

# Road Weather



## Maintenance Decision Support Systems (MDSS) w/ GPS

Denver Office  
IWAPI Inc.  
24918 Genesee Trail Road  
Golden, Colorado 80401

[www.iwapi.com](http://www.iwapi.com)

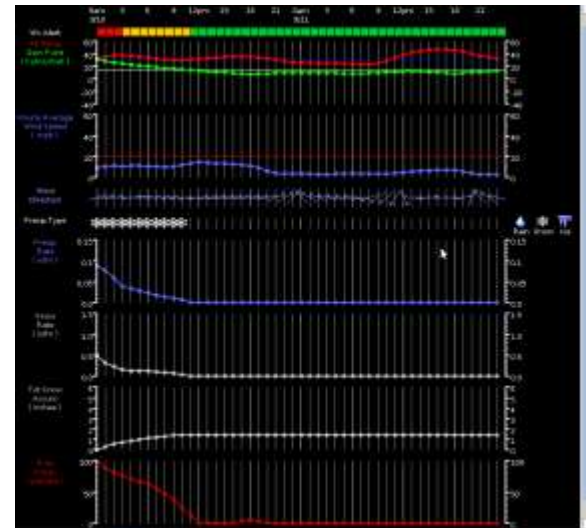
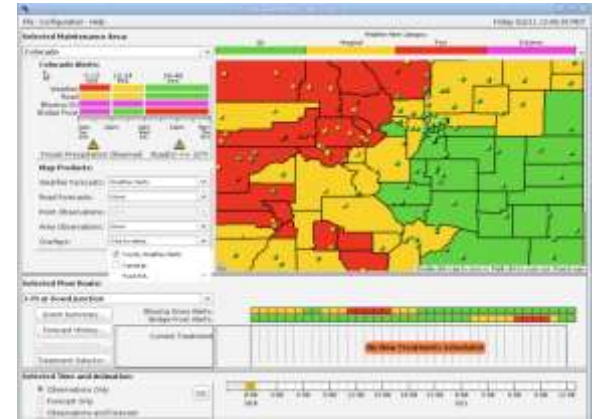
wireless web:  
[go.iwapi.com](http://go.iwapi.com)

Ph. 303.526.5995  
Fax 303.526.9959

Station	Time	Temp	Wind	Humid	Pres	Cloud	Vis	Wx
719	12:03:13	0	0	0	0	0	0	0

# iwapi®

(New)  
**MDSS**  
&  
**In-Vehicle  
Systems**



# iwapi®

SUPPORTING  
MAINTENANCE &  
ITS USE OF...

TRADITIONAL MDSS  
SYSTEMS

(Based on Fed Prototype –  
Central Processing)

Meridian

Vaisala

Telvent

IWAPI – Based on Latest


FHWA Release

(w/ live feeds from trucks)

### Fighting snow and ice with technology

Knowing when to treat the roads before a snowstorm used to be partly guesswork — sometimes a radio forecast or even an achy joint. But this winter the Colorado Department of Transportation is using a new system that rivals battlefield technology. The key to the Maintenance Decision Support System is a computer program that sorts through weather forecasts, radar and temperature readings and combines that information with real-time observations from snowplow drivers and maintenance shops. Ultimately, that leads to one plan of attack.

**Key pieces of system**

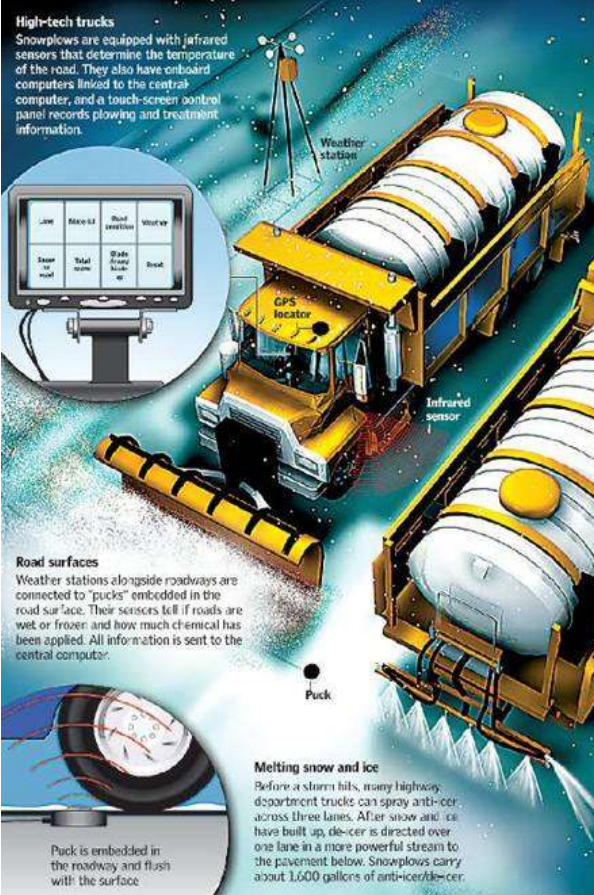


**Weather information**

- Weather stations:** Hundreds of sites across the state send readings for temperature, wind, dew point, hourly precipitation and snowfall to a central computer. That and satellite information is combined with 15 forecasts. Once real-time information from snowplow drivers is added, the most accurate weather prediction is selected.
- Selected roads:** The MDSS was successfully tested in the Greeley area last year. It has expanded this year, but because of limited equipment, it is designated for highways that often see difficult weather conditions.

**High-tech trucks**

Snowplows are equipped with infrared sensors that determine the temperature of the road. They also have onboard computers linked to the central computer, and a touch-screen control panel records plowing and treatment information.



**Road surfaces**

Weather stations alongside roadways are connected to "pucks" embedded in the road surface. Their sensors tell if roads are wet or frozen and how much chemical has been applied. All information is sent to the central computer.

**Melting snow and ice**

Before a storm hits, many highway department trucks can spray anti-icer across three lanes. After snow and ice have built up, de-icer is directed over one lane in a more powerful stream to the pavement below. Snowplows carry about 1,600 gallons of anti-icer/de-icer.

Low	Mid-Hi	High	Winter
Start of road	Total snow	Rate of snow	De-icer

Source: Ray Smith and Alan Marlowe, Colorado Department of Transportation | Jim Monaco, Joe Watt and Jeff Gierltzer | The Denver Post

NEW  
DISTRIBUTED MDSS  
SYSTEMS

by IWAPI

MDSS Refined & Rebuilt –  
Distributed Processing)

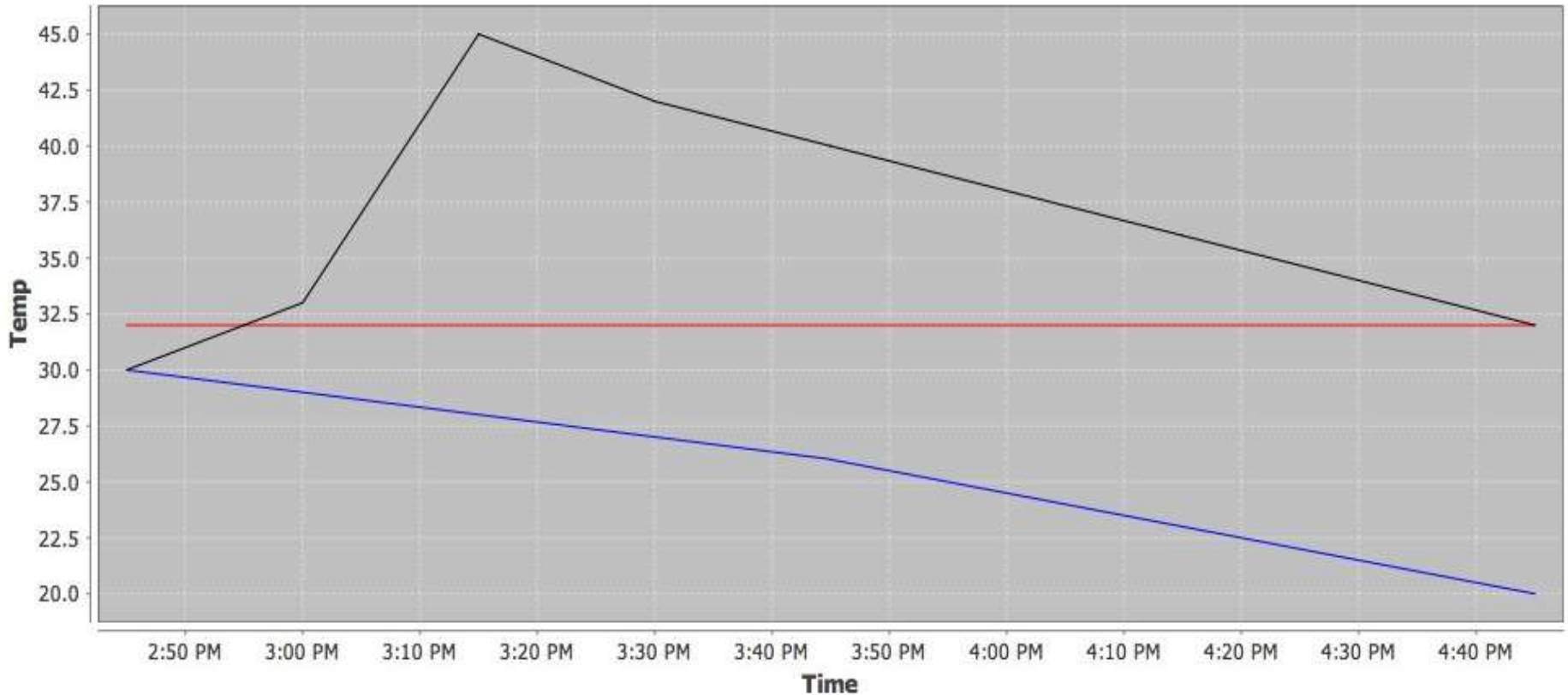
More Responsive to Local Weather

Guidance In & Out of Coverage

Standardized Interfaces for Plug and  
Play Use of Weather Service  
Providers Most Accurately Calling  
Forecasts for Your Area

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## IWAPI Material Recommendation = Salt



— Salt — Freezing Point — Forecasted Temp

Daily Max Temp : 45

Temp at 15:00 : 30

Total Snow in inches in next 3 hours : 1

Daily Min Temp : 20

Temp at 18:00 : 20

Total Snow in inches in next 6 hours : 4

Temp at 21:00 : 18

Total Snow in inches in next 9 hours : 5

# Configurable Screens & Year Around Applications



<b>LN</b> 1	LANE	MATERIAL	ROAD CONDITION	WEATHER
<b>MT</b> SALT/SAND,500				
<b>RC</b> SLUSH				
<b>Wx</b> SNOW				
<b>5</b>				
<b>6</b>				
BLADE DOWN	SNOW ON ROAD	TOTAL SNOW		
NEW MESSAGES				
DRIVER ID 31412				
WEB ACCESS				
NIGHT				

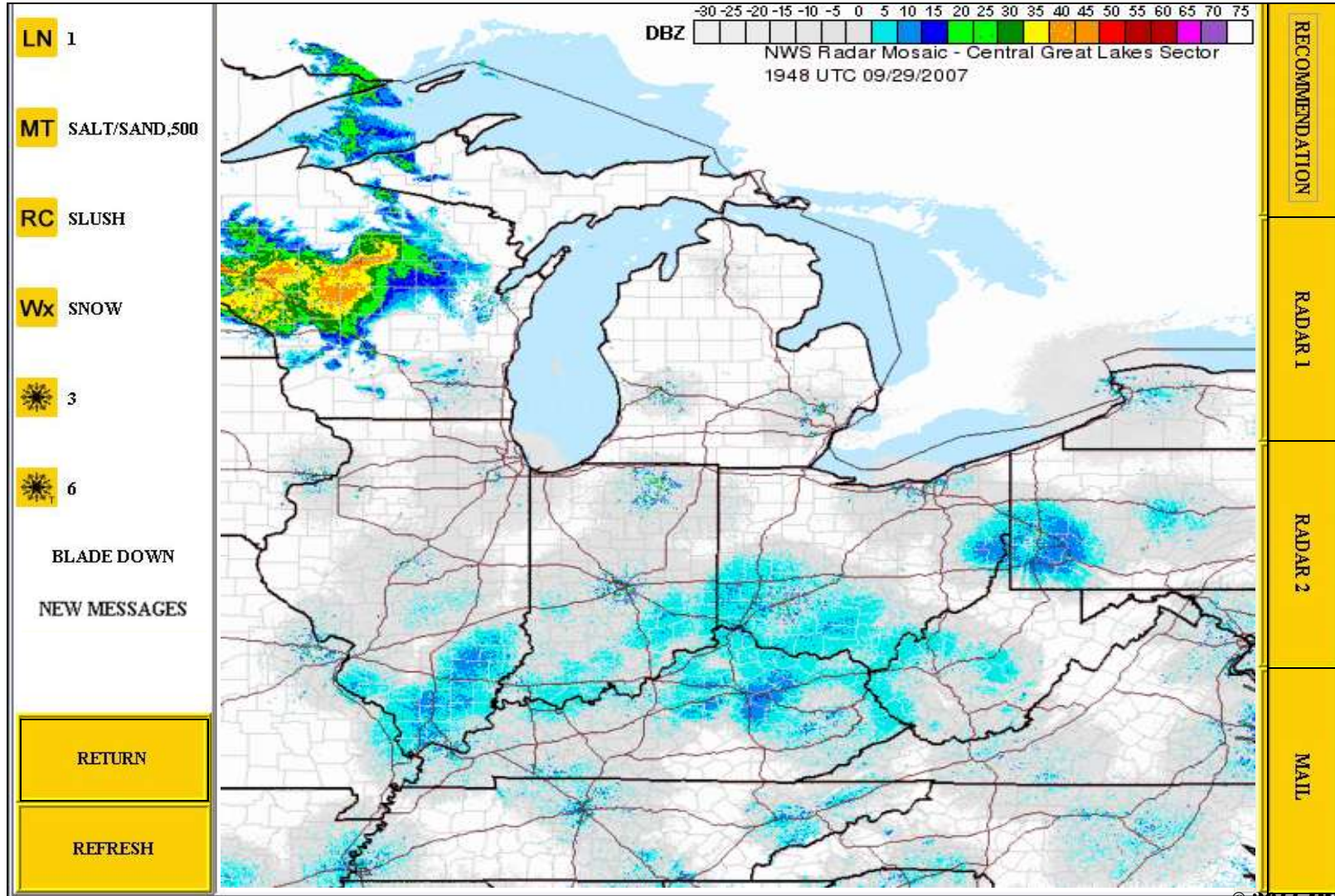
<b>LN</b> 1	<b>Forecast:</b>					<b>Recommended Actions:</b>				
<b>MT</b> SALT/SAND,500	Time	Wind speed (miles/hour)	Wind Direction	Precip Type	Precip Prob (%)	Snow Rate (in/hour)	Cloud Cover (%)	Start Time	Practice	Rate
<b>RC</b> SLUSH	Tue 14:00 MDT	2	WNW	-	0	-	0	Sun 04:40 MST	Prewet NaCl	200lbs
<b>Wx</b> SNOW	Tue 15:00 MDT	2	W	-	0	-	0	Sun 15:46 MST	Prewet NaCl	100lbs
	Tue 16:00 MDT	3	WNW	-	0	-	0	Sun 15:46 MST	Prewet &	-
	Tue 17:00 MDT	3	W	-	0	-	0	Sun 15:48 MST	Plow & Patrol	-
								<b>For demo segment 1:</b>		
								Sun 04:40 MST	Prewet NaCl	200lbs
								Sun 15:46 MST	Prewet NaCl	100lbs
								Sun 15:48 MST	Plow & Patrol	-
								<b>For demo segment 2:</b>		
								Sun 04:40 MST	Prewet NaCl	200lbs
								Sun 15:46 MST	Prewet NaCl	100lbs
								Sun 15:48 MST	Plow & Patrol	-

DBZ 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75  
NWS Radar Mobile - Vertical Grid Labels Society  
1948 U TC 06/29/2007

Dec 20, 2006 4:54:27 PM UTC

RECOMMENDATION
RADAR 1
RADAR 2
MAIL

Time Lapse Loop  
Composite



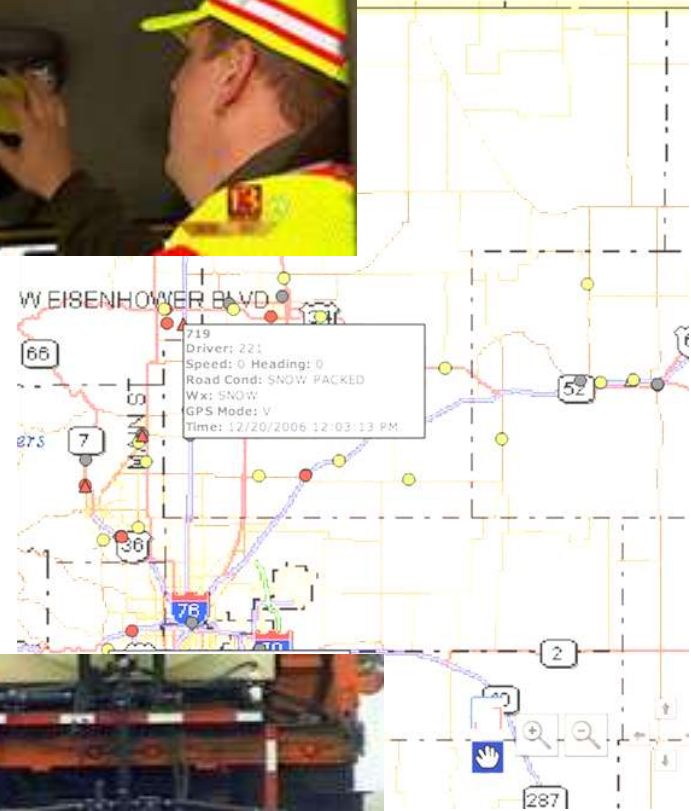
Live Displays  
*Office, Home & Mobile Access*

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The image displays a live traffic map interface. Two data pop-ups are visible:

- Pop-up 1 (Top):**  
Dec 20, 2006 4:54:27 PM UTC  
719  
Driver: 221  
Speed: 0 Heading: 0  
Road Cond: SNOW PACKED  
Wx: SNOW  
GPS Mode: V  
Time: 12/20/2006 12:03:13 PM
- Pop-up 2 (Bottom):**  
1539  
Speed: 24 Heading: 326  
No current Road Condition  
Current Wx not reported  
GPS Mode: A  
Time: 12/20/2006 12:03:20 PM

Two inset photos show snowy road conditions: one from a driver's perspective looking down a road, and another showing a road with a large snowbank on the side. A photo of a red snowplow truck is also included.



**Temps**

**Cameras**

- **Front & Rear**

**Blade & Load**

**Materials, Quantities & Locations**



## Vehicle Information

*Established Standards*

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### **Electronics**

**High - IWAPI (Computer)/Modem**

**Mid - Some Controllers**

**Low - Other Controllers &  
Sensors**

**Base - SAE/MID Codes**

### **Standard SAE/MID Codes**

- **J-1939/1708/1587**
  - **Warning Messages**
- **Temps, Brakes & Wipers**
- **Fuel, Odometer**
- **& More**



**SAE** International™



International  
Organization for  
Standardization

Year Around

# iwapi®



## ACCESS

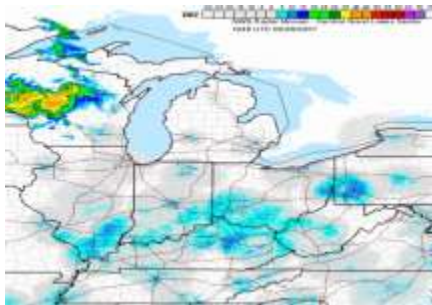
*What you need – Where you need it*

***Truck***

***Office***

***Home***

***Cell or  
PDA***



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