



THE UNIVERSITY OF
NEW MEXICO.

**Department of Behavioral
Health Services *Take a
Ride on Us Safe Ride
Option Program***

Prepared by:

Bryan Pino Ayala

Samuel A. Torres, M.A.

Paul Guerin, Ph.D.

Prepared for:

Bernalillo County

Introduction

What follows is a simple crash avoidance, DWI episodes prevented, and cost benefit analysis of the Bernalillo County *Take a Ride on Us* program for fiscal year (FY) 2018. The program provides an Uber discount code for riders that waives the first \$10 of any ride, during specific events (i.e. some music concerts and holidays), to encourage the use of the service in Bernalillo County to reduce the number of drunk drivers on the road and the resulting crashes with injuries and fatalities. A description of the program, the number of rides and other information is provided below.

***Take a Ride on Us* Program**

Bernalillo County and the New Mexico Department of Transportation in collaboration with Uber and Cumulus Media have implemented this program in an effort to keep Bernalillo County roads safe from the hazards of drinking while driving. The service provides an Uber discount code that waives the first \$10 off of any ride, during the specific events and dates, to reduce the number of drinking drivers on the road and the resulting crashes with injuries and fatalities. *Take a Ride on Us* advertised the availability of Uber rides for specific events, since the number of drinking drivers during these events is considered higher than normal. Bernalillo County has an area of 1,160 square miles and is New Mexico's most populous county with more than 674,00 residents. Bernalillo County government provides a wide range of public services to residents who live in Albuquerque, Los Ranchos, and Tijeras, along with the 111,000 residents who live outside the village and city limits in the unincorporated areas of the county.

During FY 2018, there were 20 events and 7,803 safe rides were provided. This information is reported in Table 1. The New Year's Eve and Memorial Day events plus the multi-day Cinco de Mayo event accounted for 70.3% of the safe rides. The Memorial Day event was the longest event from May 24th to June 3rd or 11 days. Music events accounted for 5 events, holidays for 11 events, sporting events for 3 events, and Mardi Gras was the other event.

Table 1. Fiscal Year 2018

Event	Dates	Safe Rides
July 4 th	July 1 st to July 2 nd	17
Brad Paisley Concert	July 14 th	34
Jeff & Larry's Backyard BBQ Concert	August 20 th	0
Foreigner with Cheap Trick	August 23 rd	0
Dierks Bentley	September 1 st	48
Labor Day	September 1 st - September 5 th	419
Nickelback	September 14 th	10
Halloween	October 27 th - November 1 st	256
Thanksgiving	November 22 nd - November 27 th	264
New Mexico Bowl	December 16 th	6
Holiday Parties	December 8 th - December 9 th , December 15 th - December 16 th , December 22 nd - December 23 rd	66
Lobos BB December Games	December 9 th , December 16 th , December 19 th , December 22 nd , December 27 th	4
Christmas	December 24 th - December 26 th	790
New Year's Eve	December 31 st - January 1 st	1,800
Super Bowl	February 4 th	52
Mardi Gras	February 13 th	24
Valentine's Day	February 14 th	54
St. Patrick's Day	March 16 th - March 17 th	276
Cinco de Mayo	May 4 th - May 6 th	1,168
Memorial Day	May 24 th - June 3 rd	2,515
Total		7,803

Crash Avoidance Analysis for Bernalillo County

The crash avoidance analysis is based on a methodology developed by Professor Michael Rothschild of the University of Wisconsin to evaluate the effectiveness of the Wisconsin *Safe Ride* programs. Professor Rothschild defines effectiveness as “the ability to avoid alcohol-related crashes and their associated costs.” He has noted that programs like *Safe Ride* should be considered as a tool to reduce alcohol-related crashes rather than a “silver bullet” to eliminate all alcohol-related crashes. This method was used in a previous report completed in June 2016. The formula relies on the reported number of DWIs in a time

period and the number of times on average a person can drive over the legal limit and not be stopped by law enforcement.

The number of DWI arrests in Bernalillo County were obtained from the New Mexico Administrative Office of the Court's annual 2018 Statistical Addendum report. The Insurance Information Institute states that one arrest is made for every 88 instances of driving over the legal limit, in the method this number was rounded to 90 driving instances. The above numbers are used to provide an estimate of the number of episodes of drunk driving in Bernalillo County. The number is then divided by the number of alcohol-related crashes in Bernalillo County. The number of alcohol-related crashes in Bernalillo County was derived from the number published in the 2018 DWI report produced by UNM Traffic Research Unit (TRU). The resulting number represents a crash to "episodes of drunk driving" ratio.

To find the number that represents the number of alcohol related crashes that *Take a Ride on Us* avoided, the number of rides is divided by the sum of episodes of drunk driving and an estimate of the percentage of bar patrons leaving bars legally impaired.

Using the Rothschild method, we determined that *Take a Ride on Us* prevented approximately 6 alcohol-related crashes during FY 2018.

The method is displayed below.

- $2,692 \text{ DWI arrest} \times 90 \text{ driving episodes (over legal limit)} = 242,280 \text{ episodes of drunk driving}$
- $242,280 \text{ episodes of drunk driving} \div 664 \text{ alcohol-related crashes} = 1 \text{ crash for every } 365 \text{ episodes of drunk driving in Bernalillo County}$
- $7,803 \text{ Take a Ride on Us rides} \div 365 \text{ episodes of drunk driving} \times 28\% \text{ (estimated percent impaired)} = 6 \text{ alcohol-related crashes avoided}$

Cost Benefit Analysis

This study includes a cost analysis that translates the estimated changes in the frequency of crashes to a dollar impact. This analysis is conducted using cost data available from the National Safety Council (NSC) and the New Mexico Department of Transportation (NMDOT) provided in their annual New Mexico Crash Report. The information in the NMDOT report uses information from the federal Bureau of Labor Statistic's consumer price index (CPI) and employment cost index (ECI). Other studies have used cost data developed by the National Highway Traffic Safety Administration (NHTSA) (NSC, 2016). The estimate we use includes economic costs (i.e. wage and productivity losses, medical expenses, administrative expenses, vehicle damage, and employer's uninsured costs) and comprehensive costs that focus on lost quality of life. The cost of all these items is calculated for each fatality, injury (serious and minor) and property damage crash. NSC uses the KABCO injury scale established by the American National Standards Institute (ANSI). This injury scale is designed for law enforcement coding of motor vehicle crashes and is the scale used in the New Mexico Uniform Crash Report. The KABCO injury scale measures fatalities (K), incapacitating injuries (A), non-incapacitating injuries (B), possible injuries (C), and property damage only (O). Due to the high cost and infrequency of K+A, and the difficulty in coding non-incapacitating injuries and possible injuries all injuries have been grouped together in previous studies. The following table shows the calculation of comprehensive cost estimates for alcohol-involved crashes for 2018. The comprehensive crash cost includes human capital costs, which are measurable costs plus an estimated value for the loss of quality of life. This value is intended to more completely measure

the cost of an injury. The data displayed in the table was retrieved from the UNM Geospatial and Population Studies Traffic Research Unit (TRU).

The data provided in Table 2 was used to derive the cost estimate for Bernalillo County. Unlike previous studies that have not included fatal and serious injury crashes in their calculations, we include these crashes because this information is available for New Mexico. We use the costs by crash severity type to estimate the costs of the estimated 6 alcohol-related crashes avoided by the *Take a Ride on Us* program in Bernalillo County.

Table 2. Calculation of Comprehensive Alcohol-Involved Crash Cost Estimates (UNM TRU, 2018)

Crash Severity	Comprehensive Costs per Crash, 2018 Adjusted (\$)	Alcohol-Involved Crashes 2018	Total Comprehensive Costs Estimate (\$)
Fatal Crash (K)	\$6,043,455	40	\$241,738,200
Suspected Serious Injury Crash (A)	\$319,715	32	\$10,230,880
Suspected Minor Injury Crash (B)	\$116,779	154	\$17,983,966
Possible Injury Crash (C)	\$65,760	252	\$16,571,520
Property Damage Only Crash (O)	\$10,609	1,224	\$12,985,416
Total		1,702	\$299,509,982

The following calculations are estimates for Bernalillo County for FY 2018. The average for 2018 were used in the calculations. The estimated cost per crash was derived from Table 3, and the total cost for the *Take a Ride on Us* program for FY 2018 (\$78,030) was provided by Cumulus Radio. The final cost savings number should be interpreted with caution and used as an approximate reference point.

The Program Benefits were calculated by multiplying the number of crashes avoided by the program by the cost of the estimated crash type. The estimated crash type (i.e. fatal, suspected serious injury, suspected minor injury, possible injury and property damage only) was calculated by determining the proportions of the crash type to the estimated 6 avoided crashes. The program costs provided by Cumulus Radio for FY 2018 was subtracted from the program benefits defined as the value of the crashes avoided. This amount was then divided by the program costs. The point of view of this cost benefit calculation is from the perspective of Bernalillo County. The benefits are compared with the program costs to determine the effectiveness of the program.

$$\text{Cost Benefit Analysis} = (\text{program benefits defined as the value of crashes avoided}) - (\text{program costs}) / \text{program costs}$$

As noted earlier, the value of 6 crashes was calculated. Using the information in Table 3 we estimated 4.31 of the avoided crashes were property damage only crashes, 0.89 of a crash was a possible injury crash, 0.54 of a crash was a minor injury crash, 0.11 of a crash was a serious injury crash, and 0.14 was a

fatal injury crash. Applying these proportions to the value of the crashes listed in Table 3 generated the program benefit values listed in Table 4.

Table 3. Cost Benefit Analysis – Crashes Avoided

Program Benefits = Value of 6 crashes avoided	\$1,055,852
Cost for the Program in Fiscal Year 2018	\$78,030
Cost Savings	\$977,822
Cost Benefit	\$12.53

Using the formula provided above we found a cost benefit of \$12.53. This can be interpreted as for every \$1.00 spent the program created \$12.53 in benefits. Thus, there was a 1,253% return on investment.

In June 2016 we completed a review and report of a previous version of the program named *Tavern Taxi and Pick me up, Take me home*. The report estimated a crash avoidance of four crashes in 2015, reported a program cost of \$205,597 in FY 2015 and a cost benefit \$6.74. The cost benefit of this program of \$12.53 is 1.86 times more than the previous program. This is partly due to the fact that the *Tavern Taxi and Pick me up, Take me Home* program cost was significantly higher (around 2 and a half times greater) than the current program’s cost.

Updated Program Benefit to Include DWI Episodes Prevented

The following analysis updates the program benefit for FY 2018 by incorporating episodes of driving while intoxicated prevented by drivers’ participation in the program. The benefit is calculated using two estimates: the number of DWI episodes the program prevented, and the societal cost per DWI episode. As above the resulting benefit is from the perspective of Bernalillo County.

Calculating the number of DWI episodes prevented requires several assumptions about driver behavior. These assumptions can yield greater or lesser program benefits and include (1) the location from which participants hailed a safe ride, which determines the proportion who should reasonably be expected to have been intoxicated at the time of the ride; (2) what proportion of the participants would have driven home were the program not available; and (3) whether the participant would have made more than one driving trip to arrive home after drinking. This analysis assumes drivers were traveling home from a bar, which is reasonable given that more than 70% of the safe rides taken during FY 2018 occurred during multi-day holiday events (rather than during music or sporting events where alcohol may have been provided). To produce a conservative estimate the analysis also assumes that not every participant would have driven themselves home if the program did not exist (some may have carpooled or took public transportation) and that without the program, each participant would have made only one driving trip to arrive home.

The number of DWI episodes avoided (D) can then be calculated by multiplying together:

- (A) The number of safe rides offered by the program in FY 2018,
- (B) The average proportion of bar patrons who drive home intoxicated, and
- (C) The average proportion of safe ride program participants who would have driven themselves home were the program not available.

There were 7,803 safe rides provided in FY 2018. An estimate of (B) is taken from Beirness and Beasley (2010), whose survey of nighttime drivers in British Columbia found that 26% of drivers with a bar or tavern as their point of origin had BAC levels > .08%. An estimate of (C) is taken from Sarkar, Andreas, and de Faria (2005), whose study of a safe ride program operating in Sacramento and San Diego reported that 44% of participants claimed they would have driven themselves home were it not for the program. The calculation is shown below.

$$(D) = (A) * (B) * (C)$$

$$\text{Number of DWI episodes prevented} = (7,803) * (.26) * (.44)$$

$$\text{Number of DWI episodes prevented} = 893 \text{ episodes}$$

Next, the societal cost per DWI episode (G) can be calculated by multiplying together:

(E) The average cost to society (i.e., irrespective of payer) per mile traveled by an intoxicated driver, and

(F) The average distance in miles traveled by an intoxicated driver.

Estimates of both (E) and (F) are taken from Zaloshnja, Miller, and Blincoe (2013), who estimate an average societal cost of \$8.12 per mile traveled by drivers with BAC levels > .08% in 2010 and an average distance per DWI trip of 9.7 miles. The \$8.12 per mile figure is based on crash costs and accounts for “medical costs, work losses, monetized quality-adjusted life years, property damage, insurance claims processing, and legal costs...[as well as] coroner, congestion, roadside furniture, and incident management costs, and...estimates of employer and police/fire services costs” (Zaloshnja et al., 2013:5). The analysis below inflates the \$8.12 to 2018 dollars, which amounts to \$9.35 per DWI mile driven (Halfhill, 2020). The 9.7 miles estimate is based on a weighted average of the distance of social and recreational trips using data from the 1995 National Personal Transportation Survey (Miller, Spicer, & Levy, 1999; Zaloshnja et al., 2013). The calculation is shown below.

$$(G) = (E) * (F)$$

$$\text{Societal cost per DWI episode} = (9.35) * (9.7)$$

$$\text{Societal cost per DWI episode} = \$90.70$$

Finally, the program benefit generated by DWI episodes prevented (H) equates to the product of (D) and (G):

$$(H) = (D) * (G)$$

$$\text{Program benefit} = (893) * (90.7)$$

$$\text{Program benefit} = \$80,995$$

The updated cost benefit compares the value of both crashes avoided and DWI episodes prevented:

$$\text{Cost Benefit Analysis} = (\text{program benefits defined as the value of crashes avoided and DWI episodes prevented}) - (\text{program costs}) / \text{program costs}$$

Table 4 presents the program benefit values updated to reflect the costs of both crashes and DWI episodes avoided. For every \$1.00 spent the program created \$13.57 in benefits.

Table 4. Updated Cost Benefit Analysis

Value of 6 crashes avoided	\$1,055,852
Value of 893 DWI episodes prevented	\$80,995
Total Program Benefits	\$1,136,847
Cost for the Program in Fiscal Year 2018	\$78,030
Cost Savings	\$1,058,817
Cost Benefit	\$13.57

Conclusion

This report is a follow up to an earlier report where we only measured the program cost benefit based on a crash avoidance analysis that is included in this report as Table 3. This report expands the analysis by including avoided DWI episodes. As noted in Table 4, the program avoided an estimated 6 alcohol involved crashes in FY 2018 and an estimated 893 DWI episodes. This increased the cost savings from \$977,872 to \$1,058,817 or an increase to the cost benefit of \$1.04 or 8.3%.

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