RoadDSS On-Demand

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"RoadDSS On-Demand"

How can I benefit?

- Maintenance Operations:
  - Identify and measure weather impacts on winter maintenance
    - Identify when to send out plows and how much de-icing materials to use

- Mayors, Administrators, Directors & Elected officials:
  - By choosing Vaisala's On-Demand Road Weather Solution, your staff will be able to reduce budgets, accidents & environmental impacts
  - Improve mobility and commerce, allowing you to focus media attention on a better place to live, work & play
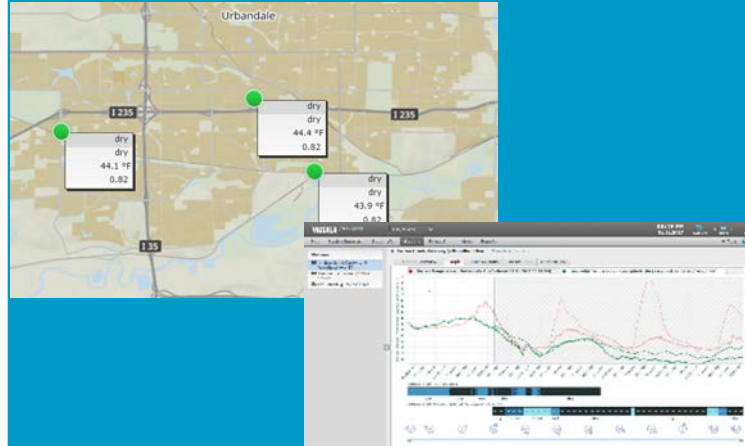
"RoadDSS On-Demand" – what is it?

Hardware

- A complete Vaisala Road Weather Station installed at a mutually agreed location on your road network

- Vaisala owns, operates and maintains the equipment, eliminating the need for maintenance and operation tasks.

Web Interface

- Vaisala RoadDSS Navigator is a web software interface for viewing road weather information for the past, present, and future

- Alerts and informs key personnel of weather impacts

What does it provide?

Total Decision Support Solution (DSS) combining observations, forecasts & reports enabling maintenance staff to make efficient decisions leading to:

- Reduction of vehicle crashes due to snow and ice covered roads
- Reduction in your annual winter maintenance budget
- Reduction in the use of de-icing chemicals
- Increased mobility meaning fewer complaints & improved economy
- Archived RWIS (and operational decisions) to tackle potential litigation

How does it work?

Step 1

- Vaisala will work with you to establish the most suitable location on your network

- Typically we mount the road weather station to a traffic signal pole, providing power, as well as offering suitable exposure for the weather sensors

- In order to keep the price model as low as possible, we ask you to help with the installation by supplying a bucket truck and any needed traffic control

Step 2
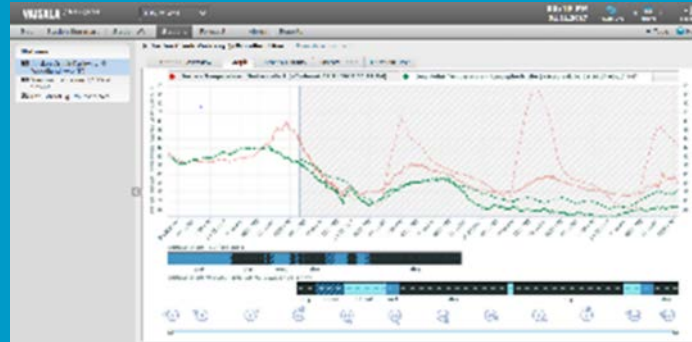
- Vaisala will provide a user login and password for access to RoadDSS Navigator

- "Navigator" is a web-based interface for viewing road weather information in the past, present, and future

- By combining the observation data with forecasts from the National Weather Service, you can easily identify how weather systems are going to impact your road network

Step 3

- Vaisala will provide on-line training session(s) to teach the benefits and functions of software

- The training will cover:
  - Setting weather alerts that can be sent to your cell phone and/or email

  - How to access winter performance reports, which can help improve maintenance operations

  - How to compare observations with National Weather Service forecasts, offering accuracy comparison

Vaisala's Road Weather Stations
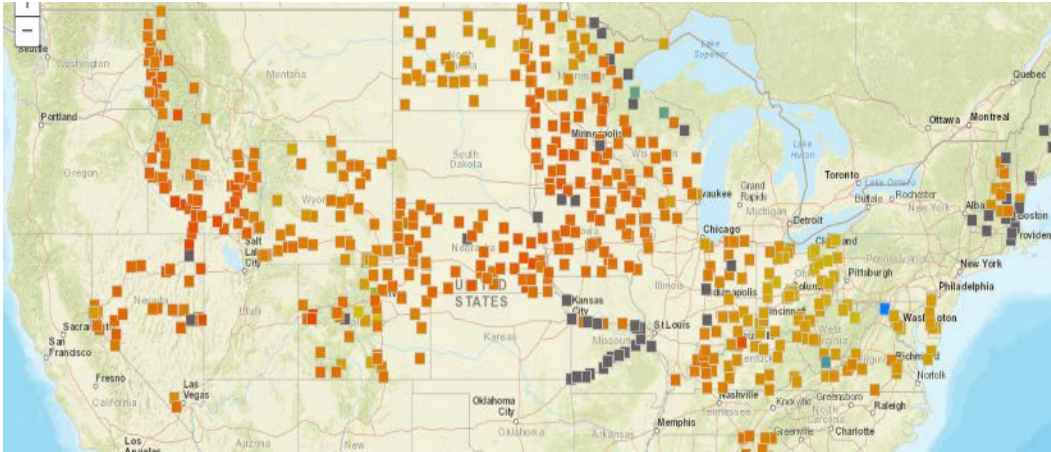
- Vaisala has supplied over 90% of the road weather stations (4000+) in the USA

- State DOTs with large budgets have built their own networks that have previously been out of reach to cities and counties

- 97% of all RWIS are state owned, although cities and counties own 77% of the 40M miles of roads in the USA

Did you know pavement surface temperatures can easily differ by 10°F or more over a 2 mile road distance?

- The benefits of Road Weather Information Systems (RWIS) have been understood for many years and have allowed road authorities to:
  - Improve winter maintenance operations
  - Reduce budgets; Labor & de-icing materials
  - Reduce environmental impacts
  - Save lives

- By objectively monitoring and measuring what is happening on your road network, you can do the same
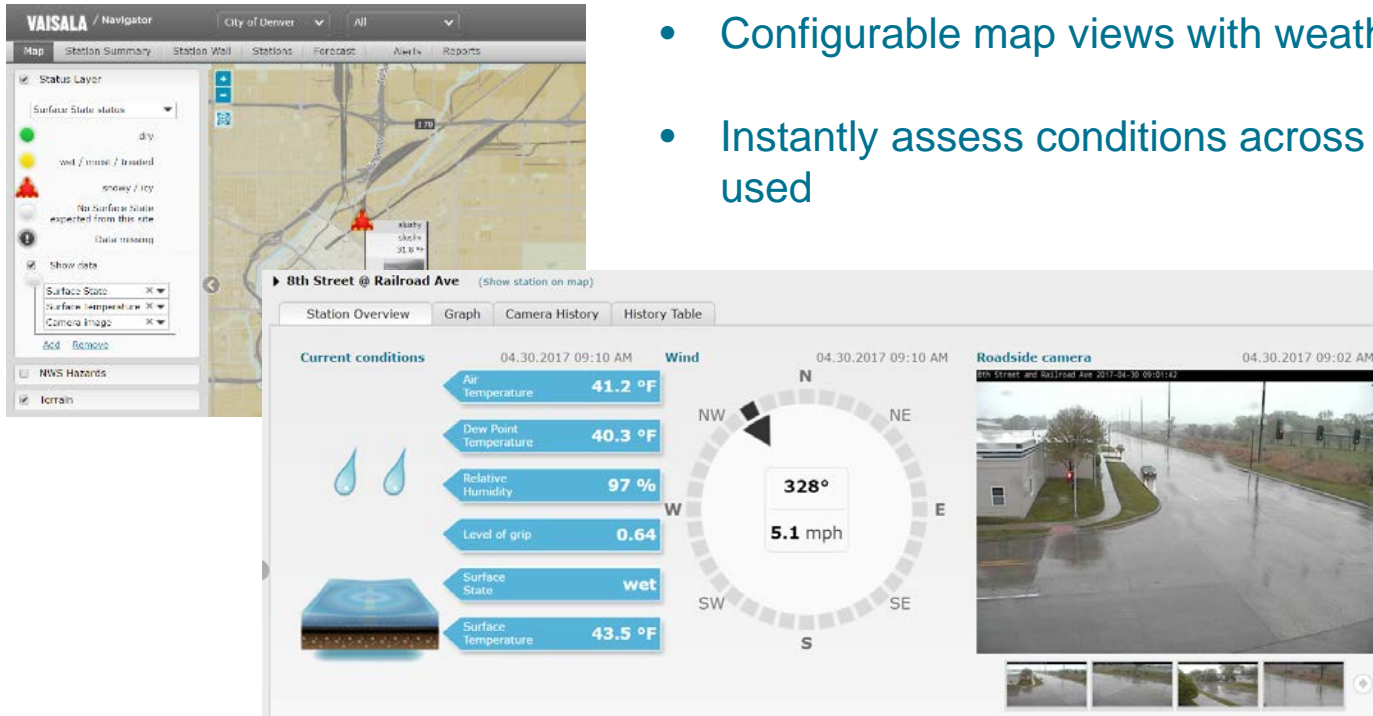

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What will the Road Weather Station measure and what does it mean to my operations?

- **Wind Speed & Direction**
  - Determine when blowing snow is occurring or the best time for weed spraying

- **Pavement Temperature**
  - This can often differ enormously from air temperature readings, especially in the fall and spring
  - Understand the effectiveness of your de-icing chemicals
  - Also useful for concrete or asphalt repairs

- **Pavement Conditions**
  - Identify how much water, ice, slush or snow is on the pavement
  - It can also tell you how slick the pavement is with a simple to understand grip reading

- **Air Temperature & Humidity**
  - Identify when fog is likely

- **Visibility**
  - How thick is the fog or how bad is snow affecting visibility for drivers

- **Present Weather**
  - Identify how much precipitation is falling and determine if it is rain, sleet, snow or even freezing rain
  - Useful in summer for weed spraying, pavement marking, concrete or asphalt repairs

- **Pavement Depth Temperature**
  - Used for forecasting pavement temperature by allowing to view the stored heat in the pavement

What will I see in the Web-Based Interface?

- Configurable map views with weather radar data

- Instantly assess conditions across your network when multiple sites are used

- Camera images along with easy-to-read pavement conditions data

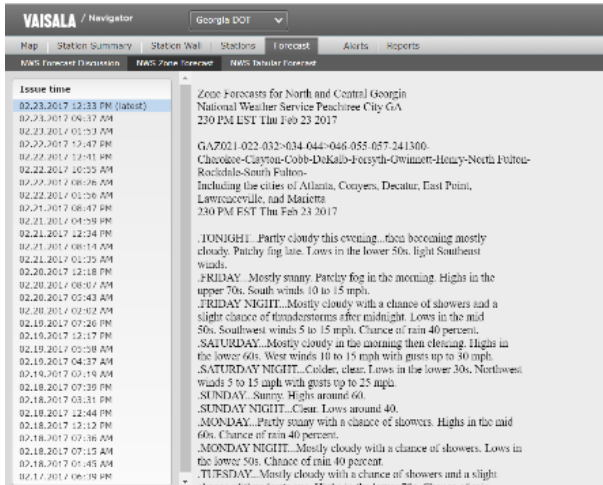- Wind Speed & Direction how it is orientated to the road

- View data in a user configurable tabular and/or graphical format

- Data is stored allowing for:

  - Historical information when you need it.

 - Review storm data for operational improvements

  - Defending litigation
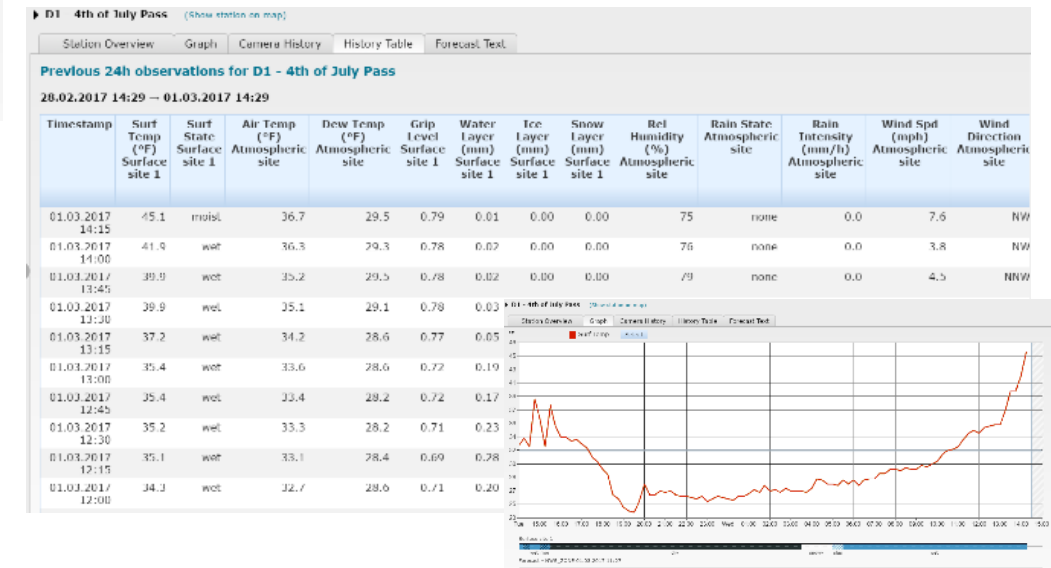
Where do the Weather Forecasts come from & how accurate?

- Vaisala is weather forecast agnostic, which means you can decide on your forecast provider
  - If you have a contract in place with a provider, we can display their forecasts within "Navigator"

- Our standard offering uses weather forecasts originating from your local National Weather Service (NWS) office

- Text forecasts, forecaster discussions, and Hazard Map Warnings are stored in our data base. This allows for historical review of weather events during the post event review
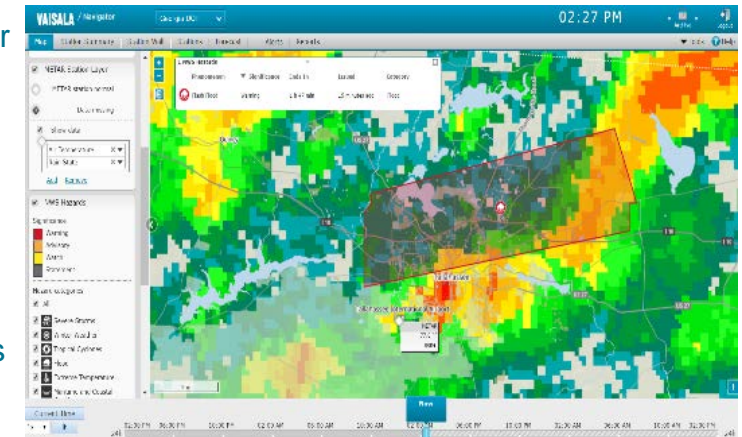
- Not all weather forecasts are tailored for understanding impacts on the pavement

- Vaisala uses pinpoint NWS forecasts and blends them with our pavement model, providing a site specific 3-day (36 hrs) weather forecast

- This gives you the information you need to understand whether the snow will stick or melt on the pavement
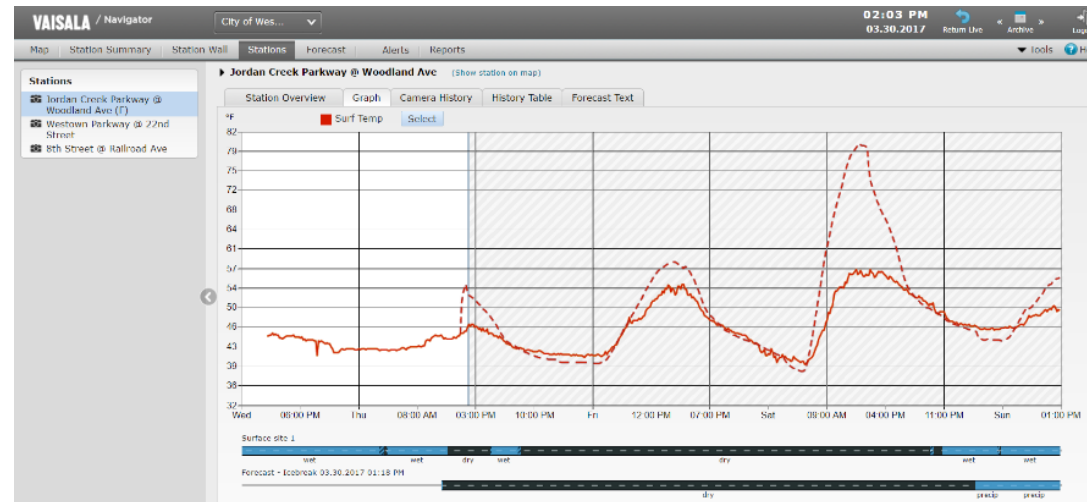
- Not only can you see what is going to happen to your network in the next 3-days (36 hrs)……

- …… you can also look back at the history and confirm forecast accuracy

- This allows you to understand whether there are any repeated errors in the weather forecasts

Don't be caught off guard!

What happens when weather forecasts go wrong or I just want to be notified when conditions worsening?

- "RoadDSS Navigator" allows users to set a variety of alarms, which can involve single or multiple parameters of data

- The system is user configurable, and thresholds can easily be set by simply clicking on pre-set drop down boxes, using a color coded slider or typing in threshold values

- Alarms are activated when user defined thresholds are met. Users are alerted via warning lights and sounds that appear on the screen

- However, each user can also set the system to send email and/or SMS alerts to self or a distribution list

- This feature can be enabled or disabled at any time

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You can't improve what you don't measure!

Winter Performance Index Report

After a winter event, users can select a specific RWIS site, time period, and generate a report. The Excel report is color-coded according to the level of performance during the observed period. The formula is based on the methodologies from the Idaho Transportation Department (ITD):

Winter Performance Measure
Identifies treatment and timing success of the maintenance personnel

Winter Mobility Index
Identifies percentage of time the road conditions DID NOT impede mobility during the event

Storm Severity Index
Quantifies winter event severity, which is beneficial when assessing treatment outcomes

ITD uses the Mobility Index to inform the public of their achievements when ensuring passable road network.

The following graph is available on their public website under "Percent of Time Highways Clear of Snow/Ice During Winter Storms"

http://apps.itd.idaho.gov/apps/Dashboard/
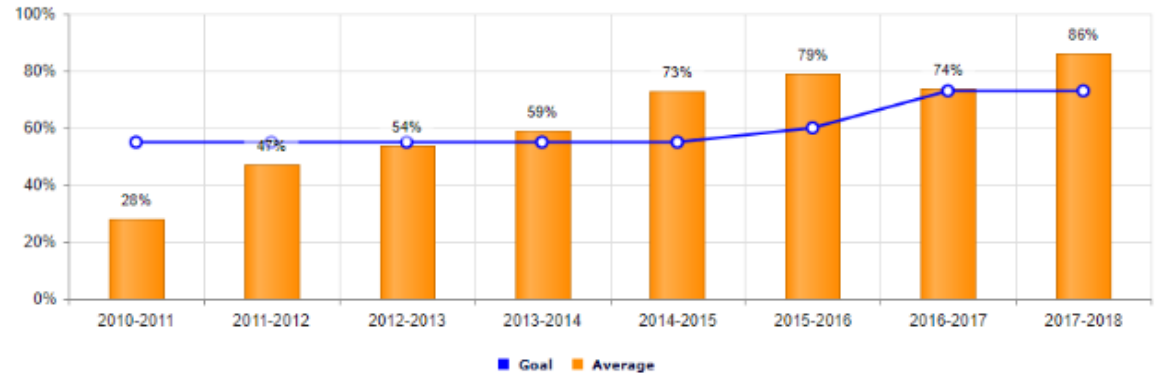
Since introducing performance measures, Idaho has achieved:

- *Reduction of ~50% in vehicle crashes due to snow and ice covered roads*

- *A reduction in their annual winter maintenance budget from $30M to $21M*

- *A reduction in the use of de-icing chemicals of up to 25% per event*

What is the future of "RoadDSS On-Demand"?

FUTURE DEVELOPMENT TOPICS

Integration of additional services, such as:

- AVL (Automatic Vehicle Locating)
- Mobile Sensors
- Air Quality
- Thermal Mapping
- Route Optimization