

Best Practices for Road Weather Management

Version 2.0

City of Aurora, Colorado Maintenance Vehicle Management System

In 1998 the City of Aurora, Colorado deployed a system to monitor the operation of maintenance vehicles, including snowplows and street sweepers. The system has facilitated real-time communication between maintenance managers and vehicle drivers, enhanced productivity, and improved public relations.

System Components: The maintenance vehicle management system is comprised of in-vehicle devices, central control systems, and a wireless communication system. Twenty snowplows are equipped with integrated display, messaging and communication devices. With these in-vehicle devices, text messages can be entered with a keypad, displayed to drivers, and transmitted between maintenance vehicles and central computers via a Cellular Digital Packet Data modem. These devices send position data to a central computer every 20 seconds. Each in-vehicle device (shown in the figure) also includes an interface to vehicle systems and a Global Positioning System receiver, which is used to automatically track equipment status and vehicle location from control computers in two central facilities.



City of Aurora, CO In-Vehicle Device

System Operations: Central control systems allow maintenance managers to transmit pre-programmed or customized messages to a single plow, a selected group of plows, or all snowplows. Managers can monitor road treatment activities with a map display of snowplow locations to assess which routes have been serviced, determine when a plow is off of its designated route, and plan route diversions as needed. The status of vehicle systems may also be monitored to ascertain plow position (i.e., plow up or down) and to determine when treatment materials are being dispensed (i.e., spreader on or off). The management system is utilized for treatment strategy planning, real-time operations monitoring, and post-event analysis.

Transportation Outcome: By using the management system to track maintenance vehicles, managers have minimized treatment costs and improved productivity by 12 percent. Additionally, managers can easily access the system and provide accurate information to citizens who call the City to inquire about plowing of a particular street.

Implementation Issues: The City contracted with a private vendor to furnish and install in-vehicle and central components of the management system. System deployment was expedited by involving the City's information systems staff in planning and design, and by hiring a local system integrator to resolve compatibility issues related to the various component and communications providers.

Best Practices for Road Weather Management

Version 2.0

Contact(s):

- Lynne Center; City of Aurora, Colorado Public Works Department, 303-326-8200, lcenter@ci.aurora.co.us.

Reference(s):

- Beneski, B., "Orbital's Satellite-Based Vehicle Tracking System Selected by Aurora, Colorado," Orbital Sciences Corporation Press Release, July 1998, <http://www.orbital.com/Template.php?Section=News&NavMenuID=32&template=PressReleaseDisplay.php&PressReleaseID=159>.
- Anderson, E. and Nyman, J., "Southeast Michigan Snow and Ice Management (SEMSIM): Final Evaluation at End of Winter Season Year 2000," prepared for the Road Commission of Oakland County, September 2000.

Keywords: winter storm, snow, ice, maintenance vehicle management system, winter maintenance, treatment strategy, advisory strategy, maintenance vehicle, productivity