Turning Friction into Foresight:

Smarter Winter Maintenance Decisions

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The Winter Safety Challenge

Keeping them safe means fighting ice, managing costs, and acting fast without wasting a single resource.

Icy roads, black ice, and snow cause a sharp rise in skid-related incidents.

De-icing salts cost as much as asphalt, every spread must count.

Road owners seek smarter, more efficient winter maintenance to protect both people and budgets.

> We are four times more likely to have a road traffic accident in December than in July.

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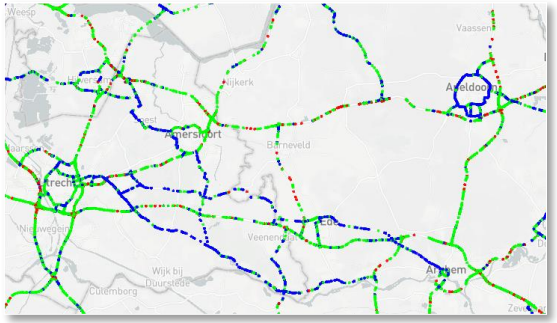
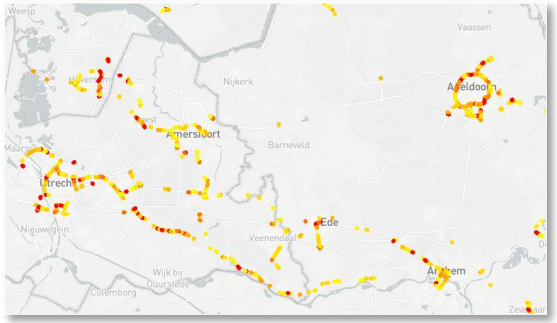
Traditional Tools

Salt remains the main de-icing medium — dry, pre-wetted, or molasses-coated.

Modern fleets use telematics, calibration systems, and spreading sensors.





Routes are optimised using weather dashboards and increasingly detailed forecasts.

But ultimately, winter operations still rely on risk-based judgement:

Do we go? When do we go? How much do we spread?

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Friction Is the Key

Friction governs winter driving

Friction determines how vehicles brake and skid. It changes daily with ice, snow, and freezing rain.

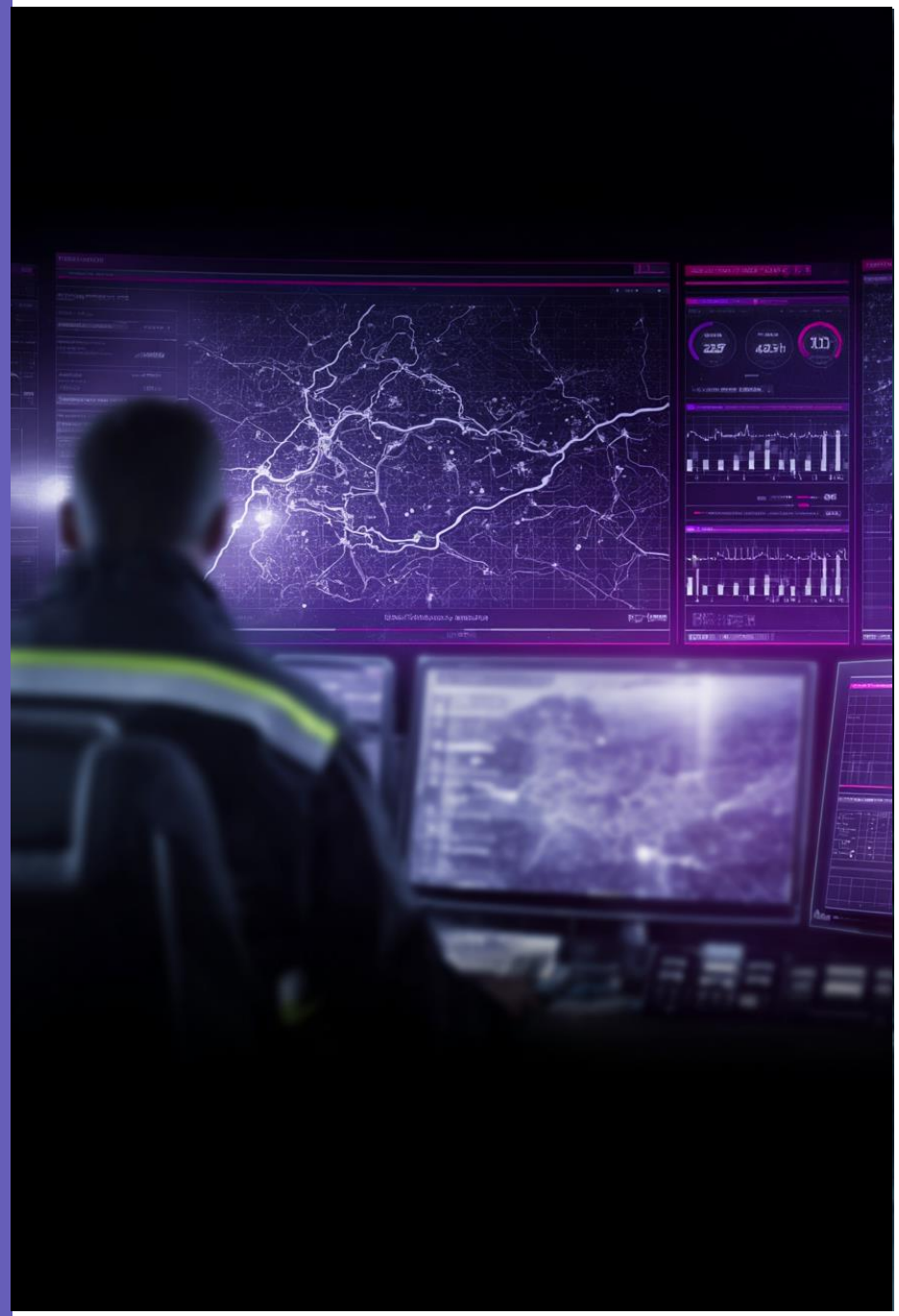
Managing friction at scale

Winter maintenance is fundamentally about friction, yet until now it hasn't been measurable across the network.

Understanding effectiveness

Knowing how friction varies is key to assessing the true impact of winter service.

Road Surface	Friction Coefficient	Description
Dry	0.8 – 1.0	Ideal conditions
Wet	0.6 – 0.9	Rainy or damp roads
Gravel	0.5 – 0.7	Loose gravel or sand
Snow	0.25 – 0.5	Plowed or light snow
Ice	0.1 – 0.35	Black ice or very slippery



How Do We Know We Made the Best Decisions?

Winter maintenance decisions have always been guided by experience, but how do we know they truly work?

We know the route was completed and the spreader operated, but did the salt actually reach the road?

Our goal is always to keep the network safe, yet how can we be sure the actions taken were the most effective and efficient?

These questions have always been there — we've just lacked the tools to answer them.

> So what's changed now that lets us finally know?

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Winter Road Insights — The Breakthrough

Powered by NIRA Dynamics' Volkswagen Group connected vehicle data, this solution provides continuous, network-wide friction monitoring.

"Every Day, Every Road, Every Vehicle.

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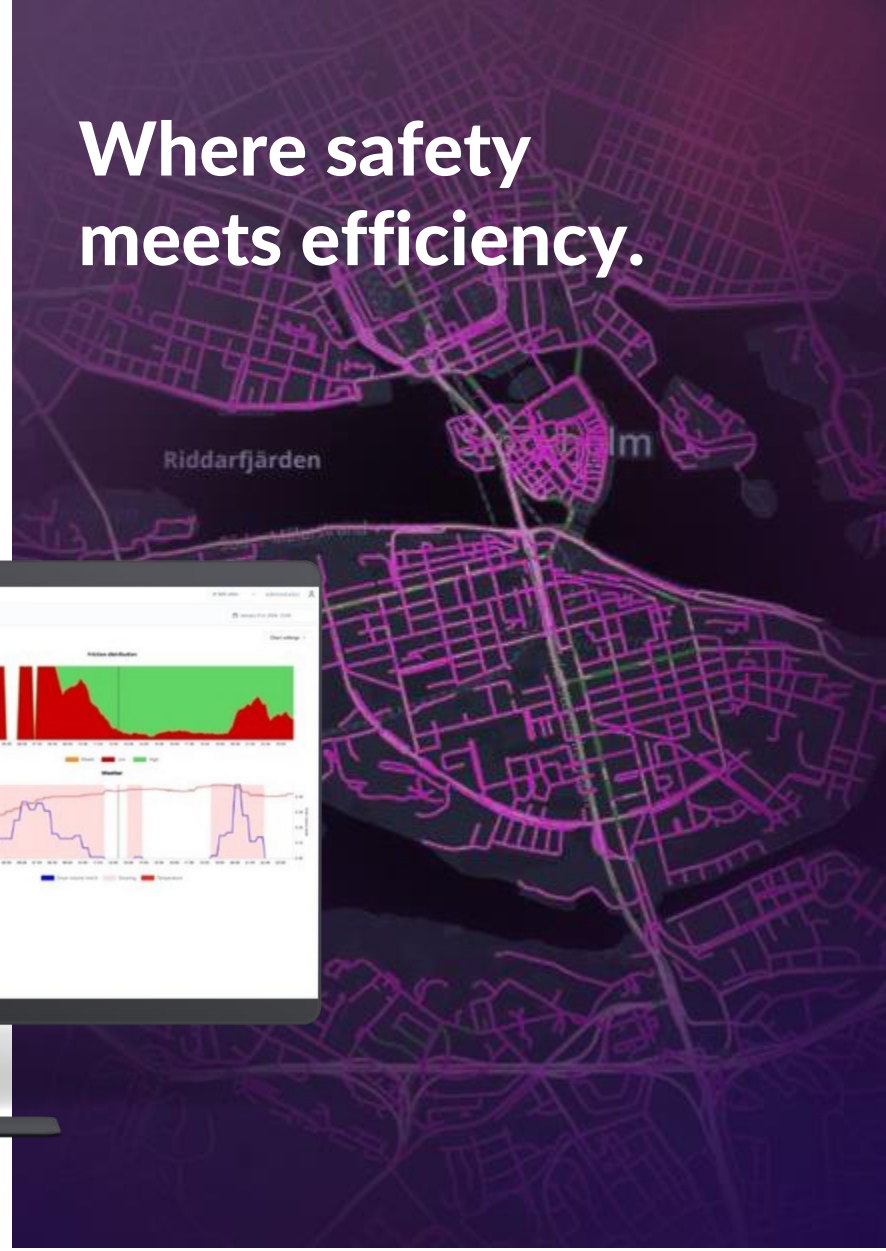
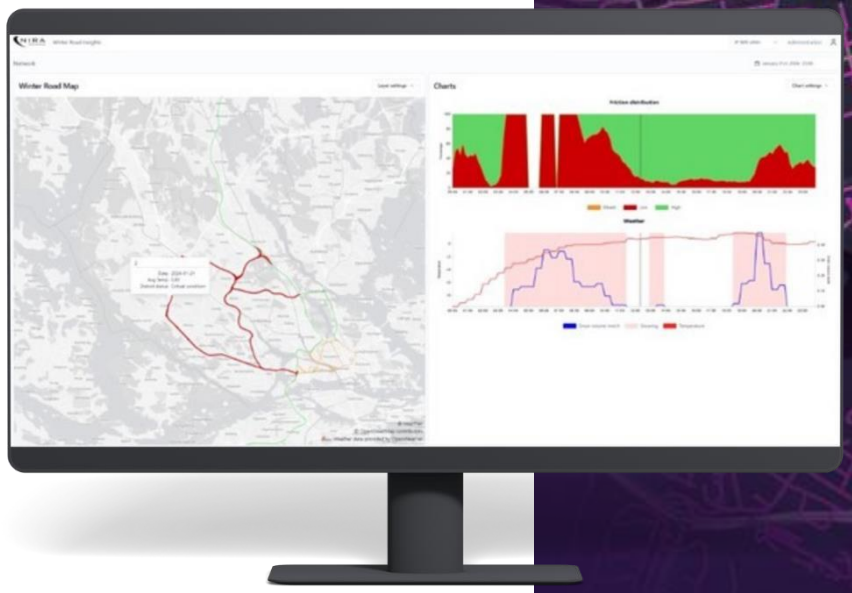
Winter Road Insights — What It Delivers

Actionable Insights for Safer, Smarter Winter Maintenance.





Evidence:

Proves roads are safe for public, insurers, and councillors.

Optimised Salt Use:

Use salt efficiently over time.

Route Prioritisation:

Prioritise gritting routes effectively.

Additional Treatment:

Identify locations needing extra attention.

Targeted Treatments:

Focus treatments where they're needed most.

Efficiency Gains:

Cost savings, environmental benefits, and improved productivity.

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Beyond Winter: A Safer System

Vision Zero & Safe System

Supports Vision Zero and Safe System goals, promoting safer roads year-round.

High-Risk Sites

Helps authorities identify high-risk locations throughout the year, not just in winter.

Low-Friction Detection

Detects standing water and aquaplaning — identifying very low-friction sites after rainfall.

Targeted Safety Spending

Enables more effective and focused allocation of safety investments.

Standing water causes accidents

> We know where the locations are.

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Real time and over time visibility

What We're Doing at NIRA Dynamics

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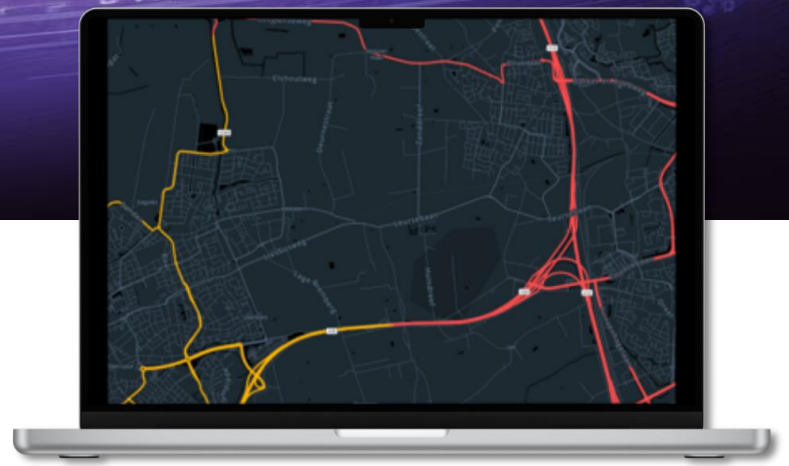

Empowering authorities to integrate data driven insights into winter service, combining engineering precision with grounded, defensible and future ready decision support.


Don’t just spread salt
— spread foresight
Use innovation to make winter safer, smarter, and more sustainable. Make every risk-based decision an informed one.
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