An Evaluation of the Great Lakes Region Rural Safety Belt Demonstration Project in Minnesota

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July, 2005

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INTRODUCTION

Residents of rural areas are at greater risk of traffic-crash-related death or injury than those who reside in urban areas. While only about 21 percent of the United States' (US) population lives in rural areas and about 40 percent of total vehicle miles traveled are on rural roads, 60 percent of the US traffic fatalities occur on rural roads (National Highway Traffic Safety Administration, NHTSA, 2004). There are many factors that account for the over-representation of rural roads in fatal crashes including alcohol, high-speeds, vehicle rollovers, and greater delays in emergency services responding to crashes. Lack of safety belt use is also a contributing factor.

Great strides have been made in increasing safety belt use in the United States over the past decade. According to NHTSA, however, safety belt use in rural areas is less than use elsewhere (Glassbrenner, 2003). In 2002, rural belt use was 72 percent while urban use was 75 percent nationwide (Glassbrenner, 2003). These differences are even greater when certain vehicle types are considered. For example, belt use in pickup trucks was only 54 percent in rural areas compared to 69 percent in non-rural areas of the US (Glassbrenner, 2003).

Similar results are found in the Great Lakes Region of the US which includes Minnesota, Wisconsin, Illinois, Michigan, Indiana, and Ohio. In this region, about two-thirds of crash-related fatalities are in rural areas (Great Lakes Project, 2005). In 2003, of the 4,830 passenger vehicle occupant fatalities, 66 percent were rural, 55 percent of the rural fatalities were not belted, and 68 percent of all unrestrained fatalities were in rural areas (Great Lakes Project, 2005).

In order to target belt use promotion efforts to rural areas in the Great Lakes Region, NHTSA created the *Great Lakes Region Rural Safety Belt Demonstration Project* in January 2005. Based upon the successful formula of the *Click It or Ticket* (CIOT) program, the rural demonstration project was composed of highly visible enforcement efforts coupled with targeted outreach and media efforts (Great Lakes Project, 2005). The region-wide approach was designed to be implemented alongside the CIOT campaign occurring in each state in the region.

Minnesota participated in both the May 2005 CIOT campaign and the *Rural Safety Belt Demonstration Project*. As part of the rural project, NHTSA spent $300,000 for a media campaign in four rural Minnesota markets that included radio, broadcast/cable television, and billboards. No targeted enforcement in rural areas was conducted in Minnesota, but there was increased enforcement statewide in the form of over time enforcement as part of the CIOT campaign.

The Minnesota Office of Traffic Safety (OTS) selected EPIC•MRA and consultants from the University of Michigan Transportation Research Institute to assist in the selection of survey sites and to analyze data in order to evaluate the *Rural Safety Belt Demonstration Project* activities implemented in Minnesota. This report documents the survey design, methods, data analysis, and results.

METHODS

As developed by NHTSA and the Preusser Research Group (PRG), the study was designed to determine the effectiveness of the *Great Lake Region Rural Safety Belt Demonstration Project* in Minnesota by comparing safety belt use rates from data collection sites in two rural areas in Minnesota. In one area (Southeastern Minnesota) the project activities were implemented (targeted area), while in the other area (Northwestern Minnesota) no activities were implemented (non-targeted area). The rural project activities took place the two weeks prior to the CIOT campaign activities. In addition to targeted/non-targeted evaluation, OTS wanted to evaluate the changes in safety belt use at all sites that received the demonstration project activities (28 sites total). Therefore, two separate evaluations were conducted.

Data for the rural demonstration project evaluation activities were collected at the same time as the May 2005 CIOT evaluation in Minnesota, which included three waves of data collection—before, during, and after the campaign.

For the targeted/non-targeted evaluation PRG selected the counties that comprised each rural area in Minnesota based on population and other demographic variables. For the targeted region, the counties were: Fillmore, Mower, Dodge, Freeborn, Wabasha, Goodhue, Rice, Steele, and La Sueur. Counties in the non-targeted region were: Kittson, Roseau, Lake of the Woods, Marshall, Pennington, Red Lake, Clearwater, Polk, Norman, Mahnomen, and Becker. In order to be able to compare the project data to past data collection, PRG selected sites within each region from the statewide sample design (Eby, Vivoda, & Cavanagh, 2003). Since NHTSA (1992, 1998) guidelines, however, allow for the elimination of low population counties from the statewide sample, many rural counties in Minnesota did not have previous data collection sites. Therefore, in addition to the sites from the statewide survey, an additional 10 sites from the targeted area and 6 sites from the non-targeted area were selected by the authors using the same random procedures that were utilized for site

selection in the statewide survey (Eby, Vivoda, & Cavanagh, 2003). Standing locations at each intersection were also determined using the same procedures as the statewide survey (Eby, Vivoda, & Cavanaugh, 2003). All data for this evaluation effort were collected by trained PRG researchers. Data collection followed the procedures utilized in the May 2005 *CIOT* evaluation (Eby, Vivoda, & Cavanagh, 2005). Data from these sites were forwarded to us by PRG for analysis of belt use in the two areas across the three waves of data collection.

Sites for the second evaluation consisted of all sites from the statewide survey that were in a media market in which rural safety belt demonstration project information was shown. This consisted of a total of 28 sites. This evaluation utilized the May 2005 *CIOT Safety Belt Mobilization* evaluation efforts already taking place in the state. Data from the existing sites were extracted for separate analysis of the rural demonstration safety belt project. Data from these were analyzed for belt use in each of three waves of data collection.

Because sites were selected without respect to a statistical sample survey design, no weighting of data was conducted in either evaluation. Data between sites within each area were combined and standard use-rates and variances were calculated. Chi-square tests were conducted to test for differences between the rates as a function of survey wave.

RESULTS

Targeted/non-targeted evaluation

The study results are summarized in Table 1. This table shows the percent belt use and number of observations (N) for the targeted and the non-targeted rural regions for each survey wave by overall, vehicle type, sex, and age. Also included is the chi-square (Π^2) statistic and probability value (P) calculated across survey waves. Significant P-values are shown in bold.

Table 1: Regional Safety Belt Use Rates as a Function of Region, Survey Wave, Variable, and the Chi-Square Statistic Across Waves.

Variable	Wave 1 (April)		Wave 2 (May)		Wave 3 (June)		Statistic	
	% Use	N	% Use	N	% Use	N	Π^2 (DF)	P
Overall								
Targeted (T)	72.3	846	72.0	1,091	73.8	1,278	1.11 (2)	.573
Non-Targeted (NT)	53.5	708	56.6	624	60.1	662	6.05 (2)	**.049**
Vehicle Type								
T Car	76.5	413	76.3	548	79.9	561	2.48 (2)	.290
NT Car	64.0	286	65.3	248	59.9	302	1.91 (2)	.385
T Pickup	54.7	214	62.5	261	56.2	338	3.52 (2)	.172
NT Pickup	35.3	255	40.5	215	53.7	190	15.52 (2)	**.000**
T SUV	77.5	89	72.7	139	78.2	211	1.51 (2)	.469
NT-SUV	63.9	83	63.9	61	64.4	101	0.01 (2)	.997
T-Van/minivan	84.6	130	72.0	143	83.3	168	8.59 (2)	**.014**
NT-Van/Minivan	63.1	84	65.0	100	72.5	69	1.64 (2)	.441
Sex								
T Male	66.1	484	66.5	606	67.6	757	0.36 (2)	.835
NT Male	42.6	432	48.2	365	53.7	365	9.81 (2)	**.007**
T Female	80.6	360	78.9	484	82.7	520	2.31 (2)	.315
NT Female	70.6	272	68.3	259	68.0	297	0.51 (2)	.776
Age								
T 0-10	100	1	100	1	80.0	5	.467 (2)	.792
NT 0-10	35.7	14	40.0	5	66.7	3	.981 (2)	.612
T 11-15	90.9	11	88.9	9	75.0	20	1.572 (2)	.456
NT 11-15	60.0	5	60.0	5	66.7	9	.090 (2)	.956
T 16-29	65.5	84	64.1	128	65.2	181	.058 (2)	.971
NT 16-29	43.1	130	45.4	97	49.6	123	1.103 (2)	.576
T 30-64	70.7	525	72.1	752	75.2	896	4.026 (2)	.134
NT 30-64	55.8	448	55.8	385	61.5	442	3.869 (2)	.145
T 65+	77.5	222	75.6	201	75.0	176	.374 (2)	.829
NT 65+	58.6	111	67.4	132	66.7	84	2.357 (2)	.308

Consideration of the regional use rates shows that belt use in the non-targeted region was quite low compared to the targeted region and the state of Minnesota as a whole, even in the first wave conducted prior to rural belt use project activities. This finding highlights one of the difficulties of conducting an evaluation of a traffic safety project in a rural region—it is difficult to find a adequate matching rural region where no program activities will take place. The use rates by vehicle type, sex, and age all show trends that are similar to what we have found in other Minnesota direct observation surveys (Eby, Vivoda, & Cavanagh, 2003, 2004, 2005).

Examination of the overall regional use rates show that rates in the targeted area did not change significantly among waves. Counter to our expectation, however, belt use in the non-targeted region increased significantly across the three waves. We found a significant increase in belt use for pickup truck occupants and males in the non-targeted area. There was also a significant change in belt use across waves for the van/minivans in the targeted area but the highest use was in Wave 2.

All sites in media market evaluation

The study results of this evaluation are summarized in Table 2. This table shows the percent belt use and number of observations (N) for the each wave and the chi-square (Π^2) statistic and probability value (P) calculated across survey waves. No significant differences in belt use across waves was found. Statistical comparisons between waves 1 and 2 [Π^2 (2) =1.86; P=.172], waves 2 and 3 [Π^2 (2) =0.124; P=.725]; and waves 1 and 3 [Π^2 (2) =3.02; P=.082] showed that there were no significant differences in safety belt use rates between any of the waves in the study.

Table 2: Safety Belt Use Rates for Sites in Minnesota Rural Media Markets as a Function Survey Wave, and the Chi-Square Statistic Across Waves.

	Wave 1 (April)		Wave 2 (May)		Wave 3 (June)		Statistic	
	% Use	N	% Use	N	% Use	N	Π^2 (DF)	P
Overall	76.5	1,164	78.8	1,304	79.4	1,426	3.31 (2)	.191

DISCUSSION

This study was designed to determine if the *Great Lakes Region Rural Safety Belt Demonstration Project* activities in Minnesota increased use of belts. We investigated this issue in two ways: (1) by analyzing direct observation data collected before, during, and after the project activities in two rural regions of the state, one of the regions received activities while the other received no special activity; and (2) analysis of belt use data collected at all sites in the media markets utilized by the demonstration project efforts before, during, and after project activities.

The study found that overall belt use in the rural targeted area and in the media market sites did not change significantly across the three survey waves, indicating that the program activities did not change belt use enough to be detected by this study design. On the other hand, we found that safety belt use increased significantly in the non-targeted area, where no Minnesota rural belt use promotion activities took place.

How do we reconcile these seemingly backward results? As mentioned earlier, there are several difficulties conducting an evaluation of a rural traffic safety project. This first is that the study design is limited by small sample sizes. In the targeted/non-targeted evaluation, use rates were calculated from 800 or less observations per wave for the non-targeted area. With a low sample size across a wave, a single site with high traffic volumes can skew the overall results. A second difficulty is that it is hard to find a valid control (non-targeted) rural region on which to match with the experimental region (targeted). The present study found that the non-targeted area had extremely low use compared to the targeted area in the baseline data collected during Wave 1. Thus, the two regions were unmatched from the start on the main variable of interest—safety belt use. A given influence on safety belt use, such as the statewide CIOT campaign, would likely have a greater effect on the low use region because it has more room to increase. It is possible that this effect accounts for the significant increase in belt use found in the non-targeted region.

Finally, it is difficult to define boundaries for the program activities. The *Great Lakes Region Rural Safety Belt Demonstration Project* relied heavily on media penetration. The non-targeted area was selected in part because it was not within a

targeted Minnesota media market. These markets, however, are not clearly defined and there in undoubtedly some bleed-over to other regions. In addition, the non-targeted area in this study was in Northwestern Minnesota bordering with North Dakota. While not in the Great Lakes Region, North Dakota also participated in a rural safety belt promotion project and advertisements from ND were likely also received in Northwest Minnesota. Thus, the non-targeted area in Minnesota may have actually received advertisements from ND that influenced belt use in this region.

Regardless of the evaluation outcomes, the study did find low belt use for both rural regions, supporting the notion that rural areas should be targeted with belt use promotion programs. This study indicates that continued effort should be applied to increase belt use in Minnesota's rural areas. While the results do not point to the effectiveness of the *Great Lakes Rural Safety Belt Demonstration Project* in increasing belt use in rural Minnesota, the study has several limitations that may have prevented us from determining the effect of the program in the targeted area. Further evaluation of this program is, therefore, recommended.

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