

Adequate Traffic Engineering Organization

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The provision of a system of roads or ways for public travel is well established as a governmental responsibility. The extent of this responsibility, however, has increased over the years. Originally it was largely a requirement to maintain a system planned by the accidents of nature and developed by the fitful activities of man.

Today the responsibility is to plan, construct, maintain and operate a complete network of streets and highways to serve the needs of the public. And this responsibility continues to increase. Consider the full meaning of "operate" on the multi-thousand mile system of controlled access highways to be built in the next 15 years.

This evolution of the highway responsibility requires a continuing reappraisal of the organization of government. Thirty years ago the term "traffic engineer" was unknown simply because the highway responsibility was confined to construction and maintenance. He is now an accepted member of the highway team in all states, large cities, and an increasing number of counties.

Preceding him the design engineer, bridge engineer and location engineer joined the staff of the progressive department. The landscape engineer is a more recent addition and another example of the broadening of the highway responsibility. In this atmosphere of change, the organization that was adequate 50 years ago, 30 years ago, or even 10 years ago, may not be adequate for today's or tomorrow's needs.

It is regrettable, but true, that governmental organization is long on inertia and many cities, counties and even states are attempting to make their 1907 model suit fit the 1957 body. It leaves some pretty big gaps!

We recently completed a study of the street and traffic management structure in one of this country's largest cities. Instead of one

department and one executive charged with the responsibility for street and traffic affairs, we found 21 agencies and 66 executives sharing the burden. As a new responsibility developed, it had been assigned or assumed by whoever had the skill or equipment or time to carry it out. As one small example, parking meter maintenance was assigned to the division handling the fire alarm and police communication system because they had a machine shop and employed instrument makers. Naturally, this method of splitting responsibilities on the basis of skill leads to many duplications and waste of effort. In this case, the agency responsible for curb parking control—the decision to use meters—the agency purchasing and installing the meters, and the agency maintaining the meters were each in separate city departments. The fact that anything was done is a credit to the caliber of the men in the jobs.

Transportation Planning

Of perhaps greater importance, however, are the functions not assigned to anyone in the absence of one overall authority. Transportation planning is a good example of a neglected area in many city and county organizations. Good planning begins with a good continuing program of data collection: data on traffic flow, origins and destinations, growth of major traffic generators, changes in mode of travel and travel desires. All of this must be known for today before it can be accurately predicted for tomorrow, and we must plan and build our highway system for tomorrow.

This is a vital area of concern for cities, for the growth of cities and city transportation needs in the next decade will be tremendous. By 1975 the urban population of this country will increase by 50 per cent. This population will require developing new residential areas at the rate of a million acres per year. This means new streets and new or improved arterials to reach the central city. It also means that many peaceful country roads will become the major arterials of tomorrow's city. The increase in urban population will continue to spill over into county territory. For every car today there will be two cars in 20 years and this traffic to a large extent will be served on roads which exist today. There are roughly $3\frac{1}{2}$ million miles of roads and streets in this country today. This figure is relatively stable and has been since 1934. We will serve this traffic not so much on new mileage of roads as on wider, more efficient versions of today's street plant. Planning for this service must start today or, preferably, yesterday.

Planning a transportation system to serve these demands is clearly a responsibility of the local highway agency. In large depart-

ments a separate planning section staffed by competent traffic engineers may be established. In other cases this function may be combined with the operational responsibilities of the traffic engineering division. In either case, the traffic engineer should be in a position to supply a substantial part of the basic data from his normal data collection process. In cities and some counties there will be a planning commission to assist in this work and see that the transportation plan is in agreement with other capital improvement programs. The planning commission function is to coordinate the planning of the operating departments. It is seldom staffed or equipped nor is it its function to do the detailed planning work for the departments. *The planning responsibility belongs to the department.*

Operational Aids

Planning is only one area in which the highway responsibility is increasing. We have only begun to fill the need for operational aids to the motorist. As highway use continues to grow, new measures must be devised to meet the needs of the user—for effective use of both existing and new facilities. Carl McMonagle mentioned the advantages of limited access. I'd like to mention some of the problems.

We are proposing to build a 41,000 mile system of highways free from intersections, roadside businesses and even advertising signs. Removing these from the travelled way is essential to the level of service these roads must provide but it imposes new requirements on the operation agency. The motorist's needs include food, refreshment, rest rooms and an opportunity to relax for a moment. In many cases he may need a telephone or detailed directions to his destination. His automobile requires fuel and, not too infrequently, mechanical repairs. These are all services which roadside businesses have, in the past, provided. These are services to which the motorist has grown accustomed. The operation of the highway must compensate for isolating him from these services through limiting access. We must develop means to communicate with him and direct him to the services he requires. The New Jersey Turnpike experience indicates a need for emergency roadside service for each 21,500 vehicle miles. Nor is this exclusively a rural problem. The City of Syracuse has found it necessary to provide roadside telephones on an expressway of less than three miles in length. Retaining walls and right-of-way fences are as effective as rural countryside in blocking communication.

As traffic volumes on existing streets increase, it will be neces-

sary to increase the operational controls correspondingly. A route which may be safe and efficient for 500 vehicles a day needs an entire new set of operational signs, signals and markings to serve 5,000 vehicles a day. Also, the changes in type of traffic on existing streets will require new study and new devices.

Whatever devices will be required, and you can let your imagination soar on that subject, the point is that the responsibility for traffic operations is becoming both broader in scope and more complicated in application. The organization of government must reflect this changing pattern.

Organizations which have been occupied with maintenance, and many county road departments are still in this class, will be required to revise their view to accept planning, design and operations as co-equal functions. How they accomplish this will depend upon the magnitude of their problem. Cities, too, should review their organizational structure to see that all of the important functions are assigned and carried out with maximum efficiency.

Administrative Structure

Although no two situations will be identical, there are some general rules which can be applied to evaluate the administrative structure of a jurisdiction. The organization should achieve the maximum possible grouping of related and interdependent functions under one administrator. In a smaller community this will mean that all street functions—planning, design, construction, operations and maintenance—be grouped under one man, probably the public works director. He, in turn, should delegate his authority on this same basis. Street operations might be the exclusive job of one man or it might be combined with planning or design if the department is small. It is important, however, that each function be recognized and definitely assigned to someone.

In large communities the magnitude of the problem justifies a department devoted exclusively to street transportation, just as states have established broad scope highway departments. Their function would encompass off-street parking and public transportation to the extent that the city is active in these fields, and both are essential ingredients of the street transportation problem in urban areas.

As a second general rule, each major division should have clearly defined duties and authority sufficient to discharge its duties. There should be a minimum requirement for specific clearance of individual actions. These limits of responsibility and authority should be spelled out in writing in the basic law of the jurisdiction

or in official administrative orders. There is no easier way to determine where assignments overlap or leave gaps than to draw up a written statement of duties. This process may point out, also, where administrative and policy decisions have become confused. It is not uncommon for the policy level of government to hoard to itself decisions which are properly placed at the technical, administrative level. Certainly the requirement of city council action and the mayor's signature authorizing each parking sign in a city is an example of poor delegation of authority. The council should be informed of, and approve, the general criteria or warrants established by the department. The application of these warrants to specific situations is better handled at the technical rather than political level. Implementing this decision with appropriate signs and markings is obviously an administrative act.

It goes without saying that doing an adequate job requires, in addition to authority, personnel and budget. It has been extremely difficult in the past for an agency to evaluate its budget or personnel situation in the absence of norms or yardsticks. An encouraging step to fill this void has been taken by the Yale Bureau of Highway Traffic. They, in conjunction with the National Committee on Urban Transportation, have launched an exhaustive study into the functions and levels of service of urban transportation agencies. At the state level, the traffic committee of the American Association of State Highway Officials is looking into the same problem.

Budget and Manpower

The budget and manpower required is related to the scope of the assigned responsibility. Certainly it can be said that the budget for traffic operations, or planning, or any other important function should be established as an independent item under the stewardship of the official responsible for that function. Attempting to carry out the traffic operations responsibility with scraps of funds left over from maintenance or construction is an impossible handicap. Along the line of budget, I think many traffic engineers are under-estimating the potential benefits they can provide and putting self-imposed limits on the expenditures for adequate traffic control devices. The Boston Central Artery was constructed at the cost of \$50 million for the most expensive mile. Therefore, an operational device which would increase the efficiency of that route by 1 per cent would have a value of \$500,000. Not many of us are going to be concerned with the Boston Central Artery but the parallel situation exists in every community. The cost of adequate traffic control devices is such a small part of the total cost of providing the travel way that there

can be little justification for scrimping. It is a necessary part of the traffic engineering responsibility to develop support for an adequate program. This includes informing the public, the city or county council and superiors in the department of the needs and potential benefits of that program. The traffic engineer can be reasonably assured that no one will do it for him.

The magnitude and scope of the highway responsibility is inevitably increasing and with it will increase the magnitude and scope of the responsibility of the traffic engineer. It behooves us to prepare for this responsibility by examining the administrative framework and legal tools with which we work. We are prone to give a great deal of thought to that which exists today and be too little concerned with what it should be. It is too easy to say "this is all I have to do." It is necessary to think, "this is what I should be doing to provide the service the public requires."