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NHTSA Technical Report

Highway Safety Assessment
A Summary of Findings in Ten States

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An agency staff review of an existing Federal regulation, performed in response to Executive Order 12866

16. Abstract

The assessment is based on studies done in 10 states, one in each NHTSA Region: Connecticut (Region 1), New Jersey (Region 2), Pennsylvania (Region 3), North Carolina (Region 4), Ohio (Region 5), New Mexico (Region 6), Kansas (Region 7), Colorado (Region 8), Nevada (Region 9), and Washington (Region 10). The assessment covers the period from 1980 through 1993 and focuses on the Federal highway safety program of formula and incentive grants (Sections 402, 408, 410, and 153 of the Highway Safety Act). These 10 states account for almost 22 percent of the Federal highway safety grant funding and represent geographic, programmatic and management variety. In the early 1980's, NHTSA undertook rulemaking to establish the priority areas where funding was to be concentrated to address the most severe highway safety problems. The assessment looked at these priority areas which include: impaired driving, occupant protection, police traffic services, traffic records, emergency medical services, motorcycle safety and pedestrian and bicycle safety. Speed control was added after the completion of the assessment as a separate priority area. In the assessment, speed control is included as part of police traffic services.

The assessment addressed the following questions about how Federal grants were used:

- -Were projects focused on major safety problems?
- -Were new programs initiated with Federal grants?
- -Did Federal grants lead to participation by state, community and private entities?
- -Were projects started at one or more sites replicated elsewhere?
- -Were concepts and technology developed with Federal funds used?
- -What would be the consequences of removing Federal grants from the program?
- -Were projects monitored or evaluated?

The principal findings of the report are:

- -The planning process for states to obtain Federal funds has helped assure that state highway safety programs receiving grants are focused on major safety problems.
- -The Federal grant programs have achieved Congressional intent. Federal grants, amounting to less than two percent of total spending, have acted as seed money to initiate solutions to resolve highway safety problems and leveraged other funding.
- -Federal leadership and resources have helped states to maintain programs addressing the most important issues.

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ACKNOWLEDGMENTS

After the completion of the pilot assessment in Washington State, a cooperative agreement was made with the International Association of Chiefs of Police (IACP) to obtain the services of consultants who were experienced in state and local operations. Eugene Dzikwiez, retired law enforcement civilian, helped compile local interview notes for several states. Frank Ephraim, retired Federal employee, compiled and wrote several state assessment reports and compiled and wrote a draft assessment report based on eight of the ten states. Other IACP consultants were trained by Plans and Policy to conduct interviews with local officials. The interviewers were organized into two teams with Don Uelman, retired Lieutenant with the California Highway Patrol, and Larry Thompson, retired Lieutenant Colonel with the Arizona Highway Patrol, acting as team leaders. David Smith, Master Sergeant with the Virginia State Police, was the coordinator for both teams.

The Highway Safety Assessment

EXECUTIVE SUMMARY

Introduction

Under the Highway Safety Act of 1966, the National Highway Traffic Safety Administration (NHTSA) provides grants and technical assistance to states and communities. Section 402 of the Act requires each state to have a highway safety program to reduce traffic crashes and deaths, injuries and property damage. Section 402 grant funds are apportioned to the states based on the ratio of state population to the national population (75%) and state public road mileage to the total national public road mileage (25%). Section 402 was set up by Congress to provide Federal leadership and assistance to state and community highway safety activities.

From time to time, Congress earmarks §402 funds to be set aside for special purposes such as enforcement of the National Maximum Speed Limit or for traffic records development. In addition, Congress has passed legislation to provide incentive grants: Section 408 of the Highway Safety Act authorized NHTSA (enacted in 1982, funds were available through FY 1994) to provide alcohol incentive grants to states that had certain laws and provisions covering the apprehension, conviction and rehabilitation of persons driving while impaired from alcohol or drugs; Section 410 of the Act (originally enacted in 1988 and significantly amended in FY 1992 and FY 1998) to provide additional alcohol incentive grants for states meeting certain criteria concerning drunk driving; and Section 153 of the Act authorized NHTSA to provide incentive grants (in FY's 1992 through 1994) to states for passing and achieving compliance with their laws making it unlawful to operate a motorcycle without wearing a helmet and to operate a passenger vehicle whenever an individual in the front seat is not wearing a safety belt (except a child in a child restraint). Finally, Section 403 authorizes NHTSA to perform research, conduct demonstrations and provide technical assistance to improve the effectiveness of state safety programs.

The Federal highway safety program is a combination of formula and incentive grants and technical assistance to state and local governments. It operates under a set of guidelines that have evolved since the Highway Safety Act was passed in 1966. NHTSA handles those aspects of the program that concern traffic safety while the Federal Highway Administration is responsible for the safety of highway infrastructure. The highway safety program is a textbook example of how a small amount of Federal funding can catalyze significant changes in the nation's approach to safety.

The U.S. Congress and the Office of Management and Budget have expressed interest in what the highway safety program has achieved and how Federal funds were used. In response, NHTSA has conducted the assessment of the highway safety program. This study covers the period from 1980, when major changes in safety emphasis and funding began, to 1993. NHTSA reviewed the programs of ten states, one in each of its regions. Data collection, interviews and reports are now complete for all 10 states. The states are: Region 1 - Connecticut, Region 2 - New Jersey, Region 3 - Pennsylvania, Region 4 - North Carolina, Region 5 - Ohio, Region 6 - New Mexico, Region 7 - Kansas, Region 8 - Colorado, Region 9 - Nevada, and Region 10 - Washington. These ten states account for 21.8 percent of NHTSA Federal highway safety grant funding and represent geographic,

programmatic, and management variety. From NHTSA's assessment of these ten states, key features and achievements of the highway safety program have emerged.

One of the goals of the assessment was to review the individual safety programs in the 10 states to answer the following questions about how Federal grants were used:

> Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?
>
> Were new programs initiated with Federal grants?
>
> Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?
>
> Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?
>
> Were concepts and technology developed with federal funds used to improve state program effectiveness?
>
> What would be the consequences of removing federal grants from the program?
>
> Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?

In the early 1980's, Congress reduced funding for highway safety grants. To ensure that Federal funds would be spent where they could have the most impact, NHTSA initiated discussions with the states, followed by rulemaking, to establish highway safety priority areas. Rulemaking resulted in identification of six priority areas: impaired driving, occupant protection, police traffic services, traffic records, emergency medical services and trauma care systems and roadway safety (FHWA's responsibility). Motorcycle safety and pedestrian and bicycle safety were added at a later date. Speed control was added to the list of national priority program areas on December 13, 1994 but it is included as part of Police Traffic Services in this assessment because it was not yet a separate priority area when the sample states were visited.

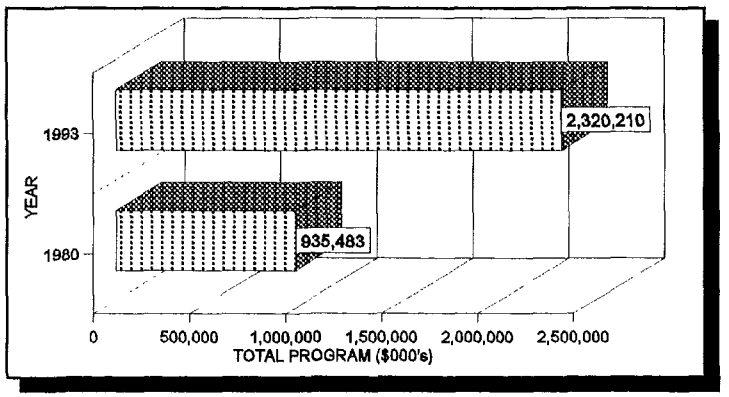
The current assessment looks at Community Traffic Safety Programs (CTSPs), a development of the late 1980's. CTSPs grew out of DWI (Driving While Intoxicated) task forces in some states, and out of occupant protection efforts in others. CTSPs are defined as a program administered by an established unit in the community, sustained over time, that has public and private participation and input to an action plan to solve one or more of the community's traffic safety problems.

The assessment focuses on reviewing the progress in the 10 states in each of these priority areas between 1980 and 1993.

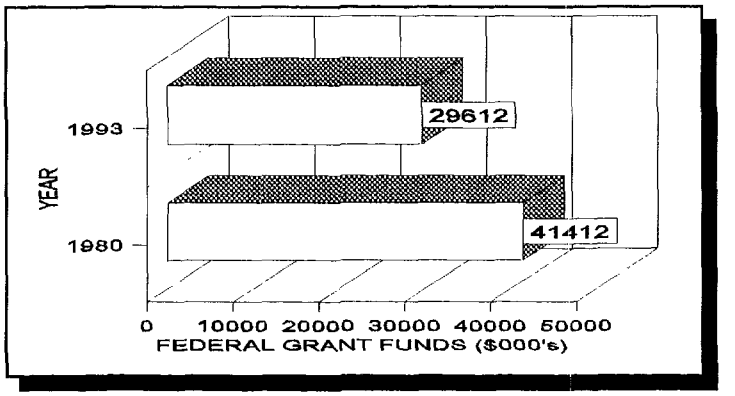
Highway Safety Program Costs and Federal Funding

The total Federal and state expenditures in the 10 states for highway safety programs increased almost two and one half times from 1980 ($935,483) to 1993 ($2.32 billion). In constant dollars (1996 base), the increase was over 40 percent from 1980 ($1.78 billion) to 1993 ($2.52 billion). In contrast, the amount of Federal grant funds decreased 30 percent from 1980 to 1993. But in constant 1996 dollars, the decrease was almost 60 percent. In constant 1996 dollars per capita, total spending increased from $35 to $45 per person while Federal grants decreased from $1.54 to $0.59 per person. As a result, the percentage of the total expenditures that is Federal grant funds decreased from 4.4 percent in 1980 to 1.3 percent in 1993. Appendix A of this Summary Report compares key cost and performance data from NHTSA's 1975 Highway Safety Assessment with this Assessment.

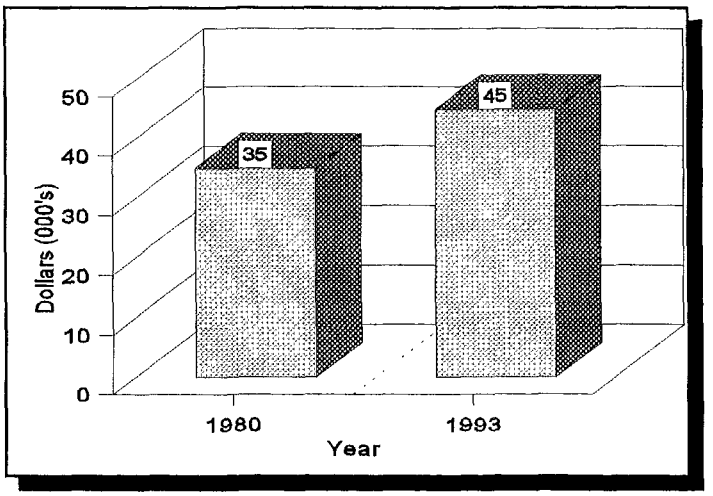
TOTAL HIGHWAY SAFETY EXPENDITURES FOR TEN STATES



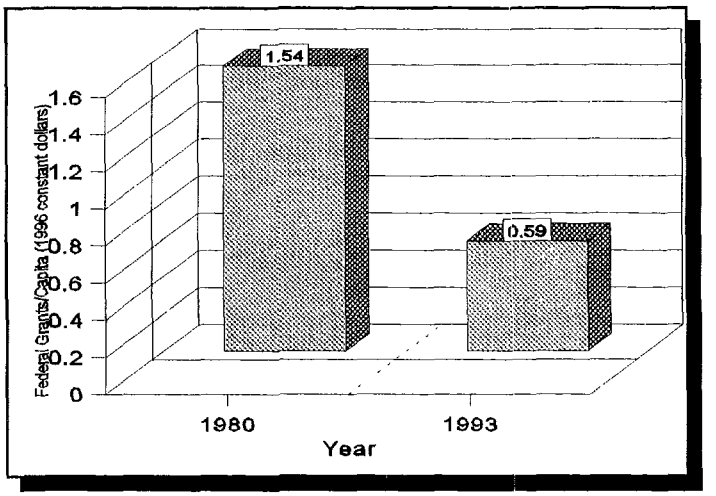
FEDERAL GRANT FUNDS FOR TEN STATES



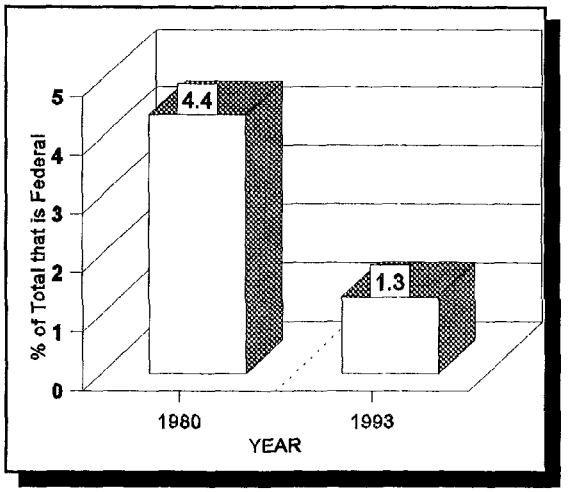
TOTAL EXPENDITURES PER CAPITA IN CONSTANT 1996 DOLLARS



FEDERAL EXPENDITURES PER CAPITA IN CONSTANT 1996 DOLLARS

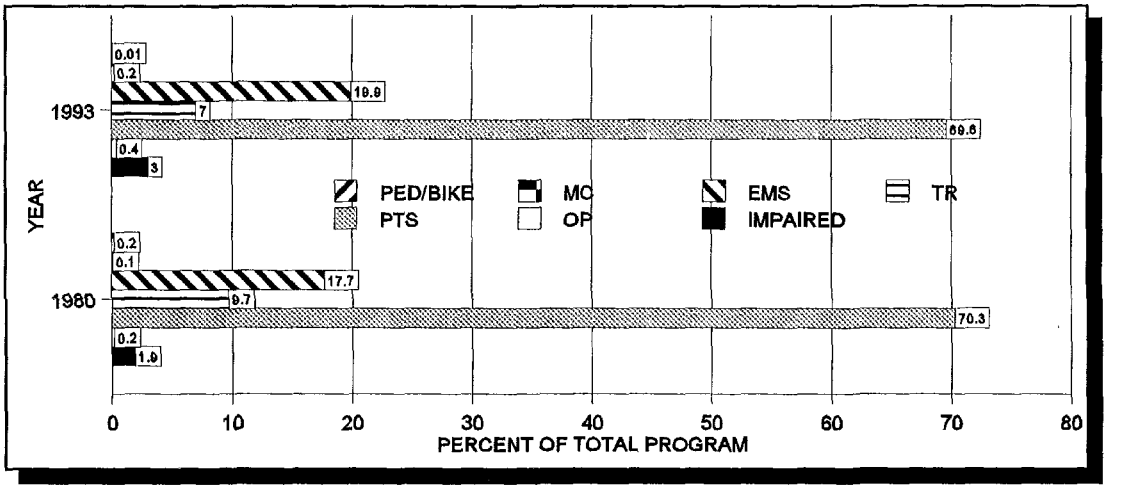


PERCENT OF TOTAL EXPENDITURES
THAT IS FEDERAL GRANT FUNDS



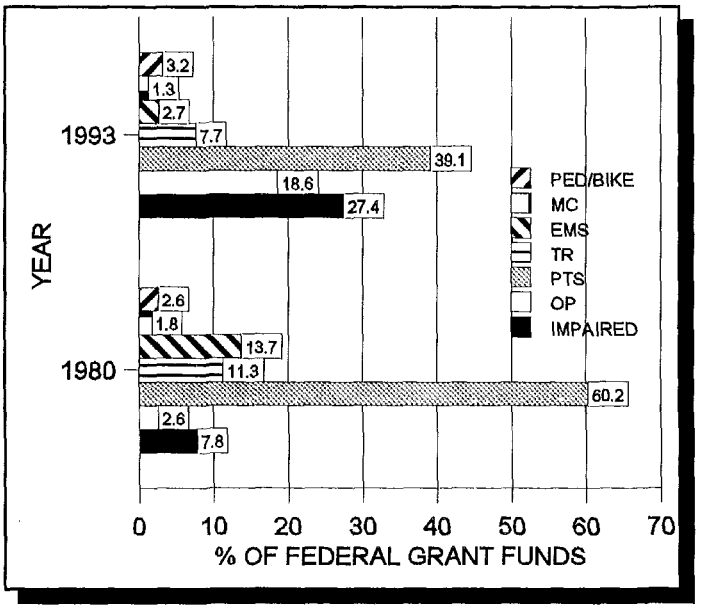
The distribution of the total program expenditures by the states from all sources has not varied much between 1980 and 1993. The overwhelmingly large program area is Police Traffic Services (PTS) which is about 70 % of the total. Part of this is because officers are enforcing laws involving other programs areas (Impaired driving and occupant protection). Emergency Medical Services and Trauma Systems (EMS) is the next largest program area and varied between 18% and 20% of the total. Traffic Records (TR) varied between 7% and 10%. Next comes Impaired Driving at 1.9% and 3.0%. Occupant Protection (OP), Motorcycle Safety (MC), and Pedestrian and Bicycle Safety each represented less than 0.5% of the total program cost. The following chart shows these distributions.

DISTRIBUTION OF TOTAL PROGRAM EXPENDITURES



In the distribution of §402 and other grant funds by priority area, there is a marked difference between 1980 and 1993 as seen in the next chart.

DISTRIBUTION OF FEDERAL GRANT FUNDS



The most noticeable changes were for PTS which dropped from 60% to 39% of Federal funding, EMS which dropped from about 14% to almost 3%, Impaired Driving increased from 8% to 27%, OP which increased from about 3% to almost 19%, and Traffic Records which decreased from 11% to almost 8%.

Looking at spending from a different perspective, there has definitely been a shift from 1980 to 1993 in the proportion of total spending that is Federally funded, by priority area. The following table shows that the proportion of funds spent on impaired driving derived from Federal funds dropped from 19% in 1980 to 12% in 1993, Occupant Protection increased from 62% to 66%. PTS, Traffic Records, and EMS all dropped from four to five percent to one percent or less. Motorcycle Safety decreased from 74% in 1980 to 8% by 1993, and Pedestrian and Bicycle Safety decreased from 65% to 42%. The major finding here is the continued dependence of Occupant Protection on Federal grant funds whereas other priority areas have been partially or almost completely successful in reducing their dependence on Federal funding.

Total Costs and Grants for Safety Priority Areas:
Percent of total spending derived from Federal funds

Safety Priority Area	1980			1993		
	Total Cost ($1,000)	Safety Grants		Total Cost ($1,000)	Safety Grants	
		($1,000)	Percent		($1,000)	Percent
Impaired Driving	17,355	3,244	**18.7**	68,561	8,106	**11.8**
Occupant Protection	1,724	1,064	**61.7**	8,334	5,519	**66.2**
Police Traffic Services	657,793	24,933	**3.8**	1,614,132	11,589	**0.7**
Traffic Records	90,459	4,675	**5.2**	161,580	2,288	**1.4**
Emergency Medical Service	165,475	5,666	**3.4**	460,683	801	**0.2**
Motorcycle Safety	1,018	750	**73.7**	4,667	359	**7.7**
Ped/Bicycle Safety	1,659	1,080	**65.1**	2,253	950	**42.2**
TOTAL	935,483	41,412	**4.4**	2,320,210	29,612	**1.3**

Overview of Highway Safety Programs in the Ten States, 1980-1993

The Highway Safety Act of 1966 established the development of standards that would be the heart of state traffic safety programs. Beginning in 1967, the Federal traffic safety program included 18 highway safety program standards covering a wide range of safety issues. In 1982, grant funding was sharply curtailed and the grant program was refocused to cover priority safety areas based on guidelines rather than standards. The priority safety areas were based on analysis of crash data to determine where the major safety problems existed and for which methods were available or could be developed for addressing these problem areas. Until recently, the approval process was based on the states preparing a Highway Safety Plan (HSP), which included a discussion of crash data and the identification of safety problems to be addressed. The following is a discussion by priority area.

Impaired Driving

The 1980-1993 period was characterized by a remarkable increase in public awareness and government effort to combat drunk driving, and the nation has seen a decline in alcohol-involved crash fatalities from 23,000 (10.2 per 100,000 pop.) to 17,461(6.8 per 100,000 pop.). Beginning in the early 1980's tougher impaired driving laws were enacted in most states. To explain the laws and to raise public awareness, public information and education campaigns were launched and sustained over the ensuing years. A large number of impaired driving reduction programs were established in the 1980's. There was Project Graduation, often begun with safety grant support and subsequently funded by PTA's and businesses. Students Against Drinking and Driving (SADD) chapters were created. Impaired driving information -- brochures, pamphlets, and related material -- was widely distributed. In the early 1990's almost 4.9 million informational items were distributed each year as compared to 1.6 million items in 1980 (a three fold increase).

Impaired driving reduction incentive grants enacted by Federal legislation have been successful. The states participating in this assessment became eligible under at least one of the two incentive grant programs (§408 or §410) at some point during the 1980's and early 1990's. By the end of the 1980's, all 10 states had programs that included DWI offender evaluations, minimum sentences, and a license suspension process. Offender course fees and fines helped achieve self sufficiency.

Occupant Protection

The ten assessment states enacted belt use laws between 1984 and 1986. Since the mid 1980's, programs to raise the use of safety belts have provided the highest safety benefits at one of the lowest costs for any safety program. In 1993, the per capita cost was 13 cents and the cost per licensed driver was 19 cents a year. More than 66 percent of the costs of safety belt use programs continued to be funded with safety grants in 1993. The estimated safety belt use rate in 1980 was approximately 12 percent in the 10 states. Belt use laws raised this rate considerably -- to more than 47 percent in 1990, and more than 65 percent in 1993. NHTSA estimates that safety belts saved 1,673 lives in the 10 states in 1993, up from 115 in 1980. PI&E is an important component of the program to increase belt use. Approximately 2.3 million safety belt brochures were distributed in 1991, up from two million in 1981.

By 1985, all 10 states had mandatory child protection laws. Safety seat loaner programs were established throughout all 10 states. There was a trend toward partial self sufficiency in child passenger safety. Child safety seats are estimated by NHTSA to save 58 lives in 1993 as compared to nine lives saved in 1980. Five of the 10 states were close to complete self sufficiency, three used matching grants, but the remaining two depended on Federal grants.

Comprehensive Traffic Safety Programs

Seven of the 10 states covered in this report created comprehensive or community traffic safety programs (CTSPs) in the mid to late 1980's. More than 20 percent of an average state's safety grants were allocated to CTSPs. In one of the states, the CTSPs covered the entire state. In others, the coverage involved several counties or municipalities.

By combining the various safety program areas, economies of scale were achieved by, for example, making it possible for one source to supply technical assistance, support and materials to many, or all parts of the state.

The most important capabilities of CTSP's were the abilities of the states to address regional safety problems, to reach more citizens, and to gain resource support from local governments, communities and the private sector. The integration of programs also allowed better planning of projects to address key problems and to make better budgetary decisions about the level of program support. The number of CTSPs in the five states grew from two in 1987 to 83 in 1993.

Police Traffic Services

There were 97,736 sworn police officers in the 10 states in 1980, and 116,654 in 1993 -- a 19 percent increase. Based on data from 134 enforcement agencies in the 10 states, officers, in the aggregate, spend approximately 21 percent of their time performing traffic related activities. General patrol of city streets, with an emphasis on traffic violations, has declined slightly over the past 15 years. The Full Time Equivalent (FTE) number of sworn officers in traffic service per 1,000 licensed drivers declined from 0.60 in 1980 to 0.56 in 1993. In 1980, one citation was issued for every nine licensed drivers. In 1993, enforcement agencies issued a traffic violation citation to one of every 10 licensed drivers. This decline of approximately 10 percent has to be viewed against the ever tighter budgets and the diversion of sworn officers to crime enforcement and prevention over the past 15 years.

Despite these reductions in overall police traffic services, officers from 1980 to 1993 made 33 percent more DWI arrests and issued 14 percent more speeding citations. In 1980, officers made 238,000 DWI and 1.4 million speeding arrests as compared to 317,000 DWI and 1.6 million speeding arrests in 1993. The breath testing programs, based on data from five states, show continued growth. Unlike programs to curb impaired driving, the effort to curb speeding encountered difficulties. Data from eight states show that the average (weighted) percentage of motorists exceeding the 55 mile per hour National Maximum Speed Limit (NMSL) was 44.2 percent in 1980. It rose to 44.7 percent in 1986, and was 47.6 percent in 1992[1]. The NMSL was abolished by the end of 1995, even so officers are still responsible for speed control.

Substantial improvements were made to the training of police officers in the field of crash investigation with courses funded with safety grants. In the early 1990's, between 200 and 600

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[1] The percent of motorists exceeding the NMSL was not available for 1993.

police officers, depending on the size of the force in a state, were trained each year at various levels of crash investigation. This was more than double the number trained in the early 1980's. Safety grants made up only a very small part of traffic related enforcement costs -- 3.8 percent in 1980 and less than 1 percent in 1993. Total enforcement costs were estimated at $1.61 billion for the 10 states in 1993. This amounted to $512 per traffic citation, or $29 per capita, each year. In 1996 dollars, the 1993 costs would be $1.75 billion as the total enforcement cost for the 10 states, $556 per citation and $31 per capita. In comparable 1996 dollars, the 1980 values would have been $407 per citation and $25 per citizen with a total traffic related cost of $1.25 billion. This means that there was a 40 percent real cost increase between 1980 and 1993 for traffic enforcement.

Traffic Records

By 1986, all 10 states were able to produce detailed crash statistics on an annual basis. These and other data were sufficient to carry out extensive problem identification analyses. Beyond crash data, annual compilations of impaired driving, speeding arrests and citations for violating occupant protection and child restraint laws were also being recorded. New traffic court case systems were providing data on dispositions and fines, and automated driver licensing systems contain data on license suspensions and revocations.

There were 42 computerized data systems in the 10 states in 1980, compared to 70 in 1993. The safety grant portion of all traffic records system costs in the 10 states was 5.2 percent in 1980 which decreased to 1.4 percent in 1993. This shows an increasing trend toward self sufficiency.

Emergency Medical Services

The number of Emergency Medical Technicians increased in the 10 states from 95,500 in 1980 to 171,290 in 1993, a 79 percent increase, while the number of people injured in crashes remained nearly constant. This means that emergency medical services were made available to a larger percentage of people injured in crashes. Most of the 10 states enacted new, or revised, EMS legislation to establish medical direction procedures, regulations and practices. In two of the 10 states, a dedicated EMS fund was established that was supported by surcharges on moving violations. By the early 1990's, five of the 10 states supported their EMT training without safety grants. Safety grants for EMS programs amounted to 3.4 percent in 1980 of all EMS costs which decreased to 0.2 percent in 1993. During the time when safety grants from NHTSA were being reduced, Federal grants from Health and Human Services (HHS) were increasing. The HHS grants were not specifically tied to highway safety issues.

The level of EMT services was continually upgraded, and there were approximately 4,000 paramedics in 1980 in the 10 states which increased to 21,300 paramedics in 1993. The number of trauma centers that were accredited, designated, verified or otherwise identified as meeting the American College of Surgeons standards grew from 29 in 1980 to 94 in 1993.

Safety grant "seed money" helped provide leverage for state funds to improve the EMS delivery systems in the early 1970's and 1980's. By the 1990's most of the pre-hospital care programs and services were self sufficient -- funded by fees, taxes and private contributions and possibly HHS Federal grants. The advanced life saving and trauma care systems are essentially self sufficient in most states, being funded by fees, taxes, gifts and endowments. Safety grants were used in the 1980's for paramedic training, and in the early 1990's, for EMS planning and advisory services.

Motorcycle Safety

In the United States, motorcyclist fatalities declined from 5,144 in 1980 to 2,449 in 1993 as motorcycle ridership decreased, especially among young people. In 1980, four of the 10 states required helmets be worn by all riders and two states for riders either under 16 or under 18 years old. As part of the change in public attitude regarding traffic safety, a mandatory helmet use law was reinstated in one of the states in 1992. Grants were primarily used to help create most of the rider education programs in the 1970's and early 1980's. The states enacted legislation to establish rider education funds supported by license or registration fees. This led to self sufficiency for all but one of the states. In the 10 states, there were 64 graduates for every 1,000 new motorcycle registrations in 1984. There were 24,400 rider education graduates in 1993, or 482 graduates for every 1,000 new motorcycle registrations -- a seven fold increase over 1984. Almost one-half of all new registrants in 1993 appear to be taking the rider education courses. In 1993, rider education cost an average of $191 per graduate.

Pedestrian and Bicycle Safety

Pedestrian fatalities in the United States declined from 8,070 in 1980 to 5,649 in 1993, and bicyclists from 965 to 816 respectively. Elementary school education programs, that include components on pedestrian and bicycle safety, have been institutionalized in the states. New approaches begun with safety grants in the late 1970's and early 1980's were curtailed after reductions in the safety grant program in 1982. Communities, however, continued to support bicycle rodeos, and many programs shifted to comprehensive traffic safety programs in the latter 1980's.

The reemphasis on pedestrian and bicycle safety in the early 1990's focused on bicycle helmet use, and laws to make such use mandatory. This has already been a successful program. Smaller scale pedestrian safety programs directed at senior citizens were just beginning in the early 1990's.

A Synopsis of Findings in Relation to the Assessment Questions

The heart of this Assessment was a review of 171 individual highway safety programs in the 10 states. From the review of these 171 programs, it became possible to answer the seven assessment questions listed at the beginning of this report. The results are summarized in Table 1, and in the following discussion including examples of typical safety projects in the individual states.

Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?

All the 171 programs reviewed in this assessment were focused on major safety problems, either established as national priorities or as priorities based on a states' own safety problem identification process. A fundamental step, in line with the Transportation Research Board's publication *Comprehensive Computerized Safety Record Systems* in 1985, was taken by many states when they began to review and upgrade their data collection and processing systems and to improve their analytic capability for problem identification.

The state traffic safety offices became able to access crash data for problem analysis and to publish the crash statistics. Every project that addressed impaired driving, for example, was based on the analysis of crash data that identified the degree of the problem in terms of age, time period and location.

In 1980, crash data in one state showed that the number of fatalities per 1,000 licensed drivers were declining, but young people were being killed at twice the rate of others in alcohol related crashes. This persistent problem was addressed anew with an alcohol and drug education project established at junior high schools in 40 school districts of the state.

Were new programs initiated with Federal grants?

New programs and major program changes in all safety program areas were initiated with safety grants. As Table 1 shows, 92 percent or 157 of the 171 programs constituting the array of safety efforts of the 10 states covered in this report, were initiated with safety grants. The other 14 programs were initiated with either private or state or local funds without Federal grants.

All the states in this assessment used safety grants to initiate -- and continue -- campaigns to raise public awareness of the drinking and driving problem. One of the states launched a media campaign called "It's Time to Treat Drunk Driving Like the Crime It Is" with a grant of $100,000.

A model safety belt community program that began operations in 1985 in one of the states was supported with safety grants and a statewide public information campaign that started in 1985 and continued in 1986 was funded with a grant of $155,000. In another state, Federal grants were used for projects promoting the use of bicycle helmets, safety education classes and bicycle

rodeos. All the comprehensive traffic safety programs (CTSPs) were initially begun with either basic or incentive safety grant support. States also used safety grants to establish and upgrade their breath testing programs.

Safety grants were used in nine of the 10 states to initiate emergency medical technician (EMT) training. One of the states used $900,000 for the training of 8,000 EMTs in 1980 and 1981.

Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?

An important outcome of the safety grant program is that states and communities have taken over the responsibility for projects that began with federal support. This "catalytic" effect of the safety grant program appears in many forms: Federal funds are matched by state and/or private groups (leveraging); states continue safety projects after federal funding ceases (grants serve as seed money); and projects continue to be supported through user fees (become self-sufficient).

More than two-thirds (68 percent) of the 171 safety programs in the 10 states showed evidence that safety grants led to or encouraged state, local or private participation and support. Traffic records programs -- the development and implementation of crash and other traffic related data systems -- had the highest participation level (90 percent). The least amount of state, local and private support (48 percent) was for programs that promoted safety belt and child safety seat use.

In one state, where liquor sales were state-controlled, a two percent from liquor sales profits was deposited into an alcohol education fund. That state also fielded model county comprehensive DWI programs that drew a great deal of support from volunteers. The programs were begun with safety grants of $500,000 in 1990. By 1991, grant funding was down to $100,000. Several projects were self sufficient by 1993.

The youth-oriented SOBER program in another state was funded with grants of $114,000 that were matched by $265,000 provided by the counties in which the program was operating. One of the states enacted legislation in 1991 to establish a $60 fee for every DWI conviction to support the breath testing program.

Motorcycle rider education programs had been established in all 10 states by 1991. They were supported primarily by funds derived from license surcharges.

TABLE 1. ASSESSMENT QUESTIONS and ANSWERS

QUESTIONS		ANSWERS -- In Percent YES, by Priority Area and No. of Programs ( )								
		Impaired Driving (35)	Occupant Protection (27)	Comprehensive Safety Programs (9)	Police Traffic Services (37)	Traffic Records (20)	Emergency Medical Services (21)	Motorcycle Safety (11)	Pedestrian and Bicycle Safety (11)	Total (171)
Were programs focused on major safety problems such as those identified through national priority rulemaking and through states' own safety problem identification process?		100	100	100	100	100	100	100	100	100
Were new programs initiated with federal grants?		89	100	100	95	100	76	91	91	92
Did federal grants lead to participation or full support by state, community and private entities? Did federal grants encourage other state and local spending on highway safety?		63	48	78	61	90	71	82	82	68
Were programs started at one or more sites replicated elsewhere in their original form or in an adapted form?		83	100	100	92	85	86	82	86	89
Were concepts and technology developed with federal funds used to improve state program effectiveness?		54	81	56	43	60	67	67	36	57
What would be the consequences of removing federal grants from the program?	**Critical**	34	89	56	41	50	10	10	45	43
	Important	43	4	44	54	25	28	45	45	36
	No Effect	23	7	0	5	25	62	45	10	21
Were programs formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?	**Yes**	14	30	11	22	15	5	36	0	18
	No	80	11	78	70	40	52	64	91	58
	Partial	6	59	11	8	45	43	0	9	24

Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?

The replication of programs based on pilot projects, or started at a limited number of sites, was widespread in all 10 states. Adaptations and replications occurred in more than 152 (89 percent) of the 171 programs that were assessed. All occupant protection and comprehensive traffic safety programs followed the route from pilot or initial sites to other areas in the states.

Impaired driving programs were among those most frequently replicated. The "Slow On the Bottle, Enjoy the Road" (SOBER) campaign in one state began as a pilot in 1979 in three of the state's counties. By 1982, the campaign was picked up by another seven counties. In the next year, 1983, 18 more counties replicated the campaign.

The safety belt promotion campaigns were statewide efforts, but were often carried out by unique organizations that had chapters in many of a state's localities. In one example, the Extension Homemaker program began a safety belt awareness campaign that eventually also included 1,000 "4-H" clubs involving 24,000 members. Safety-seat loaner programs are a prime example of child safety protection projects that quickly spread throughout a state. One state began a pilot loaner program in two of its counties in 1981. It expanded rapidly to 50 programs by the end of 1982. By 1984, there were 77 loaner programs run by volunteers, and by the early 1990's, loaner safety seats were available to every child in the state.

Were concepts and technology developed with Federal funds used to improve state program effectiveness?

Technology developed with technical assistance grants under the §403 program was used in 57 percent of the programs that were part of this assessment. Occupant protection and emergency medical services have led the safety priority areas in using technology and demonstrations to further state program effectiveness. The other safety areas have also benefitted from technical assistance, often through the adoption of new technologies and processes first developed by other states and by NHTSA.

In one state, model local crash data collection systems that could be used to identify key problems were developed with technical assistance grants.

One state received a technical assistance grant in 1987, three years after the state had enacted a mandatory safety belt use law, to conduct a valid observational survey of belt use. Another state received funds to study the effects of combining public information with enforcement activities to boost the use of child restraints in 1989.

More than 40 percent of the many enforcement programs in the 10 states were improved by the development of new technologies. Primary among these, in more recent years, were the development of Standardized Field Sobriety Testing (SFST) and the methodology for implementing effective sobriety checkpoints. Laser speed devices were tested by a number of police agencies in six of the 10 states.

What would be the consequences of removing Federal grants from the program?

It is concluded that more than 40 percent of the programs in the 10 states would not have been initiated or would have been discontinued in the absence of further safety grants. The problem is critical for almost 90 percent of the programs that promote the use of safety belts.

For another 36 percent of the programs, federal grants were important for their initial start-up and/or continuation. The majority of enforcement programs were in that category. Some 20 percent of the programs did not depend on federal funds for implementation or continuance. The majority of emergency medical services programs were among this group.

Almost 80 percent of the public information and education programs on impaired driving would likely be discontinued or considerably reduced. Only the DWI offender evaluation and education programs are self sufficient in all of the 10 states, although there are grants from the Department of Health and Human Services that support certain aspects of these programs.

By 1993, safety seat loaner programs were heading toward self sufficiency in several of the states and were run by volunteers. The other states remained dependent on Federal support with grant support ranging from 50 to more than 90 percent.

The comprehensive/community traffic safety programs (CTSPs) would certainly lapse without safety grants. Much like the grant assistance that is needed for safety belt and child restraint use programs, and for impaired driving reduction campaigns, there continues to be a need for grant funds.

New approaches to DWI enforcement would very likely be reduced or not attempted without the availability of safety grants. Although such grants constituted one percent or less of total traffic enforcement spending in 1993, grants have provided the incentive to establish new approaches such as sobriety check points, video taping of offenders, and training. The upgrading of breath testing equipment would be affected -- substantially slowed -- in many states. In some states it would lapse. The concurrent training of breath test device operators would follow suit.

Hard hit would be the speed enforcement programs that no longer benefit from set asides and the acquisition of vehicles, radar and new laser devices would very likely be delayed. Training for the various levels of crash investigation would have to be reduced without the assistance of safety grants. Educational outreach programs conducted by enforcement agencies, on the other hand, have been supported by states and localities and would, therefore, not be affected by reductions or elimination of grant funds.

More than one half of the programs to develop and implement traffic records systems had a critical need for grant support. Six of the 10 states continue to rely in whole or in part on safety grants for new data systems development, system upgrades and design.

The EMS systems would be the least affected by grant funding reduction, although Federal grant assistance was found to be critical or important to 38 percent of the programs in the 10 states. The partial funding of EMT training programs and support for several of the central EMS offices would lapse with the withdrawal of grant funds. Most EMS programs are, however, self sufficient and funded through fees, taxes and private contribution and possibly HHS Federal grants. Many ambulance units are made up of volunteers. Trauma care centers have been developed with state, local and private support. Some paramedic training and EMS/Trauma Care planning would be affected.

The motorcycle rider education programs in all states are, or are close to being, self sufficient. Removing safety grants would not have any effect on most of the programs, but those that still rely on such funding would have to reduce the number of rider courses or increase their fees.

Almost 90 percent of the pedestrian and bicycle safety programs in the 10 states would have to sharply curtail their activities in adult pedestrian programs and for certain bicycle safety activities. There is some local support for bicycle helmet purchases, bicycle rodeos and the distribution of informational brochures.

Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?

Four out of every 10 programs was formally monitored, assessed or evaluated in some way to determine effectiveness, or measure accomplishments. Programs for occupant protection, traffic records, motorcycle safety and emergency medical services were subjected to more review than the other safety priority areas.

Crash data and related traffic data systems that served the problem identification process were frequently reviewed in all states. Observational sampling with multi-stage probability samples of road segments to determine safety belt use was employed by the states. While 70 percent of the 37 enforcement programs did not include assessments or evaluations, they were monitoring the 55 mph NMSL.

NHTSA's EMS Assessments were conducted in each of the 10 states. While focusing on current status in relation to guideline requirements, the EMS Assessments provided a much needed set of information that could be used to make subsequent improvements.

The beneficial effect of using a motorcycle helmet has been shown in many studies. One state, however, undertook an impact evaluation of its rider education program -- and was not able to find a relationship between such a program and crash outcomes.

It should be noted that many of the projects implemented by the states evolved from program strategies previously demonstrated and evaluated by NHTSA. The agency will continue to be the principal evaluator of programs of national interest.

General Conclusions

The planning process for States to obtain Federal funds has helped assure that highway safety programs receiving grants undertaken by states are focused on major safety problems. State traffic safety offices' increased ability to access crash data for problem analysis was instrumental in identifying major safety problems so that programs to resolve them could be developed and implemented. The planning process also helped assure that safety grants initiated new programs and resulted in major program changes in all safety program areas.

States and communities tend to take responsibility for projects begun with Federal funds when project objectives are perceived as relating to established state and local safety goals. The states and communities must perceive that they "own" the safety projects before they are willing to invest time and resources on them. In the individual priority areas, between 50 percent and 90 percent of the safety programs were taken over by states and localities after Federal funding ended. In addition, projects once begun in one location were repeated elsewhere. All this suggests that because of good problem identification based on automated crash data, states were able to address safety issues with programs that in their view truly reduced crashes and their consequences.

The Federal grant program has achieved the intent of Congress when it passed the Highway Safety Act of 1966. Federal grants which represent less than two percent of the funds expended on highway safety programs have led the states in addressing the most important safety issues and leveraged funds to provide many services to a wide public. Even so, in some priority areas states continue to be highly dependent on Federal direction and funding. While it is unknown whether programs would have been initiated by states without Federal direction or funding, it seems obvious that Federal leadership and resources have helped states to maintain traffic safety programs addressing the most important issues.

Because of the limited time period for which Federal grants were available, and the fact that development of new, innovative problem solving approaches is a slow evolutionary process, it was necessary in some instances for states and communities to repeat the same programs which had been "repackaged".

Under the process in place until FY 1996, fewer than half of the traffic safety programs are monitored or evaluated to determine their effectiveness. Because evaluation studies can be difficult and expensive to perform and often do not arrive at conclusive results, energy was focused on planning without the benefit of objective evidence that programs are achieving their goals, except the evidence provided by national demonstrations. This may be driven by the limited time period that a project can receive Federal funds. There may be a tendency to put as much Federal grant funds into the operation of the project rather than spending resources on evaluating the project.

Changes in the Management of the §402 Grant Program Beginning in FY 1996 [2]

The State and Community Highway Safety Grant Program was enacted by the Highway Safety Act of 1966 as §402 of Title 23, U.S.C. Grant funds are provided to the states, Indian Nations, and Territories each year based on a formula of population and road mileage to encourage and facilitate implementation of programs to improve highway safety. The grants provide "seed" money for safety programs and leverage public and private sector resources for highway safety.

The §402 process that was in place through the time period of the assessment required states to develop Highway Safety Plans (HSP's) that included data to support problem identification and project descriptions for proposed programs. The Plan was approved by the Regional Office and changes in excess of 10 percent of programs costs needed prior approval. The process to make changes was often time-consuming, resulting in some states delaying making changes, though warranted, until the following fiscal year. Annual Reports were required and accountability was at the project/program level.

Beginning in FY 1996, NHTSA initiated a new performance-based process for the management of the §402 State and Community Grant Program - this was consistent with efforts to relieve burdens on the states under the President's regulatory reform initiative. The change took place not long after the data collection phase for the highway safety assessment was completed in 1994. The new process requires states to develop Performance Plans that establish state traffic safety goals and performance measures, and to describe the processes used to (1) identify highway safety problems; (2) establish goals; and (3) select projects to be used to achieve the performance measures. Also, the state prepares a Highway Safety Plan which describes specific programs and projects to be funded. Annual Reports are still required; however, accountability is now at the goal level. The new process provides states with maximum flexibility to make program changes as they are needed. States agreed that, if progress toward meeting goals does not occur in a state, both state and Federal officials would cooperate to develop an improvement plan for the state. States are free at any time to request assistance or advice from the regional offices, which remain ready to devote available resources as needed.

A recent NHTSA Publication, *Evaluation of the Section 402 Pilot Process* (not part of this Assessment) found that the immediate effects of the change on the highway safety programs included greater linkage between project and problem identification and re-energized state highway safety office staff. The first Annual Reports under the new process indicated that pilot states were clearly making progress toward achieving established performance goals. Some states exceeded nearly all their short-term performance measures and were crafting more ambitious goals for future years. Some states were overly ambitious in setting their first year performance measures and revised them for the next year. These are expected outcomes in the transition from the old to the new process.

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[2] Based on information in *Evaluation of the Section 402 Pilot Process*, DOT HS 808 583, May 1997 and the Interim final rule, 23 CFR Parts 1200 and 1205, June 26, 1997

Other improvements derived from the new process include paperwork and time saving considerations because fewer reviews and discussions with Federal agencies are needed, less detailed information is required, and planners are free from rigid Federal formats. Success is measured in terms of achieving performance goals rather than completing projects. States with their flexibility can broaden the types of programs funded which leads to increased partner involvement - both in terms of funds and types of involved organizations. Program quality is improved because planning documents are more useful and are based more on the "big picture". NHTSA Regional staff are able to devote more time to value-added activities and marketing priorities. Data systems have been expanded to identify traffic safety problems which helps in determining and measuring performance goals. States still emphasize priority areas under the new process even though they are not required to do so. Establishing baseline measurements for some states was a problem because data collection systems had not been established. In other cases, there is a lag time between data collection, analysis and when the information can be incorporated into the strategic planning process. Steps are being taken to improve even further the data systems needed for problem identification and to measure progress in terms of performance measures.

In addition to the Regional Office staff being freed up from administrative oversight activities to being able to provide more technical assistance to the states, the Traffic Safety Programs Office has created a Technical Assessment Program to assist states by examining state programs in areas such as EMS, Traffic Records, and Police Traffic Services. At a state's request, teams of technical experts are sent to examine the state's program against existing technical program criteria. The team accordingly provides the requesting state with a report of the assessment, along with recommendations on how the state can improve its program.

This Highway Safety Assessment was originally planned to include recommendations for improvements based on looking at programs before the change in operating procedures had been invoked. It became apparent that the new procedures have already achieved many of the improvements that were going to be recommended or have changed conditions so that other recommendations no longer apply. As a result, the assessment contains no recommendations but is a document that shows how states implemented their highway safety programs with Federal funding stimulation during the 1980-1993 time period. The major conclusion is that with very little Federal assistance, states have been able to focus their resources on resolving major highway safety problems, and they achieved significant improvements in many key measures of safety performance.

NATIONAL STATISTICS

DEMOGRAPHICS and FATALITIES

	1969	1973	1980	1993
U.S. POPULATION	201,921,000	211,357,000	226,505,000	257,980,000
LICENSED DRIVERS	108,306,000	121,546,000	145,972,000	173,149,000
REGISTERED VEHICLES	105,000,000	130,025,000	146,330,000	188,453,000
VMT (BILLIONS)	1,062	1,313	1,527	2,288
FATALITIES	53,543	55,113	51,091	40,115
FATALITIES/100,000 LIC. DRIVERS	49	45	35	23
FATALITIES/VMT	5.0	4.1	3.3	1.7

EXPENDITURES

1996 DOLLARS	1969	1973	1980	1993
NATIONAL TOTAL	$12,400,000,000	$12,355,000,000	$ 8,000,000,000	$11,750,000,000
TOTAL FEDERAL TRAFFIC SAFETY GRANTS			$ 355,000,000	$ 165,000,000
FEDERAL §402 GRANTS	$ 338,000,000	$ 265,000,000	$ 347,000,000	$ 117,000,000
PERCENT §402 OF NATIONAL TOTAL	2.7%	2.1%	4.3%	1%
TOTAL COST PER LICENSED DRIVER	$ 114.49	$ 101.66	$ 54.78	$ 66.69
§402 COSTS PER LICENSED DRIVER	$ 3.12	$ 2.19	$ 2.37	$ 0.66

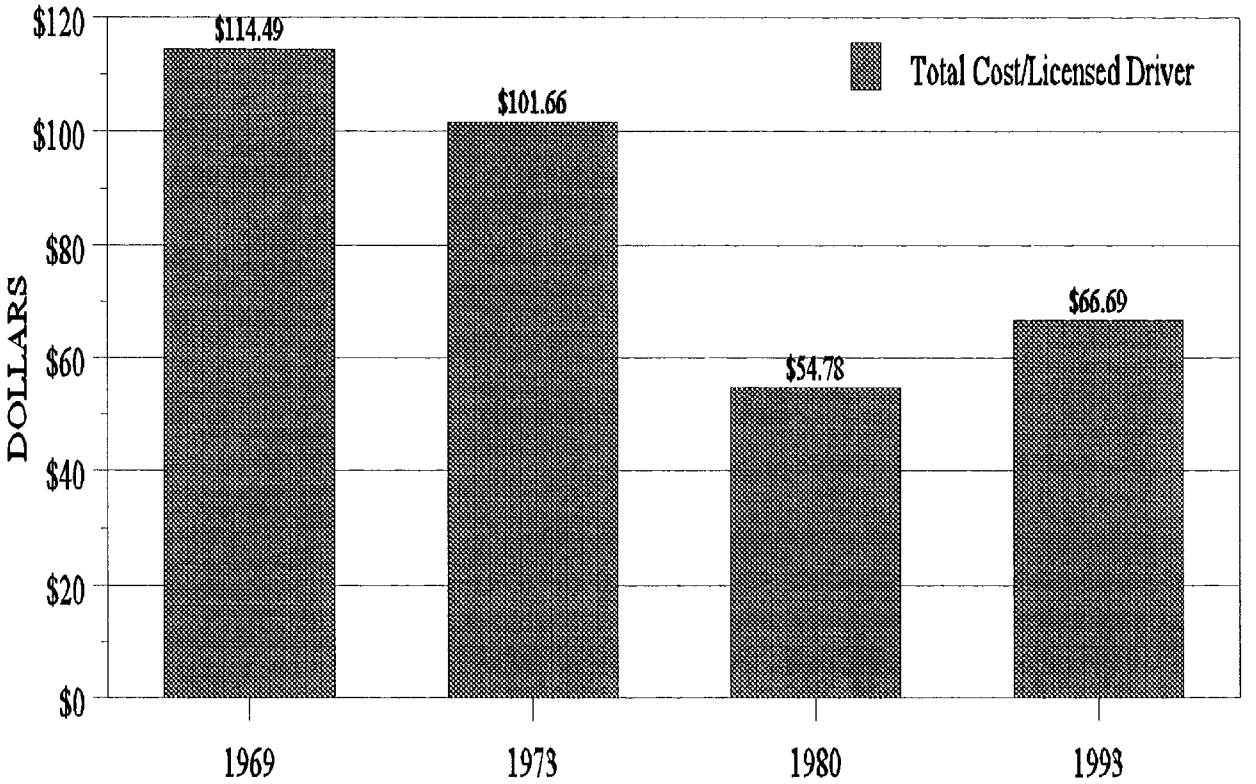
POLICE TRAFFIC SERVICES

1996 DOLLARS	1969	1973	1980	1993
EXPENDITURES	$8,721,000,000	$8,577,900,000	$ 5,619,400,000	$ 8,130,958,000
§402 FUNDING	$ 59,850,000	$ 70,600,000	$ 207,008,000[3]	$ 42,014,000
TOTAL OFFICERS	280,000	350,000	478,277	590,465

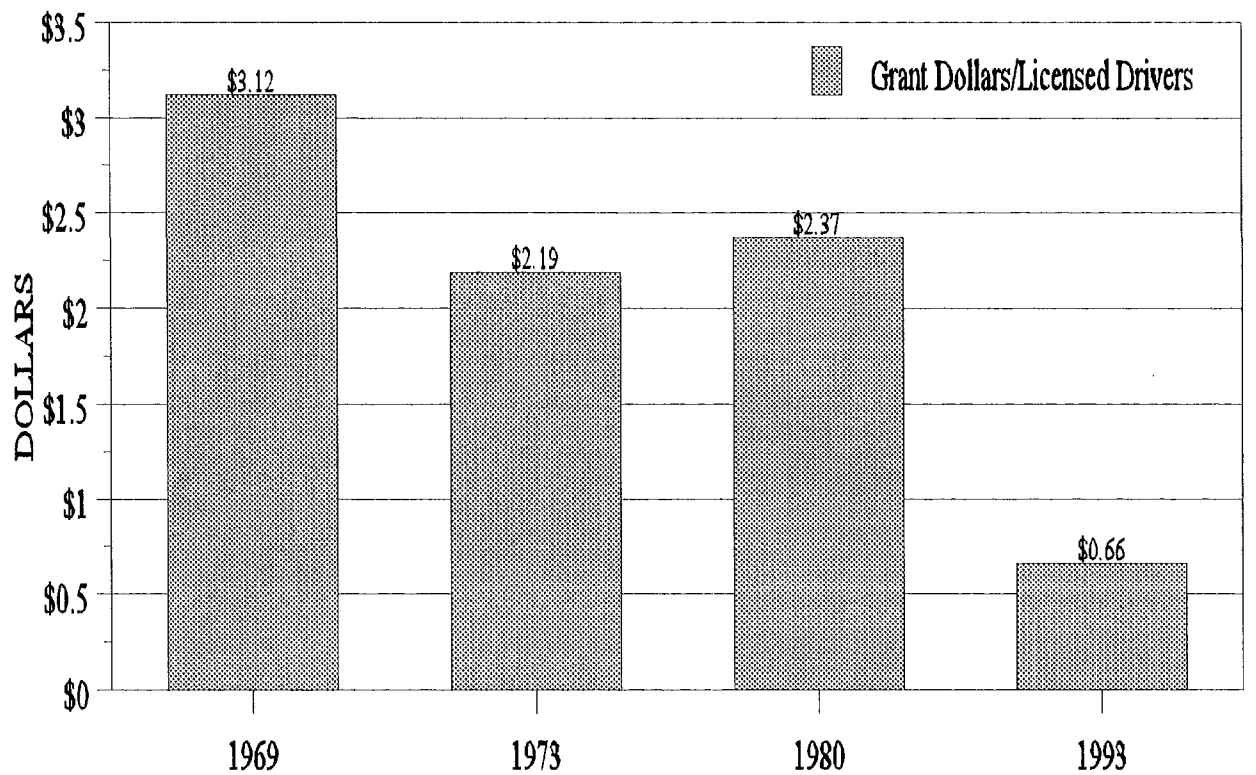
[3] This includes National Maximum Speed Limit enforcement funds which gradually decreased to zero by 1995

NUMBER FTEs ON TRAFFIC SAFETY	127,000	164,500	98,000	102,740
FTEs/100,000 LICENSED DRIVERS	117	131	67	58
NUMBER OF SPEEDING ARRESTS			7,930,000	9,285,000
PERCENT OF DRIVERS EXCEEDING 55 MPH	83	65	49	60
PERCENT OF DRIVERS EXCEEDING 60 MPH	65	30	18	32
PERCENT OF DRIVERS EXCEEDING 65 MPH	42	10	5	12

TOTAL COSTS PER LICENSED DRIVER



GRANT DOLLARS PER LICENSED DRIVER



IMPAIRED DRIVING

1996 DOLLARS	1969	1973	1980	1993
EXPENDITURES	$ 42,750,000	$50,880,000	$146,631,000	$344,509,000
§402 FUNDING	16,245,000	26,394,000	$ 25,876,000	$ 28,009,000
ALCOHOL INVOLVED FATALITIES			23,165	17,461
ALCOHOL INVOLVED FATALITIES/ 100,000 LICENSED DRIVER			16	10
DWI ARRESTS	560,000	1,040,000	1,335,000	1,840,000
BAC TESTS	390,000	800,000	1,033,000	1,326,000
NUMBER OF BROCHURES for DWI			6,800,000	23,212,000
DWI OFFENDERS in SCHOOL			215,500	335,300

OCCUPANT PROTECTION

1996 DOLLARS	1980	1993
EXPENDITURES	$ 12,938,000	$ 47,615,000
§402 FUNDING	$ 8,626,000	$ 22,408,000
BELT USE	14%*	66%**
LIVES SAVED BY BELTS	575	8,347
STATES with BELT LAWS		48, D.C.& P Rico
CHILD SAFETY SEAT LOANER PROGRAMS	2,950	5,000
CHILD SAFETY SEATS on LOAN	317,000	387,000
LIVES SAVED BY SAFETY SEATS	39	247
EXPENDITURES PER LIFE SAVED BY BELTS OR SAFETY SEATS	$ 21,072	$ 5,541

* 1980 belt use from 19-City Survey **1993 belt use from State Surveys

EMERGENCY MEDICAL SERVICES

1996 Dollars	1969	1973	1980	1993
EXPENDITURES			$ 1,414,551,000	$ 2,321,903,250
§402 GRANTS	$ 38,475,000	$ 45,890,000	$ 47,440,000	$ 28,009,000
EMTs	220,000	280,000	428,000	795,000
PARAMEDICS			18,120	96,715
RESPONSES TO VEHICLE CRASHES	1,300,200	2,300,000		2,554,000

MOTORCYCLES

1996 DOLLARS	1969	1973	1980	1993
EXPENDITURES			$ 19,560,000	$ 43,410,000
§402 GRANTS			$ 10,805,000	$ 1,821,000
MOTORCYCLE FATALITIES	1,870	3,230	5,144	2,449
MOTORCYCLE FATALITIES/10,000 REGISTERED MOTORCYCLES	8.1	7.4	9.0	6.2
STATES WITH HELMET LAWS COVERING SPECIFIC RIDERS	38	42	37	40
STATES WITH HELMET LAWS COVERING ALL RIDERS	35	41	19	20
NATIONAL HELMET USAGE			60	62.5
REGISTERED MOTORCYCLES	2,315,708	4,371,011	5,693,940	3,977,856
LIVES SAVED BY HELMETS			871	572
LIVES SAVED BY HELMETS/100,000 REGISTERED MOTORCYCLES			15.3	14.4
RIDER COURSE STUDENTS TRAINED (Motorcycle Safety Foundation)		15,629	31,666	111,615

GLOSSARY

Term	Definition
Catalytic Effect	Section 402 grant funds encourage states to introduce new, innovative strategies to address existing or emerging safety problems. Section 402 grant funds accelerate State programs to address major safety issues with a statewide strategy (in Senate Appropriations Committee Report on FY 1993 NHTSA §402 grant program).
DWI	The term "DWI" is a general (non legal) term that refers to any criminal action of driving a motor vehicle either (1) while "illegal per se", (2) while either impaired by, while under the influence of (also called DUI - driving under the influence) or while intoxicated by either alcohol or other drugs. In Ohio, the term OMVI is sometimes used which means operating a motor vehicle while intoxicated.
"illegal per se"	The term :illegal per se" refers to state laws that make it a criminal offense to operate a motor vehicle at or above a specified alcohol concentration or with any amount of a drug (usually a controlled (illegal) substance), in the body.
Leverage	Section 402 grant funds encourage states localities to invest their own funds in highway safety programs. Section 402 grant funds stimulate state/local/private investment in safety. Section 402 leverages additional state and local investment in highway safety (in Senate Appropriations Committee Report on FY 1993 NHTSA §402 grant program).

Term	Definition
NHTSA Priority Program Areas	The Omnibus Budget Reconciliation Act of 1981 required DOT to identify the most effective NHTSA (and FHWA) highway safety programs through the rulemaking process. These programs areas would be eligible for Federal funding (a mechanism was also established whereby other programs might be eligible for Federal funds). In 1982 the NHTSA priority programs areas included: • Alcohol Countermeasures, • Police Traffic Services, • Occupant Protection, • Traffic Records, and • Emergency Medical Services. In 1987, Alcohol Countermeasures was changed to Impaired Driving Programs and Emergency Medical Services was expanded to include Trauma Care Systems. Motorcycle Safety was added as another priority program area. In 1991, Pedestrian and bicycle safety were added as another priority program area.
Section 153 Incentive Grants	Beginning in FY 1992, grants to states were authorized for states that had in effect: (1) a law making it unlawful throughout the state to operate a motorcycle if any individual on the motorcycle is not wearing a motorcycle helmet; and (2) a law making it unlawful throughout the state to operate a passenger vehicle whenever an individual in the front seat of the vehicle (other than a child in a child restraint) is not wearing a safety belt properly fastened. A state can only receive funds for three years in declining proportion of 75%/50%/25% Federal funds in years ½/3 respectively. Beginning in FY 1994, any state without such laws shall transfer 1-1/2 percent of the Federal road construction funds to the states §402 program. In FY 1995, 3% will be transferred if no laws are passed in the state.

Term	Definition
Section 402 grants	Section 402 of the Highway Safety Act of 1966 required each state to have a highway safety program to reduce traffic crashes and deaths , injuries and property damage resulting therefrom. Grant funds are apportioned based on the ratio of state population to the national population (75%) and state public road mileage to the total national public road mileage (25%). Because the total grant funds appropriated for the §402 program were significantly reduced in 1981, action was taken to determine the priority program areas which would get the bulk of the available grant funds. Section 402 was set up to provide leadership and assistance to state and community highway safety activities (in Senate Appropriations Committee Report on FY 1993 NHTSA §402 grant program). From time-to-time, Congress earmarks funds for program set asides under §402 such as National Maximum Speed Limit enforcement and traffic records.
Section 403	Section 403 of the Highway Safety Act of 1966 authorizes DOT to use appropriated funds to engage in research on all phases of highway safety and traffic conditions. This includes training of highway safety people, development of improved crash investigation procedures, emergency service plans, demonstration projects, and related research and development activities (conferences, public service announcements and other public information and education products). Section 403 funds can be used in conjunction with §402 funds for demonstration projects. Section 403 funds are used to develop research concepts and technology to improve highway safety program effectiveness.
Section 408 Alcohol Incentive Grants	DOT was authorized in the FY 1983 through 1985 time period and again in the FY 1992 though FY 1994. To be eligible for a basic grant, a state had to have prompt license suspension, mandatory jail or community service for repeat offenders, Illegal Per Se of 0.10 BAC, and increased DWI enforcement/public information. Additional funding was available for meeting supplemental criteria. A state could receive §408 grants for up to five years and gant funds must be used to support the impaired driving prevention plan.

Term	Definition
Section 410 Alcohol Incentive Grants	Beginning in FY 1992, states could receive basic §410 alcohol incentive grants by meeting 4 of 5 criteria: expedited license suspension, 0.10 BAC for first 3 years then 0.08 BAC, statewide program for stopping motor vehicles, self-sustaining drunk driving prevention program, and under age 21 program. Addition funding could be obtained for meeting supplemental criteria. Grant funds must be used to support the impaired driving prevention plan.
Seed	Section 402 grant funds are used to start up or create new and effective highway safety programs. Section 402 funds enhance states' highway safety programs by providing seed money resources to start up new, more effective projects (in Senate Appropriations Committee Report on FY 1993 NHTSA §402 grant program).
Trauma Center Levels I, II, II	**Level I** hospitals are usually teaching hospitals that annually admit 700 or more trauma patients. They also have resident and attending surgeons maintaining 24-hour coverage. **Level II** facilities provide the same quality of patient care as Level I but do not have the overhead of education and research. Level II hospitals generally admit approximately 350 trauma patients annually. **Level III** are small hospitals that are part of the health care system since physicians first established their own clinics. Level III trauma hospitals serve neighborhood needs. In suburban areas, Level III hospitals stabilize patients who cannot be safely transported to Level I or Level II facilities. In rural areas, they may be called on to treat severely injured patients too distant from higher level hospitals.

HIGHWAY SAFETY ASSESSMENT

Preface

Since the establishment of the National Highway Traffic Safety Administration (NHTSA) as an agency within the U.S. Department of Transportation in 1971, the evaluation of traffic safety programs has been one of the agency's management policies. An office responsible for program evaluation has been part of the organizational structure of NHTSA for the past 25 years (1996).

The first overall assessment of the highway safety grant program was conducted in the 1972/1973 period. After collecting program and cost information from the 50 states through the 10 NHTSA Regional Offices, a report that described the programs and what was actually "bought" with the safety grants was published in October 1973. Another assessment, that addressed program output from 1969 through 1974, using key performance indicators was undertaken in 1974 and published in 1975.

The two assessments, with selected periodic updates, served for many subsequent years as a basis for responding to Congressional questions, strategic planning and budget justifications.

After completing the pilot highway safety assessment in the State of Washington in 1992, nine more state highway safety programs were assessed -- Colorado, Connecticut, Kansas, Nevada, New Jersey, New Mexico, North Carolina, Ohio, and Pennsylvania.

The NHTSA would like to thank the many people who took the time to contribute to this assessment in the ten states -- state, county, and municipal officials, representatives of private and volunteer organizations, and the staffs of hospitals and universities.

Each of the ten state highway safety offices made special efforts to coordinate the many interviews and point the assessment teams to information and data sources. They were of extraordinary assistance to the completion of the highway safety assessments. We offer them our profound thanks.

The ten NHTSA Regional Offices were instrumental in the selection of the participating states and in guiding the assessment teams during their state visits. Their many suggestions are gratefully acknowledged.

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INTRODUCTION

Legislative History and Purpose

Under the Highway Safety Act of 1966, the National Highway Traffic Safety Administration (NHTSA) provides grants and technical assistance to states and communities. Section 402 of the Act requires each state to have a highway safety program to reduce traffic accidents and deaths, injuries and property damage.

Grant funds under §402 are apportioned to the states based on the ratio of state population to the national population (75 percent), and state public road mileage to the total national public road mileage (25 percent). Congress enacted §402 of the Highway Safety Act in 1966 to provide Federal leadership and assistance to state and community highway safety activities.

Technical assistance and support for demonstrating new and innovative projects are provided in §403 of the Highway Safety Act of 1966. Under §403 the Department of Transportation (NHTSA) is authorized to use appropriated funds to engage in research on all phases of highway and traffic safety. This includes, for example, training of personnel, development of emergency medical service plans, technical demonstration projects and related research and development activities.

From time to time, Congress earmarks §402 funds to be set aside for special purposes such as the enforcement of the National Maximum Speed Limit, for traffic records development, child restraint use promotion, and programs aimed at young drivers. In addition, Congress has enacted legislation to provide incentive grants.

Under §408 -- the Alcohol Incentive --was enacted in 1982 and funds remained available through 1994, if there were laws or provisions that allowed prompt license suspension, mandatory jail or community service for repeat offenders, an "illegal per se" of 0.10 blood alcohol concentration (BAC), and increased DWI enforcement and related public information programs. Additional Alcohol Incentive funding was available to states that met supplemental criteria.

Another incentive grant for impaired driving reduction programs was enacted in 1988 as §410 of the Highway Safety Act and significantly amended in 1992 and 1998. Beginning in 1992, states could receive basic impaired driving incentive grants by meeting four out of five criteria: Expedited license suspension, an "illegal per se" of 0.10 BAC for three years followed by a 0.08 BAC, a statewide program for stopping motor vehicles (sobriety checkpoints), self-sustaining drinking and driving prevention programs, and laws that prohibited alcohol consumption for those under 21 years of age. Additional incentive funding could be obtained by the states for meeting supplemental criteria. The incentive grant funds had to be used to support impaired driving prevention plans.

In 1992 an occupant protection incentive grant program was initiated. Congress added §153 of the Highway Safety Act to authorize grants to states that: (1) enacted a law prohibiting the operation of a motorcycle unless all riders wear motorcycle helmets; and (2) enacted a law that prohibited the operation of a passenger vehicle whenever an individual in the front seat of the vehicle (other than a child in a child restraint) is not wearing a properly fastened safety belt. Incentive grant funding was limited to three years -- and in declining proportions to the total program costs of 75 percent for the first year, 50 percent for the second year and 25 percent for the third year.

Federal Standards, Guidelines, and Regulations

The Federal highway safety program is a combination of formula and incentive grants and technical assistance to state and local governments. It began after the enactment of the Highway Safety Act of 1966 with the development and publication of 18 Highway Safety Standards that covered every aspect of highway and traffic safety. At that time all highway safety functions were organized under the Federal Highway Administration (FHWA, then the Bureau of Public Roads). When NHTSA was organized as a separate entity, 14 ½ of the Standards came under its jurisdiction. The ½ Pedestrian Standard that dealt with the physical separation of pedestrians from the roadway became part of FHWA's 3 ½ Highway Safety Standards.

The original standards under NHTSA's jurisdiction included, by Standard Number, Periodic Motor Vehicle Inspection, Motor Vehicle Registration, Motorcycle Safety, Driver Education, Driver Licensing, Codes and Laws, Traffic Courts, Alcohol in Relation to Highway Safety, Traffic Records, Emergency Medical Services, Pedestrian Safety, Police Traffic Services, Pupil Transportation Safety, Accident Investigation and Reporting. A Bicycle Safety Standard was subsequently added.

In 1982, six Safety Priority Areas were established by regulation and the existing Highway Safety Standards became "Guidelines." One of the six Safety Priority Areas is under the jurisdiction of the FHWA. The other five are: Occupant Protection, Impaired Driving, Police Traffic Services, Emergency Medical Services and Traffic Records. In 1989, Motorcycle Safety was added, and in 1991 Pedestrian and Bicycle Safety were added to make it seven Safety Priority Areas under NHTSA jurisdiction.

Objectives and Approach of the Highway Safety Assessment

The U.S. Congress and the Office of Management and Budget have expressed an interest in what the highway safety program has achieved and how Federal funds were used. In response the National Highway Traffic Safety Administration (NHTSA) undertook an assessment of the highway safety grant program.

The basic objective of the assessment is to provide Congress and the Administration with a clear understanding of what Federal safety grant programs have achieved. The achievements are based on a set of criteria that are expressed in terms of the following questions:

1. Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification processes?

2. Did initial Federal grants create new programs?

3. Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?

4. Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?

5 Were concepts and technology developed with Federal funds used to improve state program effectiveness?

6. What would be the consequences of removing Federal grants from the program?

7. Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?

The study covers the period from 1980, just before major changes in safety emphasis and funding began, to 1993, and in some areas through 1994. NHTSA reviewed the programs in 10 states, one in each of its regions. Reports for the 10 states, Washington, North Carolina, New Jersey, Ohio, Kansas, Pennsylvania, Connecticut, Nevada, Colorado and New Mexico are complete.

In 1993 the 10 states represented a population of 55.6 million, or 21.5 percent of the nation. Similarly, the number of drivers and registered vehicles in the 10 states are 22.6 percent and 23.8 percent, respectively of the nation's totals. These 10 states account for 23.7 percent of all NHTSA Federal highway safety grant funding and represent geographic, programmatic, and management variety.

In terms of traffic crash statistics, the average fatality rate was 3.1 per 100 million vehicle miles in 1980 and 1.6 per million vehicle miles in 1993. The national fatality rates were 3.3 and 1.8 per 100 million vehicle miles for 1980 and 1993, respectively.

In each state visits were made to municipalities, town and county agencies in selected areas of a state to obtain the information and data needed. Information was obtained from police

departments, trauma centers, ambulance services, and traffic safety organizations. A team of assessors spent two or three weeks conducting interviews at the selected sites in each state.

In addition, interviews with State level officials and representatives of safety related organizations were held in and around a State's capital over a two-week time period. Between 100 and 150 people were interviewed in each State. Prior to, and during, each interview copies of reports, studies, data sets and any other traffic safety relevant information were requested. A considerable amount of material was collected.

Safety Program Concepts, Planning, Operations, and Reporting

The Program Concept and the Paradigm for Assessment -- A Discussion

The basic premise of creating and conducting safety activities or programs is the belief that they will reduce the level of safety problems that were identified by an analysis of crash data. For example, when schools and PTA's sponsor alcohol-free graduation proms, it is believed that graduates will drive sober and avoid potentially deadly car crashes in which alcohol was a contributing factor.

The belief that programs will work is based on the results of field research where specific countermeasures were tested using an experimental design -- such as before and after measurements at both an experimental and a control site. The actual route that leads from a safety action, such as an alcohol-free party, to alcohol related crash reductions is often circuitous. No direct causal relationships can readily be assumed since many other factors can also contribute to traffic crashes and their outcomes.

Conducting alcohol/drug free graduation proms, distributing discount coupons to buy bicycle helmets, loaning infant car seats, providing radar units to police departments, and distributing public service announcements to the media, are activities that might intervene with at least one link along the deadly "causal chain" that leads to a traffic crash.

The targeted intervention -- the "program" -- often faces heavy odds. For example, what are the chances of apprehending most drinking drivers on a night where thousands of them are on the road? Apprehending drinking drivers, giving them breath tests, videotaping their booking, and processing them through the courts, is in the expectation that the offense will not be repeated. Publicity about the process may also deter others from impaired driving.

The first step in tracing the effects of a program -- to provide a measure of progress -- is an accounting of how many DWI stops, and arrests, were made. How many breath tests were given, how many refused, how many drivers were formally charged for DWI, and what were the dispositions? What has been the average BAC trend over the past 10 years?

Unless a planned and funded program's products -- DWI arrests, for example -- and subsequent

events in the enforcement and adjudication process, are documented (measured) there is no basis for even assuming that a "program" had a role in contributing to the prevention or mitigation of traffic crashes.

The assessment of programs to increase the use of safety belts, for example, involves estimating the number of the given (area) population that attended presentations, saw demonstrations, heard or saw information on the value of safety belts. All things being equal, the larger the coverage, the better. Observational surveys of belt usage are the main stays of assessing the contribution of safety belt use programs.

The point of this discussion is to describe the assessment process, and what it produces. It is far more than a listing of what safety grants funds were spent for -- radars, breath testers, salaries. It does not, and cannot, establish how many fewer fatalities and injuries were due directly to a speed enforcement program funded with safety grants. It will, however, describe and analyze what the program or activity produced such as time-based trends of speeding citations, speeds, citations per licensed driver and the cost per citation.

Whether a program continued beyond the grant period, whether similar programs were established elsewhere, and what, if any, use was made of grant funded technical assistance, such as the results of pilot tests with laser speed measuring devices, provides important additional information in assessing the highway safety programs.

The Problem Identification Process.

The ideal starting point for planning and developing safety programs is to assemble crash data into sufficiently detailed subsets so that the over representations of certain types of crashes or involvements can be isolated. Identifying an over representation of young driver aged 16 to 18 in alcohol related crashes highlights that particular problem.

The rate of severe and fatal injuries to riders in motorcycle involvements can be expected to outpace similar rates for vehicle occupants. The absence of a helmet use law would be a contributing factor as would the lack of body protection, besides the degree of riding experience and riding practice of the motorcyclist.

The identification of problems is, however, the first step in a logical planning process. It is followed by considering arrays of possible contributing factors. An understanding of these factors leads to the development of safety programs and activities such as mounting a drive get a helmet law on the books, creating rider education programs and starting public awareness projects. Each of these, as discussed previously, should be based on the experience of safety program demonstrations.

The ability to identify traffic crash problems relies on the ready availability of crash data that has been properly collected, edited, verified, and entered into a computerized data base that can interact with analytic systems such as SAS. The introduction of other data sets such as licensed drivers, registered vehicles, population, roadway characteristics, and vehicle miles driven, adds another dimension to problem identification analyses since it allows so called "exposure" rates to be calculated.

Program and activity data sets such as DWI arrests, traffic citations, license revocations, and breath test readings, represent additional information under the safety priority area Traffic Records and are covered later.

Highway Safety Plans

Every state has to submit a Highway Safety Plan (HSP) for each fiscal year. The HSP had to be approved by NHTSA in Washington until 1974 when this procedure was delegated to the NHTSA Regional Offices. The basic HSP included statistics and analyses to identify traffic safety problems. Programs in the previous Standard and current Safety Priority Areas were described in terms of what these could accomplish, how they were to be developed and implemented and the amount of safety grants that would be needed to launch and conduct the programs and projects.

A new procedure was introduced in the late 1980's that allowed a state to submit an HSP once every three years. Such HSP had to identify the proposed activities to address highway safety problems for each of three consecutive years.

Beginning in FY 1996, NHTSA initiated a new performance-based process for the management of the §402 State and Community Grant Program - this was consistent with efforts to relieve burdens on the states under the President's regulatory reform initiative. The change took place not long after the data collection phase for the highway safety assessment was completed in 1994. The new process requires states to develop Performance Plans that establish state traffic safety goals and performance measures, and to describe the processes used to (1) identify highway safety problems; (2) establish goals; and (3) select projects to be used to achieve the performance measures. Also, the state prepares a Highway Safety Plan which describes specific programs and projects to be funded. Annual Reports are still required; however, accountability is now at the goal level. The new process provides states with maximum flexibility to make program changes as they are needed. States agreed that, if progress toward meeting goals does not occur in a state, both state and Federal officials would cooperate to develop an improvement plan for the state. States are free at any time to request assistance or advice from the regional offices, which remain ready to devote available resources as needed.

Annual Reports

Annual Reports were required to be prepared by each state to document their actual expenditures each year against obligations, and to describe their program accomplishments. Program and

project status was to be reported, including those cases where a shift in grant funds was necessary, and cases where program start-ups were delayed or postponed for various reasons.

Operating a Highway Safety Project -- An Abbreviated Hypothetical Illustration

A Local Project to Deter Impaired Driving. After a rash of crashes in which several young people were seriously injured and where alcohol had been a factor, the local police department decided to do something about what appeared to be a persistent problem. The Community Relations Officer (CRO) had heard that there was a State Highway Safety Office (SHSO) that could support safety activities with Federal grants.

The CRO met with the Deputy Police Chief and was given the go ahead to make contact with the SHSO. The SHSO suggested that a project application and plan be prepared with an analysis of crash data showing that the municipality ranked among the highest in the State for alcohol related crashes involving young people.

A safety grant of $60,000 was requested for each of three years. Three officers would be on designated drinking and driving patrol for 20 hours of overtime every weekend. A public information campaign would be launched, using public service announcement to be broadcast by local radio and TV stations. Brochures, key rings and bumper stickers were part of the campaign directed to young drivers.

A Safety Advisory Committee was formed. It was made up of the local PTA president (Chair) and vice president, a parent of one of the seriously injured teenagers, a Police Lieutenant, a drug rehabilitation advisor and an emergency medical technician. A member of the local Restaurant Association and the vice president of a large automobile dealership also agreed to serve.

Most of the safety grant was for overtime salaries, but $3000 was for expenses in setting up alcohol free parties held once a month at both area high schools. The PTA agreed to fund all other costs associated with these parties. Local radio and TV stations agreed to run several announcement during prime time. The auto dealership also funded the purchase of a video system used in the arrest process. Contributions and in-kind services easily matched the safety grant.

The Safety Advisory Board continued to meet quarterly. Statistics on the number of DWI arrests, breath alcohol test results, the number of crashes, injuries and fatalities -- total and those that were alcohol related -- were collected.

DWI arrests had increased, but there was some frustration on the part of police officers who had to take time to appear in court. The State's DWI law allowed a first offender to "divert" to an alcohol school program whose successful completion avoided the offense from being placed on the offender's record.

While the State law had a provision for a driver's license suspension, it was not the automatic revocation that really drove the drunk driving message home. By the third year the SHSO began to ask if the municipality was going to continue the enforcement and public information campaign after the grant period. The information campaign would be continued provided materials were provided. The cost of overtime enforcement was contingent on budget approvals by the municipality's Board of Councilors.

The issue had not been resolved by the time the grant ended, but the Safety Advisory Committee appeared to be carrying on, although the vice president of the car dealership had been transferred to another location and the volunteer drug counselor had accepted a position with the State's Drug Abuse Division.

Meanwhile the SHSO had received 45 applications from other municipalities for funding similar projects. Five such grants had been made the previous year and another five localities would receive grants the coming year. Requirements were getting stiffer. A commitment to continue a project past the grant period was being considered by the SHSO, even if this was at a slightly reduced level. New applications also had to include "innovative" activities that would test different approaches.

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This imagined project is designed to emphasize what often counts most. It is clearly the management and coordination of planning and operational details that occupy time and effort. The example left out many aspects -- training, networking, enforcement operations, the day-to-day distribution of informational materials by volunteers, the coordination for public presentations, disbursement procedures, funds transfer, certifications, contracting, plan preparation and program evaluation.

Effective management is a primary requirement for the highway safety program if the aim is to improve traffic safety over the long run by identifying the specific problem, obtaining start-up grant funding, trying to bring about local resource contributions and gaining support for future self sufficiency.

PART I

SAFETY GRANT PROGRAM CONCEPTS, PLANNING AND MANAGEMENT

Grant Program Concepts

The use of safety grants for seed money to start new programs has been in place for 30 years. The enactment of the Highway Safety Act of 1966 set the mandate for the development of standards that would be the heart of state traffic safety programs.

What might be called the first phase of the federal traffic safety program began in early 1967 with the creation of 18 Highway Safety Standards. These covered a range of safety issues from impaired driving to emergency medical services. Fourteen standards and one half of a fifteenth standard were under the jurisdiction of the NHTSA. The fifteenth standard dealt with pedestrian safety and was split between the NHTSA and the FHWA. Programs and projects that conformed to the standards were eligible for grants.

A federal/state partnership was created. The federal government provided a research and demonstration capability that would benefit state and community programs. States were responsible for planning and implementing programs. The partnership was an interactive process -- the experience of the states serving as input to adjust the federal role.

Fifteen years later -- in 1982 -- a second phase emerged. Grant funding was sharply curtailed and the grant program was refocused. Under new regulations, five "priority safety areas" were established. The previous standards became "guidelines." The program had reached a level of maturity; the more serious problems and needs had become much clearer, thanks in part to improved data collection and analysis. Impaired driving and the protection of vehicle occupants were the leading issues. Law enforcement and emergency medical services were, and continue to be, the "on duty" tasks that are an integral part of traffic safety operations.

In the later 1980's and early 1990's two more safety priority areas were created, and by 1994 more safety priority areas were being considered. By the mid to late 1990's, fifteen years after the last strategic change in approach, another "plateau" of program maturity may be reached. New, longer term traffic safety problem patterns could emerge -- such as the growing number of aggressive, risk taking, drivers.

Traffic safety problems of the past do not necessarily serve as adequate predictors of future problems, but the way the problems are addressed by policy makers and management can have the most profound effect on any problem. Findings, issue discussions, conclusions and options for future consideration about the traffic safety priority areas are presented in Parts II and III. Findings about the management of traffic safety programs are described in the following paragraphs.

Traffic Safety Management and Organization Structure

Traffic safety program offices are organized within the transportation departments in five of the 10 states. Four of the states have public or highway safety departments in which the traffic safety program is located. In one state the traffic safety office is an independent commission.

The Governor's Highway Safety Representatives (GHSRs) are directly in charge of the traffic safety programs in seven of the states. In the other three states, the Governor's Highway Safety Representative is at or near a cabinet department level such as deputy secretary of transportation or director of the motor vehicle and public safety department. For these states, the day-to-day management of the state highway safety office is the responsibility of the GHSR's deputy.

In six of the 10 states, in 1993, the traffic safety program organizations were three levels below the Governor of a state. In the state that has a commission, the director reports to the Governor -- at least as shown on the organization chart. The safety program is two levels below the office of the Governor in three other states.

In two of the states, the safety program organization dropped from the second to the third level below the Governor between 1980 and 1993. Management of the safety program was actually raised, in 1987, from the third to the second level below the Governor in one of the 10 states. In the aggregate there has been a net, though only a slight, reduction in organization and management levels for traffic safety programs over the 14 years covered by this assessment.

The number of staff remained approximately the same in five of the 10 states between 1980 and 1993. In three of the states there were staff reductions, but two other state traffic safety organizations had a larger staff in 1993 compared to 1980. There were approximately 213 safety program employees in the 10 states in 1980 and 181 employees in 1993 -- a 17 percent reduction.

Neither the location of the traffic safety organization nor the rank of the Governor's Highway Safety Representative appeared to be related to how a program was managed. Access to the Governor, the Governor's interest in traffic safety, the relative strength of competing state agencies -- highway, enforcement, health and education agencies and their public and private representatives -- are the defining factors that influence the policies and budgets of traffic safety programs in a state.

The size of the state highway safety office depends to some degree on the state's population and land area. In two of the three larger states there were between 25 and 40 people in the traffic safety office. One of these states was densely populated. The third state's traffic safety program was managed by a small central staff of between 12 and 14 people who coordinated the safety program through more than a dozen regional organizations. The state also contracted with two private agencies to provide public information and education services, to coordinate the state's volunteers and to provide technical assistance.

Six of the other states managed their programs centrally, with staffs ranging from nine to 25 people. The remaining state operated with a small central staff and managed its impaired driving and occupant protection program through contracts with other organizations.

Problem Analysis, Planning and Administration

The 10 states followed the federal requirement for the preparation of Highway Safety Plans (HSPs). The planning process took various forms. All the states began to use an analytic process between 1979 and 1981 to identify the more severe traffic crash problems. Several of the states experienced delays in the entry of data into automated systems and/or did not possess an adequate data manipulation capability at that time. By 1985, all the 10 states were able to process crash data to a sufficient degree so that specific problems could be identified -- and used as bases for program planning.

The introduction of problem identification techniques began to change the way HSPs were developed. In the late 1970's and in the early 1980's many states relied on the experience of their safety program managers to select those applications thought to provide the best countermeasures to traffic safety problems and the issues addressed in the 14 ½ program "standard" areas. In one state, the traffic safety program manager simply directed the program managers which project applications to approve. At the time most states were concentrating their efforts and grant funding on police traffic services, emergency medical services, traffic records and impaired driving.

Another state safety agency was criticized by a state legislative committee for not having public and legislative representation as part of the safety program development process -- the state's safety office review committee being made up mainly of representatives from grant recipients.

The reduction in safety grant funding in 1982 -- to one half or less of previous years -- and the concurrent regulation establishing the five (NHTSA) safety priority areas had a major effect on the planning effort. One of the states added staff specialists (in impaired driving and occupant protection) in the state safety office that could develop and oversee new programs, while the pass-through of grants to state and other agencies was drastically reduced.

Another state contracted out the management and operations of the impaired driving and occupant protection program, while retaining direct control of the other safety priority areas to retain the ability and flexibility to shift funds quickly. The safety office in that state was, as a matter of state policy, kept small so that the largest portion of grants would go to the programs.

The larger states began to explore the possibility of regional management structures. One of the states developed this approach successfully using the Comprehensive Traffic Safety Program (CTSP) concept as the management entity. In the seven states that created CTSPs, the transformation of single safety area programs such as impaired driving reduction into CTSPs --

and Corridor Programs -- helped breach municipal boundaries by the need for enforcement and other entities to interact, producing a desirable synergistic effect.

By the mid 1980's most of the states had established an HSP development process that began with analyses of crash data to define an array of key traffic crash problems. One of the states had created a research and evaluation center at a state university. The center was responsible for obtaining and analyzing crash data provide by the state's motor vehicle department. The problems identified through analysis by the center served as the basis for planning the allocation of highway safety funds to problem areas. The state traffic safety office invited localities and organizations throughout the state to submit project applications that addressed the problem areas, and the selected projects were then integrated into the HSP.

The other states have taken similar steps to solicit project proposals that addressed identified problems. One of the states established a technical advisory committee made up of major state and traffic related agency representatives. The committee acted like a legislative body, helping shape and coordinate the safety program, and to review the HSP.

In the latter 1980's and early 1990's with the development of personal computers, the analysis of crash and related data has become more sophisticated. It is now possible, for example, to identify specific locations where crash problems occur -- where safety belts are not used, and where there is an over representation of crashes involving 18-year old impaired drivers, for example. A greater flexibility for developing HSPs is available with the encouragement of the NHTSA. Less specific, and three-year, planning was instituted to allow states to shape their own programs within the safety priority areas.

According to safety officials in most of the states, the concentration on five safety priority areas has resulted in more efficient management, planning and operations. The trend toward centralization and regional organization has also helped establish the public information and education supporting functions within an economy of scale, by concentrating development and procurement in one place -- usually under contract.

The cost of administering the safety program at the state level is a function of the organizational structure and size of the traffic safety office. The Planning and Administration (P&A)funding category now consists of a match between federal and state support. One of the states had in the early 1980's refused to use the federal P&A allotment on the grounds that all federal funds should go to active programs. A far more common practice is the allocation of a portion of program funding for program management. For example, the P&A grant in one of the states was approximately $110,000 a year. Additional grant program funds of up to $200,000 were allocated for program management.

The state that hired specialists after the 1982 grant budget cuts and new safety priority area regulations, used program funds to support the management of new programs that emphasized impaired driving and occupant protection. Another state spent $1.2 million in 1993 for traffic

safety program management. This was approximately one-quarter of the state's total safety grant funding. Centralizing the management of safety programs at the state level, while contributing to program planning and operational efficiency, does shift the cost of management.

Program Evaluation and Reporting

One of the assessment criteria deals with the extent of program evaluation, monitoring or assessing. The Table in Part II provides answers to the question of how many of the 171 programs in the 10 states, were evaluated, reviewed or assessed. The response was "Yes" for only 18 percent of the 171 programs. Another 24 percent of the programs were considered to have been "Partially" evaluated, and for the remaining 58 percent of the safety programs no evidence of evaluative reviews were found.

A relatively broad definition of evaluation was used in the assessment. Any analysis that attempted to compare results with planned objectives, any determination of intermediate effects (i.e. belt use) and, of course, impact evaluations were included. Annual Reports, when prepared and available, were used to extract operational data and results. A number of states did indeed develop and prepare very useful annual program reports.

Discussion of Key Issues

There are a number of issues that reflect the grant program as a whole -- its purpose, content, management, and evaluation or assessment. Several issues are discussed, as follows.

1. <u>What has been the practical effect of the traffic safety planning process?</u>

   The planning process helped the states focus grant funds on specific projects that address safety problems in the priority areas. Without this formal process, which was a requirement before states could be assured of receiving grant funds in the early years, states could either more easily plan to do projects outside the priority areas, or more likely they would not do adequate planning at all.

   The development, preparation and approval processes of Highway Safety Plans (HSPs) has changed several times since 1967. There have been simplifications, less detail, Regional, rather than NHTSA headquarters approval, an option to develop three-year HSPs, and the inclusion and use of statistical tabulations and analyses to highlight specific traffic safety problems.

   Preparing the HSPs took a considerable amount of time. The appearance of a program or project in the plan did not, however, guarantee that an activity was actually going to be started. This was due to a number of reasons -- a slow contracting process, a delay in getting state or local agencies to complete their detailed action plans, changes in priorities due to emerging new or growing problems and changes that had to be made when the new

fiscal year actually arrived -- a year to 18 months after the plans had been completed. Slow or delayed starts created grant fund carryovers.

The HSP development process did mature over the years, particularly as the problem analysis process was integrated and used to guide program selection. State safety program offices began to involve the state and local traffic safety community in HSP development and review. This tended to increase cooperation and facilitate achievements. The project selection process, particularly in the enforcement area, has been very competitive, and may have discouraged applications for grant support.

The size and content of the HSPs had grown considerably by the mid 1980's. NHTSA's policy to allow less detail created a tendency to produce simplified budget documents rather than plans, with pro forma objective statements. Review of the sequential content of a state's HSPs from 1980, year by year through 1993 or 1994 during this assessment often revealed identical descriptive "planning" material that was not even updated to reflect the new fiscal year planning base.

A key problem has been the timing of an HSP. While serving as action guides for programs, the HSP has to be completed and approved long before project results from previous years' programs are available and analyzed. There was no clear indication of feedback.

2. Are safety priority areas a viable structure for conducting the safety programs?

The development of safety priority areas in 1982 was a step in the right direction. It forced states to focus on the two key traffic safety problems -- impaired driving and very low safety belt use. To successfully address these two areas, crash data had to be analyzed to allow specific problems to be identified and designation of "traffic records" as a priority made a great deal of sense. Enforcement and emergency medical services, though functionally different from each other, became the operational tasks to prevent crashes and curb offenders, and to reduce the mortality and morbidity of crash victims, respectively.

Enforcement and emergency medical services are, however, fundamentally different from the public information and education, or promotional tasks that make up impaired driving, occupant protection, motorcycle safety, and pedestrian and bicycle safety. The latter group does not have an organization, other than the state or regional safety offices, that is responsible for operations and funding. Comprehensive traffic safety programs as permanent structures were found in only one of the 10 states during the 1980's. The CTSPs encompassed all the promotional safety programs, but had little if any operational control of enforcement or emergency medical service.

The designating of safety priority areas, and adding more such areas to the roster, may negate the "priority" concept. Moreover, by separately designating police traffic services

as a priority area, its primary functional task of interaction against the identified problems -- impaired driving, violation of safety belt use laws, speeding, and more recently the emerging threat of "aggressive" driving -- is somewhat obscured. In other words, a priority area should be identified by its safety objective -- reduce impaired driving -- and then be defined in terms of the action support -- information, education, enforcement, adjudication, and similar activities. This approach would be more suitable for prioritization, curb unnecessary proliferation, and allow for better planning -- and evaluation.

3. What is the role of Annual Reports?

Annual Reports were initially designed to document actual program accomplishments and costs. Many of the states made serious efforts to compile comprehensive material and put it into a form that was useful to planners. The Annual Reports began to contain less information in the last several years, and some of the states could not find or did not keep copies for a number of the years covered by this assessment.

By the time an Annual Report was issued, say for Year 1, two subsequent Highway Safety Plans for the Years 2 and 3 had been completed. This timing lag reduced the impact value for planning. This is not an uncommon phenomenon as all post mortem reviews require time to at least cover a program's activity period, plus an analysis of the activity itself. This fact does not reduce the usefulness of reviews and reports. Far more important is the content of the report -- the descriptive and quantitative findings and results. The states that had maintained a substantive level of information in their Annual Reports, despite the time and effort this required, surely benefitted in the long run.

The concept of a safety program report is valid, but the format and means to make this a viable process need to be addressed so that the content of such a report could serve as both an accounting and an assessment that can stand by itself and become a more timely input to traffic safety program planning.

4. What is the proper balance for safety grant support between positions and equipment?

A substantial portion of safety grants support positions, overtime hours and program management. With an estimate of 40 Full Time Equivalent (FTE) positions for the average state, at an annual cost of $50,000 per FTE, the total personnel cost, including support, would be $1.8 million. The average annual grant was approximately $3.4 million in 1993. That would leave $1.6 million for equipment and materials, including vehicles.

While choices between the acquisition of equipment such as breath testing devices and the support for instructors to train breath test operators did not appear to be in conflict, there are obvious funding decisions that have to be made. The way HSPs were written, equipment, PI&E material, and vehicle procurement were always separate project and line items. The same was true for positions and training.

If funding needs do compete between position support and equipment acquisition, it may be appropriate to develop policies on an equitable distribution of safety grant funding.

Conclusions

1. State safety program administrators have energetically planned and managed the grant programs and have adapted to major changes in federal policies. The organizational location, the management structure -- centralized or delegated -- did not affect the performance of the safety program director or staff. The motivation for achievement was high in all the states.

   The attitude of the Governor toward traffic safety issues, and the relative power of other safety related state agencies are critical factors in maintaining the support of traffic safety programs.

2. Replacing the "shotgun" approach to safety problem definition, created with the 14 ½ standards in 1966, with the initial five safety priority areas in 1982, provided a needed focus to address safety problems at that time. The safety priority areas are, however, not equal in function -- impaired driving and occupant protection are broad problem directed areas, while enforcement, for example, is a specific countermeasure. Proliferation of safety priority areas could dissipate the safety effort.

3. Highway Safety Plans have been comprehensive, often containing considerable statistical and programmatic detail. By the early 1990's the HSPs had become too general and often contained the same material from year to year. Sometimes only the name of a proposed program changed to distinguish it from the same activities that had completed their three-year (or six-year) funding limitation.

4. Although the advent of computerization and process simplification have yielded many benefits, the long held practice of producing plans, budgets, reports and data sets each and every year has become too burdensome for the highway safety grant program. Simplifying the HSP requirements was an appropriate action, but the results, such as the format of the three-year HSPs sacrifice information and data (substance) for form. A better way must be found.

5. Incentive programs have had a good record. Many laws designed to combat impaired driving were passed and several advanced safety practices have been adopted -- and continued. Nine of the 10 states became eligible for the alcohol incentive grant (§408). All 10 states qualified for the incentive grants under §410, and seven of the states received both types of incentive grants. Reports on the programs funded with incentive grants were usually not available.

6. The pressure for the state safety offices to bring projects under contract each year can result in programs that will not meet the "seed money," "leverage," or "catalytic effect"

criteria used in this assessment. State contracting procedures have also been lengthy and complex, making it difficult to start some of the programs in the target fiscal year.

7. The three-year grant limitation is impractical for many programs because of the time span in bringing programs to full operating status and the time it takes for a program to show an effect.

8. The technical assistance program under §403 has supported the development of many new devices and methods that have enhanced the safety programs. It was not clear how the projects were selected, what criteria were used and how the many studies contracted for evaluating such projects fed their results into the technical assistance planning process. It appears that the technical assistance program follows a separate path from the other grants. There were cases where the state's safety office director was unaware of a major technical assistance grant to an organization in the state.

9. Not surprisingly, impact evaluations are rare -- and probably not feasible for the typical program. Assessments (for EMS, Traffic Records, Impaired Driving) are appropriate and useful, but tend to overlook the impediments states have to confront in modernizing and strengthening their programs. The recommendations tend to be too general and often unrealistic in terms of how long they may take to implement given historical experience.

The Characteristics of an Effective State Highway Safety Program

The two most important functions for managers of traffic safety programs are planning and evaluation. Both are used here in a broad sense, particularly the term "evaluation" because it can encompass anything from general reviews of projects that enumerate what was acquired, through, for example, tabulations of the number of citations that were issued by enforcement agencies, to studies that are designed to establish the "bottom line" impact of a program.

Planning includes the analysis of data to identify problems, the development of programs, how these may be undertaken, what resources are required and from where these resources are going to be obtained. Feedback from evaluation results are a key ingredient of the planning function. Above all, planning involves the setting of objectives based on known problems and needs.

The number of staff, and the level at which the safety program office is located within the state government structure are not as important as the establishment of communication networks with other state level agencies that have roles in traffic safety. At the same time, networks that include county, municipal, and private organizations are essential. Advisory bodies involving representatives from these organizations will draw support for safety programs. The limitation of grant funds must always be clearly defined so that potential recipients will not become disillusioned when their proposals do not make the cut.

In the longer term it is more important to take the time to clearly define the problems for which programs or projects are devised, even if this procedure results in delays of program starts.

Reviews that question why the same program has run for several years without any apparent effect, or without a clear objective will do considerably more harm to the overall safety program than efforts that were directed at a specific problem, but failed to affect the problem.

To the degree possible, programs should phase into operating modes that include state, local or private financial contributions in additions to safety grants. Participation and subsequent self sufficiency are the best sign of the institutionalization of a traffic safety program. The move by safety officials, and representatives of groups that are concerned about traffic safety, to encourage the enactment of legislation that establishes a surcharge and/or fee structure to fund specific safety programs is an important characteristic of any highway safety program.

To function effectively traffic safety personnel need to be trained in several areas. The various techniques for undertaking promotional efforts to reach the public and to raise awareness of the effects of impaired driving, and to the benefits of using restraints have to be well known by those that plan and manage such programs. While consultants and contractors are often used to develop and implement promotional programs, traffic safety managers and staff should be very familiar with the techniques because these are the central and critical means for conducting awareness efforts.

The usefulness of crash and other data has been highlighted before. Understanding how data are collected, edited, entered and analyzed is another important aspect of safety programs. Using data to show progress or an intermediate effect, as is done in Parts II and III of this assessment, provides the manager, legislator, and program staff with substantive information that can be used to show trends and to justify continued support or conversely to supply a basis for discontinuing a program. This is, in part, the evaluative function which will contribute to the integrity of safety programs.

SAFETY PROGRAM COSTS AND FUNDING

Traffic Safety Program Costs and Federal Funding

In 1980, the total spending for traffic safety in the 10 states was more than $935 million. Federal grants under §§ 402, 408, and 410 contributed only 4.4 percent of their total traffic safety program costs. By 1993, the proportion of Federal funding had dropped to 1.3 percent of the more than $2.3 billion that it costs the 10 states to conduct traffic safety related programs.

Table PM-1 below shows the total costs and Federal (NHTSA) safety grant portions for the 10 states.

Table PM-1
Total Costs and Grants for Highway Safety Programs in 10 States

Year	Total Costs ($1,000)	State/Local Government & Private Spending ($1,000)	Federal (NHTSA) Grants ($1,000)	Federal (NHTSA) Share -- Percent--
1980	$ 935,483	$ 894,071	$41,412	4.4%
1993	2,320,210	2,290,598	29,612	1.3%

Federal grants have played a declining role, both in amount and in proportion to total costs.

The average cost for traffic safety in 1993 was $42 a year per person in the 10 states. Federal grants -- generated through automotive fuel taxes -- defrayed $0.54 of the cost for each person. In 1980 the average cost for traffic safety was $19 per person. The cost in 1980 brought to 1993 dollars is $33 per person.

The cost of Federal technical assistance and demonstration grants under §403 of the Highway Safety Act is not included in the grant totals listed above. Over the years covered by this assessment, such technical assistance to the states has been intermittent and varied according to the type of project. However, §403 funds research and development that provides a for technical assistance to all states' traffic safety programs.

When the traffic safety costs and Federal grant contributions are broken down by safety priority area a somewhat different picture emerges. The primary safety problem directed programs -- impaired driving reduction, and occupant, rider and pedestrian safety protection -- have cost far less than enforcement, emergency medical services and traffic records, but include a much higher proportion of safety grant funding support.

Table PM-2 displays the total costs, Federal grants and the percentage of Federal funding for the safety priority areas in 1980 and in 1993.

Table PM-2
Total Costs and Grants for Safety Priority Areas

Safety Priority Area	1980			1993		
	Total Cost ($1,000)	Safety Grants		Total Cost ($1,000)	Safety Grants	
		($1,000)	Percent		($1,000)	Percent
Impaired Driving	$ 17,355	$ 3,244	18.7%	$ 68,561	$ 8,106	11.8%
Occupant Protection	1,724	1,064	61.7%	8,334	5,519	66.2%
Police Traffic Services	657,793	24,933	3.8%	1,614,132	11,589	0.7%
Traffic Records	90,459	4,675	5.2%	161,580	2,288	1.4%
Emerg. Medical Serv	165,475	5,666	3.4%	460,683	801	0.2%
Motorcycle Safety	1,018	750	73.7%	4,667	359	7.7%
Ped./Bicycle Safety	1,659	1,080	65.1%	2,253	950	42.2%
TOTAL	935,483	41,412	4.4%	2,320,210	29,612	1.3%

As can be seen, Occupant Protection -- promoting the use of safety belts and child restraints -- is a relatively low cost program, but includes a substantial amount of Federal safety grant funding. The same is true of Pedestrian and Bicycle Safety programs.

The cost and safety grant portion of Impaired Driving programs as shown in the above Table may be misleading, because DWI offender programs are included and they account for more than 70 percent of the total cost. The DWI offender programs were completely self sufficient in most states by the late 1980's and thus did not draw safety grant funds. The public information and education programs to reduce impaired driving were supported with substantial safety grants, that in several states exceeded 70 percent of total program costs.

Motorcycle safety is another area that saw major reductions in grant funding between 1980 and 1993. Legislation in the states to create rider training funds with surcharges on licensing fees led to self sufficient programs.

Enforcement and emergency medical services, as these relate to traffic safety are large and costly

operations for which major safety grant reductions took place in 1982 when Federal safety grant budgets were cut by more than 50 percent. State and local government support made up for the cuts to some degree, but there has been a drop of approximately 10 percent in enforcement resources for traffic safety between 1980 and 1993. Emergency medical services have become more reliant on fees, state and local budgets, donations and endowments (for trauma centers).

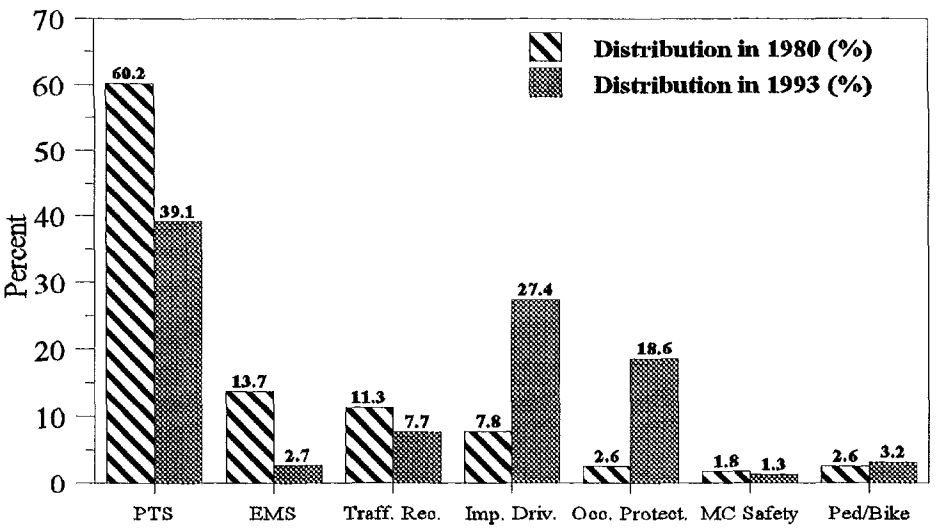
The cost and safety grants for Comprehensive Traffic Safety Programs (CTSPs) are distributed among Impaired Driving and Occupant Protection since these two safety areas made up the bulk of CTSPs. Also seven of the 10 states had launched CTSPs in the mid to late 1980's.

The Distribution of Federal Safety Grants Among Safety Priority Areas

As mentioned previously, the Federal safety grant reductions in 1982 and the creation of safety priority areas by regulation, changed the emphasis of the overall traffic safety program. The shift in safety grant funding between 1980 and 1993 for each of the safety priority areas is shown in Figure PM-1 below.

Figure PM-1

Distribution of Safety Grants



The shift from Police Traffic Services (PTS), Emergency Medical Services (EMS) to programs dealing with Impaired Driving and Occupant Protection is readily apparent in the above chart.

Conclusions

The safety priority areas are discussed in detail -- in terms of the assessment criteria -- in Part III. The following conclusions summarize several overall aspects of safety program costs and their safety grant support.

1. The primary safety problem areas -- occupant protection, impaired driving, and pedestrian and bicycle safety -- have received increasing attention since 1980. They will likely continue to require safety grant support. Approximately 50 percent of available safety grants have supported these programs in the early 1990's.

2. Self sufficiency for motorcycle safety programs, DWI offender programs (that are included in the Impaired Driving safety priority area) and parts of emergency medical services programs -- specifically emergency technician training -- have been achieved by the states. This trend has freed grant resources for the primary safety problem areas.

Part II

Summary of Assessment Findings

Introduction.

A principal task of the Highway Safety Assessment was to review each individual state program in the safety priority areas and to understand how the various types of grants (§402, 403, 408, 410, and 153) were used -- and their impact on state and local safety activities. A total of 171 programs were identified within the safety priority areas in the ten states included in this a Final Highway Safety Assessment Report.

The 171 programs that constitute the NHTSA related highway safety programs are divided into eight safety program areas. Seven of these are Safety Priority Program Areas: Traffic Records, Impaired Driving, Occupant Protection, Motorcycle Safety, Pedestrian and Bicycle Safety and Emergency Medical Services.

The eighth program area, Comprehensive or Community Traffic Safety Programs, became the means of conducting the activities of several of the basic safety priority programs under a single coordinating entity. This approach, usually begun with an existing impaired driving or occupant protection program, became a practice in many of the states with the encouragement of NHTSA in the mid to late 1980's.

In the ten states there were 20 traffic records programs that included the development and implementation of computerized data systems -- a critical need for traffic safety problem identification and analysis. Efforts to reduce drinking and drugged driving were represented by 35 programs. These programs covered activities such as public information and awareness education for the general public, and with a special emphasis on youthful drivers. The treatment and rehabilitation of convicted impaired drivers was also included among the programs.

Twenty-seven programs in the ten states were devoted to occupant protection: child and infant safety and the use of safety belts. Child safety projects included safety seat loaner programs and demonstrations on the proper installation of safety seats for children. Safety belt use projects included public information and education, and the enforcement of belt laws.

The eleven motorcycle safety programs in the ten states focused on rider education. More recent efforts included increased public information and education, and helmet law implementation in those states that had rescinded such laws in the 1970's.

There were also nine programs in the eight states that featured activities aimed at reducing pedestrian and bicycle injuries and fatalities. Bicycle rodeos, proper bicycle handling, the need

for helmets, special helmet purchase programs, and safe walking practice projects were part of the programs for children. Seniors were the target for many of the pedestrian safety projects.

The enforcement of traffic laws involved a major portion of the traffic safety effort with 37 programs in the ten states. The prevention of impaired driving and the enforcement of the 55 mph National Maximum Speed Limit were the primary programs conducted by the states under the police traffic services safety priority. Breath testing, selective traffic enforcement, extensive police officer training and crash investigation rounded out the many programs.

There were 21 emergency medical services programs that covered pre-hospital basic life, and advanced life, support and trauma care. The programs ranged from training of emergency medical technicians to trauma registry development. The remaining nine programs were Comprehensive Traffic Safety Programs (CTSPs), that included impaired driving, occupant protection, and motorcycle, pedestrian and bicycle safety activities. They were established in seven of the ten states.

Overall Capabilities and Achievements

Impaired Driving. Beginning in the early 1980's tougher impaired driving laws were enacted in most states. To explain the laws and to raise public awareness about the drinking and driving problem, campaigns were launched and sustained over the ensuing years. Projects such as "Slow On the Bottle, Enjoy The Road" (SOBER), "Report Every Drunk Driver Immediately" (REDDI), and slogans such as "Friends Don't Let Friends Drive Drunk" became rallying efforts.

A large number of impaired driving reduction programs were established in the 1980's. There was Project Graduation, often begun with safety grant support and subsequently funded by PTA's and businesses. Students Against Drinking and Driving (SADD) chapters were created, and organizations such as Mothers Against Drunk Driving (MADD) and Remove Intoxicated Drivers (RID) facilitated the establishment and continuation of the youth directed programs.

Impaired driving information -- brochures, pamphlets, and related materials -- was widely distributed. In the early 1990's more than 4.9 million informational items were distributed each year -- 984 items for every 10,000 people in the eight states. In the early 1980's the distribution was at the rate of 345 items for every 10,000 people -- a total of 1.6 million informational pieces every year. More than three time as many people were reached in the early 1990's compared to the 1980's. These awareness efforts cost 20 cents per person, or 25 cents for every licensed driver in 1993 in the eight states.

Impaired driving reduction incentive grants enacted by Federal legislation were successful. The states participating in this assessment became eligible under at least one of the two incentive grant programs (§408 and §410) at some point during the 1980's and early 1990's. In 1980, safety grants represented 21.6 percent of the total costs of the impaired driving reduction programs. In

1993 safety grants amounted to 11.8 percent of all program costs. A substantial amount of the costs (more than 70 percent) reflect the DWI offender evaluation and treatment programs. The safety grant portion for impaired driving reduction public information and education programs is, on the average, more than 70 percent of the program's total costs.

By the end of the 1980's, all the ten states had programs that included DWI offender evaluations, minimum sentences, and a license suspension process. There also were fee structures, or fines that were used to achieve self sufficiency. In 1992, on the basis of data from four states, more than 70,000 DWI offenders, or 70 percent of those arrested, attended impaired driving schools. In 1983, approximately 48,000 attended the schools, representing 53 percent of those arrested for DWI.

Occupant Protection. Since the mid 1980's programs to raise the use of safety belts have provided the highest safety benefits at one of the lowest costs for any safety program. Most of the costs are supported by safety grants. The estimated safety belt use rate in 1980 was an aggregate of approximately 12 percent in the ten states. Belt use laws raised this rate considerably -- to more than 47 percent in 1990. There were subsequent declines in the use rate in some of the following years, but by 1993 the rate had increased to more than 65 percent.

Safety belt use programs are relatively inexpensive. In 1993, the per capita cost was 13 cents and the cost per licensed driver was 19 cents a year. Approximately 2.3 million safety belt brochures were distributed in 1993, up from 2 million in 1981. In 1993 approximately 80 brochures were distributed for every 1,000 people. In 1981, the distribution rate for literature was less than 11 items for every 1,000 people.

More than 66 percent of the costs of safety belt use programs continued to be funded with safety grants in 1993. States were successful, however, in getting corporations involved in providing safety belt use incentive programs for their employees. Volunteers also played active roles in distributing promotional materials and making safety belt use presentations.

By 1985, all the ten states had enacted mandatory child protection laws. Child safety seat loaner programs had been established throughout the states. Data from four states show that there were more than 300 such programs in 1984, and these increased by 60 percent to more than 500 programs in 1993 when some 39,000 seats were in the loaner program. There was a trend toward self sufficiency in the loaner program. Five of the ten states were close to complete self sufficiency, three used matching grants. Four still depended on almost full grant funding for the program.

Comprehensive Traffic Safety Programs. Seven of the ten states covered in this report created comprehensive or community traffic safety programs (CTSPs) in the mid to late 1980's. More 20 percent of an average state's safety grants were allocated to CTSPs. In one of the states the CTSPs covered the entire state. In others the coverage involved several counties or

municipalities. By combining the various safety program areas, economies of scale were achieved by, for example, making it possible for one source to supply technical assistance, support and materials to many, or all parts, of the state.

The most important capability was the ability to address regional safety problems, to reach more citizens, and to gain resource support from local governments, communities and the private sector. The integration of programs also allowed better planning of projects to address key problems and to make better budgetary decisions about the level of program support. The number of CTSPs in the five states grew from two in 1987 to 83 in 1993.

Volunteers and in-kind participation by states, communities, and private entities were available to the CTSP management, although only a few of the programs were able to gain partial funding support from their states. The cost of the typical CTSP was estimated at approximately 23 cents per person in 1993.

Police Traffic Services. The number of sworn police officers in the ten states rose from 97,736 in 1980 to 116,654 in 1993 -- a 19 percent increase. Based on data from 134 enforcement agencies in the ten states, approximately 21 percent of officer's hours are spent in traffic related activities. Urban police departments reported that they get more calls than they can handle. Crime, particularly drug-related, has priority. General patrol of city streets with an emphasis on traffic violations has declined. Estimates of time for traffic activities were between five and ten percent in urban areas, and up to 30 percent in rural areas. The State Police and Highway Patrols reported spending between 50 and 80 percent of their activities on traffic enforcement.

The Full Time Equivalent (FTE) number of sworn officers in traffic service per 1,000 licensed drivers declined from 0.60 in 1980 to 0.56 in 1993. Despite these reductions, the officers made 317,000 DWI and 1.6 million speeding arrests in 1993, against 238,000 DWI and 1.4 million speeding arrests in 1980. To field a police officer in 1993, including administrative support, equipment, vehicles, training, salary, and fringe benefits, cost an average of $68,200. In 1980 the amount was $32,900.

The average Blood Alcohol Concentration (BAC) of arrested drivers, based on several states, dropped from 0.185 in 1980 to 0.166 in 1993. This could be due to a number of factors. More aggressive enforcement of stricter DWI laws may be reaching a larger population of drinking drivers, besides those that test out at very high BAC's. Publicity about DWI enforcement may also have a deterrent effect. The breath testing programs, based on data from five states, show continued growth. In 1982 there were 115,000 such tests and in 1993 there were 143,000 breath tests given. The number of tests as a proportion of DWI arrests also increased from 78 percent in 1982 to 84 percent in 1993.

The effort to curb speeding has encountered difficulties. Data from eight states show that the average (weighted) percentage of motorists exceeding the 55 mile per hour National Maximum Speed Limit (NMSL) was 44.2 percent in 1980. It rose to 44.7 percent in 1986 and was 47.6 percent in 1992. These percentages include all the adjustments allowed under the law. The

number of speeding citations per 1,000 licensed drivers increased from 47 in 1980 to 52 in 1986. By 1992 the rate had declined to 43 citations per 1,000 licensed drivers as the special set aside grants were being phased out.

In 1993 enforcement agencies issued a traffic violation citation to one of every 10 licensed drivers. In 1980 one citation was issued for every nine licensed drivers. This decline of approximately 10 percent has to be viewed against the ever tighter budgets and the diversion of sworn officers to crime enforcement and prevention over the past 15 years.

Substantial improvements were made to the training of police officers in the field of crash investigation with courses funded with safety grants. In the early 1990's between 200 and 600 police officers, depending on the size of the force in a state, were trained each year at various levels of crash investigation. This was more than double the number trained in the early 1980's.

Safety grants made up only a very small part of traffic related enforcement costs -- 3.8 percent in 1980 and less than 1 percent in 1993. Total enforcement costs were estimated at $1.61 billion for the ten states in 1993. This amounted to $512 per traffic citation, or $29 per capita, each year. In 1980, the values were $214 per citation and $13 per citizen, with a total traffic related enforcement cost of $658 million.

Safety grants were instrumental in the acquisition of modern breath testing devices and radar speed detection units. The grants also were a key resource for police officer overtime for special DWI, speed and other traffic violation enforcement -- as a deterrent and for the apprehension of offenders.

Traffic Records. By 1986 all the ten states were able to produce detailed crash statistics on an annual basis. These and other data were sufficient to carry out extensive problem identification analysis. Beyond crash data, annual compilations of impaired driving, speeding arrests and citations for violating occupant protection and child restraint laws, were also being recorded. New traffic court case systems are providing data on dispositions and fines. Automated driver licensing systems are supplying data on suspensions and revocations.

There were 70 computerized data systems in the ten states in 1993, compared to 42 in 1980. The safety grant portion of all traffic records system costs in the ten states was 1.4 percent in 1993 -- down from 5.2 percent in 1980. This shows an increasing trend toward self sufficiency.

Emergency Medical Services. By 1993 there were approximately 4,000 ambulance services in the ten states covered in this report. They handled 4.0 million calls. Included were 550,000 calls in response to motor vehicle crashes that involved approximately 800,000 injuries. The average cost per call was $90 in 1993 -- based on both paid and volunteer services in the states.

There have been substantial improvements in both the extent and quality of pre-hospital care for crash victims. In 1980 there were approximately 95,000 emergency medical technicians (EMTs) of all types. There were an estimated 171,000 in 1993, giving a coverage of 254 EMTs per 1,000 injured crash victims. The coverage in 1980 was 166 EMTs per 1,000 injured crash

victims. Pre-hospital services cost approximately $6.50 per person in 1993.

Most states enacted new or revised EMS legislation to establish medical direction, regulations and practices. In two of the ten states, a dedicated EMS fund was established that was supported by surcharges on moving violations. By the early 1990's, five of the ten states supported their EMT training without safety grants. Safety grants for all EMS programs amounted to 0.20 percent of all EMS costs in 1993, down from 3.4 percent in 1980.

The level of EMT services was continually upgraded and there were approximately 21,300 paramedics in the ten states in 1993, up from 3,200 in 1980. The number of trauma centers that were accredited, designated, verified or otherwise identified as meeting the American College of

Surgeons standards grew from 29 in 1980 to 94 in 1993. They represented the designated Levels I, II and III. With an estimated 109,000 identified traffic trauma cases admitted to trauma centers in 1993, coverage reached one paramedic for every five trauma cases.

Safety grant "seed money" helped provide leverage for state funds to improve the EMS delivery systems in the early 1970's and 1980's. By the 1990's most of the pre-hospital care programs and services were self sufficient or funded by fees, taxes and private contributions. The advanced life saving and trauma care systems are essentially self sufficient in most states, being funded by fees, taxes, gifts and endowments. Safety grants were used in the 1980's for paramedic training, and in the early 1990's for EMS planning and advisory services.

Motorcycle Safety. Grants helped create most of the rider education programs in the 1970's and early 1980's. The states enacted legislation to establish rider education funds supported by license or registration fees and leading to self sufficiency for all but one of the states. A mandatory helmet use law was reinstated in one of the states. In 1982, 22 states had helmet use laws, 22 states had helmet laws for riders under a specified age (usually 18), and eight had no helmet law. By 1992 this had changed as a result of §153 of the Highway Safety Act. There were 26 states with helmet laws, 23 with laws for riders under a specified age, and only three states with no helmet law.

There were 24,400 rider education graduates in 1993, or 482 graduates for every 1,000 new motorcycle registrations. This was up from 8,311 graduates and 64 graduates for every 1,000 new motorcycle registrations in 1984. New motorcycle registration have declined from 129,663 in 1984 to 50,692 in 1993. Almost one-half of all new registrants appear to be taking the rider education courses. In 1993 rider education cost an average of $191 per graduate.

Motorcycle fatality trends for the ten states in this report have been declining since 1980. One major factor has been the aging of the population, reflected in the reduction in new motorcycle registrations.

Pedestrian and Bicycle Safety. Elementary school education programs including pedestrian and bicycle safety have been institutionalized in the states. New approaches begun with safety grants in the late 1970's and early 1980's were curtailed after reductions in the safety grant

program in 1982. Communities, however, continued to support bicycle rodeos, and many program shifted to comprehensive traffic safety programs in the latter 1980's.

The reemphasis on pedestrian and bicycle safety in the early 1990's focused on bicycle helmet use, and laws to make such use mandatory. This has already been a successful program. Smaller scale pedestrian safety programs directed at senior citizens were just beginning again in the early 1990's.

A Synopsis of Findings in Relation to the Assessment Questions

Assessment questions and answers about the highway safety program, and findings for the ten states are summarized in Table SP-1 on the next page, and in the following discussion, that includes examples of relevant safety projects in the individual states.

Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?

All the 171 programs reviewed in this assessment were focused on major safety problems, either established as a national priorities or as a priorities based on a states' own safety problem identification process.

A fundamental step, in line with the Transportation Research Board's publication Comprehensive Computerized Safety Record Systems in 1985, was taken by many states when they began to review and upgrade their data collection and processing systems and to improve their analytic capability for problem identification.

New data systems were also developed to meet requirements of state laws such as mandated automatic license suspension or revocation. As a first step, states established linkages between crash files and roadway files. The state traffic safety offices began to be able to access crash data for problem analysis and to publish the crash statistics. Other new developments, such as court case automation, systems that compiled impaired driving arrest data and blood alcohol concentration readings from breath tests, were created to better track the trend of impaired driving enforcement and adjudication.

Every project that addressed impaired driving was based on the analysis of crash data to identify the problem in terms of age, time period and location. Four states established DWI task forces that combined public information with enforcement in campaigns to combat drinking and

TABLE SP-1. ASSESSMENT QUESTIONS and ANSWERS

QUESTIONS		ANSWERS -- In Percent YES, by Priority Area and No. of Programs ( )								
		Traffic Records (18)	Impaired Driving (29)	Occupant Protection (23)	Comprehensive Safety Programs (8)	Motorcycle Safety (9)	Pedestrian and Bicycle Safety (9)	Police Traffic Services (29)	Emergency Medical Services (17)	Total (142)
Were projects focused on major safety problems such as those identified through national priority rulemaking and through states' own safety problem identification process?		100	100	100	100	100	100	100	100	100
Did initial federal grants create new programs?		100	89	100	100	91	91	95	76	92
Did federal grants lead to participation or full support by state, community and private entities? Did federal grants encourage other state and local spending on highway safety?		90	63	48	78	82	82	61	71	68
Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?		85	83	100	100	82	82	92	86	89
Were concepts and technology developed with federal funds used to improve state program effectiveness?		60	54	81	56	67	36	43	67	57
What would be the consequences of removing federal grants from the program?	**Critical**	50	34	89	56	10	45	41	10	43
	Important	25	43	4	44	45	45	54	28	36
	No Effect	25	23	7	0	45	10	5	62	21
Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?	**Yes**	15	14	30	11	36	0	22	5	18
	No	40	80	11	78	64	91	70	52	58
	Partial	45	6	59	11	0	9	8	43	24

driving. Organizations such as MADD, SADD and RID (Remove Intoxicated Drivers) were active in efforts to strengthen impaired driving laws and raising public awareness.

In 1980, the number of fatalities per 1,000 licensed drivers was declining in one state, but young people were being killed at twice the rate of others in alcohol related crashes. This persistent problem was addressed anew with an alcohol and drug education project established at junior high schools in 40 school districts of the state. One of the most pervasive and popular programs was Project Graduation. Every state in the assessment took part in these activities aimed at preventing impaired driving by conducting alternative festivities.

The need to increase the use of safety belts was a safety policy since the 1960's since frontal crashes resulting in serious and fatal injuries were found to be the most common. Belt use rates continued to be very low into the early 1980's. When the incentive to enact mandatory safety belt use laws was established in the mid 1980's, states began to be more active. One state enlisted the help of 1,800 Extension Homemaker units. Meetings were organized and 28,000 Extension members attended to be trained in the conduct of belt use campaigns. Another state, after many years of public apathy managed to enact a mandatory belt use law in 1987. The belt use rate climbed to 42 percent.

Problems such as the failure to place and properly secure infants and children in safety seats were early concerns in every state. All ten states enacted child protection laws, all effective between 1982 and 1984. The programs that were developed to address the key identified problems included new K-6 educational curriculums, special feature videos, mascots, print and picture materials and items, and safety seat loaner programs in each state that included training parents and health care providers in the proper use of safety seats.

The over representation of serious injuries and fatalities in crashes involving motorcycles had been addressed by helmet laws in 47 of the 50 states by the early 1970's. The threat of grant fund sanctions for the remaining three states drew Congressional action that negated the sanctions. As a result more than one-half of the states rescinded their helmet laws. Rider education programs became the backup program to reduce motorcycle crashes. The programs consisted of a knowledge test and an on-the-road curriculum.

Eight of the ten states recorded 117 bicycle fatalities in 1982 and 106 fatalities in 1993. The same states had 1,035 pedestrian fatalities in 1982 and 844 in 1993. Using the problem identification process as a base, early programs were concentrated on children in K-6. Adult programs focused on pedestrian safety for those over 65. In later years several of the states integrated their bicycle safety activities with the national SAFE KIDS program and with their comprehensive traffic safety programs (CTSPs).

One of the states had suggested an approach to CTSPs in the late 1970's. By that time the problem identification process was to be used to select 50 of the 250 highest crash ranked municipalities and to solicit their participation in a comprehensive safety program in 1980. While

this program was delayed, the idea reemerged in the mid 1980's and plans for safety belt and child restraint projects, and motorcycle and pedestrian safety programs were prepared.

Another state used the problem identification process to target counties and cities that had the most serious drinking and driving incidents. In 1982 one of the larger cities in that state was designated as a target of opportunity to promote the adoption of a comprehensive community based alcohol deterrence program. DWI enforcement was a featured part of the effort. In the latter 1980's and early 1990's DWI enforcement included sobriety check points.

The defense for DWI cases often rested on creating a reasonable doubt about the accuracy of the breath test. This problem was common to most of the states. After passage of new legislation in the 1980's, states purchased new breath testing devices that could provide accurate BAC readings suitable for admission as evidence. One of the states that had an implied consent law for evidentiary breath tests on the books since 1969, enacted a stricter law in 1983 that set the "illegal per se " level at 0.10, established administrative per se, and allowed preliminary breath tests.

The 55 mph National Maximum Speed Limit (NMSL) initially enacted to save fuel was found to be a major factor in reducing fatalities. Bringing motorists into compliance with the speed limit became the law. Every state had an enforcement program that included ground and air patrols, radar speed detection equipment and dedicated task forces and teams. One state initiated a speed enforcement program in nine of its counties in 1978 using Bell Jet Ranger Helicopters. By 1982 the state police had purchased three Cessna fixed wing aircraft, and was using unmarked police sedans to apprehend speeders.

Beginning in the 1970's and continuing throughout the 1980's states began to address the need for improved emergency medical services to reduce mortality rates of crash victims en route to, and subsequent to arrival at receiving hospitals. Analysis of hospitalization and run report data had shown that well trained ambulance attendants were a factor in reducing mortality and morbidity. In 1970 one of the states published its first EMS plan. The state's legislature also established a budget line item for EMS in 1975. Another state adopted the DOT 81-hour EMT course in 1972.

After Congress passed the EMS Systems Act in 1973 in recognition that advanced life support and trauma care were an integral part of a total EMS system, states began paramedic programs and established mobile intensive care units. The designation of trauma centers followed in the early 1980's.

Did initial Federal grants create new programs?

New programs and major program changes in all safety program areas were initiated with safety grants. As Table SP-1 at the beginning of this section shows, 92 percent or 157 of the 171 programs constituting the array of safety efforts of the ten states covered in this report, used safety grants to fund new program initiatives.

Traffic records "set aside" funds created under Congressional legislation in the mid 1980's led the way toward upgrading existing, and the development of new, data systems. A central traffic records system to improve the problem identification process, to respond to public inquiries and to provide crash data for research studies was developed by one state. Another state used the set aside funds to completely modernize its crash data system. Set aside grant funds were used by the states to develop modern driver licensing and control systems. One state spent more than $18 million for this purpose and used grants totaling $500,000.

All the states in this assessment used safety grants to initiate -- and continue -- campaigns to raise public awareness of the drinking and driving problem. States enacted laws so that they could obtain incentive §408 and §410 incentive grants that were then used to conduct impaired driving reduction programs. One of the states launched a media campaign called "It's Time to Treat Drunk Driving Like the Crime It Is" with a grant of $100,000.

After passage of a 0.10 per se law in 1985, and the enactment of administrative license suspension in 1988, another state became eligible for §408 incentive funding. In the early 1990's this state produced 40 public service announcements, 100,000 pamphlets, and materials to be used for 40 billboards (but not the billboards) and many radio and TV interviews -- all funded with safety grants of $170,000 not including the actual air time for the PSA's or for radio or TV interview airtime.

The Project Graduation programs, the SADD chapters and summer youth camps were, for example, initially funded with safety grants. One state used a safety grant of $6,000 to sponsor a Project Graduation Conference for student representative from all over the state. Another state used $5,000 from its §410 incentive grant to create a program that focused on unlawful substances with a "no use" message to all K-12 graders.

Strengthened DWI legislation in most states created DWI offender evaluation and treatment programs. In one of the larger states such a program was actually initiated in the 1970's in 18 of the state's counties. An additional 37 county programs were subsequently established with the support of safety grants. Another state used $36,000 in the 1980's to fund a coordinator responsible for monitoring offender education programs in the state, and later in the 1990's an incentive grant was used to establish an offender assessment center as part of a municipal court system.

Programs to promote safety belt and child restraint use were initiated and supported with safety grants beginning in the 1960's. In 1982, with the creation of five safety priority areas, occupant protection programs were expanded, and even more so after mandatory safety belt use laws went into effect beginning in the mid 1980's. Safety grants supported practically all the promotional efforts, although the automobile industry sponsored Traffic Safety Now organization provided promotional funding over several years in the mid to late 1980's.

The model safety belt community program that began operations in 1985 in one of the states was

supported with safety grants and a statewide public information campaign that started in 1985 and continued in 1986 was funded with a grant of $155,000. Another state used safety grants to award mini grants to local public health departments to promote safety belt use and proper child restraint protection.

The U.S. Surface Transportation Act of 1984 provided for safety grant set asides, of at least an 8 percent, for the years 1985 and 1986 for the development and implementation of comprehensive child restraint programs. A substantial portion of these funds were used to purchase safety seats for the loaner programs that were established in each state. Several states used the safety grants to develop educational materials that physicians could use to educate parents of young children.

Federal safety grants were used by all the states in this assessment, except one, to establish motorcycle rider training programs and to train instructors in the 1970's and early 1980's. In one state six county motorcycle rider training programs were funded with safety grants in 1980. After a state university took over the coordination of the program it was operated in 20 counties and was supported with a safety grant of $296,000. The grant fund reduction in 1982 and the fact that motorcycle safety was not then a safety priority area motivated states to enact laws to create rider education programs.

A number of pedestrian and bicycle safety projects were funded with grants in the 1970's, but similarly to motorcycle safety, both areas did not become priority safety programs until the end of the 1980's. Integration into the comprehensive traffic safety programs allowed some support in the latter 1980's. In one of the states mini grants ranging from $1,000 to $3,000 were used for projects promoting the use of bicycle helmets, safety education classes and bicycle rodeos.

All the comprehensive traffic safety programs (CTSPs) were initially begun with either basic or incentive safety grant support. The establishment of several regional traffic safety offices in one of the states brought CTSP management closer to local communities. The initial CTSP was followed by eight more and all were operated with the support of safety grants -- some in part and others fully for their first three years, at an average of $75,000 a year for each CTSP.

Safety grants played a substantial role in DWI enforcement -- detection, training and adjudication. Special equipment such as video taping systems used to process DWI offenders was purchased with safety grants. Most states used safety grants to fund overtime duty hours dedicated to DWI enforcement. One of the states used safety grants to develop and establish its centralized DWI processing centers, and used a grant of $250,000 in 1987 to support a training program.

After the enactment of an administrative per se law in 1989 that placed the state's department of motor vehicles in charge of processing the administrative license suspensions, a safety grant of $435,000 was allocated for these operations in 1990, in addition to more than $500,000 budgeted by the state. States also used safety grants to establish and upgrade their breath testing programs. One state used $160,000 in 1984 to train 600 evidentiary device operators. Alcohol incentive grants were used by another state to acquire 80 Intoxilyzer 5000 models.

Set aside funds initiated the 55 mph NMSL enforcement program in practically every state. These grants were used to purchase aircraft, radar units, and to fund salaries for special speed enforcement task forces. While mostly conducted by state police or highway patrols, speed enforcement was in some areas undertaken by county and local enforcement agencies with the assistance of grant funds. One state started a public information effort to convince motorists to slow down. This program, one of four speed enforcement components in the state, was funded with grants of $470,000.

In 1983 one of the states offered 50 courses of instruction at its training sites. Among the subjects were courses in crash investigation, code revisions and related traffic topics. Safety grants of $60,000 supported this training. Another state initiated courses in DWI detection, and selective enforcement techniques with a safety grant of $138,000. The state continued to use safety grants for training through the early 1990's.

Finally, safety grants were used in nine of the ten states to initiate emergency medical technician (EMT) training. The tenth state only used safety grants to support several training coordinators. One of the states used $900,000 for the training of 8,000 EMTs in 1980 and 1981. Grant support ended the following year. Eight of the ten states used a limited amount of safety grants to begin paramedic and trauma care training and there was some grant support for the development of trauma registries and trauma care planning.

Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?

An important outcome of the safety grant program is that states and communities have taken over the responsibility for projects that began with federal support. This "catalytic" effect of the safety grant program appears in many forms: Federal funds are matched by state and/or private groups (leveraging); states continuing safety projects after federal funding ceases (seed money); and projects that became self sufficient through user fees.

More than two-thirds (68 percent) of the 171 safety programs in the ten states showed evidence that safety grants lead to or encouraged state, local or private participation and support. The programs with the highest level (90 percent) of participation were in the traffic records priority area -- the development and implementation of crash and other traffic related data systems. The least amount of state, local and private support (48 percent) was for programs that promoted safety belt and child safety seat use.

There was only one state that continued to fully rely on federal funding in the early 1990's to operate its central traffic records system -- the state refused to support the center. Another two states funded approximately 90 percent of their crash data collection and analysis with federal

grants. A fourth state has received substantial grant fund support from the FHWA. In one state data coding and entry were done under a contract with a correctional institution and were initially grant funded for $45,000 in 1986. By the early 1990's, the contract now at $67,000, was budgeted by the state.

To support campaigns for drinking and driving prevention, states used a variety of funding techniques. In one state, where liquor sales were state-controlled, a two percent "take down" from liquor sales profits was deposited into an alcohol education fund. That state also fielded model county comprehensive DWI programs that drew a great deal of support from volunteers. The programs were begun with safety grants of $500,000 in 1990. By 1991 grant funding was down to $100,000 and several projects were self sufficient in 1993.

Another state had established DWI task forces early in the 1980's and continued to do so in the 1990's. Grant funds of $4.5 million were used from 1981 to 1989. There was an initial state and local match of $700,000, and in 1990 the entire program was funded by the state beginning at $1 million a year with declining amounts thereafter.

In one of the states teachers and parents contributed more than 300,000 hours over a three-year period for a "School Team" approach that was part of an alcohol and drug abuse program. The safety grant began with $660,000 and the state contributed $237,000. The project continued into the late 1980's with expenses matched by the state.

The youth oriented SOBER program in another state was funded with grants of $114,000 that were matched by $265,000 provided by the counties in which the program was operating. By 1989 the SOBER program continued with the help of volunteers, fund drives, some United Way contributions, and county funds. "Hard matches" were provided by parents and community organizations to support the state's Project Graduation.

The promotion of safety belt and child safety seat use saw the least amount of state, local and private participation over the long run. While the Traffic Safety Now organization provided funding over a number of years in the mid to late 1980's, there was no equivalent follow up. All states, however, used volunteers to distribute materials and provide presentations. Estimates of the equivalency of volunteer and in-kind support ranged from $200,000 to $500,000 a year in one of the states.

Volunteer organizations operated loaner safety seat programs in most states. While grants remained the main source of support for the education part of the loaner programs, three of the ten programs were close to self sufficiency, five used matching grants and two still depended on grant funding for safety seats.

Motorcycle rider education programs had been established in all the ten states by 1991. They were supported primarily by funds derived from license surcharges. Four of the states never used grants for the rider education programs, but several states began their programs in the 1970's and

early 1980's with limited amounts of safety grant funding.

The widespread establishment of comprehensive traffic safety programs (CTSPs) in the mid to late 1980's was supported with safety grants. Seven of the nine CTSPs were able to draw support of some kind from localities, private sources and the states. In one state a CTSP received a grant of $76,700 and the county in which the CTSP was located contributed $104,200. Two of six CTSPs operating in the state in 1991 did so without safety grants. More than one-half of the CTSP funding in an Indian Nation area in one state was provided by the Indian Nation.

In 23 of the 37 enforcement programs in the ten states covered by this report safety grant funding lead to support from the states and localities. Legislation that became effective in one state established an alcohol education, rehabilitation and enforcement fund. It increased the tax on alcoholic beverages by 10 percent and these funds were distributed among the state's counties. Fifteen percent of the distribution was earmarked for enforcement and court assistance.

Another state enacted legislation in 1991 to establish a $60 fee for every DWI conviction to support the breath testing program. That state also purchased its new Intoxilyzer 5000 models under a grant program that required a 50 percent state funding match.

Enforcement of the 55 mph NMSL was essentially supported with set aside grants, but general patrol operations that were supported by state budgets turned in a substantial number of speeding citations. There also was the case of the threat of funding sanctions in one of the states that was in noncompliance with the mandated percentage of motorists that exceeded the speed limit. To meet the mandate, the state contributed $860,000 to the then current grant of $933,000.

State level enforcement agencies in most of the states conducted outreach education programs, as did many local enforcement agencies. There was no record of grant funding and both state and local funding supported the efforts.

More than 90 percent of the emergency medical services programs that may have initially been funded with safety grants went on to be supported by state, local and private means. By the early 1990's eight of the ten states were self sufficient or used state and local funding to support EMT training and other pre-hospital care costs. Two states created special funds supported by surcharges on traffic violations and two other states earmarked $1 from, or surcharged $1 for, vehicle registration. One of these states later replaced the earmark with a general fund appropriation. A fifth state was in the process of enacting a surcharge on vehicle registrations.

Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?

The replication of programs based on pilot projects, or started at a limited number of sites, was widespread in all the eight states. Adaptations and replications occurred 151 of the 171 programs

that were assessed. All occupant protection and comprehensive traffic safety programs followed the route from pilot or initial sites to other areas in the states.

Impaired driving programs were among those frequently replicated. The "Slow On the Bottle, Enjoy the Road" (SOBER) campaign in one state began as a pilot in 1979 in three of the state's counties. By 1982 the campaign was picked up by another seven counties. In the next year, 1983, 18 more counties replicated the campaign -- and drew free advertising estimated to be worth $2.5 million. More than 150,000 volunteers took part in the effort.

SADD chapters usually began with one or more in one area and were then replicated in many schools within a state. In one state the SADD curriculum was included within the school system and in YMCA, YWCA and 4-H centers. There were eventually 325 SADD chapters in the state.

The safety belt promotion campaigns were statewide efforts, but were often carried out by unique organizations that had chapters in many of a state's localities. In one example, the Extension Homemaker program began a safety belt awareness campaign that eventually also included 1,000 4-H clubs involving 24,000 members. The Traffic Safety Now (TSN) coalitions in the states began slowly, usually in the state's capital area, but soon expanded statewide. In one state the final TSN report stated that from 1985 to 1990, more than 13,800 film presentations to 800,000 people were made, and approximately 2 million educational brochures were distributed.

Safety seat loaner programs are a prime example of child safety protection projects that quickly spread throughout a state. One state began a pilot loaner program in two of its counties in 1981. It expanded rapidly to 50 programs at the end of 1982. By 1984 there were 77 loaner programs run by volunteers, and by the early 1990's loaner safety seats were available to every child in the state.

By the late 1980's comprehensive traffic safety programs (CTSPs) had been established in six of the ten states. The very creation of a CTSP responds fully to the question of replication since these programs pick up several kinds of safety efforts including impaired driving, safety belt use, and motorcycle, pedestrian and bicycle safety. CTSPs begun in one area or county were always replicated elsewhere. One of the states started a CTSP in one area and called it a model safety community. In 1986 it was recognized as a "noteworthy project" by the NHTSA. In 1987 the project was expanded to include a wider range of safety areas. Later, the program was broadened to include 47 municipalities. The other CTSPs in the state were similarly enlarged.

The central processing and video taping of DWI offenders is an example in the enforcement field. This new approach was begun in one county of a state and adopted by 20 counties or county groups by 1986. The same state had initiated a demonstration project to design a standard sobriety checkpoint approach for municipal police departments. The checkpoint model was subsequently adopted by local jurisdictions across the state.

Selective enforcement projects often designed to focus on specific violations using innovative techniques were used extensively over the past 15 years by many police departments. One such program in a large state began with selective enforcement of speeding and DWI violations at a few sites and the effort was expanded to 32 projects in the mid 1980's. Eventually the projects were absorbed into the state's corridor program which was expanded to 55 multi jurisdiction roadway segments in 1994.

Most improvements and the modernization of EMS systems were the result of new laws and regulations for the states as a whole. There were, however, instances were new techniques and procedures were started at one site and then adopted in other areas. A major effort concerned the introduction and expansion of communications, particularly the 911 access systems. One state, for example, enacted a law to implement the 911 system in 1980. The project began in one county and by the early 1990's approximately 95 percent of the population could reach EMS units through the 911 system.

In another state the first paramedic training program began in one hospital in 1975 with 30 students. A mobile intensive care unit was also activated in 1976 as a pilot program. These programs were replicated statewide in the early 1980's.

Were concepts and technology developed with Federal funds used to improve state program effectiveness?

Technology developed with technical assistance grants (§403) was used in 57 percent of the programs that were part of this assessment. Occupant protection, motorcycle safety, and emergency medical services have led the safety priority areas in using technology and demonstrations to further state program effectiveness. These areas have made the most gains in coverage. The other safety areas have also benefitted from technical assistance, often through the adoption of new technologies and processes first developed by other states and by the NHTSA.

In one state model local crash data collection systems that could be used to identify key problems were developed with technical assistance grants. The systems were eventually used by 170 traffic engineering offices and supported through local funding.

Special public service announcements that covered both general and youth directed messages to highlight the dangers of drinking and driving were produced with technical assistance grants by one of the states. The techniques were then used by other states. All the ten states reported that their DWI offender evaluation and education programs were based on concepts and techniques developed by another state that had developed its programs with federal technical assistance funding.

More than 80 percent of the occupant protection programs -- safety belt and child safety seat use -- had benefitted from technical assistance. An important task was to measure the level of safety belt use. One state received a technical assistance grant in 1987, three years after the state had enacted a mandatory safety belt use law, to conduct a valid observational survey of belt use.

Another state received funds to study the effects of combining public information with enforcement activities to boost the use of child restraints in 1989.
More than 40 percent of the many enforcement programs in the ten states were benefitted by the development of new technologies. Primary among these, in more recent years, were the development of Standardized Field Sobriety Testing (SFST) and the methodology for implementing effective sobriety checkpoints. Laser speed devices were tested by a number of police agencies in five of the eight states. An optical-electronic survey device used by one of the states to accurately locate crashes and record these data had been developed by another state with the support of technical assistance grants.

Extrication procedures, emergency medical technician curriculums and communications were developed with technical assistance grant funds by several states and by NHTSA. Only one state in the assessment received direct technical assistance and that was in the form of a multi-year project in 1989 to develop county wide public safety answering points -- enhanced 911. The NHTSA sponsored 1989 National Trauma Conference and subsequent technical conferences benefitted all the states in the development of advanced patient and trauma care.

What would be the consequences of removing Federal grants from the program?

It is estimated that more than 40 percent of the programs in the ten states would not have been initiated or would have to be discontinued in the absence of further safety grants. The problem is critical for nearly 90 percent of the programs that promote the use of safety belts and child safety seats.

For another 36 percent of the programs, federal grants were important for their initial start-up and/or continuation. The majority of enforcement programs were in that category. Some 20 percent of the programs did not depend on federal funds for implementation or continuance. The majority of emergency medical services programs were among this group.

One half of the comprehensive traffic safety programs and projects to develop and implement traffic records systems had a critical need for grant support. Seven of the ten states continue to rely in whole or in part on safety grants for new data systems development, system upgrades and design.

Almost 80 percent of the impaired driving reduction programs particularly those that use public information and education campaigns would likely be discontinued or considerably reduced. The DWI offender evaluation and education programs are, however, self sufficient in all of the ten states, although there are grants from the Department of Health and Human Services that support certain aspects of these programs in the states.

Safety seat loaner programs were heading toward self sufficiency and were run by volunteers in 1993. The range of grant support for the ten states was from 50 to more than 90 percent. The motorcycle rider education programs in all states are, or are close to being self sufficient. Removing safety grants would not have any effect on most of the programs, but those that rely on such funding would have to reduce the number of rider courses or increase their fees.

Ninety percent of the pedestrian and bicycle safety programs in the ten states would have to sharply curtail their activities in adult pedestrian programs and for certain bicycle safety activities. There is some local support for bicycle helmet purchases, bicycle rodeos and the distribution of informational brochures. The community traffic safety programs (CTSPs) would certainly lapse without safety grants. Much like the grant assistance that is needed for safety belt and child restraint use programs, and for impaired driving reduction campaigns, there continues to be a need for grant funds.

New approaches to DWI enforcement would very likely be reduced or not attempted without the availability of safety grants. Although such grants constitute 1 percent or less of total traffic enforcement spending in 1993, grants have provided the incentive to establish new approaches such as sobriety check points, video taping of offenders and training. The upgrading of breath testing equipment would be affected -- substantially slowed -- in many states. In some states it would lapse. The concurrent training of breath test device operators would follow suit.

Hard hit would be the speed enforcement programs that no longer benefit from set asides and the acquisition of vehicles, radar and the new laser devices would very likely be delayed. Training for the various levels of crash investigation would have to be reduced without the assistance of safety grants. Educational outreach programs conducted by enforcement agencies have been supported by states and localities and would, therefore, not be affected by reductions or elimination of grant funds.

The EMS systems would be the least affected by grant funding reduction, although such assistance was found to be important to 28 percent of the programs in the ten states. The partial funding of EMT training programs and support for several of the central EMS offices would lapse with the withdrawal of grant funds. Most EMS programs are, however, self sufficient and funded through fees, taxes and private contribution. Many ambulance units are made up of volunteers. The development of trauma care centers has been developed with state, local and private support. Grants were used for paramedic training and EMS/Trauma Care planning, and those efforts would very likely be delayed.

Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?

Approximately four out of every 10 programs were formally monitored, assessed or evaluated in some way using administrative, clinical or scientific techniques to determine effectiveness, accomplishments or other barometers of achievement. Programs for occupant protection, traffic records, motorcycle safety and emergency medical services were subjected to more of the various review levels than the other safety priority areas.

Crash data and related traffic data systems, being the resource for problem identification, subsequent program selection -- and essential for program assessment, monitoring and evaluation -- were frequently reviewed in all states. There was a considerable reliance on consultants to review, design and install new or upgraded systems. While wanting to directly manage crash and other data systems, the traffic safety offices often lacked the expertise to do so effectively.

Despite that situation, four of the ten states had acquired qualified data systems managers by the early 1990's.
Observational sampling using multi-stage probability samples of road segments was used by many of the states to determine safety belt use. Surveys in several of the states showed that safety belt use rates jumped substantially in urban areas, but less so in rural areas after enactment of mandatory safety belt use laws. Both rates began to level off or even decline after a period of time. Renewed emphasis on, and promotion of the value of using safety belts made the use rate rebound to where it was previously -- at approximately 65 percent in the aggregate -- for the ten states in 1993.

Infant and child safety seat and restraint use was frequently monitored. One state showed an increase in infant seat use from 25 percent in 1983 to 88 percent in 1991. Toddler restraint use lagged behind, growing from 29 percent in 1985 to 43 percent in one of the states.

The beneficial effect of using a motorcycle helmet has been shown in many studies. One state, however, undertook an impact evaluation of its rider education program -- and was not able to find a relationship between such a program and crash outcomes. Comparing the states with, and without, helmet laws (another sate found that trained new riders had a five percent lower crash probability than untrained riders) shows generally similar downward fatality trends. States with the helmet law had 519 fatalities in 1980 and 285 fatalities in 1993. Those without the helmet law had 533 fatalities in 1980 and 272 fatalities in 1993 -- 45 percent and 49 percent reductions, respectively.

While three-quarters of the 37 enforcement programs did not include assessments, or evaluations, there were mandated monitoring requirement for the 55 mph NMSL program. States had to measure speeds in order to establish the number and percentage of motorists exceeding the 55 m.p.h. NMSL. Several states regularly analyzed crash data to determine the number and percentage of fatal and injury cases in which speed was judged to be a key contributing factor.

NHTSA's EMS Assessments were conducted in each of the ten states. While focusing on current status in relation to guideline requirements, the EMS Assessments provided a much needed set of facts that could be used to make subsequent improvements. It was found that states took the findings seriously and initiated action -- often forming advisory boards and developing longer range plans. One of the states undertook studies of crash trauma morbidity that served as a basis for the development of ALS services trauma care training.

It should be noted that many of the projects implemented by the states evolved from program strategies previously demonstrated and evaluated by NHTSA. The agency will continue to be the principal evaluator of programs of national interest.

PART III

Discussion and Findings for Safety Priority Areas

The format for each Safety Priority Area is as follows:

- A brief description of the programs in the safety priority area
- Findings about the overall capability and achievements
- Findings, with examples, under each of the seven Assessment Criteria
- A discussion of related issues
- Conclusions

IMPAIRED DRIVING

The Programs

Impaired driving - that is driving under the influence of alcohol and/or drugs -- has been the focus of attention for many years. Traffic crashes that involved such dangerous behavior by both adult and youthful drivers had been identified as one of the most urgent problems in the 1960's. To address the problem, states launched information and education programs that featured the dangers of impaired driving. Extensive efforts to deter such behavior, eliminate plea bargaining, and punish offenders led to tougher laws designed to establish breath tests results as evidence, set legal levels of impairment and create offender treatment programs.

Law enforcement continued to be one of the central countermeasures. Special patrols to deter and apprehend impaired drivers were used extensively. There were enhanced adjudication programs to speed offender processing. Perhaps one of the most ambitious efforts was the upgrading of breath testing devices. From simple breath "balloon" readers to the current infra red breath measurement and recording devices was a major advance.

The last 15 years also saw the creation of many innovative programs such as Project Graduation, Report Every Drunk Driver Immediately (REDDI), Designated Driver, and the growth of activist groups such as Mothers Against Drunk Driving (MADD), Students Against Driving Drunk (SADD) and similar organizations. For the offender there were programs that offered an alternative for first offenders allowing them to select alcohol school or treatment in return for avoiding an impaired driving record.

By 1984 states were eligible for incentive grants that were limited to five fiscal years under §408 of the Highway Safety Act of 1966, as amended. Eligibility for a basic grant was predicated on state provisions for prompt license suspension of not less than 90 days for a first offender, a mandatory sentence for those convicted more than once in five years, a "per se" level of 0.10 Blood Alcohol Concentration (BAC) or greater, and increasing efforts and resources to the enforcement of alcohol-related traffic laws. A special supplemental §408 grant was also available to states that enacted statutes relating to mandatory license suspensions and certain mandatory minimum sentences for first and subsequent DWI offenses.

Among the ten states participating in this assessment, seven met the requirement for the basic alcohol incentive grants and four also received the special supplementary grants. Three states did not qualify for any §408 alcohol incentive grants.

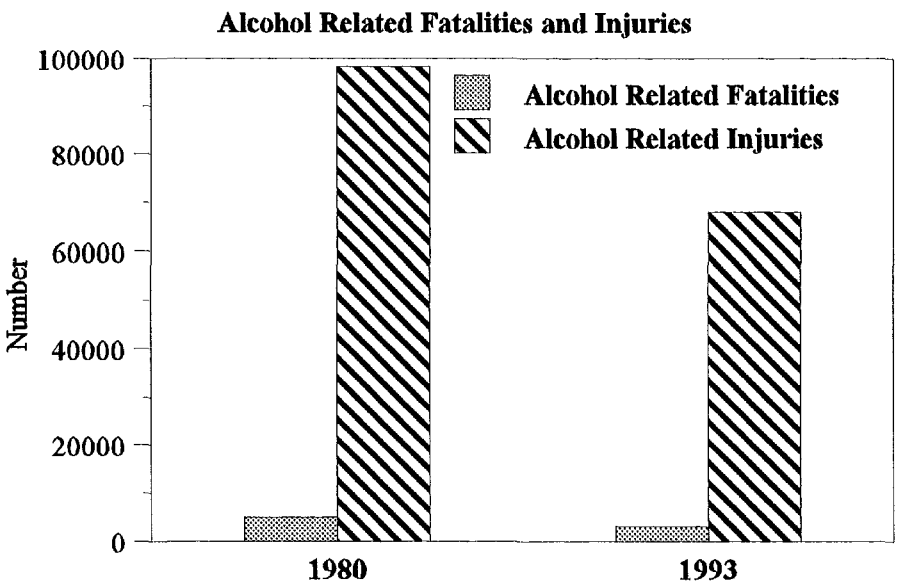
The Intermodal Surface Transportation Efficiency Act of 1991 created a new alcohol and controlled substance countermeasure program incentive grant under a new section (§410) of the Highway Safety Act. A state had to provide four of the five requirements specified in §410 to be eligible for incentive funds. The five requirements included: expedited license suspension, a 0.10

BAC for the first three years, followed by a 0.08 BAC, a statewide program for stopping motor vehicles (sobriety checkpoints), a self-sustaining drunk driving prevention program, and an under age 21 prohibition against drinking alcoholic beverages. Eight of the ten states participating in the assessment had received the incentive funds by 1994.

The Comprehensive Traffic Safety Programs (CTSP's) began to emerge in the mid 1980's (these will be discussed later), but many of them started as impaired driving reduction or safety belt and child safety seat use programs. By the late 1980's, most impaired driving programs that involved public information and education had been absorbed into the CTSP's -- in the states that had formed CTSP's.

Between 1980 and 1993 alcohol related traffic crash fatalities and injuries had declined, as shown in Figure IMP-1. The data on fatalities are for ten states, but injury data could only be obtained from seven states.

Figure IMP-1



Over the time span shown, the number of alcohol related traffic crash fatalities declined 38.3 percent for the ten states. Injuries dropped by 30.7 percent, based on seven of the states participating in the assessment. Many factors may have contributed to these reductions, and the specific role of impaired driving reduction programs cannot be isolated.

This Impaired Driving section includes findings about General Public Information and Education, Youth Awareness, and Offender Evaluation/Treatment programs. Since breath testing programs are usually conducted by enforcement agencies (with regulatory oversight by health departments), they will be included with Police Traffic Services. Impaired driving enforcement programs are

also included under Police Traffic Services. The section on Comprehensive Traffic Safety Programs will cover impaired driving projects that were part of the CTSP's.

General Public Information and Education -- Findings

Overall Capability and Achievements

Beginning in the early 1980's, tougher impaired driving laws were enacted in most of the states. The laws often were a result of the availability of incentive grant funds for eligible states that met certain requirements. Tougher DWI laws were also championed by activist organizations such as Mothers Against Drunk Driving (MADD). To explain the laws and to generally raise the awareness of the public about the impaired driving problem, campaigns and related activities were launched and sustained over the years.

Projects such as "Slow On the Bottle, Enjoy the Road" (SOBER), "Report Every Drunk Driver Immediately" (REDDI), and slogans such as "Friends Don't Let Friends Drive Drunk" became rallying efforts. A considerable amount of literature, public service announcements, films, personal presentations and posters were produced so that more than three times as many people were potential recipients of impaired driving information in the early 1990's than in the early 1980's. This does not include those reached through print and electronic media.

While there were many services in kind, free media and contributions by businesses -- and examples of state and local funding -- the sustaining support for general public information on the dangers of impaired driving continues to come from federal grants.

Assessment Criteria Findings

1. *Where projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

   Overall. Every program and project begun by the states, their local jurisdictions, or other entities, during the period covered by the assessment, was created to address an aspect of the impaired driving problem. The Alcohol Safety Action Projects (ASAPs) of the 1970's provided both ideas and techniques that formed the bases of several projects in the 1980's. **Examples.** In five of the states, Governor's Task Forces were created in the early 1980's to renew efforts to increase public awareness of the impaired driving problem.

   Four states established DWI task forces that combined public information with enforcement, including the campaign "Slow On the Bottle, Enjoy the Road" (SOBER). Other states developed comprehensive county impaired driving programs that began as local models and expanded statewide. Organizations such as MADD, SADD and RID

(Remove Intoxicated Drivers) were active in coordination with the respective states in addition to their efforts to strengthen impaired driving laws and raise public awareness through activities such as the MADD Red Ribbon campaigns.

In one state, the Governor's Task Force in 1981 recommended the development of a large scale sustained public information and education campaign to keep the public aware of the drinking and driving problem. The Task Force recommendations, that also included prevention and enforcement aspects, were incorporated into legislation that was enacted in 1983. A major campaign with the theme "It's Time to Treat Drunk Driving Like the Crime It is" was launched that year. It won an award from the American Association of Motor Vehicle Administrators.

Governors played a substantial role in initiating impaired driving reduction activities. After a relatively low level effort to boost public awareness about drinking and driving in one state, the Governor "declared war" on DWI in 1986 and launched an extensive statewide campaign. By 1989, with the help of the electronic and print media, the Governor's program was focused on reinforcing messages about the state's DWI laws to create the perception of risk of apprehension and the certainty of immediate penalties (license suspension).

Another state had a campaign to set the tone that the state would not tolerate drinking and driving. The Governor made a statement to that effect in a television documentary that used portions of NHTSA's film "Till I Get Caught."

Another state that also used the "Slow On the Bottle, Enjoy the Road" (SOBER) campaign theme established public awareness programs through its County Councils on Alcoholism with a pilot program in 1979. The SOBER campaign continued later as part of DWI task forces that eventually included all the state's counties.

Beginning with a mini refresher course on safe and sober driving habits -- a reprint from the Driver's Manual -- a state printed 500,000 copies for distribution. The state, like many others, used the NHTSA public service announcement "Friends Don't Let Friends Drive Drunk" in the early 1980's and thereafter.

The "Report Every Drunk Driver Immediately" (REDDI) program was proposed and implemented with a statewide public information campaign in two states. It remained a central public awareness and apprehension program throughout the 1980's and early 1990's.

Recognizing that the impaired driving problem had to be addressed at local levels, one state created local DWI task forces in the early 1980's. Prior to that there only was a program of DWI "skill" training designed to reduce an impaired driver's aggressiveness, and to monitor that driver's subsequent performance. The task forces, that soon covered

much of the state, were designed to increase community impairment awareness. They delivered a uniform alcohol safety message, and standardized the program throughout the state.

2. *Did initial Federal grants create new programs?*

Overall. Practically all new public awareness programs that targeted impaired drivers were created in whole or in part with federal safety grants under §§402, 408 and 410 of the Highway Safety Act. All the states in the assessment used safety grants to initiate and continue to support campaigns to raise public awareness of the dangers of impaired driving. Those states that enacted legislation making them eligible for §408, and later §410 incentive grants, used these funds for publicizing the features of the new laws and for related programs.

Examples. The state that launched the media campaign "It's Time to Treat Drunk Driving Like the Crime It is" funded the effort with a grant of $100,000. That same state developed Model County Comprehensive DUI Programs (MCCDPs) whose public information and education segments were supported with safety grants.

After passage of a 0.10 per se law in 1985 and the enactment of administrative license suspension in 1988 another state became eligible for §408 incentive funding. In the early 1990's this state produced 40 public service announcements, 100,000 pamphlets, 40 billboards and many radio and TV interviews -- all funded with safety grants of $170,000. The entire public awareness program in one state was supported with safety grants, initially with funding under §402 and later, after passage of legislation lowering the per se law to 0.08 BAC in 1994, with §410 incentive grants.

The "Slow On the Bottle, Enjoy the Road" (SOBER) public awareness campaign in one state was begun with a grant of $107,200 in three counties. Later, as the programs were extended to 18 counties, $178,000 supported part of the effort in 1983.

To support the reprinting of a mini refresher course in safe/sober driving habits in 1980, a safety grant of $25,000 was awarded to one state. The remaining cost for printing 500,000 copies was borne by the state. After enacting an administrative per se law in 1989 that provided for a mandatory operator's license suspension for anyone who failed or refused a chemical test, a wide ranging public information program was launched to publicize the law. Incentive grants of $345,454 were received by the state and used to support the public information campaign and the license suspension process.

The state that featured the REDDI program as a central effort to reduce impaired driving, used federal grants of $20,000 to obtain PI&E materials. In a related effort, this state used safety grants to establish a community program on impaired driving awareness in one

of its more populous counties. This program followed the enactment of a law (1983) that set "illegal per se" at 0.10 and provided for "administrative per se" or on the spot license suspension. These actions made the state eligible for §408 incentive grants that were, in part, used to support public awareness activities. Five other community impaired driving awareness programs were also supported with safety grants in the 1980's.

The earliest DWI task forces (1981) that were created by one of the states were established with safety grants. This state allocated the largest share of its discretionary (other than set asides) §402 funds to support the DWI task forces in 16 cities and counties in the 1980's. The program began with safety grants of $225,000 for four task forces in 1981. The other state with a large DWI task force program also established five such projects in 1983 and supported the public information and education part of the task forces with federal safety grants of $107,000.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. Obtaining funds from state, local and private sources has been one of the more challenging aspects in conducting general public information and education activities about the dangers of impaired driving. Impaired driving PI&E remains one of the safety priority areas that relies on federal safety funding. A wide ranging effort has been made by both public and private organizations to periodically mount major campaigns and to gain the support of the media and others.

Examples. One state has had an alcohol education fund that is based on a two percent "take down" from the profits of the state controlled liquor sales. That same state also drew a great deal of support from volunteers who were part of its model county comprehensive DUI program. These programs were supported with safety grants of $500,000 in 1990. By 1991 grant funding was down to $100,000 and several of the projects were self sufficient in 1993.

Another state created a traffic safety education and enforcement find in 1988 based on a $3 fee added to every traffic conviction. Part of the fund was to be used for traffic safety education programs such as the creation of local drinking and driving prevention projects. Later, in 1993, the same enacted legislation to create two grant programs funded from increased alcohol taxes -- one of these, with an appropriation of $5.5 million -- was a local program to assist communities to establish innovative anti-DWI programs.

Most of the states were able to enlist the print and electronic media in support of anti drinking and driving campaigns. The equivalent of the free media exposure often ran into the millions of dollars. One state, for example, made self sufficiency an objective. With

an initial safety grant of $32,000 a firm was hired to form a task force, obtain sponsors and organize anti impaired driving events. Radio and TV spots were aired, 370,000 red ribbons were given out, and thousands of brochures, posters and items were distributed. While not achieving self sufficiency, it was estimated that donations and in kind contributions and media coverage were equivalent to more than $800,000.

The state that had fielded DWI task forces early in the 1980's and continued to do so into the early 1990's had spent grant funds of approximately $4.5 million from 1981 to 1989. This was matched by $700,000 in state and local support. There also were corporate contributions of approximately $100,000 a year. The whole program was subsequently funded by the state with nearly $1 million a year, but with declining amounts thereafter.

In another state private organizations promoted safe rides and designated driver programs, and the beverage industry in the state directed its efforts toward alternative transportation. A "Tipsy Taxi" service in one of the state's areas was self sufficient and was recognized as a national model.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. While a number of the impaired driving reduction campaigns were designed for statewide implementation, many PI&E activities began as pilots or at only one or two sites. Most of these were replicated elsewhere, though mostly with the support of safety grants.

Examples. The model county comprehensive programs, already cited previously, grew from two to 15 in 1987. In the early 1990's they began to merge into the Comprehensive Highway Safety Programs.

The "Slow On the Bottle, Enjoy the Road" (SOBER) campaign in one state began as a pilot in 1979 in three of the state's counties. By 1982 the campaign was picked up by another seven counties. The next year, 1983, the campaign had been replicated in 18 counties -- and was drawing free advertising estimated at $2.5 million, plus the help of 150,000 volunteers.

A state that did not create specific Comprehensive Highway Safety Programs (CHSPs), did, however, establish county and city alcohol comprehensive projects. These began at two sites in 1986 and were replicated in six counties and cities by 1990.

DWI task forces that included public information and education segments grew from four to 18 between 1981 and 1992 in one state. This essentially covered most of the states jurisdictions, except for its larger cities that had their own programs.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

There were no direct technical assistance (§403) used in connection with general public information and education activities in the participating states. Considerable use, however, was made of materials on the subject and reports of techniques on conducting PI&E campaigns to reduce drinking and driving. The Alcohol Safety Action Programs (ASAPS) that had been established in 35 states in the 1970's provided information and lessons on the techniques of creating and conducting campaigns.

NHTSA had produced numerous special public service announcement (PSA's) using technical assistance funding. Some of the states had collaborated with other states in the development of drinking and driving reduction messages, and still others used or adapted packages developed by others.

6. *What would be the consequences of removing Federal grants from the program?*

Most, if not all, statewide and local impaired driving reduction public information and education programs and projects would lapse or be reduced to a fraction of their size without federal grants.

There were a few projects that became self sufficient and the state that had begun a DWI task force program in the early 1980's obtained funds from it's state legislature to continue the entire program (up to 19 task forces) in the early 1990's. The latter program was scheduled to be reduced over the following years.

One of the states that began its Report Every Drunk Driver (REDDI) program in 1980 continued to require safety grants to support the program. Although a cellular telephone company donated air time to provide statewide free service to enhance the program, the REDDI activity support was continued with an alcohol incentive grant in 1993.

While there usually is free electronic media available, materials such as brochures, posters, public service announcements must be developed, produced and distributed. To solicit the cooperation and funds from businesses requires paid staff. The availability of volunteers cannot always be assured. It is one thing to make dollar equivalent estimates of contributed time -- both media and personal -- it is another to create, launch and conduct campaigns and educational programs.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

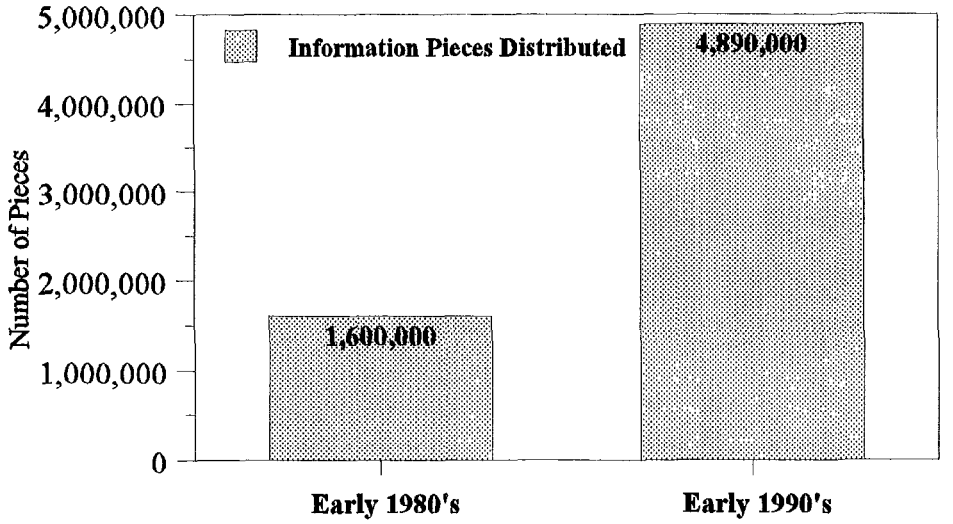
The highway safety program in one of the states operates under the guidance of a highway safety office and a research center located in one of the state's leading universities. The research center has long been involved in studying the effects and effectiveness of a range of traffic safety countermeasures and vehicle safety regulations. The other states did not have a similar arrangement.

Projects are monitored to determine what was done and how much was spent -- the administrative tasks and required reports are prepared. Statistics about the number of presentations, items and materials distributed and possibly the number of people reached though the various channels of communication, were partially available for selected years.

Figure IMP-2 displays the number of information pieces on the dangers of impaired driving that were distributed in the nine states during a typical year in the early 1980's and early 1990's.

Figure IMP-2

Distribution of Impaired Driving Information



More people were reached in the 1990's compared to the early 1980's, if the numbers of information pieces that were distributed are taken into account. The number of people reached through radio and TV is hard to estimate and there were no surveys available during the assessment.

Youth Awareness -- Findings

Overall Capability and Achievements

A large number of youth directed programs directed at youth to raise their awareness of the dangers of impaired driving, prevent their drinking and drug use, and provide support under potentially dangerous drinking situations were developed and launched in all the states in the assessment. Practically all the programs were begun with the support of grants.

The participation and continuing support by states and communities, or private entities was quite limited although a substantial amount of in kind, media and volunteer services were made available. Programs usually spread statewide once they were instituted successfully in a pilot or in a few selected areas. This was found for programs such as Project Graduation, "Slow On the Bottle, Enjoy the Road (SOBER), and Students Against Drunk Driving (SADD). Participation by parents, the PTA's, businesses, and activist organizations such as MADD and RID facilitated the creation and continuation of the youth directed programs.

While little, if any, direct technical assistance (§403) was provided, the states had developed the capability to use those products that had been developed through technical assistance funding by NHTSA. The consequences of removing federal funds would lead to serious lapses in the states' capabilities to launch or sustain programs, and to develop their capability to evaluate the existing or previous programs.

Assessment Criteria Findings

1. *Where projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

   Overall. The over representation of young drivers in alcohol related crashes was a well established fact since the 1960's. More refined analyses of crashes also identified alcohol involvements by age, sex, time of day or night and day of the week. The subject has been studied extensively and many measures to reduce the problem of driving under the influence of alcohol and drugs have been tried. Every project that was undertaken by the participating states in this assessment was aimed at reducing the incidence of young people being impaired or riding with impaired young drivers.

   Examples. In 1980, the number of fatalities per 1,000 licensed drivers were declining in one state, but young people were being killed at twice the rate of others in alcohol related crashes. This alarming fact motivated the formation of an Alcohol and Drug Education project implemented at junior high schools in 40 school districts. That state's Youth Traffic Safety Councils, its AL-CO-HOL program (sponsored by the American Automobile Association) and 400 SADD chapters and its integration of educational programs into the state's model comprehensive county DUI programs helped spread the message of the dangers of drinking and driving to a wide population of young people.

Another state, as part of a Target of Opportunity project carried out a drug and alcohol abuse prevention program that was managed by one of its unified school districts. A "School Team" approach was used and it was presented to a wide audience of young people in K-12. A quarter million brochures were distributed and 1,500 copies of the curriculum "Substance Abuse Prevention - It Starts with People" were produced.

One of the most pervasive and popular programs was Project Graduation. Every state in the assessment took part in these activities aimed at preventing impaired driving by conducting alternative festivities. The "Slow On the Bottle, Enjoy the Road" (SOBER) program, in addition to being a general PI&E campaign, also focused on young drivers. One state conducted a pilot project in 1979, beginning with 250 students and with the support of a youth committee working with a grant of $4,000.

States also established "Boost Alcohol Consciousness Concerning Health of University Students" (BACCHUS) chapters at colleges and universities. There were programs to assist high school students who found themselves in potentially dangerous drinking and driving situations by providing safe and confidential rides home. NHTSA's "Team Spirit" program was also used by the states, and in the latter 1980's many of the youth awareness programs were integrated into Comprehensive Traffic Safety Programs (CTSP's).

2. *Did initial Federal grants create new programs?*

Overall. Safety grants helped start almost every youth oriented awareness and education program.

Examples. In the early 1980's one of the states participating in the assessment created a plan for a youth traffic safety conference whose purpose it was to educate young people about alcohol and the youthful driver, attitudes toward drinking and driving and the responsibilities of young drivers. A safety grant of $8,000 (and $3,500 contributed by the state) served to get the plan and conference started.

The BACCHUS program (referred to previously) was begun in 1990 in this same state and was supported with $35,000 in incentive (§408) grants in 1991 and a similar amount in 1992. There were additional programs that were created with grant support such as "Teaching Others Alcohol Safety Tactics" (TOAST) and "44 Seconds of Silence."

The "Drive-A-Teen" project started by a local community for teens that were confronted with a drinking and driving situation was funded with a safety grant, as was the SOBER program in another state that was started as a pilot project with a $4,000 grant.

The Project Graduation programs, the Students Against Drunk Driving (SADD) chapters and programs such as the summer youth camps that promoted the prevention of drinking with messages that attendees could bring back to their communities were all begun and

supported with safety grants in most of the states. One state used a grant of $6,000 to sponsor a Project Graduation Conference that brought representatives from all over the state together to discuss the feasibility of conducting alcohol free programs on graduation night.

Several of the states used initial safety grants to develop audio-visual or multi media programs for elementary and intermediate schoolers. In one state a grant of $81,000 was used to design and produce the initial 100 pre-packaged kits for local school systems.

In the early 1990's one of the states created a variation of a SADD program that was focused on all unlawful substances with a "no use" message to all K-12 graders. A $5,000 grant from the then new §410 incentive grant program was used to implement the program in its first of three years. In another part of the same state, the Friday Night Live program was launched in 18 high schools and nine middle schools with a safety grant of $85,000 for three years.

Finally, a major program in one state known by the acronym of SAFTYE was created in 1974 as the centerpiece for educating teenagers and young adults about the dangers of drinking and driving. At that time the program was confined to 10 schools. Major revisions in 1980, and the support of $30,000 from safety grants allowed the hiring of a coordinator so that an expansion statewide could begin.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. In kind and volunteer services as well as actual state, local and private funding contributed to youth awareness programs. Initial and in most cases, continuing federal funding did generate a limited amount of state and local response.

Examples. In one state, teachers contributed more than 150,000 hours, and parents contributed more than 160,000 hours over a three-year period for the "School Team" approach that was part of an alcohol and drug abuse program in one large area of the state. The safety grant had been $660,000 and local and state expenses were $237,000. The project continued into the late 1980's with the expenses shared between federal grants and the state on a 50-50 basis.

Another state had formed youth safety councils in all state high schools to address drinking and driving, as well as other safety issues such as safety belt use. There were 100 such councils in 1988 supported with safety grants. By 1990 the organizations functioned without federal funding. The same state used basic safety grants of $80,000 to start SADD chapters throughout the state. Approximately 40 percent of the chapters were

grant funded. After federal funding ended and more than one half of the chapters had been established, state, local and private funding continued to support existing and additional SADD chapters.

The youth oriented SOBER program in one state was funded with grants of $114,400 that were matched by $265,000 provided by the counties in which the program was operating. By 1989, the long running SOBER program was no longer supported with federal grants, but it continued on with the help of volunteers, fund drives, some United Way contributions and county funds. That state's Project Graduation was integrated into its DWI Task Force program and incentive grants of $160,000 were used to support programs in more than 100 schools. Each school provided a "hard match" of between $10,000 and $15,000 raised by parents, community organizations and school boards.

A program called "Prom Promise" that had been developed by the Nationwide Insurance Company, was brought to one of the states in 1990. It was designed for the prom season and required participants to sign a "no alcohol or drugs on prom night" pledge. No federal grants were used to support the program.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. Most of the major programs to make youth aware of the dangers of impaired driving that were started at one or a few sites did gain sufficient support for implementation in other parts of a state, statewide and even spread to other states in some cases.

Examples. The creation of SADD chapters usually began with one or more in one area. These were replicated in many other schools in the state. In one state local groups were organized and the SADD curriculum within the school system and in agencies such as the YMCA, YWCA and 4-H centers. The SADD coordinating body became an independent organization with 325 chapters in the state.

Another state began establishing SADD chapters when the program went nationwide. By 1985 there were 46 chapters in the state and there were more than 300 in 1988. Grant funds had assisted in the establishment of a coordinator position, and the coordinator was instrumental in raising the number of SADD chapters to more than 600 in 1993. The chapters are self sufficient.

With safety grants, one state began supporting the activities of BACCHUS (Boost Alcohol Consciousness Concerning the Health of University Students) Chapters in 1988. By 1994 every major college campus had a chapter. Once established the BACCHUS Chapters no longer needed federal or state funding support.

The SOBER campaigns, referred to previously, were a classic example of development in selected areas and subsequent growth to cover a state. This program also attracted the assistance of organizations such as MADD, Remove Intoxicated Drivers (RID), PTA's and the SADD chapters. A similar process was followed by programs such as Project Graduation.

The SAFTYE program that was created to cover all school alcohol and drug programs in one state had 35 specific school programs in 1985. By 1992, these were replicated so that 210 schools featured the program. SAFTYE became an umbrella organization for all youth safety activities, presenting safety programs in primary and secondary schools. The SAFTYE concept was copied by other states.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. There was only a very limited direct use of technical assistance grants by any of the states. There was, however, generous use of the products of technical assistance. Most of the states used or adapted techniques, models, materials and programs that had at one time or another been developed by NHTSA, other states and private organizations.

Examples. One state used a technical assistance grant (§403) in 1985 through 1988 for the production of special public services announcements that covered both general and youth targeted anti drinking and driving messages. Another state was in the process of reviewing its youth awareness programs in light of studies that involved a "risk-focused prevention model" developed by Hawkins and Catelano. This concept would target behaviors that reflected the disposition to drinking and drug use, rather than the "act" itself. Some of the research may have been supported with technical assistance grants, although this was not clear.

There were references to NHTSA sponsored studies supported with technical assistance grants that showed that special programs targeting youthful drinkers were a key to solving the underage impaired driving problem.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. The program is dependent on federal grant funds despite support from local communities for Project Graduation activities and related projects. The consequences of removing federal funds would be widespread program discontinuation and reductions.

Examples. Several of the SADD programs or chapters could be operated without the assistance of federal funds, once these had developed and been institutionalized. There were some programs, one of them a SOBER program in one of the more populated states participating in the assessment that continued without federal grant assistance.

The average federal grant support runs at approximately 60 percent for programs targeted at youth. The range is from 30 to 80 percent. The total costs include those borne by MADD and similar organizations, that rely on contributions from the public.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. There were only a very few evaluations or surveys of specific state or local youth awareness programs, other than the routine monitoring of projects for administrative purposes. No surveys were found that addressed the subject of awareness.

Examples. In one of the states that conducted a "Target of Opportunity" project several surveys of substance abuse were conducted. Several studies by a traffic safety research center in another state about the effects of special youth programs were produced.

Youth involved alcohol related traffic crashes, fatalities and injuries, and the blood alcohol concentration trends are only available for a few states. While it is not possible to relate or associate programs statistically to such trends, there has been a slight decline in alcohol related fatalities among young people. The very limited data on blood alcohol concentration readings do not show any changes in the 1980's.

Offender Evaluation and Treatment Programs - Findings

Overall Capabilities and Achievements

The enactment of federal legislation that established incentive grants was a definite success. The states participating in this assessment became eligible under at least one of the two incentive grants (§§408 and 410) at some point. This reflects a strengthening of laws or creation of special requirements for first and subsequent "driving while intoxicated" (DWI) offenders. By the end of the 1980's every one of the participating states had a program that included evaluations, minimum sentences, a license suspension process and other features. State legislation also established fee structures that led to self sufficiency in all of the states.

Federal safety funds were used in the start up phase of the offender programs, but was soon displaced by the other funding sources such as fees, local taxes, and fines. The state legislation also created licensing and certification processes for evaluation and alcohol school and treatment services.

The effectiveness of alcohol and drug abuse presentence evaluation, school attendance and treatment has, however, been questioned by at least one study. License suspension or revocation was thought to be the best strategy. Recidivism information was available from only one state.

Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. By the early 1980's every state participating in the assessment had a presentence evaluation, a type of license suspension and special sentencing and a alcohol school/treatment program. These were by no means uniform and were primarily established as a result of state legislation that looked toward the eligibility for incentive grants under §408 of the Highway Safety Act. Later, additional impaired driving related laws and regulations came into being that tried to meet the requirements of §410 of the Safety Act.

Examples. One state had a pretrial alternative program since 1971, but in 1983 a new law prohibited diversion -- which allowed an offender to have a clean record provided he or she attended an alcohol school -- for offenders with prior DUI convictions and those who were presently enrolled in the treatment program. The new program required the offender to pay all costs of the school/treatment program, agree to a suspension of their operators license for up to 12 months, submit to an evaluation, pay restitution for all damages, agree to an educational program and report for treatment or counseling if ordered to do so.

Some states did not require full license suspension if the offenders attended alcohol school. Other states enacted legislation for administrative license suspension or revocation that meant "on-the-spot" withdrawal of the driving privilege.

The voluntary or mandatory alcohol school attendance requirement spawned services that in some states had agreements with each of the courts to provide probation and school services. Other states used a county program under the direction of a central state office to provide evaluation and rehabilitation services. State laws and regulations, in most of the states, established licensing and certification programs for the private and local services.

Among the 10 states in the assessment, there were seven that became eligible for §408 incentive grants and eight that met the §410 requirements. Five of the states received both types of incentive grants. This averages out to a 75 percent success rate -- that is 15 sets of grants were received out of a possible 20. This is a conservative rate because several states also met the supplemental incentive grant requirements, in addition to the basic grant requirements under §408.

2. *Did initial Federal grants create new programs?*

Overall. Federal grants played a role, although a minor one in some cases, in the development and initial operation of offender treatment programs in most of the states. Two of the states did not use grants for offender programs -- at least during the periods of time included in this assessment.

Examples. In one of the larger states, offender treatment programs had been initiated by 18 of the counties in the late 1970's, but 37 more were started with federal support. Another state had been operating 10 alcohol safety action programs that led to 20 court service programs, all initially supported to some degree with safety grants or in several cases with grants from alcohol programs under the Department of Health and Human Services (HHS).

Federal funds were used to support a study by a commission in the latter 1970's and the start up of pilot evaluation and treatment programs in several counties of a large state. After the enactment of legislation for a motor vehicle department to be responsible for the licensing of traffic schools, owners and instructors. A smaller state used a safety grant of $36,000 to fund a coordinator responsible for monitoring the schools statewide. In the early 1990's the same state used an incentive grant to assist in the establishment of an assessment center in a large municipal court system.

One of the states used federal grants to develop a curriculum for its alcohol information schools in the early 1980's. Instructors were both trained and paid during the development of the offender treatment programs.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. The offender evaluation and treatment programs began, in most states, with some safety or other grant support. Legislative fees or other funding structures were established so that these programs operate on a self sufficient basis. The legislation was at least in part motivated by the prospect of obtaining incentive grant funds.

Examples. One state, in addition to fees, relies on fine distributions, in kind services and county subsidies for its evaluation and treatment programs.

After establishing the offender program, another state has become self sufficient through a fee for offender schooling. This particular state program run by contracting services with courts also provides sentencing advisory services. One of the earliest and largest offender rehabilitation systems is a combined detention, evaluation, education, and referral to treatment process with the requirement that convicted drunk drivers spend 12 (first

offender) or 48 (second offense) hours in detention on two consecutive days. This is a self sufficient program that began with a start up fund of $2 million appropriated by the State legislature. Revenues are now derived from several user taxes and fees.

One state legislature enacted a law in 1981 that imposed an increase in the liquor excise tax on distilled spirits. The tax was deposited into a grant account for alcohol and drug abuse. The fund is used for the prevention of alcohol and drug abuse prevention and for detoxification and rehabilitation of abusers.

Another state enacted legislation in 1993 that established a local DSI grant that helped support alcohol screening, evaluation and school programs for DWI offenders. State funded grants of more than $600,000 were allocated in 1993.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Because of the legislative basis for the programs in each of the states, the services provided quickly spread throughout the state.

In some of the states, county level offender treatment programs had been available for a long time. Through the coordination of state traffic safety offices a more uniform process and services were eventually developed and after the enactment of state legislation, offender treatment programs had to meet certain requirements. In other states these programs were instituted by the state.

Other states developed their offender treatment programs by services in each judicial district. At some earlier point, only a few of the districts had such services, but in every case, the programs were installed in most if not all such districts in a state.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

All the states except one reported that their offender treatment programs were based on the experience of other states.

The one state was awarded a technical assistance grant to carry out a pilot program for convicted DUI offenders in 1971. After a review by the state's motor vehicle study commission in 1976, the statewide program was established in 1977 in conjunction with state legislation that required each convicted drunk driver to participate in the program.

6. *What would be the consequences of removing Federal grants from the program?*

There would not be any consequences since all of the states in this assessment were essentially self sufficient. One program did, however, use funding provided by a HHS grant.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. The effects of offender treatment programs has not been established, given the few studies that have been conducted. The one study result, that license suspension or revocation, usually referred to a Administrative License Revocation (ALR), is an effective strategy, supports current NHTSA policies.

Examples. The research center closely associated with traffic safety programs in one of the states evaluated that state's offender alcohol and drug education program. They found that those who attended the sessions had a higher DWI recidivism rate than those who did not attend! The result was attributed to the different licensing sanctions. Program participants were eligible for limited driving privileges and a full license reinstatement after six months. Non participant's licenses were suspended for one year. A follow up study in 1985 confirmed that license suspension or revocation is clearly the more effective strategy for reducing recidivism.

Another state completed two studies of its offender treatment program that found a 12 or 13 percent recidivism rate one year after participants had completed the course requirements. In this particular state 34 percent of those arrested for DWI were repeat offenders. The other states could not provide data on recidivism.

Table IMP-1 compares the number of offender education program participants with arrests for driving while intoxicated (DWI). The number of states' data used for this comparison is shown in parenthesis ( ) next to the number of participants. The number of DWI arrests are matched to the states used.

Table IMP-1

Percent of DWI Offenders Attending Alcohol School

	1983	1988	1992
No. of Alcohol School Participants	48,300 (4)	73,200 (5)	77,200 (4)
No. of DWI Arrests	90,709	103,083	109,676
Participants as a Percentage of Arrests	53.2	71.0	70.4

Since offender treatment school programs are limited to first offenders, the percentage of repeat offenders, or those that refused to participate in the special programs has remained in the 30 percent range for the four or five states included in the above table. This is better than in 1983 when that proportion may have been above 45 percent, but this may not be an accurate value since several of the programs had just started.

Discussion of Impaired Driving Program Issues

1. Is the distribution of effort and resources for prevention, deterrence, enforcement and offender treatment equitable?

The average state spends approximately $11 million for impaired driving and related enforcement programs a year. The portion devoted to public information and education is approximately 10 percent of that amount (more than $1 million for the average state). Offender treatment programs cost an average of $8 million per state a year.

While treatment programs have become self sufficient as a result of legislation that set fee structures for offender evaluation, enforcement and prevention programs (PI&E) continue to require grant support. Both the enforcement and offender treatment programs can point to numerical results -- DWI arrests and the number of offenders who completed alcohol school, respectively. The quantification of what has been achieved by PI&E campaigns or youth awareness programs is more sketchy and initially limited to the level of how many items and materials were distributed. As was seen earlier, there were no surveys that provided some feedback about how many at least heard the message.

The offender treatment programs were also unable (except for one of them) to provide information on recidivism. Enforcement, although not covered in this section, tends to be sporadic and quite labor intensive, but there are some data available on blood alcohol concentrations that do not show much change over the relevant years of the assessment. Conviction rates also have not varied and breath test refusals have actually increased from the mid 1980's to the early 1990's.

Despite these statistics, alcohol related fatalities and injuries have declined -- but it has to be repeated here that relationships between program outcomes and crash statistics cannot be assumed since many other factors contribute to casualty trends.

The fact remains that the resources used to create and sustain prevention programs consisting of public information and education efforts and special campaigns are far less than the resources for the other impaired driving reduction programs -- and there is no assurance that any one of the programs is more effective than another.

2. Can the "enthusiasm" and "motivation" for conducting PI&E campaigns be maintained over long periods of time without feedback?

Public messages about the dangers of impaired driving can lose their appeal after too much repetition. Every state highway safety office proudly displayed and showed their various items and materials that were used in campaigns. Although never mentioned directly in the assessment interviews or reports, there was the difficulty of maintaining a high level of enthusiasm for impaired driving reduction campaigns. Distributing brochures, presentations and youth awareness activities can be very repetitive.

Many of the states pointed to the free media contributions -- running public service announcements, and there were records that showed how many and which announcements were aired. Highway safety offices also kept extensive stacks of print media clippings. What was lacking, however, as mentioned previously, was information of campaign coverage -- who and how many were exposed to the messages, and what did they do subsequently?

3. How long does it take to create and run awareness campaigns to achieve desired effects?

One of the more common complaints was that PI&E efforts take time -- years -- to be effective and the three-year program grant funding limit is an insufficient time span to achieve results. State safety program managers have to search for creative new names for programs they want to continue with safety grants.

The above "creativity" was apparent in the Highway Safety Plans and Annual Reports spanning 14 years, for each of the states participating in this assessment. For impaired driving reduction -- as well as for the occupant protection programs -- sustained efforts at predetermined intervals appear to be the mode of choice.

The state highway safety staffs are quite right when they argue that one time or sporadic campaigns tend to loose the initiative begun with previous efforts, and that long interruptions between promotional campaigns require a new build up every time -- coordinating media, press, community and local government participation.

The fact is, PI&E campaign and educational programs were carried out almost continuously during much of the 1980's and early 1990's and as shown previously, were funded with safety grants for a substantial portion of their costs. Perhaps it is time to develop new "self sustaining" ideas and/or acknowledge such PI&E programs need not adhere to the three-year funding rule.

4. Is the development and production of materials in each state duplicated, and therefore a costly effort?

Development of brochures, PSAs, and other PI&E materials costs money. Each state feels that their materials should at least carry the State's logo. In many cases, states develop their own complete sets of materials. Most states did use NHTSA materials in addition to their own. Others adapted them for their own use, or simply distributed copied materials.

Viewed simply in the context of cost for the development and production of items and materials that are used to broadcast the message that impaired driving is dangerous and illegal, typical annual expenditures of $1 million (an average state; the range for the Assessment was $200,000 to $2.5 million), appear to be a lot of money. It is actually less than 20 cents per person a year, or about 25 cents for every licensed driver.

Still, grants figure prominently in the development and procurement of PI&E materials and there could be ways to save by using economy of scale concepts such as having one state in a region be responsible for one aspect of development, procurement and distribution.

5. Is there a conflict among those responsible for both offender treatment programs and impaired driving prevention programs?

Pre-sentence evaluation, school and treatment programs, a number of which are part of an alternative process for first offenders under many new laws that require mandatory minimum sentences, are operated by special coordinators and facilities that are tied in with the courts. In many states, these same coordinators play active roles in managing many aspects of impaired driving programs.

The income from pre sentence evaluation and school fees, while providing self sufficiency, may conflict with the less remunerative work necessary for providing impaired driving prevention programs. In several interviews with officials responsible for conducting offender evaluation and/or treatment services, it became clear that some of them were also responsible for conducting prevention programs, but the effort had in a number of cases lapsed. A few viewed their offender services as having more substance and as being effective. Most of the services had, in each state, formed an association that in turn wielded power in the legislature. There appeared to be regular efforts to increase offender fees.

The states also receive alcohol and drug abuse prevention (and treatment) grants from HHS. These tend to dwarf the safety grants, but are, of course, for the gamut of alcohol and drug abuse problems and not targeted to impaired driving. Grants such as these have been used to initiate and support offender treatment programs, and as such are of considerable interest to those managing offender treatment programs.

The requirements for §408 incentive grants were heavily oriented toward tougher sentencing and license suspension laws with more emphasis on enforcement and informing the public about such enforcement. The newer impaired driving incentive law §410 in addition to emphasizing the need for tough license suspension laws, does include the use of fines for remunerating a community's prevention campaign efforts. This facet had up to the time of the assessment not been in place long enough for analysis.

6. Are the offender evaluation and treatment programs effective?

The paradigm of the impaired driving program is that a large number of impaired drivers are out on the road, particularly on weekends. Only a small number of these are apprehended for impaired driving violations. Approximately 70 percent of those arrested are first offenders. Their licenses are suspended or revoked -- in accordance with the prevailing state law. The first offenders pay fees and go through school and possibly treatment and rehabilitation. After successful completion of their school/treatment or at some later time their licenses are reinstated.

The second, or multiple offenders get time and a fine and eventually also get their licenses back. The longest suspension period for the states assessed is 12 months, the shortest is no suspension at all for a first DWI offense.

In some states a revocation under a third offense will be for five or 10 years. In other states there is only a suspension for six months or a year after the third offense. The population that is subjected to this intervention is, however, very small. There have been very few recidivism studies. One of the states' research centers found that offenders attending school -- and who were eligible for limited driving privileges, and reinstatement after six months -- had a higher recidivism rate than those not attending school, and whose licenses were suspended for a year. The difference in the license penalty was found to be the basis for the difference in recidivism.

Although this was a single study -- conducted by one of the leading traffic safety research centers in the country -- it raises questions about the effectiveness of the school and treatment programs. The costs of these programs is substantial, averaging approximately $8 million per state (eight time more than the public information and education programs), or more than $100 per offender.

Often pointed out as an impaired driving reduction program that is self sufficient, it is in fact the only type of program that is usually fully self sufficient in the array of impaired driving reduction activities. It is also self sufficient by design due to legislative fee schedules. Its champions tend to be the associations of program coordinators discussed in 5. above.

There is one last factor and that is the potentially misleading perception that all impaired driving reduction programs are becoming self sufficient. As should be clear by now, this "trend" is only true for the DWI offender evaluation, school and treatment programs -- not for the public awareness or enforcement programs.

Conclusions

1. Public information and education programs for both the general public and for youth were begun with the support of federal safety grants. These grants continue to be critical for developing new and sustaining existing programs.

a. The programs have the potential for reaching the largest possible audience because they are supported by many volunteers, the print and electronic media, activist organizations, local communities and businesses.

b. The cost of campaigns, and special youth directed programs tends to be reasonable when viewed on a population or licensed driver basis, although the actual coverage -- people reached -- was not determined.

c. It is possible to expect matching funds from public and private sources for programs such as Project Graduation where there are specific risk groups involved.

2. The development of public information and education strategies, curricula, promotional materials, videos, and public service announcements by NHTSA using technical assistance funding created a very useful resource base for the states.

   a. States have used and/or adapted available education and information materials from NHTSA, and other states for their own use, thus saving development costs.

   b. Technical assistance (§403) grants were not used for development in the individual states because, as indicated above, such development was "centralized" at NHTSA.

3. Programs begun in one or more communities, or sites, were often replicated in other parts of a state or used statewide. This was common practice with most of the popular programs.

4. Incentive grant programs were instrumental in getting strengthened drinking and driving laws enacted. The emphasis on tougher penalties such as longer license suspension and revocation, law enforcement, and publicity about law enforcement, revived many faltering state drinking and driving reduction activities.

5. Despite widespread use of alcohol and drug education programs for first offenders there is a lack of evidence that these programs are effective. These programs are the only impaired driving programs that are self sufficient.

6. There is a potential for conflict between state or local offender evaluation and education programs and impaired driving awareness programs when both are directed or coordinated by the same staff.

OCCUPANT PROTECTION

The Programs

The occupant protection programs in this section cover all the activities that were, and still are, undertaken by the states and communities, and the federal government to promote and enforce the use of safety belts and child safety seat laws. For purposes of discussing the findings of the assessment, the programs are divided into "general" safety belt use and the more specific infant and child passenger protection programs.

The programs are driven by public information and education through special presentations and events, the distribution of brochures and promotional items, and enforcement, both in the "secondary law" and "primary law" states. Each of the states in the assessment had enacted mandatory safety belt use laws and child protection laws in the 1980's. Three of the states (Connecticut, New Mexico and North Carolina) had enacted primary laws. Fines ranged from $10 to $37.

Depending on the state legislation, the laws' coverage ranged from only the front seat occupants in a passenger car to all occupants in passenger cars, multi purpose vehicles, buses and trucks. For the states in the assessment, belt use laws were passed between 1985 and 1987.

The impetus for mandatory safety belt use laws can be traced to the automatic restraint regulation of 1984. An amended rule for Federal Motor Vehicle Safety Standard (FMVSS) 208 stated that if two-thirds of the U.S. population were covered by state mandatory safety belt laws, the automatic protection requirement for passenger cars could be lifted.

This prompted the U.S. auto industry to create a program called Traffic Safety Now (TSN) with activities in every state to promote the passage of state mandatory safety belt laws. Each such program was funded and staffed and operated until after the desired legislation was enacted. The TSN effort was highly successful and by 1993, 48 states, the District of Columbia and Puerto Rico had passed mandatory safety belt legislation. New Hampshire and Maine were the only exceptions.

Child passenger protection laws were enacted in the early 1980's, between 1982 and 1984 for the states in the assessment. Five of the states require safety seats for children under age four, two states under the age of five, and one state only requires children under the age of two be in a safety seat. There are various safety belts substitution allowances, depending on the state.

The main thrust of the child passenger protection program, in addition to the efforts to have strengthened laws enacted, was the promotion of the use of child restraints, the correct use of safety seats and loaner programs.

In addition, there were efforts to mobilize and encourage enforcement agencies to enforce both safety belt and child protection laws. All of the latter were mandatory laws with fines ranging from $10 up to $100 (in one state) for the states participating in the assessment.

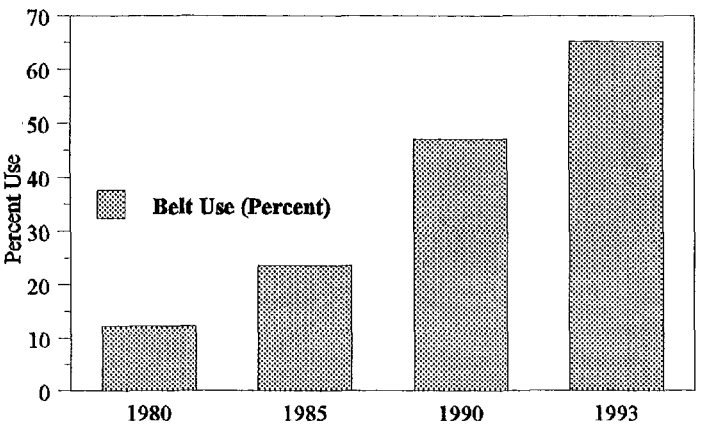
Safety Belt Information and Education - Findings

Overall Capability and Achievements

The effect of the safety belt use program -- both the efforts to have state legislatures enact a mandatory safety belt use law, and the promotion of that law can be seen in the following chart, Figure OP-1.

Figure OP-1

SAFETY BELT USE



The costs for the promotion of safety belt use would be even lower if calculated on a per capita basis -- three cents and 13 cents for 1980 and 1993, respectively. The difference in cost per capita between 1980 and 1993 seems to be only because of inflation.

This safety program has provided the most safety benefits -- and at one of the lowest costs for any safety program. The costs are, as described below, largely supported by safety grants.

Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

   Overall. All programs and activities were directed to the key effort of increasing the use of safety belts. The use of safety belts in the 1970's was estimated to range from 10 to 18 percent in the states participating in the assessment. Despite special vehicle regulations

and belt use promotion, drivers and passengers resisted belt systems even when confronted with evidence that the systems saved lives and reduced the severity of injuries.

The surge of state mandatory safety belt laws, motivated by the auto industry's response to the passive restraint regulation and a parallel effort by consumer organizations provided the basis for promotional campaigns. Of course, NHTSA was also encouraging these efforts.

Examples. One state enlisted the help of 1,800 Extension Homemaker Units whose grassroots network organized meetings around the state to plan the training of belt use campaign participants. More than 28,000 Extension members attended the meetings. The legislation of one of the states that had enacted a primary enforcement law in 1985 directed its Departments of Motor Vehicles and Public Instruction to incorporate an instruction segment to encourage compliance with the law into their driver education and driver licensing programs.

A belt use promotion campaign developed by the National Safety Council called "Make It Click" was adopted by one state together with the "101 Critical Days" campaign that ran from Memorial Day weekend through Labor Day. The first year, in 1981, more than 20,000 pledges to use safety belts were made. By 1993 the state was collecting more than 90,000 pledges. After mandatory safety belt legislation was passed in the state in 1984, county student DWI task forces were provided with safety belt brochures for distribution at events.

Faced with unacceptable levels of economic loss as a result of fatal and injury crashes, one of the states analyzed its crash data and discovered that 84 percent of all drivers involved in crashes were unrestrained. Ninety-seven percent of the persons killed were unrestrained. Extensive public education programs were launched in 1980 when 300 billboards promoted belt use. Radio, TV spots, exhibits and spokespersons were subsequently used to enlarge the program to wider audiences.

At the beginning of the 1980's another state established the position of Seat Belt Coordinator to plan and develop belt use promotion programs. The state bought a Seat Belt Convincer and adopted another state's "We Need You - Buckle Up" campaign. A survey of all municipalities found only an 11.7 percent use rate among adult drivers in 1984. A second convincer was acquired in 1986 after the state had enacted a primary safety belt use law that year.

One state had to overcome public apathy towards safety belts after a survey showed that safety belts ranked 10th out of 14 safety countermeasures, and that a mandatory belt use law ranked 12th out of 12 safety actions listed in the survey. That state did pass a belt use law in 1987 after which the use rate climbed to 42 percent.

2. *Did initial Federal grants create new programs?*

Overall. In the 1980's and early 1990's most safety belt use programs and campaigns were created and sustained with the help of safety grants. Program and funding support was provided by the Traffic Safety Now coalitions that began in 1984, but most of which were no longer in existence by the late 1980's.

Examples. After a finding that less than 10 percent of drivers were using safety belts, one of the larger states in the assessment developed a comprehensive belt use program during 1979. The program was tried out in the south-central part of the state with grant support of $74,000. By the latter 1980's the state had organized into regional comprehensive programs where safety belt use promotion was integrated into the safety activities. As a start, two counties within the comprehensive programs received grants to conduct a combination of safety belt use, pedestrian and motorcycle safety campaign supported with a grant of $100,000 for each county.

The participation of Extension Homemaker Units for a safety belt use campaign in the state, as referred to in 1. above, was funded with safety grants ranging from $150,000 to $200,000 a year under a contract between the state's transportation department and the Extension Service in the state.

Promoting the use of safety belts through networks within the public health system was a technique adopted by states. One state used safety funds to award mini grants to local public health departments in combination safety belt and child restraint use promotion activities. In the early 1990's this state used grants under the §153 incentive program to award mini grants to local police departments for the enforcement of its "primary" safety belt use law.

Another state used grants received from NHTSA's Occupant Protection special Traffic Enforcement Program (OPSTEP), under which six states were awarded grant funds in 1994, to support preventive educational programs to increase safety belt use.

A Restraint Systems Coordinator who conducted workshops to insure the proper dissemination of information, use of curriculum materials and the "convincer" was hired in 1980 in one state. The position was supported with a grant of $80,000. A few years later after the enactment of a mandatory safety belt law in 1984, and the active participation of Traffic Safety Now, the state's traffic safety office provided expanded technical assistance to more than 80 corporate safety belt programs.

The Model Safety Belt Community program that began operations in 1985 in one of the states was supported with safety grants and a statewide public information campaign that started that year and continued in 1986 was funded with a grant of $155,000. By the end of 1986, the state's belt use rate was 70 percent. Another state distributed 10,000 "Say

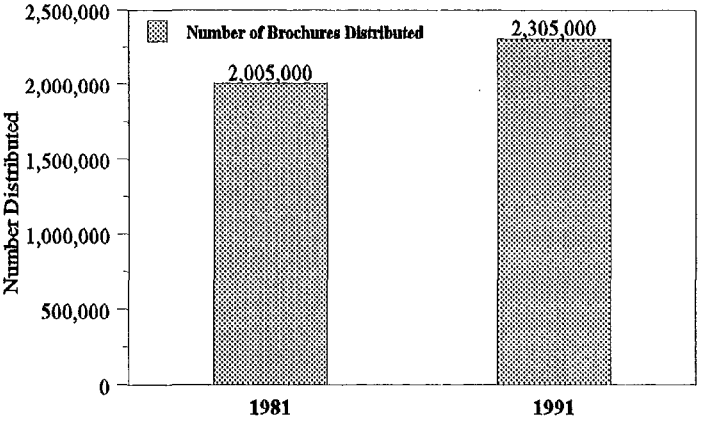
Yes to Seat Belts," 5,000 "Safety Belt Fact Sheets," and 10,000 "Fairy Tales" brochures in 1986 in a program that was supported with a grant of $29,000.

In the early 1990's "train-the-trainer" programs were established. In one state 544 instructors were graduated by 1992 and more than 120,000 people had attended presentations by the trainers.

The magnitude of the promotional program can be shown by the number of brochures and related materials that were distributed to the public. Figure OP-2 below, is based on data from seven states.

Figure OP-2

DISTRIBUTION OF SAFETY BELT MATERIALS



Both the quantity and coverage increased substantially after passage of safety belt use laws in the mid 1980's.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. More than 60 percent of the costs of safety belt use programs were funded with safety grants in 1993. States were successful in getting corporations involved in providing safety belt incentive programs for their employees, and volunteers played an active role in distributing promotional materials and making safety belt use presentations.

Examples. One of the states used the incentive program developed by a corporation to get other businesses involved. The program had achieved a 90 percent use rate by offering financial rewards to employees. The kickoff for the program began in one of the state's counties in 1984.

As previously mentioned, the Traffic Safety Now coalitions undertook programs to promote the enactment of state mandatory safety belt use laws. In each of the states, the TSN coalition created task forces of enforcement personnel, physicians, safety advocates, and others interested in traffic safety. Workshops were held and an array of PI&E materials and items were distributed. The coalitions spent between $100,000 and $300,000 a year in most states. This included the salary of a coordinator.

All the states used volunteers to distribute materials and provide presentations to schools, and civic organizations. Estimates of between $200,000 and $500,000 that represented the effort's financial equivalent were made in one state. Organizations such as Women for Highway Safety, the Federation of Women's Clubs and Cooperative Extension programs in the states participated in the volunteer activities. Some donations were made, several "convincers" were provided in this way.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. The promotion of safety belt use was primarily a statewide effort directed by the state's traffic safety office and during the mid 1980's encouraged by the Traffic Safety Now coalitions in each state. Several corporate incentive programs, and some county and regional safety belt use programs were started in a limited number of areas, but eventually spread statewide. The state programs were also part of the national campaigns such as "Operation Buckle Down."

Examples. Most of the states were able to extend the corporate incentive programs to other areas of a state once these had shown to increase safety belt use. The same was true of the comprehensive county safety belt programs, where in one large state the program grew to 16 counties between 1985 to 1987. In another state the model seat belt communities formed in the mid 1980's eventually became comprehensive regional traffic safety programs in the late 1980's and belt use promotion was taken on by localities in the regions.

One of the State's Association of Women's Highway Safety leaders, with the support of a safety grant, began a safety belt promotion program that had by the late 1980's led to contacts with most of the state's populations.

The Extension Homemaker program in another state was replicated statewide and joined by the efforts of nearly 1,000 4-H clubs involving 24,000 members. The Traffic Safety Now coalitions also began slowly, but soon expanded their efforts statewide. In one state, from 1985 to 1990, they had made 13,800 film presentations to 800,000 people and had handed out 2 million educational brochures.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. The development of safety belt use surveys using probability techniques allowed more accurate measurements of safety belt use. This process was funded with technical assistance grants. The main uses of such grants were for demonstrating the value of safety belts to enforcement organizations and to convince them to enforce the safety belt use laws.

Examples. A research center in one of the states undertook a multi-year demonstration project funded with §403 technical assistance grants to attempt to convince local police officers of the importance of wearing safety belts and the enforcement of belt use laws. The project included the production of "A Guidebook for Law Enforcement Agencies -- April 1991." The Guidebook presented a road map for implementing occupant protection programs that would be appropriate for any community.

Another state received a technical assistance grant of $126,000 in 1987, three years after that state had enacted a mandatory (secondary enforcement) law and a similar grant was awarded to conduct a statewide survey of safety belt use. Technical assistance grants were also used to establish the position of a safety belt law enforcement spokesperson -- $45,000 in 1991 and $50,000 in 1992 in one of the states. The objective of these grants was to couple PI&E initiatives with enforcement efforts.

One of the larger states participating in the assessment received a technical assistance grant in 1985 to compare the effects of paid ads used in one county with available standard public service announcements in another county. The result showed that "low budget" media blitzes were as good as high priced ads. In the same year the state also received a technical assistance grant to produce the film "Do You Buckle Up."

The belt use survey techniques involving probability sampling were developed by NHTSA. The process was tested in the states of New York and New Jersey with technical assistance support. Later applications in other states benefitted from these earlier demonstrations.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. Without federal safety grants there would be no substantive programs to promote the use of safety belts in many of the states.

Discussion. As noted previously, more than 60 percent (in 1993) of the safety belt use program costs are supported with safety grants. The range of support is from 20 to 98 percent depending on the state. Although there were volunteers from many agencies and

communities that supported and actively worked to promote the use of safety belts, the bulk of the effort was supported with federal funds.

The Traffic Safety Now coalitions in the states made substantial contributions promoting the enactment of safety belt use laws and spending funds for their staff salaries and the production and distribution of promotional materials and items. That, however, was in the years 1984 through 1989, and no further such funding has appeared in the states since then -- although General Motors has launched a funding program for traffic safety in more recent years.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. There was more monitoring in terms of conducting safety belt use surveys than in most other programs. The chart showing belt use rates was presented at the top of this section and depicts the substantial progress that was made since the very low use rates of the late 1970's and early 1980's. There were, however, no evaluations to find out if specific programs contributed to raising safety belt use.

Discussion. The survey techniques that were developed for the first states that enacted mandatory safety belt laws were used in most of the other states that subsequently passed such laws. A NHTSA advisory committee reviewed the proposed survey designs of the states, made suggestions and monitored the process.

One such state using the NHTSA's contractor developed methods of multi stage probability samples of road segments, established 1,405 observation sites in 30 counties. The initial baseline safety belt use was found to be between 45 and 48 percent in 1988. A similar survey in 1989 showed a 50.4 percent belt use rate, and by the Fall of 1993 the rate of use was observed to be 68 percent.

Observational sampling of 13 communities in another state yielded a use rate of 70.3 percent in 1992. The surveys in several states showed that use rates jumped substantially in urban areas, but less so in rural areas after the passage of a mandatory safety belt law. Both rates began to level off or even recede after a period of time, but most of the states could point to a use rate approaching or exceeding 70 percent by 1993.

Safety belt law violation data were available from some of the states. These data are shown in Table OP-1 below, for each of seven states. The data are a combination of safety belt and child protection law citations. As can be seen the relative emphasis on enforcement varies considerably (It has little correlation with the size of the state).

Table OP-1
Number of Safety Belt and Child Protection Law Violations Cited
(Citation Data from Seven States)

State	1989	1990	1991	1992	1993
1	2,604	1,767	2,128	3,486	3,689
2			27,000	42,800	41,400
3*		239,000	297,000	354,900	412,800
4	90,000	120,000	180,000	212,000	
5	8,500	9,600	15,000		
6	216,500	172,100	161,100	89,400	
7	13,863	14,388	13,582	19,375	23,212

* Primary law state

An evaluation of the mandatory safety belt law's effectiveness was carried out by a university center in one state. One conclusion was that there was a statistically significant reduction of 12 percent in fatalities among those covered by the law in the first three months after enactment of the law.

Infant and Child Safety Protection - Findings

Overall Capability and Achievements

All states had by 1985 enacted mandatory child passenger protection laws. These laws reemphasized the need to address a serious problem. In many cases the laws and the eight percent safety grant set asides invigorated state programs by expanding loaner projects and generating volunteer support for presentations and material distribution as well as operating the loaner programs.

There was a trend toward self sufficiency in the loaner programs -- three states were close to self sufficiency, six used matching grants and only one still depended on full grant funding for safety seats. Data, though incomplete, on safety seat use by infants and toddlers, based on observations are shown in Table OP-2.

Table OP-2
Child Restraint Use - Percent

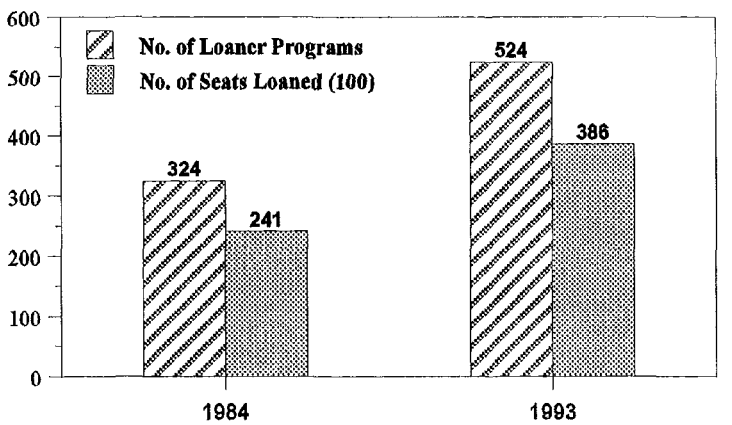
State No.	1983	1985	1987	1991	1993
1 Infants	21	60	80	80	
2 Infants/Toddlers		20	25	54	
3 Infants	25	62	86	88	
4 Infants Toddlers		89 39	Comb. 74		
5 Infants Toddlers		51 29	57 36		96 43
6 Infants/Toddlers		Comb. 40	Comb. 68		Comb. 58
7 Infant/Toddlers	25	38	39	62.5	62.5

Substantial gains in use have been made with infant safety seat use far out pacing the use of restraints by toddlers.

A companion measure and one of the contributing factors toward the use of child safety seats is the number of loaner programs and the number of seats loaned. Figure OP-3 shows these data for four states in 1983 and in 1993.

Figure OP-3

The LOANER SEAT PROGRAM



Although the detailed data are available for only a limited number of states, the programmatic findings do indicate that similar trends prevail in the other states.

Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. All the projects and programs were developed on the basis of problems identified by the states as well as nationally. Problems such as the failure to place and properly secure infants and children in safety seats were early concerns in every state. All states enacted child protection laws, all effective between 1982 and 1984 for the states participating in this assessment. The programs included K-6 educational curriculum development, special feature videos, mascots, print and picture materials and items, safety seat loaner programs and proper use training for providers and parents.

Examples. States began loaner programs in the 1970's. One state began a loaner program in two counties and provided 10,000 child safety seats in 1979. A Child Passenger Safety Act was enacted in the state in 1983 and began with warnings for a year and was followed by citations and fines of $25. Another state began its loaner program earlier, in 1978 and enacted a child restraint statute in 1981. The state developed a K-6 safety curriculum and produced a video program featuring Safety SAM (Safety Always Matters).

One state conducted an observational survey in 1982 that showed a child restraint use rate of 24.3 percent. On the basis of this finding the state legislature enacted a mandatory child passenger restraint law. It was a "secondary" law for children under five years old, that was strengthen in 1985 to become a "primary" law for children under 11 years old.

The Beltman program was used by the states and thousands of Beltman kits were distributed to elementary schools in the late 1970's and 1980. One state used its educational improvement centers as the distributing agencies for the Beltman kits, not only to schools, but also to hospitals and health maintenance organizations. A number of states held statewide child passenger safety conferences and developed multi-year plans after the initial child safety programs of the late 1970's and early 1980's had been completed. Other special brochures were "Safe Sally," and "Magic Click."

Some states began their loaner programs under the sponsorship or direction of private, non profit agencies. One state used the services of the United Cerebral Palsy organization, and another program was directed by a hospital association and a young women's service organization ran the program in a third state. There were state operated program as well, one operated by a state welfare division for low-income households.

In the latter 1980's child protection programs were integrated into the Comprehensive Traffic Safety Programs (CTSPs). Promotional and educational materials were developed

and produced under the auspices of the state's traffic safety offices, but often under contracts with support organizations that supplied the materials to agencies statewide.

2. *Did initial Federal grants create new programs?*

Overall. All the programs and projects were begun and continued with the support of safety grants. The federal set aside requirement of at least 8 percent of a state's grant funds for child protection programs ($55 million over three years for the 10 states in the assessment) focused attention on the key needs such as loaner seats and instruction on how to properly use the seats.

Examples. Multi media "Adventures of Beltman" packages were purchased with a grant of $170,000 by one state in 1981. The pilot loaner programs in that state were grant funded with $75,000 that year. The state also contracted with the state chapter of the American Academy of Pediatrics to provide public education on child passenger safety issues, correct use awareness, and compliance with the child passenger protection law. Safety grants were used to fund the contract.

Earlier, in 1977, the state with the educational improvement centers used a safety grant of $100,000 to funds its Beltman program. After that state's hospital association took over the coordination of all infant and child restraint hospital projects in 1986, the effort was supported with a safety grant of $145,000 that year.

It should be noted that the U.S. Surface Transportation Act of 1984 provided that in fiscal years 1985 and 1986 each state set aside at least 8 percent of their grant funds for developing and implementing comprehensive child restraint programs. These funds amounted to $1.8 million in 1985 and a like amount in 1986 for the 10 states participating in the assessment. The amount for 1987 was more than $1.9 million. A substantial portion of these funds were used to buy child safety seats for the loaner programs.

Several states used safety grants to develop educational materials that physicians could use to educate parents of young children. Other states made materials available to social service agencies for the same purpose. These projects were funded with safety grants.

The United Cerebral Palsy loaner project in one of the states mentioned previously, was supported with a grant of $16,000 in 1983. Six hundred infant/child safety seats were purchased for the project. The Welfare Division project in the same state was begun with a grant of $105,000 in 1993 for the purchase of safety seats and for providing instructional classes on how to properly use the seats.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. Volunteers in each of the states in the assessment provided varying degrees of support. Volunteer organizations operated loaner programs and conducted safety seat use promotion activities throughout states. Grants remained the main source of support for the information and education part of the programs. There was a trend toward self sufficiency in the loaner programs -- three were close to self sufficiency, five used matching grants and one was still dependent on full grant funding for safety seats.

Examples. Organizations such as the state Women's Highway Safety Leaders sponsored and carried out programs in schools using NHTSA's "Occupant Restraint Audio-Visual Package" in one state that also contributed $25,000 to a $125,000 grant for the purchase of child safety seats in 1985. Volunteers in several states also presented safety lessons to pre schoolers featuring "Bucklebear."

One of the states established a safety seat recycling program wherein reduced cost rentals were recycled after the first child had outgrown its use. The seats would then be rented out to generate revenue to continue the program. The state's loaner program eventually became self sufficient after initial federal funding ended. Grant funds were, however, still used to support the public information and education activities.

Corporate contributions toward loaner seat purchases and parent education, and local and state matching funds (using safety grants) for safety seat purchases were part of the child protection programs in several of the states. Loaner programs in three of the states appeared to be close to self sufficiency. Another three worked with matching funds and one continued to rely on safety grants for its safety seat purchases.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. Child protection programs that were piloted at one or more sites usually spread statewide. The programs were replicated in their entirety. Special child education programs such as Beltman, were distributed to all school districts in most states. States tended to develop or adapt educational materials under contract and then distribute these to regional or district educational facilities. The loaner programs are the prime example of child safety protection projects that quickly spread throughout the state.

Examples. One state that began pilot loaner seat programs in two of its counties in 1981 expanded rapidly to 50 programs at the end of 1982. The statewide child restraint loaner program was by then known as Project KISS (Kids in Safety Seats). By 1984 there were

77 loaner programs run by volunteers and by the early 1990's loaner safety seats were available to every child in the state.

The advent of Comprehensive Traffic Safety Programs that were established as regional operations covering the whole state also incorporated public information and education materials on the subject of child safety -- materials that were developed and distributed under a contract with the state's chapter of the American Association of Pediatrics.

When a Child Passenger Protection Law was enacted in 1984 in one of the states there were 70 loaner programs. Together with extensive promotion - - 30,000 brochures, 500 posters -- and related efforts, there were 108 loaner programs with 5,000 safety seats by the end of 1984. The following year there were 114 loaner programs with at least one in each of the state's counties.

The state that used educational improvement centers and had in the late 1970's tested the Beltman program reported that by 1982, twenty-nine hospitals were using the program. The pre school and K-6 education programs such as Bucklebear and Beltman were begun as pilot programs and quickly spread statewide in most of the states. One state that piloted Bucklebear had established it in 65 communities by 1988. This state also conducted a child passenger safety training workshop in 1993 that created a statewide network of child safety restraint advocates.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. Available NHTSA developed concepts and program materials were used extensively. There were also adaptations of programs developed and used in other states. Generally, very little technical assistance funding was awarded directly to the states.

Examples. A research firm in one of the states was awarded two contracts that were funded under the technical assistance (§403) grant program. One study funded for $188,000 in 1989 sought the effects of the combination of PI&E and enforcement on child restraint use. The study concluded that periodic information and enforcement blitzes tended to increase such use. The other study awarded in 1993 for $165,500 was to examine patterns of the misuse of child safety seats. A third study in this state, also funded with a technical assistance grant, focused on the effectiveness of belts on school buses in a large school district.

One other state received a technical assistance grant for the enforcement of the child passenger law in one of its municipalities. All of the states in the assessment used materials, curricula and related materials -- most developed by NHTSA with technical assistance funds.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. It is clear that federal grants represent a very substantial source of funding for child restraint programs. Without federal grants the child safety seat use programs -- particularly those for public information and education -- would lapse.

Discussion. Several of the loaner programs were heading toward self sufficiency and were run by volunteers. One of the states has a designated funding law where fines for violating the child protection law are to be used to purchase child safety seats. The range of grant support is from 50 percent to more than 90 percent for the states participating in the assessment.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. The states did monitor use rate trends -- at least several of them did, and kept track of loaner programs and the number of child safety seats that were loaned. These results, though only based on limited data were shown at the beginning of this section.

Discussion. The study cited in Assessment Criterion 5 above concluded that combinations of public information and enforcement contributed to increases in child safety seat use. Selected data from the states were available on the distribution of public information and education materials. Enforcement data were presented in the previous section.

Table OP-3 below shows the general levels and trends of these data. Data from seven states are shown.

Table OP-3
Child Safety Seat Programs the Distribution of Materials

State No.	1981	1983	1985	1987	1989
1	460,000			1,000,000	
2	51,000				
3	36,000			175,000	165,000
4	5,000	2,000	15,000		50,000
5				14,000	13,000
6	10,000				
7		35,000	100,000		

The general trend that can be discerned from the limited data do indicate increases in the effort to inform and educate the public, particularly parents, about the value of using child safety seats.

One state completed an evaluation of its 1983 child protection law in 1985. The findings were that unrestrained children in the under five years of age group were five times more likely to be killed and twice as likely to be injured than unrestrained children.

Discussion of Issues

1. Why do public information and education programs require such a high percentage of grant support?

The total costs of the safety belt and child protection programs were over $7 million for nine states in 1993. The average grant represented 70 percent of the total costs in 1993. In the early days (1960's and 1970's) the number of information and education programs to promote the use of safety belts and child restraints was small. They were up against widespread public resistance. Although the protection of infants and children began to appeal to parents, the use of safety belts by adults faced considerable opposition.

The idea of mandatory belt use laws was dismissed as unobtainable in the early 1970's, although the U.S. Congress passed a "Sense of Congress" resolution on the subject. The Australian experience in the 1970's spawned interest. European countries, notably England, passed such laws and compliance was ranked at more than 90 percent among motorists in the United Kingdom.

Only after the passive restraint regulation was amended in 1984 (the contents of which were presented earlier in this section on Occupant Protection) was there a concerted effort to create wide ranging programs for adult belt use. Child protection laws had been enacted in the early 1980's and programs for their use had begun earlier.

There were, and still are, no institutionalized agencies or organizations that are established to concern themselves with promoting the use of safety belts, other than NHTSA and the state traffic safety offices. The suppliers of the systems meet the demand of auto manufacturers who comply with federal regulations. Only the mid to late 1980's effort -- Traffic Safety Now -- represented this single safety measure, but the activity ended when states had enacted mandatory belt use laws.

Unlike the evolving and growing organizations to combat drinking and drugged driving such as MADD, the institutionalization of safety belt use programs with organized means of collecting resources has yet to be accomplished.

The safety grant for public information and education programs are, however, relatively small, consuming between 10 and 20 percent of the safety grants in 1993. From the total safety related program cost standpoint, occupant protection costs are less than one-half of one percent. If the value of a life is $2.7 million, only two lives would have to be saved by a safety belt to equal the program cost.

2. What did it take to reach the various use rates and what might this portend for achieving even higher use rates? What kind of belt use levels may be possible given the current level of effort?

During the early 1990's many states reported achieving belt use rates of 70 percent or more. Belt use laws and the promotion of belt use were the major contributing factors to this achievement. An analysis of costs and the percentage increase of belt use over two time periods is shown in the Table OP-4 below.

Table OP-4
Costs Associated with Each 1 Percent Increase in Safety Belt Use for Two Time Periods

Data from Six States	1984-1988	1989-1993
Weighted Average Cost per State per one percent increase	$82,000	$179,000
Weighted Average Percentage Increase in Safety Belt Use per State	33.5	21.8

States spent more than twice as much in the 1989 to 1993 period to raise the belt use rate a single percentage point, than they did in the 1984 through 1988 time period. This is probably a conservative estimate since one of the states was unable to bring its safety belt use rate back up to the nearly 64 percent that it had achieved in 1988 -- after which it had dropped to below 60 percent.

The cost to raise the belt use rate from 67 to 81 percent in future years (1998), might escalate to $400,000 for every 1 percent increase -- or an average of $6 million per state over a five year period which is twice the amount spent for current five year periods. These projections are conservative, since they are based on "straight line" projections.

These assumptions and projections are based on historical expenditures and belt use rate data and do not fully account for the increasing difficulties of getting the "hard core" belt use resistors to buckle up.

3. Which institutions, industries and organizations should form the basis for the long term support of safety belt and child restraint use programs?

NHTSA and the state safety organizations are not the only parties with a stake in increasing belt use. The benefits of restraint use have accrued to many sectors of society. The automobile insurance industry is a beneficiary, and so are the automobile manufacturing and supplier industries. The former may have reluctantly entered the safety device business, but have reaped benefits through safety advertising and the typical profits from sales. The same is true for child safety seat manufacturers and distributors.

Medical coverage services such as the health maintenance organizations and fee for service organizations insurance companies tend to benefit as well, particularly over the long term.

On a broader level, any and all businesses benefit from increased safety belt use (and this has been recognized as some of the larger industries have instituted belt use programs). There have been extensive NHTSA and state safety agency initiatives to establish program networks involving private businesses though with mixed success (Networks of Employers for Traffic Safety -- NETS) .

The successful effort to support the enactment of safety belt use laws by the Traffic Safety Now coalitions established by the automobile manufacturers in the mid 1980's has already been mentioned, as has a more recent initiative by General Motors to help fund state safety programs.

At a glance, there are substantial resources that could be tapped. For example, assuming that the automobile manufacturing industry earns $10 billion a year, a $10 million support program (one-tenth of one percent) would amount to $200,000 for an average State a year.

Impaired driving programs have gotten attention for funding. There are the alcohol incentive grants given for, example under §410, state initiatives that establish a fund based on set asides from fines. Although there are incentives under §153, they are of relatively short term duration.

As a safety measure that has a major life saving and injury reduction potential and that is one of the least costly to deploy, it is baffling that no long term public/private resource institutions, other than government resources, have been established.

Conclusions

1. The safety belt use program has been a considerable success, regardless of how this was achieved. The program is probably the "best bang for the buck!" in the arsenal of traffic safety programs. Yet most costs are still grant funded.

2. Safety belt and child restraint use programs have to continue so that the very young will be introduced to safety protection right from the start. It can probably be said that these programs have to continue in perpetuity. More dollars for each percentage increase in safety belt use will probably be needed to reach current and future use rate targets.

3. Low toddler safety seat use is a problem in some states. Continuation of loaner programs, and correct use instruction remain important activities that should be replicated throughout each state.

4. Federal leadership -- and support -- remains critical since there are no State or local agencies (other than the state safety office) that cover this safety area as part of their operating responsibilities. The only organizations involved are the Pediatric, Trauma and Head Injury associations. Much of their work is grant supported.

COMPREHENSIVE TRAFFIC SAFETY PROGRAMS

The Programs

With the encouragement of NHTSA, and also as a natural extension of state safety program management, "Comprehensive" Traffic Safety Programs (CTSPs) began to form in the mid 1980's. They were also known as Comprehensive Highway Safety Programs (CHSPs) and by other very similar titles.

Mostly growing out of occupant protection or impaired driving programs, the idea behind "Comprehensive" programs was to combine prevention, enforcement and treatment activities to achieve a degree of synergism and to create regional, county or area management structures.

The expansion into the "Comprehensive" form was essentially established by 1987/1988 in those states that opted for this approach. Initially the focus was on either occupant protection or impaired driving, but that soon also involved DWI enforcement, motorcycle, bicycle and pedestrian safety.

Regional, county or municipal area coordinators managed the program and were, in a number of states, supported by centrally grant funded organizations that supplied PI&E materials and provided technical assistance. Some comprehensive programs began as "model" or "pilot" projects. One state also developed a special concept known as a "corridor" program that functioned along an established roadway segment and concentrated on carrying out several types of safety activities. It will be covered under the section on Police Traffic Services.

Comprehensive Traffic Safety Programs - Findings

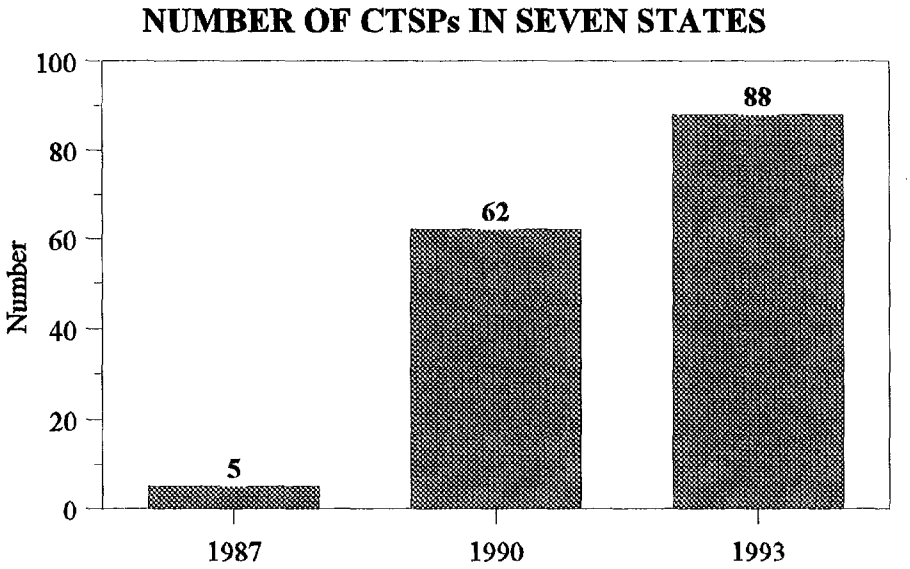
Overall Capability and Achievement

The objective of creating comprehensive traffic safety programs that encompassed the range of safety problem areas was achieved by seven of ten states. More than one-fifth of an average state's safety grants were allocated to CTSPs. In one of the states the CTSPs covered the entire state. In others the coverage involved several counties or municipalities. By combining the various safety program areas, economies of scale were achieved, by for example, making it possible for one source to supply the same materials to many, or all, parts of a state.

The most important capability was the ability to address regional safety problems, to reach more citizens and to gain resource support from local governments, communities and the private sector. The integration of programs also allowed better planning of projects toward key problem areas and better budget decisions about the level of necessary program support.

The growth in the number of CTSPs in the states that established such programs is shown in Figure CTS-1.

Figure CTS-1



Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

   Overall. The concept of Comprehensive Traffic Safety Programs (CTSPs) emerged from the experience gained operating separate programs in impaired driving, occupant protection, motorcycle, pedestrian and bicycle safety, and law enforcement. The CTSPs integrated the objectives of the separate programs and combined operations not only to bring about a broader local community involvement, but also to offer economies of scale and increase program effectiveness.

   Among the ten states covered in this report, seven states had established CTSPs. The population coverage varied depending on the period of time and the way such programs were structured. In one case the CTSPs covered approximately 7 percent of the population, in another the whole state was part of a regional CTSP structure. The content of the CTSPs also varied, with some focusing primarily on impaired driving, and others offering the full range of safety programs.

   Examples. One of the states participating in the assessment had suggested an approach to CTSPs in the late 1970's. By that time the problem identification process was to be

used to select 50 of the 250 highest accident ranked municipalities and to solicit their participation in a comprehensive safety program in 1980. The program was delayed due to budget and personnel freezes. The idea reemerged in the mid 1980's and plans for safety belt and child restraint, motorcycle and pedestrian safety programs were prepared.

By 1990, the state had 12 regional CTSPs that provided a public awareness program within a campaign directed by the state's traffic safety office. Using posters, pamphlets, videos, coloring books and stickers, the program addressed belt and child restraint use, motorcycle, bicycle and pedestrian safety. Between 1990 and 1993 nearly 3,000 safety events and presentations were held each year. These reached up to one million people in the state.

Operation "Buckle Down" in 1993 involved the then 19 CTSPs in the same state. The regional CTSPs distributed the "Summer Bummer" poster, the "Belts and Bags" brochure, the "Sudden Impact" book, the "Safety in the Balance" video as well as buttons and bumper stickers.

Another state began a pilot "comprehensive" program in 1987 that was managed by a city police department. The focus was on raising safety awareness in every traffic safety priority area. An all volunteer safety commission, that drew its membership from every traffic safety concerned organization in the area, was established as part of the program.

Since the purposes of comprehensive programs were quite clear -- to integrate a range of safety programs toward a common objective -- different management structures were introduced depending on the problems that needed to be addressed. One of the states developed CTSPs under the direction of county enforcement agencies and also under the management of hospital trauma centers. The emphasis varied in that one approach focused on enforcement and the other on injury prevention.

2. *Did initial Federal grants create new programs?*

Overall. Every CTSP began with the support of federal safety grants and incentive grants, where available. Incentive grants were also used to fund impaired driving, occupant protection and helmet use projects. Many CTSPs were expansions from model or other specific (impaired driving and occupant protection) programs. Grants usually covered salaries, benefits, travel and administrative support. PI&E material development, production and distribution was also grant funded within the local CTSP and/or through the state traffic safety office.

Examples. In order to service the many regional CTSPs in one of the larger states, the state's traffic safety office contracted with a chapter of the American Academy of Pediatrics to develop and distribute a series of informational and educational materials on bicycle, pedestrian, and school bus safety, and underage drinking and driving for the

developing CTSPs. This was fully safety grant funded. One major project that was developed by the contractor involved traffic safety calendars -- one for elementary schools and the other for secondary schools. The calendars featured monthly safety topics for presentation and activities for the children.

In addition safety grants were awarded to the CTSPs to cover salaries, fringe benefits, travel, equipment, computers, rent, mini grants and other supporting costs. In 1989, more than $1.8 million in federal safety grants were used to support the CTSPs. By the early 1990's the annual safety grants averaged $2.8 million for 19 CTSPs. A technical assistance contract to coordinate the work of volunteers was also part of the safety grant funded management in support of the regional CTSPs in the state. Later, in the early 1990's more than $700,000 under the §153 Occupant Protection/Helmet Use incentive grant were allocated to projects in the CTSPs.

The state that used both an enforcement and a trauma center management system -- it was mentioned in item 1-- allocated safety grant funds to each of its six CTSPs, beginning in 1987.

Another, smaller state, that operated four CTSPs that had expanded from its model safety belt communities, initially funded each the programs with an average of $40,000 a year in the mid 1980's. The state received a safety grant of more than $95,000 for child passenger protection in 1985 and used for this purpose in three of the CTSP programs that followed in the ensuing years. With the addition of the bicycle helmet law (for children under 12) promotion, Standard Field Sobriety Test training and "Prom Promise" assemblies that were part of the CTSPs, $223,000 in safety grants were used in 1993.

The establishment of several regional traffic safety offices in one of the states enabled the state traffic safety office to bring CTSP management closer to local communities. The initial CTSP, previously mentioned as directed by a city enforcement agency and including a 50-member traffic safety commission, as well as the eight CTSPs that followed, were safety grant funded, some in part, other fully at least for their first three years. Typical grants averaged $75,000 a year. Alcohol incentive grants (§408) were also made available to 11 county alcoholism centers in the state.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. Volunteer and in-kind participation by states, communities and private entities was available to the CTSPs, but only some of the states were able to gain partial funding support. The cost of CTSPs is approximately 23 cents per capita (1993) a year. CTSP grant funding represented just over 20 percent of all a state's safety grants in the early 1990.

Examples. Most of the state examples described so far had a volunteer program that covered the distribution of education and information materials. One of the larger states had contracted with an organization to coordinate the volunteers and to provide technical assistance. The coordinating agency was safety grant funded, but the volunteers obviously were not.

Comprehensive traffic safety programs were established in Indian Nation areas in one of the states. The program included efforts to reduce drinking and driving, improving child restraint use, and bicycle and pedestrian safety. The Indian Nation provided more than one-half of the program funding in 1994.

Another state, the one that established several local traffic safety offices, created these with safety grants and matching county funds. In one instance the safety office received $76,700 in federal safety grants and the county contributed $104,190 in 1990. Two of six CTSPs operating in 1991 did not receive grant support and it was expected that this type of program, with modifications, would continue through county and/or local support since it was viewed as a successful approach in addressing local problems.

Based on the cost of the CTSPs in the states, the cost per person was 23 cents in 1993. Such costs can only be estimated when a known population is covered by a CTSP or when the whole state is served by regional CTSPs.

Table CTS-1 below, shows the amount of safety grant funds used to support CTSPs in selected years, and the portion of total state grants (including incentive grants), that this represented.

Table CTS-1
Safety Grant Funding for CTSPs

	1987 (2 States)	1990 (4 States)	1993 (5 States)
Safety Grants for CTSPs ($1,000)	40	2,673	3,994
Safety Grants for CTSPs as a Percentage of Total State Grant Funds (%)	.34	20.1	23.6

The amounts of state, local and private funding, based on data for only two states in 1993 amounted to approximately $360,000 or 30 percent of what these two states spent for their CTSPs. The third and fourth of the four states included in 1990 and 1993 in the table above had only in-kind and volunteer time contributions to their CTSP program. The fifth state in 1993 received funding from outside agencies.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. The very creation of CTSPs responds fully to the "catalytic effect" criterion that asks whether projects begun at one or more sites were replicated elsewhere in their original or in an adapted form. All the CTSPs emerged from single safety area programs or were developed with multiple safety objectives. In the states that opted for CTSPs, replication took place. In some cases the spread of the programs eventually covered all or much of the state. In other cases CTSPs were spotted around the state, usually on the basis for what was considered their best effect and, importantly, the reception by the local communities.

Examples. The state that eventually operated 19 regional CTSPs, began the program with 12 in 1987. This particular structure enabled the state to create an effective statewide regional organization that could respond to local issues as well as represent the statewide program.

Another state started its CTSP activities with one pilot project and by 1993 there were nine CTSPs. All of the states that shifted to the CTSP approach in the late 1980's replicated their pilot or model programs in other areas of the state.

In the course of development, CTSPs took on a variety of activities in addition to impaired driving, occupant protection, motorcycle, pedestrian and bicycle safety programs. They expanded into special prevention/enforcement projects such as sobriety checkpoints and liaison with program such as SAFE KIDS.

One of the states began its CTSP activities in one area calling it a model safety community. In 1986 it was recognized by NHTSA as a "noteworthy project" and it was expanded in 1987 to include a wider range of safety areas. At one point its jurisdiction was broadened to include 47 municipalities. Several other CTSPs in that state were enlarged in the same way and eventually also included sobriety checkpoint operations.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. While not ascribed to CTSPs specifically, most technical assistance grants were used by NHTSA and the states to develop many of the programs used to operate a CTSP.

Examples. There were a number of technical assistance or demonstration grants awarded to states that while carried out under the CTSP structure were for specific traffic safety areas. One state received more than $500,000 to demonstrate adult safety belt and child safety seat programs in 1985/1986. To implement the project, the state traffic safety office established a regional program organization. In conjunction with this project comprehensive county programs for pedestrian safety were proposed in 1986.

Impaired driving PI&E materials were funded with technical assistance funds of $84,200 during those years. In the 1991/1992 period a law enforcement spokesperson was also funded with a technical assistance grant. Each of these projects supported all the state's CTSPs.

The other states that had established CTSPs used materials, programs and approaches for impaired driving, occupant protection, motorcycle, pedestrian and bicycle safety that had been developed with technical assistance by NHTSA.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. Much like the programs for impaired driving and occupant protection, safety grants continued to be the major support for CTSPs. Without such funds -- and they have been increasing relative to total safety grants available to the states -- CTSPs would lapse or have to operate at a very reduced level.

Discussion. Grant funds for CTSPs amounted to more than 20 percent of the total safety grants available to a state in 1993. The portion of the costs for CTSPs that were grant funded are not broken out since CTSPs are not a priority safety area and costs were therefore allocated to the contributing safety programs such as impaired driving and occupant protection. These program as already discussed in previous sections would decline substantially without safety grant funds.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. Tracking safety belt use and reporting localities that had achieved the target (70%) levels was one means of monitoring. CTSP-wide assessments were not found. Only one research project was reported that questioned the effectiveness of funding many small projects in contrast to focusing limited resources on specific serious problems.

Discussion. The evaluation or assessment of a CTSP is complex because of the range of contributing projects and the relative level of effort in each project. One state's research center undertook an evaluation of the state's CTSPs. It concluded that the allocation of limited resources to many small activities was not as fruitful as focusing resources on fewer programs with proven effectiveness. The research center stated that measuring and reporting results from CTSP projects is well worth the effort to provide important feedback to make subsequent decisions.

Monitoring and expense reporting was well established in the states. Tracking belt use in localities was another task. For example, one state reported that 273 organizations had made the 70 percent plus Safety Belt Honor Roll in 1993. Sixty of them qualified for the National Safety Belt Honor Role.

Discussion of Issues

1. Can Comprehensive Traffic Safety Programs be evaluated?

While the concepts of program synergism and localizing safety program management appear to be logical trends toward improving efficiency and extending program coverage, it is not clear how these programs were or can be evaluated.

Local data -- DWI arrests, crash statistics, presentations, attendance, the amount of materials distributed, the number of training courses and students, and several other data sets were recorded by the CTSP management for the array of safety projects conducted by typical comprehensive programs. The state's traffic safety office usually included most of these data as part of the reporting requirement on a quarterly basis. These reports tended to overwhelm the small staff in the state's safety office.

A "first stage" assessment wherein the amount of material distributed in relation to the relevant area population (or drivers) would be useful just to assess the degree of coverage. Awareness surveys that ask how such information is received, understood, digested and used would be the next step. Clearly, this takes time and funding. The subsequent hoped for effect -- crash prevention and reduction -- is, as has been repeatedly emphasized, the most complex evaluative process.

The process has, however, not even reached the first stage, and the case for operational CTSPs may be difficult to make in the future.

Comparison of a CTSP might be made with another similar part of the state that does not have any organized traffic safety programs.

2. What are the prospects for self sufficiency?

Closely related to the issue above is the question of local support. With impaired driving and safety belt use as the central projects what has really happened to comprehensive programs once grant funding stopped? The record so far has been limited to a few cases where some local and private funding has sustained such programs at a reduced level.

Grant funding for many CTSPs was limited for a full or part-time coordinator position with some support. Volunteers and in-kind services were used to fill the management, committee and distribution structure. The key task appeared to be the continued effort to motivate the volunteers, local agency representatives and private supporters. Unless these contributors perceived the CTSP to be a useful and successful (by their own definition) enterprise, interest would likely dissipate and with it any chance of self sufficiency. All this points to the continuing need for the state traffic safety office to be able to show the effects of CTSPs by means of at least "first stage" assessment results so that support for the CTSP approach continues.

3. How many kinds of traffic safety projects should a CTSP include?

The expansion to an array of traffic safety programs -- impaired driving, occupant protection, motorcycle, pedestrian, bicycle, and school bus safety -- by CTSPs was strongly supported by NHTSA beginning in the mid 1980's. The actual safety program management structure varied among the states, but in most instances there were projects within the CTSPs, and statewide programs in the same traffic safety area. In many cases there was effective coordination between the state's traffic safety office and the local or regional CTSP management.

The research center in one of the states undertook an assessment of that state's CTSPs as already described under the Findings. Their conclusion was that it is better to concentrate on the most serious safety problems with a few safety programs than to field many smaller projects, particularly with limited resources. Such a concentration of effort would result in the greater benefit, they concluded.

There is no simple way to arrive at an optimal CTSP content. Much depends on the identification and perception of what the most serious local or regional traffic safety problems are and what projects would stand the best chance of addressing these problems. In other words the approach that has been preached for a long time. One other criterion should, however, be added and that is harkening back to the two previous issues about the means and use of at least some measurable information that would show the coverage, outcome and effect of projects.

Conclusions

1. Delegation of safety program activities to regions or localities is a logical process to address local problems. Regional, and particularly local safety activities are more likely to be noticed by the communities, raising awareness. Mobilizing local community organizations, leaders, officials, has lead to the involvement of many more people in safety efforts.

2. Although no definitive assessment was possible, the programs to raise safety belt and child restraint use lead to increases in use rates based on local and statewide observations. Innovative and specialized projects to reduce pedestrian and bicycle deaths and injuries are also made more readily possible given the identification of area specific (urban/suburban, for example) problems.

3. Safety grants continue to be necessary to establish and support existing CTSPs, although volunteer participation, in-kind services and some private contributions were obtained. There is a potential for more local funding and services that would be enhanced with more substantive reporting of the effects of the CTSP projects.

4. State legislatures may not be inclined to fund comprehensive programs after federal safety grants are no longer available unless such programs cover the state and are shown to be effective.

5. Quantitative information is vitally necessary to demonstrate the capabilities and achievements of the CTSP projects. Collecting, summarizing and analyzing such data has been difficult mainly because of the limited amount of staff time available for this task. The lack of reports and assessments has reduced the potential to more self sufficiency.

POLICE TRAFFIC SERVICES

The Program

State, county and municipal enforcement agencies are responsible for the enforcement of Federal, state, and local laws and ordinances. Usually police work is thought of as fighting crime and enforcing traffic laws. In 1974, the highway safety assessment done at that time showed that the split between crime and traffic was almost equal: 53 percent on crime and 47 percent on traffic. By 1993, less than 20 percent of an officer's time is devoted to traffic law enforcement.

While the specifics can vary among the states, all states have laws on "driving while intoxicated"(DWI)[1], speeding and speed limits[2], and many other traffic violations. Enforcement agencies direct traffic, patrol the roads, investigate crashes, administer breath tests, and video tape those arrested to documenting arrest procedures for evidence in court. Enforcement officials appear in court to testify in traffic cases and many agencies conduct education outreach programs in their communities and participate in programs to rehabilitate DWI offenders serving 48-hour sentences as part of the "diversion" programs that are available in certain states. The routine administrative activities can take up a significant portion of an officers work day.

A considerable amount of training is provided to support the range of traffic enforcement. A segment of basic police academy training is usually devoted to traffic operations. There are in-service and special courses that teach the various levels of crash investigation, DWI patrolling and the use of breath testing and radar speed detection equipment.

Case adjudication is a function of the judicial system in a state. It interacts with the enforcement function since it is not only a direct follow on, but also generates "feedback" about acceptable evidence and the measure of a court's or judge's priorities regarding traffic cases. To raise judicial awareness about the DWI offense, for example, education programs involving DWI case procedures for district attorneys and judges were conducted.

There have also been special support programs to accelerate the adjudication process that in many states had built up a substantial back log of traffic cases with the hiring and assignment of additional prosecutors and crash case investigators to reduce this backlog.

Special enforcement techniques and practices have evolved over the years. One of these is the "selective traffic enforcement project" (STEP) that focuses on particular offenses -- usually DWI and speeding -- is used both as a prevention program as well as an apprehension process.

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[1]In some states impaired driving is referred to as "driving under the influence"(DUI)

[2]Speed was included as a priority area on December 13, 1994 after data was collected for this report.

Aircraft speed detection, special radar units and more recently laser speed measurement, have been used in the enforcement of the 55 MPH National Maximum Speed Limit (NMSL) and local speed reduction programs.

Traffic enforcement in conjunction with public information and education as an integral part of comprehensive traffic safety programs has developed into common practice since the mid 1980's.

A substantial amount of safety grants have always been allocated for enforcement activities at both the State and municipal levels. From inception in 1974 until 1992 a 55 MPH NMSL enforcement set aside grant was available each year. Additional basic and incentive grants -- §408 and §410 -- provided funding for DWI enforcement over the years.

Overall Traffic Enforcement Trends - Findings

Interviews with the 134 enforcement agencies participating in the ten states covered by this report, disclosed that urban police departments often get more calls than they can handle. Crime, particularly drug trafficking, has priority. General patrol of city streets with an emphasis on traffic violations has declined. Estimates of between five and ten percent of time (or budgets) for traffic related enforcement were common.

Outside of the urban areas, in the suburbs and in rural communities, many enforcement agencies estimated that they spend up to 30 percent of their patrol effort on traffic matters. State Police and State Highway Patrols allocate between 50 and 80 percent of their resources to traffic related services.

Table PTS-1 shows enforcement statistics -- the total number of sworn officers in the enforcement agencies of the states assessed, the "full time equivalent" (FTE) number of officers that represent the estimated traffic allocation and their percentage of the total number of sworn officers. There are also data on the number of traffic related FTEs per 1,000 licensed drivers and per 1,000 people.

Table PTS-1
Sworn Enforcement Officers in Traffic Service

	1980	1993
Total Sworn Officers *	97,736	116,654
No. of FTEs for Traffic Service**	18,647	21,017
Percent of Officer time in Traffic Service**	20.5%	17.4%
No. of FTE Officers in Traffic Service per 1,000 Licensed Drivers **	0.60	0.56
No. of FTE Officers in Traffic Service per 1,000 Population **	0.39	0.41

* Data for 10 states ** Data for 9 states

Despite the decline in urban coverage since the early 1980's -- as stated by many urban police agencies -- the overall traffic related coverage has only changed slightly.

The estimated traffic enforcement costs had more than doubled from 1980 to 1993, as shown in Table PTS-2.

Table PTS-2
Traffic Related Enforcement Costs

Traffic Related Enforcement Costs	1980	1993
Total	$655,700,000	$1,610,200,000
Per Licensed Driver	$19.61	$39.70
Per Person	$12.70	$28.85

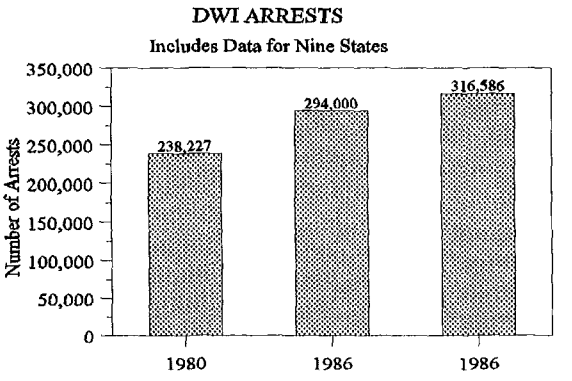
The increases primarily reflect the change in price indices for the time period. By 1993 the average cost for one enforcement officer including administrative support, equipment, vehicles and salary with fringe benefits (dividing police budgets by the number of sworn officers) was approximately $68,150. In 1980 the cost was $32,860

DWI Enforcement - Findings

Overall Capability and Achievements

Arrests for DWI have been increased from 1980 to 1986 and then leveled off as shown in Figure PTS-1 (includes data for nine of the ten states). The arrest rate per 1,000 licensed drivers declined after 1986, and this may well be due to a number of factors -- the aging of the driving population, and the contribution of laws and programs to reduce impaired driving among them -- or alternatively, less enforcement.

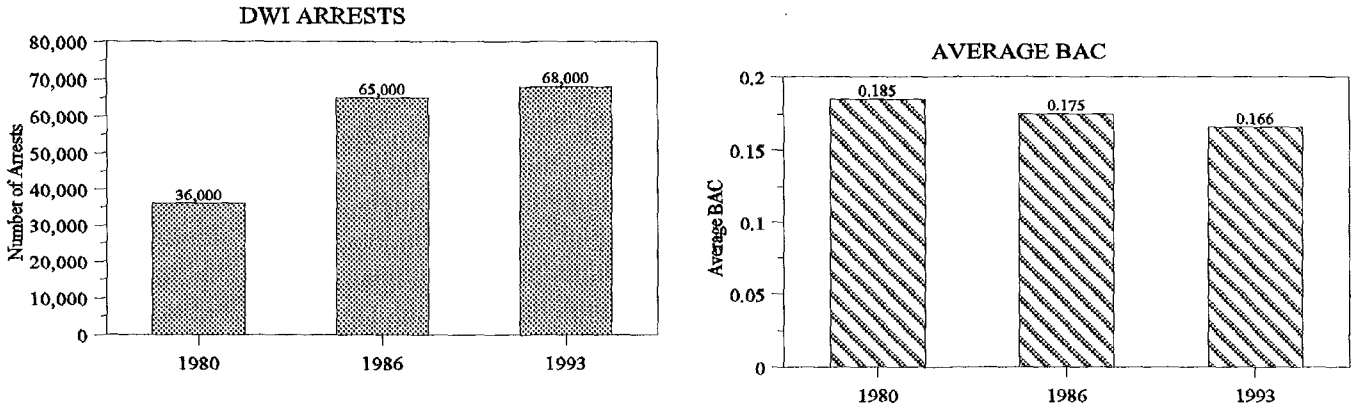
Figure PTS-1
DWI ARRESTS DATA



DWI Arrests

Average Blood Alcohol Concentration (BAC) results over a range of years were only available for three of the eight states. The number of DWI arrests for these states and their respective BACs are shown in Figure PTS-2.

FIGURE PTS-2. DWI ARRESTS AND AVERAGE BAC FOR ARRESTS

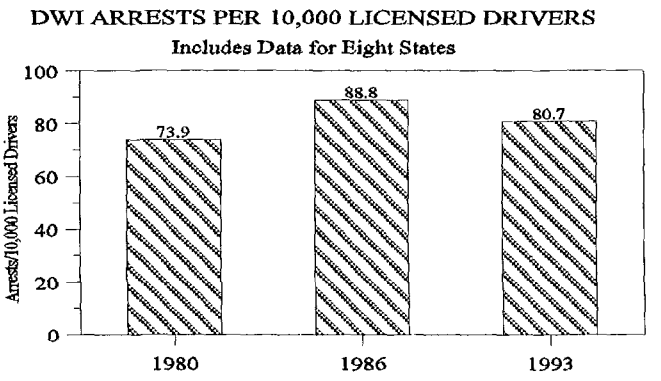


The states represented by the chart show an increase in DWI arrests and a decline in the average BAC. This could be due to a combination of factors. More aggressive enforcement may be reaching a larger population of drinking drivers, besides those that test out at very high BACs. Publicity about DWI enforcement may also have a deterrent effect.

Safety grants were used to initiate sobriety checkpoints, standard field sobriety test training, central processing and video taping of arrested DWI offenders and selected traffic enforcement projects. Some programs were later supported by local communities -- such as sobriety checkpoints, and DWI case preparation, and DWI patrols, although this was limited to just a few areas. One state enacted a alcohol tax to fund DWI enforcement and education.

Safety grant funding amounted to approximately 4.3 percent of all traffic related enforcement costs in 1980. By 1993 the proportion was 1 percent in the states. Nevertheless, these safety grants attained considerable leverage in instituting DWI enforcement programs.

FIGURE PTS-3 DWI ARREST RATE TRENDS



Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. The quantification of the level of the drinking and driving problem had been achieved by most of the states by the late 1970's or early 1980's. This gave rise to many

new laws that strengthened the enforcement process -- per se, administrative license suspension, implied consent, mandatory minimum sentences, and evidentiary use of breath tests.

Ranging from selective enforcement projects for impaired driving in the late 1970's to comprehensive community drinking and driving enforcement and sobriety checkpoints in the 1980's and early 1990's, the effort was focused on the problem of the impaired driver. Supported by special DWI detection training and increasing crash investigation expertise, DWI enforcement programs had developed into a concerted effort to reduce impaired driving.

Examples. All the states have conducted some form of DWI enforcement for many years. In the early 1980's one of the states operated central booking facilities equipped with new video taping devices. A new law that called for mandatory jail terms for offenders convicted of DWI went into effect in 1983 and a special nighttime DWI enforcement program was put into effect. In conjunction with the central processing activities the first Standard Field Sobriety Test courses were given in the state in 1984.

Sobriety checkpoints were established in the above state in 1988. Their purpose was to convey to the public that there was an actual likelihood of getting caught when drinking and driving. Later, as part of the state's Corridor Program, roving DWI patrols involving state and municipal police units were used along the designated roadways.

As with other states, the problem identification process was used by one of the states to target counties and cities that had the most serious drinking and driving situations. In 1982 one of the larger cities in the state was designated as a target of opportunity to promote the adoption of a comprehensive community-based alcohol deterrence program. To further support the DWI enforcement effort additional crash investigators were assigned. They increased the investigation coverage from 76 to 92 percent of the crashes involving injuries, fatalities or one of the vehicles had to be towed. By 1988, three-year DWI enforcement projects were established in five other cities.

One of the states began several Selective Traffic Enforcement Projects (STEPs) in the 1970's that targeted the drinking driver. Other states focused their effort on comprehensive community DWI programs in the 1980's where police officers received DWI apprehension training and, as in one of the states, the county in which the program operated served as a DWI enforcement training base for much of the state. The county comprehensive programs also included sobriety checkpoints from 1986 onwards.

Several of the states that participated in the assessment lacked adequate implied consent and breath testing laws in the 1970's. This hampered DWI enforcement. One of the states enacted legislation in 1981 that provide for a 90-day license suspension for persons who refused to submit to a chemical test. The same state passed a law in 1982 that made it a felony to fatally injure someone while driving drunk. The offender faced up to ten years in prison and/or a fine of up to $10,000. In 1989 that same state enacted an administrative per se law that provided for a mandatory operator's license suspension for anyone who failed or refused the chemical test after being arrested for DWI.

2. *Did initial Federal grants create new programs?*

Overall. Although many of the DWI enforcement programs were not "new" in the sense that similar activities had been conducted in past years, safety grants played a substantial role in establishing selective traffic enforcement projects (STEPs) that focused on impaired driving. DWI detection and apprehension training was initiated and continued with the support of safety grants. Special equipment such as video taping systems used to process DWI offenders was purchased with grant funds.

Most states utilized safety grants to fund overtime duty hours dedicated to DWI enforcement including special patrols and sobriety checkpoints. Safety grants were also used to train police officers in crash investigation and crash reconstruction. Case preparation support received grants in states that had experienced growing case backlogs.

Examples. One of the states used safety grants to develop and establish its centralized DWI processing and video taping centers. The training program to support DWI enforcement operations was supported with grants of $250,000 in 1987, for example. Similar training activities were funded with safety grants into the early 1990's. Substantial safety grants were also used to fund the State Police impaired driving enforcement efforts throughout the 1980's.

The state that conducted a target of opportunity program began the operation with a safety grant of $287,000 in 1983. This supported eight police officers, two equipped vans, several breath test devices and a video taping system. A similar program was initiated in the county that contained the target of opportunity city. Over a ten year period safety grants of $2.9 million were used to fund both the city and county DWI enforcement programs.

The above state also used grants for training police officers. In 1983, 400 officers were trained in DWI detection and apprehension with a safety grant of $138,000. Similar programs continued into the 1990's. In addition, this state like many of the others used both basic and incentive grants to fund overtime pay for DWI enforcement.

In one of the state's largest cities a special DWI enforcement squad was established in 1979. Safety grants were used to acquire two vans equipped with breath testing devices, communication gear and booking stations. The units, call BAT Mobiles continued to be created with safety grants in 1982.

The reduction in enforcement budgets in another state in the early 1980's was the basis for safety grants directed specifically at the drinking and driving problem that had been increasing at the time. This was a change in policy since prior grant funding supported general patrols. A training program for DWI detection and apprehension was also funded with grants of $42,000 in 1984. By the early 1990's overtime pay to operate the state's sobriety checkpoints was supported with grants.

Eight municipalities in another state received safety grants that totaled $1.5 million over the six years -- 1982 to 1988 -- that a DWI enforcement and education program was underway. Nearly 15,000 DWI arrests were made. After the enactment of an administrative per se law that became effective in 1990, the state's department of motor vehicles was put in charge of processing the administrative license suspensions. A safety grant of $435,000 was allocated for these operations in 1990. The next year incentive grants (§408) of $346,400 were made available for the process.

One of the states provided safety grants of $672,000 to 43 local police departments in 1982 to add 21,000 hours of overtime to their DWI enforcement effort. That same year another grant of $100,000 was used to buy video taping systems for these police departments. To further boost the state's DWI enforcement and adjudication capability, fatal crash strike forces were established for DWI case preparation in 1986. These were supported with safety grants so that the growing case backlog that had increased the time from arrest to disposition from 45 to 85 days could be reduced to a target of 60 days.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. A number of programs that were started with federal grant funds were either fully funded by the state or municipalities, or were operated with only partial grant support in subsequent years. These included crash investigation, prosecution assistance such as case preparation, license suspension processing, and some sobriety checkpoint operations.

DWI enforcement patrols continued to rely on basic and incentive safety grants in most states. One state had enacted an alcohol tax that was deposited into a drinking and driving education and enforcement fund available to all counties in the state.

Examples. Many central booking facilities that used video taping processes in one of the states became self sufficient in the late 1980's. Others could only operate during the period when grant funding was available.

The target of opportunity project that functioned for a period of 10 years in one of the states continued with the city supporting DWI enforcement. The crash investigation service in the city was supported jointly through federal grants and city funding. Prosecution assistance was by 1985 grant funded with $31,500 and city funds of $49,000 and the municipal court operated with a city contribution of $137,000 and a safety grant

of $45,700 in 1989. Some of the sobriety checkpoints that were funded with grants earlier were being supported by local communities in the early 1990's.

The state that had supported its department of motor vehicles with grant funds to process the administrative license suspensions allowed under an administrative per se law enacted in 1989 contributed $503,500 in 1991 for these operations. The incentive grant was $346,400. Incentive grant funds continued to support the program through 1994 for a total of more than $1 million over five years. The state match was $2 million. DWI enforcement that had been started with safety grant support in several communities continued with such support and it was not clear how long such an effort could be sustained after the grants ran out.

Legislation that became effective in 1984 in one of the states established an alcohol education, rehabilitation and enforcement fund. It increased the tax on alcoholic beverages by 10 percent and distributed these funds among the state's counties to be used for education, enforcement, prevention and treatment services. Fifteen percent of the fund was earmarked for enforcement and court assistance (10 and 5 percent, respectively). The enforcement portion was deposited to a drunk driving enforcement fund.

The same state enacted legislation that also provided for a $100 surcharge to any fine for each drunk driving conviction. After deducting $5 for administrative costs, the remaining $95 would also be deposited into the drunk driving enforcement fund. The fund was earmarked for DWI enforcement activities such as the purchase of new equipment and overtime patrols. In 1987 approximately $4 million was available in the fund.

The above state's fatal crash strike forces that were established to expedite DWI case preparation in 1986 were supported with grant funds, but by 1992 the work was funded by the state's counties. Alcohol incentive grants had also provided a 50/50 match with municipal funds to eliminate case backlogs beginning in 1984.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. The concept of selective enforcement targeted at DWI offenders had been devised a long time ago and was often replicated in various parts of the states. These projects were usually funded with safety grants. The more recent DWI enforcement techniques such as video taping and central processing, and the sobriety checkpoints had also been initiated with safety grants, and they were replicated to the extent possible throughout the states. Funding support was a key factor in expansion and replication of these projects.

Examples. Central processing and video taping begun in one of the counties was replicated in 20 counties or county groups in one of the states by 1986. The same state

had initiated a demonstration project to design a standardized sobriety checkpoint approach for statewide municipal police organizations in 1989. The checkpoint model was adopted by local jurisdictions across the state. Only 10 percent of all police agencies had the capability to perform checkpoint operations with their own personnel and it took the coordination and cooperation of multiple police jurisdictions to establish and operate sobriety checkpoints.

Between 1990 and 1991 more than 50 checkpoint roadblocks had been carried out in the counties that were grant funded during that time period. In several instances sobriety checkpoints were undertaken in conjunction with the Corridor Program activities in the above state.

A similar expansion of sobriety checkpoint activities occurred in another state. In addition to adopting the initial site's checkpoint procedures, three enforcement agencies also undertook an information and education campaign to explain the checkpoint procedure to the public as well as to district attorneys and traffic court judges. There was also media coverage to assist in the publicity effort.

Another state had studied the problem of backlogs of DWI cases to see how these could be reduced or avoided. After initiating an educational seminar for prosecutors and judges sponsored by the state's administrative office of the courts, the seminar approach was expanded so that by 1993 eighty-one percent of the municipal prosecutors in 14 counties had attended the educational seminars.

The state that had conducted a target of opportunity program in one of its large cities expanded the DWI enforcement activities to the surrounding county and another five cities used similar approaches that were grant funded for three years in the 1988 to 1990 period.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. Selective enforcement techniques, training programs for Standard Field Sobriety Testing, and procedures for sobriety checkpoints were among the concepts developed and/or demonstrated with technical assistance funds. The techniques and training were used by the states, although none of the states received direct technical assistance grants for the projects.

Discussion. Most of the enforcement techniques employed to reduce drinking and driving offenses had been developed over a long period of time by the various state and municipal enforcement organizations. Studies and demonstrations of selective enforcement were carried out by NHTSA in several states in the 1970's. The procedures for sobriety checkpoints were also developed by NHTSA with the input from several states that had used this approach in the past.
Standard Field Sobriety Test (SFST) training programs were also developed with federal

technical assistance grants as were other training programs for DWI detection and apprehension. The states participating in this assessment did not receive specific technical assistance funding.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. New approaches to DWI enforcement would very likely be reduced or not attempted without the availability of federal safety grants. While safety grants constitute 1 percent of the total traffic related enforcement spending (1993), the grants provide an incentive to establish new projects -- such as sobriety checkpoints, SFST training, and video taping of DWI offender processing.

Overtime pay for DWI enforcement during night and weekend period would also be severely limited, but it is a policy question as to whether safety grants should be used for such purposes -- unless it is in conjunction with new techniques such as sobriety checkpoints.

Discussion. In 1980 federal safety grants for DWI enforcement amounted to approximately 5 percent of all traffic related enforcement costs. By the 1992/1993 period this percentage had dropped to approximately 1 percent or less in the states. Federal grant reductions in comparison to actual state enforcement expenditures after 1982 account for much of this change.

Federal funds have, however, been targeted in many cases to training such as SFST, initiation of specific DWI enforcement approaches such as sobriety checkpoints and processes such as video taping and central processing. Grant funds have also been used for overtime pay to carry out DWI enforcement on weekends, or as part of other selective enforcement operations. For states that appropriate funds derived fines levied on motorists who are convicted of, plead guilty to, or receive a deferred sentence for DUI, federal grants funding is not necessary to continue the DWI operations and training. For most states, removing the availability of such funding would reduce, and in some cases eliminate the DWI operations and training, and would very likely reduce the ability by states and localities to initiate new DWI enforcement approaches.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. Only one assessment was noted -- the effect of using central processing and video taping of the DWI arrest process. Most DWI enforcement operations were monitored by collecting key statistics such as vehicle stops, tests conducted, and arrests made. There were no other evaluative procedures found.

Examples. The central processing/video taping (CP/TP) program in one of the states was assessed. It was concluded that this process had been successful in stimulating

enforcement. It was also found that only a few CP/TP programs could manage to operate during the time that grant funding was available and excessive local coordination for some locations was required. In the counties where the system had been in place police officers realized a reduction in time spent on the arrest process. The use of video taping was also a factor in reducing the number of jury trials requested by the defendants.

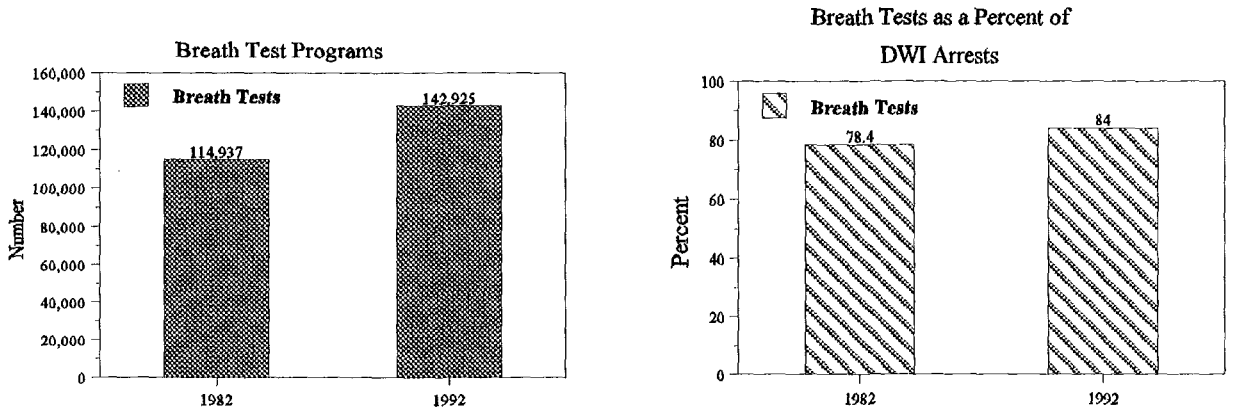
Sobriety checkpoint operations were monitored by recording the number of vehicles stopped, tests conducted, and arrests made. Similar statistics were collected for the various selective enforcement operations. There were, however, no formal evaluations of DWI enforcement operations.

Breath Testing Programs - Findings

Overall Capability and Achievements

States have instituted improved breath testing programs usually under laws enacted in the early 1980's. The test results have provided case evidence of intoxication -- at and above the legal limits established by each state The growth of the programs in terms of the number of breath tests and their proportion in relation to DWI arrests for five of the ten states is shown in Figure PTS-3.

Figure PTS-3
Growth of the Breath Testing Programs

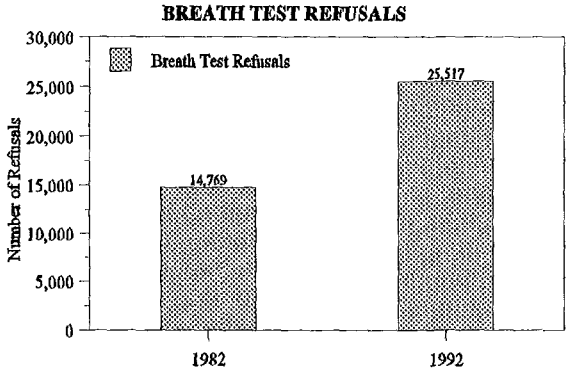


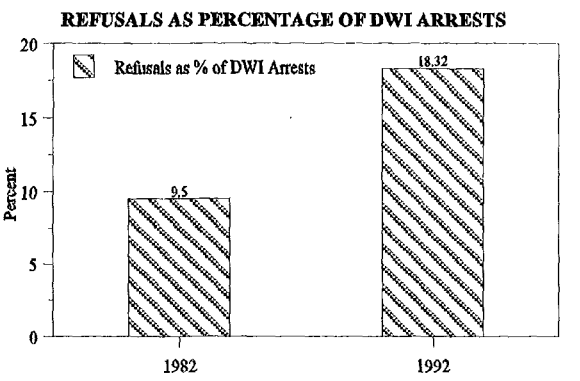
Both the number of tests given and their coverage of offenders arrested for DWI have increased during the decade of the 1980's and the early 1990's.

Grants were used extensively to upgrade and replace breath testing devices. Several states began to fund such purchases in the early 1990's, but at a cost of between $4,000 and $5,000 for each modern infrared breath testing device, a replacement or upgrading program would require substantial funding. There are states that use license renewal and fine surcharges to support equipment purchases.

DWI offenders refused breath tests in increasing numbers as courts began to rely on breath test results for evidence in DWI cases. The trend, based on five of the ten states is shown in Figure PTS-4.

Figure PTS-5
Breath Test Refusals





Despite the increasing number of breath test refusals and their growing percentage of DWI arrests, conviction rates for DWI offenders remained approximately level when averaged for the states participating in the assessment during the 1980's and early 1990's. The provision for "diversion" programs that allowed first offenders to attend alcohol school -- thereby avoiding a DWI "record" -- skews the conviction statistics because "diversions" may or may not be counted as convictions.

Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

   Overall. New legislation in the states made it easier to allow breath test results in evidence for DWI cases. Major improvements in testing, calibration and certification of breath testing devices took place in the 1980's. Improvements in training, certification and recertification of operators was also instituted in the states. New breath testing devices using infra red technology were introduced in the late 1980's and early 1990's.

   Examples. The defense for DWI cases often rested on creating a reasonable doubt about the accuracy of the breath test. In one state municipalities began favoring blood testing since the existing breath testing devices were problematic. After passage of a new DWI law in 1983, the state purchased new breath testing devices that provided accurate BAC readings suitable for admission as evidence. The devices had to be carefully operated, maintained and calibrated.

   One of the states has conducted evidentiary breath testing since 1973. The program is directed by the state's health department and a special laboratory is responsible for the procurement of breath testing devices, their testing, and operator training and certification.

Recertification of operators is required each year. A variety of breath test devices have been used since the inception of the program and a complete changeover to the Intoxilyzer 5000 model was completed in 1993.

Another state took action in 1983 to ease the introduction of breath test results as evidence. It placed the burden of proof on the defendant to demonstrate improper performance of a breath test or improper maintenance of the testing equipment rather than the state having to prove that the equipment was properly maintained and calibrated. It also made breath test admissible as evidence without the operator being at the trial.

One of the states that had an implied consent for evidentiary breath tests on the books since 1969, enacted a stricter law in 1983 that set the "illegal per se" level at 0.10, established an administrative per se, or on-the-spot, license suspension and allowed the use of a preliminary breath test (PBT). A committee on testing for intoxication was also established. In this state the motor vehicle department was made responsible for certifying breath testing devices and operators statewide.

In yet another state where the breath testing program was administered by the health department, legislation to legitimize the use of breath testing equipment was enacted in 1981. The law required an immediate license revocation for those who refused to submit to a test. The Intoxemeter 3000 was in general use in the 1980's and a shift to the newer Intoxilyzer 5000 began in the 1990's. A new law in 1994 allowed blood sample draws at the crash scene and en route to the hospital.

2. *Did initial Federal grants create new programs?*

Overall. Most of the states used safety grants for the initial upgrading of their breath testing equipment. One state used a safety grant for a limited number of new devices, but funded the major part of the program with state funds. Grants allowed the acquisition of the new infra red breath testing units that provided accurate evidentiary results.

Examples. In 1984, not long after a new DWI law had been enacted, one of the states used a safety grant of $160,000 to establish a breath testing training program. More than 600 evidentiary device operators and 50 preventive maintenance personnel in municipal police departments were trained. Training continued in 1986 with a safety grant of $150,000. A similar program in another state used safety grants of $234,000 for retraining 4,000 operators in the use of new breath testing devices

Alcohol incentive grants (§408) were used by one state to upgrade its breath testing devices beginning in 1989. More than 80 Intoxilyzer 5000 models were purchased through 1993. The total cost of the upgrading program was grant funded for $500,000. Basic grants were also used to purchase breath test devices and a state used such grants to acquire more than 90 devices in 1990/1991 for $330,000. Grants of $581,000 were used in 1985 in yet another state to purchase 150 modern infrared breath testing devices.

Grant funds of $140,000 were used to buy breath testing devices for municipal police departments in one state over a period of 13 years. The total cost of the procurement was $2.4 million, most of which was funded by the state. That same state built a modern breath testing facility in one of its counties. The operation was part of a selective enforcement project. Safety grants provided a two year start up support for staffing, equipment and a PI&E program.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. A number of states were able to support part or most of the breath test equipment upgrades in the early 1990's. In some cases there were new laws that established fees or surcharges for such a purpose. Other states continue to rely on grants for major breath testing equipment purchases, and in some cases for training system operators. Operations -- the admission of tests -- is supported by enforcement agencies as part of their regular budget.

Examples. Although as previously mentioned states used safety grants to upgrade their breath testing devices, one of the states purchased 120 Intoxilyzer 5000 models with state funds of $486,000 in 1994.

Also, briefly described before was the state that used basic safety grants of $140,000 to purchase breath test equipment for municipal enforcement agencies. The state's breath testing equipment acquisition between 1980 and 1993 cost the state $2.4 million. Revenues from license reapplication fees paid for the cost and continues to be the source of funds for breath test device procurement.

A fee of $60 per conviction for chemical analysis was legislated in one state in 1991. It was in addition to any penalty. The fee, as of 1993, supported the breath testing program in the northern part of the state. The same state, beginning in the early 1990's, used a 50 percent matching program for the purchase of breath testing devices that enabled many sheriff's offices to obtain the new Intoxilyzer 5000 models.

The state that had enacted an alcohol tax in 1984 had also established an enforcement fund and a $100 surcharge on each drunk driving conviction. The latter was also deposited into the enforcement fund and could be used to purchase new equipment.

During the 1980s, one of the states had spent more than $200,000 in safety grants to assist communities in the purchase of breath testing devices. A new law in 1990 created a law enforcement assistance fund based on fines levied against motorists convicted of impaired driving. By 1990 grants from this state fund were being used by the communities for

purchasing breath test instruments and safety grants were no longer required.

The breath testing operations -- the actual testing by a trained operator, usually a police officer -- were part of an enforcement agency's regular budget in most states.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. Since state laws mandated operational characteristics of breath testing programs, they were always established statewide.

Discussion. Breath testing programs are statewide operations that are carried out under state laws. The procurement of new breath test devices usually was a phased procedure since most states were unable to afford the costs to completely shift over in a single year. One state among those participating in the assessment created a remote breath test data collection and diagnostic program for the devices. Analyses of field tests could be made at a central laboratory. The system was pilot tested with 20 instruments in 1990 and later was in place for the breath testing devices throughout the state.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. No technical assistance funds were used by the states. Concepts and technologies were developed by manufacturers of breath testing devices primarily in response to legal challenges about the accuracy for evidentiary purposes of the equipment.

Discussion. Major technological changes in breath testing equipment occurred in the 1980's. Much of this development was in reaction to legal challenges to breath test results and the equipment and training procedures, particularly the certification and calibration issues, at the time. The states consulted among themselves and NHTSA provided some guidance on equipment, but none of the states received technical assistance funds for breath testing programs.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. While there are self sufficient breath testing upgrade and replacement programs in some states, the process would very likely be slowed in many states. In some states it would lapse. Training of equipment operators would also be affected since many enforcement training programs include such training for certification.

Discussion. The primary use of safety grants has been and will probably continue to be for the purchase of new advanced technologies in breath testing devices. These costs have typically amounted to between $4,000 and $5,000 for each device. While several of the states were able to make these purchases with state funds or through special surcharges on

license renewals or fines, many states have continued to rely on grant funds. Operator training was also supported by safety funds in some states as part of the enforcement training programs, many of which are funded with grants.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. There were no formal evaluations, but improvements were measured in terms of increased conviction rates and cost reductions per breath test.

Examples. With the enactment of stricter DWI laws and acceptance of breath testing results as evidence in DWI cases conviction rates began to improve. In one state, after breathalyser evidence and Standard Field Sobriety Testing were accepted by the courts, the DWI conviction rate rose from 50 percent in the early 1980's to more than 80 percent in the 1990's.

Another benefit that accrued from the upgrading of breath testing devices was measured by one of the states. Prior to 1985, 225 older breathalyser models were used by 2,000 operators who performed approximately 27,000 BAC tests a year. The operation cost $1.3 million. After 1985 approximately 46,000 BAC tests were performed each year with 150 modern infrared breathalysers. The program cost $1 million a year. This modernization reduced program costs by 23 percent. Case filings increased by 11 percent in 1990 compared to 1984 -- largely due to the superior evidentiary quality of the new BAC tests. Revenue from the case dispositions increased from $3.5 to $6.8 million.

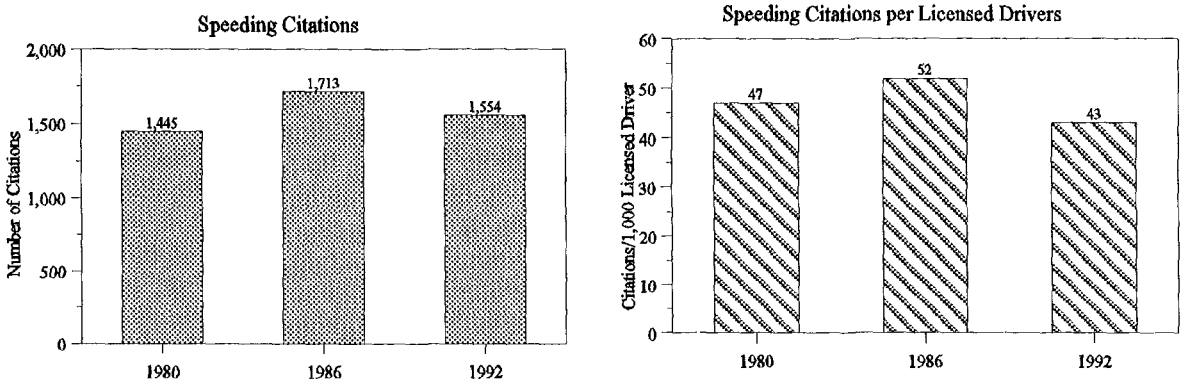
Speed Enforcement - Findings

Overall Capability and Achievements

State laws that set the speed limit at 55 miles per hour had been enacted by early 1974. The grant program to enforce the 55 Mile Per Hour National Maximum Speed Limit (55 mph NMSL) followed shortly thereafter. A considerable effort got underway to reduce speeds, at first to save fuel, but also to reduce fatalities and injuries. By the early 1980's average travel speeds had begun to climb on interstates from 57.6 mph in 1974 to 59.1 in 1983 threatening to invoke highway construction fund sanctions for states that failed to achieve mandated levels for the maximum allowable percentage of motorists traveling above 55 miles per hour.

The speeding citation trends for eight of the states participating in the assessment are shown below in Figure PTS-5 together with the number of citations per 1,000 licensed drivers.

Figure PTS-6
Speeding Citation Data



More speeding citations were issued by the mid to late 1980's than in 1980. Both the number and rate declined by 1992 when the special set aside grants for enforcing the 55 mph NMSL were being phased out.

As time went by enforcing the speed limit became more difficult and several states struggled to meet the mandated level that held the states to not having more than 50 percent of their motorists exceeding the 55 mph NMSL. Data for six of the states in the assessment were analyzed and shown in Table PTS-3.

The table depicts the effort made by enforcement agencies to assure that fewer than 50 percent of motorists exceed the speed limit of 55 mph. Even with adjustments that were applied to measured speeds -- due to speedometer error, for example -- enforcement continued to be difficult for the average state.

Table PTS-3
Speeding Citation Issued for Each Percentage Point Over 55 MPH

	1980	1986	1992
The Number of Speeding Citations Issued for Each Percentage Point Over 55 mph	19,300	22,800	15,000
Average (weighted) Percentage of Motorists Exceeding the 55 mph NMSL	44.2%	44.7%	47.6%

A substantial amount of the grant funds were used to buy radar units -- both hand held and stationary, aircraft and additional vehicles -- both police cruisers and "unmarked" police vehicles. Grants also paid for personnel overtime.

Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. Speed enforcement to bring motorists into compliance with the 55 mph NMSL was a mandated program under the federal law that set the 55 mph National Maximum Speed Limit. Every state had an enforcement program although these varied in effort level. The states participating in the assessment represented several speed enforcement strategies. Several acquired aircraft and radar units and established special speed enforcement patrols. Locations where speed measurements were made to determine compliance were mostly on Federal Interstate roads, and once selected these were the official locations throughout the years of the NMSL enforcement effort. However, some effort was made to select locations for enforcement where problem identification indicated that speeding was a problem.

Others conducted speed enforcement with existing forces augmented with additional radar equipment. Several states, in addition to the state level speed enforcement, utilized county and municipal enforcement agencies to assist in the speed reduction effort. Generally, public information accompanied enforcement to try to get the public to voluntarily obey the NMSL.

Examples. A variety of speed limit enforcement strategies and tactics were employed by the states. In addition to hand held and stationary radar speed detection on the ground, the states used aerial speed enforcement. One such state initiated such a program in nine of its counties in 1978 using Bell Jet Ranger helicopters. By 1982 the state police had purchased three Cessna fixed wing aircraft for speed enforcement. Unconventional (not marked or typical police sedans) vehicles were used by the state to apprehend speeders.

The above state also participated in the national Combined Crash Reduction Effort (CARE) and the "Summer Slowdown" project that focused on speeding on "non-

interstate" roads. In 1987 grants were awarded to 130 local police departments to enforce the 55 mph NMSL. In 1988 a new program that emphasized speed enforcement on weekends, late night and early morning periods was established in the state. By 1989 the local speed enforcement projects were transferred to the corridor programs in the state.

Another state instituted speed enforcement at the county level, in addition to its state patrol. Nine counties took part at various time periods through 1993. The state had bought three aircraft and 430 moving radar speed detection devices between 1979 and 1982.

Since it was not possible for the state police or highway patrol in most states to cover every stretch of 55 mph highway, one of the states chose strategically located cities and towns and supplied them with radar units. The local units became selective enforcement projects and helped the state achieve the mandated 50 percent compliance rate.

Some of the states faced sanctions for failing to meet the compliance level in 1982. After purchasing a fixed wing aircraft, using 12 moving radar units and issuing more than 3,400 citations in 1983, a state achieved a compliance rate of 51 percent. A second aircraft became operational in 1988, and as in other states, several county 55 mph NMSL enforcement programs were initiated in 1986.

Confronted with an average of 74 percent of its motorists exceeding the 55 mph NMSL in 1977, one of the states built up its enforcement effort to six teams with 24 troopers that were stationed at strategic locations throughout the state. In addition four radar squads were posted on limited access highways. The state by the late 1980's and early 1990's had used just about every deterrent possible, including marked and unmarked cars, radar, VASCAR, aircraft and had supplemented the effort with PI&E campaigns. Despite these activities the state received an "intention of sanction proceedings" notification from the U.S. Department of Transportation in 1991.

After raising the speed limit to 65 mph on rural interstates in 1987, one of the states continued its enforcement program issuing 30,000 aerial enforcement citations and 176,000 speed citations in 1990 on urban interstates -- where the speed limit had remained at 55 mph.

2. *Did initial Federal grants create new programs?*

Overall. The 55 mph NMSL enforcement program was created with federal grants in every state. Most states purchased aircraft, radar units and paid personnel salaries with grant funds. Special enforcement units were established, and in several cases county and municipal enforcement agencies received grants for enforcing the 55 mph NMSL.

Examples. Three Cessna fixed-wing aircraft were purchased with federal grants of $300,000 in the early 1980's by one of the states. That state's speed enforcement program had four components by that time. There was a PI&E effort to convince motorists to slow down. It was grant funded for $470,000. The enforcement program was supported with grants of $2.36 million in 1980 and a driver improvement program was funded with $97,000. An evaluation/monitoring process had been instituted for $150,000.

The "non-interstate" speed enforcement operation in the above state in 1985 and 1986 with four task force teams was grant funded for $580,000, and the state's program to use 130 local enforcement agencies to assist in enforcing the 55 mph NMSL was budgeted for $432,000 in 1987 and $371,000 in 1988. In 1992 the state received a grant of $24,725 to purchase 10 Hi-Star and 10 drone radar sets. The Hi-Star is a traffic counter with the capability of recording speed, vehicle length, time, date, spacing and headway. The "drone" radar is an unattended device.

In one of the states the county level enforcement program cost $3.1 million over a period of ten years. Approximately 100,000 additional speeding citations were issued as part of the program -- i.e., $31 per citation. The grant funds were used to pay for aircraft, radar equipment and training in the early 1980's and for overtime, equipment and vehicles in 1990 and 1991.

Hand held radar units that emitted nonionizing radiation were banned in one of the states in 1992. This was followed by another law in 1992 that forbade the motor vehicles commissioner from limiting or prohibiting the use of radar detectors. The ban rendered 75 percent of the radar units obsolete and a safety grant of $190,000 was used to purchase more than 200 TROOPER units. Grants also paid for 40 VASCAR PLUS speed detection units.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. The first example cited below gives an indication of the extent of state community and private support. Aircraft, radar units and special speed enforcement units were all supported with grants. There were a few cases of equipment contributions, and one aircraft was donated to the state police by a state transportation department. Aircraft maintenance was funded by states in most cases.

It was estimated in some of the states that between 10 and 15 percent of the 55 mph NMSL citations were issued by special speed enforcement units and the rest by the regular state police or highway patrols. As the special set aside was phased out in 1992, speed enforcement operations had to compete for regular safety grants, but there were some cases where state legislatures funded certain speed enforcement operations.

Examples. One of the states had purchased three Cessna fixed-wing aircraft in the early 1980's. State funding was used to maintain and repair the three aircraft. Another state did not use federal grants for speed enforcement until 1979 when the first of three aircraft and were acquired.

The planned funding for speed enforcement was scheduled to be reduced by one-half in 1993 in one of the states, and discontinued entirely in 1994. Aircraft operation in the state had been considered successful and a state cost assumption plan was devised. In 1993 the state legislature provided funding to sustain continued flight operations for speed enforcement.

To reduce the increase in non compliance of the speed limit, and the threat of funding sanctions, one of the states made special enforcement efforts that saw the grant funding of $933,000 in the early 1980's boosted by an estimated contribution of $860,000 by the state. Two aircraft had been purchased with grants by the state, but a third aircraft was donated to the state police by the state's transportation department. In 1993 a laser speed detection device was donated to the state police by an insurance company.

After substantial reductions in set aside funding in the 1982/1983 period one of the states was able to maintain the level of its speed summonses and was able to hold the non-compliance with the 55 mph NMSL at below 40 percent. Speed citations issued by the regular patrol units funded by the state accounted for the continued effort.

In another state that in the early 1980's had fielded 26 troopers, four aircraft and 50 motorcycles paid for with grants had reduced its grant funded force to seven troopers in 1990. This represented approximately 15 percent of the state's speed enforcement force. Data from one of the states indicated that special grant funded overtime speed enforcement operations yielded approximately 10 percent of the total speed citations issued to enforce the 55 mph NMSL.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. The 55 mph NMSL speed enforcement program was conducted at strategic sites on 55 mph posted roadways statewide. The tactics included ground radar patrols, aerial enforcement using special or regular state and sometimes county and municipal enforcement patrols. Since there were never enough patrol resources to cover every site, both the patrols and their tactics were usually rotated from time to time.

Discussion. Enforcement of the 55 mph NMSL was a statewide operation in all states. There were a number of selective enforcement projects to reduce speeding. These generally operated in conjunction with the 55 mph NMSL enforcement activities. In some states when these STEP operations were conducted by municipalities they were funded with regular safety grants. The selective enforcement technique had been available for many years and was used when extra resources were available.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. Only one instance of federally funded technology assistance was found. A laser speed measurement device was procured and tested by several states.

Discussion. A grant of $27,500 was provided to one of the states to purchase a laser speed device for testing. Similar awards went to two other states. Five of the states participating in the assessment were testing such devices. No other technical assistance funding was found among the states.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. Acquisition of replacement and new aircraft and speed detection devices would be seriously affected by the removal of safety grants. The same is true for the funding of overtime for patrol personnel to focus on speed enforcement. Set aside grants have been phased out so that enforcement programs must compete with other safety priority areas.

Discussion. As noted previously enforcing the 55 mph NMSL was a national program conducted by the states. Set aside grant funding was phased out in 1992. By then many of the states used basic safety grants, funded some operations with state funds and continued their general patrol functions -- primarily by state police and highway patrols -- that included traffic violation enforcement including speeding.

Replacement of aircraft and radar equipment would be made to maintain speed enforcement capability, but with reduced grant funding possibilities, since enforcement competes with other safety priority areas, new purchases could lapse.

One major use of grant funds, whether under the former set aside program or as part of police traffic services safety grants, has been the funding of overtime for special patrols. In the case of speed enforcement, full time special units were reduced by the 1990's so that selected overtime hours became a more flexible approach. Obviously removing or greatly reducing grants would result in severe cuts of this practice.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. Mandated monitoring of the number and percentage of motorists exceeding the 55 mph and higher level speeds was carried out by every state. Increases in non-compliance were met with additional enforcement, that in most cases brought the compliance levels into line with required thresholds. Some states also tracked fatal and injury crashes in which speed was judged to be a contributing factor.

Discussion. A key objective of the 55 mph NMSL enforcement program was to achieve the mandated percentage level of motorists complying with the speed limit. The mandated target was 50 percent which most of the states met and exceeded, although non-compliance increased in the late 1970's and early 1980's. One of the states increased enforcement levels in 1989 and 1990 without effect -- facing the threat of sanctions -- until adjusted speed measurements began to show a decline in the percentage of motorists exceeding the speed limit in 1992.

States were required to monitor speeds so that the above compliance levels could be reported to the U. S. Department of Transportation. A congressionally mandated study of the 55 mph NMSL was completed in 1984. It found that nationwide between 2,000 and 4,000 lives were saved in 1983 as a result of the 55 mph NMSL. It was noted that compliance levels, by 1983, had declined although public opinion surveys showed that 76 percent of the public supported the speed limit in 1982.

Changes to the national law in 1987 allowed states to raise their speed limits to 65 mph on rural interstates. As reported by one of the states, an evaluation of the higher speed limit was undertaken and the results were published in The Journal of the American Medical Association in their issue of October 27, 1989. The fatal crash rate one year after raising the speed limit was almost twice as high as the predicted rate based on a five-year trend. The researchers concluded that benefits associated with the 65 mph speed limit be weighed against the higher loss of lives.

General Enforcement and Outreach Programs - Findings

Overall Capability and Achievements

In 1993 enforcement agencies issued a traffic violation citation of some type to one of every 10 licensed drivers (includes data from eight of the ten states) in the states participating in this assessment. This amounted to approximately 150 citations a year for every "Full Time Equivalent"(FTE) sworn police officer that was engaged in traffic related duties. In 1980 one citation was issued for every 9 licensed drivers, or approximately 165 citations a year for every FTE sworn officer on traffic duty. This decline of 10 percent in enforcement has to be viewed against the ever tighter budgets and the diversion of sworn officers to crime enforcement and prevention over the past 15 years.

Substantial improvements were made to the training of police officers in crash investigation with courses funded by safety grants. Between 200 and 600 police officers, depending on the size of the force in a state, were trained at the various levels of crash investigation each year in 1993. This was more than double the number trained each year in the early 1980's. Expanded training programs in DWI detection and Standard Field Sobriety Testing have already been mentioned in previous sections.

Most of the enforcement agencies at the state level and many municipal police departments had outreach programs for schools and public organizations. Some of these were proactive, others were available on request. Only limited data were available on the number of presentations and attendance. Table PTS-4 shows the extent of such programs in selected states.

Table PTS-4
Enforcement Agency Presentations and Attendance

		1984	1987	1993
State A:	Presentations		3,226	2,000
	Attendance	300,000	469,400	288,100
State B:	Presentation	3,101	2,454	3,495
	Attendance	230,200	170,900	125,800
State C:	Presentations	142		
	Attendance		325,000	
State D:	Presentations	120	240	
	Attendance		100,000	
State E:	Presentations			832
	Attendance			17,008
State F:	Presentations			51
	Attendance			1,939

The scattered data can only give very general trends. Again limited resources appeared to have an effect on the extent of outreach programs although several of the states continue to maintain such programs with specially assigned sworn officers.

Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. Using selective enforcement concepts, particularly the designation of dedicated traffic units, several states established programs that were directed at a range of traffic violations. These units augmented the general patrol activities of state patrols and local enforcement agencies. A number of states conducted regular educational outreach programs, usually for school grades K-12.

Examples. One of the states established ten comprehensive enforcement programs modeled after the STEP concept in 1980. Two of the programs were in large municipalities. The focus was on all serious traffic violations by a dedicated traffic unit. The state also organized a project that would provide general enforcement as part along a 10-state corridor for a period of 24 hours on regularly scheduled shifts. The project was part of a cooperative effort organized by the International Association of Chiefs of Police.

As part of the state's corridor project, general enforcement services were provided as part of the "blitzes" that were designed to influence drivers to alter their driving habits. The focus was on DWI, safety belt use, speeding and other traffic violations. Twenty-seven corridors had been identified for enforcement with the first blitzes occurring in 1989. The corridor program earned the state a "Most Innovative Award" by the Federal Highway Administration.

The above state had for many years provided safety education programs through community service units of the state police. Thirty-eight state troopers were involved and in addition the more than 100 state police stations would, upon request, make traffic safety presentations to community groups, schools and other organizations.

The outreach activities in another state involved a continuing safety education program run by "safety sergeants" of the highway patrol. These designated officers plan, develop, and present programs throughout their troop area to students -- K-12. Local police departments in the state also conduct such presentations. One large city department has four school liaison officers who conduct safety seminars in K-12 schools.

One of the state, after analyzing county crash data, identified those that were over represented in fatal crashes and fatalities. Rather than using overtime, dedicated traffic units were established with nine STEP sites in 1981. A public information and education project was launched to highlight the program. A safety grant of more than $300,000

was used to fund the planned cost of almost $500,000.

Another state had only a few education and information outreach activities in the early 1980's. A program conducted by traffic safety education officers was established by the mid 1980's and in 1987, for example, a safety promotion involving the Vince and Larry appearances was shown to more than 300,000 people over two years. The state developed a Spanish language safety program to promote safety belt use and prevent drinking and driving.

2. *Did initial Federal grants create new programs?*

Overall. Substantial safety grants were used to develop and conduct an array of traffic related training courses, particularly crash investigation and reconstruction. Most states used grants through the early 1990's. The selective enforcement concept to establish dedicated traffic units or activities was also grant funded.

Examples. In 1983 one of the large states offered 50 courses of instruction at its training sites. Among the subjects were courses in crash investigation, code revisions, and other traffic related topics. Safety grants of $60,000 supported this training. That same year another state trained 400 police officers in DWI detection and apprehension and in selective enforcement with a safety grant of $138,000. Training support continued in both states through the early 1990's.

In 1986 the state formed eight new general enforcement projects and continued nine others with grants of $382,000. The corridor enforcement program was in its second year in 1990, funded with grants of $788,600 for overtime, training, speed timing devices, light bars, cones and safety vests. The corridor enforcement covered 39 municipalities.

In several states selective enforcement projects were merged into comprehensive traffic safety programs in the latter 1980's, yet there were continuing general traffic enforcement activities in many areas. In one state radar units and display trailers were purchased with grants of $52,500 in 1993. This program for local enforcement agencies continued in 1994. The Spanish language program that had been developed by this state was funded with a grant of $77,100 in 1994.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. There were some services in-kind that were made available during the corridor traffic enforcement operations. Most selective traffic enforcement projects were only active while being grant funded. There were limited examples of special traffic enforcement operations where the respective agencies supported the activities.

Outreach education programs were state or locally supported. Crash investigation and other traffic related training received support from safety grants through the early 1990's.

Examples. The 24-hour 10-state cooperative traffic enforcement project conducted during the years 1991 to 1994 in one of the states participating in the program was fully state funded. None of the other general traffic enforcement projects that were patterned after the STEP concept continued beyond the period covered by safety grants.

A civilian mobile crash reduction team was established in one of a state's cities to perform on-scene crash investigation, this relieving police officers. After supporting the operations for three years with safety grants, the city council decided to continue this program with city funds.

The regional general traffic enforcement in another state that was active in 1990 involved seven enforcement agencies that all lent funding support. There were no grant funds used to support this project. The same state's outreach programs at both the state and local level were always supported by the operating agencies or the state.

Most of the other states, except one, did not use grant funds for outreach education programs. That one state used grant funds in the 1980's to develop multi-image programs that could be incorporated into high school education courses.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. There was a replication of selective traffic enforcement projects, but these projects were usually grant funded and were substantially reduced or ceased operations when grant funds ran out. Training programs were offered by academies or training centers statewide.

Examples. Over a period of six years selective traffic enforcement projects in one state were replicated in other parts of the state. Beginning with a few sites, the program grew to 32 projects in 1983. As the projects completed their three-year grant supported operations, other similar projects were established. Eight new projects were begun in 1986. By the late 1980's these projects, as has been mentioned previously, were absorbed into the state's corridor enforcement program. The corridor program was expanded to 55 multi jurisdiction roadway segments in 1994.

The program to purchase radar units and radar display trailers in one of the states was extended to other enforcement agencies in 1993 and 1994. Grants were matched with local funds on a 1:3 basis.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. Several techniques used to carry out selective traffic enforcement, crash investigation and young driver education were developed with technical assistance grants awarded to several states in the 1970's (including ASAPs and STEPs). The states in this assessment did not receive technical assistance grants.

Examples. The optical-electronic survey device used by one of the states to locate crashes accurately and record data promptly. The device had been developed in a large western state with the support of technical assistance grants. The multi-image young driver education project used in this funds

The development of crash investigation training courses and techniques originated in part from the Northwestern University traffic enforcement program. There were technical assistance grants involved in this development. Most of the techniques for integrating crash investigation, case preparation and prosecution procedures derive from the Alcohol Safety Action Projects (ASAPs) in the 1970's. The STEP concept dates from the same period. Both were developed and demonstrated with technical assistance (§403) grants. NHTSA supported the development of the Standard Field Sobriety Test course.

The corridor concept was developed with §403 grant funds in one of the states after a fatal traffic crash on a state route. The state made presentations of the corridor concept to other states.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. Training in crash investigation and related traffic enforcement training would lapse or be substantially reduced. There would be no effect on outreach educational programs since these are state or locally supported. General traffic enforcement activities that had been fully safety grant supported would obviously not be possible.

Discussion. Police officer training, particularly in the fields of crash investigation, as well as in DWI detection and related traffic topics would be reduced in scope and size since much of these training activities are supported with safety grants.

Programmatic efforts that can be supported with appropriations specifically earmarked for that area through fines levied can survive without federal funding. For some states, the programs are initiated under federal grants and after several years of this support are funded through different mechanisms in addition to federal monies.

The general traffic enforcement projects that have from time to time been created in the states, and carried out for extended periods in some would not be launched since these did not long survive without grant support.

Outreach training has been supported by states and local enforcement agencies throughout

the years covered by the assessment. The level and extent of the programs vary considerably. Some states have instituted formal programs. Other offer educational presentations on request.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. No evaluations or assessments of selective traffic enforcement, training programs or outreach education programs were found in the states participating in the assessment. The overall enforcement level by the agencies in the states dropped by 10 percent between 1980 and 1993. The most likely reason is the diversion of limited resources to crime prevention.

Discussion. The programs in this segment cover a variety of activities -- training, general traffic enforcement and outreach education. Several estimates of overall capabilities and achievement were made for this assessment and these are highlighted at the beginning of this section. It was found that the enforcement level, based on traffic violation citations in relation to the numbered of licensed drivers dropped by 10 percent between 1980 and 1993. The number of such citations issued per police officer (on a Full Time Equivalent basis) engaged in traffic duties also declined by 10 percent from 1980 to 1993.

The reasons for these declines may have more to do with shrinking resources for traffic enforcement and the need by enforcement agencies to concentrate their efforts on crime prevention and apprehension of criminal felons.

A considerable effort to evaluate the early (1970's) STEP programs was made by NHTSA. The results at the time were inconclusive primarily due to their small size, limited operational scope and problematic comparison sites. The concept is, however, very popular with enforcement agencies. No evaluations for these projects in the participating states were found.

Evaluations were not performed of the public's perception of enforcement. Other forms of public information and education likewise were not evaluated.

Discussion of Issues

1. Can the effects of enforcement activities be assessed in terms of benefits and costs?

Traffic enforcement has, over the years covered by this assessment, represented approximately 70 percent traffic safety related costs. In 1980 safety grants for Police Traffic Services amounted to approximately 63 percent of all safety grants (including the National Maximum Speed Limit set asides). By 1993 the Police Traffic Safety portion of safety grants had dropped to approximately 42 percent. The grants are but a very small

portion of the total traffic enforcement costs -- 5.0 percent in 1980 and approximately 1 percent in 1993 -- incurred by the states.

Based on data collected during the assessment, annual traffic enforcement cost rates were calculated. They are shown in Table PTS-5

Table PTS-5
Total Annual Traffic Enforcement Cost Rates

	1980	1993
Cost per Citation	$205.00	$464.00
Cost per Person	$ 14.36	$ 30.50

Data such as these only bring the total costs -- $1.62 billion in 1993 for the ten states more into focus in terms of a per capita or per "product" cost.

The generalized measures of traffic enforcement output include apprehension capability -- citations, arrests, investigations, breath tests administered -- and subsequent outcomes such as convictions, fines and jail terms. The input side can also be measured in more detail by listing what was bought -- equipment and duty time (salaries).

One can back into the potential effect of traffic enforcement by calculating how many lives would have to be saved when the "lifetime economic costs to society" of a fatality is used to make such an estimate. The NHTSA study The Economic Costs of Motor Vehicle Crashes - 1994 states that the lifetime economic costs to society of a fatality are $830,000 million. With an annual traffic enforcement cost of $1.62 billion, a reduction of approximately 1950 fatalities, annually, would be necessary to equal the cost.

The NHTSA report lists the economic lifetime costs of a critically injured crash survivor at $706,000 -- very nearly matching the economic lifetime costs of a fatality. Using an average economic lifetime cost, a reduction of approximately 2,300 critical injuries would have to be achieved by the ten states to make the benefits of traffic enforcement equal the costs. The states had an average reduction of 140 fatalities a year since 1980.

The average total lifetime economic costs per casualty, based on the total lifetime economic costs for fatalities and injuries is $98.4 billion (not including property damage). Dividing the cost by the number of fatalities and injuries (40,676 fatalities and 5.2 million non-fatal injuries) yields $18,800 injured or fatally injured person. Based on 1988 through 1993 trends, there was an average reduction of 7,350 casualties a year equaling a total lifetime economic cost of approximately $138 million a year -- against a traffic enforcement cost of more than $1 billion a year (average) since 1988. Justification for the traffic enforcement costs would be difficult using this approach.
As with several of the other safety programs, traffic enforcement activities have been

viewed as contributing to reductions in crashes and crash casualties, most probably in an indirect way, but the relationship has lacked a defining conceptual mechanism. This has left the analysis of the value of traffic enforcement to be conducted from a different standpoint -- its perception as a deterrent that can affect the extent of a crash avoidance.

The next discussion issue addresses some of these aspects.

2. Which strategies and tactical deployments of traffic enforcement resources have yielded results?

When reviewing Highway Safety Plans from 1980 through 1993 it became apparent that most traffic safety enforcement programs -- DWI and speed enforcement -- were repeated year after year in almost the same format. It seemed that for many projects, only the project name or acronym had changed, or that the same kind of operation was being carried out at another site.

The fundamental strategy for traffic enforcement has been, and remains, vehicle conflict reduction through the presence of symbols that represent the traffic laws. It is usually referred to as deterrence.

What really new tactics have emerged in the last 15 years? Very few completely new practices, but there have been new approaches and technologies. There are sobriety checkpoints, more accurate breath testing devices, improved radar and now laser speed detection units, more comprehensive training for crash investigation, video taping of arrest procedures and new laws on per se, implied consent, drinking ages, and automatic license revocation. All of these have been incorporated into the tactics used by traffic enforcement officers.

When we say traffic enforcement, is all of it really "safety" related? The substantial amount of traffic enforcement costs estimated for each of the states may raise that question, particularly when trying to determine what effect the relatively small amount safety grants have had. The proportion of traffic operations conducted by enforcement agencies was obtained from actual data or estimates by these agencies during the assessment.

Traffic operations, other than parking violations, whether they constitute so called "general patrol" or more specific activities to reduce speeding or drinking and driving, encompass an inherent "safety" orientation that can manifest itself at any time during the patrol.

The safety grant, small in relation to total costs for traffic enforcement (less than 1 percent in most cases), but large in relation to the safety grant awarded to each state, has played a key role in that grants have helped fund many if not most of the new technology

equipment acquisitions. Together with grant support for personnel overtime, an increment of enforcement capability for deterrence was obtained. If deterrence is the accepted strategy based on a historical implied sense of effectiveness, then at least some such support remains a viable program provided it does not grossly violate the "seed money" concept of the safety grant program.

Now getting back to the key discussion question, how much is the presence of traffic enforcement worth? What have been the results? Here is the dilemma that faces those operations that are designed to prevent an incident, rather than to produce the incident. Quantifying the value of an operation that deterred something from happening is like trying to prove a negative proposition -- it is not possible.

The net worth of general police traffic enforcement is hard to estimate because nobody wants to experiment with a completely unpoliced road system.

As time has passed, speed enforcement may have been hindered by the NMSL because it has had little support from the states and the public. To some, especially in western states, the NMSL has been viewed as a Federal imposition. With the expiration of the NMSL, there needs to be a coordinated strategy to do something about speed and aggressive driving. Some pilot programs are being undertaken by various jurisdictions.

3. <u>What is the role of equipment and technology in traffic enforcement and what are its funding mechanisms?</u>

New technology to improve the accuracy of measuring devices for breath testing and speed detection has been driven both by new laws and by the need for indisputable evidence in traffic court cases. The states have long been eager to improve their breath testing procedures in order to get more convictions. Upgrading the breath testing devices and the acquisition of new speed measurement radar has improved the enforcement capability in the states.

Aircraft and vehicles have also been purchased and replaced periodically to keep up with technology and to avoid old equipment breakdowns. Safety grants have been used extensively to fund such acquisitions. Only one of the states participating in the assessment had enacted a law establishing an enforcement fund from taxes on alcohol consumption (drink tax). The nearly $1 million collected each year could be used in a number of ways including the purchase of equipment.

Are there prospects for self sufficiency for the purchase of new technologies and the replacement of key traffic enforcement measurement devices? How tough should be the criteria for receiving grants for equipment? Should funding be strictly for really new concepts and technologies (such as the laser speed detection device)?

One state established the Law Enforcement Assistance Fund (LEAF) to provide funds to

enforcement agencies to increase enforcement of the state's drug and alcohol traffic laws. Funds are derived from fines, which are levied on every motorist who is convicted of, pleads guilty to, or receives a deferred sentence for DUI, DWI, or per se offense. LEAF is an example of self-sufficiency with the proceeds being distributed to local law enforcement and prevention programs.

The proportion of safety grant funding for equipment varies from year to year. Aside form the purchase of airplanes and vehicles for speed enforcement, equipment purchase safety grants are estimated at less than one-third of the grant expenditures. Personnel costs account for the larger safety grant support. While it may appear that overtime support has taken precedence for grant support, the proportion of §402 grant funds for overtime has undoubtedly dropped since 1980.

Without modern detection equipment, the deterrence factor may fast diminish in the eyes of the public since it directly affects enforcement capability and court case outcome. This is not to discount the value and need for personnel, but some kind of a priority system for disbursing safety grants might be considered, coupled with incentives to establish a funding system leading to self sufficiency.

Training, an important function to properly operate new technologies, has also been a long standing program supported with safety grants in many, if not most, states. It should take precedence over overtime when it come to grant funding.

Conclusions

The seven assessment criteria provide the best basis for guiding the conclusions about traffic enforcement programs, but overall, enforcement programs were in most cases sizable efforts to curb -- and deter -- serious traffic violations. Safety grant funds were focused on major safety problems, did create new programs, and certain enforcement techniques were replicated. New technologies -- like laser speed devices -- were adopted.

1. The two major safety problems of drinking and driving, and speeding were the main targets of traffic enforcement in the states. Specific segments of the problems were analyzed through the problem identification process. Factors such as young drivers, roadway types, weekend, holiday and nighttime driving were among the targets of traffic enforcement.

2. The creation of completely new programs with the support of federal safety grants was limited, but many innovative approaches were first deployed that were established with safety grants. Most importantly, the acquisition of improved breath testing and speed detection devices with federal safety grants represented the use of federal grants for new systems that enhanced enforcement procedures and case adjudication.

3. Enforcement organizations are traditionally state and locally funded. The role of safety grants has been to assist in addressing specific traffic safety problems. Creation of traffic units to carry out selective enforcement, acquisition of special equipment and vehicles and funding of overtime pay with grant support did engender a limited state and local response. Most of such projects either lapsed or were reduced once federal funding ended.

4. Since traffic laws affect the whole state, their enforcement follows suite. Certain selective enforcement tactics, such as sobriety checkpoints and central offender processing centers using video taping techniques were introduced at selected sites and were replicated in other parts of states thus having the "catalytic" effects deemed desirable for successful projects. Speed citations given out by regular patrols usually far outnumbered those written by the special 55 MPH enforcement teams in several states.

5. While many tactical approaches have been in use for a long time, these were enhanced through the demonstration and application of new technologies that were developed with federal technical assistance grants. The laser speed detection device was one of the latest in that category.

6. The most critical aspect when considering removing federal safety grants is that they have been a key factor in establishing and/or resuscitating traffic enforcement activities through assistance in the acquisition of new equipment, training and personnel support. Eliminating the availability of federal grants would stifle these initiatives at a time of continually limited resources and the focus on other priorities such as violent crime and drug trafficking.

7. Very little formal monitoring, and almost no assessments or evaluations were found during the assessment of the participating states. Most of the monitoring consisted of collecting activity data (vehicles stopped, arrests, warnings, patrol hours, etc.).

8. Enforcement is expensive, but it is necessary despite the lack of conclusive evidence in many areas. By being visible, available and capable of action, enforcement officers represent a first line of confrontation for public safety. Grant funding, being such a small percentage of traffic enforcement costs, should however, be used intelligently.

TRAFFIC RECORDS

The Programs

To provide a complete and useful records system for safety program management at both the state and local level, each state should have a data base consisting of files for: crashes, drivers, vehicles, roadways, citations and convictions and emergency medical services. In addition, state records should provide for file linkage and include performance level data on countermeasure management, demographic data to control for difference in exposure, and cost data.

The structure and content of the data systems vary from state to state. Each state has one or more traffic related case data collection and recording systems. The most common are the crash data systems that record fatalities, injuries and crashes. They are dependent on field entries onto a police crash report forms. To provide useful statistics for analysis and reporting, the police reports are routed for review, editing and the entering of selected data into a computerized system.

Another important information source for traffic safety are data about the enforcement of traffic laws. Citations for drinking and driving, speeding, failure to use child restraints and safety belts, and the results of breath tests are directly related to policies, programs and the emphasis on safety problem areas. There are traffic court case systems that can yield data on dispositions and penalties. In line with court cases are offender treatment and rehabilitation data systems that show how many drinking and driving offenders completed "alcohol school" or were referred for more intensive treatment.

The care of crash victims is also important information and there are systems that record and computerize ambulance calls and more specific information about each case. There are roadway, and more recently geographical information and location, systems that identify roadway characteristics and can pinpoint occurrences using a grid rather than mileposts.

Then there are the extensive driver licensing and vehicle registration systems that are usually the most common link with citation and adjudicative disposition records. They are supported by fees and constitute one source of state revenue.

To give an overview of the traffic crash statistics and vehicle miles traveled, data from the automated systems in ten states -- Pennsylvania, Kansas, North Carolina, New Jersey, Connecticut, Nevada, Ohio, Washington, New Mexico, and Colorado -- are shown, as a total, in Figure TR-1 for 1980 and 1993.

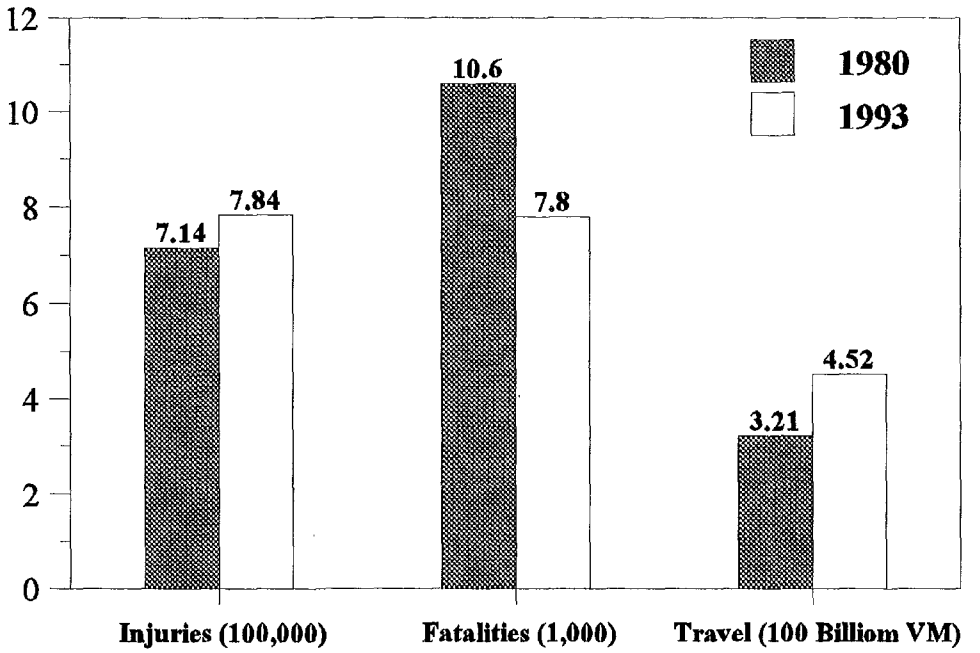
There has been a 26.5 percent decline in the number of traffic crash fatalities between 1980 and

the end of 1993. This represents a fatality rate reduction from 3.28 to 1.72 fatalities per 100 million vehicle miles over the 14 year period for the ten states.

The number of injuries for the ten states have increased from 713,000 to 783,900 -- an almost 11 percent increase. Injury rates, however, have declined from 21 to 16.7 injuries per 100 million vehicle miles, because the driving mileage increased by almost 39 percent from 1980 to the end of 1993.

Figure TR-1

INJURIES, FATALITIES AND TRAVEL



In summary, the reported statistics show a clear improvement in traffic safety. The Findings that follow focus on the traffic records systems and operations that the eight states have established, the capability improvement, achievements and the role that safety grant programs have played in systems development.

Findings

Overall Capability and Achievements

Each of the states surveyed were able to produce detailed crash statistics on an annual basis by 1986. Data processing in two of the states lagged one to two years and that was reflected in their annual traffic crash data publications. In all cases the data were sufficient to carry out extensive problem identification analyses. By the late 1980's, all Highway Safety Plans included arrays of crash statistics broken down by the type of vehicle involvement, by age, by contributing factors

such as alcohol or drug impairment, and speed level. Pedestrian and bicycle data were also included.

Charts and cross tabulations had not only improved, but there were more of them in the early 1990's. Beyond crash data, annual compilations of impaired driving arrests, and citations for violating occupant protection and child restraint laws, were also being recorded. Blood Alcohol Concentration levels, numbers of breath tests and refusals were available -- though not always in computerized form. The new traffic court case systems were providing automated data on dispositions, sentences and fines. Much of the historical data was, however, still on hard copy.

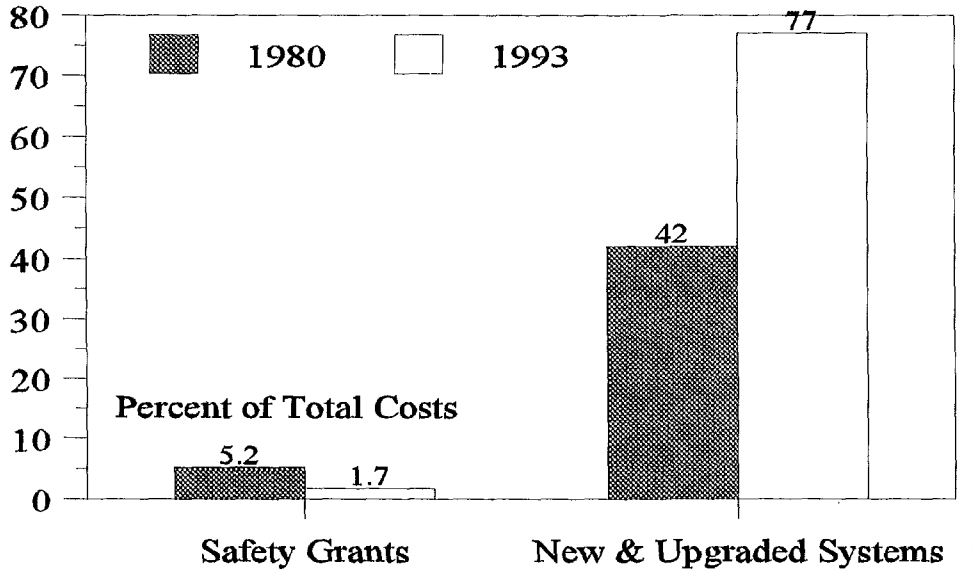
Automated driver license records could supply data on suspensions and revocations. Emergency medical records were, in most states, not complete because many of the services were operated by volunteers where record keeping was minimal. In several states the central EMS office did not have sufficient authority to require reports and such data collection was given a low priority in relation to other needs. There were also situations where the local organizations resisted coming under the direction of central EMS offices.

Despite drawbacks and funding limitations, a considerable amount of traffic safety related data are available and substantial progress has been achieved in computerizing these data. Figure TR-2 shows the number of new and upgraded computerized systems developed in the two time periods.

Figure TR-2

TRAFFIC RECORDS IMPROVEMENTS

New/Upgraded Systems and Funding Trends



Traffic

records systems have become less dependent on safety grants since 1980. There has also been an increase in the number and type of systems since 1980. Among the new installations in several states were traffic court case tracking systems, on-line driver licensing and control systems, automated DWI breath test files, and the development of emergency medical services personnel, training and certification data systems.

Assessment Criteria Findings

1. *Where projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. All the data systems that were in place before 1980 and those created or upgraded between 1980 and 1993 were useful in providing information for identifying problems, compiling informational statistics and for analyzing safety programs.

By far the largest effort was upgrading existing crash data systems through revised police crash reports, and computer hardware and software.

Examples. In line with the Transportation Research Board's publication Comprehensive Computerized Safety Records keeping Systems, many states began to review and upgrade their data collection and processing operations. One state that already had a system that linked roadway characteristics with crashes added an interactive feature that could allow a user to obtain in-depth crash information on line.

Another state purchased new equipment in 1987 to increase its capability for analyzing crash data involving heavy trucks, motorcycles, pedestrian crashes and incidents involving elderly drivers. This supported additional problem identification analyses and studies on the locations of heavy truck crashes and crashes involving elderly drivers.

A number of systems were developed to meet new requirements enacted under state laws such as automatic license suspension or revocation. One state automated its Blood Alcohol Concentration file which contained alcohol-related field arrest data, and established a link between its toxicology lab and its traffic safety office. The Intoximeters in the state were also linked to the toxicology lab.

States used the special traffic set-aside funds legislated by Congress in 1984 to undertake major upgrades, often with the assistance of specialists that were hired under various contracts. In one case such a contractor recommended a new crash data collection form, micro computer-based data entry and edits, linkages with driver and vehicle files, upgrading the road inventory, a safety management information system, a traffic citation and adjudication system, and a further coordination of driver, vehicle and emergency medical services data.

After a review of these proposals only the new crash form, the micro computer entry/edit and a main frame crash system were implemented. The other proposals were not implemented because of funding shortages, the lack of clear benefits for the proposed data linkages and the absence of system technology. Here is a case of making the best of what can be achieved with the resources at hand, because consultant specialists did not take current conditions into account.

Some data linkages simply involved, as a first step, allowing the state's traffic safety office to access crash data for analysis and to publish crash statistics. Such a "first step" was taken by a state in 1985 and was fully operational in the late 1980's. At that time linkages with the FARS files, the state's EMS files and their DWI breath test file were being developed to further increase the traffic safety offices' analytic capability.

Among the new computerized systems was the automation of court cases in several states. These systems could track the trend of case dispositions and the distribution of sentences. One of the largest such systems was developed in one state to track the more than two million cases -- 80 percent of them traffic cases -- filed there each year. Serving more than 500 courts the system converted a paper and cardboard box operation that managed to collect only 60 percent of its fines, to a high speed automated system that now collects 90 percent of its fines. It cost the state $25 million to develop the system and between $10 and $12 million to operate. It is funded through a $1.50 surcharge for each citation.

The development of prehospital care data systems has received increasing attention by states because fast and appropriate medical care has been shown to reduce mortality and morbidity. One state has made major progress by integrating basic life support algorithms into its system. They are used to compare the performance of emergency medical technicians. By 1990 more than 90 percent of all ambulance services in the state were using standard trip report forms. There is the capability to add the trip"ticket" number to the police crash report to provide an interface that would also include emergency response times.

2. *Did initial Federal grants create new programs?*

Overall. Many new and upgraded systems were created with the support of basic safety grants. The new and upgraded data systems mentioned under 1. above were usually supported with safety grants. In some cases all of the development and initial implementation was funded with grants. In other cases only a relatively minor portion of the costs used §402 basic funding.

Examples. The state that added an on line interactive analysis feature so that all crash cases could be accessed for in depth analysis, spent $435,000 for the conversion, of which $318,000 was funded with safety grants. Another state that added new data files for heavy truck crashes, motorcycle, pedestrian and elderly driver incidents used grants of $187,000 to purchase new computer systems for the program.

In some states major crash data system upgrades were funded by the Federal Highway Administration (FHWA). In one such state, after a joint NHTSA/FHWA review, a new system that would conform to the state's new location reference system was designed and implemented with a grant of $1.5 million from FHWA.

The traffic records set aside funds created under Congressional legislation in the mid 1980's were used in a variety of ways. A central traffic records system to improve the problem identification process, to respond to public inquiries and to provide data for research studies was developed by one state. Another state used the set aside funds to completely modernize their crash data system.

Set asides were also used by states to develop a driver licensing and control system. One state spent more than $18 million over several years. A set aside grant of $500,000 was used in the development of the system. To develop a tracking system for the newly legislated DWI offender treatment program in one state, set aside grants of approximately $300,000 were used for the design, procurement and implementation of the system.

One state pioneered the new geographic information/location systems and used the set aside grants to develop a geographic road network data base. That same state also created a linkage between its Justice Courts and its motor vehicle department to provide the court access to driver records, again using set aside grants.

There were also several states that used safety grants to develop new systems for emergency medical services. One state created a patient run collection system. Another state purchased software for an ambulance call data system.

A limited amount of safety grant funds were used to initially support some of the new court case systems in three of the states. One state used a safety grant of $60,000 to fund two positions in the start up of its automated traffic court case system. This was a small amount in contrast to the $4 million annual operating costs.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. Many data collection and processing systems are state or locally funded. As noted previously, safety grants supported the development of new or upgraded systems. The court case systems operate on surcharges.

Examples. There was only one state that continued to fully rely on safety grants to operate its central traffic records system -- the state refused to fund the system. Another two state funds approximately 90 percent of their crash data entry and analysis with federal safety grants. One of these has contracted for this service, and the publication of

an annual traffic data report, since 1978. A fourth state has received substantial grant fund support from the FHWA. Two other states do not use NHTSA safety grants to support their crash data systems.

A new operational approach that involved data coding and entry under contract with a correctional institution was initially funded with grants of $45,000 in 1986. By the early 1990's the contract, now at $67,000, was funded by the state. An ambulance call report system in one state was upgraded with new software and the installation of optical readers in 1988. A safety grant of $25,000 was used for acquiring the equipment. Data collection, the production of statistical reports and their distribution to ambulance and firefighting services was thereafter funded by the state.

Two of the states have experienced serious funding problems for crash data entry and processing. Both have had to delay these operations leading to a two to three year lag of crash data publication at various times over the past 10 years.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. Most traffic related records systems are uniform statewide operations. The exceptions are local police crash systems that serve their own jurisdiction. There are also some ambulance call systems that only cover a portion of a state.

Examples. A model local traffic records systems for local jurisdictions were developed with safety grants in one state. They were eventually used by 170 city and county traffic engineering offices.

Several of the court case systems were piloted in one or a limited number of courts. The state that developed an automated traffic court case system in the mid to late 1980's began its implementation in a few counties and then replicated the process until it covered more than 70 percent of the traffic cases in the state.

A court reporting network system that would standardize the adjudication and referral process for DWI offenders was first pilot tested in three counties of a state before being implemented statewide. In another state the linkages between courts and the motor vehicle department's driver licensing records were begun at a few sites in one state before expanding statewide.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. The use of technical assistance grants directly, or the development of systems based on previous §403 funding support for related projects in other states, was mixed.

Most states either obtained §403 grants for projects or used the experience and designs developed by others -- some of whom had been supported with technical assistance funding.

The drive toward a Comprehensive Computerized Safety Record keeping System has continued, but as time went by more realistic expectations prevailed. The lack of continued funding potential, the lack of expertise at the state level and a possible "over sell" on the ease and efficiency of untested "totally linked" systems were serious obstacles.

Examples. The model local traffic records system (mentioned in 4. above) to support problem identification analyses, that eventually was used by 170 traffic engineering offices in the state was developed with technical assistance funds. Another example was the state that pilot tested its offender evaluation and treatment tracking system in three counties before implementing it statewide. The concept for this system was first studied and designed with a technical assistance grant.

The drive to create Comprehensive Computerized Safety Record keeping Systems (CCSRS) that was described in a publication of the Transportation Research Board of the National Academy of Sciences was often a basis for planning and undertaking major studies and designs for the CCSRS concept. One state, after the completion of a study by a contractor (for which it paid grant funds of more than a quarter million dollars) commissioned another contractor to design a comprehensive traffic records system. This was undertaken beginning in 1992 with a completion targeted for 1995. Technical assistance grants of $1 million over a three year period were awarded.

One state used §403 funds for software to link their roadway data file to their crash data file and another state received a technical assistance grant in 1994 to link their records to the National Driver Register.

The state that had developed basic life support algorithms to compare the performance of its emergency medical technicians received a §403 technical assistance grant for this project in 1981/1982. Although not part of NHTSA's technical assistance program, one state used the U.S. Health and Human Services (HHS) Rural Services program funds to support development of a data system known as Equal Access to Community Hospitals (EACH). The objective is to create a system that collects and stores the number of emergency and transport calls, emergency technician certifications, the types of services and budgetary information.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. There would be at least a reduction of crash data system development capability if federal safety funds would not be available. Seven of the states continue to rely in whole or in part on safety grants for new crash data system development, system upgrades

and system design. Court case tracking systems, driver licensing, vehicle registration and offender evaluation systems are all self sufficient and would not be affected by the lack of grants for operations. Again new developments in these areas may be slowed down without some safety grant funding.

Examples. One state uses safety grants of nearly one half a million dollars a year to operate its central crash data system and would need to establish a fee for service process to be self sufficient.

Another state has been dependent on substantial grants from the FHWA and would have to find other resources in order to continue the extensive crash data collection, entry and analysis program. Work on system planning would also suffer since several states have used grant funds, were using or were applying for technical assistance grants, to develop strategic plans for their systems. A central factor in achieving the integration and use of several data bases, by one of the states, was a long standing -- since 1978 -- contractual agreement with the state university. Most of the traffic records safety grant funds were used to sustain this service through the early 1990's.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. NHTSA conducted a traffic records systems assessment in one of the states included in this assessment and found that there was no central coordinating entity -- necessary to facilitate linking data systems. Each state has over the past 15 years conducted reviews and produced studies that attempted to establish how future needs could be met. Upgrades of their crash records systems usually followed. As part of these reviews the shortcomings of the current systems were highlighted.

In the majority of states visited in this assessment, there was a lack of expertise in the traffic safety office to plan and direct traffic records systems -- specifically crash records systems. There was considerable reliance on consultants for planning and design, but the direction of complex data operations was usually left to those organizations that were responsible for collecting the data.

Examples. The state that was conducting a major systems design and implementation with a $1 million multi-year technical assistance grant, began the project by an exhaustive review of past and existing data collection and processing systems. These "evaluative" studies highlighted the limitations, potential obstacles and expected costs of new systems. The most immediate and critical need for the project was the hiring of an experienced data systems manager who could direct the operation.

Several of the states have advisory committees -- as recommended by NHTSA and others -- that plan and oversee the development and operation of crash data and related systems.

The committees, composed of representatives from user agencies (traffic and roadway safety, emergency medical services, police departments, highway patrols, licensing and registration, courts, safety activists, and technical experts) have met periodically to address problems, discuss plans and hear status reports. Many initial recommendations of committees or consultants lead first to a revision of the crash data collection instrument (police crash report).

There were at least three traffic safety offices that either managed, or had made considerable efforts to manage, crash data systems and to develop linkages to other files. One of these offices had an expert in charge of the traffic records systems center. Two other offices lacked that expertise.

Discussion of Issues

1. Were set aside funds used for appropriate projects ?

   Since the purpose of the set asides was to create "linked systems" that would contribute to a Comprehensive Computerized Safety Record keeping System (CCSRS), the accomplishments, though mostly worthwhile, fell somewhat short of the objective.

   Only one and possibly a second state used set aside funds for the linkage of data files. Several states developed new concepts such a geographic information system data bases with set aside funds. Major crash data records systems were upgraded with set aside grants. Then there were states that used such funds to contract for studies with the aim of systems redesign and implementation. Most of the study/design contracts fell short in that they tended to recommend new or upgraded systems that were well beyond a state's capability to implement because of the lack of sufficient funds, unavailable new technology, and the limited potential for benefits.

2. Is there a need for annual crash statistics?

   The public and safety officials want to know about trends in traffic crash fatalities and injuries as well as contributory factors such as impaired driving and speeding. Most of the states in the assessment had established efficient means of collecting, reviewing, editing, entering and publishing such data. Two of the states had run into funding and state "priority" problems and were unable to keep their data entry process current. After a time this data lag began to create controversy because these states could not update their problem identification analysis for their plans (and Highway Safety Plans) and programs.

   The issue is not about basic data collection which begins with the police filling out the crash report. It is about how much processing and subsequent analysis is necessary each and every year. Does the problem identification analysis have to be an annual process? Probably not since, for example, the outcome that young drivers of specific ages are over

represented in crashes that involve impaired drivers has been identified as a problem for some time. That the fatality rate of motorcycle riders is well above that of vehicle drivers involved in crashes is also no surprise. Such analyses can well be made every three years to check the trends of identified problems, or to discover new problems that are emerging.

3. Are data entry time lags inevitable (funding shortages, contracting delays)?

Following on from the preceding topic, the states that experienced the problem were confronted with policy decisions made at higher levels about what should have budgetary priorities, and/or exceptionally long contract review and procurement approval procedures in their respective states. There would probably be more states with a similar problem if they had to do without grants from the FHWA.

Although grant funds for data review, coding and entry are essentially inappropriate since this process hardly qualifies as a "seed" money concept, the FHWA appears to operate under the premise that such data are critical in determining the kind and level of safety programs a state needs.

4. Should NHTSA continue to push data systems linkages?

The fundamental idea behind data file links is sound. Such a system would, for example, allow a search for detailed crash data about a specific incident from a pre hospital case file on one of the injured in the crash. Such information may have many uses. Other types of linkages involve a judge's access to an offender's driving record, and the disposition and previous sentences for the offense through an on line personal computer system that can interact with the state's driver license file and the court case file.

Many linkages have in fact been created with federal grants and in several cases without. It has, however, been a slow process that is most successful when a demand for the linkages has been created. Since there is cost, training, "turf," and in some cases resistance to change, involved, the value of a linkage and who will benefit has to be quite clear.

5. Should private entities help fund traffic data systems, particularly if they are users?

What comes immediately to mind is that, for example, the auto insurance industry subsists from crash data. The auto manufacturers are also key users. How much do the private organizations that obtain state crash data pay? What does the federal government spend for state crash data?

The cost of "Traffic Records" for the ten states was more than $90 million in 1980 and approximately $162 million in 1993. Safety grants amounted to $4.7 million in 1980 and

over $2.3 million in 1993. A sizable portion of these costs is paid from license and registration revenues, but the crash data continues to be a cost that is borne by the taxpayer either in the form of grants or from a state's general fund. Crash data, if the future systems are to be viable, should become a revenue generating product and its users should pay the price.

6. Why do so few states have statewide EMS data systems?

Many EMS units began as private services, often associated with funeral homes. Suburban and rural services were created with volunteers. Incorporated municipalities operated with a mix of paid and volunteer services and cities usually maintained their own paid EMS operations that were independent or part of fire departments. There was little, if any, uniformity across a state. Volunteer organizations often formed associations that were not keen on state or regional regulation. As a result the advent of state mandated emergency medical services offices and their role in certification, inspection and oversight while having gained strength since the early 1980's, still confronted resistance in several states.

Throughout the 1980's state legislatures gave the central Offices of Emergency Medical Services mandates for the development of Trauma Registries and the designation of trauma centers. Not every such Office, however, was able to establish statewide pre hospital computerized data systems. Some of the obstacles in developing the systems are the privacy issue that precludes the use of names and social security numbers for example.

Another major factor is the competition for patients among hospitals. Rules and contracts often require that a patient be delivered to the nearest hospital. The emergence of trauma centers and crash victim triage and delivery systems has greatly improved the chances for direct transport from crash site to a trauma center. Pre hospital transport reporting using "run reports" has also improved, but there is still a general lag in the development of central systems -- possibly because of a reluctance by EMS units to share the transport "numbers."

Certification and recertification of Emergency Medical Technicians, the number of EMT's by category, and the number and types of vehicles and certain other data are available, but are not necessarily exact. A few of the states do have central EMS data systems that, since the mid 1980's, have been reporting certain pre hospital data from more than 95 percent of the state's EMS units.

7. Do the NHTSA Regional offices have the expertise to review/approve plans (in HSPs) for grant funding?

Expertise in data collection, computerization and analysis are not a requirement for the typical Regional staff person. While the assessment did not include a survey of skills in the

Regional Offices, the level of attention that can be devoted to reviews and developments in "Traffic Records" is limited because there simply are not enough staff to cover this field in detail. While the safety grant funded portion of the total costs of traffic related records systems has declined since 1980, substantial amounts of grants -- the set aside, technical assistance (§403) -- have been used to study, design, develop, implement, and in some cases operate, crash data systems.

In view of the perennial funding shortages, an effective use of funding resources is important. The availability and accuracy of crash and related traffic data underlies the planning, problem identification and monitoring/evaluation process. It is essentially the clockwork of any program management system. For this reason, the outcomes discussed under Issue 1. above, and the fact that reliable and competent "computer experts" do not come cheap, the review and approval process for Traffic Records in HSP's may be better served by small specialized staff.

Conclusions

1. Since 1980 states have made considerable progress in collecting, processing and publishing crash data. All states included in the assessment have working automated systems. There have been and continue to be barriers -- lack of funds, and lengthy project approval processes -- to timely data entry in some states.

2. Traffic safety problem identification through analyses of crash data has become a routine activity in all the 10 states, enabling them to plan and allocate resources. Highway Safety Plans are often chock full of data arrays broken down into so many "cuts" that they often lack a rationale for being there.

3. Annual processing, analysis and publication of all crash statistics may be unnecessary because there is so little change from year to year. Key tracking statistics such as the number of fatalities and injuries and their contributing causes (alcohol, drugs, speed) continue to be important for annual reporting.

4. The acquisition of systems hardware and software for crash data processing and access was usually funded by the states, but the development work received safety grant support during the 1980's. Reliance on grant support has declined.

5. As expected, systems that generate revenue -- licensing, registration and the new court case systems -- tend to be developed or upgraded. Systems that do not bring in revenue -- clearly traffic crash statistics and pre hospital care data -- have had to struggle for the basics, such as data entry funding.

6. The pursuit of comprehensive computerized safety record keeping systems (CCSRS) has in a number of instances drawn less than the desired result because

of unrealistic objectives in light of available resources, technological limitations and resistance by an entrenched bureaucracy. Had there been the necessary data systems computerization expertise at NHTSA (both headquarters and Regions) and at state safety offices, both funds and time would have been saved.

7. There is a considerable amount of traffic safety related data available. Almost all of the data are not only useful, but at times critical to assess, track, measure, evaluate and otherwise analyze trends, and outcomes. As mentioned above, some data systems serve as income generators -- in addition to other purposes. Others -- and traffic crash data are among them -- also have a real value, but whose real worth has as yet not been realized.

EMERGENCY MEDICAL SERVICES

The Program

The major aspects of emergency medical services consist of pre-hospital basic life support, advanced life support and trauma care. Basic life support (BLS) includes crash scene services, transport to a hospital and life support en route. Ground ambulance units staffed with trained ambulance attendants provide the basic services. Ambulance attendants initially began training with first aid courses and progressed through the several levels of Emergency Medical Technician (EMT) series whose curriculum was developed by the U.S. Department of Transportation.

Modern transport vehicles and equipment have resulted in the establishment of relatively sophisticated EMS systems in most states. The paramedic EMT series, and the Advanced Life Support (ALS) services are the tie-in with modern trauma care that is available in verified or designated Levels I, II and III trauma centers.

Many police officers and firefighters are trained as First Responders. Initially this program consisted of providing approved first aid courses to police and fire department personnel. EMT training is required for the fire or police departments that are responsible for EMS.

Assistance in purchasing properly equipped ambulances with two-way radio communication was available through safety grants in the 1960's and 1970's. Major safety grant support was also given to EMT training programs that consisted of the 81 hour DOT course and the 101 hour DOT course. This support has continued through the early 1990's for some states. Rescue training and equipment (extrication tools) have been funded with §402 grants.

One of the key challenges in emergency medical services has been the recruitment of EMTs. Daytime versus nighttime duty hours, working conditions, lack of advancement opportunities, and limited pay raises have narrowed the potential pool of candidates. The system relies on a large number of trained and certified EMTs to provide quality prehospital care, 24 hours a day, year round.

New communications systems were established that provide access by dialing 911. The enhanced 911 systems that allows a trace of the call are being installed in most areas. Regulations for medical direction and command, and triage procedures, are now in place in many areas. Trauma registries have been adopted or are under development. More recently there has been an emphasis on pediatric trauma care. Air ambulance services were introduced during the 1980's.

Direction of emergency medical services is usually under a state's health department. Efforts to centralize EMS management have made considerable progress. Safety grants have been used to support the EMS offices. State EMS organizations vary; some states use a regional structure. Regulations to certify EMTs, ambulance services, and vehicles have been widely adopted.

Trauma care has been expanded substantially with the designation or verification of trauma centers in every state. Many of these facilities operate the aeromedical transport teams that have been established since the mid 1980's. The same facilities also operate many of the ground paramedic units that reach the crash site to administer advanced life support services, but leave the transport of the crash victim to the basic life support (ambulance) or air ambulance unit.

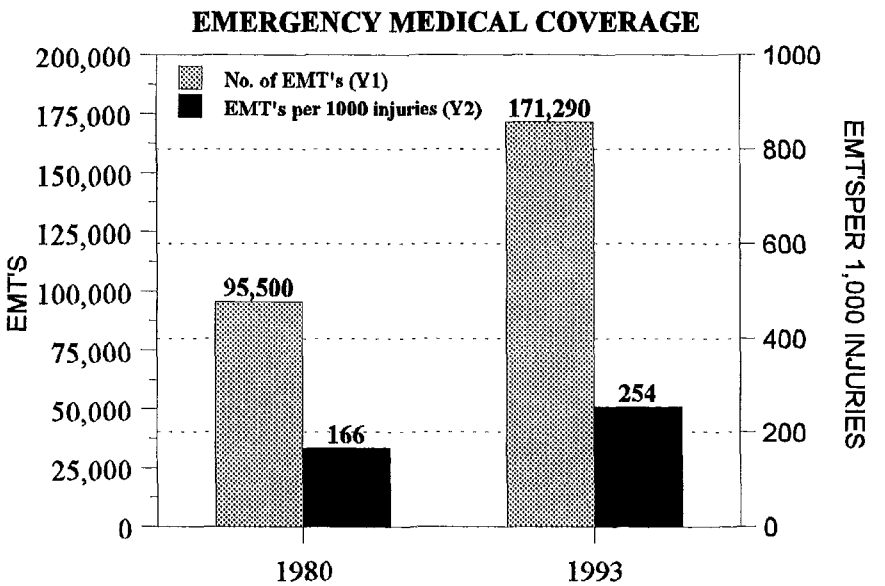
Pre Hospital Basic Life Support - Findings

Overall Capability and Achievements

By 1993 the approximately 4,079 ambulance services in the ten states covered by this report, responded to over four million calls. Included were approximately 550,400 calls that were in response to motor vehicle crashes that involved approximately 816,293 injuries.

There have been substantial improvements in both the extent and quality of prehospital care for crash victims. Despite the difficulties of recruiting and retaining qualified EMTs, both the number of trained personnel and the coverage they provide have grown since 1980. Figure EMS-1 depicts that growth.

Figure EMS-1



Most states enacted new or revised legislation to establish direction, regulations and practices. In two of the eight states covered by this report, a dedicated EMS fund was established that was supported with surcharges on moving violation fines. In 1987, another state passed the EMS Fund Act, adding a "$1 for life" amendment that provided for $1 of each vehicle registration be earmarked for EMS use. In that same state in 1988, state legislation - The Enhanced 911 Act -- authorized a 25¢ surcharge on telephone bills to support the development and implementation of

E-911 systems statewide. In 1994, the same state amended the EMS Act and replaced the "$1 for life" amendment with a general fund appropriation of $3 million annually. Another state, in 1989, began charging a $1 fee on all motor vehicle registrations to support the EMS account.
In some states EMT training is fully supported through dedicated funds. Table EMS-1 shows training costs and the grant funding status of eight states included in this report.

Table EMS-1
EMT Training Costs and Grant Funding Status

State	Cost of EMT Training in 1992	Training Safety Grant Status
A	$7,000,000	No safety grants after 1987. **A moving violation surcharge for training was enacted in 1985.**
B	N.A.[1]	No safety grants since late 1970's
C	$ 900,000	Grants reduced since 1990; $100,000 in 1992
D	$ 900,000	Grants reduced since 1990; $90,000 in 1992. **A moving violation surcharge was enacted in 1992.**
E	$1,300,000	None since 1989
F	$ 72,800	Continuing; $27,000 in 1993
G	N.A.	None after 1982
H	N.A.	None after 1987
I	N.A.	No grants by the mid-90s
J	$ 193,983	1988- end of Federal Safety Grants. A bill passed to create an EMS Account & authorized appropriations for that fund.

Prehospital emergency medical services cost approximately $6.50 per person in 1993 as compared to $ 2.80 in 1980. The cost per call amounted to an average of approximately $90 in 1993.

Safety grant seed money helped provide leverage for state funds to improve the basic EMS delivery systems in the 1970's, and early 1980's. This early federal investment provided part of an emergency capability infrastructure in the states. Safety grants made up only 0.18 percent of total EMS costs in 1993 for the eight states. This is down from 2.9 percent in 1980. Most of the EMS programs are self sufficient and/or are funded by fees, taxes and private contributions.

[1]N.A. = data not available

Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. Beginning in the 1970's and continuing throughout the 1980's, states began to address the need for improved EMS care to reduce the mortality rates of crash victims en route to, and subsequent to arrival at, receiving hospitals. This problem had been identified through analyses of hospitalization data and in part from ambulance run reports in certain states. A program to improve and modernize EMS systems had been one of NHTSA's guidelines (formerly standards) since 1967.

Despite resistance by many volunteer emergency squads, regulations covering EMT training and certification, ambulance service certification and vehicle inspection were enacted by the state legislatures. To develop and manage modern EMS systems, the states established central EMS offices, though some of them lacked sufficient authority to build a unified EMS system.

Examples. In the 1970's one of the states developed and published its first comprehensive EMS plan. The state's legislature also established a budget line item for EMS in 1975. The driving factor behind formalizing the EMS program was the need to improve services to reduce the mortality rate of crash victims -- a problem identified through analyses of hospitalization data.

The same state started a voluntary ambulance service certification program in 1977. By the early 1980's the state had established regional EMS councils that encompassed every county. The councils were responsible for planning, development and management of the EMS systems within their regions, and they were coordinated by the state's health department. Most (87 percent) of the state's ambulance services were manned by volunteers.

In 1985 the state's legislature enacted a emergency medical services law that designated the health department as the lead agency for EMS to set requirements for training, ambulance services, inspections, quality assurance, licensing, and collection of patient data. A comprehensive health services plan was prepared for the latter 1980's and emergency medical services regulations were published in 1989.

A formal planning process was begun by the state in 1990, and a report covering all aspects of EMS systems was published in 1992. That year an ambulance licensure policy manual was issued and revisions to ambulance service inspections and equipment guidelines were made. By 1993 subsequent planning for EMS focused on systems rather than services reflecting EMS as a maturing discipline and highlighting a concern with quality, efficiency and management.

Another state adopted the DOT 81-hour EMT course in 1972 after recognizing the need to improve the EMS system. More than 40 percent of the ambulance services were being operated by funeral homes at the time. Two-thirds of the ambulance attendants had completed a standard first aid course, and one-half of all attendants were qualified in advanced first aid.

The legislature in the above state had created an EMS advisory council and an office of emergency services in the state's governor's office in 1974. Both were transferred to the state's health department in 1975. An EMS communications system was established, by law, in 1977. In 1984 the central EMS office was moved to the highway patrol and in 1988 it was made an independent board. This board was granted broad powers to establish regulations, to license services, and to manage communications.

In one of the states, a law was enacted in 1971 that exempted its volunteer first aid squads from any regulations -- training and certification. Most of the state's ambulance services were operated by volunteer organizations. By 1979, however, one-half of all ambulance personnel had received basic EMT training. While a central EMS office had been established in the latter 1960's, it lacked the necessary authority to properly manage the state's EMS system.

Progress was made in 1985 when an ambulance inspection program was mandated by regulation. It only covered non-volunteer services and vehicles. By 1987, the state's highway safety act was revised to require the inclusion of a training program that met U.S. DOT standards for members of voluntary first aid, rescue and ambulance squads. The new law also required the certification for the then current members of volunteer and non-volunteer squads to be qualified as EMT-A's (Basic).

2. *Did initial Federal grants create new programs?*

Overall. After supporting the purchase of ambulances and related equipment in the 1970's the predominant use of safety grants was to initiate and in several cases continue to support the EMT training required under legislation enacted by the states in the 1970's and 1980's. Only three of the ten states included in this preliminary report continued to use grants for training in the early 1990's -- and that was a reduced level from previous years.

Grants were often used to initiate advanced training programs, EMS data systems, extrication tool purchases, and modern communications equipment.

Examples. A safety grant of $800,000 was used in 1975 by one of the states to build its regional EMS systems and to support EMT training. The state continued to use safety grants for training through 1987. Between 1980 and 1981, another state used safety grants of $900,000 to train 8,000 EMS personnel. Grant support ended the following year.

Seven of the eight states included in this preliminary report used federal safety grants to initiate their EMT training programs. One state did not use safety grants except to support several training coordinators in the mid 1980's.

Another state also used grant funds to upgrade basic EMT courses to include the U.S. DOT module on application of the Military Anti-Shock Trousers (MAST). Various refresher courses, dispatcher training and emergency driver training courses were also funded with safety grants in several states.

Safety grants of $100,000 were used by one of the states to provide extrication tools, and the training to use them, for their rescue units in 1980. Around that time safety grants of $109,000 were used by one of the states to install inter ambulance/hospital and central dispatch mobile radios in ambulances.

One of the states used grants to start a patient record-keeping system. Twenty-one of the state's ambulance service providers participated in a pilot test in 1980 and 1981. The system subsequently grew to cover two-thirds of all providers in the state. Another state used a safety grant of $30,700 in 1993 to establish a data processing system for its central EMS office.

Two of the states continued used grants, in part, to purchase ambulances for some services in rural areas in the early 1980's.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. Eight of the ten states participating in the assessment were self sufficient or used state and local funding to support EMT training and other EMS costs by the early 1990's. Two of the states had been off safety grant support since the early 1980's. Two states had enacted legislation that created special funds supported by surcharges on traffic violations. A third state was in the process of enacting a surcharge on registrations. Two states had enacted legislation that added a $1 fee to all motor vehicle registrations. One of those two states passed another act that replaced the $1 fee with a general fund appropriation of $3 million annually. There has been a definite trend toward state and local support of EMS operations in the states.

Examples. In 1975, one state had prepared its first comprehensive EMS plan and whose legislature provided a budget line item for EMS matched the federal grant with $800,000 to build its regional systems and to support EMT training. In 1985, the state's legislature enacted a law that created a special EMS operating service fund into which a $10.00 fine levied on all moving violations was deposited. The fund was to be used for the initiation, expansion, maintenance and improvement of the EMS.

By 1987 no new federal grants were allocated for EMT training in the state. In 1993 the fund expended $9.5 million for upgrading equipment, EMT training and indirect cost of the state's regional EMS organizations.

As early as 1977, one state enacted legislation that established a line item in the state budget to fund an EMS academy. A year later an EMS fund was legislated with an annual appropriation of $500,000 to meet pre-hospital care needs, and in 1987 the state legislature enacted a law that would earmark $1 from each vehicle registration for EMS equipment and training. The earmark was removed in 1994 and replaced with a general fund appropriation of $3 million a year.

Another state passed legislation in 1989 creating an EMS account, also based on a $1 fee added to motor vehicle registration. This was developed into a state EMS provider grant program for upgrading medical equipment, emergency vehicles, training and communications. A companion county subsidy program also funded from the EMS account provided financial assistance for licensure and regulation of ambulance services and the development of plans for upgrading EMS systems. EMT training programs no longer received safety grants after 1988.

Legislation was enacted in 1987 that required the inclusion of a EMT training program that met U.S. DOT standards for members of voluntary first aid, rescue and ambulance squads, in one of the states. This was followed by the enactment of a EMT training fund in 1992 that placed a $0.50 surcharge on all moving motor vehicle violations to finance basic and refresher EMT training for volunteers. The first full year of collections (1994) was expected to yield $900,000.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. Most improvements and modernizations of the EMS systems were the result of new legal and regulatory requirements at the state level. Vehicle and equipment upgrading and the extension of EMT training, as well as communications such as the 911 and enhanced 911 access followed similar legal requirements in the states. The communications systems were usually introduced in one county or site and expanded over the years so that increasing numbers of the population had access to EMS services.

Discussion. Replication or improvement of services was usually related to upgrading and modernization of vehicles and equipment -- ambulances, extrication tools, defibrillation and related equipment. Much of the upgrading was also concentrated on EMT training and certification. The efforts, while undertaken, locally, within regions, were required by the new EMS laws and guided by central EMS offices.

A major effort concerned the introduction and expansion of communications, particularly the 911 access systems. One state, for example, reported by 1978, 34.2 percent of its population was able to access emergency health care via 911. Another state had enacted a law to implement the 911 system in 1980. It was begun in one county and by the early 1990's approximately 95 percent of the population could reach EMS units through the 911 system. Other states developed similar 911 and enhanced 911 capabilities by the early 1990's.

During the early 1980's the use of mobile radios to link ambulances to hospitals had also been expanded to most EMS units and there was a concurrent development of the ambulance dispatch systems. One state had developed a patient record-keeping system in 1978 and by 1993 two-thirds of all EMS providers, representing 75 percent of call responses, were submitting data to the record system.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. There were three instances of direct technical assistance grant support and many of the new EMS concepts were developed with federal funds. These included extrication procedures, EMT curriculums and communications.

Discussion. Three of the ten states covered in this assessment report received direct technical assistance grant funding. A multi-year $1 million project to develop county wide public safety answering points -- enhanced 911 -- was awarded under a §403 grant in 1989. By 1993 more than one-half of the state's counties were on line.

Two states requested for NHTSA to send a Technical Assistance Team of EMS specialists to conduct an assessment of EMS programs. The assessments were carried out in one state in December 1988 and in the other in late 1994. Fro one of the states, NHTSA provided $20,000 of grant funds to supplement the $10,000 provided by the state to use in the assessment.

Several states were leaders in developing new and advanced EMS methodologies, including the formulation of CPR procedures. NHTSA technical information, EMT curriculums and EMS guidelines were routinely used by the states.

There were also many special grants awarded by various agencies of the U.S. Department of Health and Human Services. The grants, for example, were for establishing planning regions, and developing rural EMS services.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. Partial funding of some EMT training programs, and support for several central EMS offices would be affected by the removal of safety grants. In 1993 only 0.18 percent

of total state EMS costs are funded with safety grants. Many states have established EMS funds and others are moving in that direction.

Discussion. To cite the finding in one of the states, safety grant seed money helped provide leverage for state funds to improve the basic EMS delivery systems in the 1970's, and early 1980's. This early federal investment provided part of an emergency capability infrastructure in the state.

Only three of the ten states covered in this report continued to use safety grants for training EMTs, and this was at a reduced level. There continued to be grant support in some states for a central EMS office. Safety grants made up only 0.18 percent of total EMS costs in 1993 for the ten states. This is down from 2.9 percent in 1980. Most of the EMS programs are self sufficient and/or are funded by fees, taxes and private contributions. The federal grant in so far as it is used to generate innovative projects and to support the continuing operations of central state EMS offices serves a useful purpose.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. NHTSA's EMS Assessments have been the major, consistent and inclusive reviews of state EMS programs. Their analyses of the current status of all EMS categories against NHTSA EMS guidelines has provided a basis for improvements. Measures such as response time have served to motivate vehicle, training and equipment upgrading.

Discussion. NHTSA sponsored EMS Assessments were conducted in each of the ten states included in this report. A group of experts gathered as a Technical Assistance Team (TAT) and visited the states to hear first hand what the status of the EMS system was. Their reports documented the status against NHTSA's EMS Guidelines for each of the EMS categories -- Regulations, facilities, transportation, communications, etc. This was followed by a series of recommendations designed to meet the NHTSA Guidelines.

The EMS Assessments began in the late 1980's and continued in the 1990's. States took them seriously and prepared extensive papers for the sessions that lasted approximately two or three days. Many states also took actions based on some of the recommendations. EMS longer range planning was one result of the process, and EMS advisory boards were established.

A key factor in EMS is the response time of the system. This is often cited as a measure of effectiveness although it will vary depending on factors such as urbanization, traffic, and unit availability. One state had estimated its average response time at 10 minutes or less in 73 percent of the cases (1987). In 20 percent of the cases the response time was

between 10 and 20 minutes. NHTSA's Traffic Safety Facts for 1993 lists the average EMS response time as measured between the crash and the arrival at a hospital as ranging between 26 and 37 minutes for urban fatal crashes for the states included in this assessment.

Studies of mortality rates in one of the states of crash victims showed reductions in that rate when victims were attended by "trained" attendants. The assessment did not discover any recent analyses, but the emphasis on the life saving potential during the "golden hour" has motivated many of the new laws and equipment and facility upgrades.

Advanced Life Support and Trauma Care - Findings

Overall Capability and Achievements

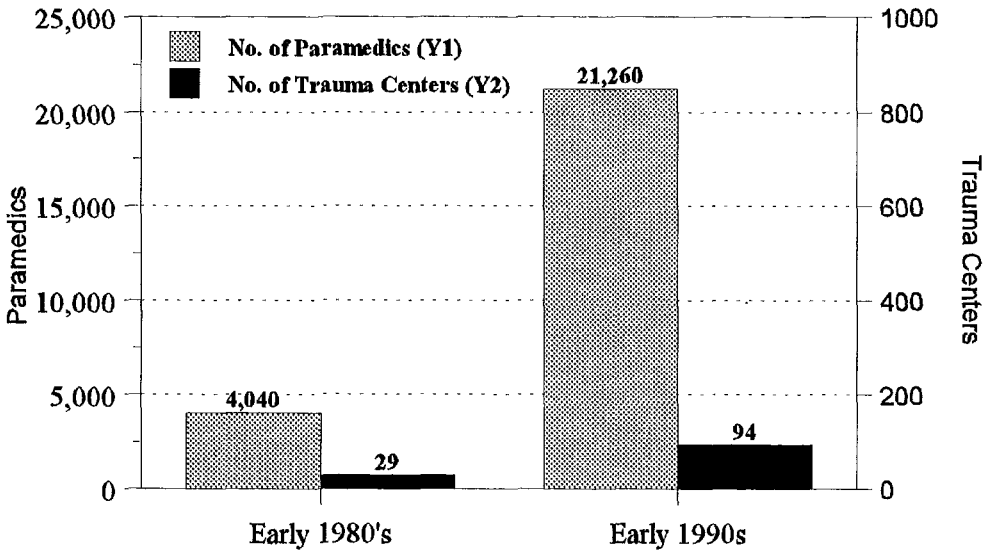
Starting with modest programs to train advanced emergency medical treatment techniques, many states initiated the paramedic series to provide advanced life saving services to victims of crash and other trauma. By 1993 there were more than 20,855 certified paramedics serving in the ten states covered in this report.

A progression in new trauma center development and their accreditation, designation or verification by the American College of Surgeons (ACS), and other developments such as the establishment of triage procedures, the creation of trauma registries, procurement of ALS vehicles and air ambulance services, has occurred since the early 1980's. More than 108,716 identified traffic crash trauma cases were admitted to trauma centers in 1993.

Figure EMS-2 shows the growth of the paramedic program and trauma centers since the early 1980's. The number of trauma centers includes those that were formally accredited, designated, verified or otherwise identified as meeting American College of Surgery requirements.

Figure EMS-2

TRAUMA CENTERS AND PARAMEDICS



As can be seen the number of trauma centers meeting ACS requirements in the ten states increased from 29 to 94. They represent the designated Levels I, II and III. Paramedic coverage in relation to trauma cases reached one paramedic for every five trauma cases in 1993.

The ALS and trauma care systems are essentially self sufficient in most states. State and local taxes, fees for service, gifts and endowments support the existing trauma care services. A very limited amount of safety grants support trauma care planning and advisory services and some paramedic training.

Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. The lack of adequate prehospital care to enhance in patient survival was a major concern following the analysis of hospital data in the early 1970's in several states. With serious traffic injuries at high levels, there were no state trauma care plans to provide the necessary services. The EMS Systems Act passed by Congress in 1973 recognized the advanced life support services as an integral element of total EMS systems and states began paramedic programs and established mobile intensive care units beginning in the 1970's.

The designation of trauma centers in accordance with the American College of Surgeons requirements began in the early 1980's. Both efforts have made substantial progress since 1980.

Examples. In 1973 one of the states established its first mobile intensive care unit using a custom built van. A state university was awarded a contract to develop the original U.S. DOT paramedic curriculum which was pilot tested in 1976. By 1980 more than 1,200 paramedics were certified and 43 percent of the state's population was covered by advanced life support services. At that time it was estimated that only one-half of all trauma cases reached trauma centers in the state.

In 1985, under EMS legislation, a system to designate trauma centers was established under an independent foundation. By 1986, nine trauma centers were accredited as meeting ACS requirements and there were 20 centers the next year, including two pediatric regional resource trauma centers. A trauma registry began in 1986 and triage and transfer protocols followed in 1988. Twenty-three trauma centers were accredited in 1993, and more than 30 percent of the state's EMS services were capable of advanced life support services. Eleven air ambulance services were available in the state in 1993.

Another state used the ACS rating system in a self verification process for trauma centers. Ambulance services deliver patients to the nearest hospital in most cases, because that of limitations in insurance coverage. There is no statewide trauma center system in the state and each major urban area has essentially been responsible for developing trauma care services.

Not until 1986 was a trauma task force established in one of the states to review the feasibility for the development of trauma center designations. A designation systems was legislated the next year under the state's health services department. After triage and related regulations were adopted in 1988, the first trauma center was designated late in 1988. By 1992 the state also had two rotary wing and three fixed wing air ambulance services.

Paramedic programs and mobile intensive care units came into being in the 1970's in most of the ten states covered by this report. Trauma center designation, or verification, were programs undertaken in the 1980's and most states also began work on local or statewide trauma registries.

2. *Did initial Federal grants create new programs?*

Overall. In seven of the ten states a limited amount of safety grant funding was used to initiate paramedic and trauma care related training. There was also some grant support for the development of trauma registries and trauma care planning. In relation to total costs, the grant support was very small.

Examples. One of the states received a safety grant to establish a trauma registry after a task force composed of representatives from eight trauma centers drew up plans for such a registry. The funding would cover three years beginning in 1986 and the system was developed by 1989 with the goal of establishing a data base to investigate the nature and extend of trauma, study the effect of the existing trauma system, assess the quality of care, and examine the availability and cost of resources.

Another state used safety grants of $36,800 in 1990 to support training of trauma care providers with courses in pre hospital trauma life support, advanced trauma life support, and critical trauma care. The state also used a safety grant of $7,500 in 1993 to hold a statewide conference on the needs of the state's trauma system. One aim was to give special emphasis on the expansion of the system to include rural regional participation.

A number of safety grants were used to develop plans and regulations as part of the efforts of task forces established by several governors in their respective states. In the 1970's and 1980's safety grants were used in one of the states to conduct mortality studies of crash victims admitted to hospitals in the state.

Three of the ten states did not receive or use safety grants for any paramedic or trauma care program from 1980 through 1993.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. Grant support for trauma care planning, the initiation of trauma registries and paramedic training in advanced life support and trauma care was a basis, in most states, for the establishment of advanced life support and trauma care systems. Trauma care centers were essentially supported by state and local taxes, private gifts and endowments, and fees for service.

Discussion. In most of the states, continuing support for paramedic training was picked up by the state in the early 1990's. The development and operation of trauma centers was fully state, local or privately funded by taxes, fees, gifts and endowments. Grant support for planning and conferences -- though limited -- led to, and continues to generate the establishment and advancement of trauma systems in most states. Trauma advisory committees though not always supported with safety grants have laid the foundation for a the array of both prehospital and trauma center care programs.

In one state, for example, a helicopter response program was established by legislation in 1986. It was operated by pilots from the state police and two ALS trained provided emergency service aboard. The program became operational in 1988. In 1992 a dedicated fund based on a $1 surcharge on each motor vehicle registration was enacted by the legislature. While not covering all costs, this funding allowed the service to be expanded to 24 hours from the initial 16, beginning in 1992.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. Paramedic training, mobile intensive units, and designated or verified trauma centers, all began as pilot or initial entities and were replicated and expanded statewide in most states. Two of the ten states are still at early stages of the trauma care program.

Discussion. Paramedic training in advanced life support and trauma care, the development of trauma centers and the establishment of air ambulance, particularly the rotary wing units, were usually begun started in one or a few areas. Replication and expansion usually followed -- to the extent possible given funding and service demand considerations.

In one state hospitals took the lead in developing paramedic programs in 1973. The first training program began in one hospital in 1975 with 30 students. A mobile intensive care unit (MICU) was operational in early 1976 as part of a pilot program. By 1979 there were nine such pilot programs. The program was replicated statewide in the early 1980's. The same state also designated its first trauma center in 1981 and had replicated this

program to include eight such centers by 1990. Most of the other states followed this example in their development of ALS and trauma care.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. Trauma care guidelines, NHTSA trauma system development conferences and paramedic curriculums developed with technical assistance grants were used extensively by the states to plan and develop their ALS, and trauma care systems.

Discussion. NHTSA's 1989 National Trauma System Development Conference, and assessments of trauma systems in states that had established them early on, provided considerable input for planning advanced life support and trauma care in the ten states included in this report. Subsequent NHTSA regional trauma care conferences supplied technical information and guidelines. Technical assistance grants from NHTSA and grant funds from the Department of Health and Human Services supported much of the research and development work.

In some of the states, earlier funding (circa 1975) for the development of a paramedic curriculum came from NHTSA technical assistance grants (§403). A patient record keeping system had been developed by NHTSA with technical assistance grants and several states used it as a model for the development of trauma registries.

One of the states, for example, was participating in a trauma study involving several other states at the time of this assessment (1993). The study was supported with federal grants.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. Federal safety grants are but a very small portion of ALS and trauma care funding. In recent years they have contributed to the development of plans for advanced EMS and trauma care systems and have thus been an important factor in motivating certain states to bring modern systems into being.

Discussion. Other than support for paramedic training, the initiation of trauma registries and for planning projects and conferences there has been no safety grant support in the area of trauma care since 1980. The facilities and services are state or locally supported with taxes, fees for service, gifts and endowments. Only a small amount of safety grants have been and occasionally continue to be used to support planning and advisory projects. This small grant contribution has been and continues to be an important lever to get those states that are lagging behind in the development of their trauma care systems, to initiate action.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. A few evaluations involving studies of crash trauma morbidity were undertaken and served as a basis for the development of ALS services and trauma care. The NHTSA EMS assessments continue to be a very useful process for establishing the current status of trauma care systems and engendering improvements.

Discussion. As in the previous segment on prehospital care, the NHTSA EMS Assessments covered advanced life support and trauma care in the states participating in this assessment. The assessments, many carried out in the early 1990's, addresses the then current status of trauma care in each state and compared that status with the NHTSA guidelines. Based on the results, the NHTSA sponsored Technical Assistance Team (TAT) made recommendations for bringing the respective systems up to par. There are the usual obstacles -- the lack of resources, specific enabling legislation, relatively weak central EMS offices, competition among leading hospitals, resistance to state mandates and the difficulty of recruiting, training and retaining capable staff.

The development of trauma registries, and the studies of crash trauma morbidity in the states have offered a basis for evaluation and assessment that should be pursued.

Discussion of Issues

1. <u>What are the impediments to state level coordination, information gathering and reporting?</u>

The mix of volunteer, paid municipal, fire department, hospital based and other modes of ambulance services, that has evolved from an even more diverse set of emergency service providers that existed prior to 1980 continues to present coordination challenges. EMS legislation in the 1980's has gone far to mandate central responsibility for regulations on equipment, services, training and particularly the designation of trauma centers.

There are special issues and problems relating to volunteer ambulance units in several states -- many of these units have resisted state coordination in regard to training and certification. This has resulted in uneven service levels. Moreover there are problems in recruiting and maintaining volunteers particularly during normal working hours. There has been a trend toward paid services that are part of municipalities or are contract operations serving such areas. The volunteer units are, however, a substantial part of the EMS system particularly in the less populated, rural areas, of states.

The relative dispersal, independence, local identity and financial support of many emergency service providers continues to create problems relating to state information

gathering and reporting systems development. Uniform run reports, data entry and processing systems are relatively rare, although some progress in certain states has been made to establish a run data reporting system and a EMT training and certification record system.

2. What should be the continuing role for safety grants?

Safety grants have made considerable contributions to the development of pre-hospital care. Health and Human Services grants have also been used extensively to improve the various services. The average safety grant, based on the ten states included in this report is $80,300 in 1993 (It was approximately $564,000 in 1980). With an average cost, per state, of all EMS and related trauma care services of $46 million a year in 1993, the safety grants are very small. More substantial grants have been made available from the Department of Health and Human Services.

The "seed money" concept has actually worked very well in the EMS area. It provided funding for the EMT course series through the paramedic level. Support for state level EMS offices was instrumental in several states. The trend toward self sufficiency through legislated EMS funds supported by surcharges on moving violation fines and fees for motor vehicle registrations has gained ground.

Grant funds seem to have made their greatest impact in the introduction of new technologies and practices -- mobile radio communications, extrication equipment, advanced EMT and trauma training, trauma registries and planning efforts. It would appear that such uses of grant support are effective and necessary to upgrade and modernize EMS systems.

The vast scale of modern EMS system costs would likely render grants for standard operations, including training, vehicles, equipment and facilities inadequate given the available safety grant resources. It may be more appropriate to focus the limited funds on really new technologies or practices such as advanced paramedic training, trauma conferences, planning and pre-hospital data system development, such as the six-state pilot (CODES) project begun in 1993.

3. Should incentive grant programs be created?

Incentive grants in the impaired driving area have been successful and such an approach may also serve the EMS systems in the states. There are some very definite objectives, activities for which are lacking, in the states as highlighted in the NHTSA EMS Assessments. The creation of statewide EMS infrastructures with specific components in EMS strategic plan development, data collection and reporting, as well as EMS management, EMT recruiting, and training and retention might be included in an incentive grant program.

Conclusions

1. The EMS safety priority area is one of the success stories in the safety grant program. By just about every assessment criterion there have been substantial achievements.

2. The early major safety problems in EMS were the provision of quality pre hospital care, especially in the "Golden Hour." Safety grants were focused on key identified areas of need -- communication, equipment and particularly EMT training to upgrade the ambulance services. New programs were created with grant funding such as rescue and extrication, advanced life support vehicles, equipment and paramedic training.

3. Passage of new legislation and regulation led the way toward self sufficiency by establishing dedicated EMS funds. Most EMS systems are fully supported through state, local and private funding, fees for service, gifts and endowments. Safety grant support is minimal.

4. EMT training programs, particularly paramedic training was replicated and expanded statewide after pilot testing. They spread to teaching and other hospitals, thereby providing better trained staff. The development of ALS and mobile intensive care units followed the same path.

5. Federally sponsored trauma conferences and guidelines were instrumental in supporting the basis for establishing trauma centers and improving trauma care.

6. Increased public concern, expanding means of state self sufficiency, and other support has reduced the urgency of federal (NHTSA) grant funding in the operational areas.

7. While NHTSA has sponsored an effective EMS assessment program that has been conducted in most states, state level monitoring continues to be difficult because the role of state EMS offices may be limited in requiring the collection and submission of key operational data.

MOTORCYCLE SAFETY

The Program

To promote motorcycle safety State programs have included helmet and protective gear use laws, licensing requirements, rider training, conspicuity techniques, impaired riding prevention and motorist awareness activities. By the early 1970's, forty-seven states required motorcycle riders to wear a safety helmet. After the U.S. Department of Transportation held discussions with the remaining three states about invoking sanctions that would withhold federal highway construction funds, Congress intervened to prohibit such sanctions. This unraveled the helmet laws in more than half the states.

Training riders became the preferred approach. In the late 1970's and early 1980's safety grant funds were used to support such programs. The Motorcycle Safety Foundation had developed courses and materials that states were encouraged to adopt.

Budget reductions and creation of the five safety priorities (that did not include motorcycle safety) effectively eliminated the federal safety grant support in many states by 1982. Over representation of fatal motorcycle crashes in relation to all motor vehicle fatal crashes continued to be one of the persistent traffic crash problems. It was not until the late 1980's that motorcycle safety was designated as a safety priority area -- by regulation. Grant funds again became available for motorcycle safety programs.

In most states rider education, instructor training and, in some states, public awareness constituted the safety programs. Efforts to introduce and enact helmet use legislation in states without such laws was another aspect of the program.

Motorcycle Safety Programs - Findings

Overall Capability and Achievement

Problem identification was used by the states to show over representation of motorcycle injuries and fatalities. Grants helped create most of the rider education programs in the 1970's and early 1980's. All the states enacted legislation to establish rider education funds with license or registration fees and this process made most education programs self sufficient.

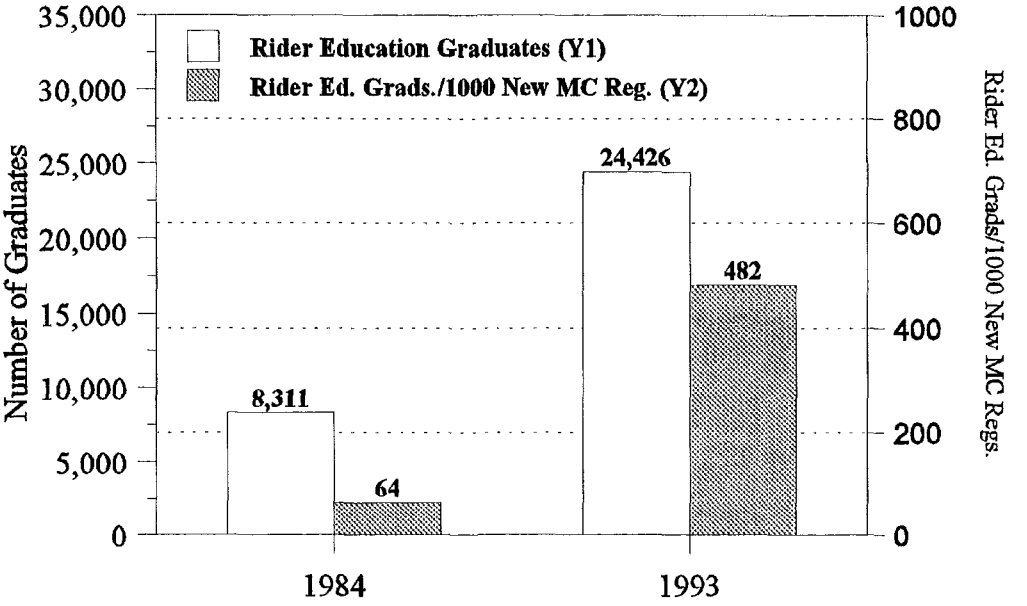
The effectiveness of helmets was studied and proven. In 1983, there were 22 states with helmet laws, 21 states requiring helmet use by riders under a certain age, and nine states did not have laws. In 1993, the number of states with helmet laws grew to 26, the number with laws for part of the riders was 23, and only three states had no laws. Technical assistance funds (§403) for the studies, and the Motorcycle Safety Foundation for the development of training materials and

curricula provided the states with bases for legislation and programs. Rider programs were well established by the early 1990's, but only one of the states in the assessment reinstated a helmet law.

All, except two of the rider education programs are self sufficient. Some indication of the coverage of rider education programs -- that is the number of rider course graduates in relation to new motorcycle registrations is shown in Figure MC-1, below.

Figure MC-1

THE GROWTH IN RIDER EDUCATION



One factor that has affected the large increase in the number of rider education graduates per 1,000 new motorcycle registrations is the decline in the number of new registrations, from 129,663 in 1984 to 50,692 in 1993. Still, nearly one half of all new registrants graduated from rider education courses in 1993 compared to approximately six percent in 1984.

Fatalities have declined by approximately 50 percent between 1980 and 1993. The effects of the helmet laws and rider education are, however, not clear since a major factor is the very large reduction in ridership.

Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. One half of the states in the assessment had mandatory helmet use laws by the early 1990's. One of these states reinstated the helmet law in 1990 after repealing it in 1977. The others did have helmet use laws in the 1960's and early 1970's, but repealed them after the threatened sanctions for not having such laws were removed.

The states analyzed their crash data and identified fatal and serious injury motorcycle crashes as a key problem. The federal safety priority areas established by regulation in 1982 did not include motorcycle safety, but states began to legislate rider training programs to address the problem.

Examples. One of the states participating in the assessment began its motorcycle rider education program in 1974 when more than 10,000 new registrations were added each year. The program at the time consisted of a knowledge test and on-the--road curriculum. There also was a helmet law that had been enacted in 1967 (it was rescinded, except for those under 18, in the 1970's). The state did identify fatal motorcycle crashes as one of several priority areas early in the 1980's.

Another state that enacted a helmet use law in 1968 and never rescinded it required only a written test to obtain a license endorsement until 1981. In 1982 an oral test based on the Motorcycle Safety Foundation's (MSF) Motorcycle Operator Manual (MOM), was introduced. Those states that required a skill test used the MSF Motorcycle Operator Skill Test (MOST).

As a result of the problem identification process, most states recognizing the seriousness of the motorcycle crash problem that clearly showed an over representation of fatal and serious injuries. Because many motorcycle crashes occur in the first months of the rider taking up motorcycling, the states began to establish statewide rider training programs. One such program -- for rider education -- was created by the legislature of a state in 1984. It was funded through license surcharges. The other states enacted similar laws during the 1980's and early 1990's.

2. *Did initial Federal grants create new programs?*

Overall. Federal safety grants were used by all the states, except one, in the assessment to establish rider training programs and to train instructors in the 1970's and early 1980's. With the reduction of federal grant funding in 1982/1983 and the fact that motorcycle safety was not designated a safety priority area in 1982, states enacted laws to create and fund rider education programs.

Examples. In one state six county motorcycle rider training programs were funded with safety grants in 1980. A state university took over the coordination of the program that operated in more than 20 counties and the federal safety grant of $296,000 supported a statewide coordinator, instructors, training facilities, and range supplies.

Another state, confronted with the rising number of motorcycle crashes and fatalities used a safety grant to have one of the state's universities conduct a feasibility study to determine the need for establishing a motorcycle safety education program. With a grant of $12,000 in 1989 a standardized test station was established in a state and a grant of $10,000 was used to train examiners in the new procedures.

One of the states in the assessment has used federal grants for most of the years to augment its rider education program that was started in 1984. Approximately 40 percent of the program was grant funded between 1984 and 1994. The program was listed as a "Noteworthy Project" by NHTSA in 1991 and had received other merit awards in 1989 and 1990.

Although a number of studies had been done on the lifesaving value of wearing motorcycle helmets, one of the states used grant funds to undertake such a study based on that state's crash statistics. Safety officials felt that this was a necessary step to confirm the value of safety helmets to a skeptical legislative committee. In 1990 efforts to reinstate a helmet law were finally successful.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. Between 1982 and 1991 all the states in the assessment had enacted laws to created rider education funds. Five of the ten states did not use any safety grants in 1993. In some of the states there was local support as well -- loans of motorcycles for training, the use of parking lots and related in kind services. While rider education programs were started with the support of safety grants in the 1970's and early 1980's, it was the withholding of federal grants in 1982/1983 that motivated some of the first laws to create a fee structure for funding rider education programs.

Examples. One of the earliest state programs to draw state support for rider education was created in 1982 when that state's legislature enacted a law to establish a motorcycle safety fund. A 20 percent earmark from motorcycle license fees supports the fund. The state has rescinded its helmet law like many others in the 1970's and never used grant funds to support its motorcycle safety programs.

There were many similar laws passed in the 1980's in other states. One state established a $2 additional fee for original motorcycle licenses, renewals, learner's permits and replacement licenses to fund rider education programs. The state law also allowed drivers

who successfully completed approved rider courses to receive a license or endorsement card without taking the rider examination that was administered by the State Police.

The state whose program was listed as a "Noteworthy Project" by NHTSA in 1991 was also one of the early states to create a rider education program in 1982. Its helmet law had been rescinded and was never reinstated. Funding for the program consisted of a $2 motorcycle registration fee that had yielded $2.3 million from 1984 through 1993. Localities budgeted $400,000 over that period of time and the federal safety grant was $882,000 for a total of $3.5 million cost over 10 years.

After safety grants were no longer available for motorcycle safety, one of the states continued to offer rider education course at two sites in 1983 and 1984, but the program waned and it was not until motorcycle safety became a NHTSA safety priority area that efforts were focused on a statewide program. This was accomplished with the enactment of new legislation in 1991 that mandated a fee of $6 for motorcycle licenses that was to be deposited in the state highway fund and credited to a rider education program. The law also created a motorcycle coordinator's position in the state traffic safety office.

To generate public awareness, particularly for motorists, about the presence and safety procedures necessary for sharing the road, one state created a public information program. It was funded at $100,000 annually as part of the state's budget beginning in 1989.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. There several instances where rider education and public information programs were begun at one or more sites and later spread across a state. In most of the states, rider education was established, by law, and thus affected the whole state immediately. The course curriculum and testing procedures were prescribed to establish uniformity.

Examples. One state began a comprehensive motorcycle safety program in one of its counties in 1986. The objective was to distribute educational materials county-wide, enlist dealers, local clubs, police departments and the media to encourage riders to take the motorcycle safety course. By 1989 this promotional campaign had been integrated into the state's Comprehensive Traffic Safety Program that was operating in all of the state's counties. Statewide rider education had been available since 1983.

Another state, after enacting a one dollar surcharge to the motorcycle driver license endorsement and a two dollar surcharge to the motorcycle registration fee in 1991 expanded its training sites from five to nine, plus a mobile training operation in 1993, thereby tripling the number of rider education graduates.

The state that had conducted a needs study in 1985 had created a pilot program that was

followed in 1989 with legislation creating a rider education programs in community colleges. By 1993 eleven community colleges across the state were offering beginner and experienced rider courses.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. No direct technical assistance funds for motorcycle safety were awarded to any of the states. Results of studies funded with technical assistance funds that showed the value of wearing safety helmets were used to persuade legislatures to pass helmet laws -- with limited success. Training and testing materials developed by the Motorcycle Safety Foundation were widely adopted -- such as the Motorcycle Operator Manual (MOM) and the Motorcycle Operator Skill Test (MOST). These materials were developed with technical assistance funds.

Discussion. A number of the states used the findings of NHTSA sponsored research studies. One of these was the California "Hurt" study and another was the "Improved Motorcyclist Licensing and Testing Project." The Motorcycle Safety Foundation (MSF) had been active for many years and had developed several training curricula and materials with support from federal technical assistance grants. The objective was to assist states in developing training programs that would lead to licensing of qualified motorcycle riders in an effort to reduce crash fatalities and serious injuries.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. The rider education programs in seven of the 10 states are, or are close to being, self sufficient. The remaining state's program relies on safety grants for one half of its cost. Removing the safety grants would not have any effect on most of the programs. For the state that relies on grant funding, a reduction in the number of courses, or an increase in fees, would be necessary

Discussion. In 1993 the motorcycle safety program cost $4.7 million and 24,400 people graduated from rider education courses. This amounts to $191 per graduate. At the same time there were 51,000 new motorcycle registrations, meaning that approximately 50 percent of the new registrants took the courses -- and this does not consider many others who own motorcycles and who should be taking the courses. In six states the skill test is waived and in two states both the skill and knowledge tests are waived upon completion of the rider education courses.

The states have approximately 2.6 million licensed motorcycle operators (1993) and charge an average of $6 for a license or endorsement. The licenses are valid for 4 years in most of the states, yielding an average of approximately $4 million a year -- or very close to the cost of motorcycle safety programs ($4.3 million) that was estimated in this

assessment. There is every indication that the motorcycle safety programs in the states can be self sufficient.

7. *Where projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. Two of the states had attempted impact evaluations of the rider education program.

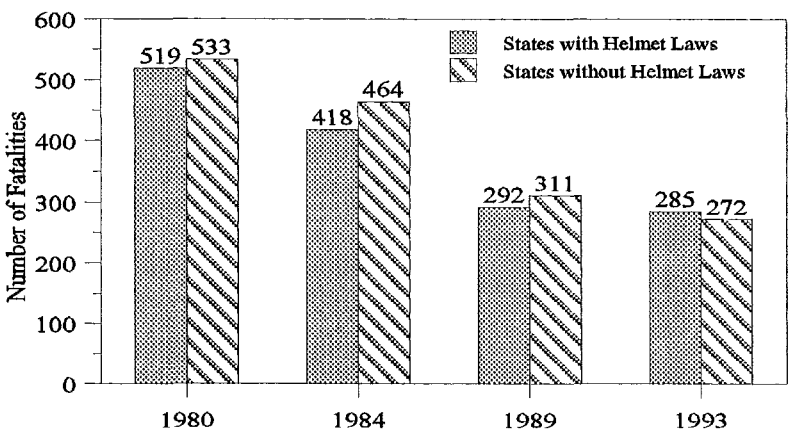
Discussion. One of the states had undertaken three impact analyses to determine if the rider program had an effect on traffic crash outcomes. The analysts were not able to establish such a relationship at the time.

The other state conducted two evaluations. The first in 1982 found that those who took the rider education course were one-third as likely to be cited for a traffic violation. The other evaluation in 1990 showed that over the long run, trained new riders had a five percent lower crash probability and a 23 percent lower traffic violation probability than untrained riders.

One half of the states had helmet laws -- one of these had reinstated the law in 1990. They all had rider education programs. The effect of the rider education has been difficult to evaluate. There has been a reduction of new registrations and the national trend of motorcycle fatalities is downwards -- from 5,097 in 1980 to 2,401 in 1993. The change in fatalities for the 10 states that were part of the assessment is shown in Figure MC-2 -- for states with, and without, helmet laws.

Figure MC-2

MOTORCYCLE FATALITY TRENDS



The fatality trends for the 10 assessment states have also declined by approximately the same percentage as the fatality trend for the whole nation. The above data are not appropriate for evaluating what the effect of helmet laws has been since most of the decline appears to be due to a reduction in ridership. The statistics on injuries were incomplete and these would be needed to further analyze the effects of helmet laws.

Discussion of Issues

1. Have the rider education programs been successful?

   From the standpoint of creating education programs that reach more and more young riders and that are self sufficient, the answer is yes. What the programs have done to reduce motorcycle fatalities and serious injuries is far less clear. A number of the programs were in answer to helmet law opponents who argued that more education and training are needed rather than restrictive laws.

   Are the rider programs then only a decorative feature that obscures the lack of a helmet law? Apparently not, since almost all states have rider education programs because they believe such training is not only useful, but necessary, particularly for the novice motorcycle rider. In one state the demand for training outstripped the supply of course openings. The lack of clear measures of effect does not mean there is no effect, and the case of the need for rider education appears to be made when states legislated this process together with designated funding sources -- license and/or registration fees.

2. What has been holding up the reinstatement of helmet laws?

   Over twenty years have passed since the helmet law sanctioning episode. Opposition to the law is still impressive despite the benefits that numerous studies have identified. The more recent sanctions (§153) for states that did not enact motorcycle helmet use laws were eliminated in 1995. Five states, including one state that participated in the assessment, have reinstated helmet laws in 1989 and 1990. The sanction rollback was believed to be the signal for repeal of the helmet laws in some of these states.

   Organized motorcycle rider groups have been the most vocal and active opponents. In some of the states they operate rider training programs that are recognized by the state as meeting requirements. With the advent of community action for safer environments, there are opportunities for a broader appeal based on a larger base of interest groups. Mobilizing this constituency, which is closely aligned with programs for safe biking -- helmets -- may hold some promise for passing motorcycle helmet laws.

   There is still the argument that motorcycle crash victims whether injured or killed are a burden on all taxpayers. Hence, the wearing of helmets not only protects the rider, but reduces the cost burden to society as a whole.

Conclusions

1. The motorcycle safety program has been successful in that it has achieved self sufficiency for rider education of the novice motorcyclist, based on the findings in the states participating in the assessment. A proportionally larger number of new riders are being trained in 1993 than in the early or mid 1980's.

2. Grant funds did support the creation of motorcycle rider programs in the 1970's and early 1980's, before states began to enact laws that established statewide programs funded by license fees. The average motorcycle safety program cost per graduate is $165 in 1993.

3. Four states, one of them among the 10 states participating in the assessment, had reinstated helmet laws by the early 1990's.

PEDESTRIAN AND BICYCLE SAFETY

The Programs

In the 1970' and early 1980's grant funded pedestrian and bicycle safety programs were usually aimed at children and seniors (pedestrian only). For children the programs consisted of bicycle rodeos, elementary and secondary education segments, and presentations. "Willie the Whistle" was one of the more popular programs at the time. State and local enforcement agencies often led the effort through their outreach programs. Research studies sponsored by NHTSA identified the more severe problems such as "dart outs" by children. NHTSA also conducted several research demonstrations in the 1970's including the ice cream vendor studies that were supported with §403 funding.

The adult pedestrian problem centered around senior citizens and the impaired (drunk or drugged) pedestrian. The programs consisted of public information and education provided through presentations and general publicity. Most federal funding stopped in the 1982/1983 period as budgets were substantially reduced.

After years of reduced attention, grant funding was made available again when pedestrian and bicycle safety became a safety priority area in the early 1990's. In the interim both areas had received some local support from police departments, the American Automobile Association, and from other nongovernmental sources.

The late 1980's and early 1990's brought a renewed emphasis with bicycle helmets, the national SAFE KIDS program, pediatric trauma care, safety cycling guides and education aimed at senior citizens. The Federal Highway Administration (FHWA) was equally involved in pedestrian and bicycle safety with projects such as "Rails to Trails."

Pedestrian and Bicycle Safety Programs - Findings

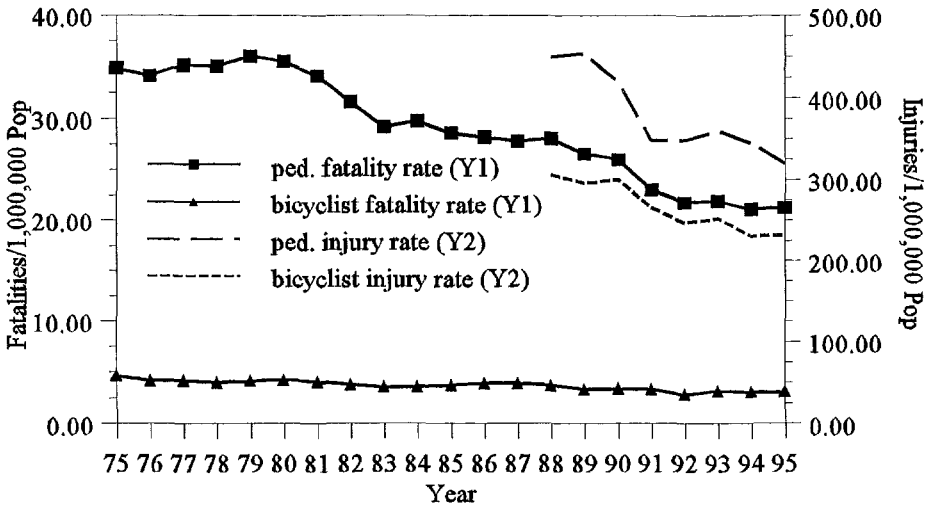
Overall Capability and Achievement

The elementary school education programs including pedestrian and bicycle safety have been institutionalized in the states. New approaches begun with safety grants in the late 1970's and early 1980's were curtailed after reductions in the safety grant program in 1982. Despite these cuts, communities continued to support bicycle rodeos. The shift to comprehensive traffic safety programs in many states created a basis for extending bicycle safety and pedestrian safety in the later 1980's where it is likely to be more effective.

The reemphasis on pedestrian and bicycle safety in the early 1990's focused on bicycle helmet use and laws to make use mandatory. This has already been a successful program. There also were

new pedestrian safety programs supported with safety grants although most projects were of a small scale, or just beginning in the early 1990's. The following figure shows National trends in pedestrian and bicyclist fatalities and injuries per one million population. Fatality rates for both pedestrians and bicyclists have steadily declined over the last 20 years. Injuries while declining for both groups seem to have leveled off in the early 1990's before continuing to decline. This may be the result of new traffic safety programs targeting these two groups during the 1990's.

Figure PB-1
PEDESTRIAN/BICYCLIST FATALITY/INJURY RATES
PER 1,000,000 POPULATION



Assessment Criteria Findings

1. *Were projects focused on major safety problems such as those identified through national priority rulemaking and through the states' own safety problem identification process?*

Overall. Most states began with the problem identification process. Eight of the ten states participating in the assessment had a total of 117 bicycle fatalities in 1982, and 106 bicycle fatalities in 1993. In the same seven states there were 1,035 pedestrian fatalities in 1982 and 844 in 1993. The early programs were concentrated in grades K-6. These covered both bicycle and pedestrian safety. Adult pedestrian safety programs focused on those over 65. By the 1980's both bicycle and pedestrian safety continued to be primarily a local safety activity.

Examples. Both pedestrian and bicycle safety were included in the safety curriculum since the late 1940's in one of the states. The State Police through their outreach program visited schools reaching a quarter of a million students with 3,000 presentations each year.

By 1980 that state planned a major urban pedestrian safety program involving 15 municipalities. The program focused on those under 14, the over-65 population and residents in areas were the pedestrian crash rate was found to be very high. A lack of resources curtailed the effort.

With the advent of comprehensive traffic safety programs in the state in 1988, a program called "Walk Smart" was produced that outlined how to cross at intersections, stop lights and corners. Another project -- a video for junior high school students called "Wanda Walker" was produced in 1990.

Bicycle rodeos were very popular in the states. These were usually sponsored by the local community with the participation of enforcement agencies and PTA's. One of the states integrated its bicycle safety activities with the national SAFE KIDS program and developed a "Cycle Smart" project designed to increase the number of children protected by a bicycle helmet by making helmets available at a reduced price. More than 8,000 helmets were distributed during the first six months of the project.

While the importance of pedestrian and bicycle safety was recognized by the states, they often lacked the resources to address the problems. One state, however, established the position of pedestrian/bicycle coordinator in 1978 after the state's pedestrian safety law had been strengthened. There was a multi media campaign designed to reach drivers, bicyclists and pedestrians of all ages. In 1979 a K-6 pedestrian and bicycle proficiency teacher's guide was produced and distributed. The same state in 1981, printed 30,000 pamphlets entitled "You Don't Know Anything About Bike Safety - What Will Your Child Know?" The pamphlet contained sections about bicycle laws, safe riding techniques and how to select and fit a bike.

Bicycle safety activists managed to get the attention of the legislature in another state. In 1989 that legislature directed that a study on the use of bicycle be conducted. Legislative action followed in 1991 creating a bicycle advisory board and required planning for transportation by bicycle.

2. *Did initial Federal grants create new programs?*

Overall. In the late 1970's and early 1980's there was a split between states that did and those that did not use safety grants for pedestrian and bicycle programs. After safety grant budget reductions in 1982, pedestrian programs for adults lapsed, but safety programs -- both pedestrian and bicycle -- continued at community levels focusing on elementary school education and bicycle rodeos. Many of these were an outgrowth of earlier grant funded programs. Pedestrian safety programs lagged due to the lack of resources. After both pedestrian and bicycle safety became a priority area new initiatives were proposed and carried out in most of the states.

A renewed emphasis for adult pedestrian programs followed the availability of safety

grants in the early 1990's. Bicycle safety was also supported with grants to promote helmet use.

Examples. A bicycle safety program was created in 1973 in one of the states and over the next 20 years the state received more than $2 million from both the state and the federal government for individual bicycle projects. Both bicycle and pedestrian safety programs were integrated into the state's comprehensive traffic safety programs in the mid to late 1980's. The pedestrian programs included information and education for senior citizens. The bicycle programs in 1991 and 1992 were supported with mini grants of from $1,000 to $3,000 for projects promoting the use of bicycle helmets, safety education classes and bicycle rodeos.

An early use of safety grant funds to support pedestrian safety was a program called "The Safest Show on Earth" which was presented to elementary school students in the early 1980's in one state. In 1981 it was funded with a grant of $40,300. After that pedestrian and bicycle programs in that state were largely left to local communities whose resources were limited.

Another early use of safety grants was for the production and distribution of 1.6 million "Hot Dots" and accompanying pamphlets and posters for bicycle safety in 1981 in one of the states. That same year 70,000 senior citizen pedestrian safety pamphlets were distributed. The safety grant for these projects was $180,000. After that no grants were used until 1994 following state legislation that mandated bicycle helmet use for children 12 years of age or younger. A safety grant of $20,000 was used to support a PI&E campaign to promote bicycle helmet use and to produce items with the slogan "Be A Safe Bike Rider ... Always Wear Your Helmet."

One of the larger states had a contract with a chapter of the American Academy of Pediatrics. This contract, supported with safety grants, covered information and education services for several programs including bicycle and pedestrian safety. In the early 1990's several brochures such as one called "A Bicycle Is Not A Toy" and another called "Bike Like The Best," were prepared. The contractor also developed games such as "Traffic Safety Jeopardy" and "Wheel Wise." A pedestrian project in the state's largest city was begun in 1991 and supported with a federal safety grant. It consisted of assemblies in public, private and parochial schools. It drew 900 students.

This state, like a number of others, did not use safety grants for pedestrian and bicycle safety programs in the late 1970's and early 1980's. Another state did not use safety grants until 1994 when a grant of $52,000 was used to buy bicycle safety helmets that were then sold at a discount.

3. *Did Federal grants lead to participation or full support by state, community and private entities? Did Federal grants encourage other state and local spending on highway safety?*

Overall. While there had been pedestrian and bicycle safety programs in schools, federal grants were used to focus on specific projects. After the cuts in federal grants after 1982, states continued supporting elementary school pedestrian and bicycle safety. In the latter 1980's when many of these programs were integrated into comprehensive traffic safety programs in many states, volunteers augmented the promotion of safety helmet use. There were also instances of private contributions and programs for specific bicycle safety purposes.

In 1980 safety grants accounted for 59.3 percent of all pedestrian and bicycle safety program costs and in 1993 the grants were 40.8 percent of all costs. This shows an increase in the contribution of state, local and private funding.

Examples. The contractor responsible for safety education and information in one of the states received a grant from the American Academy of Pediatrics and a private corporation to provide mini grants to pediatricians to promote bicycle safety. The campaign was called "Bike Safely: First Ride, Every Ride." A bike safety information kit was distributed to 1,600 pediatricians. Volunteers in that state were also involved in support of local pedestrian and bicycle safety campaigns -- particularly as part of the comprehensive traffic safety programs that covered the whole state.

A local chapter of the American Automobile Association in the above state had created a safety education office in 1983 and one half of the office's effort had been devoted to bicycle safety programs. In 1993 this included 65 elementary schools holding 343 bicycle rodeos.

As mentioned previously, one of the states had enacted legislation creating a Bicycle Advisory Board and required planning for transportation by bicycle in 1991. The fee for a driver's and motorcyclist's license was increased by 50 cents to fund two positions. One was a transportation planner in the department of transportation and the other a safety and education officer in the state's traffic safety office. Both were to address bicycle and pedestrian issues and programs.

4. *Were projects started at one or more sites replicated elsewhere in their original form or in an adapted form?*

Overall. The programs in the 1970's and early 1980's were statewide elementary school safety education programs that used a common curriculum for pedestrian and bicycle safety. Pedestrian programs for senior citizens were begun in several areas but generally lapsed due to the lack of funds. As safety grant funding again became available in the early 1990's new programs were being developed and it is too early to tell how these have

spread. The major expansion of pedestrian and bicycle safety programs has been through the comprehensive traffic safety programs that many states adopted in the late 1980's.

Discussion. By the late 1980's the comprehensive traffic safety programs in many states were the coordinating entities for most of the safety PI&E programs including pedestrian and bicycle safety. This was the case in one of the larger states were every county was part of a regional safety program. Pedestrian and bicycle projects were replicated through out the state.

A bicycle helmet use campaign that included the purchase of helmets for distribution at a discount was started in the early 1990's in another state and by 1994 was being introduced in other areas of that state. The "Hot Dot" project for improving bicycle safety in one of the states became a statewide program in the early 1980's.

Most of the pedestrian and bicycle programs were designed for statewide application or wherever these were appropriate -- in heavy pedestrian/vehicle mixing areas for example.

One such case was in a heavily Indian populated area of a state where a program to reduce the incidence of drinking and driving, as well as the severe drinking problem generally, was established in one city in 1988. Similar pedestrian related problems were subsequently addressed by a coalition of community safety committees, the state enforcement agency, and religious organizations. This culminated in programs for three counties by 1990.

5. *Were concepts and technology developed with Federal funds used to improve state program effectiveness?*

Overall. There was only one project in the states participating in the assessment for which technical assistance grants were used directly. Most of the states, however, adapted or used as reference bicycle and pedestrian safety programs developed in other states. These demonstration projects were usually funded with NHTSA technical assistance grants.

Discussion. One of the more populous states in the assessment was awarded $30,000 in 1990 under the technical assistance (§403) program to fund a community pedestrian project in one of its counties. It focused on a specific problem -- barrier vaulting. The funds were used for identifying the problem locations and to prepare and distribute a flyer to prevent barrier vaulting.

Technical assistance funds were used in 1990 by NHTSA to award a three-year contract of $797,000 to a firm for the development of five programs involving pedestrian safety. It had been recognized that new concept were needed to address pedestrian safety -- an area that had been largely neglected since 1983.

6. *What would be the consequences of removing Federal grants from the program?*

Overall. The basic elementary school pedestrian and bicycle safety programs have been institutionalized for some time. They continued after the cutback in federal grants in 1982. The more recent emphasis on overall safety programs for children stemming from the national SAFE KIDS program would continue. Helmet purchases and information brochure distribution may continue at community levels. Adult pedestrian safety appears to require continuing support. In short, removing grants would reduce or even eliminate adult pedestrian safety projects.

Discussion. One of the states was able to enact legislation to fund two bicycle program positions from a surcharge on license fees. Brochures and the work on pedestrian programs was still grant funded. The Federal Highway Administration's "Rails to Trails" program has received a great deal of attention and is a source of safety related funding for both bicycle and pedestrian projects under the concept of separating bicyclists and pedestrians from motor vehicles.

Recent pedestrian projects and proposals that focus on the senior citizen have been safety grant funded. The projects appear to be designed for very specific problems that were identified through analyses of crashes involving pedestrians.

7. *Were projects formally monitored or evaluated to compare results with planned objectives or to determine effectiveness?*

Overall. During the assessment no formal monitoring or evaluation of projects was reported. Except for the continuing elementary school education programs very few initiatives have been sustained for very long. The early school programs, such as Willie Whistle and demonstrations of the ice cream vendor projects were studied in the 1970's in some states. The more recent efforts regarding safety helmets for bicyclists, where state laws have been enacted to require helmet use under a certain age are being noted. Most of these programs were probably too new for assessments of their effect.

Discussion. The pedestrian and bicycle crash problem continues, although nationally, pedestrian fatalities have declined from 8,070 in 1980 to 5,638 in 1993. Pedestrian injuries have also declined from an estimated 110,000 in 1988 to 93,000 in 1993. Bicyclist deaths were listed as 965 in 1980 and 814 in 1993, and injuries are down to an estimated 65,000 in 1993 from 75,000 in 1988.

The states participating generally show similar trends, except for those whose populations have grown substantially in the past ten years. Such states continue to confront an increase in pedestrian and bicyclist fatalities and injuries.

Discussion of Issues

1. Is enough known about bicycle and pedestrian problems to formulate effective programs?

Extensive studies of the different risk categories that apply to small children were completed in the early 1970's. The problem of "dart outs" by children walking or playing in the streets was highlighted as a frequent occurrence. The problems of the elderly -- both as drivers and as pedestrians -- have been the focus of more recent attention, as this segment of the population has increased at a greater rate than the rest of the population.

While the risk characteristics may be the same for all pedestrians and bicyclists -- the interaction with motor vehicles on streets and roadways -- these risks are far from uniform throughout a state. Even urban areas have a range of environments that require different approaches for both bicycle and pedestrian safety. The bicyclist and pedestrian have considerably more travel route flexibility than the motor vehicle which is bound to a street or highway. On the other hand the typical pedestrian and young bicyclist usually "operate" within a more limited or defined boundary of travel than the motorist, although longer range cycling has increased substantially in recent years.

Designing programs to reduce the crash risk of pedestrians and bicyclists with motor vehicles becomes, therefore, a task that has to be tailored to a very specific population in well defined areas. Other than the generalized K-6 curriculum or packaged senior citizen safety programs, the only "specialized" projects were the ice cream vendor demonstrations in the 1970's. There have, of course, been new safety equipment advances such as safety helmets, and reflecting materials for greater conspicuity.

The question comes down to the degree of need for concentrating on designing and developing safety projects that are area and personal risk specific, or focused on the development and implementation of bicycle and pedestrian safety approaches that are generally applicable -- helmets, reflectorized equipment, education curriculums, and safety brochures. The likely response is that both approaches are needed, which may be true, but would require well thought through and targeted planning, rather than long wish list guidelines.

2. What kind of a management structure is needed for directing bicycle and pedestrian safety programs?

State education departments have traditionally directed the school safety education programs. In more recent years state transportation departments (traffic safety offices) have led bicycle and pedestrian safety program development. Many state programs were begun with the hiring of a coordinator whose job it was to identify and highlight the problem, propose safety initiatives and generate state and community responses. There often were delays in starting the projects -- in some cases there was a lack of interest.

In other cases, the leadership for programs was with the Federal Highway Administration (FHWA), private associations such as the American Academy of Pediatrics, the American Trauma Society, national programs such as SAFE KIDS and local leadership by PTA's, police departments, auto clubs, schools and senior citizens centers. The effort to coordinate these disparate entities has been difficult.

The trend in the 1990's to establish "umbrella" safety programs -- a further expansion of the comprehensive traffic safety program concept to include all personal, environmental and community safety problems. This may be a useful basis to define the most urgent problems and prioritize them to achieve the most safety "product" for the available resources. It may also work against pedestrian and bicycle safety since these could rank below other problem areas.

A number of safety officials expressed some reservations about the ability to generate interest in pedestrian safety projects at the state level. They viewed the problem as a lesser priority than their impaired driving, occupant protection and overall enforcement programs. They too expressed the opinion that countermeasures against the pedestrian safety problem were limited.

The inclusion of both the bicycle and pedestrian safety programs in the comprehensive traffic safety programs did help spread the effort, particularly when accompanied by volunteer participation and the design, production and distribution of relevant safety materials. The direction of these programs came under county, municipal or similar community management.

The need to establish "tailored" pedestrian and bicycle safety programs requires a management structure that relies on local (volunteer?) coordinators that can devise innovative projects and obtain local support for them.

3. Are programs needed for roller blade/skate safety?

Conclusions

1. States have identified and isolated bicycle and pedestrian traffic safety problems using the problem identification process.

2. Safety grants have been used in part to develop programs, both in the past and in more recent time periods. Grants are needed if adult pedestrian programs are to continue.

3. Local programs -- bicycle rodeos, even some senior citizen presentations -- have continued even when there were no grants available.

4. The effectiveness of pedestrian and bicycle safety programs has yet to be established. There has been no monitoring or evaluation.

5. Specific drives such as bicycle helmet purchase coupons and discounts, and voluntary helmet design and manufacture inspections have been successful in getting young bicyclists to wear the proper helmets.

6. The pedestrian safety problem has declined over time.