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A Master Highway Transportation Plan for Tampa Metropolitan Area, Hillsborough County, Florida

Wilbur Smith and Associates

A MASTER HIGHWAY TRANSPORTATION PLAN FOR

TAMPA METROPOLITAN AREA

HILLSBOROUGH COUNTY, FLORIDA

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HILLSBOROUGH COUNTY, FLORIDA

Prepared For

The State Road Department of Florida

The County of Hillsborough and The City of Tampa

Wilbur Smith and Associates

495 ORANGE STREET • NEW HAVEN, CONNECTICUT

SEPTEMBER, 1957

Wilbur Smith and Associates

TRAFFIC — PARKING — TRANSIT — HIGHWAYS

495 ORANGE STREET
NEW HAVEN, CONN.

Mr. Wilbur S. Jones
Chairman
State Road Department
Tallahassee, Florida

October 5, 1957

Dear Mr. Jones:

We are pleased to submit herewith a master highway transportation plan for the Tampa Metropolitan Area. The study was made in accord with our proposal letter of January 19, 1957, and your letter of acceptance of January 23, 1957. Undertaken jointly for your Department, the County of Hillsborough, and the City of Tampa, every effort has been made to develop a master transportation plan adequate for estimated 1975 needs. Conferences were held with county and city officials to coordinate the transportation plan with overall planning for the metropolitan area and to facilitate a mutual exchange of ideas.

The recommended expressway system includes 18.3 miles of freeway construction, all located on the National System of Interstate and Defense Highways. At present price levels, the plan is expected to cost approximately $96,000,000. In the development of the plan, particular attention was given to providing adequate access to and egress from the central business district, proper integration with future highway improvements outside of the study area, and maximum traffic service to both local and through traffic movements.

Extensions and improvements to the existing arterial street system, properly integrating the major street plan with the proposed expressway system, are also recommended and detailed. Completion of the recommended expressway and major street plan will provide the metropolitan area with a superior street network adequate for forecast 1975 traffic volumes and will provide good traffic service to every important traffic movement and generator of travel. The recommended transportation plan constitutes an integrated highway system and the elimination, or lack of improvement of any part of the plan will affect the overall efficiency of traffic service provided.

The very valuable assistance of city, county, and state agencies is gratefully acknowledged. The able and willing cooperation of Mr. Albert L. Rogero, District member of the State Road Department, members of your staff; Mr. Roy K. Van Camp, Superintendent of Public Works for the City of Tampa and his staff; Mr. George W. Simons, Jr., and Mr. Milo M. Smith, planning consultants, is particularly appreciated. Many other organizations furnished us very valuable information and assistance, which our project engineer, Mr. Paul Conrad and I gratefully acknowledge.

The opportunity of making this interesting and stimulating study is very much appreciated. I trust that the information furnished in our report will be of great assistance to you, Hillsborough County, the City of Tampa and residents of the metropolitan area in developing a comprehensive construction program. The importance of an adequate, integrated highway system to the realization of the potential growth of the area cannot be over-emphasized. We hope that we have conveyed the need for forceful and cooperative action.

Respectfully submitted,

Wilbur S. Smith

CONTENTS

CONTENTS (Continued)

CONTENTS (Continued)

ILLUSTRATIONS

TABULATIONS

APPENDIX TABULATIONS

Chapter I
INTRODUCTION

The Tampa area was visited by early Spanish explorers a full century before Plymouth and Jamestown were settled, but it was not until the latter part of the nineteenth century that it began to flourish and truly began its development as a major urban center. The earliest activity was the establishment of Fort Brooke at the mouth of the Hillsborough River. The first municipal government was formed in 1849. In 1855 a successful Town Council was established. The State Legislature granted Tampa its first corporate charter in December, 1855. City growth was slow during the two decades that saw the third Seminole War, the War Between the States, and recurring disasters of hurricanes and pestilence — yellow fever.

A flourishing cattle trade with Cuba, the organization of a community telegraph company which connected Tampa with the International Ocean Cable Company's trunk line, and the founding of a railroad — were primarily responsible for Tampa's rapid growth in the latter three decades of the nineteenth century. New industries, banking facilities, the discovery of the world's richest phosphate fields, and the beginning of the cigar industry gave added impetus to Tampa's urbanization. At the turn of the century, paved streets, electrified street railways, and utility services such as gas, water, and sewer plants were accelerating Tampa's growth.

In the first two decades of the twentieth century, further rapid strides were made in the city's development. Long recognized for its fine harbor, improved channels made travel by ocean-going craft possible. The growth of various industries, including huge shipbuilding plants during the first World War, the establishment of commercial airline travel, and city-wide automatic dial telephone service gave further impetus to the growth of the city.

The rapid growth in the first two decades of the twentieth century was followed by a still more accelerated period of growth during the 1920's. The increasing importance of its neighboring cities as tourist centers furthered Tampa's expansion as a distribution and service center. Before the 1930's and the depression, Tampa had gained many permanent improvements that diversified its economy.

The Greater Tampa Metropolitan area is a service and distribution center for the south-central region of Florida. Its orbit of influence extends many miles from the center of the city. The Tampa trade area is estimated to include over 900,000 people at the present time.[1] Its tributary area, while originally dependent on citrus production, phosphate mining, and tourists, has become more diversified, and growth in marketing distribution and manufacturing has been particularly strong. While Tampa still lays claim to a colorful Latin community and the production of fine cigars, the overall economy of the metropolitan area has continued to undergo marked changes. Its trade area is constantly being extended by its increased commercial, industrial, service, and cultural facilities. It is expected that the economy of the area will continue to show greater diversification, and that industry and commerce will continue to flourish.

Tampa is strategically located at the head of Hillsborough and Tampa Bay, see Figure I. It has fine port facilities, is served by two major railroads, and by a fine airport. All these transportation media are tied together by a network of highways, important not only to the Tampa area and the south central part of Florida, but also to interstate travel and commerce. Designated as primary trunk line state highways with a portion on the National System of Interstate Defense Highways, the ability of these roads to carry anticipated traffic volumes and the ability of Tampa to realize its po-

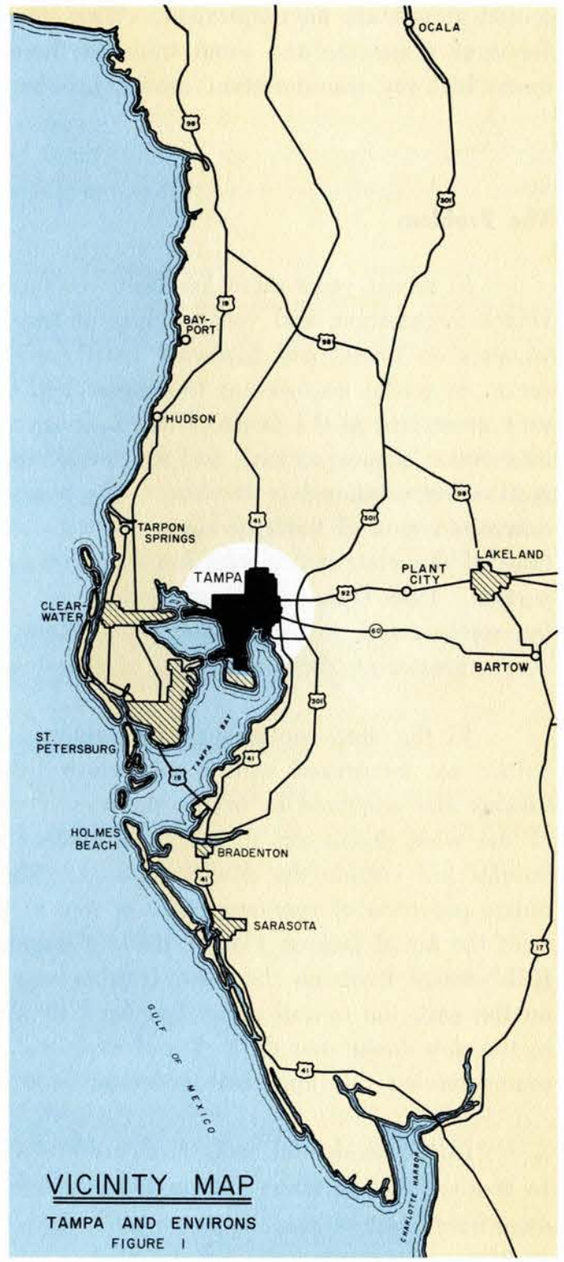


FIGURE I

[1] "Comprehensive Plan for the City of Tampa, Florida," 1956-57, prepared by George W. Simons, Jr., Planning and Zoning Consultant, Jacksonville, Florida.

tential growth are interdependent. With the increased role of industry and other forms of commerce and retail trade in the area's economy, the importance of adequate highway transportation cannot be over-emphasized.

The Problem

In recent years there has been continued rapid growth in population, motor vehicle registration, and vehicle miles of travel in Tampa and its environs. Traffic volumes on streets and highways have grown at a phenomenal rate. While application of traffic engineering techniques and improvements (such as a complete one-way street grid in the heart of the downtown business district, parking restrictions, intersection channelization), and street widening programs have been resorted to, congestion has continued to increase. The heavy traffic volumes on the streets in the downtown area of the city have grown to such a magnitude that critical intersections of the present one-way downtown street grid are inadequate during peak travel periods. Peak hour parking restrictions are desirable at many of the major street intersections and, in the ensuing years, these restrictions will have to be extended over a greater number and length of downtown streets.

In the area contiguous to downtown, where residential and commercial activities are intermixed with some industry, the through street pattern is not as continuous and adequate as in the downtown area. The lack of continuity of many of the wide downtown streets concentrates traffic onto a smaller number of traffic arteries just outside the downtown area. This situation was caused by the unfortunate provision of narrower rights-of-way in the street system extending irregularly from the initial Jackson Plat of 1853. Compounded by the natural barriers of the Hillsborough River on the west, Hillsborough Bay on the south, and the railroads on the east, the overall effect has been to make the problem of improving access to the downtown area difficult and expensive. Basically, there are too few through routes serving this important generator of travel in the metropolitan area.

In the residential areas farther removed, travel from one section of the city to another, and to areas outside the city, has grown to a magnitude that taxes the capacity of the existing street network, and in many cases overloads the existing arteries.

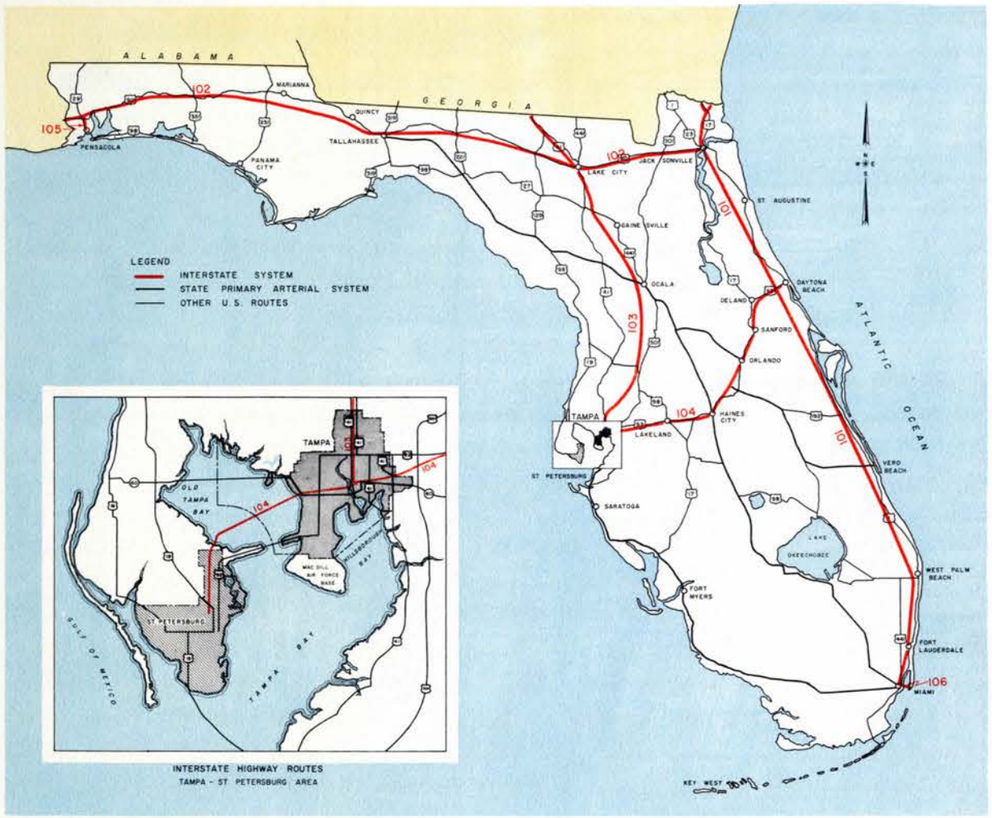
Authority and Scope of Study

Since 1946, traffic surveys have been made in the Tampa Metropolitan area to collect information that would provide the basis for recommendations, planning, and eventual construction of an integrated expressway and arterial highway network. With the passage of the Federal Aid Highway Act of 1956, large sums of monies became available that would permit the accelerated construction of the National System of Interstate and Defense Highways. Tampa is fortunately situated in that it is located in the route corridor of two designated Interstate Highways; these are depicted in Figure 2. Recognizing the inability of at-grade streets to carry expeditiously and economically the large volumes of traffic generated by metropolitan areas of any magnitude, it is readily apparent that Tampa's location in regard to the Interstate Highway System is fortuitous. Since funds are available for the construction of Interstate Highways, a major portion of the highway needs for the area, the basic expressway system, can now be financed and construction initiated.

Fully recognizing the need for a comprehensive study of an integrated expressway and arterial highway system for the Tampa Metropolitan area, the State Road Department of Florida, jointly with the County of Hillsborough and the City of Tampa, engaged Wilbur Smith and Associates to develop a Master Highway Transportation Plan for the Tampa Area. The geographic limits of the study area are defined as the city limits of Tampa on the north, Tampa Bay on the west, Hillsborough Bay on the south, and U. S. Route 301 on the east. The development of basic planning data and necessary field studies were initiated in November of 1956. The report, as contained herein, is an objective, factual study of traffic needs, roadway facilities and terminal parking necessary to meet these needs. The arterial street system necessary to supplement and complement the interstate highways traversing the area is recommended, together with detailed functional plans for the proposed expressway system. All traffic needs were evaluated in terms of projected 1975 traffic requirements.

Prior Investigations

The Federal Aid Highway Act of 1944 crystalized the sentiment that state and federal authorities have a responsibility, jointly with local authorities, in solving urban traffic problems. The federal legislation made available federal monies for aid in the extension of the primary and secondary highway systems into urban



INTERSTATE HIGHWAY SYSTEM

STATE OF FLORIDA

1957

Wilbur Smith and Associates

FIGURE 2

areas and, in addition, provided highway planning survey funds for traffic studies and preliminary planning in urban areas. In the forefront of the states that had already recognized their responsibility in this regard, the State Road Department of Florida, in cooperation with the Public Roads Administration (now designated the U. S. Bureau of Public Roads), conducted a comprehensive metropolitan area traffic survey[2] in 1946 to determine the origin and destination of all vehicle trips within the study area and to determine the magnitudes of these movements. The study consisted of several different parts. The origin and destination of external trips, both through trips and trips with one terminus within the study area, were obtained at roadside interview stations. An internal survey was made by questioning a ten per cent sample of the residents of dwelling units within the study area. Also, data were obtained on trucks and taxis.

In 1953, another comprehensive survey was made of the Tampa metropolitan area. In this study the origin and destination of external traffic, population distribution within the study area, traffic volumes upon the more important streets, and vehicle travel times were determined.

The Traffic and Planning Division of the Florida State Road Department made, at the request of city officials, a comprehensive parking survey in 1956 and 1957. Beside obtaining factual data on the supply and usage of existing parking facilities, and determining demands for parking space as evidenced by the destination and trip purpose of motorists, this survey provided additional internal traffic origin and destination data.

A preliminary engineering report[3] on the Interstate System for the Tampa Area was prepared by the Division of Traffic and Planning of the State Road Department in March of 1957. The report presented a recommended location, schematic plan and approximate profile for the interstate routes through the Tampa urban area.

Additional reports reviewed and analyzed as part of this study included the comprehensive reports[4] prepared for the City of Tampa by its planning consultant. The sections relating to transportation, streets and highways, and land uses were of particular interest.

These previous studies are subsequently discussed in greater detail.

General Plan of Study

The development of a comprehensive master highway transportation plan for the Tampa metropolitan area was undertaken in several steps. First, it was neces-

[2] "A Traffic Survey Report and Limited Access Highway Plan for the Tampa Metropolitan Area", by the Division of Research and Records of the State Road Department of Florida in cooperation with the Public Road Administration, Federal Works Agency, 1946-1947.

[3] "Tampa Interstate Routes, Preliminary Geometric Design, 1957," compiled by Division of Traffic and Planning, State Road Department of Florida, in cooperation with U. S. Department of Commerce, Bureau of Public Roads.

[4] "Comprehensive Plan for the City of Tampa, Florida, 1956-1957" (1951 and 1945) prepared by George W. Simons, Jr., Planning and Zoning Consultant, Jacksonville, Florida.

sary to review all existing traffic studies and planning data to determine what additional information should be procured. With the wealth of information available,[5] additional machine and manual vehicle classification counts at a screenline along the Hillsborough River and at the locations of external interview stations used in the 1946 and 1953 studies, together with other available traffic volume count data obtained periodically by the State Road Department, would suffice to determine the present traffic levels on the major streets and highways in the study area. The available origin-destination information was considered adequate to determine past and present travel patterns.

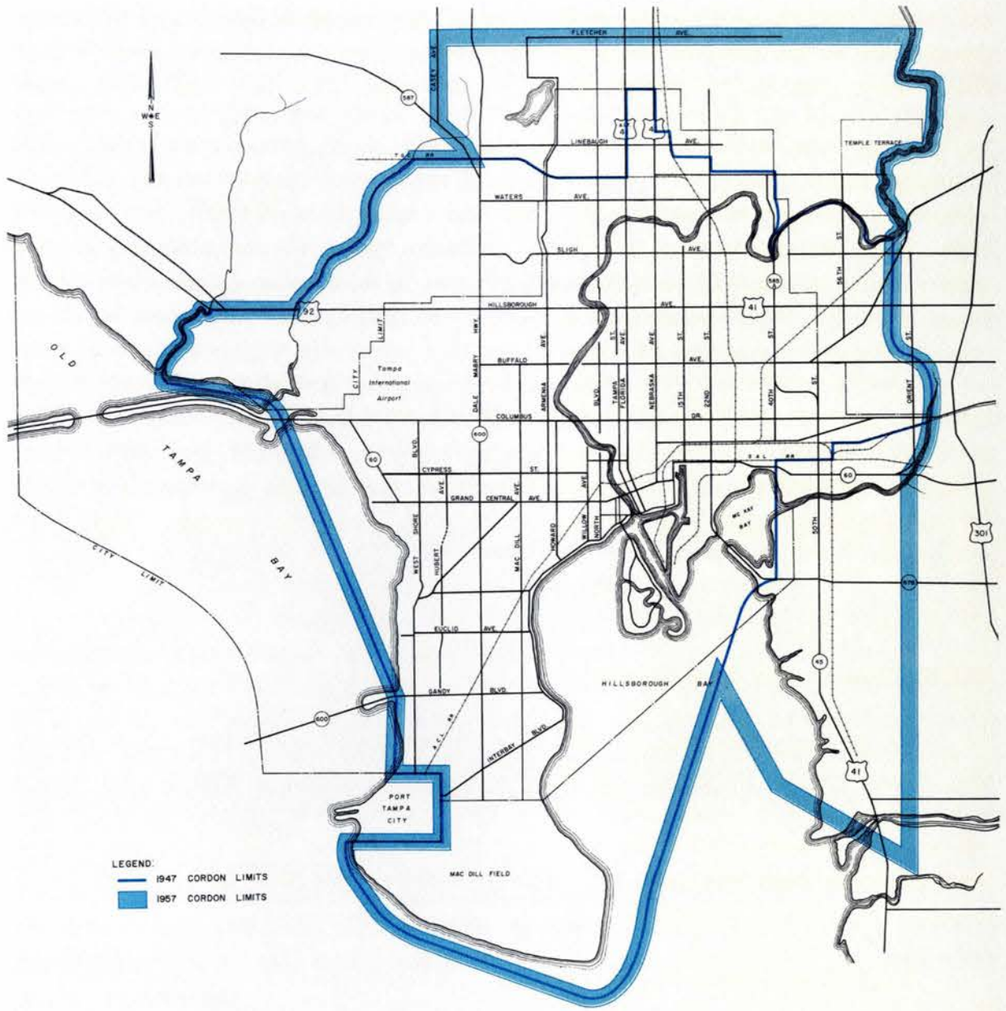
Assistance[6] was obtained to develop data on past, present and likely future distributions of population, labor force, employment, motor vehicle registration, and retail sales throughout the study area, subdivided for study purposes. This information was used in analyzing basic travel characteristics from previous traffic studies, and in synthesizing a 1975 traffic pattern. Due to the enlargement of the built-up portion of the Metropolitan Area, it was necessary to extend the limits of the previous comprehensive traffic study (see Figure 3).

A duplicate set of the statistical interview cards, developed in the 1946-1947 survey, were provided by the State Road Department. From these cards, the travel characteristics of the residents of the study area were developed. Analyses of home-interview studies made in other cities indicate that generation of travel between areas can be very closely approximated by correlating travel time and distance to population, employment, labor force, commercial and industrial activity, motor vehicle registration, and other factors. Using the specific characteristics of travel for the Tampa area, it was possible to synthesize a 1975 travel pattern utilizing the planning data previously developed.

The projected 1975 travel pattern was carefully analyzed to locate the primary travel corridors, the locations where the greatest number of vehicle movements would be served by construction of a new highway facility. Having determined the primary travel corridors, and having weighed these traffic demands against ex-

[5]The 1946-1947 report, "A Traffic Survey Report and Limited Access Highway Plan for the Tampa Metropolitan Area", prepared by the Division of Research and Records of the State Road Department of Florida in cooperation with the Public Roads Administration; the 1953 Tampa Metropolitan Area traffic survey conducted by the State Road Department with the cooperation of the City of Tampa; the 1956-57 Tampa Central Business District Parking Survey made by the Traffic and Planning Division of the State Road Department of Florida in cooperation with the U. S. Bureau of Public Roads; and, the 1957 report prepared by the Division of Traffic and Planning of the State Road Department of Florida in cooperation with the U. S. Bureau of Public Roads, entitled, "Tampa Interstate Routes, Preliminary Geometric Design".

[6]Traffic and Trade, Inc., New Haven, Connecticut.



LIMITS OF STUDY

TAMPA METROPOLITAN AREA

1957

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FIGURE 3

isting capacity provided by the present street network, field reconnaissance studies were made to find specific route locations which would give proper weight to traffic services, damages to existing developments, construction and right-of-way costs.

Next, detailed traffic assignments were made to the recommended route. The estimated traffic volumes on the proposed expressway were used in developing the geometrics of the new facility, providing basic indications of needs for number of lanes, types of interchanges, and street capacity. Once the geometrics, plan and profile had been finalized, construction and right-of-way costs were determined. Functional plans for the proposed expressway system are discussed subsequently.

Having established the location and extent of the recommended expressway system, a forecast was made of traffic demands upon the surface streets, and, upon an arterial highway system to complement and supplement the recommended expressway construction. The effect of recommended arterial street widening and traffic regulations upon parking supply and the inadequacy of terminal parking facilities in the downtown area were also evaluated.

Traffic Studies and Investigations

In the above discussion of the general plan of study, consideration was given to the present pattern of travel, but the anticipated future travel desires were emphasized. It was clearly pointed out that the major source of objective data for the survey was the projected patterns of travel desires for 1975. While the data revealed by these projections are basic to the findings and recommendations, it must be understood that other investigations and surveys were undertaken.

Basic Traffic Studies — In addition to the comprehensive origin and destination data procured from the State Road Department, up-to-date information was collected on traffic volumes and classifications, transit services, parking, and the quality of traffic flow on key streets. Extensive traffic volume counts were made to determine the complete pattern of travel for 1957. This information was collected throughout the central business district and elsewhere in the metropolitan area as required to fully understand the magnitude and characteristics of present traffic flow. In obtaining the traffic data, particular emphasis was placed upon peak hour travel which was segregated and analyzed separately from off-peak traffic volumes. Manual counts, consisting of classifying passenger cars and commercial vehicles, by type, were also procured. At all locations, mechanical counters were used to obtain volume counts over a more extended base period.

Extensive speed and delay surveys were undertaken on all major thoroughfares traversing the survey area. These studies were undertaken by the "floating with traffic" method. The speed of movement on key streets was determined for both peak and off-peak conditions. In connection with the speed and delay studies, data were recorded as to the principal causes of delay and congestion.

Planning Studies — Field survey teams were used to undertake a complete arterial street inventory. Information secured was concerned with the ability of streets to move traffic, including the location of traffic signals, whether the street operations were one-way or two-way, the number of travel lanes available, the number of parking lanes available, and parking regulations in effect during the different periods of the day. The width of pavement and the width of street rights-of-way were obtained from the records of the City Department of Public Works. The types of development traversed by arterial routes were also very carefully noted and classified as downtown business, intermediate, commercial, residential, and rural. Speed limits, special intersection treatments, the location and description of special traffic signal controls, and whether the streets were divided or undivided were also noted.

Location Studies — All physical factors affecting the feasibility of location and construction were carefully observed. Particular attention was given to topography, drainage, and land use. Special consideration was given to proposed plans for civic improvements, the construction of public buildings, existing and planned churches and schools, and other land uses which would substantially affect the integration of route location with over-all city plans.

Realizing the essentiality of careful integration of the expressway and major street plans with comprehensive city planning, special efforts were exerted to determine all of the planning objectives of the city and the involved county area. It was fortunate that the city was having its basic plans re-examined by a planning consultant during the time of this survey. From the city's planning consultant, it was possible to procure very valuable information on recommended changes in land use. The proposed location of civic improvements, and other factors affecting urban planning that should be given recognition in developing the location of the expressway system were furnished.

Every effort was directed to ascertaining present and future plans relative to public housing and future residential, commercial and industrial development. The general pattern of land use and the suitability of present land uses to the planning objectives of the city were also taken into account. Possible urban re-development and public housing projects were given special consideration in the studies aimed at determining the most suitable expressway location, particularly in the general vicinity of the central business district.

Plans already underway for major highway facilities, such as new bridges, were studied and related to the findings of this investigation.

In brief, a basic objective of all the studies was to properly relate the proposed expressway and highway facilities to over-all metropolitan planning. If the comprehensive planning studies and major transportation plans had not been brought into proper relationship and focus, the future growth and development of the metropolitan area could be adversely affected.

Right-of-Way Acquisition — To procure estimates of right-of-way cost, licensed local appraisers were employed. Excellent cooperation was obtained in expediting a thorough evaluation of preliminary right-of-way cost estimates. Each appraiser was furnished with aerial photographs and plats upon which the areas of necessary property acquisition were delineated. In several instances alternate alignments were studied and in each case, the right-of-way requirements were considered separately by the appraisers.

The appraisers were instructed to make every effort to evaluate the right-of-way costs in terms of present market values, weighing separately the land and improvement values.

Parking and Terminal Data — Complete information was procured from the Florida State Road Department on parking characteristics and needs. As a part of this information, the state also furnished an excellent cordon count of the core area of Tampa. This information was supplemented by observations of curb use, and land uses.

Basic Regulations and Devices — As already indicated, complete information was obtained relative to one-way streets, turning controls, traffic signals, pedestrian controls, and other basic regulations and devices now in effect in the survey area. This information was particularly pertinent in the development of street sufficiencies. It was also significant in preparing the functional plans for expressways, and especially plans for the interchanges.

Again, it was necessary to give particular attention to the proposed changes in present regulations and controls being considered by local authorities.

Other Data — Through the Florida State Road Department, local construction cost data were obtained.

The State Road Department also procured and furnished aerial photography and valuable base maps.

From the local transit company, data were procured on trends and present practices in the use of mass transportation. Pertinent facts concerning routing, schedules, and operations throughout the area were also provided.

Records of bridge openings, height requirements of boats, and other data relative to waterway-highway conflicts were furnished by the appropriate city and state agencies.

Chapter II
TRAFFIC AND PLANNING VALUES

It is customary to think in terms of present traffic congestion, but to plan and design for traffic volumes anticipated for some future year. Since the Federal-Aid Highway Act of 1956 provided that the Interstate System "shall be adequate to accommodate the types and volumes of traffic forecast for the year 1975,"[7] the proposed Tampa Expressway System and arterial street plans were developed, assuming 1975 as the design year. While present traffic congestion is an accurate measure of the adequacy of the existing surface streets, the origins and destinations of traffic forecast for a design year are a more appropriate method of evaluating the need and proper location of additional traffic arteries to facilitate and expedite travel within the urban area.

GENERAL TRAFFIC CONDITIONS

Traffic volumes on the existing streets in a metropolitan area, when related to the degree of congestion, or inability of the streets to move traffic freely, are a good indication of the adequacy of the present street network to serve existing traffic movements, realizing that the pattern of movement might be influenced by available street capacity as much as by basic terminii. Many of Tampa's more important traffic arteries are presently overloaded and congested. The ability of a surface street to move traffic freely, safely and efficiently, with a minimum of delay, is controlled principally by the intersections of one street with another and by pavement widths. Therefore, the capacity of the street can be increased by restricting parking, turning movements, and by the application of other traffic engineering techniques. The introduction of one-way streets can materially increase the capacity of streets. The one-way street grid in the downtown area of Tampa is perhaps the primary reason why complete traffic stagnation is not found today throughout the central business core.

Tampa's downtown problem is complicated by the location of the central business area in relation to the Hillsborough River and Hillsborough Bay, and by the numerous railroad tracks and freight terminals that bisect the central business district in an east-west direction, encircling it on the west, south, and east. The inadequacy of the existing highways providing access and egress to the central business area is demonstrated by the traffic congestion prevalent at the Platt and Lafayette Street Bridges, at the intersection of Frank Adamo Drive and 13th Street, and at many other locations.

[7]Sec. 108 (i) Standards, Federal-Aid Highway Act of 1956.

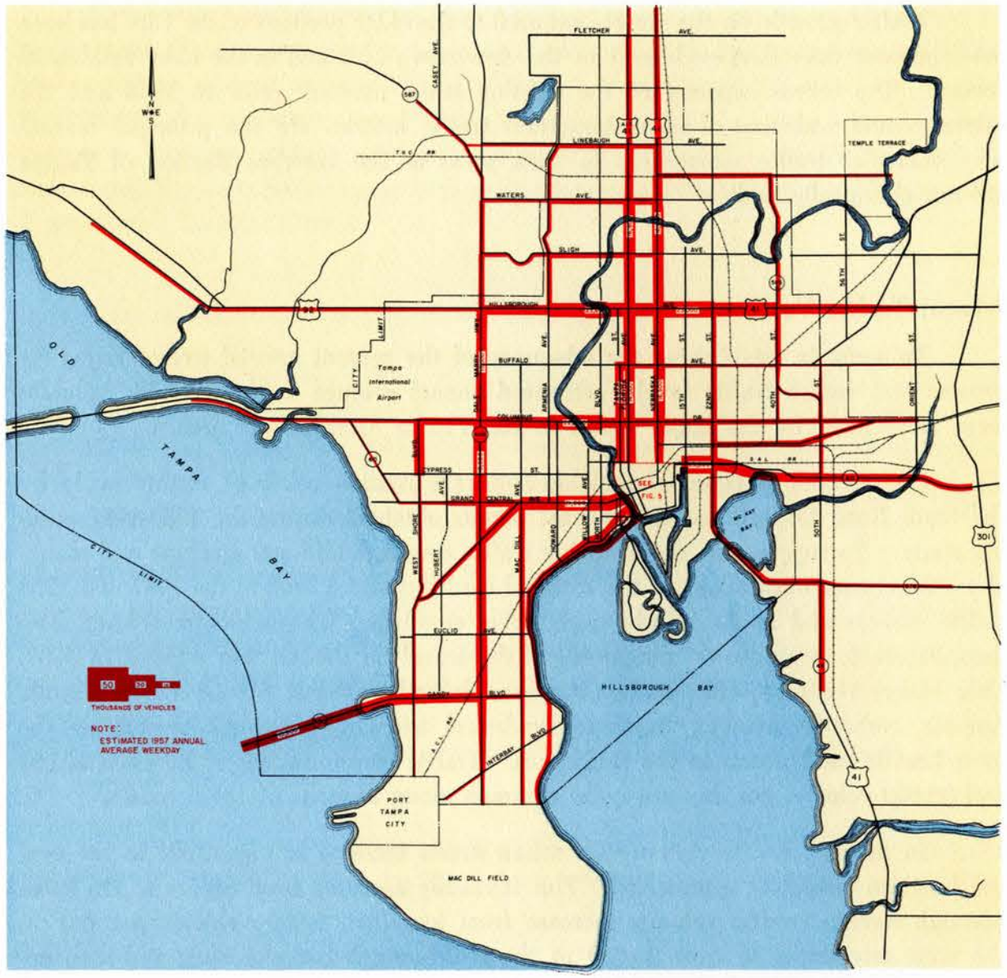
Traffic growth on the streets external to the older portions of the City has been much greater than that evidenced in the downtown area and in the older residential sectors. The excess capacity of the existing street network prior to 1946 and the extension and widening of many important traffic arteries are the principal reasons why vehicular traffic movements in such areas as the Interbay Section of Tampa are not chronically bad.

Present Traffic Volumes

To assist in establishing the adequacy of the present arterial street system for present and future traffic levels, estimated annual average weekday traffic volumes were ascertained for the major routes in the Tampa Metropolitan area.

Considerable data were available from the routine coverage counts made by the State Road Department and special counts obtained during the 1956-1957 parking study. To supplement the available traffic counts, additional machine and manual traffic counts were taken at the external cordon stations used in the 1947 and 1953 traffic surveys and at the Hillsborough River crossings. The vehicular volume flow map, Figure 4, illustrates the magnitude of the travel on the existing arteries in 1957. Dale Mabry Highway, Hillsborough Avenue, Columbus Drive, Adamo Drive, Florida Avenue, Nebraska Avenue, Bayshore Boulevard and Grand Central Avenue are the most heavily used streets in the study area. Traffic concentrations of between 20,000 and 30,000 vehicles per day are quite common along sections of these routes.

In general, traffic volumes on urban streets increase in magnitude as the central business district is approached. This is readily apparent from Figure 4. On Hillsborough Avenue, traffic volumes increase from less than 5,000 vehicles per day at the west city limits to over 23,000 at the Hillsborough River crossing and then decrease gradually to less than 12,000 vehicles per day at the east city line. A similar situation exists on Columbus Drive where traffic volumes grow from a level of 8,000 vehicles per day over the Courtney Campbell Causeway to a concentration of 22,000 vehicles per day over the Hillsborough River, dropping to 6,500 vehicles per day at the east city limits. Even more striking is the increase in traffic along Grand Central Avenue as it approaches the central business district. At its intersection with Memorial Highway, Grand Central Avenue carries approximately 2,500 vehicles per day. This volume increases rapidly to a level of 21,000 vehicles per day over the Hillsborough River. On Frank Adamo Drive, at the east city line, the present aver-



1957 TRAFFIC VOLUME FLOW

METROPOLITAN AREA
TAMPA, FLORIDA
1957

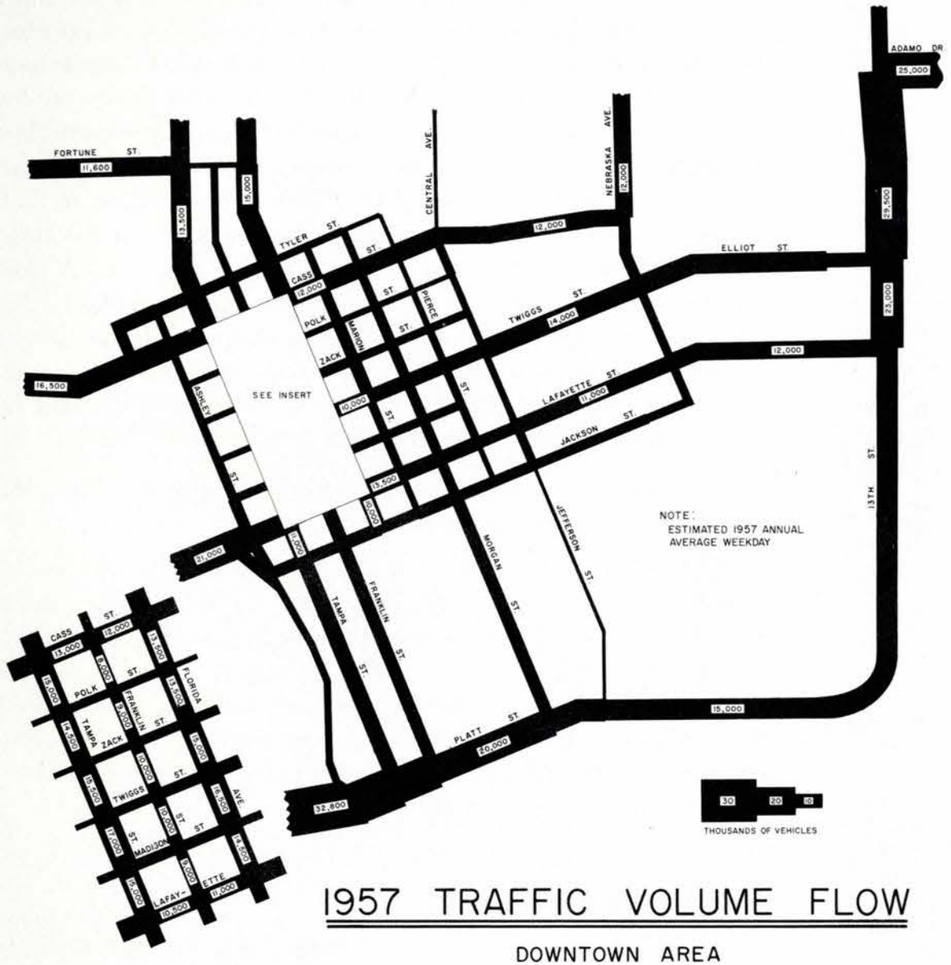
Wilbur Smith and Associates FIGURE 4

age week-day traffic volumes approximate 9,000 vehicles. This magnitude increases to over 25,000 vehicles at the intersection of Adamo Drive and 13th Street.

In a north-south direction, traffic volumes on Dale Mabry Highway increase from slightly over 4,000 vehicles per day south of Interbay Boulevard to a high of almost 19,000 vehicles per day between Grand Central Avenue and Columbus Drive, decreasing to a level of 7,000 vehicles per day at the north city line. Florida Avenue and Nebraska Avenue from the north city line southerly to Buffalo Avenue carry comparable traffic volumes. The traffic level varies from 7,500 vehicles per day near Fowler Avenue to approximately 16,000 vehicles per day at the Hillsborough River, continuing at this level to Buffalo Avenue. From Buffalo Avenue southerly, Florida Avenue is a one-way facility carrying 14,000 vehicles per day northbound and Tampa Street, the southbound artery, carries approximately 12,500 vehicles per day. Nebraska Avenue is estimated to carry an annual average weekday traffic volume in excess of 16,000 vehicles between Buffalo Avenue and Columbus Drive, decreasing slightly to 15,000 and then decreasing to 12,000 south of Henderson Avenue.

Significant Volume Changes — It is interesting to make comparisons between the present traffic level and that of a decade ago. At the outer cordon stations, the total volume of traffic entering the study area has increased over 50 per cent. At the screenline stations along the Hillsborough River, from Platt Street northerly and easterly to 40th Street, present day traffic volumes are over twice those of 1947. The growth of the Interbay Area is demonstrated by the heavy traffic movements on Dale Mabry Highway, MacDill Avenue, Gandy Boulevard, Henderson Boulevard and other streets.

The growth in traffic volumes upon the streets in the central business district has also been of considerable magnitude. Figure 5 shows traffic volume flow in the central business area for an average weekday in 1957. Traffic volumes entering the downtown area average over 50 per cent higher than those measured in 1947. In general, the growth of the central business district to the east and southeast has increased the traffic volumes upon the streets in these areas to a larger extent than the more intensively developed westerly sections of the downtown area. Also, with heavy traffic loadings on Tampa Street and Florida Avenue, more traffic now uses the other available streets to leave the downtown area in a northerly direction. Traffic entering and leaving the central business district from the east over Twiggs Street and Lafayette Street has doubled. Traffic on 13th Street from Adamo Drive southerly to Lafayette Street has almost doubled.



1957 TRAFFIC VOLUME FLOW

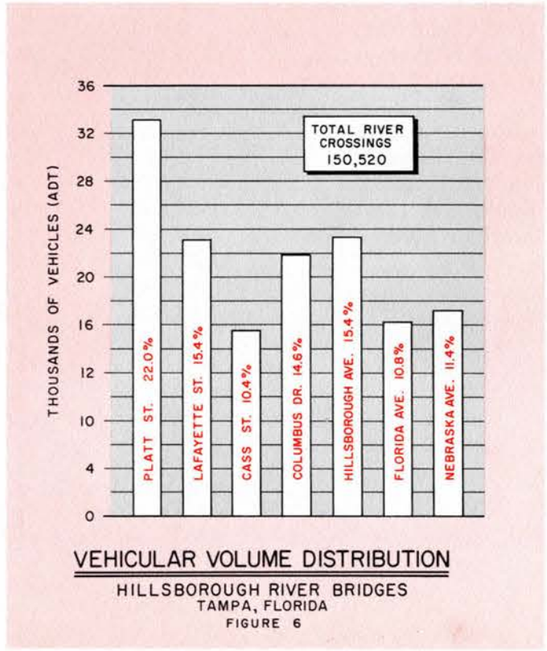
DOWNTOWN AREA
TAMPA, FLORIDA
1957

Wilbur Smith and Associates FIGURE 5

Table I shows the estimated 1957 average weekday traffic volumes at the cordon and screenline stations. In Table II the 24-hour and 16-hour manual classification counts at the same cordon and screenline stations are summarized by type of vehicle. While the relation of the average weekday traffic volumes of 1947 to 1957 is of considerable interest, the peak hour traffic is a more accurate measure of traffic loadings and congestion.

Peak Hour Volumes — An adequate street system must provide efficient traffic capacity for the relatively brief, but frequently repeated rush-hour periods. In metropolitan areas, the peak travel periods occur in the early morning and late afternoon. It was found that in Tampa the afternoon peak travel period is greater than the morning. Table III shows the peak hour volumes for the outer cordon stations and bridge crossings of the Hillsborough River. The directional distributions of traffic and the composition of traffic during the peak afternoon periods are also shown. In general, the peak period occurs in the afternoon some time between the hours of 4:00 P. M. and 6:00 P. M.

Peak hour traffic volumes are often expressed as a per cent of the daily traffic volume that occurs during that period. The per cent of peak hour traffic is generally in the range of eight to twelve per cent of total daily traffic volume. This was found to be true in Tampa, with few exceptions. Dale Mabry Highway, MacDill Avenue, and Bayshore Boulevard south of Interbay Boulevard were notable exceptions. The higher percentage of travel occurring in the peak hour period at these locations is due to the heavy traffic to and from MacDill Air Force Base.



VEHICULAR VOLUME DISTRIBUTION
HILLSBOROUGH RIVER BRIDGES
TAMPA, FLORIDA
FIGURE 6

It is interesting to note the wide variance in traffic composition on these major arteries. The per cent of trucks in the traffic stream during peak travel periods varies from less than one per cent on Dale Mabry Highway and Bayshore Boulevard near the entrance to MacDill Air Force Base to relatively heavy concentrations of 10 per cent on Harney Road and Nebraska Avenue.

Hillsborough River Bridge Volumes — For the eleven major crossings of the Hillsborough River from Platt Street northerly and easterly to 40th Street, present day peak hour traffic volumes approach the estimated practical capacity of

TABLE I

ESTIMATED 1957 AVERAGE WEEKDAY TRAFFIC VOLUMES
CORDON AND SCREENLINE STATIONS
TAMPA, FLORIDA

Station		1957 Average Weekday Traffic Volumes			
Number	Location	Passenger Cars	Trucks	Buses[1]	All Vehicles
01	22nd Street Causeway at City Line	6,600	1,780	20	8,400
02[2]	Adamo Drive, East of 50th Street	8,230	2,630	40	10,900
03	East Broadway at 6 Mile Creek	4,800	1,660	40	6,500
04	East Hillsborough Avenue, East of Orient Road	6,940	1,640	20	8,600
05	Harney Road, North of East Sligh	1,090	300	10	1,400
06	Temple Terrace, East of 45th Street	3,390	800	10	4,200
07	Nebraska Avenue at North City Line	5,570	1,860	70	7,500
08	Florida Avenue, North City Line	6,540	920	40	7,500
09	Linebaugh Avenue, West of Florida Avenue	5,740	930	30	6,700
10	North Boulevard, North of Tampa Gulf Coast Railroad	4,030	400	70	4,500
11	Armenia Avenue, North of Tampa Gulf Coast Railroad	4,150	850	0	5,000
12	Gunn Highway, North of Tampa Gulf Coast Railroad	2,680	700	20	3,400
13	West Hillsborough, West of Memorial Highway	3,180	410	10	3,600
14	Columbus Drive, East of Campbell Courtney Causeway	7,290	980	30	8,300
15	East of Gandy Bridge	13,790	2,020	90	15,900
21	West Shore Boulevard at Port Tampa City Line	1,220	360	20	1,600
22	Interbay Boulevard at Port Tampa City Line	1,230	450	20	1,700
23	Dale Mabry, South of Interbay Boulevard	4,050	140	10	4,200
24	MacDill Avenue, South Interbay Boulevard	4,830	490	80	5,400
25	Bay Shore Boulevard, South of Interbay Blvd.	4,700	190	10	4,900
31	Platt Street Bridge	28,800	3,870	130	32,800
32	Lafayette Street Bridge	18,390	2,210	400	21,000
33	Cass Street Bridge	13,820	2,390	290	16,500
34	Fortune Street Bridge	9,440	2,140	20	11,600
35	Garcia Street Bridge	9,630	1,670	0	11,300
36	Columbus Drive Bridge	18,880	3,080	40	22,000
37	Hillsborough Avenue Bridge	19,940	3,610	50	23,600
38	Sligh Avenue Bridge	6,200	880	20	7,100
39	Florida Avenue Bridge	14,380	1,880	140	16,400
40	Nebraska Avenue Bridge	12,940	2,830	230	16,000
41	40th Street Bridge	4,750	1,140	10	5,900

[1]Buses include school buses.

[2]This is not the location of Station #2 used in previous traffic studies.

the combined crossings, indicating that there is no reserve for future traffic growth. The vehicular volume distribution for seven principal bridges is graphically depicted in Figure 6. It is noted that the most severely overloaded river crossing is the Platt Street Bridge serving the Interbay Area. The Nebraska Avenue and Florida Avenue Bridges are operating beyond their practical capacity and the Lafayette Street, Garcia Street, and Columbus Drive Bridges are operating at their practical capacities. There is a small reserve capacity on the Hillsborough Avenue structure and the Sligh Avenue structure. A close scrutiny of traffic loadings on the individual crossings indicates that while some are operating at their practical capacity which implies no undue congestion, others are operating well above their practical capacity and additional traffic volumes can only be accommodated by increasing the present congestion and delays.

Hourly traffic volumes for the principal bridges are graphically depicted in Figures 7A-7D.

It was determined that the Cass Street structure could accommodate approximately 20 per cent more traffic without causing excessive delays and the Fortune Street Bridge could carry approximately 50 per cent more traffic. However, as is often the case, the excess capacity is not provided at the locations serving the greatest traffic demand, and many motorists now use crossings that entail considerable adverse travel to circumvent more direct crossings which are presently overloaded.

Impediments to Traffic Flow

There are many different sources of friction that result in reduced traffic capacity for a given street width. The volume of traffic a street can carry is in direct proportion to the width of pavement available for the movement of traffic. In this connection, parking practices determine to a large extent the ability of a given street to carry traffic. Other major considerations that influence traffic capacity are the amount of intersection interference due to traffic signals, turning movements, pedestrians, transit vehicles, and the lack of continuity in the street system.

Table II

SUMMARY MANUAL CLASSIFICATION COUNTS

Tampa, Florida

Station No.	Description	Day	Date	Duration	Passenger Cars		Single Unit Trucks		Comb. Trks.	Buses	Total Vehicles
					Florida	Other	Pickup & Panel	Other			
01	22nd Street Causeway at City Line	Mon.	3/18/57	7 AM-11 PM	4,928	1,069	810	475	347	24	7,653
02	Adamo Drive, East of 50th Street	Tues.	3/19/57	12 AM-12 AM	6,751	1,378	1,050	761	785	39	10,764
03	East Broadway at Six Mile Creek	Mon.	3/18/57	7 AM-11 PM	4,404	280	892	516	207	36	6,335
04	East Hillsborough Avenue, East of Orient Road	Mon.	3/18/57	7 AM-11 PM	4,722	2,359	781	407	498	27	8,794
05	Harney Road, North of East Sligh	Tues.	3/19/57	7 AM-11 PM	1,266	74	238	96	27	7	1,708
06	Temple Terrace, East of 45th Street	Tues.	3/19/57	7 AM-11 PM	2,872	296	463	233	41	8	3,913
07	Nebraska Avenue at North City Line	Tues.	3/19/57	7 AM-11 PM	3,689	1,174	799	471	351	63	6,547
08	Florida Avenue, North City Line	Wedns.	3/20/57	7 AM-11 PM	4,904	1,200	530	205	121	34	6,994
09	Linebaugh Avenue, West of Florida Avenue	Wedns.	3/20/57	7 AM-11 PM	5,306	483	623	260	50	29	6,751
10	North Boulevard, North of Tampa Gulf Coast Railroad	Wedns.	3/20/57	7 AM-11 PM	3,024	96	243	70	7	60	3,500
11	Armenia Avenue, North of Tampa Gulf Coast Railroad	Fri.	3/22/57	7 AM-11 PM	4,235	425	588	304	51	6	5,609
12	Gunn Highway, North of Tampa Gulf Coast Railroad	Wedns.	3/20/57	7 AM-11 PM	2,508	203	482	224	8	19	3,444
13	West Hillsborough, West of Memorial Highway	Thurs.	3/21/57	7 AM-11 PM	3,195	1,065	317	164	72	12	4,825
14	Columbus Drive, East of Campbell Courtney Causeway	Fri.	3/22/57	12 AM-12 AM	6,908	3,102	683	452	204	46	11,397
15	East of Gandy Bridge	Thurs.	3/21/57	12 AM-12 AM	10,644	4,073	1,051	702	408	124	17,002
21	West Shore Boulevard at Port Tampa City Line	Thurs.	3/21/57	7 AM-11 PM	1,813	90	222	119	217	32	2,493
22	Interbay Boulevard at Port Tampa City Line	Wedns.	3/27/57	7 AM- 3 PM	700	123	443	79	17	15	1,135
23	Dale Mabry, South of Interbay Boulevard	Mon.	3/25/57	7 AM-11 PM	4,249	971	112	41	30	12	5,415
24	MacDill Avenue, South of Interbay Boulevard	Mon.	3/25/57	7 AM-11 PM	5,243	607	445	147	8	96	6,546
25	Bay Shore Boulevard, South of Interbay Boulevard	Mon.	3/25/57	7 AM-11 PM	3,889	839	142	40	5	9	4,924
31	Platt Street Bridge	Mon.	3/18/57	12 AM-12 AM	27,528	2,441	2,296	1,220	497	132	34,114
32	Lafayette Street Bridge	Wedns.	3/20/57	12 AM-12 AM	19,864	2,365	1,879	586	209	484	25,387
33	Cass Street Bridge	Tues.	3/19/57	7 AM-11 PM	10,608	506	1,346	504	83	235	13,282
34	Fortune Street Bridge	Thurs.	3/21/57	7 AM-11 PM	6,824	213	1,160	409	32	13	8,651
35	Garcia Street Bridge	Fri.	3/22/57	7 AM-11 PM	7,727	230	1,007	357	16	0	9,337
36	Columbus Drive Bridge	Fri.	3/22/57	7 AM-11 PM	17,123	1,136	2,080	761	133	53	21,286
37	Hillsborough Avenue Bridge	Mon.	3/25/57	12 AM-12 AM	16,409	2,803	2,287	809	383	42	22,733
38	Sligh Avenue Bridge	Fri.	3/29/57	7 AM-11 PM	5,779	191	710	125	1	23	6,829
39	Florida Avenue Bridge	Thurs.	3/21/57	7 AM-11 PM	12,115	1,383	1,296	385	87	137	15,403
40	Nebraska Avenue Bridge	Mon.	3/25/57	7 AM-11 PM	10,157	1,523	1,589	655	328	216	14,468
41	40th Street Bridge	Mon.	3/25/57	7 AM-11 PM	3,959	270	708	276	35	14	5,262

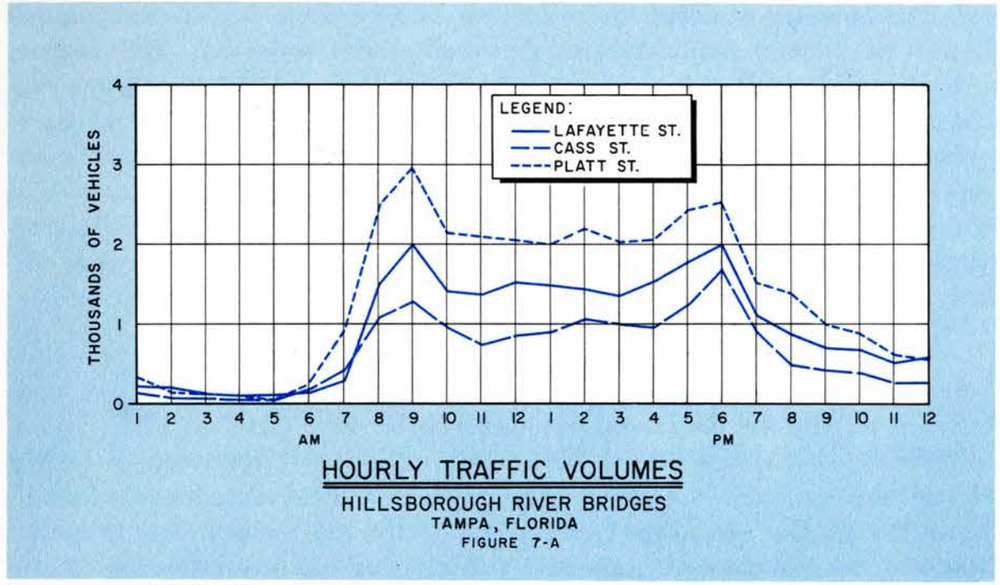
TABLE III

TYPICAL PEAK HOUR TRAFFIC CHARACTERISTICS

TAMPA, FLORIDA

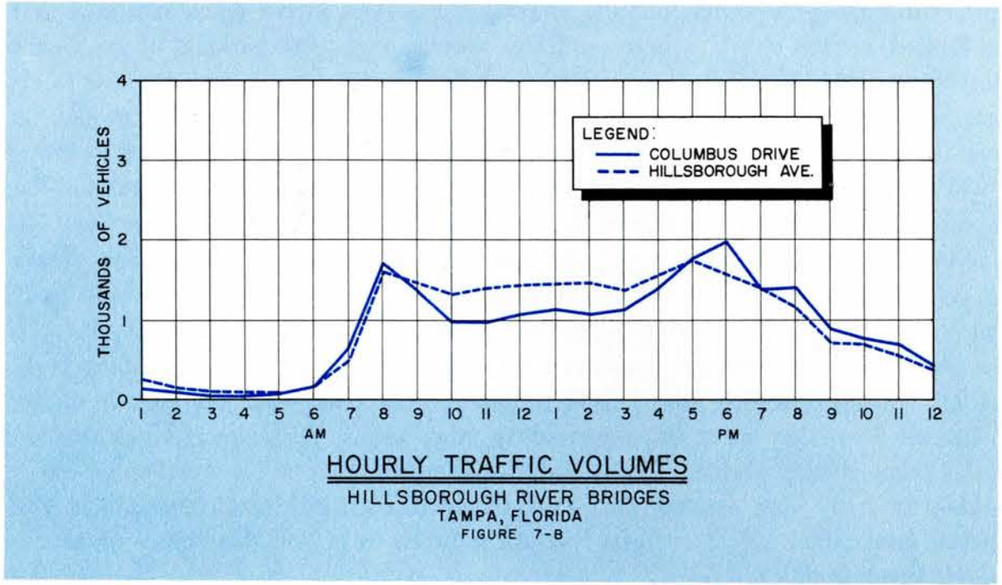
Station Number	Station Description	Peak Hour Volume	1957 ADT*	Percent Peak Hour Traffic is of ADT	Heavier Direction of Travel	Directional Distribution of Traffic	Composition (Percent Trucks)
01	22nd Street Causeway at City Line	830	8,400	10	NB	60 — 40	8
02	Adamo Drive, East of 50th Street	1,020	10,900	9	EB	60 — 40	8
03	East Broadway at 6 Mile Creek	630	6,500	10	EB	60 — 40	9
04	East Hillsborough Avenue, East of Orient Road	890	8,600	10	WB	50 — 50	9
05	Harney Road, North of East Sligh Avenue	140	1,400	10	NB	60 — 40	10
06	Temple Terrace, East of 45th Street	470	4,200	11	WB	50 — 50	5
07	Nebraska Avenue at North City Line	590	7,500	8	NB	60 — 40	10
08	Florida Avenue at North City Line	710	7,500	9	NB	65 — 35	4
09	Linebaugh Avenue, West of Florida Avenue	630	6,700	9	WB	50 — 50	2
10	North Blvd. N. of Tampa Gulf Coast RR	460	4,500	10	SB	55 — 45	6
11	Armenia Ave., N. of Tampa Gulf Coast RR	560	5,000	11	SB	80 — 20	5
12	Gunn Hwy., N. of Tampa Gulf Coast RR	370	3,400	11	NB	60 — 40	5
13	West Hillsborough, West of Memorial Highway	350	3,600	10	EB	60 — 40	6
14	Columbus Drive, East of Campbell Courtney Causeway	1,020	8,300	12	EB	50 — 50	5
15	East of Gandy Bridge	1,550	15,900	10	EB	50 — 50	6
21	West Shore Blvd. at Port Tampa City Line	190	1,600	12	NB	50 — 50	13
22	Interbay Blvd. at Port Tampa City Line	200	1,700	12	EB	65 — 35	6
23	Dale Mabry, South of Interbay Boulevard	700	4,200	17	SB	80 — 20	—
24	MacDill Avenue, South of Interbay Boulevard	970	5,400	18	SB	55 — 45	3
25	Bayshore Blvd., South of Interbay Boulevard	660	4,900	13	NB	75 — 25	—
31	Platt Street Bridge	3,050	32,800	9	EB	70 — 30	7
32	Lafayette Street Bridge	2,470	21,000	12	WB	70 — 30	3
33	Cass Street Bridge	1,600	16,500	10	WB	70 — 30	4
34	Fortune Street Bridge	1,030	11,600	9	WB	75 — 25	3
35	Garcia Street Bridge	1,060	11,300	9	NB	60 — 40	3
36	Columbus Drive Bridge	2,080	22,000	9	WB	55 — 45	6
37	Hillsborough Avenue Bridge	1,860	23,600	8	EB	55 — 45	4
38	Sligh Avenue Bridge	830	7,100	12	WB	55 — 45	1
39	Florida Avenue Bridge	1,490	16,400	9	NB	65 — 35	3
40	Nebraska Avenue Bridge	1,240	16,000	8	NB	55 — 45	6
41	40th Street Bridge	520	5,900	9	NB	55 — 45	3

*Estimated 1957 weekday annual average daily traffic volume.



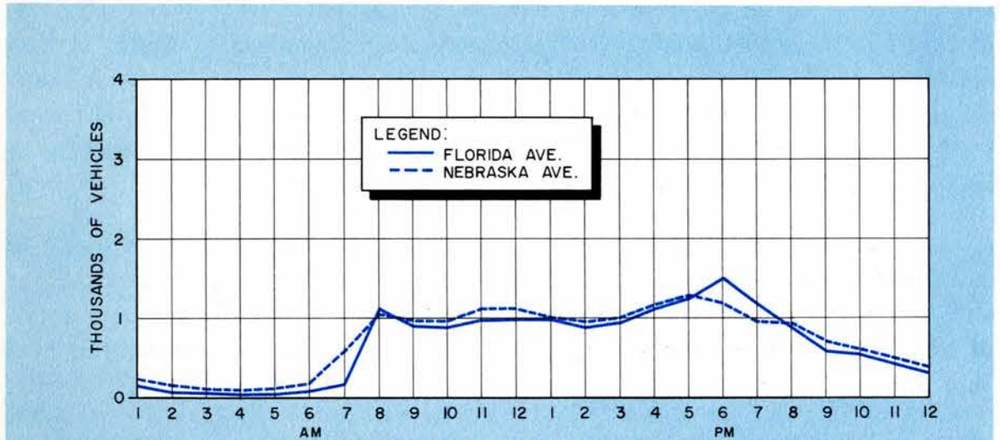
HOURLY TRAFFIC VOLUMES

HILLSBOROUGH RIVER BRIDGES
TAMPA, FLORIDA
FIGURE 7-A



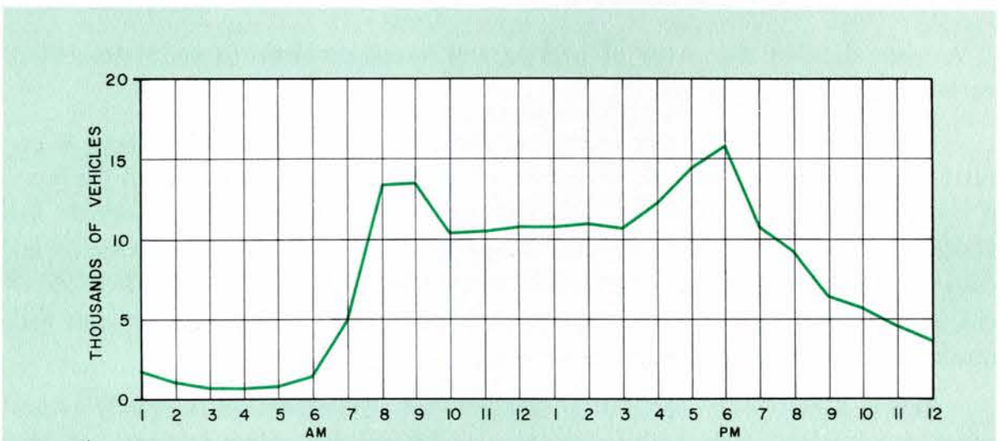
HOURLY TRAFFIC VOLUMES

HILLSBOROUGH RIVER BRIDGES
TAMPA, FLORIDA
FIGURE 7-B



HOURLY TRAFFIC VOLUMES

HILLSBOROUGH RIVER BRIDGES
TAMPA, FLORIDA
FIGURE 7-C



HOURLY TRAFFIC VOLUMES

HILLSBOROUGH RIVER BRIDGES
PLATT ST, LAFAYETTE ST, CASS ST,
COLUMBUS DR, HILLSBOROUGH AVE,
FLORIDA AVE & NEBRASKA AVE
FIGURE 7-D

Curb Usage — It has become increasingly evident in the downtown area that the limited surface street capacity will not permit usage for parking of pavement necessary to expedite the flow of traffic. Peak hour parking restrictions are now in effect on many sections of the major streets in Tampa and this practice should be extended and rigidly enforced. In future years, as traffic volumes continue to grow, it will be necessary to prohibit parking along many of the major streets outside of the downtown area and on one side of some of the existing downtown streets. By 1975, it is anticipated that, during peak travel periods, it will be necessary to eliminate parking entirely on many of the downtown streets. With parking spaces already in short supply and the present need for increased parking restrictions, it can readily be seen that an adequate parking program must be undertaken. Many of the surface parking lots now in operation are of little permanence in that, with the growth of the downtown area, they must be converted to other uses. With the gradual attrition of the existing curb parking spaces and the elimination of many existing off-street parking areas by new construction, Tampa's present critical parking situation will become intolerable, unless concerted action is taken to extend the supply of attractive off-street facilities.

Recognition should be given to the need for more adequate curb loading spaces for transit vehicles and the possibility of providing traffic lanes on some of the downtown streets exclusively for transit vehicles.

A more detailed discussion of parking and transit problems in the Metropolitan area is subsequently presented.

Pedestrians — The proper control of pedestrians in the downtown area is essential to the efficient and safe movement of large volumes of traffic. With the present one-way street grid, it is not necessary to provide separate WALK signals for pedestrians. Strict observance by pedestrians of traffic signals can materially increase the volumes of traffic moving through a street intersection. Rigid traffic enforcement in this regard will not only expedite traffic flow, but will reduce accidents and hazards to both pedestrians and motorists.

Traffic Signals — Proper traffic signal control at intersections is equally as important to developing the maximum capacity from the existing streets as the utilization of the full pavement width for traffic movements and the elimination of turning conflicts at intersections by introducing one-way streets, or special-turn regulations. The inflexibility of the present traffic signals limits the effectiveness of the signal timing program. With the present traffic signal equipment, it is necessary to adjust the cycle time for an average driving condition that will most nearly meet traffic demands during all periods of the day. With modern, improved traffic signals, it is possible to provide flexibility in the traffic signal equipment that will automatically change the signal timing to facilitate inbound traffic movements during the morning peak hour travel period and outbound traffic movements during the evening peak travel period. In addition, during the remainder of the day, when the normal downtown traffic loses much of its directional characteristics, a third cycle can be designed to accommodate this level of traffic most efficiently.

Other Considerations — Traffic usage of the streets and highways within the Greater Tampa Metropolitan area are influenced to a large extent by the geographic location of the city and the natural and man-made barriers. Old Tampa Bay, Tampa, and Hillsborough Bay are natural barriers that necessitate construction of lengthy and expensive causeways to serve traffic to the east and circuitous routings for traffic from the Interbay area to the west and south. The Hillsborough River is a major obstacle to the continuity of many streets in the area and necessitates the concentration of traffic volumes upon the existing bridge crossings. The downtown area is peculiarly situated in relation to its environs. At the present time, all traffic to and from the central business district is concentrated upon the present Hillsborough River crossings to the west, a limited number of continuous routes to the north and only one route to the east. The extremely limited number of traffic arteries available to traffic concentrates the huge volumes of traffic between the central business district and the contiguous areas along a few major streets. To further complicate the situation, the entire downtown area is encompassed and traversed by an at-grade railroad line and by spur tracks.

The natural water barriers and the man-made railroad barriers force traffic to use a limited number of access and egress routes, all subject to water and railroad traffic delays. One of Tampa's major problems today is to provide adequate access and egress to the central business area, not only for present, but for contemplated future traffic volumes.

Navigational Clearances

The existing crossings of the Hillsborough River from Garrison Channel northerly to, and including Sligh Avenue, are, with the exception of the Hillsborough River

Bridge, bascule span structures. The Hillsborough Avenue Bridge is a lift span with a 50-foot clearance over mean high water. In recent years, considerable study has been given to highway-water resources development, in particular, navigational clearances as they affect the costs of construction, operation and maintenance of vehicular bridges. The construction cost of a proposed bridge without navigational increment and the increased cost attributable to added clearances for navigational purposes have indicated that in the past the economic justification for the prescribed navigational clearances have not always been adequate. In recent years, the U. S. Corps of Engineers has given very careful study and consideration to all the ramifications of the needs of navigation versus the needs of vehicular traffic in evaluating and making decisions concerning the horizontal and vertical clearances justified from the standpoint of protecting the general public's rights.

The City of Tampa has been authorized by the U. S. Corps of Engineers[8] to construct a new river crossing at North Boulevard with a 60-foot horizontal clearance between fenders and a minimum vertical clearance of 40 feet above mean high water. The additional cost to increase navigational clearances from 40 feet above mean high water to 50 feet above mean high water was estimated at about $182,000 by the City of Tampa. The alternate provision of a draw bridge would entail a perpetual operating cost estimated at from $12,000 to $14,000 per year. When the added costs were compared to the relatively small number of boats that would be affected, it was determined that there was not adequate justification for increased vertical clearances. This finding was made fully recognizing that the fixed bridge as authorized would work certain hardships on the owners and operators of sailing vessels and operators of boat yards upstream from the bridge, particularly those catering to repairing and storing of tall-masted yachts. The City of Tampa, being fully apprised of the possible economic loss to these boat yards, did not elect to revise its application for a 40-foot vertical clearance since it considered that the general rights and welfare of all citizens outweighed those of the objectors.

Table IV shows annual openings for the Platt, Cass, Fortune, Garcia, Columbus Drive, Sligh Avenue, Lafayette and Hillsborough structures for the period 1950-1956. Monthly openings for some of the structures for the calendar year 1956 and for the first seven months of 1957 are given in Table V. In general, these figures indicate an increasing usage of the Hillsborough River by water traffic. There is no summarized information available as to the number of vessels of different heights. From

[8]SAKVK 823 (981) June 19, 1956.

TABLE IV

ANNUAL NUMBER OF BRIDGE OPENINGS

HILLSBOROUGH RIVER

1950-1956

	BRIDGE LOCATION							
Year	*Platt Street*	*Cass Street*	*Fortune Street*	*Garcia Street*	*Columbus Drive*	*Sligh Avenue*	*Lafayette Street*	*Hillsborough Avenue*
1950	2580	2421	2095	545	401	—	1531	188
1951	2752	2515	2227	532	247	—	1508	161
1952	2535	2436	2543	462	258	—	1783	152
1953	2526	2324	2660	441	321	81	1759	149
1954	2346	2140	2533	444	381	74	1554	221
1955	2247	2099	2695	470	328	87	1493	169
1956	4774	2304	2928	576	453	82	1676	187

bridge logs which give the name of the vessels for which openings were made, and from conversations with individuals familiar with river navigation, the following was derived:

1. There are less than 40 openings a year for vessels with a vertical clearance in excess of 45 feet.
2. A vast majority of shrimp boats actually have a vertical clearance of not more than 35 feet.
3. Passages of sailboats with vertical clearances in excess of 35 feet are negligible and are made generally in connection with a trip to the upstream boat yards for repairs.
4. All the vessels using the river can be modified for lesser vertical clearances at a reasonable cost, except the high masted sailboats.
5. The over-all height of 67-foot shrimp trawlers, many of which are docked in the Tampa area, is 31 feet.

The above points were substantiated by findings of the U. S. Corps of Engineers in reviewing the application of the City of Tampa for the 40 foot vertical clearance subsequently approved for the proposed North Boulevard Bridge.

TABLE V

MONTHLY BRIDGE OPENINGS

HILLSBOROUGH RIVER

BRIDGE LOCATIONS

	Platt Street Bridge		*Cass Street Bridge*		*Fortune Street Bridge*		*Lafayette Street Bridge*		*Hillsborough Avenue Bridge*	
Month	*1956*	*1957*	*1956*	*1957*	*1956*	*1957*	*1956*	*1957*	*1956*	*1957*
January	181	530	159	206	203	243	114	137	6	12
February	267	481	245	163	287	206	152	103	22	15
March	266	483	199	162	239	225	142	108	26	13
April	354	439	190	144	225	171	140	143	15	21
May	461	418	195	132	250	178	165	136	12	15
June	398	406	215	125	275	194	159	137	12	8
July	484	277	201	103	272	170	135	106	18	14
August	474	—	189	—	281	—	149	—	14	—
September	461	—	175	—	230	—	137	—	28	—
October	437	—	175	—	240	—	131	—	17	—
November	478	—	199	—	233	—	141	—	7	—
December	513	—	162	—	193	—	111	—	10	—
ANNUAL TOTAL	4,774		2,304		2,928		1,676		187	

Table VI

ROADWAY WIDTH, VERTICAL AND HORIZONTAL CLEARANCES

HILLSBOROUGH RIVER BRIDGES

Name of Bridge	*Roadway Width*	*Horizontal Navigational Clearance*	*Vertical Navigational Clearance*	
			Closed	*Open*
Platt Street	40 ft.	80 ft.	17 ft.	Unlimited
Lafayette Street	60 ft.	80 ft.	17 ft.	Unlimited
Cass Street	40 ft.	75 ft.	17 ft.	Unlimited
Fortune Street	40 ft.	75 ft.	16 ft.	Unlimited
Garcia Avenue	29 ft.	50 ft.	9 ft.	Unlimited
Columbus Drive	40 ft.	50 ft.	12 ft.	Unlimited
Hillsborough Avenue	40 ft.	50 ft.	14 ft.	55 ft.
Sligh Avenue	23 ft.	50 ft.	8 ft.	Unlimited

Roadway widths and vertical and horizontal clearances are presented in Table VI for eight structures; data were obtained from the offices of the City Department of Public Works.

The recommended twin expressway structures will carry over 100,000 vehicles per day over the Hillsborough River. Over 30 per cent of these vehicles will have origins or destinations within the central business district. To provide desirable gradients and adequate sight distances on the expressway ramps to the downtown street system, a 35 foot vertical clearance over the Hillsborough River is recommended. It is estimated that the additional five foot navigational increment of from 35 to 40 feet would necessitate, in addition to some design difficulties, an added cost of over $1,000,000.

Premised upon this information, it is recommended that the expressway crossing of the Hillsborough River north of Fortune Street be designed and constructed to provide a 35 foot vertical clearance above mean high water.

Quality of Traffic Flow

In many instances streets and special facilities such as bridges, are obviously overloaded. This is apparent from the backups and congested movements which occur, particularly during peak hours. In others, the movement of traffic is fluent at most times but there are bad accident locations, indicating a poor quality of traffic service. It is apparent, therefore, that both the quality of flow and the safety of movement are of prime importance in evaluating the quality of service provided by streets and highways.

Speed-Delay Values — As previously mentioned, the field studies included the determination of travel time and distance between street intersections along the more important streets and highways throughout the Tampa area. Dependent upon the importance and degree of congestion, a varying number of speed-delay runs were made. As many as twelve individual runs were made over some of the major congested streets; in no case were less than two runs made. The odometer reading and time were noted at all major intersections. The duration and type of delays were also noted.

The extensive speed-delay studies made in the winter and early spring of 1957 were supplemented by and compared to similar observations made by the State Road Department in previous studies. A comparison of the 1956 and 1957 data indicated that, even in the short period of time that had elapsed, there was a very slight, but measurable increase in the travel time necessary to move between certain sectors of the City. In particular, it was noted that travel time on Florida Avenue and Nebraska Av-

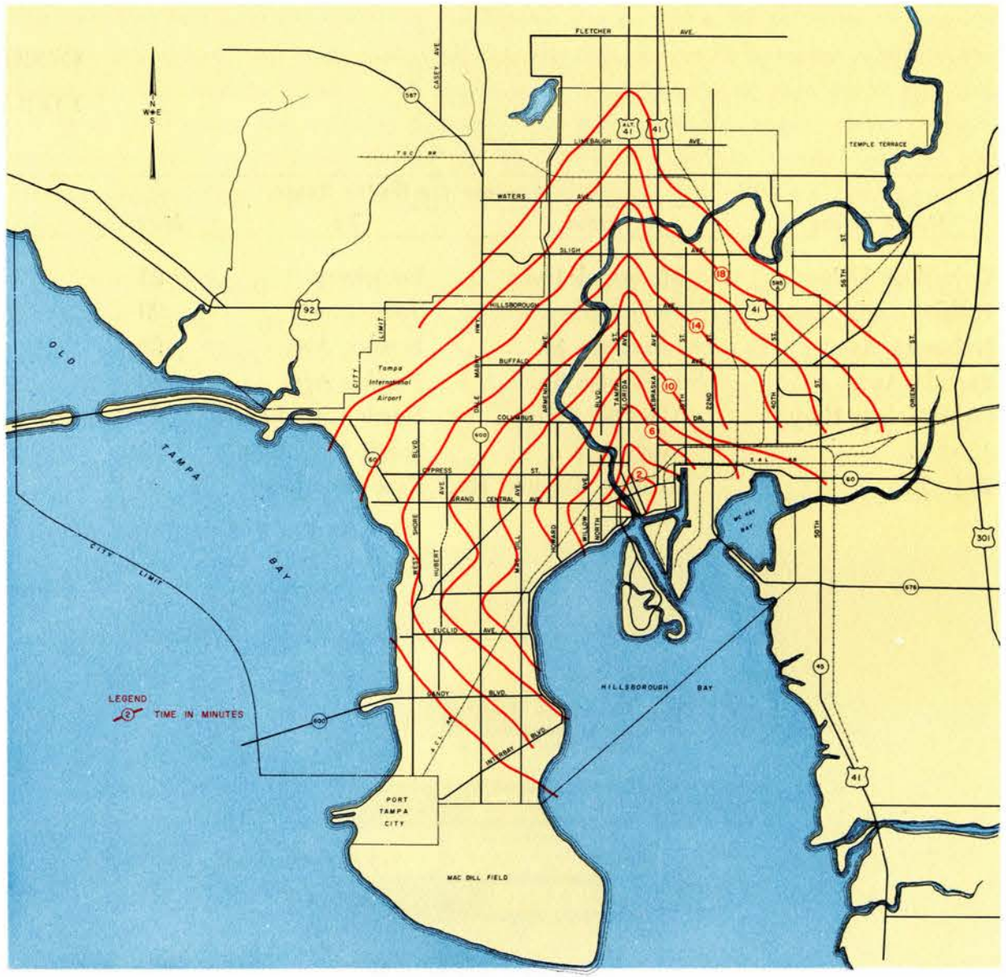
enue between Lafayette Street and the city line near Fowler Avenue had increased almost ten per cent and four per cent, respectively.

A comparative study was also made of the 1947 and 1957 average driving times. Traffic volumes have increased tremendously upon the streets in the metropolitan area in the last decade. In spite of this, travel times today, except during the peak travel periods at certain specific locations, are not appreciably different when measured along major stretches of the existing streets than they were in 1947. The reason for this is two-fold: one, in 1947, there was an excess capacity on many of the major streets; and two, improved traffic operations, including the adoption of one-way streets and parking restrictions, as well as special intersection treatments, such as channelization, have increased the effective capacity of the existing streets. Because Florida Avenue is now one-way south of Buffalo Avenue, the much heavier traffic volumes using this facility can travel from the center of the downtown area to the Seminole Heights-Sulphur Springs area in the same time as in 1947. In fact, today, Florida Avenue is a slightly faster route than Nebraska Avenue, the reverse of the situation existing in 1947. Travel times are slightly slower along Grand Central Avenue and equivalent to the 1947 level along Columbus Drive. Bayshore Boulevard is slightly slower than it was in 1947, primarily due to the extreme congestion in the Platt Street and Davis Island Bridge areas. Figure 8 shows the vehicle operating time necessary to travel from the center of the downtown area outward to the corporate limits as measured in the 1957 speed-delay studies.

Average driving speeds vary from a low of less than 10 miles per hour in the downtown area to in excess of 40 miles per hour in the more sparsely populated areas near the city limits. Table VII shows the average driving time along some of the major routes and lists the sections where the highest and lowest average driving times were observed.

Over long sections of the arterial street system, where the slower driving times in the downtown area are weighed with the higher speeds in more sparsely developed areas, average driving speeds vary from approximately 20 miles per hour to 30 miles per hour. There are many sections on the different routes where driving speeds are as low as nine miles per hour and other sections where high speeds of over 40 miles per hour were observed. At certain intersections during the peak travel periods, delays are encountered that would bring the individual driving times to considerably less than seven or eight miles per hour.

A composition of typical speeds and delays is depicted in Figure 9 for Nebraska Avenue between Lafayette and Fowler Streets, a distance of almost seven and one-



1957 TRAVEL TIMES

METROPOLITAN AREA

TAMPA, FLORIDA

1957

Wilbur Smith and Associates

FIGURE 8

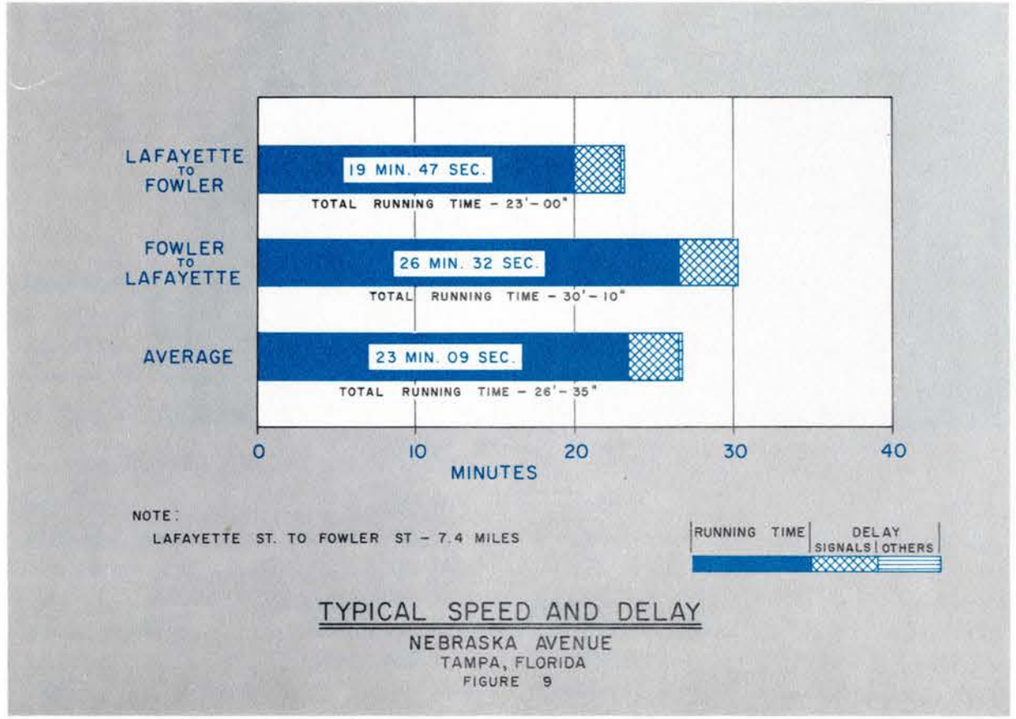
Table VII

OBSERVED DRIVING SPEEDS

TYPICAL ARTERIAL STREETS

1957

	Average for Entire Route			*Slowest Observed Speeds*			*Highest Observed Speeds*		
Major Street	*From*	*To*	*MPH*	*From*	*To*	*MPH*	*From*	*To*	*MPH*
Columbus Drive	Memorial Hwy.	Broadway	23	Nebraska Ave.	22nd St.	12	Memorial Hwy.	Dale Mabry Hwy.	42
Hillsborough Ave.	Dale Mabry	50th Street	29	Florida Ave.	Nebraska Ave.	15	40th St.	50th St.	39
Nebraska Ave.	Lafayette St.	Fowler Ave.	20	Lafayette St.	Columbus Dr.	11	Waters Ave.	Fowler Ave.	27
Florida Ave.	Lafayette St.	Fowler Ave.	20	Lafayette St.	Columbus Dr.	10	Waters Ave.	Fowler Ave.	35
Dale Mabry Hwy.	MacDill Field	North City Limits	29	Henderson Blvd.	Grand Central Ave.	16	Hillsborough Ave.	North City Limits	41
22nd St.	Sligh Ave.	South City Limits	22	Columbus Dr.	Frank Adamo	9	22nd St. Causeway	South City Limits	42
40th St.	Temple Terrace Hy.	East Broadway	30	Columbus Dr.	East Broadway	18	Hillsborough River	Hillsborough Ave.	39



TYPICAL SPEED AND DELAY

NEBRASKA AVENUE

TAMPA, FLORIDA

FIGURE 9

half miles. It is interesting to note that the major cause of delays was created by the signalized intersections on the route. Similar speed and delay studies reveal comparable conditions on other streets within the central business district.

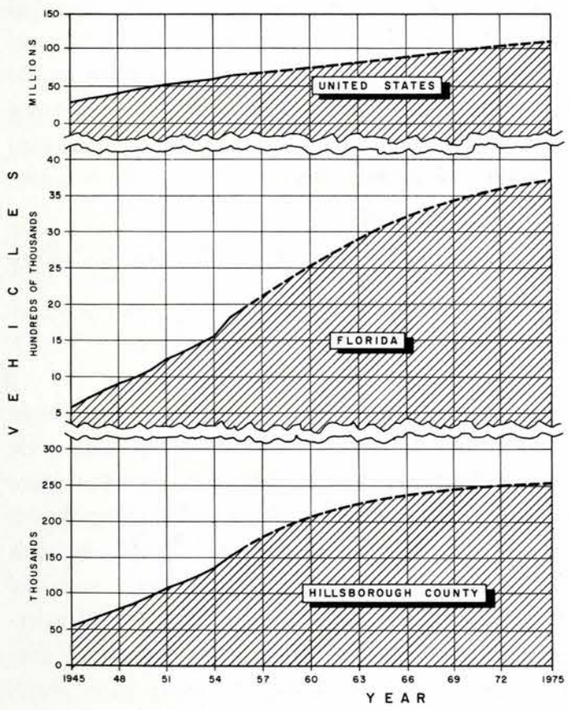
In addition to providing a measure of the adequacy of the routes for existing traffic volumes, the travel time-distance studies, when compared with the 1947 data, provide a means for checking the decay in the quality of travel on specific route sections. In making traffic assignments to the proposed expressway system, and in synthesizing the 1975 travel patterns, the techniques employed utilized estimated travel times over the unimproved city streets and over improved arterial streets, for which the speed-delay studies provide the basic data.

PLANNING DATA

In the period 1940 through 1950, the suburban areas contiguous to most major cities grew seven times as fast as the population of the central city itself.[9]. While land values outside of the central city have increased three-fold, the central cities themselves have actually lost, or just managed to hold, their former share of trade, population, and taxable land values. Traffic congestion, the difficulty of access and

[9]*Highway Highlights*, "How Roads Can Make or Break a City," by Douglas Haskell, editor Architectural Forum, June, 1957.

egress to the central city, and the terminal parking problems have finally been given recognition as chief causes of the down-grading of the central business district. However, the expressway, a primary factor in the strong and still accelerating growth of suburbia, is also one of the main forces that can be depended upon to assist the central city in retaining and increasing its importance to the entire metropolitan area. The construction of expressways is not a complete solution to the problem of improving accessibility, but must be integrated with an adequate, modern surface arterial street system, improved mass transit, and provisions must be made for a sufficient number of terminal spaces within easy walking distance of the destination of the motorist. A prerequisite to solving the metropolitan area's traffic problems is the determination of the future magnitude of and trend in the basic elements of area growth.



VEHICLE REGISTRATION TRENDS
1945-1975
FIGURE 10

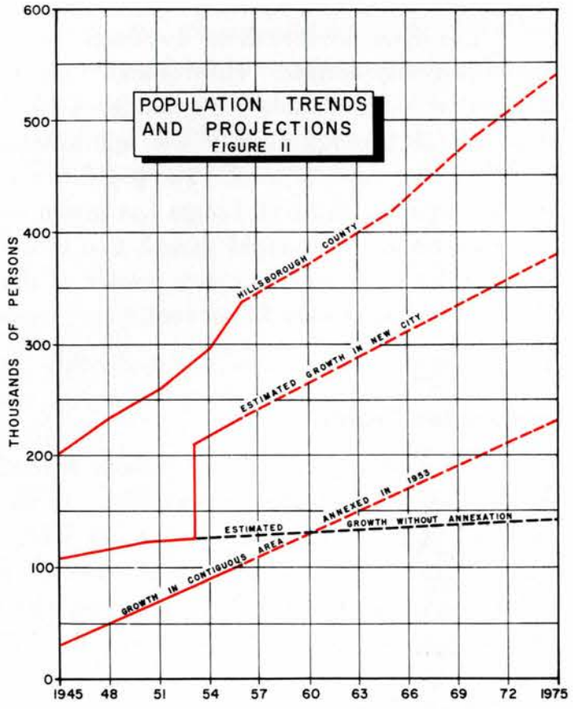
Motor Vehicle Registration and Use

In attempting to predict the growth trend in traffic usage of streets and highways, a commonly used index is motor registration. Statistical data giving the annual figures for motor vehicle registration are available. Figure 10 shows the trend in motor vehicle registration for the period 1945 through 1975 for Hillsborough County, the State of Florida, and the United States.

In the last decade, motor vehicle registration in the State of Florida has increased by almost 200 per cent. In the last five years the growth in motor vehicles using the state highways has increased over 60 per cent. These rates of increase compare with a 90 per cent increase in the last decade for the United States and a 25 per cent increase in the last five years. All indications are that the rate of growth in motor vehicle registration in the State of Florida will continue at the approximate rate of 10 per cent per year, over twice the national average. In Hillsborough County, motor vehicle registration has increased by almost 165 per cent in the last decade, and 52 per cent in the last five years. Passenger car registration is presented by zones in Appendix Table A-II.

Tourist Vehicles — Traffic usage of the area highways is not accurately reflected by the trends in motor vehicle registration and motor fuel consumption. While Tampa is not as dependent upon tourists as the Pinellas County area, it does serve a major function as a market and servicing area for this large seasonal population. The large number of visitors who stay for varying periods of time is significant both in terms of population and traffic. Since no accurate account is possible for present and future visitor and tourist populations, the indices of motor vehicle registration are not in themselves adequate to measure the true magnitude or nature of the traffic demand.

Gasoline Consumption — In addition to the motor vehicle registration trends, gasoline consumption also provides a means of predicting future traffic growth. A review of the gasoline consumption trends for Hillsborough and Pinellas Counties indicates a tremendous increase by 1975. It appears reasonable to assume that the Hillsborough County gasoline consumption will increase from approximately 107 million gallons in 1955 to about 250 million gallons by 1975. Similar trends can be expected in Pinellas County which is expected to increase from approximately 60 million gallons in 1955 to 150 million gallons by 1975.



Population

The land use report made specifically for this study,[10] indicates that the growth in population in the Tampa area has been amazing, see Figure 11. In the decade 1946-1956, from the time of the first comprehensive traffic study to the time this study was initiated, the population of the city within its present limits has grown over 50 per cent. This growth was far from uniform throughout the city. In the area defined by the corporate limits prior to 1953, the growth in population from 1946 through 1956 is estimated at slightly less than 20 per cent. On the other hand, the number of residents in the area annexed in 1953 has grown over 160 per cent, from an estimated 1946 population of 40,002 to a 1956 population of 105,435. It is conservatively estimated that the city's population in 1956 was 238,000 people. It is estimated that in 1975 Tampa's population will be in excess of 380,000. Of this growth of almost 60 per cent on a citywide basis, the major increase will occur in the portion of the city annexed in 1953, where a 120 per cent increase is expected. In the area defined by the city limits prior to 1953, a nominal 10 per cent growth is forecast.

The dynamic growth in dwellings and residents will not be limited to the city as presently defined. Hillsborough County itself has shown a growth of almost 65 per cent in the decade 1946 through 1956. It is estimated that by 1975 the population of Hillsborough County will approximate 540,000, an increase of 60 per cent over the estimated 1957 level. The population in Hillsborough County outside of the present corporate limits of Tampa has grown almost 90 per cent in the last decade. It is expected that this rapid growth rate will continue and over 160,000 people will be living in Hillsborough County outside of the corporate limits of Tampa by 1975, a further increase of over 55 per cent.

Employment Trends

The number of employed persons is another indication of the dynamic growth of the greater Tampa metropolitan area. In the period 1946 to 1956, the number of employed persons within the present city limits of Tampa increased from 45,000 to almost 67,000 persons, an increase of almost 50 per cent. It is estimated that the number of employed people within the present city will increase to over 112,000 by 1975, a further increase of over 67 per cent. By 1975 it is estimated that over 146,000 persons will be employed within Hillsborough County, an increase of almost 65 per cent over the estimated present total employed labor force of 89,000. Detailed employment data are presented in the Appendix Table A-IV.

[10]See Appendix Table A-I.

Retail Sales

In the decade 1946 through 1956, the dollar volume of retail sales in the central business area of Tampa has grown from a level of fifty-seven and one-half million dollars to over one hundred and five million dollars, an increase of approximately 84 per cent. However, in Hillsborough County, retail sales have grown from a level of one hundred and eighty million dollars to almost four hundred and eight million dollars, an increase of about 117 per cent. Stated somewhat differently, in 1946 the volume of retail sales in the central business district was over 30 per cent of the dollar volume of retail sales in Hillsborough County; in 1956 the percentage of retail sales in the downtown core was slightly less than 26 per cent of the dollar volume of retail sales in the entire county. These statistics show that while retail sales in the central business district have grown considerably in the last decade, they have not held pace with growth in the county and trade area. This indicates that larger percentages of shopping goods are now being purchased outside the central business district.

Complete information relative to retail sales by zones for Hillsborough County is presented in the Appendix Table A-III.

Central Business District

The central business district is the business, retail, financial, social and civic heart of the city. Historically, the central business district, being the original core of the city, inherits the advantages of a central location by virtue of the natural outward growth of residences and businesses. The pattern of transportation facilities is usually directed toward the central business area. Today, the downtown areas of the major metropolitan communities are faced with many serious problems. All interrelated to some extent, these problems can be broken down into several major factors. With larger and larger numbers of motor vehicles using the same basic street network, traffic congestion has become prevalent and ease of access and egress from the central business district has deteriorated. Generally, there has been a decrease in the growth rate of downtown retail sales compared to the rate of growth in retail

sales for the trade area. Another problem is the physical deterioration of the downtown area. Sub-standard buildings and non-conforming uses of land in the downtown area cause and accelerate the deterioration and ultimate blight of the contiguous areas. The resultant constantly declining building values will result in either reduced assessments or increased vacancies, both resulting in smaller tax returns from downtown property. Competition of suburban shopping centers with downtown retail businesses and service activities is another problem facing the central business district.

The problem of conflicting or non-conforming land use which has resulted in deterioration and blight of rather extensive areas immediately adjacent to the most productive land areas is readily apparent. There is a definite tendency for blighted areas to grow and to encroach upon the high-value downtown areas. Unless the adoption of comprehensive zoning ordinances is coupled with community master planning, declining tax returns from downtown properties will result. The magnitude of this reduction in income will affect the entire community tax base. If no improvements are made, no planning done, the ultimate result will be a much lower tax return from the high value downtown properties which may depress the economy of the entire metropolitan area.

The economic aspects of the problem inherent in deteriorated and declining land values in the central business district are important; however, equal consideration should be given to the peculiar and varied services offered within the central business area. It is only proper that the governmental functions of a metropolitan area, the civic center, and cultural and social activities be located in the central business district, equally accessible to all people in the metropolitan area. Studies have indicated that aside from the physical elements and monetary aspects, most people prefer to use downtown areas for general shopping. Reasons given include the greater variety and choice in style and sizes, range of prices and quality, the opportunity to make shopping excursions with friends, the convenience of good eating establishments, and the better service provided by public transportation.

It is readily apparent that the central business district of Tampa will continue to be the most important generator of travel within the metropolitan area and it must be given first consideration in developing an adequate area-wide transportation plan. The provision of adequate access and egress to the central business area was one of the foremost considerations in the development of the master highway transportation plan for Tampa.

Land Use

In the interim years from the date of the study to the design year, 1975, considerable changes are anticipated in land use throughout the Tampa Metropolitan area. In the peripheral zones where present residential development is sparse, the rapid growth and development of tracts of suburban residential areas can be expected. In the environs of the new University site in the Temple Terrace area, explosive residential and related commercial activities can be expected. The industrial site is already undergoing rapid development and this trend may be expected to accelerate. Other industrial areas east and southeast of Tampa should also show continued rapid growth. Continued public housing developments and the initiation of urban redevelopment projects will materially affect land use in the older areas of the City. Construction of the proposed expressway system will foster an expansion of the central business district northerly from its present centroid. Recent trends in population growth, distribution of retail sales, and employment, indicate a general growth throughout the urban area with particularly heavy increases in presently sparse and undeveloped areas.

In developing the planning data necessary for projecting present travel patterns to the design year 1975, detailed studies and analyses were made of potential land use. The statistical forecast for the respective origin and destination zones are discussed and listed in Appendix A. The planning studies included analyses of past, present and future population, labor force, employment, retail sales, dwelling units, and passenger car registration trends.

Local Problems Affecting Road Plans

Due to the geographic location, cultural development, and land use peculiar to the Tampa Metropolitan Area, there are many problems that must be carefully considered in developing roadway plans.

Land Development — In the older sections of the City, where residential development is very dense, the proposed expressway construction will necessarily require the acquisition of private residences.

High Land Costs — Real estate values are continuing to increase at a rapid rate and this trend is expected to continue. Relatively undeveloped areas suitable for residential and industrial development are rapidly diminishing. Coupled with the ex-

pected expansion in population and industrial activity, this further accentuates the rise in land costs and materially increases the cost of acquiring the necessary rights-of-way.

Irregular Street Pattern — The failure of land developers to extend the original street pattern and provide adequate right-of-way width materially restricts the free flow of traffic in many areas of the City, particularly in the area immediately contiguous to the central business district. This further complicates the extension and improvement of the arterial streets and expressway location. The extremely short block lengths in the central business district make it particularly difficult to provide proper interchange between expressways and the downtown streets. To maintain proper grades and adequate sight distance, ramp lengths would normally require more than two blocks which would close-off one or more cross streets. With the expected continued high usage of the surface streets, this is not feasible and further restricts possible interchange locations.

Railroads — The entire metropolitan area is traversed by railroad lines of varying use and importance. The passage of long freight trains, switching movements and freight cars standing on industrial spurs disrupt normal traffic operations upon the surface streets which necessitates extensive grade separation structures with the proposed expressways. In addition, many streets potentially useful as major arterials cannot be developed without introducing additional grade crossings of the railroad lines.

Waterways — As previously indicated, the Hillsborough River, Tampa Bay, and Hillsborough Bay are additional natural barriers to the free flow of vehicular traffic. The expense of additional crossings concentrates present traffic over a limited number of existing bridges. The necessity for a high level, fixed crossing of navigable waterways not only materially increases construction costs of the expressways, but makes the problem of obtaining adequate interchanges with the surface streets more difficult and expensive.

Public Buildings — The large number of schools, churches, parks, and other public buildings and properties, further complicates the location of the expressways and the extension and improvement of arterial streets. Interference with this type of development must be kept at a minimum. Plans for new state, county and city buildings entered into the studies of several route locations.

Heavy Traffic Generators — In the location of the proposed expressway system, special emphasis was given to providing adequate traffic service to all important traffic generators. Access and egress adequate for forecast traffic volumes between the central business district and its environs was of paramount consideration. Peak traffic loadings by facilities such as shopping centers, the popular sport and recreation centers, and existing and proposed civic buildings were also considered.

Topography and Drainage — The elevation of the terrain in sections of Tampa permits consideration of depressed roadway sections with inherent aesthetic, operational and construction costs advantages. In other sections of Tampa, the low elevations require that the proposed expressways be constructed on embankment sections to provide grade separations with intersecting streets and highways. The high water table, natural underground drainage, and anticipated soil conditions, dictate that more detailed sub-surface investigations must be made before the profile for many sections of the expressway system, particularly the depressed sections, can be finalized.

Others — The effect of the expressway location upon the normal activity of residential areas, and school and fire districts must also be given consideration and further complicate expressway locations.

Aesthetic consideration and changes in land use and the improvement and extension of arterial streets must be weighed and considered in finalizing locations.

Summary

The highway needs of the metropolitan area were evaluated in terms of present and forecast traffic usage. Present day traffic volumes upon the areas, streets and highways, were evaluated on an annual, seasonal, daily and hourly basis. All impediments to the natural flow of traffic including street width and continuity, traffic operations, parking practices, traffic signals, conflicts with waterway and railway traffic, were analyzed. Statistical data relative to expected increases in population, employment, resident labor force, retail sales, and anticipated land use changes were developed. In addition, cultural and land development affecting the expressway location and improvement of arterial streets were evaluated.

The intent of these studies was to give proper weight to all criteria that in any way would affect the desirable location of the proposed expressways and arterial streets.

Chapter III
TRAFFIC NEEDS

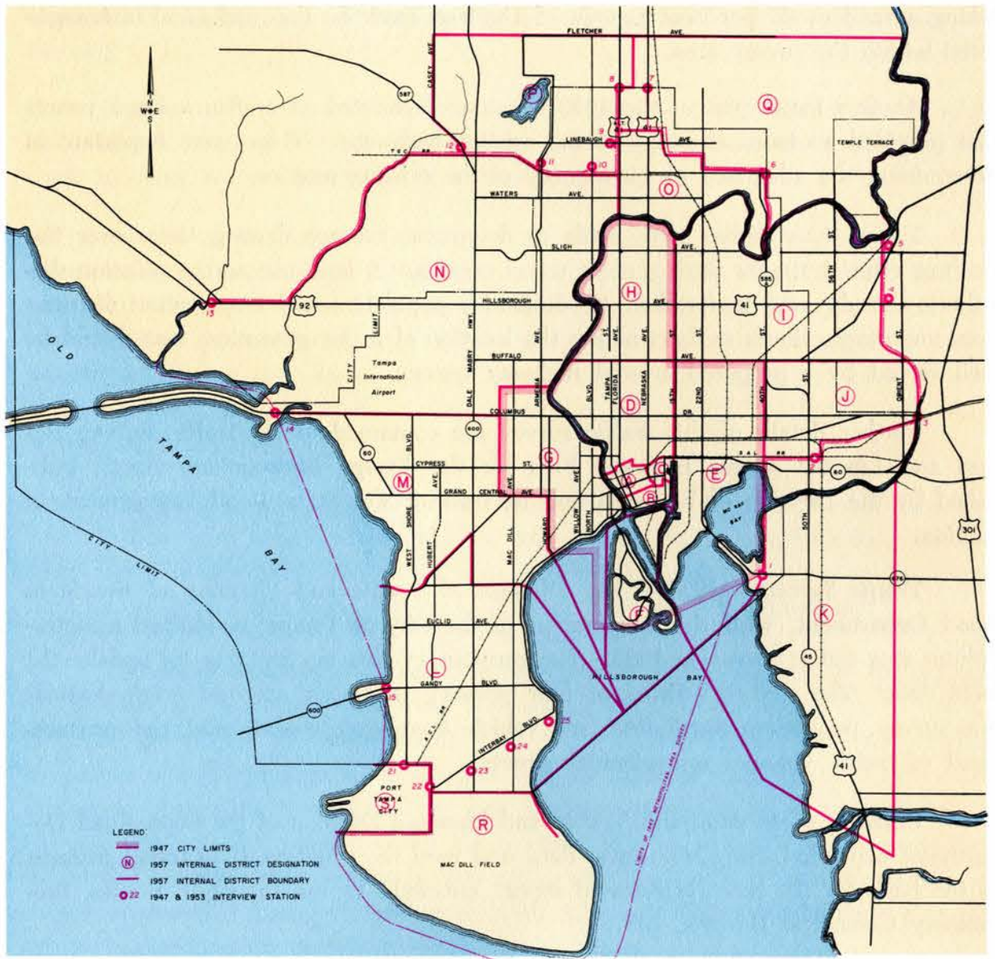
One of the most important factors in the selection of a route must be the traffic services provided. It is important to consider both local and through traffic in considering the services to be rendered by the particular route. It must also be kept in mind that the Interstate System of Highways must be designed for traffic needs which are anticipated in 1975. In view of the tremendous amounts of money which are to be invested in modern highways, it is obvious that each highway facility should be planned for both present and future needs. In preparing the estimates and projections in this report, full consideration was given to the factors and procedures presented by the U. S. Bureau of Public Roads in a "Guide to Forecasting Traffic on Interstate Systems" (a memorandum by the U. S. Department of Commerce, Bureau of Public Roads October 15, 1956).

Basic Origin and Destination Data

As mentioned earlier, three major traffic studies of Tampa have been made under the direction of the State Road Department. These surveys, supplemented by additional studies made by the consultant in 1956 and 1957, are the basic data upon which past, present, and future travel and traffic patterns have been planned. They provide extensive information for evaluating future highway needs.

The Tampa Metropolitan Survey — 1946 — Under the auspices of the State Road Department of Florida in cooperation with the U. S. Public Roads Administration (now designated the Federal Bureau of Public Roads), an extensive traffic study was conducted in 1946 and 1947. The study consisted of several related surveys.

The origin-destination survey was perhaps the most important part of the entire study. It consisted of two major parts. An external survey was made, utilizing roadside interview stations, to record the origin and destination of all external vehicular trips entering the survey area. The limits of this survey area and the internal districts of the present study are shown in Figure 12. Interviews were conducted at roadside interview locations, as shown on Figure 12, where motorists were stopped and questioned concerning their origin and destination, routing and purpose of trip. Interviews were conducted for a 24-hour weekday period on the major routes and for a 16-hour period at all other locations. The internal origin-destination survey consisted of interviewing at their home, a selected 10 per cent sample of the residents of dwelling units within the study area. Truck and taxi travel were determined by



1947 STUDY AREA

METROPOLITAN AREA
TAMPA, FLORIDA
1957

Wilbur Smith and Associates

FIGURE 12

taking a random 20 per cent sample of the trips made by the trucks and taxis registered within the survey area.

Another major part of the 1946-47 survey consisted of traffic volume counts that provided an index of usage of the existing highways. These were important in determining the adequacy or inadequacy of the existing arteries.

Travel time studies were made to determine average driving times over the existing arterial streets during peak travel periods. A land use and population distribution study was undertaken to determine population and employment distribution, important criteria in determining the location of major generators that should be well served by a proposed arterial highway system.

Further details of this traffic survey are contained in "A Traffic Survey Report and Limited Access Highway Plan for the Tampa Metropolitan Area", published by the Division of Research and Records of the State Road Department of Florida.

Traffic Survey — 1953 — The Division of Traffic and Planning of the State Road Department, with the cooperation of the City of Tampa, conducted a metropolitan area traffic survey in 1953. The purpose of this survey was to update the 1946 data. The study consisted of four primary parts, an external origin-destination survey, population distribution and vehicle travel-time studies, and, the measurement of traffic volumes on principal streets.

Utilizing these data, the Traffic and Planning Division of the State Road Department expanded the 1946 traffic data and used the resultant 1953 travel patterns as the basis for the recently released report, entitled "Tampa Interstate Routes, Preliminary Geometric Designs, 1957."

Tampa Central Business District Parking Survey — 1956-1957 — A comprehensive parking survey, to obtain factual data concerning the parking problems of the central business area, was conducted by the Traffic and Planning Division of the State Road Department at the request of Tampa city officials. The survey was conducted in accordance with methods developed by the U. S. Bureau of Public Roads.

The parking survey included interviews of motorists parking in the downtown area to ascertain their trip origin and principal downtown destination. Traffic volume counts were obtained at a cordon line encircling the entire downtown. The present destination of parkers in the central business district, the location and availability of parking spaces, and evaluation of surpluses and deficiencies of parking spaces in relation to the major downtown generators, along with other findings, are discussed subsequently.

The origin-destination data obtained in the 1956-57 parking survey were also used in the present study to develop and update the internal traffic pattern of the City of Tampa, in particular movements between other internal areas and the central business district.

Future Traffic Projections

To repeat, one of the prerequisites for Federal participation in the construction costs of the Interstate System is that the highways be planned and designed for estimated 1975 traffic needs. It is proper that highway facilities be planned for future rather than present traffic.

The comprehensive origin-destination surveys are widely accepted as the best available method of determining travel patterns in metropolitan areas. Unfortunately, too little consideration has been given to the basic characteristics of travel that can be derived from these studies in estimating future traffic demands. In the usual application of the data, the origin-destination information is plotted in the form of desire lines to show the amount and location of the principal inter-zone movements at the time of the survey. Having located the principal traffic corridors, as indicated by the desire line illustrations, feasible route alignments serving these traffic corridors are located. Next, the present traffic is assigned to the proposed expressway locations, and the route showing the better relation of traffic service to construction costs is selected. This application, while entirely adequate in many repects, does not give proper weight to the future travel patterns that the expressway and arterial street systems will have to serve. In areas of dynamic population growth, such as the Tampa area, and where the entire economy of the area is undergoing major changes, it is imperative that consideration be given to the future shape of the city, population and employment distribution within the metropolitan area, motor vehicle registration, the distribution of commercial and other services, and retail outlets. This is necessary to establish as firmly as possible future traffic load-

ings upon the proposed highway system and thereby prevent early obsolescence in terms of traffic services. Every effort, therefore, has been exerted to successfully project travel patterns to 1975, since these patterns represent basic travel desires and serve as the best means of fitting roadway plans to service needs.

Projection Method

The technique used in synthesizing the 1975 travel pattern consists primarily of establishing the relationship of travel time to trip generation between zones by mode of travel and purpose of trip. This is done by analyzing the basic trip characteristics indicated by the available origin-destination survey data. By estimating the 1975 travel times and using previously determined future values for population, employment, motor vehicle registration, and retail sales distribution, the magnitude and pattern of future travel are estimated. A comprehensive survey of the distribution of population, retail sales, employed labor force by residence and place of employment, dwelling units, and vehicle registration was made as part of this study. In addition, the relationship of 1957 travel times to those of 1946-47, was studied, giving weight to the changes in the existing street network, traffic operations thereon, and the increased traffic levels. In other words, the basic relationship between travel time and trip generation, as modified by expected changes in travel characteristics, were used to estimate 1975 travel patterns, assuming an improved highway network.

The volume of trips which begin or end in each zone must be estimated before the pattern of travel can be developed. Several sources of trip generation must be explored in developing these estimates. Most of the area trips are accounted for by the residential population and begin or end in the home. However, each trip has another end which may or may not fall in the zone of residence.

The approach involved development of a reasonable base from which to project trips. The dwelling unit was analyzed in relation to trip generation characteristics. The analysis of the available origin and destination data indicated that the best correlation with trip generation was population. The amount of travel generated by each residence was found to increase as the distance from the central business district becomes greater. More travel is made by cars in zones which are farther removed from the central business district, due to the lower quality of transit service and the higher ratio of cars to people in zones removed from the center of the city.

Employment generates travel in direct proportion to the number of jobs available in each zone. Since all zones afford some employment, travel to and from work accounts for an increment of trip-ends in each zone.

Not all of the trips which begin or end in the dwelling units have their other termini at places of employment. Social, recreational, shopping, and business trips also account for travel between the respective zones. Travel to the central business district accounts for a large share of the business and shopping trips and a smaller number of the others. Many persons from outlying zones travel to the central business district, while a few residing in the central business district travel to outlying areas.

The basic origin and destination data obtained in the 1947 survey were analyzed to determine relationships between trip generation and population, resident labor force, employment, and retail sales. Allowances were made for intra-zone trips for work and non-work purposes. Transit trips were also analyzed.

The basic relationships between trip generation, as indicated by the analysis of the 1947 traffic survey data were adjusted for expected variations due to the anticipated growth of the metropolitan area. Car ownership and the ratio of cars to people is continuing to increase each year in every part of the city. Increased ownership results in more travel by car, partly because the car is available for incidental driving, and partly because the opportunities for employment are broadened to include places which are easily accessible only by car. It is anticipated that future decreases, relative to total population, in transit riding will be more than offset by increases in car usage.

As families become two-car families, there is an initial tendency for the mileage per vehicle to slightly decrease. This decrease is normally overcome in a short time. It seems to bear a close relationship to the amount of time available for driving rather than being primarily controlled by the basic desire to travel only a given number of miles per day or per week. As improved roadways and other conditions reduce travel time by permitting higher average speeds, the total mileage operated will be greater than at present since the *time* of travel is a primary factor in the miles of travel. An increase in the amount of time available for travel will

not likely increase the number of trips per day or per vehicle as much as it is likely to increase the average length of individual trips.

Another long-range element which appears to be influencing trip volumes is the trend toward a shorter work week in many industries. Shorter working hours increase the amount of time available for recreation and other purposes. While no measure is available with which to check this argument, it is not unreasonable to expect some degree of traffic increase attributable to it.

As a metropolitan area increases in size, the variety of trip attractions increases. Improved traffic facilities will place a multitude of these attractions within easy driving time. Trip volumes decrease as trip length (driving time) increases. The reverse of these conditions is also true.

Giving full consideration to these and other rationalizations, the rates of trip generation were adjusted to conditions anticipated in 1975. From these analyses, it was indicated that the resident population would generate approximately two trips per day per individual. The total number of work trips, since employment and labor force were assumed to be equal, is equal to twice the anticipated 1975 labor force. The commercial and social non-work trips by residence is equal to the difference in total trips generated by the residential population and the estimated number of work trips. Commercial non-work trips were estimated to equal approximately 50 per cent of total non-work trips by residence and pro-rated by retail sales to the respective zones in the survey area. The distribution of social non-work trips was sub-divided into several categories. Approximately 8 per cent of the social non-work trips were assumed to be between the residential population and the central business district. Social non-work trips between residential population within the survey area was estimated to equal 32 per cent of the total social trips. The remaining 10 per cent of the non-work trips were pro-rated between employment and retail trade.

Transit trip generation was related primarily to employment and residential population on the basis of travel time from the central business district.

Analysis of present car occupancy and anticipated trends suggested a 1975 car occupancy of 1.25 persons per car for work trips and 1.75 persons per car for non-work trips.

On the basis of the projected 1975 distribution of population, employment, labor force, retail sales, trip generating characteristics, and anticipated car occupancy, total trip generation for each of the respective internal zones was developed. In Appendix F the control totals for each individual internal zone are listed for the estimated number of transit, driver and passenger trips, respectively.

From the travel characteristics of population as produced by the origin and destination data, characteristic curves were developed for the distribution of each class of trip between respective zones. Basic curves used in projections, as adjusted for anticipated changes in the characteristics of trip generation throughout the metropolitan area, are shown in Appendix E. Two independent estimates for the distribution of work trips were obtained by applying the trip generation curves for driver and passenger work trips to and from places of residence and driver and passenger work trips to and from places of employment. Subsequently, the relative travel times are applied to the estimated 1975 distribution of labor force and to metropolitan area employment. All data were considered by survey zones.

Driver and passenger non-work trips between residential populations were estimated first upon the basic relationships indicated in Figure C, Appendix E. Transit usage was derived from the curve designated as Figure D, Appendix E. The same treatment was applied to the commercial, social and miscellaneous non-work trips as was used with the development of work trip projections. In general, work trips have the longest trip length; commercial trips are second in length; and social trips are the shortest of the three.

The analysis of trip characteristics indicated that work trips (trips to work and trips from work to home) exhibited a different pattern of development than trips for other purposes. Since work trips constitute a large percentage of urban travel, the identity of these trips was maintained in the early stages of trip projection. Other internal trips displayed a reasonably uniform behavior and have been grouped and combined for analysis purposes under the designation non-work trips.

The resulting estimates for travel between each pair of zones may be quite different, for one estimate measures competition between places of work while the other measures competition between sources of employment. The independently arrived at estimates were averaged statistically.

By a programmed high speed electronic computation technique, the estimates of travel between each pair of zones were averaged and the new total trips between

zones computed. The new total is divided into the original estimate of the work trip generation in the zone and each movement to all other zones multiplied by the resulting factor. Then, new estimates of interzone movement are derived for each zone pair. By repeating the averaging process the two estimates are brought closer together until the independent estimates for interzone work trips agree within the limits of accuracy desired. This technique is known as averaging by "successive approximations". The method and technique are described in several journals, including the Highway Research Board proceedings. Three cycles of estimating and averaging resulted in the final estimates for trip exchanges between internal zones for 1975.

The "Successive Approximations" technique is quite time consuming even when done on high speed, data processing machines. It would be impractical to attempt the matter by other than mechanical means. The technique used permits semi-automatic handling of the work by the machines so that the process repeats itself and the machine automatically prints out the final origin and destination tabulation when the predetermined number of successive approximations have been made.

Trip Estimates

Premised upon the characteristics of travel developed from the previous origin-destination surveys and the anticipated distribution of population, resident labor force, employment and commercial activity as reflected in the dollar volume of retail sales, the number of person trips, by mode, within the survey area were estimated for each of the one hundred zones, or geographic areas, into which the area was sub-divided. It is estimated that by 1975 there will be a total of about 1,268,490 person trips throughout the survey area on an average weekday. Approximately 821,790 vehicular trips will be made daily. Of the 821,790 total vehicular trips, 676,863 will be by private passenger car and 144,927 by truck. Less than 35,000 daily person trips by transit are anticipated. About 411,950 person trips will be made by auto passengers accompanying the 676,863 auto drivers.

It is estimated that approximately 40,700 vehicular trips will have both origin and destination within internal zones into which the survey area was subdivided. Approximately 611,950 vehicular trips will have origin in one of the internal zones within the 1957 survey cordon and destination within another of the internal zones. An estimated 153,196 vehicular trips will have an origin outside of the survey area and a destination within the survey area. The remaining 15,944 vehicular trips will have neither origin nor destination within the survey area.

TABLE VIII

ESTIMATED TRIPS, INTO, WITHIN AND THROUGH SURVEY AREA
1975 AVERAGE WEEKDAY

Type of Trip	*Mode of Travel*				
	Transit	*Auto Passengers*	*Auto Drivers*	*Truck Drivers*	*Total Vehicles*
Internal Zone to Zone Trips	34,400	296,750	506,900	105,050	611,950
Intra-Zone Trips	350	11,200	32,100	8,600	40,700
Internal-External Zone Trips	—	93,500	124,835	28,361	153,196
External-External Zone Trips[1]	—	10,500	13,028	2,916	15,944
TOTAL	34,750	411,950	676,863	144,927	821,790

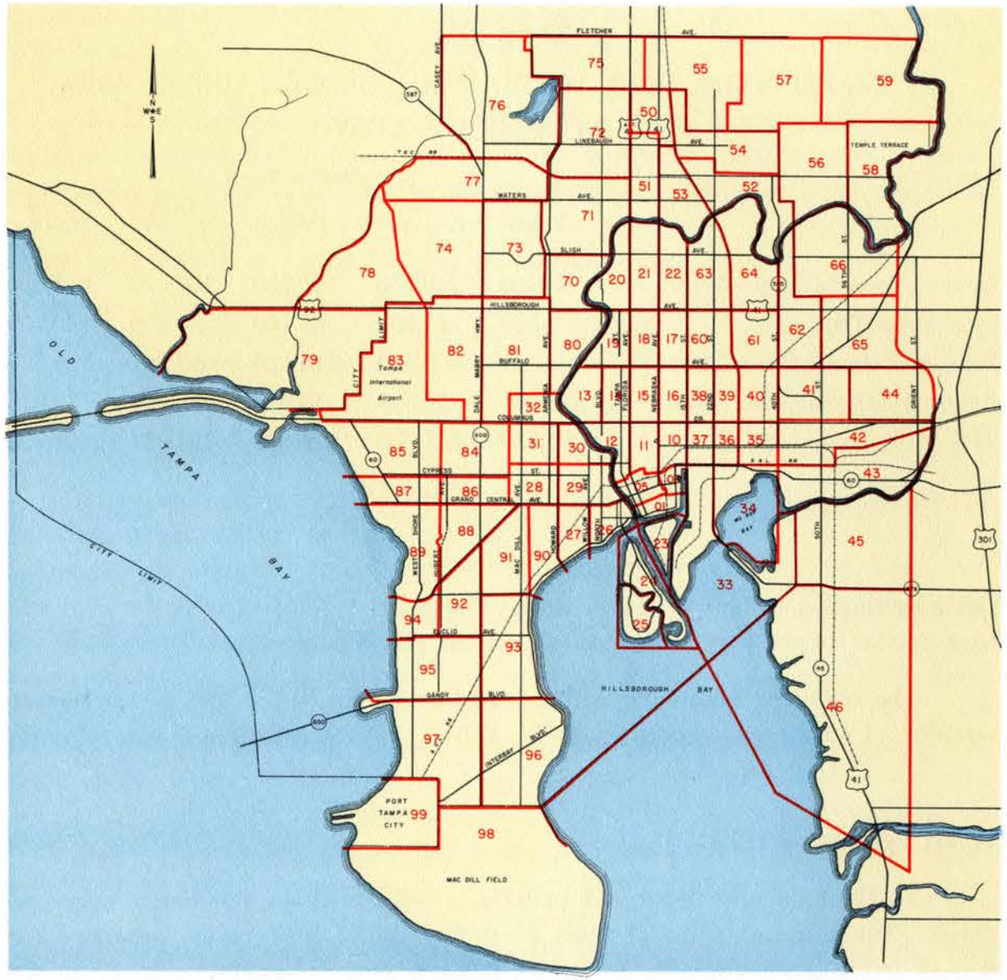
[1]Through Trips.

The estimated trips into, within, and through the survey area on an average weekday in 1975 are tabulated in Table VIII.

Travel Patterns — 1975

To illustrate projected travel patterns, a series of desire line charts were prepared. The principal value of these illustrations is to indicate the general corridors of traffic flow, which are helpful in locating proposed highway improvements to advantageously serve the area traffic needs. The internal zones are graphically depicted in Figure 13 and internal districts are shown in Figure 12. Detailed tabulations of trip movements are presented in Appendix F.

Internal Zones to Central Business District — Figure 14 shows the anticipated movement of passenger car vehicles in 1975 from internal zones to the central business district. In general, the movements are dispersed in a sunflower pattern throughout the survey area. The importance of providing adequate traffic service to the downtown area is indicated by the large number of trips between internal zones

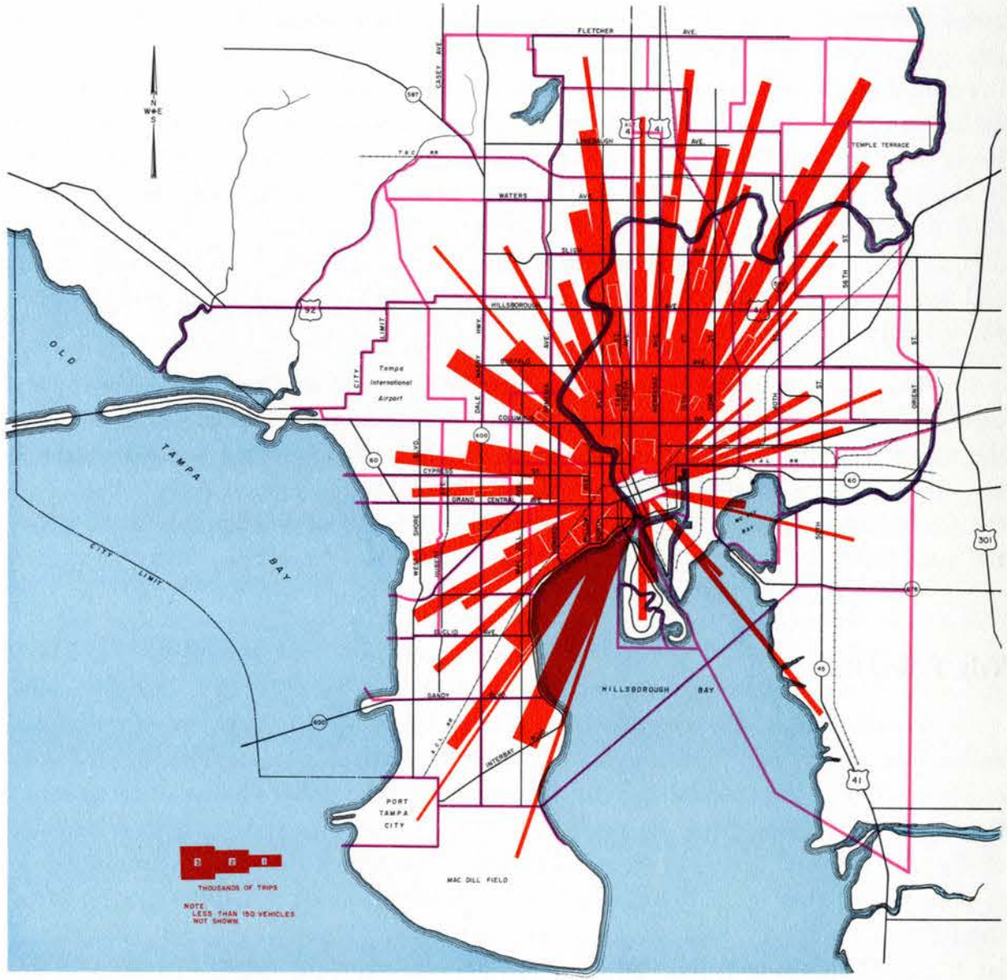


ORIGIN AND DESTINATION ZONE MAP

TAMPA METROPOLITAN AREA
1957 TRAFFIC STUDY

Wilbur Smith and Associates

FIGURE 13

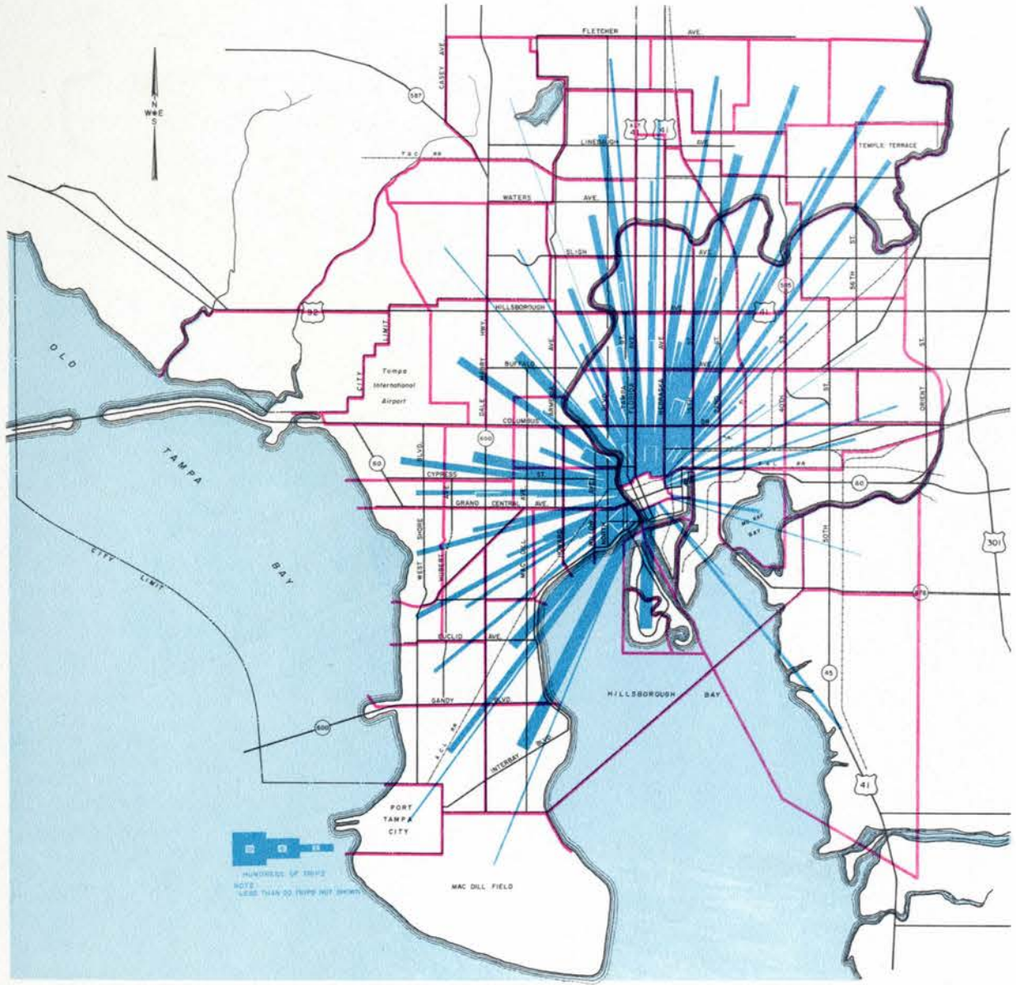


1975 DESIRE LINES
INTERNAL ZONES - C B D

PASSENGER CARS ONLY
TAMPA METROPOLITAN AREA
1957

Wilbur Smith and Associates

FIGURE 14



1975 DESIRE LINES

INTERNAL ZONES - C B D

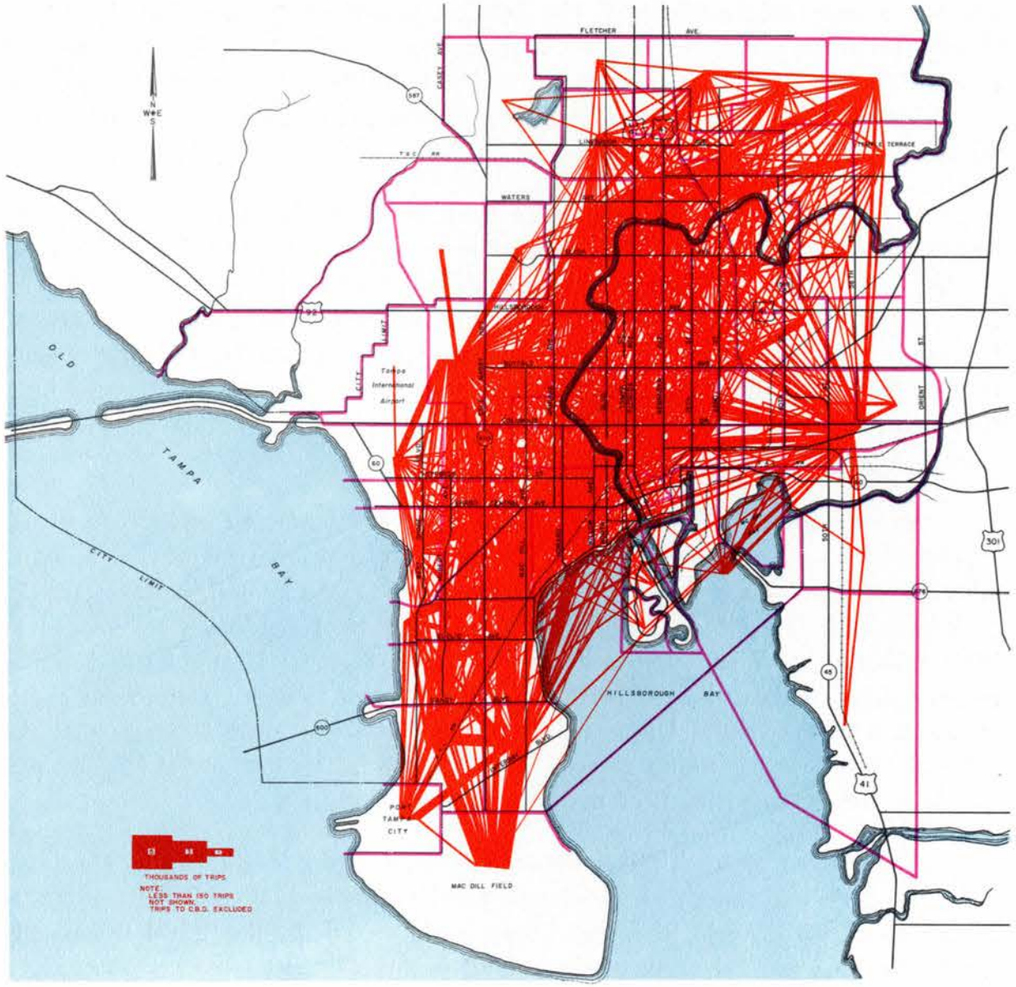
TRUCKS ONLY

TAMPA METROPOLITAN AREA

1957

Wilbur Smith and Associates

FIGURE 15



1975 DESIRE LINES

INTERNAL ZONES - INTERNAL ZONES

PASSENGER CARS ONLY

TAMPA METROPOLITAN AREA

1957

Wilbur Smith and Associates

FIGURE 16

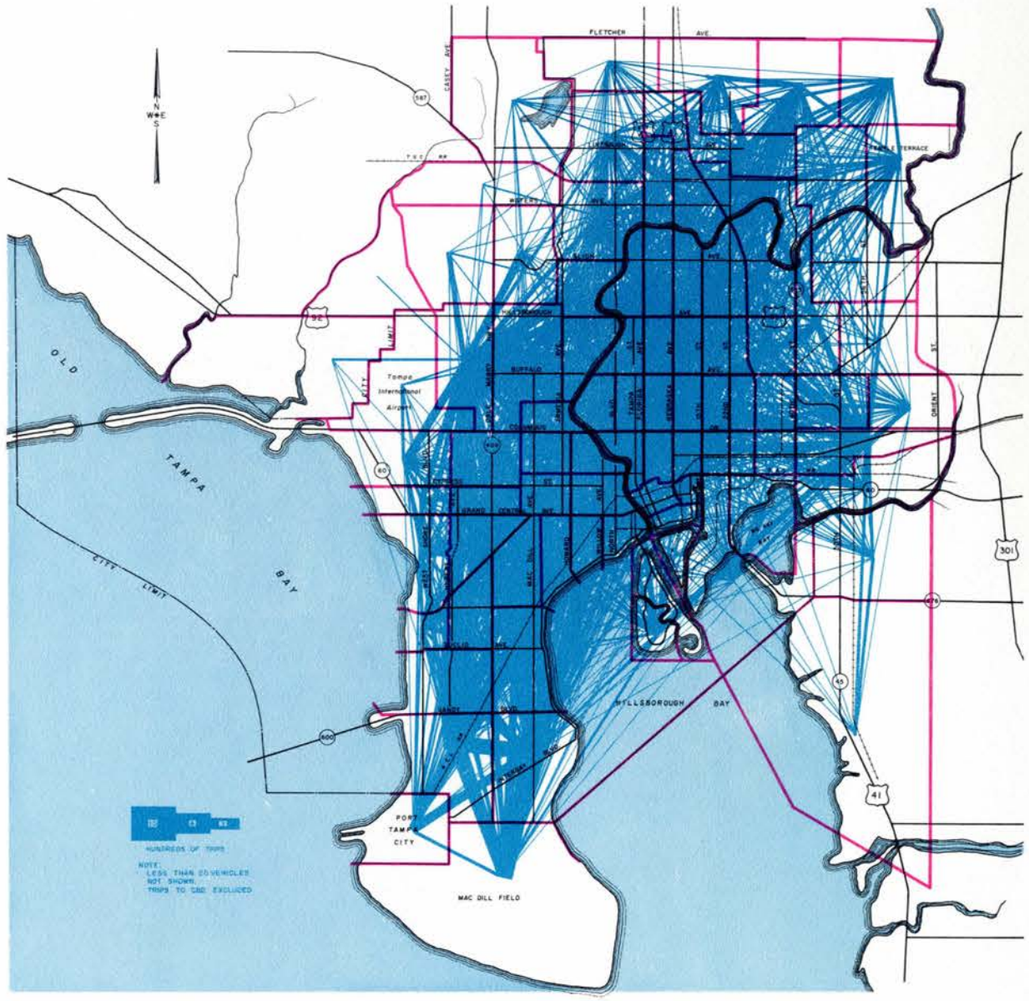
and the central business district. The heaviest movements to the central business district are from the southwest-west, and the north-northeast. Due to the physical location of the central business district, and the distribution of resident population and labor force, the magnitude of travel from the northwest and southeast is of secondary importance.

The projected travel pattern for commercial vehicle trips between the central business district and the other internal zones is quite similar to that of passenger car travel, see Figure 15. As would be expected, the total magnitude of truck trips is considerably less than the passenger car trips, and the exchange of traffic between the more industrialized zones is proportionately heavier. Again, the predominant movement of traffic from the southwest-west and north-northeast to the central business area suggests an orientation of the overall highway transportation plan to serve these heavy traffic movements.

Internal Traffic Movements Exclusive of Central Business District — In Figure 16, the anticipated 1975 movement of passenger car vehicles from internal zones to other internal zones are shown. For clarity, trips to the central business district have been excluded from this illustration. Major zones of generation are located in the southwest, north and northeastern sections of Tampa. Heavy internal traffic movements are indicated from north to south, and east to west. Due to the physical location of the central business district, the desire line chart indicates that the centroid of this heavy traffic movement desiring to bypass the central business district is to the west and north of the central business district.

The pattern of truck travel between internal zones is graphically illustrated in Figure 17. The pattern of travel assumes the same general configuration as that of passenger cars. Again, the very heavy corridor of desire line travel is generally located to the west and north of the central business district.

External Areas to Internal Districts — The estimated vehicle trips between external stations and internal zones were grouped into five external areas, and nineteen internal districts (see Figure 12) for projection and analysis purposes. This was desirable due to the location of the cordon stations and the necessity to expand the old survey area due to anticipated growth and development of the Metropolitan Area. Movements to the central business district have been included in the illustrations. Separate desire line charts are shown for passenger car and commercial vehicle trips.



1975 DESIRE LINES

INTERNAL ZONES - INTERNAL ZONES

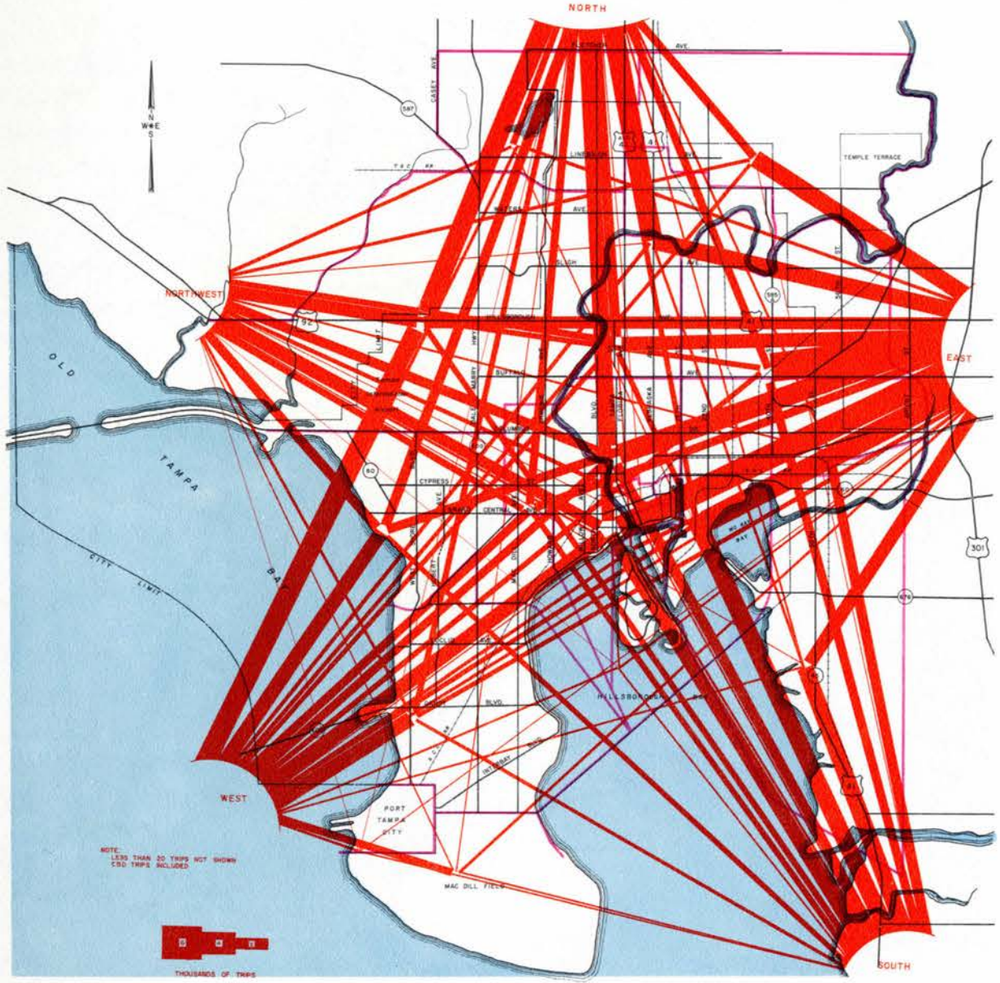
TRUCKS ONLY

TAMPA METROPOLITAN AREA

1957

Wilbur Smith and Associates

FIGURE 17



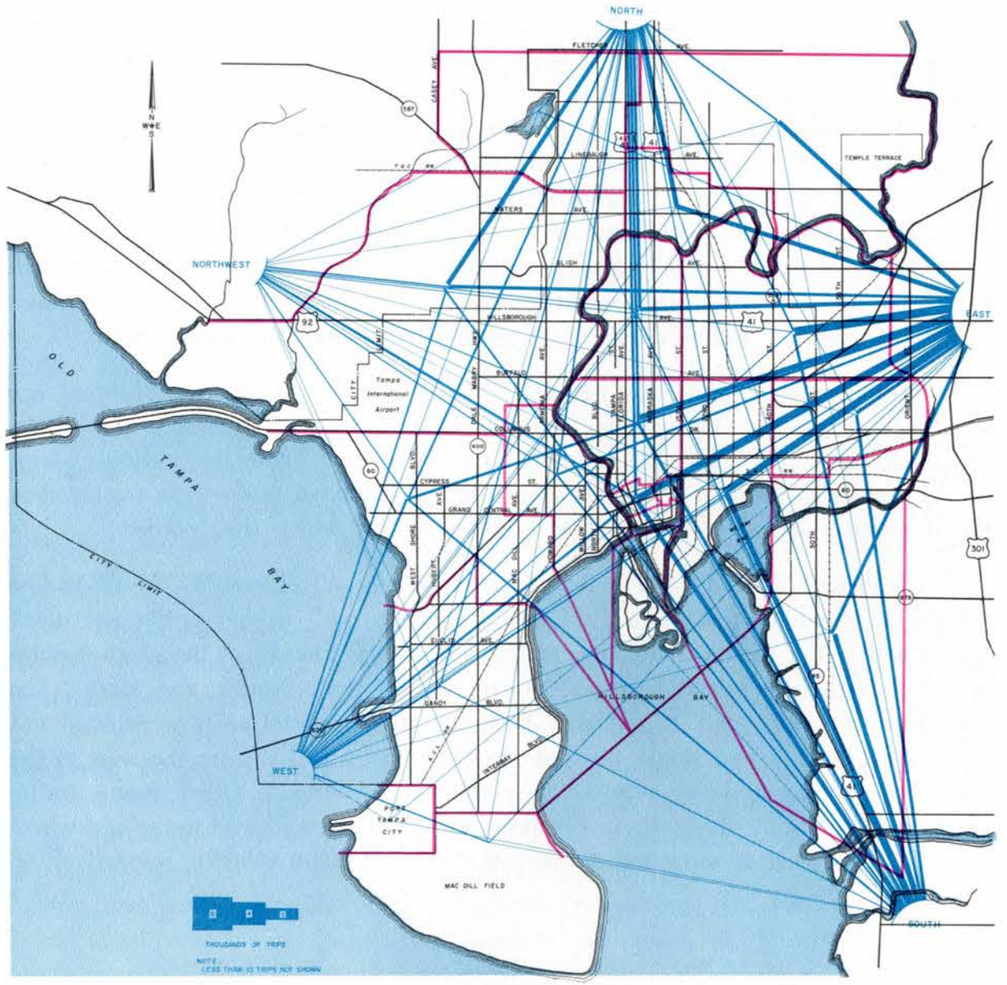
1975 DESIRE LINES

EXTERNAL AREAS - INTERNAL DISTRICTS

PASSENGER CARS ONLY

Wilbur Smith and Associates

FIGURE 18



1975 DESIRE LINES

EXTERNAL AREAS - INTERNAL DISTRICTS

TRUCKS ONLY

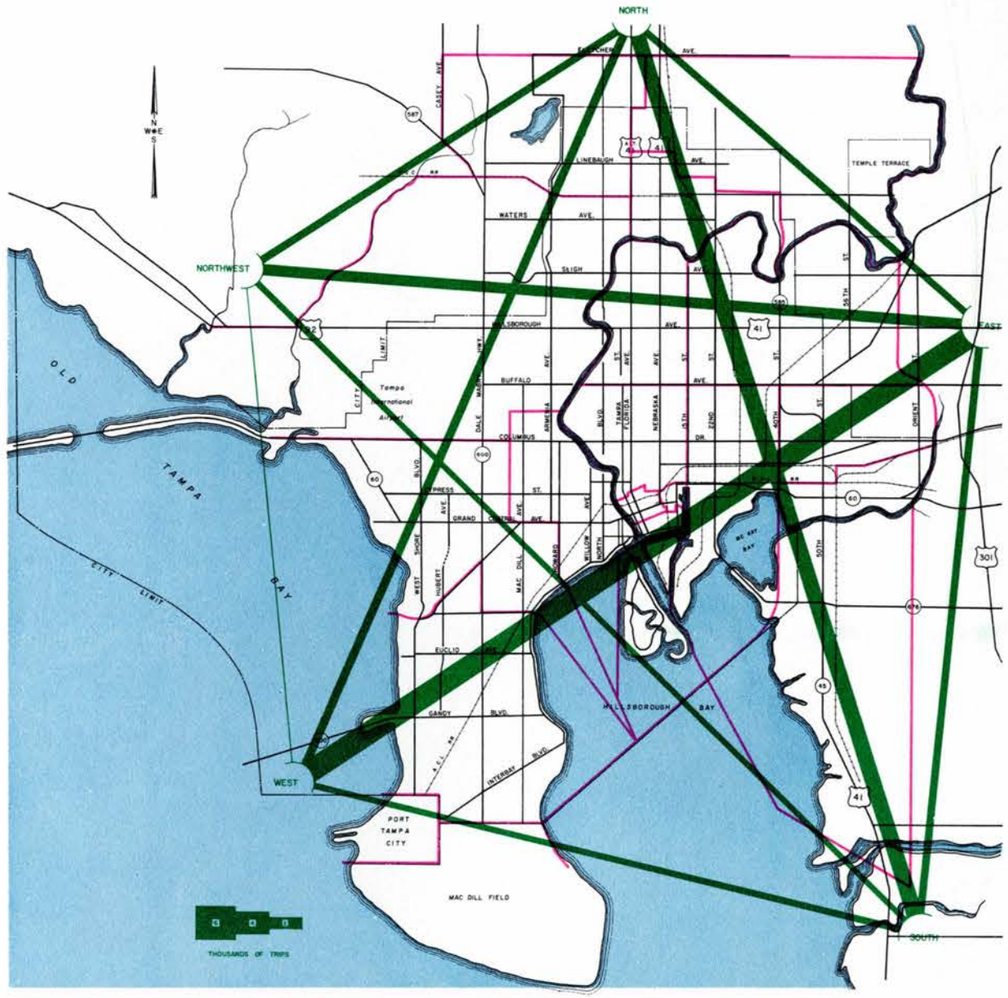
Wilbur Smith and Associates

FIGURE 19

In Figure 18, estimated 1975 vehicle trips between the external areas and the internal districts are illustrated for passenger cars. While the single heaviest generator of travel is the central business area, the importance of the internal districts immediately adjacent to the cordon area are emphasized due to anticipated development in the peripheral districts and the size of the Metropolitan Area in 1975. Many trip movements from areas immediately outside of the survey area have destinations in the adjacent peripheral districts. These trips reflect the anticipated traffic pattern due to industrial and commercial development, related shopping and business trips, and inter-residential social travel. For this reason, many major desire lines in the illustration extend only a relatively short distance into the survey area.

Commercial vehicle trips between external areas and internal districts are shown in Figure 19. The general distribution of trips is very similar to that of the passenger car travel; although, closer analysis indicates a higher proportion of trips to the industrial districts. In general, the heaviest internal movements are between the different external areas and the internal districts which they border.

Estimated Vehicle Trips Between External Areas — In Figure 20, the desire line pattern of travel anticipated in 1975 for all vehicles with neither origin nor destination within the metropolitan area are shown. It was found that the greatest number of through trips would be from the east to the north, south, and west. The magnitude of anticipated 1975 traffic from the other external areas were of almost equal magnitude. The single heaviest desire line of travel is from the west to the east where a magnitude of over 3,800 vehicles is estimated. Other heavy traffic movements are from the south to the north and from the northwest to the east where the 1975 trip level is estimated to exceed 2,800 and 2,000 vehicles, respectively.



1975 DESIRE LINES

EXTERNAL AREAS - EXTERNAL AREAS

PASSENGER CARS AND TRUCKS

Wilbur Smith and Associates

FIGURE 20

Chapter IV
AN INTEGRATED ROUTE PLAN

To satisfy the highway needs of the Greater Tampa Metropolitan Area in 1975, consideration must be given to a proposed expressway system that will form the backbone of the arterial street network, to other major streets radiating outward from the central section of the city, and to the important arteries that will serve travel between areas external to the central business district. In the past, considerable study has been given to an arterial street system for the Tampa area. As early as 1941, a major street plan was defined by planning and zoning consultants for the City of Tampa.[11] A major street plan was presented by the State Road Department in its 1946-47 traffic survey report.[12] The major innovation of the State Road Department's arterial street plan from that delineated in 1941 was the recommendation of a controlled access highway supplementing the designated arterial streets.

In 1951 the city's planning and zoning consultant reviewed prior plans and made further recommendations in regard to the major street plan. The major revisions included the addition of a system of one-way streets, principally in the central area of the city.

In March, 1957, a revised and updated "Comprehensive Plan for the City of Tampa, Florida," was submitted by the municipal planning and zoning consultant to the city.[13] This report gave full recognition and consideration to the planning of an East-West Expressway and a North Expressway serving the metropolitan area. There were no major changes in the previously recommended street plans of 1941, 1947, and 1951. Extensions of the existing one-way street plan, recommendation of more extensive parking restrictions, acquisition of more adequate right-of-way for street extensions and improvement, and specific recommendations as to street widths for the more important major surface arteries were given.

While the State Road Department in their preliminary report on Tampa Interstate Routes[14] did not study an arterial street system, the 1957 major street plan recommended by the city's planning consultant was reviewed and adopted in fixing the alignment of the proposed expressway and the location of interchanges.

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[11]George W. Simons, Jr., Planning and Zoning Consultant, Jacksonville, Florida.

[12]"A Traffic Survey Report and Limited Access Highway Plan of the Tampa Metropolitan Area", prepared by the Division of Research and Records of the State Road Department of Florida in cooperation with the Public Roads Administration, U. S. Federal Works Agency, 1946-47.

[13]"Comprehensive Plan for the City of Tampa, Florida", 1957, prepared by George W. Simons, Jr., Planning and Zoning Consultant, Jacksonville, Florida.

[14]"Tampa Interstate Routes, Preliminary Geometric Design, 1957", compiled by Division of Traffic and Planning, State Road Department of Florida in cooperation with U. S. Department of Commerce, Bureau of Public Roads.

Integrated route planning for the Tampa Metropolitan Area requires that full consideration be given to the maximum utilization of the existing street network and its improvement so that the proposed expressways and arterial streets will complement each other and serve traffic needs in the most expeditious, efficient, and economical manner.

PRESENT FACILITIES

For purposes of discussion, the highway facilities serving a metropolitan area's traffic needs may be categorized into four principal designations: (1) expressways; (2) arterial streets; (3) collector streets; and, (4) local streets. Each of these various classifications has a separate and distinct function, although there is some overlapping in the traffic services they provide. The principal function of a local street is to provide access to abutting property. Collector streets are dual function streets in that they provide access to abutting property and also carry traffic between arterial and local streets.

Arterial streets carry large volumes of traffic between different areas and across the city. They also provide access and egress to expressways. In metropolitan areas of smaller size, expressway construction may not be justified and arterial streets are the most important through traffic arteries. While arterial streets may serve abutting residential properties and often provide access to business, industrial and other service facilities, their primary function is to facilitate and expedite through traffic movements. Bus and truck routes usually follow arterial streets. The ability of even the highest type of arterial streets to accommodate traffic is materially limited by intersections and by marginal friction due to the provision of access to and egress from abutting property. Therefore, traffic capacity and speeds are limited. The urban expressway with full control of access and the elimination of at-grade street intersections can carry much heavier volumes of traffic per lane than conventional type streets, safely and with considerable savings in driving time.

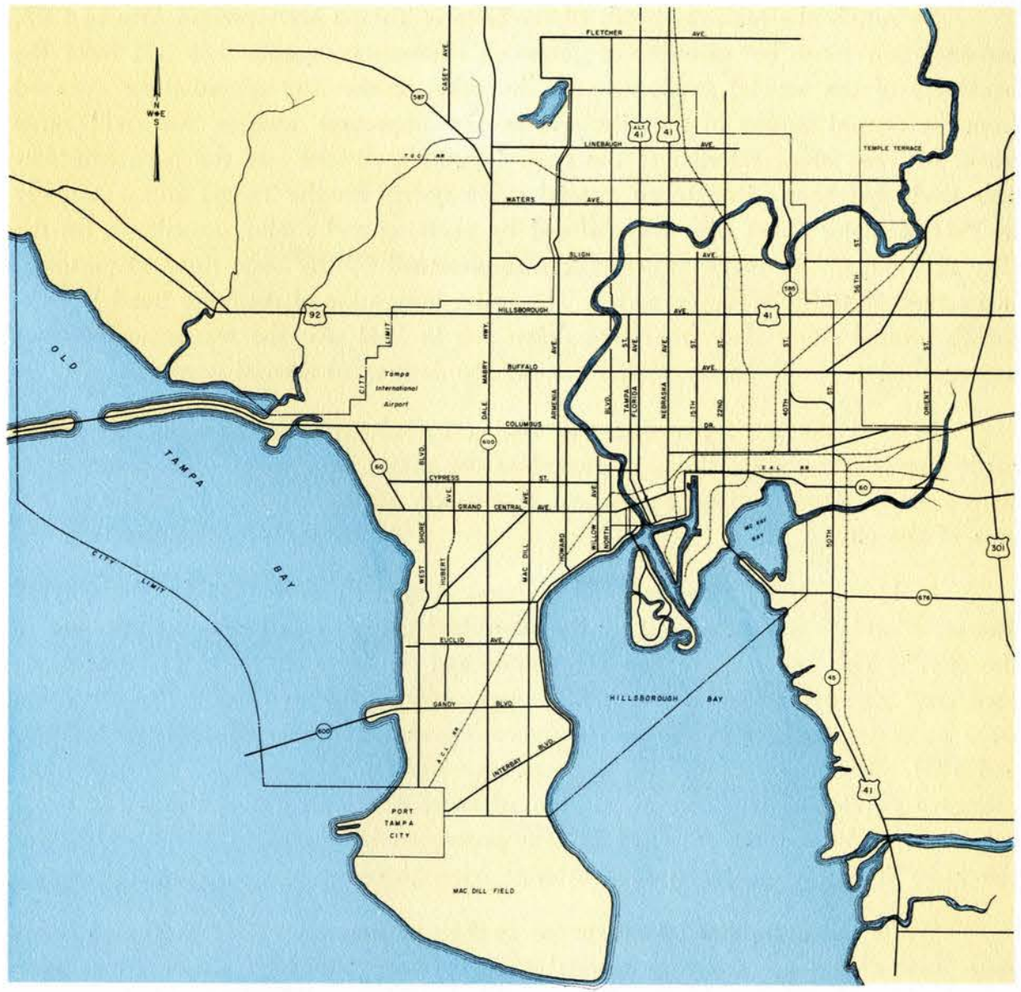
To a large extent, there has been little change in the relative importance of the most heavily traveled surface streets in the area within the last decade. However, outside of the corporate limits prior to 1953, the importance of many highways has been accentuated by the rapid residential and commercial developments in this area. Bayshore Boulevard and Gandy Boulevard, Memorial Highway — Grand Central Avenue, Columbus Drive, Hillsborough Avenue, Sligh and Waters Avenue,

and Seventh Avenue — Broadway are still the primary east-west routes traversing the Tampa area. In a north-south direction, MacDill Avenue, Armenia and Howard Avenues, North Boulevard, Tampa Street and Florida Avenue, Nebraska Avenue, 15th and 22nd, 34th and 40th Streets are still the most important arteries.

With the extension of the corporate limits and the rapid development of this area, the importance of Dale Mabry Highway, Manhattan Avenue, West Shore Boulevard and 50th Street in a north-south direction; Inter-Bay Boulevard, Euclid Avenue, Bay-to-Bay Street, Morrison Avenue in the Inter-Bay area and Buffalo Avenue, Linebaugh Avenue and Fowler Avenue have become accentuated. These streets, in effect, compose the present arterial streets in the Tampa area. Some are entirely inadequate over their entire length for present traffic volumes; most have capacity or geometric deficiencies over some portion of their length. Others are adequate for present day traffic. When the present major streets, as presented in Figure 21, are evaluated in terms of desirable performance levels for future traffic volumes, it is found that they are wholly inadequate. Highways are a major factor in the development of an area; inadequacy of the street system as measured in terms of ease of access and egress to an area may depress the potential growth and development in a specific locale. The estimated 1975 levels of traffic movement are premised upon the assumption that the highway plan will be adequate to serve the needs of the forecast population, employment, and level of economy in the trade area. Assuming no further major improvements in the existing streets and highways, the potential growth indicated could not be realized. With traffic volumes only slightly in excess of those presently realized, critical deficiencies in street capacity would materially affect the economic development of certain areas. This in turn, would set up a vicious chain of events in which the deteriorating economy would not be able to provide or attract sufficient revenues to remedy the critical deficiencies in arterial streets. To obviate the likelihood of this occuring, an integrated expressway and arterial street plan has been developed that will not only be adequate for 1975 forecast traffic volumes, but will, by its existence, foster and facilitate the potential development of the entire metropolitan area.

INTERSTATE EXPRESSWAYS

The proposed location of the Interstate Highway System, the expressway system designed to provide rapid movement of heavy volumes of mixed traffic, is shown



PRESENT
MAJOR STREET SYSTEM
METROPOLITAN AREA
TAMPA, FLORIDA
1957

Wilbur Smith and Associates

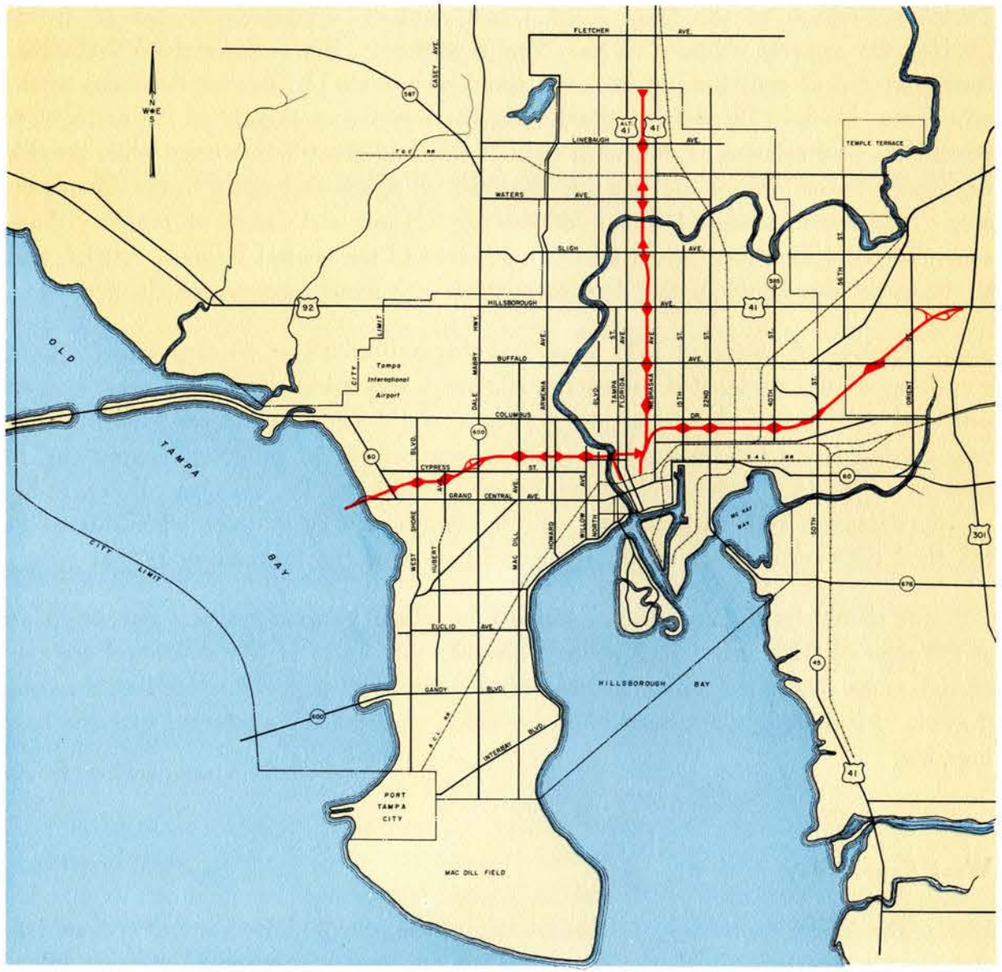
FIGURE 21

in Figure 22. For purposes of discussion and illustration, the proposed expressway has been divided into four sections:

The east-west expressway consists of three segments; the *West Expressway* extending from a connection with the proposed new Mid-Bay crossing of Old Tampa Bay, easterly to the vicinity of North Boulevard; the *Downtown Distributor* extending from North Boulevard easterly and northeasterly to a connection with the East Expressway near Nebraska Avenue, and the *East Expressway* from Nebraska Avenue, easterly and northeasterly to a junction with existing Hillsborough Avenue, U. S. Route 92, just west of the present interchange of U. S. Route 92 with U. S. Route 301. The fourth section of the proposed expressway system, described as the *North Expressway,* begins with a connection to the Downtown Distributor near Columbus Drive and extends northerly to the north city line. The Downtown Distributor also includes two spur connections, one to Tampa and Ashley Streets on the west side of the downtown area and the other to Pierce and Jefferson Streets on the east side of the central business district.

Location

From study of the projected 1975 travel desires, traffic corridors were established that would fit designated physical limitations of the termini of the proposed Interstate Highways and provide good traffic services. Field reconnaissance studies and analysis of available photogrammetric maps, furnished by the State Road Department, indicated that the West Expressway should be located as close to Memorial Highway — Grand Central Avenue as possible, pass just north of the central business district, and then proceed easterly in the vicinity of Columbus Drive and northeasterly to a connection with U. S. Route 92, Hillsborough Avenue. The North Expressway, to provide the best traffic service, should be located somewhere in the vicinity of Florida and Nebraska Avenues. Physical and topographic features, weighed with construction and right-of-way acquisition costs, dictated the location of the expressways as herein described. With the exception of the West Expressway from the vicinity of Hubert Street easterly and the Downtown Distributor, the recommended location closely conforms to that independently arrived at by the Traffic and



PROPOSED EXPRESSWAY SYSTEM

METROPOLITAN AREA
TAMPA, FLORIDA
1957

Wilbur Smith and Associates

FIGURE 22

Planning Division of the State Road Department in its preliminary study.[15] In regard to the easterly segment of the West Expressway, it was determined that equal traffic service at considerably less cost could be provided by moving the route northerly a few blocks. By shifting the Downtown Distributor slightly to the north, it is possible to save millions of dollars in right-of-way and construction costs while providing better traffic service and greater flexibility in access and egress to the downtown area. The recommended location reduces the amount and extent of property damage, materially improves access to the north side of the central business district, and at the same time provides the downtown area with more space in which to grow.

Analysis of projected 1975 travel patterns indicated that an expressway system consisting of the designated Interstate Highways traversing the Tampa area, and an extended and improved arterial street system would be adequate for forecast highway needs. Due to the natural terrain, the location of the proposed expressway in relation to existing ground elevation varies. Traffic service, existing culture, right-of-way damages, and aesthetics, as well as construction costs, were all evaluated in the final determination of the location and profile of the expressway system.

It should be realized that extensive sub-surface information was not available at the time of this study. It is entirely possible that some of the depressed sections of the route might not prove feasible after exhaustive engineering studies are conducted. Final design decisions must be based on detailed engineering analyses, borings, etc.

West Expressway

The West Expressway is that section of the proposed Tampa Expressway System from a connection with the new Mid-Bay crossing presently under construction, easterly to the vicinity of North Boulevard just west of the Hillsborough River. From Tampa Bay to Dale Mabry Highway, it is recommended that the initial construction consist of two travel lanes in each direction, separated by a 44 foot median. From Dale Mabry Highway to MacDill Avenue three travel lanes will be needed in each direction and from MacDill to North Boulevard four travel lanes in each direction are recommended.

[15] "Tampa Interstate Routes, Preliminary Geometric Design, 1957", compiled by Division of Traffic and Planning, State Road Department of Florida in cooperation with U. S. Department of Commerce, Bureau of Public Roads.

Near its western junction with the Mid-Bay crossing, an interchange is provided between the West Expressway and Grand Central Avenue Extension. The expressway running at ground level will pass under Memorial Highway, Westshore Boulevard, and Hubert Street. Interchanges are provided with each of these cross streets. Between Hubert Street and Cypress Street, the grade of the expressway will rise and pass over Cypress Street, Grady Street and Dale Mabry Highway. The proposed interchange with Dale Mabry Highway varies from the modified diamond interchanges with Memorial Highway and West Shore Boulevard in that a loop ramp is provided in the north-west quadrant to eliminate the heavy left-turning movements otherwise necessitated by traffic from the east with destinations in the Interbay area.

From Dale Mabry Highway easterly, frontage roads that will serve the dual function of providing traffic service to the abutting property and access and egress to and from the expressway are recommended. The expressway continues as an elevated section from Dale Mabry Highway, overpassing Himes Avenue, Lincoln Avenue and MacDill Avenue. A full modified diamond interchange is provided with MacDill Avenue. From Himes Avenue easterly, the West Expressway is located within the area bounded by Green Street on the north and Laurel on the south. East of MacDill, the expressway descends to ground level rising to overpass Armenia Avenue and continues in an elevated section easterly to North Boulevard, overpassing Howard Avenue, Rome Avenue, Willow Avenue, and North Boulevard. Interchanges are provided with Armenia, Howard and Willow Avenues. Over the existing Atlantic Coastline Railroad tracks in Rome Avenue, a vertical clearance of 22 feet from top of rail is recommended.

From its western terminus with the new Mid-Bay crossing to the interchange with Dale Mabry Highway, the proposed location of the West Expressway is through new residential areas either partially developed or presently undergoing rapid development. If right-of-way is not acquired soon in this area, the cost of the property to be acquired may substantially increase in a relatively short period of time.

From Dale Mabry Highway easterly, the West Expressway traverses a principally residential area to North Boulevard. From Dale Mabry Highway to Himes Avenue the development is sparse. From Himes Avenue easterly to North Boulevard, the area is composed of fully developed residential areas varying in quality from a number of fine homes in the vicinity of McFarland Park to a substantial number of sub-standard dwelling units east of Rome Avenue to the Hillsborough River.

Downtown Distributor

That portion of the Tampa Expressway System extending easterly and northeasterly from North Boulevard to Columbus Drive and Nebraska Avenue is referred to herein as the Downtown Distributor. The most costly portion of the entire expressway system, the Downtown Distributor, is also the single most important segment. It provides access and egress to the central business district and its immediate environs and also provides direct, free flowing, high speed connections between the West, East and North Expressways.

The number of traffic lanes in each direction varies from a minimum of three to a maximum of six where two separate interchange roadways are used due to the physical layout of the interchanges.

Due to the desirability of developing the Hillsborough Riverfront as a recreational area and thereby enhancing its value to the metropolitan area, it is recommended that the section of the Downtown Distributor from a point west of North Boulevard to the Hillsborough River be constructed as an elevated viaduct section. Due to the height of embankment otherwise needed and the necessity to spread the two one-way roadways in order to increase the operational efficiency of the major interchange just east of the river, preliminary costs and analyses indicate that the viaduct section would not cost appreciably more than an embankment section. Detailed soils investigations and the availability of construction materials may prove in the detailed design that the viaduct section is actually cheaper.

The eastbound and westbound roadways of the Downtown Distributor, north of the central business district, are separated by a distance varying from 20 feet to over 250 feet and the profile of the two roadways differ. Direct connections to Ashley and Tampa Streets are provided for both eastbound and westbound traffic just east of the Hillsborough River.

The entire block between Scott and Kay Streets would have to be acquired for construction of the elevated roadways, access and egress ramps, and a new arterial surface street that would facilitate the movement of vehicles from the expressway to the existing north-south streets. Scott and Kay Streets should be improved in their present location to serve as frontage roads to abutting properties. Immediately south of Kay Street and north of Scott Street, the development of a wide arterial street is recommended. This new facility would serve as a diffuser street between the Downtown Distributor and existing north-south streets. Ramps providing access and egress to the expressway system are provided west of Ashley Street and east of Morgan Street. The interchange ramps and the diffuser street would improve access to the northside of the central business district and the area immediately to the north and enhance property values in this sector of the City.

Another direct interchange is provided east of Morgan Street to permit access to the east side of the central business area via Pierce and Jefferson Streets.

Just east of Morgan Street, the Downtown Distributor would curve in a northeasterly direction overpassing Central Avenue and Henderson Avenue to the location of a third major interchange area located south of Columbus Drive and predominantly east of Nebraska Avenue. The purpose of this interchange would be to facilitate the movement of traffic between the North, East, and West Expressways and central business district via the Downtown Distributor. The interchange is so designed that all turning movements are not only direct, but direct in that left turning traffic will turn from the left entering lanes and right turning traffic will turn from the right. This condition cannot always be provided in the design of a major interchange, particularly when consideration is given to topography, right-of-way damages and construction costs. While in perspective, the downtown distribution system may appear somewhat complex, tracing typical movements will show that to the individual driver the routing is simple and direct.

East Expressway

The East Expressway as defined, is that section of the Tampa Expressway System extending easterly from Nebraska Avenue between 13th Avenue and 14th Avenue to the proposed interchange with Columbus Drive and 50th Street and then continuing in a northeasterly direction to an interchange with East Hillsborough Avenue just west of the junction of the latter with U. S. Route 301. The typical roadway section along the East Expressway varies from a depressed section in the vicinity of 15th Street to 22nd Street, to an elevated roadway section from 29th Street to a point just west of 40th Street. From near 40th Street, easterly and northeasterly to the aforementioned interchange of the East Expressway with Hillsborough Avenue, the expressway is at normal ground elevation and intersecting highways overpass the expressway.

To comply with the prescribed geometric design requirements, the westbound roadway of the East Expressway overpasses Nebraska Avenue while the eastbound

roadway underpasses Nebraska Avenue. Modified diamond interchanges are provided at 15th Street and 22nd Street. Interchanges are also provided with 40th Street, Columbus Drive, 50th Street, and Buffalo Avenue. One-way frontage roads extend from Nebraska Avenue to the Seaboard Air Line Railroad underpass.

Anticipated 1975 design traffic volumes indicate that a six-lane facility should be constructed from Nebraska Avenue to a point west of 22nd Street. A four-lane divided roadway will be adequate for design traffic volumes from the latter point to the interchange with U. S. Route 92, East Hillsborough Avenue. However, it is recommended that a 44 foot median and structures adequate for ultimate development to six lanes be provided in the design.

The expressway will underpass 15th Street, 19th Street, and 22nd Street, overpass the Seaboard Air Line Railroad, 34th Street, 36th Street, the Atlantic Coastline Railroad and underpass 40th Street, Columbus Drive, 50th Street, Buffalo Avenue, Chelsea Road and Orient Road.

A direct interchange is provided with East Hillsborough Avenue, U. S. Route 92, just to the west of the present interchange with U. S. Route 301. The present eastbound roadway of East Hillsborough Avenue will be relocated to overpass the expressway.

North Expressway

The North Expressway may be described as that portion of the proposed Tampa Expressway System extending northerly from an interchange with the Downtown Distributor at Columbus Drive to the north city limits. Underpassing Columbus Drive, the expressway located generally between Elmore and Taliaferro Avenues, continues as a depressed section underpassing Floribraska Avenue, Lake Avenue, Buffalo Avenue, Chelsea Street, Osborne Avenue, Hillsborough Avenue, Hanna Avenue, Sligh Avenue, and Flora Street. North of Flora Street the expressway transitions to an elevated embankment section overpassing Hanlon Street, the Hillsborough River, and Waters Avenue. In an alternate profile study, Waters Avenue is carried over the expressway.

From Waters Avenue northerly, the elevated roadway of the North Expressway would overpass East Arctic Avenue extended, the Seaboard Air Line Railroad, the transition to normal ground elevation underpassing Linebaugh Avenue. From Linebaugh Avenue northerly, the expressway continues at ground level east of Central Avenue. Future provision is made for the extension of Temple Terrace Highway under the expressway just north of the Seaboard Air Line Railroad crossing. Both 109th Street and Fowler Avenue are carried over the expressway.

Modified diamond interchanges are recommended at Floribraska Avenue, Buffalo Avenue, Hillsborough Avenue, Sligh Avenue and Flora Street south of the Hillsborough River. North of the Hillsborough River, interchanges are recommended with Waters Avenue, the extension of East Arctic Avenue, Linebaugh Avenue, and Fowler Avenue. Construction of a grade separation structure to facilitate the exchange of traffic between the expressway and the proposed Temple Terrace Highway extension is recommended.

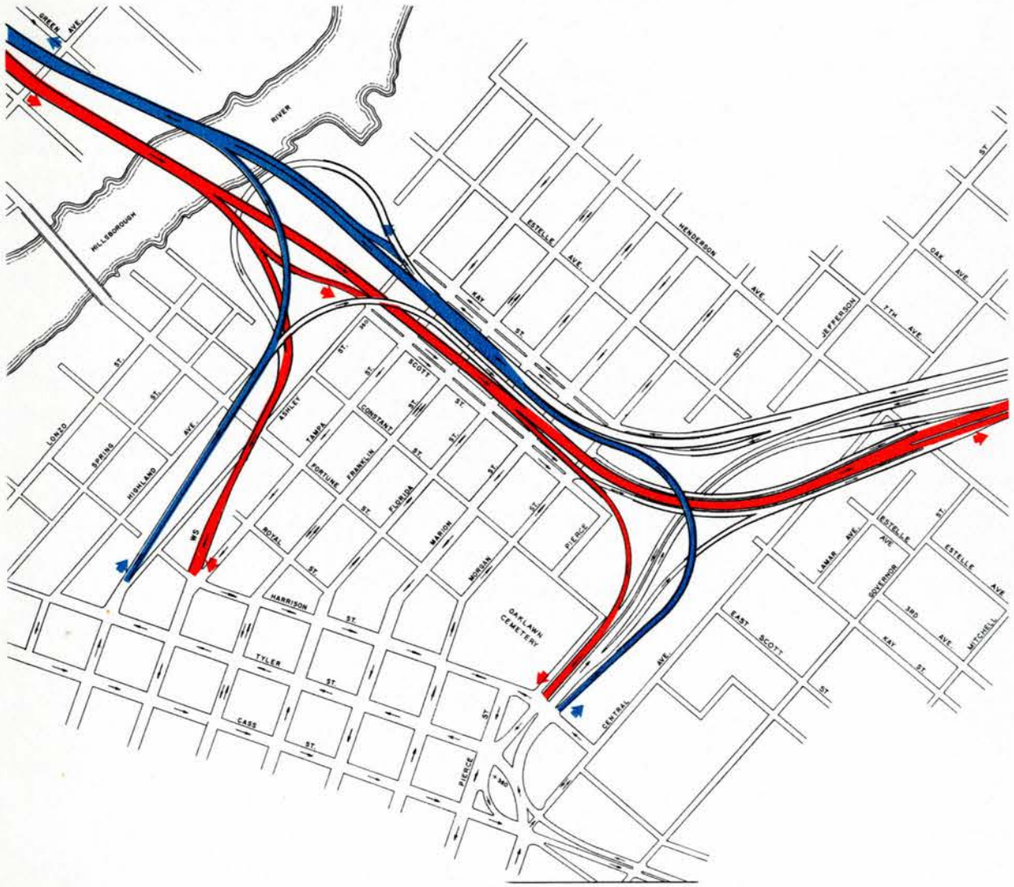
The assignment of anticipated 1975 traffic volumes to the proposed expressway indicates that from Columbus Drive northerly to Buffalo Avenue, four traffic lanes should be provided in each direction. From Buffalo Avenue northerly, a six-lane divided facility will be adequate for 1975 forecast traffic volumes as far as Waters Avenue. Initial construction of two traffic lanes in each direction will be adequate for design traffic volumes from Waters Avenue northerly to the north city limits near Fowler Avenue.

Traffic Distribution-Downtown Distributor

The distribution of traffic using the Downtown Distributor as well as traffic movements between the West, East, and North Expressways are graphically depicted in Figures 23 and 24. The flexibility of the Downtown Distributor is clearly indicated. Traffic may approach the central business district from the West Expressway, (Figure 23) via direct connections to Tampa Street on the western side, Pierce Street on the eastern side, or the diffuser street located between Scott and Kay Streets.

The return movements from the central business district to the West Expressway can be achieved via direct connections from Jefferson or Ashley Streets. Motorists desiring to utilize the West Expressway are also afforded access from the downtown diffuser street via the ramp located west of Ashley Street. Movements from the North and East Expressways, (Figure 24) are afforded access to the downtown area via the same routes.

High speed directional flow connections are provided between the three expressway segments and directly to the north, east and west sides of the central business district. The interchanges and approach roadways have been so designed that weaving traffic is almost non-existent, minimizing loss in capacity of the express roadways.



TRAFFIC DISTRIBUTION

WEST EXPRESSWAY - DOWNTOWN AREA

TAMPA, FLORIDA

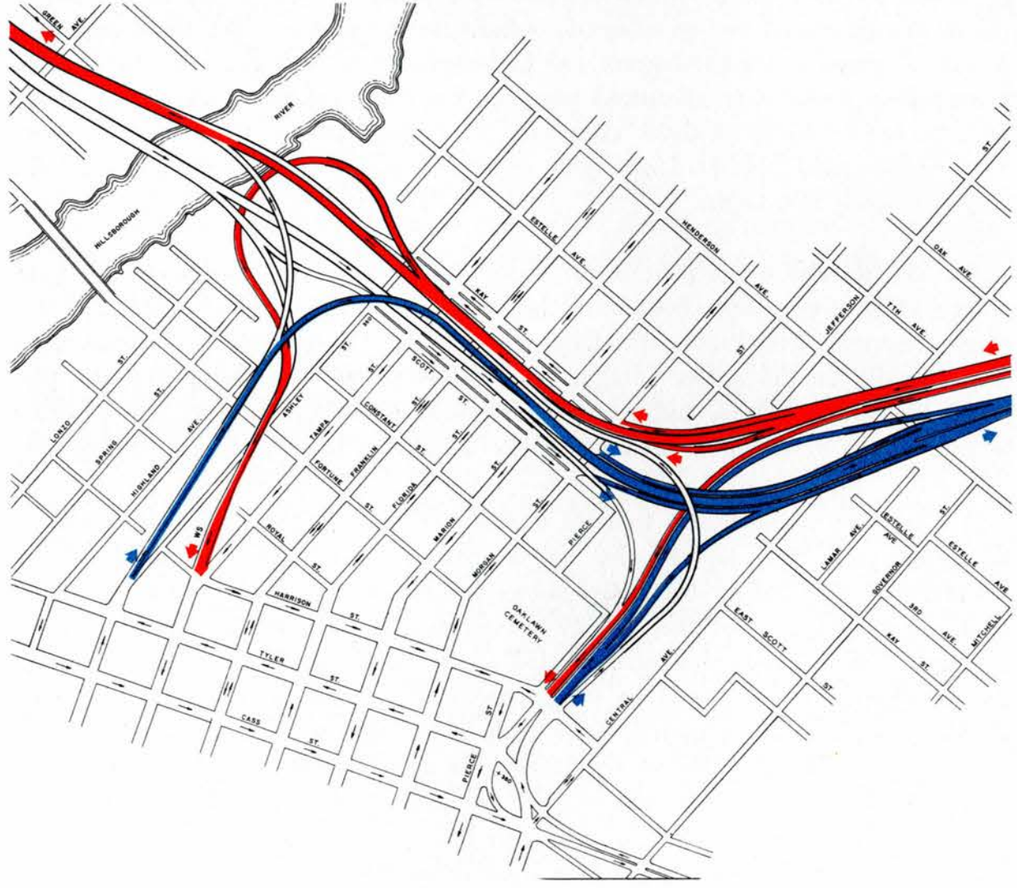
1957

Wilbur Smith and Associates

FIGURE 23

At no location does the driver have to choose between more than two paths. This design principal enables him to move freely and easily.

The flexibility of the proposed interchange design permits motorists to choose between three separate means of entry to the central business district and provides excellent connection between the expressways.



TRAFFIC DISTRIBUTION

NORTH AND EAST EXPRESSWAY - DOWNTOWN AREA

TAMPA, FLORIDA

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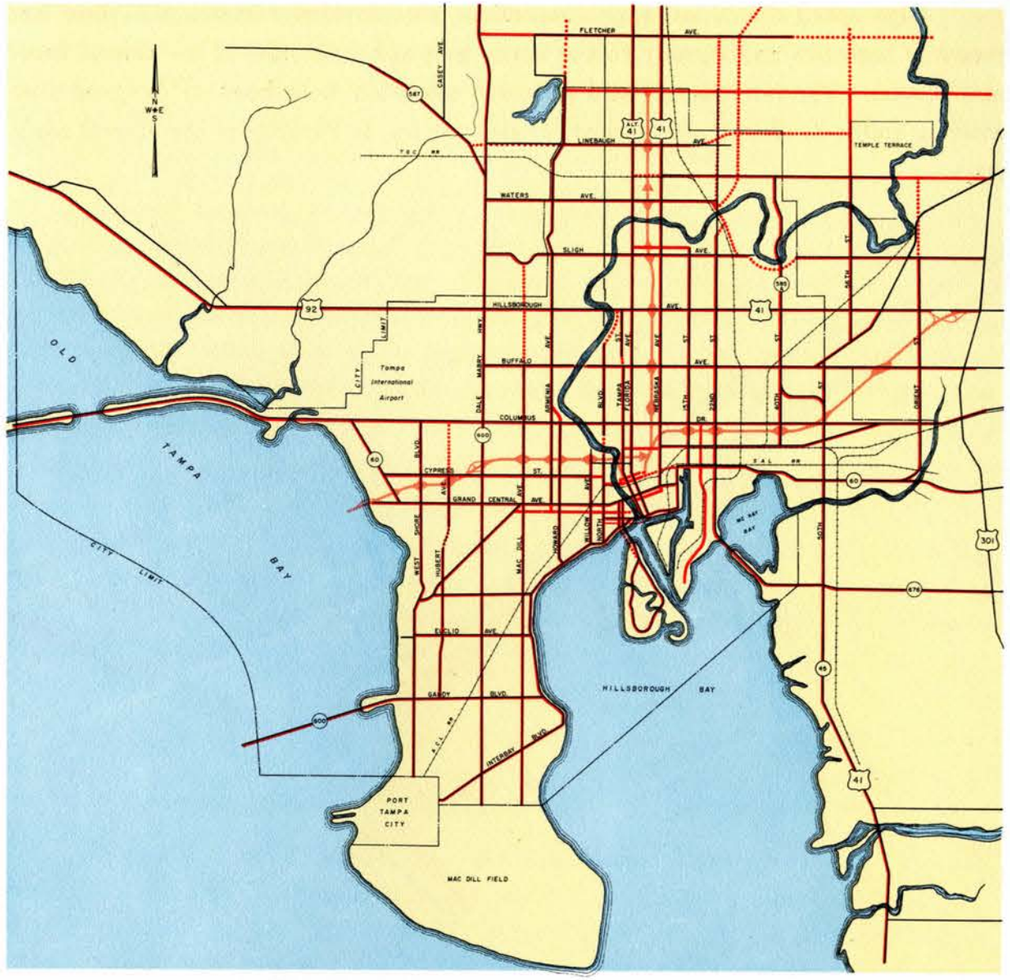
FIGURE 24

ARTERIAL STREETS AND HIGHWAYS

The expressway system will relieve many of the surface arteries of large volumes of traffic, but it is in no way a complete solution to Tampa's traffic needs. To function effectively, the expressway system must be integrated with a major street plan for the area. Only through utilization of the existing traffic arteries to the fullest extent possible, and provisions of extensions, improvements and additional facilities where necessary, can an adequate solution to the area's traffic needs be found. Figure 25 shows the arterial street and highway plan recommended for the Tampa metropolitan area. It is considered adequate for the estimated needs of the study area in 1975. Almost without exception, the present arterial streets are included. The recommended plan conforms quite closely to that previously presented by the City's Planning Consultant.

The arterial street plan is for the entire metropolitan area, including large areas outside of the City. Because of this, additional routes, not included in the plan of the Planning Consultant to the City, are included. In general, the recommended plan provides for the proper integration of the major arterial streets with the proposed expressway system, and recommends the extension and improvement of many arteries in the metropolitan area for which the present street system is inadequate.

Analyses of the traffic volumes estimated to use the arterial street system in the design year, 1975, indicate that the designated arterial streets should provide a minimum of four traffic lanes. Extensive channelization at many locations will be necessary to provide adequate capacity at intersections. To provide for the progressive free flow of traffic, the recommended arterial streets and the frontage roads of the expressway system should be interconnected by a modern traffic signal system. On many of the existing arteries, particularly in the older sections of the City, it will be many years before sufficient right-of-way for effective widening can be obtained. It is important in these areas to recognize the necessity for establishing setback lines along the arterial streets. Prompt action in this regard cannot be overemphasized. The formal designation of the surface street as an important artery will tend to accelerate the construction of new commercial development. An established setback line would regulate the new building line, which, in turn, would make the eventual acquisition of necessary rights-of-way less damaging and expensive to the going businesses, property owners and the governmental authorities participating in the construction costs.



RECOMMENDED ARTERIAL STREET AND HIGHWAY PLAN

TAMPA METROPOLITAN AREA
1957

Wilbur Smith and Associates

FIGURE 25

With the dynamic growth of the metropolitan area, it is imperative that a firm policy of land acquisition and street improvement priorities be set up. Recognition of the needs and cost of the program will be a major step forward.

North-South Arterial Streets

Specific recommendations as to the desirable right-of-way and degree of improvement for the north-south traffic arteries comprising the recommended arterial street plan follow. For clarity, the routes are discussed from west to east. This order, of course, should not be taken as a listing by importance or priority of improvement. Local officials, living with the everyday problems of moving traffic throughout the City, are in the best position to establish the priorities of construction. Therefore, no priority, or recommended scheduling, of improvement has been indicated.

West Shore Boulevard — Lightly traveled at the present time from its southern terminus with Interbay Boulevard in Port Tampa City to its northern terminus with Columbus Drive, West Shore Boulevard, because of its strategic position as the westernmost north-south street in the metropolitan area, is becoming increasingly important to the area as a traffic artery. Except for a short length immediately south of Morrison Avenue, the existing right-of-way width of 80 feet is considered adequate for the development of this facility, except for the section between Cypress Street and Grand Central Avenue where heavy traffic volumes interchanging between the West Expressway require a 120 foot right-of-way. The section of the route through Sunset Park is on poor alignment and early consideration of this improvement should be given. In the ultimate development of the facility to a minimum of four traffic lanes, special consideration should be given to the intersection with Interbay Boulevard, Gandy Boulevard, Grand Central Avenue, the West Expressway and Columbus Drive.

Manhattan Avenue — Hubert Avenue — At the present time, Manhattan Avenue northerly to Henderson Boulevard is heavily used by traffic from the Interbay Area with destinations in the downtown, northern and eastern parts of the City. With the completion of the expressway, it would be desirable to furnish an alternate outlet for this heavy traffic volume via Hubert Avenue and the West Expressway. The major obstacle to continuity in the route is in the Beach Park area. Study should be given to connecting Manhattan Avenue to Hubert Avenue in this vicinity.

Dale Mabry Highway — Dale Mabry Highway is and will continue to be the primary north-south arterial in the western section of Tampa. Early consideration should be given to its improvement as a four-lane highway from Euclid Avenue southerly, and the provision of improved intersection channelization at Columbus Drive, Grand Central Avenue, and Gandy Boulevard. Ultimate improvement to six traffic lanes from Gandy Boulevard, northerly to Hillsborough Avenue, is indicated as necessary. Four traffic lanes should be adequate for anticipated 1975 traffic volumes from Hillsborough Avenue northerly.

MacDill Avenue — The importance of this north-south route will be increased by provision of an interchange connecting to the West Expressway. Generous setback lines should be established along this important facility from its southern terminus at MacDill Field, northerly to Buffalo Avenue. It should be widened to a minimum of four traffic lanes and extended from Buffalo Avenue northerly, to a connection with Sligh Avenue.

Bayshore Boulevard — Presently heavily traveled, this artery will become even more important to the metropolitan area in the future. With the natural control of access provided by Hillsborough Bay, it presently has high traffic capacity and can be improved to accommodate much heavier traffic volumes at a moderate cost. The basic problem in providing free traffic flow and developing the potential capacity of this facility lies in the improvement of its northern terminus at the Platt Street Bridge and improvement of the channelized intersection with the Davis Island Bridge. With provision of an additional bridge crossing to Davis Island, thereby reducing turning conflicts at the present Davis Island Bridge, and the provision of added traffic capacity at the Platt Street crossing of the Hillsborough River, this facility could easily handle volumes far in excess of the present volumes. It is recommended that a four-lane bridge be built parallel and just south of the existing Platt Street Bridge. The new structure should be operated as a one-way facility eastbound, paired with the existing Platt Street Bridge as a one-way facility westbound. By providing a direct ramp connection from Bayshore Boulevard for eastbound traffic and an overpass of Bayshore Boulevard for traffic from Platt Street, traffic volumes almost double those presently carried with considerable congestion could be handled without any congestion. To complete this improvement, it is recommended that Platt Street, east of the Hillsborough River, be operated as a one-way facility westbound and that Ellamae Avenue, improved and extended to the new river structure, be designated as one-way eastbound.

This improvement would not only eliminate the existing congestion at the Platt Street structure, but would provide for a circumferential arterial street routing of vastly increased capacity around the southern and easterly fringe of the central business area. The functional plan of this proposed improvement is subsequently presented. At some future date, present indications are later than 1975, it would be desirable to further increase the capacity of Bayshore Boulevard from Gandy Boulevard northerly by providing two traffic lanes in the present median and widening to six traffic lanes where the present turf median ends. The two additional lanes should be operated as northbound traffic lanes in the morning and southbound traffic lanes in the evening.

Armenia and Howard Avenues — Howard Avenue, from its southern terminus with Bayshore Boulevard northerly to its connection with Armenia Avenue north of Columbus Drive, and Armenia Avenue, from Cleveland Street northerly to the city limits at Fowler Avenue and beyond, should be improved as major arterial streets. Limited improvements can be made in Armenia Avenue from Columbus Drive to the south. The strategic location of these streets indicate that it may be preferable to operate them as one-way facilities southerly to Cleveland Street from their junction, rather than to acquire sufficient rights-of-way for two-way operation along either street. The proposed interchange with the West Expressway was designed giving full consideration to this possibility.

North and South Boulevard — The proposed high-level fixed crossing of the Hillsborough River, providing continuity in this street, will vastly increase its usefulness as a primary traffic artery. Setback lines should provide for a more adequate right-of-way for this important facility. Consideration should also be given to its future extension northerly to Hillsborough Avenue.

Tampa Street—Florida Avenue — A very important artery in the central section of the City, this facility will be relieved of considerable traffic by the proposed North Expressway. Even with the traffic relief provided, it will be necessary to extend the present parking restrictions along Florida Avenue. It is also desirable to increase the capacity of this facility between Buffalo and Hillsborough Avenues by extending the one-way operation. To facilitate this, a connection from Tampa Street to Highland Avenue is recommended.

Nebraska Avenue — Considerable traffic relief will also be provided to Nebraska Avenue by the construction of the North Expressway. However, the requirements of local traffic will necessitate parking restrictions and the eventual widening of this facility. Particular attention should be given to adequate channelization of the intersections with the recommended east-west arterials, particularly Hillsborough Avenue, Buffalo, and Columbus Drive.

15th Street — Fifteenth Street is the only north-south artery between Nebraska Avenue and 22nd Street upon which continuity from Adamo Drive to the Hillsborough River exists. The designation of adequate setback lines and ultimate provision of a minimum four-lane traffic section for this facility is recommended.

22nd Street — Strategically located to serve local traffic needs in the section of Tampa it traverses, this important artery also connects the metropolitan area with central and southern Florida. It should be extended, via a connection to the new bridge crossing of the Hillsborough River east of the Seaboard Air Line Railroad, northerly to Fletcher Avenue and beyond. A minimum of four traffic lanes should be provided for the entire length of this facility from its junction with 50th Street southeast of Tampa, to Fletcher Avenue. In the densely settled areas through Ybor City, it will be necessary to provide this roadway capacity by prohibiting parking and undertaking some minor widening.

40th Street — This important artery will continue to grow in importance, serving the industrial development in southeastern and northeastern Tampa. The scope of improvement should contemplate provision of a four-lane divided facility from the cutoff to 50th Street northerly to Temple Terrace Highway.

50th Street — The recent improvements to 50th Street over Palm River should be extended northerly and westerly to 40th Street to provide an ultimate four-lane facility. The existing street should be improved from Columbus Drive to Buffalo Avenue. A high type channelized intersection with Buffalo Avenue and improved connection via Lake Avenue to 56th Street should also be constructed.

56th Street — To serve the eastern edges of the City which are now undergoing rapid development, the industrial park, the new university site, and the residential areas that will mushroom around the latter, 56th Street should be improved as a divided surface street. The initial improvement should be two lanes offset on a wide right-of-way with dualization of the highway as traffic demands require. Right-of-way should be obtained for an ultimate six-lane divided arterial street.

Orient Road — It is anticipated that by 1975 the suburban residential areas of Tampa will have spread easterly beyond Orient Road and that this facility will be required to accommodate large volumes of traffic. Provisions should be made for the development of this highway as a four traffic lane facility, with ultimate extension, via a grade separation with the Coastline Railroad, to Temple Terrace Highway.

U. S. Route 301 — It is anticipated that by the end of the forecast design period, that this important highway facility will form part of a circumferential route of the suburban Tampa metropolitan area. Consideration should be given to the construction of grade separation structures with the more important east-west arterials and the provision of frontage roads for service to abutting properties. This will greatly enhance the capacity of the highway and decrease the accident potentials.

East-West Arterial Streets

In the following section, the major east-west traffic arteries are discussed beginning with the southernmost facility and proceeding northerly to the limits of the study area, Fowler Avenue, and beyond.

Interbay Boulevard — This facility serving the traffic needs of MacDill Air Force Base and the southernmost reaches of the Interbay Area should be developed eventually to a four-lane roadway. Particular attention should be given to the channelization of the intersections of this arterial with Dale Mabry Highway and Bayshore Boulevard.

Gandy Boulevard — The importance of this route to the traffic needs of the metropolitan area can be expected to continue. With the progressive improvement of Bayshore Boulevard, the initial improvement at its northern terminus with Platt Street and the ultimate improvement providing directional lanes in its median, the importance of Gandy Boulevard as a distributor of traffic from the Gandy Bridge to Dale Mabry Highway and Bayshore Boulevard will increase. A minimum of six travel lanes should be provided for its entire length. Consideration should also be given to an ultimate grade separation with Dale Mabry Highway.

Euclid Avenue — The improvement of this artery as a four-lane surface street is recommended. The initial step should be the opening of the street across the Atlantic Coast Line Railroad right-of-way.

Bay to Bay Boulevard — The improvement of this artery to four traffic lanes is recommended from its intersection with West Shore Boulevard easterly to Bayshore Boulevard.

Henderson Boulevard — The importance of Henderson Boulevard in the movement of local traffic from the Interbay area to north and east Tampa will continue. A particular problem in the development of full utilization of this important artery is the provision of adequate capacity at its intersection with Dale Mabry Highway and Morrison Avenue.

Morrison Avenue — To aid in the dispersal of the heavy east-west traffic in the northern sector of the Interbay Peninsula, the development of Morrison Avenue as an arterial street is recommended. The acquisition of additional rights-of-way will be necessary along portions of this route.

Cleveland Street — The development of this facility to serve the proposed Lee-Krause Bridge is recommended. Its improvement will relieve traffic loadings on both Grand Central Avenue and Platt Street, and will provide additional street capacity which is needed in this area.

Grand Central Avenue — The extension and improvement of Grand Central Avenue westerly from Memorial Boulevard to the interchange with the proposed West Expressway and the new Mid-Bay crossing is recommended.

Cypress Street — Important in providing adequate access to western Tampa and the rapidly developing residential areas west of Dale Mabry Highway is the improvement of Cypress Street as a major arterial. The improvement of Cypress Street should provide for a minimum of four traffic lanes and auxiliary parking lanes. Special consideration should also be given to the intersections with Memorial Highway and Dale Mabry Highway.

Frank Adamo Drive — The extension of Frank Adamo Drive via an elevated viaduct over 13th Street, the Atlantic Coast Line Railroad yard, and Nebraska Avenue westerly to a high type channelized intersection with Cass and Tyler Streets is recommended. This improvement will not only relieve present traffic congestion at the intersection of 13th Street and Frank Adamo Drive, but will provide a more direct routing for many travel movements from the central business area to east Tampa. The widening of Frank Adamo Drive from four to six lanes from 13th Street to a point east of 50th Street is also recommended. Plan and profile are subsequently presented.

Columbus Drive — Due to its strategic location in connecting the Tampa metropolitan area with Pinellas County and the Tampa International Airport, Columbus Drive will become an increasingly important arterial. The first through street north of the central business area, it is part of a frequently used circumferential routing by local traffic as well as through traffic. Present plans call for its early improvement from the Campbell-Courtney Causeway easterly to Dale Mabry Highway. Particular attention should be given to the proposed channelized intersection with Dale Mabry Highway. The right-of-way for the facility through the central and easterly sections of the metropolitan area is wholly inadequate. Setback lines for the ultimate improvement of this arterial to a minimum of four traffic lanes are recommended.

Buffalo Avenue — The early improvement of Buffalo Avenue as a major surface arterial is recommended. The construction of a river crossing will be of immediate benefit to traffic. West Buffalo Avenue should be extended to Dale Mabry Highway. Rights-of-way along major portions of this route are inadequate for its ultimate development as a high type four-lane facility. High priority should be given to the acquisition of the necessary rights-of-way and improvement of this arterial.

Hillsborough Avenue — The early improvement of Hillsborough Avenue from Nebraska Avenue westerly to Florida Avenue is recommended. Ultimately, the facility should be developed to six traffic lanes. Where existing right-of-way is inadequate, setback lines should be established to facilitate the necessary widening.

Sligh Avenue — With the urbanization of the northern sections of Tampa, the importance of many existing east-west streets will increase. Sligh Avenue is presently feeling the impact of expanding residential development. Provision should be made for its ultimate improvement as a four-lane traffic artery from the Dale Mabry Highway extension easterly via an improved crossing of the Hillsborough River to U. S. Route 301. Additional rights-of-way will be necessary along sections of the route. Some relocation and new construction in the vicinity of Egypt Lake and the bend of the Hillsborough River in the vicinity of 40th Street are essential.

Waters Avenue — The improvement of Waters Avenue as a four-lane traffic artery from the Dale Mabry Highway extension easterly to a connection with the proposed 22nd Street river crossing and 30th Street is recommended. It is desirable to obtain a minimum right-of-way width of 100 feet in the more sparsely developed sections and 80 feet in the present densely built-up areas.

Temple Terrace Highway — The extension of this important street westerly from Nebraska Avenue to Florida Avenue is recommended. Provision for this has been made in the functional design of the North Expressway. With the rapid development of the Henderson Industrial Park and the new State University, the importance of this highway to the area's traffic requirements will increase tremendously.

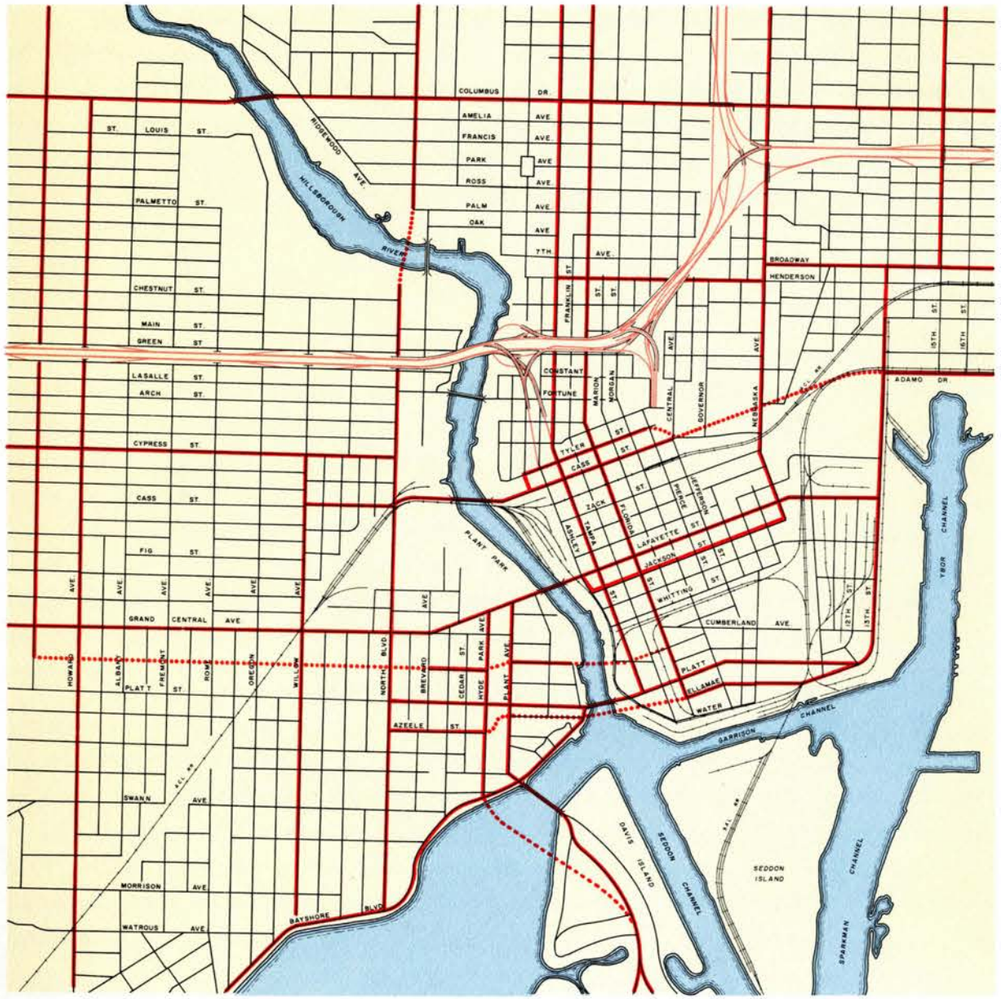
Linebaugh Avenue — To provide adequate traffic service to the northern sections of the city, Henderson Industrial Park and Temple Terrace, the improvement of this facility as a four-lane arterial is recommended. Linebaugh Avenue should be extended on new location from Armenia Avenue westerly to an intersection with the Dale Mabry Highway extension. Construction on new location easterly, from a point near the Seaboard Air Line Railroad crossing to the Henderson Industrial Park and 56th Street, would be desirable.

Fowler Avenue — The designation of this thoroughfare from Armenia Avenue to U. S. Route 301 as an arterial street is recommended. Within the city a minimum 100 foot right-of-way should be acquired and wherever possible a greater width. From the east city limits easterly, a 200 foot right-of-way is recommended.

Fletcher Avenue — Although outside the limits of the study area, this highway is so important in providing adequate traffic service to the northern sections of the metropolitan area that a discussion of the arterial street plan would be inadequate without mentioning it. A northerly circumferential route to the metropolitan area, providing access to the proposed State University site and the new Industrial Park, improvement of this facility upon a 200 foot right-of-way is recommended from the Dale Mabry Highway extension easterly to U. S. Route 301.

Central Business District

Repeatedly throughout the report, the inadequacy of the present street system serving the central business area has been emphasized. Figure 26 graphically depicts the arterial street system recommended to serve this important generator of traffic. With the construction of new river crossings at North Boulevard, Lee-Krause Street and the provision of a parallel structure to the existing Platt Street bridge, the problem of ingress and egress from West Tampa and the Interbay area will be alleviated. The North Boulevard-Columbus Drive routing and the Bayshore-Platt-Ellamae routing will provide circumferential by-passes of the central business area. The opening of Adamo Drive across



RECOMMENDED ARTERIAL STREET AND HIGHWAY PLAN

TAMPA DOWNTOWN AREA
1957

Wilbur Smith and Associates

FIGURE 26

the Atlantic Coast Line Railroad yard, and its connection with the expressway system and the Cass Street bridge, will provide an additional arterial routing through the central business district. The construction of the recommended expressway system will relieve the present and proposed arterials of through traffic, a large per cent of the longer internal traffic movements and considerable local traffic. The provision of an improved connection between the Cass Street bridge and the Cypress Street arterial would be an additional and very desirable improvement.

Summary

The arterial street plan recommended will complement and supplement the proposed expressway system. The completion of the improvements previously described will provide the metropolitan area with a fine street system adequate for future traffic needs. The scope of proposed improvement to the arterial streets and highways is a program of considerable magnitude; however, the recommended major street and highway plan is the minimum considered adequate for the Tampa area. The importance of an adequate system of surface streets to the attainment of the potential growth of the metropolitan area is readily apparent. The most important steps that should be taken at this time are the formal delineation and designation of a major street plan, the establishment of adequate set-back requirements along the designated arterial streets, and the formalization of a long range plan of improvement, giving full consideration to priority of improvement and the availability of construction funds.

Chapter V
TRAFFIC ASSIGNMENTS

The services provided by any roadways are largely determined by the volumes of vehicles accommodated. Expressways are capable of accommodating large volumes at relatively free operating speeds; further, they provide heavy movements at high average speeds with very low accident rates. With properly located and designed interchanges, the expressway-type facilities can accommodate three to four times as many vehicles per travel lane as at-grade streets where movements are hampered by intersectional conflicts, parking, and pedestrians. Estimates of the volumes that can be expected to use expressways are basic to the proper location and design of such facilities.

To properly locate the expressway system in Tampa, approximate traffic assignments based on 1957 traffic values were made to several alignments in each major traffic corridor. From these assignments, it was possible to determine the locations that would provide the maximum traffic services. It was also possible to approximate the number of lanes that should be provided at various points and the best locations for interchanges with local streets. While it was necessary to compromise maximum traffic services with right-of-way costs and basic planning values, all of the recommended roadways are generally located where they will provide optimum traffic services measured in terms of vehicular volumes.

After the routes were located and functional plans were developed, complete assignments were made of traffic volumes potential to each section of the expressway taking into account all of the operational features of the expressway and interchanges as well as the capabilities of local streets to serve the expressway demands at interchanges. After the route system was determined, the forecasts of traffic problems, which were dependent upon zone to zone travel times, were completed. The assigned traffic values subsequently discussed are based on the projected 1975 travel patterns.

Assignment Methods

It has been well demonstrated in many studies that the primary basis used by motorists in selecting routes is travel time and distance. To a lesser degree, there are miscellaneous factors such as safety, the ease of driving on free-flowing facilities, and psychological preferences for expressways that also enter into route choices. Using previous data collected from numerous before-and-after studies, traffic assignment curves have been prepared. These curves take into account the time and distance relationships between alternate routes and the relationships are adjusted for the intangible or psychological values which have been measured in actual practice and which reflect the desires of motorists to travel on high-type, continuous-flow roadways.

Using the origin and destination data projected for 1975, each zone to zone movement was analyzed by using the traffic assignment curves to determine the percentage of the movement assignable to different sections of the expressway system. In each instance, the time and distance values included all travel necessary on the existing streets as well as the travel that could occur on the proposed expressways. Very few trips are served in their entirety by the expressway system so that practically every assignment had to consider a total movement involving partial travel over local streets and part over the expressways. Obviously, there are many trips that gain no advantage by use of the expressways and which must, therefore, be retained in assignment studies on the local street system. It should also be pointed out that in the assignments, consideration was given to the arterial street improvements recommended in this report, particularly the major thoroughfares and new waterway crossings.

In computing travel time for the zone to zone movements, it was assumed that speeds on all portions of the recommended expressway system would average 50 miles per hour except on that portion designated as the "Downtown Distributor." For the Downtown Distributor, an average speed for through movements of 40 miles per hour was assumed. In the portions of trips on local roadways, the peak hour speeds measured during the survey (1957) were used as average speed values. If the recommended improvements are made in the arterial street system and if progressive interim traffic regulations are adopted, aimed at giving preference to moving traffic, then it must be assumed that the 1975 average speeds on local streets should certainly be no lower than the present peak hour speeds on the streets.

Basic Factors

In making assignments to any route, or to a system of routes, it is necessary to examine local conditions and controls which to a great degree influence traffic values. Basic assumptions must be made, traffic inducements and growth must be considered, and time savings must be computed. It is also necessary to consider peak and off-peak operating conditions, separately.

Basic Assumptions — The principal assumptions considered necessary in the traffic assignments to the proposed Tampa Expressway System include:

1. The expressway system to which trips are assigned will be constructed and in operation as a complete system prior to 1975.

2. Interchanges will be located and the construction of the system will conform generally to the functional plans recommended herein.

3. The Interstate System of Rural Highways which form the extensions or connectors to the metropolitan expressway system will be developed and in operation prior to 1975.

4. All types of legally registered vehicles will be permitted to use the expressway system, i.e., passenger, commercial and transit vehicles. Pedestrians will be excluded from the expressway.

5. The expressway system will be well marked and designated as numbered interstate routes. All interchanges will be conspicuously marked for traffic movements on the expressways and for traffic movements on the local streets at expressway interchanges. In addition, "trail blazer" or other appropriate markings will be provided in the general area to direct unfamiliar motorists to the expressways.

6. Vehicles which do not use the expressways will use surface streets between origins and destinations and will operate on the streets at average speeds which conform to the existing average peak-hour speeds on the same routes.

7. In lieu of calculations of average speeds and time values through expressway interchanges, it was assumed that each movement onto and off of the expressway would add the equivalent of one mile of travel distance. It was also assumed that the entrance to or exit from the expressway through an interchange would add the equivalent of one and two-tenths minutes to the time required for the expressway trip.

Traffic Growths and Inducements — By using the projected 1975 zone to zone traffic movements in making the assignments to the expressway system, it was not necessary to estimate or assume general growth rates and inducement factors. This is a principal advantage afforded by the method described previously of fabricating travel patterns for a given year — in this case, 1975.

The necessity for traffic inducements in the final assignments was removed since the firm of Traffic and Trade, Inc. was furnished an assumed expressway system for consideration in developing land uses and population distributions at 1975 levels. The distribution of persons and activities which generate travel in accord with the assumed expressway and major street systems were automatically adjusted for conventional traffic inducements.

In the projected patterns of travel for 1975 levels, separate growth rates were assumed during the period 1957-1975 for each of the survey zones. Obviously, a much higher degree of accuracy is obtained by studying and estimating growth by zones than could be derived from estimates which assumed over-all average growth rates. The travel desires have taken into account the growth in terms of very small areas because each area was studied independently in the analysis of populations, workers, and other basic land uses in the fabrication of the future trip movements. These trip movements were the basis for the assignments and since they were for the design year (1975), no growth rates were necessary.

Travel Savings — In discussing the method of making traffic assignments, it was pointed out that the use of a given alternate route is largely dependent upon the time and distance savings. It has become increasingly recognized that time is a much more important factor than distance since the average motorist is more concerned with the amount of time that a given trip requires than the distance to be traveled. This is vividly demonstrated on toll roads where it is found that an appreciable number of motorists travel greater distances because less time is required. Studies have shown that some motorists use the superior type route facilities and even pay tolls although the distance traveled is greater and no time savings are effected. In general, the expressway system that has been recommended is located so that heavy travel corridors are well served from practically all points of major traffic generation in the Tampa metropolitan area. The eastern and northern sections of the system conform ideally to the patterns of travel desires. The western section serves a major movement, but its relationship to the street pattern is such that the heavy movements from the southwest do not enjoy high distance and time advantages by using the West Expressway. This has, of course, been acknowledged in developing the system of major route improvements and in recommending substantial improvements in such facilities as Bayshore Boulevard to supplement the basic expressway system. In the assignments, however, it is found that a very high percentage of all trip movements in the Tampa area can gain some time and/or distance advantages by using portions

of the expressway. Because of the completeness of the street network and the comprehensiveness of the recommended system of major street improvements, the recommended expressway system will not provide substantial distance savings except for the few trips with origins and destinations immediately adjacent to the expressways. Because of this, it is apparent that distance savings are of little consequence in most of the trip assignments and the principal values are time savings which can be afforded by use of a substantial section of the expressway system, or by even short sections of the system.

For all practical purposes, the assignments of traffic to the proposed expressways were based on time savings, empirically adjusted for the intangible and psychological values which enter into the decisions of motorists to use expressway-type facilities. The advantages in terms of time savings of the expressway system are demonstrated by the values shown in Table IX. In this table, typical trip movements in the Tampa area are shown together with the time required to make the movements on existing streets, in relation to the time estimated for the trips over all or appropriate parts of the expressway system. At estimated 1975 travel speeds, a trip from the central business district of St. Petersburg to the central business district of Tampa would require almost an hour over local streets and less than 40 minutes over the expressway; a saving of almost 30 per cent would be achieved by using the expressway and the new bridge over Tampa Bay. From the International Airport to the central business district, a time saving of about five and one-half minutes would be achieved via the expressways, or about 35 per cent of the time required on local streets. As expected, the longer the distance over the expressway, the greater the time savings achieved. Since the expressways do not serve directly such generators as MacDill Air Force Base and Port Tampa City, movements from these places to other points in the area are not proportionately as great in terms of time savings as are movements from localities more directly served.

TABLE IX

TIME SAVINGS FOR TYPICAL TRIPS
VIA PROPOSED EXPRESSWAYS

Trip Movements	*Time via Existing Street* (Minutes)	*Time via Expressway* (Minutes)	*Time Saved* (Minutes)	*Per Cent Reduction*
Midway Bridge to C.B.D.	13.0	8.1	4.9	37.7
Port Tampa City to C.B.D.	21.8	22.9	–1.1	–5.0
Port Tampa City to Sulphur Springs	38.8	29.4	9.4	24.2
International Airport to C.B.D.	15.8	10.3	5.5	34.8
St. Petersburg (C.B.D.) to Tampa (C.B.D.)	53.0	37.9	15.1	28.5
Barrett Park to Davis Islands	23.3	18.6	4.7	20.2
Harney to Airport (International)	29.0	24.9	4.1	14.1
MacDill Airbase to North Tampa City Limits	44.3	32.1	12.2	27.5
Industrial Park to C.B.D.	25.4	18.5	6.9	27.2

While the shorter trips would not save as much time proportionately as some of the longer trips shown in Table IX, the savings would still be appreciable and many motorists would be attracted to sections of the expressway for relatively short distances of travel.

Peak Hour Versus Average Daily Traffic Levels — As indicated in Chapter II, the peak hour traffic on major thoroughfares in the Tampa area is only about eight to twelve per cent of the average 24-hour total. Experiences with urban expressways show that with use and experience by drivers, the peak hour traffic volumes become smaller in relation to the total average daily volumes. This is due to the practice of motorists in seeking out the expressways after their effectiveness is recognized and in avoiding them during the hours of greatest congestion when periods of delay are likely. This condition tends to produce lower peak hour percentages than those normally found on urban streets and thoroughfares. The relatively low peak hour percentages and the tendency to develop even lower percentages on urban expressways were taken into account in the assignment of traffic to the expressway system. This provides a factor of optimism relative to average daily traffic values that are assigned to different sections of the expressway.

Maximum Lane Volumes — For design for purposes, it is customary to use conservative traffic lane volumes. Design volumes of about 1,200 vehicles per lane per hour are commonly employed in rural expressway design. For urban expressways, higher lane volumes are assumed in design. The new manual on "A Policy On Arterial Highways In Urban Areas", published by the American Association of State Highway Officials (1975), suggests urban lane design capacities up to 1,500 vehicles per hour with *possible capacity* values up to 1.33 times the design values. Such volumes do not exceed the practical capacity of a well designed expressway and it is expected that at these volumes, free-flow characteristics will prevail at high average speeds. In practice, it is known that much higher lane volumes are handled

during periods of heavy traffic demand on urban expressways. Actually, the higher type at-grade thoroughfares with good signal controls are capable of achieving volumes as high as 1,200 vehicles per lane per hour under conditions of heavy traffic pressure. Since during peak hours, lane volumes far in excess of the design values are commonly achieved, it has been assumed for assignment purposes that maximum loadings will approach 1,600 to 1,800 vehicles per lane per hour.

Research in operational characteristics on California's extensive system of freeways show volumes on the inside lane in the direction of heaviest flow on four-lane freeways ranging from 1,650 at 39 miles per hour to 2,437 at 45 miles per hour operating speeds; volumes on the inside lanes of the heaviest flow of six-lane facilities from 1,530 at 53 miles per hour to 2,360 at 45 miles per hour; and for eight-lane freeways inside lane volumes from 1,425 to 2,226 at 36 miles per hour. This research also demonstrates that the adverse effect upon operating speeds by the total volume of vehicles is not nearly as great as is the percentage of trucks, rate and length of grade.

It is realized that the assumption of the heavier lane volume at peak hours may produce operating conditions that are below those desired; particularly in the area of certain interchanges and at the points where interchange ramps connect with local roadways. The volumes which have been assigned to certain sections of the expressway could not be achieved if desirable operating capacity values were assumed, but again, it is known that such volumes will become a reality under practical operations and it is therefore unrealistic to assign lower volumes.

There is another factor that cannot be overlooked: If the Tampa area develops as has been anticipated, by 1975 the total traffic movements will be so great that heavy pressures will exist on the local and major streets as well as on the expressways. While motorists will seek the routes of least resistance, it cannot be assumed that even during peak hours surface streets will provide as much freedom of movement as the expressways, even though the expressways may be operating considerably above desirable capacities. It is a matter of tolerating the delays either on the expressways or on the regular street system. In most cases, the corridor demands are found to be so great during peak hours at the projected 1975 travel patterns, that speeds below those normally obtainable and volumes greater than those desired will prevail on the critical expressway and major street sections.

System Traffic Volumes

The average daily traffic volumes assigned to the Tampa Expressway System are shown in Figures 27, 28, 29, and 30. The volumes are indicated at each interchange; they are also shown by direction on sections between interchanges. While the values are based on assignments from 1975 travel desires, it is apparent from the pressures and the relative fluidity of movement on the local streets that the indicated volumes will be achieved on some sections of the system many years prior to 1975. It is also apparent from observing the values, that capacity conditions will prevail on certain sections of the expressway system and these sections cannot accommodate the total volumes that could be assigned if additional capacity was available.

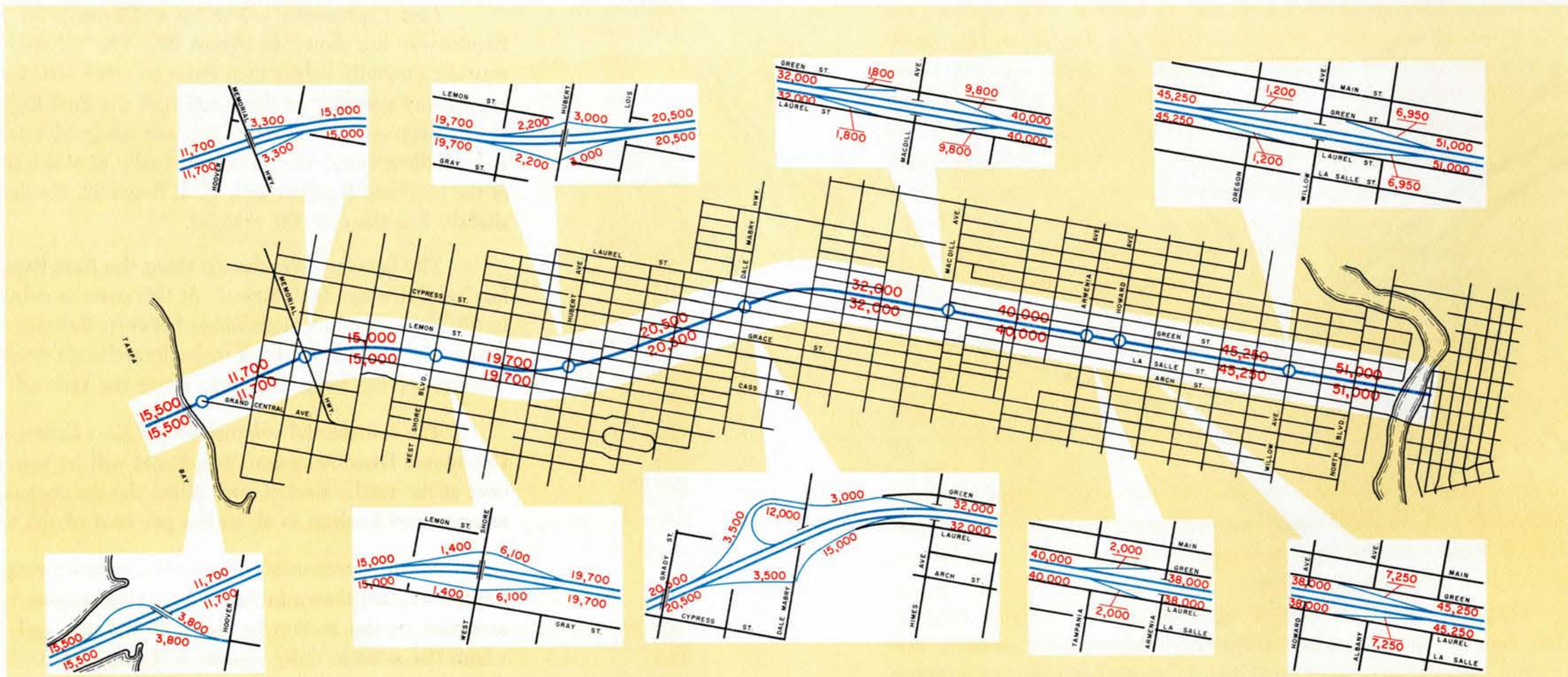
West Expressway — In Figure 27, the volumes assigned to the West Expressway are indicated. Because of the heavy traffic generators in Pinellas County, the International Airport, MacDill Field, Port Tampa City, and concentrated development along the expressway, the highest volumes in the entire expressway system, excluding the Downtown Distributor, are assigned to the West Expressway. Immediately west of the Hillsborough River an average daily value of 102,000 vehicles is indicated. Because of the heavy movements assignable to the West Expressway from the Interbay area the volumes dropped substantially west of the Dale Mabry Highway. Between Dale Mabry Highway and MacDill Avenue, an average daily volume of 64,000 vehicles is expected. This increases to 80,000 vehicles between MacDill and Howard Avenues and to 90,500 vehicles between Howard and Willow Avenues. At the new Tampa Bay Bridge, the average daily volumes should approximate 31,000. The interchange at Dale Mabry Highway and the West Expressway is the heaviest, although the values assigned to some other interchanges such as at MacDill Avenue are restricted by the capacities of the local streets rather than by the basic travel desires.

In considering the volumes assigned to the West Expressway, particularly at such interchanges as Hubert Avenue, it must be realized that the street improvements indicated in the arterial street plans must be developed.

The Downtown Distributor — The most intricate movements onto and off of the expressway system will occur in the vicinity of the downtown area of Tampa. The movements on the ramps provided in this area and on the main lines of the expressway are shown in Figure 28.

The heaviest traffic volumes in the entire system will occur between the junction of the North Expressway with the East Expressway and the ramps into the central business district near Jefferson Street. On the combined lanes of the expressway in this section, an average daily volume of approximately 122,000 vehicles is expected by 1975. At this point on the Distributor there will be a total of 11 traffic lanes some of which are provided to eliminate weaving and merging movements.

In the assignment of volumes to the ramps on the Downtown Distributor, it was assumed that the movements into and out of the central area streets would be balanced in accord with the capacities available on these streets. Because the ramps are designed primarily to take advantage of major one-way north-south street patterns, it was possible to assign high volumes to the principal ramps without overloading the local streets.



ANTICIPATED 1975 TRAFFIC VOLUMES

WEST EXPRESSWAY

TAMPA, FLORIDA

1957

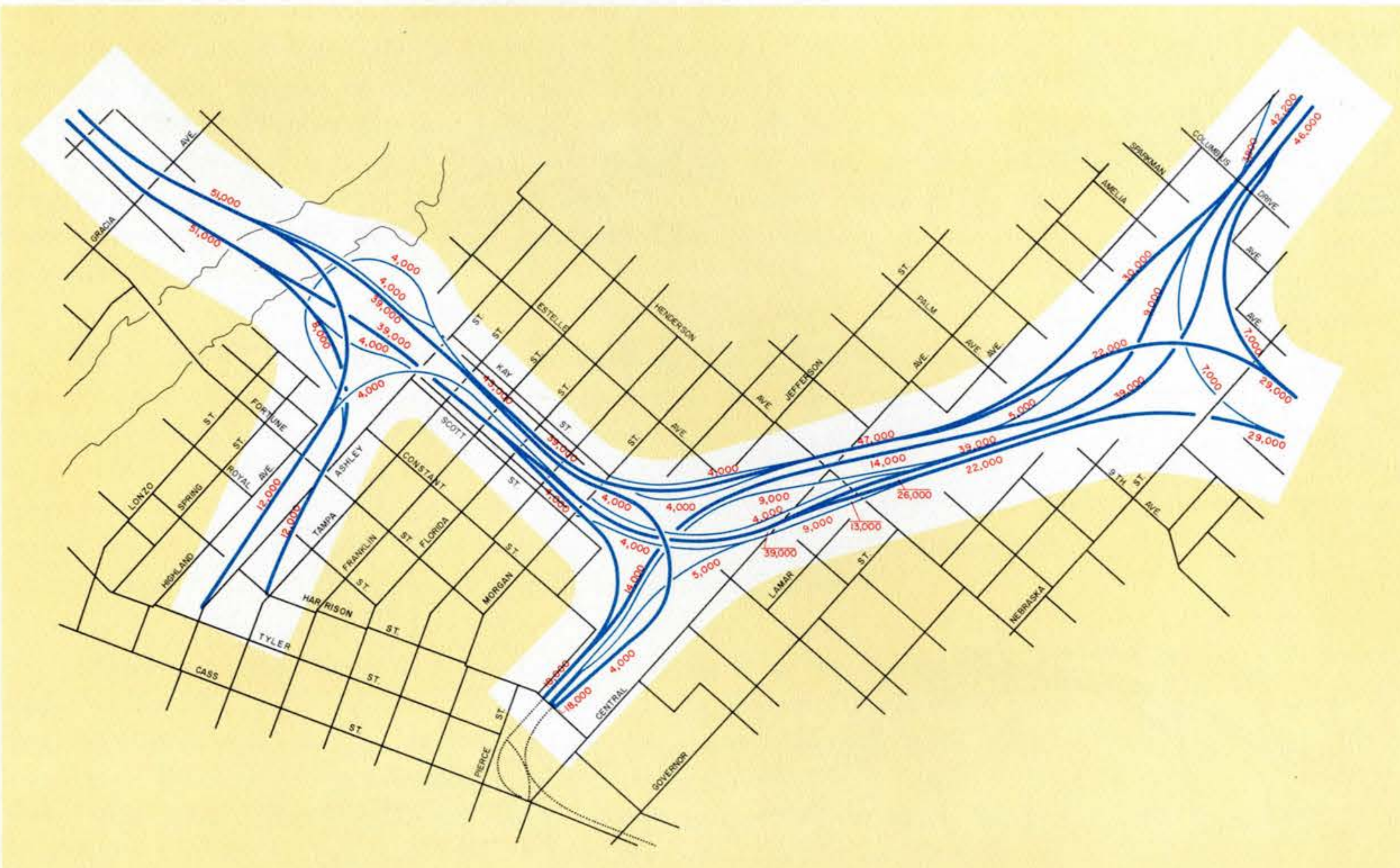
Wilbur Smith and Associates

FIGURE 27

By the development of a distributor roadway on the axis of the expressway between the interchange just east of the Hillsborough River and the interchange just north of Oaklawn Cemetery, it was again possible to make high ramp assignments without taxing the capacities of local streets.

The Downtown Distributor would feed approximately 18,000 vehicles per day southbound into Pierce Street and it would receive from Jefferson Street northbound a similar volume — 18,000 vehicles per day. From the expressway southbound, Tampa Street would receive a daily volume of approximately 12,000 vehicles and a complementary northbound movement would enter the Downtown Distributor via Ashley Street.

Eastbound traffic leaving the Distributor on East Scott Street would total about 4,000 vehicles per day. A comparable volume would enter the Distributor westbound through the prospsed new diffuser street just to the north of the Downtown Distributor.



ANTICIPATED 1975 TRAFFIC VOLUMES

DOWNTOWN DISTRIBUTOR

TAMPA, FLORIDA

1957

Wilbur Smith and Associates

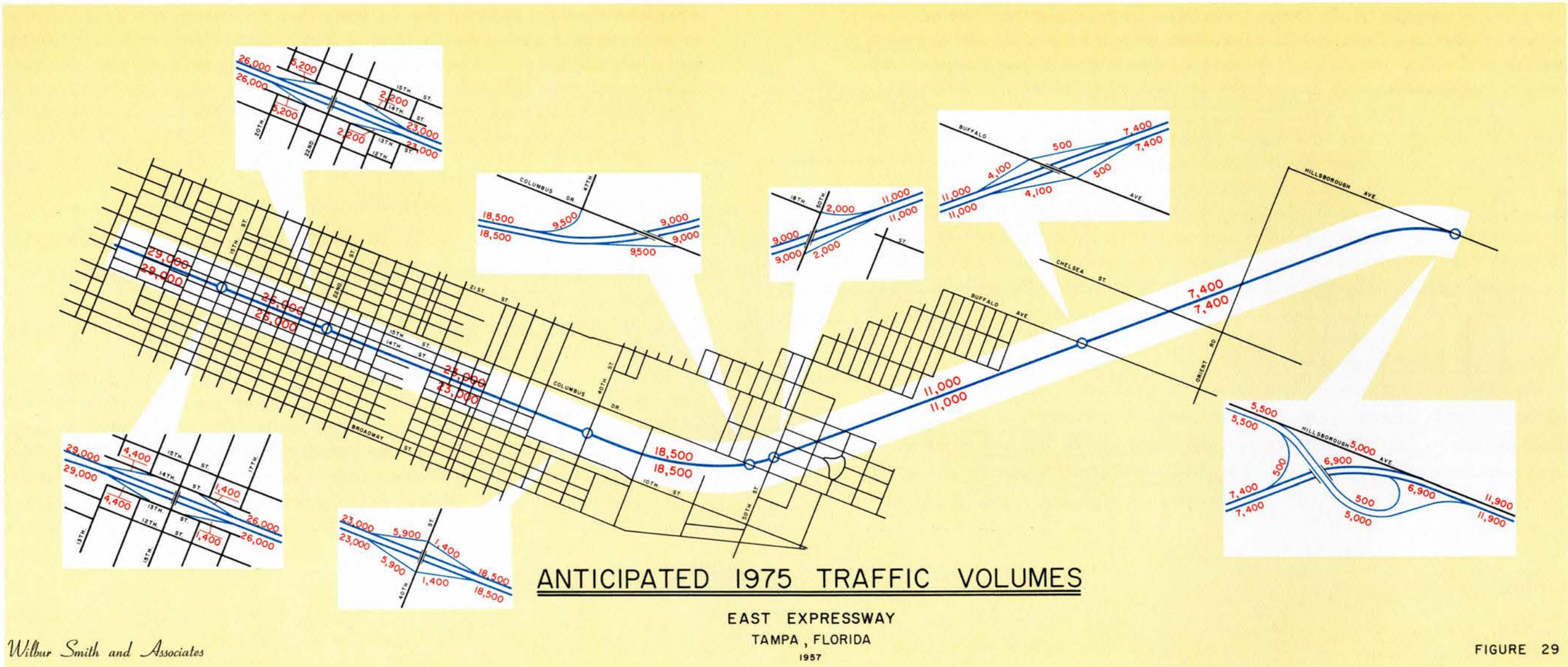
FIGURE 28

East Expressway — Volume assignments for 1975 on the East Expressway are shown in Figure 29. The volumes on this expressway are generally lighter than those on other sections of the proposed expressway system. At the junction of the East Expressway with the North Expressway, the daily volumes assigned total 58,000 vehicles in both directions. The values gradually diminish so that to the east of the proposed junction with U. S. Route 92, the daily values will be slightly less than 24,000 vehicles.

The heaviest interchange along the East Expressway is at Columbus Drive and 50th Street. At this point, a substantial volume of traffic is expected to interchange between the expressway and U. S. Route 41. It will also be a major interchange point for commercial vehicles serving industrial areas along the railroad.

The commercial volumes on the East Expressway between the Downtown Distributor and 50th Street will be approximately 14 per cent of the total. East of 50th Street the commercial traffic volumes are expected to drop to about ten per cent of the total.

North Expressway — The traffic volumes assigned to the North Expressway are shown in figure 30. The heaviest volumes are to be expected on the section between Floribraska and Buffalo Avenues where the average daily volume will exceed 88,000. This is largely due to the fact that Buffalo Avenue will be the first major point of interchange between the Downtown Distributor and the residential areas of the City. The volumes are gradually reduced on the North Expressway as the distance from the central area of the City increases. Just south of the proposed interchange at Linebaugh Avenue, the

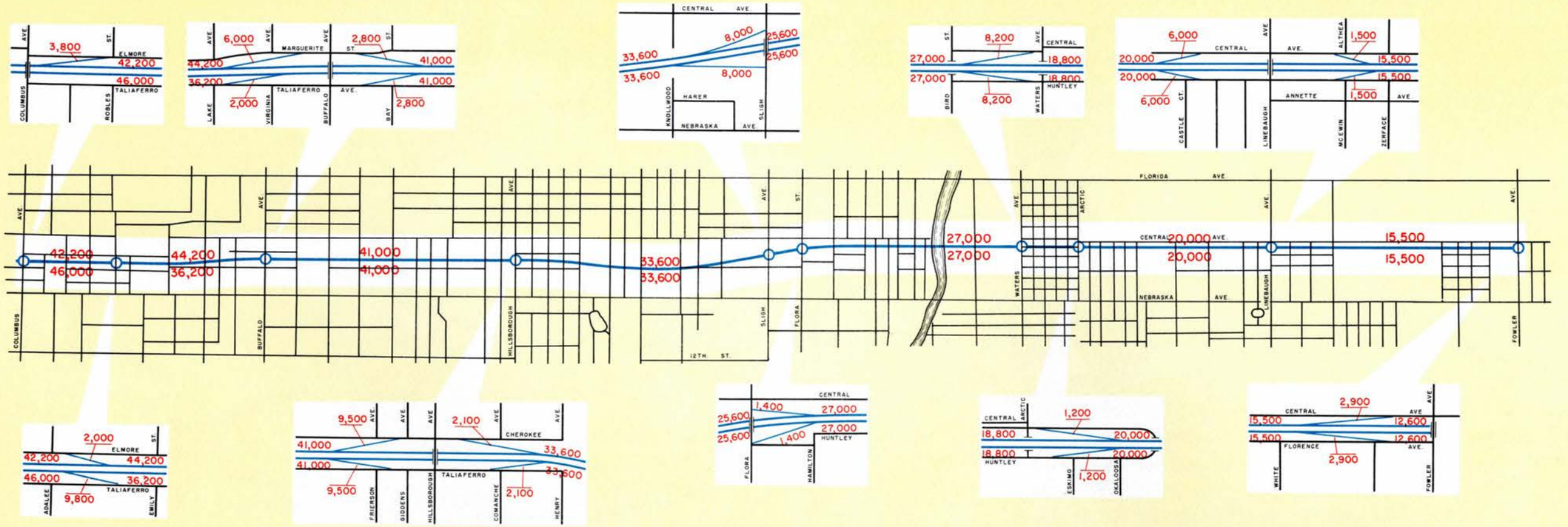


daily volumes should be approximately 40,000 vehicles. North of this interchange, the volumes are expected to drop rapidly so that north of Fowler Avenue the anticipated 1975 average daily volumes will be slightly over 25,000 vehicles.

In reviewing the interchange volumes it is found that the movements on the ramps at Buffalo, Hillsborough, Sligh, and Waters Avenues are high. At several of these interchanges even higher values could have been assigned if sufficient capacity on the local streets could have been demonstrated.

Considering the over-all volumes, commercial vehicles account for approximately 11 per cent of the total vehicles assigned to the North Expressway.

Where the North Expressway connects with the East Expressway and the Downtown Distributor it will have an average daily volume in 1975 of about 92,000 vehicles.



ANTICIPATED 1975 TRAFFIC VOLUMES

NORTH EXPRESSWAY
TAMPA, FLORIDA
1957

Wilbur Smith and Associates

FIGURE 30

Adjustments and Assignments

In making the traffic assignments for the zone to zone movements indicated for 1975, it was found that capacities of the local streets where interchanges are recommended controlled the assignments to a point that the accumulated assigned values on the main lines of the expressway do not exceed "workable capacities". As has been pointed out, there are several critical points at which the peak hour volumes can be expected to produce some congestion and where the most desirable operating conditions cannot prevail during the brief periods of heaviest flow. While it was necessary to adjust the interchange values to the volumes which can be supplied or received by the local streets, even with the recommended physical improvements on these streets, it was not necessary to make over-all adjustments in the expressway system because of impossible theoretical assignments to the most critical sections. In this connection, it should also be pointed out that the capacities of the local streets in most instances control the design of the interchanges. At many places, higher

capacity interchanges could have been designed and proposed but the interchanges recommended, even though quite simple in many instances, have adequate capacity to accommodate the loads which the local streets can serve. On the Downtown Distributor, the total volumes exceed eight-lane capacities at several points, however congestion has been avoided by providing additional lanes which not only give a greater total capacity but which also control the weaving and merging movements. This again increases the basic capacity of the Distributor.

Traffic Volumes on Arterial Street System

The importance of a major street plan or an arterial street system to supplement the expressway system was discussed in Chapter IV. This involves many important route improvements and the construction of new major waterway crossings. The traffic demands of 1975 could not be accommodated by the expressway system alone and a substantial portion of the movements must use, or will benefit most by using the major streets that are recommended for improvement. The system of arterial streets and highway improvements has been carefully related to the travel corridors reflected by the 1975 trip movements and it is expected that these facilities will be used in every case to their practical capacity and, as with the expressway system, will be used in excess of this capacity during peak periods.

In addition to fitting the arterial street system to the pattern of movements, it has also been pointed out that the interchanges between the arterial street system and the expressway system have been located and designed so that traffic flows at these points of interchange will not exceed the capacities of the local streets.

The travel pressures will increase throughout the area in accord with the basic trip desires that have been discussed and presented previously in the report. Attempts to make 1975 traffic assignments to the arterial street system would have little meaning because it is expected that the major streets will be used to at least their practical capacity by that time. As one portion of the major street system reaches or exceeds practical capacity levels, it is realized that the traffic demands will automatically distribute themselves to other parallel facilities thereby equalizing the pressures throughout the entire major street system.

In the development of the arterial street system recommended in Chapter IV, it was not considered advisable to attempt to establish priorities for construction or improvement. It is expected, however, that the various segments of the system will be improved and that interim traffic regulations will be effected so that traffic movements can distribute themselves uniformly in accord with demands as the expressway system and interchanges are constructed.

Chapter VI
EXPRESSWAY COSTS AND CONSTRUCTION PROGRAM

The Tampa area is fortunate in that its entire expressway system, as herein recommended, is composed of designated Interstate Highways. With the passage of the 1956 Federal Aid Highway Act, funds are now available for the accelerated construction of the National System of Interstate and Defense Highways. Prompt action by the responsible public officials will permit early construction of portions of the recommended routes resulting in traffic relief and other favorable effects upon the area's economy and development.

PROJECT COST

At present unit prices,[16] it is estimated that the total cost of constructing the proposed Tampa Expressway System, including the detailed design and acquisition of necessary rights-of-way, will approximate $95,992,000. Of this amount, $28,928,000 will be needed to construct the North Expressway from Columbus Drive to the north city line, a distance of 6.1 miles. The West Expressway, 4.7 miles in length from its connection with the new Mid-Bay Bridge crossing to North Boulevard, will cost $16,541,000. The mile and one-half long Downtown Distributor, the most important and expensive section of the entire Expressway System, will necessitate the expenditure of $34,953,000. The East Expressway, from a point east of Nebraska Avenue to the interchange with East Hillsborough Avenue near the present U. S. Route 301 interchange is 6.0 miles in length. The estimated cost of construction is $15,570,000.

It should be emphasized that the estimated cost of construction of the Tampa Expressway System is premised upon field reconnaisance and inspection, discussions and consultations with other highway engineers, and analyses of present day costs of right-of-way acquisition and construction items. The extensive borings and soil investigations that will be undertaken when the detail design contracts are awarded may disclose unanticipated underground drainage and sub-soil conditions that can materially change estimated costs at several locations, particularly where depressed roadway sections are recommended. *Economic evaluations of the relative cost of construction, premised upon the detailed soil investigations and borings, may disclose the desirability of an elevated embankment section where a depressed roadway cross section is presently recommended.*

[16]Representative unit or component cost for the last half of 1956 as directed in the "Instruction Manual for Preparation and Submission of a detailed estimate of the cost of the Interstate System," Oct., 1956, U. S. Department of Commerce, Bureau of Public Roads.

The right-of-way cost estimates are an evaluation of present day costs of acquiring the necessary properties. They are premised upon a parcel by parcel, external, visual examination by licensed, competent, local appraisers who made maximum use of real estate maps, assessed valuations, recent local sales data in the area, and other information locally available. The final appraisal necessary before the rights-of-way can be acquired, and subsequent land development and changes in land use may considerably increase the estimated land costs. In this regard, experience in areas where expressways have been constructed indicates that early acquisition of the necessary rights-of-way will produce savings amounting to hundreds of thousands of dollars. In an area undergoing rapid industrial and residential development, as is true in Tampa, the right-of-way costs may easily increase a substantial amount unless the projects are undertaken in the near future.

In the decade it will take to complete construction of the expressway system, the cumulative effect of more detailed design studies, exact land appraisal and the rise in land values and construction costs, will be to substantially increase estimated costs of construction. It is difficult to weigh the impact of all these variables on the present cost level. Based on judgment, experience and recent price trends, the total cost of the Tampa expressway system may exceed the costs based upon present price levels by 25 per cent, indicating an over-all total of $120,000,000 rather than the estimated $96,000,000.[17]

A detailed discussion of the cost of the four major segments of the proposed expressway system, based upon 1956 prices, follows:

West Expressway

For cost computation purposes, the West Expressway has been broken into three separate segments, essentially at the locations where the number of travel lanes change from four to six, to eight lanes, respectively.

The 2.4 miles of four-lane divided facility from the new Mid-Bay crossing to Dale Mabry Highway will cost approximately $7,009,000. Right-of-way cost, including costs of all land required, improvements thereon, access rights, legal fees and

[17]For uniformity in developing the estimate of the total cost to complete the Interstate System, the U. S. Bureau of Public Roads specified that all cost estimates were to be based upon the cost for construction items that prevailed in the second half of calendar year 1956, "Instruction Manual for preparation and submission of a detailed estimate of the cost of completing the Interstate System in accordance with Section 108 (d) of the Federal Aid Highway Act of 1956."

surveys, is estimated at $2,010,000. The total of all construction items is estimated at $4,385,000, of which $2,642,000 is for highway grade separation structures and interchanges. Construction engineering and contingencies are estimated at 10 per cent of construction costs, or $439,000 and preliminary engineering is estimated to cost $175,000.

The 0.8 mile of six-lane divided expressway from Dale Mabry Highway to MacDill Avenue is estimated to cost $3,007,000, of which $599,000 is for right-of-way acquisition and $2,112,000 for construction items. The remaining amounts, $85,000 and $211,000, are for preliminary engineering and contingencies, respectively.

The section of the West Expressway from MacDill Avenue to North Boulevard, an eight-lane facility, is estimated to cost $6,525,000. Of the total construction cost of $3,856,000, construction of highway grade separations and interchanges is estimated at $1,280,000. The cost for the necessary right-of-way is estimated at $2,129,000. Preliminary engineering, construction engineering and contingencies, are estimated at $154,000 and $386,000 respectively.

Almost 3,000,000 cubic yards of embankment will be required to construct the West Expressway. It is estimated that 1,000,000 cubic yards of embankment will be used in the construction of the West Expressway from the new Mid-Bay Crossing to Dale Mabry Highway. From Dale Mabry Highway easterly to MacDill Avenue, an additional 675,000 cubic yards of embankment are required. In excess of 1,200,000 cubic yards of embankment will be necessary to construct the West Expressway from MacDill Avenue easterly to North Boulevard.

The location, type of structure, length of span and width are enumerated in Table X. Detailed costs by work classification are given in Appendix D.

TABLE X

STRUCTURE DETAILS — WEST EXPRESSWAY

Structure Location	*Expressway over*	*Expressway under*	*Span (feet)*	*Width (feet)*	*Estimated Cost*
Ramp to Grand Central Avenue Ext.		X	260	32	$ 124,800
Memorial Highway		X	202	70	213,150
West Shore Blvd.		X	200	70	210,000
Hubert Avenue		X	214	70	224,700
Grady Street	X		161	1@ 56 1@ 44	241,500
Cypress Street	X		340	2@ 44	448,800
Dale Mabry Highway	X		252	1@ 56 1@ 44	378,000
Himes Avenue	X		150	2@ 56	252,000
Lincoln Avenue	X		150	2@ 56	252,000
MacDill Avenue	X		160	2@ 44	211,200
Armenia Avenue	X		160	2@ 56	268,800
Howard Avenue	X		160	2@ 56	268,800
Rome Avenue	X		150	2@ 68	306,000
Willow	X		160	2@ 56	268,800
TOTAL 14 SEPARATIONS	10	4	—	—	$3,668,550

Downtown Distributor

For cost computation and detailed design purposes, the Downtown Distributor has been broken into two portions, one extending from North Boulevard to Henderson Avenue, and the other from Henderson Avenue to the junction of the Downtown Distributor with the North Expressway at Columbus Drive and the East Expressway near Nebraska Avenue.

The section of the Downtown Distributor from North Boulevard to Henderson Avenue is an elevated structure section and is estimated to cost $26,608,000. Only 0.9 of a mile in length, right-of-way acquisition costs are estimated at $6,742,000 and construction costs at $17,426,000, of which $15,690,000 is for structures. Preliminary engineering, construction engineering and contingencies are estimated at $697,000 and $1,743,000, respectively. The remaining 0.6 of a mile length of the Downtown Distributor, from Henderson Avenue northeasterly to Columbus Drive and Nebraska Avenue, is estimated to cost $8,345,000, of which $4,389,000 is for right-of-way acquisition and $3,470,000 for construction items. Preliminary engineering, construction engineering and contingencies are estimated at $486,000.

It is estimated that over 400,000 cubic yards of excavation will be required for construction of the Downtown Distributor. Approximately, 150,000 cubic yards of embankment will be used.

The structures listed in Table XI are included in that section of the Tampa Expressway System described as the Downtown Distributor.

TABLE XI

STRUCTURE DETAILS — DOWNTOWN DISTRIBUTOR

Structure Location	*Expressway* over	under	*Span (ft.)*	*Width (ft.)*	*Estimated Cost*
Main Expressway section, including access ramp construction	X		—	variable	$15,500,00
Ramp 3-ES	X		900	variable	891,000
Ramp 3-SN	X		300	44	198,000
Nebraska Avenue		X	300	70	315,000
Columbus Drive		X	310	70	325,500
TOTAL ELEVATED SECTION AND 4 STRUCTURES	3	2	—	—	$17,229,500

Further details on the cost breakdown of the Downtown Distributor, including demolition, utility, grading and draining, paving and structure costs, are enumerated in Appendix D.

East Expressway

The East Expressway is 6.0 miles in length and is estimated to cost $15,570,000. For cost purposes, it has been broken into three sections — the six-lane section from a point east of Nebraska Avenue to 22nd Street; the four-lane urban section from 22nd Street to the east city line; and the four-lane rural section from the east city line to the interchange with U. S. Route 92, just east of the present interchange of U. S. 92 with U. S. 301, northeast of Tampa.

The 0.8 mile of six-lane divided expressway from east of Nebraska Avenue to 22nd Street is estimated to cost $4,835,000. Of this total, $1,488,000 is for acquisition of the necessary right-of-way and $2,936,000 for construction items. Preliminary engineering, construction engineering and contingencies are estimated at $117,000 and $294,000, respectively.

The East Expressway from 22nd Street to the east city line, a distance of 2.8 miles, will cost approximately $6,946,000 at present cost levels. Of the total, $935,000 is the cost of acquiring the necessary right-of-way and $5,275,000 the cost of construction. Approximately, $2,956,000 is required to build the necessary highway grade separation structures and interchanges. An estimated $211,000 will be required for preliminary engineering and $527,000 for construction engineering and contingencies.

TABLE XII

STRUCTURE DETAILS — EAST EXPRESSWAY

Structure Location	*Expressway* over	under	*Span (ft.)*	*Width (ft.)*	*Estimated Cost*
Fifteenth Street		X	200	70	$ 210,000
19th Street		X	224	58	194,900
22nd Street		X	200	70	210,000
Seaboard Airline RR	X		270	2@ 44	475,200
34th Street	X		150	2@ 44	198,000
36th St. & Atlantic Coast Line RR	X		520	2@ 44	915,000
40th Street		X	200	70	210,000
Columbus Drive		X	400	58	348,000
50th Street		X	260	70	273,000
Buffalo Avenue		X	294	70	308,700
Chelsea Street		X	294	58	255,800
Orient Road		X	260	58	226,200
East Hillsborough Ave., U. S. 92, SR 600		X	204	1@ 34 1@ 26	183,600
TOTAL 13 STRUCTURES	3	10	—	—	$4,008,600

Construction of the initial four-lane divided section from the east city line to East Hillsborough Avenue near the present interchange with U. S. Route 301 will approximate $3,787,000. Right-of-way acquisition cost is estimated at $400,000 and construction costs at $2,971,000. Preliminary engineering is estimated at $119,000, construction engineering and contingencies at $297,000.

Over 600,000 cubic yards of excavation and 1,900,000 cubic yards of embankment will be required to construct the East Expressway.

There are 13 grade separation structures in the 6.0 mile length of the East Expressway. Eleven are highway grade separation structures; two are combination railroad and highway grade separation structures. Table XII shows the location, length and cost of structures.

In Appendix D, considerable additional detail is given in regard to the cost of the various construction items.

North Expressway

The North Expressway is 6.1 miles in length and is estimated to cost $28,928,000 at present prices. For estimating purposes, the expressway has been divided into three sections: the eight-lane section from Columbus Drive to Buffalo Avenue, the six-lane divided facility from Buffalo Avenue to Waters Avenue, and the initial four-lane construction from Waters Avenue to the north city line at Fowler Avenue.

The first section of the North Expressway from Columbus Drive to Buffalo Avenue, 1.0 miles in length, is estimated to cost $5,373,000. Of this total, $1,950,000 is the cost of right-of-way and $3,003,000 the cost of construction. Preliminary engineering is estimated at $120,000 and construction engineering and contingencies at $300,000.

Only 3.1 miles in length, the portion of the North Expressway between Buffalo Avenue and Waters Avenue is estimated to cost $16,852,000. Of the total, $6,289,000 is for right-of-way costs and $9,266,000 for construction items. Approximately $2,518,000 will be used for the construction of highway grade separations, interchanges, and other bridges. Preliminary engineering is estimated at about $370,000. Construction engineering and contingencies will cost $927,000.

TABLE XIII

STRUCTURE DETAILS — NORTH EXPRESSWAY

Structure Location	*Expressway* over	under	*Span (ft.)*	*Width (ft.)*	*Estimated Cost*
Floribraska Avenue		X	226	70	$ 237,300
Lake Avenue		X	232	58	202,000
Buffalo Avenue		X	200	70	210,000
Chelsea Street		X	224	36	121,000
Osborne Avenue		X	200	58	174,000
Hillsborough Avenue		X	200	80	240,000
Hanna Avenue		X	202	58	174,000
Sligh Avenue		X	206	58	179,200
Flora Street		X	204	58	177,500
Hanlon Street	X		160	2@ 44	211,200
Hillsborough River	X		260	2@ 44	572,000
Bird Street	X		160	2@ 56	268,800
Waters Avenue	X		160	2@ 44	211,200
East Arctic St. Ext.	X		160	2@ 44	211,200
Seaboard Airline RR and Temple Terrace Highway Ext.	X		285	2@ 56	638,400
Future Interchange Structure	X		250	30	150,000
Linebaugh Avenue		X	200	70	210,000
109th Street		X	200	58	174,000
Fowler Avenue		X	200	70	210,000
TOTAL 19 STRUCTURES	7	12	—	—	$4,571,800

The northernmost section of the North Expressway, from Waters Avenue northerly to the north city line at Fowler Avenue, is estimated to cost $6,703,000. Two miles in length, right-of-way acquisition costs are estimated at $1,572,000 and construction costs at $4,501,000. Preliminary and construction engineering and contingencies are estimated to total $630,000.

Grading of the one-mile length of the eight-lane divided expressway section from Columbus Drive to Buffalo Avenue will require the excavation of 555,000 cubic yards of material. The expressway section from Buffalo Avenue northerly to a point north of Flora Street will require over 1,020,000 cubic yards of excavation. The

embankment section from Flora Street to Waters Avenue will require 410,000 cubic yards of fill. To construct the North Expressway from Waters Avenue to the north city line near Fowler Avenue over 660,000 cubic yards of embankment and over 35,000 cubic yards of excavation will be needed.

Table XIII lists in detail the costs of the recommended structures on the North Expressway from north of Columbus Drive to, and including, Fowler Avenue.

A more detailed breakdown of the construction cost items is given in the Appendix D.

CONSTRUCTION PROGRAM

The magnitude of the required construction and the availability of funds necessitates that the proposed Tampa Expressway System be constructed in several stages. It was not possible to establish with any degree of certainty the annual apportionment of federal aid interstate funds to the State of Florida, the reapportionment of federal funds to the various state road districts in Florida, and the disposition of district funds to improvements in specific areas. However, keeping in mind the magnitude of the construction project, and the availability of engineering and contracting forces, a proposed construction schedule was finalized.

It has been assumed that within a short period of time, the detailed design and preparation of contract plans, specifications and estimates for the entire expressway system would be initiated. The complexity of the expressway design and necessity for further exploratory soil investigations indicate that a minimum period in excess of 12 months and as long as 24 months will be required to complete the detailed design of the different sections of the system. In developing the proposed construction schedule, consideration was given to the following:

(1) the new Mid-Bay crossing is presently under construction,

(2) the detailed design and right-of-way acquisition phases can be completed in less time in the more rural, sparsely settled areas,

(3) highest priority should be given to sections of the proposed expressway system that will provide the greatest traffic relief,

(4) completed sections of the expressway system should be usable by traffic, and

(5) annual expenditures of construction funds should be spread as evenly as possible throughout the construction period.

Giving consideration to the governing criteria, it is proposed that the Tampa Expressway System be constructed in five biennium periods. Assuming that the detailed design is promptly authorized, the first biennium period would be the calendar years 1958 and 1959. Under this schedule, the entire expressway system would be completed and open to traffic in 1967. Throughout the period of right-of-way acquisition, it is essential that the highest degree of cooperation and liaison be maintained between the responsible highway, public housing and urban redevelopment agencies.

The improvement of Buffalo Avenue and the extension of Frank Adamo Drive, westerly over Thirteenth Street, the railroad yards, and Nebraska Avenue to an interchange with Cass and Tyler Streets, will improve local and through traffic circulation. Improved access to and through the central business area from the Interbay, West Tampa and the Pinellas County areas is sorely needed. Traffic relief to Florida Avenue and Nebraska Avenue is also necessary and should be given high priority. Therefore, first priority has been given to the completion of the West Expressway and sections of the North Expressway, second priority to the construction of the East Expressway.

It is proposed that initial construction be on the segment of the West Expressway from the new Tampa Bay crossing easterly to Dale Mabry Highway. The design of this section is relatively simple and the lack of intensive cultural development will facilitate the early acquisition of necessary rights-of-way. In the second biennium period 1960 to 1961, construction would be initiated on the Hillsborough River crossing of the Downtown Distributor and on the Hillsborough River crossing of the North Expressway.

Construction of the East Expressway would not be initiated until early in 1964. The entire West Expressway would be completed in 1962-1963, the third biennium period. Under the proposed program, construction of the last segments of the Downtown Distributor, the East Expressway and the North Expressway would be in the fifth biennium period, 1966-1967.

In the following discussion, the proposed construction schedule of the four major segments of the Expressway system are detailed. Table XIV is a summary of the construction activity proposed for each segment of the system by biennium periods.

Table XIV

PROPOSED CONSTRUCTION SCHEDULE

TAMPA EXPRESSWAY SYSTEM

(In thousands of dollars)[1]

			ROUTE SECTION					
			West Expressway			*Downtown Distributor*		
Stage No.	*Biennium Period*	*Item*	*Limits of Work*	*Length (Mi.)*	*Est. Cost*	*Limits of Work*	*Length (Mi.)*	*Est. Cost*
1	1958-59	Detailed Design and Preparation of Contract Plans	Entire Facility	4.7	$ 414.	Entire Facility	1.5	$ 836.
		Right-of-Way	Tampa Bay to Dale Mabry	2.4	$2010.	North Blvd. to Henderson Ave.	0.9	$6742.
		Construction	Tampa Bay to Dale Mabry	2.4	$4824.			
2	1960-61	Right-of-Way	Dale Mabry to North Blvd.	2.3	$2728.			
		Construction				North Blvd. to Ashley St.[2]	0.4	$8000.
3	1962-63	Right-of-Way						
		Construction	Dale Mabry to North Blvd.	2.3	$6565.	Ashley St. to Morgan St.[3]	0.2	$4500.
4	1964-65	Right-of-Way				Henderson Ave. to Columbus Dr. and Nebraska Ave.	0.6	$4389.
		Construction				Morgan St. to Henderson Ave.	0.3	$6669.
5	1966-67	Construction				Henderson Ave. to Columbus Dr. and Nebraska Avenue	0.6	$3817.
SECTION TOTALS		Detailed Design	West Expressway (Tampa Bay to North Blvd.)	4.7	$ 414.	Downtown Distributor (North Blvd. to Columbus Dr. and Nebraska Ave.)	1.5	$ 836.
		Right-of-Way			4738.			$11,131.
		Construction			$11,389.			$22,986.
		TOTAL			$16,541.			$34,953.

Notes:[1]- All costs are estimated on basis of 1956 price level (last two quarters), [2]- Includes ramp construction to Ashley and Tampa Streets, [3]- Includes ramp connections to Pierce and Jefferson Streets.

Table XIV

PROPOSED CONSTRUCTION SCHEDULE

TAMPA EXPRESSWAY SYSTEM

(In thousands of dollars)[1]

ROUTE SECTION

East Expressway			*North Expressway*			*Summary Biennium Program*		
Limits of Work	*Length (Mi.)*	*Est. Cost*	*Limits of Work*	*Length (Mi.)*	*Est. Cost*	*Length (Mi.)*	*Est. by Item*	*Cost Total*
Entire Facility	6.0	$ 447.	Entire Facility	6.1	$ 670.	18.3	$ 2,367.	
			Columbus Dr. to Buffalo Ave.	1.0	$1950.			
			Sligh Ave. to Waters Ave.	1.0	$1621.	5.3	$12,323.	
						2.4	$ 4,824.	
								$19,514.
			Buffalo Ave. to Sligh Ave.	2.1	$4668.			
			Waters Ave. to Fowler Ave.	2.0	$1572.	6.4	$ 8,968.	
			Sligh Ave. to Waters Ave.	1.0	$3898.	1.4	$11,898.	
								$20,866.
22nd St. to Hillsborough Ave.	5.2	$1335.				5.2	$ 1,335.	
			Buffalo Ave. to Sligh Ave.	2.1	$6295.	4.6	$17,360.	
								$18,695.
Nebraska Ave. to 22nd St.	0.8	$1488.				1.4	$ 5,877.	
40th St. to E. Hillsborough Ave.	3.9	$4672.	Columbus Dr. to Buffalo Ave.	1.0	$3303.	5.2	$14,644.	
								$20,521.
Nebraska Ave. to 40th St.	2.1	$7628.	Waters Ave. to Fowler Ave.	2.0	$4951.	4.7	$16,396.	
								$16,396.
East Expressway (Nebraska Ave. to East Hillsborough Ave.)	6.0	$ 447.	North Expressway (Columbus Dr. to Fowler Ave.)	6.1	$ 670.	18.3	$ 2,367.	
		$2823.			$9811.		$28,503.	
		$12,300.			$18,447.		$65,122.	
		$15,570.			$28,928.		$95,992.	$95,992.

West Expressway

It is assumed that the detailed design and preparation of contract plans for the West Expressway will be authorized by early 1958. As soon as permitted by the status of the contract plans, and existing state laws, the necessary rights-of-way from Tampa Bay to Dale Mabry Highway should be acquired. This schedule will permit the initiation of construction of the West Expressway from the new Tampa Bay crossing to Dale Mabry Highway by the middle of 1959. Construction of this section would continue through 1960 with completion estimated early in 1961. As early as possible in the second biennium, 1960-1961, right-of-way acquisition proceedings should be initiated on the section of the West Expressway from Dale Mabry Highway to North Boulevard. Sections of the West Expressway in the area traverse a densely populated residential area and as much time as possible should be allowed to provide for the resettlement of the present residents. By early 1962, the necessary rights-of-way for the section of the West Expressway from Dale Mabry Highway to North Boulevard should have been acquired and construction of this segment initiated. By late 1963, the West Expressway should be completed in its entirety from the Mid-Tampa Bay crossing to North Boulevard.

Downtown Distributor

Construction of the Downtown Distributor poses the greatest difficulty as far as design and right-of-way acquisition is concerned. Assuming prompt initiation of design phases of the work, the status of plan development should allow the initiation of acquisition of the necessary rights-of-way by mid-1959. A relatively small number of properties are required for the construction of the section of the Downtown Distributor from North Boulevard to Ashley Street. This will permit the initiation of construction of the proposed Hillsborough River crossing and access ramps to Ashley and Tampa Streets by the summer of 1960. Early in 1962, the continuation of the Downtown Distributor from Ashley Street to Morgan Street could be under way and the construction of the Hillsborough River crossing completed. In the fourth biennium period, 1964-1965, the necessary properties could be acquired from Henderson Avenue to Columbus Drive and Nebraska Avenue, and construction initiated on the section of the Downtown Distributor from Morgan Street easterly and northerly to Henderson Avenue. This will place under contract the remaining portion of the elevated viaduct. By early 1966, the necessary properties from Henderson Avenue to Columbus Drive and Nebraska Avenue should have been acquired and construction initiated on the remaining section of the Downtown Distributor. By late 1967, the entire Downtown Distributor would be completed.

East Expressway

In the third biennium period, 1962-1963, it is proposed that right-of-way acquisition for the East Expressway between 22nd Street and East Hillsborough Avenue be initiated. If funds are available at an earlier date, prompt acquisition of the necessary right-of-way in this area should materially reduce expenditures for land costs. Presently sparsely settled and undeveloped from the vicinity of 50th Street and Columbus Drive northeasterly, intensive residential development in this area is imminent.

In 1964, the acquisition of the necessary rights-of-way from Nebraska Avenue easterly to 22nd Street is proposed. Also proposed in the fourth biennium, is the construction of the East Expressway from 40th Street easterly and northeasterly to East Hillsborough Avenue. This phase of construction activity could be completed by late 1965 and early in 1966 construction could be initiated on the remaining section of the East Expressway from Nebraska Avenue to 40th Street. The latter construction will take approximately two years and indicates opening of the East Expressway, in its entirety, to traffic in late 1967.

North Expressway

It has been assumed that the detailed design, preparation of contract plans, specifications and estimates for the North Expressway would be authorized early in 1958. This should allow beginning of acquisition of the necessary rights-of-way by the spring of 1959. It is proposed that initial rights-of-way acquisition be from Columbus Drive to Buffalo Avenue and from Sligh Avenue to Waters Avenue. In the second biennium period, 1960-1961, it is recommended that the necessary rights-of-way between Buffalo Avenue and Sligh Avenue and between Waters Avenue and Fowler Avenue be acquired. The importance of early acquisition of rights-of-way in reducing acquisition costs cannot be overemphasized. In the more densely populated residential areas traversed by the North Expressway, early right-of-way acquisition will permit displaced residents a longer period of time to relocate. Early ac-

quisition of the necessary rights-of-way in the more sparsely and rural areas will permit acquisition of the properties before they are developed, decreasing land costs and inconvenience to property owners.

The construction of the section of the North Expressway from Sligh Avenue northerly over the Hillsborough River to Waters Avenue is proposed for the second biennium period. Completion of this segment of the North Expressway will provide an additional crossing of the Hillsborough River, relieving the existing Florida Avenue and Nebraska Avenue crossings. Early in the third biennium, the segment of the North Expressway from Buffalo Avenue to Sligh Avenue could be placed under construction. The expressway northerly from Columbus Drive to Buffalo Avenue is scheduled for the fourth biennium period, 1964-1965. Construction of the section from Waters Avenue to Fowler Avenue in 1966-1967 would complete the North Expressway by end of the fifth biennium.

Summary Biennium Programs

Under the proposed construction schedule, the entire detailed design of the proposed expressway system would be initiated by early 1958. In the first biennium, initial right-of-way acquisition would be undertaken on the West Expressway, the Downtown Distributor and the North Expressway. Construction would be initiated along the westernmost section of the West Expressway. Of the $19,514,000 scheduled for expenditure in the biennium period 1958-1959, $2,367,000 is for the detailed design and preparation of contract plans, $12,323,000 for acquisition of necessary right-of-way, and $4,824,000 for construction.

The continuation of right-of-way acquisition along the West Expressway and the North Expressway in the second biennium period, 1960-1961, is estimated at $8,968,000. The initiation of construction of the Downtown Distributor, from North Boulevard to Ashley Street, and along the North Expressway, from Sligh Avenue to Waters Avenue, is estimated at $11,898,000. The total expenditure for the second biennium is, therefore, $20,866,000.

In the third biennium, 1962-1963, right-of-way acquisition would be initiated along the East Expressway and construction continued along the West Expressway, the Downtown Distributor and the North Expressway. Right-of-way acquisition is estimated at $1,335,000 and the construction program at $17,360,000. This indicates a total program of $18,695,000.

Acquisition of necessary rights-of-way would be completed in the fourth biennium 1964-1965. The land costs, at present price levels, is estimated at $5,877,000. Construction totaling $14,644,000 would be underway on sections of the Downtown Distributor, East Expressway and North Expressway. The total program scheduled for the fourth biennium is $20,521,000.

In the fifth and final construction period, 1966-1967, the remaining segments of the Downtown Distributor, East Expressway and North Expressway would be completed. The estimated construction cost at present price levels is $16,396,000.

In summary, the initial years of the construction program would be devoted largely to the detailed design and acquisition of rights-of-way. In the later stages, the majority of the expenditures would be devoted to construction. The five two-year programs vary from a high of over $20,000,000 a year in the second and fourth bienniums to a low of $16,396,000 a year in the fifth biennium.

The simplified outline of the proposed construction schedule for the Tampa Expressway System is one of many possible variations. Giving due consideration to traffic service, keeping inconvenience to the residents and everyday business activities to a minimum, the availability of construction funds and a balanced workload, the recommended program is considered the best scheme of all those considered. It is recognized, however, that many acceptable variations of the proposed construction schedule are possible and are dependent upon local conditions and the status of related arterial street improvements. Of primary importance is the working out of a construction schedule acceptable to all concerned, and continued support of the construction program by everyone.

Chapter VII
RECOMMENDED ROADWAY PLANS

In the early days of road building, primary consideration was given to the elements of construction and the availability of material. While this was satisfactory for the needs of traffic at that time, the tremendous advances made in the design and usage of motor vehicles, and a growing knowledge in the art of traffic engineering, and the geometric design of highways, dictate that road building today should provide maximum traffic service and operational efficiency with minimum hazard and at reasonable costs. Giving full consideration to the design controls and criteria developed in recent years and continuing studies of driver behavior, safe highways adequate for the tremendous traffic volumes anticipated in the very near future can be constructed at a reasonable cost. It must be recognized, however, that proper driver attitudes can greatly influence the number of accidents and efficient use of highways. In this regard, driver education and law enforcement cannot be over-emphasized.

Recognizing the significance of proper design to achieving the greatest return for capital expenditures on the highway plant, public and highway officials from all sections of the country have banded together to pool their knowledge and disseminate this information. There exists today a national policy on the geometric design of rural and urban highways[18] which sets forth in great detail the latest accepted thinking in regard to the proper design of highways. Because of its great importance to the economic welfare and defense of the nation, geometric design standards have been prepared and accepted by the various state and federal officials for the design of the Interstate Highway System.[19] The following discussion of the design standards used and recommended for the Tampa Expressway and arterial street system are premised upon the design standards enumerated above. All known features of safety and traffic service have been incorporated into the recommended design. Considerable attention has also been given to aesthetics and landscaping.

Design Criteria — Expressway System

Considering the early completion of the National System of Interstate and Defense Highways essential to the national interest, the Congress[20] specifically prescribed that the geometric and construction standards adopted for the Interstate Highway System should be those approved by the Secretary of Commerce in cooperation with State Highway Department officials. Furthermore, it was specified that the standards and resultant highway construction should be adequate to accommodate the type and volumes of traffic forecast for the year 1975. Design criteria developed in the manner prescribed by Congress were adopted as a national standard on July 12, 1956. The geometric design of the proposed Tampa Expressway System satisfies these design requirements. Near minimum values have only been used where culture, right-of-way damage and excessive construction costs outweigh the traffic service and operational considerations. Portions of the design policies for the National System of Interstate and Defense Highways is presented in Appendix B of this report. Unfortunately, in connection with highway facilities, there is a wide variation in local, regional, and general use of various terms. This usage of different terms for the same design feature is particularly confusing in the field of urban arterial highways. The American Association of State Highway Officials designated a special committee on nomenclature, and the highway and traffic engineering terms used throughout this report are as defined by that AASHO Committee. As an aid in understanding and reviewing various aspects of the study, a glossary of terms has also been included in Appendix B.

Some discussion of the terms, arterial highways and expressways is considered pertinent in understanding the various street systems discussed and recommended in this report. An "arterial highway" is a general term used to signify a street used primarily for through traffic on a continuous route. Control of access, the right of abutting property owners or occupants to access to an arterial highway, may be fully or partly controlled by public authorities. If full control of access is exercised, preference to through traffic is given by providing access connections with selected highways only and by prohibiting crossings at grade or private driveway connections to the arterial highway. With partial control of access, preference is still given to through traffic but access connections, in addition to those with selected public streets, may also include crossings at grade and some private driveway connections. In the very general heading of arterial highways there is a more specific term, "expressways," which is defined as a divided arterial highway with full or partial control of access, giving preference to through traffic and generally with grade separations at intersections with public highways. In Tampa the improved sections of Hillsborough Avenue and Dale Mabry Highway would be good examples of arterial highways. Due to the natural control of access provided by Hillsborough Bay, sections of Bayshore Boulevard might be considered an expressway at grade.

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[18] "A Policy on the Geometric Design of Rural Highways," American Association of State Highway Officials, 1954; "A Policy on the Geometric Design of Urban Highways," American Association of Highway Officials, 1957.

[19] American Association of State Highway Officials, Committee on Planning and Design Policy, "Geometric Design Standards for the National System of Interstate and Defense Highways," adopted July 12, 1956 (supersedes the Design Standards for the National System of Interstate Highways adopted August 1, 1945).

[20] Federal-Aid Highway Act of 1956.

Expressway Design Standards

Certain geometric design standards for the National System of Interstate and Defense Highways, as approved by the American Association of State Highway Officials, are printed in Appendix B of the report. Specific design criteria for the recommended expressway system are as follows:

a. *Control of Access* — Full control of access is maintained throughout the Expressway system. Access and egress to the expressways are permitted only at designated points where on and off ramps are provided. No pedestrian traffic will be permitted and no grade crossings are allowed.

b. *Design Speed* — The design speed for all through lanes of the expressway is 60 miles per hour, except for one major curve in the Downtown Distributor which is designed for 55 miles per hour, and the interchange roadways connecting the North and East Expressways, where a minimum 50 mile per hour design was used.

c. *Sight Distance* — The minimum non-passing sight distance for the expressway system is 475 feet. Non-passing sight distance is the minimum distance required for a vehicle traveling at the design speed to stop before reaching an object in its path. It is measured from the driver's eye, 4½ feet above the road, to the top of an object four inches high on the road surface.

d. *Horizontal Curvature* — The maximum horizontal curvature used in designing the expressway system is 6½ degrees, a radius of 881 feet, except for the roadways connecting the North and East Expressways where 8 degree curves with radii of 716 feet were used.

e. *Superelevation of Horizontal Curves* — Horizontal curves sharper than 0 degrees 30 minutes shall be superelevated. The maximum rate of superelevation shall be 0.10 of a foot per foot.

f. *Grades* — The maximum grade used for the expressway system is 3 per cent with the exception of a 7 per cent downgrade in the east-to-north roadway between the North and East Expressways.

g. *Lane Width* — Through traffic lanes are 12 feet wide; acceleration and deceleration lanes are also 12 feet wide. For a single lane ramp in tangent, a pavement width of 14 feet is recommended. A 26-foot width is recommended for two-lane ramps.

h. *Medians* — Where initial construction of a four-lane divided facility is recommended, a 44 foot depressed median is specified. This provides for future widening to a six-lane divided facility. Where a six or eight-lane divided roadway is proposed, a 20-foot median is recommended. To prevent the occasional crossing of vehicles from one directional roadway to the other, a positive median barrier is recommended in the 20-foot median. This will necessitate the construction of median crossovers, at vantage points with optimum sight distances in both directions, for the use of emergency, maintenance and police vehicles.

i. *Shoulders* — Paved shoulders on the right side, 10 feet wide with a 2-foot curb and gutter section, are recommended where the expressway is in a cut or depressed section. Where a 44-foot median is specified, a paved five foot shoulder on the left is recommended to provide lateral support of base and surface courses and reduce hazard to both motorists and maintenance personnel. Where a 20-foot median is specified, it is recommended that the entire width be paved to provide a disablement area, thereby discouraging stopping of disabled vehicles in the left travel lane. Experience of expressways now in operation indicate it is difficult for motorists in the left lanes to gain access to the right side disablement shoulder during peak travel periods. Extreme congestion results when a disabled vehicle stops in a left traffic lane.

j. *Slopes* — Side slopes shall not be steeper than two to one. In general, 6 to 1 slopes for cuts and fills less than six feet high, and 4 to 1 slopes for fills from 6 to 12 feet high are used.

k. *Frontage Roads* — At several locations, it will be necessary to provide frontage roads parallel to the expressways to service abutting property owners. To facilitate the interchange of traffic from the expressways to the frontage roads and intersecting streets, and reduce conflict at the intersections with major arterials, the frontage roads must be operated as one-way streets. A 34-foot width of pavement is proposed, providing for two traffic and one storage or parking lane. At the intersections with the more heavily travelled arterial streets, it will be necessary to use more width to provide storage of

traffic at the traffic signals. A typical section for the proposed frontage roads is shown in Figure 31.

l. *Right-of-Way* — A minimum right-of-way of 200 feet and 300 feet is specified where no frontage roads are provided and at locations where frontage roads are specified, respectively.

m. *Fencing* — Adequate fencing to keep pedestrians, children, and pets off of the right-of-way is recommended. Pedestrian crossings are recommended, where necessary, in order not to disrupt the normal pattern of area activities.

n. *Erosion Control and Landscape Development* — Landscape development should be in keeping with the character of the highway and should be a part of the initial highway construction. Erosion control and maintenance costs are minimized by the use of flat side slopes rounded and blended with the natural terrain; ditches and channels with flat side slopes and protective treatment; interceptors located and spaced to control erosion; proper facilities for ground water interception; dikes, berms and other protective devices and protective ground covers, and planting. Ribbon, park-like development screens out unsightly roadside development; and, homes along the roadside are insulated by thick plantings against noise and headlight glare. Curving rows of trees alert drivers to coming changes in the road's direction. A backdrop of vegetation makes directional and caution signs more visible and green sidelands clearly define the driving area.

Landscape development should be an integral part of interchange design. Special emphasis should be given to the arrangement of landscaping that will aid in warning of necessary speed reduction and changes in direction. Plantings that interfere with sight distance should be avoided. Landscaping of an interchange area should be designed as a single unit rather than treating each through roadway or ramp as a separate unit graded and planted to a standard cross section.

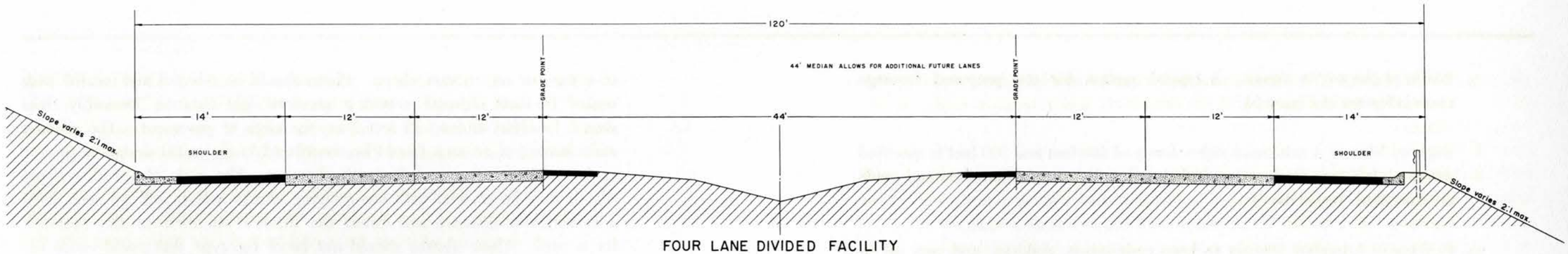
Proper planting produces many beneficial effects. Planting can be used for traffic guidance, screens, and to relieve fatigue of long trips. Trees or shrubs may be used to outline travel paths or to give drivers a sense of a turn or obstruction ahead. Plants should be selected and located with regard to their ultimate growth to preserve sight distance. Desirably, trees should be offset at least 15 feet from the edge of pavement. The seeding and planting of an area should be considered in the initial design to protect against slope erosion and drainage clogging. The ends of the directional islands may be planted with low-growing shrubs which will be seen from a considerable distance and direct the driver's attention to the necessity for a turn. These shrubs should not be of the type that could cause vehicle damage upon impact and they should not obscure signs or warning devices. Improperly located shrubs or trees may seriously shorten horizontal sight distance on curves and seriously interfere with lateral sight distance between adjacent roadways. Even low-lying ground cover can seriously shorten vertical sight distance on curving ramps.

The benefits of skillful roadside planting are many: roadside noises are reduced to a minimum, headlight glare is reduced, and erosion control and maintenance is simplified. When noise is absorbed by a broad planted right-of-way and traffic is screened out of sight, the value of neighboring homes in residential areas is not depreciated. Experience indicates that homes adjacent to properly landscaped expressways actually gain in value over comparable residences further removed. Savings in maintenance costs alone are usually adequate to pay for the initial expense of plantings and other landscaping.

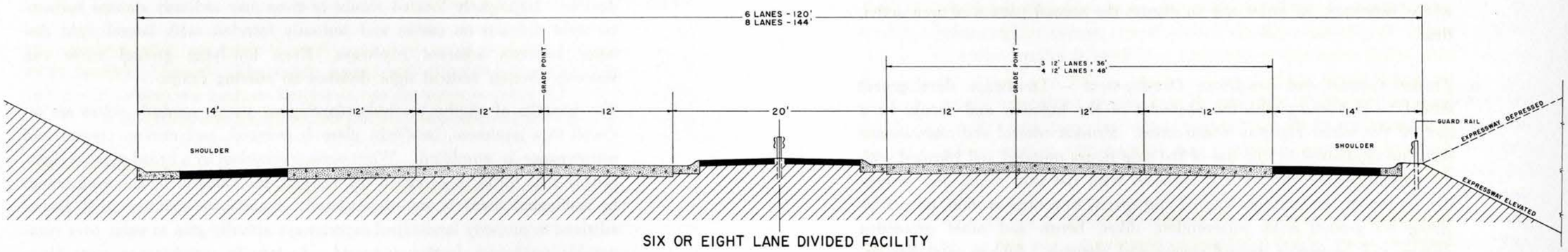
It is recommended that remnants of property acquired for roadway construction be properly landscaped and improved to provide a green belt of park-like development throughout the metropolitan area.

o. *Lighting* — Due to its urban nature and the proximity of interchanges, it has been assumed that ultimately the entire expressway system will be lighted. A 90 foot staggered spacing for luminaires has been assumed for the four and six-lane divided roadways. A diamond-type spacing with luminaires 150 feet apart, two luminaires per pole in the median, is recommended for the eight-lane divided roadway sections.

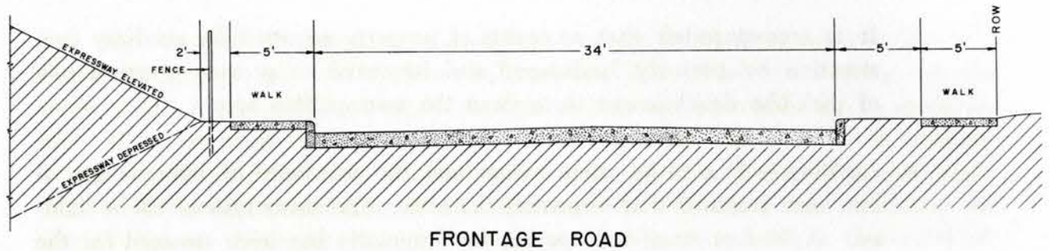
p. *Signing* — Maximum operational efficiency and safety require adequate signs. Illuminated overhead signs are recommended for the major interchange areas.



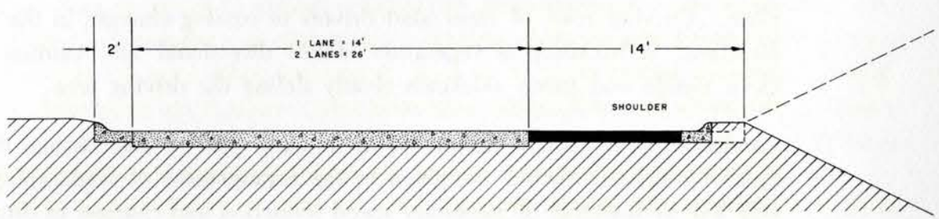
FOUR LANE DIVIDED FACILITY



SIX OR EIGHT LANE DIVIDED FACILITY



FRONTAGE ROAD
(ULTIMATE)



RAMP SECTION

200' MINIMUM R/W WITHOUT FRONTAGE ROAD
300' MINIMUM R/W WITH FRONTAGE ROAD

TYPICAL ROADWAY CROSS SECTIONS

PROPOSED EXPRESSWAY SYSTEM
TAMPA, FLORIDA
1957

q. *Traffic Signals* — An inter-connected, actuated traffic signal system is recommended for the sections of the expressway where frontage roads are provided.

r. *Bridges and Other Structures* — Bridges and overpasses, preferably of deck construction, should be located to fit the over-all alignment and profile of the highway. The height of structures shall be not less than 14 feet 6 inches over the entire roadway width, including the usable width of shoulders. In an elevated embankment section where the expressway is carried over the intersecting streets, separate structures are recommended for the directional roadways. Due to the relatively narrow 20 foot-median recommended there are little actual economies in construction of twin structures. However, due to the width of the roadway section, equal to 148 feet where speed change lanes are provided in eight-lane divided sections, a decided advantage of the twin structures is the daylighting of the underpass area. This will reduce the contrast between brightness and darkness and improve visibility for pedestrians and motorists.

Expressway Underpasses — All bridges, including grade separations, are a length in excess of 150 feet between abutments. The full pavement width plus two-foot offsets to the inside face of barrier curbs should be carried the full length of the structures. Where initial development of a four-lane divided facility is recommended, the initial construction should provide for the ultimate six-lane divided roadway. This results in a minimum structure width between barrier curbs of 40 feet. A two-foot width from the barrier curb to the inside face of handrail, to provide safety walks, is recommended.

Expressway Overpasses — Where the intersecting road is carried over the expressway, the lateral clearance from the edge of through traffic lanes to the abutments and piers shall be the usable shoulder width, a minimum of 10 feet on the right and 8 feet on the left of the expressway roadways.

Arterial Street Structures — All of the structures carrying cross traffic over the expressway are recommended to have a minimum roadway width adequate for four traffic lanes. Where heavy left turns are expected from the cross street into the frontage road paralleling the expressway, an extra lane is recommended. The minimum structure width recommended for arterial streets is 58 feet. This width of structure is considered adequate for four traffic lanes and sidewalks. Where heavy left turns are anticipated, for example—locations where access and egress ramps to the expressway intersect cross streets, a minimum structure width of 70 feet is recommended.

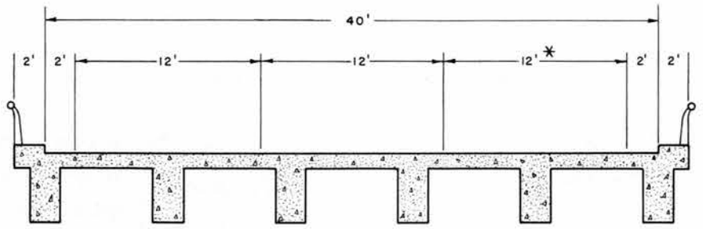
In locations where the expressway is carried on an elevated embankment section, open end span structures are recommended. The minimum center span should be adequate for a minimum of four traffic lanes plus desirable lateral clearances, irrespective of the present status of improvement of the intersected street.

s. *Typical Roadway Cross Sections* — Figure 31 shows the typical roadway cross sections recommended for the Tampa Expressway System. Typical treatments for both embankment and depressed sections are shown. Cross sections for the frontage roads and typical ramps are also indicated.

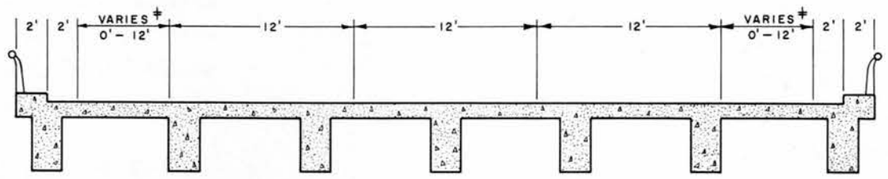
t. *Typical Structure Cross Sections* — In Figure 32 the recommended cross sections for the various structures are indicated.

Arterial Street Design Standards

Design standards for streets and highways constructed by federal, state and county agencies are fairly well standardized and follow the prescribed design standards of the American Association of State Highway Officials. A much wider variance is found in the street width provided by municipal authorities. In most cases, this is the result of local compromise between existing rights-of-way, desirable standards, and availability of construction funds. The desirability of 12-foot traffic lanes and ten-foot parking lanes is almost universally accepted. In addition, the value of median separation of opposing traffic streams and provision of turning lanes at intersections is also recognized. The major difficulty is in adjusting the desirable cross section to the available right-of-way and construction funds. Dependent upon the predominant width of existing rights-of-way and the cost of additional right-of-way width, compromises in roadway cross section are dictated. The importance of adequate rights-of-way in all newly-developed areas and provision of continuity in selected through streets cannot be over-emphasized. A minimum desirable right-of-



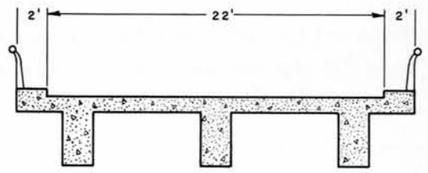
TWIN 3 LANE STRUCTURE
(FOR 4 OR 6 LANE DIVIDED FACILITY)



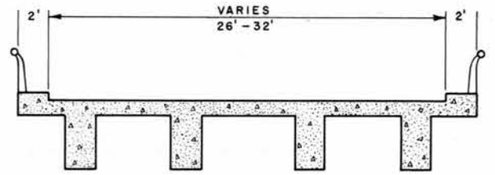
3 LANE STRUCTURE
(WITH SPEED CHANGE LANES)

* ALL STRUCTURES FOR INITIAL 4 LANE DIVIDED SECTION TO BE CONSTRUCTED WITH 3 LANES TO ACCOMMODATE ULTIMATE 6 LANE FACILITY.

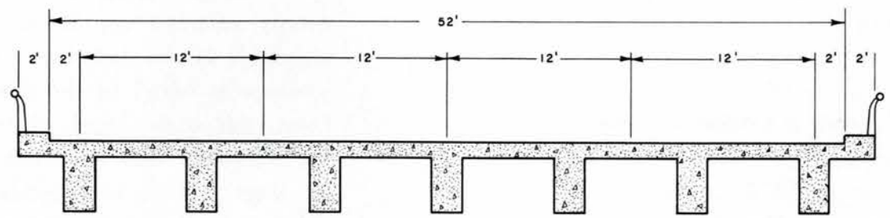
\+ AS REQUIRED BY LOCATION OF ACCELERATION OR DECELERATION LANES.



ONE LANE RAMP



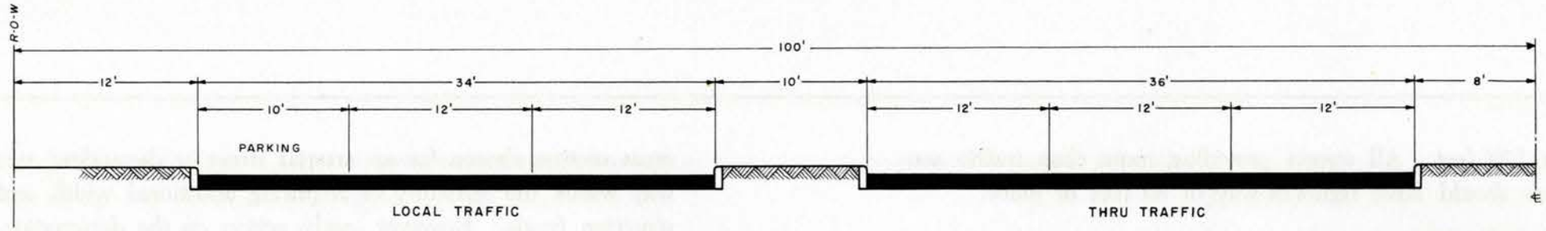
2 LANE RAMP



TWIN 4 LANE STRUCTURE

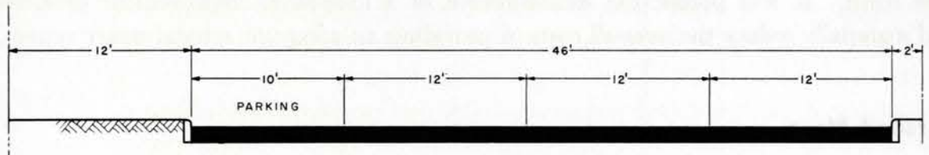
TYPICAL STRUCTURE CROSS SECTIONS

PROPOSED EXPRESSWAY SYSTEM
TAMPA, FLORIDA
1957

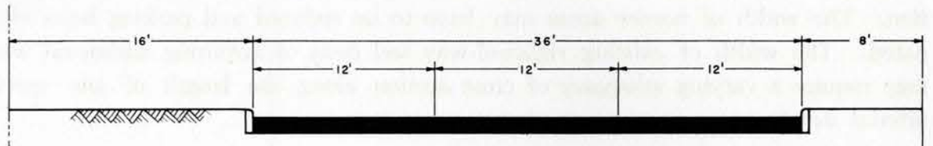


10 TRAFFIC LANES ON 200' RIGHT-OF-WAY

(WITH DIRECTIONAL ROADWAYS FOR LOCAL AND THRU TRAFFIC)

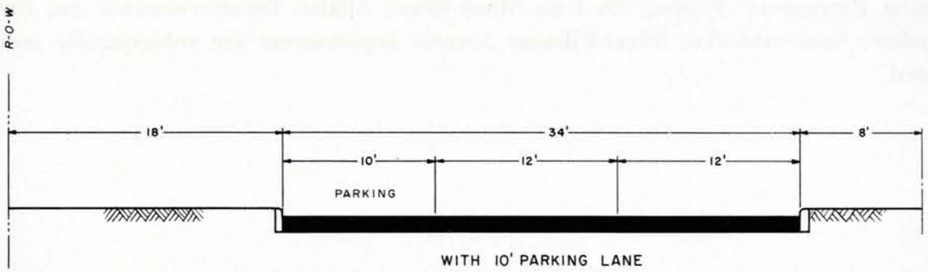


WITH 10' PARKING LANE

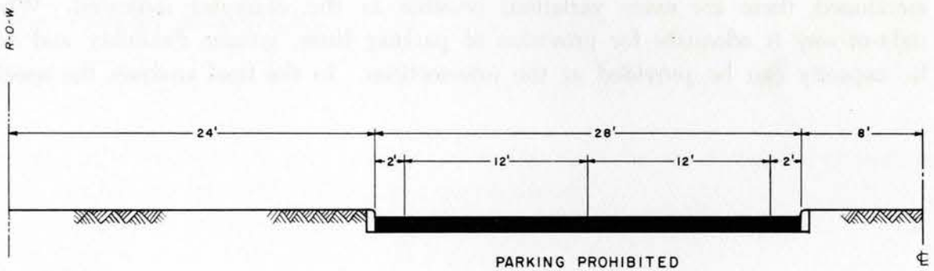


PARKING PROHIBITED

6 TRAFFIC LANES ON 120' RIGHT-OF-WAY

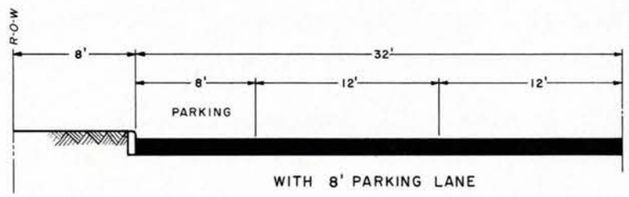


WITH 10' PARKING LANE

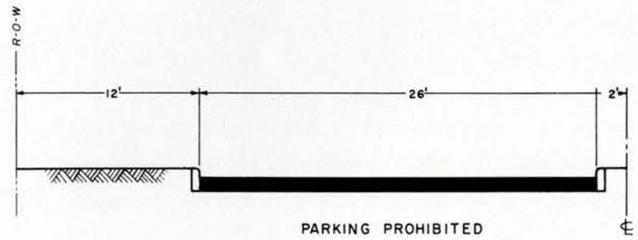


PARKING PROHIBITED

4 TRAFFIC LANES ON 120' RIGHT-OF-WAY



WITH 8' PARKING LANE



PARKING PROHIBITED

4 TRAFFIC LANES ON 80' RIGHT-OF-WAY

TYPICAL ARTERIAL STREET CROSS SECTIONS

PROPOSED EXPRESSWAY SYSTEM
TAMPA, FLORIDA
1957

way for an arterial street is 120 feet. All streets providing more than traffic service to abutting land owners should have rights-of-way of 80 feet or more.

It is recognized that to provide the necessary number of traffic lanes along sections of the designated arterial streets in the older built-up sections of Tampa that some compromise will have to be made in desirable arterial street cross section. The width of border areas may have to be reduced and parking lanes eliminated. The width of existing rights-of-way and costs of acquiring additional width may require a varying adequacy of cross section along the length of any specific arterial street.

Typical arterial street cross sections are shown in Figure 33. As previously mentioned, there are many variations possible in the examples indicated. Where right-of-way is adequate for provision of parking lanes, greater flexibility and traffic capacity can be provided at the intersections. In the final analysis, the specific cross section chosen for an arterial street is dependent upon the available right-of-way width, the difficulty of acquiring additional width and the availability of construction funds. However, early action on the designation of the arterial street system, provision of generous setback lines, and the establishment of desirable arterial street cross sections will enable City authorities to evaluate the scope of the task before them. It will permit the establishment of a long-range improvement program and materially reduce the over-all costs of providing an adequate arterial street system.

Detailed Plans

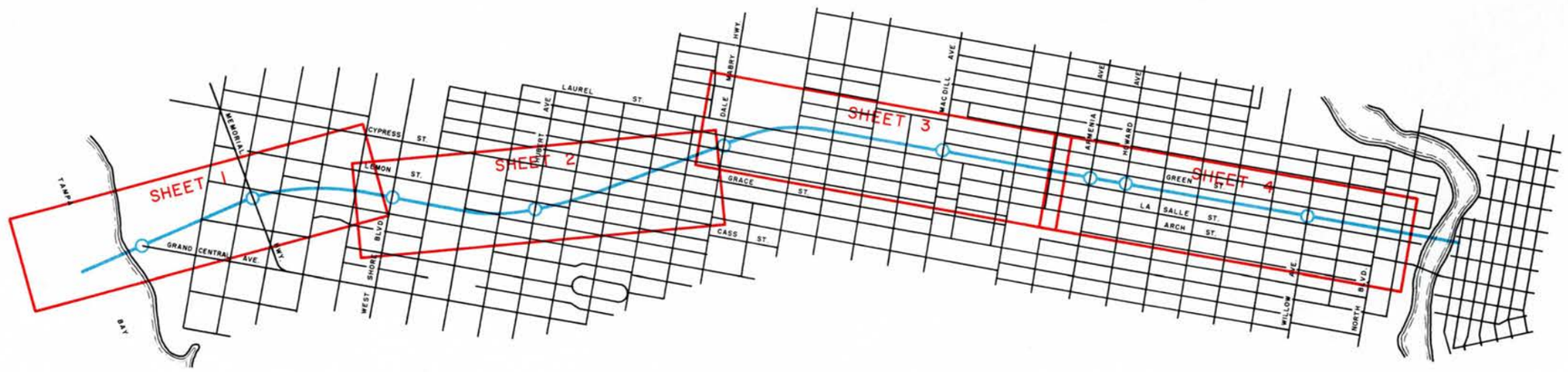
Functional plans showing details of the proposed location and design of the Tampa Expressway System, the Cass Street-Frank Adamo Drive connector and the Bayshore Boulevard-Platt Street-Ellamae Avenue improvement are subsequently presented.

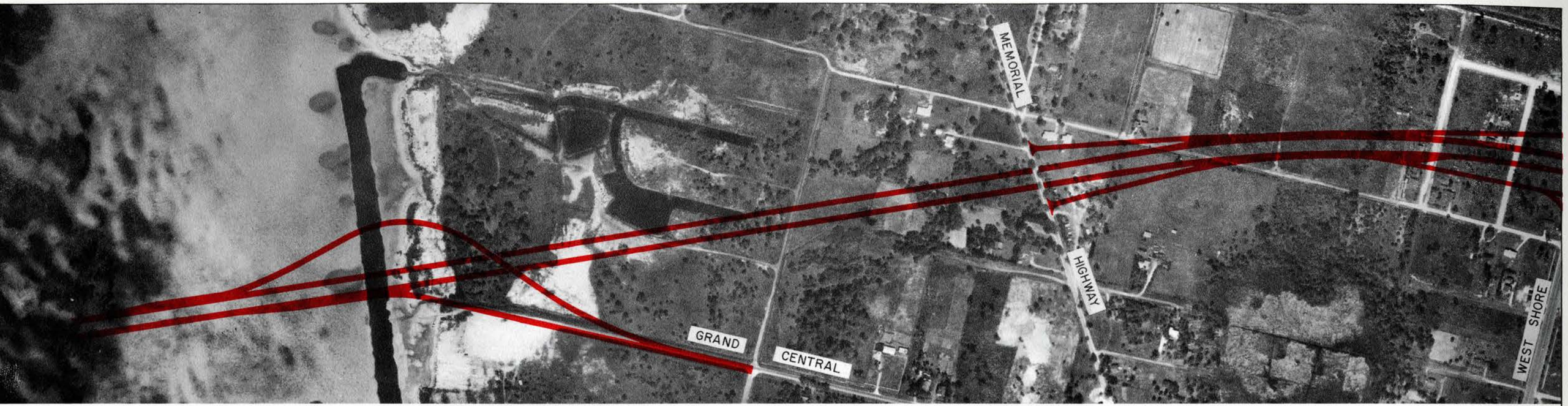
FUNCTIONAL PLAN

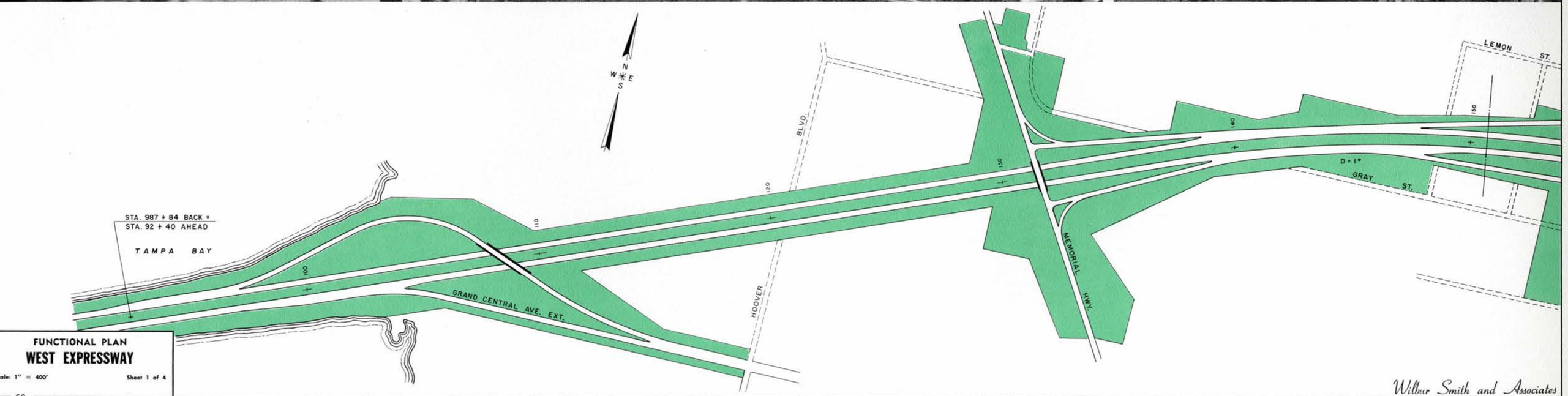
WEST EXPRESSWAY

FIGURE 34

Scale: 1" = 400' Sheets 1 to 4







FUNCTIONAL PLAN

WEST EXPRESSWAY

Scale: 1" = 400' Sheet 1 of 4

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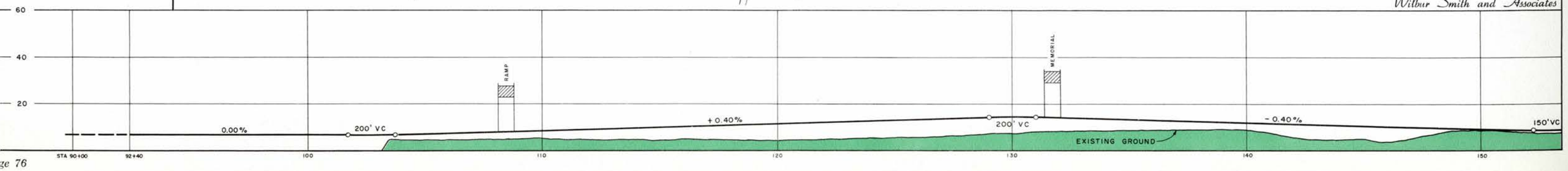

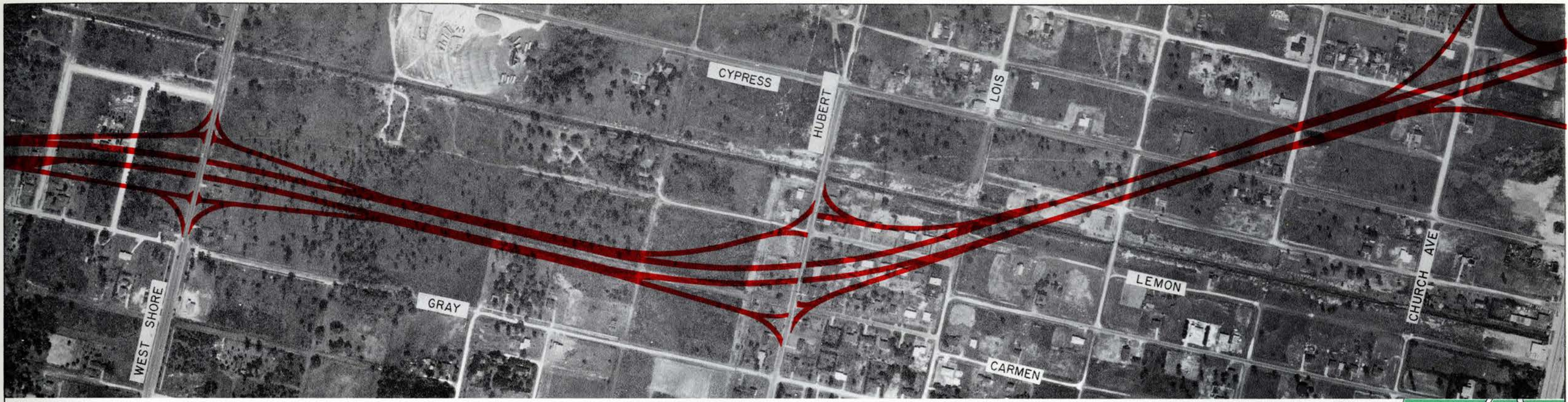

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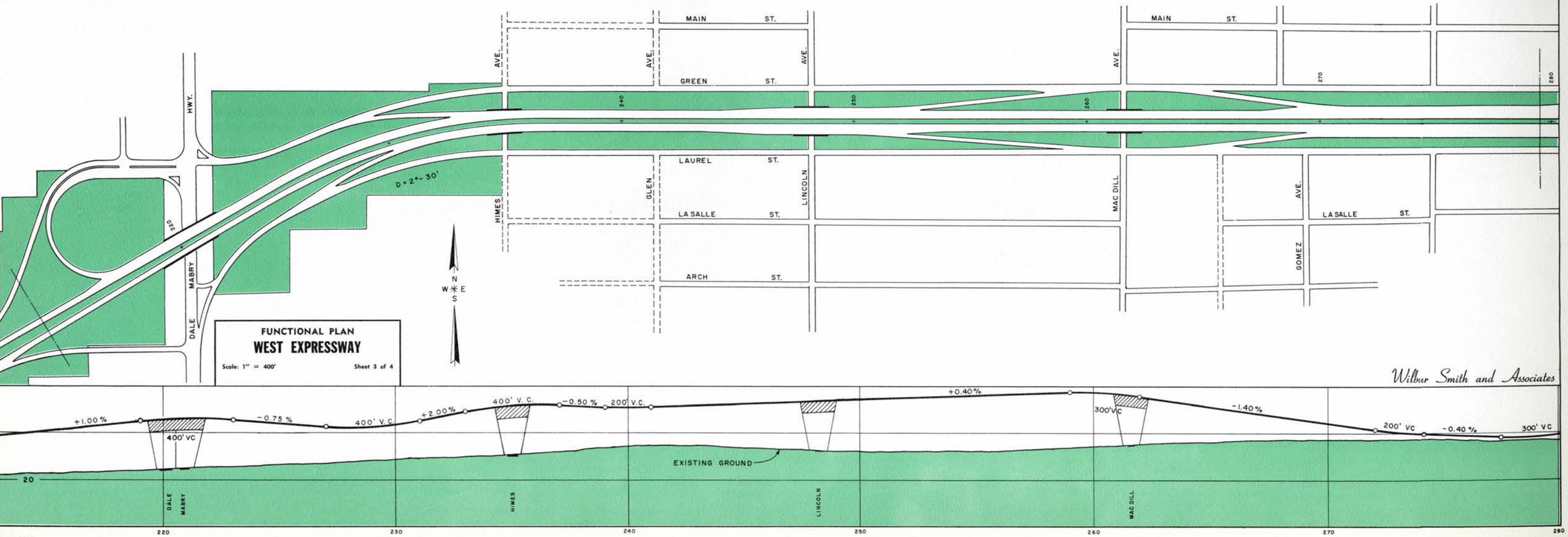
FUNCTIONAL PLAN

WEST EXPRESSWAY

Scale: 1" = 400'

Sheet 2 of 4



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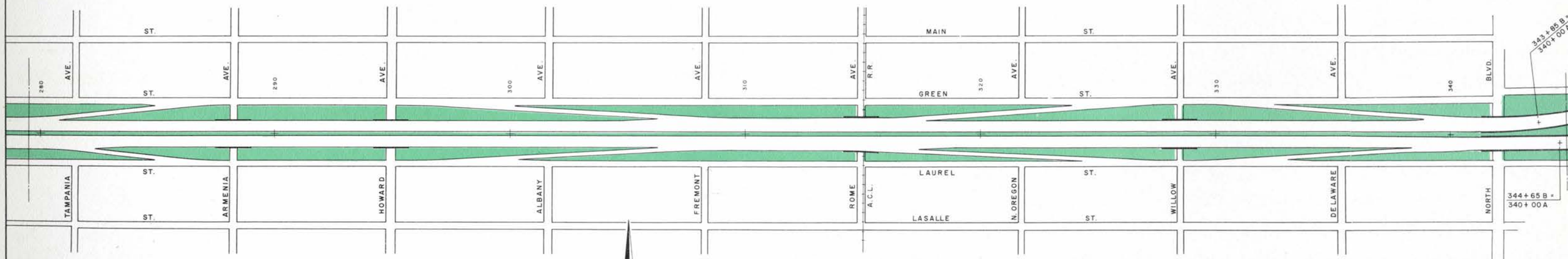

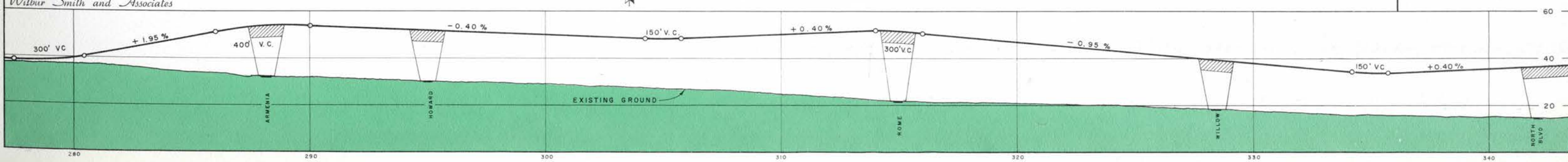

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FUNCTIONAL PLAN

WEST EXPRESSWAY

Scale: 1" = 400'

Sheet 4 of

FUNCTIONAL PLAN

DOWNTOWN DISTRIBUTOR

FIGURE 35

Scale: 1" = 400' Sheet 1

FUNCTIONAL PLAN

DOWNTOWN DISTRIBUTOR

Scale: 1" = 400' Sheet 1

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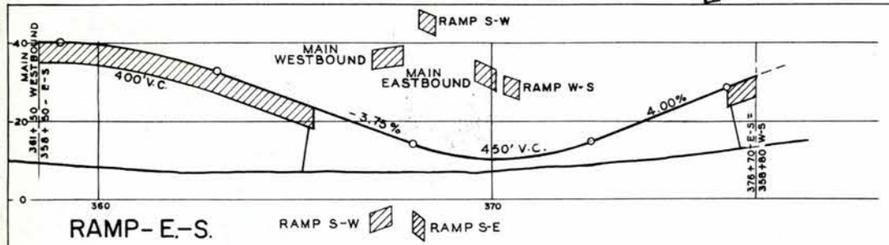
RAMP S-W RAMP S-E



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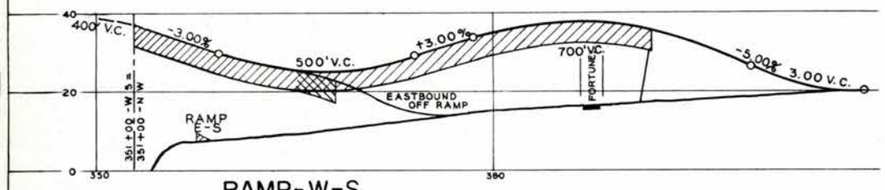

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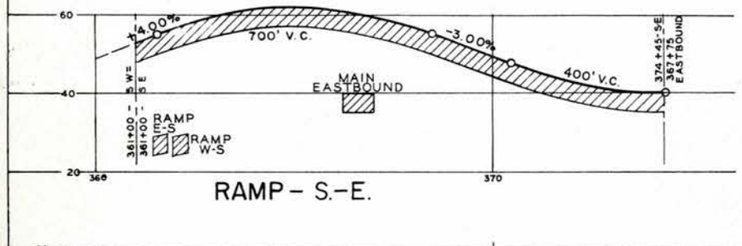

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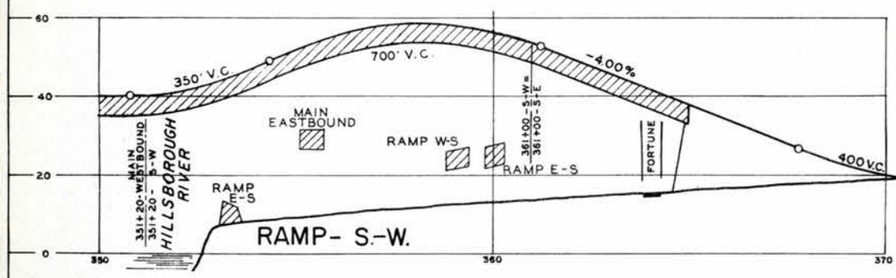

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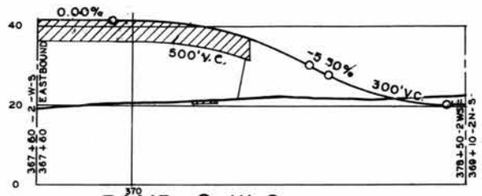

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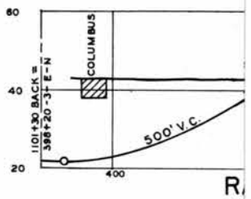

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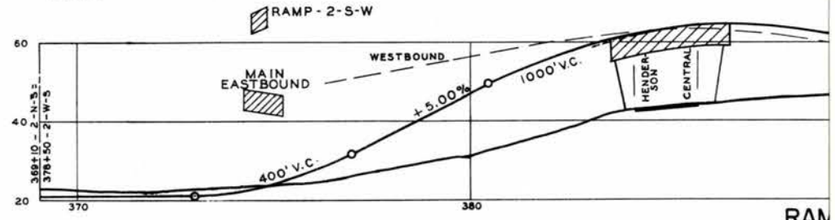

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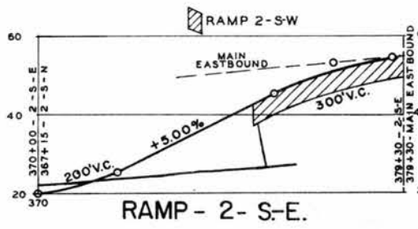

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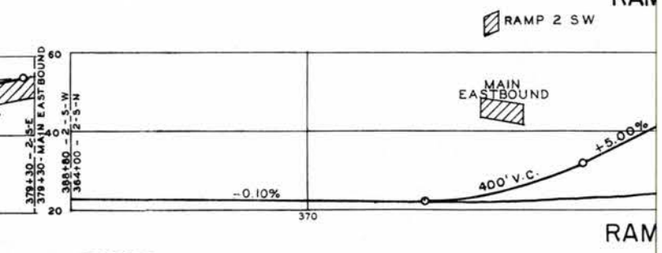

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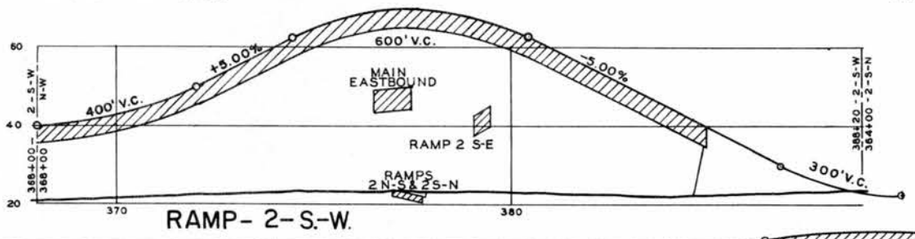

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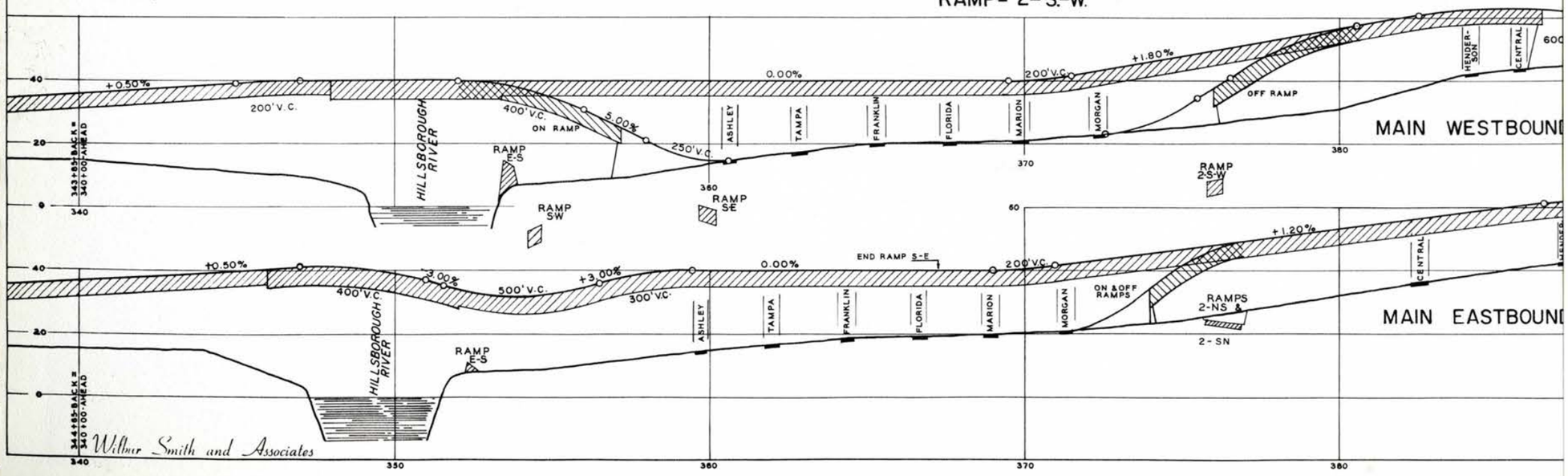

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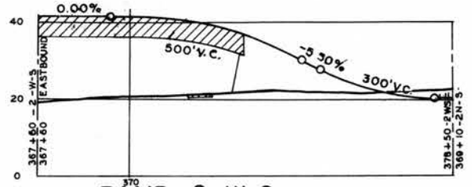

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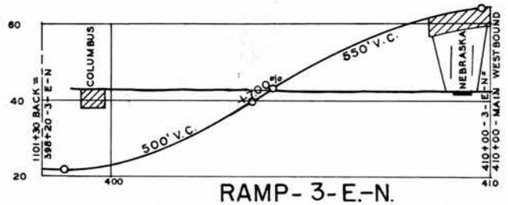

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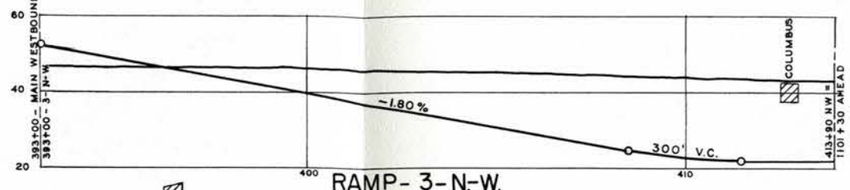

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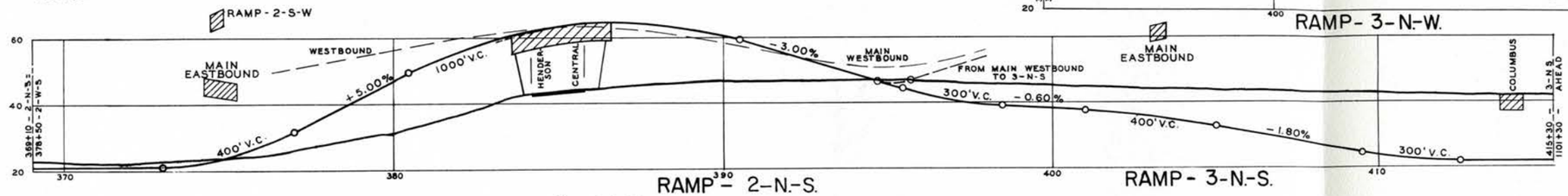

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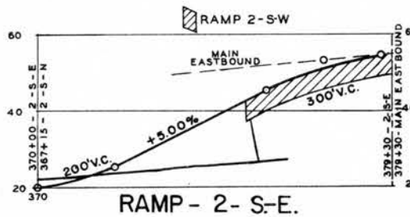
RAMP- 3-N.-S.



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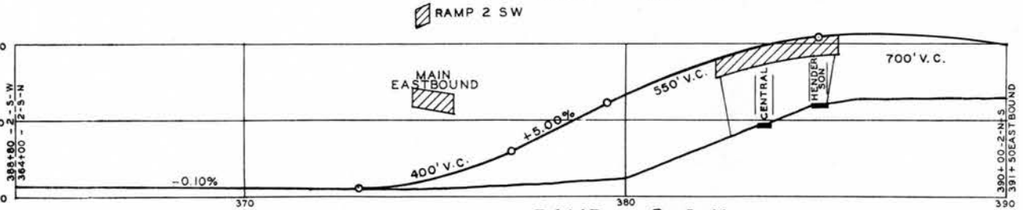

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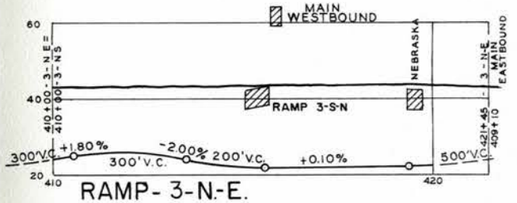

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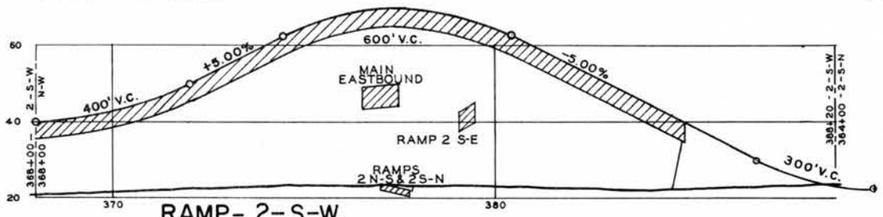

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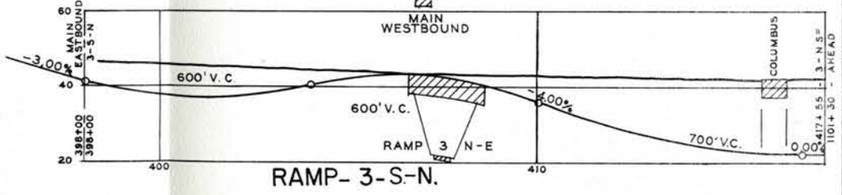

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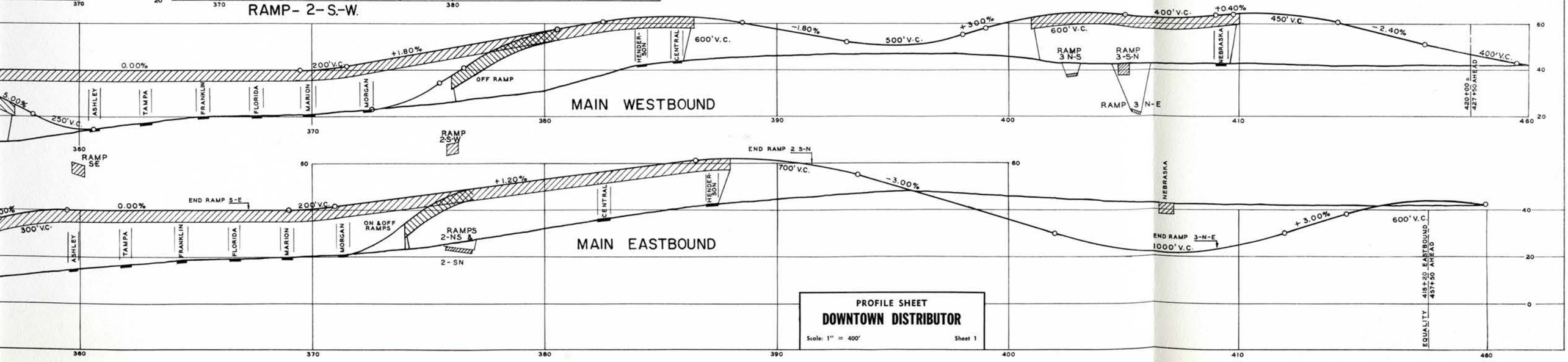


PROFILE SHEET

DOWNTOWN DISTRIBUTOR

Scale: 1" = 400' Sheet 1


FORTUNE
LONZO
TAMPA
FRANKLIN
MORGAN
TYLER
CASS
CENTRAL
JEFFERSON
CENTRAL
SCOTT
KAY
HENDERSON
GOVERNOR

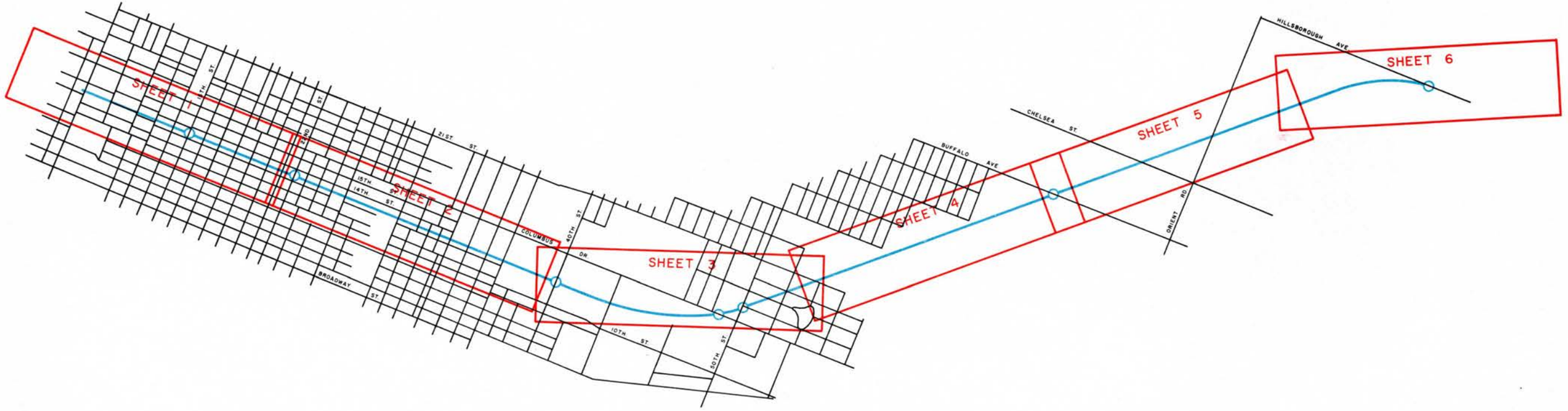
FUNCTIONAL PLAN

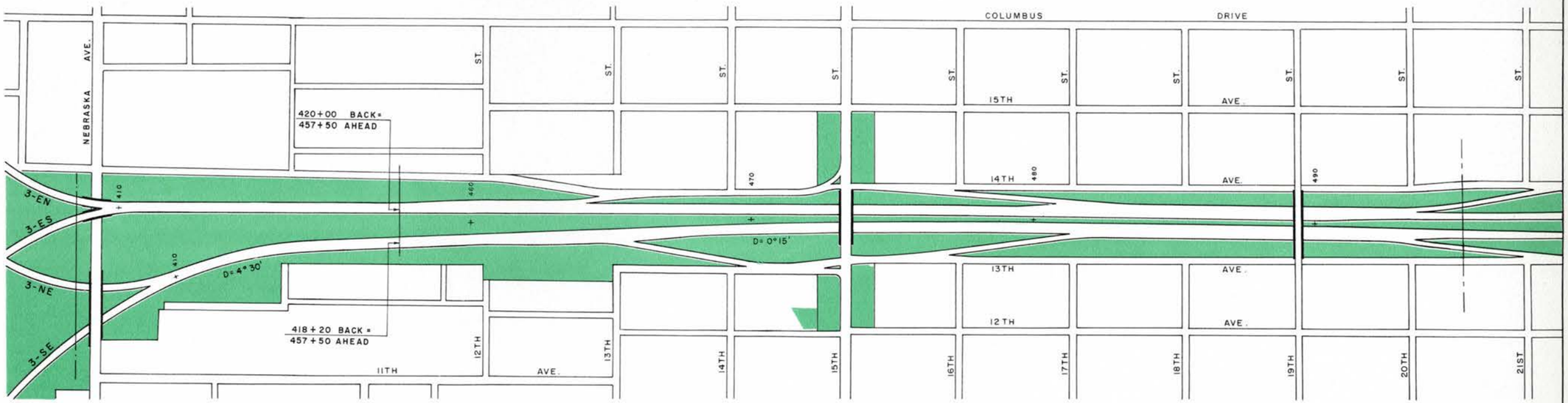
EAST EXPRESSWAY

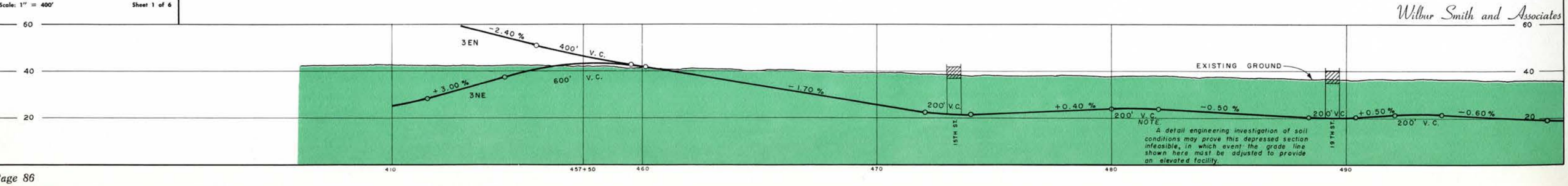
FIGURE 36

Scale: 1" = 400'

Sheets 1 to 6







SEE FIGURE 35
SHEET 1
DOWNTOWN DISTRIBUTOR

FUNCTIONAL PLAN
EAST EXPRESSWAY
Scale: 1" = 400' Sheet 1 of 6

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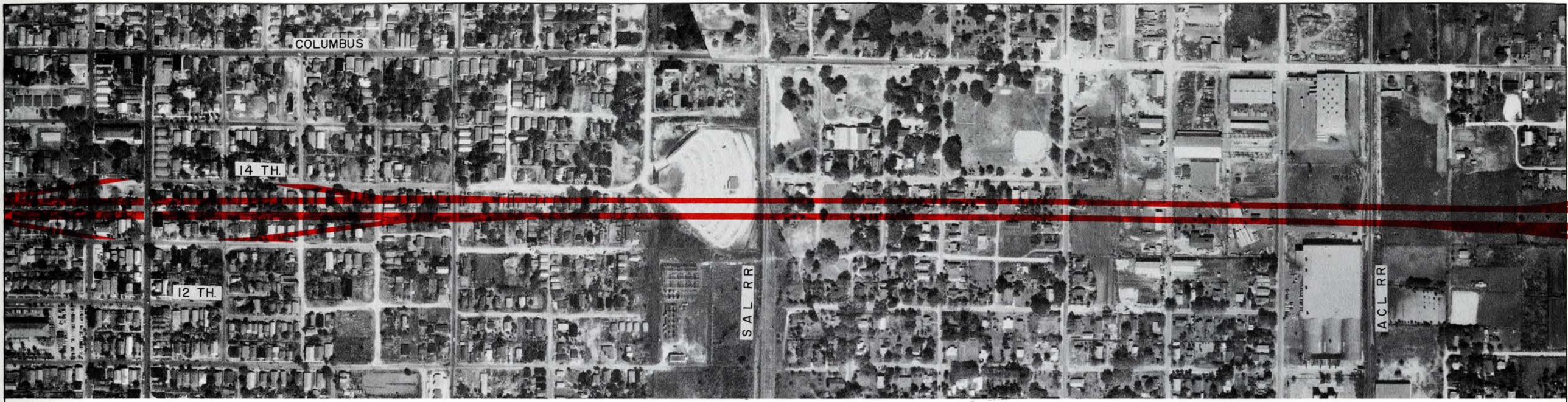

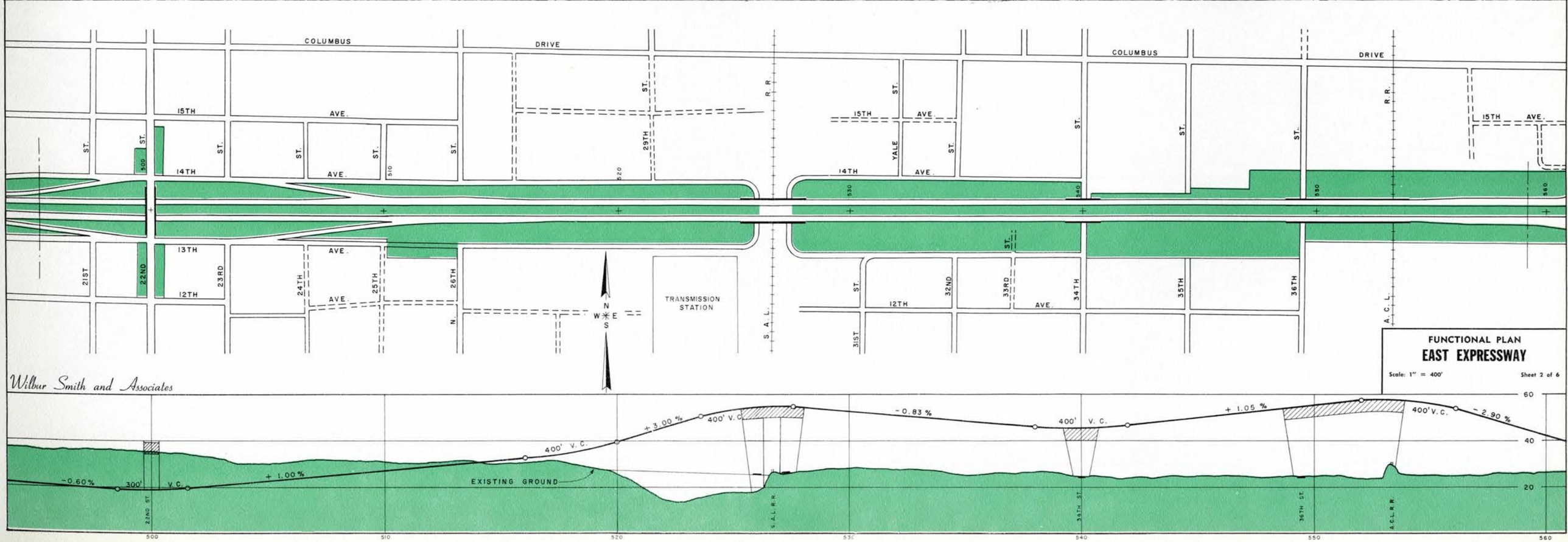

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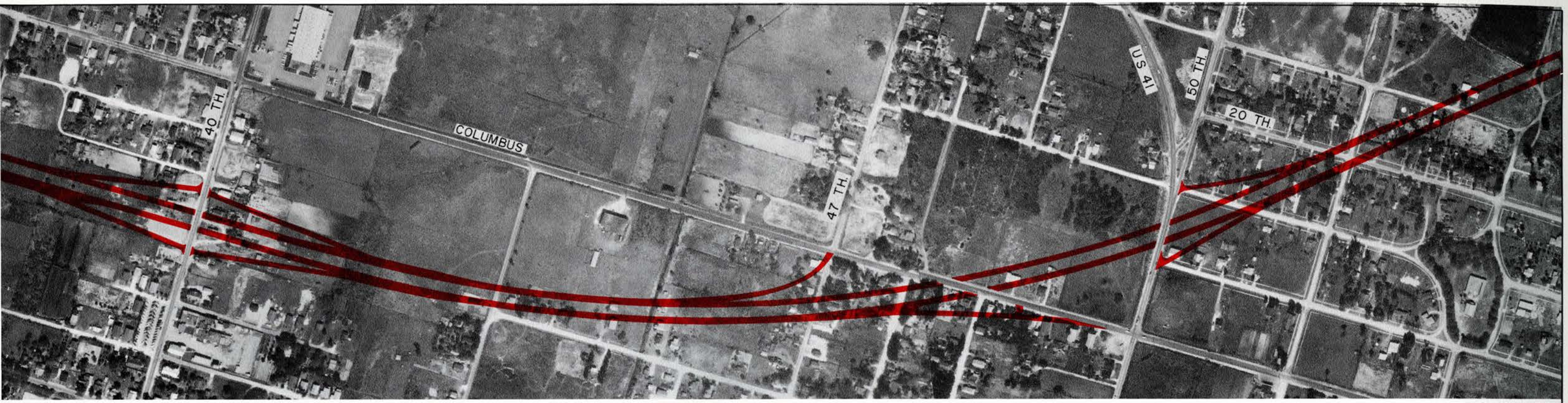
FUNCTIONAL PLAN

EAST EXPRESSWAY

Scale: 1" = 400'

Sheet 2 of 6

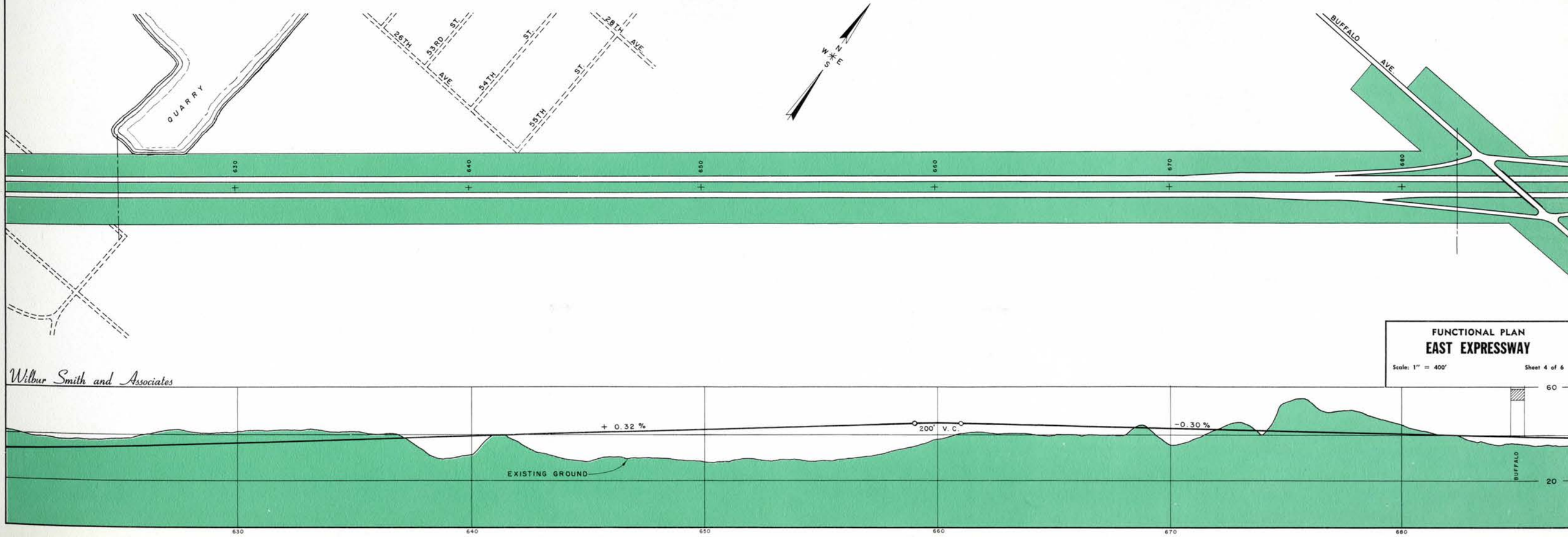


FUNCTIONAL PLAN

EAST EXPRESSWAY

Scale: 1" = 400' Sheet 3 of 6

Wilbur Smith and Associates



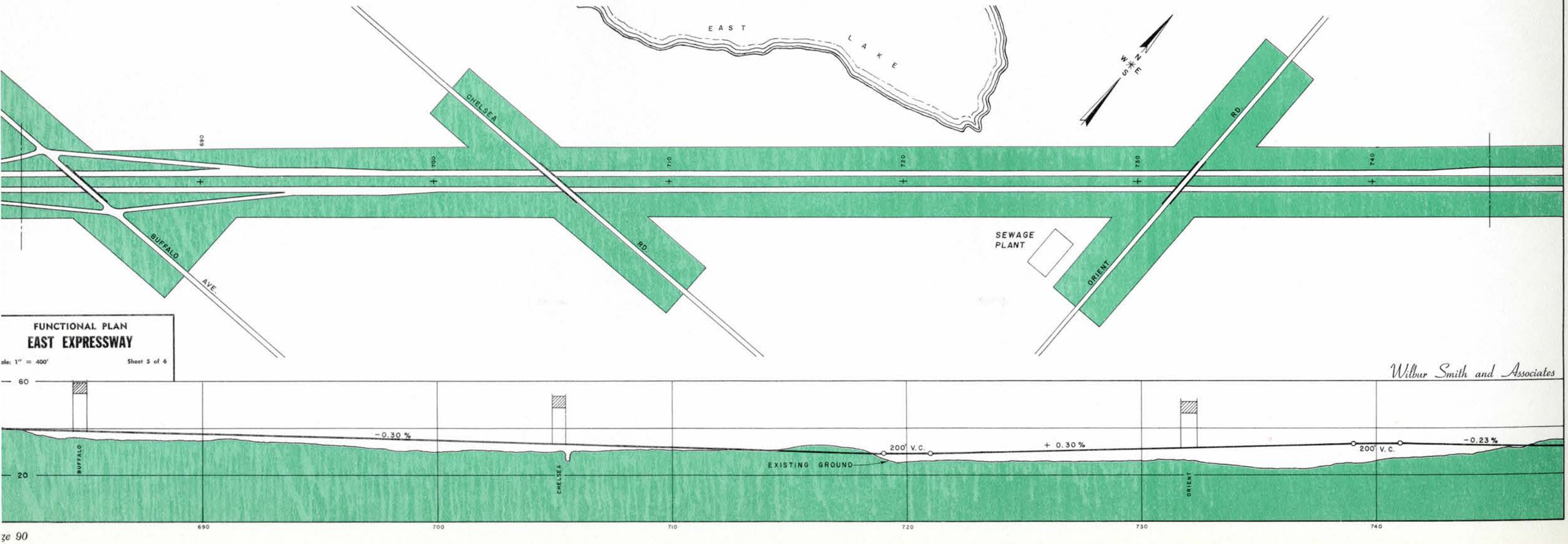
FUNCTIONAL PLAN

EAST EXPRESSWAY

Scale: 1" = 400'

Sheet 4 of 6

Wilbur Smith and Associates

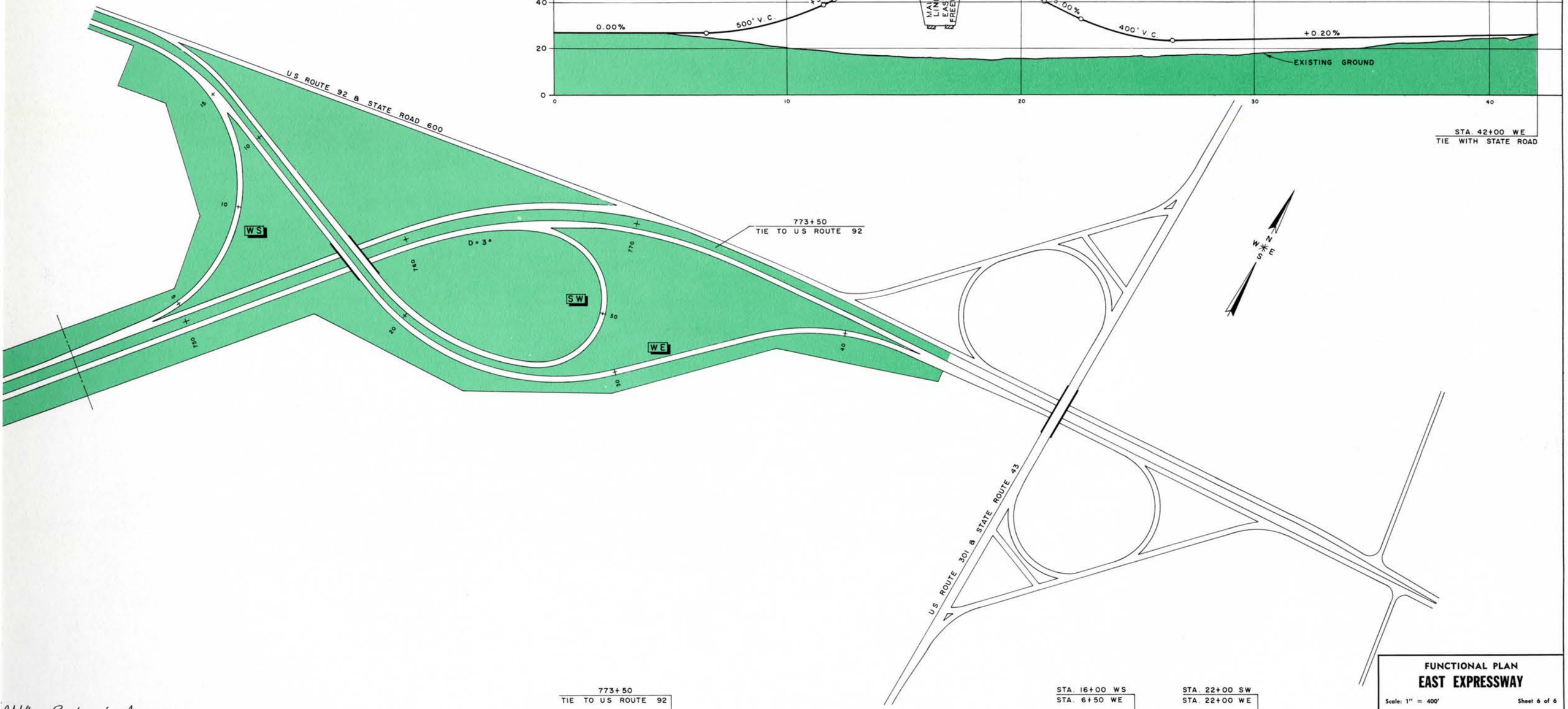


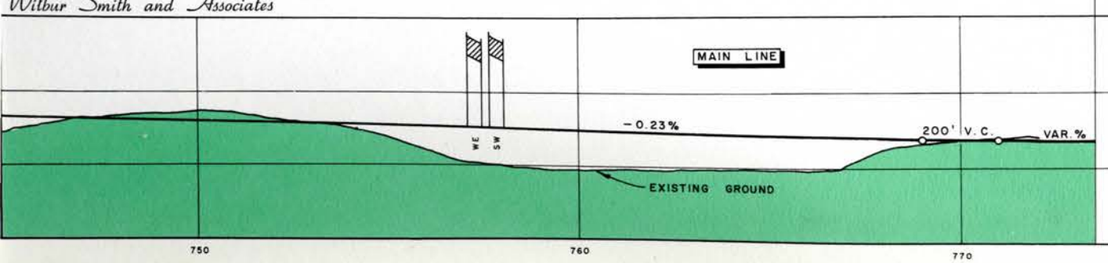
FUNCTIONAL PLAN

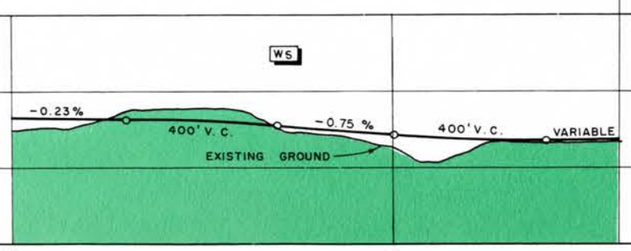
EAST EXPRESSWAY

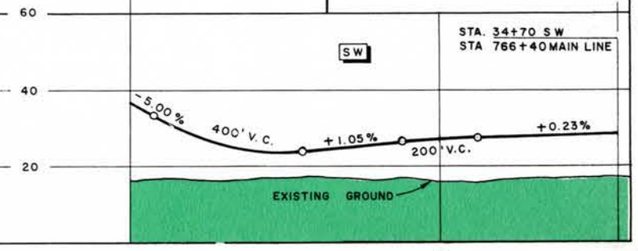
ale: 1" = 400' Sheet 5 of 6

Wilbur Smith and Associates









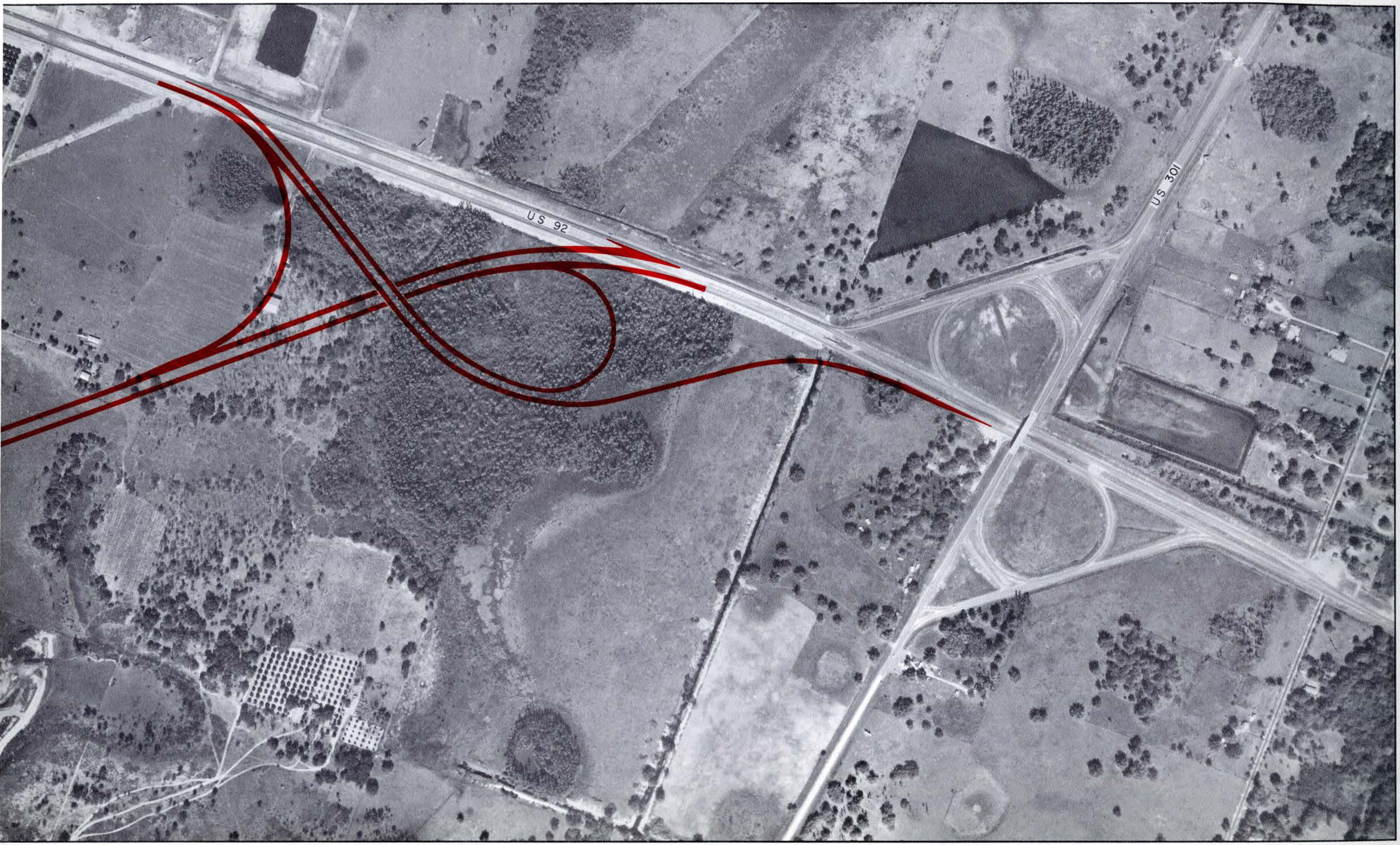
FUNCTIONAL PLAN

EAST EXPRESSWAY

Scale: 1" = 400'

Sheet 6 of 6

Wilbur Smith and Associates

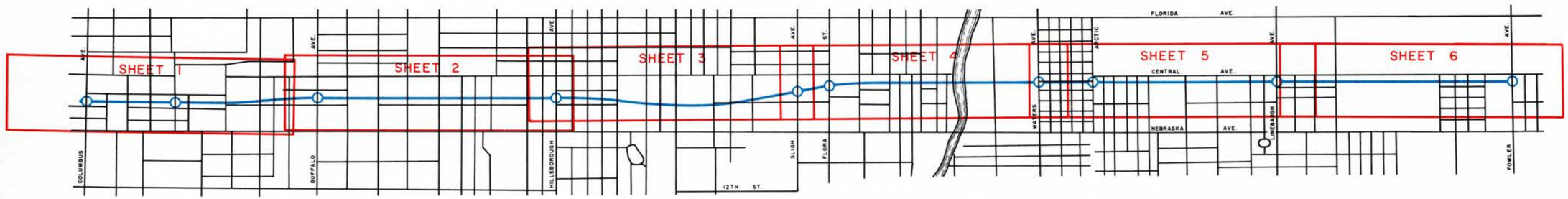

US 92
US 301

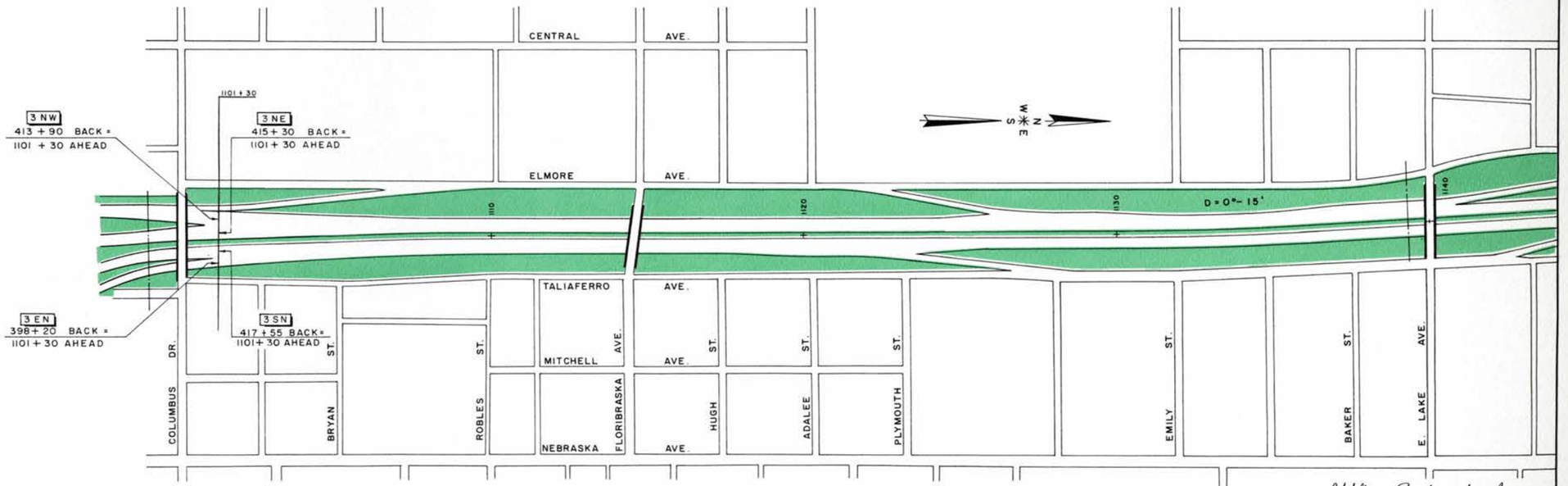
FUNCTIONAL PLAN

NORTH EXPRESSWAY

FIGURE 37

Scale: 1" = 400' Sheets 1 to 6

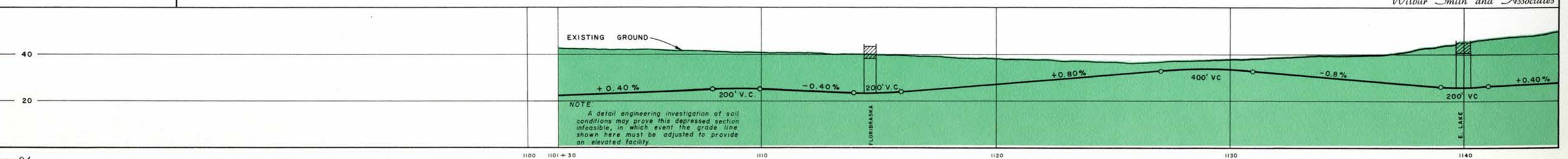


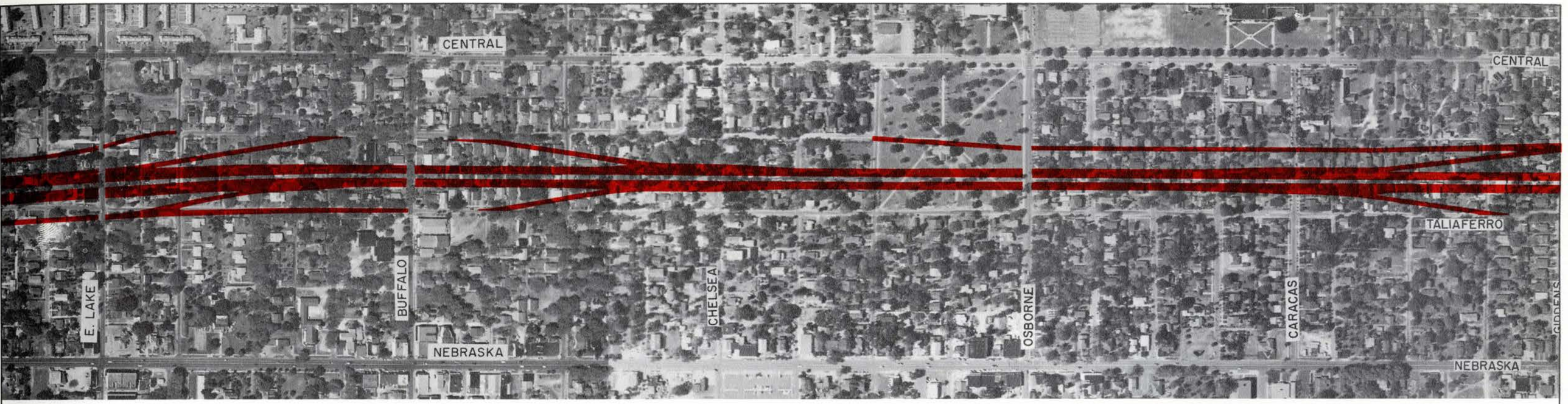


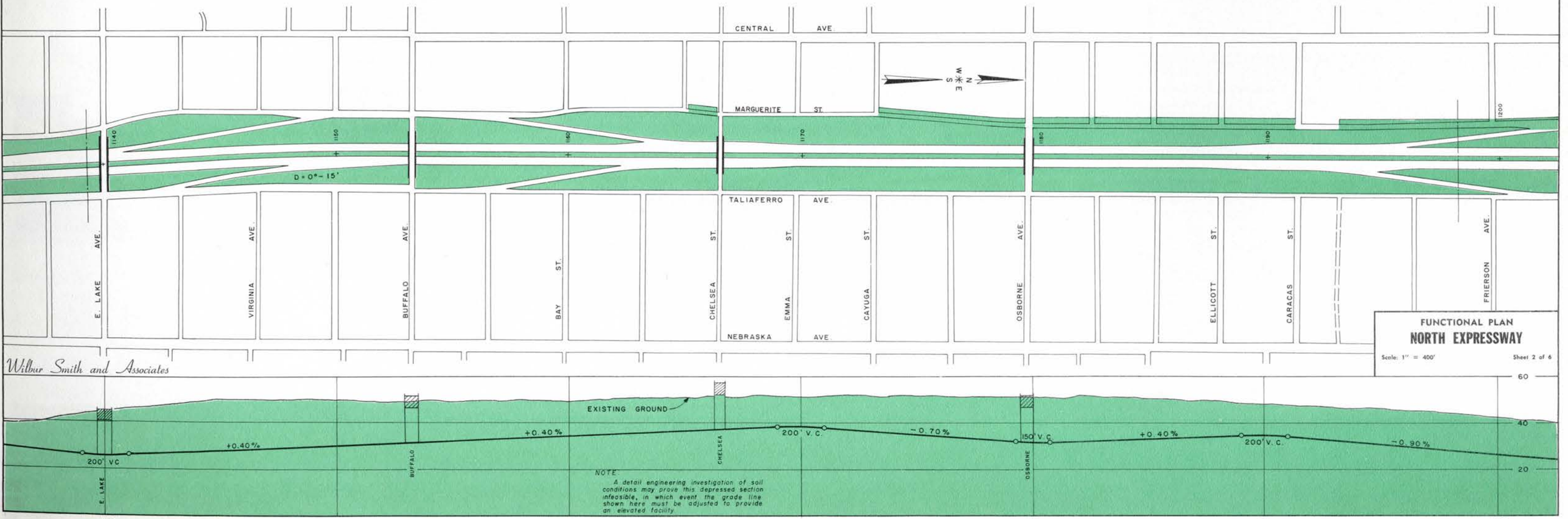
SEE FIGURE 35
SHEET 1
DOWNTOWN DISTRIBUTOR

FUNCTIONAL PLAN
NORTH EXPRESSWAY
Scale: 1" = 400' Sheet 1 of 6

Wilbur Smith and Associates







FUNCTIONAL PLAN
NORTH EXPRESSWAY
Scale: 1" = 400' Sheet 2 of 6

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NOTE:
A detail engineering investigation of soil conditions may prove this depressed section infeasible, in which event the grade line shown here must be adjusted to provide an elevated facility.

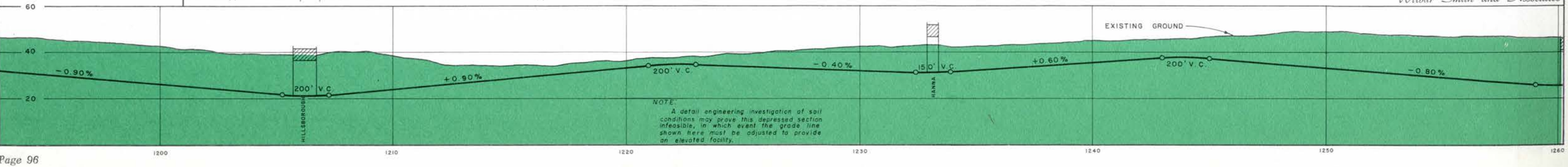
FUNCTIONAL PLAN

NORTH EXPRESSWAY

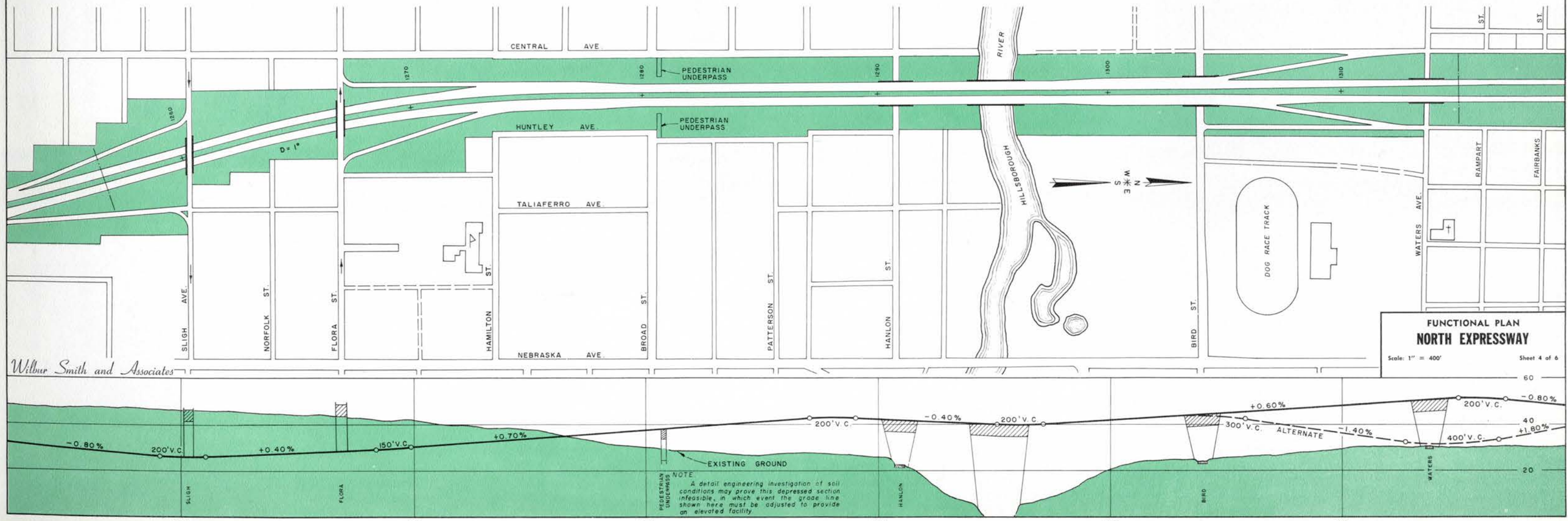
Scale: 1" = 400'

Sheet 3 of 6

Wilbur Smith and Associates



NOTE:
A detail engineering investigation of soil conditions may prove this depressed section infeasible, in which event the grade line shown here must be adjusted to provide an elevated facility.



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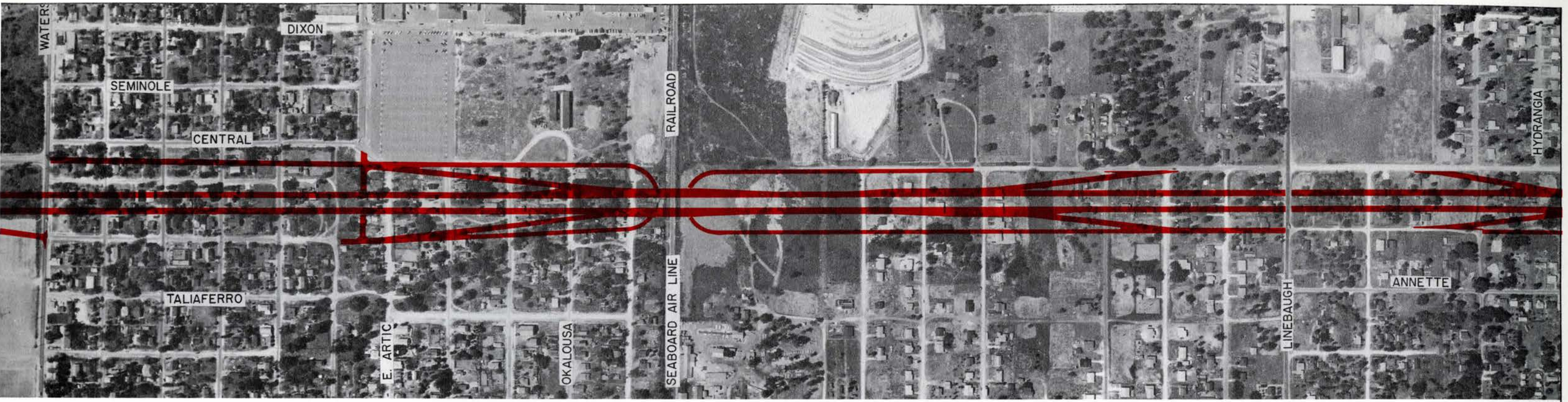
FUNCTIONAL PLAN

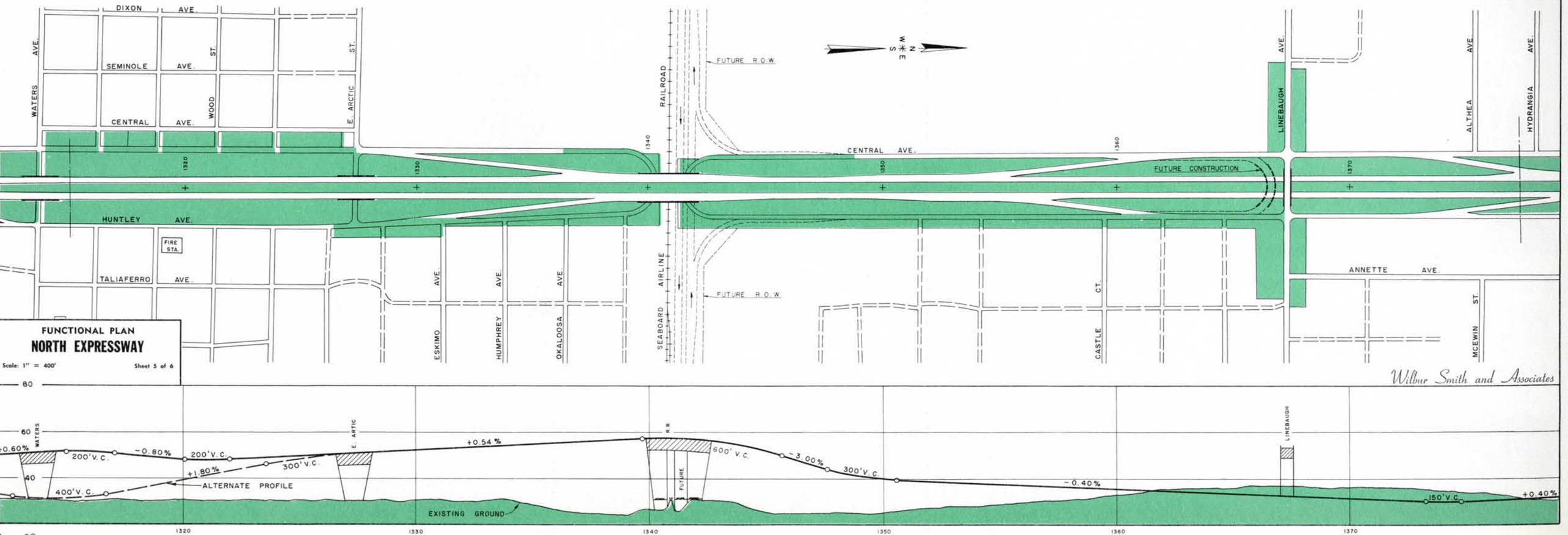
NORTH EXPRESSWAY

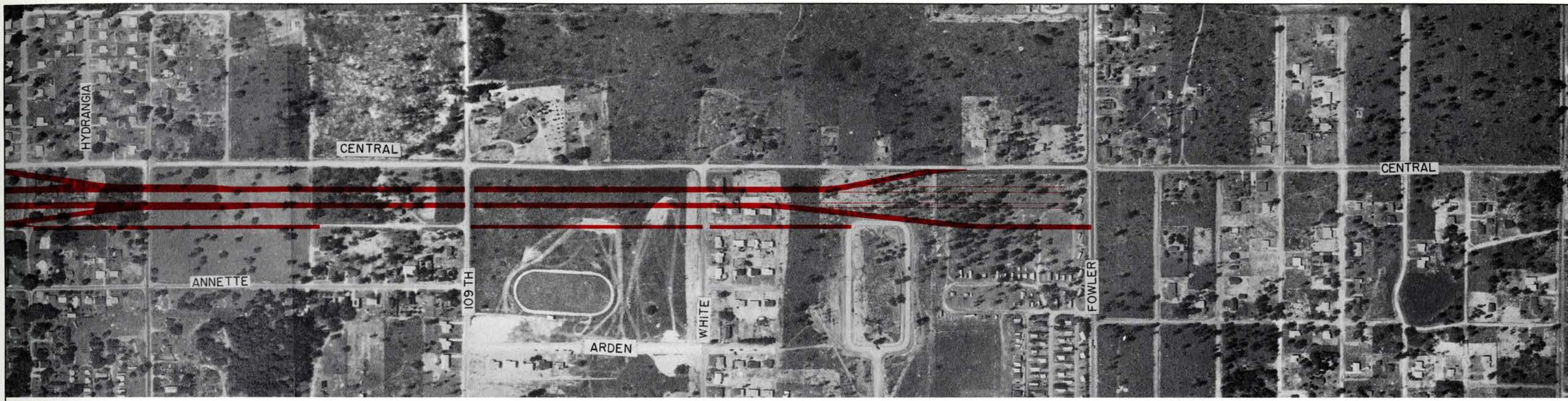
Scale: 1" = 400'

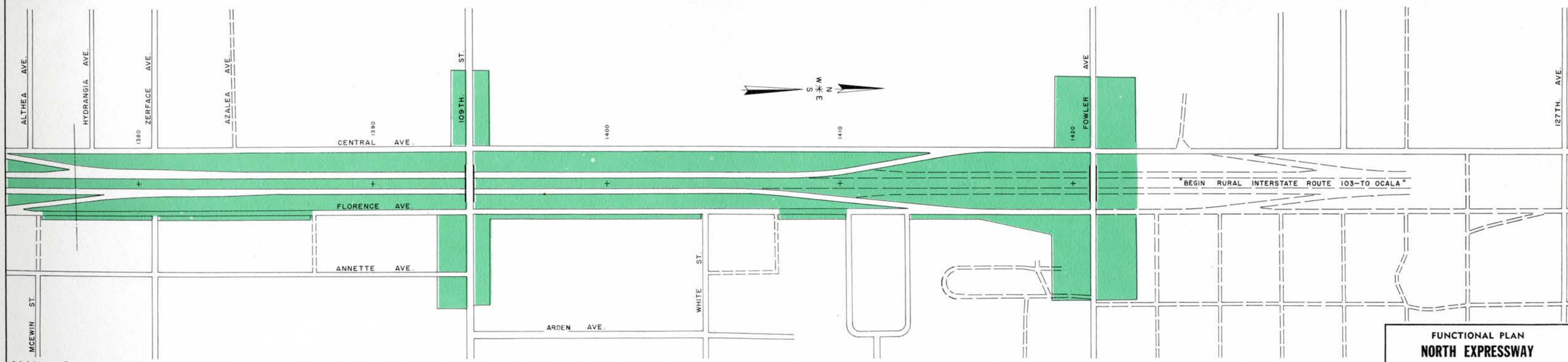
Sheet 4 of 6

NOTE:
A detail engineering investigation of soil conditions may prove this depressed section infeasible, in which event the grade line shown here must be adjusted to provide an elevated facility.


WATERS
DIXON
SEMINOLE
CENTRAL
TALIAFERRO
E. ARTIC
OKALOUSA
SEABOARD AIR LINE
RAILROAD
LINEBAUGH
ANNETTE
HYDRANGIA


DIXON AVE.
SEMINOLE AVE.
CENTRAL AVE.
HUNTLEY AVE.
TALIAFERRO AVE.
WATERS AVE.
WOOD ST.
E. ARCTIC ST.
FIRE STA.
ESKIMO AVE.
HUMPHREY AVE.
OKALOOSA AVE.
SEABOARD AIRLINE RAILROAD
FUTURE R.O.W.
CENTRAL AVE.
FUTURE CONSTRUCTION
LINEBAUGH AVE.
ALTHEA AVE.
HYDRANGIA AVE.
ANNETTE AVE.
CASTLE CT.
MCEWIN ST.
1320
1330
1340
1350
1360
1370
FUNCTIONAL PLAN
NORTH EXPRESSWAY
Scale: 1" = 400'
Sheet 5 of 6
Wilbur Smith and Associates
80
60
40
+0.60%
200'V.C.
-0.80%
200'V.C.
+1.80%
300'V.C.
400'V.C.
ALTERNATE PROFILE
+0.54%
600'V.C.
-3.00%
300'V.C.
-0.40%
150'V.C.
+0.40%
EXISTING GROUND
FUTURE
R.R.





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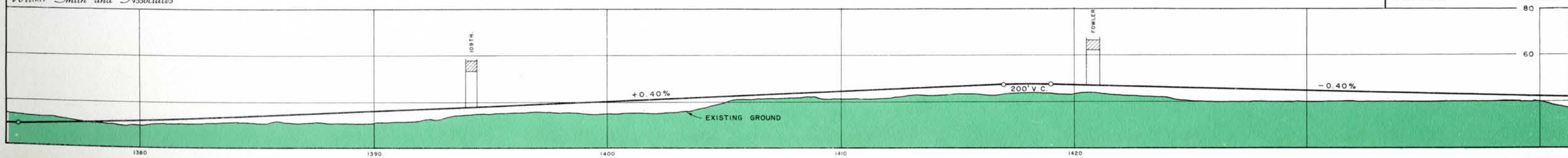
FUNCTIONAL PLAN

NORTH EXPRESSWAY

Scale: 1" = 400'

Sheet 6 of 6

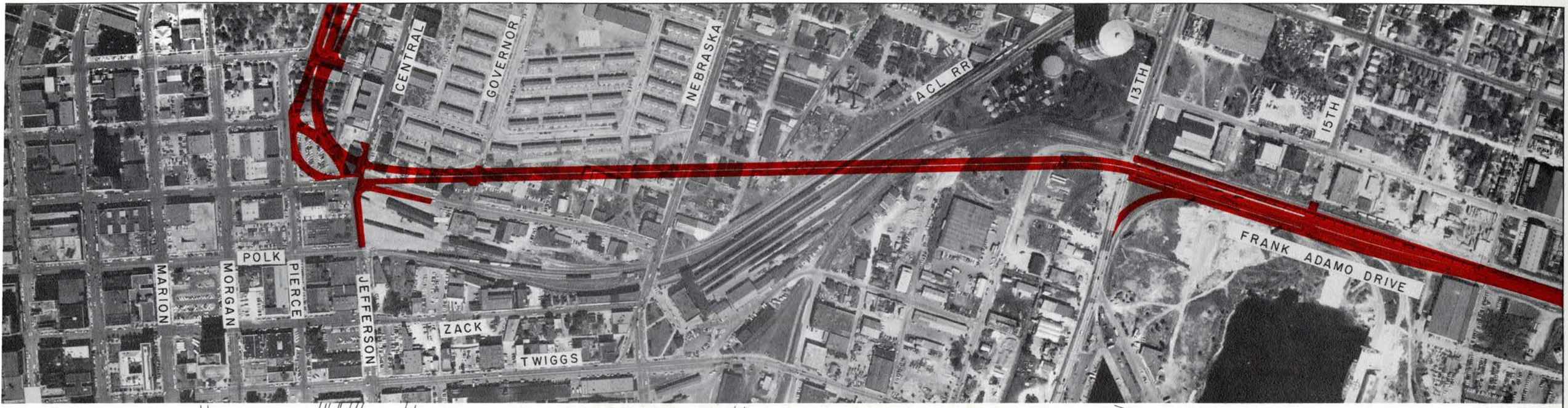


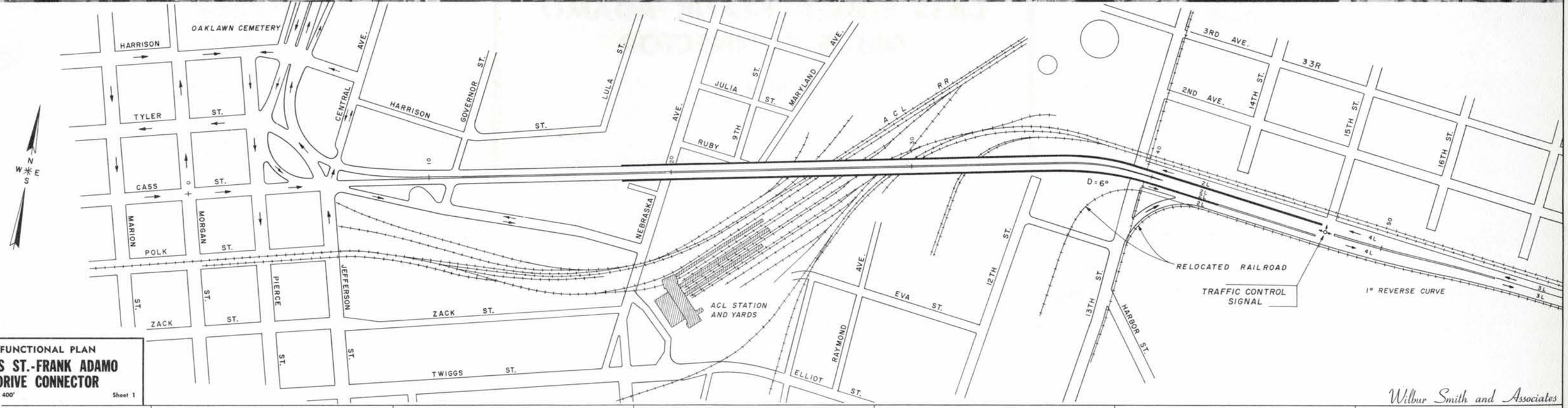
FUNCTIONAL PLAN

CASS STREET - FRANK ADAMO DRIVE CONNECTOR

FIGURE 38

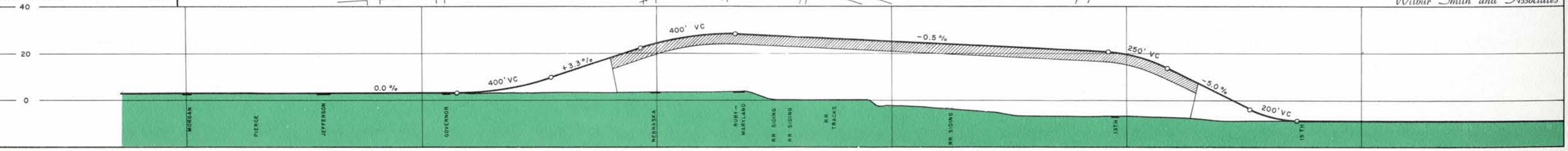
Scale: 1" = 400' Sheet 1





FUNCTIONAL PLAN
CASS ST.-FRANK ADAMO DRIVE CONNECTOR
Scale: 1" = 400' Sheet 1

Wilbur Smith and Associates



FUNCTIONAL PLAN

BAYSHORE BLVD. - PLATT ST. - ELLAMAE AVE. IMPROVEMENT

FIGURE 39

Scale: 1" = 400' **Sheet 1**

EAGLE ST.
WHITING ST.
BELL ST.
GRAND CENTRAL AVE.
LEE ST.
CARDY ST.
CUMBERLAND AVE.
HAMPTON ST.
EUNICE AVE.
PLATT ST.
ELLAMAE AVE.
HILLSBOROUGH RIVER
CEDAR AVE.
HYDE PARK AVE.
PLANT AVE.
PARKER ST.
WATER ST.
KRAUSE ST.
TAMPA ST.
FRANKLIN ST.
FLORIDA AVE.
MORGAN ST.
JEFFERSON ST.
NEBRASKA AVE.
CAESAR ST.
MERIDIAN AVE.
11TH. ST.
12TH. ST.
13TH. ST.
N W E S
10+00 BEGIN LINE A
28+00 END LINE B
52+80 END LINE A
15+00 BEGIN LINE B
BEACH PL.
VERNE ST.
BAYSHORE BLVD.
TO DAVIS ISLAND
PROPOSED DAVIS ISLAND BRIDGE
DAVIS ISLAND
GARRISON CHANNEL

LEGEND:
RECOMMENDED NEW CONSTRUCTION
ONE WAY TRAFFIC FLOW

FUNCTIONAL PLAN
BAYSHORE BLVD.-PLATT ST.-ELLAMAE AVE. IMPROVEMENT
Scale: 1" = 400' Sheet 1

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LINE A
-0.30% 200' V.C. -0.50% 300' V.C. +5.00% 500' V.C. -5.00% 250' V.C. +1.00%
HYDE PLANT PARKER BAYSHORE WATER FRANKLIN FLORIDA MORGAN JEFFERSON NEBRASKA
10 20 30 40 50

LINE B
0.00% 300' V.C. +5.00% 500' V.C. -5.00% 250' V.C.
20 30

Chapter VIII
RELATED TRAFFIC SERVICES

If full benefit is to be enjoyed from the improved and expanded major street and expressway system, improvements in all other related traffic services must be carefully integrated. The proposed expressway system will have profound effects on travel patterns and driving habits, particularly to and from the central business district. With this improved access, the central area of Tampa can be expected to attract substantial increases of both persons and vehicles. Terminal facilities, mass transportation, and traffic control equipment are of primary importance in the facilitation of person and vehicular movements. These closely related services must be given thorough consideration in the over-all improvement plans.

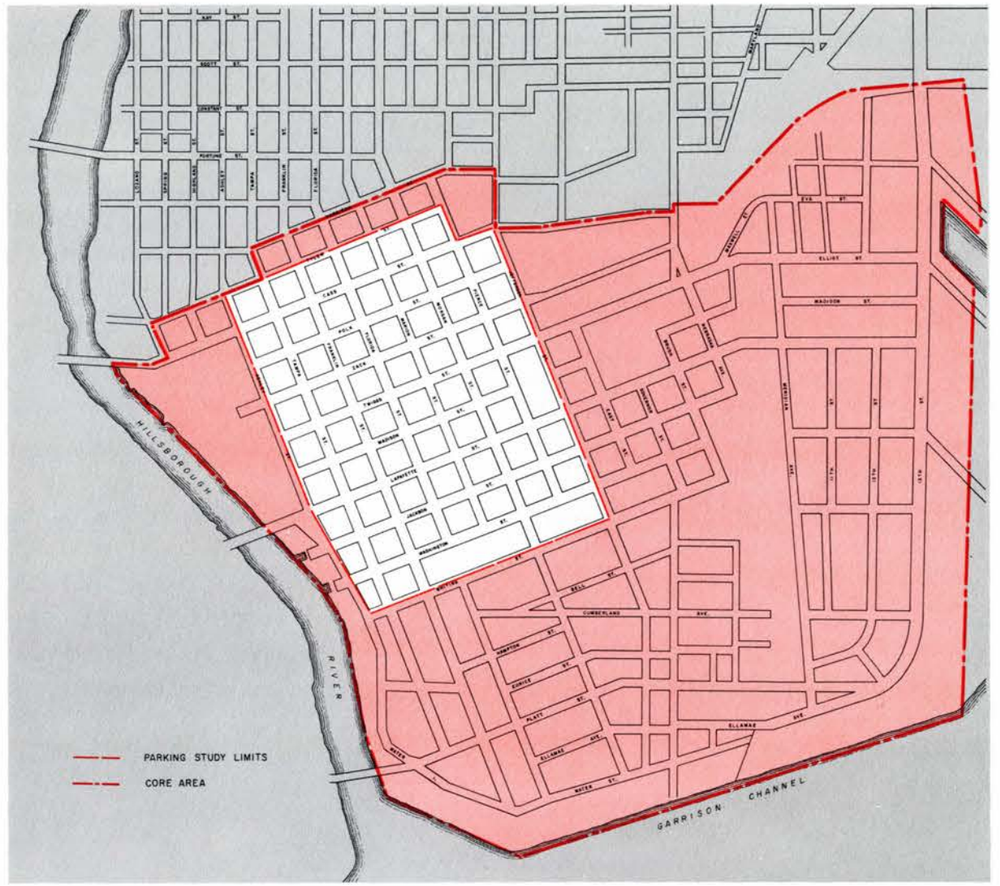
Parking

The economic future of the central business district of Tampa, as in most cities, depends to a large extent on the adequacy of terminal facilities. Improvements in the traffic accessibility of the central area create increased parking demands, thus necessitating the development of additional parking facilities. In the past, most of the available parking supply was located at curb facilities; however, much of this supply has been eliminated to provide adequate street capacities for moving traffic. Because of the increasing traffic volumes, it is not unlikely that many additional curb spaces will be eliminated in the future. It is apparent that curb facilities are completely inadequate to meet modern parking needs. To the contrary, parkers' demands must be met through the implementation of a parking plan, including the provision of off-street facilities.

Previous Action — During 1956, the Florida State Road Department undertook a parking study to determine the magnitude and nature of the parking problem within the central business district of Tampa. While the results of this study are not complete, the data were carefully reviewed and applicable portions are subsequently discussed.

Several other parking studies were conducted prior to the study being made by the State Road Department. The results of these studies were also reviewed as the data were available.

Available Parking Supply — In obtaining data relative to parking, the Florida State Road Department considered the central business district as all of the area south of Harrison Street; see Figure 40. This includes both the concentrated demand area and the so-called "fringe" blocks. As shown in Table XV, there are 15,184 available parking spaces within this area. Of the total, 5,607 spaces are found at curb facilities and 9,577 in off-street lots and garages. The block-by-block distribution of available spaces is graphically depicted in Figure 41.



PARKING SURVEY LIMITS

DOWNTOWN AREA
TAMPA, FLORIDA
1957

Wilbur Smith and Associates

FIGURE 40

TABLE XV

AVAILABLE PARKING SPACES
ENTIRE SURVEY AREA

Type	*Number*[1]
Curb Spaces	5,607
Lot Spaces	8,146
Garage Spaces	1,431
TOTAL	15,184

[1]Furnished by the Florida State Road Department, 1956-1957.

The present supply is reasonably well distributed throughout the study area; however, there is a noticeable void of off-street facilities within the "core" area. It is in this area that land values are extremely high and the land is most attractive for business and retail development. The core area, as shown in Figure 41, is bounded generally by Tyler Street on the north, Jefferson Street on the east, Whiting Street on the south, and Ashley Street on the west. It is in this area that parking demands are concentrated. At present, there is a total of only 4,597 parking spaces in this area, see Table XVI.

TABLE XVI

AVAILABLE PARKING SPACES
CORE AREA

Type	*Number*[1]
Curb Spaces	1,579
Lot Spaces	1,821
Garage Spaces	1,197
TOTAL	4,597

[1]Furnished by the Florida State Road Department, 1956-1957.

Eight blocks within the study area have a parking supply in excess of 200 spaces, with only three of these blocks located in the core area. About 33 blocks provide over 100 spaces, with 10 of these located in the core area. Many of the

DISTRIBUTION OF
AVAILABLE PARKING SPACES
DOWNTOWN AREA
TAMPA, FLORIDA
1957

Wilbur Smith and Associates

FIGURE 41

blocks in the concentrated retail area where demands are high provide less than 50 spaces.

The present curb supply, while limited, can be expected to be further reduced to provide sufficient street capacities for the increasing traffic volumes. Some peak-hour curb restrictions are in effect and it is reasonable to assume that more ex-

tensive restrictions will be required in the future. To facilitate traffic movements, it can be anticipated that almost all curb parking in the core area will be eliminated by 1975. Because of the existing street widths and the implementation of such operational techniques as one-way streets and signal improvements, the loss of curb spaces has been minimized.

Many off-street spaces are poorly located with respect to the parkers' demands due to excessive walking distances. Others are unattractive or must be considered temporary since they are located on leased properties and will likely be converted to other land uses. With this conversion, additional parking generators will be established; consequently the loss to the parking supply will be two-fold.

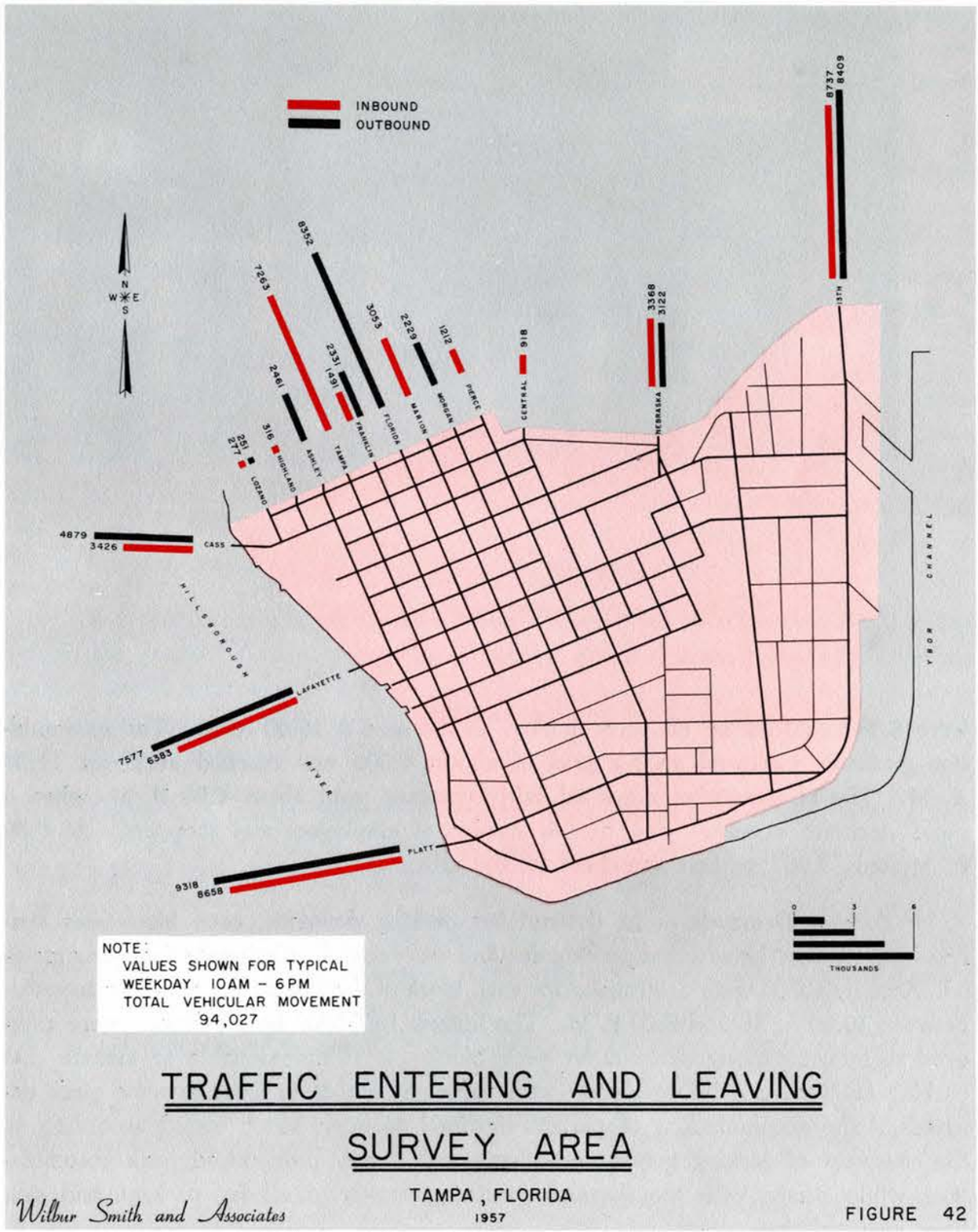
Cordon Count — As part of the comprehensive parking study conducted by the Florida State Road Department, a cordon count of vehicles entering and leaving the survey area was made. Between the hours of 10:00 A. M. and 6:00 P. M., over 94,000 vehicles entered and left the central business district via 15 streets and bridges. The "inbound" and "outbound" vehicle movements for each of the facilities are graphically presented in Figure 42. The total movement at each of three of the cordon points exceeded 13,000 vehiles. Two of these exceeded 17,000 vehicles, with the largest movement (17,976) being recorded over the Platt Street Bridge.

It is interesting to note that about one of every two vehicles entering the business area actually had destinations within the area. This emphasizes the need for adequate parking facilities within the area. As access to the area is improved by the development of the expressway system, further increases can be anticipated.

Hourly variations in traffic movements entering and leaving the survey area are shown in Figure 43 for the period 10:00 A. M. to 6:00 P. M. It can be seen that there is little variation from 10:00 A. M. until 4:00 P. M. when both the "inbound" and "outbound" movements begin to increase. The heaviest movement occurs between 5:00 P. M. and 6:00 P. M. when almost 15,800 vehicles move across the cordon limits.

The "inbound" movement gradually increases during the morning hours but reaches a peak around 5:00 P. M. The "outbound" movement reaches a distinct peak period between 5:00 P. M. and 6:00 P. M. when about 9,400 vehicles leave the cordon area.

Parking Accumulations — As shown in Figure 44, the accumulation of parked vehicles within the entire study area remains far below the available supply. There

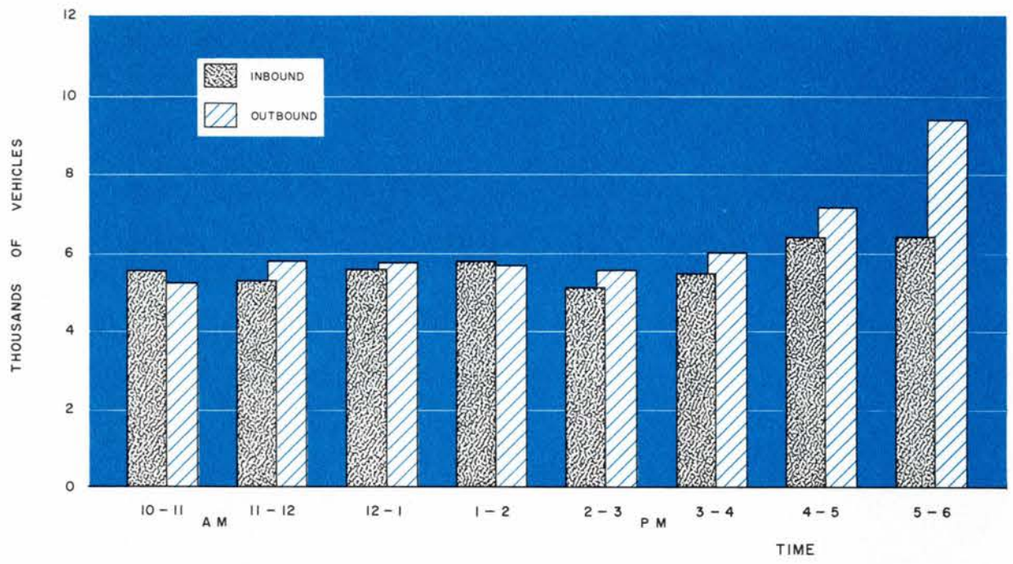


TRAFFIC ENTERING AND LEAVING SURVEY AREA

TAMPA, FLORIDA
1957

Wilbur Smith and Associates

FIGURE 42



HOURLY TRAFFIC VARIATIONS

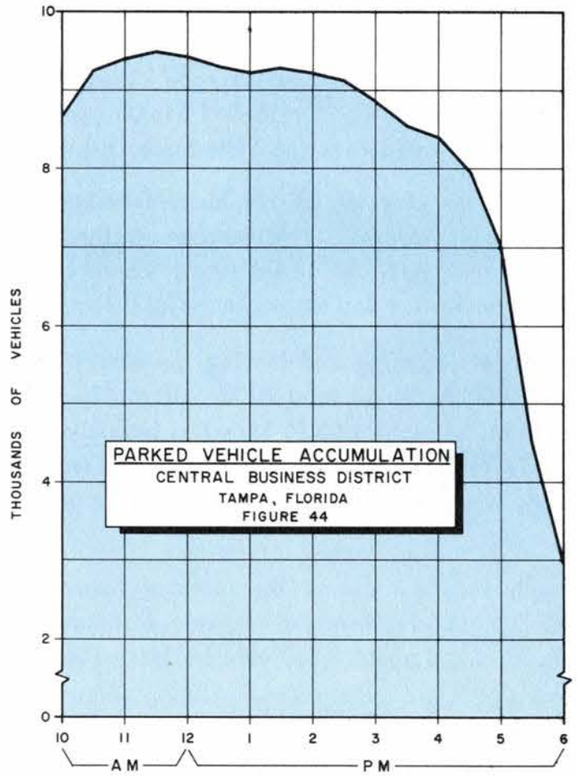
TRAFFIC MOVEMENT CROSSING CORDON LINE
TAMPA, FLORIDA
FIGURE 43

were 8,683 vehicles of all types parked in the area at 10:00 A. M. The accumulation gradually increased until a peak of almost 9,500 was reached at about 11:30 A. M. The accumulation remained fairly constant until about 4:00 P. M. when a rapid decrease occurred due to the exodus of employees and shoppers. At 6:00 P. M. only 2,987 parkers remained in the area.

Parking Demands — In determining parking demands, each block was analyzed separately. The adjusted parking demand was derived, utilizing the following method. Accumulations were determined for each block of destination for half-hour intervals between 10:00 A. M. and 6:00 P. M. The highest half-hour accumulations were averaged to reflect parking demand for each block. It is unreasonable to assume that parking facilities can be developed with sufficient spaces to meet extreme peak demands. The accumulations of parkers destined to each block varied according to the character of parking generators. Some had a very pronounced peak accumulation, while others, with the demand consisting mostly of all-day parkers, had uniform accumulation curves.

A total of about 34,000 parkers had destinations within the entire survey area during the eight-hour interval. The concentrated demand in the core area is emphasized: within this area 21,984 parkers had destinations, representing about 64 per cent of the total number of parkers destined to the survey area. The total number of parkers having destinations in each block of the core area during the eight hour interval is shown in Figure 45. Eight of the 59 blocks within the core area were the destinations of over 700 parkers, with five of these being the destination of over 1,100 parkers. Six additional blocks each were the destination of over 500 parkers.

The total number of parkers having destinations in each block often varies greatly from the actual parking accumulation of the block, particularly in the case of blocks attracting large numbers of short-time parkers. It was determined that the present total demand of the hard core area is for 5,557 parking spaces. The greatest concentrations of parking demand are located in strips extending between Franklin and Tampa Streets and between Zack and Twiggs Streets. The block bounded by Zack, Franklin, Twiggs, and Tampa Streets has an average peak demand of 583 parking spaces. This block has the greatest parking demand in the central business district; the major generator of parking demand in the block is the Maas Brothers Department Store. The block immediately north of this block has a demand of 368 spaces; the major generators in this block are Wolf Brothers Department Store, the Citizen's National Bank Building, and Salk's Department Store. A demand of 394 spaces was revealed in the block bounded by Franklin,



Tampa, Madison, and Lafayette Streets. A principal generator in this block is the First National Bank Building. The block bounded by Twiggs, Jefferson, Lafayette, and Pierce Streets has a demand of 396 vehicles; however, this block is located on the periphery of the hard core in an area where parking space is relatively abundant.

In addition, there are two blocks having demands of between 200 and 300 spaces, while eleven blocks have demands varying between 100 and 200 spaces.

DESTINATIONS OF PARKERS

DOWNTOWN AREA
TAMPA, FLORIDA
1957

Wilbur Smith and Associates

FIGURE 45

Thus a total of 17 blocks were found to have demands in excess of 100 parking spaces. About 65 per cent of the total demand of the 59-block core area is concentrated in these seventeen blocks, most of which are located north of Jackson Street and west of Marion Street.

The entire 195-block area of the central business district was found to have a demand of 10,222 parking spaces. Thus, about 54 per cent of the total average peak demand of the central business district is located in the core area, which comprises less than one-third of the total area. Only three blocks outside the core area had parking demands in excess of 100 spaces; these blocks are located in close proximity to the core area.

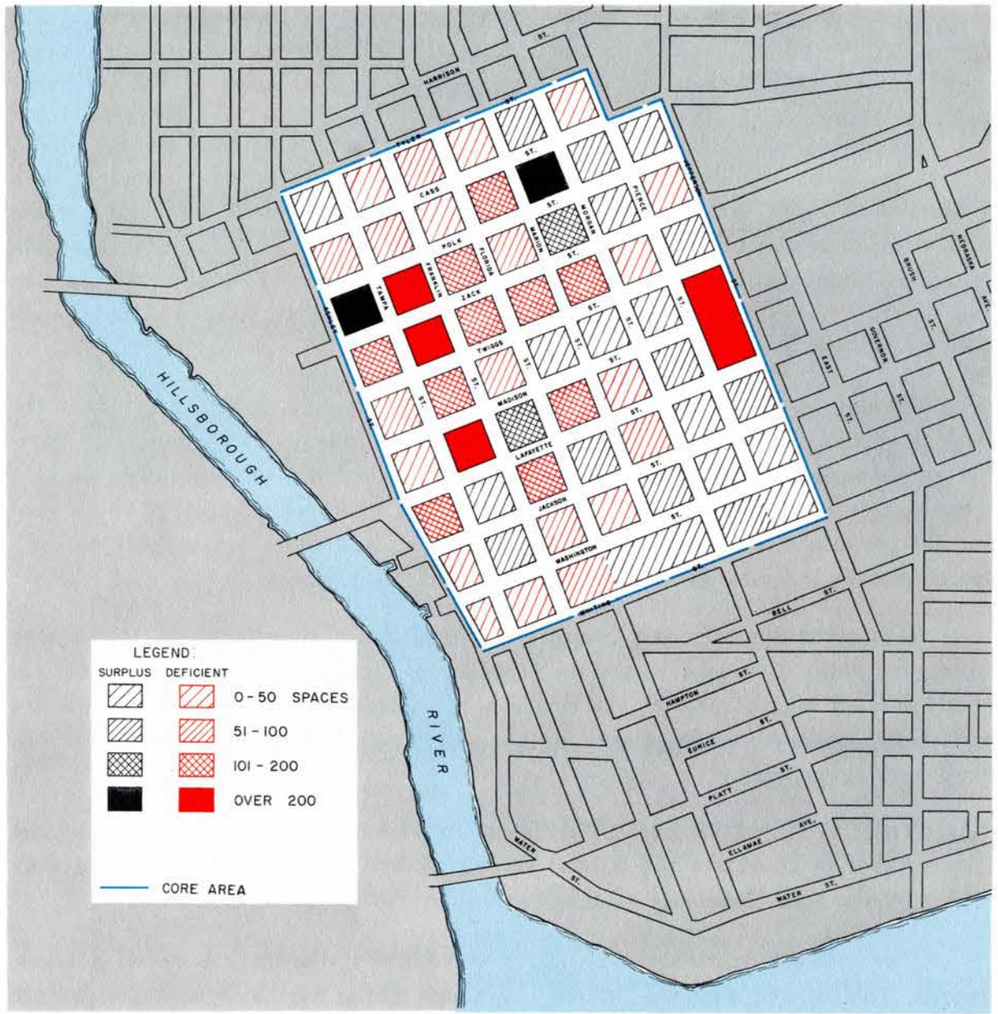
Parking Surpluses and Deficiencies — A comparison of parking demands in the core area with the present supply of parking spaces was made to determine parking surpluses and deficiencies. In making this calculation, the available parking space supply was adjusted for operating efficiency. Efficiency factors of 85 per cent and 90 per cent were applied to off-street and curb facilities, respectively, as curb spaces usually operate more efficiently than off-street spaces.

It is noted that there is a present over-all surplus of approximately 3,000 spaces within the entire 195-block survey area. Many of these surplus spaces, however are poorly located with respect to the demands of parkers. Some are quite unattractive and poorly operated while others are not within easy walking distances to the primary parking generators.

There is a present over-all deficiency of 1,897 parking spaces in the core area. Although 26 blocks had a total surplus of 2,051 spaces, this was more than off-set by the total deficiency of 3,948 spaces in the remaining 35 blocks.

The greatest deficiency, 559 spaces, was found in the block bounded by Zack, Twiggs, Tampa, and Franklin Streets. Although this is the block with the greatest demand, it provides only 27 curb spaces and no off-street spaces. Two other blocks had deficiencies in excess of 300 spaces, as shown in Figure 46. There are a total of 13 blocks having deficiencies of 100 spaces or more. The blocks with the greatest deficiencies are generally concentrated in the area between Cass, Jackson, Ashley, and Marion Streets.

General Recommendations — From the above data, it is obvious that Tampa has a parking problem which will tend to become more serious unless plans are made



1957 PARKING SPACE
SURPLUSES AND DEFICIENCIES
CORE AREA
TAMPA, FLORIDA
1957

Wilbur Smith and Associates

FIGURE 46

for its alleviation. It is anticipated that the completion of the expressway system will stimulate downtown business by providing easier and more convenient accessibility. It is not expected that the upward trends in population and motor vehicle registration will level off in the near future. The combination of these and other factors will tend to increase the number of vehicles destined to the central business district which require parking facilities. It is conservatively estimated that the parking demands of the central business district will increase at least 30 per cent by 1975. The complete loss of curb spaces expected in the central area by 1975 will further aggravate the parking problem.

It is not within the scope of this report to recommend the development of specific sites as parking facilities. Data from the parking study made by the Florida State Highway Department, completion of which is expected in the near future, should provide the necessary information in regard to the location of new off-street facilities. Because of high land acquisition costs, it is unlikely that it will be economically feasible to construct parking facilities within the heavily developed hard core area; rather, sites in the fringe area within easy walking distance of the hard core should be sought. Consideration should be given toward the development of parking facilities under elevated sections of the proposed expressway, where such sections are near areas of heavy parking demand.

A forward step that would greatly expedite the solution of parking problems in Tampa would be the creation of a Parking Authority. Such a body should be empowered to acquire lands and structures, plan and finance improvements, and subsequently operate them either directly or under lease. It should be authorized to issue certificates of indebtedness to finance the facilities and provide ways and means for the payment of certificates. It is recommended that steps be taken leading to the creation of a Parking Authority to coordinate all activities relative to the solution of the parking problem. Such an authority could develop and administer a comprehensive parking program designed to meet existing and expected future needs. It is only through a comprehensive plan that future parking demands can be accommodated. Private enterprise should also be encouraged to continue to develop and expand new parking facilities. It matters not how parking spaces are provided, so long as an adequate supply is made available.

In addition to considering the establishment of a parking authority to foster and administer a strong parking program for the downtown area of Tampa, it is sug-

gested that the city give serious consideration to municipal regulation and control of existing private parking facilities. Such control has been provided in many cities throughout the United States. Through the licensing, by ordinance of the facilities, desired municipal control is achieved. The control should include physical control, including signs, posting the operating hours, rate schedules, etc.; barriers that may be provided between the facility and the adjoining properties or sidewalks; surfacing with a dust-proof material; lighting for night operation; and well-designed entrances and exits. The licensing should also include protective control such as insurance coverage, the transfer of vehicles from one facility to another without the consent of the owner, fire equipment as approved by the city fire department, and claim checks to precisely identify the parked vehicle.

It is suggested that the City of Tampa give serious consideration to initiating such a program. The licensing of this type has proven very satisfactory in other cities and has improved both the operational level and the efficiency of the off-street facilities when it is impartially administered.

Zoning for parking is also of vital importance to the City in planning future development. Through this medium, off-street parking becomes an integral part of planned development. New parking facilities should be provided as required in accord with a pre-determined schedule for newly erected buildings as well as those that are altered to the extent that they become conforming land uses. It is only through this method that a proper and balanced program of parking can be obtained.

As Tampa continues to grow and prosper, it will become imperative that adequate terminal facilities be provided.

Mass Transportation

It was not a primary function of the study to provide recommendations relative to mass transportation services. It was, however, necessary to review the present transit operations and to some degree integrate these operations with the expressway and major street improvements. It is anticipated that the recommended improvements will provide important gains for transit operations.

It is recognized that mass transportation is a highly desirable, if not essential, component of the over-all transportation scheme in urban areas. In recent years, however, the use of public transportation systems has experienced a continuous decline, while the number of persons utilizing privately owned automobiles has shown a marked increase. The present overloading of urban streets is often attributed to the decline in the use of public transit systems. It is quite obvious that many transit companies face serious economic difficulties unless the present trend is corrected. At present, many cities furnish some type of subsidization as a means of maintaining efficient mass transportation services.

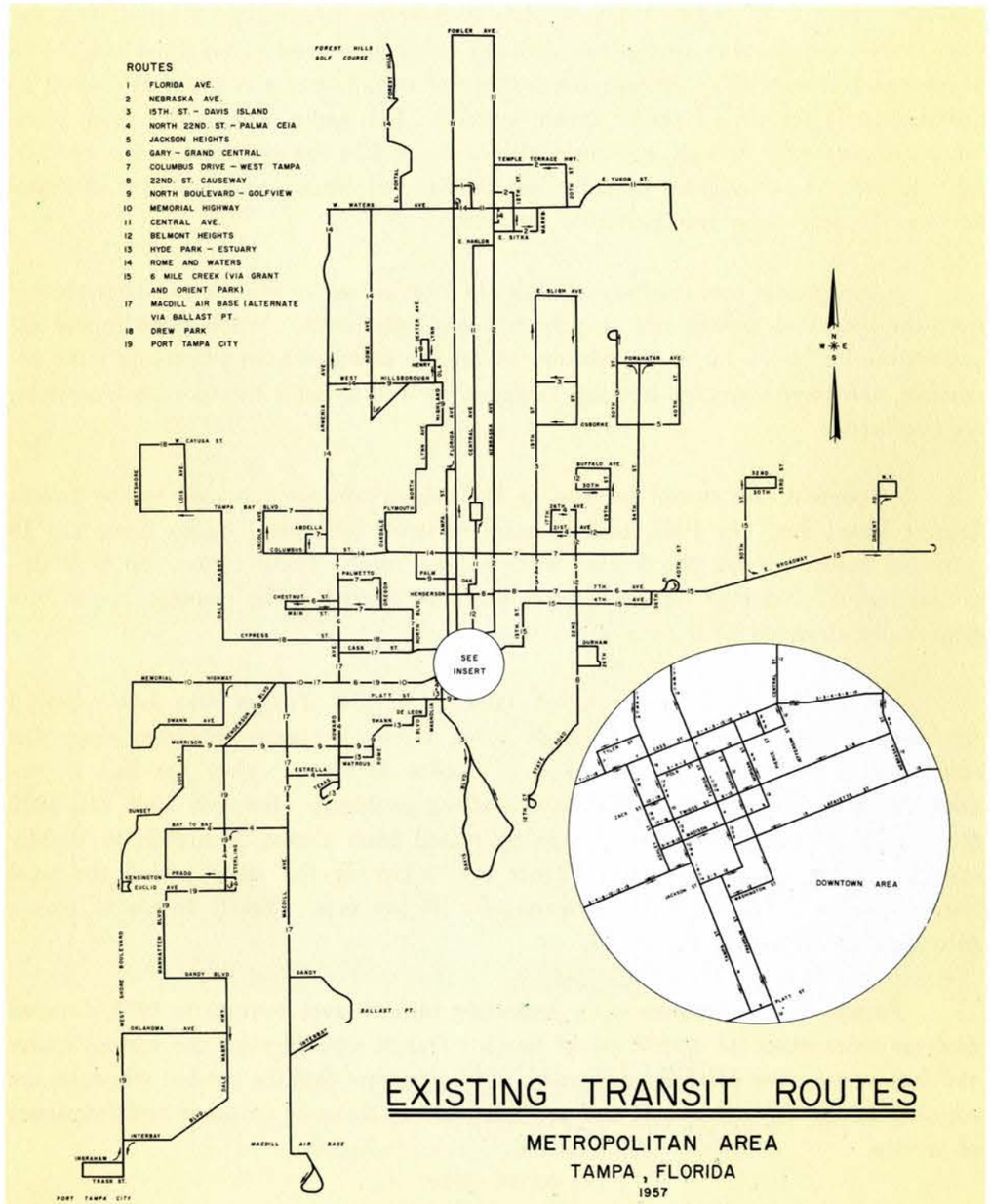
It is apparent that roadway facilities in most urban areas have not kept abreast with the increased growth rate in private automobile usage. When large capital expenditures for street improvements are made, the downtown area becomes more accessible, and more adequate terminal facilities, as well as mass transportation services, are required.

At present, the transit services in the Tampa area are provided by the Tampa Transit Lines, Inc. In 1946, trolleys were replaced by buses. Today there are 18 principal routes serving the Tampa metropolitan area. These routes are well dispersed and all converge on the central business district. The present routes are graphically depicted in Figure 47.

The use of mass transportation facilities in the Tampa area has followed the same general trend experienced in other cities of comparable size since the conclusion of World War II. The rate of decline in transit riders has had a pronounced effect on municipal traffic and parking problems. Between 1948 and 1956 the number of transit riders in Tampa decreased from almost 30 million to slightly over 11 million, or approximately 62 per cent. During the same period the total transit mileage decreased only approximately 38 per cent. Yearly trends in transit patronage are shown in Figure 48.

Future Transit Patterns — In projecting future travel patterns to 1975, detailed analyses were made of transit travel times. Transit schedules for the various routes and headways were carefully appraised. It is apparent that the present schedules are adjusted to the rider demands and are adequate in terms of coverage and frequency of service.

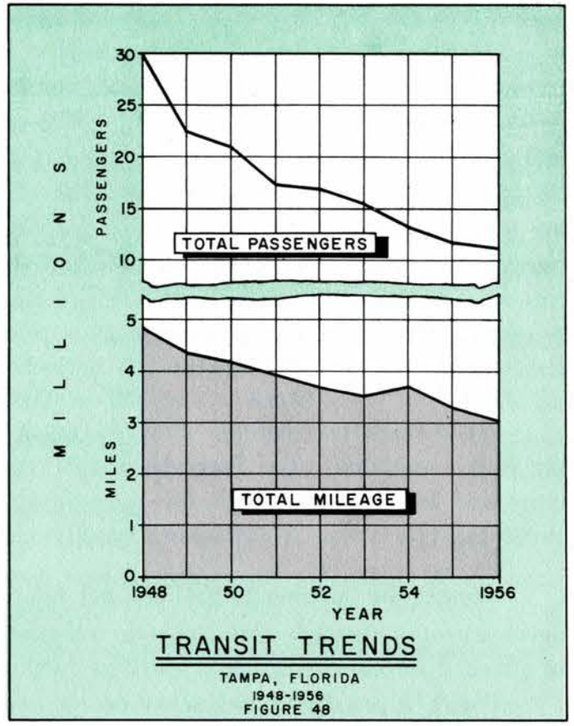
With the completion of the recommended Tampa Expressway System and Arterial Street Plan, it can be anticipated that mass transit will recover some of the



Wilbur Smith and Associates

FIGURE 47

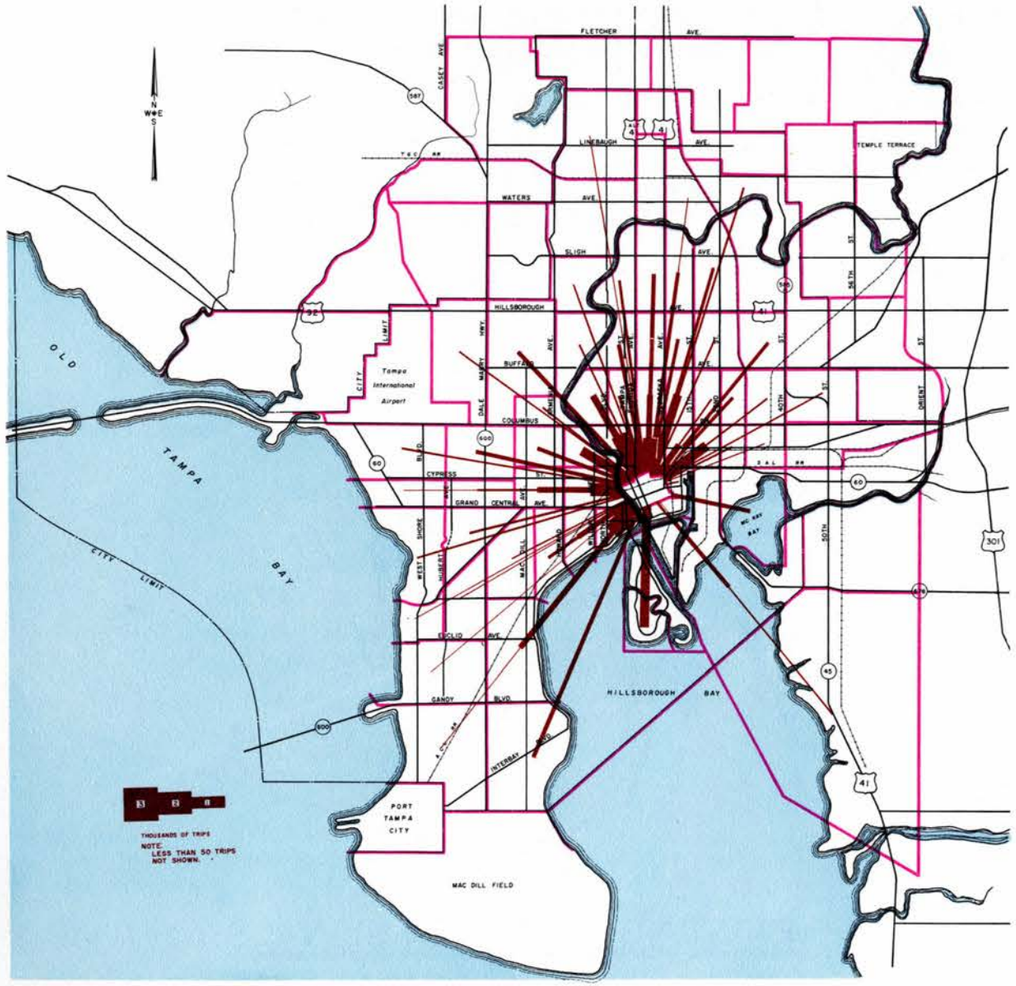
rider losses; however, future development of off-street parking facilities will further increase the attractiveness of automotive usage. Most of the factors that delay or retard automobile travel also retard transit vehicles, although the greatest delay is usually experienced by private vehicles. In a recent study published by the U. S. Bureau of Public Roads,[21] it was determined that buses were over seven times more efficient than automobiles on expressways in terms of utilizing street space and transporting people. It was further determined that buses were almost four times as efficient as automobiles on downtown streets and over twice as efficient in outlying areas.



When all of the analyses were completed, it was determined that the 1975 transit trips should exceed 12,000,000 or about 1,500,000 more than in 1956. Most of these trips would undoubtedly be between internal zones and the central business district. This will result primarily because of concentrated generators within the downtown area, partly due to the growing deficiency in off-street parking, and transit will continue to provide maximum service in this heavy centroid of trip generators.

To illustrate the pattern of heaviest transit movements expected in 1975, desire lines of travel from the internal zones to the central business district are graphically depicted in Figure 49. It is readily apparent that the distribution is quite uniform throughout the study area. It is also noted that a large number of relatively

[21] "The Efficiency of Public Transit Operation in the Utilization of City Streets" by the Division of Highway Transport Research, Bureau of Public Roads, *Public Roads*, October, 1957.



1975 DESIRE LINES

INTERNAL ZONES - C B D

TRANSIT PASSENGERS

TAMPA METROPOLITAN AREA

1957

Wilbur Smith and Associates

FIGURE 49

short trips are anticipated. It is not expected that there will be an appreciable number of intra-zone transit trips.

Recommendations — It is obvious from the anticipated growth trends, that mass transit must receive major consideration in the over-all transportation plan for the Tampa area. It cannot be expected that sufficient highway or terminal facilities can be developed to accommodate the ever-increasing demands solely by private vehicles.

The proposed expressway system is located and designed to meet anticipated travel desires and can be utilized as transit routes in an efficient manner. Because of the diamond shaped interchanges, express transit vehicles could easily utilize surface streets for loading and unloading at natural transfer points. The ease and free flow of movement on the expressways would reduce operating costs and probably increase passenger loadings because of the time savings factor.

It can not be expected that rail rapid-transit is likely in Tampa since it is generally recognized that this type facility can not be economically operated in metropolitan areas of less than one million persons. It is considered however, that free-wheeled transit service will be provided on the proposed expressways as a part of the normal traffic service, with passenger loading and unloading facilitated off the expressways.

More efficient transit operations will also be provided by the development of the arterial street system. Additional street capacities will be afforded by the widened and extended street system as well as improvements in traffic control devices and curb parking restrictions. The expressways will divert some traffic from the existing street net permitting better transit services thereon. In summary, better street operations within the downtown area and possible express routes to outlying areas should improve transit operations and usage.

Modification and changes in transit routes and services should be effected to enable full use of the expressway and arterial routes. Transit operations on urban expressways have proven profitable in other cities and should stimulate the use of expressways in the Tampa area. Decisions on details of possible transit use of proposed expressway facilities cannot be made at this time. Full consideration should be given to the potential use of the expressways by transit vehicles in development of additional plans and design details. Integration of transit needs to provide attractive, efficient and economical transit service for the Tampa area should be a primary objective of transit, municipal and state officials.

Traffic Control

A city the size of Tampa must provide a well integrated traffic system if it is to accommodate the present and future traffic demands efficiently. This can only be accomplished by judicious and careful planning of streets, traffic signals, lane markings, and parking regulations, to afford sufficient street capacities.

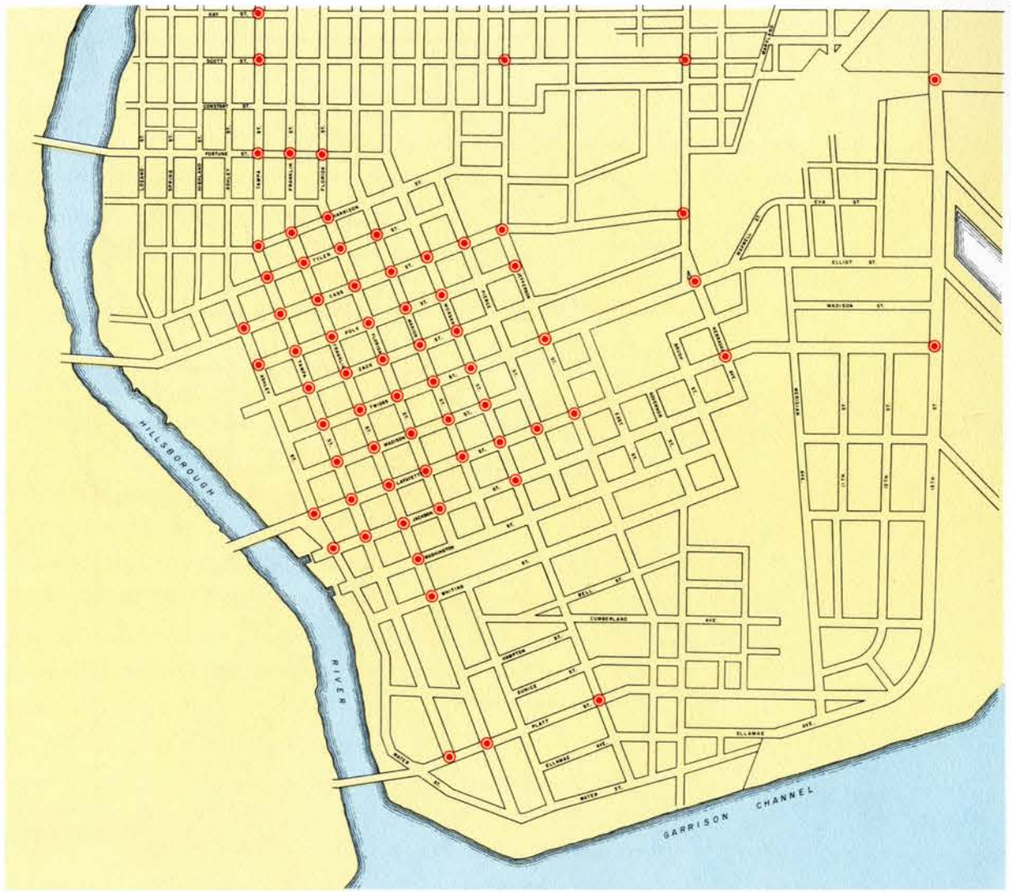
Present Signal Control — Although the city of Tampa has adequate signals from the standpoint of quantity, much of the equipment is inadequate to move traffic conveniently and efficiently. Figure 50 depicts the location of some of the 252 signalized intersections in the city. Of this number, 224 intersections are controlled by fixed-time signals, 11 employ a flashing beacon to warn of some special intersection condition, and the remaining 17 intersections are either semi-actuated or other special type.

Fixed Time Signals — Of the 224 intersections that are controlled by fixed-time signals, only 11 intersections are provided with multi-dial controllers. This means that the other 213 intersections are operated on a preselected time cycle length during all hours of operation. If a long cycle has been chosen to handle afternoon peak conditions, which is usually the case, then inefficient operation is likely to result during other hours of the day, or vice versa.

Actuated Signals — Where positive right-of-way control is needed only intermittently to allow a side street vehicle to enter or cross a heavy traffic artery, semi-actuated signal control should be employed. Tampa is presently using such control advantageously at 13 intersections.

Only three intersections in the city are designed to operate on a fully actuated basis, and it is understood that these intersections are not taking full advantage of such equipment. Cities the size of Tampa are progressively using more and more fully actuated equipment at complex intersections where demands are such that traffic must be moved in the most convenient and efficient manner to avoid congestion.

Pedestrian Signals — This type control is ideal for school and church crossings where push-button control allows safe passage for pedestrians and a minimum delay to vehicles. This type of control is used at only one location now, but could be applicable at other similar locations.



EXISTING TRAFFIC SIGNALS

DOWNTOWN AREA
TAMPA, FLORIDA
1957

Wilbur Smith and Associates FIGURE 50

Signal Coordination — It will be noted from Figure 50 that virtually every intersection in the downtown area is signalized. These signals operate on a 60 second cycle, and are supervised and controlled by a master controller. This provides a progressive movement of vehicles in the downtown area at about 18 miles per hour.

Outside of the central business district, no general system of interconnection is provided other than a few adjacent signals along East Broadway, Florida Avenue,

and Nebraska Avenue. Recent studies show that when signals are spaced as far as 2,500 feet apart, a definite advantage is gained by their being interconnected.

Recommendations — It is not within the scope of this report to offer specific signal recommendations, but rather an attempt is made to evaluate the signal system as a whole and offer general recommendations. These recommendations are listed below:

(1) Signal operation should be modernized to permit increased efficiency of traffic movement. This will necessitate a program to purchase additional multi-dial signal controllers.

(2) Signalized intersections in outlying areas where side street traffic is light should be converted to semi-actuated control.

(3) Fully actuated signal control is needed at many of the intersections in Tampa to provide efficient traffic flow. This type of equipment is flexible to meet both present and future traffic demands. The three intersections with this type of equipment, namely Bayshore and Bay to Bay, Lafayette and Crescent Place, and Nebraska and Floribraska Street, should be operated to take full advantage of the equipment instead of on a fixed-time basis. Consideration should be given to using fully actuated equipment at the following additional intersections:

Dale Mabry and Gandy Boulevard
Dale Mabry and Henderson Boulevard.
Dale Mabry and Columbus Drive
Dale Mabry and West Hillsborough Avenue
Hillsborough Avenue and Florida Avenue
Hillsborough Avenue and Nebraska Avenue

(4) In addition to the downtown street system, it appears there are numerous other heavily travelled streets in Tampa along which signals are closely spaced, and coordination through signal interconnection would be desirable. This is true of Florida Avenue, Nebraska Avenue, Dale Mabry Highway, Columbus Drive and Hillsborough Avenue.

(5) Signals suspended at the far-side of the intersection and over approach lanes make a desirable installation and should be considered as an objective. At important intersections, and on streets with more than one approach lane, it is desirable to install two far-side signals. There is a definite need to standardize signal head locations.

APPENDIX

A Traffic Forecast

B Design Criteria and Standards

C Expressway Data by Route Sections

D Expressway Cost Details

E Traffic Generation Characteristics

F Origin and Destination Tables

Appendix A

Traffic Forecast

EXCERPTS FROM A REPORT PREPARED FOR WILBUR SMITH AND ASSOCIATES BY TRAFFIC AND TRADE, INCORPORATED, NEW HAVEN, CONNECTICUT.

Statistical Forecast

Introduction — The attached tables report population, dwelling units, labor force, retail sales, and passenger car registrations for the individual origin and destination zones used in the 1957 Traffic Study of Tampa.

Statistics are given for the years 1946, 1956, and a forecast for 1975. The O. & D. Zones of 1957 are identified with the old system of O. & D. Zones used in the 1946 Traffic Study of Tampa. Both zone systems are in turn identified with the area included in the old City Limits previous to 1954, with that in the new City Limits since 1954, and with the area in the rest of Hillsborough County, outside the City Limits of Tampa. The Zone figures are summarized by these divisions at the end of each table.

The statistics reported are estimates, based on all available sources. The data for individual zones is presented in unrounded form merely for convenience in processing, not as a measure of precision.

Sources of Data

Sources of base data were the following:

1. Published statistics of the U. S. Census for 1948, 1950 and 1954.
   Unpublished statistics and maps of Census enumeration districts in Hillsborough County, for population and retail sales.
2. Estimates of the population, number of dwelling units and motor vehicle registration prepared for the 1946 Traffic Study.
3. Motor Vehicle Registration List of Hillsborough County for 1956.
   Summary of statistics since 1950.
4. Commercial statistical publications, including Polk's 1956 Directory of Hillsborough County; and Sales Management's Survey of Buying Power, for the years 1950 to 1956.
5. General reference material, most kindly furnished by County Departments, the Tampa Chamber of Commerce, the *Tampa Tribune*, and the Peninsular Telephone Company.

Definition of Terms — Zones, New, Column 1, are the code numbers of the O. & D. Zones used in the 1957 Traffic Study.

Zones, Old, Column 2, are the code numbers of the O. & D. Zones used in the 1946 Traffic Study.

Location, Column 3, are the code designations of the old City Limits, the new City Limits, the rest of Hillsborough County, MacDill Field, Port Tampa and Plant City.

Population — Includes all residents, both military and civilian, of all ages. Forecasts were guided by the trend since 1940, the Master Plan and Zoning system, and the current densities of population.

Dwelling Units includes all occupied units, as defined by the Bureau of the Census for 1950. Forecasts were guided by relationship to population.

Labor Force includes all employed persons, civilian and military. Forecasts were guided by relationship to population.

Retail Sales — in dollar volume were distributed among the zones using the 1948 Census enumeration districts. Forecasts were based on current distribution, the trends, projections of current land use, and population.

Passenger Car Registration in the zones was estimated using 1946 distribution and the distribution of population and dwelling units in 1956. Forecasts were guided by trends in car ownership and the projections of population and dwelling units.

TABLE A-I

POPULATION — HILLSBOROUGH COUNTY, FLORIDA

Zones		Location	Population 1946	Population 1950	Population 1956	Population 1975
New	Old					
0	0	1	124	102	93	98
1	1	1	326	98	99	104
2	2	1	—	70	48	50
3	3	1	—	—	17	18
4	4	1	—	71	93	98
5	5	1	536	220	208	218
6	6	1	258	141	227	238
7	7	1	398	162	279	293
8	8	1	626	398	97	102
9	9	1	22	70	53	56
10	10	1	6,530	6,684	5,189	3,732
11	11	1	8,403	8,869	5,491	6,003
12	12	1	4,161	4,905	4,691	5,129
13	13	1	1,425	2,852	5,000	5,466
14	14	1	3,727	3,600	3,814	4,171
15	15	1	3,774	4,304	5,000	5,466
16	16	1	3,988	4,782	8,780	9,596
17	17	1	3,081	3,692	3,760	4,111
18	18	1	3,121	2,256	3,415	3,735
19	19	1	2,737	3,126	3,415	3,735
20	20	1	3,295	3,928	4,860	5,315
21	21	1	6,010	6,362	6,920	7,566
22	22	1	2,671	3,745	6,611	7,228
23	23	1	—	—	—	—
24	24	1	1,308	1,229	4,142	6,920
25	25	1	88	639	688	1,149
26	26	1	6,644	5,789	5,681	6,212
27	27	1	5,595	5,629	6,589	7,204
28	28	1	1,208	2,064	4,259	4,657
29	29	1	4,080	5,842	4,647	5,081
30	30	1	7,848	7,714	7,832	8,563
31	31	1	3,360	3,761	3,770	4,123
32	32	1	1,166	1,587	2,179	2,383
33	33	1	2,485	2,538	1,489	1,630
34	34	1	2,010	2,148	2,885	3,156
35	35	1	1,391	1,624	1,911	2,091
36	36	1	2,640	2,908	2,695	2,948
37	37	1	6,570	6,599	5,981	5,800
38	38	1	5,585	6,055	3,911	4,283
39	39	1	4,200	5,273	3,680	4,025
40	40	1	2,020	2,845	2,054	2,247
41	57	2	576	862	1,219	3,518
42	57	2	1,453	2,174	1,852	4,325
43	760	2	233	234	246	260
44	57	3	738	1,112	1,987	2,412
45	760	3	719	723	1,242	1,503
46	760	3	991	997	1,738	2,108
50	780	2	406	426	1,248	2,689
51	51	2	1,160	1,625	2,259	3,646
52	52	2	488	1,134	2,396	9,280
55	750	3	704	740	930	6,570
56	750	3	255	268	936	5,430
54	750	2	765	805	855	11,365
53	53	2	5,250	5,567	5,120	6,654
57	750	3	25	26	30	7,380
58	750	3	409	433	253	5,640
59	750	3	107	112	263	7,890
60	55	2	1,890	2,581	3,181	5,784
61	55	2	3,220	4,403	2,590	6,051
62	56	2	301	457	1,546	3,165
63	54	2	884	1,624	2,818	7,125
64	54	2	985	1,811	1,651	3,702
65	56	3	274	415	745	907
66	56	3	301	457	828	1,005
70	81	2	1,256	1,982	3,036	6,724
71	81	2	2,834	4,465	6,795	11,422
72	780	2	976	1,028	3,998	9,852
73	82	3	623	893	1,573	3,640
74	82	3	504	720	1,242	1,503
75	780	3	416	436	745	4,410
76	780	3	453	476	828	1,012
77	82	3	112	161	166	222
78	82	3	74	106	165	215
79	83	3	58	178	248	302
80	83	2	592	1,787	2,980	6,591
81	83	2	420	1,268	2,626	13,991
82	83	2	418	1,265	2,635	10,965
83	83	2	229	693	94	183
84	71	2	372	772	2,241	8,002
85	71	2	313	653	558	5,257
86	71	2	499	1,035	1,678	3,902
87	71	2	315	652	346	4,507
88	72	2	907	1,687	5,212	6,528
89	72	2	350	652	2,980	8,268
90	73	2	3,741	4,762	8,437	9,993
91	73	2	2,632	3,346	5,376	6,654
92	75	2	613	1,397	5,847	6,184
93	74	2	4,017	4,987	8,362	11,834
94	75	2	613	1,397	4,205	5,988
95	75	2	491	1,117	4,443	5,212
96	76	2	624	3,900	4,979	13,940
97	76	2	179	1,118	1,626	11,696
98	76	4	467	2,920	1,612	1,800
99	76	5	1,180	1,497	1,608	2,000
750	750	3	8,538	8,971	16,059	19,523
750A	750	6	8,540	9,230	14,500	18,500
760	760	3	8,508	9,045	16,390	19,914
780	780	3	3,658	3,847	6,871	8,337
790	790	3	16,933	17,784	31,953	38,650

POPULATION — HILLSBOROUGH COUNTY, FLORIDA
SUMMARY

	Population 1946	*Population 1950*	*Population 1956*	*Population 1975*
Old city limits	113,411	124,681	132,553	145,000
New Part city limits	40,002	63,666	105,435	235,257
Total — city limits	153,413	188,347	237,988	380,257
Port Tampa	1,180	1,497	1,608	2,000
McDill Field	467	2,920	1,612	1,800
Rest of County	52,940	57,130	99,692	157,073
TOTAL COUNTY	208,000	249,894	340,900	541,130
Survey Area Total (Zones 0-99)	161,823	201,017	251,127	436,206

NOTE: Location No. 1 — Old city limits.
Location No. 2 — New city limits.
Location No. 3 — Outside city limits.
Location No. 4 — McDill Field.
Location No. 5 — Port Tampa.
Location No. 6 — Plant City.

TABLE A-II
CAR REGISTRATIONS — HILLSBOROUGH COUNTY, FLORIDA

Zones New	*Zones* Old	*Location*	*1946*	*1956*	*1975*
0	0	1	11	251	341
1	1	1	61	268	364
2	2	1	—	132	179
3	3	1	—	48	65
4	4	1	—	251	341
5	5	1	41	563	765
6	6	1	72	610	830
7	7	1	51	754	1,024
8	8	1	30	263	358
9	9	1	—	144	196
10	10	1	580	1,999	1,437
11	11	1	1,020	2,371	3,284
12	12	1	646	2,023	2,806
13	13	1	394	2,299	3,196
14	14	1	869	1,760	2,437
15	15	1	745	2,298	3,196
16	16	1	969	2,011	2,879
17	17	1	747	1,928	2,679
18	18	1	919	1,567	2,183
19	19	1	646	1,567	2,183
20	20	1	806	1,928	2,678
21	21	1	1,283	2,754	3,833
22	22	1	741	2,622	2,935
23	23	1	—	36	—
24	24	1	381	1,509	3,204
25	25	1	25	251	531
26	26	1	1,864	2,562	3,551
27	27	1	1,570	2,921	4,052
28	28	1	392	1,341	1,861
29	29	1	673	2,047	2,841
30	30	1	697	2,047	2,844
31	31	2	509	1,221	1,693
32	32	2	278	706	978
33	33	1	444	359	499
34	34	1	220	694	964
35	35	1	278	1,114	1,551
36	36	1	290	790	1,096
37	37	1	600	1,748	1,694
38	38	1	747	1,545	2,148
39	39	1	380	1,461	2,028
40	40	1	424	1,197	1,666
41	57	2	175	659	1,902
42	57	2	264	1,006	2,349
43	760	2	94	156	165

TABLE A-II — *Continued*

Zones New	*Zones* Old	*Location*	*1946*	*1956*	*1975*
44	57	3	117	443	617
45	760	3	78	132	522
46	760	3	36	60	731
50	780	2	346	575	1,651
51	51	2	420	1,042	1,682
52	52	2	95	1,102	5,110
53	53	2	1,006	2,359	3,665
54	750	2	236	394	6,975
55	750	3	101	168	2,213
56	750	3	102	168	1,821
57	750	3	—	—	2,562
58	750	3	28	48	1,986
59	750	3	30	49	2,682
60	55	2	349	1,473	3,200
61	55	2	284	1,197	3,350
62	56	2	266	718	1,470
63	54	2	287	1,305	3,946
64	54	2	168	766	1,718
65	56	3	4	12	471
66	56	3	18	48	577
70	81	2	369	1,316	3,480
71	81	2	819	2,909	5,847
72	780	2	1,041	1,736	6,047
73	82	3	309	479	1,275
74	82	3	102	156	219
75	780	3	179	299	2,583
76	780	3	29	48	354
77	82	3	23	36	56
78	82	3	—	—	112
79	83	3	6	48	157
80	83	2	153	1,293	3,427
81	83	2	155	1,316	8,386
82	83	2	155	1,316	6,571
83	83	2	6	48	92
84	71	2	170	1,006	4,290
85	71	2	42	251	2,365
86	71	2	129	754	2,093
87	71	2	26	156	2,430
88	72	2	314	2,143	3,214
89	72	2	179	1,221	4,050
90	73	2	1,458	3,388	4,802
91	73	2	954	2,215	3,275
92	75	2	179	2,406	3,248
93	74	2	1,389	3,628	6,151
94	75	2	129	1,736	2,962
95	75	2	177	2,394	2,808
96	76	2	414	3,113	6,336
97	76	2	136	1,017	5,316
98	76	4	75	563	741
99	76	5	12	84	123
750	750	3	2,185	3,639	8,217
750A	750	6	2,183	3,627	8,599
760	760	3	1,609	2,681	6,043
780	780	3	7	12	2,886
790	790	3	2,925	4,861	10,922

CAR REGISTRATIONS — HILLSBOROUGH COUNTY, FLORIDA
SUMMARY

	1946	*1956*	*1975*
Old city limits	20,404	53,955	73,300
New Part city limits	12,384	48,114	124,373
Total — city limits	32,788	102,069	197,673
Port Tampa	12	84	123
McDill Field	75	563	741
Rest of County	10,071	17,014	55,605
TOTAL COUNTY	42,946	119,730	254,142
Survey Area Total (Zones 0-99)	34,037	104,910	217,475

NOTE: Location No. 1 — Old city limits.
Location No. 2 — New city limits.
Location No. 3 — Outside city limits.
Location No. 4 — McDill Field.
Location No. 5 — Port Tampa.
Location No. 6 — Plant City.

TABLE A-III

RETAIL SALES — HILLSBOROUGH COUNTY, FLORIDA

Zones		Location	Retail Sales ($000)		
New	Old		1946	1956	1975
0	0	1	1,410.9	2,592.2	3,182.3
1	1	1	1,014.9	1,864.6	2,289.1
2	2	1	309.0	567.7	696.9
3	3	1	—	—	—
4	4	1	926.9	1,702.9	2,090.6
5	5	1	15,217.0	27,957.3	34,322.1
6	6	1	5,907.4	10,853.3	13,324.2
7	7	1	33,362.7	61,295.3	75,249.8
8	8	1	2,980.5	5,475.9	6,722.5
9	9	1	617.9	1,135.2	1,393.6
10	10	1	4,917.3	9,034.3	11,744.6
11	11	1	9,070.9	16,665.4	21,665.0
12	12	1	14,401.2	26,458.5	34,396.1
13	13	1	—	—	—
14	14	1	1,700.6	3,124.4	4,061.7
15	15	1	2,996.7	5,505.7	6,759.1
16	16	1	1,112.4	2,043.7	2,509.0
17	17	1	2,444.9	4,491.9	5,514.5
18	18	1	2,444.9	4,491.9	5,839.5
19	19	1	595.1	1,093.3	1,342.2
20	20	1	2,396.1	4,402.2	5,404.4
21	21	1	1,721.8	3,163.4	3,883.6
22	22	1	1,319.7	2,420.9	2,972.0
23	23	1	—	—	—
24	24	1	148.6	273.0	335.2
25	25	1	49.5	90.9	111.6
26	26	1	5,496.4	10,099.3	12,398.5
27	27	1	4,392.5	8,070.1	9,907.3
28	28	1	1,679.0	3,084.7	3,787.0
29	29	1	4,693.8	8,623.6	10,586.8
30	30	1	2,251.6	4,136.7	5,078.5
31	31	1	1,518.0	2,788.9	3,423.8
32	32	1	348.0	639.4	785.0
33	33	1	535.5	983.8	1,207.8
34	34	1	535.5	983.8	1,207.8
35	35	1	2,596.0	4,769.5	5,855.3
36	36	1	1,784.8	3,279.1	4,026.9
37	37	1	7,316.0	13,441.2	16,501.2
38	38	1	1,059.5	1,046.6	2,389.8
39	39	1	942.2	1,731.0	2,125.1
40	40	1	935.3	1,718.4	2,109.6
41	57	2	2,181.7	10,681.4	16,022.1
42	57	2	2,727.0	13,351.2	20,026.8
43	760	2	—	—	—
44	57	3	592.3	946.9	2,230.3
45	760	3	556.4	889.5	2,095.1
46	760	3	411.1	657.2	1,548.0
50	780	2	43.4	212.5	14,236.5
51	51	2	348.3	1,705.2	17,052.0
52	52	2	364.4	1,784.1	10,975.0
53	53	2	174.1	852.4	8,524.0
54	750	2	60.7	297.2	5,944.0
55	750	3	66.0	105.5	248.5
56	750	3	—	—	—
57	750	3	—	—	—
58	750	3	65.9	105.3	9,779.8
59	750	3	—	—	—
60	55	2	1,431.0	7,006.1	14,012.2
61	55	2	1,430.0	7,001.2	13,002.4
62	56	2	358.4	1,754.7	5,264.1
63	54	2	357.4	1,749.8	5,249.4
64	54	2	452.8	2,216.8	6,650.4
65	56	3	—	—	—
66	56	3	70.1	112.1	264.0
70	81	2	2,486.5	12,173.7	18,260.6
71	81	2	584.4	2,861.2	14,306.0
72	780	2	87.1	426.4	—
73	82	3	1,081.0	1,728.1	4,070.4
74	82	3	540.3	863.7	2,034.4
75	780	3	—	—	—
76	780	3	47.2	75.5	177.8
77	82	3	—	—	—
78	82	3	—	—	—
79	83	3	—	—	—
80	83	2	73.5	359.9	7,198.0
81	83	2	73.6	360.3	9,007.5
82	83	2	73.5	359.9	13,797.0
83	83	2	—	—	—
84	71	2	147.1	720.2	17,404.0
85	71	2	73.5	359.9	11,997.5
86	71	2	147.1	720.2	14,404.0
87	71	2	73.5	359.9	7,198.0
88	72	2	588.5	2,881.2	25,931.0
89	72	2	—	—	—
90	73	2	1,889.0	9,248.4	18,496.8
91	73	2	1,133.4	5,549.0	22,196.0
92	75	2	344.6	1,687.1	8,435.0
93	74	2	1,901.5	9,309.6	18,619.2
94	75	2	185.7	909.2	6,364.0
95	75	2	309.6	1,515.8	15,158.0
96	76	2	860.4	4,212.4	21,062.0
97	76	2	859.3	4,207.1	21,035.5
98	76	4	116.0	484.0	576.0
99	76	5	259.0	476.0	595.0
750	750	3	882.2	1,410.3	3,321.8
750A	750	6	12,463.5	19,924.1	32,078.3
760	760	3	2,364.0	3,779.1	8,901.3
780	780	3	634.9	1,015.0	2,390.7
790	790	3	3,362.1	5,374.7	12,659.6

RETAIL SALES — HILLSBOROUGH COUNTY, FLORIDA

($000)

SUMMARY

	1946	1950	1956	1975
Old city limits	143,149	189,007	263,000	327,200
New Part city limits	21,446	27,871	106,834	407,829
Total — city limits	164,595	216,878	369,834	735,029
Port Tampa	259	312	476	595
McDill Field	116	628	484	576
Rest of County	23,137	30,549	36,987	81,800
TOTAL COUNTY	188,107	248,367	407,781	818,000
Survey Area Total (Zones 0-99)	8,960	—	92,749	224,483

NOTE: Location No. 1 — Old city limits.
Location No. 2 — New city limits.
Location No. 3 — Outside city limits.
Location No. 4 — McDill Field.
Location No. 5 — Port Tampa.
Location No. 6 — Plant City.

TABLE A-IV

EMPLOYED LABOR FORCE — NON-AGRICULTURAL

HILLSBOROUGH COUNTY, FLORIDA

Zones		Location	1946		1956		1975	
New	Old		Resident	Employed	Resident	Employed	Resident	Employed
0	0	1	23	357	37	458	27	504
1	1	1	10	705	37	897	28	988
2	2	1	—	209	—	267	14	294
3	3	1	—	103	10	134	5	148
4	4	1	—	645	75	821	27	904
5	5	1	82	2,059	137	2,615	61	2,881
6	6	1	—	4,510	111	5,727	67	5,828
7	7	1	51	4,089	234	5,192	82	5,237
8	8	1	101	1,141	85	1,451	28	1,598
9	9	1	11	256	37	325	16	358
10	10	1	1,930	1,396	1,852	1,775	1,045	2,961
11	11	1	2,586	1,562	2,107	1,985	1,681	2,186
12	12	1	1,141	1,896	1,110	2,405	1,436	2,650
13	13	1	478	163	1,273	210	1,530	231
14	14	1	1,091	436	1,160	554	1,167	610
15	15	1	1,509	358	1,350	458	1,530	504
16	16	1	1,520	256	1,154	325	2,687	358
17	17	1	1,101	316	1,018	401	1,151	442
18	18	1	1,091	570	978	725	1,046	799
19	19	1	1,020	270	986	344	1,046	379
20	20	1	1,020	134	1,040	172	1,487	189
21	21	1	1,798	464	1,659	592	2,117	652
22	22	1	687	177	1,233	229	2,024	252
23	23	1	—	—	—	—	—	112
24	24	1	350	630	1,118	802	1,938	883
25	25	1	13	14	182	19	322	21
26	26	1	1,864	1,034	1,524	1,317	1,738	1,451
27	27	1	1,955	960	1,663	1,222	2,017	1,346
28	28	1	562	256	1,226	325	1,314	358
29	29	1	1,295	2,151	1,524	2,730	1,423	3,008
30	30	1	2,101	676	2,282	859	2,398	946
31	31	1	721	464	1,543	592	1,154	652
32	32	1	342	404	655	515	667	567
33	33	1	768	1,457	327	1,851	456	2,039
34	34	1	560	149	404	191	884	210
35	35	1	381	510	326	649	585	715
36	36	1	790	690	771	878	825	967
37	37	1	1,560	2,632	2,026	3,341	1,624	3,681
38	38	1	1,909	751	1,775	955	1,198	1,052
39	39	1	1,420	238	1,371	305	1,127	336
40	40	1	616	270	713	344	628	379
41	57	2	128	136	786	308	985	724
42	57	2	324	654	621	1,478	1,211	4,434
43	760	2	63	150	54	339	73	1,695

TABLE A-IV — *Continued*

EMPLOYED LABOR FORCE — NON-AGRICULTURAL

HILLSBOROUGH COUNTY, FLORIDA

Zones		Location	1946		1956		1975	
New	Old		Resident	Employed	Resident	Employed	Resident	Employed
44	57	3	164	391	449	544	593	909
45	760	3	165	457	281	637	370	1,064
46	760	3	228	36	393	51	519	85
50	780	2	100	41	162	92	753	920
51	51	2	384	340	737	770	1,020	3,080
52	52	2	42	163	515	370	2,598	870
53	53	2	640	368	974	831	1,863	3,324
54	750	2	208	27	478	62	3,182	620
55	750	3	162	130	210	184	1,615	736
56	750	3	59	65	212	92	1,331	460
57	750	3	6	—	7	—	1,810	541
58	750	3	94	—	57	21	1,387	420
59	750	3	25	—	59	—	1,931	131
60	55	2	464	777	1,102	1,755	1,620	4,126
61	55	2	791	123	1,065	277	1,694	651
62	56	2	42	82	236	185	886	925
63	54	2	454	381	532	862	1,995	2,027
64	54	2	506	150	826	339	1,037	1,695
65	56	3	39	198	168	281	223	469
66	56	3	43	12	187	39	247	65
70	81	2	304	204	1,048	462	1,883	1,086
71	81	2	686	450	1,577	1,016	3,198	2,388
72	780	2	265	95	1,048	216	2,759	508
73	82	3	119	126	355	179	895	299
74	82	3	97	134	281	190	370	318
75	780	3	96	132	168	187	1,085	312
76	780	3	104	261	187	370	249	618
77	82	3	22	128	38	182	55	304
78	82	3	14	—	37	—	53	—
79	83	3	14	194	56	275	74	459
80	83	2	146	232	808	524	1,845	1,232
81	83	2	104	272	900	616	3,917	1,448
82	83	2	103	763	606	1,724	3,070	5,172
83	83	2	57	123	17	277	51	651
84	71	2	71	191	296	431	2,241	2,155
85	71	2	60	27	71	62	1,472	622
86	71	2	95	272	327	616	1,093	1,448
87	71	2	60	14	273	31	1,262	310
88	72	2	371	368	1,355	831	1,828	1,953
89	72	2	143	41	532	92	2,315	216
90	73	2	1,268	872	2,035	1,971	2,798	4,633
91	73	2	893	749	1,102	1,694	1,863	3,982
92	75	2	166	381	1,577	862	1,732	2,026
93	74	2	1,421	409	2,121	924	3,314	2,172
94	75	2	166	123	658	277	1,677	651
95	75	2	133	286	1,574	647	1,459	1,941
96	76	2	219	245	1,850	554	3,903	1,302
97	76	2	63	232	604	524	3,275	1,512
98	76	4	164	1,399	455	3,160	560	3,470
99	76	5	414	658	451	1,490	504	1,780
750	750	3	1,964	301	3,393	427	4,565	713
750A	750	6	2,323	3,187	4,350	5,968	5,550	7,760
760	760	3	1,957	2,344	3,463	3,324	4,657	5,553
780	780	3	841	107	1,455	152	1,944	254
790	790	3	3,895	3,047	6,752	4,317	9,046	7,210

EMPLOYED LABOR FORCE — NON-AGRICULTURAL

HILLSBOROUGH COUNTY, FLORIDA

SUMMARY

	1946		1956		1975	
	Resident	Employed	Resident	Employed	Resident	Employed
Old city limits	34,457	35,358	37,115	44,957	40,600	49,676
New Part city limits	10,940	9,741	28,467	22,019	65,872	62,499
Total — city limits	45,397	45,099	65,582	66,976	106,472	112,175
Port Tampa	414	658	451	1,490	504	3,470
McDill Field	164	1,399	455	3,160	560	1,780
Rest of County	12,431	11,250	22,558	17,420	38,569	28,680
TOTAL COUNTY	58,406	58,406	89,046	89,046	146,105	146,105
Survey Area Totals (Zones 0-99)	47,626	49,420	69,633	74,858	120,343	124,615

NOTE: Location No. 1 — Old city limits.

Location No. 2 — New city limits.

Location No. 3 — Outside city limits.

Location No. 4 — McDill Field.

Location No. 5 — Port Tampa.

Location No. 6 — Plant City.

NOTE (2): — Classification of the labor force follows the grouping used by the U. S. Census, as follows:

1. Agriculture (excluded).
2. Mining (excluded).
3. Construction.
4. Manufacturing.
5. Transportation, Communication and other Public Utilities.
6. Wholesale Trade.
7. Retail Trade.
8. Finance, Insurance and Real Estate.
9. Business and Personal Service, excluding private household.
10. Professional and related services.

TABLE A-V

DWELLING UNITS — HILLSBOROUGH COUNTY, FLORIDA

Zones		Location	1946	1950	1956	1975
New	Old					
0	0	1	34	26	24	24
1	1	1	102	86	85	90
2	2	1	—	18	12	13
3	3	1	—	—	6	6
4	4	1	—	21	26	27
5	5	1	279	108	99	105
6	6	1	217	111	174	184
7	7	1	256	99	166	175
8	8	1	252	152	36	38
9	9	1	11	33	25	26
10	10	1	1,969	1,855	1,415	1,079
11	11	1	2,916	2,833	1,784	1,961
12	12	1	1,531	1,658	1,557	1,715
13	13	1	538	990	1,726	1,898
14	14	1	1,202	1,067	1,111	1,222
15	15	1	1,259	1,318	1,504	1,653
16	16	1	1,314	1,523	2,750	3,021
17	17	1	1,049	1,155	1,155	1,271
18	18	1	1,055	700	1,041	1,145
19	19	1	885	927	994	1,094
20	20	1	1,140	1,249	1,519	1,671
21	21	1	2,052	2,000	2,133	2,345
22	22	1	898	1,155	2,008	2,207
23	23	1	—	—	—	—
24	24	1	597	516	1,704	2,864
25	25	1	25	175	186	313
26	26	1	2,774	2,223	2,146	2,359
27	27	1	2,250	2,082	2,395	2,632
28	28	1	402	631	1,285	1,414
29	29	1	1,492	1,965	1,533	1,687
30	30	1	2,325	2,101	2,091	2,302
31	31	1	889	915	902	993
32	32	1	341	426	573	631
33	33	1	815	765	442	486
34	34	1	660	649	859	945
35	35	1	463	497	574	632
36	36	1	772	781	711	783
37	37	1	1,966	1,817	1,617	1,574
38	38	1	1,540	1,535	971	1,069
39	39	1	1,483	1,712	1,174	1,292
40	40	1	564	726	517	368
41	57	2	163	247	332	964
42	57	2	414	614	497	1,159
43	760	2	48	49	49	52
44	57	3	209	320	590	714
45	760	3	167	172	304	368

TABLE A-V — *Continued*

DWELLING UNITS — HILLSBOROUGH COUNTY FLORIDA

Zones New	*Zones* Old	*Location*	*1946*	*1950*	*1956*	*1975*
46	760	3	215	222	399	483
50	780	2	100	103	289	608
51	51	2	421	568	748	1,211
52	52	2	178	404	807	3,183
53	53	2	1,922	2,032	1,759	2,231
54	750	2	172	177	179	2,321
55	750	3	171	186	241	1,701
56	750	3	43	46	171	992
57	750	3	6	6	7	1,722
58	750	3	86	93	56	1,248
59	750	3	43	46	111	3,330
60	55	2	588	786	919	1,630
61	55	2	1,000	1,340	750	1,710
62	56	2	117	173	554	1,112
63	54	2	279	522	858	2,116
64	54	2	309	557	482	1,082
65	56	3	105	163	302	368
66	56	3	117	180	336	4,006
70	81	2	435	672	975	2,107
71	81	2	978	1,512	2,180	3,570
72	780	2	229	236	869	3,079
73	82	3	187	275	499	1,153
74	82	3	152	225	400	484
75	780	3	100	108	191	1,129
76	780	3	115	123	221	270
77	82	3	34	50	54	72
78	82	3	22	32	52	68
79	83	3	21	66	95	116
80	83	2	214	632	1,004	2,060
81	83	2	153	452	887	4,371
82	83	2	152	451	892	3,426
83	83	2	83	356	29	55
84	71	2	124	252	714	2,487
85	71	2	105	218	177	1,670
86	71	2	166	337	518	1,175
87	71	2	104	214	108	1,373
88	72	2	341	622	1,815	2,218
89	72	2	132	241	1,043	2,824
90	73	2	1,264	1,577	2,639	3,050
91	73	2	886	1,132	1,745	2,108
92	75	2	205	457	1,813	1,871
93	74	2	1,392	1,693	2,691	3,716
94	75	2	205	457	1,273	1,769
95	75	2	165	367	1,382	1,623
96	76	2	227	1,392	1,690	4,573
97	76	2	65	390	538	3,870
98	76	4	170	896	912	1,021
99	76	5	428	456	486	603
750	750	3	1,891	2,043	3,772	4,601
750A	750	6	1,890	2,103	3,406	4,360
760	760	3	1,960	2,134	3,978	4,853
780	780	3	890	960	1,769	2,140
790	790	3	3,825	4,102	7,573	9,163

DWELLING UNITS — HILLSBOROUGH COUNTY, FLORIDA

SUMMARY

	1946	*1950*	*1956*	*1975*
Old city limits	38,317	38,600	41,030	45,314
New Part city limits	13,336	21,232	33,205	72,374
Total — city limits	51,653	59,832	74,235	119,688
Port Tampa	428	456	486	603
McDill Field	170	896	912	1,021
Rest of County	12,249	13,655	24,527	43,341
TOTAL COUNTY	64,500	74,839	100,160	164,653
Survey Area Total (Zones 0-99)	54,004	63,497	79,662	139,536

NOTE: Location No. 1 — Old city limits.
Location No. 2 — New city limits.
Location No. 3 — Outside city limits.
Location No. 4 — McDill Field.
Location No. 5 — Port Tampa.
Location No. 6 — Plant City.

Appendix B

DESIGN CRITERIA AND STANDARDS

Design Criteria — The criteria presented herein conform to the standards adopted by the American Association of State Highway Officials and approved by the U. S. Bureau of Public Roads, and published in, "Geometric Design Standards for the National System of Interstate and Defense Highways — 1956."

DEFINITION OF TERMS:

1. *Highway, Street or Road* — A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way. (Recommended usage: in urban areas — highway or street; in rural areas — highway or road.)
2. *Arterial Highway* — A general term denoting a highway primarily for through traffic, usually on a continuous route.
3. *Control of Access* — The condition where the right of owners or occupants of abutting land or other persons to access, light, air, or view in connection with a highway is fully or partially controlled by public authority.

   Full control of access means that the authority to control access is exercised to give preference to through traffic by providing access connections with selected public roads only and by prohibiting crossings at grade or direct private driveway connections.

   Partial control of access means that the authority to control access is exercised to give preference to through traffic to a degree that, in addition to access connections with selected public roads, there may be some crossings at grade and some private driveway connections.
4. *Expressway* — A divided arterial highway for through traffic with full or partial control of access and generally with grade separations at intersections.
5. *Freeway* — An expressway with full control of access.
6. *Major Street or Major Highway* — An arterial highway with intersections at grade and direct access to abutting property and on which geometric design and traffic control measures are used to expedite the safe movement of through traffic.
   side of an arterial highway for service to abutting property and adjacent areas for control of access.
7. *Frontage Street or Frontage Road* — A local street or road auxiliary to and located on the
8. *Roadway* (General) — The portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways. (In construction specifications.) The portion of a highway within limits of construction.
9. *Median* — The portion of a divided highway separating the traveled ways for traffic in opposite directions.
10. *Traveled Way* — The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.
11. *Shoulder* — The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.
12. *Traffic Lane* — The portion of the traveled way for the movement of a single line of vehicles.
13. *Speed-change Lane* — An auxiliary lane, including tapered areas, primarily for the acceleration or deceleration of vehicles entering or leaving the through traffic lanes.
14. *Traffic Signal* — A power-operated traffic control device by which traffic is regulated, warned, or alternately directed to take specific actions.
15. *Design Speed* — A speed determined for design and correlation of the physical features of a highway that influence vehicle operation. It is the maximum safe speed that can be maintained over a specified section of highway when conditions are so favorable that the design features of the highway govern.

16. *Possible Capacity* — The maximum number of vehicles that can pass a given point on a lane or roadway during one hour under the prevailing roadway and traffic conditions regardless of their effect in delaying drivers and restricting their freedom to maneuver.
17. *Practical Capacity* — The maximum number of vehicles that can pass a given point on a lane or roadway during one hour under the prevailing roadway and traffic conditions, without
18. *Origin-Destination Survey* — A public traffic unreasonable delay or restriction to the drivers' freedom to maneuver.
survey to determine origin and destination of vehicle trips within a given area.
19. *Origin* — The beginning of a trip.
20. *Destination* — The end of a trip.
21. *Trip* — One-way journey between two locations.
22. *Travel Time* — The time of travel, including stops and delays, except those off the traveled way.
23. *Through Trips* — Trips through the urban area with both origin and destination outside the area.
24. *Local Trips* — Trips with either or both origin or destination inside the area.
25. *Zone* — Areas into which the Tampa Metropolitan Area was divided for the purpose of traffic movement analysis.
26. *Intersection* — The general area where two or more highways join or cross, within which are included the roadway and roadside facilities for traffic movements in that area.
27. *Intersection Leg* — Any one of the highways radiating from the forming part of an intersection. The common intersection of two highways crossing each other has four legs.
28. *Median Opening* — A gap in a median provided for crossing and turning traffic.
29. *Channelized Intersection* — An at-grade intersection in which traffic is directed into definite paths by islands.
30. *Turning Roadway* — A connecting roadway for traffic turning between two intersection legs.
31. *Grade Separation* — A crossing of two highways, or a highway and a railroad, at different levels.
32. *Underpass* — A grade separation where the subject highway passes under an intersecting highway or railroad. (Also called Undercrossing.)
33. *Overpass* — A grade separation where the subject highway passes over an intersecting highway or railroad. (Also called Overcrossing.)
34. *Interchange* — A grade separated intersection with one or more turning roadways for travel between intersection legs.
35. *Cloverleaf* — A 4-leg interchange with loops for left turns and outer connections for right turns or two-way ramps for these turns. A full cloverleaf has ramps for two turning movements in each quadrant.
36. *Diamond Interchange* — A 4-leg interchange with a single one-way ramp in each quadrant. All left turns are made directly on the minor highway.
37. *Directional Interchange* — An interchange, generally having more than one highway grade separation, with direct connections for the major left-turning movements.
38. *Right-of-way* — A general term denoting land, property, or interest therein, usually in a strip, acquired for or devoted to a highway.
39. *Acquisition or Taking* — The process of obtaining right-of-way.
40. *Setback Line* — A line outside the right-of-way, established by public authority, on the highway side of which the erection of buildings or other permanent improvements is controlled.
41. *Market Value* — The highest price for which property can be sold in the open market by a willing seller to a willing purchaser, neither acting under compulsion and both exercising reasonable judgment.

Design Standards — The following excerpts relative to urban development of the National System of Interstate and Defense Highways were taken from geometric standards adopted by the American Association of State Highway Officials and approved by the U. S. Bureau of Public Roads in July 1956:

"Interstate highways shall be designed to serve safely and efficiently the volumes of passenger vehicles, buses, and trucks, including tractor-trailer and semitrailer combinations and corresponding military equipment, estimated to be that which will exist in 1975, including attracted, generated, and development traffic on the basis that the entire system is completed."

"The peak-hour traffic used as a basis for design shall be as high as the 30th highest hourly volume of the year 1975."

"All at-grade intersections of public highways and private driveways shall be eliminated, or the connecting road teminated, rerouted, or intercepted by frontage roads, except as otherwise provided under control of access."

"The design speed of all highways on the system shall be at least 70, 60, and 50 miles per hour for flat, rolling, and mountainous topography, respectively, and depending upon the nature of terrain and development. The design speed in urban areas should be at least 50 miles per hour."

"For design speeds of 70, 60, and 50 miles per hour, gradients generally shall be not steeper than three, four, and five per cent, respectively. Gradients two per cent steeper may be provided in rugged terrain."

"Traffic lanes shall not be less than 12 feet wide."

"Where the design hourly volume (1975) exceeds 700 or exceeds a lower two-lane design capacity applicable for the conditions on a particular section, the highway shall be a divided highway. For lower volumes, the highway shall be a two-lane highway so designed and located on the right-of-way that an additional two-lane pavement can be added in the future to form a divided highway."

"Medians in rural areas in flat and rolling topography shall be at least 36 feet wide. Medians in urban and mountainous areas shall be at least 16 feet wide. Narrower medians may be provided in urban areas of high right-of-way cost, on long and costly bridges, and in rugged mountainous terrain, but no median shall be less than four feet wide."

"Curbs or other devices may be used where necessary to prevent traffic from crossing the median."

"In urban areas right-of-way width shall be not less than that required for the necessary cross section elements, including median, pavements, shoulders, outer separations, ramps, frontage roads, slopes, walls, border areas, and other requisite appurtenances."

"Bridges and overpasses, preferably of deck construction, should be located to fit the overall alinement and profile of the highway."

"The clear height of structures shall be not less than 14 feet over the entire roadway width, including the usable width of shoulders. Allowance should be made for any contemplated resurfacing."

"The width of all bridges, including grade separation structures, of a length of 150 feet or less between abutments or end supporting piers shall equal the full roadway width on the approaches, including the usable width of shoulders."

Appendix C
EXPRESSWAY DATA BY ROUTE SECTIONS

	FAI 103				FAI 104								
DESCRIPTION	*Columbus Drive to Buffalo Avenue*	*Buffalo Avenue to Waters Avenue*	*Waters Avenue to North City Limits*		*Tampa Bay to Dale Mabry Highway*	*Dale Mabry Highway to MacDill Avenue*	*MacDill Avenue to North Boulevard*	*North Boulevard to Henderson Avenue*	*Henderson Avenue to Columbus Drive and Nebraska Avenue*	*Nebraska Avenue to 22nd Street*	*22nd Street to East City Limits*	*East City Limits to East Hillsborough Avenue*	
Item	A1 - A2	A2 - A3	A3 - A4	Total	A6 - A7	A7 - A8	A8 - A9	A9 - A10	A10 - A11	A11 - A12	A12 - A13	A13 - A14	Total
Section length, miles	1.0	3.1	2.0	6.1	2.4	0.8	1.5	0.9	0.6	0.8	2.8	2.4	12.2
Class — rural or urban	U	U	U		U	U	U	U	U	U	U	R	
Location — existing, new or toll	N	N	N		N	N	N	N	N	N	N	N	
Traffic: ADT 1955[1]	45,000	40,000 to 27,000	20,000 to 15,000		12,000 to 20,000	30,000	40,000 to 45,000	50,000 to 60,000	60,000 to 25,000	25,000	20,000 to 15,000	15,000 to 10,000	
Traffic: ADT 1975[2]	92,000 to 92,200	82,000 to 54,000	40,000 to 31,000[2]		23,400 to 41,000	64,000	80,000 to 90,500	102,000 to 122,000	122,000 to 58,000	58,000 to 52,000	46,000 to 37,000	37,000 to 22,000	
Traffic: DHV 1975	8,500	7,000	3,500		4,000	6,500	9,000	10,000 to 12,000	12,000 to 6,000	6,000	4,500	3,500	
Directional distribution factor (D), 1975	60	60	60		60	60	60	60	60	60	60	60	
Percent trucks (T), 1975	7	7	8		6	7	7	7	7	8	8	9	
Design Speed (V)	60	60	60		60	60	60	50	50	60	60	60	
Number of through traffic lanes	8	6	4		4	6	8	Variable 8-12	Variable 12-6	6	4	4	
Mileage without frontage roads	—	1.6	—	1.6	2.4	—	—	0.7	0.6	0.1	2.5	2.4	8.7
Mileage with frontage road one side only	—	—	—	—	—	—	—	—	—	—	—	—	
Mileage with frontage road on both sides	1.0	1.5	2.0	4.5	—	0.8	1.5	0.2	—	0.7	0.3	—	3.5
Typical cross section reference[3]													

[1]Traffic assignments made on basis of projected 1975 travel pattern assuming completion of Interstate System; therefore, ADT 1955 is only an approximation of 1975 volumes.

[2]1975 ADT = 25,200 north Point A4.

[3]Approved Florida typical urban section is generally representative of section used; minimum Right-of-way 200 feet without frontage roads, 300 feet with frontage roads.

Appendix D
EXPRESSWAY COSTS DETAILS
(In Thousands of Dollars)

DESCRIPTION	*Columbus Drive to Buffalo Avenue*	*Buffalo Avenue to Waters Avenue*	*Waters Avenue to North City Limits*	TOTALS			*Tampa Bay to Dale Mabry Highway*	*Dale Mabry Highway to MacDill Avenue*	*MacDill Avenue to North Boulevard*	*North Boulevard to Henderson Avenue*	*Henderson Avenue to Columbus Drive and Nebraska Avenue*	*Nebraska Avenue to 22nd Street*	*22nd Street to East City Limits*	*East City Limits to East Hillsborough Avenue*	TOTALS		
Section	A1-A2	A2-A3	A3-A4				A6-A7	A7-A8	A8-A9	A9-A10	A10-A11	A11-A12	A12-A13	A13-A14			
Class — rural or urban	U	U	U	Rural	Urban	Total	U	U	U	U	U	U	U	R	Rural	Urban	Total
Location — existing, new or toll	N	N	N				N	N	N	N	N	N	N	N			
Length, miles	1.0	3.1	2.0		6.1	6.1	2.4	0.8	1.5	0.9	0.6	0.8	2.8	2.4	2.4	9.8	12.2
Code	23	23	23				23	23	23	23	23	23	23	23			
WORK CLASSIFICATION (In Thousands of Dollars)																	
1. Preliminary engineering	$120	$370	$180		$670	$670	$175	$85	$154	$697	$139	$117	$211	$119	$119	$1,578	$1,697
2. Right-of-way	1,950	6,289	1,572		9,811	9,811	2,010	599	2,129	6,742	4,389	1,488	935	400	400	18,292	18,692
3. Clear and grub; demolition	136	593	161		890	890	132	53	164	723	306	125	100	59	59	1,603	1,662
4. Utility adjustments	580	1,530	160		2,270	2,270	200	120	200	760	935	720	200	100	100	3,135	3,235
5. Grade and drain; minor structures	1,059	2,916	758		4,733	4,733	674	646	1,129		94	844	1,077	495	495	4,464	4,959
6. Base; surfacing; shoulders	566	1,160	777		2,503	2,503	454	371	811	100	276	373	608	476	476	2,993	3,469
7. R. R. grade separations																	
8. Highway grade separations without ramps	202	1,039	1,070		2,311	2,311	690	252	346			235	1,605	707	707	3,128	3,835
9. Interchanges, complete	313	907	1,319		2,539	2,539	1,952	548	934	190	1,729	520	1,351	927	927	7,224	8,151
10. Other bridges; tunnels		572			572	572				15,500						15,500	15,500
11. Walls[1]																	
12. Guardrails; fencing; lighting; traffic control devices	142	478	246		866	866	271	118	264	153	124	115	320	195	195	1,365	1,560
13. Roadside improvement	5	16	10		31	31	12	4	8		6	4	14	12	12	48	60
14. All other items		55			55	55											
15. Subtotal, lines 3 to 14	3,003	9,266	4,501		16,770	16,770	4,385	2,112	3,856	17,426	3,470	2,936	5,275	2,971	2,971	39,460	42,431
16. Construction Engineering and Contingencies, 10% of Line 15	300	927	450		1,677	1,677	439	211	386	1,743	347	294	527	297	297	3,947	4,244
17. Total Estimated Cost	$5,373	$16,852	$6,703		$28,928	$28,928	$7,009	$3,007	$6,525	$26,608	$8,345	$4,835	$6,948	$3,787	$3,787	$63,277	$67,064

[1]All wall costs reported under items 5, 7-10, inclusive.

APPENDIX E

TRAFFIC GENERATION CHARACTERISTICS

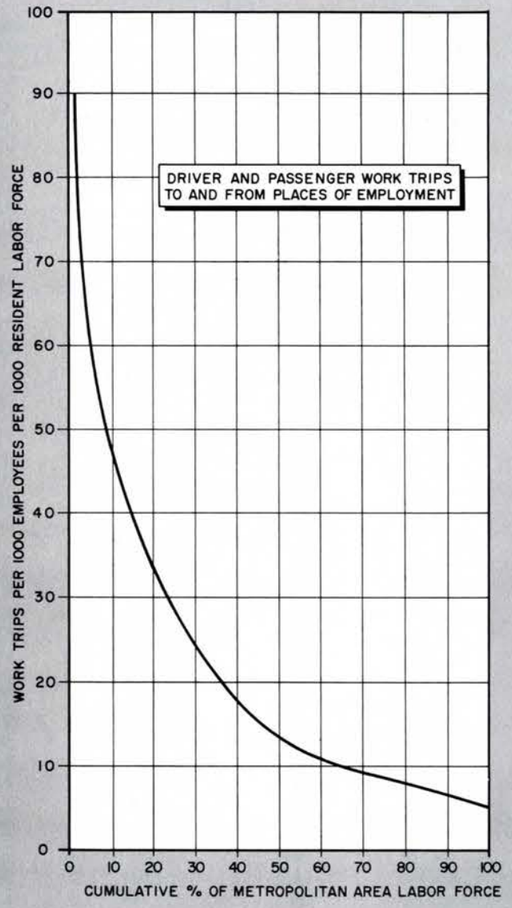


FIGURE A

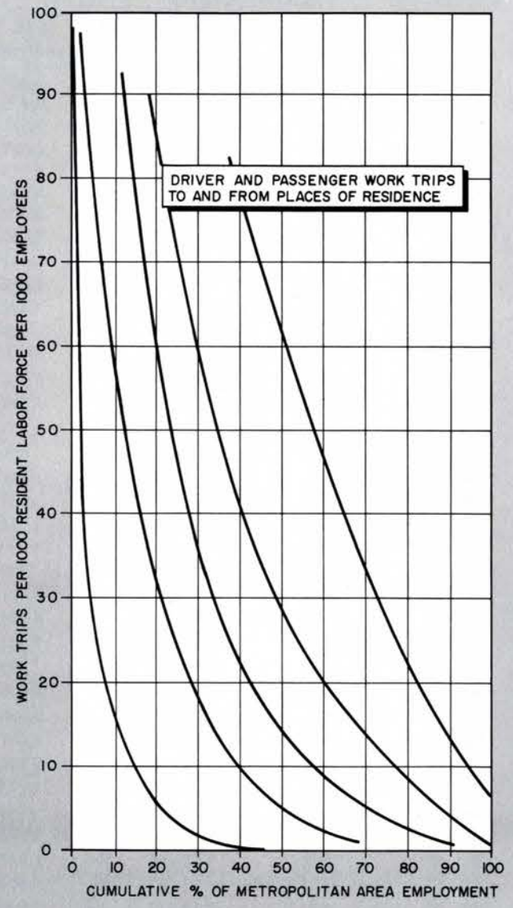


FIGURE B

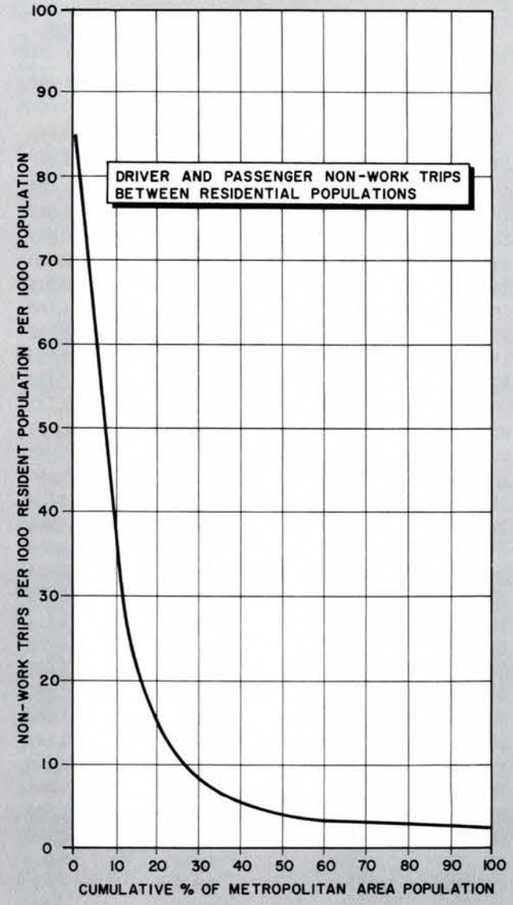


FIGURE C

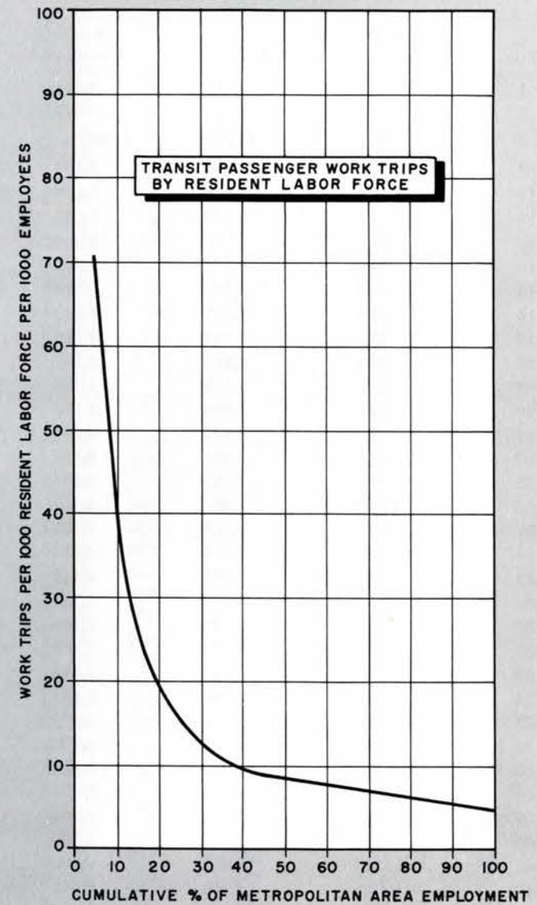


FIGURE D

RELATIVE RATE OF TRIP GENERATION

TAMPA, FLORIDA

1957

Appendix F
ORIGIN AND DESTINATION TABLES

TABLE F-I

ZONE CONTROL TOTALS

	TRIP ORIGINS			TRIP ENDS			
Zone	Transit Passengers	Auto Drivers	Auto Passengers	Zone	Transit Passengers	Auto Drivers	Auto Passengers
1	445	2,646	1,308	1	493	2,477	1,200
3	315	1,962	928	3	406	1,850	857
5	7,957	45,033	28,542	5	11,126	44,047	27,273
10	1,023	6,412	3,499	10	1,170	6,433	3,477
11	1,507	8,664	5,288	11	1,171	8,598	5,226
12	1,513	9,120	5,658	12	1,210	10,096	6,245
13	630	3,788	2,282	13	384	3,676	2,243
14	316	3,832	2,302	14	293	3,692	2,208
15	543	4,909	3,088	15	378	4,832	3,011
16	910	6,897	4,243	16	668	6,717	4,150
17	287	3,583	2,187	17	290	3,726	2,302
18	260	3,917	2,337	18	263	3,893	2,315
19	372	2,913	1,756	19	258	2,913	1,752
20	261	4,262	2,675	20	243	4,365	2,741
21	335	6,071	3,697	21	355	6,020	3,623
22	333	5,227	3,149	22	328	5,352	3,888
25	799	5,123	3,101	25	555	4,149	2,595
26	1,683	6,908	4,212	26	976	6,740	4,094
27	609	6,853	4,103	27	474	7,092	4,248
28	540	3,976	2,454	28	328	3,790	2,338
29	1,219	7,781	4,334	29	1,309	7,195	3,939
30	931	7,057	4,252	30	596	6,994	4,219
31	428	3,645	2,200	31	292	3,697	2,214
32	203	2,140	1,201	32	159	2,117	1,199
33	570	2,925	1,345	33	679	3,013	1,383
34	443	2,364	1,441	34	211	2,397	1,481
35	108	2,816	1,672	35	143	2,778	1,654
36	197	3,168	1,786	36	200	3,233	1,842
37	1,421	8,776	4,842	37	1,431	9,150	5,066
38	191	3,198	1,794	38	291	3,936	2,239
39	273	3,061	1,864	39	280	3,167	1,936
40	128	2,009	1,190	40	155	2,061	1,230
41	145	4,577	2,829	41	158	5,088	3,247
42	365	9,405	5,082	42	196	9,368	5,023
43	1	1,486	831	43	3	1,658	595
44	41	2,665	1,484	44	46	2,702	1,482
45	42	2,198	1,173	45	47	2,219	1,162
46	98	1,584	973	46	84	1,652	1,042
50	—	4,474	2,771	50	—	4,599	2,833
51	—	7,509	4,206	51	—	7,470	4,088
52	221	8,432	5,071	52	207	8,433	5,105
53	130	8,518	4,578	53	156	8,504	4,512
54	18	10,999	6,481	54	17	9,188	5,466

TABLE F-I — *Continued*

ZONE CONTROL TOTALS

	TRIP ORIGINS			TRIP ENDS			
Zone	Transit Passengers	Auto Drivers	Auto Passengers	Zone	Transit Passengers	Auto Drivers	Auto Passengers
55	—	5,123	2,966	55	—	5,118	2,951
56	—	4,086	2,408	56	—	4,104	2,405
57	—	5,604	3,301	57	—	5,493	3,238
58	—	5,404	3,397	58	—	5,486	3,319
59	—	5,556	3,349	59	—	5,488	3,332
60	173	9,611	5,245	60	263	9,227	4,894
61	189	4,859	3,013	61	292	6,254	3,925
62	67	3,531	2,046	62	63	3,650	2,074
63	259	7,243	4,141	63	324	7,140	3,985
64	43	4,687	2,588	64	83	4,901	2,694
65	8	957	492	65	26	1,018	508
66	—	732	429	66	20	729	441
70	181	7,626	4,706	70	157	7,937	4,893
71	109	10,385	5,768	71	123	10,182	5,595
72	87	7,157	4,096	72	70	7,244	4,195
73	7	3,051	1,862	73	9	3,187	1,974
74	—	1,533	905	74	—	1,614	942
75	—	3,233	1,893	75	—	3,281	1,944
76	9	1,223	597	76	32	1,211	602
77	—	381	176	77	—	408	167
78	—	140	90	78	2	151	90
79	—	575	265	79	—	606	264
80	352	6,404	3,788	80	297	6,313	3,703
81	576	11,281	6,696	81	635	11,645	6,969
82	238	14,346	7,823	82	245	13,736	7,337
83	—	753	299	83	—	678	260
84	549	9,790	5,838	84	372	9,470	5,613
85	171	5,825	3,620	85	120	5,720	3,555
86	241	6,162	3,757	86	186	5,772	3,455
87	130	4,399	2,729	87	111	4,220	2,610
88	278	9,499	5,879	88	294	9,467	5,806
89	200	5,965	3,534	89	181	5,753	3,437
90	809	12,895	7,255	90	692	12,852	7,150
91	342	10,584	5,948	91	307	10,800	6,051
92	126	7,327	3,668	92	142	7,047	3,938
93	622	11,821	7,049	93	553	12,189	7,315
94	122	5,326	3,161	94	133	5,414	3,227
95	144	7,231	4,267	95	183	7,638	4,424
96	413	12,826	7,651	96	318	13,377	8,207
97	126	11,317	6,723	97	136	12,167	7,376
98	10	4,484	1,915	98	15	4,364	1,806
99	2	2,977	1,416	99	14	2,997	1,416
Total	34,394	506,792	296,658	Total	34,427	507,125	296,830

TABLE F-II

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones	Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
1 03	17	5	12	—
1 05	97	59	116	20
1 10	58	41	90	50
1 11	70	84	170	70
1 12	77	89	174	70
1 13	15	29	58	20
1 14	11	24	48	10
1 15	12	30	59	10
1 16	36	62	120	50
1 17	8	20	41	10
1 18	9	21	42	10
1 19	9	15	28	10
1 20	20	63	119	40
1 21	11	37	72	30
1 22	12	39	70	30
1 25	—	148	312	80
1 26	97	103	206	80
1 27	22	48	94	40
1 28	17	34	67	30
1 29	32	26	61	20
1 30	18	38	78	30
1 31	9	21	42	10
1 32	4	11	23	—
1 33	18	6	17	—
1 34	15	25	49	20
1 35	5	14	28	10
1 36	5	13	28	10
1 37	38	26	61	20
1 38	5	14	29	10
1 39	11	20	38	10
1 40	4	11	23	—
1 41	5	29	55	10
1 42	3	29	65	20
1 43	—	1	2	—
1 44	1	15	35	10
1 45	—	9	21	—
1 46	4	19	36	10
1 50	—	12	22	—
1 51	—	13	30	10
1 52	6	50	98	40
1 53	4	23	50	20
1 54	—	46	96	40
1 55	—	21	43	10
1 56	—	19	38	10
1 57	—	27	57	30
1 58	—	22	43	20
1 59	—	26	51	20
1 60	6	19	41	10
1 61	8	32	58	20
1 62	1	11	25	10
1 63	9	21	46	20
1 64	1	9	20	—
1 65	—	2	4	—
1 66	—	4	8	—
1 70	3	32	64	20
1 71	3	39	87	30
1 72	3	47	96	40
1 73	—	14	28	10
1 74	—	5	10	—
1 75	—	17	35	10
1 76	—	2	2	—
1 77	—	—	—	—
1 78	—	—	—	—
1 79	—	—	1	—
1 80	5	24	52	20
1 81	11	70	136	50
1 82	3	35	80	10
1 83	—	—	1	—
1 84	7	29	61	20
1 85	3	32	63	20
1 86	4	17	33	10
1 87	4	53	103	40
1 88	4	32	64	20
1 89	8	27	59	20
1 90	12	48	103	40
1 91	24	51	117	40
1 92	4	18	45	10
1 93	35	120	242	50
1 94	5	33	64	20
1 95	3	24	47	10
1 96	10	90	177	60
1 97	1	35	71	30
1 98	—	3	8	—
1 99	—	2	6	—
3 05	106	44	88	20
3 10	45	33	79	40
3 11	59	72	150	60
3 12	65	73	152	60
3 13	14	23	49	20
3 14	8	17	38	10
3 15	26	58	118	50
3 16	26	45	93	40
3 17	7	17	34	10
3 18	4	12	27	10
3 19	6	12	24	10
3 20	7	23	48	20
3 21	9	28	62	20
3 22	9	30	58	20
3 25	—	57	108	50
3 26	29	37	79	30

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones	Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
3 27	14	36	75	30
3 28	14	26	52	20
3 29	17	15	35	10
3 30	14	29	59	20
3 31	8	15	31	10
3 32	4	7	15	—
3 33	13	5	15	—
3 34	8	18	37	10
3 35	4	14	31	10
3 36	4	11	26	10
3 37	30	20	45	20
3 38	5	11	23	10
3 39	11	22	46	20
3 40	4	11	24	10
3 41	2	20	40	10
3 42	3	20	48	20
3 43	—	—	2	—
3 44	2	11	26	10
3 45	—	7	17	—
3 46	4	13	29	10
3 50	—	10	19	—
3 51	—	13	30	10
3 52	2	26	53	20
3 53	2	13	30	10
3 54	—	30	67	30
3 55	—	17	37	10
3 56	—	14	28	10
3 57	—	16	36	20
3 58	—	21	45	20
3 59	—	26	55	20
3 60	5	13	32	10
3 61	14	52	102	40
3 62	2	17	39	10
3 63	7	16	38	10
3 64	1	9	21	10
3 65	—	2	5	—
3 66	—	3	6	—
3 70	3	25	52	20
3 71	3	29	67	30
3 72	1	31	68	30
3 73	—	32	65	30
3 74	—	3	5	—
3 75	—	11	27	—
3 76	—	1	1	—
3 77	—	—	1	—
3 78	—	—	—	—
3 79	—	—	1	—
3 80	4	19	40	10
3 81	10	51	105	40
3 82	3	25	61	20
3 83	—	—	1	—
3 84	6	24	49	20
3 85	3	26	51	20
3 86	4	13	26	10
3 87	4	18	39	10
3 88	4	26	52	20
3 89	5	29	63	20
3 90	7	27	62	20
3 91	3	11	28	10
3 92	4	15	34	10
3 93	13	53	109	40
3 94	2	17	40	10
3 95	2	16	36	10
3 96	9	64	134	50
3 97	—	21	45	—
3 98	—	2	8	—
3 99	—	1	4	120
	—	—	—	290
	—	—	—	170
5 10	532	365	645	—
5 11	1,190	1,486	2,327	—
5 12	1,267	739	1,139	—
5 13	548	1,046	1,625	240
5 14	231	551	880	120
5 15	482	1,249	1,911	230
5 16	728	1,423	2,178	260
5 17	228	475	719	110
5 18	158	469	744	120
5 19	302	539	856	130
5 20	202	630	946	90
5 21	263	800	1,259	160
5 22	285	831	1,158	150
5 25	795	1,394	2,094	390
5 26	1,552	1,805	2,832	420
5 27	459	1,101	1,739	210
5 28	507	1,191	1,826	230
5 29	1,123	1,016	1,775	220
5 30	817	1,878	2,952	350
5 31	372	795	1,264	160
5 32	148	280	470	80
5 33	297	170	352	40
5 34	345	587	902	110
5 35	92	318	503	40
5 36	145	372	618	80
5 37	852	568	979	120
5 38	131	284	475	80
5 39	239	458	714	90
5 40	98	256	407	50
5 41	81	608	894	70
5 42	32	383	677	90

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
5	43	—	16	45	10
5	44	20	229	397	50
5	45	17	135	245	30
5	46	109	473	699	90
5	50	—	372	574	80
5	51	—	361	631	80
5	52	164	1,215	1,898	240
5	53	79	454	815	100
5	54	23	1,405	2,246	280
5	55	—	550	902	110
5	56	—	439	715	90
5	57	—	668	1,076	200
5	58	—	796	1,219	150
5	59	—	719	1,122	190
5	60	143	465	839	100
5	61	218	602	900	110
5	62	48	274	451	60
5	63	222	432	736	90
5	64	48	312	539	60
5	65	6	38	72	20
5	66	—	102	161	30
5	70	105	958	1,470	180
5	71	44	1,040	1,791	220
5	72	74	1,168	1,905	240
5	73	8	370	562	70
5	74	—	139	224	40
5	75	—	442	706	80
5	76	6	46	87	20
5	77	—	5	13	—
5	78	—	31	44	10
5	79	—	15	30	—
5	80	163	551	897	120
5	81	382	1,735	2,734	340
5	82	98	1,056	1,892	240
5	83	—	7	17	—
5	84	409	1,665	2,688	320
5	85	128	1,041	1,585	200
5	86	123	545	869	110
5	87	92	723	1,104	140
5	88	137	861	1,330	150
5	89	146	798	1,271	160
5	90	267	1,027	1,755	220
5	91	109	540	910	110
5	92	72	460	825	100
5	93	431	1,691	2,657	320
5	94	78	802	1,254	160
5	95	56	552	900	110
5	96	290	2,183	3,364	400
5	97	60	988	1,529	180
5	98	2	73	167	40
5	99	2	76	154	50
10	11	328	733	1,306	340
10	12	81	179	316	80
10	13	22	84	149	40
10	14	11	50	89	30
10	15	19	99	172	40
10	16	66	262	457	120
10	17	15	64	113	30
10	18	16	75	137	40
10	19	12	45	83	10
10	20	8	49	84	10
10	21	20	109	195	50
10	22	12	64	101	40
10	25	—	79	108	40
10	26	50	108	193	50
10	27	16	69	126	30
10	28	13	63	109	30
10	29	76	116	233	50
10	30	17	86	152	40
10	31	11	45	80	10
10	32	5	17	36	—
10	33	39	31	75	10
10	34	13	52	88	30
10	35	11	73	133	20
10	36	13	67	129	30
10	37	338	455	895	230
10	38	20	82	159	50
10	39	15	60	108	30
10	40	8	34	62	10
10	41	14	132	222	30
10	42	16	180	365	40
10	43	—	8	24	—
10	44	3	39	76	10
10	45	2	25	52	10
10	46	7	37	63	10
10	50	—	37	65	10
10	51	—	44	87	10
10	52	8	98	177	40
10	53	7	53	108	30
10	54	—	97	179	40
10	55	—	48	92	30
10	56	—	66	123	40
10	57	—	58	106	50
10	58	—	54	97	30
10	59	—	100	177	40
10	60	12	103	211	50
10	61	16	110	187	50
10	62	4	43	81	10
10	63	13	51	100	30
10	64	8	108	212	50
10	65	1	7	17	—
10	66	—	16	27	—
10	70	5	80	140	30
10	71	4	83	164	40
10	72	3	89	166	40
10	73	—	47	81	10
10	74	—	13	23	—
10	75	—	36	65	10
10	76	1	6	16	—
10	77	—	1	4	—
10	78	—	2	5	—
10	79	—	3	6	—
10	80	8	57	106	30
10	81	24	139	252	70
10	82	11	116	239	50
10	83	—	2	6	—
10	84	17	107	194	50
10	85	4	56	98	30
10	86	6	36	66	10
10	87	4	40	72	10
10	88	11	80	141	40
10	89	8	61	113	30
10	90	20	103	199	50
10	91	15	73	142	30
10	92	6	38	79	10
10	93	19	115	208	50
10	94	3	51	91	30
10	95	4	46	87	10
10	96	15	184	327	80
10	97	4	91	162	40
10	98	—	10	25	—
10	99	—	8	18	—
11	12	68	254	395	80
11	13	14	91	144	30
11	14	22	134	212	20
11	15	13	103	158	30
11	16	47	259	399	80
11	17	11	75	116	20
11	18	96	636	1,024	220
11	19	9	52	84	20
11	20	7	56	85	10
11	21	26	199	317	60
11	22	14	134	194	40
11	25	—	94	120	30
11	26	43	141	223	40
11	27	19	132	211	40
11	28	13	90	139	20
11	29	58	163	288	50
11	30	21	172	275	60
11	31	12	79	129	20
11	32	9	36	61	10
11	33	49	58	124	40
11	34	9	61	91	20
11	35	6	61	99	10
11	36	12	86	146	30
11	37	95	227	398	80
11	38	15	103	173	40
11	39	14	102	159	30
11	40	10	65	108	40
11	41	8	108	160	30
11	42	10	161	287	70
11	43	1	17	49	40
11	44	3	46	81	30
11	45	4	44	76	30
11	46	6	43	65	20
11	50	—	54	84	20
11	51	—	120	212	40
11	52	11	94	150	30
11	53	7	88	160	30
11	54	1	150	245	50
11	55	—	67	109	20
11	56	—	45	73	10
11	57	—	63	101	40
11	58	—	73	112	20
11	59	—	101	160	30
11	60	10	115	210	40
11	61	8	86	129	20
11	62	3	40	66	10
11	63	11	78	136	20
11	64	2	39	67	10
11	65	2	10	21	—
11	66	—	15	23	—
11	70	9	173	270	50
11	71	5	124	216	40
11	72	4	112	184	30
11	73	—	78	122	20
11	74	—	17	26	—
11	75	—	46	78	10
11	76	2	10	21	—
11	77	—	3	8	—
11	78	—	4	6	—
11	79	—	7	16	—
11	80	14	75	127	20
11	81	23	173	275	60
11	82	14	188	340	140
11	83	—	5	12	—
11	84	21	196	322	60
11	85	5	114	175	30
11	86	9	83	133	20
11	87	5	69	108	20

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
11	88	12	114	179	30
11	89	5	72	113	20
11	90	23	155	271	50
11	91	17	156	267	50
11	92	7	75	137	30
11	93	24	199	317	60
11	94	5	53	86	20
11	95	6	94	156	30
11	96	13	213	334	70
11	97	5	128	203	40
11	98	2	33	77	40
11	99	—	7	14	—
12	13	47	282	439	90
12	14	29	185	294	60
12	15	20	147	224	40
12	16	29	167	256	50
12	17	17	100	151	30
12	18	15	118	188	40
12	19	13	71	113	20
12	20	19	165	248	50
12	21	22	165	260	50
12	22	13	106	149	30
12	25	—	387	623	160
12	26	84	284	444	90
12	27	27	174	271	50
12	28	21	131	202	80
12	29	83	202	351	70
12	30	32	240	378	80
12	31	16	109	174	30
12	32	14	75	126	30
12	33	41	47	97	40
12	34	14	82	125	50
12	35	8	80	127	40
12	36	14	110	183	70
12	37	119	272	468	180
12	38	13	81	138	40
12	39	16	96	144	30
12	40	5	42	65	20
12	41	7	89	132	30
12	42	14	204	363	140
12	43	—	15	37	20
12	44	3	57	97	40
12	45	4	47	86	40
12	46	4	48	72	30
12	50	—	68	102	20
12	51	—	83	145	30
12	52	11	150	238	50
12	53	7	102	181	40
12	54	1	176	282	60
12	55	—	81	133	30
12	56	—	65	102	20
12	57	—	65	104	40
12	58	—	87	133	30
12	59	—	102	158	30
12	60	11	128	226	40
12	61	17	168	251	50
12	62	5	75	122	20
12	63	13	97	166	30
12	64	3	62	107	20
12	65	1	11	21	—
12	66	—	22	34	—
12	70	7	139	214	40
12	71	7	162	277	50
12	72	4	155	255	50
12	73	—	79	121	20
12	74	—	41	65	10
12	75	—	65	102	20
12	76	2	15	31	20
12	77	—	3	8	—
12	78	—	5	6	—
12	79	—	10	19	—
12	80	12	100	161	30
12	81	48	411	650	130
12	82	13	220	394	160
12	83	—	8	18	—
12	84	28	261	419	80
12	85	7	147	223	40
12	86	20	198	314	60
12	87	4	93	140	30
12	88	22	235	362	70
12	89	10	166	267	50
12	90	26	186	317	60
12	91	18	184	310	60
12	92	9	118	211	40
12	93	40	372	584	120
12	94	6	111	174	30
12	95	9	177	290	60
12	96	30	576	884	180
12	97	8	323	497	100
12	98	2	64	148	70
12	99	1	25	49	30
13	14	20	122	197	40
13	15	5	44	68	10
13	16	4	19	32	—
13	17	3	21	34	—
13	18	4	25	39	10
13	19	9	54	86	20
13	20	2	9	14	—
13	21	2	19	30	10
13	22	2	12	18	—

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
13	25	—	7	13	—
13	26	16	68	105	20
13	27	5	37	60	10
13	28	2	14	22	—
13	29	24	82	142	30
13	30	9	93	147	30
13	31	2	15	25	—
13	32	2	12	21	—
13	33	11	20	41	20
13	34	—	6	9	—
13	35	2	25	41	10
13	36	3	25	42	20
13	37	72	276	477	190
13	38	2	24	38	10
13	39	2	13	21	10
13	40	1	11	19	10
13	41	4	30	45	10
13	42	4	90	163	60
13	43	—	16	42	40
13	44	2	25	44	20
13	45	2	32	59	20
13	46	—	5	4	—
13	50	—	32	49	10
13	51	—	55	98	20
13	52	3	27	41	10
13	53	3	60	109	20
13	54	—	28	47	10
13	55	—	24	41	10
13	56	—	14	22	—
13	57	—	17	27	10
13	58	—	25	39	—
13	59	—	7	9	—
13	60	5	92	165	30
13	61	2	29	45	10
13	62	—	17	28	—
13	63	3	43	72	10
13	64	2	36	63	10
13	65	1	9	16	—
13	66	—	1	2	—
13	70	3	39	62	10
13	71	2	56	97	20
13	72	—	18	28	—
13	73	—	15	22	—
13	74	—	14	22	—
13	75	—	14	24	—
13	76	1	9	18	—
13	77	—	3	8	—
13	78	—	—	—	—
13	79	—	7	16	—
13	80	15	51	83	20
13	81	22	83	133	30
13	82	9	125	226	90
13	83	—	7	18	—
13	84	9	78	125	20
13	85	2	24	36	—
13	86	5	51	82	10
13	87	2	17	28	—
13	88	11	95	149	30
13	89	2	18	28	—
13	90	9	94	161	30
13	91	8	92	157	30
13	92	3	46	85	20
13	93	6	58	90	20
13	94	2	17	27	—
13	95	3	40	65	10
13	96	4	42	64	10
13	97	1	41	65	10
13	98	—	28	67	40
13	99	—	21	43	30
14	15	39	400	629	110
14	16	12	87	137	30
14	17	7	58	88	20
14	18	5	47	77	20
14	19	8	54	89	20
14	20	2	31	49	10
14	21	4	34	55	10
14	22	2	33	51	10
14	25	—	43	82	30
14	26	28	127	206	40
14	27	4	32	55	10
14	28	2	18	30	10
14	29	30	123	220	40
14	30	8	83	134	30
14	31	3	20	33	10
14	32	2	13	23	—
14	33	10	23	47	20
14	34	2	17	26	10
14	35	1	19	32	10
14	36	2	24	43	20
14	37	16	70	127	50
14	38	2	25	44	10
14	39	2	24	37	10
14	40	1	12	18	10
14	41	2	37	59	10
14	42	2	55	101	40
14	43	—	8	23	20
14	44	1	22	41	20
14	45	—	20	37	10
14	46	—	10	14	—
14	50	—	24	36	10

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
14	51	—	58	104	20
14	52	3	39	66	10
14	53	3	73	133	30
14	54	—	69	114	20
14	55	—	35	59	10
14	56	—	25	41	10
14	57	—	38	63	20
14	58	—	32	53	10
14	59	—	24	39	10
14	60	4	82	149	30
14	61	2	48	76	20
14	62	—	22	39	10
14	63	4	53	93	20
14	64	1	33	58	10
14	65	—	5	10	—
14	66	—	2	3	—
14	70	2	36	57	10
14	71	2	45	78	20
14	72	1	67	114	20
14	73	—	17	26	—
14	74	—	6	10	—
14	75	—	25	43	10
14	76	1	10	19	—
14	77	—	2	3	—
14	78	—	—	—	—
14	79	—	2	5	—
14	80	4	25	44	10
14	81	8	53	89	20
14	82	4	77	141	60
14	83	—	2	7	—
14	84	4	57	95	20
14	85	2	24	35	10
14	86	2	21	38	10
14	87	2	18	30	10
14	88	3	44	71	10
14	89	2	31	50	10
14	90	6	67	117	20
14	91	5	70	121	20
14	92	2	22	42	10
14	93	6	72	116	20
14	94	2	18	30	10
14	95	2	42	71	10
14	96	2	251	404	80
14	97	1	70	112	20
14	98	—	18	46	40
14	99	—	4	9	—
15	16	62	494	746	120
15	17	4	43	63	10
15	18	3	36	57	10
15	19	6	49	77	20
15	20	4	44	62	10
15	21	2	32	47	10
15	22	4	51	72	10
15	25	—	45	57	10
15	26	10	56	85	20
15	27	4	39	61	10
15	28	3	24	37	10
15	29	21	95	164	30
15	30	4	64	98	20
15	31	2	32	50	10
15	32	3	14	25	—
15	33	15	38	80	30
15	34	2	15	25	10
15	35	2	46	72	20
15	36	3	44	72	30
15	37	29	144	243	100
15	38	3	48	78	30
15	39	2	37	52	10
15	40	3	18	27	10
15	41	4	64	95	20
15	42	7	199	348	140
15	43	—	14	37	40
15	44	2	26	44	20
15	45	2	27	51	20
15	46	2	13	22	10
15	50	—	45	69	10
15	51	—	68	115	20
15	52	5	73	110	20
15	53	3	81	143	30
15	54	—	71	108	20
15	55	—	37	61	10
15	56	—	28	46	10
15	57	—	42	67	30
15	58	—	51	78	20
15	59	—	41	64	10
15	60	3	95	168	30
15	61	2	50	73	10
15	62	—	26	43	10
15	63	3	58	95	20
15	64	1	36	61	10
15	65	1	9	16	—
15	66	—	4	6	—
15	70	2	44	66	10
15	71	3	83	141	30
15	72	2	61	98	20
15	73	—	13	17	—
15	74	—	10	15	—
15	75	—	25	40	10
15	76	1	10	20	—
15	77	—	3	6	—
15	78	—	—	—	—
15	79	—	7	14	—
15	80	7	33	51	10
15	81	9	59	91	20
15	82	4	113	200	80
15	83	—	4	9	—
15	84	5	61	98	20
15	85	2	38	53	10
15	86	3	39	61	10
15	87	2	19	29	—
15	88	3	58	88	20
15	89	2	19	28	—
15	90	8	87	148	30
15	91	6	90	150	30
15	92	2	43	78	20
15	93	7	92	142	30
15	94	2	20	33	—
15	95	2	62	101	20
15	96	5	79	122	20
15	97	2	81	125	20
15	98	—	30	67	50
15	99	—	20	41	30
16	17	10	75	111	190
16	18	11	79	124	210
16	19	5	23	34	10
16	20	5	29	43	10
16	21	11	98	153	30
16	22	5	35	47	10
16	25	—	43	53	10
16	26	25	94	145	30
16	27	7	55	87	20
16	28	4	20	30	—
16	29	32	111	190	40
16	30	5	56	86	20
16	31	5	35	54	10
16	32	5	18	31	10
16	33	33	51	108	40
16	34	3	19	31	10
16	35	4	49	77	20
16	36	5	45	77	30
16	37	103	372	634	240
16	38	11	108	180	50
16	39	8	69	105	20
16	40	8	63	98	40
16	41	8	63	92	20
16	42	9	190	333	130
16	43	1	28	75	60
16	44	4	47	81	30
16	45	5	44	79	30
16	46	2	14	21	10
16	50	—	45	68	10
16	51	—	125	218	40
16	52	12	88	135	30
16	53	9	149	265	50
16	54	—	84	136	30
16	55	—	45	74	10
16	56	—	37	59	10
16	57	—	49	77	30
16	58	—	47	70	10
16	59	—	37	58	10
16	60	9	181	324	60
16	61	4	75	113	20
16	62	25	644	1,054	210
16	63	8	101	169	30
16	64	1	65	112	20
16	65	2	15	29	—
16	66	—	4	6	—
16	70	4	59	89	20
16	71	4	74	127	20
16	72	1	63	99	20
16	73	1	22	36	10
16	74	—	18	30	—
16	75	—	32	49	10
16	76	1	15	31	—
16	77	—	6	11	—
16	78	—	—	—	—
16	79	—	8	16	—
16	80	10	48	77	20
16	81	12	76	117	20
16	82	11	145	255	90
16	83	—	7	16	—
16	84	11	108	173	30
16	85	4	59	87	20
16	86	8	71	112	20
16	87	4	26	39	—
16	88	11	84	128	30
16	89	3	15	25	—
16	90	19	135	227	40
16	91	14	143	239	50
16	92	5	70	125	30
16	93	15	132	204	40
16	94	5	30	48	10
16	95	6	92	149	30
16	96	10	114	174	30
16	97	4	95	148	30
16	98	—	52	116	40
16	99	1	52	103	60
17	18	19	137	213	40
17	19	9	59	93	20
17	20	5	55	79	20

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones	Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
17 21	6	72	111	20
17 22	6	60	84	20
17 25	—	7	10	—
17 26	6	37	58	10
17 27	4	35	55	10
17 28	2	12	21	—
17 29	16	70	121	20
17 30	2	23	35	—
17 31	2	15	23	—
17 32	2	10	16	—
17 33	11	27	57	20
17 34	2	12	18	10
17 35	2	30	47	10
17 36	2	28	47	20
17 37	20	93	157	60
17 38	5	62	103	30
17 39	2	25	36	10
17 40	2	13	19	10
17 41	2	42	65	10
17 42	4	110	190	80
17 43	—	15	41	40
17 44	2	21	38	20
17 45	1	24	45	20
17 46	1	11	15	—
17 50	—	52	78	20
17 51	—	75	128	30
17 52	3	40	61	10
17 53	5	89	157	30
17 54	—	66	100	20
17 55	—	34	56	10
17 56	—	28	45	10
17 57	—	40	64	20
17 58	—	46	69	10
17 59	—	40	62	10
17 60	31	606	1,069	190
17 61	6	125	184	40
17 62	1	31	53	10
17 63	10	142	235	50
17 64	2	47	80	20
17 65	1	8	15	—
17 66	—	4	8	—
17 70	2	39	58	10
17 71	2	48	81	30
17 72	1	60	96	20
17 73	—	21	32	—
17 74	—	12	18	—
17 75	—	24	37	10
17 76	1	13	24	—
17 77	—	3	7	—
17 78	—	—	—	—
17 79	—	3	5	—
17 80	8	51	81	20
17 81	8	51	79	20
17 82	4	66	117	40
17 83	—	3	8	—
17 84	5	45	71	10
17 85	2	23	35	—
17 86	3	25	43	10
17 87	1	13	20	—
17 88	4	49	75	10
17 89	1	15	24	—
17 90	8	79	132	30
17 91	6	82	137	30
17 92	2	24	46	10
17 93	6	55	84	20
17 94	2	17	27	—
17 95	2	30	49	10
17 96	4	39	59	10
17 97	1	38	57	10
17 98	—	20	45	20
17 99	—	15	31	—
18 19	30	230	377	70
18 20	5	57	87	20
18 21	6	65	105	20
18 22	6	62	90	20
18 25	—	13	54	10
18 26	7	23	39	—
18 27	3	25	41	—
18 28	3	29	46	10
18 29	10	45	82	20
18 30	3	33	55	10
18 31	3	29	49	10
18 32	1	8	15	10
18 33	8	17	38	20
18 34	1	16	26	10
18 35	—	17	26	10
18 36	1	21	35	10
18 37	21	111	196	80
18 38	—	13	23	—
18 39	2	15	22	—
18 40	1	10	16	—
18 41	2	36	55	10
18 42	2	71	130	50
18 43	—	6	18	—
18 44	—	21	38	20
18 45	—	16	29	10
18 46	—	10	16	—
18 50	—	39	62	10
18 51	—	94	167	30
18 52	3	71	115	20

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones	Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
18 53	4	101	185	40
18 54	—	87	145	30
18 55	—	35	56	10
18 56	—	29	49	10
18 57	—	43	72	30
18 58	—	55	87	20
18 59	—	56	89	20
18 60	5	155	287	60
18 61	2	47	74	10
18 62	—	24	41	10
18 63	7	92	163	30
18 64	—	33	60	10
18 65	—	5	10	—
18 66	—	4	7	—
18 70	2	57	93	20
18 71	2	85	151	30
18 72	2	75	125	20
18 73	—	23	36	10
18 74	—	11	20	—
18 75	—	34	56	10
18 76	1	7	15	—
18 77	—	2	4	—
18 78	—	—	—	—
18 79	—	3	5	—
18 80	4	44	73	10
18 81	5	51	85	20
18 82	3	71	132	50
18 83	—	2	6	—
18 84	2	38	64	10
18 85	1	22	35	10
18 86	2	20	31	10
18 87	—	15	24	—
18 88	2	37	61	10
18 89	—	18	31	—
18 90	4	54	96	20
18 91	3	57	97	20
18 92	1	23	44	10
18 93	5	75	121	20
18 94	1	21	36	10
18 95	2	33	55	10
18 96	3	61	96	20
18 97	2	51	82	20
18 98	—	24	56	20
18 99	—	14	31	20
19 20	6	53	84	20
19 21	9	82	134	30
19 22	2	24	34	10
19 25	—	7	11	—
19 26	12	43	69	10
19 27	4	28	45	10
19 28	2	14	21	—
19 29	13	45	81	20
19 30	2	14	25	—
19 31	2	10	16	—
19 32	1	8	14	—
19 33	12	22	47	20
19 34	1	10	15	—
19 35	1	16	27	10
19 36	1	15	26	10
19 37	20	66	117	40
19 38	1	13	22	—
19 39	2	13	20	—
19 40	1	10	16	—
19 41	1	20	30	10
19 42	2	48	86	30
19 43	—	8	21	20
19 44	1	15	26	10
19 45	2	19	35	10
19 46	—	9	10	—
19 50	—	36	57	10
19 51	—	52	92	20
19 52	5	45	74	10
19 53	4	63	115	20
19 54	—	50	80	20
19 55	—	24	42	10
19 56	—	22	35	10
19 57	—	28	46	20
19 58	—	38	59	10
19 59	—	33	52	10
19 60	3	73	136	30
19 61	2	38	58	10
19 62	—	17	30	—
19 63	4	44	80	20
19 64	1	33	58	10
19 65	—	5	10	—
19 66	—	3	6	—
19 70	9	187	294	60
19 71	3	67	119	20
19 72	1	49	82	20
19 73	—	21	31	10
19 74	—	9	16	—
19 75	—	16	28	—
19 76	1	9	19	—
19 77	—	2	4	—
19 78	—	—	2	—
19 79	—	5	8	—
19 80	25	155	258	50
19 81	11	68	111	20
19 82	5	70	128	50
19 83	—	3	6	—

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
19	84	3	32	51	10
19	85	2	16	27	—
19	86	3	19	29	—
19	87	1	10	17	—
19	88	3	35	55	10
19	89	1	11	20	—
19	90	7	54	94	20
19	91	4	40	72	10
19	92	2	18	33	—
19	93	5	36	60	10
19	94	3	13	20	—
19	95	1	21	33	—
19	96	3	44	69	10
19	97	2	59	93	20
19	98	—	11	24	—
19	99	—	9	17	—
20	21	25	359	549	90
20	22	2	56	75	10
20	25	—	—	—	—
20	26	8	42	64	10
20	27	5	41	62	10
20	28	2	20	28	—
20	29	8	49	85	20
20	30	2	25	40	10
20	31	4	32	51	10
20	32	1	14	23	—
20	33	9	24	49	20
20	34	—	6	9	—
20	35	—	22	33	10
20	36	—	24	35	10
20	37	13	82	138	60
20	38	1	23	37	10
20	39	—	19	27	—
20	40	1	18	24	10
20	41	1	32	45	10
20	42	3	94	161	60
20	43	—	16	41	40
20	44	1	27	45	20
20	45	—	21	38	20
20	46	—	4	6	—
20	50	—	128	191	40
20	51	—	219	371	70
20	52	4	63	92	20
20	53	7	222	388	80
20	54	—	92	142	30
20	55	—	57	90	20
20	56	—	29	43	10
20	57	—	35	54	20
20	58	—	34	49	10
20	59	—	28	41	10
20	60	5	185	319	60
20	61	2	30	41	10
20	62	—	27	45	10
20	63	9	175	290	50
20	64	2	79	131	30
20	65	1	8	16	—
20	66	—	2	5	—
20	70	7	178	265	50
20	71	3	131	217	40
20	72	1	45	72	10
20	73	—	32	49	10
20	74	—	15	22	—
20	75	—	25	36	10
20	76	1	17	30	—
20	77	—	9	19	—
20	78	—	—	—	—
20	79	—	7	15	—
20	80	20	151	238	50
20	81	16	114	173	30
20	82	5	131	227	80
20	83	—	4	12	—
20	84	3	55	84	20
20	85	2	26	36	10
20	86	2	35	52	10
20	87	1	25	36	10
20	88	3	62	90	20
20	89	—	10	15	—
20	90	8	96	160	30
20	91	6	97	161	30
20	92	3	50	88	20
20	93	5	72	110	20
20	94	1	28	45	10
20	95	2	61	96	20
20	96	6	81	121	20
20	97	1	64	94	20
20	98	—	35	77	40
20	99	—	33	66	30
21	22	24	339	467	90
21	25	—	26	35	10
21	26	10	59	96	20
21	27	6	59	95	20
21	28	2	26	41	10
21	29	12	67	117	20
21	30	3	40	63	10
21	31	2	36	56	10
21	32	2	19	31	—
21	33	12	34	73	30
21	34	1	15	22	10
21	35	2	30	49	10
21	36	2	29	51	20

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
21	37	29	157	274	100
21	38	4	48	80	30
21	39	3	38	56	10
21	40	2	23	34	10
21	41	4	69	102	20
21	42	6	186	337	120
21	43	—	20	53	40
21	44	2	36	64	20
21	45	1	36	65	20
21	46	2	13	21	—
21	50	—	138	219	40
21	51	—	229	408	80
21	52	7	117	188	40
21	53	8	236	431	90
21	54	—	120	192	40
21	55	—	69	113	20
21	56	—	46	77	10
21	57	—	61	99	40
21	58	—	74	112	20
21	59	—	60	94	20
21	60	7	177	325	60
21	61	2	81	122	20
21	62	2	40	68	10
21	63	12	195	338	70
21	64	2	77	138	30
21	65	1	12	23	—
21	66	—	6	10	—
21	70	8	230	361	70
21	71	8	275	482	100
21	72	2	137	227	40
21	73	—	41	65	10
21	74	—	18	31	—
21	75	—	48	80	20
21	76	1	22	42	20
21	77	—	9	19	—
21	78	—	—	—	—
21	79	—	7	15	—
21	80	10	79	129	20
21	81	9	89	141	30
21	82	6	160	290	110
21	83	—	5	15	—
21	84	7	107	178	40
21	85	2	40	58	10
21	86	4	45	73	10
21	87	2	21	34	—
21	88	5	83	129	20
21	89	2	14	21	—
21	90	12	90	156	30
21	91	7	133	230	50
21	92	2	53	98	20
21	93	5	78	125	20
21	94	2	37	59	10
21	95	2	53	90	20
21	96	3	62	96	20
21	97	2	80	124	20
21	98	1	35	82	40
21	99	—	27	53	30
22	25	—	13	16	—
22	26	8	56	79	10
22	27	5	50	71	10
22	28	2	22	31	—
22	29	13	65	104	20
22	30	2	34	50	10
22	31	4	36	53	10
22	32	2	16	25	—
22	33	18	50	94	40
22	34	—	17	19	10
22	35	1	33	50	10
22	36	2	35	52	20
22	37	31	172	274	110
22	38	2	50	78	30
22	39	2	34	52	10
22	40	1	22	33	10
22	41	2	40	55	10
22	42	7	206	332	130
22	43	—	21	48	40
22	44	1	31	52	20
22	45	2	44	69	30
22	46	—	9	12	—
22	50	—	79	116	20
22	51	—	230	365	70
22	52	5	79	113	20
22	53	8	236	387	80
22	54	—	83	117	20
22	55	—	64	91	20
22	56	—	36	55	10
22	57	—	46	68	30
22	58	—	58	82	20
22	59	—	36	51	10
22	60	12	386	641	130
22	61	2	81	111	20
22	62	—	54	83	20
22	63	48	840	1,261	250
22	64	3	168	267	50
22	65	1	14	24	—
22	66	—	6	8	—
22	70	3	99	140	30
22	71	4	141	225	40
22	72	1	76	112	20
22	73	—	27	36	—

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
22	74	—	17	25	—
22	75	—	29	42	10
22	76	1	20	35	—
22	77	—	5	10	—
22	78	—	—	—	—
22	79	—	7	12	—
22	80	10	76	112	20
22	81	9	69	103	20
22	82	6	137	215	70
22	83	—	6	13	—
22	84	4	70	104	20
22	85	2	32	44	10
22	86	2	43	61	10
22	87	—	16	26	—
22	88	5	78	107	20
22	89	—	15	24	—
22	90	11	126	193	40
22	91	7	122	183	40
22	92	2	48	81	20
22	93	6	78	107	20
22	94	1	29	44	10
22	95	2	72	105	20
22	96	2	47	68	10
22	97	1	77	104	20
22	98	—	27	55	20
22	99	—	20	36	20
25	26	—	247	400	100
25	27	—	191	305	80
25	28	—	8	15	—
25	29	—	114	208	50
25	30	—	39	42	—
25	31	—	47	61	—
25	32	—	12	24	—
25	33	—	19	70	30
25	34	—	—	—	—
25	35	—	13	25	—
25	36	—	12	24	—
25	37	—	62	134	50
25	38	—	13	27	—
25	39	—	13	19	—
25	40	—	9	14	—
25	41	—	20	36	—
25	42	235	198	378	180
25	43	—	7	17	20
25	44	—	48	56	30
25	45	—	8	19	—
25	46	—	—	—	—
25	50	—	19	35	—
25	51	—	70	92	30
25	52	—	16	31	—
25	53	—	56	130	40
25	54	—	48	102	30
25	55	—	6	10	—
25	56	—	8	12	—
25	57	—	7	11	—
25	58	—	10	15	—
25	59	—	—	—	—
25	60	—	91	168	40
25	61	—	24	44	—
25	62	—	13	27	—
25	63	—	36	94	30
25	64	—	28	48	—
25	65	—	5	9	—
25	66	—	—	—	—
25	70	—	65	75	—
25	71	—	109	161	40
25	72	—	13	27	—
25	73	—	8	12	—
25	74	—	7	11	—
25	75	—	11	17	—
25	76	—	8	18	—
25	77	—	—	—	—
25	78	—	—	—	—
25	79	—	3	6	—
25	80	—	53	61	—
25	81	—	70	123	30
25	82	—	201	303	120
25	83	—	4	13	—
25	84	—	130	189	50
25	85	—	82	126	30
25	86	—	46	59	—
25	87	—	42	46	—
25	88	—	70	88	30
25	89	—	7	11	—
25	90	324	203	357	90
25	91	—	112	219	50
25	92	—	49	105	30
25	93	—	132	199	50
25	94	—	13	25	—
25	95	—	107	157	40
25	96	—	140	251	70
25	97	—	46	69	—
25	98	—	61	101	50
25	99	—	24	45	20
26	27	49	243	388	80
26	28	12	53	83	20
26	29	82	183	323	60
26	30	15	89	142	30
26	31	17	85	135	30
26	32	11	34	57	10
26	33	38	45	93	30
26	34	7	32	48	20
26	35	2	26	40	10
26	36	6	32	56	20
26	37	46	92	158	50
26	38	7	40	67	10
26	39	7	31	50	10
26	40	3	21	34	10
26	41	8	62	93	20
26	42	9	126	228	70
26	43	—	10	26	20
26	44	3	34	59	20
26	45	2	18	31	10
26	46	—	14	21	—
26	50	—	46	70	10
26	51	—	73	129	20
26	52	5	56	91	20
26	53	7	85	157	30
26	54	—	86	142	30
26	55	—	50	85	20
26	56	—	25	40	10
26	57	—	37	62	20
26	58	—	40	62	10
26	59	—	43	69	10
26	60	11	108	197	40
26	61	7	64	96	20
26	62	2	29	47	10
26	63	11	65	113	20
26	64	2	38	68	10
26	65	1	14	26	—
26	66	—	5	8	—
26	70	7	92	144	30
26	71	6	113	197	40
26	72	2	77	127	30
26	73	1	45	66	10
26	74	—	13	22	—
26	75	—	31	49	10
26	76	1	12	23	—
26	77	—	3	5	—
26	78	—	4	5	—
26	79	—	5	11	—
26	80	16	69	112	20
26	81	32	143	229	50
26	82	18	199	362	110
26	83	—	11	27	—
26	84	20	134	221	40
26	85	4	59	92	20
26	86	7	54	87	20
26	87	5	39	62	10
26	88	14	112	174	30
26	89	4	45	71	10
26	90	45	242	420	80
26	91	21	162	278	60
26	92	9	99	184	40
26	93	39	262	421	80
26	94	6	100	157	30
26	95	10	136	225	40
26	96	26	322	501	100
26	97	8	177	277	60
26	98	2	55	128	50
26	99	1	27	54	30
27	28	8	79	123	20
27	29	50	214	381	80
27	30	15	170	271	50
27	31	5	46	74	10
27	32	4	31	52	10
27	33	11	24	52	20
27	34	2	19	30	10
27	35	2	32	54	10
27	36	4	44	75	20
27	37	27	117	204	60
27	38	4	40	68	30
27	39	4	33	49	10
27	40	2	21	36	10
27	41	2	55	83	10
27	42	5	131	237	70
27	43	—	9	27	20
27	44	1	23	42	10
27	45	—	8	15	—
27	46	—	3	4	—
27	50	—	46	73	10
27	51	—	76	137	30
27	52	5	71	112	20
27	53	2	65	119	20
27	54	—	79	129	30
27	55	—	38	65	10
27	56	—	20	32	10
27	57	—	42	69	20
27	58	—	32	50	10
27	59	—	47	73	10
27	60	5	114	209	40
27	61	4	51	77	20
27	62	—	27	46	10
27	63	4	47	81	20
27	64	—	37	65	10
27	65	—	7	14	—
27	66	—	3	4	—
27	70	3	75	118	20
27	71	3	101	176	40
27	72	2	62	101	20

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
27	73	—	42	66	10
27	74	—	25	42	10
27	75	—	30	46	10
27	76	1	12	22	—
27	77	—	3	5	—
27	78	—	4	5	—
27	79	—	8	19	—
27	80	8	60	98	20
27	81	15	140	224	40
27	82	9	204	374	100
27	83	—	6	16	—
27	84	9	124	207	40
27	85	2	58	93	20
27	86	5	68	112	20
27	87	2	39	59	10
27	88	10	157	247	50
27	89	2	50	80	20
27	90	109	1,141	1,982	380
27	91	29	416	716	120
27	92	5	95	177	40
27	93	18	237	383	80
27	94	5	95	151	30
27	95	6	138	230	50
27	96	13	307	481	100
27	97	6	244	384	80
27	98	2	79	186	70
27	99	—	35	72	30
28	29	19	86	148	30
28	30	4	52	81	20
28	31	37	326	514	90
28	32	3	20	33	—
28	33	5	15	31	10
28	34	1	6	9	—
28	35	2	23	38	10
28	36	2	23	38	10
28	37	20	89	151	40
28	38	2	20	33	10
28	39	2	13	22	—
28	40	1	13	21	—
28	41	2	25	36	10
28	42	3	87	152	50
28	43	—	11	30	40
28	44	1	21	35	10
28	45	—	16	29	10
28	46	—	2	3	—
28	50	—	31	46	10
28	51	—	55	93	10
28	52	3	24	37	—
28	53	3	58	103	20
28	54	—	38	59	10
28	55	—	23	37	10
28	56	—	12	19	—
28	57	—	16	26	10
28	58	—	4	7	—
28	59	—	8	13	—
28	60	3	73	129	30
28	61	2	27	41	10
28	62	—	19	32	—
28	63	3	36	61	10
28	64	1	31	54	10
28	65	1	7	13	—
28	66	—	2	3	—
28	70	2	39	61	10
28	71	1	52	90	20
28	72	—	24	39	10
28	73	—	20	30	—
28	74	—	13	22	—
28	75	—	13	21	—
28	76	1	6	13	—
28	77	—	3	7	—
28	78	—	—	2	—
28	79	—	7	15	—
28	80	7	42	68	10
28	81	11	73	115	20
28	82	8	152	272	80
28	83	—	6	16	—
28	84	7	83	130	30
28	85	2	51	76	20
28	86	6	67	107	20
28	87	2	26	38	10
28	88	9	116	178	40
28	89	2	19	29	—
28	90	22	197	333	70
28	91	13	168	283	60
28	92	4	48	87	20
28	93	9	98	154	30
28	94	2	34	51	10
28	95	4	75	121	20
28	96	5	57	88	20
28	97	2	58	91	20
28	98	—	34	78	20
28	99	—	25	51	10
29	30	286	1,192	2,107	310
29	31	16	70	126	30
29	32	8	30	57	10
29	33	21	16	38	10
29	34	6	27	45	10
29	35	5	28	51	10
29	36	7	37	69	20
29	37	46	66	129	40

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
29	38	11	51	98	30
29	39	11	42	73	10
29	40	6	26	47	10
29	41	6	58	99	20
29	42	7	83	165	50
29	43	—	8	23	—
29	44	2	21	41	10
29	45	2	27	56	20
29	46	3	29	49	20
29	50	—	40	67	10
29	51	—	60	117	20
29	52	11	89	158	30
29	53	7	64	130	30
29	54	1	123	226	50
29	55	—	53	101	20
29	56	—	43	80	20
29	57	—	53	95	30
29	58	—	48	82	20
29	59	—	49	87	20
29	60	10	90	180	40
29	61	9	62	107	20
29	62	2	31	59	10
29	63	13	65	125	30
29	64	3	40	80	20
29	65	1	7	15	—
29	66	—	4	8	—
29	70	7	89	156	30
29	71	7	105	203	40
29	72	5	96	178	40
29	73	1	70	121	20
29	74	—	31	58	10
29	75	—	41	73	10
29	76	—	8	20	—
29	77	—	2	6	—
29	78	—	3	6	—
29	79	—	6	17	—
29	80	13	65	119	40
29	81	46	214	381	80
29	82	15	150	304	90
29	83	—	4	13	—
29	84	24	169	304	60
29	85	11	174	298	60
29	86	12	66	118	20
29	87	9	115	199	40
29	88	18	149	258	50
29	89	7	62	111	20
29	90	40	200	385	80
29	91	22	155	296	60
29	92	7	56	117	20
29	93	28	164	290	60
29	94	6	69	123	20
29	95	7	76	141	30
29	96	19	199	349	70
29	97	5	82	147	30
29	98	—	19	50	20
29	99	—	15	36	20
30	31	5	59	94	20
30	32	5	42	72	10
30	33	27	55	117	30
30	34	2	30	45	10
30	35	2	32	52	10
30	36	3	40	67	20
30	37	27	123	217	60
30	38	3	43	73	10
30	39	2	29	43	10
30	40	1	21	33	10
30	41	2	44	67	10
30	42	6	138	250	70
30	43	—	15	40	20
30	44	1	30	53	20
30	45	2	39	70	20
30	46	—	14	21	—
30	50	—	37	60	10
30	51	—	58	102	20
30	52	3	61	95	10
30	53	3	67	123	20
30	54	—	89	142	30
30	55	—	43	73	10
30	56	—	28	46	10
30	57	—	39	65	20
30	58	—	43	66	10
30	59	—	31	51	10
30	60	4	98	177	40
30	61	4	71	112	20
30	62	1	31	53	10
30	63	3	54	93	20
30	64	2	48	84	20
30	65	—	11	22	—
30	66	—	4	6	—
30	70	2	61	96	20
30	71	2	76	132	30
30	72	1	107	180	40
30	73	—	30	49	10
30	74	—	21	33	—
30	75	—	31	49	10
30	76	1	13	26	—
30	77	—	5	8	—
30	78	—	—	2	—
30	79	—	8	16	—
30	80	11	77	124	20

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
30	81	19	152	243	50
30	82	11	225	410	120
30	83	—	7	16	—
30	84	12	166	271	50
30	85	4	118	186	40
30	86	10	128	206	40
30	87	3	69	107	20
30	88	8	117	185	40
30	89	1	52	85	20
30	90	16	160	277	60
30	91	10	152	259	50
30	92	3	62	114	20
30	93	11	156	248	50
30	94	2	50	79	20
30	95	3	65	106	20
30	96	7	136	215	40
30	97	3	134	209	20
30	98	—	43	100	40
30	99	—	33	66	20
31	32	28	184	320	80
31	33	11	23	47	10
31	34	2	17	27	10
31	35	2	14	22	—
31	36	2	18	34	10
31	37	14	64	114	30
31	38	3	39	66	10
31	39	2	15	26	—
31	40	1	13	20	—
31	41	2	25	41	10
31	42	2	56	104	30
31	43	—	5	16	—
31	44	—	14	24	—
31	45	2	16	30	10
31	46	—	9	12	—
31	50	—	24	39	—
31	51	—	37	67	10
31	52	3	42	68	10
31	53	2	42	78	20
31	54	—	73	119	20
31	55	—	34	56	10
31	56	—	16	26	—
31	57	—	19	34	10
31	58	—	24	38	—
31	59	—	31	51	10
31	60	2	43	79	20
31	61	2	28	44	10
31	62	—	14	25	—
31	63	2	35	58	10
31	64	—	21	38	10
31	65	—	2	9	—
31	66	—	1	4	—
31	70	2	57	90	20
31	71	2	41	72	10
31	72	—	31	55	10
31	73	—	24	38	10
31	74	—	13	23	—
31	75	—	15	25	—
31	76	1	5	9	—
31	77	—	2	6	—
31	78	—	—	2	—
31	79	—	8	16	—
31	80	7	42	71	10
31	81	21	153	249	50
31	82	6	123	226	70
31	83	—	5	12	—
31	84	7	77	128	30
31	85	2	63	96	20
31	86	4	60	98	20
31	87	3	34	56	10
31	88	9	111	178	40
31	89	4	52	86	20
31	90	9	95	166	30
31	91	6	81	144	30
31	92	2	27	52	10
31	93	6	66	108	20
31	94	2	24	43	—
31	95	2	40	65	10
31	96	4	72	114	20
31	97	2	98	156	30
31	98	—	23	53	20
31	99	—	17	35	20
32	33	4	6	14	—
32	34	—	7	10	—
32	35	—	8	15	—
32	36	—	9	17	10
32	37	7	31	59	30
32	38	1	11	19	—
32	39	2	9	14	—
32	40	—	7	11	—
32	41	—	15	23	10
32	42	1	29	55	30
32	43	—	2	7	—
32	44	—	7	13	—
32	45	—	6	12	—
32	46	1	4	6	—
32	50	—	12	21	—
32	51	—	22	44	10
32	52	1	22	37	—
32	53	2	26	51	10
32	54	—	24	45	10
32	55	—	12	20	—
32	56	—	7	13	—
32	57	—	13	26	10
32	58	—	16	27	—
32	59	—	15	25	—
32	60	—	22	42	10
32	61	2	15	25	—
32	62	—	7	13	—
32	63	2	19	36	10
32	64	—	10	20	—
32	65	—	2	4	—
32	66	—	2	3	—
32	70	2	19	32	10
32	71	1	35	63	10
32	72	—	21	35	10
32	73	—	20	34	10
32	74	—	10	16	—
32	75	—	8	15	—
32	76	—	3	8	—
32	77	—	2	3	—
32	78	—	—	2	—
32	79	—	3	6	—
32	80	8	53	94	30
32	81	15	112	192	50
32	82	9	154	302	120
32	83	—	4	9	—
32	84	4	55	93	30
32	85	2	25	40	—
32	86	3	42	72	30
32	87	2	26	44	—
32	88	5	81	136	40
32	89	2	38	66	—
32	90	7	62	115	30
32	91	4	51	96	30
32	92	1	19	37	10
32	93	5	49	84	30
32	94	—	18	33	10
32	95	2	48	86	30
32	96	1	35	60	10
32	97	2	73	122	30
32	98	—	15	38	20
32	99	—	11	27	20
33	34	109	220	450	140
33	35	8	28	61	10
33	36	18	48	108	30
33	37	121	102	236	70
33	38	14	30	67	30
33	39	22	40	81	20
33	40	8	17	35	10
33	41	19	97	193	40
33	42	15	114	272	80
33	43	—	4	13	—
33	44	4	24	57	20
33	45	3	18	43	10
33	46	8	29	55	20
33	50	—	22	45	20
33	51	—	25	61	20
33	52	10	41	87	30
33	53	4	18	45	10
33	54	1	42	94	30
33	55	—	22	46	10
33	56	—	18	40	10
33	57	—	27	59	20
33	58	—	33	68	20
33	59	—	51	106	30
33	60	9	39	93	30
33	61	12	46	93	30
33	62	5	30	71	20
33	63	7	22	48	20
33	64	1	12	28	10
33	65	—	5	14	—
33	66	—	10	21	—
33	70	3	30	64	20
33	71	4	38	90	30
33	72	3	34	75	20
33	73	—	13	26	—
33	74	—	3	6	—
33	75	—	14	32	10
33	76	—	1	1	—
33	77	—	—	1	—
33	78	—	—	—	—
33	79	—	—	2	—
33	80	4	25	54	20
33	81	16	43	91	30
33	82	6	39	95	30
33	83	—	—	2	—
33	84	10	42	90	30
33	85	3	19	42	10
33	86	6	20	43	10
33	87	4	13	28	10
33	88	6	26	56	20
33	89	5	24	52	20
33	90	20	63	144	40
33	91	6	25	55	20
33	92	4	18	43	10
33	93	18	58	121	40
33	94	5	20	41	10
33	95	3	13	32	10
33	96	9	47	93	30
33	97	3	32	67	20

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
33	98	—	4	15	—
33	99	—	4	11	—
34	35	6	78	121	30
34	36	6	75	124	40
34	37	19	73	127	40
34	38	1	24	40	10
34	39	1	19	33	10
34	40	5	15	23	—
34	41	16	201	299	50
34	42	4	85	146	50
34	43	—	12	31	20
34	44	1	21	37	10
34	45	2	33	58	20
34	46	—	10	13	—
34	50	—	16	26	—
34	51	—	25	43	10
34	52	2	18	26	—
34	53	1	31	57	20
34	54	—	21	35	10
34	55	—	11	16	—
34	56	—	11	17	—
34	57	—	14	21	10
34	58	—	16	22	—
34	59	—	8	12	—
34	60	2	60	106	30
34	61	2	25	35	10
34	62	—	18	28	—
34	63	1	22	37	10
34	64	—	17	28	10
34	65	1	10	18	—
34	66	—	1	1	—
34	70	1	38	58	20
34	71	1	43	73	20
34	72	—	11	17	—
34	73	—	6	9	—
34	74	—	1	3	—
34	75	—	7	12	—
34	76	—	3	5	—
34	77	—	2	3	—
34	78	—	—	—	—
34	79	—	2	3	—
34	80	3	26	41	10
34	81	4	27	42	10
34	82	3	54	96	30
34	83	—	2	5	—
34	84	3	40	61	20
34	85	—	19	28	10
34	86	2	22	36	10
34	87	—	6	9	—
34	88	2	44	65	20
34	89	—	7	11	—
34	90	9	67	115	30
34	91	3	39	65	20
34	92	1	20	36	10
34	93	4	41	62	20
34	94	—	10	15	—
34	95	1	22	33	10
34	96	1	38	55	20
34	97	1	23	36	10
34	98	—	7	14	—
34	99	—	9	17	—
35	36	11	189	321	70
35	37	18	109	191	40
35	38	3	47	80	10
35	39	2	46	72	10
35	40	17	145	238	50
35	41	2	70	106	10
35	42	3	140	254	60
35	43	—	21	58	20
35	44	1	67	118	20
35	45	1	38	72	10
35	46	1	41	61	10
35	50	—	26	44	—
35	51	—	40	71	10
35	52	1	47	75	10
35	53	—	26	49	—
35	54	—	53	86	20
35	55	—	52	89	20
35	56	—	30	51	10
35	57	—	49	80	10
35	58	—	43	67	10
35	59	—	36	59	10
35	60	2	59	111	20
35	61	2	60	94	20
35	62	—	28	49	10
35	63	2	30	51	10
35	64	1	36	65	10
35	65	—	11	23	—
35	66	—	6	10	—
35	70	—	17	27	—
35	71	—	46	80	10
35	72	—	31	54	10
35	73	—	14	21	—
35	74	—	5	7	—
35	75	—	19	28	—
35	76	—	4	8	—
35	77	—	1	2	—
35	78	—	—	—	—
35	79	—	2	2	—
35	80	1	21	34	10
35	81	1	44	72	10
35	82	2	51	94	20
35	83	—	2	4	—
35	84	2	48	79	10
35	85	—	23	37	10
35	86	—	18	32	10
35	87	—	15	21	—
35	88	1	28	46	10
35	89	—	17	29	—
35	90	2	37	66	10
35	91	2	35	59	10
35	92	—	16	31	—
35	93	2	44	70	10
35	94	—	10	16	—
35	95	—	18	32	—
35	96	1	38	61	10
35	97	—	32	51	10
35	98	—	11	24	20
35	99	—	2	3	—
36	37	70	330	614	180
36	38	3	44	78	30
36	39	4	45	74	20
36	40	2	28	48	10
36	41	2	67	106	20
36	42	4	129	245	70
36	43	—	19	56	40
36	44	—	23	41	10
36	45	—	22	41	10
36	46	—	15	28	10
36	50	—	18	32	—
36	51	—	39	73	20
36	52	1	47	80	20
36	53	2	33	66	20
36	54	—	55	93	30
36	55	—	24	42	10
36	56	—	30	53	10
36	57	—	50	86	30
36	58	—	24	40	10
36	59	—	59	100	30
36	60	2	69	133	40
36	61	2	59	93	30
36	62	—	26	46	10
36	63	2	39	71	20
36	64	—	21	40	10
36	65	—	7	13	—
36	66	—	3	5	—
36	70	2	47	78	20
36	71	1	61	113	30
36	72	—	39	71	20
36	73	—	13	23	—
36	74	—	7	13	—
36	75	—	17	29	—
36	76	—	3	8	—
36	77	—	1	2	—
36	78	—	—	—	—
36	79	—	2	6	—
36	80	1	22	37	10
36	81	5	61	103	30
36	82	1	38	73	20
36	83	—	2	5	—
36	84	2	46	80	20
36	85	—	25	37	10
36	86	—	14	27	—
36	87	—	21	37	10
36	88	2	42	71	20
36	89	—	25	40	10
36	90	5	58	107	30
36	91	3	47	88	30
36	92	—	23	45	10
36	93	4	60	101	30
36	94	—	15	26	—
36	95	1	27	47	10
36	96	2	52	87	30
36	97	1	43	71	20
36	98	—	9	22	—
36	99	—	7	14	—
37	38	126	459	858	290
37	39	34	138	239	70
37	40	16	82	146	40
37	41	19	194	319	50
37	42	25	279	554	180
37	43	2	34	103	60
37	44	5	58	112	30
37	45	10	76	152	50
37	46	7	52	87	30
37	50	—	65	110	30
37	51	—	79	149	40
37	52	13	143	248	70
37	53	10	95	190	60
37	54	2	170	300	80
37	55	—	40	76	20
37	56	—	96	172	50
37	57	—	156	276	90
37	58	—	145	247	60
37	59	—	136	236	70
37	60	20	158	317	90
37	61	25	176	292	90
37	62	6	72	131	40
37	63	18	92	177	50
37	64	4	51	98	30

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
37	65	2	15	29	—
37	66	—	20	33	20
37	70	7	83	144	50
37	71	10	157	302	90
37	72	5	129	233	70
37	73	—	68	116	30
37	74	—	17	32	—
37	75	—	52	95	30
37	76	1	10	21	—
37	77	—	3	6	—
37	78	—	2	5	—
37	79	—	6	14	—
37	80	18	98	178	50
37	81	28	185	324	90
37	82	13	150	301	110
37	83	—	4	8	—
37	84	29	158	281	80
37	85	7	93	159	50
37	86	9	60	109	30
37	87	6	86	149	40
37	88	15	112	190	60
37	89	10	102	181	50
37	90	31	138	261	70
37	91	12	77	148	40
37	92	6	52	108	30
37	93	27	161	282	70
37	94	4	70	121	40
37	95	6	70	126	40
37	96	16	161	278	90
37	97	7	128	221	60
37	98	—	15	39	20
37	99	—	11	26	—
38	39	24	242	406	100
38	40	2	32	54	10
38	41	2	73	118	20
38	42	3	79	152	40
38	43	—	6	19	—
38	44	—	25	48	10
38	45	—	19	37	10
38	46	—	16	25	—
38	50	—	26	42	10
38	51	—	57	108	30
38	52	1	42	70	10
38	53	2	41	80	10
38	54	—	61	103	30
38	55	—	20	35	—
38	56	—	32	56	10
38	57	—	49	86	30
38	58	—	44	77	10
38	59	—	40	67	10
38	60	7	171	330	90
38	61	2	61	101	30
38	62	—	24	45	10
38	63	4	59	108	30
38	64	1	33	63	10
38	65	—	6	13	—
38	66	—	6	10	—
38	70	2	45	78	10
38	71	2	99	185	50
38	72	—	43	78	30
38	73	1	23	36	—
38	74	—	8	12	—
38	75	—	19	33	—
38	76	—	6	12	—
38	77	—	1	2	—
38	78	—	—	—	—
38	79	—	2	4	—
38	80	2	31	56	10
38	81	2	50	85	30
38	82	2	48	92	40
38	83	—	2	6	—
38	84	3	43	75	10
38	85	—	32	51	10
38	86	2	23	41	10
38	87	—	20	32	—
38	88	3	49	83	30
38	89	—	29	51	10
38	90	5	48	87	10
38	91	3	47	86	10
38	92	1	26	50	—
38	93	5	63	107	30
38	94	—	23	42	—
38	95	1	22	38	—
38	96	1	49	83	30
38	97	1	55	93	30
38	98	—	11	25	—
38	99	—	2	4	—
39	40	13	131	212	40
39	41	5	67	99	10
39	42	9	191	341	70
39	43	—	13	36	—
39	44	1	27	48	10
39	45	2	25	44	10
39	46	1	16	20	—
39	50	—	25	34	—
39	51	—	46	79	20
39	52	3	40	61	10
39	53	2	43	77	20
39	54	—	36	55	10
39	55	—	23	36	—

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
39	56	—	25	39	—
39	57	—	34	52	10
39	58	—	34	53	10
39	59	—	22	36	—
39	60	8	187	340	70
39	61	4	106	164	30
39	62	—	29	52	10
39	63	4	62	105	20
39	64	2	48	79	20
39	65	1	17	28	—
39	66	—	4	5	—
39	70	2	34	51	10
39	71	2	42	76	10
39	72	—	28	49	—
39	73	—	12	14	—
39	74	—	8	10	—
39	75	—	15	22	—
39	76	1	12	23	—
39	77	—	1	3	—
39	78	—	—	—	—
39	79	—	3	5	—
39	80	3	24	41	—
39	81	4	36	59	10
39	82	3	48	87	20
39	83	—	3	5	—
39	84	5	48	77	20
39	85	—	21	30	—
39	86	2	29	45	10
39	87	1	16	24	—
39	88	4	42	68	10
39	89	—	15	25	—
39	90	8	66	114	20
39	91	5	60	102	20
39	92	—	19	33	—
39	93	5	51	80	20
39	94	—	15	22	—
39	95	2	29	48	10
39	96	2	47	68	10
39	97	1	36	55	10
39	98	—	15	32	—
39	99	—	14	27	—
40	41	2	45	69	10
40	42	3	110	204	60
40	43	—	18	51	20
40	44	2	47	85	20
40	45	1	30	56	10
40	46	1	20	31	10
40	50	—	13	22	—
40	51	—	20	37	—
40	52	1	28	46	10
40	53	1	24	44	10
40	54	—	33	52	10
40	55	—	11	19	—
40	56	—	18	29	—
40	57	—	29	45	20
40	58	—	25	42	10
40	59	—	18	32	—
40	60	2	58	109	30
40	61	4	80	120	30
40	62	—	20	37	10
40	63	2	26	46	10
40	64	—	28	49	10
40	65	1	14	27	—
40	66	—	3	6	—
40	70	1	21	33	—
40	71	—	28	51	10
40	72	—	18	30	—
40	73	—	9	10	—
40	74	—	4	6	—
40	75	—	11	16	—
40	76	—	4	6	—
40	77	—	—	2	—
40	78	—	—	—	—
40	79	—	—	2	—
40	80	2	17	28	—
40	81	5	36	59	10
40	82	1	37	68	20
40	83	—	2	4	—
40	84	2	23	40	10
40	85	1	22	32	—
40	86	1	20	29	—
40	87	—	9	12	—
40	88	2	27	44	10
40	89	10	9	17	—
40	90	4	38	68	10
40	91	2	33	58	10
40	92	—	12	23	—
40	93	3	31	51	10
40	94	—	12	20	—
40	95	1	17	28	—
40	96	1	30	46	10
40	97	—	18	29	—
40	98	—	8	22	—
40	99	—	6	13	—
41	42	15	661	1,125	180
41	43	—	40	101	40
41	44	3	221	367	60
41	45	1	70	124	20
41	46	1	48	66	10
41	50	—	41	63	10

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
41	51	—	103	171	20
41	52	1	71	105	10
41	53	2	73	126	10
41	54	—	82	123	10
41	55	—	20	32	—
41	56	—	42	68	10
41	57	—	69	105	20
41	58	—	84	126	10
41	59	—	93	138	20
41	60	2	143	247	40
41	61	4	94	135	20
41	62	2	112	178	30
41	63	2	60	96	20
41	64	—	66	109	20
41	65	1	66	117	40
41	66	—	18	29	—
41	70	1	57	84	10
41	71	1	66	109	10
41	72	—	48	75	10
41	73	—	21	29	—
41	74	—	11	17	—
41	75	—	26	43	10
41	76	—	10	17	—
41	77	—	3	5	—
41	78	—	—	—	—
41	79	—	3	3	—
41	80	3	43	69	10
41	81	6	69	106	10
41	82	1	61	104	20
41	83	—	3	3	—
41	84	2	61	93	10
41	85	1	46	66	10
41	86	1	35	53	10
41	87	—	29	43	10
41	88	2	85	126	10
41	89	—	25	38	—
41	90	5	104	172	20
41	91	2	92	147	20
41	92	—	37	64	10
41	93	4	92	139	20
41	94	—	32	49	10
41	95	1	42	67	10
41	96	2	70	106	10
41	97	1	62	91	10
41	98	—	26	57	20
41	99	—	3	6	—
42	43	—	109	331	180
42	44	2	208	415	110
42	45	2	141	294	90
42	46	4	184	314	90

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
42	50	—	68	121	20
42	51	—	62	126	20
42	52	3	161	289	60
42	53	2	98	203	40
42	54	—	382	698	210
42	55	—	77	143	50
42	56	—	115	211	60
42	57	—	94	173	50
42	58	—	211	375	70
42	59	—	169	303	60
42	60	3	171	355	70
42	61	4	208	359	70
42	62	2	80	153	50
42	63	3	101	197	40
42	64	1	93	184	40
42	65	1	42	90	60
42	66	20	32	56	30
42	70	2	113	198	40
42	71	2	142	278	60
42	72	1	147	276	60
42	73	—	32	56	10
42	74	—	22	40	—
42	75	—	58	106	20
42	76	—	11	26	—
42	77	—	2	4	—
42	78	—	3	4	—
42	79	—	3	10	—
42	80	1	87	163	30
42	81	5	216	389	80
42	82	1	88	180	50
42	83	—	3	8	—
42	84	2	120	222	40
42	85	2	108	188	40
42	86	1	49	87	20
42	87	1	56	100	20
42	88	2	94	168	30
42	89	2	94	171	30
42	90	4	148	290	60
42	91	2	107	209	40
42	92	1	63	131	30
42	93	5	197	354	70
42	94	1	85	152	30
42	95	1	23	44	10
42	96	3	179	316	60
42	97	2	142	254	50
42	98	—	24	64	20
42	99	—	21	47	20
43	44	—	8	21	—
43	45	—	16	51	20
43	46	—	27	70	40

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
43	50	—	6	18	—
43	51	—	10	28	—
43	52	—	26	70	20
43	53	—	10	28	—
43	54	—	28	82	40
43	55	—	12	33	—
43	56	—	7	21	—
43	57	—	12	32	20
43	58	—	21	55	20
43	59	—	23	63	20
43	60	—	13	40	—
43	61	—	28	75	20
43	62	—	9	27	20
43	63	—	14	42	20
43	64	—	13	36	—
43	65	—	2	5	—
43	66	—	3	9	—
43	70	—	16	44	20
43	71	—	20	60	20
43	72	—	19	54	20
43	73	—	4	11	—
43	74	—	2	6	—
43	75	—	8	25	—
43	76	—	—	2	—
43	77	—	—	—	—
43	78	—	—	—	—
43	79	—	—	—	—
43	80	—	13	36	20
43	81	—	22	62	20
43	82	—	4	10	—
43	83	—	—	—	—
43	84	—	13	33	—
43	85	—	12	32	—
43	86	—	5	16	—
43	87	—	9	21	—
43	88	—	11	27	—
43	89	—	11	29	—
43	90	—	9	28	—
43	91	—	8	23	—
43	92	—	4	13	—
43	93	—	23	63	20
43	94	—	6	19	—
43	95	—	4	12	—
43	96	—	40	105	40
43	97	—	20	49	20
43	98	—	3	15	—
43	99	—	—	—	—
44	45	—	34	69	20
44	46	1	42	68	20
44	50	—	28	48	10

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
44	51	—	41	81	20
44	52	—	49	86	20
44	53	—	31	63	10
44	54	—	114	202	60
44	55	—	24	45	10
44	56	—	16	29	—
44	57	—	23	41	10
44	58	—	46	79	20
44	59	—	37	65	10
44	60	—	67	133	30
44	61	1	60	101	20
44	62	—	26	48	10
44	63	1	40	76	20
44	64	—	34	64	10
44	65	1	24	52	40
44	66	—	9	16	20
44	70	—	30	51	10
44	71	—	46	88	20
44	72	—	32	60	10
44	73	—	12	21	—
44	74	—	3	7	—
44	75	—	18	31	—
44	76	—	5	8	—
44	77	—	—	2	—
44	78	—	—	—	—
44	79	—	1	3	—
44	80	1	28	50	10
44	81	1	43	79	20
44	82	—	36	70	20
44	83	—	1	2	—
44	84	1	34	62	10
44	85	—	25	39	—
44	86	—	18	33	—
44	87	—	13	21	—
44	88	—	27	49	10
44	89	—	18	32	—
44	90	2	35	68	10
44	91	1	32	59	10
44	92	—	19	38	—
44	93	2	42	73	20
44	94	—	8	15	—
44	95	—	16	33	—
44	96	—	42	71	20
44	97	—	31	55	10
44	98	—	9	21	—
44	99	—	2	3	—
45	46	4	136	237	70
45	50	—	20	35	10
45	51	—	24	47	10
45	52	—	41	74	10

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
45	53	—	21	45	10
45	54	—	75	139	40
45	55	—	22	42	10
45	56	—	13	24	—
45	57	—	21	40	10
45	58	—	28	48	10
45	59	—	27	51	10
45	60	1	49	102	20
45	61	2	74	130	30
45	62	—	17	31	10
45	63	2	31	62	10
45	64	—	20	41	10
45	65	—	6	13	—
45	66	—	4	8	—
45	70	—	33	60	10
45	71	—	39	80	20
45	72	—	27	53	10
45	73	—	12	20	—
45	74	—	5	10	—
45	75	—	16	30	10
45	76	—	4	8	—
45	77	—	—	2	—
45	78	—	—	—	—
45	79	—	—	—	—
45	80	1	23	41	10
45	81	1	36	68	10
45	82	—	6	14	—
45	83	—	—	1	—
45	84	—	22	40	10
45	85	—	8	14	—
45	86	—	11	21	—
45	87	—	6	9	—
45	88	—	12	23	—
45	89	—	9	16	—
45	90	2	32	63	10
45	91	1	28	53	10
45	92	—	9	20	—
45	93	2	44	81	20
45	94	—	11	21	—
45	95	—	16	31	10
45	96	1	45	83	20
45	97	—	35	63	10
45	98	—	4	9	—
45	99	—	3	7	—
46	50	—	18	29	—
46	51	—	27	46	10
46	52	—	18	28	—
46	53	—	8	15	—
46	54	—	26	44	10
46	55	—	11	21	—
46	56	—	6	11	—
46	57	—	5	7	—
46	58	—	14	18	—
46	59	—	2	4	—
46	60	2	63	108	20
46	61	1	25	39	10
46	62	—	11	18	—
46	63	—	23	39	10
46	64	—	18	30	10
46	65	—	6	9	—
46	66	—	—	—	—
46	70	—	19	29	—
46	71	—	27	48	10
46	72	—	9	14	—
46	73	—	4	8	—
46	74	—	—	—	—
46	75	—	3	9	—
46	76	—	1	3	—
46	77	—	—	3	—
46	78	—	—	—	—
46	79	—	—	1	—
46	80	—	10	14	—
46	81	—	7	10	—
46	82	—	7	10	—
46	83	—	1	3	—
46	84	1	28	45	10
46	85	—	3	5	—
46	86	—	3	5	—
46	87	—	1	2	—
46	88	—	7	9	—
46	89	—	1	1	—
46	90	2	27	41	10
46	91	1	32	53	10
46	92	—	9	13	—
46	93	2	32	47	10
46	94	—	6	9	—
46	95	—	14	22	—
46	96	—	16	26	—
46	97	—	13	17	—
46	98	—	8	16	—
46	99	—	4	11	—
50	51	—	158	274	50
50	52	—	173	268	50
50	53	—	174	312	60
50	54	—	340	542	110
50	55	—	267	438	80
50	56	—	56	91	20
50	57	—	132	212	60
50	58	—	87	132	30
50	59	—	250	386	80
50	60	—	73	131	30
50	61	—	81	121	20
50	62	—	35	60	10
50	63	—	97	165	30
50	64	—	46	79	20
56	65	—	9	14	—
50	66	—	9	15	—
50	70	—	119	182	40
50	71	—	269	462	90
50	72	—	220	359	70
50	73	—	46	67	10
50	74	—	18	29	—
50	75	—	99	161	30
50	76	—	31	60	20
50	77	—	6	11	—
50	78	—	4	5	—
50	79	—	5	8	—
50	80	—	47	73	10
50	81	—	88	136	30
50	82	—	86	154	40
50	83	—	2	3	—
50	84	—	59	95	20
50	85	—	41	59	10
50	86	—	34	52	10
50	87	—	29	43	10
50	88	—	72	111	20
50	89	—	34	57	10
50	90	—	76	132	30
50	91	—	64	106	20
50	92	—	35	64	10
50	93	—	70	111	20
50	94	—	35	54	10
50	95	—	46	75	10
50	96	—	65	101	20
50	97	—	71	112	20
50	98	—	13	31	—
50	99	—	15	29	—
51	52	—	468	826	160
51	53	—	229	463	90
51	54	—	290	520	100
51	55	—	140	259	50
51	56	—	99	180	40
51	57	—	121	219	60
51	58	—	157	270	50
51	59	—	227	398	80
51	60	—	87	176	30
51	61	—	134	225	40
51	62	—	53	100	20
51	63	—	125	237	50
51	64	—	73	141	30
51	65	—	11	23	—
51	66	—	20	34	—
51	70	—	165	283	60
51	71	—	399	773	160
51	72	—	356	655	130
51	73	—	80	140	30
51	74	—	36	64	10
51	75	—	151	278	60
51	76	—	16	37	—
51	77	—	4	8	—
51	78	—	4	6	—
51	79	—	3	7	—
51	80	—	129	235	50
51	81	—	170	302	60
51	82	—	115	233	50
51	83	—	2	6	—
51	84	—	129	235	50
51	85	—	68	120	20
51	86	—	45	83	20
41	87	—	69	118	20
51	88	—	103	177	40
51	89	—	72	128	30
51	90	—	107	207	40
51	91	—	82	156	30
51	92	—	56	112	20
51	93	—	125	223	40
51	94	—	75	131	30
51	95	—	61	113	20
51	96	—	145	250	50
51	97	—	208	360	70
51	98	—	17	41	20
51	99	—	22	51	20
52	53	8	489	889	180
52	54	3	573	925	180
52	55	—	155	258	50
52	56	—	307	503	100
52	57	—	412	669	130
52	58	—	348	541	110
52	59	—	280	443	90
52	60	4	171	310	60
52	61	6	197	297	60
52	62	3	109	184	40
52	63	7	220	377	80
52	64	3	167	291	60
52	65	1	42	81	40
52	66	—	31	49	20
52	70	4	198	307	60
52	71	3	261	457	90
52	72	3	238	391	80
52	73	—	48	73	10

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
52	74	—	31	52	10
52	75	—	114	185	40
52	76	1	33	66	20
52	77	—	7	14	—
52	78	—	—	—	—
52	79	—	8	19	—
52	80	8	153	249	50
52	81	7	142	226	40
52	82	5	240	434	80
52	83	—	7	17	—
52	84	5	117	190	40
52	85	3	46	72	10
52	86	3	69	112	20
52	87	—	36	56	10
52	88	3	98	152	30
52	89	2	43	71	10
52	90	8	145	248	50
52	91	4	107	188	40
52	92	—	38	71	10
52	93	7	115	184	40
52	94	—	33	53	10
52	95	4	81	134	30
52	96	3	76	122	20
52	97	1	63	98	20
52	98	—	34	78	40
52	99	—	25	52	20
53	54	2	563	1,046	210
53	55	—	167	318	60
53	56	—	167	314	60
53	57	—	244	454	90
53	58	—	142	252	50
53	59	—	222	401	80
53	60	2	108	224	40
53	61	2	85	150	30
53	62	—	37	73	10
53	63	5	158	311	60
53	64	1	76	152	30
53	65	—	7	14	—
53	66	—	17	30	—
53	70	3	203	365	70
53	71	4	429	858	170
53	72	2	366	695	140
53	73	—	88	155	30
53	74	—	32	62	10
53	75	—	160	299	60
53	76	—	20	47	20
53	77	—	4	10	—
53	78	—	9	12	—
53	79	—	6	15	—
53	80	5	156	297	60
53	81	6	187	344	70
53	82	2	144	303	90
53	83	—	4	9	—
53	84	2	96	178	40
53	85	2	77	134	30
53	86	2	55	98	20
53	87	1	54	96	20
53	88	2	117	209	40
53	89	1	77	144	30
53	90	5	110	219	40
53	91	3	103	203	40
53	92	1	51	109	20
53	93	5	152	277	60
53	94	1	65	119	20
53	95	2	67	128	20
53	96	3	151	274	50
53	97	2	123	220	40
53	98	—	18	50	20
53	99	—	23	54	20
54	55	—	458	774	160
54	56	—	323	540	120
54	57	—	418	693	170
54	58	—	324	513	110
54	59	—	260	419	100
54	60	—	200	371	90
54	61	—	198	305	70
54	62	—	119	206	50
54	63	—	190	330	80
54	64	—	184	327	70
54	65	—	43	84	40
54	66	—	29	45	20
54	70	—	192	301	100
54	71	—	339	602	150
54	72	—	218	372	100
54	73	—	44	70	20
54	74	—	33	56	10
54	75	—	210	344	80
54	76	—	65	129	60
54	77	—	17	39	20
54	78	—	—	—	—
54	79	—	11	19	—
54	80	—	144	242	60
54	81	—	150	247	60
54	82	—	212	389	100
54	83	—	8	21	—
54	84	—	141	232	60
54	85	—	53	77	20
54	86	—	83	139	30
54	87	—	42	67	20
54	88	—	109	173	40
54	89	—	46	74	20
54	90	1	162	284	70
54	91	—	152	266	70
54	92	—	65	121	30
54	93	—	137	219	50
54	94	—	46	77	20
54	95	—	104	173	40
54	96	—	80	127	30
54	97	—	126	200	50
54	98	—	32	74	40
54	99	—	22	47	20
55	56	—	83	140	30
55	57	—	347	595	180
55	58	—	131	215	40
55	59	—	181	300	60
55	60	—	177	337	70
55	61	—	37	59	10
55	62	—	26	46	10
55	63	—	48	87	20
55	64	—	38	71	10
55	65	—	6	12	—
55	66	—	7	11	—
55	70	—	95	155	30
55	71	—	181	329	60
55	72	—	131	229	40
55	73	—	52	85	20
55	74	—	17	29	—
55	75	—	151	261	50
55	76	—	30	64	20
55	77	—	8	17	—
55	78	—	—	—	—
55	79	—	4	9	—
55	80	—	39	69	10
55	81	—	135	227	40
55	82	—	100	190	60
55	83	—	4	10	—
55	84	—	108	185	40
55	85	—	35	54	10
55	86	—	36	58	10
55	87	—	21	32	—
55	88	—	66	110	20
55	89	—	26	44	10
55	90	—	73	135	30
55	91	—	90	161	30
55	92	—	128	256	50
55	93	—	69	112	20
55	94	—	23	38	—
55	95	—	41	72	10
55	96	—	62	104	20
55	97	—	53	84	20
55	98	—	18	42	20
55	99	—	17	39	20
56	57	—	241	404	100
56	58	—	324	518	100
56	59	—	241	393	80
56	60	—	115	217	40
56	61	—	89	138	30
56	62	—	56	103	20
56	63	—	116	207	40
56	64	—	88	159	30
56	65	—	17	34	—
56	66	—	27	45	20
56	70	—	60	99	20
56	71	—	106	191	40
56	72	—	50	85	20
56	73	—	15	23	—
56	74	—	10	14	—
56	75	—	49	83	20
56	76	—	22	46	20
56	77	—	2	4	—
56	78	—	—	—	—
56	79	—	3	4	—
56	80	—	51	85	20
56	81	—	53	91	20
56	82	—	65	122	30
56	83	—	3	6	—
56	84	—	40	67	10
56	85	—	24	38	—
56	86	—	22	39	—
56	87	—	14	18	—
56	88	—	45	74	10
56	89	—	9	15	—
56	90	—	38	70	10
56	91	—	47	86	20
56	92	—	19	36	—
56	93	—	32	53	10
56	94	—	17	28	—
56	95	—	23	39	—
56	96	—	36	58	10
56	97	—	29	44	10
56	98	—	12	27	—
56	99	—	8	19	—
57	58	—	235	374	90
57	59	—	163	266	70
57	60	—	190	354	100
57	61	—	121	189	60
57	62	—	84	147	50
57	63	—	118	207	60
57	64	—	130	234	70
57	65	—	26	52	40

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
57	66	—	21	35	20
57	70	—	95	151	30
57	71	—	155	277	50
57	72	—	145	247	50
57	73	—	20	29	—
57	74	—	13	21	—
57	75	—	22	34	—
57	76	—	64	125	60
57	77	—	7	17	—
57	78	—	—	—	—
57	79	—	5	10	—
57	80	—	77	130	30
57	81	—	74	118	20
57	82	—	99	185	50
57	83	—	4	11	—
57	84	—	57	96	20
57	85	—	29	49	10
57	86	—	32	53	10
57	87	—	18	28	—
57	88	—	63	101	20
57	89	—	21	35	—
57	90	—	61	109	20
57	91	—	43	77	20
57	92	—	40	74	20
57	93	—	44	73	20
57	94	—	25	42	10
57	95	—	33	57	10
57	96	—	46	71	20
57	97	—	62	97	20
57	98	—	17	42	20
57	99	—	11	26	—
58	59	—	433	667	140
58	60	—	226	407	80
58	61	—	95	142	30
58	62	—	155	256	50
58	63	—	118	198	40
58	64	—	154	265	50
58	65	—	36	65	20
58	66	—	48	76	30
58	70	—	94	144	30
58	71	—	162	281	60
58	72	—	68	109	20
58	73	—	21	31	—
58	74	—	12	19	—
58	75	—	51	81	20
58	76	—	26	50	20
58	77	—	3	8	—
57	78	—	—	—	—
58	79	—	4	9	—
58	80	—	42	70	10
58	81	—	64	102	20
58	82	—	134	238	70
58	83	—	4	8	—
58	84	—	78	124	20
58	85	—	23	33	—
58	86	—	35	55	10
58	87	—	13	20	—
58	88	—	51	79	20
58	89	—	11	18	—
58	90	—	14	24	—
58	91	—	11	20	—
58	92	—	7	12	—
58	93	—	52	80	20
58	94	—	19	31	—
58	95	—	38	61	10
58	96	—	55	82	20
58	97	—	42	63	10
58	98	—	20	46	20
58	99	—	15	29	—
59	60	—	87	158	30
59	61	—	92	144	30
59	62	—	96	161	30
59	63	—	140	240	50
59	64	—	167	290	60
59	65	—	40	74	40
59	66	—	24	39	20
59	70	—	125	194	60
59	71	—	184	320	60
59	72	—	68	113	20
59	73	—	23	34	—
59	74	—	17	27	—
59	75	—	64	104	20
59	76	—	23	45	20
59	77	—	6	13	—
59	78	—	—	—	—
59	79	—	5	11	—
59	80	—	54	90	20
59	81	—	85	134	30
59	82	—	133	242	70
59	83	—	6	15	—
59	84	—	89	145	30
59	85	—	22	34	—
59	86	—	38	59	10
59	87	—	12	18	—
59	88	—	52	81	20
59	89	—	8	13	—
59	90	—	100	170	30
59	91	—	66	114	20
59	92	—	30	52	10
59	93	—	47	74	20
59	94	—	19	32	—
59	95	—	41	67	10
59	96	—	41	61	10
59	97	—	37	57	10
59	98	—	22	52	20
59	99	—	16	32	20
60	61	12	617	1,066	—
60	62	1	82	157	30
60	63	7	386	761	150
60	64	1	230	467	90
60	65	—	24	55	20
60	66	—	31	56	20
60	70	2	158	280	60
60	71	2	180	362	70
60	72	—	155	294	60
60	73	—	48	86	20
60	74	—	20	38	—
60	75	—	136	252	50
60	76	—	11	26	—
60	77	—	4	8	—
60	78	—	3	8	—
60	79	—	3	8	—
60	80	2	112	213	40
60	81	6	187	344	70
60	82	2	136	283	80
60	83	—	3	8	—
60	84	3	104	194	40
60	85	1	77	134	30
60	86	2	53	98	20
60	87	—	58	103	20
60	88	3	130	233	50
60	89	2	96	177	40
60	90	5	99	198	40
60	91	3	87	170	30
60	92	1	51	111	20
60	93	5	137	252	50
60	94	—	88	162	30
60	95	1	50	94	20
60	96	2	184	327	60
60	97	1	135	245	50
60	98	—	15	42	20
60	99	—	14	32	20
61	62	2	181	292	60
61	63	9	264	435	90
61	64	2	212	354	70
61	65	—	4	5	—
61	66	—	3	4	—
61	70	2	65	101	20
61	71	2	91	151	30
61	72	—	63	98	20
61	73	—	24	36	—
61	74	—	21	34	—
61	75	—	31	47	10
61	76	1	13	23	—
61	77	—	4	6	—
61	78	—	—	—	—
61	79	—	4	10	—
61	80	4	54	83	20
61	81	5	83	128	30
61	82	2	105	181	50
61	83	—	4	11	—
61	84	3	79	125	20
61	85	1	38	52	10
61	86	2	44	71	10
61	87	—	27	41	10
61	88	3	87	129	30
61	89	—	29	43	10
61	90	6	100	166	30
61	91	4	95	156	30
61	92	2	50	90	20
61	93	2	54	82	20
61	94	2	31	49	10
61	95	1	38	59	10
61	96	2	61	89	20
61	97	2	101	152	30
61	98	—	19	43	20
61	99	—	15	30	20
62	63	4	170	310	70
62	64	1	122	225	50
62	65	1	28	60	40
62	66	—	29	49	30
62	70	—	37	61	10
62	71	—	48	92	20
62	72	—	42	76	20
62	73	—	14	24	—
62	74	—	7	13	—
62	75	—	43	76	20
62	76	—	9	18	—
62	77	—	1	2	—
62	78	—	—	—	—
62	79	—	1	2	—
62	80	—	30	51	10
62	81	1	49	87	20
62	82	—	50	95	30
62	83	—	2	3	—
62	84	—	38	66	10
62	85	—	23	39	10
62	86	—	20	37	10
62	87	—	17	27	—
62	88	—	14	24	—

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

TABLE F-II — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
62	89	—	10	19	—
62	90	2	44	83	20
62	91	2	34	63	10
62	92	—	12	27	—
62	93	1	47	79	20
62	94	1	14	25	—
62	95	—	17	32	—
62	96	—	38	66	10
62	97	—	28	47	10
62	98	—	7	19	—
62	99	—	7	15	—
63	64	12	578	1,097	220
63	65	1	25	51	20
63	66	—	31	53	20
63	70	3	89	149	30
63	71	4	211	400	80
63	72	3	194	348	70
63	73	—	43	72	10
63	74	—	14	25	—
63	75	—	68	116	20
63	76	1	17	38	—
63	77	—	3	8	—
63	78	—	2	5	—
63	79	—	5	11	—
63	80	4	63	113	20
63	81	9	143	246	50
63	82	3	112	220	50
63	83	—	4	9	—
63	84	4	82	147	30
63	85	1	45	74	10
63	86	2	39	69	10
63	87	2	38	66	10
63	88	4	85	146	30
63	89	1	48	82	20
63	90	8	116	219	40
63	91	6	98	182	40
63	92	1	39	76	20
63	93	7	101	176	40
63	94	1	38	64	10
63	95	2	56	100	20
63	96	2	70	119	20
63	97	1	51	88	20
63	98	—	15	39	—
63	99	—	22	48	20
64	65	—	25	54	20
64	66	—	42	73	20
64	70	—	54	94	20
64	71	1	105	204	40
64	72	—	67	122	20
64	73	—	22	37	—
64	74	—	9	15	—
64	75	—	67	119	20
64	76	—	6	13	—
64	77	—	1	3	—
64	78	—	2	3	—
64	79	—	2	5	—
64	80	1	43	79	20
64	81	1	72	130	30
64	82	—	60	120	40
64	83	—	2	5	—
64	84	1	52	94	20
64	85	—	31	52	10
64	86	—	20	35	—
64	87	—	25	42	10
64	88	1	43	76	20
64	89	—	31	55	10
64	90	2	53	101	20
64	91	2	48	88	20
64	92	—	25	53	10
64	93	—	43	76	20
64	94	1	34	62	10
64	95	—	24	40	10
64	96	—	56	97	20
64	97	—	65	114	20
64	98	—	8	21	—
64	99	—	6	16	—
65	66	—	11	21	—
65	70	—	9	20	—
65	71	—	14	31	—
65	72	—	18	33	—
65	73	—	8	16	—
65	74	—	2	3	—
65	75	—	6	13	—
65	76	—	1	2	—
65	77	—	—	—	—
65	78	—	—	—	—
65	79	—	—	1	—
65	80	—	7	14	—
65	81	—	12	24	—
65	82	—	10	22	20
65	83	—	—	—	—
65	84	1	10	21	—
65	85	—	5	11	—
65	86	—	6	9	—
65	87	—	4	11	—
65	88	—	9	17	—
65	89	—	6	13	—
65	90	—	9	18	—
65	91	—	8	17	—
65	92	—	4	8	—
65	93	1	15	28	—
65	94	—	5	10	—
65	95	—	2	6	—
65	96	—	12	20	—
65	97	—	15	29	20
65	98	—	2	5	—
65	99	—	1	2	—
66	70	—	10	15	—
66	71	—	18	32	20
66	72	—	6	10	—
66	73	—	2	3	—
66	74	—	1	1	—
66	75	—	4	6	—
66	76	—	2	3	—
66	77	—	—	—	—
66	78	—	—	—	—
66	79	—	—	—	—
66	80	—	5	8	—
66	81	—	9	14	—
66	82	—	16	29	20
66	83	—	—	1	—
66	84	—	7	11	—
66	85	—	3	5	—
66	86	—	4	8	—
66	87	—	1	1	—
66	88	—	1	2	—
66	89	—	—	1	—
66	90	—	13	24	—
66	91	—	14	24	20
66	92	—	4	6	—
66	93	—	10	15	—
66	94	—	2	4	—
66	95	—	4	7	—
66	96	—	5	9	—
66	97	—	3	6	—
66	98	—	3	7	—
66	99	—	2	4	—
70	71	5	577	987	190
70	72	2	204	330	70
70	73	—	81	123	20
70	74	—	48	77	30
70	75	—	70	111	20
70	76	1	33	63	20
70	77	—	12	23	—
70	78	—	4	5	—
70	79	—	12	28	—
70	80	34	1,169	1,882	380
70	81	27	608	953	190
70	82	5	380	679	180
70	83	—	8	18	—
70	84	3	105	170	30
70	85	2	52	76	20
70	86	2	61	99	20
70	87	2	40	59	10
70	88	2	101	153	30
70	89	2	42	65	10
70	90	4	145	246	50
70	91	2	108	181	40
70	92	1	45	84	20
70	93	4	113	176	30
70	94	1	39	61	10
70	95	2	82	135	30
70	96	2	105	161	30
70	97	1	66	104	20
70	98	—	47	108	40
70	99	—	19	38	20
71	72	3	427	778	160
71	73	—	118	198	40
71	74	—	69	122	30
71	75	—	133	237	50
71	76	1	72	154	60
71	77	—	31	77	40
71	78	—	6	10	—
71	79	—	11	26	—
71	80	12	470	852	170
71	81	12	377	664	130
71	82	3	273	543	140
71	83	—	6	20	—
71	84	2	126	228	40
71	85	1	66	113	20
71	86	2	75	133	30
71	87	1	53	90	20
71	88	2	148	257	50
71	89	1	65	115	20
71	90	4	141	272	50
71	91	2	100	191	40
71	92	—	75	151	30
71	93	3	151	267	50
71	94	—	68	121	20
71	95	2	105	189	40
71	96	1	109	185	40
71	97	2	164	281	60
71	98	—	55	143	50
71	99	—	25	58	20
72	73	—	83	132	30
72	74	—	62	104	30
72	75	—	120	204	40
72	76	1	83	166	60
72	77	—	19	45	20
72	78	—	—	—	—

TABLE F-11 — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
72	79	—	9	22	—
72	80	4	145	251	50
72	81	4	100	169	30
72	82	2	213	402	100
72	83	—	7	19	—
72	84	2	102	171	30
72	85	—	48	78	20
72	86	1	62	103	20
72	87	—	54	87	20
72	88	2	107	176	40
72	89	—	26	44	10
72	90	3	141	254	50
72	91	1	99	176	40
72	92	—	51	97	20
72	93	2	97	161	30
72	94	—	30	50	10
72	95	1	62	105	20
72	96	—	73	115	20
72	97	1	82	132	30
72	98	—	47	112	40
72	99	—	34	74	30
73	74	—	32	49	10
73	75	—	34	55	10
73	76	—	30	56	20
73	77	—	18	41	20
73	78	—	2	2	—
73	79	—	16	32	—
73	80	1	64	100	20
73	81	1	124	194	40
73	82	2	537	945	220
73	83	—	8	16	—
73	84	—	87	136	30
73	85	—	38	55	10
73	86	—	47	73	10
73	87	—	25	38	—
73	88	—	74	113	20
73	89	—	32	49	10
73	90	—	53	88	20
73	91	—	87	145	30
73	92	—	27	47	10
73	93	—	57	86	20
73	94	—	18	28	—
73	95	—	54	86	20
73	96	—	35	54	10
73	97	—	76	115	20
73	98	—	10	22	—
73	99	—	17	34	—
74	75	—	10	18	—
74	76	—	9	19	—
74	77	—	7	15	—
74	78	—	2	4	—
74	79	—	7	14	—
74	80	—	35	61	10
74	81	—	81	129	40
74	82	—	234	431	140
74	83	—	2	6	—
74	84	—	44	74	10
74	85	—	23	36	10
74	86	—	21	35	—
74	87	—	17	29	—
74	88	—	35	57	10
74	89	—	18	30	—
74	90	—	23	41	10
74	91	—	47	80	30
74	92	—	12	23	—
74	93	—	32	52	10
74	94	—	20	34	—
74	95	—	16	26	—
74	96	—	21	34	10
74	97	—	33	53	30
74	98	—	10	22	20
74	99	—	7	12	—
75	76	—	32	67	20
75	77	—	3	4	—
75	78	—	—	—	—
75	79	—	4	6	—
75	80	—	51	86	20
75	81	—	52	85	20
75	82	—	80	147	40
75	83	—	4	6	—
75	84	—	44	70	10
75	85	—	19	30	—
75	86	—	26	42	10
75	87	—	14	22	—
75	88	—	39	63	10
75	89	—	12	21	—
75	90	—	57	100	20
75	91	—	44	77	20
75	92	—	23	42	10
75	93	—	44	73	10
75	94	—	18	29	—
75	95	—	35	58	10
75	96	—	28	42	10
75	97	—	43	67	20
75	98	—	11	24	20
75	99	—	9	15	—
76	77	—	2	5	—
76	78	—	—	—	—
76	79	—	—	2	—
76	80	1	17	35	—
76	81	1	24	48	20
76	82	1	36	80	40
76	83	—	—	1	—
76	84	1	10	19	—
76	85	—	9	18	—
76	86	—	4	11	—
76	87	—	5	10	—
76	88	—	6	12	—
76	89	—	10	21	—
76	90	1	10	19	—
76	91	—	9	20	—
76	92	—	5	12	—
76	93	1	12	26	—
76	94	—	6	13	—
76	95	—	5	11	—
76	96	1	15	27	20
76	97	—	10	20	—
76	98	—	2	6	—
76	99	—	1	3	—
77	78	—	—	2	—
77	79	—	—	2	—
77	80	—	5	12	—
77	81	—	8	20	—
77	82	—	17	42	20
77	83	—	—	1	—
77	84	—	5	13	—
77	85	—	3	5	—
77	86	—	2	4	—
77	87	—	3	6	—
77	88	—	4	11	—
77	89	—	5	12	—
77	90	—	3	7	—
77	91	—	2	6	—
77	92	—	2	5	—
77	93	—	5	12	—
77	94	—	2	6	—
77	95	—	3	7	—
77	96	—	4	8	—
77	97	—	11	25	20
77	98	—	—	1	—
77	99	—	—	2	—
78	79	—	—	—	—
78	80	—	2	4	—
78	81	—	6	7	—
78	82	2	29	51	40
78	83	—	1	3	—
78	84	—	6	8	—
78	85	—	2	2	—
78	86	—	6	9	—
78	87	—	2	2	—
78	88	—	6	10	—
78	89	—	—	—	—
78	90	—	7	10	—
78	91	—	4	7	—
78	92	—	2	5	—
78	93	—	2	3	—
78	94	—	—	—	—
78	95	—	4	5	—
78	96	—	—	—	—
78	97	—	3	4	—
78	98	—	1	1	—
78	99	—	1	2	—
79	80	—	9	21	—
79	81	—	22	50	20
79	82	—	34	86	60
79	83	—	—	1	—
79	84	—	11	23	—
79	85	—	16	35	—
79	86	—	10	21	—
79	87	—	4	9	—
79	88	—	12	26	—
79	89	—	10	23	—
79	90	—	15	37	—
79	91	—	18	45	20
79	92	—	6	16	—
79	93	—	12	25	—
79	94	—	9	21	—
79	95	—	11	27	—
79	96	—	14	31	20
79	97	—	21	46	20
79	98	—	1	4	—
79	99	—	3	9	—
80	81	58	504	837	170
80	82	12	296	556	130
80	83	—	6	13	—
80	84	10	109	184	40
80	85	3	50	76	20
80	86	4	69	114	20
80	87	4	43	72	10
80	88	5	90	147	30
80	89	2	37	61	10
80	90	11	134	239	50
80	91	8	101	179	40
80	92	3	41	77	20
80	93	10	97	161	30
80	94	5	37	60	10
80	95	1	57	98	20
80	96	5	62	103	20
80	97	3	81	134	30
80	98	—	20	50	20

TABLE F-11 — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

Zones		Transit Passengers	Auto Passengers	Passenger Car Drivers	Total Truck Trips
80	99	—	16	33	—
81	82	38	1,314	2,402	600
81	83	—	33	89	40
81	84	36	456	748	150
81	85	6	162	252	50
81	86	12	236	385	80
81	87	10	162	252	50
81	88	19	344	541	110
81	89	12	112	180	40
81	90	25	304	528	100
81	91	18	314	542	110
81	92	7	167	305	60
81	93	21	268	430	90
81	94	10	145	229	40
81	95	8	253	424	80
81	96	9	159	251	50
81	97	9	379	594	120
81	98	1	78	186	70
81	99	1	93	189	60
82	83	—	27	78	40
82	84	14	555	1,037	250
82	85	7	503	888	220
82	86	5	184	342	80
82	87	5	324	572	140
82	88	8	408	728	170
82	89	8	272	501	120
82	90	11	331	654	160
82	91	6	330	646	160
82	92	4	291	593	140
82	93	11	369	672	170
82	94	2	159	287	70
82	95	3	274	514	120
82	96	7	281	500	120
82	97	5	653	1,161	280
82	98	—	54	145	70
82	99	—	75	176	60
83	84	—	10	26	—
83	85	—	86	215	80
83	86	—	8	20	—
83	87	—	31	79	40
83	88	—	17	43	20
83	89	—	14	37	—
83	90	—	12	33	20
83	91	—	8	23	—
83	92	—	5	15	—
83	93	—	12	31	—
83	94	—	8	23	—
83	95	—	7	20	—
83	96	—	14	38	20
83	97	—	25	61	40
83	98	—	2	5	—
83	99	—	2	5	—
84	85	5	179	280	60
84	86	37	946	1,572	310
84	87	14	545	870	180
84	88	13	300	481	100
84	89	7	168	279	60
84	90	26	435	776	160
84	91	9	204	360	70
84	92	4	105	200	40
84	93	15	273	448	90
84	94	5	115	186	40
84	95	4	142	243	50
84	96	7	189	305	60
84	97	2	191	306	60
84	98	—	68	164	50
84	99	—	38	81	30
85	86	3	137	214	40
85	87	4	288	434	80
85	88	5	248	380	80
85	89	8	469	737	150
85	90	6	189	316	60
85	91	4	166	277	60
85	92	2	80	143	30
85	93	5	162	250	50
85	94	2	127	198	40
85	95	2	131	211	40
85	96	4	197	298	60
85	97	2	186	281	60
85	98	—	52	120	40
85	99	—	41	82	30
86	87	5	253	395	80
86	88	28	900	1,433	290
86	89	4	135	221	40
86	90	8	144	257	50
86	91	9	252	440	90
86	92	2	61	116	20
86	93	9	175	284	60
86	94	3	72	117	20
86	95	3	98	166	30
86	96	6	234	372	70
86	97	2	179	281	60
86	98	—	33	81	40
86	99	—	28	60	20
87	88	4	153	236	50
87	89	4	174	272	50
87	90	4	115	195	40
87	91	2	104	175	30
87	92	1	49	87	20
87	93	4	97	153	30
87	94	2	72	108	20
87	95	2	81	133	30
87	96	2	110	167	30
87	97	2	107	162	30
87	98	—	39	90	40
87	99	—	31	60	20
88	89	34	1,122	1,786	350
88	90	17	315	539	110
88	91	14	521	882	180
88	92	6	257	470	90
88	93	17	352	554	110
88	94	6	269	423	80
88	95	5	213	348	70
88	96	12	456	699	140
88	97	5	392	605	120
88	98	—	88	204	70
88	99	—	71	144	50
89	90	10	206	363	70
89	91	13	357	622	120
89	92	3	220	406	80
89	94	5	87	142	40
89	95	6	242	407	30
89	96	5	131	209	80
89	97	4	191	303	40
89	98	—	77	183	60
89	99	—	62	130	70
—	—	—	—	—	50
90	91	75	1,495	2,795	560
90	92	7	183	369	70
90	93	83	1,132	1,973	390
90	94	8	212	367	70
90	95	8	276	496	100
90	96	23	711	1,207	250
90	97	9	538	916	210
90	98	2	104	266	110
90	99	1	56	127	50
91	92	7	279	557	110
91	93	22	445	769	150
91	94	5	190	326	60
91	95	5	232	416	80
91	96	13	654	1,099	220
91	97	7	595	1,005	230
91	98	2	121	305	110
91	99	1	64	143	50
92	93	15	441	818	160
92	94	8	575	1,066	210
92	95	4	234	446	90
92	96	8	365	660	140
92	97	11	1,311	2,369	490
92	98	—	69	187	70
92	99	—	68	158	50
89	93	4	122	197	—
93	94	16	426	684	140
93	95	20	720	1,197	240
93	96	35	825	1,295	260
93	97	13	663	1,046	210
93	98	3	235	555	200
93	99	2	224	460	140
94	95	5	270	447	90
94	96	8	353	554	110
94	97	3	245	384	80
94	98	—	134	313	110
94	99	—	91	187	60
95	96	17	862	1,406	280
95	97	6	662	1,084	220
95	98	—	103	253	90
95	99	1	100	216	60
96	97	24	1,422	2,192	—
96	98	4	565	1,310	470
96	99	3	429	874	270
97	98	2	416	972	340
97	99	2	318	647	200
98	99	—	59	180	70

TABLE F-11 — *Continued*

ESTIMATED TRIPS BETWEEN INTERNAL ZONES — 1975

TABLE F-III

ESTIMATED VEHICLE TRIPS BETWEEN INTERNAL DISTRICTS AND EXTERNAL AREAS — 1975

Internal District	EXTERNAL AREAS: NORTH Passenger Cars	NORTH Trucks	NORTH Total Vehicles	EAST Passenger Cars	EAST Trucks	EAST Total Vehicles	SOUTH Passenger Cars	SOUTH Trucks	SOUTH Total Vehicles	WEST Passenger Cars	WEST Trucks	WEST Total Vehicles	NORTHWEST Passenger Cars	NORTHWEST Trucks	NORTHWEST Total Vehicles	TOTAL Passenger Cars	TOTAL Trucks	TOTAL Total Vehicles
A	2,246	460	2,706	4,496	1,268	5,764	2,580	770	3,350	2,710	404	3,114	2,202	300	2,502	14,234	3,202	17,436
B	313	65	378	873	245	1,118	482	143	625	602	90	692	410	55	465	2,680	598	3,278
C	193	40	233	443	125	568	350	105	455	175	28	203	130	18	148	1,291	316	1,607
D	2,025	415	2,440	3,793	1,070	4,863	1,913	570	2,483	1,510	225	1,735	1,845	253	2,098	11,086	2,533	13,619
E	933	190	1,123	4,038	1,140	5,178	3,010	900	3,910	900	135	1,035	795	108	903	9,676	2,473	12,149
F	212	44	256	436	124	560	248	72	320	380	56	436	40	4	44	1,316	300	1,616
G	1,445	295	1,740	1,568	442	2,010	1,060	315	1,375	1,540	230	1,770	1,283	175	1,458	6,896	1,457	8,353
H	1,898	387	2,285	2,610	735	3,345	900	270	1,170	928	137	1,065	1,275	173	1,448	7,610	1,702	9,312
I	1,480	305	1,785	5,320	1,500	6,820	1,650	495	2,145	950	140	1,090	1,035	140	1,175	10,435	2,580	13,015
J	500	105	605	2,360	665	3,025	1,785	530	2,315	595	90	685	355	50	405	5,595	1,440	7,035
K	305	60	365	2,420	680	3,100	2,975	890	3,865	365	55	420	205	30	235	6,270	1,715	7,985
L	1,120	230	1,350	814	230	1,044	589	176	765	2,740	410	3,150	513	72	585	5,778	1,118	6,896
M	1,815	370	2,185	1,625	460	2,085	945	285	1,230	2,640	395	3,035	1,770	240	2,010	8,795	1,750	10,545
N	3,545	725	4,270	2,165	610	2,775	970	290	1,260	2,155	320	2,475	2,360	320	2,680	11,195	2,265	13,460
O	4,250	870	5,120	3,115	880	3,995	580	170	750	700	105	805	165	25	190	8,810	2,050	10,860
P	1,175	240	1,415	645	185	830	295	85	380	555	85	640	605	85	690	3,275	680	3,955
Q	1,540	320	1,860	3,140	880	4,020	100	30	130	640	100	740	700	100	800	6,120	1,430	7,550
R	248	50	298	510	143	653	325	98	423	1,415	213	1,628	250	35	285	2,747	539	3,286
S	96	18	114	141	39	180	246	75	321	474	72	546	69	9	78	1,026	213	1,239
TOTAL	25,339	5,189	30,528	40,512	11,421	51,933	21,003	6,269	27,272	21,974	3,290	25,264	16,007	2,192	18,199	124,835	28,361	153,196

TABLE F-IV

ESTIMATED VEHICLE TRIPS BETWEEN EXTERNAL AREAS — 1975

EXTERNAL AREA (From)	EXTERNAL AREAS: NORTH Passenger Cars	NORTH Trucks	NORTH Total Vehicles	EAST Passenger Cars	EAST Trucks	EAST Total Vehicles	SOUTH Passenger Cars	SOUTH Trucks	SOUTH Total Vehicles	WEST Passenger Cars	WEST Trucks	WEST Total Vehicles	TOTAL Passenger Cars	TOTAL Trucks	TOTAL Total Vehicles
East	908	212	1,120										908	212	1,120
South	2,276	532	2,808	988	280	1,268							3,264	812	4,076
West	1,208	228	1,436	3,124	684	3,808	920	216	1,136				5,252	1,128	6,380
Northwest	1,008	192	1,200	1,692	372	2,064	772	180	952	132	20	152	3,604	764	4,368
TOTAL	5,400	1,164	6,564	5,804	1,336	7,140	1,692	396	2,088	132	20	152	13,028	2,916	15,944

WILBUR SMITH
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