

MDSS and Mobile Data Collection as an Integrated ITS Technology



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Intelligent Devices, Inc.

- Leader in NTCIP technology
- Legacy protocol translators
- Provider of NTCIP central software
- Mobile Data Collectors

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What is MDSS?

- Maintenance Decision Support System (MDSS)
- A multi-layered decision assistance tool utilizing
 - Weather forecasts
 - Driver observations
 - Truck sensor information
 - Historical weather modeling
 - RWIS sites
- Provides decision support to winter road maintenance managers
- The goal is to figure out the best utilization of resources when planning for treating snow and ice

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MDC and Maintenance Decision Support

If you know...

- Road characteristics
- Current conditions
- Weather forecast
- Physics & chemistry of snow, ice, chemicals
- Available resources (material, equipment, schedule)

...then you can recommend...

- Treatment type
- Application rate
- Optimal timing

...and predict

- Future road conditions with or without treatments

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Benefits of Maintenance Decision Support

Cost savings and benefits include:

- Reduction of material cost
- Reduce equipment usage
- Reduce fleet replacement costs
- Reduce infrastructure damage due to road salts
- Reduce environmental impact
- More efficient use of manpower
- A consistent and desired level of service
- Development of uniform treatment applications based on reporting from various storms.
- Year round applications (Mowing, Chip Sealing, Repaving, etc...)

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Cost Savings by Various Agencies

- Indiana DOT \$9,978,536 in salt usage alone for 2008-2009
 - <http://www.in.gov/indot/2926.htm> under Maintenance Decision Support System – Winter of 2008/2009 (PDF)

	Salt Usage (Nov - Apr)							
	3 Year Ave.	5 Year Ave.	10 Year Ave.	FY 08	FY 09	Variation 3 yr ave to 09	Variation 10 yr ave to 09	Variation from 08 to 09
Crawfordsville	58,313	58,324	51,484	95,318	41,402	-29.2%	-19.6%	-56.6%
Fort Wayne	70,389	71,946	66,893	100,762	71,674	1.8%	7.0%	-28.9%
Greenfield	74,087	74,886	78,883	110,870	80,886	-18.1%	-23.0%	-45.2%
LaPorte	86,387	88,830	103,021	132,038	89,546	3.7%	-13.1%	-32.2%
Seymour	82,212	83,174	45,388	66,726	40,260	-35.3%	-11.3%	-38.7%
Vincennes	35,355	32,997	29,059	92,789	26,246	-25.8%	-8.7%	-50.3%
All Districts	389,723	390,157	374,818	558,274	329,804	-14.7%	-12.0%	-40.9%

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Cost Savings by Various Agencies

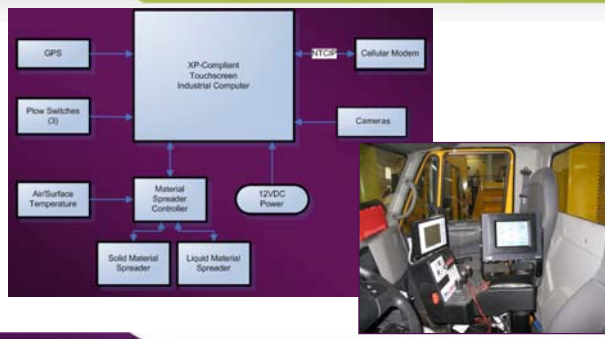
- Western Transportation Institute (WTI)
 - New Hampshire: Benefit to Cost Ratio of 2.13
 - Minnesota: Benefit to Cost Ratio of 3.20
 - Colorado: Benefit to Cost Ratio of 1.69
- http://www.meridian-enviro.com/mdss/pfs/files/WTI-4W1408_Final_Report.pdf

Mobile Data Collectors

- Light weight
- Durable
- Remotely updateable
- Windows based
- Expandable
- Easy to install in vehicle

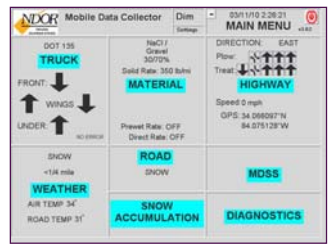


MDC Truck Configuration



Mobile Data Collection

- Automatically Collected:
 - Vehicle Location
 - Speed
 - Direction
 - Material Application Rate
 - Solid
 - Pre-Wet
 - Liquid
 - Plow Blade Position
 - Road Temperature
 - Air Temperature



Mobile Data Collection

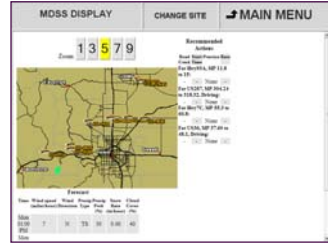
- Operator Enters:
 - Plow/Treat Lanes
 - Material Application
 - Visibility
 - Precipitation
 - Road Condition
 - Snow Accumulation

ROAD CONDITIONS				MAIN MENU
ROAD CONDITION	DRY	DAMP	WET	FROST
	SNOW	DRIFTED SNOW	SLUSH	SLUSH
AIR/SURFACE TEMP	27°F			

WEATHER CONDITIONS					MAIN MENU
PRECIP TYPE	NONE	DRIZZLE	RAIN	SLEET	
	HAL	SNOW			
VISIBILITY	CLEAR	SMOKE	BLOWING SNOW		
DISTANCE	NEAR ZERO	>1/4 mile			
WIND (MPH)	LIGHT 10-30	MEDIUM 20-30	STRONG >30		

Maintenance Decision Support

- Driver receives MDSS recommendation
- Driver receives regional weather



Configurability

- Screen brightness
- Plow blade
 - Automatic monitoring
 - Manual monitoring
- Device password
- Device settings
- On board camera
- Smart power supply

Configurability

- XML configurable
- Uses Windows XP
- Support for any NTCIP objects
- Materials list and URL list fully configurable by agency

Web Services

- Limited or full web browser
- Ease of navigation through touch screen

Route Optimization – Map View

- Displays turn by turn instructions for full route
- Color coded actions
 - Blue – Spreading
 - Green – Deadheading
 - Red – Plowing
- 7 Zoom levels
- Text to speech


Cameras

- Off the shelf
- Easily available
- Snap shot rate configurable
- Uses USB port
- Cuts down on driver distractions
- Management quickly understands current conditions

Engine Codes

MDSS and MDC as an Integrated ITS Technology

- Open Standard
- Integration with TMC
- Combined fleet and traffic management
- Works with any NTCIP compliant central software
- Motorists are provided more information on current driving conditions
 - DMS Signs
 - Highway Advisory Radios (HAR)
 - Public Website



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Questions?

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