

Traffic Safety Evaluations: Barnes County Highway 21



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Traffic data show that North Dakota is an atypical state in two ways. First, as illustrated in Figure 1, travel is primarily rural in nature (more than 70%, versus 35% for the 48 contiguous states). Second, ND rural roads are a relatively high-risk travel environment, as shown in Figure 2.

Figure 1: Share of Annual Vehicle Miles Travelled

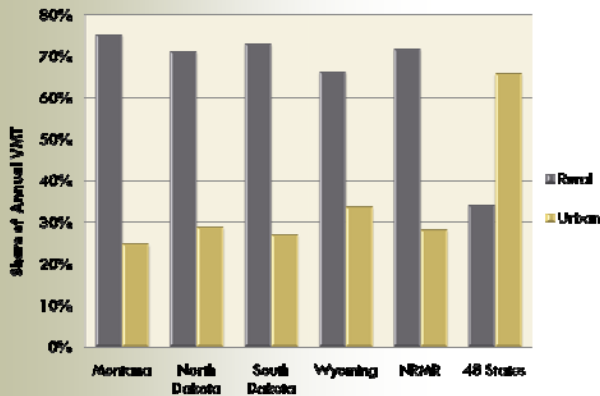
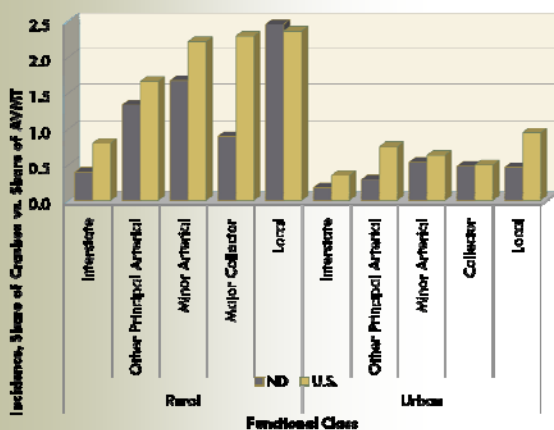


Figure 2: Share of Crashes, by Road Type



Crash statistics from the ND Department of Transportation reveal several additional characteristics of safety concerns in the state (2008):

- Young teens were 9% of drivers in crashes, and only 3% of licensed drivers.
- Failure to yield was the #1 crash factor for drivers age 65 and older.
- Seat belts were not worn in 75% of traffic deaths.
- Alcohol was a factor in 51% of fatalities.
- Speed was a factor in 31% of fatalities.
- **41% of fatalities occurred on local roads.**

Traffic Safety Evaluations

To address these and other traffic safety concerns in North Dakota, engineering experts at Upper Great Plains Institute perform traffic safety evaluations (TSE) in cooperation with local road managers and users. TSEs are a proactive, interdisciplinary team approach to identifying potential safety issues and opportunities for safety improvements.

A TSE follows the following steps:

- Identify the roadway facility or project to evaluate
- Select independent, multidisciplinary team
- Perform field reviews under various conditions
- Conduct analysis and document findings
- Present findings to project owner/management
- Prepare formal response
- Incorporate findings into project in either short- or long-term planning

TSE improvements can be divided into three categories:

- Immediate safety improvements: signage, vegetation, delineation in clear zone, etc.
- Low-cost safety improvements: signage, clearing the clear zone, etc.
- High-cost safety improvements: construction, reconstruction.

TSEs have many benefits. They serve as a practical and proactive approach to addressing safety that highlights low-cost/high value improvements. Implementing TSEs should yield fewer and less severe crashes, provide continuous advancement of safety knowledge, create benchmarks for safety issues on future projects, and promote efficient use of limited time, money, and resources. A TSE also fulfills a “major driving factor in performing a good audit” with regard to liability issues (NCHRP 336, Survey of State DOTs).

Application: Barnes County Highway 21

The Sheyenne Scenic byway in Barnes County, on highway 21, is a local example of a TSE. The team identified a horizontal curve (Figure 3) approximately 3 miles north of Valley City as a possible safety concern.

Figure 3: Horizontal Curve North of Valley City



Figure 4: Suggested Improvements



Suggested improvements included the installation of chevrons and advance intersection warning signs, as well as trimming vegetation (Figure 4).

Figure 5 shows the improvements made: an advance intersection warning sign and chevrons. The local road manager estimated this safety project to cost \$1500 in materials plus labor.

Conclusion

Because local roads are a critical focus of traffic safety in North Dakota, a practical, proactive, and cost-effective approach is necessary. TSEs are a valuable tool to improve safety of roadway facilities because of their time-, money-, and resource-efficiency.

Common Safety Issues

- Inadequate sight distance
- Insufficient signage
- Faded pavement markings
- Poor sign retroreflectivity
- Edge drop-offs/shoulder deterioration
- Missing/outdated features (eg. guardrails)
- Short turn lane lengths
- Improper speed limits
- Poor lighting

Common Safety Countermeasures

- Install chevrons and advance warning signs on curves
- Improve pavement markings
- Install or modernize guardrails
- Improve traffic control at intersections
- Speed reduction
- Install edgeline and centerline rumble stripes

Figure 5: Recommended Signage Installed



For more details regarding TSEs, current and past projects, and approximate NDDOT Improvement Price Schedules, visit the RTSSC website: <http://www.ugpti.org/rtssc>

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For more information contact:
Rural Transportation Safety and
Security Center
UGPTI, NDSU
Fargo, ND 58105
Email: rtssc@ugpti.org
Phone: 701.231.7767