

New Mexico's Comprehensive Impaired-Driving Program: Crash Data Analysis

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16. Abstract In late 2004, the National Highway Traffic Safety Administration provided funds through a Cooperative Agreement to the New Mexico Department of Transportation to demonstrate a process for implementing a comprehensive State impaired-driving system. NHTSA also contracted with the Pacific Institute for Research and Evaluation to measure the effect of that system on various factors including driving-while-impaired (DWI) crash, injury, and fatality rates; DWI arrest rates; DWI conviction rates; blood alcohol concentration (BAC) rates; and public awareness. New Mexico's core activities included high-visibility impaired-driving law enforcement operations, increased paid and earned media concerning New Mexico's law enforcement efforts, and prosecutorial and enforcement training in the five counties with the highest rates of alcohol-involved fatalities. Other components of the comprehensive system include the creation of a Statewide DWI leadership team that provided support and direction to the system and the participation of a Traffic Safety Resource Prosecutor to assist on DWI and other traffic safety laws. The five counties initially participating in the project were Bernalillo, Doña Ana, McKinley, Rio Arriba, and San Juan. Santa Fe County joined that group in 2007. Alcohol-involved (those with BACs of .01 g/dL) fatal crashes decreased by 36.5% in the participating counties during the project period of 2005 to 2009. The rest of the State experienced a 31.6% reduction. Alcohol-impaired (those with a BAC of .08 g/dL or higher) fatal crashes decreased by 35.8% in the participating counties during the same period. The rest of the State experienced a 29% reduction. The decrease in the participating counties was not statistically significantly different from the decrease in the rest of the State. This was likely because there were significant Statewide anti-DWI activities during that period as well. However, overall, New Mexico's multi-faceted efforts appeared to have benefits for the State.					
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List of Acronyms

Acronym	Meaning
ADA	assistant district attorney
BAC.....	blood alcohol concentration
BAT Mobile	breath alcohol testing vehicle
CDWI.....	Community Driving While Impaired Program
CSIDS.....	New Mexico Comprehensive State Impaired-Driving System
CTS.....	New Mexico Citation Tracking System
DWI.....	driving while impaired
LDWI.....	local driving while impaired program
NHTSA.....	National Highway Traffic Safety Administration
NMDOT	New Mexico Department of Transportation
ODWI.....	Operation DWI
PDA.....	personal digital assistants
PBT.....	preliminary breath test device
SFST.....	Standard Field Sobriety Testing
TSB.....	Traffic Safety Bureau (New Mexico's)
TSRP	traffic safety resource prosecutor

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Executive Summary

Background

Since the fall of 2004, New Mexico has been involved in implementing a number of enhanced activities that contribute to its comprehensive impaired-driving system. This crash data analysis report looks at the project's impact on alcohol-involved crash, injury, and fatality rates to date. This report also looks at results of three roadside surveys that were conducted in New Mexico and blood alcohol concentration rates at arrest.

Figure 1 compares the percentage of crash fatalities that were alcohol-impaired¹ in New Mexico and the United States between 1998 and 2008. In that period, the percentage of crash fatalities that were alcohol-impaired in the United States stayed around 30%. In comparison, the percentage of crash fatalities that were alcohol-impaired in New Mexico declined during that period after hitting a peak in 2002. In 2002, 35% of crash fatalities in New Mexico were alcohol-impaired. In 2009, 32% of crash fatalities in New Mexico were alcohol-impaired. In 1998, New Mexico had the 9th highest alcohol related fatality rate in the country. In 2004, New Mexico's ranking had risen to seventh. By 2009, New Mexico's alcohol related fatality rate had dropped to nineteenth.

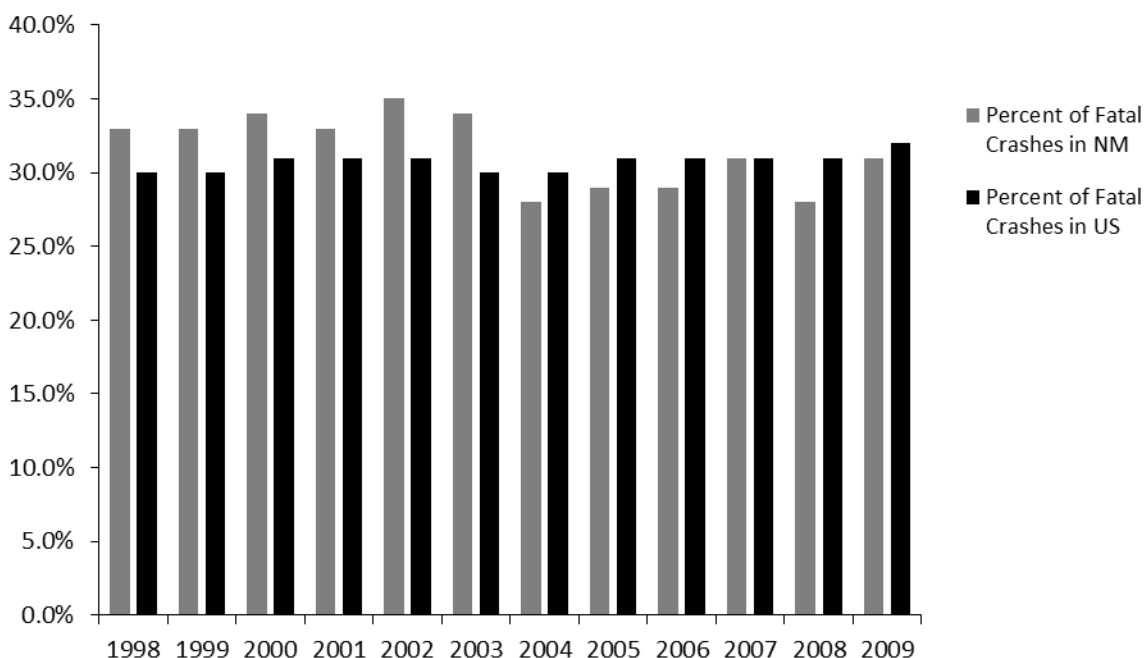


Figure 1. Percentage of Alcohol-Impaired Crash Fatalities in New Mexico and the United States, 1998–2008
(Source: NHTSA FARS 2010)

¹ From the Fatality Analysis Reporting System, which defines alcohol-impaired crashes as those that have at least one driver or motorcyclist who has a BAC of .08 g/dL or higher. Retrieved at www.fars.nhtsa.dot.gov/Crashes/CrashesAlcohol.aspx. A BAC of .08 g/dL is the illegal level in New Mexico and all other U.S. States.

Program

In September 2004, NHTSA entered into a cooperative agreement² with New Mexico to implement a comprehensive alcohol-impaired driving reduction effort with a primary focus on increasing high-visibility enforcement in five counties. Enforcement efforts were coordinated by 2 (and later 4) deputies in each sheriff's office in the five counties. These deputies were to focus solely on impaired-driving enforcement activities. The deputies were to conduct more enforcement activities to combat alcohol-involved impaired driving, such as sobriety checkpoints, saturation patrols, and inactive/phantom checkpoints. The deputies were to record their daily activities (number of operations, arrests, etc.) into a Web-based database designed for this project. The database was to be used to measure the amount of enforcement activity.

New Mexico's comprehensive program included media efforts in support of enforcement activities and several coordinated media campaigns known as "*Superblitzes*." New Mexico also established a leadership group known as the "DWI Leadership Team" that coordinated all driving-while-impaired (DWI) efforts throughout the State. The team included key members of both governmental and nongovernmental entities and was facilitated by a "DWI czar," a cabinet-level position within the governor's office. In addition, the program included efforts to better train prosecutors on handling DWI cases and working with both the legislature and the judiciary to address legal matters related to DWI.

NHTSA awarded a cooperative agreement to the TSB in September 2004, and the project continued through March 2009 (54 months), with funding flowing to the five target counties during different periods, in part due to the time it took for each Sheriff's Office to negotiate and ratify agreements with the TSB. The five counties were Bernalillo, Doña Ana, McKinley, Rio Arriba, and San Juan. Later, Santa Fe County joined the project³.

Methodology and Limitations

Also in 2004, NHTSA awarded the Pacific Institute for Research and Evaluation a contract to measure the effects of the enhanced activities of New Mexico's comprehensive alcohol-impaired driving reduction efforts on rates of alcohol-related crashes, injuries, and fatalities. However, several limitations contributed to difficulties in evaluating the high-visibility enforcement activities of New Mexico's Comprehensive State Impaired-Driving System in the five (later six) targeted counties where the special emphasis was placed, including:

- Limited "pre-data" on enforcement activities which limited comparison of enforcement activities prior to implementation of high-visibility enforcement to activities after program implementation. Without knowing if the independent variable (enforcement activity) changed, we cannot know if it affected the number of crashes.
- County enforcement activities, including the hiring of law enforcement officers, started on different dates.

² Cooperative Agreement #DTNH22-04-H-05108.

³ Santa Fe was originally a control site for this project, but in early 2007, the Santa Fe County Sheriff's Office was given additional funds by the New Mexico Traffic Safety Bureau, so it became the sixth and final target county. In this document, we will refer to the six counties even though Santa Fe County came aboard at a later date than the original five counties.

- Limited data entered in a Web-based reporting system developed for the target counties related to their DWI enforcement activities. Information was not entered uniformly into the Web database, and counties did not enter sufficient data to allow for statistical analyses.
- Funding for the CSIDS was in addition to funding given to the five (later six) participating sheriffs' offices from various State or Federal resources to conduct driving while impaired (DWI) operations and other traffic safety initiatives. These sheriffs' offices typically did not separate operations conducted under the CSIDS grant from the DWI operations conducted as part of other funding sources. One DWI operation might have been reported on multiple reporting forms; thus, the same enforcement activity would then be counted more than once. Conversely, an operation might not have been reported to the appropriate funding authority as it was reported elsewhere (thus, under-reported).
- Statewide efforts took place, including planning efforts, leadership initiatives, enforcement, public information, law changes and increased use of ignition interlocks, which may have overshadowed effects due solely to the enhanced enforcement in the targeted counties.

In light of these limitations, it was difficult to evaluate the effect of high-visibility enforcement in the targeted counties and to isolate their impact.

Highlights

Although it was difficult to draw conclusive findings on the effect of the enhanced enforcement program in the intervention counties based on the crash and arrest data available, the reductions experienced in both the intervention counties and Statewide were significant and quite impressive. Some of the key findings of this study regarding New Mexico's CSIDS are highlighted below.

Alcohol-Involved Crashes and Fatalities

- At the beginning of the project in 2004, the year before additional enforcement began, there were 176 alcohol-involved (.01+ g/dL BAC) fatal crashes in New Mexico (40% of all fatal crashes) that resulted in 219 fatalities. At the end of the project in 2009, there were 147 alcohol-involved fatal crashes (40.7% of all fatal crashes) that resulted in 152 fatalities in New Mexico.
- For alcohol-involved fatal crashes between 2005 and 2009, the intervention counties experienced a reduction of 36.5%. The rest of the State (i.e., non-intervention counties) experienced a 31.6% reduction.
- For alcohol-impaired (.08+ g/dL BAC) fatal crashes from 2005 to 2009, the intervention counties experienced a reduction of 35.8%. The rest of the State experienced a 29% reduction.
- The decreases in alcohol-involved and alcohol-impaired fatal crashes were significant in both the intervention counties and the rest of the State. However, the decreases in the intervention counties were not significantly different from the decreases Statewide.
- When New Mexico's intervention counties' 36.5% reduction in alcohol-involved fatal crashes was compared with five neighboring States' 6.4% reduction, the effect for New Mexico's intervention counties was statistically significant ($t=3437$; one-tailed $p=.001$).

- When New Mexico's intervention counties' 35.8% reduction in alcohol-impaired (.08+ BAC) fatal crashes was compared with five neighboring States' 6.9% reduction, the effect for New Mexico's intervention counties was statistically significant ($t=2.75$; one-tailed $p=.004$).
- Between 2005 and 2008, a 25% reduction in alcohol-involved drivers in all crashes (including property-damage only) was found ($t=10.17$; $p<.001$) for the five intervention counties. For the rest of the State, there was no significant change, though the tendency was towards a reduction of about 8.9% ($t=1.21$; $p=.229$).
- For the five intervention counties, a 33.6% reduction in alcohol-involved (BAC = .01+) driver in injury crashes was found ($t=8.88$; $p<.001$). This equates to a reduction of 26.8 alcohol-involved drivers in injury crashes per month. For the rest of the State, a 31.8% reduction was found ($t=10.36$; $p<.001$)⁴. Both reductions were statistically significant. Contrasting the reductions for the two geographical groups, the intervention counties' result would be a net decrease of about 2.6%, which is not statistically significant ($t=0.44$; $p=.330$).
- When using single-vehicle nighttime crashes as a surrogate measure of alcohol-involved crashes between 2005 and 2008, the intervention counties had a reduction of 8.2% and the non-intervention counties had a reduction of 15.2%. Both reductions were statistically significant. However, the reduction in the intervention counties were significantly ($p = .001$) smaller than seen in the non-intervention counties.
- At the beginning of the project in 2004, New Mexico had the seventh highest alcohol related fatality rate in the country. By the end of the project in 2009, New Mexico's alcohol related fatality rate had dropped to nineteenth.
- It is clear from these crash analyses that New Mexico experienced a dramatic reduction in alcohol-involved crashes during the period of this project. Probably because of the extensive statewide efforts, it is difficult to discern a separate effect in the five (later six) program counties. However, overall, New Mexico's multi-faceted efforts appeared to have benefits for the State.

Blood Alcohol Concentration Levels at Arrest

- In computing the average BAC of all DWI arrestees from the program counties and for the rest of the State for the years 2002 through 2008, we see that there has been a decrease in the majority of program counties and for the rest of the State.

Roadside Surveys

- PIRE conducted a series of DWI roadside surveys in New Mexico. All surveys were conducted between 10 p.m. and 3 a.m. on Friday and Saturday nights. These were conducted from July to December 2005, alongside 20 sobriety checkpoints and 3,307 vehicles were selected to participate in the surveys. Between September and December 2007, they were conducted alongside 17 sobriety checkpoints and 3,622 vehicles were selected to participate in the survey. Between May and September 2008, there were 20 sobriety checkpoints and 4,229 vehicles were selected to participate in the survey.

⁴ 2005-2008 vs. projected 2005-2008, based on extrapolating "trends" (models) beyond end of 2004.

For the 2005 roadside surveys, 95% of drivers were not alcohol-positive. In 2007, 94.4% were not alcohol positive. In 2008, 94.9% were not alcohol-positive.

The percentage of drivers who had BACs between .005 and .049 g/dL increased slightly from 3.3% in 2005 to 4.1% in 2007 but decreased slightly to 3.7% in 2008. The percentage of drivers with BACs between .05 - .079 g/dL remained constant at .6% for all three years, while the percentage of drivers with BACs at or over .08 g/dL remained steady (1% in 2005 and .8% in 2007 and 2008).

Introduction

In late 2004, the National Highway Traffic Safety Administration provided funds to the New Mexico Department of Transportation through a competitive cooperative agreement to demonstrate a process for developing and implementing an enhanced comprehensive State impaired-driving reduction system. Funds were given to the Pacific Institute for Research and Evaluation to measure the effect of that system on alcohol-involved crash, injury, and fatality rates. Guided through a development, planning, and implementation process which occurred a few years earlier and involved outside assessments of the State's anti-DWI efforts, the State Task Force developed a strategic plan and recommended that the Governor appoint a DWI czar to coordinate efforts among State agencies and across the State.

In 2005, New Mexico created a DWI leadership team to assist in the implementation and refinement of that plan. Activities called for under the plan included high-visibility impaired-driving law enforcement operations, increased paid and earned media concerning law enforcement efforts, and prosecutorial training in the five counties with the highest rates of alcohol-involved fatalities. The five counties that initially participated in the project were Bernalillo, Doña Ana, McKinley, Rio Arriba, and San Juan.⁵

Part of this comprehensive project was documenting and evaluating the enhanced impaired-driving countermeasures and determining their effectiveness in reducing DWI crashes and fatalities in New Mexico. This crash data analysis report provides those findings for the years 1990-2008 and is presented in six sections.

Section I, New Mexico's Comprehensive State Impaired Driving Program: This section provides a brief history of impaired driving in the State and describes New Mexico's comprehensive efforts to reduce impaired driving. This section briefly describes the DWI leadership team that was created as part of this project, enforcement activities, judicial efforts, and media campaigns.

Section II, Methodology and Limitations: In this section, we discuss how we obtained our information and also provide a discussion of other analyses that would have been desirable but could not be conducted. We also list which key data elements were difficult to obtain (thus preventing a more in-depth analysis).

Section III, Results: Here, we provide the results of our analysis of Fatality Analysis Reporting System data and New Mexico crash data and provide the results of an ARIMA analysis of both fatal and non-fatal crashes to assess the potential impact of the project activities on alcohol-involved crashes. All fatal crashes from the FARS database for New Mexico from 1990 through 2009 are used. We also compare the FARS data of the five intervention counties to the rest of New Mexico covering data from 2000 through 2009. Comparisons are made also with five neighboring States.

Section IV, Blood Alcohol Concentration Levels at Arrest: This section covers the average BAC levels at arrest made by the sheriff's offices in the participating counties and those made by all law enforcement agencies in the participating counties.

⁵ Santa Fe and San Miguel Counties were initially chosen to be control communities but in 2007 Santa Fe County became part of the implementation group.

Section V, Roadside Survey Data: This section provides the results of the DWI roadside surveys conducted in 2005, 2007, and 2008.

Section VI, Conclusions: This section provides concluding remarks.

New Mexico's Comprehensive State Impaired Driving Program

Alcohol-Related Driving in New Mexico

Alcohol-related driving has been recognized as a major traffic safety problem for decades, both in New Mexico and nationally. NHTSA considers a crash to be alcohol-involved when any driver or non-occupant (e.g., pedestrian or cyclist) had a BAC of .01 g/dL or more. NHTSA defines a impaired-driving crash as one involving a driver or motorcyclist with a BAC of .08+ or higher. All States have an illegal per se BAC limit of .08 g/dL.

In 1979 and 1980, there were more than 400 alcohol-involved fatalities per year in New Mexico. Alcohol was involved in two-thirds of all traffic fatalities in the State. From 1982 through 1993, New Mexico had the highest rate among all U.S. States of alcohol-involved fatalities per 100,000 population (Allena & Scott, 2003).

In New Mexico, alcohol-involved fatalities declined steadily from 1979 to 1998, falling from 413 in 1979 to 188 in 1998, even though the population of New Mexico grew by almost 50% over that period. In 1998, the number of alcohol-involved fatalities began to rise slowly, both in New Mexico and nationally (Allena & Scott, 2003), and since has begun to drop again.

In 2004, NHTSA sought to test a comprehensive approach in one State that had a high number or rate of alcohol-involved fatalities and demonstrated a willingness and ability to work closely with NHTSA to address its impaired-driving problem comprehensively. NHTSA conducted a competitive procurement process among States that had a high number or rate of alcohol-involved fatalities and selected New Mexico.

Through this program, NHTSA sought to help New Mexico make improvements. More importantly, however, as a demonstration program, NHTSA sought to accomplish a number of additional objectives:

- Demonstrate a process for the development of a comprehensive Statewide impaired-driving program;
- Measure the effectiveness of the comprehensive program on impaired-driving outcomes in the State; and
- Assess the contribution of individual components to the overall initiative in the State.

Program Management

The CSIDS was a multi-faceted project. The project was initially created to concentrate additional enforcement efforts in five counties (Bernalillo, Doña Ana, McKinley, Rio Arriba, and San Juan) with two control counties (San Miguel and Santa Fe). However, a catastrophic alcohol-involved fatal crash in late 2006 that occurred in Santa Fe County and involved San Miguel County residents stimulated an expansion of the program to include Santa Fe County. In addition, many aspects of the comprehensive impaired driving program were conducted statewide. The comprehensive approach in New Mexico was reflected in the many components that were implemented. Those components included:

- As a part of the overall management of the comprehensive DWI control system, a leadership team was formed to foster the coordination of anti-DWI efforts across the various

governmental and nongovernmental organizations involved in combating impaired driving in New Mexico. This group was chaired by the Governor's DWI czar, thus elevating its level of influence to the cabinet level.

- High-visibility impaired driving operations in targeted counties.
- Community outreach to complement the work of law enforcement agencies.
- Adjudication issues looking at the role of prosecutors and adjudication rates.
- Media outreach (including both paid campaigns and working with community groups on earned media).

The DWI Leadership Team Statewide

As part of the CSIDS, a DWI leadership team was created to review a Comprehensive Impaired Driving Program Work Plan and discuss progress toward accomplishing the initiatives outlined in the Governor's DWI Strategic Plan that was created in 2003. The DWI czar, a cabinet-level position created to coordinate all DWI activities in the State, led and set the agenda for the meetings and the groups' work.

The DWI leadership team responsibilities were to be a driving force behind the New Mexico DWI Strategic Plan, getting recommendations implemented and tracking progress of recommendations previously implemented. The DWI leadership team roster included 70 names and Team members included leaders from several State agencies, law enforcement agencies, and nongovernmental organizations.

The DWI leadership team served as a basis for prioritizing, coordinating, and maximizing resources on impaired-driving efforts. Examples of how the DWI leadership team coordinated and prioritized efforts included:

- The formation of a subcommittee of members to coordinate the anti-DWI activities initiated by various State agencies in the target counties. TSB, the Department of Health, and the Department of Tax and Revenue all provided funding to support community efforts against impaired driving. This subcommittee was tasked with ensuring that those efforts were coordinated and the subcommittee communicated on a regular basis.
- The formation of a subcommittee to "clean up" several provisions in the State's impaired-driving statutes.
- Sponsoring a Law Enforcement Leaders' Summit in an effort to better understand the challenges faced by law enforcement agencies relative to impaired driving and determining additional State resources to assist law enforcement in confronting these challenges.
- The compilation of existing DWI treatment and prevention activities in the State in an attempt to diversify and expand New Mexico's current DWI strategic portfolio. The inventory was compared against a matrix of accepted, evidence-based impaired-driving prevention strategies and a list of recommendations was developed.

In short, the DWI leadership team was the driving force for all DWI-related issues in New Mexico. The DWI czar, in consultation with the director of the Traffic Safety Bureau, set the agenda and ensured that all players and components working on DWI issues were on the same page.

Governor's Leadership Statewide

Another important component of leadership was that provided by New Mexico Governor Bill Richardson. Most importantly, he used his name and office to encourage and heighten the visibility of the efforts to reduce the toll of impaired driving. As indicated earlier, he appointed a DWI czar as a cabinet level position and empowered her to influence decisions throughout State government related to programs and policies concerning DWI.

Governor Richardson lent his image to anti-DWI public information and education campaigns including participating in radio and television advertisements. He also participated in several news conferences each year addressing DWI. In the words of the DWI czar, "Governor Richardson was instrumental in sending a message to the community that DWI would not be tolerated anymore."

Governor Richardson was also involved in other aspects of impaired driving. He issued an executive order implementing the three strike regulation wherein alcohol establishments experiencing three or more over service violations within a year would lose their alcohol beverage service license, and he directed that the regulation be enforced. He was also heavily involved in the adoption and implementation of New Mexico's strong interlock laws, including creating the Governor's Interlock Task Force.

High-Visibility Impaired-Driving Operations in Targeted Counties

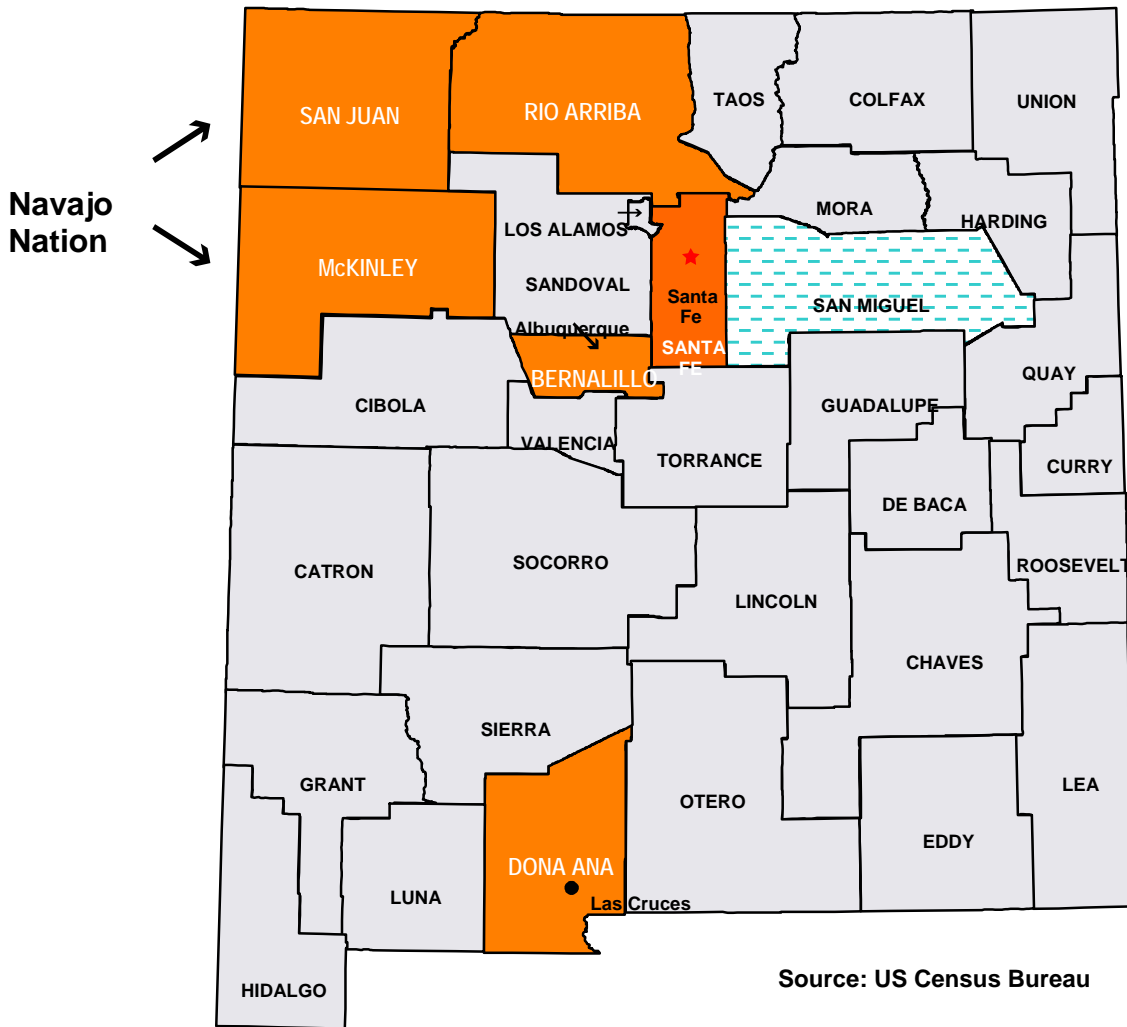
A major focus of the CSIDS was enhanced high-visibility DWI enforcement operations in five (later, six) selected counties. High-visibility enforcement engages law enforcement agencies, and in this case the selected Sheriff's Offices, in both periodic impaired-driving crackdowns and sustained impaired-driving enforcement throughout the year, and ensures enforcement efforts are highly visible and well publicized through paid and earned media support. High-visibility enforcement programs affect behavior through general deterrence by increasing the public's perception that people who violate the law will be ticketed, arrested, convicted, and punished, thereby persuading them to adhere to the law.

These enhanced activities were designed to affect New Mexico's DWI problem by supporting additional full-time officers solely to enforce DWI laws in the State's highest risk counties. These program activities supplemented *Operation DWI* and other checkpoint and saturation patrol activities already being conducted in these counties. Initially, New Mexico selected Bernalillo, Doña Ana, McKinley, Rio Arriba, and San Juan Counties and the Navajo Nation to participate in the Enhanced Enforcement Project due to their high-risk status for alcohol-involved crashes, fatalities, and injuries (see Figure 2 for a map of the location of the counties within the State).

We selected Santa Fe and San Miguel Counties as comparison sites. In February 2007, Santa Fe received funding to become part of the project, leaving only San Miguel as a comparison community. In July 2004, the Traffic Safety Bureau program staff contacted the Sheriffs from each of the participating counties to discuss the program and determine their interest. TSB program staff already had working relationships with these agencies through their ongoing participation in ODWI activities. Sheriff's offices specifically were selected due to their ability to engage in enforcement activities throughout the county rather than just one city.

Each contracted agency assigned the full-time DWI officers to work solely on DWI enforcement activities. Each officer worked a 40-hour week and was encouraged to participate in DWI checkpoints and other highly visible enforcement activities and events. Enforcement supervisors

in Rio Arriba and McKinley County were paid from project funds for their time. In Bernalillo, Doña Ana, and San Juan Counties, supervisors were paid from other project grants. In addition, Bernalillo County had established a DWI Unit consisting of four program officers and three in-kind officers to conduct enhanced law enforcement activities.





-  Comparison Site County
-  Implementation Site Counties (Santa Fe was initially identified as a comparison county but became an implementation county in 2007)

Figure 2. Participating Counties in New Mexico

New Mexico's highly publicized and highly visible enforcement efforts included sobriety checkpoints, saturation patrols, and inactive checkpoints (also known as phantom checkpoints). Saturation patrols were the most frequently reported DWI operations used by the Sheriff's offices involved in the project. Saturation patrols are an increased enforcement effort that targets a specific area to identify and arrest impaired drivers. These operations are used often in smaller enforcement departments as they are not labor intensive, a key factor in small, rural law enforcement agencies. However, in mid-size to bigger departments (such as those in Santa Fe

County) the Sheriff's Office needed a minimum of seven deputies to conduct saturation patrols. In Rio Arriba County, the Sheriff's Office used at least two deputies but not more than five for a saturation patrol.

Community Outreach in Targeted Counties

As part of CSIDS, TSB funded the DWI Resource Center to provide an outreach coordinator in each of the five originally-funded counties and one for the Navajo Nation. The outreach coordinator was the prevention, public awareness, and support arm of each county's enhanced DWI-enforcement efforts. Each outreach coordinator provided data assistance, coordinated media activities in each of the participating counties, participated in planning meetings with law enforcement, and attended community events to highlight the enhanced enforcement efforts.

Adjudication Component Statewide

Another major component of this project was the involvement of and potential effect on the judicial system resulting from the enhanced DWI-enforcement operations. NHTSA and TSB co-funded a Traffic Safety Resource Prosecutor to determine the training needs of local prosecutors and to serve as a resource on DWI cases. The Resource Prosecutor's duties and responsibilities included but were not limited to the following:

- Providing regional DWI prosecutor training sessions statewide to improve the ability of prosecutors to effectively prosecute DWI cases. Training included, but was not limited to, evidence derived from video cameras, passive alcohol sensors, traffic records systems, and other innovative methods and systems.
- Providing training and technical assistance to judges on DWI issues.
- Acting as a liaison with other public interest groups and policymaking agencies on DWI prosecution issues.
- Providing expert legal advice on DWI policy matters.
- Assisting prosecutors in handling difficult impaired-driving cases.

Media Overview in Targeted Counties

One of the most effective ways of stopping impaired driving is through high-visibility law enforcement. The theory is that when the perceived risk of getting caught increases, the likelihood that people will make the decision to drink and drive decreases. This general deterrence effect can come only when enforcement is known about and feared. The use of media, both paid and earned, is a powerful method of informing the public of the risks of impaired driving. NHTSA, through the former *You Drink & Drive. You Lose*, the current *Drunk Driving: Over the Limit. Under Arrest*, and the *Click It or Ticket* campaigns, is working to successfully combine law enforcement efforts with paid advertising to create highly visible enforcement efforts.

Therefore, another major component of the CSIDS project was increasing the general deterrent effect of impaired driving enforcement by establishing times when enhanced enforcement efforts were combined with paid advertising and through earned media to raise visibility and create a strong general deterrent effect.

Since 2006, TSB has contracted with various media outlets to air public service announcements related to New Mexico's DWI initiatives. The contracts paid for television and radio media ads and other materials such as posters, pamphlets, and internet campaigns. These campaigns were spread throughout the year. Table 1 shows the number of ads and amount spent on the ads for the sustained DWI and *Superblitz* campaigns. From 2006 through 2008, there were 11,120 paid television ads and an additional 22,626 bonus television ads aired. From 2006 to 2008, there were 72,921 paid radio ads and 65,920 bonus radio ads aired.

**Table 1. Number of Paid and Bonus Media
Public Service Announcements 2006 – 2008**

	Television Paid	Television Bonus	Radio Paid	Radio Bonus	Amount
2006	3,256	5,657	20,832	13,515	\$927,030
2007	3,934	7,258	26,647	27,344	\$1,223,756
2008	3,930	9,711	25,442	25,061	\$1,389,593
Totals	11,120	22,626	72,921	65,920	\$3,540,379

Methodology and Limitations

In 2004, PIRE was awarded a contract to measure the effects of New Mexico's comprehensive alcohol-impaired driving reductions efforts, especially high-visibility enforcement activities in targeted counties, on alcohol-involved crash, injury, and fatality rates. The following sections detail how information was obtained and analyzed.

Alcohol-Involved Crashes and Fatalities

Analyses were conducted on both fatal and non-fatal crashes to assess the potential impact of the project activities on alcohol-involved crashes and proxies thereof. Time series analyses of alcohol-involved fatalities from fatal crashes in New Mexico were performed using ARIMA intervention models. Prior to analysis, all fatal crashes from NHTSA's Fatality Analysis Reporting System (FARS)⁶ database for New Mexico for the 20 years between 1990 and 2009 (inclusive) were separated into three geographic groups: those from the "intervention" counties,⁷ those for the rest of the State, and those from five neighboring States (Arizona, Colorado, Utah, Texas, and Oklahoma). Then, within each of these three geographic groups, fatalities were separated into alcohol-involved (.01+ g/dL BAC) and non-alcohol-involved, and alcohol-impaired (.08+ g/dL BAC) and non-alcohol-impaired. These determinations for each fatality were based on the highest measured BAC for *any driver* in the crash, or in cases where BACs were unmeasured/unknown, based on the imputed probability that *any driver* in the crash was alcohol-positive. Thus, because some of the crashes were categorized as having a certain probability of being alcohol-involved (for example, a probability of .7) the counts in the tables below have totals that are not always whole numbers. In these analyses, a crash whereby a nonoccupant such as a pedestrian was alcohol-positive (but not a driver) was not included.⁸

Counts of alcohol-involved fatalities (and non-alcohol-involved fatalities) were then tabulated by quarter, producing time series of length equal to 80 quarters and separately by intervention counties (pooled), the rest of the State (pooled), and neighboring States (pooled).

Another set of analyses were conducted on New Mexico State crash data for the years 2000-2008, which included crashes of lesser levels of severity than the fatal crash analyses from FARS data discussed above. Because this data set included many more crashes, the analyses were based on a monthly series rather than the quarterly series described for the fatal crashes. This provided more post-intervention data points and thus was likely to be more sensitive in identifying changes in the pattern of crashes.

ARIMA intervention analyses similar to those performed on the fatal crash series were performed for each of three outcome measures:

- Alcohol-involved drivers in any police-reported crashes⁹ (including property damage only);
- Alcohol-involved drivers in injury crashes; and

⁶ FARS is a census of all crashes involving a fatality on public roadways in the United States.

⁷ Only the original five intervention counties are used in these analyses. Santa Fe became an intervention site in early 2007.

⁸ The interventions in this project are aimed at impaired drivers, not pedestrians; therefore the crashes in these analyses only look at those crashes with alcohol-positive drivers.

⁹ Alcohol involvement is based on determination/judgment of officer investigating the crashes.

- Drivers involved in single-vehicle nighttime (10 p.m. - 5:59 a.m.) crashes, excluding pedestrian crashes.

These three series (listed above) were created for the five intervention counties pooled and the same three series were also created for the rest of the State pooled (as a contrast or control group) for a total of six outcome series. All series were monthly counts and were analyzed using a natural log transform.¹⁰

For each of the six outcome series, a comparison series (representing the complement – that is, the rest of the drivers in crashes in that region) was used as a regressor to account for trends, weather conditions, seasonal fluctuation/periodicity, and other factors that would affect crash likelihood regardless of alcohol.

Blood Alcohol Concentrations at Arrest

A lower average BAC is often used as an indication of progress in deterring impaired driving, as drivers may be drinking less (per drinking driving event) than previously, and some people with high BACs may now be deciding not to drive.

To compute the average BAC of all DWI arrestees from the program counties and for the rest of the State for 2002 to 2008, we obtained BAC levels from all DWI arrestees that were captured in the New Mexico Citation Tracking System. The CTS is a dataset collected by the Motor Vehicle Division of the New Mexico Tax and Revenue Department. The CTS contains arrest and conviction records of all DWI offenders in New Mexico since July 1984.

Roadside Surveys

One direct measure of a program's effect can be whether there are changes in the distribution of BACs of nighttime weekend drivers. To measure this, PIRE conducted nighttime weekend roadside surveys in New Mexico. The first round of roadside surveys occurred in 2005 and, due to funding constraints, roadside surveys were not conducted in 2006. PIRE received additional funds from the New Mexico TSB and conducted the roadside surveys again in 2007 and 2008. PIRE was to have conducted the surveys in 2009 and 2010 but State funding constraints resulted in the cancellation of the final two years of data collection.

These roadside surveys were conducted in conjunction with law enforcement checkpoints, and provide data about the BAC levels of drivers on the road at various locations in New Mexico. After the law enforcement officer had concluded the investigation of a driver at a checkpoint, and while the vehicle was still stopped, a researcher asked the driver for an anonymous breath sample. If the officer detained a driver for a DWI investigation, who had been identified as being part of our sample, the researcher gave the officer a bright colored 3 x 5 card on which to record the results arrest investigation results (if any), and preliminary breath test device (PBT) reading if any. The researcher then collected that card to coordinate with our observations.

PIRE set the PBT device (Intoxilyzer 400PA) to record and store the BAC measurement in memory without displaying a read-out. Thus, the BAC measurement was not available to the researcher or anyone else at the scene. PIRE staff also entered observational data into personal digital assistants.

¹⁰ The five counties were pooled (not separate), so there are two groups of counties, but each of those 2 groups had 3 outcome measures (listed above); 2 groups x 3 outcome measures = 6 series.

All the surveys were conducted on Friday and Saturday nights, between 10 p.m. and 3 a.m. There were 20 roadside surveys in 2005, conducted July to December; 17 surveys in 2007 from September to December; and 20 surveys in 2008 from May to September. Each year, over 2,000 drivers provided breath samples. Any driver who appeared impaired was given an alternative means home.

Challenges

There were several limitations to evaluating the activities of New Mexico's Comprehensive State Impaired-Driving System, especially from sources that were created for this program. These limitations made it difficult to measure the effectiveness of the CSIDS, and include:

- Limited “pre-data” on enforcement activities which limited comparison of enforcement activities prior to implementation of high-visibility enforcement to activities after program implementation and without knowing if the independent variable changed we cannot know if it affected the number of crashes.
- County enforcement activities, including the hiring of law enforcement officers, started on different dates.
- Limited data entered in a Web-based reporting system developed for the target counties related to their DWI enforcement activities. Information was not entered uniformly into the Web database, and counties did not enter sufficient data to allow for statistical analyses.
- Funding for the CSIDS was in addition to funding given to the five (later six) participating sheriffs' offices from various State or Federal resources to conduct DWI operations and other traffic safety initiatives. These sheriffs' offices typically did not separate operations conducted under the CSIDS grant from the DWI operations conducted as part of other funding sources. One DWI operation might have been reported on multiple reporting forms; thus, the same enforcement activity would then be counted more than once. Conversely, an operation might not have been reported to an appropriate funding authority as it was reported elsewhere.
- Statewide efforts took place, including planning efforts, leadership initiatives, enforcement, public information, law changes and increased use of ignition interlocks, which may have overshadowed effects due solely to the enhanced enforcement in the targeted counties.

In light of these limitations, it was difficult to evaluate the effect of high-visibility enforcement in the targeted counties and to isolate their impact. In addition to this analysis, PIRE also developed a separate case study. The focus of the case study was to document several activities incorporated into New Mexico's comprehensive anti-DWI efforts and “tell the story” of that process so that other States would have ample descriptions of those elements from which to possibly model their own efforts in the future.

Results

DWI Crashes and Fatalities

As noted in the introduction, the purpose of this project was to demonstrate a process for developing and implementing an enhanced comprehensive State impaired-driving reduction system and to measure the effect of that system on alcohol-involved crash, injury, and fatality rates. This next section looks at the project's impact on alcohol-involved crash, injury, and fatality rates to date, focused especially on enhanced high-visibility enforcement activities in the intervention counties. We looked at the raw numbers of motor vehicle fatalities using FARS and New Mexico State crash data.

Analyses were conducted on both fatal and non-fatal crashes to assess the potential impact of the project activities on alcohol-involved crashes and proxies thereof. Time series analyses of alcohol-involved fatalities from fatal crashes in New Mexico were performed using ARIMA intervention models. Prior to analysis, all fatal crashes from the FARS¹¹ database for New Mexico for the 20 years from 1990 to 2009 (inclusive) were separated into three geographic groups: those from the five "intervention" counties,¹² those for the rest of the State, and those from five neighboring States (Arizona, Colorado, Utah, Texas, and Oklahoma). Then, within each of these three geographic groups, fatalities were separated into alcohol-involved (.01+ g/dL BAC) and non-alcohol-involved, and alcohol-impaired (.08+ g/dL BAC) and non-alcohol-involved. These determinations for each fatality were based on the highest measured BAC for *any driver* in the crash, or in cases where BACs were unmeasured/unknown, based on the imputed probability that *any driver* in the crash was alcohol positive. Thus, because some of the crashes were categorized as having a certain probability of being alcohol-involved (for example, a probability of .7) the counts in the following tables have totals that are not always whole numbers. In these analyses, crashes where a non-occupant such as a pedestrian was alcohol-positive (but not a driver) were not included.¹³

Counts of alcohol-involved fatalities (and non-alcohol fatalities) were then tabulated by quarter, producing time series of length equal to 80 quarters and separately by intervention counties (pooled), the rest of the State (pooled), and neighboring States (pooled).

Table 2 shows the raw numbers and percentage of alcohol-involved fatalities for the participating counties.

¹¹ FARS is a census of all crashes involving a fatality on public roadways in the United States.

¹² Only the original five intervention counties are used in these analyses. Santa Fe became an intervention site in early 2007.

¹³ The interventions in this project are aimed at impaired drivers not pedestrians, therefore the crashes in these analyses only look at those crashes with alcohol-positive drivers.

Table 2. Raw Numbers of Motor Vehicle Fatalities and Percent of Fatalities That Are Alcohol-Involved for Participating Counties¹⁴

COUNTY	YEAR	Total fatalities		Alcohol-related fatalities		Fatalities at BAC= .01-.07		Fatalities at BAC= .08+	
		N	%	N	%	N	%	N	%
1 Bernalillo (intervention county)	2000	61		20	32%	2	4%	17	29%
	2001	78		24	30%	5	7%	18	23%
	2002	72		23	33%	5	7%	19	26%
	2003	61		25	40%	4	7%	20	33%
	2004	79		26	33%	3	3%	23	29%
	2005	82		32	39%	6	7%	26	32%
	2006	73		23	31%	4	5%	19	26%
	2007	67		22	33%	4	6%	18	26%
	2008	57		13	23%	2	3%	12	20%
	2009	58		13	23%	4	6%	10	17%
	Total		688		221	32%	39	6%	182
13 Dona Ana (intervention county)	2000	22		11	50%	2	8%	9	43%
	2001	18		4	22%	1	6%	3	17%
	2002	32		15	46%	3	8%	12	38%
	2003	29		14	49%	2	5%	13	44%
	2004	44		15	34%	1	1%	15	33%
	2005	22		5	24%	0	1%	5	22%
	2006	34		9	28%	1	2%	9	26%
	2007	25		5	20%	0	1%	5	19%
	2008	12		6	47%	0	1%	6	46%
	2009	29		15	50%	2	7%	13	43%
	Total		267		99	32%	12	4%	90
31 McKinley (intervention county)	2000	48		20	42%	3	6%	18	36%
	2001	33		12	37%	1	2%	12	35%
	2002	36		18	50%	0	1%	18	49%
	2003	43		15	34%	3	7%	12	27%
	2004	57		22	38%	3	5%	19	33%
	2005	54		22	40%	3	5%	19	35%
	2006	45		24	53%	2	5%	22	48%
	2007	39		15	38%	4	9%	11	28%
	2008	32		16	48%	1	3%	15	46%
	2009	34		17	50%	2	6%	15	44%
	Total		421		181	43%	22	5%	161

¹⁴ Fatality Analysis Reporting System. www-fars.nhtsa.dot.gov/Crashes/CrashesAlcohol.aspx

New Mexico's Comprehensive Impaired-Driving Program: Crash Data Analysis

COUNTY	YEAR	Total fatalities		Alcohol-related fatalities		Fatalities at BAC= .01-.07		Fatalities at BAC= .08+	
		N	%	N	%	N	%	N	%
39 Rio Arriba (intervention county)	2000	25	64%	16	64%	4	14%	12	50%
	2001	14	50%	7	50%	0	1%	7	49%
	2002	22	42%	9	42%	2	7%	8	35%
	2003	14	64%	9	64%	2	16%	7	49%
	2004	29	48%	14	48%	5	18%	9	30%
	2005	18	66%	12	66%	1	6%	11	60%
	2006	12	37%	4	37%	0	2%	4	35%
	2007	16	83%	13	83%	0	1%	13	82%
	2008	15	46%	7	46%	2	13%	5	33%
	2009	15	67%	10	67%	0	0%	10	67%
	Total	180	56%	101	56%	16	9%	86	48%
45 San Juan (intervention county)	2000	33	58%	19	58%	2	6%	17	52%
	2001	41	63%	26	63%	6	14%	20	49%
	2002	48	46%	22	46%	3	5%	19	40%
	2003	41	52%	22	52%	1	3%	20	49%
	2004	37	55%	20	55%	3	7%	18	48%
	2005	35	35%	12	35%	1	2%	12	33%
	2006	44	38%	17	38%	4	9%	13	30%
	2007	40	47%	19	47%	2	4%	17	43%
	2008	30	41%	12	41%	0	1%	12	40%
	2009	16	26%	4	26%	0	1%	4	25%
	Total	365	47%	173	47%	22	6%	152	42%
49 Santa Fe (intervention county beginning 2007)	2000	25	58%	14	58%	2	8%	12	50%
	2001	22	46%	10	46%	1	6%	9	40%
	2002	27	31%	9	31%	2	8%	6	23%
	2003	19	53%	10	53%	4	23%	6	31%
	2004	24	40%	10	40%	0	0%	10	40%
	2005	33	40%	13	40%	0	1%	13	39%
	2006	31	40%	12	40%	0	0%	12	40%
	2007	19	56%	11	56%	1	7%	9	48%
	2008	14	35%	5	35%	1	10%	4	25%
	2009	26	32%	8	32%	1	2%	8	30%
	Total	240	43%	102	43%	12	5%	89	37%
Total for 5 counties	2000	189	46%	86	46%	13	7%	73	21%
	2001	184	40%	73	40%	13	8%	60	33%
	2002	210	41%	87	41%	13	6%	76	36%
	2003	188	45%	85	45%	12	6%	72	38%
	2004	247	39%	97	39%	15	6%	84	34%
	2005	211	39%	83	39%	11	5%	73	44%
	2006	208	37%	77	37%	11	6%	67	32%
	2007	187	40%	74	40%	10	5%	64	34%
	2008	146	37%	54	37%	5	3%	50	34%
	2009	152	39%	59	39%	8	5%	52	34%
	Total	1922	40%	775	40%	111	6%	671	33%

New Mexico's Comprehensive Impaired-Driving Program: Crash Data Analysis

COUNTY	YEAR	Total fatalities		Alcohol-related fatalities		Fatalities at BAC= .01-.07		Fatalities at BAC= .08+	
		N		N	%	N	%	N	%
47 San Miguel (control site)	2000	8		2	28%	0	0%	2	26%
	2001	10		6	63%	0	4%	6	59%
	2002	11		5	45%	0	4%	5	42%
	2003	11		6	55%	1	9%	5	45%
	2004	13		7	54%	0	0%	7	54%
	2005	13		4	32%	0	3%	4	28%
	2006	9		1	12%	0	1%	1	11%
	2007	6		2	37%	1	17%	1	20%
	2008	9		4	44%	0	0%	4	44%
	2009	7		2	29%	1	14%	1	14%
Total		97		39	40%	3	3%	36	37%
REST OF STATE (i.e., minus 5 intervention counties)	2000	243		99	41%	21	9%	78	46%
	2001	280		112	40%	19	7%	93	33%
	2002	239		96	40%	13	5%	81	34%
	2003	251		89	42%	18	7%	72	29%
	2004	274		84	31%	10	4%	73	27%
	2005	277		83	30%	6	2%	76	27%
	2006	276		79	39%	9	3%	69	25%
	2007	207		77	37%	9	4%	68	33%
	2008	206		63	31%	7	3%	55	27%
	2009	183		69	38%	8	4%	60	33%
Total		2495		851	34%	120	5%	725	30%
STATEWIDE (all of NM)	2000	432		185	43%	34	8%	151	35%
	2001	464		185	40%	32	7%	153	33%
	2002	449		183	41%	26	6%	157	35%
	2003	439		174	40%	30	7%	144	33%
	2004	521		181	35%	25	5%	157	30%
	2005	488		166	34%	17	3%	149	31%
	2006	484		156	32%	20	4%	136	28%
	2007	413		151	37%	19	5%	132	32%
	2008	366		117	32%	12	3%	105	29%
	2009	361		128	35%	16	4%	112	31%
Total		4417		1626	37%	231	5%	1396	32%

The intervention point used was January 1, 2005, which admittedly statistically simplifies the phasing in of the gradual implementation to a single point. Note also that because data were only available for crashes through 2009, there were only 20 temporal data points available post-intervention (2005 to 2009) for the FARS analysis, which could provide only moderate statistical sensitivity for being able to detect a change if there were one. Figure 3 shows the ARIMA intervention analyses of the numbers of alcohol-involved fatalities in the five intervention counties and the rest of the State.

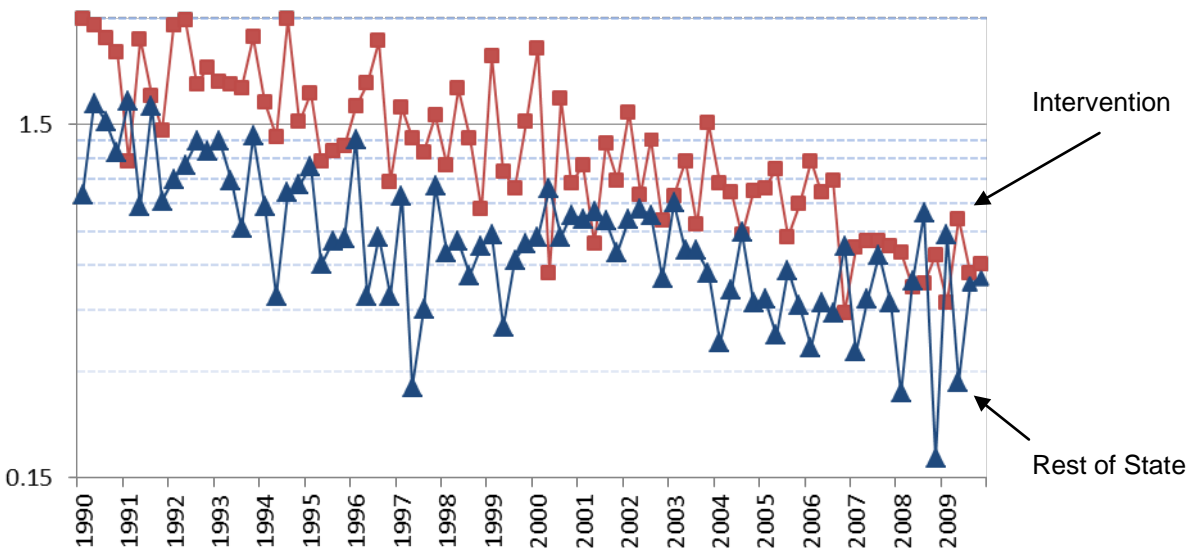


Figure 3. ARIMA Intervention Analyses of the Numbers of Alcohol-Involved (.01+ g/dL BAC) Fatalities in New Mexico for the 6 Intervention Counties and “Rest of State.”

Alcohol-Involved Fatal Crashes (.01+ g/dL BAC)

ARIMA intervention analyses of the numbers of alcohol-involved (.01+ g/dL BAC) fatalities in the five intervention counties (plus Santa Fe beginning in 2007) using the non-alcohol fatalities as a within-group comparison series showed indications of a possible change beyond the already extant downward trends in place prior to 2005. Coefficients for the intervention estimate a reduction of 46.8 fatalities per year for these six counties (which amounts to 36.5% lower than projected from pre-intervention patterns). This estimate was statistically significant ($t=4.37$; $p<.001$).

For the comparison sites (Santa Fe prior to 2007, San Miguel County, and the rest of the State), the estimate for the intervention coefficient was a 31.6% relative decrease beyond expected, also significantly different from no change ($t=3.69$; $p=.001$). The contrast of the estimates for the comparison counties' coefficient (31.6%) and that for the intervention counties (36.5%) was not significantly different ($t=0.51$; one-tailed $p=.306$).

Visual inspection of the graph of the data (Figure 3) for both the intervention and non-intervention groups' ratio series (odds of alcohol-involved fatalities to non-alcohol-involved fatalities), and their trends over time (fitted using a Loess function), depict nearly identical and parallel slopes for both groups during most of the 20 years, and particularly during the last 2 years during which the intervention took place.

Using five neighboring States as a comparison series, analyses showed a 6.4% decrease for the five neighboring States at the point of the New Mexico intervention, which was not statistically significant ($t=1.45$; $p=.152$). The contrast of the estimates for the comparison States' coefficient (6.4%) and that for the intervention counties' (36.5%) was significantly different ($t=3.43$; one-tailed $p=.001$).

Alcohol-impaired Fatal Crashes (.08+ g/dL BAC)

Figure 4 shows the ARIMA intervention analyses of the numbers of alcohol-impaired (.08+ g/dL BAC) fatalities in the five intervention counties and the rest of the State. ARIMA intervention analyses of the numbers of alcohol-impaired fatalities in the five intervention counties (plus Santa Fe beginning in 2007) using the non-alcohol fatalities as a within-group comparison series showed indications of a possible change beyond the already extant downward trends in place prior to 2005. Coefficients for the intervention estimate a reduction of 40 fatalities per year for these six counties (which amounts to 35.8% lower than projected from pre-intervention patterns). This estimate was statistically significant ($t=3.46$; $p<.001$).

For the comparison sites (Santa Fe prior to 2007, San Miguel County, and the rest of the State), the estimate for the intervention coefficient was a 29% relative decrease beyond expected, also significantly different from no change ($t=3.19$; $p=.002$). The contrast of the estimates for the comparison counties' coefficient (29%) and that for the intervention counties (35.8%) was not significantly different ($t=0.61$; one-tailed $p=.273$).

Visual inspection of the graph of the data (Figure 4) for both the intervention and non-intervention groups' ratio series (odds of alcohol-involved fatalities to non-alcohol-involved fatalities), and their "trends" over time (fitted using a Loess function), depict nearly identical and parallel slopes for both groups during most of the 20 years, and particularly during the last 2 years during which the intervention took place. Thus, the difference between the intervention counties and the non-intervention counties was not statistically significant.

Using five neighboring States as a comparison series, analyses showed a 6.9% decrease for the five neighboring States at the point of the New Mexico intervention, which was not significant ($t=1.60$; $p=.114$). The contrast of the estimates for the comparison States' coefficient (6.9%) and that for the intervention counties' (35.8%) was significantly different ($t=2.75$; one-tailed $p=.004$).

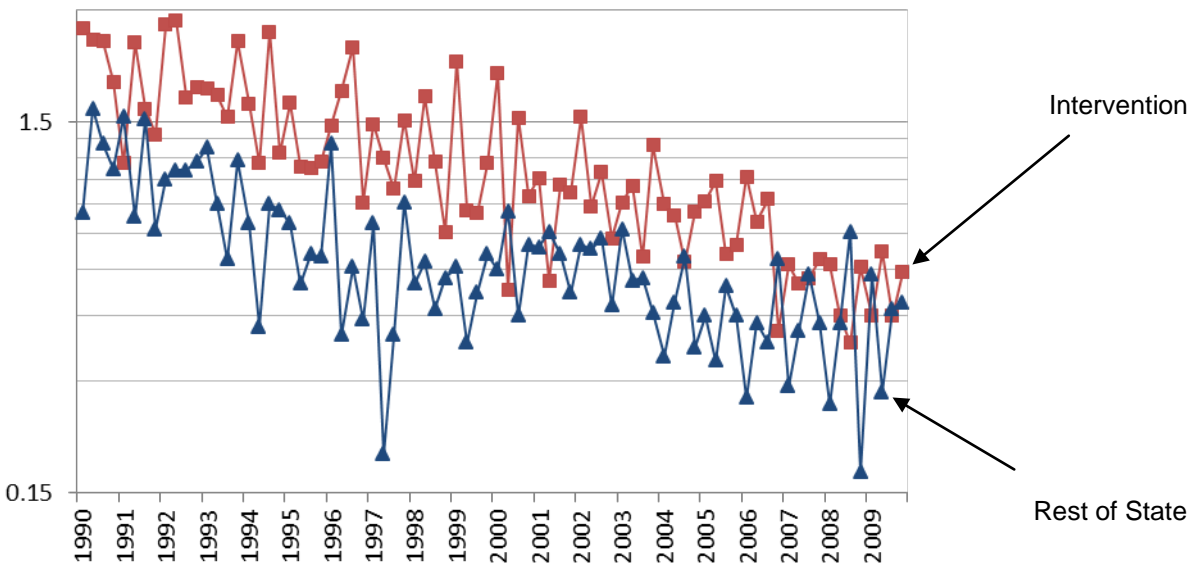


Figure 4. ARIMA Intervention Analyses of the Numbers of Alcohol-Impaired (.08+ g/dL BAC) Fatalities in New Mexico for the 6 Intervention Counties and “Rest of State.”

All Crashes (including non-fatal)

Another set of analyses were conducted on New Mexico State crash data which included crashes of lesser level of severity than the fatal crash analyses discussed above. Because this data set includes many more crashes, the analyses were based on a monthly series rather than the quarterly series described for the fatal crashes. This provides more post-intervention data points and thus is likely to be more sensitive in identifying changes in the pattern of crashes.

ARIMA intervention analyses similar to those performed on the fatal crash series were performed for each of three outcome measures:

- Alcohol-involved drivers in any police-reported crash¹⁵ (including property damage only);
- Alcohol-involved drivers in injury crashes; and
- Drivers involved in single-vehicle nighttime (10 p.m. - 5:59 a.m.) crashes, excluding pedestrian crashes.

These three series (listed above) were created for the five intervention counties pooled, and the same three series were also created for the rest of the State pooled (as a contrast or control group) for a total of six outcome series. All series were monthly counts and were analyzed using a natural log transform.¹⁶

For each of the six above outcome series, a comparison series (representing the complement – that is, the rest of the drivers in crashes in that region) was used as a regressor to account for trends, weather conditions, seasonal fluctuation/periodicity, and other factors that would affect crash likelihood regardless of alcohol use.

¹⁵ Alcohol-involvement is based on determination/judgment of officer investigating the crash.

¹⁶ The five counties were pooled (not separate), so there are two groups of counties, but each of those 2 groups had 3 outcome measures (listed above); 2 groups x 3 outcome measures = 6 series.

Alcohol-involved Drivers in All Crashes

For the five intervention counties pooled together, a 25% reduction in alcohol-involved (BAC .01+) drivers in all crashes was found, which is statistically significant ($t=10.17$; $p<.001$). This equates to a projected reduction of 40.5 alcohol-involved drivers per month based on a model projection for the 12 months of 2005, had there been no intervention parameter. The total analysis period was 9 years, from 2000 through 2008, inclusive. The reduction is estimated for January 2005 to December 2008.¹⁷

For the rest of the State, there was no significant change, though the tendency was towards a reduction of about 8.9% ($t=1.21$; $p=.229$).

Contrasting the two intervention results to rest of State, the Intervention counties' result would still be a net decrease of 17.6% and is statistically significant ($t=2.37$; one-tailed $p=.010$).¹⁸

These results are presented in Figure 5. However, these results should be considered with caution. There are indications that alcohol-involved crashes were underreported in Bernalillo County in 2005. Because Bernalillo County represents approximately 44% of those crashes in the intervention group, this underreporting could significantly affect the findings.

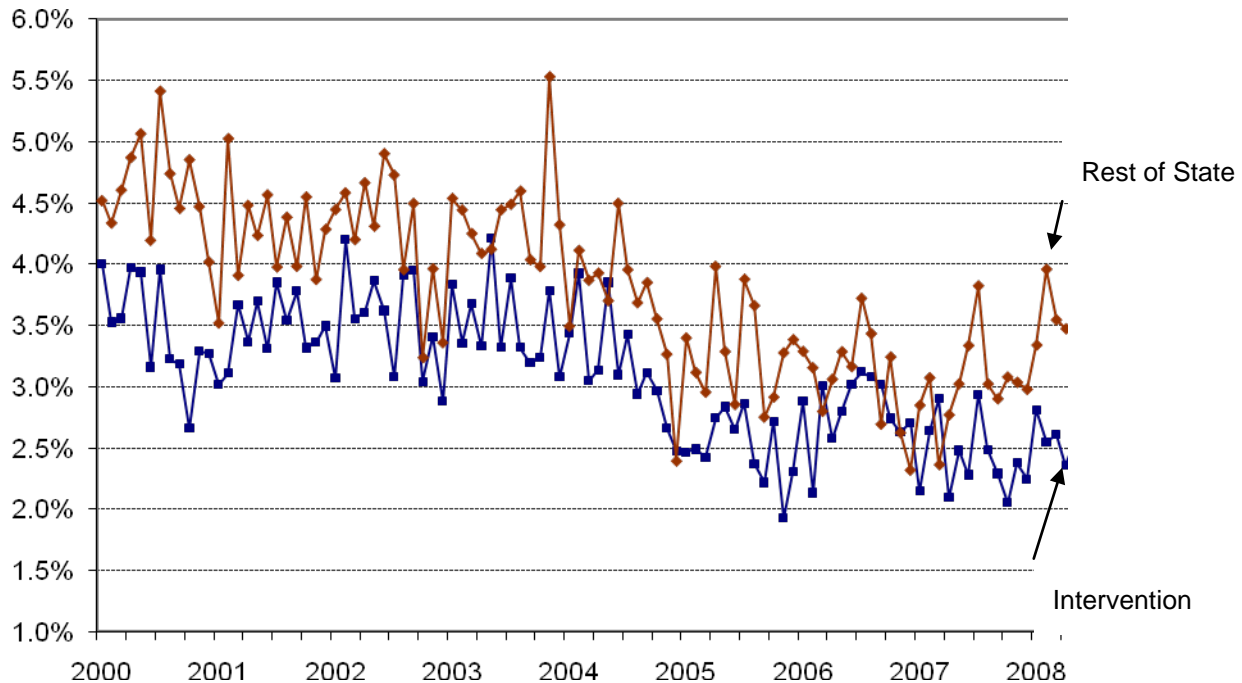


Figure 5. Percentage of Drivers in Crashes Who Were Alcohol-Involved

Alcohol-involved Drivers in Injury Crashes

For the five intervention counties, a 33.6% reduction in alcohol-involved (BAC = .01+) drivers in injury crashes was found, which is statistically significant ($t=8.88$; $p<.001$). This equates to a

¹⁷ The time frame for analysis is from 2000 to 2008. The pre-intervention is from 2000 to 2004 (60 months) and post-intervention is for 2005 to 2008 (48 months).

¹⁸ The reason it comes out to 17.6 percent rather than 16.1 percent is because we subtracted the log-transformed parameter estimates before converting them back to percentages (using an exponential transform to “invert” the log transform).

reduction of 26.8 alcohol-involved drivers in injury crashes per month. The total analysis period was 9 years, from 2000 to 2008. The reduction is estimated for January 2005 to December 2008.

For the rest of the State, a 31.8% reduction was found ($t=10.36$; $p<.001$ ¹⁹).²⁰ This was a statistically significant reduction.

Contrasting the reductions for the two geographical groups, the intervention counties' result would be a net decrease of about 2.6%, which is not statistically significant ($t=0.44$; $p=.330$).

These results are presented in Figure 6. However, these results should be considered with caution. There are indications that alcohol-involved crashes were underreported in Bernalillo County in 2005. Because Bernalillo County represents approximately 44% of those crashes in the intervention group, this underreporting could significantly affect the findings.

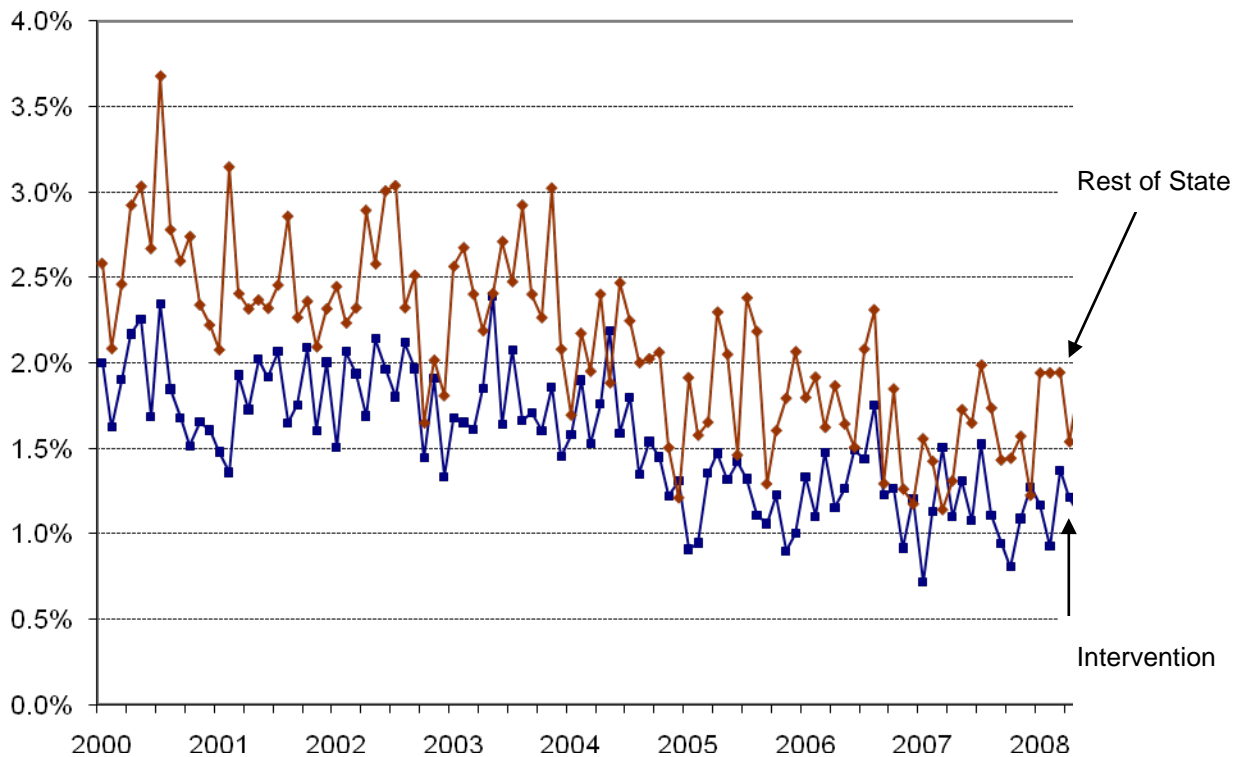


Figure 6. Percentage of Drivers in Injury Crashes That Were Alcohol-involved

Drivers in Single-Vehicle Nighttime Crashes (Surrogate Measure of Alcohol Involvement)

Single-vehicle nighttime crashes are often used as a surrogate measure of alcohol involvement in crashes. For the five intervention counties, the models estimate an 8.2% reduction in drivers in single-vehicle nighttime crashes ($t=3.51$; $p=.001$). This is a statistically significant reduction.

¹⁹ These State analyses are not using the ratio approach. The non-alcohol drivers were included in the models as a regressor series, instead of as the denominator for a ratio series. Both implementation counties and rest of State were analyzed the same way. But both of those were different for INJURY crashes (this section) than was done for both groups in the previous section for ALL crashes. When limiting the crashes to injury-only, the smaller number of crashes makes using the ratio too highly unreliable. The ratio approach requires a sufficiently large number of cases to keep denominator stable.

²⁰ 2005-2008 versus projected 2005-2008, based on extrapolating trends (models) beyond end of 2004.

This equates to a reduction of roughly 9.2 drivers per month involved in single-vehicle nighttime crashes. The total analysis period was nine years, from 2000 through 2008, inclusive. The reduction is estimated for January 2005 to December 2008.

For the rest of the State, a statistically significant 15.2% reduction was found ($t=5.27$; $p<.001$).

Contrasting the reductions for the two geographical groups, the intervention counties' result would be a net increase for 2005 to 2008 (relative to the much larger decrease in the rest of the State) of +8.2%, which is significantly greater than the rest of the State ($t=2.01$; 2-tailed $p=.046$).

These results are presented in Figure 7.

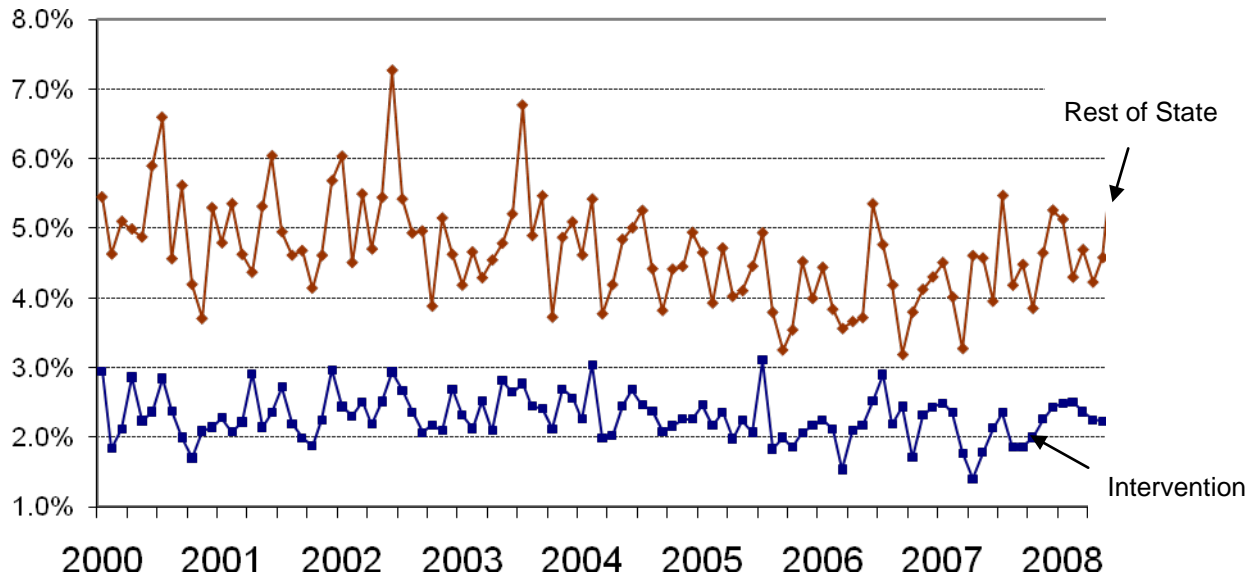


Figure 7. Percentage of Drivers in Crashes in Single-Vehicle Nighttime Crashes

In summary, for alcohol-involved fatal crashes between 2005 and 2008, the intervention counties experienced a reduction in alcohol-involved crashes, which was statistically significant. The rest of the State (i.e., the non-intervention counties) experienced a smaller, but also statistically significant, reduction in alcohol-involved crashes. The reduction in alcohol-involved crashes in the intervention counties was not significantly larger than in the rest of the State (i.e., the non-intervention counties). For non-fatal crashes between 2005 and 2008, the intervention counties experienced a reduction in alcohol-involved crashes, which was statistically significant. The rest of the State (i.e., the non-intervention counties) did not experience a significant change, though the tendency was towards a reduction. The reduction in non-fatal alcohol involved crashes in the intervention counties was significantly larger than in the rest of the State when looking at all non-fatal crashes. However, the difference from the rest of the State in size of reduction almost disappears when looking only at injury crashes (i.e., excluding property-damage-only crashes).

When using the surrogate measure for alcohol-involvement of single-vehicle nighttime crashes between 2005 and 2008, both the intervention counties and the rest of the State had reductions that were statistically significant. The reduction in the intervention counties was significantly smaller than in the non-intervention counties.

Blood Alcohol Concentrations at Arrest

In computing the average BACs of all DWI arrestees from the program counties and for the rest of the State for the years 2002 through 2008, there was a decrease in all but one of the program counties and for the rest of the State. A lower average BAC is often used as an indication of progress in deterring impaired driving, as drivers may be drinking less (per drinking driving event) than previously, and some people with high BACs may now be deciding not to drive.

Table 3 shows the average BAC of DWI arrestees made by the sheriffs' offices in the program counties and the rest of the State for the years 2002 through 2008. In general, all the counties, including non-intervention counties, experienced fluctuations in average BAC both up and down. Except for Rio Arriba, each of the intervention counties had a lower average BAC in 2008 at the end of the project, than in 2002 at the beginning of the project. The control site of San Miguel also had a lower average BAC.

Table 3. Average BAC of DWI Offenders Arrested by Sheriffs' Offices in Program Counties and Rest of State, 2002-2008, in g/dL

County	2002	2003	2004	2005	2006	2007	2008
Bernalillo	.154	.149	.149	.152	.153	.143	.140
Dona Ana	.156	.150	.145	.149	.143	.151	.154
McKinley	.176	.177	.171	.171	.167	.165	.166
Rio Arriba	.160	.158	.168	.163	.163	.148	.164
San Juan	.165	.157	.159	.160	.167	.161	.160
Santa Fe	.145	.147	.147	.144	.128	.147	.130
San Miguel (control)	.165	.090	.150	.065	.085	.050	.145
Total Other Counties	.150	.146	.142	.152	.153	.148	.150

Source: New Mexico Citation Tracking System (CTS).

Similarly, Table 4 shows the average BAC for DWI arrests by all law enforcement agencies (not only Sheriffs' Offices). Here again, the average BAC at arrest fluctuated up and down across the years, but with the average generally lower in the implementation, and control, counties.

Table 4. Average BAC of DWI Arrestees Made by All Law Enforcement Agencies in Program Counties and Rest of State, 2002-2008, in g/dL

County	2002	2003	2004	2005	2006	2007	2008
Bernalillo	.147	.146	.145	.146	.145	.142	.143
Dona Ana	.155	.150	.150	.146	.146	.147	.152
McKinley	.171	.170	.167	.174	.167	.161	.163
Rio Arriba	.156	.156	.143	.158	.157	.144	.154
San Juan	.156	.157	.157	.162	.166	.158	.156
Santa Fe	.154	.154	.158	.151	.145	.152	.151
San Miguel (control)	.160	.160	.149	.147	.153	.148	.153
Total Other Counties	.150	.146	.143	.147	.148	.147	.152

Source: New Mexico Citation Tracking System (CTS).

Roadside Survey Data

One direct measure of a program's effect can be whether there are changes in the distribution of BACs of nighttime weekend drivers. To measure this, PIRE conducted nighttime weekend roadside surveys in New Mexico in 2005, 2007 and 2008.

Table 5. 2005, 2007, and 2008 New Mexico DWI Roadside Survey Results

	2005		2007		2008	
	Number	%	Number	%	Number	%
# of roadside surveys	20		17		20	
# of vehicles selected for survey	3,307		3,622		4,229	
# valid breath tests	2,403	72.7%	2,719	75.1%	3,091	73.1%
# no sample	572	17.3%	497	13.7%	549	13.0%
# did not participate	332	10.0%	406	11.2%	589	13.9%
Distribution of BACs (g/dL)						
.00 (no alcohol)	2,284	95.0%	2,568	94.4%	2,934	94.9%
Positive BAC	119	5.0%	151	5.6%	157	5.1%
.005 - .049	79	3.3%	112	4.1%	113	3.7%
.05 - .079	15	0.6%	17	0.6%	18	0.6%
.08 and higher	25	1.0%	22	0.8%	26	0.8%

As Table 5 shows, the percentage of valid breath tests for all three years was in the low- to mid-70s. However, the percentage of drivers who declined to participate increased from year to year, from 10% in 2005 to 11.2% in 2007 to 13.9% in 2008. The percentage of "no samples," in which a driver agreed to participate but a valid breath sample could not be obtained, was reduced from 17.3% in 2005 to 13.7% in 2007 to 13% in 2008.

In 2005, 95% of drivers had .00 BACs (no alcohol); in 2007 it was 94.4% while in 2008 it was 94.9%. The percentage of drivers who had BACs between .005 and .049 increased slightly from 3.3% in 2005 to 4.1% in 2007 but decreased slightly to 3.7% in 2008. The percentage of drivers with BACs between .05 to .079 remained constant at .6% for all three years, while the percentage of drivers with BACs at or over .08 was remained steady (1% in 2005 and .8% in 2007 and 2008).

The next series of tables show the results of each of the seven counties that participated in the 2005, 2007, and 2008 roadside surveys. In Bernalillo County, three roadside surveys were conducted in 2005, two in 2007 and four in 2008. Results for Bernalillo County are shown in Table 6. The percentage of participants who had .00 BACs rose from 90% in 2005 to 95% in 2007 then declined slightly to 92.4% in 2008. The percentage of participants with BACs of .08 or higher decreased from 3.1% in 2005 to 1.6% in 2007 but rose again to 2% in 2008.

Table 6. Bernalillo County 2005, 2007, and 2008 DWI Roadside Survey Results

	2005		2007		2008	
	Number	%	Number	%	Number	%
# of roadside surveys	3		2		4	
# of vehicles selected for survey	770		664		945	
# valid breath tests	511	66.4%	444	66.9%	685	72.5%
# no sample	160	20.8%	124	18.7%	89	9.4%
# did not participate	99	12.9%	96	14.5%	171	18.1%
Distribution of BACs (g/dL)						
.00 (no alcohol)	460	90.0%	422	95.0%	633	92.4%
Positive BAC	51	10.0%	22	5.0%	52	7.6%
.005 - .049	28	5.5%	13	2.9%	33	4.8%
.05 - .079	7	1.4%	2	0.5%	5	0.7%
.08 and higher	16	3.1%	7	1.6%	14	2.0%

In Doña Ana County, four roadside surveys were conducted in both 2005 and 2008 but in 2007 only one was conducted. Based on this comparison, the percent of drivers who did not blow a positive BAC decreased from 96.7% in 2005 to 90.4% in 2007 but increased to 95.4% in 2008. The percent of drivers who had BACs between .005 and .049 increased from 2.9% in 2005 to 8.7% in 2007 but dropped to 2.7% in 2008. The results are shown in Table 7.

Table 7. Doña Ana County 2005, 2007, and 2008 DWI Roadside Survey Results

	2005		2007		2008	
	Number	%	Number	%	Number	%
# of roadside surveys	4		1		4	
# of vehicles selected for survey	593		146		901	
# valid breath tests	421	71.0%	104	71.2%	656	72.8%
# no sample	120	20.2%	27	18.5%	136	15.1%
# did not participate	52	8.8%	15	10.3%	109	12.1%
Distribution of BACs (g/dL)						
.00 (no alcohol)	407	96.7%	94	90.4%	626	95.4%
Positive BAC	14	3.3%	10	9.6%	30	4.6%
.005 - .049	12	2.9%	9	8.7%	18	2.7%
.05 - .079	2	0.5%	1	1.0%	8	1.2%
.08 and higher	0	0.0%	0	0.0%	4	0.6%

Table 8 shows the results of the three roadside surveys conducted in McKinley County in both 2005 and 2007 and the four that were conducted in 2008. In McKinley County, the number of drivers who declined to participate dropped from 19.2% in 2005 to 8.4% in 2007 but increased to 12.1% in 2008, while the percent of valid breath tests increased from 60.5% in 2005 to 71.8% in 2007 but decreased in to 65.3% in 2008. The data show that in 2005, 99% of drivers did not register any BAC and in 2007, 97.9% of drivers did not register any BAC, while in 2008 96.5% of drivers did not have positive BACs.

Table 8. McKinley County 2005, 2007, and 2008 DWI Roadside Survey Results

	2005		2007		2008	
	Number	%	Number	%	Number	%
# of roadside surveys	3		3		4	
# of vehicles selected for survey	516		394		528	
# valid breath tests	312	60.5%	283	71.8%	345	65.3%
# no sample	105	20.3%	78	19.8%	119	22.5%
# did not participate	99	19.2%	33	8.4%	64	12.1%
Distribution of BACs (g/dL)						
.00 (no alcohol)	309	99.0%	277	97.9%	333	96.5%
Positive BAC	3	1.0%	6	2.1%	12	3.5%
.005 - .049	2	0.6%	6	2.1%	8	2.3%
.05 - .079	0	0.0%	0	0.0%	1	0.3%
.08 and higher	1	0.3%	0	0.0%	3	0.9%

Table 9 shows the results of the two roadside surveys conducted in Rio Arriba County in both 2005 and in 2007 and the one survey conducted in 2008. In Rio Arriba, the percent of drivers who declined to participate in the survey increased from 6.8% in 2005 to 14% in 2007 to 17.3% in 2008. In 2005, 97.5 percent of drivers did not register any BAC and in 2007 it decreased to 93.4% but increased slightly to 95.7% in 2008.

Table 9. Rio Arriba County 2005, 2007, and 2008 DWI Roadside Survey Results

	2005		2007		2008	
	Number	%	Number	%	Number	%
# of roadside surveys	2		2		1	
# of vehicles selected for survey	251		420		150	
# valid breath tests	200	79.7%	316	75.2%	93	62.0%
# no sample	34	13.5%	45	10.7%	31	20.7%
# did not participate	17	6.8%	59	14.0%	26	17.3%
Distribution of BACs (g/dL)						
.00 (no alcohol)	195	97.5%	295	93.4%	89	95.7%
Positive BAC	5	2.5%	21	6.6%	4	4.3%
.005 - .049	3	1.5%	17	5.4%	4	4.3%
.05 - .079	0	0.0%	0	0.0%	0	0.0%
.08 and higher	2	1.0%	4	1.3%	0	0.0%

Table 10 shows the results of the two DWI roadside surveys conducted in San Juan County in 2005, the three roadside surveys conducted in 2007 and the four surveys conducted in 2008. In San Juan County, the percent of drivers who did not register any BAC level increased from 92.7% in 2005 to 95.2% in 2007 to 95.6% in 2008.

Table 10. San Juan County 2005, 2007, and 2008 DWI Roadside Survey Results

	2005		2007		2008	
	Number	%	Number	%	Number	%
# of roadside surveys	2		3		4	
# of vehicles selected for survey	378		562		959	
# valid breath tests	287	75.9%	435	77.4%	735	76.6%
# no sample	67	17.7%	54	9.6%	92	9.6%
# did not participate	24	6.3%	73	13.0%	132	13.8%
Distribution of BACs (g/dL)						
.00 (no alcohol)	266	92.7%	414	95.2%	703	95.6%
Positive BAC	21	7.3%	21	4.8%	32	4.4%
.005 - .049	17	5.9%	17	3.9%	27	3.7%
.05 - .079	3	1.0%	0	0.0%	2	0.3%
.08 and higher	1	0.3%	4	0.9%	3	0.4%

Four roadside surveys were conducted in the control county of San Miguel County in 2005 while two were conducted in 2007 and only one in 2008. In 2005, 96.7% of the drivers had .00 BACs; in 2007 94% had .00 BACs; and in 2008 95.9% had .00 BACs.

Table 11. San Miguel County 2005, 2007, and 2008 DWI Roadside Survey Results

	2005		2007		2008	
	Number	%	Number	%	Number	%
# of roadside surveys	4		2		1	
# of vehicles selected for survey	363		212		132	
# valid breath tests	272	74.9%	149	70.3%	98	74.2%
# no sample	73	20.1%	34	16.0%	24	18.2%
# did not participate	18	5.0%	29	13.7%	10	7.6%
Distribution of BACs (g/dL)						
.00 (no alcohol)	263	96.7%	140	94.0%	94	95.9%
Positive BAC	9	3.3%	9	6.0%	4	4.1%
.005 - .049	7	2.6%	9	6.0%	3	3.1%
.05 - .079	1	0.4%	0	0.0%	0	0.0%
.08 and higher	1	0.4%	0	0.0%	1	1.0%

In Santa Fe County, two roadside surveys were conducted in 2005, four in 2007 and two in 2008. Table 12 shows the survey results of those two years. In 2005, 96.7% percent of drivers did not register any BAC and in 2007 it decreased to 94% percent but increased slightly to 95.9% in 2008.

The majority of the positive BAC cases were in the .005 to .049 category for all three years.

Table 12. Santa Fe County 2005, 2007, and 2008 DWI Roadside Survey Results

	2005		2007		2008	
	Number	%	Number	%	Number	%
# of roadside surveys	2		4		2	
# of vehicles selected for survey	436		1,224		614	
# valid breath tests	316	72.5%	988	80.7%	479	78.0%
# no sample	97	22.2%	135	11.0%	58	9.4%
# did not participate	23	5.3%	101	8.3%	77	12.5%
Distribution of BACs g/dL)						
.00 (no alcohol)	300	94.9%	926	93.7%	456	95.2%
Positive BAC	16	5.1%	62	6.3%	23	4.8%
.005 - .049	10	3.2%	42	4.3%	20	4.2%
.05 - .079	2	0.6%	11	1.1%	2	0.4%
.08 and higher	4	1.3%	9	0.9%	1	0.2%

Conclusions

The purpose of the New Mexico CSIDS was to demonstrate a process for implementing a comprehensive State impaired-driving system and to document and determine the effectiveness of a State's efforts to implement a comprehensive impaired-driving program with a focus on high-visibility enforcement. A primary focus was on allocation of resources to increase DWI enforcement in five (later six) counties.

However, there were several limitations to evaluating the activities of New Mexico's Comprehensive State Impaired-Driving System as it relates to the targeted counties, especially from sources that were created specifically for this program. Because of these limitations, it was difficult to measure the effectiveness of the high-visibility enforcement activities of New Mexico's CSIDS in the intervention counties. These limitations included:

- Limited "pre-data" on enforcement activities which limited comparison of enforcement activities prior to implementation of high-visibility enforcement to activities after program implementation. Without knowing if the independent variable (enforcement activity) changed, we cannot know if it affected the number of crashes.
- County enforcement activities, including the hiring of law enforcement officers, started on different dates.
- Limited data entered in a Web-based reporting system developed for the target counties related to their DWI enforcement activities. Information was not entered uniformly into the Web database, and counties did not enter sufficient data to allow for statistical analyses.
- Funding for the CSIDS was in addition to funding given to the five (later six) participating sheriffs' offices from various State or Federal resources to conduct DWI operations and other traffic safety initiatives. These sheriffs' offices typically did not separate operations conducted under the CSIDS grant from the DWI operations conducted as part of other funding sources. One DWI operation might have been reported on multiple reporting forms; thus, the same enforcement activity would then be counted more than once. Conversely, an operation might not have been reported to an appropriate funding authority as it was reported elsewhere (thus, under-reported).
- Statewide efforts took place, including planning efforts, leadership initiatives, enforcement, public information, law changes and increased use of ignition interlocks, which may have overshadowed effects due solely to the enhanced enforcement in the targeted counties.

In light of these limitations, it was difficult to evaluate the effect of high-visibility enforcement in the targeted counties and to isolate their impact. Although it was difficult to draw conclusive findings on the effect of the enhanced enforcement program in the intervention counties based on the crash and arrest data available, the reductions experienced in both the intervention counties and Statewide were significant and quite impressive. Some of the key findings of this study regarding New Mexico's CSIDS project are highlighted below:

- At the beginning of the project in 2004, there were 176 alcohol-involved (.01+ g/dL BAC) fatal crashes in New Mexico (40% of all fatal crashes) that resulted in 219 fatalities. At the end of the project in 2009, there were 147 alcohol-involved fatal crashes (40.7% of all fatal crashes) that resulted in 152 fatalities in New Mexico.

- For alcohol-involved fatal crashes between 2005 and 2009, the intervention counties experienced a reduction of 36.5%. The rest of the State (i.e., non-intervention counties) experienced a 31.6% reduction.
- For alcohol-impaired (.08+ g/dL BAC) fatal crashes from 2005 to 2009, the intervention counties experienced a reduction of 35.8%. The rest of the State experienced a 29% reduction.
- The decreases in alcohol-involved and alcohol-impaired fatal crashes were significant in both the intervention counties and the rest of the State. However, the decreases in the intervention counties were not significantly different from the decreases Statewide.
- When New Mexico's intervention counties' 36.5% reduction in alcohol-involved fatal crashes was compared with five neighboring States' 6.4% reduction, the effect for New Mexico's intervention counties was statistically significant ($t=3437$; one-tailed $p=.001$).
 - When New Mexico's intervention counties' 35.8% reduction in alcohol-impaired (.08+ g/dL BAC) fatal crashes was compared with five neighboring States' 6.9% reduction, the effect for New Mexico's intervention counties was statistically significant ($t=2.75$; one-tailed $p=.004$).
 - Between 2005 and 2008, a 25% reduction in alcohol-involved drivers in all crashes (including property-damage only) was found ($t=10.17$; $p<.001$) for the five intervention counties. For the rest of the State, there was no significant change, though the tendency was towards a reduction of about 8.9% ($t=1.21$; $p=.229$).
- For the five intervention counties, a 33.6% reduction in alcohol-involved (BAC = .01+) driver in injury crashes was found ($t=8.88$; $p<.001$). This equates to a reduction of 26.8 alcohol-involved drivers in injury crashes per month. For the rest of the State, a 31.8% reduction was found ($t=10.36$; $p<.001$).²¹ Both reductions were statistically significant. Contrasting the reductions for the two geographical groups, the intervention counties' result would be a net decrease of about 2.6%, which is not statistically significant ($t=0.44$; $p=.330$).
- When using single-vehicle nighttime crashes as a surrogate measure of alcohol-involved crashes between 2005 and 2008, the intervention counties had a reduction of 8.2% and the non-intervention counties had a reduction of 15.2%. Both reductions were statistically significant. However, the reduction in the intervention counties were significantly ($p = .001$) smaller than seen in the non-intervention counties.
- At the beginning of the project in 2004, New Mexico had the seventh highest alcohol related fatality rate in the country. By the end of the project in 2009, New Mexico's alcohol related fatality rate had dropped to nineteenth.
- It is clear from these crash analyses that New Mexico experienced a dramatic reduction in alcohol-involved crashes during the period of this project. Probably because of the extensive statewide efforts, it is difficult to discern a separate effect in the five (later six) program counties. However, overall, New Mexico's multi-faceted efforts appeared to have benefits for the State.

²¹ 2005-2008 versus projected 2005-2008, based on extrapolating trends (models) beyond end of 2004.

- In computing the average BAC of all DWI arrestees from the program counties and for the rest of the State for the years 2002 through 2008, we see that there has been a decrease in the majority of program counties and for the rest of the State.
- PIRE conducted a series of DWI roadside surveys in New Mexico. All surveys were conducted between 10 p.m. and 3 a.m. on Friday and Saturday nights. From July to December 2005, these surveys were conducted alongside 20 sobriety checkpoints and 3,307 vehicles were selected to participate in the surveys. Between September to December 2007, PIRE participated in 17 sobriety checkpoints and 3,622 vehicles were selected to participate in the survey. Between May and September 2008, PIRE participated in 20 sobriety checkpoints and 4,229 vehicles were selected to participate in the surveys.

In 2005, 5% of drivers were alcohol-positive. In 2008, 94.9% were alcohol-positive. The percentage of drivers who had BACs between .005 and .049 grams g/dL increased slightly from 3.3% in 2005 to 4.1% in 2007 but decreased slightly to 3.7% in 2008. The percentage of drivers with BACs between .05 - .079 g/dL remained constant at .6% for all 3 years, while the percentage of drivers with BACs at or over .08 g/dL remained steady (1% in 2005 and .8% in 2007 and 2008).

Though we were unable to draw definitive conclusions about the effect of the high-visibility enforcement program in the targeted counties, it is clear that New Mexico's statewide efforts, which included high-visibility enforcement, extensive publicity, legislative, and policy initiatives, statewide agency collaboration and coordination, and high level leadership with visibility, have resulted in meaningful reductions in alcohol-involved crashes.

References

Allena, T., & Scott, S. (2003) *New Mexico Multi-Agency DWI Strategic Plan*. Albuquerque: New Mexico Department of Corrections.

National Highway Traffic Safety Administration. (2010). *Fatality Analysis Reporting System*. Washington, DC: Author. Retrieved from www-fars.nhtsa.dot.gov/Crashes/CrashesAlcohol.aspx

New Mexico Traffic Safety Bureau. (2009). *Driving While Impaired*. Santa Fe, NM: Author. Retrieved from www.unm.edu/~dgrint/dgr.html

Appendix A:
Activity Report
(for Web-based reporting system)

Activity Report - New Mexico

Enforcement Activity Type:

Reporting Period:

Location of Activity

Intersection or Roadway: Starting Time:
 City: Ending Time:
 County: Site Supervisor:
 Activity Date: Contact Phone Number:

Participating Law Enforcement Agencies

State Police District: Number – FTE:
 County: Number Other Sworn:
 City: Other Participating Entity:
 Other: Government/Non-Government Entities:

Law Enforcement Activities

Number of Vehicles Contacted or Passing Through Checkpoint: Number of Vehicles Pulled Aside as a Suspected Impaired:
 Number of DWI Arrests:

Citations

Seat Belt Citations: Child Restraint Warnings:
 Seat Belt Warnings: Party Patrol Citations:
 Child Restraint Citations: Underage Drinking Citations:

Other Traffic Related Offenses

Felony Arrests: Uninsured Motorists:
 Recovered Stolen Vehicles: Speeding:
 Number of Weapons Seized: Reckless Driving:
 Fugitives Apprehended: Drug Arrests:
 Suspended Licenses: Other Traffic Offenses:
 Warnings: Careless Driving:
 Open Container: Vehicle Crash:

Juvenile Information

Juveniles Cited for Underage Drinking: Total Number of Citations Issued at Checkpoint:
 Juveniles Cited for Zero Tolerance (DWI) Violations:

Other Information

Notes:

Media Activity

Materials Distributed

Was there any informational materials distributed? Type of Materials:

Type of Media

Paid Media

Number of Paid Advertisements Broadcast This Radio Ads:

Reporting Period:

TV Ads:

Billboards:

Print Ads:

Total Dollars:

Other (please explain):

Earned Media

Press Conferences:

TV News Stories Aired:

Radio News Stories Aired:

Print News Stories Run:

Other (please explain):

Officer Information

Total Number of Officer Hours Worked:

Total Number of Officer Overtime Hours:

Total Number of Administrative Hours (reporting, office work, administration):

Total Number of Personnel Activity Hours (administrative leave, personal leave, holidays, sick leave):

==Total Number of Officer Training Hours:

Total Number of Officer Court/Hearing Appearance Hours:

Total Number of DWI Arrests for the Month

Name of the Person Submitting the Report:

Phone Number:

E-mail Address:

DOT HS 811 985
March 2014



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**



www.nhtsa.gov

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