Traffic Engineering in Small Cities

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Travel in 1951 was nearly 500 billion vehicle miles, an 8 per cent increase over 1950. Traffic deaths in 1951 approached 37,500, also an increase over 1950.

In other words, travel kept pace with deaths to highlight the only favorable item in the record. The biggest increase was in rural areas while a slight drop was evident in municipalities.

However, about half of the travel occurred in urban areas on about 10 per cent of the total street and highway mileage in the United States. This points out that efficient movement of transportation on city streets is essential and therefore from an economic point of view must be accepted as a city responsibility.

Most of our cities under 50,000 population face similar problems of traffic congestion. From the standpoint of engineering responsibility, these might be grouped into six classifications:

No. 1. *Inadequate Parking Facilities:* Inadequate off-street parking is perhaps the major traffic problem facing communities today. Financing of off-street parking lots is a stumbling block.

A. The curb parking problem in business areas and along major through streets is being approached in three stages. First, the elimination of angle parking on at least one, then finally both sides of the streets. Secondly, prohibiting parking during rush hours on one or both sides of certain streets. Third, prohibiting parking on both sides of major streets at all times.

B. Financing of off-street parking is accomplished by several methods:

1. Municipal bond issue.
2. Assessment of immediately benefited district.
3. Use of revenue from parking meters.
4. Revenue bonds based on fees from parking facility users.
5. Lease of privately owned land.

6. Creation of a parking authority with broad power to chose and utilize one or more of the various financing methods.

No. 2. *The Need For More Street Capacity:* Many cities are widening major streets. However, the need for additional roadway capacity places additional emphasis on parking regulations. The removal of parking is more practical in many instances than widening streets.

No. 3. *Speed Control:* Speed zones, with special limits suited to road and traffic conditions are needed in many sections of urban streets to supplement present business and residence district speed limits.

No. 4. *Special or Intermittent Type of Regulations:* Prohibiting parking during rush hours or at all times along certain streets comes into this category also. There is a need for establishing special routes, prohibiting turning movements at certain intersections, adoption and expansion of the one-way street principle and special signal timing, perhaps during certain hours to obtain greater efficiency of city streets.

No. 5. *Better Facilities for Pedestrians:* Pedestrian movement should be considered in the timing of traffic signals, redesign of unusual intersections, channelizing islands and special markings.

No. 6. *The Development of a Comprehensive Street Plan for Future Transportation Needs:* Many cities, including those with populations less than 50,000, are preparing or having prepared by traffic consultants such a plan for the future needs of the city.

NEED FOR FACTUAL AND SCIENTIFIC APPROACH

Traffic engineering techniques have been developed for studying the problems listed above and for scientific approach to solutions of these problems. The revised edition of "Traffic Engineering Handbook" contains 520 pages of illustrations, tables and definitions, a practical day by day guide for those who are called upon to solve traffic problems. Other publications also available are, Traffic Engineering Magazine, and "Getting Results," produced by the Association of Casualty and Surety Companies, etc.

These techniques should be applied by specialists instead of basing solutions to traffic problems upon opinions, as has been done many times in the past.

In other fields of engineering, city officials and the public recognize the need for specialists. In sanitary engineering, for example, specialists design the sewage system only after careful study. Likewise, in traffic engineering it is essential that the proper techniques be used for determining which types of remedies are appropriate for the conditions. Responsibility for traffic engineering needs to be definitely assigned to an engineer in the city government. The necessary budget and staff with proper training given are also essential.

FIXING THE RESPONSIBILITY

We find that in many cities the police department is handling the traffic engineering duties. However, in many instances the city's traffic engineering program has been handicapped through lack of proper scientific and factual direction. First, traffic engineering is engineering. Second, irrespective of the ability and training of the police administrator, he usually has more enforcement planning and other administrative work than he can handle, and does not have the necessary time to devote to the many detailed functions of traffic engineering. In too many instances, police administrators have been *forced* to take over the traffic engineering duties, because a weak engineering program or no program at all offsets the effects of good enforcement activities.

Third, one of the major avenues of attack on the problem is engineering, and it is essential that the person responsible for traffic planning and operation have the necessary engineering training and background. It deals with the planning and geometric design of streets as well as the operation thereon. Fourth, when the functions of traffic engineering are the responsibility of two or more departments, the net result is, too often, lack of coordination and overlapping of responsibility.

An effective traffic engineering program must be coordinated because its broad scope comprises the collection, analysis and interpretation of factual data, traffic planning and design and traffic operational measures. For these reasons, the Engineering Committee of the President's Highway Safety Conference has recommended the following:

1. For cities over 100,000 population, a traffic engineering unit should be established in the city government, comparable with other divisions of the public works or other engineering department.

2. In cities from 50,000 to 100,000 population, there should be at least one full-time traffic engineer, with sufficient authority delegated to him for traffic engineering functions.

3. In cities below 50,000 population, the responsibility for traffic engineering functions should be delegated to an engineering official, such as the city engineer, the head of the department of public works, or an employee in the engineering department, and opportunities should be given for this man to obtain the necessary training and experience.

Reports of cities in the Annual Inventory of Traffic Safety Activities for 1950 show that all cities over 300,000 population have full-time traffic engineering departments. Seventy-seven per cent of the cities from 200,000 to 300,000 population reported full-time traffic engineers while cities from 100,000 to 200,000 population was 60 per cent. It is interesting to note that a number of cities from 50,000 to 100,000 population have a traffic engineering department. Also, one city below 50,000, Burlington, Iowa, has a full-time traffic engineer.

In cities not having traffic engineers, the responsibility for traffic engineering has been assigned to someone in the engineering department in over half the cities above 25,000. In the 10-25,000 population group 46 per cent indicated the engineering department was charged with this responsibility while 34 per cent indicated the police department assumed these duties. However, there has been a gradual trend toward placing the responsibility in the engineering department. Yet, this percentage unquestionably should be much higher than at present.

THINGS WHICH CAN BE DONE TO IMPROVE TRAFFIC OPERATIONS AND CONTROL

Steps which can be taken toward improving the traffic control and accident prevention activities in smaller communities are listed below. These deal primarily with engineering matters, rather than with traffic law enforcement or public information, which also are essential parts of a balanced accident prevention program.

1. If already not in effect, assign the responsibility of traffic engineering functions to an engineer and arrange for sufficient budget and staff assistance so that this man may do the proper job. Leading cities have indicated that 23 per cent of one man's

time per 10,000 population is necessary to carry on an adequate program.

2. Traffice regulations and restrictions of course should be brought up to date and in step with present traffic conditions by modernizing your traffic ordinance.
3. Inventory your traffic signs, signals and pavement markings. They should conform with the uniform standards required by state law and contained in the Indiana Manual of Traffic Control Devices. The public may not be qualified to pass judgment on street improvements but the appearance of traffic signs is apparent to every layman. Unfavorable opinion of the city's efficiency is easily formed if signs, signals and markings are not properly maintained. A schedule for replacement of non-standard signs, etc. should be maintained.
4. Set up administrative procedures for centralizing traffic engineering functions under the traffic engineer, or engineer made responsible.
   A. All complaints, suggestions and evidence of high accident locations should be referred to the engineer for study.
   B. Plans for street improvements should be referred to the engineer for checking from a standpoint of street capacity and geometric layout as it affects safety.
   C. All matters relating to maintenance and installation of signs, signals and pavement markings as well as surveys and investigations should be referred to the engineer. Quite often these responsibilities are divided among several city departments.
5. Schedules and records for routine activities should be established and maintained:
   A. Schedules for inspecting, reconditioning and periodic maintenance of signs and signals.
   B. Schedules for placing and maintaining pavement and other markings.
   C. Records for traffic signs, particularly those in regard to regulation, play streets, bus stops, etc.
6. The engineer should have easy access to accident records and information revealed by accident reports so it can be used in engineering studies.

7. Angle parking (studies will reveal) chokes traffic movement and causes unnecessary delay. Forty per cent of the cities under 50,000 population have no angle parking on main or business area streets. Seven to ten per cent of the cities reduced angle parking in 1950. Thus, if the city has considerable mileage of streets with angle parking, steps should be taken to eliminate it, perhaps on a long-range program basis.

8. Many cities are restricting curb parking use by prohibiting parking during rush hours on one side during certain hours along major thoroughfares and many cities have prohibited parking at all times along certain streets. We find that at least three-fourths of the cities under 50,000 population have prohibited parking on some streets at all times, whereas one out of every four cities indicated that they have certain streets along which parking is prohibited during rush hours only. A number of cities increased their street mileage during 1950—prohibiting parking at all times and/or rush hours only.

9. The adoption of the one-way street principle has become an accepted engineering approach to the transportation problem in municipalities. Three-fourths of the cities from 25,000 to 50,000 population indicated they had one-way streets, while approximately one-fourth of the cities in this group increased the mileage or adopted such principle during 1950. For cities from 10,000 to 25,000, 60 per cent indicated having one-way streets whereas 10 per cent adopted or increased the mileage during 1950.

10. Greater use of the intermittent type of regulation is being made—has been for several years in larger cities and is now being accepted in the smaller municipalities. These intermittent type of regulations are prohibiting parking on certain streets, one side during certain hours; prohibiting turning movements during certain hours at certain intersections; adopting reversible one-way street systems, and establishing unbalanced flow and special signal timing during certain hours of the day.

11. A number of municipalities have established or are planning to set up special routes for commercial traffic in order to eliminate congestion in downtown areas.

12. Modernization of traffic control signals has become an important activity. All traffic signals within 1200 feet of one another, at

least, should be coordinated for progressive movement. Modern type equipment includes timers which provide greater flexibility so cycle lengths and cycle splits can be changed during rush hours. In addition, the signal modernization program includes special indications for pedestrians.

13. An important activity for consideration by every municipality is a study of its through street system. This of course directly affects the efficiency of the state highway system throughout the city and again cooperation and coordination of a through street plan is doubly important.

14. Over half the cities with parking meters have used the revenues for traffic improvements such as the development of off-street parking facilities (cities from 10,000 to 25,000 population). We find in this classification, leading cities indicated 105 off-street parking spaces per thousand registered vehicles, which is considered by no means adequate. Half the cities from 10,000 to 25,000 population completed off-street parking lots in 1950 whereas three-fourths of the cities from 25,000 to 50,000 population completed such facilities.

15. Following are some of the traffic planning activities in cities under 50,000 population:

    Ames, Iowa—major and minor street plan completed by city plan commission, ready for adoption in 1952.

    Beaver Dam, Wisconsin—A master plan for a truck route around the city has been suggested by the state planning board, and the planning commission is using this information for future street layouts. Two off-street parking areas were added in 1951.

    Bellevue, Pennsylvania—Recommendations being prepared for city council to change two-way street to one-way streets leading to main arterials.

    Bristol, Virginia—More one-way streets, change in routing of truck traffic, removal of some parking and other changes according to complete survey to be published in April 1952.

    Brookfield, Illinois—Comprehensive traffic survey by Cook County Traffic Safety Foundation.

    Cleveland, Tennessee—Establishment of special truck routes.

Coral Gables, Florida—Synchronization of downtown traffic signals and installation of master timer to connect to 18 downtown traffic signals. Designating several miles of streets as one-way.

East Moline, Illinois—A comprehensive street plan for future transportation needs being prepared by the highway department.

Freeport, New York—Prohibition of truck traffic on several streets and re-routing of buses. Installation of traffic signals to be inter-connected so as to produce progression planned for 1950.

Garden City, Kansas—A survey made for a truck route, one-way traffic installed in alleys and eliminated parking on additional streets near schools.

Grosse Pointe Park, Michigan—Plans for 1952—completion of arterial street program, prohibition of parking on narrow streets, installation of signals.

Monterey, California—Special truck route established. One-way street placed in operation.

Muscatine, Iowa—Changed truck route to by-pass business area. Installed traffic signals at two intersections.

Palestine, Texas—Two major streets changed to one-way movement.

Paris, Texas—One-way system inaugurated. Developed plan for through street system to be started as a stage construction program.

River Rouge, Michigan—Thirteen streets changed to one-way streets.

Rocky River, Ohio—Coordinated traffic signals as well as pedestrian indications at several high volume intersections. Channelization at one intersection.

Two Rivers, Wisconsin—Installation of modern type street lighting.

Weirton, West Virginia—Proposals under consideration for prohibiting parking on one side of certain streets.

Alliance, Ohio—Established truck routes by ordinance. Re-routed public carriers within city.

Dubuque, Iowa—One-way street established. Improvements scheduled for 1952 include one-way streets in business district. Restricting of all parking on one street. Installation of walk signals at six downtown intersections.

Enid, Oklahoma—Completed two miles of one-way streets. New belt line truck route around the city. Restricted left turns at signalized intersections in business district. A city-wide comprehensive street plan for future transportation needs has been completed.

Kearny, New Jersey—A series of one-way streets to be put into effect to relieve congestion in a very heavy truck area, to be completed in 1952.

Manitowoc, Wisconsin—Through truck route changed to by-pass downtown area now routed over a new bridge.

Plainfield, New Jersey—Master plan completed.

Pocatello, Idaho—Truck routes into, through and out of city to serve wholesale district, and modern type lighting planned for 1952.

Watertown, New York—Rerouted heavy truck traffic out of one section of city.

West Palm Beach, Florida—Turning movements prohibited at certain intersections to improve pedestrian safety.

Yonkers, New York—Added to one-way streets in a congested section of city. Master plan for city being prepared by city planning board.

Sequin, Texas—Special by-pass route established for flammable carriers.

Monroe, Michigan—Establishment of a one-way street system.

Ironwood, Michigan—Modern street lighting to be installed in 1952 throughout the business district. Replacement of existing traffic signals with modern type timers and fixtures.

Norfolk, Nebraska—New truck route through city planned for 1952.

Freeport, Illinois—New traffic signals for five intersections planned for 1952.

Ecorse, Michigan—Four residential streets changed to one-way streets.

Montclair, New Jersey—Special route established to eliminate trucking through residential areas. Two one-way streets established. Some angle parking eliminated.

Petersburg, Virginia—Channelization of three major streets. Completed studies and plans for a one-way street system in downtown area.

Sheboygan, Wisconsin—Prohibition of parking on certain streets to facilitate snow removal.

Rochester, Minnesota—Installation of modern type traffic signals planned for 1952.

Santa Barbara, California—Modernization of existing signal equipment.

Oshkosh, Wisconsin—Establishment of a one-way street system.

Lynchburg, Virginia—Truck route established. One-way street system established.

Middletown, Ohio—Study under way for creating one-way streets and rerouting heavy truck traffic.

Hollywood, Florida—Parking eliminated on one side along three arterial streets. One-way streets established.

Rye, New York—Two municipal parking areas, 240 car capacity total, completed in 1951.

Rocky Mount, North Carolina—New system of traffic signals and system of one-way streets planned for 1952.