

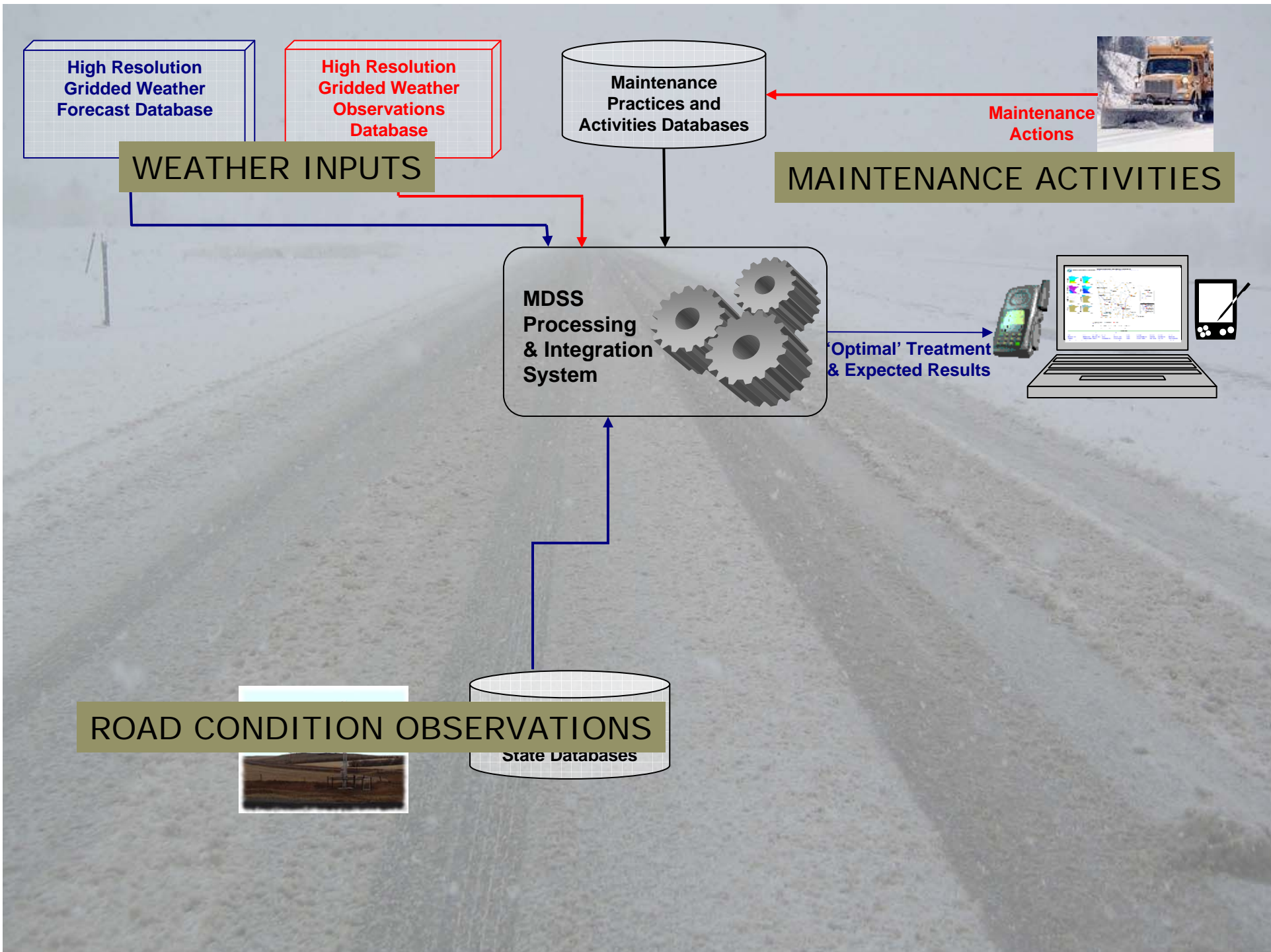
An aerial photograph of a desert landscape. A paved road with a double yellow line runs from the bottom center towards the horizon. In the distance, a large pyramid is visible on the horizon line. The terrain is flat and sandy with some sparse vegetation. The sky is clear and blue.

# Human Factors Issues for MDSS

John Mewes, Ph.D.

Chief Scientist

Meridian Environmental Technology, Inc.



# Human Factors for MDSS

- ◆ Is it viewed as a useful tool, a nuisance, or a threat?
  - Decision Support is the goal.
- ◆ Will the recommendations be followed or systematically adjusted?
- ◆ If not followed, is the recommendation wrong or is it different?
  - Recommendations that are different from what the user would normally do are often labeled as 'wrong', when in fact it might just be a different approach

# Human Factors for MDSS

- ◆ When it is wrong, can the user distinguish the reason or is MDSS automatically faulted?
  - MDSS relies on weather forecasts, which are inherently error prone
  - Other data flows into MDSS can fail or contribute bad information
- ◆ Should MDSS make judgment calls?
  - Experienced maintenance personnel may choose to leave a road 'out of spec' for a period knowing the road may take care of itself given time
  - Does this type of decision have a place in MDSS?
- ◆ Level of Service doesn't always tell the whole story.
  - Political or societal considerations weigh in maintainer's decision process.

# Human Factors for MDSS

- ◆ Realistic expectations need to be set.
  - Users understand that weather forecasts will have errors and can still find value in those forecasts. Does the same apply for MDSS' recommendations?
- ◆ MDSS needs to be a give and take technology.
  - To get user buy-in, it has to provide something the user views as being of benefit worthy of the time and energy it takes to enter information into the system.
- ◆ Training is extremely important.
  - Not just to show users the way around an interface, but to preemptively address the aforementioned human factors.

# Interface Issues for MDSS

The screenshot displays the Maintenance Decision Support System (MDSS) interface, version 1.80.5, running on a Windows operating system. The interface is divided into several main sections:

- Top Panel:** Contains menu options (File, Report, Data Sync, Region, Options, Help) and a status bar with window controls.
- Left Panel:** A sidebar with various alert and view controls, including "Alerts Next 24 Hours" (State Wide, Current View), "MDSS Weather Alerts", "MDSS Road Alerts", "MDSS Blowing Snow Alerts", and "NWS Alerts". It also includes "Map View", "MDSS Route View", "METAR View", "RWIS View", and "Web Browser Links".
- Map Area:** A central map showing a geographic region with color-coded overlays. A pop-up window for "CO-01-1: I-25 (MP 150-167, Driving)" provides detailed data:
  - Date & Time: 6:30PM Mon Oct 10, 2005
  - Road Temp: 34F
  - Road Cond: Wet
  - Percent Ice: 1%
  - Mobility Index: 70%
  - Snow Depth: 0.00"
  - Liquid Depth: 0.022"
  - Ice Depth: 0.000"
  - Frost Depth: 0.000"
  - Last Maintenance Action Reported: Vehicle ID: 2108, Plow Down, MgCl<sub>2</sub>, 35 gallons brine MgCl<sub>2</sub>, Start Time: 1:35PM Mon Oct 10, 2005, Midpoint Time: 2:10PM Mon Oct 10, 2005, End Time: 2:50PM Mon Oct 10, 2005.
  - Last Condition Reported: No Recent Condition Report.
- Bottom-Right Panel:** A "Message Center" window displaying a "MDSS (Recommended)" alert. Below it is a "Precipitation" bar chart showing forecasted precipitation from Saturday to Monday. Other charts include "Cloud Cover", "MDSS Road Cond.", "MDSS Liquid Deg", "MDSS Ice Depth", "MDSS Frost Dep", "MDSS Snow Dep", "MDSS Maint. Action", and "Blowing Snow".
- Bottom Panel:** A "Processing" status bar and a "start" button. A "MDSS" data panel shows a line graph of "Road Temp" and "Dew Point" in Fahrenheit over time, with values ranging from 29 to 73.

# Interface Issues for MDSS

- ◆ “One Stop Shop” concept is a big carrot that can get potential users regularly looking at MDSS
  - Recommendations aren’t the only type of decision support.
- ◆ Configurability is key to usability and maintainability of MDSS.
  - User to user, route to route, garage to garage, agency to agency
- ◆ Even very simple customization capabilities may not be used by the majority of users.
  - Need to give careful consideration to default options that are available in the system.
- ◆ Performance of interface is a key predictor of use
  - Having adequate hardware and communication specifications essential for successful deployment.