



TECHNICAL SUMMARY

Questions?

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LRRB PROJECT COST:

\$93,928



The TDSS app posts the speed limit on the screen of a dash-mounted smartphone.



Follow-Up Study Examines Impacts of Teen Driver Support System

What Was the Need?

Inexperience and risk-seeking have been shown to contribute to a disproportionate risk of serious and fatal injuries for teenage drivers in motor vehicles. In 2015, investigators for MnDOT reported on findings from a study of 300 teen drivers who had used a smartphone app developed to alert drivers when they were exceeding the speed limit.

The [Teen Driver Support System \(TDSS\)](#) study, the largest research project of its kind, tracked driving behavior during participants' first 12 months of licensure. Investigators gathered data on the impact of warnings issued via the app when subjects began to exceed speed limits.

The study provided participants with a smartphone and tracked the speed of vehicles carrying the phone, turning speeds, deceleration, acceleration, stop sign behavior, seat belt use and other behaviors for one year. One-third of the group was tracked as a control group as they received no alerts about their driving and, although strongly discouraged, had the ability to illegally call or text while driving (a behavior that was also tracked). Another third received warnings for excessive braking, sudden acceleration, high turning speeds, seat belt use, coming to a complete stop at signs and other risky habits. Speed limits posted on white screens of phones mounted on vehicle dashboards changed to yellow if the limit was exceeded by 2.5 mph and to red with repeated verbal warnings if the limit was exceeded by 7 mph. This group was prohibited from calling or texting on their phone while driving.

The last third of participants received the same coaching and warnings followed by alerts that a text had been sent to their parents when they hadn't responded to warnings to slow down or when they engaged in other risky driving behaviors like running a stop sign. This group was also restricted from calling or texting on the phone while driving. (Parents were also issued weekly reports and access to a website with information on their teen's driving behavior.) The innovative study identified positive short-term effects of the TDSS.

What Was Our Goal?

This Local Road Research Board (LRRB) project sought to determine the impact, if any, that the TDSS has had on the behavior of these young drivers over time.

What Did We Do?

For the follow-up study, researchers located and recruited 150 participants from the original group: 47 from the original control group, 58 from the warnings received group and 45 from the warnings plus parental notifications group.

Participants completed a survey that closely matched a survey they took in the original study and granted researchers access to their Minnesota state driving records. Researchers compared survey responses and driving records of these drivers to their original results to analyze the impact of the TDSS on long-term behavior of young drivers.

Five years after a groundbreaking study of Minnesota teens using a driver support smartphone app, LRRB learned that drivers from the study who were less likely to take risks in their first year were less likely to have driving citations in the following five or six years.

“I was very impressed by the participation rate—it was outstanding. The methodology was rigorous; the data just didn’t provide quite as clear of a long-term effect as we might have hoped.”

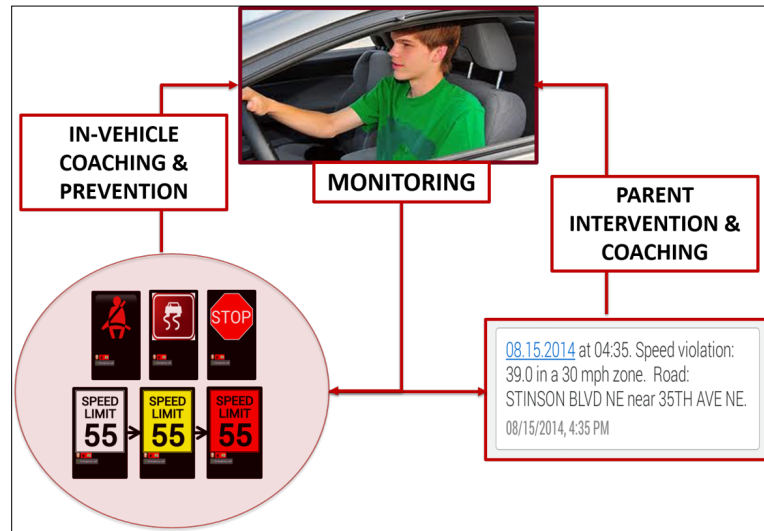
—Joe Gustafson,
Traffic Engineer,
Washington County

“I would encourage all drivers to use this type of system. But it was a research app, not a commercial app. We need a company to deploy it commercially.”

—Nichole Morris,
Director, University of
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Produced by CTC & Associates for:

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The TDSS alerted smartphone users about speed limits in areas where they were driving and issued warnings about risky behavior, in some cases also notifying parents.

What Did We Learn?

While the TDSS correlated with reduced risky driving behavior in the original test period, its long-term impact was less pronounced. Originally, drivers in the warnings received and warnings plus parental notifications groups had fewer speeding instances than the control group, including a significantly smaller percentage of total miles at more than 7 mph over speed limits. Researchers determined that parental feedback was critical to significantly lower rates of hard braking, hard acceleration and hard turning in the first study.

Analysis of the original results for this study’s 150 follow-up participants indicated participants from the two warnings groups experienced significantly fewer excessive speed warnings and notifications than those in the control group and also showed significantly reduced texting rates.

State records indicated that 70% of these drivers were free of traffic citations or tickets. Excessive speed was the most prevalent type of citation issued against ticketed drivers. Crash records indicated 26 accidents in the six years since obtaining full driver’s licenses, with 80% of participants crash-free in state records.

The study size and response biases limited linkage of long-term crash and safety outcomes to early intervention outcomes. Nevertheless, results indicated that participants who were more involved in speeding, hard braking, texting and other risky behaviors in their first year were more likely than those who were less involved in such behaviors to have citations on their records in the five or six years following licensure. How significant the TDSS was in encouraging low-risk habits is unclear.

What’s Next?

This unique longitudinal study provides a significant step forward in research of in-vehicle coaching systems and their impact. Follow-up studies in another five years may also be useful, given that drivers in most cases will no longer be in college and may become more frequent drivers.

A recent small study developed an app based on the TDSS called “RoadCoach” for drivers 65 years and older. Participants showed improved driving behavior while using the app and were enthusiastic about using it more.

This Technical Summary pertains to Report 2021-01, “Effectiveness of Teen Driver Support System (TDSS) on Reducing Traffic Violation Behaviors for Teenage Drivers at the Early Time of Licensure,” published January 2021. The full report can be accessed at mndot.gov/research/reports/2021/202101.pdf.