GULF FREEWAY

A divided road having all crossroads separated in grade from the pavements for through traffic and with the control of access fully exercised.

# GULF FREEWAY

COMPLETED SECTION

ANNUAL REDUCTION IN VEHICLE STOPS

120,000,000

ANNUAL TIME SAVINGS (VEHICLE MINUTES)

106,234,240

MONETARY VALUE OF ANNUAL TIME SAVINGS

$ 2,688,684

CONSTRUCTION AND RIGHT-OF-WAY COSTS

$ 11,000,000

# ECONOMIC EVALUATION

# OF

# THE GULF FREEWAY

## HOUSTON, TEXAS

*REPORT PREPARED BY*

CITY OF HOUSTON

DEPARTMENT OF TRAFFIC AND TRANSPORTATION

Thos. E. Willier, Director

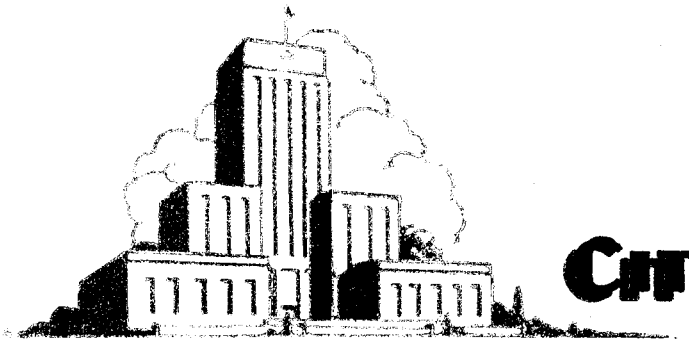
Eugene Maier, Asst. Director

JULY, 1949

OSCAR HOLCOMBE
MAYOR

COUNCILMEN-AT-LARGE
J. S. GRIFFITH PHIL HAMBURGER
CHARLES H. WINERICH, JR.

DISTRICT COUNCILMEN
POS. 1 TOM NEEDHAM
POS. 2 JOE G. RESWEBER
POS. 3 HARRY HOLMES, JR.
POS. 4 TOM H. CRAWFORD
POS. 5 GEO. G. MARQUETTE, JR.



# CITY OF HOUSTON

July 22, 1949

Hon. Oscar F. Holcombe, Mayor
City of Houston

Dear Mayor Holcombe:

Although all types of motor vehicles, including automobiles, buses and trucks, have been radically improved in recent years, most streets and rural highways have not been designed and constructed to meet present-day transportation requirements. The social and economic potentialities of urban places have not been realized, therefore, because proper consideration has not been given to the stimulation of the life-blood of communities by providing adequate facilities for the efficient and safe movements of persons and goods.

Your foresight in conceiving the Gulf Freeway and the cooperation of members of City Council have resulted in the completion of the first link in a chain of modern roadways which are essential to the future development and growth of Houston. Through the aid of citizens who voted bonds for right-of-way acquisition and the assistance of the Texas Highway Department and the Federal Government in making available funds for construction work, the first section of the Gulf Freeway was completed and opened to traffic in September 1948 and work is progressing rapidly on the remainder of the Freeway.

An objective evaluation of the social effects of the Gulf Freeway is not possible but our Department of Traffic and Transportation has conducted surveys which have resulted in establishment of economic values. The attached report, "Economic Evaluation of the Gulf Freeway", should convince citizens and governments officials that large expenditures of public funds for modern-type roadways, such as the Gulf Freeway, may be warranted by assigning monetary values to time savings which accrue to motorists and operators of commercial vehicles.

Respectfully yours,

Thos. E. Willier

Thos. E. Willier, Director
Dept. of Traffic and Transportation

# ACKNOWLEDGEMENTS

Mr. W. J. Van London, Engineer-Manager of the Gulf Freeway for the Texas Highway Department, has been responsible for the preparation of plans and for the supervision of all construction work and to him is due much of the credit for the utility value and beauty of the Freeway. Mr. Van London and his able assistant, Mr. H. W. Elder, contributed valuable advice and assistance in the preparation of this report and provided certain statistical data and photographs.

Mr. Eugene Maier, Assistant Director of the Department of Traffic and Transportation of the City of Houston, supervised the collection of field survey data and his analyses of facts and figures made possible the economic evaluations of time savings. Other members of the staff of the Department of Traffic and Transportation who assisted in compiling report data include Mr. Cooper McEachern, Assistant Traffic Engineer, Mr. Andrew R. Sanchez, Draftsman, Mr. Marion C. May, Chief Traffic Checker, and Mrs. K. T. Edminster, Secretary.

Owing to the lack of generally accepted monetary values which might be applied to time savings produced through use of the Gulf Freeway, nationally known traffic authorities were requested to supply information based upon their respective experiences and research work. The following were among those who provided data: Mr. Nathan Cherniack, Economist, Port of New York Authority, Mr. Edward H. Holmes, Chief, Division of Highway Transport Research, U. S. Public Roads Administration, and Mr. Theodore Matson, Director, Bureau of Highway Traffic, Yale University. An outstanding Houston realtor, who has requested that his name be withheld, provided facts relating to changes in property values which resulted from construction of the Gulf Freeway.

Cooperation of the persons whose names have been mentioned as well as the assistance and advice of others is gratefully acknowledged.

# CONTENTS

# ILLUSTRATIONS

## LIST OF PLATES



## LIST OF FIGURES

# CHAPTER I

## VALUE OF A FREEWAY

Is an urban freeway a luxury or a necessity? Can the construction of a modern-type freeway be justified on the basis of utility value as a sound investment? These questions and many others have confronted highway engineers who have been responsible for providing roadway facilities to transport persons and goods efficiently and safely in urban areas. Owing to the lack of economic analyses of freeway operations, it has been difficult and in most cases impossible to obtain public support and necessary funds for the acquisition of rights-of-way and for the construction of freeways which are urgently needed in many large cities throughout the country.

The Department of Traffic and Transportation of the City of Houston has assembled statistical data relating to the economic values which have resulted from the construction and use of the Gulf Freeway. This report has been prepared in order to demonstrate that the expenditure of millions of dollars for construction of a freeway is warranted. If the public in general and motorists in particular can be informed regarding the value of time savings which are produced through use of a freeway, public officials will have less difficulty in obtaining financial support for freeway development work. It is hoped that the factual data contained herein will aid engineers in planning and financing future freeways.

An economic evaluation of a freeway must necessarily include reference to a number of intangible values as well as to the tangible ones. Although it is possible to assign monetary values to the savings in time which may be effected through use of a freeway, it is more difficult to measure the appreciation in land values and in business operations adjacent to a freeway, and especially in other areas which are made more accessible through use of a freeway. Values of this kind would have to be offset to some extent by decreases in property values and adverse effects on business along routes of travel which were used prior to the construction of a freeway. There is no way to assign definite values to the added stability of land and business in a central business district of a city where accessibility has been produced through construction of a freeway even though it is obvious that favorable effects result from development of roadways which facilitate vehicle movements to and from business centers.

The statistical data in this report pertain primarily to an evaluation of the savings in travel time which have resulted from use of the Gulf Freeway although there is some reference to increases in the value of land adjacent to the Freeway. Inasmuch as the completed section of the Freeway has been open to traffic for less than one year, insufficient traffic accident records make it impossible to evaluate the economic savings which may be attributed to an evident reduction in accidents, injuries and fatalities resulting from the operation of motor vehicles

on the modern-type roadway. Any equitable comparison of accidents before and after construction of a freeway should be based upon reports for at least one year prior to completion and use of the roadway and for one year after it is opened to traffic. An analysis of accident experience on the Gulf Freeway will be published later.

ROADWAY SECTION FROM VELASCO OVERPASS

PLATE I

# CHAPTER II

# DEVELOPMENT OF THE GULF FREEWAY

## LOCATION AND DESIGN

The Gulf Freeway was planned to provide for the efficient and safe movements of persons and goods within the City of Houston and between Houston and Galveston. It will connect with future freeways, shown on Figure 7, which will be built in the western section of the City on routes leading to San Antonio, Austin and Dallas. The route to Galveston generally follows an abandoned interurban railway line. The Freeway section, within the City of Houston, was designed to provide better accessibility to the central business district for persons residing in the southeastern portion of the City and to serve other business and residential areas. Figure 1 indicates the relationship between the Freeway and other Express Streets.

In designing the Gulf Freeway, engineers provided for the type of construction which would expedite traffic flow and minimize accidents. The throughway section, shown on Plate I, consists of six, twelve-foot traffic lanes, three in each direction, with a four-foot raised divider island. All intersecting streets and railroad lines are overpassed. Two service roadways parallel the throughway section but are separated from it with grass-covered parkways. These roadways, which are thirty-two feet wide, are designated for one-way traffic movements. Parking is not permitted on the two service roads and access driveways are limited. Access to the Freeway is limited because the route is a new one which the City purchased and to which abutting property owners have no rights of ingress and egress other than at locations approved by the City.

The first section of the Gulf Freeway between Dowling Street and Telephone Road was opened to traffic on September 30, 1948. The four-street distribution system between Dowling Street and Louisiana, which may be observed in the photograph, Plate II, was opened a few months prior to the completion of the Freeway to Telephone Road. Total distance from Louisiana Street to Telephone Road is 3.7 miles. Construction work on the Gulf Freeway is proceeding and it is anticipated that the roadway will be completed to the east city limits before the end of 1950. The extension of the Freeway to Galveston should be opened to traffic early in 1951.

## CONSTRUCTION AND RIGHT-OF-WAY COSTS

Approximately $11,000,000 has been expended on the Gulf Freeway to date. Of that amount, $8,500,000 was for construction and $2,500,000 for right-of-way acquisition. Although the Freeway is not routed through the high value land in the central business district, right-of-way costs

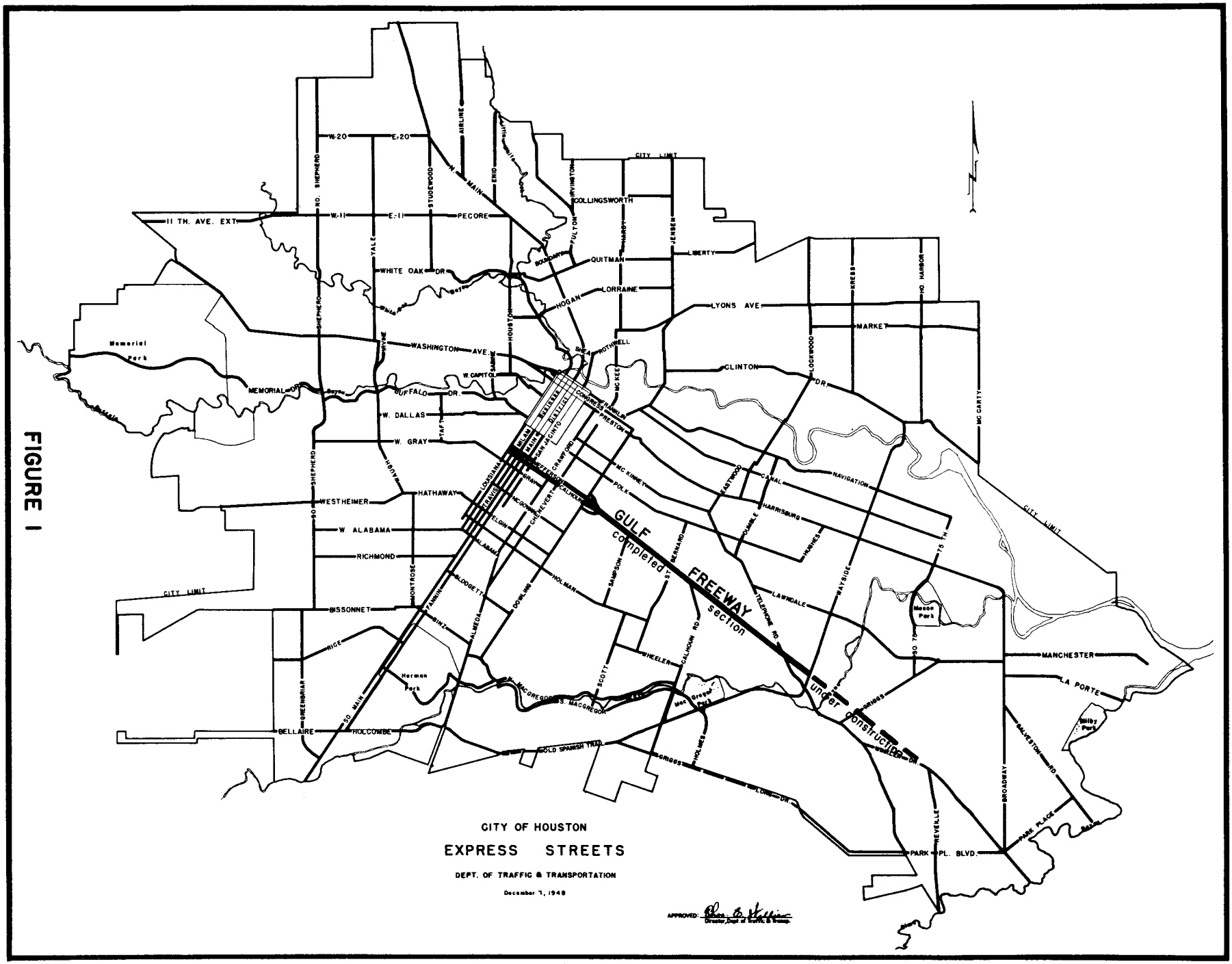



FIGURE 1

CITY OF HOUSTON

EXPRESS STREETS

DEPT. OF TRAFFIC & TRANSPORTATION

December 1, 1948

APPROVED: Director, Dept. of Traffic & Transp.

TRANSITION TO FEEDER STREET SYSTEM

have amounted to about one-third the total cost of construction. Construction costs are defrayed jointly by the Texas Highway Department and the Federal Government. The City of Houston provides necessary right-of-way with funds obtained through bond issues.

Construction costs of the four-street feeder system amounted to about $1,000,000. The total cost included $300,000 for modern-type traffic signal controls, at sixty-eight intersections, where north and south streets intersected the four feeder streets.

It is estimated that the total cost of the Gulf Freeway within the City limits from West Dallas Street, a street located a few blocks west of Louisiana Street, to the east city limits will be about $20,000,000.

## TRAFFIC CONTROL

The speed limit on the Freeway is 45 m.p.h. The speed limit is 30 m.p.h. on the two service roadways and on the four feeder streets which connect the Freeway with streets leading to the central business district.

Traffic on the north service road is routed one way inbound and traffic on the south service road is routed one way outbound. As will be noted on Figure 2, the four-street system, composed of Pease, Jefferson, Calhoun and Pierce Streets, provides a unique method for feeding the heavy volumes of traffic into the north and south streets which serve the central business district. Traffic is routed one-way inbound on Pease and Jefferson and one way outbound on Calhoun and Pierce, between Louisiana and Dowling Streets. By disseminating traffic over a number of north and south streets, traffic congestion is reduced to a minimum and motorists may travel to their ultimate destinations by direct routes without traveling through the heart of the business district.

In view of the fact that a freeway provides for the movements of heavy volumes of vehicular traffic at relatively high rates of speed, a serious problem usually develops where traffic enters an existing street system. In the Houston business district, streets are arranged in a checkerboard pattern and traffic moves to and from the four-street portion of the Gulf Freeway and the center of the business district by way of a number of north and south streets, thereby spreading the traffic load and reducing travel time.

Modern-type traffic signals were installed at all intersections along the four-street feeder system, as indicated on Figure 2, and they were timed to provide for progressive movements of motor vehicles at a speed of 30 m.p.h. In February, 1948, a nationally publicized One-Way Street System was adopted on twenty-two miles of streets in the central business district. Traffic signals on the one-way streets were timed for progressive vehicle movements so that traffic moves from the Gulf Freeway feeder streets into the north and south one-way streets and then flows efficiently into the central section of the business district.

# FEEDER STREET SYSTEM
# GULF FREEWAY

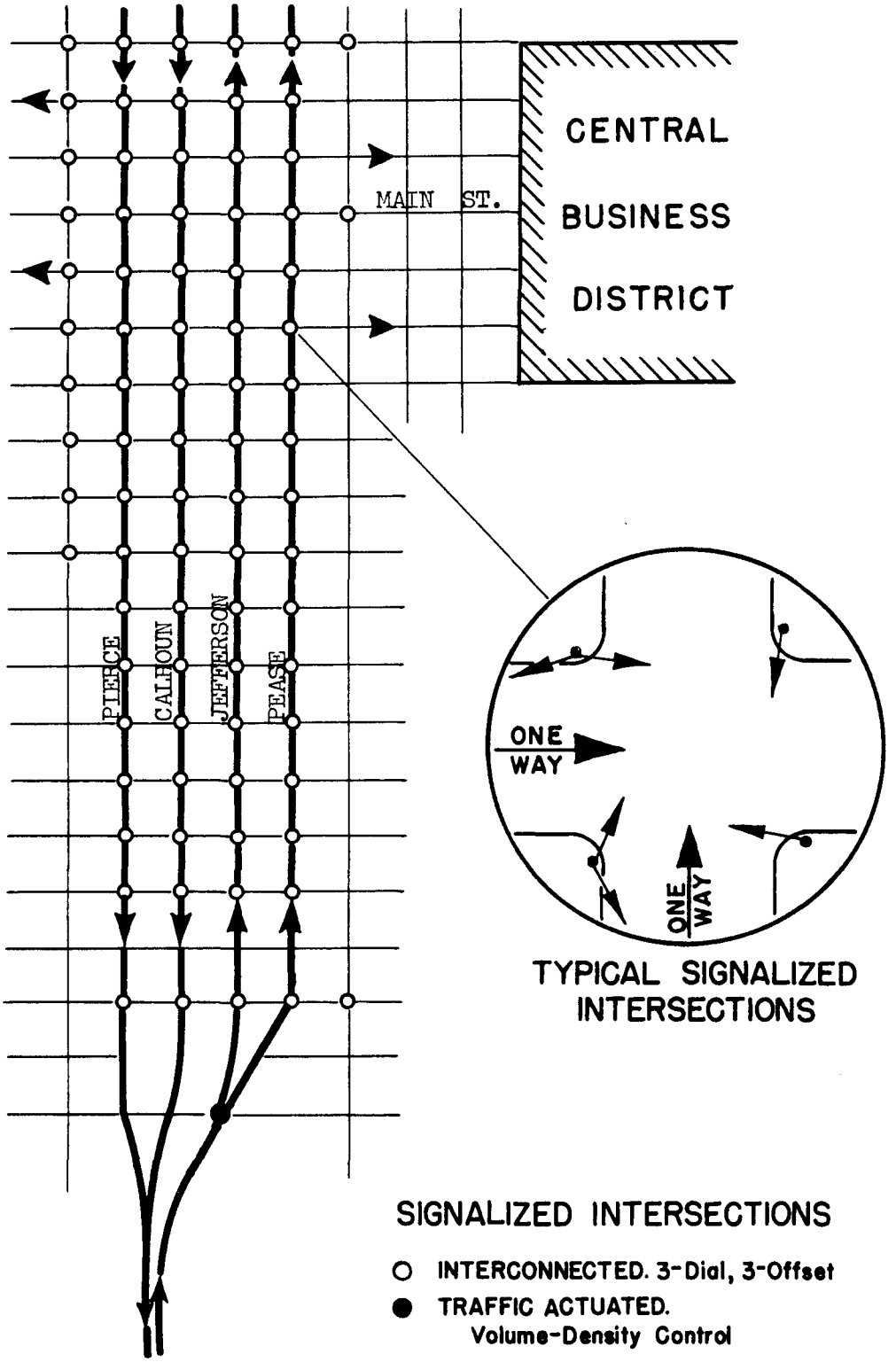



FIGURE 2

## PARKING TERMINAL PROBLEMS

Owing to the lack of curb space and off-street parking space to meet the ever-increasing demands for parking and storage of motor vehicles in central business districts, large cities consider parking to be the most important civic problem. Improvements in traffic flow along the Gulf Freeway and on the one-way streets reduced congestion and delays but the heavy volumes of fast-moving traffic created unusual parking problems in the Houston central business district. Fortunately, it has been possible to provide curb space and off-street parking space, in the form of parking lots and garages, to generally satisfy current parking demands of short-time and long-time parkers. In the future, however, as additional freeways are constructed and heavier volumes of traffic are imposed on the central business district, the parking problem will be aggravated and there will be a need for the development of additional parking terminal facilities.

VELASCO OVERPASS

PLATE III

# CHAPTER III

# ECONOMIC VALUE OF TIME SAVINGS

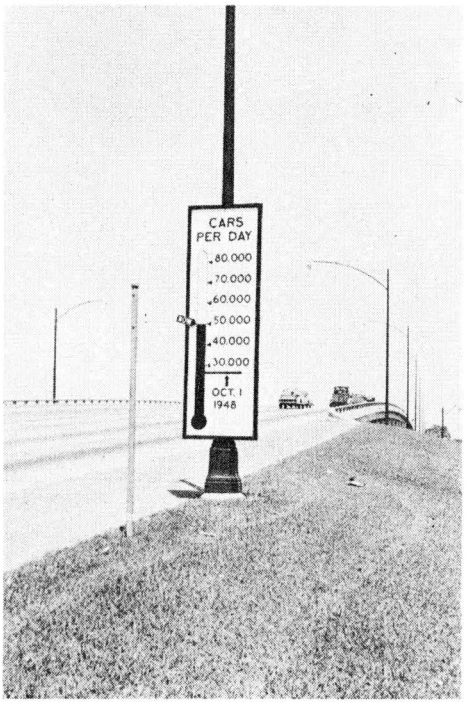
## TRAFFIC VOLUMES

The utility value of the Gulf Freeway may be measured directly in terms of time savings which are evident in the transportation of persons and goods in motor vehicles. Part of the traffic which uses the Freeway formerly used other city streets and the remainder has been generated as a result of land developments and because motorists have found that they can travel faster and more safely on the Freeway. Higher speed limits have been established on the multi-lane throughway section, which incorporates grade separations at all railroad and street crossings, so that uniform speeds may be maintained with no interference from opposing or merging traffic. The Velasco Overpass, Plate III, is typical of other overpasses on the Freeway.

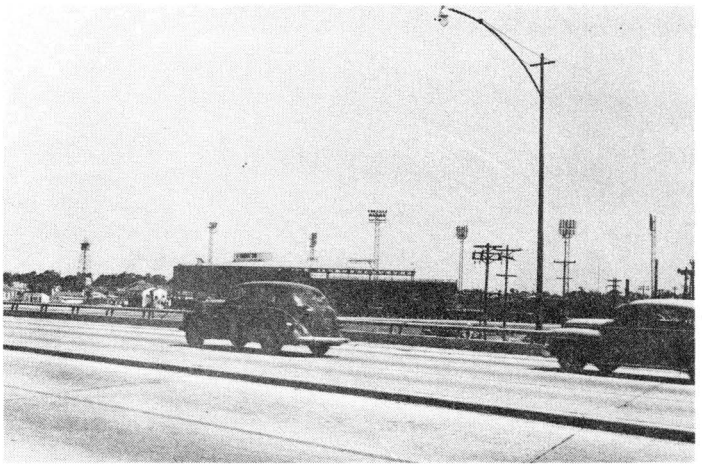
A noticeable change was evident in the traffic pattern on various streets in the vicinity of the Gulf Freeway soon after the roadway was opened and traffic counts on the throughway section have revealed an ever-increasing volume of vehicular traffic. As indicated on Figure 3 and Plate IV, about 28,000 motor vehicles used the Freeway daily when it was first opened, whereas at the present time more than 50,000 vehicles travel on the roadway each day. A traffic count on June 15, 1949 revealed 51,100 motor vehicles of which number 45,560 were using the throughway section and 5,540 were using the two service roadways. When the Gulf Freeway is completed, it is anticipated that the volume of traffic will increase to over 70,000 vehicles per day at the maximum point east of Dowling Street.

The daily distribution of traffic and the hourly distribution are graphically indicated on Figure 4 and Figure 5. Traffic volumes are fairly constant for each day throughout the week except Sunday. As might be expected, the inbound traffic is heaviest between 7:00 a.m. and 8:00 a.m. and the outbound traffic peak is between 5:00 p.m. and 6:00 p.m. With exception of the peak hours, the inbound and outbound traffic volumes are about equal throughout the day.

Plate VIII indicates the volume of traffic on the Gulf Freeway as compared with traffic on various streets including Telephone Road, Leeland, Polk and McKinney Streets. The traffic volumes were observed in March, 1949. Approximately 17% of the traffic on the Freeway consisted of commercial vehicles. Numerous city and intercity trucks travel on the Freeway which is used also by the operators of some intercity and interstate bus lines. Local city buses are excluded from the throughway section. Provisions are being made, however, in the construction of additional sections of the Gulf Freeway for bus loading zones along the service roadways at grade separations. Express bus service will be provided by way of the throughway section and rapid mass transportation will then be available to bus riders.



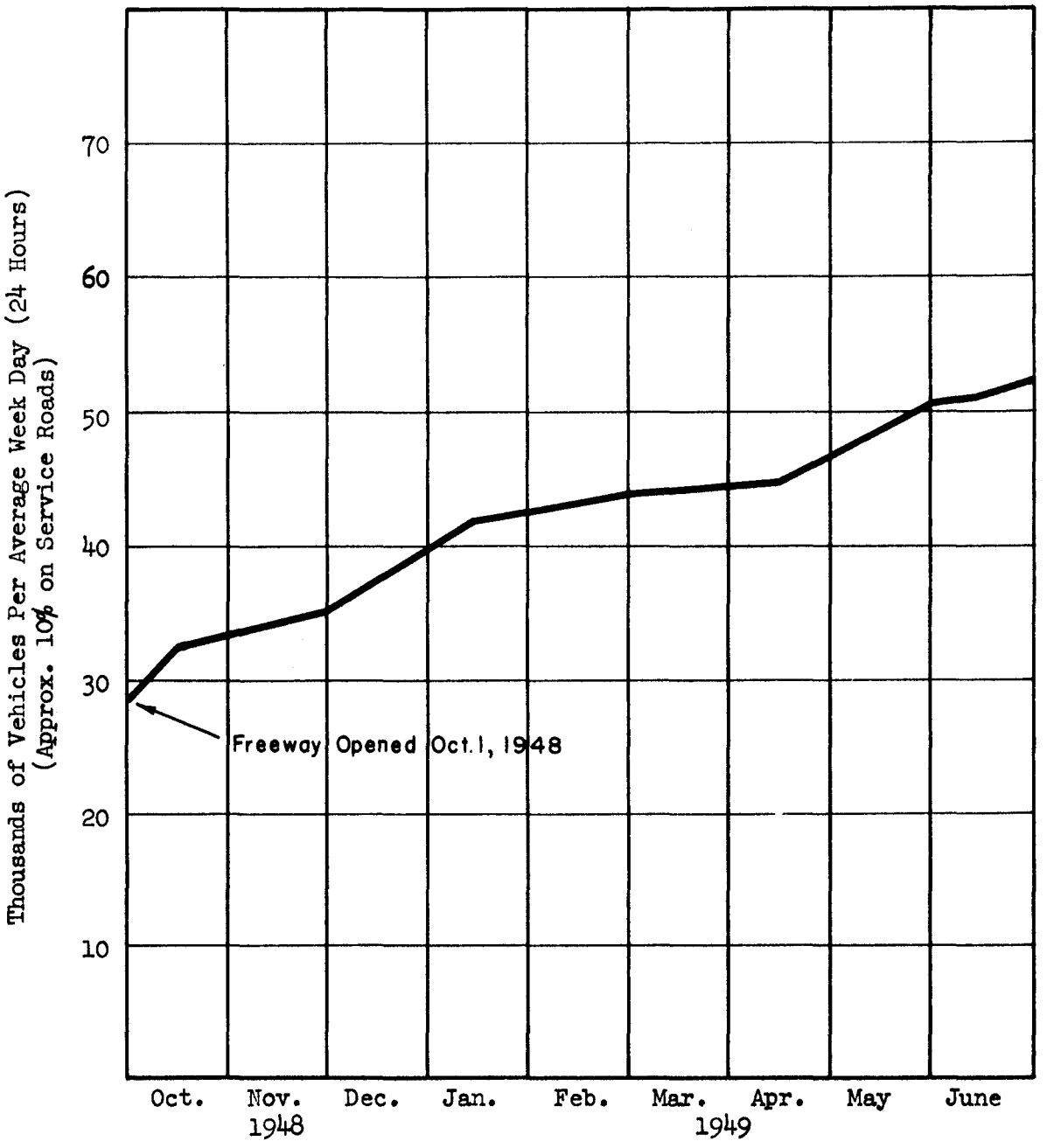

Automatic counter at I.G.&N. R.R. overpass records daily traffic. Motorists are informed regarding current traffic flow by visible indicator.



Accessibility to Houston Baseball Park, shown in background, provided by Gulf Freeway. Photograph from St. Bernard overpass.

PLATE IV

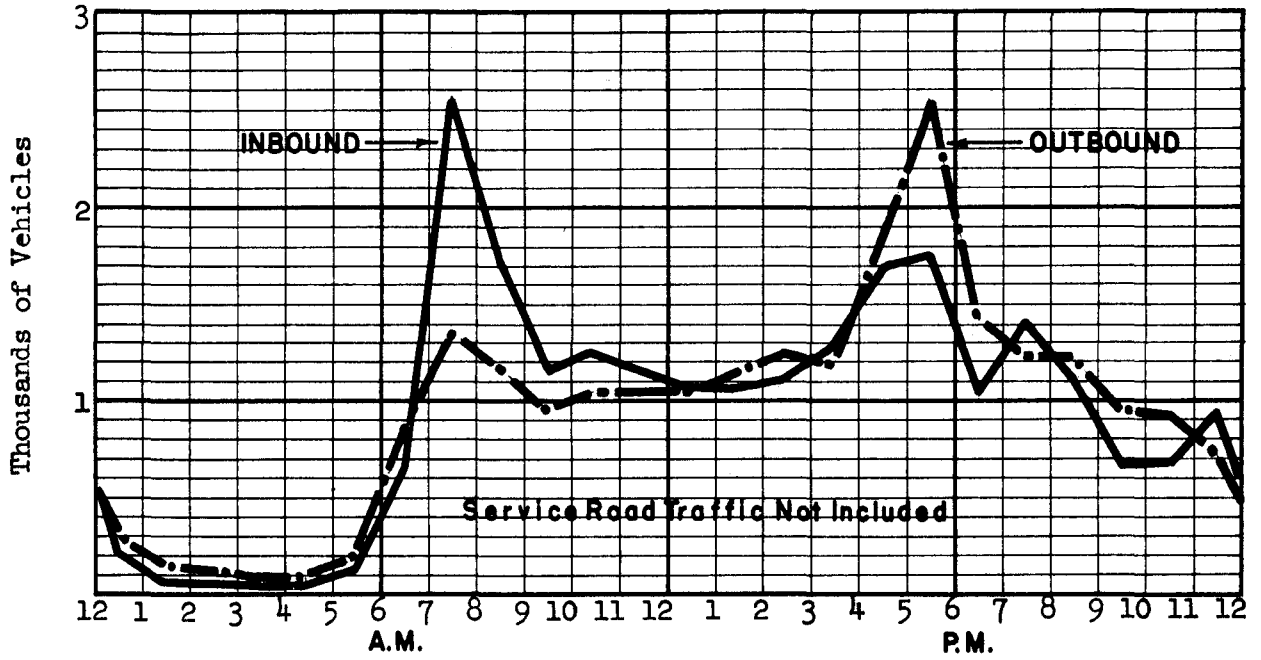
# TREND OF TRAFFIC VOLUMES
# GULF FREEWAY




AVERAGE WEEKDAY TRAFFIC AT I.G.&N.R.R. OVERPASS

FIGURE 3

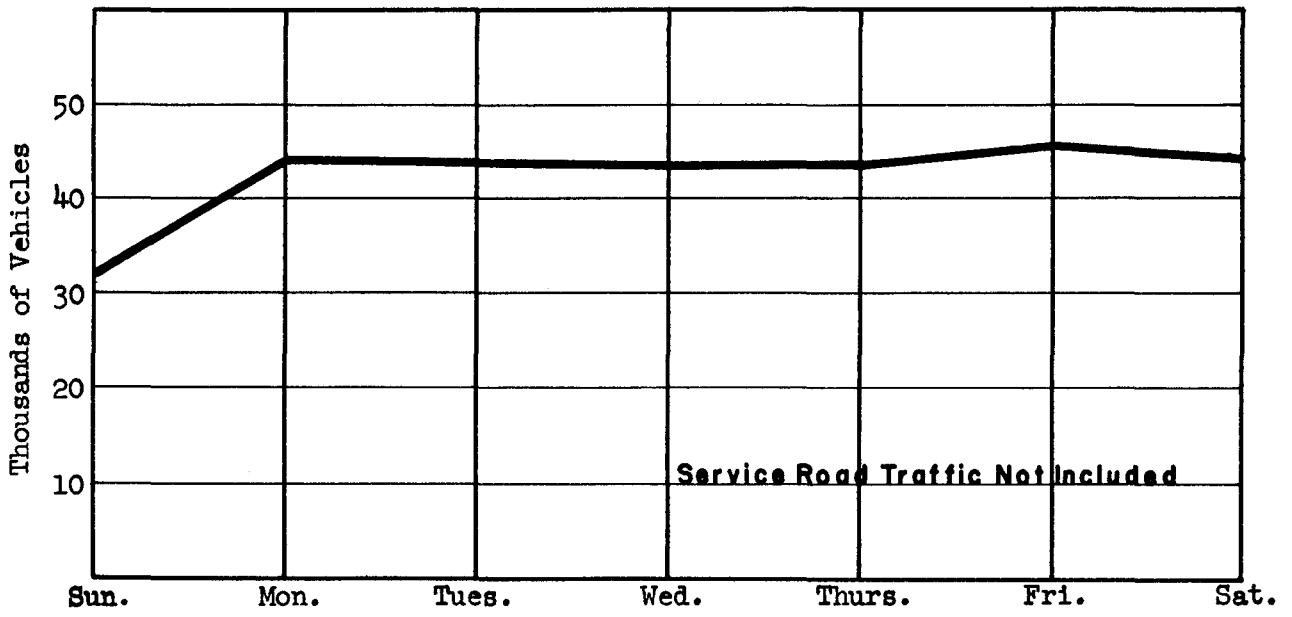
# HOURLY DISTRIBUTION OF TRAFFIC
# GULF FREEWAY




AVERAGE WEEKDAY TRAFFIC AT I.G.&N.R.R. OVERPASS

FIGURE 4

# DAILY DISTRIBUTION OF TRAFFIC
# GULF FREEWAY




TRAFFIC AT I.G.&N. R.R. WEEK OF JUNE 5-11, 1949

FIGURE 5

In order to measure the effects of the Gulf Freeway upon traffic patterns, motor vehicle volumes were observed on a few more important old traffic arteries prior to the opening of the Freeway and again several months after it was opened to traffic as far as Telephone Road. Reductions in traffic on the old routes apparently accounted for two-thirds of the traffic on the Freeway. Resulting changes in traffic volumes on the old streets as well as the volume of traffic on the throughway portion of the Gulf Freeway are shown on Plate IX. The reductions in traffic volumes varied from 50% on Telephone Road to 10% on Harrisburg and, in general, they were in proportion to the distances between respective streets and the Freeway.

## RESULTS OF SPEED AND DELAY SURVEYS

Speed and delay surveys were conducted along various streets which parallel the Gulf Freeway, from the intersection of Telephone Road and the Freeway to Main Street, prior to the opening of the new roadway. After the Freeway was opened to traffic, similar surveys were conducted on the same streets and on the throughway between the same terminal points. The "floating car" method was used for these surveys.

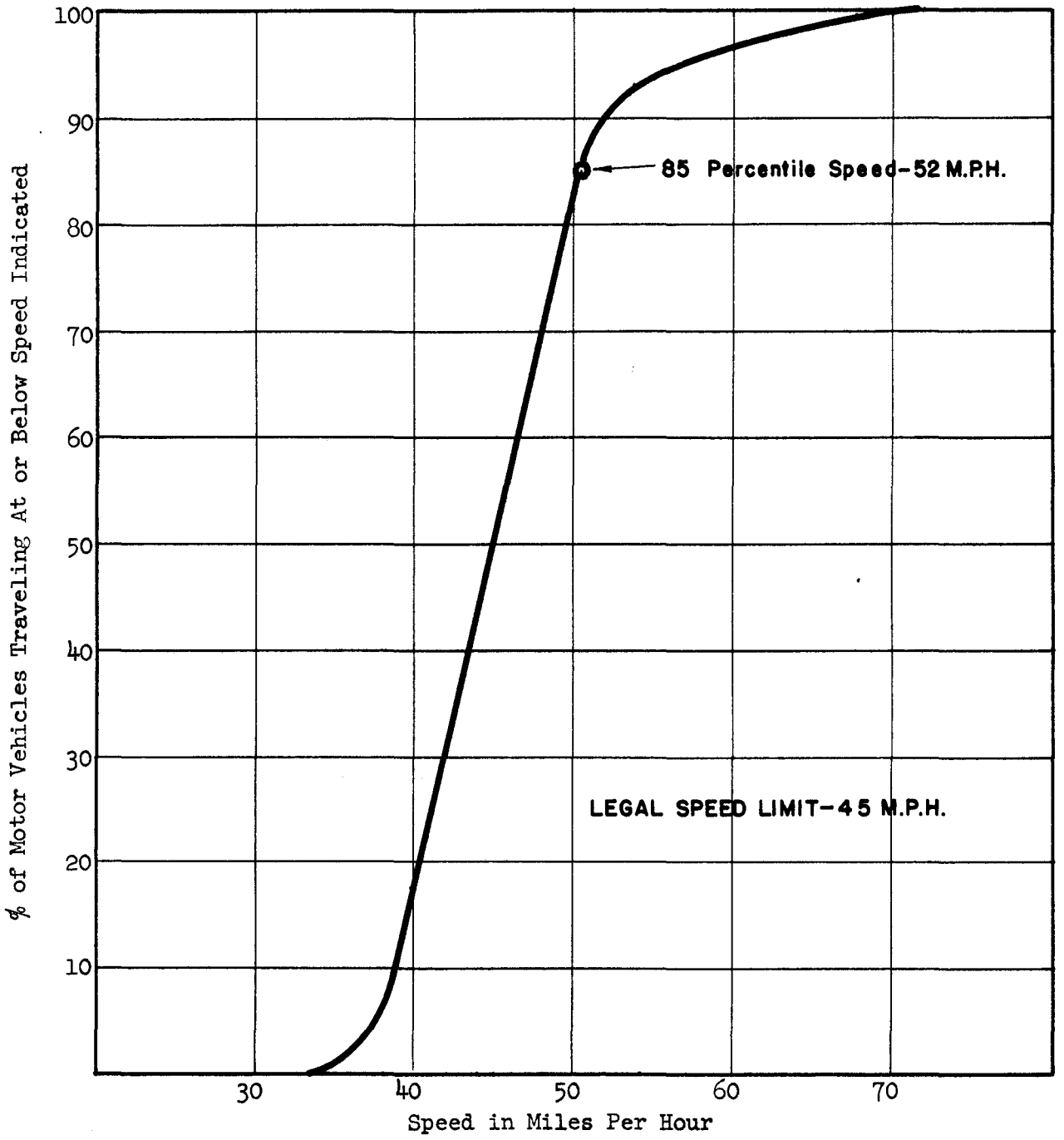
In the speed and delay surveys, the inbound (westbound) runs were made during the morning peak traffic period and the outbound (eastbound) runs during the evening peak period. Results of the respective surveys are shown graphically on Plate X and Plate XI. A summary of the speed and delay survey results, showing the average values for numerous runs made on each route, is included in Table 1 and Table 2 of the Appendix.

Although the speed limit on the Gulf Freeway is higher than the city speed limit which prevails on the four feeder streets, speed and delay surveys included runs from Main Street along the feeder streets and on the Freeway to Telephone Road. Recent speed surveys on the Freeway, where the speed limit is 45 m.p.h., revealed speeds ranging from 34 to 66 m.p.h. with the 85 percentile being 52 m.p.h. (Results of the speed surveys are indicated on Figure 6.) On the four feeder streets between Main Street and Dowling Street, traffic signals are timed for progressive movements of traffic at 30 m.p.h. so that most motor vehicles traveling on those streets move between 30 and 35 m.p.h.

## TIME SAVINGS

Time savings resulting from use of the Gulf Freeway have been calculated and results based upon current traffic volumes are indicated in Table 3 of the Appendix. Motorists who travel by way of the Gulf Freeway to and from Main Street may now complete trips in less than half the time formerly required when they followed old routes. The annual time saving for vehicles operating on the Gulf Freeway has been calculated at 100,684,240 vehicle minutes.

# MOTOR VEHICLE SPEEDS
# GULF FREEWAY




## VEHICLE SPEEDS BETWEEN H.B.&T.R.R. OVERPASSES

Time: 1:00 P.M. To 2:30 P.M.

**FIGURE 6**

In addition to the time saved by motorists who now use the Gulf Freeway, the reduction in traffic on Harrisburg, McKinney, Polk, Leeland and Telephone has relieved traffic congestion so that delays have been appreciably lessened and vehicles move more freely on those streets. Survey results indicate that the average time required for a trip between Main Street and the intersection of Telephone Road and the Freeway by way of the old routes has been reduced by about one and one-half minutes. The total annual time savings for vehicles operating on old routes amount to approximately 5,550,000 vehicle minutes.

## VALUE OF TIME SAVED

Economists have been attempting for many years to assign monetary values to time savings which may be effected in the transportation of persons and goods by motor vehicles. The problem of developing acceptable values has been a difficult one because of the various types of vehicles in use, variations in operating expenses of automobiles, trucks and buses, and the actual value of time savings to persons who travel in motor vehicles and those who transport goods in trucks.

During the last war, it was effectively demonstrated that the term "pleasure vehicle" when applied to an automobile was a misnomer. Many automobiles are used entirely for commercial purposes and the majority are used to some extent for business purposes. Results of a number of surveys indicate that an average of three-fourths of all automobile trips are in connection with work or business. Considering this factor and others which must be weighed and evaluated in determining an equitable monetary value to be applied to savings in time, it is obvious that any measure of time savings in terms of monetary values may be acceptable to some persons and not to others.

A conservative value which may be used for passenger vehicle time savings appears to be 2¢ per minute whereas a similar value for commercial vehicles would be 5¢ per minute. These values apply not only to the savings in operating costs, produced by reductions in delays and in "stop and go" driving at railroad crossings and street intersections, but also to the man-minute savings which accrue to motorists and operators of commercial vehicles.

An application of the values of time savings to vehicles now operating on the Gulf Freeway and on old routes results in the following total annual savings:

| | | |
|---|---|---|
| Time savings by passenger vehicles<br>87,434,240 minutes @ 2¢ per minute | | $1,748,684 |
| Time savings by commercial vehicles<br>18,800,000 minutes @ 5¢ per minute | | 940,000 |
| TOTAL ANNUAL TIME SAVINGS: | 106,234,240 min. | $2,688,684 |

Savings in motor vehicle travel time are of particular interest to the operators of commercial vehicles because in the transportation of goods and in the mass transportation of persons "time is money". The conservative figures which have been applied to time savings in the operation of passenger and commercial vehicles are by no means a measure of the unusually high values which many truck and bus operators attribute to time saved through use of the Gulf Freeway. These time savings will continue to increase as more traffic uses the Gulf Freeway in the future.

# CHAPTER IV

# EFFECT OF THE GULF FREEWAY UPON PROPERTY VALUES

## PROPERTY ADJACENT TO FREEWAY

When plans for the new Gulf Freeway were first announced, real estate developers immediately recognized that the value of land adjacent to the Freeway right-of-way would increase rapidly because of the added accessibility which would be provided by the new roadway. After the roadway alignment was definitely fixed, adjacent land began to change hands and much of the property has been sold and resold many times. Although there has been some leveling off in prices of land since the completion of the first section of the Gulf Freeway to Telephone Road, a point of stability has not been reached. It is probable that land values will not be stabilized along the Freeway until the roadway is completed to Galveston and used for a few years.

In view of the fact that the Gulf Freeway is a limited access roadway, which incorporates two service roads, the abutting property has not been developed for retail trade. A few types of building developments are illustrated on Plate V. Large tracts of land have been purchased and developed for industrial and manufacturing purposes and the purchase prices reflect the desires of business interests to locate along a roadway which will provide an efficient and rapid facility for moving persons and goods. Some of the land acreage adjacent to the Gulf Freeway which was valued at from six cents to eight cents per square foot in 1945, prior to construction of the Freeway, is now valued at sixty cents per square foot. One piece of undeveloped land is now being held by the owner for seventy-five cents per square foot.

Property which formerly abutted streets now within the Freeway right-of-way has appreciated greatly in value but not in proportion to the increase in land value where acreage was made more accessible because of the roadway which has been provided. In general, records reveal that most of the property adjacent to the Gulf Freeway has increased from 200% to 300% in value. No attempt has been made by the City of Houston to reevaluate the land. However, adjustments in property values for taxation purposes will have to be considered in the near future when greater stabilization is evident and as land is further developed.

## PROPERTY ACCESSIBLE VIA FREEWAY

Numerous business and residential developments have been noted since the completion of the Gulf Freeway in areas which are served directly or indirectly by the new roadway. These real estate developments have been justified because of the time savings for motorists which have been provided through use of the Freeway to and from the central


This wholesale distributor of building materials is typical of the businesses attracted by the Gulf Freeway.

The Gulf Freeway provides a rapid transportation facility for manufacturers and distributors. These two plants were constructed on undeveloped land not previously served by adequate streets.


BUILDING DEVELOPMENTS ADJACENT TO GULF FREEWAY

PLATE V

business district and between various sections of the city. Although it is known that property values have risen considerably in the newly developed localities, there is no feasible method for calculating the exact proportion of the increases which may be attributed directly to the accessibility provided by the Freeway.

## PROPERTY ALONG OLD STREET ROUTES

An unsuccessful attempt has been made to determine the effects of the use of the Gulf Freeway, and consequent reductions in traffic on old street routes, upon property values and business along those routes. There are no records available to indicate any reduction in property values on the old streets, such as the two streets shown on Plate VI, which would parallel the reductions in traffic on respective streets. It is possible that the abutting land is just as valuable, when used for business and residential purposes, as it was when the streets carried heavier volumes of traffic. Traffic congestion on the old routes undoubtedly impaired accessibility to property and caused many persons to purchase merchandise and transact business in less congested districts. With a reduction in traffic on the streets, motor vehicles flow in a more fluid manner with less delay and fewer traffic conflicts so that persons may travel faster and may have better access to property abutting the streets.

Some types of business along the old street routes have been adversely affected by the development of the Gulf Freeway, particularly those businesses which depend directly upon motor vehicle traffic. Gasoline filling stations, automotive supply stores and drive-in markets have noted some losses in business because of reductions in traffic. Operators of chain stores and super markets, similar to the ones illustrated on Plate VII, have reported reductions in business since traffic has moved to the Gulf Freeway. One particular operator of a large chain of super markets has stated that the development of freeways similar to the Gulf Freeway may cause a complete change in plans for the locations and types of future markets. He believes that a number of smaller markets located at points which may be served by freeways may be more desirable than the present type of large super market which serves arterial streets and residential districts.

## HOUSTON CENTRAL BUSINESS DISTRICT

Property values and business in a central business district are stimulated by accessibility as well as by the provision of efficient means of transportation for persons and goods, the adequacy of parking terminal facilities, and availability of loading and unloading space for commercial vehicles. Conversely, decentralization of a business district with consequent reductions in property values and business may be attributed to the lack of accessibility. Businessmen and merchants in the central business district of Houston generally agree that the Gulf Free-

way which offers an efficient facility for promotion of accessibility to the business district has favorably affected business and has stabilized property values.

Traffic congestion formerly evident on Telephone Road, a main traffic artery serv- the central business district, has been relieved through construction of the Gulf Freeway. Photograph from Telephone Road overpass.

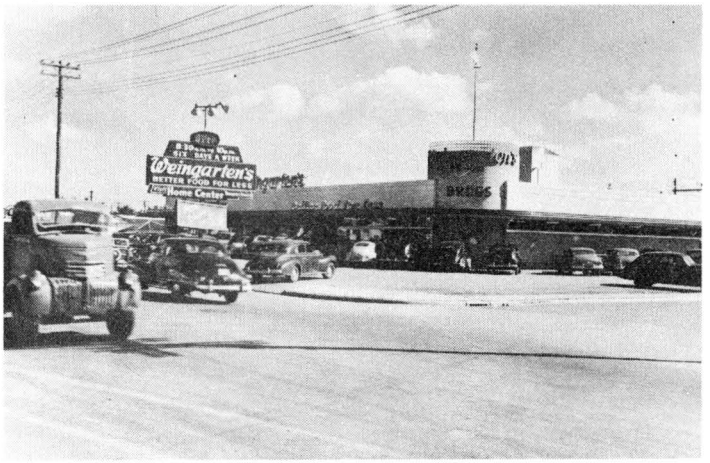
The inadequacies of old traffic arteries are shown in this photograph of Polk Avenue taken from H.B.&T.R.R. underpass. Note narrow roadway and heavy commercialization of abutting property.

OLD TRAFFIC ROUTES TO CENTRAL BUSINESS DISTRICT

PLATE VI

Through traffic which now passes this super-market will be diverted to the Gulf Freeway when section under construction is completed.

Traffic on Telephone Road in front of this super-market decreased about 50% after opening of Freeway. Future trends in trade at such super-markets will reveal whether business is favorably or unfavorably affected by this decrease in traffic.




TYPICAL SUPER-MARKETS ON OLD ROUTES

PLATE VII

# CHAPTER V

## FUTURE FREEWAYS FOR HOUSTON

Several additional freeways which are being planned for Houston are shown on Figure 7. The Texas Highway Department, which has been preparing plans for future freeways, has indicated a willingness to proceed with construction work as soon as the City of Houston provides necessary rights-of-way. A bond issue to supply funds for the acquisition of rights-of-way for the freeways may be submitted to the Houston voters within the next few months. Favorable approval of the proposed bond issue is anticipated.

The Gulf Freeway will not be completed to Galveston until 1951 and other freeways in Houston cannot be constructed and made available to motorists for several years. However, the facts and figures contained in this report demonstrate the value of time savings which have been accruing to motorists as a result of the use of the completed section of the Freeway. Even though the initial cost of construction of the Freeway was relatively high, economists and businessmen probably would agree that a return of over $2,500,000 annually on the investment of $11,000,000 indicates that the roadway is a paying proposition.

In addition to the annual monetary value of time savings which has been evaluated in connection with the use of the Gulf Freeway, other advantages such as reductions in traffic accidents, appreciation in land values, and stabilization of property values and business in the central business district and in other areas have been cited. The facts and figures reveal that a modern freeway is a "necessity" and not a "luxury" and that the relatively higher construction costs may be justified as a sound investment in the provision of efficient motor vehicle transportation.

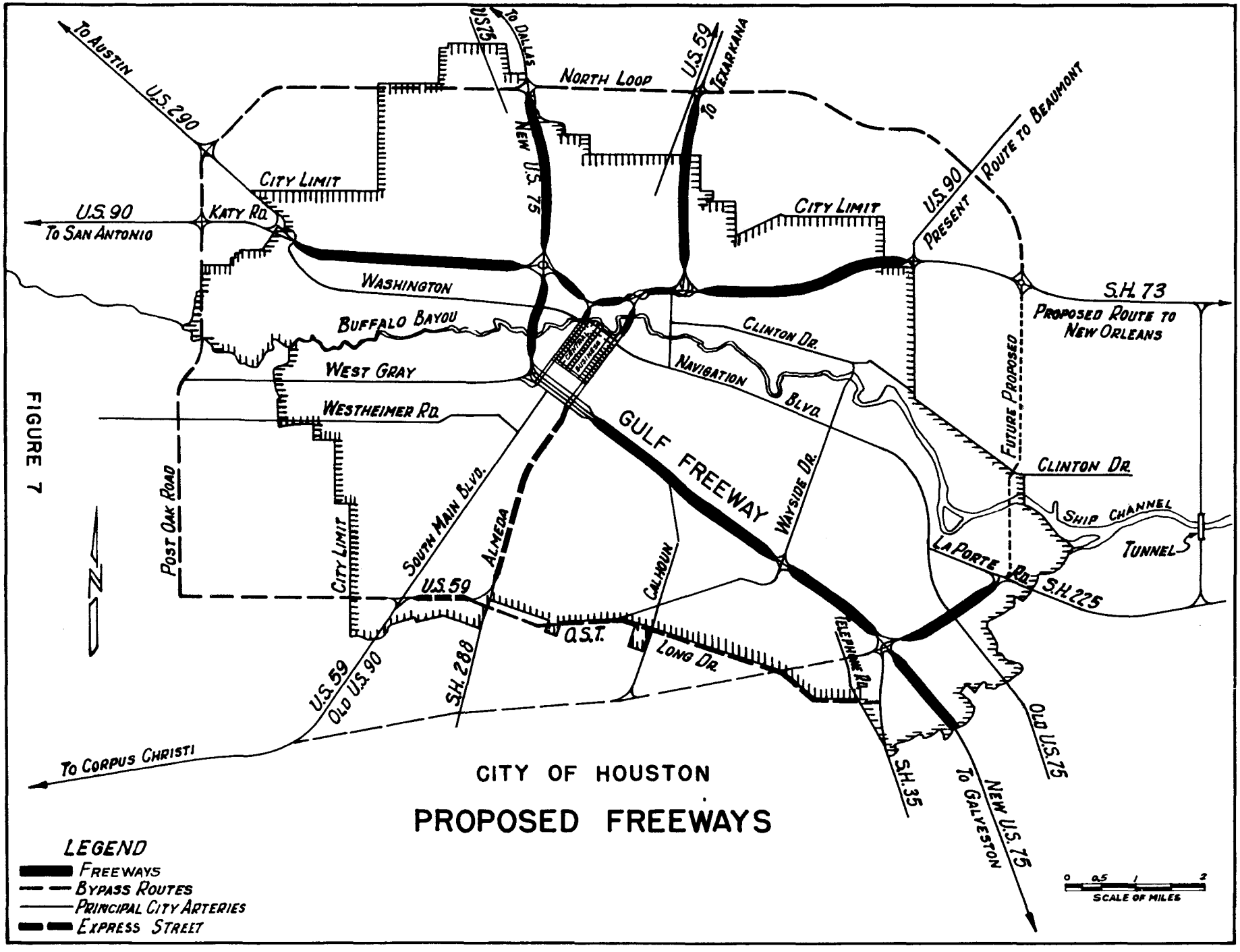
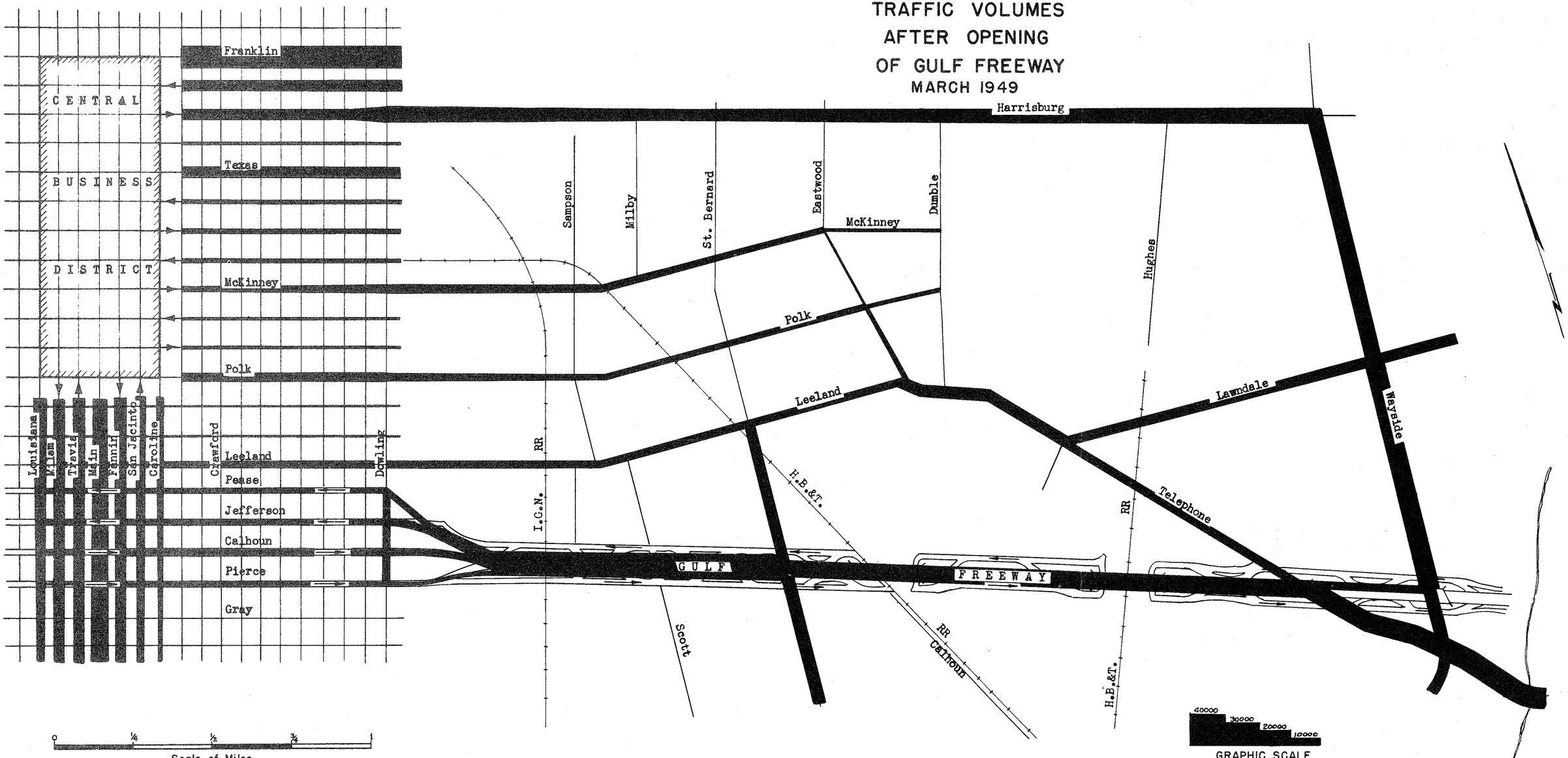

To Austin U.S. 290
U.S. 90
To San Antonio
Katy Rd.
City Limit
U.S. 75
To Dallas
North Loop
New U.S. 75
U.S. 59
To Texarkana
City Limit
U.S. 90
Present
Route to Beaumont
S.H. 73
Proposed Route to New Orleans
Future Proposed
Clinton Dr.
Ship Channel
Tunnel 5
La Porte Rd.
S.H. 225
Old U.S. 75
Washington
Buffalo Bayou
West Gray
Westheimer Rd.
Clinton Dr.
Navigation Blvd.
Gulf Freeway
Wayside Dr.
Post Oak Road
City Limit
South Main Blvd.
Almeda
U.S. 59
Calhoun
A.S.T.
Long Dr.
Telephone Rd.
S.H. 288
U.S. 59
Old U.S. 90
To Corpus Christi
S.H. 35
To Galveston
New U.S. 75
N
0 0.5 1 2
Scale of Miles
City of Houston
Proposed Freeways
Legend
Freeways
Bypass Routes
Principal City Arteries
Express Street

FIGURE 7

PLATE 8

# TRAFFIC VOLUMES AFTER OPENING OF GULF FREEWAY MARCH 1949

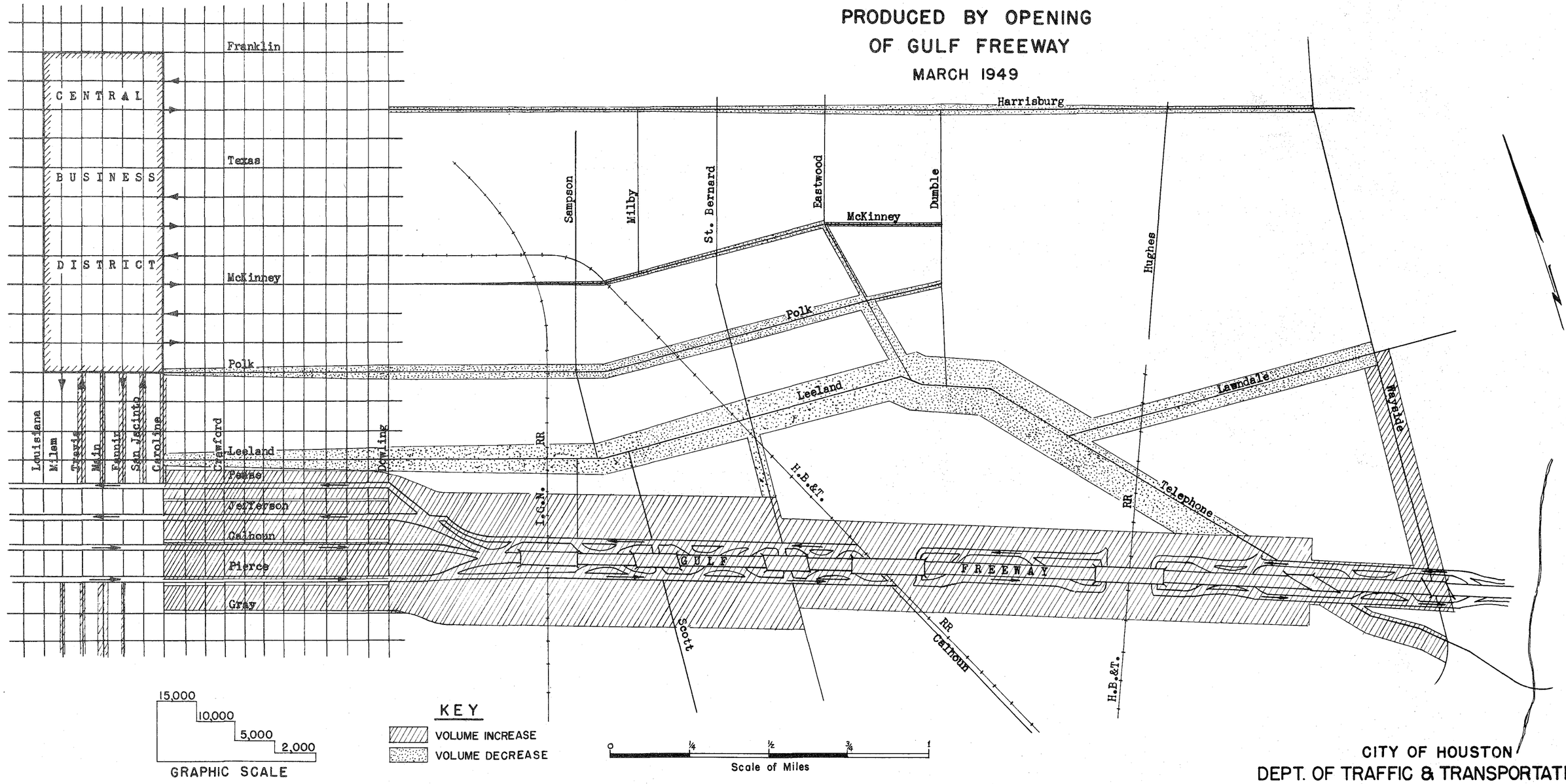



CITY OF HOUSTON
DEPT. OF TRAFFIC & TRANSPORTATION

PLATE 9

# CHANGES IN TRAFFIC VOLUMES PRODUCED BY OPENING OF GULF FREEWAY

MARCH 1949

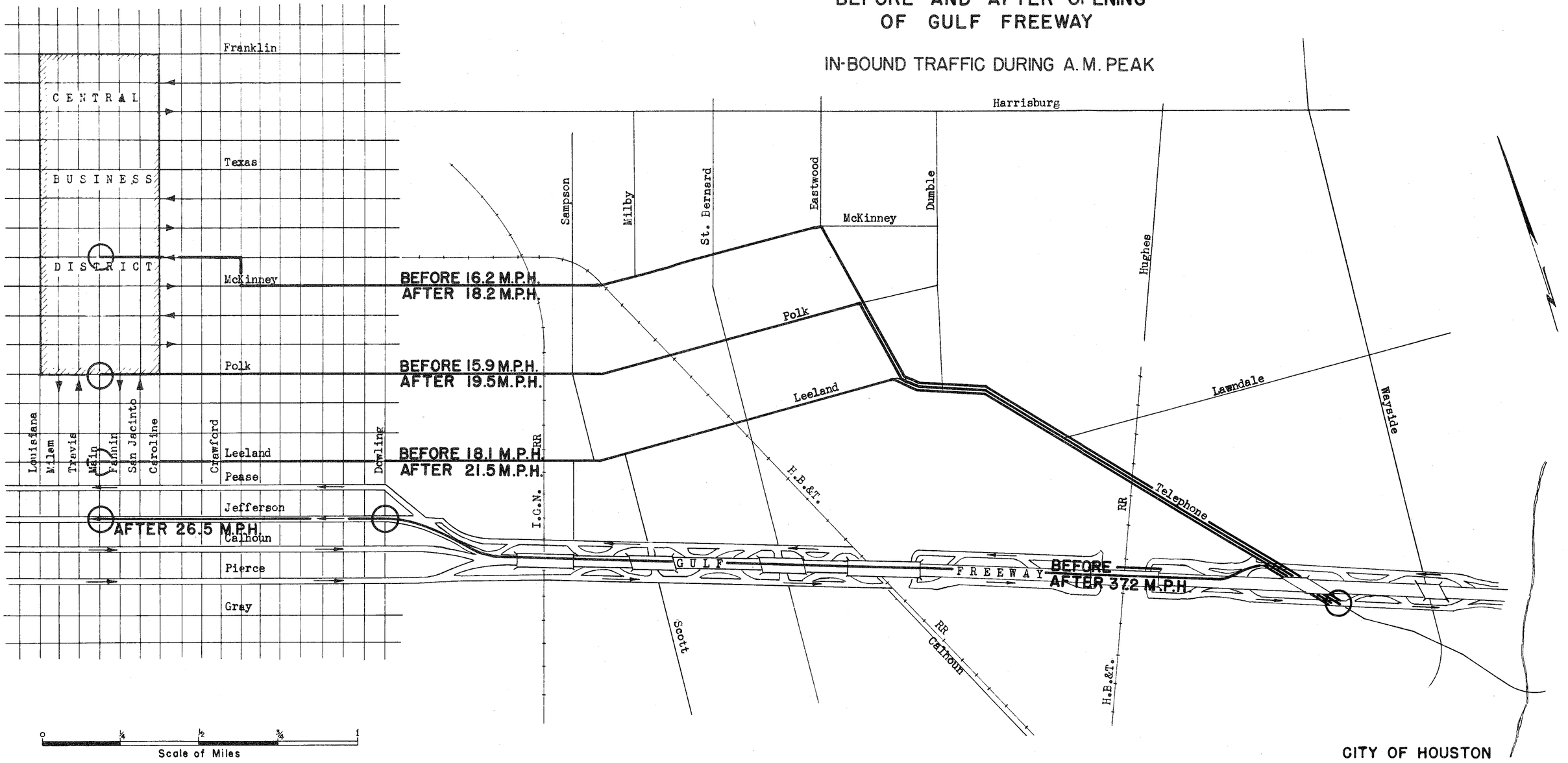



CITY OF HOUSTON
DEPT. OF TRAFFIC & TRANSPORTATION

PLATE 10

# AVERAGE OVERALL SPEEDS BEFORE AND AFTER OPENING OF GULF FREEWAY

## IN-BOUND TRAFFIC DURING A. M. PEAK

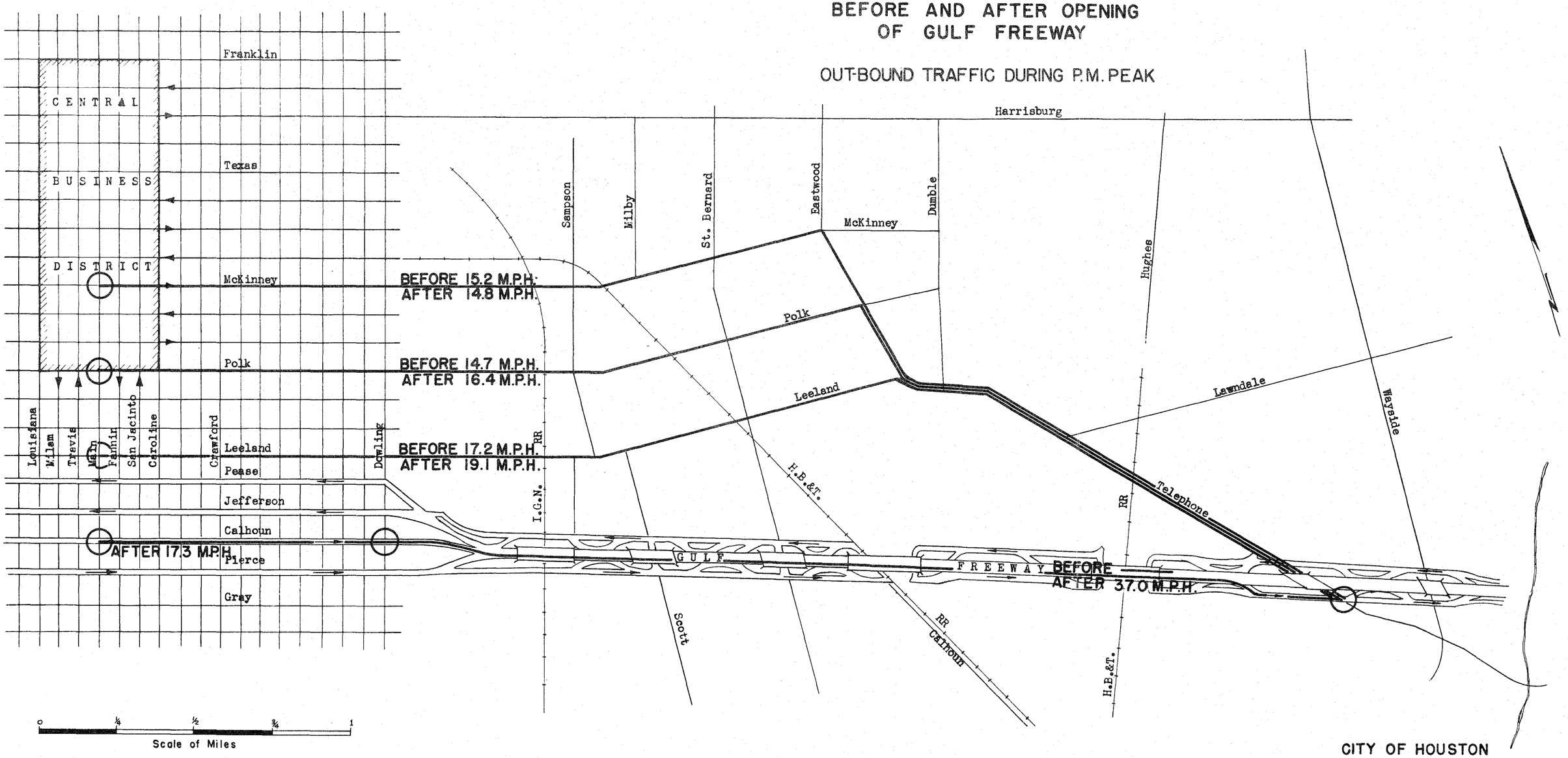



CITY OF HOUSTON
DEPT. OF TRAFFIC & TRANSPORTATION

PLATE II

# AVERAGE OVERALL SPEEDS BEFORE AND AFTER OPENING OF GULF FREEWAY

## OUT-BOUND TRAFFIC DURING P.M. PEAK




CITY OF HOUSTON
DEPT. OF TRAFFIC & TRANSPORTATION

# APPENDIX

TABLE I

## SUMMARY OF SPEED AND DELAY DATA

Average of Test Runs Between Telephone Road and Main Street
Before and After Opening of Gulf Freeway

*MORNING INBOUND RUNS* - 7:30 AM to 8:00 AM

| TEST RUNS | DISTANCE (MILES) | OVERALL TIME | RUNNING TIME | TOTAL DELAY | AV. OVERALL SPEED (MPH) | AV. RUNNING SPEED (MPH) | PERCENT DELAY | NO. OF STOPS |
|---|---|---|---|---|---|---|---|---|
| | | | | **McKinney Avenue** | | | | |
| BEFORE | 4.02 | 14'53" | 12'02" | 2'51" | 16.2 | 20.0 | 19.2 | 9.3 |
| AFTER | 4.02 | 13'15" | 11'06" | 2'09" | 18.2 | 21.7 | 16.2 | 8.5 |
| | | | | **Polk Avenue** | | | | |
| BEFORE | 3.98 | 15'01" | 11'46" | 3'15" | 15.9 | 20.3 | 21.6 | 10.3 |
| AFTER | 3.98 | 12'14" | 10'34" | 1'40" | 19.5 | 22.6 | 13.7 | 6.0 |
| | | | | **Leeland Avenue** | | | | |
| BEFORE | 3.95 | 13'04" | 10'37" | 2'27" | 18.1 | 22.6 | 18.7 | 8.7 |
| AFTER | 3.95 | 11'07" | 9'21" | 1'46" | 21.5 | 25.4 | 17.5 | 9.0 |
| | | | | **Gulf Freeway (Telephone to Dowling)** | | | | |
| AFTER | 2.85 | 4'35" | 4'35" | 0 | 37.2 | 37.2 | 0 | 0 |
| | | | | **Freeway Feeder Streets (Dowling to Main)** | | | | |
| AFTER | 0.87 | 1'59" | 1'56" | 0'03" | 26.5 | 27.2 | 2.5 | 0.5 |
| | | | | **Gulf Freeway Including Feeder Streets (Telephone to Main)** | | | | |
| AFTER | 3.72 | 6'34" | 6'31" | 0'03" | 34.0 | 34.3 | 0.1 | 0.5 |

TABLE 2

## SUMMARY OF SPEED AND DELAY DATA

Average of Test Runs Between Main Street and Telephone Road
Before and After Opening of Gulf Freeway

*EVENING OUTBOUND RUNS* - 5:00 PM to 5:30 PM

| TEST RUNS | DISTANCE (MILES) | OVERALL TIME | RUNNING TIME | TOTAL DELAY | AV. OVERALL SPEED (MPH) | AV. RUNNING SPEED (MPH) | PERCENT DELAY | NO. OF STOPS |
|---|---|---|---|---|---|---|---|---|
| | | | | **McKinney Avenue** | | | | |
| BEFORE | 4.02 | 15'55" | 12'15" | 3'40" | 15.2 | 19.7 | 23.1 | 11.0 |
| AFTER | 4.02 | 16'17" | 11'54" | 4'23" | 14.8 | 20.3 | 28.2 | 9.0 |
| | | | | **Polk Avenue** | | | | |
| BEFORE | 3.98 | 16'13" | 11'54" | 4'19" | 14.7 | 20.7 | 26.6 | 10.0 |
| AFTER | 3.98 | 14'36" | 12'09" | 2'27" | 16.4 | 19.7 | 16.8 | 8.5 |
| | | | | **Leeland Avenue** | | | | |
| BEFORE | 3.95 | 13'48" | 11'44" | 2'04" | 17.2 | 20.2 | 15.0 | 8.0 |
| AFTER | 3.95 | 12'25" | 10'46" | 1'39" | 19.1 | 22.0 | 13.3 | 5.5 |
| | | | | **Freeway Feeder Streets (Main to Dowling)** | | | | |
| AFTER | 0.87 | 3'02" | 2'22" | 0'40" | 17.3 | 22.2 | 22.0 | 1.5 |
| | | | | **Gulf Freeway (Dowling to Telephone)** | | | | |
| AFTER | 2.85 | 4'36" | 4'36" | 0 | 37.0 | 37.0 | 0 | 0 |
| | | | | **Gulf Freeway Including Feeder Streets (Main to Telephone)** | | | | |
| AFTER | 3.72 | 7'38" | 6'58" | 0'40" | 29.3 | 32.1 | 9.2 | 1.5 |

## SUMMARY OF TIME SAVINGS

Figures Based Upon Results of Speed and Delay Survey
Test Runs Between Telephone Road and Main Street

### TIME SAVED BY USING GULF FREEWAY

| | |
|---|---|
| AV. RUNNING TIME ON OLD ROUTES (PRIOR TO OPENING OF FREEWAY) | 14 MIN. 49 SEC. |
| AV. RUNNING TIME ON FREEWAY | 7 MIN. 06 SEC. |
| AV. TIME SAVING PER VEHICLE | 7 MIN. 43 SEC. |
| AV. ANNUAL VOL. OF TRAFFIC ON FREEWAY (AV. DAILY VOL. 38,000 VEHICLES) | 13,042,000 VEHICLES |
| **ANNUAL TIME SAVED BY USING FREEWAY** | **100,684,240 Veh. Min.** |

### TIME SAVED ON OLD ROUTES

| | |
|---|---|
| AV. RUNNING TIME ON OLD ROUTES: | |
| PRIOR TO OPENING OF FREEWAY | 14 MIN. 49 SEC. |
| AFTER OPENING OF FREEWAY | 13 MIN. 19 SEC. |
| AV. TIME SAVING PER VEHICLE | 1 MIN. 30 SEC. |
| AV. ANNUAL VOL. OF TRAFFIC ON OLD ROUTES | 3,700,000 VEHICLES |
| **ANNUAL TIME SAVED ON OLD ROUTES** | **5,550,000 Veh. Min.** |
| TOTAL ANNUAL TIME SAVED | 106,234,240 Veh. Min. |

TABLE 3