

# 2016 SIRWEC Conference

Fort Collins, CO  
April 28 2016



**ASSIST - ADVANCED SNOW PLOUGH AND SALT SPREADER  
BASED ON INNOVATIVE SPACE TECHNOLOGIES**



**TRAFIKVERKET**  
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# Do we really need all new technologies to move some snow or remove some ice?







# SNOW ON THE GROUND, LOOKING AT THE SPACE...

## 3.1 Study Objective

The objective of the feasibility study is to determine the technical feasibility and economic viability of space based services that supports winter road maintenance. The focus shall in the first hand be on services assisting drivers of snow ploughs in finding the way and spreading suitable amounts of salt and abrasives, although other related areas may also be considered. Key will be to find a suitable trade-off between cost and sophistication taking market demands into account. Also a suitable model for service provisioning needs to be determined. The service and system need to build on already existing and mature components as far as possible.

An important part of the study is the Proof-of-Concept, whose main objective is to verify and validate critical issues. This shall include a demonstration.

In addition to the users brought to the feasibility study by the tenderer, The Swedish Transport Administration and the Norwegian Public Roads Administration will be involved as users in the study. The study itself shall also take a wider market into account (at least a European perspective). Involvement of users and other stakeholders shall be secured for a follow-on demonstration project.



Space based → utilization of at least two space assets, e.g. satellite communications, Earth Observation, satellite navigation (GPS, Galileo, GLONASS)



## THE ORIGINS...

Invitation to Tender (ITT) issued by the European Space Agency (ESA) for a 1-year Feasibility Study dealing with the winter road maintenance



# ASSIST CONSORTIUM AND PARTNERSHIP

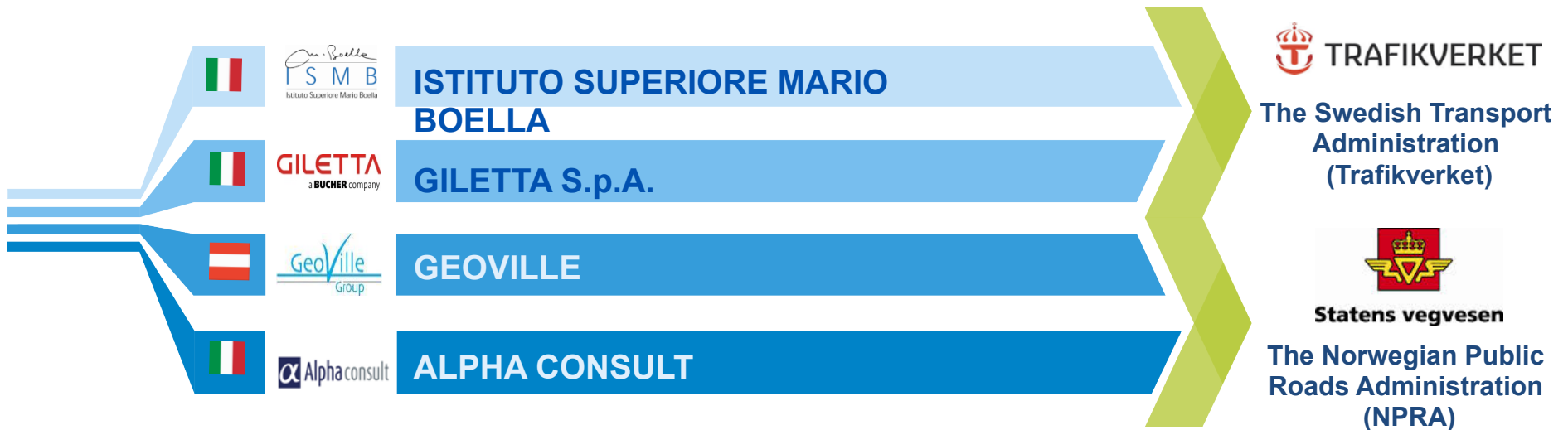
FUNDED by



ESA funds ASSIST in ARTES 20 Integrated Application Promotion (IAP)

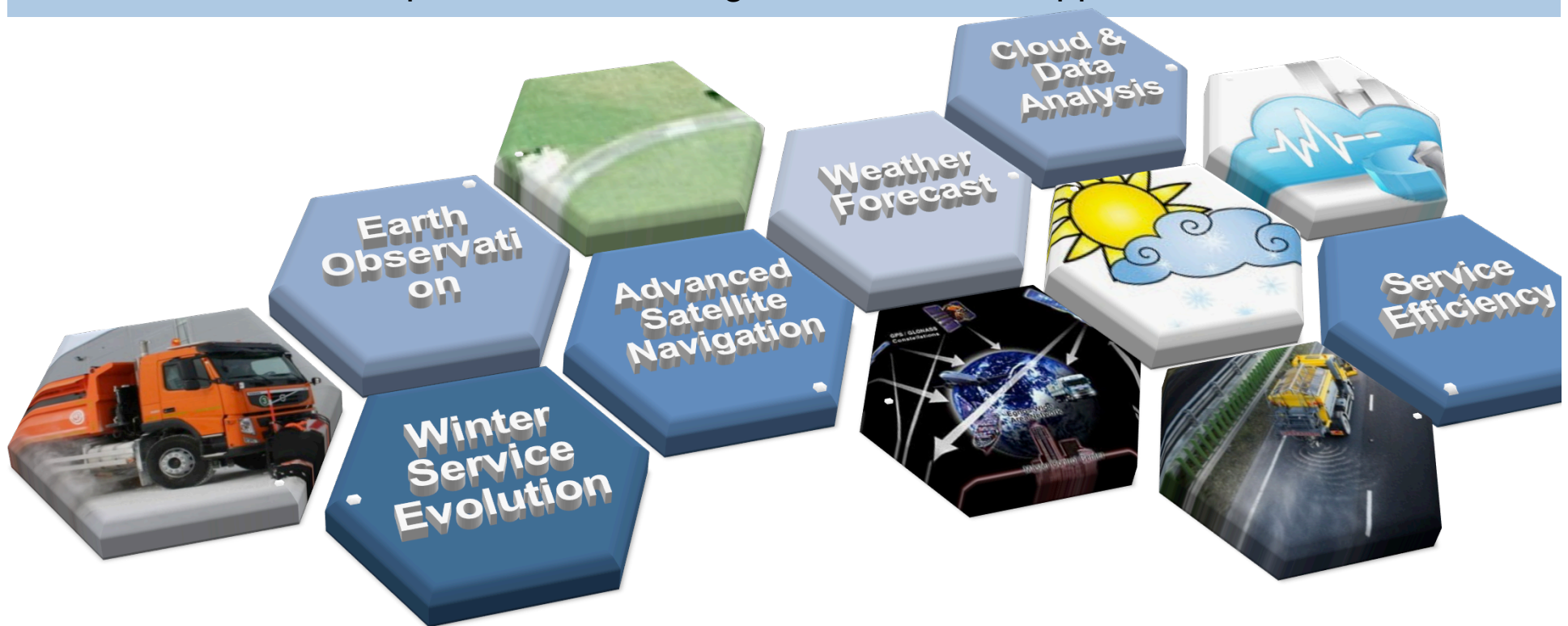
## PROJECT PARTNERS

## ENGAGED USERS



# WHAT IS ASSIST?

A project that aims to evaluate the convergence of multiple space assets from both technical and economic point of view. It aims to trade off the most efficient solutions with respect to the identified user needs and requirements for the winter road maintenance operations according to a user driven approach.



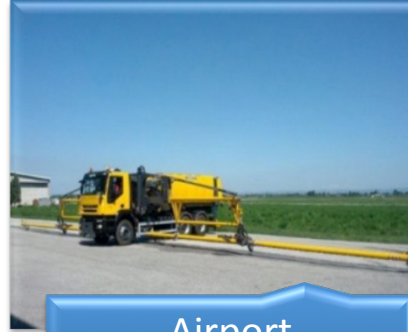
# ASSIST OPERATIONAL SCENARIOS



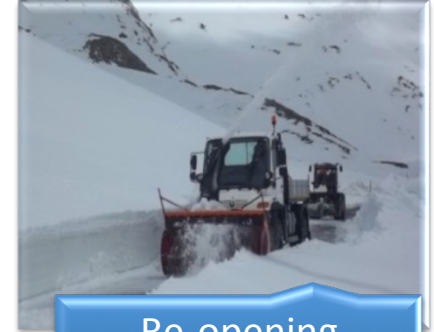
Snow plowing



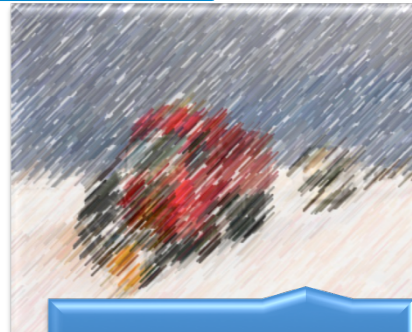
Anti- and De-icing



Airport  
Maintenance



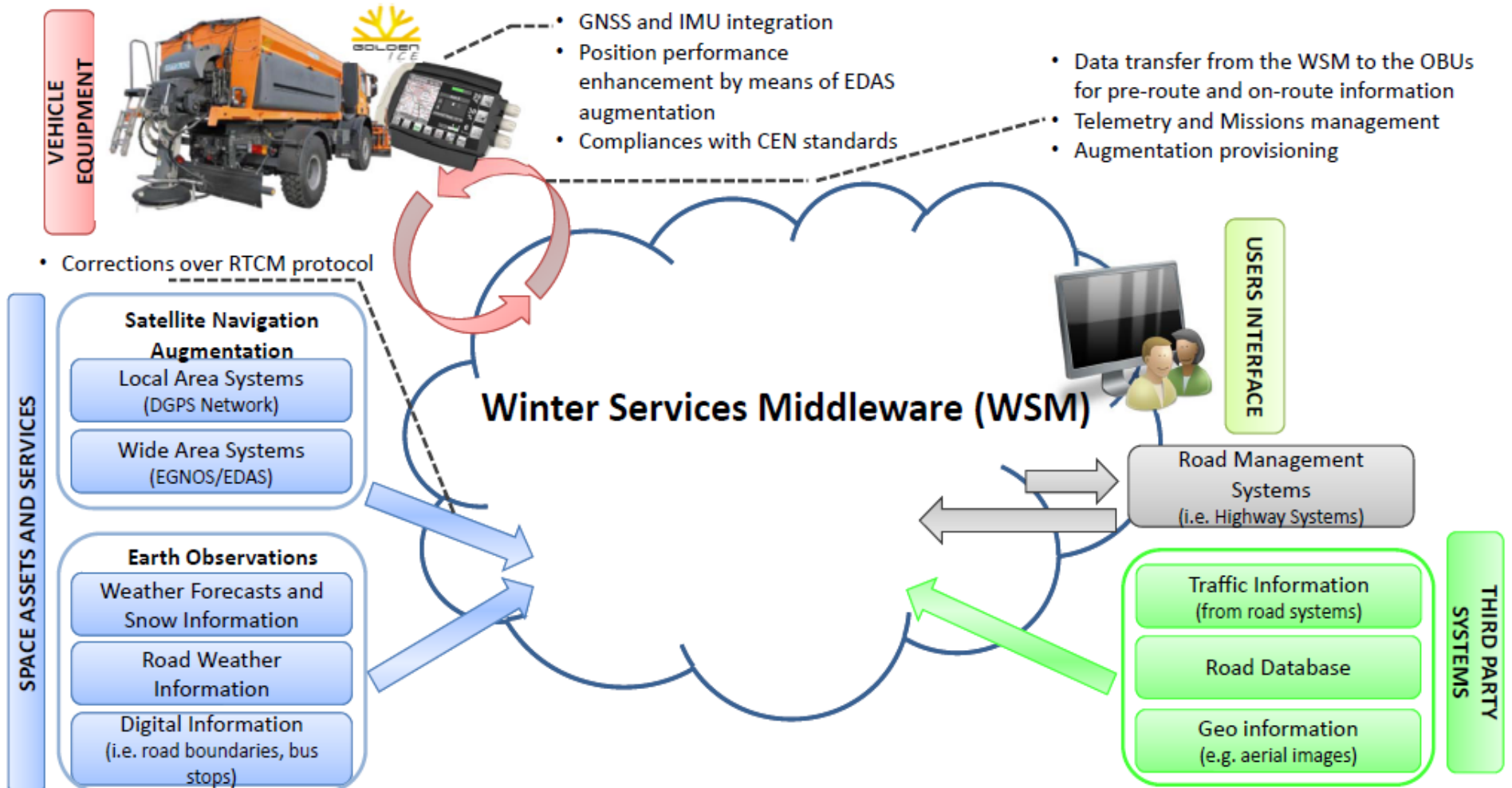
Re-opening  
Mountain Passes



Winter Convoys



# ASSIST ARCHITECTURE



# ASSIST SERVICES

Services	Level of Services	
Snow Plow Control Assistance Service	0	Context information provisioning
	1	Automatic snow plow control (operator confirm)
Road Icing Control Assistance Service	0	Fully automation based on a priori road information
	1	Fully automation with real-time updated road information
	1a	Fully automation with enhanced real-time updated road information

MANAGEMENT  
ASSISTANCE SERVICE

**DRIVING ASSISTANCE SERVICE**





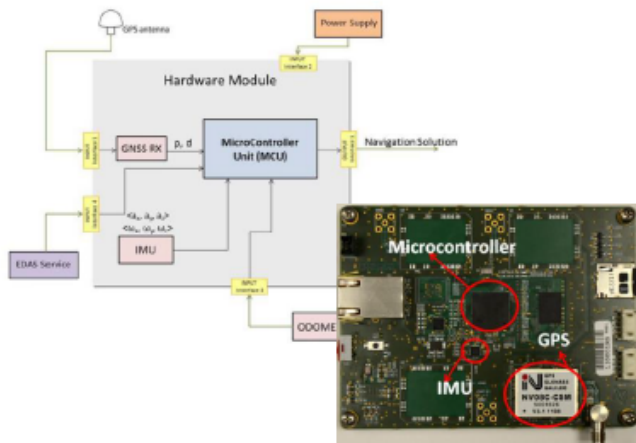
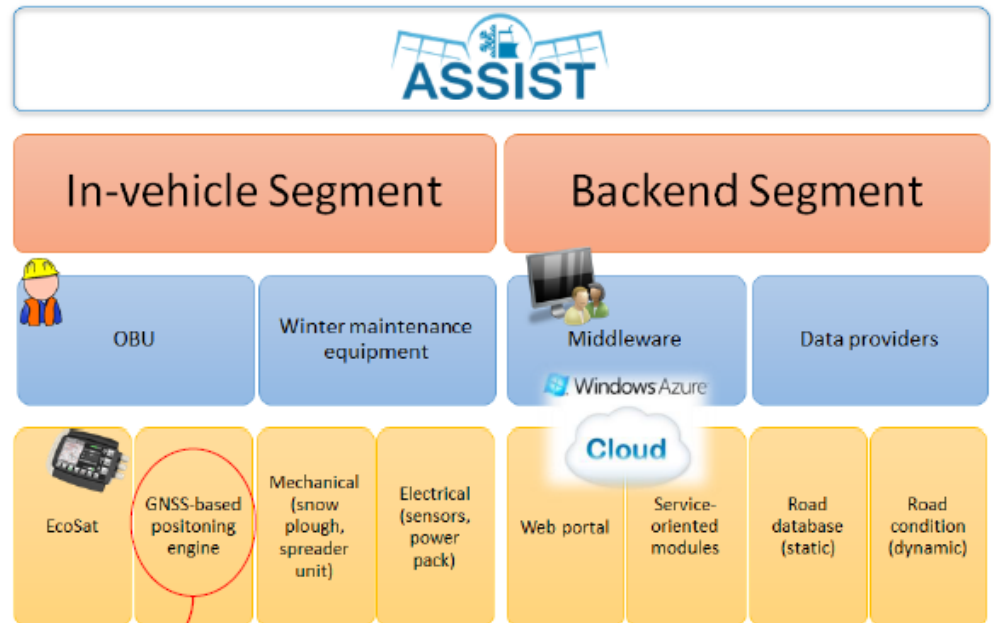
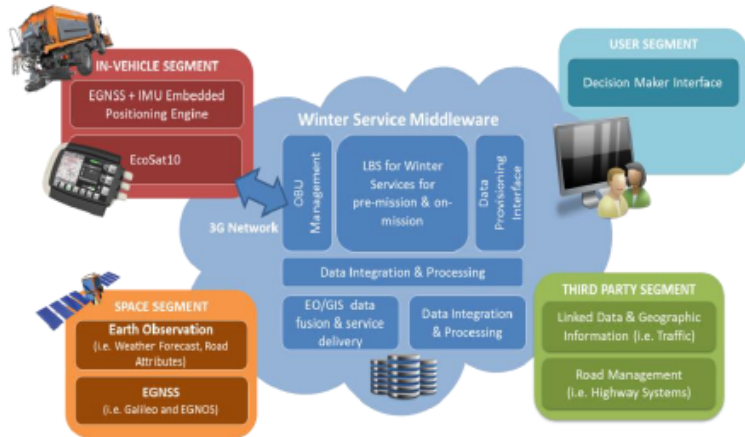
# PILOT-DEMONSTRATIONS AREAS

## THE USERS AND STAKEHOLDERS

- ✓ 4 different end-users
  - Private highway concessionaires
  - Contractors
- ✓ 4 different Countries
- ✓ 3 different «regions»
  - Nordic (Scandinavia)
  - Alps
  - Central Europe



# THE ARCHITECTURE TO BE DEPLOYED

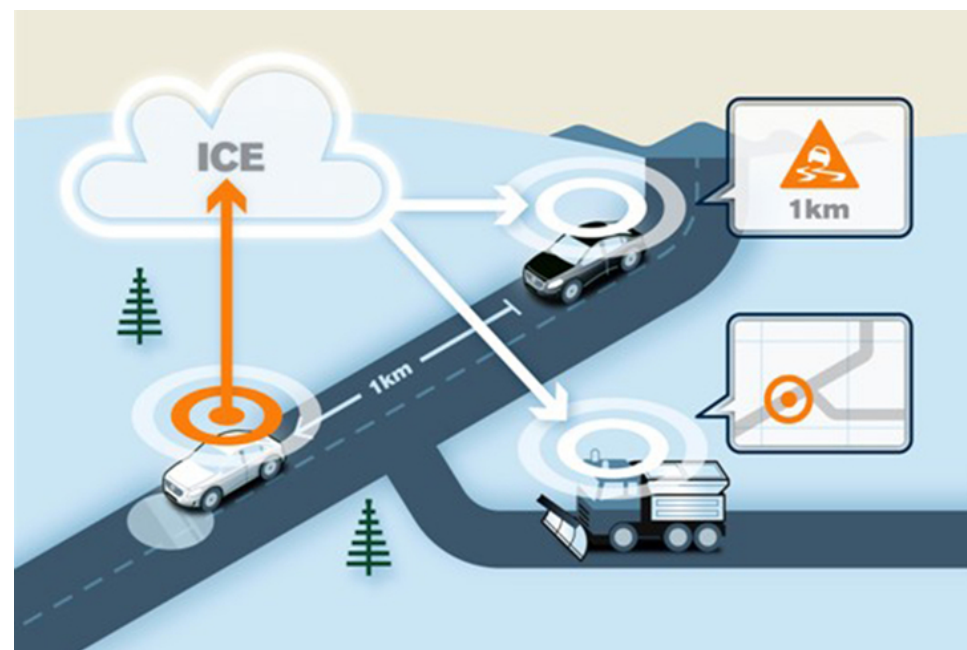
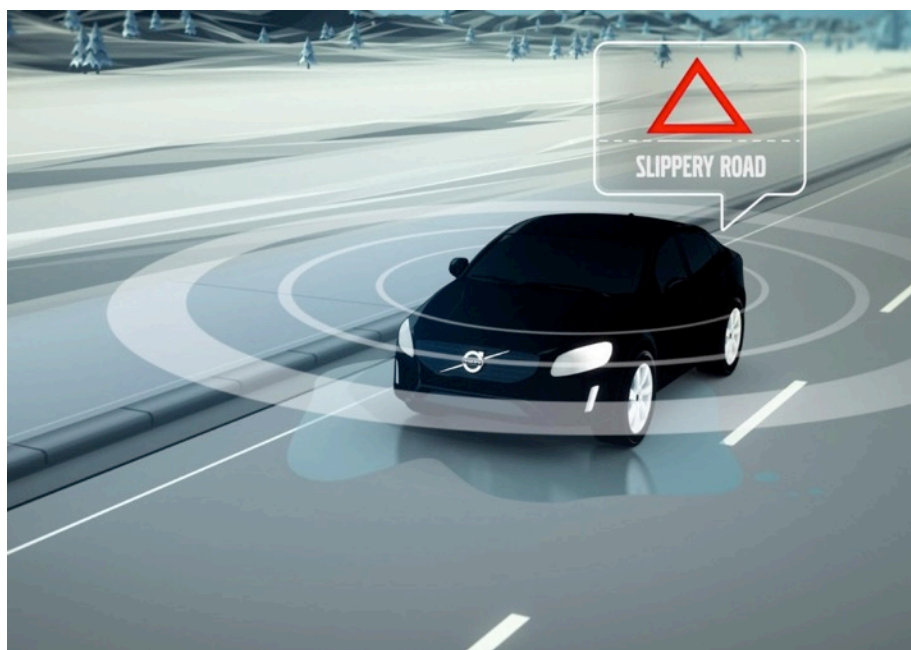


# Pilot Demonstration vehicle in Sweden



# RSI – Road Surface Information

## Volvo car-to-car slippery road detection





An illustration of a winding road on a snowy mountain. The road is covered in snow and has several vehicles: a red car at the bottom left, a yellow car in the middle, and a blue truck at the top right. There are also several traffic signs, including a yellow triangular sign with a black silhouette of a person walking, and a blue rectangular sign with a white 'P' for parking. A person in a red jacket is walking on the snow. The background shows a snowy mountain landscape with a small building on the peak.

**Thank you for your attention**

*More and updated information at:*  
<https://artes-apps.esa.int/projects/assist-fs>