

RESULTS SUMMARY

This project added two new modules to Clear Roads' training materials for snowplow operators: defensive driving and safe driving. These customizable classes will help operators learn how they can anticipate and prevent situations that lead to snowplow crashes.

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SAFE AND DEFENSIVE DRIVING TRAINING FOR SNOWPLOW OPERATORS

Each winter, snowplows are involved in crashes, costing agencies money in repair and replacement expenses and causing equipment downtime that can impact traveler safety. In many crashes, snowplows are struck by other vehicles; rear-end collisions and crashes during turning movements are two common types of crashes. Although snowplow operators are rarely at fault in these crashes, training operators on defensive driving practices—as well as reviewing general safe driving practices—may help reduce crashes involving snowplows.

PROJECT DETAILS

Project Title: Defensive Driving for Snowplow Operators

Project Number: CR18-01

Project Cost: \$70,000

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Need for Research

While safety is an integral part of snowplow operator training at agencies across the country, this training typically does not cover defensive driving: strategies operators can employ to anticipate and prevent situations that can lead to crashes. Research was needed to develop defensive driving training geared specifically toward snowplow operators, and to develop complementary safe driving training that emphasizes avoiding preventable crashes.

Objectives and Methodology

This project sought to examine the key causes of crashes involving snowplows and to identify defensive driving strategies that snowplow operators can use to reduce the risk of being struck by other drivers.

To learn firsthand about the snowplow crashes experienced by state DOTs, researchers sent an online survey to winter maintenance managers, conducted follow-up interviews with practitioners in selected states, and compiled state snowplow crash data.

The survey gathered data from 86 respondents in 20 states, and the interviews yielded perspectives from managers and operators in six states (California, Colorado, Idaho, Montana, Ohio and Virginia). Five states provided at least one year of crash data, with details including time, location, crash type and weather conditions.



A snowplow is passed by two vehicles on a snowy rural road. Clear Roads' defensive driving training for snowplow operators stresses the need for constant awareness of other vehicles near the plow to avoid crashes.

Through an analysis of the survey results, interviews, and crash data, researchers identified the five most common types of preventable snowplow crashes—fixed-object strikes, run-off-road crashes, backing crashes, wing plow strikes, and rear-end strikes by another vehicle—and developed a framework of strategies to help prevent them.

Results

Researchers created two modular, instructor-led [training courses](#) for snowplow operators—defensive driving and safe driving—that state DOTs and other agencies can customize and integrate into their operator training programs. Both courses include presentation slides with instructor notes, an instructor's guide, and post-training assessments. Video animations allow instructors to step through hazardous scenarios, identify decision points, and discuss strategies to avoid crashes.

Defensive Driving Training

The defensive driving training module is a first-of-its-kind compilation of approaches that plow operators can take to anticipate and prevent crashes caused by another vehicle. Sample strategies include:

- **Make safe left turns:** Signal well in advance, since turn signals may be obscured by snow or blend in with other warning lights. Keep mirrors clear and check them before turning.
- **Minimize the snow cloud:** Reducing speed may help make the snow cloud around the plow smaller. If the surrounding traffic is obscured by the cloud, take care in changing lanes.
- **Wing plow strikes:** Use the wing plow on shoulders, not to plow the active driving lanes

(unless plowing in team formation). If possible, raise the wing if another vehicle is about to strike it.

Safe Driving Training

The safe driving training module provides a thorough review of strategies for navigating the roadway and avoiding obstacles, especially when visibility is limited. Sample strategies include:

- **Identify hazards:** In dry weather, scan the route for potential hazards. Document known hazards in a GIS database or other shared file. If possible, mark hazards such as soft shoulders with delineator posts.
- **Practice safe backing:** When backing is unavoidable, use a spotter, or get out and look all around the truck. Open garage doors and look for hidden objects.
- **Manage fatigue:** Maintain a regular sleep schedule when possible. Learn to self-assess fatigue. Take breaks every two hours; get out at each turnaround and when refilling material.

Benefits and Further Research

The information and strategies offered in these two training modules will help operators better understand the causes of snowplow crashes and will provide them with new approaches to proactively avoid hazardous situations. By learning and using defensive driving strategies, operators may be able to help prevent more types of crashes—ultimately keeping highways safer and saving agencies money.

Like Clear Roads' well-received [Snowplow Operator and Supervisor Training](#) courses, the two new training modules are available for any agency to download for free on the [Clear Roads website](#).

"Rear-end collisions have taken a toll on our fleet. Repairs are expensive and take trucks out of service for a long time. Our state will start defensive driving training this winter; if we prevent one crash a year, the savings will pay for our training efforts."

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