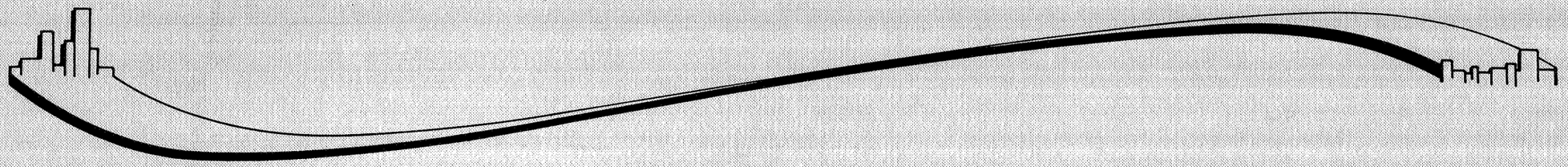
CORRIDOR STUDY

REPORT



prepared for the

Tampa-Hillsborough County Expressway Authority

on the proposed

South Crosstown Expressway
Eastern Extension to Brandon

GREINER ENGINEERING SCIENCES, INC. ▪ WATSON & COMPANY ▪ MICHAEL BAKER, JR., INC. ▪ CONSULTING ENGINEERS ▪ TAMPA, FLORIDA

1974

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1974

STATE OF FLORIDA

GOVERNOR
HONORABLE REUBEN O'D. ASKEW

SECRETARY OF TRANSPORTATION
WALTER L. REVELL

TAMPA–HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

Theodore C. Taub . . . . . Chairman

George R. McElvy . . . . . Vice Chairman

J. O. Driggers . . . . . Secretary

William F. Poe, Mayor of Tampa . . . . . Member

Frances M. Davin, County Commissioner . . . . . Member

H. L. Culbreath . . . . . Member

C. W. Monts De Oca, DOT District I Engineer . . . . . Member

John Dobbins . . . . . Administrative Consultant

Ray Speer . . . . . Right-of-Way Administrator

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Wilbur Smith and Associates . . . . . Traffic and Revenue Consultants

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Greiner Engineering

6807-0000
January 31, 1975

Mr. Theodore C. Taub, Chairman
Tampa-Hillsborough County
Expressway Authority

Mrs. Davin and Gentlemen:

Presented herewith is our Corridor Study Report summarizing our preliminary studies and recommendations on the Eastern Extension of the South Crosstown Expressway.

Elements of the study prepared by Watson and Company, Consulting Engineers, and Michael Baker, Jr., Inc., Environmental Consultants, appointed by the Authority, have been incorporated in the Report intact as specified in the Agreement dated January 8, 1974, authorizing the Corridor Study. Traffic and fare collection information from Wilbur Smith and Associates, Consulting Engineers, developed concurrently was utilized throughout this assignment.

We have developed schematic plan and profile plates for each corridor studied for the proposed Expressway Extension. These plates, transmitted under separate cover, depict the alternative general corridor limits on photographic base maps and assumed vertical configuration of the roadways in relation to the physical features of the areas.

Cost estimates were based on details sufficient to determine comparative project costs within the scope of the study using representative 1974 prices and right-of-way estimates furnished by others.

Our recommended corridor from the downtown Tampa terminus of Project One under construction at this time to east of Brandon is the Northern Corridor connecting to the Central Corridor east of I-75E. It is further recommended that the present northern limits of the Northern Corridor be extended by the Authority further north than originally prescribed to permit more flexibility in defining the final recommended route and related interchanges.

The preliminary estimated cost of the complete Expressway Extension, if constructed within this corridor, exclusive of interest during construction and financing costs, is approximately $188-million. Current cost estimates should be projected to the period of advancement of the project for financial feasibility determinations.

It must be understood that the studies summarized in this Report are of a preliminary nature, primarily intended to determine an optimum corridor. More detailed Civil Engineering and Environmental Impact Statements will be necessary to develop route location within the approved corridor, general details, more definitive cost estimates and data sufficient for funding and obtaining necessary permits. Such additional studies may result in some revisions.

We sincerely appreciate the opportunity of performing these studies and preparing this report. We wish to extend our thanks and appreciation for the assistance and cooperation extended to us in the accomplishment of this assignment.

Very truly yours,

GREINER ENGINEERING SCIENCES, INC.

WATSON AND COMPANY

MICHAEL BAKER, JR., INC.

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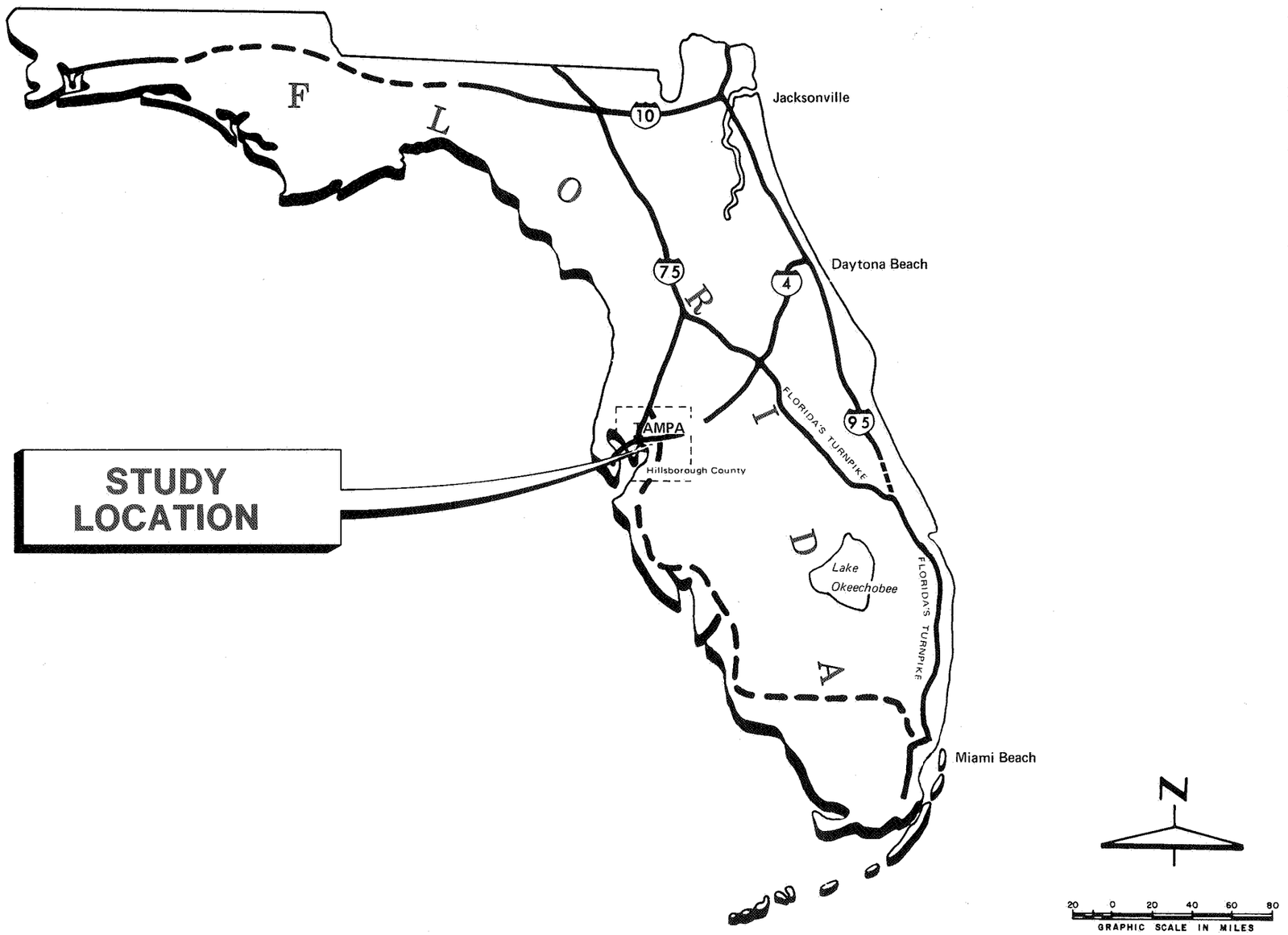
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introduction

CORRIDOR STUDY



major expressway system of florida

EXHIBIT 1

transportation needs

The task of providing and maintaining an adequate system of transportation to serve the Tampa Bay Region, more specifically Hillsborough County and Tampa, requires continual planning and implementation.

The State of Florida Department of Transportation and Hillsborough County, frequently with funding support from the Federal Government, are constructing or improving several primary and secondary roads with the County. Interstate 75 is in the advanced planning stages to be extended from north of Tampa southward through the West Coast of Florida counties and ultimately to the Miami-Ft. Lauderdale Area.

Studies and programs are being pursued to improve bus facilities and establish other types of mass and rapid transit in the area to achieve a balanced transportation system. The recent energy crisis, highlighted by the gasoline shortages, stressed the need for reasonable alternatives to safe, economical and efficient travel.

In times of local or national emergency, the proposed Expressway Extension would be immensely valuable for urban area evacuation and transportation mobilization, especially considering its high type criteria and strategic connections to other major routes.

Determination of the need and related substantiation is a primary responsibility of the Tampa-Hillsborough County Expressway Authority, Department of Transportation, County Planning Commission, Tampa Urban Area Transportation Study Committee, Tampa Bay Regional Planning Council, Hillsborough County Board of County Commissioners, Tampa City Council and others in proper authority. The Corridor Study's primary objective is to determine the optimum corridor location and very preliminary features for the Expressway Extension as the need has previously been substantiated.

The demand to modernize the total highway network, the predominant component now and in the foreseeable future of the balanced transportation system, have strained local, county, state and national resources to their maximum

Forward thinking, planning and transportation agencies are very cognizant of these problems. The 1990 Major Thoroughfare Plan for Hillsborough County, released in August, 1973, contemplates highway improvements at a cost which would exceed 500 million dollars, projecting the 1985 Tampa Urban Area Transportation Study estimates, consistent with recent trends. The South Crosstown Expressway System is a vital component of the area's transportation system.

The eastern leg of the Expressway is primarily contemplated to improve traffic service between downtown Tampa and the rapidly developing Brandon area with an adequate connection to the proposed I-75 Bypass in the area of U.S. 301 south of U.S. 60. State Route 60 (Adamo Drive) is highly congested now in the Study Area and an Expressway Extension will substantially relieve this arterial highway and others. This will especially be evident in future years when the Study Area becomes very densely developed as forecast by responsible planning agencies. The extended South Crosstown Expressway will also effectively provide an alternative to using the congested Interstate Route from Pinellas County and other local highways.

toll financing

The estimated cost of projected highway improvements cannot be totally financed without the use of toll revenues and appreciable Federal Aid. Florida is fortunate that the State now contains numerous toll facilities that are successfully demonstrating that it is feasible and practical to plan, construct, operate and maintain such projects financed in whole or in part by bonds to be repaid by revenue from the highway user.

toll road advantages

Safety should be recognized as an important characteristic of limited-access, toll expressways, even in urban areas. Accident statistic experience has documented that well-designed, well-maintained limited-access toll roads, when compared to local roads, are far safer to the motorist, the community and their personal property.

Not only do expressway users benefit directly from the construction of such a project by reduced travel time, lower accident rates and other attributes, but non-users generally benefit by a reduction in traffic volumes on adjacent local streets and highways. Revenue bond financing will permit tax and other funds previously designated for highway construction to be used for construction or improvement of other needed public facilities.

It is not uncommon that excess revenues are allocated in early years on such projects to extend the initial projects or to improve nearby access and intersecting crossroads to better serve the toll facility and the community, both through and local traffic.

history of the south crosstown expressway

The Tampa-Hillsborough County Expressway Authority was established by an Act of the Florida State Legislature in 1963. The Authority was charged with the responsibility to study, construct and administrate those projects, if feasible, found to be needed for the movement of highway traffic in Hillsborough County.

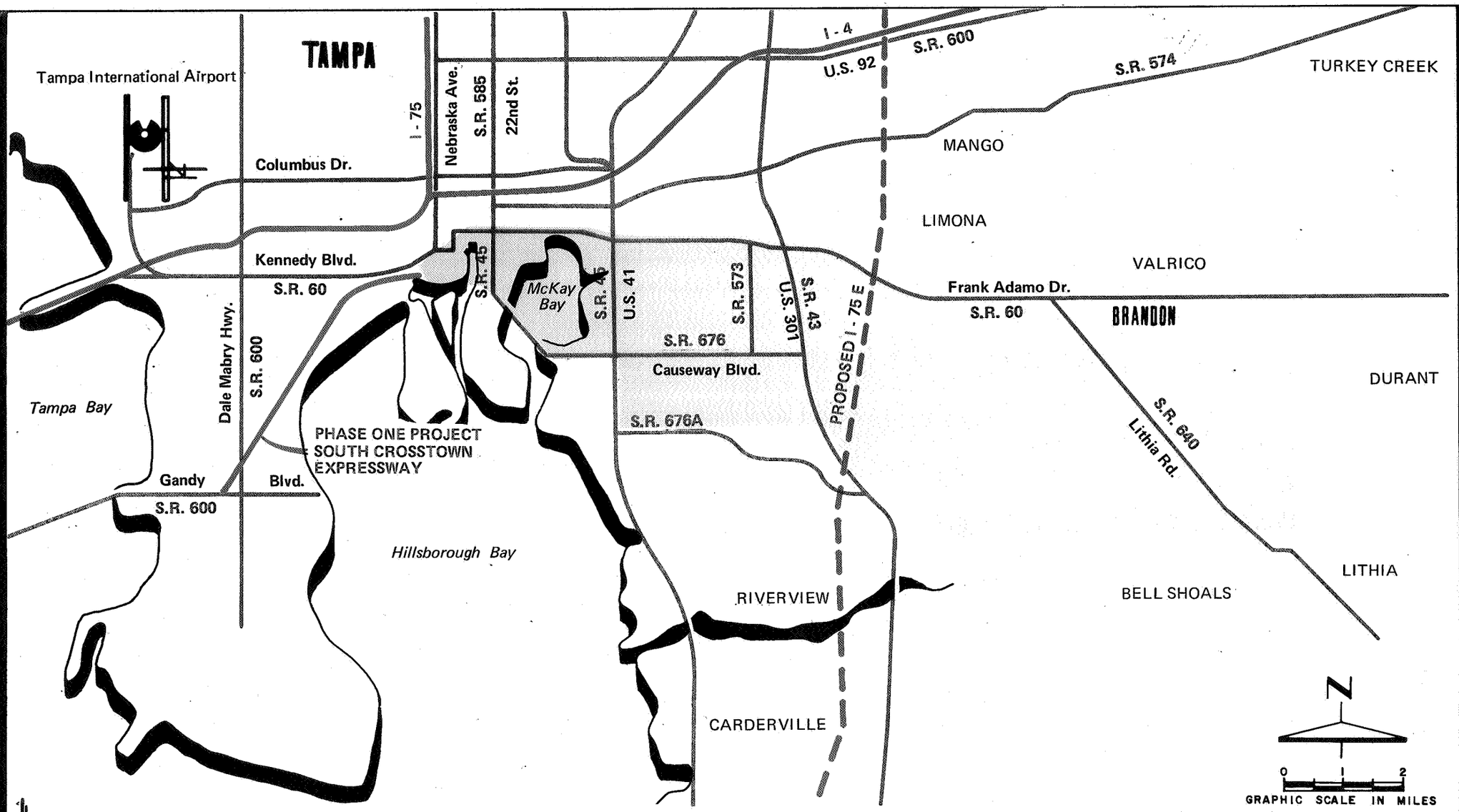
Subsequent to numerous planning, engineering and traffic and revenue needs and feasibility studies, the Authority adopted, as the Phase One Project, the western (interbay) leg of the South Crosstown Expressway to alleviate traffic congestion on the Interbay Peninsula and to provide a limited access link between Gandy Boulevard and downtown Tampa with provisions for extension. Bonds were validated and sold through cooperation of the Division of Bond Finance of the State Department of General Services, the Department of Transportation, Hillsborough County and the Authority. The Hillsborough County Planning Commission endorsed that action as being consistent with the Tampa Urban Area Transportation Study.

Construction is well underway at the time of this Report on this initial 5.2 mile segment of the South Crosstown Expressway System.

Primarily as a result of the need to establish certain details affecting the Interstate 75 Bypass Project for the Department of Transportation and upon strong recommendations of the Hillsborough County Planning Commission, the Expressway Authority retained J. E. Greiner Company, Inc. on January 8, 1974 to study alternative corridors, prepare and present a preliminary report, assist in a public hearing and finally recommend a single corridor in a final report. It should be noted J. E. Greiner Company, Inc. changed its corporate name to "Greiner Engineering Sciences, Inc." during the period of the Corridor Study without any organizational revisions that would affect the Corridor Study.

Elements of the Study were prepared by other Consultants appointed by the Authority and incorporated in the Report intact. Watson and Company, Consulting Engineers, completed preliminary engineering studies and cost estimates relative to structures, drainage, soils and utility relocations. Michael Baker, Jr., Inc., Environmental Consultants prepared and are responsible for the preliminary environmental assessment portion of the Corridor Study.

CORRIDOR STUDY



LEGEND

- EXPRESSWAY (EXISTING AND UNDER CONSTRUCTION)
- EXISTING PRIMARY ARTERIAL
- STUDY AREA

major roadway system of tampa and vicinity

EXHIBIT 2

This Study utilizes data and recommendations from Wilbur Smith and Associates, Consulting Engineers, who are concurrently preparing the preliminary Traffic and Revenue Report for the Authority.

chronology

The following is a summary of significant dates and events in the development of the Eastern Extension of the South Crosstown Expressway Corridor Study:

1950

Planning began for improved access to Tampa's Central Business District.

1963

The Tampa-Hillsborough County Expressway Authority was created by the Florida State Legislature.

1965

March: A preliminary Engineering Report was prepared and submitted for the Authority with the limits of the project from Gandy Boulevard to 39th Street determining corridor alignment and preliminary feasibility.

1968

October: An Engineering Report was prepared for the Authority as documentation for the sale of bonds. The limits of the report were from Melville Avenue to 39th Street.

1969

January: Funding of the Project by sale of revenue bonds failed due to State limitations on the maximum allowable interest rate. The Interbay Leg of the Expressway was then pursued as an alternative initial project.

1972

January 12: At the request of Mr. C. W. Monts De Oca, Department of Transportation, District I Engineer, Authority requested the Hillsborough County Planning Commission and Tampa Bay Regional Planning Council to study the Eastern Extension to establish the corridor location, especially as it affects the I-75 Bypass.

May 2: A report was received and referred to the Department of Transportation by the Authority from the Hillsborough County Planning Commission recommending two corridor alignments within the Study Area. The Authority authorized securing a proposal from the Consulting Engineers for a preliminary engineering report and feasibility study for the proposed extension of the Expressway from the terminus of the 1971 Project easterly to the I-75 Bypass.

October 17: Authority requested proposals from several engineering firms.

November 9: Tampa City Council request to implement an environmental impact study prior to adoption of final planning was received and held for consideration when consultants are selected. Several consulting engineering firms presented qualifications and proposals for the preliminary engineering study.

November 15: The Authority voted to continue to retain their Consulting Engineers, Greiner-Watson, for the Eastern Extension Corridor Study to the I-75 Bypass including a preliminary environmental assessment, subject to concurrence and funding by the State Department of Transportation.

November 22: The Authority reorganized with four new members due to Hillsborough County Commission election results.

December 19: The Authority voted to retain separate firms to do the engineering and environmental studies. Several firms presented their interest and qualifications for the environmental portion of the study.

1973

January 9: The firm of Michael Baker, Jr., Inc., recently established in this area, was selected to perform the preliminary environmental study and Greiner-Watson was selected to perform the engineering corridor study with J. E. Greiner Company, Inc. being the lead consultant for coordination.

February 13: Proposals were received, as requested, and referred to a committee of Authority members for review.

March: Authority and Department of Transportation representatives discuss scope of proposals, limits of study, previous corridors recommended by the Planning Commission, and availability of funds.

April 13: Authority requested J. E. Greiner Company, Inc. to resubmit a proposal for the Corridor Study expanding the limits to Brandon appointing Michael Baker, Jr., Inc. as subcontractors for the preliminary environmental assessment and Watson and Company for certain services on the preliminary engineering study.

May 8: Corridor Study proposals were received by the Authority, as requested from J. E. Greiner Company, Inc. along with a separate proposal from Wilbur Smith and Associates for the preliminary traffic and revenue study. All proposals were forwarded to the Department of Transportation in Tallahassee for review and comments.

June 13: After considerable negotiation following receipt of Department of Transportation comments, the Authority accepted the revised proposal from J. E. Greiner Company, Inc. and Wilbur Smith and Associates.

July 10: Department of Transportation approved advancement of $225,000 for preliminary studies. Authority authorized the Chairman to execute agreements and authorize the consultants to proceed upon receipt of Department of Transportation's authorization to proceed.

August: 1990 Plan of Development for Hillsborough County prepared by the Planning Commission was released documenting that the Eastern Extension is a needed improvement of high priority.

August 14: Authority authorized execution of Department of Transportation-Authority Agreement for $225,000 advance funds.

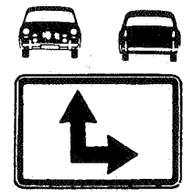
October 9: Authority received and forwarded to the Department of Transportation for review and funding Addendum No. 1 from J. E. Greiner Company, Inc. proposing additional fee and time of completion for the expanded study area requested by the Hillsborough County Planning Commission and Authority.

October 18: J. E. Greiner Company, Inc. again revised their proposal dated June 13, 1973 at the request of the Department of Transportation to add Addendum No. 2 containing conflict of interest and termination clauses required by recent Department of Transportation policy changes.

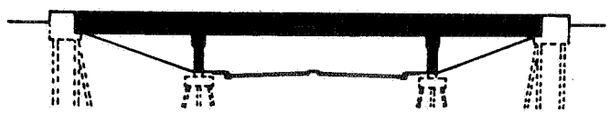
December 18: Authority was advised of Department of Transportation approval of Addendums to Consulting Engineer's proposals and proceeding with the studies.

1974

January 8: Authority authorized J. E. Greiner Company, Inc., with Watson and Company and Michael Baker, Jr., Inc. and Wilbur Smith and Associates, Inc., to proceed with their respective assigned preliminary engineering, preliminary environmental assessment, preliminary traffic and revenue feasibility studies.



preliminary engineering report



CORRIDOR LOCATION

study area

The limits of the Study Area were determined by the Hillsborough County Planning Commission and Department of Transportation based on the Tampa Urban Area Transportation Study. A significant revision to the Study Area increased the area of consideration beyond the original limits in the vicinity of Brandon at the request of the Planning Commission.

Necessarily the Study Area begins on the west at the temporary eastern terminus of the Phase One Project in downtown Tampa between Cumberland Avenue and Platt Street at Morgan Street. The western boundary generally conforms to the southern and eastern limits of the Tampa Central Business District.

East of Tampa the northern limit of the Study Area generally conforms to State Route 60 (Adamo Drive) west of the proposed I-75 Bypass and approximately one mile north of S.R. 60 in the Brandon area.

The southern limit is located approximately one mile south of Causeway Boulevard between U.S. 41 and U.S. 301; Bloomingdale Avenue between U.S. 301 and Providence Church Road; and approximately one mile south of Bloomingdale Road from Providence Church Road to the vicinity of Dover Road. Dover Road was designated as the eastern boundary of the Study Area to provide for eastern terminus interchanges about two miles east of the Brandon Central Business District.

preliminary study routes

Initial corridor location studies consisted of thorough field and office review of available maps, studies, and aerial photographs. Numerous potential alignments were delineated on aerial photographs and maps of appropriate scale. Subsequent to considerable field reconnaissance and preliminary study, several segments were eliminated from further consideration generally for environmental, engineering or economic reasons.

The alignments of the preliminary study routes physically tended to evolve into rather distinct north, central and southern groupings especially in the area of Clair Mel City, the proposed I-75 Bypass and the Brandon Central Business District. (See Exhibit 3)

Several segments were combined into a single corridor at various locations as the broad width of the proposed study corridors would easily encompass such alternatives for further study. This was consistent with the Corridor Study objective to develop and study, in relative detail, at least two and no more than three viable alternative study corridors.

U.S. Coast Guard navigational horizontal and vertical clearance requirements over Ybor Channel and McKay Bay, physical limitations of certain connections to the Phase One Project, and present land use in this area eliminated further consideration of several preliminary study routes west of U.S. 41.

Prior to this Corridor Study the Hillsborough County Planning Commission studied two alternate eastward extensions of the South Crosstown Expressway. The Planning Commission's routes were termed Alternate "A" and Alternate "B". Both were investigated further during this Corridor Study and were eliminated in part or whole as discussed below.

Alternate "A" crossed the Ybor Channel, McKay Bay and terminated west of Brandon at S.R. 60. This alternate was eliminated in

part, due to vertical clearance requirements of Ybor Channel and its terminus west of Brandon.

Alternate "B" crossed the southern end of Ybor Channel, paralleled the 22nd Street Causeway and Causeway Blvd., and terminated west of Brandon at S.R. 60.

This alternate was eliminated from further study due to (1) the vertical clearance requirements over the Ybor Channel and its location in the southern end of the channel made it impossible to interface or interchange with the project now under construction; (2) its paralleling of 22nd Street Causeway which is being improved at the present time by the Department of Transportation; and (3) its terminus west of Brandon.

Several preliminary study routes were studied and eliminated from futher consideration as study corridors south of Clair Mel City from Maydell Drive to U.S. 301 due to potential neighborhood disruption, conflict with existing sewerage treatment facilities and the location of the Delaney Creek flood plain.

North of S.R. 60 on the west side of Brandon considerable difficulty was encountered locating potentially feasible crossings and interchange locations at S.R. 60. A preliminary study route located between Brandon High School and its athletic field was considered and given no further study primarily due to potential disruption to the school and other recreational facilities. A more feasible alternative route was available in this vicinity.

Preliminary study routes in the area between Kings Avenue and Durant Road all involve potential disruption and acquisition of prime residential lands that are very rapidly developing at this time. Several segments were deleted from further study due to apparent adverse social and environmental impacts. Consideration of the proximity to parks, churches and schools in this area contributed to elimination or modification of preliminary study routes which were potential study corridors in South Brandon-Bloomingdale sections of the study area.

Extreme southerly preliminary study routes were adversely traversing the Alafia River and Buckhorn Creek drainage basins with appreciable negative environmental impacts and presented obvious engineering problems. In addition, such routes were potentially unattractive to serve traffic due to their location relative to proposed I-75 Bypass and S.R. 60 interchange location.

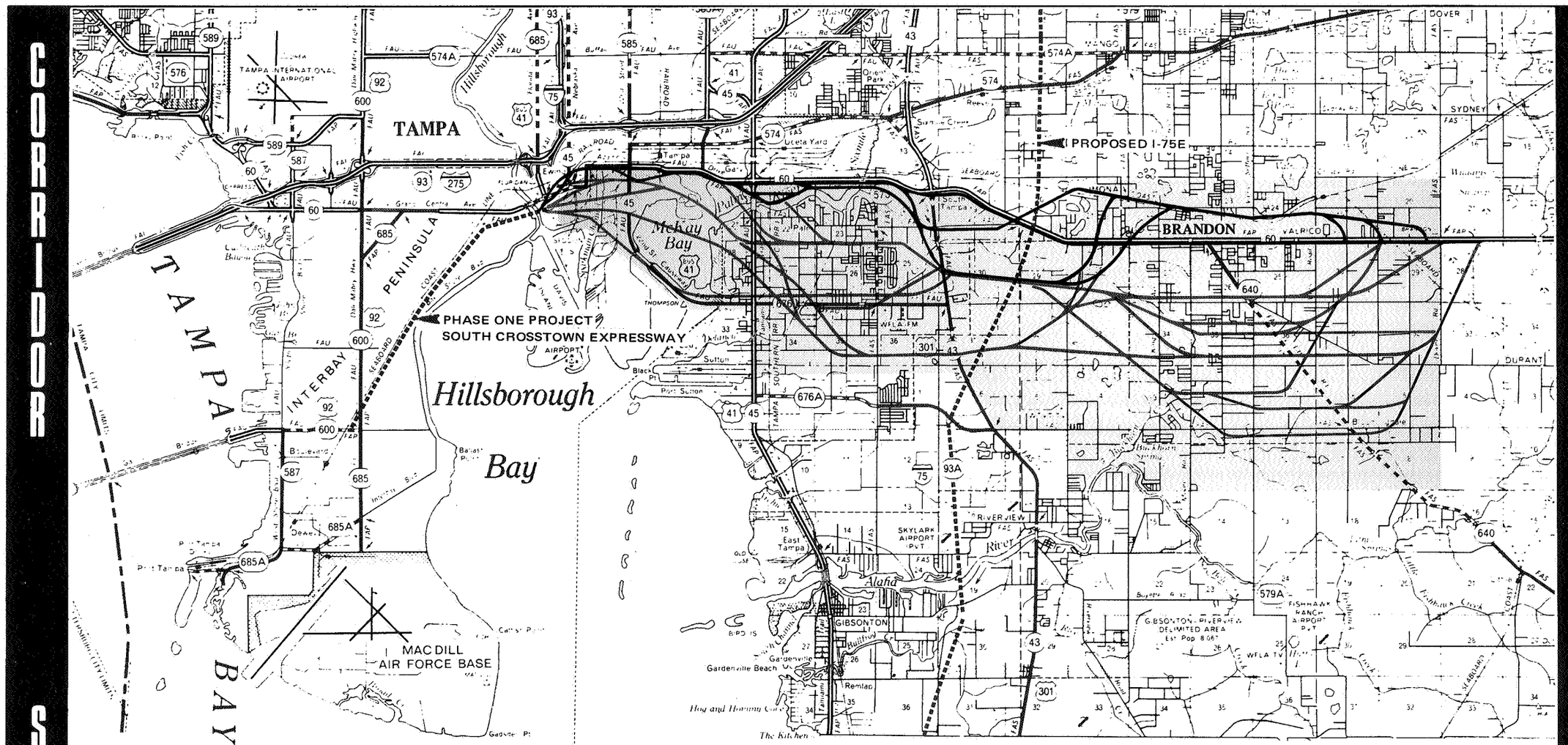
Some consideration was given at this stage of the study to terminating the Expressway east of the railroad spur crossing of S.R. 60 near Dover Road. This existing at-grade railroad crossing is seldom used by rail traffic and could be reconstructed over a railroad grade separation at much less cost than the additional cost to the Expressway in this rather undeveloped area.

The presence of State Route 60, with reasonably wide right-of-way improved to four lanes with a median over most of the twelve mile length between 13th Street to east of Brandon prompted inquiry concerning dual utilization of this existing highway corridor for such an expressway extension.

Existing right-of-way and median widths are insufficient for up-grading this arterial highway to a limited access expressway with its inherent interchanges instead of intersections, overpasses and necessary frontage roads, even if it were not proposed as a toll road. A significant portion of State Route 60 length, especially in industrial areas on the west and commercial areas on the east, is not a divided highway with considerable development along both sides.

CORRIDOR STUDY

EXHIBIT 3


TAMPA
TAMPA INTERNATIONAL AIRPORT
PROPOSED I-75E
PHASE ONE PROJECT
SOUTH CROSSTOWN EXPRESSWAY
TAMPA BAY PENINSULA
INTERBAY
Hillsborough Bay
MacDill AIR FORCE BASE
McKay Bay
BRANDON
VALRICO
DOVER
SYDNEY
DURANT
RIVERVIEW
SKYLARK AIRPORT PVT
FISHHAWK RANCH AIRPORT PVT
GIBSONTON
Alafia River
Gardenville Beach
Hog and Hominy Cut
The Kitchen
Port Sutton
Port Tampa
East Tampa
Ballast Point
Seddon Channel
Big Bend
Riverview
WFLA-FM
WFLA-TV
GIBSONTON-RIVERVIEW DELIMITED AREA Est. Pop 8,667
Hillsborough River
Palm River
Bullfrog Creek
Alafia River
Rattlesnake Creek
Turkey Creek
Simmons Creek
Ucela Yard
Orient Park
Tampa Garden
Tampa Yard
Tampa Bay
Hillsborough Bay
Old Tampa Bay
Boyette
Mango
Sydney
Durant
Valrico
Brandon
Riverview
Gibsonton
Gardenville Beach
Remlap
Port Tampa
Port Sutton
Ballast Point
Black Pt
Seddon
Thompson
Pulaski
Sutton
Tampa Bay
Hillsborough
Bay
Alafia

Double-decking State Route 60 was given preliminary consideration. Considering recent engineering studies from a similar assignment for the Georgia State Tollway Authority and experience with other such concepts throughout the nation, the potential route was determined not feasible for further consideration primarily due to enormous construction costs for the structures alone (approximately $24 million per mile four-lane structure and $32 million per mile six-lane structure); serious detrimental environmental factors (aesthetics, noise and air pollution); and inability to satisfactorily interchange with U.S. 301 and I-75 Bypass.

Another alternative was studied as a preliminary study route in the existing S.R. 60 corridor. This route was proposed to conform as closely as possible to the location of two existing rights-of-way, Adamo Drive (State Road 60) and the railroad tracks of the Seaboard Coast Line through the northern portion of the Brandon area.

The route considered begins at 13th Street and Adamo Drive on the west, and extends east to the vicinity of Maydell Drive. Adamo Drive was proposed to be upgraded to limited access expressway status. One-way service roads on the north (2nd Avenue) and on the south would provide service for local traffic oriented toward the industries in that area. From Maydell Drive to a point just east of 78th Street, State Road 60 would function as a service road and the Expressway would be constructed parallel on the south side.

East of 78th Street, the Expressway would cross back over State Road 60 to the northeast. After spanning and interchanging with U.S. 301 and the proposed I-75 Bypass, the Expressway would run parallel and contiguous to the narrow Seaboard Coast Line right-of-way through northern Brandon to the proposed eastern terminus.

This alternative study route possesses a more distinct set of advantages and disadvantages than any of the routes or corridors studied.

With no encroachment on Ybor Channel and little, if any, involvement on McKay Bay, environmental disturbance would be minimal except for isolated areas along the railroad right-of-way in Brandon. By utilizing significant portions of existing rights-of-way throughout most of the route, residential displacements or neighborhood pattern interference would be greatly reduced.

In land planning, an existing railroad is a physical barrier within the present land use development pattern, therefore, no new man-made barrier potentially disruptive to Brandon's community development pattern would be created.

This concept could also better serve industries in the vicinity of the Expressway by separating through and local traffic. Since most of the land areas adjacent to the S.R. 60 corridor are already developed, land speculation would probably be less of a problem than in the more undeveloped areas.

Major disadvantages evident include greater difficulty in designing and constructing tollroad interchanges to accommodate traffic desires along the existing Adamo Drive, U.S. 301 and the proposed I-75 Bypass. Heavy traffic burdens would be induced further on Brandon's north-south arterials by potential users living in the south of that community and seeking access to and from the Expressway Extension. This study route goes beyond the prescribed boundaries of the original Study Area.

In summary on this preliminary study route, the advantages are more social and environmental in nature, while the distinct disadvantages are primarily engineering and economically oriented. Therefore, this route was not selected as a Study Corridor, but these advantages and disadvantages should be collectively compared to those of each of the three primary Study Corridors given consideration as an alternative Northern Corridor variation.

study corridors

Corridor location studies considered appropriate civil engineering criteria such as safety, traffic service and economics. Particular attention was given to the effects of each corridor upon the environment, both natural and human effects. This Report contains a complete section dedicated to the preliminary environmental assessment of the proposed Eastern Extension of the Tampa South Crosstown Expressway to Brandon.

Three corridors emerged from review of preliminary study routes for further studies. As shown on Exhibit 4, a northerly, a central, and a southerly corridor alignment appeared to be practical and viable to be studied in more detail to the degree authorized. Connections between Study Corridors were possible increasing flexibility and alternatives.

Experience on similar projects and, again, during this Corridor Study indicated individuals are often confused by and misunderstanding the term "corridor." The American Association of State Highway Officials (AASHO) appropriately defines "corridor" to mean "...a strip of land through which a highway can be developed to satisfy the traffic demands and the environmental considerations of the community through which it passes."

The width of the corridor varies considerably depending on the type of highway being proposed and the characteristics of the area being traversed. Often the typical width of ultimate potential right-of-way taking (200'-350') is confused with corridor width. Referring to Plate 4 accompanying this Report, the definition of corridor vs. right-of-way is graphically illustrated as throughout the Study Corridors the corridor width varies from about 600 feet minimum to about one-half mile (2640 feet maximum) to accommodate the expressway, if the corridor is recommended and the project is feasible for proceeding with necessary, more definitive studies.

Physical control points, both of minor and major importance, within the Study Area were considered in determining the location and the limits of the Study Corridors. Significant controls were:

Project One's temporary eastern terminus and configuration;
existing street and railroad patterns;
public, historical, institutional and cultural features;
parks and recreational areas;
bays, estuaries, streams, and rivers;
residential, commercial and industrial areas;
designated interchange area with the proposed I-75E approximately midway between planned interchanges at S.R. 60 and U.S. 301; and
limits of the designated Study Area.

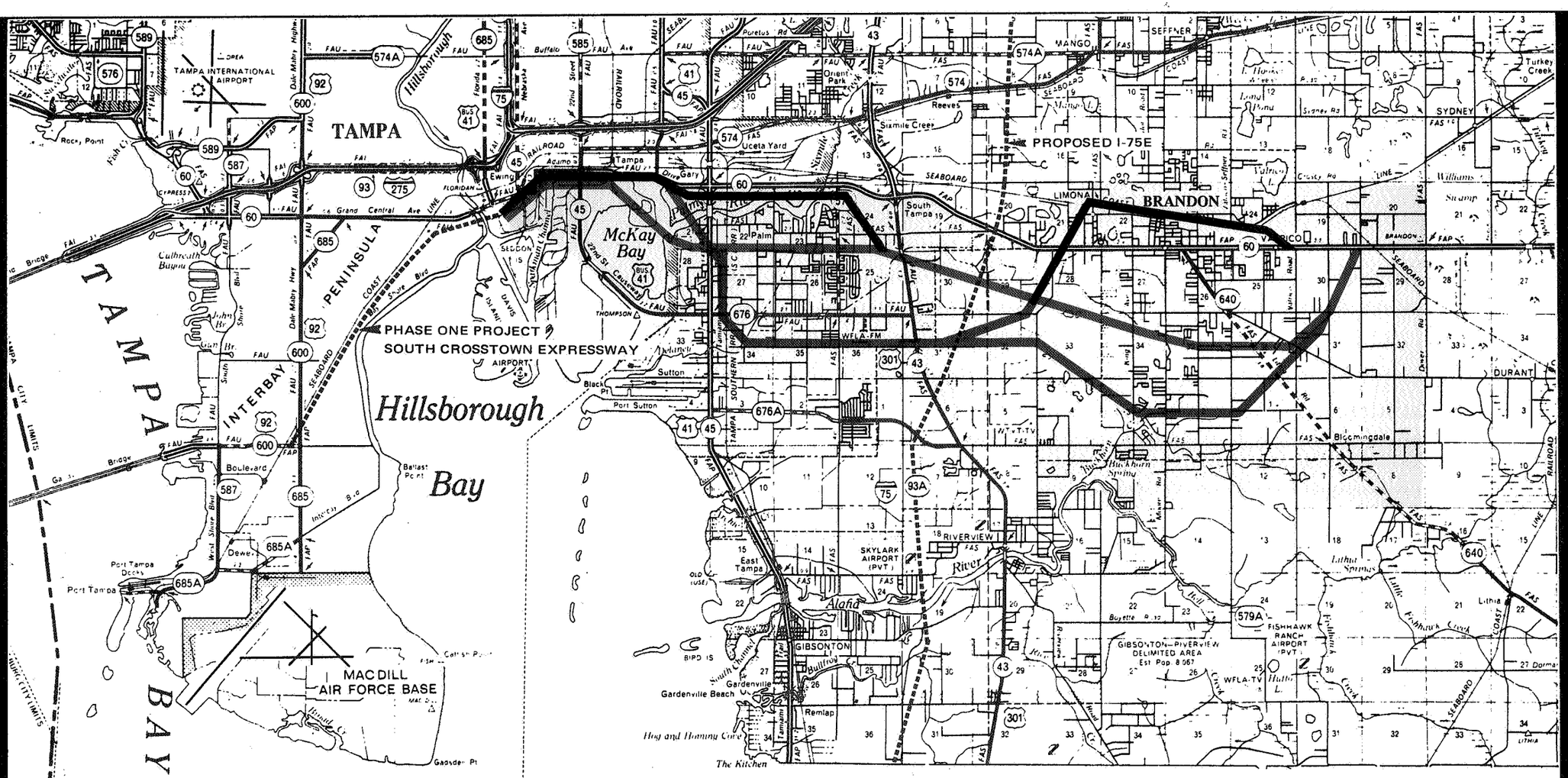
Throughout the Study, there has been continuous interaction between responsible planning, traffic, environmental, and engineering representatives adjusting and refining the location process.

Central Corridor

The Central Corridor originates at the temporary terminus of the Phase One Project west of Morgan Street in downtown Tampa, between Cumberland and Platt Streets. The corridor alignment proceeds generally in a northeasterly direction crossing the Seaboard Coast Line Downtown Yard to the area of the intersection of Twiggs Street and 13th Street, crosses Ybor Channel and proceeds eastward generally along Long Street east of 22nd Street, then veers southeasterly at the south end of 34th Street, across McKay Bay to an intersection with U.S. 41 (50th Street) in the vicinity of 12th Avenue.

Between U.S. 41 and U.S. 301, the Central Corridor generally orients east-west, encompassing the northern limits of the Clair Mel City

CORRIDOR STUDY



LEGEND

- NORTH CORRIDOR
- CENTRAL CORRIDOR
- SOUTH CORRIDOR
- STUDY AREA

N

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GRAPHIC SCALE IN MILES

study corridors

EXHIBIT 4

Subdivision. The interchange area within the Central Corridor with U.S. 301 and the proposed Interstate Route 75 Bypass (I-75E) are located north of and near Causeway Boulevard (S.R. 676). Turning southeasterly in the area of Providence Road, the Central Corridor crosses the extension of Lumsden Road under construction at this time traversing the area between Kings Avenue and Durant Road, centered about the location of DeWolf Road. At about the intersection of Durant and Valrico Roads, the Central Corridor turns northward to an eastern terminus at S.R. 60 between Miller Road and St. Cloud Avenue. The estimated length of the basic Central Corridor is 15.16 miles.

On the Central Corridor between Morgan and Cumberland Streets, a significant portion of the Eli Witt Cigar Division cannot be avoided, which may cause considerable damages to the remaining improvements and business. This area of Downtown Tampa is principally occupied by wholesale, retail warehousing and light industry. It appears no property south of Eunice Avenue will be taken by the Extension Project. Pyramid Paper Company definitely lies within its path on either the North or Central Corridors.

North of Cumberland, a small portion of the Hillsborough County Maintenance Division facility at Jefferson Street would be taken, but considerable parking space under the proposed viaduct would be provided after construction. The Ware Construction Company office building, recently remodeled, appears to be within the taking if the Central Corridor is selected.

Between Jefferson Street and Nebraska Avenue, the majority of the land is vacant and cleared of improvements indicating the area is in transition. Some old residences, a grocery store, and tavern in poor condition, would be acquired along this Corridor, displacing some persons in the area of Nebraska Avenue and Walton Street.

Between Cedar Street and the railroad yard, a contractor's storage yard, an empty warehouse, and on the north side of Walton Street, a truck storage yard probably would be acquired on the Central Corridor. The Con Agra, Inc. bakery flour tanks on Finley Street at Cedar Street, would be avoided, even though they are located well within the Corridor limits.

Crossing over the Seaboard Coast Line Downtown Railroad Yard at a most advantageous location, the Central Corridor may involve the vacant Porter Paint Company building; Southern Pump and Supply, Inc. at the corner of 11th Street and Washington Street; Sun City Wholesale's warehouse; Kain and Bultman, Inc.; Vento Oil Company; Bonanni Ship Supplies and Marine Fuel Supply; Amazon Hose & Rubber Company, and other smaller businesses, as it proceeds to the alternative Ybor Channel crossings.

Near 12th Street and Kennedy Boulevard, takings may involve a portion of the 7-Up and Dr. Pepper Bottling company, the Gator Lounge, and others, especially for interchange movements on the low level structure alternative.

The northern portion of the port's receiving warehouse between Ybor Channel and 13th Street would be acquired and removed for construction of all Central Corridor Channel crossing alternatives.

The right-of-way appraiser estimates, if a fixed low-level bridge is constructed (40-foot maximum vertical clearance), it will curtail the port use of all of the land north of the Central Corridor. Estimated damages from this curtailment, on a real estate basis alone, without business damages, are at least $5 million on this alternative. The Tampa Port Authority indicated strong opposition to that proposal and the high-level bridge and tunnel alternate Ybor Channel crossing schemes that restricted navigation even during construction.

East of Ybor Channel, a route within the Central Corridor would avoid the Phillip's 66 petroleum storage tanks and related railroad spur tracks and try to avoid Bekins Moving and Storage warehouse and Spicola's Hardware, but Acme Fast Freight appears to be unavoidable.

East of 22nd Street to the proposed crossing over McKay Bay, numerous small, generally wooden residences in varying condition, would have to be acquired. At several locations, multi-family and abandoned residences are in evidence. More residences would be acquired on the Central Corridor than on the Northern Corridor in this area, due to the diagonal alignment.

The McKay Bay crossing would originate near the south end of 34th Street in the area being developed by the City of Tampa for Police and Fire support facilities.

After passing through stockpiled spoil from dredging of the channel, the Central Corridor routes would interchange with U.S. 41 and proceed eastward in relatively undeveloped areas west of 66th Street.

The north end of Clair Mel City, including an elementary and junior high school complex and small commercial area are located within the Central Corridor which shouldn't be taken. Through this one-mile segment estimates indicate approximately 172 homes would be acquired and families relocated resulting in considerable replacement housing problems, as well as appreciable cost.

Late in the Corridor Study, an alternative corridor (which was previously considered as a preliminary study route) was given further study. This alternate, referred to as the Causeway Boulevard Alternate, was located through the south portion of Clair Mel City. While schools were avoided and residential displacements were reduced approximately 25%, costs increased significantly due to its comparatively longer length.

Immediately east of Clair Mel City, utilities have been installed for apparently more residential development. The proposed U.S. 301 and I-75 E Interchanges and mainline toll plazas west of Providence Road would be constructed on both the Central and Northern Corridors in predominantly open areas being used for cattle grazing. However, it appears it would be unavoidable that the Harvest Time Memorial Church and a small restaurant on the west side of U.S. 301 will have to be acquired. East of U.S. 301 an extensive area within the Corridors has recently been purchased and rezoned for industrial park purposes. Total ownership is approximately 450 acres of land, and the Appraiser foresees land values increasing substantially in this area.

The Central Corridor proceeds easterly through open land to Kings Avenue, necessitating overpassing of the extension of Lumsden Road presently under construction. From this area through John Moore Road the Central Corridor is rapidly developing with single-family home developments at this time, including the Brandon Trade Winds and Brandon Spanish Oaks developments.

West of Bryan Road, acquisition would require taking several recently constructed large homes in the Oak Mount Manor development. Between Bryan Road and Lithia-Pinecrest Road, the existing residences in the Central Corridor are generally constructed on large, deep lots, resulting in considerable open land. Brooker Elementary School is located within the Corridor limits between Bryan Road and Bell Shoals Road, but would not be involved in Expressway acquisition, if this Corridor were selected.

The assumed profile on the plates accompanying the Report indicates that, in this area, considerable portions of the proposed Expressway would be depressed below existing ground levels, lessening the adverse impact on the community. Relatively unobstructed view and reduced noise levels are advantages to the adjacent community.

The area from the intersection of Valrico and Durant Roads in the Corridor to Miller Road is predominantly residences developed on large properties. East of Miller Road to the vicinity of S.R. 60, the Corridor passes through rather undeveloped grove lands with scattered residences.

The east terminus interchange would be located west of St. Cloud Avenue in an area where highway frontage is increasing rapidly in value. Access would have to be provided in the project to an existing motel complex from St. Cloud Avenue. North of S.R. 60, the entrance to the Expressway westbound would be near the Valrico First Baptist Church. Access to the Church, Oak Hill Mobile Village, and residences north of S.R. 60 would be maintained using frontage roads around the "fly-over" interchange ramp.

It appears that no major relocation or demolition problems occur on the eastern segment of the Central Corridor as adequate relocation housing of the same character exist now. This could change in future years, however.

Northern Corridor

The Northern Corridor also originates at the terminus of Project One and proceeds more northerly than the Central Corridor crossing Kennedy Boulevard between the railroad yard and Governor Street, turning eastward southeast of Union Station, following generally along and south of Adamo Drive (S.R. 60) from 13th Street to 78th Street, where the corridor turns southeasterly across Palm River Road to join and coincide with the Central Corridor in the vicinity of U.S. 301 and I-75E.

East of the proposed Expressway interchange with I-75E, the Northern Corridor turns northeastward, crossing Brandon Boulevard (S.R. 60) at Lakewood Drive to the Seaboard Coast Line Railroad tracks in the area of Limona Road, where the alignment would cross over to the north side of and follow contiguous to the existing railroad tracks for approximately two and one-half miles crossing back over the tracks near Mt. Carmel Road to the proposed eastern terminus at S.R. 60 in the vicinity of Valrico Road. The basic Northern Corridor is estimated to be 14.51 miles in length.

The Northern Corridor limits in the area between Morgan Street and Cumberland Avenue substantially conform to the limits of the Central Corridor previously described. However, a smaller relative involvement with Eli Witt Company's facilities appears probable compared to the Central Corridor.

In the area of Cumberland Avenue and Jefferson Street, generally due to the proposed interchange, it is assumed substantially all of the County Maintenance Division's facilities, a small law office, South Land Office Supply, Rickett Bag Company and some small residences in poor condition would be involved in the taking for a route within this corridor. Existing warehouses west of Jefferson Street, north of Bell Street appear not necessary to be acquired.

In the Northern Corridor east of Jefferson Street at Whiting Street, several warehouse and related facilities are assumed to be taken, including the Hillsborough County Hospital and Welfare Board's warehouse, Standard Container Company, Diamond Tager Company, and Multi-Mile Tires. However, Gulf Refrigeration Supply, Inc. appears not to be involved even though it is within this corridor.

Near Washington Street, east of Governor Street, King and Company and Sealtest Foods probably will not be involved. Armour Foods would probably be totally taken at the southwest corner of Governor and Washington Streets. In this area it appears the proposed viaduct structures will not involve any acquisition of improvements of WFLA Television

Station, but the recently remodeled law offices on the northwest corner of Governor and Washington Streets probably would have to be taken.

On Jackson Street between Governor and Brush Streets, Tampa Technical Institute and another substantially vacant building appear to be located within the taking. East of Nebraska Avenue the northbound on-ramp from Jackson Street would go through properties adjacent to the railroad as it crosses over Kennedy Boulevard. The Hillsborough County Department of Health's large building will be avoided even though it is well within the Northern Corridor.

North of Kennedy Boulevard, the 58-unit Travelodge Motel would probably have to be acquired as a total taking along with a warehouse on the west side of Brush Street. The City-owned parking garage on Twiggs Street would be avoided but some special consideration in design appears necessary to maintain access to the garage at Madison Street at Brush Avenue.

At Nebraska Avenue between Madison and Twiggs Streets considerable area has been recently cleared of buildings. Drucas Moving and Storage Service and other smaller warehouses unavoidably would probably have to be acquired.

East of the railroad at Twiggs Street only certain properties north of Twiggs Street appear to be necessary to be acquired for development of a route including Lenfestey Supply Company, Miller Machinery Supply Company and an empty warehouse. North of the intersection of Eva and Raymond Streets, several isolated residences and rather small storage buildings appear to be involved. Right-of-way acquisition and construction would probably also involve the City's Central Maintenance Department facilities along Eva Street, west of 13th Avenue.

Between 12th and 13th Streets, a portion of the B&B ("U-Save") warehouse facilities appears to be unavoidably involved. The total complex (80,000 square feet) is presently listed for sale, the Appraiser reports, at an asking price of $1 million or offered for lease on a long-term basis. WESCO Marine Supply, Inc. is assumed to be necessarily taken also, but the Tampa Bottle Gas Company storage tanks apparently will be avoided by the Northern Corridor route.

East of 13th Street, alternative segments were studied within the Northern Corridor to the area of the proposed 39th Street Interchange.

The suggested "Second Avenue Alternative" consists of utilizing existing Second Avenue and Adamo Drive (S.R. 60) as one-way frontage roads (westbound and eastbound respectively) with the Expressway in between. Several more rather substantial manufacturers, warehouses and other businesses, some having railroad access, would be displaced in comparison to the alternative studied south of S.R. 60 between 13th Street and 23rd Street. Residential properties between 23rd and 24th Streets would also be involved. Portions of the proposed construction would be over continuous structure (viaduct) due to the frequent railroad track crossings and cross streets which would have to remain open, as indicated on the applicable plates accompanying this Report. Considerable lengths of retaining walls would apparently be necessary to contain the Expressway between the railroad tracks, contiguous to and north of Adamo Drive (S.R. 60) and the south edge of 2nd Avenue.

The basic alternative within the Northern Corridor beginning at 13th Street proceeds eastward on the south side of Adamo Drive north of and not within Ybor Channel. This immediate area is occupied by Texas Gulf Sulphur Company storage tanks. The Appraiser reports, at this time, the property along with other lands, is listed at approximately $38,000.00

per acre and strongly urges acquiring the land necessary for the Expressway Extension by special negotiation, if this alternative segment in the Northern Corridor is selected. Ybor Channel and terminal facilities immediately south of this location should not be involved in takings for the Northern Corridor. Acquisition would include a salt storage warehouse, parking lot and oil company facilities, including bulk storage tanks, west at 19th Street. Between 19th and 22nd Streets, the Northern Corridor generally involves undeveloped lands except for the Royal Castle Restaurant, Jean Vega Auto Parts and International Steel Workers of America (Local Union 2120) Headquarters.

The southwest portion of the American Can Company parking lot would probably be involved primarily due to the 22nd Street interchange, but, Drask Coffee Company may not be taken south of the railroad tracks in this area.

South of the railroad, generally in the area of Long Street several single family and a few multi-family residences would be acquired. The Northern Corridor would proceed through generally open land between 31st and 34th Streets.

East of 34th Street, the proposed 39th Street interchange and the southward relocation of the eastbound lanes of S.R. 60 would occupy the wetlands and marsh in the northern limits of McKay Bay.

The basic Northern Corridor would pass through property east of McKay Bay, north of Palm River to 78th Street that generally has been filled hydraulically from deepening of Palm River as part of the Tampa Bypass Canal Project. This land is considered good industrial development land, especially with increased railroad and roadway access. When the new bridge at 22nd Street (Causeway Boulevard) is completed, barge traffic may also serve certain of these properties in the future. Some of this land is owned by the Southwest Florida Water Management District (SWFWMD) and future agreements may be possible for its use for the Expressway in the public interest.

It is not anticipated that appreciable relatively valuable S.R. 60 frontage on the south side of Adamo Drive will be taken or that the south S.R. 60 right-of-way line will be designated limited access right-of-way by an Expressway route, if this Corridor is selected. Existing developed properties may be substantially avoided in this area.

Crossing Palm River interchanging with and turning southeastward over 78th Street, the Northern Corridor alignment is assumed to avoid multi-family dwellings now under construction to the south, the existing vehicle inspection station, and Tampa Armature Works (dislocated by Project One) facilities now under construction.

Between 78th Street and the common corridor segment of the Central Corridor near U.S. 301, most of the land involved is substantially undeveloped. Notable exceptions include Red Wing Carrier and Koolee Beverage Dispensers on Palm River Road.

Diverging from the Central Corridor, the Northern Corridor turns northeasterly east of the proposed Interstate 75E toward S.R. 60 through an area generally occupied by scattered groves and residences. Relocation of Providence Church Road, as planned by the Hillsborough County Engineering Department would be necessary in the Expressway Extension project.

Considerable prime commercial land and improvements along S.R. 60, immediately west of Lakewood Drive would be necessary to be taken for the limited access Expressway proposed interchange, and Providence Road relocation. Such takings are assumed to include: Club Venus; Corral Restaurant; a Texaco station; W. K. Jefferys, Inc. model home; E.M.W. Fence Company; Rent and Save Rental Tools; Kings

Automotive; Burnett Real Estate; Mechanical and Chemical Equipment Company; ABC Lounge; Berks Western Supply; Brandon Chrysler-Plymouth, Inc.; and Majik Market and related gasoline station. In addition, approximately 18 acres of potential commercial land and some residences would probably be taken at this location.

Crossing Lakewood Drive, the Northern Corridor route would avoid the K-Mart store and most of a recent development of single-family homes. Several residences in the area of Hilltop Road would have to be taken, especially to avoid acquiring the church and school complex of the Limona Village Chapel of the United Methodist Church located on the southwest corner of Limona and Victoria Roads.

The Northern Corridor crosses to the north side of the Seaboard Coast Line Railroad tracks immediately east of Limona Road where a small convenience store and several residences south of Mook Road would have to be displaced.

Proceeding eastward in the area north of the Brandon High School considerable unimproved land exists west of Parsons Road. Approximately twenty-seven homes in the Brandon Estates Subdivision, the Brandon Veteran's Post and Park Association building, Simmons Child World day nursery, and several other residences and small commercial establishments would probably have to be acquired by a route in this area. Between Parsons Avenue and the proposed eastern terminus at S.R. 60 immediately west of Valrico Road considerable undeveloped land exists, however, a substantial portion of a rather dense residential development east of Kingsway Avenue would have to be acquired. The Church of God at the intersection of Clay and Kingsway Avenues and the school-recreation complex south of the railroad at Kingsway Avenue would be avoided.

It is assumed that Marjory Avenue and Front Street would be improved by the project between Clay Avenue and the frontage road alongside of the railroad tracks.

Preliminary studies considered relocation of the Seaboard Coast Line Railroad tracks in this area along the north side of the proposed Expressway similar to the concept being constructed in Project One from Dale Mabry Highway to Platt Street, but after coordination, correspondence, meetings, and field review with railroad company representatives, the Corridor Study Consultants were advised that it would not be in the Railroad's best interest to continue to consider such a track relocation.

It appears that constructing the Expressway along the north side of the existing tracks would be more expensive in comparison, however, primarily due to the cost of rather long structures over the tracks that would be necessary. Traffic service is also less desirable, as most of the traffic serving Brandon through the Parsons Interchange would have to cross the railroad tracks, if not relocated. Estimates in this Report assumed the railroad tracks would not be relocated.

At the east terminus interchange on the Northern Corridor, some right-of-way would be acquired south of S.R. 60, including a mobile home sales and service to accommodate the "fly-over" type interchange.

Southern Corridor

West of U.S. 41, the connections between the Southern Corridor and the Central and Northern Corridors are possible. From the U.S. 41 Interchange in the area of 12th Avenue, the Southern Corridor turns sharply southward after crossing the Seaboard Coast Line Railroad tracks. South of Causeway Boulevard (S.R. 676), the corridor turns eastward and proceeds generally along 36th Avenue through the proposed interchanges with U.S. 301 and I-75E, veering southeasterly at Providence Road. Between Kings Avenue and Bell Shoals Road, the Southern Corridor would be about centered on a line which would be the westerly extension of Guiles Road,

approximately one-half mile north of Bloomingdale Avenue. East of Bell Shoals Road, the Southern Corridor turns northeasterly to join and coincide with the Central Corridor in the vicinity of Valrico Road. The total estimated length of the Southern Corridor from U.S. 41 to the eastern terminus at S.R. 60 east of Brandon is 12.61 miles.

Between U.S. 41 and Kings Avenue, most of the Southern Corridor consists of undeveloped land at this time. Noteworthy exceptions are:

Concrete products fabricating plant under construction south of 24th Avenue in the vicinity of 54th Street;

Fabricating facilities of American Pecco Corporation in the area of St. Paul Street, west of 54th Street; and

rather dense residential properties between 78th Street and U.S. 301.

All of the above mentioned significant properties are assumed able to be avoided from takings if a route were developed within the Southern Corridor.

The Southern Corridor in the area of Kings Avenue crosses immediately north of Kingswood Elementary School and the South Brandon Recreation Area. Both public facilities are not within the corridor limits. On the east side of Kings Avenue a substantial portion of the Southwood Subdivision lies within the Corridor, affecting approximately forty-one (41) homes.

The Emmanuel Lutheran Church is located on the west side of John Moore Road within the Southern Corridor and would be avoided, if possible. The area between John Moore Road and Bell Shoals Road is generally undeveloped with scattered residences existing. At Bell Shoals Road, the Church of Christ future site and a development by Boyd W. Burley is being constructed within the Southern Corridor.

This entire area is dotted with clumps of old oak trees and remnants of groves. Most of the land is being used for cattle grazing at this time, but development appears eminent.

Between Bell Shoals Road and Lithia-Pinecrest Road several large residences exist. This area contains more dense groves than to the west.

As the Southern Corridor joins the Central Corridor near Valrico Road and Durant Road, the Buckhorn Springs Golf Course located to the southeast is bypassed.

Connectors were developed during the Corridor Study to provide flexibility of alternatives.

Connection between the Central and Northern Corridors near 30th Street (both ways) and across the Palm River are feasible. The Palm River Connector crossing near the mouth of Palm River at McKay Bay is particularly attractive as it traverses an area of relatively low cost and displacement compared to alternative segments in this area.

The Southern Corridor Connector to the Northern and Central Corridors immediately east of I-75E is located in an open area of the same characteristics of all Study Corridors in this area.

recommended corridor

General Conclusions

Subsequent to the presentation of the Draft Report to the Authority and others and following the two Authority-held public hearings, the Consultants studied the public hearing transcripts and other written comments which had been received. Responses were prepared to specific public hearing comments and questions, and where appropriate, acknowledgments were made to letters and petitions received.

Prior to the elimination of any alternative study corridors, the Consultants reviewed and analyzed in considerable detail, the intent and purpose of the proposed project.

It was concluded that optimum traffic service to and through the designated Study Area was of primary importance, but was not the sole factor considered in recommending a single corridor. Environmental, economic, social and engineering factors were heavily integrated into the selection process as important considerations in evaluating alternatives. However, it was recognized that these other factors may detract considerably from the serviceability objective.

The assumption that the Expressway must interchange with the planned Interstate 75 Bypass between proposed interchanges at S.R. 60 and U.S. 301 remains valid. This requirement was one of the primary reasons for the Department of Transportation requesting the Authority to initiate Corridor Studies in January, 1972 and was reaffirmed by Department of Transportation several times in correspondence and at meetings during the proposal and study portions of the assignment.

Consideration was given to the possible recommendation of a foreshortened or "bob-tail" version of the Eastern Extension project. Several specific terminus locations were studied and rejected for the following reasons:

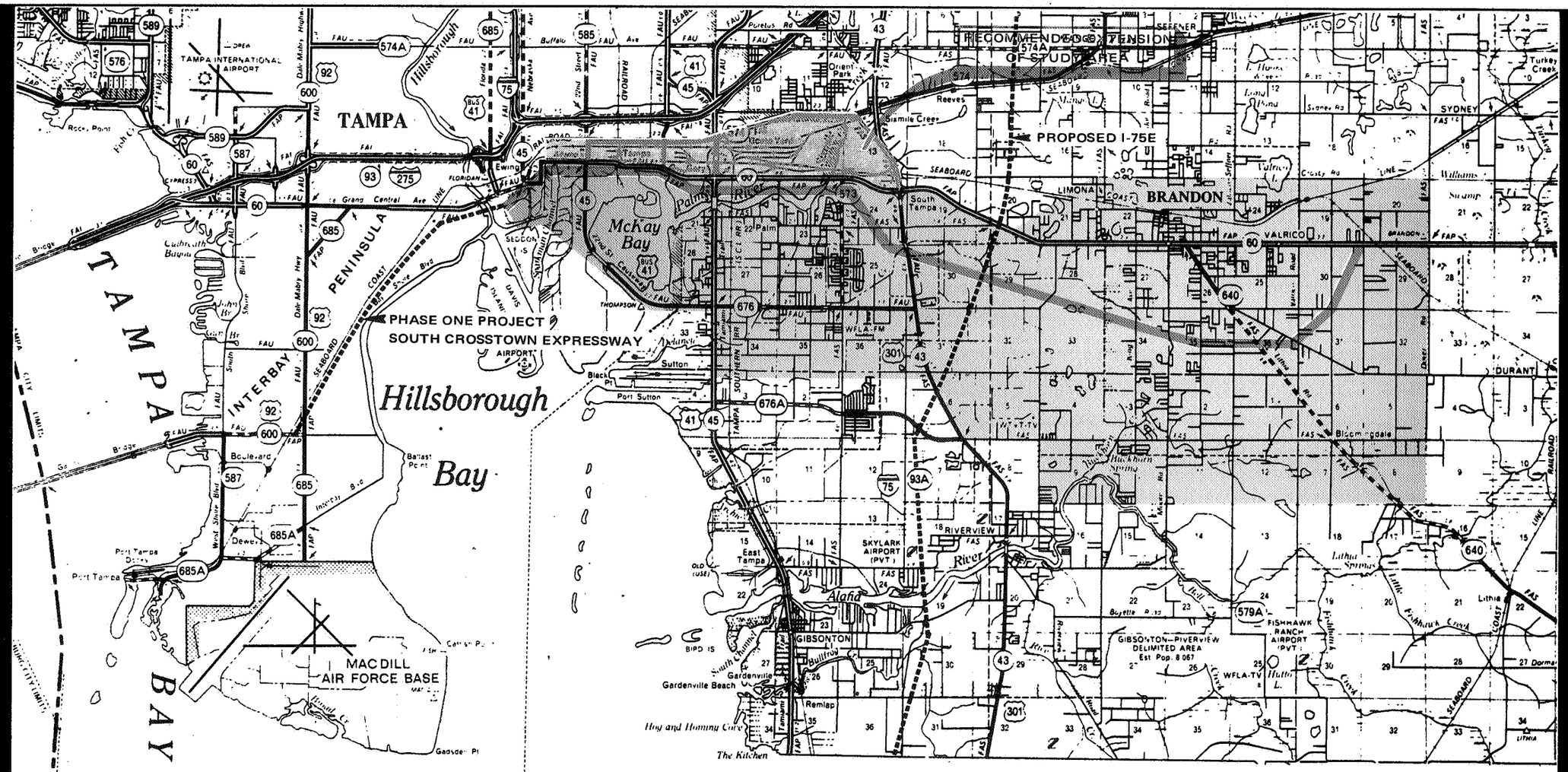
* Traffic volumes projected by the Traffic Engineers for the Corridor Study were of such magnitude along all three basic Study Corridors to substantiate the need for construction of a limited access facility beyond I-75E, through Brandon to an eastern terminus at S.R. 60 beyond the Brandon Central Business District.

* Approximately fifty percent (50%) of the traffic forecast on each of the three study corridors immediately east of I-75E would enter on to or exit from the Expressway in Brandon. The Traffic Engineer's forecasts of this local traffic for the year 2000, which vary from approximately 18,600 vehicles per day on the Southern Corridor to 28,400 on the Northern Corridor, indicated that it would exceed the total capacity of existing local streets and arterial highways, even if those facilities were substantially improved.

It is therefore the Consultants recommendation that the Eastern Extension of the Tampa South Crosstown Expressway be constructed to the prescribed terminus east of Brandon, recognizing that the timing of the actual construction will be contingent upon the availability of funds. This recommendation is consistent with the stated positions of the Florida Department of Transportation, Hillsborough County Planning Commission, Tampa Bay Regional Planning Council, and Tampa Urban Area Transportation Study.

The Consultants systematically eliminated alternative corridors to select the recommended corridor. The sequence of this selection commenced with Ybor Channel alternatives, considered Brandon corridors next, then west of U.S. 41 emphasizing McKay Bay and concluded with the central segment alternatives between U.S. 41 and I-75E. The configuration of the Study Area, the prescribed segments for possible incremental construction, and certain geographic features supported such

CORRIDOR STUDY


TAMPA
TAMPA INTERNATIONAL AIRPORT
PENINSULA
TAMPA BAY
INTERBAY
Hillsborough Bay
McKay Bay
PHASE ONE PROJECT
SOUTH CROSSTOWN EXPRESSWAY
MACDILL AIR FORCE BASE
RECOMMENDED EXTENSION OF STUDY AREA
PROPOSED I-75E
BRANDON
RIVERVIEW
SKYLARK AIRPORT (PVT.)
GIBSONTON
GIBSONTON—RIVERVIEW DELIMITED AREA
Est. Pop. 8 067
FISHHAWK RANCH AIRPORT (PVT.)
SYDNEY
VALRICO
DURANT
Bloomingdale
Alafia River
Little Fishhawk Creek
Gardenville
Gardenville Beach
Remlap
Hog and Hominy Cove
The Kitchen
Port Sutton
Port Tampa
Boulevard
Dewey
East Tampa
Lithia Springs
Lithia
Seffner
Reeves
Sixmile Creek
Palm River
South Tampa
Orient Park
Ybor City
Rocky Point
Cockroach Bayou
Sutton
Black Pt
Ballast Point
Bird Is
Davis Is
Thompson
Seddon Is
Buckhorn Springs
Williams Swamp
Turkey Creek
Little Alafia River
Bullfrog
Dorman
WFLA-TV
WFLA-FM
SEABOARD
SOUTHERN
RAILROAD
CITY LIMITS
Tampa
Brandon
Lithia
Riverview
Seffner
Sydney
Durant
Valrico
Limona
Reeves
Palm

an approach. Salient elements of the recommended corridor selection are summarily presented hereinafter, consistent with the approach and sequence used in the selection process. The remainder of the Corridor Study Report contains detailed summaries of pertinent data.

Ybor Channel Alternates

The Central Corridor crossings of Ybor Channel, utilizing the High-Level Bridge and Tunnel alternatives were eliminated from further consideration for the following reasons:

* Inability to interchange with Kennedy Boulevard at 13th Street on the west and 22nd Street on the east;
* Extremely high initial construction cost and maintenance and operation expenses;
* Apparent adverse environmental and sociological effects; and
* Objectionable aesthetic appearances of a high-level bridge structure to the community and of a tunnel to the motorists.

Alternates East of I-75E

Focusing directly on the area where the greatest public opposition centers, it is acknowledged that any of the three study corridors through Brandon or any other corridor east of the proposed Interstate 75 Bypass will be very controversial and objectionable to certain segments of the community. The method used for selecting a single corridor in this area was to eliminate the most objectionable study corridors, from preliminary engineering, social, and environmental viewpoints, optimizing the single corridor selection.

The Southern Corridor was the least desirable corridor in which to locate the Expressway Extension and was eliminated for the following reasons:

* Poor through and local traffic service;
* Least acceptable interchange location with U.S. 301 and I-75E;
* Highest total project cost ($48.7 million);
* Adverse impact on the natural environment; and
* Projected displacement due to Expressway land acquisition (86 residences) would increase more rapidly due to potential future development.

The Northern Corridor was eliminated east of I-75E, for reasons which were not as obvious as those corresponding to the Southern Corridor, but which were more objectionable than the Central Corridor, including the following:

* High displacement of existing commercial (21 businesses) and residential (116 homes) properties with no significant overriding advantages favoring such acquisition;
* Unavoidable involvement with existing lakes;
* Compounding effect of Expressway related traffic on north-south local streets, and especially on and crossing S.R. 60;
* Unnecessary involvement with the Railroad, when a more viable alternative is available;

- ★ Proximity to more schools, churches and other community facilities;

- ★ More complex interchanges;

- ★ Highest cost per mile ($8 million per mile) compared to other alternatives in this area with the total cost greatly exceeding (by approximately 25%) the Central Corridor.

Therefore, the Central Corridor is recommended east of I-75E as the Corridor Study findings substantiate:

- ★ This Corridor segment provides the most effective traffic service in the Study Area for the least total project cost ($37.8 million);

- ★ It is the most direct corridor;

- ★ The considerable length of the proposed roadway which is to be depressed below the general ground surface will significantly reduce traditional negative impacts;

- ★ Less potential for adverse effect on the north-south streets and S.R. 60 in Brandon will result from the Expressway when compared to the Northern Corridor; and

- ★ An estimated total of 118 residences and no businesses would be displaced east of I-75E.

To optimize this recommended corridor segment, the northern limits have been moved south of Brooker School in the most developed section of this corridor between John Moore Road and Lithia-Pinecrest Road, thus reducing the width of corridor in this area to approximately 1,400 feet or one-quarter of a mile.

The Consultants stress that the findings show that this corridor will have the least long term adverse impact considering all factors.

Alternates West of U.S. 41

Considering the remaining alternatives west of U.S. 41, the special study of locating the Expressway between the railroad tracks directly adjacent to and north of S.R. 60 (Adamo Drive) and 2nd Avenue deserves no further consideration as a Study Corridor since no apparent advantage exists to a comparable segment of the Northern Corridor when considering right-of-way and construction factors. Potential business damages could be extensive from the estimated businesses taken and a conflict with railroad switching facilities can be avoided on another more viable alternative. The required interchange at 22nd Avenue would also be far less desirable and more restricted as extensive lengths of retaining walls would be necessary between overpasses.

Two alternatives remained under consideration in the area between Project One and Ybor Channel. One, the Central Corridor Low Level Bridge Alternate was eliminated considering:

- ★ Clearances violated U.S. Coast Guard requirements;

- ★ Objections of the Tampa Port Authority;

- ★ Comparable displacement to the Northern Corridor; and

- ★ Probable property damages due to loss of ship service north of the crossing may be excessive.

No apparent support from the planning agencies developed during the Corridor Study to encourage selection of this alternative to facilitate redevelopment of the northern limits of Ybor Channel for water-oriented, high density residential or commercial use.

In this area, the emphasis centered on McKay Bay! It must be pointed out that the prescribed Study Area is, for all intents and purposes, completely traversed by the waters of McKay Bay. The Corridor Study clearly confirmed the environmental importance of preserving McKay Bay and its related wildlife habitats. The Consultants' objective is likewise quite clear --- To recommend a corridor where potential negative impacts on McKay Bay can be ameliorated, yet giving due consideration to the many other factors pertinent to corridor location!!

Strict evaluation of alternative McKay Bay crossings indicated the bridge structures studied on the Central Corridor located south of the Incinerator fill would have relatively less adverse impact on McKay Bay proper. However, significant developed property acquisition and related displacement would result from the connection to the Northern Corridor on the west approach to the Bay crossing through DeSoto Park and eastward, especially through the populous northern and southern limits of the Clair Mel City Subdivision.

The Corridor Study confirmed the Florida Department of Transportation Division of Planning comments contained in proposal review comments transmitted to the Authority on January 18, 1973 prior to the Corridor Study that "The omission of a point of ingress-egress with 39th Street will greatly impair the serviceability of these alternates in the sense of traffic relief to S.R. 60." Therefore, the Northern Corridor is recommended in this area specifying that the related south limit of the corridor be located north of Ybor Channel, through the northern limits of DeSoto Park and the extreme upper limits of McKay Bay.

It is strongly recommended that future more detailed engineering and environmental studies on the Recommended Corridor give extensive study toward locating the Expressway more northward to minimize the direct involvement with McKay Bay.

It is further recommended that the present northern limits of the Northern Corridor be extended by the Authority further north than originally prescribed in the Corridor Study between the area of 13th Street and U.S. 301 to permit more flexibility in defining the final recommended route and related interchange.

East of 39th Street, two alternative paths remained under consideration to connect with the Northern Corridor. One, referred to as the Palm River Connector, would have much shorter bridges over Palm River as compared to McKay Bay crossings and Northern Corridor crossings of the Bypass Canal near 78th Street. However, more mangroves would be destroyed on the Palm River Connector than on any other corridor, if it were selected.

Alternates Between U.S. 41 and I-75E

The link between the Northern Corridor west of U.S. 41 and the Central Corridor east of I-75E involved four (4) possible alternatives. Late in the Corridor Study, in response to citizen comments, the Consultants studied an alternative to the Central Corridor which would traverse the southern limits of Clair Mel City just north of Causeway Boulevard. While the displacement of residences would be approximately twenty-five percent less than (150 vs. 200) on the Causeway Boulevard Alternate, as it was referred to, project costs would be approximately 10 percent greater ($3.5 million).

The Consultants eliminated both Central Corridor alternatives through Clair Mel City in favor of a more desirable alternative for the following reasons:

* Extremely high displacement of residences which could be avoided;

* Presently developing subdivisions;

* Restricted interchange configuration capabilities at 78th Street; and

* Close proximity to the residential community including its inherent schools, churches and recreational facilities

The Southern Corridor was eliminated between U.S. 41 and I-75E for the same reasons as used in eliminating the Southern Corridor east of I-75E, but it should be noted that the undesirable features were more pronounced.

Therefore, the Consultants recommend the Northern Corridor west of Interstate 75E to the connection with Project One.

As a result of this preliminary engineering study and preliminary environmental assessment, it is quite clear that this study corridor segment possesses the following engineering and environmental advantages which far exceed the advantages of those of all other Study Corridors:

* Maximum traffic serviceability;

* Best intersection and crossing capabilities of existing streets, highways and railroad tracks;

* Greater existing and proposed land use compatibility with the Expressway, especially the section proposed on viaduct structure;

* Most appropriate interchange locations and configurations;

* The least comparative residential and commercial displacement (only 49 residences and 37 businesses would be acquired over the 8.7 mile length of this segment);

* Relatively shorter design and construction time; and

* Minimum adverse ecological impact on McKay Bay, Ybor Channel and Palm River (Tampa Bypass Canal).

Summary

The Consultants recommend the Northern Corridor as the most viable corridor for the necessary further engineering location studies, traffic analysis and environmental impact determinations. The corridor for which proceeds from Morgan Street on viaduct to a point west of 21st Street, crossing Kennedy Boulevard between the railroad yard and Governor Street, turning eastward southeast of Union Station and paralleling S.R. 60 (Adamo Drive) north of Ybor Channel and Palm River (Tampa By-Pass Canal) between 13th Street and 78th Street, then southeasterly across Palm River Road to join the Central Corridor in the vicinity of U.S. 301 and I-75E north of Causeway Boulevard (S.R. 676). The corridor recommended through Brandon is the modified Central Corridor which turns southeasterly in the area of Providence Road and Lumsden Road, transverses the area between Kings Avenue and Durant Road, generally between DeWolf Road and Overhill Drive, with proposed roadways below general ground level for most of this length, then turning northeastward at Valrico Road to an eastern terminus at S.R. 60 between Miller Road and St. Cloud Avenue.

It is also recommended that the northern limits of the Northern Corridor between 13th Street and U.S. 301 be extended north of S.R. 574 to permit future preliminary engineering design and location and environmental impact studies to pursue development and evaluation of a detail alignment and related interchange that would not infringe on the northern limits of McKay Bay.

The estimated length of the Recommended Corridor is approximately 15 miles. The total estimated project cost is approximately $188 million. An estimated total of 167 residences and 37 businesses would require displacement by right-of-way acquisition, assuming an average route within the Corridor.

It should be recognized, however, if funding conditions necessitate construction in incremental stages, the future segments could very well be susceptible to increased costs and development of open lands, if steps are not taken to control these problems. The Authority should endeavor to preserve the land area within the approved corridor from further development by urging appropriate City and County agencies to initiate and enforce development controls on building and zoning requests until specific areas of properties are eliminated from further consideration.

PROJECT DESCRIPTION

general

The eastern leg of the South Crosstown Expressway is proposed to be designed and constructed in accordance with the latest standards for modern toll expressways.

Design criteria and policies established by the American Association of State Highway Officials (AASHO) and the Federal Highway Administration (FHWA) for Interstate Highways in Florida, and the Florida Department of Transportation will be followed with modifications only when required to meet specific needs of this facility.

Particular attention will be directed toward safety aspects, economics of construction, services to patrons and maintenance and operation. Special consideration must be given to the impact on the environment and on the community as a whole.

The Expressway is assumed to be limited access for the entire length of the project and should be appropriately fenced. Access and egress will be provided by certain interchange movements at carefully selected locations with grade separation structures proposed at other selected highways, streets and railroad crossings.

Toll plazas will be strategically located on the Expressway and on certain ramps to efficiently collect fares from all users, thus not permitting any free use of this proposed Expressway.

roadway

The proposed Expressway roadway configuration generally consists of a six-lane divided highway transitioning from four lanes at the east terminus of the Phase One Project to the proposed Jefferson Street-Cumberland Avenue Interchange.

On the Southern Corridor east of U.S. 41 projected traffic indicates only four lanes are necessary initially. East of the proposed I-75 Bypass Interchange to the eastern terminus at S.R. 60, the Expressway, if constructed within any Study Corridor, would be a four-lane, divided toll road.

All medians proposed initially on any Corridor are 88 feet wide except in the downtown viaduct areas where the width between structures will be 23'-2".

These wide medians will be sufficient for the construction of additional lanes and/or special use such as mass transit, if future demands warrant and funds are available.

The basic mainline design speed criteria should be 70 miles per hour except in the downtown area where it should be a minimum of 50 miles per hour. The maximum horizontal curvature anticipated on any Study Corridor will be 3 degrees in the 70 mph segments and 6 degrees in the 50 mph portion. The maximum vertical grade anticipated will be 3 percent, except on the tunnel crossing alternative at the Ybor Channel, 4 percent grades would be necessary.

Flexible pavement is recommended as opposed to rigid pavement (concrete) for initial cost savings and to reduce highway noise. The roadway surface should be skid resistant asphaltic concrete as recently prescribed by the Florida Department of Transportation.

All design features and criteria are anticipated to be in accordance with AASHO and Florida's Department of Transportation design policies and would exceed the criteria of the Phase One Project.

interchanges

The Expressway will interchange with several major intersecting

streets and highways, either existing or planned, to efficiently serve through and local traffic. Interchange configurations will be of the highest type practical for each location to permit the safe, orderly and expeditious movement of traffic. The interchanges should permit through Expressway traffic to proceed without interference through the interchange areas and will include well designed ramps, speed change lanes and grade separation structures. Crossroads should be constructed to the ultimate practical planned typical section within the interchange areas and transitioned to meet existing pavements and right-of-way at points where existing roads can accommodate the additional traffic or other programs can continue further improvements. All interchanging crossroads are commended to be included in the State Road System for maintenance and further improvements.

The interchange locations on the Study Corridors are tabulated herein. Schematic layouts are shown on the Plates accompanying this Report. Locations, preliminary configurations and ramp toll collection requirements were determined from preliminary traffic data furnished by Wilbur Smith and Associates, Traffic and Revenue Engineers, retained by the Authority.

It should be recognized that the assumed locations and layouts are determined in the Corridor Study for the purpose of evaluation of alternative corridors for selection of the recommended corridor and related preliminary cost estimates. Additional required engineering and traffic studies may require significant revisions. Toll collection requirements and little or no projected traffic demands have resulted in elimination of some possible locations and movements from further consideration.

The study with respect to interchanges has resulted in several pertinent conclusions which are:

Jefferson Street-Cumberland Avenue Interchange - Due to emerging redevelopment of the southern portion of the downtown Tampa Central Business District and proposed development of Seddon Island, interchange ramps to and from the east, with toll collection, are necessary to serve projected traffic demands.

Kennedy Boulevard (S.R. 60) - Jackson Street Interchange - Physical restrictions require ramp toll plazas to be proposed on ramp structures on the Northern Corridor.

Central Corridor Interchanges in the Areas West and East of Ybor Channel - Due to vertical clearance requirements of the U.S. Coast Guard at the Ybor Channel, interchanges in the vicinity of 13th Street and 22nd Street are impractical on the high-level bridge and tunnel alternative segments on this Study Corridor. However, the low level bridge alternate segment provides for those interchanges.

39th Street Interchange - Due to large traffic demands on the Northern Corridor, an interchange at this location is necessary. A portion of the interchange and necessary relocation of Adamo Drive (S.R. 60) eastbound lanes may require construction within the northernmost limits of McKay Bay.

U.S. 41 Interchange - The study indicates the Expressway, if constructed within the Northern Corridor at U.S. 41 (50th Street), would greatly reduce present and future traffic congestion at the intersection of S.R. 60 and U.S. 41 (50th Street). Therefore, the previously planned grade separation, interchange ramps and frontage roads should not be constructed

in that event. Minor intersection modifications could be made now at this location to improve traffic flow.

Construction of both S.R. 60 improvements and Expressway Extension Interchange in such close proximity would be inadequate to function properly. If the planned S.R. 60 improvements are constructed prior to the Expressway Extension along the Northern Corridor in this area, only a grade separation of the Expressway over U.S. 41 would be practical without interchange ramps.

U.S. 301 - I-75E Interchanges - Tampa-Interstate 75E traffic to and from the south is projected to use U.S. 301 between the Expressway Extension Study Corridors and the approved I-75E-U.S. 301 Interchange. Directional movements are provided for these major movements at U.S. 301 except on the Southern Corridor where the close proximity of such ramps requires a less desirable loop ramp. Relatively simple interchange movements (alternate quadrant loops and direct returns without tolls) are necessary at the Expressway on I-75E. On the Southern Corridor full movements can be accomplished in all directions utilizing the ramps proposed at U.S. 301, I-75E and Expressway. Due to the limited access requirements of these three major highways, the triangular shaped property resulting within the confines of these highways would be severed from access. Acquisition in lieu of damages may provide an area suitable for use as a borrow pit and landscaping storage area and a retention area which ultimately could have further Expressway related use.

Limona Road - Victoria Street Interchange - An eastbound off-ramp was added in the Northern Corridor late in the Study to help relieve the Parsons Avenue ramp to better serve the Brandon Area.

Kings Avenue Interchanges - Projected traffic volumes indicate little demand for future ramps to and from the east at these locations of the Central and Southern Corridors. However, unforeseen growth may develop such a demand. Therefore, initial right-of-way acquisition should acquire sufficient land for these ramps, with toll collection provisions.

CORRIDOR STUDY

NORTHERN CORRIDOR	CENTRAL CORRIDOR	SOUTHERN CORRIDOR	RECOMMENDED CORRIDOR
Jefferson St.-Cumberland Ave.	Jefferson St.-Cumberland Ave.	Same as Northern or Central Corridors	Jefferson St.-Cumberland Ave.
Kennedy Blvd.-Jackson St.			Kennedy Blvd.-Jackson St.
22nd Street			22nd Street
39th Street			39th Street
U.S. 41 (50th Street)	U.S. 41 (50th Street)	U.S. 41 (50th Street)	U.S. 41 (50th Street)
78th Street	78th Street	78th Street	78th Street
Palm River Road			Palm River Road
U.S. 301	U.S. 301	U.S. 301	U.S. 301
Interstate 75E	Interstate 75E	Interstate 75E	Interstate 75E
S.R. 60 (West of Brandon)			
Limona Rd.-Victoria St.	Kings Avenue	Kings Avenue	Kings Avenue
Parsons Avenue	Bell Shoals Road	Bell Shoals Road	Bell Shoals Road
East Terminus at S.R. 60	East Terminus at S.R. 60	East Terminus at S.R. 60	East Terminus at S.R. 60

INTERCHANGES

proposed locations

soils

The United States Department of Agriculture, Soil Conservation Service has studied the soils in Hillsborough County to help in the agricultural resources of the area. Their findings and recommendations have been published in a report called "Soil Survey Hillsborough County, Florida." An updated report, "Supplement to the Soil Survey Hillsborough County, Florida," is concerned with the problems of soil and water resources development as it relates to land-use planning. Information from these two reports, plus additional information provided by local Soil Conservation Service personnel, have been used to analyze the soil conditions in the Corridor Study Area.

The Consultants are primarily concerned with the strength and drainage characteristics of the soil. These characteristics influence the type and size of structural footings, amount of unsuitable soil excavation, amount and type of artificial drainage; stability of slopes, and many other engineering features. A complete soil survey with adequate soil borings should be made prior to preparation of engineering plans to correctly determine the characteristics of the soil along the selected corridor.

Soils tests will also reveal the condition of the existing hydraulic fill areas around McKay Bay. Fill material in these areas was dredged from the bay and Palm River. The fill material is a heterogeneous mass composed of sands, silt sands, clayey sands and lumps and seams of cohesive soils of clay and silt. The occurrence of cohesive soils, requires special compaction procedures and certain areas may require excavation of unsuitable material. Recommendations from the testing laboratory would determine the best method of handling this material.

Soils may be arranged according to several different classifications. The AASHO Classification is used by most highway engineers and is based upon the engineering characteristics and performance of subgrade materials. This system is divided into eight basic classifications, A-1 through A-8 with subdivisions in each classification. Those designated A-1, A-2 and A-3 are the coarse-grained soils, such as gravel, sand and mixtures of sand and gravel. The next two classifications, A-4 and A-5, are the predominantly silty soils. The A-6 and A-7 classifications included the clayey soils while the A-8 classification refers to peat and mucks. Based on Florida Department of Transportation standards, selected classes of materials can be used in specified areas for roadway embankment.

Movements and retention of water in the soil are important engineering properties and can be divided into four distinct groups for the Study Area. The first are well drained soils with no water problems where the seasonal high water stays three feet or more below ground surface. The second are high water table soils where water comes to the surface during periods of heavy rains, causing some flooding. The third group are very wet soils with extended periods of high water at surface level or above. This group has frequent flooding for long periods of time. The last group has very wet soils and is usually under water. The soils in this group can have areas of peat and muck except those in tidal areas. These four groups are shown in the two exhibits on soils at the end of this section.

The first well drained soils of the group are composed of Arredondo, Blanton, Eustis, Fort Meade Loamy, Gainesville Loamy, Lakeland, Orlando and Pomello fine sands. These sands have very high permeability rates (6.3 inches per hour) which enables them to absorb water rapidly. These soils have enough natural drainage to be used intensively with only minimum artificial drainage required. Soils of this group are a fair to good source of roadway fill having the A-2, A-3 and A-2-4 classification. These soils are comprised of loose sands and are highly erodible in steep cuts.

The Northern Corridor from Mile Post 9.4 easterly through Brandon contains approximately 85% of this type of soil. This is the only area, except for isolated spots, that these soils are found in this Corridor.

The Central Corridor from Mile Post 9.0 easterly to its terminus contains approximately 85% of this soil group. The Southern Corridor contains approximately 38% of this group from Mile Post 6.0 to 11.7.

The second group with high water table characteristics consists of Bradenton, Keri, Leon, Ona and Ruskin fine sands. Sands of this group have permeability rates up to 6.3" per hour and have infrequent to frequent flooding potential. Flooding occurs because a layer or pan of clay is usually found from 12 to 30 inches below the surface. This layer reduces the rate in which water can flow through it and causes a high water table. These soils are a fair source of roadway fill, being composed mainly of the A-2, A-3, A-2-6 AASHO grouping. These soils are the predominate group for all three Study Corridors. The Northern Corridor, from east of McKay Bay to its eastern terminus, contains approximately 51% of this grouping with 78% in the section from McKay Bay to I-75. The Central Corridor, from east of McKay Bay to S.R. 60, has 41% with 75% from east of McKay Bay to I-75. Fifty-one percent of the Southern Corridor is located on this type of soil with 83% between the western terminus and I-75.

The third group is very wet and is composed of Alachua, Charlotte, Delray, Manatee, Plummer, Pompano, Rutlege and Scranton fine sands. These soils are fair to poor as a roadway fill, being mostly of A-6 and A-4 with some A-3 and A-2 classifications. Flooding occurs more than once each year in these areas and often remains longer than six months. The water table is very shallow, from 0 to 15 inches below the surface for long stretches of time. Areas of this group are located in all three corridors, mostly small in size. They are located in low areas mostly associated with natural water courses.

The last group consists of fresh water swamps, shallow ponds with grass, and tidal marshes and swamps. These soils occur near McKay Bay, near low flat lands, and near natural streams, waterways and lakes. Excavation of these materials to certain depths, would be required to insure a proper foundation for the roadway and for the bridge and other related structures. This group is composed mostly of A-7 and A-8 materials, not usable for roadway fill except in special limited applications.

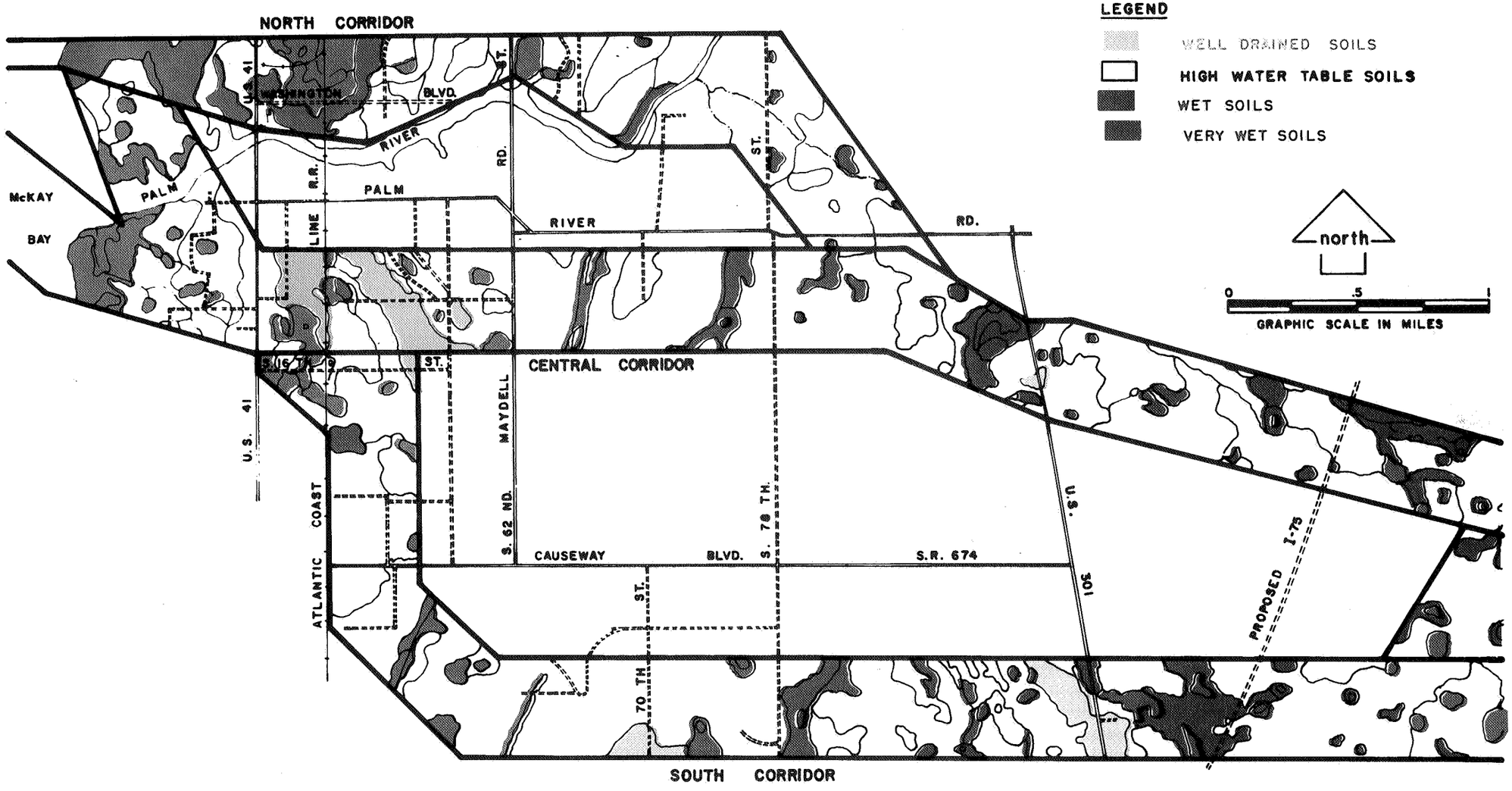
Northern Corridor

The section from 34th Street to U.S. 41 has poor soil, mostly of the fourth group. Much subsoil excavation would be required in this area. From U.S. 41 to U.S. 301 most of the soil is of the second group characteristics, with some patches of the third and fourth group. The North Corridor merges with the Central Corridor in this area and then swings north from the Central Corridor east of the I-75 interchange. Except for isolated areas, this section has excellent soil conditions of the group one characteristics.

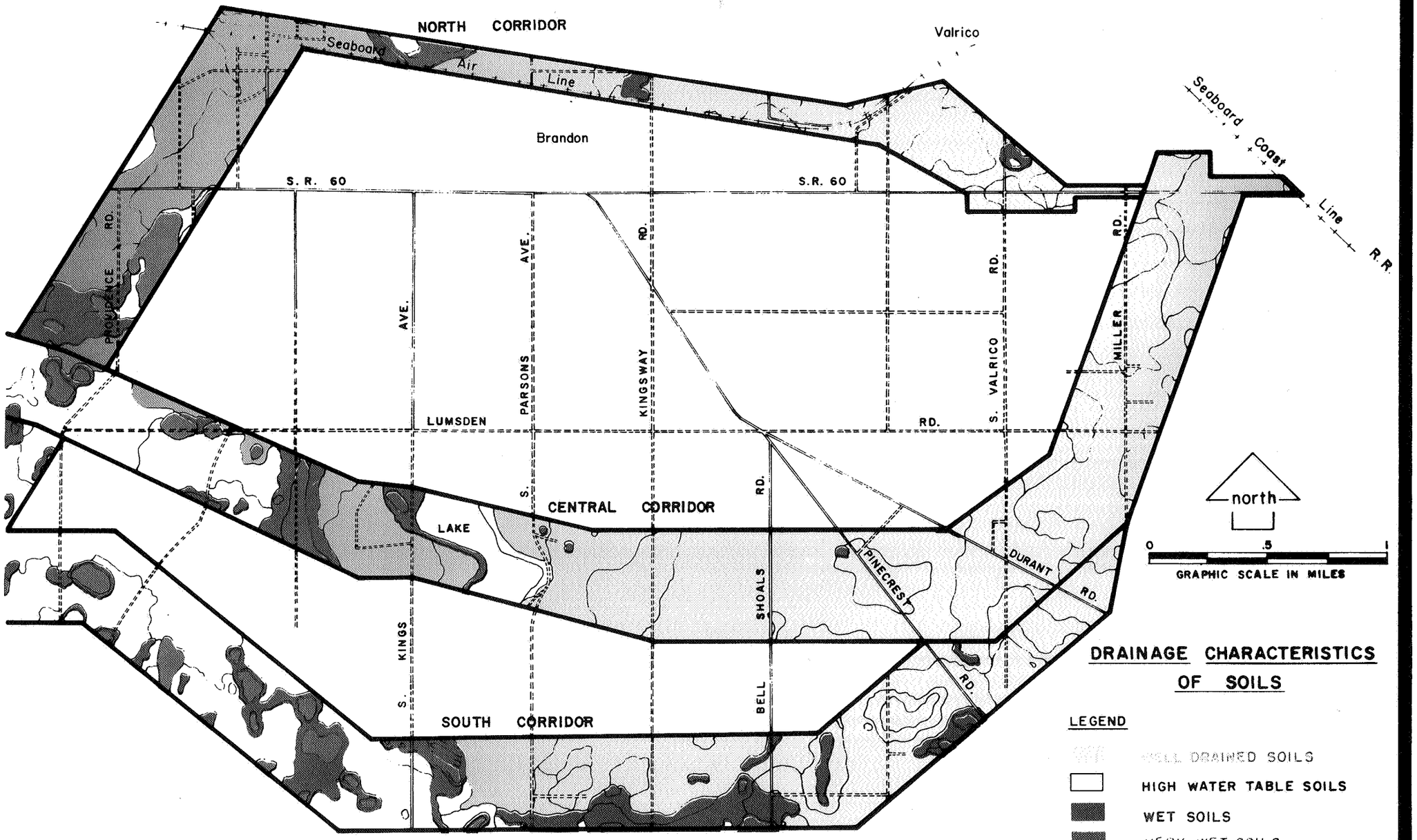
Central Corridor

East of 34th Street, the corridor crosses a sanitary landfill on its approach to the McKay Bay crossing. This landfill should not affect the Expressway since it will be on structure throughout this area. On the east side of McKay Bay a small area of unsuitable material will require some subsoil excavation. From U.S. 41 to I-75 the soils are generally of the group two category. The area does contain several large sections of group three material where frequent flooding occurs. These areas are located near Mile Posts 4.7, 5.0, 6.5 and 7.7. Other similar areas occur between I-75 and S.R. 60 at Mile Post 8.4, 8.8, 9.3, 9.9 and 10.7. The section from Mile Post 11.0 to the eastern terminus consists chiefly of excellent soil of the type one group.

DRAINAGE CHARACTERISTICS OF SOILS



CORRIDOR STUDY



SOILS B

DRAINAGE CHARACTERISTICS OF SOILS

LEGEND

- WELL DRAINED SOILS
- HIGH WATER TABLE SOILS
- WET SOILS
- VERY WET SOILS

Southern Corridor

From the western terminus to U.S. 301, the soil characteristics are mostly of the type two with several areas of group three and four located near Mile Posts 0.2, 0.8, 1.7, 2.7 and 3.9. From U.S. 301 to Kings Avenue, areas of poor soils are located near Mile Posts 4.5, 5.9, 6.3, 7.1 and 7.5. From Kings Avenue to the eastern terminus principally excellent group one soils with only small segments of moderately bad material.

Summary

Soil conditions from Florida Avenue to 22nd Street are approximately uniform for each Study Corridor. Since most of this section is on structure with relative little choice of location, any soil variation, will be of little consequence to the corridor choice.

From 22nd Street to U.S. 41 areas of very poor soils occur on the Northern Corridor and on the Palm River Connector, Plates 47 and 48. These areas will require much subsoil excavation and the replacement of these soils with suitable materials. The Central Corridor, in this section, crosses mostly group one soils except those areas directly adjacent to McKay Bay.

The three Corridors have very similar soil characteristics from U.S. 41 to the Brandon area consisting mainly of group two soils with areas of group four. The Northern Corridor will require the least unsuitable material excavation in this section with the Central and Southern requiring slightly more.

The Brandon area, on all three Corridors, has excellent, well drained soils with high permeability rates. Very little artificial drainage, storm sewers, manholes, inlets, etc., will be required in this area. Ditch and canals will have to be protected by grassing, sodding or ditch paving due to the highly erodable materials and the steeper slopes of the terrain.

In general, the lowest quality soils of any significant quantity are located near McKay Bay in the Northern Corridor and on the Palm River Connector. These areas will require much excavation of unsuitable soils and backfilling for proper compaction. Other areas in the Corridors will require some replacement of unsuitable materials, but quantities may be reduced by shifting the Expressway within the limits of the Study Corridor.

drainage

Highway drainage costs are neither incidental nor minor on most roads in Florida. Costs may range up to 25 percent of the total construction cost for urban drainage facilities, while those on rural highways are usually less expensive. In urban areas, and in suburban areas where space permits, side ditches and median ditches are used to collect the runoff and then carry it to the receiving streams. These ditches must have adequate capacity for the design runoff and must be shaped to avoid creating a hazard to traffic.

Drainage design for the selected corridor will be based on a 10-year frequency storm for the major portions of the route and a 50-year storm for depressed sections on the Central or Southern Corridors. Major cross drains will also be designed for the 50-year frequency storm or the maximum storm of record. The design will be compatible with the applicable regulations of the Florida Department of Transportation, Hillsborough County, City of Tampa, and the Southwest Florida Water Management District (SWFWMD).

Hillsborough County and the City of Tampa are requiring, in many areas, that no additional runoff be discharged into existing receiving streams. This regulation necessitates the construction of retention basins or percolation pits to handle the increased runoff due to a higher coefficient of runoff or channelization of flow. These basins will be designed for a 25-year, 24-hour rainfall with protection to a 50-year, 24-hour rainfall.

The basin will be large enough to store the peak discharges and to have a maximum discharge volume equal to or less than the existing hydraulic conditions. These areas can also function as detention and sedimentation basins for erosion and sediment control as outlined in the American Associations of State Highway Official (AASHO) publication, "Guidelines for Erosion and Sediment Control in Highway Construction." Other erosion control features will include:

Ditch slopes compatible with soil properties;
Grassing, sodding or other protection for all areas;
Control concentration of runoff;
Making stream crossing as close to ninety degrees as practical; and
Roadway grades which fit the terrain with a minimum of cuts and fills.

Retention basins will be designed to have flat side slopes and be landscaped with trees and bushes. Landscaped areas will also help control the amount of nutrient runoff by the consumption of the nutrients (phosphate, nitrate and potash) by the root systems of fast growing trees and shrubs.

Land use and soil type greatly affect the hydraulic design. These factors are used to determine the coefficient of runoff for calculating the discharge based on the Rational Method of analysis. This method is an empirical formula relating rainfall to runoff. Highly developed areas such as the Tampa central business district, have high coefficients of runoff while swampy-flat lands have low coefficients. The viaduct section of the Northern and Central Corridors in the downtown area have approximately the same runoff characteristics as the existing conditions with high runoff rates and storm waters can be put directly into existing storm sewer systems. Undeveloped areas with present low runoff rates will require the storage of increased runoff from the Expressway.

The U.S. Geological Survey (U.S.G.S.) on their "Map of Flood Prone Areas Brandon, Florida" designates much of the area between Delaney Creek - U.S. 301 and John Moore Road as a flood prone area. This area has a 1 in 100 chance of being inundated during any year. These flood boundaries were determined from photographs taken during a time of flooding, profiles based on highwater marks, regional stage frequency relations, soils maps, photographic interpretation and other indirect information. Soils maps indicate that much of the area has extended periods of highwater table at ground elevation or even above. The Expressway grade in these flood prone areas will be set to have a minimum vertical clearance of three feet between the bottom of the pavement base and the design high water. The design high water is based on existing and future conditions, frequency and duration of high waters, size of drainage area and area affected; it is not, necessarily, the highest elevation on record. High water elevations along Delaney Creek during the June, 1974 storms, were determined by the Hillsborough County drainage engineer and furnished to the Consultants.

There was considerable flooding in the Clair Mel City area from the June storm. Waters did not overflow the Delaney Creek bank, but many of the streets in the area below this elevation causing the water to back up in the storm sewer systems. Hillsborough County is in the process of acquiring a 200-foot strip of right-of-way for a Delaney Creek Pop-Off Canal to help alleviate this drainage problem, but the actual design and construction is an indeterminate time in the future. This area has a major drainage problem, and the design and construction of the Pop-Off Canal should be initiated as soon as possible.

Cost estimates for the corridors were made by making a preliminary drainage design based on available information and field observations. Available information consisted of City of Tampa drainage atlases, Florida Department of Transportation drainage maps, U.S.

Geological Survey maps of flood prone areas, Southwest Florida Water Management District contour maps of the Alafia River Basin and Brandon area, City of Tampa and Hillsborough County proposed works, and discussions with the drainage engineers of the appropriate agencies. Design for similar sections in each corridor were based on the same hydraulic criteria.

Northern Corridor

The viaduct section of the Northern Corridor, Plates 29 and 30, will cause minimal disturbances to existing storm sewer systems. This section of the project is proposed to be constructed all on structure (viaduct). Roads and rights-of-way can be spanned with existing systems undisturbed. Footings for piers can be located so that most storm sewers not located in the streets can still be missed. Several major drainage structures effect the cost on Plate 31. The City of Tampa has plans for a drainage outfall system along 29th Street as part of the Model Cities Program. This outfall system will head south and go under S.R. 60 just west of the railroad tracks near 29th Street. It is designed to be a triple 10' x 6.25' box culvert, replacing a double 10' x 6' box culvert. The system turns east and parallels the south right-of-way line of S.R. 60 with a paved ditch and a new bridge at 34th Street then discharges into McKay Bay east of 34th Street. Design discharge for this system at a point approximately 500' west of 34th Street is 2,450 cubic feet per second (cfs). This system would have to be carried under the Expressway either by a box culvert or a bridge. In the same area there are three other box culverts, 8' x 4', 12' x 6' and double 10' x 5', plus several large round pipes across Adamo Drive from the north to the south. Large structures under the Expressway will have to be provided to handle the flow from these cross drains. These structures will have to be at least the same size as those existing and probably a larger size will be required. The Delaney Creek crossing, Plate 33, will require a bridge due to the proposed enlargement by Hillsborough County. Their design calls for a 200 foot right-of-way with a channel of 150 feet width across the top. The cost of this bridge is included in the estimated structure costs. Other non-typical hydraulic considerations occur on Plates 35 and 36. These areas in Brandon have few natural drainageways, requiring most of the water off of the Expressway to be retained on site. Most of the soil in this area is made up of well drained sands with the water table more than three feet below ground elevation even in periods of heavy rains. These sands have high percolation rates and are perfect for the construction of percolation pits.

Central Corridor

Drainage design for the Central Corridor in the central business district, for the high level and low level bridge is basically the same as the Northern Corridor's viaduct section. Drainage cost for the tunnel alternate are included in the structure cost for the tunnel itself. The Central Corridor, on Plate 15, by-passes the concentration of large drainage structures that occur on S.R. 60 between 29th Street and 50th Street. Plates 16 and 17 contain many existing drainage canals that are adequate for receiving the runoff from the Expressway. These canals are tributaries to Delaney Creek and would require the retention of the increased runoff caused by the Expressway before discharging into the canals.

Plates 17 and 18 have many large ditches that intersect the Expressway which will require the construction of box culverts or multiple pipes. Lumsden Road is now being extended by Hillsborough County from Kings Avenue to the Providence Road-Causeway Boulevard intersection. They are constructing triple 48" culverts under Providence Road and Causeway Boulevard. No cross drains are to be constructed under Lumsden Road and all runoff flowing from the south to the north will pass through the triple 48" culverts. This runoff will all pass through the Expressway corridor in the north-south canal approximately 1,400' west of Providence Road and will require at least a triple 48" cross drain.

Major drainage items on Plate 19 include structures at the Lumsden Road overpass to accommodate large side ditches on Lumsden Road.

Plate 20 contains a proposed depressed section beginning between John Moore Road and Bryan Road. Special consideration will be given in this section to avoid deposition of sediment and debris on the highway and in drainage facilities. Headwaters of a tributary to Delaney Creek are located between Kings Avenue and John Moore Road. These headwaters can be the receiving stream for the Expressway runoff after flowing through retention-percolation basins to handle the peak discharge. Plates 20 and 21 have well drained soils, good for retention-percolation areas.

Southern Corridor

The Southern Corridor drainage is very similar to that of the Central Corridor. Increased runoff will be retained to reduce peak volumes and then discharged to the receiving streams. Plate 40 shows the proposed location for the Delaney Creek Pop-Off Canal. A bridge will be required for the canal and the cost is included in the estimated structure costs. Generally, smaller drainage structures are required on this Corridor, Plate 41, than the similar area on the Central Corridor because it is nearer to the ridge line dividing the Alafia River Basin and the Delaney Creek Basin. Runoff in much of this area can flow either way depending on the weather conditions.

A proposed depressed section on the Southern Corridor begins east of Bell Shoals Road and will be designed similarly to the Central Corridor, but discharging into Buckhorn Creek instead of Delaney Creek.

structures

The evaluation of alternative corridors involved analysis of bridge alignment and configurations in sufficient detail to determine estimated construction costs for each of the corridors.

The latest edition of the AASHO Standard Specifications for Highway Bridges will govern the design of all structures on the Expressway. Individual loadings for individual structures will be determined in a future report or design criteria manual.

The design and construction of the bridges on this extension of the South Crosstown Expressway System, where applicable and practical, will adhere to the recommendations of Florida's Bridge Beautification Committee, which is chaired by Mr. Tom Alberdi, Jr., of the Florida Department of Transportation. This means, as far as appearance is concerned, that the handrails will be parapet type as were those on the Phase One project, pier caps will be partially embedded within the depth of the superstructure, and the number and size of pier columns will be kept to a minimum to eliminate massiveness. Vertical clearances will be planned to provide as much head-room as practicable to give a lighter, more open effect and still maintain reasonable fill heights. Other recommendations by the Committee, such as good proportions and simplicity, will be adhered to, all with economy as one of the primary considerations.

Basically, the bridge decks will be supported by standard AASHO prestressed concrete beams. Where this is impractical or impossible, studies will be made to determine the most feasible framing. Usually this will be built-up steel plate girders, but individual situations will dictate.

Where it becomes necessary for a bridge to carry utilities, the cost for the required structural support is included with the bridges.

The latest Interstate Standards will control bridge widths. Refer to Plates 8 and 9 for Typical Structure Sections. Horizontal and vertical clearances under bridges will at least meet and sometimes exceed the minimum required by the railroad company or governmental agency involved.

Downtown Viaduct

The Expressway, from the terminus of Phase One in downtown Tampa to a point east of Ybor Channel, is recommended to be elevated roadway with the one exception of a tunnel alternate under Ybor Channel in the Central Corridor. Overhead, viaduct-type construction emerges as the only reasonable alternative due to the many street and railroad crossings, expensive rights-of-way and multitudinous utility conflicts. A major advantage will be the lessened impact on the community due to the potential use of space underneath the viaduct for city parking lots, parks, or other convenient uses. On the Northern Corridor, the viaduct will go around the north end of Ybor Channel, ending at 19th Street, terminating just west of the 22nd Street interchange. On the Central Corridor, the viaduct will end at 19th Street with a low level Ybor Channel crossing and at 26th Street with a high level crossing.

Ybor Channel Crossing

In the Central Corridor, three alternatives for the crossing of Ybor Channel were studied: a low level bridge; a high level bridge; and a tunnel.

The low level bridge would be a continuation of the downtown viaduct, rising slightly in elevation to obtain a vertical clearance of 40 feet above mean high water (MHW). This is similar in height to the Phase One bridge crossing over the Hillsborough River. Advantages associated with this alternative are that it provides the capability for access to the project by ramps at Kennedy Boulevard and 22nd Street, and the fact that it would have the lowest construction cost of the three alternatives. The major disadvantage is that shipping would be cut off from upper Ybor Channel.

The elevation of the high level bridge over the channel would have to provide a vertical clearance of 135 feet above MHW, similar in height to the Sunshine Skyway Bridge over lower Tampa Bay. This alternate would enable shipping to continue, but would eliminate the capability of access to the project by Kennedy Boulevard and 22nd Street.

The tunnel alternative would necessitate starting down on a negative grade immediately after crossing Cumberland Avenue, going below grade between Jefferson Street and Nebraska Avenue, continuing down until profile grade reaches approximately 59 feet below mean low water. East of the Channel, the roadway would ascend and emerge just beyond 26th Street. At each end, the depressed roadway would be protected by retaining walls until the walls attained a height of approximately 30 feet. The remainder, a length of about 5,500 feet, would be tunnel.

The construction of the tunnel would be similar to that of a large double concrete box culvert with three traffic lanes provided each way. The top and bottom slabs at the Channel, where the hydrostatic pressures would be greatest, would be about 5 or 6 feet and the sidewalls about 2.5 or 3.0 feet thick. Concrete thicknesses would decrease as over-burden pressures decrease, but provision would be made for ventilation, lighting, removal of water, etc., throughout. Construction at the channel might be accomplished by the segmental cofferdaming to minimize the disruption of shipping. Between the channel and the retaining wall sections, mining methods might possibly be used, which would necessitate extensive tunneling and shoring.

The grades of Nebraska Avenue and 26th Street near the east end of the tunnel would have to be raised 10 to 15 feet and bridges added to cross the depressed Expressway at those points. Jefferson Street in downtown would also need realignment, either vertically or horizontally.

Advantages of the tunnel would be that shipping in Ybor Channel would not be affected except during construction and that for over a mile the Expressway would be hidden from the view of the community. Major disadvantages would be the high cost; the elimination of the capability for access to the project by ramps at Kennedy Boulevard and 22nd Street; the motorist's experience of the unpleasant feeling of confinement in the tunnel; and the unpleasant high noise level. Additionally, it may be necessary to use grades that are steeper than desirable.

Bridge Drainage

On the downtown viaduct and on some of the longer bridges, it will be necessary to provide drainage systems to remove storm water from the bridges to the storm sewer system in the area. This drainage system for the bridges over waterways such as Ybor Channel, McKay Bay, and Tampa Bypass Canal will consist simply of scuppers draining directly into the waterway. Bridges over streets and highways will have a system that will allow water to be drained from the bridge deck to ground level, or to an underground storm sewer system, in a manner that will be functional and aesthetically pleasing. The structure cost estimates include bridge drainage.

Substructures

The structural foundations for bridges were studied using existing data. Final design will require extensive additional subsurface exploration and evaluation.

In the downtown area, it may be possible to place some piers on spread footings, and allowance for this was included in the cost estimates. From Ybor Channel to the vicinity of 78th Street, analysis of old bridge borings in the area indicate that piling will probably be necessary. Limited information is available from 78th Street eastward to Brandon other than data presented in the soils section of this Report. The indications are that piling will be the proper foundation support in this area.

The bridges over McKay Bay, Tampa Bypass Canal, Delaney Creek and the proposed Delaney Creek Pop-off Canal, were planned for simple pile bents as intermediate supports. These are economical and over the years have proven to be very satisfactory in all areas of Florida.

utility adjustments

Adjustments to utilities are required in the interest of safety and for the protection and utilization of both the Expressway and the utility involved. Studies were made to determine the total cost of all required adjustments, not just those that are a direct expense of the Expressway Authority, as utility adjustment cost borne by the utility companies will probably be passed on to the public through rate increases.

Utility companies were advised of the corridor routes and asked to submit locations of their utilities in these areas. Information received from these companies was used to make a preliminary evaluation of the extent of the conflicts within each corridor. The following companies were contacted regarding this information: Tampa Electric Company, General Telephone Company of Florida, City of Tampa Water and Sewer Departments, Central Florida Pipeline Corporation, Peoples Gas System, Florida Gas Transmission Company, Brandon Water and Sewer Company, Inc., and other County franchised utility companies.

Adjustments made to public owned water supplies and sanitary sewer facilities, due to the construction of the Expressway, will be made or reimbursed by the Expressway Authority. Modifications to other utilities located in public rights-of-way or other areas dedicated for public use will be accomplished by the utility companies themselves. Utilities located on property in which they hold a compensable interest, will be reimbursed by the Expressway Authority for modifications that are required due to Expressway construction. Betterments installed solely for the benefit of the utility company such as larger size lines, service improvements, etc. will not be eligible for Expressway monies.

Utilities will conform to the requirements of the Expressway Authority, State of Florida Department of Transportation's "Utility Manual," the American Association of State Highway Official's "A Policy on the Accommodation of Utilities on Freeway Rights-of-Way," and other applicable regulations.

Utility lines will be designed so that they can be serviced from outside of the limited access line. This will permit servicing without disrupting traffic flow. Underground lines will be designed to cross as close to normal to the centerline of the Expressway as possible. Where the Expressway passes under a street, utility lines will be relocated when feasible and reasonable. If lines cannot be relocated, then they will either be attached to the bridge structure or located underground. Attachments to structures will generally be avoided unless there are no other feasible alternatives. Transmission mains and primary electrical mains will be permitted to remain as overhead utilities, providing that proper vertical and horizontal clearances are maintained.

There are heavy concentrations of underground utility systems by the General Telephone Company, Tampa Electric Company and the City of Tampa Water and Sewer Departments in the central business district of Tampa. The Expressway will be designed as an overhead structure through this section, both in the Northern and Central Corridors, and almost all of this maze of underground utilities and overhead lines can remain in place. Pier footings will be located to minimize conflicts with these systems.

Numerous small water lines and gravity sanitary sewers will require adjustments on both the Central Corridor and the North-Central Connector on Plates 15 and 46 respectively. Adjustments to these lines will require encasement and/or some relocation.

Florida Gas Transmission Company has a 6-5/8" O.D. high pressure gas line located east of 78th Street and south of Palm River Drive. This line is located on private right-of-way which the Expressway crosses on both the Central and Northern Corridors, Plates 17 and 33. This gas main will require encasement within the limits of the Expressway right-of-way.

The corridors under study contain several Tampa Electric Company substations. These stations are within the limits of the corridors and may be affected by the final route selection. The TECO substations are located at the southwest corner of Washington Street and 11th Street on the north side of 12th Avenue just west of U.S. 41, just west of 78th Street and north of Robindale Road, and behind the K-Mart in Brandon on Lakewood Drive. Cost of these facilities vary from $100,000 to $280,000 as estimated by TECO. If no sites were available in the general vicinity, relocation cost would be greatly increased.

Sections of both the Central and Southern Corridors that cross Kings Avenue, John Moore Road, Bryan Road and several other roads in the Brandon area on the North Corridor contain utilities, many of which will require adjustments.

Summary

Each corridor has basically the same type and number of utility relocation requirements as the corresponding area in the other corridors except for the Tampa Electric Company substations. Acquisition of these substations could be avoided by the selection of a corridor without these conflicts or by modification of the alignment inside the study corridor.

lighting

In compliance with "An Informational Guide for Roadway Lighting," March, 1969, published by the American Association of State Highway Officials, it is recommended that the South Crosstown Expressway Extension to Brandon be continuously lighted on segments where the estimated average daily traffic (ADT) for the design year (2000) exceeds the 30,000 traffic volumes stipulated in Case A-3, page 5 therein.

The interchanges beyond the area of continuous roadway and bridge lighting should all be lighted as traffic volumes estimated for the year 2000 exceed the minimum desirable conditions of Case B-2, page 6.

Therefore, cost estimates herein reflect this recommendation with continuous lighting assumed from:

Northern Corridor - Project One through Parsons Avenue Interchange
Central Corridor - Project One through the Bell Shoals Road-Lithia Road Interchange
Southern Corridor - Project One through the I-75E Interchange

With recent developments of high output light sources, trends toward high mounting height systems (especially at certain type interchanges and toll facilities), and considering possible extended effects of the "Energy Crisis," a more thorough investigation into lighting system concepts would be made during the more comprehensive Civil Engineering Report Study.

signing, signalization and pavement marking

Adequate signs conforming to the latest approved standards are recommended for use in controlling, protecting, and expediting traffic in connection with the Expressway. Good signing will be essential, especially considering the large number of tourists in the Tampa Bay area, to communicate regulations, advise of hazards, and display information concerning destinations, directions, and other points of interest. Some signs, particularly overhead signs should be lighted.

In addition to signs, some intersections of interchange ramps with local arterials should initially be signalized with various types of traffic control devices to safely expedite the flow of projected turning and through vehicular traffic and permit safe pedestrian crossing. Provision for power-operated traffic signals, generally of the type commonly used in this area has been considered. Determination of locations of required types of signals and operation should be coordinated with the local authorities having jurisdiction over local traffic signal systems. Intersection design should consider the addition of supplementary traffic signalization as traffic demands increase in the future.

Pavements will be striped in conformance with the latest criteria with materials economically practical to provide adequate delineation of roadway and interchange lanes and shoulders under all conditions of light and weather. Potentially hazardous areas, such as ramp noses and widening for future lanes will be liberally marked to supplement signing in the interest of expressway user safety.

Concern has been expressed for the condition which would exist when all roadway, ramp and shoulder pavements would be surfaced with asphaltic concrete surface course resulting in the absence of contrast in surface color or texture across the entire transverse roadway section. Experience on several operating roadways where this situation exists indicates the problem is not serious if adequate edge striping and other warning devices are used. Therefore, we recommend that continuous reflective stripes mark the roadway inner and outer edges supplemented by reflective pavement markers on the outside of curves, on the inside edge of ramps, on the skip stripe between lanes and on any potential problem areas. Roadway delineators should be used on the outside shoulder of all ramps.

landscaping

Landscaping should continue to be an integral part of the Crosstown Expressway System in order to blend the proposed facility into the existing surroundings without abrupt or inharmonious changes. Through the use of native plant materials and coordinated slope transitions, the basic criteria of landscape design should be integrated with all aspects of the project at the early stages of planning to maximize its effectiveness.

Aesthetic treatment using plant material helps psychologically and to some degree actually eliminates objectionable visual, audible and air pollution for both the user of the Expressway as well as those occupying adjoining properties. This is accomplished by creating: (1) an environment which is a pleasing and relaxing experience for the motorist; and (2) an acceptable relationship between the adjoining land uses and the necessarily fixed geometry and design features of the highway, especially toll plazas and structures.

Consideration of the following recommended criteria during preliminary design, right-of-way acquisition and construction will provide an expressway facility landscaped to a high degree of attractiveness.

Selective clearing through wooded areas, particularly in the urbanized sections, where the normal clearing operations leave a harsh line of cleared area, is recommended.

A band, preferably 30 feet in width, should be established outboard from the intersection of the cut or fill slope or drainage ditch and natural ground. Within this band (which should apply to interchange ramps as well as the main roadway) existing trees of three-inch caliber and over in a healthy, growing condition should be flagged and preserved. The remainder of this area should be cleared and graded to round, smooth flowing contours around those trees which are to be retained. This operation would result in a gradual transition between undisturbed existing woodlands and highway construction slopes.

Slope contour and grading operations should be intended to relieve the visual monotony of straight line cut and fill slopes. It is recommended that all slopes be contoured by the landscape designer to develop undulations, benches, and smooth flowing ground surfaces of 2:1 or less, which will blend with the natural terrain of adjoining areas yet not prevent maintenance and proper drainage. A 60-foot vertical curve is recommended at the top of cut slopes, if this occurs, and at the toe fill slope regardless of the gradient and adjoining natural ground. Shaping around flagged trees within the band of selective clearing will be graded and sloped to protect the root systems of the trees and to provide proper drainage. Tree wells may be used at the toe slopes in order to preserve certain specimen trees which fall within the graded area. In areas which require retention basins or borrow pits, the landscape designer should configure or shape these areas in a natural way, grading the surrounding slopes to blend with those of the Expressway construction. Such ponds would become highway beautification ponds. Slopes and undulating areas thereby would become natural features of the environment, allowing for the placement of trees and shrubs at the conclusion of construction and subsequent years as additional funds become available.

In areas where extensive retaining walls are planned, particular consideration should be given in the design of the retaining wall of textured and striated surfaces. Coordination of such wall treatment with the planting design of trees and shrubs will relieve the monotony of the barren wall and have a great positive impact on the adjoining properties with respect to the visual relationship thereto. In cases where the roadway is elevated on a viaduct structure, it is recommended that the under-areas of these structures be utilized, where possible, for multi-use facilities, such as parking areas, rest areas, mini-parks and small play yards for children in the appropriate locations.

Plant material used throughout the project should be selected from a list of plants which is a tried and true list for the Tampa Bay Area, requiring a minimum of maintenance. Deciduous material and palms should be used primarily, except where broad-leaved evergreens and conifers are needed for year-round screening of certain areas and for blending with adjoining native woodlands. Specimen and accent plants should be placed near structures, interchanges, toll plazas and other points where the visual impact must be of a high quality.

Consistent with the policy in the Phase One Project, every effort should be made to salvage acceptable trees and shrubs within the right-of-way of the Expressway prior to the early construction stages of the project to conserve these natural resources. These plant materials should be maintained in a holding area and transplanted to the project after roadway and structure grading and related operations are completed. New planting should supplement the placement of stored material in areas where high density is desirable.

Using recent aerial photographs and observation during field reconnaissance the following is a summary of estimates of wooded areas within the Study Corridors:

Description of Wooded Area	Corridor Area		
	Northern	Central	Southern
Dense Woods	11%	4%	7%
Moderate Woods	2%	4%	2%
Light Woods	1%	1%	1%
Total Area	**14%**	**9%**	**10%**

Landscape design, when executed in accordance with these general principles and consistent with the Authority's policy, will play an important role in creating an Expressway facility which will not only be beautiful and pleasant to drive on, but one which will provide compatibility with its surroundings by preserving as many living plants as is possible or practical along the route of the Expressway.

Cost estimates provided herewith are for budgeting purposes consistent with the scope of the Corridor Study. For the development of understructure parks and playgrounds, in the downtown segments of the Northern and Central Corridors, an allowance of $250,000 should be provided. For removal and maintenance of existing plant material to be stored in a holding area and re-used on the Expressway, an allowance of $50,000 per mile should be allocated over the lengths of the Corridors where such material exists. In addition, the replacement of the plant material held in maintenance and some supplemental plants should require approximately an additional $75,000 per mile for replanting.

right-of-way

Estimates of costs of right-of-way for each of the Study Corridors were prepared utilizing the services of an independent right-of-way appraiser retained by the Authority, experienced in this work and knowledgeable of the Study Area (Knight Appraisal Services, Inc.).

Acquisition, demolition, and relocation assistance costs, including staff expenses, title search and insurance, closing costs and all expenses (including legal fees) in connection with condemnation proceedings have been estimated by the Expressway Right-of-Way Section based on such costs experienced on the Phase One Project.

In general, estimates were made to develop the actual 1974 value of the property to be acquired, assuming that acquisition, either by negotiation or condemnation by eminent domain proceedings, would be accomplished under previous normal procedures of the Expressway Authority right-of-way acquisition used on the Phase One Project.

Estimated right-of-way limits were indicated by Greiner Engineering Sciences, Inc. on preliminary prints of the plates included with this Report and furnished to the Appraiser, Right-of-Way Coordinator and Environmental Consultant for estimating. These limits represented an estimated average taking within each Study Corridor and connectors.

The land size of the various individual properties was estimated from information contained in the public records of Hillsborough County; improvements that appeared to be within the taking area were examined by exterior visual inspection only and verified with information contained in the public records.

Market information gathered, analyzed and used for comparison for single family residential home sites and completed homes was processed and analyzed based on the consideration indicated by the State of Florida Documentary Stamps. Where available, sales information pertaining to large tracts of vacant land were analyzed and verified with one or more parties to the sale when possible.

The right-of-way value estimates contained herein include land and improvements and proximity damages where clearly discernible on the maps supplied. It should be emphasized that these estimates do not include any allowance for "business damages," as defined by Florida Statute.

The Appraiser was asked to prepare a recommendation for "factors" that could be used to adjust the value estimates contained herein for possible future adjustments as real estate market values fluctuate. This is extremely difficult to do for the following reasons: When the final alignment of the proposed facility is announced past experience has shown that real estate values of adjacent lands will increase; and most recent legal opinions indicate that property within the route of the proposed facility can be valued by giving consideration to the sales of adjacent land, which in some cases may clearly reflect enhancement due to the proposed facility.

At the time of preparation of this Report, it is public knowledge that the Tampa Interstate Highway 75 Bypass will be constructed between U.S. Highway 301 and the western periphery of Brandon crossing State Road No. 60 near the present intersection of State Road No. 60 and Faulkenburg Road. The Appraiser advises that if the Interstate Highway 75 Bypass becomes a reality before land acquisition has commenced on the Eastern Extension of the South Crosstown Expressway, land values in the general vicinity of State Road No. 60 and Faulkenburg Road in Brandon can be anticipated to increase drastically. Real estate values around the proposed Interstate 75-Bypass-State Road 60-Faulkenburg Road Interchange will surely at least double.

It is common knowledge that at this time construction costs of residential, commercial, and industrial improvements are increasing monthly. The Department of Labor Statistics published information indicates that during the period 1967 through 1973, such construction costs have increased in the United States more than fifty percent (50%). In some cases this increase would appear to be more rapid on the West Coast of Florida.

Therefore, it appears that, due to the present inflationary period, the uncertainty of future economic condition, with questions of "timing" of the Interstate 75-Tampa Bypass land acquisition and construction, and other factors, it is impractical and, indeed, impossible to promulgate a single set of factors that can be effectively used to forecast real estate value changes at some future date.

The character of the areas to be served by this proposed Eastern Extension of the Expressway ranges from rural to dense urban on all Study Corridors. The alignment is adjacent to or passes through several sites of present or potential residential or commercial development, especially in the rapidly developing Brandon area.

The Appraiser agrees that the proposed "low level fixed bridge" crossing the Ybor Channel would probably be opposed vigorously by the Tampa Port Authority and local shipping interests.

The Northern Corridor crossing of State Road No. 60 near Providence Road and Lakewood Drive, is proposed in a prime commercial area which should become even more valuable in the foreseeable future.

The Appraisal Report discussed some of the areas where large numbers of residences are involved in the proposed corridors. It emphasized that the Central Corridor, through Clair Mel City Subdivision, would appear to affect approximately 172 owner-occupied residences and the Northern Corridor would appear to affect approximately 27 homes north of the Seaboard Coast Line Railroad in the Brandon Estates Subdivision. In addition, the Central Corridor affects approximately 37 homes in Oakmont Subdivision west of Bryan Road.

Potential for multiple use or joint development of Expressway rights-of-way exists at several locations within the Study Corridors. The Expressway Authority's policy has been and should continue to be to encourage such use generally consistent with Federal Highway Administration and State Department of Transportation policies.

The proposed downtown Tampa portion of the project is an outstanding multiple-use example being elevated structures primarily due to the presence of numerous railroad tracks and streets that must remain open. Parking demand requirements in this area continue to increase, even without the Expressway. Solutions to the parking problem should be planned and located concurrently with planning for this major highway component of the Tampa urban transportation system.

Significant areas under the structures should be available for developing parking facilities after acquisition of fee title to the lands and construction of the Expressway. It may be very practical that such multiple use or others such as attractively landscaped parks, playground areas or even public buildings, could be developed by and at the expense of the City of Tampa consistent with the authorized agreement for parking in the Tampa Street area on Project One.

In some areas it may be reasonable and proper to lease back to certain former owners by Agreement prior to acquisition for compatible use of the space not needed for continuous operation of the Expressway, thus saving considerable cost to the Project. Multiple use is a major tool that should be used in making the project fully compatible with the developed and developing urban Study Area.

fare collection

The fare collection system should conform to and be an extension of the barrier system being constructed on Project One. Facilities, however, may vary to site particular or economic reasons.

Fares would be collected at plazas located at suitable sites along the length of the Expressway. Plazas located on the main roadway of the Expressway would be provided with multiple lanes for handling the peak flow of traffic. Each mainline plaza would have at least one lane in each direction attended at all times to serve patrons who must stop to make change, obtain a receipt, or ask questions. The attended lane would also be required to classify commercial vehicles with higher rates than passenger cars. The attended lanes would be provided with booths for the comfort of personnel, and canopies above should provide shade from direct sun and some protection from rain. Unattended, automatic exact change fare collection equipment would be made available in certain lanes designated for use of passenger cars only.

Where fares are to be collected at ramps leading to and from the Expressway, the ramps would contain at least one attended lane and one or more unattended lanes.

It is assumed for this Report, that toll facilities will be constructed initially for 1985 traffic projections and ultimate plaza configurations will be accomplished as traffic demands warrant costs for which would be paid from Department of Transportation funds.

administration and maintenance

It is assumed for the purposes of this Report that the State Department of Transportation will enter into another lease-purchase agreement extending provisions of the present South Crosstown Expressway Lease-Purchase Agreement to include the Expressway Extension to Brandon.

Therefore, it is assumed no special additional facilities will be necessary for operation and maintenance and the administration thereof. Maintenance would be performed by the Department of Transportation forces from local staging areas in conjunction with such activities or other local Department maintained projects.

Toll operations and routine maintenance on toll equipment is assumed to be sufficiently handled from the mainline toll plaza operations facility on Project One and at the individual toll installations proposed on this extension project.

It is anticipated that no separate facilities will be necessary to be constructed for the Authority or their staff. Preliminary cost estimates for maintenance and operations are included in this Report in that section. A preliminary estimate of administrative costs of the Authority and staff is included in Project costs summarized for each Study Corridor.

PROJECT DEVELOPMENT

A realistic, general progress schedule indicating possible advancement of this Project through the various stages to completion and opening to traffic has been developed in the Corridor Study and included in the Report.

In consideration of spiraling inflation, unforeseen labor and material shortages and other factors which may invalidate early Project cost estimates, it is recommended that revenue bond financing occur late in the design phase after a significant portion of the design and appraisals for right-of-way have been completed enabling estimates to be current at bond validation.

Considerable advance funds would have to be borrowed from other sources to be repaid after the sale of bonds to defray the necessary costs of reports, preliminary engineering, right-of-way appraisals and administrative expenses.

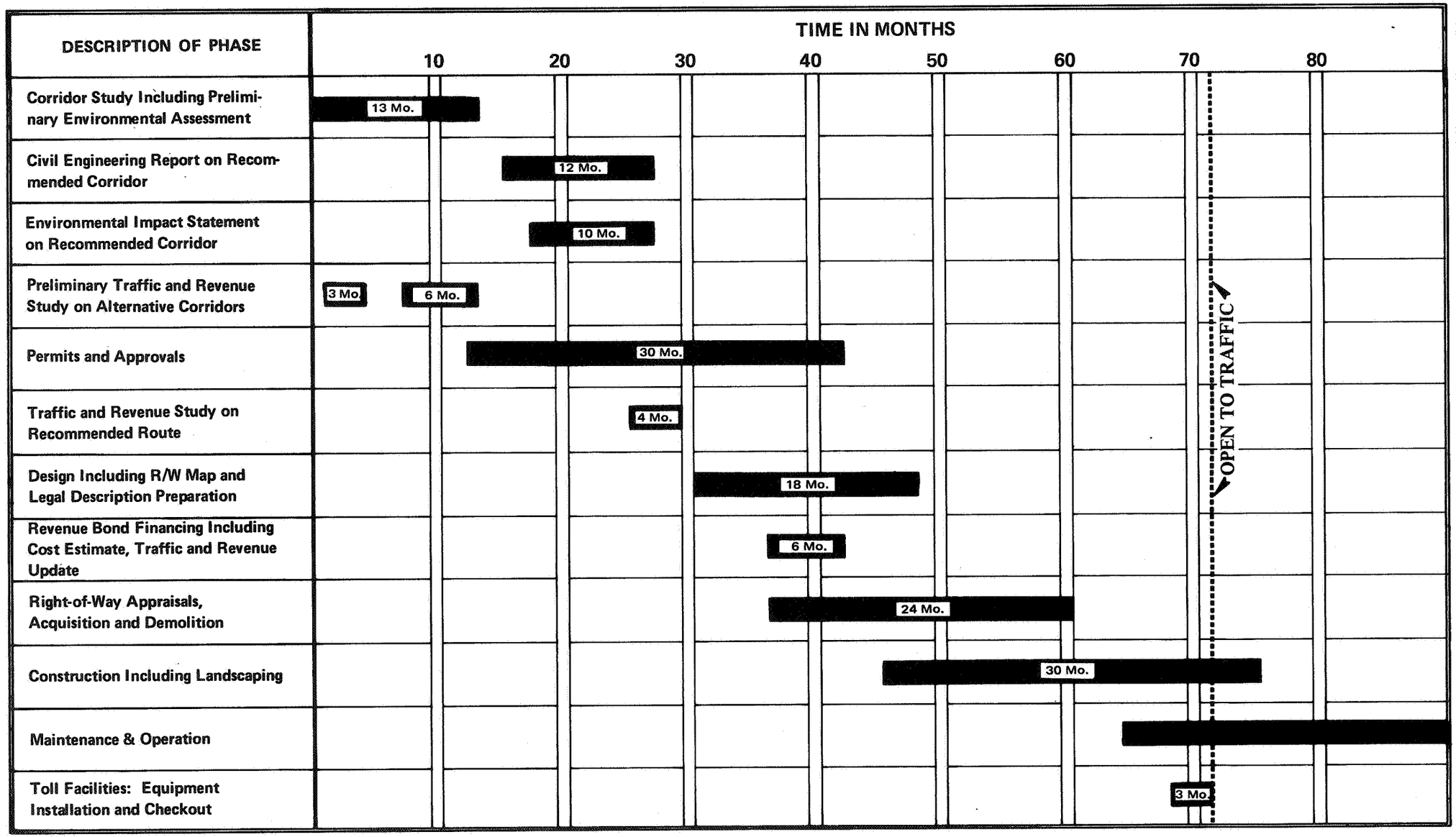
An additional phase has been included in the proposed schedule to prepare, apply for and obtain substantially all of the necessary permits and approvals now required on such projects. Information developed during the Civil Engineering Report and Environmental Impact Study phases should be sufficient for the basis of preparing a substantial portion of the required permits, but final design data would be necessary for some permits. If permits or approvals required significant revisions to the project or were denied, funding could be adjusted to consider the design ameliorations.

The proposed schedule contains reasonable periods for expeditious approvals of prerequisite reports, recommendations, proposals and to advance funds. Delays in administrative actions on such items would have direct effects on commencement and completion of the related phases.

All or significant portions of the Expressway Extension could be opened to traffic prior to completion of construction of some of the non-essential items.

CORRIDOR STUDY

SCHEDULE



LEGEND

PHASE PERIOD IN MONTHS

PERIOD OF ONE MONTH

proposed project development

PUBLIC AND AGENCY DEVELOPMENT

Throughout the Corridor Study, coordination and involvement with the public and interested agencies was pursued exceeding the requirements of the Florida Department of Transportation Action Plan.

The following is a list of agencies or groups to which specific material was furnished for information, comment and coordination. Responses were received from a majority of those contacted. Meetings were held with representatives of several of these groups in the interest of the project:

Tampa Bay Area Rapid Transit Authority (TBART)
Tampa Urban Area Transportation Study Citizen Advisory Committee
Brandon Planning and Zoning Authority
Brandon Rotary Club
Bloomingdale-South Brandon Civic Association
Board of Trustees of the Florida Internal Improvement Fund
Brandon Kiwanis Club
Brandon Chamber of Commerce
Brandon Sertoma Club
City of Tampa Fire Department
City of Tampa Land Agent
City of Tampa Metropolitan Development Agency
City of Tampa Parking and Transportation Department
City of Tampa Parks and Cemeteries Department
City of Tampa Police Department
City of Tampa Public Library
City of Tampa Public Works Department
City of Tampa Recreation Department
City of Tampa Sanitation Department
Clair Mel Citizens Association
Exchange Club of Tampa
Florida Bureau of Sport and Marine Fisheries
Florida Bureau of Geology
Florida Coastal Coordinating Council
Florida Department of Pollution Control
Florida Game and Fresh Water Fish Commission
Florida Department of Transportation
Florida Department of Administration Clearinghouse
Hillsborough County Agricultural Agents
Hillsborough County Auto Tag Department
Hillsborough County Building and Zoning Department
Hillsborough County Community Action Agency
Hillsborough County Council on Aging
Hillsborough County Environmental Protection Commission
Hillsborough County Fire Marshall
Hillsborough County Legislative Delegation
Hillsborough County Health Department
Hillsborough County Historical Commission
Hillsborough County Hospital and Welfare Board
Hillsborough County Parks Department
Hillsborough County Planning Commission
Hillsborough County Recreation Department
Hillsborough County Sheriff's Office
Hillsborough County Engineering Department
Hillsborough County School Board
Hillsborough County Tax Assessor
Hillsborough County Utilities Department
Hillsborough County Catholic Board of Education
National Oceanographic and Atmospheric Administration
Southwest Florida Water Management District
Tampa Bay Regional Planning Council
Tampa Audubon Society
Save Our Bay, Inc.
Seaboard Coast Line Railroad
U.S. Department of Agriculture Soil Conservation Service
U.S. Geological Survey (Tampa Office)

U.S. Army Corps of Engineers
U.S. Coast Guard
Tampa Chamber of Commerce Streets and Highways Committee
Tampa Port Authority
Community Coordinating Council

Acknowledgments and sincere appreciation are hereby given to all those organizations and individuals who provided information, assistance and cooperation in the preparation of this Report.

Citizen participation throughout the Expressway Extension project was established as a goal by the Expressway Authority and their Consulting Engineers.

Early in the Corridor Study a newspaper advertisement was prepared and printed in local newspapers advising the public and media of the Study, its objectives and providing an address and phone number for dissemination of information. Numerous telephone and written inquiries, some offering suggestions or opinions, resulted directly from this advertisement and periodic media coverage.

A Citizen Advisory Committee for the Corridor Study was appointed by the Authority at the suggestion of the Consulting Engineers.

The Advisory Committee was created to provide for citizen participation by offering and receiving suggestions, comments and information during the period of the Study.

In the United States, and particularly in Florida, the citizens are well educated and knowledgeable about the factors which are important in determining the quality of their life. A professional engineer, with his technology, must seek out the advice of an enlightened citizenry and consider the desires of the individuals affected when applying his technology to the solution of our more complex problems (in this case, a transportation problem).

Highway engineers in the past have laid ribbons of concrete or asphalt through neighborhoods as a result of conformance with good, sound, technical and economic guidelines, without careful consideration of environmental and sociological factors. The engineering profession has reached such a stage of maturity that requires the participation of an enlightened citizenry in planning the route location of transportation facilities. Public transportation agencies recognize and encourage this involvement.

This affords the individuals for whom the project is intended or affects the opportunity to have a voice in the development. The professional's scope of considerations in such a study as this includes understanding of the community and user needs and desires.

The Committee was appointed on March 6, 1974 by the Authority after nominations from each Authority member. It was apparent that the Committee includes individuals who belong to or their interests represent local park boards, educational and other professional groups, business and civic clubs, specific neighborhoods, and environmentalists. The Committee has been interested, responsive and objective in their comments, suggestions, criticism and reviews.

The Committee met with the Consultants and Authority staff, generally at two-month intervals, but held several separate meetings on their own initiative to organize and discuss relevant issues. The Committee acted as a "filter or pipeline" for the exchange of information between the project's planners and the community at large. They alerted the Authority and Consultants to potential problems as they developed, and in turn, provided citizen groups or their neighbors with qualified information about the project.

The Committee was not asked to vote "yes" or "no" on the project or any of its details, however, it was asked to consider study area problems and opportunities, and to take the long-range, as well as the current needs of the community into account in the course of making its general comments and recommendations.

Attendance by committee members was excellent. The Authority, Department of Transportation and Hillsborough County Planning Commission were advised of Committee actions by summaries of all meetings prepared after each meeting by the Consultants and other representatives attended as observers. Tape recordings were made of all Advisory Committee meetings held by the Consultants for reference and record purposes. All questions asked by Committee members were reviewed to determine if responses were complete or if they needed to be answered at the next meeting. Copies of correspondence, maps, and other information of interest were periodically furnished the Committee through their Chairman.

It became evident early in the Corridor Study as indicated by questions and comments from Committee members, service club presentations and other public involvements, that fundamental features or policies of such projects are misunderstood or unknown by the general public. Staff or official attempts to inform historically have been hindered or blocked by even a few unreceptive individuals and are often distorted by the media.

The Citizens Advisory Committee was very helpful to inform the segment of the involved public they represent or are in day-to-day contact with of such pertinent definitions or policies, in addition to available details of the project and dispel false rumors. Examples of such terms or policies defined, compared or presented to the Committee are:

intersection vs. interchange
limited access vs. free or controlled access
condemnation vs. confiscation
revenue bonds
relocation assistance
cul-de-sac
corridor vs. right-of-way width

Early in the determination of Study Corridors phase of the Study, the Consultants formulated a procedure for Committee participation which includes a method of assigning numerical values to analysis and interpretation of information on various factors related to the Study Corridors.

These factors are difficult to categorically classify into environmental, social, political, physical, or economical subdivisions as several, such as the human factors (aesthetics, comfort, convenience and safety) overlap more than one classification.

The Committee was urged to recognize that basically three groups of people are primarily interested in the Expressway. Many people are in more than one group.

1. Those who will live or work near or in its path
2. Those who will drive the Expressway; and
3. The community as a whole.

Intangibles such as community goals, pride and heritage are almost impossible to quantify or even survey effectively. Not to be overlooked is the fact that the user pays the cost of such a toll expressway. Their comfort, convenience and environmental sensitivities must be considered also.

The importance of an impact factor is a relative term based on the value judgments of the individual members of the Committee doing the evaluation. "Importance" is a relative term when comparing alternatives. The Committee was asked to quantify "importance" for assessment of portions of each Study Corridor.

It was recognized that determining a magnitude for such factors could not be the sole consideration of corridor evaluation. Ballots, surveys or even elections fall drastically short of providing realistic indications of the will or opinion of the public as a whole. The opinion of the consensus of the Citizens Advisory Committee, especially if they receive input from the groups they may represent, was helpful to develop and evaluate the alternative corridors in this Study.

A form containing over thirty evaluation factors was provided to indicate in the space provided for each factor a number between 1 and 10 inclusive, to represent each person's opinion of the degree of importance of the factor when evaluating alternative Study Corridors for the proposed Expressway.

A low value such as 2 would indicate, in the individual's opinion, the factor is of little or no importance. A value of 10 indicates a factor of utmost importance. A particular value could be used as many times as the person elected, but they were cautioned that they should recognize that they are providing input to determining weight values for all defined factors and the relation of one factor to the other was one objective of the exercise.

Upon receipt of the completed forms from all the Advisory Committee members who chose to participate (over 50%), the Consulting Engineers tabulated the returns, utilizing their computer, to determine the average weight values for each factor expressed as a portion of 1000 for simplicity. No identification of the name of the Committee member was required. The values appeared in the range from about 100 to 400 similar to baseball batting averages, relating well for comparison of importance.

The following is a summary of the Authority's Citizens Advisory Committee average determination of importance of corridor evaluation factors:

Corridor Evaluation Factors

		Degree of Importance
1.	Compatibility with existing or planned land use	390
2.	Noise	225
3.	Air quality	263
4.	Water quality	280
5.	Expressway appearance, aesthetics and landscaping	258
6.	Preservation of neighborhood character and community identity	423
7.	Displacement of residences and/or businesses	373
8.	Impact on educational or church facilities and related bus routes	395
9.	Impact on growth of the area	379
10.	Availability of replacement housing	258
11.	Joint and multiple use of expressway right-of-way	309

12. Traffic services or accessibility to existing or proposed:

    a. Residential developments 412

    b. Recreational or entertainment areas 219

    c. Commercial establishments 351

    d. Industrial facilities 329

    e. Medical or other health facilities 373

    f. Employment 368

13. Location of access through (overpasses or underpasses) expressway 478

14. Traffic conditions on local streets after expressway is open to traffic 428

15. Extension or improvement of utility (sewer, water, electric, etc.) systems and service areas 357

16. Expressway related storm drainage improvements 373

17. Location and type of interchanges 390

18. Expressway erosion and water pollution control devices 302

19. Safety 456

20. Wide expressway right-of-way 214

21. Effects on efficiency of fire protection, police protection and other municipal services and facilities 379

22. Property values 274

23. Expressway project cost 346

24. Availability of replacement business sites 280

25. Removal of lands acquired for expressway from tax rolls 109

The results of this survey were interesting and appropriately considered in selection of the Study Corridors.

The Tampa Urban Area Transportation Study (TUATS) Citizens Advisory Committee was also given the opportunity to determine their degree of importance for these factors. The results were comparatively close, in many respects, to the Authority's Committee Survey as nearly 40% of the values compared within 10%. However, traditional environmental factors such as noise, air and water pollution were evaluated considerably (42%) higher by the TUATS committee, indicating more concern with the environment by that group. Both groups valued safety very high and loss of taxable lands very low.

Subsequent to the presentation of the Draft Corridor Study Report without a recommendation of a single corridor by the Consultants on October 16, 1974 to the Authority, Department of Transportation and others, the Authority held two public hearings.

The first public hearing was held on November 26, 1974 at Brandon High School. Over 700 people attended.

On December 4, 1974 another public hearing was held in Tampa at the Jefferson High School. Approximately 125 people attended this hearing.

Both public hearings were held consistent with prescribed standards. Appropriate displays and hand-outs of related information were available to the public prior to the hearings. Transcripts and responses to certain comments were completed and furnished to the Authority by the Consultants for information and record purposes.

The Department of Transportation contemplates holding another public hearing after completion of the Corridor Study, notifying all property owners as required, and receiving comments from agencies on the circulated preliminary environmental assessment.

Citizens made a real contribution to the Corridor Study without straying into areas requiring technical competence. The Expressway Authority and the Consulting Engineers, should maintain a primary objective to substantially satisfy the community through which this facility will pass and serve. By effectively utilizing the advice of this community, it should enhance the probability of this project serving the public in a more effective manner and gaining the support of this public.

Citizen participation is not a substitute for decision-making by elected officials or their designated representatives, but it is an essential contribution to such decision-making.

MASS TRANSPORTATION

The proposed Eastern Extension of the South Crosstown Expressway should not eliminate the possibility of development of mass transit within or near the same corridor, if studies by appropriate agencies indicate that the public will support such a system and it can be funded.

Recent extension of the Tampa City Bus System to the Brandon Area and the establishment and progress of the Tampa Bay Rapid Transit Authority are encouraging developments toward achieving a more balanced transportation system in the Tampa Bay Area in the future.

Presently, the most effective mass transportation system, modern efficient buses, is severely hampered by congested local and through highways, especially S.R. 60. The proposed Expressway extension would offer an alternative route, regardless of the corridor selected, for express bus service on Expressway lanes or special lanes in the wide medians unobstructed by frequent intersections and traffic control devices on narrow roads.

Another mass transit concept becoming increasingly popular in such areas is establishment of attractive passenger stations on or adjacent to the Expressway. Commuter parking lots served by connecting local bus service or "kiss and ride" activities could be provided. Such systems are operating efficiently in other cities, even on toll facilities, in Florida. Joint use of these facilities with car pools is very practical.

An elaborate and sophisticated rapid transit system will not be available in the anticipated period of development of the Expressway Extension. If there is any consideration for such a system to utilize any lands or facilities of this Expressway System, enabling funding provisions must provide for such prior to bond validation, as it may be impractical at a later date. Appreciable reduction of revenue may result to the Expressway project if such a competing system went into operation and it was unanticipated.



preliminary environmental assessment

INTRODUCTION

overview

Michael Baker, Jr., Inc., as Environmental Consultant to Greiner Engineering Sciences, Inc., has been charged with the responsibility of preparing a Preliminary Environmental Assessment as part of the proposed Eastern Extension of Tampa's South Crosstown Expressway Corridor Study authorized by the Tampa-Hillsborough County Expressway Authority.

This proposed facility, extending from downtown Tampa to a point east of Brandon, represents a vital component in the overall future traffic circulation system of the Tampa Bay Region. The need has been established; congestion on S.R. 60 and the general lack of accessibility between Tampa and the rapidly-growing Brandon area have become serious problems.

However, the question of where within the prescribed Study Area the facility can most feasibly be placed poses its own unique set of problems. The initial phase of this study process analyzed all feasible corridor locations within the Study Area and resulted in the selection of three general corridors warranting further examination. The preceding Engineering Report presented an analysis of these corridors from one point of view. This Preliminary Environmental Assessment represents a different set of parameters reflecting the realization among public officials, professionals, and the general populace that the construction of any highway facility produces significant, far-reaching impacts on the land through which that facility passes, as well as on the population it is intended to serve. Engineering and cost considerations, therefore, have been joined by in-depth analyses of environmental conditions and the effects that a proposed highway facility would have on these conditions.

purpose and scope

The purpose of this Preliminary Environmental Assessment is to assure that the selection of the most feasible corridor location for this facility is based on sound environmental planning in conjunction with the other parameters involved.

The scope of this study centered around an evaluation of the full environmental effects of the feasible corridors within the prescribed Study Area. Both the natural and the human environments were considered in the following categories: Natural Environment (physical setting, terrestrial habitats, aquatic habitats, water quality, air quality, noise pollution, light pollution, aesthetics and landscaping); Human Environment (land use structure, community and neighborhood identity, governments, landmarks, transportation and displacements).

The initial section of this assessment is a recapitulation of the environmental input to the corridor selection process. The evaluation process, which comprises the largest portion of the assessment, includes a summary of the existing conditions within the overall Study Area and the corridors themselves; the environmental impacts of these corridors; a comparison of these relative impacts; significant findings derived from the evaluation; and a summary of findings.

CORRIDOR SELECTION

As noted in the Engineering Report, preliminary investigation by representatives of the participating firms, individually and collectively, resulted in the determination of all reasonable corridors within the Study Area. These corridors were subsequently analyzed and evaluated for the purpose of selecting two or three corridors deemed suitable for more detailed examination.

This section evaluates the initial corridor proposals from the environmental standpoint and explains the rationale applied in the evaluation process which led to potential corridor elimination and the selection of three general corridors for further study. The initial proposals are illustrated on Exhibit 3 in the Engineering Report.

The methodology used in the initial corridor evaluation process included field investigation, examination of aerial photographs, and preliminary data analysis. The corridor proposals were evaluated in terms of their relative impacts on the natural environment (i.e., general ecology, air and water quality) as well as on the human environment (i.e., land use, neighborhoods and displacements). It should again be noted that these initial corridor proposals were evaluated only in a cursory manner to facilitate the elimination of those alignments that were obviously not feasible, and to determine those alignments possessing potential for further investigation.

The initial examination revealed three basic corridor locations -- Central, Northern and Southern All potentially feasible expressway alignments were then plotted into these basic corridors. The evaluation and elimination process yielded three potential corridor locations which essentially coincided with the three basic locations. They are shown on Exhibit 4 in the Engineering Report.

It is a known fact that the construction of any highway facility will create a certain amount of disruption in both the human and natural environments through which it passes. The three corridors chosen possessed relative environmental advantages and disadvantages that were sufficiently comparable to merit further study. It is intended that this further study will yield an ultimately recommended corridor which will hopefully fulfill its designated purpose and, at the same time, minimize environmental disruption.

central corridor

The Central Corridor, in essence, provides the backbone for all the corridors selected for further investigation and will therefore be discussed first in the succeeding sections of this assessment. It is the only corridor (including a combined Central-Northern segment in the DeSoto Park area) traversing the entire Study Area between the designated terminal points. The Northern and Southern Corridors both utilize various Central Corridor segments to cover the Study Area.

The Central Corridor required more refinement during the preliminary evaluation and selection process than did its Northern and Southern counterparts. More variations were initially proposed through this section of the Study Area and more environmental obstacles required consideration.

Each of the initially considered variations of the Central Corridor included crossings of Ybor Channel and environmentally sensitive McKay Bay. The crossing point ultimately selected for Ybor Channel was considered to be the least disruptive to the various port-related industries in the vicinity, although the removal of some industries from the northern end of the channel might be required, depending on the type of crossing structure deemed most desirable. The selected McKay Bay crossing is the shortest and avoids the highly sensitive mangrove areas. Some impact on the City of Tampa police and fire facilities under construction on the landfill south of the incinerator would, however, be likely.

Variations following Palm River Road (considered as a possible expressway route in earlier highway studies) were eliminated due to the extensive residential development that has occurred in recent years. Clair Mel City, a well-defined community, also poses a barrier that eliminated several other variations. The selected Central Corridor location leaves the Palm River Road area largely intact but does affect the northern portion of Clair Mel City.

Possible locations for the Central Corridor between U.S. Route 301 and Brandon were limited from the outset by the interchange location requirements for the proposed I-75 E. Although the land is relatively open (currently undeveloped) and contains few environmental constraints, this interchange control point was the prime determining factor in the location of this segment of the corridor.

Of the numerous initial Central Corridor alternatives in the Brandon area a somewhat southerly location was retained for further study, primarily because it would cause the least comparative residential disruption in this rapidly developing community. However, it should be noted that no highway corridor could adequately serve this community without causing some amount of residential displacement.

Overall, the significant environmental issues considered in selecting a corridor location through the central portion of the Study Area included the crossings of Ybor Channel and McKay Bay, and the potential disruption of developed areas.

northern corridor

The selection of the Northern Corridor involved many of the same environmental problems encountered in the selection of the Central Corridor. Again, several potential crossings of water bodies had to be considered, as well as the possible disruption of developed areas. These parameters, in addition to essential engineering feasibility issues and the proximity of the Study Area's northern boundary, were of prime importance in eliminating many of the initially proposed corridor locations.

The corridor, as selected for further study, minimizes the possible adverse environmental effects on Ybor Channel and McKay Bay by eliminating bridge crossings, although care must be taken to maintain the integrity of the mangrove area along McKay Bay's northern shoreline. A bridge crossing over Palm River (Tampa Bypass Canal) would be required.

As previously stated, interchange location requirements for proposed I-75 E greatly limited alternate corridor locations in that portion of the Study Area. As a result, the Northern corridor was merged with the Central Corridor from a point just east of Clair Mel City to a point just west of Brandon.

The selection of the northerly approach to Brandon, including the crossing of S.R. 60, was made largely on the basis of environmental criteria, both natural and human. Apparent and determined environmentally sensitive and productive areas necessitated the elimination of some potential corridor locations, and extensive development adjacent to and north of S.R. 60 eliminated others. Through Brandon itself, proximity to the Seaboard Coast Line Railroad was considered logical since it is presently a transportation corridor and represents an existing barrier to development, thereby minimizing further disruption in this section of the Study Area. Engineering considerations and the existence of several extensive mobile home developments were foremost in eliminating two of the three proposed return approaches to S.R. 60 near the eastern limits of the Study Area.

southern corridor

Preliminary investigations served to greatly reduce the number of location alternatives for the Southern Corridor west of U.S. Route 41.

It is therefore dependent on the Northern and Central Corridor locations in this section of the Study Area. Although the initially proposed western segments were eliminated because of engineering considerations associated with the southerly crossings of Ybor Channel and McKay Bay, severe environmental constraints were apparent as well, particularly with reference to the disruption of existing port activities along the east bank of the Channel, the splitting of the DeSoto Park neighborhood, and the potentially adverse effects of crossing the southern portion of McKay Bay.

Finding a suitable crossing of Delaney Creek was a limiting factor in locating the corridor in the central portion of the Study Area. Existing development along U.S. Route 301 and, again, the I-75 E interchange location requirements, were also prime location determinants.

In the eastern portion of the Study Area, the extreme southerly corridor alternatives were eliminated through concern that their proximity to the Alafia River might accelerate development in this environmentally sensitive area. In addition, occasional sinkhole occurrence, and the location of a golf course between Durant Road and S.R. 674, north of Bloomingdale Avenue, affected the location of the corridor from an environmental viewpoint. The return approach to the eastern terminus at S.R. 60 utilizes the final segment of the Central Corridor.

northern corridor variation

A variation of the Northern Corridor located partially outside the Study Area, was also proposed and merits some consideration, even though it was not ultimately selected as a primary corridor location. Briefly, this alternative corridor location utilizes the service road concept combined with extensive utilization of existing rights-of-way.

Description

The variation begins at 13th Street and Adamo Drive. Extending east from 13th Street to the vicinity of Maydell Drive, Adamo would be upgraded to expressway status (limited access) and a service road located to the north (2nd Avenue) would provide local traffic access oriented toward the industries in that area. From Maydell Drive to a point just east of 78th Street, S.R. 60 would function as a service road and the expressway would run parallel on the south side. At this point, the expressway crosses back over S.R. 60 to the northeast. After crossing U.S. Route 301 and proposed I-75 E (with possible interchanges), the expressway would continue easterly parallel to the Seaboard Coast Line Railroad through northern Brandon. In the Brandon area, the Northern Corridor alignment as previously described herein would be utilized. The return to S.R. 60 east of Brandon would also remain as previously described. This corridor is shown with the other initially-proposed corridor locations in Exhibit 3 in the Engineering Report.

This alternative corridor location possesses a more distinct set of advantages and disadvantages than any of the other primary corridors under consideration to this point of the study and elimination process.

With no encroachment on either Ybor Channel or McKay Bay, environmental disturbance would be minimal except for isolated areas along the railroad right-of-way in Brandon. By utilizing existing rights-of-way throughout most of the route, residential displacements or neighborhood structure interference would be greatly reduced. The railroad was, in the past, and continues to be a major factor within the present land use development pattern, therefore, no new artificial barrier (potentially disruptive to Brandon's community development pattern or the Study Area in general) would be created. The service road concept would permit staged construction, thereby minimizing the disruption of traffic flow on S.R. 60. This approach would also better serve industries in the vicinity by separating through and local traffic. Since most of the land areas adjacent to this corridor are already developed, land speculation would probably be less of a problem than in the more undeveloped areas. The proximity of this corridor to the center of Brandon would also permit this area to maintain

its identity as the focal point for community development -- urban sprawl would be somewhat discouraged.

Major drawbacks include greater difficulty in designing interchanges to facilitate traffic desires along the existing Adamo Drive alignment in Tampa; overpass and interchange problems in the vicinity of U.S. Route 301 and I-75 E; heavy traffic burdens that would be placed on Brandon's north-south arterials by persons living in the southern portion of that community seeking access to and from the expressway; problems associated with the potential railroad relocation and the fact that the corridor exceeds (to some extent) the prescribed boundaries of the original Study Area.

In essence, the advantages are primarily social and environmental in nature, while the disadvantages are primarily engineering and economically oriented. However, comparison is not between the advantages and disadvantages of this particular corridor, but how these advantages and disadvantages collectively measure up to those of each of the three primary corridors selected for further consideration.

It is the opinion of the Environmental Consultants that this corridor proposal, although tentatively precluded from more in-depth analysis because of its apparent inherent disadvantages, possesses a sufficient number of environmentally favorable attributes to warrant the preceding documentation and further evaluation in the future.

EVALUATION PROCESS

natural environment: summary of existing conditions

Physical Setting

Geographic Location

Hillsborough County is located on the west coast (Gulf Coast) of Florida, approximately midway along the peninsula. The County forms an imperfect square with its northern boundary at approximately 28°10' north latitude and its eastern boundary at approximately 82°4' west longitude. With a total north-south extension of 36 miles and a total east-west extension of 36 miles, the County is bordered on the north by Pasco County, on the south by Manatee County, on the east by Polk County and on the west by Pinellas County and Tampa Bay. The 1040 square miles of land area places Hillsborough County among the ten largest in the State of Florida.

The Study Area, located in the east central portion of the County, originates in downtown Tampa. It extends approximately 12 miles to a point east of the community of Brandon. The Study Area involves a total area of slightly less than 50 square miles. At its greatest width, the Study Area extends south to the Alafia River and north to the Seaboard Coast Line Railroad. Exhibit 4 in the Engineering Report affords further clarification.

Climate

The climate of Hillsborough County is subtropical and is therefore characterized by warm, humid summers and mild winters. The average long-term monthly temperatures range from approximately 60 degrees in January to approximately 82 degrees in August. During the warmest months of the year (June, July, and August) daytime temperatures usually reach the high 80's or low 90's. During the coldest months of the year (January and February) the daytime temperatures are mild, usually ranging in the high 60's to the low 70's. However, during the winter months of December, January, February, and March, it is not uncommon for temperatures to be in the 40's one day and in the 80's the next. Day-to-day temperature variations can be quite pronounced during that four-month period.

Cold fronts occasionally move through Hillsborough County during the winter months but hard freezing temperatures are rare. Light to moderate frosts occur several times during the winter months and hard freezes capable of extensive crop damage (vegetables and citrus) infrequently occur. During such a cool weather season, late evening and early morning ground fogs are quite common. These fogs dissipate rapidly with the warm early morning sun; however, strong temperature inversions which cause urban atmospheric pollution problems may result in fogs remaining into mid-day.

The average long-term annual rainfall for Hillsborough County is approximately 51 inches. This rainfall is unevenly distributed with the months of June, July, August, and September, receiving approximately 30 inches or 60 percent of the total average. The fall and spring of the year are characteristically dry with the winter months receiving most of their rainfall from cold front activity. During the summer months, thunderstorm activity is quite frequent, occurring almost on a daily basis. One may easily observe the rapid formation of large cumulonimbus clouds which generate the thundershower activity during the hot summer afternoons. However, these afternoon showers are most welcome since they tend to lower the hot afternoon temperatures.

It is interesting to note that Hillsborough County has the highest incidence of these meteorological phenomena (thunderstorms) of any place in the entire United States. This high incidence of electrical storms makes Hillsborough and the surrounding counties extremely prone to lightning accidents.

Hillsborough County's climate, as well as the whole of Florida, is greatly affected by the Gulf of Mexico, the Caribbean Sea, and the Atlantic Ocean. The annual rainfall, the prevailing winds, tropical storms, and hurricane and tornado activity are largely generated by the sun's influence on the surrounding marine environment. However, one should not misconstrue the fact that Hillsborough County has basically a continental climate, one greatly influenced by marine factors. It is also essential to understand that Hillsborough County's weather is very unpredictable. It is quite common to realize an annual precipitation deficit or for such deficit to extend from one year to the next. Relatively dry summers with wet winters are also common. Precipitation has likewise been abundant throughout the year causing extensive flooding problems.

Some of the more extreme meteorological phenomena include hurricanes and tornadoes. Tornadoes are experienced year round; however, the incidence is higher in the summer months during thunderstorm activity. Hurricane threats are most pronounced during the months from June to October (source: U.S. Department of Commerce), but hurricanes are not experienced throughout the course of the year. Most meteorologists feel that the incidence rate for hurricanes in Hillsborough County is approximately one every ten years.

Topography and Drainage

In studying aerial photographs and topographic maps of Hillsborough County, it is quite apparent that no significant elevation changes exist (See Exhibit 6). In most instances, the land is rather level with an almost imperceptible rise from the bay margins inland. Land slopes rarely exceed 10 to 12 degrees and the steeply sloped areas are almost always associated with sinkhole features or riverine settings. These conditions generally exist throughout the Study Area. Elevations range from sea level along the margins of McKay Bay to a high point slightly in excess of 126 feet southeast of Brandon near the intersection of Valrico and Lithia Roads. In general, it may be stated that the land is yielding and conducive to the uses of man. Hillsborough County's interesting terrain and pleasant climate have contributed greatly to its rapid growth and development.

From the shoreline of McKay Bay, the land is characterized by low coastal flatwoods which extend inland for approximately 3.5 miles to an elevation of 25 feet. It is this low coastal area that is most susceptible to marine influences. Unusually high tides and tropical storms have historically caused the most damage in these areas of the Florida landscape. Within the low coastal portion of the Study Area, one major and one minor stream facilitate natural land drainage. These are the Palm River and Delaney Creek.

Palm River enters into the Study Area just east of the intersection of S.R. 60 and Orient Road. From this point it flows westward for approximately three miles prior to discharging into McKay Bay. In essence, Palm River is an extension of Six Mile Creek, its largest tributary. The river drains approximately 40 square miles of Hillsborough County and has a long term average discharge of approximately 45 million gallons per day (mgd) at McKay Bay. It should be noted that Palm River and Six Mile Creek have been greatly altered for flood control and water conservation purposes. In fact, this work still continues. As part of the Four River Basins Project by the U.S. Army Corps of Engineers and the Southwest Florida Water Management District, Palm River has been widened and deepened to effectively accommodate excess flood waters from the Hillsborough River and the Lake Thonotosassa area of the County. Flood waters which cannot be retained on the land will be channeled to Palm River via a system of man-made canals. The flood waters will then move through the Palm River channel, and eventually discharge into McKay Bay. The need for a flood control program of this nature was prompted during the late 50's and early 60's when greater than normal rainfall caused extensive flooding in the Hillsborough River Drainage Basin. In conjunction with flood water control, it is also hoped that the water retained in Palm

River can be used as a source of potable water for Tampa's growing populace. The project name for the Palm River portion of the Four River Basin Project is the Tampa Bypass Canal.

Delaney Creek has its origin within the Study Area near the community of Clair Mel City. The creek channel has been altered considerably to facilitate the drainage of storm water runoff from urbanized areas. At several locations, however, the creek is still bordered by a narrow band of vegetation which, no doubt, serves as a habitat for some wildlife forms. This aspect will be discussed in more detail in the terrestrial and aquatic survey portions of this study. Delaney Creek leaves the Study Area at U.S. 41 approximately one-half mile north of Santa Fe Road.

Beyond the low coastal area and above the 25 foot land contour is an intermediate topographic zone. The land within this portion of the Study Area is situated from a line approximately 0.4 miles west of U.S. Route 301 to Kings Avenue on the east and S.R. 60 on the north. The land in this intermediate zone is referred to as slash pine and scrub palmetto flatwoods and is characterized by rather level topography with poor surface drainage outfall (in its natural state). For the most part, this land area has undergone much improvement for agricultural purposes. Dominant native vegetation has been removed, and man-made drainage systems have been constructed to partially remedy the problems of local flooding and high seasonal water tables in the soils. Major drainage outfall for this area is by Delaney Creek on the north and the Alafia River on the south. It can be generally stated that most of the fresh water ponds, lakes, and lesser creeks are greatly subject to drought influences and tend to be intermittent in nature. The land has been herein presented as an intermediate topographic zone inasmuch as it tends to be an area of division between the coastal zone and the sandy, hilly uplands. This is characteristic of many areas of the State of Florida.

Leaving the intermediate topographic zone on the east at the previously indicated boundaries (S.R. 60 and Kings Avenue), the land gradually rises to 50 feet in elevation. Here the land is characterized by a gently undulating terrain, sandy well-drained oils and "rich" oak tree plant communities. This third zone is generally referred to as the hilly uplands and is quite conducive to citrus agriculture and residential development. Much of the land in the Brandon area was initially utilized for citrus production. However, the preservation of native oak forests in conjunction with the very appealing topography have ignited rapid residential and commercial development. All these factors combined have caused Brandon to become one of Hillsborough County's fastest growing communities. Hence, great pressures have been placed on S.R. 60 and lesser east-west transportation corridors which move people and goods from the Tampa employment centers to Brandon and points farther east.

Within the area of sandy hills and prominent live oaks, lakes tend to be more permanent in nature, and flooding rarely occurs, except in low places which act as natural surface retention areas during periods of intense or prolonged rainfall. Drainage is more internally oriented as the droughty soils tend to quickly accept precipitation in most instances. To the south in the Bloomingdale area, the land tends to be more level in character and major drainage outfall is facilitated by Buckhorn Creek to the Alafia River. It is here that flooding poses the greatest threat to homes constructed within the Alafia River Floodplain.

The Alafia River Drainage Basin is the second largest natural drainage system in the County. It drains approximately 240 square miles in Hillsborough County and an additional 170 square miles in Polk County. With a long term average flow of 300 mgd at its point of discharge into Tampa Bay, it surpasses the flow of the Hillsborough River by approximately 130 mgd. The Alafia River enters and leaves the Study Area within a distance of approximately 0.9 miles along the southern terminus near its confluence with Buckhorn Creek.

CORRIDOR STUDY

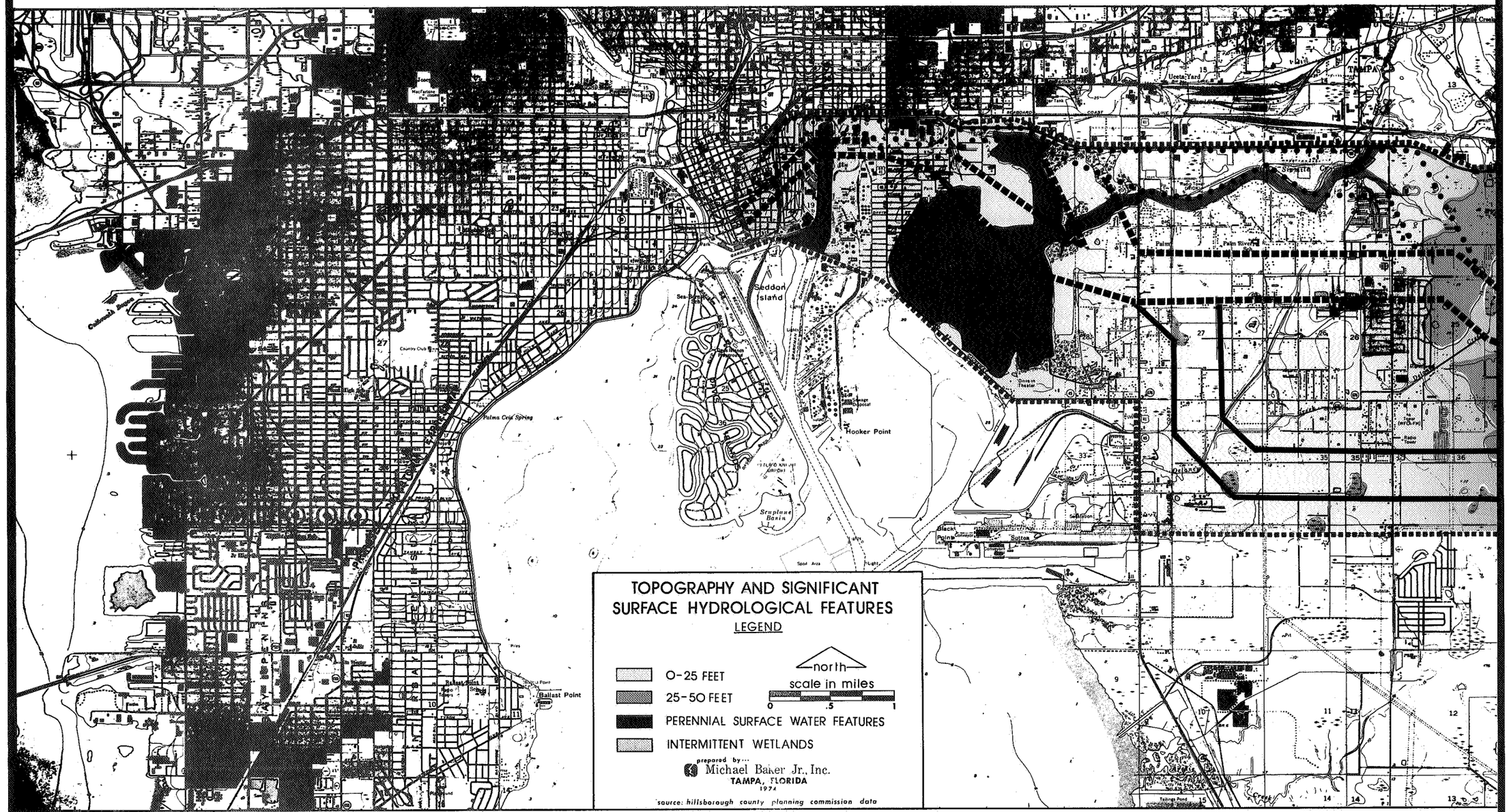


EXHIBIT 6A

CORRIDOR STUDY

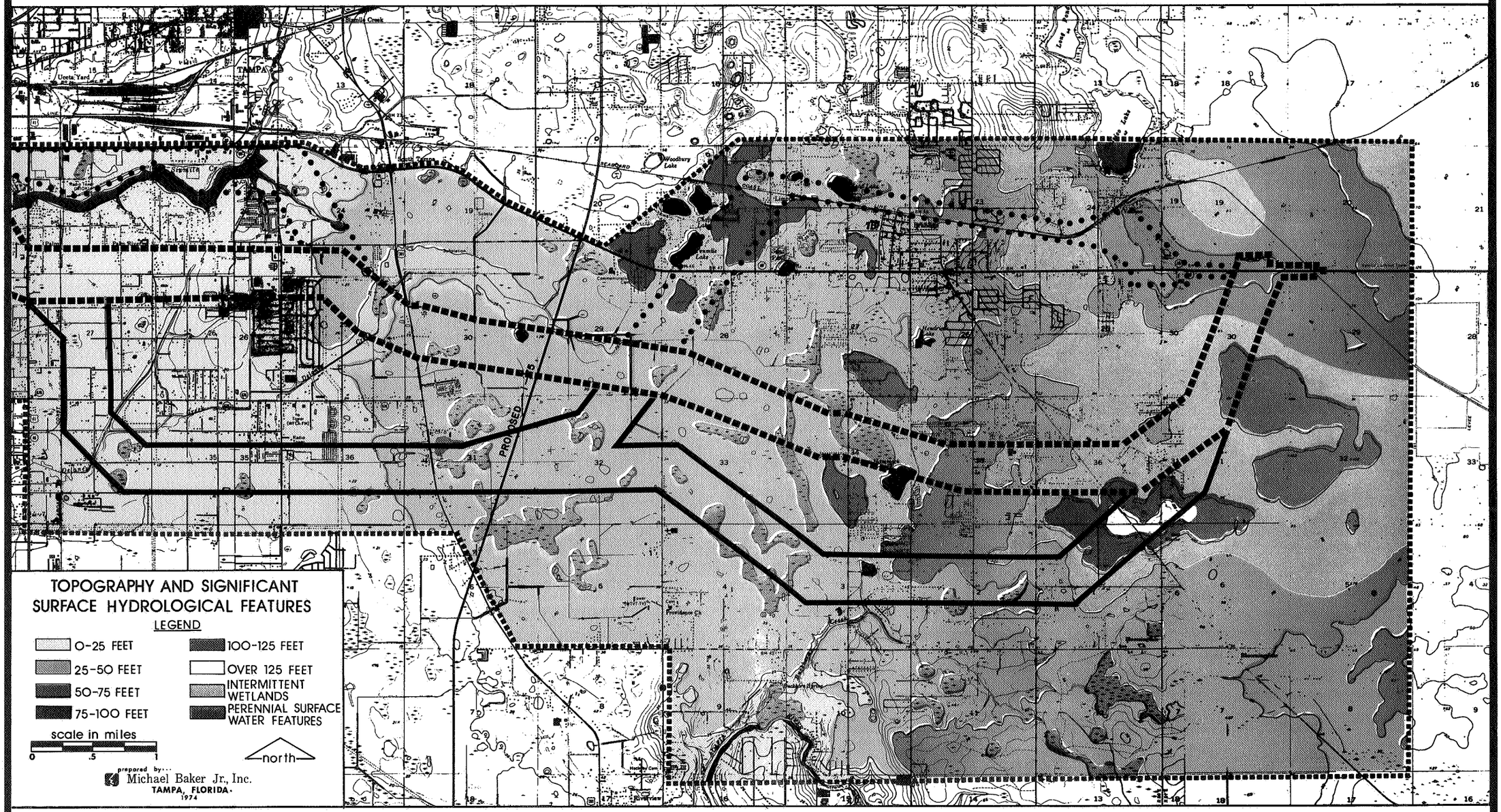


EXHIBIT 6B

Geology and Soils

The geology of Florida was primarily generated and shaped by two main forces, the sea and a changing climate. In essence, these same forces continue today to bring about changes in the Florida landscape. In its infancy, Florida was little more than a shallow place in a vast marine environment which covered much of the current landscape of the Southeastern and Gulf Coastal United States. As climatic and associated atmospheric changes generated the great continental glaciers, cyclical changes in sea levels initiated the elements of land formation which began the slow process of creating the Florida Peninsula.

In its early stages of formation, physical and chemical forces greatly influenced the formation of various sedimentary rock types consisting of limestone, sandstone, gypsum anhydrite, and dolomite. These were formed in layers of varying degrees upon an existing base of crystalline rocks. As time progressed, climatological and environmental factors favored the abundant growth of plants and animals in a warm marine sea. It was from this transgressing warm tropical sea, through the activities of marine plants and animals having the ability to form the basic elements of limestone that Florida underwent pronounced emergence as a distinct land form. Other dynamic forces throughout time have also played an important role in Florida's evolution; yet, none have left as vivid a record as the marine plants and animals which occur today in profusion as fossil remains.

In reviewing the geology of Hillsborough County, one becomes aware of the various elements comprising the general geology of Florida. Underlying the County are thick accumulations of sedimentary rock descending to depths exceeding 8000 feet. Overlying the sedimentary rock is a mantle of quartz sand interlayered in various locales with clay seams and lenses. Within the Study Area the thickness of overlying quartz sand and clay deposits range from ten feet near McKay Bay to eighty feet just east of Brandon. It is within and through this mantle of undifferentiated sand and clay that the activities of surface and subsurface natural and man-induced phenomena meet.

Here in Hillsborough County and other parts of Florida there is extensive topographic and geological evidence which points to the existence of ancient marine-formed terraces. Within the County there remains evidence of five such terraces as determined by members of the U.S. Geological Survey. The names of these terraces and the approximate elevations at which they occur are as follows:

1. Pamlico Terrace - sea level to 25 feet
2. Talbot Terrace - 25 feet to 45 feet
3. Penholoway Terrace - 45 feet to 70 feet
4. Wicomico Terrace - 70 feet to 100 feet
5. Sunderland Terrace - 100 feet to 170 feet

It is believed that these terrace formations were generated during the period of continental glaciation (the Pleistocene Epoch, The Ice Age) in past geologic time. As the great continental glaciers advanced and receded over the northern United States, sea levels likewise advanced and receded over the Florida Peninsula. The activities of an advancing and receding sea (and to a lesser degree stream activity) transported and deposited quartz sand and finer sediments over what is now the subsurface limestone rock. It is generally believed that these sediments had their points of origin in Alabama and Georgia. As the sea advanced and receded, the sediments were moved about and shaped into terraces, sand bars and barrier islands. In some instances even the wind participated by forming dunes. The approximate upper elevations of the terrace formations (the scarp) mark the suspected level of the sea during that period in time.

Since the initial formation of the terraces, the processes of geological weathering and biological activities have greatly altered these features. Land subsidence through the solution of underlying limestone

rock and the activities of surface water and plants have brought about the reduction in the distinctness of the terrace land forms. The terraces are now dotted with many lakes, sinkholes, swamps, and forests, and have undergone dissection by riverine activity. This is the case within the Study Area where apparently four of the previously noted terraces may be noted through the study of topographic maps and field observations.

The upper 48 to 60 inches of the previously noted quartz sand and finer sediments overlying the sedimentary rock in Hillsborough County may be classified as the most significant section of the soil profile. In fact, it is this portion of the overlying sediments that has received the most intense research and analysis by the U.S. Soil Conservation Service. A great amount of information has been generated by this agency regarding soil characteristics in the County.

Within the aforementioned upper zone the most pronounced interplay between the activities of natural biota and man take place in the soil. Fluctuating water table levels, downward leaching of nutrients and fine sediments, infiltration of natural and urban runoff, agricultural pursuits and the construction of permanent structures have a daily effect on this portion of the soil profile. Within the Study Area and throughout the County, these factors are evident to varying degrees dependent upon topography, hydrology, and man-made changes.

From a starting point along the margin of McKay Bay to approximately 7.5 miles inland, the soils generally are poorly drained and have a tendency toward seasonal flooding when left in their natural state. Flooding is for the most part associated with seasonal high water tables which may rise above the surface of the land during periods of prolonged rainfall. Shallow depressions which support intermittent lakes and marshy ponds are common and usually function as natural water retention areas during periods of rainfall. As previously noted, natural internal drainage and surface water outfall is poor. Those locales which have not been urbanized or still remain in a natural state have been improved for agricultural purposes.

For the remainder of the Study Area, the elevation of the land increases gently giving rise to more well-drained sandy hills. In the Brandon area particularly, the soils have a pronounced sandy character and are prone to rapid erosion by wind and water when denuded. This factor deserves careful consideration during site clearing and the initial phases of road construction. For the most part, though, the soils in this area are well suited to urbanization because of their deeper seasonal high water tables and low to non-existent flood hazard. Within and along the periphery of the Brandon area there is also evidence of past land subsidence which may be noted in the observation of sinkhole depressions and sinkhole-type lakes. These phenomena are usually quite common in the higher, well drained soil areas and may be observed northwest of Brandon near the community of Limona and south of Brandon near Hickory Hammock Lake.

In general cross sections, the geology of Hillsborough County and the Study Area may be characterized as depicted in Exhibits 7 and 8. For the most part, the first consistent limestone rock unit is the Tampa Limestone formation of Miocene age. This limestone formation varies in color from white to gray; from soft to hard in consistency; and is characterized by the presence of gastopod and peleaypod molds. Overlying the Tampa limestone formation is found the Hawthorn formation also of Miocene age. The Hawthorn formation varies in color from white to gray and is characterized by the presence of thick clay deposits interlayered and mixed with quartz, sand, phosphatic minerals, and limestone fragments. In many instances, the clays are well formed and are tens of feet thick. Limestone members tend to be most consistent toward the bottom of this formation. Overlying the Hawthorn formation is the undifferentiated mantle of sand, clay and marl of Pliocene to Pleistocene and Recent age. The dominant member is almost always a fine to medium grained quartz sand which may be interlayered or intermixed with silt and clay size sediment

CORRIDOR STUDY

TOPOGRAPHY AND SUBSURFACE CROSS SECTION
EXAGGERATED SCALE

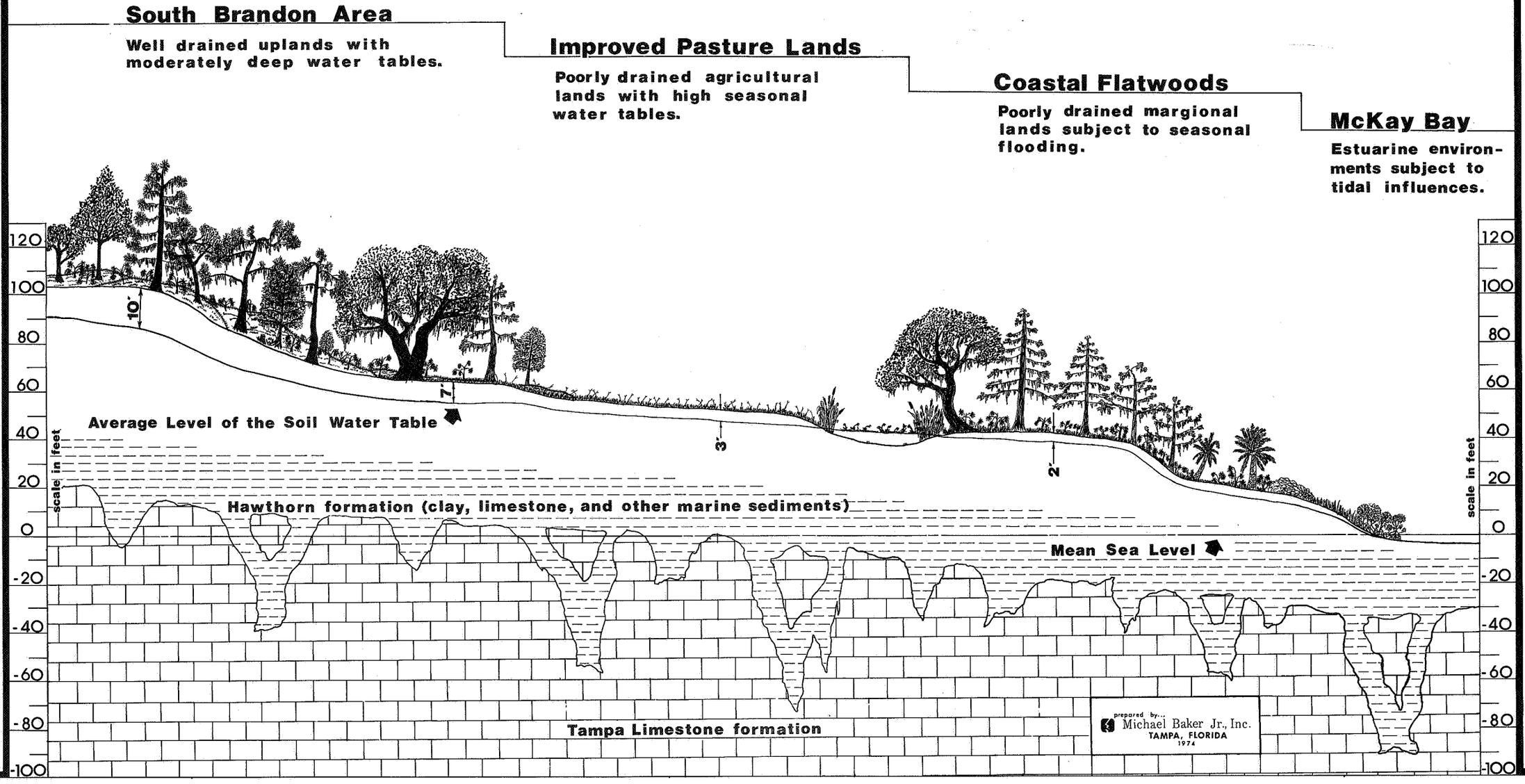
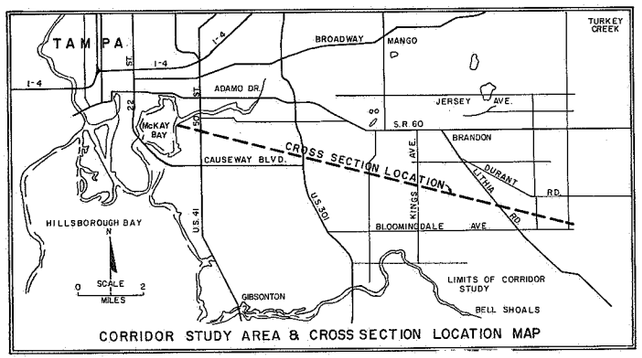


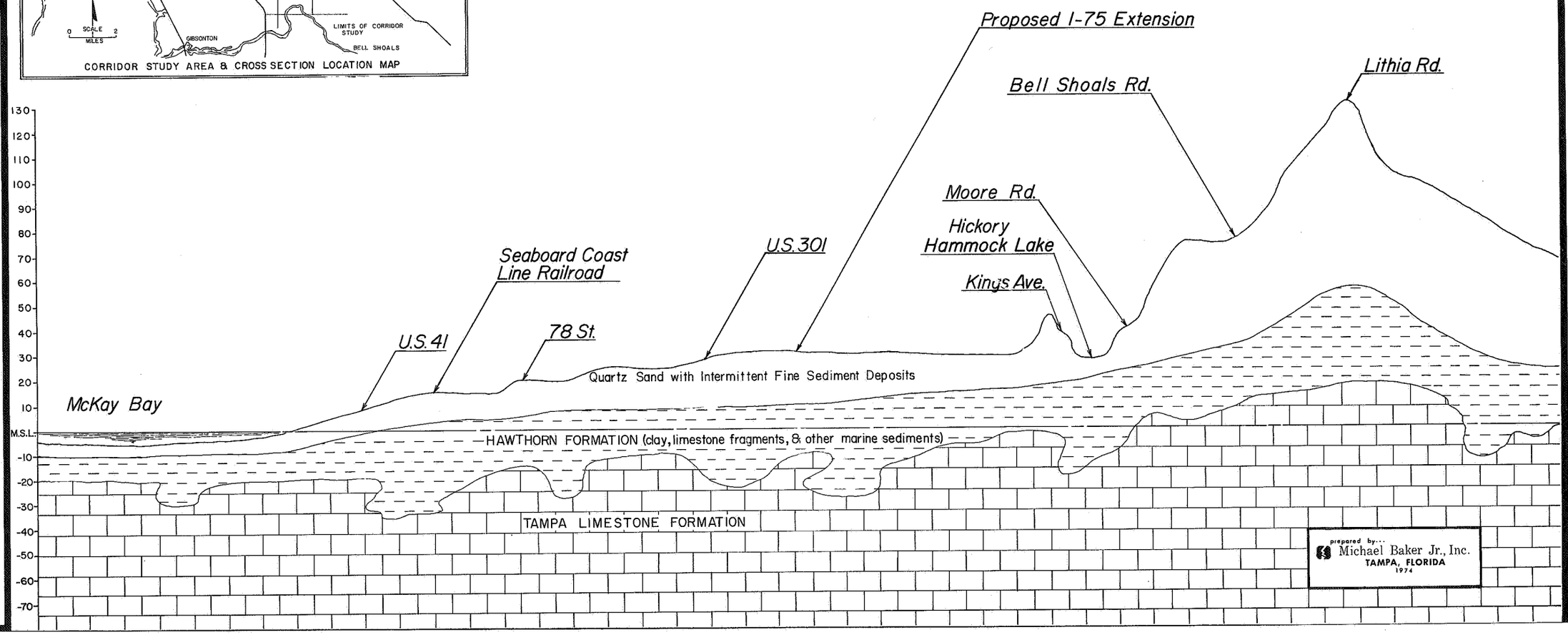
EXHIBIT 7

CORRIDOR STUDY

GENERALIZED TOPOGRAPHIC & SUBSURFACE CROSS SECTION



CORRIDOR STUDY AREA & CROSS SECTION LOCATION MAP



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TAMPA, FLORIDA
1974

EXHIBIT 8

at varying depths. In some instances, clay deposits occur as seams or lenses in rather substantial amounts.

Hydrology

Perhaps one of the most significant natural aspects of Florida is its highly productive hydrological resource. During the summer wet season (June through September) the lakes, streams, and the ground water system experience pronounced replenishment. Throughout this four-month period, problems related to local flooding are also evident. During the fall, winter, and spring rainfall is somewhat evenly distributed. However, during the period of March to June, pre-wet season droughts are quite common and often generate critical water supply problems in major urban areas and in the rural wetlands. It is not uncommon for long-term annual rainfall deficits to occur, bringing about the drying up of lesser lakes, ponds, and swamps. In many instances, stream discharges decrease significantly and lesser water courses cease to flow entirely.

For the 12-year period from 1961 through 1972, a 102.3-inch rainfall deficit was recorded for the City of Tampa. As can be expected, this deficit, combined with rapid growth requiring large amounts of fresh water, has significantly affected most surface water features in the County. All surface water levels have declined and many features have dried up completely. The effects of deficient rainfall and rapid growth have also cut into the ground water resource. For the most part ground water levels are down sharply and the rates of pumping in large ground water well fields have had to be carefully monitored.

In view of the fact that the County receives well over 40 inches of rainfall even during most deficit years, it is difficult for most individuals to understand the occurrence of water shortages. However, a major portion of the problem relates directly to how the rainfall is absorbed by nature. It has been calculated by members of the U.S. Geological Survey that approximately 35 to 40 inches of the annual rainfall is returned to the atmosphere through the processes of evaporation and transpiration (activities by plants). The remaining 15 to 20 inches is handled as natural runoff and ground water recharge. The runoff water sustains lake levels, stream flows, spring flows and the aquifer systems.

Once the water reaches the land and is gradually accepted by the soils, the various processes related to ground and surface water hydrology become the prime determinants in the storage and movement of the water (man's influences considered). In this regard one of the most important factors to be considered is the Floridan Aquifer system underlying the County and much of the entire state.

The Floridan Aquifer is a dynamic artesian system from which large quantities of fresh water may be obtained for domestic, agricultural and industrial purposes. Within Hillsborough County, the previously discussed Hawthorn formation serves as the confining layer and in this respect greatly restricts the quantity and rate of water movement between the overlying sand mantle and underlying limestone rock. In various locales where the Hawthorn is absent, poorly formed or breached, the exchange of water in the overlying sands and the underlying limestone is usually quite pronounced. In essence, the Hawthorn formation is a prime component of the system inasmuch as it regulates recharge activities and hydraulic pressures between external and internal positions of the Floridan Aquifer system.

Within the mantle of sands overlying the Hawthorn formation, there exists another, nonartesian, aquifer system referred to as the water table aquifer. The water levels within this system react rapidly to rainfall influences and are generally subject to local variations dependent on topographic and vegetative factors. This is to say that in the higher sandy

areas, water table levels are usually ten to 20 feet below the land's surface while in the lower and more level flatwoods the water table may be at the surface of the land or two to three feet below. Although this is the rule rather than the exception, in some locales a perched water table may occur above the true water table as a result of a hard pan formation or fine sediment accumulation. Such is the case with various lakes, swamps, or depressions in the higher well-drained hilly areas of the County. To put the description of the Floridan Aquifer into greater detail, the following excerpt taken from Map Series No. 16, published by the Florida Board of Conservation Division of Geology, is given:

> "The thick limestones of the Florida Aquifer underlie all of the State and supply ground water to all but southernmost and westernmost Florida. Along much of the Atlantic and Gulf Coastal areas, the aquifer contains highly mineralized water.
>
> The Floridan Aquifer includes the Lake City, Avon Park and Ocala Limestones, all of Eocene age; the Suwannee Limestone of Oligocene age; and the Tampa Limestone and permeable parts of the Hawthorn Formation of Miocene age. In some areas the aquifer is exposed at the surface, but over much of the State it lies beneath several hundred feet of sediments.
>
> The thick semipermeable beds which overlie the aquifer, except in its outcrop areas, restrict the upward movement of the water and cause the aquifer to have artesian pressure. The altitude to which water will rise in artesian wells generally ranges from a few feet above mean sea level, in areas near the coast, to more than 130 feet above mean sea level in Polk County. In Southern Florida, along coastal areas, and in low valleys, the artesian pressure is sufficient to cause wells to flow. However, in some heavy use areas such as eastern Duval County and southern Bay County, the water level has been lowered below sea level."

Terrestrial Habitat and Wildlife

The following section describes regional, local and specific floral and faunal characteristics relative to the Study Area.

Regional Flora

The vegetation of the Tampa Bay Region, and particularly Hillsborough County, exhibits a greater complexity than areas 200 miles to the north or south. This complexity, in part, is attributed to the fact that Hillsborough County sits within the transition zone between the Magnolia Climax Forest of the Temperate Deciduous Forest Biome (southern) and the Subtropical Forest Biome exhibited farther south. That is, although the dominant vegetation in the County represents the Temperate Biome, subtropical species do occur within this area. However, the predominant natural vegetation (in descending order of total area covered) of Hillsborough County consists of low lying Pine Flatwood Forests and Longleaf Pine - Xerophytic Oak Forests which are common to the higher, well drained areas. The Pine Flatwoods and Longleaf Pine - Xerophytic Oak Forest are fire climax or sub-climax communities. That is, the dominance or persistence of the fire resistant components of these plant communities are most commonly due to the somewhat regular occurrence of naturally induced fires. Fire not only physically damages or destroys nonresistant species, but maintains the relatively poor physical and chemical conditions of the soil, keeping it less suitable for the more shade tolerant hardwoods that would otherwise succeed the coniferous dominants. Also characteristic of the Pine Flatwoods is the poorly drained soil which quite often exhibits a relatively impervious organic hard pan formation about 14 inches below the land's surface. The hard pan is due in part to a usually high water table common to these areas. Leon soils, the most extensive soil in the County, is characterized by its organic hard pan and is typical of the flatwoods.

Characteristic vegetation of the Pine Flatwoods association include Saw Palmetto, Slash Pine, Wax Myrtle, Live Oak and Laurel Oak. Other vegetative associations represented in Hillsborough County include the Swamp Forest and the Mixed Hardwood (not periodically flooded) Forest.

Swamp Forests are characteristically found in areas that are periodically or continuously flooded. Three components of the Swamp Forest are the Cypress Swamp, the Mixed Hardwood Swamp, and the Hardwood Swamp (dominated by evergreen species - bayheads).

Dominant species in Cypress Swamps include Bald Cypress, Red Maple, and Water Ash with the Cypress being the dominant species. These swamps may fringe lakes, rivers, or ponds but are most commonly exhibited as heavily vegetated depressions in the Pine Flatwoods.

Mixed Hardwood Swamps, which may occur along creeks, rivers, or irregularly flooded basins, include Water Oak, Black Gum, Florida Holly and Water Hickory as dominant species.

The Bayhead or Hardwood Swamp may develop from swamps, marshes or low pine flatwood areas having seasonally flooded soils with high organic matter composition. Sweet Bay, Swamp Red Bay, and Loblolly Bay are dominant components of this swamp community.

The Mixed Hardwood Forest includes Hickory, American Holly, Sweet Gum, Southern Magnolia, Red Bay, Laurel Oak and Live Oak as dominant trees. This deciduous and evergreen forest characteristically experiences no periodic flooding and is most common to areas having well drained phosphatic soils. The Mixed Hardwood Forest, considered by some to be the climax on upland areas, is found in areas where natural occurrence intervals are long enough to allow succession to continue past the subclimax Pine Flatwoods stage.

Another vegetative component of the County, the Mangrove Community, occurs along intertidal estuarine areas. Black Mangrove, Red Mangrove and White Mangrove are dominant vegetation components.

Although this community is relatively small when compared to the total area of the County, it is known to be highly productive and is therefore of great natural value. Table 1 contains a list of plant species found in Hillsborough County.

Study Area Flora

Within the Study Area the above-mentioned vegetative communities are represented to varying degrees (See Exhibit 9). To date, much of Hillsborough County has been developed (see Exhibit 11) and the rate and intensity of future development is expected to increase (see Exhibit 12). Because of existing development much of the natural vegetation within the County has been either removed or altered.

Representative remnants of natural vegetation communities that are found within the Study Area were sampled to provide the basis to qualitatively and, where possible, quantitatively determine the vegetative type and its distribution, as well as determine its value as wildlife habitat (sample point locations and vegetative distribution are shown on Exhibit 9).

In general, the results of the vegetative analysis indicated that, within the Study Area, the Mangrove Community is confined to the eastern and northern intertidal areas of McKay Bay and a portion of the mouth of the Palm River. The Swamp Forest is represented primarily in the northern and southern extremities by Cypress Heads and Mixed Hardwood Swamps associated with lakes such as Chapman, Ten Mile, and Mead, as well as along the Alafia River and its tributary, Buckhorn Creek. Sandhill (a subdivision of the upland Pine Forest, characteristically open and dominated by longleaf pine and turkey oak) and Xerophytic Oak community remnants along with Mixed Hardwoods are primarily distributed along the eastern boundary of the area where the soil has superior drainage and phosphatic material is a component of the soil.

Original stands of the Pine Flatwoods dominated the Study Area landscape from the vicinity of U.S. Route 301 east to Kings Avenue in Brandon. Now, however, much of this land is improved pasture with only scattered remnants of natural vegetation.

Tree core samples, relative and absolute density, relative dominance, relative frequency and species composition illustrate the age, number of trees per area (stocking), tree size, commonness of a particular species, and species diversity all generally indicated that the existing natural vegetation is relatively young (25-55 years old). This vegetation has, to varying extents, been influenced by man's activities (i.e., ditches, grazing, and channelization).

No known rare or endangered plant species were reported or observed growing in the Study Area (list of Florida's protected trees, shrubs, and other plants, 1965).

Regional Fauna

Although most of the Florida Peninsula is often included in the Magnolia Climax Forest Region, the actual predominant climax community for the region is the fire dependent Pine Flatwoods, along with the Swamp Forest and Mixed Hardwood Forest. Faunal representatives of these Forests include the White-Tailed Deer, (Odocoileus virginianus) Southeastern Pocket Gopher (Gromys pinetis), Southern Bald Eagle (Haliaeutus leucocaphalus), and the American Alligator (Alligator mississippienisis).

Common animals of the Pine Flatwoods include the Eastern Cottontail Rabbit (Sylvilagus floridanus), Morning Dove (Zenaidura macroura), Bobwhite Quail (Colinus virginianus), Armadillo (Dasypus novemcinctus), Cotton Rat (Sigmodon hispidus), Southern Flying Squirrel (Glaucomys volans) and the Eastern Diamond Back Rattlesnake (Crotalus adamanteus).

CORRIDOR STUDY

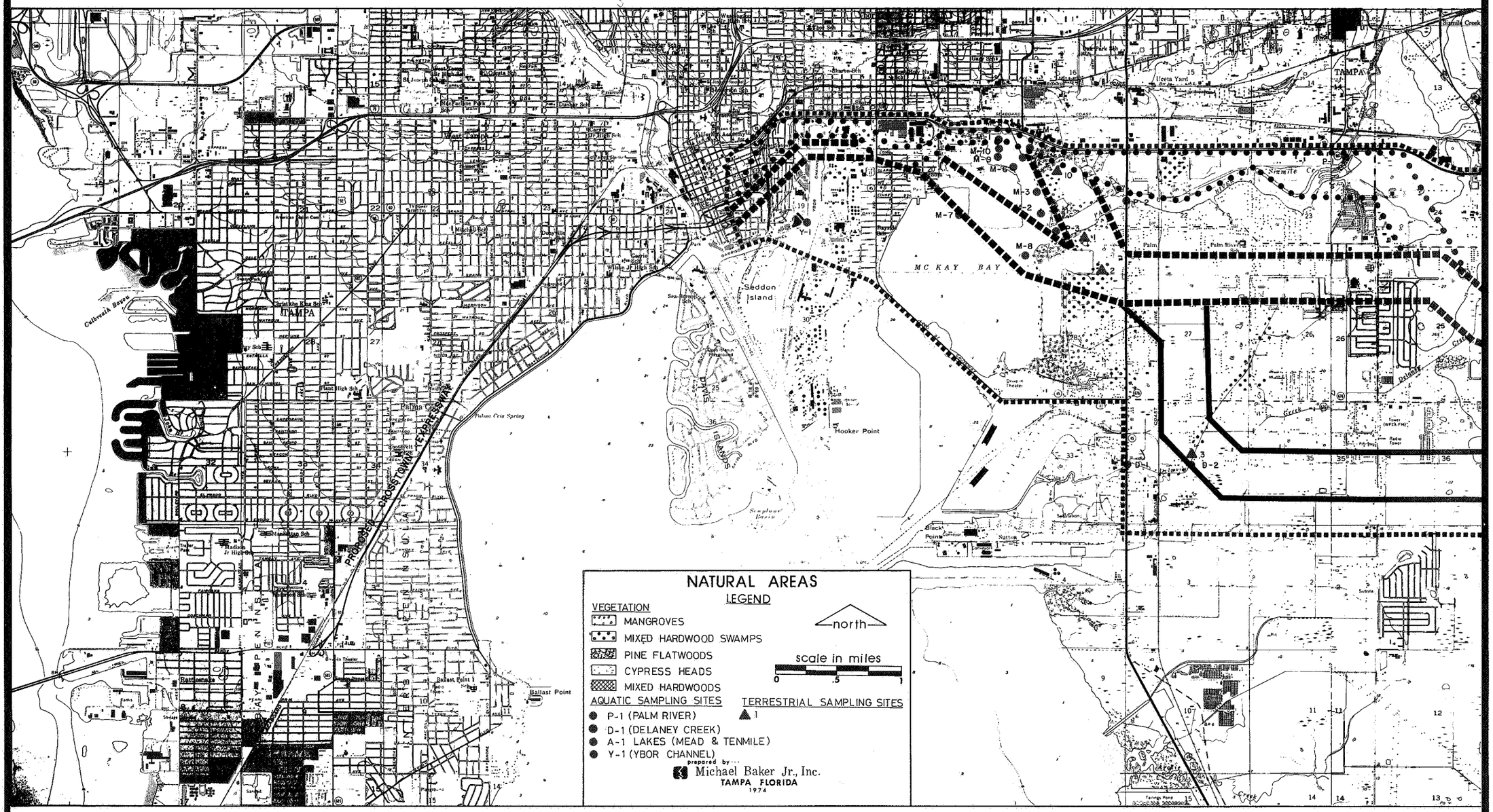
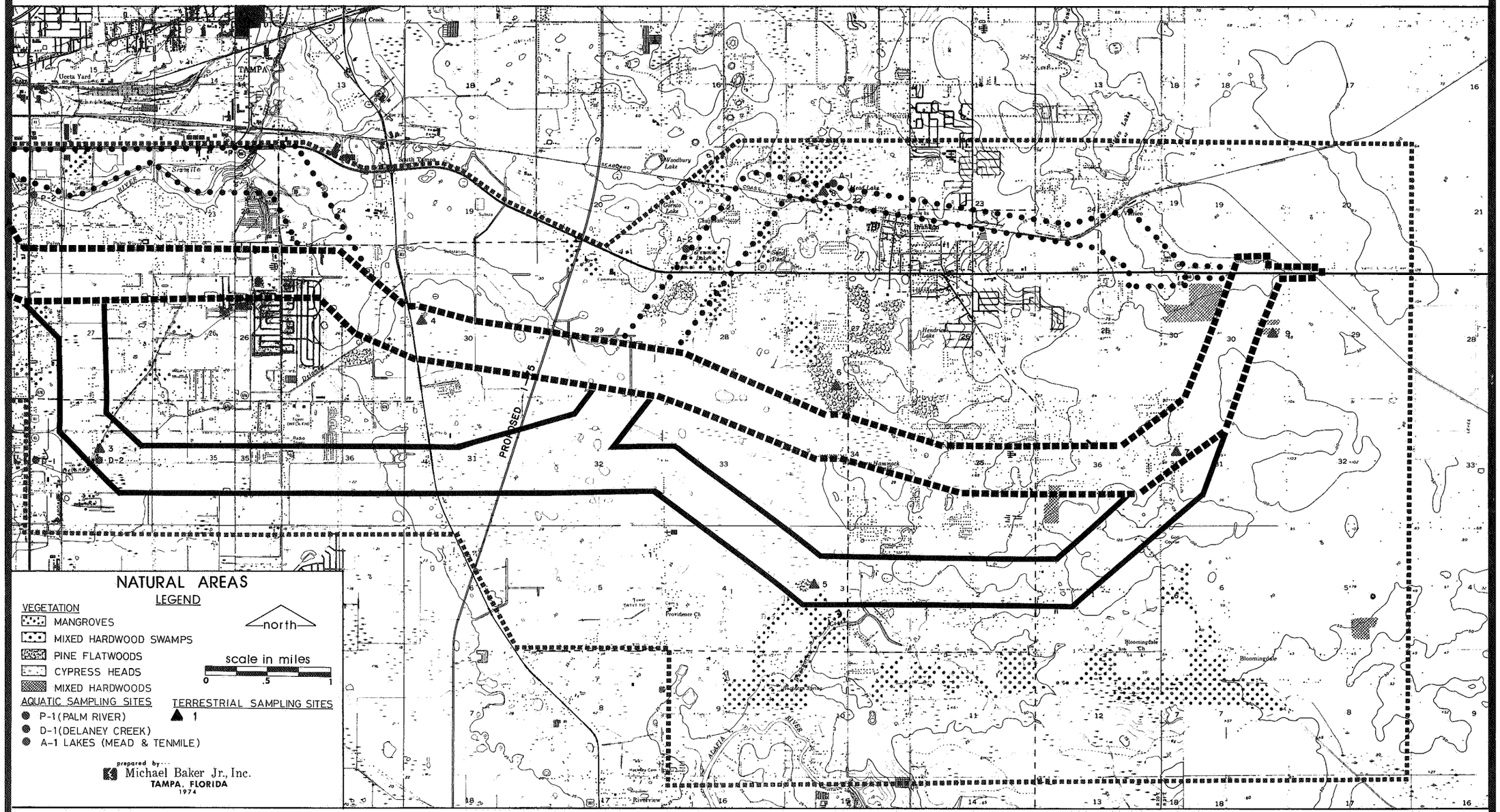


EXHIBIT 9A

CORRIDOR STUDY



NATURAL AREAS

LEGEND

VEGETATION

- MANGROVES
- MIXED HARDWOOD SWAMPS
- PINE FLATWOODS
- CYPRESS HEADS
- MIXED HARDWOODS

north

scale in miles

0 .5 1

AQUATIC SAMPLING SITES

- P-1(PALM RIVER)
- D-1(DELANEY CREEK)
- A-1 LAKES (MEAD & TENMILE)

TERRESTRIAL SAMPLING SITES

▲ 1

prepared by:
Michael Baker Jr., Inc.
TAMPA, FLORIDA
1974

EXHIBIT 9B

Common animals of the Swamp Forest include Marsh Rabbit (Sylvilagus balustris), Opposum (Didelphis marsupialis), Florida Water Rat (Neofiber alleni), Nutria (Myacastor coypos), Red-Shouldered Hawk (Bueto lineatus), and Eastern Cottonmouth (Agkistrodon pisciourus).

Common animals of the Mixed Hardwood Forest include the Southeastern Pocket Gopher (Geomys pinetis), Gopher Tortoise (Gopherous polyphemus), Eastern Gray Squirrel (Sciurus carolineusis) and the Gray Fox (Urocyon cinereoargenteus).

Animals common to the Mangrove Community include the Clapper Rail (Rallus longirestris), Prairie Warblers (Dendroica discolor), Brown Pelican (Pelecanus occidentalis), and the Yellow Rat Snake (Elaphe Obsoleta quadrivihata). Shorebirds, also common to the Mangrove Community, are discussed in a subsequent section.

Study Area Fauna

Due to extensive development, relatively high human populations, and remnant nature of natural vegetation within the Study Area, animals which are relatively intolerant of people and/or require larger continuous tracts of native habitat such as the Florida Panther (Felis concolor coryi) and the American Osprey (Pandion haliaetus) are not found or are extremely rare.

In general, plant productivity within the temperate ecosystem increases from dry (xeric) to medium (mesic) to wet (hydric) communities. Therefore, productivity within the Study Area would generally increase from the Pine Flatwoods to the Mixed Hardwoods to the Cypress Swamps to the Mangrove Community.

Wildlife productivity is influenced by many factors including plant productivity, vegetation species composition, and the spatial distribution of different plant communities. The more wildlife food produced the more wildlife can be supported, within other constraints.

Not all plants growing in a community are equally valuable to wildlife. The Oaks, dominant components of the Pine Flatwood Forest, Mixed Hardwood Swamp Forest and the Mixed Hardwood Forest, are generally regarded as the most valuable wildlife plants in the Southeast Region. This ranking is based on the number of species of waterbirds, marsh and shore birds, upland game birds, song birds, fur and game mammals, small mammals and browsers using the plant as a food, as well as on the extent of use (varying from 0.5 to more than 50 percent of diet). Along with the Oaks other plants valuable to wildlife found within the Study Area are, in descending order of relative importance, Pine, Cherry, Greenbriar, Blueberry, Hickory, Black Gum, Holly, Maple, Persimmon, Wax Myrtle, Dogwood, Palmetto and Elderberry. Table 2, entitled "Wildlife Use of Study Area Vegetation," lists some of the wildlife species using the above listed plants.

Spatial distribution of vegetation affects habitat diversity, which is directly related to wildlife species diversity. For example, a unit area composed of improved pasture, Pine Flatwoods and Mixed Hardwood Swamp would provide a diverse habitat supporting a richer fauna than the same unit area composed only of Pine Flatwoods vegetation. The scattered remnants of natural vegetation within the Study Area are frequently interspersed with improved pasture and/or cropland. Therefore, although the natural vegetation is small in total area and thus could not support a large population of any single species, the habitat diversity (due to the spatial distribution of the natural areas) does support a large number of different species.

Rare and endangered species of wildlife other than those noted in McKay Bay and the aquatic section of this Report are not known to occur within the Study Area.

TABLE 1
LIST OF OBSERVED PLANT SPECIES

Common Name	Scientific Name	Common Name	Scientific Name
Butterfly Weed	Asclepias tuberosa	Sow Thistle	Sonchus sp.
Running Oak	Quercus Pumila	Elderberry	Sambucus sp.
Phlox	Phlox Dummandii	Carolina Willow	Salix caroliniana
Sweetbay	Magnolia virginiana	- -	Myrica bedens
Grape	Vitis rotundifolia	Live Oak	Quercus virginianus
- -	Blechnum serrulota	Heath	Ericaccae
White-top Aster	Aster reticulota	Taflower	Beforia racemosa
Fetter Bush	Lyonia lucida	Shiny Blueberry	Vaccinium myrsinites
Water Hickory	Carya aquatica	Laurel Oak	Quercus laurifolia
Willow Oak	Quercus phellos	Beech	Castanea
Persimmon	Diospyra virginiana	Cape Weed	Lippia nodiflora
Water Oak	Quercus nigra	Mallow	Malvaceae
Longleaf Pine	Pinus palustris	Shrub Verbena	Lantana camara
Bald Cypress	Taxodium distichum	Goldenrod	Solidago sp.
Saw Palmetto	Seronoa repens	Sea Purslane	Sesuvium portulacastrum
Florida Elm	Ulmus floridana	Sea Daisies	Borrichia frutescens
Polkeweed	Phytolacca sp.	Groundsel Tree	Baccharis halimifolia
Sumac	Rhus copallina	Rice Rush	Juncus effusus
Poison Ivy	Toxicodendron radicans	Knot Weed	Poligonium sp.
White Mangrove	Laguncalaria racemosa	Turkey Oak	Quercus laevis
Red Mangrove	Rhizophora mangle	Carolina Laurel Cherry	Prunus carolinensis
Sensitive Plant	Aeschynomene viscidula	Green Eyes	Berlandiera subacaulis
Wax Myrtle	Myrica cerifera	Indigo	Indigofera sp.
Brazilian Pepper	Schinus terebinthifolius	St. Johns' Wart	Hypericum hypericoides
Galingale	Cyperus sp.	Chapman Oak	Quercus chapmanii

Source: Michael Baker, Jr., Inc

TABLE 2

WILDLIFE USE OF STUDY AREA VEGETATION[1]

Wildlife	Oak	Pine	Cherry	Greenbriar	Blueberry	Hickory	Blackgum	Holly	Maple	Persimmon	Waxmyrtle	Dogwood	Palmetto	Elderberry
blue bird					**2			**			+			*
blue jay	****													
bobwhite	**	***				+					+			
brown thrasher		*					*	**						**
cardinal			+											+
caroling chickadee		**							+		+			
cat bird				**				**		*	**	*		*
clapper rail	+													
deer	***			**	**	+	*	*	***					+
fish crow				****										
florida crane					*									
florida duck								+						
florida jay	****													
flying squirrel	**													
fox squirrel	****								**					
grey fox			+	+	+					*				
grey squirrel	****	****	+				*		**				-	
mockingbird				**			*				+	+		*
mourning dove	*							+						
myrtle warbler											+		+	
oppossum							*			*				
piliated woodpecker													+	
pine woods sparrow		*			*									
quail		***				+		+			+	*		
rabbit									*					
raccoon	***			**			*			***			***	
red-bellied woodpecker													+	+
red-eyed vireo			+											+
robin							***	**		*		*	****	
sandhill crane					+									
tufted titmouse		+			*						+			

[1] *Source: Martin, et.al. 1951.*
[2] *- Use to an undetermined extent*
+ - 1/2% to 2% of diet
** - 1% to 5% of diet*
*** - 5% to 10% of diet*
**** - 10% to 25% of diet*
***** - 25% to 50% of diet*

With the exception of birds in the McKay Bay vicinity, wildlife was assessed simultaneously with the vegetation analysis. In general, larger and more demanding (in terms of habitat area) wildlife species such as deer are limited to wetland areas associated with lakes or rivers within the Study Area. The most extensive area of this type is in the Alafia River - Buckhorn Creek Flood Plain. Smaller and less demanding species are less restricted.

By far the most productive portion of the Study Area in terms of wildlife is the McKay Bay vicinity.

Prime sources of information for avian wildlife report were the three Christmas Bird Counts and three Summer Bird Counts conducted since January 1972 by the Tampa Audubon Society. Additional information was gathered from records published in the journal American Birds (formerly Audubon Field Notes) and unpublished observations of State biologists and professional ornithologists.

Throughout the Report "McKay Bay" or the "McKay Bay area" refers to the area bounded by S.R. 60 on the north, U.S. 41 on the east, 22nd Street Causeway on the south and roads bordering the bay on its west shore. The taxonomic order, common names, and scientific names used in this report conform to the American Ornithologist's Union Check-list of North American Birds, and the thirty-second supplement to the check-list published in the Auk.

The different avian species known to occur in the slightly more than three square mile McKay Bay area at some time during the year are listed in Table 3, entitled "Avifauna Recorded to Utilize McKay Bay." There is probably no other location in the State (and possibly the southeast) where such a variety of species, especially waterfowl and shorebirds, can be observed in such a small area. Many of the 148 species recorded are not commonly observed elsewhere nearby, making McKay Bay attractive to students, bird watchers, and ornithologists.

Eighteen of the 148 species that utilize McKay Bay are ducks including several species favored by hunters. The bay thus serves as a winter refuge for birds that are legal game.

The Brown Pelican and Bald Eagle, officially endangered species, have been recorded in McKay Bay. Many species observed are rare or uncommon in occurrence. Although not officially endangered, the White Pelican, Reddish Egret, Black-crowned Night Heron, Wood Stork, Glossy Ibis, White Ibis, Sharp-shinned Hawk, Marsh Hawk, Osprey, Snowy Plover, American Oystercatcher, and Least Tern are species that have shown indications of non-cyclic population declines or range contractions in the past few years due to a wide variety of causes. All of these species can be found in McKay Bay. Further degredation of this valuable natural resource might increase the stress on many of these birds.

The sheltered nature of McKay Bay and the food availability in its large expanse of shallow water makes the estuary attractive to tens of thousands of birds in the winter and migratory seasons. The results of Christmas Bird Counts of the McKay area for three years from January 1972 through December 1973 are presented in Table 4. No previous detailed censuses of the area are known to exist.

Throughout North America, 963 such counts were conducted in the winter of 1971-72. A comparison of the results revealed that the Tampa count had the highest number of individuals counted for six species across the continent. Four of these high counts were totally derived from McKay Bay. The 3,000 Semi-palmated Sandpipers and 10,000 Western Sandpipers found in McKay Bay were the highest totals of these two species counted in North America during the count period. The single Lesser Black-backed Gull and White-rumped Sandpiper observed were each seen in only one other location during the North American count. The gull is a European species that rarely occurs along the Eastern U.S., while the White-rumped Sandpiper usually winters in South America. A high count

TABLE 3
AVIFAUNA RECORDED TO UTILIZE McKAY BAY

Common Loon
Horned Grebe
Pied-billed Grebe
White Pelican
Brown Pelican ■
Double-crested Cormorant
Great Blue Heron (Blue & White forms) ■
Green Heron
Little Blue Heron
Cattle Egret
Reddish Egret
Great Egret
Snowy Egret
Louisiana Heron
Black-crowned Night Heron
Yellow-crowned Night Heron
American Bittern
Wood Stork
Glossy Ibis
White Ibis
Roseate Spoonbill
Snow Goose (Blue form)
Fulvous Tree Duck
American Kestrel
Bobwhite ■
King Rail
Clapper Rail ■
Sora
Common Gallinule
American Coot
American Oystercatcher
Semi-palmated Plover
Snowy Plover
Wilson's Plover
Killdeer
Black-bellied Plover
Ruddy Turnstone

Mallard
Black Duck
Mottled Duck
Gadwall
Pintail
Common Teal (Green-winged form)
Blue-winged Teal
European Wigeon
American Wigeon
Northern Shoveler
Redhead
Ring-necked Duck
Canvasback
Lesser Scaup
Bufflehead
Ruddy Duck
Red-breasted Merganser
Turkey Vulture
Black Vulture
Sharp-shinned Hawk ■
Red-tailed Hawk
Bald Eagle ■
Marsh Hawk
Osprey
Least Sandpiper
Dunlin
Short-billed Dowitcher
Long-billed Dowitcher
Stilt Sandpiper
Semipalmated Sandpiper
Western Sandpiper
Marbled Godwit
Sanderling
American Avocet
Black-necked Stilt
Wilson's Phalarope
Northern Phalarope
Lesser Black-backed Gull

Common Snipe
Long-billed Curlew
Whimbrel
Spotted Sandpiper
Solitary Sandpiper
Willet
Greater Yellowlegs
Lesser Yellowlegs
Red Knot
White-rumped Sandpiper
Black Tern
Black Skimmer
Mourning Dove
Ground Dove
Screech Owl ■
Common Nighthawk
Chimney Swift
Belted Kingfisher
Common Flicker (Yellow-shafted form)
Red-bellied Woodpecker
Downy Woodpecker
Gray Kingbird
Western Kingbird
Scissor-tailed Flycatcher
Great Crested Flycatcher
Eastern Phoebe
Tree Swallow
Purple Martin
Blue Jay
Fish Crow
Carolina Chickadee
House Wren
Carolina Wren
American Goldfinch
Rufous-sided Towhee
Savannah Sparrow

Herring Gull
Ring-billed Gull
Laughing Gull
Bonaparte's Gull
Forster's Tern
Common Tern
Least Tern
Royal Tern
Sandwich Tern
Caspian Tern
Sharp-tailed Sparrow
White-crowned Sparrow
Swamp Sparrow
Song Sparrow
Short-billed Marsh Wren
Mockingbird
Gray Catbird
Brown Thrasher
Robin
Blue-gray Gnatcatcher
Ruby-crowned Kinglet
Water Pipit
Cedar Waxwing
Loggerhead Shrike
Starling
White-eyed Vireo
Solitary Vireo
Yellow-rumped Warbler
Prairie Warbler
Palm Warbler
Common Yellowthroat
House Sparrow
Eastern Meadowlark
Red-winged Blackbird
Boat-tailed Grackle
Common Grackle
Cardinal

This species list was composed of observations from the three Tampa Christmas Bird Censuses, three Tampa Summer Bird Censuses, regional reports published in American Birds, and notes from state biologists and professional ornithologists. ■ *Endangered or protected birds, according to Threatened Wildlife of the United States, 1973 Edition, U.S. Department of the Interior.*

TABLE 4
CHRISTMAS BIRD COUNT TOTALS FOR McKAY
1972-1973

Species	1 January 1972[1]	23 December 1972[2]	29 December 1973[3]
Common Loon	6	-	-
Horned Grebe	2	1	3
Pied-billed Grebe	12	30	1
White Pelican	40	6	8
Brown Pelican	5	25	15
Double-crested Cormorant	15	20	10
Great Blue Heron	15	5	5
Green Heron	1	6	3
Little Blue Heron	10	30	20
Cattle Egret	5000	2000	10
Great Egret	20	30	20
Snowy Egret	12	5	12
Louisiana Heron	20	20	15
Black-crowned Night Heron	18	1	8
Yellow-crowned Night Heron	-	8	2
Wood Stork	8	2	10
Glossy Ibis	-	2	-
White Ibis	60	300	50
Roseate Spoonbill	-	2	-
Snow Goose (Blue form)	1	-	-
Mallard	-	3	3
Mottled Duck	2	5	-
Gadwall	7	9	-
Pintail	1200	50	-
Common Teal (Green-winged form)	25	25	60
Blue-winged Teal	17	4	5
European Wigeon	-	-	1
American Wigeon	2500	100	15
Northern Shoveler	1500	500	500
Redhead	-	4	-
Canvasback	150	1000	300
Lesser Scaup	4000	8000	1500
Bufflehead	-	2	-
Ruddy Duck	500	800	900
Red-breasted Merganser	5	12	10
Turkey Vulture	2	5	5
Black Vulture	-	1	-
Sharp-shinned Hawk	-	-	3
Red-tailed Hawk	1	1	4
Marsh Hawk	1	1	2
Osprey	-	-	1
American kestrel	1	6	4
Bobwhite	2	5	-
King Rail	-	1	-
Clapper Rail	20	25	25
Sora	7	35	-
Common Gallinule	-	1	2
American Coot	1500	150	100
Semi-palmated Plover	10	50	5
Wilson's Plover	10	20	8
Killdeer	50	50	40
Black-bellied Plover	50	50	100
Ruddy Turnstone	1	15	-
Common Snipe	1	1	2
Long-billed Curlew	2	-	-
Whimbrel	-	7	3
Spotted Sandpiper	4	10	25
Willet	15	80	40
Greater Yellowlegs	30	10	10
Lesser Yellowlegs	100	30	20
Red Knot	15	20	-
White-rumped Sandpiper	1	-	-
Least Sandpiper	300	1000	400
Dunlin	600	5000	5000
Short-billed Dowitcher	1000	2000	3000
Long-billed Dowitcher	12	2	3
Stilt Sandpiper	-	1	-
Semipalmated Sandpiper	3000	7000	5000
Western Sandpiper	10,000	3000	6000
Marbled Godwit	-	2	-
Sanderling	2	-	-
American Avocet	95	150	300
Lesser Black-backed Gull	1	-	-
Herring Gull	70	40	50

TABLE 4
(Cont'd.)

Species	1 January 1972[1]	23 December 1972[2]	29 December 1973[3]
Ring-billed Gull	1500	80	100
Laughing Gull	3000	200	500
Bonaparte's Gull	1	15	3
Forster's Tern	30	70	50
Royal Tern	4	2	-
Sandwich Tern	-	1	-
Caspian Tern	4	1	-
Black Skimmer	150	80	80
Mourning Dove	40	50	15
Ground Dove	12	20	6
Screech Owl	1	-	-
Belted Kingfisher	8	22	10
Common Flicker (Yellow-shafted form)	5	-	5
Red-bellied Woodpecker	-	1	-
Western Kingbird	-	1	-
Eastern Phoebe	-	1	-
Tree Swallow	2	5	-
Blue Jay	5	20	10
Fish Crow	1500	5000	200
Carolina Chickadee	-	-	6
House Wren	6	1	-
Carolina Wren	3	5	-
Short-billed Marsh Wren	-	2	-
Mockingbird	35	25	30
Gray Catbird	15	3	8
Brown Thrasher	1	4	4
Robin	600	40	2000
Blue-gray Gnatcatcher	10	5	12
Ruby-crowned Kinglet	3	3	1
Water Pipit	1	-	-
Cedar Waxwing	-	-	15
Loggerhead Shrike	5	10	3
Starling	50	30	50
White-eyed Vireo	3	1	4
Solitary Vireo	-	1	-
Yellow-rumped Warbler	100	50	10
Prairie Warbler	2	1	5
Palm Warbler	50	20	20
Common Yellowthroat	40	20	20
House Sparrow	12	50	30
Eastern Meadowlark	20	5	1
Red-winged Blackbird	400	400	800
Boat-tailed Grackle	15	10	100
Common Grackle	8	10	200
Cardinal	3	2	5
American Goldfinch	4	10	15
Rufous-sided Towhee	10	10	5
Savannah Sparrow	15	40	10
Sharp-tailed Sparrow	2	1	2
White-crowned Sparrow	-	2	-
Swamp Sparrow	38	55	10
Song Sparrow	-	-	4
Total number of species	**101**	**111**	**91**
Total number of individuals	**39,767**	**38,161**	**27,987**

[1]From the Tampa, Florida Christmas Bird Count published in the journal American Birds, 26(2):316-317

[2]From the Tampa, Florida Christmas Bird Count published in the journal American Birds, 27(2):313-314

[3]From the Tampa, Florida Christmas Bird Count published in the journal American Birds, 28(2): in press

of 125 Lesser Yellowlegs was also recorded in Tampa, a majority of these birds being counted in McKay Bay. In the winter of 1972-73, 111 species were observed in McKay Bay including 19 species not seen on the previous count. When compared with the 1,013 Christmas counts conducted across the continent that year, the Tampa count had five of the highest counts for individuals. Two of these high counts were totally derived from McKay Bay. The 2,300 short-billed Dowitchers and 7,000 Semi-palmated Sandpipers observed in McKay Bay were the highest totals counted of those two species in North America during the count period. Five thousand of the high count of 5,700 Fish Crows observed in Tampa also were seen in McKay Bay.

In the 1973-74 count, high numbers of many shorebird species were again observed. At this writing, tabulation of all the North American counts has not been published. However, it is very probable that McKay Bay again recorded the highest totals for two or three species in North America. The 1973-74 count recorded six species not observed in the previous two years.

Aside from the wide variety of avifauna that can be observed at McKay Bay, the Christmas count data also reveals that the habitat provided by the estuarine conditions produces probably the most concentrated assemblage of individuals in the State. In both 1971-72 and 1973 nearly 40,000 individuals of over 100 species were observed in an area of less than four square miles. In both years, approximately 10,000 ducks were utilizing roughly two square miles of wet and open-water areas.

The 1973-74 data show a decline in the number of species and individuals. The greatest individual declines were in the numbers of Cattle Egrets, Fish Crows and ducks utilizing the area. The differences between 1973-74 and the previous years are probably attributed to the following reasons: (1) early morning fog until approximately 10:00 a.m. limited the ability to observe the less numerous species such as Gadwall, Pintail and Redhead, all of which were seen in the bay prior to and after the count day; (2) the occurrence of hunting simultaneous with the count could easily have acted in combination with the heavy fog to lower the number of ducks observed; (3) ducks were noted to be less numerous statewide than in previous years, hence McKay Bay is only reflecting the statewide trends; (4) shorebird numbers were fairly stable. Clark and Brownell (1973) have indicated that the shorebirds "...are an essential component of the natural (marine) ecosystem. The birds of this group are generally more dependent upon estuarine conditions than the adaptable waterfowl species and have demonstrated a greater sensitivity to the overall encroachment of man." Hence, the stability of the shorebird populations is of importance to note, and (5) the movement of roosting species from the area also caused a drop of almost 7,000 individuals from the total.

Little long-term data is available to give a definitive picture of population trends in McKay Bay. However, for the past three years, most species have not fluctuated greatly in numbers. The 1973-74 fluctuation of ducks is probably temporary and explained by the reasons listed above.

In addition to the overwintering species, other types of birds use the bay's resources during migration. Several species even breed at McKay Bay and many birds that breed elsewhere in the Tampa Bay Area utilize the food resources present in McKay Bay during the nesting season. The birds listed in Table 5 entitled "Breeding Birds of McKay Bay" are of those species that have been confirmed to breed in the estuarine environment of McKay Bay. With the exception of the Prairie Warbler, a confirmed observation included the recording of an active nest with eggs or observation of unfledged young. Two additional species that might very well breed in the immediate salt water area but have not been confirmed as doing so are the Green Heron and the Killdeer. Many Passerine species undoubtably can be found breeding in the wooded area in the southeast corner of the McKay Bay area.

TABLE 5
BREEDING BIRDS OF McKAY BAY

Clapper Rail	Builds nests of dead vegetation on or near the ground among the mangroves.
Common Gallinule	Builds nests from dead plant material on clumps of vegetation usually standing in water.
Wilson's Plover	Lays eggs in a shallow shell-lined hollow scraped out of the ground in sandy areas.
Willet	Nests on the ground in a depression in the sand lined with dried grass or bits of debris.
Black-necked Stilt	Nests in a hollow area scraped out and lined with sticks, stones, shells or vegetation.
Least Tern	Lays eggs in shallow scrapes lined with shells in sandy areas devoid of most vegetation.
Black Skimmer	Nests in shallow scrapes in sandy areas.
Prairie Warbler	Nests in the mangrove trees.
Red-winged Black Bird	Nests in small bushes along the bay.

Source: Tampa Audubon Society, William Courser

The results of three summer bird censuses of McKay Bay are presented in Table 6. Most of the ducks and shorebirds observed are species that generally breed farther north. However, for various reasons they have not migrated with others of their kind. These species apparently find the conditions at McKay Bay appropriate to meet their summer food and cover requirements. Some species, such as the Brown Pelican, Double-crested Cormorant, the various herons and egrets, White Ibis, Osprey, Bald Eagle, Laughing Gull, several terns, Black Skimmer and various Passerines, although they breed elsewhere nearby, utilize McKay Bay as a food source during the breeding season and as an area to seek food and shelter after completion of the reproductive cycle. Aside from some tropical species, Florida is more noted for its wintering and migratory bird life than its summer bird population. The results of the summer counts indicate that a variety of species derive benefit from the McKay Bay estuary even in the summer.

Professional and amateur ornithologists, game and fish biologists and state biologists have all attested to the value of McKay Bay for waterfowl and shorebirds. Such a large concentration of birdlife makes McKay Bay a tourist attraction for bird watchers vacationing or spending the winter in Florida. Several State Audubon Chapters conduct field trips to the bay and local universities conduct student field trips, as well as research, in the area. The Tampa Audubon Society has stated that 50 people per year request information on the best bird watching areas in Tampa, and McKay Bay is always listed first. An unknown number of similar requests are also received by Florida Audubon headquarters in Maitland. McKay Bay is one of the areas of the State recommended for bird watching by the Florida Audubon Society. The publication of the Tampa Audubon Christmas Counts in the journal American Birds has increased the number of out-of-state and out-of-town observers visiting the bay.

TABLE 6
SUMMER BIRD COUNT TOTALS FOR McKAY BAY 1972-1974[1]

Species	17 June 1972	9 June 1973	8 June 1974
White Pelican	117	535	1
Brown Pelican	36	157	63
Double-crested Cormorant	3	13	15
Great Blue Heron	2	3	10
Great Blue Heron (White form)	-	-	1
Green Heron	4	6	8
Little Blue Heron	-	12	8
Cattle Egret	4	6	3
Reddish Egret	-	1	-
Great Egret	13	17	50
Snowy Egret	19	15	28
Louisiana Heron	8	8	17
Black-crowned Night Heron	-	1	-
Yellow-crowned Night Heron	5	8	14
Wood Stork	17	7	2
Glossy Ibis	-	-	1
White Ibis	7	19	65
Roseate Spoonbill	42	17	28
Black Duck	-	-	2
Mottled Duck	-	1	-
Blue-winged Teal	-	1	11
Northern Shoveler	1	6	5
Lesser Scaup	22	16	15
Ruddy Duck	2	8	9
Red-tailed Hawk	-	1	1
Osprey	-	1	-
Bobwhite	-	1	2
Clapper Rail	1	1	14
Common Gallinule	8	1	4
American Coot	-	1	1
Semipalmated Plover	-	-	10
Wilson's Plover	9	33	31
Killdeer	14	14	9
Black-bellied Plover	9	-	78
Ruddy Turnstone	-	-	2
Whimbrel	-	-	1
Willet	3	13	28
Greater Yellowlegs	-	-	1
Lesser Yellowlegs	-	1	1
Red Knot	-	-	6
Dunlin	2	-	-
Short-billed Dowitcher	216	11	305
Long-billed Dowitcher	1	-	2
Semipalmated Sandpiper	-	-	121
Western Sandpiper	-	103	155
American Avocet	44	9	19
Black-necked Stilt	28	34	78
Herring Gull	1	1	-
Ring-billed Gull	21	11	6
Laughing Gull	50	58	209
Forster's Tern	79	1	3
Common Tern	16	2	1
Least Tern	65	443	44
Royal Tern	6	-	-
Caspian Tern	-	-	5
Black Tern	42	9	39
Black Skimmer	201	250	64
Mourning Dove	12	3	8
Ground Dove	2	6	22
Chimney Swift	1	-	-
Belted Kingfisher	1	-	-
Common Flicker (Yellow-shafted form)	2	-	-
Downy Woodpecker	-	-	1
Great Crested Flycatcher	-	1	-
Blue Jay	-	-	2
Fish Crow	2	-	3
Mockingbird	-	3	19
Brown Thrasher	-	1	-
Loggerhead Shrike	-	1	3
Prairie Warbler	2	9	19
Yellowthroat	5	-	1
Eastern Meadowlark	-	2	-
Red-winged Blackbird	50	235	356
Boat-tailed Grackle	33	4	14
Cardinal	-	-	1
Rufous-sided Towhee	-	2	5
Common Nighthawk	-	-	2
Total number of species	**46**	**54**	**63**
Total number of individuals	**1228**	**2123**	**2052**

[1] *Tampa Audubon Society unpublished data*

Water Quality and Biota

Aquatic and marine environments within the Study Area can be classified into four broad categories:

1. Estuarine Bay (McKay Bay);
2. Estuarine River and Stream (Palm River, Delaney Creek);
3. Channel (Ybor Channel); and
4. Freshwater Lake (Mead Lake, Ten Mile Lake)

This section provides a detailed description of the chemical, physical, and biological conditions, and where applicable, the ecological relationships present in these bodies of water.

McKay Bay

McKay Bay, located at the northeastern tip of Hillsborough Bay, is estuarine in nature. The bay is fed by freshwater discharges from Delaney Creek, the Palm River, urban runoff, and tidal driven saline water from Hillsborough Bay. The bay is very shallow, with mean low tide depths ranging from one to five feet at various locations. (U.S. Department of Commerce, National Ocean Survey, 1973). This shallow water condition results in minimal water circulation and corresponding poor flushing characteristics within the bay itself.

The chemical, physical, and biological conditions of McKay Bay were investigated to ascertain existing conditions and ecological sensitivity. The locations of the sampling stations are shown on Exhibit 9. The results of physical analyses are given in Table 7. Examination of the results revealed that existing conditions for marine life in parts of McKay Bay are extremely poor. Thermal effluent directed to the bay from the Tampa Municipal Incinerator results in elevated water temperatures in the vicinity of Station 9 (See Exhibit 9). Temperatures as high as 43° C (109° F) were recorded in this area. With the exceptions of Stations 7 and 8, the bay sediments consist of a thick, gray-black organic ooze emitting a strong odor of hydrogen sulfide, which is indicative of anaerobic conditions. The sediments at Stations 7 and 8 consist of coarse sand, with little organic matter present. The results of water and sediment chemical analyses of samples collected from McKay Bay can be found in Tables 7, 8 and 9. While phosphate concentrations were quite high throughout the bay, no nitrate was detected at any of the sampling sites, indicating that lack of nitrate is probably a limiting factor for plant growth.

Dissolved oxygen concentrations measured in the early morning hours were less than 100 percent saturation, while those measured in mid-afternoon sometimes exceeded 200 percent saturation. This indicates that primary production by marine algae in the bay is quite prolific, with the plants producing oxygen during the day, and using large amounts of oxygen for respiratory functions during the night hours. It is quite possible that the algae are using large enough quantities of oxygen during the night phase of biochemical activity to cause an oxygen deficit great enough to result in the suffocation of faunal species requiring relatively high concentrations of oxygen. A 24-hour test for dissolved oxygen should be run during future studies of the bay to determine if oxygen concentrations fall to critical levels at night. This aspect will be of particular importance during the preparation of the environmental impact statement on the project.

Both water samples and sediment samples collected from McKay Bay were analyzed for six heavy metals: mercury, lead, zinc, cadmium, arsenic and chromium. The results of these tests appear in Tables 8 and 9.

The results of the heavy metals analyses revealed elevated levels of lead, arsenic and zinc in most parts of McKay Bay. Of particular interest were the sediment analyses which showed extremely high levels of metals in the bay sediments, with concentrations of lead and zinc in excess of 1,100 ppm and 2,100 ppm, respectively. This is of concern because

TABLE 7

WATER QUALITY DATA FOR McKAY BAY

	McKay Bay 1	McKay Bay 2	McKay Bay 3	McKay Bay 4	McKay Bay 5	McKay Bay 6	McKay Bay 7	McKay Bay 8	McKay Bay 9	McKay Bay 10
Water Temperature (C^o)	28.8	23.8	24.0	25.0	22.0	23.0	25.0	27.8	43.0	32.0
Dissolved O_2(mg/1)	13.7	7.6	10.1	17.2	6.7	6.9	5.8	9.5	7.5	16.7
Percent O_2 Saturation	175%	89%	118.9%	204.8%	76.1%	79.3%	69%	120.2%	119%	225.7%
Phosphate (mg/1) (Dissolved Ortho)	3.6	4.6	4.8	3.9	4.5	4.4	4.7	4.6	2.0	3.5
Nitrate (mg/1)	0	0	0	0	0	0	0	0	0	0
pH	8.78	8.55	8.75	8.90	8.45	8.32	7.90	8.20	8.00	8.20
Iron (mg/1)	0.15	0.10	0.11	0.18	0.05	0.05	0.04	0.06	0.15	0.07
Depth (m)	0.5	0.5	0.25	0.2	0.2	0.1	0.25	0.3	0.3	0.4
SO_4 (ppm)	2187	2375	2360	2125	1875	2500	2500	1750	1825	1850

Source: Michael Baker, Jr., Inc.

TABLE 8

HEAVY METAL CONCENTRATIONS OF WATER IN McKAY BAY

Station	Heavy Metal Concentration					
	Mercury	Lead	Arsenic	Cadmium	Chromium	Zinc
1	0.5 ppb	0.29 ppm	1 ppb	0.02 ppm	40 ppb	0.12 ppm
3	0.5 ppb	0.25 ppm	1 ppb	0.01 ppm	22 ppb	0.06 ppm
7	0.5 ppb	0.23 ppm	1 ppb	0.01 ppm	27 ppb	0.04 ppm
9	0.65 ppb	0.71 ppm	9.5 ppb	0.03 ppm	40 ppb	0.62 ppm

Source: Thornton Laboratories, Inc., Tampa, Florida

TABLE 9

HEAVY METAL CONCENTRATIONS OF SEDIMENT OF McKAY BAY

Station	Mercury	Lead	Arsenic	Cadmium	Chromium	Zinc
1	0.75	755	0.75	0.18	122	1,364
2	0.67	1,146	2.31	0.20	76	2,184
3	0.39	302	0.03	0.05	48	453
4	0.43	42	3.56	0.01	13	56
5 (Sample of ash from surface of sediment)	0.12	272	0.30	0.01	15	329
6	0.11	120	1.44	0.02	24	145
7	0.14	32	0.46	0.01	13	24
8	0.01	2	0.02	0.01	4.5	1
9	0.50	1,245	2.14	0.09	42	2,092
10	0.16	430	2.15	0.09	34	865

Source: Thornton Laboratories, Inc., Tampa, Florida

concentrations of heavy metals in the marine environment could pose a danger to many life forms. Past research indicates that these and other metals have a tendency to accumulate in the tissues of most organisms and are very toxic at rather low concentrations. While the source of heavy metals has not been pinpointed, it is possible that the metals may be leaching out from landfill areas surrounding the Tampa Municipal Incinerator. Some metals may also be contributed from incinerator ash deposits in the bay and thermal effluent discharges.

While extensive biological investigations have been carried out in much of Tampa and Hillsborough Bays, very few biological studies have been conducted on McKay Bay. However, much of the biological data collected in Tampa and Hillsborough Bays can be directly related to McKay Bay, since tidal flow through these areas enhances the movement of organisms from one area to another within the marine continuum.

Phytoplankton and zooplankton comprise an essential part of the estuarine ecosystem and as such, serve as the initial link in the food chain for many species of marine life. The phytoplankton also aid in the replenishment of oxygen in the water, as a result of their photosynthetic activities. While more than 100 species of diatoms and dinoflagellates have been reported in the Tampa Bay estuary, the diatom Skelotoma costatum and the dinoflagellates Ceratium hircus and Gonyaulax balechii are the most abundant representatives of phytoplankton life found in the estuary.

It has been determined that a sergestid shrimp is the most numerous zooplankton in the bay (Kelly and Dragovich, 1967). As a group, decapod crustaceans comprised 87 percent of all the zooplankton collected. Several of the species collected were of considerable importance to sport and commercial fisheries. These included pink shrimp, as well as larval forms of herrings, croakers, and anchovies. Many other species, while not of direct value to man, are consumed in interrelated food chains that ultimately affect species of value to man.

Table 10 contains a list of the 15 most common fishes collected in the estuaries of Tampa Bay, in descending order of abundance. Since many of these species are present not only in McKay Bay, but in other estuarine bodies of water within the Study Area, they will be discussed in greater detail in a succeeding section of this study.

The benthic, or bottom dwelling organisms of McKay Bay were sampled at ten locations, using a core sampler. The locations of the sampling points are indicated on Exhibit 9. Table 11 lists the species collected at the respective sampling sites.

Benthic life in the northern end of the bay was very sparse, with four of the ten stations yielding no apparent life forms. However, at the other collection stations, oligochaetes, polychaetes, and isopods were present in small numbers. The paucity of benthic life in the areas sampled is most probably due to the extremely high levels of heavy metal contaminants present in the bay sediments, thermal effluent discharges from the Tampa Municipal Incinerator, adverse anaerobic conditions in the sediments of the bay, or the compounding-cumulative effect of all of these factors working together to bring about potentially lethal conditions.

The diversity of marine life that is present in McKay Bay exists there because of a unique combination of factors which ranks Florida's mangrove-bordered estuaries among some of the most productive areas of the world. The high productivity of these estuaries is primarily dependent upon organic detritus (particulate material), which serves as a base for the estuarine food chains. It has been estimated that organic detritus accounts for 80 to 90 percent of the nutrition of marine worms, crustaceans and small fishes found in estuaries. These detritus eaters are, in turn, the prey of larger fish, including many species of commercial importance. Many species of birds, including pelicans, herons, egrets, storks, ibis, spoonbills and ducks are also dependent upon this detrital based food chain and as such are very abundant throughout the Tampa Bay estuarine system.

TABLE 10
COMMON FISH SPECIES OF TAMPA BAY

Bay anchovy	Anchoa mitchilli
Tidewater silversides	Menidia beryllina
Spot	Leiostomus xanthurus
Pinfish	Lagodon rhomboides
Silver perch	Bairdiella chrysura
Silver jenny	Eucinostomus gula
Striped mullet	Mugil cephalus
Longnose killifish	Fundulus similis
Sheepshead killifish	Cyprinodon Variegatus
Spotfin mojarra	Eucinostomus argenteus
Rainwater killifish	Lucania parua
Scaled sardine	Harengula pensacolae
Goldspotted killifish	Floridichthys carpio
Gulf killifish	Fundulus grandis
Rough silverside	Membras martinica

Source: Finucane, J. H. (1966)

Palm River

The average annual flow of the Palm River is 62.3 cfs and is estuarine in nature, with the headwaters of Six-Mile Creek supplying fresh water as McKay Bay periodically receives tidal driven saline waters from the Gulf. Although the Palm River was originally quite shallow, with mean low tide depths averaging four feet, much of the river has been dredged to a depth of approximately 20 feet. The sediments of the river consist of a thick ooze composed of silt and organic material. Chemical, physical and biological conditions of the Palm River sediments were examined. The results of chemical and physical analyses are given in Table 12. The locations of data collection sites are shown on Exhibit 9.

In general, both phosphate and nitrate levels in the Palm River are very high. These elevated nutrient levels are probably due to municipal sewage discharges, naturally occurring phosphate deposits, and urban runoff which enters the river at various sites. This high nutrient load indicates that large algal blooms may occur in the river during the summer growing season, causing a reduction in water quality during this period. The Palm River also serves as a receiving area for many types of domestic and industrial wastes, including chemicals, insecticides, and grease. Table 13 contains a list of sources and types of waste that are discharged into the Palm River.

Table 11 contains a list of benthic organisms found in Palm River. The list was compiled from a preliminary survey of benthos in the river and should not be considered to be a complete listing of benthic species.

Fish species present in McKay Bay, or elsewhere in the Tampa Bay estuary would also be expected to occur in the Palm River proper, dependent upon the ability of various species to tolerate low salinity conditions.

Delaney Creek

A large portion of Delaney Creek flows through residential areas, and it has been channelized to facilitate drainage throughout much of its length. The substrate of the creek is composed largely of decomposed and partially decomposed organic material. Samples were taken at two sites on Delaney Creek to determine the chemical, physical and biological characteristics of the stream. The locations of data collection sites are found on Exhibit 9. The results of chemical and physical analyses are given in Table 12.

Concentrations of both phosphates and nitrates were found to be extremely high. Nutrient levels of this magnitude could result in severe eutrophication problems and a corresponding reduction in water quality. The high levels of nutrients present are most probably due to the large volumes of domestic wastes, urban runoff and industrial discharges containing fertilizer and nitrogen compounds. The sources and volumes of these discharges are listed in Table 13.

Benthic organisms found in Delaney Creek consist primarily of isopods, oligochaetes (worms) and midge larvae, which are all pollution tolerant species. Pollution-intolerant species were generally found to be absent from the samples.

Ybor Channel

Ybor Channel is connected to Hillsborough Bay by Sparkman and Garrison Channels. The Channel plays a vital role in shipping in the Tampa area, and as a result, it has been dredged to accommodate large vessels. The results of chemical and physical analyses performed on Ybor Channel are given in Table 12. The locations of the sampling sites are shown on Exhibit 9.

Chemical analyses revealed high levels of phosphate in the water and an absence of nitrate, indicating that nitrate is a probable factor limiting algal growth in the channel.

Polychaetes appeared to be dominant bottom fauna of Ybor Channel, with lesser numbers of pinnotherid crabs and caridean shrimp. Table 14 contains a list of benthic species found in the Channel. Many of the fish species found elsewhere in the Tampa Bay estuary would also occur in Ybor Channel.

Estuarine fishes - The Tampa Bay estuarine complex supports a diverse assemblage of about 400 fish species. Although many of these species are occasionally found in the deeper portions of the estuary, the majority are generally associated with grass flats and other shallow areas. Although some species spend their entire lives within the estuary, others use the area as feeding grounds or for spawning and nursery purposes.

Table 10 contains a list of the 15 most common fishes collected in the estuaries of Tampa Bay in descending order of abundance. As in other estuarine systems of the eastern Gulf of Mexico, the most common fish in the estuary is the bay anchovy. Many of these fish, as well as less abundant species, are important to commercial interests. In 1970, 12.3 million pounds of fish, worth more than two million dollars to the fishermen, were landed in the three counties (Pinellas, Hillsborough and Manatee) surrounding Tampa Bay (Florida Department of Natural Resources, undated). From the standpoint of pounds and dollars, the most valuable commercial fishes are the snappers, groupers, black mullet, spotted seatrout and mackerels. It has been determined that the five most important commercial species in the Gulf of Mexico and many other species of lesser importance inhabit Tampa Bay area during their immature stages of development. Table 15 contains a list of the fish species of major commercial importance found in Tampa Bay as juveniles.

TABLE 11*

QUALITATIVE AND QUANTITATIVE DATA FROM BENTHIC SAMPLES

McKay Bay, Tampa Bay, Florida

Taxon	Number
Station 1	
Oligochaetes	15
Nematodes	7
	22
Station 2	
Nemerteans	3
Cumacean	1
Amphipod	1
Isopod	
Cyathura sp.	14
Polychaete	
Streblospio benedicti	2
	21
Station 3	
Nemerteans	2
Isopod	
Cyathura Sp.	15
Mollusk	
Tagelus divisus	2
Polychaete	
Streblospio benedicti	2
	21
Station 4	
No organisms found	
Station 5	
Mollusk	
Tagelus divisus	1
	1
Station 6	
No organisms found	
Station 7	
Mollusks	
Melongena corona	1
Macoma constricta	1
Tagelus divisus	28
Polychaetes	
Laeonereis culveri	18
Nereis succinea	5
Poldora sp.	1
Eteone sp.	2
Isopod	
Cyathura sp.	1
Anomura	
Upogebia affinis	1
	58
Station 8	
Mollusks	
Melogena corona	1
Tagelus divisus	2
Polychaete	
Laeonereis culveri	4
Insects	
Tabanid larva	1
Amphipod	1
Isopod	
Cyathura sp.	1
Grapsoid Crabs	
Uca sp.	1
	11
Station 9	
No organisms found	
Station 10	
No organisms found	

**Locations of sampling stations are shown on Exhibit 9.*

Source:
Michael Baker, Jr., Inc.

TABLE 12

WATER QUALITY DATA FOR PALM RIVER, DELANEY CREEK AND YBOR CHANNEL

	Palm River 1*	Palm River 2*	Palm River 3	Delaney Creek 1	Delaney Creek 2	Ybor Channel
Water Temperature (C^o)	25.6	24	24.6	25°	25°	24.5
Dissolved O_2 (mg/1)	6.1	7.2	7.2	---	---	---
Percent O_2 Saturation	73.5%	84.7%	84.9%	---	---	---
BOD (mg/1)	3.8	5.3	---	---	---	---
Turbidity (JTU)	14.4	7.4	---	---	---	---
PO_4 (dissolved ortho) (mg/1)	3.00	5.5	4.5	3.4	3.3	4.5
NO_3 (mg/1)	3.41	1.51	0	8.0	13.0	0
Suspended Solids (mg/1)	24.1	22.4	---	---	---	---
Alkalinity (mg/1 as $CaCO_3$)	120	103	---	---	---	---
Conductivity (ymhos)	27,300	30,700	---	---	---	---
Salinity (ppt)	7.46	19.14	---	---	---	---
pH	7.9	7.9	8.3	8.2	8.2	8.4
Iron (mg/1)	---	---	0.05	0.02	0.1	.13
Chlorophyll A (mg/1)	0.0333	0.0417	---	---	---	---
Chlorophyll B (mg/1)	0.0113	0.0037	---	---	---	---
Depth (m)	---	---	6	1.5	1	6.5
SO_4 (ppm)	---	---	2250	1625	950	2125

**Source: Florida Department of Air and Water Pollution Control*

TABLE 13
POINT SOURCES OF WASTES DISCHARGED INTO ESTUARINE WATERS WITHIN THE STUDY AREA

Sources of Discharge	Type of Discharge	Receiving Waters	Treatment	Average Daily Discharge (MGD)
Florida Steel Corporation	Domestic waste	Six Mile Creek to Palm River to McKay Bay	Extended aeration	0.0100
Adamo Acres	Domestic waste	Canal to Palm River to McKay Bay	Trickling filter	0.2720
Herman Sausage Company	Meat products; Processing wastes	Palm River to McKay Bay	Settling tank	Unknown
Florida Nitrogen Company	Fertilizer; chemicals; NaOH	Palm River to McKay Bay	Unknown	Unknown
Tampa Soap and Chemical	Soap products; grease; tallow	Six Mile Creek to Palm River to McKay Bay	Untreated	Unknown
Stauffer Chemical Company	Insecticides; chemicals; grease	Palm River to McKay Bay	Settling lagoon	Unknown
Flag Chemical Company	Agricultural insecticides; oil; grease	Six Mile Creek to Palm River to McKay Bay	Untreated	Unknown
Clair Mel City	Domestic waste	Pond to Delaney Creek to Hillsborough Bay	Contact stabilization	0.8200
Nitram Chemicals	Domestic waste	Canal to Delaney Creek to Hillsborough Bay	Extended aeration	0.0050
Nitram Chemicals	Fertilizer; nitrogen	Delaney Creek to Hillsborough Bay	Settling lagoon	Unknown
Yocam Battery Plant	Domestic waste	Delaney Creek to Hillsborough Bay	Aeration; settling	0.0090

Source: Shaw (1972), McNulty, Lindall, and Sykes (1972)

TABLE 14*

BENTHIC SPECIES OF THE PALM RIVER, DELANEY CREEK AND YBOR CHANNEL

Taxon	Number
Delaney Creek (Station 13)	
Amphipods	9
Isopods	
Cyathura sp.	11
	20
Delaney Creek (Station 14)	
Oligochaetes	4
Insects	
Tabanid larvae	2
Chironomid larvae	4
Amphipod	1
	11
Palm River (Station 12)	
Pinnotherid Crab	
Pinnixa sp.	1
Isopod	
Cyathura sp.	1
	2
Ybor Channel (Station 11)	
Polychaetes	
Paraprionospio pinnata	59
Glycinde sp.	1
Nereis succinea	1
Parahesione luteola	1
Nemertean	1
Pinnotherid Crabs	
Pinnixa sp.	6
Caridean Shrimp	3
	72

**Locations of sampling sites are shown on Exhibit 9.*

Source: Michael Baker, Jr., Inc.

TABLE 15

FISH SPECIES OF COMMERCIAL IMPORTANCE FOUND IN TAMPA BAY

White mullet	Mugil curema
Fantail mullet	Mugil trichodon
Striped mullet	Mugil cephalus
Spanish mackerel	Scomberomorus maculatus
Florida pompano	Trachinotus carolinus
Gog	Myctoperca microlepis
Red grouper	Epinephelus morio
Crevalle jack	Caranx hippos
Permit	Trachinotus falcatus
Sheepshead	Archosargus probatocephalus
Spot	Leiostomus xanthurus
Spotted seatrout	Cynoscion nebulosus
Silver jenny	Eucinostomus gula
Spotfin mojarra	Eucinostomus argenteus
Striped mojarra	Diapterus plumieri
Red drum	Sciaenops occellata
Sand seatrout	Cynoscion arenarius
Black drum	Pogonias cromis
Gulf Menhaden	Brevoortia patronus
Yellowfin menhaden	Brevoortia smithi

Source: Sykes and Finucane, 1966.

Sport fishing is also important to the economy of the Tampa Bay area. A recent survey of pier fishermen in Pinellas County by the National Marine Fisheries Service resulted in a list of most commonly caught species. Table 16 contains this list. Estuarine areas are essential for the continuation of commercial and sport fisheries in the Tampa area and, indeed, in the entire Gulf Coast Area because of their importance as feeding, spawning, and nursery areas. It has been estimated that estuarine-dependent species of fish and shellfish account for approximately 90 percent of the annual fisheries value in the Gulf. Most of the estuarine waters in the Study Area are to a large extent, dependent upon mangroves, whose fallen leaves serve as a base for the estuarine food chain. Disruption of mangrove swamps could adversely affect estuarine food chains and greatly affect the sport and commercial fisheries of Western Florida.

Ten Mile Lake

Ten Mile Lake is located in a suburban area and is surrounded to a large extent by lakefront residential dwellings. The lake covers approximately 16 acres and was relatively shallow when measured with an average depth of 1.9 meters. The lake bottom, substrate, was composed primarily of fine quartz sand. Small amounts of organic detritus were present in the sand around the shoreline with somewhat greater amounts of detrital material present in the substrate in areas farther out from shore.

The results of chemical and physical analyses performed on Ten Mile Lake are given in Table 17. The results of a test for hardness indicated that the water was very soft. Slightly elevated phosphate concentrations in the water indicated that the lake may be receiving some input of nutrients from outside sources and may experience algal blooms during the summer growing season with a resultant temporary decrease in water quality. The values of all of the water chemicals and physical parameters measured, however, fell well within the limitations set by the Florida Department of Pollution Control relative to water quality.

The results of biological sampling performed in Ten Mile Lake are given in Table 18. Benthic organisms found in the lake included mussels, several kinds of dipteran larvae (flies and midges) and dragonfly nymphs. Dipteran larvae are found to inhabit waters of both good and poor quality and as such are not good indicators of water quality. Most dragonfly nymphs and mussels are abundant only in clean water, and as such, their presence was an indication of favorable conditions where the viability of a desirable aquatic environment is concerned.

Algal species of Ten Mile Lake are listed in Table 19. Dominant algae include the filamentous species Mougetia and Microspora, and the diatom Navicula. Sport and pan fish present in Ten Mile Lake include small-mouth bass (Micropterus dolomieui), sunfish, and the brown bullhead (Ictalurus nebulosus).

Cursory examiniation of the chemical, physical, and biological conditions of Ten Mile Lake indicated that the lake is in generally good condition.

TABLE 16
COMMONLY CAUGHT SPORT FISHES IN TAMPA BAY

Common Name
Snook
Silver perch
Sheepshead
Spotted seatrout
Atlantic croaker
Grunt
Spanish Mackerel
Crevalle jack
Gulf flounder
Red drum
Black drum
Whiting
Sand seatrout
Pinfish
Atlantic Spadefish
Gray Snapper

Source: Lindall, Hall and Saloman, 1973

TABLE 17
WATER QUALITY DATA FOR MEAD LAKE AND TEN MILE LAKE, HILLSBOROUGH COUNTY, FLORIDA

	Ten Mile Lake	Mead Lake
Temperature (C°)	23°	25°
pH	6.55	6.45
Phosphate (mg/1)	0.15	0.08
Nitrate (mg/1)	0.4	0.4
Total Hardness (mg/1)	45	35
Alkalinity (mg/1)		
Phenolphthalein	0	0
Total	20	15
Sulfate (ppm)	38	30
Depth (meters)	2	1.3

Source: Michael Baker, Jr., Inc.

Mead Lake

Mead Lake is located in an area of sparse residential development just north of Brandon. The lake, under normal conditions, has an area of approximately 15 acres. Recent periods of drought, however, have caused it to shrink considerably into two smaller lakes with a marshy area connecting the two bodies of water. The acreages of the two lakes at the time of sampling were approximately six acres and one acre respectively. Only the larger body of water was sampled, because of the small size and shallow nature of the lesser pool. The lake, at the time of sampling, was very shallow, with an average depth of 1.3 meters, having a substrate comprised primarily of organic detritus.

The results of chemical and physical analyses performed on Mead Lake water samples are given in Table 17. Chemical analyses indicated that the water was quite soft. Phosphate concentrations were slightly elevated, indicating that the lake may have been receiving some input of nutrients from outside sources, probably from an adjacent pasture. The values of all of the chemical and physical water parameters measured fell well within the limitations set by the Florida Department of Pollution Control.

The results of biological sampling performed on Mead Lake are given in Table 18. Midge larvae were the only benthic macroinvertebrate species found in the lake, therefore, no evaluation of water quality could be based on benthic organisms.

Fish present in the lake include the brown bullhead (Ictalurus nebulosus), small-mouth bass (Micropterus dolomieui), and species of sunfish. River otters (Lutra canadensis) and alligators (Alligator mississipiensis) are reported by residents to inhabit the lake at times. The American Alligator is considered by the United States Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, to be a threatened species.

Rare and Endangered Species

There are two threatened aquatic species which occur to greater or lesser degrees in the Tampa Bay Area. The Atlantic Green Turtle, a tropical sea turtle which inhabits coastal waters, may frequent the Tampa Bay estuarine system. The American Alligator is found in freshwater marshes, lakes and swamps throughout Florida and is well established in these habitats in the Tampa Bay Region.

TABLE 18
LAKE FAUNA OF MEAD LAKE AND TEN MILE LAKE, HILLSBOROUGH COUNTY, FLORIDA

Ten Mile Lake

Pelecypoda (mussel)
- Elliptio sp.

Heleidae (biting midges)
- Palpomyia sp.

Culicidae (mosquitoes)
- Anopheles sp.

Chironomidae (midges)

Odonata (dragonflies)
- Gomphus sp.

Lumbricidae (worms)

Mead Lake

Chironomidae (midges)

Source: Michael Baker, Jr., Inc.

TABLE 19
ALGAL SPECIES OF TEN MILE LAKE

Filamentous Green Algae
- Mougetia
- Microspora

Desmids
- Cosmarium

Diatoms
- Navicula
- Diatona
- Melosira
- Tabellaria
- Pinnularia
- Synedra
- Staurastrum
- Cyclotella
- Cymbella
- Amphipleura
- Eunotia

Source: Michael Baker, Jr., Inc.

Air Quality

Meteorological Implications

Meteorological phenomena may, in many instances, be utilized for the determination of the limits in which air quality levels exist. This is not to say that atmospheric events are the causes of air quality degradation. Rather, the atmosphere serves to aid or abate a developing air quality situation, depending on the conditions present at any given time. From a superficial analysis of some of the basic meteorological phenomena that occur in the Tampa Bay area, the degrees to which air quality fluctuates may more readily be definable.

One of the basic elements of physical meteorology, atmospheric temperature, may have some effect on air quality levels. In the case of the Tampa area, which experiences mild winters and warm summers, temperature levels are of primary importance to the mixing ability of the air near the ground. During daylight hours, particularly in the summer season, energy from the sun heats the land surface and causes atmospheric instability to develop near ground level. This heating causes the gases present in the lowest atmospheric levels to disperse upward, mixing into higher zones. The mean altitude of the mixing zone varies throughout the day and year; being highest in the summer months and occurring during the afternoon, and being lowest in the winter season and occurring during the early morning hours. Atmospheric mixing conditions at any one time may cause pollutants to be concentrated near the ground or allow them to readily diffuse upward, thus lowering concentration levels. Table 20 lists the morning and afternoon mixing heights and their seasonal variations.

TABLE 20
MEAN SEASONAL AND ANNUAL MORNING AND AFTERNOON MIXING HEIGHTS IN METERS TAMPA, FLORIDA

Time	Winter	Spring	Summer	Fall	Annual
Morning	436	526	674	439	519
Afternoon	1,079	1,544	1,526	1,429	1,394

Source: Holzworth, 1972.

Another instance in which temperature may affect air quality is when inversion conditions develop due to a warmer layer of air overlying a cooler one. Locally, these conditions develop most frequently when rapid radiation cooling takes place during the evening hours. During these hours the ground loses heat to the atmosphere and, in the process, cools the air with which it comes in contact. By morning there may exist a situation where a zone of cool air near the surface many tens of feet in depth becomes trapped below warmer air due to density differences. This type of situation will develop most often and become most pronounced in low, inland, rural areas where radiation cooling functions best. Inversions due to radiation cooling commonly occur in the cooler months of the year on evenings when calm, clear conditions prevail. The duration of these inversions is usually short, with dissipation occurring several hours after sunrise when the cooler layer is warmed to the temperature of the containing layer.

The effect of an inversion on air quality can become quite pronounced if it exists for extended periods of time. Gaseous pollutants, such as those generated by industry and/or internal combustion vehicles diffuse upward into the atmosphere from their sources. When these gases reach the altitude of the inversion layer, they tend to spread horizontally, continually collecting below the inversion. Dangerously high concentrations of pollutants may collect if conditions favorable to inversion formation persist for more than several hours at a time.

A second element basic to meteorological science, and also to air quality levels, is wind. The presence of a measurably significant wind over an area tends to aid in the mixing processes of air in the lower atmosphere. Airborne pollutants are usually dispersed more rapidly during periods of substantial wind action. It is when winds become calm that high concentrations of pollutants are most likely to occur and persist. No truly distinctive pattern of wind velocity exists in the Tampa area, although, generally, wind speeds tend to be lowest in the summer months and during the evening hours. Table 21 lists the predominant wind direction and mean speed for each month of the year.

In the Tampa area the prevailing wind direction is easterly. This means that on the average, air quality conditions to the immediate west of a defined source area will be similar to those of the source area, being modified only slightly as distances increase between the two areas. The wind rose diagram, Figure 1, represents the frequency with which wind blows from all compass points in the Tampa Bay area. The length of each line is proportional to the frequency with which wind blows, and the position of the line represents the direction from which the wind is blowing.

The other meteorological element having a significant influence on air quality levels is atmospheric moisture as expressed in precipitation. As water droplets fall downward through various layers of atmosphere during a rain shower, much of the gaseous pollutant content of the air

TABLE 21

MEAN VELOCITY AND PREDOMINANT WIND DIRECTION BY MONTH

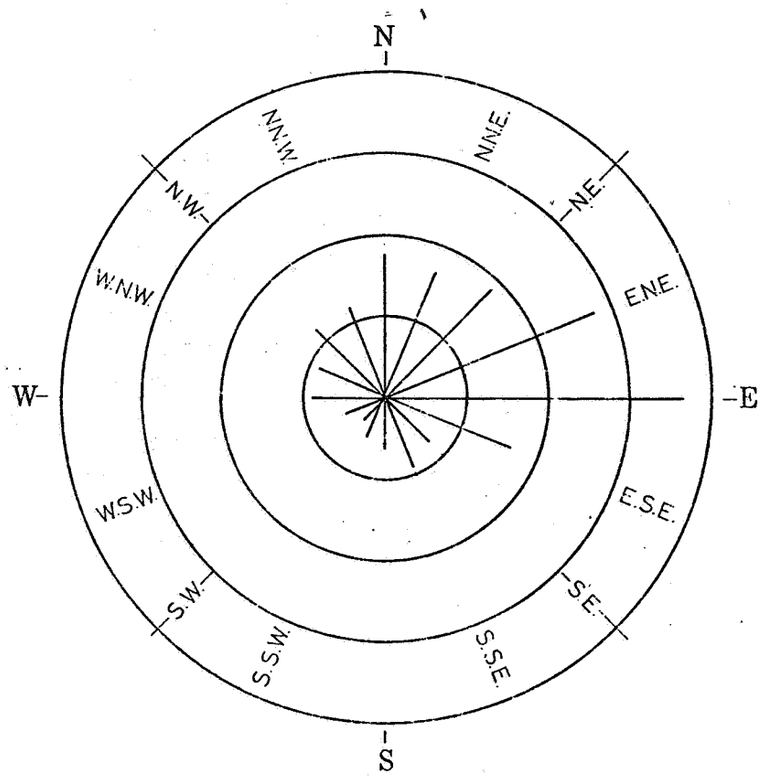
Month	Mean Wind Speed*	Prevailing Direction**
January	9.0	N
February	9.7	E
March	10.0	S
April	9.8	ENE
May	9.2	E
June	8.5	E
July	7.6	E
August	7.4	ENE
September	8.5	ENE
October	9.5	NNE
November	8.9	NNE
December	8.9	N
Annual	8.9	E

**The mean speed is recorded for a 27 year period.*
***The prevailing direction is recorded for a 14 year period.*

Source: Data from the Tampa International Airport.

FIGURE - 1

ANNUAL WIND ROSE
STABILITY CLASS E (40.5%)



Source: Tampa W.S.O. (1965-69).

is dissolved into the moisture droplet upon contact. Showers or thunderstorms are capable of cleansing the atmosphere and will, in many cases, improve air quality conditions in the immediate area of a rainfall.

In the Tampa Bay area, which receives large amounts of precipitation yearly, the effect of rainfall on air quality levels may be significant. Since Tampa receives most of its rainfall during the summer months in the form of heavy showers and thunderstorms, the greatest cleansing effect may be expected during this season. During the other months of the year rainfall is of a lesser intensity and occurs more randomly over periods of time. This type of distribution would indicate that cleansing action is a less important factor in controlling atmospheric quality levels during these months.

Existing Air Quality

The primary source of air quality information for the Tampa area is a report published by the Hillsborough County Environmental Protection Commission in 1972. It summarizes the air quality measurements obtained during the two-year period 1970-1971. During that period, the following pollutants were monitored:

- Suspended particulates
- Dustfall
- Sulfation
- Sulfur dioxide (SO_2)
- Nitrogen dioxide (NO_2)
- Hydrocarbons (HC)
- Carbon monoxide (CO)
- Photochemical oxidants (OX)
- Fluorides
- Radioactivity

The location of monitoring stations for traffic generated pollutants are given in Table 22. Two of these sites are relatively near the Tampa International Airport and the other two are close to the downtown area (See Exhibit 10). There are several stations in the vicinity of the proposed expressway, but the pollutants (sulfation, suspended particulates, and radioactivity) are not from transportation sources.

Carbon Monoxide (CO) - Measurements of CO in Hillsborough County date back to 1968. There were three sampling sites for CO during 1971. Peak values during the day correspond to the rush hour traffic. The afternoon peak values are generally lower than morning peak values as a result of the increased mixing ability of surface air in the afternoon. Federal ambient air quality standards for CO are 35 parts per million (ppm) - maximum one-hour average and 9 ppm - maximum eight hour average. Examination of the 1970-1971 data indicated that the eight hour average value was exceeded on one occasion at Station 80.

Nitrogen Dioxide (NO_2) - Approximately 41 percent of the total nitrogen dioxide emissions were estimated to be from transportation sources according to an emission inventory prepared in 1970 for Hillsborough County. Nitrogen dioxide measurements were made at only one location during 1971. The federal ambient air quality standard for NO_2 (annual arithmetic mean: 0.05 ppm) was exceeded in every year that it was monitored (1968-1971).

Hydrocarbons (HC) - During 1971, hydrocarbons were measured at two locations (Stations 81 and 84) by the Flame Ionization method. At Station 81, near downtown Tampa, the measured levels of total hydrocarbons (as change between I-4 and I-75), the maximum one hour average value was 4.5 ppm.

The non-methane part of hydrocarbons is of interest in estimating effects of the pollutant. Accordingly, changes in instrumentation

TABLE 22
LOCATION OF AIR QUALITY MONITORING STATIONS
(TRAFFIC GENERATED POLLUTANTS)

Pollutant	Station	Location
NO_2	1	Health Center, 1105 E. Kennedy
HC	81	906 Jackson Street
	84	I-75 and I-4 Interchange
OX	81	906 Jackson Street
	83	W.T. Edwards Hospital
CO	80	I-75 and Dale Mabry Highway
	81	906 Jackson Street
	84	I-75 and I-4 Interchange

Source: Hillsborough County Environmental Protection Commission (1972)

CORRIDOR STUDY

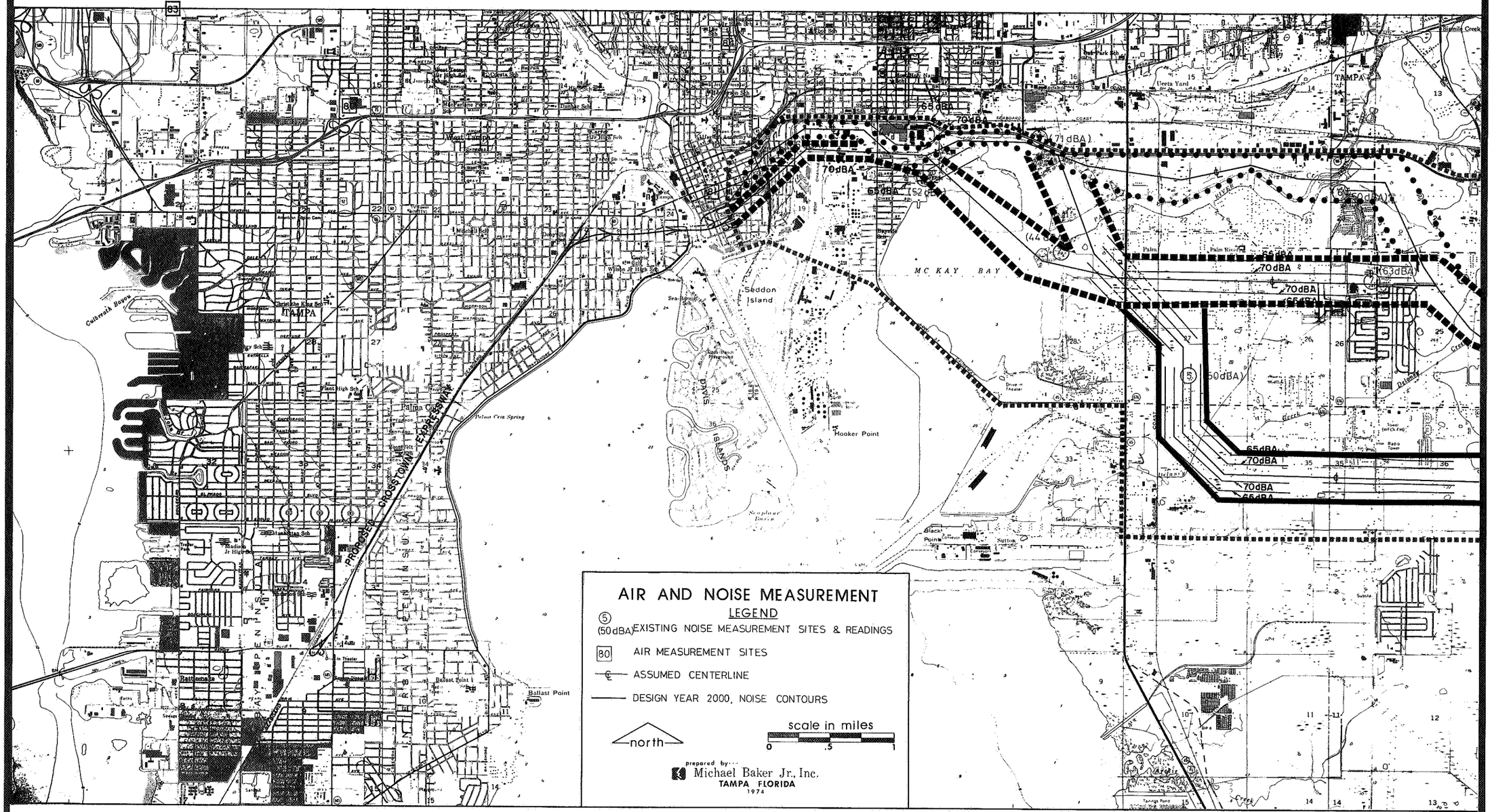
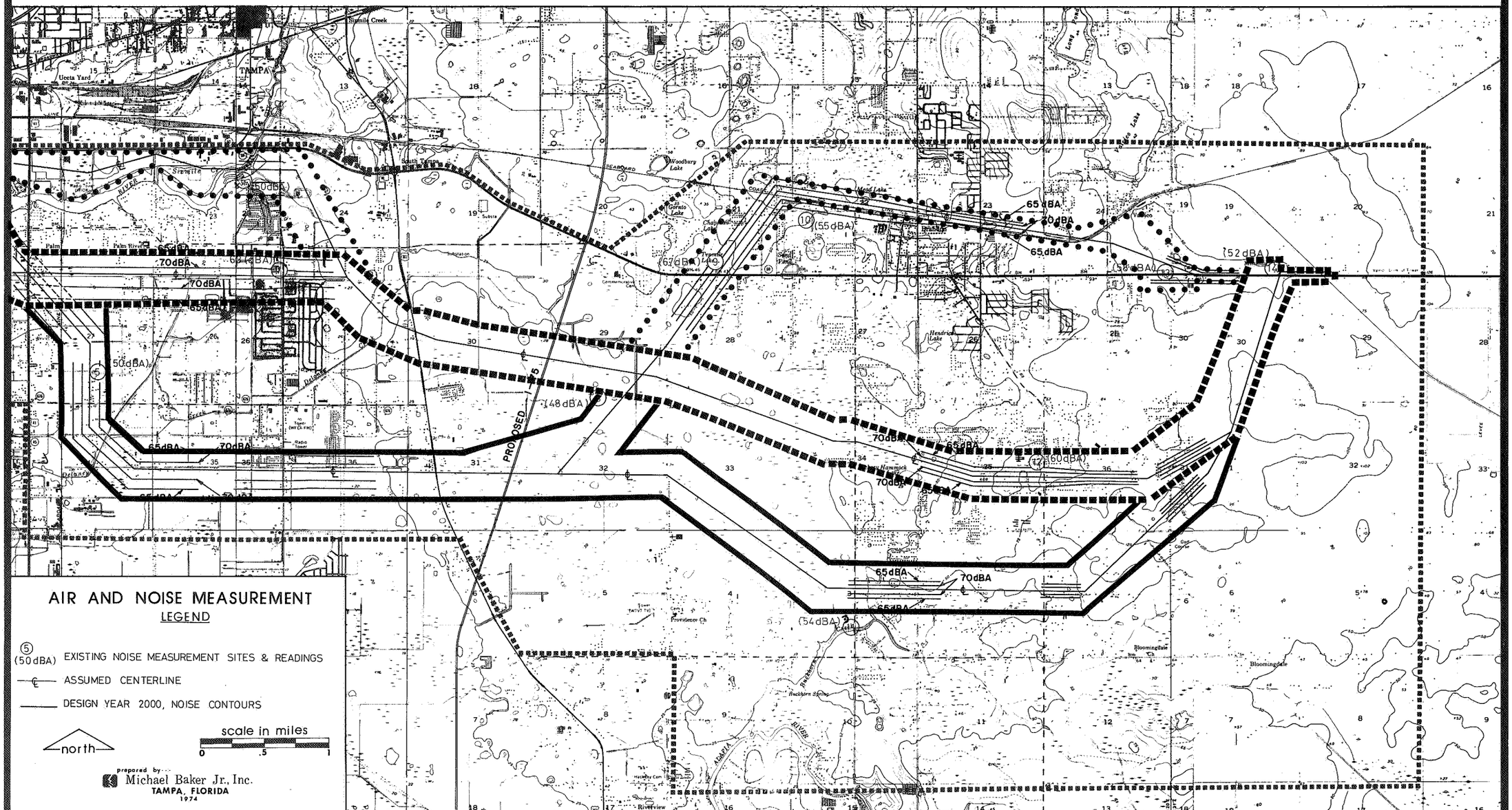


EXHIBIT 10A

CORRIDOR STUDY



AIR AND NOISE MEASUREMENT

LEGEND

(5) (50dBA) EXISTING NOISE MEASUREMENT SITES & READINGS

℄ ASSUMED CENTERLINE

DESIGN YEAR 2000, NOISE CONTOURS

north

scale in miles
0 .5 1

prepared by...
Michael Baker Jr., Inc.
TAMPA, FLORIDA
1974

EXHIBIT 10B

have since been made to permit measurement of these non-methane components.

Oxidants (OX) - Photochemical oxidants were measured at two locations (Stations 81 and 83) during 1971 using Bendix Ozone Monitors. Oxidant concentration levels are generally low at sunrise and high in the afternoon. The Federal ambient air quality standard is 0.08 ppm (maximum one hour value). At Station 83, the maximum one hour value exceeded the standard on at least one occasion.

Data collected during the past two years (1972-1973) is expected to be summarized and released late in 1974. Measurements of traffic-generated pollutants in the vicinity of the proposed Crosstown Expressway Eastern Extension could be used in estimating the background concentrations for these pollutants. It would then be possible to determine whether or not the increase in emissions due to anticipated traffic growth would result in ambient concentrations exceeding the National air quality standards.

It should be noted that much of this air quality analysis, as well as the following noise analysis, have been based on traffic data primarily generated in the late 1960's for the TUATS studies. Traffic patterns and volumes have changed since that time, and updated information should be formulated prior to the initiation of further studies to assure their validity.

Noise

Noise may generally be defined as unwanted or destructive sound. Sound is energy transmitted by longitudinal pressure waves in the air or any other elastic material and is measured in units called decibels. Decibels (dB) are logarithmic units of pressure change. A scale of 0-140 dB denotes the range of sound levels from the threshold of hearing to the threshold of pain, respectively, for a person of normal hearing capabilities.

Loudness and sound pressure levels, while different, can be compared. To the average listener, a doubling of the loudness is equal to a 10 dB increase in sound pressure level. An increase of 20 dB approximates a fourfold increase of the loudness, etc.

Since decibels are logarithmic units, they cannot be numerically added. The net sound level of two equal sources is three dB greater than one of those sources. However, the net sound level resulting from two unequal sources is a function of the difference of the two sources. For example, a difference of five dB between two sources will result in only a 1.2 dB increase over the higher level. As the difference between the sound levels of two sources increases, the net effect will decrease.

Several different weighting scales may be used to measure an existing noise environment. The A-weighting scale (dBA) is commonly used in an environment composed chiefly of traffic noise, because it closely approximates the response of the human ear to such an environment. The A-scale has been found to correlate well with a person's subjective judgment of noise "annoyances" and thus is useful in evaluating public acceptability of noise exposure.

Traffic noise consists chiefly of engine/exhaust noise and tire/roadway interaction. However, other factors may also greatly influence vehicular noise levels. For instance, the type of roadway surface, travel speed, road grades, configurations and the percentage of trucks are all critical factors in evaluating a traffic noise environment.

Public acceptance of noise levels is dependent on location (urban and rural), time of day, fluctuation of noise levels, duration, and individual judgments of the listener. Nearly 25 percent of the population will rarely complain of noise, while another ten percent are extremely sensitive to noise and constantly complain. The evaluations in this report are directed toward the remaining two-thirds of the population, since most noise

abatement measures are designed for them. Figure 2, entitled "Common Noise Levels," presents various common noise sources and their resulting levels.

The evaluation of existing noise conditions and projected noise impacts of the proposed Tampa South Crosstown Expressway Eastern Extension corridors adheres to Federal Highway Administration Policy and Procedure Memorandum 90-2. This document requires:

1. Identification of existing developed land uses which may be affected by highway noise;

2. Prediction of highway-generated noise levels from anticipated future traffic on the facility;

3. Measurement of existing noise levels;

4. Comparison of predicted levels with both existing levels and the design noise levels listed in the noise standards of PPM 90-2;

5. Where predicted levels exceed design noise level standards for a particular land use activity, identification and analysis of feasible noise abatement measures is required.

In analyzing the noise environment, three indicators are used:

1. L_{10} - That noise level exceeded ten percent of the time for the period under consideration (tenth percentile).

2. L_{50} - That noise level exceeded 50 percent of the time for the period under consideration. This is also known as the median.

3. L_{90} - That noise level exceeded 90 percent of the time for the period under consideration (ninetieth percentile).

The design noise level standards are based on the L_{10} factor. The L_{10} is an indicator of both the magnitude and frequency of occurrence of the loudest noise event. The design noise level/land use relationships are reproduced from PPM 90-2 in Table 23 entitled "Design Noise/Level/Land Use Relationships."

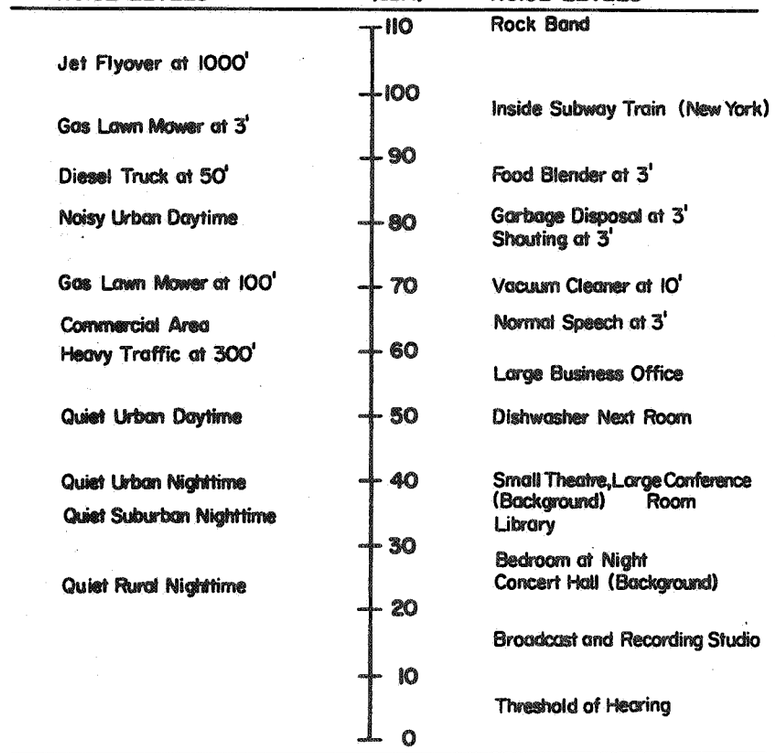
The design noise levels expressed by this memorandum represent a balancing of noise levels which may be desirable and levels which may be achievable. The values expressed should be considered as maximum noise levels accepted by the Federal Highway Administration.

Although not directly stated in PPM 90-2, it is a suggested policy of the Federal Highway Administration that the increase of the predicted noise levels over the existing noise levels be compared. The impacts associated with various increases are as follows:

0 - 5 dBA increase	No Impact
5 - 10 dBA increase	Minor Impact
10 - 15dBA increase	Moderate Impact
15 dBA and above	Severe Impact

FIGURE - 2

COMMON NOISE LEVELS



SOURCE: BOLT, BERANEK & NEWMAN, INC., FUNDAMENTALS & ABATEMENT OF HIGHWAY TRAFFIC NOISE, OFFICE OF ENVIROMENTAL POLICY, FEDERAL HIGHWAY ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, WASHINGTON D.C., 1973.

Existing Noise Environment

Mean existing noise levels and the parameters under which they were measured are shown in Table 24 entitled "Tampa South Crosstown Expressway - Existing Noise Levels." The 14 measurement sites, as shown on Exhibit 10 were chosen based on their sensitivity to noise (i.e., churches, schools, residential areas, parks, etc.), and their ability to provide a means of measuring noise levels related to land use categories. The background noise sources listed are all distinguishable sources of noise contributing to the total noise environment at each location. The peak source indicates the origin of the highest magnitude of noise. The land use category shown corresponds to the design noise level (L_{10}) which is comparable with the associated land use characteristics.

The results of the existing noise survey, as shown on Table 24 indicate that all measurement sites are below the design noise level for their respective land use categories. The highest L_{10} noise level (71 dBA) was recorded at Site 3 along S.R. 60.

The east side of McKay Bay in the Central Corridor was the quietest area measured. Noise levels in this area were in the low 40's (dBA). Around Clair Mel, in the Central Corridor, noise levels were in the low 60's (dBA) due to automobile traffic. In the area of proposed Interstate 75E, noise levels were low due to its undeveloped state and low traffic volumes. The Central Corridor south of Brandon, noise levels were in the high 50's to low 60's (dBA). This is a developing residential area with an Elementary School located off Bell Shoals Road.

TABLE 23

DESIGN NOISE LEVEL/LAND USE RELATIONSHIPS

Land Use Category	Design Noise Level-L_{10}	Description of Land use Category
A	60 dBA (Exterior)	Tracts of land in 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. Such areas could include amphitheaters, particular parks or portions of parks, or open spaces which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B	70 dBA (Exterior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, recreational areas, playgrounds, active sports areas, and parks.
C	75 dBA (Exterior)	Developed lands, properties or activities not included in Categories A and B above.
D	---	For requirements on undeveloped lands see paragraphs 5.a(5) and (6) of PPM 90-2.
E*	55 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

**The interior design noise level in Category E applies to indoor activities for those situations where no exterior noise sensitive land use or activity is identified.*

Source: PPm 90-2, Interim Noise Standards and Procedures for Implementing Section 109(i) Title 23 U.S.C.

TABLE 24

TAMPA SOUTH CROSSTOWN EXPRESSWAY—EXISTING NOISE LEVELS

Site Number[1]	Date Of Measurement	Time Of Measurement (24-Hour Clock)	L_{90} (dBA)	L_{50} (dBA)	Background Noise Sources	L_{10} (dBA)	Peak Noise Sources	Weather Conditions During Measurements	Land Use Category[2]
1	5/31/74	12:05	55	62	Traffic, People	66	Traffic	Partly Cloudy, 90°	C
2	5/30/74	8:30	47	49	Traffic, Birds	52	Traffic	Partly Cloudy, 82°	B
3	5/30/74	15:20	61	66	Traffic	71	Traffic	Partly Cloudy, 90°	C
4	5/30/74	13:15	42	43	Birds	44	Birds	Partly Cloudy, 85°	C
5	5/30/74	15:00	46	48	Birds, Traffic	50	Traffic	Partly Cloudy, 90°	
	5/30/74	9:30	44	47	Birds, Traffic	50	Birds	Partly Cloudy, 85°	B
7	5/30/74	9:00	47	56	Birds, Traffic	63	Traffic	Partly Cloudy, 85°	B
8	5/30/74	14:25	38	41	Birds	48	Birds	Partly Cloudy, 85°	C
9	5/30/74	16:30	56	61	Birds, Traffic	67	Traffic	Partly Cloudy, 90°	C
10	4/28/74	14:30	45	49	Birds, Traffic Air Conditioning Unit	55	Traffic	Partly Cloudy, 90°	B
11	4/28/74	14:50	52	53	Birds, Air Conditioning Unit	54	Birds	Partly Cloudy, 90°	B
12	4/28/74	15:20	45	50	Birds, Traffic	60	Traffic	Partly Cloudy, 90°	B
13	4/28/74	13:40	42	50	Birds, Traffic	58	Traffic	Partly Cloudy, 88°	B
14	4/28/74	13:05	44	48	Birds, Traffic	52	Traffic	Partly Cloudy, 88°	B

1. *Refer to Exhibit 10*
2. *Refer to Table, "Design Noise Level/Land Use Relationship."*

Source: Resource and Environmental Planning, Michael Baker, Jr., Inc.

Noise levels near the west end of the Study Area around Ybor Channel are due to automobile traffic, work in the freight yards and rail traffic passing through the Union Station. This was one of the noisiest areas measured. State Route 60 in the Northern Corridor was the noisiest area due to heavy automobile traffic with a nine percent truck volume measured during the noise sampling period. The eastern leg of the Northern Corridor was an area of typical quiet urban noise levels ranging in the 50's (dBA).

The Southern Corridor is the quietest of the three corridors with noise levels in the low 50's (dBA) throughout the entire corridor. These low noise levels are due to its generally undeveloped state.

The Study Area is an area of frequent aircraft flyover. Air traffic noise, in this case, must be considered as an integral part of the total noise environment and cannot be regarded as transient noise, thus eliminating it from consideration.

Light Pollution

The role of lighting as an extremely important safety factor in expressway design has long been established. However, environmental considerations must be combined with safety in designing the lighting of any expressway facility, particularly one that passes through urbanized areas.

Proper illumination is necessary for the safety of the motorist and aids in maintaining the designed vehicular capacity of the facility.

It is anticipated that lighting will be provided along much of the Expressway's length. Therefore, the issue of light "spillage" poses a potential problem in developed areas.

Illumination in the vicinity of downtown Tampa and the Ybor Channel area should create no problem since the areas are commercial or industrial and are accustomed to nighttime lighting.

Several portions of the various corridors are in proximity to residential areas, however. One example is the joint Northern-Central Corridor route which traverses the fringe of the DeSoto Park neighborhood. Other sensitive areas in the Northern Corridor include Clair Mel City and Brandon. Similar sensitive areas are found in the Central and Southern Corridors. These sensitive areas will require the selective shielding of illumination to prevent or minimize light spillage.

Another lighting problem common to highway facilities is headlight beam intrusion into adjacent areas. This potential problem is present in all three proposed corridors and must be considered as an integral part of the overall roadway design.

Aesthetics and Landscaping

The motor vehicle and its attendant facilities form today's major influence on the environment from the point of view of aesthetic effect. The replacement of landscape and architectural amenities with pavement seems a universal condition of life, typifying the overall visual intrusion of the automobile into the urbanscape.

Possible negative aesthetic effects exist in all potential expressway corridors, including those under consideration here, and must be dealt with in order to arrive at an appropriate mix of natural and man-made environments.

One example of a potential visual problem is the chaotic clutter of signs, lights, and signals necessary to control traffic movements. This, combined with the inevitable advertisements created to catch the attention of driver and rider, serve both to confuse motorists and blight the surrounding environment.

The above problems are applicable to all highway facilities, and, as mentioned, all the corridors under examination here are susceptible to them. However, it is felt that they merit mention here as an "advance warning" that the ultimate design of this facility, regardless of its location, should adhere to the proportions, scale, texture and rhythm that allow it to blend harmoniously into the areas through which it passes.

Proper landscaping is one means of accomplishing this. Landscaping can create a pleasing visual experience for the motorist and soften the highway's intrusion into an area. This can be accomplished through the use of native plant materials, selective clearing, saving and replanting of salvable trees and shrubs, and coordinated slope transitions, all designed to make the proposed facility a visual asset rather than a liability. These alternatives are discussed in greater detail in the Engineering Report.

human environment: summary of existing conditions

Land Use

In general terms, land use refers to the spatial distribution, or arrangement, of an area's functions - its residential areas, its industrial, commercial, public, and agricultural districts and the spaces set aside for leisure time activities.

Of the three basic elements identifying any community or area (land, people, economy), land is considered the most permanent and the most difficult to alter. The population can fluctuate numerically or change in composition, and the economy can be affected by cyclical changes, both internal and external. However, the overall quality of the land usually remains basically the same.

Therefore, an analysis of the existing and potential uses of the land, as well as the forces that determine those uses, form an essential part of any effort to evaluate the various possible locations of a proposed highway facility.

Existing Land Use Patterns

The generalized existing land use pattern for the Study Area is illustrated on Exhibit 11. The illustration is based on the Existing Land Use Map presented in the 1990 Plan of Development prepared by the Hillsborough County Planning Commission in 1973. For purposes of this study, a general updating of that map was necessary. Unfortunately, any illustration of existing land use in a rapidly developing area soon becomes outdated. A land use map represents the conditions on a given date, and its validity becomes progressively less with each change in use of property. Therefore, it must be stressed that, especially in the Brandon area, much of the land use data used herein will have been rendered somewhat dated during the time interval between data collection and publication.

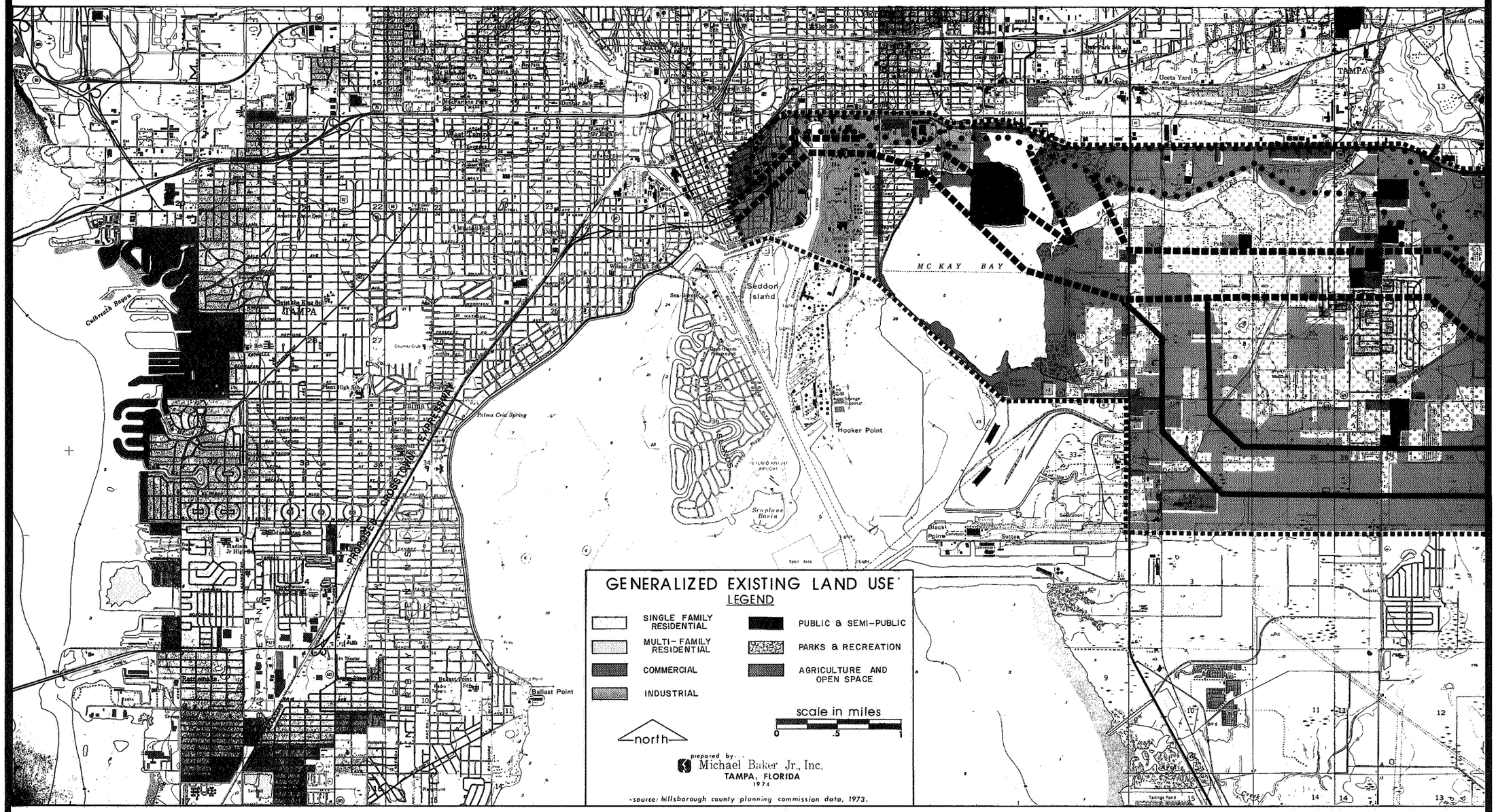
An explanation of the land use categories utilized in Exhibit 11 is beneficial here, since the definitions for these categories sometimes vary from study to study. It should be noted, also, that each category illustrated on the map represents the predominant - not exclusive - use contained in a particular area.

The residential categories (single family and multi-family) are self explanatory, as are the categories for agriculture and recreation and open space. However, the commercial category represents only primary retail establishments and general offices. Wholesale businesses and warehouses are, for the most part, included in the industrial category along with manufacturing plants and port facilities. Public and semi-public facilities include governmental offices, schools, major utility installations, cemeteries, and communications facilities such as radio and television broadcasting towers.

It should be noted again that both the graphic and written land use descriptions contained herein are general in nature. The intent was not to tabulate the use of each parcel within the Study Area, but to present an overview of the predominant uses and patterns that have emerged, thus forming a basis for analyzing the relative impacts of the proposed corridors on both the existing and potential patterns of development.

Within the Study Area all of the selected corridor locations encounter virtually a complete range of land uses. The eastern fringe of Tampa's Central Business District is characterized by warehouses, wholesale businesses, and industries, mainly oriented toward the Seaboard Coast Line Railroad yard. Governmental functions, as well as scattered retail establishments and offices, are also present. Primary structures in this area include the County Governmental Complex, a Travelodge Motel and the Health Department Building.

CORRIDOR STUDY



GENERALIZED EXISTING LAND USE

LEGEND

- SINGLE FAMILY RESIDENTIAL
- MULTI-FAMILY RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- PUBLIC & SEMI-PUBLIC
- PARKS & RECREATION
- AGRICULTURE AND OPEN SPACE

scale in miles

0 .5 1

north

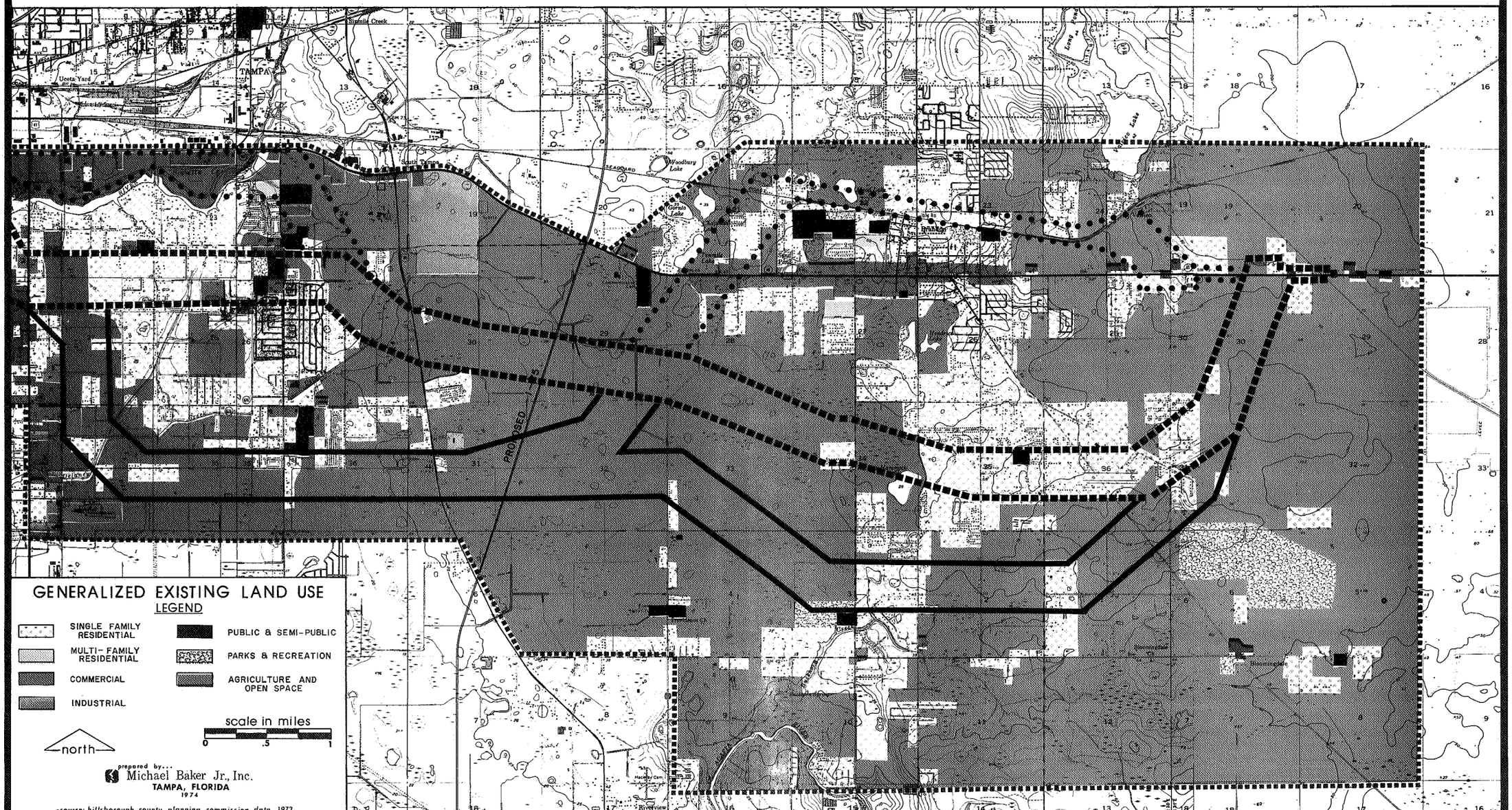
prepared by
Michael Baker Jr., Inc.
TAMPA, FLORIDA
1974

source: hillsborough county planning commission data, 1973.

EXHIBIT 11A

CORRIDOR STUDY

EXHIBIT 11B



Land uses in the vicinity of Ybor Channel are oriented toward the area's port facilities. Cargo docks, storage facilities, and business establishments are almost exclusively related to the various port activities. The DeSoto Park neighborhood is situated between Ybor Channel and McKay Bay. Although the neighborhood is essentially composed of single family residences, scattered commercial uses exist along 22nd Street, the area's main north-south arterial. Industrial and warehouse uses (particularly the American Can Company) border the neighborhood on the north along Adamo Drive. Religious and educational institutions are also present in the area as well as DeSoto Park itself, for which the neighborhood was named.

Adamo Drive (S.R. 60) essentially acts as the northern boundary of the Study Area from 13th Street in Tampa to a point just east of the proposed I-75E near Brandon. This highway, presently the main vehicular connection between Tampa and Brandon, is bordered by industrial and truck-oriented commercial uses along much of its route. The most notable exception is an undeveloped strip near the northern boundary of McKay Bay.

Much of the land around McKay Bay is open at this time, except for the DeSoto Park area along the bay's western perimeter and the land fill near the Tampa Municipal Incinerator. The incinerator, as well as the new police and fire facilities located there, are designated as public and semi-public uses in Exhibit 11.

22nd Street crosses McKay Bay from DeSoto Park to the southeast, then becomes a major east-west arterial. It serves the phosphate terminal and is characterized by numerous highway-oriented commercial uses, most of which are located west of its intersection with U.S. Route 41.

Although some open space exists east of McKay Bay between S.R. 60 and 22nd Street (Causeway Boulevard), single family residential uses predominate. Development in the Palm River area now extends to the more defined community of Clair Mel City, forming a relatively large residential enclave. Commercial concentrations in this area are generally confined to the main arterials: U.S. Route 41, Causeway Boulevard, Palm River Road, and 78th Street. Commercial interests along the latter two arteries are primarily local in nature, serving the surrounding population. Religious and educational uses are also scattered throughout this area, including a large school complex in the vicinity of the Central Corridor.

With the exception of scattered residential, commercial and industrial uses located along S.R. 60 and U.S. Route 301, the portion of the Study Area between Clair Mel City and Brandon is largely undeveloped and is designated as agriculture or open space.

The eastern portion of the Study Area is dominated by the community of Brandon. Its growth in recent years has resulted in wholesale changes in the overall land use pattern. Open space is rapidly being converted, primarily, to single family residences on relatively large lots. Strip commercial uses line both sides of S.R. 60, Brandon's main shopping artery. Some multi-family dwelling units have been built recently, but the overall residential character of the community is oriented toward the free-standing, single family home. Each of the corridors traversing the Brandon area encounters this residential development to some extent. Every land use category, except industrial, exists in Brandon.

The land use pattern to the south of Brandon is also changing. Agriculture and open space are giving way to large scale single family residential development. To Brandon's east, toward the Expressway's eastern terminus, development is sparce with agricultural and recreational uses still very much in evidence.

Future Land Use

Although this section is primarily a summary of existing conditions, a cursory examination of projected land use patterns is

appropriate to establish an overall framework within which an analysis of the impacts of the proposed Expressway Corridors can best be accomplished.

Exhibit 12 depicts Hillsborough County's projected generalized patterns of land use as contained in the 1990 Plan of Development, prepared by the Hillsborough County Planning Commission. The Plan represents an overall picture of the recommended development pattern for the County and is based on long range population projections, review of historical growth patterns, analysis of existing development patterns, and review of alternative future growth patterns.

In general the 1990 Plan of Development envisions three broad categories in outlining projected residential development patterns: urban residential areas, transition areas, and rural and agricultural reserve areas. The chief distinction among these areas in the concept of the Plan lies in their respective population densities and intensities of land uses and human activities. By 1990 the urban residential areas are expected to be fully developed, the transition areas are expected to be semi-urbanized, and the rural and agricultural reserve areas are expected to remain very low in both density and intensity of use.

Little change is forecast for the western portion of the Study Area with the possible exception of Tampa's CBD near the western terminus of the Extension. Commercial and office activities may, to some extent, replace the warehouses and industries in this vicinity. The Ybor Channel and DeSoto Park areas are expected to generally retain their existing character.

Industrial uses are expected to remain or increase along Adamo Drive (S.R. 60) in the Palm River area. South of the Palm River (Tampa Bypass Canal) residential development is expected to increase, forming virtually a solid residential enclave extending south from the river to the Study Area's southern boundary and east from McKay Bay to U.S. Route 301.

Industrial and commercial uses are expected to predominate in the vicinity of the intersection of S.R. 60 and U.S. Route 301. A large industrial-commercial complex is already underway in the area generally bounded by S.R. 60 on the north, U.S. Route 301 on the west, S.R. 676 on the south, and the proposed I-75E on the east, and significant expansion of these facilities is planned. It is anticipated that commercial and industrial uses will also predominate in the vicinity of the proposed interchange of I-75E and U.S. Route 301.

Development is expected to continue in the Brandon area with much of the existing open area changing to residential uses. Lower densities and some open space are recommended for the southern portion of this area near the Alafia River, but development pressures are already intense. Brandon's community-oriented commercial uses will probably be primarily confined to S.R. 60. At this point it appears that Brandon's most intensive development will occur west of Dover Road. Most of the development pressure is expected to continue in the already-established pattern, extending to the north and south of S.R. 60.

Communities and Neighborhoods

Although current definitions of community vary greatly, a community can generally be described as a definable territory with which an individual can identify and within which virtually all basic needs can be satisfied. Tampa, although it does not lie totally within the Study Area, is a community - or, more specifically, a group of sub-communities. Rapidly growing Brandon has developed sufficiently to shed its "Tampa suburb" identification, and can also be termed a community.

A neighborhood is one level down from a community in the hierarchy. It is usually defined as an integrated urban unit related to the larger community of which it is a part, consisting of residential areas, a school or schools, shopping facilities, religious buildings, open spaces, and

CORRIDOR STUDY

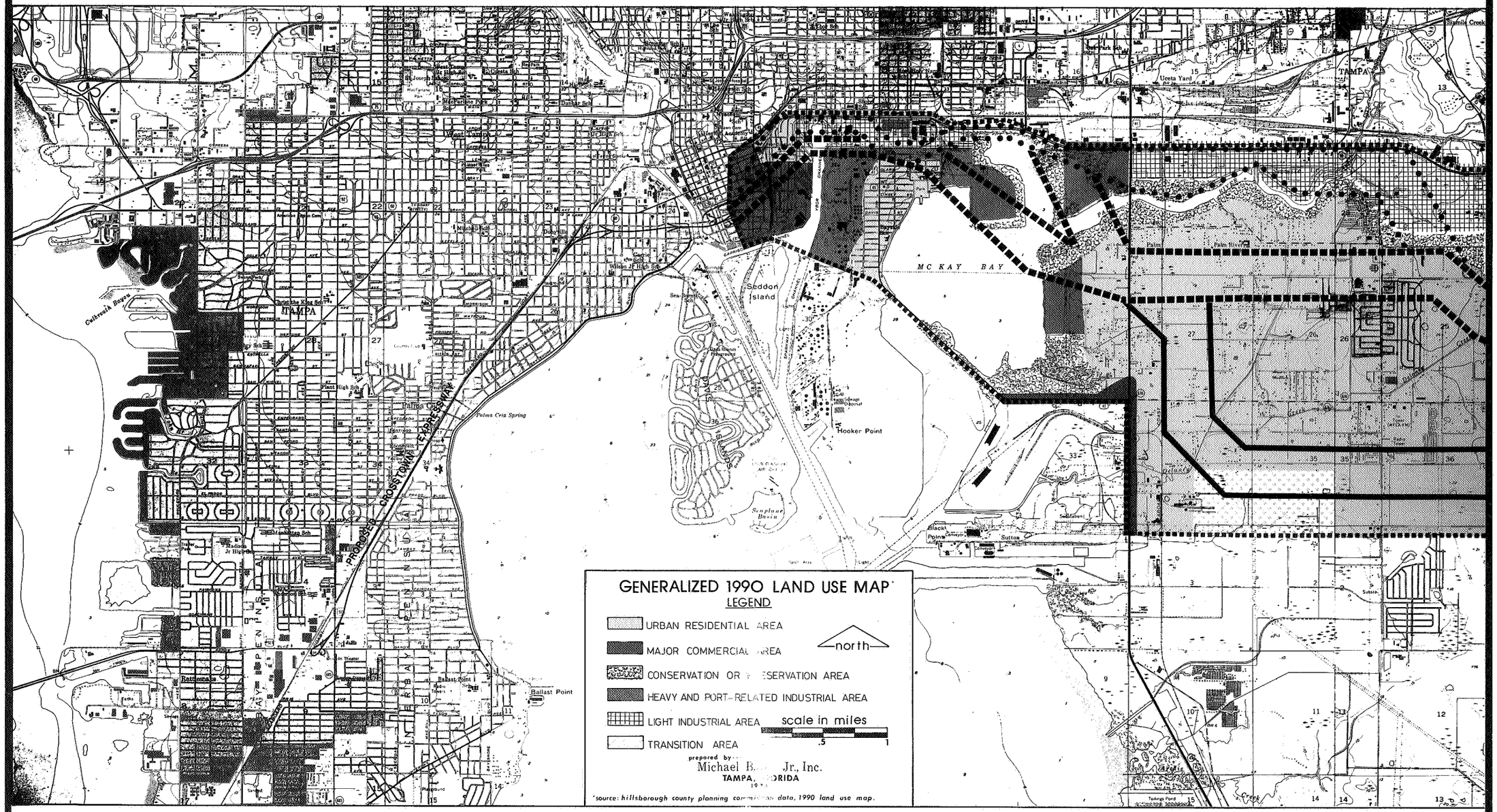
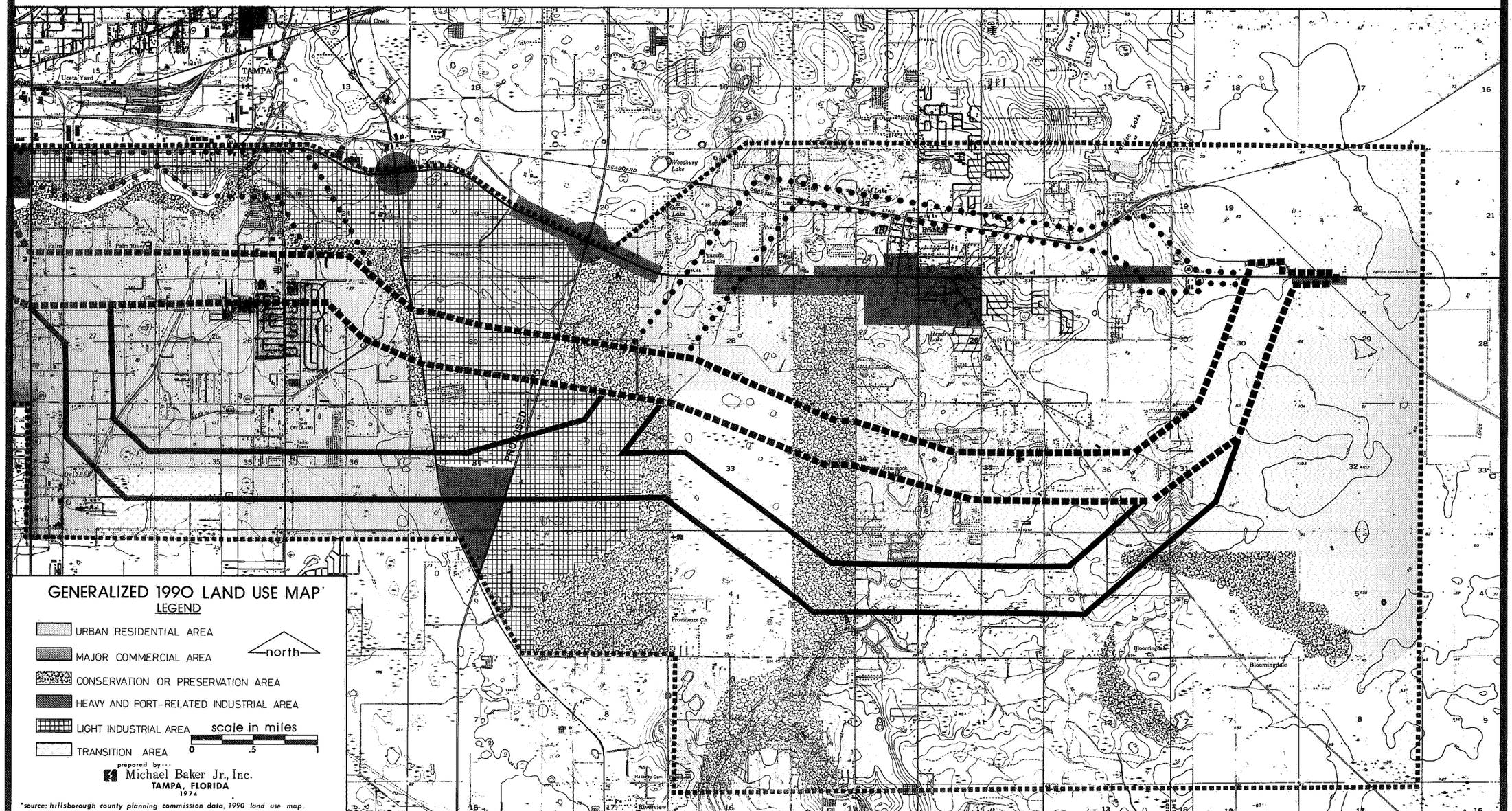


EXHIBIT 12A

CORRIDOR STUDY


TAMPA
Ueeta Yard
Sulphur Springs
Sulphur Springs
Sulphur Springs

CORRIDOR STUDY

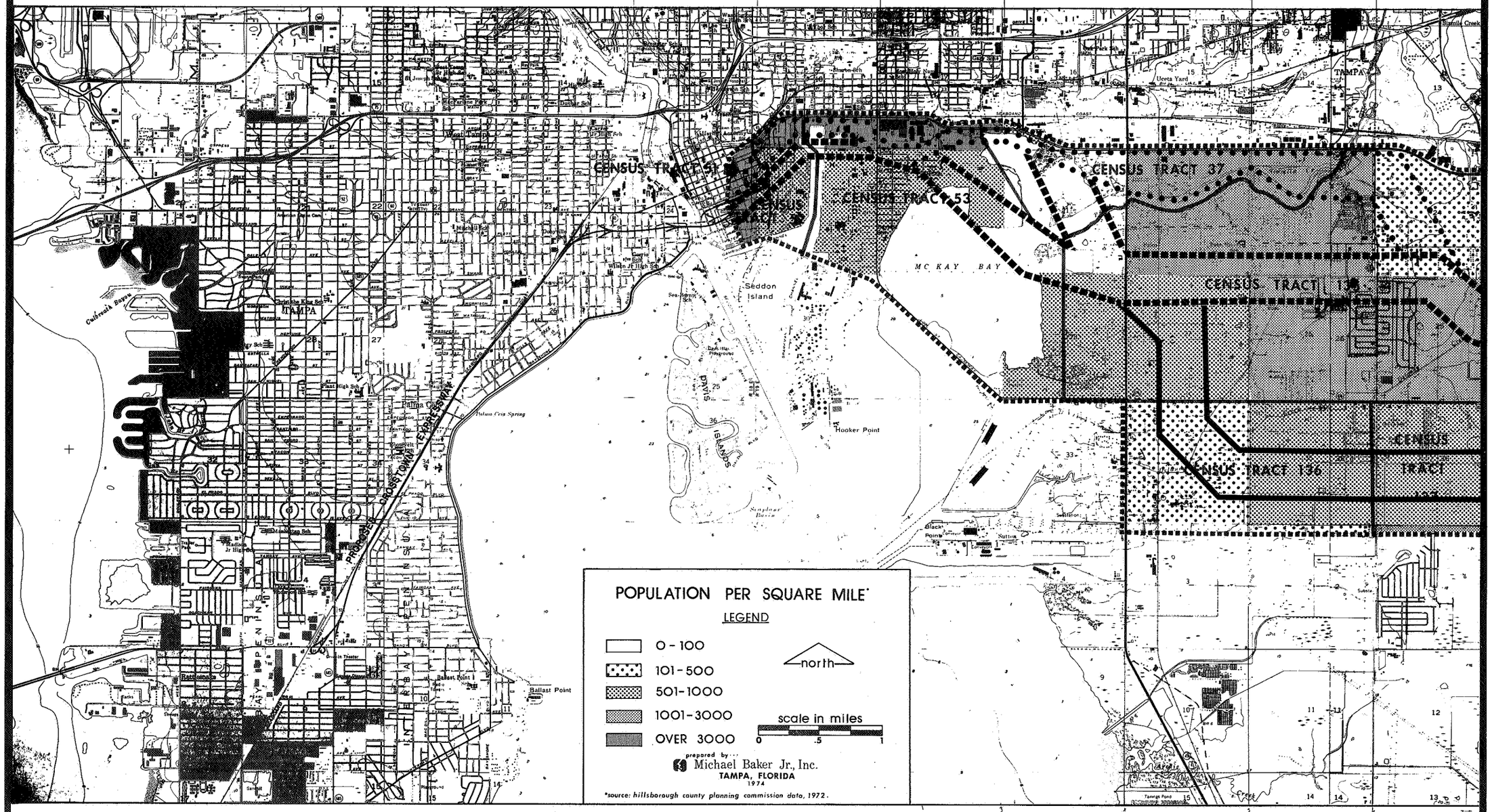
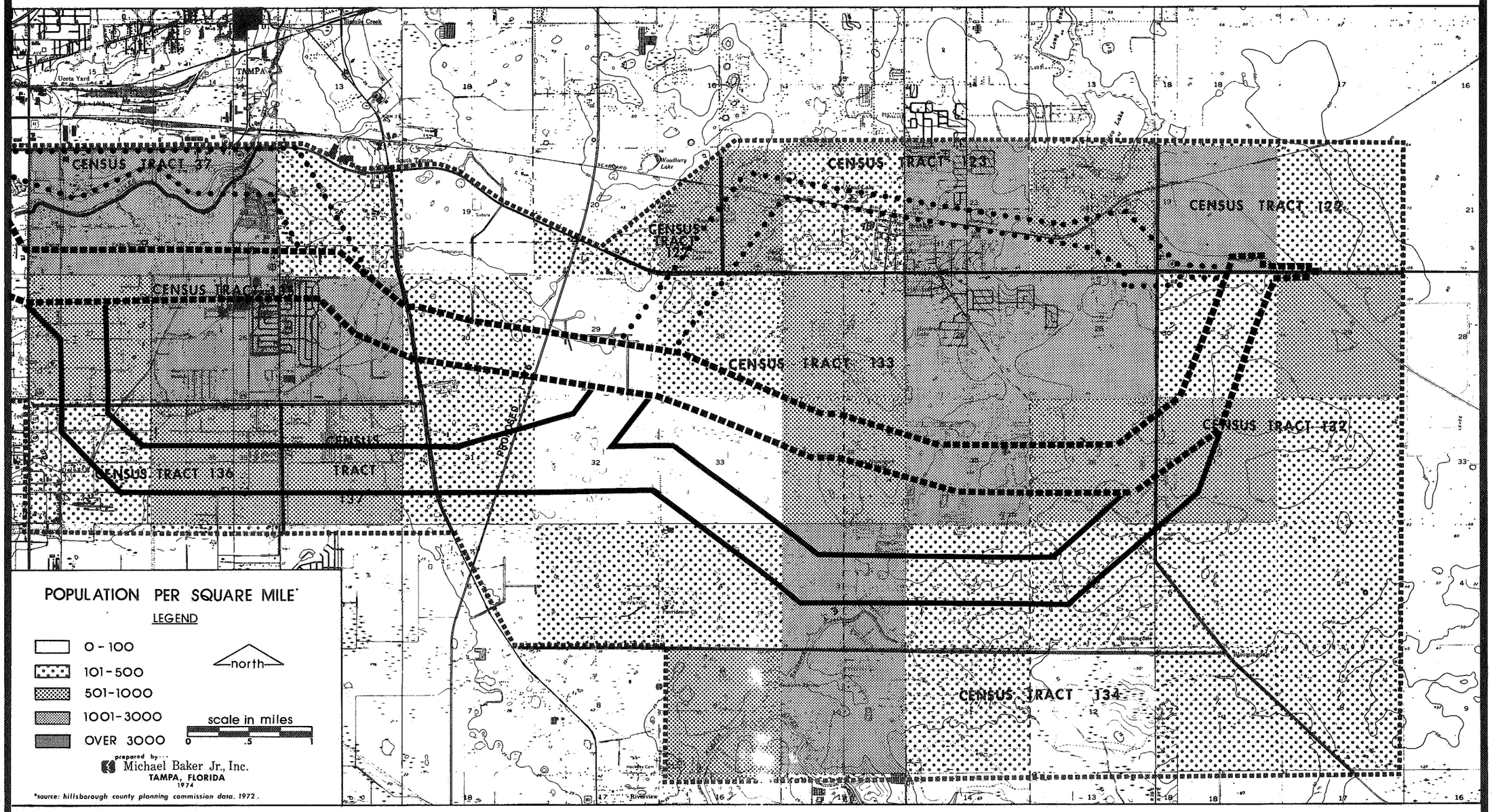


EXHIBIT 13A

CORRIDOR STUDY

EXHIBIT 13B



perhaps a degree of service industry. DeSoto Park and Clair Mel City are the largest definable neighborhoods within the Study Area. The Palm River Road area, Valrico, and the rapidly developing Bloomingdale Road area may also be placed in this category. Other portions of the Study Area satisfy many of the criteria used, but are less definable.

This section examines the basic socioeconomic characteristics and patterns of the Study Area and, where possible, of the communities and neighborhoods of which it is comprised.

Population Growth and Composition

The population of the Tampa Bay area continues to experience a steady growth, and the Study Area is no exception. It is this growth that is largely responsible for bringing into focus the need for this proposed highway facility.

The growth has taken place primarily in the eastern portion of the Study Area, particularly Brandon and its environs. In the Study Area's western portion, especially within certain areas of Tampa, the population has either remained stable or declined. Exhibit 13 depicts the Census Tracts totally or partially within the Study Area, as well as the Study Area's population density per square mile in 1972. Although the boundaries of these Census Tracts do not conform exactly to the Study Area boundaries, they do provide the best breakdown of information needed for this analysis, and, thus, will be utilized as the basis for much of the following text and many of the accompanying tables. Table 25 lists the Census Tracts and their tabulated or estimated populations for given dates.

To further amplify the population trends within the Study Area, Table 26 lists the percentage and absolute changes as well as 1975 projections. These figures are based on data formulated by the Hillsborough County Planning Commission. (NOTE: The differences between the noted HCPC population figures - derived from U.S. Census - and other census figures used in this text are due to adjustments made in the official census figures.) Although no estimates or projections can be totally accurate, they do provide a clear overall picture of the population in and around the Study Area.

It is apparent from these figures that the most substantial recent growth has taken place in the Brandon area. The average increase in population for this immediate area (Tracts 122, 123, 132 and 133) was 21 percent during 1973. The total population in Brandon was estimated at approximately 32,400 persons as of January 1, 1974, and the projected 1990 population is 53,000 (HCPC - 1973). The western portion of the Study Area, however, has steadily declined in population in recent years. This reflects an overall trend in the southeast portion of Tampa.

Data from the 1970 Census was utilized in determining the composition of the Study Area population. Figure 3, an age-sex pyramid, provides a general picture of this breakdown.

The pyramid shows the Study Area to have a generally normal population composition except for a somewhat larger than average number of children between the ages of 5 and 14. Unlike portions of Pinellas and Pasco Counties, for example, there is not an exceptionally large number of elderly residents. Further analysis of the specific tract-by-tract data comprising the pyramid reveals that the western portion of the Study Area has a somewhat more "mature" composition, possessing proportionally fewer young people and proportionally more older people than the Brandon area which is largely composed of younger families with school-age children.

The population of the Study Area census tracts is predominantly white with a total minority group population of approximately eight percent of the total. Negroes are the only minority inhabiting the Study Area in significant numbers. Census Tracts 37 and 52 in Tampa and, to a lesser

TABLE 25

POPULATION ESTIMATES BY CENSUS TRACT 1970-1974

Census Tract	4/70 Pop.	1/71 Pop.	4/71 Pop.	1/72 Pop.	4/72 Pop.	1/73 Pop.	4/73 Pop.	1/74 Pop.
37	2,648	2,622	2,619	2,619	2,607	2,610	2,607	2,557
51	789	785	784	781	1,145	1,142	1,142	1,140
52	126	122	122	120	119	119	119	117
53	2,568	2,562	2,560	2,560	2,554	2,557	2,551	2,546
122	3,416	3,762	3,862	4,172	4,195	5,003	5,569	7,355
123	6,019	6,147	6,195	6,366	6,380	7,048	7,096	7,373
132	3,249	3,518	3,655	3,934	3,992	4,293	4,406	5,163
133	8,523	9,148	9,248	9,982	9,986	11,118	11,697	12,496
134	3,995	4,242	4,296	4,624	4,667	5,209	5,358	5,894
135	8,536	8,649	8,763	9,184	9,194	9,748	10,196	10,498
136	2,054	2,152	2,189	2,356	2,427	2,579	2,600	2,669
137	4,988	5,090	5,109	5,169	5,203	5,395	5,490	5,716
Total	**46,911**	**48,799**	**49,402**	**51,867**	**52,469**	**56,821**	**58,831**	**63,524**

Source: Hillsborough County Planning Commission

TABLE 26

POPULATION GROWTH TRENDS BY CENSUS TRACT

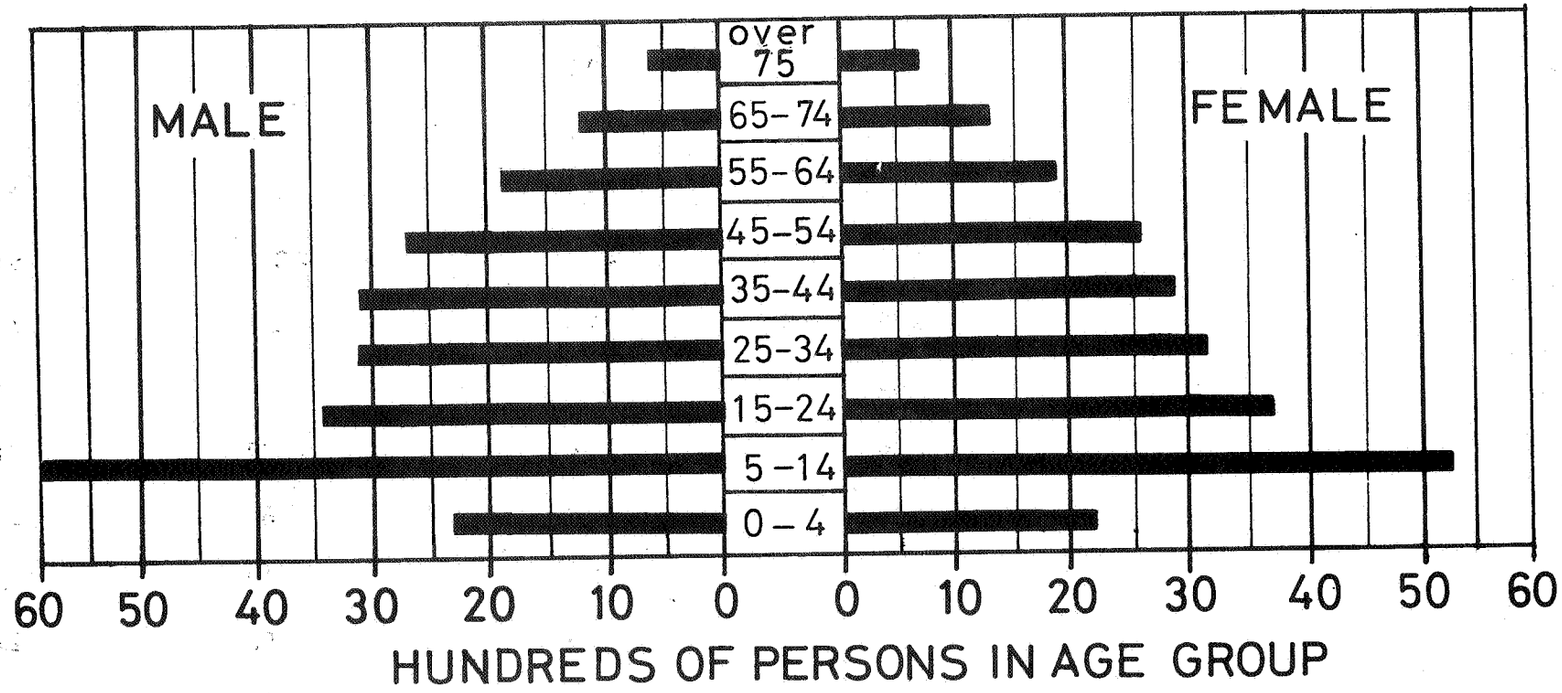
Census Tract	Percent Change 4/70-1/73	Absolute Change 4/70-1/73	Percent Change 1/73-1/74	Absolute Change 1/73-1/74	Projection 4/75
37	-1.4	-38	-2.0	-53	2,587
51	44.7	3.53	-0.2	-2	1,257
52	-5.6	-7	-1.7	-2	114
53	-0.4	-11	-0.4	-11	2,539
122	46.5	1,587	47.0	2,352	8,668
123	17.1	1,029	4.6	325	7,824
132	32.1	1,044	20.3	870	5,801
133	30.5	2,595	12.4	1,378	13,820
134	30.4	1,214	13.2	685	6,527
135	14.2	1,212	7.7	750	11,152
136	25.6	525	3.5	90	2,874
137	8.2	407	6.0	321	5,959
Total	**21.1**	**9,910**	**11.8**	**6,703**	**69,122**

Source: Hillsborough County Planning Commission

FIGURE - 3

STUDY AREA

AGE - SEX PYRAMID



Source: U.S. Bureau of Census 1970

TABLE 27

MINORITY GROUPS - 1970

Census Tract	White Population	Negro Population	Percent Negro
37	2,490	161	6.0
51	521	261	33.1
52	55	71	56.3
53	2,546	14	0.5
122	3,260	44	1.3
123	6,007	0	0.0
132	3,507	0	0.0
133	8,498	9	0.1
134	3,936	46	1.2
135	8,506	0	0.0
136	2,046	4	0.2
137	1,965	3,002	60.2
Total	43,347	3,612	8.3

Source: 1970 U.S. Census

extent Tracts 122 and 134 contain black enclaves. However, no definable black communities exist in these areas that would be significantly affected. Tract 137 includes Progress Village, a sizable black community, but this portion of the tract is outside the Study Area. Table 27 presents a breakdown of the minority group population within the Study Area.

Overall, approximately 3 percent of the Study Area population is foreign born and approximately 10 percent is of foreign stock, according to the 1970 Census. In addition, a somewhat substantial number of persons of Spanish language are present in Tract 53, which includes the DeSoto Park neighborhood. A small part of this area would be affected by the Central Corridor.

Employment

Data indicates that a large portion of the labor force residing in the Study Area is employed within the City of Tampa, although not necessarily within the central business district. Employment opportunities are increasing, however, in the Brandon area. Table 28 lists the various places of work for those in the Study Area and indicates, not surprisingly, that, as of 1970, over 85 percent utilized the automobile for getting to and from their places of employment.

Overall, unemployment is not a serious problem for those living in the Study Area. Unemployment levels in 1970 were generally lower than the averages for Hillsborough County or the total SMSA. The highest percentages of unemployed were in the census tracts in the western and southern portions of the Study Area where residents had a somewhat lower education level than those in the Brandon area. Any of the proposed expressway corridors, however, would afford greater mobility and more employment opportunities. Table 29 portrays the unemployment statistics.

Recent employment trends reflect those in the total SMSA, and,

TABLE 28

MEANS OF TRANSPORTATION AND PLACE OF WORK - 1970[1]

Category	Tract 37	Tract 51	Tract 52	Tract 53	Tract 122	Tract 123	Tract 132	Tract 133	Tract 134	Tract 135	Tract 136	Tract 137	Total
All Workers	901	82	64	1,051	1,125	2,279	1,238	3,169	1,228	3,144	799	1,695	16,775
Auto (Driver)	664	26	4	839	963	1,930	991	2,620	1,087	2,590	614	1,373	13,701
Auto (Passenger)	105	17	0	144	100	234	101	254	79	295	120	214	1,663
Bus	14	8	0	5	0	6	0	8	0	0	0	47	88
Railroad	0	0	0	0	0	0	0	15	0	0	0	5	20
Walked to Work	77	9	27	36	27	27	9	75	21	43	11	34	396
Worked at Home	10	22	33	15	35	58	40	92	19	72	49	7	452
Other	31	0	0	12	0	24	97	105	22	144	5	15	455
Tampa CBD	50	20	4	65	25	129	0	252	64	149	13	85	856
Remainder of Tampa	617	57	60	794	431	948	527	1,324	521	1,811	365	894	8,349
Remainder of Hills. County	124	0	0	85	516	896	470	1,254	476	873	262	517	5,473
St. Pete CBD	0	0	0	0	0	6	0	0	0	0	0	0	6
Remainder of St. Pete	19	0	0	10	27	14	6	9	8	34	28	27	182
Remainder of Pinellas County	6	5	0	13	22	28	29	0	15	41	38	17	214
Outside SMSA	26	0	0	0	45	167	127	155	54	87	18	38	717
Place not Reported	59	0	0	84	59	91	79	175	90	149	75	117	978

[1] *Data based on sample.*

Source: 1970 U.S. Census

TABLE 29

1970 EMPLOYMENT - CIVILIAN LABOR FORCE[1]

Category	Tract 37	Tract 51	Tract 52	Tract 53	Tract 122	Tract 123	Tract 132	Tract 133	Tract 134	Tract 135	Tract 136	Tract 137	Total	Hills. Co.	Total SMSA
Total Civilian Labor Force[2]	934	159	60	1,070	1,141	2,327	1,356	3,150	1,315	3,261	838	1,641	17,252	188,262	359,289
Employed	896	128	60	1,018	1,096	2,280	1,296	3,116	1,256	3,160	794	1,560	16,660	181,351	346,353
Unemployed	38	31	0	52	45	47	60	34	59	101	44	81	592	6,911	12,936
Percent Unemployed	4.0	19.5	0.0	4.9	3.9	2.0	4.5	1.1	4.5	3.1	5.3	4.9	3.4	3.7	3.6

[1]Data based on sample.
[2]Sixteen years and older.

Source: 1970 U.S. Census

indeed, the entire State. Non-agricultural wage and salary employment shows steady gains while agricultural employment continues to decline. This is especially true in the areas surrounding Brandon where pasture-lands and citrus groves are falling prey to developers almost daily.

The median and mean income levels of families residing in the Study Area are generally higher than the levels for Hillsborough County or the total SMSA with Tracts 123 and 133 in Brandon being the highest. The most notable exceptions are in tracts within the City of Tampa.

Housing

Reflecting the Study Area's population increase in recent years is a corresponding increase in the number of dwelling units. According to HCPC estimates the census tracts in and around the Study Area witnessed an increase of almost 3300 dwelling units between April, 1970 and January, 1973 - most within the Brandon area. The increase between January, 1973 and January, 1974 was even more pronounced, numbering over 2100 units in that 12 month period. By 1975, HCPC projects over 22,000 dwelling units in the Study Area census tracts.

The housing stock within the Study Area is primarily composed of single family, owner occupied dwelling units, as shown in Tables 30 and 31.

Statewide and nationwide trends reveal dramatic increases in multi-family dwelling units, largely resulting from increased land and construction costs that have fostered a need for higher intensities of land utilization. However, these trends do not yet apply to the Study Area. Although some multi-family dwelling units have recently been constructed or are planned, single family units dominate residential construction.

Not unexpectedly, the average value of the housing in the Study Area is considerably higher in the Brandon area than in the western portion.

TABLE 30

HOUSING TYPES - 1970[1]

Census Tract	Year Round Housing Units	Single Family Units[2] No.	%	Multi-Family Units No.	%
37	863	805	93.3	58	6.7
51	295	32	10.8	263	89.2
52	41	27	65.9	14	34.1
53	1,002	881	87.9	121	12.1
122	1,042	1,029	98.8	13	1.2
123	1,886	1,797	95.3	89	4.7
132	1,065	1,037	97.4	28	2.6
133	2,611	2,487	95.3	124	4.7
134	1,280	1,238	96.7	42	3.3
135	2,520	2,457	97.5	63	2.5
136	694	680	98.0	14	2.0
137	1,515	1,495	98.7	20	1.3
Total	**14,814**	**13,965**	**94.3**	**849**	**5.7**

[1]Data based on sample.
[2]Includes mobile homes and trailers.

Source: 1970 U.S. Census

TABLE 31

HOUSING OCCUPANCY - 1970

Census Tract	Owner Occupied No.	%	Renter Occupied No.	%	Vacant No.	%	Year Round Total Housing
37	561	64.1	256	29.3	53	6.6	875
51	12	4.1	239	81.0	44	14.9	295
52	12	23.1	28	53.8	12	23.1	52
53	661	66.4	262	26.3	73	7.3	996
122	835	80.2	165	15.8	42	4.0	1,042
123	1,512	81.6	253	13.7	88	4.7	1,853
132	881	83.2	152	14.3	27	2.5	1,060
133	2,166	84.1	290	11.3	118	4.6	2,574
134	1,093	82.8	166	12.6	61	4.6	1,320
135	2,134	84.6	277	11.0	111	4.4	2,522
136	500	71.8	168	24.2	28	4.0	696
137	1,121	74.3	201	13.3	187	12.4	1,509
Total	**11,488**	**77.7**	**2,457**	**16.6**	**849**	**5.7**	**14,794**

Source: 1970 U.S. Census

Census figures also reveal that Brandon area housing is generally newer and larger than in the remainder of the Study Area. Tables 32 and 33 present residential construction and occupancy trends for the Study Area.

Table 32 depicts, by census tract, the amount of residential construction for various time periods in and around the Study Area. The percentage figures illustrate what portion of the current housing stock was built during each period. Table 33 represents, numerically and in percentages, the time period in which the units were occupied by the present owners or tenants.

Cohesion

In the human environment, cohesion usually refers to the attraction between parts of a community or neighborhood or between entire communities, and is generally expressed in behavioral or perceptual relationships. Behavioral relationships include interaction such as visiting, use of local facilities, and participation in local organizations. Perceptual relationships are the underlying feelings or attitudes influencing this behavior. They involve psychological identification with the local community, commitment to the community, and positive evaluation of the community.

Expressways exert both positive and negative forces on this cohesion. Negative effects may be caused by increased noise, dirt, or congestion during the construction process, by removal of vital neighborhood services or the population levels needed to assure adequate neighborhood facilities, or by restrictions of movement to activities within the community. On the other hand cohesion may be strengthened if the highway forms a border protecting the area from encroachment by a conflicting land use. In addition, highway proximity may provide better access to community services.

TABLE 32

YEAR OF RESIDENTIAL CONSTRUCTION BY CENSUS TRACT[1]

Census Tract	1969-March 1970	%	1965-1968	%	1960-1964	%	1950-1959	%	1940-1949	%	1939-and earlier	%	Year Round Housing Unit
37	24	2.8	40	4.6	92	10.7	177	20.5	225	26.1	305	35.3	863
51	0	0.0	0	0.0	10	3.4	14	4.7	10	3.4	261	88.5	295
52	0	0.0	0	0.0	0	0.0	14	34.1	10	24.4	17	41.5	41
53	10	1.0	25	2.5	45	4.5	214	21.4	304	30.3	404	40.3	1,002
122	105	10.1	275	26.4	244	23.4	161	15.5	104	10.0	153	14.6	1,042
123	113	6.0	392	20.8	716	38.0	438	23.2	57	3.0	170	9.0	1,886
132	117	11.0	185	17.4	255	23.9	239	22.4	103	9.7	166	15.6	1,065
133	263	10.1	791	30.3	857	32.8	427	16.4	137	5.2	136	5.2	2,611
134	190	14.8	334	26.1	298	23.3	348	27.2	64	5.0	46	3.6	1,280
135	68	2.7	242	9.6	724	28.7	1,130	44.9	182	7.2	174	6.9	2,520
136	48	6.9	85	12.3	144	20.7	252	36.3	113	16.3	52	7.5	694
137	89	5.9	87	5.7	901	59.5	342	22.6	49	3.2	47	3.1	1,515
Total	**1,027**	**6.9**	**2,456**	**16.6**	**4,286**	**28.9**	**3,756**	**25.4**	**1,358**	**9.2**	**1,931**	**13.0**	**14,814**

[1] *Data based on sample.* *Source: 1970 U.S. Census*

TABLE 33

YEAR OF RESIDENTIAL OCCUPANCY BY CENSUS TRACT[1]

Census Tract	1968-March 1970	%	1965-1967	%	1960-1964	%	1950-1959	%	1949-or earlier	%	Occupied Housing Units
37	290	36.1	155	19.3	51	6.4	156	19.5	150	18.7	802
51	113	49.3	60	26.2	7	3.1	30	13.1	19	8.3	229
52	7	19.4	7	19.4	0	0.0	7	19.4	15	41.8	36
53	281	29.6	111	11.7	134	14.1	149	15.7	274	28.9	949
112	468	46.8	235	23.5	147	14.7	85	8.5	65	6.5	1,000
123	604	34.0	474	26.7	458	25.7	174	9.8	67	3.8	1,777
132	353	34.1	216	20.8	208	20.1	178	17.2	81	7.8	1,036
133	987	40.0	653	26.5	486	19.7	264	10.7	76	3.1	2,466
134	661	53.1	209	16.8	160	12.8	196	15.7	20	1.6	1,246
135	881	36.5	469	19.5	532	22.0	419	17.4	110	4.6	2,411
136	247	38.6	84	13.1	113	17.7	169	26.5	26	4.1	639
137	509	37.7	312	23.1	417	30.9	80	5.9	33	2.4	1,351
Total	**5,401**	**38.7**	**2,985**	**21.4**	**2,713**	**19.5**	**1,907**	**13.7**	**936**	**6.7**	**13,942**

[1] *Data based on sample.* *Source: 1970 U.S. Census*

Varying degrees of cohesion exist within and among the communities and neighborhoods in the Study Area. Most means of measuring this cohesion are subjective, but in some instances, it is readily identifiable. Brandon residents, for example, exhibit strong perceptual behavior regarding issues that affect the community as a whole. The relative impacts of the three corridors on community and neighborhood cohesion will be a vital indicator in determining the overall effects of the corridors on the human environment.

Displacements

The construction of any highway facility inevitably necessitates the displacement of a certain amount of residences and business, although attempts must be made to minimize this type of disruption. Table 34 illustrates the estimated residential and business displacements for each of the primary corridors under consideration.

It should be noted here that the Tampa-Hillsborough County Expressway Authority has drafted a set of policies and procedures for relocation assistance. More detailed analyses of displacement issues are contained in the Corridor Impacts section.

TABLE 34
ESTIMATED DISPLACEMENTS

Type	Corridor	Project One to U.S. 41	U.S. 41 to I-75E	I-75E to East	Total
Residential	Northern	42	7	116	165
	Central	112	200	118	430
	Southern	56	52	86	194
Business	Northern	34	3	21	58
	Central	35	2	00	37
	Southern	34	5	00	39

Source: Tampa-Hillsborough Expressway Authority Staff and Retained Appraiser

Governmental Services and Community Facilities

This section examines some of the governmental services and community facilities provided within the Study Area with particular emphasis on parks, recreation areas, and schools.

Although a small portion of the City of Tampa lies within the Study Area boundaries most of the area is unincorporated and, therefore, is largely dependent on Hillsborough County for services and facilities.

Police protection, for example, is primarily provided by the Hillsborough County Sheriff's Department which maintains an office in Brandon. County water is provided to some subdivisions south of Bloomingdale Road, although most of the water supply in the eastern portion of the Study Area is provided by the privately owned Brandon Water Company and individual wells. Much of the sewage is treated through the use of septic tanks, although the County is expected to become increasingly involved in centralized sewage treatment and disposal in this area.

County participation in fire protection within the Study Area is less direct, involving a fire taxing district in Brandon. The resulting funds derived through such a taxing district provide salaries and equipment for one station in the eastern portion of that community, and an additional station is planned. Volunteer fire departments exist in the Bloomingdale and Palm River areas. A City of Tampa Fire Department station is located on 22nd Street in the DeSoto Park neighborhood, and a station is proposed along Adamo Drive near the City Limit.

The Tampa Public Library (a city-county system) operates a branch in Brandon containing over 31,000 volumes and will soon begin an expansion program which will double the size of the facility. In addition, very limited bookmobile service is available to some other portions of the Study Area. Also, a temporary "test" branch, staffed by volunteers, has been established in the Winston Park Community Center in the Clair Mel City area.

Additional information pertaining to governmental services and community facilities will be available through a series of public facilities reports now being prepared by the Hillsborough County Planning Commission.

Tax Base

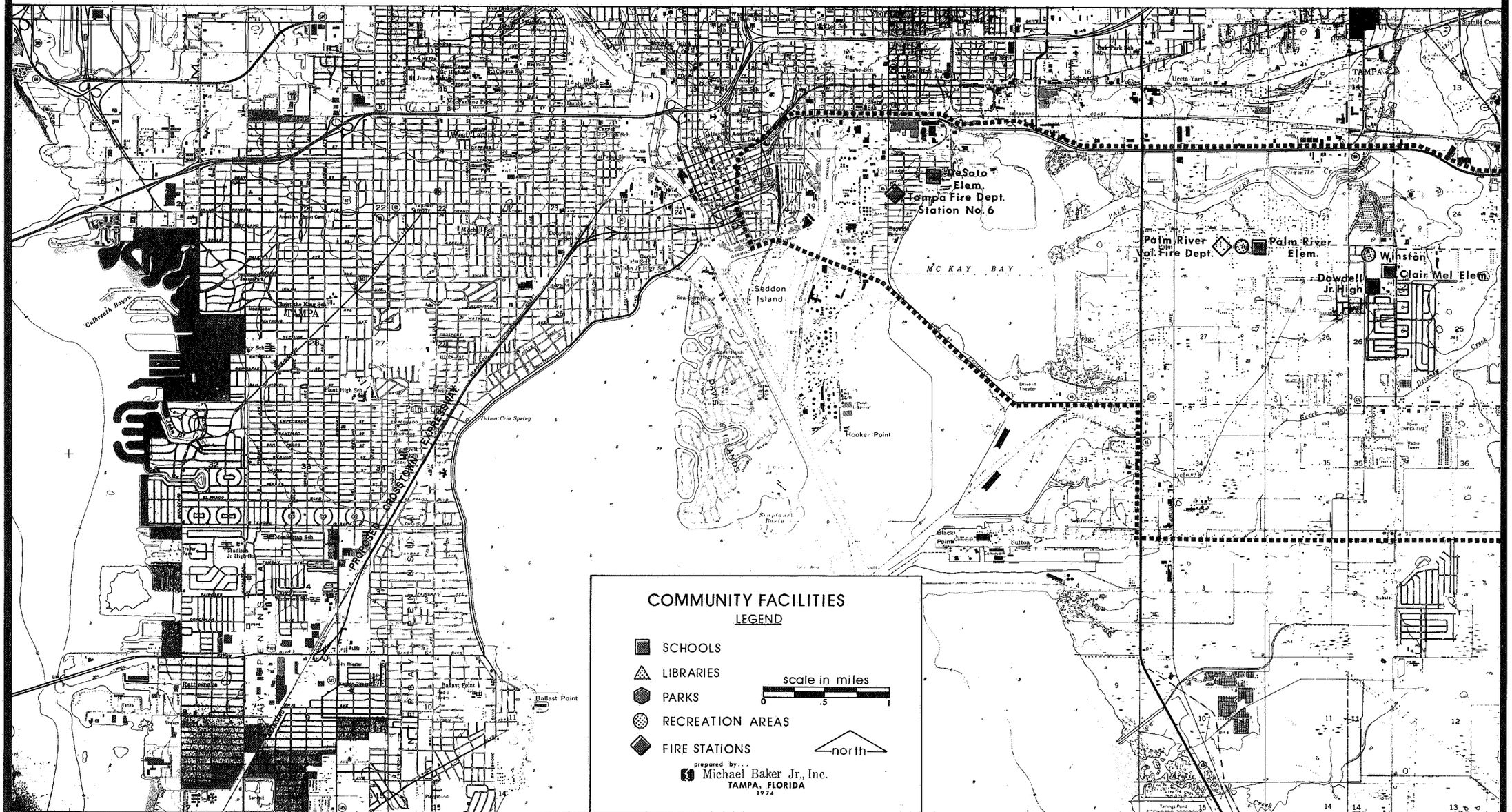
The effects of a highway on an area's tax base are considered on a general basis. Since property taxes are normally the primary source of revenue for local governments, officials often express concern that acquisition of property for highway right-of-way significantly reduces the local tax base.

It is generally true that tax rolls may initially be lowered when property is acquired for highway use. This often raises questions about the ability of the local government to pay for needed services, particularly if the highway is associated with an increased need for services.

However, initial tax roll losses are often offset by renewal, redevelopment, and more intensive development attracted by the highway. The transition to more intensive land development is accelerated by the improvements in accessibility due to the highway. This development, where possible, should, however, conform to the land use plans for the area. If such a procedure can be accomplished, a new highway may not only ultimately increase the local tax base, but provide planners and the community with a tool for controlling orderly growth and development.

CORRIDOR STUDY

EXHIBIT 14A



COMMUNITY FACILITIES

LEGEND

- SCHOOLS
- LIBRARIES
- PARKS
- RECREATION AREAS
- FIRE STATIONS

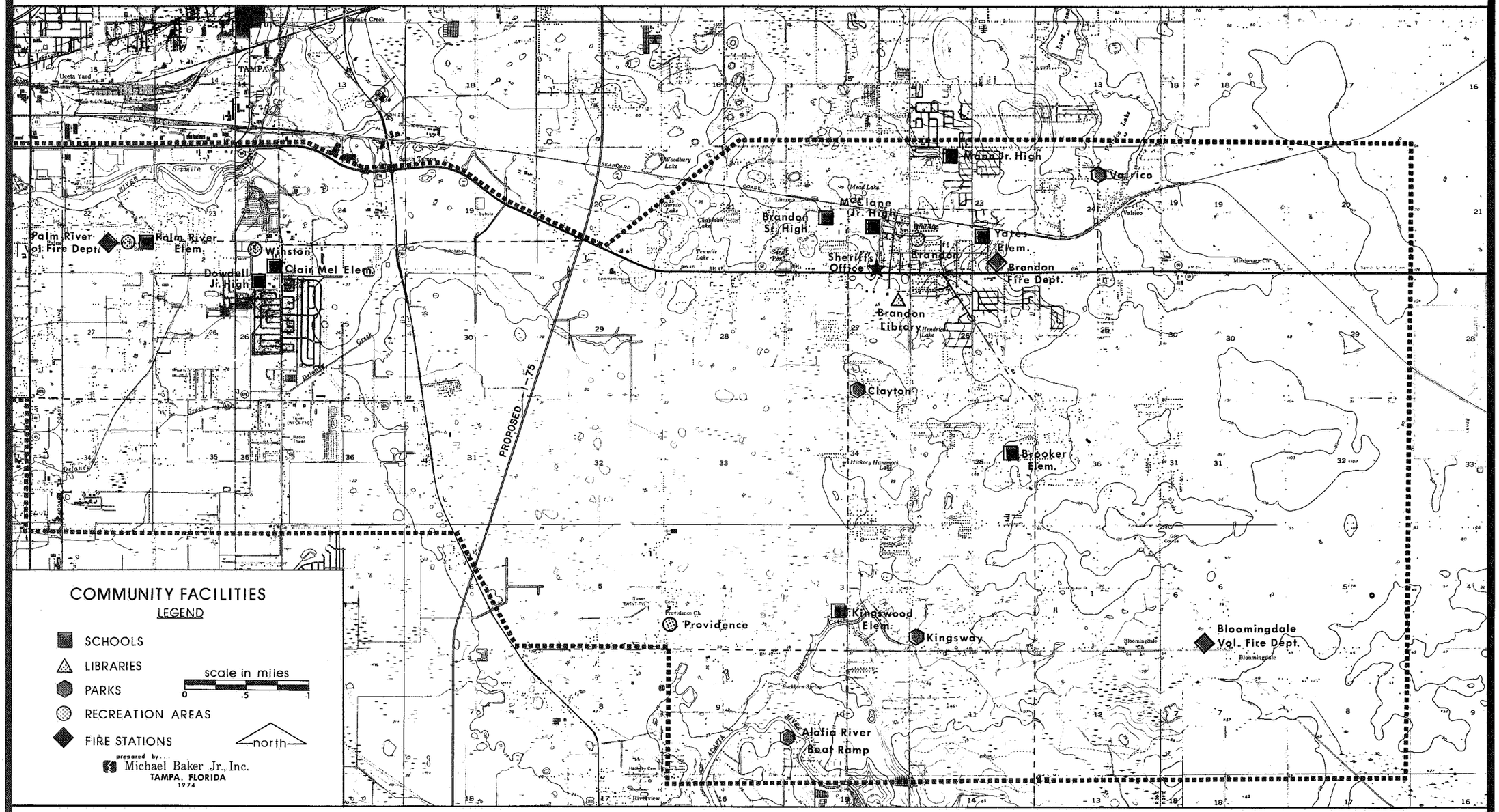
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Michael Baker Jr., Inc.
TAMPA, FLORIDA
1974

CORRIDOR STUDY

EXHIBIT 14B



near the Southern Corridor. Also in proximity to the Southern Corridor is a major privately-owned recreation facility, the Buckhorn Springs Golf and Country Club.

An Open Space Plan is currently being prepared by the Hillsborough County Planning Commission in conjunction with its overall 1990 Plan of Development. The results of that effort should provide a clearer picture of potential parks and recreation areas within the County.

Schools

The proximity of a proposed expressway corridor to an existing or planned educational facility presents a very sensitive set of parameters that must be considered in the evaluation of that corridor. Problems such as auto emissions, noise intrusion, accessibility, and, above all, pupil safety are of great importance. Each of the corridors under consideration affects existing school facilities to some extent.

Presently, ten public schools lie within the boundaries of the Study Area. This figure includes six elementary schools, three junior high schools and one high school (see Exhibit 14).

Most of the existing school facilities within the Study Area are relatively new and in satisfactory condition. The most notable exception is DeSoto Park Elementary School which was constructed in 1910. Although periodic additions have been made to many of these facilities, the rapidly increasing population (and corresponding school enrollment increases) has resulted in capacities being exceeded, thus forcing the widespread use of portable classrooms. Table 35 provides a breakdown of the school facilities within the Study Area.

The schools most directly affected by the proposed corridors are Clair Mel Elementary and Dowdell Junior High School. Both are located within the Central Corridor. DeSoto Park Elementary is situated on the border of this corridor, as are Palm River Elementary and Brooker Elementary.

Yates Elementary, McClane Junior High School, Brandon High School, and, to a lesser extent, Mann Junior High School are in proximity to the Northern Corridor. Kingswood Elementary is located on the border of the Southern Corridor. In addition a new elementary school is planned for a site on Bell Shoals Road, 1.2 miles south of Bloomingdale Road, near the southern boundary of the Study Area.

Religious Institutions and Cemeteries

It has been determined that almost 50 churches lie within the boundaries of the Study Area, including several located in one or another of the corridors under consideration. These churches range from small chapels with very localized congregations to large, community-serving institutions providing a myriad of facilities and services.

Traditionally, the location of religious institutions emphasizes quietness and, to some extent, pedestrian accessibility. Experience in other areas, however, indicates that churches may derive some advantages from proximity to a highway, notably increased accessibility and visibility from the road. These advantages, however, do not negate the potential adverse effects of air and noise pollution and pedestrian safety brought about by immediate proximity to a highway facility. These potential negative impacts must be recognized and minimized in both the location and design analyses for this proposed expressway.

In the planning of all highway facilities extreme care must be taken to avoid the disruption of cemeteries. Only one major cemetery, Hillsboro Memorial Gardens on West Brandon Boulevard in Brandon, is known to be located in the Study Area. No cemeteries are known to

TABLE 35

STUDY AREA SCHOOLS

School	Type	Year Constructed	Additions	74 Capacity W/O Portables	6th Month 1974 Enrollment
Brooker	Elementary	1961	63-65-69	780	944
Clair Mel	Elementary	1959	61	830	1,053
DeSoto	Elementary	1910	46	385	369
Kingswood	Elementary	1968	71	840	1,155
Palm River	Elementary	1948	49-63-72	655	976
Yates	Elementary	1954	59	720	719
Dowdell	Junior High School	1963	None	806	1,298
Mann	Junior High School	1958	59-60-69	1,230	1,375
McClane	Junior High School	1914	19-28-48-52 61-62-65-68	1,238	1,229
Brandon	High School	1972	None	1,762	2,704

Source: Hillsborough County School Board

lie within the boundaries of any of the proposed corridors.

Transportation Patterns

New expressways invariably affect existing street and highway systems in the areas through which the new facilities pass. Each of the corridors under consideration here would produce changes in the traffic volumes and patterns on the local system in and around the Study Area. These changes will be discussed in the Corridor Impact section, but some general statements about the existing local system and the overall effects of the proposed expressway on that system are appropriate here.

One major intent of the proposed facility is to reduce traffic volumes on existing east-west arterials between Tampa and the Brandon area. In accomplishing this, however, increased burdens on north-south arterials will result from motorists travelling to and from the facility. These burdens will be greatest on arterials directly feeding expressway interchanges, and particular problems will arise where these arterials are also residential streets, such as Kings Avenue, John Moore Road, and Bell Shoals Road in the Brandon area.

Street closings in the vicinity of the expressway would alter traffic patterns and could have some effect on land use patterns. The overall design of the facility would largely determine the streets to be closed, but every effort must be made to assure that major arterials are kept open. It has been established elsewhere, however, that the closing of local residential streets near expressway facilities often enhances these areas by reducing the amount of through traffic.

It must be remembered, also, that new highway facilities usually generate new growth and traffic, regardless of their location. These are long-term effects and are difficult to measure, but must be considered as part of the overall planning process.

The existing and potential transportation problems in and around the Study Area are compounded by the fact that adequate mass transit facilities do not exist. The Study Area population, especially in the Clair Mel City and Brandon areas, is extremely auto-oriented. As the population continues to grow, alternatives to the automobile must be found, even if this proposed expressway becomes a reality. If this growth continues, as it is expected to do, densities will rapidly reach levels high enough to justify some type of mass transit facility. Therefore, as mentioned in the Engineering Report, it is essential that the future planning of this expressway explore the various possibilities of joint auto-transit usage within the right-of-way.

Architectural, Historic, and Archaeological Landmarks

As revealed in a joint study conducted by the Hillsborough County Planning Commission and the Florida Department of State, Division of Archives, History, and Records Management (DAHRM) in 1973-74, Hillsborough County possesses a large number of structures and sites having architectural, historic or archeological significance. Efforts are continuing by public agencies and private groups to record such landmarks and, where possible, prevent their degradation or destruction.

Seven important architectural and/or historic structures exist within the Study Area, and two more exist near the Study Area's northern boundary. Three of these structures lie within the Northern Corridor. They are Union Station (601 North Nebraska Avenue, Tampa), the Victoria Street House (1514 Victoria Street, Brandon), and the Moseley House (1820 West Brandon Boulevard, Brandon). Others within the Study Area, but not in any of the corridors, are the Johnson Building (955-60 East Twiggs Street, Tampa), the Valrico Civic Club (Fifth Street, Valrico), the Brandon House (401 West Brandon Boulevard, Brandon), and the Skjellte House (Morningside Road and East Brandon Boulevard, Brandon). Located near the Study Area's northern boundary are the Yanez House (1301 North

23rd Street, Tampa) and the Brown House (1201 Telfair Road, Brandon). All of these structures are listed on the Florida State Register of Historic Places. Tampa's Union Station, recognized as one of Florida's best examples of Beaux Arts Classicism, has also been nominated to the National Register of Historic Places.

In addition, two known archeological sites exist within the Study Area, according to records of the DAHRM. Both of these sites are located at the mouth of the Palm River and are in the Central Corridor. Little information is currently available pertaining to these sites except that they are prehistoric shell middens, one of which is known to be approximately 70' x 500' in size, archeologically undisturbed, and of the early Safety Harbor Period.

These historic/architectural landmarks and archeological sites are vital and irretrievable parts of Hillsborough County's cultural heritage and every effort must be made to assure that the planning and design of this expressway facility recognizes their importance.

Section 4(f) Involvement

Section 4(f) of the Department of Transportation Act as amended in Section 18 of the "Federal Aid Highway Act of 1969" permits the Secretary of Transportation to approve a program or project which requires the use of publicly owned land from a park, recreation area, or wildlife and waterfowl refuge of national, State or local significance as determined by local officials having jurisdiction thereof, or land from an historic site of national, State, or local significance as so determined by such officials only if:

(1) There is no feasible and prudent alternative to the use of such land, and

(2) Such program includes all possible planning to minimize harm to the Section 4(f) land resulting from such use.

Although a formal 4(f) statement is not required until during the preparation of a complete Environmental Impact Statement, it is felt that those potential 4(f) lands within the proposed corridors should be noted and be included in the evaluation process.

Lands and structures possessing the possibility of 4(f) involvement include McKay Bay (Northern and Central Corridors), Tampa Union Station (Northern Corridor), the Moseley House and the Victoria Street House in Brandon (Northern Corridor), Winston Recreation Area (Central Corridor) and playground facilities adjacent to schools located in any of the three corridors.

methodology

Outlined herein are the various methods utilized in the collection and synthesis of the data utilized to determine the relative impacts of the selected corridors. The noise and air quality methodologies are presented in detail so that the terminology and results of these quantitative analyses contained in the subsequent Corridor Impacts section may be more readily understood.

Terrestrial Habitat and Wildlife

Apparent productive natural habitats were selected and sampled using the quarter method to ascertain the vegetative species composition, diversity, density and relative value. These habitats were also mapped to determine their spatial distribution. The age and relative health of various vegetative species were determined through visual observation and tree-core

TABLE 36
AQUATIC SAMPLING STATISTICS

Station	Date	Time	Water Temperature (C°)	Depth (Meters)	Bottom Type
McKay Bay 1	5/7/74	3:30 p.m.	28.8°	0.5	organic ooze
McKay Bay 2	5/8/74	9:00 a.m.	23.8°	0.5	organic ooze
McKay Bay 3	5/8/74	9:50 a.m.	24.0°	0.25	organic ooze
McKay Bay 4	5/8/74	11:00 a.m.	25.0°	0.2	organic ooze
McKay Bay 5	5/9/74	7:50 a.m.	22.0°	0.2	organic ooze
McKay Bay 6	5/9/74	8:55 a.m.	23.0°	0.1	organic ooze
McKay Bay 7	5/9/74	10:25 a.m.	25.0°	0.25	sand
McKay Bay 8	5/9/74	11:40 a.m.	27.8°	0.3	sand
McKay Bay 9	5/9/74	1:00 p.m.	43.0°	0.3	organic ooze
McKay Bay 10	5/9/74	1:25 p.m.	32.0°	0.35	organic ooze
Palm River	5/8/74	8:10 a.m.	24.6°	6.0	organic ooze
Delaney Creek 1	5/13/74	6:20 p.m.	25.0°	1.5	organic ooze
Delaney Creek 2	5/13/74	7:30 p.m.	25.0°	1.0	organic ooze
Ybor Channel	5/16/74	10:00 a.m.	24.5°	9.0	organic
Mead Lake	5/18/74	10:00 a.m.	25.0°	1.0	organic
Ten Mile Lake	5/16/74	12:30 p.m.	23.0°	2.0	sand-organic

Source: Michael Baker, Jr., Inc.

sampling. The composition, diversity, and density of faunal species were also established during these on-site vegetative investigations. Historical data, as well as communications with local biologists and representatives of the Florida Game and Fresh Water Fish Commission supplemented the on-site investigations.

Water Quality and Biota

Subsequent to the selection of apparent productive areas, water and sediment samples were collected for chemical analysis and for the determination of flora and fauna composition. Particular attention was directed to the species composition of benthic habitats as an aid in determining the relative health and productivity of the marine and freshwater ecosystems. Bottom samples were collected with an Eckman dredge and a punch core sampler (See Table 36 for aquatic sampling statistics). The organisms retrieved were preserved in formalin and bottled for later microscopic identification. The on-site investigations and analyses were supplemented by historical data.

Noise

To effectively assess the ambient or existing noise environment in the community, proper sampling techniques were utilized. Existing noise levels in the Tampa Bay area were measured using a Bruel and Kzaer, Type 2203 precision sound level meter. [American National Standard Institute - (A.N.S.I. Type 1]. The meter was set to the A-weighting scale with the slow integration speed as recommended by the National Cooperative Highway Research Program (N.C.H.R.P.), Report 117. Both pre and post calibration checks were made with a rule and Kaizer, Type 4230 sound level calibrater.

Two sampling runs of five minutes each, with five second samplings, were made during a period of 15 minutes at each site. This procedure was used at what was believed to be peak traffic volume and

non-peak time periods. A sufficient number of readings were taken to assure that the variability of the high and low meter readings were accounted for during each sampling run. This data was then statistically analyzed to determine L_{90}, L_{50}, and L_{10} noise levels at each of the selected noise sampling sites.

Noise level projections for the year 1985 and the design year 2000 were determined using the Connecticut modified computer version of the National Cooperative Highway Research Program (NCHRP) Report 117. These projections were based on peak hour traffic conditions. Basic traffic and roadway data was provided by Wilbur Smith and Associates. A series of assumptions and adjustments were made to facilitate use of the basic data in conducting noise and air pollution studies.

The peak route speed assumed was 40 mph for each expressway corridor and 30 mph on all other roads. Also assumed were truck traffic and Design Hourly Volume (DHV) figures of ten percent of the total traffic. The average assumed width of the expressway was 136 feet within an average right-of-way of 350 feet. This resulted in an average distance of 175 feet from the centerline to the edge of the right-of-way. For analysis purposes, all roadway gradients were assumed to be less than three percent. All roadway geometry was assumed to be at grade with the exception of that segment of the roadway from the Western Terminus to 22nd Street which is elevated. Ybor Channel was analyzed for two alternatives. The first included a low level crossing, and the second a high level crossing. The centerlines depicted on Exhibit 10 were assumed to facilitate the evaluation process. They should in no way be construed as the actual proposed centerline. Due to a lack of traffic and roadway data, the portion of roadway crossing McKay Bay at the Tampa Municipal Landfill was not analyzed.

The results of the noise analysis are shown on tables in the Impact section. These tables illustrate corridor results by roadway section between the various interchanges. Each section was analyzed for the year 1985 and the design year, 2000. Since the most sensitive noise areas are residential areas, the results of the analysis are illustrated in terms of the distance to the 70 dBA contour line and the approximate number of residential units that would be affected by this noise contour line. It should be noted that 70 dBA is the design noise level considered compatible with residential areas, schools, churches, and other noise sensitive areas. The residential areas along each corridor are contoured for the year 2000 on Exhibit 10. The 70 dBA contour line and the 65 dBA contour line are illustrated on the exhibit. The number of units indicated in the tables represent an approximation of the actual area of impact since the centerline of the roadway has not yet been established. The actual figures will probably be lower since all structures within the average right-of-way on each centerline will probably be removed.

Air Quality

Traffic information was essential to the air quality analysis. Current data for the Study Area was obtained from Florida Department of Transportation figures and traffic projections for the years 1985 and 2000 were obtained from Wilbur Smith and Associates. The following assumptions were made for peak hour and average speeds:

	Peak Hour	Average
Route 60	30 mph	35 mph
Expressway	40 mph	45 mph

The traffic data for the Study Area is summarized in Table 37. Average Daily Traffic (ADT) figures for the year 1973 and projections for 1985 are shown for S.R. 60. Traffic estimates for the proposed expressway are also shown for 1985 and 2000.

TABLE 37

TRAFFIC DATA (ADT)

(Peak Hour Volumes are 10% of ADT)

Route 60	1973	1985			2000
1. Downtown					
a. J.F. Kennedy Blvd. 100' in off 13th Street	11,432	---			
b. Between downtown (13th Street) and 22nd Street	3,491	60,800 60,600 63,400		(N) (C) (S)	---
2. Between Routes 45 and 573 (Same as 41 and 78th Street)	27,960	28,000 30,200 36,200		(N) (C) (S)	---
3. West of Brandon between Providence Road and Kingsway	25,400	35,800 36.0 38.0	 38.8 39.8	(N) (C) (S)	---
4. East of Kingsway (Brandon)	12,360	21.4 17.2 24.8	 12.8	(N) (C) (S)	---

TABLE 37 (cont.)

Crosstown Expressway	1973	1985		2000	
1. Downtown (Between downtown and 22nd Street)	---	55,200 54,200 51,200	(N) (C) (S)	81,600 79,600 75,400	(N) (C) (S)
2. Between Routes 45 and 573 (Same as 41 and 78th Street)	---	43,800 41,400 34,000	(N) (C) (S)	64,500 60,000 50,400	(N) (C) (S)
3. West of Brandon between Providence Road and Kingsway	---	21,800 22.4/16.2 k 16.2/11.8 k	(N) (C) (S)	32,200 32.4/20.6 k 24.0/17.4 k	(N) (N) (S)
4. East of Kingsway (Brandon)	---	8.2 8.8 9.6/8.0 L	(N) (C) (S)	12.0 12.8 14.2/11.6 L	(N) (C) (S)

(N) North Corridor
(C) Central Corridor
(S) South Corridor
k Kingsway
L Lithia Road
36.0 38.8 Traffic volumes changing within the segment under consideration
22.4/14.2 Traffic volumes in thousands. Number to the left refers to traffic west of Kingsway and number to the right refers to traffic east of Kingsway

Source: Wilbur Smith and Associates

Two types of air quality analysis were made: microscale and mesoscale. Generally, a microscale analysis consists of an estimation of roadside concentrations of carbon monoxide off the highway by using a computer dispersion model. If background concentrations of carbon monoxide are available for the Study Area, then the total concentration is the sum of the estimated roadside concentration plus the background value. This total value is then compared with the National Ambient Air Quality Standard for Carbon Monoxide: 35 parts per million (ppm) maximum one hour concentration (same as the Florida State Standard for Carbon Monoxide).

Generally, concentrations of carbon monoxide are estimated off the highway at various distances in the microscale analysis. Maximum concentrations are expected during peak hour traffic and when the meteorological conditions are such that dispersion of pollutants is at a minimum. The Study Area is characterized by stable conditions (Class E) during approximately 40 percent of the year. Winds under Class E conditions are usually from the east. Concentrations are generally higher with winds blowing parallel to the highway rather than across it.

The computer model used for estimating the carbon monoxide concentrations was developed by the California Department of Highways. To facilitate model application the following parameters are required as input to the model:

1. Peak hour traffic volume (vehicles/hour)
2. Emission rate of pollutant (grams/sec)
3. Height of emission (meters)
4. Height of receptor (meters)
5. Wind speed (mph)
6. Angle at which the wind blows with respect to the highway (degrees)
7. Distance of the receptor from the edge of highway (shoulders)
8. Stability class (one of six, A through F)
9. Molecular weight of the pollutant

For corridor locations subject to parallel wind, other parameters are also required. These include the downwind distance along the highway from a point where the wind becomes initially parallel to the highway alignment, the width of the highway, and the average width of the top and bottom of the cut sections.

For highways possessing medians in excess of 30 feet, traffic in each direction is treated as a separate source and the concentrations at the receptor from each source are summed. Such a procedure was followed in this study and the results of the microscale analysis are presented in Table 38.

It should be noted that (1) concentrations decrease with increasing distance from the highway, and (2) concentrations are greater with the wind blowing parallel to rather than across the highway. The concentrations are expected to decrease with time because of the continued efforts of exhaust emission controls. The increase in traffic towards the year 2000 would result in slightly higher values, but these concentrations are by far less than the National Ambient Air Quality Standard of 35 ppm for carbon monoxide (maximum one-hour concentration).

The mesoscale analysis consisted of estimating the total traffic generated pollutant burden in the Study Area, before and after the construction of the proposed expressway. Both carbon monoxide and hydrocarbons were considered.

TABLE 38

MICROSCALE ANALYSIS

Year	Highway	Emission Factor Grams/mile	Wind Speed (mph)	Stability Class	Carbon Monoxide (ppm) Cross Wind Distance from Edge of Highway Shoulder (Feet) 0	100	200	400	Parallel Wind Distance from Edge of Highway Shoulder (Feet) 0	100	200	400
1973	Existing		4.6	E	2.30	1.11	0.95	0.83	14.49	5.78	1.30	0.02
	Route 60	44.98	2.0	F	5.29	2.88	2.55	2.25	45.57	13.51	1.56	0.01
1985	Existing		4.6	E	1.34	0.64	0.53	0.48	8.41	3.36	0.76	0.01
	Route 60	11.96	2.0	F	3.07	1.15	1.47	1.32	26.38	7.91	0.79	0.01
	Proposed		4.6	E	0.42	0.39	0.35	0.32	0.81	0.18	0.92	0.01
	Expressway	9.44	2.0	F	1.13	1.03	0.98	0.89	1.79	0.21	0.01	0.01
2000	Proposed		4.6	E	0.56	0.52	0.47	0.43	1.06	0.24	0.02	0.01
	Expressway	8.65	2.0	F	1.47	1.34	1.25	1.16	2.32	0.26	0.02	0.01

National Ambient Air Quality Standard for carbon monoxide is 35 ppm - maximum one-hour concentration. (For the expressway, concentrations listed are sums of contributions from the highway treated as two separate sources. Distance 0 feet refers to the edge of right-of-way. The expressway is assumed to be four-lane and right-of-way of 350 feet.)

Prepared by Michael Baker, Jr., Inc.

The Average Daily Traffic (ADT) multiplied by the total distance traversed yields the daily vehicle miles (DVM). The product of the DVM and emission factor yields the total pollutant emission. Exhaust emissions are indicated in units of tons per day (see Tables 40, 42 and 44 in the Impact section).

Hydrocarbons are generally estimated for the period from 6:00 a.m. to 9:00 a.m. A coefficient of 0:15 was assumed for calculating traffic counts during this period from the ADT figures.

Several assumptions were also made in obtaining the estimates of pollutant emissions. An average speed of 45 mph was assumed for the expressway and 35 mph for S.R. 60. The Study Area was divided into sections because of the varying ADT values. DVM values for each section were accumulated to obtain one value for the entire length of the highway.

Emission factors were calculated on the basis of assuming truck traffic as ten percent of the ADT and applying the procedures described in the "Compilation of Air Pollutant Emission Factors" published by the U.S. Environmental Protection Agency.

Human Environment

The various impacts on the human environment were analyzed using similar techniques. Historical and current data, particularly U.S. Bureau of the Census documents and Hillsborough County Planning Commission information, were extensively utilized. Public agencies were contacted by letter and/or telephone and personal interviews were conducted. Data collection and analysis were also supplemented by review of aerial photography, field investigations and verification.

corridor impacts

This section presents the results of the analyses determining the relative impacts of the selected corridors on the natural and human environments in the Study Area. The natural environmental issues are addressed separately for each of the three primary corridors, but the human environmental issues are discussed jointly, due to their somewhat complex interrelationships. A matrix at the end of the section illustrates the comparative environmental impacts of the primary corridors, as well as those of the major combinations of these corridors.

Central Corridor

Terrestrial Habitat and Wildlife

Within the Central Corridor a maximum of 180 acres of natural vegetation-wildlife habitat would be adversely affected. Of particular significance is the Mixed Hardwood Swamp vegetation adjacent to the Mangrove community along McKay Bay. This vegetation type provides food, cover, and breeding sites for several wildlife species and could also provide nesting and/or escape cover for birds feeding on nearby McKay Bay. Wildlife species would be displaced.

The Mangrove community affected along McKay Bay is extremely sensitive providing a high quality habitat for avifauna. Along with the actual loss of habitat acreage, secondary temporary negative impacts would occur as a result of the construction of the proposed bay crossing. These short-term impacts would include the disruption of fauna due to construction activity, siltation related to fill and/or piling installation and erosion, and subsequent siltation from roadway construction on the adjacent shoreline. Wildlife would be displaced. The impact on the food chain would be considerable, at least temporarily.

Near the eastern extremity of this corridor is a small area of Mixed Hardwoods that would also be affected. The dominating Oaks provide food, cover, and nesting habitat for several wildlife species. This particular area, however, is of moderate quality for wildlife habitat because of its small size and misuse by man. The wildlife displaced would be lost, being forced to move to similar vacant habitat not readily available nearby.

Water Quality and Biota

The Central Corridor would exert impacts on the water quality and biota of Ybor Channel and McKay Bay.

For purposes of this study a low level bridge crossing Ybor Channel was assumed for the Central Corridor. Activities related to bridge construction would result in the resuspension of channel sediments and a corresponding temporary decrease in water quality due to increased turbidity and the resuspension of nutrients and toxic substances (heavy metals and pesticides) now present in the sediments. This resuspension of sediments may also exert an oxygen demand upon the water resulting in a temporary reduction in the water's oxygen concentrations.

One long-term effect of an Ybor Channel bridge on the water quality would be some degree of restriction of the flow of water through the channel caused by bridge supports. Storm water runoff entering the channel from the bridge and adjacent highway could have minor effects upon chlorinity patterns, but the overall impact on water quality in the channel would be largely dependent upon the content and concentrations of the roadway pollutants (oil, grease, heavy metals) that are generally contained in roadway runoff (Sylvester and DeWalle, 1972).

The increased turbidity that could occur from construction activities on an Ybor Channel bridge would decrease the depth to which light would penetrate the water causing a decrease in phytoplankton activity.

Suspensions of sediments would also adversely affect benthic populations in the channel. As the particulate matter settles, it would bury and smother existing benthos. Such an impact, although temporarily significant, would cease after the completion of the construction activities. Fish in the channel could be suffocated by suspended sediments clogging the gills and opercular cavities. Such effects would be temporary and localized, and the degree of damage would be dependent upon the concentration composition of the suspended particles, as well as the tolerance levels of the fish species present to the suspended solids. Changes in water quality due to runoff would adversely affect, and perhaps eliminate, some sensitive species of invertebrates and fish in the channel.

The Central Corridor could also require a bridge spanning McKay Bay between the landfill near the incinerator and the area just south of the mouth of the Palm River. During construction of such a bridge, the placement of supports or pilings would produce the same adverse effects on water quality as those discussed for the Ybor Channel bridge. Adverse effects similar to those in Ybor Channel would also be experienced from storm water runoff following the span's completion.

Southeast of the mouth of the Palm River the proposed bridge facility would touch down in an area of mangroves and tidal wetlands. These areas, as discussed previously, are environmentally sensitive and vital to the ecology of the estuaries. This Central Corridor alignment would probably affect these tidal wetlands to a lesser degree than the other alternatives that might traverse this general area.

Disturbance of the landfill south of the incinerator during construction could produce other adverse effects on the water quality of McKay Bay. High levels of heavy metals and other toxic substances contained in the landfill could enter the bay if adequate precautions were not taken. Since heavy metal concentrations in the water and sediments of the bay are already alarmingly high, the potential introduction of additional heavy metals could have severe repercussions within the bay's ecosystem.

Short-term impacts during construction of a Central Corridor McKay Bay bridge upon biota would probably include decreased primary production due to the decreased light penetration caused by the resuspension of bay sediments. Settlement of suspended particles could disturb or temporarily destroy the bottom habitat of some organisms. The oxygen demand exerted by resuspended sediments could cause an oxygen deficit in the water which could affect species requiring relatively high oxygen levels.

The long-term effects of the Central Corridor on the biota of McKay Bay would be dependent upon the extent to which the Mangroves and tidal wetlands are affected. If large areas of wetlands are disturbed, changes in primary productivity, fish production, and ecological relationships throughout the Tampa Bay complex could result.

Noise

The results of the noise impact analysis for the Central Corridor are shown in Table 39 which divides the corridor into sections for evaluation.

The estimated total numbers of residential units within the 70 dBA contour line in the Central Corridor are 275 for 1985 and 339 for the design year 2000, more than in either the Northern or the Southern Corridor.

In comparing projected noise levels with existing noise levels for the year 2000, the increase at Site 1 near DeSoto Park Elementary School would be approximately 15 dBA which is considered a severe impact under FHWA standards (the locations of existing noise measurement sites

are shown on Exhibit 10). The increase in noise levels in the area north of Clair Mel City at 78th Street (Site 7) would be more than 20 dBA also considered a severe impact. Site 12, near the Brooker Elementary School, and Site 14, at the eastern end of the corridor, would have increases in noise levels of five to ten dBA, constituting a minor impact. At Site 12 the centerline of the proposed roadway would have to be kept 250 to 350 feet from the school to minimize any noise impact.

Analysis of the two bridge structures proposed for crossing Ybor Channel, (low level and high level), indicates that the high level crossing would be the quieter of the two on the surrounding environment.

NOTE: During the period of construction, short-term adverse impact would occur throughout any of the three corridors. The duration of such an impact is obviously dependent on the period of construction. Figure 4, entitled "Construction Equipment Noise Ranges" indicates noise levels for all three corridors that can be expected to be generated from various types of equipment during the construction phases at distances of 50 feet from the source. A general rule for sound propogation loss from point sources is 6 dBA for each doubling of distance. Therefore, a source producing 91 dBA at 50 feet would produce 85 dBA at 100 feet, 79 dBA at 200 feet, 73 dBA at 400 feet and 67 dBA at 800 feet.

TABLE 39

PROJECTED NOISE ANALYSIS AND IMPACTS FOR THE CENTRAL CORRIDOR

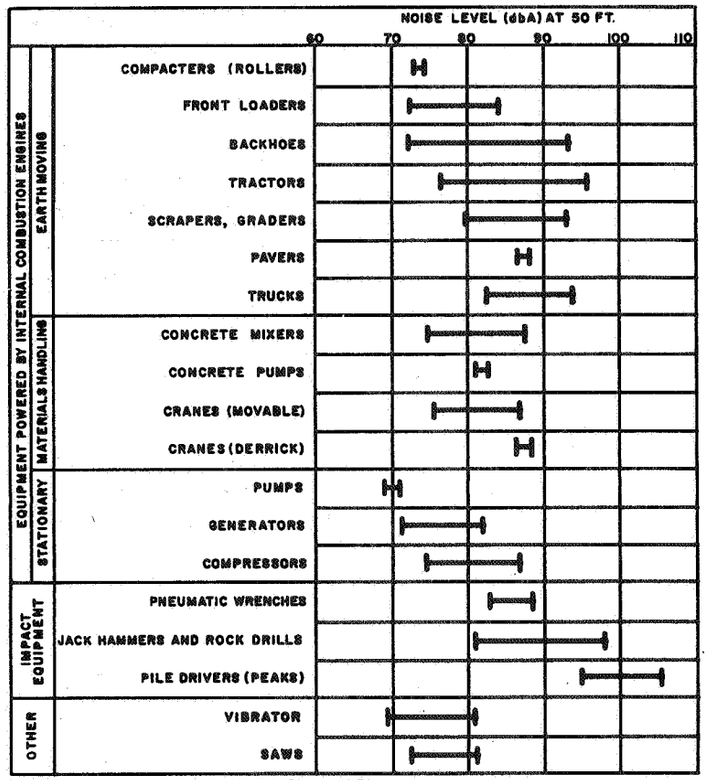
Section	Distance From CL to 70 dBA Contour (feet)		Approximate Number of Residential Units Within 70 dBA Contour[1]	
	1985	2000	1985	2000
W. Terminus to 22nd St. 40 ft. elevation	144	194	0	0
W. Terminus to 22nd St. 22 ft. elevation	187	200	0	0
22nd St. to 39th St.	413	507	123	156
39th St. to U.S. 41	375	502	4	12
U.S. 41 to 78th St.	326	400	32	44
78th St. to U.S. 301	304	375	92	99
U.S. 301 to I-75	226	298	1	1
I-75 to Kings Ave.	200	275	2	3
Kings Ave. to Bell Shoals Road	148	196	7	8
Bell Shoals Rd. to S.R. 60	110	141	14	16

[1] Residential units taken from base map and aerial photographs.

Source: Michael Baker, Jr., Inc.

FIGURE-4

CONSTRUCTION EQUIPMENT NOISE RANGES



Note: BASED ON LIMITED AVAILABLE DATA SAMPLES

Source: BOLT, BERANEK AND NEWMAN, NOISE FROM CONSTRUCTION EQUIPMENT & OPERATIONS, BUILDING EQUIPMENT & HOME APPLIANCES, U.S. ENVIRONMENTAL PROTECTION AGENCY, NTID 300.1, 1971.

Air Quality

In determining the impact that the Central Corridor would create in terms of air quality a number of variables, all capable of modifying generated pollutant concentrations, were evaluated and combined with the results of the mesoscale analysis.

Both the length of the Central Corridor and its overall directional trend should be analyzed. The length of a corridor is an important factor in the calculation of total vehicular emission loading in either pounds or tons per day. The longer the Corridor length, the greater is the potential atmospheric loading by vehicular traffic. In the case of the Central Corridor, which is intermediate in length among the three routes, the potential for loading will exist at a lower level than the Southern Corridor, but at a higher level than the Northern Corridor.

The directional orientation of the Central Corridor becomes important when pollution dissipation rates are evaluated. A corridor that is oriented parallel to a prevailing wind, (easterly in this area) will cause airborne pollutants to accumulate in areas downwind along the highway alignment. Where a corridor is oriented perpendicular to the prevailing winds, emissions have no opportunity to concentrate since the pollutants are dissipated over a small cross-sectional area. The Central Corridor is generally oriented parallel to the prevailing winds, except in its western and eastern extremities. The portion of the corridor traversing the Palm River Road - Clair Mel City area will contribute most to vehicular emission accumulations due to its east - west direction being parallel with the prevailing winds. The airborne pollutants generated by traffic along this segment of the corridor would accumulate and the easterly winds would concentrate them near McKay Bay.

In addition to the physical condition of the Central Corridor, the topography along the route possesses the potential to influence pollutant

concentrations, particularly in the morning coincident with rush hour traffic. Low areas or depressions along any of the corridors would have a tendency to contribute to the formation of localized inversion conditions. An area lying appreciably lower than the surrounding terrain will tend to remain under the influence of a typical, shallow surface morning inversion for a prolonged period of time, permitting airborne pollutants to concentrate below the inversion ceiling. Along the Central Corridor, areas that might be inversion-prone include the low area around Delaney Creek, the portion of the route passing near Hickory Hammock Lake, and the intermittent low profile valleys that occur from Brandon eastward.

Another variable, land use, is similar in effect to topography in that its use configuration has the capability of increasing the average, or mean, pollution levels that would be created by Central Corridor traffic. In the vicinity of existing industrial and high density residential areas, a pattern of ambient air quality exists that is radically different from the conditions found in agricultural or low density residentially developed areas. Because pollutant concentrations occur on an elevated level near built up areas, any portion of a corridor that passes through such a use pattern will serve only to aggrevate existing air quality conditions. Along the Central Corridor, areas of elevated pollution levels exist in downtown Tampa, the Clair Mel City area, and suburban Brandon.

An integral part of evaluating the impact of the Central Corridor must concern the vehicular pollutant levels that will be generated by the volume of daily traffic utilizing the route. Impact determination through mesoscale analysis will enable the Central Corridor as well as the other two proposed corridors, to be evaluated in a manner designed primarily to quantitatively define the total atmospheric loading produced by the various vehicular pollutants. For purposes of this study, both carbon monoxide and hydrocarbons are defined in grams per mile and tons per day for S.R. 60 in 1973 and 1985, and for each of the three corridors in 1985 and 2000. Table 40 presents the results of the mesoscale analysis of the Central Corridor.

Examination of the tabular data presented in the mesoscale analysis of the Central Corridor reveals that even though traffic conditions on the corridor in the year 2000 will be three times greater than those presently experienced on S.R. 60, the amount of pollutants produced will be less. This is due to the improved vehicular emission control devices that are and will continue to be installed in the new vehicles. The same pattern of lower vehicular emission levels in future years will hold true for the other two corridors as well.

NOTE: The overall problems pertaining to Light Pollution and Aesthetics and Landscaping, as well as general ameliorative measures dealing with these problems have been addressed in the Engineering Report and in the Summary of Existing Conditions section of this assessment. Since these issues are largely dependent upon the ultimate design of the facility, regardless of the corridor chosen, no further analyses of their effects are deemed necessary at this time.

Human Environment

The primary Central Corridor is the least circuitous of the alternatives under consideration. Its location affords the most direct access to the greatest number of people within the Study Area, but is also potentially disruptive to existing and developing communities and land use patterns.

In the area surrounding Tampa's Central Business District a significant number of light industries and warehouses would be displaced. This would also be true in the vicinity of Ybor Channel, and a bridge crossing of the channel would result in a distinct negative impact on the port related concerns located around the northern portion of that estuary, thus reducing the importance of this area as an employment center. In addition, the inability of this corridor to provide an interchange in the eastern portion of Tampa's CBD would lessen the accessibility of this area, possibly harming future planning efforts.

TABLE 40

MESOSCALE ANALYSIS
CENTRAL CORRIDOR

			Carbon Monoxide		Hydrocarbons		
Year	Highways	DVM	Stability Class E-F (gm/mile)	(tons/day)	Stability Class E-F (gm/mile)	(tons/day)	(lbs/day)
1973	S.R. 60	274,340	39.06	11.79	4.51	0.206	412
1985	S.R. 60	403,018	10.35	5.044	1.277	0.093	186
Proposed X-Way Central Corr.		479,290	8.64	4.599	1.057	0.083	166
2000							
Proposed X-Way Central Corr.		698,817	7.87	6.05	0.946	0.190	380

Prepared by Michael Baker, Jr., Inc.

This corridor would necessitate the removal of a few homes in the northeast section of the DeSoto Park neighborhood, and its proximity to the DeSoto Park Elementary School could adversely affect that facility.

Perhaps the most negative potential human environmental impacts of the Central Corridor are due to its location through the Palm River Road - Clair Mel City and Brandon areas.

The Palm River Road area and the northern portion of Clair Mel City would be split by the corridor and it is estimated that well over 100 residences could be taken. Despite the availability of relocation assistance, suitable replacement housing is not as plentiful here as in some other portions of the Study Area. For some of those forced to relocate, this lack of replacement housing in the immediate vicinity could create difficulties, especially in terms of potential increases in travel time to their place of employment.

Pronounced problems could be created by the corridor's proximity to Clair Mel Elementary School, Dowdell Junior High School, and the Winston Recreation Area, requiring complicated and costly precautions designed to restrict noise and air pollution levels and maintain safety. In addition, the proposed 78th Street interchange would increase congestion in this area and also increase the possibility of commercial intrusion into the adjacent residential enclaves. This is a relatively stable and cohesive lower middle class community oriented to both Tampa and Brandon for sources of employment, shopping, and services. This corridor affords direct access for residents of this area to Tampa and Brandon, but the land use pattern, several vital community facilities and the overall cohesion, character, and the identity of the area could be adversely affected.

The community of Brandon would be affected in a similar manner by the Central Corridor. This corridor would provide the best access to the Brandon population, since extensive residential development exists both to the north and to the south of its alignment. However, it might tend to split the community and help create a distinct artificial barrier. Though the area through which it is proposed to pass is not totally developed, existing undeveloped open spaces are rapidly being filled by new residences and light commercial uses. The established residential character and local traffic patterns could be disrupted, and the potential for commercial development in the areas near the proposed Kings Avenue and Bell Shoals Road interchanges could result in encroachment upon residential districts and be somewhat detrimental to Brandon's existing commercial district along S.R. 60.

The actual number of displacements in this area would, of course, depend on the actual alignment of the facility but could, nevertheless, be significant. Those displaced would be primarily middle and upper middle income families who chose Brandon because it offered them a lifestyle difficult to find elsewhere in the County. Acquisition costs would tend to be high.

Although Brandon is a relatively young community, it is rapidly developing its own identity. The community pride exhibited by its residents and a level of concern for its orderly development reveal a very definite overall cohesion which could be adversely affected by an expressway corridor interrupting that development pattern.

Comparatively, the Central Corridor does have some advantages in the Brandon area. Its location would adversely affect fewer schools and other community facilities in that area than would the locations of its Northern and Southern counterparts. In addition, even though this corridor could displace the greatest amount of residences (over 400) throughout its overall length, replacement housing is more readily available in Brandon than in other portions of the Study Area. Much of the available replacement housing is not of comparable quality as those residences requiring acquisition.

Northern Corridor

Terrestrial Habitat and Wildlife

Of the three corridors studied, the Northern Corridor adversely affects the largest amount of native vegetation wildlife habitat. Approximately 405 acres of Mixed Hardwood Swamp vegetation would be affected, along with 137 acres of Mangroves, 105 acres of Cypress Heads, and 21 acres of Mixed Hardwoods.

The Mixed Hardwood Swamp vegetation found along the Palm River and near the lakes in the northeastern portion of the Study Area are of a higher quality than similar areas found within the Central and Southern Corridors. The mature, diverse, and undisturbed nature of this vegetation provides a somewhat higher quality of wildlife habitat, and its loss would most likely result in a corresponding loss of its wildlife due to the lack of habitat similar in quantity and quality in the immediate vicinity.

The segment of the Northern Corridor crossing McKay Bay would significantly affect both vegetation and avifauna. Construction would result in the loss of a substantial portion of the bay's Mangrove community, which provides the basis of organic material for a complex detritus food web and is used directly by fauna for food, nesting, and cover. Virtually all wildlife utilizing McKay Bay, including rare and endangered species, would be negatively affected.

The small areas of Cypress Head and Mixed Hardwood vegetation types within this corridor are not of exceptional quality. The wildlife displaced from these areas would be minimal and include no rare or endangered species.

Water Quality and Biota

The Northern Corridor would potentially affect Ybor Channel, northern McKay Bay, the Palm River, Tenmile Lake and Mead Lake. The impacts on Ybor Channel would be essentially the same as discussed for the Central Corridor, if, in fact, the ultimately selected alignment within the Northern Corridor encroaches on the channel at all.

Any Northern Corridor encroachment along the northern edge of McKay Bay requiring extensive filling operations in the bay and destroying mangroves along the shoreline would adversely affect the bay's water quality by causing severe siltation in an already shallow area. Suspension of particulate matter would increase the already high turbidity of the bay water. Destruction of the shoreline vegetation could also very adversely affect water quality.

Since it is presently believed that McKay Bay may serve as a sink for heavy metals, any disturbance of bay sediments could re-introduce high levels of these heavy metals into the water. Highway runoff could also contribute to this buildup of heavy metals.

The filling operations and destruction of Mangroves would have severe and far reaching effects on the biota of the immediate area, and, perhaps, areas far removed from the bay. One reason is the vital role played by Mangroves, whose fallen leaves serve as a base for the estuarine food chain of the bay. Destruction of this base would adversely affect all facets of the ecosystem from primary production through man's harvesting of fish and shellfish in the Tampa Bay complex and Gulf fisheries. In addition, the previously mentioned siltation that would result from highway construction in the vicinity of McKay Bay could destroy the spawning grounds of many species of fish which would in turn adversely affect future fish populations in a widespread area.

Endangered species such as the Brown Pelican and the Bald Eagle, as well as many other species of birds, feed in McKay Bay. Disturbance of bay sediments containing toxic heavy metals could be extremely harmful to these birds.

Although the Northern Corridor parallels the Palm River for approximately 2.5 miles, the impacts on its water quality would be largely determined by the proximity of the actual alignment to the river and by the effectiveness of measures employed to prevent damage. Possible impacts on water quality during construction include siltation due to storm water runoff and corresponding increases in turbidity and nutrient levels from soil particulates present in that runoff. Long term effects of runoff containing petroleum products and heavy metals would be dependent upon the content and concentration of these substances as well as the highway's proximity to the river.

The impacts of this corridor upon the biota of the Palm River are largely dependent on changes in water quality. Impacts during construction could include temporary disturbances of river bottom habitat due to siltation, decreases in primary productivity due to increased turbidity, and the temporary movement of fish and other mobile organisms out of the vicinity. A long term impact might involve a reduction in the number of species inhabiting the river, but the industrial and municipal discharges presently being received by the river make it unlikely that any pollution-sensitive species would be expected to be found.

The potential impacts of the Northern Corridor on the water quality and biota of Tenmile Lake and Mead Lake would range from virtually none to the complete filling in of the lakes, depending upon the exact alignment. Any alignment necessitating the filling of either or both of these lakes would obviously cause severe impacts. Mead Lake is especially sensitive, since it is reported to contain a threatened species, the American alligator. River otters are also reported to inhabit the lake at times. Disturbance of these lakes could destroy the habitat of the species inhabiting them.

Noise

The Northern Corridor would have 185 residential units subject to noise impact (70 dBA contour line) in 1985 and an estimated 247 units by the year 2000.

The projected noise analysis and impacts pertaining to the Northern Corridor are contained in Table 41.

TABLE 41

PROJECTED NOISE ANALYSIS AND IMPACTS FOR THE NORTHERN CORRIDOR

Section	Distance From ℄ to 70 dBA Contour (feet)		Approximate Number of Residential Units Within 70 dBA Contour[1]	
	1985	2000	1985	2000
W. Terminus to Kennedy Boulevard	250	258	0	0
Kennedy Blvd. to 22nd St. 40 ft. elevation	144	197	0	0
Kennedy Blvd. to 22nd St. 22 ft. elevation	187	203	0	0
22nd St. to 39th St.	382	515	116	168
39th St. to U.S. 41	382	518	9	12
U.S. 41 to 78th St.	339	433	2	4
78th Street to Palm River Road	304	382	4	5
Palm River Rd. to U.S. 301	316	389	6	8
U.S. 301 to I-75	241	322	1	1
I-75 to S.R. 60	233	310	10	12
S.R. 60 to Moore Rd.	200	275	27	27
Moore Rd. to Valrico Rd.	100	134	10	10

[1] *Residential units taken from base map and aerial photographs.*

Source: Michael Baker, Jr., Inc.

Projected noise levels for the year 2000 show an increase of five to ten dBA over existing noise levels at Site 1, near Union Station in Tampa. This is considered a minor impact by FHWA standards. Sites 3 (S.R. 60 near 39th St.) and 13 (S.R. 60 east of Brandon) would exhibit only minor increases in noise levels by the year 2000. Likewise, Site 9, near Tenmile Lake would have little or no impact due to increased noise levels because of the high existing traffic volumes on S.R. 60. Noise levels around the new Brandon High School would increase 15 to 20 dBA over existing levels by the year 2000, constituting a severe impact situation. The centerline of the roadway in this area should be kept a minimum of 300 to 400 feet from the school if this impact is to be neutralized.

Air Quality

The length of the Northern Corridor is the shortest of the three primary routes. This means that there is a lower potential for atmospheric loading by vehicular pollutants since there is less corridor distance available for emissions to be generated.

The directional orientation of the Northern Corridor is much the same as the other two corridors with some minor variations. Overall, the course of the corridor deviates more from a true east-west direction than the Central Corridor, decreasing the chances of airborne pollutant accumulations due to the greater cross sectional area of expressway exposed to the prevailing wind. The prime area for an air quality problem to develop is at the northern end of McKay Bay, where the expressway route extends directly eastward for nearly two miles.

A topographic analysis of the Northern Corridor reveals several possible low areas that might be prone to inversion formation and

stabilization. The first of these, which is minor, exists at Delaney Creek where the topographic relief drops nearly ten feet into the creek bed. Further eastward, near Limona, approximately a mile of the proposed corridor is generally lower than the surrounding terrain. This low area is centered at the southern shore of Mead Lake, where the drop in elevation reaches 20 feet. East of Brandon, at the terminus of the corridor, another depressed area occurs. In this case the elevation drops more than 30 feet in a very short distance. A shallow surface, morning inversion in this location would very likely persist for a significantly longer period of time than one at the crests of the surrounding hills.

The land use pattern associated with the Northern Corridor is more urbanized than either of the two more southerly routes. Only a short segment of the corridor between metropolitan Tampa and Brandon is sparcely settled. The high degree of human interaction in the vicinity of the corridor, in combination with the corridor-generated emissions, will cause the total air quality level to become significantly reduced.

Table 42 graphically presents the mesoscale analysis of the Northern Corridor.

This analysis illustrates the fact that the pollution levels associated with the route will be greater than those of the Central Corridor. The driven vehicular miles (DVM) are greater in the Northern Corridor than the Central Corridor even though the distance of the route is one mile less. This discrepancy is due to the fact that the more urbanized land use pattern of the Northern Corridor will contribute to a larger volume of traffic utilizing the expressway route.

Human Environment

The potential positive and negative impacts of the primary Northern Corridor on the human environment are somewhat less definable than those of the Central or Southern Corridors because its location necessitates the consideration of a greater number of interdependent variables.

By allowing access to Tampa's CBD via a proposed interchange at Kennedy Boulevard and by not requiring a bridge crossing of Ybor Channel, the western portion of this corridor would best serve Tampa's primary industrial and commercial area.

The Northern Corridor interchange at 39th Street would provide a more direct link with Interstate 4 and the industrial area around Ybor City than would be possible with the other corridors. Also, this corridor would best serve the expanding industrial commercial strip along S.R. 60 east of Tampa.

Just west of Brandon an interchange is proposed at the corridor's crossing of S.R. 60. This interchange would result in the closing of Providence Road in that vicinity, thus reorienting local traffic patterns. In addition, some principal commercial structures and residences would be displaced. However, this interchange, as well as the interchange at Parsons Avenue, would improve access to Brandon's central area, reinforcing its role as the community's commercial focal point.

The corridor parallels the alignment of the Seaboard Coast Line Railroad right-of-way through the northern portion of Brandon. Normally, traversing an existing transportation corridor and barrier would be considered advantageous. However, numerous problems, including the narrow width of the right-of-way, objections from the railroad, difficulties in interchange design, residential displacement and disruption, and severe potential negative impacts on three major educational facilities (Brandon High School, McClane Junior High School, and Yates Elementary School) outweigh the advantages in this instance.

TABLE 42

MESOSCALE ANALYSIS
NORTHERN CORRIDOR

			Carbon Monoxide		Hydrocarbons		
Year	Highways	DVM	Stability Class E-F (gm/mile)	(tons/day)	Stability Class E-F (gm/mile)	(tons/day)	(lbs/day)
1973	S.R. 60	274,340	39.06	11.79	4.51	0.206	408
1985	S.R. 60	403,018	10.35	5.044	1.277	0.093	186
Proposed X-Way Northern Corr.		502,477	8.64	4.778	1.057	0.087	174
2000							
Proposed X-Way Northern Corr.		741,405	7.87	6.42	0.946	0.115	230

Prepared by Michael Baker, Jr., Inc.

As previously mentioned, several structures of architectural or historical interest in both the Tampa and Brandon areas lie within the boundaries of this corridor and could be threatened.

This corridor would also adversely affect existing transportation patterns in Brandon. Since much of this community's population lives south of S.R. 60, the location of this corridor would result in significantly increased traffic pressure on Brandon's already inadequate north-south arterials.

Overall, the Northern Corridor would displace fewer residences than the Central Corridor and would provide the greatest access to existing and planned industrial and commercial developments in and around the Study Area. Potential commercial displacements, however, would be the highest of the three primary corridors, especially in the Brandon area. Although it would be less disruptive to community and neighborhood character than the Central Corridor, it would create substantial disruption to land use patterns, transportation patterns, and community facilities in northern Brandon.

Southern Corridor

Terrestrial Habitat and Wildlife

More than 306 acres of natural vegetation-wildlife habitat would be negatively affected within the Southern Corridor. Much of the natural vegetation lost would be of the Mixed Hardwood Swamp type and is primarily located in the McKay Bay area where the Southern and Central Corridors share the same alignment. The remaining Mixed Hardwood Swamp vegetation within the Southern Corridor parallels Delaney Creek just east of U.S. Route 41 and is of moderate wildlife value due largely to the predominance of adjacent development and associated land alterations.

The Mangrove community and Mixed Hardwood communities, as well as their respective wildlife, negatively affected by the Southern Corridor would be the same area discussed in the Central Corridor section.

Approximately 42 acres of relatively undisturbed Pine Flatwood vegetation located in the southwestern portion of the Study Area would be adversely affected. This forest community, habitat for many wildlife species, was the original dominant natural vegetation within the Study Area, but most of it has been converted to residential or commercial developments and pasturelands. The wildlife displaced from the Pine Flatwoods habitat would be lost, move to similar habitat provided by the adjacent unimproved paturelands.

Water Quality and Biota

The Southern Corridor would affect Ybor Channel, central McKay Bay and Delaney Creek. Since the Southern Corridor is joined with the Central Corridor through the western portion of the Study Area, the impacts on those bodies of water would be the same as those discussed in the Central Corridor impact section.

Delaney Creek would be crossed by the Southern Corridor in the vicinity of 36th Avenue and U.S. Route 41. Conditions created by bridging Delaney Creek would have minimal impact on the water quality of the stream. This would occur in the form of temporary increases in turbidity and localized siltation during the construction stage. Long term impacts would be restricted to the effects of storm water runoff from the bridge which would involve the possible addition of petroleum products and heavy metals to the stream. The overall impact on water quality would be dependent on the content and concentrations of these substances in the runoff.

Biological impacts resulting from bridging Delaney Creek should

not be severe and might include a possible short-term decline in benthic organisms due to the effects of siltation on the stream bottom habitat, movement of fish out of the area during construction, and a slight decrease in plant productivity due to decreased light penetration in the water. This decline, however, should not be great since Delaney Creek is normally quite turbid. No long-term impacts on the biota of the creek are anticipated.

Noise

The Southern Corridor would have approximately 203 residential units subject to noise impact (70 dBA contour line) in 1985 and a projected 285 units by the year 2000. A breakdown of these figures with reference to the total corridor is reflected in Table 43:

Site 5, southwest of Clair Mel City near U.S. Route 41, would have a projected year 2000 noise level increase of 15 to 20 dBA over existing levels, creating a severe impact according to FHWA standards. Levels would not increase significantly at Site 11, but it should be noted that the centerline of the roadway should be kept at least 350 feet north of the Kingswood Elementary School to minimize roadway noise impact.

Air Quality

At 17 miles, the length of the Southern Corridor is the longest of the three possible routes. Because of its extended length there will exist a greater potential for atmospheric loading by vehicular pollutants since more distance is available for the generation of emissions.

TABLE 43

PROJECTED NOISE ANALYSIS AND IMPACTS FOR THE SOUTHERN CORRIDOR

	Distance From ℄ to 70 dBA Contour (feet)		Approximate Number of Residential Units Within 70 dBA Contour[1]	
	1985	2000	1985	2000
Start to 22nd St. 40 ft. elevation	140	189	0	0
Start to 22nd St. 20 ft. elevation	181	198	0	0
22nd St. to 39th St.	364	484	108	154
U.S. 41 to 78th St.	287	364	53	75
78th St. to U.S. 301	256	335	17	18
U.S. 301 to I-75	182	256	0	7
I-75 to Kings Avenue	161	219	1	2
Kings Avenue to Bell Shoals Road	134	168	4	7
Bell Shoals Road to S.R. 60	120	134	12	13

[1] *Residential units taken from base map and aerial photographs.*

Source: Michael Baker, Jr., Inc.

TABLE 44

MESOSCALE ANALYSIS
SOUTHERN CORRIDOR

			Carbon Monoxide		Hydrocarbons		
Year	Highways	DVM	Stability Class E-F (gm/mile)	(tons/day)	Stability Class E-F gm/mile)	(tons/day)	(lbs/day)
1973	S.R. 60	274,340	39.06	11.79	4.50	0.206	408
1985	S.R. 60	18	10.35	5.044	1.277	0.093	186
Proposed X-Way Southern Corr.		469,553	8.64	4.267	1.057	0.077	154
2000 Proposed X-Way Southern Corr.		469,506	7.87	5.75	0.946	0.103	206

Prepared by Michael Baker, Jr., Inc.

Generally, the directional orientation of this corridor, as with the other two routes, is east-west. At either extremity of the corridor the orientation of the route varies significantly from the direction of the prevailing wind. The major problem area for the corridor in terms of wind-blown pollutant accumulations will occur near U.S. Route 41, slightly south of the 22nd Street Causeway. The corridor extends foru miles due eastward from the zone of accumulation, a sufficient distance to allow high concentrations of vehicular pollutants to develop.

Topographically, the Southern Corridor presents the most uniform rise in elevation from west to east with only a few deviations. The only low area along the route occurs southeast of Brandon in an intermittent valley-hill arrangement. A shallow valley that is approximately 20 feet lower than the surrounding hills will be prone to evening air drainage and morning inversion formation.

The land use pattern associated with the Southern Corridor is the most rural of the three routes. Segments of the corridor in metropolitan Tampa, which are primarily industrial, commercial, and moderate-to-high density residential, and in the area south of Brandon, which is low-to-moderate density residential, are background pollutant sources. However, a large segment of the corridor passes through a low density, rural landscape, allowing the route itself to function as the only contributor to the atmospheric pollutant mix in the local area.

The mesoscale analysis of air quality pertaining to this corridor is presented in Table 44.

A comparison of the Southern Corridor mesoscale analysis with the analyses of the other two routes demonstrates that, even though the Southern Corridor is significantly longer than the other two, its DVM is the lowest of the three, primarily because of the low projected traffic volumes for this route.

Human Environment

For purposes of this study the primary Southern Corridor is an independent entity only between U.S. Route 41 and Durant Road, traversing the alignment of the primary Central Corridor in the western and extreme eastern portions of the Study Area. Since the Central Corridor has previously been examined, this discussion will focus on the aforementioned independent portion.

Of the three primary corridors and the independent portion of the Southern Corridor is the farthest removed from most of the Study Area's population centers. It would serve the fewest people, provide the poorest access to major employment areas, and allow the least amount of relief to the existing congestion on S.R. 60. This overall apparent locational liability, however, serves as an asset when other human environmental parameters are considered.

Relative to the Central Corridor alignment the Southern Corridor more closely approximates the apparent transition delineated in the Hillsborough County Planning Commission's 1990 Plan of Development, between the urban residential areas of Brandon and the lower density development of the Bloomingdale Road area. The Southern Corridor, combined with appropriate land use and development controls, could provide an important tool in directing and molding the future development pattern deemed most desirable in the Plan for that portion of the County.

The corridor avoids any disruption of the Palm River Road - Clair Mel City area and, based on existing development, would create less disruption in the Brandon area than either the Central or Northern Corridor.

Through the Bloomingdale area the corridor would avoid the ecologically sensitive Alafia River basin and adequately serve the needs of that developing community and, to a lesser extent, Brandon to the north.

It is noted that some existing and planned development would be disrupted, but this disruption would be less than that caused by the other corridors in terms of displacements, and preservation of overall community character.

Potential disadvantages, beyond the obvious lower level of service, would include the corridor's proximity to Kingswood Elementary School and the planned recreation area adjacent to this facility, as well as possible commercial intrusion into the low density residential areas near the proposed Kings Avenue and Bell Shoals Road interchanges.

Overall, the primary Southern Corridor exhibits two distinct characteristics from the human environmental point of view. Of the three corridors, it affords the lowest level of service but creates the least amount of disruption.

Connectors

Northern-Central Connector

The Northern-Central connector is located just east of McKay Bay. It is less than a mile in length but serves to greatly increase the number of possible corridor combinations. The land traversed by this connector varies from fill areas to tidal wetlands and low density agricultural/residential land. Disruption to terrestrial habitat and wildlife would center around the potential destruction of mangroves near Palm River which serve as habitat for various forms of avifauna. The impacts due to air and noise pollution would be similar to those of the primary Central Corridor through this area. The only significant effects on the human environment would be the possible displacement of a few residences south of Palm River.

One of the most notable negative impacts of this connector would center around the disruption of water quality and biota caused by the necessity of a bridge crossing of the Palm River. This disruption would also extend to nearby McKay Bay.

Impacts during bridge construction would include extensive siltation, severe turbidity problems, and possible problems related to dredge and fill operations. The water quality in mangrove bordered estauries is, in part, dependent upon the shoreline vegetation, and any activities that disturb or destroy the mangroves and other tidal vegetation would ultimately have adverse and possibly far-reaching impacts upon the water quality of adjacent water bodies.

The mangroves, juncus marshes, and other tidal wetlands present throughout this area play a vital role in estuarine ecology and estuarine productivity. Destruction of these areas would destroy the base of the estuarine food chain, affecting all facets of the ecosystem, from primary production, through fish and shellfish populations, with man's harvests from the Tampa Bay complex and Gulf fisheries also being affected.

Construction of a highway and bridge through these tidal wetlands would cause irreparable damage to an area that is environmentally sensitive and vital to the ecology of both terrestrial, marine, and estuarine ecosystems.

Southern-Northern Connector

This connector separates from the Southern Corridor alignment just east of the proposed I-75E and joins the Northern Corridor traversing the Brandon area. It is less than one mile in length, but, like the Northern-Central connector, allows a greater flexibility in possible corridor combinations.

The land area through which this connector passes is almost exclusively improved pastureland with widely-scattered remnants of Pine

Flatwoods. Impact on wildlife habitat would be negligible. The short length of the connector and open character of the land would render air and noise impacts minimal as well. No bodies of water would be crossed, and no inhabited areas would be disrupted.

Causeway Boulevard Alternate

Terrestrial Habitat

The Causeway Boulevard alternate to the primary Central Corridor between U.S. Route 41 and I-75E traverses several areas of natural vegetation - wildlife habitat that would be adversely affected.

Most of these areas are Slash Pine and Saw Palmetto Flatwoods, composed primarily of the aforementioned dominant species, as well as varied species of oak, grasses herbaceous plants, and Southern Bayberry. Small mammals, reptiles, and numerous species of bird life characteristically inhabit this type of vegetative community. Destruction of these habitat conditions, although of moderate quality due to their relatively small size, would force displaced wildlife to seek similar habitat which is not readily available nearby.

These affected Flatwoods areas are scattered throughout the western portion of the alternate corridor to the north of Causeway Boulevard and to the west of Maydell Drive. In the eastern portion somewhat larger areas exist to the east of 86th Street and to the east of U.S. Route 301.

In addition, the eastern portion of this alternate contains several Intermittent Cypress Wetlands (between U.S. Route 301 and I-75E) and Intermittent Marshy Pond areas (near the proposed interchange with I-75E). Potential adverse affects could result from: (1) the fact that wet areas are much more biologically productive than the above-mentioned drier areas, and (2) construction is more difficult in these areas due to filling and drainage problems.

Overall, the alternate under consideration is somewhat more disruptive to natural vegetation - wildlife habitat than the primary Central Corridor because the route traverses a greater amount of natural acreage.

Water Quality and Biota

This alternate necessitates two crossings of Delaney Creek, with the resultant impacts being quite similar to those noted for the Southern Corridor crossing of this body of water. One branch of the creek would be crossed in the vicinity of Maydell Drive and the other branch would be crossed east of 78th Street. Minimal water quality impacts would result from these crossings. Short-term effects would include temporary increases in turbidity and localized siltation during construction. Long range impacts would be restricted to the effects of storm water runoff from the bridge structures. The overall effects on water quality would depend largely on the content and concentrations of organic petroleum derivatives and heavy metals in the runoff.

Bridging Delaney Creek should not cause severe biological impacts. Construction would produce siltation which could lead to a short-term decline in benthic organisms, result in a temporary movement of fish out of the area, and decrease aquatic plant productivity due to decreased light penetration in the water. No long term effects on biota are expected.

It should also be noted that the area surrounding Delaney Creek is flood-prone and any potential highway design must take this into consideration.

Noise

Noise analysis and impacts are directly related to traffic projections. For purposes of this alternate study, it is assumed that future traffic levels on this portion of the proposed expressway will be similar to those computed for the primary Central Corridor, although truck volumes should be slightly lower due to the alternate's more southerly location.

Exhibit 10 of this assessment depicts a number of sites where measurements of existing noise levels have been recorded. Site 5 (southwest of Clair Mel City near U.S. Route 41) was analyzed for the Southern Corridor configuration and was found to have a projected year 2000 noise level increase of 15 to 20 dBA over the existing 50 dBA level, which constitutes a severe impact according to FHWA standards. This site also lies within the boundary of this alternate, and it is anticipated that the projected noise level would be even higher within this configuration, because higher levels of traffic are expected for the Central Corridor than for the Southern Corridor.

Since the assumed traffic levels for the alternate are the same as for the primary Central Corridor, and since the area traversed is similar, it is expected that, overall, the noise levels generated by the alternate would be similar to those generated by the primary Central Corridor. Residential areas and religious institutions would be affected in both instances, but the primary Central Corridor has the added disadvantage of potentially aggrevating noise levels in the vicinity of the educational facilities located in the northern portion of Clair Mel City.

Air Quality

For purposes of air quality analysis this alternate possesses many characteristics similar to those of the corresponding segment of the primary Central Corridor. Both the lengths (important in calculating total vehicular emission loading) and the directional trends (necessary in evaluating pollution dissipation rates) are essentially the same. The alternate, however, passes through a slightly lower percentage of high intensity land use than does the primary Central Corridor.

The similarities between this alternative and the primary Central Corridor, combined with the assumption that traffic volumes will be essentially the same, result in an extremely close correlation between the two relative impacts. However, again, the alternate must be considered somewhat more desirable because its location obviates the potential air quality problems created by the proximity of the primary corridor to the Clair Mel City schools.

Human Environment

One of the primary reasons for examining this alternate is the potential disruptive effect of the primary Central Corridor on human environmental conditions in the Clair Mel City area.

Of specific importance is the estimation that the four mile segment of the primary Central Corridor through this area would potentially displace approximately 200 residences. This is an especially critical point when combined with the relocation problems anticipated due to the lack of similar replacement housing in the area.

The alternate under consideration would potentially displace somewhat fewer residences, approximately 150, but this is not as substantial an improvement as was originally anticipated, due to recent development.

Other human environmental problems, however, would be greatly reduced by this alternate, particularly the potential disruption of educational and recreational facilities. The primary Central Corridor, by its proximity to Clair Mel Elementary School, Dowdell Junior High School,

and the Winston Recreation Area, would pose potential problems related to noise and air pollution and safety. By extending to the south of the Clair Mel City area, the alternate would minimize these problems. This constitutes the most significant human environmental advantage of the alternate over the primary Central Corridor location.

SUMMARY OF FINDINGS

Although the detailed Corridor Impact section centered around the three primary corridors under consideration, many combinations of the various segments of these corridors are possible, each possessing a different combination of potential environmental effects.

Through the use of a matrix (Figure 5), the relative environmental effects of 20 major corridor combinations are summarized. The matrix delineates the various segments comprising the possible corridors and numerically rates the respective effects of each, utilizing 13 natural and human environmental categories. The ratings of the various categories are not totalled for the respective corridors because each category possesses a different weight value. The intent is to compare each corridor on a category-by-category basis. The ratings are, necessarily, subjective to some degree due to the nature of much of the subject matter and represent the results of the preliminary evaluation required for this assessment. Exhibit 15 is a key map depicting the various corridor segments referred to in the matrix.

The findings of this Preliminary Environmental Assessment represent only some of the factors to be considered in a Corridor Location Study. The corridor recommendations emanate from combined evaluation of environmental, engineering, and traffic and revenue considerations.

Once a general corridor location is chosen, further studies will be necessary to determine the optimum alignment within that corridor. These efforts must include an engineering design and location study and a formal Environmental Impact Statement (EIS), both involving a much higher level of analysis than is required for a Corridor Location Study.

FIGURE 5
MATRIX

CORRIDOR	SEGMENT COMBINATIONS	CORRIDOR	Terrestrial Flora and Fauna	Marine Flora and Fauna	Fresh Water Flora and Fauna	Marine Water Quality	Fresh Water Quality	Air Quality	Noise Pollution	Architectural, Historic & Archeological Landmarks	Transportation Patterns on Existing Streets and Highways	Land Use Patterns	Community Facilities and Governmental Services	Neighborhood Stability	Displacements
(1)	N1-N2-N3-N4-C6-C7-N5	1	-2	-2	-2	-2	-2	-2	-1	-2	-2	-1	-2	-1	-1
2	N1-N2-N3-N4-C6-C7-C8-C9	2	-2	-2	0	-2	0	-1	-2	-1	+1	-2	-1	-2	-2
3	N1-N2-N3-C3-C4-C5-C6-C7-N5	3	-2	-2	-2	-2	-2	-1	-2	-2	-2	-1	-2	-2	-2
4	N1-N2-N3-C3-C4-C5-C6-C7-C8-C9	4	-2	-2	0	-2	0	0	-2	-2	+1	-2	-2	-2	-2
5	N1-N2-N3-C3-C4-S1-S2-C7-N5	5	-2	-2	-2	-2	-2	-1	-1	-2	-2	-1	-2	-1	-1
6	N1-N2-N3-C3-C4-S1-S3-C9	6	-2	-2	0	-2	0	-1	-1	-2	0	-1	0	-1	-1
7	N1-N2-C2-C4-C5-C6-C7-N5	7	-1	-1	-2	-1	-2	-1	-2	-2	-2	-2	-2	-2	-2
8	N1-N2-C2-C4-C5-C6-C7-C8-C9	8	-1	-1	0	-1	0	0	-2	-2	+1	-2	-2	-2	-2
9	N1-N2-C2-C4-S1-S2-C7-N5	9	-1	-1	-2	-1	-2	-1	-1	-2	-2	-1	-2	-1	-1
10	N1-N2-C2-C4-S1-S3-C9	10	-1	-1	0	-1	0	-1	-1	-2	0	-1	-1	-1	-1
11	C1-N2-N3-N4-C6-C7-N5	11	-2	-2	-2	-2	-2	-2	-1	-1	-2	-1	-2	-1	-1
12	C1-N2-N3-N4-C6-C7-C8-C9	12	-2	-2	0	-2	0	-1	-2	0	+1	-2	-1	-2	-1
13	C1-N2-N3-C3-C4-C5-C6-C7-N5	13	-2	-2	-2	-2	-2	-1	-2	-2	-2	-2	-2	-2	-2
14	C1-N2-N3-C3-C4-C5-C6-C7-C8-C9	14	-2	-2	0	-2	0	-1	-2	-1	+1	-2	-2	-2	-2
15	C1-N2-N3-C3-C4-S1-S2-C7-N5	15	-2	-2	-2	-2	-2	-1	-1	-2	-2	-1	-2	-1	-1
16	C1-N2-N3-C3-C4-S1-S3-C9	16	-2	-2	0	-2	0	-1	-1	-1	0	-1	0	-1	-1
17	C1-N2-C2-C4-C5-C6-C7-N5	17	-1	-1	-2	-1	-2	-1	-2	-2	-2	-2	-2	-2	-2
(18)	C1-N2-C2-C4-C5-C6-C7-C8-C9	18	-1	-1	0	-1	0	0	-2	-1	0	-2	-2	-2	-2
19	C1-N2-C2-C4-S1-S2-C7-N5	19	-1	-1	-2	-1	-2	-1	-1	-2	-2	-1	-2	-1	-1
(20)	C1-N2-C2-C4-S1-S3-C9	20	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	-1

(1) Primary Northern Corridor
(18) Primary Central Corridor
(20) Primary Southern Corridor

+2 Major Positive Impact
+1 Minor Positive Impact
0 No Impact (or balance between positive and negative impacts)
-1 Minor Negative Impact
-2 Major Negative Impact

CORRIDOR STUDY

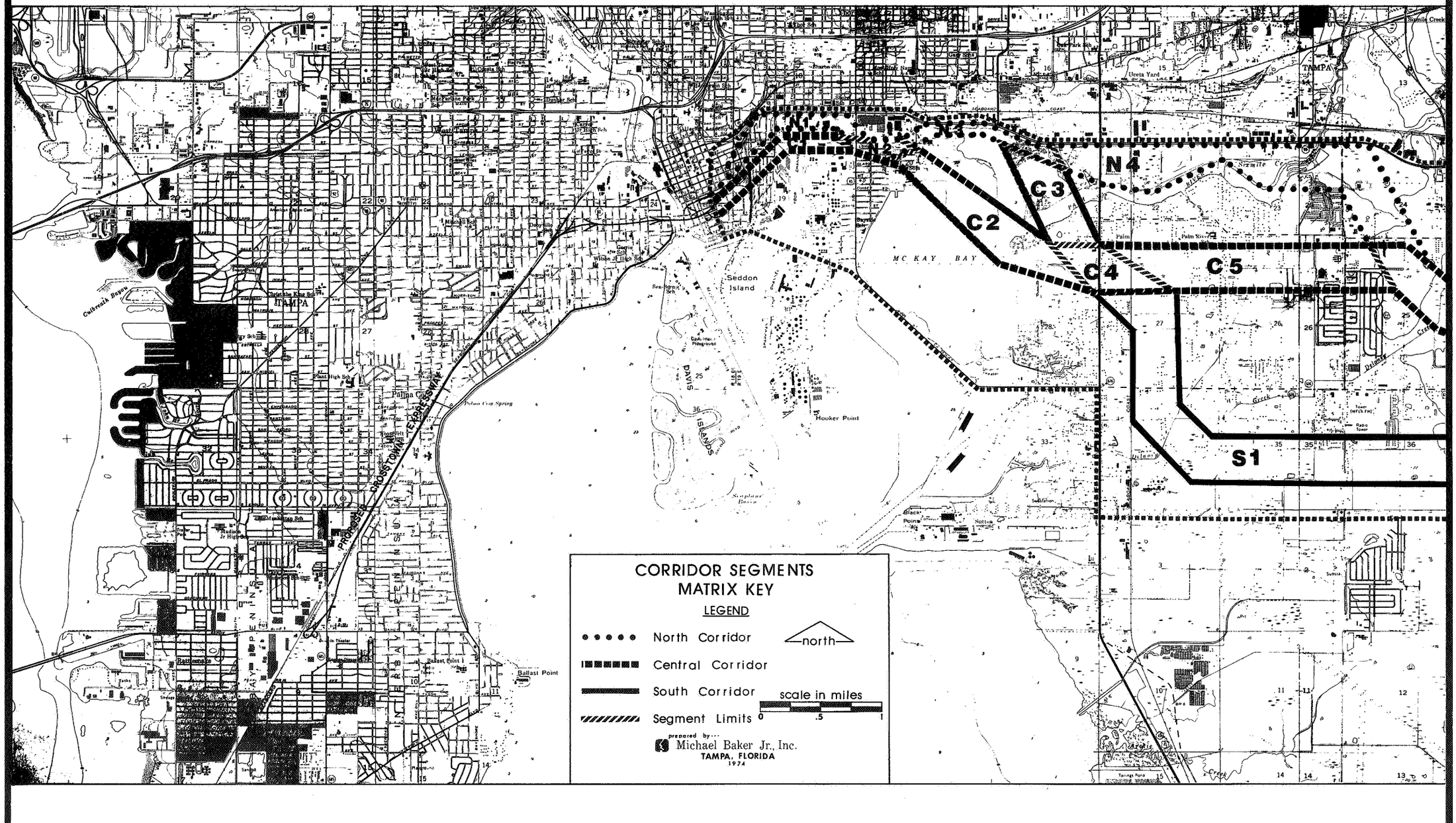


EXHIBIT 15A

CORRIDOR STUDY

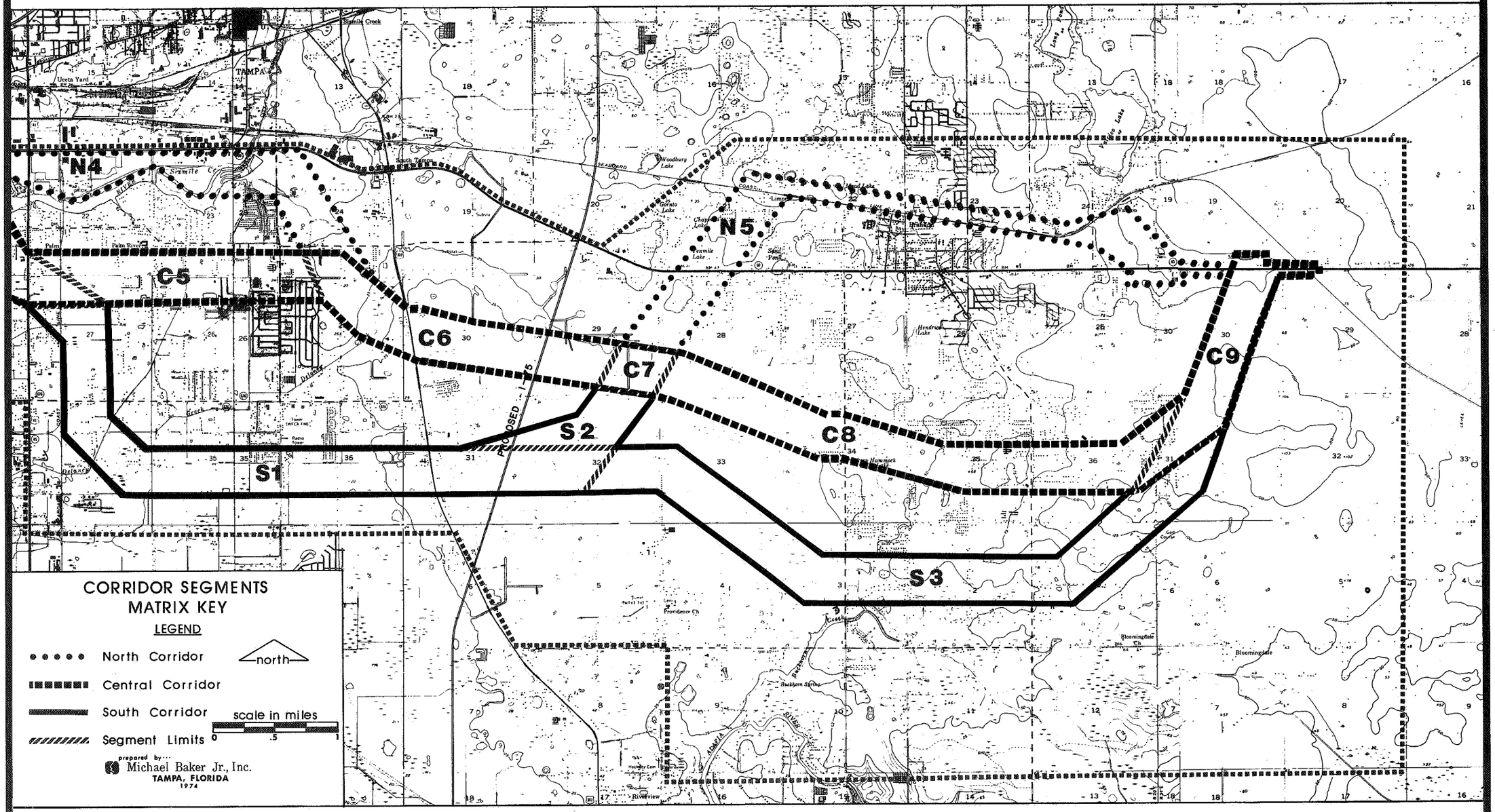


EXHIBIT 15B

APPENDIX
letter to agencies

MICHAEL BAKER, JR., INC.
CONSULTING ENGINEERS - PLANNERS - SURVEYORS

SUITE 713
BARNETT BANK BUILDING
TAMPA, FLORIDA 33602

Re: Preliminary Environmental Assessment for Corridor Study for Eastern Extension of Tampa South Crosstown Expressway

Gentlemen:

Michael Baker, Jr., Inc. is currently engaged as the environmental consultant to the J. E. Greiner Company for the purpose of preparing the preliminary environmental assessment for the Corridor Study authorized by the Tampa-Hillsborough County Expressway Authority for the proposed Eastern Extension of Tampa's South Crosstown Expressway

As the attached map indicates, the project Study Area extends from the downtown terminus of the Expressway's Western leg to a point east of Brandon. The primary objectives of this extension are to relieve the current congestion on S.R. 60 (Adamo Drive) and to provide improved access between Tampa and the rapidly growing Brandon area. The Expressway would be a vital link in the Tampa Bay Area's overall circulation system.

Our tasks in this capacity involve analyzing the relative impact of each of the selected corridors on both the natural and human environments. The natural environment analyses will focus on air and water quality, acoustic sound, general ecology (vegetation, wildlife, etc.), light pollution, hydrology, and erosion, as well as aesthetics and landscaping. Investigations relating to impact on the human environment and community will

center around existing and future land use, neighborhoods (social interaction, property values, mobility, etc.), governments, displacements, supporting functions (facilities, services, etc.), and transportation facilities.

As our work progresses, we may have occasion to call upon your agency to request pertinent data or other information. However, at this early stage in the development of the assessment, we would greatly appreciate receiving any comments or opinions you may have on the possible environmental impacts of these corridors, as well as a list of any relevant publications released through your agency. By indicating your particular areas of concern, you will better enable us to identify and evaluate any associated positive or negative impacts. In addition, we would be most pleased to meet with you at your convenience.

We appreciate your cooperation in the orderly progression of this project.

Sincerely yours,

MICHAEL BAKER, JR., INC.

Matthew J. Stegner

Matthew J. Stegner
Assistant to the Executive
Vice President

MJS/dh

list of agencies contacted

The following agencies were contacted by letter, telephone or personal interview:

1. Board of Trustees of the Florida Internal Improvement Fund
2. City of Tampa Fire Department
3. City of Tampa Land Agent
4. City of Tampa Metropolitan Development agency
5. City of Tampa Parking and Transportation Department
6. City of Tampa Parks and Cemeteries Department
7. City of Tampa Police Department
8. City of Tampa Public Library
9. City of Tampa Public Works Department
10. City of Tampa Recreation Department
11. City of Tampa Sanitation Department
12. Florida Bureau of Sport and Marine Fisheries
13. Florida Bureau of Geology
14. Florida Coastal Coordinating Council
15. Florida Department of Pollution Control
16. Florida Game and Fresh Water Fish Commission
17. Hillsborough County Agricultural Agents
18. Hillsborough County Auto Tag Department
19. Hillsborough County Building and Zoning Department
20. Hillsborough County Community Action Agency
21. Hillsborough County Council on Aging
22. Hillsborough County Environmental Protection Commission
23. Hillsborough County Fire Marshall
24. Hillsborough County Health Department
25. Hillsborough County Historical Commission
26. Hillsborough County Hospital and Welfare Board
27. Hillsborough County Parks Department
28. Hillsborough County Planning Commission
29. Hillsborough County Recreation Department
30. Hillsborough County Sheriff's Office
31. Hillsborough County Soil Conservation Service

32. Hillsborough County School Board

33. Hillsborough County Tax Assessor

34. Hillsborough County Utilities Department

35. National Oceanographic and Atmospheric Administration

36. Southwest Florida Water Management District

37. Tampa Bay Regional Planning Council

38. Tampa Audubon Society

39. Save Our Bay, Inc.

40. U.S. Geological Survey (Tampa Office)

41. U.S. Army Corps of Engineers

42. U.S. Coast Guard

43. Tampa Port Authority

44. Community Coordinating Council

45. Hillsborough County Catholic Board of Education

46. Florida Department of State, Division of Archives, History, and Records Management

State of Florida

DEPARTMENT OF NATURAL RESOURCES

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Comptroller
THOMAS D. O'MALLEY
Treasurer
DOYLE CONNER
Commissioner of Agriculture
FLOYD T. CHRISTIAN
Commissioner of Education

HARMON W. SHIELDS
Executive Director

LARSON BUILDING / TALLAHASSEE 32304

COASTAL COORDINATING COUNCIL
309 Office Plaza Drive
Tallahassee, Florida 32301

April 10, 1974

RECEIVED
APR 12 1974
TAMPA OFFICE

Mr. Matthew J. Stegner
Assistant to the Executive Vice President
Michael Baker, Jr., Inc.
Suite 713, Barnett Bank Building
Tampa, Florida 33602

Dear Mr. Stegner:

The staff of the Florida Coastal Coordinating Council has made a preliminary review of your proposed alternates to the Eastern Extension of Tampa's Crosstown Expressway. We will be responding to your Draft Environmental Impact Statement in the future as a part of the State Clearinghouse review.

The following comments are in order at this time with reference to the project as proposed on your sketch. Our answer is based on our previous mapping of the coastal zone of Hillsborough County in the Florida Coastal Zone Management Atlas.

(1) We prefer the route designated in red on the enclosed sketch.

(2) Upgrading of Adamo Drive from Florida Avenue to State Road 60 to Palm River would have an adverse effect on McKay Bay and Palm River. The road, if constructed along this path, would be for approximately six miles in the Hurricane Flood Zone but would disturb less amount of waterfront than a new road over McKay Bay.

(3) The road by proceeding southeasterly from State Road 60 south to Brandon and back to State Road 60 in Valrico would alleviate much traffic on State Road 60 to and from Tampa. As sketched, it would pass through some developed areas, cross I-75 (when it is built) and be constructed on soils which are suitable for transportation routes (see Hillsborough County's Detailed Soil Survey).

DIVISIONS / ADMINISTRATIVE SERVICES · ENVIRONMENTAL RESEARCH AND PROTECTION · INTERIOR RESOURCES
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(4) There are no preservation lands or conservation lands (other than the Hurricane Flood Zone) along the enclosed suggested route.

We appreciate being able to comment at such an early stage on a project of this scope. If the Coastal Coordinating Council staff can be of further assistance, please feel free to contact this office.

Sincerely,
Lawrence D. Bobo
Lawrence D. Bobo
Coastal Planner

LDB/rh

attachment
cc: Bruce Johnson

THE
BOARD OF COUNTY COMMISSIONERS

ROBERT E. CURRY, CHAIRMAN
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BOB LESTER, VICE-CHAIRMAN
DIST. 5, PLANT CITY

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ELIZABETH B. CASTON, DIST. 3, TAMPA
CARL L. CARPENTER, JR., DIST. 4, PLANT CITY

P.O. BOX 1110
TAMPA, FLORIDA 33601
TELEPHONE: (813) 223-1311



COUNTY of HILLSBOROUGH
Tampa, Florida 33601

JAMES F. TAYLOR, JR.
CLERK

RUDY SPOTO
COUNTY ADMINISTRATOR

JAMES H. PITTMAN
DIRECTOR OF UTILITIES
EXT. 398

WILLIAM D. JOHNSON
DEPUTY DIRECTOR OF UTILITIES
EXT. 387

P.O. DRAWER 3292
TAMPA, FLORIDA 33601

April 17, 1974

Michael Baker, Jr., Inc.
Suite 713
Barnett Bank Building
Tampa, Florida 33602

Re: Preliminary Environmental Assessment for Corridor Study for Eastern Extension of Tampa South Crosstown Expressway

Gentlemen:

Receipt is acknowledged of your letter dated April 3, 1974, informing us that you are acting as consultant for J. E. Greiner Company for the purpose of preparing the preliminary environmental assessment for the Corridor Study of the Tampa South Crosstown Expressway.

The Hillsborough County Utilities Department operates water and sewer systems at various locations throughout Hillsborough County, and there is a possibility that some of these systems might be affected by your Corridor Studies.

Please feel free to contact this office if you have any questions concerning utilities systems owned or operated by Hillsborough County which might lie within the Corridor Study areas.

Yours very truly,

James H. Pittman

James H. Pittman
Director of Utilities

JHP/llc

RECEIVED
APR 24 1974
TAMPA OFFICE

CITY OF TAMPA

SANITATION DEPARTMENT
4010 W. SPRUCE STREET

NORMAN CONATY, DIRECTOR
PHONE: 877-6031

TAMPA, FLORIDA 33602

April 22, 1974

Mr. Matthew J. Stegner
Assistant to the Executive
Vice President
Michael Baker, Jr., Inc.
Suite 713
Barnett Bank Bldg.
Tampa, Florida

Ref. Your letter 4/3/74, Crosstown Expressway

Dear Mr. Stegner:

In reference to your letter pertinent the expressway corridor. We see no problem with the environmental impact as far as this department is concerned.

I would like to express one point to consider though. This is the official closure of any alleys abutting the proposed corridor. In the planning of I-4 and I-75 they ignored this area and we ended up with a bunch of dead-end alleys we no longer could collect refuse from. Consequently they ended up a "no man's land" without maintenance or care and turned into large outlaw dumping areas. If in this case any alleys are cutoff, they should be officially closed and the property returned to adjacent landowners to eliminate this problem.

If we can be of further help, please advise.

Sincerely,

Norman Conaty

Norman Conaty,
Director

NC:il

cc: Wayne Jump

RECEIVED
APR 24 1974
TAMPA OFFICE

FLORIDA GAME AND FRESH WATER FISH COMMISSION

OGDEN M. PHIPPS, Chairman, Miami
E. P. "Sonny" BURNETT, Vice Chairman, Tampa
HOWARD ODOM, Marianna
O. L. PEACOCK, JR., Ft. Pierce
RANDOLPH R. THOMAS, Jacksonville

DR. O. E. FRYE, JR., Director
H. E. WALLACE, Assistant Director

P. O. Box 1840
Vero Beach, Florida 32960

April 22, 1974

Mr. Matthew J. Stegner
c/o Michael Baker, Jr., Inc.
Suite 713
Barnett Bank Bldg.
Tampa, Florida 33602

Dear Mr. Stegner:

Your letter of April 3 to our department has been forwarded to me for review and comment. Our agency is very much interested in having preliminary input into the environmental assessment for the proposed eastern extension of Tampa's South Crosstown Expressway. I would like to review the proposed alternative corridors with you at an agreeable date so that we may be able to express our opinion as to which corridor should have minimal adverse effects on the fish and wildlife resources of the area. Of course, our comments will be directed only toward the natural environment, however, we may be able to offer helpful suggestions for various aspects of the proposed project, especially since it is in such an early stage of development.

I hope we will be able to plan a joint inspection date in the not-to-distant future. I will await your reply before any further steps are taken so that we may be able to coordinate our efforts.

Sincerely,

Charles Y. Williams, Jr.
Environmental Specialist

CYWJr/rs

RECEIVED
APR 24 1974
TAMPA OFFICE

THE BOARD OF COUNTY COMMISSIONERS
ROBERT E. CURRY, CHAIRMAN, DIST. 1, TAMPA
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ELIZABETH D. CASTOR, DIST. 3, TAMPA
CARL L. CARPENTER, JR., DIST. 4, PLANT CITY
P.O. BOX 1110
TAMPA, FLORIDA 33601
TELEPHONE (813) 223-1311

JAMES F. TAYLOR, JR.
CLERK
RUDY SPOTO
COUNTY ADMINISTRATOR
R.H. WILLIAMSON
PARKS DIRECTOR
1505 ORIENT ROAD
TAMPA, FLORIDA 33619



COUNTY of HILLSBOROUGH
Tampa, Florida 33601

25 April 1974

Mr. Matthew J. Stegner
Assistant to the Executive Vice President
Michael Baker, Jr., Inc.
Suite 713
Barnett Bank Building
Tampa, Florida 33602

Dear Mr. Stegner:

SUBJECT: Preliminary Environmental Assessment for Corridor Study for Eastern Extension of Tampa South Crosstown Expressway

In response to your letter dated 3 April 1974--at this time I am not aware of any significant facts regarding an environmental assessment within your proposed corridor study area.

The best that I can offer you is our map indicating the general locations of the existing County Parks and Recreation areas. If there are specific questions, I will certainly attempt to provide the answers.

Sincerely,

R. H. Williamson
Robert H. Williamson
Parks Director

Copy furnished:
Mr. Dennis Ross

RECEIVED
APR 29 1974
TAMPA OFFICE

State of Florida

DEPARTMENT OF NATURAL RESOURCES

HARMON W. SHIELDS
Executive Director

LARSON BUILDING / TALLAHASSEE 32304

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Governor
RICHARD (DICK) STONE
Secretary of State
ROBERT L. SHEVIN
Attorney General
FRED O. DICKINSON, JR.
Comptroller
THOMAS D. O'MALLEY
Treasurer
DOYLE CONNER
Commissioner of Agriculture
FLOYD T. CHRISTIAN
Commissioner of Education

25 April 1974

Mr. Matthew J. Stegner
Assistant to the Executive
Vice President
Michael Baker, Jr., Inc.
Suite 713, Barnett Bank Building
Tampa, Florida 33602

Dear Mr. Stegner:

Thank you very much for your letter requesting comments on your proposed expressway extension.

As your organization proceeds through the normal permitting and approval requirements, appropriate sections of ours and other state departments will be called on to make comments and give their approval based on onsite inspections and surveys. Thus, I do not feel that any comments I would make at this time would be pertinent.

If you have any specific questions, I will be glad to try to answer them.

Sincerely yours,

DIVISION OF MARINE RESOURCES

C. A. Willis

C. A. Willis
Director

CAW/ejj

RECEIVED
APR 26 1974
TAMPA OFFICE

DIVISIONS / ADMINISTRATIVE SERVICES · ENVIRONMENTAL RESEARCH AND PROTECTION · INTERIOR RESOURCES
MARINE RESOURCES · RECREATION AND PARKS

SERVING AMERICA'S EIGHTH LARGEST PORT

TAMPA PORT AUTHORITY FLORIDA USA

Tampa Port Authority

GEORGE B. HOWELL MARITIME CENTER

811 WYNKOOP ROAD • P. O. BOX 2192 • TAMPA, FLORIDA 33601

May 9, 1974

Mr. Matthew J. Stegner
Assistant to the Executive Vice President
MICHAEL BAKER, JR., INC.
Suite 713, Barnett Bank Building
Tampa, Florida 33602

Re: Preliminary Environmental Assessment for
Corridor Study for Eastern Extension of
Tampa South Crosstown Expressway

Dear Mr. Stegner:

The proposed Corridor Study on the northerly end of McKay Bay has been the subject of many discussions and would probably be strongly opposed if the southerly route across McKay Bay were used due to the marine environment in McKay Bay. However, I would like to support this southerly route across McKay Bay, this route being in the vicinity of the Tampa City Incinerator, because it would better serve the port area as it now exists and as it will be in the future. Port oriented businesses will be adjacent to portions of McKay Bay and Palm River in the vicinity of the proposed crossing and there should be adequate connections into existing thoroughfares which serve the port area such as U. S. 41, Adamo Drive and 22nd Street.

The extension into the Brandon area to best serve the majority of the traffic and the traffic pattern as now developed in that area should be along the Atlantic Coast Line Railroad track north of Frank Adamo Drive. This could be connected into Frank Adamo Drive (S. R. 60) to the east and west of Brandon as well as within the center of Brandon. This would allow traffic generated from the Brandon area to use the expressway more efficiently and would also allow through truck traffic to use the expressway as a bypass around the Brandon C.B.D. Any extension into the Brandon area south of Frank Adamo Drive (S. R. 60) I believe would not be in the best interests of the community and would create grave noise pollution in areas not now subject to such pollution.

Very truly yours,

Allan M. Schrader, P.E.
Director of Engineering

AMS:vh

RECEIVED
MAY 17 1974
TAMPA OFFICE

FLORIDA'S GATEWAY TO LATIN AMERICAN AND WORLD COMMERCE

Southwest Florida Water Management District

P. O. BOX 457 BROOKSVILLE, FLORIDA 33512

DERRILL McATEER, Chairman, Brooksville
S. C. BEXLEY, JR. Vice Chairman, Land O' Lakes
JOHN A. ANDERSON, Treasurer, St. Petersburg
HERMAN BEVILLE, Bushnell
J. R. GRAW, Ocala
JOE E. HILL, Leesburg
N. BROOKS JOHNS, Lakeland
THOMAS VAN der VEER, Yankeetown
ROBERT E. VAUGHN, Brandon
Donald R. Feaster, Executive Director

May 13, 1974

Mr. Matthew J. Stegner
Michael Baker, Jr., Inc.
Suite 713
Barnett Bank Building
Tampa, Florida 33602

Dear Mr. Stegner:

In reply to your letter of 3 April 1974, we have forwarded to your office, in care of Mr. Varney, relevant publications of our agency within the limits of the corridor study area as outlined in your letter. The Corps of Engineers have also prepared an Environmental Impact Statement on the Tampa By-Pass Canal which should be of interest relative to the proposed roadway. You may obtain a copy of that Environmental Impact Statement from the Corps District office in Jacksonville. The Corps of Engineers will no doubt also have vertical and horizontal clearance requirements for any crossing of the canal.

Our studies of McKay Bay have shown it to be a very productive estuarine environment. Actual measurements of water quality in McKay Bay by other agencies have revealed that McKay Bay is not as polluted as is generally believed.

We would very much appreciate a copy of the environmental assessment report for our files when your study is completed.

Very truly yours,

William D. Courser

WILLIAM D. COURSER
Chief,
Special Projects

WDC:lr

RECEIVED
MAY 16 1974

THE BOARD OF COUNTY COMMISSIONERS
ROBERT E. CURRY, CHAIRMAN
DIST. 1, TAMPA
BOB LESTER, VICE-CHAIRMAN
DIST. 5, RUSKIN
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ELIZABETH B. CASTON, DIST. 3, TAMPA
CARL L. CARPENTER, JR., DIST. 4, PLANT CITY
P.O. BOX 1110
TAMPA, FLORIDA 33601
TELEPHONE: (813) 223-1311

COUNTY of HILLSBOROUGH
Tampa, Florida 33601

JAMES F. TAYLOR, JR.
CLERK
RUDY SPOTO
COUNTY ADMINISTRATOR

June 3, 1974

Michael Baker, Jr., Inc.
Consulting Engineers-Planners-Surveyors
Suite 713
Barnett Bank Building
Tampa, Florida 33602

Dear Mr. Baker:

Though I realize the corridors for the Eastern Extension of the South Crosstown Expressway are preliminary, I would appreciate it if you could tell me if the southern most corridor would envelope a park we are starting to construct.

This park is located on Kings Avenue and approximately three blocks north of Bloomingdale Avenue adjacent to the Kingswood Elementary School on the north and west.

This is a 46 acre park and we estimate construction of proposed facilities to run approximately two million dollars.

Please advise as to the best of your knowledge as quickly as feasible.

Sincerely,

Curtis Bradford

Curtis Bradford
Director of Recreation Department

CB:jh

RECEIVED
JUN 4 1974
TAMPA OFFICE

questionnaire

Distributed to Tampa-Hillsborough County Expressway Authority Board members, Staff members, and Citizens Advisory Committee members.

CORRIDOR LOCATION STUDY

Crosstown Expressway Eastern Extension

SURVEY QUESTIONNAIRE

Prepared by

Greiner Engineering Sciences, Inc.

Michael Baker, Jr., Inc.

Watson and Company

INSTRUCTIONS:

Please respond to those questions within your area of concern or knowledge by circling the number on the left that corresponds to your corridor selection on the accompanying map.

Additional space has been provided to afford you an opportunity to explain or comment on your selection.

Please feel free to explore any additional location criteria or corridor considerations and note such comment either within the Survey Questionnaire, on the attached map, or by separate correspondence.

If further explanation of this Survey Questionnaire is desired, please inquire c/o:

Greiner Engineering Sciences, Inc.
5601 Mariner Street
Tampa, Florida 33622
Telephone: 813/879-1711

Following is an example to aid you in completing this questionnaire:

EXAMPLE

Which corridor provides the best access to the Community?
1. Northern Corridor
(2.) Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why? This corridor affords good access to business and industrial areas and is properly located to serve existing and planned residential areas.

1. Which corridor do you feel would be most compatible with existing and proposed land use patterns?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why? _____

2. Which corridor will have the least detrimental effect on the overall natural environment?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why? _____

3. Which corridor will have the least detrimental effect on air quality?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why? _____

4. Which corridor will have the least detrimental effect on water quality?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why? _____

5. Which corridor will have the least detrimental effect from the standpoint of noise pollution?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

6. Which corridor do you feel would offer the greatest opportunity for aesthetics and landscaping compatible with its surrounding areas?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

7. Which corridor do you feel would best allow preservation of overall neighborhood character and community identity?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

8. Which corridor do you feel would cause the least residential displacement?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

9. Which corridor do you feel would have the least effect on existing educational systems and planned facilities?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

10. Which corridor do you feel could improve present school bus routes?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

11. Which corridor do you feel would least affect religious institutions?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

12. Which corridor do you feel would have the greatest impact on the growth of the area?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

13. Which corridor do you feel would least affect the availability of replacement housing?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

14. Throughout the Study Area can you suggest additional uses of the corridors under consideration?

a. Special provisions for recreational facilities within or adjacent to the proposed corridors:
   1) What type of recreational facility?_____
   2) In what corridor(s)?_____
   3. Where?_____
   (Indicate on attached map if necessary.)

b. Construction of residential, commercial, or industrial buildings over or under the corridor:
   1) In what corridor(s)?_____
   2) Where?_____
   (Indicate on attached map if necessary.)

c. Provision for future mass transit facilities:
   1) In what corridor(s)?_____
   2) Where?_____
   (Indicate on attached map if necessary.)

d. Use of parking over, under, or adjacent to the proposed corridor:
   1) In what corridor(s)?_____
   2) Where?_____
   (Indicate on attached map if necessary.)

e. Special provisions for other facilities within or adjacent to the proposed corridors:
   1) What type of facility?_____
   2) In what corridor(s)?_____
   3) Where?_____
   (Indicate on attached map if necessary.)

15. Which corridor do you feel would best serve existing and proposed residential developments?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

16. Which corridor do you feel would best serve existing and proposed recreational or entertainment areas?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

17. Which corridor do your feel would best serve existing and proposed commercial developments?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

18. Which corridor do you feel would best serve existing and proposed industrial developments?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

19. Which corridor do you feel would provide the best access to hospitals, medical clinics and similar health facilities?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

20. Which corridor do you feel would permit the most efficient local traffic pattern between employment centers (commercial, industrial, and public) and residential areas?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

21. Which corridor do you feel would be most beneficial in improving present traffic conditions on local streets in and around the Study Area?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

22. Which corridor do you feel might cause the greatest need for local road improvements due to increased traffic on local systems?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

23. Which corridor do you feel would have the least detrimental effect on existing and proposed public utility systems and service areas (sewer, water, electric, and related facilities)?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

24. Which corridor do you feel would have the least detrimental effect on public safety?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

25. Which corridor do you feel would most improve the efficiency in moving equipment from fire stations to department service areas?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

26. Which corridor do you feel would most improve the efficiency of present police protection services?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

27. Which corridor do you feel would least affect other governmental services and facilities?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

28. Which corridor do you feel would have the least detrimental effect on property values?

1. Northern Corridor
2. Central Corridor
3. Southern Corridor
4. Combination of above (explain)
5. None of above

Why?_____

29. Overall, which corridor best satisfies your needs? _____

Would you suggest an alternative?_____

Why?_____

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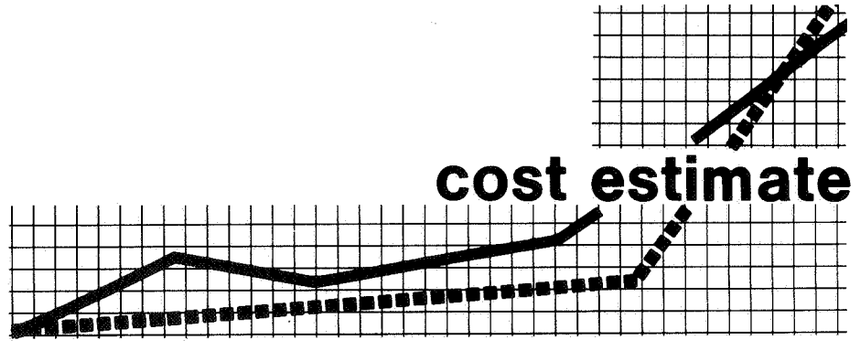
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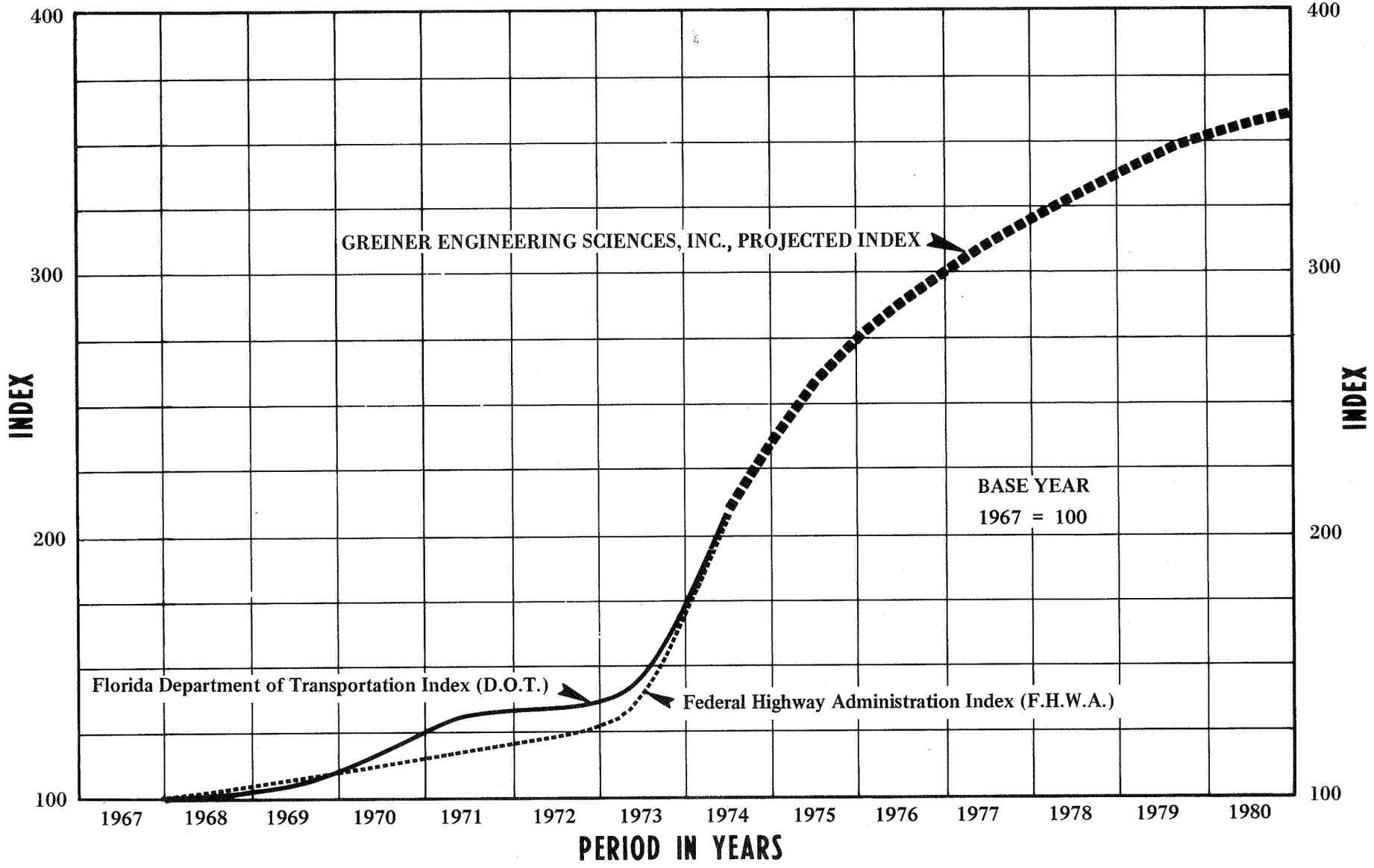
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cost estimate

CORRIDOR STUDY



COST INDEX

construction cost trends and projections

COST ESTIMATES

construction cost

The construction cost estimates summarized hereinafter are generally based on approximate quantity estimates derived from the preliminary plans and profiles, typical sections, and schematic interchange and toll plaza layouts accompanying this Report. Anticipated improvements to local roads and frontage roads have been included as a cost to the project.

Prices were developed for the year 1974 from analysis of recent bids received on similar work on Florida Department of Transportation projects. Due to recent and expected future increases in costs of labor, materials, and equipment, adjustments to the construction cost estimates, we have attempted to predict construction period costs as indicated on the chart projecting the historical price trend index for Florida Highway construction included in this Report.

Even an estimate of current construction costs (which does not purport to predict construction costs which will occur at the time the project is actually bid), is only an educated engineering estimate, and not a guarantee.

project cost

The estimated project costs have been divided into appropriate elements of cost for each Study Corridor and the specified subdivisions thereof to permit consideration of preliminary feasibility of various lengths of extension of the Expressway.

The categories to which the various elements of project cost have been estimated are as follows:

Preliminary Expenses includes all costs incurred prior to bond funds becoming available and which should be repaid. The estimates, however, do not include design and right-of-way costs which may be incurred, if authorized, prior to bond sale as these costs are included in those respective categories hereinafter.

Right-of-Way estimates include current value estimates prepared by a qualified real estate appraiser retained by the Authority for estimated average takings within each Study Corridor including land, improvements and proximity damages. They have been increased by the Expressway Right-of-Way Staff for other and anticipated costs of acquisition, relocation and demolition.

Construction cost estimates include the cost of all materials, labor and installed equipment for the actual construction of the project based on current prices.

Engineering and Administrative expenses are estimated herein based on similar costs incurred in Project One, including all engineering and testing costs during the design and construction phases and administrative and extraordinary legal services and expenses subsequent to the sale of lands.

Contingencies is an amount equal to approximately fifteen percent (15%) of the above elements of costs to provide for unforeseen increases in estimated costs.

In utilizing these estimates for preliminary revenue bond financing feasibility determinations for each Study Corridor, it should be recognized that estimated costs were developed using current price and value data. Estimates do not include financing costs and interest on the bonds accrued during the period prior to opening to traffic.

Presented hereinafter are the rather detailed breakdowns of estimated project costs for four representative Study Corridors, including

the Recommended Corridor, followed by a summary of total project costs for all corridors studied. All individual alternative corridor project costs were developed and subdivided into three segments, as specified:

Project One to U.S. 41 (50th Street);
U.S. 41 to the proposed Interstate 75E Interchange; and
I-75E to the eastern terminal at S.R. 60.

maintenance and operation costs

The preliminary estimate of annual maintenance and operating expenses projects the amounts considered necessary to accomplish the toll collection activities and physical maintenance of the Expressway Extension within each Study Corridor at the high level necessary to afford the maximum comfort, attractiveness, and safety to its patrons and the adjacent community.

Operating costs for the project include amounts for salaries of operations personnel, services and supplies, rental of toll collection equipment, utility expenses, insurance, engineering, audits, and expenses of all other items necessary and incidental to the operating procedures consistent with the existing Lease-Purchase Agreement. Administrative costs of the Authority and staff are not included.

In addition, preliminary estimates include monies for maintenance, including the care and incidental repair of the physical components of the project including the pavements, striping, structures, lighting, drainage facilities, grass mowing, periodic replacement of worn, inoperable or damaged equipment, buildings, and other related elements. Allowances have been made for major maintenance such as resurfacing roadway lands and bridge painting.

These combined estimated expenses projected for the first ten years of operation, including a modest annual increase for the average annual cost growth rate, were developed with the able assistance of qualified representatives of the Toll Facilities and Maintenance sections of the State of Florida Department of Transportation.

The existing Lease-Purchase Agreement between the Authority and the State of Florida, Department of Transportation designates the Department of Transportation as lessee, to operate and maintain the Expressway system, including the collection of tolls. The maintenance and operation costs would not be included in the bond issue proposed for constructing Expressway Extensions, but would be paid back to the Department after bond payout.

In analyzing estimated maintenance and operation expenses for each Study Corridor, the total costs compare with each other favorably in early years. However, primarily due to the shorter, more direct westerly segment of the Central Corridor alternatives and less interchanges, estimated expenses for that segment compared to the Northern Corridor alternatives are less, initially, by as much as 38% on the low level bridge alternative, 29% on the tunnel alternative, and 15% on the high level bridge. In future years, based on the 10-year projections, these expenses on the western segment of the Northern Corridor increase at a faster rate primarily due to operation costs related to assumed expansion of toll facilities.

CORRIDOR STUDY — COST ESTIMATE

CORRIDOR DESCRIPTION	ITEM	PROJECT ONE TO U.S. 41	U.S. 41 TO I-75E	I-75E TO EAST TERMINUS	TOTAL
Northern Corridor	PRELIMINARY EXPENSES	586,000	293,000	293,000	1,172,000
	RIGHT-OF-WAY	21,994,145	5,982,103	13,757,726	41,733,974
	CONSTRUCTION	59,975,588	27,813,730	23,678,885	111,468,202
	ENGINEERING & ADMINISTRATION	8,396,582	3,893,922	3,315,044	15,605,548
	CONTINGENCIES	13,618,248	5,672,814	6,132,099	25,432,159
	SUB TOTAL	104,570,563	43,655,569	47,176,753	195,402,885
	LENGTH	4.00 MILES	4.58 MILES	5.93 MILES	14.51 MILES
Recommended Corridor Northern Corridor Connecting to Central Corridor East of I-75E.	PRELIMINARY EXPENSES	586,000	293,000	293,000	1,172,000
	RIGHT-OF-WAY	21,994,145	8,189,753	9,052,918	39,236,816
	CONSTRUCTION	59,975,588	27,310,215	20,613,263	107,899,066
	ENGINEERING & ADMINISTRATION	8,396,582	3,823,430	2,885,857	15,105,869
	CONTINGENCIES	13,618,248	5,967,058	4,926,756	24,512,062
	SUB TOTAL	104,570,563	45,583,456	37,771,794	187,925,813
	LENGTH	4.00 MILES	4.67 MILES	6.30 MILES	14.97 MILES
Central Corridor low level bridge over Ybor Channel crossing McKay Bay.	PRELIMINARY EXPENSES	586,000	293,000	293,000	1,172,000
	RIGHT-OF-WAY	19,515,308	9,210,319	9,052,918	37,778,545
	CONSTRUCTION	37,918,840	22,519,219	20,613,263	81,051,322
	ENGINEERING & ADMINISTRATION	5,308,638	3,152,690	2,885,857	11,347,185
	CONTINGENCIES	9,388,782	5,276,284	4,926,756	19,591,822
	SUB TOTAL	72,717,568	40,451,512	37,771,794	150,940,874
	LENGTH	4.53 MILES	4.50 MILES	6.30 MILES	15.33 MILES
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Southern Corridor connecting again to the Central Corridor between Valrico Road and the eastern terminus.	PRELIMINARY EXPENSES	586,000	293,000	293,000	1,172,000
	RIGHT-OF-WAY	22,338,508	4,727,327	8,875,052	35,940,887
	CONSTRUCTION	49,701,200	26,395,960	29,125,968	105,223,128
	ENGINEERING & ADMINISTRATION	6,958,168	3,695,434	4,077,635	14,731,237
	CONTINGENCIES	11,486,276	5,266,758	6,355,748	23,108,782
	SUB TOTAL	88,061,452	40,378,479	48,727,403	177,167,334
	LENGTH	4.27 MILES	4.98 MILES	7.68 MILES	16.93 MILES

CORRIDOR STUDY

COST ESTIMATE

CORRIDOR DESCRIPTION	PROJECT COST
Northern Corridor	195,402,885
Northern Corridor connecting to Central Corridor east of I-75E.	187,925,813
Northern Corridor connecting through the Central Corridor east of I-75E to the Southern Corridor until connecting back to the Central Corridor to the eastern terminus.	196,228,205
Northern Corridor connecting to the Central Corridor McKay Bay Crossing connecting again to the Northern Corridor east of I-75E.	171,772,469
Northern Corridor connecting to the Central Corridor crossing McKay Bay.	164,664,295
Northern Corridor connecting to the Central Corridor crossing McKay Bay connecting to the southern Corridor east of I-75E until connecting back to the Central Corridor to the eastern terminus.	171,324,908
Northern Corridor connecting to the Southern Corridor across McKay Bay connecting to the Central Corridor from Valrico Road to the eastern terminus.	183,010,083
Northern Corridor connecting to the Southern Corridor across McKay Bay connecting to the Northern Corridor east of I-75E.	182,776,542
Northern Corridor connecting to the Southern Corridor across McKay Bay connecting to the Central Corridor east of I-75E.	176,931,879
Northern Corridor connecting across Palm River to the Central Corridor connecting to the Northern Corridor east of I-75E.	206,622,033
Northern Corridor connecting across Palm River to the Central Corridor.	204,174,531
Northern Corridor connecting across Palm River to the Central Corridor connecting to the Southern Corridor east of I-75E connecting again to the Central Corridor from Valrico Road to the east terminus.	213,216,630
Northern Corridor utilizing the 2nd Ave. alternate segment.	190,644,114
Northern Corridor utilizing the 2nd Ave. alternate segment connecting to the Central Corridor east of I-75E.	183,067,667

CORRIDOR DESCRIPTION	PROJECT COST
Northern Corridor utilizing the 2nd Ave. alternate segment connecting through the Central Corridor east of I-75E to the Southern Corridor connecting back again to the Central Corridor from Valrico Road to the eastern terminus.	191,279,348
Northern Corridor utilizing the 2nd Ave. alternate segment crossing Palm River connecting to the Central Corridor connecting again to the Northern Corridor east of I-75E.	202,095,317
Northern Corridor utilizing the 2nd Ave. alternate segment crossing Palm River connecting to the Central Corridor.	198,060,353
Northern Corridor utilizing the 2nd Ave. alternate segment crossing Palm River connecting to the Central Corridor connecting to the Southern Corridor east of I-75E connecting again to the Central Corridor from Valrico Road to the eastern terminus.	216,737,088
Central Corridor high level bridge over Ybor Channel connecting to the Northern Corridor at 22nd Street.	305,280,524
Central Corridor high level bridge over Ybor Channel connecting to the Northern Corridor at 22nd Street connecting to the Central Corridor east of I-75E.	299,617,060
Central Corridor high level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. connecting through the Central Corridor east of I-75E to the Southern Corridor connecting again to the Central Corridor between Valrico Rd. to the eastern terminus.	321,604,613
Central Corridor high level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Central Corridor connecting again to the Northern Corridor east of I-75E.	322,931,169
Central Corridor high level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Central Corridor.	319,090,471
Central Corridor high level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Central Corridor connecting to the Southern Corridor east of I-75E connecting again to the Central Corridor between Valrico Road to the eastern terminus.	339,291,906

CORRIDOR STUDY

COST ESTIMATE

CORRIDOR DESCRIPTION	PROJECT COST
Central Corridor high level bridge over Ybor Channel crossing McKay Bay connecting to the Northern Corridor east of I-75E.	295,182,278
Central Corridor high level bridge over Ybor Channel crossing McKay Bay.	286,399,100
Central Corridor high level bridge over Ybor Channel crossing McKay Bay connecting east of I-75E to the Southern Corridor connecting again to the Central Corridor between Valrico Road to the eastern terminus.	295,690,846
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St.	169,553,107
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd Street connecting to the Central Corridor east of I-75E.	163,860,468
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. connecting through the Central Corridor east of I-75E to the Southern Corridor connecting again to the Central Corridor between Valrico Road and the eastern terminus.	174,888,603
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Central Corridor connecting to the Northern Corridor again east of I-75E.	186,073,106
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Central Corridor.	190,656,957
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd Street crossing Palm River connecting to the Central Corridor connecting east of I-75E to the Southern Corridor again connecting to the Central Corridor between Valrico Road and the eastern terminus.	190,976,258
Central Corridor low level bridge over Ybor Channel crossing McKay Bay connecting to the Northern Corridor east of I-75E.	158,999,493
Central Corridor low level bridge over Ybor Channel crossing McKay Bay.	150,940,874
Central Corridor low level bridge over Ybor Channel crossing McKay Bay connecting east of I-75E to the Southern Corridor connecting again to the Central Corridor between Valrico Road and the eastern terminus.	160,523,397

CORRIDOR DESCRIPTION	PROJECT COST
Central Corridor tunnel under Ybor Channel connecting to the Northern Corridor at 22nd St.	332,158,004
Central Corridor tunnel under Ybor Channel connecting to the Northern Corridor at 22nd St. connecting to the Central Corridor again east of I-75E.	328,136,167
Central Corridor tunnel under Ybor Channel connecting to the Northern Corridor at 22nd St. connecting through the Central Corridor east of I-75E to the Southern Corridor connecting again to the Central Corridor between Valrico Road and the eastern terminus.	336,137,469
Central Corridor Tunnel under Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting again to the Central Corridor connecting east of I-75E to the Northern Corridor.	354,608,704
Central Corridor high level bridge over Ybor Channel crossing over McKay Bay connecting to the Southern Corridor connecting again to the Central Corridor between Valrico Road and the eastern terminus.	291,389,394
Central Corridor high level bridge over Ybor Channel crossing over McKay Bay connecting to the Southern Corridor connecting to the Northern Corridor east of I-75E.	291,991,615
Central Corridor high level bridge over Ybor Channel crossing over McKay Bay connecting to the Southern Corridor connecting again to the Central Corridor east of I-75E.	286,378,617
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the southern Corridor connecting again to the Central Corridor between Valrico Road and the eastern terminus.	177,167,334
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Southern Corridor connecting again to the Northern Corridor east of I-75E.	178,844,536
Central Corridor low level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Southern Corridor connecting again to the Central Corridor east of I-75E.	172,986,034

CORRIDOR STUDY

COST ESTIMATE

CORRIDOR DESCRIPTION	PROJECT COST
Central Corridor tunnel under Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Southern Corridor connecting again to the Central Corridor between Valrico Road and the eastern terminus.	356,806,612
Central Corridor tunnel under Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Southern Corridor connecting again to the Northern Corridor east of I-75E.	358,954,577
Central Corridor tunnel under Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Southern Corridor connecting east of I-75E again to the Central Corridor.	353,096,074
Central Corridor tunnel under Ybor Channel crossing over McKay Bay connecting to the Southern Corridor connecting again to the Central Corridor between Valrico Road and the eastern terminus.	310,506,442
Central Corridor tunnel under Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting again to the Central Corridor.	348,740,056
Central Corridor tunnel under Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting again to the Central Corridor connecting east of I-75E to the Southern Corridor again connecting to the Central Corridor between Valrico Road and the eastern terminus.	356,592,472
Central Corridor tunnel under Ybor Channel crossing over McKay Bay connecting to the Northern Corridor east of I-75E.	315,364,724
Central Corridor tunnel under Ybor Channel crossing over McKay Bay.	311,300,361
Central Corridor tunnel under Ybor Channel Crossing over McKay Bay connecting east of I-75E to the Southern Corridor connecting again to the Central Corridor between Valrico Road and the eastern terminus.	310,288,637
Northern Corridor crossing Palm River connecting to the Southern Corridor connecting to the Central Corridor between Valrico Road and the eastern terminus.	200,588,315
Northern Corridor crossing Palm River connecting to the Southern Corridor connecting east of I-75E to the Northern Corridor.	199,587,295
Central Corridor tunnel under Ybor Channel crossing over McKay Bay connecting to the Southern Corridor connecting to the Northern Corridor east of I-75E.	312,884,425
Central Corridor tunnel under Ybor Channel crossing over McKay Bay connecting to the Southern Corridor connecting to the Central Corridor again east of I-75E.	307,025,922
Northern Corridor crossing Palm River connecting to the Southern Corridor connecting east of I-75E to the Central Corridor.	194,241,081
Northern Corridor utilizing the 2nd Ave. alternate segment crossing Palm River connecting to the Southern Corridor connecting to the Central Corridor between Valrico Road and the eastern terminus.	206,438,978
Northern Corridor utilizing the 2nd Ave. alternate segment crossing Palm River. connecting to the Southern Corridor connecting to the Northern Corridor east of I-75E.	206,419,879
Northern Corridor utilizing the 2nd Ave. alternate segment crossing Palm River connecting to the Southern Corridor connecting east of I-75E to the Central Corridor.	202,931,972
Central Corridor high level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Southern Corridor again connecting to the Central Corridor between Valrico Road and the eastern terminus.	325,486,162
Central Corridor high level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Southern Corridor connecting to the Northern Corridor again east of I-75E.	327,430,594
Central Corridor high level bridge over Ybor Channel connecting to the Northern Corridor at 22nd St. crossing Palm River connecting to the Southern Corridor connecting again to the Central Corridor east of I-75E.	312,215,143

PRELIMINARY ESTIMATE OF MAINTENANCE AND OPERATION EXPENSES CENTRAL CORRIDOR

LOW LEVEL BRIDGE OVER YBOR CHANNEL ALTERNATIVE

Year	Project One To U.S. 41	U.S. 41 To I-75 E	I-75 E To East	Total
1980	$ 492,600	$ 626,200	$ 581,200	$1,700,000
1981	516,400	656,200	607,100	1,779,700
1982	541,300	687,700	634,200	1,863,200
1983	567,600	720,800	662,700	1,951,100
1984	595,100	755,500	692,700	2,043,300
1985	804,400	1,040,000	1,113,900	2,958,300
1986	843,800	1,090,700	1,166,400	3,100,900
1987	885,100	1,143,900	1,221,500	3,250,500
1988	928,500	1,199,800	1,279,300	3,407,600
1989	974,100	1,258,500	1,340,100	3,572,700
1990	1,055,000	1,328,000	1,370,000	3,753,000
1991	1,115,000	1,400,000	1,450,000	3,965,000
1992	1,175,000	1,470,000	1,520,000	4,165,000
1993	1,232,000	1,536,000	1,595,000	4,363,000
1994	1,290,000	1,605,000	1,670,000	4,565,000
1995	1,350,000	1,675,000	1,740,000	4,765,000

HIGH LEVEL BRIDGE OVER YBOR CHANNEL ALTERNATIVE

Year	Project One To U.S. 41	U.S. 41 To I-75 E	I-75 E To East	Total
1980	$ 590,000	$ 626,200	$ 581,200	$1,797,400
1981	613,400	656,000	607,100	1,876,500
1982	638,000	687,700	634,200	1,959,900
1983	663,900	720,800	662,800	2,047,500
1984	691,000	755,500	692,700	2,139,200
1985	899,800	1,040,000	1,113,900	3,053,700
1986	938,700	1,090,700	1,166,400	3,195,800
1987	979,500	1,143,900	1,221,500	3,344,900
1988	1,022,400	1,199,800	1,279,300	3,501,500
1989	1,057,500	1,258,500	1,340,100	3,656,100
1990	1,100,000	1,310,000	1,390,000	3,800,000
1991	1,140,000	1,362,000	1,450,000	3,952,000
1992	1,181,000	1,418,000	1,510,000	4,109,000
1993	1,220,000	1,470,000	1,565,000	4,255,000
1994	1,261,000	1,525,000	1,620,000	4,406,000
1995	1,300,000	1,570,000	1,680,000	4,550,000

TUNNEL UNDER YBOR CHANNEL ALTERNATIVE

Year	Project One To U.S. 41	U.S. 41 To I-75 E	I-75 E To East	Total
1980	$ 525,600	$ 626,200	$ 581,200	$1,733,000
1981	551,000	656,200	607,100	1,814,300
1982	577,700	687,700	634,200	1,899,600
1983	605,700	720,800	662,800	1,989,300
1984	635,200	755,500	2,083,300	3,474,000
1985	846,500	1,040,000	1,113,900	3,000,400
1986	888,000	1,090,700	1,166,400	3,145,100
1987	931,500	1,143,900	1,221,500	3,296,900
1988	977,200	1,199,800	1,279,300	3,456,300
1989	1,025,300	1,258,700	1,340,100	3,624,100
1990	1,065,000	1,305,000	1,380,000	3,750,000
1991	1,110,000	1,306,000	1,435,000	3,851,000
1992	1,150,000	1,410,000	1,490,000	4,050,000
1993	1,195,000	1,462,000	1,540,000	4,197,000
1994	1,239,000	1,518,000	1,590,000	4,347,000
1995	1,280,000	1,570,000	1,640,000	4,490,000

PRELIMINARY ESTIMATE OF MAINTENANCE AND OPERATION EXPENSES

NORTHERN CORRIDOR

Year	Project One to U.S. 41	U.S. 41 to I-75 E	I-75 E to East	Total
1980	$ 682,000	$ 632,000	$ 657,900	$1,971,900
1981	715,200	651,700	688,100	2,055,000
1982	750,100	682,900	719,800	2,152,800
1983	786,800	715,600	753,000	2,255,400
1984	825,300	750,000	788,000	2,363,300
1985	1,463,600	1,046,800	1,017,800	3,528,200
1986	1,535,900	1,097,700	1,065,900	3,699,500
1987	1,611,800	1,151,200	1,116,500	3,879,500
1988	1,691,600	1,207,300	1,169,600	4,068,500
1989	1,775,400	1,266,300	1,225,300	4,267,000
1990	1,850,000	1,325,000	1,267,000	4,442,000
1991	1,910,000	1,370,000	1,320,000	4,600,000
1992	2,000,000	1,437,000	1,371,000	4,808,000
1993	2,080,000	1,491,000	1,425,000	4,996,000
1994	2,155,000	1,550,000	1,480,000	5,185,000
1995	2,230,000	1,610,000	1,530,000	5,370,000

SOUTHERN CORRIDOR

Year	Project One to U.S. 41 (Northern Corridor Over Palm River)	U.S. 41 to I-75 E	I-75 E To East	Total
1980	$ 685,800	$ 559,900	$ 530,600	$1,776,300
1981	719,200	583,300	553,600	1,856,100
1982	754,200	613,000	577,700	1,944,900
1983	791,000	642,000	603,000	2,036,000
1984	829,600	672,600	629,600	2,131,800
1985	1,468,000	945,600	981,700	3,395,300
1986	1,540,500	991,300	1,027,200	3,559,000
1987	1,616,600	1,039,300	1,075,000	3,730,900
1988	1,696,500	1,089,700	1,125,200	3,911,400
1989	1,780,400	1,142,600	1,177,900	4,100,900
1990	1,825,000	1,190,000	1,230,000	4,245,000
1991	1,910,000	1,240,000	1,280,000	4,430,000
1992	2,000,000	1,289,000	1,330,000	4,619,000
1993	2,080,000	1,338,000	1,380,000	4,798,000
1994	2,150,000	1,385,000	1,430,000	4,965,000
1995	2,220,000	1,435,000	1,480,000	5,135,000