

# National Conference on Street and Highway Safety

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REPORT OF COMMITTEE

*on*

CITY PLANNING AND ZONING

*Appointed by*

The Secretary of Commerce

This report is one of eight issued for consideration in advance of the National Conference on Street and Highway Safety. The reports are: I Statistics; II Traffic Control; III Construction and Engineering; IV City Planning and Zoning; V Insurance; VI Education; VII The Motor Vehicle; VIII Public Relations

Washington, D C

November 24, 1924

**National Associations cooperating with the Department of  
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# Conference on Street and Highway Safety

## Committee on City Planning and Zoning

Hon Herbert Hoover, Chairman,  
Conference on Street and Highway  
Safety Washington, D C

Sir

Experience with the constantly growing volume of vehicular traffic makes clear that if we are to decrease the hazard to life and property or provide for the traffic needs of the future we must plan our street and highway systems and must design the individual thoroughfares with these ends in view

The Committee therefore submits the following recommendations

### Summary of Recommendations

1 Street and highway hazards are due chiefly to vehicular traffic These hazards can be greatly reduced by a *proper arrangement of streets and highways* Consequently each community must necessarily study and carefully consider its own special problems with particular emphasis upon

(a) The problems presented by *streets and highways crossing each other at grade or crossing railroad or rapid transit lines at grade*, with the two purposes of reducing the number of crossings by a better arrangement of transit lines and thoroughfares and by separating grades so far as practicable where crossings remain necessary Elimination of grade crossings is most needed along major traffic arteries or boulevards

(b) The problem of *classifying traffic* and of providing suitable and adequate facilities for each class This involves the proper location of the various kinds of development, industrial, commercial, residential through a proper planning of traffic and other public facilities provided in the various areas, supplemented by zoning regulation of private property

(c) The location of its traffic originating centers and the possible development of its outlying areas with the two purposes of straightening main *traffic arteries* and of so spacing them that there will lie between them areas sufficient in size to support neighborhood stores schools and recreation facilities

(d) The possibilities offered by its topography and its present development to create *by-pass highways and belt highways* which will permit through traffic, especially trucks to avoid congested districts or even any built-up portions of the city or town

2 *Stopping and Day Storage Space for Automobiles*—Each community should reach a decision, based upon present local conditions and probable future development, as to how it will provide for the stopping and parking or day storage of automobiles, and should apply that decision in its city plan

3 *Design and Equipment of Streets*—While the arrangement of streets and parking spaces is the first essential in securing an even and safe flow of traffic, this must be supplemented for each kind of street by determining the most effective width corner radius sight clearance, etc., and the needed equipment, such as safety zones or isles of safety, lighting devices traffic signals, pavement marking. These will differ with the character of the street and the width of its roadway

4 *Importance of Sub Centers and Satellites*—It is necessary for each region or group of communities to plan more carefully the development of industrial and business sub centers and satellite communities with a view both to encouraging appropriate decentralization and to preventing these new centers from in turn becoming areas of traffic congestion and danger

5 *Relation Between Street Facilities and Development of Private Property—Zoning*—Each community should, in determining the character width and arrangement of its streets at the same time determine, through zoning, the character, use and bulk of abutting buildings

Each community or group of communities in planning the main arterial highway system should take account of the effect of zoning regulations in regulating and stabilizing traffic flow

6 *Playgrounds and Schools*—Each community should study the opportunities offered by its territory to provide playgrounds and recreation spaces adequate in size and number so that it will not be necessary to use the roadway for play purposes, and, like the schools, so located that children will not have to cross busy traffic streets in going to and from them

7 *Inter-relation of Traffic Facilities*—Each community should in planning its traffic system, bear in mind that the automobile and the motor bus supplement rather than conflict with rapid transit rail lines

8 *Comprehensive Traffic and Thoroughfare Plan Necessary*—In order that a community may deal effectively with its problems of street and highway safety it must coordinate all its efforts in a comprehensive traffic and thoroughfare plan showing a complete system of traffic ways,

parking or automobile storage areas and needed street improvements both within the city limits and within the area of probable building development outside of the city limits. The traffic and thoroughfare plan should be developed in consonance with a plan for the transportation and transit lines and stations and with the zoning regulations. The adoption of these plans should be followed by a definite long-term improvement and financial program.

By the Committee

Frederic A. Delano, *Chairman*

Washington, D. C.

November 24, 1924

*(The full text of the report follows)*



## The Relation of City Planning and Zoning to Street and Highway Safety

Of the several important phases of the problem of street and highway traffic safety that of the proper planning of community activities and traffic facilities is undoubtedly fundamental. It is clear that a carefully designed arrangement or organization of community functions and activities and of the system of circulation between them is a first essential in securing an orderly flow of traffic and in minimizing the interruptions, conflicts and dangers that constitute our chief traffic problem.

The automobile is a transportation agency of manifest social and economic importance. Its flexibility and speed tend to a spreading out of the residence areas and facilitate most business operations. Except in small communities however, the automobile can not take the place of other forms of transportation but will merely supplement them.

### 1 Arrangement of Streets and Highways

(a) *Grade Crossings*—At peak points of congestion and danger it is desirable and sometimes practicable to separate grades so as to carry the through traffic of one street over or under the other street. This permits a free flow of vehicular traffic across the intersection on both streets and lessens the difficulties and dangers of the pedestrian as well. Under the assumed conditions such a separation of grades may clear up congestion for a considerable distance in all directions from the intersection.

In order to handle a maximum through vehicular traffic rapidly and safely a roadway must be entirely free from cross traffic interference either vehicular or pedestrian. Such a traffic way may handle two or three times the traffic at two or three times the average speed possible under ordinary congested conditions with the frequent interruptions due to cross traffic. Most large cities will find it necessary to build a number of such trunk-line routes or super-traffic ways. They will be costly but not so costly as the extreme congestion that will otherwise develop.

All cities in laying out in the as yet unbuilt areas streets that may become portions of future super-traffic ways should provide the extra width necessary to facilitate a future separation of grades at important

intersections Moreover by providing additional space for tracks and stations the super-traffic way in the future can be made to accommodate rapid transit train operation at comparatively small cost

The task of separating the grades of railroads and rapid-transit lines from those of intersecting streets and highways, now well advanced in many parts of the country should, of course, be continued

(b) *Classification of Traffic*—The most serious traffic difficulties result where there is a great mixture of all kinds of traffic (automobiles, street cars, trucks, buses, teams), especially on a narrow roadway There being no opportunity to separate into different lanes according to speed and mode of operation, all vehicles are compelled to take the speed of the slowest The automobile must trail behind the street car, the street car behind the heavy motor truck and the heavy motor truck behind the team Where there are three parallel narrow streets with mixed traffic as above, great relief can be secured by confining street car operation to one street and reserving another primarily for the slow moving trucks and teams and the third for the faster moving motor cars Similarly if there are but two such parallel routes the assignment of one primarily for street car operation will give considerable relief

Except on a wide thoroughfare where the street railway tracks and roadbed are separated from the paved roadway by curb or parked strip, a heavy automobile traffic combined with a heavy street car traffic multiplies interruptions both for the automobiles and for the street cars This makes it desirable where feasible in laying out a complete traffic and transit plan to provide alternate street car and automobile routes

To achieve the best results the character of given streets must be related to the character of the district they serve, industrial, commercial, residential

(c) *Arrangement of Traffic Arteries*—Through traffic of all kinds should be confined to main thoroughfares while traversing residence districts and outlying areas and these main thoroughfares should be so arranged that they will form natural boundaries to homogeneous districts, as residential areas, large enough to support neighborhood facilities such as stores schools and recreation places This regulation of traffic will be difficult of strict enforcement unless the minor streets of the residence district have been so planned as to discourage rather than invite through traffic

In laying out the minor streets in the unbuilt areas the number of intersections with or crossing of the main thoroughfares should be minimized Every such crossing is a danger point Both speed and safety will be gained by combining the traffic of a number of such

minor streets at a single crossing. Such a layout will have the very great additional advantage of keeping traffic off the minor residence streets by making access to them less direct and inviting, and this will reduce accidents, especially to children.

In some large cities most of the heavy trucking between terminals and between the terminals and the markets or warehouses must cross through the office or shopping center, thus intensifying the interruptions and dangers usual in that already congested area. While it is seldom feasible to effect a radical rearrangement of misplaced activities and functions, opportunities sometimes arise in connection with extensive reconstruction projects to secure a relocation of freight terminals, produce markets or warehouse districts that will afford great traffic relief.

Too often expensive bridges, viaducts or vehicular tunnels are built without sufficient attention being given to the approaches that are to carry traffic to and from them. By this failure the effective capacity of such a structure is often reduced by fully fifty per cent. The approach to an important bridge head should sometimes be carried a long distance back from the bridge and should be of such ample width and so free from cross traffic interference that it can carry without congestion the maximum traffic that the bridge itself is designed to accommodate.

Traffic dangers and difficulties are greatly increased by a haphazard spotting of industries and stores throughout the housing areas. Zoning regulations, establishing separate store centers and industrial districts and maintaining a proper ratio between the areas set aside for industry and the nearby areas reserved for housing, can do much to render possible the laying out of an adequate traffic system and prevent a haphazard development in existing residence districts that will create traffic dangers and difficulties for the future.

(d) *By-Passes and Belt Highways*—Often traffic congestion is created not so much by the vehicles of persons who have business in the congested district as by the vehicles of those whose business or pleasure takes them *through* the congested district. In such cases the opening of convenient by-passes routing traffic around the congested district will unquestionably give relief. There are many cities where good crosstown or circumferential routes are so scarce that it is usually easier to go into the center and out again than to attempt to go directly from one nearby section to another.

The same principle of by-passing congested centers should be applied to the laying out of a system of state and national highways. While such highways normally pass through the most congested parts of the communities little and big along their routes, it seems reasonable that where feasible the motorist should be given the alternative of passing

around the community on a by-pass route. Every large city should have a belt line traffic way entirely outside of its built-up area connecting all the main radial highways entering the city and making it possible for all through traffic to avoid all built-up urban areas.

## 2 Stopping and Day Storage Space for Automobiles

Streets and highways are designed primarily for moving traffic but they cannot fulfill their function efficiently and they become increasingly hazardous unless adequate provision is made for stopping and day storage of automobiles. Facilities for stopping to discharge passengers and facilities for storage for considerable periods or for all day should be an integral part of a complete traffic and thoroughfare plan.

With the present situation in our large cities it may be said that the larger the city the less efficient the automobile becomes as a means of shopping, making business calls or getting to and from work. It is moreover, very uneconomical in its use of street space per passenger carried as compared with the street car or the motor bus. The motor bus and the street car are at a similar disadvantage as compared with the rapid transit line, subway or elevated. So far as concerns the central business district of the very large city, street capacity and automobile storage or parking space adequate to accommodate a very general use of the private passenger automobile can not reasonably be provided. This is not saying that such facilities could not have been provided if they had been planned for when the city was originally laid out. But the expense would now be practically prohibitive. Probably the best that can now be done is to provide large automobile storage stations near the edge of the congested districts, from which places persons can either walk to their destination or transfer to subway, street car, bus or taxicab.

With the exception of these few very large cities however all communities can provide, more or less adequately, for a very considerable use of the private passenger automobile for shopping and business calls and for getting to and from work within the central business district. The city in which such facilities are unavailable will be at a serious disadvantage.

Failure to deal comprehensively and constructively with the automobile storage problem is responsible for much of our traffic trouble. Adequate storage space is an essential part of any transportation system. In order that the automobile may perform efficient service for the community it is almost as necessary that convenient and adequate provision be made for short-time stops as that adequate roadways be provided for movement. Facility for stopping and facility for movement are both important and in a complete traffic plan neither can be ignored.

The failure to recognize responsibility for dealing with the problem of automobile day storage or parking has led generally to haphazard parking arrangements in ill-chosen locations with almost a maximum interference to traffic movement.

On the ordinary traffic route in the congested district it is desirable that a strip next the curb be available for stops of delivery trucks and motor buses and for the very short-time stops of passenger automobiles. In most business districts there are a number of little used streets where space for longer stops can be made available. Sometimes the slightly used sidewalks on such streets may be narrowed and storage space made available in the center of the widened roadway. The interior of a large block can sometimes be converted into a parking space or used for a day storage garage.

In planning such day storage facilities account must be taken of the fire hazard and of the impediment to fire apparatus presented by unattended automobiles. This is particularly important in theater and shopping districts where large crowds of people must be dispersed quickly.

The automobile storage or parking plan should be developed as a part of a complete traffic thoroughfare and zoning plan and should lay out adequate, safe and convenient parking facilities, not in a temporary, makeshift way but with a view to permanency and to providing adequately for future needs.

Whether these facilities are to be provided by municipal authority or by private initiative they should be planned comprehensively in the public interest and carried out according to such plan. Private initiative, if it is to be induced to supply this needed facility, should have the protection as well as the obligations usually inherent in the performance of an essential public service.

### 3 Design and Equipment of Streets

The convenience and safety of the pedestrian should receive special consideration in the design of main thoroughfares. Sidewalks in the central retail and office sections should be of ample width. Safety zones should be provided at all important street car loading points. Isles of safety should be constructed to aid the pedestrian across wide boulevards. If however, traffic at the intersection is controlled during hours of heavy travel by an officer or by mechanical signals the isle of safety may be omitted.

Particular attention should be given to the design of thoroughfares at important intersections. Additional width at and near an important intersection will facilitate a future separation of roadway grades. It will pending such separation, provide space for safety zones or isles

of safety and also space for additional traffic lanes that will furnish reservoir capacity when traffic is held by the "stop" signal and a quicker clearance of the crossing when the "go" signal is given

Too often no provision is being made for the eventual widening or realignment of the main roads radiating from the city. These highways originally laid out as county roads, forty to sixty feet in width are gradually incorporated into the city street system and become its most important arteries of travel. Where not already built up with business structures building lines should be established so that any new buildings erected will be set back far enough not to interfere with the future widening of the road. Where the land along such a road has not already been subdivided into lots the city's approval of the subdivision plat should be conditioned on the widening of the thoroughfare to the width shown on the city's thoroughfare plan.

So far as feasible, the creation of "blind corners" on county highways or city streets should be prohibited. The maintenance of fences, walls, billboards or shrubbery in such locations at corners as to obstruct the view of drivers of vehicles approaching the intersection should be controlled to a reasonable extent by zoning regulations.

As traffic movement is the primary consideration in designing streets, attention should be given not only to the radius of corners so that vehicles may turn into intersecting streets with the least possible hindrance, but also to the most effective width of roadway. Unused or inefficiently used roadway space is an extravagance.

#### 4 Importance of Sub-Centers and Satellites

The increasing use of the automobile has forced us to plan for a whole region or metropolitan area instead of for a single community. Traffic originating at the center or centers flows in constantly greater volume through sub centers and suburban or satellite communities.

One fundamental means of traffic relief is to take from the chief business and financial center the industries and trades that do not properly belong there and especially all those that can be more economically carried on in sub-centers of business and industry located in other parts of the city and in its suburbs. Ideally the big city proper should be devoted primarily to commerce and administration and to the homes of the people engaged in these activities. The suburban towns and satellite cities clustering about the big commercial city should be devoted primarily to industries and to the homes of the workers employed in such industries. Such an arrangement would reduce housing, transit and traffic difficulties and should, if properly worked out, greatly increase commercial and industrial efficiency.

Regional planning should seek to create the conditions that will draw

industries away from the congested commercial centers to outlying areas or to suburban or satellite towns. To do this it is necessary to provide transportation, transit traffic ways power, water, sewers and other utilities, and what is sometimes of paramount importance houses and attractive living conditions for the workers.

The prevention of the increase and spread of tenement congestion in the housing areas near the business center of the great city is another way in which the decentralization of industry can be promoted. Such housing congestion leads to increased concentration of many kinds of light industry and every increase in industrial concentration leads to increased housing congestion. Zoning regulations limiting housing density and at the same time restricting the locations available for industry adjacent to the central commercial district will tend to lessen both demand and supply in the case of these central factory sites.

The decentralization of a part of the business and traffic of the central district could be promoted if more thought were given to the proper planning of business sub-centers. Such centers now develop in a haphazard way. They are usually located on narrow traffic and transit routes where the stopping and parking incident to business use creates a bottle neck for through traffic and produces a congestion that obstructs business development. These business sub-centers should be laid out in such locations or with such adequate width of roadway that through traffic will not be impeded, and with such adequate block interior or central plaza parking facilities that the automobile trade will be attracted to them from a wide radius.

## 5 Relation Between Street Facilities and Development of Private Property—Zoning

It is obviously impossible to plan for adequate street facilities if there is no way of determining the demand which will be made upon those facilities. To widen streets in a congested area or even to increase the number of those streets is patently futile if the widening or increase is followed by an unforeseen increased intensive use of abutting property demanding still further increase of street facilities. It is equally impossible to plan for adequate outlets or arterial thoroughfares from a traffic originating center if there is no way of estimating with a fair degree of accuracy the volume of traffic which may be expected to flow from an area to this center.

As the volume of traffic upon a given street (excepting through or arterial highways) depends chiefly upon the use made of abutting property there is an ascertainable relation between the character, use and bulk of abutting buildings and the needed traffic capacity of the street.

Furthermore as the volume of traffic upon a through or arterial street depends chiefly upon the character and size of the centers which feed into it there is an ascertainable relation between such centers and the needed thoroughfare or arterial highway capacity

A considerable degree of centralization is desirable for those financial and commercial institutions which have a widespread clientele. For them the business advantage of location at the center is so great that mounting taxes, rentals and other costs are usually insufficient to offset it. A business or financial institution serving an entire city or region may be handicapped unless located in the chief business center of such city or region. While a measure of decentralization may be obtained by the establishment in sub centers of branch stores and offices, the main store or office must often be retained in the central district.

The concentration of commerce and finance in a central business district may be attended with maximum or minimum traffic difficulties depending on the way in which the retail theater, hotel, office, financial and wholesale sections are located within the district and the relation maintained between street capacity and the load imposed on the streets by reason of the use and bulk of the buildings fronting upon them. Segregation of the various business uses is often advantageous both from an economic and a traffic standpoint. Sometimes, however, such segregation produces excessive peak conditions that would be avoided by a more diversified arrangement, or by so locating traffic or passenger originating centers that a two-way movement will be developed. The location of high schools in outlying areas so that pupils will be going outward while the bulk of the travel is inward is illustrative. Ideally a city would not have a central terminal for its passenger traffic but every stop would be a way station from which there would be passenger movement in both directions.

While the limitation of the height of buildings may not reduce and may conceivably even somewhat increase total traffic within the *entire* central district, it will tend to spread the district and prevent the concentration of very high buildings in limited sections. Such concentration inevitably leads to intolerable conditions only remedied at enormous expense by the creation of such devices as subways, elevated sidewalks or two level streets. In all fairness, expenses so incurred should be assessed upon the property whose intensive use has made them necessary.

## 6 Playgrounds and Schools

Busy traffic streets must not be used as playgrounds, but there should be playgrounds accessible without the necessity of crossing busy traffic streets.

The number of accidents to children while playing in the streets is



very large. The children must have some place to play and unfortunately in congested sections the street is usually the only space available. The obvious remedy is the provision of adequate open space for recreation convenient of access from every home where children may play and be kept off the streets. These recreation spaces should not only be made accessible to the homes where the children live but should be made accessible with a minimum risk to those who use them. Some playgrounds can be reached only by approaches across crowded and dangerous thoroughfares.

The order in which playground space is most needed and most suitable for use is: first, the private yard adjoining the home; second, a small playground within easy reach of the home; and third, the large playground in a public park or elsewhere. It is only by a properly adjusted city plan that consideration can be given to all these requirements. In particular, it is evident that the most nearly ideal form of play space can be obtained only by decreasing housing density and encouraging the building of separate dwellings with private yards about them. This means that one of the important reasons in favor of decentralization is that of obtaining safety for the children.

The same problems that are connected with the safety of children going to and from playgrounds arise in connection with the approaches to the schools. Too many schools, even in small cities, have inadequate school yards and are located on main thoroughfares, causing the maximum of inconvenience to vehicular traffic and the maximum of danger to the children. Schools and playgrounds should, whenever practicable, be so located that the children will not have to cross main thoroughfares in going to and from them.

### **7. Interrelation of Traffic Facilities**

The rapid transit railroad and the automobile should not be considered to be conflicting or antagonistic modes of transportation in any complete plan of metropolitan development. It is true that the private automobile and the motor bus are spreading out the population so thinly in the suburban areas that a direct rapid transit service to each small suburban community can not be financially self-supporting. The logical answer would seem to be—not that the population should be crowded together in apartment houses for the purpose of supporting rapid transit, nor that rapid transit should no longer be considered a factor in suburban development—but that the automobile and the motor bus should be depended upon to supplement rapid transit by collecting the traffic from the detached residence areas and carrying it to the stations of a limited number of rapid transit-trunk lines.

## 8 Comprehensive Traffic and Thoroughfare Plan Necessary

Under the strain caused by the recent enormous increase in the use of motor vehicles for purposes of business, convenience and pleasure our street traffic facilities have broken down. They are in large measure unsuited either in character or in capacity for the burden suddenly thrown upon them. Each community must restudy its present traffic facilities and determine in a farsighted and comprehensive way what changes and improvements should be undertaken to provide more adequately and safely for present and anticipated future traffic.

As a result of such survey and study each city should prepare and adopt a comprehensive traffic and thoroughfare plan showing a complete system of traffic ways, automobile storage facilities and needed street improvements both within the city limits and within the area of probable building development outside of the city limits. The adoption of this plan should be followed by the official adoption of a definite long term improvement and financial program that will meet in a business-like and courageous way the emergency created by the recent traffic flood and the lack in most cases, of even ordinary foresight in the building of the city.

In many rapidly-growing cities the central congested district is spreading and the chief retail center is gradually shifting. Under such conditions it is often more important that necessary widenings be undertaken and parking facilities provided just outside the present congested district and before this adjacent area is solidly built up with expensive structures, than that seemingly more urgent but also more costly and less permanently advantageous projects be undertaken in what is for the moment the heart of the congested area. It is only by having and adhering to a complete traffic plan and improvement program that the maximum benefits can be secured from a given expenditure.

In short the planning of safe and adequate traffic facilities is a major part of the bigger problem of comprehensive city and regional planning. Traffic and thoroughfare planning must be correlated with all other phases of community development, including transportation and rapid-transit facilities and the control of land and building development by platting, zoning and housing regulation.

## APPENDIX

### SUMMARY OF REPLIES TO QUESTIONNAIRE

The Committee addressed a series of questions to city planning commissions and other interested organizations in 250 cities and towns. Replies were received from 116. The population of the places from which these replies came ranges from 2,500 to 2,959,000. They fall into the following groups:

<i>Population of Cities</i>	<i>Number</i>
500,000 and over	11
250,000 to 500,000	8
100,000 to 250,000	22
50,000 to 100,000	20
25,000 to 50,000	19
10,000 to 25,000	19
Under 10,000	17

Not only do these cities vary widely in size and population but they differ greatly in character. Some are the old, closely built communities of the Atlantic seaboard; others the more generously spaced municipalities of the middle west; still others the young cities of the Mountain and Pacific Coast states. Not only do they differ in density of building but also in arrangement and width of street and roadway. Some are self-contained communities; others are suburbs. In some traffic congestion and accidents have been so long a serious problem that they have been given careful study. In others they have either not yet been recognized as questions of any significance—aside from the almost universal difficulties caused by lack of proper parking spaces—or have appeared so recently that no thorough study has yet been given them and there is an easy optimism which finds expression in the belief that mere street or roadway widening will remedy the trouble.

#### Increase of Street Accidents

Consequently these replies are chiefly valuable as indicative of the state of public opinion in the various communities. They do, however, indicate certain conditions from which conclusions may be drawn. The most obvious of these is that street accidents are increasing appallingly, and that they are notably greater in those cities where there is the least effective control of traffic. That is, the motor vehicle has increased street and highway hazard and therefore calls for regulation.

This, however, is evidently merely a superficial remedy which reduces the number of accidents due to reckless or careless driving or to the

confusion resultant from lack of generally recognized rules of the road. Beyond this there appears to be evidence that the rate of minor accidents at least increases with the volume of traffic and particularly with traffic congestion. The word "congestion" implies more than volume. A very heavy volume of traffic which moves smoothly and without confusion does not cause congestion. Undoubtedly many accidents are due to strain, fatigue and the psychological effect of driving through crowded streets.

### Effects of Traffic Congestion

The opinion prevails that a heavy volume of traffic causes delay and consequent congestion with increased hazard, even where well regulated, and obviously delay spells economic loss, though the estimates given in the replies, varying from a few hundred thousand dollars to \$60 000 000 annually are too vague to be of statistical value. The loss however, is unquestionably a large one and the prevention of the difficulties causing this loss is one of the important functions of city planning.

An interesting result of tabulating the replies was that about 30 per cent express a belief that crowded vehicular traffic hampers the business of retail merchants. The rest are either doubtful or express no opinion. On the other hand 86 per cent indicate a belief that congested pedestrian traffic does not hamper business while a considerable number say that sidewalks crowded almost to the limit of discomfort are advantageous to storekeepers. Such general statements without qualification or explanation are, of course, merely clues that call for further study. In response to another question seventeen replies gave instances of stores and business houses moving from congested to less congested areas though the great majority of replies denied there had been such moving in their cities. This is a recent development, however and with long term leases or ownership of property general to say nothing of the value of a location with which a firm's customers have become familiar, it would be slow in manifesting itself.

It seems obvious that if a roadway is so filled with vehicles that a driver hesitates to enter that street or having entered finds it difficult to stop or even to glance at shop windows, the storekeepers will not profit greatly by his patronage. It also seems obvious that if a sidewalk is filled to capacity with pedestrians any one of whom may make his way to the door, the shopkeeper has before him an increased number of potential customers. But some more thorough studies have shown that the latter assumption is not justified in the case of all classes of business. While the store which caters to an impulse trade, the cigar store and soda fountain are illustrative, profits by crowded sidewalks, the store

which caters to those who have set out with the intention of making a specific purchase, may lose to a competitor on a more comfortable street

### Traffic Studies and Forecasts

The replies indicate that about one-third of the cities have made traffic studies—one-half of this third exceed 100 000 in population. But only 10 per cent of these cities have utilized the studies after they were made. Nevertheless about two-thirds of the cities have made forecasts of their traffic needs. While it is evident that some forecast is better than none at all those made without a study of existing conditions are of comparatively little value.

### Parking or Day Storage

About one half of the replies indicate a belief that a change in parking i. e., day storage or out-door storage regulations will relieve traffic congestion and therefore promote highway safety. In many other replies doubt is expressed as to the efficacy of new regulations. While regulation is general, the rules vary from city to city. Generally speaking the time limit is the form used. Evidently public attention in nearly all of our cities is still concentrated upon the day storage problem in business districts for 80 per cent say that parking before apartment houses has not yet become a serious problem and few suggest any remedy for it. In two thirds of the cities from which replies were received storage on side streets is permitted while parking in the interiors of blocks appears to be practiced in only about one-fourth of them. Use of vacant lots, necessarily a temporary expedient which will fail as the need grows greater with the erection of buildings on these lots, is practiced in one-half of these cities. Only three replies state that parking space for automobiles is provided beneath the surface of the ground. One-third of the replies stated that day storage in garages has become a familiar practice.

### One-Way Streets

Opinion is divided as to one-way streets particularly as to their effects on business. One-quarter of those who reply indicate that merchants believe one-way streets are hurtful to business, one-quarter say it has no effect, one-quarter have never tried the experiment and twelve have not made up their minds.

### Alternating Traffic Lanes

Alternating traffic lanes, for example three out of four lanes on a street used for incoming traffic in the morning and three for out-going

traffic in the evening is being studied in three cities. But 80 per cent of the replies say it has not been tried in their cities. Two say it is undesirable.

### **Left-Hand Turns**

Opinion is divided on left-hand turns also and this divided opinion is confined to one quarter of the cities which replied. Seventeen cities have had no experience. Nineteen say that the rule "no left-hand turns" is injurious. The diversity and indefiniteness of the answers perhaps indicate that prohibition of left-hand turns is too recent to have led to any established opinion.

### **Cruising of Automobiles**

One-half the cities which replied permit the cruising of taxi cabs. A somewhat larger number permit the cruising of private automobiles. In many responses the question was not answered.

### **By-Passes for Through Traffic**

One-third of the replies stated that it is desirable to provide by-passes for through traffic so that such traffic may be diverted from or carried around the crowded district. One-fourth say it is undesirable. The rest give no definite opinion or do not answer the question.

### **Segregation of Traffic**

More than one-half of the cities do not provide for any segregation of traffic. One-third forbid trucks to enter parks, parkways or boulevards. In a few cities trucks are also forbidden to use shopping streets. In these cities it is proposed to devote certain streets in wholesale and industrial districts to heavy trucking.

### **Street Widening**

About 50 per cent of the replies indicate a belief that increased width of street permitting additional lanes for moving traffic, will overcome traffic congestion. They differ however as to whether the additional lanes should be added with or without parking facilities. Apparently the only thought on the part of many of these advocates of street widening is simply to provide more space for existing traffic. There is no indication of any ultimate maximum width of roadway. In fact 80 per cent of the replies indicate that there is as yet no apprehension that roadways on dense traffic streets will be too wide for traffic efficiency or for the safety of pedestrians.