

HIGHWAY SAFETY PROGRAM
GUIDELINE No. 21
ROADWAY SAFETY

Each State, in cooperation with its political subdivisions, should have a comprehensive roadway safety program that is directed toward reducing the number and severity of traffic crashes. Roadway Safety applies to highway safety activities related to the roadway environment. (Section 402 funds may not be used for highway construction, maintenance, or design activities, but they may be used to develop and implement systems and procedures for carrying out safety construction and operation improvements.)

I. PROGRAM MANAGEMENT

The Federal Highway Administration (FHWA) provides administrative oversight for the Roadway Safety portion of the Section 402 highway safety program in close coordination with the State Highway Safety Agency (SHSA) and the State Highway Agency (SHA). An effective Roadway Safety program is based on sound analyses of roadway-related crash information and applies engineering principles in identifying highway design or operational improvements that will address the crash problem. The SHSA should:

- Assign program staff to work directly with the FHWA division safety engineer on roadway-related safety programs;
- Work in close harmony with the SHA, particularly with SHA staff who are responsible for traffic engineering, pedestrian and bicycle programs, commercial motor vehicle (CMV) safety, rail-highway crossing safety issues, work zone safety, design and operational improvements, and hazardous roadway locations;
- Foster an ongoing dialogue among all disciplines with a vested interest in highway safety, including engineers, enforcement personnel, traffic safety specialists, driver licensing administrators, CMV safety specialists, and data specialists;
- Promote a multi-disciplinary approach to addressing highway safety issues which focuses on comprehensive solutions to identified problems (e.g., a Community/ Corridor Traffic Safety Program (C/CTSP));
- Become familiar with the various highway-safety related categories of Federal-aid highway funds--in addition to Section 402--in order to maximize the safety benefits of the entire program;
- Become familiar with the State's traffic records system and play a role in the system's ongoing operation, maintenance and enhancement;
- Become familiar with the Motor Carrier Safety Assistance Program (MCSAP) and coordinate MCSAP and section 402 program activities; and
- Assist community leaders in managing and/or coordinating roadway safety issues which fall under the jurisdiction of local communities.

II. IDENTIFICATION AND SURVEILLANCE OF CRASH LOCATIONS

Each state, in cooperation with county and other local governments, should have a program for identifying crash locations and for maintaining surveillance of those locations having high crash rates or losses. A model program should have the following characteristics:

- Procedures for accurate identification of crash locations on all roads and streets which identify crash experience on specific sections of the road and street system.
- An inventory of high crash locations and locations experiencing sharp increases in crashes and design and operational features with which high crash frequencies or severities are associated.
- Appropriate measures for reducing crashes and evaluating the effectiveness of safety improvements on any specific section of the road or street system.
- A systematically organized method to ensure continuing surveillance of the roadway network for potentially high crash locations and to develop methods for their correction.

III. HIGHWAY DESIGN, CONSTRUCTION AND MAINTENANCE

Every state, in cooperation with county and local governments, should have a program of highway design, construction, and maintenance to improve highway safety. A model program should have the following characteristics:

- Design guidelines relating to safety features such as sight distances, horizontal and vertical curvature, spacing of decision points, width of lanes, etc., for all new construction or reconstruction on expressways, major streets and highways, and through-streets and highways.
- Street systems that are designated to provide a safe traffic environment for all roadway users when subdivisions and residential areas are developed or redeveloped.
- Efforts to ensure that roadway lighting or new technology, such as retroreflective materials, is provided or upgraded on a priority basis at expressways and other major arteries in urban areas, junctions of major highways in rural areas, locations or sections of streets and highways which have high ratios of night-to-day motor vehicle and/or pedestrian crashes, and tunnels and long underpasses.
- Guidelines for pavement design and construction with specific provisions for high skid resistance qualities.
- 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 or potentially high crash rates susceptible to reduction by providing improved surfaces.
- Efforts to ensure that there is guidance, warning and regulation of traffic approaching and traveling over construction or repair sites and detours, in conformance with the *Manual on Uniform Traffic Control Devices*.

- A method for systematic identification and tabulation of all rail-highway grade crossings and a plan for the elimination of hazards and dangerous crossings.
- Projects which provide for the safe and efficient movement of traffic by ensuring that roadways and the roadsides are maintained consistent with the design guidelines which are followed in construction.
- Procedures to identify and correct hazards within the highway right-of-way.
- Procedures for incident management and congestion mitigation.
- Wherever possible for crash prevention and crash survivability, efforts to include at least the following highway design and construction features:
 - roadsides which are clear of obstacles, with clear distance determined on the basis of traffic volumes, prevailing speeds, and the nature of development along the street or highway;
 - supports for traffic control devices and lighting that are designed to yield or break away under impact wherever appropriate;
 - protective devices that afford maximum protection to the occupants of vehicles where fixed objects cannot be reasonably removed or designed to yield;
 - bridge railings and parapets which are designed to minimize severity of impact, redirect the vehicle so that it will move parallel to the roadway, and minimize danger to traffic below;
 - guardrails, and other design features which protect people from out-of-control vehicles at locations of special hazard such as playgrounds, schoolyards and commercial areas.
- A post-crash program that includes at least the following:
 - signs at freeway interchanges directing motorists to hospitals which have emergency care capabilities;
 - maintenance personnel who are trained in procedures for summoning aid, protecting others from hazards at crash sites, and removing debris;
 - provisions for access for emergency vehicles to and from freeway sections, where travel time would be reduced without reducing the safety benefits of access control.

IV. TRAFFIC ENGINEERING SERVICES

Each State, in cooperation with its political subdivisions and with each Federal department or agency which controls highways open to public travel or supervises traffic operations, should have a program for applying traffic engineering measures and techniques, including the use of traffic control devices which are in conformance with the *Manual on Uniform Traffic Control Devices*, to reduce the number and severity of traffic crashes. A model program should have the following characteristics:

- A comprehensive resource development plan to provide the necessary traffic engineering capability, including:
 - provisions for supplying traffic engineering assistance to those jurisdictions that are unable to justify a full-time traffic engineering staff;
 - provisions for upgrading the skills of practicing traffic engineers and for providing basic instruction in traffic engineering techniques to other professionals and technicians.
- Use of traffic engineering principles and expertise in the planning of public roadways, and in the application of traffic control devices.
- A traffic control device plan which includes:
 - an inventory of all traffic control devices;
 - periodic review of existing traffic control devices, including a systematic upgrading of substandard devices to conform with standards contained in the *Manual on Uniform Traffic Control Devices*;
 - a maintenance schedule adequate to insure proper operation and timely repair of control devices, including daytime and nighttime inspections; and
 - where appropriate, the application and evaluation of new ideas and concepts in applying control devices and in the modification of existing devices to improve their effectiveness through controlled experimentation.
- An implementation schedule which utilizes traffic engineering resources to:
 - review road projects during the planning, design, and construction stages to detect and correct features that may lead to operational safety difficulties;
 - install safety-related improvements as part of routine maintenance and/or repair activities;
 - correct conditions noted during routine operational surveillance of the roadway system to rapidly adjust for the changes in traffic and road characteristics as a means of reducing the frequency and severity of crashes;
 - conduct traffic engineering analyses of all high crash locations and develop corrective measures;
 - analyze potentially hazardous locations--such as sharp curves, steep grades, and railroad grade crossings--and develop appropriate countermeasures;

- identify traffic control needs and determine short- and long-range requirements;
- evaluate the effectiveness of specific traffic control measures in reducing the frequency and severity of traffic crashes; and
- conduct traffic engineering studies to establish traffic regulations, such as fixed or variable speed limits.

Companion *Highway Safety Program Manuals* (February, 1974), which supplement this guideline, are available from the Federal Highway Administration's Office of Highway Safety. These supplements provide additional information to assist State and local agencies in implementing their roadway safety programs.

V. OUTREACH PROGRAM

While considerable progress has been made in reducing the highway death rate, forecasts of increased highway travel place new demands on the highway system. By necessity, roadways are being reconstructed while open to traffic, which places additional demands on motorists and construction workers. Increasing awareness of roadway-related safety issues will enhance highway safety in construction zones.

A proactive roadway safety outreach program will provide critical information to the public on roadway safety issues, explain existing roadway safety features, and establish communication channels among engineers, planners, enforcement personnel, highway safety advocacy groups, and the motoring public. To encourage outreach in the roadway safety area, States should:

- Identify those groups or individuals that may have an interest in promoting roadway safety, including roadway safety advocacy groups, law enforcement, community advocacy, the medical community, and create an effective communication network among the groups to keep members informed;
- Target specific areas in which the public needs roadway safety information and develop appropriate public information and education materials on various roadway safety issues.

VI. EVALUATION

Roadway Safety programs should be periodically evaluated by the State, or appropriate Federal department or agency where applicable, and the Federal Highway Administration should be provided with an evaluation summary. Evaluations should include measures of effectiveness in terms of crash reduction.