

## Snow Plowing Best Practices

An in-house study by Organizational Results in cooperation with the Maintenance Division

### MoDOT Summary Statement

*Selected participants were asked to relay their best practices in the area of snow plowing. Responses from the group were similar, with a majority of the practices relating to either the use of GeoMelt, effective communication techniques or technological advances.*

### Background

On October 31, 2008, the Maintenance Division sponsored a focus group to compile a list of specific best practices currently being used statewide. The focus group had following participants:

- Dale Niece, Maintenance Superintendent – District 2
- Owen Hasson, Maintenance Superintendent – District 6
- Tim Rice, Maintenance Superintendent – District 7
- Armin Herrman, Maintenance Superintendent – District 8
- Henry Haggard, District Maintenance Engineer – District 9

The complete list of district comments are on page 2 of this document.

### MoDOT Findings

Overall, the identified best practices can be narrowed into three general categories: GeoMelt, communication, and technological/equipment advances. GeoMelt has enhanced winter event road maintenance in Missouri. The product, when mixed with salt brine, increases efficiency and helps salt work better at lower temperatures. Further, it is also reported to be less corrosive and more environmentally friendly than other snow and ice removal chemicals. Therefore, it potentially reduces labor and material costs. GeoMelt product use was identified as a best practice in districts 2, 8 and 9.

Effective communication techniques were identified as best practices in districts 2, 6, 7 and 8. District 2 increases its communication by adding radio personnel during the winter storm season. District 8 establishes hands-on communication with the maintenance engineer in order to create the best environment for effective mobilization of resources. Most notably, districts 6 and 7 have implemented a Winter Event Action Plan (WEAP), which includes a conference call with representatives from the field, equipment, and buildings and grounds *prior* to the forecasted winter storm. This communication establishes a district-wide knowledge of the plan of action for the specific storm and provides all of the parties with the knowledge of the truck and personnel availability. Additionally, the meeting identifies the needs and extent of mobilization before the issue arises.

Finally, technological and equipment advances, such as the installation of global positioning systems and the use of wider snowplows have increased productivity of the response teams.



### MoDOT Findings (cont'd.)

GPS technology allows for tracking of not only the progress of the plowing, but also for potential bottlenecks in traffic. If a bottleneck is spotted, the truck can be re-routed, which limits unproductive work time.

Wider snowplows allow for one pass clearing of roadways during winter storms. Snowplow trucks equipped with the wider plows can plow snow off the entire width of roadways, whereas before, multiple trips would have to be made to clear one lane of traffic. Additionally, TowPlows allow for one truck to plow snow off of two lanes of traffic or one lane plus a paved shoulder in a single pass. This allows for more efficient operations, especially in urban areas.

### Focus Group Comments

#### **District 2**

- The use of GeoMelt, a bi-product of a sugar beet (*Beta vulgaris*), blended with salt brine increases the effectiveness for pretreatment and ice melting. The mixing of the products is more effective and less expensive in that you use less of the combination than salt alone. Additionally, the mixture is environmentally friendly.
- Increased radio personnel during the winter storm season improve accessibility and familiarity of the job and how to handle problems/questions.
- Effective mobilization of trucks if a big event happens in one part of the district and either partial or no effect on other parts of the district.

#### **District 6**

- Implemented a Winter Event Action Plan (WEAP). The WEAP includes a conference call with representatives from the field, equipment, and buildings and grounds *prior* to the forecasted winter storm. This conference call establishes a district-wide knowledge of the plan of action for the specific storm and provides all of the parties with the knowledge of the truck and personnel availability. Additionally, the meeting identifies the needs and extent of mobilization before the issue arises.

#### **District 6 (cont'd.)**

- The use of TowPlows and 14-foot front snowplows has helped enhance the coverage of multi-lane interstates and freeways, especially in light of the system expansion. As the snow fleet reduces or stagnates, the use of the larger/wider equipment enables plowing in wider areas without adding trucks to the fleet.
- Plows and other response vehicles have been equipped with Global Positioning System (GPS) technology allows for tracking of not only the progress of the plowing, but also for potential bottlenecks in traffic. If a bottleneck is spotted, the truck can be re-routed, which limits unproductive work time.
- Implementation of the “Gang Plow Strike Team.”

#### **District 7**

- Implemented the Winter Event Action Plan (WEAP) – see above.
- Activation of the Employee on Call (EOC). This action makes an engineer available at all hours for expert knowledge and advice. Additionally, area personnel in the north and south of the district work together to collaborate resources in the most efficient manner.

#### **District 8**

- At least one Global Positioning System (GPS) per crew have been installed on response vehicles that service major routes in the district.
- Hands-on communication with the maintenance engineer creates the best environment for effective mobilization of resources.
- The use of GeoMelt – see District 2 comments.

#### **District 9**

- Prioritization of all routes in the district using employee feedback to categorize by either Interstate, Major Roadway, Minor Major Roadway, High Volume Minor Roadway, Low Volume Minor Roadway, and Route. Once categorized, the service of the roads is delegated as shown in the chart on page 3.

***District 9 (cont'd.)***

- Prioritization of all routes in the district using employee feedback to categorize by either Interstate, Major Roadway, Minor Major Roadway, High Volume Minor Roadway, Low Volume Minor Roadway, and Route. Once categorized, the service of the roads are delegated as follows:

Interstate	12 lane miles per truck
Major	25 lane miles per truck
Minor Major	25 lane miles per truck
High Volume Minor	50 lane miles per truck
Low Volume Minor	100 lane miles per truck
Route	0 lane miles per truck

*This prioritization creates an equal level of service or importance as the surface maintenance on the same roads.*

- The use of GeoMelt – see District 2 comments.
- The use of 12- and 14-foot wide snowplows allow for better clearance with fewer passes, creating efficiency in time and labor hours.
- When a winter storm is forecasted, planning is made in advance and schedules of employees are adjusted as much as possible in order to limit or eliminate overtime. Further, routine maintenance crews are on a weekly work schedule of four ten-hour work days – Tuesday through Friday; weekend crews work four ten-hour work days – Friday through Monday; and roadside crews work four ten-hour days – Monday through Thursday.