

Traffic Engineering by Non-Traffic Engineers

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My topic today is "Traffic Engineering by Non-Traffic Engineers". Tomorrow afternoon I will discuss the subject, "Why the Traffic Engineer Needs Training". Can these two subjects be reconciled . . . or do I find myself in the unfortunate position of talking out of two sides of my head—one side for today, another side for tomorrow?

Personally, I feel that the two are compatible and that any seeming inconsistency lies in how you approach the subject.

Let's consider traffic engineering as it is today.

As a profession, I feel that traffic engineering has now become of age. The services of the traffic engineer have been demanded; his contribution has been recognized. Today he shares equal stature with those on the traffic team responsible for highway planning, design, construction and maintenance. His specialized field is in the operation of traffic upon our highway facilities.

To maintain professional stature, the traffic engineer must, of course, be a trained man. He must first of all be a highway engineer. But he must then acquire additional training and skills dealing with the operation of traffic. He must be versed in carrying out the following functions—collection, analysis and interpretation of factual data, traffic planning, traffic design, and traffic operational measures.

So that we are all thinking along the same line, here is the definition of traffic engineering offered by the Institute of Traffic Engineers:

"Traffic engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is

related to the safe, convenient, and economic transportation of people and goods.”

This is the professional approach to traffic engineering.

Let's be Realistic

We well know that there are not enough trained, professional traffic engineers to go around and that area after area does not have available the immediate services of a traffic engineer. Yet in these same areas, the street and highway plant must be made to operate and this operation must be in the hands of someone other than a professional traffic engineer.

Necessity dictates that certain engineering functions must be conducted by non-traffic engineers. As a matter of fact, if it is actually an engineer who is conducting these functions, the picture is not as black as it could be. In many different places traffic operation activities are conducted by many different types of individuals—some without even general engineering training.

Until only a few years ago, traffic engineering in Madison, Wisconsin, was handled by the police department.

It would be ideal if the operation of traffic on every mile of our streets and highways could be in the hands of professional traffic engineers but today this is not yet possible.

What Then is the Alternative?

The answer is in good, sound administrative practices, an enlightened administration that recognizes the dangers and that knows those areas that can be handled successfully with limited personnel and limited finances.

Such administration should also recognize the importance of careful selection of the employee who must handle problems of traffic operation if no traffic engineer is available.

Let's see what benefits can be obtained by the non-traffic engineer who must wrestle with traffic operational problems.

A really constructive part of traffic engineering is first of all in making today's road-ways do today's work. Not only does such traffic engineering produce improved results until new facilities can be constructed; it may even point the way toward more practical and economical methods of providing adequate service to traffic.

Basically, such traffic engineering efforts are concerned with deficiencies and inadequacies in highway facilities and in uncertainties of driver skill and judgment.

For more years than we care to remember, “deficiencies” and

"inadequacies" have been key words in highway transportation and administration.

Regardless of currently accelerated highway improvement programs, highway transportation must continue to function in spite of recognized deficiencies and inadequacies. The result is that our non-traffic engineer must become a trouble-shooter. Within his means and abilities, he must create the best traffic operation that he can on the roadways of his areas as they exist at any given time.

In doing this, a competent employee can accumulate a pretty good kit of tools and a certain amount of skill in their use.

Trouble Shooting

Usually it is an emergency that brings the trouble-shooter and his tools into action. It may be a flurry of accidents, particularly fatal accidents. It may be peak-hour traffic jams; it may be changes in the type of traffic using a certain facility.

The trouble-shooter can, by studying the situation and analyzing the conditions, locate the danger spots. Warning signs can be installed, no-passing zones set up or speed controls invoked. Traffic control signals, properly used, can regulate and curb the flow of through traffic and pavements can be marked to guide erring motorists into paths of righteousness.

Of course, the non-traffic engineer coping with operational problems cannot usually provide for new facilities. But that is no reason he must drop his hands and complain that there is nothing he can do. To be sure, the methods at his disposal are limited, but there is plenty that can be accomplished.

By applying traffic engineering methods, he can actually increase the capacity, for example, of existing facilities in his jurisdiction. He can, for one thing, reclaim for traffic use the borders of the pavement by revising parking habits which usually are irresponsibly wasteful of needed space. He might do this, first, by a shift from angle to parallel parking and, finally and where necessary, by eliminating on-street parking entirely. For another thing, he can eliminate a large part of the trouble generated at the roadside by suitable control measures.

These are only a few examples. However, with study and the application of a healthy measure of old-fashioned common sense, the root cause of local congestion and conflict can be discovered. Most often it is in confusion in the flow of and in the contacts between the traffic streams.

Situations can be analyzed, and the cause for confusion identified. In some cases it will be due to physical bottlenecks. In other

cases it will be found that difficulties are caused by operational faults.

It is the correction of operational faults that lies within the realm of possibility for the non-traffic engineer working in the area of traffic operation. To make such corrections he needs a knowledge of the character and desires of the traffic with which he must deal, a sound understanding of the principles of traffic management, and the intestinal fortitude to demand that plainly indicated remedies be applied and enforced.

Lack of knowledge about either conditions, problems or techniques can be overcome. A large amount of information and many sources of assistance are available.

Sources of Assistance

A major difficulty confronting the non-traffic engineer—and certainly one that also confronts professional traffic engineers—is the obstacles that get in the way when remedies are ready to be applied.

When the time for change comes, it may be found that there are a good many people—some of them important and influential—who feel that they have a proprietary interest in the existing pattern. They want things left as they are, and they will make every effort and use every pressure to prevent change.

Yet the job must be done. If traffic operation is to be improved, minority influence or selfish interest must be overcome.

I am not suggesting that the investigator should start a crusade that will antagonize anyone who is open to argument. What I am saying is that an aggressive campaign must be waged against traffic conditions that are open to remedy. Such a campaign can be successfully organized and operated on the basis of good engineering principles, good judgment, and a sound sense of public relations.

Here again—in the area of public acceptance—the same principles that help the non-traffic engineer solve traffic operational problems come into play.

If he has analyzed the conditions thoroughly, and sensibly; if he has selected common-sense methods that serve best to improve conditions; if he has made sure that the selection of methods has been sound; if he has sought out the best available advice and assistance then he also has the selling tools to gain official and public acceptance for the needed changes.

Usually it is better to urge the program of changes as a carefully thought-out plan that has a good chance of succeeding, rather

than as a sure-fire cure-all. Then the best ingenuity should be used to get the backing of all local officials and the public.

If the opposition of some rugged and contrary-minded individualist is encountered, patient convincing may turn the tide. Even if you do not succeed, your effort may help win other support.

I mention these points because they indicate the type of individual needed if traffic engineering functions are to be carried out by a non-traffic engineer.

He must be able to seek out the problem. He must be able to acquaint himself with traffic engineering methods and techniques. He must be able to find and accept needed help and advice. He must have a diplomatic approach necessary to win the support of all officials as well as the public.

An engineering background helps but even lacking this, results are possible in certain activities.

If no engineer is available for the assignment of the traffic engineering functions, a person who has taken some engineering training is a logical choice. He should be capable of learning and should be given the opportunity to become familiar with traffic engineering techniques.

And most important of all, responsibility for the traffic operations function should be clearly placed with the individual so that confusion and misunderstanding can be avoided.

Pitfalls

The pitfalls confronting the non-traffic engineer handling traffic operational problems are evident.

The major trap is the improper analysis of the situation, lack of sufficient knowledge and assistance, or the misguided or misinformed application of the wrong solutions.

For these mistakes the public pays—either in lives lost or injuries suffered, in property damage, in additional congestion and inconvenience, and often in public monies spent for the wrong remedies.

Let me cite one example:

A certain county road, gravel surface, carrying fairly heavy traffic volumes for such a facility, wound through a hilly section of countryside. On this section of road, the accident occurrence was unusually high. The local public demanded action.

The county administrator, under pressure to reduce the accident incidence, ordered that section of gravel road be blacktopped, presumably to provide a better wearing surface. The improvement, however, resulted in an increase in the number of accidents.

The application of known traffic engineering principles would have anticipated such a result. Basically, the improvement did not remove the cause of the accidents—restricted sight distances imposed by numerous curves, turns and excessive grades.

What happened, as a matter of fact, was that a 65 mile-an-hour surface was provided on a road which was unsafe for travel at speeds above 35 miles-per-hour. The higher speeds permitted by the improved surface merely increased the existing hazards.

Conclusion

While this example is perhaps an extreme, it is typical of problems to which sound thinking and planning must be applied. No highway administrative agency can afford errors attributable to insufficient consideration of faulty planning.

A rudimentary knowledge of the principles of traffic operation, gained through study of traffic engineering, will assist materially in preventing such costly errors, and should insure the economical expenditure of such funds as are available to administration.

Efficiency, convenience, economy and safety of movement are essential on all roadways, whether state trunklines or county roads or city or village streets. It is the responsibility of administration to provide these factors to the best of its ability within limitations imposed by operating budgets, by physical factors of the area, and by considerations of available personnel.

Yet traffic engineering problems are manifold and many can be solved if administration takes advantage of available opportunities. The necessity for assigning responsibility for traffic operation to one person—even though a professional traffic engineer is not available—and of providing that person an opportunity to learn the rudiments of the profession and to seek competent help are corollaries of administration's responsibility.

Good engineering principles, good judgment and a good sense of public relations can be combined within any highway administrative agency to accomplish the objectives of safety, economy and efficiency in the movement of vehicular traffic in any given area.