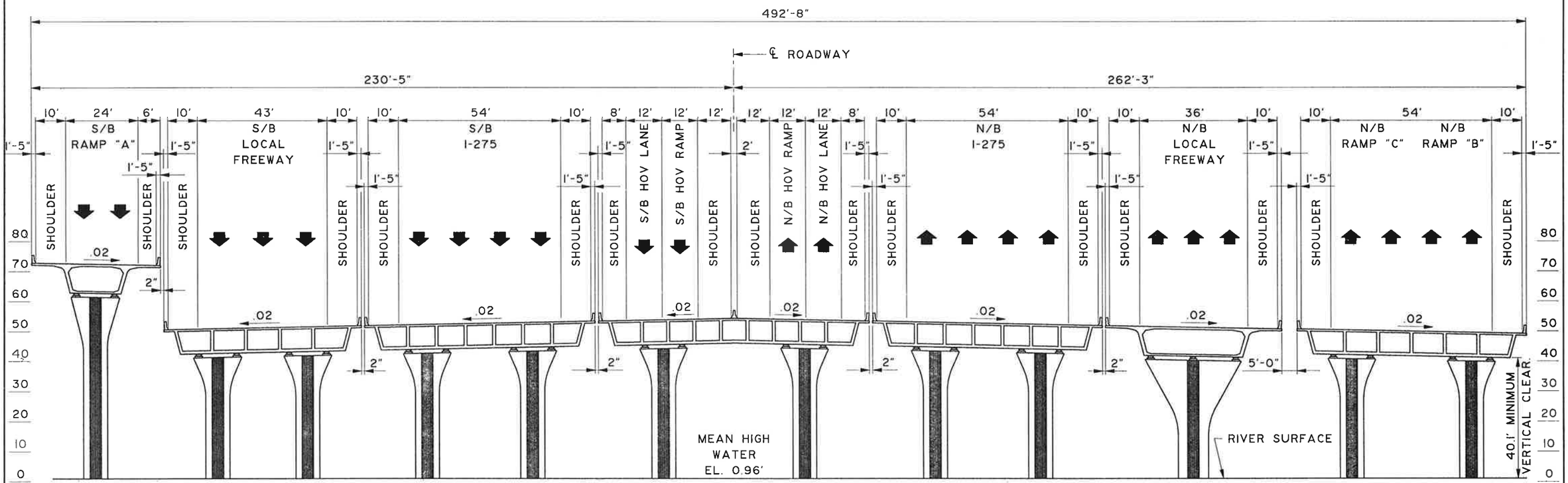
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 2B
KEY MAP

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-18 OF 135



STATION 421+00

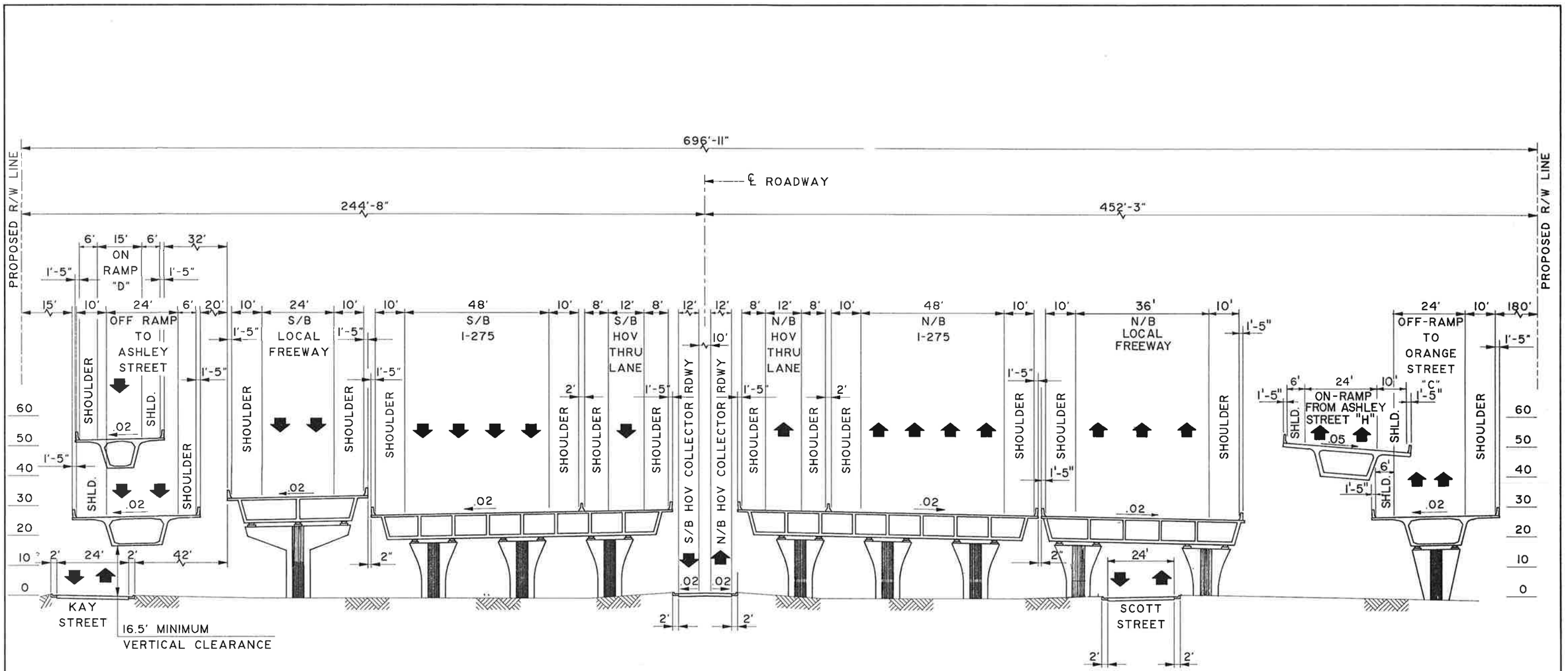
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-275 CROSS SECTION AT
HILLSBOROUGH RIVER

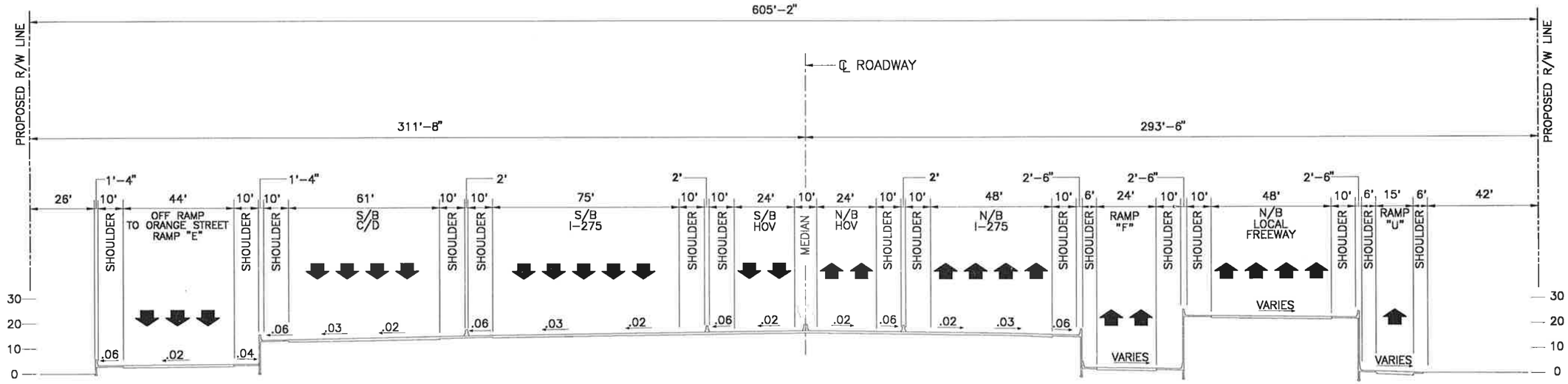
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-19 OF 135



STATION 432+00

PROJECT No. C1104				
PROJECT DATES		THE GREINER TEAM GREINER, INC. GANNETT FLEMING TRANSPORTATION ENGINEERS, INC. TEXAS TRANSPORTATION INSTITUTE KNIGHT APPRAISAL SERVICES	MASTER PLAN CONCEPT DESIGN STUDY SEGMENT 2B I-275 CROSS SECTION AT TAMPA ST.	TAMPA INTERSTATE STUDY FLORIDA DEPARTMENT OF TRANSPORTATION
DATES	DESCRIPTION			
3-26-89	DRAFT MASTER PLAN CONCEPT			STATE PROJECT No. 99007-1402 SHEET A-20 OF 135
6-89	FINAL MASTER PLAN CONCEPT			



STATION 454+00

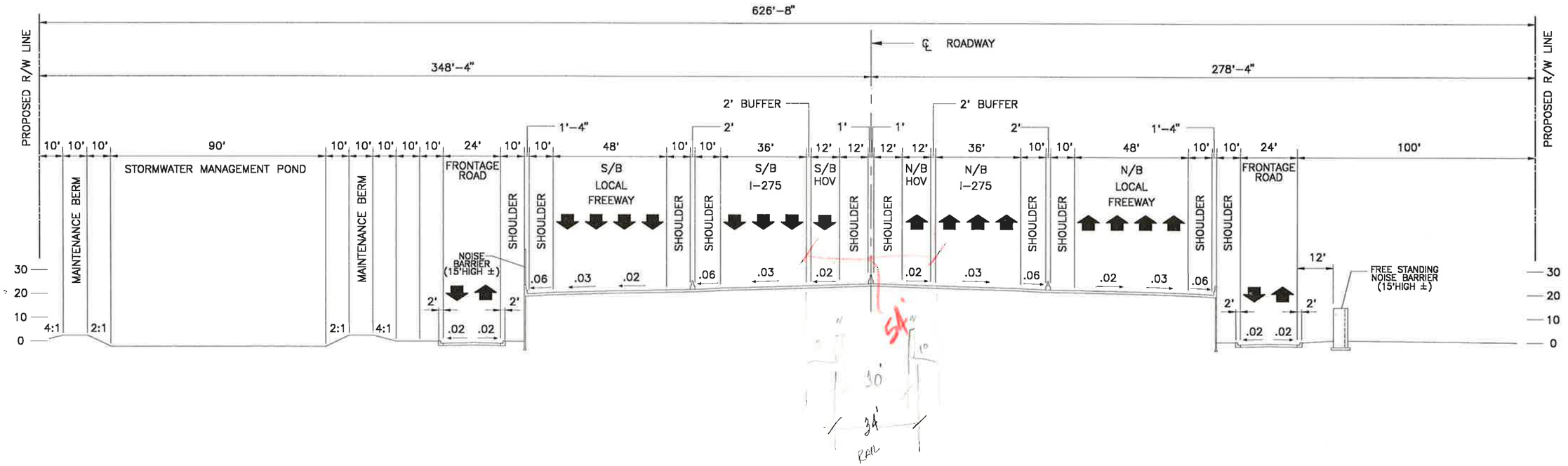
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-275 CROSS SECTION AT
HENDERSON ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-21 OF 135



STATION 737+00

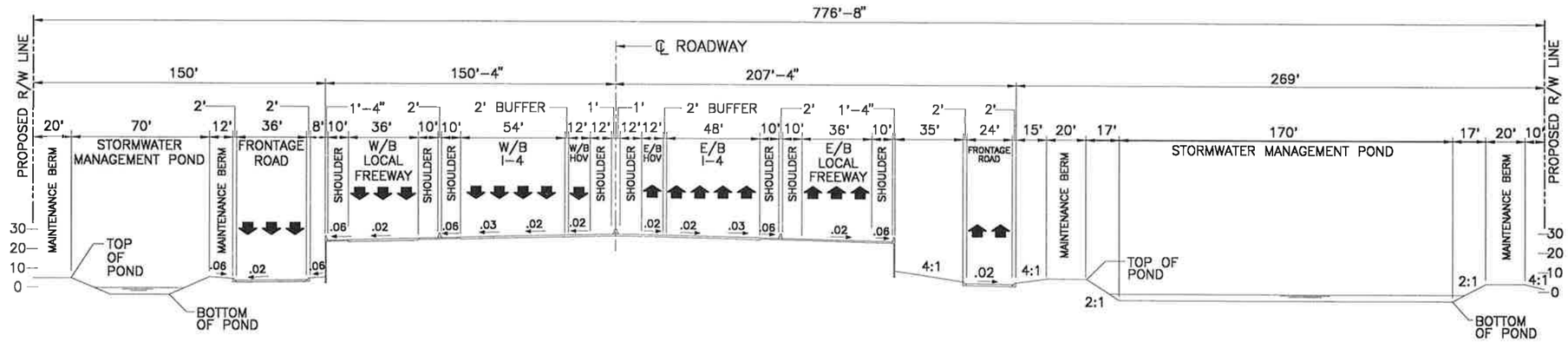
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-275 CROSS SECTION AT
ROEBLES PARK

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-22 OF 135

8-30
SYT12RP



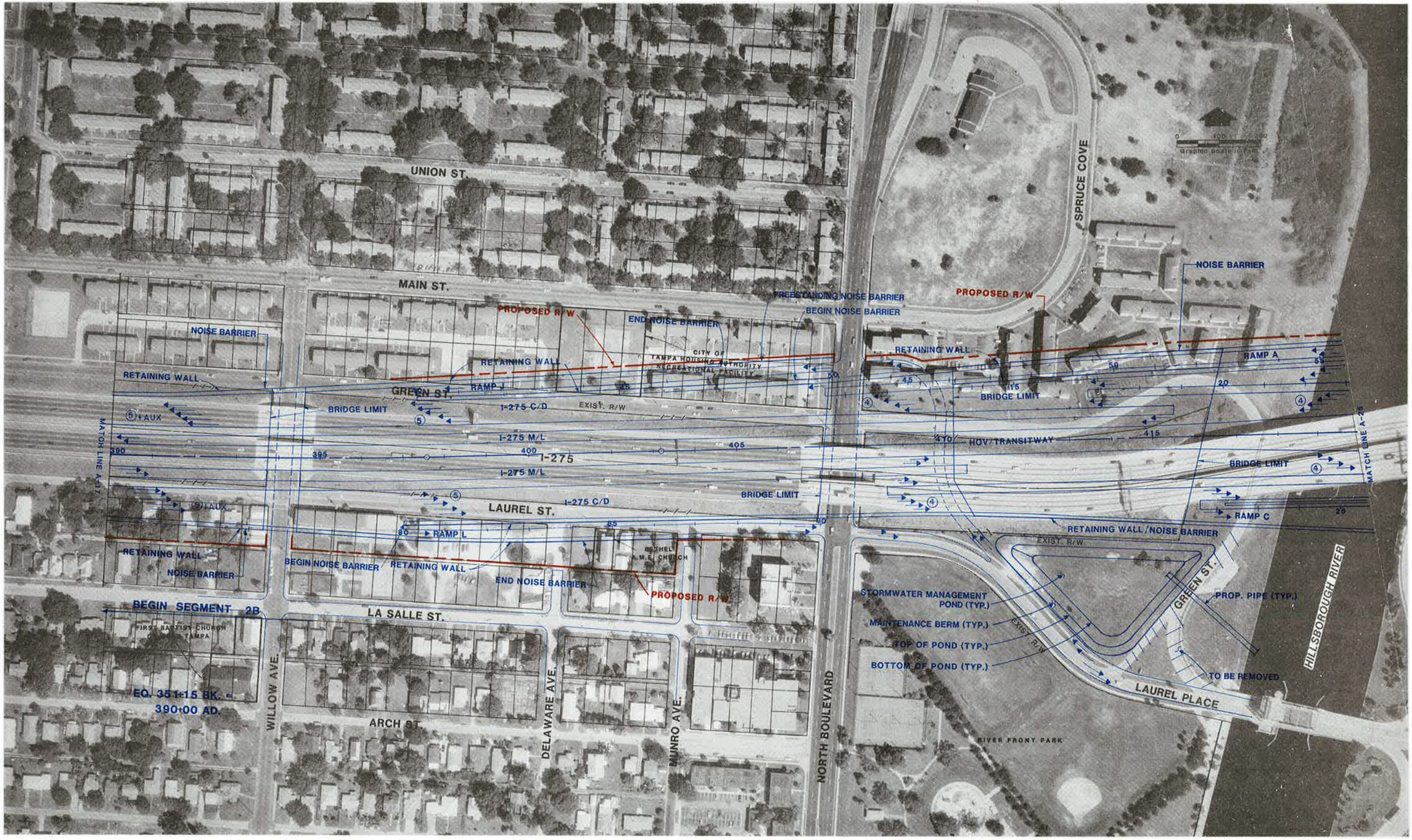
STATION 472+00

PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-4 CROSS SECTION AT
14TH ST. AND 15TH ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-23 OF 135



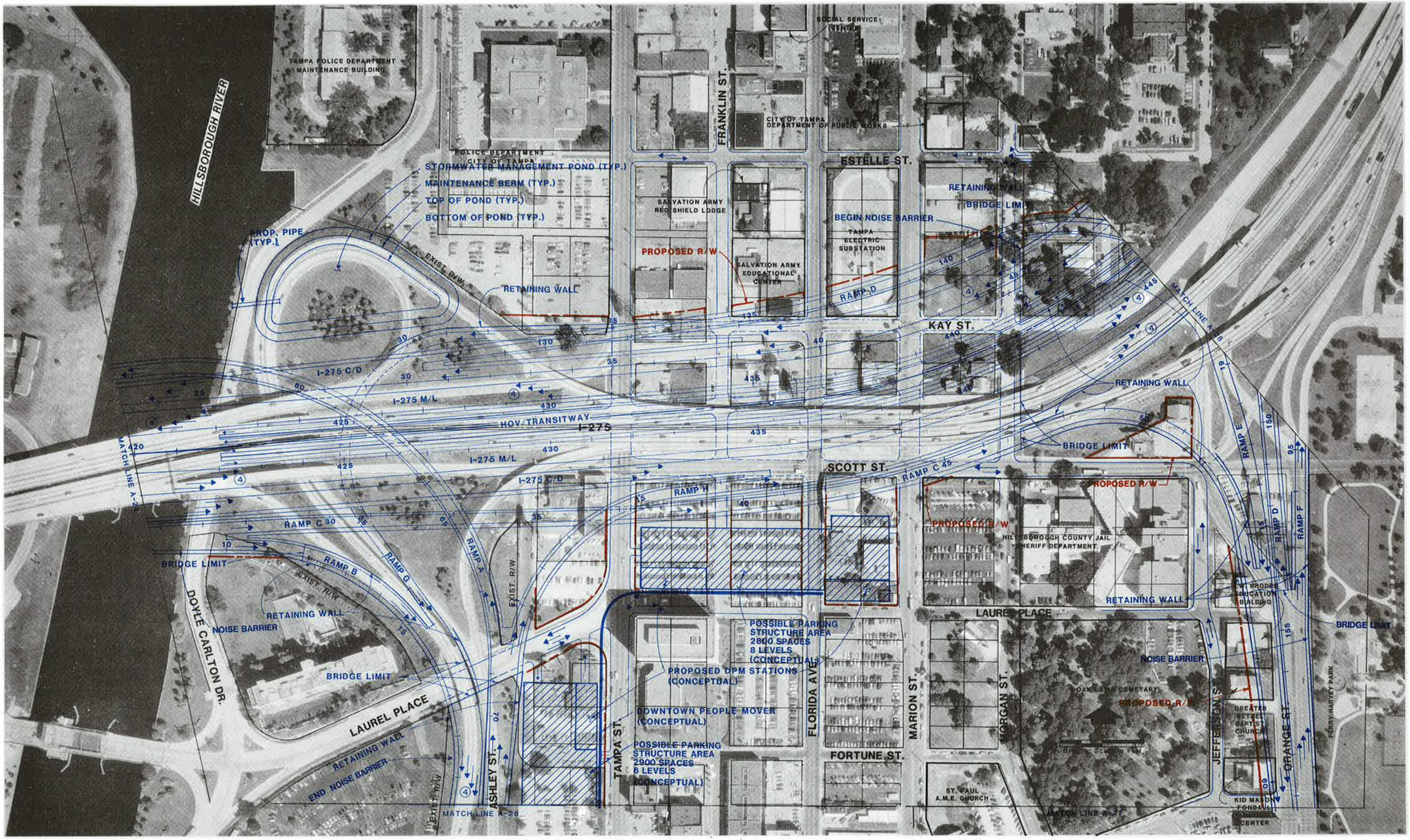
PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-275 AT NORTH BLVD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-24 OF 135



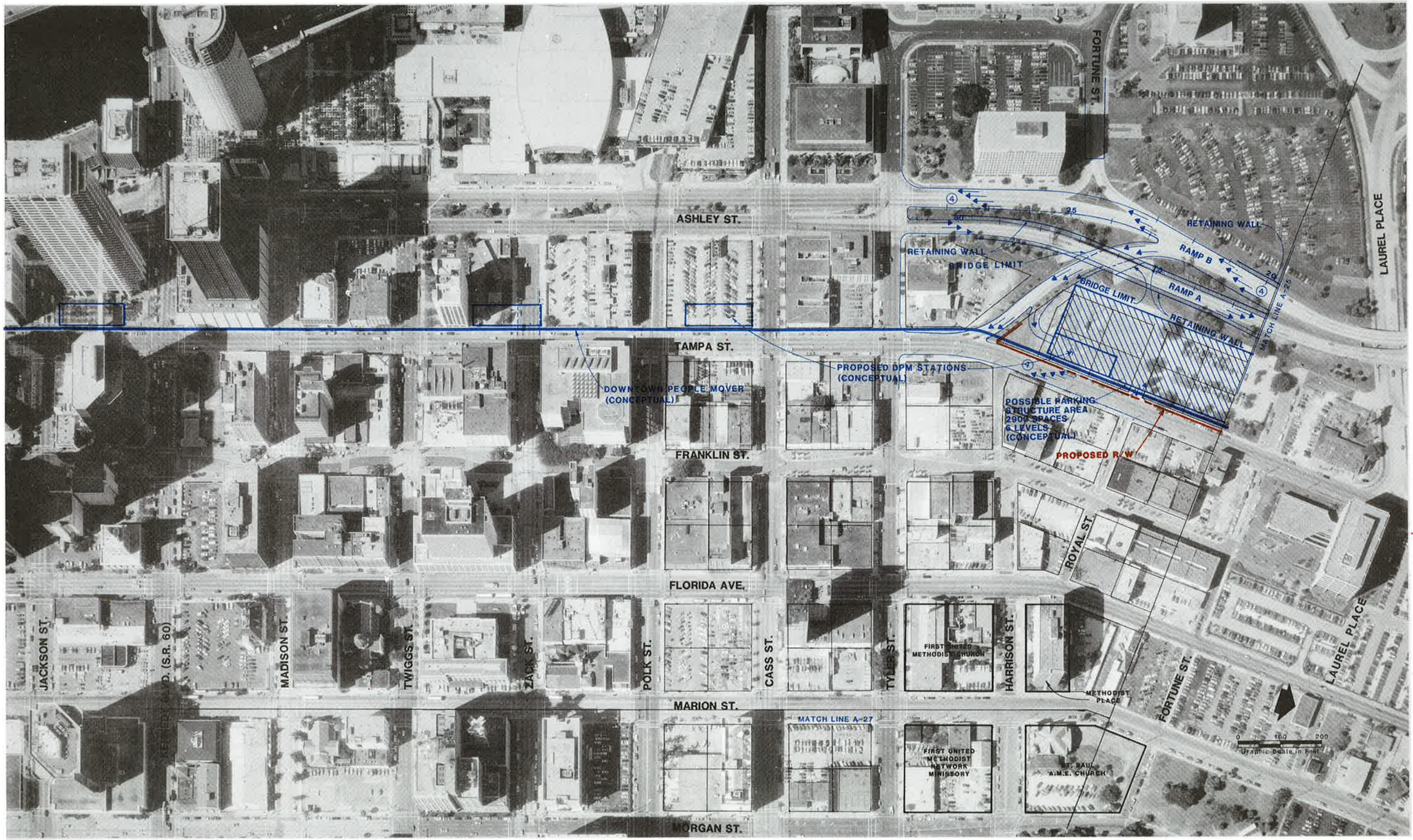
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-275 AT ASHLEY STREET AND ORANGE STREET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-25 OF 135

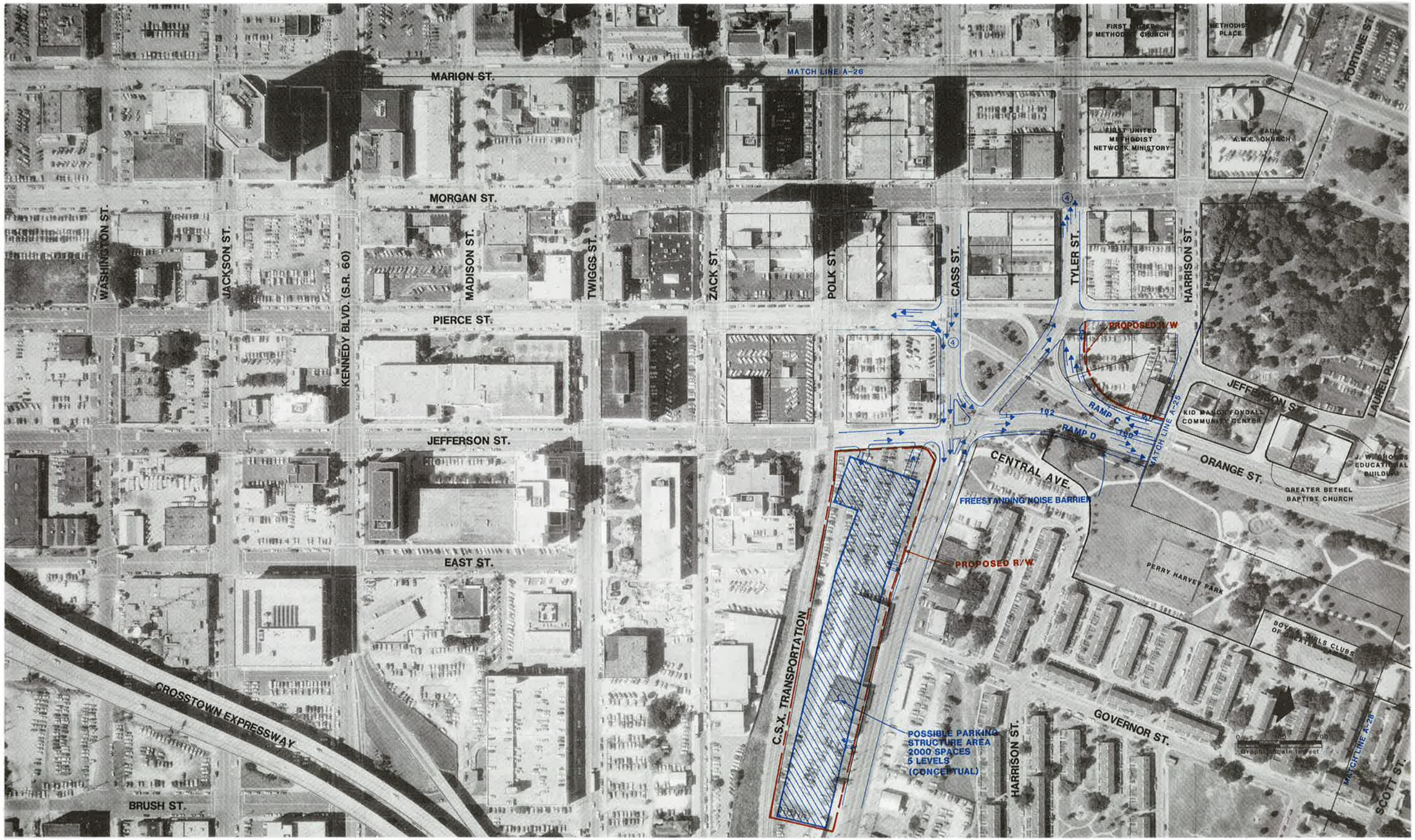


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
ASHLEY ST. DOWNTOWN DISTRIBUTOR

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-26 OF 135



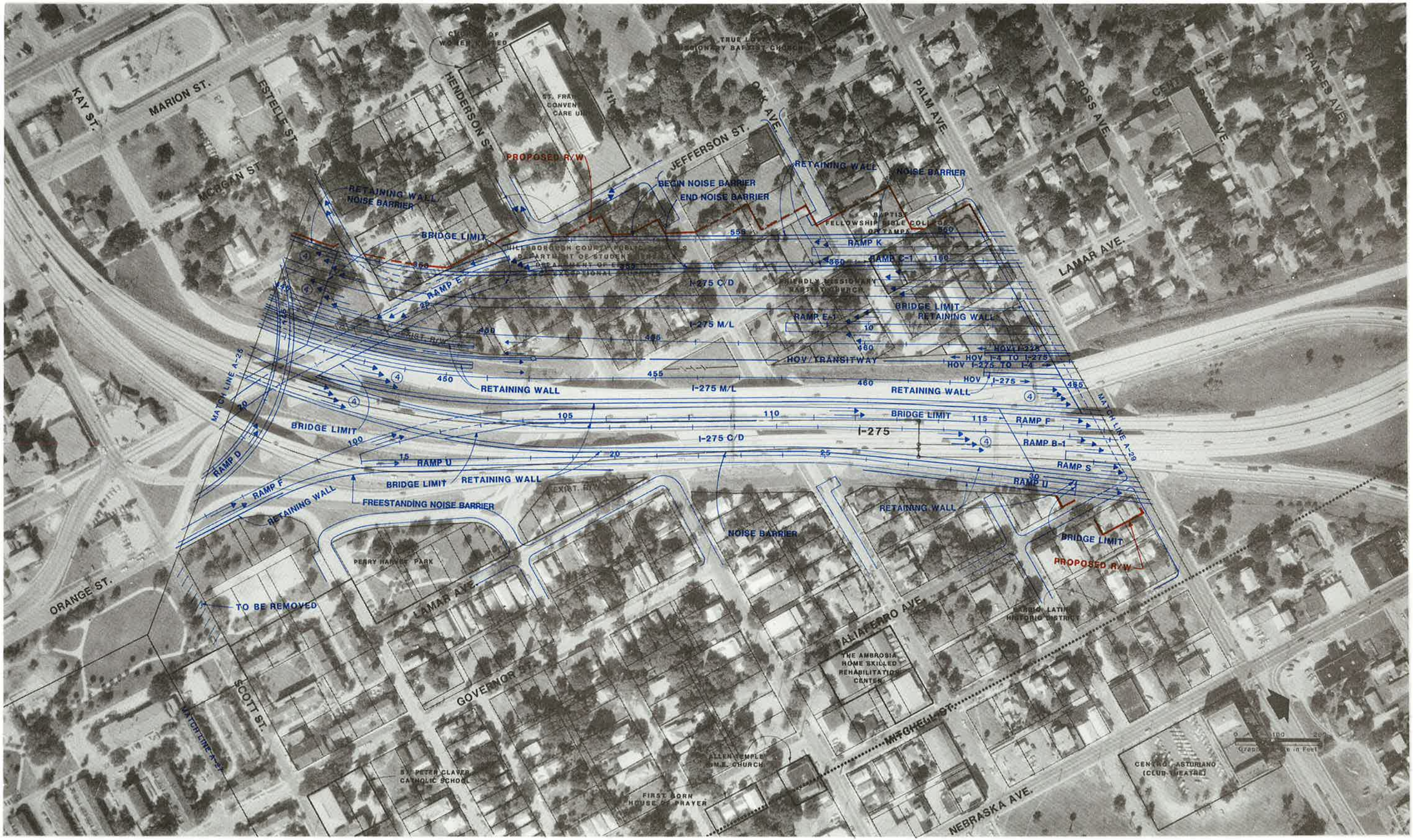
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
ORANGE ST. DOWNTOWN DISTRIBUTOR

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-27 OF 135



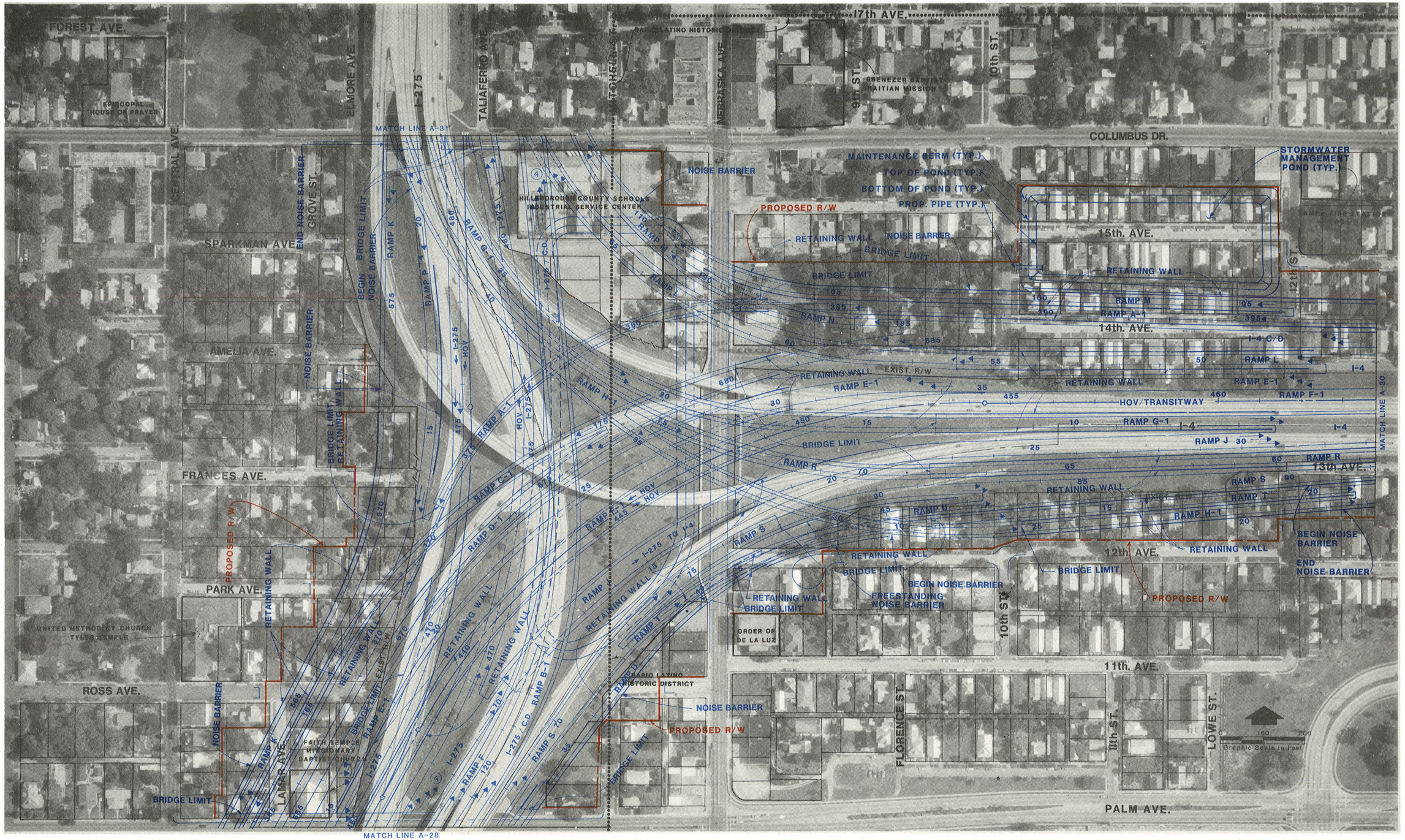
PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-275 AT HENDERSON STREET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-28 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.

GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.

TEXAS TRANSPORTATION INSTITUTE

KNIGHT APPRAISAL SERVICES

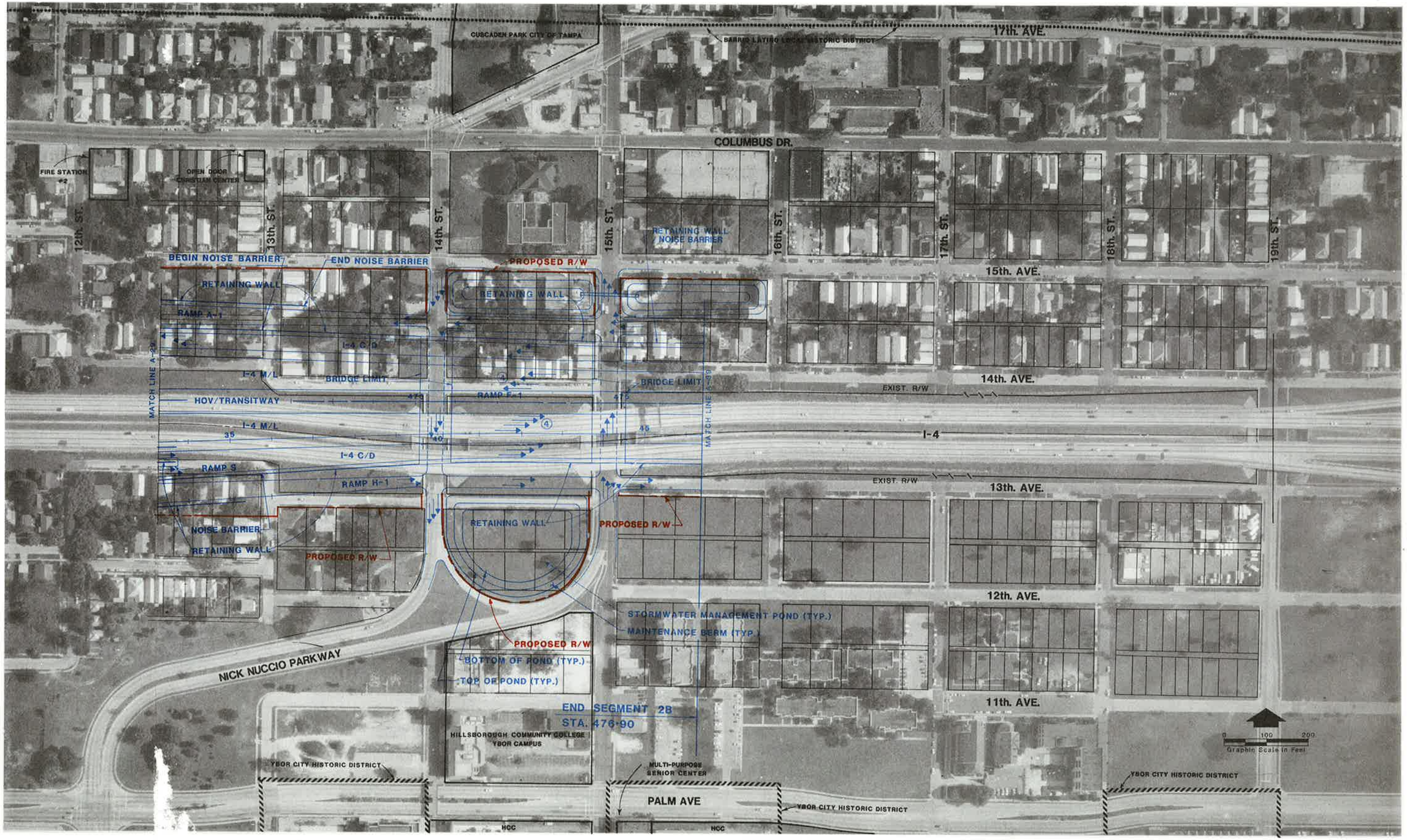
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 2B
I-275 AT I-4 INTERCHANGE

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

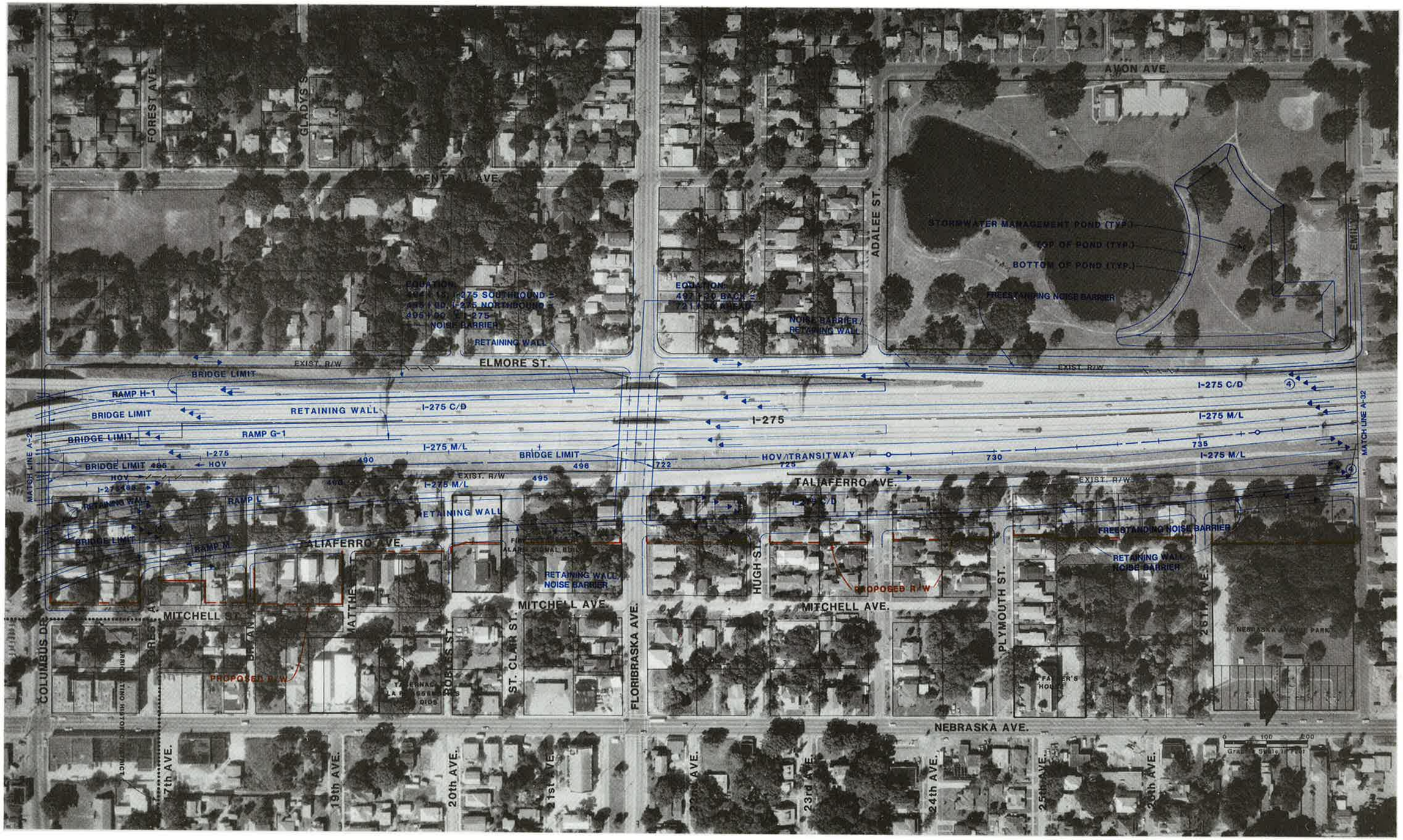


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-4 AT 14TH STREET AND 15TH STREET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-30 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

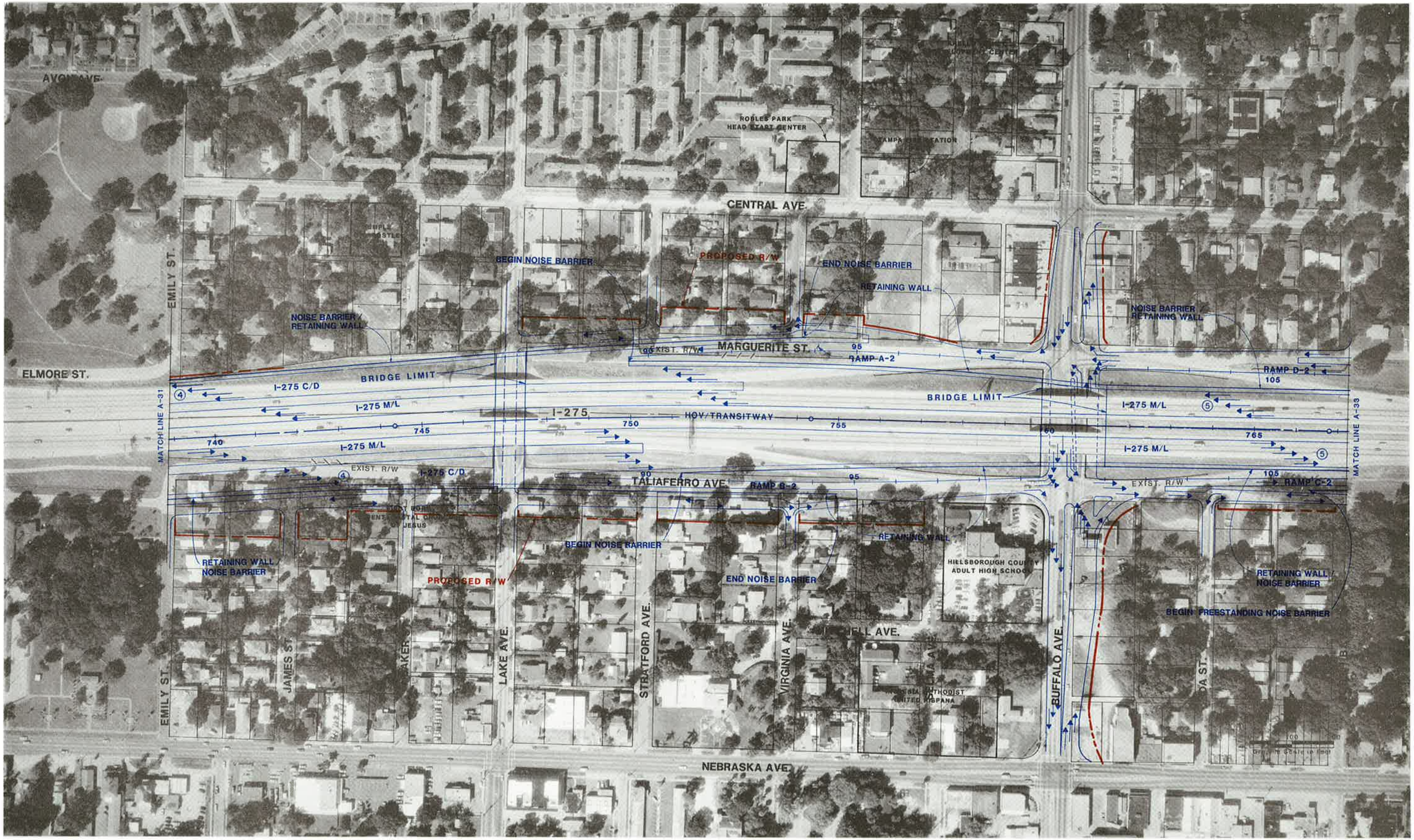
PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-275 AT FLORIBRASKA AVENUE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-31 OF 135



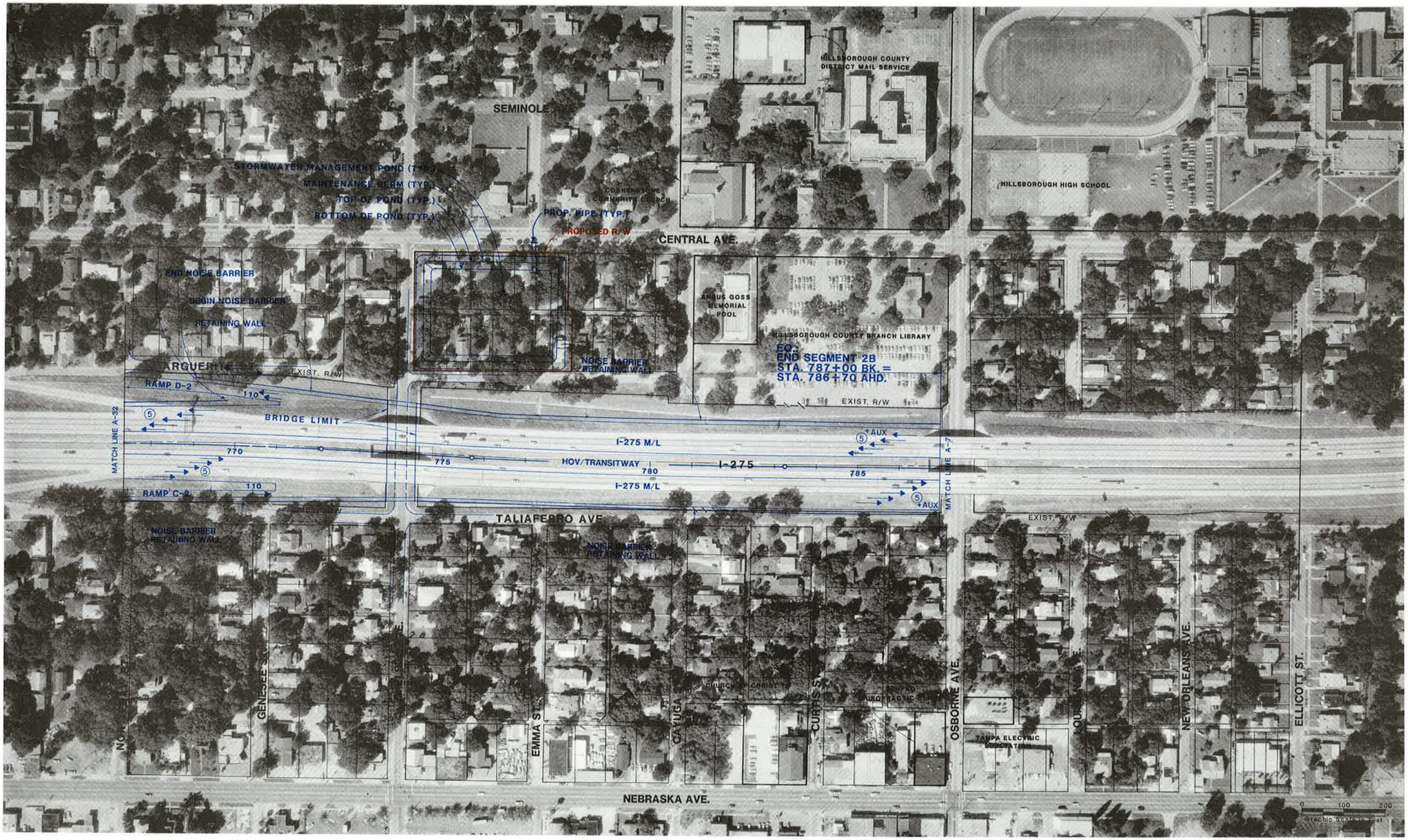
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-275 AT BUFFALO AVENUE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-32 OF 135



PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 2B
I-275 AT OSBORNE AVENUE

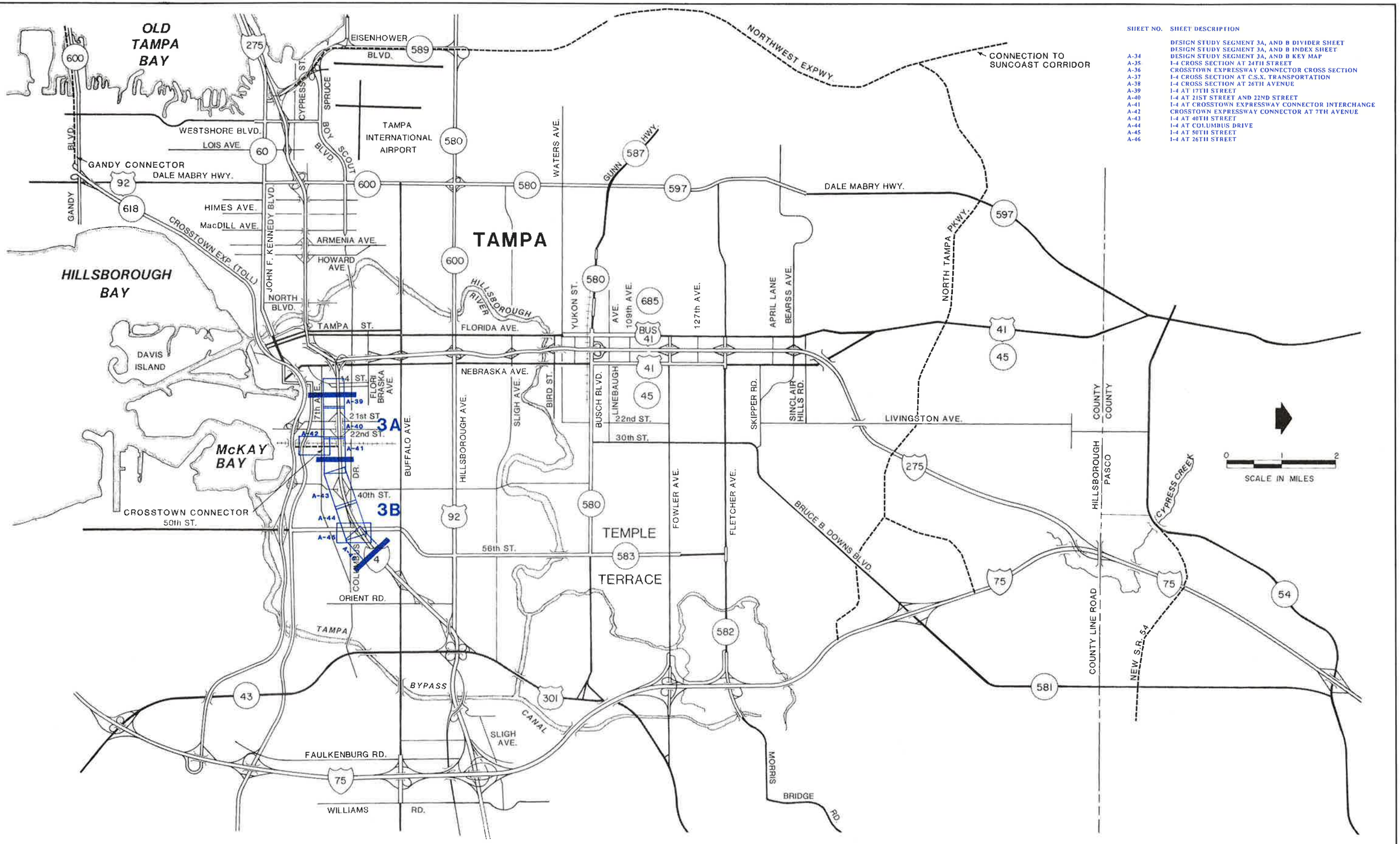
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-33 OF 135

DESIGN SEGMENTS 3A AND 3B

I-4 from 14th Street to East of 50th Street (Ybor City Area)

- 4 Roadway System transitioning to 2 Roadway System at 50th Street
- High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
- New Ybor City/Eastside Central Business District interchange on Interstate 4 at 14th and 15th Streets
- Extension of 14th and 15th Street ramps as parallel local frontage roads to 21st and 22nd Streets
- Remove Interstate 4 interchange at 21st and 22nd Streets
- Remove Interstate 4 19th Street overpass
- New directional freeway to freeway interchange with Crosstown Expressway Connector on Interstate 4 at 30th Street
- Reconfigure split interchange at Columbus Avenue and 50th Street on Interstate 4
- Remove Interstate 4 interchange at 40th Street



SHEET NO.	SHEET DESCRIPTION
	DESIGN STUDY SEGMENT 3A, AND B DIVIDER SHEET
	DESIGN STUDY SEGMENT 3A, AND B INDEX SHEET
A-34	DESIGN STUDY SEGMENT 3A, AND B KEY MAP
A-35	I-4 CROSS SECTION AT 34TH STREET
A-36	CROSSTOWN EXPRESSWAY CONNECTOR CROSS SECTION
A-37	I-4 CROSS SECTION AT C.S.X. TRANSPORTATION
A-38	I-4 CROSS SECTION AT 26TH AVENUE
A-39	I-4 AT 17TH STREET
A-40	I-4 AT 21ST STREET AND 22ND STREET
A-41	I-4 AT CROSSTOWN EXPRESSWAY CONNECTOR INTERCHANGE
A-42	CROSSTOWN EXPRESSWAY CONNECTOR AT 7TH AVENUE
A-43	I-4 AT 40TH STREET
A-44	I-4 AT COLUMBUS DRIVE
A-45	I-4 AT 50TH STREET
A-46	I-4 AT 26TH STREET

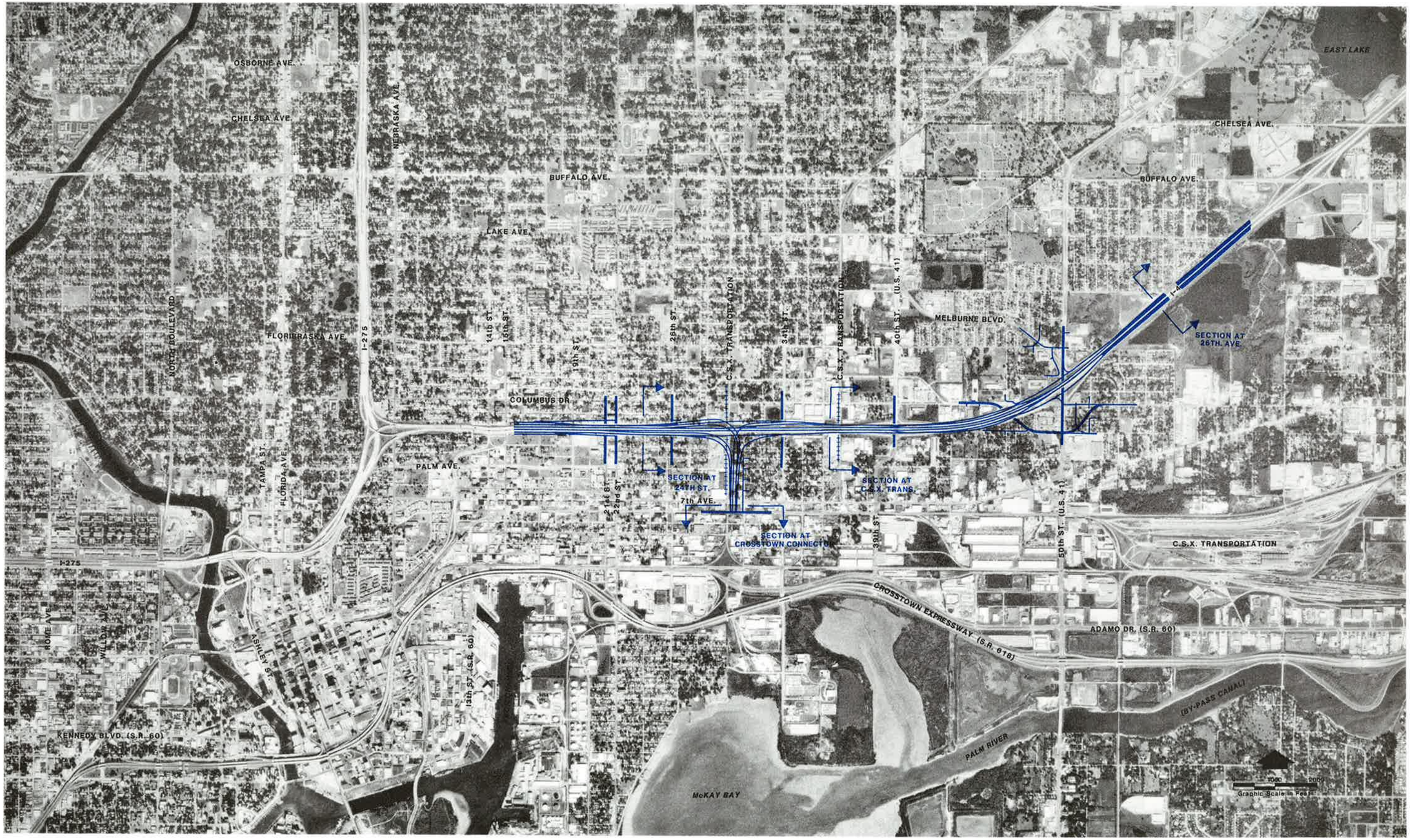
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3A, 3B
INDEX SHEET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402



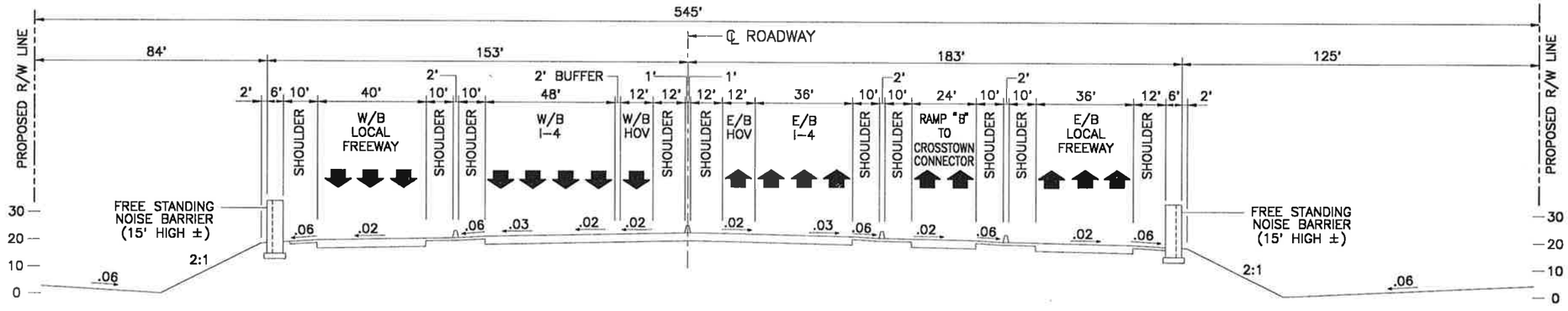
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3A AND 3B
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-34 OF 135



STATION 508+00

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

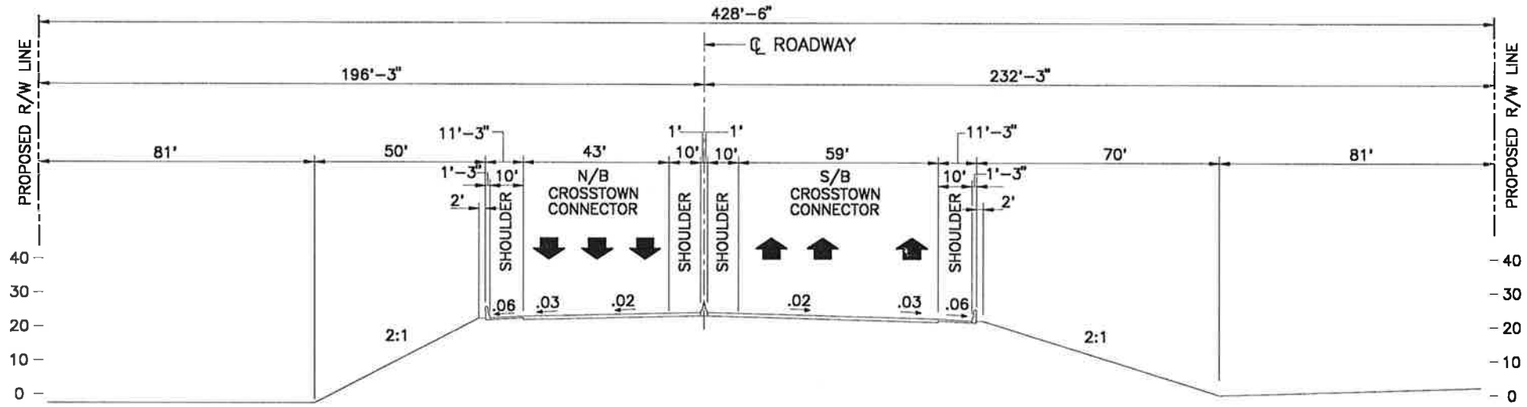
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3A
I-4 CROSS SECTION AT
24TH ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-35 OF 135

LD-30
SY1124



STATION 348+00

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

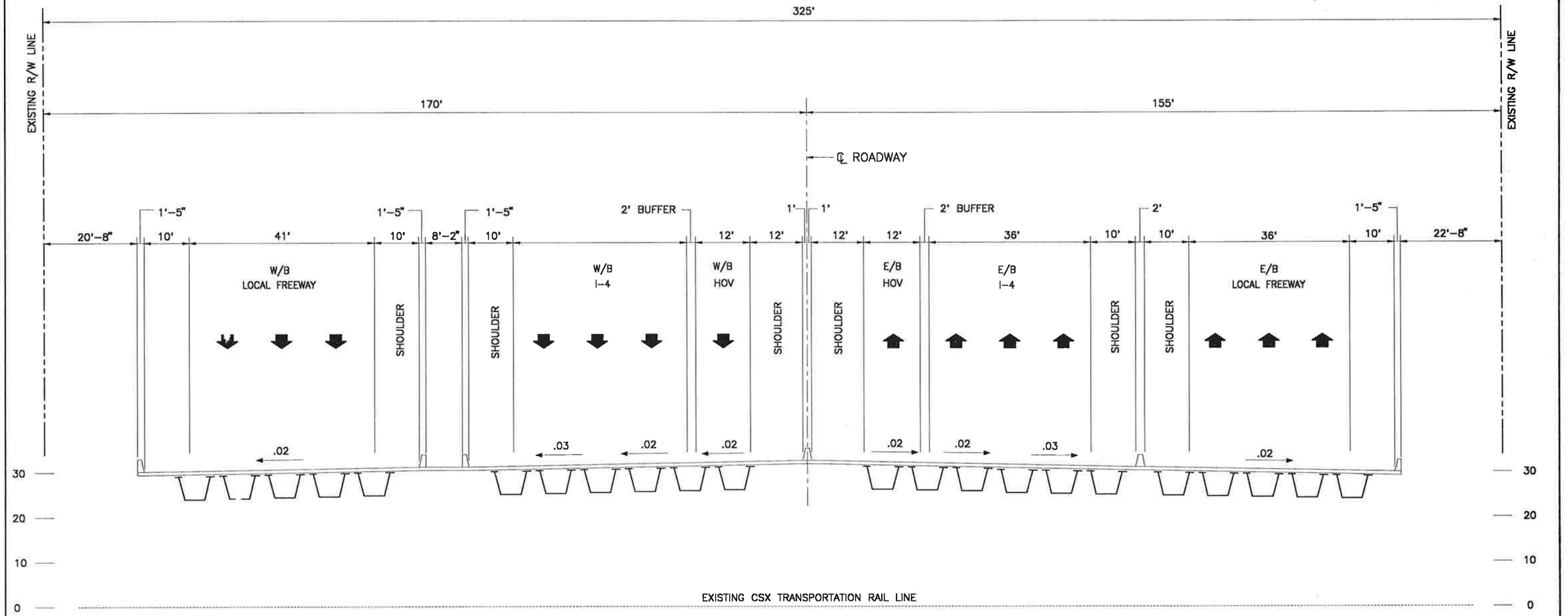
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3A
CROSSTOWN EXPRESSWAY CONNECTOR
CROSS SECTION

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-36 OF 135

11-39
SYM/CTC



STATION 555+00

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

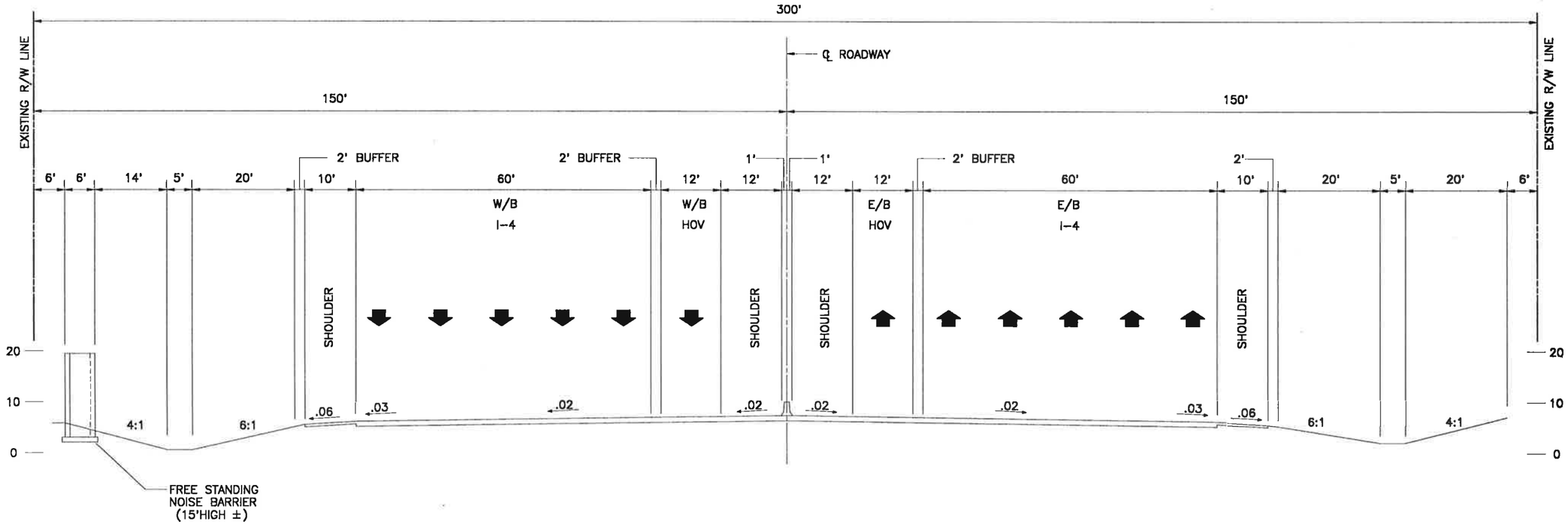
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3B
I-4 CROSS SECTION AT
C.S.X. TRANSPORTATION

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-37 OF 135

12-26
STTCSX



STATION 645+00

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

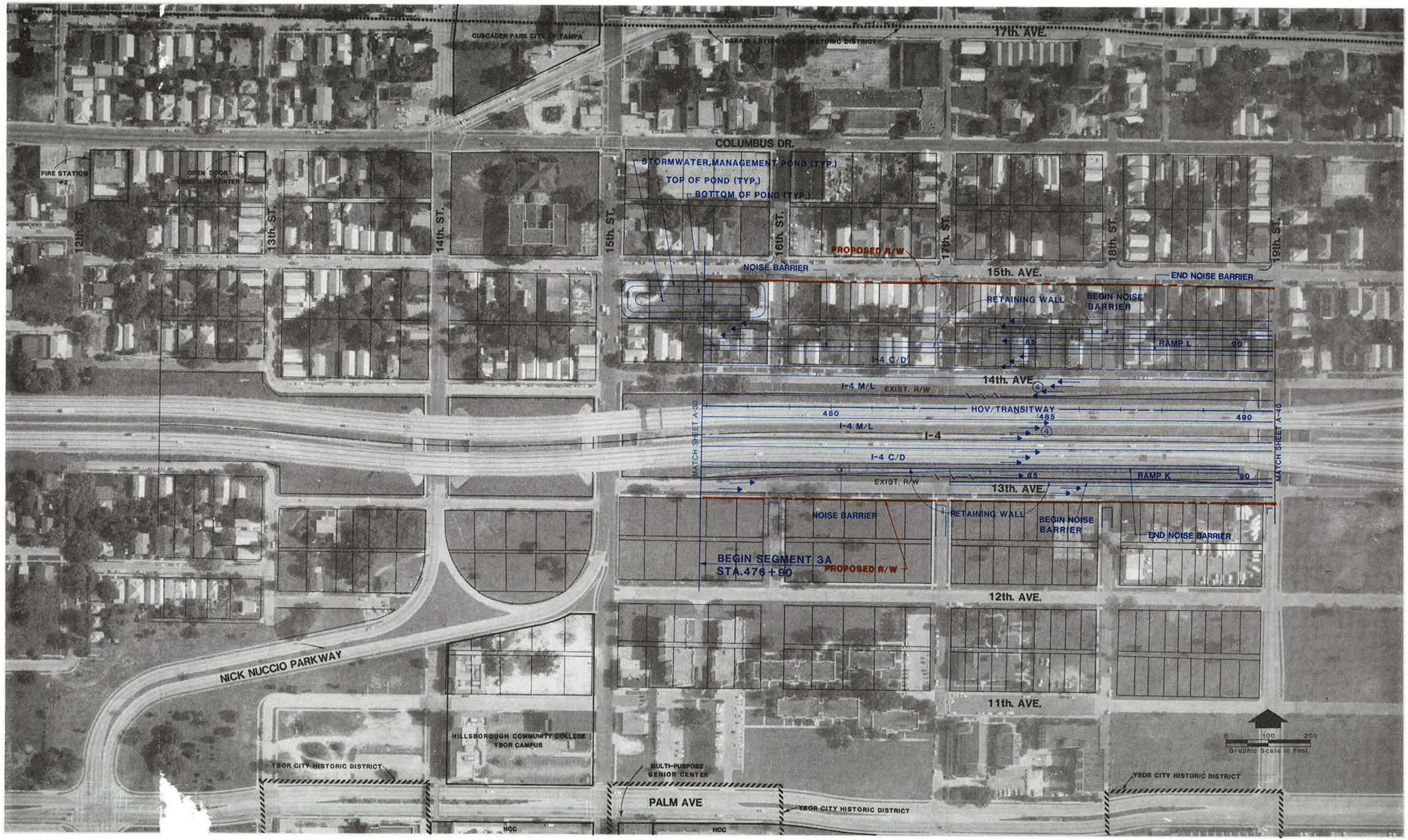
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3B
I-4 CROSS SECTION AT
26TH AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-38 OF 135

13-93
SYT126

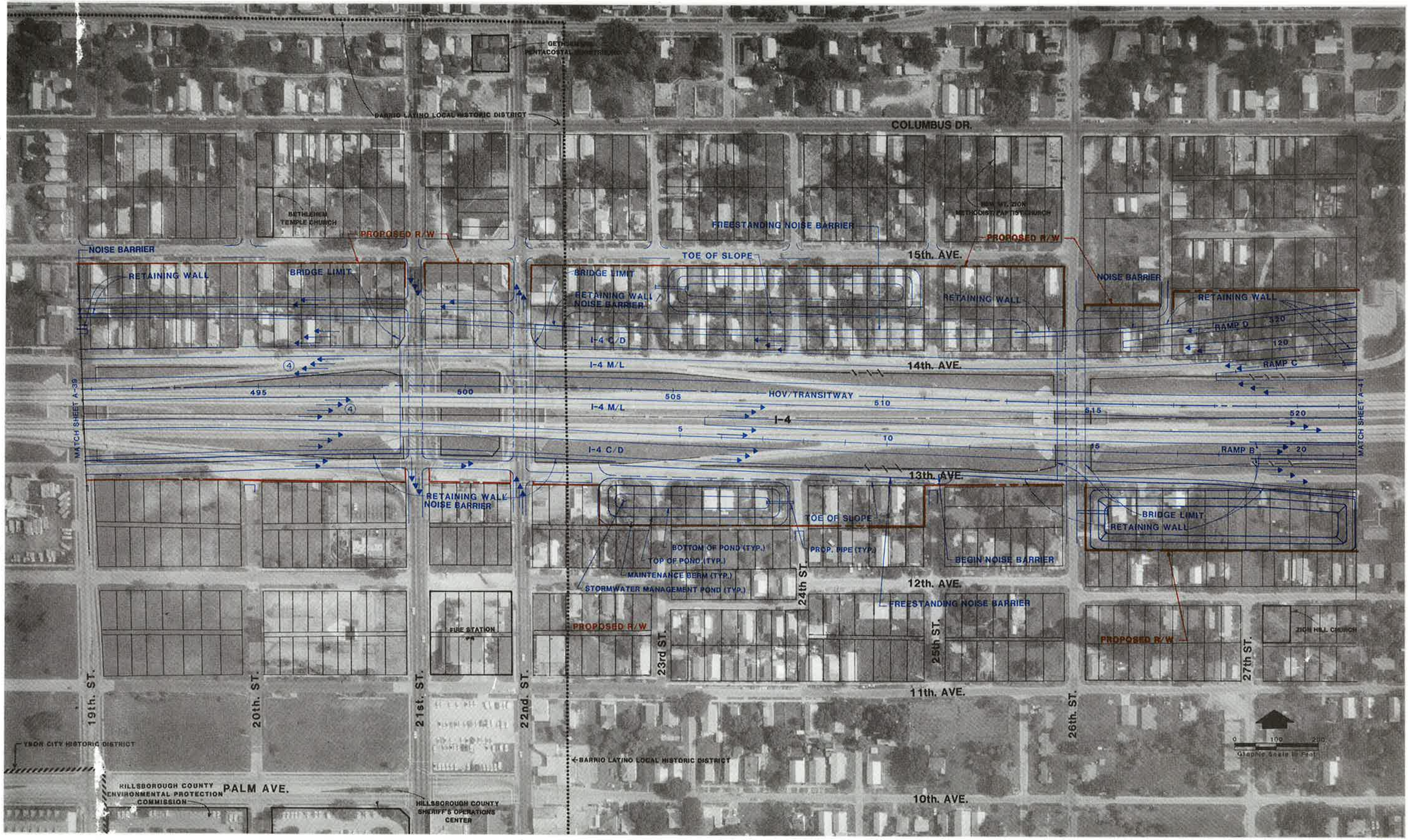


PROJECT No. C1[illegible]		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3A
I-4 AT 17TH ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-39 OF 135

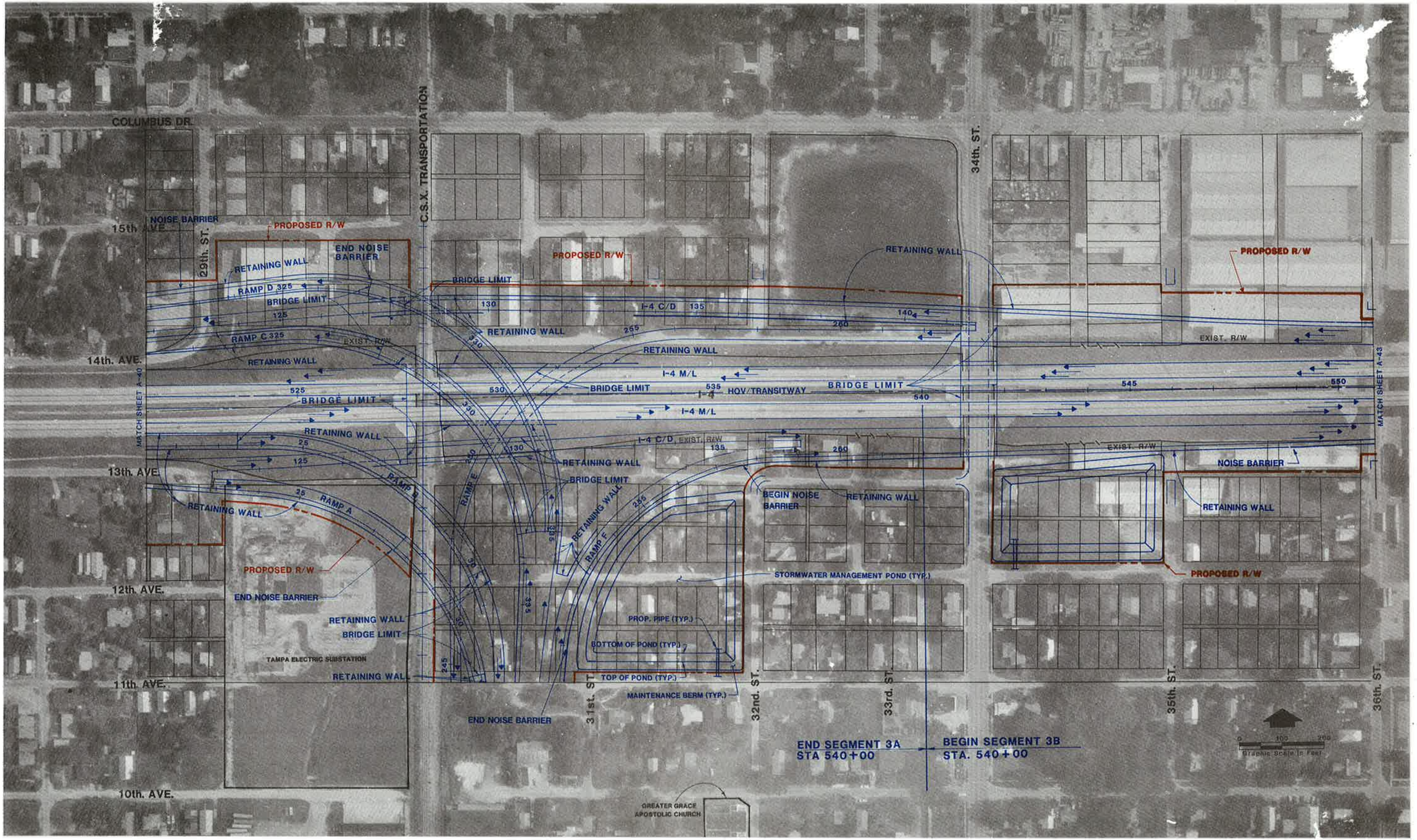


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3A
I-4 AT 21ST & 22ND ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-40 OF 135

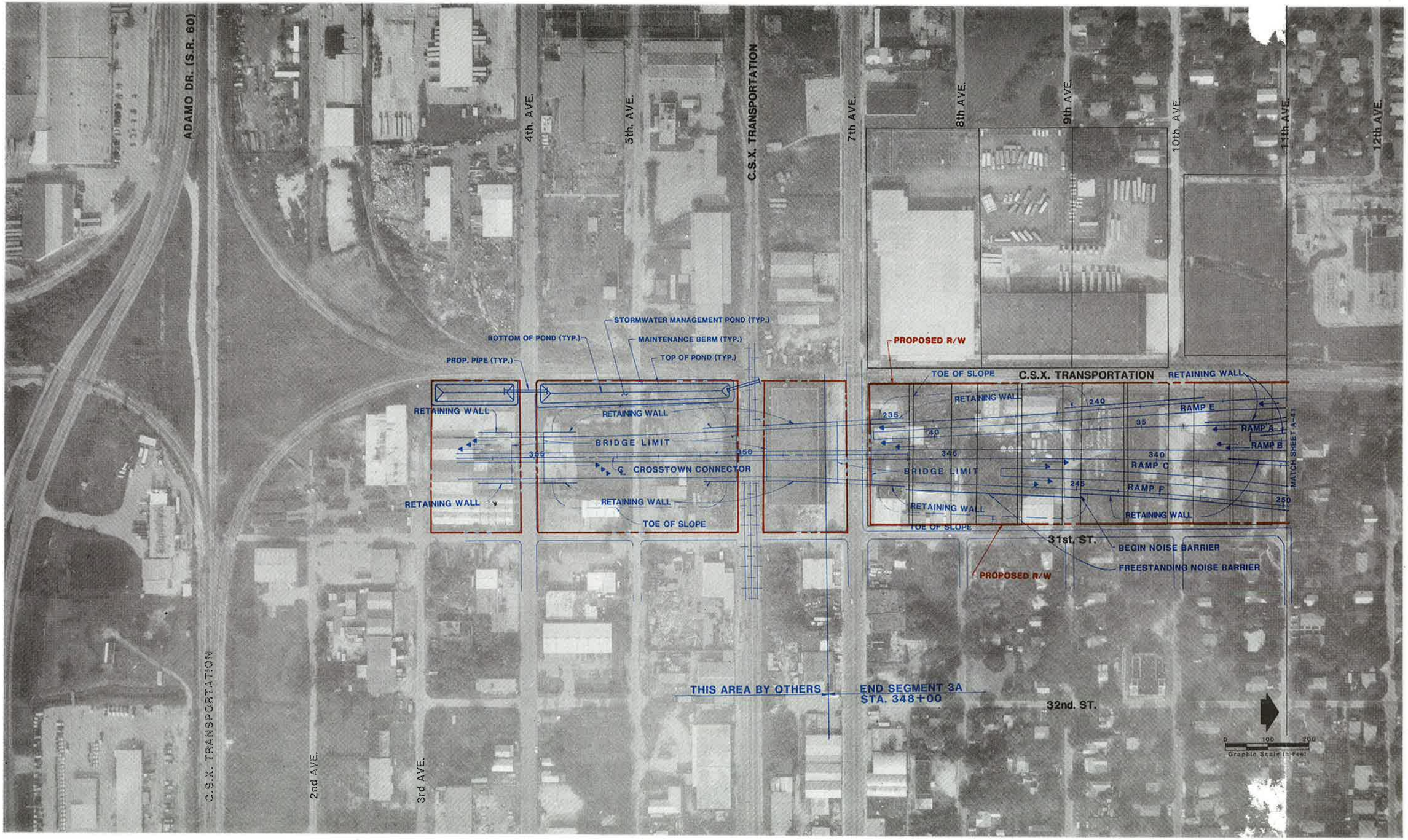


PROJECT No.	04
PROJECT	
DATES	D N
3-26-89	DRAFT MASTER PLAN CONCE

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3A
I-4 AT CROSSTOWN EXPRESSWAY
CONNECTOR INTERCHANGE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-41 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

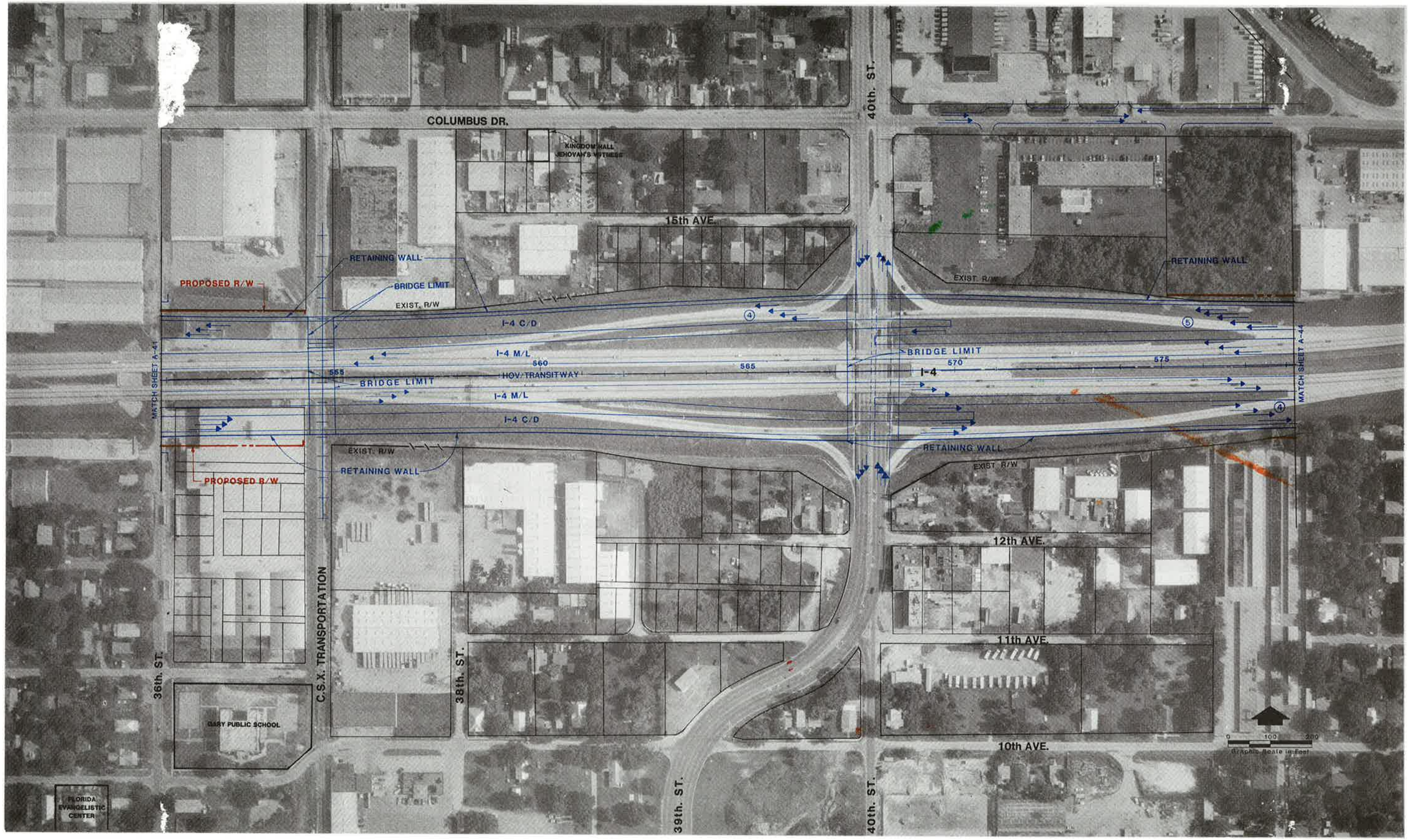
DESIGN STUDY SEGMENT 3A
CROSSTOWN EXPRESSWAY CONNECTOR AT 7TH AVE.

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

SHEET A-42 OF 135



PROJECT No. C1

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

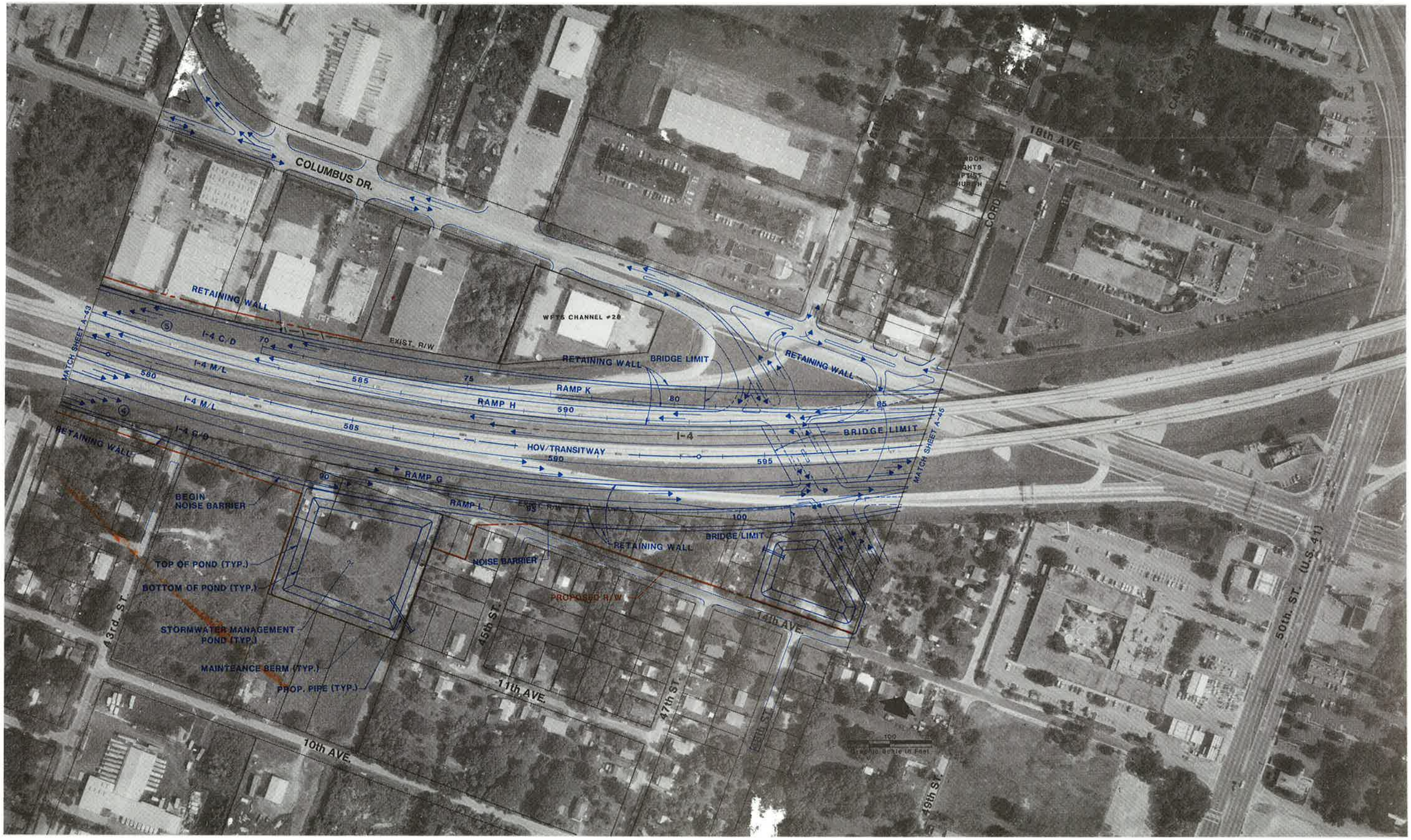
DESIGN STUDY SEGMENT 3B
I-4 AT 40TH ST.

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

SHEET A-43 OF 135



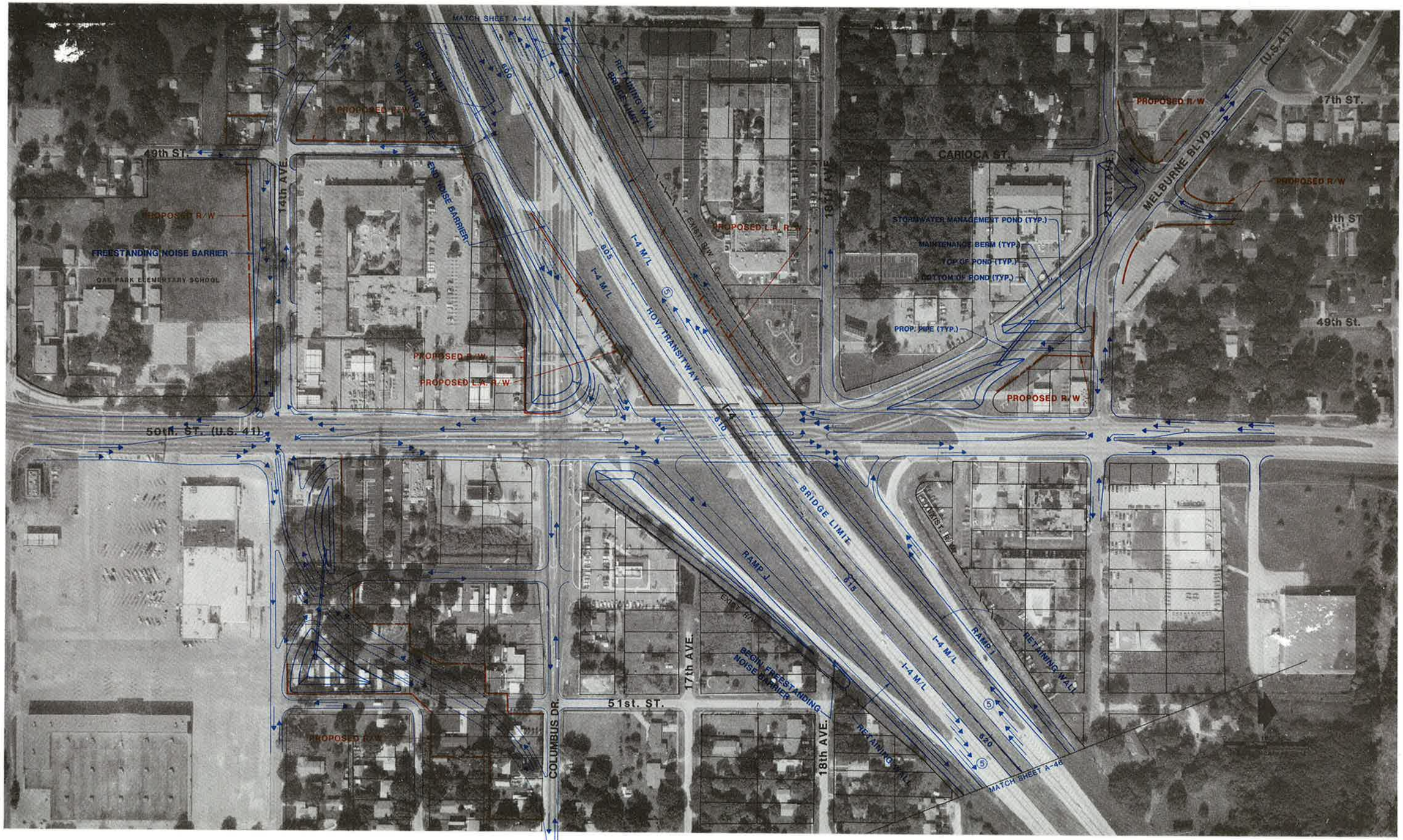
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3B
I-4 AT COLUMBUS DR.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-44 OF 135



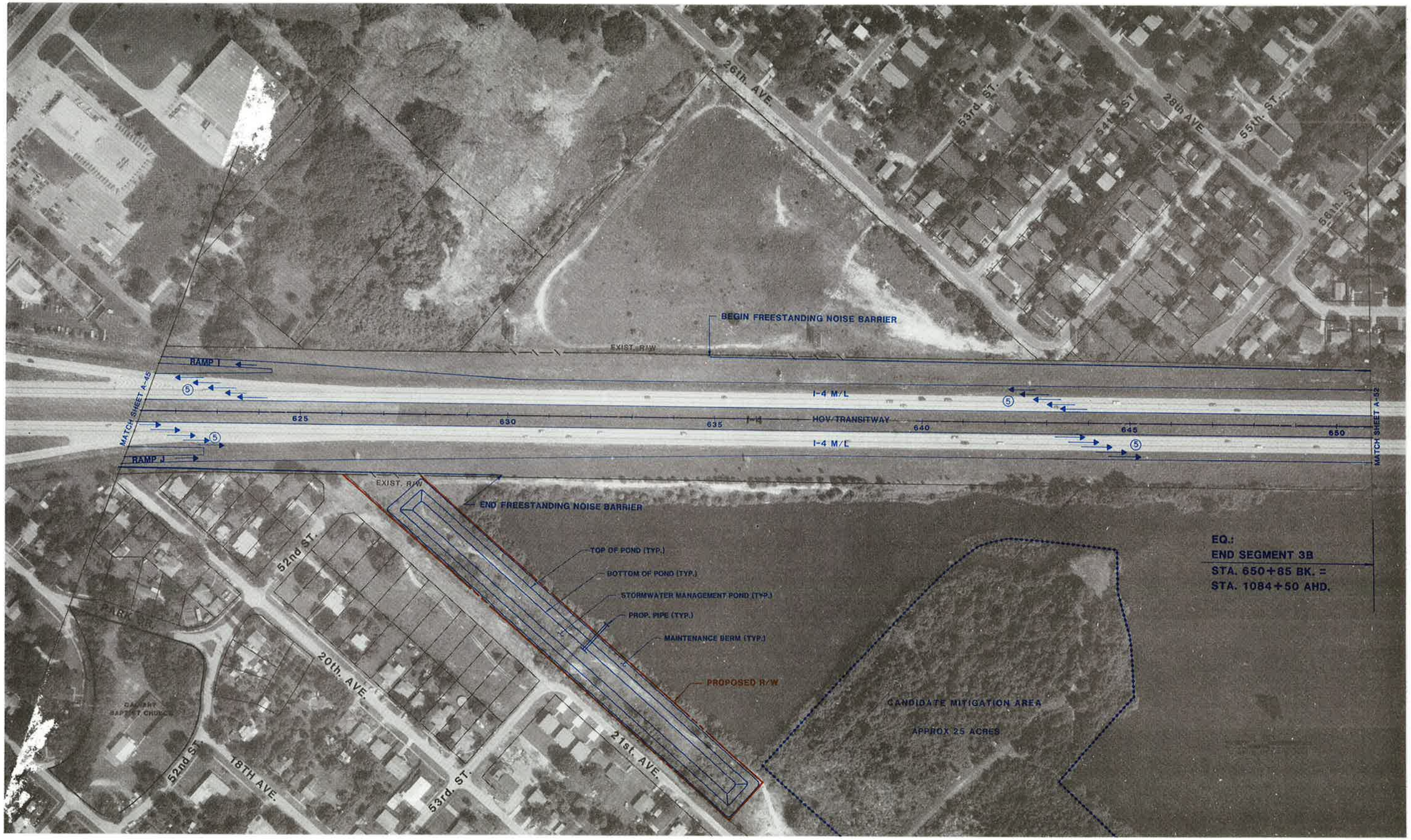
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3B
I-4 AT 50TH ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-45 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 3B
I-4 AT 26TH AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-46 OF 135

DESIGN SEGMENTS 4A-4C

I-4 from East of 50th Street to East of I-75 Interchange

(East Tampa Area)

- 2 Roadway System on Interstate 4 beginning east of 50th Street
- High Occupancy Vehicle (HOV)/Transitway Lanes beginning and ending west of Interstate 75
- HOV priority access to and from the west at Orient Road serving new HOV Park and Ride lot
- Existing interchange locations at Buffalo Avenue, Orient Road, U.S. 92, U.S. 301 and Interstate 75 remain
- Remove Chelsea Avenue Overpass
- Existing partial interchange at Orient Road with ramps to and from west on Interstate 4 remains
- Partial cloverleaf interchange at U.S. 301 with flyover ramps for south to west and north to east movements
- U.S. 92 on separate alignment with ramps to Interstate 4 and U.S. 301
- Retain Garden Lane Road Bridge across By Pass Canal
- New extension of Faulkenburg Road between U.S. 92 and Sligh Avenue
- New extension of Sligh Avenue from Williams Road west to U.S. 301 across By Pass Canal
- New interchange ramps at Sligh Avenue to and from north on Interstate 75
- New interchange ramps at U.S. 92 to and from south on Interstate 75

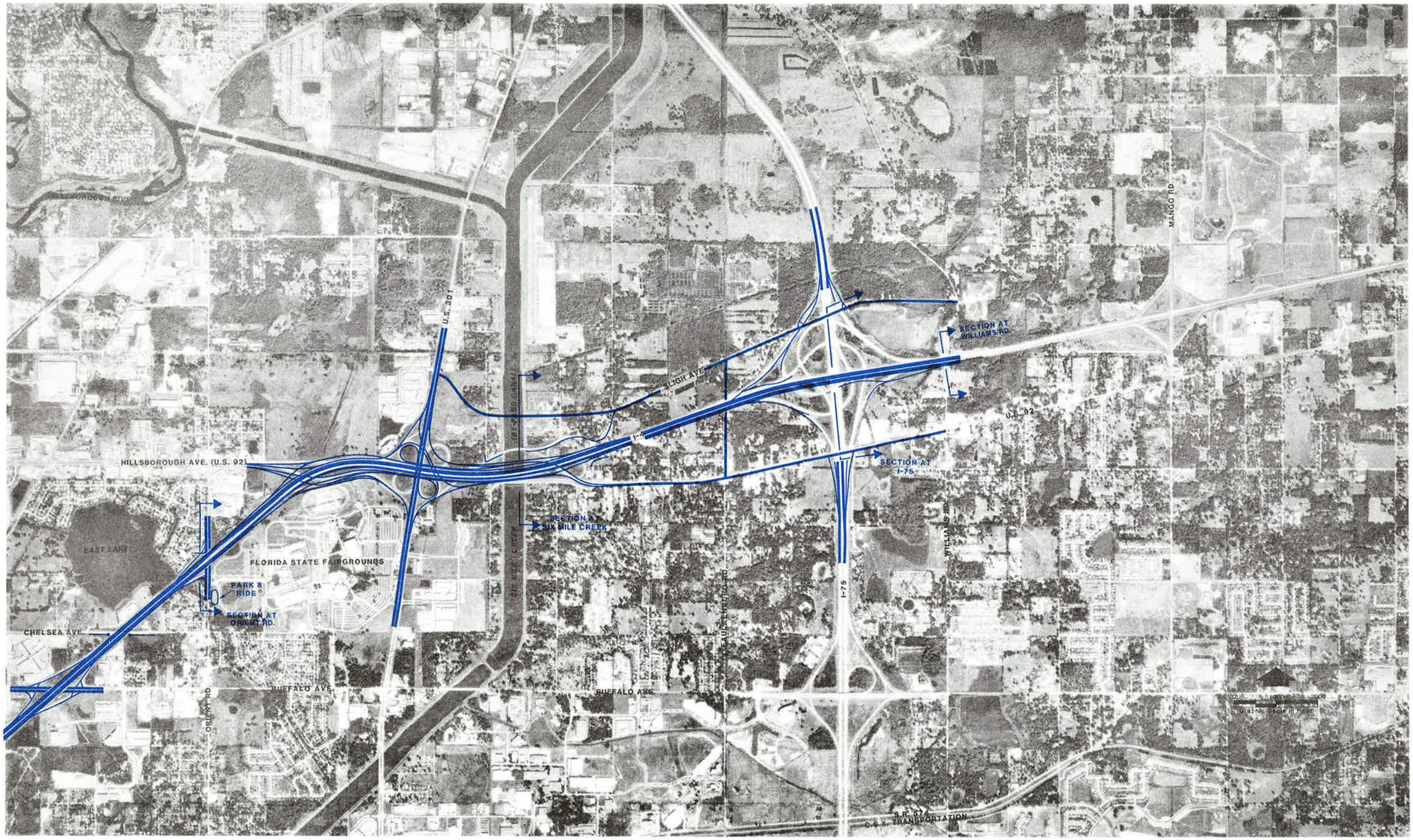
SHEET NO.	SHEET DESCRIPTION
	DESIGN STUDY SEGMENT 4A, B, C DIVIDER SHEET
	DESIGN STUDY SEGMENT 4A, B, C INDEX STREET
A-47	DESIGN STUDY SEGMENT 4A, B, C KEY MAP
A-48	I-4 CROSS SECTION WEST OF ORIENT ROAD
A-49	I-4 CROSS SECTION AT SIX MILE CREEK
A-50	I-4 CROSS SECTION AT I-75
A-51	I-4 CROSS SECTION EAST OF WILLIAMS ROAD
A-52	I-4 AT 30TH AVENUE
A-53	I-4 AT BUFFALO AVENUE
A-54	I-4 AT ORIENT ROAD
A-55	I-4 AT FLORIDA STATE FAIRGROUNDS
A-56	I-4 AT U.S. 92
A-57	I-4 AT U.S. 301
A-58	U.S. 301 SOUTH OF I-4
A-59	U.S. 301 NORTH OF I-4
A-60	I-4 AT SIX MILE CREEK (BY-PASS CANAL)
A-61	I-4 AT BAPTIST CHURCH ROAD
A-62	I-4 AT FAULKENBURG ROAD
A-63	I-75 AT U.S. 92
A-64	I-75 AT SLIGH AVENUE
A-65	I-4 AT I-75
A-66	I-4 AT WILLIAMS ROAD
A-67	SLIGH AVENUE AT SIX MILE CREEK (BY-PASS CANAL)
A-68	SLIGH AVENUE AT EUREKA SPRINGS ROAD
A-69	SLIGH AVENUE AT FAULKENBURG ROAD
A-70	SLIGH AVENUE AT WILLIAMS ROAD
A-71	U.S. 92 AT BAPTIST CHURCH ROAD
A-72	U.S. 92 AT FAULKENBURG ROAD
A-73	U.S. 92 AT WILLIAMS ROAD

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4A, B, C
INDEX SHEET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402



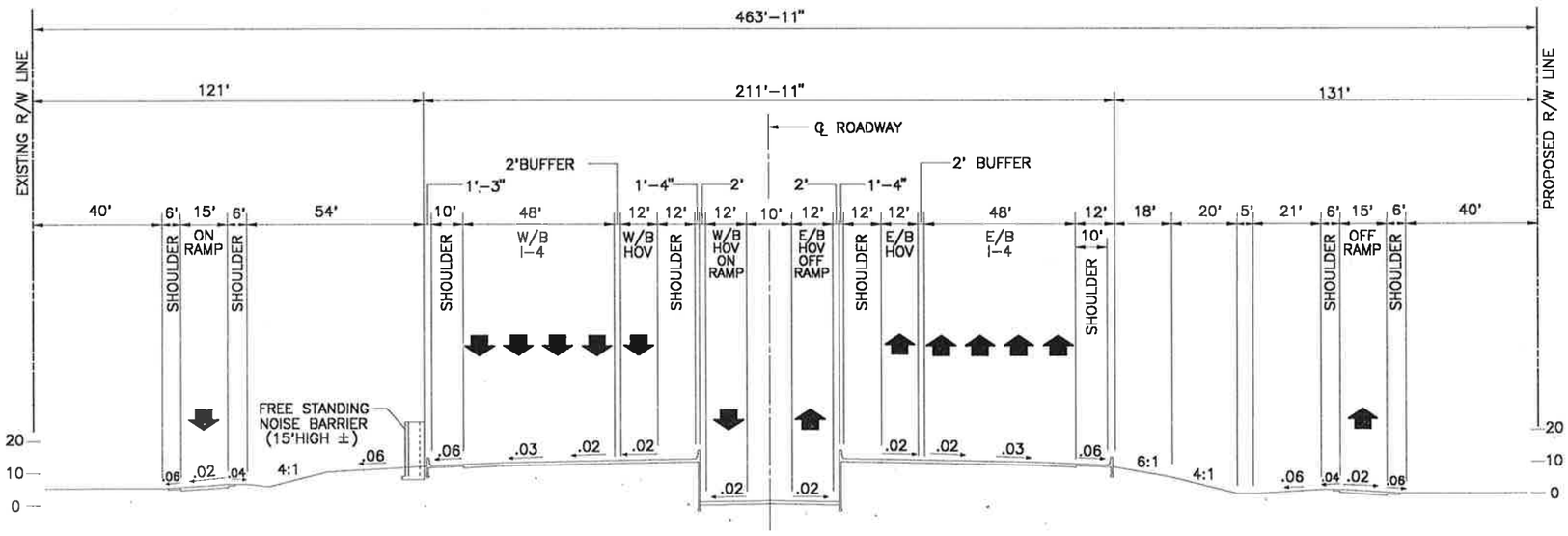
PROJECT No. C1104			
PROJECT DATES			
DATES	DESCRIPTION		
3-26-89	DRAFT MASTER PLAN CONCEPT		
6-89	FINAL MASTER PLAN CONCEPT		

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENTS 4A, 4B AND 4C
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-47 OF 135



STATION 116+00

PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

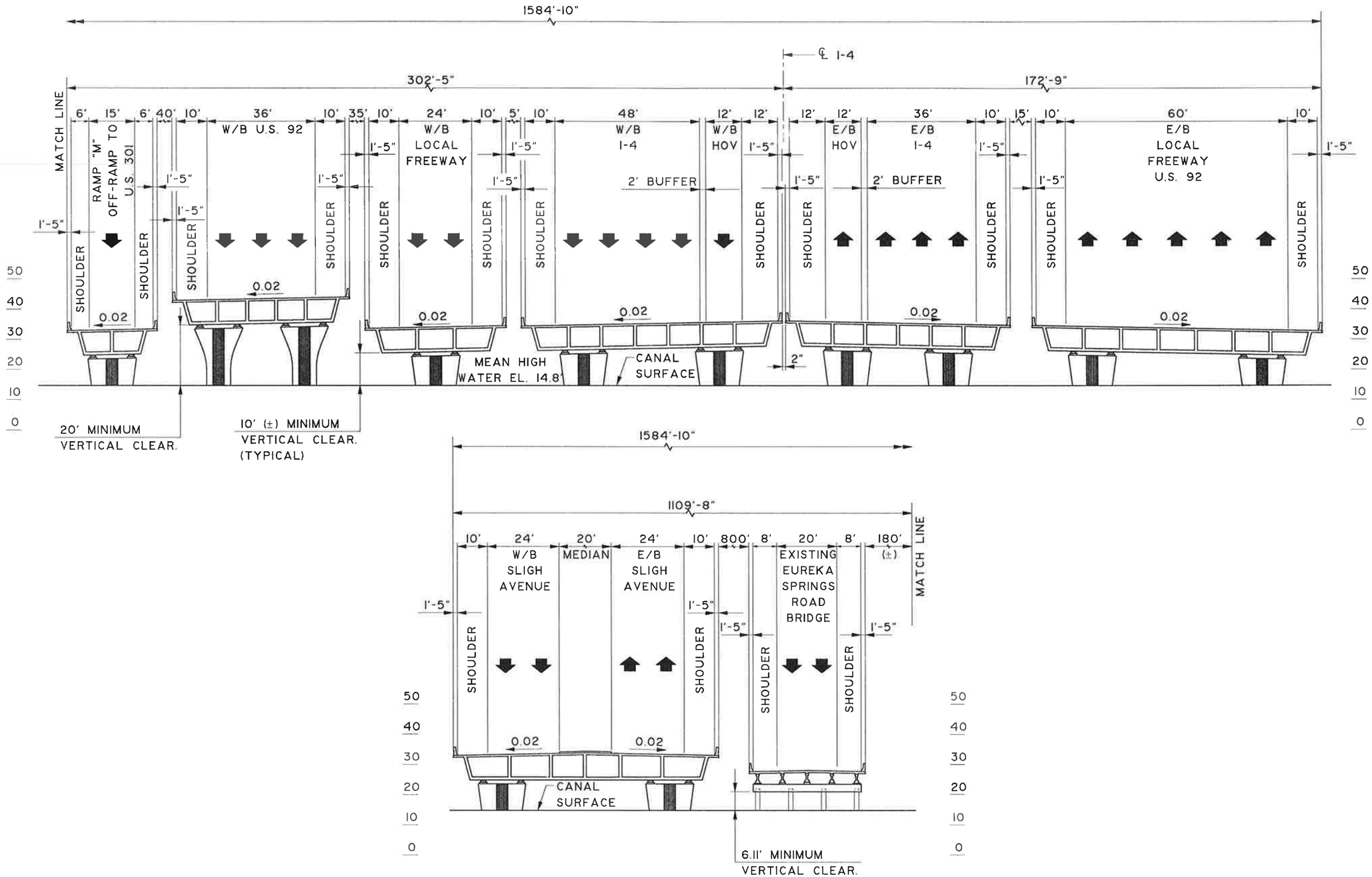
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4A
I-4 CROSS SECTION AT
WEST OF ORIENT RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-48 OF 135

14-30 SYTVCR



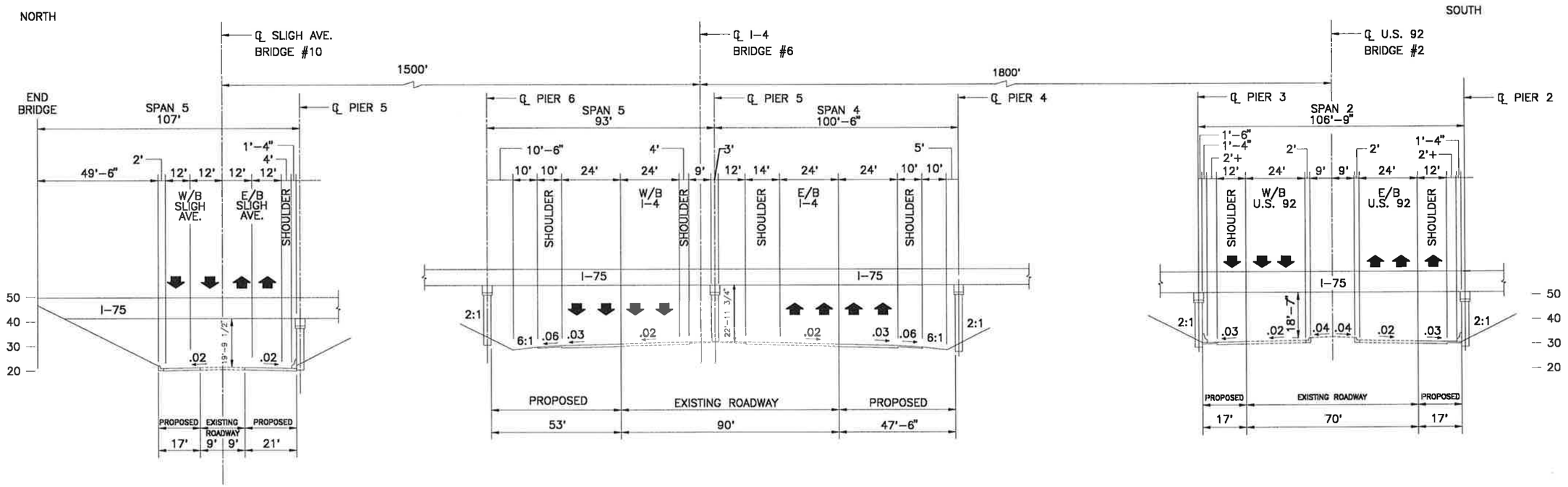
STATION 1245+00

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4B
I-4 CROSS SECTION AT
SIX MILE CREEK

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-49 OF 135



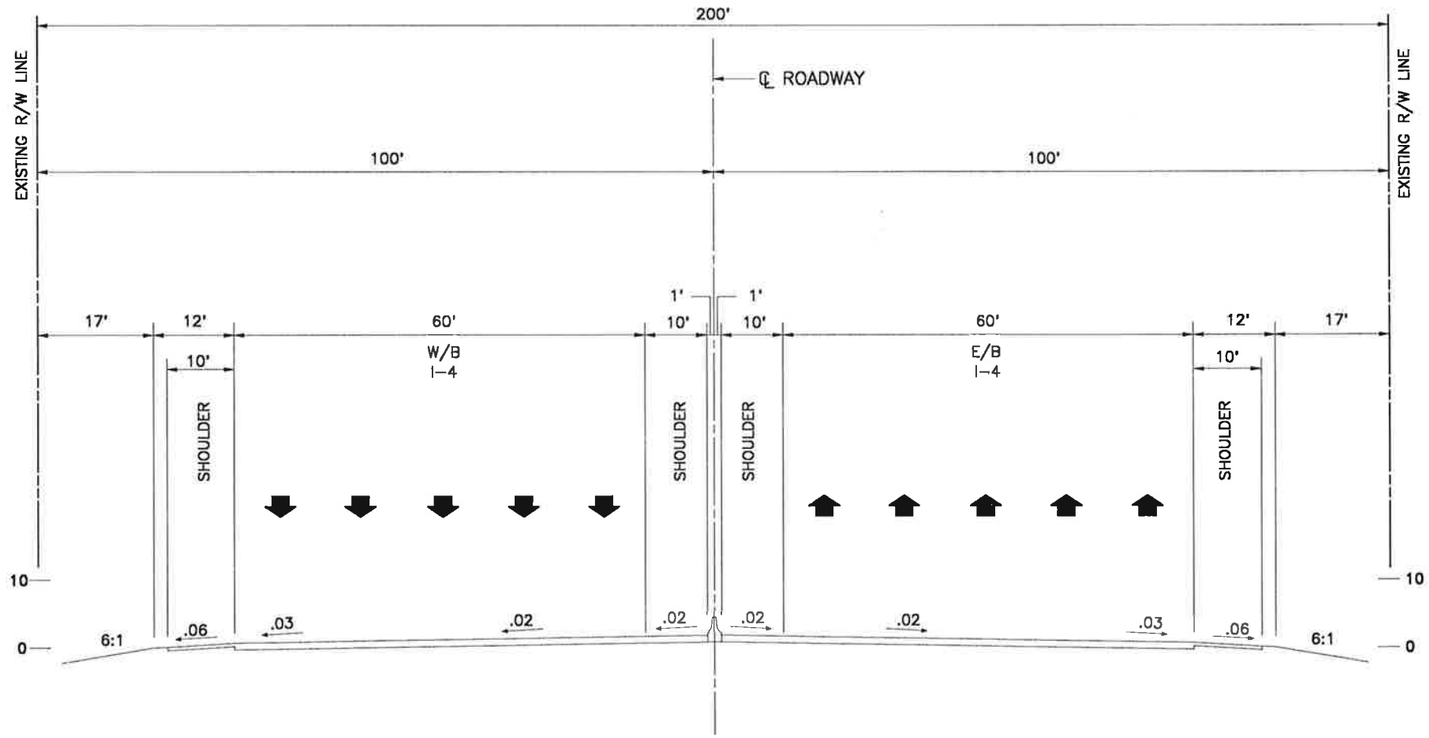
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
I-4 CROSS SECTION AT I-75

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-50 OF 135



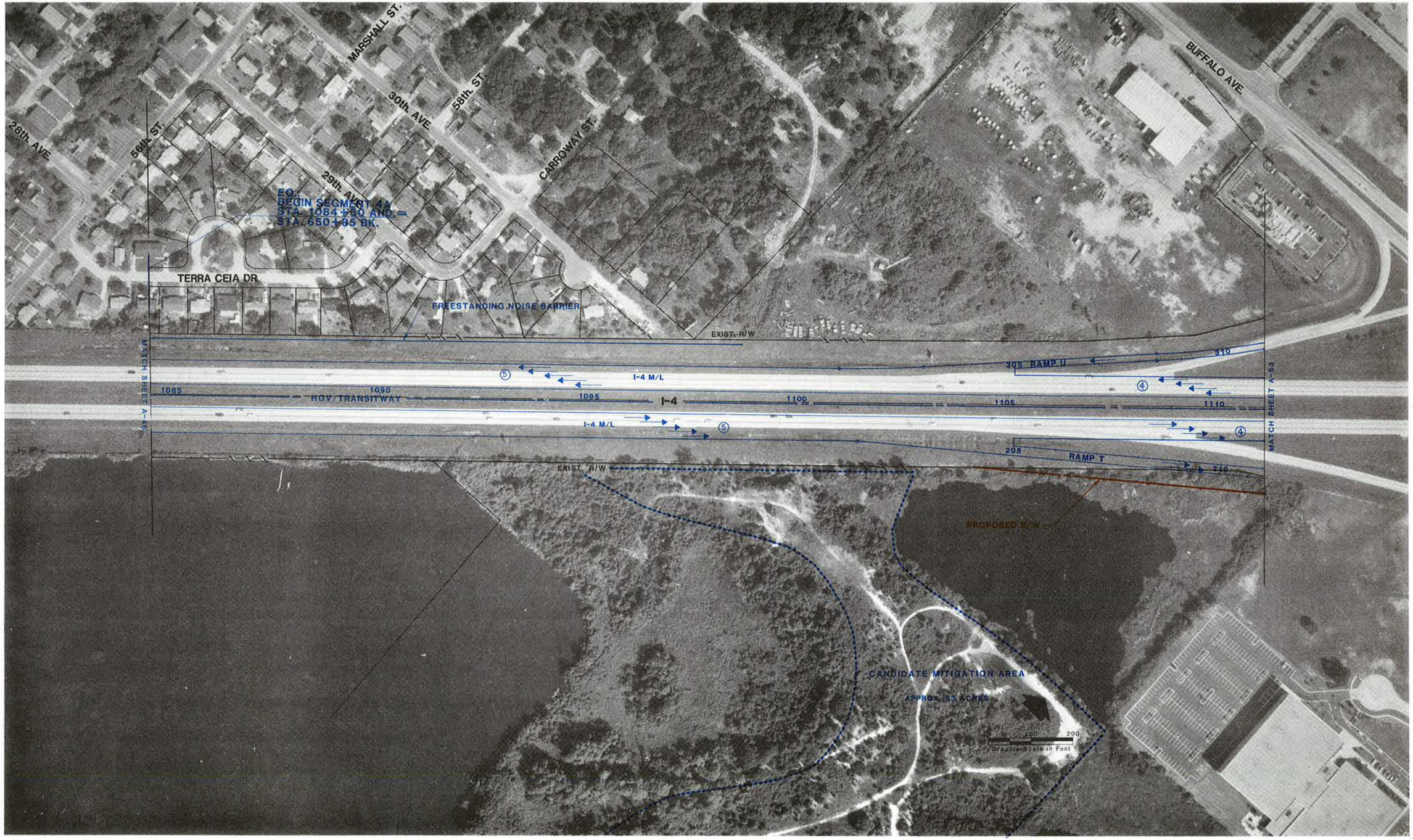
STATION 1370+00

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
I-4 CROSS SECTION AT
EAST OF WILLIAMS RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-51 OF 135

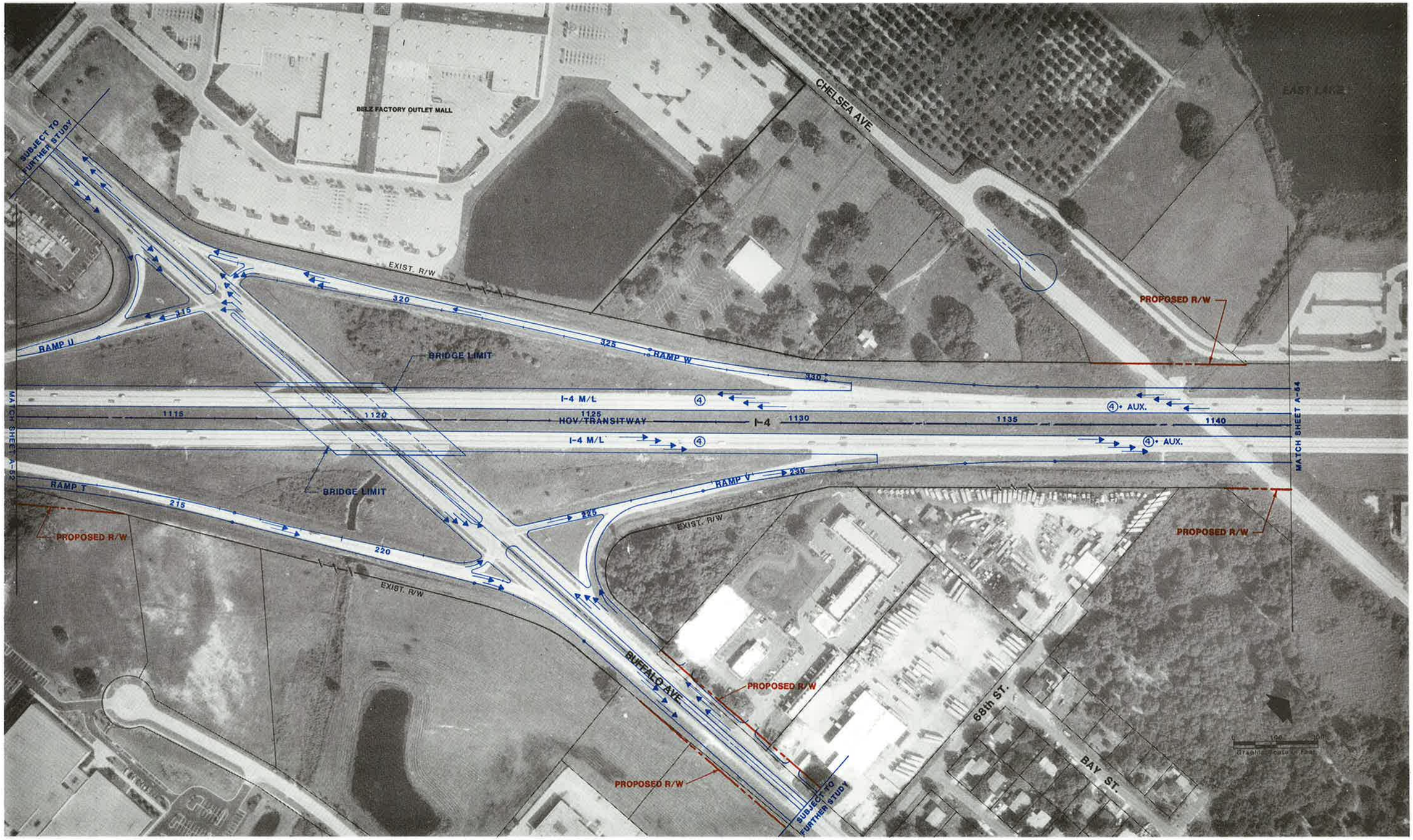


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4A
I-4 AT 30TH AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-52 OF 135

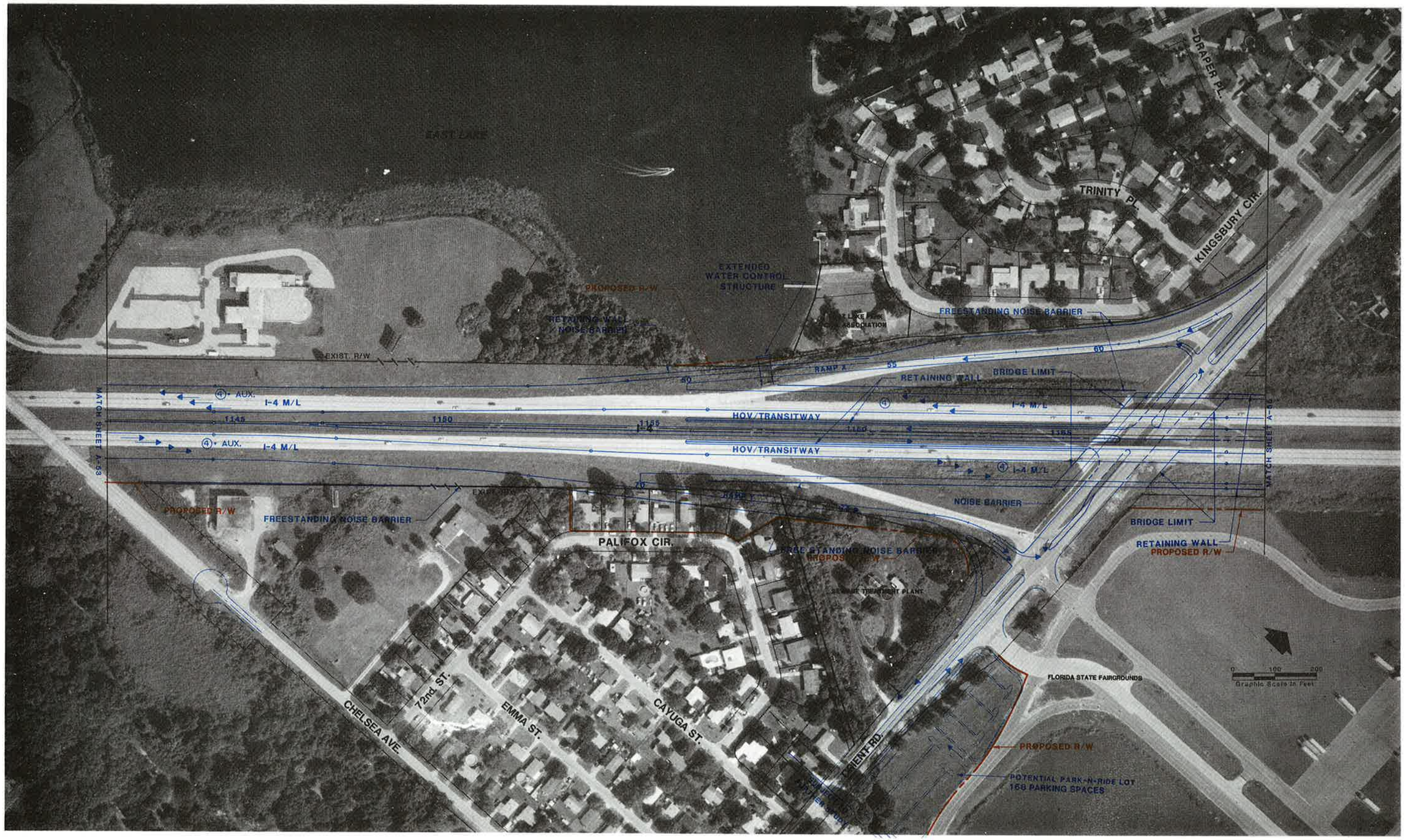


PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-28-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4A
I-4 AT BUFFALO AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-53 OF 135



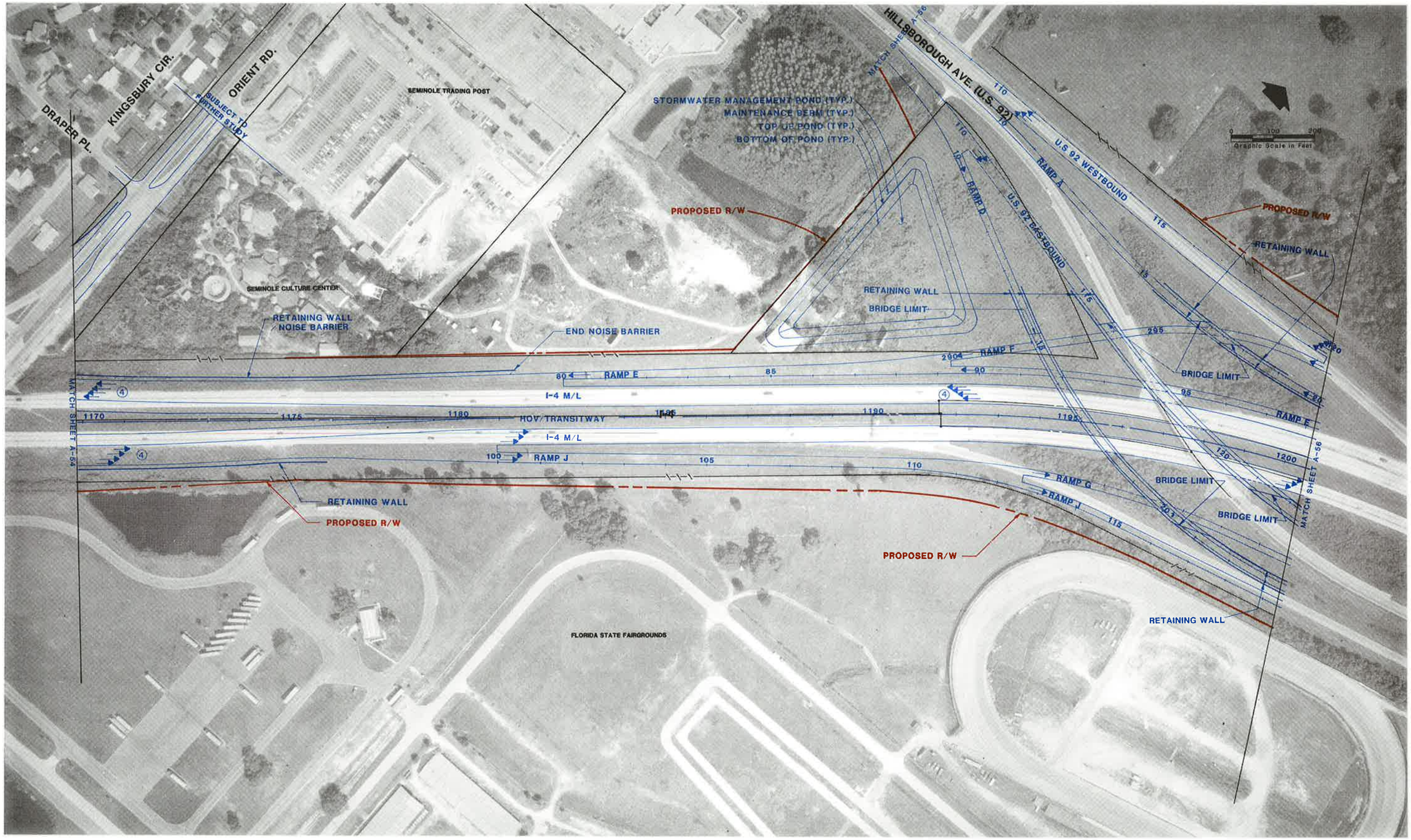
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4A
I-4 AT ORIENT RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-54 OF 135



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

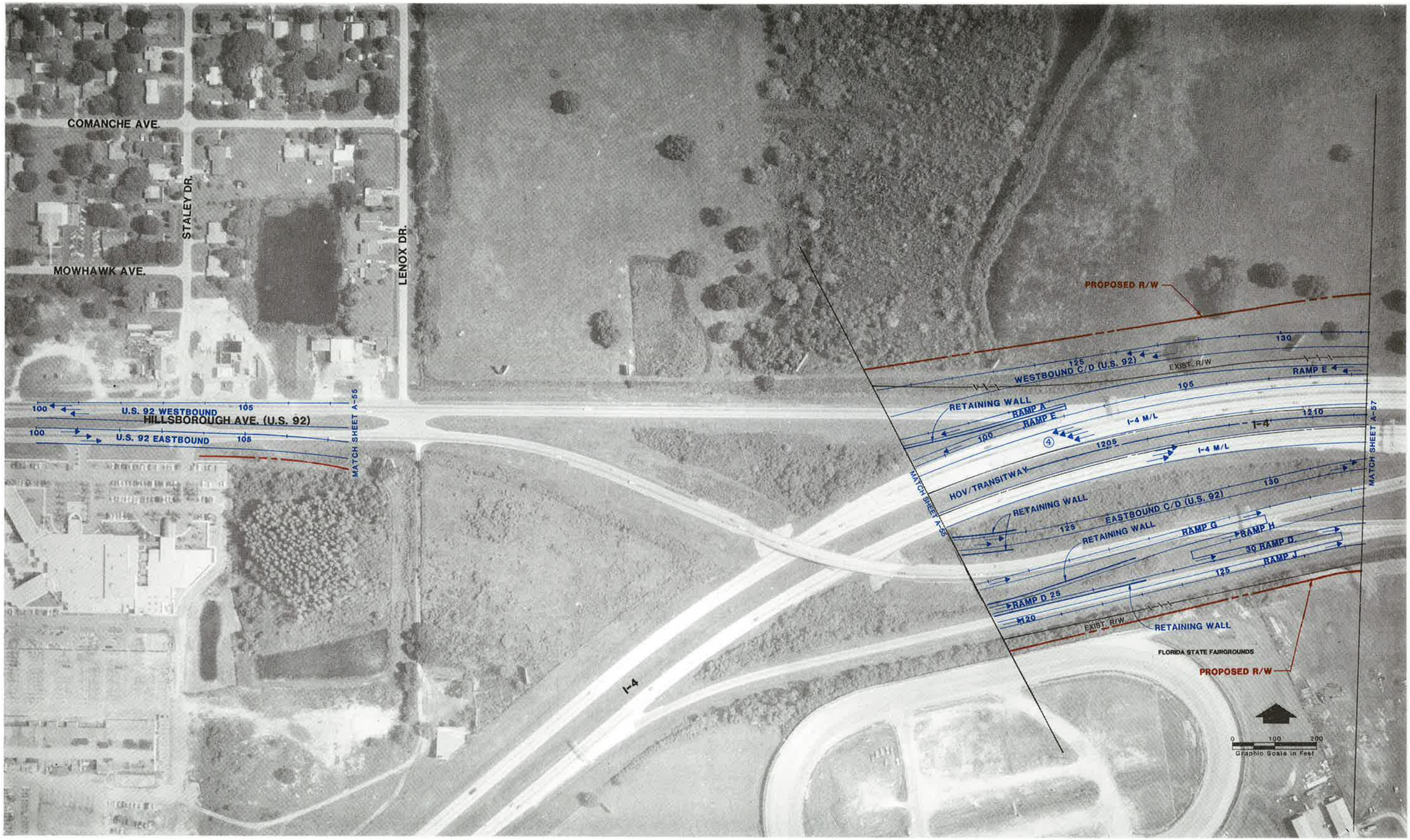
DESIGN STUDY SEGMENT 4A AND 4B
I-4 FLORIDA STATE FAIRGROUNDS

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

SHEET A-55 OF 135



PROJECT No. C1104			
PROJECT DATES			
DATES	DESCRIPTION		
3-26-89	DRAFT MASTER PLAN CONCEPT		
6-89	FINAL MASTER PLAN CONCEPT		

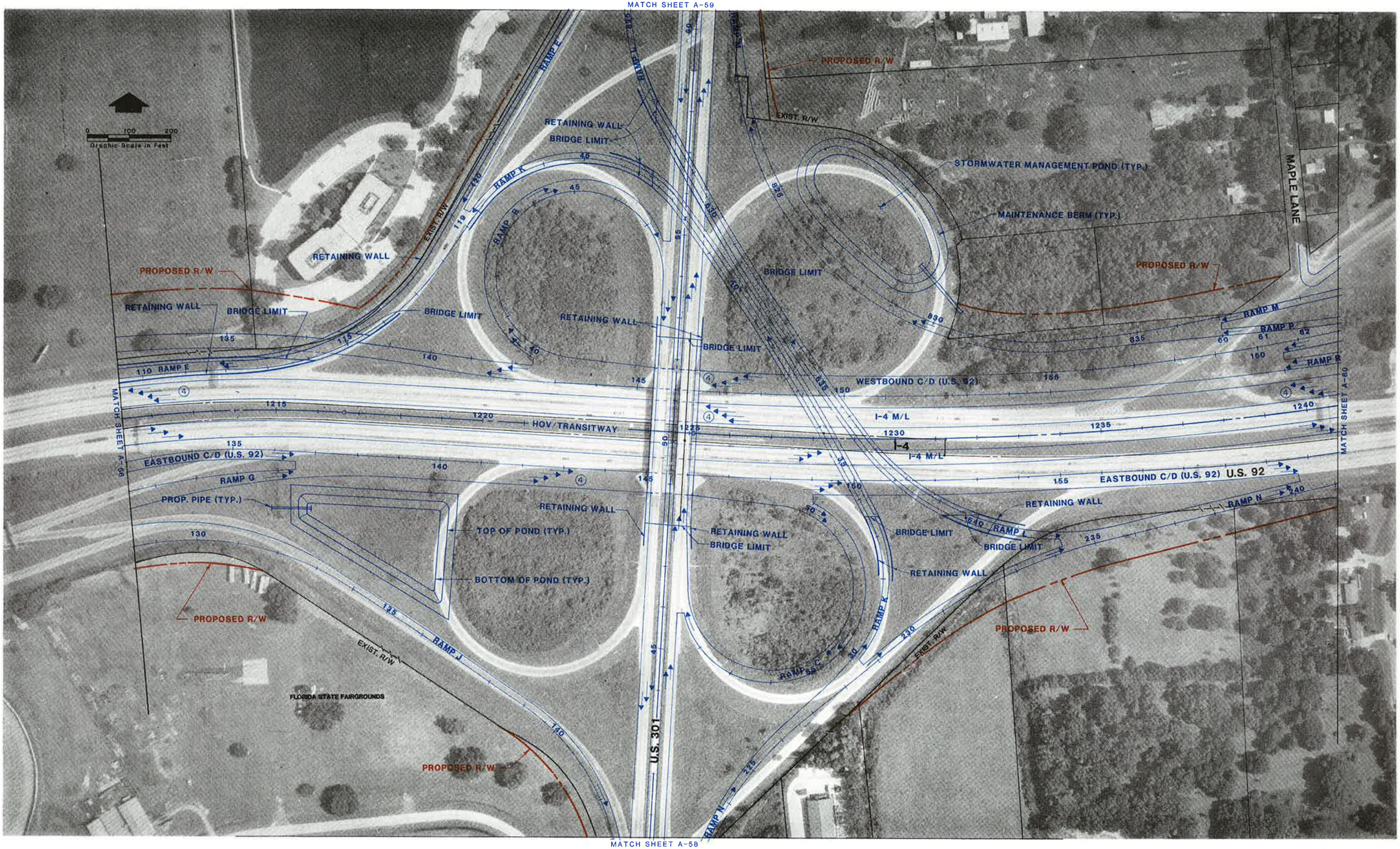
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4B
I-4 AT U.S.92

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-56 OF 135

MATCH SHEET A-59



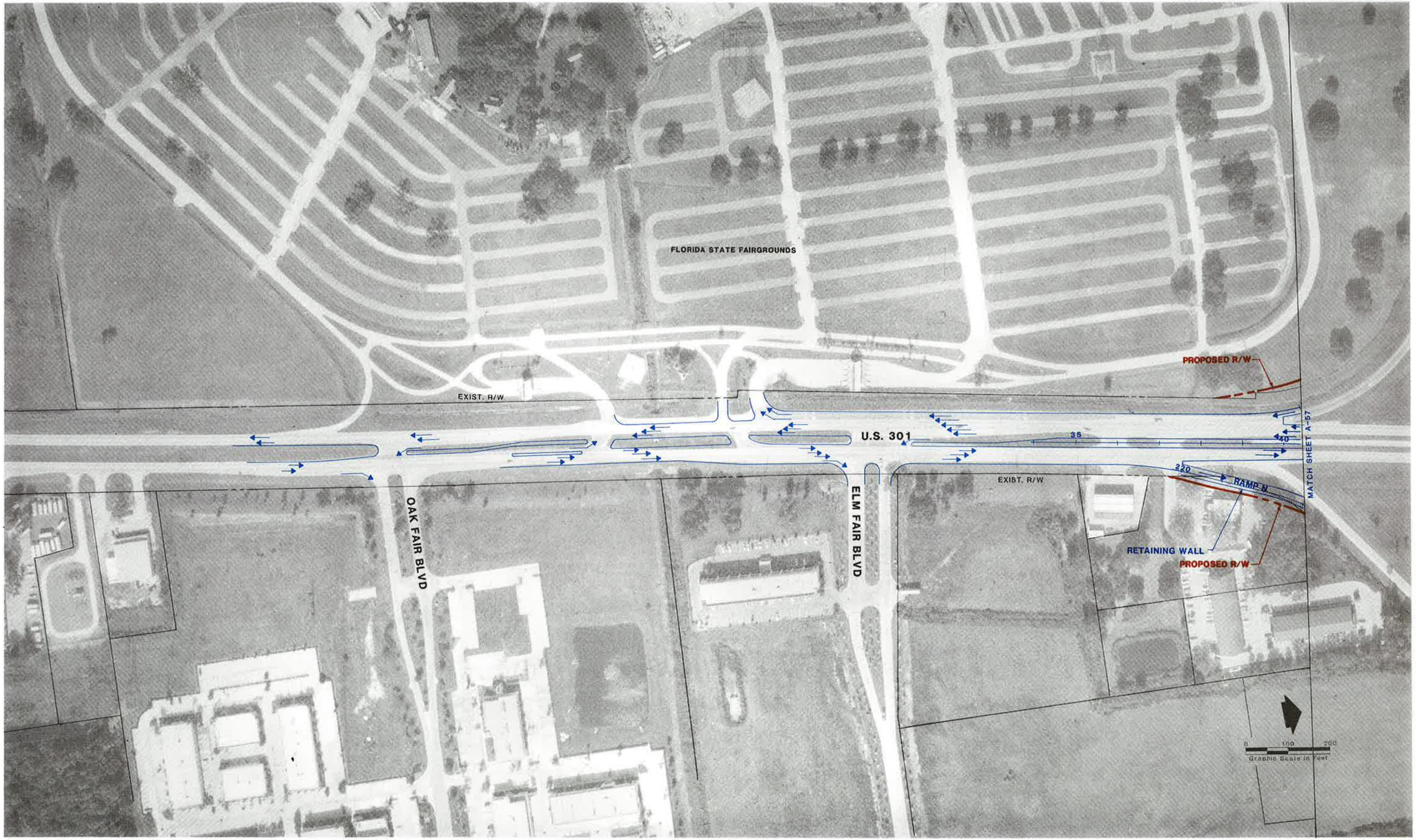
MATCH SHEET A-58

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4B
I-4 AT U.S. 301

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-57 OF 135



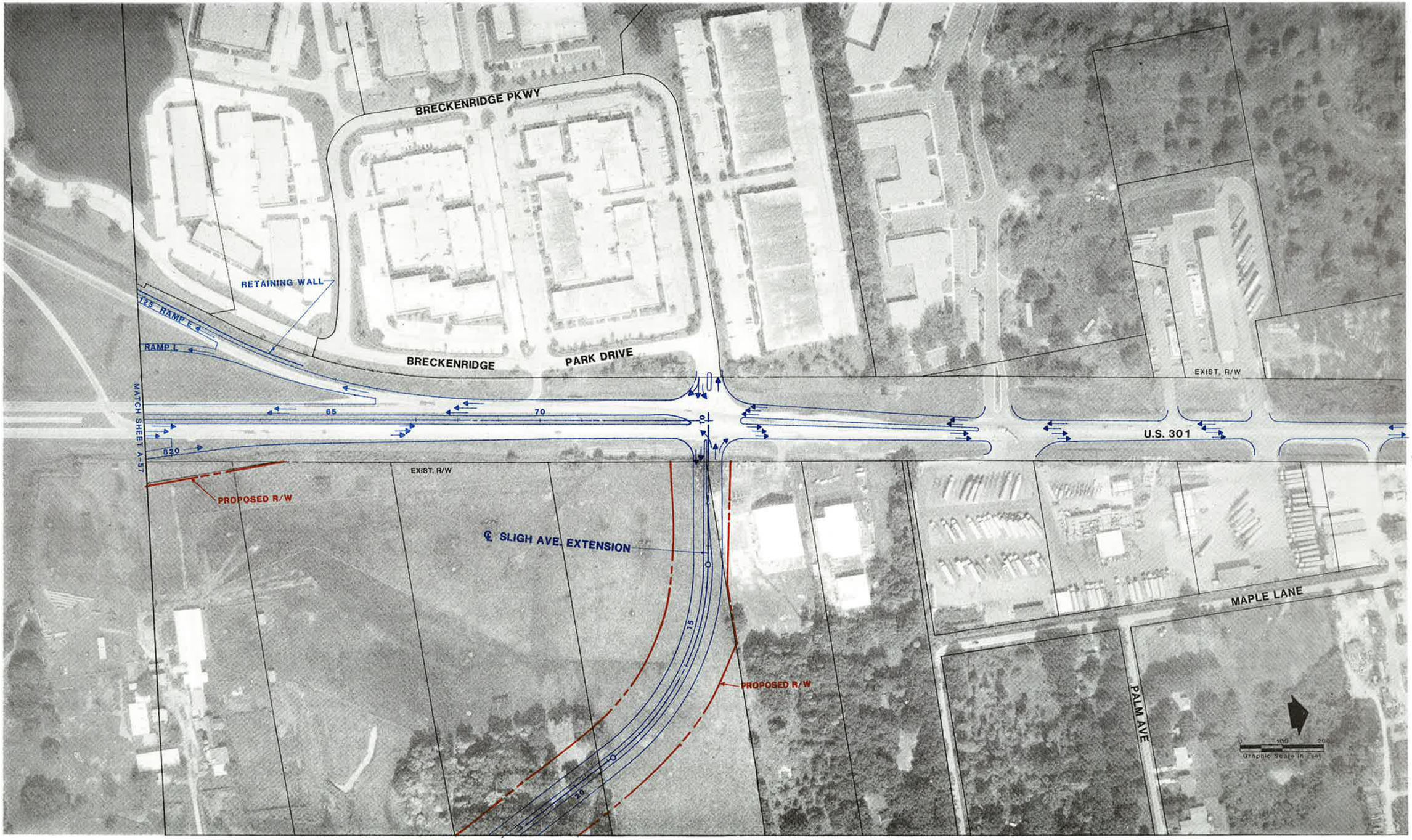
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4B
U.S. 301 SOUTH OF I-4

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-58 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

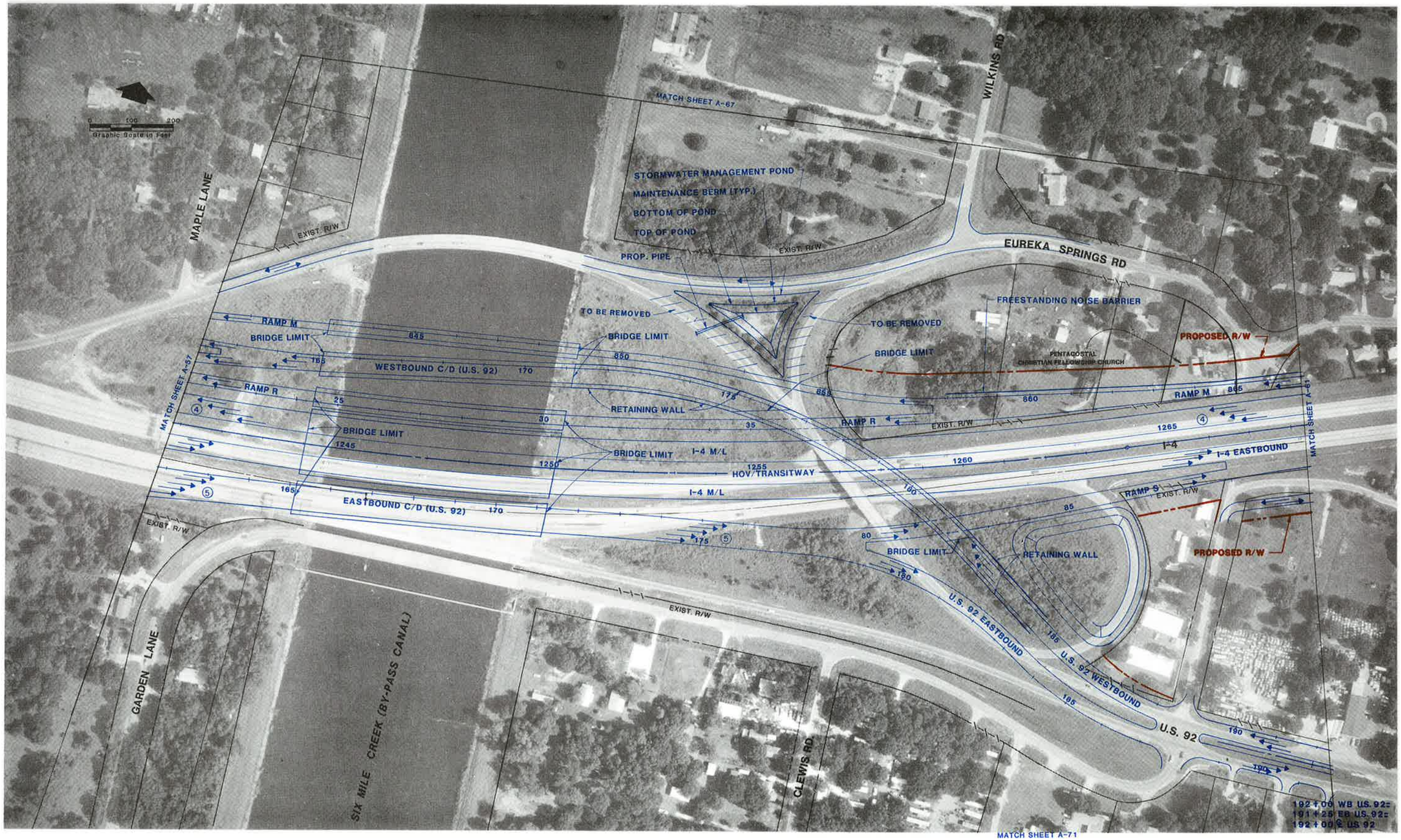
PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4B
U.S. 301 NORTH OF I-4

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-59 OF 135



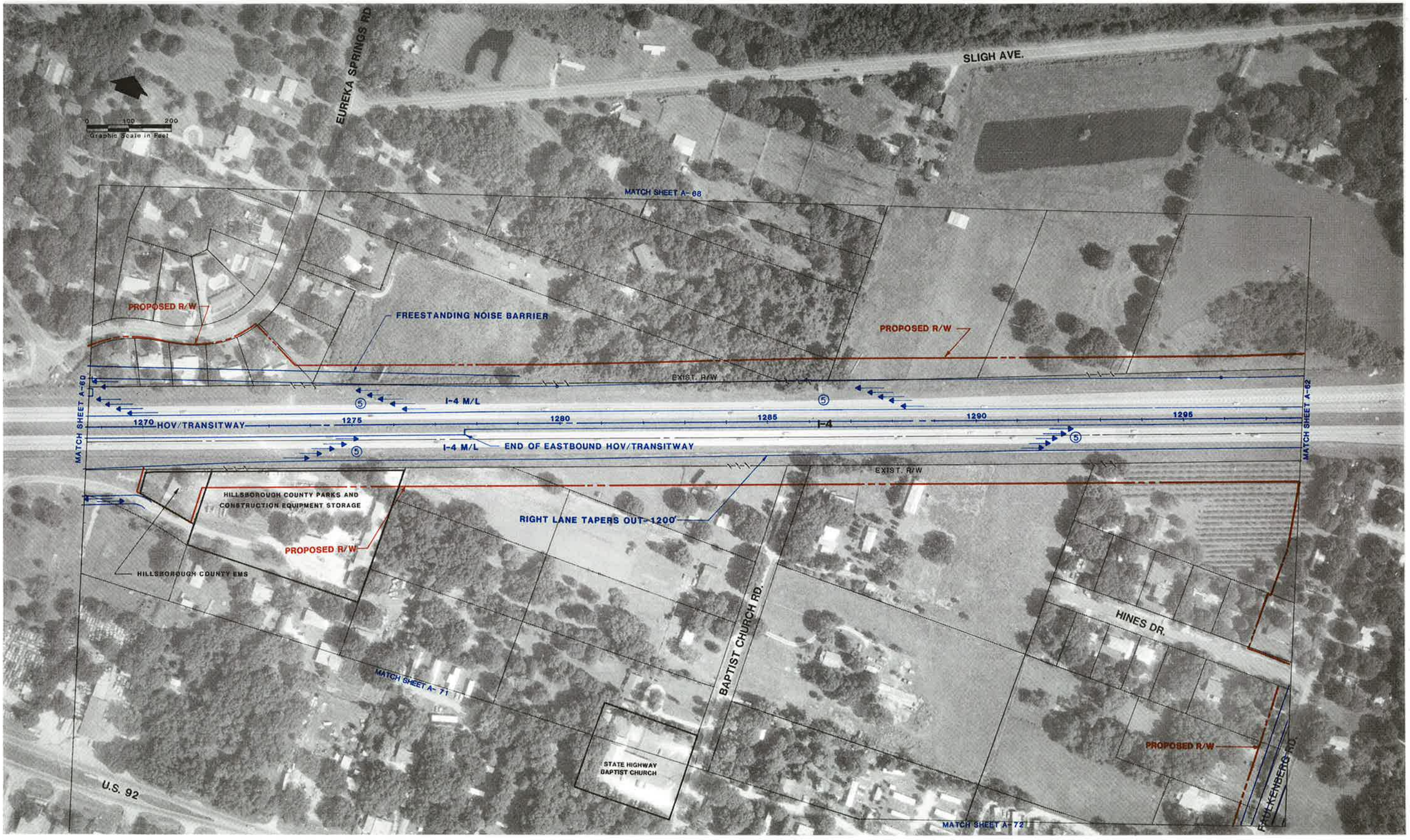
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4B
I-4 AT SIX MILE CREEK (BY-PASS CANAL)

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-60 OF 135



PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

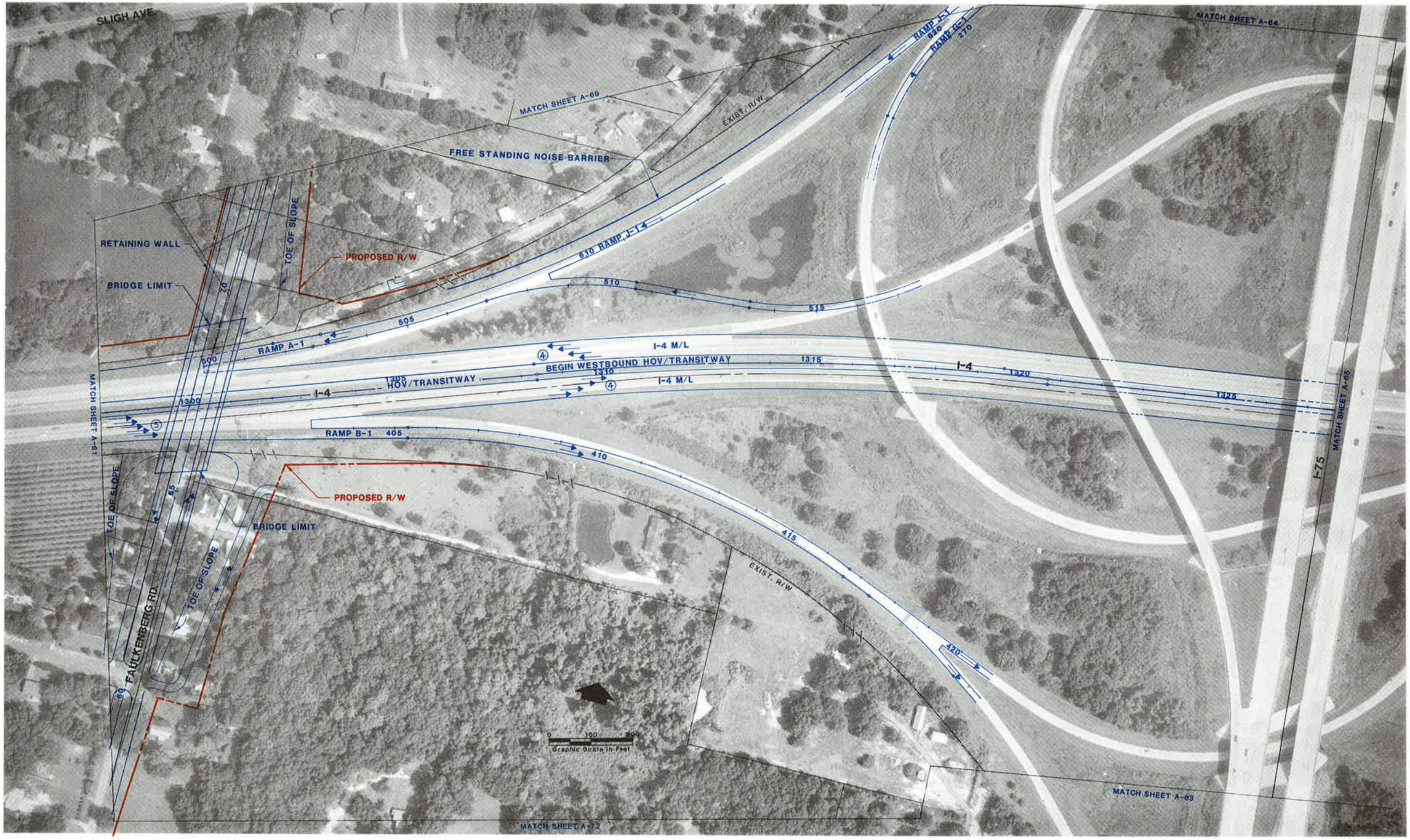
PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
I-4 AT BAPTIST CHURCH RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-61 OF 135



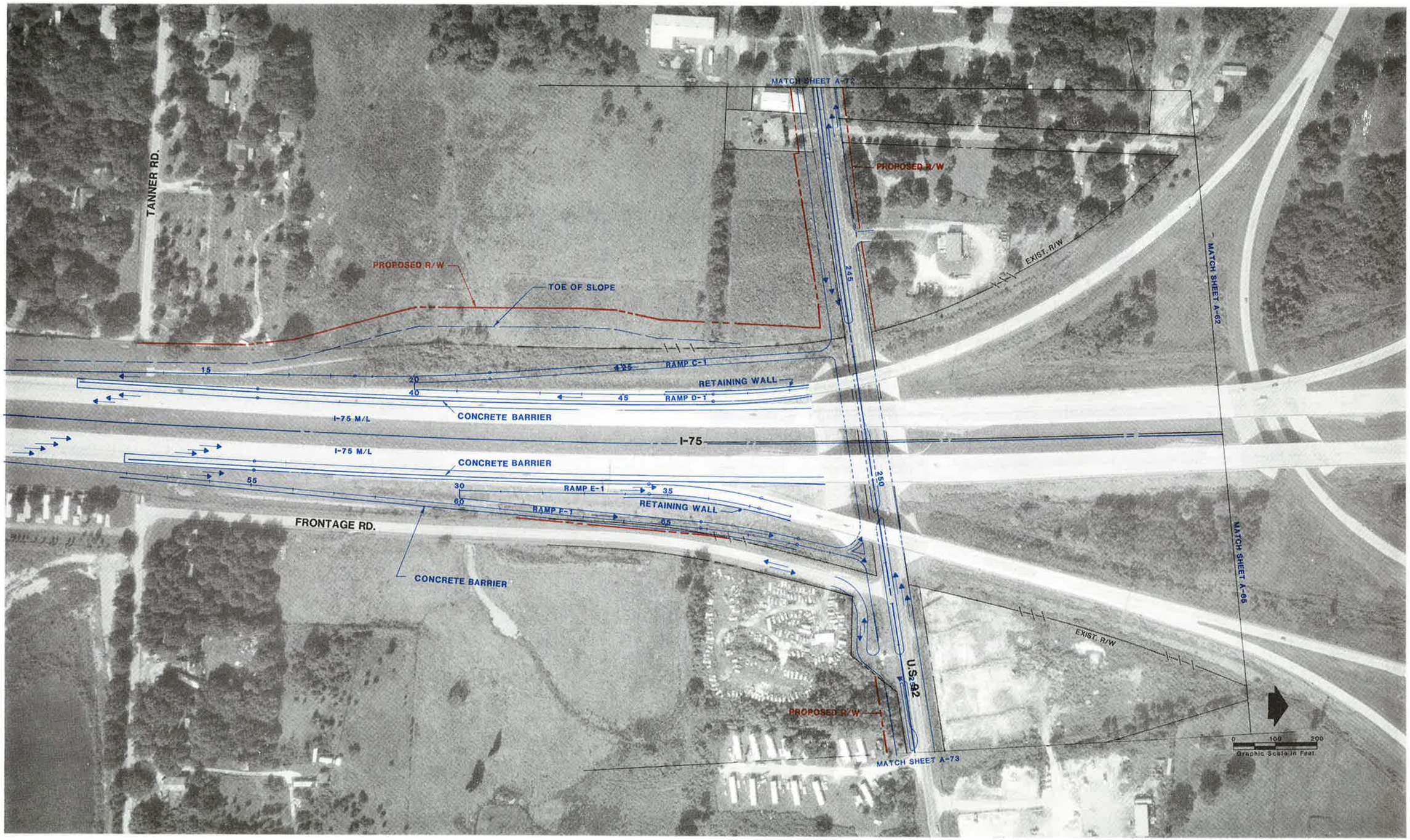
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
I-4 AT FAULKENBURG ROAD

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-62 OF 135



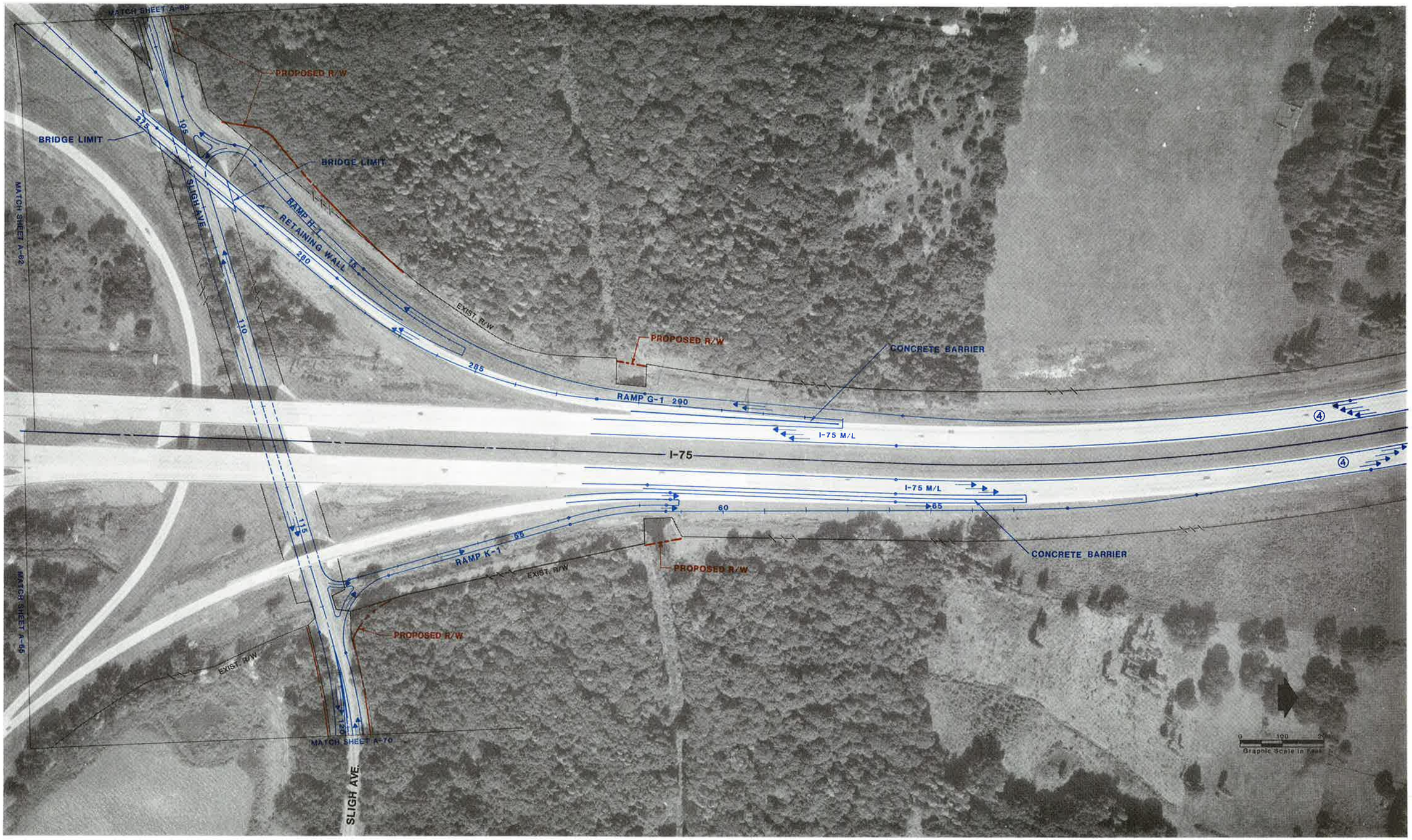
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
I-75 AT U.S. 92

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-63 OF 135



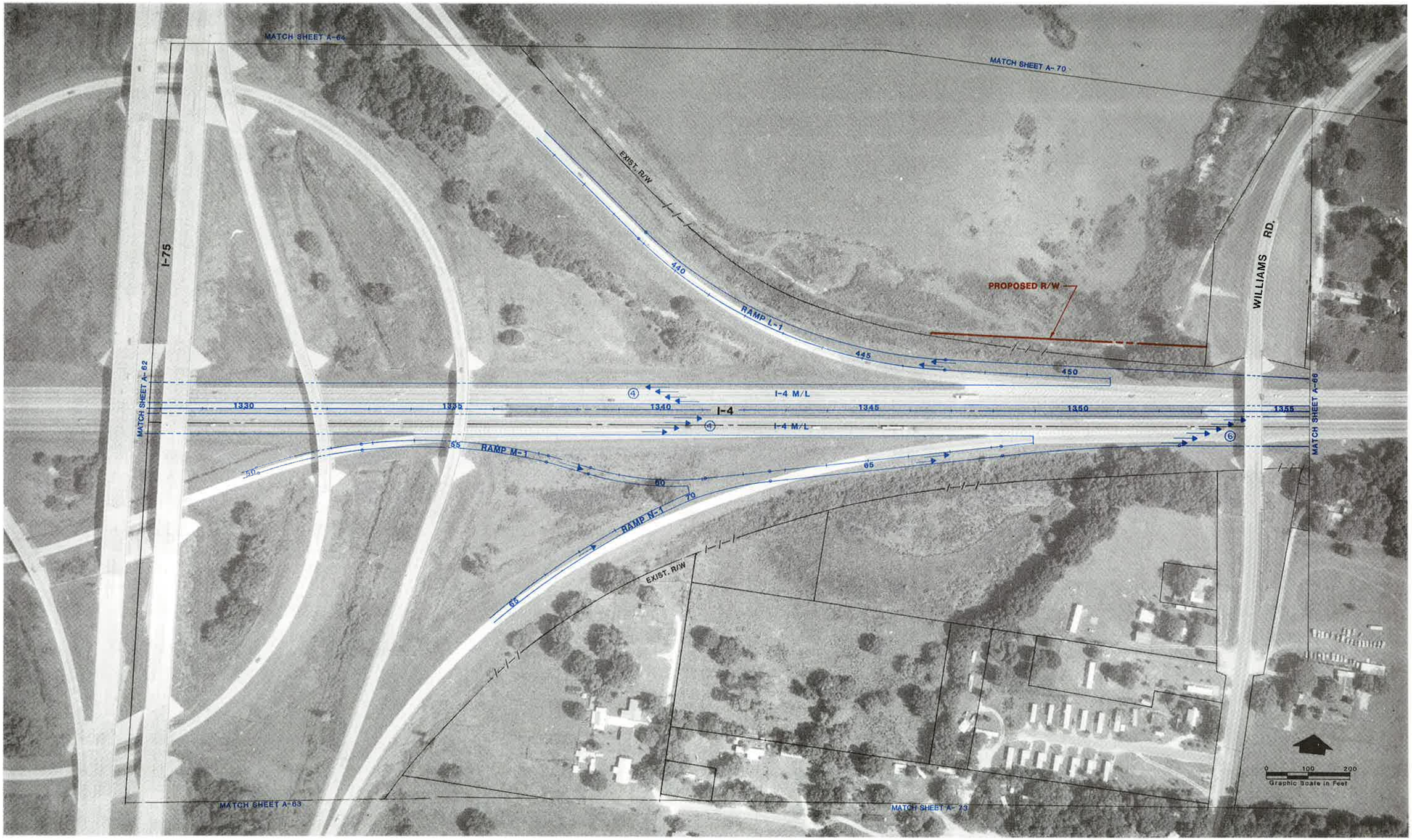
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
I-4 AT SLIGH AVENUE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-64 OF 135



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-28-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

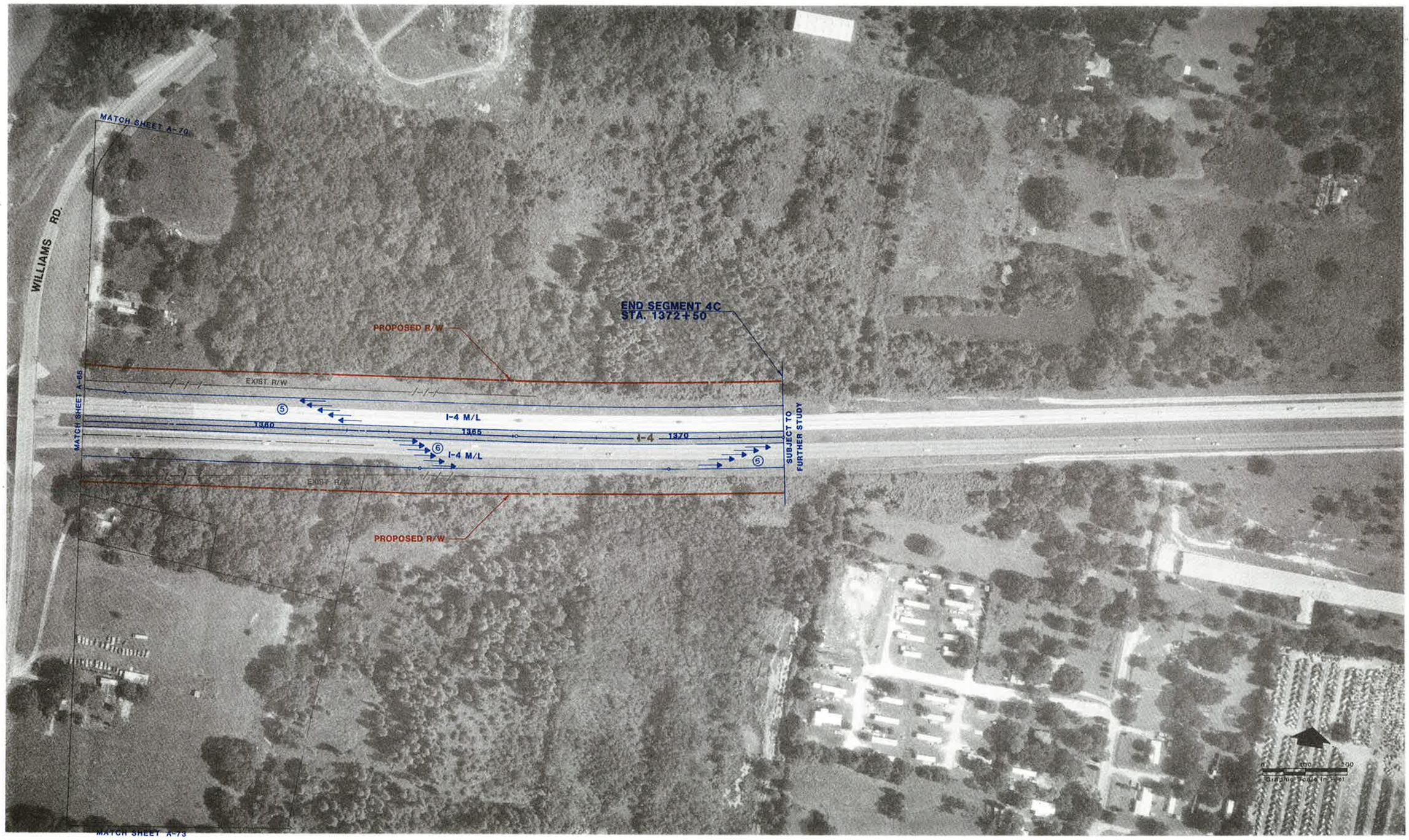
DESIGN STUDY SEGMENT 4C
I-4 AT I-75

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

SHEET A-65 OF 135

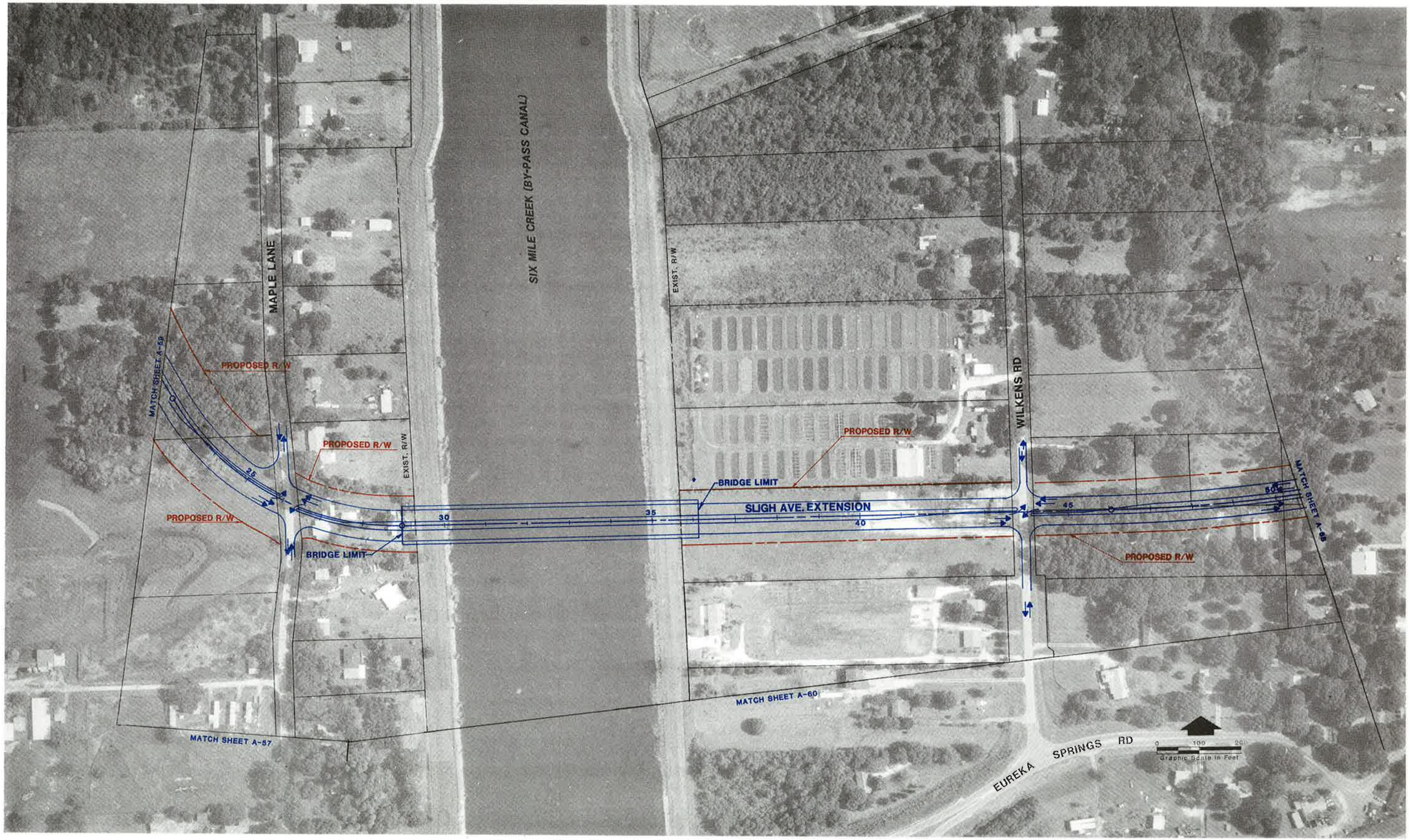


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
I-4 AT WILLIAMS RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-66 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

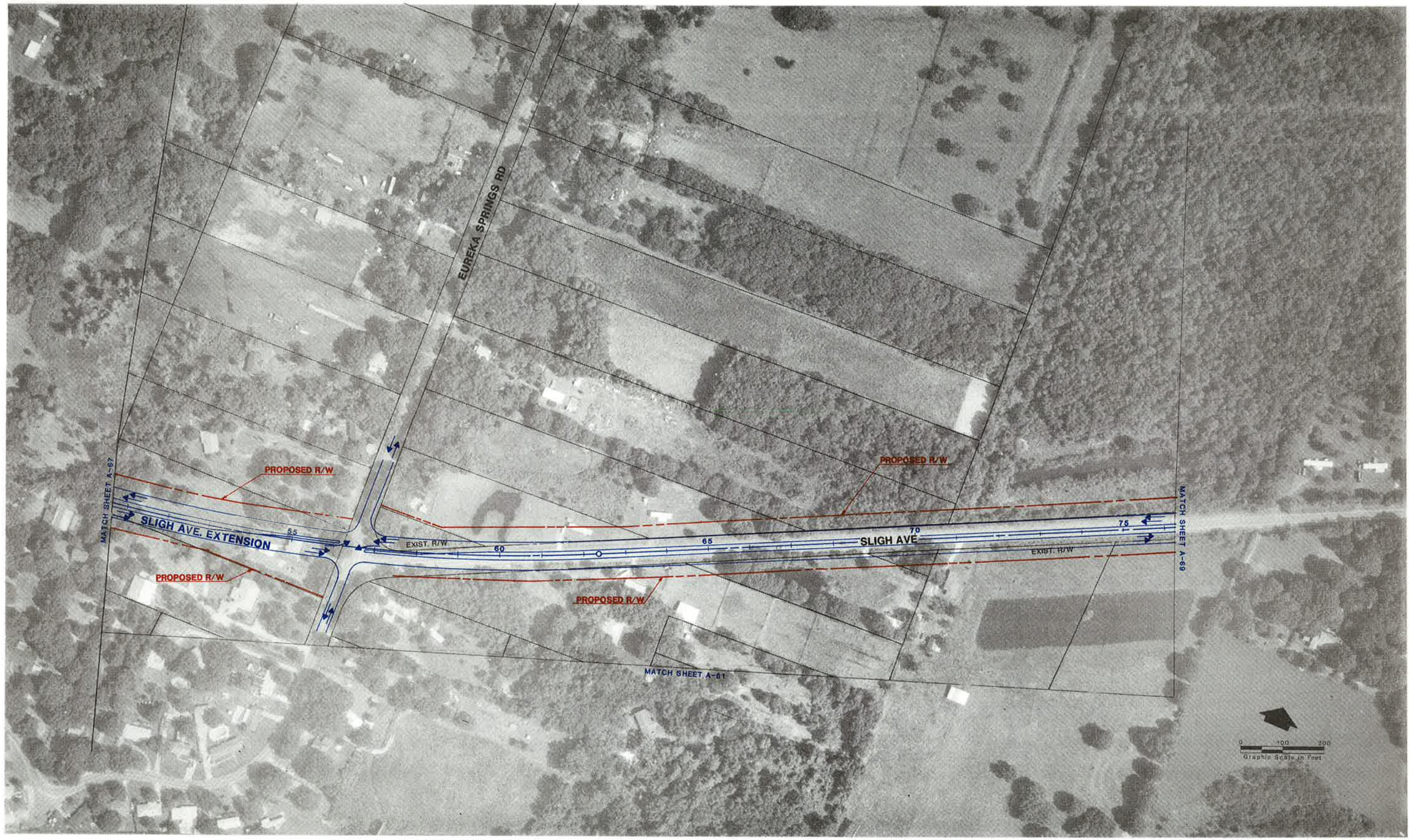
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 4C
SLIGH AVENUE AT SIX MILE CREEK (BY-PASS CANAL)

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-67 OF 135



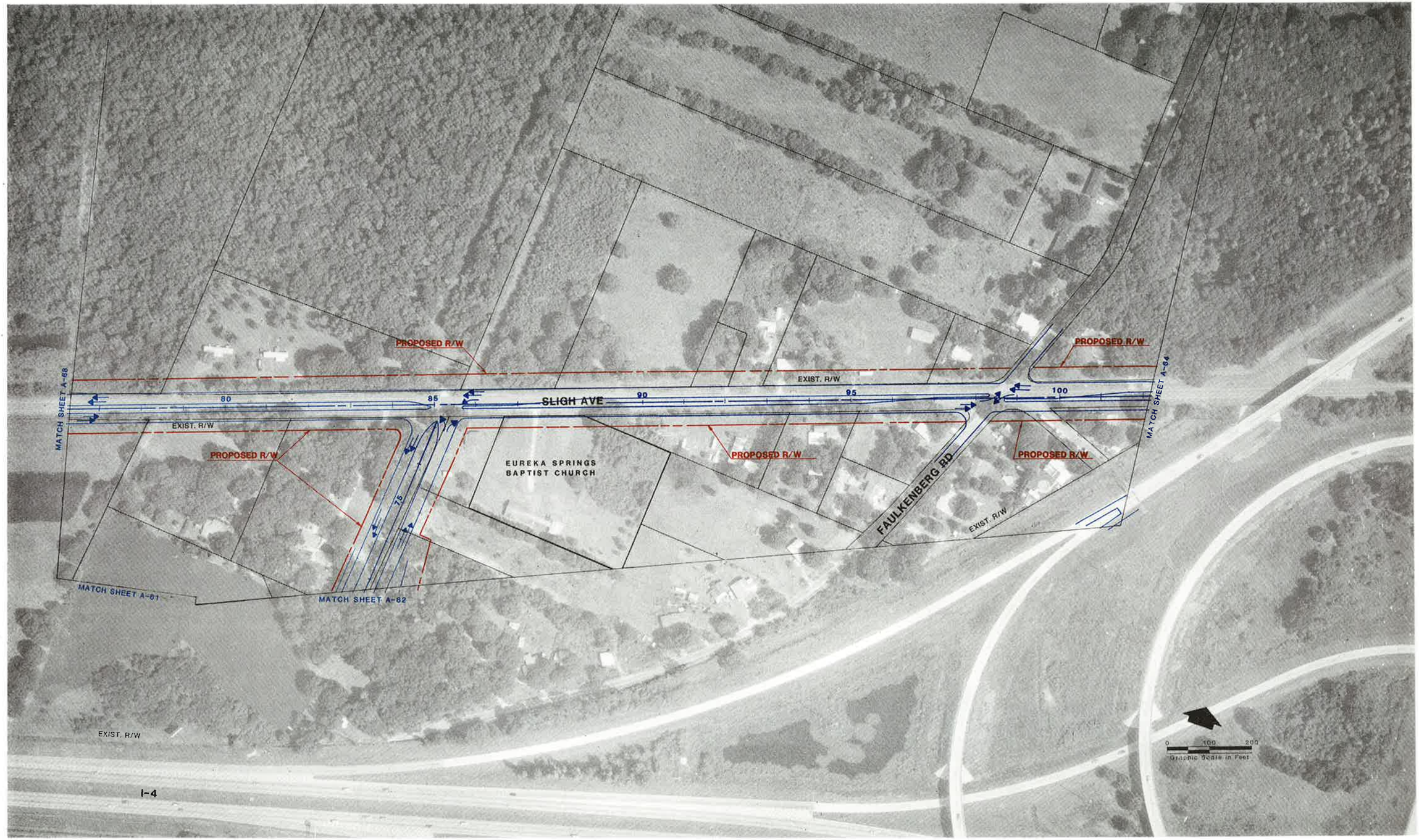
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
SLIGH AVENUE AT EUREKA SPRINGS ROAD

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 SHEET A-68 OF 135

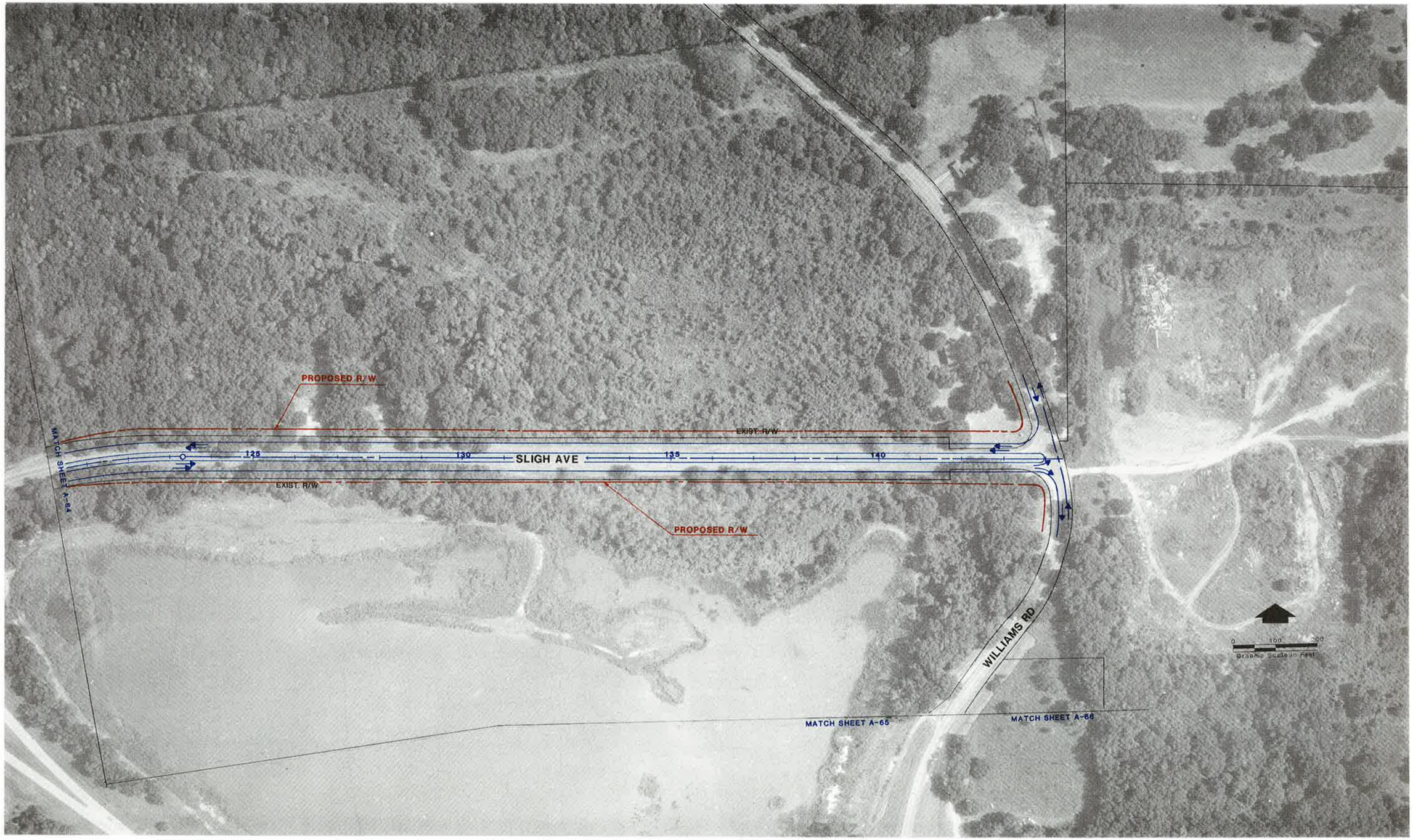


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
SLIGH AVENUE AT FAULKENBURG ROAD

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-69 OF 135



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

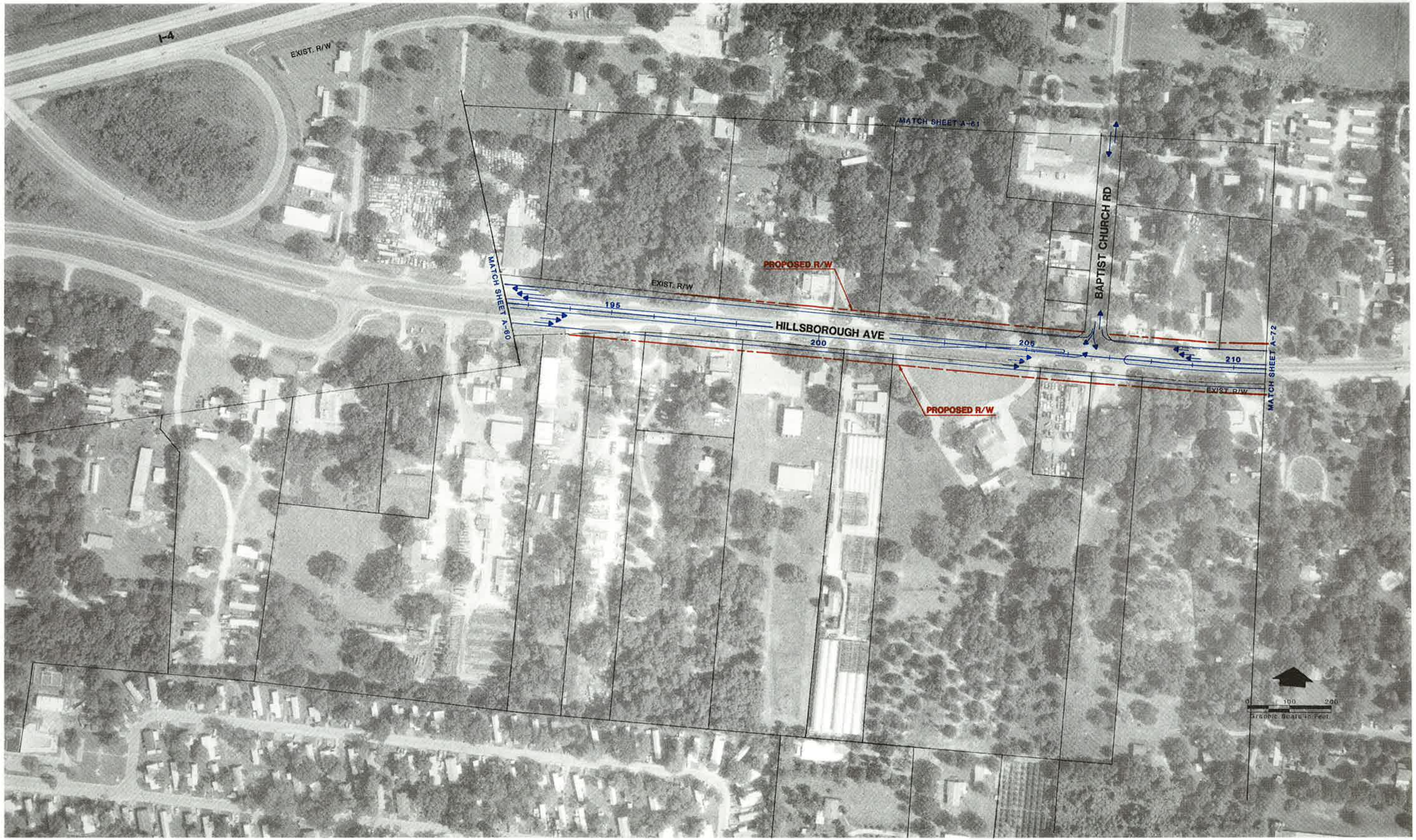
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 4C
SLIGH AVENUE AT WILLIAMS ROAD

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-70 OF 135



PROJECT No. C1104			
PROJECT DATES			
DATES	DESCRIPTION		
3-26-89	DRAFT MASTER PLAN CONCEPT		
6-89	FINAL MASTER PLAN CONCEPT		

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
U.S. 92 AT BAPTIST CHURCH ROAD

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 SHEET A-71 OF 135



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
5-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

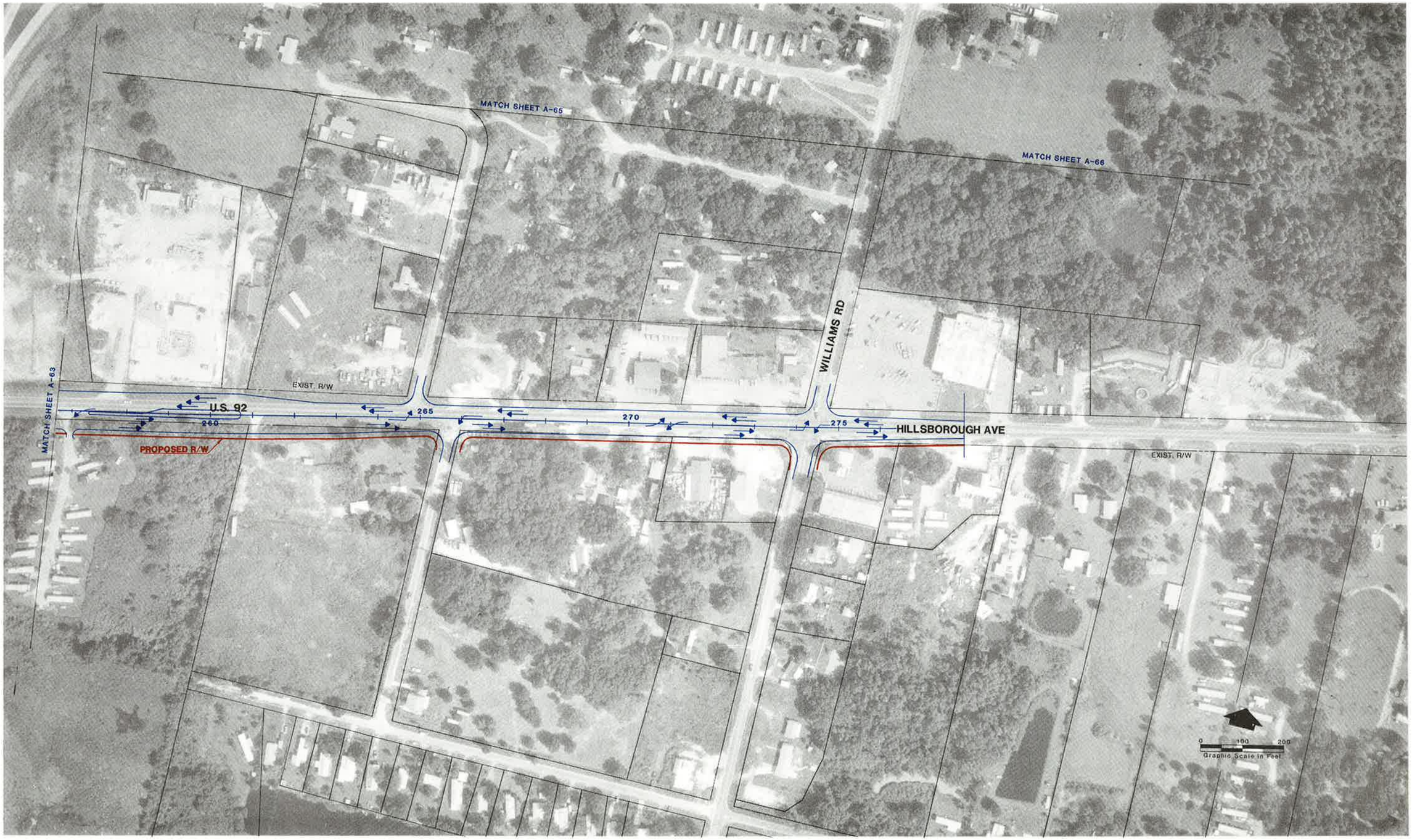
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 4C
U.S. 92 AT FAULKENBURG ROAD

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-72 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW
TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 4C
U.S. 92 AT WILLIAMS ROAD

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-73 OF 135

DESIGN SEGMENTS 5A-5D

I-275 from North of Buffalo Avenue to North of Linebaugh Avenue

(Seminole Heights, Sulphur Springs Areas)

- 2 Roadway System on Interstate 275 beginning north of Buffalo Avenue
- High Occupancy Vehicle (HOV)/Transitway Lanes within interstate alignment
- HOV priority ramps at Yukon Street serving existing Park and Ride Lot
- Existing interchange locations at Hillsborough Avenue, Sligh Avenue, and Busch Boulevard remain
- One-way Frontage Roads from Bird Street to Busch Boulevard parallel to Interstate 275
- Relocation of Bird Street interchange ramps to Waters Avenue to and from the south on Interstate 275
- New interchange ramps at Linebaugh Avenue to and from the south on Interstate 275

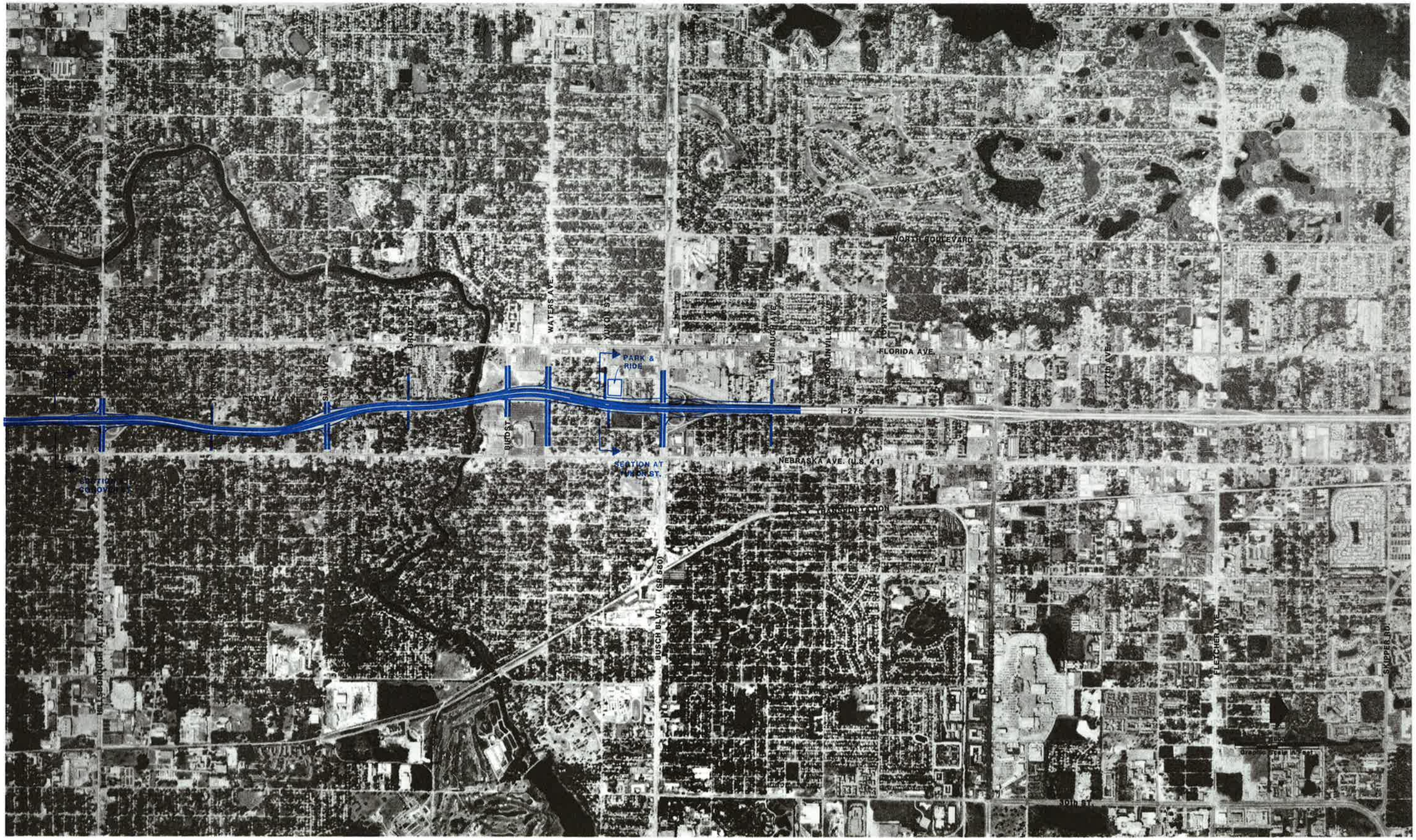
SHEET NO.	SHEET DESCRIPTION
	DESIGN STUDY SEGMENT 5A, B, C AND D DIVIDER SHEET
	DESIGN STUDY SEGMENT 5A, B, C AND D INDEX SHEET
A-74	DESIGN STUDY SEGMENT 5A, B, C AND D KEY MAP
A-75	I-275 CROSS SECTION AT CONOVER STREET
A-76	I-275 CROSS SECTION SOUTH OF YUKON STREET CROSS SECTION
A-77	I-275 AT OSBORNE AVENUE
A-78	I-275 AT HILLSBOROUGH AVENUE
A-79	I-275 AT HANNA AVENUE
A-80	I-275 AT SLIGH AVENUE
A-81	I-275 AT BIRD STREET
A-82	I-275 AT YUKON STREET
A-83	I-275 AT BUSCH BOULEVARD
A-84	I-275 AT LINEBAUGH AVENUE

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5A, B, C, D
INDEX SHEET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402

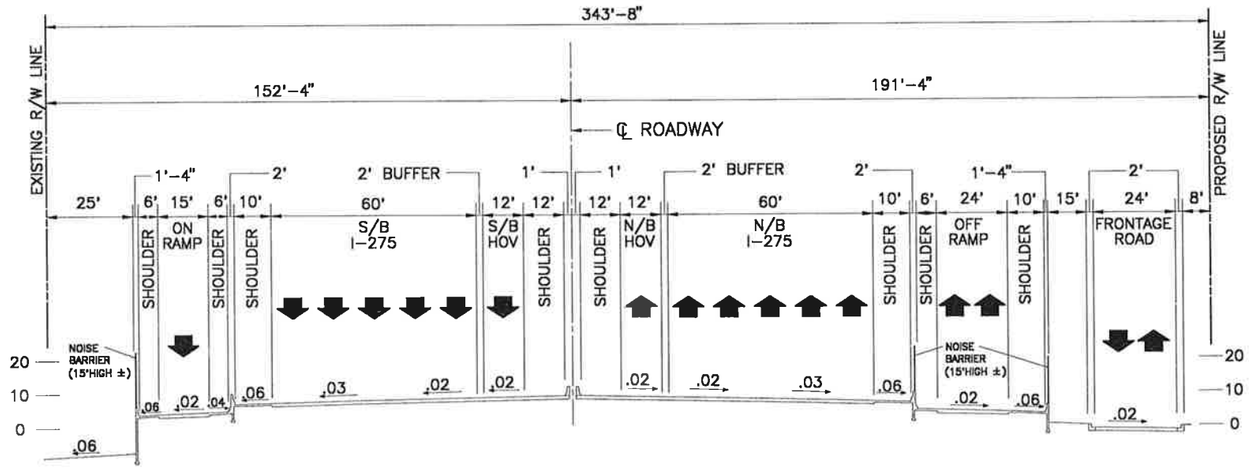


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

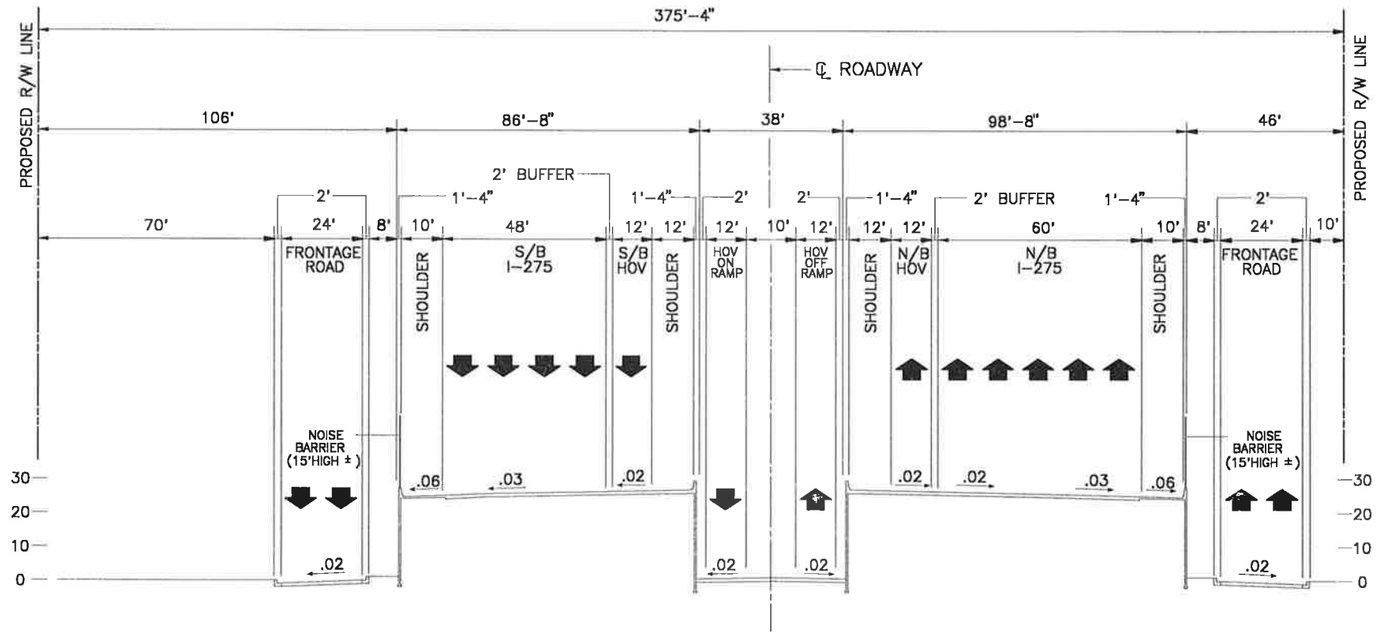
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENTS 5A, 5B, 5C AND 5D
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-74 OF 135



STATION 804+00

PROJECT No. C1104				
PROJECT DATES		THE GREINER TEAM GREINER, INC. GANNETT FLEMING TRANSPORTATION ENGINEERS, INC. TEXAS TRANSPORTATION INSTITUTE KNIGHT APPRAISAL SERVICES	MASTER PLAN CONCEPT DESIGN STUDY SEGMENT 5B I-275 CROSS SECTION AT CONOVER ST.	TAMPA INTERSTATE STUDY FLORIDA DEPARTMENT OF TRANSPORTATION
DATES	DESCRIPTION			
3-26-89	DRAFT MASTER PLAN CONCEPT			
6-89	FINAL MASTER PLAN CONCEPT			
				STATE PROJECT No. 99007-1402 / SHEET A-75 OF 135



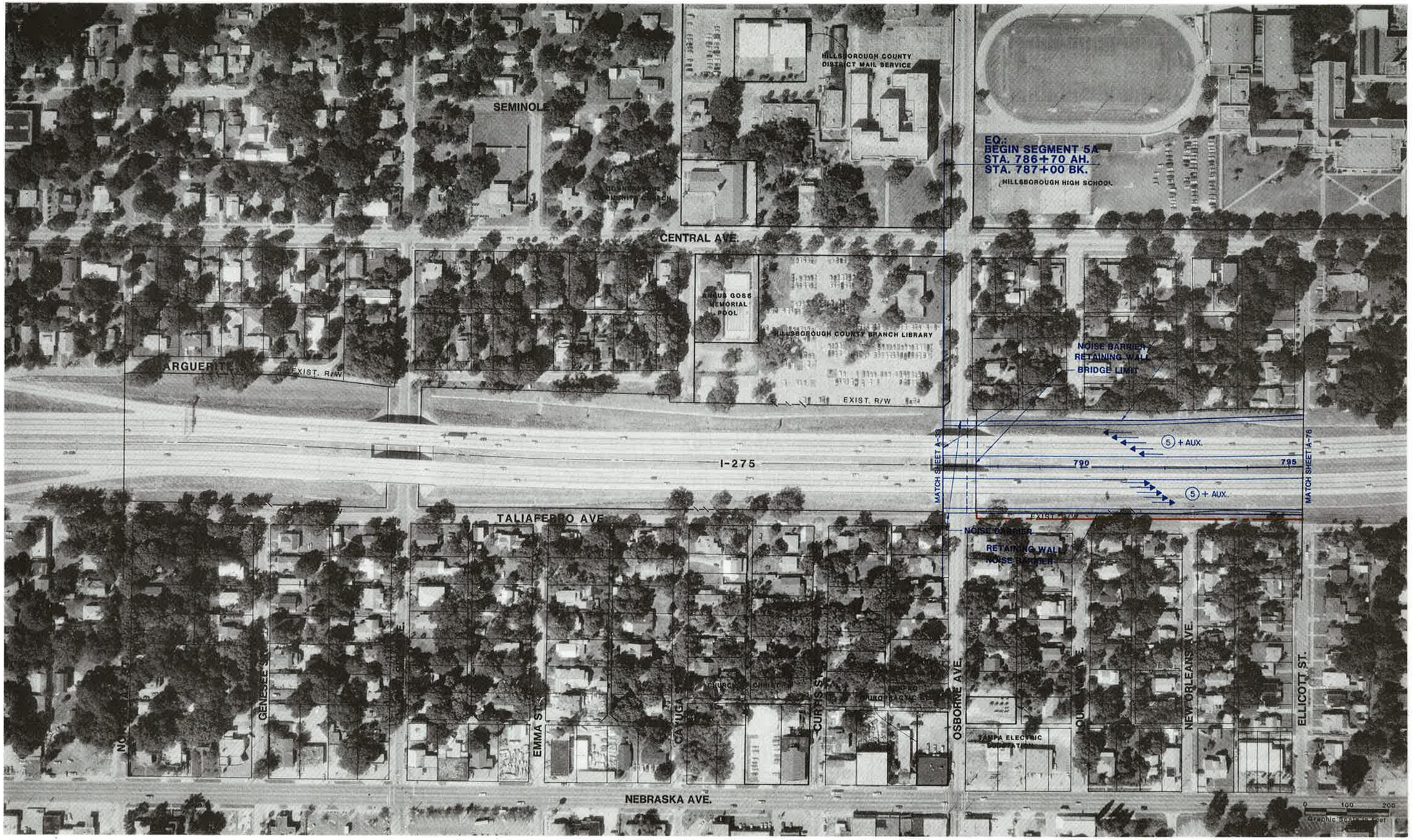
STATION 565+00

PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5C
I-275 CROSS SECTION
SOUTH OF YUKON ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-76 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

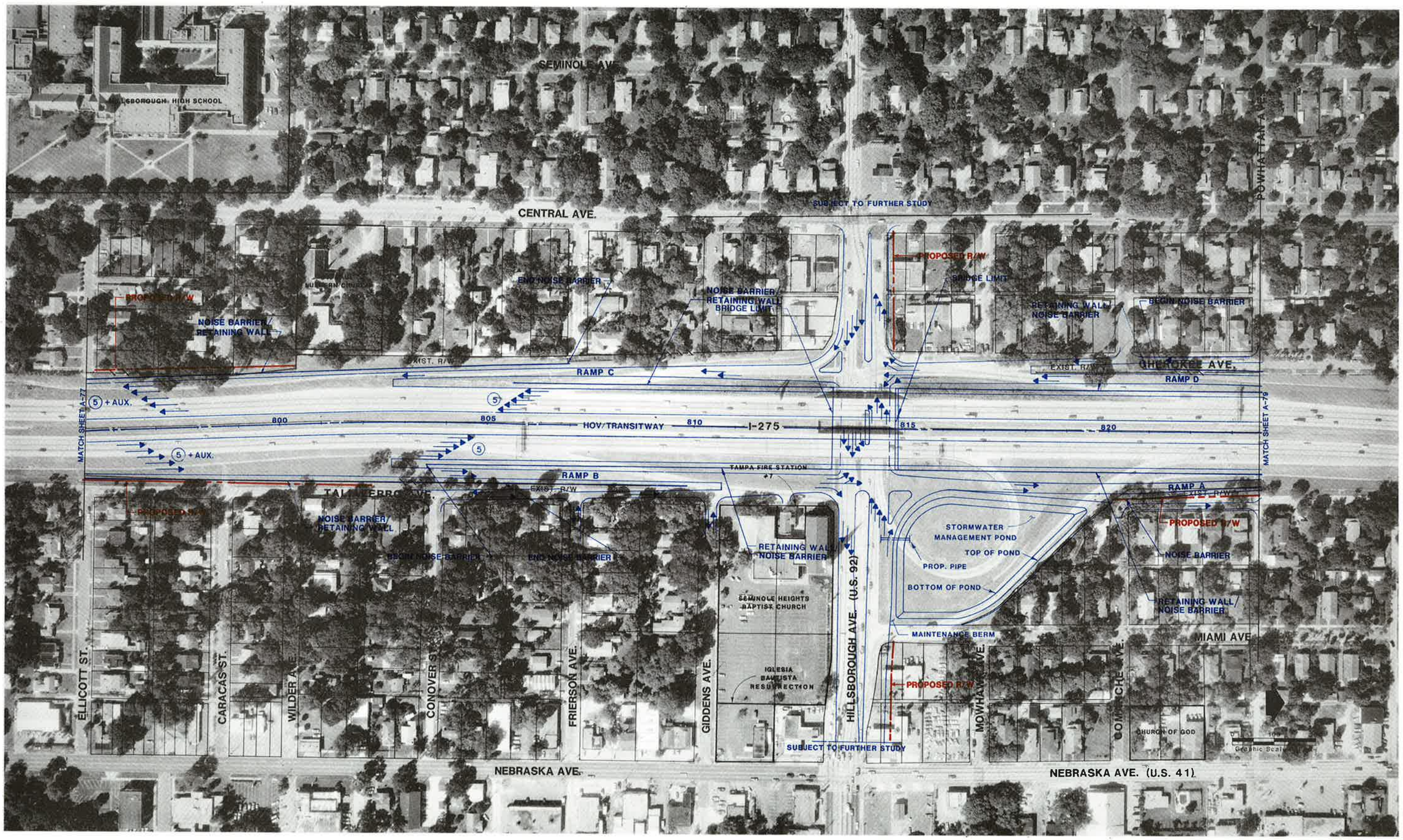
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 5A
I-275 AT OSBORNE AVE.

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-77 OF 135



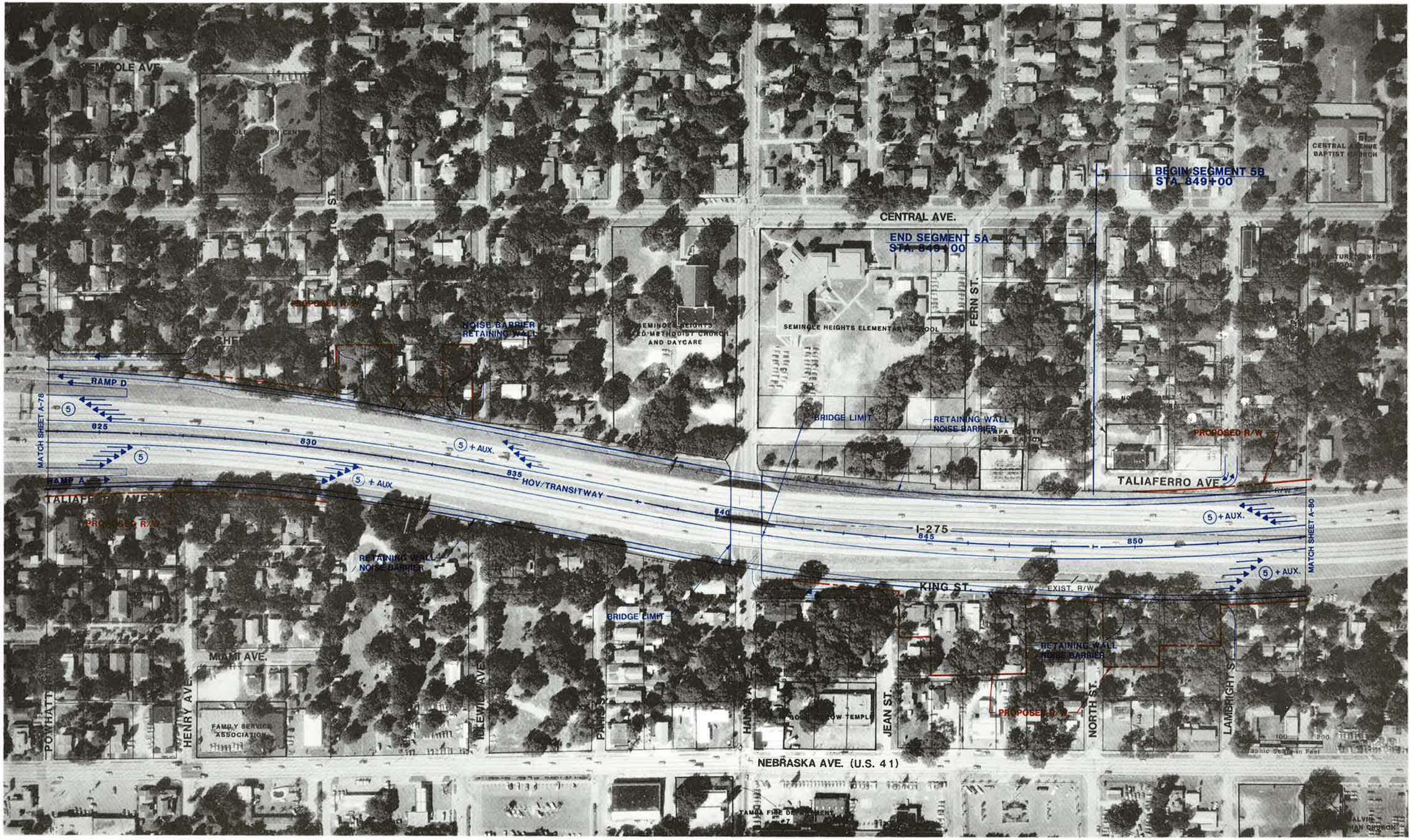
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-28-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5A
I-275 AT HILLSBOROUGH AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-78 OF 135



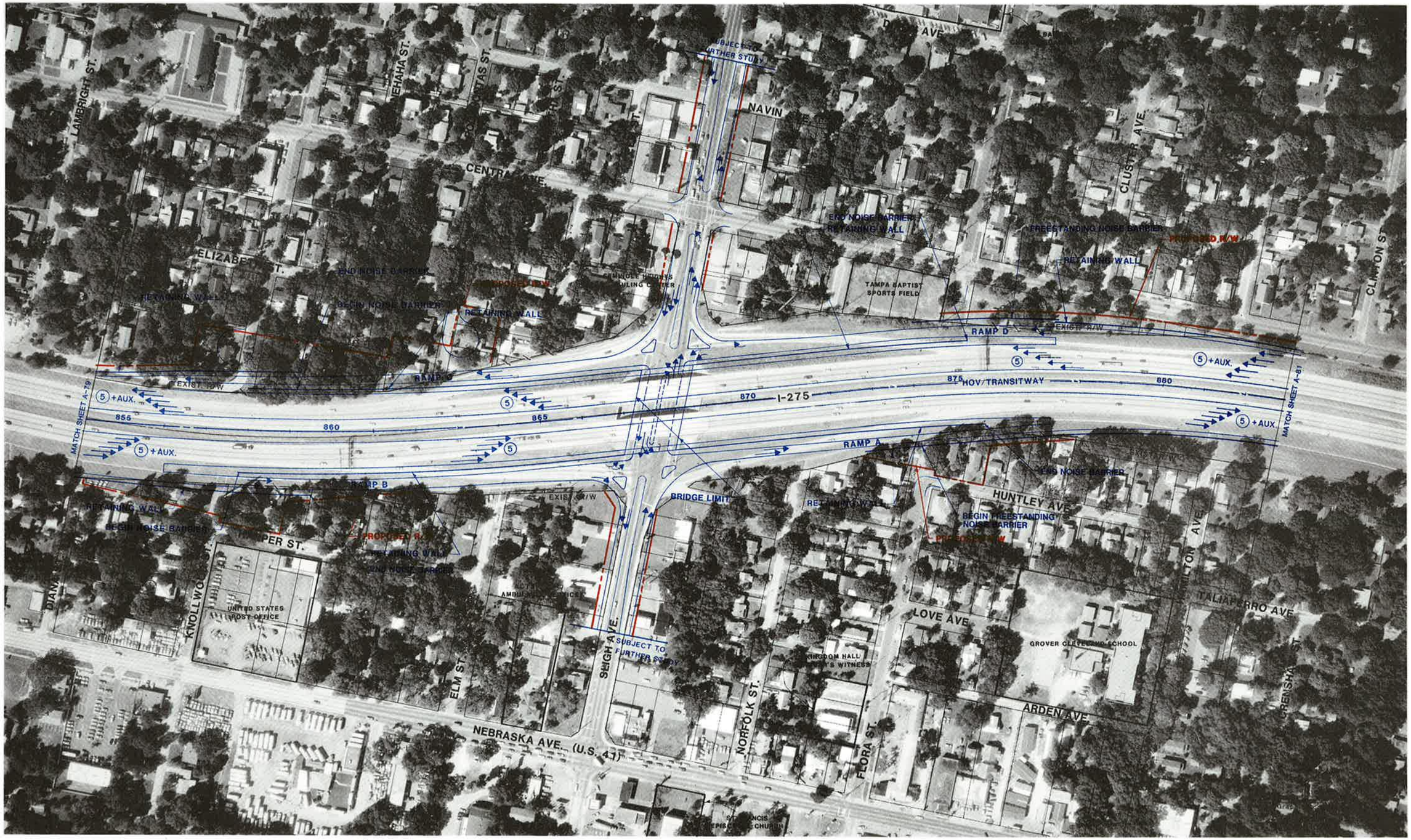
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5A
I-275 AT HANNA AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-79 OF 135

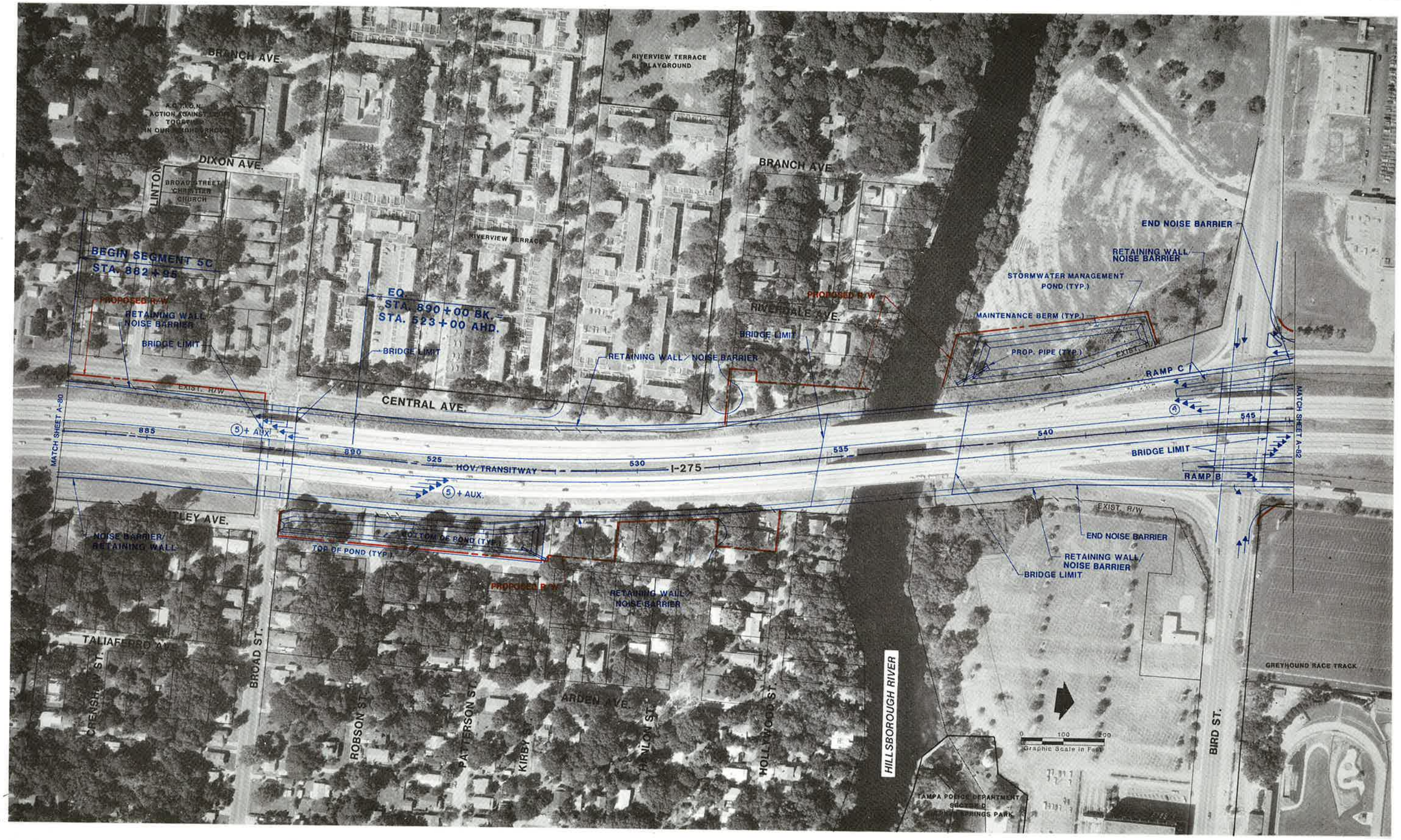


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5B
I-275 AT SLIGH AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-80 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5C
I-275 AT BIRD ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-81 OF 135



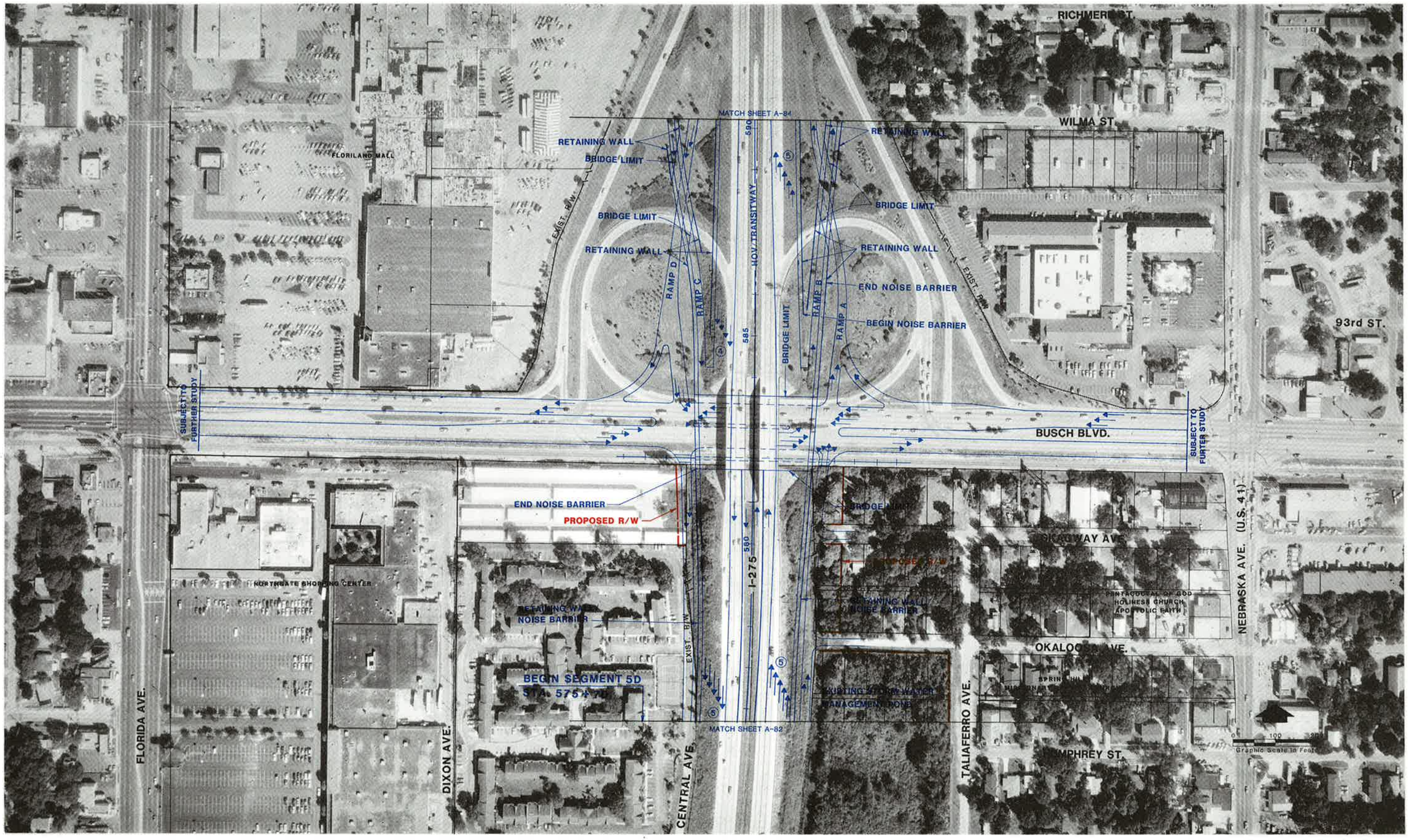
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-99	DRAFT MASTER PLAN CONCEPT
6-99	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5C
I-275 AT YUKON ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-82 OF 135



PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5D
I-275 AT BUSCH BLVD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-83 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 5D
I-275 AT LINEBAUGH AVE.

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-84 OF 135

SHEET NO.	SHEET DESCRIPTION
	DESIGN STUDY SEGMENT 5E, F, G DIVIDER SHEET
	DESIGN STUDY SEGMENT 5E, F, G, INDEX SHEET
A-85	DESIGN STUDY SEGMENT 5E, F, G KEY MAP
A-86	I-275 CROSS SECTION AT 109TH AVENUE
A-87	I-275 CROSS SECTION SOUTH OF SINCLAIR HILLS ROAD
A-88	I-275 AT 109TH AVENUE
A-89	I-275 AT FOWLER AVENUE
A-90	I-275 AT 127TH AVENUE
A-91	I-275 AT FLETCHER AVENUE
A-92	I-275 AT 143RD AVENUE
A-93	I-275 AT APRIL LANE
A-94	I-275 AT BEARSS AVENUE
A-95	I-275 AT SINCLAIR HILLS ROAD
A-96	SINCLAIR HILLS ROAD AT FLORIDA AVENUE
A-97	I-275 AT NEBRASKA
A-98	I-275 AT LAKE PALM DRIVE

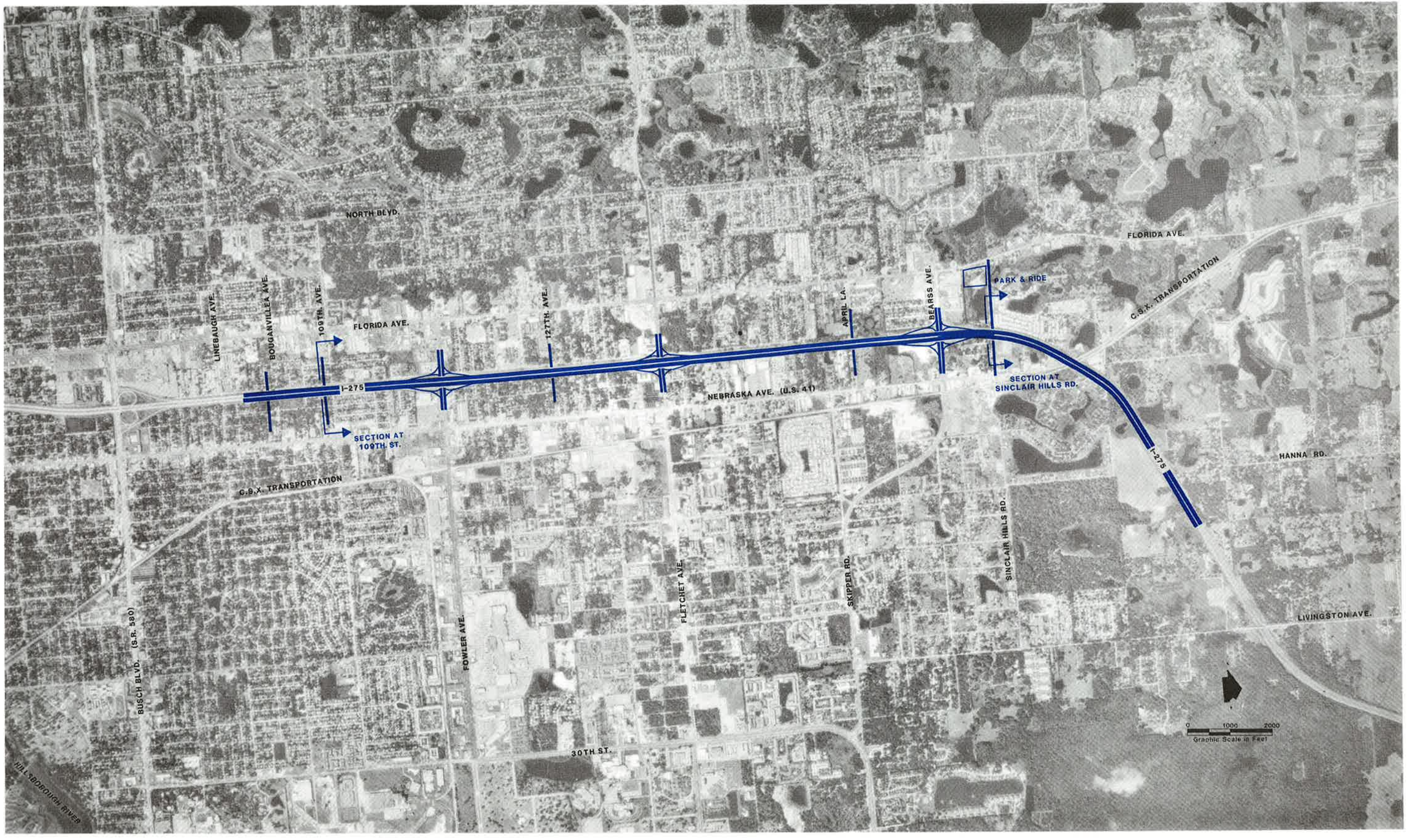
OLD TAMPA BAY
HILLSBOROUGH BAY
McKAY BAY
DAVIS ISLAND
TAMPA
TEMPLE TERRACE
TAMPA INTERNATIONAL AIRPORT
EISENHOWER BLVD.
WESTSHORE BLVD.
LOIS AVE.
GANDY CONNECTOR
DALE MABRY HWY.
GANDY BLVD.
HIMES AVE.
MacDILL AVE.
ARMENIA AVE.
HOWARD AVE
NORTH BLVD.
TAMPA ST.
CROSSTOWN EXP. (TOLL)
JOHN F. KENNEDY BLVD
CYPRESS ST.
SPRUCE ST.
BOY SCOUT BLVD.
WATERS AVE.
GUNN HWY.
NORTHWEST EXPWY.
CONNECTION TO SUNCOAST CORRIDOR
DALE MABRY HWY.
NORTH TAMPA PKWY.
HILLSBOROUGH RIVER
FLORIDA AVE.
NEBRASKA AVE.
YUKON ST.
109th AVE.
127th AVE.
APRIL LANE
BEARSS AVE.
SINCLAIR HILLS RD
SKIPPER RD.
LINEBAUGH AVE.
BUSCH BLVD.
SLIGH AVE.
BIRD ST.
14 ST.
FLORIBRASKA AVE.
7th AVE.
21st ST.
22nd ST.
30th ST.
40th ST.
BUFFALO AVE.
HILLSBOROUGH AVE.
CROSSTOWN CONNECTOR
50th ST.
56th ST.
COLUMBUS DR.
ORIENT RD.
TAMPA BYPASS CANAL
SLIGH AVE.
FAULKENBURG RD.
WILLIAMS RD.
FOWLER AVE.
FLETCHER AVE.
BRUCE B. DOWNS BLVD.
LIVINGSTON AVE.
COUNTY HILLSBOROUGH COUNTY PASCO
COUNTY LINE ROAD
NEW S.R. 54
CYPRESS CREEK
5E
5F
5G
SCALE IN MILES
0 1 2

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5E, F, G
INDEX SHEET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402



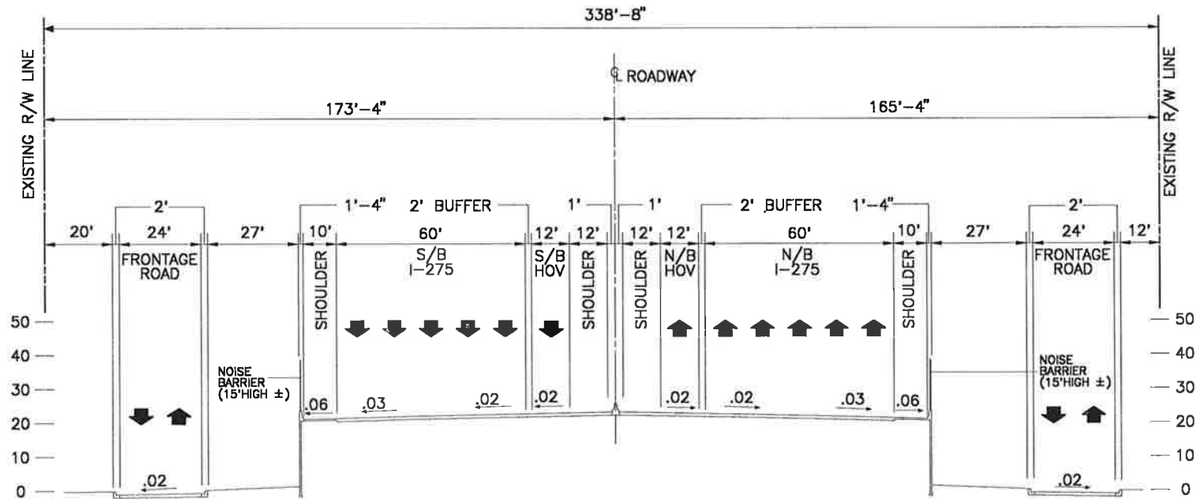
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENTS 5E, 5F AND 5G
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-85 OF 135



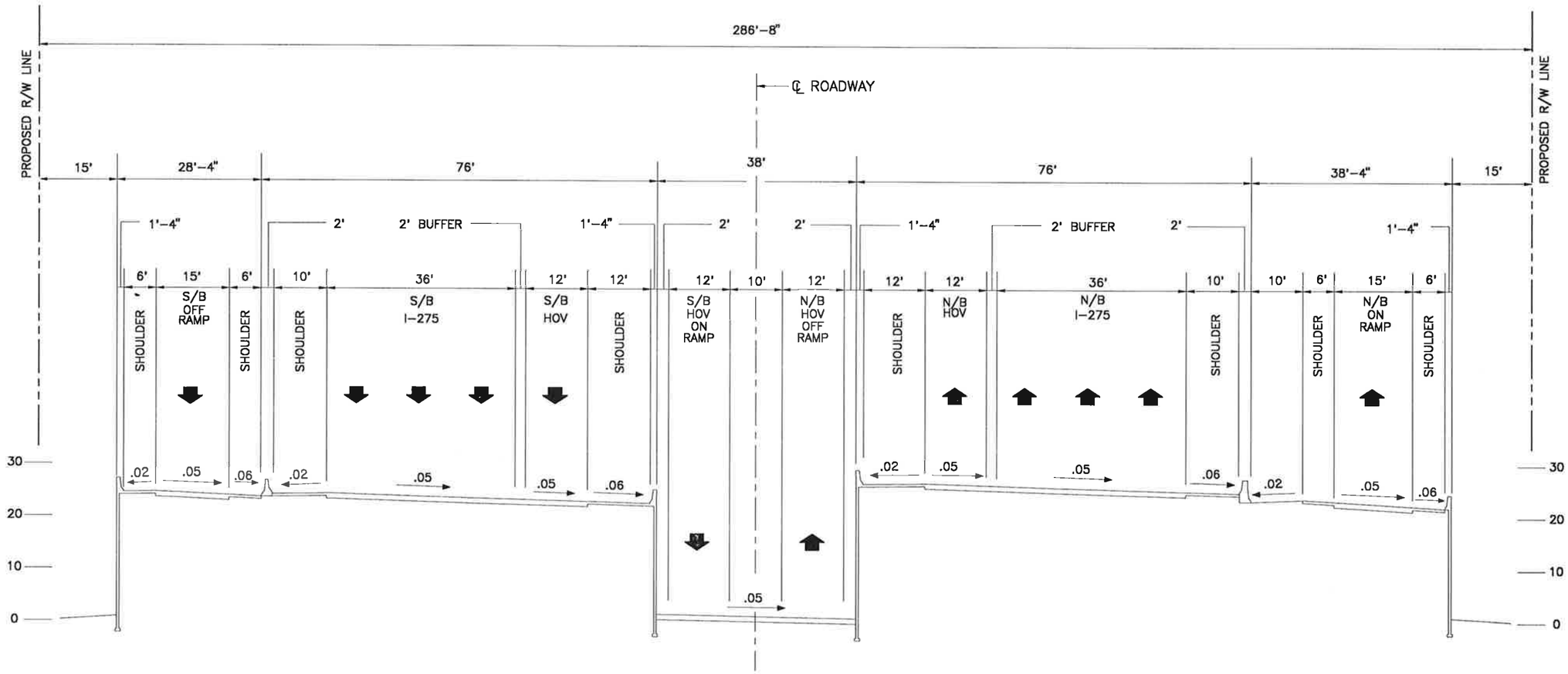
STATION 635+00

PROJECT No. C1104			
PROJECT DATES			
DATES	DESCRIPTION		
3-26-89	DRAFT MASTER PLAN CONCEPT		
6-89	FINAL MASTER PLAN CONCEPT		

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5E
I-275 CROSS SECTION AT
109TH AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-86 OF 135



STATION 233+00

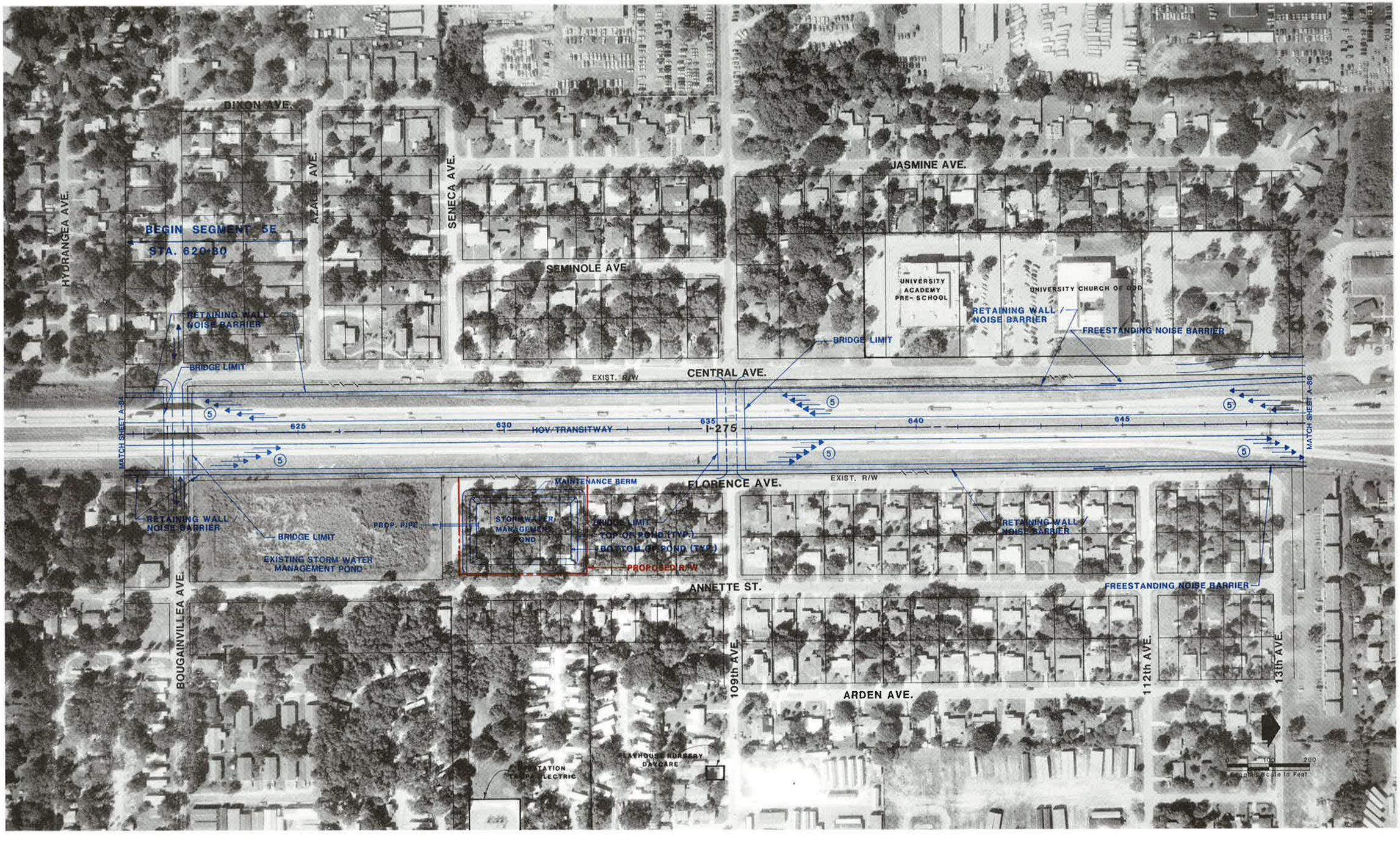
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5G
I-275 CROSS SECTION
SOUTH OF SINCLAIR HILLS RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-87 OF 135

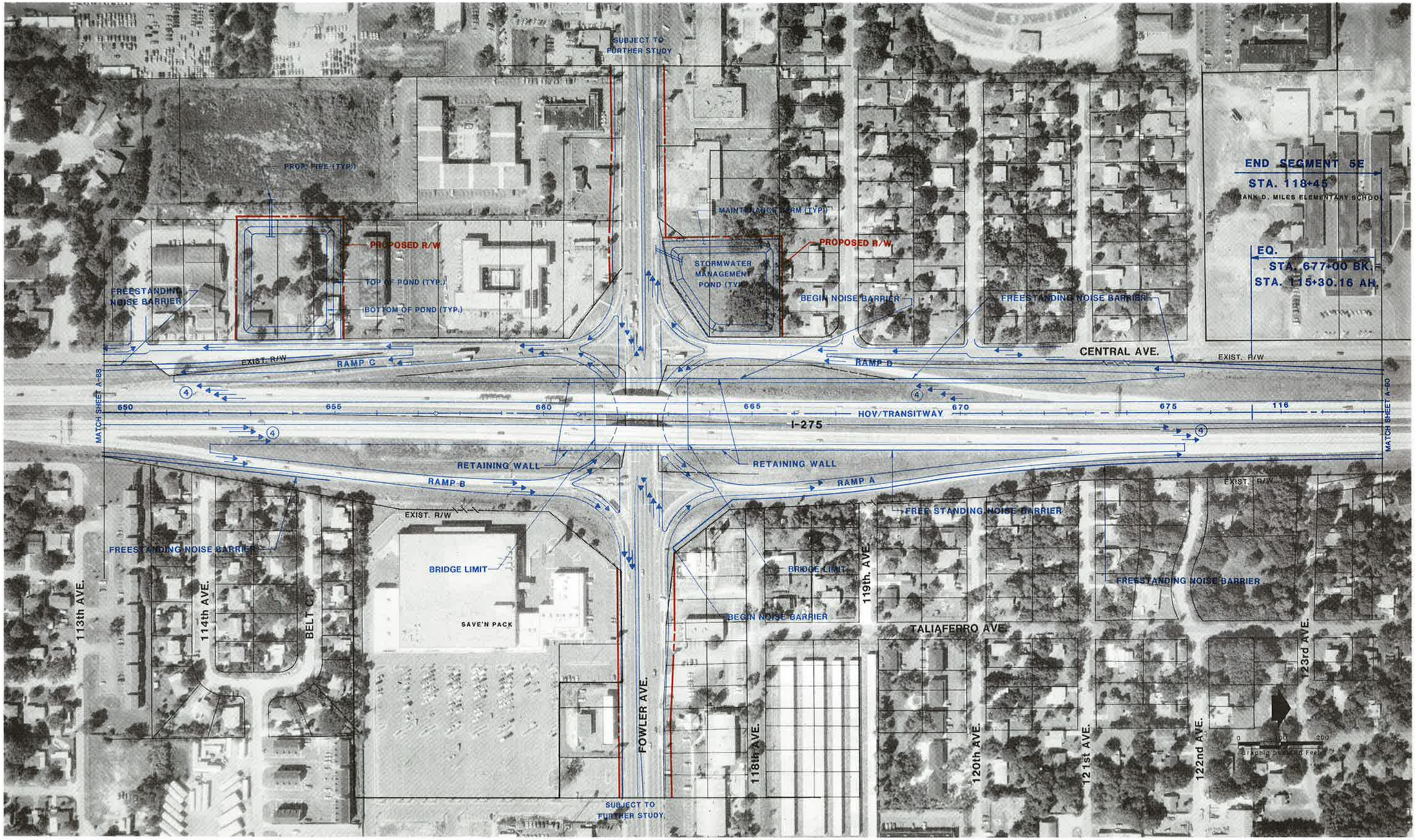


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-28-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5E
I-275 AT 109TH AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-88 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5E
I-275 AT FOWLER AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-89 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

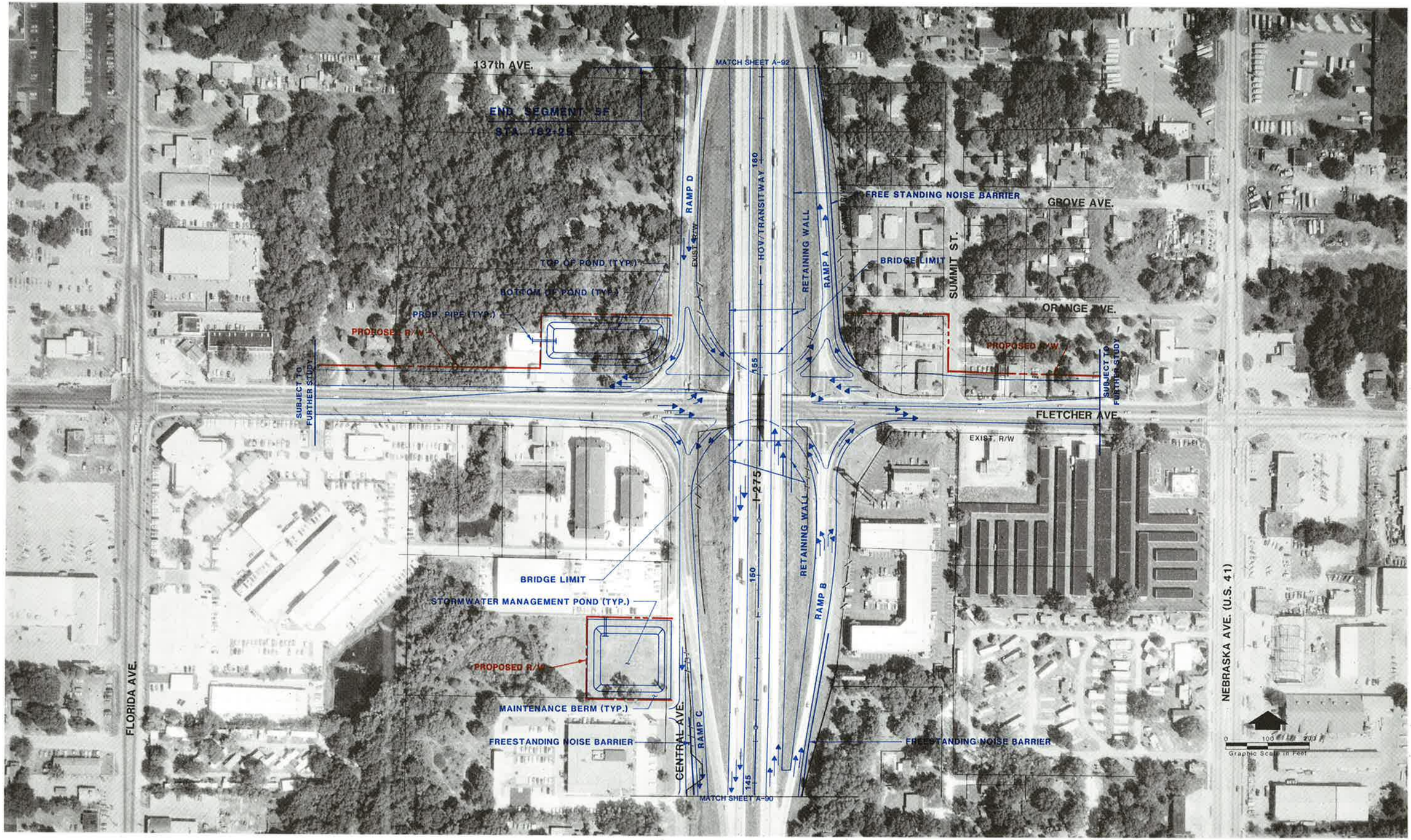
PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5F
I-275 AT 127TH AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-90 OF 135

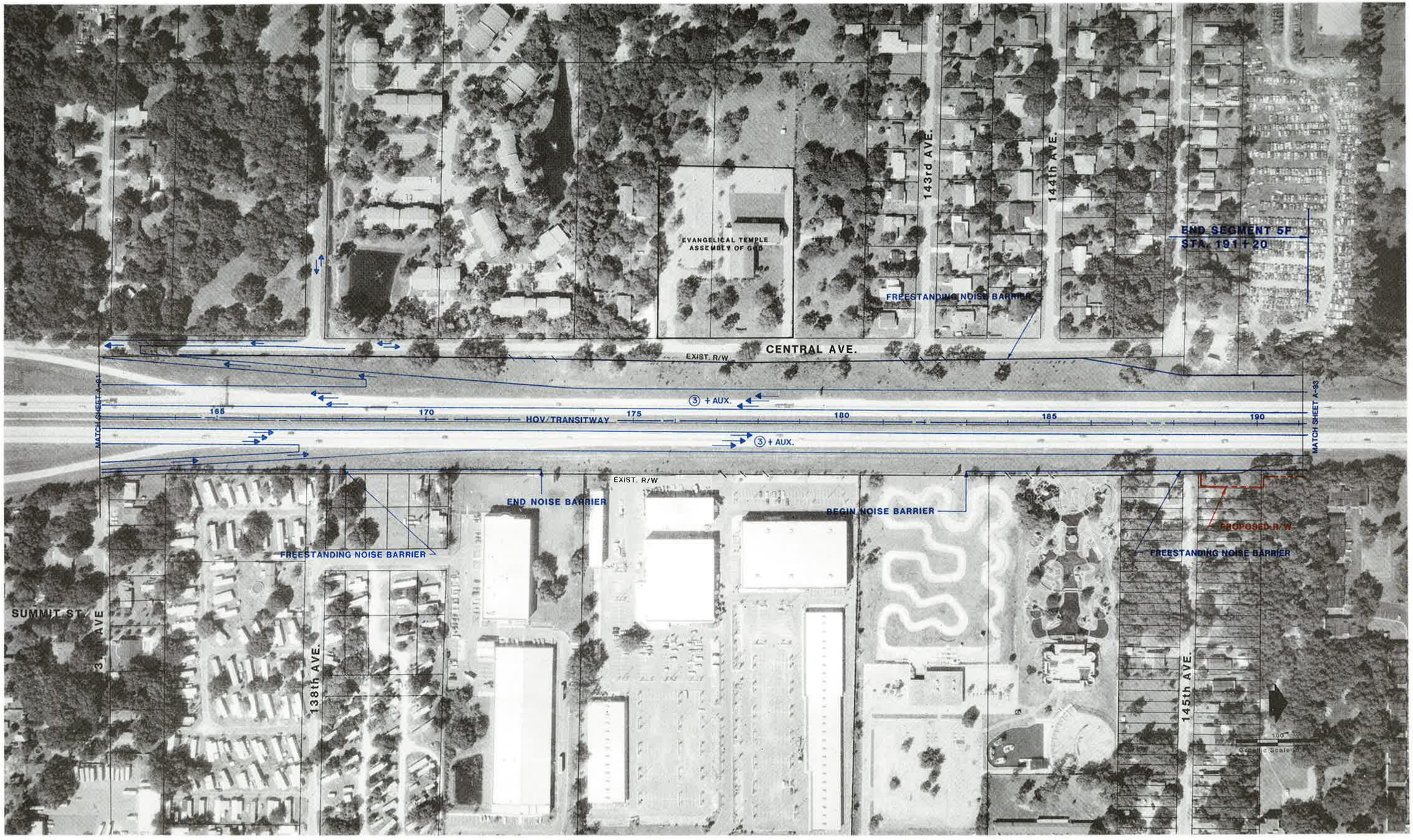


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5F
I-275 AT FLETCHER AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-91 OF 135



PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-88	DRAFT MASTER PLAN CONCEPT	
6-88	FINAL MASTER PLAN CONCEPT	

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY — I-275

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5F
I-275 AT 143RD. AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-92 OF 135



PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

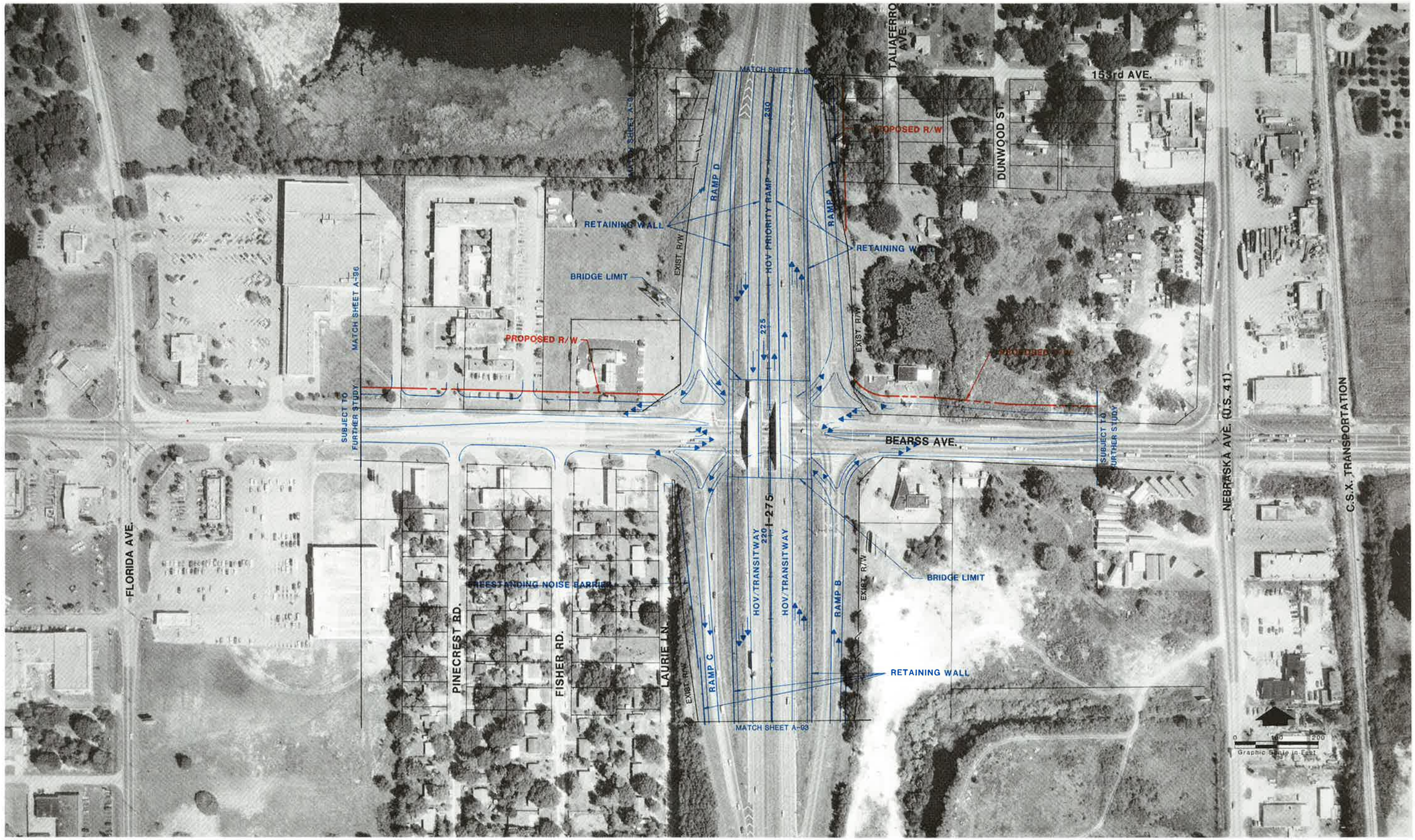
PLANNING FOR TOMORROW 1979 TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5G
I-275 AT APRIL LANE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-93 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
~~2-26-89~~	~~DRAFT MASTER PLAN CONCEPT~~
6-89	FINAL MASTER PLAN CONCEPT

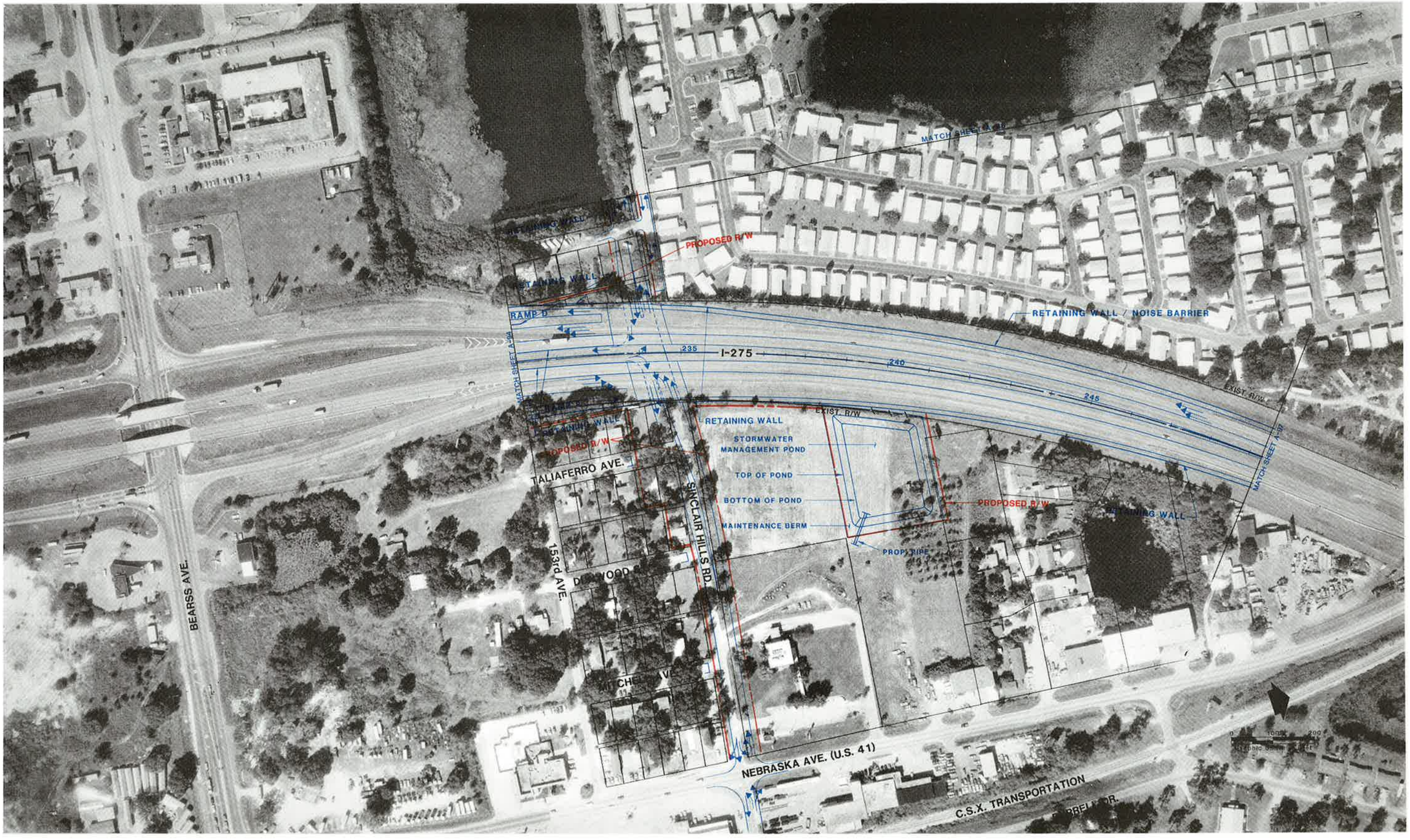
PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5G
I-275 AT BEARSS AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET ~~A-94~~ OF ~~135~~

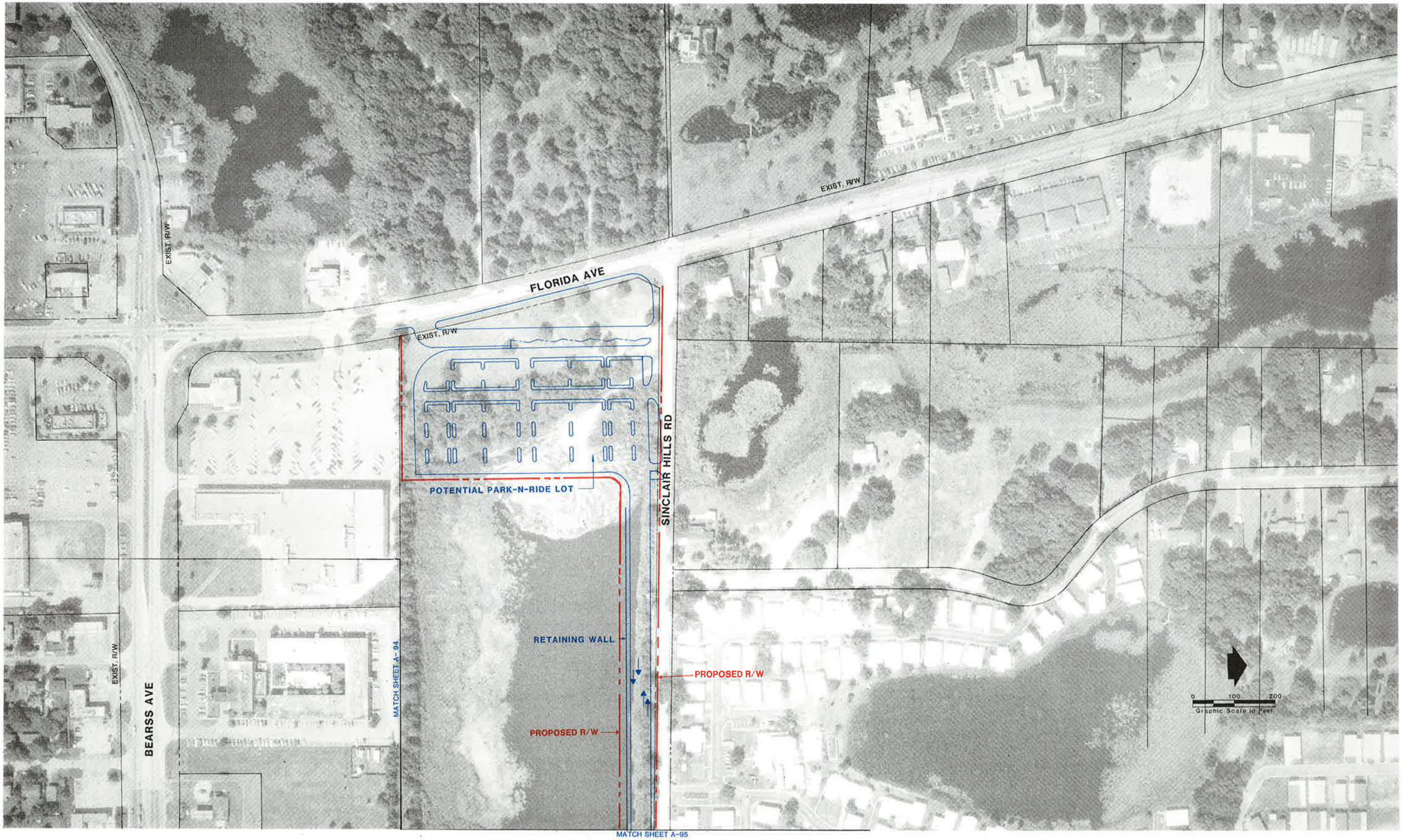


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
5-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5G
I-275 AT SINCLAIR HILLS RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-95 OF 135



PROJECT No. G1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

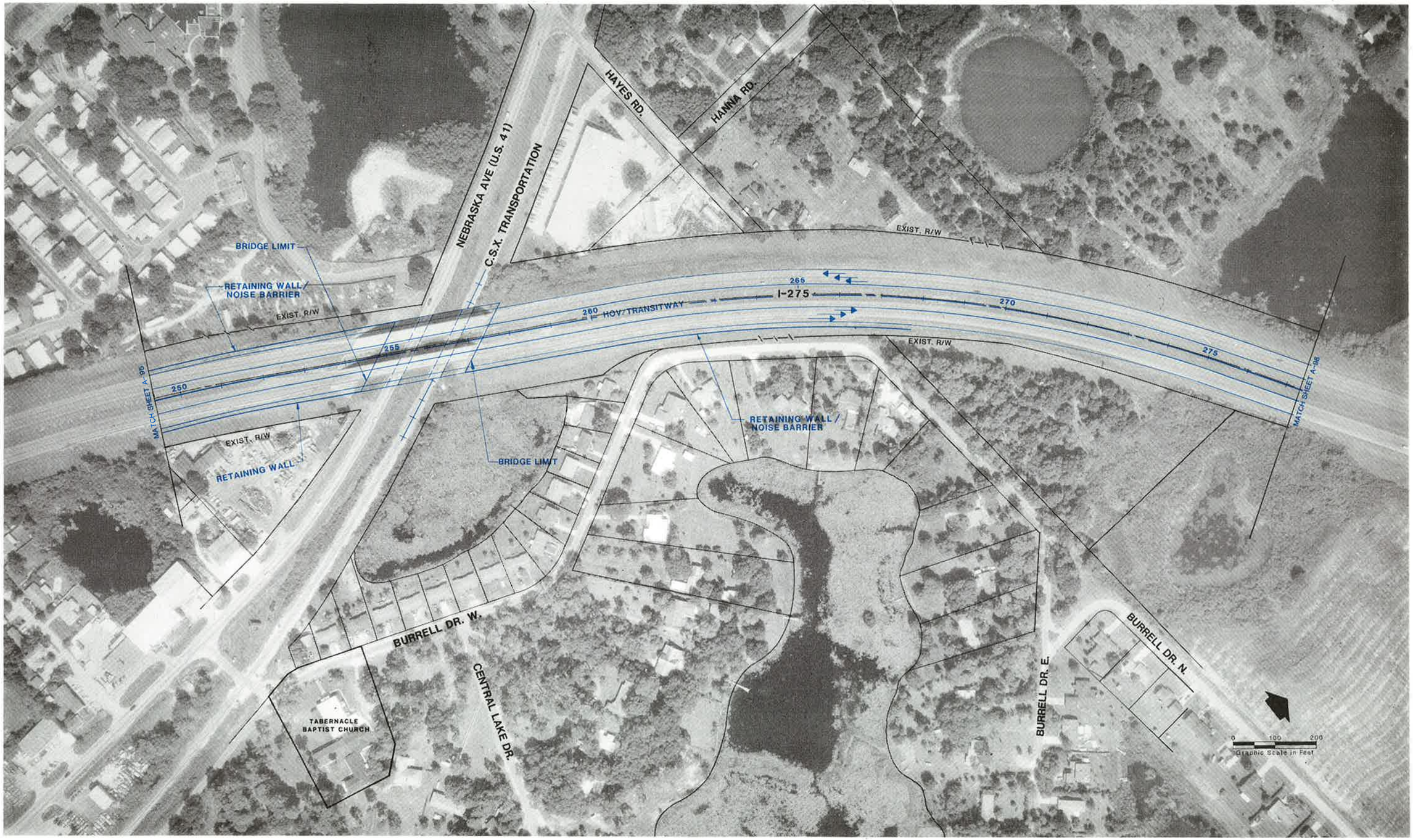
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 5G
SINCLAIR HILLS RD. AT FLORIDA AVE.

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-96 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5G
I-275 AT NEBRASKA AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-97 OF 135



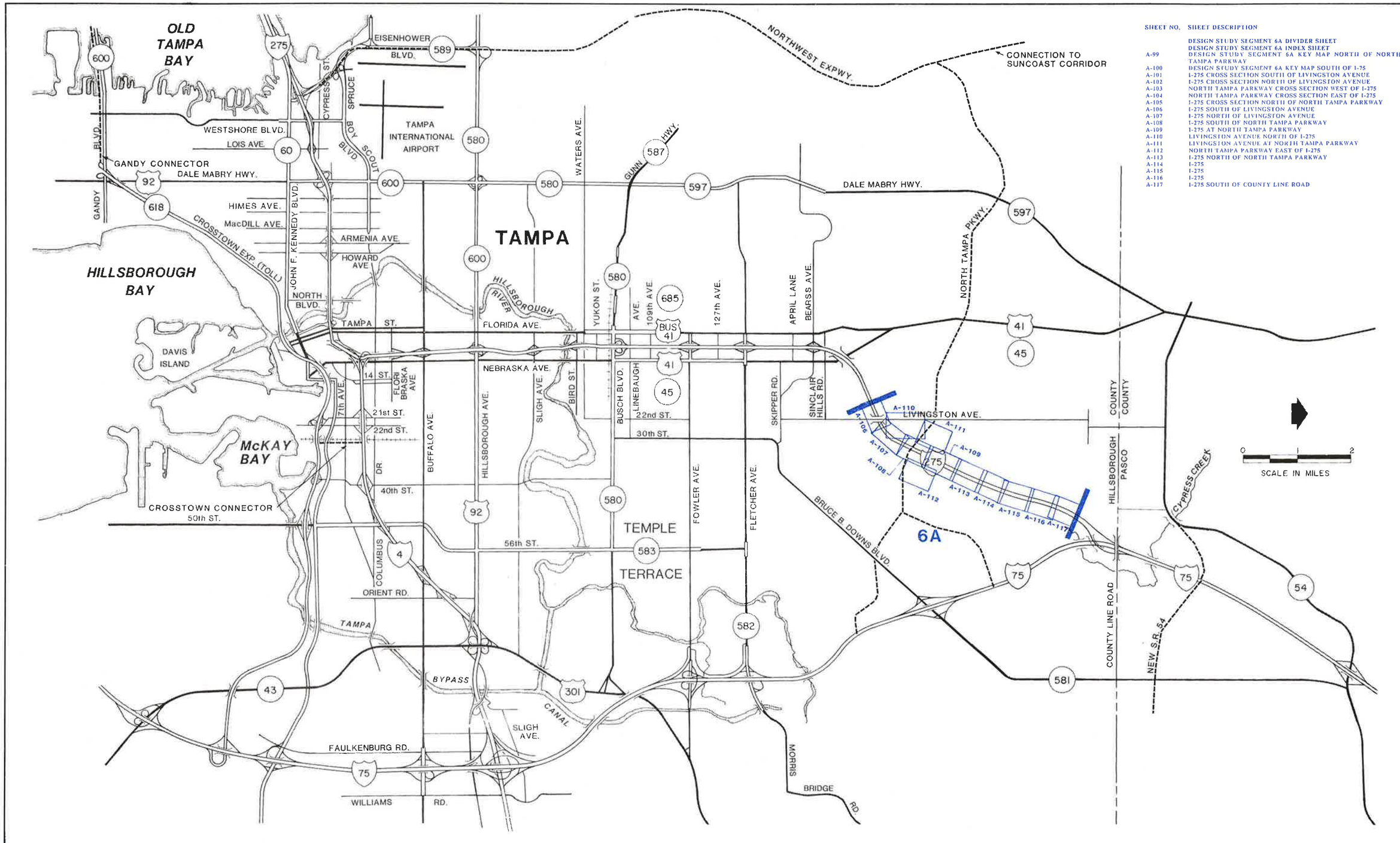
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-99	DRAFT MASTER PLAN CONCEPT
[illegible]	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 5G
I-275 AT LAKE PALM DR.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-98 OF 135



SHEET NO.	SHEET DESCRIPTION
	DESIGN STUDY SEGMENT 6A DIVIDER SHEET
	DESIGN STUDY SEGMENT 6A INDEX SHEET
A-99	DESIGN STUDY SEGMENT 6A KEY MAP NORTH OF NORTH TAMPA PARKWAY
A-100	DESIGN STUDY SEGMENT 6A KEY MAP SOUTH OF I-75
A-101	I-275 CROSS SECTION SOUTH OF LIVINGSTON AVENUE
A-102	I-275 CROSS SECTION NORTH OF LIVINGSTON AVENUE
A-103	NORTH TAMPA PARKWAY CROSS SECTION WEST OF I-275
A-104	NORTH TAMPA PARKWAY CROSS SECTION EAST OF I-275
A-105	I-275 CROSS SECTION NORTH OF NORTH TAMPA PARKWAY
A-106	I-275 SOUTH OF LIVINGSTON AVENUE
A-107	I-275 NORTH OF LIVINGSTON AVENUE
A-108	I-275 SOUTH OF NORTH TAMPA PARKWAY
A-109	I-275 AT NORTH TAMPA PARKWAY
A-110	LIVINGSTON AVENUE NORTH OF I-275
A-111	LIVINGSTON AVENUE AT NORTH TAMPA PARKWAY
A-112	NORTH TAMPA PARKWAY EAST OF I-275
A-113	I-275 NORTH OF NORTH TAMPA PARKWAY
A-114	I-275
A-115	I-275
A-116	I-275
A-117	I-275 SOUTH OF COUNTY LINE ROAD

PROJECT No. C1104

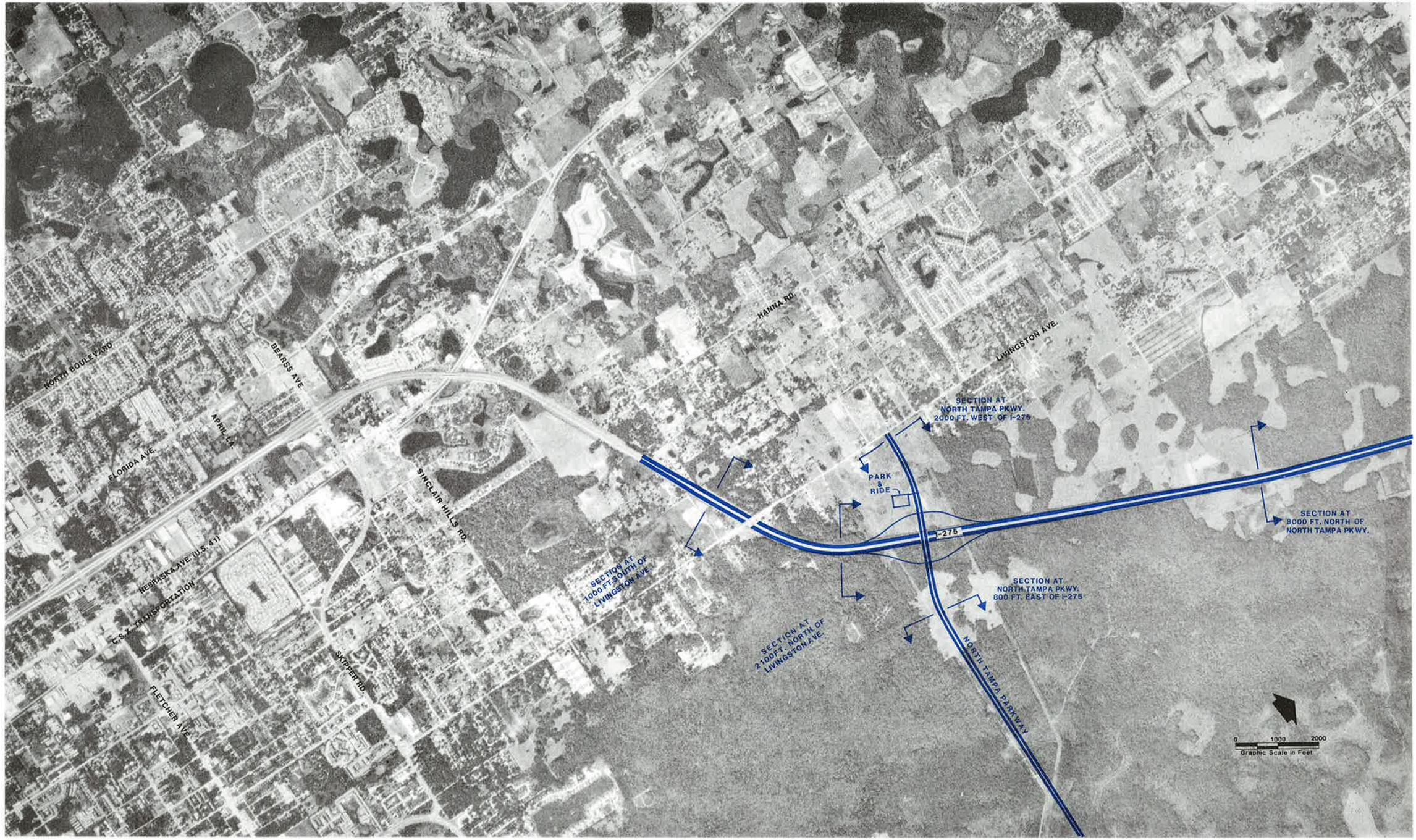
PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
INDEX SHEET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402

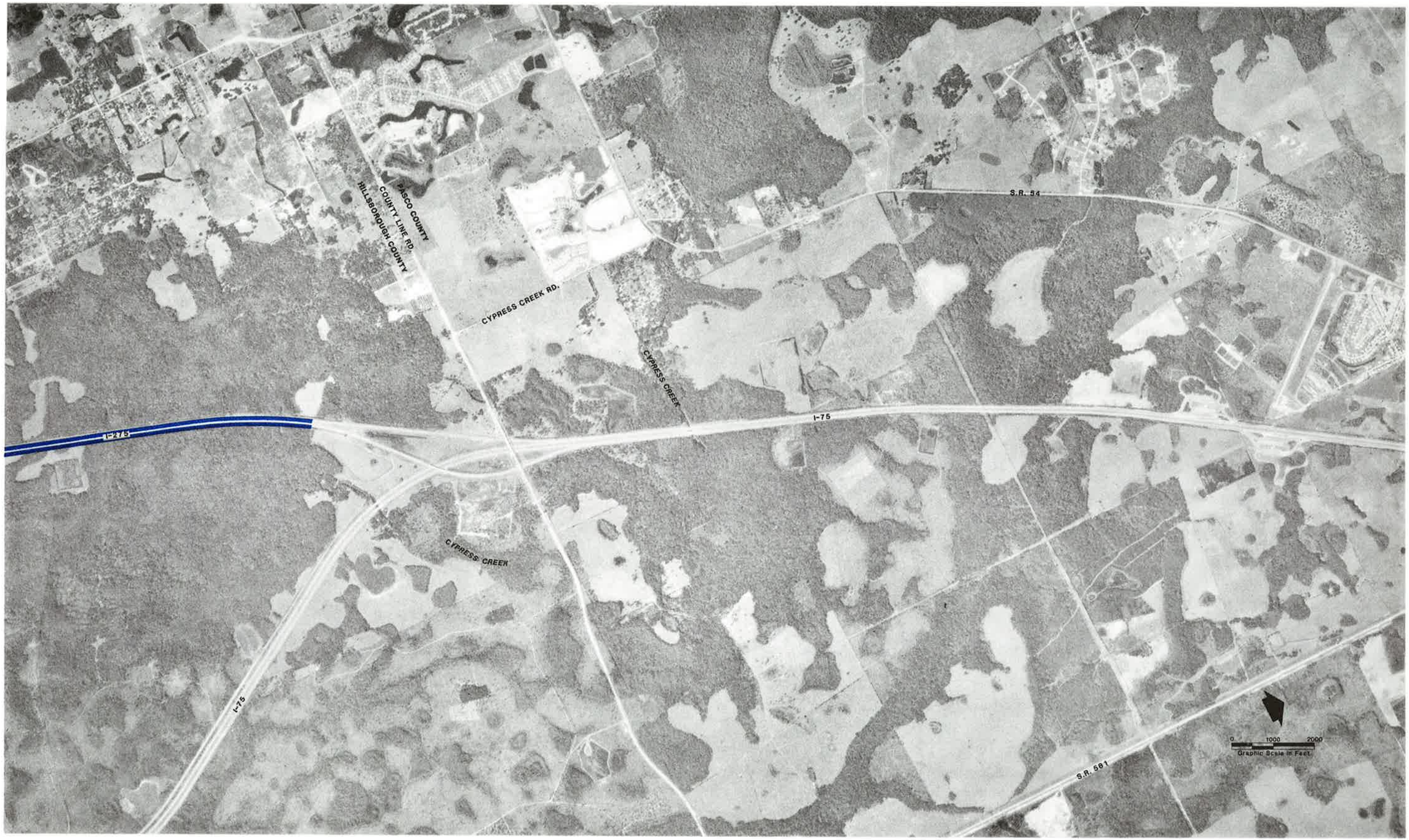


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-28-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-99 OF 135

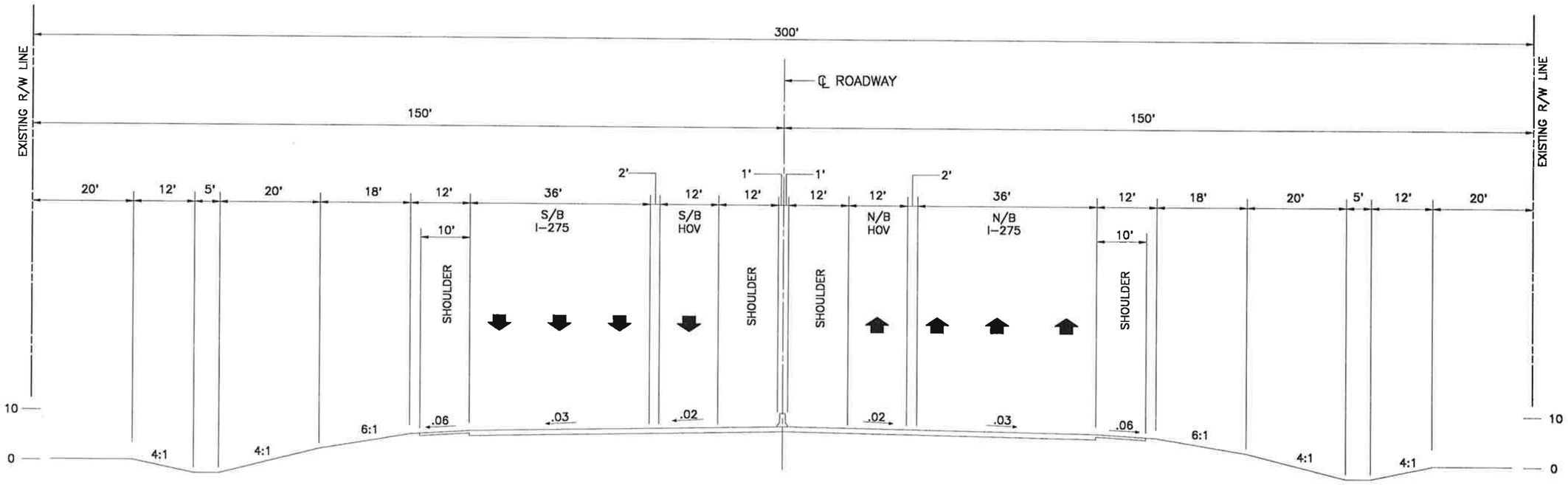


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-100 OF 135



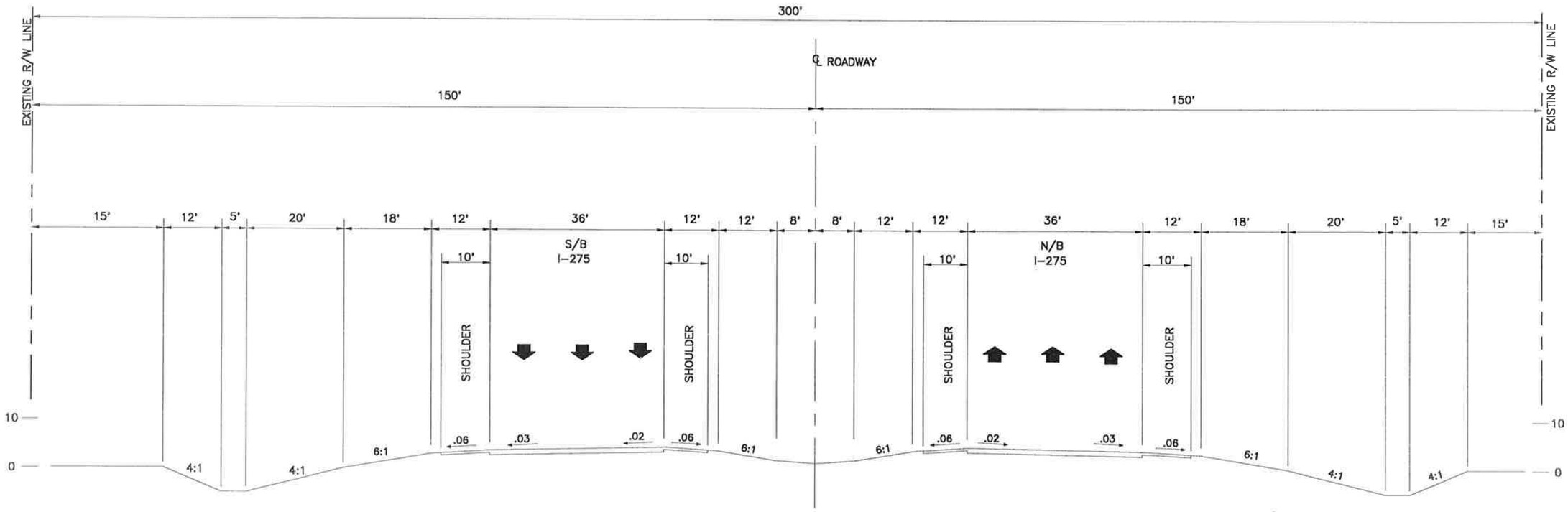
STATION 325+00

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
I-275 CROSS SECTION
SOUTH OF LIVINGSTON AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-101 OF 135



STATION 358+00

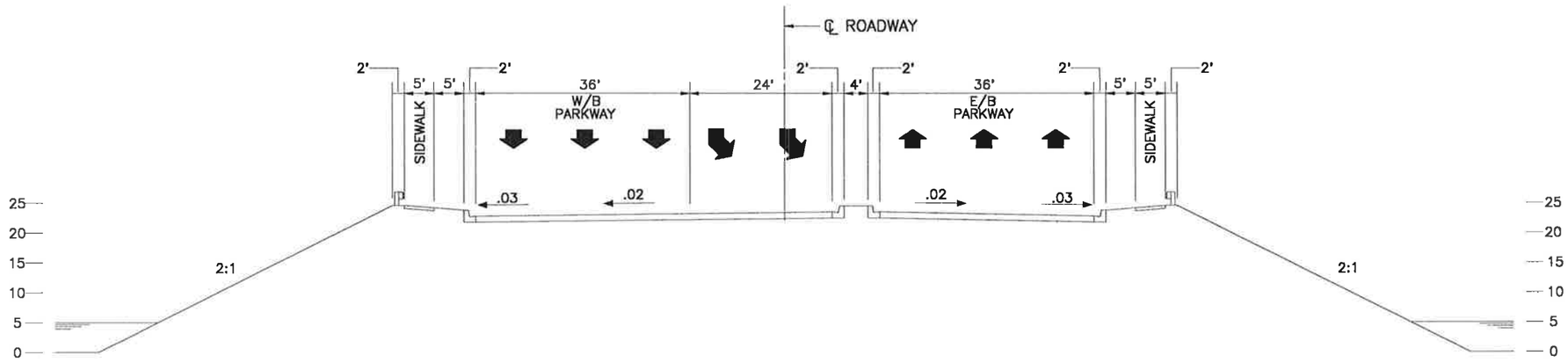
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
I-275 CROSS SECTION AT
NORTH OF LIVINGSTON AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-102 OF 135



STATION 498+00

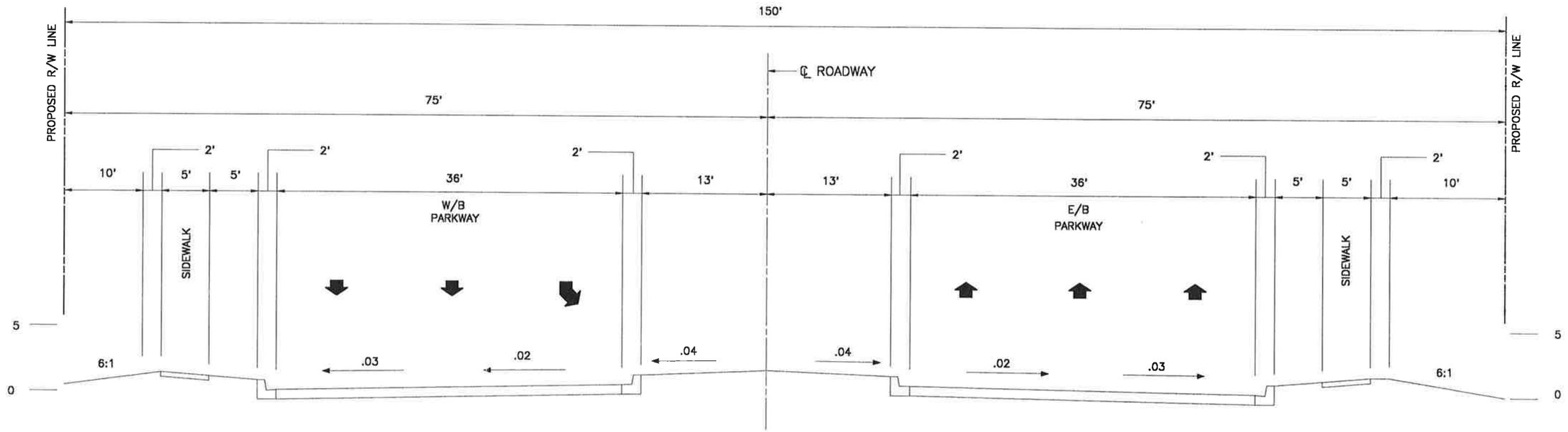
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
NORTH TAMPA PKWY. CROSS SECTION
WEST OF I-275

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-103 OF 135



STATION 506+00

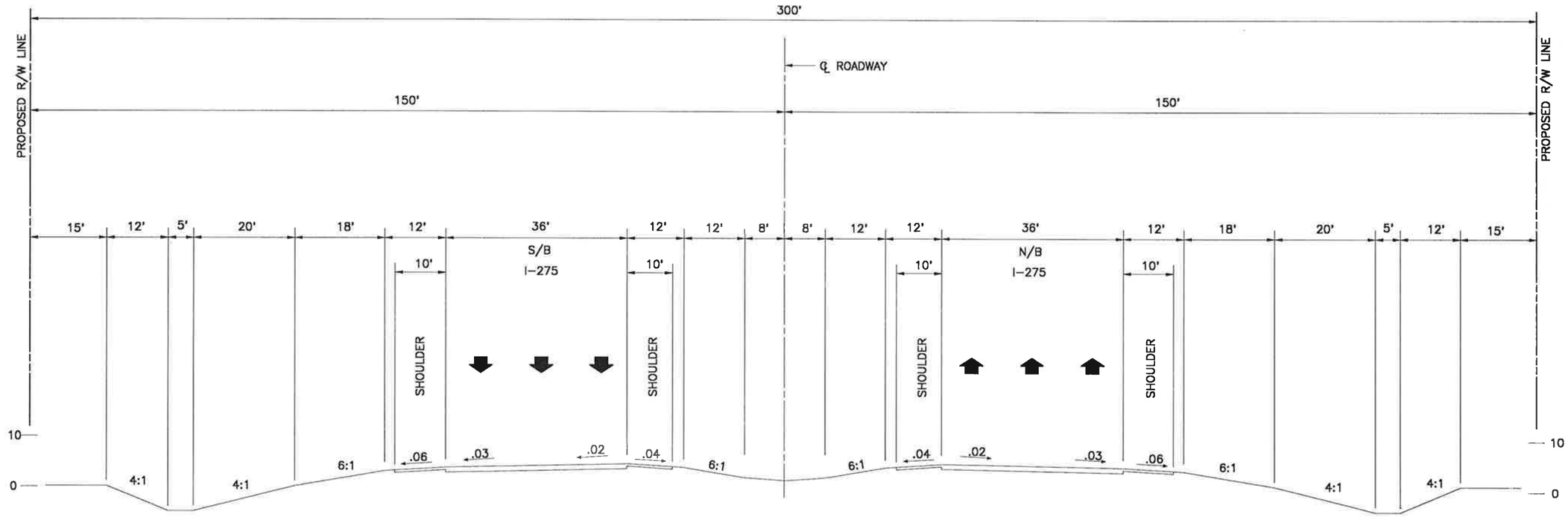
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
NORTH TAMPA PKWY. CROSS SECTION
EAST OF I-275

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-104 OF 135



STATION 400+00

PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
I-275 CROSS SECTION
NORTH OF NORTH TAMPA PKWY.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET A-105 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-28-89	DRAFT MASTER PLAN CONCEPT
5-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
I-275 SOUTH OF LIVINGSTON AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-106 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
3-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
I-275 NORTH OF LIVINGSTON AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
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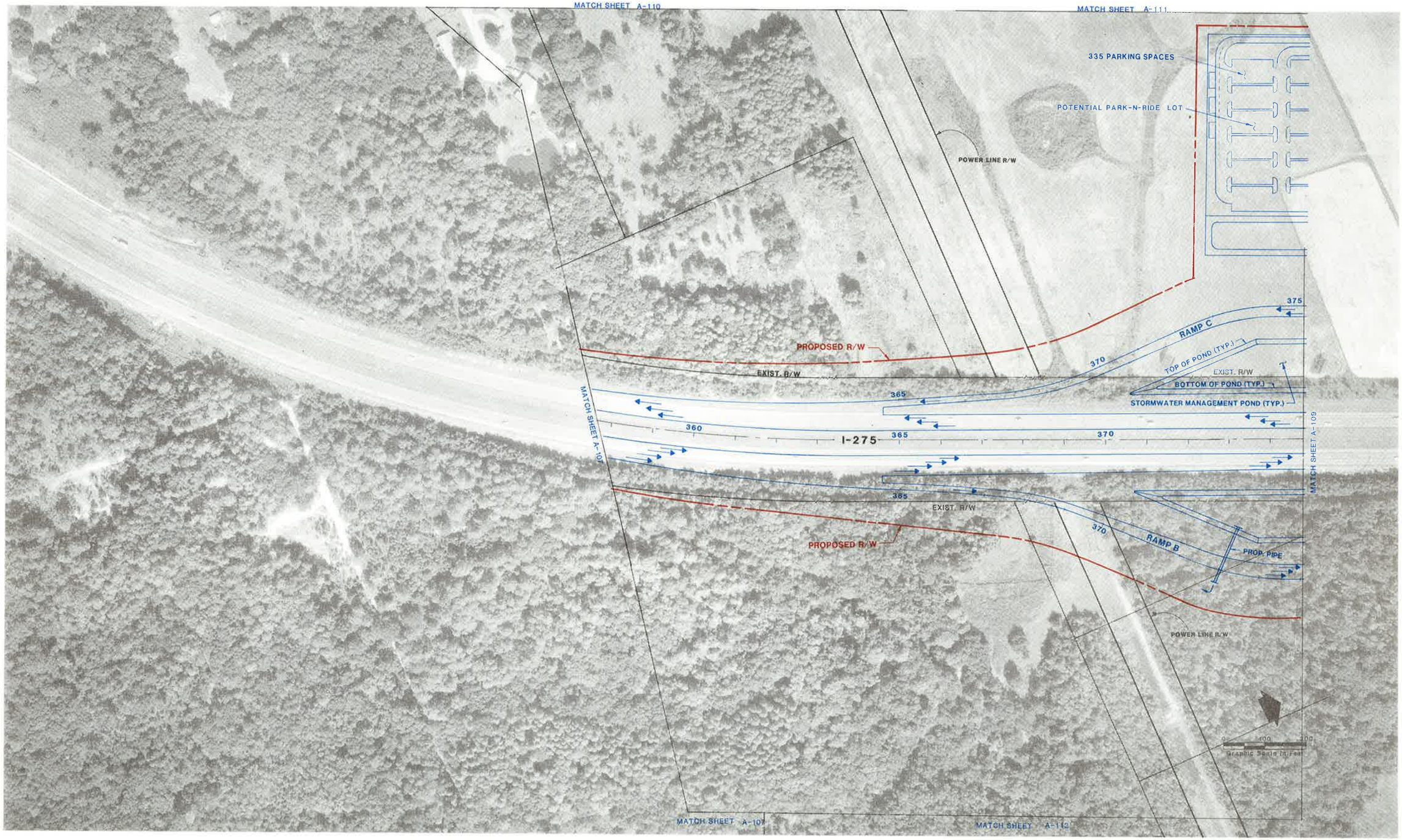


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
3-83	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW 1975 TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
I-275 SOUTH OF NORTH TAMPA PKWY.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-108 OF 135

MATCH SHEET A-111

POWER LINE R/W

380

RAMP D

PROP. PIPE

PROPOSED R/W

BRIDGE LIMIT

PROP. PIPE

EXIST. R/W

385

389

375

380

385

390

395

400

I-275

MATCH SHEET A-108

MATCH SHEET A-113

PROP. PIPE

STORMWATER MANAGEMENT POND (TYP.)

BRIDGE LIMIT

BOTTOM OF POND (TYP.)

TOP OF POND (TYP.)

RAMP A

389

385

EXIST. R/W

PROPOSED R/W

380

NORTH TAMPA PARKWAY

POWER LINE R/W

0 100 200

Graphic Scale In Feet

MATCH SHEET A-112

PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-23-89	DRAFT MASTER PLAN CONCEPT
5-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.

GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.

TEXAS TRANSPORTATION INSTITUTE

KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 6A

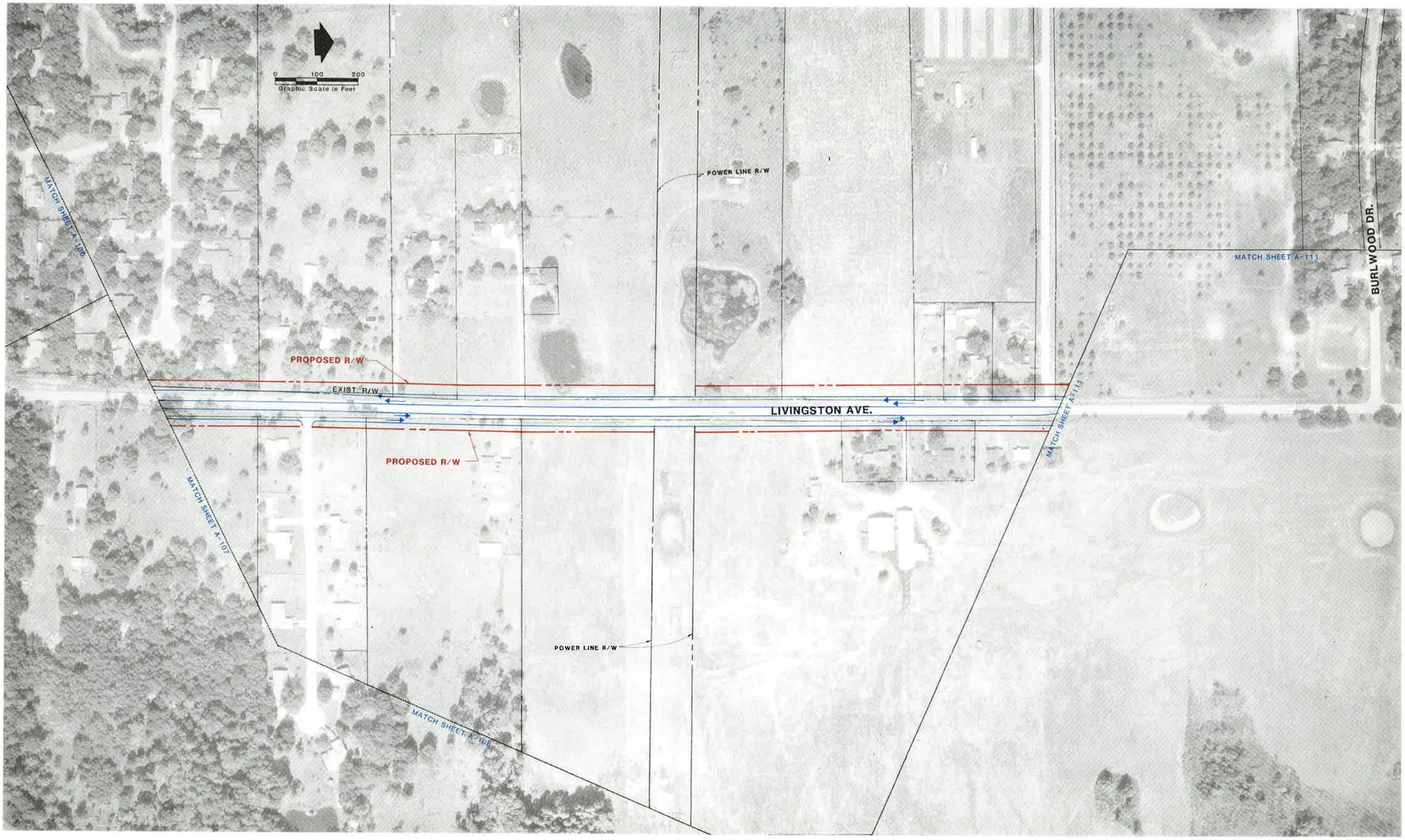
I-275 AT NORTH TAMPA PKWY.

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

SHEET A-109 OF 135



PROJECT No. C1104			
PROJECT DATES			
DATES	DESCRIPTION		
3-26-89	DRAFT MASTER PLAN CONCEPT		
9-89	FINAL MASTER PLAN CONCEPT		

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STYDY SEGMENT 6A
LIVINGSTONE AVE. NORTH OF I-275

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-110 OF 135



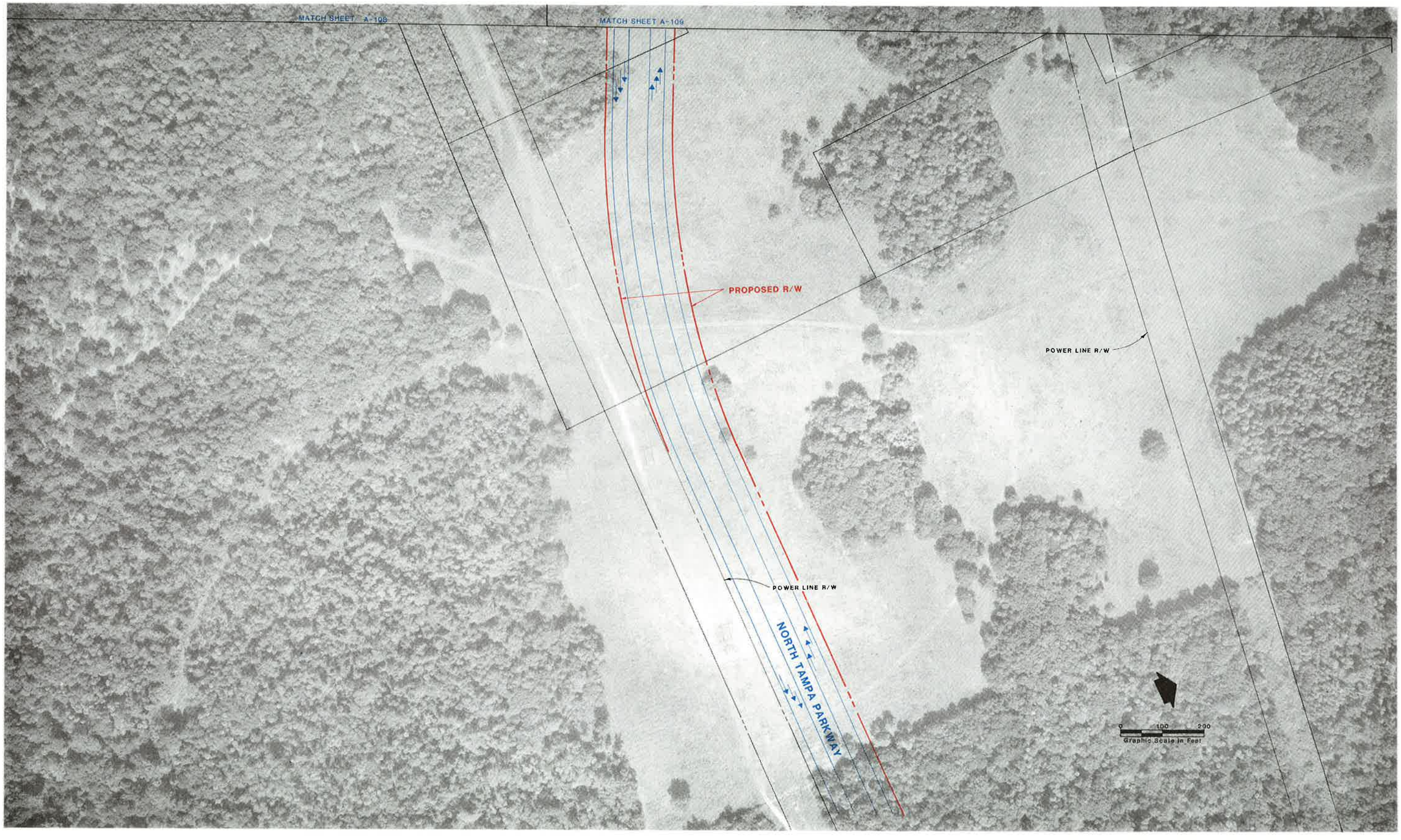
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
5-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STYDY SEGMENT 6A
LIVINGSTONE AVE. AT NORTH TAMPA PKWY.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-111 OF 135



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-20-89	DRAFT MASTER PLAN CONCEPT
3-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

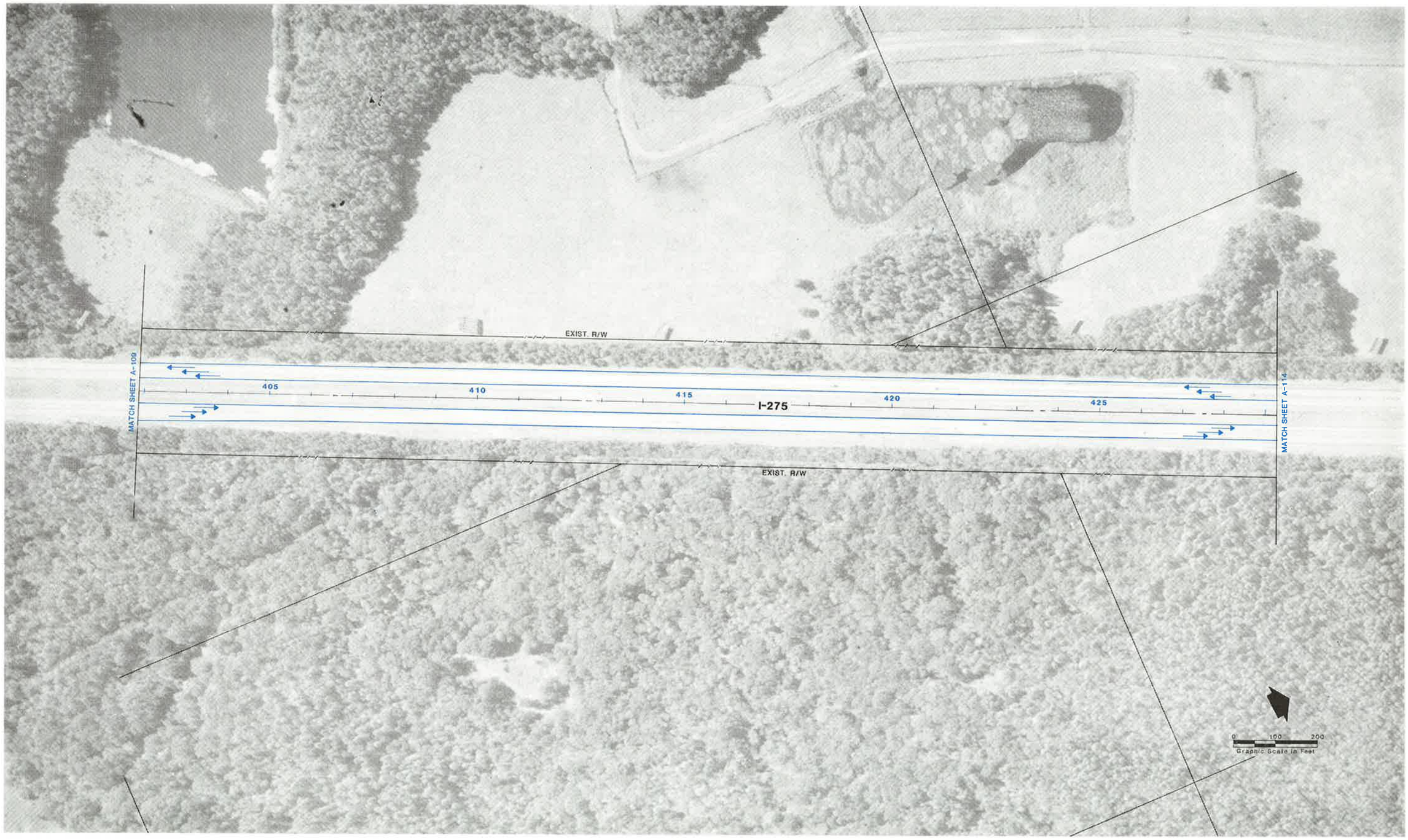
THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
NORTH TAMPA PKWY. EAST OF I-275

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-112 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-23-89	DRAFT MASTER PLAN CONCEPT
3-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

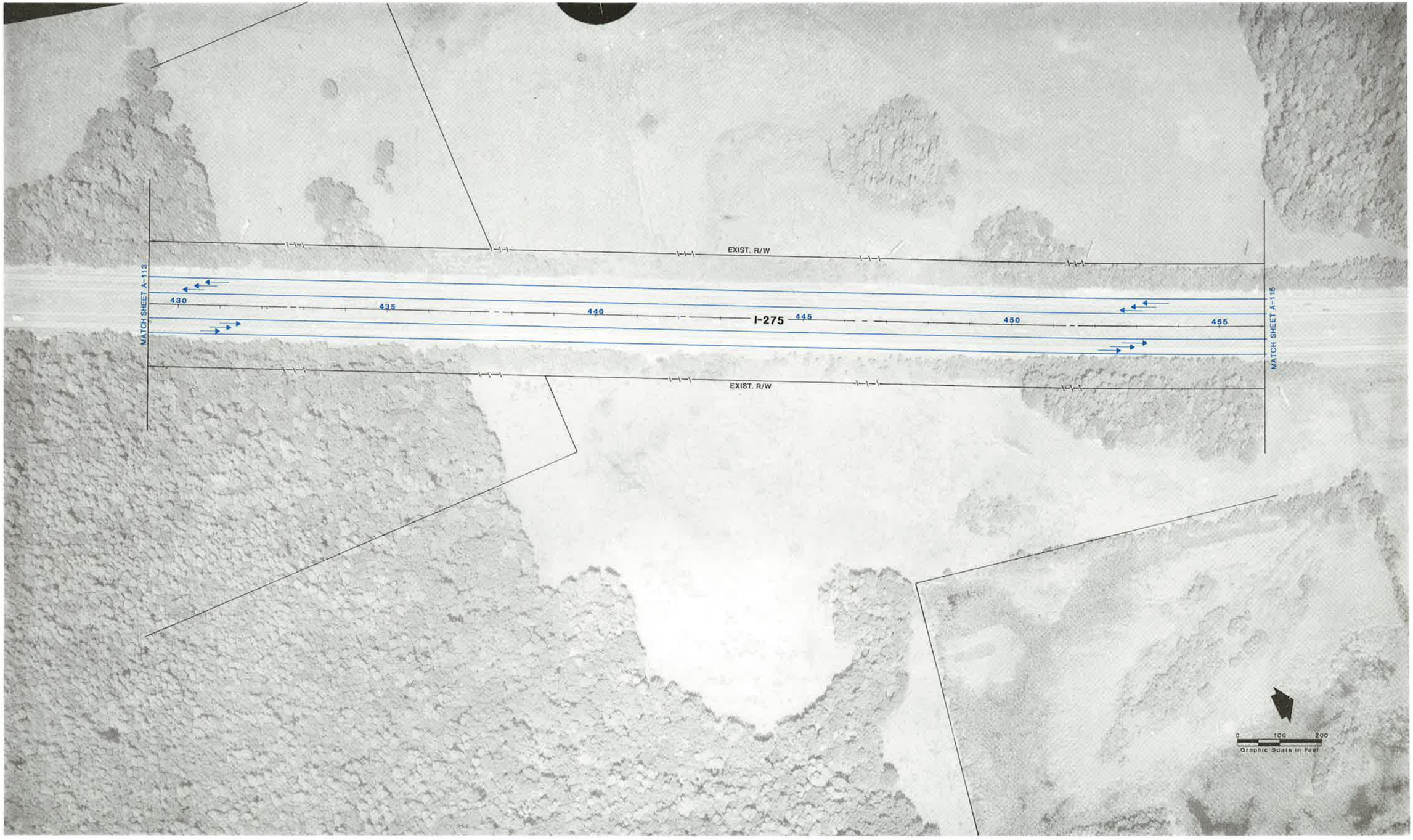
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 6A
I-275 NORTH OF NORTH TAMPA PKWY.

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-113 OF 135



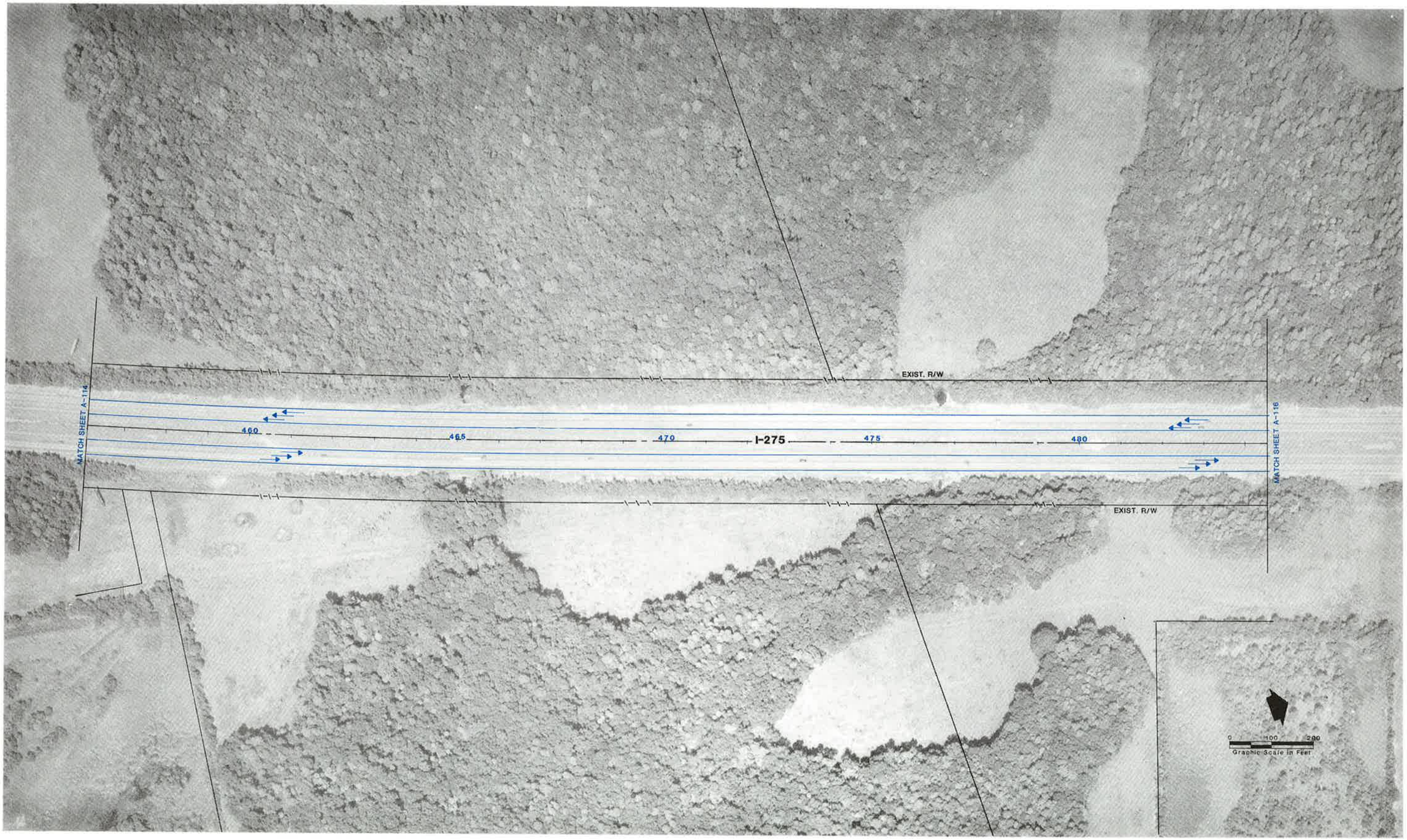
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
I-275

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-114 OF 135



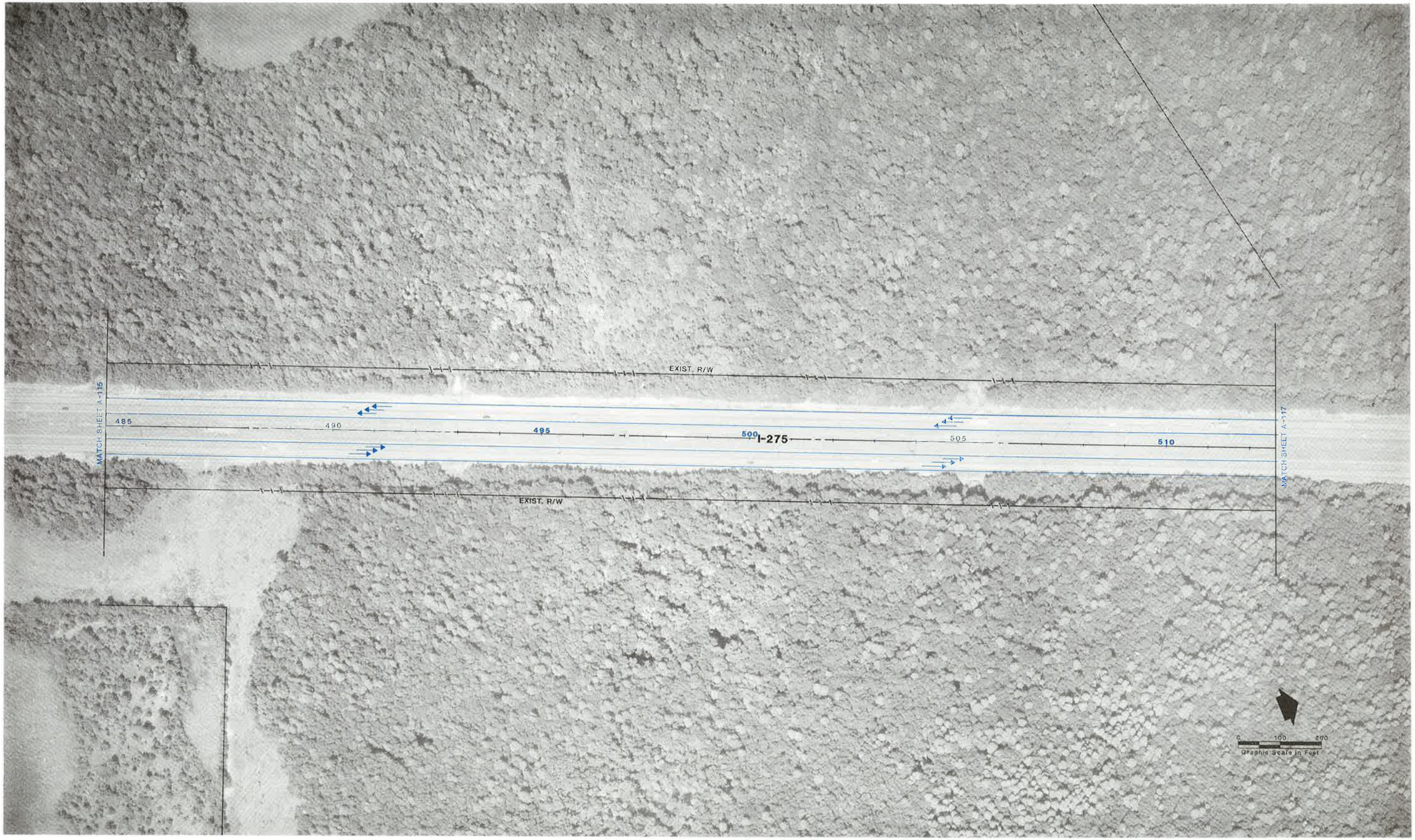
PROJECT No. C1104				
PROJECT DATES				
DATES	DESCRIPTION			
3-20-89	DRAFT MASTER PLAN CONCEPT			
6-89	FINAL MASTER PLAN CONCEPT			

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
I-275

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-115 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-25-89	DRAFT MASTER PLAN CONCEPT
1-87	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

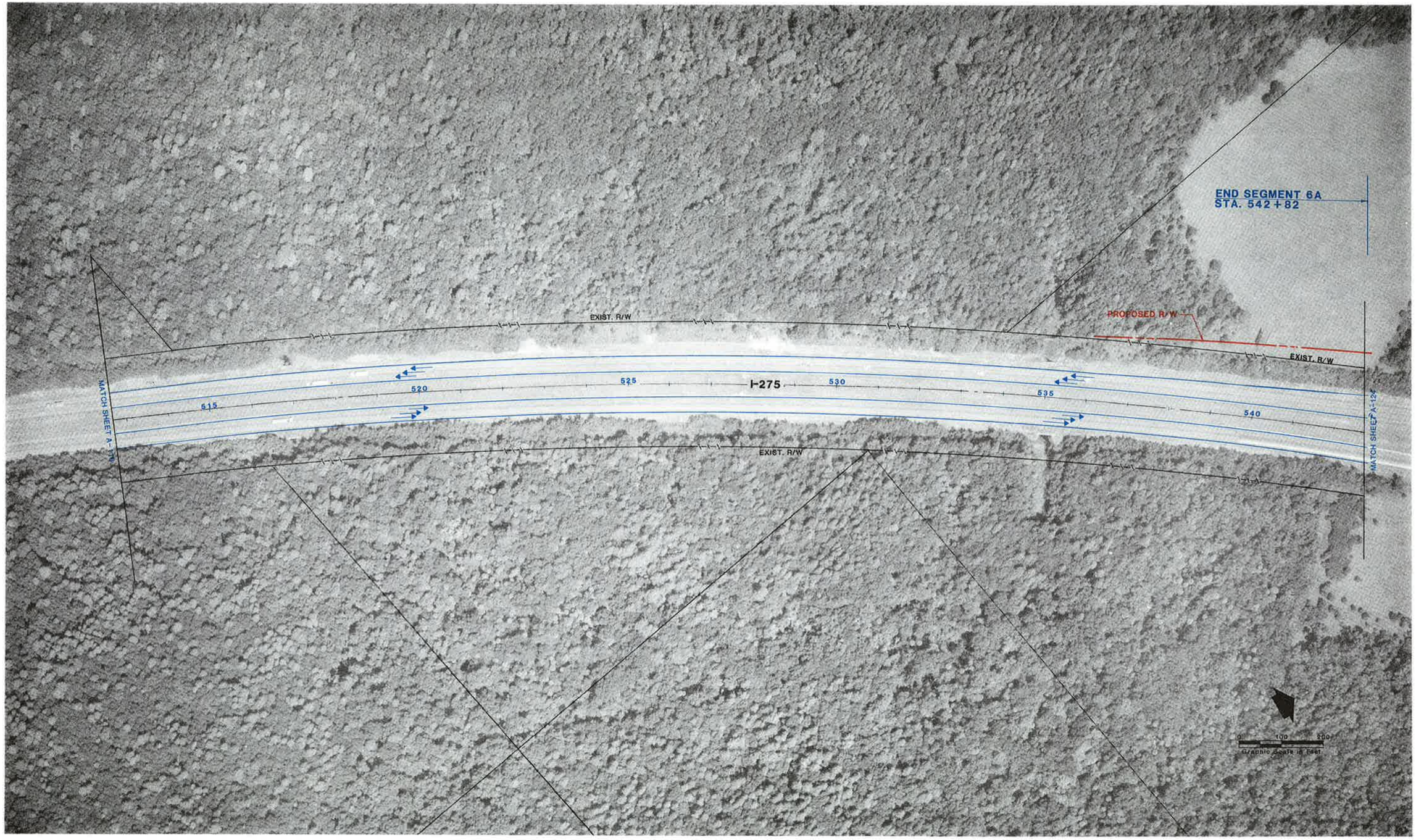
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 6A
I-275

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-116 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
5-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6A
I-275 SOUTH OF COUNTY LINE RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-117 OF 135

DESIGN SEGMENT 6B

I-75 from Hillsborough/Pasco County Line to South of State Road 54 in Pasco County

- 2 Roadway System on Interstate 275
- Interstate 275 six lane roadway joining Interstate 75 six lane roadway.
- Transition from 12 lanes to 10 lanes between County Line Road and New SR 54. Eight lanes north of New SR 54, and six lanes north of Existing SR 54.
- Directional flyover ramps from Interstate 275 northbound to Interstate 75 southbound and Interstate 75 northbound to Interstate 275 southbound
- New interchange at New SR 54 on Interstate 75
- New HOV Park and Ride lot at New SR 54 interchange

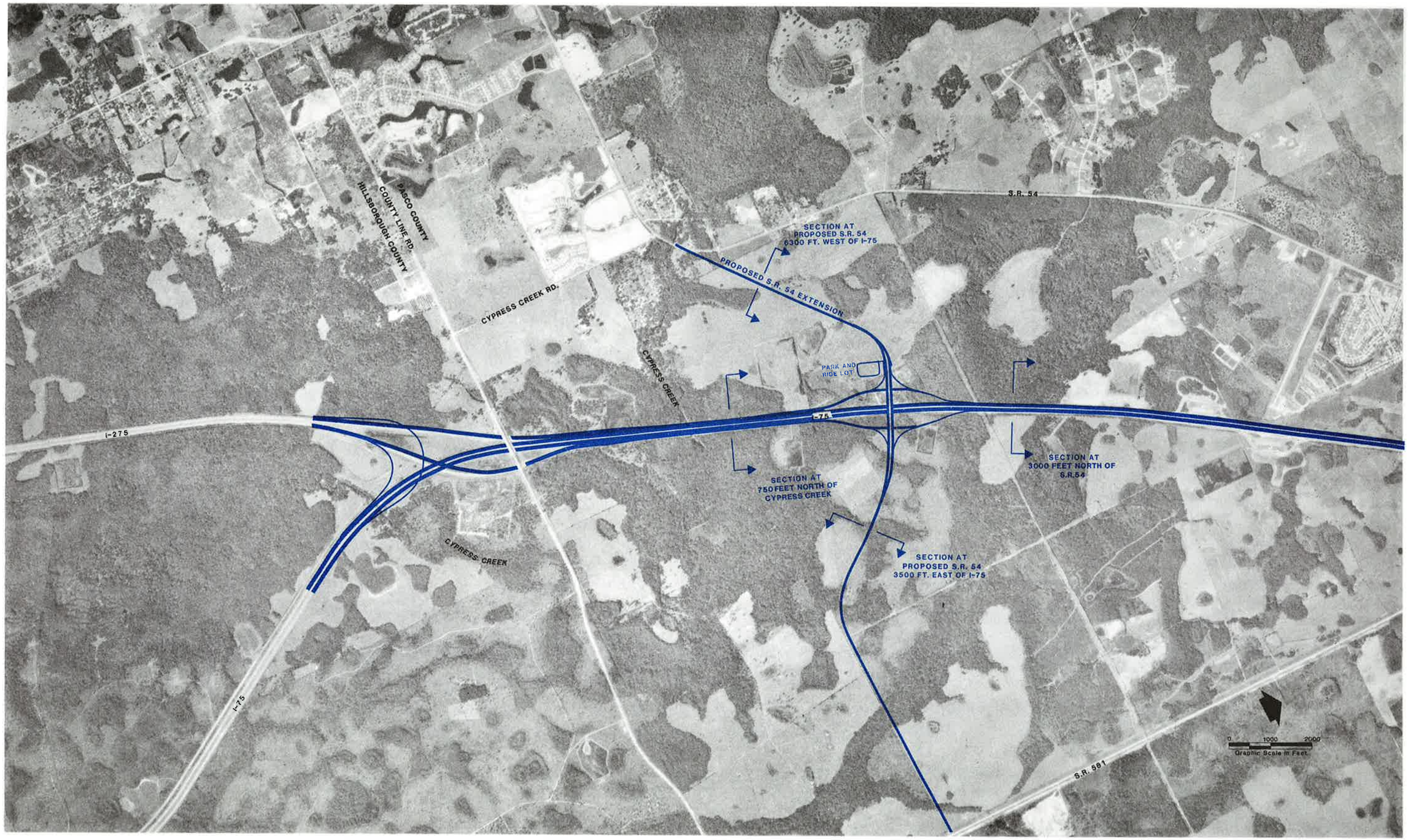
SHEET NO.	SHEET DESCRIPTION
	DESIGN STUDY SEGMENT 6B DIVIDER SHEET
	DESIGN STUDY SEGMENT 6B INDEX SHEET
A-118	DESIGN STUDY SEGMENT 6B KEY MAP NORTH OF NEW S.R. 54
A-119	DESIGN STUDY SEGMENT 6B KEY MAP SOUTH OF EXISTING S.R. 54
A-120	I-75 CROSS SECTION NORTH OF CYPRESS CREEK
A-121	NEW S.R. 54 CROSS SECTION WEST OF I-75
A-122	NEW S.R. 54 CROSS SECTION EAST OF I-75
A-123	I-75 CROSS SECTION NORTH OF NEW S.R. 54
A-124	I-275 SOUTH OF COUNTY LINE ROAD
A-125	I-75 SOUTH OF COUNTY LINE ROAD
A-126	I-75 AND I-275 AT COUNTY LINE ROAD
A-127	COUNTY LINE ROAD EAST OF I-75
A-128	I-75 SOUTH OF CYPRESS CREEK
A-129	I-75 NORTH OF CYPRESS CREEK
A-130	I-75 AT NEW S.R. 54
A-131	I-75 NORTH OF NEW S.R. 54
A-132	I-75
A-133	I-75 AT REST AREA
A-134	I-75 AT TOPP OF TAMPA AIRPORT
A-135	I-75 NORTH OF TOPP OF TAMPA AIRPORT

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
INDEX SHEET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402

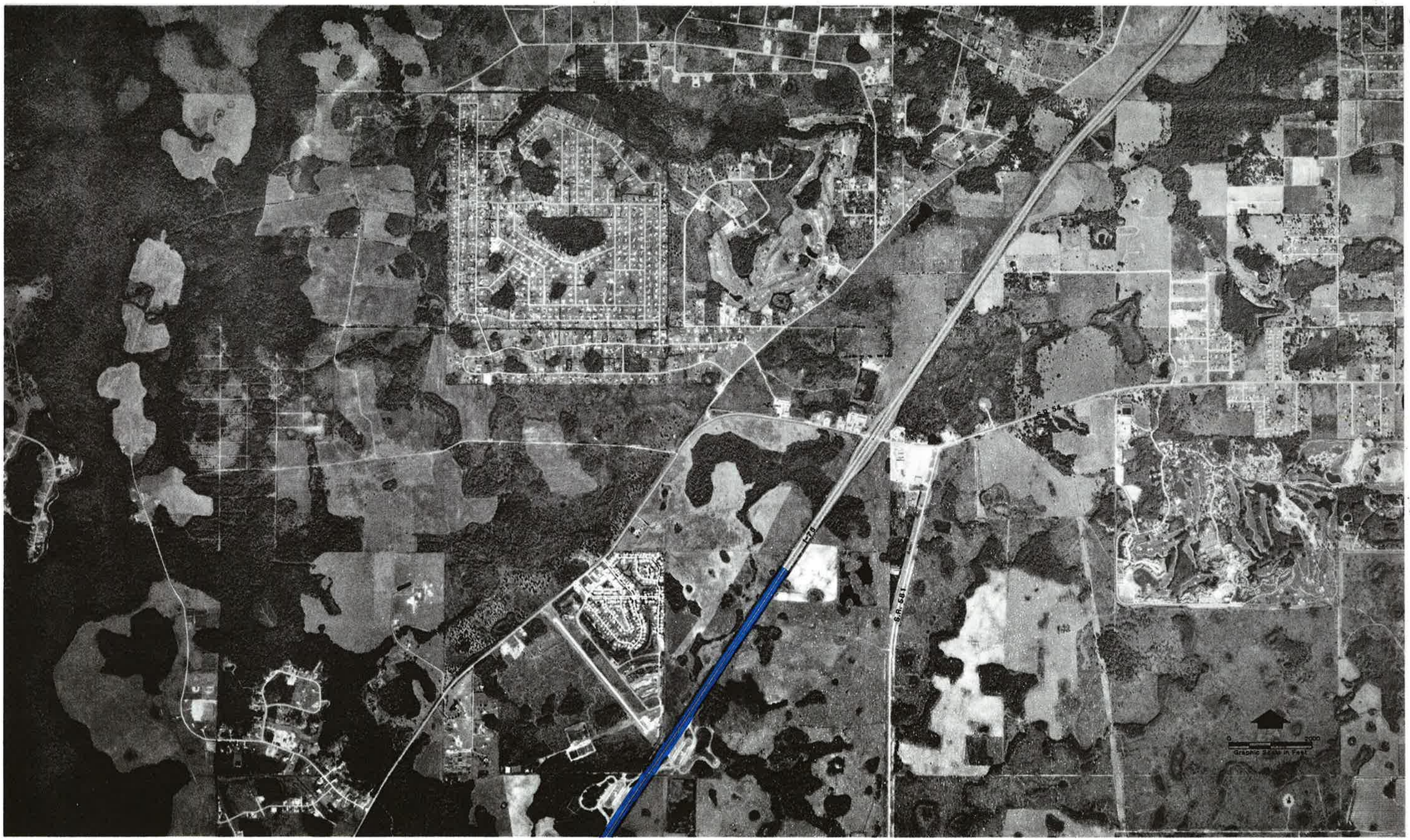


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-118 OF 135



PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

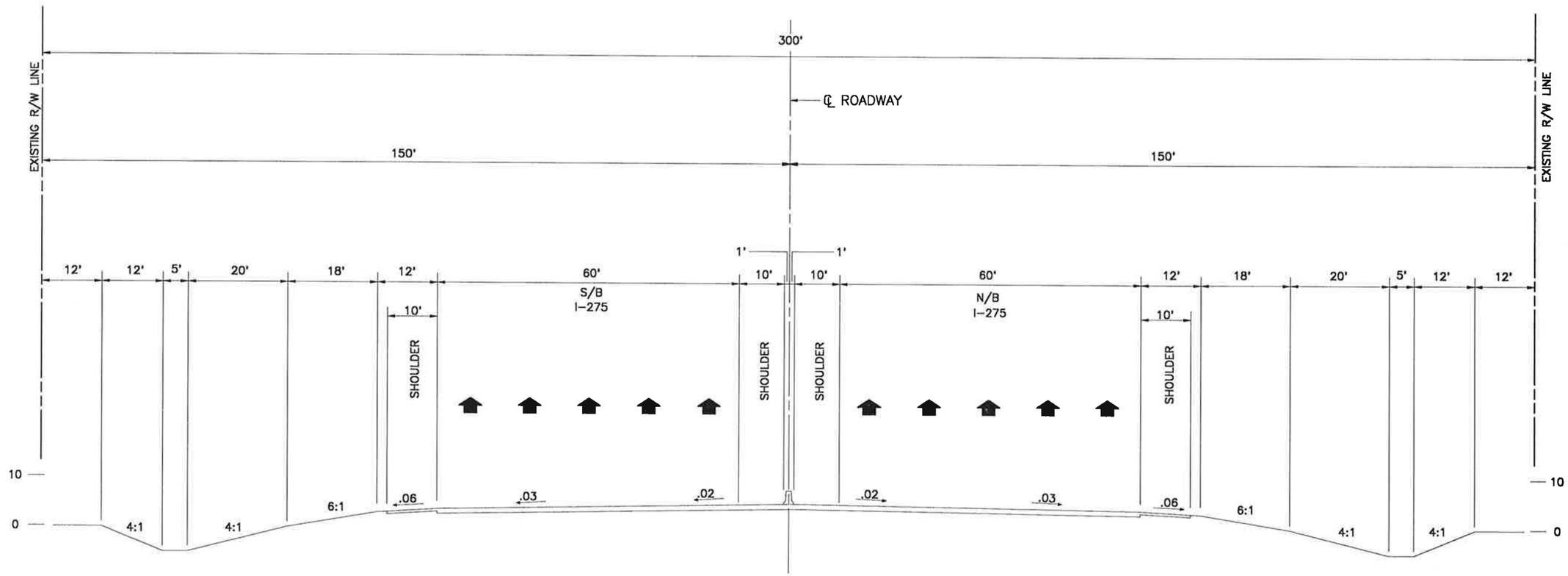
MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 6B
KEY MAP

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-119 OF 135



STATION 648+00

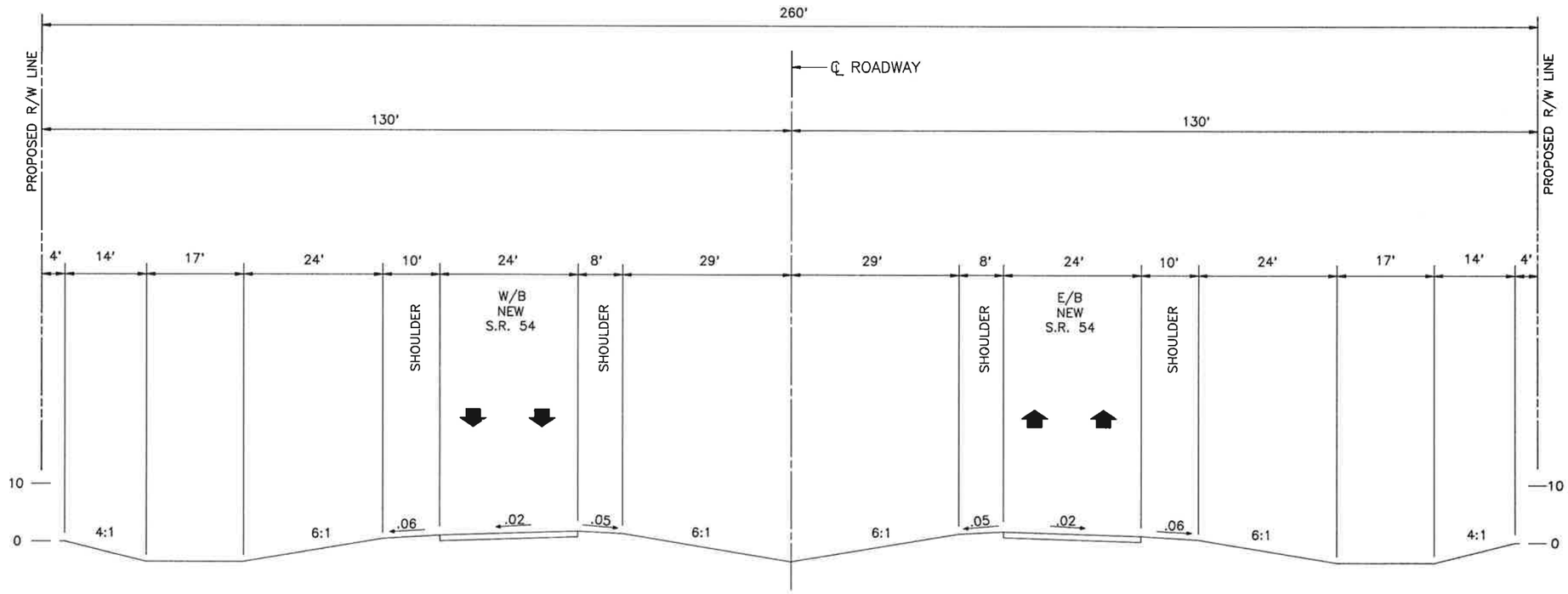
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-75 CROSS SECTION
NORTH OF CYPRESS CREEK

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-120 OF 135



STATION 502+00

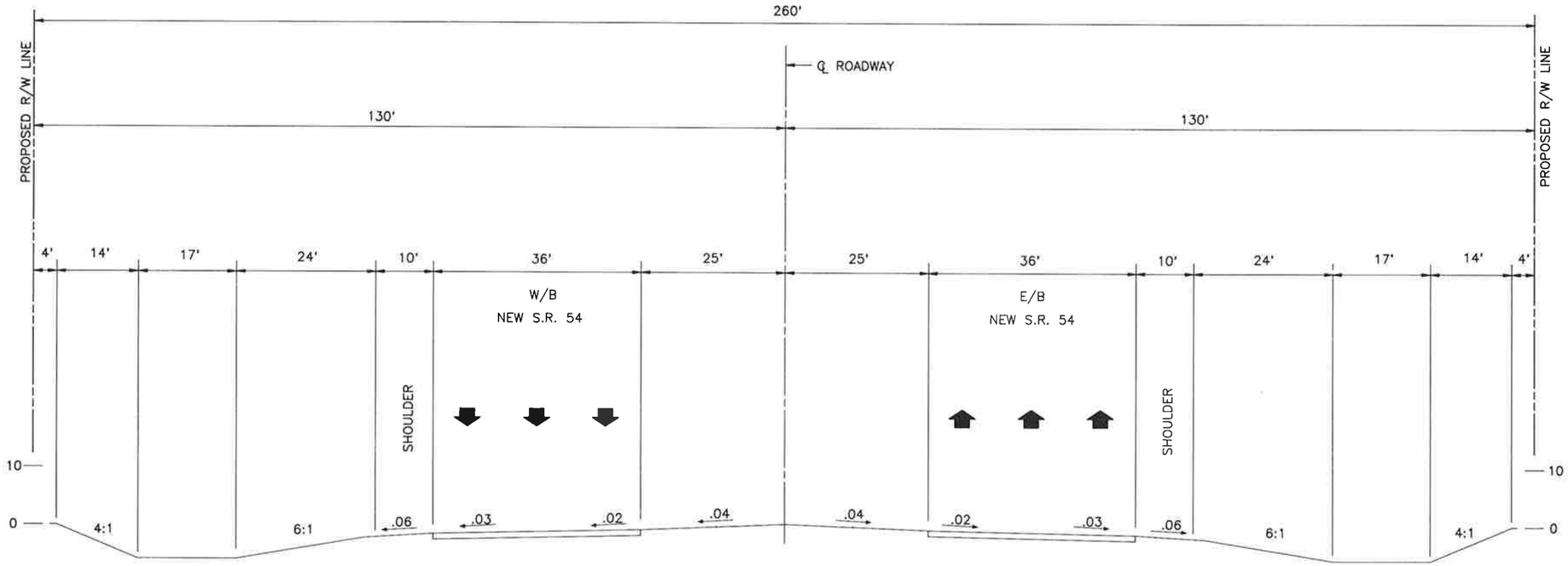
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
NEW S.R. 54 CROSS SECTION
WEST OF I-75

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-121 OF 135



STATION 521+00

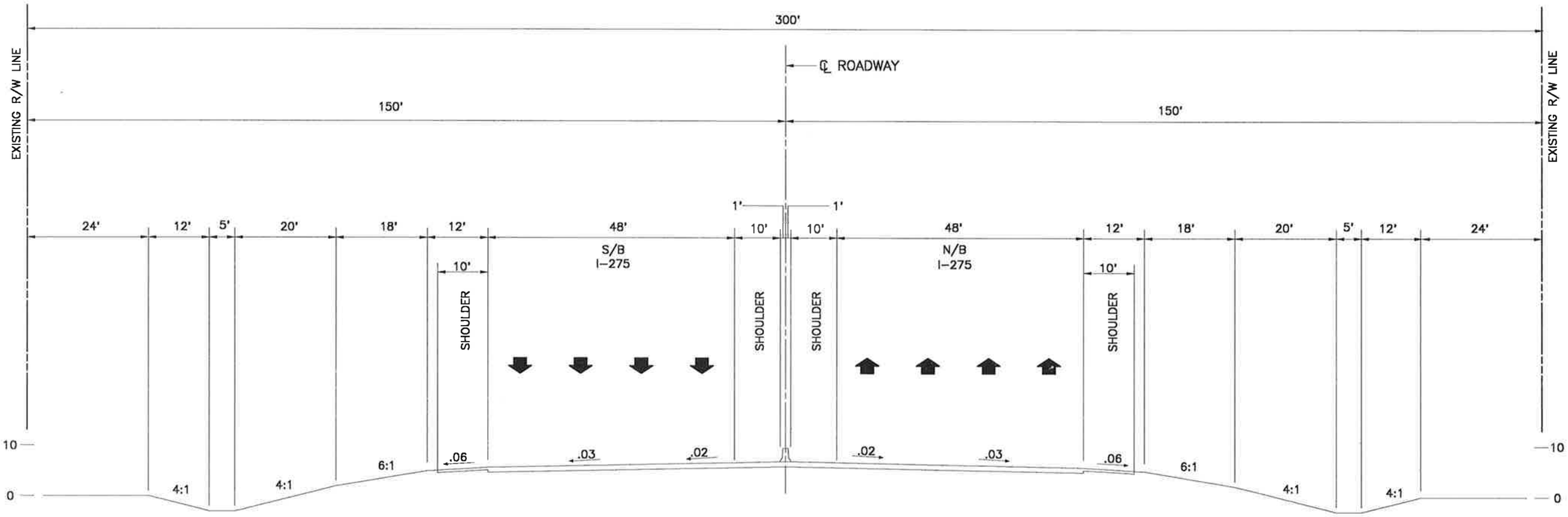
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
NEW S.R. 54 CROSS SECTION
EAST OF I-75

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-122 OF 135



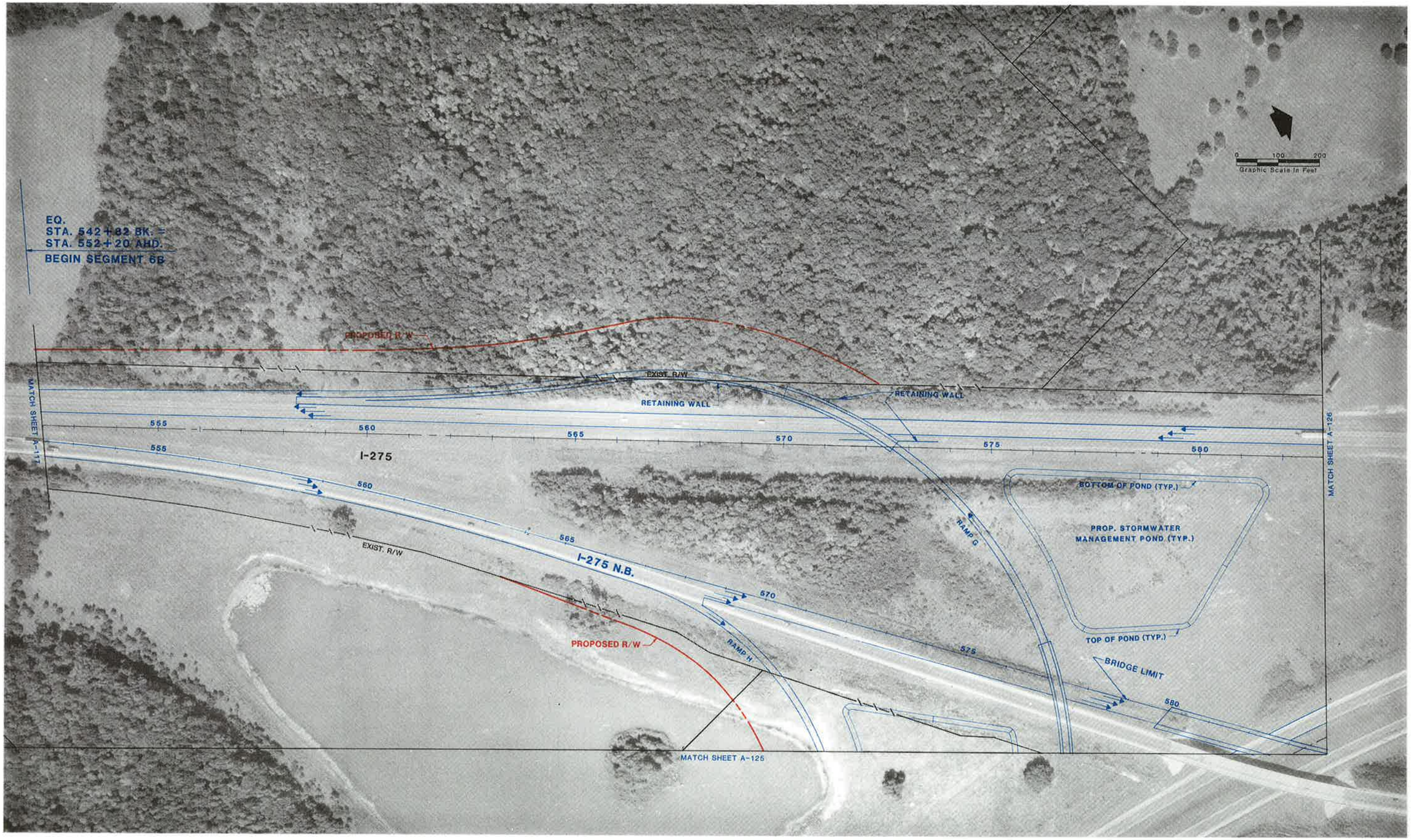
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-75 CROSS SECTION
NORTH OF NEW S.R. 54

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-123 OF 135

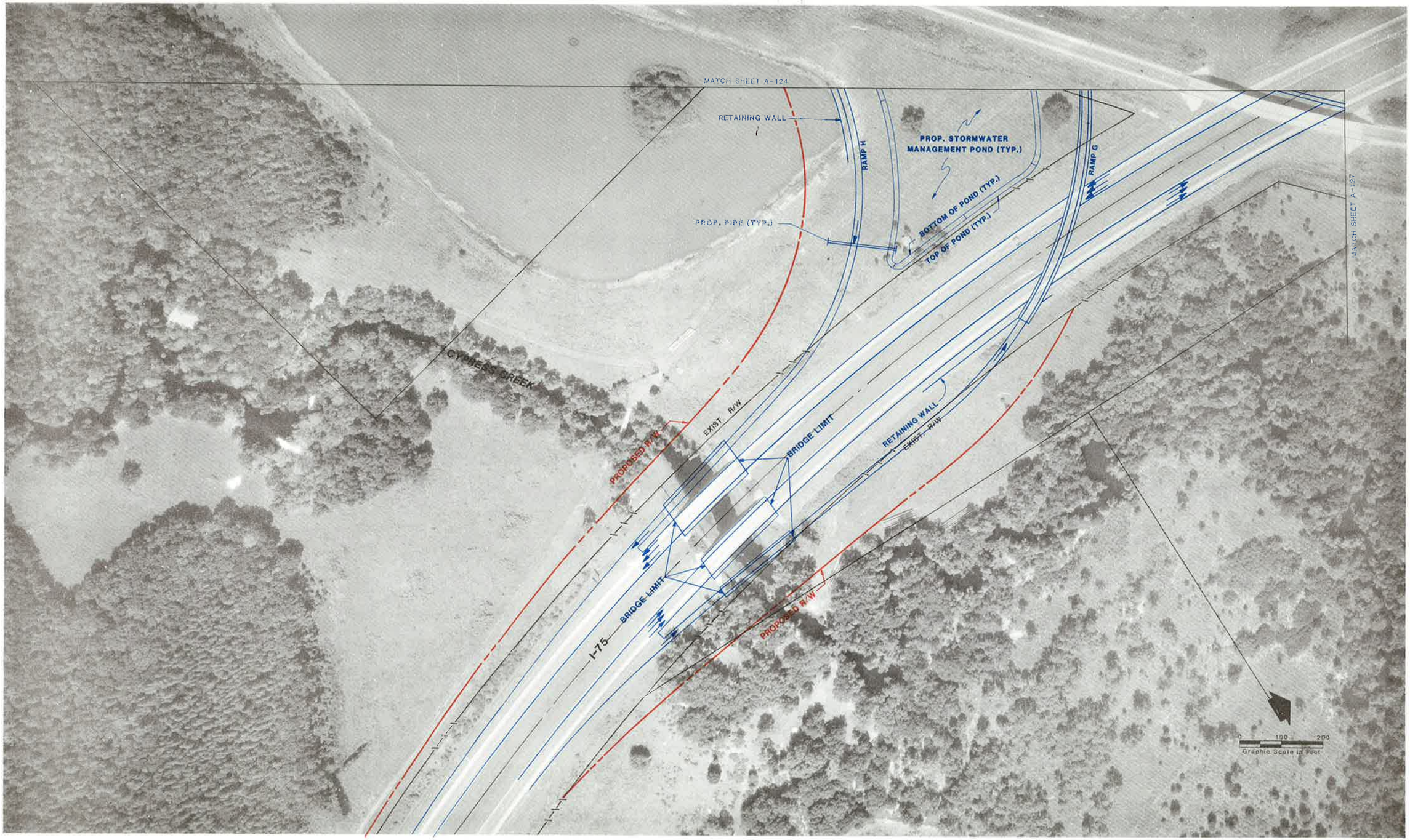


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-80	DRAFT MASTER PLAN CONCEPT
6-82	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-275 SOUTH OF COUNTY LINE RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 SHEET A-124 OF 135



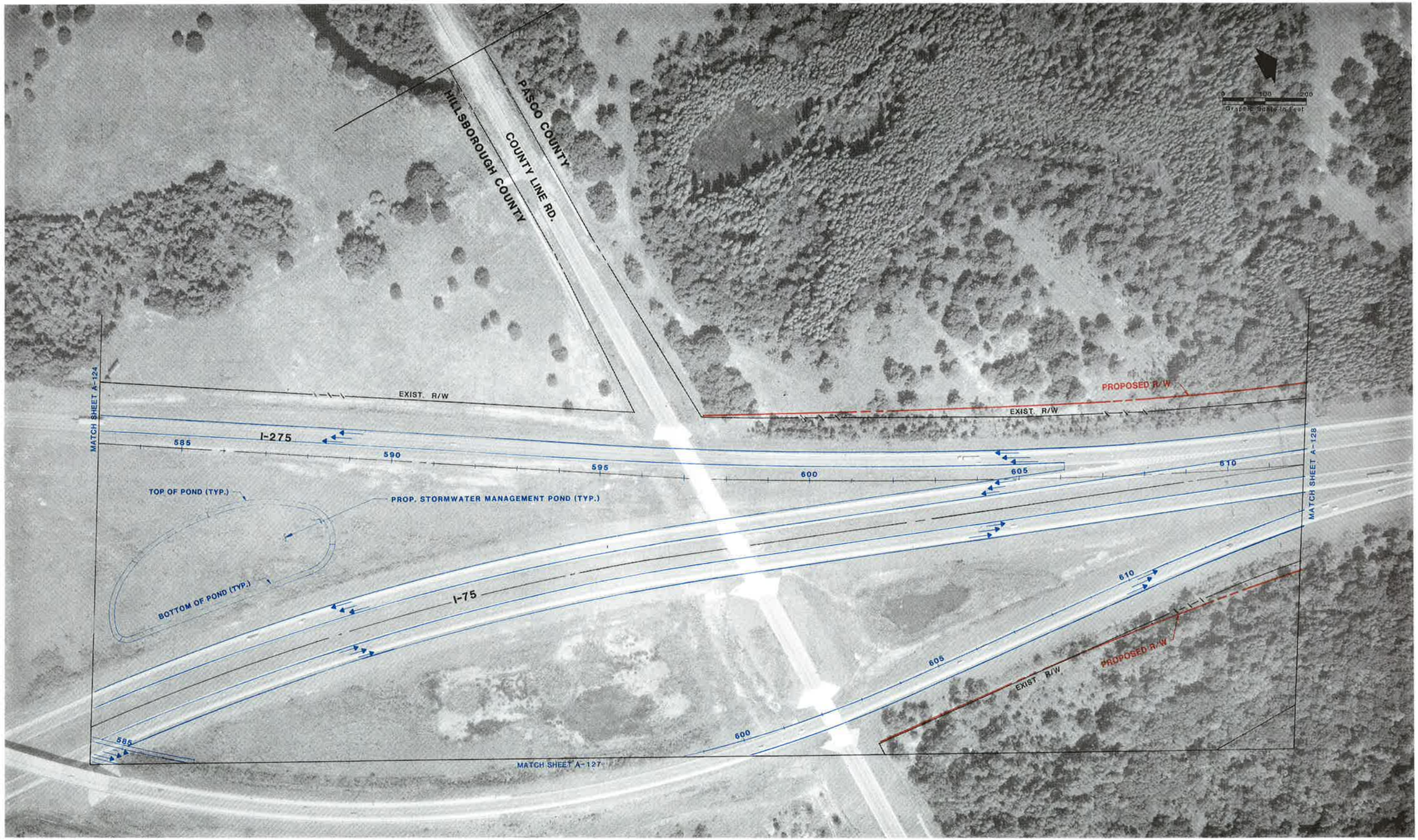
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
5-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-75 SOUTH OF COUNTY LINE RD.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-125 OF 135



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

DESIGN STUDY SEGMENT 6B
I-75 AND I-275 AT COUNTY LINE RD.

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

SHEET A-126 OF 135



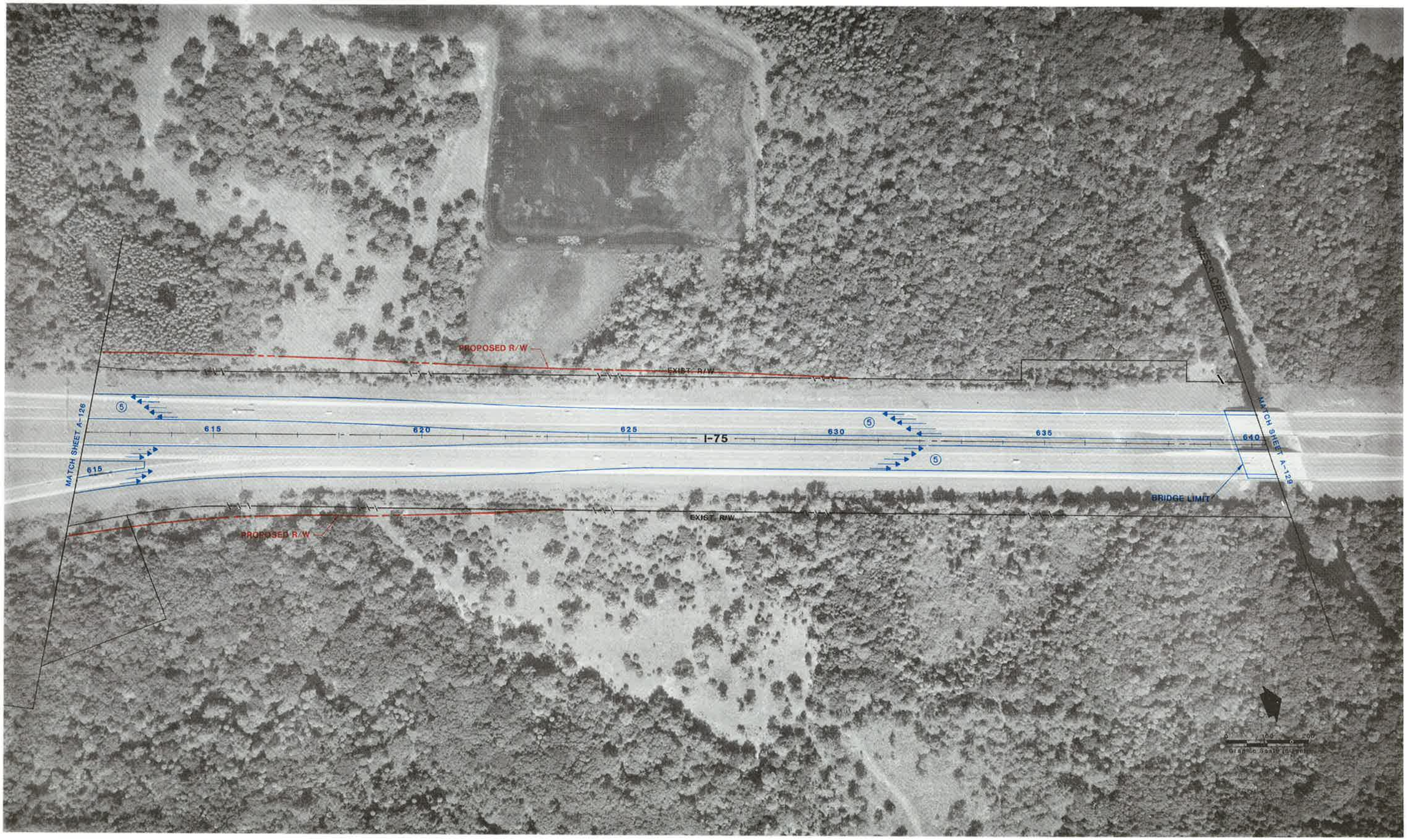
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
COUNTY LINE RD. EAST OF I-75

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-127 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-75 SOUTH OF CYPRESS CREEK

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET A-128 OF 135



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-28-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

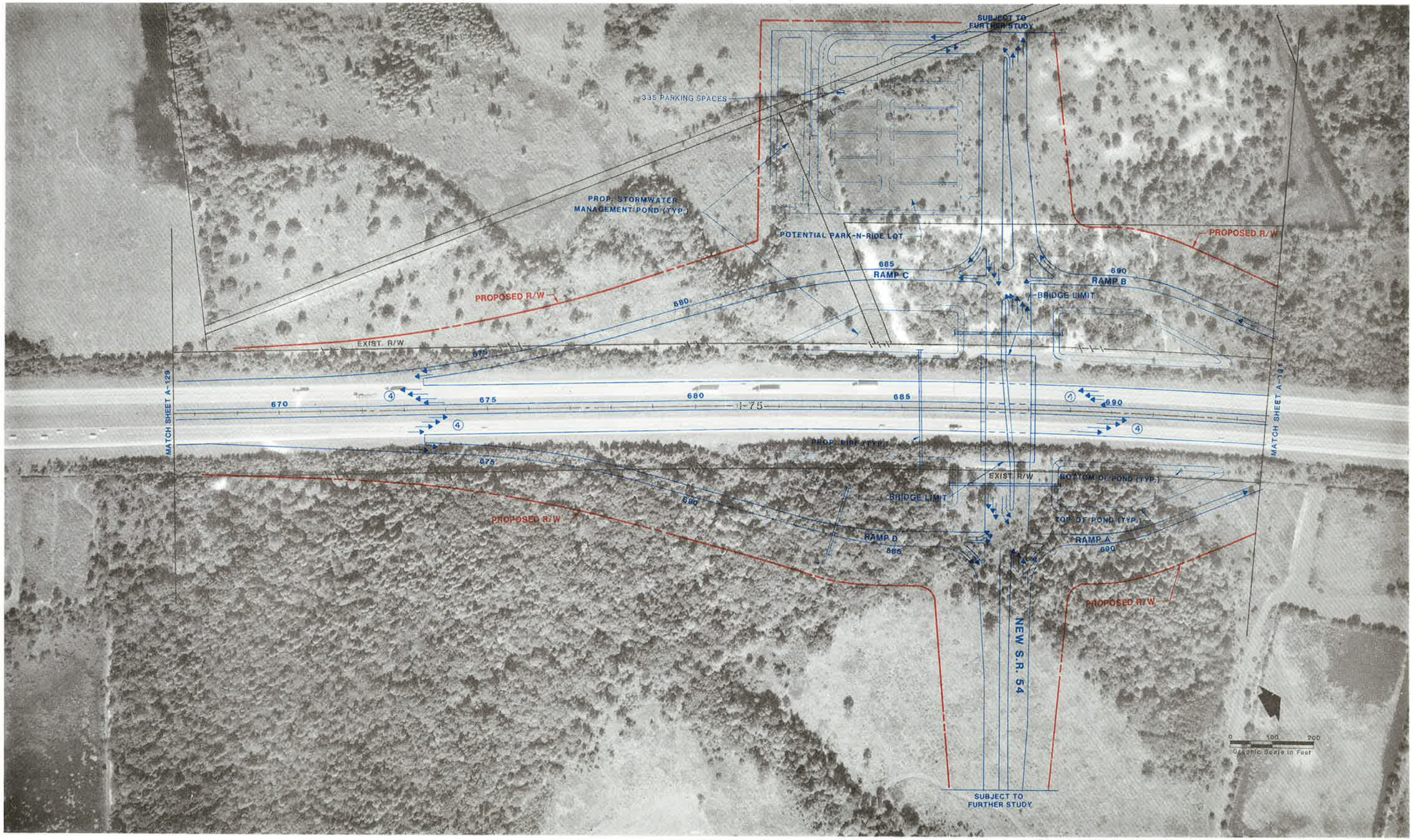
DESIGN STUDY SEGMENT 6B
I-75 NORTH OF CYPRESS CREEK

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

SHEET A-129 OF 135



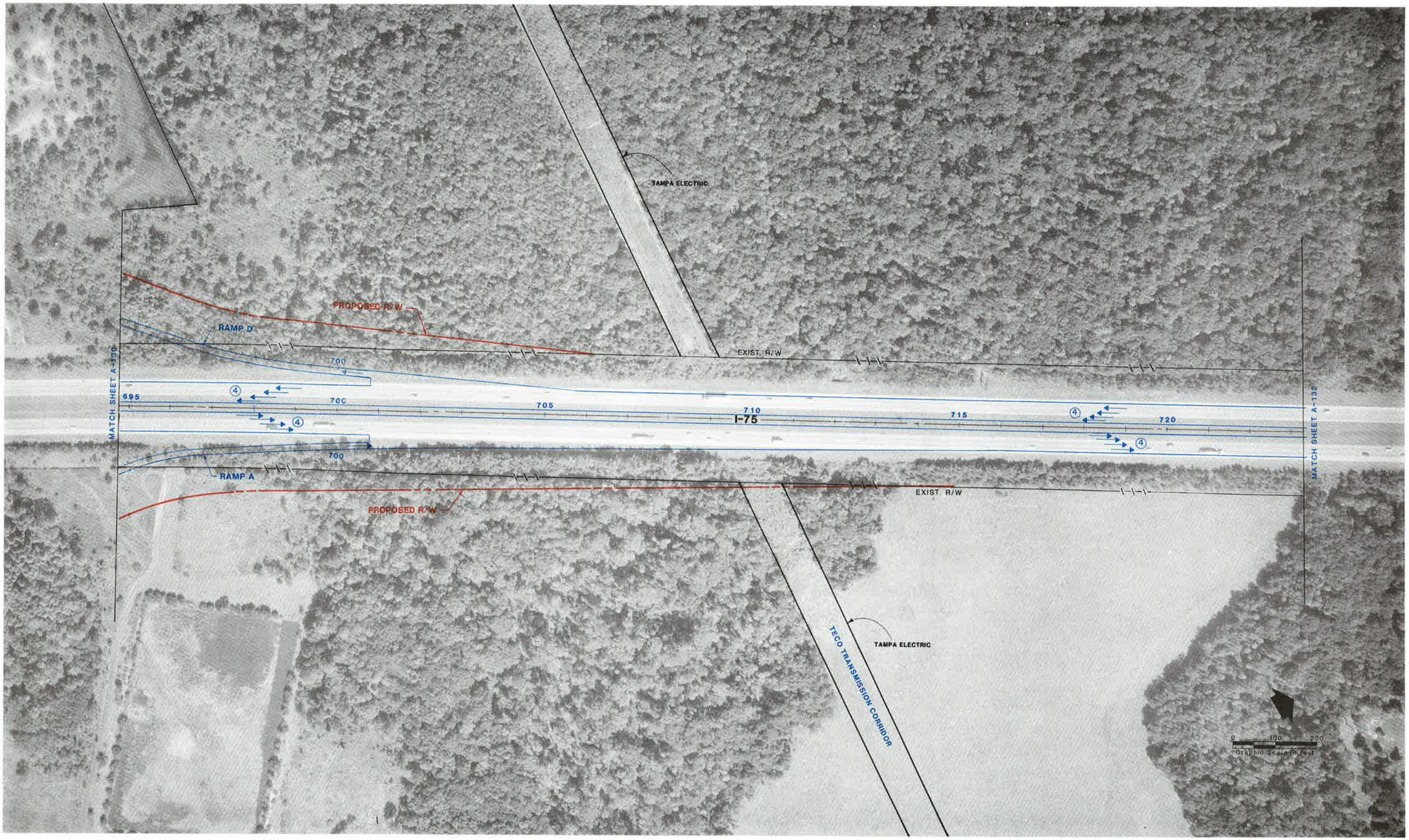
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
5-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-75 AT NEW S.R. 54

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-130 OF 135



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

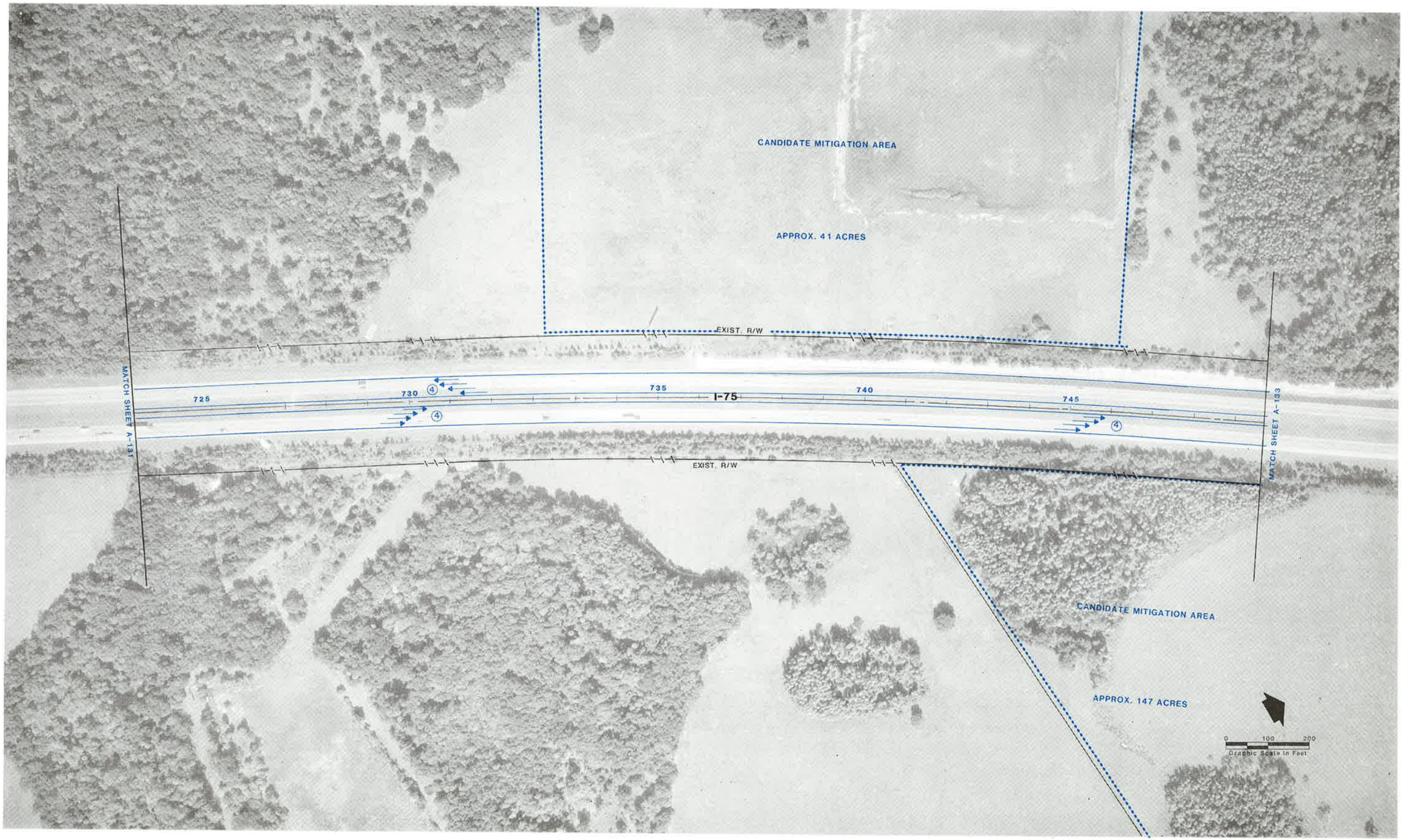
DESIGN STUDY SEGMENT 6B
I-75 NORTH OF NEW S.R. 54

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

SHEET A-131 OF 135



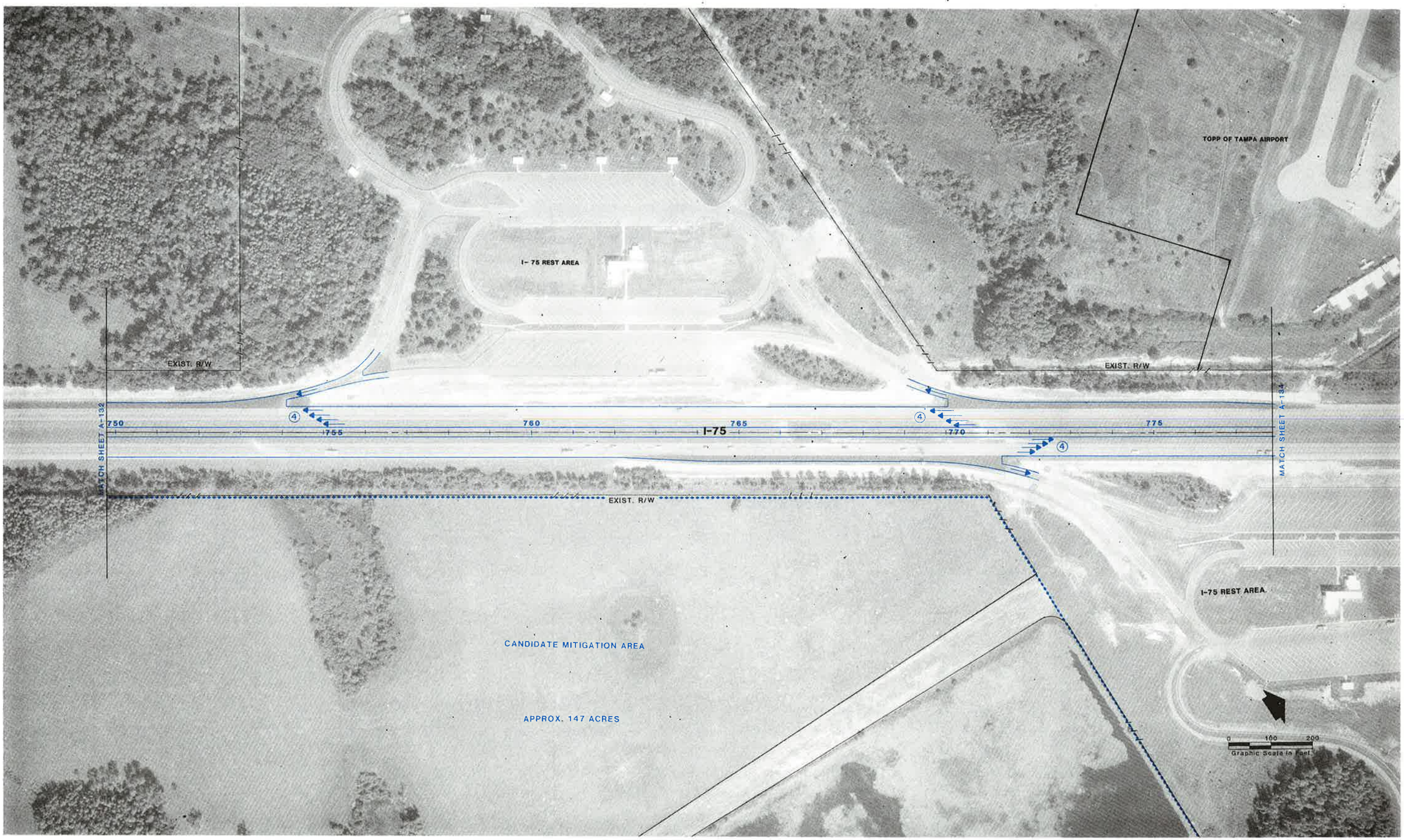
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
5-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-75

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-132 OF 135

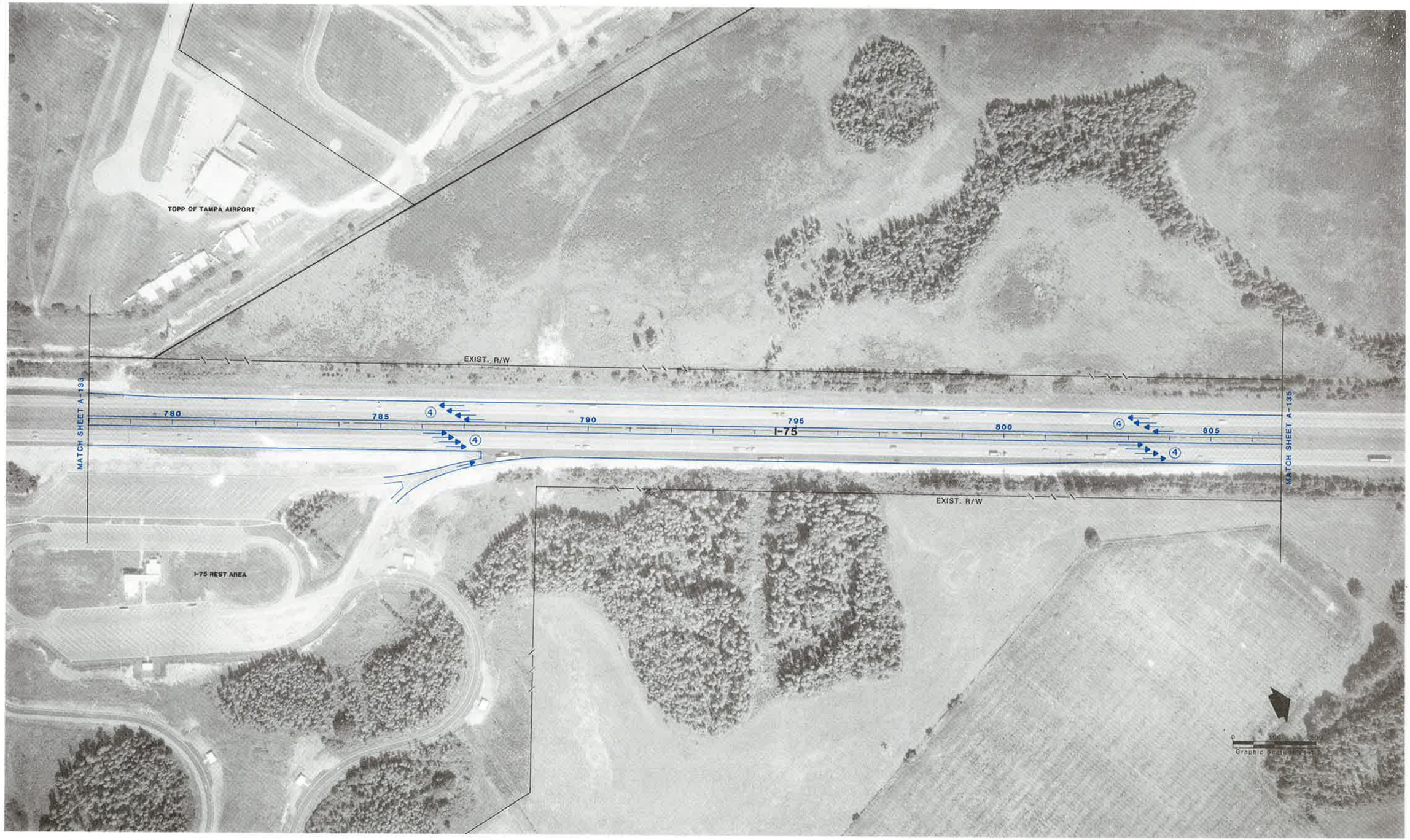


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-75 AT REST AREA

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 SHEET A-133 OF 135



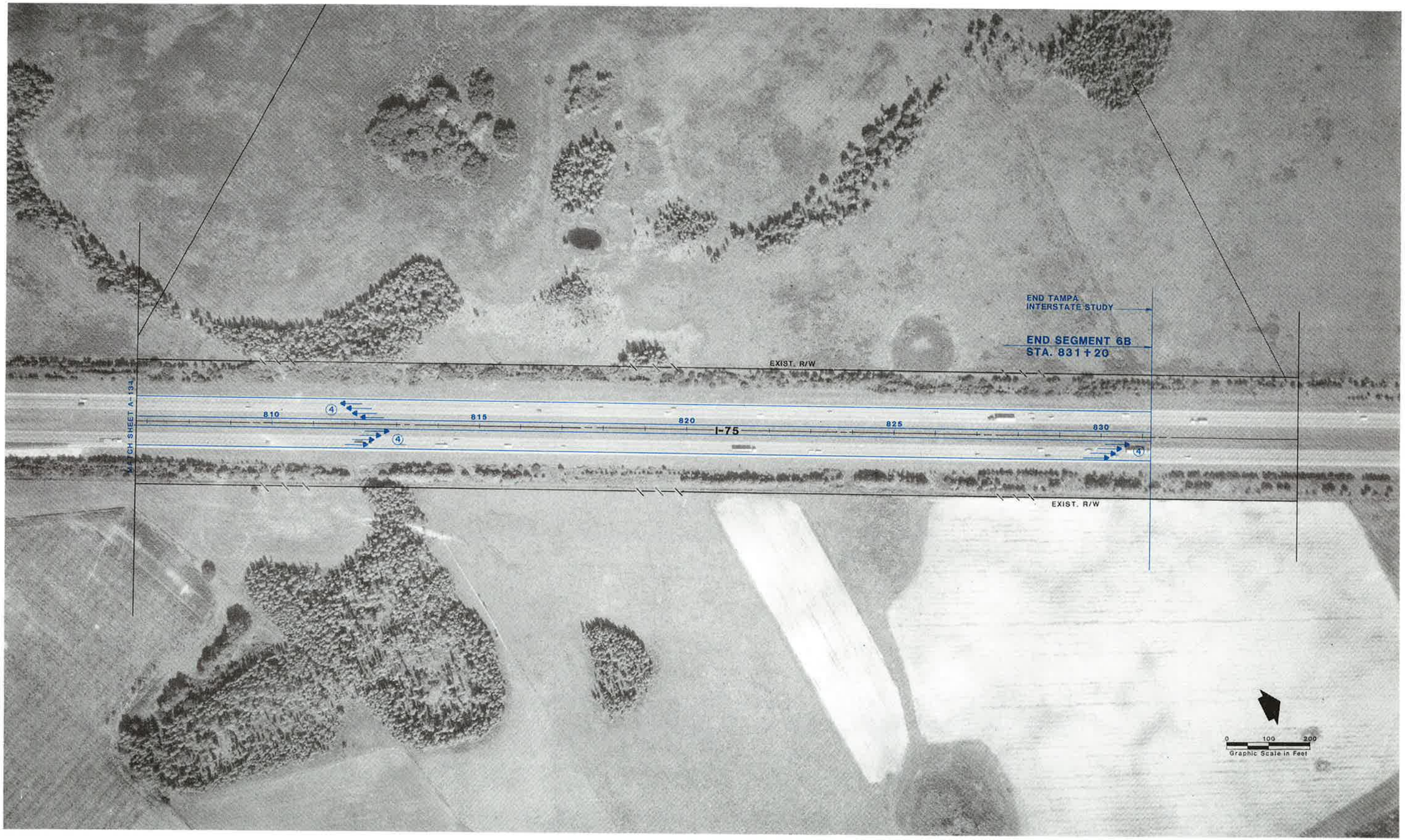
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-75 AT TOPP OF TAMPA AIRPORT

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-134 OF 135



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENT 6B
I-75 NORTH OF TOPP OF TAMPA AIRPORT

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET A-135 OF 135

PRIORITY CONSTRUCTION SEQUENCE AND MAINTENANCE OF TRAFFIC

SECTION B

PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

PRIORITY CONSTRUCTION SEQUENCE AND MAINTENANCE OF TRAFFIC

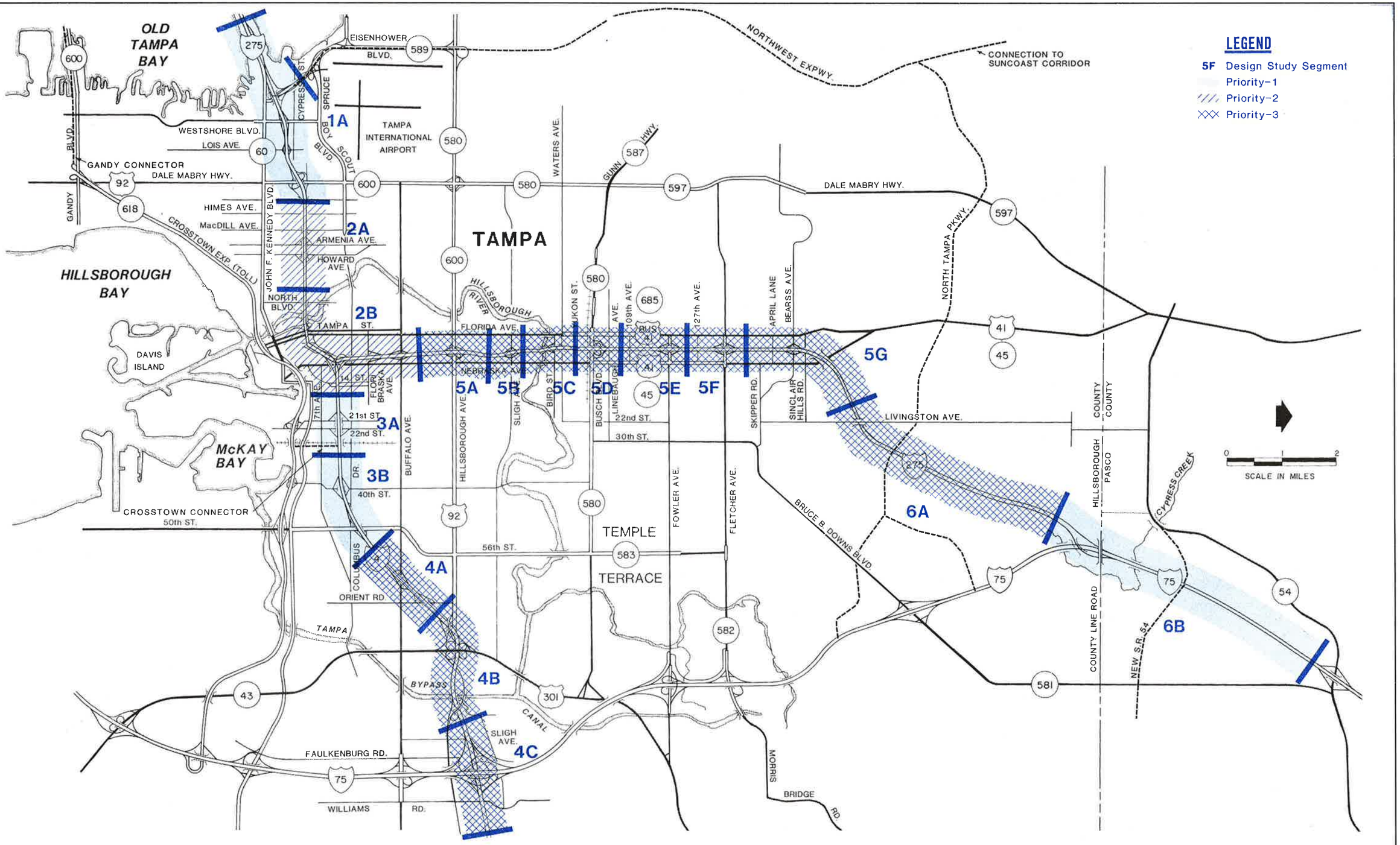
SECTION B



HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

SECTION B PRIORITY CONSTRUCTION SEQUENCE AND MAINTENANCE OF TRAFFIC

SHEET NO.	SHEET DESCRIPTION
	SECTION B DIVIDER SHEET
	SECTION B INDEX SHEET
B-1	INTERSTATE RECONSTRUCTION PRIORITIES
B-2	TWO ROADWAY RECONSTRUCTION SEQUENCE
B-3	TWO ROADWAY LANE ADDITIONS
B-4	FOUR ROADWAY RECONSTRUCTION SEQUENCE



LEGEND

- 5F Design Study Segment
- Priority-1
- Priority-2
- Priority-3

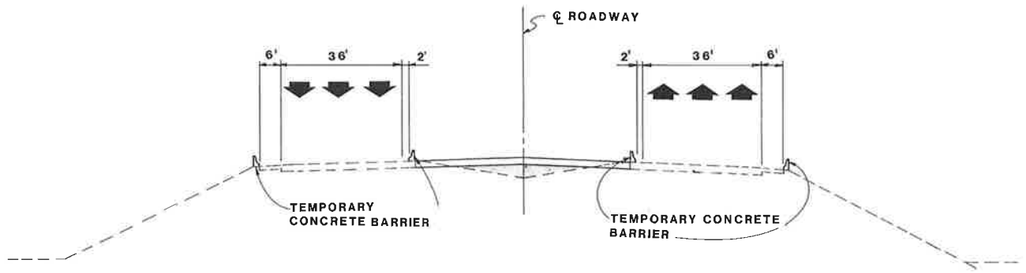
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
INTERSTATE RECONSTRUCTION PRIORITIES

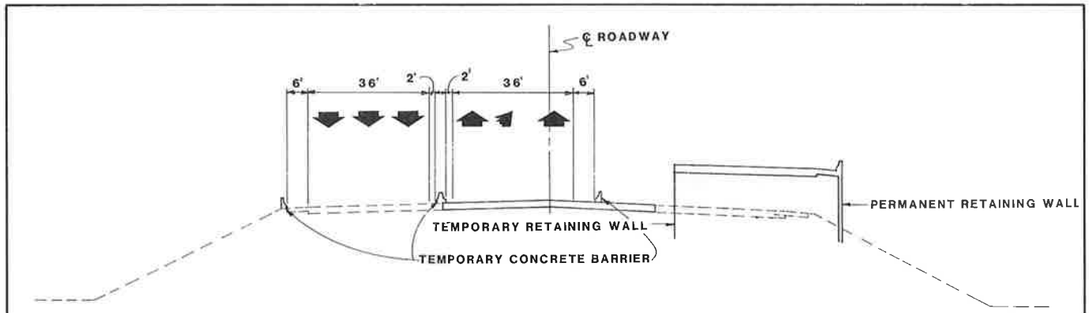
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET B1 OF 4



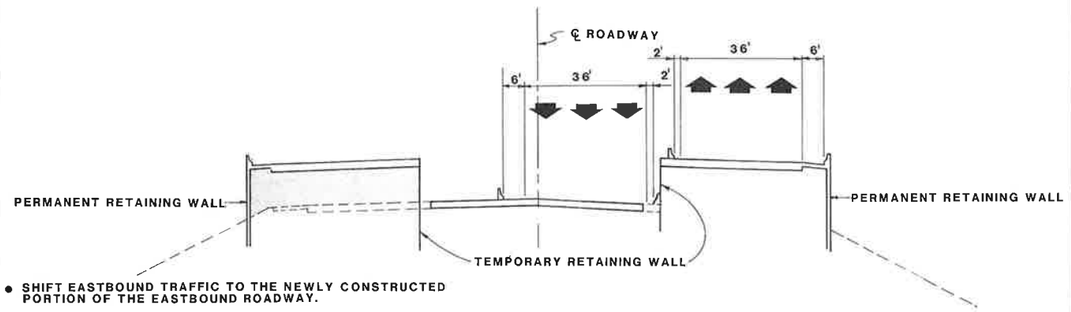
- PLACE TEMPORARY CONCRETE BARRIERS
- SHIFT TRAFFIC TO THE OUTSIDE UTILIZING EXISTING SHOULDERS
- CONSTRUCT TEMPORARY PAVEMENT IN MEDIAN

PHASE I



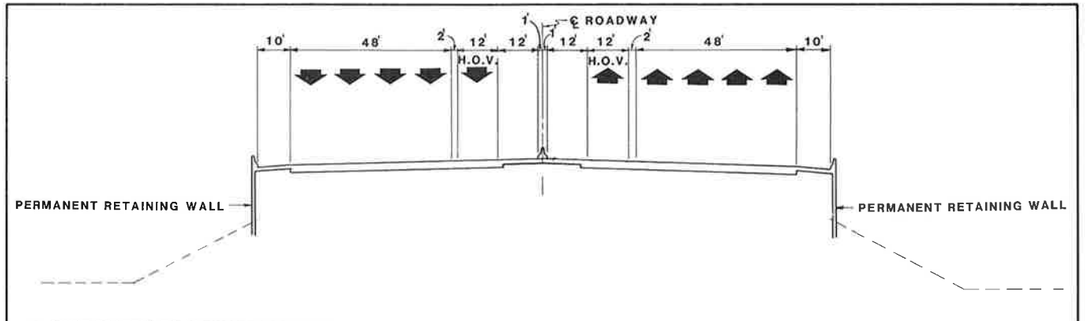
- SHIFT EASTBOUND TRAFFIC ONTO TEMPORARY PAVEMENT IN MEDIAN
- CONSTRUCT RETAINING WALL AND A PORTION OF EASTBOUND EMBANKMENT AND ROADWAY PAVEMENT

PHASE II



- SHIFT WESTBOUND TRAFFIC ONTO THE NEWLY CONSTRUCTED PORTION OF WESTBOUND ROADWAY.
- SHIFT EASTBOUND TRAFFIC TO THE NEWLY CONSTRUCTED PORTION OF THE EASTBOUND ROADWAY.
- SHIFT WESTBOUND TRAFFIC TO THE TEMPORARY MEDIAN PAVEMENT.
- CONSTRUCT RETAINING WALL AND A PORTION OF WESTBOUND EMBANKMENT AND ROADWAY PAVEMENT.

PHASE III



- SHIFT TRAFFIC TO ULTIMATE LOCATION
- RESURFACING AND FINAL WEARING COURSE AND STRIPING CAN BE ACCOMPLISHED BY SHIFTING TRAFFIC LANE BY LANE
- AN ADDITIONAL LANE PLUS AN H.O.V. LANE IS NOW AVAILABLE IN EACH DIRECTION

COMPLETED SECTION PHASE V

PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

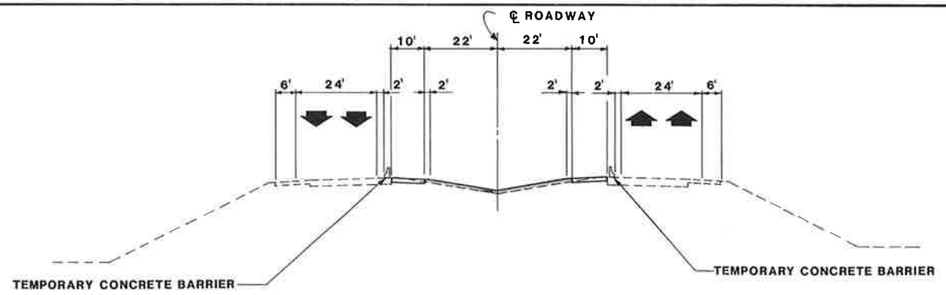
MASTER PLAN CONCEPT

TWO ROADWAY RECONSTRUCTION SEQUENCE

TAMPA INTERSTATE STUDY

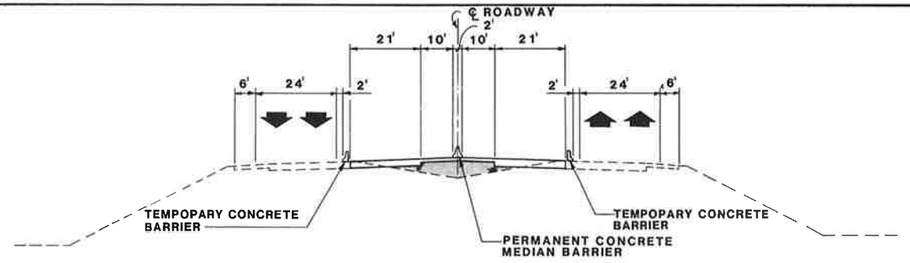
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET B-2 OF 4



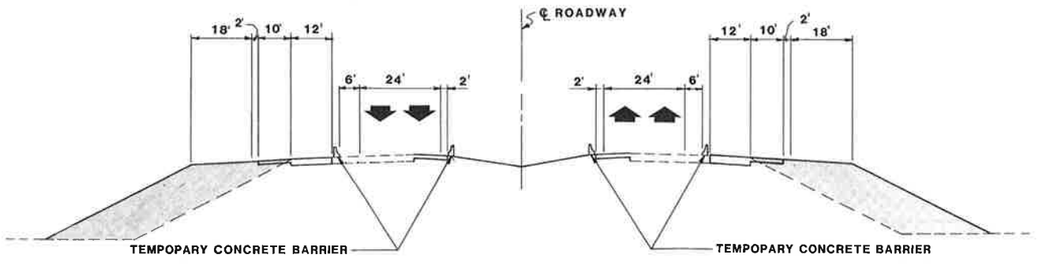
- SHIFT TRAFFIC TO OUTSIDE UTILIZING EXISTING PAVED SHOULDER.
- PLACE TEMPORARY CONCRETE BARRIER AT THE INSIDE EDGE OF EXISTING ROADWAY PAVEMENT.
- REGRADE MEDIAN AND CONSTRUCT PROPOSED MEDIAN PAVED SHOULDERS.

PHASE I



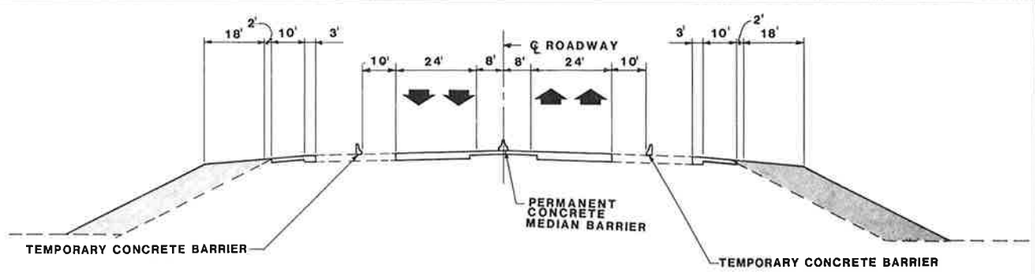
- SHIFT TRAFFIC TO OUTSIDE UTILIZING EXISTING PAVED SHOULDER.
- PLACE TEMPORARY CONCRETE BARRIER AT THE INSIDE EDGE OF EXISTING ROADWAY PAVEMENT.
- REGRADE MEDIAN AND CONSTRUCT PROPOSED PAVED SHOULDERS, ROADWAY LANES, AND PERMANENT CONCRETE MEDIAN BARRIER.

PHASE I



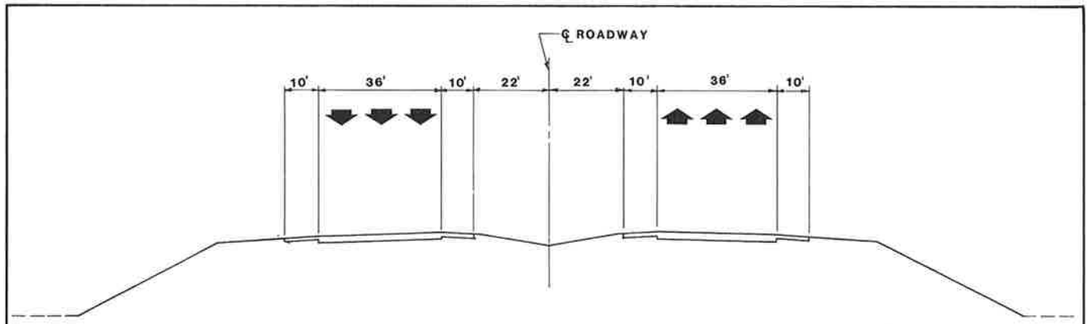
- SHIFT TRAFFIC TO THE INSIDE UTILIZING NEWLY CONSTRUCTED PAVED SHOULDER.
- PLACE TEMPORARY CONCRETE BARRIER AT THE OUTSIDE EDGE OF EXISTING ROADWAY PAVEMENT.
- CONSTRUCT EMBANKMENT AND THE PROPOSED ADDITIONAL ROADWAY LANE AND PAVED SHOULDER.

PHASE II



- SHIFT TRAFFIC TO THE INSIDE UTILIZING NEWLY CONSTRUCTED ROADWAY PAVEMENT AND SHOULDER.
- PLACE TEMPORARY CONCRETE BARRIER AT THE LOCATION SHOWN TO PROVIDE FOR 2 LANES PLUS SHOULDER.
- CONSTRUCT EMBANKMENT AND THE PROPOSED ADDITIONAL ROADWAY LANE AND PAVED SHOULDER.

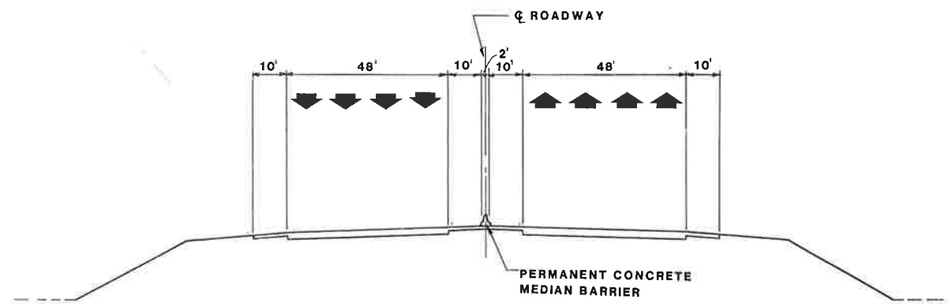
PHASE II



- REMOVE TEMPORARY CONCRETE BARRIERS.
- PLACE TRAFFIC IN FINAL LOCATION.
- RESURFACING AND FINAL WEARING COURSE CAN BE PLACED BY SHIFTING TRAFFIC LANE TO LANE.

COMPLETED SECTION PHASE III

2 ROADWAY SYSTEM-CONVERSION FROM FOUR LANES TO SIX LANES



- REMOVE TEMPORARY CONCRETE BARRIERS
- OPEN ALL LANES TO TRAFFIC.
- RESURFACING AND FINAL WEARING COURSE CAN BE PLACED BY SHIFTING TRAFFIC LANE TO LANE.

COMPLETED SECTION PHASE III

2 ROADWAY SYSTEM-CONVERSION FROM FOUR LANES TO EIGHT LANES

PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

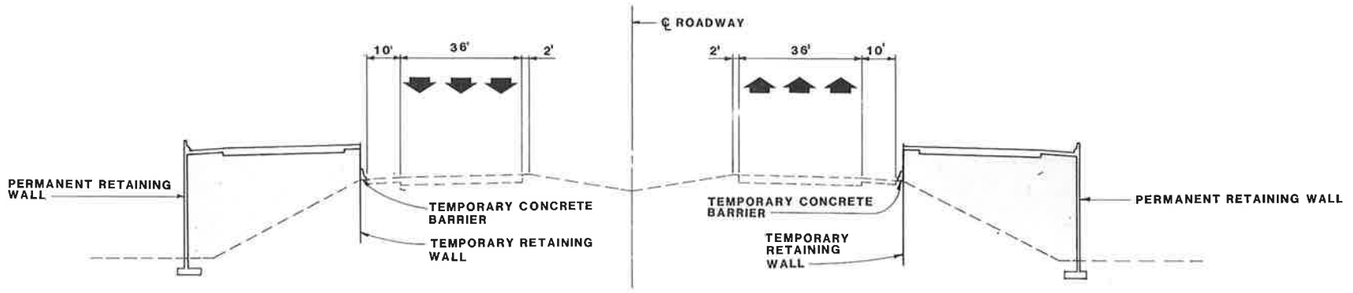
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TWO ROADWAY LANE ADDITIONS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

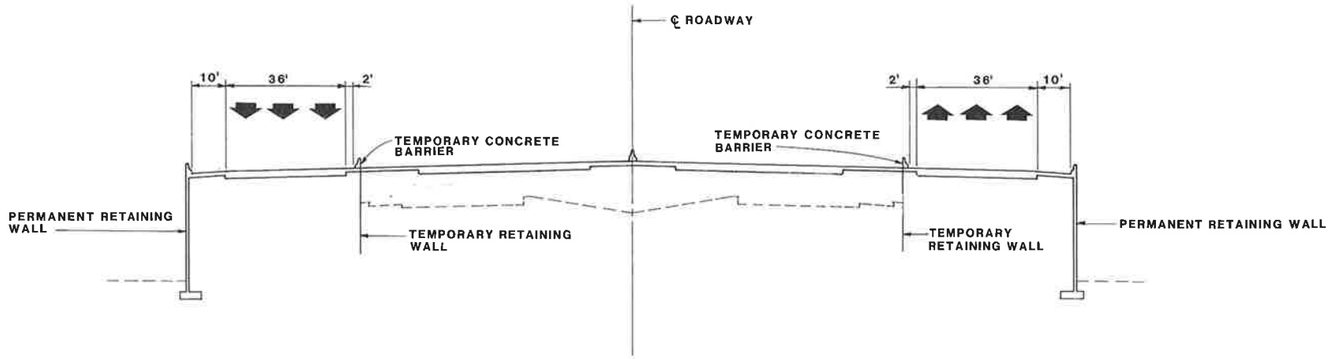
STATE PROJECT No. 99007-1402 | SHEET B-3 OF 4

- MAINTAIN TRAFFIC IN ORIGINAL POSITION.
- PLACE TEMPORARY RETAINING WALLS ON THE OUTSIDE EDGES OF EXISTING PAVEMENT.
- PLACE TEMPORARY CONCRETE BARRIERS ON THE OUTSIDE OF EXISTING SHOULDERS.
- CONSTRUCT RETAINING WALLS, EMBANKMENTS AND A PORTION OF THE C/D ROADWAY PAVEMENTS.
- IN SOME AREAS IT MAY BECOME NECESSARY TO BUILD ONE C/D ROADWAY AT A TIME AND THEN SHIFT TRAFFIC. THE HORTIZONTAL LOCATION OF THE C/D ROADWAY SYSTEM MAY OVERLAP THE EXISTING PAVEMENT.



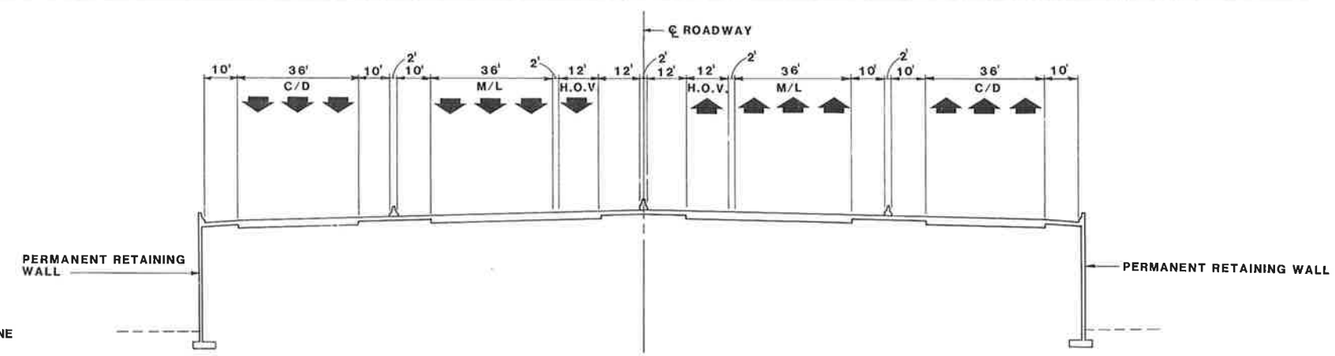
PHASE I

- PLACE TEMPORARY CONCRETE BARRIERS ON THE INSIDE EDGE OF NEWLY CONSTRUCTED C/D ROADWAY PAVEMENT.
- SHIFT TRAFFIC TO THE NEWLY CONSTRUCTED PORTIONS OF C/D ROADWAY.
- CONSTRUCT INTERIOR PORTIONS OF C/D, MAINLINE AND H.O.V. ROADWAYS.



PHASE II

- SHIFT TRAFFIC TO ULTIMATE LOCATION.
- RESURFACING AND FINAL WEARING COURSE AND STRIPING CAN BE ACCOMPLISHED BY SHIFTING TRAFFIC LANE BY LANE
- ADDITIONAL LANES PLUS H.O.V. LANES ARE NOW AVAILABLE.



COMPLETED SECTION PHASE III

4 ROADWAY SYSTEM

PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
FOUR ROADWAY RECONSTRUCTION SEQUENCE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET B-4 OF 4

TRAFFIC ASSIGNMENTS

SECTION C

PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

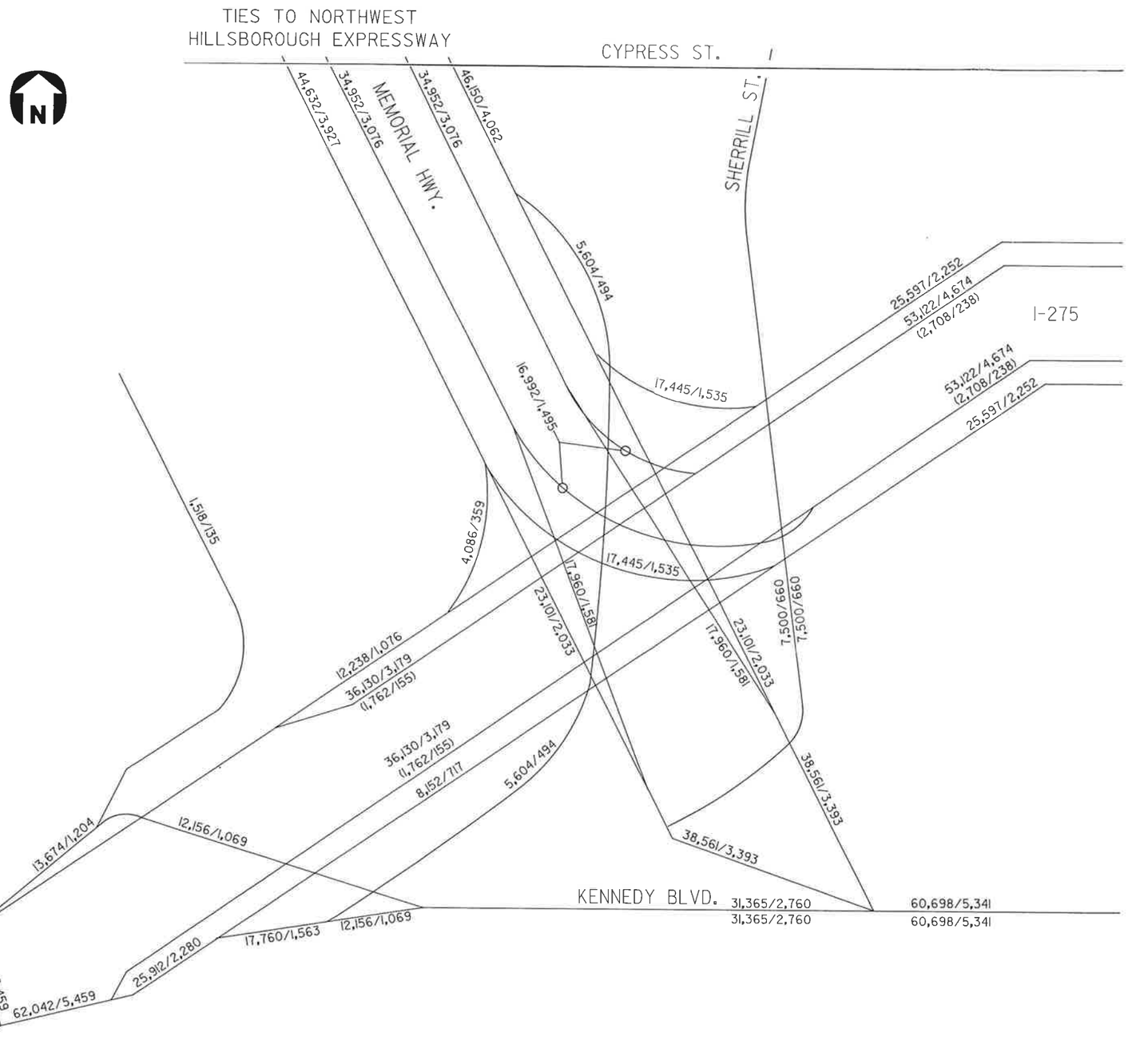
TRAFFIC ASSIGNMENTS

SECTION C



HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

SECTION C	TRAFFIC ASSIGNMENTS
SHEET NO.	SHEET DESCRIPTION
	SECTION C DIVIDER SHEET
	SECTION C INDEX SHEET
C-1	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENT 1A WEST
C-2	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENT 1A EAST
C-3	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENT 2A
C-4	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENT 2B
C-5	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENT 3A
C-6	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENTS 3B AND 4A
C-7	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENTS 4B AND 4C
C-8	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENTS 5A, 5B, AND 5C
C-9	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENTS 5D AND 5E
C-10	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENTS 5F AND 5G
C-11	2010 TRAFFIC VOLUMES DESIGN STUDY SEGMENTS 6A AND 6B



LEGEND

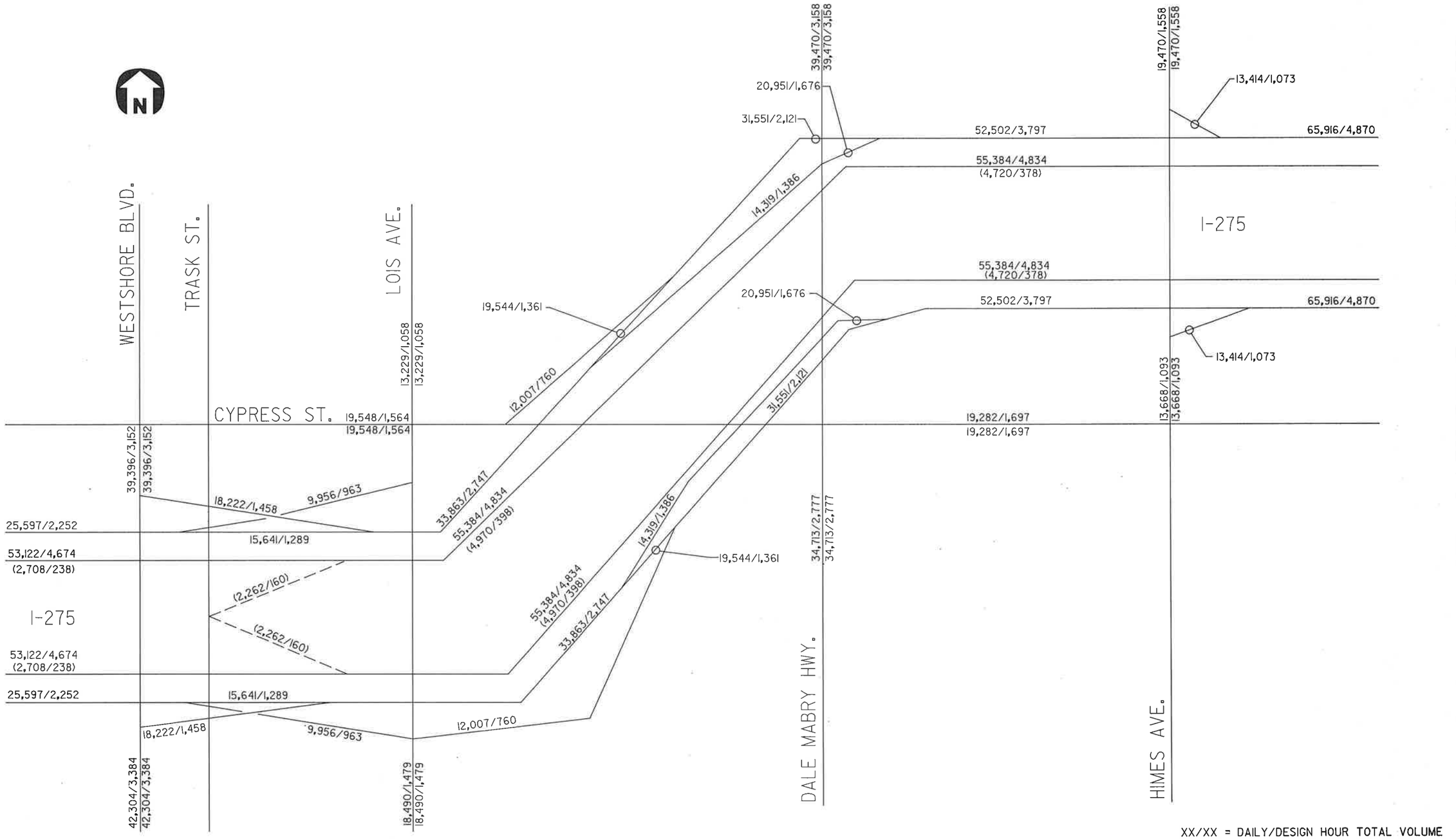
XX/XX = DAILY/DESIGN HOUR TOTAL VOLUME
(XX/XX) = DAILY/DESIGN HOUR HOV VOLUME
— — — — · HOV RAMP

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENT 1A WEST

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET C-1 OF 11

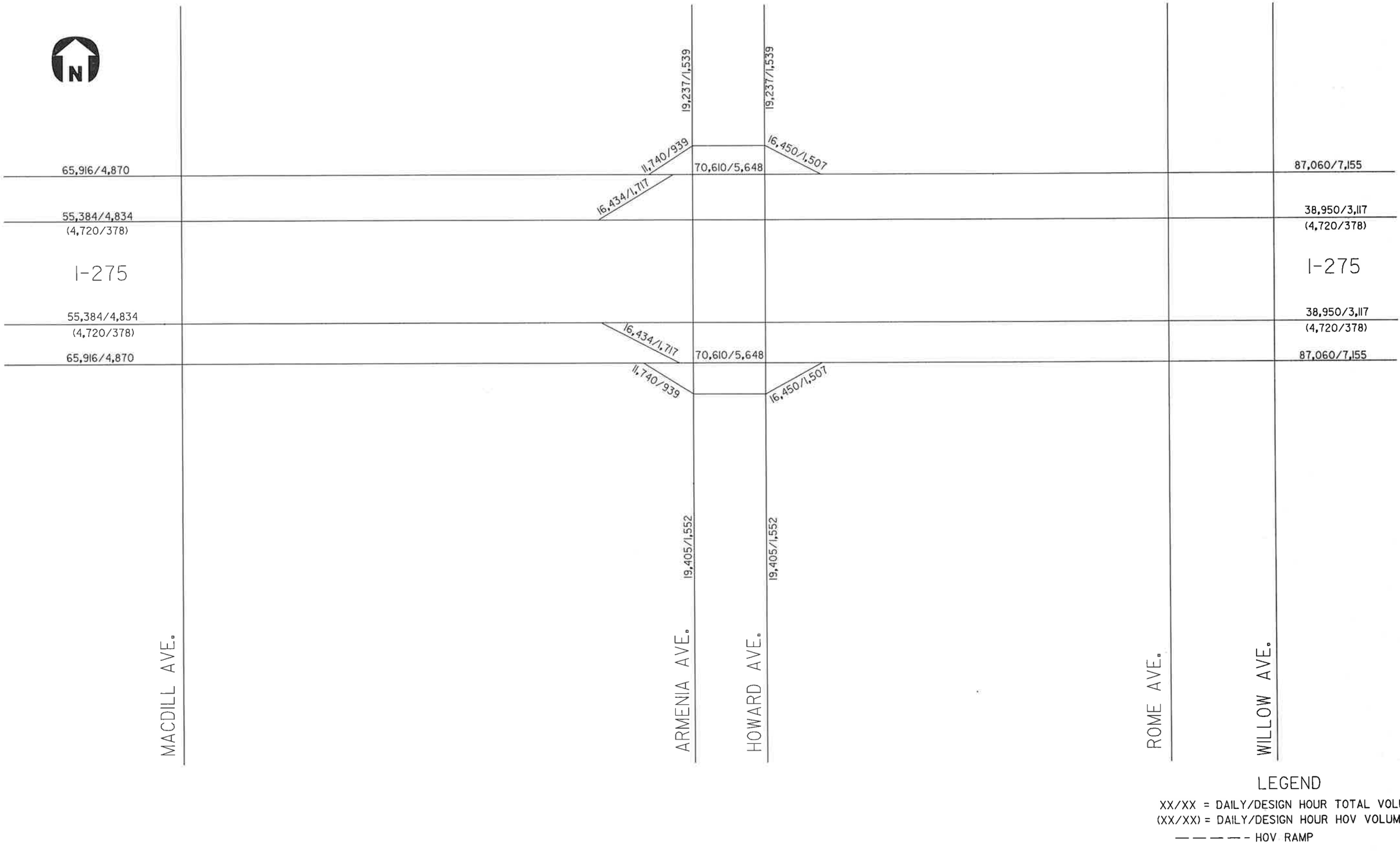


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENT 1A EAST

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET C-2 OF 11



LEGEND

XX/XX = DAILY/DESIGN HOUR TOTAL VOLUME
(XX/XX) = DAILY/DESIGN HOUR HOV VOLUME
— — — — HOV RAMP

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

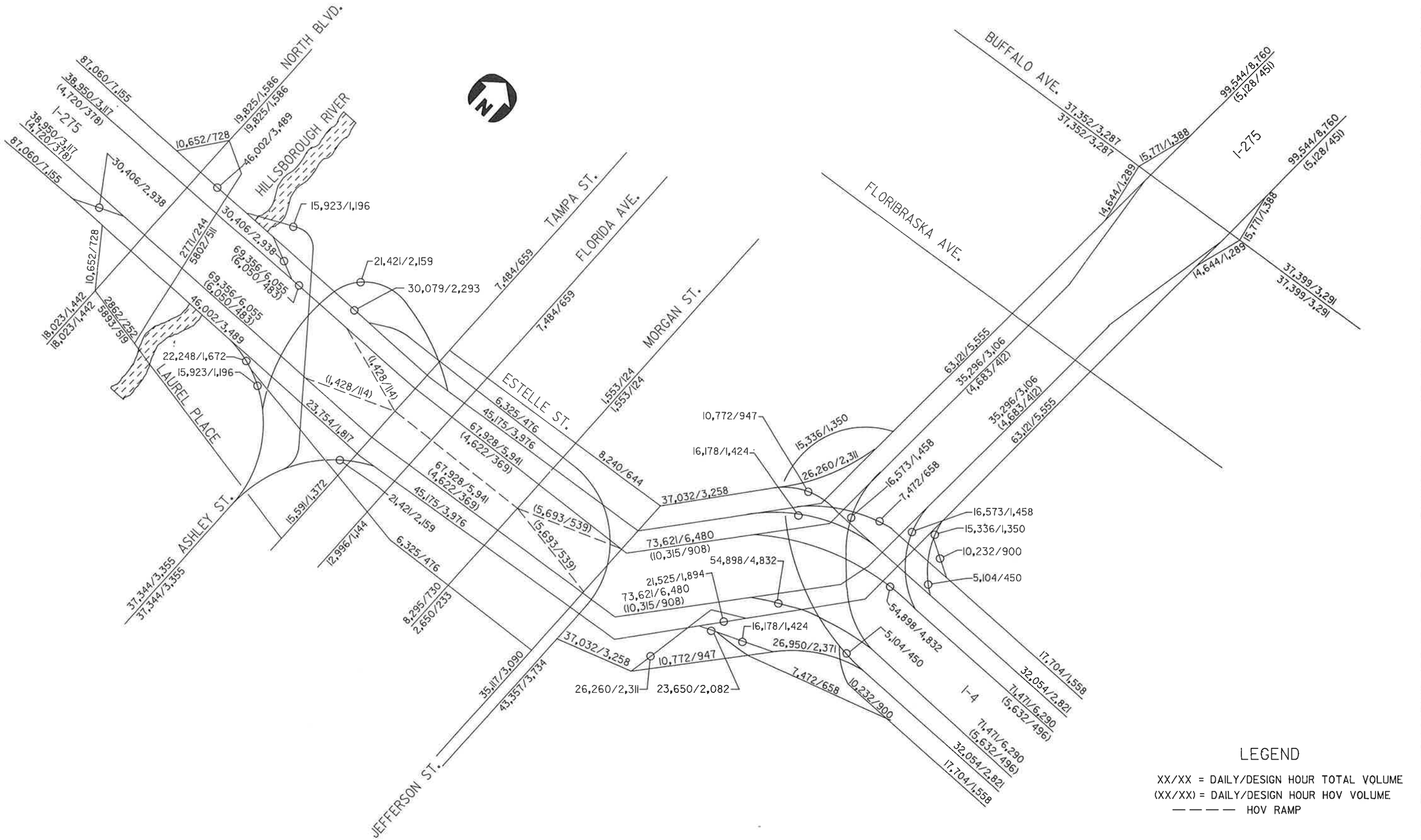
PLANNING FOR TOMORROW TODAY I-4 I-275 I-75 TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENT 2A

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET C-3 OF 11



LEGEND

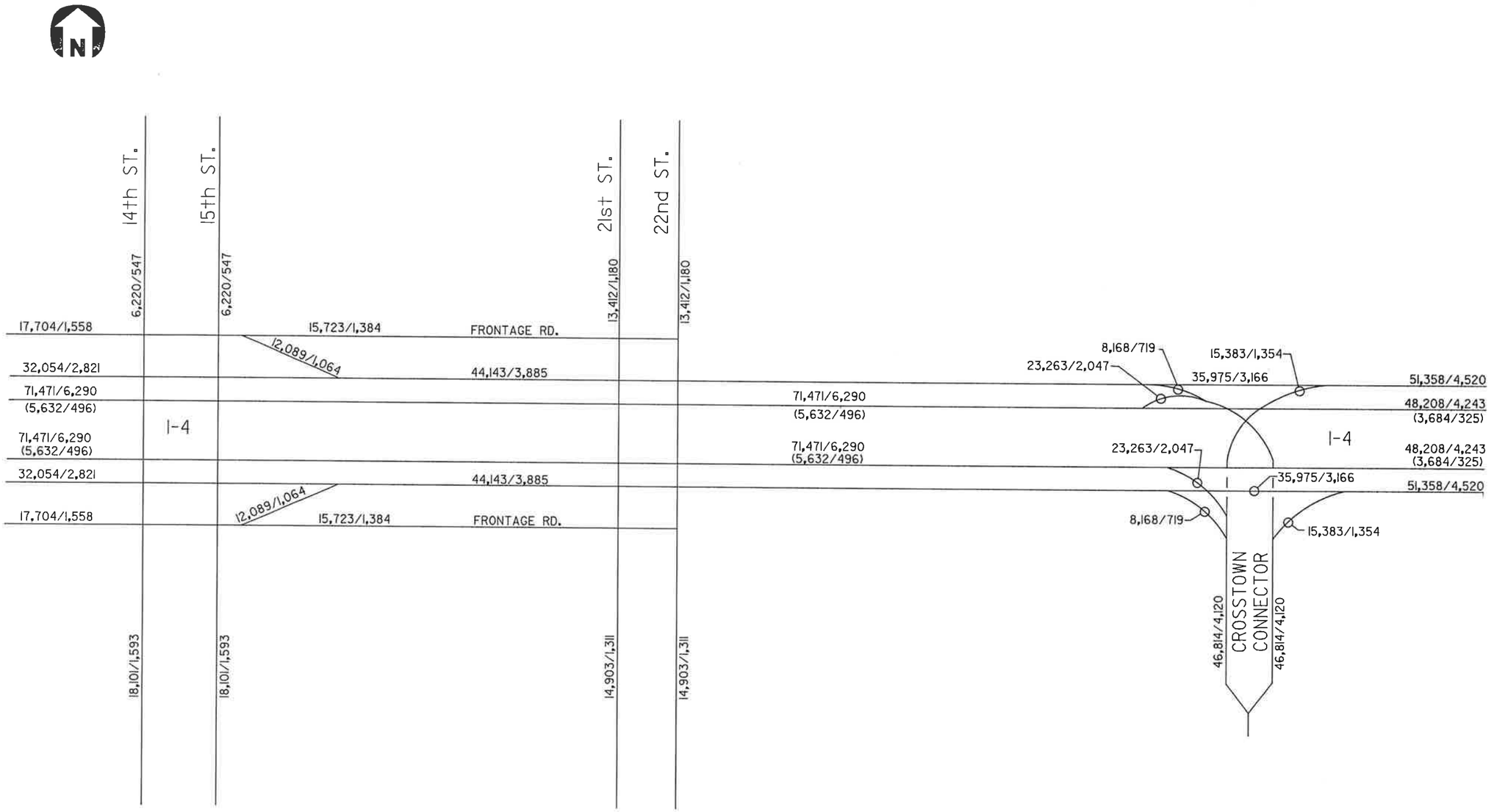
XX/XX = DAILY/DESIGN HOUR TOTAL VOLUME
(XX/XX) = DAILY/DESIGN HOUR HOV VOLUME
— — — — HOV RAMP

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENT 2B

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET C-4 OF 11



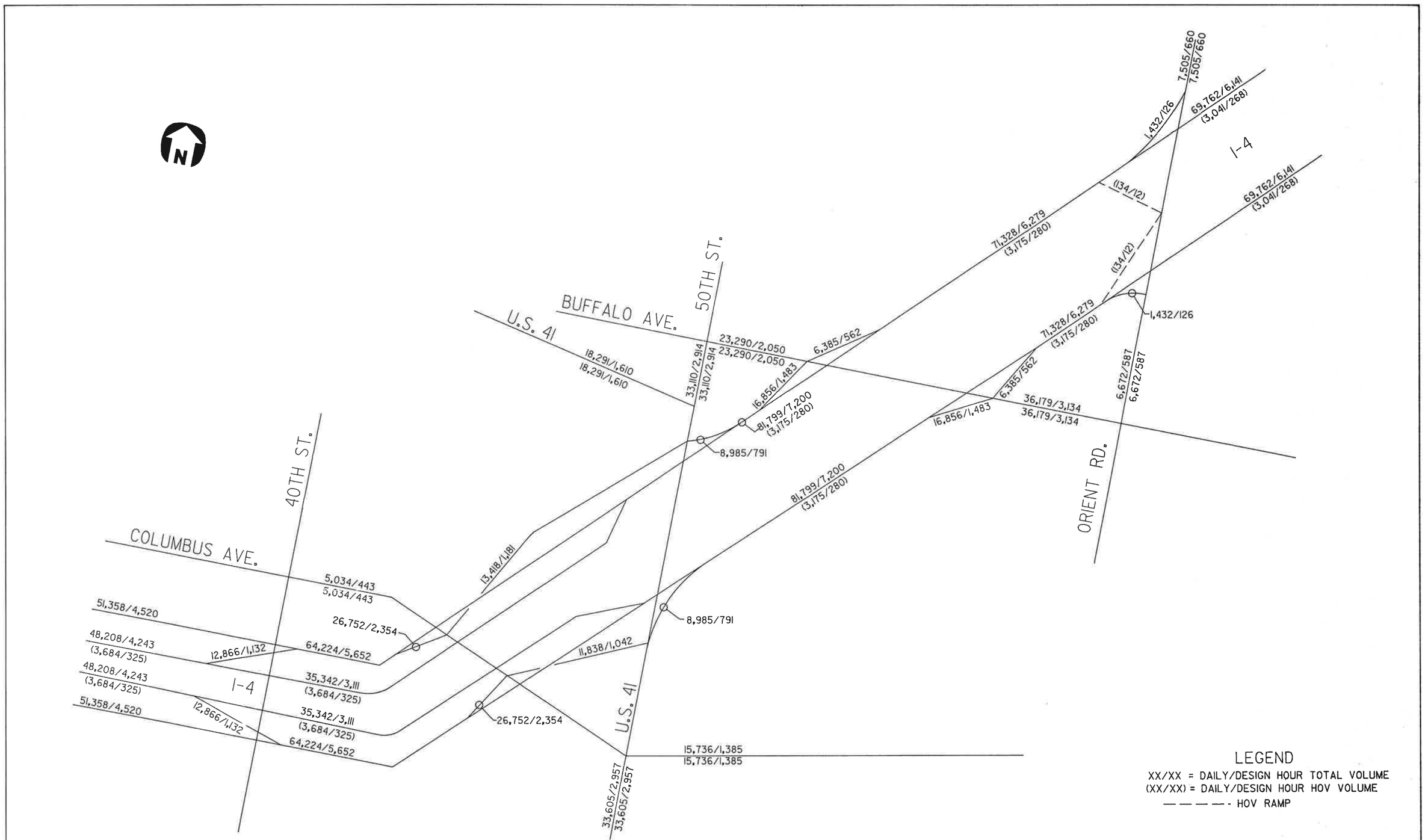
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENT 3A

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET C-5 OF 11



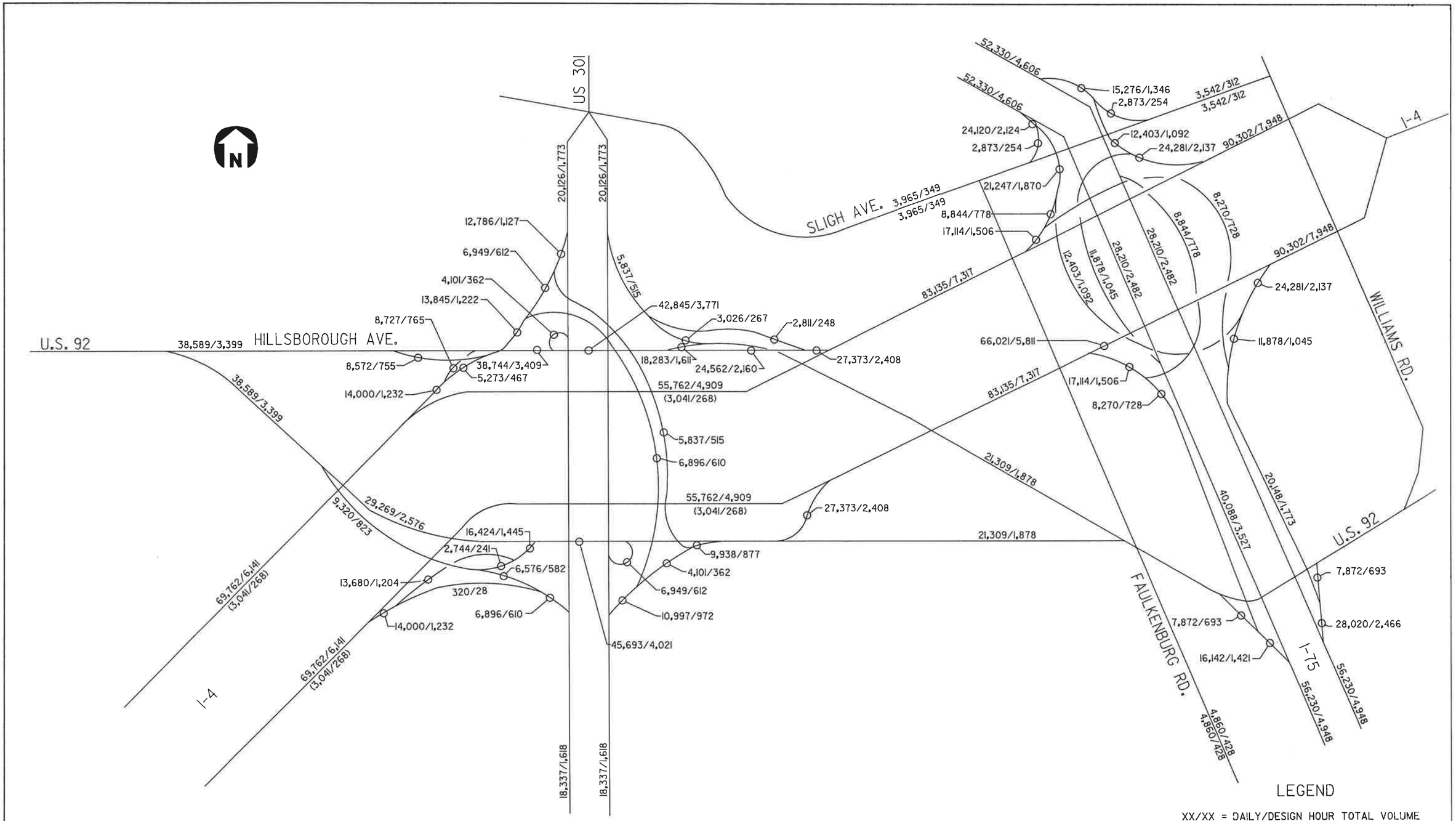
PROJECT No. C1104			
PROJECT DATES			
DATES	DESCRIPTION		
3-26-89	DRAFT MASTER PLAN CONCEPT		
6-89	FINAL MASTER PLAN CONCEPT		

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENTS 3B AND 4A

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET C-6 OF 11



LEGEND

XX/XX = DAILY/DESIGN HOUR TOTAL VOLUME
(XX/XX) = DAILY/DESIGN HOUR HOV VOLUME
— — — — HOV RAMP

PROJECT No. C1104

PROJECT DATES

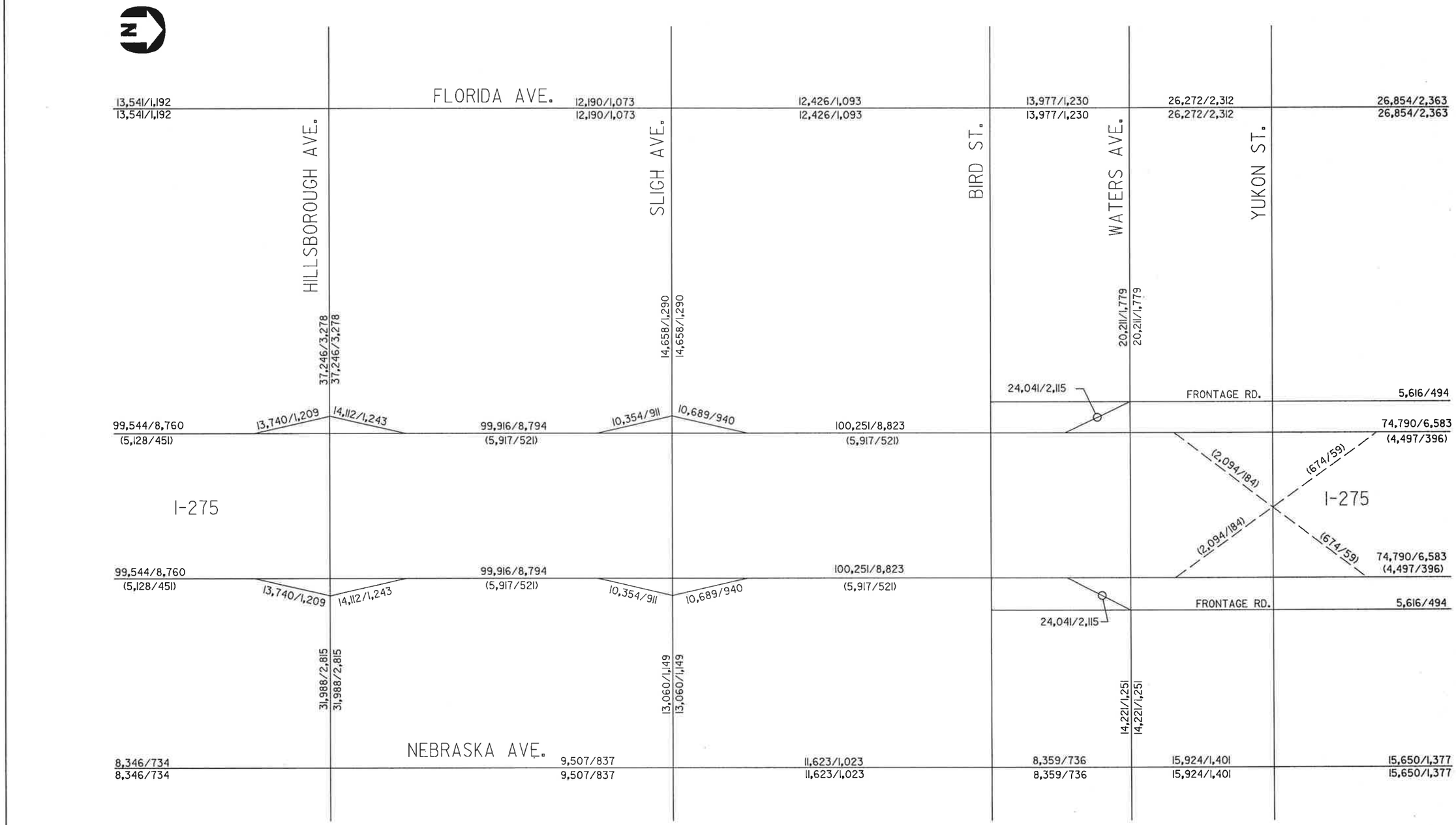
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENTS 4B AND 4C

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET C-7 OF 11



LEGEND

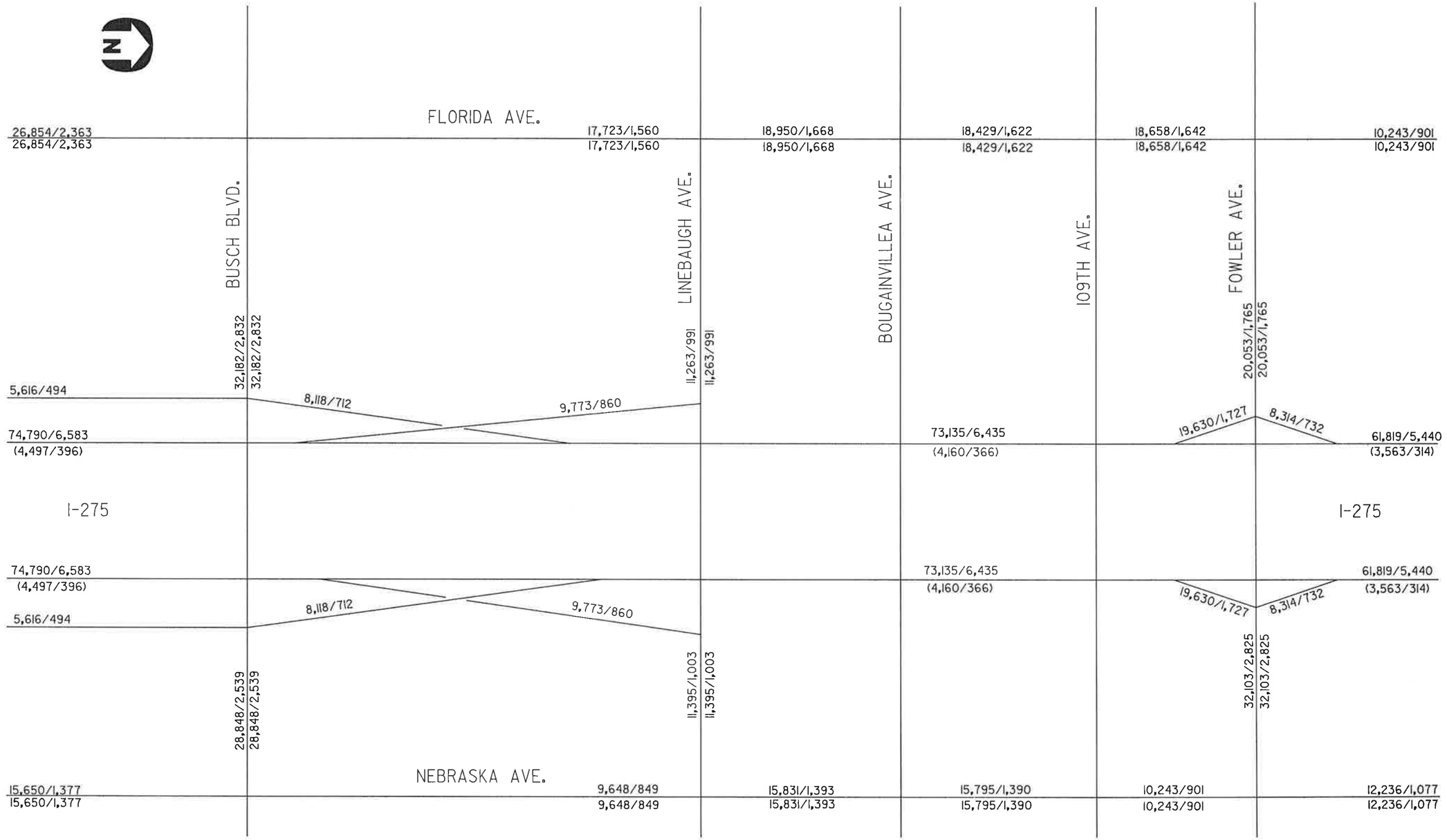
XX/XX = DAILY/DESIGN HOUR TOTAL VOLUME
(XX/XX) = DAILY/DESIGN HOUR HOV VOLUME
— — — — HOV RAMP

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENTS 5A, 5B AND 5C

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET C-8 OF 11.



LEGEND

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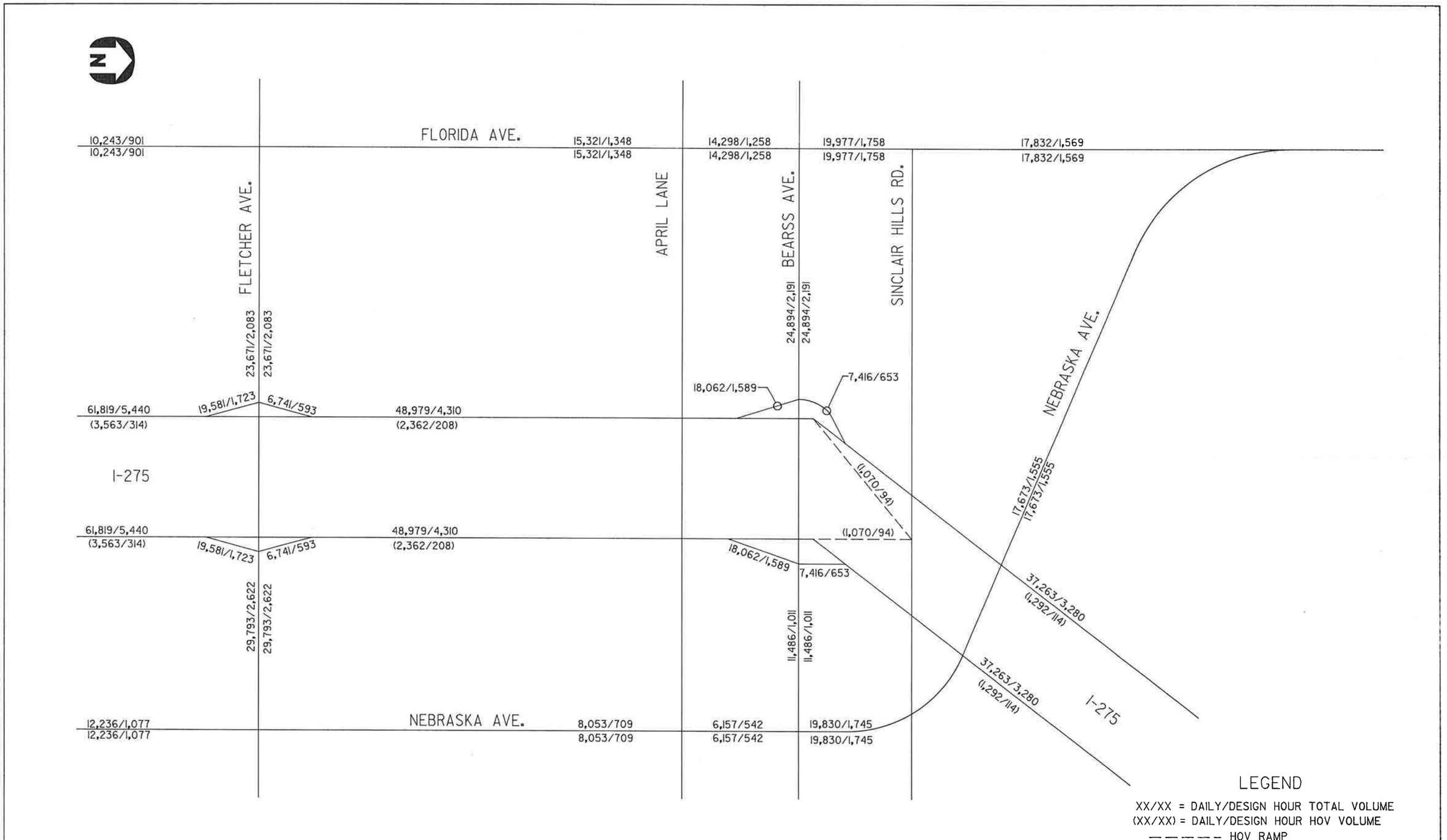
– – – – – HOV RAMP

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENTS 5D AND 5E

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET C-9 OF 11

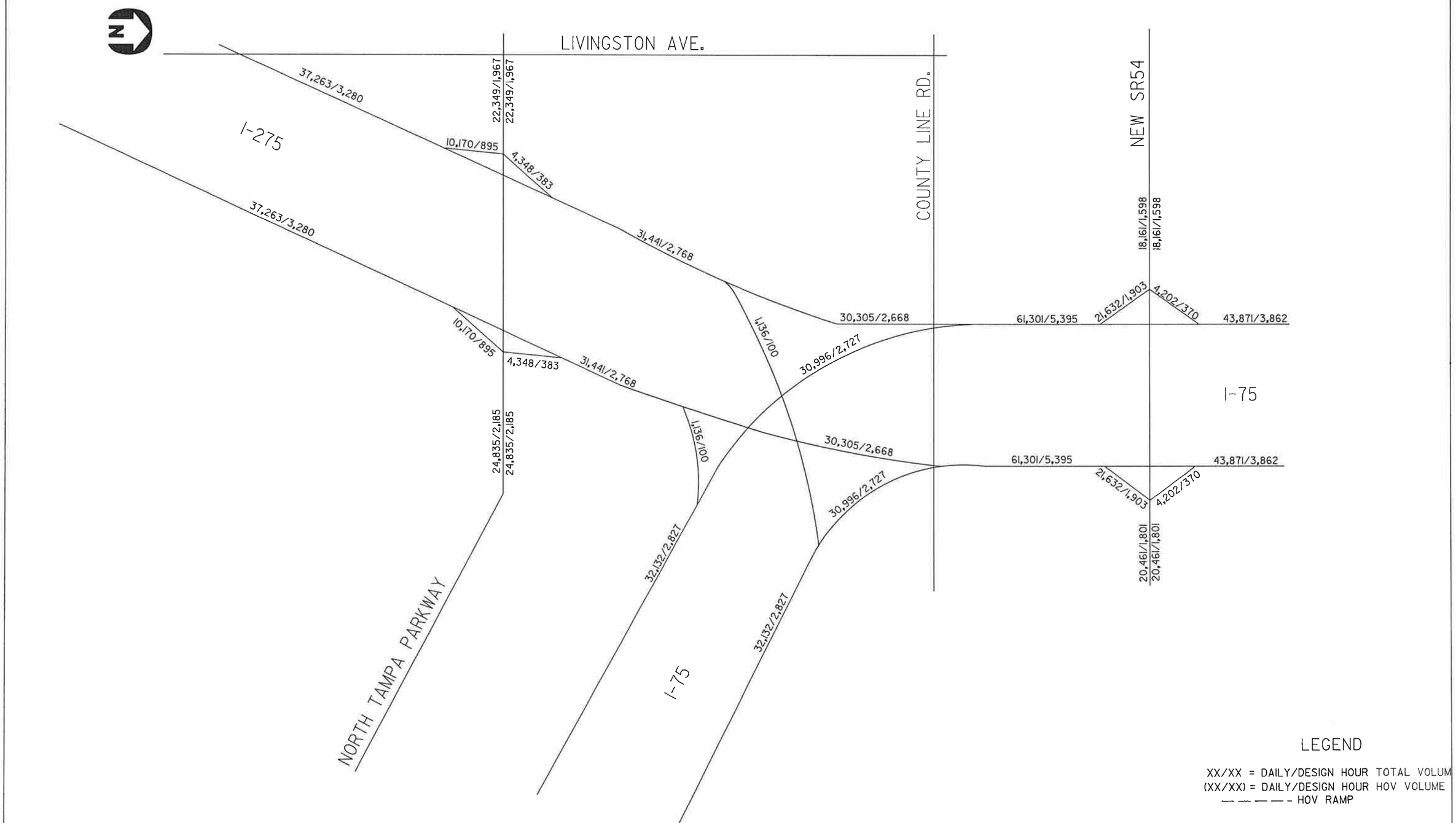


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENTS 5F AND 5G

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET C-10 OF 11



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
2010 TRAFFIC VOLUMES
DESIGN STUDY SEGMENTS 6A AND 6B

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET C-11 OF 11

DESIGN AMENITIES

SECTION D



PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

DESIGN AMENITIES

SECTION D

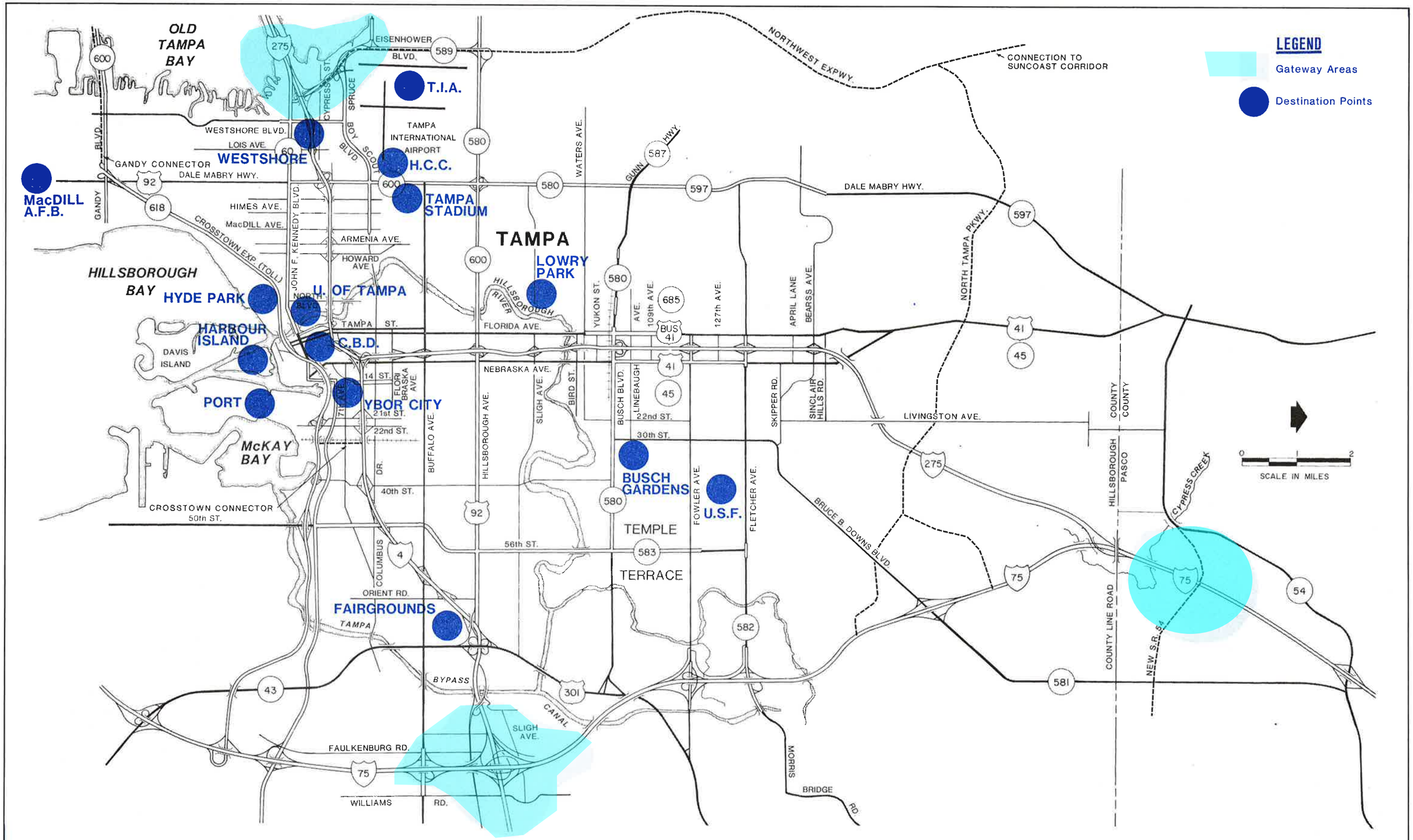
PLANNING FOR TOMORROW

I-4 I-275 I-75

TAMPA INTERSTATE STUDY

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

SECTION D	DESIGN AMENITIES
SHEET NO.	SHEET DESCRIPTION
	SECTION D DIVIDER SHEET
	SECTION D INDEX SHEET
D-1	GATEWAYS AND DESTINATIONS
D-2	YBOR GATEWAY
D-3	GREENWALL WITH NOISE BARRIER
D-4	TEXTURED WALL TREATMENTS
D-5	SOUND BARRIER TREATMENTS
D-6	PEDESTRIAN AND ACCENT LIGHTING



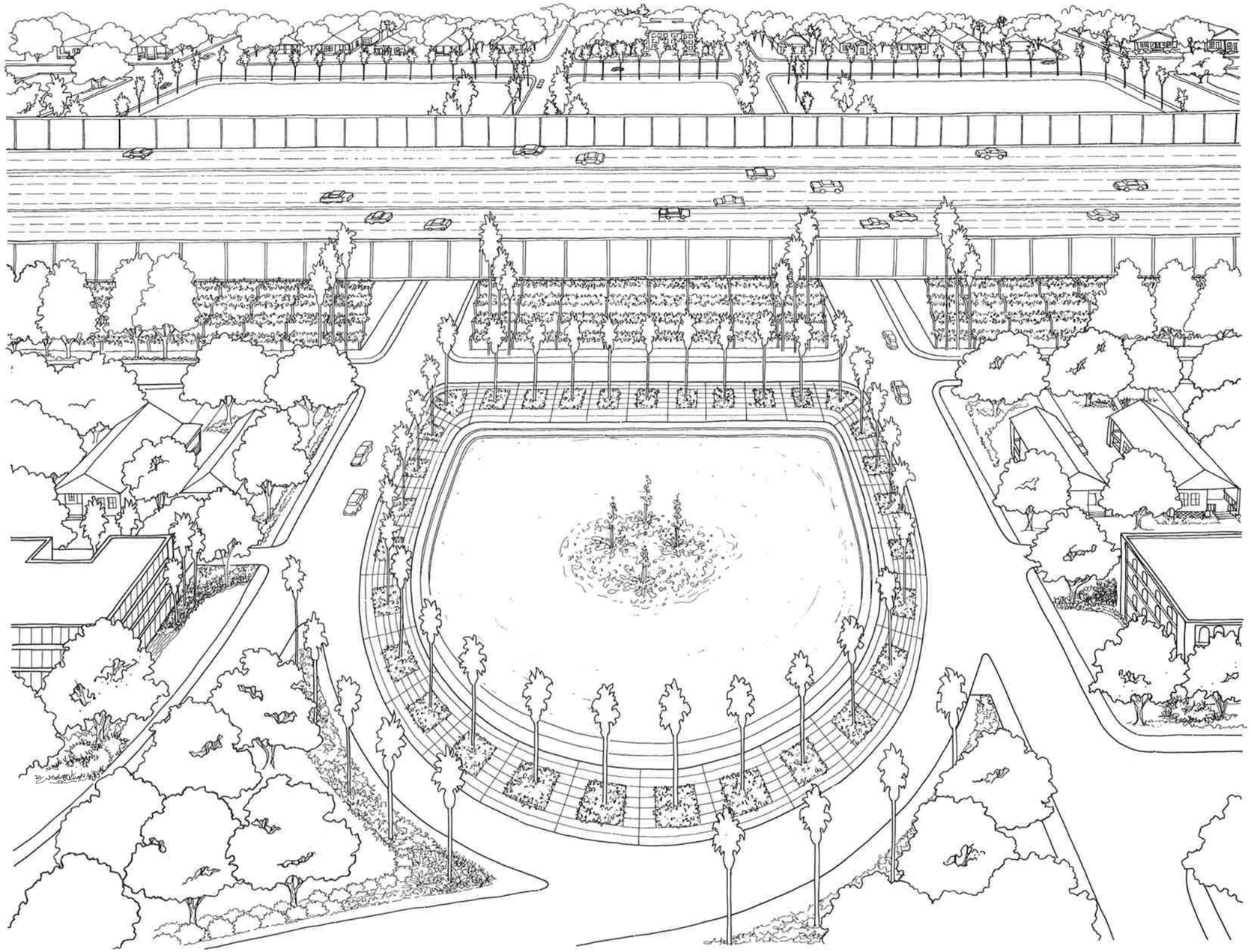
PROJECT No. C1104		
PROJECT DATES		
DATES	DESCRIPTION	
3-26-89	DRAFT MASTER PLAN CONCEPT	
6-89	FINAL MASTER PLAN CONCEPT	

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
GATEWAYS AND DESTINATIONS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET D1 OF 6



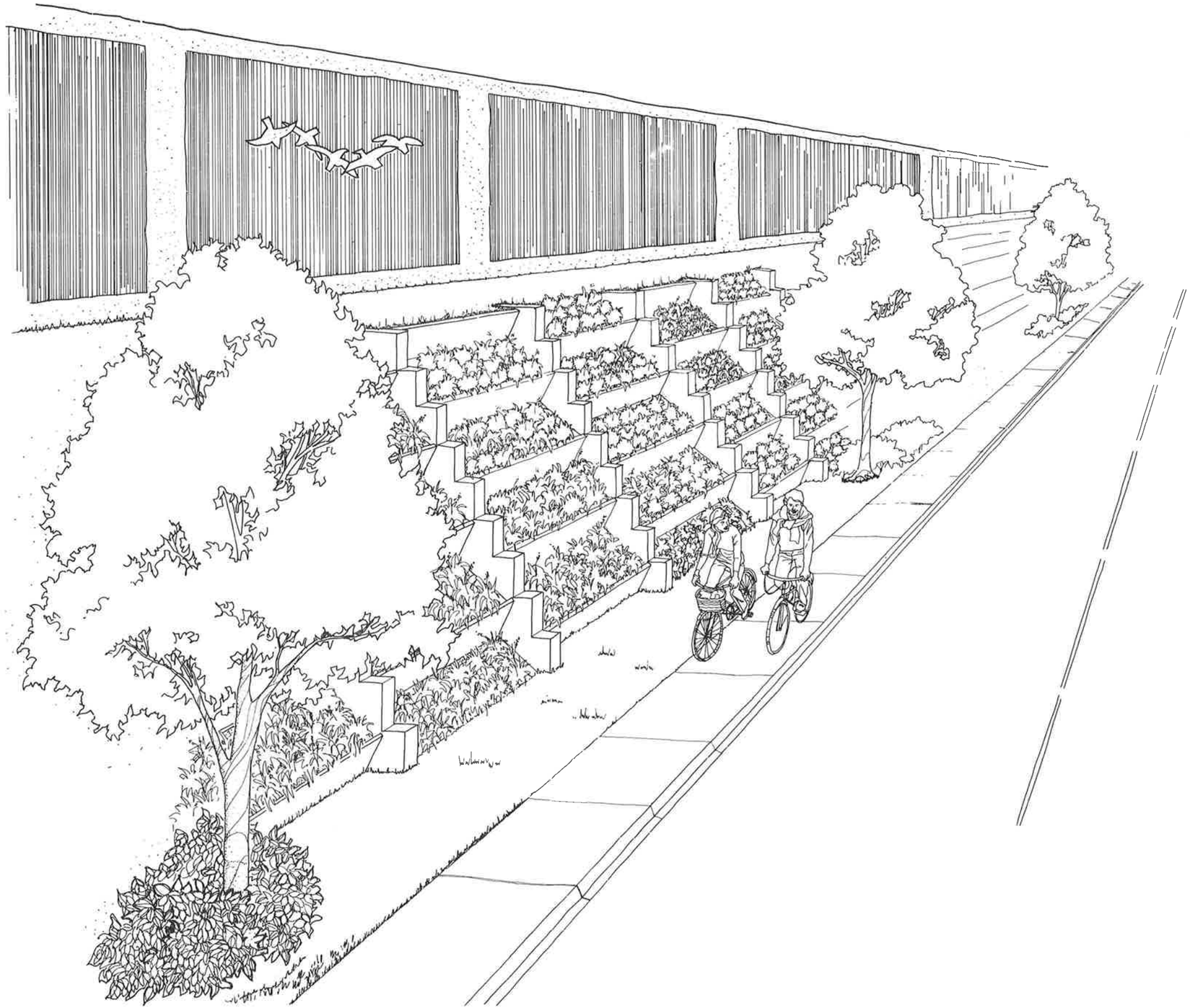
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
YBOR GATEWAY

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET D-2 OF 6



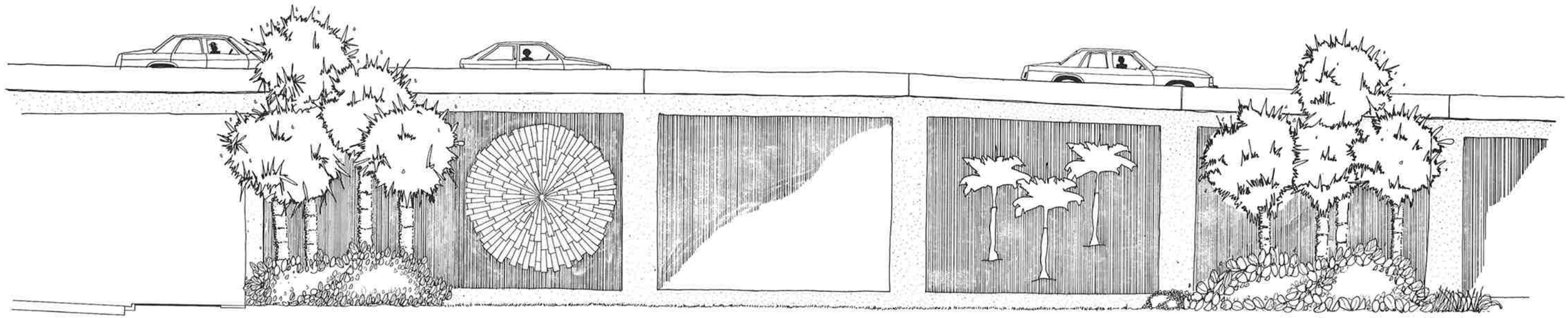
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

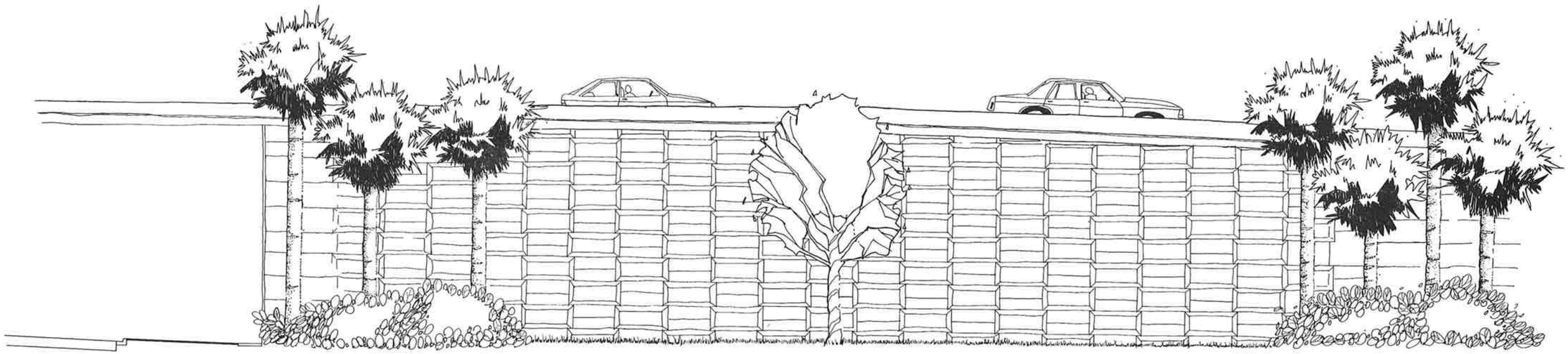
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
GREENWALL WITH NOISE BARRIER

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET D-3 OF 6





PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

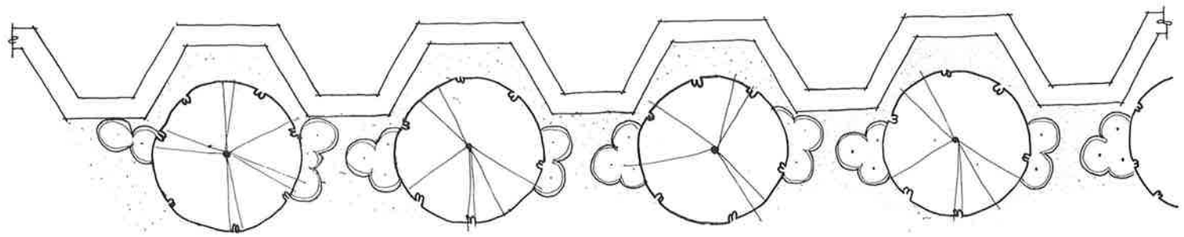
THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

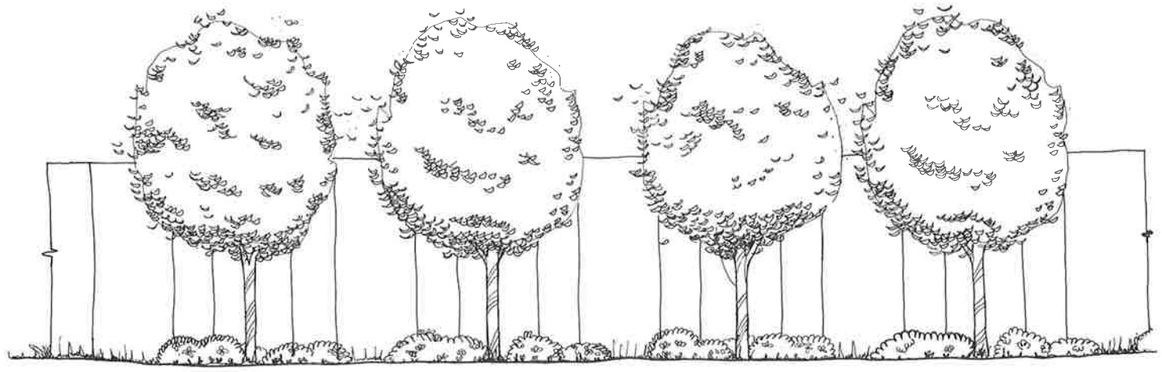
MASTER PLAN CONCEPT
TEXTURED WALL TREATMENTS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

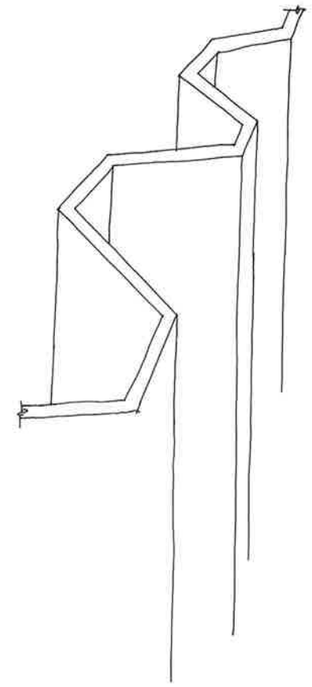
STATE PROJECT No. 99007-1402 | SHEET D-4 OF 6



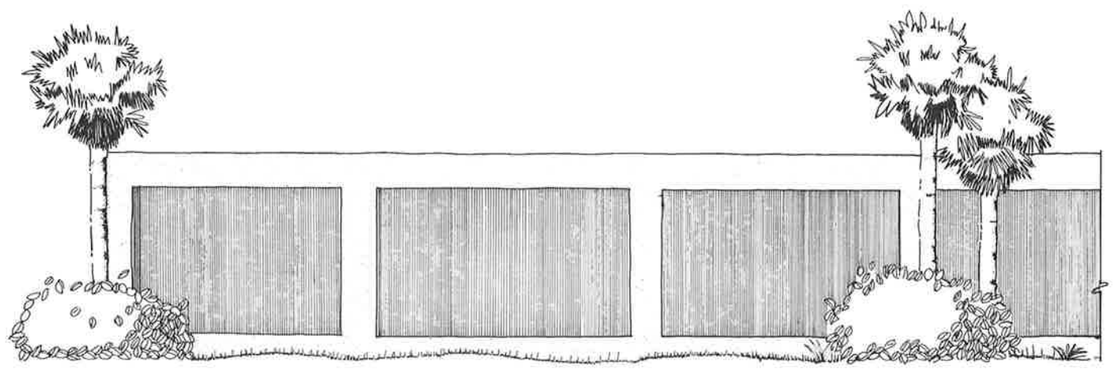
PLAN – FAN WALL



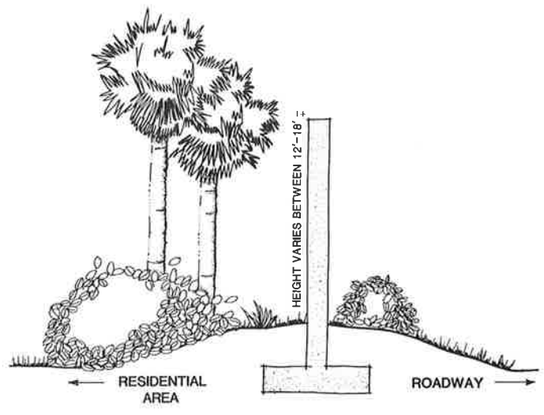
ELEVATION – FAN WALL



ISOMETRIC – FAN WALL



ELEVATION – CAST IN PLACE CONCRETE WALL



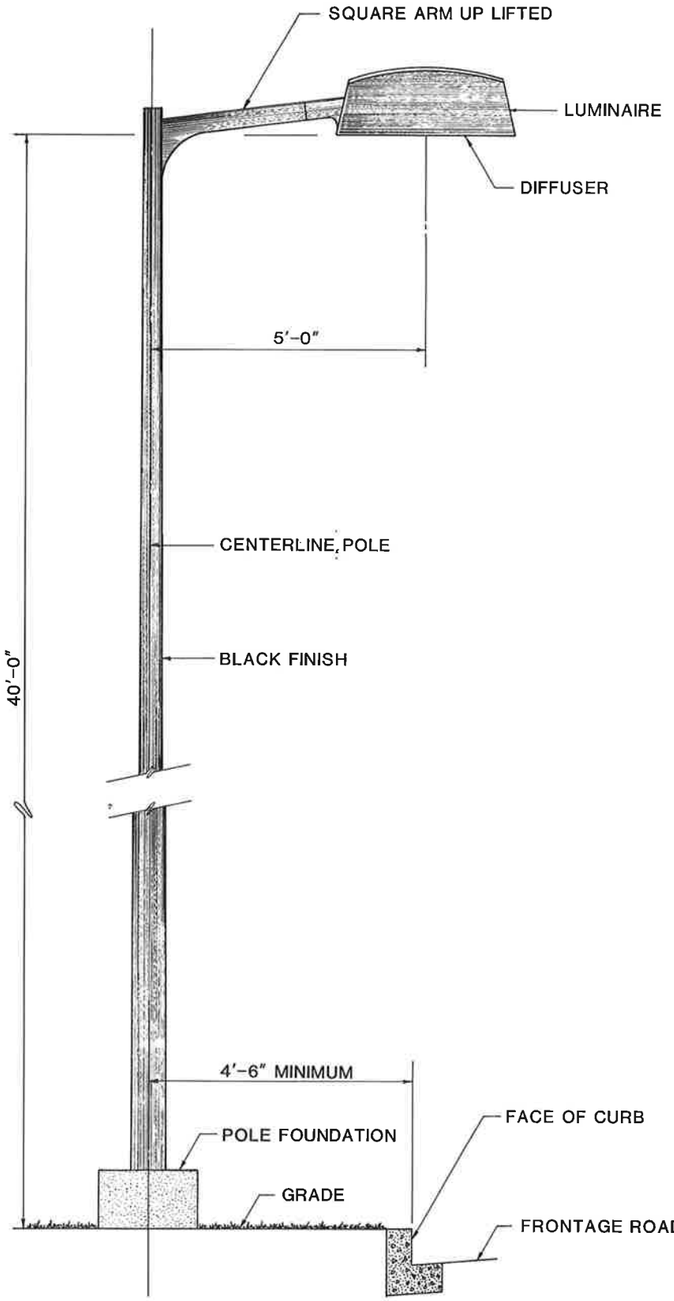
SECTION – CAST IN PLACE CONCRETE WALL

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

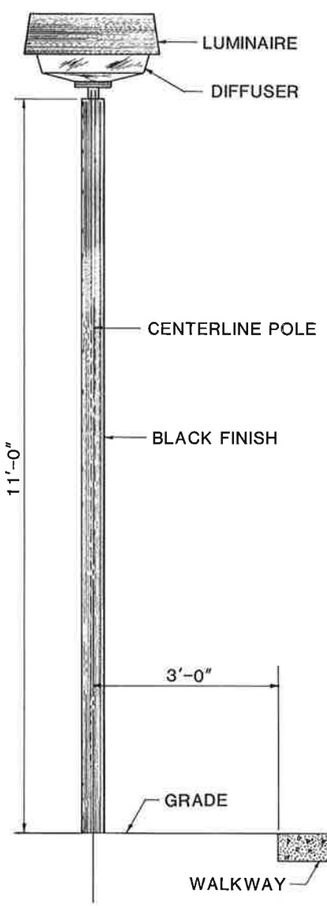
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
SOUND BARRIER TREATMENTS

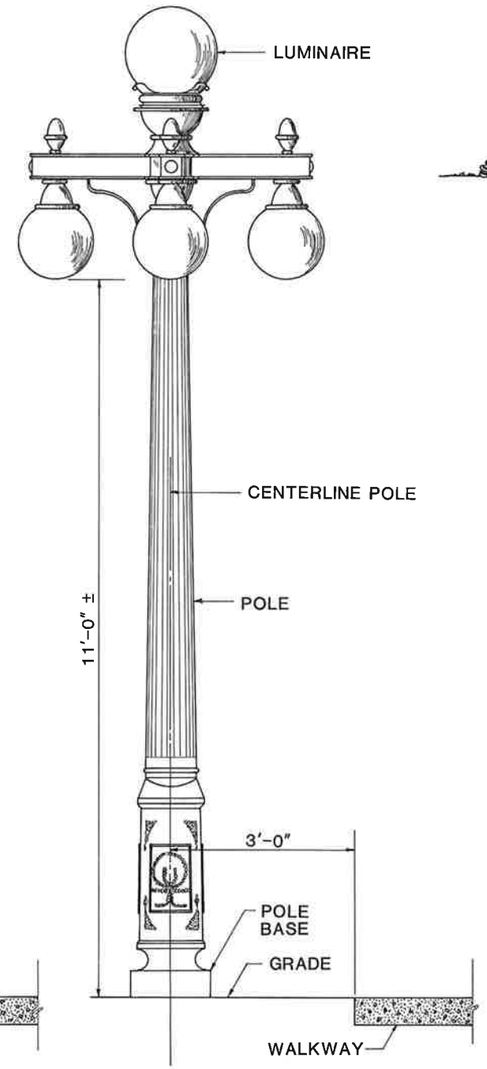
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET D-5 OF 6



FRONTAGE ROAD LIGHTING

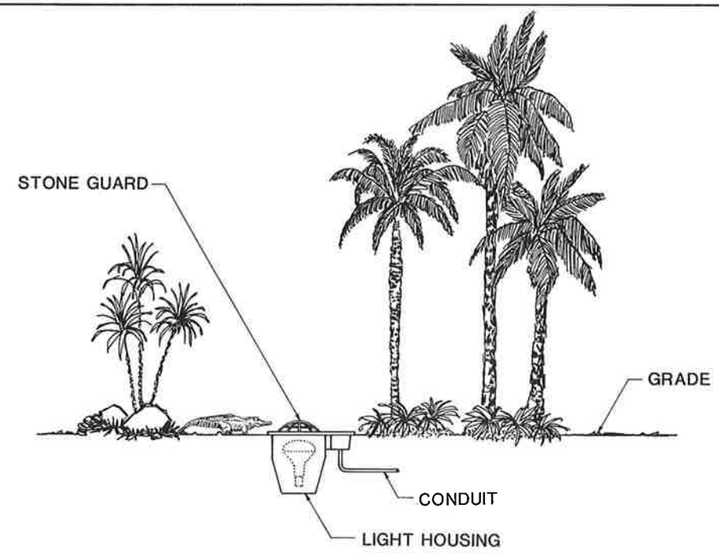


DOWNTOWN AND WESTSHORE AREAS

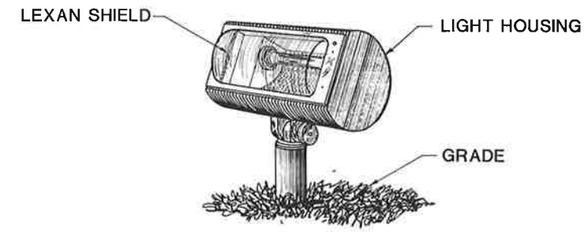


YBOR CITY AREA

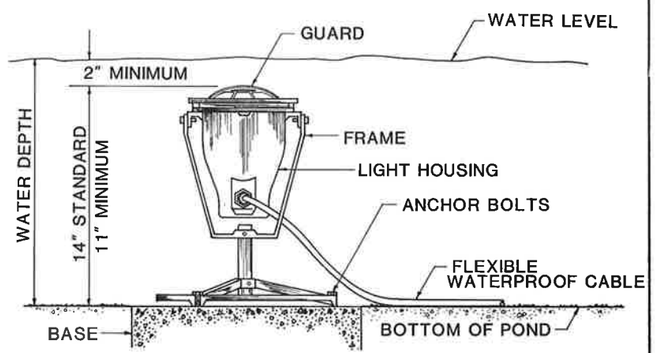
PEDESTRIAN LIGHTING



DIRECT BURIAL LIGHTING



FLOOD LIGHTING



UNDERWATER FOUNTAIN LIGHTING

PROJECT No. C1104			
PROJECT DATES			
DATES	DESCRIPTION		
3-26-89	DRAFT MASTER PLAN CONCEPT		
6-89	FINAL MASTER PLAN CONCEPT		

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PEDESTRIAN AND ACCENT LIGHTING

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET D-6 OF 6

TRANSIT

SECTION E

PLANNING FOR TOMORROW

I-4 I-275 I-75

TAMPA INTERSTATE STUDY

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

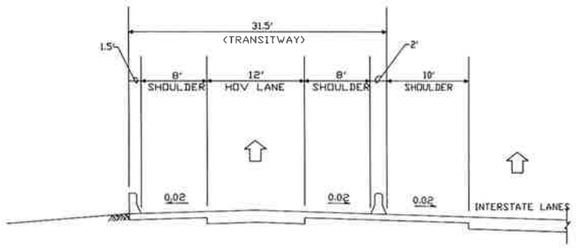
TRANSIT

SECTION E

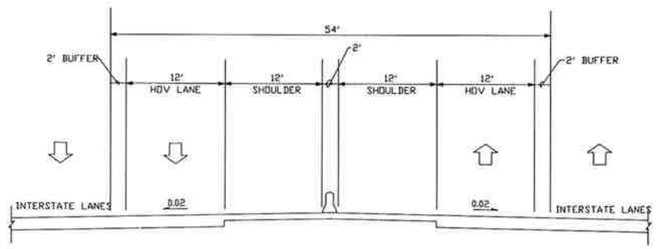


HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

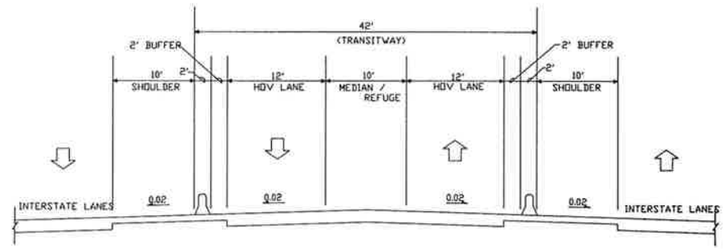
SECTION E	TRANSIT
SHEET NO.	SHEET DESCRIPTION
	SECTION E DIVIDER SHEET
	SECTION E INDEX SHEET
E-1	TYPICAL HOV SECTIONS
E-2	HOV CONCEPT DESIGN SEGMENT 2B - CBD INTERCHANGES - NORTH BOULEVARD TO PALM AVENUE
E-3	HOV CONCEPT DESIGN SEGMENT 2B - CBD INTERCHANGES - PALM AVENUE TO FLORIBRASKA AVENUE AND 14TH STREET
E-4	HOV CONCEPT DESIGN SEGMENT 2B - CBD INTERCHANGES - I-275 CROSS SECTIONS
E-5	HOV CONCEPT DESIGN SEGMENT 2B - CBD INTERCHANGES - I-4 CROSS SECTIONS
E-6	HOV CONCEPT DESIGN SEGMENT 2B - CBD INTERCHANGES - TAMPA STREET TO MORGAN STREET
E-7	HOV TRANSITION CONCEPT FROM CONCURRENT FLOW LANES TO EXCLUSIVE HOV TRANSITWAY
E-8	PRIORITY HOV RAMP CONCEPT
E-9	TYPICAL HOV RAMP INTERSECTION WITH CROSS STREET
E-10	PROPOSED PARK-N-RIDE LOT - NEW SR 54
E-11	PROPOSED PARK-N-RIDE LOT - NORTH TAMPA PARKWAY
E-12	PROPOSED PARK-N-RIDE LOT - FLORIDA STATE FAIRGROUNDS



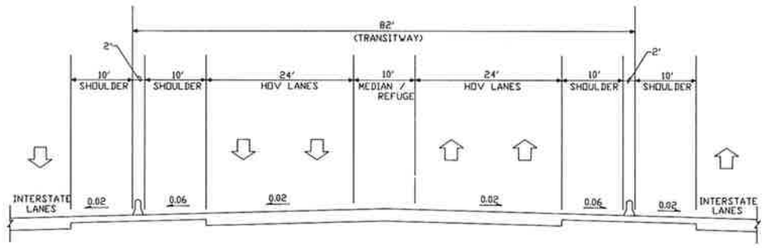
ONE-WAY, ONE-LANE HOV TRANSITWAY
DESIGN SEGMENT 2B - CBD INTERCHANGES



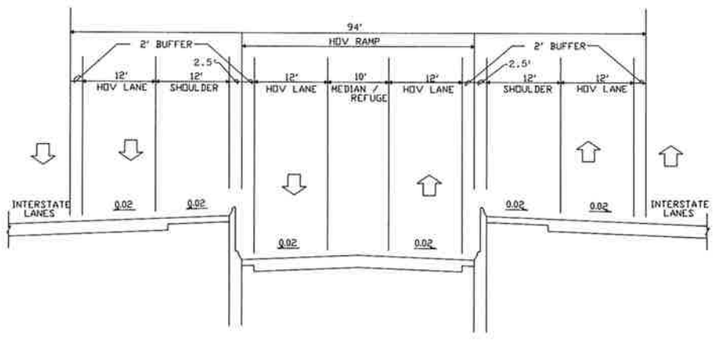
CONCURRENT FLOW HOV LANES



TWO-WAY,TWO-LANE HOV TRANSITWAY
DESIGN SEGMENT 2B - CBD INTERCHANGES



TWO-WAY, FOUR-LANE EXCLUSIVE HOV TRANSITWAY
DESIGN SEGMENT 2B - CBD INTERCHANGES



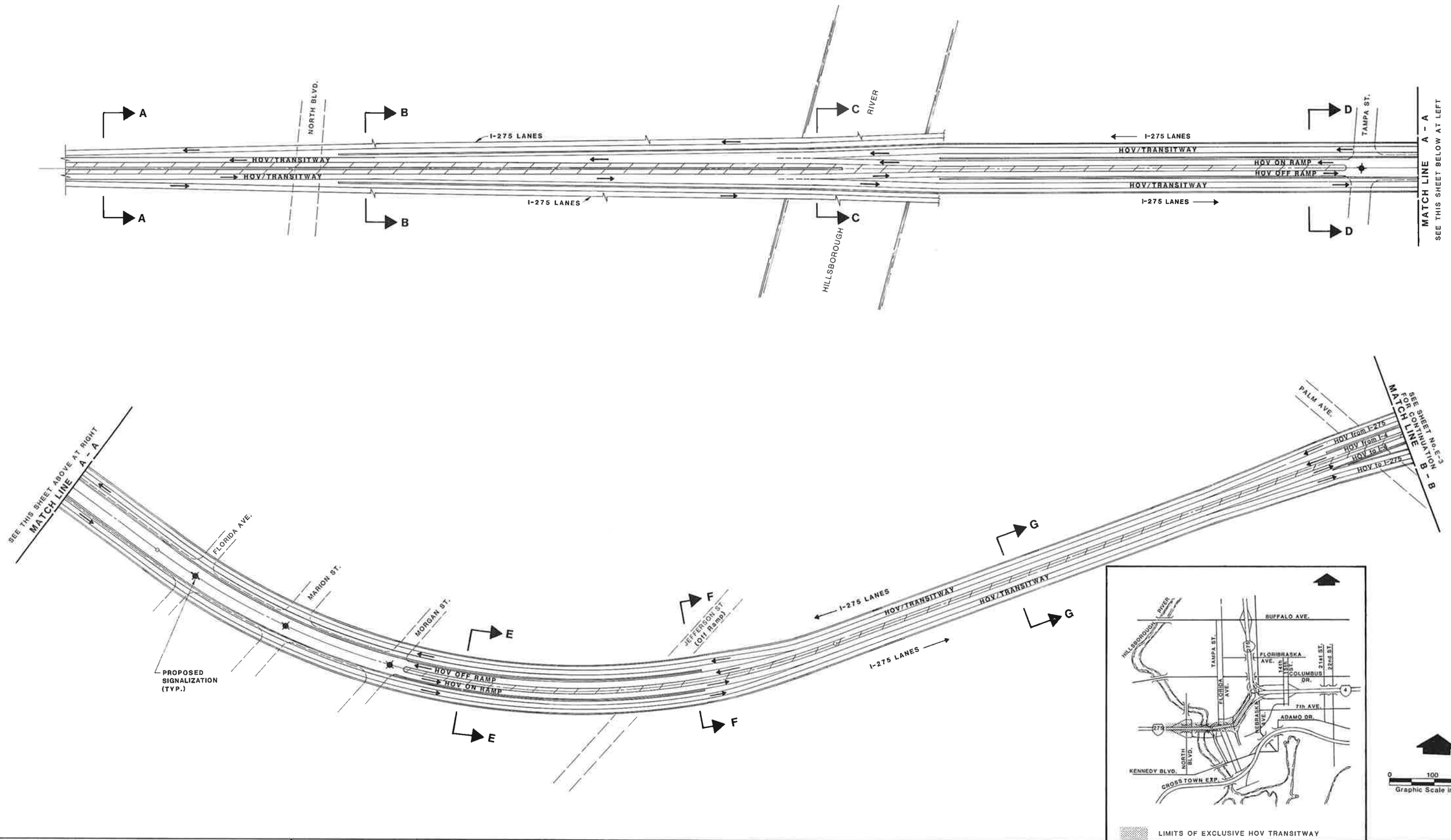
TWO-WAY, TWO-LANE HOV PRIORITY RAMP

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL HOV SECTIONS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET E1 OF 12



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

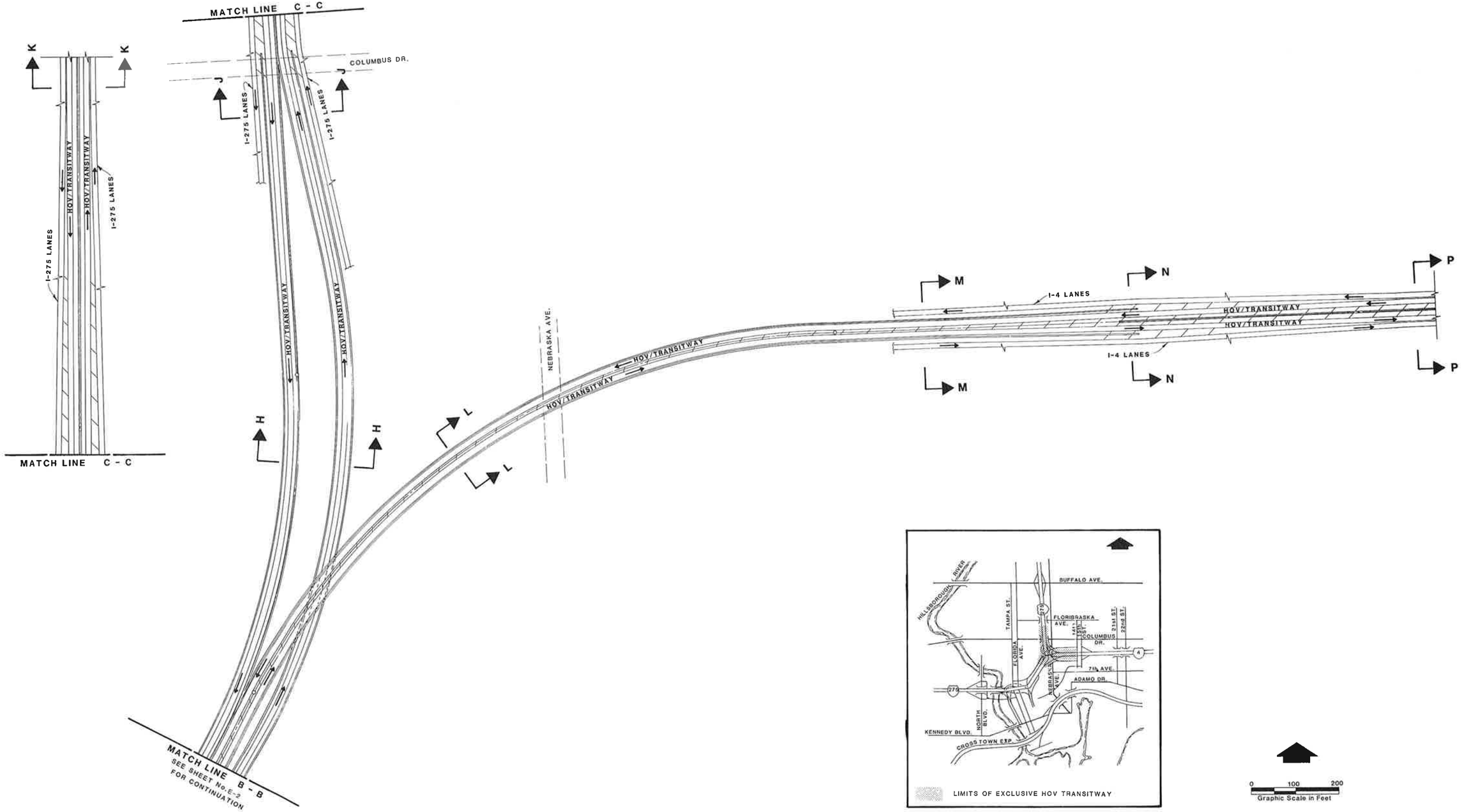
PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
HOV CONCEPT-DESIGN SEGMENT 2B
CBD INTERCHANGES
NORTH BLVD. TO PALM AVE.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET E-2 OF 12



0 100 200
Graphic Scale in Feet

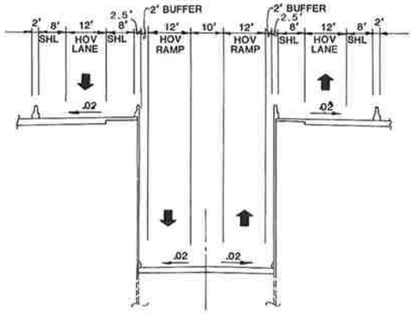
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

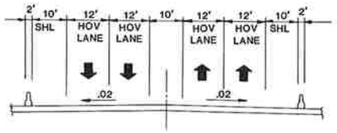
MASTER PLAN CONCEPT
HOV CONCEPT-DESIGN SEGMENT 2B
PALM AVE. TO FLORIBRASKA AVE. AND 14TH ST.

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET E-3 OF 12



SECTION D - D



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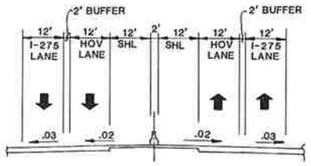

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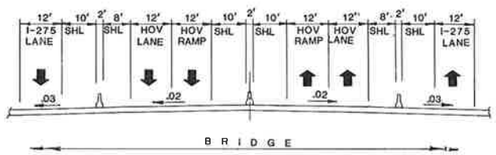
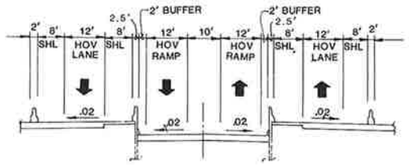
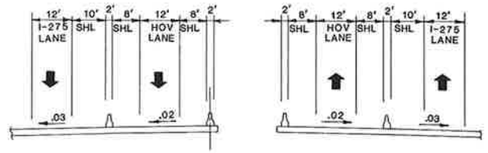


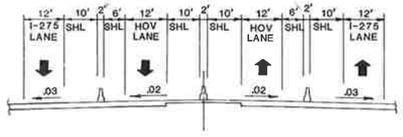
SECTION C - C



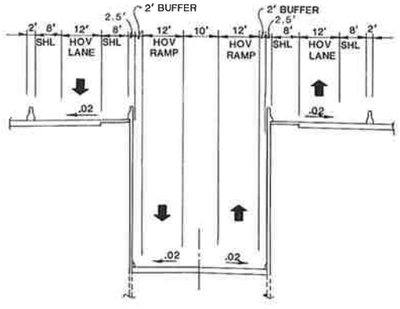
SECTION F - F



SECTION J - J



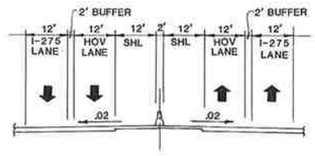
SECTION B - B



SECTION E - E



SECTION H - H



SECTION A - A

ABBREVIATIONS:

HOV : HIGH OCCUPANCY VEHICLE
SHL : SHOULDER

Horiz. 0 20 40 Graphic Scale in Feet
Vert. 0 10 20 Graphic Scale in Feet

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-20-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

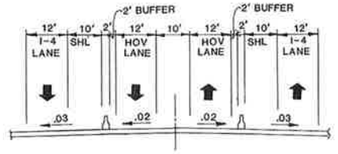
PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

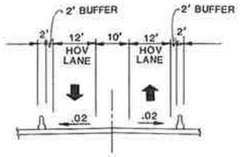
MASTER PLAN CONCEPT
HOV CONCEPT-DESIGN SEGMENT 2B
CBD INTERCHANGES
I-275 CROSS SECTIONS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

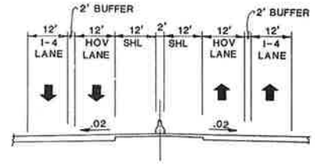
STATE PROJECT No. 99007-1402 | SHEET E-4 OF 12



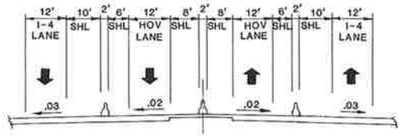
SECTION M -M



SECTION L - L



SECTION P - P



SECTION N - N

ABBREVIATIONS:

HOV : HIGH OCCUPANCY VEHICLE
SHL : SHOULDER

Horiz. 0 20 40 Graphic Scale in Feet
Vert. 0 10 20 Graphic Scale in Feet

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

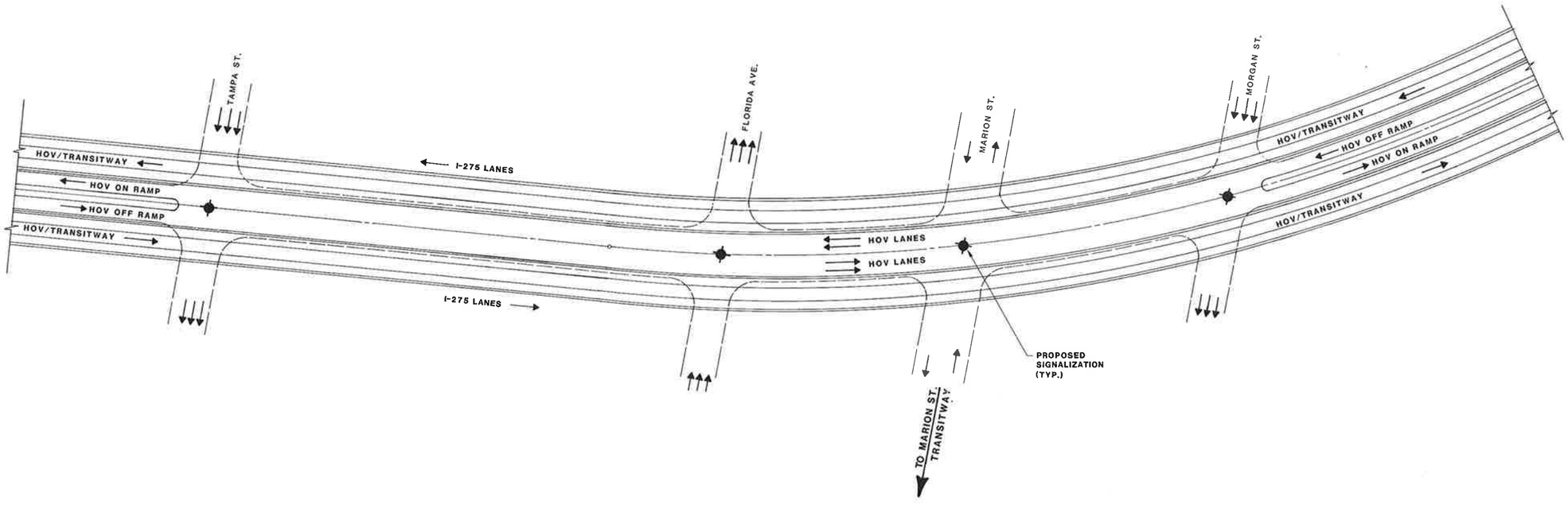
PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
HOV CONCEPT-DESIGN SEGMENT 2B
CBD INTERCHANGES
I-4 CROSS SECTIONS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET E-5 OF 12

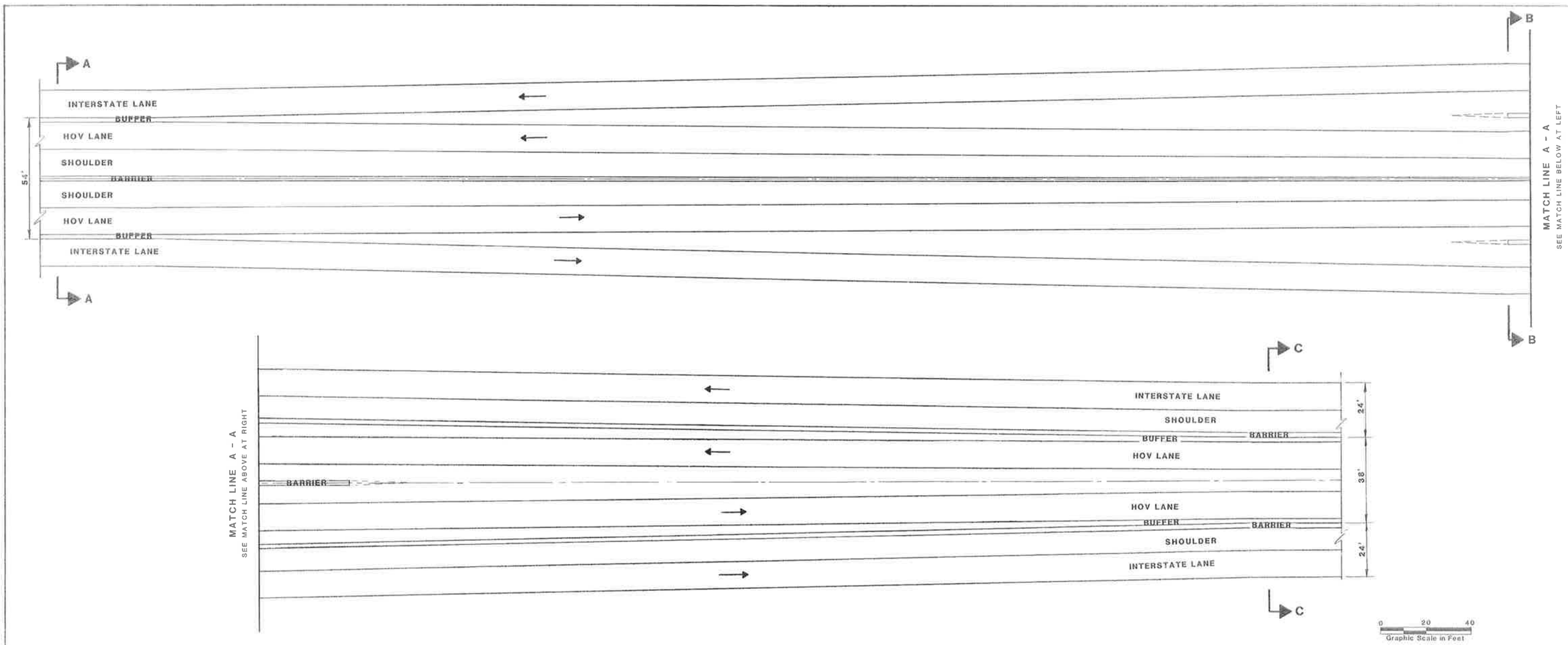


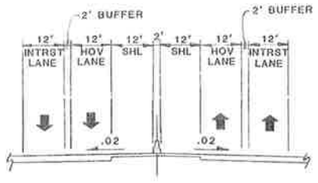
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
HOV CONCEPT-DESIGN SEGMENT 2B
CBD INTERCHANGES
TAMPA ST. TO MORGAN ST.

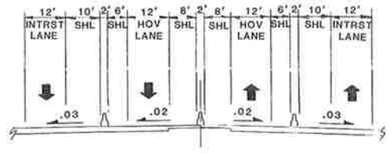
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET E-6 OF 12





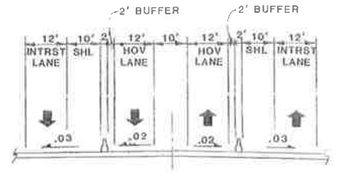
SECTION A - A

CONCURRENT FLOW
HOV LANES



SECTION B - B

TRANSITION SECTION



SECTION C - C

EXCLUSIVE HOV LANES

ABBREVIATIONS:

INTRST. : INTERSTATE
HOV : HIGH OCCUPANCY VEHICLE
SHL : SHOULDER

Horiz. 0 20 40 Graphic Scale in Feet

Vert. 0 10 20 Graphic Scale in Feet

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

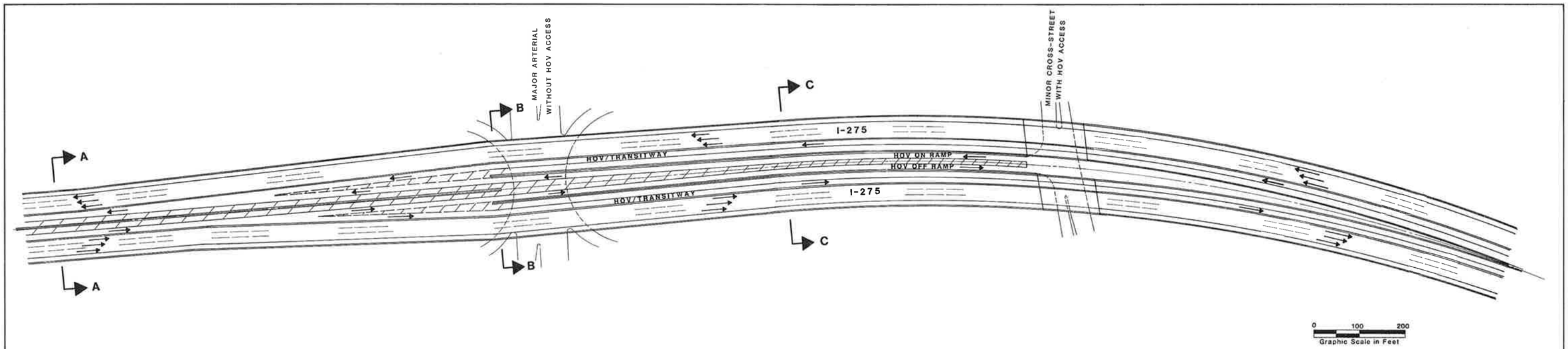
PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

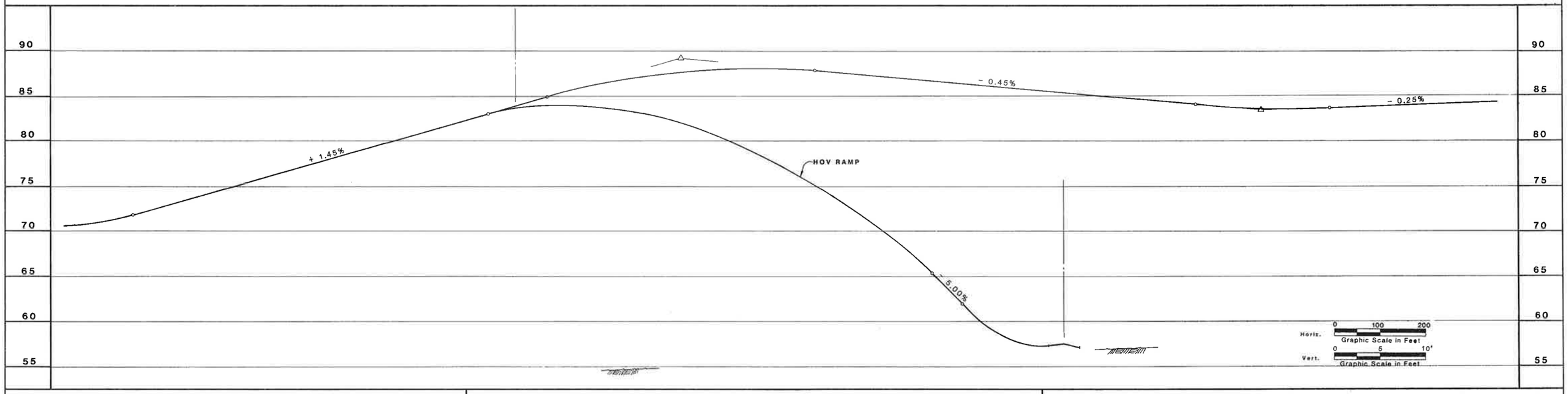
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

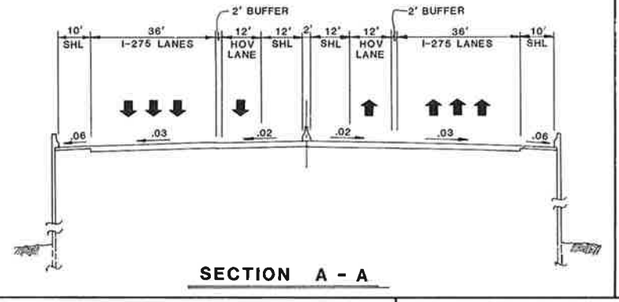
MASTER PLAN CONCEPT
HOV TRANSITION CONCEPT FROM CURRENT FLOW LANES TO EXCLUSIVE HOV TRANSITWAY

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

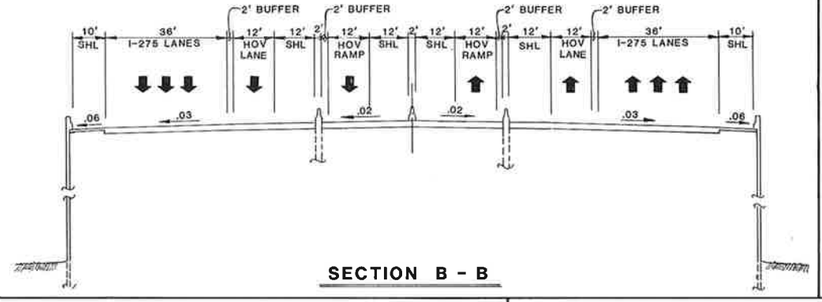
STATE PROJECT No. 99007-1402 | SHEET E-7 OF 12



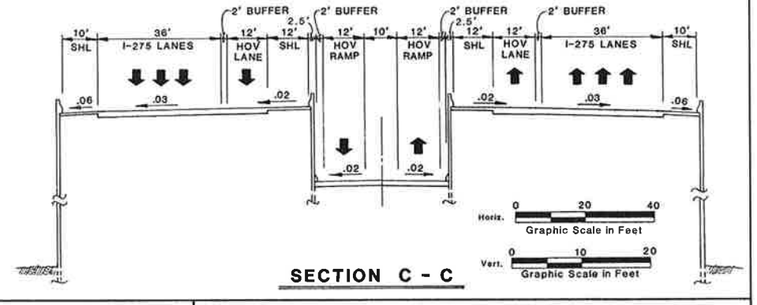




SECTION A - A



SECTION B - B



SECTION C - C

PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

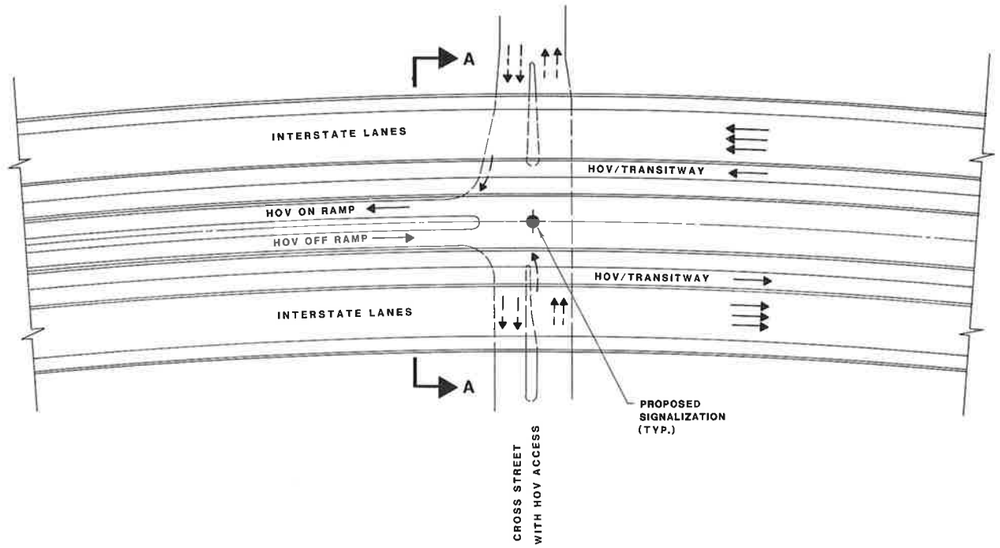
THE GREINER TEAM

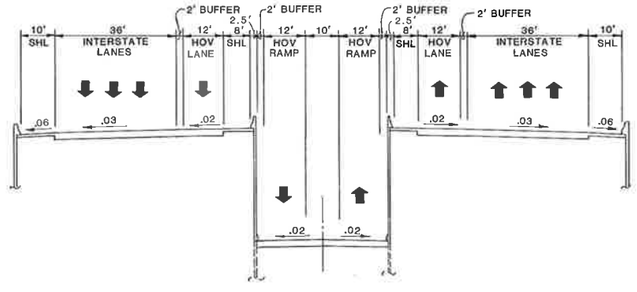
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PRIORITY HOV RAMP CONCEPT

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET E-8 OF 12





SECTION A - A

0 20 40
Graphic Scale in Feet

0 50 100
Graphic Scale in Feet

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

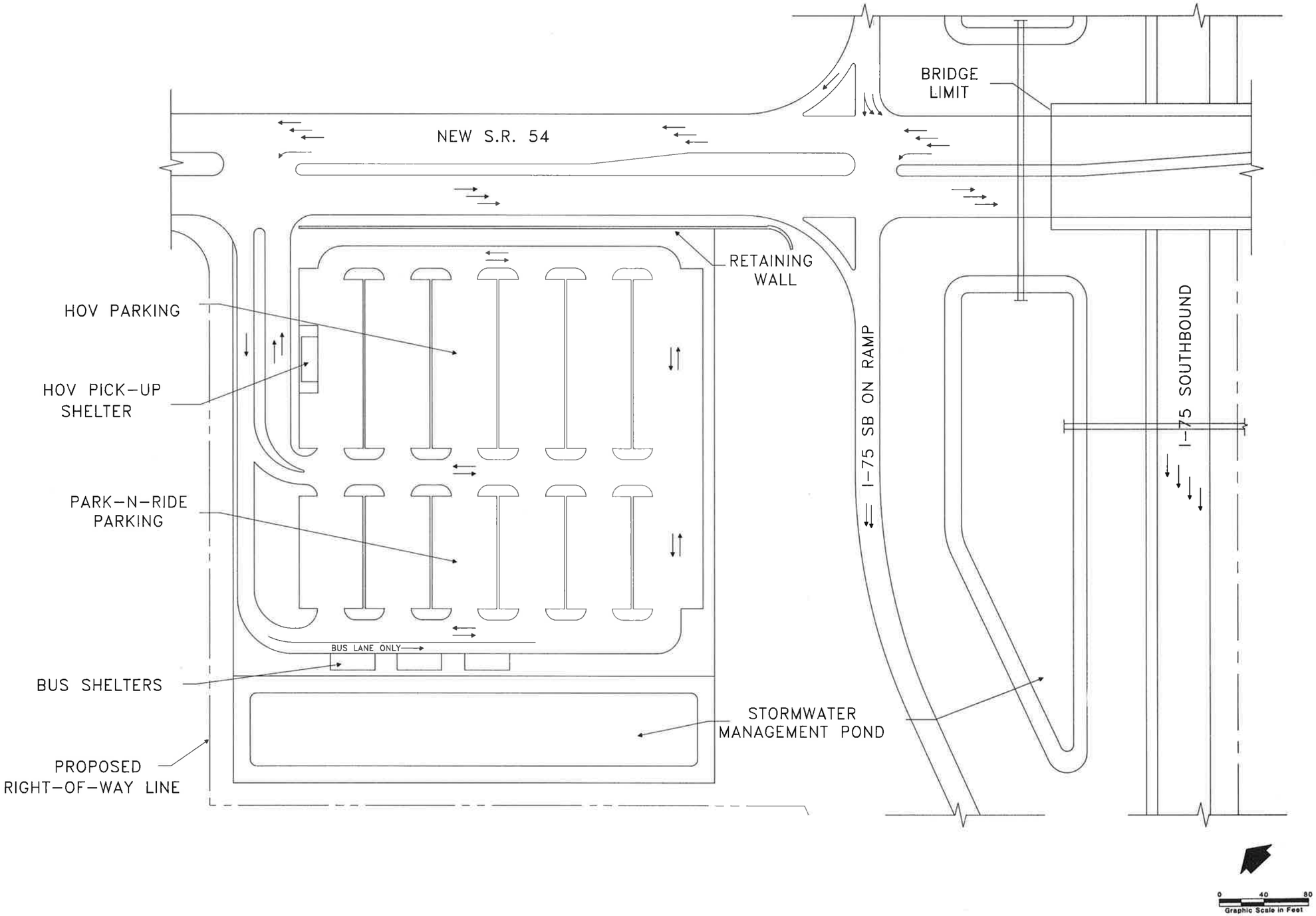
PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL HOV RAMP INTERSECTION WITH CROSS STREET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET E-9 OF 12



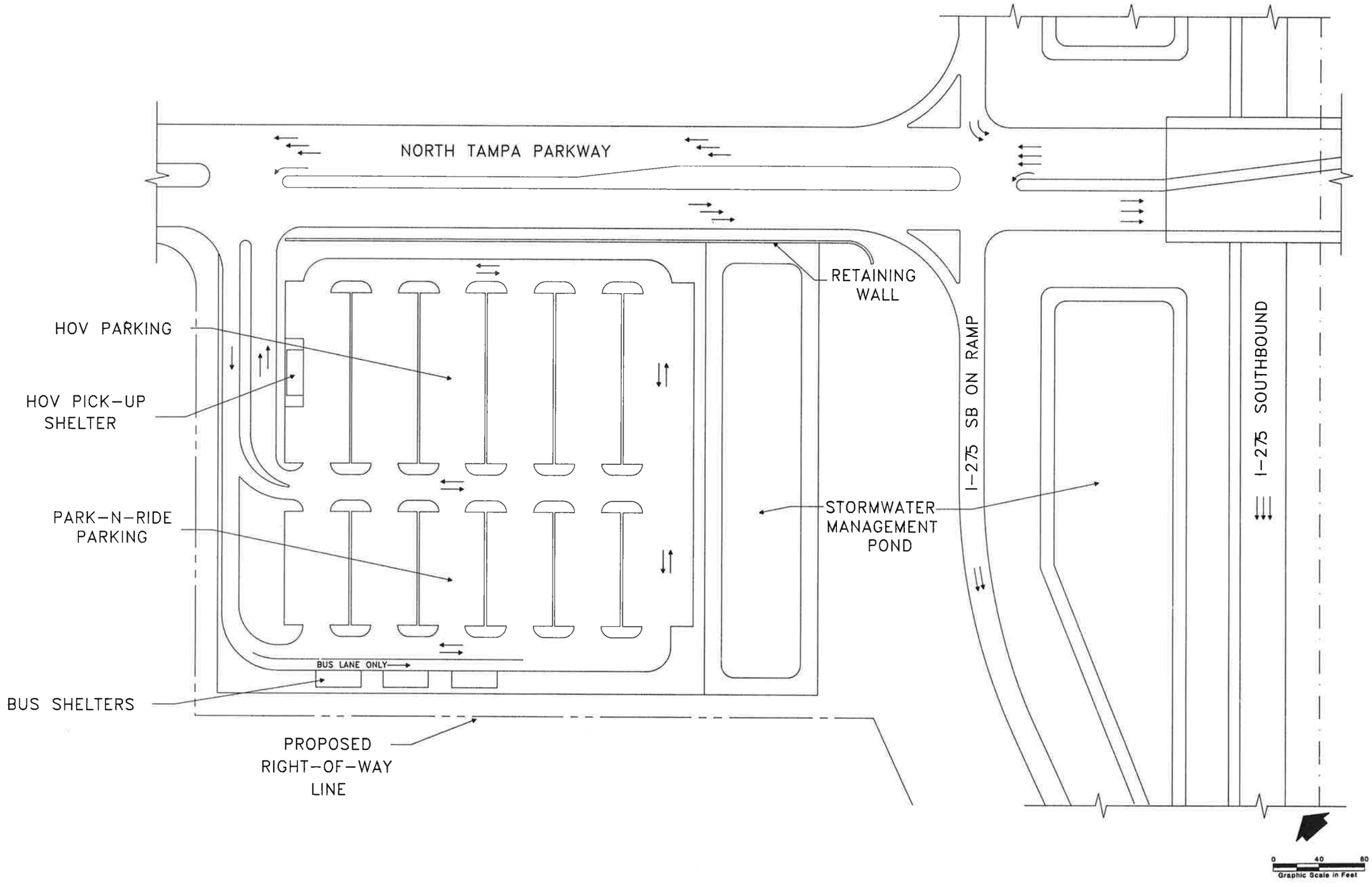
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PROPOSED PARK-N-RIDE LOT
NEW SR 54

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET E-10 OF 12



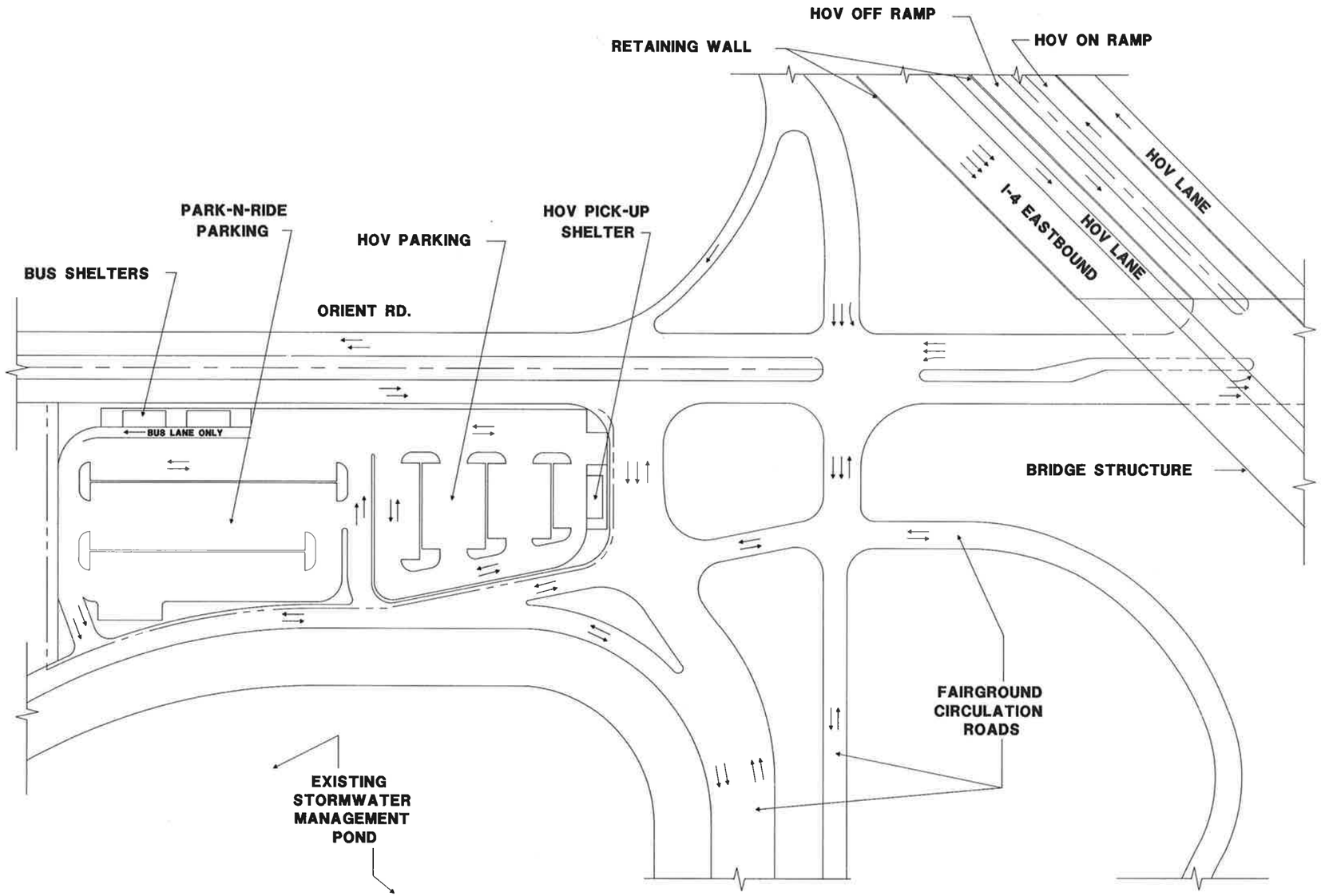
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PROPOSED PARK-N-RIDE LOT
NORTH TAMPA PARKWAY

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET E-11 OF 12



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PROPOSED PARK-N-RIDE LOT
FLORIDA STATE FAIRGROUNDS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET E-12 OF 12

INCIDENT MANAGEMENT

SECTION F

PLANNING FOR TOMORROW

I-4 I-275 I-75

TAMPA INTERSTATE STUDY

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

INCIDENT MANAGEMENT

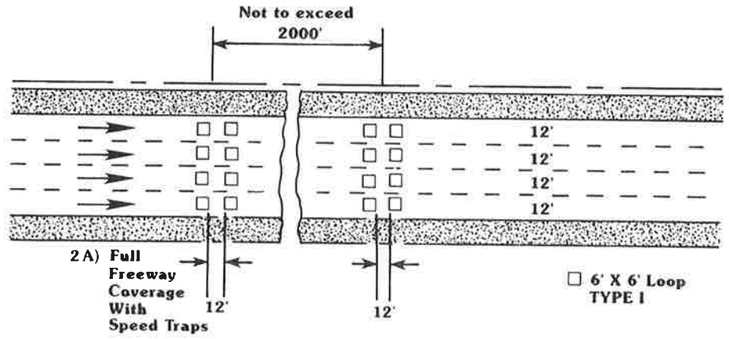
SECTION F

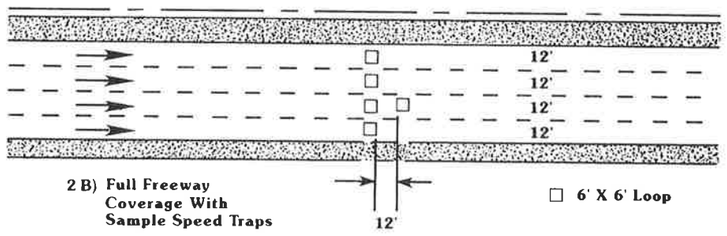
PLANNING FOR TOMORROW
I-4 I-275 I-75
TAMPA INTERSTATE STUDY

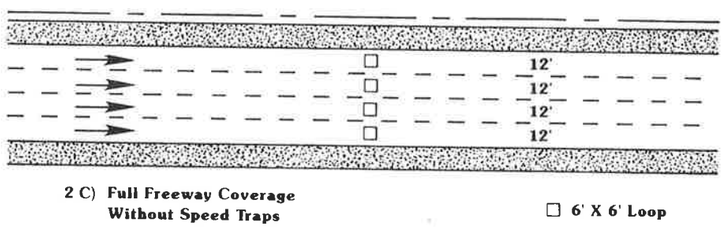
HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

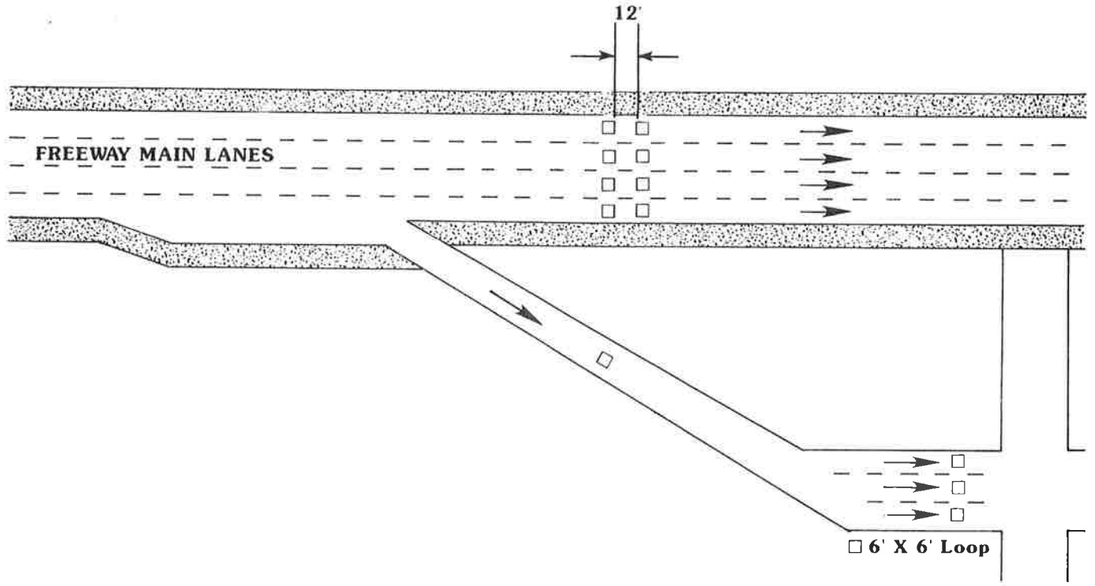
SECTION F INCIDENT MANAGEMENT

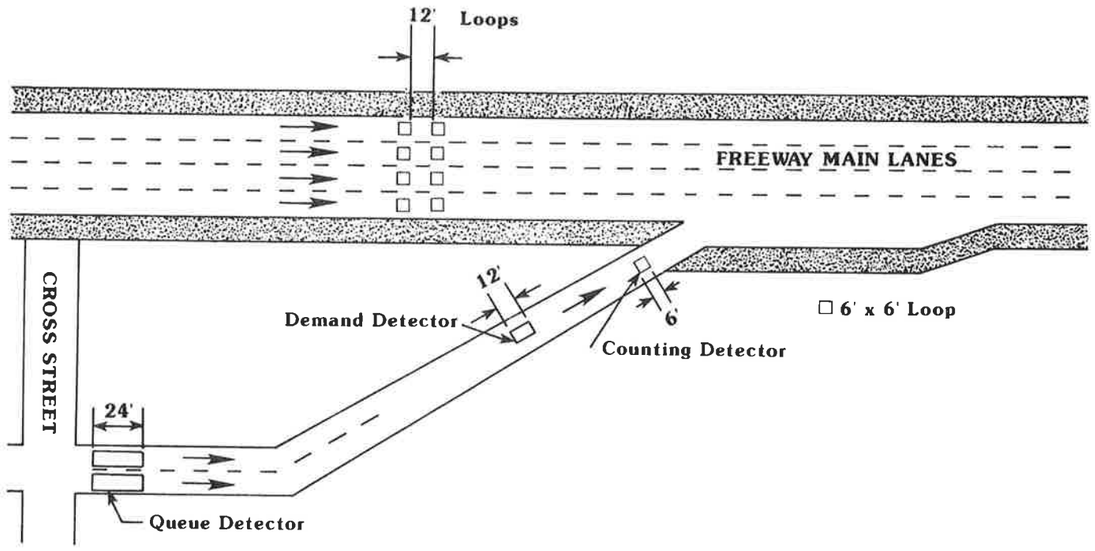
SHEET NO.	SHEET DESCRIPTION
	SECTION F DIVIDER SHEET
	SECTION F INDEX SHEET
F-1	TRAFFIC DETECTION LOCATION REQUIREMENTS
F-2	TYPICAL ACCIDENT INVESTIGATION SITES
F-3	DESIGN STUDY SEGMENTS 1A, 2A AND 2B SURVEILLANCE, COMMUNICATIONS AND CONTROL SYSTEM
F-4	DESIGN STUDY SEGMENTS 3A, 3B, 4A, 4B AND 4C SURVEILLANCE, COMMUNICATIONS AND CONTROL SYSTEM
F-5	DESIGN STUDY SEGMENTS 5A, 5B, 5C, 5D, 5E, 5F AND 5G SURVEILLANCE, COMMUNICATIONS AND CONTROL SYSTEM
F-6	DESIGN STUDY SEGMENTS 6A AND 6B SURVEILLANCE, COMMUNICATIONS AND CONTROL SYSTEM











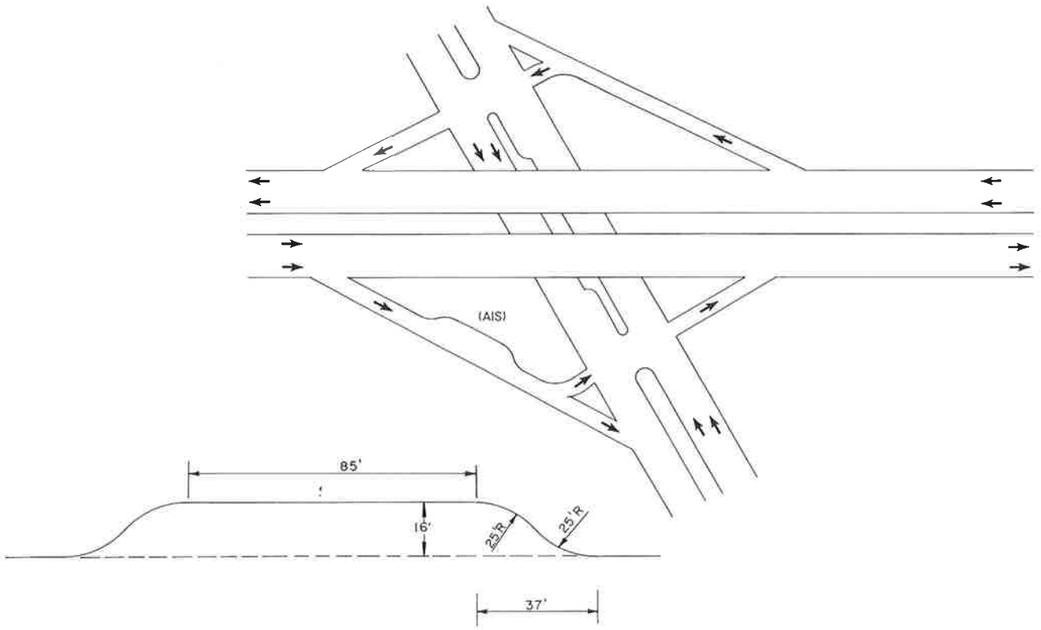
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

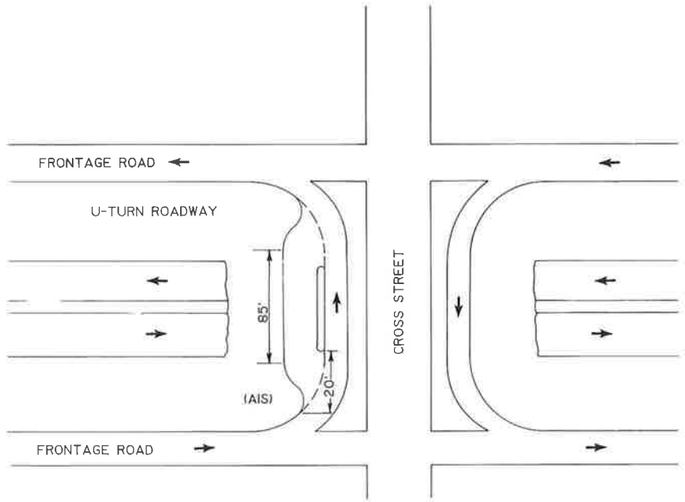
MASTER PLAN CONCEPT
TRAFFIC DETECTION LOCATION REQUIREMENTS

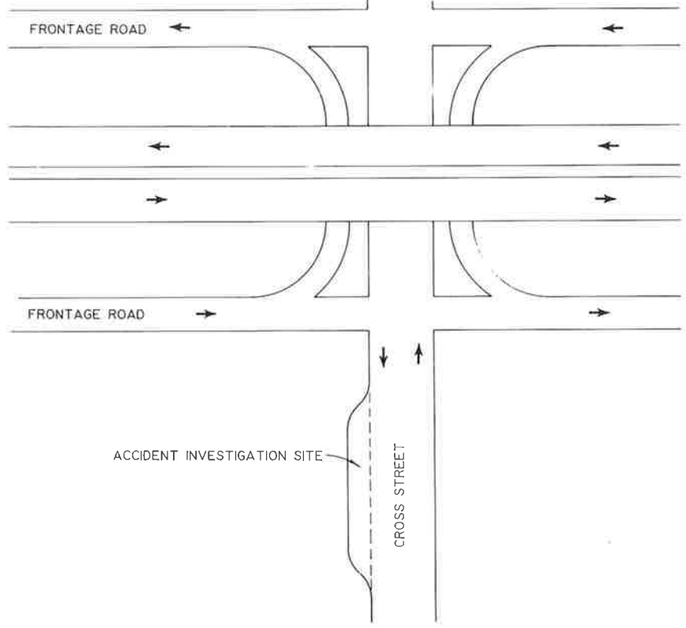
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET F-1 OF 6



ACCIDENT INVESTIGATION SITE (AIS)







DETAIL A





PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

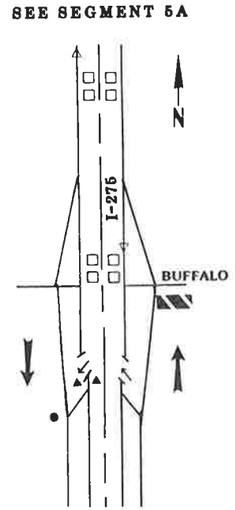
MASTER PLAN CONCEPT
TYPICAL ACCIDENT INVESTIGATION SITES

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET F-2 OF 6

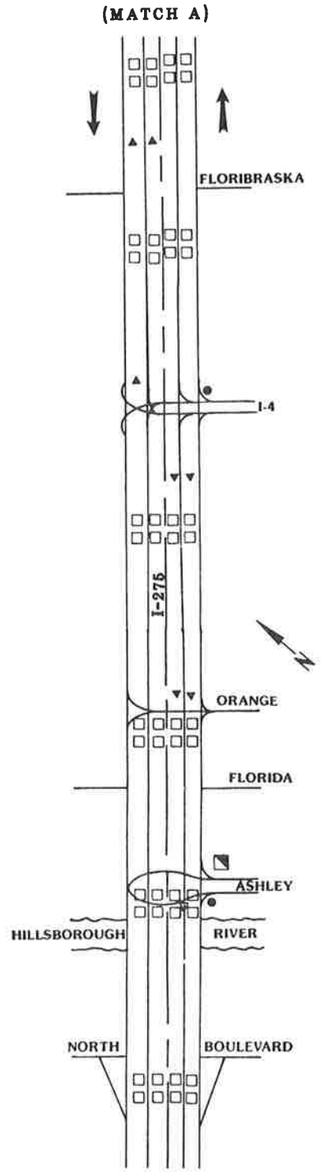
LEGEND

- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover

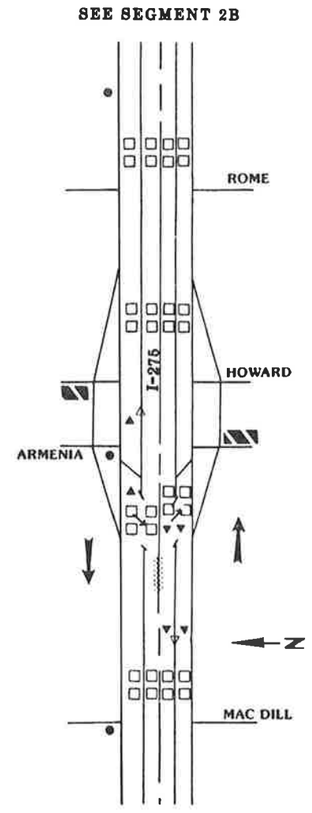


(MATCH A)

DESIGN STUDY SEGMENT 2-B

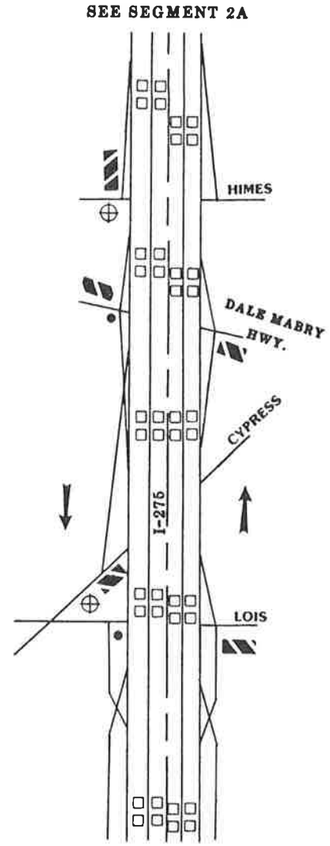


SEE SEGMENT 2A



SEE SEGMENT 1A

DESIGN STUDY SEGMENT 2-A



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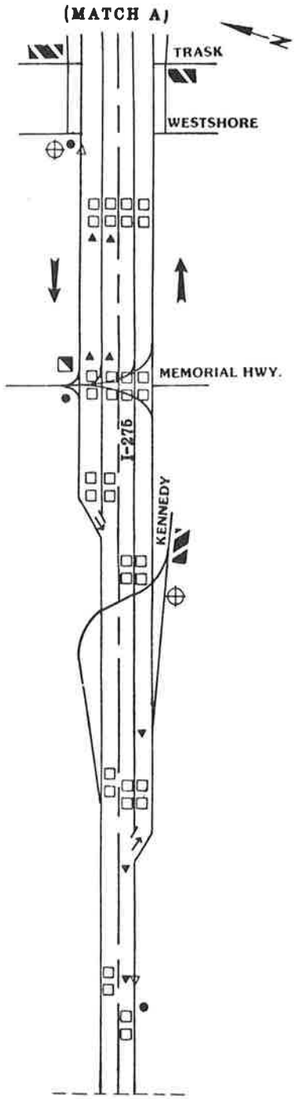


PROJECT LIMIT

DESIGN STUDY SEGMENT 1-A

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

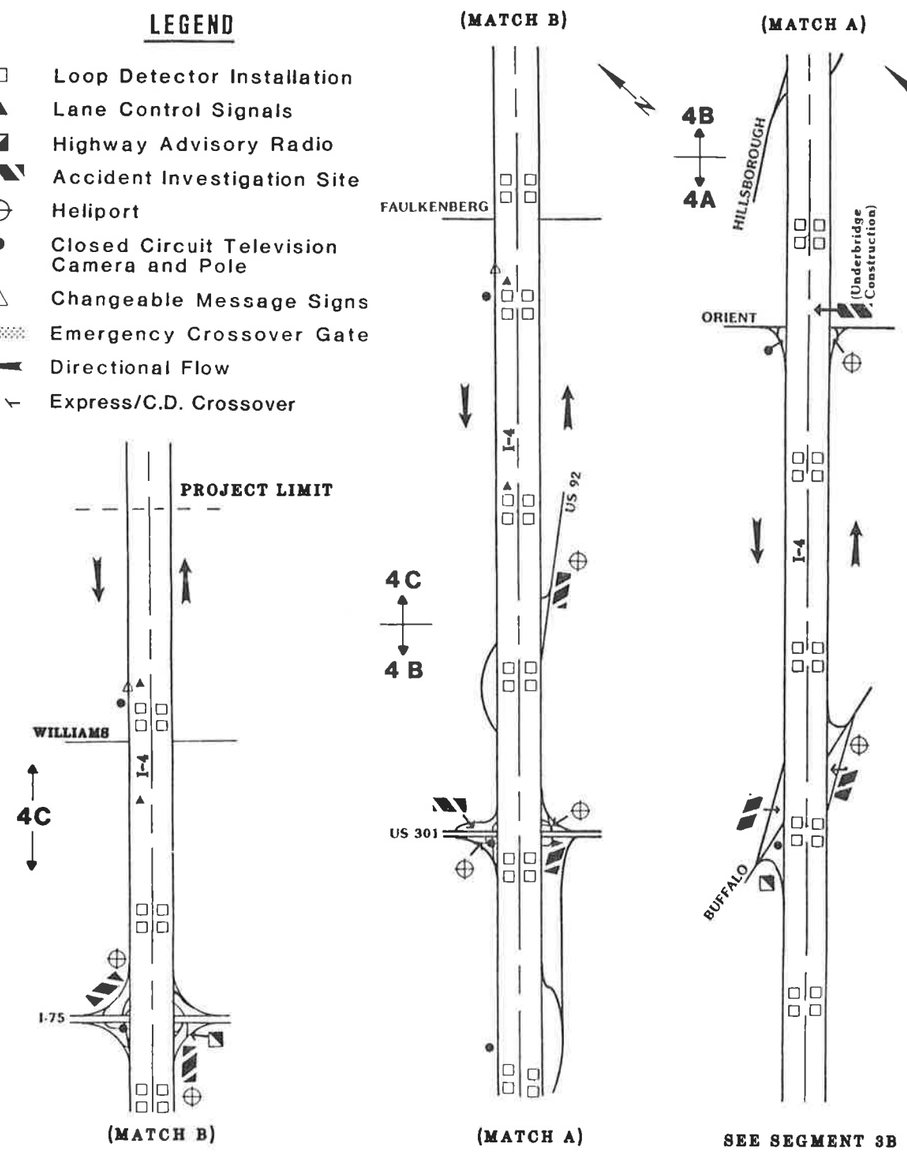
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENTS 1-A, 2-A & 2-B
SURVEILLANCE, COMMUNICATIONS AND CONTROL SYSTEM

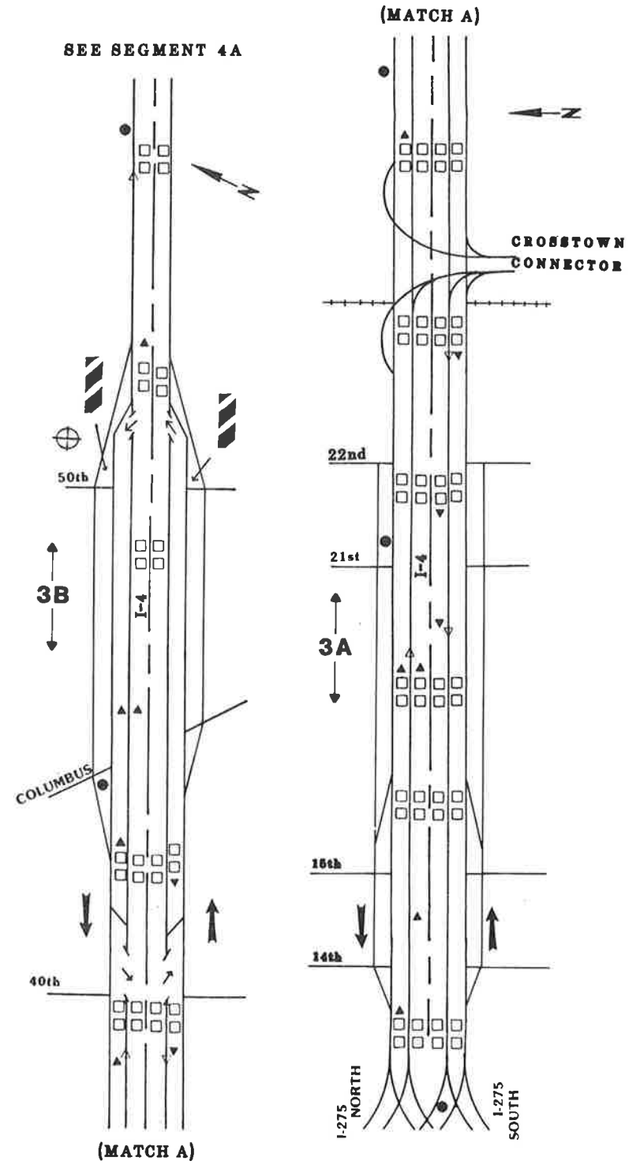
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET F-3 OF 6

LEGEND

- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover



DESIGN STUDY SEGMENTS 4-A,4-B & 4-C



DESIGN STUDY SEGMENTS 3-A & 3-B

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

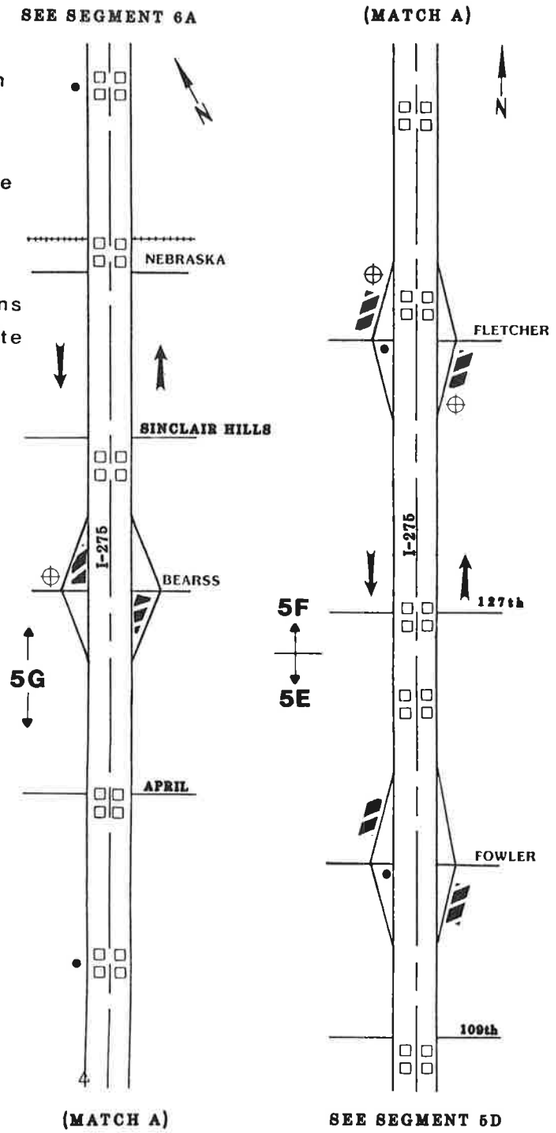
MASTER PLAN CONCEPT
DESIGN STUDY SEGMENTS 3-A, 3-B, 4-A, 4-B & 4-C
SURVEILLANCE, COMMUNICATIONS AND CONTROL SYSTEM

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

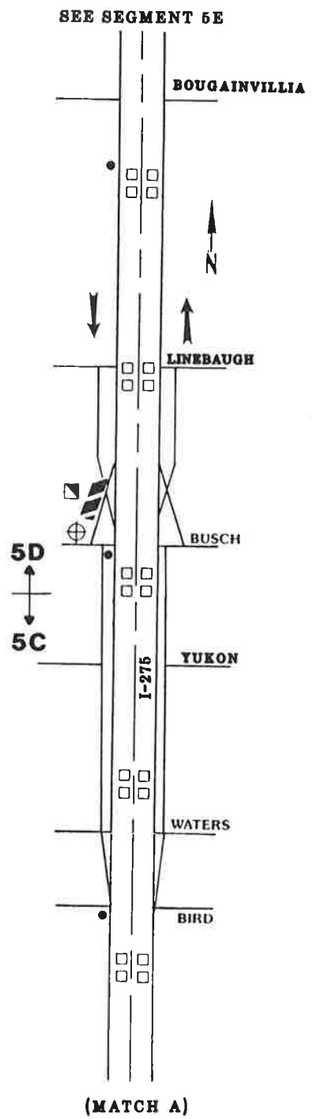
STATE PROJECT No. 99007-1402 | SHEET F-4 OF 6

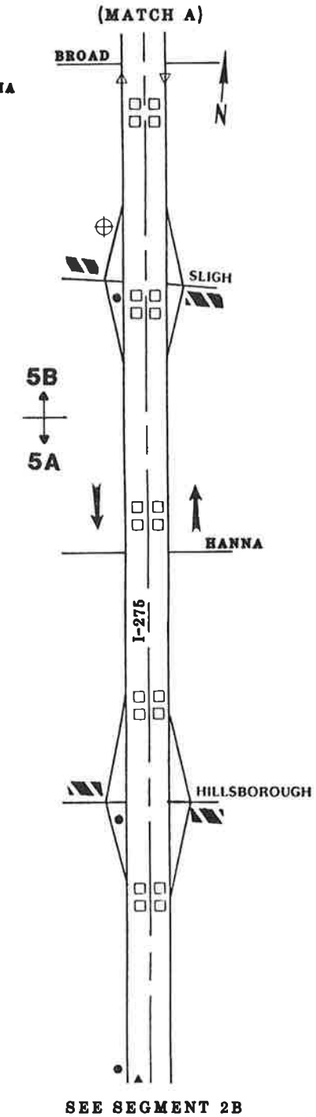
LEGEND

- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover



DESIGN STUDY SEGMENTS 5-E,5-F & 5-G





DESIGN STUDY SEGMENTS 5-A,5-B,5-C & 5-D

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

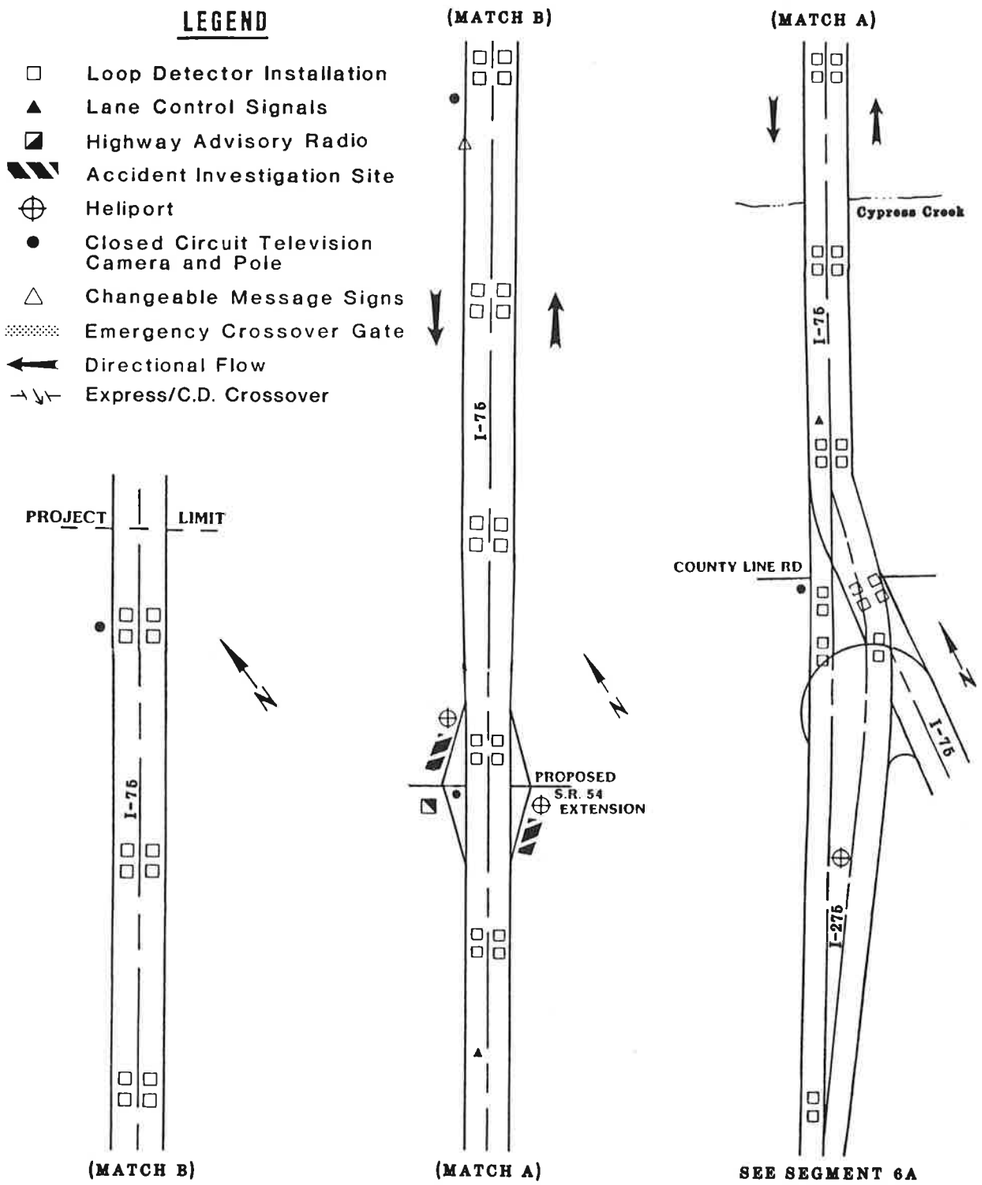
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENTS 5-A,5-B,5-C,5-D,5-E,5-F & 5-G
SURVEILLANCE, COMMUNICATIONS AND CONTROL SYSTEM

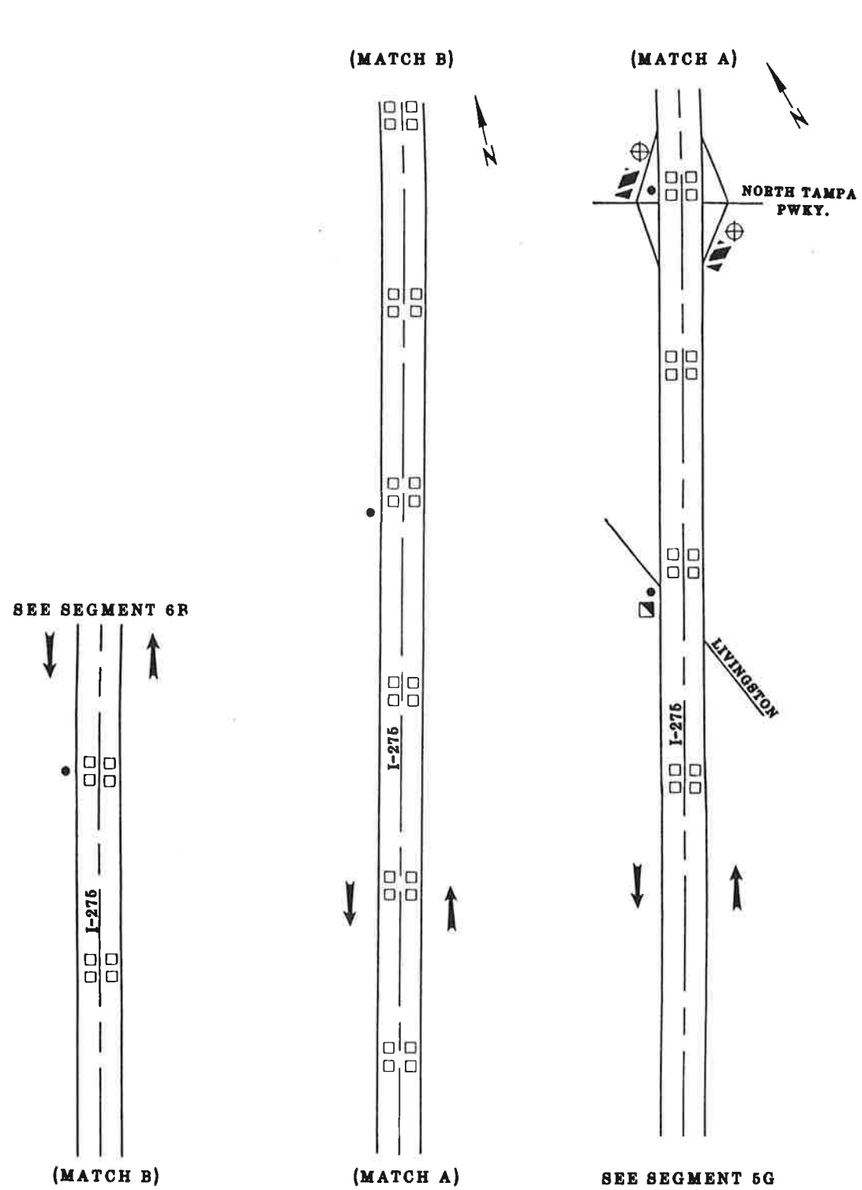
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET F-5 OF 6

LEGEND

- Loop Detector Installation
- Lane Control Signals
- Highway Advisory Radio
- Accident Investigation Site
- Heliport
- Closed Circuit Television Camera and Pole
- Changeable Message Signs
- Emergency Crossover Gate
- Directional Flow
- Express/C.D. Crossover



DESIGN STUDY SEGMENT 6-B



DESIGN STUDY SEGMENT 6-A

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DESIGN STUDY SEGMENTS 6-A & 6-B
SURVEILLANCE, COMMUNICATIONS AND CONTROL SYSTEM

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET F-6 OF 6

SIGNING AND LIGHTING

SECTION G



HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

SIGNING AND LIGHTING

SECTION G

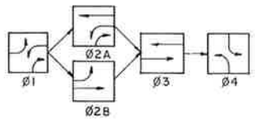


HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

SECTION G SIGNING AND LIGHTING

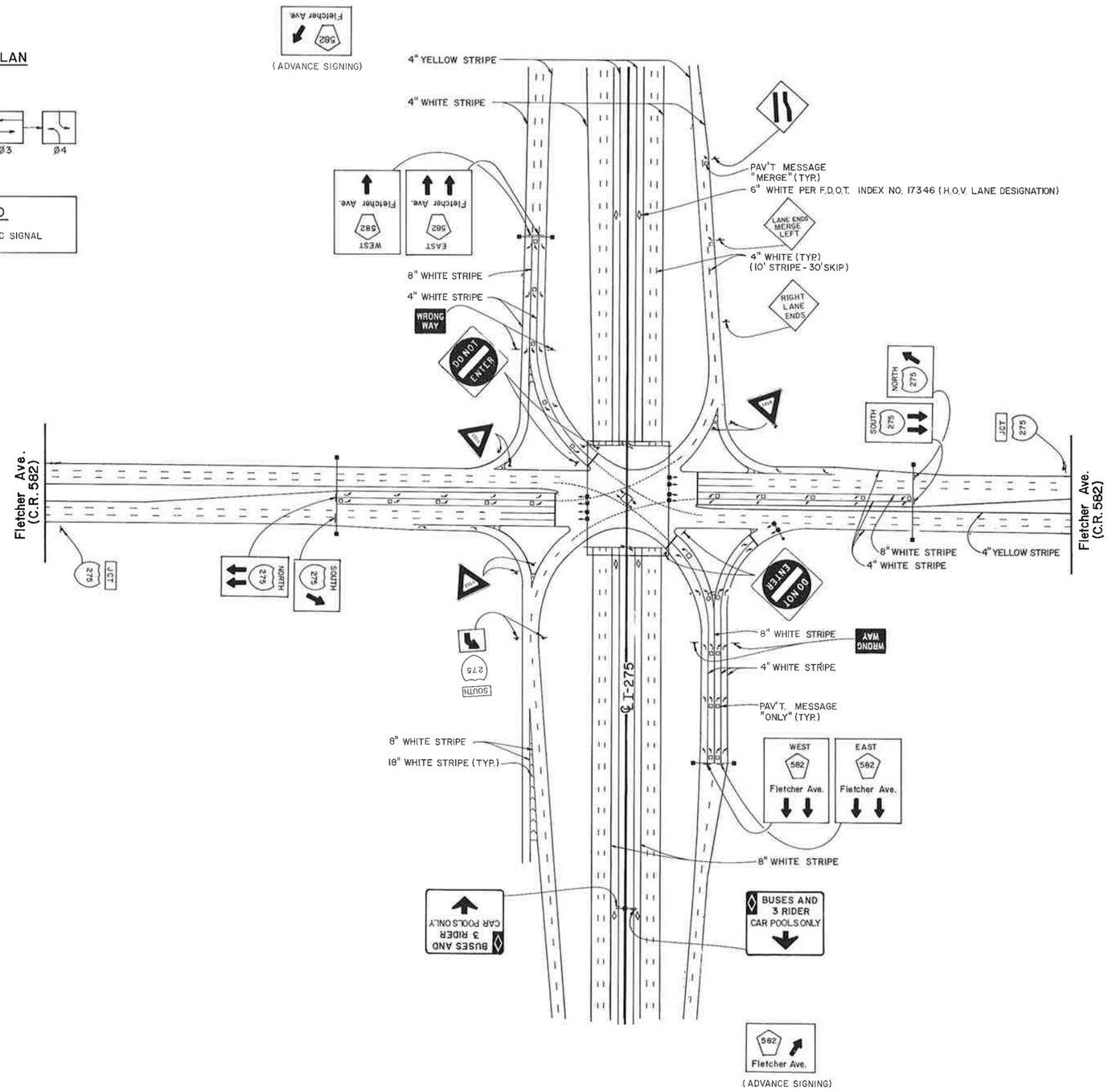
SHEET NO.	SHEET DESCRIPTION
	SECTION G DIVIDER SHEET
	SECTION G INDEX SHEET
G-1	TYPICAL TRAFFIC CONTROL FOR URBAN INTERCHANGE
G-2	TYPICAL TRAFFIC CONTROL FOR DIAMOND INTERCHANGE
G-3	TYPICAL TWO AND FOUR ROADWAY SYSTEM LIGHTING
G-4	TYPICAL LIGHTING SECTIONS FOR MAINLINE BRIDGES AND GRADE RAMPS
G-5	TYPICAL RAMP LIGHTING SECTIONS ON STRUCTURES AND RETAINING WALLS
G-6	TYPICAL LIGHTING DETAILS

PHASING PLAN



LEGEND

TRAFFIC SIGNAL



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

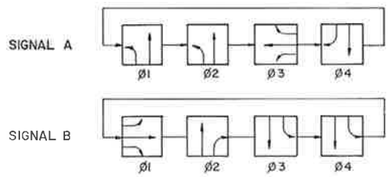
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL TRAFFIC CONTROL FOR URBAN INTERCHANGE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET G-1 OF 6

PHASING PLAN



LEGEND

- TRAFFIC SIGNAL
- SIGNAL POLE

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

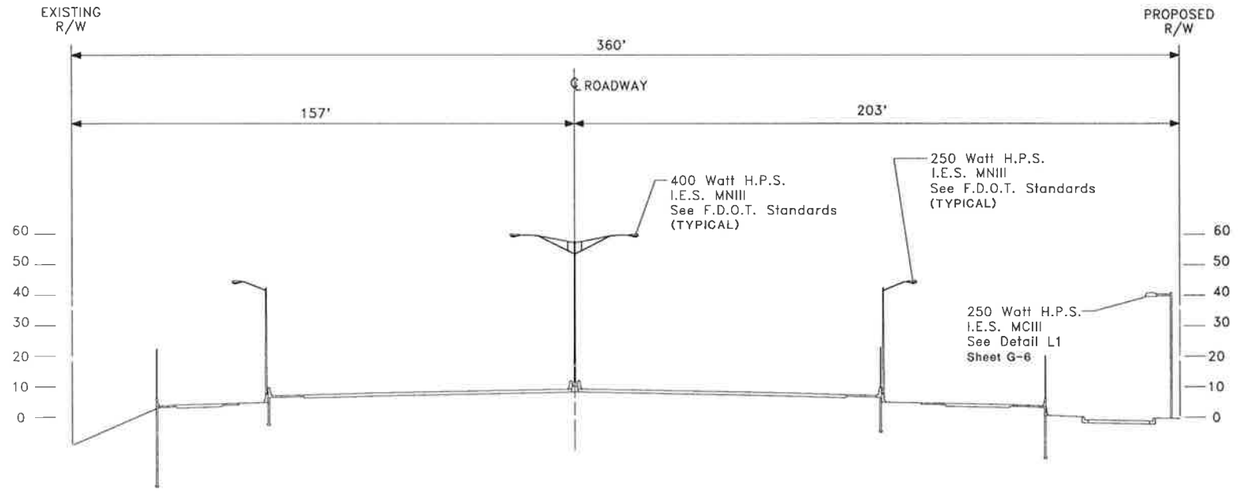
PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

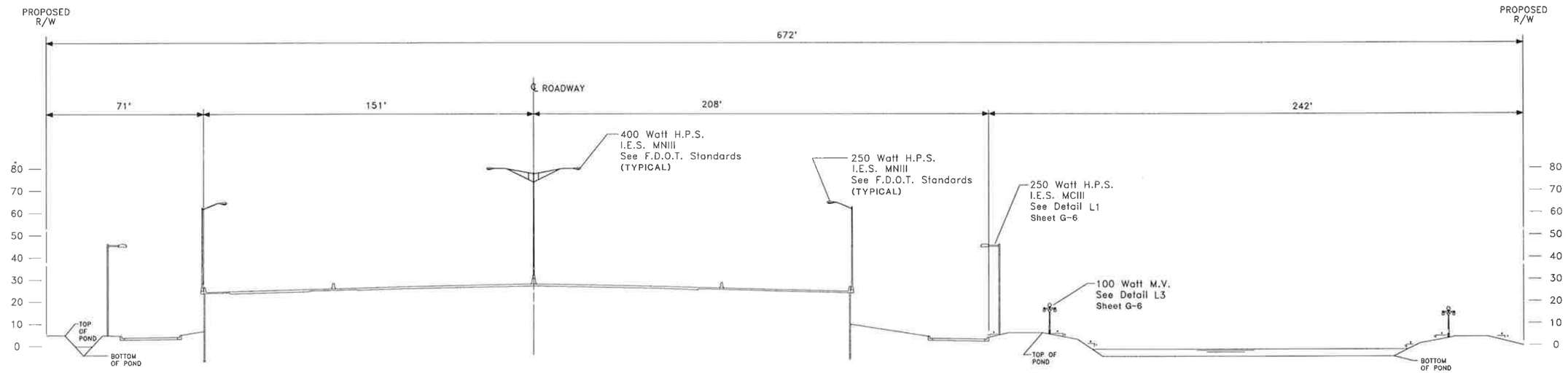
MASTER PLAN CONCEPT
TYPICAL TRAFFIC CONTROL FOR DIAMOND INTERCHANGE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET G-2 OF 6



TWO ROADWAY SYSTEM



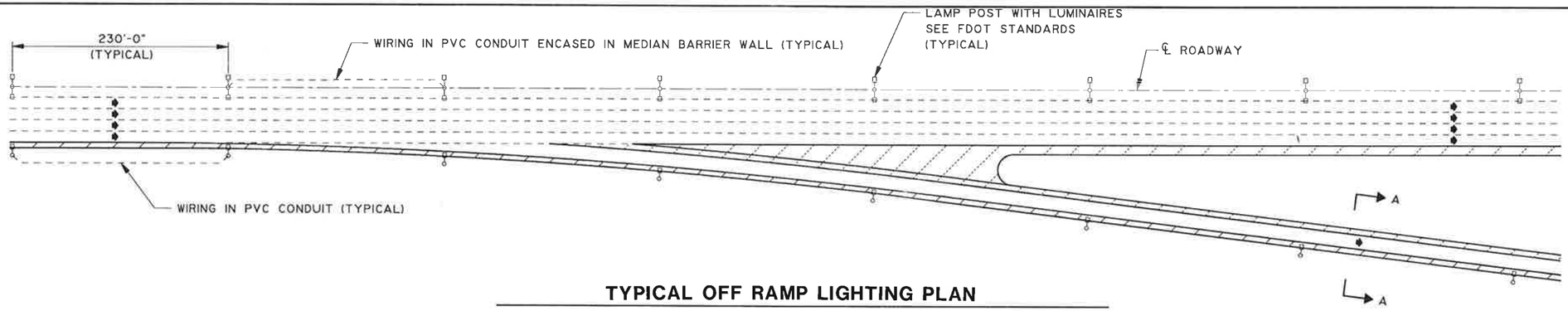
FOUR ROADWAY SYSTEM

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

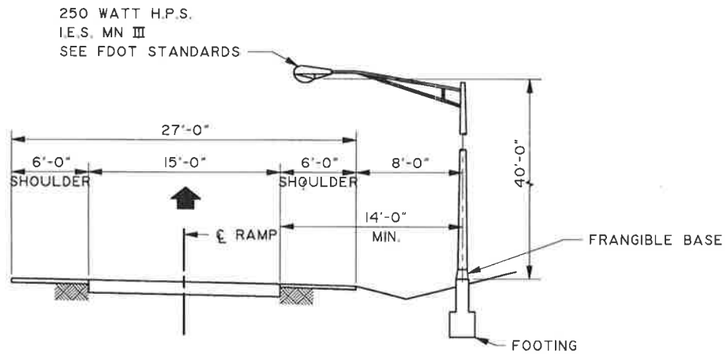
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL TWO AND FOUR ROADWAY SYSTEM LIGHTING

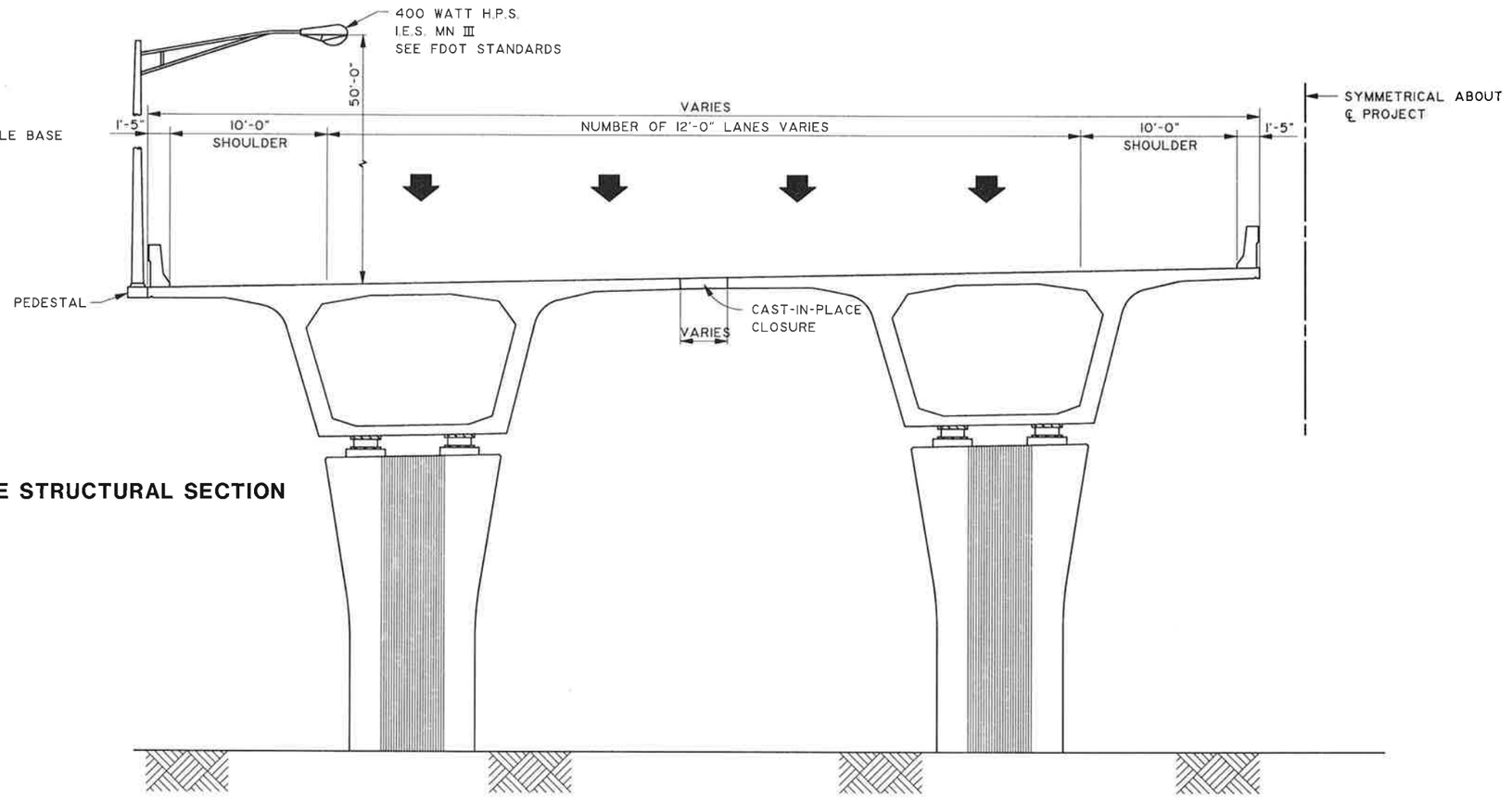
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET G-3 OF 6



TYPICAL OFF RAMP LIGHTING PLAN



SECTION A-A



MAINLINE STRUCTURAL SECTION

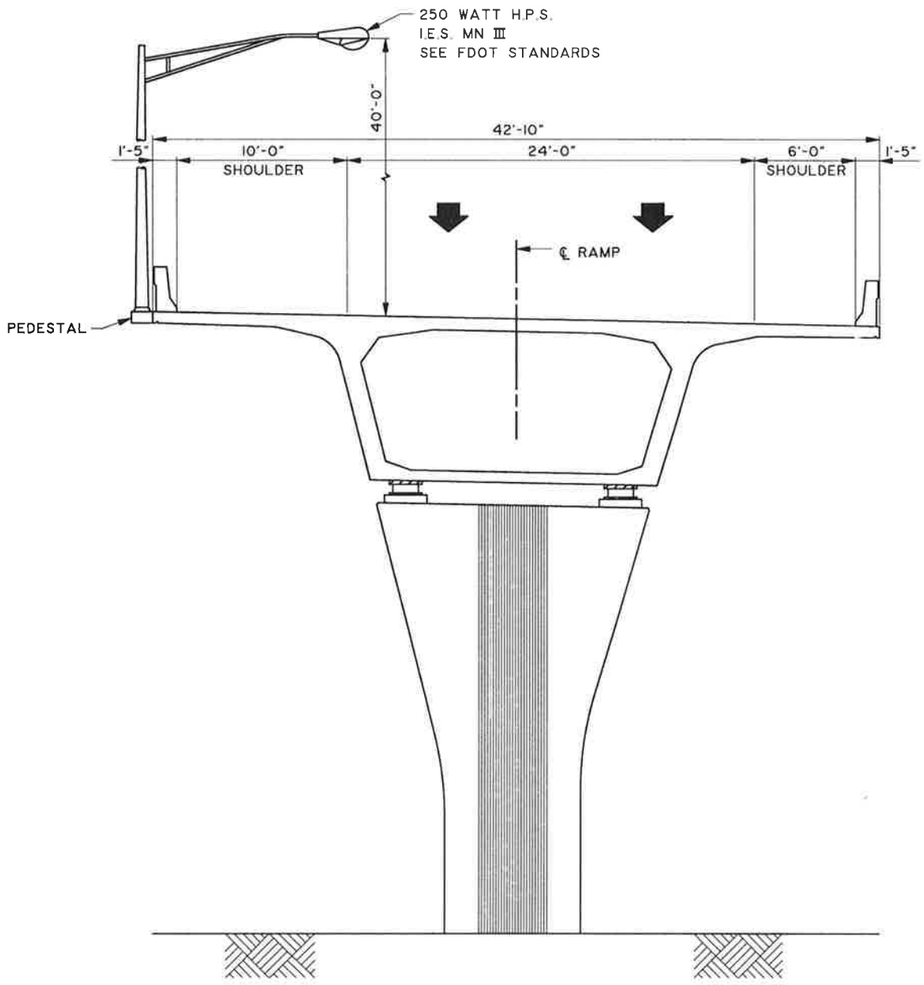
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

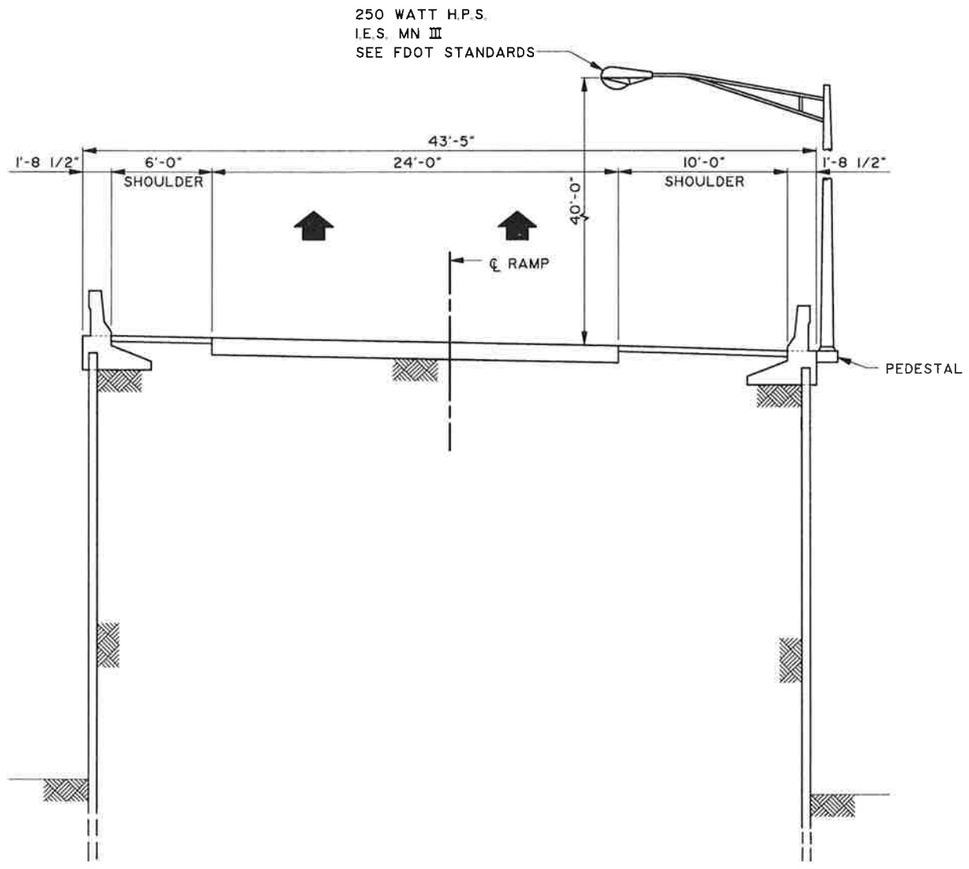
MASTER PLAN CONCEPT
TYPICAL LIGHTING SECTIONS FOR
MAINLINE BRIDGES AND
GRADE RAMPS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET G-4 OF 6



STRUCTURAL SECTION



RETAINED SECTION

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PROJECT DATES	
DATES	DESCRIPTION
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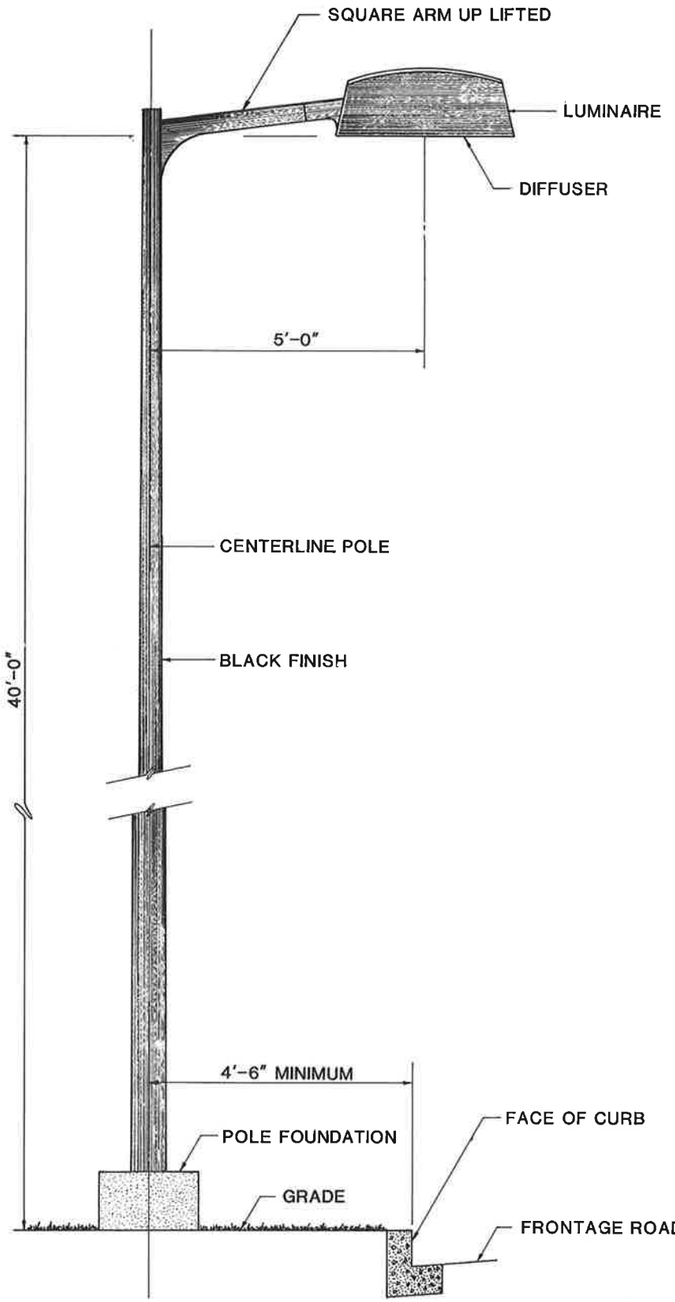
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL RAMP LIGHTING SECTIONS ON STRUCTURES AND RETAINING WALLS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET G-5 OF 6



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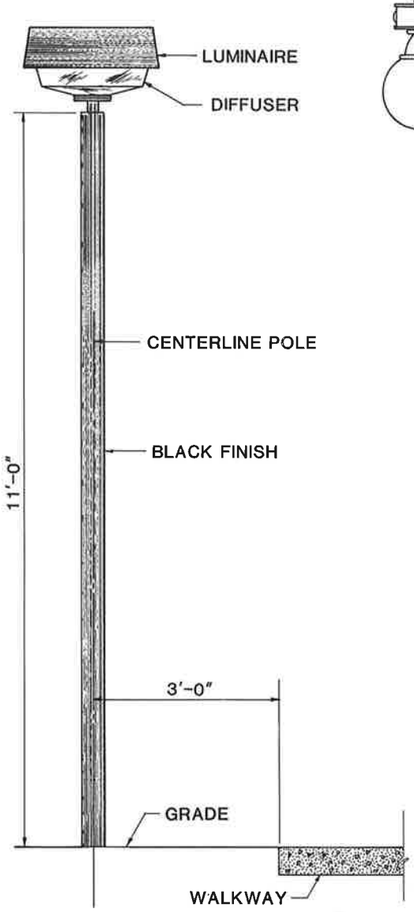
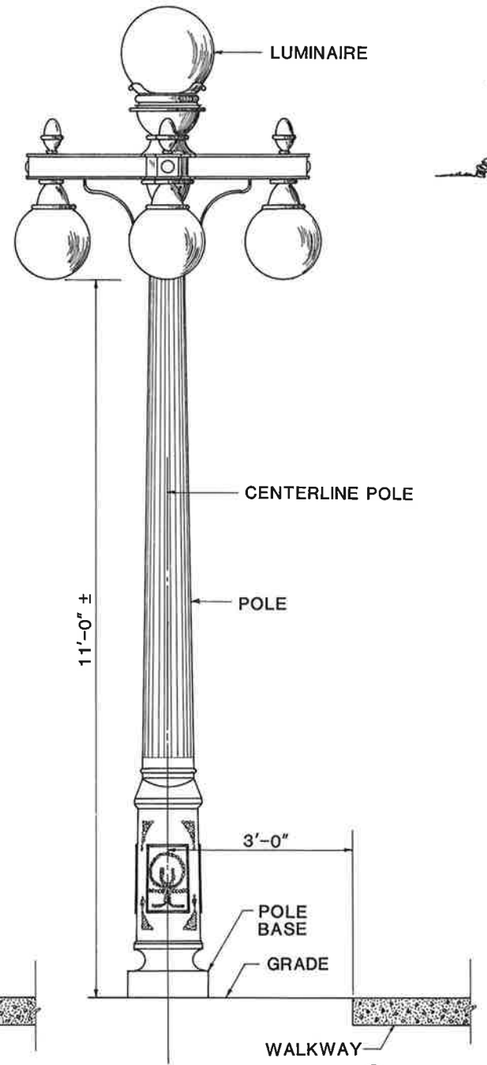
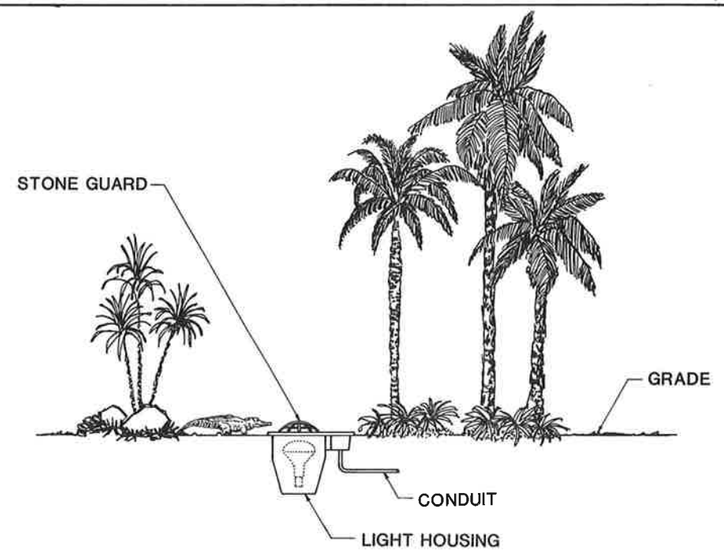


DOWNTOWN AND WESTSHORE AREAS (L2)



YBOR CITY AREA (L3)

PEDESTRIAN LIGHTING



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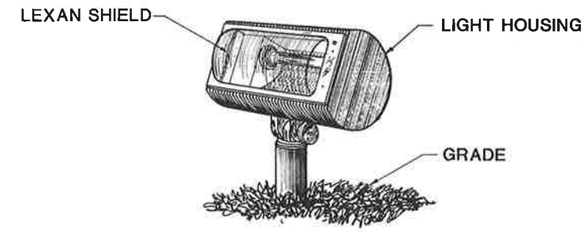

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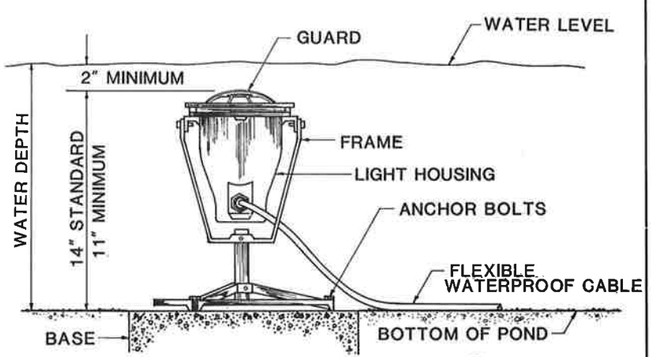


UNDERWATER FOUNTAIN LIGHTING (L6)

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
~~6-89~~	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL LIGHTING DETAILS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 SHEET G-6 OF 6

DRAINAGE

SECTION H

PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

DRAINAGE

SECTION H

PLANNING FOR TOMORROW

I-4 I-275 I-75

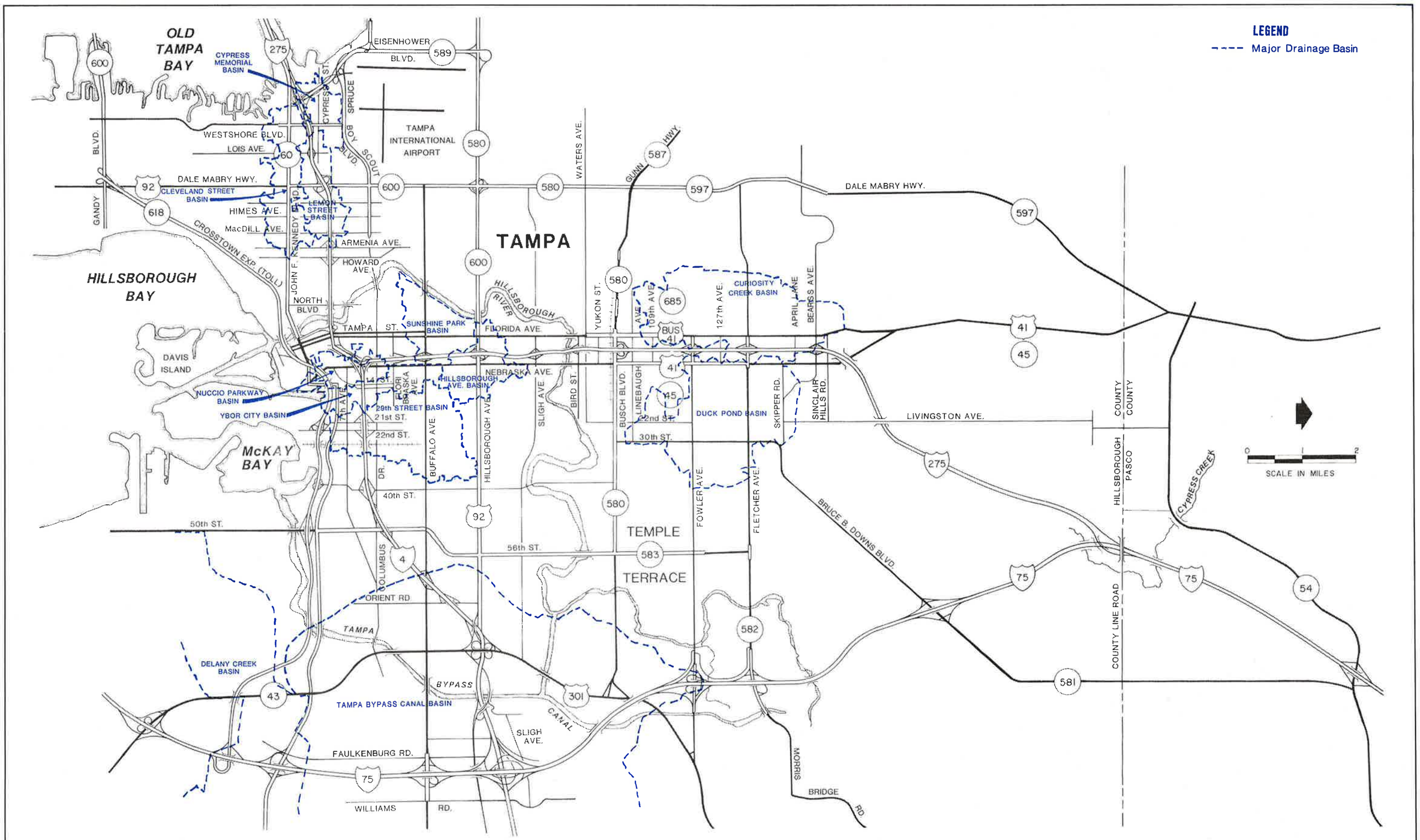
TAMPA INTERSTATE STUDY

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

SECTION H DRAINAGE

SHEET NO. SHEET DESCRIPTION

SECTION H DIVIDER SHEET
SECTION H INDEX SHEET
H-1 MAJOR DRAINAGE BASIN MAP
H-2 DRAINAGE SENSITIVE AREAS
H-3 STORMWATER MANAGEMENT DESIGN CRITERIA MATRIX
H-4 100-YEAR FLOODPLAIN MAP



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GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
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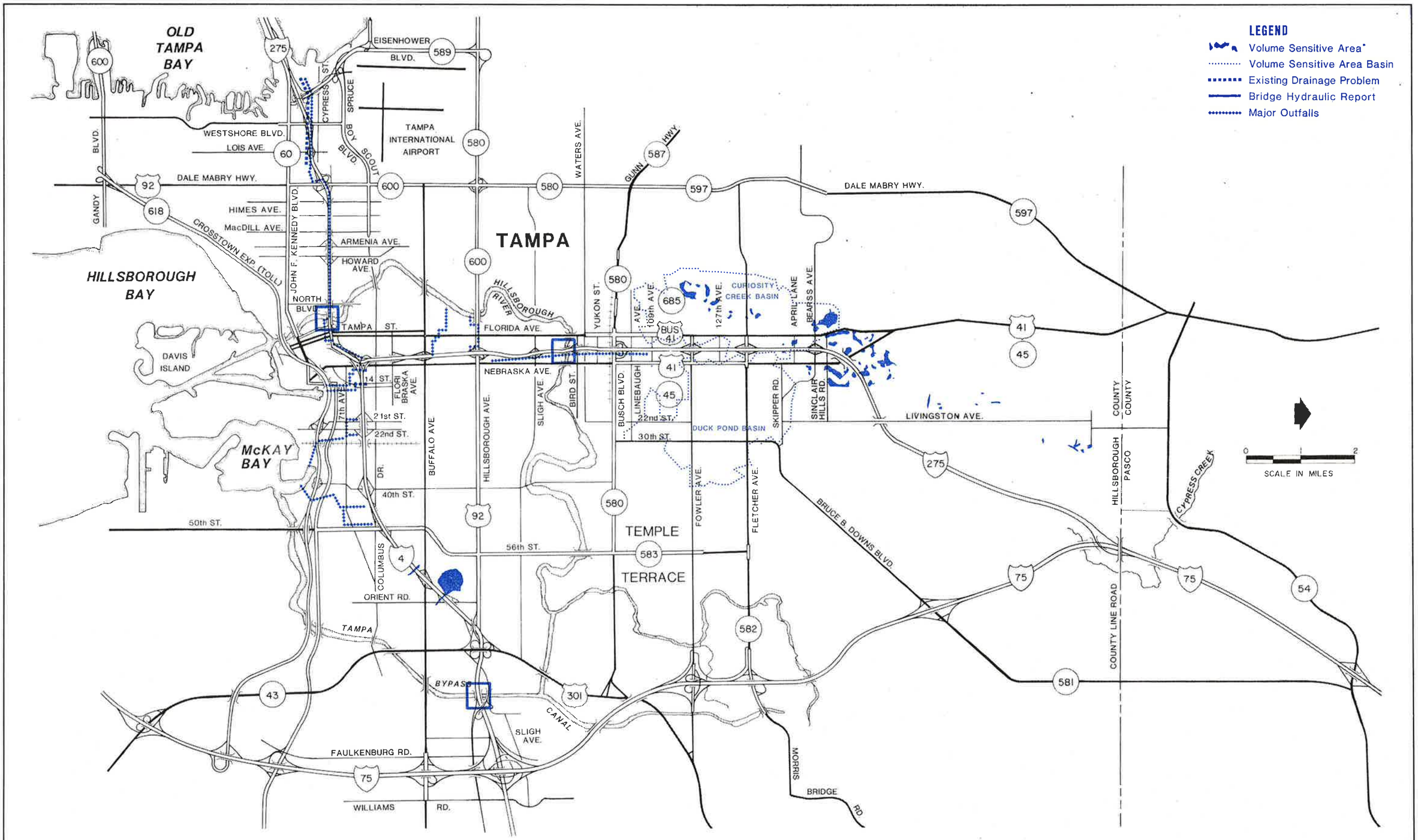
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
MAJOR DRAINAGE BASIN MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET H1 OF 4



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GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
DRAINAGE SENSITIVE AREAS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET H2 OF 4

STORMWATER MANAGEMENT DESIGN CRITERIA MATRIX

AGENCY

CRITERIA	CITY OF TAMPA	HILLSBOROUGH COUNTY	S.W.F.W.M.D.	F.D.E.R.	F.D.O.T. DRAINAGE	F.H.W.A.	U.S.A.C.O.E.	PASCO COUNTY	E.P.A.
RULE	STORMWATER MANAGEMENT TECHNICAL STANDARDS OCTOBER, 1988	HILLSBOROUGH COUNTY STORMWATER MANAGEMENT TECHNICAL MANUAL MAY, 1988	RULES OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT PERMIT INFORMATION MANUAL 1988 400-4 SURFACE WATER MANAGEMENT 400.4.301 GENERAL SURFACE WATER MANAGEMENT PERMITS	REGULATION OF STORMWATER DISCHARGE CHAPTER 17-25, AUGUST 1988	RULES OF THE DEPARTMENT OF TRANSPORTATION CHAPTER 14-86 DRAINAGE CONNECTIONS "HANDBOOK FOR DRAINAGE CONNECTION PERMIT" FEBUARY 1987	FEDERAL HIGHWAY PROGRAM MANUAL # 6732 APRIL 24, 1984	TAMPA BYPASS CANAL DETAIL DESIGN MEMORANDA CANAL 1.35	SUBDIVISION ORDINANCE	CODE OF FEDERAL REGULATIONS TITLE 40 PARTS 122,123,124 AND 504 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT APPLICATION REGULATIONS FOR STORM WATER DISCHARGES. (CURRENTLY PENDING)
AREA WHERE APPLICABLE	TAMPA CITY LIMITS	HILLSBOROUGH COUNTY	400-4.041 PERMITS REQUIRED Permits required within S.W.F.W.M.D. jurisdiction prior to construction, alteration, operation, or abandonment of any dam, impoundment, reservoir, appurtenant work or works.	17-25.02(10) "NEW STORMWATER DISCHARGE FACILITY" means coming into existence after Feb. 1, 1982. (can also mean modified) 17-25.090 Delegated to S.W.F.W.M.D. 40E-4.011 unless dredge and fill permit needed. (17-25.09(2)	14-86.003(2) PERMIT. All improvements that are not exempted in Rule Section 14-86.003(1) require a drainage connection permit whether or not the work is done in conjunction with a vehicular connection. 14-86.002(4) "Drainage Connection" means any structure which conveys stormwater runoff or other surface water discharge from the adjacent property to the Department Facility.	Par. 5 The provisions of this directive shall apply to all encroachments and to all actions which affect base flood plains. Par. 4b. BASE FLOOD- the flood or tide having a one-percent chance of being exceeded in any given year. in the 100 year flood plain (FIRM)	I-4 Crossing of Bypass Canal	PASCO COUNTY EXCEPTION: CORPORATE LIMITS OF MUNICIPALITIES	
POLICY	1.B Prevent damage, provide access , preserve quality.	1.2 Protect Life, Health, and Welfare. Minimize private and public property damage. Provide efficient/cost effective drainage design. Maintain/enhance quantity/ quality of ground water supply.	400-4.011 Regulate and control the management and storage of all surface waters.	17-25.001 Prevent Pollution of Waters of State by Discharges of Stormwater.	14-86.001 Ensure Safe Conditions for F.D.O.T. Facilities.	Par. 3a Prevent hazardous use of flood plains.		Reasonable regulations and minimum standards to preserve Health, Saftey and Welfare of citizens.	
DESIGN STORM EVENTS TO BE ANALYZED	POST 50 YEAR POST 25 YEAR PRE/POST 5 YEAR	PRE 10 YEAR PRE/POST 25 YEAR PRE/POST 50 YEAR	PRE/POST 25 YEAR STORM PRE/POST 100 YEAR STORM (Closed Basin) ONE INCH RAINFALL (Water Quality)	ONE INCH RAINFALL	2-100 YR., 1 HR.-10 DAY CRITICAL STORM ANALYSIS	Par. 9a(9) DESIGN STANDARDS Base Flood (100 year) Overtopping flood Greatest flood if no Overtopping	STANDARD PROJECT FLOOD	25 yr. for drainage area > 640 acres. 10 yr. for drainage area < 640 acres.	
DISCHARGE RATE (POSITIVE OUTFALL)	III.E.1 Runoff determination by Rational Method III.E.2 Conduit System Design based on 5 yr., F.D.O.T. Zone 6. III.E.7 Detention/Retention ponds create an asset to Community. 5.0.2 Detention Ponds-positive outfall. Volume detained is difference between pre 5 yr.-24 hr. Zone 6 storm. Drawdown time is 72 hours. Retention Ponds-nonpositive outfall. Volume retained is difference between pre 5 yr.-24 hr. Zone 6 and post 50 yr.-24 hr. Zone 6 storm. Percolation drawdown in 72 hrs.	3.1.B. Outfall Conditions 1. More than adequate outfall. -no limit (eg. Tampa Bay) -connecting facilities designed for 100 year storm. 2. Adequate/Peak Sensitive Outfalls Peak discharge for post 25 yr.-24 hr. less than/equal to pre 10 yr.-24 hr.	3.2.1.2b Discharge computed from S.W.F.W.M.D. 25 yr.-24 hr. rainfall map,s, SCS type II Florida modified 24 hr. distribution, AMC II. 3.2.1.2 Offsite discharge cannot cause any adverse offsite impacts. 3.2.2.2 Total detention volume for quantity shall be available within 36 hours. Treatment can be counted as part of storage volume required under quantity requirments.	25.025(1) Detention Ponds -volume drawdown in 72 hours. -volume detained, 1 inch of rainfall. (1/2 inch for < 100 acres)	14-86.003 Discharge Limited By One of: STORMWATER MANAGEMENT PLAN APPLICABLE LOCAL REGULATION WAIVER FROM DISTRICT DEPUTY ASSISTANT SECRETARY Detention Ponds: Attenuate post improved peak rate to the pre improved peak rate for all frequencies (2yr.-100 yr.) for critical duration (1 hr.-10 day).				
DISCHARGE RATE (CLOSED BASIN OR VOLUME SENSITIVE)		3.1.B.4 VOLUME SENSITIVE Retention ponds storage equal difference of pre and post development runoff volume for 100 yr -24 hr. storm. 100% volume drawdown in 72 hours.	3.2.1.2.c Closed Basin Retention Volume is the difference between post and pre runoff volume computed using S.W.F.W.M.D. 100 yr.-24 hr. rainfall map, SCS type II modified distribution, AMC II.	25.025(4) Retention Ponds -volume drawdown (by percolation, evaporation, evapotranspiration in 72 hours)	14-86.003 Volume or Discharge Limited By One of: STORMWATER MANAGEMENT PLAN 100 YR.-CRITICAL DURATION (up to 10 days) WAIVER FROM DISTRICT DEPUTY ASST. SECRETARY Non Positive Outfall Retention Volume = Post minus pre improved runoff volume for 100 year - critical duration storm. 50% volume drawdown = 7 days 100% volume drawdown = 30 days		VELOCITY EQUAL TO OR LESS THAN 2.5 FPS		
SPECIAL BASINS AND SPECIAL CONCERNS		Henry Street Curiousity Creek I-4 and Buffalo Avenue I-4 and S.R. 579 Duck Pond	TAMPA BYPASS CANAL CURIOUSITY CREEK						
WATER QUALITY	III.A.5 Approval of S.W.F.W.M.D. and F.D.E.R.	7.2.B.4 Credit for water quality storage volume for the portion of pollution abatement volume which can be bled down within 72 hours. -minimum orifice/rectangular opening is 3 inches. -no V-notch weirs are permitted.	3.2.2.1 Meet applicable state water quality standards in Chapter 17-3 and Section 17-4.242, F.A.C. 3.2.2.2 TREATMENT VOLUME a. Wet Detention - 1 inch runoff. b. Detention with effluent filtration - runoff from 1 inch of rainfall or 1/2 inch runoff if less than 100 acres. c. Retention, filtration - 1/2 inch runoff. d. On line treatment (same as b.) e. Off line treatment (same as b.) f. Discharge into O.F.W. treat 50% more than required amount.	17-25.025 1. 100% volume drawdown in 72 hours. 3. Filtration system saftey factor = 2.0 unless proved appropriate otherwise (req'd volume drawdown in 36 hours). 8. Stormwater discharge facilities with potential oil/grease pollution beyond standards, use baffles, skimmers, grease traps (etc.) to meet standards. 9. If discharged into O.F.W. treat additional 50% of required volume.					Design criteria should encourage removal of oils, suspended solids etc..	
FLOOD PLAIN ENCROACHMENT		3.2 No development allowed in conveyance portion of 100 yr. floodplain unless conveyance reduction is compensated. No development allowed in 100 yr. floodplain unless storage volume is compensated. If development is a causeway type encroachment may allow a small increase (± .1 ft.) in upstream offsite elevation.	3.2.1.4 No net encroachment in 100 yr. floodplain which causes adverse effects to conveyance, storage, water quality or adjacent lands.			FHWA 6732 Par. 7. LOCATION HYDRAULIC STUDIES required for encroachment into the floodplain. 8. ONLY PRACTICABLE FINDING is required for encroachment design alternate. 9. DESIGN STANDARDS a. Analysis of (1) Risk analysis of design flood. (2) Interstate roadway not exceeded by 50 year. (3) Freeboard provided on bridges. (5) Consistant with FEMA b. Rest area out of 100 year floodplain. c. Design meets DAM criteria if roadway is levied for 50 acre-feet of storage or 25 feet deep.				
DESIGN GEOMETRY	III.E.6 DITCHES -Mannings Formula -Trapezoidal or V-shaped -Side slope 4:1 (2:1 maximum) -Bottom width - 2 ft. wider than storm system serving as outfall -Minimum freeboard = 1 ft.. Minimum maintenance access = 15 ft. berm (for ditches ≤ 15' width)	7. Detention/Retention Pond -unobstructed 20 ft. wide maintenance area on both sides of county maintained ditches/channels. 10. Ditches -maximum side slope 4:1. -minimum 1 ft. freeboard in channels. -maximum side slope 4:1 (ditches and ponds) depth of ditches $2 \leq D \leq 3.5$ ft. unless approved otherwise by County Administrator. -minimum bottom width = 3.0 ft.	3.2.4.4.1 WET PONDS a. Width greater than 100 ft. b. Berm width 20 ft. (minimum). c. Maximum side slope 4:1 3.2.2.2.4 Wet detention treatment volume drawdown greater than or equal to 120 hours. 50% wet detention treatment volume drawdown ≥ 60 hours.	25.025(6) Ditches (swales) -design to percolate 80% of runoff for 3 yr.-1 hr. storm in 72 hours. Retention/Detention ponds restricted from public access (ie. fenced). Side slope maximum 4:1 for the first 2.0 feet below control elevation.	1 INCH OF RAINFALL If connecting to a Department System must meet minimum Department WQ Standards of System.			Roadway Swales maximum slope 4:1 minimum shoulder width 8 ft. on both sides. Grassed ditches may be used except where velocities exceed 3 fps.	

PROJECT No. C1104	
PROJECT DATES	
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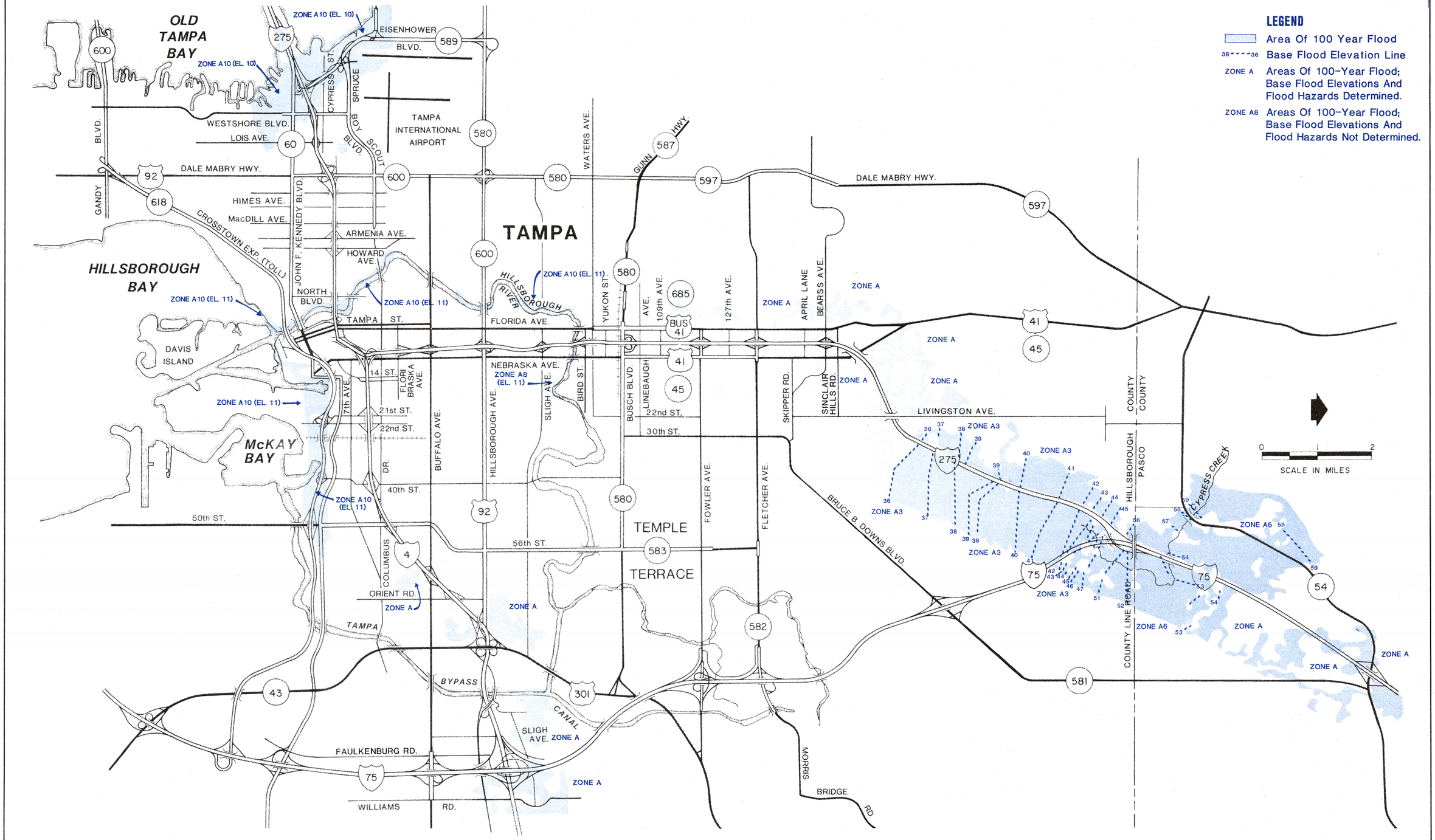
PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
STORMWATER MANAGEMENT DESIGN CRITERIA MATRIX

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET H-3 OF 4



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GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
100-YEAR FLOODPLAIN MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 SHEET H4 OF 4

STRUCTURES

SECTION I



PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

STRUCTURES

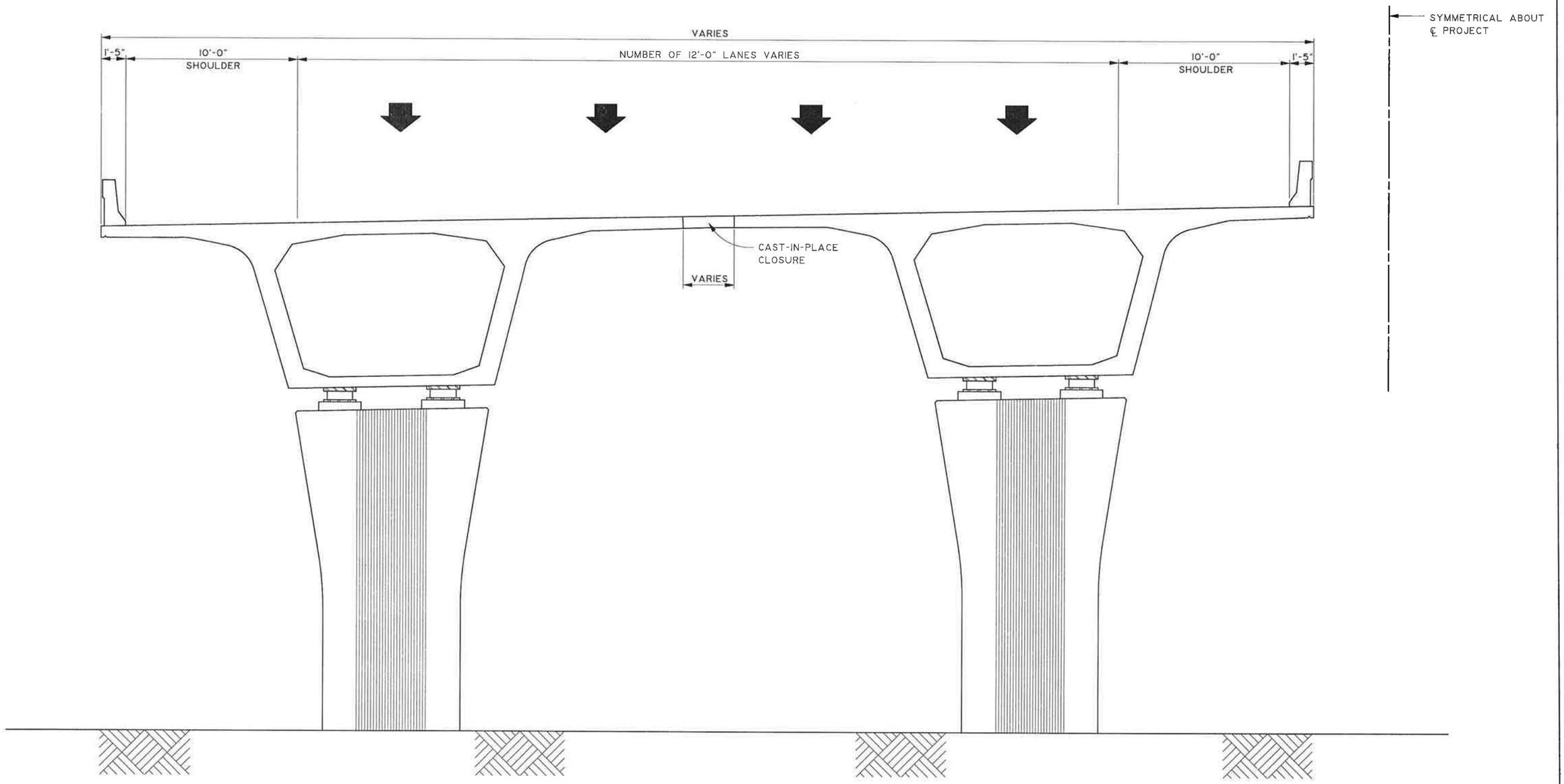
SECTION I



SECTION I STRUCTURES

SHEET NO.	SHEET DESCRIPTION
	SECTION I DIVIDER SHEET
	SECTION I INDEX SHEET
I-1	MAINLINE TYPICAL SECTION PRECAST SEGMENTAL CONCRETE BOX GIRDERS
I-2	MAINLINE TYPICAL SECTION CAST-IN-PLACE CONCRETE BOX GIRDER
I-3	MAINLINE TYPICAL SECTION CAST-IN-PLACE CONCRETE BOX GIRDERS WITH FLOOR BEAMS
I-4	MAINLINE TYPICAL SECTION PRECAST CONCRETE SPINE WING CONCEPT
I-5	MAINLINE TYPICAL SECTION STEEL BOX GIRDERS
I-6	MAINLINE TYPICAL SECTION STEEL BOX GIRDERS WITH FLOOR BEAMS
I-7	MAINLINE TYPICAL SECTION AASHTO GIRDER GRADE SEPARTATION
I-8	RAMP TYPICAL SECTION PRECAST SEGMENTAL CONCRETE BOX GIRDER
I-9	RAMP TYPICAL SECTION CAST-IN-PLACE CONCRETE BOX GIRDER
I-10	RAMP TYPICAL SECTION PRECAST CONCRETE SPINE WING CONCEPT
I-11	RAMP TYPICAL SECTION STEEL BOX GIRDERS
I-12	RAMP PLAN AND TYPICAL SECTION OPEN TARNSVERSE GIRDER FRAMING CONCEPT
I-13	NOISE WALL ATTACHMENT TO BRIDGE STRUCTURE
I-14	NOISE WALL ATTACHMENT TO RETAINING WALL
I-15	SIGN SUPPORT STRUCTURE ELEVATIONS AND SECTIONS
I-16	TYPICAL URBAN OVERPASS SECTIONS FOR 2, 3 AND 4 LANES NEW CONSTRUCTION
I-17	TYPICAL URBAN OVERPASS SECTIONS FOR 5 AND 6 LANES NEW CONSTRUCTION
I-18	TYPICAL INTERCHANGE STRUCTURE WITH 4 LANE CROSS STREET
I-19	TYPICAL INTERCHANGE STRUCTURE WITH 6 LANE CROSS STREET
I-20	TYPICAL COLUMN-SUPPORTED INTERCHANGE STRUCTURE OVER ONE-WAY PAIRED CROSS STREETS
I-21	TYPICAL RETAINED EARTH INTERCHANGE STRUCTURE OVER ONE-WAY PAIRED CROSS STREETS

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402



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THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

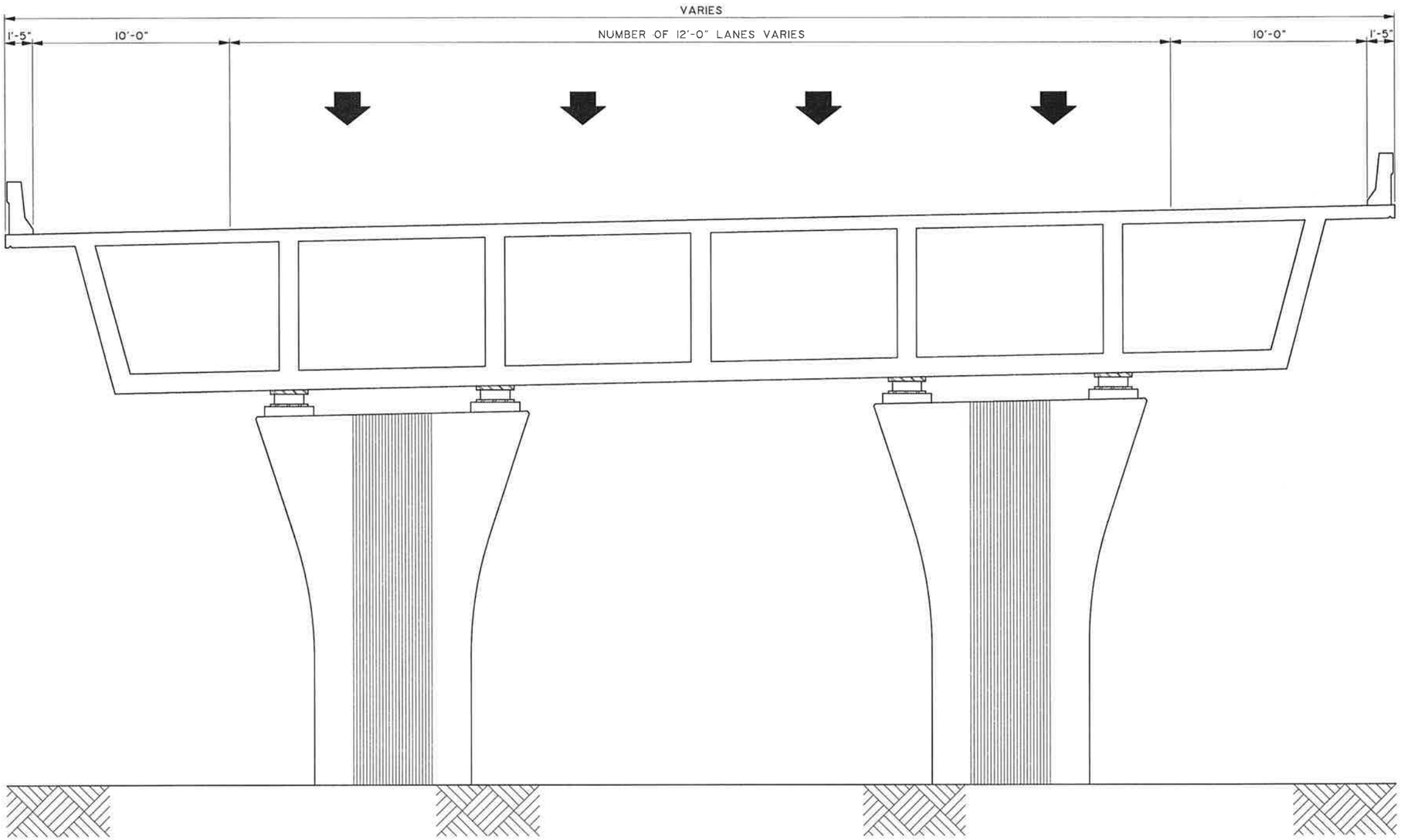
MASTER PLAN CONCEPT

MAINLINE TYPICAL SECTION
PRECAST SEGMENTAL CONCRETE BOX GIRDERS

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-1 OF 21



SYMMETRICAL ABOUT
℄ PROJECT

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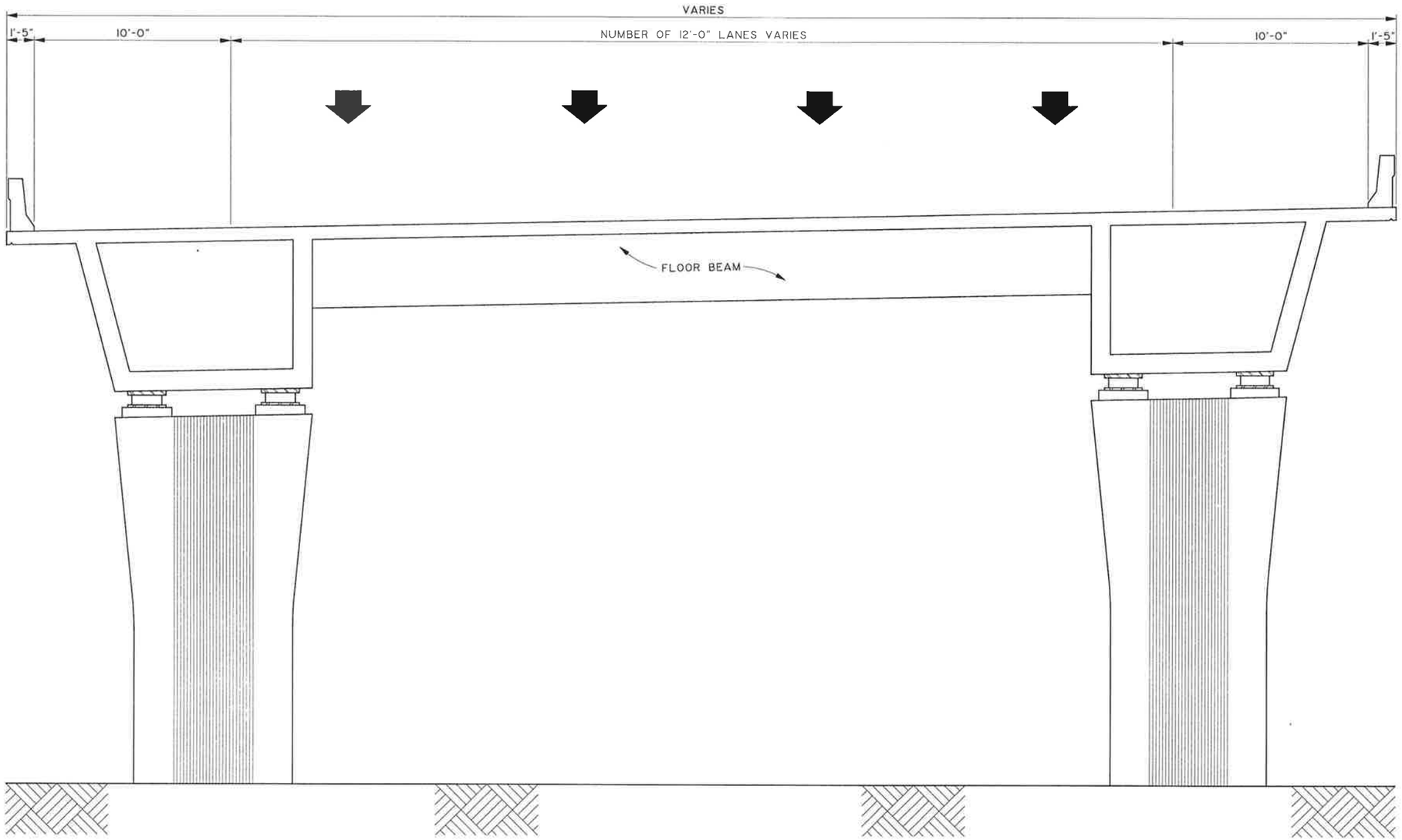
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
MAINLINE TYPICAL SECTION
CAST-IN-PLACE CONCRETE BOX GIRDER

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-2 OF 21



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TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

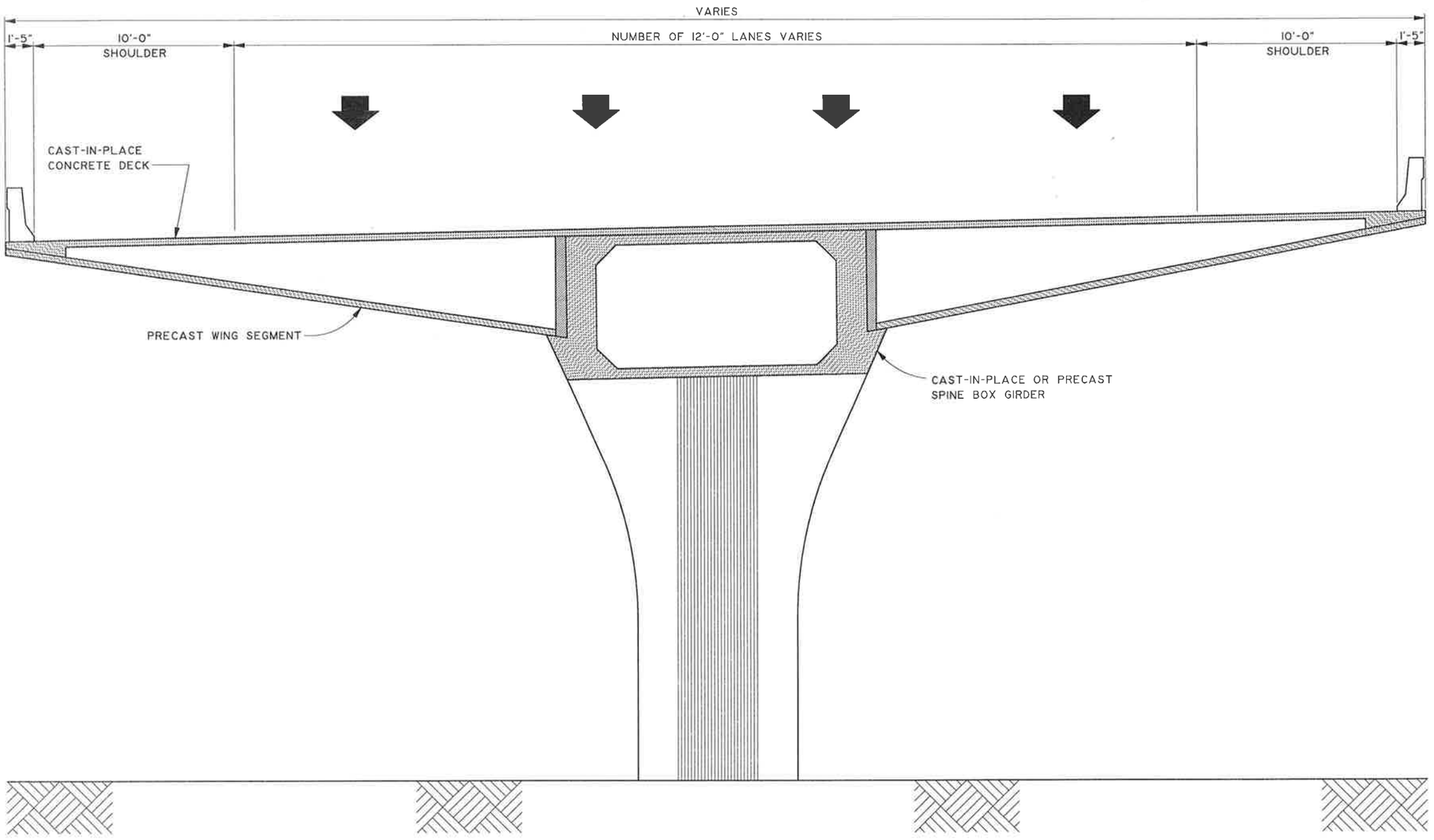
MASTER PLAN CONCEPT

MAINLINE TYPICAL SECTION
CAST-IN-PLACE CONCRETE BOX GIRDERS WITH FLOOR BEAMS

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-3 OF 21



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

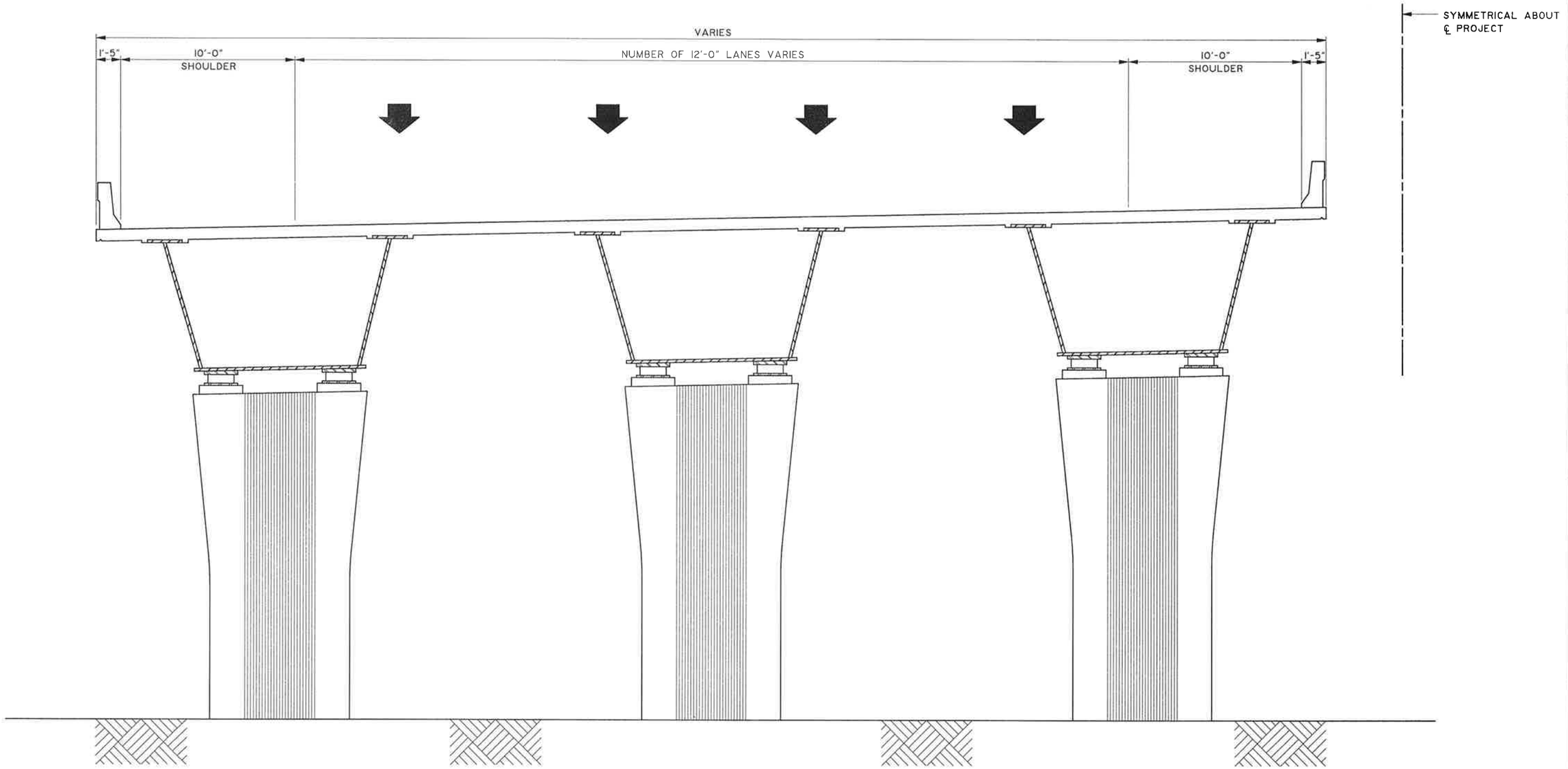
MASTER PLAN CONCEPT

MAINLINE TYPICAL SECTION
PRECAST CONCRETE SPINE WING CONCEPT

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-4 OF 21



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT

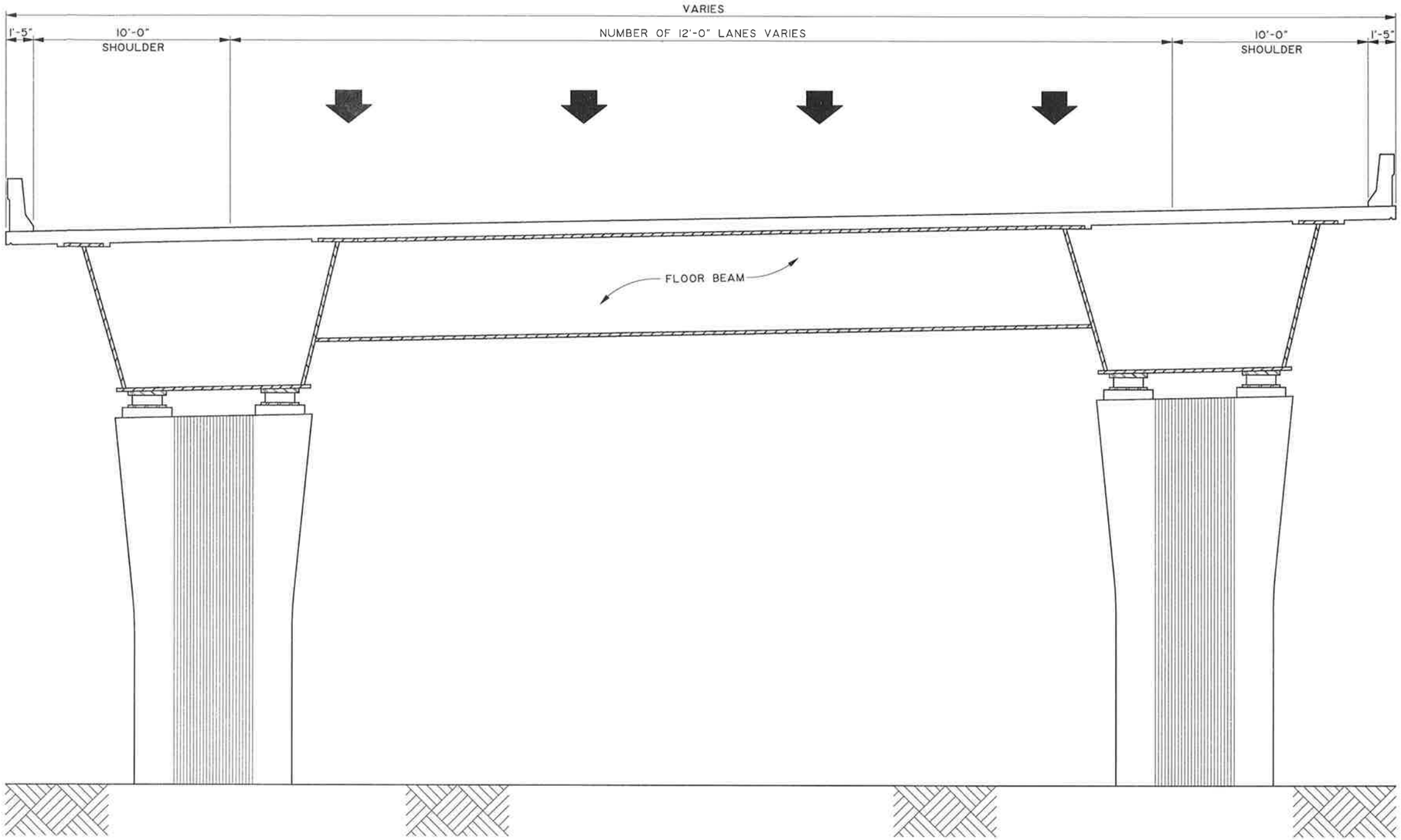
MAINLINE TYPICAL SECTION
STEEL BOX GIRDERS

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402

SHEET I-5 OF 21



SYMMETRICAL ABOUT
℄ PROJECT

PROJECT No. C1104

PROJECT DATES

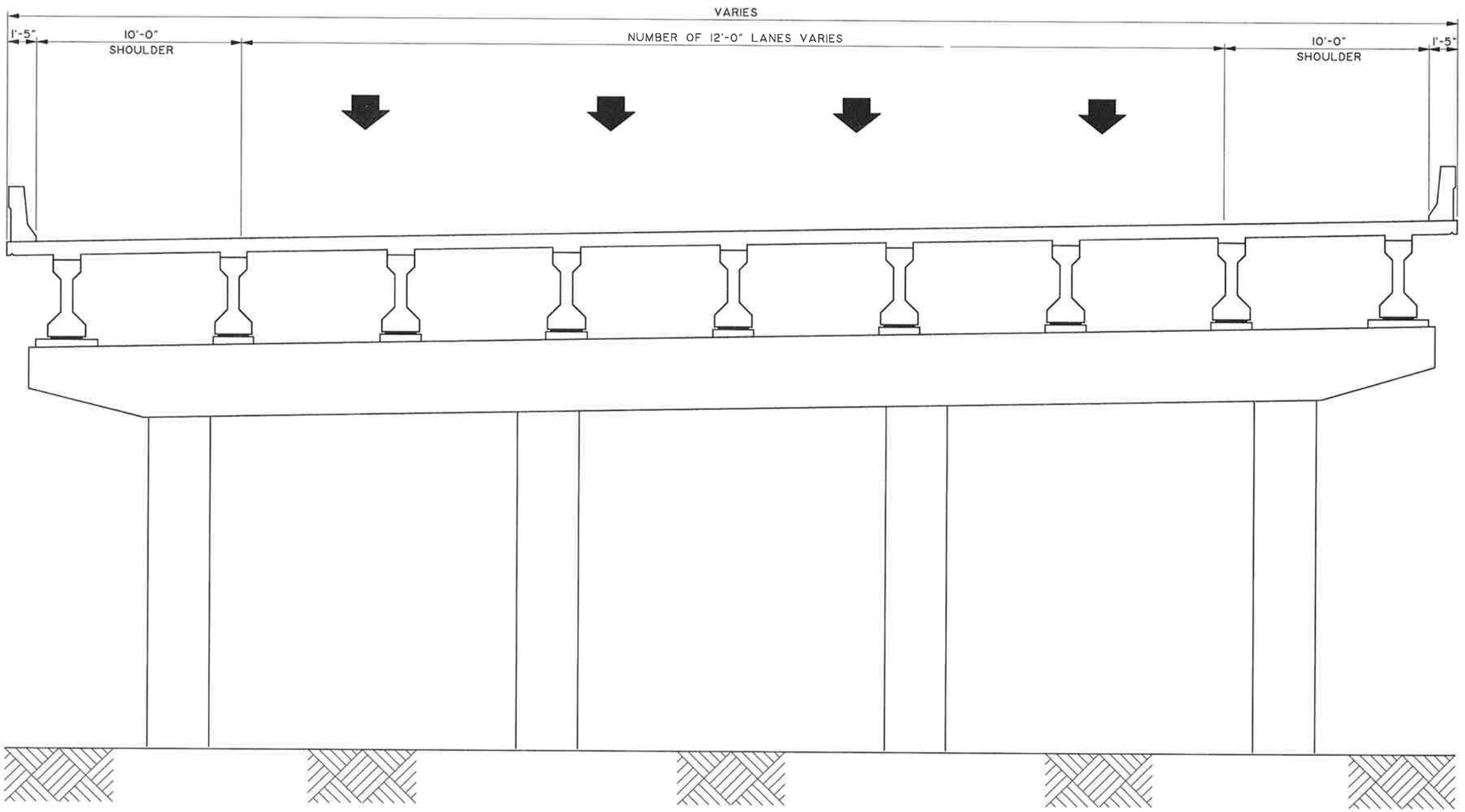
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
MAINLINE TYPICAL SECTION
STEEL BOX GIRDERS WITH FLOOR BEAMS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-6 OF 21



SYMMETRICAL ABOUT
℄ PROJECT

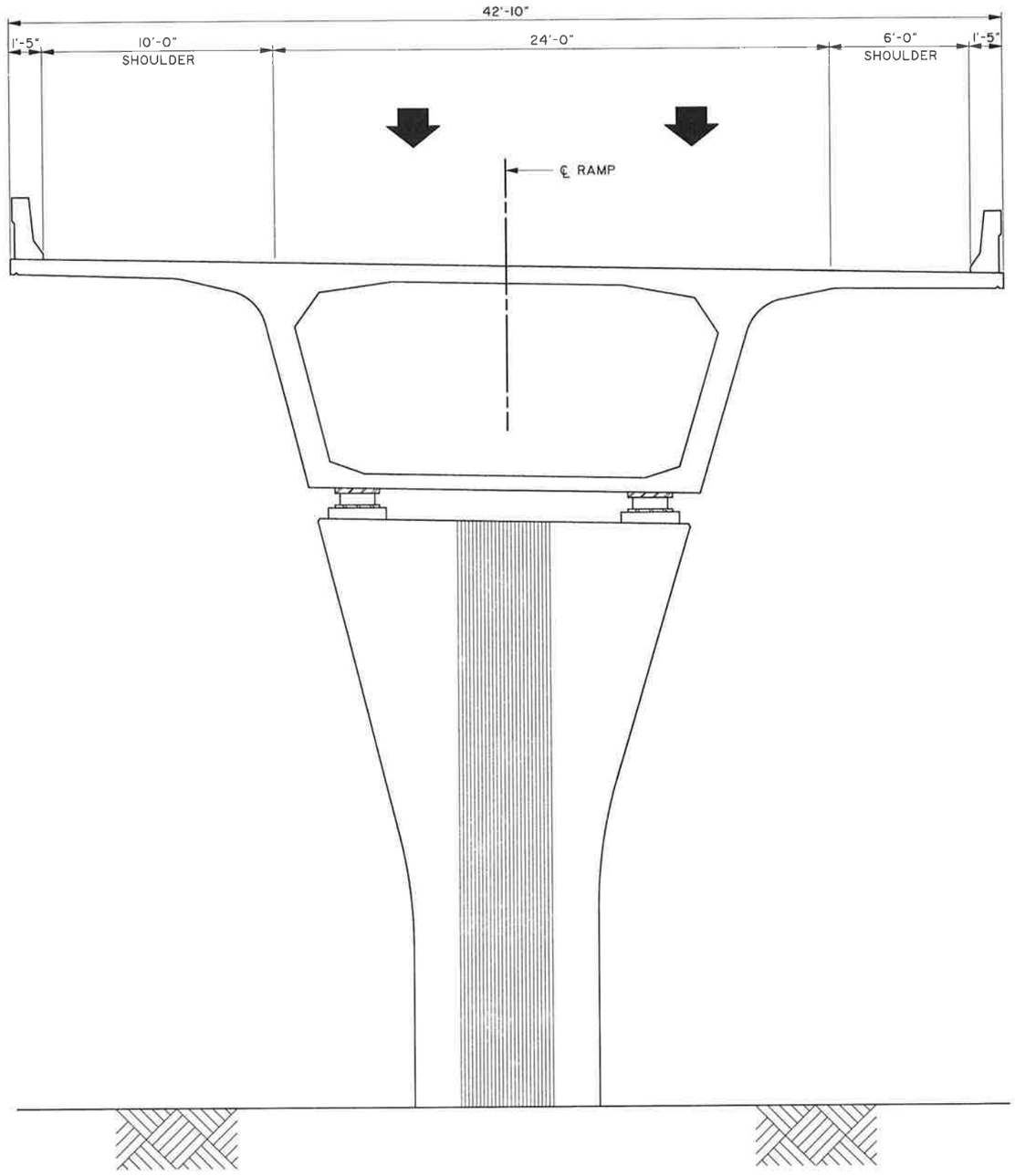
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
MAINLINE TYPICAL SECTION
AASHTO GIRDER GRADE SEPARATION

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-7 OF 21



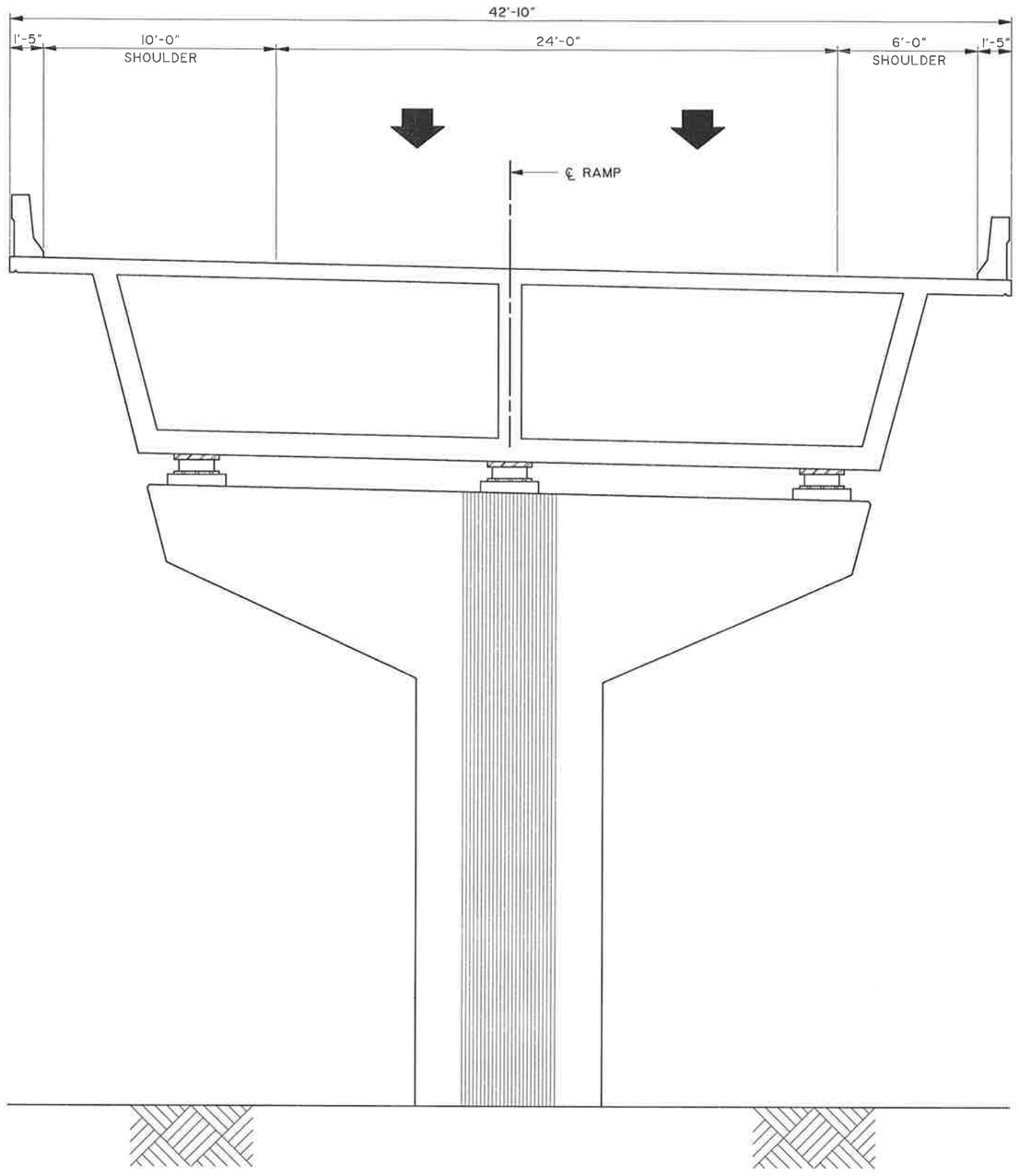
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
RAMP TYPICAL SECTION
PRECAST SEGMENTAL CONCRETE BOX GIRDER

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-8 OF 21



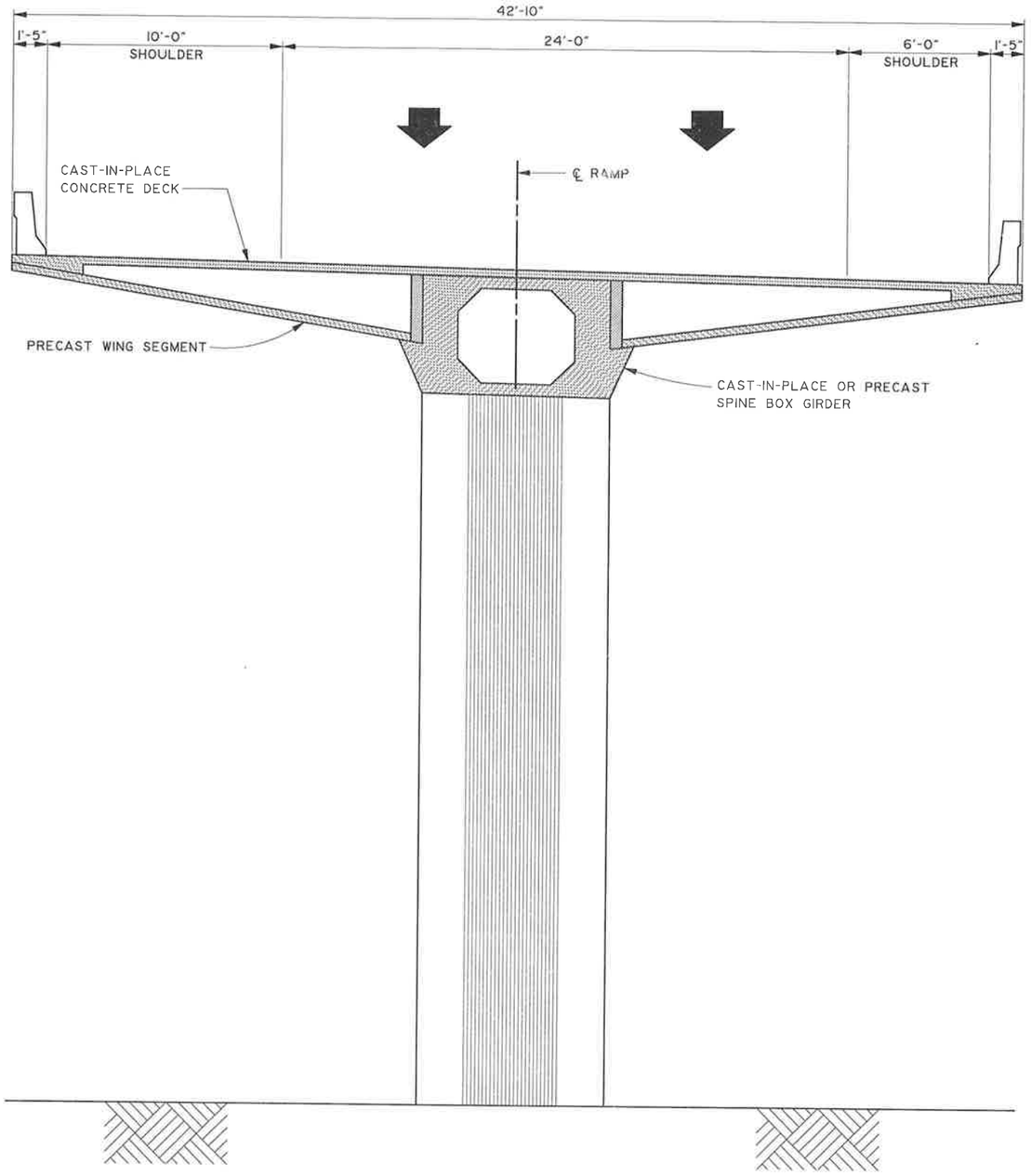
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
RAMP TYPICAL SECTION
CAST-IN-PLACE CONCRETE BOX GIRDER

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-9 OF 21



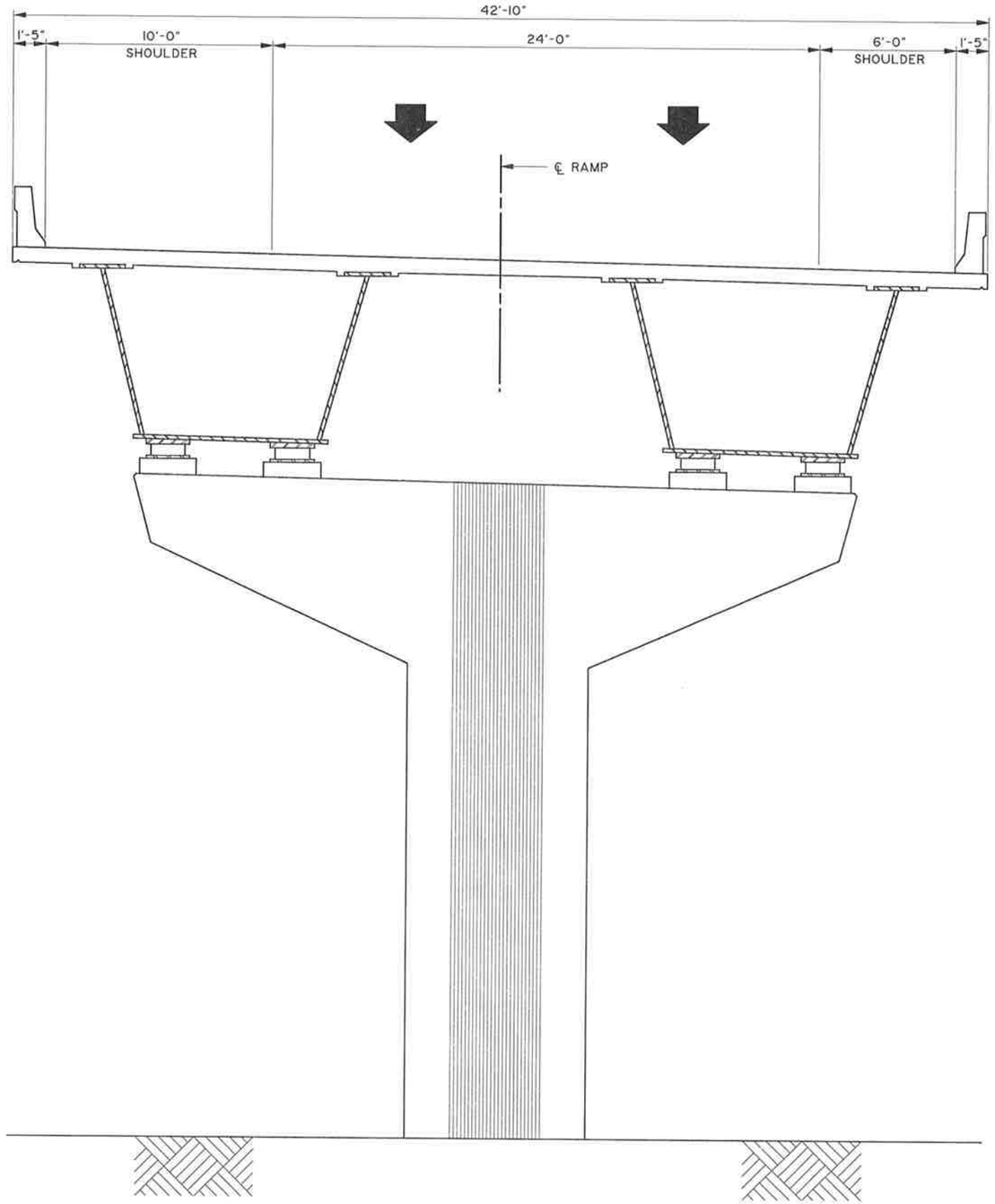
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
RAMP TYPICAL SECTION
PRECAST CONCRETE SPINE WING CONCEPT

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-10 OF 21



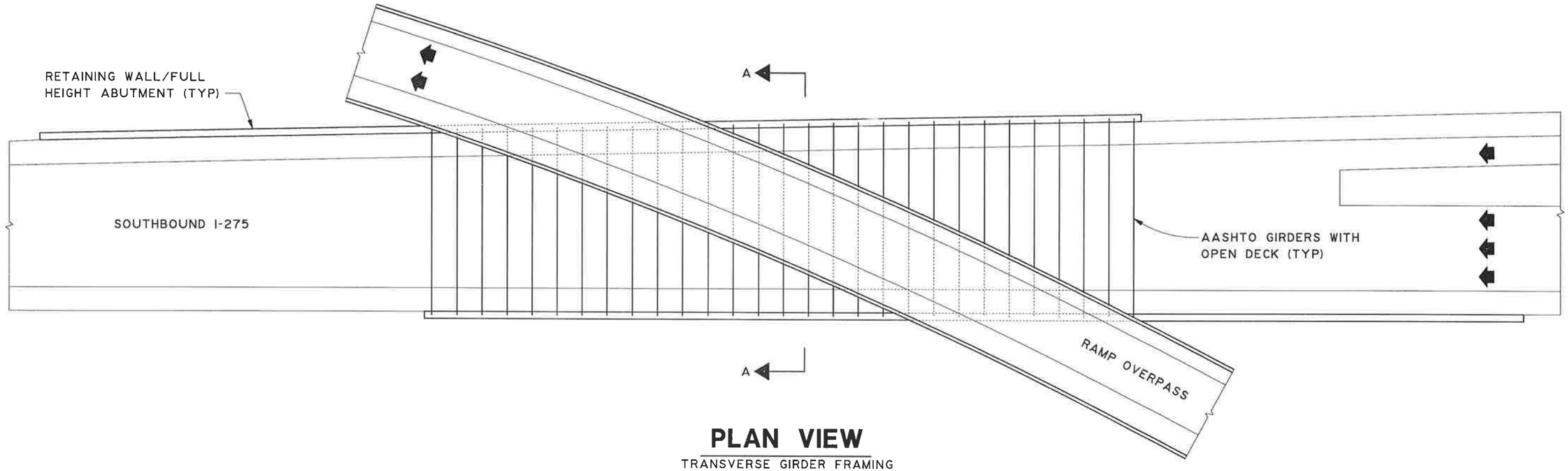
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
RAMP TYPICAL SECTION
STEEL BOX GIRDER

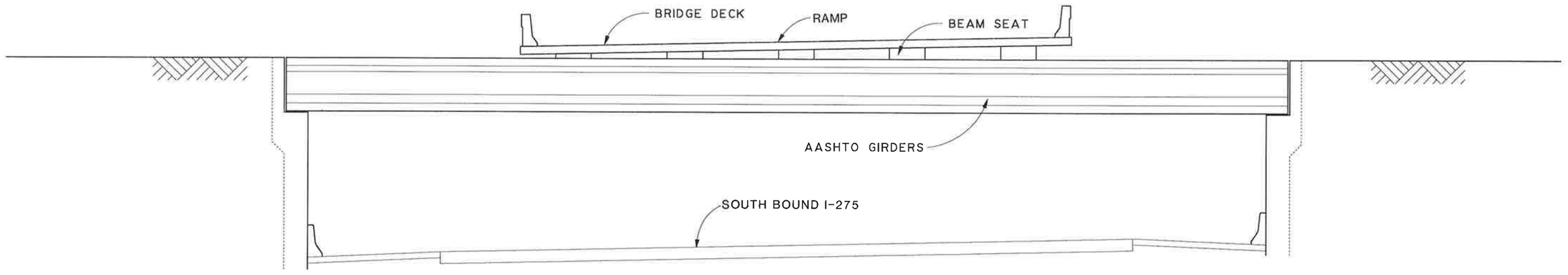
TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-11 OF 21



PLAN VIEW

TRANSVERSE GIRDER FRAMING



SECTION A-A

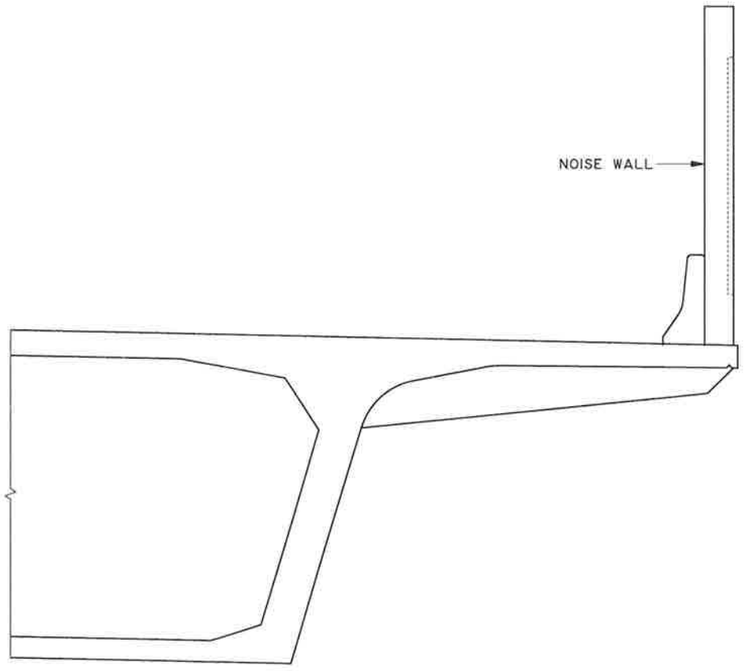
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

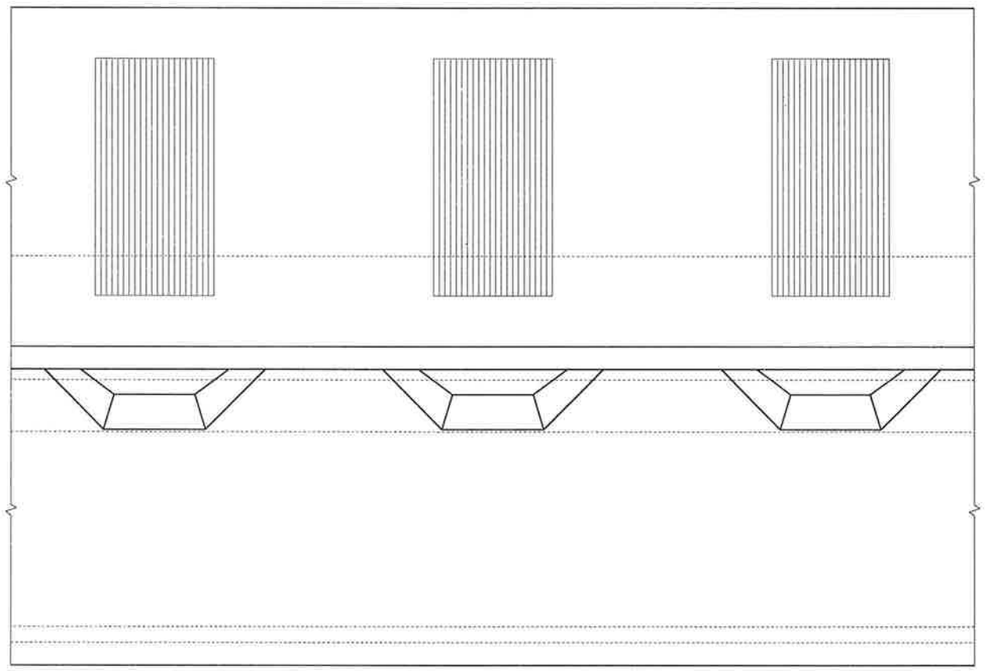
MASTER PLAN CONCEPT
RAMP PLAN AND TYPICAL SECTION
OPEN TRANSVERSE GIRDER FRAMING CONCEPT

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-12 OF 21



SECTION



ELEVATION

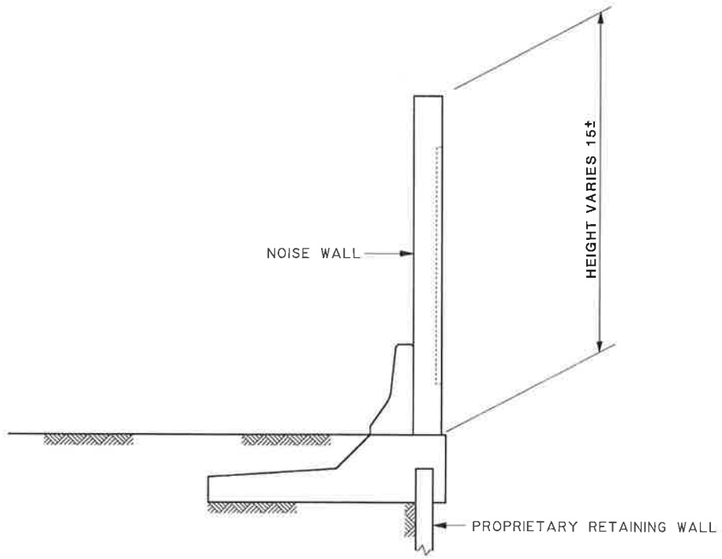
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
NOISE WALL ATTACHMENT TO BRIDGE STRUCTURE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-13 OF 21



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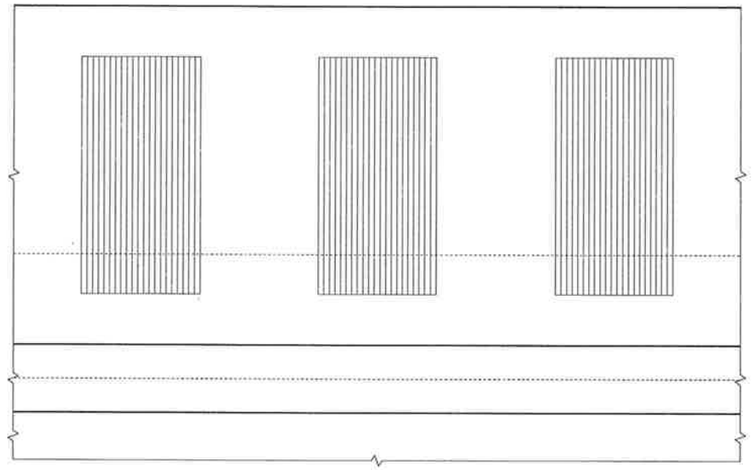


ELEVATION

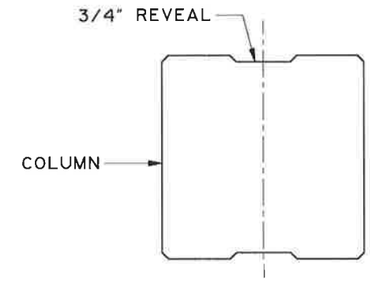
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

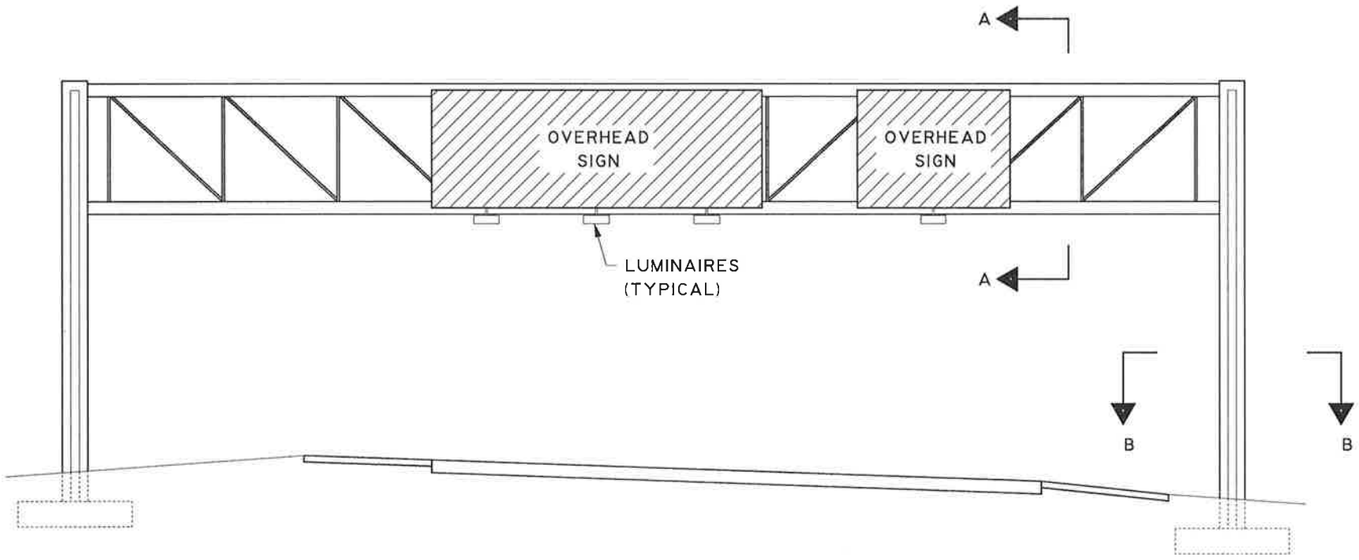
MASTER PLAN CONCEPT
NOISE WALL ATTACHMENT
TO RETAINING WALLS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

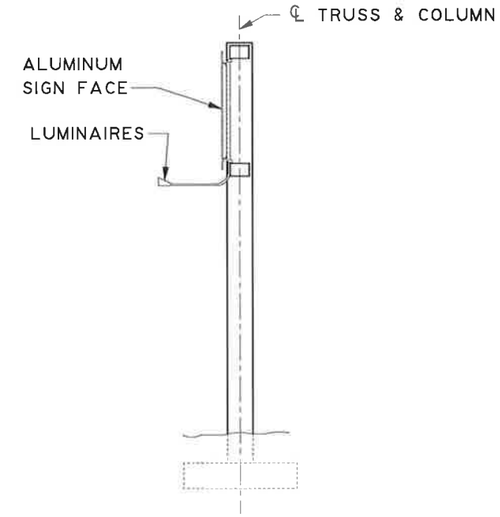
STATE PROJECT No. 99007-1402 | SHEET I-14 OF 21



SECTION B-B



FRONT ELEVATION



SECTION A-A

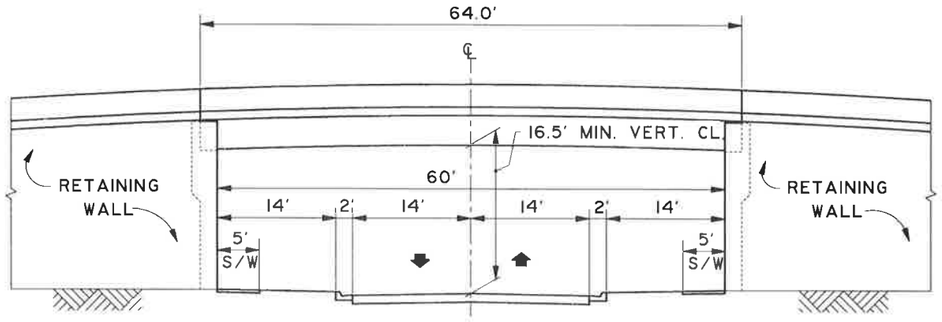
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

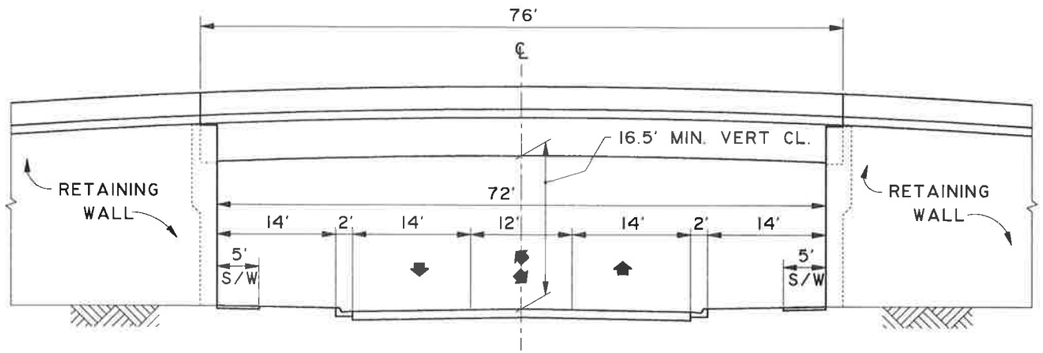
MASTER PLAN CONCEPT
SIGN SUPPORT STRUCTURE

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

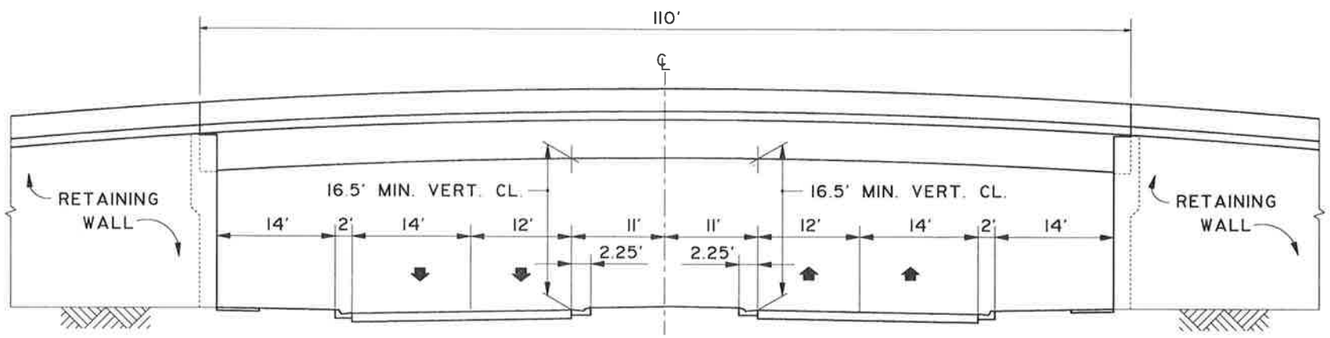
STATE PROJECT No. 99007-1402 | SHEET I-15 OF 21



TWO LANE



THREE LANE



FOUR LANE (DIVIDED)

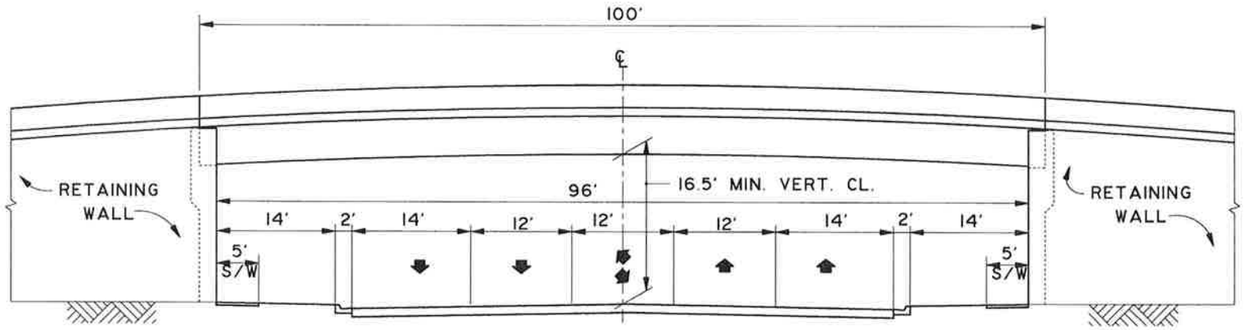
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

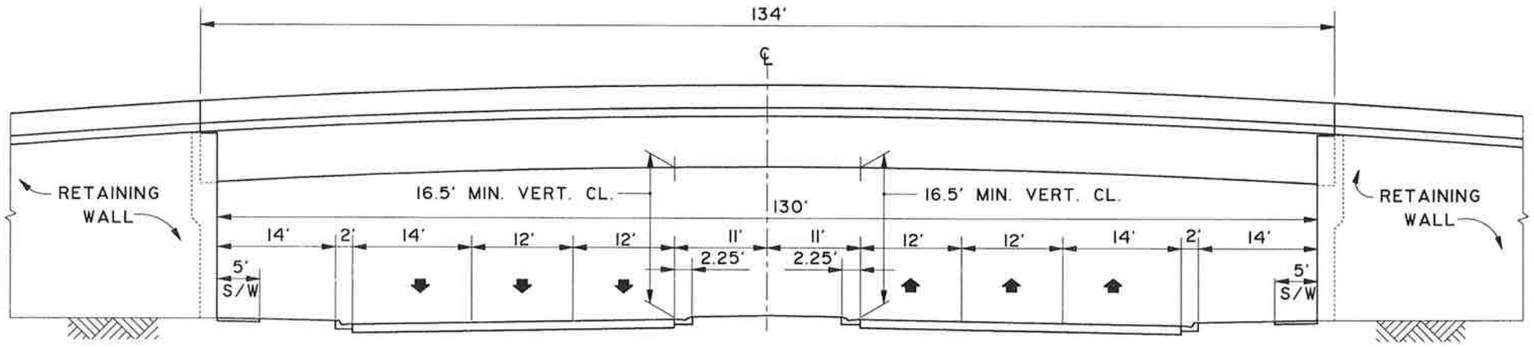
MASTER PLAN CONCEPT
TYPICAL URBAN OVERPASS SECTIONS FOR 2, 3 AND 4 LANE NEW CONSTRUCTION

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-16 OF 21



FIVE LANE



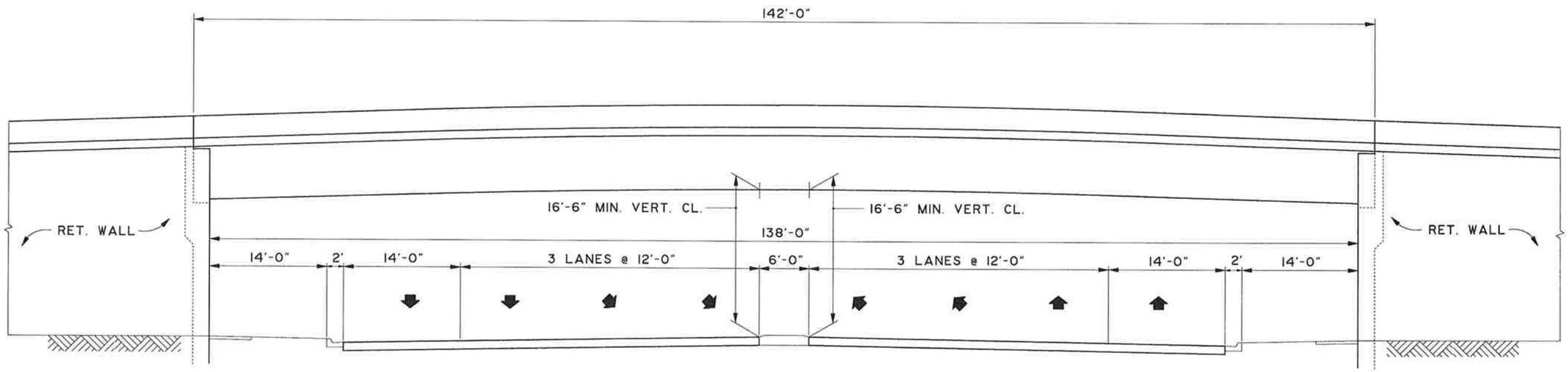
SIX LANE (DIVIDED)

PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL URBAN OVERPASS SECTIONS FOR 5 AND 6 LANE NEW CONSTRUCTION

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET I-17 OF 21



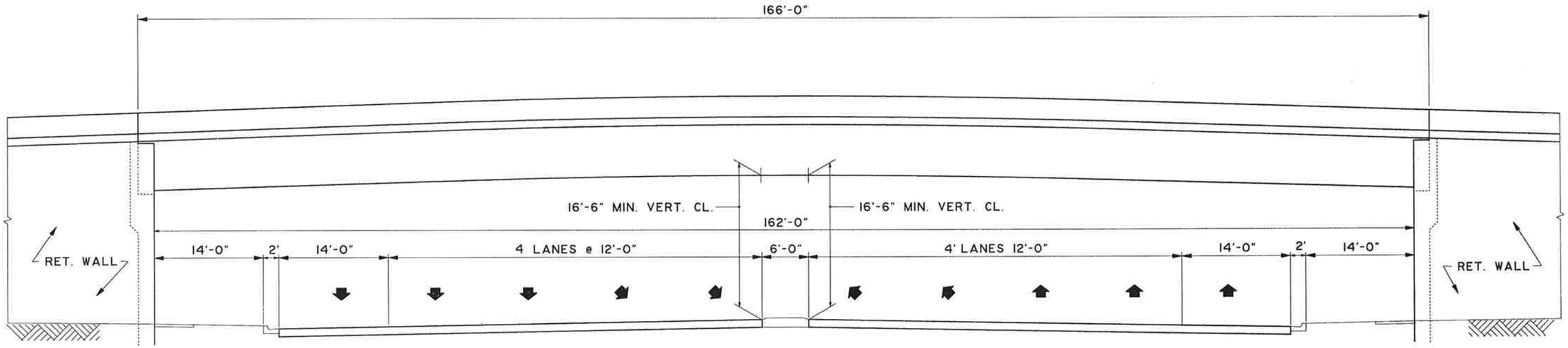
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL INTERCHANGE STRUCTURE
WITH 4 LANE CROSS STREET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-18 OF 21



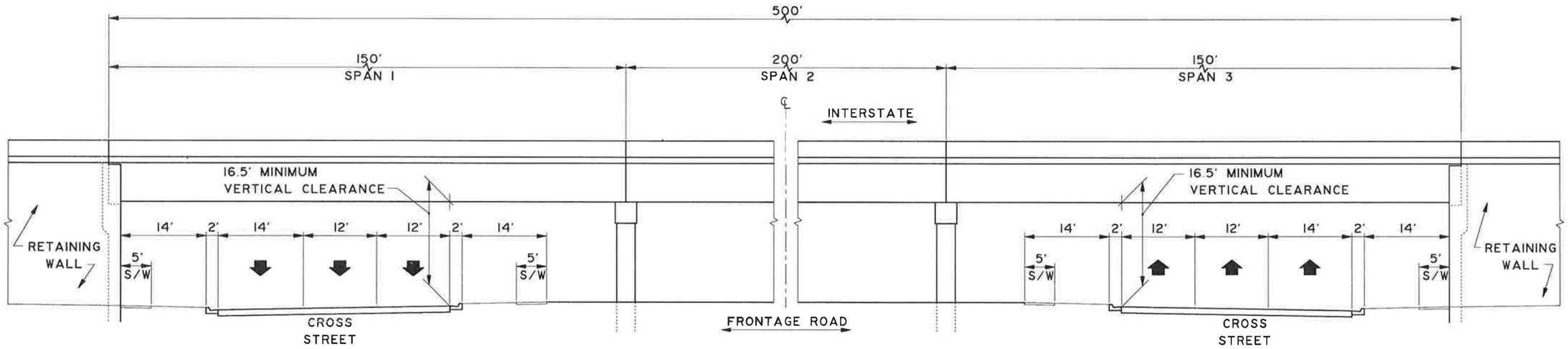
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL INTERCHANGE STRUCTURE
WITH 6 LANE CROSS STREET

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-19 OF 21



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

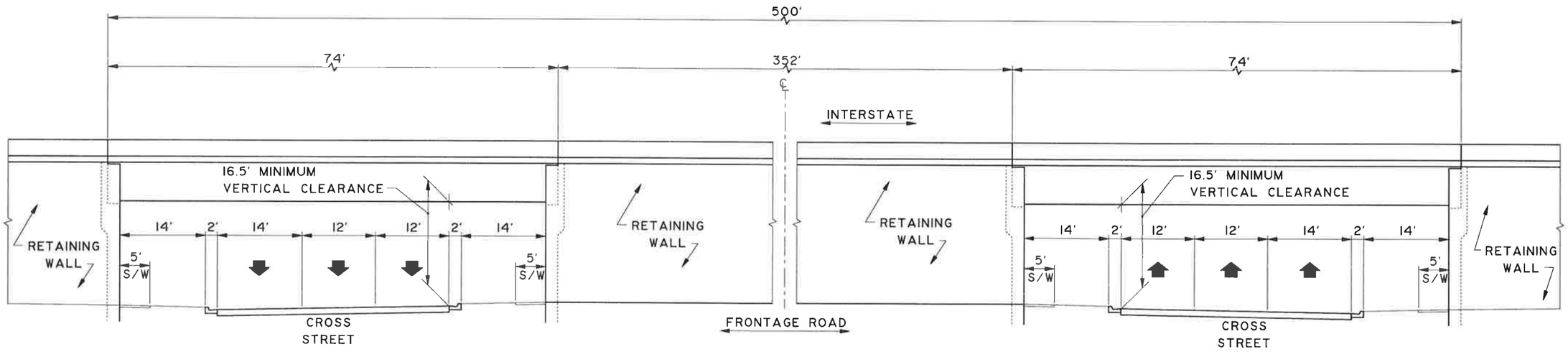
MASTER PLAN CONCEPT

TYPICAL COLUMN SUPPORTED
INTERCHANGE STRUCTURE OVER
ONE-WAY PAIRED CROSS STREETS

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-20 OF 21



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
3-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
TYPICAL RETAINED EARTH
INTERCHANGE STRUCTURE OVER
ONE-WAY PAIRED CROSS STREETS

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET I-21 OF 21

SOILS, GEOTECHNICAL AND PAVEMENT

SECTION J

PREPARED FOR
FLORIDA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PREPARED BY
THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

SOILS, GEOTECHNICAL AND PAVEMENT

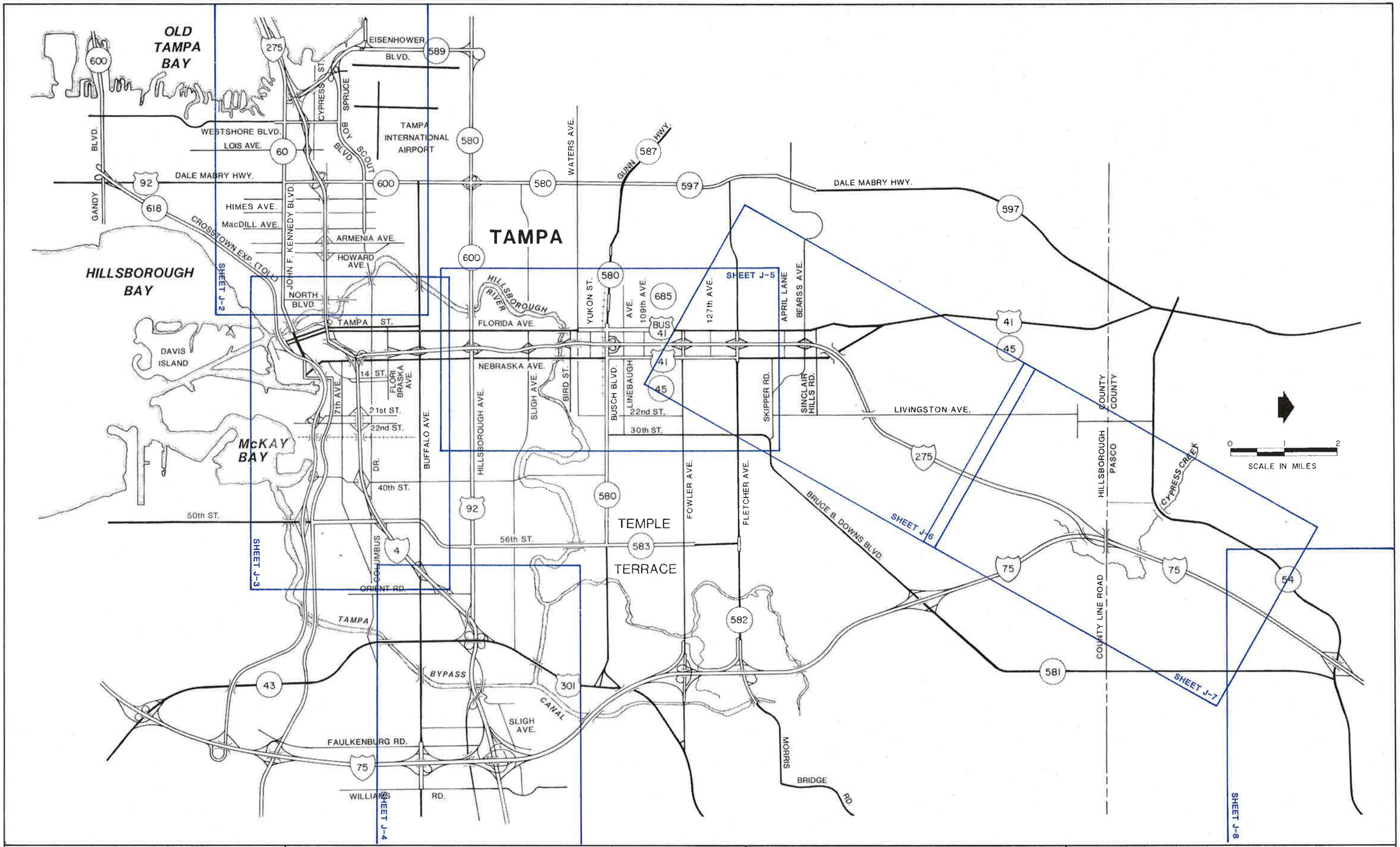
SECTION J



HILLSBOROUGH AND PASCO COUNTIES, FLORIDA
STATE PROJECT NUMBER 99007-1402

SECTION J SOILS, GEOTECHNICAL AND PAVEMENT

SHEET NO.	SHEET DESCRIPTION
	SECTION J DIVIDER SHEET
	SECTON J INDEX SHEET
J-1	PAVEMENT CONDITION SURVEY - KEY MAP
J-2	PAVEMENT CONDITION SURVEY DESIGN SEGMENTS 1A AND 2A
J-3	PAVEMENT CONDITION SURVEY DESIGN SEGMENTS 2B, 3A, 3B, 4A AND 5A
J-4	PAVEMENT CONDITION SURVEY DESIGN SEGMENTS 4A, 4B AND 4C
J-5	PAVEMENT CONDITION SURVEY DESIGN SEGMENTS 5A, 5B, 5C, 5D, 5E AND 5F
J-6	PAVEMENT CONDITION SURVEY DESIGN SEGMENTS 5F, 5G AND 6A
J-7	PAVEMENT CONDITION SURVEY DESIGN SEGMENTS 6A AND 6B
J-8	PAVEMENT CONDITION SURVEY DESIGN SEGMENT 6B
J-9	SOIL SURVEY LEGEND AND NOTES
J-10	SOIL SURVEY KEY MAP
J-11	SOIL SURVEY DESIGN SEGMENTS 1A AND 2A
J-12	SOIL SURVEY DESIGN SEGMENTS 2B, 3A, 3B, 5S AND 5A
J-13	SOIL SURVEY DESIGN SEGMENTS 4A, 4B AND 4C
J-14	SOIL SURVEY DESIGN SEGMENTS 5A, 5B, 5C, 5D, 5E AND 5F
J-15	SOIL SURVEY DESIGN SEGMENTS 5F, 5G AND 6A
J-16	SOIL SURVEY DESIGN SEGMENTS 6A AND 6B
J-17	SOIL SURVEY DESIGN SEGMENT 6B



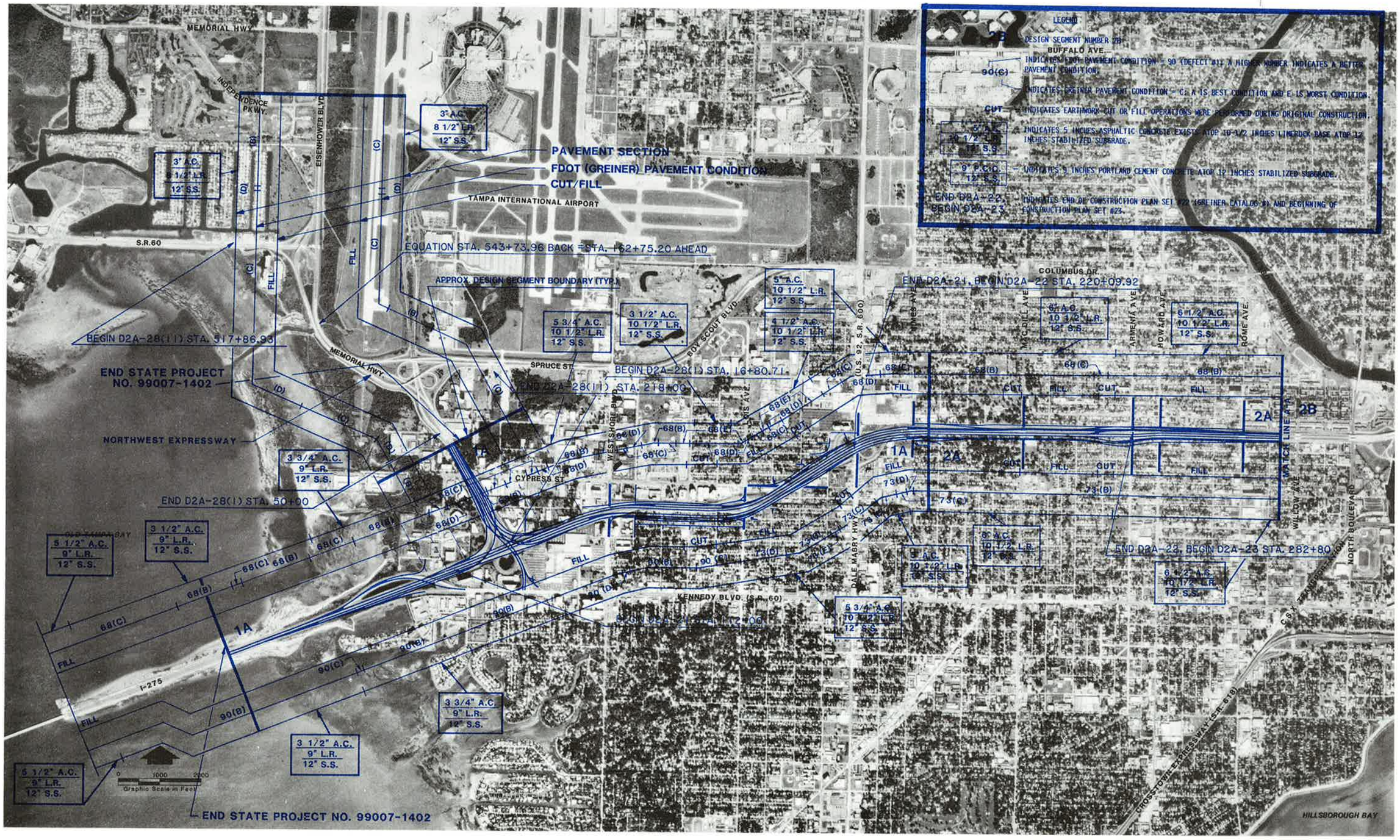
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
SEPT. 1988	PAVEMENT CONDITION SURVEY
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PAVEMENT CONDITION SURVEY
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-1 OF 17



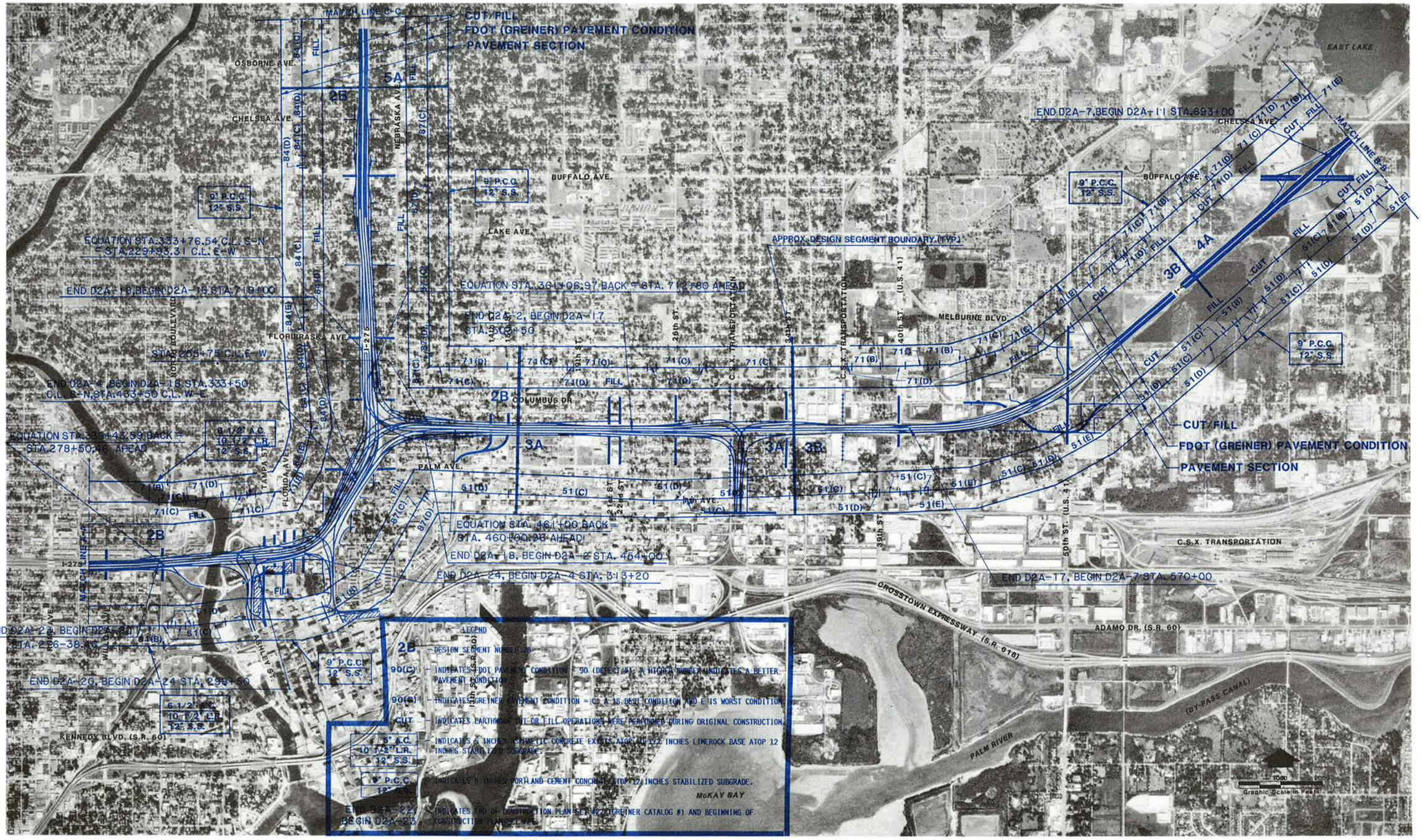
PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
SEPT. 88	PAVEMENT CONDITION SURVEY
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PAVEMENT CONDITION SURVEY
DESIGN STUDY SEGMENTS 1A AND 2A

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-2 OF 17

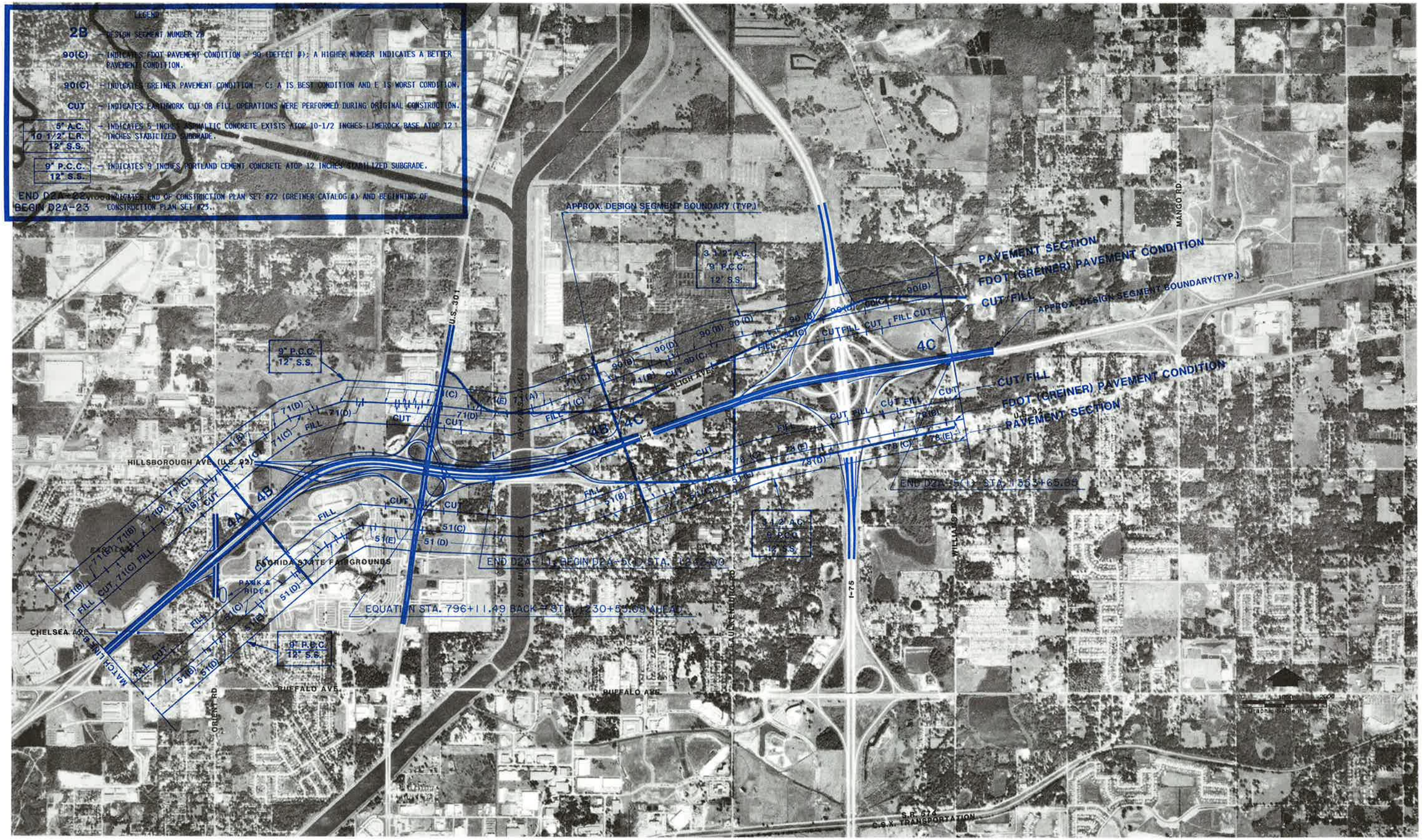


PROJECT No. C1104			
PROJECT DATES			
DATES	DESCRIPTION		
SEPT. 88	PAVEMENT CONDITION SURVEY		
1-26-89	DRAFT MASTER PLAN CONCEPT		
6-89	FINAL MASTER PLAN CONCEPT		

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PAVEMENT CONDITION SURVEY
DESIGN STUDY SEGMENTS 2B,3A,3B,4A AND 5A

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET J-3 OF 17

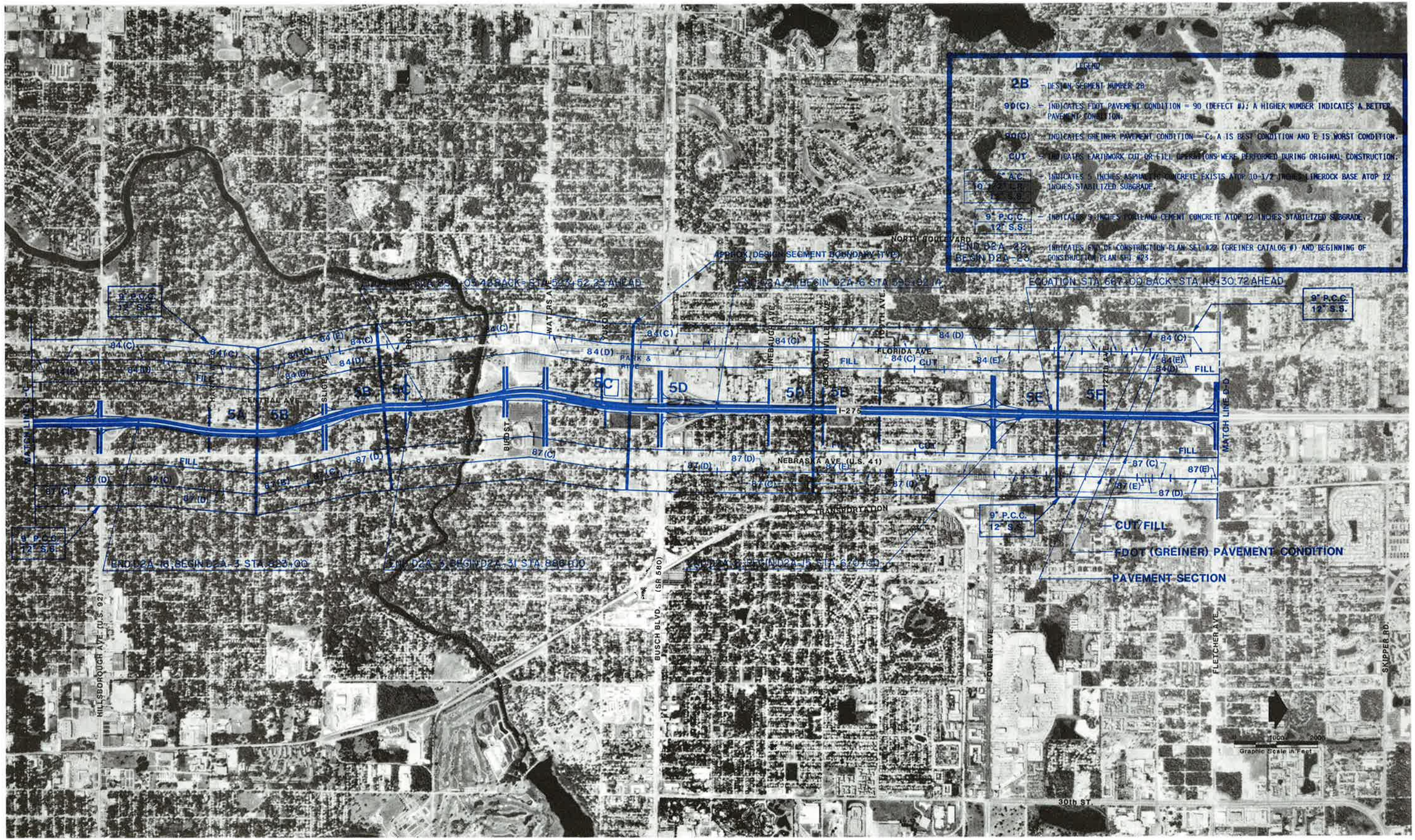


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
SEPT. 88	PAVEMENT CONDITION SURVEY
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PAVEMENT CONDITION SURVEY
DESIGN STUDY SEGMENTS 4A,4B AND 4C

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402
SHEET J-4 OF 17



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
SEPT. 88	PAVEMENT CONDITION SURVEY
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

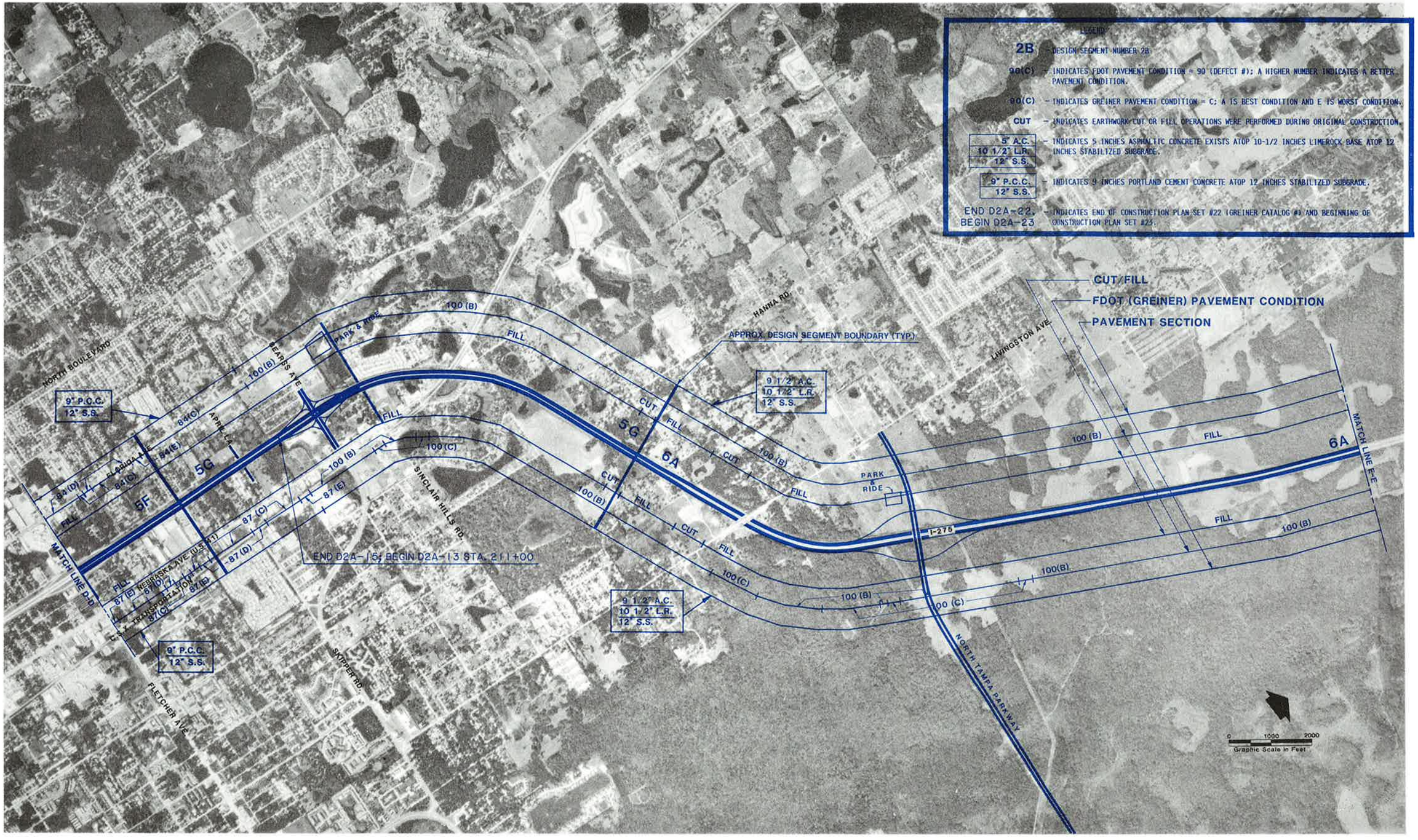
MASTER PLAN CONCEPT

PAVEMENT CONDITION SURVEY
DESIGN STUDY SEGMENTS 5A,5B,5C,5D,5E AND 5F

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-5 OF 17

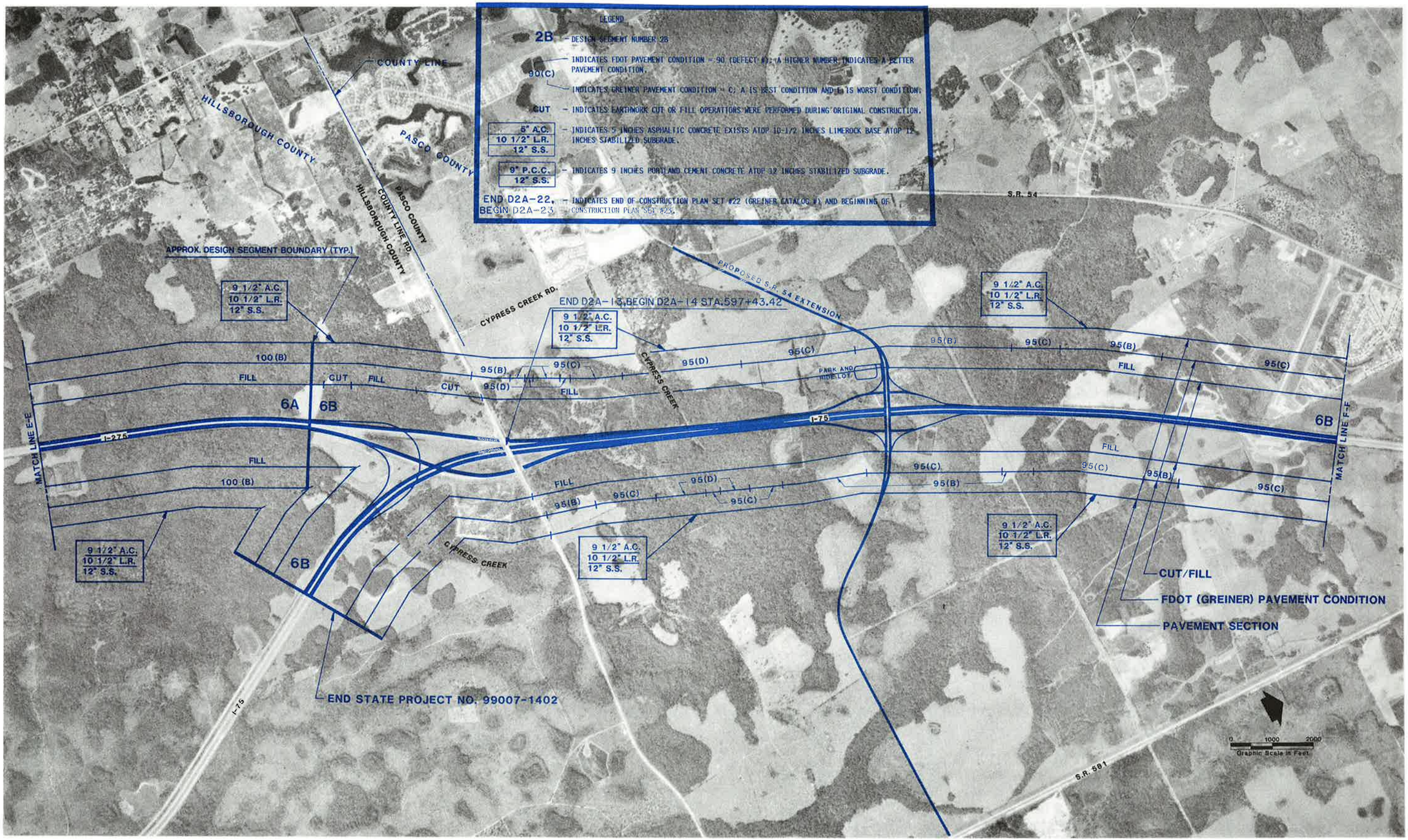


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
SEPT. 88	PAVEMENT CONDITION SURVEY
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PAVEMENT CONDITION SURVEY
DESIGN STUDY SEGMENTS 5F,5G AND 6A

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET J-6 OF 17

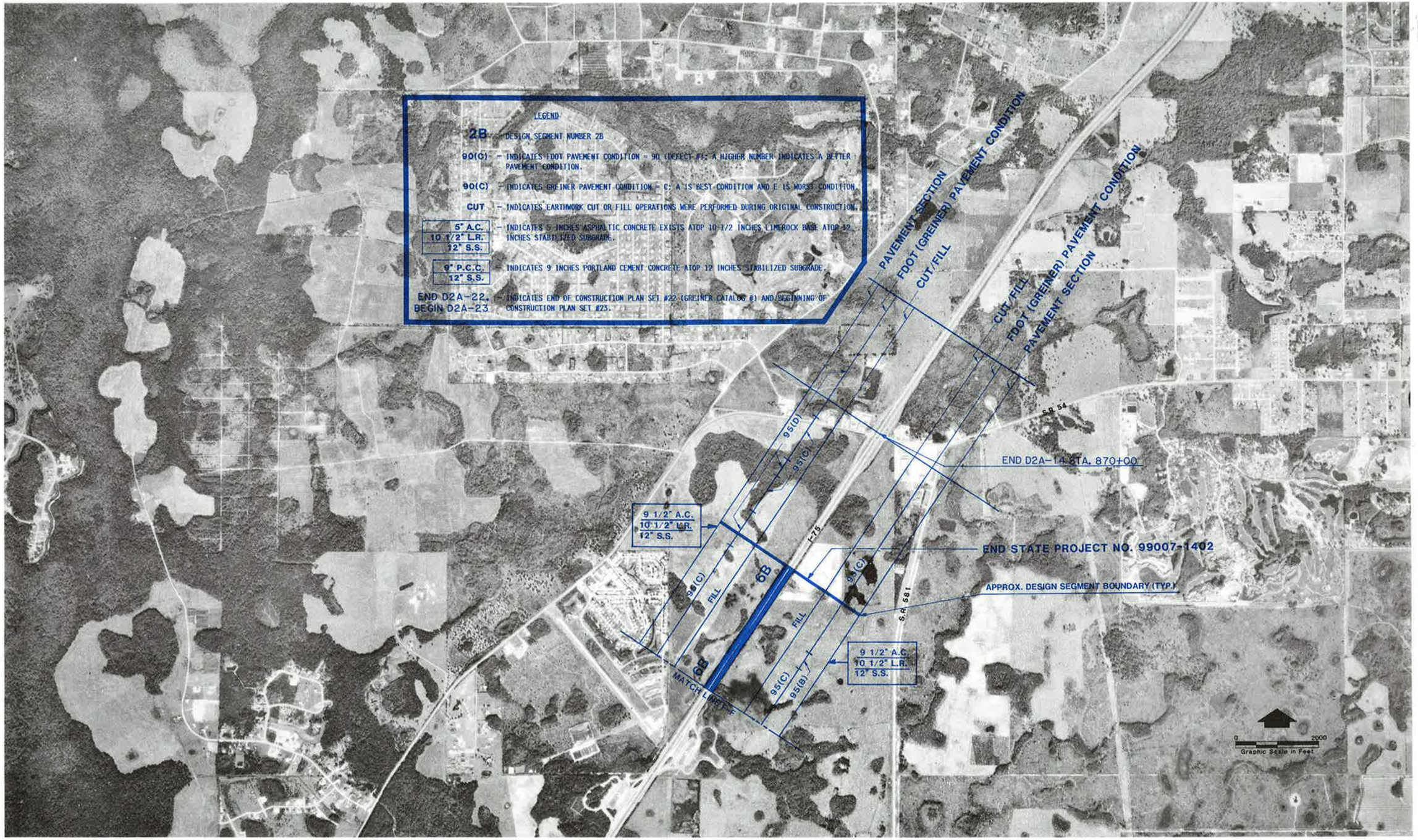


PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
SEPT. 88	PAVEMENT CONDITION SURVEY
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PAVEMENT CONDITION SURVEY
DESIGN STUDY SEGMENTS 6A AND 6B

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET J-7 OF 17



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
SEPT. 88	PAVEMENT CONDITION SURVEY
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
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TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
PAVEMENT CONDITION SURVEY
DESIGN STUDY SEGMENT 6B

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET J-8 OF 17

NOTES:

1. ALL SOIL SURVEY INFORMATION WAS OBTAINED FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE SOIL SURVEY PUBLICATIONS FOR HILLSBOROUGH COUNTY (1987), AND PASCO COUNTY (1982).

2. ALL D2A ROADWAY PLAN NUMBERS REFER TO THE GREINER, INC., INDEXING AS OF FEBRUARY 15, 1988.

HILLSBOROUGH COUNTY
SOIL SURVEY LEGEND

SOIL SYMBOL	MAP UNIT NAME
2	ADAMSVILLE FINE SAND
3	ARCHBOLD FINE SAND
4	ARENTS, NEARLY LEVEL
5	BASSINGER, HOLOPAW AND SAMSULA SOILS, DEPRESSIONAL
6	BROWARD-URBAN LAND COMPLEX
7	CANDLER FINE SAND, 0 TO 5 PERCENT SLOPES
8	CANDLER FINE SAND, 5 TO 12 PERCENT SLOPES
9	CANDLER-URBAN LAND COMPLEX, 0 TO 5 PERCENT SLOPES
10	CHOBEE LOAMY FINE SAND
11	CHOBEE MUCK, DEPRESSIONAL
12	CHOBEE SANDY LOAM, FREQUENTLY FLOODED
13	EATON FINE SAND
14	EATON MUCKY SAND, DEPRESSIONAL
15	FELDA FINE SAND
16	FELDA FINE SAND, OCCASIONALLY FLOODED
17	FLORIDANA FINE SAND
18	FORT MEADE LOAMY FINE SAND, 0 TO 5 PERCENT SLOPES
19	GAINESVILLE LOAMY FINE SAND, 0 TO 5 PERCENT SLOPES
20	GYPSUM LAND
21	IMMOKALEE FINE SAND
22	IMMOKALEE-URBAN LAND COMPLEX
23	KENDRICK FINE SAND, 2 TO 5 PERCENT SLOPES
24	KESSON MUCK, FREQUENTLY FLOODED
25	LAKE FINE SAND, 0 TO 5 PERCENT SLOPES
26	LOCHLOOSA-MICANOPY FINE SANDS, 0 TO 5 PERCENT SLOPES
27	MALABAR FINE SAND
28	MILLHOPPER-URBAN LAND COMPLEX, 0 TO 5 PERCENT SLOPES
29	MYAKKA FINE SAND
30	MYAKKA FINE SAND, FREQUENTLY FLOODED
32	MYAKKA-URBAN LAND COMPLEX
33	ONA FINE SAND
34	ONA-URBAN LAND COMPLEX
35	ORLANDO FINE SAND, 0 TO 5 PERCENT SLOPES
36	ORSINO FINE SAND, 0 TO 5 PERCENT SLOPES
37	PAISLEY FINE SAND, DEPRESSIONAL
38	PINELLAS FINE SAND
39	ARENTS, VERY STEEP
41	POMELLO FINE SAND, 0 TO 5 PERCENT SLOPES
42	POMELLO-URBAN LAND COMPLEX
43	QUARTZIPSAMMENTS, NEARLY LEVEL
44	ST. AUGUSTINE FINE SAND
45	ST. AUGUSTINE-URBAN LAND COMPLEX
46	ST. JOHNS FINE SAND
47	SEFFNER FINE SAND
50	SLICKENS
51	HAPLAQUENTS, CLAYEY
52	SMYRNA FINE SAND
53	TAVARES-MILLHOPPER FINE SANDS, 0 TO 5 PERCENT SLOPES
54	TAVARES-MILLHOPPER FINE SANDS, 5 TO 8 PERCENT SLOPES
55	TAVARES-URBAN LAND COMPLEX, 0 TO 5 PERCENT SLOPES
56	URBAN LAND
57	WABASSO FINE SAND
58	WABASSO-URBAN LAND COMPLEX
59	WINDER FINE SAND
60	WINDER FINE SAND, FREQUENTLY FLOODED
61	ZOLFO FINE SAND

PASCO COUNTY
SOIL SURVEY LEGEND

SOIL SYMBOL	MAP UNIT NAME
1	WAUCHULA FINE SAND, 0 TO 5 PERCENT SLOPES
2	POMONA FINE SAND
3	PINEDA FINE SAND
4	FELDA FINE SAND
5	MYAKKA FINE SAND
6	TAVARES SAND, 0 TO 5 PERCENT SLOPES
7	SPARR FINE SAND, 0 TO 5 PERCENT SLOPES
8	SELLERS MUCKY LOAMY FINE SAND
9	ONA FINE SAND
10	VERO FINE SAND
11	ADAMSVILLE FINE SAND
12	ASTATULA FINE SAND, 0 TO 5 PERCENT SLOPES
13	CANDLER FINE SAND, 0 TO 5 PERCENT SLOPES
14	CANDLER FINE SAND, 5 TO 8 PERCENT SLOPES
15	TAVARES-URBAN LAND COMPLEX, 0 TO 5 PERCENT SLOPES
16	ZEPHYR MUCK
17	IMMOKALEE FINE SAND
18	ELECTRA VARIANT FINE SAND, 0 TO 5 PERCENT SLOPES
19	PAOLA FINE SAND, 0 TO 8 PERCENT SLOPES
20	ARIPEKA FINE SAND
21	SMYRNA FINE SAND
22	BASINGER FINE SAND
23	BASINGER FINE SAND, DEPRESSIONAL
24	QUARTZIPSAMMENTS, SHAPED, 0 TO 5 PERCENT SLOPES
25	JONESVILLE FINE SAND, 0 TO 5 PERCENT SLOPES
26	NARCOOSSEE FINE SAND
27	ANCLOTE FINE SAND
28	PITS
29	LACOOCHEE COMPLEX
30	OKEELANTA-TERRA CEIA ASSOCIATION
31	UDALFIC ARENTS-URBAN LAND COMPLEX
32	LAKE FINE SAND, 0 TO 5 PERCENT SLOPES
34	POMPANO FINE SAND
35	EAUGALLIE FINE SAND
36	CANDLER-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES
37	PAOLA-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES
38	URBAN LAND
39	CHOBEE SOILS, FREQUENTLY FLOODED
40	PAISLEY FINE SAND
41	PITS-DUMPS COMPLEX
42	POMELLO FINE SAND, 0 TO 5 PERCENT SLOPES
43	ARREDONDO FINE SAND, 0 TO 5 PERCENT SLOPES
44	ARREDONDO FINE SAND, 5 TO 8 PERCENT SLOPES
45	KENDRICK FINE SAND, 0 TO 5 PERCENT SLOPES
46	CASSIA FINE SAND, 0 TO 5 PERCENT SLOPES
47	WEEKIWACHEE MUCK
48	LOCHLOOSA FINE SAND, 0 TO 5 PERCENT SLOPES
49	BLICHTON FINE SAND, 0 TO 2 PERCENT SLOPES
50	BLICHTON FINE SAND, 2 TO 5 PERCENT SLOPES
51	BLICHTON FINE SAND, 5 TO 8 PERCENT SLOPES
52	SAMSULA MUCK
53	SPARR FINE SAND, 5 TO 8 PERCENT SLOPES
54	FLEMINGTON VARIANT FINE SAND, 2 TO 5 PERCENT SLOPES
55	HOMOSASSA MUCKY FINE SANDY LOAM
56	EAUGALLIE-URBAN LAND COMPLEX
57	VERO VARIANT FINE SAND
58	TOMOKA MUCK
59	NEWNAN FINE SAND, 0 TO 5 PERCENT SLOPES
60	PALMETTO-ZEPHYR-SELLERS COMPLEX
61	POMPANO FINE SAND, FREQUENTLY FLOODED
62	KENDRICK FINE SAND, 5 TO 8 PERCENT SLOPES
63	DELRAY MUCKY FINE SAND
64	NOBLETON FINE SAND, 0 TO 5 PERCENT SLOPES
65	GAINESVILLE LOAMY FINE SAND, 0 TO 5 PERCENT SLOPES
66	MICANOPY FINE SAND, 2 TO 5 PERCENT SLOPES
67	KANAPAHA FINE SAND, 0 TO 5 PERCENT SLOPES
68	LAKE FINE SAND, 5 TO 8 PERCENT SLOPES
69	MILLHOPPER FINE SAND, 0 TO 5 PERCENT SLOPES
70	PLACID FINE SAND
71	ANCLOTE-TAVARES-POMELLO ASSOCIATION, FLOODED
72	ORLANDO FINE SAND, 0 TO 5 PERCENT SLOPES
73	ZOLFO FINE SAND
74	CANDLER VARIANT FINE SAND, 0 TO 5 PERCENT SLOPES
75	BEACHES
76	BESSIE MUCK

PROJECT No. C1104

PROJECT DATES

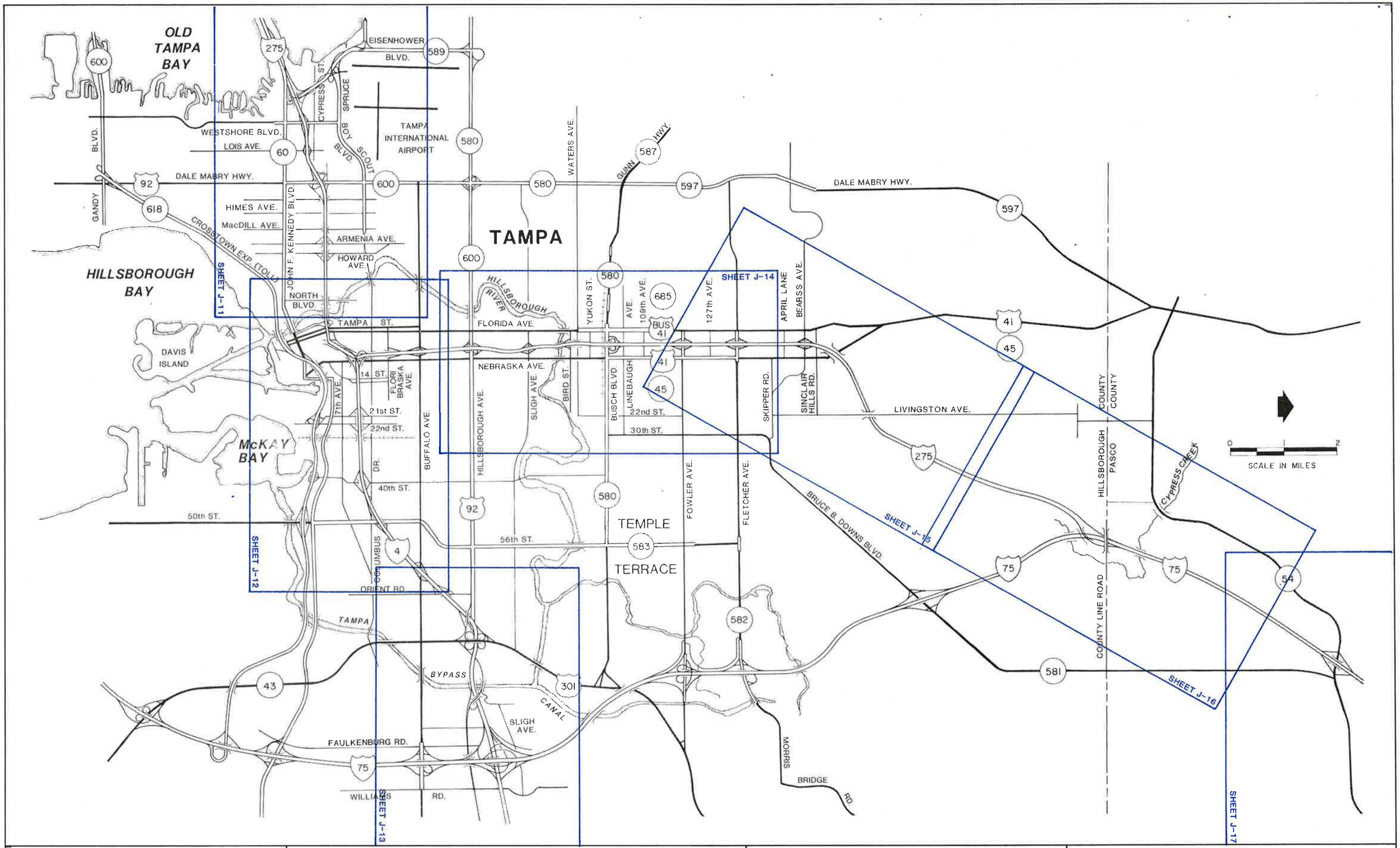
DATES	DESCRIPTION
FEB. 1988	SOIL SURVEY
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
SOIL SURVEY
LEGEND AND NOTES

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402



PROJECT No. C1104	
PROJECT DATES	
DATES	DESCRIPTION
FEB. 1988	SOIL SURVEY
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6-89	FINAL MASTER PLAN CONCEPT

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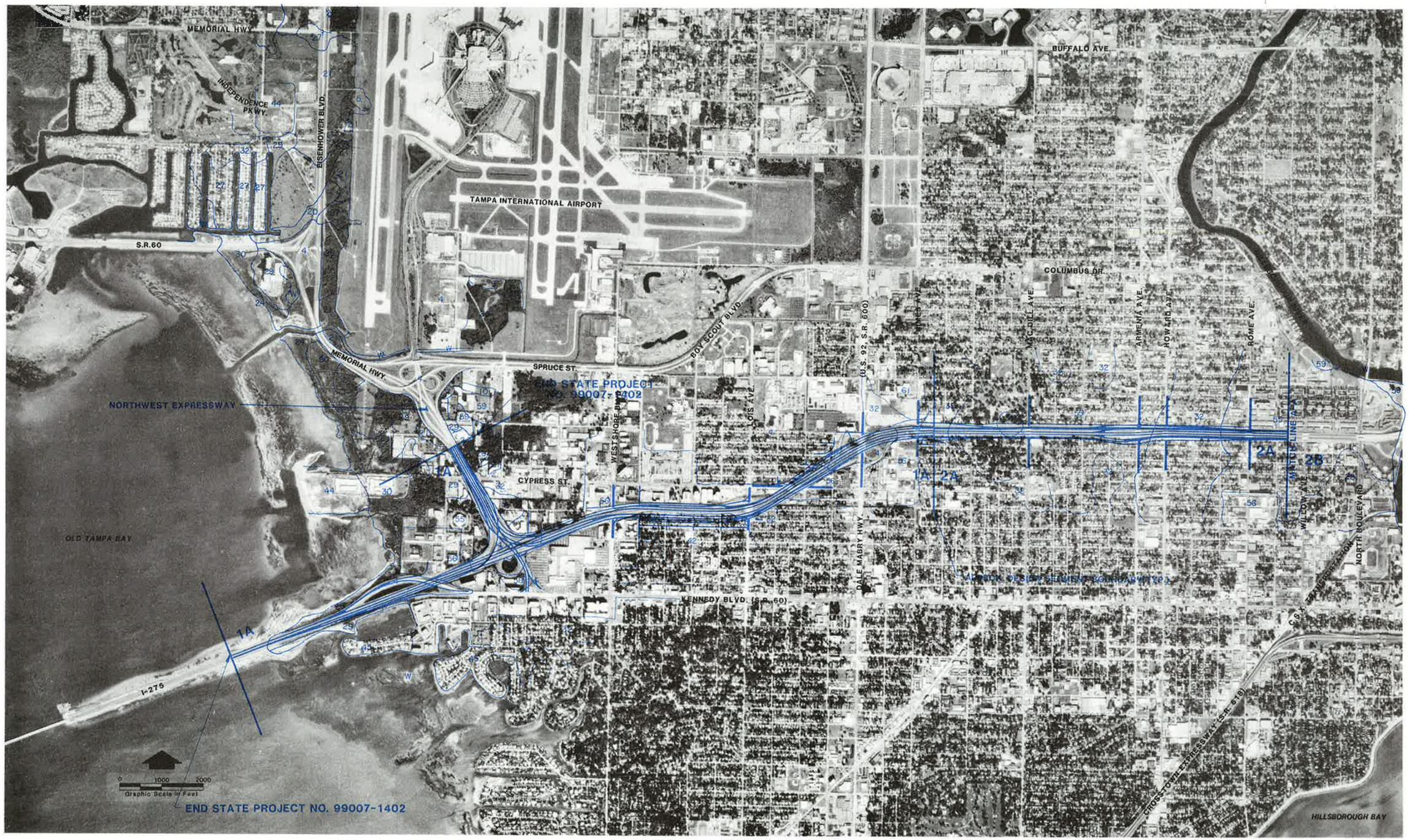
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
SOIL SURVEY
KEY MAP

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJECT No. 99007-1402 | SHEET J-10 OF 17



PROJECT No. C1104

PROJECT DATES

DATES	DESCRIPTION
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1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

THE GREINER TEAM

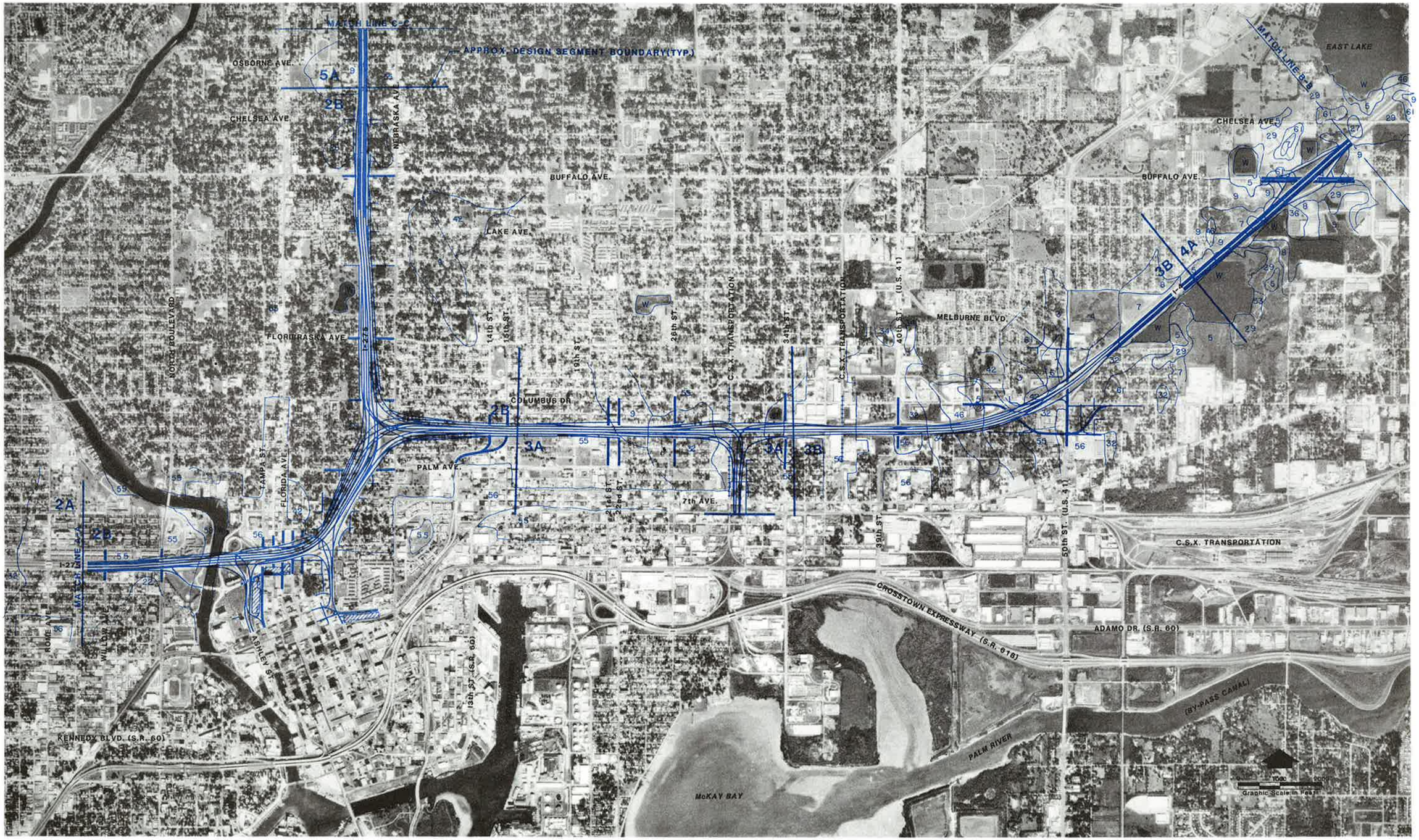
GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
SOIL SURVEY
DESIGN STUDY SEGMENTS 1A AND 2A

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-11 OF 17



PROJECT No. C1104			
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1-26-89	SOIL SURVEY		
1-26-89	DRAFT MASTER PLAN CONCEPT		
6-89	FINAL MASTER PLAN CONCEPT		

THE GREINER TEAM

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TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

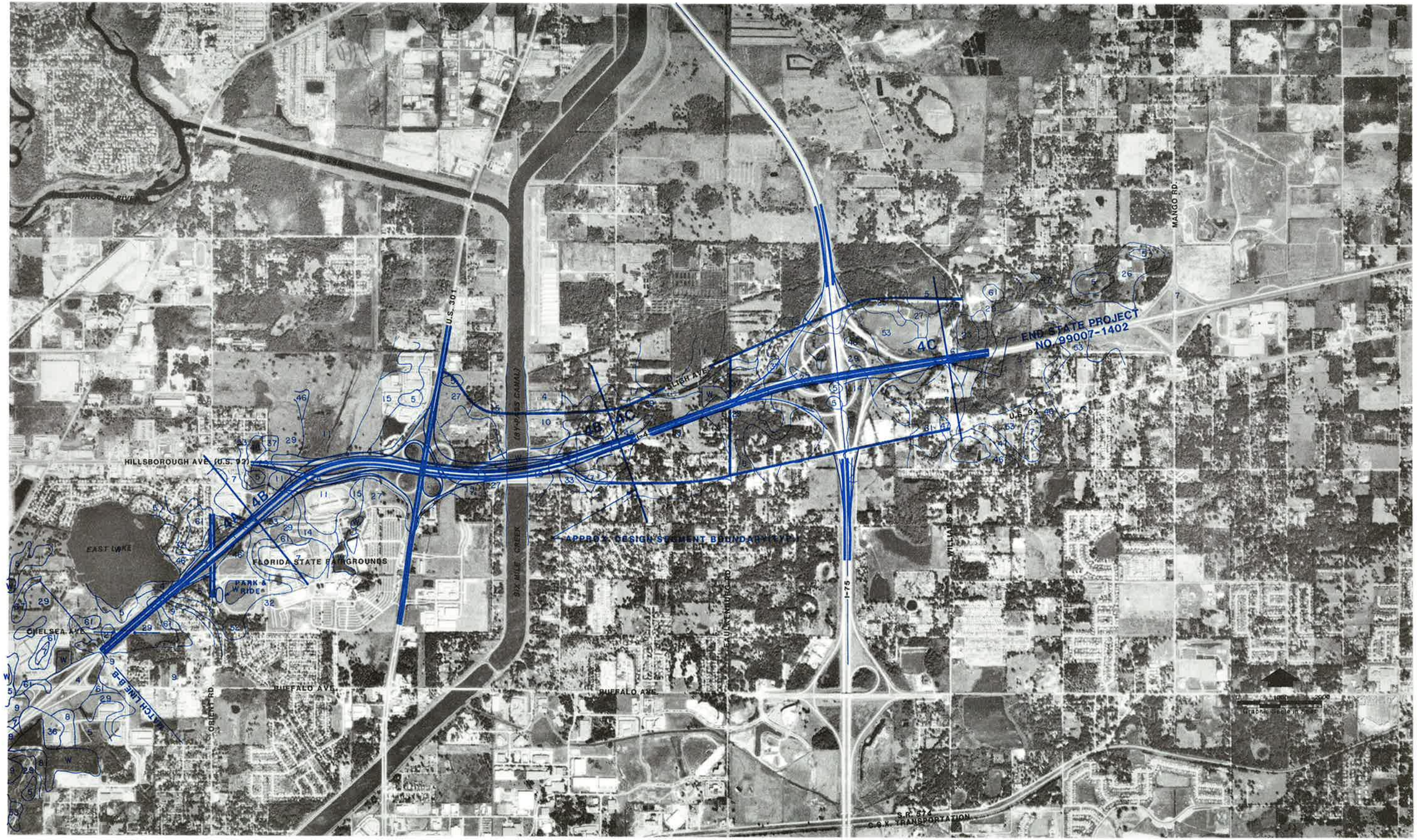
MASTER PLAN CONCEPT

SOIL SURVEY
DESIGN STUDY SEGMENTS 2B,3A,3B,4A AND 5A

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-12 OF 17



PROJECT No. C1104	
PROJECT DATES	
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1-26-89	SOIL SURVEY
1-26-89	DRAFT MASTER PLAN CONCEPT
6-89	FINAL MASTER PLAN CONCEPT

PLANNING FOR TOMORROW — TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

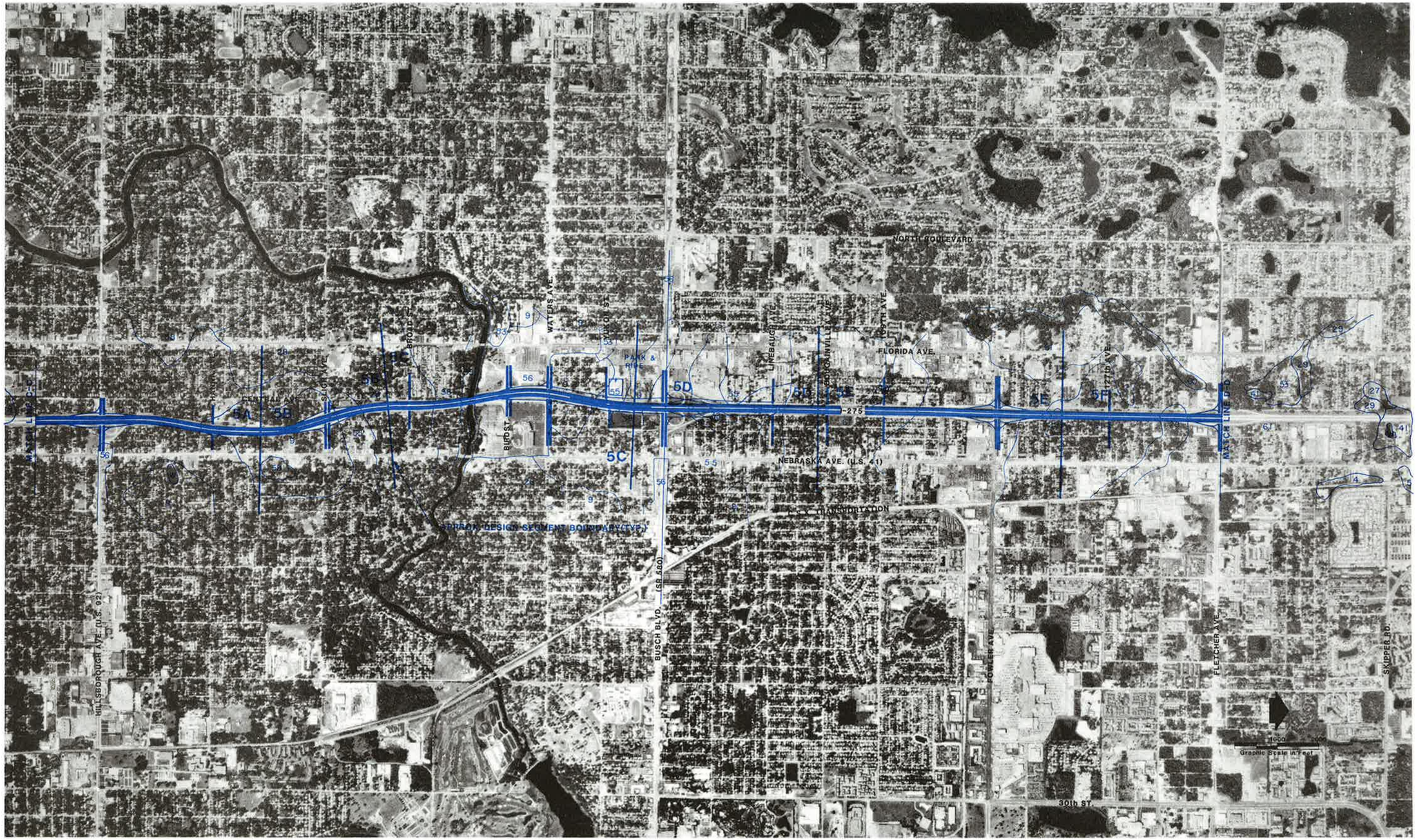
MASTER PLAN CONCEPT

SOIL SURVEY
DESIGN STUDY SEGMENTS 4A,4B AND 4C

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-13 OF 17



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THE GREINER TEAM

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GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

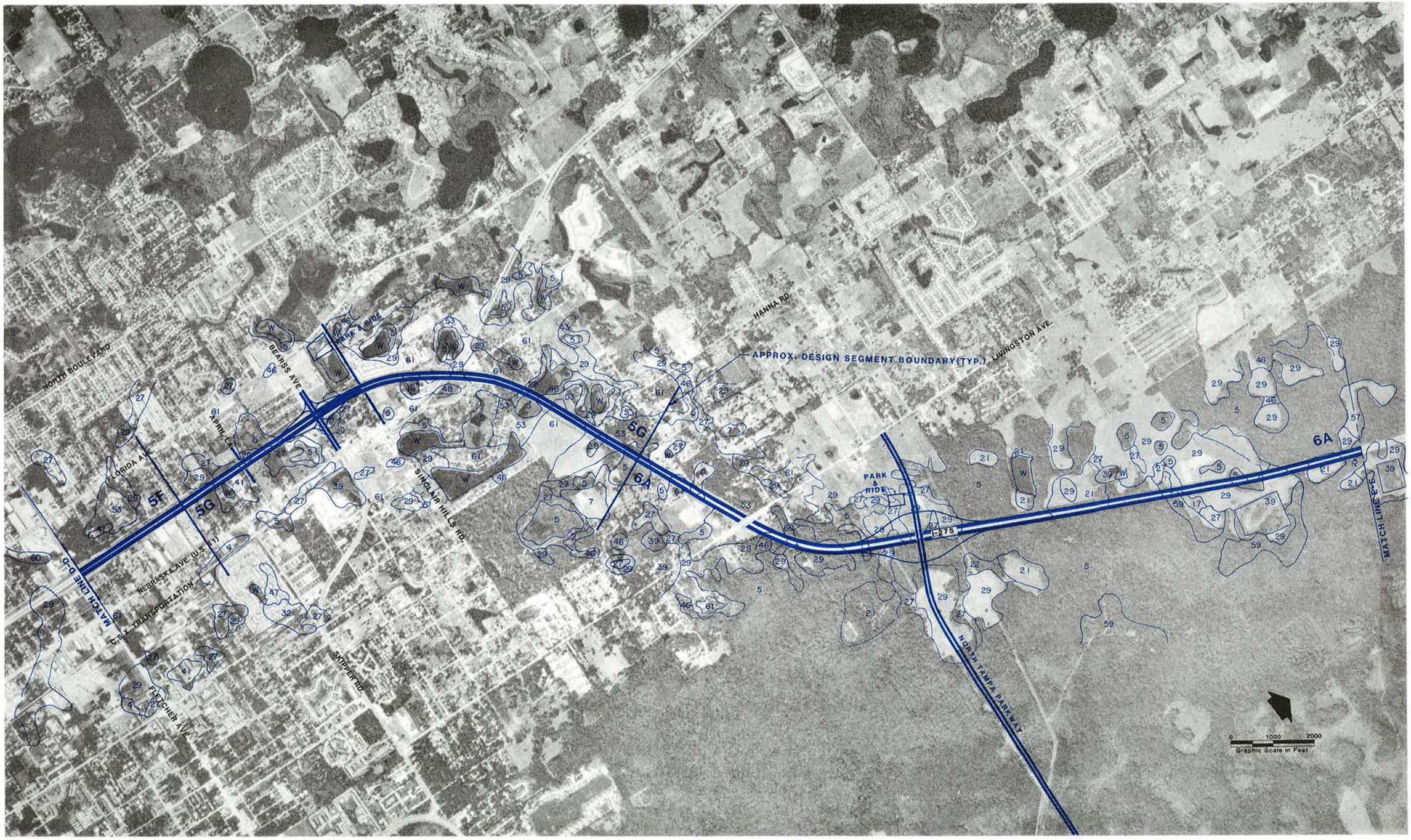
MASTER PLAN CONCEPT

SOIL SURVEY
DESIGN STUDY SEGMENTS 5A,5B,5C,5D,5E AND 5F

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-14 OF 17



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PLANNING FOR TOMORROW TAMPA INTERSTATE STUDY

THE GREINER TEAM

GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

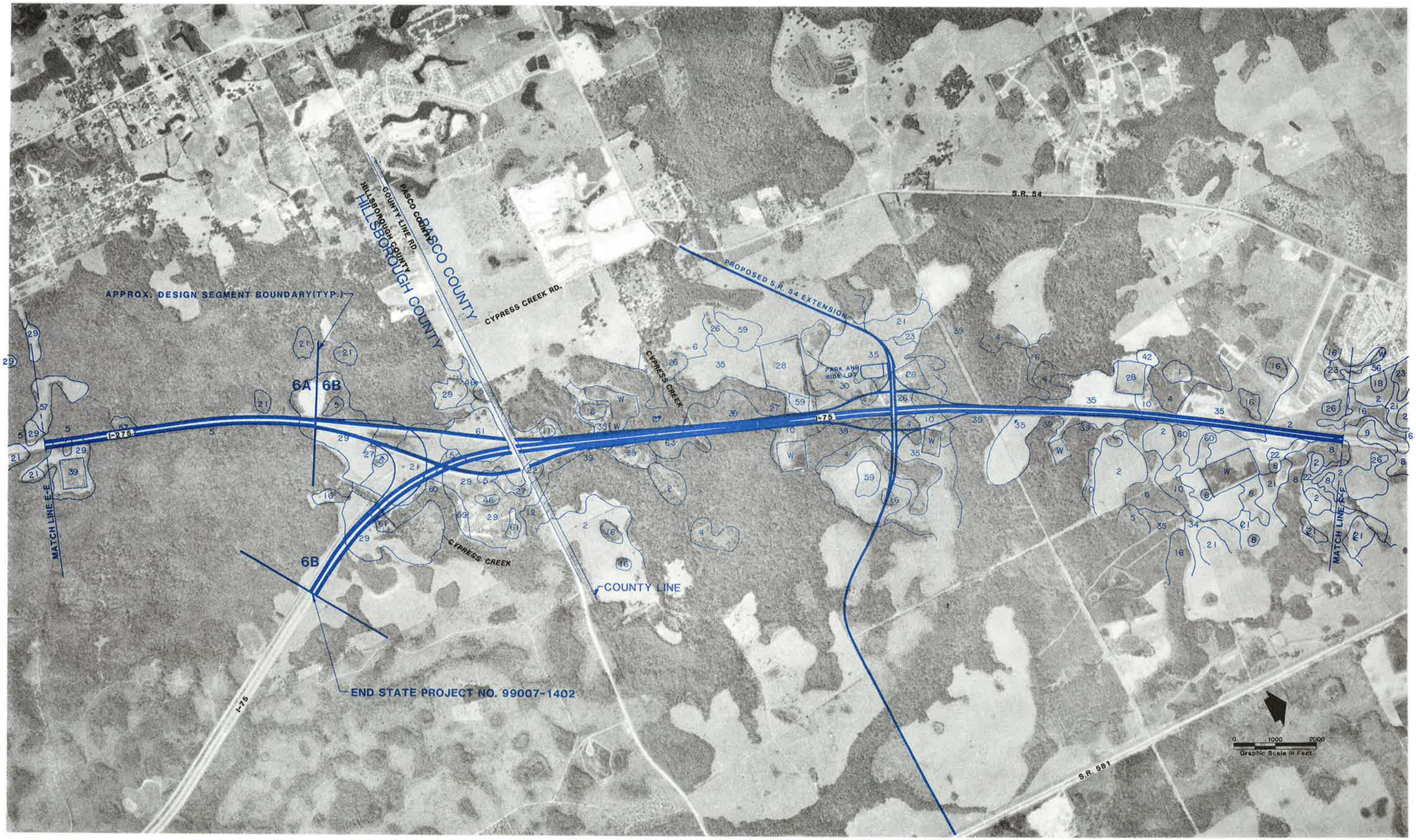
MASTER PLAN CONCEPT

SOIL SURVEY
DESIGN STUDY SEGMENTS 5F, 5G AND 6A

TAMPA INTERSTATE STUDY

FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-15 OF 17



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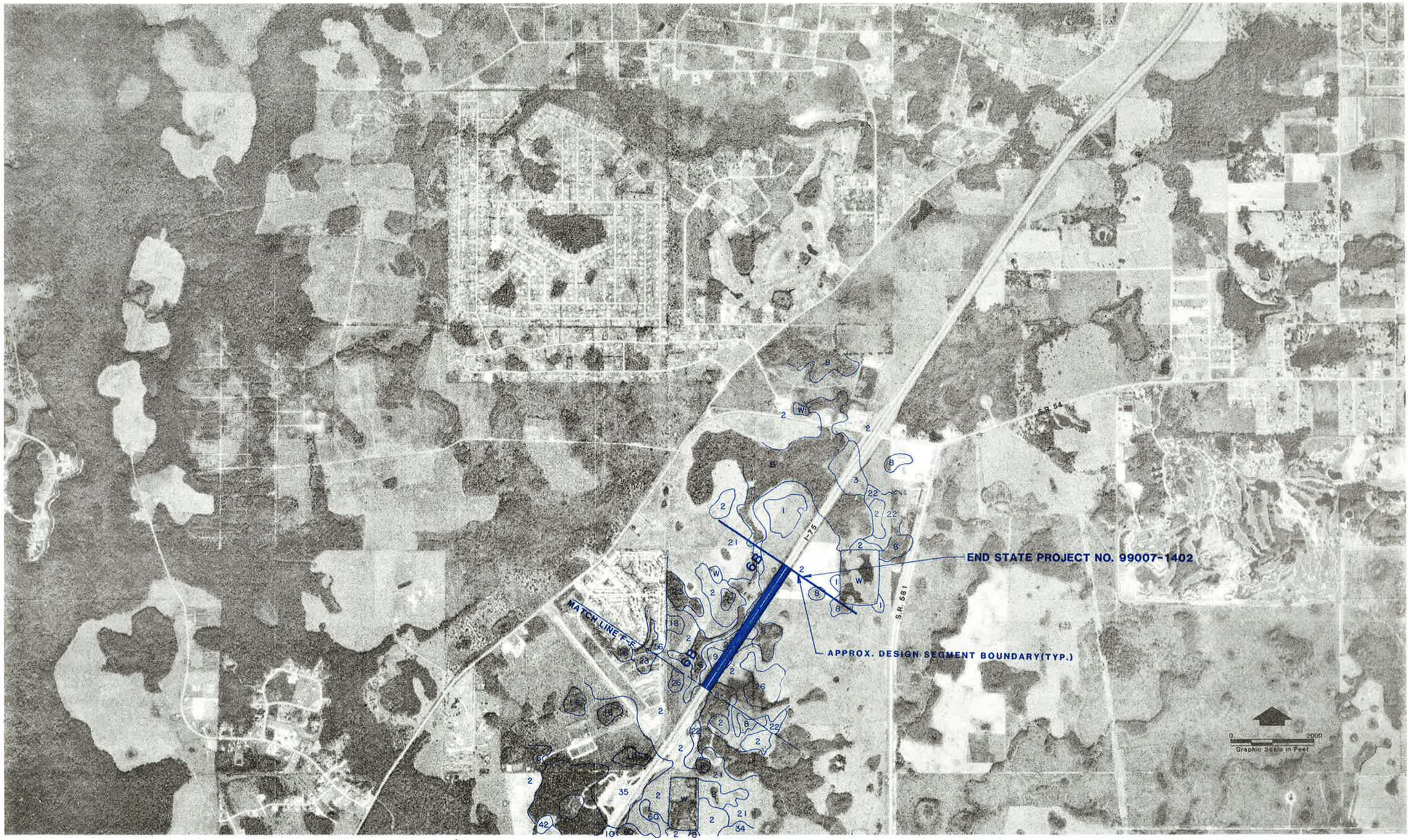
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
SOIL SURVEY
DESIGN STUDY SEGMENTS 6A AND 6B

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-16 OF 17



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GREINER, INC.
GANNETT FLEMING TRANSPORTATION ENGINEERS, INC.
TEXAS TRANSPORTATION INSTITUTE
KNIGHT APPRAISAL SERVICES

MASTER PLAN CONCEPT
SOIL SURVEY
DESIGN STUDY SEGMENT 6B

TAMPA INTERSTATE STUDY
FLORIDA DEPARTMENT OF TRANSPORTATION

STATE PROJECT No. 99007-1402 | SHEET J-17 OF 17