2011 RWM STAKEHOLDERS MEETING

MDSS PILOT PROJECT
Sector M-1. Madrid, Spain

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Network maintained by the Spanish Ministry of Public Works and Transport (Ministerio de Fomento)

STATE ROAD NETWORK

- High capacity network: 11096 km
  - toll motorways: 2493 km
  - toll-free motorways: 8603 km
- Single road: 14537 km
- Total network: 25633 km
- Number of maintenance sectors: 160

Ministry maintains 15% of the country’s roads. These roads, though, account for 51% of the total traffic, and 64% of heavy traffic.
Spain: Geographic Description

- 2nd most mountainous country in Europe.
- Average altitude: 660m (2165 ft).
- 37% of the network is at +700 m (+2300ft).
- Conclusion: despite generally temperate weather, many areas present snow problems due to altitude.
Spain: Winter weather

- Winter presents some areas in Spain with abundant below freezing temperatures and snowy days.
- Mountainous areas in northern, central and southern Spain present an average of as many as 50 days of snow per year.
- Central and Northern Spain: high average elevation + continental climate= 150 days per year (on average) of below - freezing temperatures.
Public-private partnership in Spanish road maintenance

- The Ministry outsources road maintenance to private contractors, manages, supervises and enforces maintenance standards.

- Total BUDGET for road maintenance and routine maintenance 2010: €350 million ($503m).

- Winter Maintenance: €60 million ($86m) (15% of total).

- Capacity for improvement through further deployment of means is very limited: increased efficacy is only viable option.
MDSS Test Site: the A-1 motorway

- 70 km: start at 600 m (1968 ft), highest point, 1200 m (3937 ft).
- Pronounced slopes: up to 5%.
- 27 km with 6 lanes (+ 4 auxiliary lanes). Rest: 4 lanes.
- Average daily traffic between 30,000 and 100,000
- Beyond test site (30 km after the end) is Europe’s highest stretch of motorway (1440 m- 4725 ft).
MDSS Test Site: Weather

- Extreme changes in temp.
  Range from -7 to 40+ºC (19 to +100 ºF)
- Days of snow: 15
- Days of -0º: 100
- Very low visibility during storms (fog+snow).
MDSS Test Site: available means in M1Sector

For M1 Sector (70 km):

- Snow plows: 19
- Brine plants: 2
- Brine storage units: 4
- Total brine capacity: 100,000 L
- Salt silos: 7
- Salt storage barn: 1
- Total salt capacity: 2,500 T
Why MDSS?

Ministry Objectives in Winter Maintenance:

- Reduce to smallest expression any risks & disturbances to traffic due to weather.
- Impede ice formation on road.
- Inform stakeholders of conditions in advance.

MDSS Pilot Objectives:

- Improvement of service through more means can only be marginal: only possible through better use of available means.
- To this day, reduction in cost is not objective: improve our efficiency as a way to improve our efficacy.
A1 Motorway MDSS
A1 Motorway MDSS
Lessons learnt and future challenges

Objectives achieved:

- Improved weather predictions.
- Characterization of road segments. Segmented predictions.
- Improved response planification for preventive treatments.
- Concentrated all information flows into 1 interface (forecast, cameras, weather stations, radar).

Future challenges:

- To test over full season.
- Integrate other information flows, especially AVL.
- To be able to actually follow MDSS recommendations.
- To use results of these recommendations to improve general procedures (operation plan).
Thank you!