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**National Highway
Traffic Safety
Administration**

Effectiveness and Efficiencies in Police Traffic Services Programs

Traffic Safety Programs
Office of Program and Demonstration Evaluation

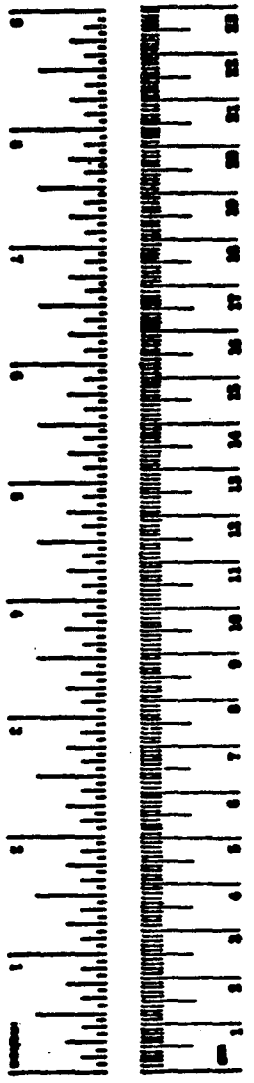
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16. Abstract <p>Traffic law violations were causative factors in about 90 percent of all motor vehicle crashes. Primary responsibility for deterring traffic law violations and for apprehending violators of these laws rest with State, county and municipal police agencies. Police traffic services address both impact and systems support problems. The principal impact targets of selective enforcement focus on the speeding and drinking drivers, as well as drivers committing other unsafe (unlawful) driving acts. Foremost among effective police traffic services efforts are Selective Traffic Enforcement Programs (STEPS) which consist of enforcement which is proportional to traffic accidents with respect to time and place with heaviest emphasis on accident causative violations. STEPs are directed toward one of three classes of unlawful driving behaviors; speeding, driving under the influence, and other unsafe driving acts; after the behavior and its chronological characteristics have been identified through an examination of accident data. Programs having a significant potential for accident reduction include automated equipment and aircraft enforcement. Programs addressing the areas of training, technology transfer, technical assistance, and data collection are critical to improving the efficiency and reducing the cost of police operations.</p>			
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METRIC CONVERSION FACTORS

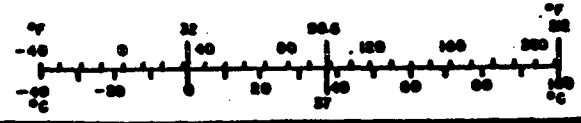
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
sq in	square inches	6.5	square centimeters	cm ²
sq ft	square feet	0.93	square meters	m ²
sq yd	square yards	0.8	square meters	m ²
sq mi	square miles	2.6	square kilometers	km ²
acre	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	-
VOLUME				
teaspoon	teaspoons	5	milliliters	ml
tablespoon	tablespoons	15	milliliters	ml
fluid ounce	fluid ounces	30	milliliters	ml
cup	cup	0.24	liters	l
pint	pint	0.47	liters	l
quart	quart	0.95	liters	l
gallon	gallons	3.8	liters	l
cu ft	cubic feet	0.03	cubic meters	m ³
cu yd	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	yards	yd
		0.6	miles	mi
AREA				
sq cm	square centimeters	0.16	square inches	sq in
sq m	square meters	1.2	square yards	sq yd
ha	square kilometers	0.4	square miles	sq mi
	hectares (10,000 m ²)	2.5	acres	-
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
	tonnes (1000 kg)	1.1	short tons	-
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	1.1	pints	pt
	liters	1.06	quarts	qt
	liters	0.26	gallons	gal
m ³	cubic meters	36	cubic feet	cu ft
	cubic meters	1.3	cubic yards	cu yd
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



*1 in = 2.54 exactly. For other exact conversions and more detailed tables, see NBS Mon. Publ. 285, *Units of Length and Mass*, Price \$2.25, SD Catalog No. C13.10-285.

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EXECUTIVE SUMMARY

Despite the gains made in developing effective highway safety programs since passage of the Highway Safety Act, the loss of life and property through motor vehicle crashes in this country remains at unacceptably high levels. The purpose of this paper, which is based on comments received from a number of States, counties, cities, and private organizations as well as private citizens, and a review of Police Traffic Services Program data accumulated by NHTSA, is to suggest high payoff and potentially high payoff program areas for which Federal funding assistance should be continued.

The research for this paper which was done in accordance with the guidance provided in the Omnibus Reconciliation Act resulted in grouping program activity in four areas. Those groupings are programs proven to be effective, programs having a significant potential for reducing crashes, those which have an efficiency increasing or cost reducing potential and those which appear to justify consideration for future funding.

Programs Proven Effective

Foremost of effective Police Traffic Services efforts are Selective Enforcement Programs which may be described as enforcement which is proportional to traffic accidents with respect to time and place with heaviest emphasis on accident causative violations.

Selective Traffic Enforcement Programs (STEP)

STEP's are generally directed toward one of three classes of unlawful driving behavior after the behavior and its chronological characteristics have been identified through the examination of accident data. These STEP classes are speeding, driving under the influence, and other unsafe driving acts.

1. Speeding

Speeding, either in excess of posted limits or excessive for conditions, has been identified as a contributor in 35 percent of the fatal crashes nationally. There have been many successful STEP operations directed at the speeding driver. Texas reported a reduction of almost 20 fatalities per month during 1974 and 1975, while Utah reported a reduction of almost 10 fatal crashes per month during the same period.

2. Driving Under the Influence

Data indicates that in almost 50 percent of highway fatalities alcohol was a contributor.

The Alcohol Safety Action Projects (ASAP) of the early '70's were the testing grounds within which the vital elements of a successful alcohol STEP were identified, developed and refined. As a result, many alcohol STEP efforts have demonstrated success: Massachusetts reported alcohol related weekend

nighttime crashes were reduced from 57 to 36 percent; Montgomery, Alabama reported a 64 percent reduction in accidents over a 12 month period; while California reported an increase in DUI arrests of 875 percent over a three year period.

3. Other Unsafe Driving Acts (UDAs)

Studies indicate that 90 percent of the national accident experience can be linked to some traffic law violation. It should be noted that speed and alcohol impairment are included in this percentage. However, it similarly should be noted that selective enforcement programs, although directed at a specific type violation, do not preclude officer action in the case of other observed hazardous traffic violations.

UDA programs for which successful results have been reported are: Tyler, Texas, where weekday accidents were reduced by 27 percent; Dayton, Ohio reported a 33 percent decrease in crashes, and Louisiana reported an 11 percent decrease in project areas as opposed to a 31 percent increase in non-project areas.

Programs Having a Significant Potential

Thus far, the programs in this area which appear to have the highest success potential are those which are directed at solving special enforcement problems which have not been given sufficient attention primarily because effective levels are too labor intensive.

1. Automated Enforcement

Automated Enforcement has been widely and successfully used in Europe. It consists of sensing equipment which causes a photograph to be taken of the rear of the offenders vehicle. A citation is issued (on the basis of the photographs) and mailed much the same as a notice of an overdue parking ticket in this country.

This equipment may be used to enforce stop sign, red light, speed, and other laws and could prove extremely effective on bridges, limited access roadways, or in high traffic volume intersections. However, devices such as these require a fundamental change in the underlying legal principle of liability. In conventional enforcement situations, the driver of the vehicle is responsible for violations occurring while the car is under his control. In order for automated enforcement devices to work successfully, the law must be changed to imposed liability for violations on the owner of the vehicle. This problem presents a significant barrier to widespread use of this technology in this country.

2. Aircraft Enforcement

The airplane has the potential to be one of the most versatile and productive pieces of equipment in the police inventory, particularly in rural or sparsely populated areas. It can be used in conjunction with ground units in speed

enforcement, drunk driver detection and various other hazardous violations. By way of example, the Maine State Police reports that air assist allows violators to be located 90 percent faster and citations issued at 30 percent less cost.

Programs Having Efficiency Increasing/Cost Reducing Potential

Inefficiencies in police traffic services systems, from both the perspective of productivity/impact and cost, can be related directly to four areas: training, technology transfer, technical assistance, and data collection. These inefficiencies could be minimized through the implementation of a national police force in which all officers would receive the same training and all management functions would be conducted by one central unit. There are now some 34,000 law enforcement agencies in this country, more than 19,000 of which are involved in traffic law enforcement. These agencies range in size from one or two personnel to more than 20,000.

The amount and quality of training received by these personnel range from virtually none to extensive and highly professional. Likewise, the efficiency of the agencies varies widely. With an average 10 percent annual turnover rate of personnel, recruiting and training is a continuing process.

There is no national repository for all law enforcement information or data nor is there a national clearinghouse for methodology and technology. To further compound these problems, very few police agencies have the in-house capability to analyze their management or operational techniques and effect necessary changes. Therefore, inefficiencies are perpetuated as the quantity and quality of law enforcement activities fail to keep pace with exhibited needs.

Programs to address the areas of training, technology transfer, technical assistance, and data collection are critical to improving the efficiency and reducing the cost of police operations.

Programs Appearing to Warrant Consideration

Programs in this category are primarily catalytic in nature in that all of the elements necessary for a system are in place but are fragmented. The addition of one element, as was the case with the addition of an Alcohol Coordinator in the District of Columbia, is often all that is necessary to provide the adhesive necessary to bind the elements together.

Conclusion

Police Traffic Service programs have proven to be successful in crash reductions and in improving the efficiency/cost effectiveness of traffic enforcement. However, due to the numbers of police agencies not yet exposed to the best available methodologies and the constant state of flux from both the point of view of technological advances and personnel, there continues to be a need for funding assistance. This position is shared by the members of the highway safety community in their submissions to the Docket for the rulemaking process mandated by Congress. (See Figure 1).

The paper which follows is a more detailed examination of the specific programs which fall within the broad categorical areas touched upon in this summary.

Figure 1
Police Traffic Services
Effectiveness and Efficiency Matrix

Impact on Accidents and Injuries

Countermeasure	Measured	Potential	Efficiency	Cost/Benefit
Speed STEP	High	---	High	High
Alcohol STEP	High	--	Medium	Medium
UDA STEP	High	--	Medium	Medium
Automated Enf.	--	High	High	High
Aircraft Enf.	--	Medium	High	High
Training	--	High	High	High
Technology Transfer	--	Med. to High	Med. to High	High
Technical Assistance	--	Med. to High	Med. to High	High
Data Collection	--	Medium	Med. to High	Medium

I. Problem Statement

In Calendar Year 1980, motor vehicle crashes resulted in the loss of over 52,000 lives (FARS), two million injuries, and in excess of \$40 billion in property losses (National Safety Council). Alcohol impairment was a contributing factor in approximately 50 percent of the crashes in which lives were lost 23/ 14/, speeding was a contributor in 35 percent of fatal crashes (FARS), and in about 90 percent 22/ of all crashes traffic law violations were causative factors.

The primary responsibility for deterring traffic law violations and for apprehending violators of those laws rests with State, county, and municipal police agencies.

A. Impact Problems

Police traffic services address both impact and systems support problems. The principal impact targets of selective enforcement focus on the speeding and the drinking drivers, as well as drivers committing other unsafe (unlawful) driving acts. The following paragraphs document the target problems of speeding, the drinking driver, and those committing other unsafe driving acts as they are of interest and concern in police traffic services programs using selective enforcement techniques.

1. Drinking Driver Enforcement

Enforcement is the most critical element in the entire system for controlling drinking drivers, since the remaining elements of the system are unable to function if the police do not detect and apprehend persons who are driving under the influence. Enforcement agencies have long recognized that drinking drivers are involved in a disproportionate number of crashes and that they represent one of the more difficult and time consuming problems in accident prevention. They are also aware that the rate of arrests and convictions for driving while intoxicated is low. For example, there are about two driving while intoxicated arrests per year per uniformed officer; for every driving while intoxicated arrest there are some 2,000 undetected violations; the average blood alcohol concentration per arrest is very high--almost twice the legal limit, meaning poor detection capabilities; the conviction rates on the original charges are very low; and alcohol involvement in fatal crashes exceeds 50 percent.

There are many explanations for the historically low rate of arrests and convictions. One reason is the nature of the legislated penalties for driving while intoxicated. Correctly perceiving the high degree of risk presented by drinking drivers, legislatures set heavy penalties for driving while intoxicated including heavy fines, and/or mandatory jail sentences, and mandatory suspension of the driver's license for up to a year. The legislative assumption was that drinking drivers are clearly alcoholics with little control over themselves and little respectability. This, however, is not a picture of the drinking driver who reaches the courts. As judges and prosecutors discovered that they are dealing with regular citizens who have jobs, families, and a future, they began to regard the legislated penalties as too severe. Juries

agree; they see the offender as a person like themselves. They are unwilling to see him suffer "too much," especially when the arrested individual is not involved in a crash. (Table 1 shows the demographics of offenders in Fairfax County.)

Table 1
SUMMARY OF DRIVING WHILE INTOXICATED OFFENDER CHARACTERISTICS
FAIRFAX COUNTY, VIRGINIA--1972 DATA

MAJOR CATEGORY	SUB-CATEGORY	PERCENT
SEX	MALE	93
	FEMALE	7
AGE	<25	17
	25-34	30
	35-44	29
	45-54	18
	>55	6
EDUCATION	HIGH SCHOOL OR LESS	70
	COLLEGE (1 YEAR OR MORE)	30
OCCUPATION	PROFESSIONAL/BUSINESS	29
	CRAFTSMAN/LABORER	49
	OTHER	22
RESIDENCE	ASAP AREA	34
	OTHER AREAS	46
MARITAL STATUS	MARRIED	62
	SINGLE	30
	WIDOWED, SEPARATED, DIVORCED	18
FAMILY INCOME	UNDER \$5,999	14
	\$6-14,999	48
	\$15 - OVER \$25,000	33
	UNKNOWN	5
PREVIOUS DWI ARREST	NONE	86
	ONE OR MORE	14
PREVIOUS RECKLESS ARREST	NONE	63
	ONE OR MORE	37
OTHER MOVING VIOLATIONS (LAST 3 YEARS)	NONE	36
	ONE OR MORE	44
LICENSE REVOKED	NONE	62
	ONE OR MORE	38
REPORTABLE ACCIDENTS (LAST 3 YEARS)	NONE	73
	ONE OR MORE	25
ARREST RECORD (LAST 5 YEARS)	NONE	88
	ONE OR MORE	12
TOTAL DWI OFFENDERS		821

SOURCE: Analysis of ASAP Patrol Activity, Fairfax Co., Virginia, ASAP

Table 2 shows that the blood alcohol concentration category by offender characteristics is fairly constant, except that "under 25" and "students" have relatively low blood alcohol concentration, probably caused by lower tolerance for alcohol. The result is that many courts have begun to handle drinking drivers lightly in order to avoid imposition of severe penalties. As a result, police cite many drinking drivers for lesser offenses, get them off the road temporarily, and avoid the labor of proving a case which the court system does not treat "seriously." In this respect, they are clearly responding to the attitude of the public.

Table 2
 PERCENT OF DRIVING UNDER THE INFLUENCE OFFENDERS
 IN BLOOD ALCOHOL CONCENTRATION CATEGORIES
 FAIRFAX COUNTY, VIRGINIA--1972 DATA

DUI Offender Characteristics		Percent by DAC Category					Total Cases (N)
		Under .10	.10-.15	.16-.20	Over .20	Refused Test or Unknown	
Age	Under 25 Years	12	24	37	2	14	139
Education	8th Grade or Less	1	17	52	17	13	104
Occupation	Student	19	44	26	0	11	27
Residence	ASAP Area	4	15	40	12	22	439
	Other Area	3	24	50	8	15	322
Marital Status	Married	2	10	50	11	19	505
	Single	10	23	43	4	15	164
Previous DUI Arrest	One or More	0	12	49	17	22	115
	None	4	20	49	0	10	705
Previous Reckless Arrest	One or More	2	16	52	12	18	504
	None	4	21	43	0	19	517
Total Sample		9	19	49	10	10	621

Source: Analysis of ASAP Road Activity
 Fairfax Co., Virginia

Further, drinking drivers are well protected from false arrest by both legislation and court rulings. The result is to make the procedures for arresting a drinking driver much more cumbersome and time-consuming than for any other traffic offense. Some statutes, for instance, require a licensed physician to take a blood test. Cooperative physicians are difficult to find, since they do not want to risk potential involvement in a civil suit. Under these circumstances, it is easier for the officer to see that the driver gets home safely, charged with a lesser offense. Patrolmen cannot give up hours of

patrol time to arrest a single driver. Nor can supervisors, with good conscience, assign officers to time-consuming driving while intoxicated cases.

Patrol patterns are not usually organized to detect the maximum number of drinking drivers. The peak hours of driving while intoxicated activity are late at night when accident rates and vehicle counts are lowest although crash severity and alcohol involvement are highest. (See Tables 3 and 4 for arrests by time of day and day of week.) Note in Table 5 that midnight to 4 a.m. requires the fewest man-hours per alcohol-related traffic arrest, followed by 8 p.m. to midnight. However, traffic patrols are normally assigned to peak accident and traffic hours according to the general principles of selective assignment. General patrols operating at night also have heavy crime prevention responsibilities. The effect of this combination is that neither regular patrols nor traffic patrols can concentrate on drinking drivers at the times when they are most common and easy to detect.

Table 3
AVERAGE BLOOD ALCOHOL CONCENTRATION AND PERCENT OF
ARRESTS WITH BLOOD ALCOHOL CONCENTRATION TAKEN
BY TIME OF DAY--1972 DATA*

Patrol	M - 4a.m.	4a.m. - 8a.m.	8a.m. - N	N - 4p.m.	4p.m. - 8p.m.	8p.m. - M	24 HOUR AVERAGE
Average BAC (%)							
ASAP	.17	.18	.20	.19	.18	.18	.178
Regular	.18	.18	.21	.21	.20	.19	.195
Percent of Arrests with BAC Taken							
ASAP	85	83	80	86	80	86	84.1
Regular	80	78	77	75	79	80	78.7

*All FY 1970 and FY 1971 ASAPs except Wisconsin and Boston.

Table 4
 DISTRIBUTION OF ALCOHOL SAFETY ACTION PROJECT
 ALCOHOL-RELATED TRAFFIC ARRESTS BY DAY OF WEEK
 1973

Item	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
21 ASAPs:								
Number of arrests	2,180	4,342	4,710	5,727	8,682	7,985	2,007	35,633
Percent	6.1	12.2	13.2	16.1	24.4	22.4	5.6	100.0
6 ASAPs:								
Number of arrests	624	665	875	1,027	1,983	2,071	1,006	8,251
Percent	7.6	8.1	10.6	12.4	24.0	25.1	12.2	100.0
27 ASAPs:								
Total	2,804	5,007	5,585	6,754	10,665	10,056	3,013	43,884
Percent	6.4	11.4	12.7	15.4	24.3	22.9	6.9	100.0

Table 5
 ALCOHOL SAFETY ACTION PROJECT PATROL MAN-HOURS PER
 ALCOHOL-RELATED TRAFFIC ARREST BY TIME OF DAY
 1972 DATA*

	Time Period						24 HOUR AVERAGE
	M - 4a.m.	4a.m. - 8a.m.	8a.m. - N	N - 4p.m.	4p.m. - 8p.m.	8p.m. - M	
Man-Hours per A/R Arrest	9.5	20.9	54.5	51.2	45.8	15.6	15.9

*Does not include Wisconsin, Boston, Indianapolis, New Hampshire, and South Dakota ASAPs since data on both arrests and man-hours are not available.

2. Speed Compliance

Speeding is the result of several interrelated factors which separately, or in combination, can be modified either to discourage or to encourage speeding. For example, the availability of high-powered autos equipped with racing stripes, large racing style tires, and so forth, tends to encourage speeding.

Highway design also affects speeding behavior. The rural interstate system with its widely touted "70 mph design speed" clearly encourages higher speeds. Other road systems, with much lower design speeds, discourage speeding. Unfortunately, many motorists equate "design speed" with "safe operating speed" and, especially on interstate highways, feel safe traveling in excess of 55 mph, regardless of actual operating conditions.

Driver behavior, the single most important factor in speeding, is also the most complex element in the speeding equation. Modifying driver behavior is squarely within the purview of police traffic services. One approach designed to influence compliance behavior of drivers is to provide knowledge regarding the safety, energy, and legal consequences of noncompliance in order to encourage more positive attitudes toward compliance.

General public information activity on behalf of 55 mph and other speed compliance programs have been intense at both State and Federal levels. Most of the activity at the Federal level has consisted of mass media programs directed at the public nationally, while State public information and education programs vary in size and content from State to State. For example, Georgia uses radio and TV spots developed and produced by university students; California uses billboards, flyers, and public service announcements; and West Virginia uses TV spots which feature a show business personality.

By far, the most common deterrent approach involves expanded police enforcement coupled with related public information activities to deter speeding (an approach typically referred to as "general deterrence"). The basic objective of this approach is to increase motorist perception of the risk of detection and apprehension for speeding violations. Various enforcement strategies (increased manpower, different patrol strategies, use of fixed-wing aircraft, and enforcement directed at specific problem groups, such as truck and bus drivers), coupled with public information strategies (periodic media campaigns to increase awareness of apprehension risk), are utilized. Another approach is to advise motorists of intensive speed enforcement on the road ahead.

Most enforcement activities have taken the form of (1) short, intensive campaigns involving a significant temporary increase in police manpower and a good deal of associated publicity, or (2) more mid-to-long-term effort using increased manpower or different patrol-detection strategies. Examples of these programs include the 1977 and 1978 Combined Accident Reduction Effort Programs (multi-State combined enforcement efforts for the three major holiday weekends) and numerous and strategically varied Selective Traffic Enforcement Programs implemented in selected States and cities. These programs appear to effect significant reductions in fatal accidents and increases in compliance behavior, benefits that appear to erode gradually after the enforcement programs are terminated. NHTSA has also sponsored a large project designed to determine

the precise impact of varying levels of increased enforcement on 55 mph compliance, also workshops and projects to identify successful and/or innovative ongoing State enforcement techniques and to disseminate these findings to assist the law enforcement community.

3. Unsafe Driving Acts

Other major unsafe driving acts are causally associated with 58 percent of all accidents and 37 percent of fatal accidents (FARS). Therefore, the maximum possible savings, using the latest cost estimates for fatal accidents (\$327,000), accidents involving injuries (\$2,000), accidents involving property damage (\$600), and 1977 accident frequencies, would be \$25 billion for a 58 percent reduction in all accidents or \$5.7 billion for a 37 percent reduction in fatal accidents alone. Maximum cost savings for two unsafe driving acts (following too closely and making unsafe entry into traffic flow) would be \$1.1 billion for fatal accidents alone or \$10.9 billion for all accidents. Even if all the major unsafe driving acts were eliminated, however, the maximum cost savings should not be construed as realistically obtainable. More than one factor is often causally associated with an accident, and removal of any specific factor is no guarantee that the accident will not occur. It is clear, however, that reduction or elimination of these unsafe behaviors will result in significant life and cost savings.

In addition to speeding and driving while intoxicated, recent research has identified, on a preliminary basis, the other major unsafe (unlawful) behaviors that the driver is aware of and can control. These behaviors include the following crash contributing acts in descending order of frequency.

- o Following too closely
- o Making unsafe entry into traffic flow (e.g., pulling in front of traffic from a road or driveway)
- o Backing into traffic
- o Turning in front of oncoming traffic
- o Driving too fast for traffic or weather conditions
- o Running a stop sign or light
- o Changing lanes or merging in front of traffic
- o Driving to the left of the center line or on center line
- o Turning too widely or sharply
- o Passing improperly.

Of these unlawful acts, following too closely and making an unsafe entry into traffic flow have been identified, on a preliminary basis, as being causally associated with nine percent of all accidents.

B. Systems Support Problems

A system support problem is a deficiency in a vital traffic safety program function, the correction of which may not produce measurable accident/fatality/injury changes but, nonetheless, affects the ability of the system to function adequately. Depending on the nature of the deficiency, systems support problems are often as deserving of attention as are impact problems. For example, in order to identify the causes of accidents, it is necessary for a State/juris-

diction to collect, report, and analyze large amounts of accident data. The absence of a good police accident investigation program (a systems problem) could lead to a jurisdiction formulating inadequate or erroneous countermeasure activities.

C. Components of a Police Traffic Services System

The major components of an effective system in the police traffic services area are:

1. Training
2. Management
3. Selective Enforcement
4. Accident Investigations
5. Hazardous Condition Control
6. Planning
7. Evaluation

The following paragraphs describe these components:

1. **Training**--Uniform and periodic training in all aspects of police functions relative to driver, vehicular, and pedestrian highway safety, including use of appropriate instructional materials and techniques for recruit, advanced, in-service, and special course training.
2. **Management**--Organization, rules, policies, and procedures for uniformed and other police department employees assigned to traffic duties dealing with:
 - a. Cost-effective administration and management of driver, vehicular, and pedestrian police traffic services (including public information and education programs which are specifically designed to encourage public and official support for police traffic services).
 - b. Analysis, interpretation, and use of accident and other traffic records data.
 - c. Court appearances.
 - d. Prompt, reliable post-accident response, including skilled aid to the injured and control of hazardous conditions and materials.
 - e. Accomplishing other post-accident responsibilities.
3. **Selective Enforcement**--Policies and procedures for cost-effective assignments of trained police personnel to supervise driver, vehicular, and pedestrian traffic, including selective enforcement patrols in hazardous areas based on time and location of:

- a. Traffic volume.
 - b. Accident experience.
 - c. Traffic violation type and frequency with emphasis on alcohol, speeding, and other unsafe driving acts.
4. **Accident Investigation**--Procedures for investigating, recording, and reporting accidents including:
- a. The human, vehicular, and highway causative factors in individual accidents.
 - b. The human, vehicular, and highway causative factors of injuries and deaths with emphasis on alcohol, speeding, and safety belt usage.
 - c. The efficiency and effectiveness of the post-accident response systems.
5. **Hazardous Conditions**--Procedures for recognizing, reporting, and controlling hazardous highway defects and conditions, including:
- a. Condition of drivers (with emphasis on driving while intoxicated).
 - b. Operational condition of motor vehicles.
 - c. Defective signs, signals, controls, construction, and maintenance deficiencies.
6. **Planning**--A planning function which has the capability to regularly examine new developments in highway safety and/or the police traffic services area to identify new problems or emerging technology and develop programs in response to the new challenges or technology.
7. **Evaluation**--Appropriate and periodic evaluation of all operating and support program components.
- D. **Deficiencies and Problems in a Police Traffic Services System**

In many instances deficiencies in police traffic services systems grow out of the very nature of the police agency in the United States. Agencies are fluid in that upward mobility moves seasoned, well trained traffic officers into supervisory positions in other areas of police work. Similarly experienced traffic supervisors are promoted or retire from traffic work.

This nation's understandable concern that there be no national police force, although well based, creates many inefficiencies in the 19,000 separate police agencies which deal in police traffic services. More specifically, this approach hampers the transfer of information on both successful and unsuccessful programs, management techniques, training, data analysis, etc. There is frequently a need to "re-invent the wheel" 19,000 times.

Some of the deficiencies/problems that appear in specific police traffic services systems areas are:

1. Training

A constant turnover of operational and supervisory personnel creates a continuing need for training. Since the field is not static, technological advances in the vehicle, the roadway, and countermeasure design further compound the need for training.

2. Management

As was the case with training, police managers change constantly; for example, the average tenure as a Municipal Chief of Police is 18 months (IACP). This creates a continuing need for managerial training. Since it is highly improbable that an efficient, cost effective police traffic services program can be implemented or continued without trained management, this area can heavily impact on program success.

3. Selective Enforcement

The concept of selective enforcement has been with us for many years and the term is widely used by the police. However, in many agencies there is a definite lack of understanding of the intricacies of such a program. An effective selective enforcement program is based on the availability and careful analysis of data to formulate meaningful problem identifications and to formulate a successful countermeasure design. These are skills beyond the current in-house capabilities of many police agencies. The practice of putting more police on the street to just write tickets can no longer be characterized as selective enforcement.

4. Accident Investigation

Accident investigation should not be confused with accident reporting which is also done by the police but takes the form of what the involved drivers say happened rather than a conclusion based on the examination of all available evidence. Too often accidents that are only reported are used to compile data upon which selective enforcement programs are built. The end result is an enforcement program about which supportable conclusions cannot be reached. The need for accident investigation training and practices is constant.

5. Hazardous Conditions

As stabilizing the patient to prevent further injury is the first rule in First Aid, so too is it the first rule in accident scene management. Failure to safeguard accident victims, control hazardous material spills, and recognize and report roadway defects, according to many police administrators, represents a serious potential for further injury and damage.

6. Planning

Programs and programmatic changes are all too often made without benefit of a working knowledge of the state-of-the-art and/or the ability to recognize newly developing problem areas. Poor planning also contributes to programs so poorly designed as to render them virtually impossible to accurately evaluate. In many agencies, long range planning and articulated program priorities/goals are often nonexistent.

7. Evaluation

Good evaluation design and execution is the key to identifying what methodology works and more importantly what does not. It also provides the administrator with the data to determine what level of resource allocations is sufficient to attain the desired result. The absence of good evaluation, as is all too often the case, proliferates poor programs, inefficiencies, and poor management.

II. Overview of Program Area

A. Police Traffic Services Functions and Purpose

Police traffic services are those law enforcement or service rendering efforts which relate to defined highway safety programs and include the administrative functions necessary to support those activities. As such, police traffic services provides the impetus for a success potential and shares responsibility for a number of program areas such as: traffic records vis-a-vis accident investigation, driver licensing, motor vehicle inspection and registration, traffic safety education, traffic courts, pedestrian safety, motorcycle safety, alcohol safety, hazardous material and debris control, emergency medical services, and the issuance of traffic citations, an activity which not only contributes to traffic records but serves to identify problem drivers.

The ultimate purpose of police traffic services is to reduce the incidence of motor vehicle crashes and crash-related injuries and fatalities. In addition, it is intended to facilitate the safe, orderly, and efficient movement of goods and persons on the roadways.

B. Program Areas

Based on the functions and purposes enumerated, key program areas have been identified and divided into two primary categories. In the following sections of this paper, we will discuss the effectiveness and efficiencies of police traffic services programs in both categorical groupings, the Impact and Systems Support Areas.

The **Impact Areas** are:

1. Selective Traffic Enforcement Programs
 - a. Alcohol
 - b. Speed
 - c. Other Unsafe Driving Acts
2. Programs which have not yet proven effective but which are felt to have a success potential.

The **Systems Support Areas** are:

1. Technical Assistance
2. Technology Transfer
3. Training
4. Accident Records
5. Public Information and Education

III. Results by Countermeasure Area--Police Traffic Services Programs

For the purposes of this paper, police traffic services programs are grouped in four categorical areas: (1) those that have been proven to be effective, (2) those which have significant potential for reducing crashes, (3) those which are not directly related to crash reduction but have an efficiency increasing or cost reducing potential, and (4) those others which appear to justify consideration. Each category will be treated separately.

Category I--Programs Proven Effective

Selective Traffic Enforcement Program

Selective enforcement is that part of a traffic safety program which involves the planning, directing, implementing, and evaluating of traffic law enforcement activity. The ultimate goal of selective enforcement is to reduce traffic accidents and injury severity by systematically improving the manner in which available police manpower and equipment resources are used.

Maximization of resources is achieved through the well planned, geographical/chronological assignment of personnel and equipment, and the establishment of preventive patrols to deal with specific categories of unlawful driving behavior, according to needs which are based on accident statistics, enforcement activity records, traffic volume, and other local traffic conditions.

More concisely, selective enforcement is enforcement which is proportional to traffic accidents with respect to time, place, and type of violation. 3/

Typically, selective traffic enforcement programs are conducted to affect three primary violations categories: speeding, driving under the influence of alcohol, and other unsafe driving acts.

A. Speed Enforcement

How the Program Works

Accident data are used to identify sections of roadways (places), days of the week, and times during which speed is a prime contributing factor in the accident experience. Normal and/or special patrols are advised of these circumstances and are directed to strictly enforce the speed regulations in the identified area during the appropriate time frames and days of the week. In the case of special patrols, personnel are assigned to that identified portion of roadway and devote their full-time and attention to enforcing the speed regulations.

How Reduction is Achieved

Patrol units, by virtue of their visible enforcement activities, increase the perception of risk of apprehension for the commission of this infraction on this particular segment of roadway as was shown in the Speed Limit Enforcement Demonstration Projects in Connecticut and Utah. In these projects, varied levels of patrol intensity resulted in a reduction as high as 18 percent

in the number of vehicles exceeding the speed limit. 9/ More importantly however, slower and more uniform speeds reduce accident potential. 4/ 16/ 8/

In addition to average speed and effects on the accident experience, the number of violation notices issued can also be used as a secondary measure of effectiveness.

Examples of Successful Projects

The following are some examples of effective selective traffic enforcement programs which clearly demonstrated an impact on speed related crashes.

1. Texas

The Texas Highway Patrol, in 1974, initiated a speed selective traffic enforcement program on high speed roadways. Speeding arrests by the Texas Highway Patrol doubled (see Figure 6). Although the initial reduction in fatal crashes was primarily attributed to the fuel crisis, the fatality experience on treated roadways remained constant (see Figure 7); while the frequency on untreated roadways returned to the former (higher) levels. 21/

Figure 6
SPEEDING CITATIONS BY TEXAS HIGHWAY PATROL

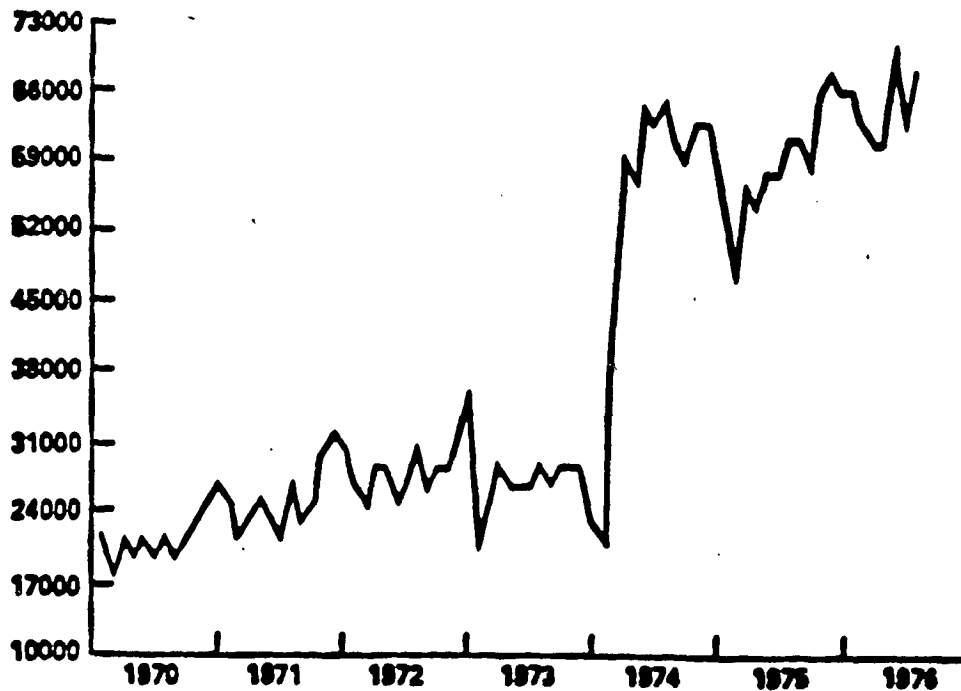
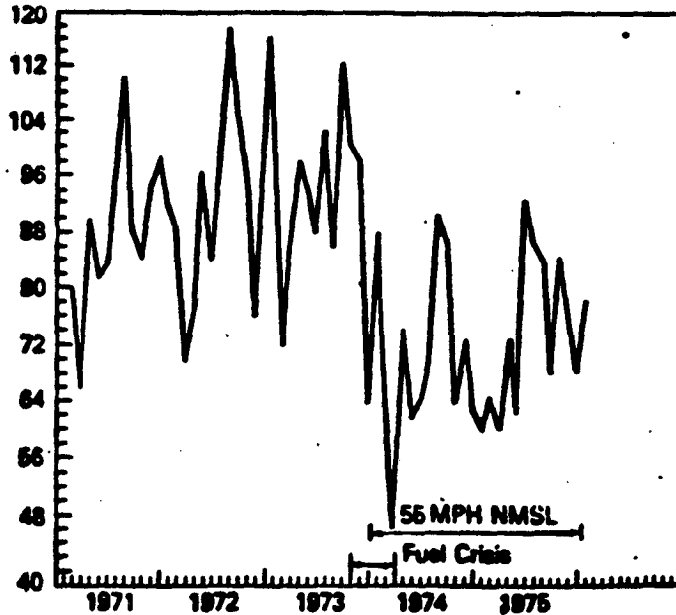


Figure 7
FATAL ACCIDENTS ON 55 MPH ROADWAY IN TEXAS



The study concludes that the traffic enforcement projects prevented 19.8 fatal crashes per month during 1975 and 1976. (Abstract 1)

2. Illinois

A study similar to the Texas study just described was conducted in Illinois. Once again the police increased their selective enforcement efforts and speeding arrests (citations) increased rapidly (see Figure 8). Fatal crashes on high speed roads fell and remained below the previous level during 1974 and 1975 (see Figure 9). Meanwhile, there was a slight drop in fatalities during the fuel crisis on low speed roads, but a return to the previous level following the crisis. The study estimated that the 55 mph national maximum speed limit and the police selective traffic enforcement program reduced fatal accidents on interstate highways in Illinois by about five per month and injury accidents by about 73 per month. (Abstract 2)

Figure 8
 SPEEDING CITATIONS IN ILLINOIS
 FEDERAL AID INTERSTATE AFFECTED BY 55 MPH

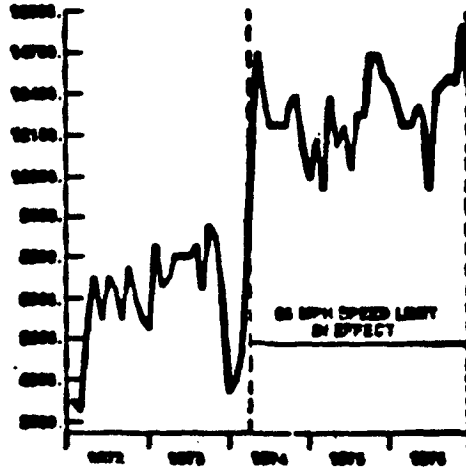
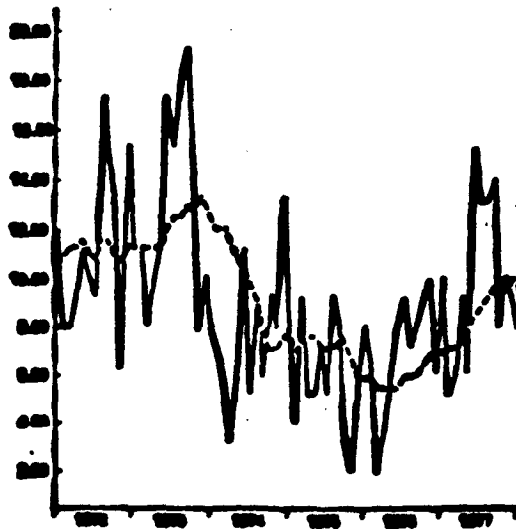


Figure 9
 FATAL ACCIDENTS ON 55 MPH ROADWAYS IN ILLINOIS
 FEDERAL AID INTERSTATE AFFECTED BY 55 MPH
 12 MONTH MOVING AVERAGE



3. Utah

In Utah, highway fatalities fell following the fuel crisis in 1974 as shown in Figure 10. An analysis of this change indicated that some of this reduction was due to the fuel crisis, but that the 55 mph law and the police selective traffic enforcement program produced an estimated reduction of 9.6 fatal crashes per month during 1974 and 1975. 9/

New Jersey--Docket Submission N01-441--Tactical patrol units effected 58.3 percent reduction in fatal accidents and 60 percent reduction in fatalities over three year period.

Georgia--Docket Submission N01-511--Reduced fatalities 53 percent and dropped 85th percentile speed from 67.93 to 60.97 mph, and average speed from 61.87 to 57.4 mph.

Illinois--Docket Submission N01-017--Troopers working 48,554 hours of extra patrol affected a 43 percent reduction in accidents. Savings exceeded costs 25 to 1.

North Dakota--Docket Submission N01-223--Crashes decreased from 22,440 in 1970 to 14,740 in 1975, a 34 percent decrease even though licensed drivers increased 20 percent and vehicle miles traveled increased 39 percent. Driving while intoxicated convictions increased from 2,600 in 1970 to 6,600 in 1980.

Washington--Docket Submission N01-064--55 mph enforcement reduced injury crashes 26 percent. Percent of vehicles exceeding 55 mph dropped from 48.1 percent in June 1980 to 39.6 percent in June 1981.

Evidence Establishing Order of Effectiveness

Imposition and enforcement of reduced speed limits have proven to be one of the single most effective safety measures ever implemented in America and several European countries. 10/ For the two years before the national maximum speed limit, fatalities averaged more than 54,000 while for the three years after the average was 45,000. Between 4,000 and 6,000 of the 9,000 lives saved annually are attributed to the speed limit and the enforcement thereof. 8/

Relationship of Program Cost to Benefits

Once properly installed (data collection, problem identification, resource allocation, and evaluation), usually through seed money, a highly efficient program generates similarly equivalent revenues to that which it expends. 18/ The lives saved, injuries eliminated, or severity reduced are not as amenable to a cost/benefit comparison.

Docket Submissions

Of the 72 Docket Submissions relating to police traffic services, 47 supported continued funding for this program area. There were none opposed to funding. Two submissions by individuals opposed the national maximum speed limit, but not speed enforcement programs.

B. Alcohol Enforcement

How the Program Works

Through the examination of accident data, a jurisdiction learns that a disproportionate number of crashes involve drinking drivers. The locations, days of week, and predominant time frames are also established. Trained regular or special patrols are assigned to the identified area during high frequency hours to detect and arrest drinking drivers.

How Reduction is Achieved

The primary measures of effectiveness have generally been accepted to be a reduction in the number of alcohol related fatal and injury crashes, the number of arrests, and the average blood alcohol concentration of persons arrested.

As was demonstrated in the Massachusetts Alcohol Crash Reduction Program (Abstract 5), the representative proportion of alcohol related nighttime crashes on weekend nights was reduced from 57 percent to 36 percent. In the District of Columbia (Abstract 7), the average increase in arrests was in excess of 300 percent and the average blood alcohol concentration of persons arrested decreased from .31 to .18. In Tucson, Arizona, 343 fewer crashes in the first half of 1981, as compared to the same period in 1980, were attributed to a 200 percent increase in driving under the influence arrests during the same time frame. (Abstract 6)

Highly visible patrols making arrests for driving while intoxicated, particularly when coupled with an effective public information campaign, can reduce the incidence of alcohol related crashes by markedly increasing the perceived risk of arrest. 15/ 14/ 5/

Examples of Successful Projects

The following are some examples of effective selective traffic enforcement programs which clearly demonstrated an impact on alcohol related crashes:

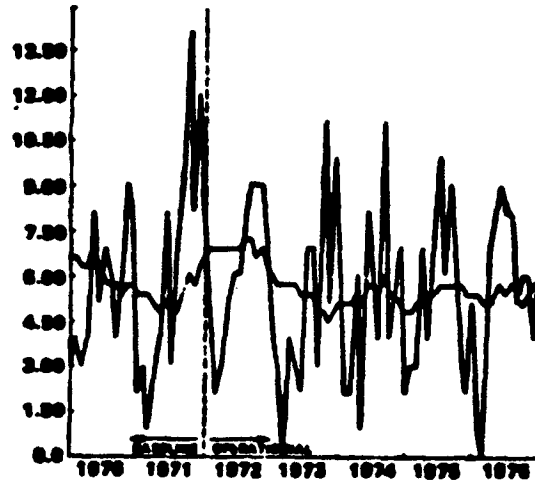
1. New Hampshire

Analysis of the New Hampshire Alcohol Safety Action Project showed a statistically significant reduction of 1.65 fatal crashes per month attributable to that program. This equates to a savings of 94 lives over the five years of the project. 14/

The New Hampshire Alcohol Safety Action Project began operations in January 1972. This statewide project was originally designed for a three year operational period (1972-1974). In 1974, a two year extension was awarded to continue operations through December 1976. The analysis considered a comparison of night fatal crashes between the baseline (1969-1971) and operational (1972-1976) periods, taking into account the possible effects of the fuel crisis and the 55 mph national maximum speed limit.

The analysis of monthly night fatal crashes showed the series to have a distinct 12 month (annual) cycle which was "removed" using well defined time series analysis procedures. This periodicity is smoothed for graphic purposes using a 12 month moving average (see Figure 11).

Figure 11
NEW HAMPSHIRE ALCOHOL SAFETY ACTION PROJECT NIGHT FATAL CRASHES
12 MONTH MOVING AVERAGE



The resulting analysis showed that neither the fuel crisis nor the speed limit had affected night fatal crashes. However, a statistically significant reduction of 1.65 fatal crashes per month was attributed to the presence of the alcohol safety action project. This equates to a savings of approximately 94 fatal crashes during the project life.

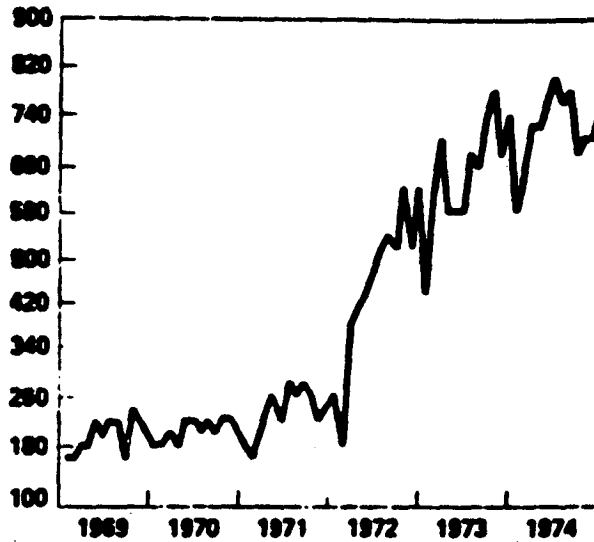
fatal crashes

1.65 per month x 57 months = 94 fatal crashes

57 months = 5 years - 3 months delay time (start up)

Coincidental to the reduction in nighttime fatal crashes was a marked increase in arrests (see Figure 12).

Figure 12
NEW HAMPSHIRE ARRESTS



2. New Orleans

The New Orleans Alcohol Safety Action Project demonstrated a reduction of 1.12 fatal crashes per month or a reduction of 67.2 fatal crashes for the operational life of the project.

This alcohol safety action project began operation in 1972. It was originally intended for a three year operational period (1972-1974). In 1974, the project was extended to continue through December 1976. Night fatal crashes in the baseline (1969-1971) and operational (1972-1976) periods are compared to determine effectiveness (Figure 13).

Figure 13
CUMULATIVE SUM
(-) NEW ORLEANS NIGHT FATAL CRASHES
(---) NEW ORLEANS DAY FATAL CRASHES



The analysis of monthly night fatal crashes showed a statistically significant reduction of 1.12 fatal crashes per month attributed to alcohol safety action project presence in New Orleans (a reduction of 67.2 fatal crashes for the entire five year operational period). No effect was found for either the fuel crisis or speed limit.

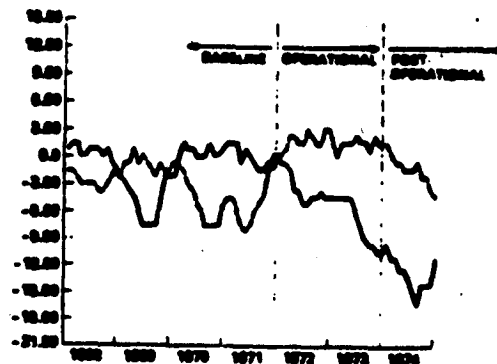
3. Charlotte, North Carolina

The Charlotte Alcohol Safety Action Project resulted in a reduction of .77 fatal crashes per month or 18.48 during the life of the project. 14/

The project began operation in 1971. The experimental design provided for one year (1971) of a public information and education media countermeasure followed by the introduction of special enforcement in January 1972. (See Figure 4)

It was felt that the media campaign alone was not effective in deterring the drinking driver. Hence, for the purpose of evaluating the impact of the total alcohol safety action project, January 1972 was selected as the point of intervention. This brings about a four year baseline period (1968-1971) and a two year operational period (1972-1973). In addition, the Charlotte Alcohol Safety Action Project was awarded a post alcohol safety action project evaluation extension which consisted of the collection and reporting of specified impact variables. The year 1974 represents this post operational period during which there was no alcohol safety action project activity in Charlotte. (See Figure 14)

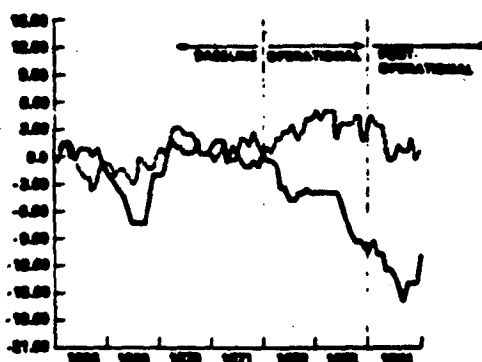
Figure 14
CUMULATIVE SUM
(-) CHARLOTTE NIGHT FATAL CRASHES
(---) CHARLOTTE DAY FATAL CRASHES



Analysis of night fatal crashes revealed a statistically significant reduction of .77 fatal crashes per month (9.24 per year or 18.48 during the life of the project) due to the presence of the alcohol safety action project. Neither the fuel crisis nor the 55 mph national maximum speed limit had any effect on night fatal crashes in Charlotte.

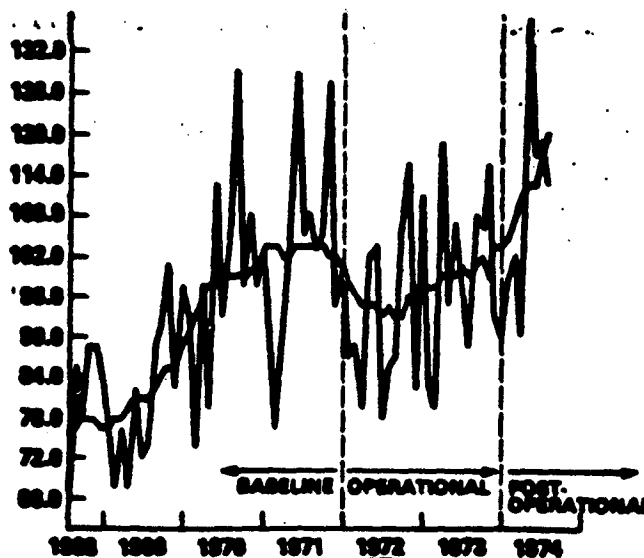
The Charlotte Alcohol Safety Action Project had two comparison sites: Pima County, Arizona and Dade County, Florida. Neither of these sites experienced a change in the mean level of monthly night fatal crashes coincident with the alcohol safety action project operational period. Figure 15 reflects the comparison between Dade County and Charlotte.

Figure 15
 CUMULATIVE SUM
 (-) CHARLOTTE NIGHT FATAL CRASHES
 (---) DADE COUNTY, FLORIDA NIGHT FATAL CRASHES



Interestingly, there was a marked upward movement in the incidence of nighttime injury crashes during the post operational period (See Figure 16).

Figure 16
 CHARLOTTE NIGHT INJURY CRASHES
 WITH 12 MONTH MOVING AVERAGE



Other alcohol selective traffic enforcement programs reporting significant impact are:

Montgomery, Alabama--Docket Submission N01-011--Effected a 64 percent reduction in accidents over a 12 month period in 1980.

Massachusetts--Docket Submission N01-005--Improved driving under the influence detection, developed advanced accident investigation techniques, implemented commercial vehicle enforcement program, and improved staff capabilities. Speeds down from 67.7 to 55.6, accidents down 43 percent.

California--Docket Submission N01-032--Driving under the influence arrests up 404 percent first year, 684 percent second year, and 875 percent third year, driving under the influence convictions at 90 percent.

Virginia--Docket Submission N01-581--Traffic crashes dropped from 157,637 in 1973 to 116,382 in 1980. In 1980, 24,024 driving under the influence defendants referred to VASAP rehabilitation program.

Evidence Establishing Order of Effectiveness

A comprehensive drinking driver control system, of which enforcement is the key ingredient, has been shown to reduce the incidence of alcohol related crash fatalities and injuries but to a lesser extent than speed enforcement most probably due to the numbers of offenders and the normal time frames of most frequent occurrence. 3/ 15/ 8/ 5/ 23/

Most recently and based on the alcohol safety action project findings, an effectiveness (impact) evaluation study was conducted in Stockton, California. This driving under the influence enforcement project was designed to impact on the driving population in Stockton between 8 p.m. and 4 a.m., Friday and Saturday nights.

Initially, the city was divided into geographic enforcement areas based on similar demographic factors, such as population, traffic volume, drinking establishments, etc. During the first year, each area was designated as an experimental area for six months and then as a control area for six months.

The second year of operations started with three months of zero enforcement followed by nine months of city-wide enforcement with ten officers. The third experimental year was comprised of six months of no additional enforcement levels. The project ended with one year of increased enforcement again utilizing the ten officers.

City-wide collisions decreased significantly from the baseline in Experiment I. When the patrols were removed, the collisions returned to the baseline level. When the Traffic Task Force was reinstated during Experiment II, the collisions once again decreased, but not significantly. This is also true for the Experiment III collisions. The comparison city data showed that only Stockton demonstrated a general downward trend in nighttime collisions in 1976, 1977, and 1978.

The blood alcohol concentration data obtained by the roadside surveys showed a decrease in the number of drivers on the city streets between 8 p.m. and 4 a.m. with illegal blood alcohol concentration from 1975 through 1978.

The evaluation results of Experiment I showed strong support for the hypothesis that the presence of specially trained police could impact drinking driver related activities. The Experiment II and III results were not as conclusive. 5/

Relationship of Program Cost to Benefits

Due to widely divergent costs for program operations nationally (e.g., salaries, program sizes, fine structures, etc.) and the understandable reluctance of the police community to create an aura of profit motivation for enforcement programs, it is difficult if not impossible to arrive at a generally accurate or acceptable cost/benefit ratio.

However, in the Stockton Project previously discussed, the following data were accumulated: The total cost per driving under the influence arrest during Experiment I was \$100, during Experiment II \$87, and \$135 in Experiment III. The revenue generated by the Traffic Task Force activities in Experiment I was \$413,829, in Experiment II \$398,593, and \$423,820 in Experiment III. The estimated cost benefit ratio for 1976, 1977, and 1978 combined was one.

Docket Submissions

Thirty-eight of the 72 Docket Submissions relating to police traffic services supported continued funding for this program area, none were opposed.

C. Other Hazardous Violations

How the Program Works

Accident data are used to identify prime causative violations in the crash experience including those sections of roadways (places), days of the week, and times of day which are overrepresentative in the accident experience.

Normal and/or special patrols are advised of these circumstances and are directed to take strict enforcement action against those drivers who commit identified crash contributing violations in the identified areas, during the appropriate time frames, and days of the week. In the case of special patrols, personnel are assigned to that identified portion of roadway during the times and days of the week of the high accident experience and devote their full time and attention to enforcement of the laws governing the prime causative violations.

How Reduction is Achieved

Police patrol units visible by virtue of aggressivity and the issuance of traffic citations increase the general perception of risk of apprehension for the commission of any infraction on the patrolled segment of roadway. 24/

More detailed experiments in the deterrent effect of increased perception of risk of apprehension on the commission of traffic offenses are seen in the studies conducted by Ross 15/ and Solomon. 16/

The primary measures of effectiveness have generally been accepted to be:

1. A reduction in the total number of crashes as was demonstrated in the Tyler, Texas Selective Traffic Enforcement Program (Abstract 10). In this project, Monday through Friday accidents were reduced 27 percent.
2. A stabilization of the accident experience in the treatment area and an increase in the control area as was the case in the North Dakota Selective Traffic Enforcement Program. 11/ Here, there was no change over baseline in the treated area while there was an 18 percent increase in accidents in the control area during the same period.
3. Studies have also shown that public information programs conducted prior to and simultaneously with selective traffic enforcement programs have a substantial influence on the impact of the enforcement efforts. The combination was demonstrated in the Grand Forks County, North Dakota Selective Traffic Enforcement Program (see Figure 17).

A comparison is made for a period of 17 months from a base--August 1, 1970 through December 31, 1971--with the selective traffic enforcement program operational data recorded from August 1, 1972 through December 31, 1973.

Figure 17

<u>Year</u>	<u>Personal Injury</u>	<u>Persons Killed</u>	<u>Fatal Accidents</u>	<u>Injury Accidents</u>	<u>Property Damage</u>	<u>Total</u>
1970-71	93	9	8	47	66	120
1972-73	42	1	1	25	57	83
% of Change	-54%	-88%	-87%	-42%	-13%	-30%

4. As a secondary measure of effectiveness, the increase in the number of citations issued for identified violations can be compared to baseline as well as to the proportion of citations issued for identified violations as compared to all moving citations issued.

Examples of Successful Projects

The following are some examples of effective unsafe driving acts STEPS which reported an impact on crashes:

1. Ohio

The Dayton, Ohio Selective Traffic Enforcement Program reported that the number of accidents at the six high accident locations included in the project dropped from 111 in 1978 to 74 in 1979, a 33 percent decrease. 1/

2. Louisiana

The results of a rural selective enforcement project in Louisiana indicated an 11 percent decrease in total accidents for the project areas, compared to an increase of 31 percent in control or nonproject areas. 1/

3. California

A selective traffic enforcement program operating in Sacramento, California, reported that total accidents were reduced 13 percent in 1974 compared to a baseline period in 1971. There was a reduction of 994 non-injury, 347 injury, and 24 fatal crashes. 1/

Other unsafe driving acts selective traffic enforcement programs reporting significant impact are:

Texas--Docket Submission N01-629--Texas reports that in the City of Tyler an unsafe driving act selective traffic enforcement program resulted in a 27 percent reduction of accidents in the selected patrol sites.

Michigan--Docket Submission N01-016--Bay City reports that through the use of a comprehensive selective traffic enforcement program directed at specific unsafe driving acts, they experienced a 26 percent reduction in personal injury crashes and a 38 percent reduction in property damage crashes.

Maine--Docket Submission N01-123--Although no supportive data was supplied, Maine considers their unsafe driving act selective enforcement program to have been successful.

Mississippi--Docket Submission N01-374--Mississippi reports a decrease in injury accidents ranging from 20 to 53 percent in six of its eight unsafe driving acts selective traffic enforcement programs funded cities and from 28 to 95 percent in five of seven counties.

Evidence Establishing Order of Effectiveness

The successful projects enumerated in this section offer strong support for the premise that comprehensive selective traffic enforcement programs directed at the reduction of specific accident causing violations have been shown to reduce crash frequency and injury severity.

Further, a review of the evaluation literature leaves little doubt that enforcement projects can and do reduce unsafe driving acts of motorists and ultimately reduce accidents in the project areas. This occurs in spite of the sometimes weak methodology employed to document such results. What we have is a consistent documentation of impact on accidents in a project area when compared to prior years, comparison or control areas, and projection of accident levels based on base period trends in accidents. Further, these reductions are often very large--20 and 30 percent--leading to the conclusion that the results are practically significant as well as statistically significant. 21/

Relationship of Program Cost to Benefits

Due to the widely divergent salaries, varying numbers of personnel involved in enforcement projects and activities, and other costs related to law enforcement operations, it is not possible to determine an enforcement cost figure for each enforcement activity that would be applicable to all law enforcement agencies across the country. Traffic enforcement is but one of many duties and services performed by most police officers. Not all of these activities produce revenue and the value of benefits derived from services rendered cannot be calculated. Historically, law enforcement has not been justified on a cost/benefit basis. In most cases, no part of revenues generated through traffic law enforcement goes to the police. Rather, police are financed from general revenue funds. In at least one study (Connecticut), however, it was shown that revenues generated through speeding fines exceeded the cost of enforcement. 9/

Docket Submissions

Of the 72 Docket Submissions related to police traffic services, 43 supported continued funding for this program area, none opposed.

Category II--Programs Not Yet Proven Effective

A. Automated Enforcement

Enforcement of speed and other hazardous violation laws is very labor intensive. The use of automated equipment to enforce speed, stop sign, red light, and lane change laws under special circumstances may well result in high payoff with minimal resources. Special circumstances as used herein might be construed to include segments of roadway where the accident experience is high but are so designed as to limit the potential for effective enforcement (e.g., one way bridges, limited access roadways, constantly high volume traffic intersections).

How the Program Works

Automated speed or violation sensing equipment detects, photographs, and documents the violation. Much the same as with an overdue parking ticket, a violation notice is sent to the owner of record who is required to post collateral for the offense or provide the name of the person who was operating the vehicle at the time of the offense. 2/ The absence of vicarious liability laws for moving traffic violations is a constraint. Devices such as these

require a fundamental change in the underlying legal principle of liability. In conventional enforcement situations, the Driver of the vehicle is responsible for violations occurring while the car is under his control. In order for automated enforcement to work successfully, the law must be changed to impose liability for violations on the owner of the vehicle. This problem presents a significant barrier to widespread use of this technology in this country.

How Reduction is Achieved

A publicized enforcement presence in an area not regularly patrolled for enforcement purposes coupled with the issuance of citations should change driver behavior while traversing the treated section of roadway. It should follow that a reduction in accidents would be experienced and with a minimal investment of manpower. 2/

This premise is supported by the results of the automated speed enforcement effort on Elzer Berg, a mountain just outside of the town of Elz, Germany. In 1971 on the downgrade side of the mountain (toward Frankfurt), there were 199 accidents of which eight were fatal and 83 involved injury. After the first full year of automated enforcement (1974) there were 45 accidents, one fatal, and 18 injuries.

In 1978, there were 63,000 violations recorded by the Elzer Berg System, which operates 24 hours a day, every day. Fines collected from the violations amounted to about \$3 million (United States). 2/

Measurement Criteria

- Average speed pre and post treatment (if applicable)
- Number of accidents pre and post treatment
- Number of citations issued
- Citations per man-hour

Examples of Successful Projects

Elzer Berg, Germany (Abstract 12) was discussed previously.

Holland (Abstract 13) has found that the use of automated devices makes speed enforcement far less labor intensive.

Switzerland (Abstract 14) has had similar success in freeing officers for other duties.

Relationship of Program Cost to Benefits

Program cost could be compared to man-hours saved vis-a-vis citations issued per hour through the automated systems and the average number of similar citations issued per patrol hour.

B. Aircraft Enforcement

Traffic law enforcement has become a highly complex activity which requires practitioners to achieve maximum productivity from available resources. The airplane has proven to be one of the most versatile and productive pieces of equipment in the police inventory, particularly in the rural environment.

How the Program Works

Aircraft are used extensively in speed enforcement, drunk driving detection, following too closely, and various other hazardous moving violations. The aircraft pilot and observer witness the violation and contact ground units to effect the apprehension. The aircraft can work with several ground units in several different locations at the same time.

How the Reduction is Achieved

The aircraft can cover a much larger area more quickly than can a ground unit. Violations can be observed from the air that are extremely difficult to observe on the ground. Aircraft enforcement procedures coupled with aggressive public information and education programs increase public awareness of the probability of apprehension for traffic violations. The cost of aircraft operation on a per contact basis is lower than ground unit operation. 1/

The Maine State Police reported that an analysis of 911 citations issued by air assist indicate that the violators were located 90 percent faster, and the citations were issued at 30 percent less cost (man-hours) while using one third the amount of fuel that would have been consumed by radar equipped ground units (Abstract 17).

Measurement Criteria

- Average speed pre and post treatment
- Driving while intoxicated arrests
- Hazardous moving violations arrests
- Number of accidents pre and post treatment
- Violator contacts per hour of operation

Examples of Successful Projects

Maryland (Abstract 15) used aircraft in concert with unconventional ground vehicles to force speed limit compliance by trucks and buses.

Iowa (Abstract 16) uses 12 aircraft in traffic enforcement; very successful in apprehending high speed vehicles.

Maine (Abstract 17) aircraft used 2/3 less fuel per contact than car and issue tickets in half the time, 30 percent cheaper.

Illinois (Abstract 18) increased apprehensions and reduced cost per contact with aircraft use. Particularly successful in overcoming the use of CB radios to divulge locations of police units.

Relationship of Program Cost to Benefits

Program cost can be compared on the basis of violator contacts generated by the air units versus ground units. Operating costs of the aircraft spread over its life can be compared to the operating cost of a ground unit during its life.

Category III--Programs with Efficiency Increasing Potential

Inefficiencies in police traffic services systems from both the perspective of productivity/impact and cost can be related directly to four areas: training, technology transfer, technical assistance, and data collection.

These four areas are addressed rather than problem identification, countermeasure design/implementation and evaluation, of which they are the key ingredients, because they are more easily related to specific projects and lend themselves more readily to grouping projects by function.

There exists in many quarters a quite common misconception that once a police officer is trained, he is always trained. This would be accurate if police traffic services and those who deliver the services were stagnant. However, the field and those who work in it are vital and constantly changing.

As technology advances, the face of the problems addressed by police traffic services changes. New problems, the high occupancy vehicle, the off-road vehicle, the self contained camper and camp trailer (which are so susceptible to roll overs), the moped, the peda-vehicle, the trail bike, the proliferation of motorcycles, the sub-compact automobile, and the tandem bus are all examples of problems which have emerged in the last decade. Change is not limited to merely the mode of transportation. Those who operate vehicles change each year as a new crop of first year drivers are licensed and become part of the traffic problem. For example, one might expect a total personnel turnover in a traffic unit once every ten years. Therefore, the need for information and training is constant.

Technical assistance serves to identify operational problems where the in-house skills are nonexistent. Technology transfer makes for more cost effective and operationally efficient approaches by demonstrating what has or has not worked and eliminates the expensive necessity for each of the 19,000 traffic service rendering enforcement agencies inventing its own "wheel." Training, evaluation, updating training material, and retraining are the key elements in attaining and maintaining operational efficiency.

A. Technical Assistance

Law enforcement agencies often encounter complex administrative and/or operational problems which cannot be resolved by in-house resources. In such instances, technical assistance from other agencies or professional consultants is required. Management studies, resource allocation planning, and operational procedure audits are done through such technical assistance programs.

Measures of Increased Efficiency

- o Improved, modernized management techniques
- o Increased productivity
- o Improved resource allocation
- o More effective utilization of available resources

How the Program Works

Technical assistance is acquired from experts in other police agencies or from professional consultants. These experts conduct on-site evaluations and develop recommended plans and procedures for correcting identified problems.

How Reduction is Achieved

Operating cost reductions are achieved through more efficient operation of the department and/or more effective utilization of available resources.

Examples of Successful Projects

New Mexico (Abstract 19) was experiencing difficulty in resource allocation and deployment. A technical assistance team analyzed the problem and developed a plan to resolve them. The plan is currently being implemented.

Texas (Abstract 20) had a problem similar to New Mexico, resource allocation along with one in public information. The technical assistance team provided a plan for the resolution of identified problems.

Louisiana (Abstract 21) had a problem with public information and resource management. Here, again, the technical assistance team devised a plan for problem solution.

B. Technology Transfer

As new technologies/strategies are developed and tested in the enforcement environment by one or more agencies, the results are shared with other enforcement agencies through technology transfer programs. Duplication of testing technologies/strategies is held to a minimum through the use of this system.

Measures of Increased Efficiency

The elements which may be used to gauge success in this area are: early implementation/utilization of proven effective new technologies/strategies, disregard of proven ineffective new technologies/strategies, and/or improvements in cost/benefit ratios.

How the Program Works

When new technologies/strategies are developed, a small number of police agencies test them and then share their findings with other agencies. The technology transfer is accomplished through workshops, conferences, and direct interagency contact.

How Reduction is Achieved

Through the technology transfer program, the costs of testing new technologies/strategies are reduced by the elimination of duplication of effort. Moreover, increased efficiency becomes evident.

Examples of Successful Projects

- o Maine Aircraft Project 1/--Evaluation of the main aircraft project showed that aircraft operation is less costly than patrol cars on a cost-per-contact basis. The technology was transferred to all 50 State law enforcement agencies. Florida, Nebraska, Tennessee, and California used the data in developing their aircraft programs.
- o New York Task Force (Abstract 4)--Strategies of police resource deployment and enforcement techniques were tested and evaluated. The technology was given to all 50 States, four Canadian Provinces and two universities. Northwestern University and North Florida University have incorporated portions in their traffic training programs. Part of the techniques developed have been adopted by an as yet undetermined number of States.
- o Burlington, Vermont Computer Project (Abstract 23)--The Burlington, Vermont Police Department used a very inexpensive micro-computer to analyze and store accident data. All aspects of the project were made available to other police agencies. More specifically, the program was presented to 40 Massachusetts Police Chiefs in a seminar; 20 of the Police Chiefs adopted the program immediately. The remaining Chiefs plan to implement this program in FY 1982.
- o Colorado State Patrol Computerized Records System (Abstract 24)--Troopers use computers to determine when and where enforcement is needed. All technology relative to this project is available to all other police agencies. Thirty-one States' representatives have been given instruction on this system, its development, and operation. This system has or is being implemented in five other States: Nebraska, Nevada, Texas, Ohio, and Utah.

Measurement Criteria

The number of technology transfers effected and the increased efficiency of police operations resulting from the technology transfers are good measures of effectiveness, although frequently difficult to quantify.

C. Training

Inefficiencies in police traffic services systems, once identified, are almost always amenable to solution through training. What follows is a list of training program areas (not intended to be all inclusive) and the areas upon which they impact:

1. Accident Investigation

Accurate identification of prime causative violations in the crash experience is the key element in traffic enforcement programs. The data also supports traffic engineering and educational efforts.

2. Radar Training

The use of radar has made speed enforcement more accurate and efficient and is capable of producing more uniform traffic speeds. As vehicular speeds become more uniform, crash frequency and severity are reduced. 19/ 4/ 16/

3. Pre-arrest Breath Tester Training

The use of pre-arrest breath test instruments can add to probable cause for arrest at the scene of the traffic stop. Their use can also eliminate the time lost in transporting drivers who are suspected of being under the influence long distances to evidentiary instruments when they are in fact below the presumptive limits.

4. Breath Test Training

The Director of the Alcohol Enforcement Unit in the District of Columbia reported that evidentiary breath testing devices have reduced the cost of chemical testing (blood, urine) from the \$200 per test range to the area of \$1.00. The State of Colorado attributes part of its 20 percent increase in driving under the influence arrests to the expanded use of breath testing instruments. (Docket Submission N01-008)

5. Operation of Emergency Vehicle (Driver) Training

Training in the proper operation/handling of emergency vehicles can reduce the police crash experience. A reduced number of police crashes affects the overall accident experience, and allows monies that would have been spent on repairs to be used more constructively. For example, monies saved on vehicle repair might be used to purchase gas and eliminate the current practice of parking police vehicles for 15 minutes every hour to save fuel, and reduce enforcement man days lost through injury.

6. Management Training

This training prepares new managers and also helps existing administrators function more effectively.

7. Evaluation Training

Accurate program evaluation identifies effective programs and/or managers.

8. Records Management Training

This training can reduce operational cost through developing more efficient records systems. Records systems support a variety of other functions such as evaluation and problem identification.

9. Pilot/Observer Training

The use of aircraft in traffic enforcement, particularly in rural areas, increases efficiency and productivity.

10. Accident Scene Management

Stabilization of the accident scene can reduce additional crashes through the elimination of post-crash hazards and injury severity through the use of emergency medical services techniques.

11. Traffic Supervision

Mid or first line supervisory training is a key element in the implementation and operation of police traffic services programs.

12. Alcohol Enforcement

Alcohol related traffic deaths amounted to about 50 percent of those recorded for Calendar Year 1980. Arrests for driving while intoxicated occur once for each 2,000 trips while under the influence and arrests per police officer remain fairly constant at two per year.

Training needs in this area and the resultant increase in enforcement activity were well documented in the alcohol safety action project reports.

13. Problem Identification

Cost effective selective enforcement programs must be based on problem areas which are overrepresentative contributors to the crash experience as demonstrated by analysis of data collected through accident reports. Training in problem identification is critical to this process.

14. Planning

Planning, both long and short range, is a critical element of the police traffic services operation. This is also one of the weakest areas in police management. For this weakness to be corrected, it is essential that training be provided for planning officers. Effective police traffic services operations are dependent upon good planning and good planning is dependent upon training.

15. Public Information and Education

Experience has shown conclusively that when applied together, enforcement and public information and education do effect changes in driver behavior. Every member of the police profession needs to be trained in the use of public information and education as a support activity to enforcement. Practitioners and specialists also need to be better trained in the mechanics of providing public information and education materials that support enforcement programs.

16. Hazardous Materials

It has been estimated that there are 250,000,000 shipments of hazardous materials by motor vehicle in the continental United States each year. In every case, these shipments represent a danger that the carrier may become involved in a crash which can result in spillage of life threatening or potentially injurious chemicals.

In order to minimize the danger to those involved with the accident scene, passing motorists, immediately adjacent residents, and responding enforcement officers should be trained in the recognition and containment of hazardous materials.

17. First Responder (Emergency Medical Services) Training

In most areas, the police are the first persons of authority on the scene of injury accidents. In rural or suburban areas, medical assistance for the injured is, at best, many minutes away. It is, therefore, imperative from both the community services and injury lessening points of view that officers assigned to areas of this type receive, at a minimum, First Responder Training.

D. Accident Records

The Mississippi submission to the docket states, "Reliable and adequate traffic records, particularly accident data, are essential to highway safety problem identification, program planning, and evaluation functions of national, State, and local agencies seeking to identify and address traffic accident problems. Data are needed which accurately identify the nature, magnitude, and location of accident problems. Reliable data are also needed in order to evaluate

the effectiveness of past and current program countermeasures in order that effective and resourceful countermeasures may be designed." (Docket No. N01-062.) This is an accurate assessment.

Measures of Increased Efficiency

- o More and accurate accident data
- o Better planned and evaluated traffic safety programs
- o More clearly identified traffic safety problems and countermeasures

How the Program Works

Through better accident investigation and accident records keeping, data is made available for problem identification, program planning, implementation, and evaluation.

How Reduction is Achieved

With better data from which problems can be identified and appropriate countermeasures implemented, non-productive projects can be effectively eliminated, thereby reducing waste.

Examples of Successful Projects

- o Burlington, Vermont Police Department Traffic Records System (Abstract 23)--The Burlington Police Department, utilizing a very inexpensive micro-computer, analyzes all accidents and deploys resources according to need, location, time of day, day of week, and causation.
- o Colorado Highway Patrol Traffic Records System (Abstract 24)--The Colorado Highway Patrol has terminals in all district headquarters through which information in the main frame can be accessed by individual troopers who use the information to determine locations, times, etc., of high accident and violation incidence and deploy themselves accordingly.
- o Florida Highway Patrol Traffic Records System (Abstract 25)--This system, like that in Colorado, is used to deploy patrol resources according to data based need.

Measurement Criteria

Increased number of accidents investigated and submitted to the traffic records system. The presence of more detailed accident data improved countermeasure planning, implementation, and evaluation are all useful in determining program success.

E. Public Information and Education

Experience has shown that enforcement conducted in concert with well planned public information and education is much more effective than when either activity is conducted in isolation. 15/ 11/ Police (enforcement) types of public information and education are not generally included in overall, state-wide public information and education programs. It is, therefore, essential that public information and education be provided specifically for traffic law enforcement programs.

Measures of Increased Efficiency

- o Feedback from public
- o Measurable reductions in accidents and violations
- o Feedback from police

How the Program Works

Public information and education projects are designed and executed to support specific enforcement activities. Both the enforcement and public information and education portions of the project are planned and coordinated at the same time so they are mutually supportive.

How Reduction is Achieved

By conducting enforcement and public information and education in a coordinated, concerted effort, the motoring public is made aware of the police enforcement activities and the perceived risk of being apprehended is increased. Either activity conducted in isolation does not create this effect.

Examples of Successful Projects

- o North Dakota Selective Traffic Enforcement Projects (Abstract 8)-- This State reported a 43 percent decrease in traffic accidents in the treated area as a result of a public awareness campaign coupled with increased enforcement.
- o Iowa Highway Patrol Truck Enforcement (Abstract 3)--The State identifies the 50 worst trucking firms in the State each month by virtue of receipt of violations. The names of the firms are publicized in a special report which is sent to all of the trucking companies. Iowa reports a significant reduction in truck speed as a result of this program.
- o California Highway Patrol Aircraft (Abstract 27)--California reports significant success in speed reduction in remote areas through the highly publicized use of aircraft for speed enforcement.

Measurement Criteria

Reductions in the occurrence of the offense on which the project is designed to impact, increased public awareness of the activity, and the media coverage given the project are the primary measures of effectiveness.

Category IV--Programs Appearing to Warrant Consideration

Often, all of the necessary ingredients for a successful highway safety or police traffic services program are in place in a jurisdiction but fragmented and/or uncoordinated. Each element works on/in its own specialty area without concern for or communications with the other elements. In some of these cases the addition of another element may be the catalyst necessary to pull all of the separate entities into a working group. For example, the addition of an Alcohol Coordinator or a radio tower to allow police, fire and emergency medical services cross communication, or something as uncomplicated as a Radio Shack computer to generate accident data for a selective enforcement program (as in Burlington, Vermont) can become the glue necessary to bond the elements.

Projects which appear to justify consideration in selection and approval to receive Federal funding assistance generally may be categorized as catalytic.

A. Catalytic Projects

1. District of Columbia

The addition of an Alcohol Coordinator was the adhesive necessary to the solidification of the Driver Control System. (Abstract 7)

2. Mississippi

A newly acquired Traffic Records Coordinator/Systems Analyst is developing and coordinating the Mississippi Highway Safety Information System. Plans include the revision of the accident report form, statewide training of law enforcement personnel in accident reporting, legislation to require uniform use of the new standard form, data processing systems changes to accommodate the new format, and development of user oriented accident data. (Docket Submission N01-062)

3. Florida

A breath alcohol module testing van was the catalyst that pulled a fragmented Driver Control System together and provided the impetus for increased driving while intoxicated enforcement not only in Broward County but in two adjoining counties. (Abstract 28)

4. Vermont

The purchase of a Radio Shack micro-computer to generate accident analysis data served to renew police enforcement efforts and community interest in the accident problem. (Abstract 23)

5. Arizona

The purchase of breath testing instruments revitalized the driving while intoxicated enforcement effort. (Abstract 6) (Also see Louisiana Docket N01-074)

V. Summary of Effectiveness of Countermeasure Areas

As was reported in Section III of this document, selective traffic enforcement programs have been shown to be the most effective of the police traffic services impact countermeasure areas provided that program participants and managers are exposed to training in necessary areas such as management, problem identification, resource allocation, countermeasure development, data analysis, and evaluation.

The other impact countermeasure areas, automated enforcement and aircraft usage, have the potential to maintain an increased productivity in highly labor intensive areas with a lower manpower investment.

VI. Summary of Docket Submission Comments on Effectiveness

As of December 2, 1981, 72 submissions to Docket 81-12 referred to one or more components of police traffic services. Most of the submissions alluded to the importance of selective traffic efforts and many cited specific selective traffic enforcement projects in support of the effectiveness of police traffic services. Selective traffic enforcement projects which targeted driving while intoxicated, speeding, and other unsafe driving acts were frequently referred to in these Docket Submissions. None of the submissions challenged the effectiveness and/or importance of police traffic services and none opposed Federal funding assistance for any component within this program area.

State Police and Highway Patrol Chiefs, in the group submission forwarded by International Association of Chiefs of Police and in individual State Police and/or Highway Patrol agency submissions, cited specific selective traffic enforcement projects in more than 20 States as evidence of effectiveness.

The submissions by other State or local government officials which alluded to this program area also reflected unanimous support for its effectiveness and importance. Strong endorsement and no opposition for this program area was evident in submissions by universities, individuals, and other organizations.

Further, support for police systems support functions, i.e.: training, evaluation, accident investigation, accident records, management information programs, etc., is evident in the Docket Submissions.

In addition, very strong support for retention and enforcement of the 55 mph speed limit was clearly evident in the Docket.

Moreover, many submissions strongly endorsed retention of 18 Highway Safety Program Standards but, some commentaries advocated State flexibility in application of the standards.

The table which follows is a succinct recapitulation of the docket submissions which referred to police traffic services which includes the areas of primary emphasis and the method of inclusion in this paper.

DOCKET SUBMISSIONS

<u>STATE</u>	<u>DOCKET SUBMISSION NUMBER</u>	<u>SUBMITTED BY</u>	<u>SUPPORT SPEED ENFORCEMENT</u>	<u>SUPPORT ALCOHOL ENFORCEMENT</u>	<u>SUPPORT ENFORCEMENT OTHER UNSAFE DRIVING ACTS</u>	<u>SUPPORT# TRAINING</u>	<u>CITED</u>	
							<u>SPECIFIC</u>	<u>GENERAL</u>
Alabama	N01-011	City of Montgomery		YES	YES		X	
Arizona	N01-289	Gov. Rep. Office	YES	YES	YES			X
	N01-509	Highway Patrol	YES	YES	YES		X	
California	N01-032	City of Richmond		YES			X	
	N01-593	Highway Patrol	YES					X
Colorado	N01-543	Dept. of Highways	YES	YES	YES			X
	N01-008	City and County of Denver	YES			YES		X
Connecticut	N01-088		YES		YES			X
Florida	N01-020	.IPTM	YES	YES	YES	YES		X
	N01-438	Gov. Rep. Office	YES					X
Georgia	N01-511	Gov. Rep. Office	YES	YES	YES	YES	X	
	N01-511A	Gov. Rep. Office	YES	YES	YES	YES		X
Hawaii	N01-151	Gov. Rep. Office	YES	YES	YES		X	
Illinois	N01-084	NUTI				YES		X
	N01-051	NUTI				YES		X
	N01-015	City of DeKalb				YES		X
	N01-017	State Police			YES		X	
	N01-568	Dept. of Transp.	YES	YES	YES	YES		X
Iowa	N01-243	Office of Planning and Programming	YES	YES	YES	YES		X
	N01-666	Highway Patrol	YES			YES	X	
Kansas	N01-023	KS DOT	YES	YES	YES	YES		X
	N01-215	White	YES					X
	N01-277	Highway Patrol	YES	YES				X
Louisiana	N01-074	State Police	YES	YES	YES	YES	X	

STATE	DOCKET SUBMISSION NUMBER	SUBMITTED BY	SUPPORT SPEED ENFORCEMENT	SUPPORT ALCOHOL ENFORCEMENT	SUPPORT ENFORCEMENT OTHER UNSAFE DRIVING	SUPPORT TRAINING	CITED	
					ACTS		SPECIFIC	GENERAL
Maine	N01-123	State Police	YES	YES	YES	YES	X	
Maryland	N01-035	State Police	YES	YES		YES		X
	N01-323	Baltimore Health Department		YES				X
Massachusetts	N01-005	State Police	YES	YES	YES	YES	X	
Michigan	N01-569	State Police	YES	YES	YES	YES		X
	N01-016	City of Bay City	YES	YES	YES		X	X
	N01-059	Road Commissioners Oakland, Michigan	YES					X
	N01-080	Traffic Safety Assoc. of Detroit	YES	YES	YES			X
Minnesota	N01-152	State Patrol	YES					X
Mississippi	N01-374	Gov. Rep. Office	YES	YES	YES		X	
	N01-062	Gov. Rep. Office	YES	YES	YES		X	
Missouri	N01-483	Gov. Rep. Office	YES	YES	YES	YES		X
Nebraska	N01-232	City of Lincoln		YES	YES			X
Nevada	N01-498	City of Reno				YES		X
New Jersey	N01-098	State Police	YES	YES	YES	YES		X
	N01-441	State Police	YES	YES	YES	YES		X
	N01-487	Gov. Rep. Office	YES	YES	YES	YES		X
New York	N01-148	New York Assoc. of Traffic Safety Boards	YES	YES	YES	YES		X
N. Carolina	N01-233	Highway Patrol	YES	YES	YES	YES		X
	N01-258	University of NC	YES	YES	YES	YES		X
	N01-225	City of Greensboro			YES	YES		X
N. Dakota	N01-233	Gov. Rep. Office	YES	YES	YES	YES	X	
Ohio	N01-095	Gov. Rep. Office	YES		YES	YES	X	

DOCKET SUBMISSIONS

<u>STATE</u>	<u>DOCKET SUBMISSION NUMBER</u>	<u>SUBMITTED BY</u>	<u>SUPPORT SPEED ENFORCEMENT</u>	<u>SUPPORT ALCOHOL ENFORCEMENT</u>	<u>SUPPORT ENFORCEMENT OTHER UNSAFE DRIVING ACTS</u>	<u>SUPPORTS TRAINING</u>	<u>CITED</u>	
							<u>SPECIFIC</u>	<u>GENERAL</u>
Pennsylvania	N01-096	State Police	YES	YES	YES	YES		X
	N01-311	Gov. Rep. Office	YES		YES	YES		X
	N01-092	Dept. of Health	YES	YES				X
Puerto Rico	N01-220	Gov. Rep. Office	YES	YES	YES	YES		X
Rhode Island	N01-325	Gov. Rep. Office	YES	YES	YES	YES		X
Texas	N01-629	Gov. Rep. Office	YES	YES	YES	YES	X	
	N01-435	City of Corpus Christi				YES		X
Virginia	N01-122	Gov. Rep. Office	YES	YES	YES	YES		X
	N01-581	Gov. Rep. Office		YES			X	
	N01-646	Gov. Rep. Office		YES		YES		X
Washington	N01-064	State Patrol	YES	YES	YES	YES	X	
	N01-283	Douglas County	YES	YES	YES	YES		X
<u>OTHERS</u>								
Diversified Reporting Services	N01-102							X
American Traumatic Society	N01-305		YES					X
ITE	N01-082							X
IACP/State and Provincial Division	N01-422		YES	YES	YES	YES		X
Doron	N01-444		YES	YES				X
Matthias	N01-069					YES		X

DOCKET SUBMISSIONS

<u>STATE</u>	<u>DOCKET SUBMISSION NUMBER</u>	<u>SUBMITTED BY</u>	<u>SUPPORT SPEED ENFORCEMENT</u>	<u>SUPPORT ALCOHOL ENFORCEMENT</u>	<u>SUPPORT ENFORCEMENT OTHER UNSAFE DRIVING ACTS</u>	<u>SUPPORTS TRAINING</u>	<u>CITED</u>	
							<u>SPECIFIC</u>	<u>GENERAL</u>
<u>OTHERS</u>								
National School Transportation Association	N01-221					YES		X
AAMVA			YES					X
Oral Smith	N01-173							X
Billing	N01-166							X
Engel	N01-149		NO					X

ABSTRACTS

1. Texas, Tarrants, W.E., Enforcement Impact on Speed and Accident Reduction, 1981.

Analysis of data compiled in connection with the Texas Selective Traffic Enforcement Programs intended to control speed shows that strict speed limit enforcement on main rural roads effected an 8.3 percent reduction in average vehicle speeds, a 28 percent reduction in speed variability, and a 19.8 percent reduction in rural fatal crashes per month.

2. Illinois, Tarrants, W.E., Enforcement Impact on Speed and Accident Reduction, 1981.

A study similar to the Texas study just described was conducted in Illinois. Once again, the police increased their enforcement efforts and speeding arrests (citations) increased rapidly. Fatal crashes on high speed roads fell and remained below the previous level during 1974 and 1975 (see Figure a-5). Meanwhile, there was a slight drop in fatalities during the fuel crisis on low speed roads, but a return to the previous level following the crisis. The study estimated that the 55 mph law reduced fatal accidents on interstate highways in Illinois by about five per month and injury accidents by about 73 per month. The Illinois Selective Traffic Enforcement Programs which was intended to control speed effected a statistically significant reduction in motor vehicle crashes, deaths, and injuries on rural roads.

3. Iowa, Polofsky, S., Iowa Department of Public Safety, Effectiveness of Iowa Highway Safety Program, 1981.

In March 1979, the Iowa Highway Patrol implemented a selective traffic enforcement program to gain increased compliance with the 55 mph speed limit by truckers. The federally funded specialized enforcement team used radar, stop watches, and aircraft to apprehend speeding trucks. Using information derived from arrest data, a monthly publication of the 50 worst driving firms was distributed to all trucking companies in Iowa. At the end of September 1981, the average truck speed was 54.6 mph, down from 57 mph in 1978, and the percent of trucks exceeding the speed limit was down from 63.1 percent to 46.5 percent. The cost/benefit analysis of the project shows a two year total cost of \$1,304,000 and a benefit (lives saved, injuries prevented, and property damage avoided) of \$11,105,395.

4. New York, Duff, Warren G., Controlled Access Highway Task Force, Albany, New York, New York State Police and the Governor's Traffic Safety Committee, Highway Safety Project PT-77-010, May 1981.

The Controlled Access Highway Task Force, consisting of 135 New York State Police, patrolled 600 miles on Interstate Highway for the purpose of reducing the number and severity of motor vehicle accidents and speed violations and determining the effectiveness of innovative enforcement programs designed to accomplish this objective. A total of 70 radar-equipped vehicles were assigned to the project. Three types of vehicles were utilized: (1) a standard marked patrol car, (2) a concealed identity vehicle, and (3) a standard produc-

tion model (unmarked). The impact of these three types of vehicles on highway speed and accidents was examined. The effect of highway segment length on speed and accidents was also examined. The three levels of patrol vehicle visibility were assigned at random to two levels of highway segment length (10 and 20 miles) using a basic cross-over design consisting of 3X3 latin squares. The highest number of total arrests/patrol hours was recorded by unmarked vehicles in nominal 20 mile highway segments. When the baseline period was compared to the previous year, highway speeds at 60 mph on the thruway increased while the 60 mph speeds on the Task Force patrolled highway decreased. It was concluded that the Task Force had an initial significant impact on decreasing the highway speeds which was not experienced on other similar highways in the State. The presence of the Task Force maintained the speed reductions on the patrolled highways throughout the program. Accident frequency was significantly reduced an average of 22 per month on the nominal 20 mile segments of the 600 miles patrolled by the Task Force during the first experimental period. The New York State Thruway (comparison group) experienced no statistically significant changes in accident frequency during the experimental period. It was concluded that high and standard visibility patrol vehicles are better tools for use in accident reduction patrol than low visibility vehicles; however, speed enforcement can best be done with unmarked vehicles or an even mixture of marked and unmarked vehicles. Finally, it was concluded that there is a positive correlation between accident frequency reduction and the time dedicated to patrol and arrest activity on a particular road segment.

5. Massachusetts, Port, J.G., Massachusetts State Police, Alcohol Related Crash Reduction Program, 1981.

On July 1, 1980, the Massachusetts State Police geared patrol activities toward removing the drinking driver from the highways. Sixty percent of fatal accidents occurred between 7 p.m. to 3 a.m. and 57 percent occurred on Friday, Saturday, and Sunday. Rotating patrols of four teams, each consisting of six patrolmen, saturated a zone with emphasis toward alcohol related offenses. As of July 1, 1981, during the times the teams were working an assigned zone, there were no fatal accidents in 141 days of operation.

In comparing the fatal accident data in 1980 with 1979, the base year, there were 32 fewer fatal accidents in 1980, and of the 184 fatal accidents that did occur, only 36 percent occurred on Friday, Saturday, or Sunday night, 7 p.m. to 3 a.m. Cost of the project to date consists of \$438,000 of 402 funds and \$40,000 of State monies. This project will be continued in FY 1982 with \$375,000 in 402 funds.

6. Arizona, Office of State Program Assistance, NHTSA, Tucson Alcohol Enforcement, 1981.

After less than a year of operation, a special enforcement effort by the Tucson, Arizona Police Department has reduced the city's high rate of car crashes by almost doubling the number of arrests for drunk driving. Before creation of a federally funded "driving while intoxicated squad" last November, more Tucson residents were dying in car crashes than in any other city of its size in the country. In most of the fatal crashes, high blood alcohol levels were found in the drivers, or occasionally, in pedestrians.

A two year 402 project funded in the amount of \$444,000, enabled the city to train and support one sergeant, five traffic officers, and purchase six patrol cars specially equipped with advanced breath-alcohol testing gear to concentrate full-time on driving while intoxicated enforcement.

The new breath-testing machines cut down processing time for drunk drivers by at least an hour per arrest. The special squad was targeted on areas of the city, and at times of night, where accident data showed drunk-driving crashes to be most common. The specially-trained six-man team has averaged 108 driving while intoxicated arrests per officer. This compared to an average of 38 arrests per officer for the patrol cars assigned to normal police work.

In the first six months of 1980, Tucson arrested 1,029 drunk drivers. For 1981, the special six-man team has boosted this number by 1,892, with 4,000 driving under the influence arrests expected for 1982. Last year 65 percent of the city's traffic deaths involved alcohol. In 1981, it's down to 39 percent. There were 343 fewer car crashes in Tucson the first half of this year than in the same period in 1980.

7. District of Columbia, Goldstein, R. and Layfield, W., Metropolitan Police Department, Washington, DC, Alcohol Countermeasures Program, 1981.

Between 1970-74, traffic fatalities were at an all-time high and alcohol was a major factor in 57 percent of all fatalities. Less than 900 drunk driving arrests were made per year, and the average blood alcohol level was .31 percent at time of arrest. With the assistance of 402 funding, averaging \$380,000 per year, the Police Department was able to update its archaic chemical test program, provide driving under the influence and breathalyzer training, and expand the Driving Under the Influence Enforcement Unit through overtime programs. The police also developed new driving under the influence arrest procedures through utilization of mobile alcohol vans thereby reducing arrest down time from 6.5 hours in 1974 to less than 30 minutes in 1980, and reduced the average cost of a driving under the influence arrest from \$60 to \$5. An alcohol diversion program was established to permit those arrested with .20 or less blood alcohol concentration, who have no prior convictions or not involved in a serious accident to be diverted from the criminal justice system after pleading guilty and then receive help through an alcohol counseling center.

Since implementation of these programs, 4,000 drunk drivers are arrested on a yearly basis compared with less than 900 in the early seventies. The average blood alcohol concentration dropped from .31 at time of arrest to .18. Traffic fatalities have decreased from 121 in 1970 to 46, an all-time low, in 1980.

8. North Dakota, Johnson, Thomas P., STRIP Project, North Dakota Traffic Safety Programs Division, Bismark, North Dakota, 1980.

The City of Mandan, North Dakota, annexed an area known as the "strip" and with it a severe accident problem in the area. For a three year period, an increased enforcement program during the late night hours was maintained

along with a public awareness campaign about the enforcement effort. The yearly enforcement effort amounted to about 1.5 additional patrolmen.

During three years of operation, citations issued were about 82 percent above the 1976-77 base period. Traffic accidents declined 43 percent during the period in which traffic volume increased 62 percent.

9. Ohio, Chiramonte, Robert M., Summary of Selective Enforcement Projects, 1979, Department of Highway Safety, Columbus, Ohio, 1979.

This report summarizes several evaluations of selective enforcement activities. Projects SMASH and OASIS were State Patrol projects which documented accident reductions during the project period. The evaluation of the Dayton enforcement project showed a significant reduction in total accidents.

10. Tyler, Texas, Griffin, Lindsay I. and Hatfield, Nancy J., Texas Transportation Institute, Evaluation of a Selective Traffic Enforcement Program in Tyler, Texas, Docket NO1-629, 1981.

During the first year of a three year (ongoing) Selective Traffic Enforcement Program consisting of three patrol units assigned to 5.4 miles of highway between 10 a.m. and 6 p.m., Monday through Friday, accidents have been reduced 27 percent. The three units made 4,831 violator contacts during the period for an average of 1.05 contacts per hour.

11. Alabama, Quinn, James F., Alabama Office of Highway and Traffic Safety, Evaluation of the Montgomery Police Department's Computerized Accident Records System, 1981.

The Montgomery Police Department has implemented a computerized accident records system to target high accident locations for selective enforcement activities. A successful selective traffic enforcement program has been implemented based on this information.

12. Elzer Berg, West Germany, Glauz, W.D. and Blackburn, R.R., Technology For Use in Automated Speed Enforcement, 1980.

The West German Police installed an automatic (Multinova) speed enforcement device on a particularly dangerous downgrade segment of roadway (7.2 km) near the town of Elz to reduce crashes due to excessive speed. In 1978, the equipment recorded 63,000 violations which resulted in 5.1 million DM (\$3 million in the United States) in fines being collected. Crashes decreased significantly.

13. Holland, Glauz, W.D. and Blackburn, R.R., Technology For Use in Automated Speed Enforcement, 1980.

The National Police of Holland use Gatso and Multinova fully automated speed control devices throughout the country. These devices effectively control speed and free officers to do other duties.

14. Switzerland, Glauz, W.D. and Blackburn, R.R., Technology For Use in Automated Speed Enforcement, 1980.

The Swiss Police use unmanned, fully automatic speed enforcement equipment throughout Switzerland with great success. The owner of the speeding vehicle is cited and is responsible for fines assessed.

15. Maryland, Clark, W.E., Maryland State Police, Evaluation of Maryland Aircraft, 1981.

The Maryland State Police uses both rotary and fixed wing aircraft. The rotary winged craft are utilized extensively for medical evacuations and manhunts. The fixed wing craft are used in traffic law enforcement, particularly speed control. This is a very successful project.

16. Iowa, Polofsky, S., Iowa Department of Public Safety, Docket N01-666) 1981.

The Iowa Highway Patrol has a fleet of 12 aircraft which are used for traffic law enforcement throughout the States. These aircraft have proven quite successful in rural areas where speeding has been a particularly difficult problem to bring under control. The operating cost of the aircraft is roughly the same as that of a patrol car, its violator detection rate is much higher than a ground unit, and it can cover much more area more quickly than can a ground unit. Weather conditions in Iowa are such that aircraft can operate most of the year.

17. Maine, Tarrant, W.E., Enforcement Impact on Speed and Accident Reduction, 1981.

The Maine State Police report on aircraft status "...officers issued 911 air-assist citation in 90.11 percent less time, 1010.81 percent faster, and 30.88 percent cheaper while using 67.26 percent less gasoline than radar equipped ground units performing the same amount of work."

18. Illinois, O'Brien, James, Evaluation of Aerial Patrol of Interstate Highways by Illinois State Police, Illinois Department of Transportation, Division of Traffic Safety, Springfield, Illinois, 1980.

In response to high speed and accidents on the Interstate system, the Illinois State Police used aerial patrols during April 1978-March 1979. Aerial patrols successfully reduced accidents in a cost-beneficial manner as indicated by the analysis of the first year of operation. There were 18 percent fewer accidents in the areas patrolled by the aircraft than expected from accident trends (p .01). Further, a benefit to cost ratio of 9.1 to 1 was achieved using the National Safety Council's estimate of costs for traffic accidents. The success was attributed to the effect of the 3,243 citations issued to drivers speeding over 70 mph.

19. New Mexico, Searcy, W.G., NHTSA, Washington, DC, 1981.

A technical assistance team studied the New Mexico State Police management procedures, resource allocation and utilization, and public information programs. Recommended changes have been or are being implemented.

20. Texas, Searcy, W.G., NHTSA, Washington, DC, 1981.

A technical assistance team surveyed Texas Department of Public Safety's records system and public information and education programs. Both programs are being modernized and improved.

21. Louisiana, Searcy, W.G., NHTSA, Washington, DC, 1981.

The Louisiana State Police management and public information and education programs have been surveyed by a technical assistance team. Recommended changes are being made.

22. Maryland State Police

The Maryland State Police public information and education program has been recognized as the best of its kind in the nation. Many States have patterned their police public information and education programs after that in Maryland. The Maryland State Police have attended numerous technology transfer workshops and conferences where they have explained their public information and education program and assisted several other States in developing a similar program.

23. Burlington, Vermont, Searcy, W.G., NHTSA, Washington, DC, A Report on the Burlington, Vermont Police Department's Accident Investigation Unit, 1980.

The Burlington, Vermont Police Department purchased a micro-computer (TSR 80) with CRT and printer which was used to develop a computerized traffic records system for that city. The system worked so well that the Vermont State Police asked the Police Department to analyze all fatal accidents state-wide. Sergeant King of the Burlington Police Department has traveled throughout New England demonstrating the system to police agencies of various sizes.

24. Colorado, Venturi, C., NHTSA, Washington, DC, Colorado Highway Patrol Computerized Traffic Records System, 1981.

The Colorado State Patrol has inaugurated a computerized traffic records system which is accessible by field personnel through computer terminals located at all Colorado State Patrol district headquarters. This technology has been made available to other police agencies across the country.

25. Florida, Venturi, C., NHTSA, Washington, DC, Florida Highway Patrol Computerized Records System, 1981.

With Federal funding support, the Florida Highway Patrol has developed a very sophisticated computerized traffic records system. The technology/knowledge gained by the Florida Highway Patrol in developing and operating this system

has been made available to police agencies throughout the country. This transfer of technology has been quite beneficial to other agencies, making it possible to avoid many costly mistakes in hardware and software acquisitions.

26. Kansas, Reiting, W.J., Kansas 55 MPH Aircraft Enforcement, 1981.

In FY 1981, a project was federally funded for the Kansas Highway Patrol to purchase and operate two aircraft and train four pilots for 55 mph enforcement. The Kansas Highway Patrol supplied the pilots and ground support officers and will assume the operating cost of the two planes starting in FY 1983. As a part of the agreement, the two planes are to be used at least 800 hours per year and 90 percent of the time for traffic enforcement and 60 percent speed patrol. Also, each plane is to maintain an average of 9.5 speed arrests per patrol hour. The Kansas Highway Patrol was operating three airplanes for traffic enforcement prior to this project and was required to de-emphasize that effort. The objective for this project is to increase aircraft speed arrests from 14,070 to 18,870 by September 30, 1981 and to 23,190 by September 30, 1981.

During FY 1981, the pilots were trained and the airplanes were purchased. One plane was operated for four months and the other for three months during FY 1981. The results of this operation are:

<u>Item</u>	<u>Plane 4 Months</u>	<u>Plane 3 Months</u>
Total Hours	315.8	223.3
Patrol Hours	219.4	164.7
Arrests	2,916	1,664
Warnings	122	281
Arrests Per Hour	13.3	10.1
Contacts Per Hour	13.8	11.8

The activity for these two airplanes exceeded the hours of usage and arrests required by the project. The total airplane speed arrests for five airplanes in Kansas for FY 1981 was 24,822, exceeding the objective.

Federal funds totaled \$177,600 for this project, consisting of \$150,600 for two airplanes, \$12,500 for operating costs, and \$14,500 for pilot training.

27. California, Milton, K., California Highway Patrol, Highway Patrol Aircraft Patrol Program, 1981.

The California Highway Patrol, denied authorization to use radar in speed limit enforcement, used Federal funds to purchase fixed wing aircraft for use in traffic law enforcement with emphasis on speed control. The aircraft are used in the sparsely populated, lightly patrolled parts of the State where speeds are highest. The aircraft, combined with an intense public information and education campaign, have effected significant speeding arrests and reductions in average vehicle speeds.

28. Florida, Burke, J.G., Governor's Highway Safety Representative, A Review of the Blood Alcohol Testing Mobile Program in Florida, 1981.

Since FY 1979, the Florida Bureau of Highway Safety has provided funding assistance to several local law enforcement agencies in the State to initiate the development of individual Mobile Blood Alcohol Testing Programs (blood alcohol testing mobile). The primary thrust of these programs has been to impact three areas in the following manner:

- o Increase the number of driving while intoxicated/driving with unlawful blood alcohol level (.10 percent or greater) arrests.
- o Decrease average arrest processing time.
- o Increase the driving while intoxicated/driving with unlawful blood alcohol level conviction rate,

So far, experience with these programs has been favorable. Two local programs which have been in operation for sufficient time to effectuate measurable impact and provide minimal evaluation time are Broward County and Duval County.

The Broward County Sheriff's Office commenced blood alcohol testing mobile operation in September 1979. Driving while intoxicated/driving with unlawful blood alcohol level arrests increased 17 percent throughout the county during 1979 as compared to 1978 and comparing the first six months of 1979 with the first six months of 1980, the countywide monthly arrest rate was up 24 percent (388 to 479). Average arrest processing time is reported to have decreased from 2-3 hours prior to program commencement to 45-60 minutes per arrest during the program. The driving while intoxicated/driving with unlawful blood alcohol level conviction rate increased from 56.7 percent in 1978 to 59 percent for the first six months of 1980.

Since the purchase of the first blood alcohol testing mobile unit in 1979 with 402 funds, the Sheriff's Office has purchased two additional units. Therefore, the success of the blood alcohol testing mobile program in Broward County can be measured not only by the available statistical data which favorably supports the program, but also by local commitment to the expansion of an effective program.

The Duval County Sheriff's Office commenced blood alcohol testing mobile operation with four units in late January 1980. During the year, 3,071 driving while intoxicated/driving with unlawful blood alcohol level citations were issued, an 80 percent increase over the 1,709 citations issued during 1979.

Seventy percent of the citations issued during 1980 were blood alcohol testing mobile related. Average arrest processing time during 1979 is reported to have decreased from 2½-3 hours per arrest to a 1980 average of 63.65 minutes per arrest. The driving while intoxicated/driving with unlawful blood alcohol level conviction rate is up from 79 percent during 1979 to 82 percent during 1980.

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