

started, the date completed, the man-hr consumed, the total cost, and the unit cost. In arriving at the unit cost for any particular part of the survey its total cost was divided by the number of units involved.

For example, the total cost of sampling including dwelling units, trucks, and taxis was \$7,899.63 and the total number of samples selected was 16,246 giving a unit cost of \$0.49 per sample. In a similar manner the unit cost for dwelling unit, truck, and taxi sampling can be obtained from the table as \$0.58, \$0.21, and \$0.49 per sample respectively.

Much time can be saved and costs reduced by planning the several stages of the work in a

manner designed to keep the data flowing in the proper order for analysis. If started properly it is possible to carry on several elements of the work simultaneously and makes possible the reduction of forces as phases of the work are completed. The personnel chart (Fig. 1) illustrates how we attempted to do this.

All phases of the origin and destination study have been completed and the report, in three volumes, is now being printed.

The analysis of the data from the parking survey is nearing completion and the report is being prepared in the rough as the data become available from the tabulations.

## PROVIDENCE CENTRAL BUSINESS DISTRICT PARKING SURVEY<sup>1</sup>

By LESTER P. MANNING

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### SYNOPSIS

The findings from a parking survey consisting of the following correlated studies are presented:

1. Inventory of existing facilities.
2. Cordon count of vehicles.
3. Parking Interviews at curb and lot.

The feasibility of conducting several distinct operations of the survey during different periods by a limited force of field men was indicated on the basis of a 2 percent statistical error.

The demand for parking spaces is treated in terms of destination desire, and destination desire is analyzed quantitatively in terms of number of trips, and space-hours of parking required for weekday and peak hour.

Significant findings with respect to the parking problem in Providence are recited as follows:

1. 26,000 passenger cars, or 54 percent of the total number, could by-pass the central business district between 8:00 A.M. and 5:00 P.M. if proper by-pass facilities were developed.
2. 500 additional parking spaces are needed to serve present (1945) demands in or near the heart of the central business district.
3. Because of high land values in the heart of the central business district the solution seems to be the expansion of existing facilities and the development of new ones on the fringe of this critical area.
4. An estimated 180-250 additional spaces will be needed each year to keep pace with the demand.
5. It should be possible to open up new lots within suitable walking distances to destinations in vacant areas or where obsolete buildings can be razed.
6. Ratios of floor areas of traffic generators to parking spaces as derived in the parking survey should be used in computing capacities required in additional parking facilities.

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<sup>1</sup>This paper is a brief of parts of a comprehensive report of a survey on parking bearing the same title and published by the Rhode Island Department of Public Works. The section entitled "Demand for Parking Facilities," treating of demand and deficiency in terms of destination is a unique analysis in the field of parking and is included in full.

During October and November, 1945, a comprehensive survey was made of the parking habits of passenger car drivers in the central business district of Providence, Rhode Island. This survey, which supplements "A Traffic Survey of the Providence Metropolitan Area" also made in 1945, was undertaken by the Highway Planning Survey of the Division of Roads and Bridges, Rhode Island Department of Public Works in cooperation with the Public Roads Administration.

This paper treats of the methods employed in the survey and devotes its major emphasis to the demand for parking facilities and their deficiencies as translated into terms of destination desire.

#### SCOPE OF STUDY

*Inventory of Existing Facilities:* The inventory of curb spaces obtained the location, number of legal parking spaces, and posted allowable parking time; of parking lots the location, number of parking spaces, type of ownership, whether public or private, and parking rates; and of garages, the location, number of parking spaces, and the parking rates.

*Cordon Count of Vehicles:* Traffic counts were taken on all streets leading into or from the central business area, classifying traffic for half-hour periods between 8 a.m. and 6 p.m. for direction of travel and for type of vehicle, that is, passenger car, truck, bus or taxicab.

*Parking Interviews at Curb and Lot:* The use of the parking facilities was obtained by interviewers who recorded, for each car which was parked, the time of arrival, the destination and home address of the driver, the purpose of the trip, and the time of departure from the parking space. Curb parking interviews were conducted between 8 a.m. and 4:30 p.m. since nearly all curb parking in the area is prohibited after 4:30 p.m. Interviewing at parking lots and garages continued until 5 p.m.

*Area of the Study:* Figure 1 shows the area studied, approximately 0.32 square miles, which is bounded by the New York, New Haven, and Hartford Railroad on the north, by parts of North and South Main Streets and the Providence River on the east, by Ship, Clifford, and Broad Streets on the south, and Claverick, Franklin, and Jackson Streets on the West. Several off-street parking facilities outside these boundaries on South Water

Street and Atwells Avenue were also included as important in serving the area.

This is the area where traffic is most congested and the area where the center of shopping and business activity lies. The area in which vehicles are parked is somewhat larger than this, but the additional area was not included because there were few or no shopping or business interests which would attract traffic to those blocks.

#### ACCURACY OF STUDY

The completeness with which the study was made may be expressed in the following comparison:

26,333	passenger cars moving through the central business district without stopping to park,
18,951	passenger cars leaving parking spaces during the day,

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Total 45,284 estimated number of passenger cars leaving the central business district.

Since the actual number of passenger cars leaving the district was 44,513, according to the cordon counts, there is a discrepancy of 771 cars, or less than 2 percent, between these figures. Considering the fact that the interviews and counts were made over a period of several days, this difference is relatively insignificant.

#### SUMMARY OF DATA OBTAINED

In addition to the usual analyses of location, capacity and usage the following additional analyses were developed:

1. The demand for parking places and deficiency
2. Parking habits as related to walking distance
3. The ratio of floor space to parking space.

#### TRAFFIC MOVEMENT AND PARKING VOLUMES

Figure 2 shows these volumes separately for passenger cars and commercial vehicles for each street in each direction of movement. For example, during the period of study between 8:00 a.m. and 6:00 p.m. 5,819 passenger cars and 1,262 commercial vehicles entered the district on Gaspee Street. During the same time 5,624 passenger cars and 1,415 commercial vehicles left on the same street.

*Passenger Cars:* The accumulation of traffic within the cordon area is shown in the series spaces at 8:00 a.m. when the study started. This increased to a peak of 7,897 vehicles



Figure 1. Location and Parking Capacity of Garages, Lots and Curbs, Providence Central Business District

of bars on Figure 2 for each hour period. There were 2,644 cars parked at parking between 2:00 and 3:00 p.m. The number of vehicles in the downtown area in any half-hour

period between 9:30 a.m. and 5:00 p.m. was within 75 percent of this volume and within the area each day between 8:a.m. and 6:00 p.m. This was 19 percent of the total number

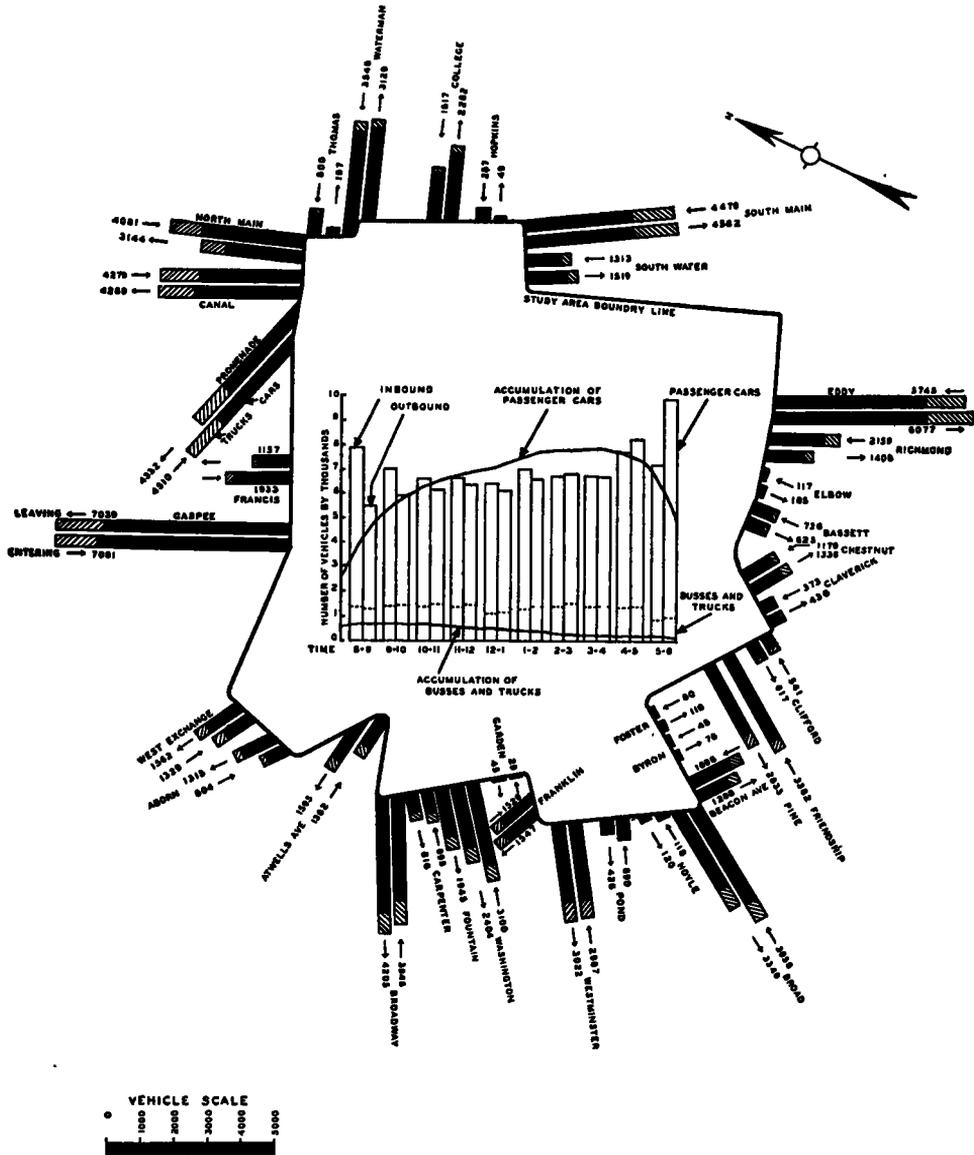


Figure 2. Providence Central Business District. Number of Vehicles Entering and Leaving the Central Business District on a Weekday between 8:00 A.M. and 6:00 P.M.

at least 90 percent of the peak at any time between 12 noon and 5:00 p.m.

**Commercial Vehicles:** An average of 13,468 commercial vehicles was recorded entering

of motor vehicles that entered the area during that time. The greatest number, in any half-hour period, 769, entered between 9:00 and 9:30 a.m. and the flow during the day was

relatively uniform, dropping below 65 percent of the peak period only between 5:30 p.m. and 6:00 p.m. when there were 397 or slightly less than 52 percent of the peak half hour.

#### *Through Traffic:*

49,297 Inbound passenger cars were counted at cordon between 8 a.m. and 5 p.m.

22,964 Passenger cars were parked between 8 a.m. and 5 p.m.

#### *Difference*

26,333 Passenger cars moving into the area without stopping to park in the area.

It is significant to note that these 26,333 cars (53.4 percent of all passenger cars entering the area) drove through without stopping to park. Conversely it means that 46 percent of the cars entering the area wanted to park in it.

#### DEMAND FOR PARKING FACILITIES

The demand for parking spaces has been shown on Figures 3 and 4 for weekday parking, peak hour parking, and space hours for each block or group of blocks. This demand has been shown in terms of destinations since these determine where the car drivers would have parked if facilities had been available. The extent to which the bar showing demand is greater than the one showing usage indicates the degree of inadequacy of parking spaces. These demand bars also show the purpose of the trip with destinations in each block.

These charts are based on existing conditions of transit service, street layouts, and parking facilities. It is difficult to foretell what effect improvement in transit service, new or improved "Through" or "Limited access" type streets, and additional off street parking facilities will have.

The figures in the report show the demand with respect to specific locations. For example, in Figure 3 in the blocks bounded by Exchange, Westminster, Dorrance Streets and Exchange Place, 825 vehicles were parked during the day but 2,108 auto drivers had destinations in this block and presumably would have parked in that block if it had been possible. This demand is shown for each

block in Tables 4, 4a, 4b, and 4c in section XI, of the report.<sup>2</sup>

For the central business district as whole, evidence of existing demand is in the parking of 2,362 cars every day in prohibited spaces.

Overtime parking also shows a demand for more space with at least 80 cars in the 5-min. spaces, 415 cars in the 15-min. spaces, 830 cars in the 30-min. spaces, and 2,718 cars in the 1-hr. spaces.

#### PARKING IN THE CRITICAL AREA

A block-by-block study of Figure 4 indicates what might loosely be termed the critical parking area in the central business district where the demand for parking considerably exceeds the supply of available parking space. This is the area from Market Square on the east to Mathewson Street on the west and from Pine Street on the south to the Mall and Fountain Street on the north. This area is shown in Figure 5 and is not large. All other blocks or block groups in the central business district, except five, had parking facilities with capacity equal to or greater than the all-day demand. Three of these five exceptions were adjacent to the critical area and two were several blocks removed. The excess demand in each case, however, was not large and was satisfied by the surplus capacity in adjacent blocks. Table 1 shows the usage of parking space compared with the availability of space in the several parts of the central business district.

#### *Space Deficiency in the Core*

In this critical area there were 492 parking spaces, 363 at the curb and 129 in lots. Considering the element of time, these spaces provided (theoretically) 4,247 space-hours for parking use during the business day.

In this same period 3,551 cars were parked in these spaces, 3,106 at the curb, and 445 in lots, using a total of 2,785 space hours, which is 66 percent of those available. In addition to this, 935 cars were parked at prohibited places at the curb. Since the maximum possible or practical use undoubtedly was made of these facilities in this most crowded part of the district (as evidenced also by the

<sup>2</sup> Published by the Rhode Island Department of Public Works.

extent of illegal parking), it is obvious that a facility cannot as a rule be expected to approach its theoretical capacity. It is not possible to utilize existing spaces to better

to park the car in that space; also some space outside of truck loading zones is used by commercial vehicles.

The demand for space in this area was by

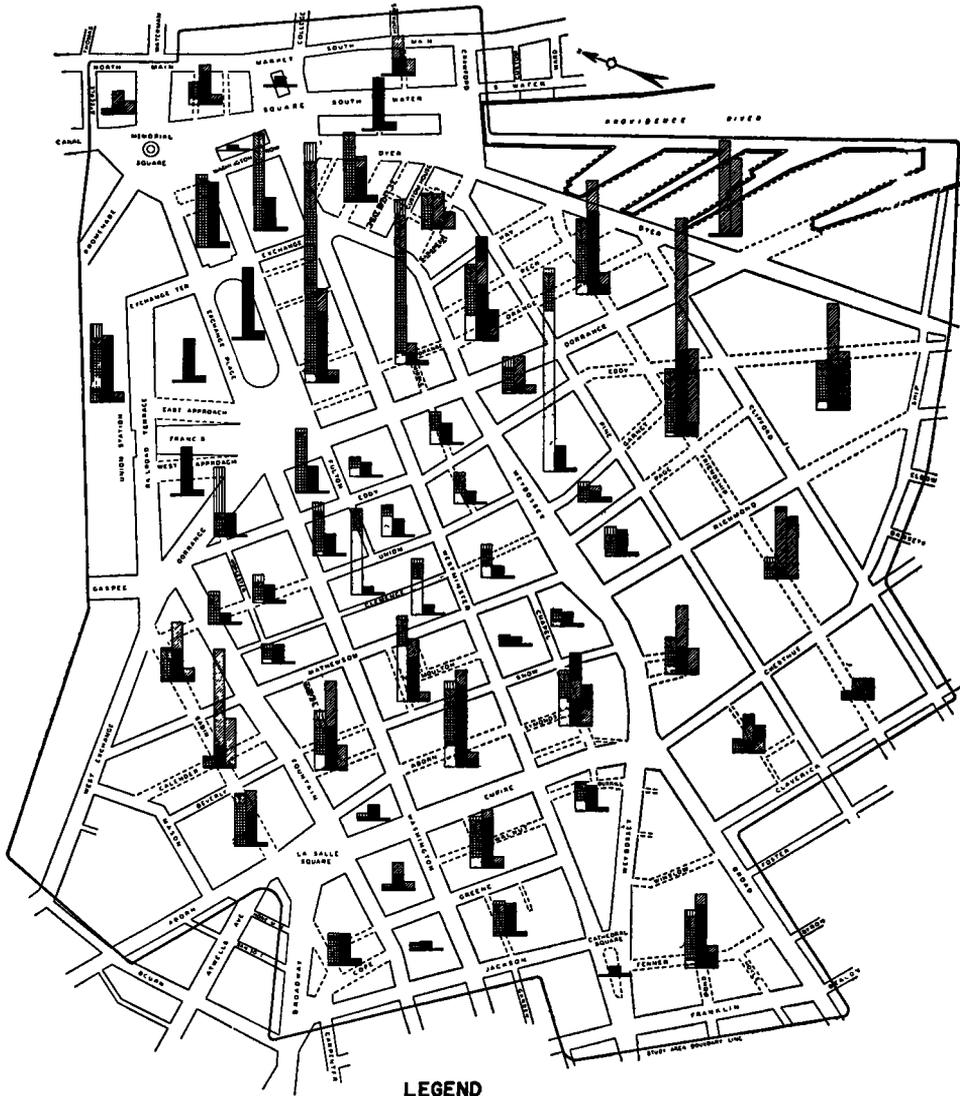


Figure 3. Weekday parking—Providence Central Business District, The Number of Destinations by Trip Purpose, Cars Parked by Kind of Parking, and Kind of Parking Facilities Available, by Block or Block Group, from 8:00 A.M. to 5:00 P.M.

advantage because of the time it takes to make a turn-over in usage of a space—the time to leave the space, the time it is empty until a car to be parked finds the space and the time

12,501 drivers requiring 22,623 space. hours, approximately 50 percent of the drivers who parked in the entire business district. Nearly 75 percent of the destinations to this area were

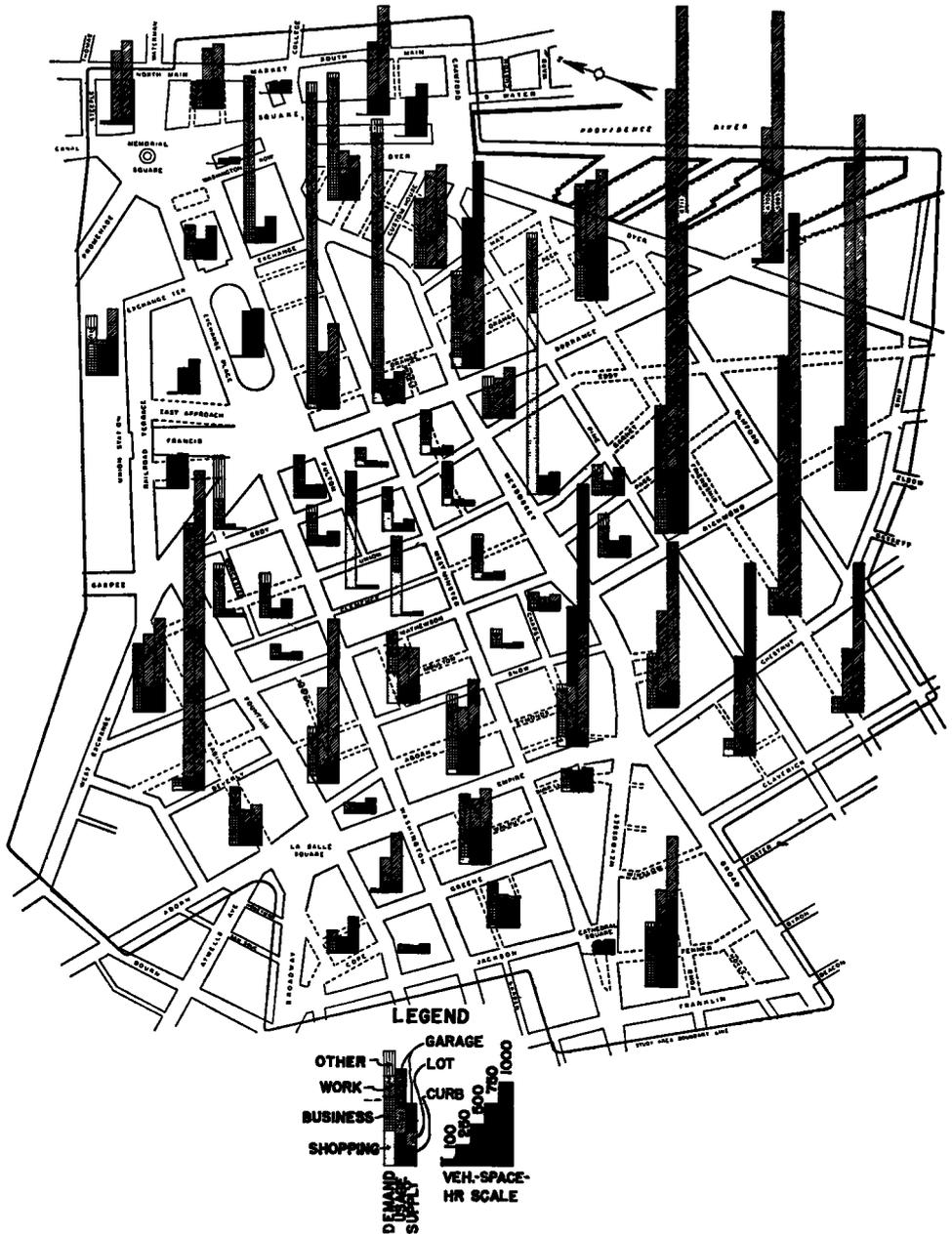


Figure 4. Space Hours—Weekday Parking—Providence Central Business District. The Number of Space Hours Needed for Destinations, of Each Trip Purpose Used by Parked Cars and Available for Parking in Each Block or Block Group from 8:00 to 5:00 P.M.

for shopping or business and the average distance walked by the drivers with these destinations was 636 feet as against an average distance walked of 495 feet for shopping and

business trips in the entire downtown business district.

The demand for space in this area shows a practical deficiency of 19,838 space-hours



Figure 5. Space Hours—Weekday Parking—Critical Area and Adjacent Blocks. Excess Demand for Parking Space Hours of Destinations Over Parking Space Hours Available in the Critical or Deficient Area from 8:00 A.M. to 5:00 P.M.

(22,623 minus 2,785), greatly in excess of the theoretical 4,247 space-hours available.

The blocks in the ring one block further out and surrounding the critical area or core (see Figure 5) have 2,473 spaces, 631 at the curb, 1,692 in lots, and 150 in garages, providing (theoretically) 21,942 space hours. These spaces were used by 8,732 drivers, 4,918 at the curb, 3,607 in lots, and 207 in garages

using a total of 16,884 space hours, or 77 percent of those available. In addition, 538 cars were parked at prohibited spaces. The greater degree of usage of space in the ring was undoubtedly due to the lighter restrictions on curb parking. (In the core parking for 1 hr. is permitted at 47 percent of the spaces, while in the adjacent ring it is permitted at 90 percent of the spaces).

The demand for space by drivers with destinations in this area (in addition to the excess or overflow from the core) was 8,203 space hours, 8,681 space hours less than the practical capacity of 16,884 space hours.

#### *Space Deficiency in the Core and Adjacent Ring*

The data on usage and on illegal parking in the core and adjacent ring make it clear that the space now available there cannot be used to a greater extent than at present; that is, their practical capacity is no greater than their present usage, or from 66 to 77 percent.

TABLE 1  
SUMMARY OF PARKING SPACES AND USAGE

Location	Number		Space hours		Per- cent used
	Spa- ces	Users <sup>a</sup>	Avail- able	Used <sup>a</sup>	
<b>Critical or core area</b>					
Curb	363	3,106	3,086	1,837	59.5
Lots	129	445	1,161	948	81.7
Garages	—	—	—	—	—
Totals . . .	492	3,551	4,247	2,785	65.6
<b>Adjacent ring of blocks</b>					
Curb	631	4,918	5,364	3,984	74.3
Lots	1,692	3,607	15,228	11,956	78.4
Garages	150	207	1,350	944	70.0
Totals . . .	2,473	8,732	21,942	16,884	76.9
<b>Total core and ring</b>	2,965	12,283	26,189	19,669	75.1
<b>Central business district</b>					
Curb	2,070	13,988	17,595	12,123	69.0
Lots	5,144	8,443	46,296	34,471	74.5
Garages	875	815	7,875	3,945	50.1
Totals	8,089	23,246	71,766	50,539	70.5

<sup>a</sup> The amount of illegal parking at the curb is not included

The ring adjacent to the core has a practical capacity of 16,884 space hours. On the presumption that drivers with destinations in the core should be able to park either in the core or within the adjacent ring, and on the further presumption that persons with destinations in that ring (or further out) should park entirely outside that ring, there remains a deficiency of 2,954 space hours (19,838 minus 16,884).

These 2,954 space hours should be provided by additional spaces in the core of the adjacent ring and, since no more curb space is available, these space hours must be provided by additional lots or garages. Such facilities should be expected to achieve at least as high a degree of practical capacity as the lots or

garages now in operation. It is probable that careful consideration in the location and design of facilities may reduce the time taken to handle cars and hence increase the practical capacity of new facilities. Assuming a practical occupancy of 75 percent, these 2,954 actually needed space hours therefore require the provision of 3,939 space hours which, for a nine-hour day, mean the provision of 438 additional spaces in the core or adjacent ring.

The blocks in the ring are from 600 ft. to 1,300 ft. from the center of the area, but the destinations are scattered through the area, and any parking spaces developed in the ring will still be 600 ft. or more from many destinations. Fifty-seven percent of the drivers having destinations in the core now have to walk 400 ft. or more after parking. New facilities must be developed no further out than the ring, to meet the requirements of drivers having destinations in the core.

The calculated deficiency of 438 spaces is based upon the traffic volumes existent at the time of the study, upon curb restrictions then in effect, and upon the off-street facilities then available. Since the study was completed the traffic volume has increased over 10 percent and will undoubtedly continue to rise rapidly. The increase in traffic and in congestion in the downtown area may soon cause the imposition of more severe restrictions on curb parking.

Provision of 500 additional parking spaces in the core area or in the adjacent ring would have comfortably met the needs of those desiring to park at the time of the survey. However, in the light of present trends in other large cities towards the complete elimination of parking at the curb in congested areas, it is obvious that provision may need to be made for replacing part at least of present curb parking spaces with sufficient off-street areas. In addition, some of the present core area parking lots are to be used as sites for new building construction. This would create additional parking demand and at the same time would reduce the supply of spaces available for parking. Thus the figure of 500 spaces will necessarily have to be increased in proportion to changing needs regardless of the cause. Therefore, this figure must be considered as meeting immediate needs as existing at the time of the survey and does not represent the projected or future parking

needs. The balance of the area in the central business district has 5,124 spaces, 1,076 at the curb, 3,323 in lots, and 725 in garages, providing (theoretically) 45,577 space-hours. Applying factors based upon the performance in the core and its adjacent ring, with consideration for the easier curb restrictions in the outer area and for the nature of the demand, the practical capacity of the outer area and in the business district are given in Table 2.

The demand for space in the business district is for 52,010 space-hours, indicating a present surplus of 4,653 space-hours. This surplus space, however, is so remote from the center of the business district (as much as 2,200 ft. distant) and in some cases so poor in the service provided, that it cannot be con-

TABLE 2  
OUTER AREA CAPACITY

	Theoretical capacity Space hours	Percent occupancy	Practical capacity Space hours
Curbs ..	9,145	× 0.73 =	6,676
Lots ...	29,907	× 0.85 =	25,420
Garages	6,525	× 0.75 =	4,898
	45,577		36,994

BUSINESS DISTRICT CAPACITY

Curbs .....	12,497 space hours
Lots .....	38,324 space hours
Garages .....	5,842 space hours
	56,663

sidered as available to meet the present demand, although it may be improved as the city grows and as traffic congestion forces less and less use of curb space.

PARKING HABITS AS RELATED TO WALKING DISTANCE

The interviews obtained from persons parking cars in the downtown area make it possible to study parking habits under existing conditions—and to make estimates, for example, for provision of adequate parking capacity for different trip purposes in different areas by recognizing, in addition to time-space requirements, how far people will walk after parking, as related to trip purpose.

Actually many of the most desirable lots in the center of the city were filled to more than capacity by crowding cars in the drive-

ways. Nearly all of the surplus capacity was in the less desirable lots near the outer edge of the area, which required a longer walking distance by users.

The present walking practice was analyzed in terms of the composite parker and is presented in Table 3.

RATIO OF FLOOR SPACE TO PARKING SPACE

The summary as developed from the Providence Survey shows ratios of floor area of a few large traffic generators to the parking spaces needed by car drivers whose destinations were in those generators and is given in Table 4.

TABLE 3  
DISTANCE FROM PARKING PLACE TO DESTINATION

Distance in feet	Number of cars	Percent
Less than 100	5,502	21.5
100-399	8,951	35.0
400-799	4,696	18.3
800-1199	2,966	11.6
1200-1599	1,332	5.2
1600-1999	652	2.5
2000-2399	264	1.0
2400-and over	197	0.8
Unknown	1,048	4.1
Total ...	25,608	100.0

TABLE 4  
RATIO OF GENERATOR FLOOR SPACE TO PARKING SPACE

Building usage	One-parking space for each
Department Stores	1,350 sq ft floor space
Hotel	2,000 sq ft floor space
City Hall—Offices	800 sq ft floor space
Offices and Bank	1,150 sq ft floor space
Small Retail and Drug Stores	2,600 sq ft floor space

CONCLUSIONS

1. 26,000 Passenger Cars Could be Bypassed

Congestion could be reduced materially in the central business district by the development of expressways or limited access type streets skirting the district to carry the large volume of traffic which now goes through the district to points beyond it. About 54 percent of all passenger cars entering the district during the business day do not stop to park. This represents a volume of approximately 26,000 vehicles which could be bypassed in nine-hours.

In the nine-hour period this averages about

2,900 cars an hour, which is not large. However, during the late afternoon peak traffic hour a volume of slightly over 5,500 cars could be bypassed.

### 2. 500 Parking Spaces are Needed Now—1945

At least 500 additional parking spaces are needed now in or near the core or center of the central business district to serve present (1945) demands in that area adequately. This is emphasized by the fact that two thousand four hundred persons each day prefer to park illegally in the central business district rather than to be inconvenienced by parking in spaces at too great a distance, or at a price not considered reasonable.

This estimated future need for 500 additional core area parking spaces will be subject to future increases due to present critical area parking lots becoming sites for new buildings and elimination of some existing curb parking areas.

### 3. Fringe Facilities Needed

Figure 5 shows the heart of the central business district where the deficiency of parking spaces is critical. Because of high land values in this area the solution seems to be the expansion of existing facilities and the development of new ones on the fringe of this critical area. Although the center of this critical area is approximately 900 feet from its edge, many of the destinations are closer. It is not unreasonable to expect people to walk some distance from parking place to destination. At the present time 57 percent of all parkers in the entire central business district walk less than 400 feet to their destination, but 57 percent of the persons with destinations in the core of the business district walk more than 400 feet after parking. There are 12,501 destinations in this core area, about half of all the parkers in the central business district.

### 4. Parking Spaces Needed in the Future

An estimated 180-250 additional spaces will be needed each year to keep pace with the demand. This need is based on the assumption that even under normal conditions traffic volumes will increase 3 percent a year on the average and that half of this will represent potential parkers (50 percent in (1)

above). This future need for the parking of cars in the central business district is dependent to a large extent on the continued use of the private motor vehicle and on the economic position of persons who own and operate them. Assuming the continued use of the automobile and the development of through-ways, limited access type streets and other street improvements, it is reasonable to expect that there will be an increase in the number of persons coming to the district, because the improvement in traffic conditions will make driving to the downtown area much more attractive.

### 5. Off-street Facilities Needed

The capacity of existing parking lots cannot be increased but it should be possible to open up new lots in vacant areas or where obsolete buildings can be razed. Parking lots in strategic locations might be considered as sites for the construction of the open-deck type of parking garage. Garages of this type of moderate capacity (200-400 spaces) have proved successful in some cities when properly located and when designed to permit easy access to the street.

### 6. Capacity of Facilities Should be Planned

The ratios of the floor area of traffic generators to the parking spaces needed by car drivers whose destinations are in those generators have a place in computing the capacity which should be planned for a parking facility in a given location, taking into consideration the usage of buildings in areas adjacent to the proposed location.

### 7. Enforcement will Help

Although the physical extent of the length of curb space available for parking is limited, it is possible to increase the use of the existing spaces by strict and impartial enforcement of parking regulations and by changing the time restrictions where necessary. At the present time 49.3 percent of existing curb space is used for parking, with space for 2,070 cars at any one time. The remaining space is used for crosswalks, public entrances, fire hydrants, bus or streetcar loading zones, and for truck loading or delivery.

### 8. Continuation of Studies

There is no way of measuring the demand for parking spaces which will be generated by the improvement of streets and parking facilities. It would be desirable, therefore, to repeat this type of survey at some future time not too far distant following the development or improvement of some parking facilities to measure the effect of the use of that improve-

ment by automobile drivers. It is probable that a sample can be selected or that an abbreviated study can be made which will indicate the effect of such improvements. It is only by continual observation of travel and parking habits that the results of the studies, which have been made, can be kept up-to-date and revised, if necessary, to reflect changing conditions.

## DISCUSSION

MR. SAMUEL WOLF, *Public Roads Administration*: In respect to utilization of available parking spaces, the "critical area" can be regarded as a parasite upon the facilities of surrounding areas. It is also possible to extend this term to parcels within the area itself. That sufficient provision be required to satisfy the respective demands constitutes an approach to effectuation of a program and leads up to determination of the measure of responsibility for which the Report offers ratios of generator floor space to parking space for several categories of land and building utilization.

Examination into these categories proves that department stores vary in quality and generator-capacity. Hotels, offices and banks are subject to similar criticism and small retail stores and drug stores really do vary.

A view of the situation is not conducive to an easy mind on the subject of supplying an obvious need and action seems difficult from the point of view of a collective solution for groups. It seems possible to work out a method of financing such a facility through private means with due regard to usage by benefiting participants or cooperators plus an overall guarantee by such group members based upon some agreed upon ratios, perhaps set by a duly accepted arbitrator.

It is this ratio of responsibility that may scuttle a project because it involves land and building utilization and all the economics that go with the controversy of fixing assessment valuations. The properties having the highest assessed valuations for land do not possess comparable generator capacity but rather tend in the opposite direction. Department stores of the better class generate maximum demand figures but do not occupy the highest priced land as do the five and ten cent stores and other street-floor chain stores. However, conditions vary and the building

valuation has some compensating effect. There is need for investigation into the situation of basing the financing of a parking facility upon the assessment valuations.

A survey might be made of the building space available in the central business district and an estimate made of that possible under a restrictive zoning ordinance. The results should be related to the economic possibilities of the community. Also, due consideration should be given to overzoning of the central business district as was found to be the case in Providence in 1937. It could be found that a central business district might not grow appreciably in area but perhaps tend to contract excepting perhaps in the critical area. Hence, the supply of open lots available for parking should depend upon the rate of obsolescence and of new construction which makes competing buildings obsolesce rapidly to point of razing for the more economic operation of the land as a parking lot. This points to the necessity for a study covering building operations over a long period of years to be combined with the survey of space for determination of what open spaces may be expected to be available. From this can be concluded the need for a fixed parking facility or for dependence upon the opening of parking lots.

It will be found that the critical area is a compact comparatively small portion of the central district in which land ownership rarely changes and in which the structures are often modernized under stress of competition. Land in the critical area is exceptionally valuable and is rarely utilized as a parking lot. Such permanence deserves a permanent parking facility.

Hence it appears that a study of parking habits constitutes an approach to the problem and much is ahead for the effectuation of a solution.