

The Highway Safety Program and the Traffic Engineer

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INTRODUCTION

When I was asked to be here today I was also given my choice of subjects. As a traffic engineer with the Federal Highway Administration, I was aware of numerous subjects and federal programs which might be of interest and concern to you. Still the decision as to the subject which most needed coverage was not at all difficult. The goal of the Highway Safety Program is the reduction of deaths, injuries and property damage accidents on *all* of the nation's roads and streets. The part of the program having to do directly with roads and streets is the responsibility of the Federal Highway Administration.

The goals and activities of this part of the Highway Safety Program coincide with those of the city, state and county traffic and highway engineers. In order to be successful the program must have the involvement of you, the traffic and highway engineer, and must give support to your activities. Yet it is my feeling that most highway and traffic engineers are not fully familiar with the program, are not involved in the program, and are not making full use of the highway safety funding available for their type of activities. Thus I felt a discussion of the Highway Safety Program would both benefit the program and be of help to you.

Motor Vehicle Fatality Rates

Before getting into specifics of the Highway Safety Program allow me, if you will, to present a brief overview. The motor vehicle fatality rate reached a high of 16.8 fatalities per 100 million vehicle miles in 1934. The death rate was reduced to 5.2 by 1961. This, with better roads, improved automobiles, more experienced drivers and the development of professional traffic engineering and police highway safety activities.

National Highway Safety Acts

A trend reversal was then experienced in 1961 and the fatality rate began to climb reaching a peak of 5.5 deaths per 100 million vehicle

miles in 1965. Many of you probably recall the national concern with this climb. Thus, in 1965 Congress enacted the Baldwin Amendment. This provided that each state should have a highway safety program—designed to reduce traffic accidents, deaths, injuries and property damage. One year later the Baldwin Amendment was repealed and two more comprehensive safety acts were enacted. These were the National Traffic and Motor Vehicle Safety Act of 1966 and the Highway Safety Act. The first act dealt primarily with vehicle standards that you are no doubt familiar with. These include such items as seat belts and shoulder straps, buzzer systems, bumpers, tires, etc. This act, dealing with motor vehicle standards is administered nationally by the National Highway Traffic Safety Administration which we often refer to as NHTSA or “Nitsa.”

THE NATIONAL HIGHWAY SAFETY ACT OF 1966 AND THE STATES' HIGHWAY SAFETY PROGRAM

The Highway Safety Act was concerned with the other two elements of the safety picture—the driver and the road. It states in part, and I am almost quoting a part of the act, that each state shall have a highway safety program approved by the secretary of transportation. The program is to be designed to reduce traffic accidents and deaths, and injuries and property damage resulting therefrom. Such programs are to be in accordance with uniform standards promulgated by the secretary of transportation. Such uniform standards shall be expressed in terms of performance criteria.

I feel there are several important points in the wording of the act. First this is the state's Highway Safety Program. The standards promulgated by the secretary are in the form of broad goals. But each state determines its own path as how to reach out to achieve those goals. Nor does this responsibility end at the state level. The act goes on to authorize and encourage local activities and involvement in the Highway Safety Program.

Standards or Goals of the Program and Jurisdiction by FHWA and NHTSA

What are these standards or goals of which we speak? They include standards related to motor vehicle inspection; motorcycle safety; driver education; driver licensing; traffic courts; alcohol in relation to highway safety; identification and surveillance of accident locations; traffic records; highway design, construction and maintenance; traffic engineering services (which include traffic control devices); pedestrian safety and others. The standards which concern the roadway are administered by

the Federal Highway Administration. The National Highway Traffic Safety Administration is primarily responsible for the portions of the Highway Safety Act dealing with the driver. As I previously indicated, they are also responsible for the vehicular standards. Of course, both FHWA and NHTSA are part of the Department of Transportation.

Available Funding for States' Programs

Before getting into a more detailed discussion of the standards of most concern to the traffic and highway engineer, I should touch on several other points. The Highway Safety Act in addition to providing for state programs to achieve the standards also provides some funding for these activities. This funding is available to both state and local jurisdictions. There is \$85 million available nationally for the Highway Safety Program. Indiana's share of this is \$2 million. We will also discuss that later. The other point which should be emphasized is that the two safety acts recognize that there is no one answer to safety. Programs must be concerned with *all* aspects of the problem—the driver, the vehicle and the road.

If you will permit someone from Michigan State to talk about football in the hallowed halls of Purdue—the safety effort is somewhat like a football game. It requires teamwork and preparation and all aspects of the game plan must work to produce victory. That's a lesson we from Michigan State learned from several contests with Purdue. Thus, victory in the safety program requires an improved vehicle, an improved driver and an improved roadway.

As I previously said, a portion of the Highway Safety Program deals with those goals with which the highway and traffic engineer are directly concerned. These are often referred to as the three-plus standards and are the responsibility of FHWA.

STANDARD NINE—IDENTIFICATION AND SURVEILLANCE OF ACCIDENT LOCATIONS

The first of these standards is titled "Identification and Surveillance of Accident Locations." Some of its key elements are: that there be a procedure to identify accident locations on all roads and streets and that there be a procedure to produce an inventory of high accident locations and an inventory of design and operating features with which high accident frequencies or severities are associated. Inherent in the program is the reduction of accidents at spots and sections where accidents are occurring. This reduction may be achieved by increased enforcement, minor work such as control device upgrading or reconstruction of problem locations such as to provide a left turn lane, provide improved sight distance, etc.

The portion of standard nine dealing with tabulating the number of accidents by location constitutes a type of accounting system for the highway and traffic engineer. It indicates where his operation falls short of its goals—this can be in terms of spots, sections, types of highways and features. When the engineer or enforcement official takes corrective action to reduce accidents this “accounting” system tells him the degree of success and whether further effort is needed. If the three-plus portion of a state’s Highway Safety Program is to be operated in a sound businesslike manner, it is essential that emphasis be given to development of capability for identification of accident locations.

FOUR-YEAR PLANS AND ANNUAL PLANS

Before discussing the remaining three-plus standards, let me digress to discuss some other aspects of the Highway Safety Program. As we previously said each state is, per the Highway Act, to have a highway safety program designed to reduce traffic accidents and deaths, injuries and property damage resulting therefrom. The program is to be in accordance with the standards promulgated by the secretary of transportation. Standard nine, which I have just described, is one of 18 such standards. The three-plus standards of concern to the traffic and highway engineer are applicable to all roads and streets of a state. Each standard contains a number of goals.

There are two documents which constitute a state’s program. The Comprehensive Highway Safety Plan is a four-year plan in which a state describes its present status in relation to elements of the various standards; describes its four-year goals; and most importantly its plan—including financial expenditures—for achieving these goals. The other document is the Annual Highway Safety Program. This describes a program of activities in greater detail and includes budgetary type figures for the forthcoming fiscal year. The Highway Safety Act includes funding provisions and the Annual Highway Safety Program specifies for what activities and to what extent these funds will be used. The Annual Highway Safety Program is the basis on which highway safety funds are jointly authorized for use by a state by the National Highway Traffic Safety Administration and the Federal Highway Administration.

MORE ON STANDARD NINE

Some typical activities in the standard nine area include:

1. Installation of a reference marker system in order to facilitate coding of accident locations by police officers.

2. Development and implementation of a statewide system to tabulate high accident locations.
3. Development and implementation to furnish accident information to state highway departments, state police and to local units of police and traffic and highway engineers.
4. Investigate high accident locations on state and local systems and develop recommended improvements.
5. Implement recommended improvements.
6. Evaluate improvements.
7. Photolog state or local road systems.

Annual Work Programs and Funding

A complete annual work program would include many or all of the items listed above and constitutes a method of meeting the various goals basic to the standard.

Highway safety funding would be eligible for all of the type activities listed above, except for the actual physical improvement of problem locations. However, it is expected that TOPICS and other federal-aid funding could be used for such physical improvements on the federal-aid system. Also Congress is now considering legislation which, if enacted, would provide for physical improvement of hazardous locations.

Another point to be emphasized is that there is considerable flexibility for each state to tailor its highway safety program to its particular situation with due consideration to its priorities and its approach to getting a job done.

A further, and very major point, is that a state's highway safety program is expected to also benefit local roads and streets. The Highway Safety Act provides for funding of local activities and indeed provides that at least 40 percent of the highway safety funds apportioned to a state will be expended by its political subdivisions in carrying out local highway safety programs.

A state may approve local projects which are covered in the approved Annual Work Program. For example, we have numerous projects in Indiana and elsewhere providing for the review of high accident locations and development of recommendations for their improvement.

STANDARD 12 GOALS—HIGHWAY DESIGN, CONSTRUCTION AND MAINTENANCE

The previous discussion was a considerable digression from my discussion of the three-plus standards. Let me now return to these standards. We previously discussed standard nine—Identification and Sur-

veillance of Accident Locations. Standard ten, Traffic Records, and Standard 11, Emergency Medical Services, are administered by NHTSA. Standard 12, the next of the three-plus standards, is titled "Highway Design, Construction and Maintenance." It includes many diverse elements. Some of its goals are:

1. That there be design standards relating to safety features such as sight distance, width of lanes, curvature, etc. for all new construction or reconstruction, at least on expressways, major streets and highways and through streets and highways.
2. Street systems designed to provide a safe traffic environment for pedestrians and motorists when subdivisions are developed.
3. That there be standards for pavement design and construction with specific provision for high skid resistance qualities.
4. A program for resurfacing or other surface treatment with emphasis on correction of locations or sections of streets and highways with low skid resistance and high accident rates susceptible to reduction by providing improved surfaces.
5. Relating to traffic control in construction and maintenance areas.
6. Relating to a program for the elimination of hazards at dangerous railroad crossings.
7. Relating to maintenance standards.
8. That hazards within the right-of-way be identified and corrected.
9. That there be highway design and construction features whenever possible for accident prevention and survivability including the following:
 - A. Roadside clear of obstacles within a degree of practicality.
 - B. Supports for traffic control devices and lighting that are designed to yield or breakaway under impact whenever appropriate.
 - C. Protective devices (now called impact attenuation devices) that afford maximum protection to the occupants of vehicles wherever fixed objects cannot reasonably be removed or designed to yield.
 - D. Bridge railings and parapets which are designed to minimize severity of impact.

In my opinion the know-how exists to make new streets and highways safer than we are presently doing without greatly adding to their costs. For example, I feel there are too many cases of guardrail designed to less than the optimum, of sign posts installed near the roadway and of pavement surface not designed for an optimum long life of high skid

resistance. I also feel that "standardization" of many of these elements must afford considerable flexibility and that traffic and highway engineers must fully understand the principles behind each standard if they are to be able to utilize them in a practical manner. Thus an important part of efforts towards development of design standards must also include training relating to the principles behind the standards.

Activities Relating to Standard 12

Activities relating to standard 12 might include many items, some of these are:

1. Development of standards for local roads, a statewide training and information program, inventory of hazardous elements and assistance to local jurisdictions in implementing standards.
2. Purchase of a skid testing machine and provision of testing to local agencies.
3. Development of handbook and training related to construction and maintenance area traffic control.
4. Bridge inventory with emphasis on structural capacity, geometric adequacy and signing.
5. Inventories or assistance concerning railroad protection needs.
6. Highway safety funds can be used for warning and regulatory signs not on the federal-aid highway system. Therefore, railroad crossing signs could be funded on a citywide, countywide or statewide basis.

STANDARD 13—TRAFFIC ENGINEERING SERVICES

The next highway safety standard is Standard 13 entitled, "Traffic Engineering Services." The standard is concerned, as might be surmised from the title, with development of adequate traffic engineering capability and with utilization of traffic engineering manpower. It is also concerned with adequacy and uniformity of traffic control devices. The National Manual of Uniform Traffic Control Devices is issued as a national standard and is, of course, an important element in this highway safety standard.

States Should Train or Hire Traffic Personnel

One of the announced goals of the Highway Safety Program is that traffic engineering expertise be available to all jurisdictions within the state having responsibility for public roads. This expertise can be provided through training of existing employees, employment of qualified personnel or part-time consulting services from public or private agen-

cies. The goal is that by December 31, 1975 this capability be established in all cities of 50,000 or more and all counties of 250,000 or more. Cities of 25,000 should have traffic engineering capability by 1982.

Naturally, in order to reach these goals, there will need to be a great deal of training activities. This training is of varied types.

Various Training Seminars and Funds

Highway safety funds can be used to sponsor short seminars designed for professional traffic engineers and for traffic technicians. These may be comprehensive or may be related only to specialized areas such as control devices. They can also be utilized for short seminars designed for people who are not traffic engineers but who are involved in traffic engineering activities. These might include police officials or engineers in smaller jurisdictions who are involved in traffic engineering activities. The intent of such seminars is to develop some degree of expertise in these individuals concerning routine type situations. Highway safety funds can also be utilized for longer type courses, for example, a three-week course for traffic engineers and traffic technicians.

Traffic Engineering Fellowship Program

The highway safety funds administered by the states can be used only for courses which are relatively short term in duration—that is, less than one academic year. However, there is a Traffic Engineering Fellowship Program administered directly by the Washington office of the Federal Highway Administration which provides for 45 \$5,000 fellowships.

Control Devices—Manuals and Inventories

Activities related to the traffic control devices portion of Standard 13 include development of state manuals and control device inventories. All of the inventories in the world will not produce a safety benefit as long as they are used only to fill someone's bookshelves. In other words, the safety payoff is only when needed devices are installed. We have been encouraging TOPICS funds to be used for such purpose within the urban areas. However, these funds can only be used on the federal-aid system, including the TOPICS type II system. Other federal-aid highway funds can be used for the remainder of such installations on the federal-aid highway system. Highway safety funds can be used to some degree for control devices off the federal-aid system. Specifically they can be used for warning and regulatory signs off the federal-aid system.

STANDARD 14—PEDESTRIAN SAFETY

Standard 14 relates to pedestrian safety. Elements of the standard include provision for:

1. A statewide inventory of pedestrian-motor accidents including location, age of pedestrian and other statistics.
2. Procedures for reduction of pedestrian accidents through:
 - a. Traffic engineering practices
 - b. Education
 - c. Enforcement

Part of the Pedestrian Safety Standard is the responsibility of FHWA and part of it is the responsibility of NHTSA. Thus it is the “+” in FHWA’s three-plus standards.

Activities in the Pedestrian Safety Standard include:

1. Provisions to indicate incidence of pedestrian accidents, especially sections of streets or areas of disproportionate hazard.
2. Conducting engineering studies for high hazard sections and areas.
3. Development of statewide operational procedures for improving the protection of pedestrians.
4. Development of “safe route to school” handbooks.

INDIANA’S DIRECTOR—HIGHWAY SAFETY PROGRAM

That concludes our discussion of the highway safety standards and funding of projects. Before closing let me emphasize that the Highway Safety Program is administered in the state by an individual or organization designated by the governor. The governor, and in turn his designee, is expected to be responsible for the Highway Safety Program and to coordinate safety activities with the various state and local agencies involved in highway safety. The designee also administers the state’s program. That man in Indiana is Phillip Martin, director of the Indiana Department of Traffic Safety.

CONCLUSION

I have tried to cover the aspects of the Highway Safety Program which I felt would be of interest and direct concern to you. Achievement of the goals pertaining to roads and streets together with achievement of the goals pertaining to the driver and to the vehicle would, I am certain, result in a substantial reduction in the number of accidents, injuries and fatalities on the nation’s roads and streets. At first glance these goals may seem overambitious or even ivory tower in nature. They

may seem that way because we somehow have become accustomed to a less than optimum effort for safety in this country. We seem to have grown immune to the 56,000 deaths suffered annually on the nation's highways. However, a close look will indicate each of the Highway Safety Program goals to be practicable and achievable and at a relatively small percentage of the overall cost of our roads and streets.

We feel that nationally highway safety is of the highest priority and hope highway safety will also be given this highest priority in the states, counties and cities. Why? Because we remain convinced that the terrible loss from accidents measured by deaths, injuries and property damage *can* be reduced. It is as if we have a cure for a terrible disease. Having the cure it follows we must use it. I hope you will get fully involved in supporting and implementing the program in your communities, your counties and your state.