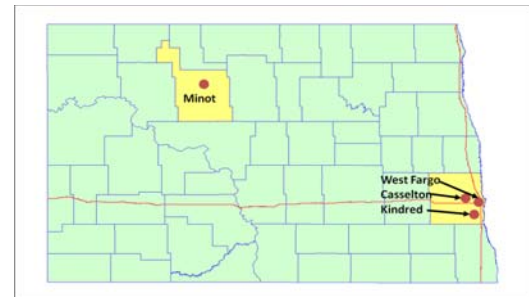


Seat belts are a primary motor vehicle safety device. Studies have shown that seat belts not only decrease the likelihood of being injured in a crash, they also save lives (Abdel-Aty, 2003; Yamamoto and Shankar, 2004). Because of this, seat belt use is a primary concern of traffic safety professionals. Of particular concern is seat belt usage of younger or novice drivers. However, more experienced drivers are also experiencing rates of seat belt use that are not at 100%. North Dakota is currently ranked 19th in terms of having the lowest seat belt use in the nation, with a compliance rate of 81.6%. The seat belt usage rate for the United States as a whole is 83%. North Dakota enacted a primary seat belt law for drivers under 18 years of age in 2004, although a primary seat belt law for drivers aged 18 or older has yet to be sanctioned.

In the spring of 2009, several activities specifically aimed at teen seat belt use and indirectly the seat belt use of the overall community took place at the following North Dakota cities/towns: Kindred, Casselton, and West Fargo (Figure 1.1). Seat belt observations were scheduled to be conducted in the designated communities at the high schools and in the community at large prior to the commencement of the events and after the activities concluded. Minot was selected as a control community as no seat belt activities were scheduled to take place in that location during the designated observation periods (Figure 1.1).



Observational Methodologies

Kindred and Casselton Seat Belt Challenges

In coordination with the Safe Communities Coalition of the Red River Valley (SCCRRV), a case study of seat belt education for teens was scheduled to be undertaken at Kindred High School (KHS) in Kindred, North Dakota and Central Cass High School (CCHS) in Casselton, North Dakota in February-April of 2009. The two schools and their respective communities were scheduled to be part of a 'seat belt challenge.' The community/high school seat belt challenge is designed to increase awareness and use of seat belts among students and community members where each school attempts to attain the highest seat belt usage rate through the use of a sex-week awareness campaign. In addition, the challenge would have involved two unannounced observations of the high school's seat belt use, as well as the community's.

The initial seat belt observations were conducted by researchers twice on one individual day for each of the high schools/communities to capture the arrivals and departures from the schools and to capture community traffic during both designated times as well. The first seat belt check was conducted prior to the anticipated start of the educational campaign, before any educational efforts would have begun. The second check would have taken place after all educational efforts were completed. However, activities and subsequent seat belt observations were cancelled due to inclement weather and severe spring flooding.

West Fargo Seat Belt Enforcement Unit

The West Fargo Police Department instituted a new Seat Belt Enforcement Unit on March 1, 2009 to encourage an increase in the proper use of vehicle safety restraints. The emphasis of the program was to influence public perception and officer philosophy with an emphasis on enforcement. Through the use of print and video media, the public was informed of the new unit. Three patrol vehicles were also marked with seat belt enforcement team identification.

Observations at the high school were done twice daily to capture arrivals and departures, and once a day at the two community locations— both on two separate days. According to the West Fargo Police Department, traffic stops and citations actually declined from January through June of 2008 to the same time period in 2009, a 10% decline in traffic stops and a 11% decline in citations. Several factors may have led to the decline in citations, including the full mobilization of the seat belt enforcement campaign being hindered by flooding as well as fewer drivers on the road during this time period, thus, fewer stops/citations.

Minot High School and Community

Minot was chosen as a control community and Minot High School as a control high school due to the fact that there were no known directed efforts aimed at increasing seat belt use, neither at the high school nor in the community at-large. For the high school observations, observations were made twice daily to capture arrivals and departures. For the community, observations were conducted only once per day. Only vehicles occupied by what appeared to be students were included in the observations for the high schools. Due to the high traffic volume and the vantage point chosen for both high school and community observations, only driver seat belt use was recorded.

Results

NOTE: Unless otherwise noted, numbers in the following results are based on all scheduled seat belt observations February through May 2009. In addition, due to inconsistencies with driver and passenger information collection, the following results include driver data only.

Overall Results

Of the cities included in this analysis, seat belt use was greatest in West Fargo (including high school and community at-large observations), with nearly 66% of observed drivers using their seat belts, and lowest in Casselton, with slightly more than half of observed drivers using their seat belts (Figure 3.1). High school seat belt usage was consistently higher than the community at-large seat belt usage for all cities (Figure 3.2).

Because the seat belt observations for the communities at-large took place during times when drivers of high school age (aged 18 or younger) would have been attending class, it can be assumed that the observed community drivers represented the more experienced driver population, or the drivers aged 19 or older. Previous studies have shown that age is directly correlated with seat belt use – the younger the driver, the less likely they are to wear their seat belts (Phebo and Dellinger, 1998; Womack et al, 1997; Williams et al, 2003; Kim and Kim, 2003; USDOT, 2008). Seat belt use rate by age in this study show exactly the opposite results. The younger the driver, the more likely they were to wear their seat belts. It is possible that this contrast is in part due to the primary seat belt law for drivers 18 years of age or younger.

Gender

Females were significantly more likely to wear their seat belts than males. Of the four cities (including both community and high school observations), males in West Fargo were most likely to wear their seat belts, with a usage rate of 60%, while males in Casselton were least likely to wear their belts, with a usage rate of slightly less than 40% (Figure 3.4). The differences in seat belt use by gender were significant for all communities, with the exception of West Fargo.

Rural/Urban

By examining the city data by their rural and urban designations, with West Fargo and Minot specified as 'urban' and Kindred and Casselton specified as 'rural', it is found that seat belt use in the urban areas, at least for this study, is significantly greater than that of the rural areas (Figure 3.7), with 54% seat belt use in the rural areas compared to 61% seat belt use in the urban areas. This is consistent with results from previous studies (Womack et al, 1997; Kim et al, 2009; McCart and Northrup, 2004; USDOT, 2007).

Differences are also evident between rural and urban seat belt use at the high schools and in the communities at-large (Figure 3.8). At the rural high schools, seat belt use is at just under 60%, while at the urban schools, usage is nearly 65%, although these differences are not statistically significant. In the rural communities, seat belt use is significantly lower than in their urban counterparts (50% and 57%, respectively)

Figure 3.1. Overall Seat Belt Use by City

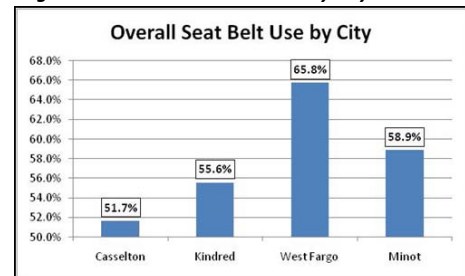


Figure 3.2. Seat Belt Use by Location within Select Cities

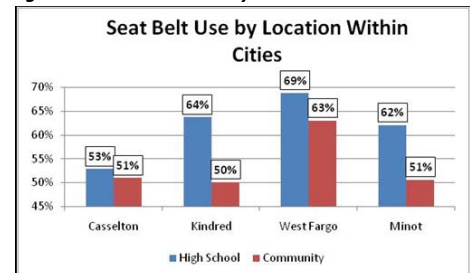
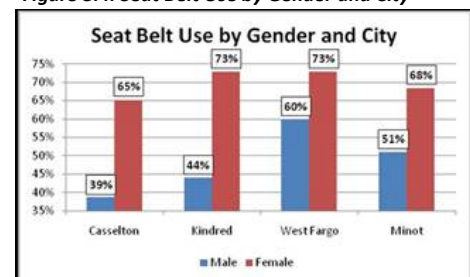


Figure 3.4. Seat Belt Use by Gender and City



Analyzing gender differences by rurality elicits interesting results (Figure 3.9). Although overall seat belt use for rural populations is lower than urban populations, it appears that seat belt use is on par for rural and urban female drivers, with 70% of urban female drivers and 69.2% of rural female drivers being observed wearing their seat belts. It is with the male drivers that the differences in rural and urban seat belt use become more distinct. Rural male drivers had a seat belt use rate of 41.8%, while urban male drivers wore their seat belts slightly more than 54% of the time. Rural females are 1.7 times more likely than rural males to wear their seat belts, as compared to urban females who are 1.3 times more likely than their male counterparts to buckle up.

Figure 3.7. Seat Belt Use by Rurality

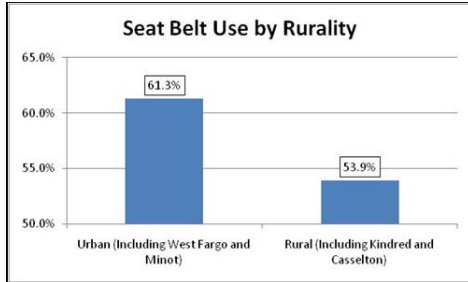


Figure 3.8. Seat Belt Use by Rurality and Location within Cities

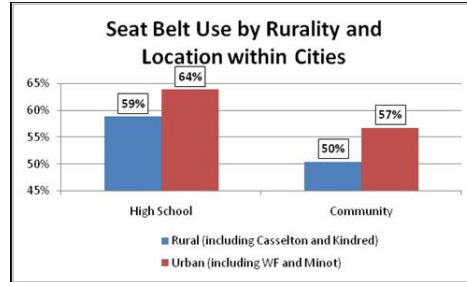
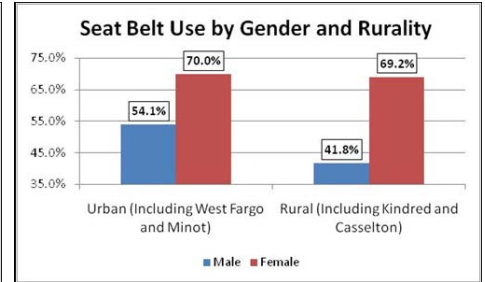


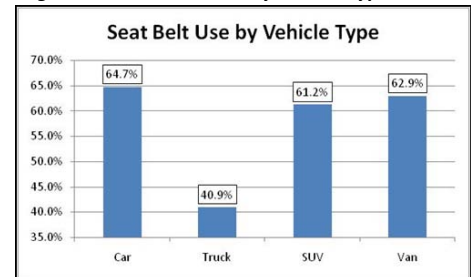
Figure 3.9. Seat Belt Use by Gender and Rurality



Vehicle Type

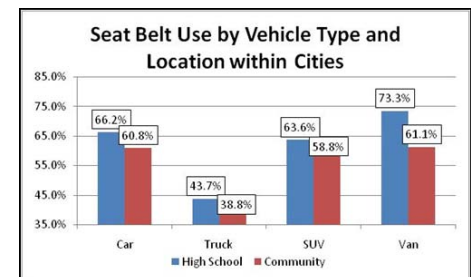
Results from this analysis were also consistent with previous studies on seat belt use and vehicle type (Kim and Kim, 2003; Kim et al, 2009; McCart and Northrup, 2004; USDOT, 2007). Seat belt use by drivers of pickup trucks was about 20% lower, on average, than the other vehicles observed. Drivers of pickup trucks wore their seat belts approximately 41% of the time, while seat belt rates for drivers of SUVs, vans, and cars hovered between 61% and 65% (Figure 3.10). Consistent with overall seat belt use by location, seat belt use by drivers of all vehicle types for high school drivers is greater than seat belt use of all vehicle types for drivers from the communities at-large (Figure 3.12). However, with the exception of the vehicle type of car, none of the differences between high school and community seat belt use by vehicle type were significant.

Figure 3.10. Seat Belt Use by Vehicle Type



For both of the rural locations (Casselton and Kindred) seat belt use was highest for vans, while SUV seat belt use was highest for the urban locations (West Fargo and Minot). Drivers of pickup trucks had the lowest seat belt use in all cities. However, Casselton had the lowest seat belt use for pickup trucks of all cities, with less than a third of pickup truck drivers wearing their seat belts. For Kindred, West Fargo, and Minot, seat belt use for drivers of pickup trucks was very comparable – hovering around 42%.

Figure 3.12. Seat Belt Use by Vehicle Type and Location within Cities



Morning/Afternoon

Overall, there was a decline in seat belt use when comparing morning to afternoon observations. Looking at the specific schools, Kindred HS saw an increase in seat belt use and West Fargo HS saw a very slight increase, while Minot HS had a small decline (Figure 3.14). None of these results were significant. However, Central Cass saw a significant decline in seat belt use from the morning to the afternoon.

Figure 3.14. Comparison of Before-School and After-School Seat Belt Use

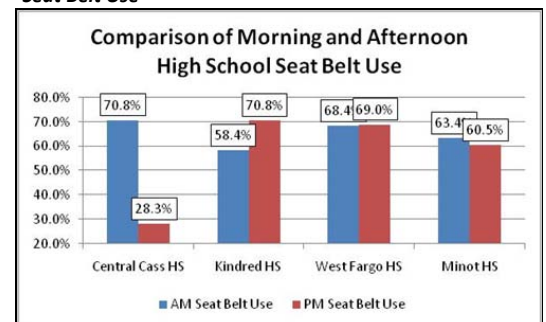
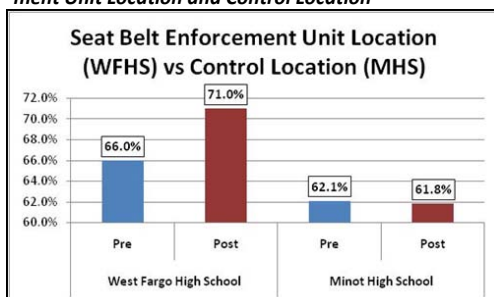


Figure 3.15. Comparison of Seat Belt Enforcement Unit Location and Control Location



Pre- vs. Post- Enforcement Unit Addition

A comparison of pre- and post- enforcement unit addition in West Fargo saw seat belt use increase by 5%, as compared to Minot where no change in seat belt use was seen during the same period (Figure 3.15). However, the differences in pre- and post- enforcement results were not statistically significant for West Fargo or Minot.

Limitations

There were several limitations to the seat belt observations recounted in this report. First, regarding the methodologies, seat belt tracking methods were not consistent among all observation events (i.e. audio versus manual recording). Second, time limits for observation events were not delineated. Some observation events took place for exactly one-half hour while others took up to an hour. Third, some observers recorded seat belt use for drivers and passengers while others recorded only drivers. For this analysis, it should be noted, passenger observations were excluded. In addition, weather might have played a role in seat belt use. Some of the observation events took place immediately following a major snowfall, which might have influenced seat belt use. It is possible that drivers are more cautious after a snowfall and therefore more likely to wear their seat belts. Finally, some of the observation events took place in state fleet vehicles. It is unknown what affect, if any, official vehicles have on seat belt use. However, drivers might have seen the official license plates, associated the plates with law enforcement, and buckled up as a precaution.

Conclusion

Seat belts are a primary motor vehicle safety device which have been shown to decrease the likelihood of being seriously or fatally injured in a crash. Seat belt use in North Dakota overall is lower than the national average, and seat belt use in rural areas, lower still. Attempts were made to test the effectiveness of seat belt educational activities at two rural schools/communities at increasing seat belt use, and to determine if increased enforcement has any effect at increasing seat belt use both at the high school and community levels. Although the aforementioned educational activities were not completed at the selected schools outlined in this report, the results from the observational surveys were useful in conveying both high school and community seat belt use. Results did indicate that increased enforcement was affective at increasing seat belt use among high school drivers, but not in the community at-large. Comparisons made between the communities/high schools reinforced the findings of prior studies regarding seat belt use and gender, driver location (urban/rural), and vehicle type. Unexpected findings were obtained regarding seat belt use and age, with the results from this study completely contradicting previous studies. Further research into the effects of educational activities and increased enforcement on high school/community seat belt use is recommended.

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