A COMPREHENSIVE SUPERHIGHWAY PLAN FOR THE CITY OF CHICAGO

EDWARD J. KELLY
Mayor

GEORGE D. KELLS
Chairman, Committee on Traffic and Public Safety

CHARLES E. DE LEUW, Consulting Engineer

WILLIAM R. MATTHEWS, Engineer, Department of Public Works

A. J. SCHAFMAYER, Engineer, Board of Local Improvements

DEPARTMENT OF SUPERHIGHWAYS

PHILIP HARRINGTON, Acting Commissioner

1939

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PHILIP HARRINGTON, Acting Commissioner

Submitted to the Mayor and the City Council of
the City of Chicago October 30, 1939

ADDRESS ALL COMMUNICATIONS TO THE ACTING COMMISSIONER

DEPARTMENT OF SUPERHIGHWAYS

CITY OF CHICAGO

20 NORTH WACKER DRIVE

TELEPHONE RANDOLPH 6440

EDWARD J. KELLY
MAYOR

PHILIP HARRINGTON
ACTING COMMISSIONER

October 30, 1939.

TO THE HONORABLE,
THE MAYOR AND THE CITY COUNCIL
OF THE CITY OF CHICAGO

GENTLEMEN:

On March 1, 1939, in a communication to the City Council, His Honor, Mayor Edward J. Kelly presented a physical and financial program looking to the adoption and early construction of a comprehensive system of superhighways designed to meet the traffic requirements of the City of Chicago.

The plan suggested by the Mayor at that time consisted of two major thoroughfares to the west side area, and one each to the northwest, southwest and southeast sections of the City. He estimated the cost of these highways at $100,000,000 and suggested that this cost be allocated equitably between the City, State, and County of Cook, with possibly some Federal cooperation. He further suggested that the City's share of the cost be defrayed by the issuance of long term obligations payable out of its share of future motor fuel taxes, and called attention to the fact that it would be necessary for the City to obtain enabling legislation to make this possible.

The City Council authorized the Mayor to negotiate with the other interested public agencies and instructed the Corporation Counsel to prepare and present the necessary enabling legislation to the General Assembly (Journal, Council Proceedings March 1, 1939, Page 8094).

Such enabling legislation was promptly prepared by the Corporation Counsel and introduced in the General Assembly by Senator Ward on March 7, 1939. An informal engineering committee consisting of representatives of the City, County and State instituted studies of the program, both engineering and financial, and held conferences with representatives of the Federal Bureau of Roads, Chicago Park District, the Chicago Plan Commission and the Chicago Regional Planning Association, as well as other public and civic bodies, all of whom gave full cooperation.

The bills were finally passed on June 29, 1939. They authorize the City and County of Cook to each pledge a portion of its share of the motor fuel tax (but

not to exceed 50 per cent) for this purpose, and require that plans showing specific locations of highways to be constructed under this authority be filed with the State Division of Highways on or before March 1, 1940.

A report on the progress of this superhighway program was submitted by the Mayor to the City Council in a communication dated August 8, 1939, in which he urged the Council and its appropriate committees to give prompt consideration to the matter of adopting and approving final plans for constructing and financing this project. On that same date, the City Council assigned the problem to a special committee to be composed jointly of the members of the Committee on Finance and the Committee on Traffic and Public Safety. (Journal, Council Proceedings August 8, 1939, Page 656.)

Thereafter, on August 30, 1939 (Journal, Council Proceedings 779-782), pursuant to recommendations of its committee, the Council passed an ordinance establishing a Department of Superhighways and creating the office of Commissioner of Superhighways; adopted a resolution authorizing the issuance and sale of $100,000 Motor Fuel Tax Notes under the new enabling legislation in force July 22, 1939; adopted another resolution authorizing the Commissioner of Superhighways to expend not to exceed $100,000 for engineering costs necessary for surveys and the preparation of plans and specifications for a system of superhighways: and adopted a resolution establishing a joint engineering committee composed of representatives of the State, County and City to make surveys, studies, plans and estimates of cost of an Initial System of Superhighways for the City of Chicago, and invited the Public Roads Administration of the Federal Works Agency and the Chicago Plan Commission to cooperate and advise with said joint committee.

The ordinance establishing the Department of Superhighways provides:

> "Section 6. Until such time as funds are made available for construction work from the proceeds of the sale of motor fuel tax notes or otherwise, the Commissioner of Subways and Traction shall be Acting Commissioner of Superhighways."

The ordinance further provides that the Commissioner of Superhighways

> "shall have the power and it shall be his duty to make surveys and studies and to prepare plans and specifications for the opening, widening, extending, improving, constructing or reconstructing of roads, streets or thoroughfares within the city to be paid for, in whole or in part, from the proceeds of sales of notes issued under authority of 'An Act authorizing the issuance and sale and providing for payment of motor fuel tax notes,' in force July 22, 1939."

Pursuant to this ordinance, there has been prepared under my direction and I present herewith, a comprehensive superhighway plan for the City of Chicago. (Figure 1.)

In the preparation of this report, I desire to express my appreciation of the efforts of Mr. Charles E. DeLeuw, Consulting Engineer for the City, Mr. W. R. Matthews, Engineer for the Chicago Department of Public Works, and Mr. A. J. Schafmayer, Engineer for the Board of Local Improvements, to whom fell the task

of studying and developing the details of the plan and the preparation of the accompanying report. I also desire to acknowledge the cooperation and assistance of the County and State Highway Departments, the Federal Public Roads Administration, the Chicago Park District, the Chicago Plan Commission, and the Chicago Regional Planning Association.

In selecting a comprehensive superhighway plan as here recommended, its adaptability to the promotion of general city development (which embraces but is not limited to its traffic capacity) was considered the paramount test.

Quoting from a report submitted November 22, 1937 recommending a comprehensive local transportation plan for the City of Chicago, the writer, in collaboration with R. F. Kelker, Jr. and Charles E. DeLeuw, expressed these fundamentals (Page 240 et seq.):

> The primary function of a major improvement project for a metropolitan city is to promote the physical and social welfare of its citizens. The requirements of its people are four-fold and may be classified as residential, occupational, cultural and recreational. The city must provide attractive and adequate services and opportunities for living, working and playing, and to do so must stimulate the broadest and best uses of its commercial and industrial advantages.
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> * * * * *
>
> To articulate the industrial and commercial activities of a large city with the physical and social welfare of its people requires that industrial establishments be convenient to, but not in conflict with residential areas.
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> * * * * *
>
> It must be noted that convenience is an elemental requirement common to all phases of urban life and activity.
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> * * * * *
>
> The metropolitan city of today is a complex mechanism. Its streets and highways are its mediums of transport. They constitute the land use set aside not only for the movement of large numbers of persons, but also for the transportation of vast quantities of goods. In many cases, they are used for the storage of vehicles as well. Intermingled upon them and frequently hopelessly entangled, are pedestrians, private automobiles, trucks, street cars, buses, taxicabs, and sometimes bicycles. Overhead and underground "transportation" facilities are usually present. To a great extent, this is the prevalent condition of streets in Chicago today.
>
> * * * * *
>
> With this conglomerate use of thoroughfares increasing steadily, the only apparent method that offers hope of disentangling traffic and providing facility and safety of movement for all, lies in a segregation of dissimilar types of traffic.
>
> * * * * *
>
> In general, urban modes of travel can be classified in two groups:
>
> 1. *Fast moving traffic* which includes the private automobile and taxicab employed in through travel, and the long haul service furnished by mass transit.
> 2. *Slow moving traffic* which includes the private automobile and taxi-

cab operating in its origin and destination zones; local service furnished by mass transit; the motor truck; and the pedestrian.

* * * * *

To segregate these groups requires the allocation of arteries for the exclusive use of each.

* * * *

Thus the solution to the problem of providing convenient means of travel to all citizens of the city involves planning for the more efficient use of both mass transportation vehicles and private automobiles.

* * * * *

Engineering practice and scientific planning dictate that the projects recommended for the solution of this problem must not only be structurally and economically sound, but must lend themselves to the broad development and orderly expansion of other civic improvements.

* * * * *

The removal of thousands of automobiles from the surface will produce an increased street capacity equivalent to that attainable by the expenditure of large sums for widening. It is not unreasonable to expect that modernization of surface facilities and new superhighways may produce some general improvement to areas now badly in need of revitalization.

* * * * *

The plan here recommended is based primarily on satisfying these fundamental requirements. It is proposed that a master plan be adopted, consisting of six superhighways, radiating from the four corners of a modified quadrangle around the central business district. These radial superhighways would be articulated by a crosstown superhighway providing for heavy movements of through traffic north and south across the City along a line two to three miles west of the central business district.

Where feasible the express roadways of these superhighways are recommended to be eight lanes wide, centered in broad rights-of-way, thus aiming to benefit rather than depreciate the districts traversed.

Dividing the program into two construction stages, the following superhighways are proposed for initial construction:

Superhighway	*Limits*	*Length in Miles*	*Estimated Cost*
North	Foster to Bryn Mawr	0.7	$ 3,000,000
Northwest	Orleans to Menard	9.3	30,000,000
West	Outer Drive to Austin	7.7	32,000,000
Southwest	Harrison to Garfield	7.3	29,000,000
Southeast	49th to State Line	7.5	16,000,000
Total		32.5	$110,000,000

The *North Side initial construction* is an extension of the outer drive from Foster Avenue to Bryn Mawr Avenue, to be eventually extended to the City limits.

The determination of the exact type and route of the *Northwest highway* can be made only after the completion of detailed surveys, estimates of cost, and

analysis of relative traffic and city benefits. The County Highway Department is now engaged in this study.

The route selected for the *West Side Superhighway*, after consideration of many previous plans and suggested alternate routes, supplemented by our own surveys, follows the general line of Congress Street, from a connection with Columbus Drive east of Michigan Avenue to the Medical Center, thence swinging north to Van Buren Street. The section west of Garfield Park to Columbus Park follows a route along the north side of Van Buren Street. This highway would be elevated from Wells Street to Throop Street and depressed ("parkway type") west of Throop Street. East of Wells Street it is indicated as a surface street, although there have been suggestions that it be carried east to Grant Park as an elevated structure. A detailed study of the Congress Street route as recommended, together with various alternates, is contained in a companion report also being filed with the City Council today, entitled "A Comprehensive Plan for Extension of the Subway System."

The *Southwest Highway* route selected for initial construction follows the general route of Franklin Street south to Cermak Road, southwest to the vicinity of 31st Street and Damen Avenue, thence south to Garfield Boulevard. The Illinois and Michigan Canal route should also be constructed as soon as abandonment of the canal and filling can be accomplished. This should be undertaken now. Likewise an extension of this route along the line of Archer Avenue to Harlem Avenue should be included.

The *Southeast Superhighway* would be an extension of the outer drive south and east to a connection with Indianapolis Avenue at or near the Indiana State Line.

The completion of this initial program should be promptly followed by the inauguration of work on the remainder of the plan embracing an additional 29.7 miles estimated to cost $95,000,000, making a total program of 62.2 miles of superhighways and a total cost of $205,000,000.

Considering the fact that more than $400,000,000 has been spent on street improvements in Chicago in the last 25 years, and comparing the substantial benefits that can be expected from this proposal, it is none too broad in scope as a long range program.

Among the significant features of the report are these:

Automobile registration has increased from one car per 70 inhabitants, to one per 7 in the last 24 years.

Over one-third of the total traffic of the State of Illinois is concentrated on the streets of Chicago.

With the exception of the outer drive, Chicago has no highway approaching the characteristics or efficiency of a superhighway.

In 1938, traffic injuries in Chicago totaled 20,719 persons with 686 fatalities.

Widened surface streets showed the worst accident records.

The specification recommended for these superhighways requires:

Location and design must coordinate with inter-regional plan
Terminals must be adequate
Continuous separation from cross traffic
Separation of through roadways from abutting property
Limited access to express roadways
Separation of opposing streams of traffic
Ample widths of lanes
Adequate ramps
Adequate terminal facilities
Elimination of pedestrians and parking
No traffic control lights
Minimum as well as maximum speeds
Depressed "parkway type" where feasible and economical, to provide greatest benefit to surrounding areas

The combined capacity of the five initial superhighways will be 30,000 vehicles per hour.

Initial use is estimated at 250,000 vehicles daily, and an initial travel of 600,000,000 vehicle miles annually.

Where segregation is almost complete on the outer drive, there were 8 accidents in 10,000,000 vehicle miles in 1938. On Cicero Avenue betwen Irving Park and Roosevelt Roads there were 189 accidents per 10,000,000 vehicle miles. Analysis indicates that the use of the proposed superhighways can be expected to eliminate 2,700 traffic injuries and 80 fatalities each year.

Transfer of fast traffic to superhighways will free surface streets for local and commercial uses, and reduce congestion.

It is estimated that the saving to motorists in time and expense will amount to $16,000,000 annually. This figure does not include the enormous saving to business and industry in speeding up commercial deliveries.

Analysis indicates the greater benefit (both to riders and property) will be to Chicago residents, as compared with the popular conception that suburbs will be greatest beneficiaries. In fact, at present, the population of the suburban areas is increasing at twice the rate of increase of the City of Chicago.

The City can finance its $30,000,000 share of the $110,000,000 program without interference with its normal highway requirements. Cost of amortizing notes is only slightly greater than present payments from motor fuel tax of $2,000,000 annually to the Board of Education. These payments terminate in 1940.

The County of Cook can likewise finance its $30,000,000 share of the program, having both motor fuel tax note and bonding power.

The State of Illinois can reasonably be expected to contribute part of its highway revenues, in the interest of providing adequate terminals for its State wide system.

The Federal Public Roads Administration is advocating that the United States Government extend substantial financial assistance toward the acquisition of rights-of-way for metropolitan superhighway projects. pointing out that the most influential causes of delay are the cost and legal obstacles that stand in the way of obtaining essential rights-of-way.

In the preparation of this report and the selection of the plan recommended, attempt has been made to fairly evaluate the adaptability of each possible alternative to the fundamental principles which we believe to be basic to this problem. It is presented, not with the expectation that it will be adopted exactly as submitted, but rather in the hope that it will provide in concrete form, the material necessary for your committee to carry on its studies and hearings, so that the recommendation and adoption of an official plan may be expedited.

The act authorizing the financing of the cost of these superhighways requires that plans showing specific locations must be filed with the State Division of Highways on or before March 1, 1940.

Before the work of preparing plans and specifications for the City's share of this program can proceed as required by the ordinance, it is necessary that specific routes be officially adopted, and the portions to be undertaken by each public agency must be agreed upon.

Therefore, it is requested that this report and plan be received and referred to the appropriate committee for its prompt consideration.

Respectfully submitted,

Philip Harrington

Acting Commissioner.

PROPOSED
COMPREHENSIVE SUPERHIGHWAY PLAN
FOR
THE CITY OF CHICAGO

OCTOBER 1939

FIGURE I

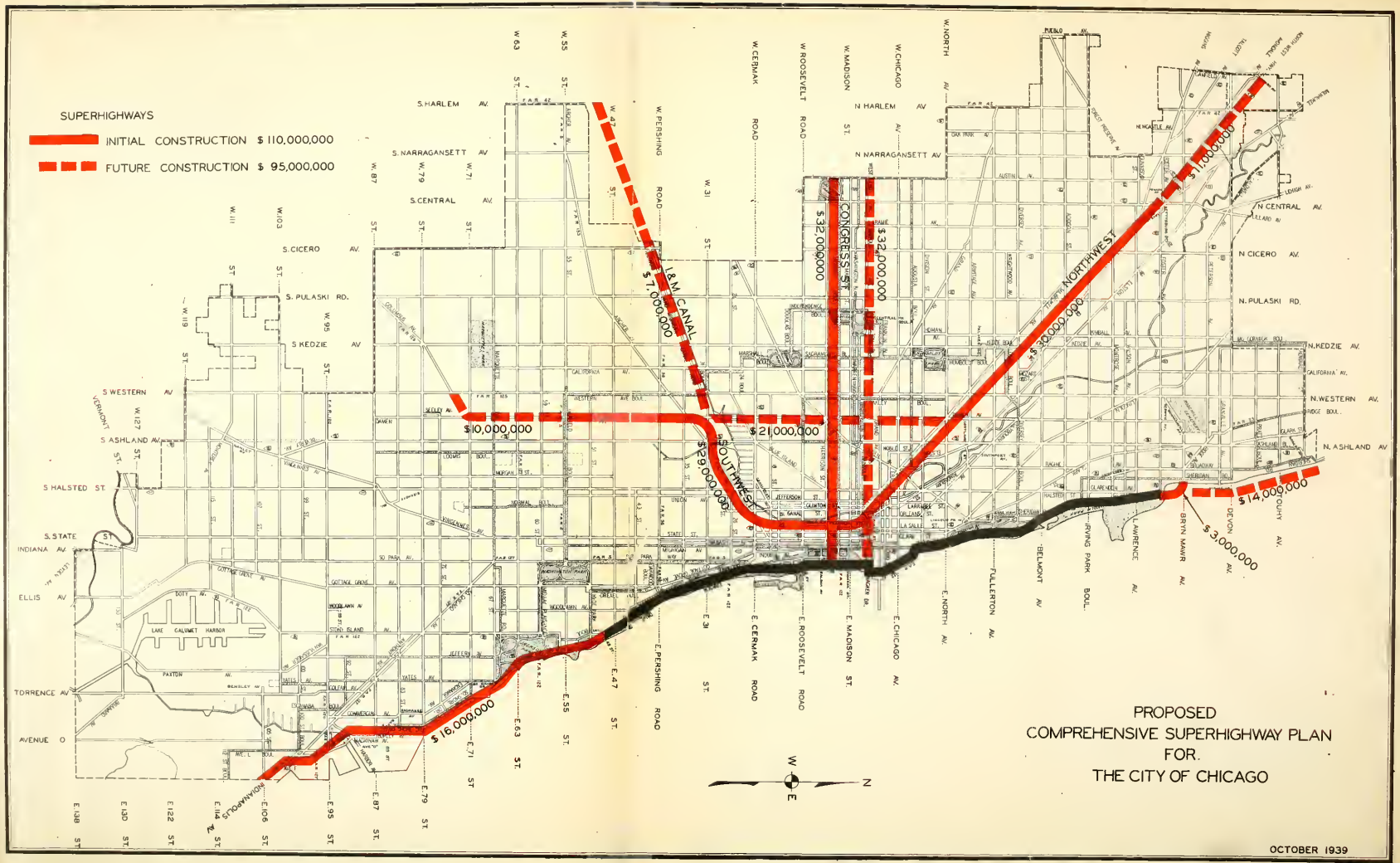

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FIGURE I

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THE INITIAL USE AND THE CAPACITY OF THE PROPOSED WEST SIDE SUPERHIGHWAY

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(Follow Appendix)

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(Follows Figures Listed on Page 13)

Contained in "A Comprehensive Plan for the Extension of the Subway System of the City of Chicago" submitted on October 30, 1939.

NUMBER

SUMMARY OF REPORT

October 27, 1939.

Mr. Philip Harrington,
Acting Commissioner of Superhighways,
City of Chicago.

Dear Sir:

A report on a comprehensive superhighway plan for the City of Chicago has been prepared by this engineering committee and is transmitted herewith for consideration. This committee was organized by Mayor Edward J. Kelly pursuant to authority of the Chicago City Council of March 1, 1939. Its organization followed conferences of officials of the State of Illinois, the County of Cook and the City of Chicago, at which there was agreement as to the urgent need for superhighway construction and also as to the advisability of securing enabling legislation to permit the several highway agencies to finance a comprehensive superhighway program in the City of Chicago.

Preliminary studies were commenced early in March with a view to establishing the general pattern of a comprehensive superhighway development in Chicago as well as the probable cost of the projects to be constructed initially. At the same time various data were assembled relative to the extent, condition and use of the state, county and city primary road systems, the characteristics of traffic and the necessity for providing through traffic facilities in the terminal metropolitan area. Analysis was made not only of the necessity for such a program but also of the benefits to be derived, all of which was assembled and submitted to the State Legislature for its consideration in connection with the enabling legislation, which was introduced by Senator Harold Ward on March 7, 1939. Subsequent to the final passage of the bills, which became effective on July 25th, these preliminary studies were carried further with a view to the submission of the comprehensive superhighway plan recommended herein.

In this work, the committee has had occasion to consult frequently with engineers of the State Division of Highways and the Cook County Highway Department. There have also been conferences with engineers of other agencies such as the Public Roads Administration of the Federal Works Agency, the Chicago Park District, the Chicago Plan Commission and the Chicago Regional Planning Association, as well as other public and quasi-public bodies. Superhighways of various types were inspected in both New York and St. Louis and we are greatly indebted to the officials and engineers of the New York City Department of Parks, the New York Port Authority, the Borough of Manhattan of New York City and the Board of Public Service of the City of St. Louis for the many courtesies

extended on these field inspections. Advantage has been taken and study made of the numerous reports and plans previously prepared for superhighway or elevated highway construction in and near the City of Chicago.

The report describes in a general way the studies made of various phases of the problem necessarily preliminary to the preparation of a general plan of superhighways: including trends in ownership and use of motor vehicles, the effects of automobile transportation on social development, the existing physical development of the highway systems in and near Chicago, and finally the present and probable future traffic densities on the local and suburban thoroughfares. Notwithstanding the expenditure of more than $400,000,000 in the past 25 years for street improvements in the City of Chicago, there is at present a condition of intolerable congestion resulting from the intermingling of through traffic moving at high speeds through well developed commercial districts with cross traffic streams intersecting at practically every street corner. One of the results of this is the current heavy toll of traffic accidents—17,231 in Chicago in 1938 resulting in the injuries to 20,719 persons and 686 fatalities. That these street widening improvements constructed at the cost of many million dollars have failed to meet traffic needs is indicated by the fact that accident records are the worst on the thoroughfares with widened roadways and with heavy concentrations of through traffic.

It is evident that nothing less than a major operation will meet the present situation. It is now recognized that the existing system of streets at grade, with through traffic subject to continual interference from cross traffic and parking, is no longer adequate and that the construction of superhighways free from grade crossings and providing for the segregation of through traffic from local vehicular and pedestrian traffic is an immediate necessity.

The report discusses briefly the general engineering requirements for modern superhighways—developed by experience in the construction and operation of many miles of such thoroughfares in densely built up metropolitan areas during the past few years. The several available types and the advantages of each are covered in some detail. The conclusion is reached that the eight-lane express roadways should generally be centered in broad rights-of-way and located either above or below the intersecting streets. Such construction, through which the express roadways are separated from abutting property and parallel service drives by broad landscaped parkways, will be a benefit rather than a detriment to the neighborhoods penetrated by these thoroughfares, and in the long run will cost no more than elevated highways on narrow rights-of-way.

In the preparation of the comprehensive plan, the pronounced radial character of flow from the great central district to thoroughfares extending outwards from the city limits in all directions was recognized. Therefore, six superhighways, largely radial in character, are included in the plan. This system is supplemented

and articulated by a crosstown superhighway providing for heavy movements of through traffic north and south through the city along a line about 2 miles west of the central business district.

The comprehensive superhighway plan is proposed to be accomplished in two steps; an initial program involving 32.5 miles of superhighway at a total estimated cost of $110,000,000 and a future program involving an additional 29.7 miles at a total cost of $95,000,000. The entire plan includes some 62 miles of superhighways at a total cost of $205,000,000. The superhighways recommended for inclusion in the general plan, their lengths and approximate costs are summarized as follows:

ESTIMATED COSTS OF SUPERHIGHWAYS

Initial Program

Superhighway	*Limits*	*Length in Miles*	*Estimated Cost*
North	Foster to Bryn Mawr	0.7	$ 3,000,000
Northwest	Orleans to Menard	9.3	30,000,000
West	Outer Drive to Austin	7.7	32,000,000
Southwest	Harrison to Garfield	7.3	29,000,000
Southeast	49th to State Line	7.5	16,000,000
	Total	32.5	$110,000,000

Future Program

North	Bryn Mawr to City Limits	2.5	$ 14,000,000
Northwest	Menard to City Limits	3.3	11,000,000
West (Second Route)	Outer Drive to City Limits	8.2	32,000,000
Southwest—			
I. & M. Canal	Damen to Harlem	7.3	7,000,000
South Extension	Garfield to 74th	2.7	10,000,000
North and South Crosstown	31st to Northwest Superhighway	5.7	21,000,000
	Total	29.7	$ 95,000,000

The report takes up in some detail the problems of distribution of superhighway traffic near the central business district. It is recognized that the building of these new facilities will induce additional travel. Studies were made to determine the latent capacity of the existing street system in and near the central business district for the distribution of the traffic concentrated on radial superhighways to ultimate destinations in the central district. A number of streets were found on the north and west sides of the central business district which now carry but little traffic and therefore have a great latent capacity and which can be made to function as supplemental distributor streets. More efficient traffic regulation, particularly to eliminate the double parking now prevalent on

most of these thoroughfares and the construction of modern and wider pavements such as those on Franklin Street and Harrison Street will provide ample capacity for distribution of traffic from the superhighways into the central area. In the central business district proper a vast improvement will be effected and substantial increases in traffic capacity afforded through the construction of the two street car subways proposed in Washington and Jackson Streets east of Clinton Street. It seems likely, therefore, that the existing street system in the central business district, when relieved and improved as proposed, has capacity for the accommodation of such additional traffic as may result from the construction of superhighways.

The report also deals with the necessity for through highways in or near the loop district. Exceptional facilities for through movements between the north and south sides are now provided by the Outer Drive. Comprehensive and detailed surveys made in 1930 and 1931 show the volume of traffic moving from the west side to either the north or south sides to be insignificant. However, the concentration of traffic from the proposed west and southwest superhighways near the southwest corner of the central business district makes it advisable to provide a cross connection extending between the southwest and the northwest corners of this district so as to provide for the free movement of traffic along its western boundary, and this connection is included in the plan.

The comprehensive system of superhighways, when completed, will form a network of express routes intersecting practically all of the major traffic streets and boulevards in the city. Convenient, fast and safe express routes with four lanes in both directions will be provided for through traffic. Practically all of the great central area bounded by Lake Michigan, Belmont Avenue, California Avenue and Pershing Road will be within one mile of the comprehensive system. The proposed superhighways will connect with the more important state and interstate highways at or near the city limits. The direct benefits to motorists, using these thoroughfares through time savings, more direct routes and accident reduction—based on the initial program only—is calculated at more than $16,000,000 per annum. The great benefit to commerce and industry which will result from freeing surface streets through business centers from heavy streams of through traffic will be spread throughout the entire city.

Recent counts of pedestrians in the central business district, which indicate the relative intensity of activities in this area, show the greatest number of pedestrian movements near State and Madison Streets. The center of activity is somewhat south of Madison Street. The proposed superhighways, therefore, will conform to a balanced plan at their inner termini with new thoroughfares at the north and at the south about equidistant from the business center.

In respect to financing the program; five public agencies—the City of Chicago, the County of Cook, the Chicago Park District, the State of Illinois and the Federal Government can legally and appropriately contribute to its completion. Through the new enabling legislation, the City of Chicago and the County of Cook are in a position to finance over half of the initial $110,000,000 project without any undue interference with normal arterial highway construction programs. The total cost of such a program to the City of Chicago will be only slightly more than the present payments from the motor fuel tax fund to the Board of Education ($2,000,000 per annum which will terminate in 1940).

The Chicago Park District has taken the lead in the past in providing facilities for through traffic. While not primarily a highway building agency, it seems reasonable to assume that the Park District will cooperate in the execution of the superhighway program insofar as it may conform to plans for the extension of the park system. On various occasions, the administrative officials of the State of Illinois—recognizing the need of adequate terminal facilities for the state wide highway system—have expressed the desire of the State to cooperate in and make substantial contributions from its highway funds toward the Chicago superhighway program.

There are many indications that the Federal Government also will aid in this project. As eminent an authority as Mr. Thomas H. MacDonald, Chief of the Public Roads Administration, has characterized the construction of superhighways in metropolitan centers as the outstanding need in the development of the nation's primary road system, and has recommended the creation of a federal agency to assist in or be responsible for the acquisition of necessary rights-of-way —generally involving one-third or more of the total cost. It is believed, therefore, that the $110,000,000 program proposed for initial construction can be financed through the cooperation of the public agencies above enumerated.

The Cook County Board of Commissioners has recently passed a resolution providing that the county undertake the construction of the northwest superhighway described and recommended in the report. The City of Chicago is in a position to consider which of the projects should be constructed by it. Enabling legislation requires that specific locations on all routes on which either the city or county propose to expend funds must be filed with the State Department of Public Works and Buildings before March 1, 1940. In view of this, early consideration of the proposed program is suggested so that detailed field surveys and specific plans can be filed before such date.

In the preparation of this report we have received assistance from many engineers and public officials. The traffic counts carried on by the Division of Traffic

Engineering with the cooperation of the Works Progress Administration during 1938 and 1939, which were made available through the courtesy of Mr. Leslie J. Sorenson, City Traffic Engineer, have been of inestimable value in providing a factual basis for traffic studies. We are likewise indebted to Mr. Otto K. Jelinek, Traffic Engineer for the Chicago Park District, for valuable data relating to traffic movements and physical development throughout the city's boulevard system. The engineering staffs of the Chicago Plan Commission, the Chicago Regional Planning Association and the City Council Committee on Traffic and Public Safety, have also furnished helpful information. Much useful data relative to the present development and use of the road systems of the state have been furnished through the courtesy of Mr. Ernst Lieberman, Chief Highway Engineer and Mr. F. N. Barker, Engineer of Highway Research of the Division of Highways, Department of Public Works and Buildings, State of Illinois. Major George A. Quinlan, Superintendent of Highways and the engineering staff of the Cook County Highway Department have cooperated continuously and have been especially helpful in the preparation of this comprehensive superhighway plan.

Respectfully submitted,

CHARLES E. DE LEUW,
Consulting Engineer

WILLIAM R. MATTHEWS,
Engineer, Department of Public Works

A. J. SCHAFMAYER,
Engineer, Board of Local Improvements.

A COMPREHENSIVE SUPERHIGHWAY PLAN FOR THE CITY OF CHICAGO

THE PROBLEM

As a preliminary to the preparation of a general plan for a comprehensive system of superhighways of the City of Chicago it was first necessary to make a study of the following phases of this problem:

(1) A study of the growth of motor vehicle ownership and use with its effect on population distribution and social trends in large metropolitan centers;

(2) The existing highway and traffic facilities in Chicago, including the connections of the local thoroughfares to the Federal, State and County highways leading to the city from the metropolitan area and beyond; and

(3) The traffic intensities on these systems of local and suburban highways, including estimates of future increases of such traffic densities.

The results of these studies are summarized below.

The Growth of Automobile Traffic

The growth in automobile transportation during the past thirty years, from the point where a self-propelled vehicle was something of a novelty to the present stage where a motor car is considered a necessity by the great majority, is one of the marvels of modern civilization. The tremendous increases in automobile ownership are summarized in the following tabulation showing total passenger cars registered in the United States and in the City of Chicago:

TABLE 1

MOTOR VEHICLE REGISTRATIONS — 1895-1939

(FIGURES AS OF DECEMBER 31ST, EXCEPT AS NOTED)

Year	Total Passenger Cars U. S. A.	Total Passenger Cars Chicago
1895	4	No Record
1896	16	
1897	90	
1898	800	
1899	3,200	
1900	8,000	
1901	14,800	
1902	23,000	
1903	32,920	
1904	54,590	
1905	77,400	
1906	105,900	
1907	140,300	
1908	194,400	4,200
1909	305,950	5,500
1910	458,500	9,963
1911	619,500	11,876
1912	902,600	16,807
1913	1,194,262	22,136
1914	1,625,739	26,814
1915	2,309,666	35,218*
1916	3,297,996	48,542*
1917	4,657,340	58,486*
1918	5,621,617	59,965*
1919	6,771,074	73,790*
1920	8,225,859	86,670†
1921	9,346,195	137,750
1922	10,862,650	172,655
1923	13,479,608	218,991
1924	15,460,649	260,887
1925	17,496,420	289,948
1926	19,237,171	317,433
1927	20,219,224	335,263
1928	21,379,125	360,985
1929	23,121,589	402,098
1930	23,059,262	406,916
1931	22,366,313	423,786
1932	20,885,814	396,783
1933	20,643,564	367,402
1934	21,532,408	367,585
1935	22,562,847	397,023
1936	24,178,211	461,527
1937	25,449,924	504,207
1938	25,261,649	506,071
1939		508,900‡

* License Year May 1 to April 30, 1915-1919 inclusive.
† Figures for May 1, 1920 to December 31, 1920.
‡ Figures up to and including August 30, 1939.

The growth in the use of motor cars in Chicago is further illustrated by the fact that twenty-four years ago there was one registered passenger car in the city for every *seventy* inhabitants, while today there is one to every *seven* persons. There was a steady growth in automobile registration up to the early years of the depression—then a decrease from 1932 to 1935 when the upward trend was resumed.

An analysis of the registration figures in Chicago covering only the last decade indicates that the number of registered passenger automobiles increased 27 per cent, from 402,098 in 1929 to 508,900 for 8 months of 1939 or about 2.7 per cent per annum.

Population

Numerous forecasts of probable increases in population of the City of Chicago and of the metropolitan district have been made from time to time by various agencies. Probably the most reliable estimates available for the City of Chicago are those prepared by the staff of the Illinois Bell Telephone Company and for the suburban areas surrounding Chicago by the Chicago Regional Planning Association. These forecasts were published in the 1937 report to the Committee on Local Transportation of the Chicago City Council suggesting a comprehensive local transportation plan for the City of Chicago. Table 2 shows actual population of the City of Chicago and its metropolitan area as reported by the United States Census Bureau for the years 1920 and 1930 and estimated increases in population as forecast by these agencies for 1940, 1950 and 1960.

TABLE 2

Population Forecast — City of Chicago and Chicago Metropolitan District

	1920	*1930*	*1940*	*1950*	*1960*
City of Chicago	2,701,705	3,376,438	3,700,000	4,200,000	4,500,000
Cook County (Remainder)	351,312	605,685	750,000	930,000	1,170,000
DuPage	42,120	91,998	114,000	157,000	202,000
Kane	99,499	125,327	137,000	159,000	180,000
Lake (Illinois)	74,285	104,387	118,000	148,000	177,000
Will	92,911	110,732	120,000	133,000	146,000
Lake (Indiana)	159,957	261,310	304,000	368,000	422,000
Total	3,521,789	4,675,877	5,243,000	6,095,000	6,797,000

It is believed that these forecasts of population growths are conservative and may be utilized as a basis for estimates of probable highway traffic.

Social Changes Resulting from Motor Transportation

The improvement in the design of motor vehicles, the reduction in operating costs and the consequent ever increasing use of this individual transportation

unit have wrought far reaching and significant changes in the American habit of living. Thousands of families formerly confined to the crowded, close-in sections of metropolitan cities have taken advantage of the freedom offered by automobile transportation and have moved to the outlying portions of the cities and to the suburban areas surrounding the metropolitan centers. The extent of this movement may be summarized from the above figures on population for Chicago and the metropolitan area.

While Chicago was increasing from a population of 2,701,705 in 1920 to 3,376,438 in 1930, an increase of approximately 25 per cent, there was an increase in the metropolitan district outside of the City of Chicago proper from 820,084 in 1920 to 1,299,439 in 1930, an increase of 479,355, or almost 59 per cent. Thus the population of the suburban areas has been increasing at more than twice the rate of that of the City of Chicago. Various analyses of population distribution in Chicago have shown a steady shift outward from the inner zones. This is a natural result of many families leaving crowded tenement buildings within a radius of two or three miles of the center of the city and moving to single family dwellings six, seven or eight miles from the center.

With the spread of industrial and commercial activities to areas immediately adjacent to the central business district of any large metropolitan city, districts formerly devoted to residential purposes are penetrated by industry and commerce. In Chicago this development has been marked. Coming at a time that the automobile gave impetus to the outward movement, there has developed a broad so-called blighted area—a belt around the central business district which, with the single exception of certain limited areas on the near north side, varies from three to four miles in width. A recent study of this situation showed an actual decrease in population in the area bounded by 63rd Street, Kedzie Avenue, Belmont Avenue and Halsted Street, a district which comprises about one-fifth of the city's area. This investigation indicated a decline in population of 211,000 between 1920 and 1934, the greater part of which occurred in the area between North Avenue and Cermak Road—east of Ashland Avenue.

However, shifts in population in and near Chicago are such that the increases in population are in general spreading throughout the corporate area of the City more or less uniformly in all directions. For instance, the distribution of population within the corporate area of Chicago as shown by the United States Census Bureau figures for 1920 was such that the center of population was located at the intersection of Taylor Street and Laflin Street. Ten years later, the 1930 census showed a shift to Paulina and Polk Streets or approximately one-quarter of a mile west and one-sixth of a mile north.

It is estimated that the center of population is still shifting but at a slightly reduced rate so that by 1940—when the total population is estimated to be 3,700,000—it will have moved west to Honore Street extended and about one-half block south of Harrison Street or near the northwest corner of the Cook

County Hospital. Thus the total movement in two decades will be about one-half mile.

The Existing Highway Systems

During the past thirty years, the City of Chicago has accomplished much in the development of major thoroughfares. Most of these improvements have been pursuant to the original Chicago Plan of 1908 or to recommendations of the Chicago Plan Commission subsequent to that date.

One of the important accomplishments during this period was the completion of the inner distributor street system providing for the distribution of traffic into and around the central business district. This was accomplished through the widening of Canal Street and of Roosevelt Road, the construction of a viaduct over the railroad area along Roosevelt Road and the construction of the double-deck Wacker Drive improvement on the southerly bank of the Chicago River, which—coupled with the broad roadway of Michigan Avenue—met the immediate need for the distribution of traffic.

The opening and widening of N. Michigan Avenue, together with the construction of the double-deck bridge over the Chicago River, provides an excellent thoroughfare leading north from the northeast corner of the central business district. Lake Shore Drive has been developed from Oak Street to Foster Avenue so as to provide two or more wide roadways for the free movement of traffic with complete separation of grades at intersecting thoroughfares except for a short section south of Grace Street. This superhighway now carries not only a tremendous volume of passenger automobile traffic but also express buses operated by the Chicago Motor Coach Company serving the north and northwest sides of the City. On the south side, similar facilities between the central business district and Jackson Park are provided by Leif Eriksen Drive.

The Outer Drive connection (which was opened for traffic early in October, 1937) provides a splendid wide thoroughfare connecting with Lake Shore Drive at Oak Street and Michigan Avenue and extending southerly over the Chicago River to a connection with Randolph Street and Leif Eriksen Drive to the south.

Widened LaSalle Street provides a broad highway at street grade from Washington Street to Lincoln Park with connections at the north to the several roadways in Lincoln Park. Cermak Road has been widened from Archer Avenue to a connection with the 23rd Street viaduct leading to Leif Eriksen Drive at the lake shore.

In the suburban areas, where the problem of acquiring rights-of-way necessary to the construction of broad thoroughfares is less troublesome than along the built up city streets, the major thoroughfare system is much further advanced than in the City of Chicago. Through the efforts of the State and County Highway Departments broad thoroughfares have been brought close to the city limits on radial routes, extending in practically all directions, north, northwest, west, southwest, south and southeast from the city.

The situation today, therefore, is that many wide highways of modern design reach the city limits, concentrating vast volumes of traffic on the local city street system. With a few notable exceptions these thoroughfares connect to the radial streets laid out in the days when Chicago was a small village. These streets have long since been lined with commercial or industrial establishments and cluttered with local traffic throughout their lengths. Many of these radial streets are narrow and, in addition, serve as routes for street car lines, making them unfit for use as major thoroughfares.

The Present Traffic Tangle

The data studied shows that more than one-third of the total traffic on all of the streets and highways of the State of Illinois is concentrated on streets in Chicago—in an area of approximately 200 square miles. The high density of traffic which is incidental to the ordinary activities of the 4,000,000 people who live and work in Chicago is accentuated by the fact there are large surges in flow during morning and evening rush hours when the city is going to and leaving work. In addition to strictly local traffic, there is also a substantial volume of through traffic from points in the suburban area and beyond. This intermingling of local and through traffic brings about an unsafe condition of congestion and interference with practically all civic activities.

Every user of a motor vehicle is well aware of the traffic congestion to be found in all parts of the developed portions of the city, which remains in spite of the many millions of dollars that have been spent for highway construction, and of the delays to traffic are due in large part to the cross movements at street intersections. All are aware of the mounting number of traffic deaths and injuries, and of property damage, likewise resulting in great measure from these cross traffic movements, both vehicular and pedestrian.

The Chicago Plan, published 30 years ago, and before the development of the motor vehicle was largely devoted to the traffic problems of the city. It pointed out the congestion that even then existed on the highways. The plan made provision for the opening of new thoroughfares and the widening of existing ones, to improve the means for circulation of traffic. Many of the street improvements recommended in the plan, and others, have been since carried out but such improvements have failed to keep pace with increases in traffic volumes and have added to the traffic hazards.

The State Legislature has recognized the need of improved traffic facilities in the cities of the state, and particularly in the City of Chicago, to complement the state primary road system. Acts have been passed that charge the state with the duty of extending state highways through cities and of improving the same, and which authorize the counties to extend their systems of county roads into and through the cities of the state and to improve them. One-third of the receipts of the state motor fuel tax are granted the counties of the state and another one-third to the cities and such shares are and have been in part available for the improvement of highways in Chicago.

The state has designated a system of highways in the city as extensions of the primary routes comprising about 235 miles of streets. Cook County has designated over 340 miles of additional streets to comprise its highway system in Chicago. The city, on its part, has designated a system of arterial streets of a total of about 343 miles, which is eligible for improvement from the city's share of the motor fuel tax. Since 1930 the State, Cook County and the city have been engaged on the improvement of these three systems of main highways, such improvement consisting of the construction of modern pavements of various widths. In the nine years (1930-1939) these improvements built total 240 miles of highway, at a cost of about $27,000,000. These improvements, with a single exception, are all highway improvements at grade. While adding much to the highway facilities of the city, these improvements, too, have failed to remove congestion and do little or nothing to reduce the number of deaths and injuries resulting from the hazards of traffic.

Mr. Thomas H. MacDonald, Chief of the Public Roads Administration, Federal Works Agency, had accurately described this condition in covering the necessity for Trans-City Connections and Express Highways in his recent report on Toll Roads and Free Roads as follows:

> "One of the striking characteristics common to all highway traffic maps is the sharp enlargement of the bands representing the volume of traffic on the important highways as they approach the larger cities. Obviously these enlargements have a local cause. They are in fact caused by a multiplicity of short movements into and out of the city; and it is not uncommon to find that the traffic on a main route approaching the city is thus swelled to several times its volume a few miles from the city limits. Unfortunately, it is not common to find the capacity of the highway proportionately enlarged. In consequence there is often on such relatively short sections of highway an actual development of congestion or an approach to it.
>
> "If we inquire into the reason for the failure to augment the traffic facility in proportion to the increase in traffic we usually encounter right-of-way difficulties. At the approach to the city road-bordering developments thicken to such an extent that the additional space required for the widening or other increase of the highway facility may be obtainable only at heavy cost because of the closely crowding suburban residences and industrial establishments.
>
> "Once inside the city, where the block plan offers alternate avenues of travel, it might be assumed that the congestion would be substantially relieved. In some instances a measure of relief is observed; but generally such a desirable condition is not realized. The particular street joining directly with the main highway at the city's edge usually serves as a trunk line far into the city, generally to its very center. It thus conveys the inbound traffic to convenient points of departure toward its ultimate destinations, and reciprocally collects the outbound traffic at similar points. Frequently such a street is identified by U. S. or State route numbers as the direct inward extension of the external highway, so that strangers as well as local citizens are channeled into it. Quite often, particularly in the older cities of the East, the present internal street, which before the city's growth was actually the external highway still follows its historic radial course toward the center of the city, and cuts conveniently across the rectangular block plan of younger city streets."

With the single exception of the Outer Drive along the lake shore between Foster Avenue on the north and Jackson Park on the south, vehicles utilizing Chicago's major street system travel at extraordinarily low speeds. Numerous tests made by observers for the State Highway Department, the Chicago Park District and other agencies have found average over-all speeds between the downtown district and points near or at the city limits to be well below 20 miles an hour, in some cases as low as 12 or 15 miles an hour, especially during the periods of maximum use, i.e., the morning and evening rush hours.

The present intermingling of all types of traffic with cross traffic streams intersecting at every street corner, has logically resulted in a tremendous toll of traffic accidents. As a result there were 17,231 traffic accidents in the City of Chicago in the year 1938, resulting in the injury of 20,719 persons and 686 fatalities. Analyses of accident ratios on various types of thoroughfares showed the worst record on such thoroughfares as Cicero Avenue, South Parkway, Ashland Avenue and Western Avenue, three of which are streets carrying mixed traffic in large volume including street cars. The traffic accident rate was as high as 189 accidents per 10,000,000 vehicle miles, improving to a low rate of 8 accidents per 10,000,000 vehicle miles on the grade separated portions of the Outer Drive.

Mr. MacDonald emphasizes the seriousness of this situation and points a way to its solution in his discussion on "A Master Plan for Free Highway Development." The urgency of this need as described by him was in reference to any large metropolitan center but is especially applicable to Chicago. We quote from his report as follows:

> "In numerous cities conditions of the sort here described are fast reaching a critical point. Some measures of relief are imperative, and the only course that promises a really satisfactory solution is the provision of adequate facilities for conduct of the heavier entering traffic streams *through the city at or near its center*, and on to appropriate exit points.
>
> "The nature of the facilities required will depend upon conditions peculiar to each city. In some cases redesign and widening of the main highways and connecting city streets may suffice and may be feasible; although on the rural highway sections involved, widening should always include a physical separation of the opposing traffic streams, and any widening in the downtown area of cities is certain to be beset with difficulties.
>
> "In the larger cities generally only a major operation will suffice—nothing less than the creation of a depressed or an elevated artery (the former usually to be preferred) that will convey the massed movement pressing into, and through, the heart of the city, under or over the local cross streets without interruption by their conflicting traffic. Such facilities are not required in any city for the service of through highway traffic alone. They are not required solely for the service of the traffic entering the city from typically rural highways. There usually is added to these streams in the outer reaches of the city or its immediate suburbs a heavy movement of purely city traffic that mounts to high peaks in the morning and evening rush hours. Movements of this latter sort largely follow the same lines as the traffic entering the city from main rural highways

simply because the peripheral city areas and suburbs in which they are generated have developed along such highways.

"Whether the needed facility be a trans-city connection or an express highway, or whether the traffic to be served includes large or insignificant contributions from extra-city highways, in either case the nature of the traffic *within the city* is much the same.

"It always is largely a movement from the periphery to the center of the city, and is little concerned with intermediate city sections, but it must pass through them and, in so doing, is obstructed more or less frequently at the cross streets. The congestion that results, under present conditions, is due in part to the usually inadequate width of the existing artery and in part to conflict with cross traffic, generally complicated by parked vehicles.

"Reference has previously been made to the leap-frog-like movement of traffic from the periphery of the cities over intervening areas to their centers. The motor vehicle itself is the primary cause of this phenomenon. It made possible the outward transfer of the homes of citizens with adequate income from the inner city to the suburbs and it now conveys these citizens daily back and forth to their city offices and places of business.

"The former homes of the transferred population have descended by stages to lower and lower income groups, and some of them (each year an increasing number, and generally those nearest the center of the city) have now run the entire gamut. Almost untenable, occupied by the humblest citizens, they fringe the business district, and form the city's slums—a blight near its very core! Each year a few of these once prouder tenements, weakened by want of repair, tumble into piles of brick, not infrequently taking a human life in their fall. Each year a few of them make way for parking lots—unsightly indices to needed facilities of higher dignity! Each year the city 'takes over' a few of them for unpaid taxes. And now—the Federal Government is beginning to acquire them in batches in connection with its slum clearance projects. Heralds of a better future though they are, these acquisitions comprise one of the reasons for avoidance of delay in dealing with the problem of trans-city highway connections and express highways.

"Another reason lies in the fact that, here and there, in the midst of the decaying slum areas, substantial new properties of various sorts are beginning to rise—some created by private initiative, some by public.

"There is growing danger that these new properties, sporadically arising, and the more compact developments by the Government in its slum clearance projects, will block the logical projection of the needed new arteries into the city center. Since the actual accomplishment of such projects will at best require time they should now be planned in order that their eventual courses may not be barred by newly created property."

Mr. MacDonald discusses the situation at Baltimore as being somewhat typical of that in all large cities, as follows:

"It is apparent that the whole interior of the city is ripe for the major change that it must undergo to afford the necessary relief to pressures generated by the effort to force the stream of 20th-century traffic through arteries of the early 19th century. The map shows where properties are dying. In places, new

and important developments are beginning to occur—developments of great possible significance in relation to the future plan of the city and particularly to the new major arteries that should supply the skeletal structure for that plan.

"For example, the map shows that two of the planned slum clearance projects of the Federal Government lie directly athwart the possible courses of major new radial arteries. The new development of these areas and other developments of similar character that will certainly follow should not proceed far in the absence of a definite plan for the needed new street and highway facilities. If it does, new and more serious obstacles will certainly be placed in the way of a proper meeting of growing traffic needs, where obstructing private interests are now reaching their point of least resistance.

"The general appearance and design of a depressed artery of the type suggested is shown in Figure 3. As illustrated, the depressed and divided arterial lanes would be bordered on each side by one-way surface streets for local service. At intervals, important cross streets would be bridges over the depressed way and in the first blocks from each of such bridges, ramps at each side of the artery would afford separated up-and-down connections with the surface streets.

"The depressed highways, especially, would necessitate acquisition of wide rights-of-way, and it is because property along several of the suggested lines has already dropped close to its lowest level, and land can therefore be obtained at approximately minimum cost, that the time is now ripe for the undertaking of such improvements."

THE SOLUTION

It is now generally recognized that the existing system of streets at grade with through traffic streams subject to all of the interferences from vehicular and pedestrian cross traffic and parking vehicles is no longer adequate. A study of all of the conditions summarized above leads to the conclusion that the construction of superhighways free from grade crossings and providing for the segregation of through traffic—not only from local traffic but also from all cross traffic—can no longer be postponed.

The problem of providing adequate facilities for passenger and commercial vehicles is definitely related to the problem of providing improved public transportation on common carriers. Chicago has suffered by reason of its failure to develop and modernize its public transportation facilities. This situation is so well known as to require no discussion here. The city is using its utmost efforts to modernize the local transit facilities, and any improvement which may come through the modernization either of the entire system or of the equipment utilized on any of its divisons should be beneficial to street traffic congestion. There should be a continuing effort to provide adequate and convenient public transportation for all of the residents of the Chicago metropolitan area so as to attract to these services the maximum number of persons now using individual transportation units. Thus the improvement and modernization of the highway system and of the transportation system should be accomplished simultaneously.

In this connection, comparative figures on the roadway area occupied by passengers using various types of vehicles is of interest. The individual occupies as a passenger in an:

Automobile	
On the basis of 5 passengers	22 square feet
On the basis of 4 passengers	28 square feet
On the basis of 2 passengers	56 square feet
Street Car	
On the basis of 58 passengers	7 square feet
On the basis of 100 passengers	4 square feet
Single-deck Motor Bus	
On the basis of 40 passengers	6 square feet
On the basis of 50 passengers	5 square feet
Double-deck Motor Bus	
On the basis of 72 passengers	4 square feet
On the basis of 100 passengers	3 square feet

It should be noted that passengers carried in subways or on elevated railroad structures require no roadway space whatsoever. In this connection, the city's proposal to construct two street car subways in the loop district to remove all east and west street car tracks will be of enormous benefit to the traffic movements in the congested loop district.

Specifications for a Superhighway

A specification of the basic principles to be followed in the planning of a superhighway should include more than the essential featuers of safety, of design for rapid movement, of capacity and of location. It is particularly desirable that the superhighways be built so as to avoid damage and as far as may be feasible, to constitute an improvement aside from their traffic value, to the streets, the properties and the localities through which they run as well as to the city as a whole. This is true whether damage to private property can or can not be assessed against the public. A specification for a superhighway should include the following:

(a) Continuous grade separation, or at least separation for all of the major streams of cross traffic, both vehicular and pedestrian;

(b) Separation of the through traffic lanes from abutting property;

(c) A limited number of points of access to the through traffic lanes;

(d) Longitudinal separation of the roadways;

(e) Traffic lanes of ample widths, well defined; and

(f) Adequate terminal facilities.

Superhighways—Depressed Type

This type of project—see Figure 4—has minor disadvantages such as slightly higher construction cost, also minor increases in maintenance cost for drainage and snow removal. On the other hand there are many advantages which may be summarized as follows:

(1) The provision of suitably landscaped parkways between the express roadways and abutting property virtually eliminates any nuisance from noise or exhaust gases;

(2) The wide rights-of-way will provide for parallel driveways required properly to serve the adjacent buildings;

(3) Such improvements with broad widths varying from 200 to 400 feet, suitably landscaped, will provide breathing spaces in many sections of the city where they are badly needed;

(4) There will be substantial benefits through the neighborhoods where the superhighways are located. Experience in Chicago shows increased land values in the vicinity of thoroughfares placed in wide boulevards such as Garfield Boulevard, Independence Boulevard and Kedzie Boulevard;

(5) Ramp connections can be made to the express roadways without any disturbance to normal street traffic;

(6) Safety is improved through improved vision for all motorists using or approaching the superhighways (if depressed) and through the complete elimination of all pedestrians;

(7) The adoption of this type of thoroughfare will have a marked beneficial effect on the general development of the city; and

(8) Superhighways, if depressed, have flexibility in that additional bridges can be built after the initial construction when, as and if needed, and additional ramps and connections can be added at any time required.

Figures 3 and 4 illustrate a parkway type of superhighway in which the express drives are depressed below the normal grade.

Elevated Highways

The advantages of elevated highways, if any, are largely confined to construction cost. However, if located in public streets, no right-of-way is required. The disadvantages of the elevated highways to be built in streets are numerous and may be enumerated as follows:

(1) They shut off light and air from abutting property.

(2) They depreciate property values in their immediate vicinity.

(3) They obstruct roadways and impede traffic movements on the street surface, particularly at and near ramps and connections.

(4) With a notable exception of Randolph Street and certain of the park boulevards, few streets in Chicago are of sufficient width to permit the construction of roadways adequate in width.

Note: Elevated highways with four lanes in each direction require about 104 feet of width between ramps. At ramps with a clear width of

24 feet, a total width of 155 feet is required. If built in new rights-of-way and provision is made for ramps, service drives, parkways and sidewalks, a total width of about 260 feet is necessary—see Figure 5. Most of the earlier proposals for highways of this type were made without reference to methods of getting traffic on and off the structure.

(5) With respect to proposals to put one-way elevated highways on two adjacent streets or to build double decked or even triple decked structures, the damage would be spread to a wider area or intensified.

(6) The effect on the general development of the city would be adverse.

Construction of elevated highways should be confined as far as may be feasible to locations adjacent to railroad right-of-ways. However, they will be necessary in certain locations, and not undesirable in them. For example, the proposed extension of Franklin Street, from Harrison Street to Cermak Road along the east bank of the straightened Chicago River, which will pass over railroad lands, may best be made by a structure of the viaduct type.

Available Studies and Plans

Numerous plans ranging from proposals for a comprehensive system of elevated highways or superhighways to suggestions for the construction of a single major thoroughfare have been originated from various public and private sources during recent years. Among the more important of these were:

"The Plan of Chicago" by D. H. Burnham and E. H. Bennett (1908);

Proposals for a Congress Street Thoroughfare by Bennett, Parsons and Frost and also Mr. I. F. Stern;

Plans for a comprehensive system of superhighways or elevated highways by the staff of the Chicago Plan Commission;

"A Limited Way Plan" contained in the Massen-McClintock Report of the Committee on Traffic and Public Safety (1932);

A proposal for a depressed highway between Adams and Monroe Streets by Mr. Joshua D'Esposito;

Plans for superhighways in Congress Street and Randolph Street prepared by the Division of Highways, Department of Public Works and Buildings of the State of Illinois (1935);

Recommendations for a west side highway in the Report of the Committee on West Side Superhighways by the Honorable Oscar E. Hewitt (1938).

These reports and proposals as well as numerous other suggestions for the improvement of street traffic made by various public agencies and individuals have been studied as a basis for the development of a sound plan.

A splendid system of grade separated thoroughfares is in process of development in New York City and surrounding suburban areas. These noteworthy projects involve the construction of almost 300 miles of modern superhighways of which about two-thirds has now been built.

This work was inspected in considerable detail. Numerous plans made available through the courtesy of the New York City Department of Parks were also reviewed. Highway engineers in New York have proven without any question the practicability of the complete segregation of through traffic from all types of local and cross traffic both vehicular and pedestrian. In New York these improvements have been planned with a bold hand. Broad strips of right-of-way have generally been acquired, permitting the development of adequate parkways between the express roadways and service drives serving nearby commercial and residential areas. Express roadways are depressed so as to pass under cross streets wherever practicable. As a result these superhighways or parkways have not only effected a remarkable improvement in convenience and safety of traffic but also had a marked beneficial effect on the districts penetrated by the parkways. Recent studies have shown substantial increases in property values in these areas —in many of which real estate values had been stagnant for years.

Superhighway building has not been confined to the largest metropolitan centers. In St. Louis, the Oakland express highway through Forest Park, a thoroughfare with broad express roadways depressed below normal street grade, was opened to traffic in 1936. The State of Missouri is now constructing a new grade separated express thoroughfare into St. Louis connecting with the superhighway through the urban area. This new connecting road, practically all of which has grade separations at intersections, will be approximately 30 miles in length.

THE PROPOSED PLAN

A study of the traffic movement on the existing highway system in the City of Chicago shows that without doubt the most intense movements are those which flow to the central business district from all parts of the city, the metropolitan district and beyond. There are other movements of high density particularly those north and south with concentrations in such thoroughfares as Ashland Avenue and Western Avenue. Therefore, it was determined that the general plan should include a radial system extending from the central business district to or near the city limits supplemented by a north and south superhighway extending across the city in the area between Ashland Avenue and Western Avenue. The recommended plan includes the following units:

1. A north superhighway (extension of the outer drive to the north).
2. A northwest superhighway.
3. A west superhighway.
4. A southwest superhighway.
5. A southeast superhighway (extension of the outer drive to the south).
6. A north and south crosstown superhighway.
7. A second west superhighway.

This system of superhighways is shown on Figure 1, a map showing the existing arterial street system, also on Figure 2, a map of vehicular traffic flow in the metropolitan district. It will be noted that all of these projects, with the single exception of the north and south crosstown superhighway have been frequently proposed in the past and have in general been accepted with approval. A general description of these projects follows:

North Superhighway

A superhighway leading north from the central business district, the route commonly referred to as the Outer Drive, is now available from the center of the city as far north as Foster Avenue. Present traffic pressure requires the extension of this shore highway. The plan recommended provides for its immediate extension to Bryn Mawr Avenue and a later extension to the north city limits. The improvement is to be similar to the existing highway improvement through Lincoln Park in the section between Irving Park Boulevard and Foster Avenue. Provision is made for two four-lane roadways, the same as in the present section referred to. The type of improvement proposed is shown on Figure 7.

The immediate construction of the section of this superhighway from Foster Avenue to Bryn Mawr Avenue is estimated to cost $3,000,000. The plan should include a connection into Hollywood Avenue, will give separate connections to the state highway routes in Foster Avenue and in Bryn Mawr Avenue, and will relieve the most serious condition of congestion now existing in the Sheridan Road route north of Foster Avenue.

The construction of a northwest superhighway hereinafter proposed will greatly improve traffic conditions on the Outer Drive. This will be accomplished through the provision of a more convenient and more direct route between the northwest side and the downtown district through which thousands of motorists who now travel to the Outer Drive on east and west streets on the north side, will be attracted to the new northwest superhighway. Through this reduction of traffic density on the north Outer Drive and the construction of the half mile section as proposed, it is believed that the extension of the Outer Drive north to the city limits may be postponed.

This superhighway to the north will provide a city route for through traffic from Sheridan Road, Ridge Avenue, McCormick Road, Lincoln Avenue, Touhy Avenue, Peterson Avenue and Foster Avenue. In addition, it will continue to attract some of the traffic from Skokie Boulevard (U. S. 41), the principal thoroughfare for traffic between Milwaukee and Chicago.

Northwest Superhighway

A number of plans have been advanced for highways leading northwest from the central business district. One much discussed plan proposed an elevated superhighway from Orleans Street and Kinzie Street running northwesterly from

the business district, in Kingsbury Street and in Clybourn Avenue. The plan provided a four-lane elevated highway in streets 66 feet wide. The four lanes suggested, however, are not sufficient in number to provide the capacity that must be built into a northwest highway and the available width of the right-of-way does not permit of a structure of more than four lanes. Nor is it feasible to widen the existing rights-of-way, because of the nature of the abutting property.

The plan most frequently suggested is for an elevated highway immediately adjacent to the right-of-way of the Wisconsin Division of the Chicago and North Western Railroad (Avondale Avenue) extending northwest from the northwest corner of the central business district to a connection with the Northwest Highway at Menard Avenue. The original plan for this route was prepared by the Chicago Plan Commission in 1927. Figure 10 shows a view of this location.

Other plans which may be found feasible would provide either depressed or elevated express roadways centered in a broad right-of-way and planned in a location entirely independent of existing railroad rights-of-way or embankments.

The Kingsbury-Clybourn Avenue plan is obviously inadequate and should be given no further consideration. The determination of the exact type and route as between the second and third plans as mentioned, can be made only after the completion of detailed surveys and estimates of real estate and property values and construction costs.

The proposed northwest superhighway should, however, consist of a reasonably direct route extending from the northwest corner of the central business district to a connection with Northwest Highway near Menard Avenue—see Figure 8. It is suggested that four traffic lanes in each direction be provided throughout.

Such a superhighway—estimated to cost approximately $30,000,000, will afford admirable facilities between the city limits on the northwest and the downtown district and intermediate points for a number of important state and federal highways from the northwest. Traffic will be attracted to the new superhighway from the following heavily traveled routes as shown on Figure 6:

Skokie Boulevard, U. S. 41,
Cicero Avenue, Ill. 50,
Waukegan Road, Ill. 42-A,
Milwaukee Avenue, Ill. 21,
Harlem Avenue, Ill. 42-A,
Rand Road, U. S. 12,
Northwest Highway, U. S. 14,
Talcott Road-Algonquin Road, Ill. 62,
Higgins Road, Ill. 72.

In addition, motorists from a number of other heavily traveled routes will utilize the proposed superhighway, including:

Crawford Avenue,
Carpenter Road,
Caldwell Road,
Touhy Avenue,
Lawrence Avenue, and
Irving Park Road.

At the downtown terminus adequate provision should be made for connections to certain distributor streets along the west side of the river such as Canal and Clinton Streets and along east and west streets just north of the river such as Kinzie Street, Illinois Street, Grand Avenue, Ohio Street and Erie Street, affording convenient means for distribution of traffic both on east and west streets and north and south streets serving the loop district, the near west side and near north side areas. The project should ultimately include a satisfactory connection to both Michigan Avenue and to the Outer Drive. It is also recommended that it be extended northwest to the city limits when future traffic demands warrant the expenditure.

The West Superhighway

All of the twelve principal proposals which have been advanced for a west side superhighway were studied in an exhaustive and painstaking manner by the Committee on West Side Superhighways which reported to the Honorable Oscar E. Hewitt, Commissioner of Public Works in February, 1938. This 1938 report was made by a committee of engineers—five from various departments of the City of Chicago and one, the chief engineer of the Chicago Plan Commission. As a result of these studies the Committee recommended the adoption of a plan for a broad thoroughfare along the general line of Congress Street and extending from the central business district to and through Columbus Park to the west city limits at Austin Boulevard. This plan was in general agreement with the plan proposed by the State Division of Highways in 1935. The plan provided for a superhighway of the boulevard or parkway type, with express roadways elevated or depressed at principal cross streets and located in a broad right-of-way with liberal provision for parkways and parallel service drives.

The report contains a fairly detailed description of each plan, together with an estimate of the total cost of each project including not only construction but also land, buildings and damage. A number of these plans proposed the construction of an elevated highway or limited way in the area between Randolph Street and Hubbard Street. Certain proposals contemplated the construction of an elevated highway immediately adjacent to the existing embankment of the Chicago and North Western Railway through at least a portion of the route. It

should be noted that these projects, which ranged in estimated cost from $10,500,000 to $20,000,000, were all inadequate in width and capacity. The proposed widths ranged from 46 feet to 80 feet, and the number of lanes proposed to be accommodated ranged from four express lanes to four express lanes and two local lanes. Judged by present day standards, most of the plans were subject to criticism by reason of inadequate ramps and connecting roadways.

It is obviously unfair to compare the estimated cost of these earlier proposals for elevated highways inadequate in many respects with the cost of an adequate and properly designed superhighway. A study has been made of the additional cost involved in providing 8 lanes for express traffic, convenient, safe and adequate ramps, as well as a terminal east of the river at Wells Street. On all of these elevated highway proposals, the cost would be enormously increased so as to involve total expenditures ranging from 25 million dollars to 36 million dollars.

Other proposals involved the widening of existing west side streets to 120 feet and the construction of elevated structures therein. Two of these plans, if provided with 8 express lanes and adequate ramps, would involve total expenditures ranging from 34 million dollars to 40 million dollars. A variation of the above scheme is the one proposed for Madison and Monroe Streets, where the width of each of these thoroughfares would be increased to 120 feet with an elevated structure providing 4 express lanes on each. The approximate cost of such a project would total 42 million dollars. Other proposals cover the opening and widening of streets with a width of 120 feet or more at grade, which type of thoroughfare is now admittedly inadequate to meet present day requirements.

One of the plans advanced provided for the acquisition of a broad strip of right-of-way between Monroe Street and Adams Street—a total width of 525 feet. The cost of right-of-way in this location could be cut in two by reducing the width to one-half block instead of a full block, with the result that a depressed thoroughfare in this location would cost approximately 43 million dollars.

A variation from all of the above suggestions was that for a vehicular subway in Madison Street. This subway as proposed provided only 4 express lanes so that a similar subway would be required in a parallel street. The total cost of this unique suggestion, even with inadequate terminals west of the river (at Clinton Street) and with all of the other disadvantages inherent in such a plan, would involve a total cost of well over 50 million dollars.

Another alternate recently studied provided for the construction of a modern superhighway along the line of Polk Street with 8 lanes for express traffic, the section east of Halsted Street to be elevated and the 6½ mile section west to the City limits depressed in a broad right-of-way. It was found that any alignment along Polk Street in the terminal area east of the Chicago River would require the construction of an elevated structure passing over the railroad tracks serving the Grand Central station at Harrison and Wells Streets and also over the already elevated tracks of the New York Central and Rock Island railroads south of the La

Salle Street terminal station. This peculiar physical condition, requiring a highway to be elevated some 40 feet above street grade at La Salle Street, would locate the terminal of a parallel ramp east of the river directly in front of the Dearborn-Polk Street railroad station. This, with the great cost of making connections to distributor streets between Canal Street and Dearborn Street, would render such a route impracticable. However, it would be possible to utilize the Congress Street location for a downtown terminal and construct a connection from Canal and Congress Streets to a right-of-way to be acquired along the general line of Polk Street. The cost of such an improvement is estimated at approximately $30,600,000. Such an alignment would lack many of the advantages of a location to the north, particularly in view of the necessity for swinging to the south of the medical center, which is planned eventually to occupy practically all of the area between Roosevelt Road, Damen Avenue, Congress Street and Hermitage Avenue.

Consideration was also given to the practicability of widening Harrison Street to provide terminal facilities for the west side superhighway in the downtown district. Such a location involves a number of complicated problems. The alignment would of necessity be located on the south side of Harrison Street opposite the United States Post Office building and swing over to the north side of the street opposite the Grand Central Railroad station. This would require the partial destruction of freight stations of the C. B. & Q. R. R. and the C. & A. R. R. in the section between Canal Street and the Chicago River and increase the difficulty of providing a suitable grade separation with Franklin Street just east of the river. The Harrison Street location would also require the destruction or partial destruction of such important buildings as the U. S. Customs building west of Canal Street and the Rand, McNally building on the northeast corner of Clark and Harrison Streets. Figures 11 and 12 show views along Harrison Street both east and west of the river, and illustrate the many difficulties of this location.

More recently the Department of Subways and Traction of the City of Chicago has, pursuant to the subway Grant Agreement with the Federal Government, prepared plans for the opening and improvement of Congress Street from Michigan Avenue westward—see Figure 9. These plans provide eight wide express lines with complete segregation of through traffic from all local and cross traffic, both vehicular and pedestrian, in the seven mile section between Canal Street and the west city limits. The improvement as planned also provides adequate spaces between the express roadways and abutting property for parkways, the necessary parallel service roadways and sidewalks, and, in general, all of the features required for an efficient limited access thoroughfare. Figures 13 and 14 show views along the proposed line of Congress Street between State Street and the Post Office building.

The project includes the construction of a plaza between the Chicago River and Wells Street 350 feet in width, providing for the elevation of the Congress

Street traffic above both Market and Franklin Streets and for the distribution of traffic into those thoroughfares by right turn movements. East of Wells Street, the improvement is planned at street grade and consists of a thoroughfare 120 feet in width with divided roadways acommodating four traffic lanes in each direction. The improvement as planned makes adequate provision for the distribution of traffic into and near the central business district and also provides for the separation of its east and west traffic streams with those from the proposed southwest superhighway along Franklin Street.

The west side superhighway as proposed will serve as a city terminal connection for a number of important thoroughfares extending west from the city limits. The more important of these are:

North Avenue, Route 64,
Lake Street, U. S. 20,
St. Charles Road, Route 118,
Washington Boulevard, Route 56,
Roosevelt Road, U. S. 330,
Cermak Road, Route 55, and
Ogden Avenue, U. S. 34.

Other highways which will also deliver, in the aggregate, a substantial volume of traffic to the proposed superhighway include:

Grand Avenue,
Harrison Street,
26th Street, and
31st Street.

The total estimated cost of the entire project west of Michigan Avenue is approximately $31,500,000. The estimated cost of the improvement between Michigan Avenue and Wells Street is $5,000,000, so that the cost of the section west of Wells Street is about $26,500,000. This may be compared with the estimated costs of alternate routes varying from $25,500,000 to more than $40,000,000.

The somewhat detailed studies of the west side superhighway problem indicate clearly the advantages of the superhighway broad right-of-way type. It is recommended, therefore, that the general plans prepared by the Department of Subways and Traction, with such modifications in design and location as more detailed consideration may prove advisable, be adopted for the initial west side superhighway. The need for superhighway facilities is more urgent on the west side than in any other section of the City and it is further recommended that this project be given priority in the construction program.

Southwest Superhighway

A study has been made of the location of a superhighway extending southwest from the central business district. The principal schemes heretofore proposed are for a superhighway to be built along the right-of-way of the I. & M. Canal (now abandoned) or an elevated highway along the line of Archer Avenue. The traffic movements along the lines of these proposed improvements are less intense than on the lines of the other proposed radial superhighways. Furthermore, the I. & M. Canal must first be officially abandoned and filled before a southwest superhighway along this route can be constructed, which should be done. On the other hand, the traffic movements originating south of 31st Street along the lines of Ashland Avenue, Western Avenue and other north and south thoroughfares are in great volume, and these movements would find but little relief from a superhighway on the canal route or along the line of Archer Avenue.

While a superhighway route from the central business district to Harlem Avenue along the general line of Archer Avenue will eventually be a necessary unit in a complete superhighway system in Chicago, there is no question but that such express traffic facilities are now at least equally required to the south. Therefore, a study was also made of available routes leading south from the central district.

The character of the existing development is such that a satisfactory strip of right-of-way could be secured at a reasonable cost either along a line east of Halsted Street or between Ashland Avenue and Western Avenue. The activities concentrated in the Union Stock Yards would render impracticable any superhighway location in the area between Halsted Street and Ashland Avenue. While north and south superhighway facilities in any location between Lake Calumet and the west City limits would be of vast benefit, the alignment just west of the Stock Yards area is such as to approximately bisect the heavy streams of north and south traffic. Further, it would provide an excellent connection to the Southwest Highway (Columbus Avenue) which now serves as a thoroughfare for traffic to and from the southwest part of Cook County and which is destined to be extended and improved in the future so as to become of increasing importance.

It is therefore recommended that a north and south superhighway be built between the lines of Ashland Avenue and Western Avenue to extend south to connect with the Southwest Highway, which highway now terminates in Western Avenue at 74th Street. The proposed southwest superhighway will provide a satisfactory city route for the several thoroughfares extending southwest from the city limits. The proposed branch to the south will provide connections for:

Southwest Highway, Route 7,

Cicero Avenue, Route 50,

Western Avenue,

Ashland Avenue, Route 49, and

Halsted Street, Route 1.

There will be traffic from secondary roads such as:

Crawford Avenue,
Kedzie Avenue,
South Parkway,
Indiana Avenue, and
Cottage Grove Avenue.

The proposed future extension along the I. & M. Canal will attract traffic from:

Joliet Road, U. S. 66,
Mannheim Road, U. S. 45,
Harlem Avenue, Route 42-A,
Archer Avenue, State Route 4-A, and
Cicero Avenue, State Route 50,

as well as a number of secondary thoroughfares such as:

47th Street,
55th Street, and
71st Street.

It is recommended that this north and south superhighway be built from Garfield Boulevard to 31st Street initially, and connected to the central business district by a new route extending easterly and north-easterly from the vicinity of 31st Street and Damen Avenue to a connection with the proposed Franklin Street elevated structure at or near Cermak Road. The Franklin Street viaduct would extend along the location specified in the River Straightening Ordinance—approximately 100 feet east of the east dock line of the straightened Chicago River to a connection with Harrison Street at present street grade. It is recommended that an 8 lane superhighway of the boulevard or parkway type be planned in most of the section south of Cermak Road and that a steel viaduct type be adopted on the Franklin Street extended section north of Cermak Road which is largely over railroad tracks. The section recommended for initial construction is estimated to cost approximately $29,000,000.

The general location of the recommended southwest superhighway is shown on an aerial view of the southwest side—see Figure 15. An idea of the character of right-of-way available for the proposed future extension along the I. & M. Canal is shown on Figure 16—a view southwest along the abandoned canal from the vicinity of Central Park Avenue. The character of the improvements along most of the route of the proposed south branch of the southwest superhighway is shown on Figure 17. This is a view of the east side of Winchester Avenue—north from 53rd Street.

Southeast Superhighway

As in the case of the north superhighway, there is an existing thoroughfare extending south along the lake front from the central business district which has the characteristics of a superhighway to 49th Street. There is common agreement that the extension of this superhighway south and east to a connection with Indianapolis Avenue at or near the Indiana State Line would be of great benefit. Therefore, an 8 lane superhighway along this route is recommended at an estimated cost of $16,000,000.

Several highway types may well be incorporated in this improvement but most of it will be of the parkway or boulevard types. The section from 49th Street to 67th Street involves the reconstruction and relocation of the shore drive through Jackson Park. The section from 67th Street to 79th Street should be built along the Lake Shore and later probably will be incorporated into the general park development. The type of highway in these sections will be suitable to the locations and similar to that shown on Figure 7. The general location of the proposed southeast superhighway extension is shown on an aerial photograph of the southeast side—see Figure 18.

The development here proposed is in conformity with the policies of the Chicago Park District, which include the segregation of through traffic from local and pedestrian traffic and from general park activities.

The proposed southeast superhighway will provide city connections for the heavy traffic volumes to and from the Gary industrial district and interstate points to the east from such thoroughfares as:

U. S. 12,
U. S. 20,
U. S. 41, and

in addition it will provide indirectly for traffic from:

Torrence Avenue, U. S. 330,
Doty Avenue,
Stony Island Avenue, and
Avenue O.

North-South Crosstown Superhighway

As noted previously there are dense traffic streams moving north and south across the city, particularly along Ashland Avenue and Western Avenue. The southwest superhighway heretofore recommended includes one section of a complete north and south thoroughfare which should eventually extend from 74th Street on the south at least to the northwest superhighway on the north. The future program logically includes the construction of an extension of this route which is planned about midway in the area between Western Avenue and Ash-

land Avenue, extending north from 31st Street to a connection with the northwest superhighway. Grade separated connections should be provided at the intersections of this route with the southwest, the west side, and the northwest superhighways.

When completed, it will provide a convenient means for long distance traffic with destinations on the west side and will undoubtedly do much to reduce existing street congestion in the central business district. A number of important focal points will be served almost directly by the proposed crosstown superhighway including the Stock Yards, the central manufacturing district, the Chicago Stadium and the numerous important commercial and industrial districts located along both Ashland and Western Avenues. This superhighway should also be of the broad parkway type and be built with eight lanes for express traffic.

Second West Superhighway

In its report of 1938 the Committee on West Side Superhighways recommended the future construction of a second west side thoroughfare to be located along the Galena Division of the Chicago and North Western Railway (in the vicinity of Kinzie Street); this superhighway to be built primarily for express traffic having its origin and destination in the north central business district and in the area lying directly west of it. While it is believed that the eight lane Congress Street thoroughfare recommended for initial construction will be adequate for the immediate future, it is possible that a second major thoroughfare may be ultimately required. Therefore, this second unit is shown in the comprehensive plan for future construction.

When constructed, this second west side superhighway would intersect the northwest superhighway at the northwest corner of the central business district. Thus there would be heavy traffic streams from two superhighways concentrated at this location. It is believed that the construction of a new distributor street, extending from a location west of the north branch of the Chicago River east along a route north of the Chicago River to a connection with both Michigan Avenue and the Outer Drive, would then be required for the proper distribution of traffic in this area.

The extension east of the river should have the same general characteristics as the broad thoroughfare proposed along Congress Street which is planned as a new distributor street on the south side of the loop district. Grade separated connections to Orleans Street, Franklin Street, Michigan Avenue and the Outer Drive should be provided if feasible.

Estimates of Cost

Preliminary estimates of cost of the proposed superhighways have been prepared and are summarized below. While believed to be ample, these estimates should be considered as approximations only, as accurate estimates may be made

only after the completion of field surveys, the final determination of locations and highway types and the preparation of detailed plans. The approximate cost of the projects recommended for initial construction are as follows:

ESTIMATED COSTS OF SUPERHIGHWAYS — INITIAL PROGRAM

Superhighway	*Limits*	*Length in Miles*	*Estimated Cost*
North	Foster to Bryn Mawr	0.7	$ 3,000,000
Northwest	Orleans to Menard	9.3	30,000,000
West	Outer Drive to Austin	7.7	32,000,000
Southwest	Harrison to Garfield	7.3	29,000,000
Southeast	49th to State Line	7.5	16,000,000
	Total	32.5	$110,000,000

The above estimates include right-of-way, engineering and construction costs and contain reasonable allowances for fluctuations in the cost of labor and materials and for contingencies. It is believed that the sums estimated are sufficient to contruct the several projects recommended. The approximate cost of the future construction is summarized, as follows:

ESTIMATED COSTS OF SUPERHIGHWAYS — FUTURE PROGRAM

Superhighway	*Limits*	*Length in Miles*	*Estimated Cost*
North	Bryn Mawr to Citiy Limits	2.5	$ 14,000,000
Northwest	Menard to City Limits	3.3	11,000,000
West (Second Route)	Outer Drive to City Limits	8.2	32,000,000
Southwest—			
I. & M. Canal	Damen to Harlem	7.3	7,000,000
South Extension	Garfield to 74th	2.7	10,000,000
North and South Crosstown	31st to Northwest Superhighway	5.7	21,000,000
	Total	29.7	$ 95,000,000

The comprehensive superhighway plan, including both initial and future programs, is summarized as follows:

Superhighway	*Length in Miles*	*Estimated Cost*
North	3.2	$ 17,000,000
Northwest	12.6	41,000,000
West—Initial Route	7.7	32,000,000
West—Second Route	8.2	32,000,000
Southwest	17.3	46,000,000
Southeast	7.5	16,000,000
North and South Crosstown	5.7	21,000,000
Total	62.2	$205,000,000

THE BENEFITS

The benefits resulting from the construction of the superhighways will be widespread. Facilities will be provided for segregating local and through traffic throughout the urban area. The thoroughfares proposed will provide connections for the more important truck highways at or near the city limits—see Figure 6. Connections will be provided by grade separated ramps to the existing distributor street system at various intermediate and downtown focal points in the city. It is estimated that the five superhighways recommended for initial construction will have combined capacity for the movement of 30,000 vehicles in one direction per hour. The use of the superhighways proposed for initial construction, based on detailed studies of present traffic flow, will reach an average total of 250,000 vehicles daily passing the points of maximum flow and a total initial travel aggregating some 600,000,000 vehicle miles annually.

Studies made of the accident records of various thoroughfares in Chicago prove that increased safety results from segregation of through from local and pedestrian traffic streams. The closest approach to a completely traffic separated thoroughfare in Chicago is the existing outer drive structure between Randolph Street and Ohio Street, where such segregation is almost complete. Analysis of the 1938 records of the Chicago Park District shows that there were 8 accidents to 10,000,000 vehicle miles operated in this section. This record may be compared with that of Augusta Boulevard, having numerous cross streets and no segregation of through from local vehicular and pedestrian traffic, where this ratio was increased to 34 accidents to 10,000,000 vehicle miles. The record is even worse on heavily traveled Cicero Avenue between Irving Park and Roosevelt Roads. This thoroughfare carries mixed traffic including street cars, and is intersected by numerous east and west streets with large volumes of traffic. Here the ratio is increased to 189 accidents per 10,000,000 vehicle miles. The following tabulation shows a comparison on various types of roadways in Chicago and the ratio of accidents to vehicle miles operated:

COMPARISON OF ACCIDENTS ON VARIOUS TYPES OF BOULEVARDS FOR THE YEAR 1938 — EXCEPT AS NOTED

Thoroughfare	*From*	*To*	*Number of Accidents* *Fatal*	*Non-Fatal*	*Total*	*Accidents Per 10,000,000 Vehicle Miles*
Lake Shore Drive	Randolph	Ohio	0	12	12	8
Lake Shore Drive	Foster	Irving Park	0	32	32	11
Leif Eriksen Drive	Roosevelt	51st	3	119	122	12
*Outer Drive	Foster	51st	11	369	380	14
Augusta Boulevard	Elston	Austin	4	103	107	34
South Parkway	24th	35th	2	28	30	37
†La Salle Street	Kinzie	North	..	..	115	84
†Western Avenue	Devon	87th	..	..	1,270	91
†Ashland Avenue	Cortland	87th	..	..	922	100
South Parkway	35th	51st	5	156	161	111
†Cicero Avenue	Irving Park	Roosevelt	..	..	407	189

* Includes Field Boulevard, Lake Shore and Beach Drives.
† 1937.

An example of the remarkable improvement in safety is the recently published record of the grade separated Merritt Parkway in Connecticut. This fine superhighway carries an average of 18,800 vehicles daily—a total of more than 1,000,000 in the first 13 months operation. During this period there was a single fatality—in no way attributable to the highway design.

An analysis of available traffic accident records in Chicago develops the fact that more than 2,700 traffic injuries and 80 deaths can be expected to be eliminated each year through the completion of the superhighways recommended for initial construction.

The benefit to motorists traveling long distances within the city has already been discussed. However, there will be similar and almost equal benefits to many other groups. Through the transfer of through traffic to superhighways, such traffic will be removed from the local streets, thereby greatly reducing the densities of traffic on the existing street system. Thus, traffic congestion will be eliminated throughout the entire urban area, in many cases along thoroughfares and at street intersections somewhat remote from the actual superhighway location.

It has long been recognized that through traffic is of no benefit to local business but on the other hand is an actual detriment. This is because large volumes of such traffic, operating at relatively high speeds, hinder the free movement of motorists moving to and from and doing business in these local commercial areas. Through the transfer of the through traffic to superhighways, a substantial benefit will accrue to all local commercial districts throughout corporate Chicago.

Finally, there will be a general improvement in the districts traversed by the superhighways themselves. The construction of express roadways through broad rights-of-ways, flanked by suitably landscaped parkways, will have the result of providing, in effect, boulevards through now densely built up commercial and residential districts.

That such breathing spaces and landscaped parkways are of real benefit has been proven conclusively both in Chicago and elsewhere. In Chicago the improvement in the neighborhoods in the immediate vicinity of the existing park boulevards and in increase in property values is well known. In New York City, where many miles of superhighways of this character have been built, there has already been a marked improvement in character of neighborhoods penetrated, accompanied by increases in land values.

It is manifestly impossible to estimate in terms of dollars and cents the total value of the direct and indirect benefits which will flow to the community from the proposed comprehensive superhighway program. However, the direct benefits to motorists using these thoroughfares through time savings, more direct routes and accident reduction has been caluculated. The total annual time saving to automobile passengers has been estimated at 25,500,000 passenger hours. Based on an average figure of 60 cents per hour, the total annual savings amount to

more than $15,000,000. Computing accidents involving injuries and personal property losses to be eliminated at an average of $140, and deaths at $10,000, the annual savings would total more than $1,000,000. Thus, the total direct saving to motorists using the initial superhighways would be in excess of $16,000,000 each year, exclusive of the enormous saving to business and industry in making commercial deliveries.

The question of how much of the benefits from superhighways will flow to residents of Chicago is of considerable interest. Therefore, a study has been made for the purpose of determining the origin of the through traffic which will be attracted to the new arteries.

Origin and destination counts of traffic made by the State Division of Highways during August, 1931 show the percentage of traffic passing Harlem Avenue, with destinations east of Halsted Street on six thoroughfares extending northwest, west and southwest from Chicago, ranging from 45 per cent on Washington Boulevard to 6 per cent on Archer Avenue, with an average of 22 per cent. This is suburban and other out of city automobile traffic which would be attracted to superhighways. Counts made during November, 1937 of typical week-day eastbound traffic on the Washington-Warren Boulevard thoroughfare showed that 56 per cent of the total vehicles passing Cicero Avenue were from out of the city. At Ashland Avenue this percentage is reduced to 28 per cent of the total. The detailed studies of characteristics of existing traffic from the west side made in connection with preliminary estimates of the probable initial use of the west side superhighway indicate the percentage of vehicles originating west of the city limits to be approximately 40 per cent. These studies show that, contrary to the general impression, the majority of use and benefit from the superhighways will flow to motorists originating within the limits of the City of Chicago.

DISTRIBUTION OF SUPERHIGHWAY TRAFFIC NEAR THE CENTRAL BUSINESS DISTRICT

A study has been made of the situation which will result from the completion of the several superhighways radiating north, northwest, west, southwest and south from the central business district when the radial system will deliver traffic to each of the four corners of the central business district. Pedestrian movements as counted by the City Division of Traffic Engineering on a typical week-day in 1938 were charted to develop data in respect to the extent and location of the various activities carried on in the central district. These studies are shown on Figure 19. Distribution of pedestrian concentrations may be regarded as a fair index to general activities in any business section. Maximum pedestrian movements are located principally east of Wells Street between Jackson and Randolph Streets. These movements shrink materially near Harrison Street on

the south and Wacker Drive on the north. They are centered at or slightly south of Madison Street. Therefore, new distributor streets as proposed along Congress Street and ultimately north of the river are properly located—slightly outside of the area of densest use.

A better understanding of the problem of distribution of superhighway traffic in and near the central business district may be had if traffic flow is discussed in hydraulic terms. The radial superhighways will really function as gigantic siphons. Large flows of through traffic now moving slowly through the local street system will be intercepted near the city limits and connected to the superhighway near its outer terminus. Through traffic then flows through the siphon along an entirely independent channel completely separating the heavy through traffic streams from all intersecting and local cross traffic streams. Near the central business district this process is reversed and the traffic flow—concentrated on the superhighways—will be distributed so as to flow over the existing street system to its destination. This is illustrated on the diagram reproduced on Figure 20.

The provision for adequate feeder and distributor streets with sufficient capacity to carry (in addition to their present traffic load) the volumes of traffic to be fed to and distributed from the superhighway is a fundamental element of superhighway design. This is just as important as providing adequate facilities for through trunk line travel on the express roadways or properly designed ramps.

Increases in traffic concentrations will be confined largely to those thoroughfares used as feeders and distributors which convey traffic to and from the superhighway. Traffic on existing thoroughfares in the area between the central business district and the outer termini of the superhighways will be substantially reduced through the diversion of through traffic to superhighways.

Upon the completion of the Congress Street improvement there will be a reasonably adequate distributor street system surrounding the loop district, consisting of Congress Street on the south, Canal Street and Wacker Drive on the west, Wacker Drive on the north and Michigan Avenue on the east. These distributor streets will be supplemented by Roosevelt Road on the south. Other existing streets which may be utilized extensively as routes for traffic to and from the proposed superhighways include Harrison and Polk Streets on the south; Canal, Clinton, Jefferson, Desplaines, Peoria and Morgan Streets on the west; and Kinzie, Hubbard, Illinois, Ohio, Ontario, Erie and Huron Streets and also Grand Avenue on the north. Existing facilities, supplemented by Congress Street,

are available for traffic distribution along the south and east margins of the central business district. However, facilities on the north and on the west may require improvement.

A study has been made of existing traffic densities on the streets which may be utilized as distributor streets west and north of the river from which it is apparent that these existing streets, if improved with wider pavements, and if double parking were to be eliminated, would have capacity for substantial increments in traffic. To illustrate this, recent counts (1938-1939) showing typical week-day traffic during the maximum 30-minute period of the morning rush hour (8:30 to 9:00) are tabulated below.

Figures 25 and 26 show views of Jefferson Street and illustrate the existing conditions. Figures 27 and 28 show present light use made of Ontario Street and Hubbard Street on the near north side.

MAXIMUM 30-MINUTE TRAFFIC ON VARIOUS DISTRIBUTOR STREETS WEST AND NORTH OF CENTRAL BUSINESS DISTRICT*

	Two-Way Traffic		
	Passenger Cars	*Commercial Vehicles †*	*Total*
West Side Streets			
Canal	540	200	740
Clinton	250	130	380
Jefferson	100	40	140
Desplaines	160	110	270
Peoria	75	50	125
Morgan	110	110	220
Total—West Side	1,235	640	1,875
North Side Streets			
Kinzie	105	90	195
Hubbard	75	20	95
Illinois	55	45	100
Grand	95	110	205
Ohio	185	30	215
Ontario	40	20	60
Erie	80	30	110
Huron	20	15	35
Total—North Side	655	360	1,015

* Mean of available counts—Roosevelt Road to Madison Street on west side streets. Traffic counts at Clark Street on north side streets.

† Includes street cars, buses and taxicabs.

Some idea of the latent capacity of these streets for handling additional traffic may be gained through a comparison of the present rush hour traffic as shown above with that on various heavily traveled thoroughfares both inside and outside of the central business district, shown in the following tabulation:

MAXIMUM 30-MINUTE TRAFFIC — VARIOUS STREETS

Street	*Location Between*	*Passenger Cars*	*Commercial Vehicles **	*Total*
La Salle	Madison and Washington	536	61	597
State	Monroe and Madison	265	333	598
Harrison	Clark and La Salle	413	290	703
Cicero	Diversey and Parker	630	118	748
Jackson	Market and Franklin	638	117	755
Franklin	Madison and Washington	513	246	759
Diversey	Damen and Chicago River	745	38	783
Ogden	Washington and Randolph	652	229	881
Ridge	Clark and Peterson	912	54	966
Washington	Canal and Wacker	959	67	1,026
†Ashland	North and LeMoyne	786	277	1,063
†Western	Irving Park and Belleplaine	965	176	1,141

* Includes street cars, buses and taxicabs.
† Wide roadway.

Taking a conservative figure of 800 vehicles in the maximum 30-minute period for potential 2-way use of roadways (with 4 lanes for moving traffic) near the outer fringe of the central business district, the normal useable capacity of six distributor streets on the west side may be estimated at 4,800. Eight streets are available on the north side with total useable capacity of 6,400.

On the west side, the existing traffic on the six streets studied totals 1,875 so that these streets, when properly paved and controlled can be utilized for distributing some 2,900 vehicles from superhighways to east and west delivery streets. This is substantially in excess of the estimated maximum number of vehicles to be distributed from the west side superhighway in this area.

On the north side, the existing traffic on the eight streets studied amounts to only 1,015 vehicles in the maximum 30-minute period. Therefore, if provided with suitable pavements and properly controlled, these streets could distribute up to 5,300 vehicles from superhighways, a number greatly in excess of any load which might be imposed by the initial superhighway construction program.

The manner in which traffic from the proposed northwest and west superhighways might be distributed through certain of the distributor streets above discussed is illustrated in the diagram reproduced in Figure 20. The present traffic flow on proposed distributor streets on the near west side appears on Figure 22. This drawing also indicates the unused capacity of each of these thoroughfares—available for handling additional traffic. A similar chart covering the existing east and west streets on the near north side is shown on Figure 23.

It is apparent that the streets studied—suggested as supplemental distributor streets—have a large capacity in the aggregate to deliver traffic from superhighways to the downtown street system. However, there is a possibility of need for a cross connection between the southwest and the northwest superhighways along the west side of the business district. This connection should be built whenever the traffic demands warrant the expenditure and provision for it is made as a part of the comprehensive plan. It is concluded that, except for a cross connection near the river, there will be no need for any special off-grade distributor facilities in the central area as a part of the initial program. However, it will be necessary to provide suitable connections to and effect paving improvements on certain of the thoroughfares which will function as feeder and distributor streets.

In the study of this problem it has been assumed that the northwest superhighway would connect with and deliver northwest side traffic to the central business district at or near its northwest corner; and that *logically* the initial west side superhighway would deliver west side traffic at or near the southwest corner of the district. Therefore, the chart illustrating the probable distribution of superhighway traffic into the downtown district has been made with this common sense arrangement in view. Figure 24 shows a diagram of the initial subway system now under construction; also the west and the northwest superhighways. This chart also shows intensities of pedestrian movements in the central business district. The balanced plan proposed avoids unnecessary concentration of traffic in the downtown district and will also tend to stabilize downtown development.

It seems almost obvious that no sound plan for a city wide superhighway system should concentrate the traffic of two of the most important of the proposed thoroughfares at a single point, if there is any way in which it can be avoided. In spite of this, suggestions have been made from time to time to locate the initial west side highway somewhat north of the central business district so that the total traffic from both the northwest and west superhighways would be concentrated at a single location. This would result in doubling the traffic load on distributor streets extending south and east from this concentration point. It would unbalance the traffic load in the entire central area. In addition, such location for the west superhighway would unnecessarily concentrate practically all new transit facilities in the north end of the central business district.

Increase in Use and Capacity of Downtown Streets

The situation in the central business district proper may be analyzed by reference to the flow chart shown on Figure 30. This chart shows maximum passenger and commercial vehicular traffic flow during the period 8:30 to 9:00 A. M. on a typical week-day. The data was obtained by counts made in 1938 and 1939.

The construction of the initial superhighways to the west and northwest will result in a redistribution of traffic on the streets in and near the loop district.

Much of the traffic will flow to the loop district on east and west streets from distributors west of the river.

The probable distribution may be estimated on the theory that passenger traffic from the superhighways will be attracted to the streets in the terminal area in inverse proportion to their traffic densities. The removal of street car tracks east of Clinton Street will effect a remarkable increase in useful capacity of all east and west streets from Harrison Street to Lake Street. The construction of modern pavements and setting back the curbs would alone provide substantially greater capacity. Attention is called to the large traffic volumes carried on Franklin and Harrison Streets—both newly paved—in comparison with other similar streets in this area—see Figure 30. An instance of the possibilities of streets with four lanes for moving traffic and free from street cars is found on Washington Street between Canal Street and Wacker Drive. Here 653 vehicles move eastbound in the maximum 30-minute period of the morning rush hour. This volume of traffic crosses Canal Street and Wacker Drive in spite of relatively heavy movements of cross traffic and the fact that left turn movements are permitted at each intersection—those at Wacker Drive constituting a substantial portion of the east and west traffic at this intersection.

It may be concluded that the street system in the loop district can be developed and controlled so as to accommodate all probable increases in traffic concentration resulting from the construction of the proposed comprehensive system of superhighways. Except for transportation subways, the physical improvements required will not involve any major problem in financing.

Through Routes in Central Business District

Plans have been frequently proposed for the construction of elevated highways in or near the central business district to provide facilities for through traffic from the west side to the south or the north sides. The cost of such thoroughfares, either elevated or depressed, when provided with suitable ramps and connections and if private property should be acquired so as to avoid bottlenecks in the existing street system, would be heavy. There is a grave question as to whether such off-grade facilities for through traffic are required, and their necessity should be clearly proven before they are planned.

Available data covering the movement of vehicles from the west side to the north or south sides have been canvassed to determine the volume of traffic which might be convenienced by such through routes near the central business district if built. Accurate information as to vehicles from areas west of the central business district moving to the north side over the Michigan Avenue bridge is obtained from the count made by the Lincoln Park Board on July 3, 1930, under the supervision of the late J. R. Bibbins, Consulting Engineer. This count showed that of the total vehicles northbound over the Michigan Avenue bridge,

only 4.1 per cent originated in the entire area west of Halsted Street and between Chicago Avenue and Cermak Road. The number of vehicles originating in the west suburbs amounted to only 1.8 per cent of the 32,000 vehicles crossing the Michigan Avenue bridge outbound. Thus, less than 1,900 vehicles originating on the west side, both in the city and in the suburban district beyond, had destinations north of the Chicago River—either the near north side or in areas further north—which would be convenienced by off-grade facilities between the west side superhighway and the Outer Drive to the north, if built. It should be noted that the Ogden Avenue improvement—providing a by-pass for traffic between the west and north sides—was not completely built at the date of the above count.

Another origin and destination survey was carried on by the City Council Committee on Traffic and Public Safety and the Illinois Division of Highways, covering typical week-days in October, 1931 (7:00 A.M. to 11:00 A.M. and 2:00 P.M. to 6:00 P.M.) The movements of approximately 100,000 vehicles were recorded at 171 stations located at strategic points in and near Chicago. At the station at the intersection of Washington and Sacramento Boulevards, data covering origin and destination of 31,349 vehicles was obtained. Of this total number, 624 or 2.0 per cent had origins and destinations in the near north side district bounded by the Chicago River, Lake Michigan, Division Street and Halsted Street. Only 412 vehicles or 1.3 per cent of the total checked had origins and destinations in the south side area bounded by the South Branch of the Chicago River and Roosevelt Road on the north, Halsted Street on the west, 35th Street on the south and Lake Michigan on the east. This survey, therefore, produced results which sustantiate the 1930 study of the Lincoln Park Board. In commenting on the distribution of Washington Boulevard traffic at Sacramento Boulevard the report states:

> "Again the dominance of the central business district as the hub of City traffic activities is shown. Of the total daily traffic movements of 31,349 the central district origins and destinations account for 7,621 or 24.3 per cent. Washington Boulevard illustrates again the pronounced radial character of the major routes connecting the central district with the other parts of the City and the principal State routes beyond the City. . . . It should be noted that very little of the traffic is distributed to the lake shore districts to the south or to the north of the central district notwithstanding the great traffic importance of these areas."

Conditions today are not materially different from those prevailing in 1930 and 1931 (except for the completion of the Ogden Avenue improvement). Therefore, the foregoing surveys show that the traffic volumes between the west side and the north or south sides are insufficient at present to warrant large investment in grade separated through highways in and near the central business district. When and if the volume of such traffic becomes substantial, provision for it should be made by some route which would carry such through traffic outside of the congested terminal area. It should be noted that the comprehensive

superhighway plan provides for the future construction of a superhighway about two miles west of the central business district which will provide first class facilities for by-passing the central business district on the west. This north and south crosstown route will articulate all of the proposed superhighway network except the Outer Drive routes to the north and to the south as well as all of the existing east and west arterial streets from Fullerton Avenue on the north to 71st Street on the south.

The small volumes of traffic from Congress Street west of the river, destined to points on the south side east of Clark Street, can utilize for a through route either Clinton, Jefferson or Desplaines Streets and Roosevelt Road as well as Congress Street. The existing viaduct on Roosevelt Road provides elevated highway facilities between Canal Street and Wabash Avenue.

It should be noted that the present plans for the improvement of Congress Street terminate at Michigan Avenue. In the section between State Street and Michigan Avenue, widening of the roadway to 50 feet and repaving is suggested as an initial step. However, it may be determined as a matter of policy to include the widening of the existing street to a broad thoroughfare 120 feet in width and this can be done—even at the expense of deferring the construction of a short section at the western end. The extension of this thoroughfare east to Columbus Drive would improve its efficiency and is therefore recommended. This connection could be made at a moderate cost and without serious effect on the existing plaza on the east side of Michigan Avenue. The improvement could terminate at Columbus Drive with traffic routed either north or south to the existing connections along Monroe Street, Jackson Street, Balbo Avenue or 11th Street to the Outer Drive.

It has been suggested that the higher level of Congress Street at the river be continued east across Michigan Avenue, ramping down to a surface connection in Grant Park. This, in effect, would be a second level thoroughfare through the central business district, and would involve the problem of crossing over the LaSalle Street station terminal tracks, and of ramp distribution to surface streets in the loop. However, as an alternate to the plan suggested herein, it can be given further consideration and study before any plan is finally adopted.

Analysis of present west side traffic flows shows the present Congress Street plans, which include a grade crossing at Canal Street and a six-lane bridge over the river, to be adequate. The Canal Street grade crossing is nevertheless undesirable and if further study develops any feasible plan for grade separation, the recommended plan can be modified before actual construction. Further study should also be given to the number of lanes to be provided on the river bridge.

Accessibility of Proposed Superhighways

The comprehensive system of superhighways, when completed, will connect with and form a network of trunk lines for practically all of the major traffic

streets in the city. Convenient, fast and safe routes will be provided for the heavier through movements. Figure 31 indicates the manner in which traffic will be delivered to the principal arterial streets by the proposed network. Practically all of the great central district bounded by Lake Michigan, Belmont Avenue, California Avenue and Pershing Road will be within one mile of the superhighway system.

THE FINANCIAL PROBLEM

The program proposed herein involves the expenditure during the next five years of $110,000,000 to be followed by a further expenditure of $95,000,000 when feasible. The immediate concern is with the initial program.

There are at present five public agencies which can legally and appropriately make contributions, either directly or indirectly to this program, as follows:

The City of Chicago,
The County of Cook,
The Chicago Park District,
The State of Illinois, and
The Federal Government.

Through legislation which became effective in July, 1939 state officials, on request of the City of Chicago and the County of Cook, are authorized to pledge not to exceed one-half of the net revenues of these agencies from the collection of motor fuel taxes. These future revenues may be pledged to secure the payment of principal and interest on notes to be issued by the State of Illinois. Figure 32 shows a tentative financial program based on this legislation and indicates the portions of estimated future revenues of the City of Chicago required to finance a $30,000,000 construction program at an interest rate of 3 per cent per annum. Estimates of future motor fuel tax revenues are based on estimates of motor fuel consumption recently made by the State Wide Highway Planning Survey.

A study has been made of normal highway requirements of the city, and it is believed that a superhighway program of $30,000,000 or even more can be financed and at the same time permit normal programs of essential paving and bridge construction and reconstruction to be carried on. In fact, the total annual cost of such a program to Chicago spread over a 20-year period is less than one-third of the city's anticipated revenues from motor fuel taxes and is only slightly more than the present payments of $2,000,000 per annum to the Board of Education, which will terminate in 1940.

As stated above, the County of Cook is likewise authorized to pledge not to exceed one-half of its net revenue from motor fuel tax for superhighway construction, and such net revenue is sufficient to finance a construction program of $30,000,000 or more. The County of Cook has definitely moved toward super-

highway construction by the adoption by the Board of Commissioners of a resolution on September 28, 1939, providing that the County undertake the construction of the northwest superhighway herein described and recommended. The resolution authorizes and directs the Superintendent of Highways to proceed with plans for such superhighway, to be submitted to the state on or before March 1, 1940.

The Chicago Park District, while not primarily a highway building agency, has developed a splendid system of boulevards and park drives that today carry large volumes of passenger motor vehicles. The Park District planned and built the outer drives which now extend from Foster Avenue on the north to Jackson Park on the south, with the exception of the short stretch of Lake Shore Drive from Montrose Avenue to Foster Avenue which was built by the State Division of Highways. It now is and for the past several years has been engaged in the reconstruction of these outer drives to provide more efficient through traffic movements and more complete segregation from cross traffic of all kinds. The Park District has prepared tentative plans to extend these drives both north and south. These extensions are included in the recommended initial superhighway program. It is recognized that the Park District may not have sufficient funds to carry out the whole of these projects at this time, but it seems reasonable to assume that it may acquire necessary right-of-way and riparian rights in locations where the proposed superhighways are to be later incorporated into park areas. As the Park District proposed further increases of its made land for the park extensions, it may in certain locations be expected to provide the fills necessary for superhighway construction.

The State Division of Highways has a net income—including Federal aid—available for new construction, renewals and extensions of the primary road system throughout the entire state of more than $15,000,000 per annum. It was originally proposed that the enabling legislation include authority to issue notes to be retired from the state's share of future motor fuel tax revenues. However, due to the fact that the state has such large sums available for highway expenditures annually and for the further reason that the state highway authorities preferred to participate on a pay-as-you-go basis, the legislation was amended so as to limit the pledging of future motor fuel tax revenues to those of the city and county.

However, during the numerous hearings and conferences preliminary to the enactment of the legislation, representatives of the State Division of Highways expressed the state's willingness to participate in an initial superhighway program for Chicago—and therefore it may be expected that the state will assume the responsibility for a substantial portion of the program.

The recognition of the national importance of providing suitable and adequate terminals in large cities for interstate highways warrants the belief that financial assistance of the Federal Government, either direct or indirect, may be

given to the Chicago program. In Mr. Thomas H. MacDonald's report of last April, he discussed the right-of-way problem in considerable detail and stated:

> "The most influential causes of the delay in effecting the needed changes hitherto have been the inadequacy of available funds and the overpowering legal obstacles and inhibitions that stand in the way of obtaining essential rights-of-way; and these will continue to retard action and eventually build up a formidable burden of deferred construction expenditure unless early provision is made to deal adequately with this problem.
>
> "The right-of-way problem could be greatly simplified and in a large measure eliminated with respect to major highways and streets if there were some central agency with sufficient funds and authority of law to acquire the lands necessary for the improvement of such highways and streets at a period substantially in advance of the time when the improvements actually would be made. If this were done, then the right-of-way previously acquired could be made available to the highway authorities charged with the duty of making the improvements, either on a rental basis or at the price paid by the acquiring agency, plus the costs of such acquisition and any interest charges paid thereon to the date of the use of the lands. Acquisitions by such agency should include all areas, the need for which reasonably might be anticipated for the physical construction of the improvement and for necessary roadside development, including probable future expansions of the transportation facility itself. Such an agency would have to be created by the Congress in order that its jurisdiction and authority might be general throughout all of the States, and that its operations could be on such a basis that it would be in whole or in substantial part self-liquidating.
>
> "Consideration might be given by the Congress to the setting up of a Federal agency for the purpose of acquiring necessary lands in advance of highway and street improvements, as outlined more in detail elsewhere in this report. Such agency should have authority, under proper restrictions, to make such lands available to State and local highway and street authorities for rights-of-way and for development for recreational, tourist, and the other facilities for the accommodation of traffic, all on a basis which would render such agency either partly or wholly self-liquidating over a period of years.
>
> "The aid of the Federal Government can be practically extended by supplying capital for investment in highway and street rights-of-way on a scale sufficient to protect the facilities and provide amply for their expected growth.
>
> "Such rights-of-way acquired with Federal funds at the request of a State highway department, and in accordance with State and Federal laws, could remain the property of the Federal Government subject to lease by the State over a period of 50 years on terms that would in that period amortize the initial cost. Representative State highway officials with whom this suggestion has been discussed are unanimously of the opinion that such a provision would not only be helpful toward a solution of the difficult right-of-way problem, but would also be welcomed and utilized by the State Governments.
>
> "Effectively to administer such a provision would probably require the creation of a Federal Land Authority, having corporate status with adequate capitalization and authority to issue obligations within prescribed limits, which would be empowered to acquire, hold, sell and lease lands for stated purposes."

Subsequently on August 5, 1939, Mr. Wilburn Cartwright, Chairman of the House Committee on Roads of the United States Congress, introduced a bill giving effect to Mr. MacDonald's recommendations. While not yet acted upon, the bill provides that the Commissioner of Public Roads is authorized to acquire, hold, lease, sell or exchange real estate adjacent to any road project "which will be a post road or will foster interstate commerce, aid in the national defense, facilitate the use of the mails, or promote the general welfare; and to pay all expenses in connection with the acquisition of real property hereunder."

This bill also authorizes the Reconstruction Finance Corporation "to make loans to States, municipalities, or other public bodies to finance, or to aid in financing, the construction, reconstruction, or improvement of road projects and the acquisition of real property or interest in property necessary or desirable for, or adjacent to, such road projects; such loans to be made after the approval by the Commissioner of Public Roads of plans and specifications for such projects submitted by such States or other public bodies, and upon such terms and conditions as will reasonably assure the repayment thereof within forty years, with interest at such rate or rates as may reasonably be expected to reimburse said Corporation for the cost to it of the capital required for the making of such loans." The bill further provides for contracts between the Commissioner of Public Roads and the various local highway building agencies; for the institution and prosecution of all condemnation proceedings by the Attorney General and authorizes the Commissioner of Public Roads and the Reconstruction Finance Corporation to utilize the services of various local agencies and to reimburse such agencies and their employees for services rendered on such right-of-way acquisition.

This proposed legislation has been submitted to all of the State Highway departments for their review and criticism and will undoubtedly be the subject of active consideration at the next regular session of Congress. It seems reasonable to presume, therefore, that substantial aid in the financing of the acquisition of rights-of-way—the cost of which may be estimated at about approximately one-third of the total cost of superhighways—is possible if not probable.

It is believed, therefore, that the $110,000,000 program proposed for initial construction is one which can be financed through the joint efforts of the five public agencies above enumerated.

THE ACCOMPLISHMENT OF THE PLAN

Many of the preliminaries to the inauguration of the actual construction program have already been accomplished. The next logical step appears to be the allocation of responsibility for so much and such portions of the recommended program as the various public agencies may elect to assume. The assumption of one or more entirely separate projects by each agency would expedite the construc-

tion through the centralization of responsibility and the elimination of unnecessary red tape in the prosecution of the work.

In view of the recent action of Cook County in reference to the northwest superhighway, the City of Chicago is in a position to consider which of the remaining projects should be selected and constructed by it. In the event the City elects to proceed with the west side superhighway along the general line of Congress Street, the plans and studies just completed in connection with a comprehensive plan for the extension of the subway system will serve to accelerate the actual start of the work. With this exception the plans and studies which have been made to date are general and preliminary in character. No detailed field surveys have been made and as soon as the City Council has determined—after conference with the other agencies at interest—which superhighways the City should undertake, detailed surveys and plans should be started immediately.

It should be noted that the enabling legislation provides that specific locations on all routes on which either the city or county propose to expend funds to be realized from the sale of the notes must be filed with the Division of Highways, Department of Public Works and Buildings, State of Illinois, before March 1, 1940. In view of this requirement, it may be advisable to plan all of the superhighways included in the initial program in such detail as may be required to file such specific locations before the specified date.

APPENDIX

THE INITIAL USE AND THE CAPACITY OF THE PROPOSED WEST SIDE SUPERHIGHWAY

This study was made in special reference to the plan for the widening of E. and W. Congress Street and appears as an appendix in the report on "A Comprehensive Plan for the Extension of the Subway System of the City of Chicago" submitted to the City Council on October 30, 1939. However, the data and analyses therein presented apply equally to any superhighway project in Chicago and therefore are republished as an appendix to this report to provide a more complete engineering basis for the comprehensive superhighway plan.

October, 1939.

APPENDIX I

THE INITIAL USE AND THE CAPACITY OF THE PROPOSED WEST SIDE SUPERHIGHWAY

PRESENT WEST SIDE TRAFFIC

This memorandum describes in some detail the several studies involved in estimating the initial use and capacity of the proposed Congress Street thoroughfare, together with summaries of data utilized.

Data on traffic on west side thoroughfares which will be benefited by the construction of a west side superhighway are available through traffic counts made by the State Division of Highways, the Chicago Park District, the Division of Traffic Engineering and the Committee on Local Transportation of the City of Chicago. The State counts include numerous 12-hour counts made in 1933 and subsequent years. The Committee counts were made in 1936 and 1937. The Park District counts, which were made in 1936 and 1937, were for 12 and 24-hour periods and also included continuous counts at certain intersections.

The Division of Traffic Engineering of the Department of Streets and Electricity, City of Chicago, has conducted periodical traffic checks at a large number of important street intersections throughout the urban area, starting in the year 1926. These checks have been made by a small skilled staff and have been taken at various seasons during the year. These counts cover the 16-hour period from 7:00 A. M. to 11:00 P. M.

This data, covering as it does the entire urban area and a period of more than 10 years, provides an exceptionally reliable factual basis for determining the increase in traffic volumes over the city street system. An analysis of these counts indicates that the average increase in traffic throughout the entire urban area has been at the rate of approximately 3.4 per cent per annum. This compares with an increase in ownership of motor vehicles, of approximately 5 per cent per annum. That the rate of increase of use of motor vehicles is only 78 per cent of the rate of increase of ownership is doubtless due to the fact that the development of the highway facilities in and near Chicago has not kept pace with automobile registration.

Data on traffic to the central business district was summarized in the 1937 Report on A Comprehensive Local Transportation Plan for the City of Chicago, as follows:

> "During the last ten years cordon counts have been made to determine the volume and character of traffic to and from the central business district. These counts cover a twelve-hour period from 7:00 A. M. to 7:00 P. M. and represent a typical weekday for May. The number of all vehicles entering the central business district has increased 26.6 per cent from 132,913 in the year 1926 to 168,251 in 1937, or about 2.5 per cent per annum.
>
> "It is significant that the average annual rate of increase for traffic entering the central business district is less than half the annual rate of increase in registration. This is largely the result of four factors:

1. The actual area of the so-called central business district is larger than the area within the cordon count boundaries and therefore the cordon counts can not accurately reflect the activities of the true central business area;
2. Inadequate highway facilities in and leading to the central business district;
3. The cost of parking cars within this district; and
4. The increasing development of commercial, industrial and recreational centers elsewhere throughout the corporate area of Chicago."

The Division of Traffic Engineering also carried on comprehensive volume counts of both vehicular and pedestrian traffic during the period February 26, 1938 and April 22, 1939 with personnel provided by the Works Progress Administration. These were more comprehensive and more recent than counts completed by any other agency and were therefore utilized throughout this study as a basis for estimating traffic volumes.

Hourly, Daily and Monthly Variations in Traffic

The test of the capacity of any transit facility occurs during the peak periods of the morning and evening rush hours. Certain of the data on traffic volumes available for this study was in the form of 12, 16 or 24-hour count totals. Therefore, the data available through the continuous counts made by the Chicago Park District for a 12-month period during 1936 and 1937 were invaluable as a basis for estimating peak period volumes. Three continuous count stations were maintained—

At Michigan Avenue and Monroe Street,
At Sacramento, Washington and Warren Boulevards, and
At Jackson and Ashland Boulevards.

These continuous counts have been summarized in Tables 1, 2 and 3. These tables show maximum week-day 30-minute traffic volumes, 12 and 24-hour totals, and percentages of maximum 30-minute to 12 and 24-hour totals and resultant averages. These percentages have been used in estimating maximum 30-minute traffic volumes at locations on various west side thoroughfares from which traffic will be diverted to the proposed superhighway system.

TABLE 1

Summary of Continuous Counts Made By Chicago Park District—1936-1937
At Michigan Avenue and Monroe Street

	Maximum ½ Hour				Totals 12 Hours			Totals 24 Hours			Percentages: Maximum ½ Hour to 24 Hours, Inbound		Percentages: Maximum ½ Hour to 24 Hours, Outbound		Percentages: Averages Max. ½ Hour to 24 Hours	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	12-14	13-15
Date of Count	*East*	*West*	*North*	*South*	*E-W*	*N-S*	*Total*	*E-W*	*N-S*	*Total*	*2/9*	*4/10*	*3/9*	*5/10*	*E-W*	*N-S*
Thur. 4-23-36	252	703	1,092	1,466	13,740	40,736	54,476	19,250	57,252	76,502	1.31	1.91	3.66	2.56	2.49	2.23
Mon. 5-11-36	193	569	948	1,388	12,042	42,446	54,488	16,699	58,261	74,960	1.15	1.63	3.40	2.38	2.27	2.01
Tue. 6-16-36	251	746	1,041	1,409	15,173	39,665	54,838	21,886	56,655	78,541	1.15	1.84	3.40	2.49	2.27	2.16
Wed. 7- 8-36	215	876	1,494	1,417	14,529	41,975	56,504	23,299	65,823	89,122	0.92	2.27	3.76	2.15	2.34	2.21
Mon. 8-24-36	250	794	830	1,483	15,127	41,440	56,567	21,464	58,839	80,303	1.16	1.41	3.70	2.52	2.43	1.97
Wed. 9- 9-36	225	686	967	1,445	14,348	43,084	57,432	19,995	59,525	79,520	1.13	1.62	3.43	2.43	2.28	2.02
Mon. 11-23-36	216	644	947	1,503	13,182	42,132	55,314	17,872	58,227	76,099	1.21	1.63	3.60	2.58	2.41	2.11
Tue. 12-29-36	251	630	901	1,302	13,967	41,187	55,154	18,657	57,282	75,939	1.35	1.57	3.38	2.28	2.36	1.93
Wed. 1- 6-37	226	608	924	1,443	12,606	41,594	54,200	17,020	57,539	74,559	1.33	1.60	3.57	2.51	2.45	2.05
Fri. 2-12-37	202	732	815	1,294	14,324	40,576	54,900	19,725	56,803	76,528	1.02	1.44	3.71	2.27	2.37	1.86
Mon. 3- 1-37	224	665	864	1,437	13,347	40,464	53,811	17,525	54,771	72,296	1.28	1.58	3.80	2.62	2.54	2.10
Average 11 Months	228	696	984	1,417	13,853	41,391	55,244	19,399	58,271	77,670	1.18	1.68	3.58	2.44	2.38	2.06

TABLE 2

Summary of Continuous Counts Made By Chicago Park District—1936-1937 at Sacramento, Washington and Warren Boulevards*

	Maximum ½ Hour				Totals 12 Hours			Totals 24 Hours			Percentages: Maximum ½ Hour to 24 Hours				Averages Max. ½ Hour to 24 Hours	
	Inbound		Outbound								Inbound		Outbound			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	12-14	13-15
Date of Count	East	South	West	North	E-W	N-S	Total	E-W	N-S	Total	2/9	3/10	4/9	5/10	E-W	N-S
Mon. 4- 6-36	1,496	418	1,448	380	27,761	8,660	36,421	37,697	11,481	49,178	3.97	3.64	3.84	3.31	3.90	3.48
Fri. 5-15-36	1,618	405	1,420	345	28,813	7,712	36,525	41,830	11,131	52,961	3.87	3.64	3.40	3.10	3.64	3.37
Tue. 9- 1-36	1,383	500	1,219	386	27,333	10,231	37,564	38,245	14,165	52,410	3.62	3.53	3.19	2.73	3.40	3.13
Tue. 11-24-36	1,359	561	1,299	436	26,788	10,089	36,877	37,587	13,778	51,365	3.62	4.07	3.46	3.17	3.54	3.62
Fri. 12-11-36	1,366	509	1,499	451	26,695	10,051	36,746	38,015	13,893	51,908	3.59	3.64	3.95	3.23	3.77	3.44
Fri. 1- 8-37	1,343	566	1,380	469	25,419	10,754	36,173	35,086	14,400	49,486	3.83	3.93	3.95	3.26	3.89	3.60
Wed. 2- 3-37	1,262	535	1,447	492	25,675	10,593	36,268	35,709	14,252	49,961	3.56	3.75	4.05	3.46	3.80	3.61
Tue. 3- 9-37	1,291	605	1,456	561	25,934	11,256	37,190	35,003	14,933	49,936	3.69	4.05	4.16	3.75	3.92	3.90
Average 8 Months	1,389	512	1,396	440	26,802	9,918	36,720	37,396	13,504	50,901	3.72	3.79	3.72	3.26	3.73	3.52

*During months of June, July and August, 1936, counts were suspended during pavement repairs.

TABLE 3

Summary of Continuous Counts Made By Chicago Park District—1936-1937 At Jackson and Ashland Boulevards

	Maximum ½ Hour				Totals 12 Hours			Totals 24 Hours			Percentages: Maximum ½ Hour to 24 Hours				Averages Max. ½ Hour to 24 Hours	
	Inbound		Outbound								Inbound		Outbound			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	12-14	13-15
Date of Count	East	South	West	North	E-W	N-S	Total	E-W	N-S	Total	2/9	3/10	4/9	5/10	E-W	N-S
Wed. 4-15-36	669	362	658	452	15,536	12,540	28,076	20,759	16,305	37,064	3.22	2.22	3.17	2.77	3.20	2.50
Thur. 5-21-36	711	330	712	437	16,831	12,806	29,637	22,918	17,481	40,399	3.11	1.89	3.11	2.50	3.11	2.20
Wed. 6-10-36	671	354	709	439	16,560	13,056	29,616	22,502	17,377	39,879	2.99	2.04	3.15	2.53	3.07	2.28
Thur. 7- 9-36	639	311	707	526	15,600	12,680	28,280	22,003	17,490	39,493	2.90	1.78	3.21	3.01	3.06	2.40
Fri. 8-14-36	701	359	862	493	15,584	13,156	28,740	21,432	18,050	39,482	3.27	1.99	4.02	2.73	3.66	2.36
Tue. 9-15-36	831	350	755	502	18,613	13,352	31,965	24,745	17,802	42,547	3.37	1.97	3.05	2.82	3.21	2.40
Mon. 11-23-36	750	382	703	421	17,156	13,307	30,463	21,827	16,398	38,225	3.43	2.33	3.22	2.57	3.32	2.45
Thur. 12-10-36	731	362	721	446	16,693	13,761	30,454	22,345	18,070	40,415	3.28	2.00	3.23	2.47	3.26	2.24
Sat. 1- 9-37	605	369	544	423	17,171	13,666	30,837	23,740	19,010	42,750	2.55	1.94	2.29	2.23	2.42	2.08
Wed. 2- 3-37	677	330	698	444	16,131	12,590	28,721	21,068	15,838	36,906	3.23	2.09	3.32	2.81	3.28	2.45
Tue. 3-16-37	696	391	709	468	16,379	12,912	29,291	21,734	17,044	38,778	3.21	2.30	3.26	2.75	3.24	2.52
Average 11 Months	698	355	707	459	16,569	13,075	29,640	22,270	17,351	39,631	3.14	2.05	3.18	2.65	3.16	2.35

Half hour variations in traffic based on averages of five week-day counts during January, July and May have been plotted on Figure 23. The sharp peak during the morning rush hour is clearly brought out and indicates the advisability of basing capacity studies on maximum 30-minute periods.

Daily variations in traffic during typical winter and summer weeks are shown on Figure 24. The uniformity of traffic volumes on the six week-days is brought out by this chart, as is the rather remarkable decrease in traffic on Sundays. The soundness of basing superhighway design on week-day traffic counts is conclusive, in the absence of heavy week-end volumes.

Figure 25 shows available data from the three continuous count stations in monthly variations in total 24-hour week-day traffic. These charts show the very interesting uniformity of traffic volumes throughout the calendar year.

The maximum variation from average traffic volumes noted was only 13 per cent and the minimum varied from the average less than 7 per cent.

Traffic Volumes

Estimates were made from all of the data studied of average week-day inbound passenger vehicle movements* on major thoroughfares between the west side and the central business district during the maximum 30-minute period. These estimates have been summarized and are charted on Figure 17. No attempt has been made to indicate the flow of traffic on local streets such as Taylor, Polk, Fulton or Erie Streets as for various reasons these and the other streets not shown are of no importance as thoroughfares for traffic to and from the central business district.

The following thoroughfares** are now available to serve east and west traffic between the central business district and the west city limits:

Chicago Avenue	Monroe Street
Huron Street	Adams Street
Erie Street	Jackson Boulevard
Hubbard Street	Van Buren Street
Kinzie Street	Harrison Street
Fulton Street	Lexington Street
Lake Street	Polk Street
Randolph Street	Arthington Street
Washington-Warren Boulevard	Taylor Street
Madison Street	Roosevelt Road

Of these only the following afford continuous travel to the western city limits:

Chicago Avenue	Jackson Boulevard
Lake Street	Harrison Street
Washington-Warren Boulevard	Roosevelt Road
Madison Street	

* Street cars and buses excluded.

** Streets with maximum continuous section of less than 2 miles omitted. Grand Avenue and Ogden Avenue diagonals not directly serving the central business district, also omitted.

Chicago Avenue, Lake Street, Madison Street, Harrison Street and Roosevelt Road are street car routes—the two center lanes being largely given over to street car traffic. The roadway of Lake Street is obstructed by elevated railroad structure columns for much of its length. With the exception of Roosevelt Road, the boulevards and short sections of the other thoroughfares, roadways are narrow and partially obstructed by parking; with the result that the major portion of the east and west traffic burden is carried by Washington (Warren) Boulevard, Jackson Boulevard and Roosevelt Road. This condition is shown clearly on the flow chart showing existing inbound traffic during the maximum 30-minute period—see Figure 17.

The beneficial effect of the one-way street operation afforded by the Washington-Warren artery between Garfield Park and Ogden Avenue is apparent from the following tabulation showing distribution of the total eastbound passenger vehicle traffic at 3 locations between Western Avenue and Canal Street:

INBOUND PASSENGER VEHICLE TRAFFIC
MAXIMUM 30-MINUTE PERIOD

Typical Week-Day—1938-1939

	East Line of Western Avenue		West Line of Ashland Avenue		East Line of Canal Street	
Thoroughfare	*Vehicles*	*Per Cent*	*Vehicles*	*Per Cent*	*Vehicles*	*Per Cent*
Warren Boulevard	1,882	54	1,329	37	653	24
Jackson Boulevard	739	20	728	21	418	16
Roosevelt Road	425	11	733	21	480	18
Other Streets—						
Chicago Avenue to Roosevelt Road	556	15	726	21	1,112	42
Total	3,602	100	3,516	100	2,663	100

Inbound traffic in the central business district during the maximum 30-minute period based on typical week-day counts made during 1938-39 is shown on Figure 19. This chart shows inbound passenger vehicles eastbound to Michigan Avenue, northbound and southbound from Congress Street. It is noted that there is a tendency for this passenger vehicle traffic to equalize on the roadways of the several streets in this highly congested area. The heavy use of the existing distributor streets—Wacker Drive and Michigan Avenue—is also evident.

The inefficient use of most of the roadways in the loop district is apparent from an examination of this flow chart. The total eastbound traffic on the several loop streets at the west line of Clark Street, the width of the roadway of each and the percentage use, taking present use of the Jackson Street roadway at 100 per cent, is shown on the following tabulation:

Street	*Roadway Width in Feet*	*Eastbound Passenger Vehicles Maximum 30 Minutes*	*Per Cent of Use*
Harrison Street	51	188	66
Van Buren Street	38	110	39
Jackson Street	38	284	100
Adams Street	38	73	26
Monroe Street	38	121	43
Madison Street	44	63	22
Washington Street	48	159	56
Randolph Street	48	195	69
Lake Street	48	95	34
Average	43	143	51

Much of this inefficient distribution of traffic may be attributed to intensive use of most of these thoroughfares for downtown terminal movements of west side street car lines. The removal of trolley car operation from east and west streets, as proposed in the foregoing report on the extension of the subway system, will permit the more efficient use of these streets, thereby providing a substantial increase in capacity to accommodate any prospective increases in passenger automobile traffic which will result from the construction of the west side and other superhighways.

Origin and Destination

The results of origin and destination counts of traffic using state highways within the Chicago metropolitan district during the period August 1, 1931 to Labor Day, made by the State Division of Highways, were published in a "Report on the Survey of Traffic on Illinois State Highways." The following tabulation abstracted from that report shows the percentage of traffic passing Harlem Avenue which had a destination east of Halsted Street:

Thoroughfare	*Per Cent of Traffic With Destination East of Halsted Street*
North Avenue	19.9
Lake Street	23.1
Washington Boulevard	44.6
Roosevelt Road	22.3
Archer Avenue	6.0
Milwaukee Avenue and Northwest Highway	16.8*

* Counts made at City Limits.

The staff of the Committee on Local Transportation made a count of eastbound vehicles with and without city license tags using Madison Street and Washington Boulevard with a view to securing a further basis for estimating probable use of the proposed west side superhighway. This count was made from 7:00 A. M. to 1:00 P. M. on November 19, 1937 with the results appearing in the following tabulation:

COUNTS OF VEHICLES WITH AND WITHOUT CITY LICENSE TAGS
Eastbound Traffic—7:00 A. M.—1:00 P. M.

	At Cicero Avenue			At Ashland Avenue		Per Cent
		Foreign Vehicles				
	Total	Number	Per Cent	Total	Foreign Vehicles Number	(5) of (2)
	(1)	(2)	(3)	(4)	(5)	
Washington-Warren Boulevards	4,768	2,663	56	8,770	2,484	93
Madison Street	2,874	1,425	50	1,131	246	17
Total	7,642	4,088	53.5	9,901	2,730	67

Speeds

During January and February of 1934, a check of the average speed of passenger automobiles was made by the State Division of Highways on a number of the principal arteries on the west side. The following table shows the average speed reported for the various routes checked:

Thoroughfare	From	To	M.P.H. Outbound	M.P.H. Inbound
Cermak Road	Canal Street	Austin Boulevard	16.6	19.0
Roosevelt Road	Canal Street	Austin Boulevard	18.3	18.3
Jackson Boulevard	Canal Street	Austin Boulevard	19.9	20.8
Washington-Warren Boulevards	Canal Street	Austin Boulevard	19.7	20.8

In November and December of 1937, test runs in private automobiles were made by the staff of the Committee on Local Transportation on thoroughfares tabulated below. Test runs were made during rush and non-rush periods and the average speeds developed are shown in the following table:

			M.P.H.	
Thoroughfare	From	To	Rush Hour	Non-Rush Hour
Ogden Avenue	Cermak Road	Wood Street	13.8	16.8
Washington-Warren Boulevards	Austin Boulevard	Paulina Street	16.6	20.4

Test runs in private automobiles were also made by the Traffic Engineering Section of the Chicago Park District and resultant average speeds are shown in the following table:

			M.P.H.	
Thoroughfare	From	To	Outbound	Inbound
Augusta Boulevard	Austin Boulevard	Elston Avenue	28—	22+
Washington Boulevard	Oakley Boulevard	Michigan Avenue	12+	13+
Jackson Boulevard	Damen Avenue	Michigan Avenue	14—	15+
Austin Boulevard	North Avenue	Roosevelt Road	20+	26—
Roosevelt Road	Canal Street	Pulaski Road	16+	15
Ashland Avenue	Roosevelt Road	North Avenue	14+	15+
North Avenue	Elston Avenue	Austin Boulevard	19+	19—
Pulaski Road	Ogden Avenue	North Avenue	16—	15+
Madison Street	Canal Street	Austin Boulevard	12+	16+

DATA ON ROADWAY CAPACITY

A study of useful and convenient capacity of traffic lanes on major thoroughfares as well as speeds thereon, is essential to an estimate of the probable use and capacity of the proposed west side superhighway. Detailed studies of traffic movements at and near intersections are also required to appraise the effect of exit and entrance ramps. There has been a great deal of technical discussion relative to traffic control published during the past few years from which certain data applicable to the study at hand has been abstracted as a basis for the consideration of this special problem.

Speeds—Various Data

In a paper on "A Study of Traffic Capacity" by Bruce D. Greenshields, Research Engineer of the Ohio State Highway Department, the results of speed observations on a number of state highways in Ohio are presented. These studies are summarized in Table 4.

TABLE 4

SPEEDS—AVERAGE DATA FOR UNCONGESTED ROADS

Route	*Density in Vehicles per Hour*	*Number of 100-Vehicle Groups Observed*	*Mean Smoothed Speed M.P.H.*	*Percentage of Trucks*	*Percentage Traveling in One Direction*
U. S. 6, 4.9 Miles East of Vermilion					
Friday, 8-17-34	379	68	42.4	7.5	54.4
Sunday, 9-2-34	654	99	38.8	0.8	56.8
Wednesday, 8-29-34	267	69	45.3	7.7	64.4
U. S. 20, 2.0 Miles West of Oberlin	277	30	43.3	6.9	41.5
U. S. 20, 1.4 Miles West of Monroeville	593	109	44.2	3.7	50.4
U. S. 20, 1.5 Miles West of Bellevue	336	59	42.8	7.5	56.0
U. S. 20, 0.25 Miles West of Oberlin	382	27	37.1	6.8	38.5
U. S. 20, 1.8 Miles East of Perrysburg	134	72	37.0	6.7	39.8
U. S. 20, 2.4 Miles East of Oberlin	360	13	42.9	2.2	49.8

U. S. 6—30′ new pavement—straight—unobstructed view—ideal for high speed traffic.

Others—Brick—asphalt—macadam—concrete—18′ to 22′ wide—all fair condition—some with deep ditches and narrow shoulders.

Mr. Greenshields concluded as follows:

"It may be concluded from the study of 1,180 groups of 100 vehicles each, taken from over 22,000 vehicles observed, that the average free moving speed of vehicles on a first class roadway in dry weather with the percentage of trucks varying from zero to ten is very nearly constant and equal to approximately 43 miles per hour. This speed holds for either a two or three lane highway. The bumps per mile on one location were twelve and on another 492, showing that a certain amount of roughness has little effect on the speed. Passenger speeds of over 80 miles per hour and truck speeds of 60 miles per hour were recorded.

"The average free speed of 18 buses observed was 41.6 miles per hour."

Data on speeds of vehicles on city streets is contained in a paper on "Use and Capacity of City Streets", Transactions A. S. C. E. Vol. 99 (1934) by Hawley S. Simpson, Research Engineer, American Transit Association, New York, N. Y. The following tabulation based on surveys by the Detroit Rapid Transit Commission is abstracted from that paper:

TABLE 5

AVERAGE AND MAXIMUM MOTOR VEHICLE SPEEDS
DETROIT, MICHIGAN

Street	*Distance in Miles*	*Time Required in Minutes*	*Speed in Miles per Hour Average Including Effect of Delays*	*Number of Stops*	*Maximum Speed Between Stops in Miles per Hour*
Woodward Avenue	5.0	25	12.0	27	27
Gratiot Avenue	5.0	29	10.3	34	30
Grand River Avenue	5.0	28	10.7	33	25
Woodward Avenue	12.7	46	16.5	35	43
Gratiot Avenue	12.5	47	15.9	39	35
Grand River Avenue	12.6	50	15.0	41	35

Observations were made by the State Wide Highway Planning Survey of the State Division of Highways during the summer of 1937 to determine average speeds on free running sections of various highways in the Chicago metropolitan district. In all cases, observations were taken during normal summer week-days at times when traffic densities were comparatively light and the interferences to free flow of traffic at normal speeds resulting from traffic congestion were a minimum. Observations were taken covering standard two-lane and four-lane roadways and also a four-lane roadway divided by a broad center parkway. All pavements were built of concrete in first class condition with lane widths of at least 10 feet. The results of these observations are summarized in the following tabulation. The

summary shows the average speed of all cars observed and also the speed of the largest group of cars traveling at the several M. P. H. speeds observed.

TABLE 6

AVERAGE MOTOR VEHICLE SPEEDS—
STATE WIDE HIGHWAY PLANNING SURVEY

Highway	*Location*	*Direction*	*Time*	Speeds *Average*	Speeds *Highest Group*
Cicero Avenue (2-Lane)	81st Street	N. B.	A .M.	33.9	33
		S. B.	A. M.	37.6	40
		N. B.	P. M.	33.4	33
		S. B.	P. M.	36.1	33
			Average	35.3	34.8
Cicero Avenue (4-Lane)	75th Street	S. B.	A. M.	40.9	48
		N. B.	A. M.	38.8	45
		S. B.	P. M.	—	42
		N. B.	P. M.	—	45
			Average	39.9	45.0
Skokie Highway in Lake County (Two 2-lane roadways with broad center parkway)	West of North Chicago	N. B.	A. M.	46.6	48
		S. B.	A. M.	49.2	51
		N. B.	P. M.	46.0	46
		S. B.	P. M.	46.0	46
			Average	47.0	47.8

Data on Capacity and Use

Mr. Simpson's paper also contains useful information on street capacity and use—abstracted as follows:

"The results of representative surveys appear in Table 7 for which the following authorities may be recorded: Item No. 1, by A. N. Johnson, M. Am. Soc. C. E.; Items Nos. 2 and 3, by the American Transit Association; Item No. 4, by the Highway Research Board, Committee on Highway Traffic Analysis; Item No. 5, by the Cleveland Railway Company; Item No. 6, by the Detroit, Michigan, Rapid Transit Commission; Item No. 7, by Ole Singstad, M. Am. Soc. C. E.; Item No. 8, by E. A. Byrne, M. Am. Soc. C. E.; and, Item No. 9, by Day and Zimmerman, Inc. Referring to Item No. 7, the capacity of the Holland Tunnel is computed by the Engineers of the Port of New York Authority as 1,270 vehicles per hour per lane, in two lanes, when most of the traffic is composed of passenger vehicles. M. O. Eldridge, Assoc. M. Am. Soc. C. E., has stated that delays incident to the purchase

and collection of tickets, the weaving of vehicles from several lanes into two at the tunnel entrances, and the grades within the tunnel limit the capacity of the tubes."

TABLE 7

MAXIMUM OBSERVED RATES OF TRAFFIC FLOW PER AVERAGE LANE — ONE DIRECTION

Item No. (1)	Location (2)	Number of Lanes in Each Direction (3)	Maximum Hourly Rates 20 sec. (4)	1 min. (5)	5 min. (6)	10 min. (7)	30 min. (8)	60 min. (9)
1	Baltimore-Washington Highway	1	..	..	1,968	..	..	1,502
	Lake Shore Drive Chicago, Illinois:							
2	Average for Both Lanes	2	2,070	1,830		1,392	1,365	1,349
3	Inner Lane	2	2,520	2,160	..	1,542	1,412	1,395
	Superior-Detroit High Level Bridge, Cleveland, Ohio:							
4	1928	3	.	.	.	.	..	1,241
5	1927	2½*		.	1,958	1,874	1,699	1,557
6	East Grand Boulevard, Detroit, Michigan	1		1,800	.	1,404	1,200	..
	New York, N. Y.:							
7	Holland Tunnel	2		..	..	..	.	1,253
8	Queensborough Bridge	3			..	.	.	1,482
9	Manhattan Bridge	2	.		.		..	1,300

* Estimated number of effective lanes.

Mr. Simpson concludes from his studies of lane capacity: "A rate of flow for short periods as high as the probable ultimate will occur when the hourly traffic is about 1,800 vehicles per lane. The acceptance of such a figure for working purposes would leave only a small factor of safety, however. For present purposes a value of 1,500 vehicles per single lane per hour may be adopted as representing 'capacity', with the realization that higher flows are possible and in the belief that the factor of safety allowed is no greater than is necessary to maintain reasonably fluid movement at speeds consistent with safety and efficiency."

The results of observations of traffic flow in the curb lane and maximum hourly traffic per lane at Detroit are summarized in Mr. Simpson's paper as shown in Tables 8 and 9.

TABLE 8

USAGE OF CURB LANE DURING MAXIMUM HOUR IN DETROIT, MICHIGAN (PARKING PROHIBITED)

Item No. (1)	*Location (2)*	*Number of One-Way Free Lanes (3)*	*Vehicles per Hour in Curb Lane Parking Prohibited (4)*	*Curb Lane Vehicles as Percentage of Average Vehicles per Lane in Adjacent Lanes (5)*
1	John R. Street, at East Grand Boulevard	2	384	70
2	West Grand Boulevard, at 14th Street	3	295	40
3	West Grand Boulevard, at Cass Avenue	4	543	106
4	Grand River Avenue, at West Grand Boulevard	3	830	93
5	Jefferson Avenue, at East Grand Boulevard	4	707	78

TABLE 9

MAXIMUM HOURLY MOTOR VEHICLE TRAFFIC PER LANE, DETROIT, MICHIGAN

Location and Nature of Traffic	*One-Way Roadway Width in Feet*	*Lane Number*	*Hourly Traffic*
Grand River Avenue, at West Grand Boulevard (automobiles, street cars, and buses; parking prohibited)	36	1 (curb)	830
		2	890
		3 (street car)	634*
Jefferson Avenue, at East Grand Boulevard (automobiles, street cars, and buses; parking prohibited)	45	1 (curb)	707
		2	895
		3	919
		4 (street car)	25†

* Also, 51 street cars; total vehicles in lane, 685.

† Private motor traffic prohibited on street car lane, used by express street cars and local motor buses. Total vehicles in lane, 91, consisting of 41 street cars, 25 buses, and 25 private automobiles.

An important contribution to traffic engineering was recently made by Mr. Lewis W. McIntyre of Pittsburgh in a paper on "Causes of Failure in Handling Traffic" published in the Proceedings of the A. S. C. E.—Volume 63 (November, 1937), from which the following is abstracted:

"Further light on the accuracy of Figure 1 was obtained from studies of the vehicle flow on the Wilmot Street Bridge, in Pittsburgh. This is a two-lane bridge —one lane in each direction. It has a large reservoir at one end for entering vehicles to accumulate, and at the other end for leaving vehicles to spread out promptly, so as not to delay those on the single lane of movement on the bridge. Table 10 shows an average rate of 1,710 vehicles per hour at a speed of 20 miles per hour, which rate was sustained over a period of 5 minutes at a time. A rate of 1,680 vehicles per hour was sustained for as long as 25 minutes." This data is summarized as follows:

TABLE 10

VEHICLE FLOW ON WILMOT STREET BRIDGE
PITTSBURGH, PENNSYLVANIA (ONE LANE)

Date (1933)	*Number of Vehicles in 25 Minutes*	*Number of Vehicles in a Maximum 5 Minutes*	*Rate of Flow in Vehicles per Hour*	*Speed in Miles per Hour*
October 5	701	145	1,740	20
October 6	619	142	1,680	20
Average	660	143.5	1,710	20

Table 11 shows counts of traffic volumes and hourly rate per lane for several typical congested Pittsburgh streets, as reported by Mr. McIntyre.

TABLE 11

TRAFFIC VOLUME PER LANE, TYPICAL PITTSBURGH INTERSECTIONS

Street	*At*	*Traffic From*	*Volume Maximum in 15 Minutes*	*Number of Lanes*	*Traffic per Lane*	*Hourly Rate per Lane*	*Remarks*
Fifth Avenue	Smithfield Street	East	124	2	62	248	Street Cars
Fifth Avenue	Smithfield Street	West	195	2	98	392	Street Cars
Ninth Street	Liberty Street	North	173	2	86	346	Street Cars
Sixth Avenue	Grant Street	East	261	2	130	520	Street Cars
Sixth Street	Penn Avenue	North	135	2	67	270	Street Cars
Allies *	Grant Street	East	377	2	188	754	No Street Cars
Allies *	Grant Street	West	305	3	102	408	No Street Cars
Grant Street	Allies *	North	217	3	72	288	Street Cars
Grant Street	Allies *	South	169	3	56	224	Street Cars
Grant Street	Seventh Street	North	207	3	69	276	No Street Cars
Grant Street	Seventh Street	South	252	3	84	336	Street Cars
Seventh Avenue	Grant Street	East	233	3	78	312	No Street Cars
Seventh Avenue	Grant Street	West	241	3	80	320	Street Cars
Fourth Avenue	Smithfield Street	West	100	3	33	132	One-Way †
Smithfield Street	Water Street	South	254	2	127	508	Bridge
Penn Avenue	Sixth Street	East	185	4	46	185	One-Way
Smithfield Street	Fourth Avenue	South	196	4	49	196	One-Way
Smithfield Street	Fifth Avenue	South	205	4	51	205	One-Way

* Boulevard of the Allies.
† Three Lanes.

A recent report covering street traffic in the City of Detroit—1936-1937, contains the following pertinent information on lane performance at a point of congestion:

"Investigations at the intersection of Woodward and Grand Boulevard reveal that traffic moving northward on Woodward Avenue during the evening rush hour is considerably delayed but that, in spite of the delay, the lanes for northbound traffic have a very high utility. The lane situated on the street car track carried 48 vehicles in the maximum five minute interval, 118 vehicles in the maximum fifteen minute period, and 212 vehicles in the maximum thirty minute period. These movements are at the respective rates of 576, 472 and 424 vehicles per hour. The vehicular traffic in this lane is of course interfered with by the movements of street cars, operating on approximately one and one-half minute headways. The lane adjacent to the street car track carried volumes during the maximum five minute period of 55 vehicles, during the maximum fifteen minute period, 161 vehicles, and during the maximum half hour period, 310 vehicles; these movements were at the rate of 660, 644 and 620 vehicles per hour, respectively. The lane adjacent to the parking lane carried vehicles at rates of 636, 604 and 596 vehicles per hour based upon volumes during the maximum five, fifteen, and thirty minute periods. During the observation, the lane adjacent to the curb was occupied by only one illegally parked car in the entire block south of the Boulevard, but this reduced the capacity of the lane to 12, 8, and 6 vehicles per hour, likewise based upon volumes during the five, fifteen, and thirty minute maximum periods.

"During all of these observations a condition of congestion existed. Each unit of traffic on Woodward was subjected to numerous stops before reaching the Boulevard and lines of vehicles were observed standing back of the intersection for distances ranging from two to four blocks, at times reaching as far south as Piquette. In this particular instance, congestion was caused by both the interference of a traffic signal at the Boulevard, so timed that traffic on Woodward was permitted to move through the intersection during only 40 per cent of the signal cycle, and by a reduction in the width of the pavement on Woodward, resulting in the reduction in the number of lanes available to the large volumes of traffic approaching the Boulevard from the south."

Numerous traffic counts have been made on thoroughfares in various locations within the metropolitan district of Chicago which provide a basis for estimating probable useful capacity of superhighways. The following table shows maximum observed rates of traffic flow in one direction for various thoroughfares within the metropolitan area:

TABLE 12

MAXIMUM TRAFFIC VOLUMES IN CHICAGO

Location	Date	Direction	Roadway Width	Number of Lanes in Direction of Heavy Traffic	Traffic Maximum 30 Minutes Total	Traffic Maximum 30 Minutes Per Lane
Foster Avenue and Sheridan Road	9-14-36	E. B.	48′	4*	1,803	451
Michigan Avenue Bridge	11- 6-36	N. B.	54.5′	3	1,375	458
LaSalle Street and North Avenue	9-11-36	S. B.	74′	3	1,199	400
Warren Blvd. and Oakley Blvd.	6-14-38	E. B.	50′	5**	1,882	376
Jackson Blvd. and Ashland Blvd.	9-15-36	W. B.	48′	2***	862	431

* Only 2 lanes available at west line of Sheridan Road.

** One way street.

*** Roadway at intersection marked so as to provide 3 lanes approximately 8 feet in width.

The count for Foster Avenue and Sheridan Road as indicated above was made from 8:15 to 8:45 A. M. at the west line of Sheridan Road and shows 1,803 private cars and taxis flowing eastbound on the four lanes available for eastbound traffic during the morning rush period. At the east line of Sheridan Road, all of this eastbound traffic is forced to flow through two lanes. There were no traffic lights or other interferences at this intersection.* This indicates that a total flow of traffic in a single lane free of control delays and other interferences of more than 1,800 vehicles per hour.

Summaries of maximum hourly flows on various major thoroughfares in New York have been made available through the courtesy of Mr. N. Cherniack, Statistical Analyst of the Port of New York Authority. These data are set forth in Table 13.

* Interference limited to northbound buses on Sheridan Road which are permitted to cross eastbound traffic streams.

TABLE 13

Observed Maximum Hourly Flows—Selected Crossings, Parkways, and Streets—In the City of New York

Location	Day	Date	Hour	Cycle		Number of Lanes		Direction	Vehicles Per Hour		
				Green	Total	Total	Free		Total Clocked	Per Lane as Clocked	Per Lane Continuous
CROSSINGS, EXPRESS HIGHWAYS AND PARKWAYS											
Long Island Parkway	Sun.	5-10-36	10-11 P. M.	60	60	2	2	WB	4,550	2,775	2,775
Queensboro Bridge	Thur.	6-18-36	5- 6 P. M.	60	60	2	2	—	3,722	1,861	1,861(a)
Queensboro Bridge	Thur.	10-24-36	6- 7 P. M.	60	60	3	3	—	4,414	1,471	1,471(b)
Manhattan Bridge	Thur.	12-17-36	11-12 A. M.	60	60	2	2	WB	3,566	1,783	1,783(a)
Manhattan Bridge	Sat.	4- 4-36	9-10 A. M.	60	60	2	2	WB	3,090	1,545	1,545(a)
Holland Tunnel	Sun.	11-20-27	5- 6 P. M.	60	60	2	2	EB	2,450	1,225	1,225
Holland Tunnel	Fri.	5-30-30	8- 9 A. M.	60	60	2	2	WB	2,507	1,254	1,254
Holland Tunnel	Fri.	5-21-37	6- 7 P. M.	60	60	2	1	WB	1,404	1,404	1,404(c)
Holland Tunnel	Fri.	5-28-37	6- 7 P. M.	60	60	2	2	WB	2,508	1,254	1,254
Holland Tunnel	Fri.	5-28-37	6- 7 P. M.	60	60	2	1	WB	1,148	1,148	1,148(d)
George Washington Bridge	Sun.	7-19-36	11-12 P. M.	60	60	3	3	—	3,961	1,320	1,320
STREETS AND AVENUES											
Park Ave. at 57th St.	Tue.	4-9-35	5- 6 P. M.	60	90	4	3	SB	2,876	958	1,437
Park Ave. at 34th St.	Mon.	3-11-35	5- 6 P. M.	60	90	3	2	SB	1,735	867	1,301
Park Ave. at 57th St.	Tue.	7-27-37	5- 6 P. M.	60	90	4	3	NB	2,265	755	1,132
5th Ave. at 57th St.	Thur.	6-24-37	5- 6 P. M.	60	90	3	2	NB	982	491	736
57th St. at 5th Ave.	Thur.	6-24-37	5- 6 P. M.	22	90	3	2	EB	783	391	1,600
5th Ave. at 57th St. and 57th St. at 5th Ave.	Thur.	6-24-37	5- 6 P. M.	88	90	3	2	EB-NB	1,765	882	992
5th Ave. at 42nd St.	Thur.	3-14-35	5- 6 P. M.	60	90	3	2	NB	1,148	574	861
5th Ave. at 34th St.	Tue.	5- 4-37	10-11 A. M.	60	90	3	2	SB	797	398	598
34th St. at 5th Ave.	Tue.	5- 4-37	10-11 A. M.	22	90	3	2	EB	723	361	1,478
5th Ave. at 34th St. and 34th St. at 5th Ave.	Tue.	5- 4-37	10-11 A. M.	88	90	3	2	EB-SB	1,520	760	855

(a)—Upper Roadway.
(b)—Lower Roadway.
(c)—Fast Lane.
(d)—Slow Lane.

Intersection Movements

Mr. McIntyre's paper contains summaries of numerous observations of downtown street intersections made by the Bureau of Traffic Planning of the City of Pittsburgh. The more significant of these are set out as follows:

SPACE BETWEEN MOVING AUTOMOBILES AT INTERSECTIONS

Number of Intersections	*Number of Observations*	*Average Space in Feet*	*Remarks*
3	574	17.82	Free Movement
1	139	17.42	Following Street Car
1	71	12.8	Especially Dense Traffic

TIME TAKEN BY AUTOMOBILES TO CLEAR INTERSECTION
(12-FOOT SIDEWALK PLUS 36-FOOT ROADWAY)

Type of Car	*Number of Observations*	*Time in Seconds*	*Speed in Miles per Hour*	*Effective Free Movement in Seconds*	*Headway Dense Traffic in Seconds*
Passenger:					
First Car Group	93	3.92	10.8	2.01	1.70
Following Cars	161	2.77	15.3	1.43	1.20
Mixed Group	199	2.95	15.3	1.60	1.38
Truck:					
First Car Group	21	4.61	10.9	2.78	2.44
Following Cars	10	4.06	12.4	2.42	2.14

Mr. McIntyre's discussion of traffic movements at and near intersections is of such interest that it is quoted somewhat fully, as follows:

"Cross interference shows further restrictive effect in the delay that follows the stopping of a vehicle. Some data showing the time taken to start automobiles at an intersection, after the 'Go' signal has been given, have been obtained as follows:

Position of Car in Line	*Number of Observations*	*Average Time in Seconds*
First Car	224	1.6
Second Car	224	2.9
Third Car	202	4.1
Fourth Car	185	5.1
Fifth Car	101	7.4
Sixth Car	81	7.6

"The average time required to start equals approximately 1.41 times the position of the car in line. Naturally, the more stops that are caused by intersections which are too close together, the more frequently will this delay occur and the greater will be its effect in reducing street capacity. One of the fundamentals of good traffic regulation is to keep the traffic moving. The following simple illustration, involving the sixth and last car of a line stopped at an intersection, will show the importance of effective headway (rate of flow, 1,275 cars per hour):

Description	*Time Required in Seconds*
For Sixth Car to Start	7.6
To Travel 48 feet, at 10.8 Miles per Hour, after Starting	3.92
To Travel 48 feet, at 15.3 Miles per Hour, through the Intersection	2.77
To Travel another 51 feet, at 13.0 Miles per Hour	2.67
Total Time	16.96
Effective Headway	2.82

"Assume the six cars to be stopped with a distance of 3 feet between each car, and each car to be 14 feet long. The rear of the sixth car will be 99 feet from the intersection, and must travel 147 feet for the rear of the car to clear the far curb of a 36 foot roadway. The data in Table 2* demonstrate that the first passenger car of a group will travel 48 feet in 3.92 seconds and that the following cars of this group will travel 48 feet in 2.77 seconds. The speed of the first car in traveling 48 feet was 10.8 miles per hour and that of following cars, as they cleared the intersection, 15.3 miles per hour. Assuming the average of these two speeds as the speed which the sixth car made in the remaining 51 feet which it was required to travel, gives a total of 17 seconds before this sixth car clears the intersection, or an effective headway for these 6 cars of 2.82 seconds, and a rate of flow of 1,275 cars per hour per lane."

"These data** show: (a) The time required by vehicles of various types to clear their own lanes; (b) the delay to following traffic; (c) the time required to complete the turn; and, (d) the delay to oncoming traffic where the turn crosses such traffic.

"Turns are designated by the number of the lane from which, and to which, the turn is made. Lanes are numbered across both streets starting from the corner about which the turn is made. Average delays to following traffic range from zero to 6.1 seconds, depending on the type of turn, whether the streets are one-way or two-way, the type of vehicle, the volume of oncoming traffic, etc. Interference to oncoming traffic ranges to as high as 15.3 seconds, and time to complete the turn to as much as 22.6 seconds in the case of a street car train making the ordinary left turn from one two-way, four-lane street to another."

* Tabulation on Page 93.

** Shown in Table 14.

TABLE 14

Delays Caused by Turns—Pittsburgh

Type of Turn: From Lane No. *	Type of Turn: To Lane No. *	Type of Vehicle	Number of Observations	Time Required in Seconds: To Clear its Own Lane	Time Required in Seconds: To Turn	Delay in Seconds Due to Interference With Oncoming: Lane No. 3 *	Delay in Seconds Due to Interference With Oncoming: Lane No. 2 *	Delay in Seconds Due to Interference With Oncoming: Lane No. 1 *	Delay, in Seconds, in its Own Lane, at Straight-Ahead Speeds (in Miles per Hour) of: 6	12	18	Actual
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1	1	Passenger	18	2.5	4.5	—	—	—	0.0	1.0	1.5	0.9
		Trucks	10	2.8	5.0	—	—	—	0.0	0.6	1.4	0.6
1	3	Passenger	76	3.2	5.2	—	—	—	0.0	1.3	1.9	1.1
		Trucks	16	4.1	6.5	—	—	—	0.0	1.5	2.4	1.4
1	4	Passenger	22	3.0	5.0	—	—	—	0.0	0.0	0.9	0.0
		Trucks	16	3.2	6.3	—	—	†	0.0	0.0	0.7	0.0
2	2	Passenger	65	2.8	5.7	—	—	3.1	0.0	1.3	1.8	1.2
		Trucks	18	4.2	6.6	—	—	4.2	0.0	2.0	2.8	2.0
2	3	Passenger	103	3.3	5.6	—	—	3.2	0.3	1.8	2.3	1.7
		Trucks	26	3.9	6.8	—	—	4.2	0.0	1.7	2.5	1.7
2	4	Passenger	45	3.4	5.5	—	—	3.1	0.4	1.9	2.4	1.8
		Trucks	29	3.3	6.8	—	—	3.2	0.0	1.1	1.9	1.1
3	2	Passenger	167	4.0	6.9	—	2.7	2.7	1.0	2.5	3.0	2.4
		Trucks	30	5.6	9.1	—	4.3	4.5	1.3	3.4	4.2	3.4
3	3	Passenger	17	3.2	5.7	—	5.0	1.8	0.2	1.7	2.2	1.6
		Trucks	17	4.9	6.2	—	4.5	2.1	0.6	2.7	5.5	2.7
4	2	Passenger	21	8.2	11.1	1.2	3.0	2.5	4.3	6.3	6.9	6.1
		Trucks	16	8.7	11.6	3.7	5.3	4.5	3.5	6.1	7.0	6.0
1	1+	Passenger	20	2.3	3.8	—	—	—	0.0	0.8	1.3	0.7
		Trucks	7	2.6	4.5	—	—	—	0.0	0.0	1.2	0.4
2	2+	Passenger	90	2.4	4.3	—	—	2.8	0.0	0.9	1.4	0.8
		Trucks	29	2.7	4.9	—	—	3.2	—	0.5	1.3	0.5
3	2+	Trucks	18	5.9	9.7	—	4.4	4.9	1.6	3.7	4.5	3.7

* All left turns, except as indicated in Column (2).
+Right turn.
† Actual speed.

Similar observations covering intersection movements of various types in Chicago were carried on by the staff of the Committee on Local Transportation during November and December, 1937. In order to eliminate so far as possible any delays to free movement of automobiles due to pedestrian or other interferences, intersection movements were studied at the following intersections on Michigan Avenue:

Wacker Drive,	Washington Street,	Adams Street, and
Randolph Street,	Monroe Street,	Jackson Street.

Observations were made during normal weather and at times when pavements were entirely free of ice or snow. About two-thirds of the straight crossing movement studies covered vehicles moving along Michigan Avenue across Washington Street (80 foot width)—the other observations covering movements across Monroe and Adams Streets (66 foot width). Right turn movements observed were from Randolph, Washington, Adams and Jackson Streets into Michigan Avenue and from Michigan Avenue into Wacker Drive and Jackson Street. About two-thirds of the left turn movements were from Wacker Drive into Michigan Avenue—the remainder being from Randolph and Washington Streets into Michigan Avenue and from Michigan Avenue into Washington and Monroe Streets. All instances where free movement of vehicles was delayed by cross streams of either vehicular or pedestrian traffic were eliminated. The following tabulation shows a summary of the observations made:

TABLE 15

AVERAGE TIME REQUIRED FOR VARIOUS MOVEMENTS OF PASSENGER CARS THROUGH INTERSECTIONS — CENTRAL BUSINESS DISTRICT, CHICAGO

			Time Through Intersection					
			Straight Through		Right Turn		Left Turn	
Position in Line	*Time to Start After "Go" Signal Seconds*	*Time to Intersection Seconds*	*Number Observations*	*Seconds*	*Number Observations*	*Seconds*	*Number Observations*	*Seconds*
1st Car	—	—	15	6.4	—	—	—	—
1st Car	—	—	—	—	12	8.0	—	—
1st Car	—	—	—	—	—	—	25	10.2
2nd Car	2.3	3.3	—	—	4	6.5	—	—
2nd Car	2.6	2.1	—	—	—	—	4	8.1
3rd Car	3.3	4.0	4	4.2	—	—	—	—
3rd Car	3.3	6.0	—	—	4	5.9	—	—
3rd Car	3.8	4.5	—	—	—	—	19	6.7
4th Car	3.8	5.6	5	4.0	—	—	—	—
4th Car	4.0	6.0	—	—	9	8.0	—	—
4th Car	4.5	6.4	—	—	—	—	13	6.9
5th Car	5.7	7.0	9	4.4	—	—	—	—
5th Car	6.2	8.3	—	—	20	7.0	—	—
5th Car	5.3	7.2	—	—	—	—	8	6.9

Field observations indicated that the average distance between cars standing in line awaiting traffic signal is approximately 5 feet so that with an average length of 14 feet per vehicle, the total distance center to center between standing vehicles is approximately 19 feet. Additional studies were made of the length of time required for cars standing in line to start after receiving "GO" signal, and these data are summarized as follows:

AVERAGE TIME REQUIRED TO START PASSENGER AUTOMOBILES AFTER THE "GO" SIGNAL

Position in Line	*Number of Observations*	*Seconds*
2nd Car	13	2.60
3rd Car	40	3.90
4th Car	60	4.66
5th Car	68	6.06
6th Car	26	6.09

The small increment of time noted for the 6th car may be attributed to the fact that this car was frequently observed to be in motion at a low speed when the 5th car was starting. If such running starts were to be eliminated, it is estimated that the average time required for the 6th car would be at least 6.5 seconds.

The data covering straight crossing movements, right turn movements and left turn movements are plotted on Figure 26. No attempt was made to determine the exact shape of that portion of the curve covering acceleration. It is apparent, however, that the cars complete most of their acceleration in less than 50 feet. The several points plotted for each type of movement warrant the belief that a somewhat uniform speed prevails covering movements through the intersection. Therefore, straight lines were projected which represent the mean of the various movements recorded. From these curves, time required to travel the first 50 feet may be estimated as follows:

Straight Crossing Movements	5.3 Seconds
Left Turn Movements	6.2 Seconds
Right Turn Movements	7.7 Seconds

The average speed to and through the intersection (after the first 50 feet) expressed in feet per second is as follows:

Straight Crossing Movements	21.4 Feet per Second
Left Turn Movements	18.0 Feet per Second
Right Turn Movements	10.4 Feet per Second

Estimates based on these figures are compared with the computation made by Mr. McIntyre as a result of the Pittsburgh observations in the following tabulation:

	TIME REQUIRED IN SECONDS			
		CHICAGO		
	Pittsburgh	*Straight Through*	*Left Turn*	*Right Turn*
For 6th Car to Start	7.6	6.5	6.5	6.5
To Travel 48 Feet	3.9	5.1	6.0	7.4
To Travel Second 48 Feet	2.8	2.2	2.7	4.6
To Travel Next 51 Feet	2.7	2.4	2.8	4.9
	17.0	16.2	18.0	23.4
Effective Headway	2.8	2.7	3.0	3.9
Cars per Minute	21	22	20	15

Although it was not so stated in Mr. McIntyre's paper, the presumtion is that his figures as noted above are based on straight crossing movements. There is no information as to whether the Pittsburgh observations excluded delays due to cross traffic. The use of the Chicago observations would result in a difference in headway of only one-tenth of one second or a total difference in flow of one car per minute. However, the Chicago observations show clearly the somewhat greater time required for making left turn movements and resulting increase in headway and decrease in flow of vehicles. The right turn movement—involving as it does a turn on a shorter radius—results in a still slower speed and a further decrease in flow. On the whole, the Chicago observations provide an approximate check of the Pittsburgh studies and provide a basis for the determination of capacity of intersections, ramp entrances and ramp exits under varying local conditions of vehicular traffic flow, physical characteristics of intersection, pedestrian flow and other factors.

NORMAL CAPACITY OF SUPERHIGHWAY FACILITIES

An estimate of the normal working capacity of the several parts of a superhighway is a necessary preliminary to its design as well as to the determination of the value and suitability of such a structure for the relief of congestion and improvement of safety. Studies of capacity and speed described hereinabove provide the basis for such estimate.

Throughout this memorandum, existing traffic volumes are expressed in terms of normal year round conditions. Admittedly, there are monthly and daily variations in these peak hour volumes, which may vary substantially from the normal. In this appraisal of normal capacity, therefore, average figures will be utilized, which may be substantially less than known tests of capacity developed under conditions of actual congestion. The use of such average figures will provide a margin of safety whereby the several component parts of the superhighway project will each have latent capacity for the accommodation of the occasional surge in traffic which may be expected.

Unobstructed Traffic Lane

Maximum observed hourly rates of traffic flow per average lane have been noted as follows:

Location	*Hourly Traffic*	*Refer to Table*
Pittsburgh	1,740	10
Pittsburgh	1,680	10
Chicago	1,803	12
New York	2,775	13
New York	1,861	13
New York	1,783	13
New York	1,545	13

With the exception of the Pittsburgh count which covered a two-lane bridge roadway—one lane for traffic in each direction—all other traffic volumes were over multiple lane highways.

Making allowance for the fact that these counts may have been made during favorable weather and during periods of congestion, it appears that a figure of

1,500 per lane per hour can be safely adopted for estimating normal working capacity and this figure will be used in this analysis.

Partially Obstructed Traffic Lane

A traffic lane may become partially obstructed through—

1. restriction of use by means of signal or other control,
2. grade crossings,
3. right turn movements,
4. left turn movements,
5. vehicles stopping for deliveries at curb,
6. parking of vehicles,
7. pedestrian interferences, and
8. vehicles entering or leaving outer lanes.

The three inner lanes of both express roadways of the proposed west side superhighway as planned would be entirely free of all of these obstructions throughout the 7 mile grade separated section between Canal Street and the west city limits. The outer lanes would be subject only to such obstructions as may be occasioned by vehicles parking and vehicles entering or leaving the express roadways. The relatively flat berms and slopes, planned adjacent to the outer curb throughout most of the grade separated sections, provide ample space for parking disabled vehicles so that the interference to the full flow of traffic in the outer lanes from parking vehicles would be negligible. The ramp layouts have been planned so as to minimize interferences from vehicles entering or leaving the outer lanes. Therefore, it may be estimated that all four lanes of the express roadways west of Canal Street may be utilized to their full capacity, thus providing normal working capacity of 6,000 vehicles per hour in each direction.

The section between Canal Street and Michigan Avenue is subject to the various interferences resulting from grade crossings and cross traffic, both vehicular and pedestrian. Between Canal Street and LaSalle Street obstructive left turn movements should be prohibited so that the full use of the lanes devoted to straight crossing movements will be permitted during the "go" time as controlled by traffic signals at each intersection. It appears, therefore, that the capacity of all lanes except the outer lane at the intersection from Canal Street to LaSalle Street may be estimated on the basis of developed capacity on similar roadways, both in Chicago and elsewhere. The following tabulation shows hourly traffic flow developed on heavily traveled arteries in various cities, as abstracted from the foregoing data.

TRAFFIC FLOW — RATE PER LANE

Thoroughfare	*City*	*Hourly Rate*
Boulevard of the Allies	Pittsburgh	754
Grand River Avenue	Detroit	890
Jefferson Avenue	Detroit	919
Park Avenue	New York	958
Michigan Avenue Bridge	Chicago	916
LaSalle Street	Chicago	800
Warren Boulevard	Chicago	752

It appears that the working capacity of the inner and intermediate lanes between Canal Street and LaSalle Street may be estimated at 800 per hour. This figure checks closely with the lane capacity as computed from observations on intersection movements with all cars stationary at the beginning of the "go" signal, and assuming almost two-thirds of the signal cycle devoted to east and west movement as would be permitted at the intersections of the Congress Street thoroughfare with Canal Street, Wells Street, Sherman Street and LaSalle Street.

At Clark Street and intersections to the east, it is planned to permit left turn movements so that straight crossing movements would be generally confined to the two intermediate lanes in each roadway. Such movements would be partially obstructed at these intersections by left turning movements. The left turning movements which would be obstructive to the straight crossing movements of the heavy rush hour traffic would be confined to movements from the opposing lighter traffic streams. The total obstruction which would result therefrom is estimated to reduce the average capacity of the intermediate lanes devoted to straight crossing movements to three-quarters of their full unobstructed capacity, or 600 cars per hour per lane.

Right turning movements would be confined to outer lanes. Assuming that the restrictions of right turn movements to the east and west "go" signal interval, the capacity of the outer lane for right turn movements as computed from observations of intersection movements would be 420 vehicles per hour—based on an approximately even division of the east and west and north and south intervals in the signal cycle, and making an allowance for the yellow interval.

In the section between Clark Street and State Street it is proposed to limit the use of inner lanes to vehicles about to make left turn movements. The observations previously analyzed show a total capacity of 1,200 vehicles per hour per lane. With an even division of the traffic signal cycle, this total would be reduced to approximately 560 per hour. Interferences from the opposing traffic stream would further reduce the efficient use of this lane to an estimated useful working capacity for the inner lane and for left turn movements at intersections of 300 vehicles per hour.

Ramps

The studies of intersection movements at Pittsburgh and Chicago—see pages 31 to 40 and Tables 14 and 15—furnish a sound basis for estimating ramp capacity. In that these observations covered movements under normal conditions in congested areas and at street intersections where all traffic was subject to stop and go regulations, there can be no question as to the capacity of ramp lanes determined by the character of movement, percentage of go time and interference of opposing traffic streams. Eliminating opposing traffic interference, rate traffic flow per lane per hour can be estimated at:

Straight crossing movements	1,320 per hour,
Left turn movements	1,200 per hour, and
Right turn movements	900 per hour.

Each ramp must be analyzed separately and its capacity determined by the application of local conditions of traffic control, character of movements and opposing traffic stream interferences. A similar analysis can be made of other special locations where restrictions to the free flow of traffic may result from grade crossings, signal control or turning movements.

ESTIMATED INITIAL USE OF SUPERHIGHWAY

Factors to be considered in estimating the initial use of the west side superhighway include not only safety and convenience but also time savings. In the complete absence of cross traffic and pedestrians, there will be no impediment to the free flow of vehicles between terminals, so that over-all speeds will be equal to average cruising speeds.

It follows that traffic conditions on the proposed superhighway will be equal or superior to conditions on uncongested sections of rural highways. The Ohio tests, see Table 4, show mean smoothed speeds on various Ohio highways ranging from 37.0 to 45.3 miles per hour. The average free running speed of buses was noted to be 41.6 miles per hour. The Illinois tests made in the Chicago metropolitan district showed a range of from 33.4 to 49.2 miles per hour.

It is recommended that minimum as well as maximum speed limitations be placed on passenger vehicles operated on the proposed highway. Assuming the adoption of such regulations, it is believed that average cruising speeds of 40 miles per hour may be utilized conservatively as a basis for estimating travel time.

The test runs on various west side thoroughfares as above summarized show over-all speeds ranging, in general, from 16 to 20 miles per hour. Only a limited number were below 16 or above 20 miles per hour. Time savings, therefore, may be estimated at about one-half of present travel time. From the west city limits to the loop district, this will be more than 20 minutes—with proportional savings for shorter trips.

Estimates of use of proposed superhighway are based on existing traffic volumes. No attempt has been made to forecast future increases. Eastbound traffic during the maximum half hour is analyzed in detail. Peak hour westbound traffic in the area studied is substantially the same as the morning peak hour traffic eastbound.

The many advantages of the proposed off-grade traffic facilities to be provided by the proposed west side superhighway will undoubtedly attract traffic from the entire area between Chicago Avenue and Roosevelt Road.

Estimates of the number of vehicles to be diverted to the superhighway are based on existing traffic densities on east and west thoroughfares between Chicago Avenue on the north and Roosevelt Road on the south. Relatively high percentages of diversion are estimated from Washington (Warren) Boulevard, Jackson Boulevard and Madison Street west of Garfield Park. These thoroughfares now carry most of the through east and west traffic to and from the central area.

TABLE 16

Estimates of Additions and Deductions of Traffic to and from the Proposed West Side Superhighway Based on Existing Passenger Vehicle Movements During Maximum 30-Minute Period Inbound

East and West Thoroughfare	*Between*	*Number of Vehicles Existing Eastbound Traffic*	*Increase or Decrease over Previous Section*	*Per Cent*	Vehicles to or from Superhighway *Number On*	*Number Off*	*Net Traffic on Superhighway*
Chicago Avenue		120	—	10	12	—	
Lake Street	Austin Boulevard	74	—	25	19	—	
Washington Boulevard	and	481	—	60	289	—	
Madison Street		336	—	60	202	—	
Jackson Boulevard	Central Avenue	309	—	75	232	—	
Roosevelt Road	(Columbus Park)	236	—	25	59	—	
					813	—	813
Chicago Avenue		128	+ 8	10	1	—	
Lake Street	Central Avenue	118	+ 44	25	11	—	
Washington Boulevard		487	+ 6	60	4	—	
Madison Street	and	406	+ 70	60	42	—	
Jackson Boulevard		542	+233	75	175	—	
Harrison Street	Laramie Avenue	114	+114	25	29	—	
Roosevelt Road		341	+105	25	27	—	
					289	—	1,102
Chicago Avenue		167	+ 39	10	4	—	
Lake Street	Laramie Avenue	190	+ 72	25	18	—	
Washington Boulevard		584	+ 97	60	59	—	
Madison Street	and	367	— 39	60	—	23	
Jackson Boulevard		542	—	—	—	—	
Harrison Street	Cicero Avenue	139	+ 25	25	6	—	
Roosevelt Road		272	— 69	25	—	17	
					87	40	1,189
Chicago Avenue		245	+ 78	10	8	—	
Lake Street	Cicero Avenue	259	+ 69	25	17	—	
Washington Boulevard		588	+ 4	60	2	—	
Madison Street	and	437	+ 70	60	42	—	
Jackson Boulevard		652	+110	75	83	—	
Harrison Street	Independence Boulevard	89	— 50	25	—	12	
Roosevelt Road		321	+ 49	25	12	—	
					164	52	1,301
Chicago Avenue		199	— 46	10	—	5	
Lake Street	Independence Boulevard	235	— 24	25	—	6	
Washington Boulevard		903	+315	60	189	—	
Madison Street	and	230	—207	60	—	124	
Jackson Boulevard		770	+118	75	88	—	
Harrison Street	Homan Avenue	103	+ 14	25	3	—	
Roosevelt Road		236	— 85	25	—	21	
					280	156	
	Add number leaving at Homan Avenue					60	
						216	1,365

TABLE 16—(Continued)

ESTIMATES OF ADDITIONS AND DEDUCTIONS OF TRAFFIC TO AND FROM THE PROPOSED WEST SIDE SUPERHIGHWAY BASED ON EXISTING PASSENGER VEHICLE MOVEMENTS DURING MAXIMUM 30-MINUTE PERIOD INBOUND

East and West Thoroughfare	*Between*	*Number of Vehicles Existing Eastbound Traffic*	*Increase or Decrease over Previous Section*	*Per Cent*	Vehicles to or from Superhighway *Number On*	*Off*	*Net Traffic on Superhighway*
		Brought Forward				216	1,365
Chicago Avenue		190	— 9	10	—	—	
Lake Street	Homan Avenue	102	—133	20	—	27	
Washington Boulevard		1,308	+405	60	243	—	
Madison Street	and	88	—142	60	—	85	
Jackson Boulevard		710	— 60	75	—	45	
Harrison Street	Sacramento Boulevard	48	— 55	20	—	11	
Roosevelt Road		277	+ 41	20	8	—	
					251	168*	1,616
Chicago Avenue		157	— 33	10	—	3	
Lake Street	Sacramento Boulevard	116	+ 14	20	3	—	
Washington Boulevard		1,790	+482	55	264	—	
Madison Street	and	72	— 16	55	—	9	
Jackson Boulevard		740	+ 30	60	18	—	
Harrison Street	Oakley Boulevard	57	+ 9	20	2	—	
Roosevelt Road		429	+152	20	30	—	
					317	12	
	Add number leaving at Sacramento Boulevard					108	
						120	1,813
Chicago Avenue		82	— 75	8	—	7	
Lake Street	Oakley Boulevard	114	— 2	15	—	—	
Washington Boulevard		1,890	+100	50	50	—	
Madison Street	and	83	+ 11	50	6	—	
Jackson Boulevard		794	+ 54	60	32	—	
Harrison Street	Damen Avenue	79	+ 22	15	3	—	
Roosevelt Road		508	+ 79	15	12	—	
					103	7	1,909
Chicago Avenue		104	+ 22	8	2	—	
Lake Street		99	— 15	15	—	2	
Washington Boulevard	Damen Avenue	1,671	—219	50	—	110	
Madison Street		85	+ 2	50	1	—	
Monroe Street	and	81	+ 81	30	24	—	
Adams Street		32	+ 32	30	10	—	
Jackson Boulevard	Paulina Street	884	+ 90	60	54	—	
Van Buren Street		63	+ 63	30	19	—	
Harrison Street		96	+ 17	15	3	—	
Roosevelt Road		554	+ 46	15	7	—	
					120	112	

* 60 leave at Independence Boulevard and 108 at Sacramento Boulevard.

TABLE 16—(Continued)

ESTIMATES OF ADDITIONS AND DEDUCTIONS OF TRAFFIC TO AND FROM THE PROPOSED WEST SIDE SUPERHIGHWAY BASED ON EXISTING PASSENGER VEHICLE MOVEMENTS DURING MAXIMUM 30-MINUTE PERIOD INBOUND

East and West Thoroughfare	*Between*	*Number of Vehicles Existing Eastbound Traffic*	*Increase or Decrease over Previous Section*	*Per Cent*	Vehicles to or from Superhighway — *Number* *On*	*Off*	*Net Traffic on Superhighway*
		Brought Forward					1,909
	Cars Off					112	
	Add Number Leaving at Paulina Street					69	
						181	1,728
	Cars On				120		1,848
Chicago Avenue		74	— 30	8	—	2	
Lake Street		152	+ 53	20	11	—	
Washington Boulevard		1,450	—221	50	—	110	
Madison Street	Paulina Street	62	— 23	50	—	11	
Monroe Street		100	+ 19	30	6	—	
Adams Street	and	109	+ 77	3	23	—	
Jackson Boulevard		790	— 94	60	—	56	
Van Buren Street	Throop Street	63	—	30	—	—	
Ogden Avenue		427	+427	25	107	—	
Harrison Street		171	+ 75	10	8	—	
Roosevelt Road		652	+ 98	15	15	—	
					170	179*	2,018
Lake Street		107	— 45	15	—	7	
Randolph Street		247	+247	25	59	—	
Washington Boulevard	Throop Street	1,100	—350	50	—	175	
Madison Street		93	+ 31	50	15	—	
Monroe Street	and	98	— 2	30	—	1	
Adams Street		95	— 14	30	—	4	
Jackson Boulevard	Morgan Street	775	— 15	60	—	9	
Van Buren Street		38	— 25	30	—	8	
Harrison Street		152	— 19	20	—	4	
Roosevelt Road		619	— 33	20	—	7	
					74	215	
		110 leave at Racine Avenue				110	
						325	1,767
Lake Street		159	+ 52	20	10	—	
Randolph Street		183	— 64	25	—	16	
Washington Boulevard	Morgan Street	952	—148	50	—	74	
Madison Street		93	—	50	—	—	
Monroe Street	and	153	+ 55	30	16	—	
Adams Street		85	— 10	30	—	3	
Jackson Boulevard	Desplaines Street	759	— 16	65	—	10	
Van Buren Street		25	— 13	30	—	4	
Harrison Street		108	— 44	20	—	9	
Roosevelt Road		480	—139	20	—	28	
					26**	144	1,623

*69 leave at Damen Avenue and 110 at Racine Avenue. **On at Canal Street.

TABLE 16—(Continued)

ESTIMATES OF ADDITIONS AND DEDUCTIONS OF TRAFFIC TO AND FROM THE PROPOSED WEST SIDE SUPERHIGHWAY BASED ON EXISTING PASSENGER VEHICLE MOVEMENTS DURING MAXIMUM 30-MINUTE PERIOD INBOUND

East and West Thoroughfare	Between	Number of Vehicles Existing Eastbound Traffic	Increase or Decrease over Previous Section	Vehicles to or from Superhighway: Per Cent	Number: On	Number: Off	Net Traffic on Superhighway
		Brought Forward					1,623
Lake Street	Desplaines Street and Clinton Street	122	— 37	25	—	9	
Randolph Street		114	— 69	30	—	21	
Washington Boulevard		800	—152	55	—	84	
Madison Street		54	— 39	55	—	21	
Monroe Street		194	+ 41	30	12	—	
Adams Street		65	— 20	30	—	6	
Jackson Boulevard		708	— 51	75	—	38	
Van Buren Street		48	+ 23	30	7	—	
Harrison Street		111	+ 3	20	1	—	
Roosevelt Road		487	+ 7	20	1	—	
					21*	179	1,444
Lake Street	Clinton Street and Canal Street	123	+ 1	25	—	—	
Randolph Street		157	+ 43	30	13	—	
Washington Boulevard		724	— 76	55	—	42	
Madison Street		51	— 3	55	—	2	
Monroe Street		177	— 17	30	—	5	
Adams Street		65	—	30	—	—	
Jackson Boulevard		582	—126	75	—	95	
Van Buren Street		54	+ 6	30	2	—	
Harrison Street		105	— 6	20	—	1	
Roosevelt Road		505	+ 18	20	4	—	
					19*	145	
		Off from Canal Street				83	
						228	1,216
Lake Street	Canal Street and Franklin Street	124	+ 1	25	—	—	
Randolph Street		210	+ 53	30	16	—	
Washington Boulevard		653	— 71	60	—	43	
Madison Street		73	+ 22	50	11	—	
Monroe Street		140	— 37	30	—	11	
Adams Street		63	— 2	30	—	1	
Jackson Boulevard		418	—164	75	—	123	
Van Buren Street		80	+ 26	30	8	—	
Harrison Street		173	+ 68	20	14	—	
Roosevelt Road		480	— 25	20	—	5	
					49	183**	
		On from Morgan Street			26		
		On from Desplaines Street			21		
		On from Clinton Street			19		
					115		1,231
		Driveway			30	10	1,251

* On at Canal Street.

** 83 off at Clinton Street.

The estimated initial flow of traffic at the maximum point at Ashland Avenue is 2,020 vehicles in the maximum 30-minute period or about two-thirds of the convenient capacity of the thoroughfare as planned. By utilizing the average ratio for east and west traffic in Tables 2 and 3, it may be estimated that the total initial typical week-day flow past this maximum point will be about 60,000 vehicles in 24 hours.

Data on turning movements during rush hours at and between various thoroughfares intersecting Washington Boulevard and other east and west arteries were analyzed as a basis for estimates of volumes of traffic entering or leaving the superhighway as summarized in Table 16. These analyses—together with other factors such as increase or decrease in total east and west traffic volumes at various key points, time savings and convenience of access of ramps—were utilized in estimating probable number of vehicles entering and leaving the several ramps. The results of these studies are summarized as follows:

TABLE 17

SUMMARY OF DATA ON RAMPS AND CONNECTIONS

Location Near	*Gradient per Cent*	*Width in Feet*	*For Traffic on Express Roadways to the*	*Serving Vehicles with Origins or Destinations in Districts Reached By*	Maximum 30 Minutes *Capacity*	*Initial Use—A.M. Rush Hour*	*Per Cent Initial Use to Capacity*
Michigan	0	*	West	Michigan (Outer Drive)	360	170	47
Wabash	0	*	West	Wabash	360	110	30
State	0	*	West	State	360	110	30
Plymouth	0	***	West	Plymouth	150	50	33
Dearborn	0	*	West	Dearborn	360	110	30
Federal	0	**	West	Federal	210	50	24
Clark	0	*	West	Clark	360	100	28
LaSalle-Sherman	0	*	West	LaSalle-Sherman	485	140	29
Wells	0	**	West	Wells	285	80	28
River Plaza	3.25	24	West	Franklin-Market (Wacker)	520	330	63
Canal	0	**	West	Canal	285	100	35
Clinton	6.00	24	West	Clinton	390	230	59
Desplaines	4.00	24	West	Desplaines	470	180	38
Morgan	4.00	12	West	Morgan-Halsted	400	145	36
Throop	4.00	18	East	Throop-Ashland	420	75	18
Throop	4.00	18	West	Throop-Racine	520	325	62
Paulina	5.00	24	East	Paulina (Medical Center)	480	170	35
Damen	4.00	24	East	Damen	360	120	33
Damen	4.00	24	West	Damen-Ogden	360	180	50
Oakley	4.00	24	East	Oakley-Western	450	105	23
Campbell	2.00	24	West	Western	535	5	1
Sacramento	3.00	24	East	Sacramento	490	315	64
Sacramento	3.00	24	West	Sacramento	535	120	22
Homan	3.00	24	East	Homan-Central Park	450	250	56
Independence	3.00	24	East	Independence-Pulaski	535	280	52
Independence	4.00	24	West	Independence	490	215	44
Kilpatrick	2.50	24	East	Cicero	450	165	37
Cicero	3.00	24	West	Cicero	535	55	10
Laramie	3.00	24	East	Laramie	450	90	20
Central	3.00	24	East	Central	490	135	28
Columbus Park—							
North Connection	3.00	36	East	Jackson	1,800	890	50
South Connection	3.00	36	East	Harrison-Austin	1,800	75	4

* Right and left turning movements to and from express roadways at grade intersection.
** Right turns only at grade intersection.
*** Left turns only at grade intersection.

DISTRIBUTION OF TRAFFIC IN AND NEAR THE CENTRAL BUSINESS DISTRICT

Cordon counts of vehicles and passengers entering and leaving the central business district bounded by Roosevelt Road on the south and the Chicago River on the north and west which have been made during the period 1926-1939 are summarized in Table 18 on page 59.

The density of existing inbound traffic during the maximum 30-minute period in and near the central business district is shown on Figure 19. It is substantially less than the maximum use which can be developed through the efficient use of existing roadways. The existing heavy concentration of traffic on Washington and Jackson Boulevards is undoubtedly the result of freedom from street car traffic throughout most of the length of these thoroughfares.

With the elimination of all east and west street car movements in the area east of the Chicago River, which will result from the construction of street car subways as proposed herein, there will be nothing to prevent a much more uniform distribution of east and west traffic in this terminal area.

A study of the redistribution of such traffic after the construction of the proposed West Side superhighway has been made and is shown on Figure 20. In this study weight has been given to the superior facilities offered by the 8-lane Congress Street terminal east of Wells Street as compared with the existing narrow roadways in the east and west streets in the loop district. The result of this will be to attract east and west traffic to the new thoroughfare, effecting a re-routing of traffic so that certain vehicles now reaching their destination in the central business district by way of east and west streets will in the future utilize Congress Street and north and south loop streets. Any estimates of redistribution of passenger vehicle traffic after the completion of the Congress Street improvement are necessarily approximations in the absence of exact data on origins and destinations.

It is evident that the heavy concentration of traffic along Congress Street near the south end of the central business district will have no adverse effect on the orderly flow of traffic on the loop streets. On the contrary, the heavier concentrations on the present downtown street system will in the future be found near the outer fringes of the district.

Automobile Storage and Parking Facilities

A survey was conducted during the summer of 1936 by the State Division of Highways of all automobile storage facilities in the area bounded by Chicago Avenue, Halsted Street and Roosevelt Road. This area was subdivided into three districts, as follows:

(a) Loop district, bounded by Lake Street, Wells Street, Van Buren Street and Michigan Avenue;
(b) The central business district, bounded by the Chicago River on the north and west, Harrison Street on the south, and Lake Michigan on the east (except the loop district); and
(c) The central district, all of the remainder of the area.

TABLE 18

Number of Passengers Entering and Leaving Central Business District—Chicago Typical Week Day in May—7:00 A. M. to 7:00 P. M.

	Street Cars		Elevated**		Steam Railroad		Motor Buses		Passenger Autos*		Total	
	In	*Out*	*In*	*Out*	*In*	*Out*	*In*	*Out*	*In*	*Out*	*In*	*Out*
1926	294,958	283,967	256,286	231,320	118,857	103,225	44,391	44,878	166,367	159,157	880,859	822,547
1928	282,013	281,041	243,594	216,241	124,107	109,310	47,472	50,234	196,873	188,554	894,059	845,380
1929	296,690	290,592	236,575	196,988	132,723	115,996	55,161	62,264	203,996	184,084	925,145	849,924
1931	281,312	271,007	191,540	159,469	119,742	108,290	46,500	44,187	203,916	189,120	843,810	772,073
1935	254,528	246,048	169,690	137,223	84,251	72,595	42,465	36,449	204,768	190,852	755,702	683,167
1936	246,781	235,391	200,212	164,845	92,144	75,367	46,812	41,171	215,849	205,765	801,798	722,539
1937	248,946	239,388	209,590	169,111	103,505	86,885	57,106	47,996	226,868	211,651	846,015	755,031
1938	228,236	222,754	193,005	166,855	94,208	81,311	57,270	52,235	239,414	233,917	812,133	757,072
1939***	235,182	228,172	205,142	174,840	99,970	87,291	54,100	48,711	244,980	233,340	839,374	772,354

* Factor used in 1929 and previous years was 1.8 passengers per auto. In subsequent years a factor of 1.7 was used.

** Includes Chicago, Aurora & Elgin Railroad Company and Chicago, North Shore & Milwaukee Railroad Company.

*** Winter count made in January.

Information was secured covering capacities of all of the parking lots and garages existing at that time, and also counts were made of in and out movements for the purpose of determining the actual use of these facilities. It was found that the average ratio of use to capacity varied with the location and cost of the storage facilities, and ranged from 2.5 in the loop district to 1.5 in the outer sections of the central district. A summary of this survey is shown in Table 19 on page 62.

A survey made by the Traffic Engineering Division of the City Department of Streets and Electricity in 1939 showed an increase in use of parking facilities in the central business district since 1936 of approximately 14 per cent. This increase applied to the use of garages and parking lots as shown in Table 19, would result in increasing the total estimated 12-hour use of all parking facilities to 95,000 on a typical week-day.

TABLE 19

AUTOMOBILE STORAGE AND PARKING FACILITIES (1936)
ESTIMATED CAPACITIES
12-HOUR PERIOD

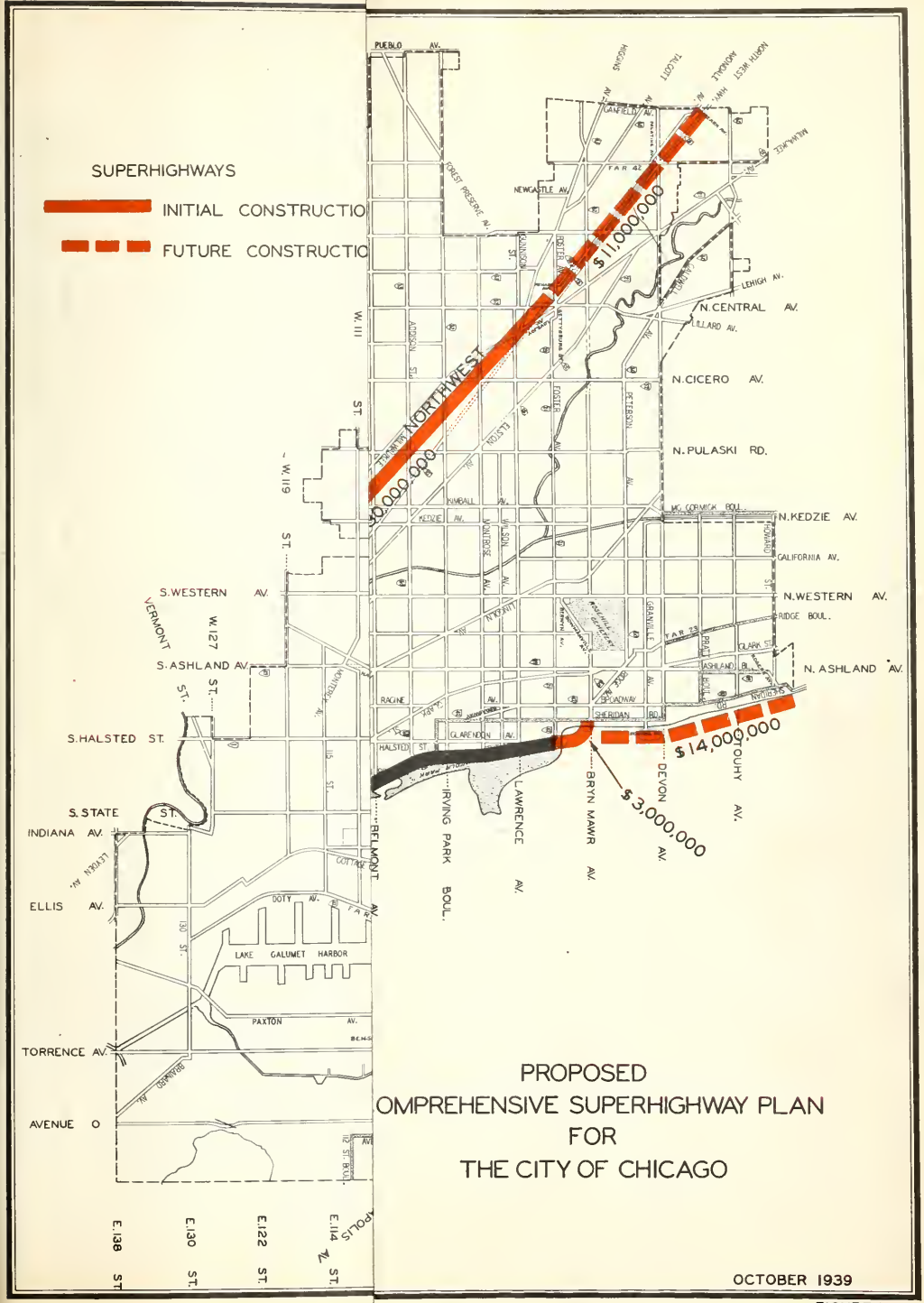
	Number	*Estimated Capacity*	*Estimated Use 12-Hour Period*
GARAGES:			
Loop District	14	4,268	10,700
Central Business District	13	2,339	4,700
Central District	33	4,843	7,300
Total	60	11,450	22,700
PARKING LOTS:			
Loop District	26	1,725	4,300
Central Business District	70	10,289	20,600
Central District	102	9,586	14,400
Total	198	21,600	39,300
STREET PARKING:			
Central Business District		3,100	7,800
Central District		6,600	16,500
Total		9,700	24,300
Grand Total		42,750	86,300

CONSTANTS FOR 12-HOUR PERIOD:

Loop District	2.5
Central Business District	2.0
Central District	1.5
Street Parking	2.5

The provision of more convenient and safe highway facilities which will result from building the West Side and other proposed superhighways will undoubtedly result in attracting additional motorists to the central district requiring additional facilities for storage of automobiles. Provision for parking facilities for some 500 vehicles is recommended through the construction of an open structure on Congress Street between Desplaines and Canal Streets. Garage and parking lot storage will undoubtedly be added in the central district from time to time to keep pace with the demand.

Any shortage can be met by the provision of large parking lots at the outskirts of the central district and the operation of short line low fare bus routes into and through the downtown area in conjunction therewith. This plan has recently been put into effect in Detroit with demonstrated success. If adopted, it would result in decreasing the traffic load on both superhighway terminals and downtown streets.



PROPOSED
COMPREHENSIVE SUPERHIGHWAY PLAN
FOR
THE CITY OF CHICAGO

OCTOBER 1939

FIGURE I

The provision of more convenient and safe highway facilities which will result from building the West Side and other proposed superhighways will undoubtedly result in attracting additional motorists to the central district requiring additional facilities for storage of automobiles. Provision for parking facilities for some 500 vehicles is recommended through the construction of an open structure on Congress Street between Desplaines and Canal Streets. Garage and parking lot storage will undoubtedly be added in the central district from time to time to keep pace with the demand.

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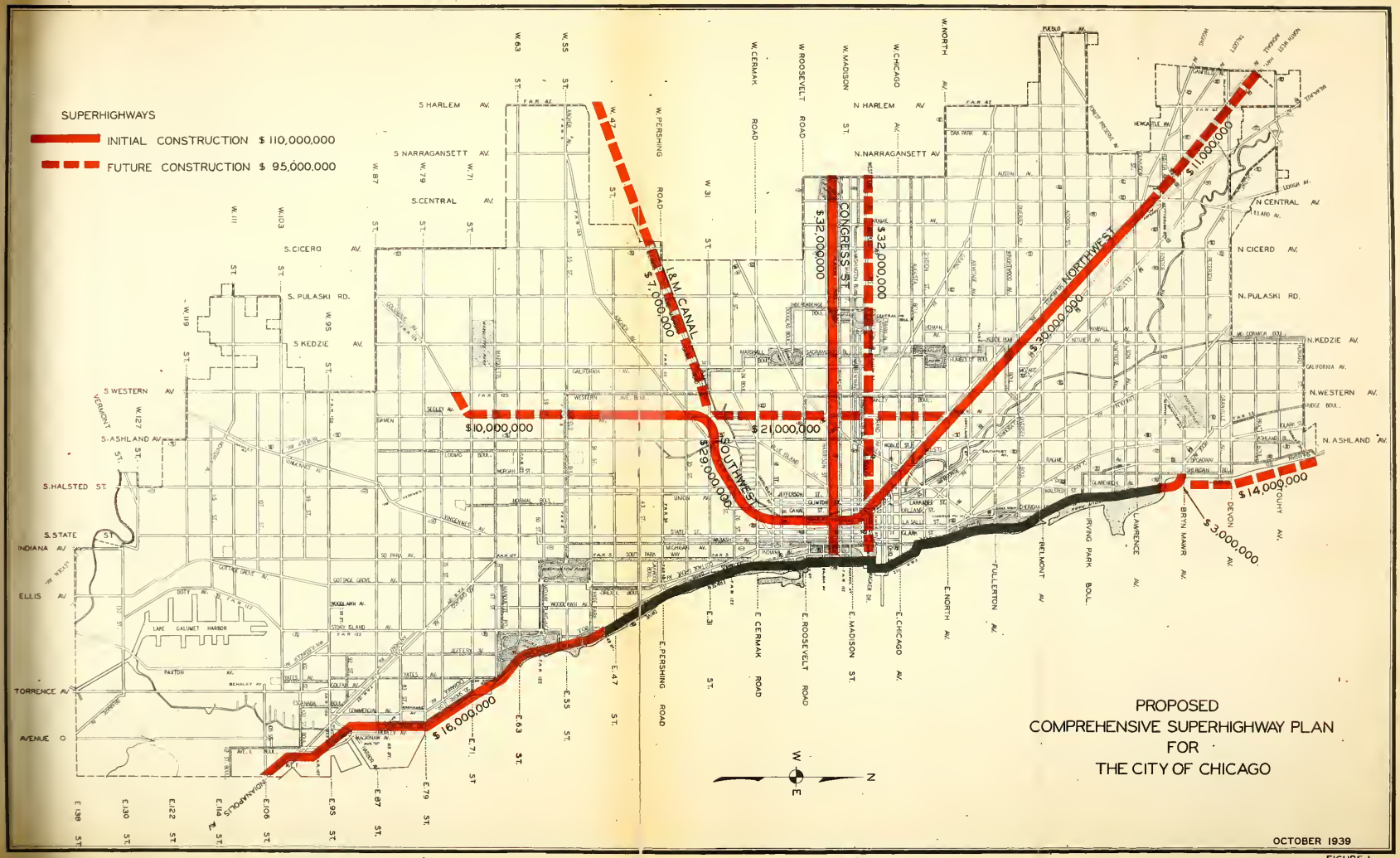

PROPOSED
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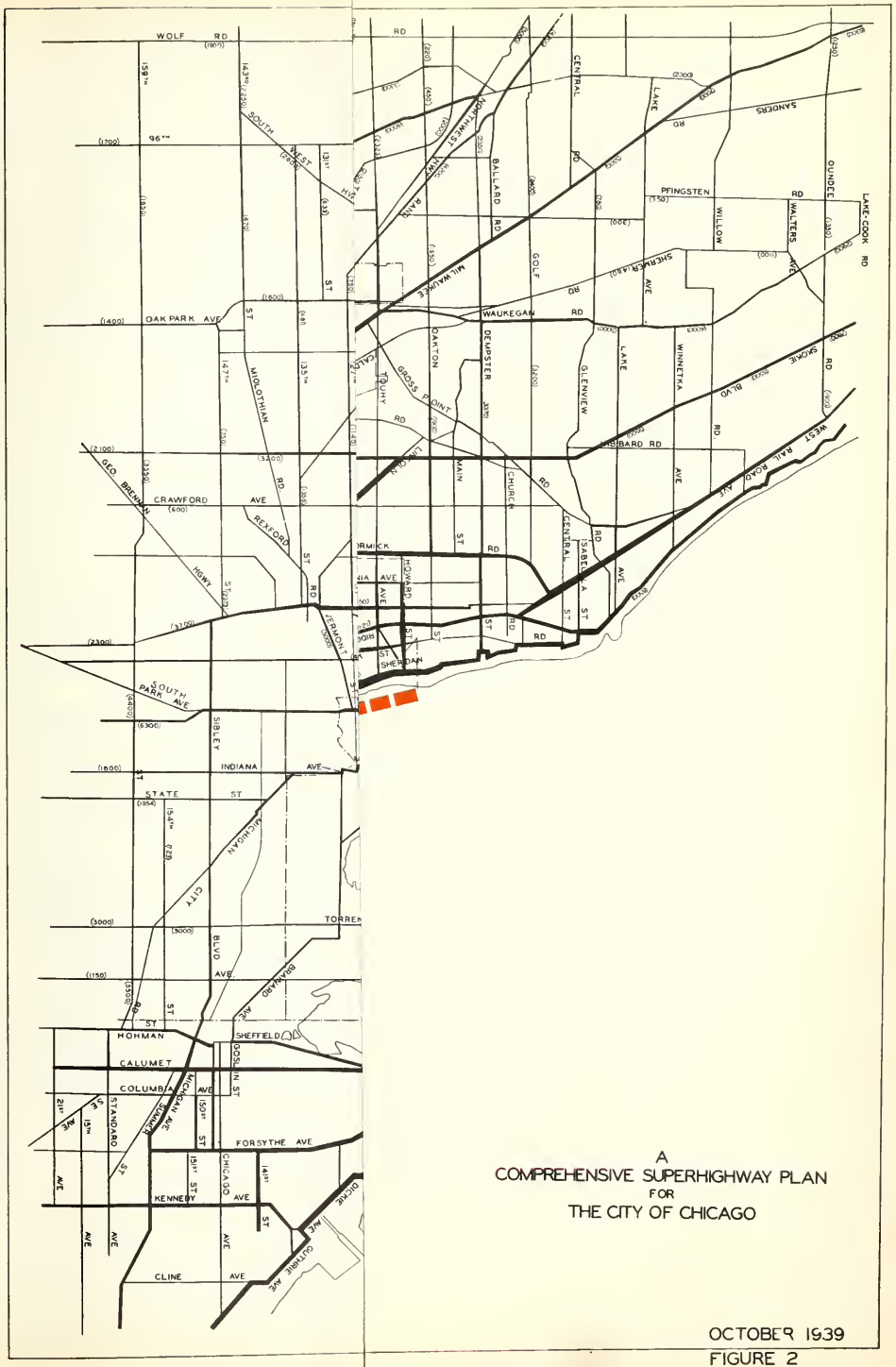
FOR
THE CITY OF CHICAGO

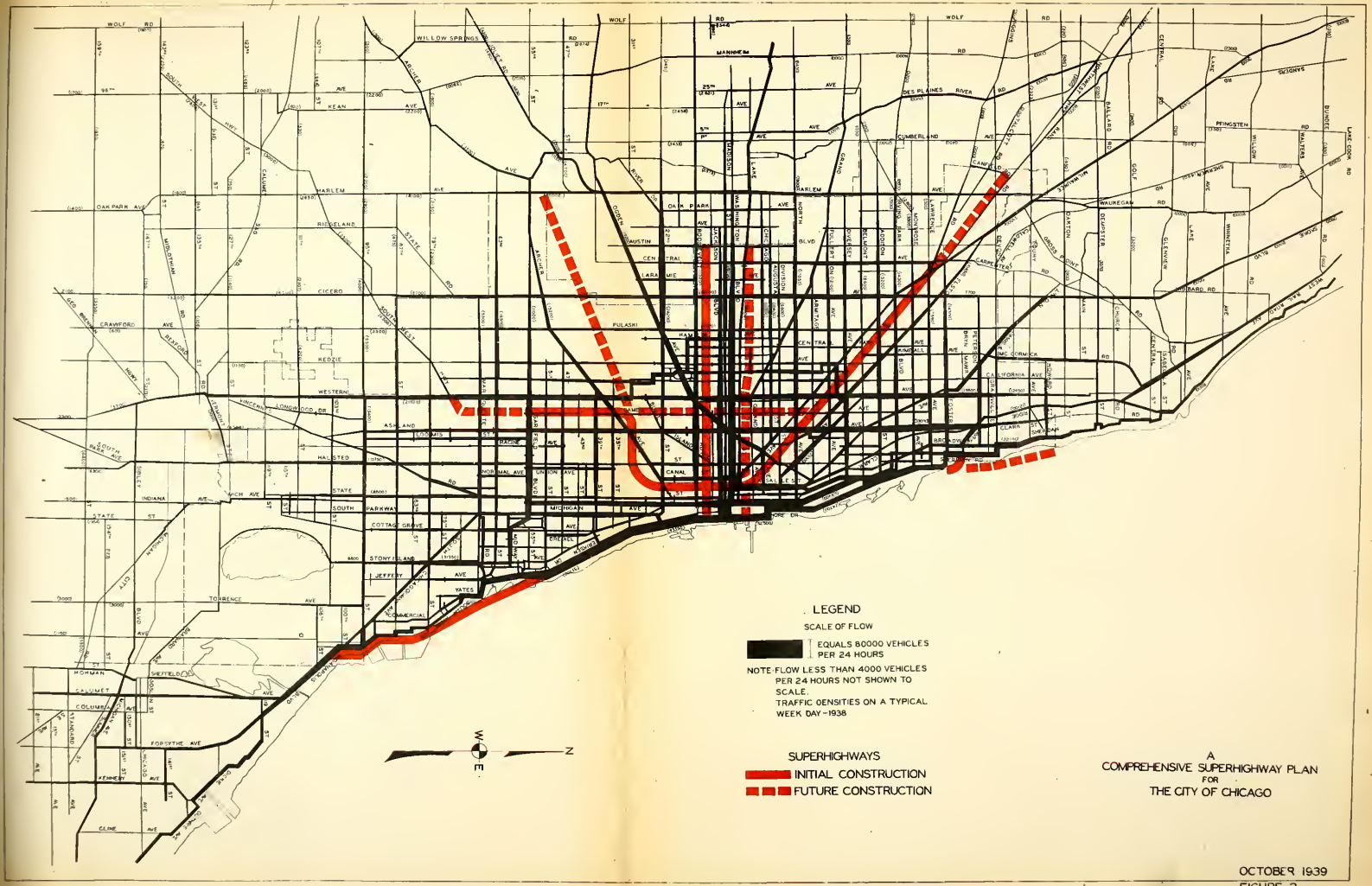
OCTOBER 1939

FIGURE I



A
COMPREHENSIVE SUPERHIGHWAY PLAN
FOR
THE CITY OF CHICAGO

OCTOBER 1939
FIGURE 2



A
COMPREHENSIVE SUPERHIGHWAY PLAN
FOR
THE CITY OF CHICAGO

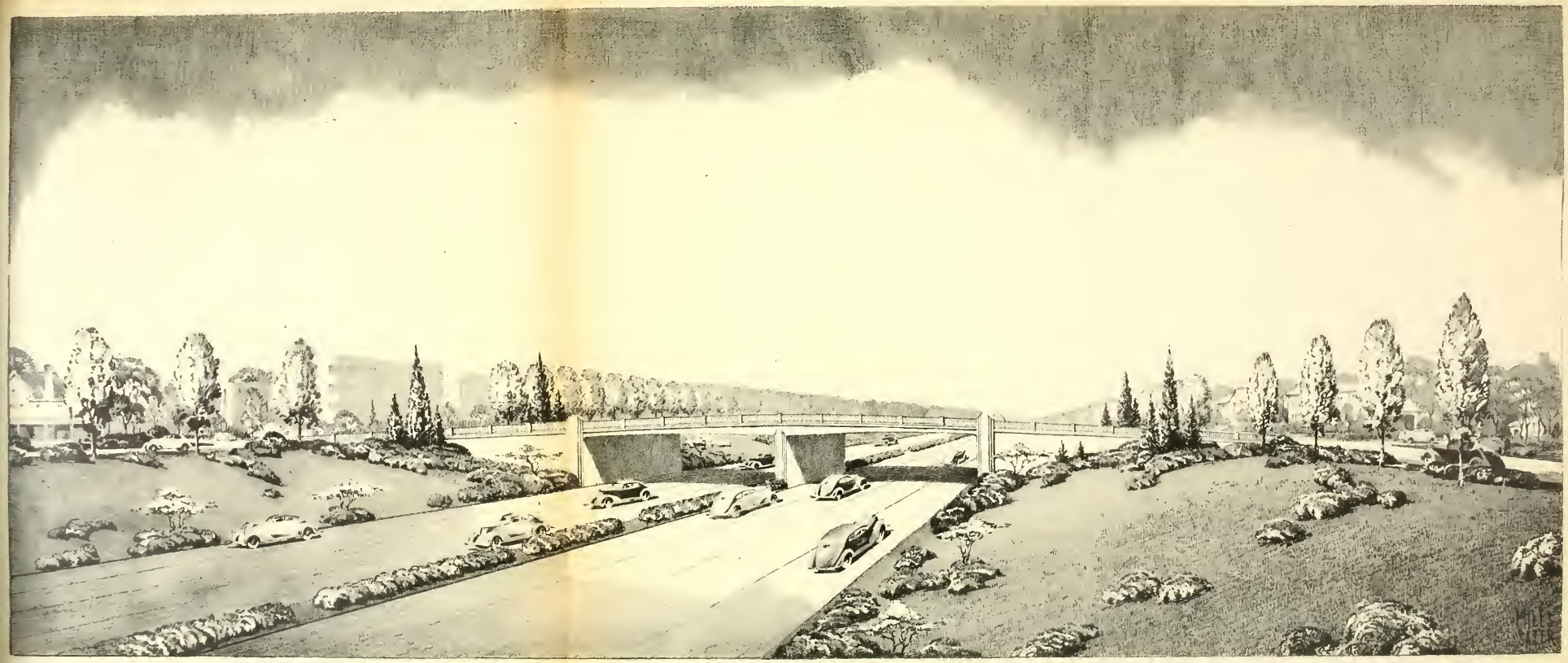
OCTOBER 1939
FIGURE 2

PERSPECTIVE OF A SUPERHIGHWAY - DEPRESSED TYPE
RECOMMENDED BY THOMAS H. MAC DONALD
PUBLIC ROADS ADMINISTRATION

FIGURE 3

HIGHWAYS ·
SUPERHIGHWAY ·
RUCTURE

FIGURE 4



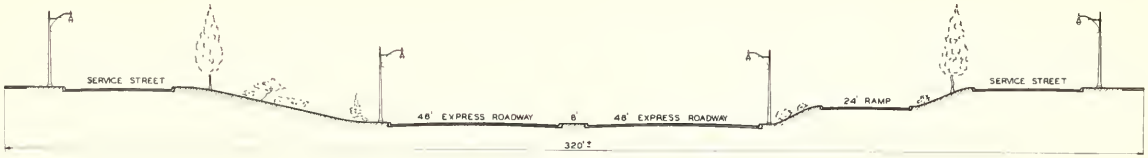
· CITY · OF · CHICAGO · · · DEPARTMENT · OF · SUPERHIGHWAYS ·

· A · SUGGESTION · FOR · THE · DEVELOPMENT · OF · A · WEST · SIDE · SUPERHIGHWAY ·

· PERSPECTIVE · NEAR · TYPICAL · OVERPASS · STRUCTURE

· 1939 ·

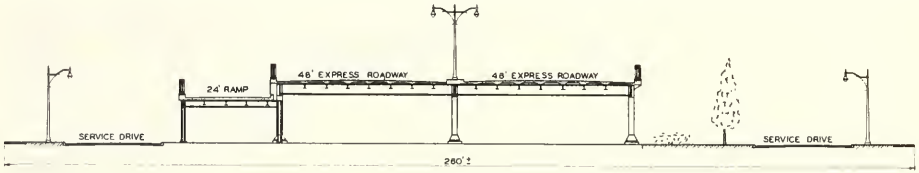
FIGURE 4



CROSS SECTION

TYPICAL DEPRESSED SUPERHIGHWAY

SCALE 0 10 20 FEET



CROSS SECTION

TYPICAL ELEVATED SUPERHIGHWAY ON COLUMNS

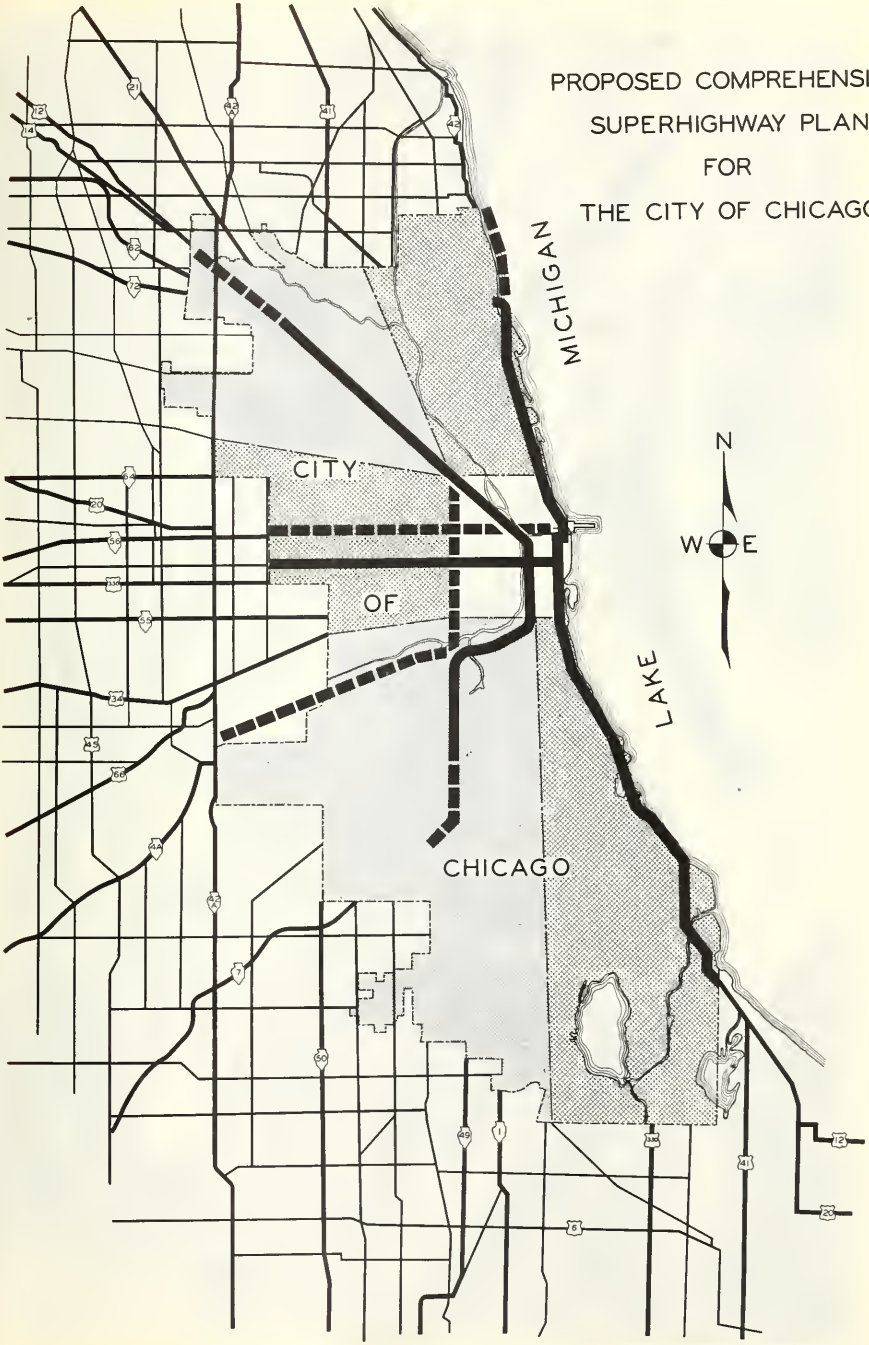
SCALE 0 10 20 FEET

TYPICAL CROSS SECTIONS

ELEVATED AND DEPRESSED SUPERHIGHWAYS

OCTOBER, 1939

FIGURE 5



OCTOBER 1939
FIGURE 6

FIGURE 7

VIEW OF OUTER DRIVE NORTH OF MONTROSE AVENUE

AERIAL VIEW SHOWING (PERHIGHWAY

FIGURE 8

AERIAL VIEW SHOWING GENERAL ALIGNMENT OF NORTHWEST SUPERHIGHWAY

FIGURE 8

Chicago Aerial Survey, Inc.

AERIA

FIGURE 9

AERIAL VIEW OF WEST SUPERHIGHWAY

FIGURE 9

FIGURE 10

VIEW NORTHWEST ALONG CHICAGO AND NORTH WESTERN RAILWAY FROM WESTERN AVENUE

FIGURE 11

VIEW EAST ALONG HARRISON STREET - FROM POINT WEST OF THE CHICAGO RIVER

FIGURE 12

VIEW WEST ALONG HARRISON STREET - FROM EAST SIDE OF CHICAGO RIVER

FIGURE 13

VIEW OF SITE OF CONGRESS STREET BRIDGE AND PLAZA
EAST FROM POST OFFICE BUILDING

FIGURE 14

VIEW EAST FROM CLARK STREET - PROPOSED CONGRESS STREET IMPROVEMENT

AERIAL VIEW
SOUTHWEST SUP
THIS SUPERHIGHWAY
INITIALLY AND TO 74

CHICAGO AERIAL SURVEY CO.

FIGURE 15

AERIAL VIEW SHOWING GENERAL LOCATION OF
SOUTHWEST SUPERHIGHWAY-NORTH OF 43RD STREET
THIS SUPERHIGHWAY TO EXTEND SOUTH TO GARFIELD BOULEVARD
INITIALLY AND TO 74TH STREET AND WESTERN AVENUE ULTIMATELY

CHICAGO AERIAL SURVEY CO

FIGURE 15

FIGURE 16

VIEW OF I.&M. CANAL - SOUTHWEST FROM CENTRAL PARK AVENUE

FIGURE 17

EAST SIDE OF WINCHESTER AVENUE - NORTH FROM 53RD STREET
GENERAL LOCATION OF SOUTHWEST SUPERHIGHWAY

CHICAGO AERIAL SURVEY CO.

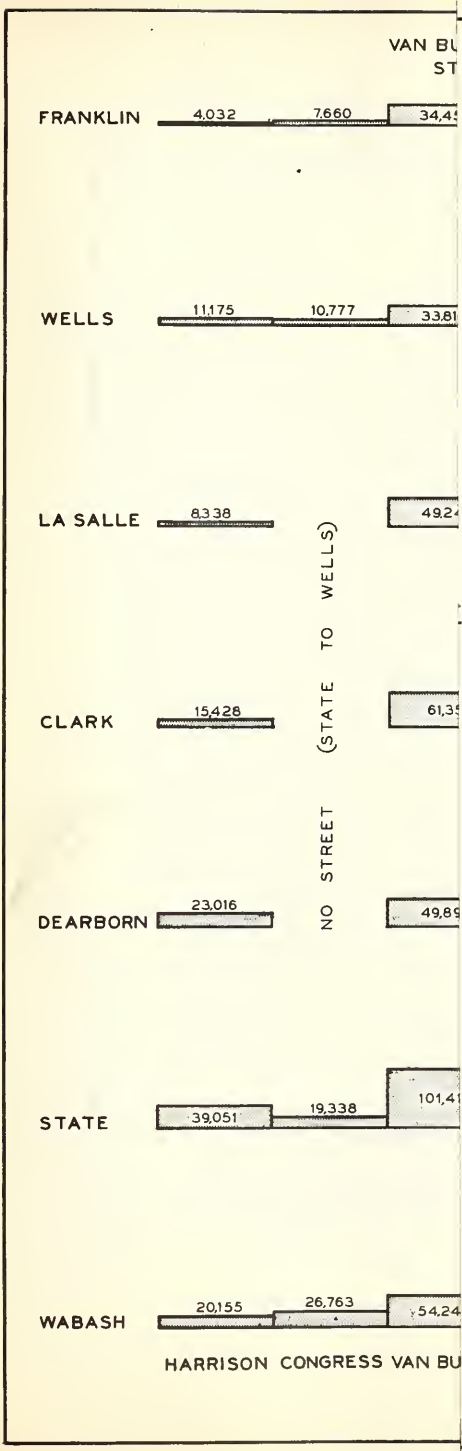
AERIAL VIEW
SOUTHEAST SUP
THIS SUPERHIGHW
AT INDIAN

FIGURE 18

AERIAL VIEW SHOWING GENERAL LOCATION OF
SOUTHEAST SUPERHIGHWAY - NORTH OF 91ST STREET

THIS SUPERHIGHWAY TO EXTEND SOUTHEAST TO STATE LINE
AT INDIANAPOLIS AVENUE AND 106TH STREET

FIGURE 18



DISTRIBUTION OF ACTIVITY

AS SHOWN BY DESTRIAN TRAFFIC COUNTS AT INTERSECTIONS IN ENTRAL BUSINESS DISTRICT

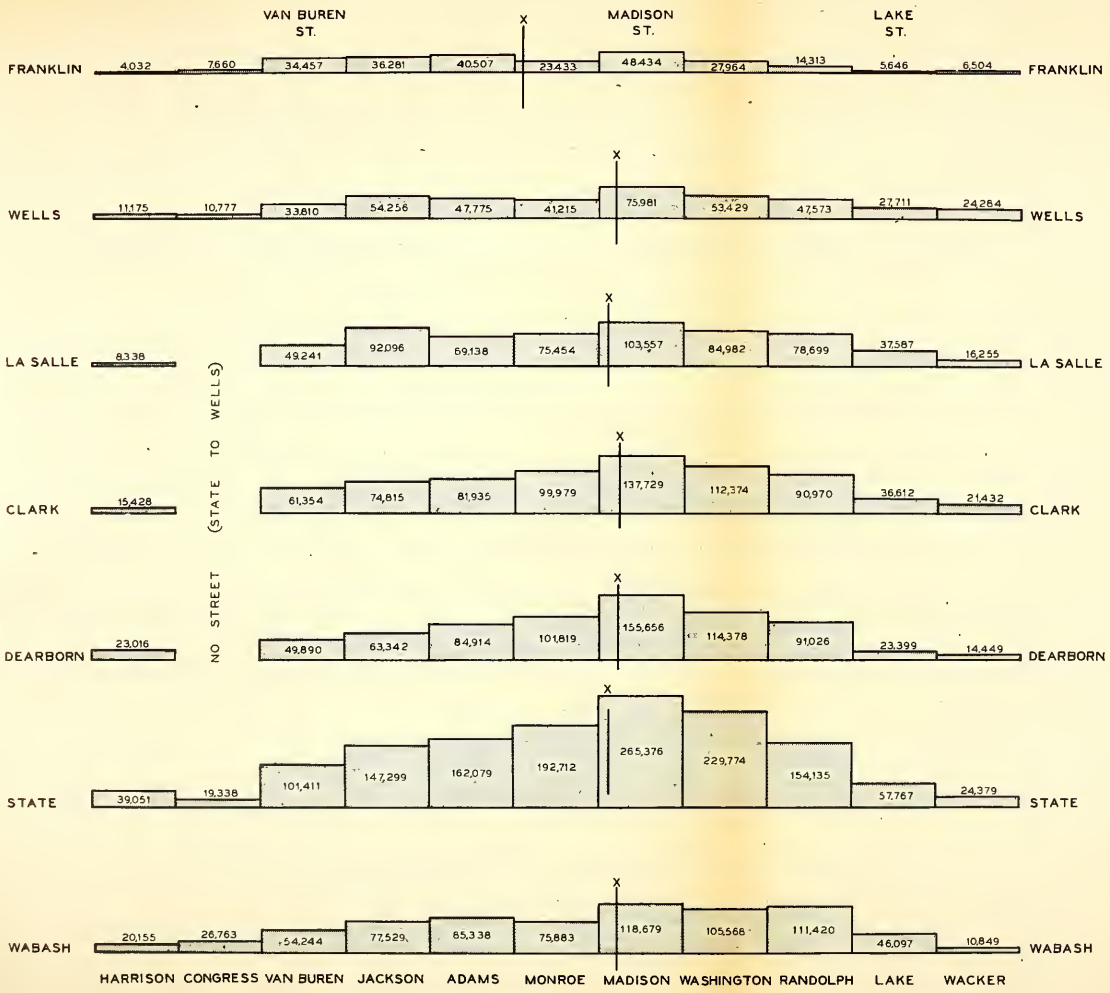
ON A
TYPICAL WEEK DAY-1938
12 HOUR COUNT 7 A.M.-7 P.M.

DATA OBTAINED FROM
"STREET TRAFFIC SURVEY"
W.P.A. PROJECTS 3748-30024
SPONSORED BY
THE CITY OF CHICAGO
DIVISION OF TRAFFIC ENGINEERING

X CENTER OF PEDESTRIAN TRAFFIC

OCTOBER 1939

FIGURE 19



DISTRIBUTION OF ACTIVITY

AS SHOWN BY PEDESTRIAN TRAFFIC COUNTS AT INTERSECTIONS IN CENTRAL BUSINESS DISTRICT

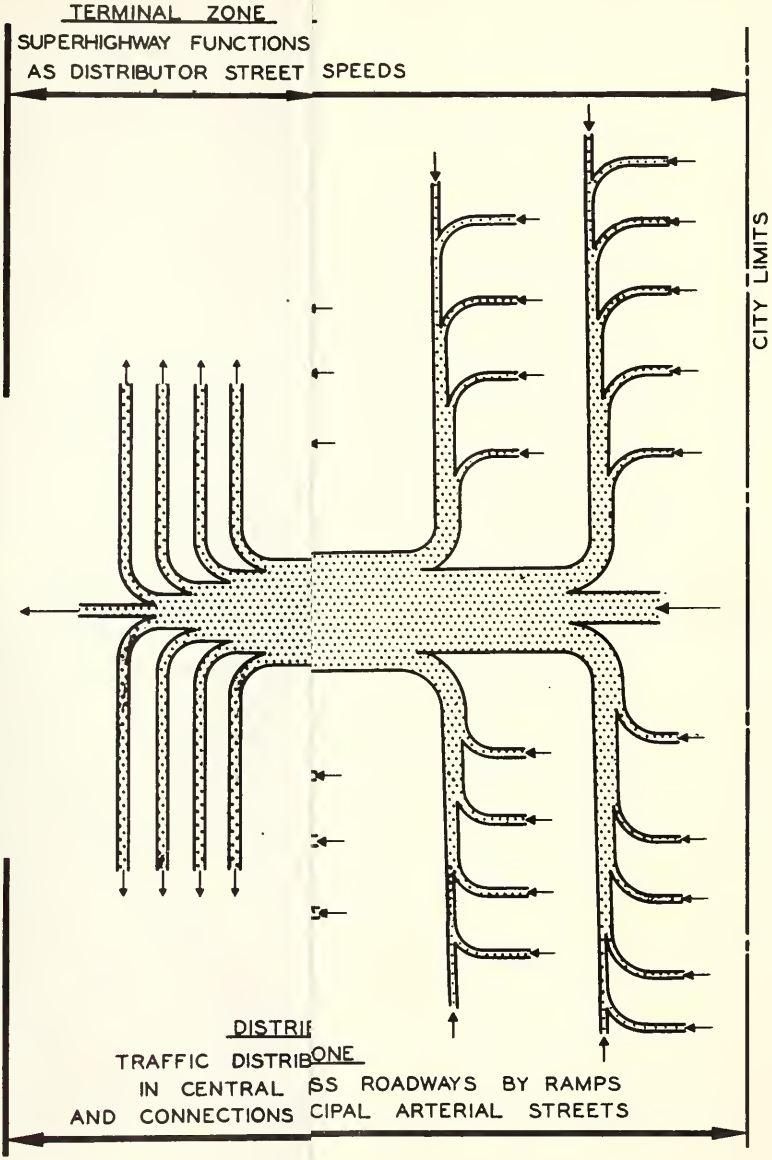
ON A
TYPICAL WEEK DAY-1938
12 HOUR COUNT 7 A.M.-7 P.M.

DATA OBTAINED FROM
"STREET TRAFFIC SURVEY"
W.P.A. PROJECTS 3748-30024
SPONSORED BY
THE CITY OF CHICAGO
DIVISION OF TRAFFIC ENGINEERING

X CENTER OF PEDESTRIAN TRAFFIC

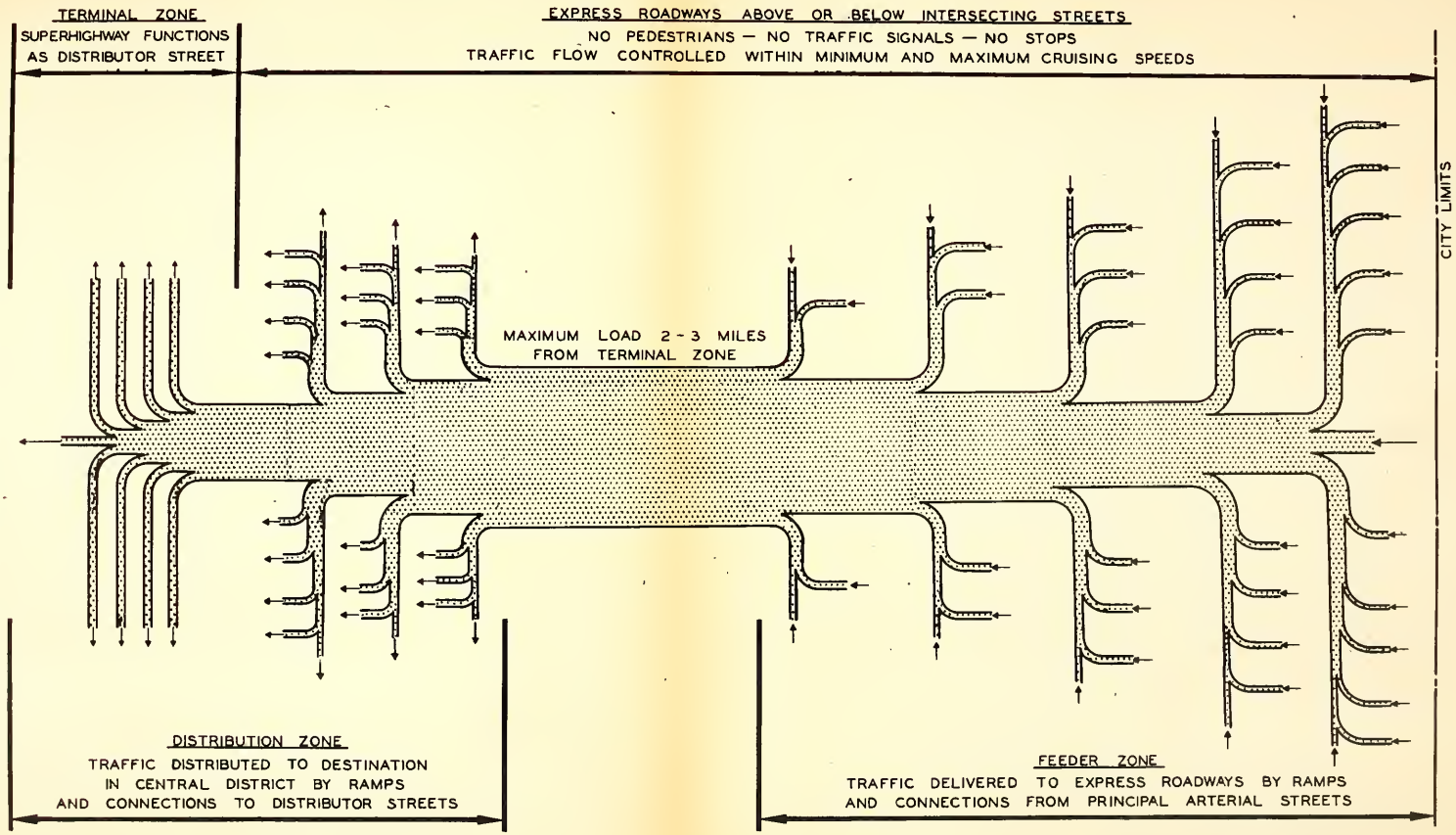
OCTOBER 1939

FIGURE 19



OCTOBER 1939

FIGURE 20



TRAFFIC FLOW THROUGH URBAN AREA

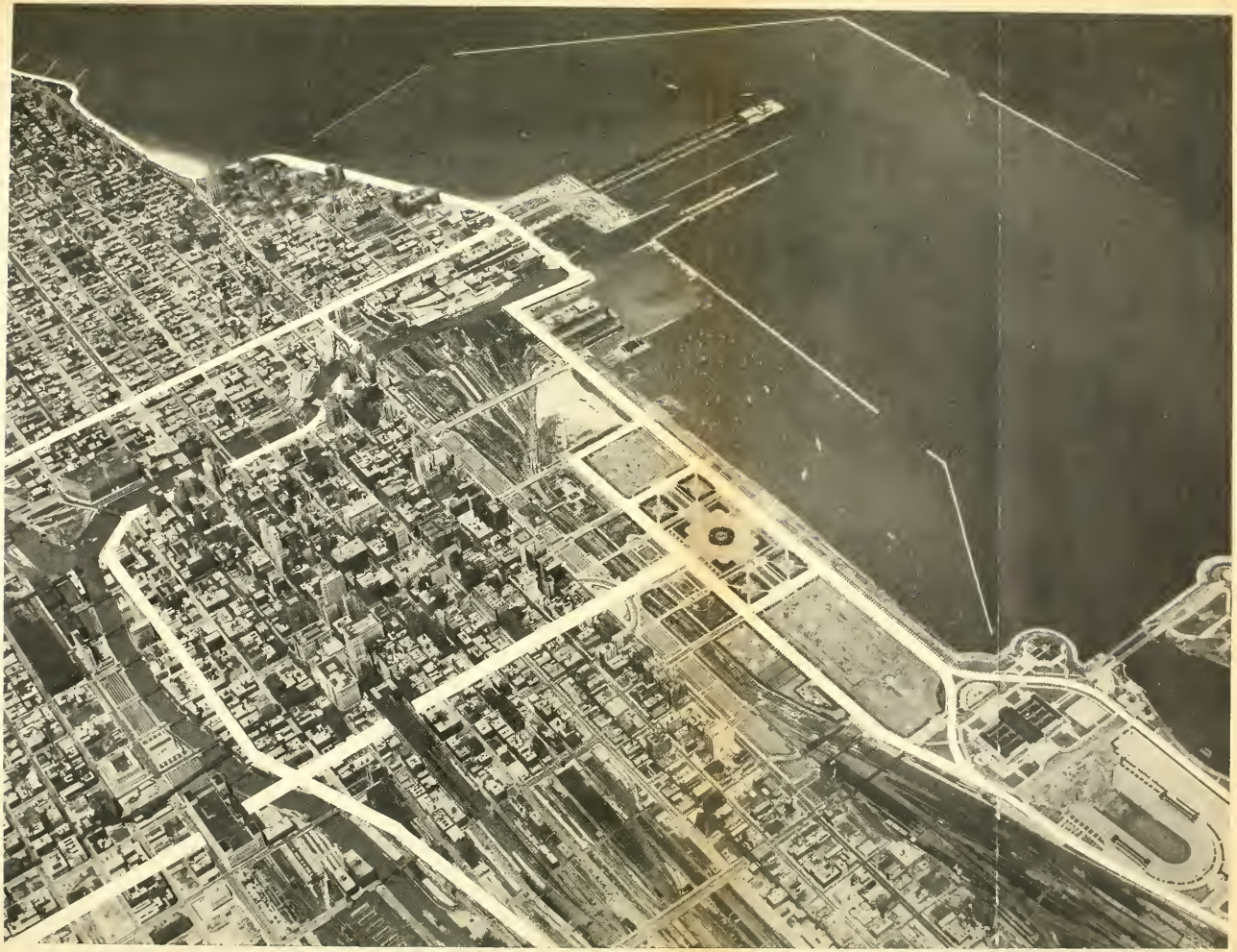
TYPICAL RADIAL SUPERHIGHWAY

OCTOBER 1939

FIGURE 20

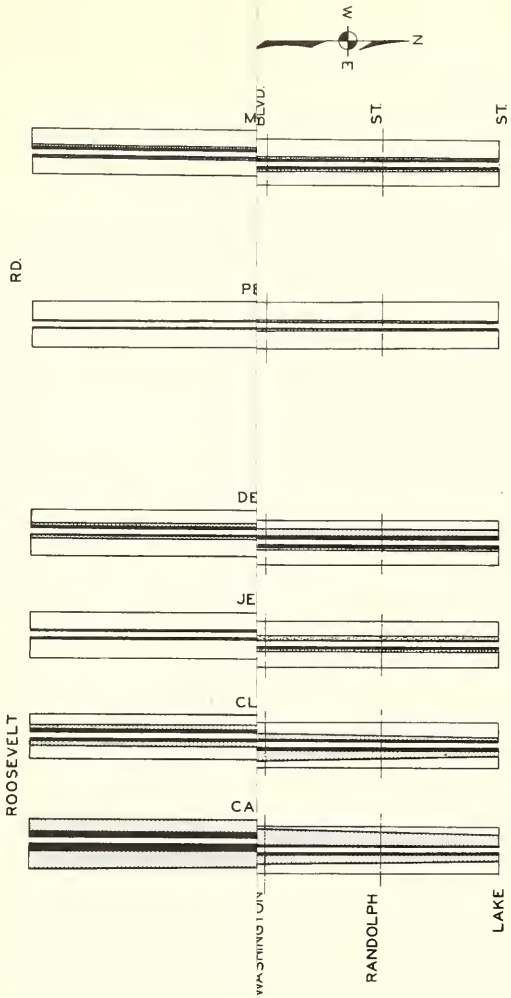
AERIAL V
SUPERHIGHV

FIGURE 21



AERIAL VIEW SHOWING GENERAL PATTERN OF SUPERHIGHWAYS IN CENTRAL BUSINESS DISTRICT

FIGURE 21

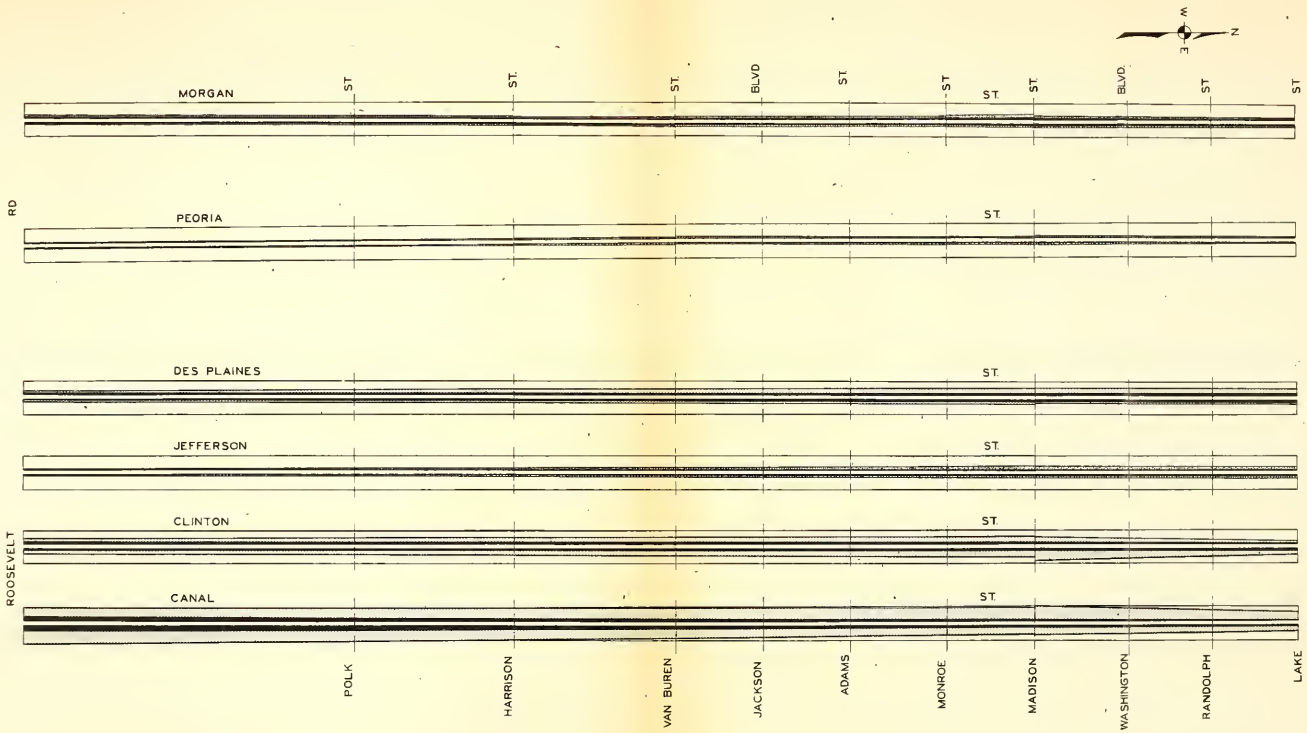


.AL WEEKDAY TRAFFIC FLOW
MINUTE PERIOD–MORNING RUSH HOUR
HOWING UNUSED CAPACITY
OF
AND SOUTH TERMINAL STREETS
ST OF THE CHICAGO RIVER

ASED ON COUNTS MADE BY W.P.A.
UNDER SUPERVISION OF
OF TRAFFIC ENGINEERING–CITY OF CHICAGO

OCTOBER 1939

FIGURE 22



LEGEND

UNUSED CAPACITY SOUTHBOUND
EXISTING PASSENGER VEHICLES
EXISTING SERVICE VEHICLES
EXISTING PASSENGER VEHICLES
UNUSED CAPACITY NORTHBOUND

SCALE

VEHICLES PER MAXIMUM THIRTY MINUTE PERIOD

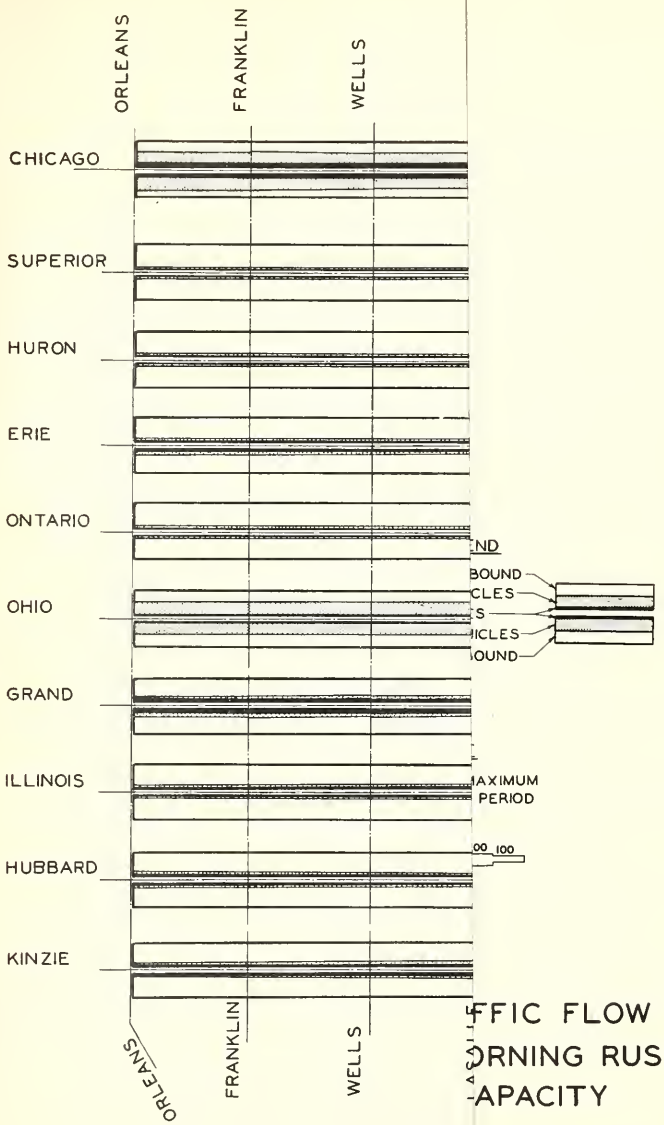
500 400 300 200 100

TYPICAL WEEKDAY TRAFFIC FLOW
MAXIMUM 30 MINUTE PERIOD – MORNING RUSH HOUR
SHOWING UNUSED CAPACITY
OF
NORTH AND SOUTH TERMINAL STREETS
WEST OF THE CHICAGO RIVER

BASED ON COUNTS MADE BY WPA
UNDER SUPERVISION OF
DIVISION OF TRAFFIC ENGINEERING – CITY OF CHICAGO

OCTOBER 1939

FIGURE 22



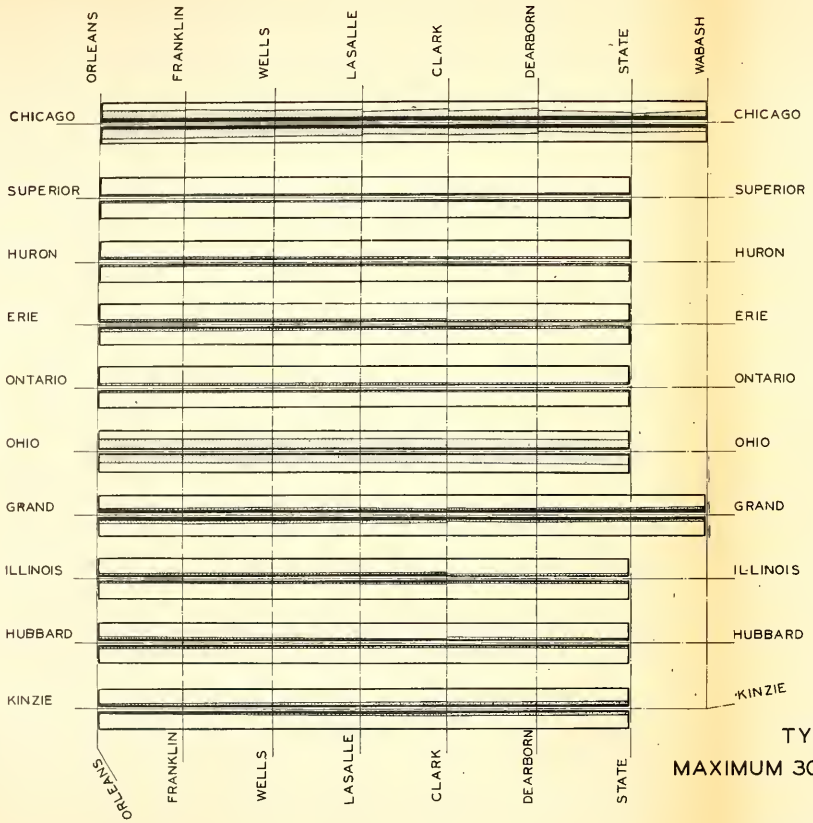
FFIC FLOW
ORNING RUSH HOUR
APACITY

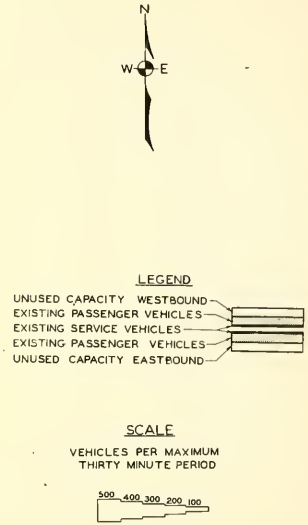
AL STREETS
O RIVER

BY W.P.A.
OF
CITY OF CHICAGO

OCTOBER, 1939

FIGURE 23



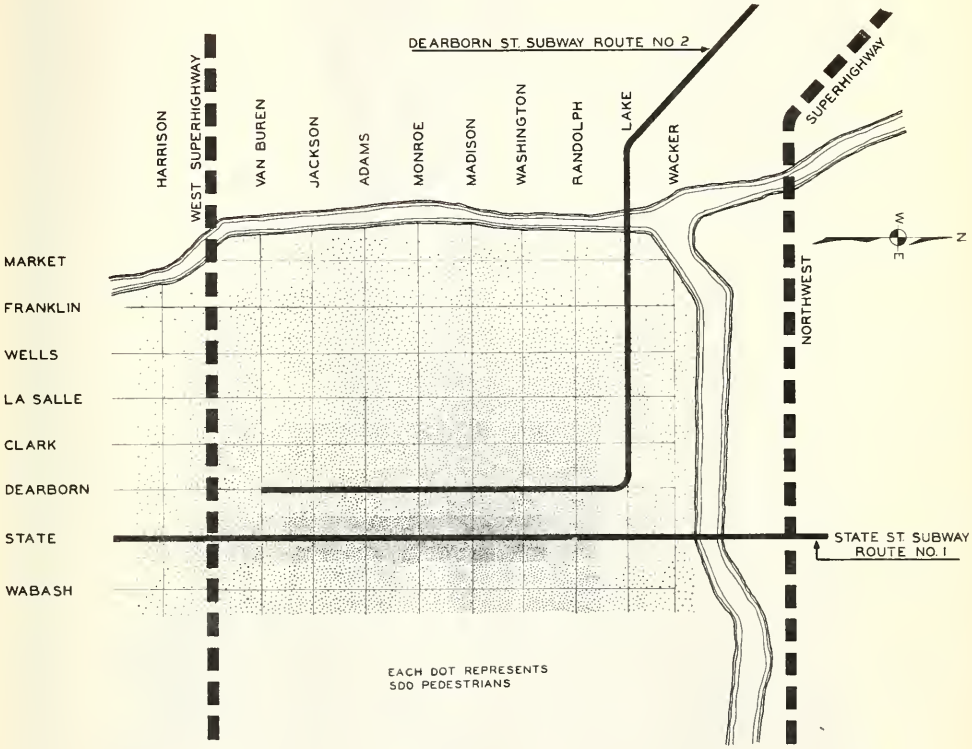


TYPICAL WEEKDAY TRAFFIC FLOW
MAXIMUM 30 MINUTE PERIOD – MORNING RUSH HOUR
SHOWING UNUSED CAPACITY
OF
EAST AND WEST TERMINAL STREETS
NORTH OF THE CHICAGO RIVER

BASED ON COUNTS MADE BY W.P.A.
UNDER SUPERVISION OF
DIVISION OF TRAFFIC ENGINEERING - CITY OF CHICAGO

OCTOBER, 1939

FIGURE 23



PRESENT PEDESTRIAN ACTIVITY
IN CENTRAL BUSINESS DISTRICT
AND
RELATED LOCATION OF SUPERHIGHWAYS AND SUBWAYS

OCTOBER 1939

FIGURE 24

FIGURE 25

VIEW OF JEFFERSON STREET - SOUTH FROM CONGRESS STREET
1:30 P.M. SATURDAY OCTOBER 14,1939

VIEW OF JEFFERSON STREET - NORTH FROM CONGRESS STREET
1:40 P.M. SATURDAY OCTOBER 14, 1939

FIGURE 26

FIGURE 27

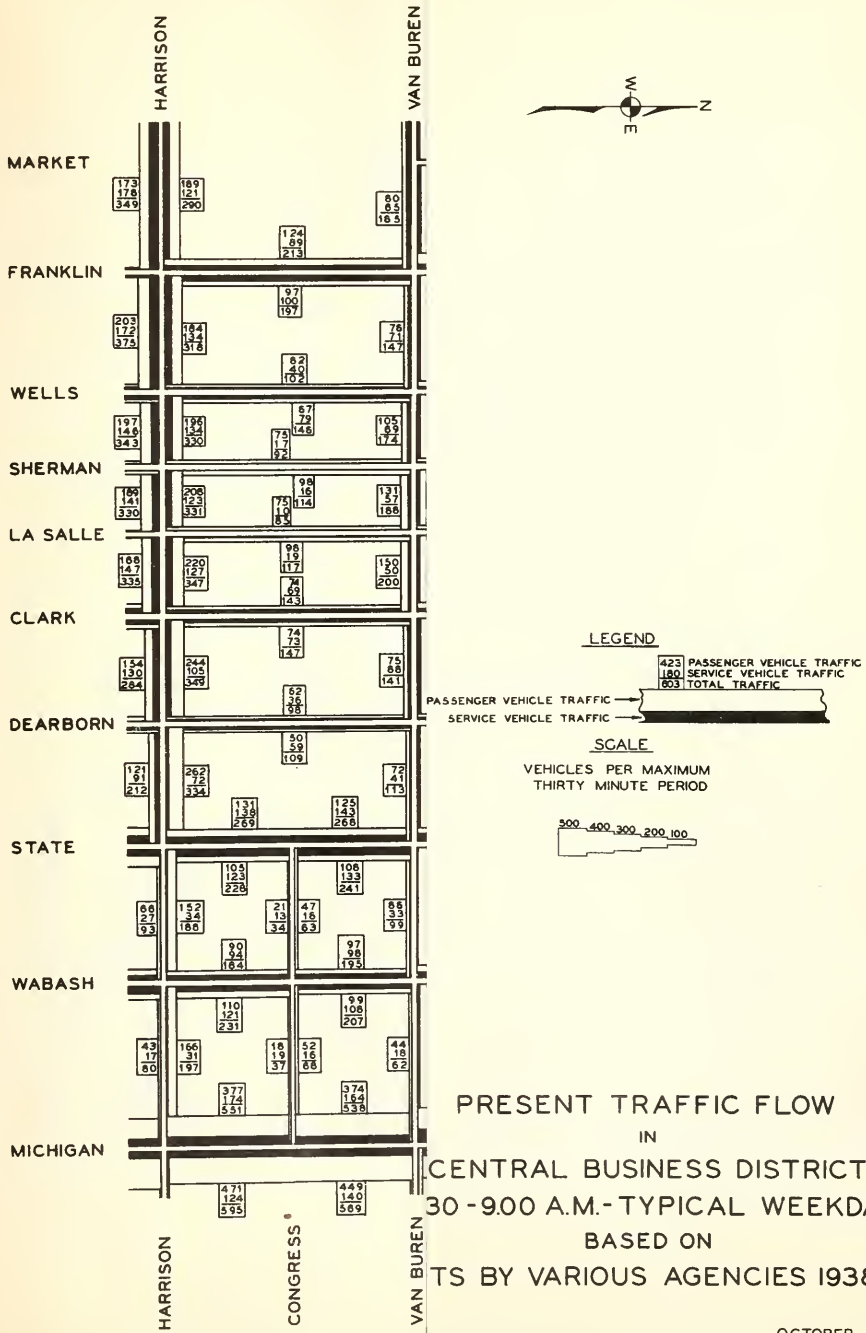
VIEW OF ONTARIO STREET - EAST FROM POINT NEAR CLARK STREET
2:00 P.M. SATURDAY OCTOBER 14,1939

FIGURE 28

VIEW OF HUBBARD STREET - EAST FROM LA SALLE STREET
2:10 P.M. SATURDAY OCTOBER 14,1939

VIEW OF FRANKLIN STREET - NORTH FROM JACKSON STREET
2:00 P.M. TUESDAY OCTOBER 17, 1939

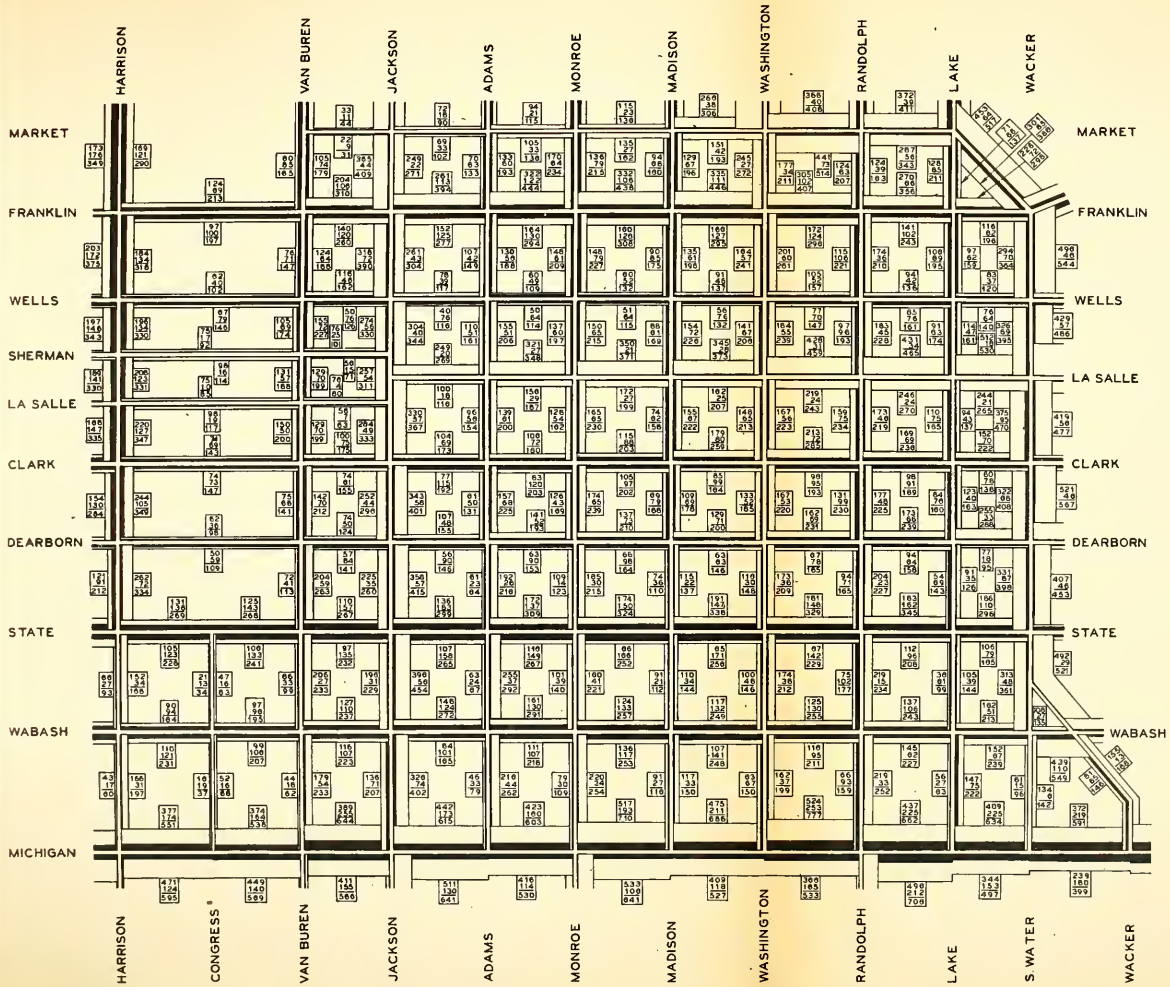
FIGURE 29



PRESENT TRAFFIC FLOW
IN
CENTRAL BUSINESS DISTRICT
30 - 9.00 A.M. - TYPICAL WEEKDAY
BASED ON
TS BY VARIOUS AGENCIES 1938-1939

OCTOBER, 1939

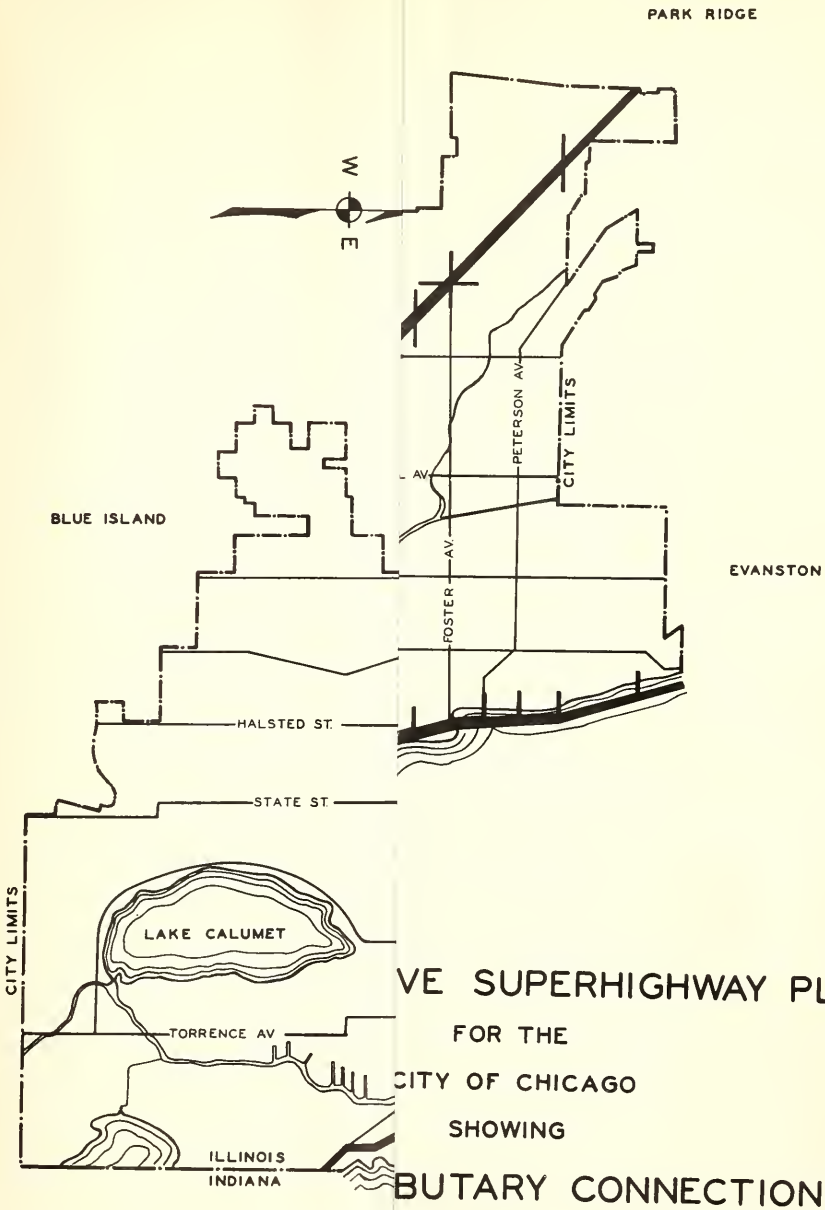
FIGURE 30



PRESENT TRAFFIC FLOW
IN
CENTRAL BUSINESS DISTRICT
8.30 - 9.00 A.M. - TYPICAL WEEKDAY
BASED ON
COUNTS BY VARIOUS AGENCIES 1938-1939

OCTOBER, 1939

FIGURE 30



VE SUPERHIGHWAY PLAN

FOR THE

CITY OF CHICAGO

SHOWING

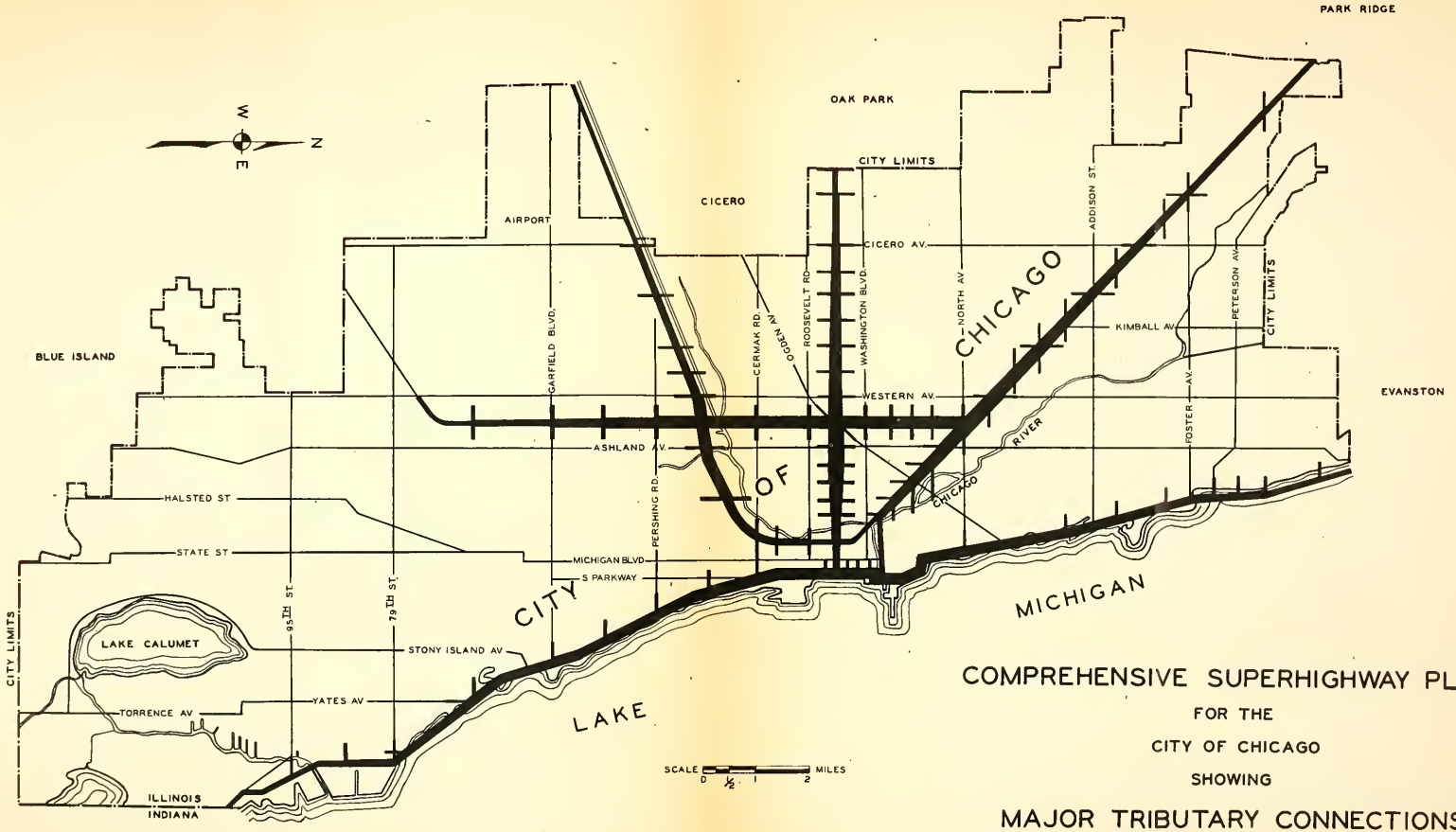
BUTARY CONNECTIONS

AND

ENSITY OF TRAFFIC LOADS

OCTOBER 1939

FIGURE 31



COMPREHENSIVE SUPERHIGHWAY PLAN

FOR THE

CITY OF CHICAGO

SHOWING

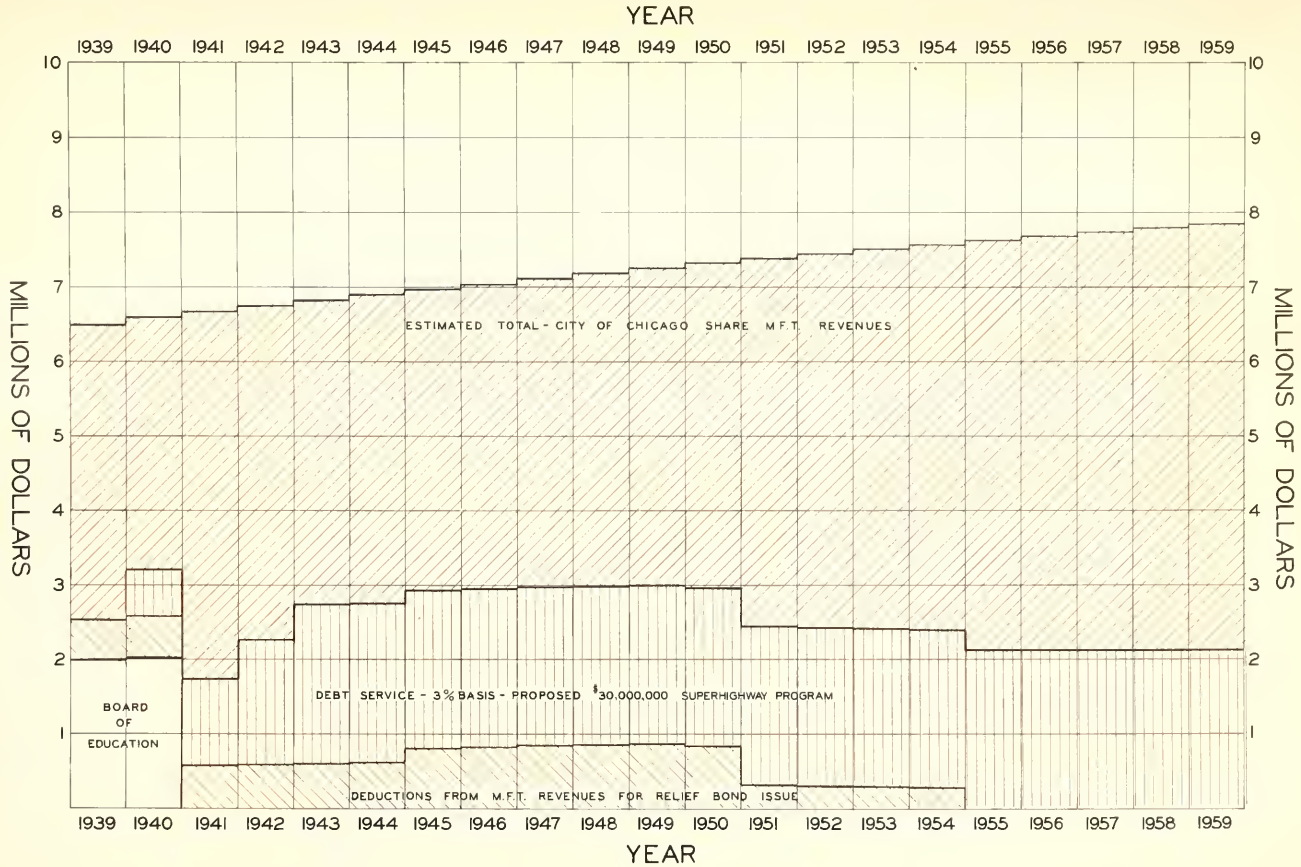
MAJOR TRIBUTARY CONNECTIONS

AND

RELATIVE INTENSITY OF TRAFFIC LOADS

OCTOBER 1939

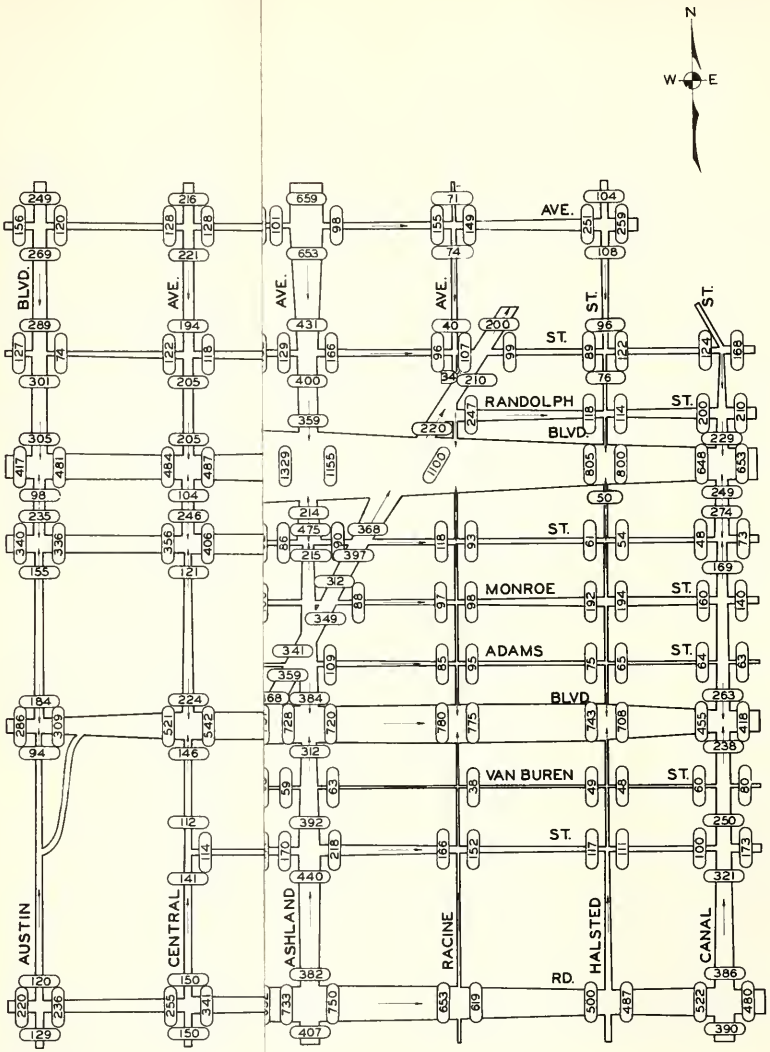
FIGURE 31



TENTATIVE FINANCIAL PROGRAM —— CITY OF CHICAGO

OCTOBER, 1939

FIGURE 32



CHART

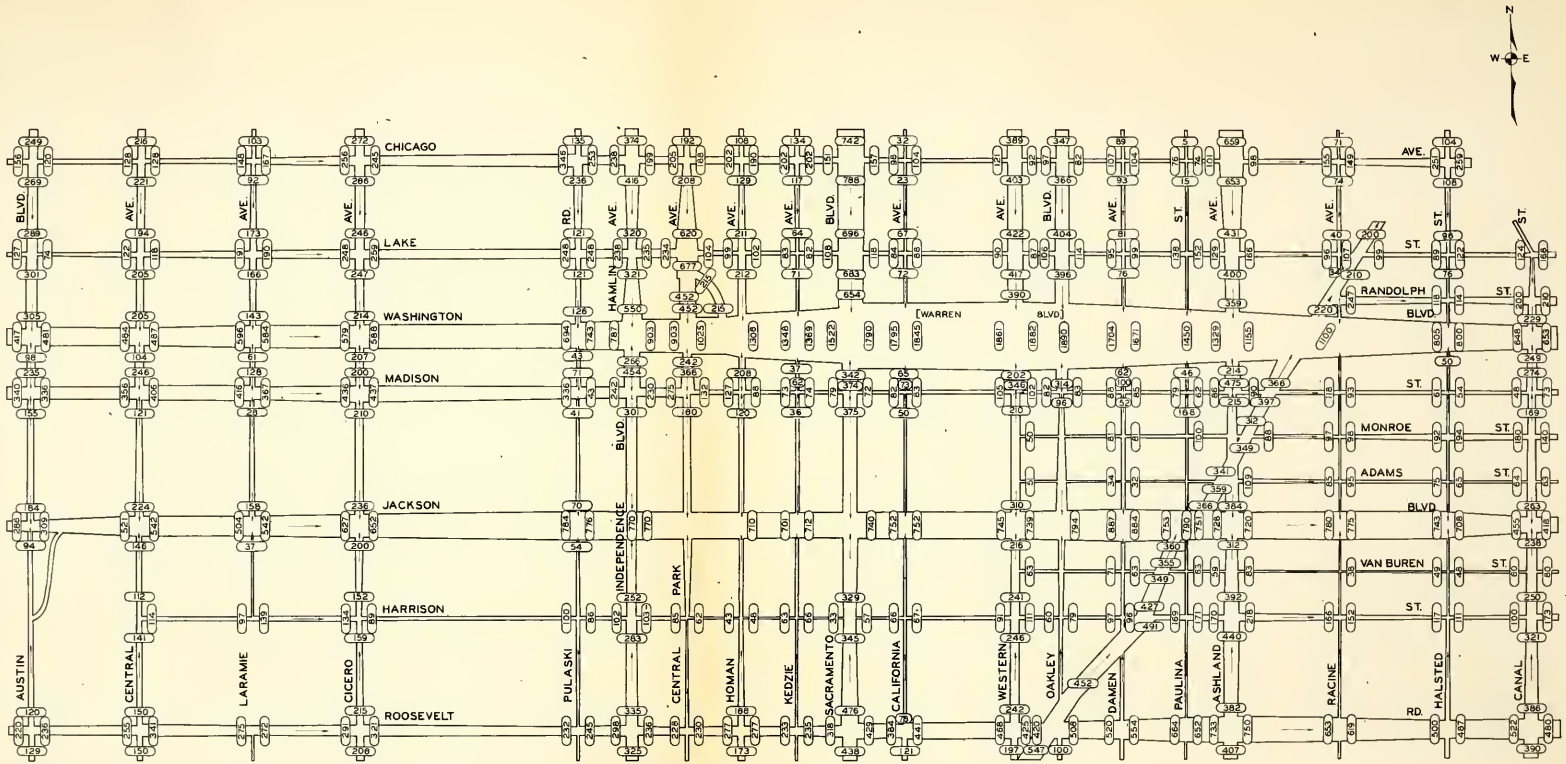
SENGER VEHICLE TRAFFIC

RTY MINUTE PERIOD

TS BY VARIOUS AGENCIES 1938-1939

VOLUME OF

FIGURE 17



SCALE

VEHICLES PER MAXIMUM THIRTY MINUTE PERIOD

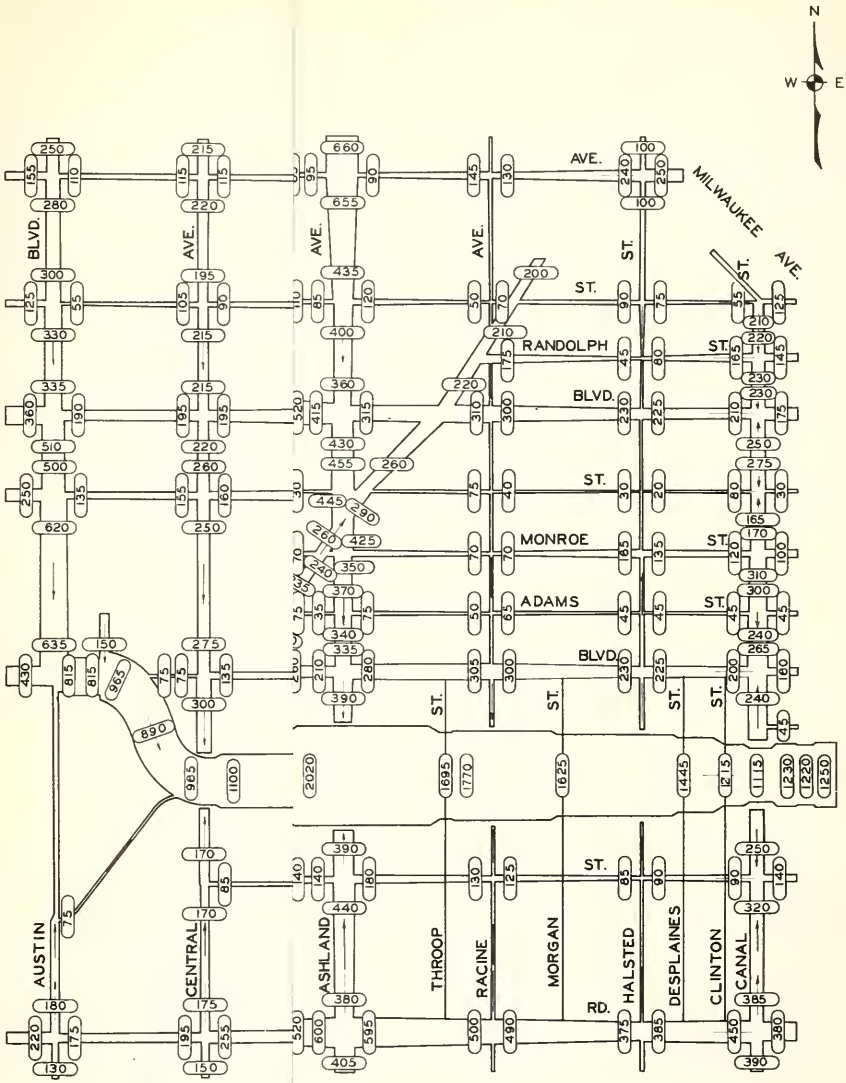
500 400 300 200 100

VOLUME OF TRAFFIC INDICATED THUS (100)

FLOW CHART

OF EXISTING INBOUND PASSENGER VEHICLE TRAFFIC
DURING MAXIMUM THIRTY MINUTE PERIOD
BASED ON TYPICAL WEEKDAY COUNTS BY VARIOUS AGENCIES 1938-1939

FIGURE 17



CHART

OF EXISTING INBOUND TRAFFIC

USINESS DISTRICT

VE

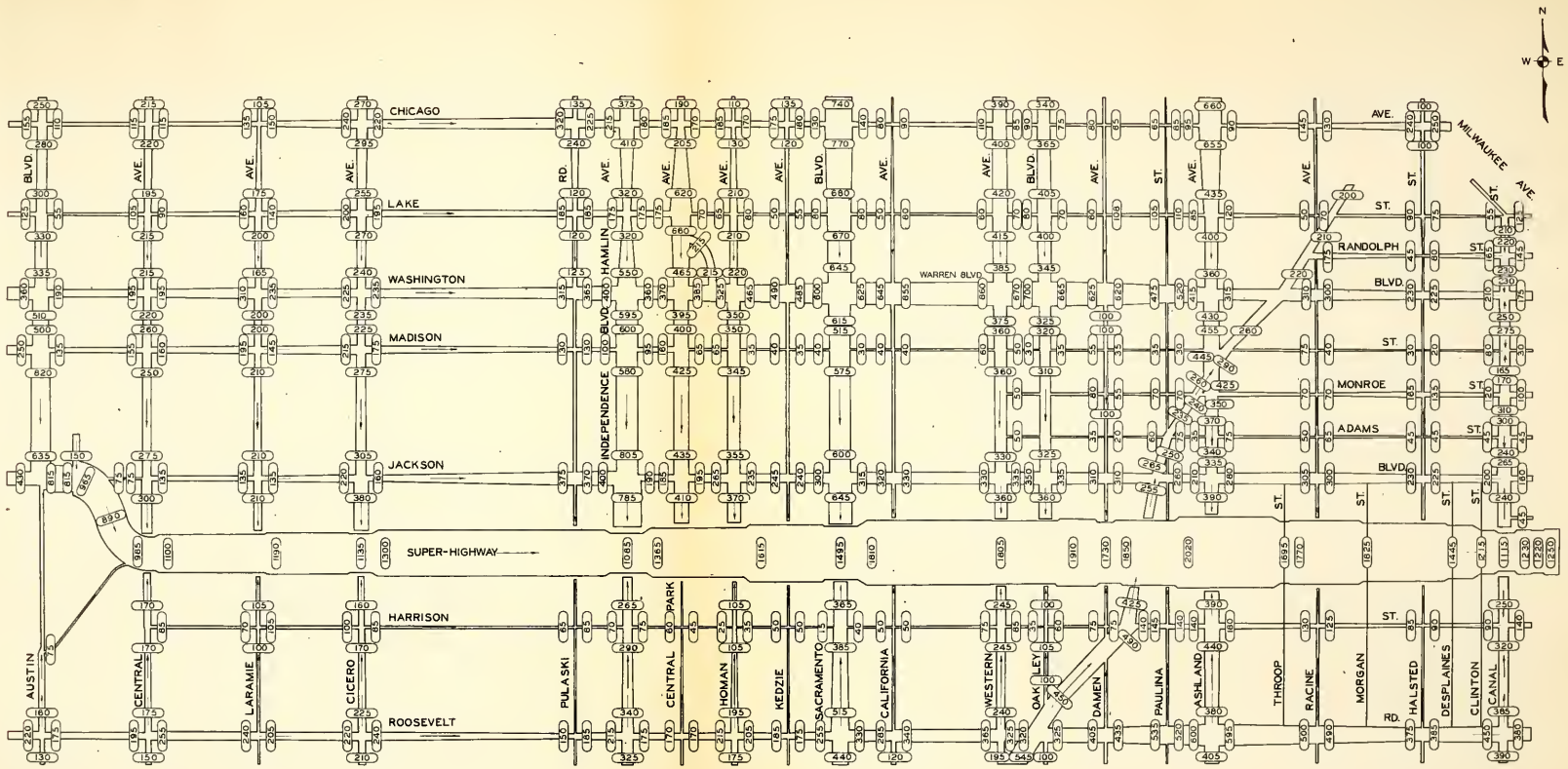
TH

ND PROPOSED WEST SIDE SUPERHIGHWAY

HIRTY MINUTE PERIOD

VOLUME OF T ITS BY VARIOUS AGENCIES 1938-1939

FIGURE 18



SCALE

VEHICLES PER MAXIMUM THIRTY MINUTE PERIOD

500 400 300 200 100

VOLUME OF TRAFFIC INDICATED THUS (100)

FLOW CHART

INDICATING REDISTRIBUTION OF EXISTING INBOUND TRAFFIC

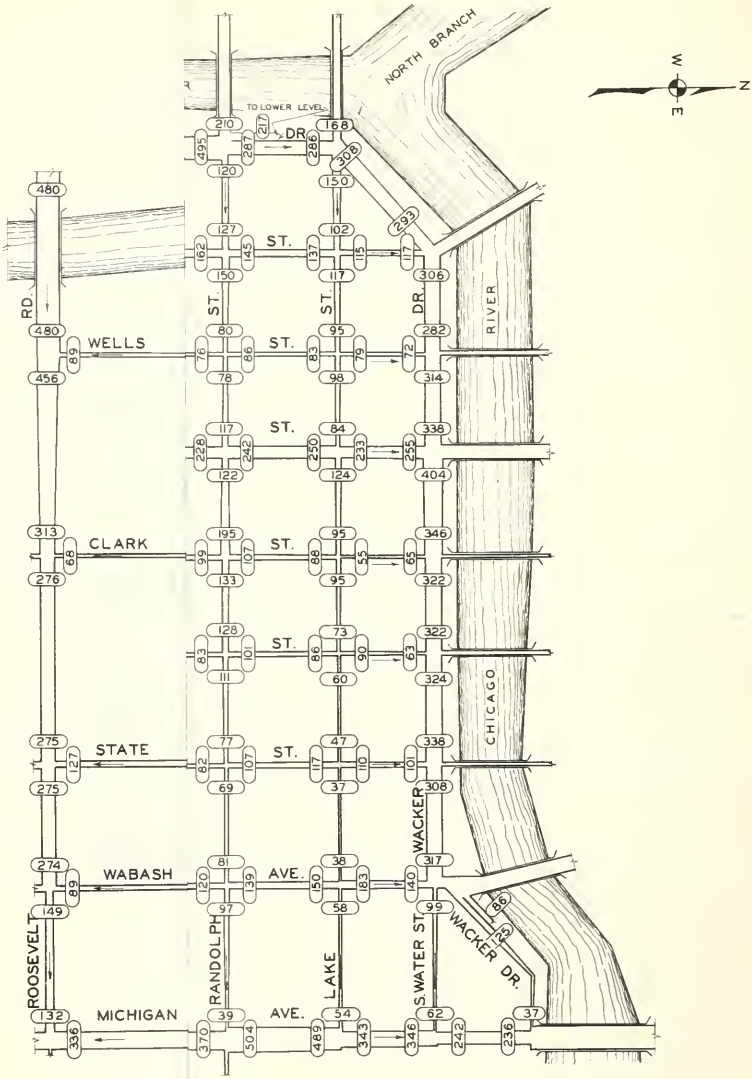
TO CENTRAL BUSINESS DISTRICT

OVER EXISTING THOROUGHFARES AND PROPOSED WEST SIDE SUPERHIGHWAY

DURING MAXIMUM THIRTY MINUTE PERIOD

BASED ON TYPICAL WEEKDAY COUNTS BY VARIOUS AGENCIES 1938-1939

FIGURE 18



CHART

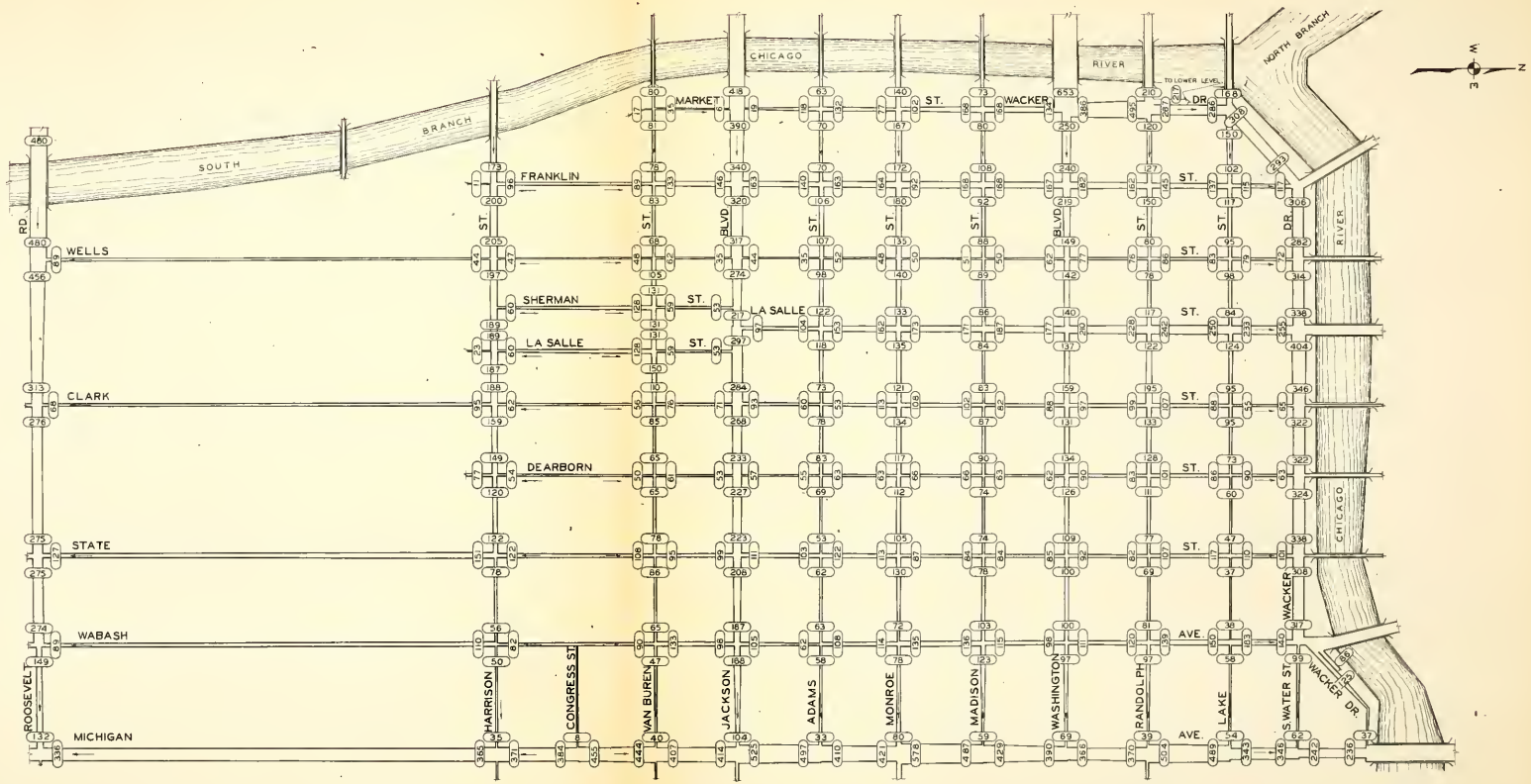
VE SENGER VEHICLE TRAFFIC

TI RTY MINUTE PERIOD

TS BY VARIOUS AGENCIES 1938–1939

VOLUME OF T

FIGURE 19



SCALE

VEHICLES PER MAXIMUM THIRTY MINUTE PERIOD

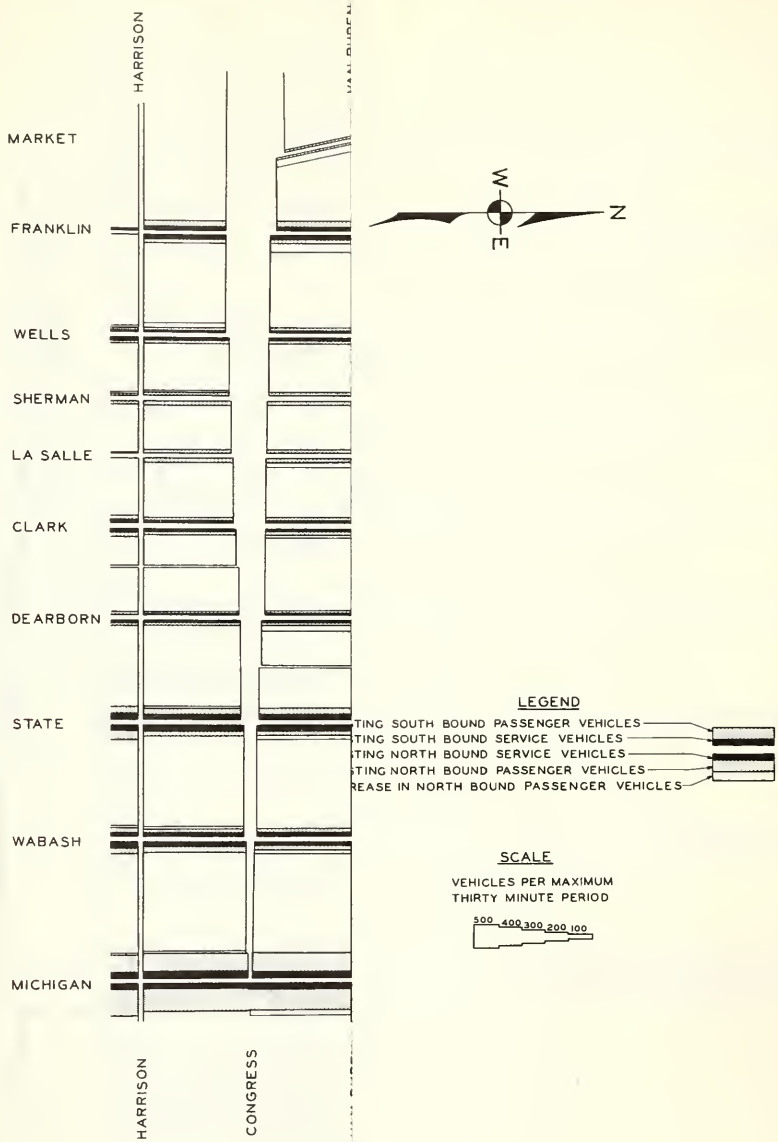
500 400 300 200 100

VOLUME OF TRAFFIC INDICATED THUS (100)

FLOW CHART

OF EXISTING INBOUND PASSENGER VEHICLE TRAFFIC
DURING MAXIMUM THIRTY MINUTE PERIOD
BASED ON TYPICAL WEEKDAY COUNTS BY VARIOUS AGENCIES 1938–1939

FIGURE 19



N

RAL BUSINESS DISTRICT

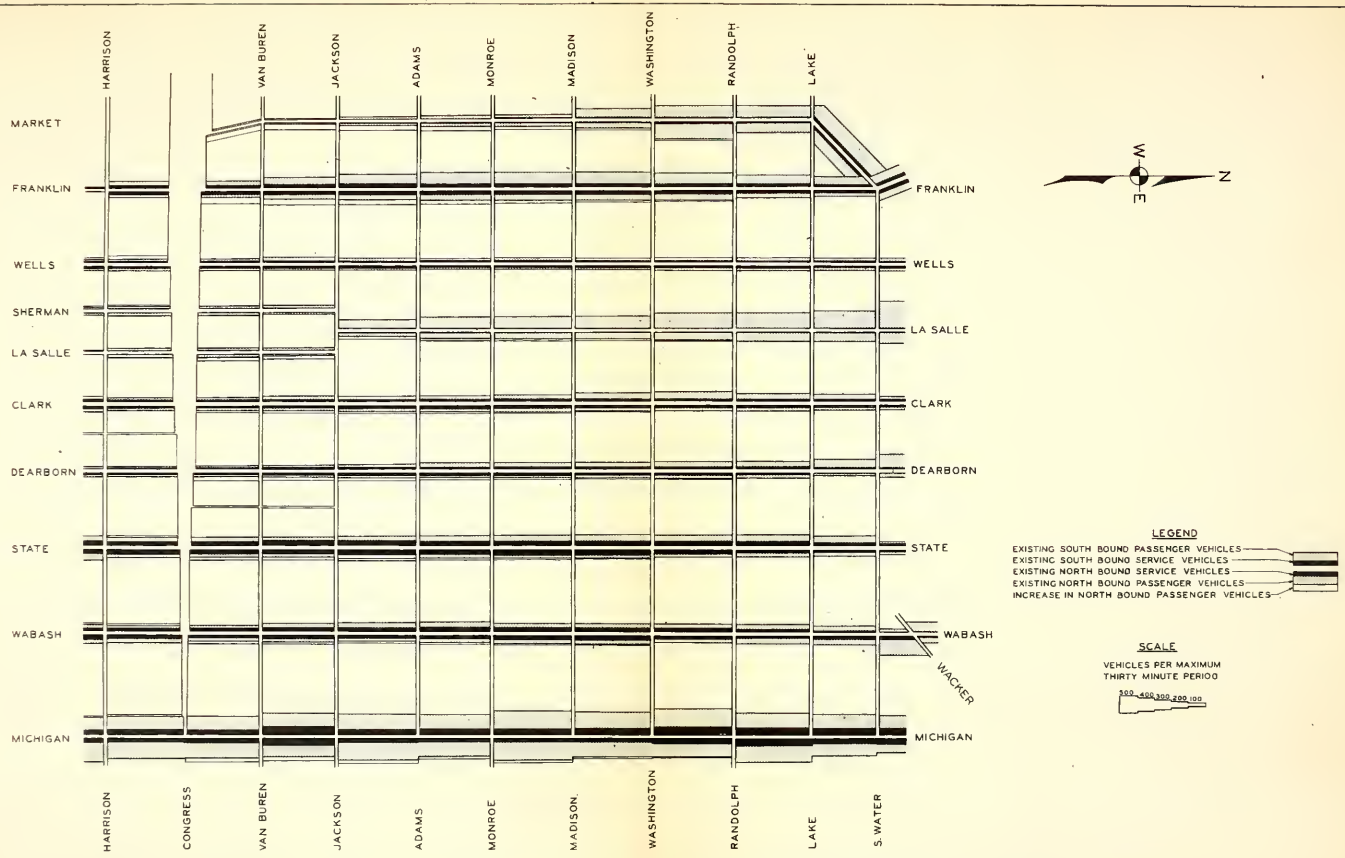
GER VEHICLE TRAFFIC

PERHIGHWAY

UTE PERIOD

ARIOUS AGENCIES 1938–1939

FIGURE 20



TRAFFIC FLOW

ON NORTH AND SOUTH STREETS IN CENTRAL BUSINESS DISTRICT
SHOWING INCREASE IN INBOUND PASSENGER VEHICLE TRAFFIC
FROM CONGRESS STREET SUPERHIGHWAY
DURING MAXIMUM THIRTY MINUTE PERIOD
BASED ON TYPICAL WEEKDAY COUNTS BY VARIOUS AGENCIES 1938–1939

SEPTEMBER 1939

FIGURE 20

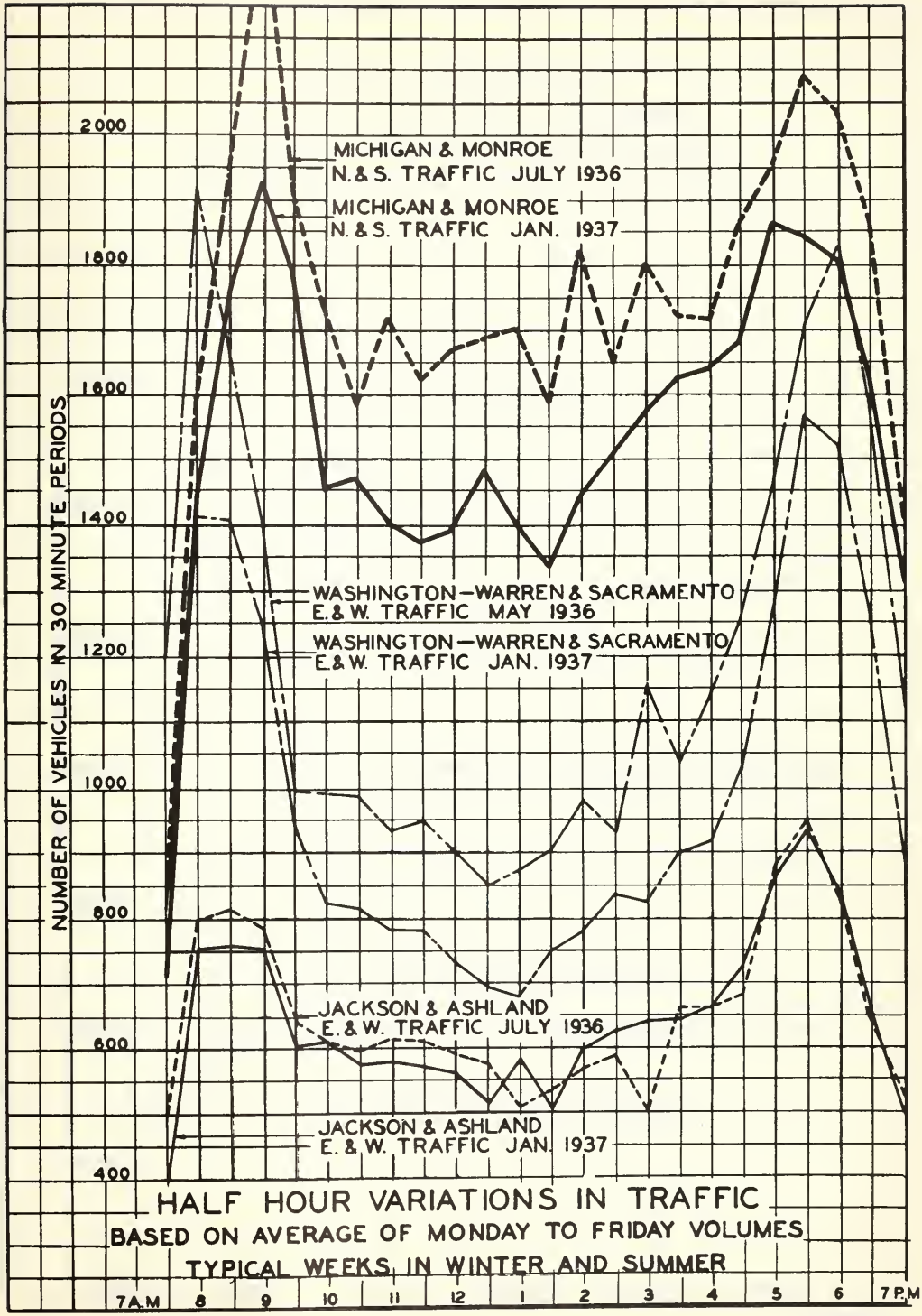

MICHIGAN & MONROE
N. & S. TRAFFIC JULY 1936
MICHIGAN & MONROE
N. & S. TRAFFIC JAN. 1937
WASHINGTON—WARREN & SACRAMENTO
E. & W. TRAFFIC MAY 1936
WASHINGTON—WARREN & SACRAMENTO
E. & W. TRAFFIC JAN. 1937
JACKSON & ASHLAND
E. & W. TRAFFIC JULY 1936
JACKSON & ASHLAND
E. & W. TRAFFIC JAN. 1937
NUMBER OF VEHICLES IN 30 MINUTE PERIODS
2000
1800
1600
1400
1200
1000
800
600
400
HALF HOUR VARIATIONS IN TRAFFIC
BASED ON AVERAGE OF MONDAY TO FRIDAY VOLUMES
TYPICAL WEEKS IN WINTER AND SUMMER
7 A.M
8
9
10
11
12
1
2
3
4
5
6
7 P.M

FIGURE 23

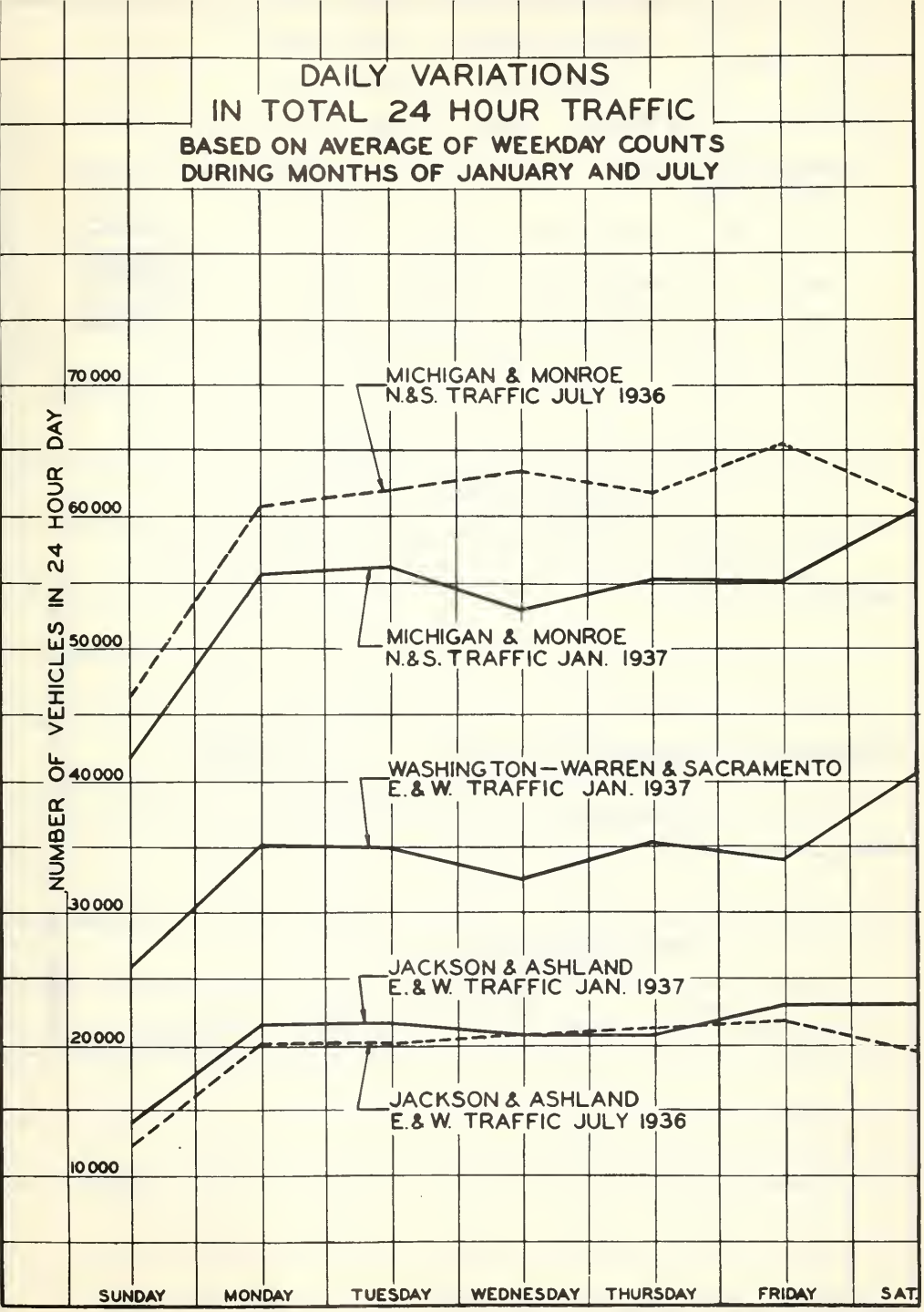

DAILY VARIATIONS
IN TOTAL 24 HOUR TRAFFIC
BASED ON AVERAGE OF WEEKDAY COUNTS
DURING MONTHS OF JANUARY AND JULY
NUMBER OF VEHICLES IN 24 HOUR DAY
70 000
60 000
50 000
40 000
30 000
20 000
10 000
MICHIGAN & MONROE
N.&S. TRAFFIC JULY 1936
MICHIGAN & MONROE
N.&S. TRAFFIC JAN. 1937
WASHINGTON—WARREN & SACRAMENTO
E.& W. TRAFFIC JAN. 1937
JACKSON & ASHLAND
E.& W. TRAFFIC JAN. 1937
JACKSON & ASHLAND
E.& W. TRAFFIC JULY 1936
SUNDAY
MONDAY
TUESDAY
WEDNESDAY
THURSDAY
FRIDAY
SAT.

FIGURE 24

MONTHLY VARIATIONS IN TOTAL 24-HOUR TYPICAL WEEK DAY TRAFFIC

INTERSECTION	DIRECTION OF TRAFFIC	AVERAGE	MAX.	MIN.	% OF AVERAGE MAX.	% OF AVERAGE MIN.
MICHIGAN & MONROE	N.& S.	58 330	65 823	54 771	113	94
WASHINGTON—WARREN & SACRAMENTO	E. & W.	38 120	41 830	35 003	110	92
JACKSON & ASHLAND	E. & W.	22 270	24 745	20 759	111	93

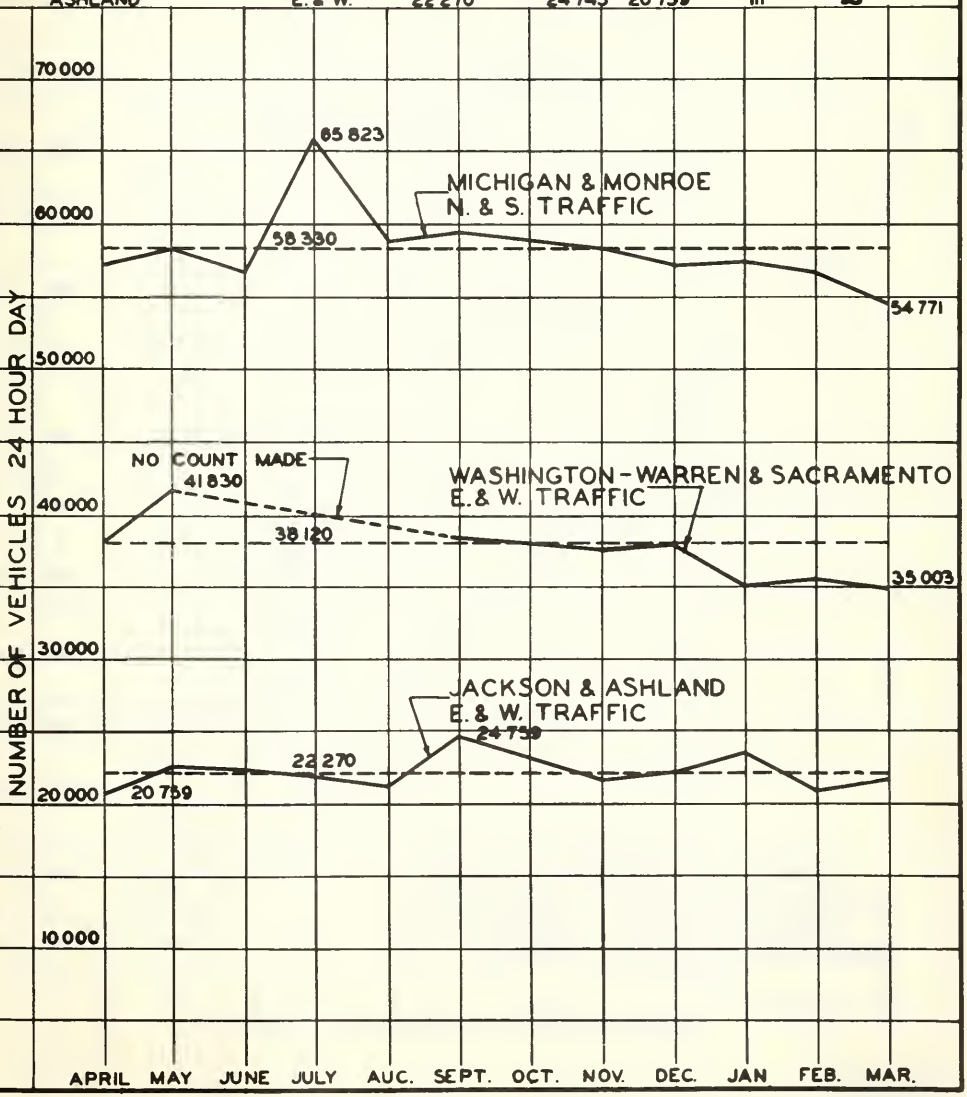


FIGURE 25

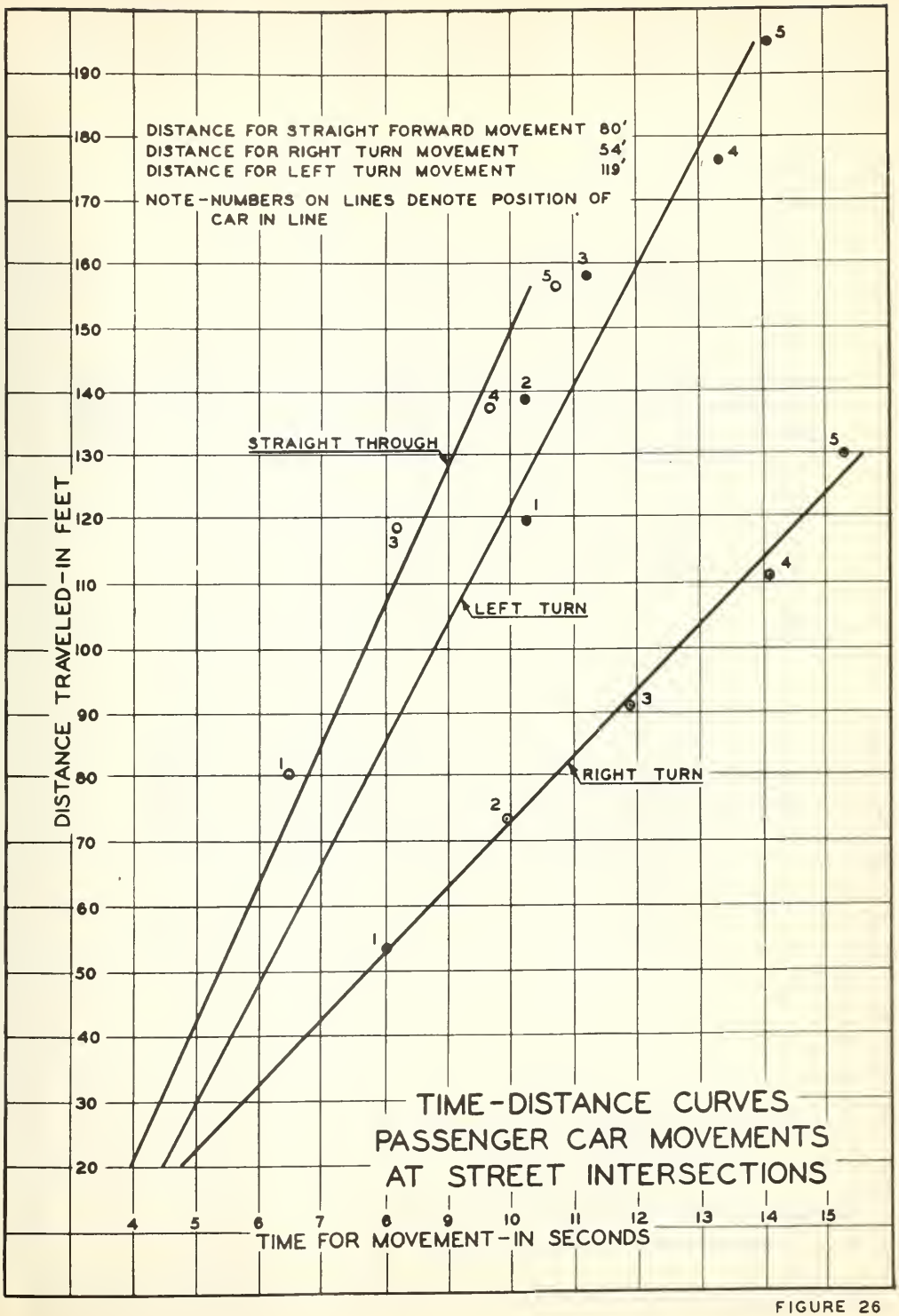
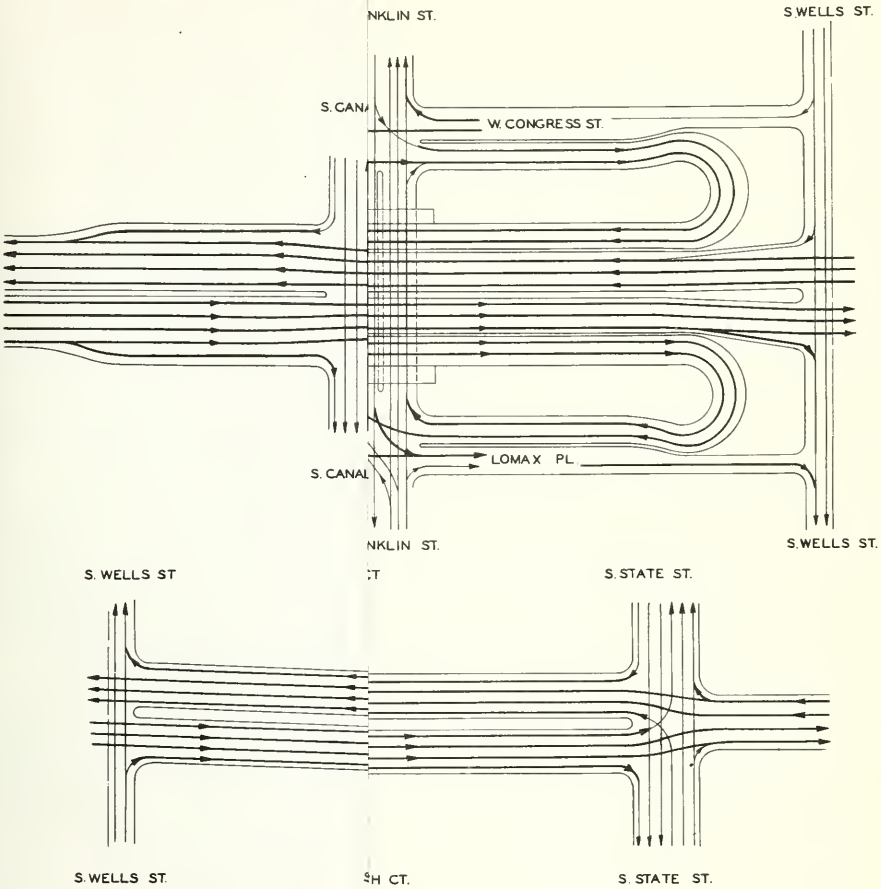

DISTANCE FOR STRAIGHT FORWARD MOVEMENT 80'
DISTANCE FOR RIGHT TURN MOVEMENT 54'
DISTANCE FOR LEFT TURN MOVEMENT 119'
NOTE-NUMBERS ON LINES DENOTE POSITION OF CAR IN LINE
STRAIGHT THROUGH
LEFT TURN
RIGHT TURN
DISTANCE TRAVELED-IN FEET
TIME FOR MOVEMENT-IN SECONDS
TIME-DISTANCE CURVES
PASSENGER CAR MOVEMENTS
AT STREET INTERSECTIONS

FIGURE 26

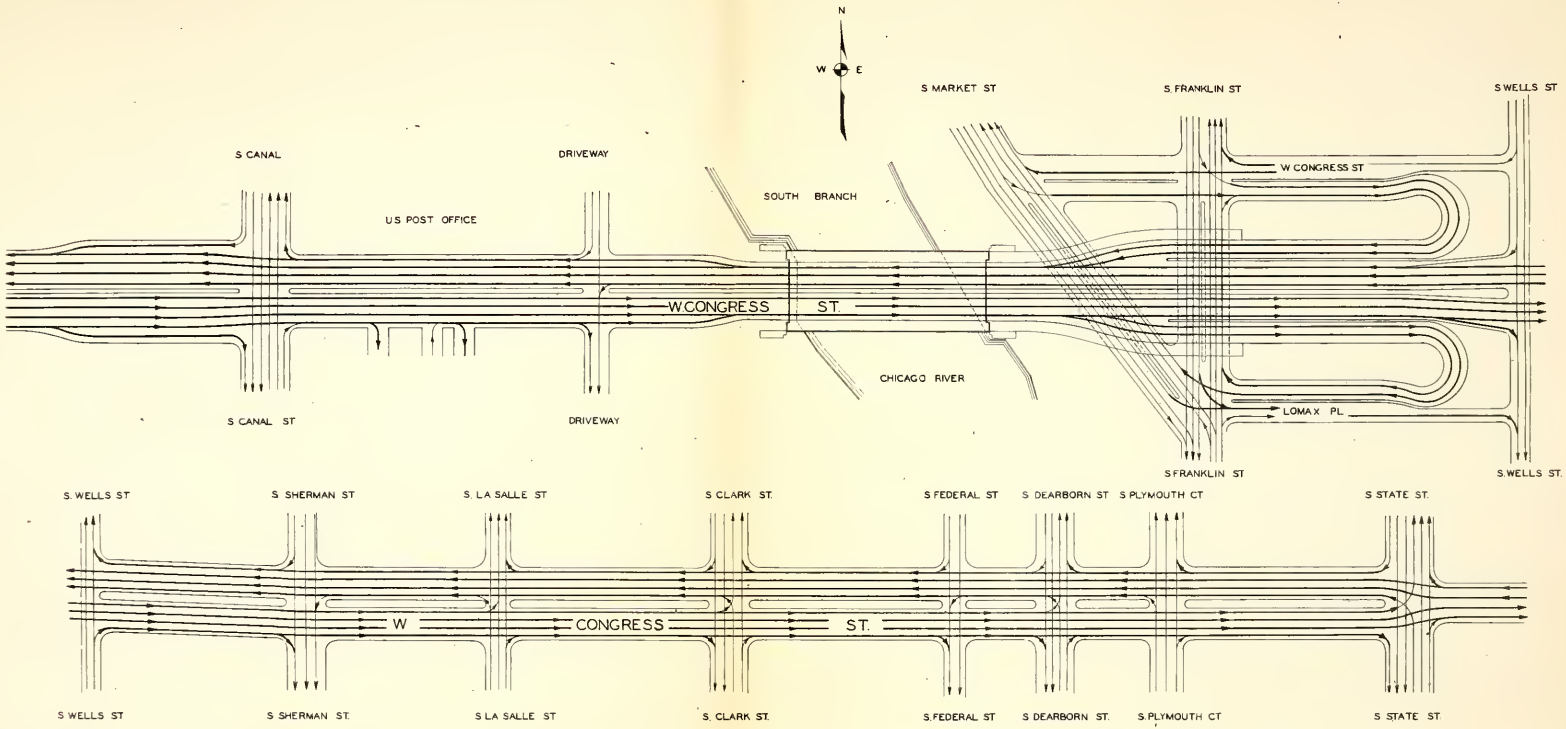


CITY OF CHICAGO
DEPARTMENT OF SUBWAYS AND TRACTION

WIDENING AND IMPROVEMENT
OF CONGRESS STREET

ART SHOWING SUGGESTED TRAFFIC CONTROL
CANAL STREET TO STATE STREET

FIGURE 27



LEGEND

TRAFFIC MOVEMENTS - EAST AND WEST SIGNAL.

TRAFFIC MOVEMENTS - NORTH AND SOUTH SIGNAL.

CITY OF CHICAGO
DEPARTMENT OF SUBWAYS AND TRACTION

WIDENING AND IMPROVEMENT
OF CONGRESS STREET

CHART SHOWING SUGGESTED TRAFFIC CONTROL
CANAL STREET TO STATE STREET

FIGURE 27

THE FRED J. SINGLEY CO., CHICAGO
83