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The 2016 North Carolina Seat Belt Survey and Other Analyses

Final Report

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1. THE NORTH CAROLINA SEAT BELT SURVEY

Annual seat belt surveys are conducted by the State of North Carolina to fulfill the requirements of the National Highway Traffic Safety Administration (NHTSA). The survey is conducted in June immediately after the Governor's Highway Safety Program's (GHSP's) Click It or Ticket program is completed. The Click It or Ticket program in North Carolina has served as a successful pilot project for similar programs nationally, and has been conducted annually since October 1993 as an enforcement and education campaign dedicated to reducing injuries and deaths in motor vehicle accidents by increasing seat belt use.

1.1 NHTSA Seat Belt Survey Certification for 2016

RTI International will submit the required documents detailing that the 2016 North Carolina Seat Belt Survey was compliant with Federal Register's final rule, published on April 1, 2013 (2127-AK41).¹ The report will describe the data collection dates, quality check information, weights, and data used to create estimates of state seat belt use.

1.2 Data from 2016

In addition to the 120 sites selected in accordance with the NHTSA-certified plan, the North Carolina Governor's Highway Safety Program opted to include another 80 sites in 10 additional counties for the June 2016 sample. The dataset consisting of 200 sites, commonly referred to as the non-NHTSA data, is the combination of a random sample plus a purposive sample of counties. The counties added to the purposive sample were Brunswick, Buncombe, Cumberland, Davidson, Durham, Forsyth, Gaston, Rockingham, Sampson, and Wayne counties. The same counties and sites were used in 2015 as in 2016.

The 200-site data generally reflected the trends shown by the 120-site sample with minimal differences between estimates. The estimates from the 200-site sample will be discussed later in this report. Any comparisons between years are done on the same type of data. For example, the 120-site data is always compared to the 120-site data from the previous year.

1.3 NHTSA 120-Site Results

Table 1-1 presents the overall results of 120-site sample of the June 2016 North Carolina Seat Belt Survey. Within the 120-site sample, the June 2016 weighted statewide seat belt usage rate for drivers (D) is 92.1%, compared with 89.8% of drivers who were observed using seat belts in the June 2015 survey. This year's weighted statewide usage rate for right front-seat passengers (RF) is 90.4%, which is up from 90.3% in June 2015. The 2016 weighted usage rate for drivers and front-seat passengers combined (D+RF) is 91.7%, which is up from the 2015 rate of 89.9%. This is a statistically significant difference.

¹ <http://www.gpo.gov/fdsys/pkg/CFR-2013-title23-vol1/pdf/CFR-2013-title23-vol1-sec1340-10.pdf>

Table 1-1. North Carolina Seat Belt Usage Rates, Unweighted and Weighted: 120-Site June 2016 Survey

Category	Unweighted	Weighted		Sample Size
	Use %	Use %	SE %	
Overall				
Driver	91.8	92.1	0.5	33,653
Passenger	91.6	90.4	1.0	8,910
Combined	91.8	91.7	0.4	42,563
Urban/Rural				
Urban	92.2	92.8	0.4	27,726
Rural	89.9	89.3	0.8	5,927
Region				
Mountain	93.5	93.4	0.4	13,731
Piedmont	92.0	92.2	0.7	9,600
Coast	89.4	90.5	1.0	10,322
Vehicle Type				
Car	92.1	92.3	0.5	15,376
Van	88.5	90.3	1.4	846
Minivan	94.5	95.9	0.8	1,829
Pickup Truck	89.1	88.8	0.7	6,500
Sport-Utility Vehicle	93.5	93.8	0.6	8,351
Sex of Driver				
Male	90.7	91.1	0.6	8,724
Female	94.6	95.1	0.6	6,263
Race/Ethnicity of Driver				
White	92.6	93.1	0.6	10,920
Black	90.4	91.7	1.0	2,834
Hispanic	94.4	93.6	1.2	821
Native American	92.6	92.1	1.3	256
Asian	95.1	99.0	0.7	142
Age of Driver				
16-24	87.2	88.1	1.9	749
25-64	92.6	93.1	0.5	12,241
65+	92.6	93.7	1.5	2,056
Cell Usage				
Cell	5.9	6.1	0.3	1,973
Text	2.9	3.2	0.4	983

1.4 Results for the 200-Site Survey

Table 1-2 presents the results of 200-site sample of the June 2016 North Carolina Seat Belt Survey. Within the 200-site sample, the June 2016 weighted statewide seat belt usage rate for drivers (D) is 91.4%, compared with 90.0% of drivers who were observed using seat belts in the June 2015 survey. This year's weighted statewide usage rate for right front-seat passengers (RF) is 91.5%, which is up from 90.5% in June 2015. The 2016 weighted usage rate for drivers and front-seat passengers combined (D+RF) is 91.4%, which is up from the 2015 rate of 90.1%.

Table 1-2. North Carolina Seat Belt Usage Rates, Unweighted and Weighted: 200-Site June 2016 Survey

Category	Unweighted	Weighted		Sample Size
	Use %	Use %	SE %	
Overall				
Driver	92.1	91.4	0.8	57,813
Passenger	92.1	91.5	0.7	14,611
Combined	92.1	91.4	0.7	72,424
Urban/Rural				
Urban	92.3	92.5	0.6	42,349
Rural	91.3	90.2	1.4	15,464
Region				
Mountain	93.0	93.2	0.6	19,610
Piedmont	92.8	90.3	1.8	19,864
Coast	90.3	90.7	1.2	18,339
Vehicle Type				
Car	92.4	92.0	0.7	26,355
Van	88.4	82.4	4.4	1,490
Minivan	95.2	95.0	1.9	3,135
Pickup Truck	89.2	89.2	1.2	11,053
Sport-Utility Vehicle	93.7	93.1	0.7	14,228
Sex of Driver				
Male	91.0	89.9	1.3	14,787
Female	94.6	94.8	0.6	10,779

(continued)

Table 1-2. North Carolina Seat Belt Usage Rates, Unweighted and Weighted: 200-Site June 2016 Survey (continued)

Category	Unweighted	Weighted		Sample Size
	Use %	Use %	SE %	
Race/Ethnicity of Driver				
White	92.8	92.2	0.9	18,724
Black	90.8	91.5	1.6	4,980
Hispanic	94.1	91.1	2.5	1,412
Native American	93.0	95.8	2.2	271
Asian	94.3	84.0	9.5	193
Age of Driver				
16–24	87.4	82.8	5.0	1,195
25–64	92.7	92.3	0.9	20,929
65+	93.0	93.0	1.2	3,559
Cell Usage				
Cell	5.7	5.4	0.4	3,307
Text	2.7	2.5	0.3	1,536

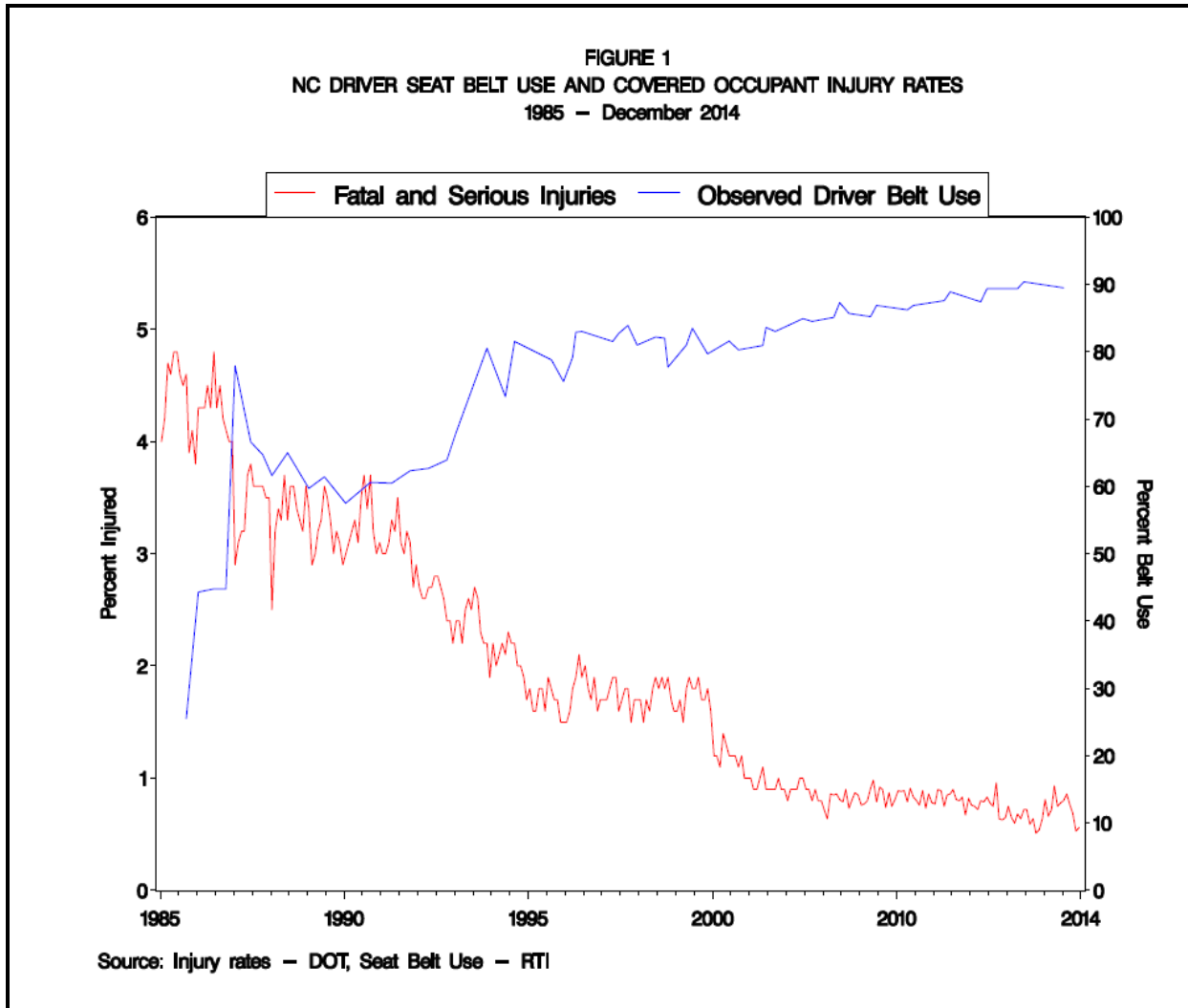
Results from the larger 200-site sample reflect most of the same trends as the 120-site sample. The estimates from the larger sample indicate a slightly lower rate of combined driver and right front passenger seatbelt use statewide (91.7% overall combined seatbelt use in the 120-site sample versus 91.4% in the 200-site sample).

1.4.1 June 2016 Comparisons and Trends

Figure 1-1 presents noteworthy historical data for driver belt-usage trends versus serious or fatal injury rates for drivers. Note the continuing strong relationship between increasing driver belt-usage rates and decreasing serious and fatal injury rates, especially after the implementation of Click It or Ticket in October 1993. As driver belt use rose from 25% to 90%, driver injury rates fell from a high of nearly 5% in 1985–1986 to a rate of less than 0.75% in 2009.

Some general trends (see Table 1-1) have not continued into recent survey years. For example, since the adoption of the North Carolina seat belt law in October 1985, combined usage rates generally have been highest among drivers and passengers of minivans. More recently, higher combined seat belt use was observed among SUV drivers. This type of trend change is likely reflective of the increase in popularity of the SUV as a family vehicle, as well as the significant increase in crossover vehicles on the market. The families who previously drove minivans and buckled up are now driving SUVs and buckling up.

Figure 1-1. North Carolina Driver Seat Belt Use versus Serious and Fatal Injury Rates, 1985–2014



Source: Prepared by RTI International—Revised September 17, 2015.

Note: The North Carolina Click it or Ticket campaign kicked off in 1993.

However, most of the other trends from past surveys are present in the June 2016 200-site survey results. In brief, these include

- higher combined usage rates among drivers and passengers of minivans (95.0%), sport utility vehicles (93.1%), and cars (92.0%), but generally lower usage rates for drivers and passengers of pickup trucks (89.2%) and vans (82.4%);
- higher belt usage rates for women (94.8%) than for men (89.9%), although the difference has been decreasing over the years (e.g., in June 2001, the rates were 89.9% and 81.1%, respectively); and
- lower usage rates for drivers under 25 (82.8%).

This report also includes a series of tables that further describe belt usage trends across North Carolina. Table 1-3 shows D, RF, and D+RF belt-usage rates by county for this survey year. The observed combined (D+RF) belt usage rates in June exceed 90% in 17 of the 25 counties surveyed in the 200 site study. Of these 17 counties, 6 belonged to the group of additional 10 counties added to the June 2016 sample.

The county with the lowest combined seat belt usage rates was Columbus (86.5%) county. Seat belt usage also lags in Brunswick (89.6%), Davidson (88.1%), Durham (89.2%), Nash (88.7%), Onslow (89.8%), Robeson (88.7%), and Wayne (89.8%) counties. Out of the 10 counties added to the sample, 4 had combined seat belt usage rates under 90%.

Table 1-3. North Carolina Seat Belt Usage Rates by County, Weighted: 200-Site June 2016 Survey

County	Driver (D)	Passenger (RF)	Combined (D+RF)	Sample Size
Overall- NHTSA	92.1	90.4	91.7	42,563
Overall – 200 Sites	91.4	91.5	91.4	72,424
Alamance	89.6	93.4	90.4	2,620
Brunswick*	89.0	92.1	89.6	2,621
Buncombe*	91.7	95.1	92.4	4,365
Cabarrus	93.5	92.7	93.4	3,456
Caldwell	90.7	91.7	90.9	3,022
Catawba	92.2	93.5	92.5	3,008
Columbus	86.5	86.2	86.5	1,849
Cumberland*	92.2	92.8	92.3	2,647
Davidson*	87.6	91.4	88.3	3,105

Table 1-3. North Carolina Seat Belt Usage Rates by County, Weighted: 200-Site June 2016 Survey (continued)

County	Driver (D)	Passenger (RF)	Combined (D+RF)	Sample Size
Durham*	88.7	91.6	89.2	2,339
Forsyth*	95.9	95.7	95.9	4,704
Franklin	94.4	94.2	94.3	1,819
Gaston*	94.1	92.2	93.8	2,981
Guilford	90.8	93.3	91.1	2,299
Harnett	91.2	93.3	91.7	2,844
Johnston	93.4	92.8	93.3	3,510
Mecklenburg	93.8	87.6	92.7	4,412
Nash	89.4	86.3	88.7	2,163
Onslow	90.0	89.2	89.8	2,823
Robeson	90.3	84.0	88.8	3,023
Rockingham*	94.2	92.9	94.0	2,328
Rowan	94.4	94.0	94.4	3,397
Sampson*	91.3	89.8	91.1	2,098
Wake	94.3	95.2	94.5	2,318
Wayne*	88.8	84.5	88.1	2,673

*Excluded from NHTSA sample.

Table 1-4 provides weighted D, RF, and D+RF seat belt use estimates for a series of surveys dating back over to 2007. There are increased belt-usage rates over the 8 years for all groups. Drivers increased from 80% in 1999 to 91.4% in 2016 (n=200). RF passengers increased from 76% in 1999 to 91.5% in 2016, and the combined rate increased from 79% in 1999 to 91.4% in 2016 (n=200). For the first time in 2016 there was an observed belt use of 90% for both drivers and RF passengers resulting in a combined statewide belt use rate of 91.4% (n=200).

Table 1-5 presents longitudinal data on observed belt use overall (D+RF) by region; vehicle type; and sex, age, and race/ethnicity of drivers. Again, note the general consistency of the trends across the surveys from 2010 through June 2016. Also note that overall seat belt use has plateaued in recent years, and the small variation in estimates is likely due to the natural variance that occurs when selecting a sample.

Table 1-4. Observed Seat Belt Use in North Carolina (%) for June, Weighted

Survey Periods	Driver (D)	Passenger (RF)	Combined (D+RF)
2010 ^a	90.4	86.7	89.7
2011 ^b	90.8	84.8	89.5
2012 ^b	88.0	85.7	87.5
2013 ^b	89.6	84.9	88.6
2014 ^b	90.9	89.7	90.6
2015 ^c	90.0	90.5	90.1
2016 ^c	91.4	91.5	91.4

^a This survey was conducted at 121 sites.

^b This survey was conducted at 120 sites.

^c This survey was conducted at 200 sites.

Table 1-5. Seat Belt Use Trends in North Carolina (%), Weighted

	June						
	2010 ¹	2011 ²	2012 ²	2013 ²	2014 ²	2015 ³	2016 ³
Overall (D+RF) Rate	89.7	89.5	87.5	88.6	90.6	90.1	91.4
Region							
Mountain	89.5	91.6	90.3	90.3	93.1	89.2	93.2
Piedmont	91.1	91.5	87.4	88.2	89.8	90.4	90.3
Coast	88.8	87.1	84.6	87.5	90.0	90.4	90.7
Vehicle Type							
Car	91.4	92.2	90.6	90.3	91.6	90.4	92.0
Van	79.9	80.9	77.3	83.8	86.8	84.3	82.4
Minivan	94.5	94.4	92.7	93.9	94.4	91.4	95.0
Pickup Truck	84.1	86.1	82.0	84.5	86.7	87.3	89.2
Sport-Utility Vehicle	91.6	91.8	91.0	92.8	94.1	93.2	93.1
Sex of Driver							
Male	87.8	89.5	85.5	87.9	89.2	88.7	89.9
Female	93.5	93.2	92.3	92.4	93.1	90.6	94.8

(continued)

Table 1-5. Seat Belt Use Trends in North Carolina (%), Weighted (continued)

	June						
	2010 ¹	2011 ²	2012 ²	2013 ²	2014 ²	2015 ³	2016 ³
Age of Driver							
16-24	86.6	88.0	89.4	85.5	89.1	79.4	82.8
25-64	90.1	90.9	88.3	90.2	90.6	90.2	92.3
65+	96.8	93.6	88.2	95.2	95.2	87.3	93.0
Race / Ethnicity							
White	90.3	91.3	89.2	91.0	91.8	89.4	92.2
Black	89.6	89.1	85.8	85.7	88.0	90.2	91.5
Hispanic	95.4	93.5	89.6	86.5	91.2	86.0	91.1

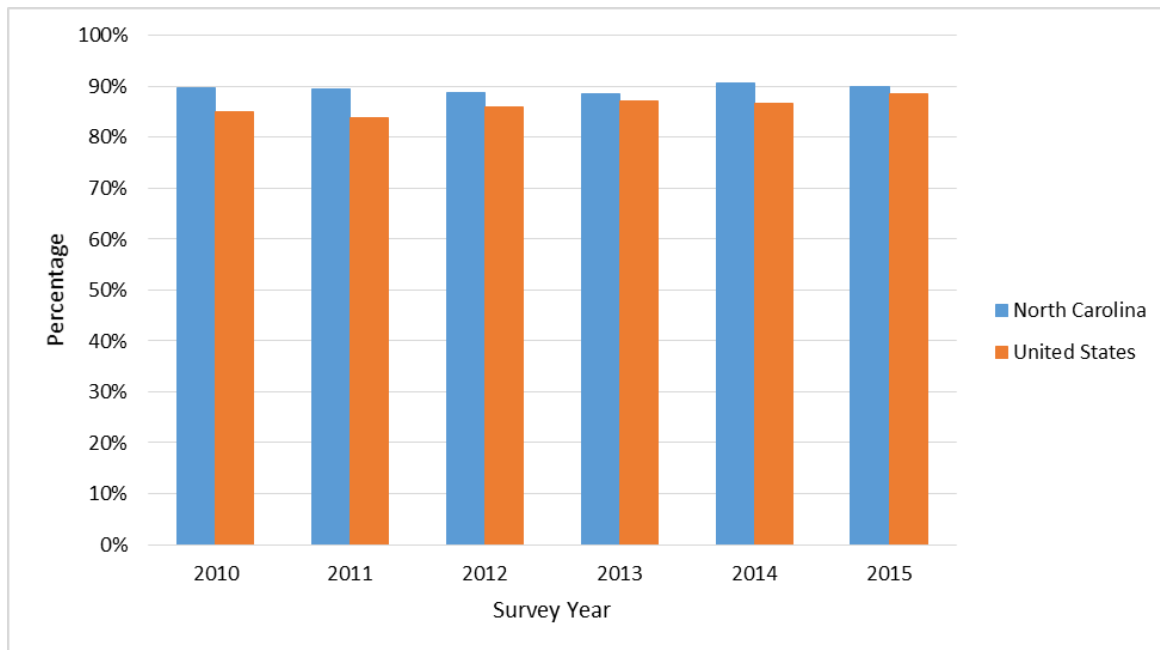
¹ This survey was conducted at 121 sites.

² This survey was conducted at 120 sites.

³ This survey was conducted at 200 sites.

The results discussed previously are shown graphically in Figure 1-2. In particular, Figure 1-2 and Table 1-5 show the upward trend of the combined (D+RF) belt usage rate in North Carolina from about 89% in 2010 to 90% in 2016. The rate of belt use in North Carolina has been consistently between five and 15 percentage points higher than the national rate, with the national rate increasing from 82% in 2007 to 88.5% in 2015.

Figure 1-2. Longitudinal View of North Carolina’s Combined Seat Belt Usage Compared with National Combined Seat Belt Usage, 2010–2015



1.5 Discussion

Trends, figures, and tables in this report are based on the weighted rates of seat belt use. The weighted rates are the best estimators of seat belt use for the entire state and for reported subgroups (e.g., male vs. female drivers).

The 2016 seat belt survey continued to assess statewide use of cell phones while driving. The 2015 seat belt survey was the third statewide survey in North Carolina to assess the use of cell phones to talk and text while driving. The weighted rates of both texting and talking on a cell phone while driving increased from 2015 to 2016 among the 120-site NHTSA sample. The rates of texting in North Carolina increased from 2.5% in 2015 to 3.2% in 2016, and the rates of cell phone use to talk while driving stayed the same at 6.1%. Accurately measuring cell phone use is difficult. A driver can use a cell phone at various points in the trip. Typically, when a person is belted, they remain belted for the entire trip. We know from self-reported studies of distracted driving that rates of cell phone use are higher than observed rates in this study. It is important to note that the trend associated with using a cell phone while driving shows the rates of use increasing. Over time, it will be important to pay attention to this trend as cell phone use while driving is considered a transportation safety hazard.

1.6 Recommendations

The various usage rates (D, RF, and D+RF) observed in North Carolina have plateaued in the 87%–90% range since 2007. Many states struggle to reach the most resistant groups in

the population. However, 10 other states with primary laws like North Carolina (California, Hawaii, Illinois, Iowa, Maryland, Michigan, Nevada, Oregon, Texas, and Washington) have consistently maintained reported combined usage rates of 90% or more from 2007 to 2014.² These states employ survey methodologies different from North Carolina, and may observe lower rates in future years because of the required changes in the survey procedures.

What might North Carolina do to increase its seat belt wearing rates? Recommendations continue to be the following:

- **Assign driver license points for seat belt infractions.** If North Carolina is indeed similar to other states, then this measure should be effective among drivers with lower seat belt usage rates (e.g., young male drivers, pickup truck drivers, and van drivers) who generally have poorer driving records and cannot afford to gain additional points.^{3,4}
- **Raise the fine** (currently \$161 when combined with court costs).
- **Impose community service hours for infractions.**
- **Publicize local seat belt tickets by jurisdiction** (to motivate local drivers and police agencies).

1.7 Conclusion

The June 2016 survey was successful in providing updated estimates of seat belt usage following the Click It or Ticket campaign for drivers and passengers statewide and within counties, by vehicle type and by important driver and passenger characteristics. Many of the previously observed seat belt usage trends have continued through the 2015 survey. For example, female drivers have consistently worn their seat belts more often than male drivers. However, trends of belt use within region and age group are changing and require monitoring in future years. Appendix A contains more detailed tables, which may be useful to North Carolina in planning future campaigns.

Over the years in which the Click It or Ticket program has been in place (since October 1993), there have been diminishing returns for the increasing seat belt usage rates; that is, there have been only very small increases from year to year. For the past few years, we have seen pre-campaign April survey results for a given year that reflected usage rates very similar to those observed in the preceding post-campaign June survey. Accordingly, these years have also seen very small increases in usage rates between pre- and post-campaign April/June survey results. Although there is great statistical power to detect small changes

² Chen, Y. Y. (2015, June). Seat belt use in 2014—use rates in the states and territories. (Report No. DOT HS 812 149). Washington, DC: National Highway Traffic Safety Administration.1-3.

³ Williams, A. F., Reinfurt, D. & Wells, J. A. (1996). Increasing seat belt use in North Carolina. *Journal of Safety Research*, 27(1), 33-41.

⁴ Manduca, P. L. (1983). *Raising the seat belt wearing rate in the Province of British Columbia*. Insurance Corporation of British Columbia.

in usage rates due to large sample sizes, recent years' changes usually have been statistically significant, but not of any practical use in shaping traffic safety policy. For this reason, North Carolina terminated the April pre-campaign survey and currently only conducts a June post-campaign survey.

We continue to recommend enhancements to the sanctions for failure to wear a seat belt while driving, including increases to fines and issuance of driver license points, as well as looking to other particularly successful state programs for ways to improve belt-wearing rates. With small positive improvements in state seat belt usage rates in North Carolina, there is also the possibility of moving some Click It or Ticket occupant restraint funding to other programs, based on an investigation of how much funding is needed to increase current seat belt usage levels. North Carolina seat belt rates have plateaued at about 90%, and the Click It or Ticket program, has not proven itself effective over time with the remaining unbuckled population. We believe it is time to give serious consideration to other options.

**Appendix A:
Detailed Tables from the 2016 NC Seat Belt Survey
200-Site Results**

Table A-1. 2016 Seat Belt Use by Time Period, Weighted

Time Period	Percent Seat Belt Use (Standard Error)		
	Driver (D)	Passenger (RF)	Combined (D + RF)
Morning Rush	91.1 (1.7)	89.3 (1.4)	90.8 (1.4)
Evening Rush	92.0 (0.6)	93.3 (1.0)	92.2 (0.4)
Nonrush	92.2 (0.6)	89.9 (1.1)	91.8 (0.6)
Weekend	90.7 (1.6)	93.6 (0.8)	91.4 (1.3)

Table A-2. 2016 Driver Seat Belt Use for Race by Sex, Weighted

Race	Percent Seat Belt Use (Standard Error)	
	Male	Female
White	90.3 (1.3)	94.8 (0.9)
Black	89.3 (3.2)	94.3 (1.1)

Table A-3. 2016 Driver Seat Belt Use for Vehicle Type by Sex, Weighted

Vehicle Type	Percent Seat Belt Use (Standard Error)	
	Male	Female
Car	91.8 (1.1)	93.5 (1.0)
Pickup Truck	89.2 (1.8)	98.6 (0.7)
Sport-Utility Vehicle	88.6 (2.5)	96.3 (1.0)
Other	89.6 (4.5)	96.6 (1.7)

Table A-4. 2016 Driver Seat Belt Use for Vehicle Type by Urbanicity, Weighted

Vehicle Type	Percent Seat Belt Use (Standard Error)	
	Urban	Rural
Car	93.0 (0.6)	90.9 (1.3)
Pickup Truck	89.2 (1.2)	89.3 (2.0)
Sport-Utility Vehicle	94.2 (0.8)	91.7 (1.2)
Other	94.3 (2.2)	87.2 (4.4)

Table A-5 2016 Driver Seat Belt Use for Vehicle Type by Region, Weighted

Vehicle Type	Percent Seat Belt Use (Standard Error)		
	Mountain	Piedmont	Coast
Car	93.7 (0.7)	90.6 (1.5)	91.8 (1.0)
Pickup Truck	88.9 (0.9)	90.0 (2.9)	88.8 (1.9)
Sport-Utility Vehicle	94.5 (0.7)	92.8 (1.0)	91.6 (1.8)
Other	95.3 (1.5)	87.1 (5.8)	90.5 (3.7)