



INVESTING IN THE FUTURE, MAKING A DIFFERENCE TODAY STATE PLANNING AND RESEARCH (SP&R) FUNDS



Pre-fabricated bridge elements were used at Keg Creek.

US 6 at Keg Creek near Council Bluffs, IA; closure of this bridge lasted only 16 days.



The Iowa Department of Transportation (DOT) relies heavily on State Planning and Research (SP&R) funding to improve the state's transportation system.

The examples described here show that the wise investment of SP&R dollars results in solutions that deliver a safer, more efficient, and longer lasting transportation system.

Accelerated Bridge Construction (ABC)

The entire nation will benefit from accelerated bridge construction (ABC) research and new bridge design methodologies. ABC reduces construction time, minimizes traffic disruption, improves safety, reduces environmental impacts, improves quality and reduces costs over the life of the bridge. The Iowa DOT invests SP&R funds in development and testing of ABC technologies. One example of ABC is the use of standard prefabricated bridge components

that allow construction off-site prior to the first work zone cones being set. Now, new bridges can be built in days instead of months. With ABC technologies, time-consuming, labor-intensive construction of cast-in-place elements is eliminated or reduced. With the roadway closed only for demolition and a swift assembly on-site, bridges can be built efficiently while minimizing disruptions to the traveling public.

"SP&R funding is the foundation of state research programs."

Sandra Larson,
Research & Technology Bureau Director
Iowa DOT

Winter Highway Maintenance

The Iowa DOT is responsible for snow and ice removal on more than 9,000 miles of roadway in the state. The goal of winter operations is to provide safe winter roads for travelers as efficiently and effectively as possible. Through SP&R funded research, the Iowa DOT continually seeks, tests, and evaluates a number of new and improved technologies, equipment, materials, and methods to assist in snow and ice removal efforts. Examples include thermal scanning of pavements,

surface weather monitoring system, multiple-blade and flexible-blade snow plows, snow plow driver simulator training, and snow fence research. The Iowa DOT also participates in national multiple-state winter operations research efforts that help better leverage SP&R funds.



Approximately 900 snowplows ensure that Iowa's state highways are clear for the traveling public.



Quick-setting adhesive is applied to sensors to bond to a concrete beam for measuring stresses and strains on a bridge due to a known load.

Bridge Diagnostic Load Testing

A primary goal of the state bridge research program at the Iowa DOT is to promote the more efficient use of resources. During the past 10 years, the Iowa DOT recognized an increasing need to explore new technologies for assessing the true load carrying capacity of bridges. Through the structural monitoring research, the Iowa DOT is able to determine if a bridge's expected load capacity accurately reflects its true load capacity. This knowledge helps bridge engineers determine when to restrict heavy truck loads

over bridges; issue permits for overweight/oversize truck loads; assess the strength of damaged bridge members; and evaluate the performance of new/innovative materials used on bridges. The bridge diagnostic load testing program also allows engineers to better monitor the structural condition of bridges over time. It is a cost-effective way to evaluate bridge load responses, and manage the state's assets over the long run.

Teen Passengers: Impact On Safety Of Iowa Teen Drivers

Enhancing Iowa's laws to limit passengers could reduce fatalities among teens, their passengers, and other drivers on Iowa roadways.

Research shows that teen drivers (ages 14-19) are at a greater risk of injury and death than all other age groups. It also shows that teen passengers are one of the factors that contribute to this increased risk.



The crash risk is 3 to 5 times greater for teens driving with teenage passengers than for teens driving alone.

Such concerns led to the need for an in-depth examination of Iowa teen drivers. The crash fatality data show that the risk associated with teen driving is high. In addition, the more teen passengers on board, the higher the crash risk. A survey of 1,065 Iowa parents across the rural, medium and urban population areas showed strong support for limits on teen passengers.

Teen Driver Video-Feedback Study

Newly licensed teens have an extremely high risk for crashes. The use of video-feedback in this research showed that it was immediately effective in reducing safety-related driving errors of teens by 61%. This research examined the use of the DriveCam™ system to reduce unsafe driving errors by teens in both urban and rural settings. "Unsafe events" triggered the video system to record a 20-second video and audio clip.

Triggered events included situations such as when abrupt acceleration, braking or erratic steering occurred. Parents received a weekly report card and coaching protocols to use when discussing unsafe events with their teens. This led to an increased communication between parents and teens regarding safety. Most dramatic improvement was in the category of improper turns made by teens.



The DriveCam™ system measures changes in vehicle velocity and forces acting on the vehicle when cornering. If acceleration or deceleration exceeds a threshold value, an event is triggered and a video recording of it is saved.

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