

Pilot Application of AVL on Snow Plows

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Overview

- Rural Maintenance Challenge
- What is AVL?
 - Winter Use
 - Beyond Winter Use
- Challenges
- MDT Pilot Project

What is Rural?

- Rural includes:
 - 80 percent of U.S. land area
 - 80 percent of roadway mileage
 - 60 percent of highway fatalities
 - 40 percent of vehicle-miles of travel

Rural Maintenance Challenges

- Safety
 - Preserve level of service
 - Tracking plows
 - Recording accidents
- Operations
 - Longer travel times
- Management
 - Chemical/material usage
 - “Do more with less...”



Automatic Vehicle Location (AVL)

- ...a computer-based system that collects and transmits information on a vehicle's actual location and other characteristics
- Components
 - In-vehicle unit
 - In-vehicle interface
 - Integrated sensors
 - Antenna
 - Communications system
 - Center software



Example AVL Applications

- Public transit
 - Vehicle routing
 - Transit security
 - Real-time information
- Emergency response
 - Dispatch assistance
- Commercial vehicle tracking

AVL Configuration

- Location / timestamp
- Environmental conditions
- Vehicle activity
- Vehicle status
- Other communication

- In-vehicle unit
- Antenna
- Sensors

- Air temperature
- Road surface temperature
- Salinity
- Freezing point / ice detection
- Friction



data

data

sensors

AVL Applications for Winter Maintenance

Real-Time

- Vehicle Tracking
- Vehicle Dispatching
- Vehicle Routing
- Vehicle Activity
- Environmental Conditions
- Driver Communications
- Interagency Coordination
- Vehicle Status
- Driver Security

Archived Data

- Maintenance Management
- Chemical and Material Management
- Contractor Accountability
- Tort Liability

Selected Users of AVL for Winter Maintenance

- SEMSIM
- Colorado DOT
- Iowa DOT
- Massachusetts DOT
- Minnesota DOT
- Utah DOT
- Virginia DOT
- Washington State DOT
- Aurora, Colorado
- West Des Moines, Iowa
- McHenry County, Illinois
- Howard County, Maryland
- Vaughan, Ontario
- Alberta DOT

Benefits of Winter Maintenance AVL

- **Management**

- Vehicle location
- Road status
- Treatment recommendations
- Re-deploy trucks
- Driver accountability
- Post-event analysis

- **Operator**

- Less radio “chatter”
- Reduce paperwork

- **Cost**

- More efficient use of chemicals
- Improved fuel efficiency
- Reduce paperwork

- **Safety**

- Accident reduction
- Accident reporting
- Improved emergency routing

- **Other**

- Traveler information
- Public opinion
- Tort claims

AVL Beyond Snowplows

- Moving work zone operations
- Incident response
- Asset management
- Weed control
- Any data where geo-location is helpful

Challenges

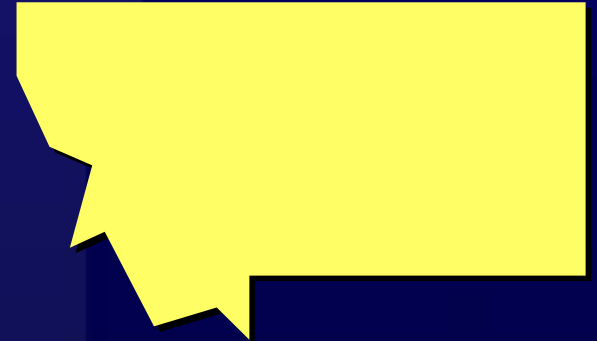
- Hardware
 - Cost
 - Rugged environment
 - Quality of installations
 - Sharing with other applications
 - Cost-effectiveness of sensors
 - Compatibility with existing equipment
- Communication
 - Availability and cost
 - Likelihood of becoming outdated
 - Update speed
 - Messaging system speed
- Personnel
 - Training
 - Willingness to use
 - “Big Brother”
 - Assignment of AVL maintenance
- Other
 - Accuracy and reliability
 - Public awareness

Jumping the Communications Hurdle

- Satellite communications
- Cellular / satellite hybrid
- Dedicated radio
- Cellular with stored data
- Drive-by Wi-Fi download
 - Maintenance shop
 - Intelligent infrastructure (rest area?)
- Download at shop

MDT Pilot Test

- Pre-pilot test
 - Few vehicles
 - Proof of technology
- Pilot test
 - Regional scale
 - Proof of utility
 - Value of real-time information



Pilot Test Status

Winter 2005-06	Pre-pilot in winter operations
Spring/Summer 2006	Pre-pilot in weed control application
Winter 2006-07	Pre-pilot continues in winter operations
Winter 2007-08?	Pilot test

Questions?

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