Traffic Engineering Services for Small Political Jurisdictions

Jerome D. Franklin, Department of Public Works, Madison, Wisconsin

When does a city need traffic engineering assistance? Is this need a function of population size or of number of traffic accidents? All communities regardless of size have traffic problems. This paper discusses methods that have been used to provide traffic engineering services in smaller communities, specifically the approximately 5670 U.S. jurisdictions having populations in the 2500 to 50 000 range. These methods were surveyed during a study of the off-system highway network of local undesignated roads and streets in cities and counties having populations of fewer than 40 000. One state and at least two local jurisdictions in each of the Federal Highway Administration regions were visited. The locations were selected after evaluation of responses to a questionnaire mailed to each state and a nationwide sample of 1350 cities and counties fitting the population criterion. The conclusions and recommendations resulting from this study are provided in this paper.

All communities, regardless of size, have traffic problems. Traffic engineering often offers the best techniques for solving these problems. As early as 1949, the President's Highway Safety Conference recommended that, in cities of fewer than 50 000 population, qualified engineering personnel should be responsible for traffic engineering.

There are approximately 5670 U.S. jurisdictions in the 2500 to 50 000 population range. This breaks down as follows:

Population Range	Number of Cities	Total Inhabitants
2 500 to 5 000	2466	18 000 000
5 000 to 10 000	1474	18 000 000
10 000 to 25 000	1213	19 000 000
25 000 to 50 000	519	26 000 000

Traffic engineering is aimed at the safe, efficient, and convenient movement of people and goods in a coordinated system with other important public services. Its specific functions include planning, design, construction, operations, and maintenance of the street and highway network and the relationship between this network and other modes of transportation. Good traffic engineering can result in

- Accident reduction
- Lower insurance premiums
- Reduced traffic congestion
- Improved parking practices
- Greater street capacity
- Improved transit operations
- Safer bicycle paths
- Pedestrian and school-route protection
- Improved street lighting
- Uniform traffic-control devices
- Better transportation for the handicapped
- Proper detours and protection at work sites
- Environmental enhancement
- Fuel conservation
- Good street design
- Proper access controls
- Proper truck routing
- Railroad-crossing protection
- Sound street-improvement planning

All states are responsible for traffic engineering services on their respective state highways. These highways, commonly referred to as on-system routes, are generally the signed federal and state routes.

State responsibility for the degree and type of service may vary according to population, availability of state and federal funds, funding policies, and other factors such as design standards and definitions of right-of-way responsibility.

Recently, the Federal Highway Administration (FHWA) sponsored a study of the off-system network, the local undesignated roads and streets in cities and counties that have populations of fewer than 40 000 persons. In this study, one state and at least two local jurisdictions in each FHWA region were visited and in-depth surveys were made. The locations were chosen as a result of the responses to a questionnaire sent to each state and a nationwide selected sampling of 1350 cities and counties having a maximum population of 40 000.

The study found that traffic engineering services and studies for local off-system streets in smaller jurisdictions are greatly dependent on the availability of federal-aid funds. These funds are usually channeled through the state governor's safety representative.

Information gathered during this study showed that a variety of traffic engineering assistance programs are in existence. These vary by state, according to the priority given to traffic engineering services in the overall traffic, safety planning, and construction programs. There appears to be no one best way to provide traffic engineering services in smaller communities; however, some methods appear to be more productive and beneficial than others. These include the following:

1. Increased emphasis on training programs for in-house staff;
2. Increased emphasis on the use of in-house traffic engineering technicians supplemented by outside professional-level traffic engineers;
3. Use of regional or circuit traffic engineers (who serve a number of jurisdictions on a parttime or as-needed basis and may be funded by a consortium of local jurisdictions or by some other combination of funding sources);
4. Use of traffic engineers employed by larger local jurisdictions and state agencies by formal contract or other type of agreement;
5. Use of traffic engineers employed by private consulting firms on an as-needed basis;
6. Use of college and university traffic engineering professionals;
7. Use of automobile associations, insurance companies, service clubs, and the media to gain support of the citizenry for improved services; and
8. The exchange of ideas and possible solutions to problems found by attending professional association meetings, seminars, and workshops.

CONCLUSIONS OF THE SURVEY

1. There is no single, best specific method by which traffic engineering services can be provided in all of the thousands of small jurisdictions. This is a result of the various constraints of funding, priorities, and communications related to this activity by the different agencies and by state and regional regulations.
2. The availability of federal highway-safety funds

has been primarily responsible for the increased attention given to local off-system traffic engineering improvements.

3. Local traffic engineering services depend on the attitude of the state, degree of urbanization, population of the jurisdiction, available resources (funding and qualified staffing), historical and traditional relationships of the jurisdiction (particularly with the state), opportunity for technological transfer for the staff, and awareness by local decision makers of the benefits to be derived from the services.

4. Training, both formal and informal, is available in most states. However, local participation in any particular program usually depends on the scheduled length, cost, and travel involved.

5. The greatest need for traffic engineering services, assuming funds were available, is for trained personnel and this is followed by equipment and materials.

6. If personnel were to become available, most of them would become part of in-house staffs.

7. Because of funding procedures and other constraints, local jurisdictions usually have more state contact for off-system services with the governor's office of highway safety than with the highway or transportation department. However, this contact varies by state as to funding, programming, and objectives.

8. Jurisdictions having populations of more than 25 000 are more aware of the need for traffic engineering services than are those that have smaller populations.

9. Most traffic engineering services in higher-population jurisdictions are the responsibility of either the director of public works or the engineering department. In less-populated jurisdictions, the responsibility may be that of the chief of police.

10. Jurisdictions are concerned about red tape (by which they usually mean higher design standards than thought to be locally necessary, time delays, eligibility requirements, unexpected changes, and increased costs). There are examples of services refused by local officials who did not want to become involved with the prescribed state and federal procedures.

11. Jurisdictions are becoming aware of the need for uniform and approved traffic-control devices because of recent litigation and subsequent large judgments.

RECOMMENDATIONS OF THE SURVEY

1. Continued federal funding is necessary to maintain the impetus of local interest for traffic engineering services—particularly for the implementation of low-cost capital improvement projects. "Studies alone may lead to frustration and to a lack of desire to request further assistance."

2. Local officials and decision makers should be made aware, through short-term training programs, of the benefits to be derived from the provision of traffic engineering expertise. Informational programs could be regularly scheduled at municipal league and county officers' regional meetings to maximize participation.

3. Technical training should be scheduled periodically in different geographic districts of each state. These programs could be in the form of continuing education workshops and seminars but should also vary by highlighting different course subjects. To encourage attendance at the training programs, federal funds should be used to underwrite the expenses of the participants.

4. Red tape, particularly involving smaller jurisdictions, should be reduced. This will promote community interest, credibility, and participation in traffic safety programs.

5. The Institute of Transportation Engineers, an organization to which most traffic engineers belong, should be assisted in its program to educate small communities in traffic engineering and to implement services according to individual jurisdictional requirements.

6. Successful methods of providing traffic engineering services to smaller jurisdictions include the following: training of in-house staff, regional or circuit-rider traffic engineers, sharing of neighboring jurisdictional or regional staffs, participation by state highway department and U.S. Department of Transportation personnel, use of consulting firms and university staffs, automobile association funding, and service club and media program support.

Funds and training alone, however, will not result in improved traffic engineering programs and services—the community and its leaders must develop an appreciation for them and an understanding of their advantages and be supportive of their implementation.

Several innovative practices were discovered by the Federal Highway Administration survey, but dissemination of the findings has apparently not occurred to any great extent. A broad publication of innovative approaches was recommended by the workshop participants.

Other responses to this resource paper included the following:

1. Programs that call for the gradual phase-in of the municipal share of a traffic engineer's salary indicate that this is not an effective program.
2. The salary levels available in small jurisdictions generally attract only entry-level engineers; however, these often have sufficient management experience.
3. Once such engineers have developed more experience, they generally move to other areas where salaries are higher and they will be given greater responsibility.
4. In the absence of full-time traffic engineers, educational materials that are distributed by federal, state, and professional organizations do not have a consistent audience at the local level.

Management by Priorities

Martin C. Nizlek, Consultant, Tucson, Arizona

Because of the constraints in available resources, traffic engineering professionals are under increasing pressure to justify expenditures. This paper presents a general methodology to aid these persons in determining priorities. Three hypothetical cases and one real one are used to illustrate the general methodology.

Traffic engineers and others in the public works sector have long recognized and operated under resource constraints far more limited than the needs calling on them, and a number of factors will, in the foreseeable future,