

Traffic-Transit-Parking in Downtown Rochester: Now to 1975

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●DOWNTOWN REVIVAL is on the move in virtually every American city. The growth of suburban shopping centers and industrial parks has sparked planners, business and civic officials to recognize the essential function of the CBD as the commercial, educational and social hub of the metropolitan area. The major improvements in every downtown—new civic centers, multi-story parking structures, office buildings, urban redevelopment projects and expressways—are testimony of the renewed interest in downtown survival.

Nowhere has the need for downtown planning been more compelling than in transportation. Nowhere is there more congestion; nowhere have daily activities been so retarded by it; and, nowhere has the problem been so neglected.

Millions, then billions, have been spent on highway improvement between cities. More billions are going into multi-lane routes from suburbs and satellite communities to downtown cores. But when downtown is reached, the highway spending stops. Why? Not because the problem diminishes. Actually, it increases—geometrically. The reason is that downtown is an area where run-of-the-mill highway building is not sufficient. The way out of the downtown traffic dilemma cannot be spent. To attempt it means only to pave most of downtown; then there would be no downtown.

Yet, it is axiomatic that (a) the traffic circulation problem in downtown must be solved, (b) adequate off-street parking must be provided, and (c) a better balance of mass transit and automobile use must be achieved. The last factor is an oft-neglected but important element in this equation. There is a well-defined correlation between transit use and size of city; it ranges from 50 percent upwards in cities of 1,000,000 or more population to 20 percent or less in cities below 100,000 (Fig. 1).

The success or failure of downtown to keep pace with metropolitan growth hinges primarily on its plan for solving the traffic-transit-parking complex. This is the story of what one medium-size city—Rochester, New York—has done in this direction over the last 15 years and its plans for the next 15—now to 1975.

TRAVEL HABITS CHANGED SINCE WORLD WAR II

Rochester has witnessed a transformation of its travel habits since World War II. Up to 15 years ago, this was a transit-oriented city. Downtown Rochester was a tight cluster of commercial and industrial buildings serviced almost entirely by transit—first, horsecars and, later, electric streetcars.

The street system was made up of radial streets—converging on the downtown hub like spokes of a wheel—too narrow, crooked and discontinuous for present-day traffic, although quite adequate when built back in the 19th century.

Widespread use of the automobile over the last 15 years has greatly changed this picture. No longer dependent on transit, people have made their homes in outlying areas, often beyond the reach of transit lines. New highways have been constructed to these suburban communities and beyond them to towns and villages in adjacent counties. As the population and trading area has grown upward and outward, the load on already crowded downtown streets has become heavier and heavier.

City and state authorities have done an outstanding job in keeping pace with the meteoric rise of automobile travel. New radial expressways, an Inner Loop and Outer Loop, trans-state toll highway and several multi-story parking structures are among the more prominent facilities constructed for automobile use. In downtown Rochester alone, the expenditure on capital improvements for automobile use and storage over

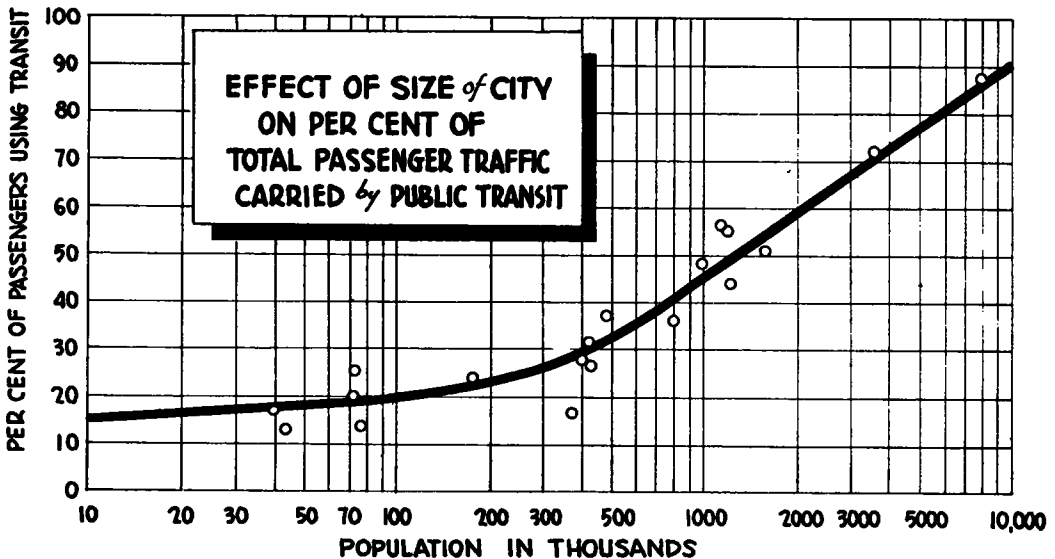


Figure 1.

the last 15 years has been greater than that for all other activities—public and private, commercial and residential.

The automobile has given people a wonderful new freedom to go places, for business as well as for pleasure. But it has also brought problems—problems of road hazard, parking, and greater operating expense that are fast becoming critical. In increasing numbers private cars are congesting Rochester streets, which were never laid out to carry so many vehicles.

MAJOR DOWNTOWN PROJECTS

This mounting wave of traffic congestion, despite the expenditures made thus far for its relief, has raised serious question concerning the whole problem of downtown circulation, both vehicular and pedestrian. Several major projects are being planned or are in construction, including the Midtown Plaza shopping center, City-County Civic Center, and Front Street Development (Fig. 2). Each of these represents a primary traffic generator, an attraction to people from all points in this trading area of nearly 1,000,000 population.

Rochester is particularly fortunate in having a compact and well-defined retail core. Seven of the city's eight major department and specialty stores are concentrated within a three-block area along Main Street and Clinton Avenue, in addition to a full complement of variety, specialty, clothing and supporting retail facilities. "This intense grouping of retail activity," the market analysis prepared by Larry Smith and Company points out, "makes the central business district the largest single retail drawing attraction in the entire standard metropolitan area, in spite of the intensive development of suburban shopping centers."

Because of the necessary compactness of downtown business cores, planners now recognize that they will never be able to develop sufficient street space or off-street parking facilities to take care of all of the people driving their cars to the center of downtown. If all workers and shoppers travel by car, 3 sq ft of automobile parking space is needed for every square foot of business floor space. This means that three-quarters of the total downtown area, exclusive of streets, would be devoted to parking facilities.

Traffic planning, although absolutely essential to a prosperous, healthy CBD, is but a means to an end. The ultimate objective is the efficient servicing of stores, offices, hotels, restaurants, theaters and other facilities which make up the basic

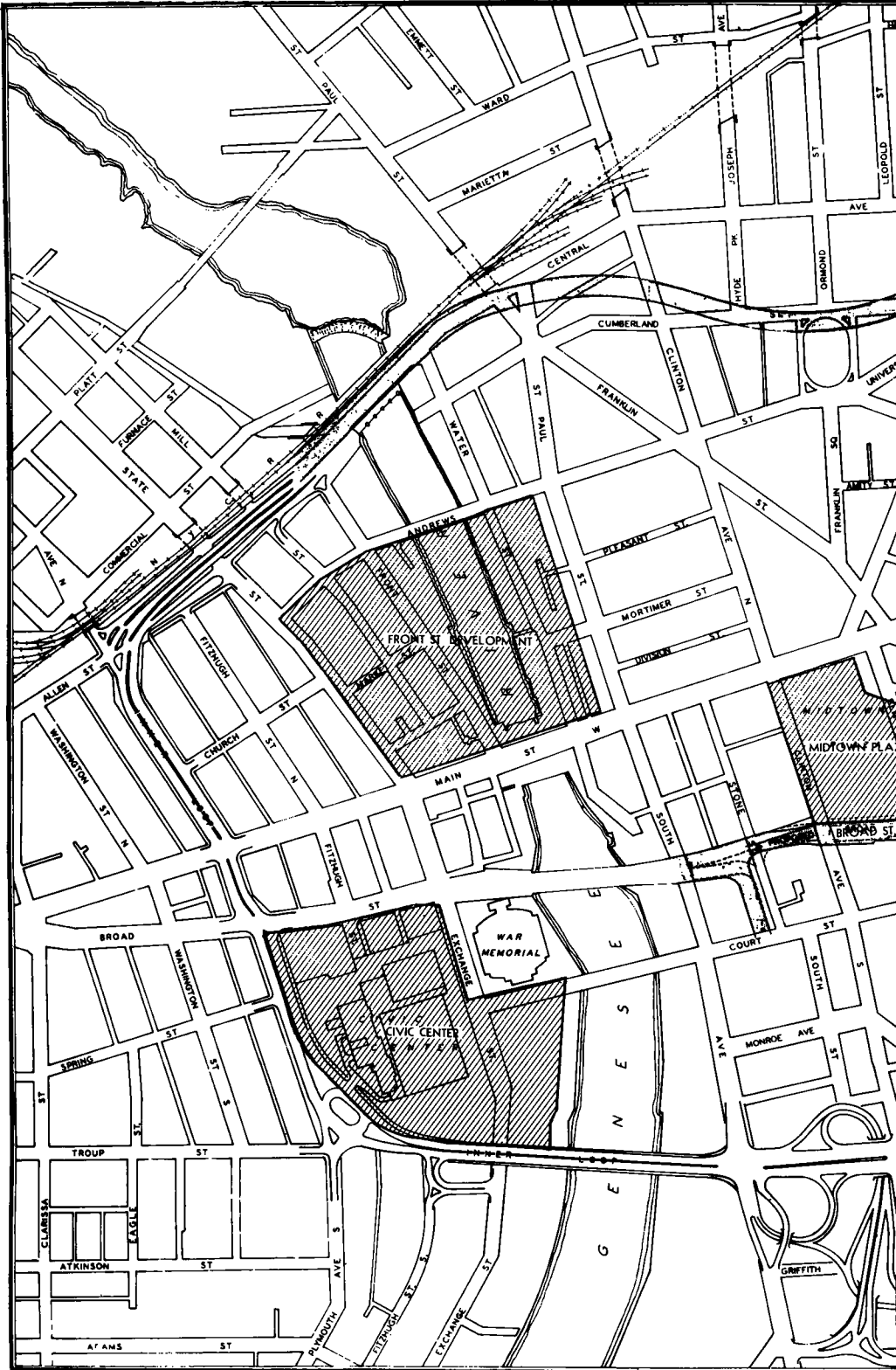
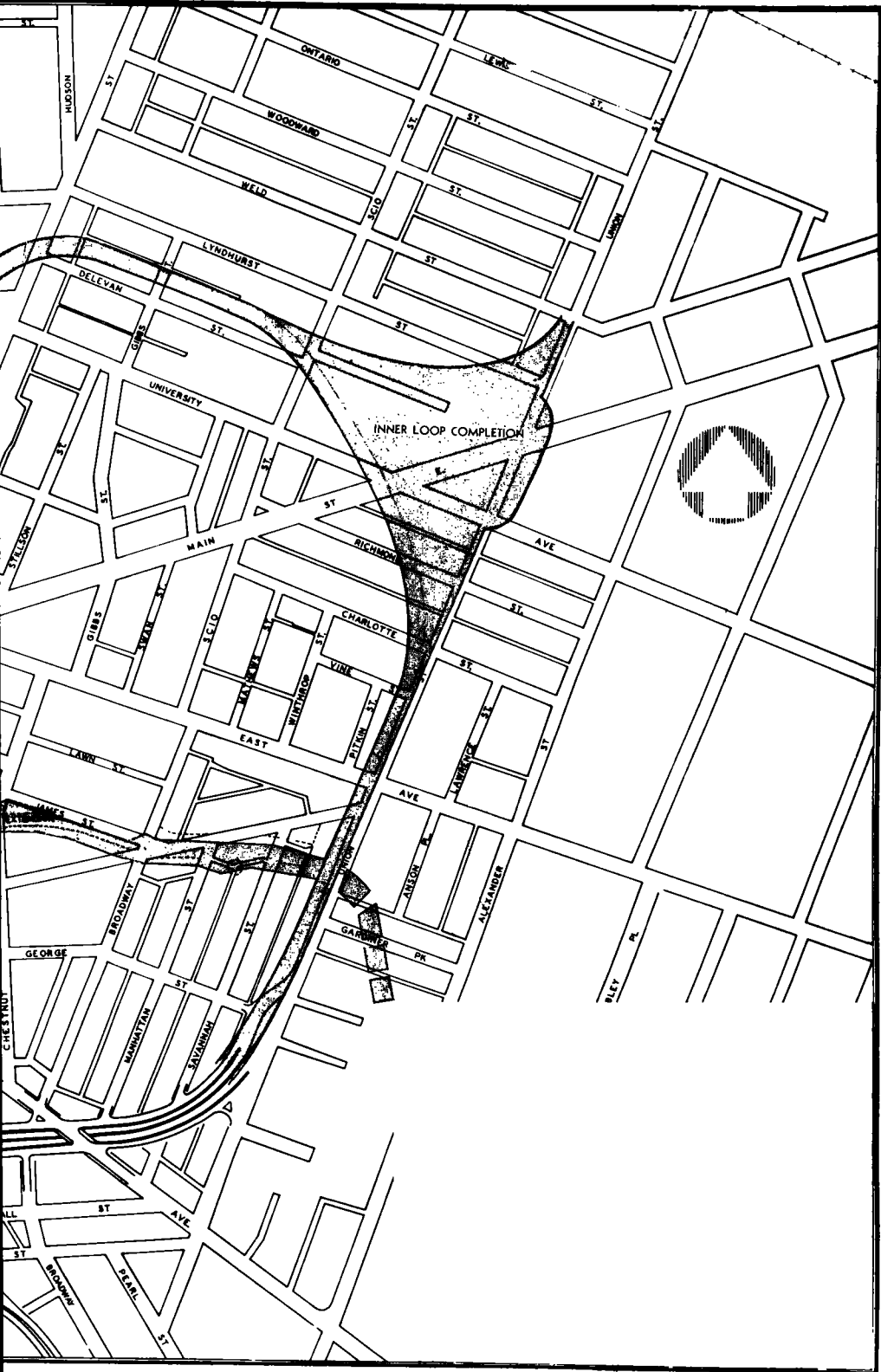


Figure 2. Plan



y improvements.

land-use pattern. People who come to the Rochester CBD by vehicle can play little part in the downtown scheme of things until they become pedestrians.

Slowly but steadily business and public officials have awakened to the fact that the movement of people is what is important. Heretofore, there has been an overemphasis on the movement of vehicles and not enough on the movement of people. But without people, the streets, stores, buildings and offices are quite unimportant. Customers, clients and employees want to move swiftly, safely, comfortably and economically. Unfortunately, Rochester, along with other American cities, has not been able to keep pace with the potentialities of the automobile on these four counts.

The transformation of the last 15 years has made Rochester an auto-oriented city in its CBD as well as in outlying sections. The Inner Loop, parking program, and other road improvements have made up an ambitious program; yet, traffic congestion is more paralyzing today than 15 years ago.

More than one-half of the land in downtown Rochester is now devoted to transportation (Fig. 3). The Inner Loop and the portion of the central city circumscribed by it includes a total of 408 acres. Fifty-two percent of this is now devoted exclusively to streets and alleys, parking lots, garages, gas stations and other auto service facilities. If space requirement was the sole criterion, transportation would be more important than all other affairs of downtown Rochester put together.

PURPOSE OF TRANSPORTATION STUDY

Recognizing the transformation which has taken place since World War II, and the direction in which this program is heading, business and civic leaders have begun to re-appraise the role of transportation in the survival of Rochester's CBD. That, primarily, is the reason for this study. This is an attempt to measure the traffic demand—vehicular and transit—on downtown streets at the present time, and to project this current situation ahead for the next 15 years with due consideration to the dynamics of change.

This analysis of the traffic and transit requirements for downtown Rochester is based on three primary sets of facts, as follows:

1. A detailed picture of the average weekday movement of people and vehicles into and within the Inner Loop;
2. The location and capacity of arterial routes, local feeder streets, on-street and off-street parking and transit facilities; and
3. Projection of population and land use for downtown Rochester to 1975.

In connection therewith, a series of traffic studies has been made—origin and destination and volume counts of automobiles, trucks and transit vehicles. In addition, field tests have included speed and delay studies and volume checks to develop the adequacy of existing parking and street facilities.

ORIGIN-DESTINATION STUDIES

The primary means of determining present travel patterns and habits was origin-destination (O-D) surveys of automobile and transit patrons. The information sought was: (a) the movement of autos and trucks passing through the CBD to permit study of possible diversion of such through traffic, (b) a measurement of cross-movements within the area by traffic terminating in the CBD, and (c) separate measurements of peak loads of traffic terminating within the CBD and of through movements.

The basic data were collected from motorists at 20 interview stations located on all primary and secondary arteries leading into the Rochester CBD. These stations were located just outside the existing and proposed Inner Loop. In analyzing the route and direction of traffic into downtown Rochester, these 20 gateways were grouped into six screenlines, each representing a major direction of traffic flow.

Roadside interviews were made at these 20 locations over a two-week period in November 1959. Altogether, a total of 27,200 interviews were made of drivers entering downtown Rochester. The information included origin of trip, destination, location

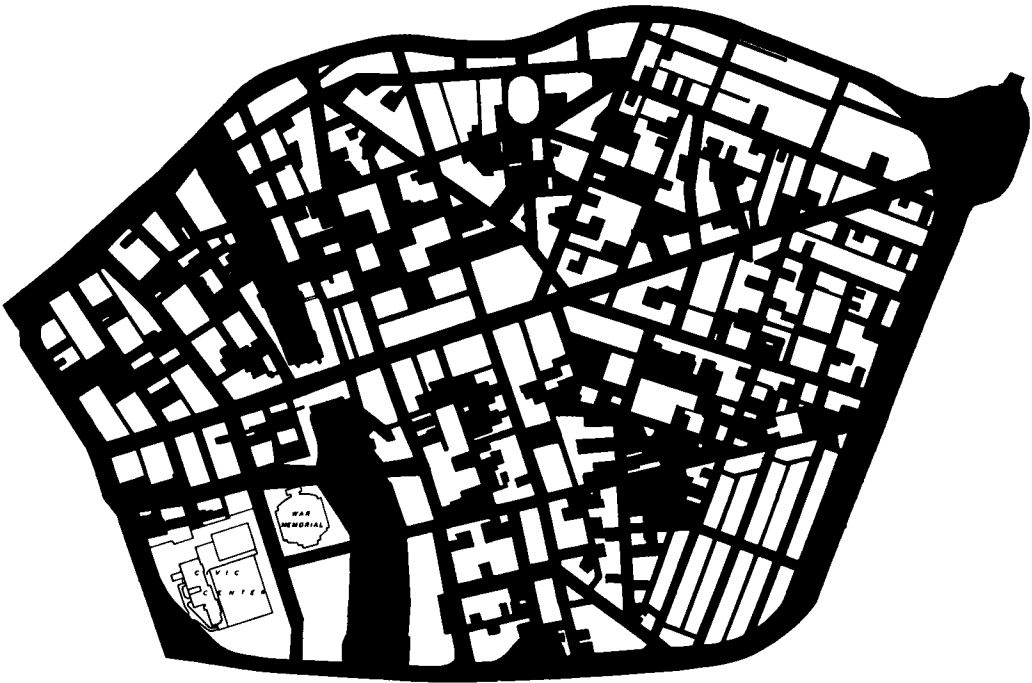


Figure 3. More than one-half of downtown Rochester is devoted to transportation.

and duration of downtown parking, purpose of trip, type of vehicle and commodity carried.

Concurrent with the O-D survey, a manual traffic count was made at each interview station. The total number of vehicles was recorded according to type, as well as number of passengers for both autos and buses. In addition, these totals were summarized by hours, providing the volumes to which the O-D data were expanded.

Field analyses of the riding pattern on transit vehicles were also determined by making an O-D survey on all buses of Rochester Transit Corporation, in which a total of 55,000 survey cards were issued to inbound, fare-paying passengers on the various routes.

This O-D information on motorist and transit patrons was coded on tabulating cards for machine processing. The coding system used outside the CBD was the Rochester area code developed by the Bureau of Highway Planning, Department of Public Works, State of New York, and used in the external O-D survey made by that state agency. A more refined breakdown within the CBD was needed for this particular study. Therefore, the highway planning zones within the Inner Loop were further subdivided into 14 zones (Fig. 4). These zones correspond closely with the CBD areas used for analytical purposes by the Rochester City Planning Commission.

Both street traffic and transit vehicle data were correlated and expanded by machine analysis to show for a typical weekday the volume and pattern of travel of automobiles, trucks and transit riders during morning and evening peak periods, as well as for the balance of the day.

TRAFFIC: NOW TO 1975

Rochester's downtown traffic problem can be summarized in a few simple figures—203,400 people travel in and out of Rochester daily and use 114,900 vehicles for this purpose. The distribution of vehicles by time of day inbound and outbound, and by vehicle types is summarized in Table 1.

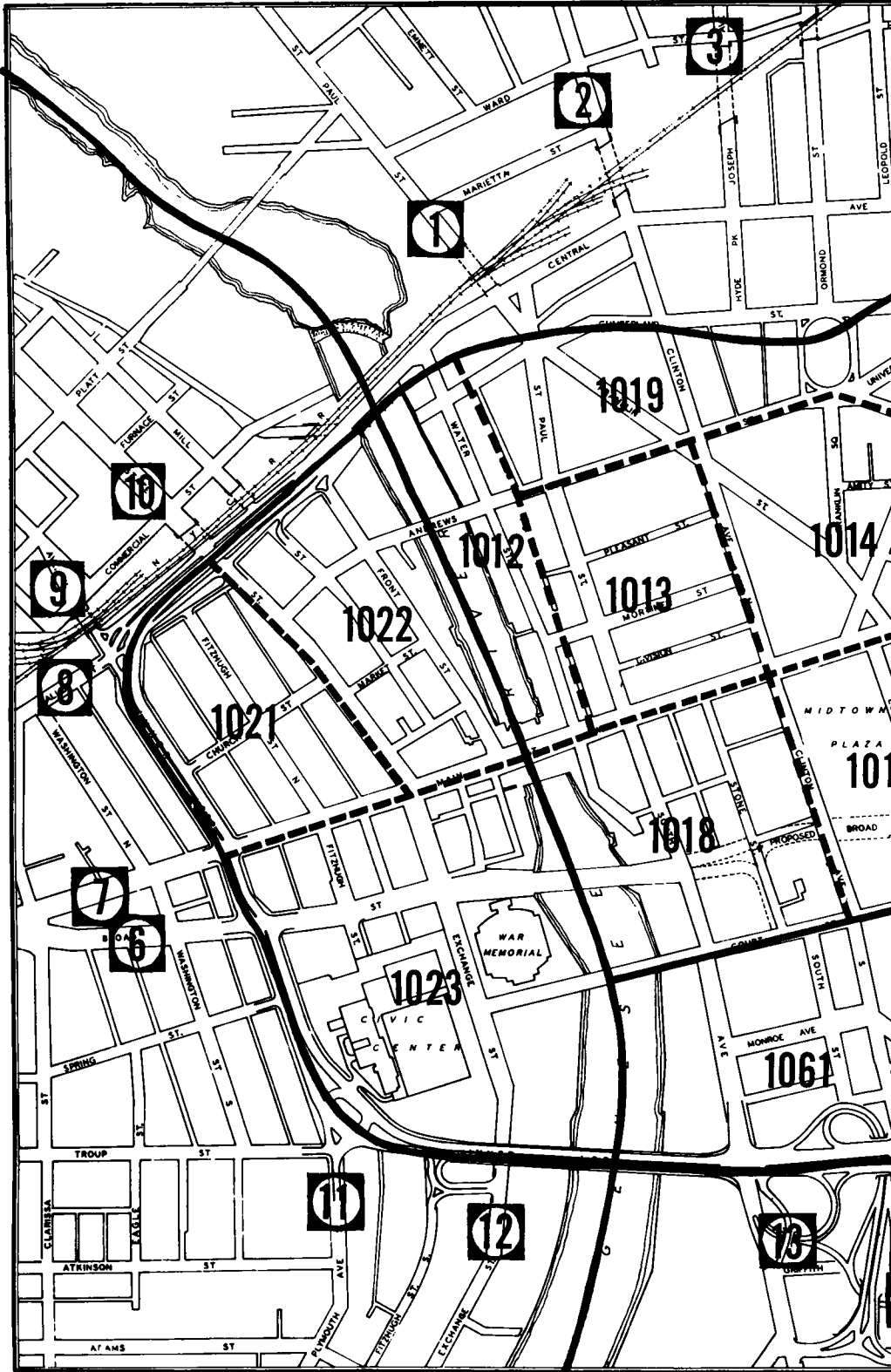
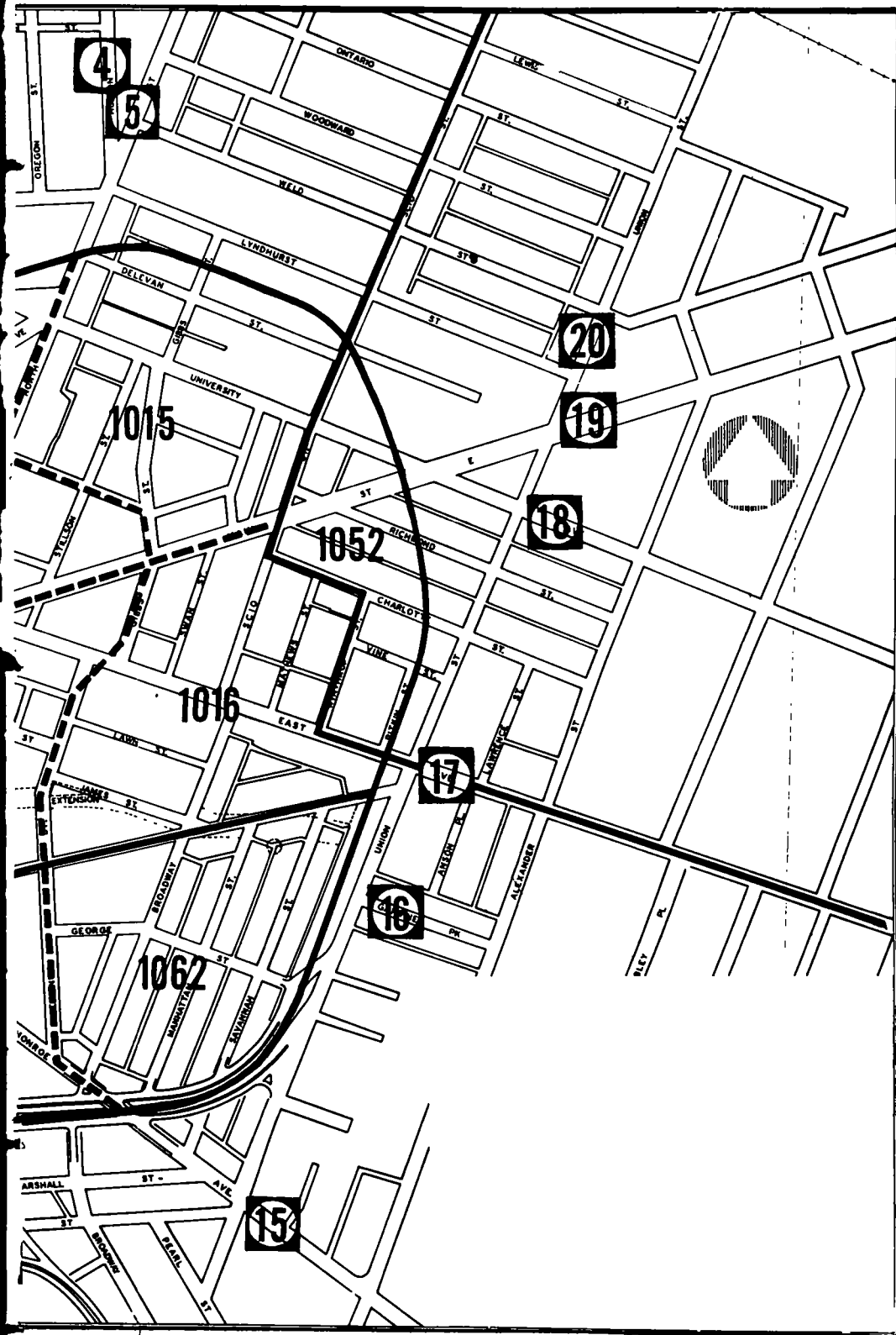


Figure 4. CBD analysis



ones and O-D survey stations.

TABLE 1
VEHICLES AND PERSONS IN AND OUT OF DOWNTOWN ROCHESTER DISTRIBUTED BY TIME OF DAY

Hour Period	Inbound					Outbound				
	Autos	Trucks	Buses	Total Vehicles	Total Persons	Autos	Trucks	Buses	Total Vehicles	Total Persons
7 00 - 7 30 a. m.	4,824	411	111	5,346	12,501	3,388	300	107	3,795	7,583
7 30 - 8 00	6,805	590	114	7,509	13,927	4,690	485	112	5,287	9,688
8 00 - 8 30	5,984	735	119	6,818	13,139	3,693	609	105	4,407	7,926
8 30 - 9 00	5,189	734	105	6,028	10,986	3,108	684	94	3,886	5,476
9 00 - 9 30	3,974	716	80	4,770	7,635	2,888	747	73	3,708	4,486
9 30 - 10 00	3,471	706	74	4,251	6,533	2,577	679	69	3,225	4,230
10 00 - 10 30	3,447	739	68	4,254	6,486	2,895	782	67	3,724	4,690
10 30 - 11 00	3,187	703	68	3,958	6,143	2,812	740	66	3,618	5,003
11 00 - 11 30	3,274	675	68	4,017	6,085	3,124	713	68	3,905	5,454
11 30 - 12 00	3,296	662	69	4,027	6,117	3,432	650	69	4,151	5,974
12 00 - 12 30 p. m.	3,569	474	68	4,111	6,484	3,455	508	67	4,030	5,858
12 30 - 1 00	3,396	614	67	4,077	6,338	3,305	541	67	3,913	5,945
1 00 - 1 30	3,683	637	68	4,388	6,996	3,526	632	66	4,224	6,271
1 30 - 2 00	3,482	642	70	4,194	6,555	3,709	663	66	4,438	6,676
2 00 - 2 30	3,521	621	71	4,213	6,308	3,798	681	72	4,551	7,063
2 30 - 3 00	3,265	586	75	3,926	7,212	4,018	678	73	4,769	8,030
3 00 - 3 30	3,662	601	102	4,365	8,820	4,193	629	95	4,917	8,837
3 30 - 4 00	3,984	607	104	4,695	8,892	4,528	649	105	5,282	9,980
4 00 - 4 30	4,777	678	120	5,573	11,026	5,300	605	116	6,021	12,147
4 30 - 5 00	5,638	468	121	6,227	12,091	7,011	457	116	7,584	15,451
5 00 - 5 00	5,859	316	117	6,292	12,318	7,995	363	126	8,484	18,615
5 30 - 6 00	3,989	230	112	4,331	7,452	5,745	302	122	6,169	13,663
6 00 - 6 30	3,625	195	77	3,897	6,880	4,253	169	75	4,497	9,052
6 30 - 7 00	3,405	152	72	3,629	6,508	3,346	107	64	3,517	6,178
Total	99,286	13,490	2,120	114,896	203,392	96,789	13,353	2,060	112,202	194,276

A significant finding from the O-D survey is that nearly two-thirds of all vehicles entering the CBD are traveling through this highly developed area to points outside of it, with no purpose other than to get through the area as quickly as possible. Only 36.8 percent of vehicles entering the CBD actually stop in downtown Rochester.

The destination of vehicular traffic entering the CBD at the north screenline was analyzed separately (Fig. 5). About 7 percent of the volume is tangent to the CBD, that is, it enters and leaves in the northerly direction without actually traveling into the core area. Another 35 percent of these vehicles from the north is destined to downtown points, while the balance is distributed evenly in three directions beyond the CBD. Similar analyses were made for traffic through each of the other five screenlines.

With a major share of traffic using downtown streets primarily as a through route, the Inner Loop's effectiveness as a by-pass facility is more significant traffic-wise than all other routes in the downtown area put together.

Where traffic is headed to in the downtown area is the next question answered in the O-D survey. Most people are driving to the retail core; the four zones comprising this core area receive 54.8 percent of the total traffic volume terminating in the CBD. The next significant destination area is the office core and Civic Center, west of the Genesee River. This complex attracts 11,473 vehicles daily—27.1 percent of downtown destinations. The distribution of traffic entering the CBD at each screenline and terminating in the 14 downtown zones is given in Table 2 and shown in Figure 6.

Truck Traffic

About 13,500 trucks enter and leave the Rochester CBD daily from 7 a. m. to 7 p. m. Only 3,800 of these have destinations in the downtown area. This represents 28 percent of the total truck movement. More than seven out of every ten trucks downtown are traveling between points outside the CBD.

Among trucks engaged in downtown deliveries, 40 percent stop in the retail core, 32 percent in the office core, with the remaining 28 percent distributed over the balance of the CBD.

Speed and Delay

The average speed of traffic in downtown Rochester is 13.6 mph. The fastest route is the completed portion of the Inner Loop at 20.5 mph, whereas Clinton Avenue at 9.3 mph is the slowest arterial street.

Altogether, 22 percent of downtown streets are operating above 15 mph, 67 percent are between 10 and 15 mph, with the remaining 11 percent below 10 mph (Fig. 7).

The Inner Loop has some sections slowed to less than 10 mph despite the fact that it is the newest and fastest artery serving the Rochester CBD. Heavy turning volumes and traffic signals at Allen Street and Plymouth Avenue North cause a slow-down in one section of the Inner Loop below 10 mph.

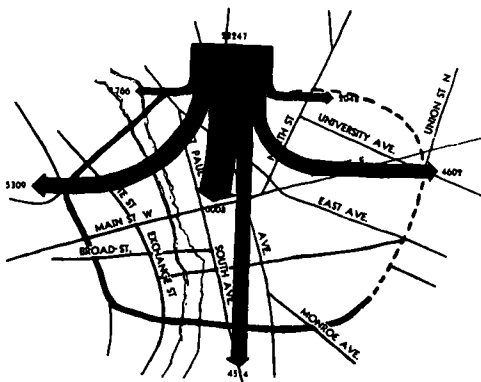


Figure 5. Destination of vehicular traffic entering at the north screenline of the CBD.

DOWNTOWN STREET SYSTEM

The 20 gateways to the Rochester CBD are connected by 12½ mi of arterial streets. Most of these are four-lane routes and all carry traffic in two directions. A detailed inventory was made on each of these streets including width, location and length of bus stops; parking restrictions; timing of traffic and pedestrian signals; turn restrictions; etc. From these data, the carrying capacity of each downtown street was determined (Table 3). It should be observed that the capacities and other limiting conditions on downtown streets were grouped by screenlines similar to the traffic demand data.

The Rochester CBD is circumscribed by the Inner Loop. This by-pass artery is approximately 50 percent completed. The open portion is 1.6 mi long and has six grade crossings. These grade crossings not only reduce speeds but also lower the capacity of the Inner Loop to less than one-half of its potential effectiveness. The remaining one-half of the Inner Loop is scheduled to be completed as a limited-access highway by late 1962.

In the east-west direction, Main Street is the only direct through route. This principal artery is six lanes wide with curb lanes being used by buses exclusively. The Rochester Transit Corporation operates 17 routes along this principal artery, with 100 buses in the morning peak hour and 120 in the afternoon. Buses at 60-sec frequency in each direction virtually pre-empt this lane for use by any other vehicles.

In the north-south direction, Clinton Avenue and St. Paul-South Avenue are the through arteries at the present time. State-Exchange Street, now blocked by construction of the Civic Center, will make a third north-south arterial route. Each of these

TABLE 2
DISTRIBUTION OF CBD DESTINATIONS BY SCREENLINES

Entering CBD	Trips Having Destination in															Total	%
	Zone 1012	Zone 1013	Zone 1014	Zone 1015	Zone 1016	Zone 1017	Zone 1018	Zone 1019	Zone 1021	Zone 1022	Zone 1023	Zone 1051	Zone 1061	Zone 1062			
North	330 32.5%	1,839 40.7%	1,681 29.0%	371 33.2%	470 21.2%	1,689 22.3%	884 18.7%	560 42.1%	660 18.1%	650 20.1%	587 12.8%	111 22.3%	146 16.2%	30 5.5%	10,008	23.66	
East	243 23.9%	1,232 27.2%	2,019 34.9%	465 41.6%	766 34.8%	2,474 32.6%	831 15.7%	422 31.8%	633 17.3%	654 20.2%	579 12.8%	275 55.2%	138 15.3%	94 17.1%	10,825	25.59	
South	164 16.1%	854 18.9%	1,181 20.4%	120 10.7%	520 23.5%	1,800 23.7%	1,292 24.4%	195 14.7%	499 13.6%	477 14.8%	549 12.0%	35 7.0%	372 41.2%	311 56.6%	8,369	19.79	
West	280 27.5%	596 13.2%	905 15.7%	162 14.5%	458 20.7%	1,628 21.4%	2,295 43.2%	152 11.4%	1,863 51.0%	1,453 44.9%	2,869 62.6%	77 15.5%	245 27.3%	114 20.8%	13,097	30.96	
Total	1,017	4,521	5,786	1,118	2,214	7,591	5,302	1,329	3,655	3,234	4,584	498	901	549	42,299	100.0	

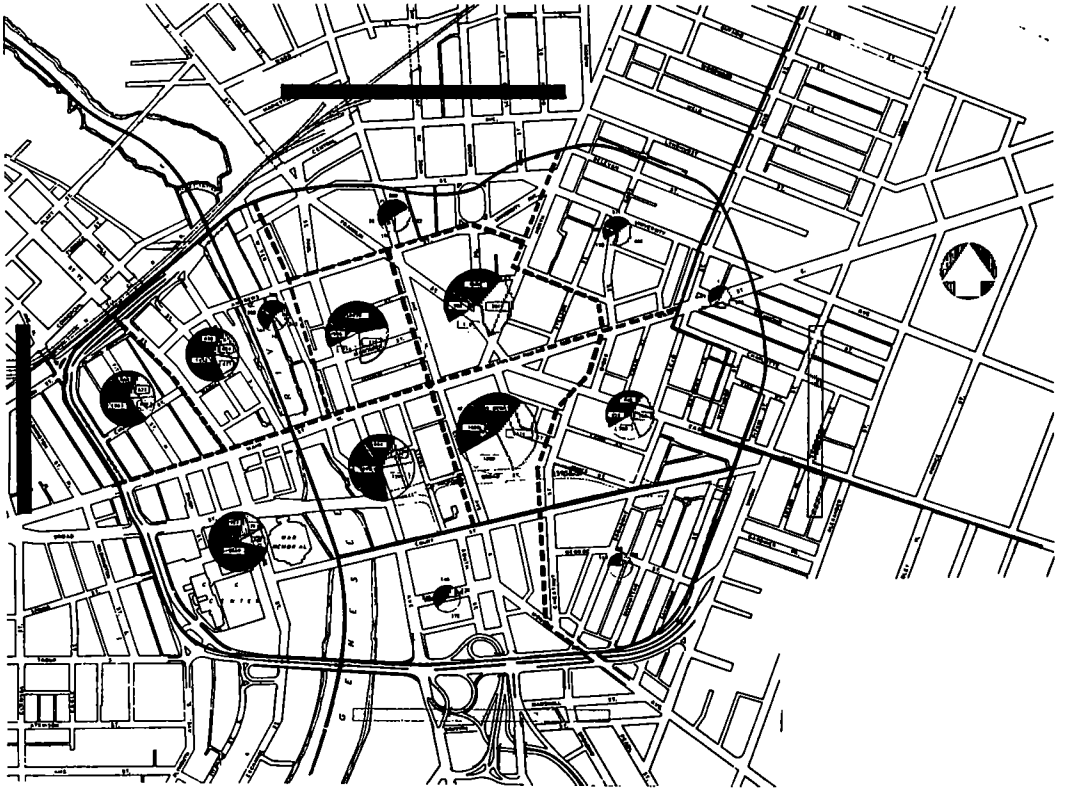


Figure 6. Downtown destinations of traffic crossing screenlines.

arteries has four effective travel lanes and carries traffic in two directions.

Traffic Signal Control

There are presently 50 signalized intersections in the Rochester CBD. Signals are on an 80-sec cycle. Field observations indicated that the efficiency of the last 10 sec of green time in the heavy flow direction is quite low. At many intersections, all vehicles had crossed in two-thirds of the green time.

Analysis of the delays recorded in the speed runs on principal arteries revealed that 79 percent of the stops and slow-downs in downtown Rochester are attributable to traffic signals. Travel times are directly affected by these delays; in many instances where the travel speeds fall below 10 mph, the primary cause is traffic signal timing and lack of signal coordination between intersections.

Curb Parking

Rochester traffic authorities have done an outstanding job in the control and elimination of curb parking over the last decade. In the retail and office core areas, curb parking has been eliminated throughout the business day on the five principal arteries. This restriction has increased the vehicular carrying capacity of these primary routes by more than 50 percent.

Curb parking is permitted on some principal streets in the outer sections of the CBD during off-peak hours. Present practice is to place hoods over the meters in periods of heavy traffic flow.

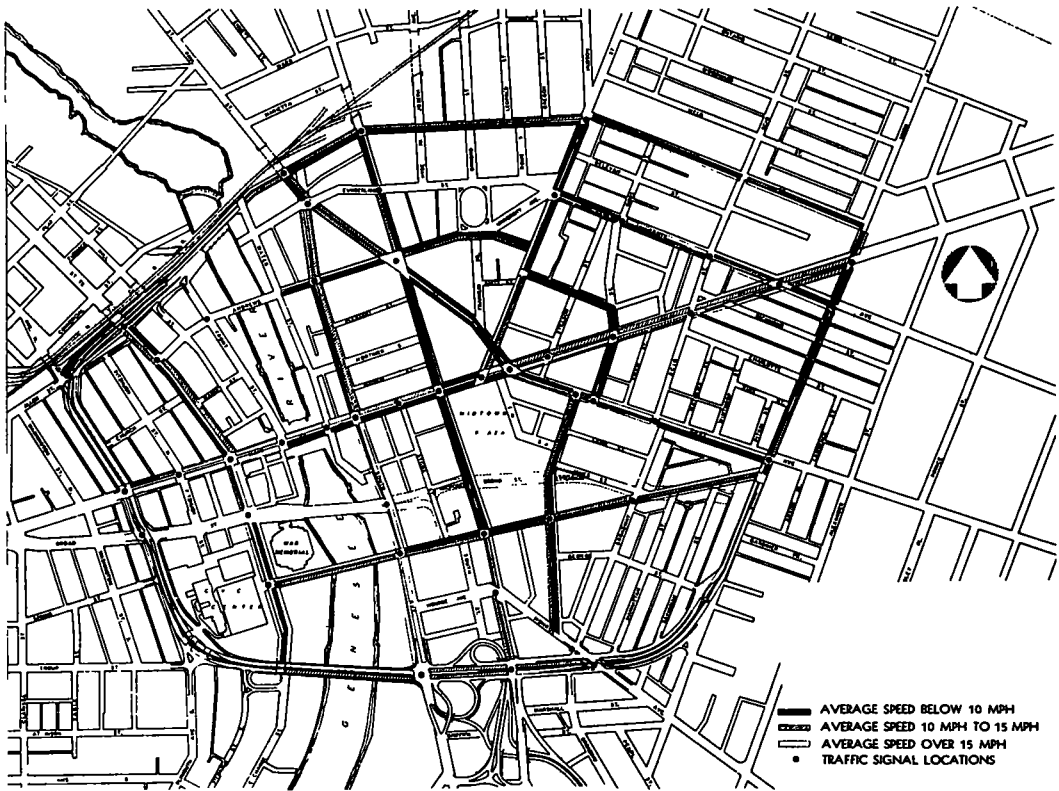


Figure 7. Travel speeds on downtown streets.

Lane Deficiencies and Surplus

The street inventory revealed that Rochester has a total of 42 lanes serving inbound traffic with another 42 lanes for outbound vehicles. The aggregate capacity of present streets is 14,700 vehicles in each direction, assuming traffic to be uniformly distributed.

The peak inbound flow each morning totals 14,327 vehicles. Outbound traffic reaches a total of 16,068 in the afternoon peak. The inbound flow would just equal existing capacity, if demand at each gateway matched its capacity. This is not the case, however; there is an actual deficiency of three lanes in the morning peak.

The principal test of the street system occurs in the afternoon peak, however. The over-all deficiency at that time is eight lanes (Table 4).

The aggregate deficiency among the four streets comprising the east screenline is three lanes. These four routes require a capacity increase of 888 vehicles hourly to meet existing peak hour demand. Similarly, routes comprising the south screenline are deficient by a total of two lanes. The northwest, north and southwest screenlines are each deficient by one lane. As given in Table 4, the only direction with surplus capacity in the morning and afternoon peaks is the west screenline, made up of Broad, Main and Allen Streets.

Although the total screenline deficiency is eight lanes, this can be overcome in a variety of ways. Most obvious are street widening and new streets. Similar results can be achieved, however, by one-way operation, progressive signal timing, curb parking elimination and by other control measures which have the effect of increasing street capacities by the equivalent of one or more lanes.

TABLE 3
WIDTH AND CAPACITY OF DOWNTOWN STREETS

Screen- line	Street	Width (ft)	No. of Lanes		Green Time (%)	Practical Capacity, One-Way (veh/hr)
			Inbound	Outbound		
North	St Paul St	37	2	2	72	910
	Clinton Ave N.	40	2	2	46	640
	Joseph Ave	38	2	2	46	610
	Hudson Ave.	40	2	2	46	640
	North St	40	2	2	46	650
	Union St.	26	1	1	34	490
	Total			11	11	
East	Main St. E.	60	3	3	54	1,200
	University Ave	40	2	2	56	820
	East Ave	40	2	2	56	800
	Gardiner Park	25	1	1		190
	Total			8	8	
South	South Ave	54	2	2	41	800
	Clinton Ave S.	54	3	3	46	900
	Monroe Ave.	50	2	2	58	720
	Total			7	7	
Southwest	Plymouth Ave S.	33	2	2	34	510
	Exchange St	40	2	2	46	680
	Total			4	4	
West	Broad St.	60	3	3	41	930
	Main St. W.	58 5	3	3	41	900
	Allen St.	40	2	2	30	590
	Total			8	8	
Northwest	Plymouth Ave N.	32	2	2	28	640
	State St.	50	2	2	46	940
	Total			4	4	

TRAFFIC IMPROVEMENTS FOR 1960

As previously indicated, the existing street network in downtown Rochester is irregular and poorly suited to serve the heavy traffic flows through the CBD. The city and state governments already have taken major steps toward arterial relief by opening new routes, such as the Broad Street Extension, Inner Loop, etc., to relieve existing congestion. These capital improvements are expensive and time consuming. Before looking to projects of such magnitude, it is appropriate to consider measures for traffic control of an operational nature which would raise present facilities to maximum usefulness.

One-Way Streets

By converting St. Paul-South Avenue and Clinton Avenue arteries to one-way operation and installing a better progression of traffic signals, a substantial increase in speed and capacity can be attained. St. Paul-South Avenue present speed of 13.8 mph can be increased to 19 mph. The average speed on Clinton Avenue would increase from 9.4 to 22 mph. The total increase in capacity for these two north-south arteries would be slightly less than 600 vehicles per hour, thereby overcoming the lane deficiency of the north and south screenlines.

Progressive Signal Timing

It is proposed that the traffic cycle on Main Street be shortened to 70 sec in the morning peak and in the afternoon peak, with a 60-sec cycle in the midday and evening periods.

This recommendation is based on an analysis of the operating speeds and lane efficiencies from progressive signal timing in both directions on Main Street. An average travel speed of 21 mph can be achieved in both directions, compared with the present averages of 12 mph eastbound and 13.3 mph westbound under stop-and-go operations. This would decrease crosstown travel time by upwards of 20 percent without causing

TABLE 4
DEFICIENCIES AND SURPLUS OF TRAFFIC LANES AT CBD SCREENLINES

Screen-line	Street	Capacity (vph)	Peak Hour Demand (veh)		Inbound (vph)		Outbound (vph)		Lanes	
			In	Out	Surplus	Deficiency	Surplus	Deficiency	Surplus	Deficient
North	St Paul St.	910	977	947	-	87	-	37	-	-
	Clinton Ave N	640	650	600	-	10	-	40	-	-
	Joseph St.	610	496	621	114	-	-	-	11	-
	Hudson Ave	640	562	384	78	-	-	256	-	-
	North St.	650	529	881	121	-	-	-	181	-
	Union St.	490	588	666	-	-	98	-	176	-
	Total				313	175	296	405	-	1
East	Gardiner Park	190	232	433	-	42	-	243	-	-
	East Ave	800	1,394	1,210	-	594	-	410	-	-
	University Ave	820	732	875	88	-	-	-	55	-
	Main St E	1,200	1,163	1,380	11	-	-	-	180	-
	Total				99	636	-	-	688	-
South	South Ave	800	723	800	77	-	-	-	-	-
	Clinton Ave S	900	822	1,077	278	-	-	-	177	-
	Monroe Ave	720	1,174	1,120	-	-	-	-	400	-
	Total				355	454	-	-	577	-
West	Broad St	930	685	435	245	-	-	495	-	-
	Main St. W	900	894	1,000	6	-	-	-	100	-
	Allen St	670	653	751	17	-	-	-	81	-
	Total				268	-	-	495	181	1
Northwest	Plymouth Ave N	510	549	505	-	39	5	-	-	-
	State St	940	1,245	895	-	305	45	-	-	-
	Total				-	344	50	-	-	1
Southwest	Plymouth Ave S	640	587	779	53	-	-	-	139	-
	Exchange St	680	552	818	128	-	-	-	138	-
	Total				181	-	-	-	277	-

any increase in accident hazard. Actually, the sustained speed of 20-25 mph would be no higher than present travel speeds between intersections along Main Street. The principal difference would be that vehicles would flow continuously instead of constant stopping and starting.

Present signal equipment on Main Street may readily be adapted to the proposed signal timing plan with only a change in meter settings. Without any capital expenditures whatever, the city could realize the same benefits and traffic flow as would be achieved under a 25-ft widening of Main Street.

Curb Parking Restrictions

State Street carries the second heaviest traffic volume in downtown Rochester—exceeded only by East Avenue. Thirty-four parking meters occupy the curb space between Main Street and the Inner Loop North on both sides of State Street.

The State Street area was analyzed from the standpoint of availability of off-street parking facilities in the immediate neighborhood. The parking inventory reveals that there are 430 off-street parking spaces within 200 ft of State Street, where elimination of curb space is proposed. Furthermore, the analysis of available off-street facilities indicates a surplus of 349 spaces throughout the day in the zone bounded by Front Street, Main Street and the Inner Loop. "No parking" restrictions now practiced in peak hours on State Street should be extended to all day operation in view of present and prospective street traffic volumes.

Intersectional Improvements

There are several critical intersections in the CBD, some of which will be relieved by the one-way streets, progression of traffic signals and shorter traffic signal cycle recommended elsewhere. A few of the intersections will be eliminated or alleviated by the completion of the Inner Loop. Recommendations for improving the remaining critical intersections are restrictions of left turns (allowing these left turns to be made at nearby uncongested intersections), special phasing of traffic signals and channelization.

Physical Improvement—East Screenline

The Broad Street Extension, now in construction, will provide an alternate east-west

route through the CBD which should relieve pressure along Main Street and also aid diagonal traffic now handled primarily on Franklin-East Avenue.

The three-lane deficiency, previously described at the east screenline of the CBD, will be eliminated by other capital improvements planned by the city and state governments. Completion of the east half of the Inner Loop will aid substantial capacity to Main Street, University Avenue and East Avenue by grade separation of heavy cross flows at these three routes.

Also, another grade separation to aid traffic to and from the east will be provided at the intersection of Broad and Court Streets where they cross the Inner Loop near Union Street.

Third, the opening of the "Subway" Expressway should relieve the existing traffic burden on Monroe and East Avenues.

Existing Inner Loop

Improvement in Inner Loop travel speed from the present 20 mph average to an estimated 40 mph is necessary if the by-pass route is to accomplish its principal purpose—diversion of through traffic now using downtown Rochester streets.

If the six present Inner Loop grade crossings were eliminated, not only would travel speed be increased, but more significantly the total vehicular capacity of the Inner Loop would be more than doubled. In other words, these six grade separations would be the equivalent of constructing another four-lane roadway around the west perimeter of the CBD.

FUTURE TRAFFIC IMPROVEMENTS

By 1975, it is estimated that vehicular traffic will expand 24.8 percent to an average daily volume of 283,440 vehicles. This expansion is based on projected changes in land use in the CBD as determined by the Rochester City Planning Commission, modified by trip generation as revealed in this survey. In the next 15 years, it is estimated that trips actually terminating within the CBD will increase by 13.7 percent while the movements of through traffic circling or passing through the downtown area will rise 31.2 percent.

The Rochester City Planning Commission has provided detailed projections of expected changes in net floor area over the period 1959 to 1975 for retail, office, warehouse, residential and other purposes, subdivided into ten zones in the CBD. Allowance is made in these projections for some reduction in the availability of floor area due to street improvements and other physical changes.

In the retail core, an increase of 5.4 percent, amounting to 371,000 sq ft in aggregate floor space, is expected by the Commission. Most of this gain will be in retail space, although some rise in office space within the retail core is expected. On the basis of existing trip generation, it is estimated that the 15-yr changes in the retail core will cause an increase of 1,271 trips to that area, an increase of 5.9 percent.

The office core west of the Genesee River is planned for the greatest expansion over the next 15 years. The City Planning Commission looks for a gain of 1,899,400 sq ft of space, 39.7 percent of which will be in office use. This increase is projected to attract 4,192 additional trips daily to the office core, a gain of 40.7 percent from present traffic generation.

The balance of the CBD is expected to remain relatively unchanged.

Expansion of through traffic is projected at about 2 percent annually over the next 15 years in comparison with the growth of CBD-destined traffic below 1 percent annually. Therefore, the proportion of through vehicles is estimated to rise from 63.2 percent in 1960 to 66.4 percent by 1975.

Inner Loop and Downtown Streets

Because the through volume is estimated to grow at a faster rate than CBD-bound traffic, a detailed analysis was made of the volume which can be diverted to the Inner Loop by fully upgrading this facility to its maximum usefulness. The greatest relief

of traffic congestion in downtown Rochester will be achieved by raising the completed section of the Inner Loop to limited-access standards, the same as is planned for the presently uncompleted portions. With full grade separation throughout, it may reasonably be expected that travel speeds of 40 mph can be maintained around this by-pass route. This would be a considerable improvement over travel on downtown streets, which would divert a greater proportion of traffic to the Inner Loop.

The projected distribution of 1975 traffic entering the Rochester CBD by the north screenline is illustrated in Figure 8. It will be seen that 60.5 percent of the total movement is diverted to the upgraded Inner Loop. Altogether, the Inner Loop is expected to handle 72.3 percent of 1975 through movements—68,830 of the total 95,250 through vehicles on a normal business day. The remaining through volumes using downtown streets will amount to 26,410 vehicles.

Combining this latter figure with the trips terminating in the CBD, it will be seen that average daily traffic on downtown streets in 1975 will aggregate 74,500 vehicles. In other words, the Inner Loop, fully completed and upgraded to limited-access standards over its whole length, will accommodate nearly as much traffic as all other downtown streets put together.

Speed and Delay

For the 1975 projected year, the target has been to raise average travel speed on all arterial routes above 15 mph. An over-all gain of nearly 50 percent would be achieved, raising the average speed on major streets to 20.2 mph. Comparison of present and 1975 average speeds for each principal street in downtown Rochester can be made as follows:

Street	Present Average Speed	1975 Average Speed	% Gain 1975 Over Present
Main Street	12.7	16.2	26.9
Clinton Avenue	9.4	22.2	136.0
St. Paul - South	13.8	19.1	38.5
Franklin - East	10.1	15.4	52.4
Court Street	13.0	18.7	43.9
North Street	12.4	16.2	30.6
University Avenue	11.5	15.8	37.3
State - Exchange	10.5	17.9	70.2
Broad Street	-	18.9	-
Inner Loop	20.5	25.0 ¹	22.0
Total	13.6	20.2	48.6

¹Forty mph on roadway, with allowance for lesser ramp speeds and added distance due to ramps.

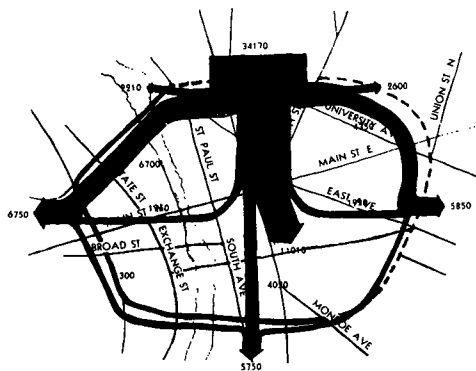


Figure 8. Destination of vehicular traffic in 1975 entering at north screenline of the CBD.

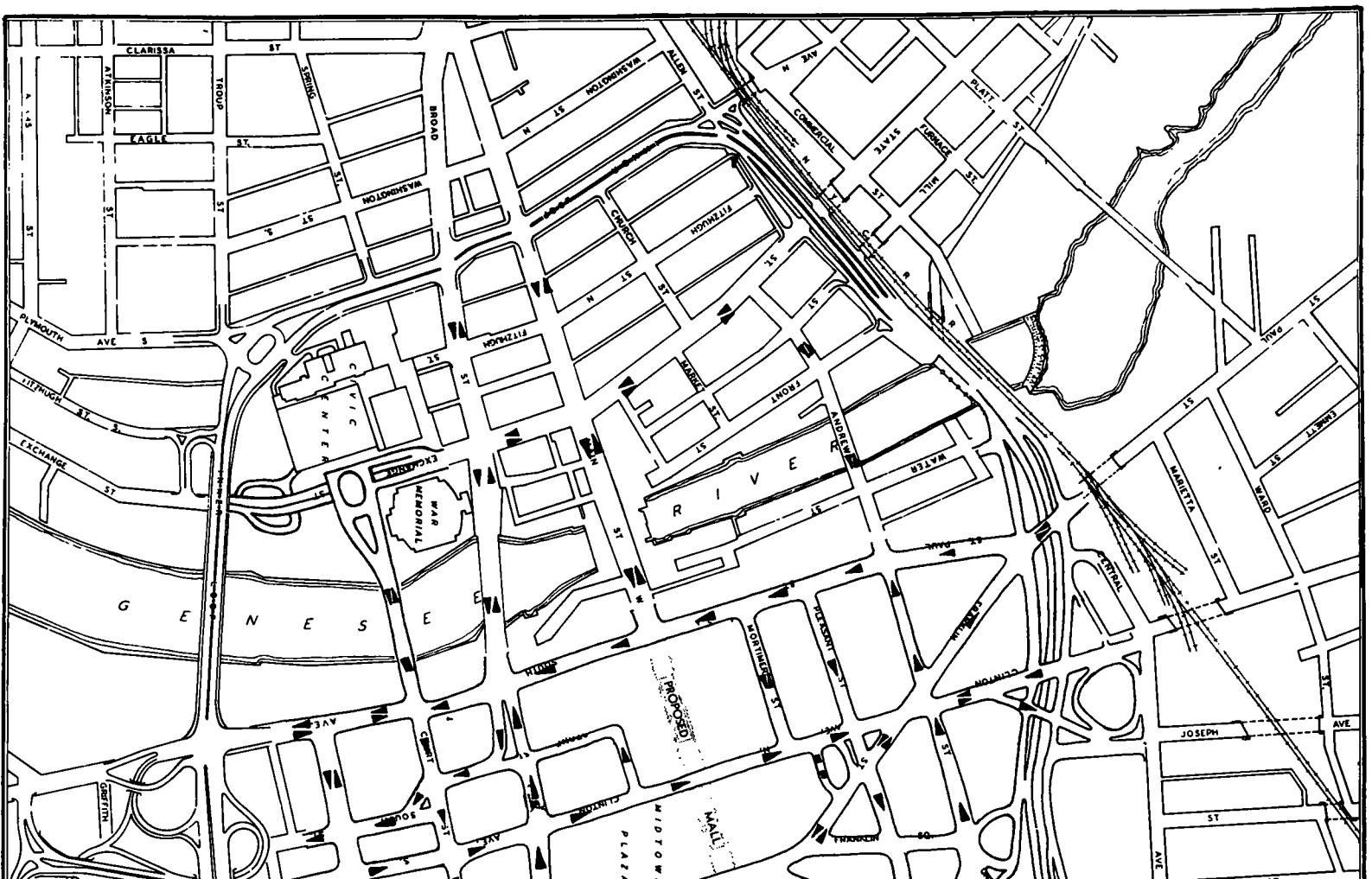
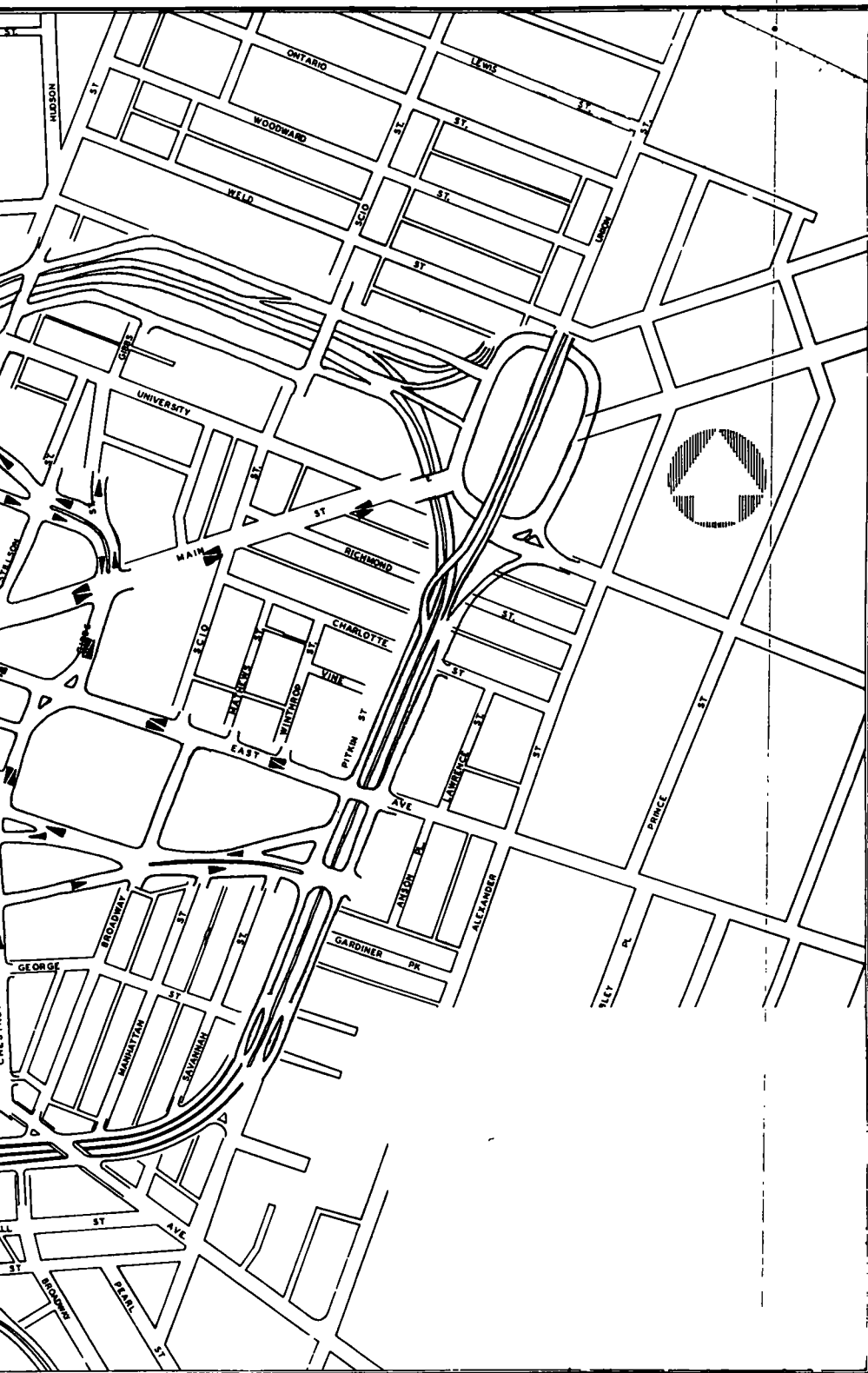


Figure 9. Recreame



downtown circulation system.

Inner-Inner Loop

Proposals have been advanced by the city planning commission for continuous one-way operation around the retail core area by installation of a clockwise and counter-clockwise loop. With one-way pairing of north-south streets, Clinton and St. Paul, and a similar set of east-west routes, Broad and Court Streets, this arrangement could be completed to some advantage. The commission's plan contemplates use of Water Street along with St. Paul as the western side of this so-called "Inner-Inner Loop". Instead, the pairing of St. Paul - South Avenue and Clinton Avenue is recommended.

With this modification, the clockwise Inner Loop would comprise Clinton Avenue, Pleasant Street Extension, Grove Street, Gibbs Street and Broad Street Extension. The counter-clockwise movement would be made up of St. Paul-South Avenue, Court Street, Gibbs and Andrews Streets.

A complete circulation plan for 1975 traffic operation in downtown Rochester, showing the Inner-Inner Loop and also other street improvements along with the Inner Loop up-graded to limited-access status, is shown in Figure 9.

Pedestrian Mall

Within the last year, there have been no less than three proposals for a pedestrian mall (Fig. 10). At this stage, it is not necessary to attempt to resolve the differences among these proposals.

The downtown mall can only be developed when other suitable traffic facilities have been completed. Inasmuch as the whole traffic flow pattern would be influenced primarily by access and egress from the Inner Loop, the mall proposal should be geared to completion of that arterial facility.

If maintaining easy pedestrian flow between the two sections of the mall along Main Street should become significant, this purpose could be achieved by the development of an attractive pedestrian platform which would bridge vehicular traffic in both directions at the Main and Clinton intersection.

Buses and emergency vehicles (police, fire and ambulances) should be permitted to travel through the pedestrian mall. This exception to the traffic exclusion is based on two significant facts: (a) there are no suitable alternate streets for loading and unloading buses; and (b) analysis of their travel habits shows that 73.5 percent of bus passengers in the downtown area are actually destined to the Main and Clinton intersection. It would be folly to deposit these people at any other location and force them to walk to this point.

TRANSIT: NOW TO 1975

It is well recognized that the welfare of the Rochester CBD is allied closely with the continuance and improvement of its public transit system. Buses are by far the most efficient carriers serving downtown; each bus in the system brings more than 150 people daily into downtown Rochester. Automobiles, on the other hand, carry an average of 1½ passengers each.

Over the past decade downtown Rochester has suffered the loss of a significant share of its retail business to outlying shopping areas. Paralleling this decline, there has

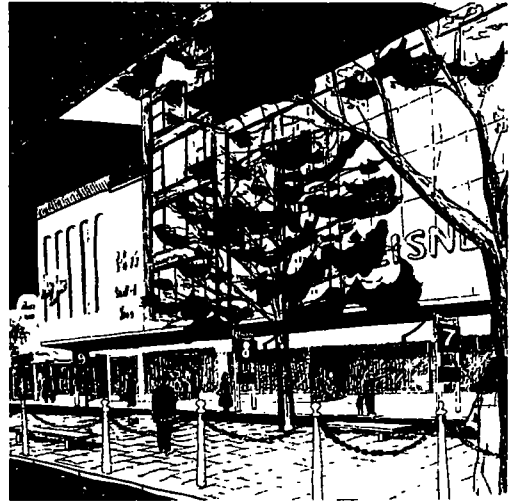


Figure 10. Pedestrian mall proposed for downtown Rochester.

been a steady drop in the use of public transportation. Transit riding in Rochester since 1950 has declined 55 percent.

A continuation of the trend away from the public transportation would mean more traffic congestion and further pre-empting of downtown space to relieve it; these steps can only result in accelerating the movement of business away from the CBD with further impairment of its economic worth.

Transit Riding Habit

The Rochester Transit Corporation carried approximately 32½ million passengers in 1959 and serves an area of approximately 463,000 people. Dividing the annual passengers by the population served, the transit riding habit for this system is determined to be 70 rides per capita annually. This corresponds exactly with the average for 21 medium-size cities.

Rochester Transit Corporation provided 18.3 vehicle-miles of service in 1959 for each person in its service area. This compares with an average of 20 miles per capita for transit companies in other medium-size cities. This average is affected by the southern cities; several major southern cities, notably Atlanta, New Orleans and Richmond, are well above average in transit miles per capita. If these three cities were eliminated from the average, the volume of transit service per capita in Rochester would be approximately the same as that in other medium-size cities.

Transit service in Rochester is as well received as elsewhere—perhaps a bit above par in relation to comparable northern cities—but this fact does not alter the need for wider acceptance and use of public transportation if the downtown area is to hold its own in the years ahead.

Transit O and D

To determine the pattern of riding on Rochester Transit lines, an O-D survey was made on all routes in November 1959. Printed cards were distributed to all fare-paying passengers with three simple questions to be answered relating to the point of origin, point of destination and use of transfers on that particular journey.

A total of 54,979 cards were issued; 40,541 of these were filled out and returned. This represents a survey return of 74 percent—an extremely good response for a survey of this type, and considerably more than an adequate sample for a valid cross-section of the riding habits of passengers.

Transit Share of CBD Traffic

On an average weekday, Rochester Transit buses deliver 38,115 people to the CBD. Ninety-seven percent of this total arrive in the 12 hours between 7 a. m. and 7 p. m. This amounts to 36,750 people arriving in the downtown area by bus. During the same 12 hours, passenger cars bring in an estimated 56,195 persons.

Therefore, in the 12 hours between 7 a. m. and 7 p. m., 92,945 people come into the CBD with destinations in the downtown area, of whom 40 percent arrive by bus and 60 percent by automobile.

Sixty-nine percent (38,115) of the 55,308 bus riders entering the Rochester CBD stop in the downtown area for some business or social purpose. This is the reverse of the proportion of auto users. In the traffic section of this report, it is pointed out that 36.8 percent of motor vehicles entering the CBD terminate within the downtown area.

Nearly three-fourths of transit passengers delivered to the CBD are destined to the retail core area. Of the 28,036 delivered to this section daily, 21,893 (78 percent) get off Rochester Transit buses along Main Street at bus stops between St. Paul and Franklin inclusive, or alight from buses along one of the north-south streets, immediately adjacent to Main Street.

More than 35,000 riders get on and off in the vicinity of Main and Clinton Avenue every day.

Transit Proportion to Core Area

Although automobiles bring in about 60 percent of the total number of people destined to the CBD as a whole, they do not have so large a proportion in the retail core area. In the 12 hours beginning 7 a. m. to 7 p. m., autos deliver about 31,500 people to the retail core. In the same period, buses deliver approximately 27,000 people to the retail core area, representing 46 percent of the total number of people coming to the downtown shopping core of Rochester.

More than one-half of the transit riders destined to the center city began their journeys within a radius of two miles of Main and Clinton. Nearly 85 percent of those coming downtown started from points not more than three miles from Main and Clinton. Transit is not carrying a significant number of riders to the downtown area from beyond a radius of three miles.

EVALUATION OF TRANSIT SERVICE

The adequacy of service may be determined by evaluating each of the following elements in terms of reasonable and commonly accepted standards: (a) speed of operation, (b) routing (coverage of area and direct service), (c) loading standards, (d) service frequency, (e) dependability, (f) bus stop frequency, (g) operator's attitude, and (h) equipment.

Speed of Operation

Rochester Transit Corporation operated nearly 8½ million vehicle-miles in 1959 at an average speed of 10.94 mph. The average operating speeds for 21 other transit systems serving medium-size cities is 11.09 mph, virtually the same as the average for Rochester.

An increase in operating speed of 1 mph on all of the lines of Rochester Transit would result in annual savings measured in six figures, as well as in a service more attractive to transit patrons. To a considerable degree, speed is dependent on street traffic conditions, a factor beyond the control of the transit company.

Rochester was among the first cities to inaugurate transit lanes in the downtown area. An extension of transit lanes in the CBD and on arterial approaches is one step which can be taken to improve transit speed. Higher bus speed downtown would also flow from improvements in traffic signal timing.

Routing

Present route coverage of the transit system is excellent. As a practical matter, virtually every point in the city is within ¼ mile of one or more bus routes. It can be concluded that there are no significant deficiencies in the route coverage within the City of Rochester.

Ten out of 11 transit riders completed their journey to their downtown destination on a single vehicle.

Loading Standards

This company is already providing a more generous standard of service than required by the criterion of a seat per passenger on each route in base hours. Hourly variations in daytime transit service and passenger loads entering and leaving downtown Rochester are given in Table 5. These figures represent totals on all routes in a given direction for a 1-hr period.

The company is now providing an average of slightly more than one seat per passenger measured over the heaviest hour of inbound travel each day. In this hour the load factor is 98.7; that is, passengers represent 98.7 percent of the total number of bus seats provided in the inbound direction at the edge of the CBD when measured over the full hour, 7 to 8 a. m.

As bus riders are well aware, the hour of greatest passenger congestion is between five and six o'clock in the afternoon on outbound vehicles. This is the only time of

TABLE 5
HOURLY VARIATIONS IN DAYTIME TRANSIT SERVICE AND PASSENGER LOADS ENTERING
AND LEAVING DOWNTOWN ROCHESTER

Hour of Day	Entering Downtown				Leaving Downtown			
	Buses	Seats	Passengers	Load Factor (%)	Buses	Seats	Passengers	Load Factor (%)
7 to 8 a m	225	9,104	8,990	98.7	219	8,834	5,937	67.2
8 to 9	224	9,130	8,436	92.4	199	8,230	4,512	54.8
9 to 10	154	6,345	4,028	63.5	142	5,882	1,708	29.0
10 to 11	136	5,641	3,338	59.2	133	5,510	2,039	37.0
11 to 12	137	5,696	3,014	52.9	137	5,677	2,682	47.2
12 to 1 p m.	135	5,585	3,021	54.1	134	5,559	2,587	46.5
1 to 2	138	5,771	3,273	56.7	132	5,519	2,999	54.3
2 to 3	146	6,004	3,917	65.2	145	6,019	4,059	67.4
3 to 4	206	8,353	6,020	72.1	200	8,250	6,654	80.7
4 to 5	241	9,802	7,233	73.8	232	9,499	9,595	101.0
5 to 6	229	9,362	4,695	50.1	248	10,281	11,803	114.8
6 to 7	149	6,027	2,077	34.5	139	5,768	4,204	72.9
Total	2,120	86,820	58,042	66.9	2,060	85,028	58,779	69.1

the day during which there is a substantial excess of passengers over seats provided by Rochester Transit.

There is no problem of loading prior to 4 p. m. in the outbound direction. In fact, prior to 3 p. m., about one-third or more of the outbound seats are empty at every hour of the day—frequently one-half or more are empty. Between 3 and 4 p. m. the load factor is 80.7 percent in the outbound direction. Between 4 and 5 p. m. seats and passengers outbound are in approximate balance with a load factor of 101 percent. In the hour commencing at 5 p. m., the company provides 248 outbound trips and a total of 10,281 seats, whereas passengers aggregate 11,803 in this same hour, yielding a load factor of 114.8 percent.

Policy Headways

Headways between buses on all major routes in the a. m. and p. m. rush hours are between 5 and 9 min, whereas the off-peak or midday headway is generally in the range of 10 to 13 min on the principal arterial routes. In the evening hours, the spacing is widened somewhat to approximately 15 to 20 min, with several above 20 min.

It is apparent from the load factors during the midday hours that the service frequency on the routes of Rochester Transit Corporation in this period are determined not by the passenger volumes, but by policy considerations. The resultant headways of 10 to 13 min in the midday on the major arterial lines represents a generous standard of service. On the assumption that the average waiting time of a passenger does not exceed one-half the headway or interval between vehicles, the waiting time for a bus normally would be 5 or 6 min in the midday hours.

Volume of service provided in 1959, when related to the quantity of riding, was considerably greater than it had been in any prior period. The total amount of service operated in relation to patronage increased by nearly one-third between 1950 and 1959.

Dependability

An important aspect of dependability is continuity of transit service without interruption despite unusual circumstances. On this score Rochester Transit Corporation has an outstanding record under very trying conditions. This is illustrated by the performance of the company and its employees in the past winter. Despite 161 in. of snow—the heaviest in Rochester's history—uninterrupted bus service was maintained.

Field studies showed that 77.1 percent of inbound trips to the CBD were on time within the definition of 1 min early to 3 min late. The on-time performance of outbound vehicles was found to be 72.6 percent within the same range of tolerance, in the 12-hr period commencing 7 a. m. The on-time performance of Rochester Transit is generally satisfactory in the peak period and in the hours immediately following the morning peak and preceding the afternoon peak.

The finding of less than 60 percent schedule adherence for outbound vehicles between 5 and 6 p. m. indicates an opportunity for supervisory investigation of operators' performance during this period. This record also reflects a need for improvement in traffic conditions in downtown Rochester during the critical afternoon peak hour.

Although the peak hour schedule adherence is generally satisfactory, the performance in off-peak hours should be susceptible of improvement. In the midday hours, particularly, headways are longer and the inconvenience resulting from off-schedule buses is more irksome.

Rochester Transit Corporation is particularly well equipped to improve its record of on-time performance. The company has installed a two-way radio hookup throughout its system. This communications system is now being used effectively in giving instructions to bus operators on the street who are delayed.

Bus Stop Frequency

Both as to the number of downtown bus stops and their location, it is felt that the present routes are well designed. The analysis of the number of bus stops per route mile outside the CBD reveals clearly a need for some reduction in the number of stops in outlying areas.

As contrasted with the recommendation of the National Committee on Urban Transportation that bus stops in residential areas be confined to a maximum of seven per mile the average number of bus stops outside the CBD is 9.3 per mile. And, with few exceptions, virtually all routes are shown to have bus stops in excess of the seven-per-mile standard recommended by the committee.

Equipment

Since switching to diesel operations after World War II, the company has spent \$3,140,000 on this type of equipment.

The program of equipment modernization has provided Rochester with an up-to-date fleet—one which is quite adequate to do the job required of public transportation in Rochester.

Altogether the replacement program is an important factor, the general condition, appearance and cleanliness of the bus fleet is probably of equal significance to the riding public. Appearance-wise, this company has a trim-looking fleet.

EXPRESS SERVICE

The most important single requirement for improved transit service in Rochester is greater speed. This is where the competitive disadvantages of transit riding with the automobile may be most clearly seen.

As the development of the metropolitan area expands in suburban communities, faster transit service must be provided from these outlying areas to offer a reasonable alternative to the private automobile.

Although transit riding has been declining not only in Rochester but in other cities throughout the country in the postwar years, some transit services have actually improved in patronage. These generally have been the upgraded bus services, the express and limited-stop operations with speeds which approach that of the automobile.

The experience in St. Louis demonstrates the attractiveness of high-speed bus operation.

The primary appeal of express bus service is speed. In addition to time saving, there are corollary appeals of comfort and attractiveness.

Rochester Transit does not operate any express service to the CBD at the present time except for newly inaugurated service on Lake Avenue. The objective is to develop a distinctive express service on a number of routes which will make it possible at least to halve the time advantage that private cars now have over regular bus service from outlying communities.

The type of transit service contemplated on these express routes is expensive to provide. Accordingly, it is suggested that the fare for an express ride be 5 cents above that charged for a corresponding trip on a local bus.

Five express routes are proposed for the inauguration of this service. They are Monroe-Pittsford, Chili Express, St. Paul-Summerville Express, Lake Avenue Express and Sea Breeze Express.

It is recommended that express operation between Pittsford and the CBD be inaugurated throughout the peak and midday hours. In the segment of the line outside the CBD, however, the total number of bus stops would be reduced from 59 to 5. It is recommended that the schedule call for a running time of 26 min in both the a. m. and p. m. peak periods (present running time, 31 min). The auto advantage, now 6 to 8 min, would be reduced to 1 to 3 min.

It is proposed that peak-hour express be inaugurated from Chili Center on a trial basis. There will be 67 fewer bus stops on the express line than on the present operation. With this reduction of passenger stops, express vehicles moving with traffic should approach the average automobile speed. A running time of 29 min is suggested (present, 33 to 36 min).

It is proposed that express service be operated over the St. Paul-Summerville line. The scheduled running time of express buses would be 29 min, both in the a. m. peak and in the p. m. rush hour (present, 35 min). No difficulty is expected in achieving this speed; experience may indicate the possibility of reducing it by 1 or 2 additional minutes. It is recommended that this express service be provided not only in the peak hours but throughout the midday period as a special premium service for shoppers coming to the downtown stores.

It is suggested that additional trips be added on the Charlotte express line, both in the peak and off-peak hours. The total potential of daily riding on proposed express routes from this suburban community is 1,683 persons. This is more than adequate to justify the inauguration of express bus service in this area on an experimental basis. It is suggested that the running time scheduled for these express trips be 30 min in the a. m. and p. m. peak hours. It is also proposed that this express operation be continued during the midday base hours to provide a fast and deluxe service for shoppers coming to the downtown area.

OTHER TRANSIT RECOMMENDATIONS

Route Changes

Although the entire City of Rochester is within $\frac{1}{4}$ mile of one or more transit routes, not all sections of the city have direct bus service to the retail core area. From some areas, it is necessary either to walk for some distance or to transfer from one line to another to reach the downtown shopping area. Many of these deficiencies in routing from the standpoint of the CBD can be remedied by recombination of existing routes and relatively modest changes in existing lines.

Bus Stop Frequency

The transit company should re-examine the bus stop locations on all routes with the objective of limiting stops to a maximum of 10 per mile. In other words, there should be no more than one bus stop in each block of the route. This maximum is 40 percent above the standard proposed by the National Committee on Urban Transportation. Although limiting bus stops in residential areas to seven per mile is entirely reasonable, it is felt that a reduction from the present level to a standard of seven would be more than could be realized in the immediate future. Application of a maximum standard of 10 stops per mile produces an average between eight and nine stops per mile.

Free Bus Service in Mall Area

A prior recommendation in this report is a downtown pedestrian mall along Main Street between St. Paul-South Avenue and Franklin-East Avenue. The mall is feasible only on completion of the proposed improvements in traffic circulation in and around the CBD, the most important one of which is the upgrading of the Inner Loop to a totally grade-separated facility.

A feature which might be considered, both from the viewpoint of faster operation and a stimulus to downtown circulation, would be no fare collection in the mall area. All buses operating through the mall would do so with both doors open at each stop.

Main Street Shuttle

The Civic Center represents a major new traffic generator in the area west of the Genesee. This addition warrants the re-institution of the Main Street shuttle between this area and the retail core for a further extended trial period.

Transit Lane

A principal recommendation in the preceding traffic section of this report is the inauguration of one-way operation on Clinton Avenue, St. Paul Street and South Avenue. This volume of transit service will necessitate a reserved bus lane to permit the optimum flow, both of transit and other vehicular traffic.

There is one additional location where the volume of bus movement is such as to require a reserved lane. On State Street between Brown and Main Street, there is need for the establishment of transit lanes in rush hour periods. In the maximum 60 min between 4:30 and 5:30 p. m., 56 buses are scheduled through this portion of State Street.

PARKING: NOW TO 1975

There are nearly 15,000 parking spaces in downtown Rochester. Ninety-two percent of these are in off-street lots and garages—commercial, publicly owned and private; the remaining 8 percent comprises the 1,241 parking spaces at street curbs. The number of parking facilities in each classification is summarized in Table 6, and the distribution by types is given in Table 7.

In 1950 there were 11,995 off-street spaces. Parking garages and lots developed in the past decade have expanded this capacity to a present off-street total of 13,731. On completion of the garage facilities at the Civic Center and at Midtown Plaza, the total off-street spaces will increase further to 16,556—a gain of 4,561 spaces, or 38 percent above 1950.

Meanwhile, nearly four out of every ten downtown curb parking spaces which were available in 1950 have been eliminated. This space has been withdrawn from the parking supply to provide more lanes for moving traffic in the CBD.

Field Studies

Field analyses of parking facilities in the CBD were made in November and December 1959. One phase of this field survey comprised a detailed inventory of every parking facility in the CBD.

The second phase consisted of interviewing motorists at 26 downtown parking facilities on weekdays between the hours of 7 a. m. and 7 p. m. Altogether, a total of 3,500 personal interviews were made. This information was correlated with the broader sample of motorist interviews at survey stations around the perimeter of the CBD to provide a total picture of traffic and parking conditions on an average weekday.

Commercial Spaces

Commercial parking lots provide the major share of the downtown parking supply—53.8 percent. Altogether, there are 105 commercial facilities supplying 8,053 spaces, or an average of 77 spaces per lot.

Commercial lots have an average turnover of 2.04 cars per parking space. The average parker leaves his car in the lot for 3.0 hr and walks 470 ft to his downtown destination.

Commercial garages represent 8.8 percent of the total parking supply in the CBD. There are six commercial garages which provide 1,320 spaces, or an average of 220 spaces per facility. The average turnover rate for these six facilities is 0.96. Parkers leave their cars for an average of 6 hr and walk 500 ft.

Municipally Owned Facilities

The City of Rochester operates eight parking lots for metered self-parking. These facilities generally are smaller than the commercial lots, averaging 53 spaces.

The most important municipal lot is a 196-car facility at the southeast corner of Court and Chestnut Streets. Every space in this lot is generally occupied by 8:30 a. m. despite the fact that there are no large traffic generators in the vicinity of the lot. Occupancy is made up primarily of all-day parkers. Average walking distance is 1,370 ft, nearly twice the normal average, indicating that this lot is serving employees in the retail core who are willing to walk some additional distance for the advantage of low parking rates.

The four municipally owned garages constitute only 13 percent of the total parking supply, but they exercise a primary influence on downtown parking rates and turnover. They provide a total of 1,815 spaces. Two additional publicly owned facilities are in the process of construction—Midtown Plaza and Civic Center garages, with accommodations for 1,900 and 1,300 cars, respectively.

Clinton Avenue Ramp Garage.—An eight-story structure directly behind Sibley's Department Store. This facility was completed in the spring of 1959 at a total cost of \$2,600,000. It has capacity for 552 vehicles on a metered, self-parking basis (average cost, \$4,700 per car space).

On an average weekday, this garage handles close to 2,000 parkers between 7 a. m. and 7 p. m. Direct access is provided to Sibley's on five of the eight floors. Average turnover for the 12 daytime hours is 3.6 cars per space.

Mortimer Street Ramp Garage.—Is located directly behind Edward's Department Store. This is also an eight-story ramp-type operation with an aggregate of 523 stalls for metered, self-parking. Total cost of this facility was \$2,307,000, averaging \$4,412 per car space.

The average weekday load is nearly 1,600 cars between 7 a. m. and 7 p. m., resulting in a daytime turnover of 3.0 cars per space.

Plymouth Avenue Ramp Garage.—Is located at the northwest corner of Main Street and Plymouth Avenue, with exits to the Inner Loop. This ramp garage has a greater portion of all-day parking. The capacity is 500 stalls.

Daytime use aggregates 832 vehicles, making the average turnover of 1.7 cars per space between 7 a. m. to 7 p. m.

Private Parking Space

One hundred and one private off-street parking areas are used principally for the convenience of customers and employees of business concerns in the CBD.

Generally, these are small service lots, with an average capacity of 20 spaces. In the aggregate, these lots accommodate approximately 2,000 cars daily.

Curb Spaces

Metered.—The 736 metered curb spaces in downtown Rochester include 113 locations in the retail core, 229 in the office core and the remaining 394 spaces in the balance of the CBD. Metered spaces accommodate a high turnover. The average daytime rate is 1.4 cars per hour. There has been a substantial decline in metered curb space in both core areas over the past decade (Table 8).

Unmetered.—Free curb parking amounts to 3.4 percent of the total CBD parking supply and is almost entirely in the perimeter residential areas.

The most significant change over the last 10 years has been the development of suitable off-street parking facilities. The lion's share of the city's capital budget for traffic improvements has gone into the development of five municipal garages, four of which are completed and the last under construction. In 1950 downtown garages had a capacity of 1,238 cars. By the end of last year this had increased to 2,895. On

TABLE 6
PARKING SPACE IN DOWNTOWN ROCHESTER

Type of Space	Type of Facility	Facilities (no.)	Spaces	
			(no)	Avg Per Facility
Commercial	Garages	6	1,320	220
	Lots	105	8,053	77
Public	Garages	4	1,950	525 ¹
	Lots	8	420	53
Private	Garages	-	-	-
	Lots	101	1,988	20
Sub-total			13,731	
Curb	Metered	-	736	-
	Un-metered	-	505	-
Sub-total			1,241	
Total		224	14,972	

¹Excluding 375 spaces at Civic Center

percent above 1950.

Table 9 shows a general upgrading in CBD parking supply by type of facility over the past decade. The over-all picture indicates an increase of 3,809 parking spaces, equivalent to 27.2 percent. Curb parking dropped 37.7 percent, while off-street capacity rose 38 percent. In absolute numbers, six off-street parking spaces have been provided to replace each curb space eliminated since 1950.

PARKING CHARACTERISTICS

In analyzing off-street parking facilities, it is important to determine the requirements of parkers. The purpose of an individual's trip influences his length of parking time, acceptable walking distance between facility and destination, and time of arrival and departure. Each of these principal characteristics was analyzed in this study to determine its effect on selection of particular parking facilities.

Duration of Parking

Hours parked by trip purpose for the retail core, office core and perimeter area are summarized in Table 10. The average parking period in the Rochester CBD is 3.6 hr. Workers, for example, in the retail core average 5 hr each time they park their cars, while office core workers average 7.3 hr of parked time daily. Shoppers average out at 1.8 hr per shopping trip in the retail core and 1.7 in the office core.

From the standpoint of use and parking turnover, it is significant that the average worker parks for a period more than three times as long as a shopper or other downtown parker. Off-street parking facilities accommodating a high proportion of workers seldom exceed a turnover of one, whereas those serving shoppers predominantly, such as the Mortimer Street and Clinton Avenue ramp garages, have turnovers of three to four per car space daily.

Arrival Time

It is no surprise that more than one-half of the parkers on business and work trips reach their parking space between 7 and 10 a. m. daily. Another 23 percent park between 10 a. m. and 1 p. m., with the remainder parking in the early afternoon (Table 11). Among shoppers the principal hours of arriving are in the late morning from 10 a. m. to 1 p. m., when 38 percent of the shoppers reach downtown parking facilities.

TABLE 7
PARKING SUPPLY BY LAND-USE AREAS

Type of Space	Type of Facility	Spaces (no)		
		Retail Core	Office Core	Perimeter
Commercial	Garages	845	475	-
	Lots	4,042	1,465	2,546
Public	Garages	1,075	875	-
	Lots	-	36	384
Private	Garages	-	-	-
	Lots	63	358	1,567
Curb	Metered	113	229	394
	Un-metered	20	177	308
Total		6,158	3,615	5,199 14,972

completion of the garage facilities at the Civic Center and Midtown Plaza, the total will climb to 6,095, a rise of nearly 400

TABLE 8
METERED CURB PARKING IN CBD, 1949-1960

Portion of CBD	Metered Curb Spaces (no)		Change	
	1949	1960	(no.)	(%)
Retail core	278	113	-165	-59.4
Office core	386	229	-157	-40.7
Remainder	284	394	+110	+38.7
Total	948	736	-212	-22.4

Distance Walked

Rochester is able to accommodate more than one-half of its shoppers within 400 ft of their retail destinations. This reflects a high degree of parking convenience. Furthermore, between 80 and 90 percent of shoppers in the retail core, office core and remainder of the CBD park less than 600 ft from their place of business.

TABLE 9
DOWNTOWN PARKING SUPPLY, 1950-1960

Type of Space	Type of Facility	Spaces (no)		Change	
		1950	1960	(No)	(%)
Curb	Metered	1,182	738	- 446	-
	Free ¹	811	505	- 306	- 37.7
	Total	1,993	1,241	- 752	- 37.7
Off-Street	Lots	10,757	10,461	- 296	- 2.8
	Garages	1,236	8,095 ²	+4,857	+392.3
	Total	11,995	16,556	+4,561	+38.0
All		13,988	17,797	+3,809	+27.2

¹Estimated
²Including 1,300 spaces at Civic Center and 1,900 at Midtown Plaza now under construction

TABLE 10
SUMMARY OF HOURS PARKED, BY TRIP PURPOSE

CBD Area	Purpose of Trip	No. of Trips ¹						Total	Avg Parked Time (hr)
		<1 hr	1-2 hr	2-4 hr	4-6 hr	6-8 hr	>8 hr		
Retail core	Work	1,041 (14.8)	1,421 (20.3)	1,013 (14.4)	689 (9.8)	717 (10.2)	2,139 (30.5)	7,020 (100.0)	5.1
	Shop- ping	2,971 (32.9)	3,853 (42.6)	1,625 (18.0)	464 (5.1)	116 (1.3)	11 (0.1)	9,040 (100.0)	1.7
	Other	2,357 (42.6)	2,141 (38.7)	770 (13.9)	92 (1.7)	62 (1.1)	108 (2.0)	5,530 (100.0)	1.6
	Total	6,369 (29.5)	7,415 (34.3)	3,408 (15.8)	1,245 (5.8)	895 (4.1)	2,258 (10.5)	21,590 (100.0)	2.8
	Office core	Work	170 (2.5)	720 (10.6)	826 (12.1)	614 (8.9)	740 (10.7)	3,790 (55.2)	6,860 (100.0)
	Shop- ping	425 (37.2)	395 (34.7)	252 (22.1)	36 (3.2)	32 (2.8)	- (-)	1,140 (100.0)	1.7
	Other	821 (35.5)	975 (42.3)	257 (11.1)	70 (3.0)	67 (2.9)	120 (5.2)	2,310 (100.0)	2.0
	Total	1,416 (13.7)	2,090 (20.3)	1,335 (13.0)	720 (7.0)	839 (8.1)	3,910 (37.9)	10,310 (100.0)	5.5
Remain- der	Work	359 (12.2)	332 (11.3)	746 (25.5)	415 (14.2)	442 (15.1)	636 (21.7)	2,930 (100.0)	4.9
	Shop- ping	199 (18.1)	318 (28.9)	437 (39.7)	106 (9.6)	27 (2.5)	13 (1.2)	1,100 (100.0)	2.5
	Other	356 (13.9)	960 (37.5)	640 (25.0)	480 (18.7)	54 (2.1)	70 (2.8)	2,560 (100.0)	2.7
	Total	914 (13.9)	1,610 (24.4)	1,823 (27.7)	1,001 (15.2)	523 (7.9)	719 (10.9)	6,590 (100.0)	3.7
	All	Work	1,570 (9.3)	2,473 (14.7)	2,585 (15.4)	1,718 (10.2)	1,899 (11.3)	6,565 (39.1)	16,810 (100.0)
	Shop- ping	3,595 (31.9)	4,566 (40.5)	2,314 (20.5)	606 (5.4)	175 (1.5)	24 (0.2)	11,280 (100.0)	1.8
	Other	3,534 (34.0)	4,076 (39.2)	1,667 (16.0)	642 (6.2)	183 (1.7)	298 (2.9)	10,400 (100.0)	2.0
	Total	8,699 (22.6)	11,115 (28.9)	6,566 (17.0)	2,966 (7.7)	2,257 (5.9)	6,887 (17.9)	38,490 (100.0)	3.6

¹Figures in parentheses are percentages.

TABLE 11
ARRIVAL TIME OF DOWNTOWN PARKERS

CBD Area	Purpose of Trip	No. of Trips ¹				Total	% of Total
		7-10 a. m.	10 a. m. - 1 p. m.	1-4 p. m.	4-7 p. m.		
Retail core	Work	3,937 (56.1)	1,409 (20.1)	1,137 (16.2)	537 (7.6)	7,020 (100.0)	32.5
	Shop- ping	982 (10.9)	3,418 (37.8)	2,951 (32.6)	1,689 (18.7)	9,040 (100.0)	41.9
	Other	834 (15.1)	1,285 (23.2)	1,248 (22.6)	2,163 (39.1)	5,530 (100.0)	25.6
	Total	5,733 (26.7)	6,112 (28.3)	5,336 (24.7)	4,389 (20.3)	21,590 (100.0)	100.0
Office core	Work	3,100 (45.3)	1,820 (26.5)	1,347 (19.7)	583 (8.5)	6,860 (100.0)	6.5
	Shop- ping	146 (12.8)	642 (56.3)	268 (23.5)	84 (7.4)	1,140 (100.0)	11.1
	Other	171 (7.4)	573 (24.8)	999 (43.2)	567 (24.6)	2,310 (100.0)	22.4
	Total	3,427 (33.2)	3,035 (29.4)	2,614 (25.4)	1,234 (12.0)	10,310 (100.0)	100.0
Remain- der	Work	1,446 (49.3)	548 (18.7)	555 (19.0)	381 (13.0)	2,930 (100.0)	44.5
	Shop- ping	101 (9.2)	223 (20.3)	430 (39.1)	346 (31.4)	1,100 (100.0)	16.7
	Other	592 (23.1)	810 (31.7)	530 (20.7)	628 (24.5)	2,560 (100.0)	38.8
	Total	2,139 (32.4)	1,581 (24.0)	1,515 (23.0)	1,355 (20.6)	6,590 (100.0)	100.0
All	Work	8,493 (50.5)	3,777 (22.5)	3,039 (18.1)	1,501 (8.9)	16,810 (100.0)	43.7
	Shop- ping	1,229 (10.9)	4,283 (38.0)	3,649 (32.3)	2,119 (18.8)	11,280 (100.0)	29.3
	Other	1,597 (15.4)	2,668 (25.6)	2,777 (26.7)	3,358 (32.3)	10,400 (100.0)	27.0
	Total	11,319 (29.4)	10,728 (27.9)	9,465 (24.6)	6,978 (18.1)	38,490 (100.0)	100.0

¹Figures in parentheses are percentages.

This proximity to primary destination compares very favorably with walking distance for shoppers in other cities; generally, the walking distance for shoppers is 800 to 1,000 ft, about twice the Rochester average.

The average worker parks 50 percent farther away from his destination than the typical shopper in downtown Rochester. Shoppers walk an average of 420 ft, those on business and work trips walk 630 ft, whereas other parkers average out at 450 ft. Walking distance from parking facility to destination by purpose of trip and by CBD areas is given in Table 12.

The average walking distance for parkers in the Clinton ramp garage is 320 ft, whereas those using the Mortimer ramp garage walk 350 ft to their primary destination. Few downtown shopping areas throughout the country are able to match this proximity in parking convenience. These two municipal garages also provide a substantial degree of accommodation for the stores on the south side of Main Street.

The influence area for the Plymouth ramp garage indicates that this facility is used

TABLE-12
WALKING DISTANCE, PARKING TO DESTINATION

CBD Area	Purpose of Trip	No. of Trips ¹						Total	Avg Dist. Walked (ft)
		<400 ft	400-600 ft	601-800 ft	801-1,200 ft	1,201-1,600ft	>1,600 ft		
Retail core	Work	2,517 (35.8)	3,059 (43.6)	727 (10.4)	474 (6.7)	139 (2.0)	104 (1.5)	7,020 (100.0)	500
	Shop- ping	4,764 (52.8)	3,121 (34.5)	568 (6.3)	428 (4.7)	149 (1.6)	10 (0.1)	9,040 (100.0)	410
	Other	2,100 (38.0)	2,489 (45.0)	452 (8.1)	276 (5.0)	163 (2.9)	50 (1.0)	5,530 (100.0)	470
	Total	9,381 (43.4)	8,669 (40.1)	1,747 (8.1)	1,178 (5.5)	451 (2.1)	164 (0.8)	21,590 (100.0)	460
Office core	Work	1,430 (20.8)	2,586 (37.8)	571 (8.3)	1,620 (23.6)	379 (5.5)	274 (4.0)	1,860 (100.0)	680
	Shop- ping	550 (48.2)	380 (33.3)	120 (10.5)	60 (5.3)	20 (1.8)	10 (0.9)	1,140 (100.0)	450
	Other	1,043 (45.2)	759 (32.8)	320 (13.9)	135 (5.8)	27 (1.2)	26 (1.1)	2,310 (100.0)	470
	Total	3,023 (29.3)	3,725 (36.2)	1,011 (9.8)	1,815 (17.6)	426 (4.1)	310 (3.0)	10,310 (100.0)	610
Remain- der	Work	1,077 (36.7)	193 (6.6)	248 (8.5)	692 (23.6)	378 (12.9)	342 (11.7)	2,930 (100.0)	810
	Shop- ping	730 (66.4)	220 (20.0)	70 (6.4)	50 (4.5)	20 (1.8)	10 (0.9)	1,100 (100.0)	400
	Other	2,075 (81.0)	139 (5.4)	173 (6.8)	76 (3.0)	62 (2.4)	35 (1.4)	2,560 (100.0)	370
	Total	3,882 (58.9)	552 (8.4)	491 (7.4)	818 (12.4)	460 (7.0)	387 (5.9)	6,590 (100.0)	570
All	Work	5,024 (29.9)	5,838 (34.7)	1,546 (9.2)	2,786 (16.6)	896 (5.3)	720 (4.3)	16,810 (100.0)	630
	Shop- ping	6,044 (53.5)	3,721 (33.0)	758 (6.7)	538 (4.8)	189 (1.7)	30 (0.3)	11,280 (100.0)	420
	Other	5,218 (50.2)	3,387 (32.5)	945 (9.1)	487 (4.7)	252 (2.4)	111 (1.1)	10,400 (100.0)	450
	All	16,286 (42.3)	12,946 (33.6)	3,249 (8.5)	3,811 (9.9)	1,337 (3.5)	861 (2.2)	38,490 (100.0)	520

¹Figures in parentheses are percentages.

primarily by office workers and businessmen in the office core, west of the Genesee River. The predominant business use of the Plymouth ramp garage is confirmed by the fact that the average parking interval is 5.7 hr—about three times as long as the average parking interval at the Mortimer and Clinton ramp garages.

The influence area of the three ramp garages, as well as the municipal parking lot at Court and Chestnut Streets, is shown in Figure 11.

Garage Discharge Rates

Studies of hourly variation of vehicles leaving the Mortimer and Clinton ramp garages show that the peak discharge occurs regularly at 4 to 5 p. m. on normal business days. This peak, coinciding with the maximum homebound traffic movement, compounds the congestion in the retail core. At the Mortimer ramp garage the maximum discharge



Figure 11. Destinations of drive



arking in four municipal facilities.

was 59.7 percent of capacity, while the Clinton ramp garage discharged 58.1 percent in the same hour.

The Plymouth Avenue ramp garage is more fortunately situated in being removed from core traffic. However, this facility has just a single exit which discharges directly into the Inner Loop. Peak hour discharge occurs at 4 to 5 p. m. at the same time that the traffic peak takes place on the circumferential route. As a result, congestion and delay frequently occur, particularly in the vicinity of Plymouth Avenue and Allen Street.

PARKING RATES

Parking rates in Rochester are determined primarily by two factors: (a) what the traffic will bear, and (b) the rate schedules of city-owned garages and lots. The average 1-hr charge throughout downtown Rochester is 28 cents, whereas the average all-day rate is 76 cents. Detailed information on average parking rates is given in Table 13.

Rates at Municipal Parking Facilities

Municipal parking rates in the retail core are designed to encourage short-term parking. At the Mortimer and Clinton ramp garages, the 1-hr rate is 20 cents. This compares with an average 1-hr rate of 29 cents at privately owned lots and 50 cents at privately owned garages in the retail core. On the other hand, the city's rate for all-day parking is \$1.00 in relation to averages of 76 and 86 cents, respectively, at the privately owned facilities. Over-all, the rates at city-owned facilities are about one-half of those prevailing at privately owned garages and lots in the same section of the CBD.

It is estimated that the average revenue per car space at three municipal ramp garages—Mortimer Street, Clinton Avenue and Plymouth Avenue—runs about 75 cents daily. It is evident that private investment could not undertake capital ventures of this magnitude at the rates currently charged for parking at these municipal facilities; no private investor would have similar benefits of tax exemption or the availability of other municipal services to sustain part of the normal costs of operation.

Average Parking Rates in the CBD

In the retail core the 1-hr average fee is 30 cents with the all-day average at 82 cents. The corresponding averages for office core are 27 cents for one hour and 85 cents for all day. The principal difference between the two areas is the greater uniformity of rates prevailing in the retail core. In the remainder of the CBD, there is a decided drop in parking rates. The 1-hr charge in this perimeter area averages 22 cents, the all-day charge 59 cents.

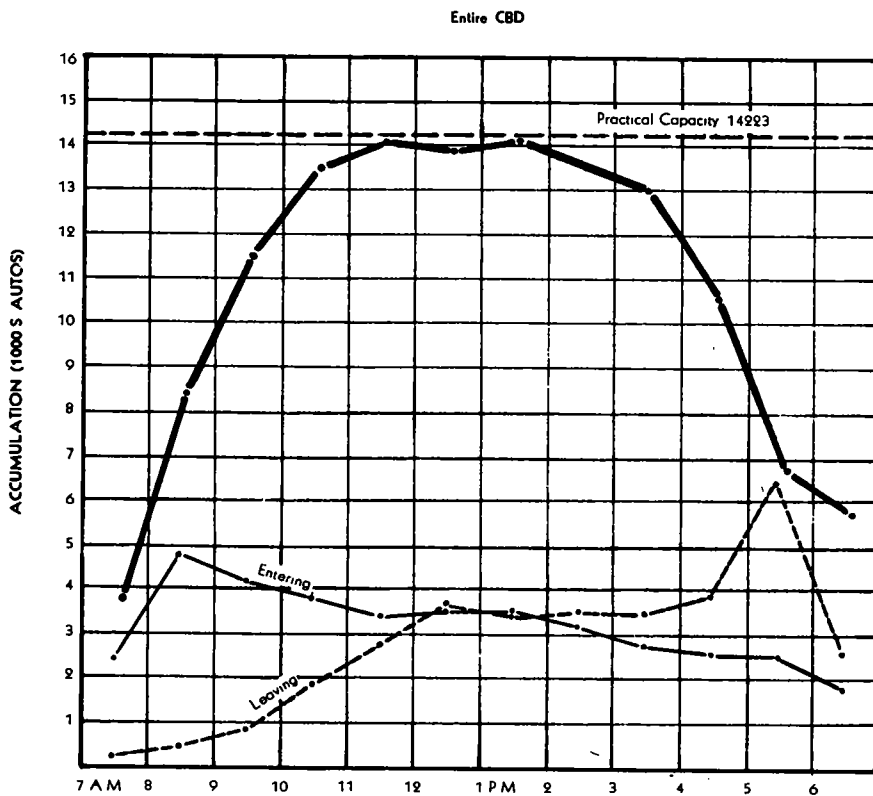
TABLE 13

AVERAGE PARKING RATES, ROCHESTER CBD

Type of Space	CBD Area	Average Parking Rates (\$)					
		Garages		Lots		Average	
		1 Hr	All Day	1 Hr	All Day	1 Hr	All Day
Private	Retail core	0.50	0.86	0.29	0.76	-	-
	Office core	0.35	1.04	0.31	0.92	-	-
	Remainder	-	-	0.24	0.62	-	-
	All	0.45	0.92	0.28	0.74	0.30	0.76
Munic. - owned	Retail core	0.20	1.00	-	-	-	-
	Office core	0.10	0.50	0.05	0.40	-	-
	Remainder	-	-	0.05	0.40	-	-
	All	0.17	0.84	0.05	0.40	0.15	0.76
All facilities	Retail core	-	-	-	-	0.30	0.82
	Office core	-	-	-	-	0.27	0.85
	Remainder	-	-	-	-	0.22	0.59
	All	-	-	-	-	0.28	0.76

COMPARISON WITH OTHER CITIES

How does Rochester compare with other medium-size cities in its supply of downtown parking? Rochester's 14,972 CBD parking spaces (to become 17,756 in the near future) compares with an average of 11,933 in urban areas of 250,000 to 500,000 population. At present, Rochester is 25 percent above average in downtown parking space, and, after completion of the Civic Center and Midtown Plaza garages, Rochester will be 50 percent above average for cities of this size.



Before
7

Entering CBD	2382	4869	4067	3859	3334	3535	3528	3100	2837	2644	2491	1844	Total
Leaving CBD	211	478	890	1921	2791	3616	3363	3568	3545	3931	6437	2679	38490
Accumulation	1796	3967	8358	11535	13473	14016	13935	14100	13632	12924	10637	6641	5856

Figure 12. Hourly accumulation of autos in downtown Rochester.

If comparison is made with cities of 500,000 to 1,000,000 (Rochester's "urban area" is close to 500,000 population), this city is still clearly out in front. When present construction is completed, Rochester will have one-third more CBD parking capacity than the average for cities in the one-half to one million category.

Rochester has not only provided more aggregate parking space than is typical for a city of its size but this has been done concurrently with a marked reduction in curb parking. The streets have been made available for traffic movement by eliminating parking at the curb. Only 8.3 percent of CBD parking in Rochester is at the curb as compared with 15.5 percent in other eastern cities.

Rochester now has 26 downtown parking spaces per 1,000 people in the metropolitan area and will have nearly 31 spaces per 1,000 population when present building is finished. This compares with an average of about 20 downtown spaces per 1,000 people in other middle-size eastern cities.

From the foregoing comparisons it is quite evident that Rochester municipal authorities have done an outstanding job over the past decade in meeting the demand for downtown parking space. Compared with cities of similar size, and also with other cities of two to three times its size, Rochester is well in the lead.

PARKING REQUIREMENTS

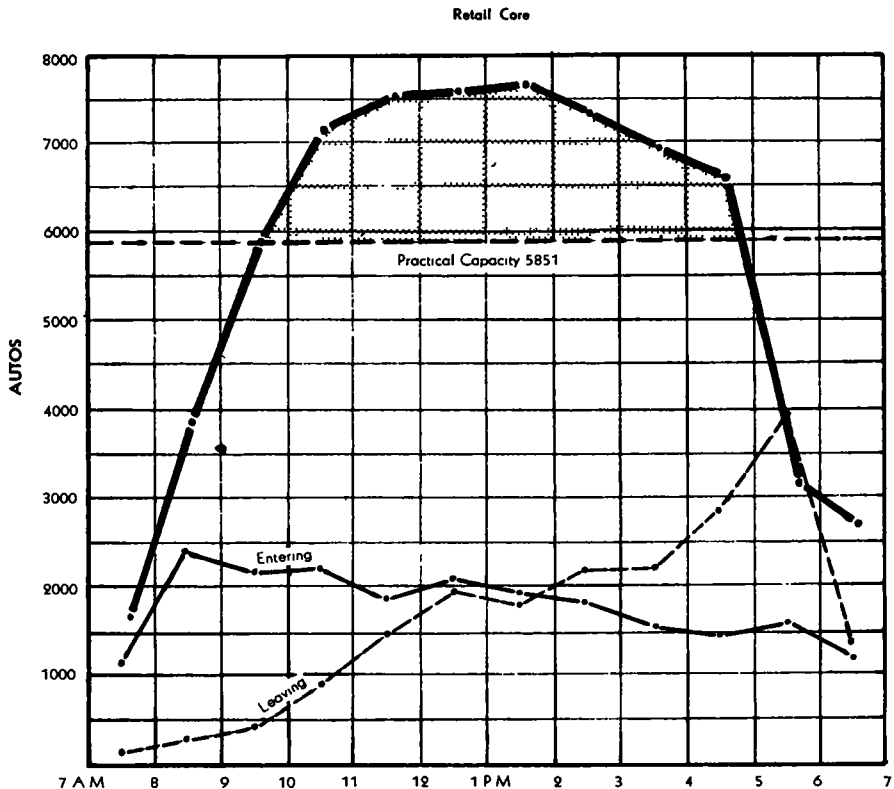
With a total of 14,972 street and off-street spaces available within the CBD, it is estimated that a practical capacity of 14,223 spaces exists.

This adjustment of 5 percent is made to account for in and out movements and motorists' lack of information on where available spaces exist. The practical capacity of 14,223, after making this adjustment, compares with a maximum demand of 14,100 in the middle of the average weekday. In other words, the practical parking capacity throughout the entire Rochester CBD is just 1 percent over the present average daily parking demand. The hourly accumulation of autos in the CBD is shown in Figure 12.

In determining parking demands, each of the 12 zones in the CBD was analyzed individually; the actual parking supply was determined by field inventory and an individual accumulation developed for that zone by tabulating traffic entering and leaving the area hourly.

Parking Demand—Retail Core

The principal traffic generator in downtown Rochester is the retail core area—100



Before
7

Entering Retail Core	1124	2413	2215	2310	1773	2029	1968	1830	1538	1470	1633	1287	Total	21590
Leaving Retail Core	76	210	315	852	1496	1961	1917	2063	2100	2716	3976	1440		19122
Accumulation	637	1685	3888	5788	7246	7591	7642	7409	6847	5601	3958	3105		

Figure 13. Hourly accumulation of autos in downtown Rochester.

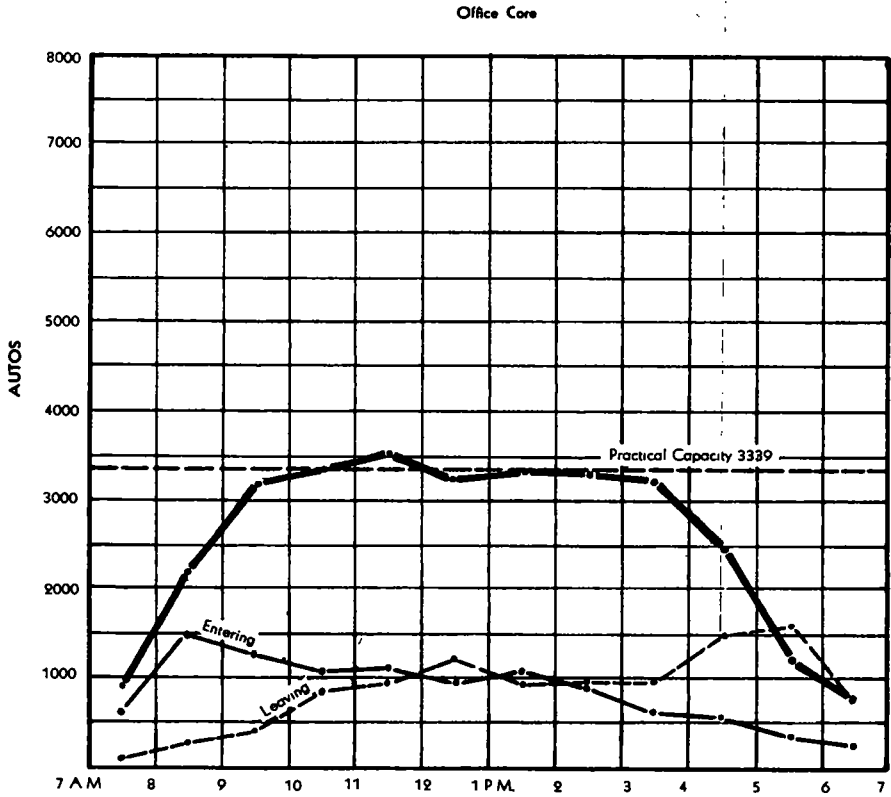
acres bounded by Andrews, Gibbs, Court and Water Streets. This area attracts 21,590 autos during daytime hours on an average weekday.

Shopping in downtown stores is the primary purpose of 42 percent of retail core parkers. Visiting other business establishments was the stated purpose of another 33 percent.

In early afternoon, 7,642 cars have accumulated in the retail core (Fig. 13). This maximum accumulation is 1,799 vehicles more than the practical capacity of parking spaces within the retail core. The two zones north of Main Street have surplus parking spaces, whereas the two zones south of Main Street have deficiencies. The Midtown Plaza, now being constructed in the southeast quadrant, will overcome this deficiency, as well as some of the deficiency in the southwest quadrant.

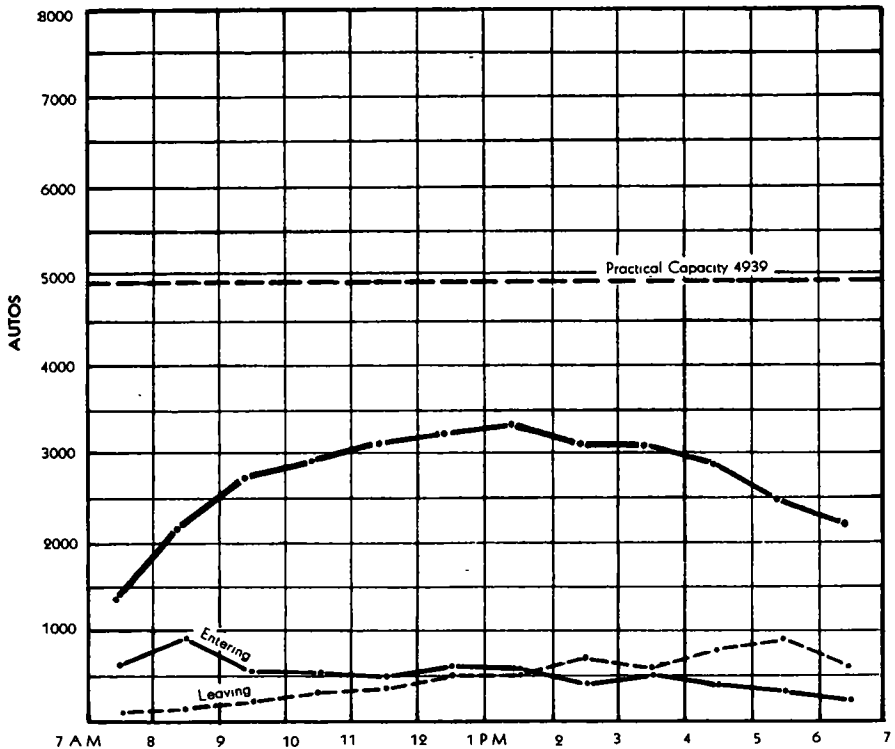
Parking Demand—Office Core

With the recent addition of 375 spaces at the new Civic Center garage, there is now a slight surplus of parking space in the office core. Altogether, the office core area is in reasonably good balance—a practical capacity of 3,434 spaces to accommodate



	7 A M	8	9	10	11	12	1 P M	2	3	4	5	6	7	Total
Before	7													
Entering Office Core	632	1514	1281	1032	1054	949	1039	814	761	657	352	225	10310	10310
Leaving Office Core	105	210	381	775	954	1184	972	848	900	1496	1559	648	10032	10032
Accumulation	329	856	2160	3060	3317	3417	3182	3249	3215	3076	2237	1030	607	

Figure 14. Hourly accumulation of autos in downtown Rochester.



	Before 7	8	9	10	11	12	1 PM	2	3	4	5	6	7	Total
Entering Perimeter	626	942	571	517	507	557	521	456	538	517	506	332		6590
Leaving Perimeter	30	58	194	294	341	471	474	657	545	719	902	591		5276
Accumulation	830	1426	2310	2687	2910	3076	3162	3209	3008	3001	2799	2403	2144	

Figure 15. Hourly accumulation of autos in downtown Rochester.

the peak daily demand of 3,417 vehicles. Hourly accumulation of autos in the office core is shown in Figure 14.

Parking Demand—Remainder of CBD

There are 4,939 spaces to accommodate the peak of 3,209 vehicles occurring on an average weekday. This leaves a surplus of 1,730 spaces among these seven zones outside the more concentrated core areas. The hourly accumulation of autos in this perimeter is shown in Figure 15.

Summary of Parking Requirements—1960 to 1975

Summarizing this current picture, it is concluded that Rochester is amply supplied with downtown parking space. Facilities now available are sufficient to meet parking demands throughout the CBD as a whole. Deficiencies exist in some downtown sections, particularly in the retail core, as given in Table 14 and shown in Figure 16. However, the completion of the Midtown Plaza and Civic Center parking structures will overcome these present deficiencies. With few localized exceptions, Rochester will then have

TABLE 14
PARKING SUPPLY AND DEMAND, 1960

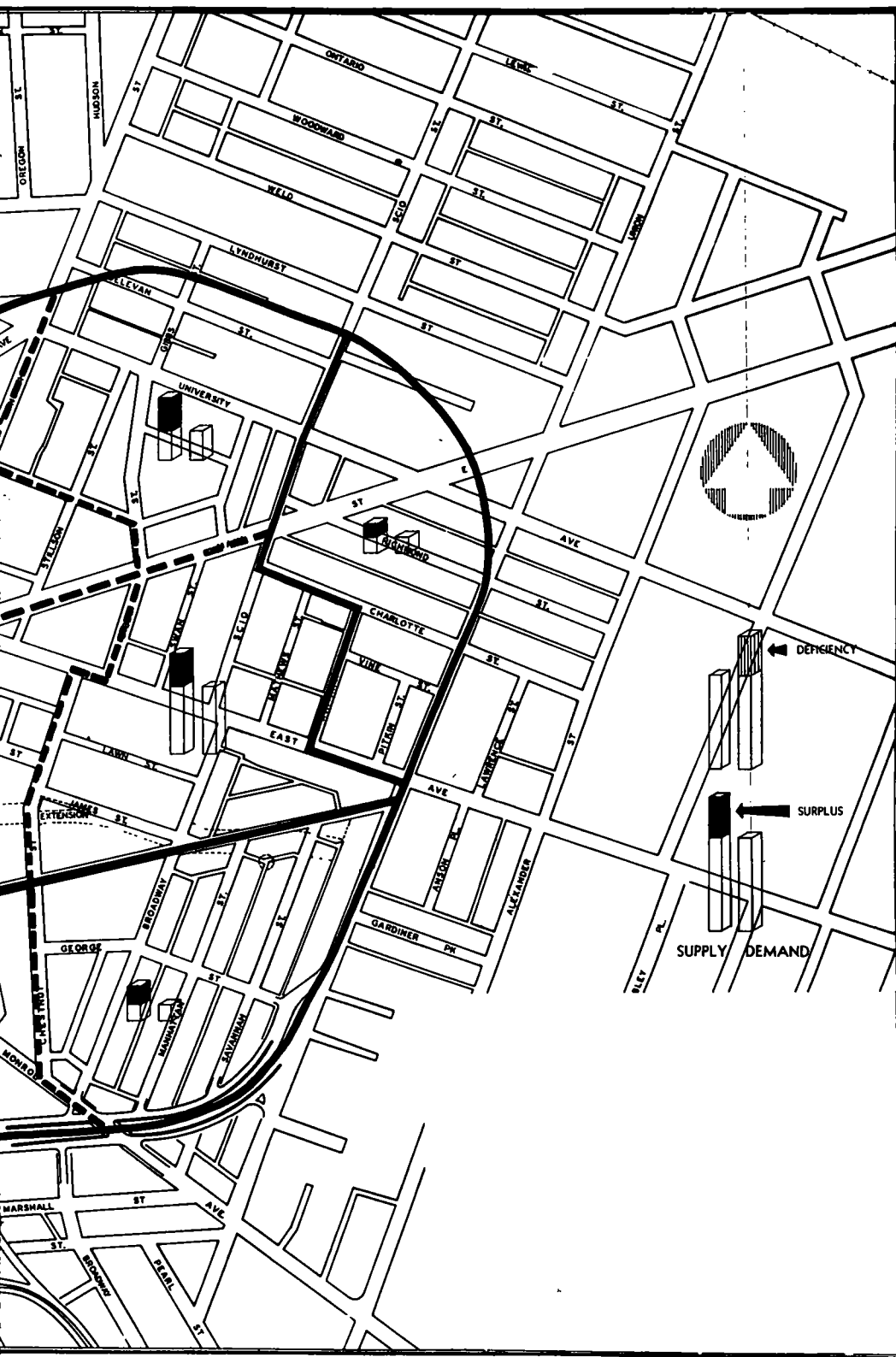
CBD Area	Zone	Daily Auto Trips				Max. Accum	Avail. Spaces	Parking Spaces		Surplus or Deficient
		Shopping	Business	Other	Total			Excess	Deficient	
Retail core	1013	1,810	1,150	1,160	4,120	1,460	1,470	10	-	-
	1014	3,390	1,420	610	5,420	1,920	2,314	394	-	-
	1017	2,280	2,550	2,290	7,120	2,520	689	-	1,831	-
	1018	1,560	1,900	1,470	4,930	1,750	1,378	-	372	-
	Total	9,040	7,020	5,530	21,590	7,650	5,851	404	2,203	-1,799
Office core	1021	820	1,880	680	3,380	1,060	1,245	185	-	-
	1022	320	1,250	1,190	2,760	870	1,082	212	-	-
	1023	-	3,730	440	4,170	1,310	1,107	-	203	-
	Total	1,140	6,860	2,310	10,310	3,240	3,434	397	203	+ 194
Remainder	1012	240	470	160	870	420	419	-	1	-
	1015	150	340	390	880	430	928	498	-	-
	1016	300	1,120	630	2,050	1,000	1,498	498	-	-
	1019	160	450	450	1,060	520	452	-	68	-
	1051	90	150	220	460	220	427	207	-	-
	1061	100	330	370	800	390	699	309	-	-
	1062	60	70	340	470	230	516	286	-	-
	Total	1,100	2,930	2,560	6,590	3,210	4,939	1,798	69	+1,729
All	All	11,280	16,810	10,400	38,490	14,100	14,224	2,599	2,475	+ 124

TABLE 15
PARKING SUPPLY AND DEMAND, 1975

CBD Area	Zone	Daily Auto Trips	Max. Accum	Avail. Spaces	Parking Spaces		Surplus or Defic
					Excess	Defic.	
Retail core	1013	4,109	1,455	1,410	-	45	-
	1014	5,241	1,855	1,995	140	-	-
	1017	8,448	2,991	2,782	-	209	-
	1018	5,063	1,792	1,335	-	457	-
	Total	22,861	8,093	7,522	140	711	-571
Office core	1021	3,675	1,158	1,202	44	-	-
	1022	4,224	1,331	1,158	-	173	-
	1023	6,603	2,080	1,780	-	300	-
	Total	14,502	4,569	4,140	44	473	-429
Remainder	1012	1,117	543	365	-	178	-
	1015	694	337	723	386	-	-
	1016	1,873	910	1,336	426	-	-
	1019	1,063	517	411	-	106	-
	1051	252	122	407	285	-	-
	1061	771	375	671	296	-	-
	1062	617	300	506	206	-	-
	Total	6,387	3,104	4,419	1,599	284	+1,315
All	43,750	15,766	16,061	1,783	1,468	+ 315	



Figure 16. Parking



supply and demand.

caught up with the demand for parking space for the next few years, at least.

Even with the Midtown Plaza garage in operation, it is estimated that a deficiency of 571 spaces will exist in the retail core by 1975. The parking supply and demand for each section of the retail and office cores, as well as the perimeter area, are given in Table 15. This tabulation indicates that the principal deficiencies will occur in the southwest quadrant of the retail core, the only part of the central shopping district which does not have a municipal off-street garage.

In its generalized land-use plans, the City Planning Commission has tentatively designated four locations for proposed garages. Two, or three at most, of these should be sufficient to fully take care of the city's future needs. It is quite unlikely, however, that any such need would exist for at least five years hence. More likely, these projected parking structures are 10 to 12 years away.

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