Motor vehicle crashes are the leading cause of teen fatalities. One approach to reducing fatalities is the use of Graduated Driver Licensing (GDL) programs that limit teens’ exposure to risky situations. However, these programs are difficult to enforce, relying largely on parents to monitor behavior on the road and ensure compliance.

A Teen Driver Support System (TDSS) has been developed by the ITS Institute to address behaviors that influence the unacceptably high crash rate among teenagers by providing critical assistance to inexperienced drivers and enabling parents to monitor their children's driving habits effectively. The TDSS, based on a teen’s smartphone, provides real-time, in-vehicle feedback to the teen about risky driving behavior and immediately communicates with parents if the behavior continues.

Feedback to the teen driver includes visual and auditory warnings about speeding, excessive maneuvers (e.g., hard braking, cornering), upcoming curves, and stop sign violations. The current implementation of the TDSS also monitors seat belt use and detects the presence of passengers (e.g., based on GDL provisions)—two known factors that increase the risk of fatalities among teen drivers. The TDSS also prevents incoming and outgoing cell phone calls (except 911) and text messaging while driving. The visual feedback interface is designed around simple, easy-to-understand graphical elements, such as iconic traffic signs that change color depending on speed or current conditions. For example, speed limits are normally displayed as white signs, but the interface turns yellow and then red when speeding is detected.

Because the TDSS is programmed in a smartphone, it is capable of providing near real-time feedback to parents about a teen’s driving behavior. For example, if a teen receives feedback that he or she is speeding but fails to reduce the vehicle’s speed after being warned, the TDSS will automatically send a text message to the teen’s parents to inform them of the behavior. Feedback to the teen informs her or him about the unsafe driving and gives the teen an opportunity to change the behavior before parents are notified. The system also produces a weekly report summarizing events and behaviors and archives the data for review over longer time periods. This helps parents and teens understand patterns of driving behavior and supports ongoing dialogue between parents and teen drivers about safe driving.

Next steps are a proposed large-scale field study of the TDSS that will explore the behavioral impacts of the system and identify any unwanted behavioral adaptation occurring in response to the TDSS. The field test would examine the effectiveness of some TDSS functions in everyday driving, including the system’s ability to detect speeding events, aggressive driving, seat belt compliance, and the presence of passengers and associate them with driving location and time-of-day.