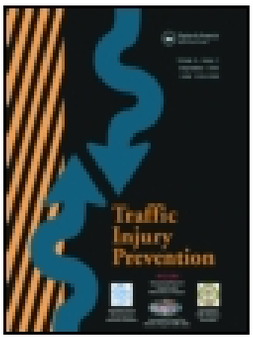

Traffic Injury Prevention

ISSN: 1538-9588 (Print) 1538-957X (Online) Journal homepage: www.tandfonline.com/journals/gcpi20

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To cite this article: Vinod Vasudevan, Shashi S. Nambisan, Ashok K. Singh & Traci Pearl (2009) Effectiveness of Media and Enforcement Campaigns in Increasing Seat Belt Usage Rates in a State with a Secondary Seat Belt Law, Traffic Injury Prevention, 10:4, 330-339, DOI: 10.1080/15389580902995190

To link to this article: https://doi.org/10.1080/15389580902995190

Traffic Injury Prevention, 10:330–339, 2009

ISSN: 1538-9588 print / 1538-957X online
DOI: 10.1080/15389580902995190

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Effectiveness of Media and Enforcement Campaigns in Increasing Seat Belt Usage Rates in a State with a Secondary Seat Belt Law

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Objective: *In 2005, in terms of seat belt usage rates, Nevada ranked third nationally and first among states with secondary seat belt use enforcement laws in the United States. An effective combination of a media-based education and enforcement campaign helped in this regard. The objective of this article is to document the effectiveness of enforcement and media-based education and outreach campaigns on the seat belt usage rates in Nevada, a state with a secondary seat belt usage law*

Methods: *Observational data on seat belt usage and passenger fatality data are used to evaluate the effectiveness of enforcement campaigns and media-based education and outreach campaigns. Data based on observations of about 40,000 vehicles in each of the years 2003 to 2005 were analyzed.*

Results: *Statistical analyses show that a significant increase in seat belt usage rates among both drivers and passengers for both genders resulted from the accompanying the media and enforcement campaigns.*

Conclusions: *The results from this study indicate that effective and well-planned media/enforcement campaigns can have a significant impact on seat belt usage rates even in a state where the enforcement of seat belt laws can only be as a secondary violation. They validate and expand on findings from other efforts documented in the literature. These results demonstrate that, if coordinated properly, media and enforcement campaigns work very effectively in increasing seat belt usage rates even in states with secondary seat belt laws.*

Keywords Seat belt; Occupant protection; Safety; CIOT campaign

INTRODUCTION

This article documents an evaluation of the effectiveness of education and enforcement campaigns, such as "Click It or Ticket" (CIOT) on the overall seat belt usage rates. This is accomplished by comparing usage rates based on observations for 3 years at 50 sites and also based on results of surveys of accompanying public awareness of the media campaigns. Because quality data on seat belt usages and documentation on the campaigns are available for the state of Nevada, they are examined to evaluate the impacts of media and enforcement campaigns on seat belt usage rates by motorists. This would be a valuable resource to other transportation and law enforcement agencies and safety advocates.

Received 13 November 2008; accepted 25 April 2009.

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The National Highway Traffic Safety Administration (NHTSA) reports that motor vehicle crashes are the eighth leading cause of death in the United States among all ages (Subramanian 2006) and motor vehicle crashes are ranked as third in terms of the years of life lost. Seat belts are intended for use by passengers as restraining devices. The proper use of seat belts also helps reduce the potential for ejection from or within the vehicle and to reduce the impact of occupant contact with the vehicle interior or other objects. A study by Blows et al. (2005) identified that non-use of seat belts was very strongly associated with increased injury crash involvement.

Seat belt usage rates historically have been influenced by the type of seat belt law in a state. Typically, states with primary seat belt laws show higher seat belt usage rates than states with secondary seat belt laws (Houston and Richardson 2005). A time-series analysis of impacts of seat belt usage laws on seat belt usage rates indicated that states with secondary enforcement laws could increase seat belt use considerably by upgrading to primary enforcement. Voas et al. (2007) identified that primary

safety belt laws have a significant impact on alcohol-related front-seat occupant fatalities on five states. The state of Nevada is one of the states yet to implement a primary seat belt law. However, belt usage rates in Nevada increased steadily over the last few years. In 2005, based on seat belt usage rates, Nevada ranked third among all the states in the United States, including states with primary seat belt laws and first among states with secondary seat belt laws (Subramanian 2005; Vasudevan and Nambisan 2005). This remarkable achievement is attributed in part to education, outreach, and enforcement campaigns implemented across the state by state safety and enforcement officials who organized several campaigns to increase motorist awareness of the importance of using seat belts (Vasudevan and Nambisan 2003, 2004, 2005; Houston and Richardson 2006).

NHTSA and individual state highway safety offices invest significant resources to improve seat belt usage rates by occupants of motor vehicles. These include media, education, and enforcement campaigns. Prior to 2004, many states conducted only one seat belt use survey per year. This was after their Click It or Ticket campaign. They did not conduct a pre-campaign survey, which would have helped to evaluate the effectiveness of the campaigns during the years prior to 2004. Because it was not mandatory for states to report such data to NHTSA, the details of surveys (of both campaigns and data collection methodology) for most states are not easily accessible. Therefore, NHTSA subsequently required each state to follow the guidelines set by NHTSA for CIOT campaigns to conduct both pre-campaign and post-campaign surveys. However, for the years 2004 and 2005, the rules established for pre-campaign surveys were not as strict as they were for the post-campaign surveys. Even then, the states were not required to document the activities or the results of the pre-campaign surveys. This makes it difficult to perform comparative analyses of the effectiveness of these campaigns on seat belt usage across states. However, such data are available for Nevada.

The Nevada Department of Public Safety's Office of Traffic Safety (NV-OTS) has been responsible since 2002 for conducting both pre-campaign and post-campaign surveys. From the year 2003 onwards, Nevada followed the CIOT guidelines established by NHTSA for both the pre- and post-campaign surveys. For both pre- and post-campaign surveys, seat belt usage data were collected for all the sites and the number of observations per site has remained the same for both these sets of surveys. NV-OTS allocates additional resources for enforcement and public education efforts as well.

OBJECTIVE

The objective of this article is to evaluate the effectiveness of enforcement and media-based education and outreach campaigns on the seat belt usage rates in Nevada.

LITERATURE REVIEW

Houston and Richardson (2006), Benjamin et al. (1996), Kostyniuk et al. (2004), and Kim and Yamashita (2003) discussed seat belt usage rates of different states based on seat belt laws and law enforcement measures. Vasudevan and Nambisan (2003, 2004, 2005) reported on efforts to determine seat belt usage rates in the state of Nevada for the years 2003, 2004, and 2005. They report that the seat belt usage rate has increased steadily over time in Nevada. Tison et al. (2008) and Vivoda et al. (2007) report on evaluations of Click It or Ticket campaigns for individual years. The Illinois DOT (2004), Williams and Wells (2004), Agent et al. (2007, 2008), and Koushki et al. (1996) documented procedures used to evaluate media and enforcement campaigns in increasing seatbelt usage rates as well as the effectiveness of these campaigns in increasing seat belt usages. Blomberg et al. (2008) illustrated the effectiveness of separate campaigns, predominantly enforcement in improving the seat belt usages in four states: Idaho, Kansas, Massachusetts, and North Dakota.

A demographic analysis of seat belt use in 2007 is reported by Ye and Pickrell (2008). Attitudes and perceptions toward seat belt usage are discussed by Perkins et al. (2009) and Ramos et al. (2008). Similar to Ramos et al., Briggs et al. (2008) report on high school students—"young" subjects. Nambisan and Vasudevan (2007) showed that the seat belt usage rates of passengers are strongly related to the usages of their drivers. These are in addition to the previously cited works by Voas et al. (2007), Houston and Richardson (2005), Blows et al. (2005), Subramanian (2005, 2006), and NHTSA (2006). Statistical analysis of seat belt usage data from high usage states and low usage states indicates that the enforcement plays a key role in higher seat belt usage rates compared to demographic characteristics or dollars spent on media (Hedlund et al. 2008). Dinh-Zarr et al. (2001) documented that stricter seat belt usage laws and enhanced enforcement showed significant improvements in occupants' seat belt usage rates. An NHTSA report (2006) discusses issues related to safety seat belt use programs and policies, and a USGAO (2008) study comments on the need to adopt improved reporting and performance measures to evaluate traffic safety programs.

In summary, a review of the literature shows that seat belt usage rates depend on a number of factors, including the types of seat belt laws (primary or secondary enforcement), penalties associated with seat belt violations (monetary fine amounts, points on drivers' records etc.), and enforcement activities. The literature also suggests that media and enforcement campaigns help enhance seat belt usage rates. However, the statistical significance of the impact of media and enforcement campaigns needs to be addressed in greater detail. These are addressed herein using data from Nevada.

METHODOLOGY

A before and after strategy was used to address the study the effectiveness of media and enforcement campaigns on seat belt usage. The term *before* (or pre-campaign) is used to identify the period each year prior to initiating a media-based education and outreach and enforcement campaign. These annual campaigns are part of the nationally recognized program known as the Click It or Ticket program, which prescribes specific dates

Table I Summary of media campaigns in Nevada, 2003–2005

Description	Year		
	2003	2004	2005
Campaign Tag Used	No Exceptions, No Excuses, Buckle Up Nevada	Click it or Ticket	Click it or Ticket
Media Used	TV and Radio	TV and Radio	TV and Radio
Funds Used	Federal and State	Federal and State	Federal and State
Languages Used	English and Spanish	English and Spanish	English and Spanish
Urban Areas Covered	Las Vegas, Reno	Las Vegas, Reno	Las Vegas, Reno
Rural Areas Covered	Elko	Elko	Elko
Target Audients' Age	18–34	18–34	18–34
Target Advertisement Penetration	At least 9 times/week	At least 6 times/week	At least 6 times/week
Additional Campaigns	Ride-alongs	Newspaper Coverage	Newspaper Coverage
Total Amount Spent on Media Campaigns	NA	NA	$180,000
GRPs for TV in Three Markets (Las Vegas, Reno, and Rural)	NA	NA	170, 100, and 100
GRPs for Radio in Three Markets	NA	NA	100, 100, and 0
Total TV Spots Purchased	NA	NA	361
Total Radio Spots Purchased	NA	NA	843
Total Media Spots (Incl. Bonus)	NA	NA	2,129

and timelines for paid and earned media campaigns, evaluation, and enforcement. The term *after* (or post-campaign) is used to refer to the period after the annual CIOT campaign. The term *media campaign* is used to refer to educational and outreach efforts through paid advertisements and public service announcements in print and broadcast media. Broadcast media include television and radio. These print and broadcast campaigns in Nevada were conducted in both English and Spanish languages. The study period consisted of the years 2003, 2004, and 2005. The rest of this section summarizes the following methodological elements: the media campaign and enforcement campaigns in Nevada, survey of public awareness, site selection, sample size determination, field observations, and statistical analyses.

Summary of Media Campaigns

NV-OTS is responsible in Nevada for the allocation of federal funds to affect the behavior of the driving public with regard to traffic safety, and particularly for seat belt usage initiatives. Table I summarizes various media campaigns in Nevada for the years 2003 to 2005. NV-OTS spent $190,000 in each of the years 2003 and 2005 and $200,000 in 2004 to pay for the Click It or Ticket media campaign, which included television (broadcast and cable) and radio markets. These amounts do not include costs associated with the production of new advertisements. These campaigns are in addition to and concurrent with those aired nationally by NHTSA. Most of the television advertisements were aired during sports broadcasts or comedy shows, and radio advertisements were aired on music stations. They were broadcast in the evening hours between 5:00 pm and midnight. These decisions were based on the characteristics of the viewers/listeners of the local broadcast markets, including the potential to reach males in the age group of 18 years to 34 years. In order to reach out to the Hispanic population, Spanish-language advertisements were also aired on Hispanic television channels and Hispanic radio stations. In addition, NV-OTS spent $70,000 in 2003, $84,485 in 2004, and $113,716 in 2005 to pay for enforcement efforts related to this program.

Purchasing paid media in Nevada is a challenging process. There are basically three media markets in the state: the Las Vegas metropolitan area, the Reno urban area, and rural areas in Nevada. Due to the nature of the spatial distribution of population within the state, there are relatively few television and radio stations available to broadcast messages in rural Nevada. Data from the Census Bureau show that in 2005, of the total population of about 2.4 million in Nevada, over 1.7 million lived in the Las Vegas metropolitan area and over 300,000 in the Reno urban area, the rest of the population (less than 15%) being scattered throughout the rural areas of the state. The Las Vegas media market is very competitive and expensive. Details of each year's media campaigns are next.

Seat belt use–related campaigns in Nevada in 2003, 2004, and 2005 consisted of federal- and state-paid media buys for TV and radio along with public service announcements (PSAs). All ads were produced in both English and Spanish. Because the concentration of paid media occurred in Clark and Washoe Counties (87% of the state's population), with both the federal TV buy as well as the state's TV buy, the message was broadcast to the target audience (males age 18–34) at least nine times within one week in 2003 and at least six times within one week in 2004 and 2005. An independent telephone awareness survey conducted for the 2002 campaign indicated significant increase in recognition of the "No Exceptions, No Excuses" slogan and credited it more toward the expectation of enforcement than to media campaigns.

Earned media during the May 2003 campaign included ride-alongs with law enforcement officers. Five major media stations (KINC-TV Univision LV; KTVN-TV [CBS Reno]; KOLO-TV [ABC Reno]; KRNV-TV [NBC Reno]; KTNV-TV [ABC LV]; and KLAS-TV [CBS LV]) requested and participated in these ride-alongs. These were in addition to the coverage of press event kick-offs and upcoming enforcement events. Although

official earned media tracking was not conducted until 2005, multiple newspaper articles were published about the enforcement campaign, as well as follow-up stories from ten major newspapers throughout the state.

The May 2005 campaign provided over $180,000 of paid media for just the state's PSA, totaling 170 gross rating points (GRPs)/week for TV and 100 GRPs/week for radio in the Vegas market; 100 and 100, respectively, in the Reno market; and 100 GRPs/week in the cable TV market for the rural areas broadcast from Salt Lake City, Utah. A total of 843 radio and 361 TV ads were purchased, with over 2129 spots being aired, including the "bonus" runs. This did not include the federal TV buy/ads.

Summary of Enforcement Campaigns

The CIOT campaign was initiated in the month of May in each year. It had two phases. Phase one consisted of determining the before condition seat belt usage rate, followed by broadcasts to inform the public about the stepped-up seat belt use enforcement that was to occur in the following weeks. The announcements stated that motorists observed not wearing seat belts would be cited. During week 1, NV-OTS initiated "earned" media events (earned media events refer to media broadcasts at no costs to NV-OTS). The earned media continued through week 4. Additionally, paid media broadcasts were made during weeks 2 and 3. Phase two consisted of two weeks of stepped up enforcement of safety belt laws (during weeks 3 and 4). In this phase, enforcement agencies cited drivers if they or their passengers failed to use seat belts while observed by a law enforcement officer for any other traffic violation (this is because a seat belt violation cannot be the primary reason for a law enforcement officer to stop a motorist in Nevada).

Utilizing the NHTSA approach for changing driving behavior, in 2001 the Nevada OTS initiated a program designed to enhance law enforcement efforts across the state. The program is called "Joining Forces." In 2005, it featured 19 law enforcement agencies who worked together in conducting multi-jurisdictional selective traffic enforcement program (STEP) and driving under influence (DUI) checkpoints. Through Joining Forces, OTS provided funding to agencies for staff overtime pay to conduct traffic enforcement activities during the year. The source of funds for these enforcement activities is primarily federal grants from agencies such as NHTSA and the Federal Highway Administration (FHWA). Agencies participating in the Joining Forces program include the Nevada Highway Patrol (three area commands), Las Vegas Metropolitan Police Department, Henderson Police Department, North Las Vegas Police Department, Reno Police Department, Sparks Police Department, Washoe County Sheriff's Department, Douglas County Sheriff's Department, and Carson City Sheriff's Department. Combined, these agencies provide service to areas covering over 90 percent of Nevada's population. These agencies were expected to participate in the key national safety belt and DUI enforcement mobilizations. In addition, they were encouraged, but not required, to participate at several key times during the year (e.g., long holiday weekends). Most of the larger agencies participated in eight or more events, but the smaller departments simply did not have the manpower to conduct more than the two required events.

Table II Summary of enforcement campaigns in Nevada, 2002–2005

	Year			
Item	2002	2003	2004	2005
Statewide Seat Belt Use (%)	74.9%	78.7%	86.6%	94.8%
State Population (Millions)	2.21	2.30	2.41	2.52
Enforcement Funding	$213,000	$250,000	$245,000	$321,000
# Law Enforcement Agencies Involved	19	22	23	27
# Enforcement Events	22	24	46	73
% State Population Covered	91.5%	92.0%	92.4%	94.8%
Overtime Hours	3,156	2,906	2,828	1,374
# Seat Belt Citations	3,570	2,294	1,598	2,706
Total Citations	11,001	8,274	6,486	7,973
% SB Citations	32.5%	27.7%	24.6%	33.9%

Table II summarizes the enforcement campaigns for the years 2002–2005. Analysis of enforcement data for May seat belt campaigns held in 2002–2005 reveals an upper limit of $321,000 for the law enforcement overtime funding. This is, of course, based on a state with only 17 (large) counties and 36 law enforcement agencies. It is also important to adjust these numbers based on inflation or purchasing power. Over the years the Click It or Ticket message has kept its strength, as evidenced by reduced enforcement (fewer hours) and lower overtime expenses, while maintaining an observed statewide seat belt usage rate of over 90 percent since 2005. Table II suggests that a combination of the level of expenditures for these enforcement campaigns, the exposure (number of events), and the proportion of population in the areas served by the agencies involved in these events are important determinants of the effectiveness of these campaigns. Simply incurring expenditures for overtime pay for officers does not ensure higher levels of seat belt usage. Thus, a prudent approach would be to arrange "more" enforcement events that occur within the normal activities of officers (perhaps shorter duration or with fewer officers) and supplement them with several similar additional events. This would translate to about $15,000 per agency annually for an average of three events per agency ($310,000/year for 27 agencies that had a total of 73 events).

Survey of Public Awareness

The Preusser Research Group (PRG) was tasked in 2004 by NV-OTS to evaluate awareness among the public of the CIOT campaign. The Preusser Research Group conducted telephone surveys during the year 2004. Before and after surveys were conducted in two phases to mirror the seat belt usage observations Over 650 responses were obtained for each of the telephone surveys (before and after). Questions asked of the respondents assessed media penetration and attitudes toward law enforcement agencies enforcing seat belt use laws. A summary of the

questionnaire is presented later in this article along with the results of the surveys. The statistical significance of the changes in public awareness was also evaluated (PRG 2004).

Site Selection and Seat Belt Usage Observations

Seat belt usage observations were conducted at 50 locations across the State of Nevada. The sites were selected based on guidelines established by the NHTSA for "State Observational Surveys of Seat Belt Use" (NHTSA 2000). The sites are distributed geographically across the state and include both rural and urban areas. The sites were originally identified to be distributed along roadways proportionate to the annual vehicle miles of travel (AVMT) across the state. A minimum of two monitoring sites was included for each functional class and area category such as rural interstates, urban interstates, rural arterials, and urban arterials. The sites are at locations with stopped or slow moving traffic where seat belt usage can be observed.

A minimum of 400 vehicles were observed at each of the 50 sites. This resulted in observations of drivers and front seat passengers in over 20,000 vehicles for each of the before and after conditions during each year of the study period. Data from the individual sites are compiled into a database to facilitate analyses. The analyses consist of the following: determination of the rates of seat belt usage, comparison of the rates of seat belt usage for the before and after conditions, and statistical tests to determine significance of the results. These analyses are performed based on data for the state as a whole, as well as disaggregated based on the following criteria: driver, passenger, and gender.

Sample size determination. To properly estimate the required number of observations, either a seat belt usage rate from an earlier study or an estimate of the seat belt usage rate is needed. A binomial distribution was assumed for the data (the subject either wore a seat belt or did not wear a seat belt). The number of observations based on binomial distribution is calculated using Eq. (1).

$$n = z^2P(1 - P)/e^2 \quad (1)$$

where n is the required number of observations, z is the standard normal deviate appropriate for the desired confidence level, P is initial or anticipated estimated seat belt usage rate, and e is the tolerable error.

If an estimate of 50 percent for the seat belt usage rate is used (i.e., $P = 0.50$), it would result in the most conservative estimate for the number of observations required for the desired level of statistical significance. This usage rate was used as a starting point for the calculations because it generated the highest number of needed observations. For a 95 percent confidence level and 5 percent tolerable error, and for $P = 0.50$, using Eq. (1) results in the minimum number of observations for each site to be 384.2. In other words, at least 385 observations should be made at each site to ensure that the observed usage rate is within the actual usage rate plus or minus the 5 percent tolerable error at a 95 percent confidence level.

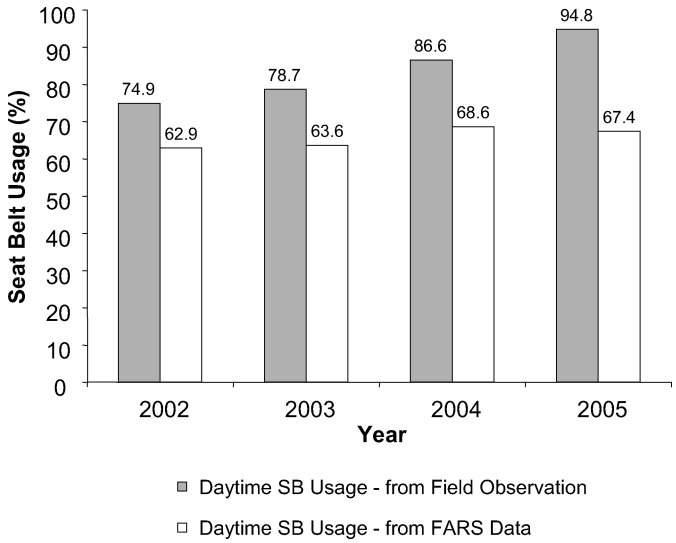

Figure 1 Comparison of daytime seat belt usage rate in Nevada: field observations vs. FARS data.

Field observations. Based on the aforementioned calculations, a minimum of 400 vehicles were observed at each site. Data were collected by observing only stopped or slow-moving traffic. The observations were made during daylight hours and on any day of the week: weekdays and weekends. Seat belt usage observations were made twice a year in order to evaluate the effectiveness of media campaigns: March–April (pre-media campaign) and June–August (post-media campaign). Only the occupants in the front seat of the vehicles were observed and their gender was also recorded.

Seat Belt Usage Rate from Fatality Data

Field observations provide the seat belt usage rates representative of that in the general population. Seat belt usage rates based on motor vehicle fatality reports also provide indications on seat belt usage in fatal crashes. The nationwide seat belt usage rates were 79, 80, and 82 percent, respectively, in 2003, 2004, and 2005 (National Center for Statistics and Analysis [NCSA] 2006), whereas the seat belt use rates from fatal crashes were 41.6, 45.0 (NHTSA 2005), and 41.0 percent (NHTSA 2006), respectively, for the same years. Figure 1 provides a comparison of the seat belt usage rates in Nevada from field observations and from daytime fatality data for the years 2001 to 2005. Fatality data were obtained from Fatality Analysis Reporting System (FARS; NCSA, 2006). The figure shows that the seat belt usage rate in fatal crashes is much lower than that observed in the field.

The data were further analyzed to check for relationships between these two data sources. A one-sided test of equality of two proportions (Walpole et al. 2002) was used in this case, which resulted in strong rejection of equal proportions for each year ($P \leq 0.0001$ for each year); in addition, the 95 percent confidence intervals for the difference in seat belt usage proportions (Nevada − FARS) were computed. These are summarized in Table III, which shows that all of these confidence intervals do not include 0 and they are positive, indicating that the Nevada proportions are higher than those calculated from the

Table III Comparison of Nevada and FARS data seat belt usage for the years 2002–2005

Year	# Seat Belt Users-Daytime (X)		Total Observation/ Sample Size (N)		95% Confidence Interval for Difference (Observed-FARS)	P-Value
	Observed	FARS	Observed	FARS		
2002	20,976	315	28,006	501	(7.8%, 16.3%)	< 0.0001
2003	20,888	280	26,471	440	(10.8%, 20/0%)	< 0.0001
2004	22,461	300	25,939	437	(13. 6%, 22.3%)	< 0.0001
2005	26,317	298	27,748	442	(23.0%, 3 1.8%)	< 0.0001

FARS data. There are two possible reasons for this observed difference in proportions for each year: (a) the Nevada seat belt usage rate used in this study is based on a specific time period, immediately after media and enforcement campaigns, whereas the FARS data are for the entire year; and (b) FARS data represent only fatal crashes and may not represent all motorists; in other words, the probabilities calculated from FARS data are conditional probabilities. However, even then, as the observed rate of seat belt usage increased in Nevada, so did the seat belt usage rates reported in the FARS.

Statistical Evaluation of Changes in Seatbelt Usage Rate

It is anticipated that the seat belt usage rate will increase due to the media and enforcement campaigns. However, in order to draw firm conclusions about the effectiveness of the campaign, it is important to check whether these increases are statistically significant. The statistical significance of the effectiveness of the campaigns can be evaluated using standard hypothesis testing techniques. In this case, the null hypothesis is that the rate (or proportion) of seat belt usage remains the same before and after the campaigns. The alternate hypothesis is that the proportion of seat belt usage rate is higher for the period after the campaigns. Let p_1 and p_2 represent proportions before and after the campaigns, respectively. Then, the hypothesis of equality of proportions is to be tested against the one-sided alternative that $p_1 < p_2$ (McClave and Sincich 2000). This is mathematically formulated as follows:

$$\text{Null hypothesis:} \quad H_o : p_1 - p_2 = 0$$

$$\text{Alternate hypothesis:} \quad H_1 : p_1 - p_2 < 0$$

The test statistic for the null hypothesis, the z statistic, Z_{OBS}, is defined as follows:

$$Z_{OBS} = \frac{\hat{p}_2 - \hat{p}_1}{\sigma_{\hat{p}_2 - \hat{p}_1}} \tag{2}$$

where $\hat{p}_1$ and $\hat{p}_2$ are the proportion of seat belt usages before and after media campaign, respectively.

$$\hat{p}_1 = x_1 / n_1 \tag{3}$$

and

$$\hat{p}_2 = x_2 / n_2 \tag{4}$$

where x_1 and x_2 are the number of drivers/occupants wearing seat belts before and after campaign, respectively, and n_1 and n_2 are the total number of drivers/occupants in the vehicles before and after campaign, respectively.

Once Z_{OBS} value is calculated, the p-value is identified from the standard normal distribution curve as follows:

$$p - \text{value} = P(Z < Z_{OBS})$$

If the p-value obtained is lower than α, then the null hypothesis is rejected; that is, if the p-value $< \alpha$, reject H_o, where $\alpha = 0.05$ for a confidence level of 95 percent. Alternatively, if the p-value is lower than the α value, the alternate hypothesis is accepted, which means that the increase in the proportion of seat belt usages is statistically significant.

RESULTS AND DISCUSSIONS

Results of the analyses and pertinent discussions follow.

Enforcement

A summary of the citations issued from enforcement activities during the Click It or Ticket campaigns is presented in Table IV.

Table IV Summary of traffic citations issued during the Click It or Ticket campaign

Violation	2003		2004		2005		Total	
	# Citations	%	# Citations	%	# Citations	%	# Citations	%
Seat Belt	2,294	27.7%	1,598	24.6%	2,727	33.6%	6,619	28.9%
Child Seat	230	2.8%	143	2.2%	255	3.1%	628	2.7%
DUI	195	2.4%	186	2.9%	94	1.2%	475	2.1%
Other	5,552	67.1%	4,559	70.3%	5,034	62.1%	15,145	66.2%
Total	**8,271**	**100.0%**	**6,486**	**100.0%**	**8,110**	**100.0%**	**22,867**	**100.0%**

Source: Nevada Office of Traffic Safety.

Table V Summary of telephone survey regarding awareness of seat belt usages and campaigns

Question (RESPONSE)	Pre Camapign N = 650 %	Post Campaign N = 652 %	Chi-Square
Media Penetration			
Awareness of any special effort by police to ticket drivers for seat belt violations? (YES)	12%	58%	$p < 0.001$
If yes, where did you hear/see the message?			
TV	—	63%	
Radio	—	16%	
Newspaper	—	11%	
Other	—	10%	
Whether they have seen/heard any messages that encourage use of seat belts (all modes including TV, Radio, Signs, News Stories, ..)	26%	45%	$p < 0.001$
Attitudes toward Law/Police			
Police are writing more seat belt tickets now than they were a few months ago. (STRONGLY AGREE)	15%	40%	$p < 0.001$
It is important for police to enforce the seat belt laws. (STRONGLY AGREE)	66%	75%	$p < 0.001$

Source: PRG (2004).

The analysis shows that of the nearly 23,000 citations issued by law enforcement officers during the Click It or Ticket campaign in the 3 years, only about 29 percent were for seat belt violations, 2 percent for DUI, and over 66 percent were for "other" violations. This is not surprising because Nevada did not have a primary seat belt enforcement law; consequently, a law enforcement officer cannot pull over a motorist and issue a citation solely because of a seat belt use violation.

Public Awareness

A summary of the questionnaire used to determine the public awareness of the Click It or Ticket campaign is presented in Table V (PRG 2004). Also included in Table V are summaries of the results of the responses to the telephone surveys for the before and after periods and the statistical significance of the differences between the two periods. The results show that 58 percent of the respondents reported being aware of efforts by police to issue citations for seat belt use violations during the after period compared to only 12 percent during the before period. A strong majority (63%) of the respondents who were aware of the efforts became aware of it from television messages. About 40 percent of the respondents in the after period thought that police were issuing more citations for seat belt violations than a few months earlier, when compared to only 15 percent of the respondents in the before period. The percentage of respondents who thought it was important for police to enforce seat belt laws changed from 66 to 75 percent from the before period to the after period. All of these changes are statistically very significant (at a confidence level better than 99%). Thus, the Preusser Research Group (2004) reported that "without a doubt the driving public in Nevada encountered the mobilization's publicity."

Seat Belt Usage Rates

Results of the aggregated analysis of seat belt use rate for the years 2003 to 2005 for Nevada as a whole are shown in Table VI. Table VI consists of three sections, one for each of the study years. Each section has three sets of columns: the first set of columns is for the pre-campaign period, the second set of columns is for the post-campaign period, and the third set of columns provides a summary of the test for statistical significance for differences between the two periods. The sets of columns for the pre-campaign and the post-campaign periods include columns with data for the number of vehicle occupants using seat belts, the total number of vehicle occupants observed, and the corresponding percentage of occupants using seat belts. For each year and for each of the pre-campaign and post-campaign periods, the data are further disaggregated by drivers and passengers and their genders. The set of columns for the statistical significance provides information about the computed Z_{OBS} value, the *p*-value (indicative of the statistical level of confidence), and whether the difference in the rates of seat belt usage before and after the campaign is statistically significant at a 95 percent confidence level.

Table VI shows that the overall seat belt usage rate in 2005 in the state of Nevada increased from 88.4 percent before the media and enforcement campaigns to 94.8 percent after the campaigns. The seat belt usage rate for drivers increased from 87.7 to 94.4 percent, whereas for front seat passengers alone the increase was from 90.1 to 96.0 percent. The seat belt usage rates in 2005 for drivers based on gender showed that the usage rate for male drivers increased from 86.0 to 93.6 percent and for female drivers the increase was from 91.3 to 96.2 percent. All of these are highly significant statistically. Therefore, in all cases the null hypothesis is rejected, indicating that the seat belt rates after the campaigns are statistically greater than the seat belt rates before the campaigns. Analyses of the data for the years 2004 and 2003 also show similar increases in seat belt usage rates.

One important observation is that the seat belt usage rate during the pre-campaign period in a year is greater than that observed in the post-campaign period of the previous year. However, these changes are relatively smaller compared to the changes observed during the Click It or Ticket campaigns. For example, the seat belt usage rates of male drivers in the 2004 post-campaign period is 84.3 percent (Table VI), whereas for 2005 pre-campaign period the seat belt usage rate for male drivers was 86.0 percent. In some of the cases the rates for the pre-campaign period in one year are marginally lower than the post-campaign period of the previous year. This could also be interpreted to mean that there is not much of a "slippage" in the usage rate from one year to another. This implies that

Table VI Seat belt usage rates of drivers and passengers (statewide data)

Year	Occupant Group	Pre-Campaign (Before)			Post-Campaign (After)			Z_{obs}	p-value	Statistical Significance (95%)
		# SB Used	# Observation	% Usage	# SB Used	# Observation	% Usage			
2003	Male Drivers	9,651	13,498	71.5%	9,832	12,935	76.0%	−8.33	<0.001	Significant
	Female Drivers	5,038	6,502	77.5%	5,885	7,065	83.3%	−8.54	<0.001	Significant
	All Drivers	14,689	20,000	73.4%	15,717	20,000	78.6%	−12.04	<0.001	Significant
	Male Passengers	1,608	2,434	66.1%	1,734	2,397	72.3%	−4.72	<0.001	Significant
	Female Passengers	3,564	4,452	80.1%	3,437	4,074	84.4%	−5.19	<0.001	Significant
	Passengers	5,172	6,886	75.1%	5,171	6,471	79.9%	−6.63	<0.001	Significant
	All Occupants	19,861	26,886	73.9%	20,888	26,471	78.9%	−13.70	<0.001	Significant
2004	Male Drivers	10,740	13,641	78.7%	11,295	13,402	84.3%	−11.74	<0.001	Significant
	Female Drivers	5,380	6,359	84.6%	5,874	6,598	89.0%	−7.45	<0.001	Significant
	All Drivers	16,120	20,000	80.6%	17,169	20,000	85.8%	−14.04	<0.001	Significant
	Male Passengers	2,070	2,614	79.2%	1,735	2,073	83.7%	−3.92	<0.001	Significant
	Female Passengers	4,188	4,727	88.6%	3,557	3,866	92.0%	−5.27	<0.001	Significant
	Passengers	5,824	6,907	84.3%	5,292	5,939	89.1%	−7.92	<0.001	Significant
	All Occupants	22,378	27,341	81.8%	22,461	25,939	86.6%	−14.99	<0.001	Significant
2005	Male Drivers	11,676	13,574	86.0%	12,686	13,560	93.6%	−20.50	<0.001	Significant
	Female Drivers	5,870	6,426	91.3%	6,196	6,441	96.2%	−11.38	<0.001	Significant
	All Drivers	17,546	20,000	87.7%	18,882	20,000	94.4%	−23.42	<0.001	Significant
	Male Passengers	2,369	2,729	86.8%	2,555	2,737	93.4%	−8.09	<0.001	Significant
	Female Passengers	4,159	4,514	92.1%	4,880	5,011	97.4%	−11.63	<0.001	Significant
	Passengers	6,528	7,243	90.1%	7,435	7,748	96.0%	−14.12	<0.001	Significant
	All Occupants	24,074	27,243	88.4%	26,317	27,748	94.8%	−27.42	<0.001	Significant

$Z_{crtitical} = 1.645$ (for $\alpha = 0.05$).

the benefits from the Click It or Ticket campaign are not fleeting (i.e., for a short duration following the campaign) but have longer lasting impacts and this is perhaps the residual or carry-over effect from one year to another. The rates of such increases are likely to diminish as the seat belt usage rates increase. The reasons for these changes could be because of other enforcement and education campaigns conducted during the year. The very high rate of seat belt usage rate observed in the most recent years should be noted in the context that the rate of improvement in seat belt usage cannot continue indefinitely into the future.

Comparison with Other States' CIOT Efforts

With the assistance of NV-OTS, attempts were made to obtain information from the other states regarding the details of their CIOT campaigns and their outcomes. Responses were provided by only three states: Colorado, Utah, and Vermont. Because these states also have secondary seat belt laws, a comparison of their seat belt campaigns and their effectiveness is relevant.

Data from Colorado did not include details of their campaigns but contained a summary of seat belt usage rates before and after the CIOT campaigns. For the year 2004, the overall seat belt usage rate increased from 78.5 to 79.3 percent after the campaign. Likewise, for the year 2005, the average seat belt usage rate increased from 75.2 to 79.2 percent after the campaign. Vermont also conducts the May CIOT campaign in accordance with NHTSA's requirements. They conduct secondary CIOT campaigns each year normally around the Thanksgiving holiday period. For the years 2002 and 2003, Vermont safety officials conducted safety checkpoints throughout the year to enforce general traffic laws and offered help with child safety seats. These proved effective in some ways. The average seat belt usage rates were 68.0 and 84.3 percent, respectively, for before and after the CIOT campaign for the year 2006. However, their data suggest that Vermont has been struggling to sustain high seat belt usage rates. Data from Utah were provided for the year 2005. Their campaigns mainly targeted high schools. In addition to organizing events at high schools, they aired advertisements both on television and radio. Their Office of Traffic Safety spent around $145,000 on paid media. Enforcement activities were also conducted with a focus on seat belt usage. A total of 6600 seat belt citations were issued over the two-week enforcement campaign period. The overall seat belt usage rate increased from 79.9 to 86.9 percent as a result of the campaign.

Data obtained from the states of Colorado, Utah, and Vermont indicate that the CIOT campaigns based on NHTSA's guidelines help improve the seat belt usage rates. However, the seat belt usage rates observed in Nevada are higher than those in these three states. It appears that Colorado, which is the only state for which data were obtained for multiple years, did not maintain the gains in seat belt usage rates after the CIOT campaign from one year to the before period in the subsequent year. This is unlike what was observed in Nevada. Further, the data from these states do not permit the detailed analyses as was performed for Nevada. Additional efforts to investigate these differences merit further consideration.

CONCLUSIONS

The results reported herein show that by effectively coupling media and enforcement campaigns, a significant increase in seat belt usage could be achieved in Nevada, a state with a secondary seat belt law. This is based on the findings of a telephone-based

survey of the general public and extensive field observations of seat belt usage by drivers and passengers in the front seats of vehicles at 50 sites across Nevada for the years 2003, 2004, and 2005. In each of these years, over 20,000 vehicles and 25,000 passengers were observed before and after a campaign that included media-based education and outreach efforts and enforcement efforts.

The results of a telephone-based survey indicates that the media-based approach for education and outreach on the use of seat belts (Click It or Ticket campaign) was effective in increasing the public's awareness of the campaign in Nevada. The respondents also felt that law enforcement officers were issuing more citations following the campaign than prior to the campaign. Further, more respondents strongly agreed that it was important for the police to enforce the seat belt law after the campaign than they did prior to the campaign. All of these were highly statistically significant (95% confidence level).

A comparison of seat belt usage rates before and after the media and enforcement campaigns shows that the campaigns were effective in improving the seat belt usage rates statewide. The rate of seat belt use increased universally among all drivers, all passengers, male drivers, and female drivers. The increases were very significant for each year during the study period for each of these groups of occupants. Further, an important observation is that in almost all cases, the seat belt usage rate in a pre-campaign period for a year is greater than the post-campaign period usage rates of the previous year. This indicates that the benefits from such campaigns have residual impacts from one year to the next. However, it is unlikely that this improvement will continue indefinitely into the future because of the very high rate of seat belt use that has already been attained.

This high observed usage rate, however, is a detriment to the state's ability to pass a primary seat belt law, because legislators do not understand how that would increase an already high observed usage rate above 90 percent. However, although increases in restraint use noted in fatal crashes correlate with the observed usage increases, they also show a different picture: they level off at approximately 50 percent of motor vehicle occupant fatalities being restrained. It is this group that would benefit the most from the enactment of primary seat belt use legislation. Other data indicate that young male, impaired, and/or nighttime drivers make up a significant portion of this group. Such analyses and safety advocates believe that a primary seat belt law will help improve seat belt usage among this group.

In summary, the analyses presented in this article clearly indicate that the public in Nevada were well aware of the Click It or Ticket campaign primarily through the education and outreach campaigns. Further, field observations reveal that this awareness had an impact on their seat belt usage. The seat belt usage rates during the period after the campaign were significantly higher (at a 95% confidence level) than those observed in the period before the campaign. The active involvement of media clearly helped to attract public attention. Similar innovative programs would help gain public attention of various campaigns. An independent survey attributed the success of Nevada's high usage rate to its enforcement and media campaigns. The Joining Forces program was effective in coordinating various enforcement campaigns and programs. This is a program that other states rates could adopt for similar programs or campaigns. The success of Nevada in improving its seat belt usage consistently over the years illustrates that effective and well-planned media/enforcement campaigns can have a significant impact on seat belt usage rates even in a state where the enforcement of seat belt laws can only be as a secondary violation. Limited data from three other states with secondary seat belt laws suggest that they too experience increases in seat belt usage rates from the CIOT campaigns, although their rates are lower than those observed in Nevada. Thus, the results from this study would be useful for improving seat belt usage rates in other states through coordinated outreach and enforcement activities.

ACKNOWLEDGEMENTS

The authors are grateful to a number of individuals and organizations who provided invaluable support on efforts that led to the development of this manuscript. Several students and staff members from the Transportation Research Center at UNLV helped with the data collection and integration efforts. The guidance and support provided by Charles Abbott, formerly of the Nevada Office of Traffic Safety, is appreciated. The authors thank the Nevada OTS for financial assistance that formed the basis of the initial efforts in the development of this article. The authors thank two anonymous referees for valuable comments that helped improve the manuscript. The authors are responsible for the accuracy of information presented in this article, and the opinions presented herein are solely those of the authors and they do not necessarily reflect those of the Nevada OTS, UNLV, or Iowa State University.

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