Evaluation of Project Increased Traffic Law Enforcement

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Executive Summary
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and
Texas State Department of Highways
and Public Transportation
ABSTRACT

Increased enforcement activities were implemented in six Texas counties in an effort to control the increase in traffic speeds and accidents on rural roadways. These enforcement activities were continued for twelve months. Speed and accident data were collected and analysed throughout the project in order to assess the impact and the associated costs of increased enforcement.

The results indicate that increased enforcement activity has the effect of decreasing speed related traffic parameters over time. Mean speed was reduced 2.4% and the percent exceeding 55 mph was reduced 14%. Increased enforcement in reducing speeds seems to have the effect of reducing both the frequency and severity of accidents. Fatal and injury accidents were reduced 13.3% and property damage accidents were reduced 11.9%. Benefit to cost ratios were calculated to determine the economic feasibility of this as well as future increased enforcement efforts. These ratios indicate that the benefits far outweigh the costs.
EXECUTIVE SUMMARY

Project Increased Traffic Law Enforcement was implemented in six Texas counties in an attempt to control the increase in traffic speeds and accidents on 56 rural roadways. Enforcement at the target areas was increased by 600 trooper hours per county per month. The enforcement efforts were allocated evenly across days of the week and concentrated during high accident and arrest time periods. Increased patrols were continued for thirteen months from August 13, 1979, to August 31, 1980.

The data used to evaluate the project was collected jointly by the Department of Public Safety and the Texas Transportation Institute in five phases. The initial data collection phase served to set baseline speed and accident measures for future comparisons. These measurements were accomplished in the absence of increased enforcement. The second phase, provided trend information for the traffic speed measures and treatment measures for the accident data during the first five months of enforcement. The third phase, interim sampling, yielded traffic speed data that was compared directly to information compiled in the first phase. The fourth phase again provided trend information for the traffic speed data over the last seven months of enforcement. The last phase, posttreatment, yielded traffic speed data for direct comparisons to pre, and interim data.

Additional information was compiled in order to evaluate the direct effects of patrol activities on vehicle speeds and accident rates. Traffic information obtained during monthly sampling was correlated with patrol information to determine if the two sets of data tended to change together.

The results indicate that increased enforcement can significantly reduce traffic speed parameters. Both the percent exceeding 55 mph and mean vehicle speed were reduced by county and the treatment region as a whole. The vehicles
exceeding 55 mph dropped from 67 percent to 57 percent while mean vehicle speed was reduced from 58.2 mph to 56.7 mph. A small, but significant reduction was also obtained in vehicle speed variance.

Accident figures for the treatment area were substantially below the rate predicted for the treatment period. Property damage accidents were 11.9 percent lower and Fatal and Injury accidents were 13.3 percent lower.

An examination of the correlation data indicates a strong relationship between the number of total arrests and speeding tickets and decreases in the percent exceeding 55 mph. A strong correlation was also obtained between arrests and speeding tickets and decreases in mean speed. The general relationship found to exist suggests that as enforcement activity increases, speed related traffic parameters decrease.

A linear regression model was used to clarify the relationship between the number of arrests and tickets and changes in the speed parameters. Due to inaccuracies at the extremes of this model, a hypothesized relationship was subsequently developed that retained linear components over the middle range of the data, but adjusted the high and low ranges toward more reasonable values. Values for tickets, manhours, miles, and costs were then generated using this projected relationship for specified changes in various noncompliance levels. The following table presents this information as a general guide or rough approximation of the enforcement resources required to achieve specified levels of compliance. It should be emphasized, however, that this data is an extrapolation beyond values obtained with project data.

The administrative evaluation yielded information concerning the operation of the project. It was demonstrated that contacts and arrests per manhour can be substantially increased above statewide levels (48% and 43%, respectively) when the emphasis is on these activities. Average cost per contact
Table 4.8
Administrative Guidelines

Non-Compliance Reduced To:

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<th>Present Non-Compliance Level</th>
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**KEY:**
- Speeding Tickets
- Manhours
- Mileage
- Cost

*Above Baseline (annual figures for rural county)
and arrest was about the same as statewide figures. This estimate includes the overtime rate paid enforcement personnel.

Benefit to cost ratios, based on the societal cost of accidents vary depending on the method of accident prediction and on the costs assigned to particular accident categories. Each of the methods employed do, however, indicate that the benefits outweigh the costs.

The following statements summarize the conclusions resulting from the analysis of project data.

Speed Data
1. The implementation of increased enforcement activity has the effect of decreasing speed related traffic parameters over time.
2. Relatively small percent reductions in mean speed (2.4%) give way to substantial percent reductions in the percent exceeding 55 mph (14%). Reductions in speed variance, while significant over the treatment region as a whole were not systematic over counties or target roadways.
3. Speed suppression was maintained on the target roadways in the absence of enforcement for a two week period prior to posttreatment sampling.

Accident Data
1. Increased enforcement in reducing speeds seems to have the effect of reducing both the frequency and severity of accidents.
2. Reduction was greatest for Fatal and Injury Accidents (13.3%), but still substantial for Property Damage Accidents (11.9%). Reductions were experienced in all counties.

Speed, Accidents, Manhours, and Ticketing
1. Significant correlations were found between the parameters associated with increased enforcement (patrol parameters) and traffic speed parameters.
2. As total arrests above baseline increase, mean speed and percent exceeding 55 mph decrease suggesting that the patrol activities are
effective in suppressing speeds.

3. A high correlation was obtained between speeding tickets above baseline and traffic speed reduction. Increased ticketing activity seems to be joined by decreases in speeds and non-compliance rates.

4. A moderately strong negative correlation (-.66) was found between project convictions (rather than arrests) and reductions in total accidents in five of six project counties. This information supports the obvious conclusion that enforcement above some baseline level is effective in reducing speeds which in turn impacts the frequency of accidents.

Cost and Effectiveness

1. Contacts and arrests per manhour can be increased substantially above statewide levels (48% and 43%, respectively) for enforcement activities. Commensurate with project goals, these rates represent arrest activity to the exclusion of other duties.

2. Average cost per contact and arrest was about the same as statewide figures (+3.2% and +1.0%, respectively) due primarily to overtime rates paid enforcement personnel.

3. Benefit to cost ratios vary depending on the method of accident prediction and depending on the method employed to estimate the societal costs of accidents. Each approach indicates, however, that the benefits greatly outweigh the costs.

The following recommendations are made based on the conclusions drawn from the study:

1. It is recommended that more funds be made available to study the promising effects of overtime enforcement activities.

2. Undertake detailed investigations of the relationships found in the project between arrest activity and speed parameters.
3. Encourage the compilation of detailed records of normal enforcement activities and speed data prior to the initiation of other increased enforcement efforts.

4. That consideration be given to a program designed to evaluate the optimal level of enforcement necessary to produce and maintain a specified impact on speed over a defined geographic region. The present study has shown that a given impact may be generated with the addition of certain amounts of manpower. However, it is quite conceivable that the impact could be maintained or improved with less manpower than was used initially.