2021-21TS
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LRRB
LOCAL ROAD RESEARCH BOARD

TECHNICAL SUMMARY

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TOTAL PROJECT COST:
$35,919

LRRB COST:
$17,960

Iowa State Patrol

In August 2020, Iowa State Patrol recorded a speeder driving 133 mph.

DEPARTMENT OF TRANSPORTATION
OFFICE OF RESEARCH & INNOVATION

Effects of COVID-19 on Driver Safety

What Was the Need?

The COVID-19 pandemic resulted in fewer drivers on Minnesota's roads in 2020 than in the previous year. Emptier roadways seem like they should be safer, but many states measured increases in speeding. For example, California issued twice as many speeding tickets, Iowa reported a 65% increase in driving 25 mph or more over the speed limit, and Ohio experienced the highest number of traffic fatalities since 2007. Clearly, some drivers were taking advantage of empty streets to speed. The pandemic also strained police forces, resulting in less enforcement.

Quantifying increases in unsafe driver behaviors such as speeding, lane departures and distracted driving during the COVID-19 pandemic will help Minnesota's transportation agencies plan effective countermeasures.

Minnesota's Toward Zero Deaths initiative has engaged in impressive, targeted efforts to reduce traffic fatalities. These efforts have shown that crashes are preventable when effective safety strategies are applied. To guide these strategies, Minnesota's transportation agencies needed to understand the magnitude of the changes in driver behavior observed during the pandemic.

Researchers gathered data in two key areas: rural roads, which typically have the highest fatality and injury rates; and work zones, which provide unique safety challenges involving not just drivers but also construction workers.

What Was Our Goal?

To quantify differences in travel speeds due to lower traffic volumes and COVID-19 conditions, researchers aimed to compare baseline measurements of speed and volume along selected MnDOT rural corridors and work zones collected before the pandemic (March through December 2019) to measures taken during the pandemic (March through December 2020).

The project was designed to collect data on speeding, lane departures and inattentive driving—the three behaviors that cause the most crashes—to support future decision-making regarding enforcement, messaging and other countermeasures.

What Did We Do?

Researchers worked with the project's Technical Advisory Panel to identify 10 rural corridors and five work zones for analysis, covering a range of roadway types where lane departure, driver inattention or speeding has been a problem in the past and data is readily available.

To measure traffic volumes and speeds at these sites, the research team used automated data collected statewide. They found that data was more plentiful than expected. One-third of Minnesota's 92 automated traffic recording (ATR) stations and nearly three-quarters of the state's 98 traffic sensor stations had sufficiently complete data for analysis. Consequently, the study was able to produce data not just for the selected sites, but for a wide range of areas throughout the state.

For work zones, the research team drew on information from the Minnesota state highway construction projects list, comparing work zones from the 2020 construction season to similar work zones from 2019.

Researchers also reached out to law enforcement to gather information on citations from these sites and to interview law enforcement officials to document their experiences with both speeding and aggressive driving. Six captains responded to an email survey or provided information through a phone interview.

continued

"The study captures in extensive data one of the largest and unexpected shifts in driver behavior in recent memory. Its results can help decision-makers understand both the ongoing effects today and provide context for future data."

—Derek Leuer,
State Traffic Safety Engineer, MnDOT Office of Traffic Engineering

"The MnDOT tool developed for this study supports characterizing speeding trends before and during 2020 as influenced by the pandemic. Our hope is that this can be used to manage future critical events."

—Shauna Hallmark,
Director, Institute of Transportation Engineers Safety Council, Iowa State University

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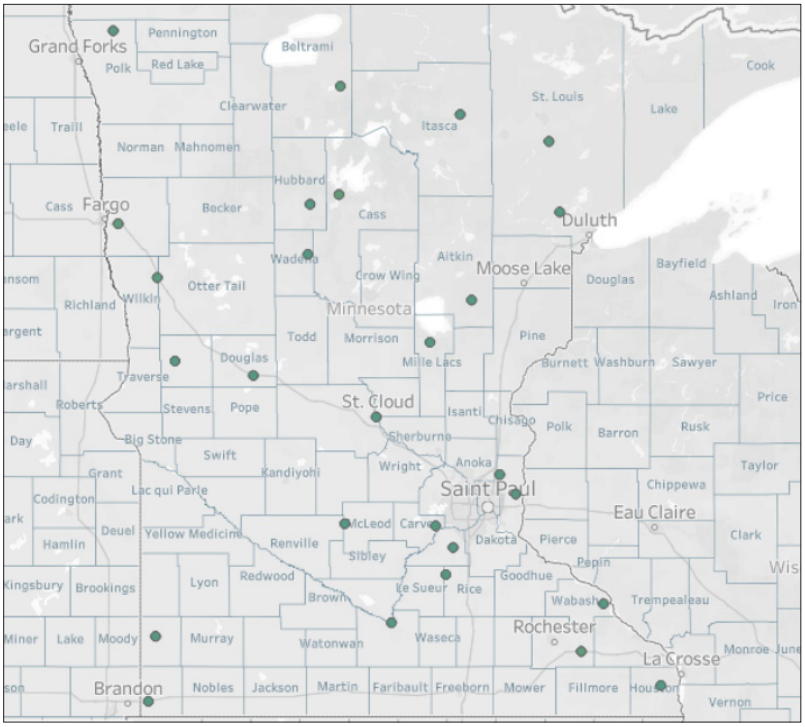

The 27 ATR sites used for this study were located throughout the state, allowing a wide view of changes in driver behavior in both rural and urban areas.

Interactive analytical tools were then developed to compile quantitative information, such as mean speed and percentage of vehicles exceeding the speed limit, with available qualitative information. The combined information provided both analytics and visualizations built into a story format where users can see results for individual sites or any combination of multiple sites.

What Did We Learn?

Traffic volumes were down across 85% of ATR sites and all sensor sites, with maximum reductions seen of 38% from ATRs and 47% from sensors in April 2020.

Speeds were higher in 2020, varying by month; the highest measured increases from 2019 were 2.9% in July from ATRs and 3.0% in April from sensors. Speeding (at least 15 mph over the posted speed limit) increased both in terms of the number of vehicles (an increase was detected by 69% of ATRs) and percent of vehicles (detected by 88% of ATRs).

Speeding-related crashes were 2% to 5% higher in five districts, though 1% lower in one district. Speeding-related crashes that resulted in serious injuries or fatalities increased 4% to 13% in four districts, with a slight decrease (1% to 4%) in two districts. An overall increase in problematic behaviors such as distraction, inattention and aggression was noted by 67% of survey respondents, and half of respondents indicated that there was more speeding in work zones.

What's Next?

These measures provide the desired data to ground future planning by Minnesota transportation agencies. The tools and techniques developed during this study, including the MnDOT ATR speed analysis tool, should be useful in managing future events and in the ongoing effort to optimize Minnesota's efforts to most effectively prevent traffic deaths.

This Technical Summary pertains to Report 2021-21, "COVID-19 Impacts on Speed and Safety for Minnesota Roads and Work Zones," published August 2021. The full report can be accessed at mndot.gov/research/reports/2021/202121.pdf.