USES OF PLANNING SURVEY DATA IN CONNECTION WITH HIGHWAY SAFETY

Burton Marye, Jr.
Traffic & Planning Engineer
Virginia Department of Highways

Highway Planning Survey data can and should be used extensively in connection with highway safety.

Facts and figures accumulated by the Planning Surveys can be used to good advantage in both short and long range safety programs and are applicable to construction, maintenance and operation.

In 1936, when the survey was started in Virginia, all highway safety work was handled by a Safety Engineer who also was responsible for employee safety, damage claims, etc. In fact, it can be stated with candor that the first duty of the Safety Engineer was employee safety and that because of limitations of personnel available to him, highway safety was forced to run a rather poor second.

Our Safety Engineer, however, being an unusually intelligent and resourceful fellow -- so much so that he has long since left the Department for greener fields -- was quick to recognize the value of the data beginning to be gathered by the Planning Survey and was probably the first official in the Highway Department to ask for and put to practical working use information of peculiar value to his particular phase of work.

If I remember correctly, the data first requested were traffic counts at certain intersections which data were used to determine the justification, if any, for traffic signal control. That was way back in the latter part of 1936 and was the beginning of the use of survey data in connection with highway safety.

Although, by digging back through eleven years of correspondence, the exact chronological sequence of the uses of Survey data in highway safety work could probably be ascertained, such sequence is of no particular moment or interest. Suffice it to say that among the early uses were the following:

1. The use by the Division of Surveys and Plans of straight traffic counts, later refined to directional movements, in the determination of intersection design.
2. The use by the State Police of Traffic Maps in the assignment of personnel used to patrol the highways.
3. The joint use by the Department of State Police and the Safety Engineer of the Highway Department of traffic flow data in the determination of accident frequency.
4. The use by the Maintenance Division of traffic data in the determination of locations for pavement marking.

The above early direct uses were, of course, supplemented by many indirect uses, as in the determination of geometric design.

It was not until 1943, however, that the Planning Survey was really given the opportunity to "spread its wings," so to speak, in highway safety work. In that year, the Virginia Highway Department employed a firm of personnel specialists to study its organization and procedures, and to recommend changes, if any. These specialists were quick to recognize the closely related, in fact, almost inseparable work of the Planning Survey with that of highway safety. The result was a recommendation, immediately adopted, that all highway traffic safety work previously handled by the Safety Engineer be combined with the responsibilities of the Planning Survey and that a new departmental division, called The Division of Traffic and Planning, be created.

Among the additional duties assigned to the new division were those of field inspection of construction plans, and general responsibility for the design and location of signs, signals and pavement markings.

It is highly significant that although additional responsibilities and considerably more work were assigned to the Planning Survey, it was only necessary to establish one new position within the organization of the Planning Survey in order to carry out the added duties. This does not mean that no additional persons were employed -- there were. It does mean that the qualifications of the normal Planning Survey personnel are so peculiarly adapted to Traffic Engineering work that the added duties can be carried out with a very minimum increase in key positions. More field work is, of course, necessary and additional statistical, clerical and drafting work is required. However, this can be accomplished either by the personnel presently employed or by new personnel in the same grades and possessing generally the same qualifications.

In our organization in Virginia, an Associate Traffic Engineer, reporting directly to the Traffic and Planning Engineer (Manager of Planning Survey) is in direct charge of traffic safety work. He has two full time assistants and a secretary. For detailed traffic surveys and clerical and drafting work the Associate Traffic Engineer calls on the particular staff member of the Planning Survey who has charge of that particular phase of work.

The following uses are being presently made of Planning Survey data in the Traffic Engineering and safety work of the Highway Department:

1. Traffic volumes and types govern the classification of the highway system, which classification determines the design speed, maximum curvature, minimum sight distance, number of lanes, lane width, etc.
2. Directional volume counts, by type of vehicle, are used to determine intersection design.
3. Directional volume counts, vehicular and pedestrian, supplemented by examination of accident records, are used to determine the justification, if any, for signal control at intersections.
4. Cultural development supplemented by volume counts, speed determination, and accident records are used in the establishment, or elimination of restricted speed zones.
5. Data on degree of curvature are used in the marking of the safe speed on curves.
6. Data on vehicle miles of travel, supplemented by accident records, are used in the determination of "high accident frequency" stretches of highway.
7. Data on vehicle and pedestrian volumes are used to determine need for sidewalks.
8. Grade crossing survey data are used to establish priority in formulating grade crossing elimination or protection programs.
9. Bridge inventory data are used to govern the erection of all clearance signs and markings.
10. Inventory data are used in connection with the routing and issuance of special trip permits for overweight and oversize vehicles.
11. Volume data are used in establishing priority of construction and reconstruction of State Highways.
12. Accident data are used in designing special treatment for accident prone locations.

While this list may be regarded as generally covering the routine usage of Planning Survey data by the highway safety section, it is by no means all inclusive of the full value of such data in the much broader field of traffic facilitation. The average Traffic Engineering Bureau has nearly always in the past been considered as an organization established to deal with the day to day problems of highway operation, such as traffic control by signs, markings, and signals. Our organization is established on a much broader concept in which day to day operation control comprises but one segment. Long range planning and active direct assistance to the administrator of all highway activities are other equally important segments.

A great deal of Planning Survey data, that are not otherwise related to highway safety or operation, are usually necessary to efficient top level highway administration in planning its future facilities. Any

efficient highway administration, like an efficient traffic engineering section, must anticipate and plan for contingencies, which may not arise for years. In this long range planning, every available fact is a necessity and an efficient traffic engineering section to serve the top management as a strong right arm is essential. The history of highway development is certainly not replete with instances of overdesign of facilities, --for every such case there are hundreds of instances of underdesign. These latter have almost invariably resulted from a lack of facts or knowledge of trends of moving traffic. Hence, a strong traffic engineering arm, properly organized to anticipate future trends and capable of evaluating their effects, is vital to the highway administration determined to avoid perpetuating existing evils or the creation of new hazards and bottlenecks. Similarly, the strong traffic engineering organization to discharge its responsibility must have the benefit of every fact gathered by the Planning Survey in order for its conclusions to be well balanced and logical.

Our experience in Virginia is that the Traffic Division is a necessary division of highway administration, and that Planning Survey data is the fuel with which it operates not only in the day to day problems of traffic control but in the far reaching field of long range planning as well.

It is realized that the foregoing discussion has strayed somewhat from the direct subject assigned to us of evaluating Planning Survey data directly with highway safety. This has been done purposely in order that the influence of highway planning data on the whole field of highway administration might be brought sharply into proper focus, for we believe that highway safety is inseparable from efficient highway administration.

Earlier, the routine usage of Planning Survey data by the highway safety section of our division was outlined. It is beyond the scope of this paper to attempt to enumerate all of the many special uses made of the data in specific cases arising from day to day and week to week. The point to be emphasized is that the traffic engineering section could not function without much of the basic data normally gathered by the Planning Surveys. This is not meant to imply that all of the data that is normally gathered by the Planning Surveys can be used for strictly traffic engineering purposes. On the other hand, it is hardly necessary to point out that it would be repetitious to have two different organizations collecting the same facts.

Accordingly, for any State contemplating organization of a traffic engineering bureau, it is strongly recommended that the Planning Survey activities be combined with the traffic engineering functions and the reorganized division placed on an equal footing with the old line highway departmental divisions such as maintenance, construction, etc.