



RESEARCH SERVICES SECTION

TECHNICAL SUMMARY

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PROJECT COST:

\$152,552

Rural



Urban



Simulator subjects experienced each road network twice to test the effect of rural vs. urban landscape on driving performance.



Rural and Urban Safety Cultures: Human-Centered Interventions Toward Zero Deaths in Rural Minnesota

What Was the Need?

According to figures from the National Highway Traffic Safety Administration and the “Crash Facts” publication of the Minnesota Department of Public Safety, the number of annual traffic fatalities is considerably higher in rural areas than in urban areas. Someone involved in a rural crash is three times more likely to die than someone in an urban crash.

This could be the result of road design factors such as the prevalence of two-lane highways with high speed limits. Distance to medical facilities also plays a part. A factor less well understood before this study was the human element: Are the driving habits and attitudes of rural residents causing higher traffic fatality rates?

We know that there are lower rates of seat belt and child safety seat use in rural areas, and there are indications that alcohol poses a greater risk on rural roads. We need to understand why this is the case to best determine what education and enforcement interventions to employ.

What Was Our Goal?

This project aimed to systematically explore the differences between rural and urban drivers in attitudes and behaviors related to safe driving. By surveying urban and rural drivers and observing their performance in the University of Minnesota driving simulator, investigators hoped to provide insights into the role of human factors in rural fatal crashes. This would be valuable in designing strategies to reduce the number of rural traffic fatalities.

What Did We Do?

The first part of the project was an eight-page survey to determine drivers’ self-reported tendencies to engage in risky driving behavior, as well as their perceptions of risk and their attitudes toward common traffic safety interventions. Investigators randomly selected respondents from groups divided by rural vs. urban county residence (from three rural and three urban counties), and three age ranges: Young (18 to 26), Middle (30 to 50), and Old (65 and over). Some 1,400 valid responses were submitted and subjected to statistical analysis.

Investigators then used driving simulators to observe the performance of 19 urban and rural respondents from high-risk categories—young males (18 to 26) and older males (65 and over)—in scenarios involving factors that often cause crashes. These included distraction evaluations, driver speed measurements, and observations of intersection crossings.

What Did We Learn?

The survey revealed several trends:

- Rural drivers (especially pickup truck drivers) were less likely to wear seat belts or to see this as risky.
- Rural respondents reported perceiving drunk driving as less dangerous.
- Urban drivers reported more frequent speeding and more driver errors and violations.

“Too many fatalities are happening on rural two-lane highways. Is that because rural drivers don’t drive as well as others? This study showed that that was not the case.”

–Mike Wagner,
Highway Engineer,
Nicollet County

“Drivers, wherever they live, tend to be more aware of risk when driving in urban environments; in rural environments, they perceive there is a lower risk of crashing or being caught.”

–Mick Rakauskas,
Research Fellow,
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Simulator participants were monitored for speed, intersection crossing behavior, and the ability to maintain safe headway while distracted by an on-dashboard task.

- Rural respondents expressed less regard for the value of government safety programs.
- Young male drivers exhibited more risk-taking attitudes regarding all of the above than older or female drivers.

Simulator tests revealed a number of trends by age: young drivers performed better on distraction tests (especially in urban environments), but older drivers were more cautious on all tasks. Residency had very little effect on performance; behavior was more likely to change with driving environment. Both rural and urban drivers tended to speed more in urban scenarios due to lower posted limits, though higher posted rural limits led to faster speeds overall. Drivers in rural scenarios did not stay centered in their lanes as well; this may be due to higher rural speed limits and the perception of fewer roadside hazards. These results suggest that the rural environment itself encourages less safe driving.

Policy suggestions in light of these results include:

- Targeting seat belt and alcohol enforcement campaigns in rural areas, focusing on increasing perception of risk.
- Incorporating speed calming measures into road design development for all areas.
- In areas too isolated to police effectively, using technologies such as speed monitors fitted to vehicles driven by teens.
- Developing safety policy directed at driver distraction among elderly drivers in complex urban environments.

What’s Next?

According to Cheri Marti, Director of Minnesota’s Office of Traffic Safety, these research findings have been incorporated into presentations to regional Toward Zero Deaths partnerships, incorporated into local community education and outreach efforts, and used to help Minnesota policy makers better shape traffic safety policies. They will be incorporated into the Office’s annual highway safety plan, which emphasizes the behavioral elements of traffic safety.

The recommendation to create campaigns specifically targeting at-risk rural drivers that convey the risks of not wearing a seat belt has already been implemented. Among other measures, this includes broad distribution of a video on drivers who would have lived if they had been wearing seat belts. Risk awareness saturation campaigns will continue to target those high-risk drivers most likely to speed, or to drive impaired or unbelted.

This Technical Summary pertains to the LRRB-produced Report 2007-41, “Rural and Urban Safety Cultures: Human-Centered Interventions Toward Zero Deaths in Rural Minnesota,” published November 2007. The full report can be accessed at <http://www.lrrb.org/PDF/200741.pdf>. More information on the Toward Zero Deaths initiative is available at <http://www.tzd.state.mn.us/>.