

# Parking Restrictions and the Curb Lane

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There is little doubt that the automobile is of great assistance to man in the modern world. However, this same vehicle is of little or no use if there is no place to store the car when he reaches his destination. In early days, when population densities in urban areas were relatively low and life was not so complex, it was usually possible to park a vehicle at the curb near your destination. As population densities increased, however, parking spaces at the curb became far less prevalent.

The need for adequate terminal facilities for highway transport and commercial activities has been recognized for a long time. In fact, it is interesting to note that one of the very first committees appointed in the "new" American Society of Civil Engineers, nearly a hundred years ago, was a committee to study the parking problem in "Lower Manhattan" and make recommendations for its solution. A cartoon of that era shows two men sitting on a park bench surrounded by parked horse-drawn carriages with a caption reading: "Some day we will have horseless vehicles and we won't have to worry about this parking problem."

Curb parking restrictions have been a matter of serious concern for a number of years as evidenced by the following quotations:

Control of parking at the curb is not the final answer to the parking problem. To have utility, vehicles must be able to load and unload and be stored.

\* \* \*

The average motorist will hesitate to walk much more than two blocks to and from an off-street parking lot or garage. If facilities are to be utilized, they must be placed very close to the motorists destination.

\* \* \*

Parking restrictions are of considerable assistance in keeping road margins clear. Vehicles leaving the parking lane immediately adjacent to a high-speed lane, travel at so low a speed as to be nearly as hazardous as fixed objects. Parked vehicles reduce the sight distance, narrow the effective width and form fixed obstacles on the sides of the road.

These extracts were taken from a publication (1) by Max Halsey in 1941. The subject of this more than 25-year-old text was "Traffic Accidents and Congestion."

Today the automobile has very substantially replaced all other modes of transportation in taking people to and from the places they want to go, except in the very largest urban areas. This certainly should not imply that a majority of traffic engineers agree with this concept. However, it is nevertheless a fact of life today.

This shift from public transit to private automobiles has had a substantial effect on retail activities downtown. As the availability of curb parking spaces downtown diminished, shoppers began to do business farther out from the core of the CBD. Downtown merchants began to establish branches in outlying areas where cheaper land was available for development of large "free" off-street parking areas at these shopping centers.

In an unpublished paper presented at a Traffic Engineering Seminar held in Washington, D. C., in 1965, John Yockey, Vice-President of Woodward and Lothrop Company said his company has eight neighborhood stores in addition to the central store downtown. Nevertheless, the downtown store still maintains 48 percent of the total

company business. This would be an indication that although some business activities have declined downtown, this area is still a magnet drawing people despite an obvious lack of curb parking spaces.

Wilbur Smith and Associates made a comprehensive parking study for the Automobile Manufacturers Association in recent years (2). They found that the "Department stores in major cities frequently estimate the value of a parking space as the generator of up to \$10,000 in annual retail sales." It should be pointed out that this does not say that the parking space must be at the curb in front of the store. Other studies have been made which illustrate the advantages of curbside parking to adjoining business establishments.

One such study was made by Herbert S. Levinson, of Wilbur Smith and Associates (3). Before World War II, the common location of parking spaces was at the curb. Limited curb space and increased parking demand have reduced on-street parking to somewhat less than 20 percent of the total parking spaces in CBD's. In this respect, Levinson found many interesting facts in his study, such as the following:

Turnover per curb space is three to seven times higher than for off-street parking spaces.

\* \* \*

Parking durations for curb parkers are consistently less than those for off-street parkers, ranging from only 10 to 50 percent as long.

\* \* \*

Walking distances for curb parkers are considerably less than for off-street parkers.

\* \* \*

Curb parking along arterial roadways, at locations other than the central business district, should never exist at the expense of moving traffic.

This last statement is certainly a most sound principle. In fact, one might even go one step further and severely question the trade-off between a few CBD curb spaces and the valuable curb lane as a means of access to the entire area.

It certainly does not make sense to design and build roads for the purpose of moving traffic and then permit curbside parking to reduce the street's capacity. The Highway Capacity Manual, 1965, indicates that parking at the curb has the effect of reducing the street width by as little as the width of the parked vehicle and as much as 20 ft per lane of parked cars (4, p. 114). In another study, Fred Hurd of the Yale Bureau of Highway Traffic found that mid-block parking at the curb provided a significant increase in the accident expectancy on the entire street.

#### WASHINGTON, D. C.

An actual case study may be cited, regarding a relatively new curb parking improvement in the Nation's Capital. This study concerns a recently installed rush-hour parking restriction on Pennsylvania Avenue, S.E., near the Capitol Hill area. Pennsylvania Avenue, S.E., connects the U.S. Capitol to adjoining Maryland to the south and east of Washington. During the rush hours, traffic was moving at a level of service of "F", as defined in the Highway Capacity Manual. Most certainly the level of service could never be classified as being better than "E".

The route is an eight-lane roadway, with four lanes in each direction separated by a wide median. Metered curb parking was permitted throughout the day. This restricted the movement of traffic to three lanes in each direction. The street is a very heavily traveled bus transit route, and because of the curb parking, buses were forced to use the second lane from the curb and had to weave in and out of traffic in order to make stops.

Peak-hour traffic in the three traveled lanes was 2300, or roughly 770 vehicles per lane per hour for in-bound traffic during the morning peak hour. The afternoon peak was slightly less when there were only 1940 vehicles during the peak hour or approximately 650 vehicles per lane per hour. The street was posted with a maximum speed

limit of 30 mph. Travel time for the critical 1.3-mi section was 3.36 min or a travel speed of 19.1 mph.

In March 1966, parking was prohibited during the rush hours in the direction of major traffic flow only. This restriction extended the 1.3-mi distance on Pennsylvania Avenue, S. E., from 2nd Street and Independence Avenue to the west side of the Sousa Bridge across the Anacostia River at Barney Circle. A "No Standing" restriction was installed on the north side of the street from 7:00 to 9:30 a. m. and on the south side from 4:00 to 6:30 p. m., Monday through Friday.

Conditions six months after the removal of parking indicated a more than 5 percent increase in rush-hour traffic volumes. However, travel time had decreased from 3.36 to 2.47 min. Travel speed had increased over 6.5 miles to 25.7 mph. With the parking removed, buses were found to be using the curb lanes exclusively and trucks in general kept to the right-hand side of the roadway.

The findings after one year of operation include:

1. Reduced rush-hour travel time for cars, 23 percent;
2. Reduced rush-hour travel time for buses, 10 percent;
3. Delays due to stopping, idling and starting were reduced 54 percent;
4. Congestion, measured by traffic density (number of vehicles per mile of roadway), was reduced by over 30 percent; and
5. A saving in incremental travel cost of over 2 cents for each vehicle-mile traveled was accomplished.

This cost savings, when expanded to the total rush-hour travel by motorists, was found to be approximately \$56,000 a year. Considering that only 57 percent of the 177 available parking spaces were being used during the rush hours this change has been a sound investment. While there has been an appreciable increase in traffic volume (more than 10 percent), the level of service was also improved to at least level "C". Therefore, the very simple and inexpensive remedy of prohibiting rush-hour parking on Pennsylvania Avenue, S. E., has provided considerable savings to the motoring public.

#### ATLANTA, GA.

Another recent example of improved street utilization can be found in Atlanta, Ga. Karl A. Bevins, Traffic Engineer of Atlanta, states that a parking regulation along the curb during the p. m. rush hours only has recently made available a third "outbound" lane on Peachtree Road. At the same time several "No Left Turn" regulations were put into effect along a 1000-ft section of Peachtree Road, which presented a critical bottleneck on this major thoroughfare. Changes in the traffic signal sequence from a three-phase to two-phase operation were also implemented as a part of this traffic improvement project in January 1966.

The results of the revised Peachtree Road Operation with the new traffic regulations are as follows:

1. Delays during the p. m. rush period (5:00 to 6:30 p. m.) have been reduced to only an occasional stop due to a "red" traffic signal or a pause for a few seconds behind a left-turning vehicle or a bus which is loading.
2. Outbound travel time during the p. m. rush hour, between the critical section from 14th Street to Lindberg Drive, has been reduced 50 percent.

The time required during the afternoon rush period to travel northbound on Peachtree Road has been reduced considerably. During the p. m. rush period, outbound traffic flow reached a level of 3060 veh/hr for three lanes or 1020 vehicles per lane. The following figures plainly indicate the improvement in street utilization:

Section of Peachtree Road	Time Saved (min)	Improvement (%)
16th Street to Deering Road	10.0 to 3.0	10
Deering Road to Lindberg Drive	8.5 to 5.5	35

This indicates a capacity increase of 58 percent.

The total vehicular volume of traffic moved past the critical Deering Road-25th Street section of Peachtree Road during the maximum 2-hr period has increased 6 percent, from 4040 to 4270 vehicles in the a. m. hours. Likewise a 23 percent increase, from 3160 to 3870 vehicles, has been recorded in the peak 2-hr afternoon period. The maximum rate of flow increased from 2420 to 2590 veh/hr, or 7 percent in the morning. Likewise an increase from 1950 to 2350 veh/hr, or 21 percent, was recorded in the afternoon rush hour.

The Peachtree Road Improvements in Traffic Utilization resulted from the following combinations of changes:

1. No parking 4:00 to 7:00 p. m. on the east side from Colonial Homes Drive to Peachtree Creek.
2. Changing the traffic signal sequence at the intersection of Peachtree Road, Peachtree Hills Avenue and Fairhaven Circle from three to two phase.
3. Prohibiting certain left turns between Spring Street and Deering Road during the period from 4:45 to 6:30 p. m., including turns into or out of driveways and at 2 free-way ramps.

It is apparent that other traffic improvement besides the rush hour no parking restrictions played an important role in this improved street utilization project in Atlanta. There are other similar examples throughout the country where it is very difficult to give total credit to curb parking restrictions since other traffic changes were imposed simultaneously. Several of these exist in Washington, D. C., notably 13th Street, 16th Street and Connecticut Avenue, N. W.

#### BEVERLY HILLS, CALIF.

Another recent example concerns Wilshire Boulevard in Beverly Hills, Calif. This success story is included in the March 1967 issue of Public Works magazine in an article entitled "Curb Parking Is the Culprit." Public Works Director, Edward E. Tufte states that Wilshire Boulevard is one of the nation's outstanding shopping streets and carries nearly 40,000 veh/day. All curb parking on Wilshire Boulevard, between 7:00 a. m. and 7:00 p. m., was banned on more than a 1-mi section of this street with the merchants' blessing.

Originally, curb parking was allowed, except between the hours of 7:00 and 9:00 a. m. and 4:00 and 6:00 p. m. on this 70-ft wide street. Traffic speeds were exceptionally low and the slowest operation occurred during mid-day when traffic averaged only 11 mph. This reduced vehicular speed resulted mainly from the presence of curb parking. A study indicated that over 40 percent of the total time spent by motorists on Wilshire Boulevard was actually spent standing still.

The following improvements were made on Wilshire Boulevard between April 1963 and August 1965, as reported by Tufte:

1. Revised lane arrangement providing for left turns in the center of the street and three through traffic lanes in each direction.
2. Extension of "No Stopping" regulation in the curb lanes, covering the hours between 7:00 and 10:00 a. m. and 3:00 and 7:00 p. m. with 1-hr parking allowed at other times.
3. Modernizing and interconnecting 18 signalized intersections along Wilshire Boulevard, including the addition of pedestrian "Walk-Dont Walk" indications.
4. Widening the west leg of Wilshire Boulevard.
5. Modernizing and interconnecting the traffic signal equipment at the intersection of Santa Monica Boulevard.
6. Relocation of bus stops from the near side to the far side of intersections.

It is reported that relocation of bus stops improved the intersection capacity approximately 7 percent. In September 1965, all stopping and parking was prohibited on the heaviest traveled section of Wilshire Boulevard between 7:00 a. m. and 7:00 p. m. Although a total of 249 curb parking spaces were removed, amazingly enough, there was little opposition expressed by merchants. Apparently the merchants had been "well

sold" in advance concerning the serious impediment to access to their area caused by curb parking.

Briefly the results of the before and after changes revealed the following positive benefits:

1. Overall normal weekday travel speed rose from 12 to 17 mph.
2. Delay to the average driver was reduced from 41 to 24 percent in terms of total travel time.
3. Comparing 1961 and 1965, there was a reduction of 195 reported property-damage accidents, representing an estimated annual savings of about \$ 50,000.

#### ACCIDENT CONCEPT

It seems appropriate to pursue this accident concept further. Last year there were 31,700 motor vehicle accidents in the District of Columbia. In 5560 or 17 percent of these mishaps, a collision with a parked car was involved. In a 1966 Congressional Record statement (see Addenda), Paul Box indicated that: "Nationally, about 17 percent of all urban accidents, and 4 percent of rural accidents are known to involve parking of vehicles along our streets and highways." This firmly supports our findings in the District, as well as the results shown by Tom Seburn (11).

It certainly cannot be assumed that there would have been over 5000 fewer accidents in the District had all curbside parking been banned. However, studies made in other locations do indicate that the number of accidents can be reduced substantially by eliminating curb parking.

#### GARDEN CITY, MICH.

An excellent example of this situation is offered in the July 1965 issue of American Highways. A report prepared by the Michigan State Highway Department indicated a reduction of 44 percent in the number of accidents on Ford Road in Garden City in a similar nine-month period before and after curb parking was prohibited (6). This report concludes the following:

1. While total accidents showed significant improvement, the most dramatic reductions occurred in mid-block accidents, those most influenced by curbside parking.
2. Property damage accidents fell 38 percent, from 65 to 40. Total casualties, those hurt or maimed by accidents, plummeted from a high of 63 to a low of 22, a 65 percent drop.
3. In addition to the reduction in accidents and casualties, motorists in Garden City area received an estimated cash savings in excess of \$100,000.
4. The savings, compiled by the National Safety Council, reflect repair costs and medical expenses which would have resulted from accidents had there not been any reduction in the accident rate.

#### CONGRESSIONAL RECORD

One of the most elaborate presentations ever made on this subject can be found in "Streets Should Not Be Used as Parking Lots" which was introduced in the Congressional Record on October 22, 1966, by Congressman Farnsley of Kentucky (7). This discussion by Paul Box covered the curb parking problem, related accident statistics, resulting traffic congestion, and concluded with some very sound principles. This entire article is reproduced in the Addenda to this paper.

#### SAN FRANCISCO, CALIF.

William Marconi, Senior Traffic Engineer of San Francisco, has found that: "Where block lengths, signals and other factors are similar, it has been demonstrated that the mid-block accident rate is affected by parking. The highest rate occurs where a mixture of parallel and angle parking is permitted. A lower rate occurs with parallel parking only and the lowest rate of all occurs where parking is prohibited."

It cannot be stressed strongly enough that terminal facilities, or parking spaces are as much a part of the highway transport system as are the vehicles and the roadways themselves. It has been clearly demonstrated that a well-built roadway is intended for the purpose of moving vehicles. There is only a limited place on major arterial roadways for vehicles that are not in motion. The trend is obviously and definitely away from use of the main roadways as a place to park and store vehicles.

Modern zoning ordinances almost everywhere now require adequate off-street parking before a new building may be erected. Developers have come to recognize the importance of providing off-street storage facilities for vehicles. For example, Montgomery County, Maryland, zoning ordinances (8) require 1.5 off-street parking spaces for every dwelling unit. In the case of high-rise apartments one-half of these spaces must be within the apartment building, either underground or on one or more of the floors of the building.

Similar regulations are currently being employed by numerous governmental agencies. In this regard, it would be interesting to canvass all of the large urban areas of the country to compare current off-street parking requirements. It is suggested that such a study should be made.

#### CHICAGO, ILL.

In 1960, William R. Marston, then Deputy City Traffic Engineer of Chicago, said the following in a Traffic Quarterly article (9):

One of the more effective traffic improvements that has been applied to our major streets is the rush-hour parking prohibition program. This is one of the lowest cost plans that we have found and results in considerable increases in speed and safety. We have over 290 curb miles presently so controlled and 160 more are before the City Council for approval. Surveys show that an average of only one car per each retail establishment is parking during the two hours the prohibition is in effect. Many objections to the curb parking prohibition result, of course, but no curtailment of the program has been necessary.

#### NEW YORK, N. Y.

In a June 1963 American City magazine article (10), Henry Barnes answered some direct questions relating to curb parking, as follows:

- Question: What conditions do you feel should exist to warrant the removal of on-street parking?
- Answer: First, when conditions demonstrate an overwhelming need for moving traffic and, secondly, when the city has provided adequate off-street parking, then curbside meters can be removed without undue hardship to motorists. However, here is a warning—do not allow curbside parking to interfere with the traffic movement needs of the street. Streets basically should move traffic, not be parking lots.
- Question: Is it possible to increase the traffic volume of outmoded streets without spending a lot of money?
- Answer: We slashed dramatically the congestion on two narrow crosstown Manhattan streets by simply removing the parking on both sides and providing three lanes of traffic during the morning and evening rush hours. Before the introduction of the "Crosstown Roll," motorists made an average of 12.2 stops in the 14-block trip. They now average 8.5 stops and save  $5\frac{3}{4}$  minutes despite the fact that improved operating efficiency has attracted 17 percent more traffic.

#### CONCLUSIONS

It is certainly a strong personal hope that the day is not too far distant when all major roadways will be used for the purpose for which they were intended. This is moving

people and goods all the way from origin to destination, with ultimate dispatch, a high level of comfort, maximum safety and the highest degree of economy possible. In the opinion of more than one traffic engineer, the day of curb parking on our major arterial streets in urban areas will be short lived.

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#### Addenda



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Streets Should Not Be Used as Parking  
Lots

EXTENSION OF REMARKS  
OF

HON. CHARLES P. FARNSLEY

OF KENTUCKY  
IN THE HOUSE OF REPRESENTATIVES  
Saturday, October 22, 1966

Mr. FARNSLEY. Mr. Speaker, the problems caused by automobile parking along our streets and highways have received entirely too little attention by our citizens, officials, and legislators. Material in the following discussion has been gathered by Paul C. Box, of Skokie, Ill. Mr.

Box has spent over 16 years in traffic engineering work for cities. He testified before committees of both the House and Senate, with respect to public lighting needs. He is chairman of the parking committee of the highway research board, and has been active in studies of parking along our streets for many years.

Mr. Box wishes to emphasize, however, that the viewpoints and conclusions in this discussion are his own, and that he is not presenting the official policy of any organization with which he is associated. The discussion follows:

## VIEWS OF MR. PAUL C. BOX

### The Problem

The motor vehicle, and most particularly the private passenger car, has brought uncountable blessings to our daily lives. It has increased productivity, and has added immeasurably to our convenience in getting from one place to another. Because of its manifold benefits, and the fact that it represents an essential element of our economy, the automobile and its future progeny are truly here to stay.

The growth in automobile ownership and use has also brought problems, too many of which we have been accepting as necessary byproducts. An obvious element is the so-called parking problem. If we are going to own automobiles, we evidently should at the same time recognize our individual responsibility to provide adequate storage to "stable the beast."

The responsibility rests with the automobile owner at his place of residence. It rests with the businessman at his place of trade, and includes provision of space for both employees and customers or clients. It also rests with the industrial manager in the establishment of parking for employees and visitors. Unfortunately, citizens, and a high percentage of our businessmen, have in the past failed to properly accept their responsibility in this area.

The product of this indifference has been use of our public streets as parking lots. The cost of this attitude is nearly unbelievable when expressed in terms of accidents and added traffic congestion.

### Accidents

Nationally, about 17 percent of all urban accidents, and 4 percent of rural accidents are known to involve parking of vehicles along our streets and highways. The number of motor vehicle occupants killed in these accidents is less than a thousand per year. This "low" figure is hardly a cause for complacency, especially if we add the thousands of children that have died in past years as a result of entering the street from behind parked cars.

Our bland acceptance of these tragic accidents, which are preventable, is difficult to understand. The figures are available to any elected or appointed public official. Many are cognizant of the

problem, but few have shown the courage to take direct and positive action. At least one example is known, where the residents themselves along an important major traffic route voted two out of three for complete banning of parking along their street. Yet two different groups of elected officials, of opposite political persuasion, separately rejected this popular mandate, and refused to take action despite the alarming parked car accident rate!

Before citing further examples, it is perhaps germane to consider how and why parking is so dangerous when allowed along streets. The first, and major cause of these accidents, is the physical location of the vehicle on the traveled way. It occupies what would otherwise usually be a traffic lane for movement. It is an obstacle in the critical area needed for right turns in and out of side streets, driveways and alleys. Furthermore, this curbside lane is often desperately needed for the added use of straight-ahead traffic. These conditions combine to create a serious conflict.

The second cause of parked car type accidents involves one vehicle leaving the curb parking area. The driver may be directly involved in a collision with one or more moving vehicles, or he may create a rear-end type accident by causing another moving vehicle to abruptly stop in order to avoid impact.

A third cause of parked car accidents involves the driver who stops or slows to enter a parking stall. Both direct and indirect (rear-end and sideswipe type) accidents are caused by such accidents.

A fourth cause is produced by drivers, or passengers of parked vehicles, opening their car doors on the street side. This action also creates direct and indirect types of accidents. Some drivers refuse to consider purchase of automobiles or sports-type cars with center consoles, because this arrangement makes it almost impossible for the driver to slide across the seat, and enter or leave by the proper, curbside door. For many years the courts have leaned toward assessment of accident blame on drivers or passengers who get struck while alighting from the street side of parked cars. Some cities have even passed ordinances assigning primary accident responsibility to such persons.

The fifth type of accident caused by parked cars has already been partially



covered, with respect to children who are slaughtered by stepping out from behind parked cars. A similar situation exists with respect to adults entering the roadway from behind parked trucks or buses. To these occurrences must also be added the intersection or driveway accident which occurs, because one or both drivers have their vision blocked by parked cars along the street.

Many of the accidents which have happened in the past, and which occur today, are really caused in part by parked cars, even though this element is never mentioned in the written accident report. It is safe to assume that curb parking is responsible for at least one out of every five accidents that occur in our cities each year.

In order to further examine this problem, we must consider the different types of streets to be found in our cities. A vast difference exists in the accident rate along various streets. Part of this is due to varying volumes of traffic. Thus the minor or side street is quite different in character from the major traffic artery. Similarly, the side street, which is abutted by single family homes, is different from the one with dense apartment development, business or industry. The major traffic route wending through a park, or along a river is not similar to one which bisects a retail area. Streets not only differ in traffic volume, but also in numbers of driveways and curb parked cars, frequency of movement in and out of driveways and parking stalls, and in amount and composition of pedestrians.

Taking first the major traffic route, or arterial street, we find its primary function is defined by the name—it is an avenue for the movement of vehicles. Furthermore, the composition of this vehicular movement is varied to include not only private passenger cars, but also trucks, buses and taxis. In retail or industrial areas, there are also large numbers of pedestrians frequently crossing the roadway.

In addition to the primary function of movement, this type of street is heavily used for access. This simply means that it must normally provide the traveling public with a means of rather directly entering roadside private developments. These developments may be homes, apartments, shops, industries or service facil-

ities. In any event, if one cannot reach these places, they frequently would have no value or utility and thus could not exist in a human-oriented society.

The twin roles of traffic movement and abutting property access are common to practically all city streets and the conventional rural highways. They are equally common to the minor side street. When realistically viewed, however, the side street abutted by homes or small apartment buildings must also act to provide a parking reservoir for unusual demands. It is practical and proper for a large apartment development, business or industry to furnish adequate parking to meet all demands of its clients, employees and customers. We cannot, however, expect the average home owner to supply parking space for more than his own cars, plus one or two visitors. Occasional overflow simply must be met by use of the street.

We then see that the primary function of the minor street is to provide access to abutting property, while a second function is circulation and travel between adjacent blocks and the nearest major traffic routes. Unless homes are built on estate size lots, a third function of the side street is to accommodate overflow parking.

Through the use of intelligent planning, zoning and building regulations, a community can handle its parking problems in two ways. First and most generally accepted is the mandatory provision of adequate off-street parking as part of new building construction, and as part of all remodeling permits. The second approach is to require construction of proper parking facilities for existing buildings. Both of these tools will subsequently be discussed in greater detail.

Failure to enact or enforce adequate local regulations results in a truly second-rate community. The older parts of nearly all our cities, from the smallest farm community to the largest metropolitan center, show the depreciating effects of parking supply neglect.

A four year accident study of some 1200 blocks has been made in one city, which included parked car accident rates along minor streets. Significant findings appeared. Before discussing these in detail, it is desirable to examine the overall accident record of this community, with respect to parked car accidents on all

classes of streets. This information is shown for the latest five year period in the following table:

	Number of Accidents	Percent
Major streets:		
Parked car . .	1, 174	12
All other . . . .	7, 795	88
Subtotal . . . .	9, 969	100
Minor streets:		
Parked car . .	1, 083	43
All other . . . .	1, 427	57
Subtotal . . . .	2, 510	100
All streets:		
Parked car . .	2, 257	18
All other . . . .	10, 222	82
Total . . . . .	12, 479	100

When these accidents are related to the mileage of streets in the community on which curb parking occurs, the major streets were found to have a rate of 14 parking accidents per mile per year. The minor street rate was, however, only 1.8 accidents per mile per year. Thus the overall hazard of parking along heavily traveled routes was nearly eight times as great as on minor streets.

The reason for this significant difference is easy to find. The traffic volumes and the degree of parking activity are both much greater, and the probability of accident occurrence is correspondingly higher, on the major traffic arteries. It is therefore clear, that, the first and most urgent activity needed by a community, is to clear parking from its major traffic routes. This should be done on a total basis, and not merely during rush hours to expedite traffic flow. In the cited community, 10 percent of all accidents in the city has been found to occur solely as a result of curb parking on only 6 percent of its total street system!

Turning now to the minor streets, we saw in the Table that 43 percent of all accidents on this class of street was caused by curb parking. If we consider only the midblock accidents (those not involving intersection collisions) we find  $\frac{2}{3}$  involve curb parking. A detailed study of these

accidents, covering a four year span, found a clear relationship among different densities of land use. [This information is shown in the table on page 71.]

In every case, it can be seen that curb parking is a leading cause of accidents. In this particular study, one short business block was analyzed, where the community had allowed 100 feet of angle type parking along one side of the street in order to service a new post office. The rate caused by the parallel curb and angle parking in this block, expressed on a mileage basis, is 63 accidents per year! This is nearly 20 times the rate on other business type side streets.

This minor example should in itself be grounds to cause the General Service Administration of the U.S. Government to examine its archaic policy of constructing government buildings without provision for customer and visitor parking. Today, the construction of adequate off-street parking for all users of every business building should be the policy of all agencies and levels of government.

#### Traffic Congestion

On older side streets, with narrow widths and dense curb parking, cities have in many cases been forced to install one-way regulations. Even though the traffic volume on these minor streets is low, vehicles will occasionally meet headon and find no opportunity to pass, if allowed to operate on a two-way basis. One study of side streets found an optimum width of 32 feet, as the one which produced the lowest accident rate with variable degrees of parking in single family areas. For apartment areas, a width of 36 feet is desirable. If the side street is abutted by business or industry, widths of 40 to 48 feet are preferred. Unfortunately, many communities are today still building their side streets at substandard widths.

The provision of proper width is important from the standpoint of avoiding minor street congestion, and allowing better access for emergency vehicles. Since the construction cost of these streets should be borne by the abutted benefited property owner, no general public tax money need be involved.

Along major traffic routes, an entirely different situation exists. Here the large share of traffic is moving to destinations

Density of Land Use	Accidents Per Mile Per Year			
	Curb Parking	Driveways	Pedestrians	Other Types
Single family homes . . . . .	1.04	0.15	0.13	0.12
Apartment areas . . . . .	3.10	.45	.25	.52
Business areas . . . . .	3.50	1.65	.20	.72
Industrial areas . . . . .	1.15	.95	.04	.20

beyond each individual block. The abutting owner cannot be fairly assessed to provide pavement for such through traffic flows. However, when major traffic routes are allowed to have curb parking, the abutting owner is reaping a personal gain, at the net expense of the general public. He is being subsidized at everyone's expense. Furthermore, this undemocratic arrangement penalizes the owner who does set aside a large share of his land for customer and employee parking. Examples exist where major streets have been widened at great public cost, and rows of stately trees cut down, so that parking lanes can be maintained in addition to the necessary lanes for traffic movement. Occasionally such widening may be warranted, but when it is, the abutting owner should pay for all added costs to provide parking. The public will pay more than enough in the long run, as a result of added accidents and congestion.

The congestion effect of curb parking is not limited to the width of the parked cars. The stopping of a vehicle to park, or the pulling away from the curb, interferes with operation on the adjacent moving traffic lane. In effect, a row of parallel parking along one side of a street takes up the equivalent of some 15 to 17 feet of roadway width.

Angle parking into the curb should never be allowed on any street, unless it is a short, dead end block. The more progressive cities across our country have moved strongly against this vice, and it is disappearing from use. Where still allowed, such parking affects 30 to 40 feet of roadway area on each side of the street. The accident and congestion penalty of this type of parking is simply too great to provide any rationalization for its use. Studies have shown that angle parking produces several times as many accidents, and much greater congestion, than does parallel arrangement.

The tool of rush hour parking restrictions is in widespread use throughout our country. The theory is simply one of providing an added traffic lane, during the hours of heaviest traffic demand. While considerable congestion, and some accidents are thus avoided, thousands of miles of such routes may be found clogged with traffic during other hours of the day. This condition is largely produced by the effect of curb parking which extends beyond the parking lane.

#### Development of an Action Program

The need for total day and night prohibition of parking along most of our major traffic arteries may readily be observed in nearly all cities. Before it can realistically be banned, however, certain principles must be accepted, which require forthright local action.

Principle No. 1: The functions of a major traffic route are to provide for safe and efficient movement, plus access to abutting property.

Principle No. 2: Curb parking is not a right which is vested with the abutting owner, and he has no legal or moral claim to such usurping of the public way.

Principle No. 3: The cost of allowing curb parking, when measured in terms of accidents and congestion, is an unrealistic and unnecessary burden to place on the public.

Principle No. 4: The continued preservation of residential, business and industrial land uses is imperative to our economy.

Principle No. 5: Parking cannot often be prohibited, until substitute spaces are provided off-street.

Principle No. 6: The leadership for development of such off-street parking must come from the local governments.

Principle No. 7: The cost of providing these parking facilities should be borne by the benefited property owners.

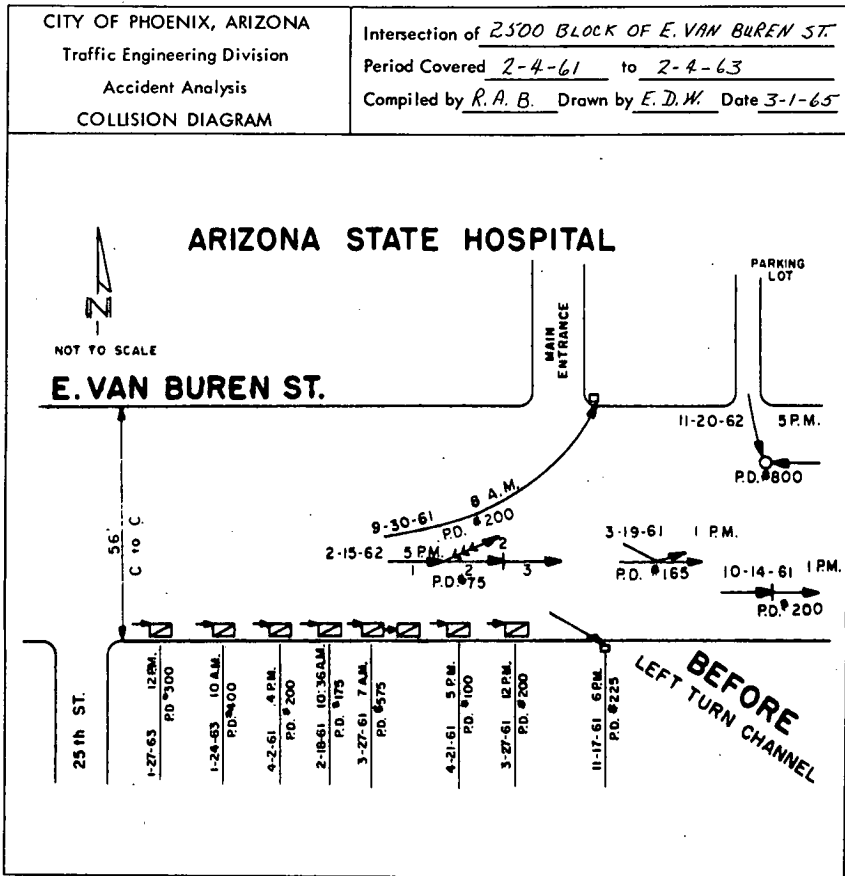


Figure 1.

*Congressional Record (continued)*

Principle No. 8: The location of parking facilities must be such as to minimize walking distance, which frequently implies wrecking older buildings near the center of each block of congested areas.

Principle No. 9: The development of such parking programs will frequently be fought by all affected owners, and powerful political pressures will be brought to bear to block the work.

Principle No. 10: Elected and appointed officials must exhibit both courage and farsightedness, to conceive, execute and maintain the policy.

The implications in adoption of these Principles are varied. In many cases our cities lack the enabling legislation, and new laws are needed at the state

levels. Such laws should allow the local community to condemn property, and assess benefited owners, for provision of all types of parking on all types of land, including residential, business and industrial. They should allow development of local parking authorities where needed to handle problems of central business areas. They should allow the establishment of street parking permit fees in dense residential areas, where the money thus collected is put into a fund for construction of local parking lots. The laws should, in short, encourage and assist local government in solving the problems.

At the state level, the legislators should strongly support their highway commissions and departments, in denying use

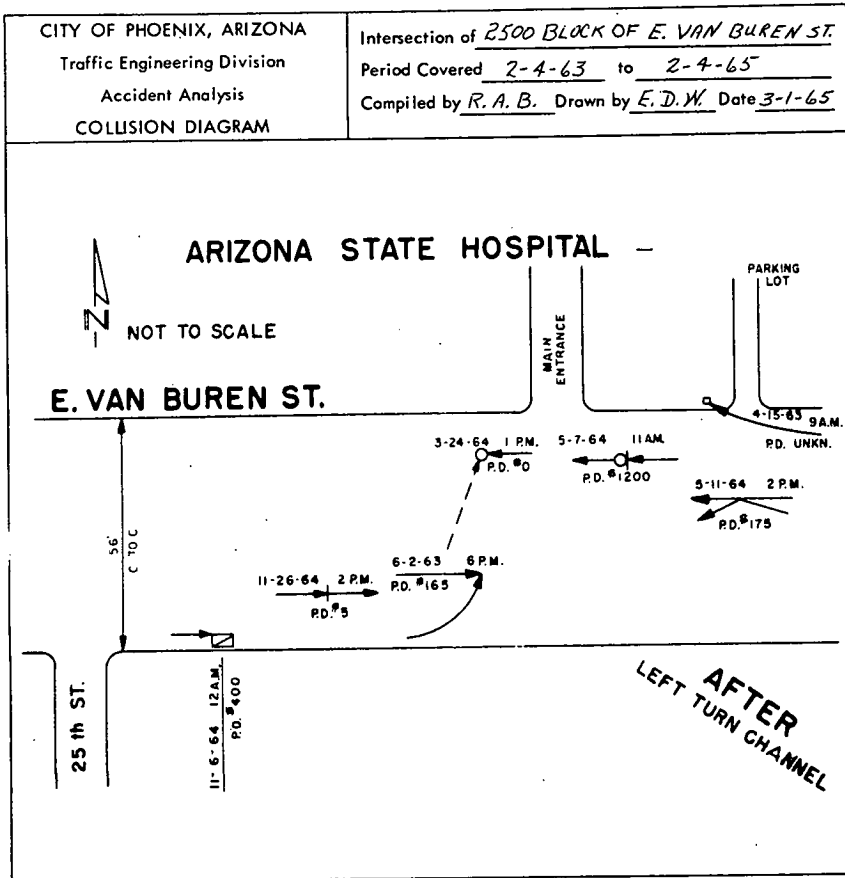


Figure 2.

*Congressional Record (continued)*

of state funds for highway or street work of any kind, along routes which have curb parking allowed. They should not allow use of local shares of motor fuel or road user gas tax funds by communities on routes with curb parking.

At the national level, legislators should not approve funds for construction of public buildings, unless these developments include provisions for adequate off-street parking to serve all users of the building. In a similar fashion, Federal funds should be denied to states for use in construction or maintenance of highways with parking.

These are strong statements, because positive action is needed. They are in-

tended to promote concepts, and not to develop detailed policy. In practice, of course, consideration must be given to individual conditions. There are exceptional cases, which are recognized even in our laws against murder. We do, however, desperately and urgently, need to first understand, and secondly to cope with, our parking problems at all levels. The conditions are worsening at an alarming rate, but there is no simple nor painless remedy. The disease of parking on our major streets and highways can only be cured by positive and continued action, and with the support of a majority of our citizens.

## MADISON, WIS.

A typical parking layout for parallel parking at the curb on high volume streets of Madison, Wisconsin, is attached. This method of marking parking stalls is new to Madison. It is not to be confused with "paired" parking, a system which has been in use in many cities for the last few years.

A no parking area of from 9 to 11 ft between each parking stall is marked on certain heavy traffic streets. In this way, a motorist can enter a vacant curb stall by using a

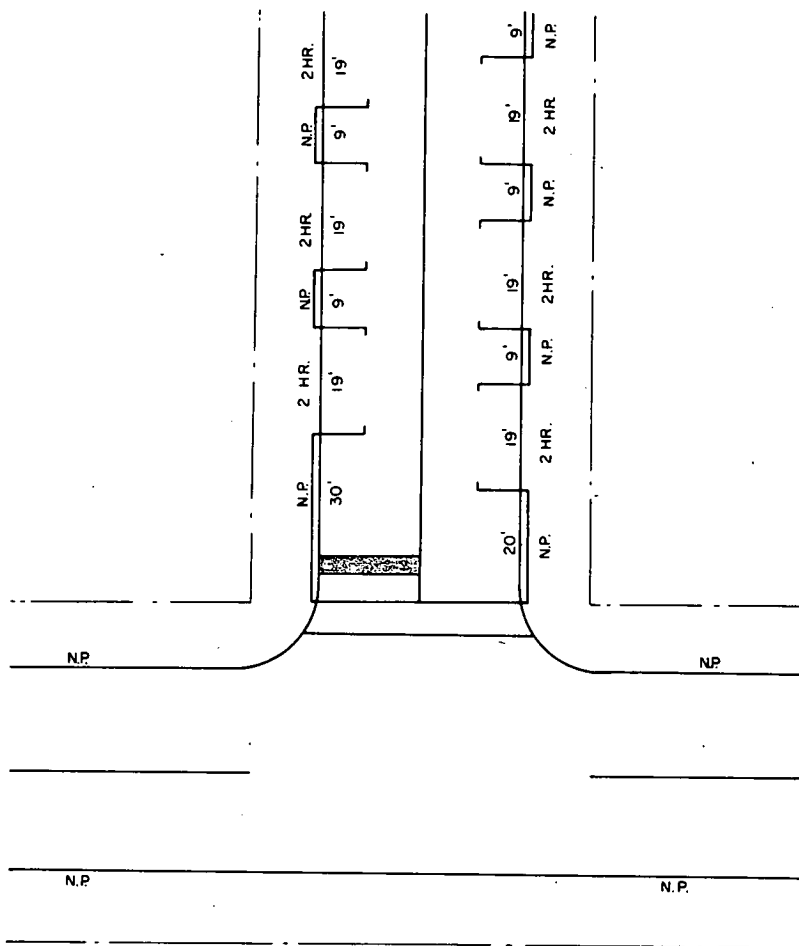


Figure 3. Typical parking layout.

total of 36 to 40 ft for the maneuver. In this way, the vehicle is driven into the stall and then is backed into the proper parking space. When leaving, the vehicle is backed into the space to its rear and then enters traffic without making any other maneuver.

These markings have been a material benefit for heavy moving traffic and also they have eliminated many delays on streets with bus routes. Bus drivers have commented many times on the decreased delays to traffic in the moving traffic lanes because of this particular type of marking.