

## REPORT OF PROJECT COMMITTEE ON PARKING

T. M. MATSON, *Chairman, Director, Bureau of Highway Traffic, Yale University*

S. T. ИТЦНСОК, *Secretary, Highway Economist,  
Public Roads Administration*

### SYNOPSIS

The direct-interview type of survey has produced data permitting the most complete analysis of parking problems yet attempted. Certain comparable information obtained for parking habits in various cities appears significant. In 12 cities the proportion of vehicles in the central business district which did not stop to park ranged between 55 and 69 percent. In six other cities this proportion was somewhat less. This travel characteristic is influenced considerably by conditions of route development, topography, location with respect to adjacent cities or economic characteristics.

Preliminary analyses of usage and availability of parking facilities indicate that efficiency in use seldom exceeds 80 percent because of the time necessary to make a turnover in the use of a space.

Limited information relative to types of traffic generators indicate that they may be grouped with respect to usage of parking space by persons whose destinations are the generators and the floor area of the generator. Significant ratios have been determined for retail outlets of mail order companies; suburban shopping centers; downtown department stores; office buildings; blocks of offices, banks, and retail stores; blocks of specialty retail stores; hotels; and blocks of 5 and 10 cent stores.

Additional data are desirable to appraise the results already obtained and to broaden the experiences obtained.

At the 25th annual meeting of the Highway Research Board, a statement of the parking problem was formulated<sup>1</sup>. It recognized that past efforts have been largely limited to the determination of parking practices in central business districts. It seemed desirable to direct future efforts not only to this same end, but also to develop the gross parking requirements for such areas and the characteristic requirements per unit area of different types of traffic generators.

To implement this work it was considered desirable for the Committee insofar as it was possible,

1. To continue the accumulation of information about the parking habits of drivers.
2. To continue to accumulate information about the characteristics of parking facilities in the central business district.
3. To study situations "before" and "after"

<sup>1</sup> Report of Committee on Parking, *Proceedings, Highway Research Board*, Vol. 25, p. 269.

the development of increased parking facilities.

4. To determine ratios of building floor areas of different types and parking spaces for those buildings so that information may be available for use in framing reasonable ordinances requiring provision of parking facilities.
5. To determine price schedules of existing facilities, their distance from the centers of activity in the central business district, and the assessed valuation of property.
6. To consider standards for the financial responsibility of owners and operators of parking facilities.
7. To develop and appraise methods used in making parking studies.

It has not been possible for the Committee to attempt all of this work or to exhaust the possibilities in any one phase, but the statement has expressed a program which, if developed in full, should contribute immeasurably to the knowledge needed to gain intelligent relief of local parking congestion.

The direct interview type of survey<sup>2</sup> which obtains parking information on every car parked in the central business district has been made in 12 cities<sup>3</sup> and will be started soon in five other cities.<sup>4</sup> Several members of the Committee have been associated one way or another with some of these studies.

It is from these studies that more information has been accumulated about the parking habits of drivers.

From the information obtained concerning the number of vehicles entering the central business district and the number of vehicles parked in the district, both at the curb and off the street, certain comparable information obtained for parking habits in various cities appears significant. In six cities where the direct interview method was used, approximately 62 percent of the vehicles entering the business district were found to be driving through the district without stopping to park. These cities and individual percentages were as follows:

	<i>Percent</i>
Portsmouth, N. H.....	69.2
Pawtucket, R. I.....	60.9
Providence, R. I.....	53.5
Nashville, Tenn.....	64.8
Atlanta, Ga.....	65.3
Baltimore, Md.....	58.6

In six cities where other data sources are available similiar proportions exist. These are:

	<i>Percent</i>
Staunton, Va.....	50.6
Springfield, Ohio.....	64.9
Glendale, Calif.....	62.5
Springfield, Mass.....	57.9
Oakland, Calif.....	63.1
New Orleans, La.....	56.4

<sup>1</sup>Lloyd M. Braff, *Studies of Parking Demand as Observed at Parking Terminals, Proceedings, the Highway Research Board, Vol. 25, p. 271.*

<sup>2</sup>Atlanta, Ga., Baltimore, Md., Nashville and Knoxville, Tenn., Portland, Oreg., New Haven, Conn., Portsmouth, N. H., Harrisburg, Penn., Providence and Pawtucket, R. I., and Seattle and Walla Walla, Wash.

<sup>4</sup>Portland, Me., Reading, Penn., Spokane, Wash., and Alexandria and Monroe, La.

In six other cities the proportion of traffic moving through is somewhat less. These are:

	<i>Percent</i>
Cudahy, Wisc.....	37.0
St. Paul, Minn.....	39.8
Pittsburgh, Pa.....	33.2
Los Angeles, Calif.....	43.5
Lima, Ohio .....	27.8
Minneapolis, Minn. ....	38.4

It is reasonable to expect that conditions of route development, topography, or location with respect to adjacent cities or economic characteristics of a city have a considerable effect on this travel characteristic.

These observations indicate that proper design of arterial streets in cities must consider not only the large number of vehicles whose origin or destination is in the central business district but also the large numbers which must be carried closely around it where the desired line of travel lies near or through it.

It is also significant to note in a few preliminary analyses of usage and availability of parking facilities in terms of space hours, that, even in areas where parking is congested and apparently used to capacity, efficiency in use seldom exceeds 80 percent of the theoretical space hours available. It takes time to remove a car from a parking space; it takes time for a would-be parker to find the vacant space; and it takes time to park a car in a vacant space. Proper design of a parking facility should therefore consider the time necessary to make a turn-over in the use of parking space in meeting any given parking volume requirements as well as the average length of time parked, trip purpose, and type of traffic generator.

From examination of reports received on the characteristics of more than 75 parking facilities and from dimensions of passenger cars now in use, certain basic elements can be reasonably specified for consideration in the design of parking facilities. Location in the "hollow" of a block or in "mid-block" is preferable, leaving the more desirable corners for business locations and at the same time keeping entrances and exits of parking facilities as far as possible from complicating traffic control at intersections.

The size and shape of the lot is usually limited by existing conditions and design

usually has to be accommodated within these limits. For driver parking, gross space of 235-250 sq ft per car should be allowed including necessary aisles and ramps. Lot areas should be constructed with an all-weather surface, stalls should be marked, and directional signs should indicate one-way movement in aisles.

Stalls may be 18 by 7 ft or 18 by 7 ft 6 in. where there are skilled attendants, but where drivers park their own cars the minimum stall should be no less than 18 by 8 ft.

TABLE 1

Number of generators studied	Type of generator	Floor area for each parking space required <sup>a</sup>
5	Retail outlets of mail order companies	175
7	Suburban shopping centers	320
6	Downtown department stores	1,040
8	Office buildings	1,000
11	Blocks of offices, banks, & retail stores	1,310
9	Blocks of specialty retail stores	1,410
3	Hotels	1,800
9	Blocks of 5 and 10 cent stores and downtown drug stores	3,010

<sup>a</sup> Floor area in stores represents selling space and does not include storage, offices, or employee facilities. Gross floor area is used for computation of ratios for offices, banks, and hotels.

In large areas the most efficient use of space is for parking to be at 90 deg to the aisles. Angle parking reduces the number of stalls in a given aisle length and requires one-way movement, but is easier for the parking of cars and can be used where full aisle widths are not possible.

Data on parking facilities have not been collected over a long enough period to compare "before" and "after" conditions.

A limited amount of information about building floor areas of different types of traffic generators and parking space requirements has been obtained from the parking studies in Providence, Pawtucket, and Atlanta and from questionnaires sent to committee members. It has been possible to group certain types of generators together and to study the

parking spaces provided or required by each in terms of floor area for each parking space. Table 1 summarizes these ratios in terms of present parking conditions.

More information of this type will be useful in framing ordinances requiring provision of parking facilities as part of the responsibility of property owners.

The Committee did not have an opportunity to study the price schedules of parking facilities with relation to centers of activity and to the assessed valuation of property. Neither did it have opportunity for studying the financial responsibility of owners and operators of parking facilities. These elements of the parking problem should be included in the future program of the Committee.

With respect to the development and appraisal of methods used in making parking studies, it appears that the direct interview type of survey has produced the most complete type of study yet attempted.<sup>5</sup> The details of this method were presented at the meeting last year and since that time it has been possible to analyze the data obtained in several cities. Analysis based on space-hour availability, usage, and demand for the whole business district or for individual blocks or groups of blocks has developed more definite measurements of the parking requirements, efficiency, and turn-over than have been available heretofore.

It is reasonable to expect that when the data obtained in these cities are studied in more detail, the method can be improved. The amount of work involved in such a study can probably be reduced by some method of sampling. With data available for all interviews in several cities it would be appropriate for the Committee to determine a method of sampling which would produce the same measurements under controlled conditions at reduced cost and in less time.

<sup>5</sup> *Proceedings*, Highway Research Board, Vol. 25, p. 271. See also pp. 422-441, this volume.

## DISCUSSION

MR. R. E. JORGENSEN, *Connecticut State Highway Department*: Since the proportion of through traffic is determined to be the difference between the volume of entering vehicles and those which parked, it would

seem to include cruising vehicles and vehicles being serviced in garages and filling stations. Hence the vehicles in their volume as expressed are not all potential users of a bypass around the central business district.

MR. HITCHCOCK: That is true. The expression "vehicles which do not stop to park" should not be interpreted to mean through traffic in the business district. It does include cruising vehicles and vehicles being serviced or repaired. Determination of the volume of cruising vehicles would be difficult but the volume of vehicles in these two classes

is small. A proportion of this volume should be considered as eligible for bypass routes. Even with bypass routes available, some traffic undoubtedly will continue to travel through the central business district. These percentages do show, however, what proportions of the congestion is caused by moving vehicles and those who park.

## STATE GENERAL, SPECIAL AND LOCAL ENABLING LEGISLATION DEALING WITH AUTOMOBILE PARKING FACILITIES<sup>1</sup>

BY DAVID R. LEVIN, *Head, Special Administrative Studies Unit, Public Roads Administration*

### SYNOPSIS

Existing parking facilities, apparently a basic ingredient in our motorized cities are still relatively inadequate in capacity, expensive in user cost, and inconvenient in location.

One of the principal barriers to betterment in the parking muddle has been the inadequacy of the legal and administrative machinery provided to do the job. Accordingly, at the earliest possible moment, all existing statutes relating to parking facilities ought to be placed under a legislative microscope by all States, and revised in accordance with present needs.

Analysis of state enabling legislation reveals that there are 91 different laws in 29 States and the District of Columbia, enacted over a period of almost three decades. Only 59 of these acts are general in application. The availability of a substantial amount of legislation in more than half the States should not be construed, however, as meaning that efficient machinery is already available to deal with the parking problem.

An essential of an adequate parking law is an appropriate declaration of legislative policy, serving as a valuable guide-post for the judiciary in legal contests that are likely to result from the extensive exercise of a relatively new public function.

The diversity of legislative terms used to describe parking facilities is amazing. There are no less than 53 different phrases in the laws investigated. Only three or four terms are necessary to describe the different functional or administrative types of automobile parking facilities, and these should be legally defined.

In spite of widespread interest in parking in the United States in recent years, bold measures directed toward alleviating the problem have been largely lacking. It is becoming apparent that preachment alone will not solve urban parking difficulties; more is required than the counting and recounting of potential parkers and present parking accommodations, the apprehension of illegal parkers, and the installation of parking meters. Parking facilities, apparently a basic ingredient in

our motorized cities, are still relatively inadequate in capacity, expensive in user cost, and inconvenient in location.

One of the principal barriers to betterment of the parking muddle has been the inadequacy of the legal and administrative machinery provided to do the job. The enactment of a comprehensive, modernized general enabling statute in many States could be a most important factor in solving the parking problem.

Accordingly, it is the responsibility of every State legislature to re-examine present State enabling legislation in the light of present needs and to revise its laws in accordance with its findings. This analysis of State enabling

<sup>1</sup> Based in part upon *An Analysis of General State Enabling Legislation Dealing with Automobile Parking Facilities*, Highway Research Board, Bulletin No. 2, Revised (1947)