

ologies to improve the quality of Pennsylvania drivers.

These MISs are just a sample of the smaller MIS used to operate the driver and vehicle record systems. Although these are specifically pertinent to Pennsylvania, the concept is applicable to any jurisdiction.

These systems have enabled Department management to focus on pertinent and highly relevant problem areas. They have helped measure and guide solutions. The greatest gift, however, has been time. With the operating systems working fairly efficiently, less time is spent by traffic records managers solving crises. Oftentimes these small MISs highlight problems well in advance of the crises stage while their

solution is still fairly simple and quick. In addition, the data from these systems often point to the solution.

With management time available, instead of consumed by endless rounds of "firefighting," managers can structure, plan, and nurture that other part of traffic records--the safety MISs.

REFERENCE

1. D.H. Besterfield. Quality Control: A Practical Approach. Prentice-Hall, Englewood Cliffs, N.J., 1979.

Pennsylvania Driving Under the Influence Extra Enforcement Grants: How Traffic Records Can Assist a Highway Safety Program

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ABSTRACT

From 1982 through 1983 the Pennsylvania Department of Transportation has funded 25 driving under the influence (DUI) extra enforcement grants. These grants consisted of patrol units of one or two officers dedicated solely to enforcing DUI laws. The hours of operation of the units, generally 10:00 p.m. to 4:00 a.m. on weekends, were suggested by data contained in Pennsylvania's accident records system. The 25 counties that received grants were identified from data contained in Pennsylvania's accident records system. A highway safety planning tool called the municipal accident priority system was used to generate a list of Pennsylvania's 67 counties in descending order of their alcohol-related accident problem. Originally, proposals were solicited from the top 20 problem counties. Thirteen counties responded and received grants. In the second phase proposals were solicited from the second group of 20 problem counties. Twelve of these counties received grants. The extra enforcement grants have resulted in increases in total DUI enforcement levels, ranging as high as 410.53 percent. The cost per arrest under the grants ranged from \$220.28 to \$613.51 during the hours specified. Preliminary accident statistics suggest that accident activity has decreased more in the municipalities with DUI extra enforcement grants than in those municipalities that did not have grants.

This is encouraging, but further research will be necessary to more exactly determine the contribution of increased DUI extra enforcement to decreased accident activity.

There is general agreement in the highway safety community that an increased level of enforcement is the single most effective countermeasure to reduce the number of alcohol- and other drug-related accidents. The theory is that increased enforcement deters people from driving drunk by making them believe that they will be caught if they do.

The nationwide average level of driving under the influence (DUI) enforcement was approximately 1.8 arrests per officer in 1982 according to NHTSA. Some highway safety experts have suggested that an average of at least 2.0 arrests per officer would be necessary to have any meaningful impact. However, there is little, if any, empirical evidence to support this proposition.

Enforcement rates vary greatly from state to state and even within states. Pennsylvania has traditionally been at the low end of the spectrum. Figure 1 shows the DUI enforcement in Pennsylvania from 1978 through 1982. The level remained fairly consistent through 1980 at or below 0.8 arrests per full-time officer.

However, Pennsylvania's level of DUI enforcement increased 37 percent (from 0.84 to 1.15 arrests per officer) from 1980 through 1982. There are two main reasons for this increase. First, police officers and management were responsive to heightened public interest in the DUI problem. In response to this heightened interest, Governor Dick Thornburgh ap-

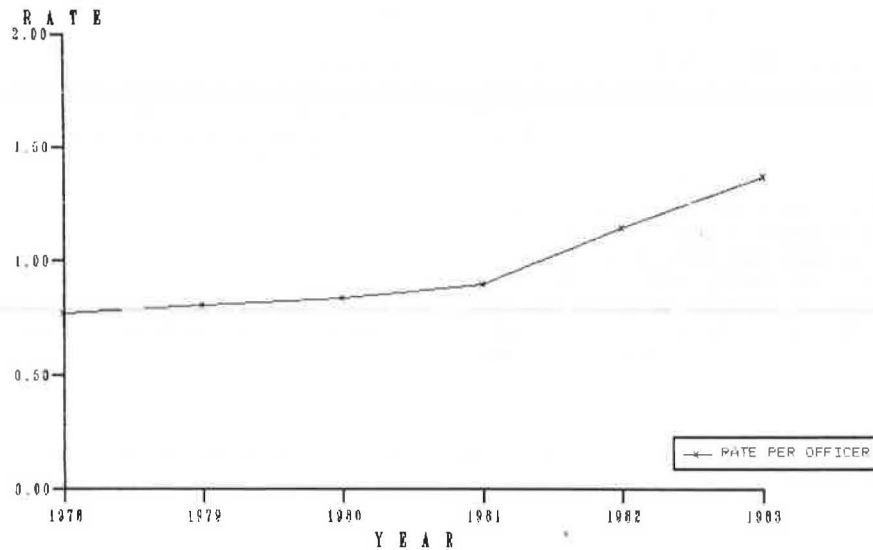


FIGURE 1 DUI arrest rate for Pennsylvania, 1978-1983.

pointed a Task Force on Driving Under the Influence of Alcohol and Other Controlled Substances in 1981. Two local police chiefs and the Pennsylvania State Police Commissioner were Task Force members.

The second reason for the state's improved arrest rates is a program specifically designed to increase DUI enforcement. In its final report, the Governor's Task Force recommended that DUI enforcement activities be expanded. The Task Force noted that data from Pennsylvania's accident records system indicated that most drunk driving and DUI-related accidents occurred on weekends, during the late night or early morning hours (see Figure 2). Usually, traffic patrols are assigned to peak traffic hours rather than those identified as peak DUI hours. Existing late-night patrols had heavy general crime prevention duties that prevented them from focusing on DUI enforcement.

EXTRA ENFORCEMENT GRANTS

In Pennsylvania the highway safety program is admin-

istered by the Pennsylvania Department of Transportation (PennDOT). During 1982 the Department decided to create a series of DUI extra enforcement grants by using federal highway safety funds. The grants would pay the salaries of special DUI teams. These teams would consist of one- or two-officer patrol units and would operate during peak DUI hours. No grant monies would be used for clerical, administrative, or equipment costs.

There are 67 counties and more than 2,500 municipalities in Pennsylvania. Few counties have countywide traffic law enforcement units of the type found in many states. Most local traffic law enforcement, including DUI, is conducted by municipal police. It would have been unwieldy to solicit grant proposals from more than 2,500 municipalities, process the information, select the recipients, and administer a myriad of grants. As a result, countywide grants were selected for ease of administration and evaluation. The Department required a county project director for each grant. This project director would solicit municipal participation in their county and

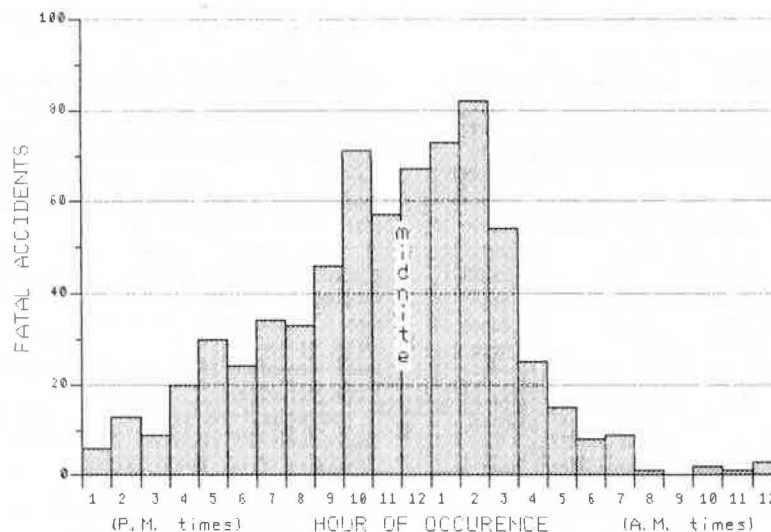


FIGURE 2 Alcohol-related fatal accidents by hour of day, 1982.

coordinate the activities of these subgrantees. Lorraine Novak of the Bureau of Safety Programming and Analysis of PennDOT provided overall program coordination and direction.

PennDOT solicited grant proposals from 20 counties. These 20 counties were selected by ranking all 67 counties by the severity of their DUI-related accident problem. The ranking was developed from data contained in Pennsylvania's accident records system.

ACCIDENT RECORDS SYSTEM

The accident records system in Pennsylvania is a computerized file that contains data from all reportable traffic accidents occurring in Pennsylvania. A reportable accident is defined by law as an accident that results in a fatality (within 90 days), an injury to any person involved, or an accident that results in damage to any vehicle to the extent that it must be towed away.

Police officers are required by law to investigate all reportable accidents and submit standardized accident report forms to PennDOT. Data from these reports and other information sources are entered into the accident records system. Other sources include driver licensing files, vehicle registration files, coroner's and medical examiner's reports, the Pennsylvania roadway information system, municipal maps, and straight-line diagram maps. Analysts enter the data via a terminal directly into the computerized file. The information is automatically edited on entry for range, verification, and consistency.

The accident records system contains descriptions in a standard format of each accident reported. This format contains almost 100 data elements that characterize various attributes of the accident, including vehicles and persons involved, weather and highway conditions, and location information. The format provides sufficient detail to identify hazardous locations and to plan necessary modifications. It also generates the statistics necessary to plan safety programs.

One of the accident records system tools used in planning safety programs is the municipal accident priority system (MAPS). This system ranks municipalities based on aggregated 3-year accident history. MAPS calculates mileage, population, and accident severity rates that are then compared with either countywide or statewide average rates and ratios. The ratios are combined to reach a final point assessment. This assessment is used to rank each political subdivision, either within its county or within the state. Counties may also be ranked according to their relative position within the state. A variety of rankings can be obtained by varying population or road-mileage parameters or by inputting only certain types of accidents.

The data contained in an accident priority listing by county are as follows:

Accident Priority Listings by County for 19__ to 19__

COUNTY	TOTAL ACC.	TOTAL MIL	TOTAL POP.	ACC/MIL	ACC/POP
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RAT/MIL	RAT/POP	RAT/SEV	POINTS		
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RAT/MIL is defined as the ratio of intensity of accidents per mile of highway in a county to the intensity of the state base (to two decimal places):

$$\text{RAT/MIL} = (\text{ACC/MIL}) / (\text{BASE ACC/MIL}) \quad (1)$$

RAT/POP is defined as the ratio of the rate of accidents per 100,000 population in a county to the rate of accidents per 100,000 of the state base data (to two decimal places):

$$\text{RAT/POP} = (\text{ACC/POP}) / (\text{BASE ACC/POP}) \quad (2)$$

RAT/SEV is defined as the ratio of the average probable accident severity of a county to the average probable accident severity of the state base data (to two decimal places). The average severity is determined by applying a calculated or relative severity point rating for each accident to the total number of accidents of that description. The totals for each accident description are summed and divided by the total number of accidents to obtain the average severity:

$$\text{RAT/SEV} = (\text{AVG SEV}) / (\text{BASE AVG SEV}) \quad (3)$$

POINTS are the final basis for ranking. They are determined by adding the ratio of mileage rates to the ratio of population rates and multiplying by the ratio of average severity:

$$\text{POINTS} = (\text{RAT/MIL} + \text{RAT/POP}) \times \text{RAT/SEV} \quad (4)$$

PROGRAM

The application of MAPS to the Pennsylvania alcohol-related accident records resulted in a list of Pennsylvania's 67 counties in descending order of their alcohol accident problem as indicated by the POINTS. Invitations to submit proposals for DUI extra enforcement grants were sent to the top 20 accident problem counties. These invitations were mailed to county drug and alcohol, probation, or District Attorney's offices depending on the structure of the DUI program in the county. Detailed guidelines for the proposals specified that they should contain a brief problem statement, quantitative goals and objectives (e.g., increase DUI arrests by 50 percent), program description, administrative detail, data-collection techniques, and a budget.

Thirteen counties submitted proposals. After review and some supplemental information, all 13 counties received DUI extra enforcement grants. The 13 original extra enforcement grants were set at 6 months duration and ran from September 1982 through February 1983. In March 1983 all 13 grants were extended another 6 months through August 1983. In addition, invitations for proposals had been extended to the next 20 counties in terms of accident problems or identified by MAPS. Twelve of these counties also began 6-month DUI extra enforcement grants in March 1983. The 25 counties selected and the amounts of their grants are given in Table 1.

TABLE 1 Extra Enforcement Grants and Amounts

County	Amount (\$)	County	Amount (\$)
Allegheny	84,000	Delaware	49,920
Armstrong		Erie	49,920
Beaver	50,835	Fayette	25,925
Berks	25,920	Franklin/Fulton	27,000
Blair	35,250	Lancaster	24,576
Bucks	33,280	Lebanon	56,768
Butler	29,636	Lycoming	
Carbon	24,336	McKean	54,536
Chester	20,827	Schuylkill	29,280
Columbia	17,880	Warren	24,960
Crawford	25,896	Wyoming	15,552
Dauphin	62,400	York	66,205

TABLE 2 Percentage Changes in DUI Arrests for 1981-1982 and the Average Cost per Arrest

County	Change in DUI Arrests 1981-1982 (%)	Avg Cost per Arrest (\$)
Berks	+36.18	256.93
Blair	+9.17	373.87
Carbon	+137.50	221.94
Columbia	+1.22	291.32
Crawford	+57.89	613.51
Franklin	+3.82	346.54
Fulton	+141.67	220.28
Lebanon	+64.18	275.95
McKean	+410.53	308.67
Schuylkill	+34.10	351.37
Warren	+50	234.63
Wyoming	+153.8	391.40
York	+90.28	221.55

The results of the DUI extra enforcement grants have been quite satisfying. The total number of DUI arrests in participating counties has increased as much as 410 percent. The data in Table 2 give the percentage increases in each of the original 13 counties from 1981 to 1982. An average cost per arrest during the target hours (for a 6-month time frame) under the grant is also specified.

The 13 DUI extra enforcement grants operative in the last 3 months of 1982 contributed to the improved statewide DUI arrest picture for that year.

Figure 3 shows that DUI arrests finally began to improve significantly in 1981 and particularly in 1982, despite declining police personnel.

The accident experience of the participating counties and municipalities has also been positive. The data in Table 3 give the percentage differences for types of accidents (e.g., alcohol, nighttime, fatal) between the first 4 months of 1982 and 1983, according to statewide accident records figures and data from municipalities that had DUI extra enforcement grants during that time period.

CONCLUSIONS

It is too early to make statistically significant statements about the impact of the grants on the frequency of alcohol-related accidents. The alcohol-related accident trends for the latter part of 1982 and early 1983 are encouraging. Corresponding data for late-night fatal accidents indicate the first downturn in recent years. These reductions cannot be solely attributed to increased enforcement. Many other factors, including the formation of the Governor's Task Force and the publicity surrounding its deliberations, can influence the accident trends, as can the enactment of a new DUI law.

A target figure of two arrests per officer per year has been used in the past as a desirable goal. There appears to be no factual basis for this number in terms of producing a desired reaction in the number of drinking drivers. Another rate commonly mea-

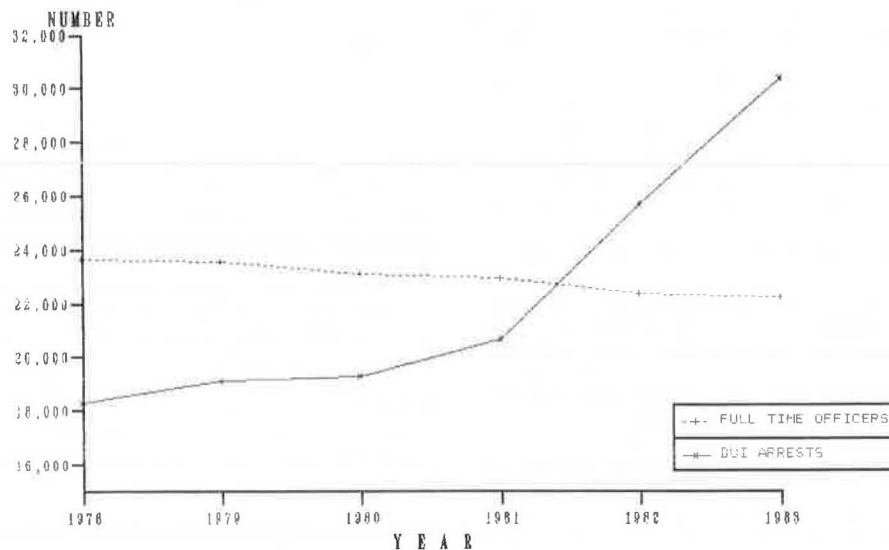


FIGURE 3 DUI arrests in Pennsylvania, 1978-1983.

TABLE 3 Percentage Change Between First 4 Months of 1982 and 1983 for Use in Evaluating DUI Extra Enforcement Grants

	Change in Municipalities with DUI Extra Enforcement Grants Within the County (%)	Change in Municipalities Without DUI Extra Enforcement Grants Within the County (%)	Change Statewide (%)
Fatal accidents	-23.33	0	-1.59
Injury accidents	-6.91	-2.7	-3.04
Property-damage-only accidents	-15.55	-10.65	-11.09
Total accidents	-10.55	-5.72	-6.12
Total fatalities	-24.24	-3.06	-4.48
Total injuries	-5.01	-3.31	-3.44
Alcohol accidents	-8.93	+2.74	+1.54
Nighttime accidents	-17.12	-9.58	-10.16

sured is the number of arrests per 1,000 licensed drivers. Again there appears to be no identifiable rate at which a desired reaction in drinking drivers will occur.

There is a significant lack of research on enforcement rates versus the reaction of drivers. It may well be that there is indeed no ideal enforcement level and that rates of change in enforcement (or perceptions of change) may be the only factor that influences drivers. There is some basis for this hypothesis, in that early peaks of reaction are commonly seen in increased enforcement efforts with a subsequent rapid tailing off, even when higher enforcement levels are maintained. The well-known English experience is an excellent example.

If research were to find that rates of change rather than actual levels of enforcement were producing the desired reactions in the driving public, this would have a significant impact on future enforcement strategies. Lacking research on this topic, researchers must continue to strive for an ideal enforcement level that attempts to balance reactions with resources.

It is certain that increased enforcement must be accompanied by significant efforts. As stated at the outset of this paper, drivers must have a perception of taking a significant risk if any enforcement level or increased enforcement activity is to be effective. Even if DUI arrests were increased

1,000 percent, if drivers are not made aware of this fact, administrators should not expect much in the way of lasting impact on accidents or the frequency of drunk driving. Grants should be awarded with fanfare. Media cooperation in publicizing not only the grant but its results should be obtained.

Publicity and increased enforcement must work together, as neither can stand alone to produce results. Enforcement officials can say that they are going to arrest more drunk drivers, but if they do not do it, the public will soon know that they do not mean it. DUI extra enforcement grants coupled with effective public information and education at the local level should produce a meaningful reduction in alcohol-related accidents that can be further evaluated in the future.

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Data Needs for the Operation and Evaluation of New York State's Special Traffic Options Program for Driving While Intoxicated (STOP-DWI)

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ABSTRACT

The traffic records system developed by New York State in response to the Federal Highway Safety Act of 1966 met the basic needs of the 1970s. However, it does not provide the detailed data needed in the 1980s for evaluation of major safety programs. By using the original traffic records systems as a base, New York State is developing a complex, multilevel, multiagency records system to collect data for evaluation of its Special Traffic Options Program for Driving While Intoxicated (STOP-DWI). This system makes maximum use of data from existing systems administered by state, county, and local agencies.

Programs in the 1960s, recognized the necessity of a uniform traffic records program that was reliable and verifiable in each of the states. The system would need to be established and fully integrated to assess the relative impact of the various countermeasures undertaken in each of the other program areas in each state. As a result, the system was heavily reliant on crash-generated information and would facilitate before-and-after intervention studies that would measure the success of each program.

The thrust of the program as such was adequate for programs in the 1960s and 1970s. However, the broad-based information network necessary to provide both baseline and intervention measures for the major programs of the 1980s is not adequately covered by the traffic records systems established one or two decades ago. NHTSA has highlighted program evaluation for alcohol countermeasures and for restraint use as priority programs for the current administration. The technology necessary for such