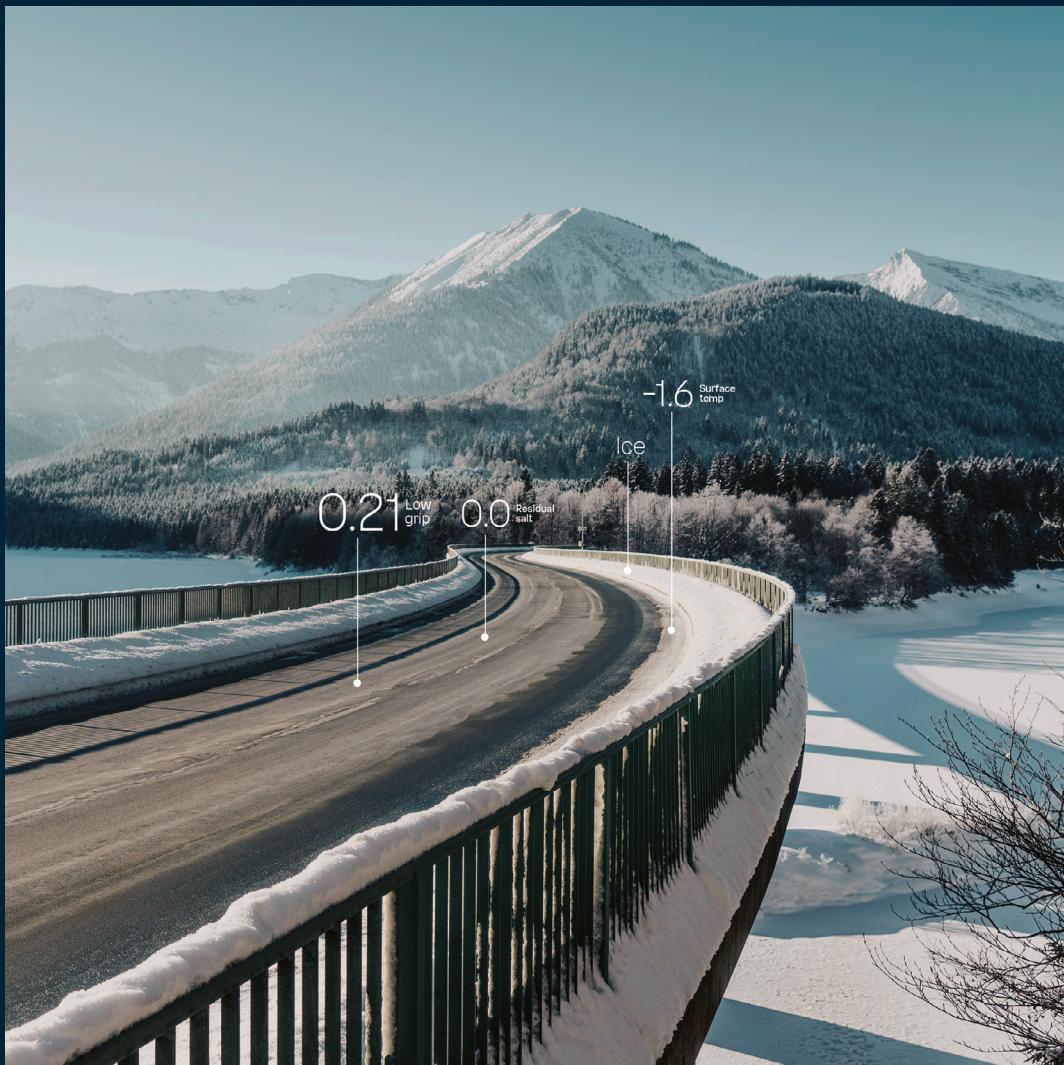


VAISALA

Intelligent winter road maintenance

Solutions Brochure



Empower your winter road maintenance decisions

Busier roads.

More severe weather. Limited budgets. Increasing public expectations. Road maintenance professionals face more winter challenges than ever before.



Yet you still need to keep your road network safe and continuously available throughout the winter season. Count on Vaisala's exclusive combination of instruments and intelligence to provide you with the critical information required for data-driven planning and real time decisions.

Vaisala's solutions arm you with the most accurate data and analysis available so you can:

Keep roads clear

Road safety is the top priority. Plan, mobilize, treat and monitor the effectiveness of winter maintenance actions with confidence.

Prioritize your budget

Act faster – and at lower costs – using data-driven road maintenance strategies. Extend the life span of your assets while improving both efficiency and safety.

Reduce the environmental impact

Targeted treatments help you use less treatment material, for a more sustainable approach to winter road maintenance.

Combining world-class instruments and intelligence for actionable insights

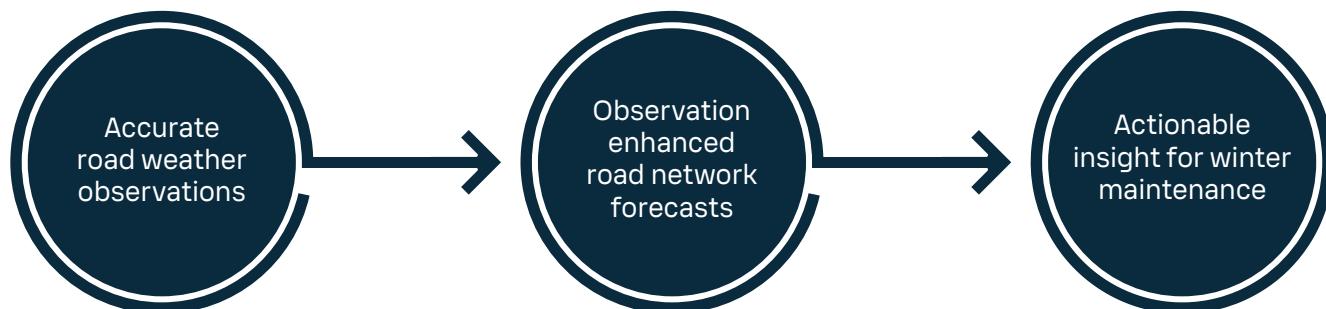
Accurate observations: the foundation of effective winter maintenance

Effective winter road maintenance demands precise, timely insights to ensure safety, sustainability, and accessibility. At Vaisala, we understand the critical role accurate data and insight play in achieving these goals. With nearly 90 years of expertise in weather and environmental technologies, our instruments are known as the gold standard for precision and reliability.

Yet even the most robust networks of road weather stations can be susceptible to a lack of coverage and blind spots. This critical gap in information makes it challenging to prioritize and allocate resources in the ever-moving, fast-paced world of winter road maintenance.

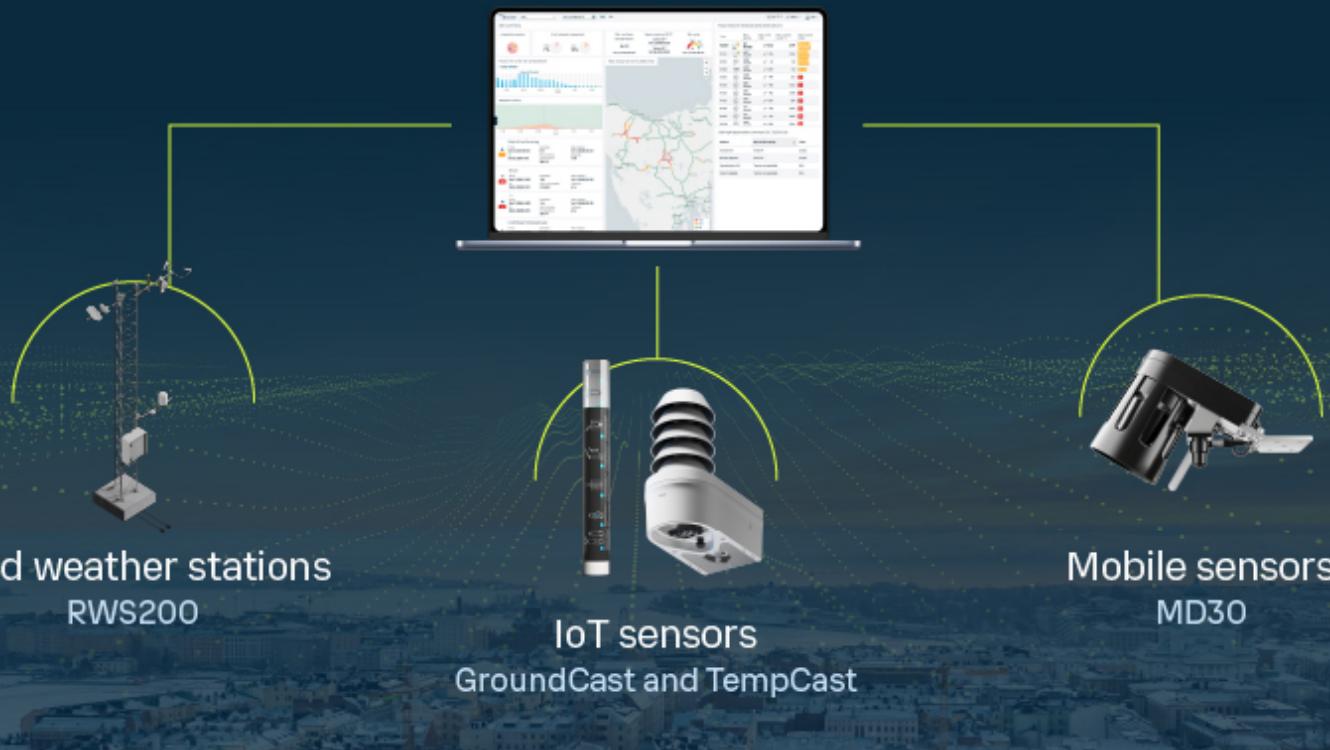
Our solution is based on a hybrid approach, where the road weather station network is combined with our innovative IoT infill sensors and mobile sensors. The IoT sensors are wireless, battery powered, and cloud connected, meaning they can be installed virtually anywhere. Our mobile sensors stay on the move with your road maintenance equipment, including plows, providing accurate readings on-the-go. These solutions, together with the existing road weather stations, provide a comprehensive coverage of your whole road network, even in areas previously deemed challenging, such as bridges, and remote locations lacking necessary infrastructure.

Now, let's put the data to work.



Visualization and forecasting

Xweather Horizon



Observation enhanced road weather forecasts

With your road network under the watchful eye of our hybrid approach, it is time to take the measurements and turn them into measures. Vaisala's advanced road weather modeling and algorithms, combined with intuitive visualization tools, provide you with a seamless view of both real-time and forecasted road weather conditions across your network.

We combine data from your array of local sensors with 70+ other data sources to power advanced Machine Learning based Weather Prediction (MLWP). These observation-enhanced road weather forecasts are constantly updated using the latest sensor data, ensuring you always have the most accurate, up-to-date forecast at your fingertips.

Real-time road condition data combined with enhanced road weather forecasts allow road maintenance agencies to proactively identify and address hazardous conditions and make cost-effective decisions on where to deploy their operations at every hour.

Empowering smarter winter road maintenance with Vaisala

Vaisala's hybrid approach is the complete winter maintenance solution, combining the best in road weather sensor technologies with advanced forecast modeling and intuitive visualization tools.

By partnering with Vaisala, you gain more than just data – you gain confidence. Confidence to optimize resources, reduce costs, and ensure safer, more sustainable roads.

Road Weather Station RWS200

Vaisala's RWS200 is the industry's most reliable, accurate road weather station (RWIS) built for winter and severe weather, offering unparalleled uptime.

Reference-grade roadside observation

With advanced algorithms, RWS200 is intelligently designed to keep all paired sensors running reliably. It provides the flexibility to deploy a variety of sensors to ensure you have the reference-grade road state information you need to make the right road maintenance decisions.

With native sensor integration, the intelligence of RWS200 roadside unit data processing goes beyond a conventional data logger.

Flexibility to work today – and tomorrow

RWS200 automatically provides information on the status and maintenance requirements of the unit itself, and the sensors deployed with it, for timely, cost-effective servicing. The station can be easily managed remotely and even reset, either entirely or sensor by sensor, boosting overall system uptime.

It is fully weatherproof and features integrated lightning protection, ensuring reliable operation for years after installation. We built RWS200 with flexibility in mind, so you can upgrade and expand the sensors you deploy as your needs change.

Easy installation and worry-free performance

Many of the problems with roadside weather stations stem from installation or calibration issues. By contrast, RWS200 features a fast, easy installation procedure. Factory-tested system

components mean less hassle with the system overall and fewer worries about uptime when the weather turns. Native integrated sensors and graphical user interface ensure calibration and maintenance are enhanced over the product lifetime.



RWS200 at a glance:

- Remote Surface State Sensor [DSC211](#)
- Remote Road Surface Temperature Sensor [DST11](#)
- WINDCAP® Ultrasonic Wind Sensor [WMT700](#)
- Present Weather Detectors and Visibility Sensors [PWD](#)
- HUMICAP® Humidity and Temperature Probe [HMP155](#)
- Embedded Road Sensor [DRS511](#)

[vaisala.com/rws200](#)

GroundCast and TempCast sensors

Vaisala's reference-grade GroundCast and TempCast IoT sensors provide an easy way to get road weather measurements from challenging locations, where it's not feasible to install a road weather station. These sensors are battery-powered and maintenance-free, meaning they can be installed virtually anywhere.

GroundCast and TempCast sensors help you fill observation gaps on your road network. The sensors integrate with our winter maintenance subscription service, Xweather Horizon, with just a few taps on your smartphone. With this integrated approach to modern winter maintenance you get access to observation-enhanced forecasts for all your sensor locations.



TempCast measures

- Air temperature
- Relative humidity
- Dew/frost point
- Surface temperature

vaisala.com/tempcast



GroundCast measures

- Temperature at three levels (surface, -6 cm, -30 cm)
- Treatment material amount
- Surface state (dry/not dry)

vaisala.com/groundcast

Mobile Detector MD30

MD30 mobile sensor measures real-time data on road surface state, grip, layer thickness, relative humidity, dew point, and road and air temperature from any vehicle. Its rugged design withstands heavy vibration and water ingress, and it features a patent-pending double-hood for window protection – ensuring accurate measurements even from a snowplow.

The sensor provides live data for plow drivers to support local treatment decisions. This data can also be fed into spreader control and AVL systems to further reduce unnecessary chemical spreading.

It also distributes precise data to supervisors and other decision-makers at the city, county and state levels to help ensure the best possible decisions. MD30 works well as a standalone sensor or to help fill in data gaps between weather stations. When integrated with Xweather Horizon, it continuously improves road network forecast accuracy.

vaisala.com/md30



Dynamic spreading: a smart solution

Dynamic spreading uses vehicle-mounted sensors and computerized dispensing systems to automatically adjust the amount of treatment materials based on real-time road conditions. This helps maintain optimal road conditions, reduces material waste, and minimizes environmental impact. In addition, it lets operators focus on safe driving.

Vaisala's MD30 is the only road surface condition sensor specifically designed for plows – making it the perfect instrument to integrate into dynamic spreader control systems.

Learn more: vaisala.com/dynamicspreading



Xweather Horizon

Stay ahead of weather's every move

Xweather Horizon is a winter maintenance subscription service that puts all the data together. It provides full awareness of current and future road weather conditions across all your network. The integration of your existing road weather stations, IoT and other sensor data with sophisticated road weather models and industry-leading weather forecasting provides the insights you need so you can act with confidence.

72-hour pavement forecasts, accurate road condition measurements, and powerful modeling take proactive winter maintenance to the next level – all in one subscription. Ideal for the hybrid approach to winter maintenance, your Xweather Horizon subscription makes it easy to expand your network with the combination of sensors that best fits your needs.

Main features

- Insights dashboard
- 72-hour road weather network forecast
- Status layers for critical parameters
- Live grip data from connected cars
- Alert notifications
- 10-day atmospheric weather forecasts, radar, wind speed, satellite and more



Actionable insights and predictions

This complete view and alert notifications of your road weather data make it easy to optimize treatment types and locations – saving time, costs, and materials.

Use the optional connected car data feature to get real-time feedback from vehicles on the road about current weather conditions, including air temperature and live grip data. This allows you to target treatments and validate the effectiveness of your ice and snow removal actions.

xweather.com/horizon

Make confident, data-driven winter maintenance decisions

- ✓ Know the **current** impact of hazardous winter weather on your entire road network
- ✓ Know the **future** impact of hazardous winter weather on your entire road network
- ✓ Plow and/or treat your network at the **optimal time**
- ✓ Learn and **improve** from past events
- ✓ **Analyze** and act on large amounts of data



Why Vaisala?

Vaisala's weather and environmental technologies take every measure for unrivaled road network awareness – keeping roadways safe and efficient in any season.

Our instruments and intelligence are built on nearly 90 years of expertise, and are known as the gold standard for precision and reliability. We understand how accurate data and insights do even more by driving sustainable road operations and climate action. Our holistic approach provides customers with end-to-end simplicity, valuable partnership, and a comprehensive portfolio that is constantly evolving.

As recognized experts in transportation, we continue to channel our curiosity into innovative ways of making roadways safer and more efficient than ever.

