

Motor Vehicle Crashes in North Dakota: Measuring the Costs – Application



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As stated in the preceding brief, motor vehicle crashes (MVC) in North Dakota have an immense impact on our economy. Annual costs, both medical and non-medical (property damage, wage and productivity loss, etc.), reach into the hundreds of millions of dollars. Research was performed to calculate these costs and explore ways to lessen the economic impact of MVCs in North Dakota. This brief will discuss the savings realized if North Dakota adopted a primary seat belt law.

Seat Belts: Laws, Use, and Effectiveness

Currently, North Dakota has a secondary seat belt law, which means that motorists can only be cited if they are stopped for a moving violation. The National Highway Traffic Safety Administration has reported seatbelt effectiveness to be between 30% and 78% in preventing injuries and fatalities, depending upon the type of restraint used, the seat position the person occupies, and the type of vehicle (NHTSA 2000). Using ND crash data from 2002 to 2006, seat belts were estimated to be 56% effective in preventing moderate to critical injuries and 50% effective in preventing fatalities, based on occupant position in the vehicle and type of restraint used (NDDOT 2010).

The NHTSA states that seat belt use increases anywhere from 10% to 15% statewide after the passage of a primary seat belt law (NHTSA 2000). According to the North Dakota Department of Transportation, seat belt usage in North Dakota reached 82.2% in 2008 (NDDOT 2008). To provide a more comprehensive understanding of the possible savings, the estimates used in the study were based on several different scenarios of increased seat belt use. Increases of 5%, 10%, and 15% were used to calculate estimated net savings. These increases correspond to seatbelt usage rates of 87.2%, 92.2%, and 97.2%, respectively.

Economic Impact of a Primary Seat Belt Law

Savings realized by a primary seat belt law were found by multiplying the current costs of MVCs by the expected increase in seat belt use and the effectiveness of the seat belts. The benefit was estimated in 2006 dollars by applying net present value calculations to the savings over the seven-year period, using a rate of return of 7%.

Using these formulas and calculations, the cost savings realized by Medicaid for the initial hospital costs would range from \$54,000 to just over \$162,000. Savings attributed to the post-discharge costs range from an additional \$15,000 to \$44,000. The total savings for the first year would range from \$69,000 to \$206,000. For every additional year, the savings associated with the crashes that occurred in 2006 are estimated to be anywhere from \$38,000 to \$115,000, based on a 5% to 15% increase in seatbelt use. Possible savings to Medicaid for each of the categories of injury and timeframe are displayed in Table 1.

Similarly, the savings for all payers, illustrated in Table 2, indicate that the medical cost savings for initial hospital costs and first-year post-discharge costs would range from just over \$930,000 to just under \$2.8 million, while the savings for each additional year would be between \$200,000 and \$600,000. Adjusting these savings for inflation, medical savings could be as high as \$34.2 million over a seven-year period (2006 to 2012).

Implementing a primary seatbelt law could reduce broader costs associated with MVCs by \$91.4 million with only a 5% increase in seatbelt use or \$277.2 million with a 15% increase in seatbelts use, as displayed in Figure 3 (reverse side).

Table 1. Savings by Medicaid with 5%, 10%, and 15% Increases in Seat Belt Use

Increase in Seat Belt Use	Injury Type	Savings of Initial Hospital Costs	Savings of First-Year Post-Discharge Costs	Savings of Costs Incurred after the First Year	NPV of Savings from First Seven Years
5%	Total Savings	\$54,012	\$14,586	\$38,324	\$996,039
10%	Total Savings	\$108,026	\$29,172	\$76,648	\$1,981,890
15%	Total Savings	\$162,037	\$43,758	\$114,973	\$2,972,840

Table 2. Savings for All Payers in North Dakota with 5%, 10%, and 15% Increases in Seatbelt Use

Increase in Seatbelt Use	Injury Type	Savings of Initial Hospital Costs	Savings of First-Year Post-Discharge Costs	Savings of Costs Incurred after the First Year	NPV of Savings from First Seven Years
5%	Total Savings	\$727,138	\$204,204	\$201,616	\$8,445,207
10%	Total Savings	\$1,454,276	\$408,408	\$403,233	\$16,890,429
15%	Total Savings	\$2,181,414	\$612,612	\$604,849	\$25,335,635

Table 3. NPV Estimated Crash Prevention Benefit Over Seven Years, Based on Decreased Injury Severity Resulting from Implementation of a Primary Seatbelt Law

	Crash Severity			Totals
	Fatal	Incapacitating Injury	Non-Incapacitating Injury	
5% downward injury severity				
Estimated Injury Costs	\$3,997,965,778	\$414,145,228	\$445,237,700	\$4,857,348,706
Benefit	\$77,707,726	\$6,259,587	\$7,459,739	\$91,427,053
10% downward injury severity				
Estimated Injury Costs	\$3,895,073,778	\$406,139,622	\$435,450,655	\$4,736,664,054
Benefit	\$157,319,746	\$12,548,006	\$14,964,130	\$184,831,882
15% downward injury severity				
Estimated Injury Costs	\$3,791,550,222	\$398,345,836	\$425,720,679	\$4,615,616,738
Benefit	\$236,133,999	\$18,664,387	\$22,433,165	\$277,231,551

Conclusion

Because passing a primary seat belt law has been shown to increase seat belt use by 10% to 15% statewide, potential benefits, conservatively estimated from 5% to 15%, are substantial. Savings to North Dakota’s Medicaid budget, and ultimately ND taxpayers, range from \$1.0 million to \$3.0 million for the first seven years after implementation. These savings extend to all medical insurance providers, not just Medicaid. The present value of the benefit to all payers, including Medicaid, over the same seven-year period would range from \$8.4 million to \$25.3 million, depending upon the actual increase in seat belt use.

Currently, 30 states, the District of Columbia, American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the Virgin Islands have successfully implemented primary seat belt laws. Implementing a primary seat belt law in North Dakota not only reduces the burden on medical payers, but also on the state’s budget. Looking at the much broader definition of costs, data suggests that the total economic benefit, including the reduction in fatalities, could be as high as \$277 million over seven years. The potential savings shared by state and federal agencies, insurance companies, employers, and families are substantial.

To read the full publication or find details on references used in this report, please visit our website: <http://www.ugpti.org/rtssc>



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