Transportation Systems Operations & Support

Asim Zaman
Artificial-Intelligence-Aided Automated Detection of Railroad Trespassing

Asim Frank Zaman
Senior Engineer, Transportation Operations Systems and Support
Grade Crossing Results: Vehicle
Grade Crossing Location 1 - Summary

Pedestrian: 17%
Cars: 79%
Trucks: 3%
Buses: 1%
Motorcycles: 0%
Bicycles: 0%

Vehicles: 83%
Grade Crossing Location 1 - 24 Hour

Grade Crossing: 24 Hour Distribution

Events Recorded

Hour of Day
ROW 2 Results
Task Force on Transit Safety Meeting

Pedestrian Safety and Driver Yielding Near Public Transit Stops
(Nichole Morris, Western Michigan University)
St. Paul, Minnesota – Vehicle x Pedestrian Accident Prevention

- **Problem:** Pedestrian x Vehicle Accidents
- **Solution:** Countermeasure Analysis
  - Social Media Campaigns (Minor Effectiveness)
  - Police Warnings (Minor Effectiveness)
  - Police Ticketing (More Effective)
  - MUTCD Pedestrian Bollard (Very Effective)

- NJ = Good overall accident fatality record
- NJ = Poor Pedestrian x Vehicle Accident Record

- Once study published, NJDOT could take action based on the formal results
Transportation Systems Operations & Support

Parth Oza
Overview of Discussion Topics
Parth Oza, Assistant Division Director, Operations, North Region

• Best Practices and Techniques for Clearing Various Interchange and Intersection Configurations
• Clear Roads Winter Maintenance Pooled Fund
• Impact of Utilizing CEI Consultants on Highway Construction Project Cost and Schedule Performance
• Other ideas
Best Practices and Techniques for Clearing Various Interchange and Intersection Configurations

Interchanges and intersections are the most complex parts in a roadway network. Currently, no detailed practice manuals are available for clearing interchanges and intersections. To address the practical snow plowing operations problem, ClearRoads initiated a research project to develop a training video and practice manual based on the best practices in clearing various interchange/intersection configurations. This paper presents the best practices and techniques for clearing nine different intersection and interchange layouts.

Safety Considerations
- Do not use cell phone which can distract the operation procedure.
- Adjust speed to avoid casting snow over bridges or overpasses or too far onto sidewalks.
- Push snow away from traffic lanes whenever possible to make sure there is no impede of the traffic flow.
- Be aware of the pavement cross slope, wind conditions and other considerations for the route.
- Flatten out plows through intersections and overbridge decks.
- Adjust the plow angle when crossing bridge joints and rail crossings.
- Be alert for the seal plates, rough pavement, and high manholes or valve-box covers.
- When using a wing plow, watch the roadside obstructions such as guardrail, sign posts, fire hydrants, and mail boxes.
- Along curves, push snow to the inside or low side, unless that is the high side of the road profile or if there is no storage to the inside.

How to Read Clearing Diagrams

Figure 1: Track and Pass Number Indication and Snow Plowing Widths

Acknowledgment
This study is sponsored by ClearRoads under the project “Developing a Training Video and Manual for Best Practices and Techniques in Clearing Different Interchange Configurations and Other Geometric Layouts.”
Clear Roads Winter Maintenance Pooled Fund

### PRACTICAL, READY-TO-IMPLEMENT RESEARCH

**Plug-and-Play Initiative**
Project 13-05 (in progress) and others

For several years, Clear Roads has led a collaborative effort to develop a universal communications protocol for in-cab electronics, allowing “plug and play” functionality regardless of the manufacturer or service provider.

This protocol will benefit both Clear Roads member states and their vendors by standardizing how critical operational data are shared on modern snow and ice vehicles, namely between compatible Automatic Vehicle Location (AVL) devices and anti-icing/deicing joystick and spreader controller systems.

“We are watching closely the next steps in this effort as ODOT moves forward with automatic data collection and using spreader controllers to collect and send truck activity information.”

—Patti Carwell, Oregon DOT

### Snowplow Supervisor and Operator Training
Project 12-04, completed April 2017

This project created a 22-module training program that states can customize to fit their needs. The modules cover equipment and materials, principles of weather and ice, safety, environmental concerns, and winter maintenance management.

“Thanks!”

—Allan Johnson, Wisconsin DOT

**Far-Reaching Benefits**

Clear Roads has received nearly 100 requests for its Snowplow Operator and Supervisor Training materials from non-member agencies.

“We’ve implemented the modules into our new snowplow operator training. Benefits include time savings in trainers and educated staff.”

—Melissa Longworth, Michigan DOT

### Annual Survey of State Winter Maintenance Data
Project 15-S1 (ongoing)

Each year, Clear Roads compiles a range of winter operations data from state DOTs across the country. These metrics are displayed on an interactive map that lets states see how they compare to others in salt use, per-ton salt costs, number of plows, and more.

“75% of member states have implemented this project.”

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—James Morin, Washington State DOT
Impact of Utilizing CEI Consultants on Highway Construction Project Cost and Schedule Performance

- Staff shortage was reason for outsourcing CEI (Construction Engineering Inspection) work
- Use of consultants → no significant impacts on cost overruns
- Use of consultants → resulted in longer project schedules
- Develop ideal staffing profiles based on project complexity

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Other Ideas

• Uber has travel time trends through Uber Movement – free data for research and analysts

• Innovation – No Boundaries Pooled Fund
  • Sign Refurbishing – 10% savings of annual operating budget for sign shop
  • MNDOT
    • Idea → Submit → Award → Evaluation → Final Assessment → Implementation

• Six Minute Pitch – Shark Tank