



Rijkswaterstaat
Ministerie van Infrastructuur en Waterstaat

BE WARNED!

Three Smart Mobility applications that share data to improve road safety

Folkert Bloembergen, Michiel Bontenbal, Ronnie Poorterman
Intertraffic Amsterdam 2024



Rijkswaterstaat
Ministerie van Infrastructuur en Waterstaat

Digital Traffic Management

Information and notifications in-car /in ship

Folkert Bloembergen
Intertraffic Amsterdam 2024

Core transitions



Multiple ways of travelling



In car & in ship
information



Connectivity & data exchange



Automation



Data driven traffic management

Information and warnings in car/ship

We enhance road safety, traffic flow, and liveability by providing **information and notification in-car/ship**, and we adapt assets accordingly.

- Traffic information and notifications in-car via public-private data chains
- Controlled transition/downsizing of assets and services without unwanted risks and unnecessary costs

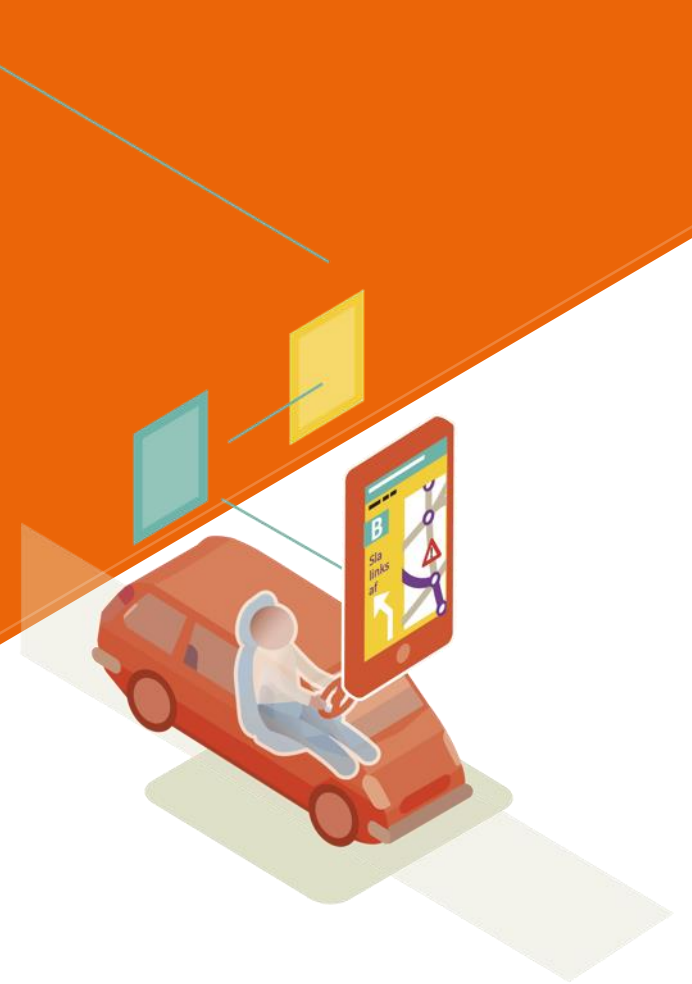
Examples

- VM-IVRA (From traffic data to smart routing)
- Safety Priority Services
- C4Safety



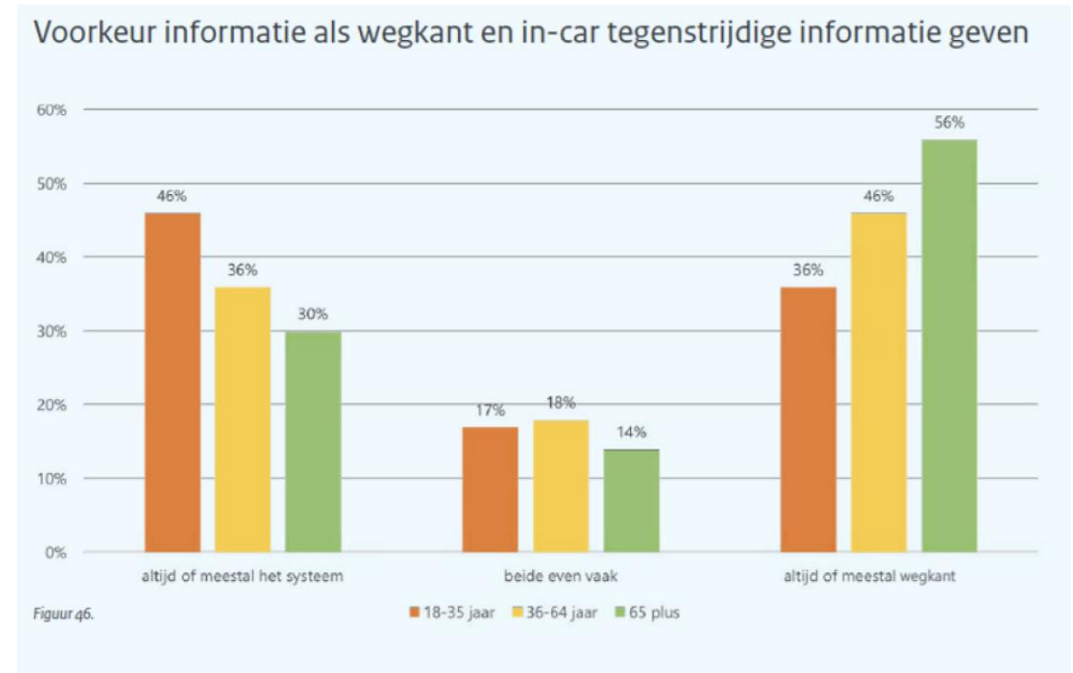
VM-IVRA

From traffic data to smart routing



Traffic management in the digital age

- Travellers primarily seek real-time and personalized information, especially young drivers
- Transition from roadside to in-car information
- Further digitization of traffic management
- **1 Januari 2025: European Real Time Traffic Information (RTTI) regulation in effect**



Source: Smart Mobility Monitor 2022

Traffic management in the digital age



Preventing traffic on unwanted routes.

Digital, but socially responsible.



Mission VM-IVRA



- **Developing in-car services** that contribute to safer, more sustainable, and smoother traffic flow.
- Achieving **real-time travel information and personalized route advice** for road users
- Guiding road authorities in transitioning to digital traffic management so they **gain experience with data service** before the European RTTI-regulation takes effect
- Establishing **uniform guidelines** for sharing traffic data and setting data quality criteria
- Making agreements to **intelligently manage traffic across the road network** to reduce traffic on unwanted routes

Collaboration and data sharing is win-win



- **Service providers** enhance their service by enriching their navigation service with real-time traffic information from road authorities
- **Road users** receive real-time and personalized traffic information
- **Road authorities** maintain control over traffic flow by digitally informing road users about traffic situations along their route

Deployed VM-IVRA data services



1. Pre-announcements of planned road works and events



ndw

Melvin

2. Sharing of traffic disruptions along the route



Diego

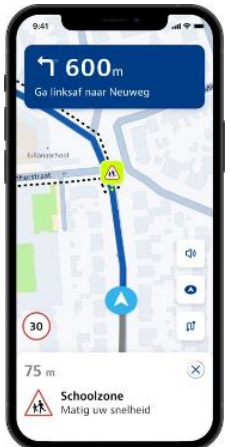
3. Digital Information Messages

4. In-car schoolzone notifications

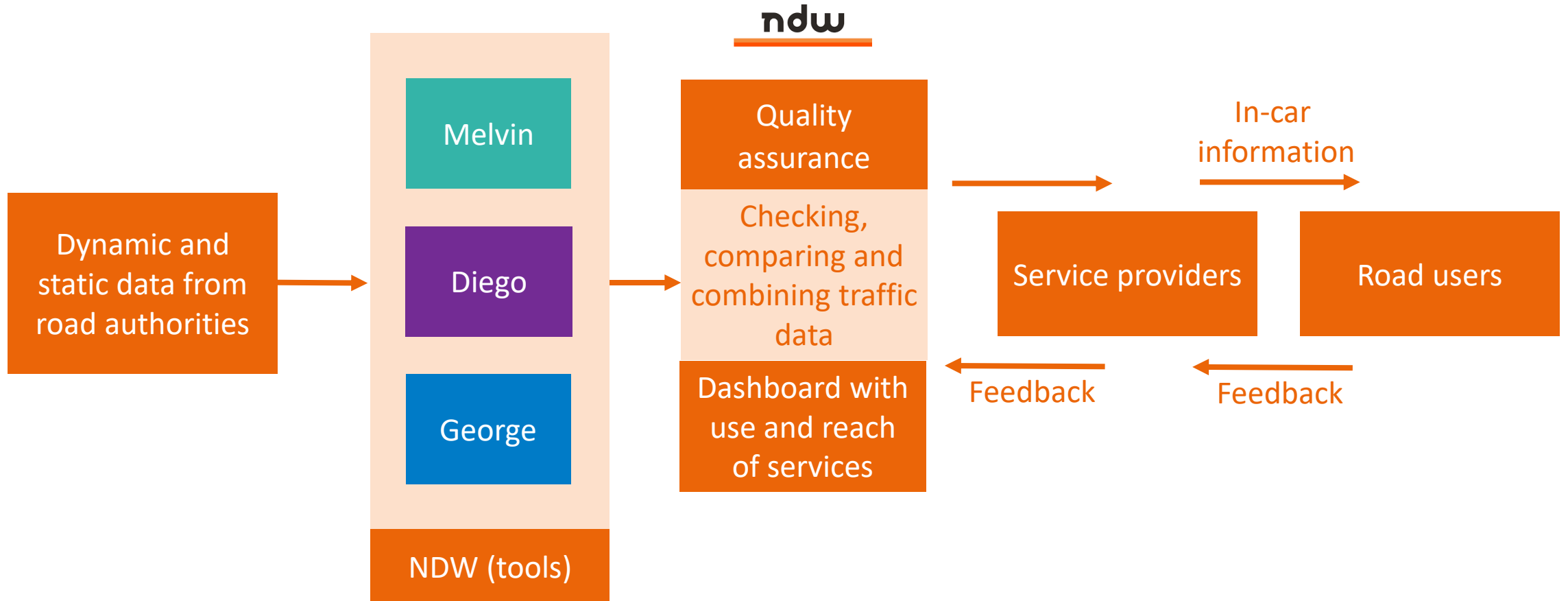
5. Sharing of environmental zones



George

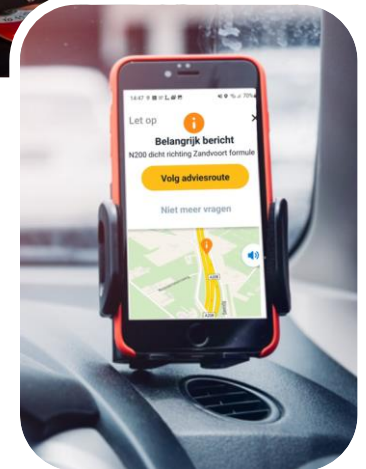
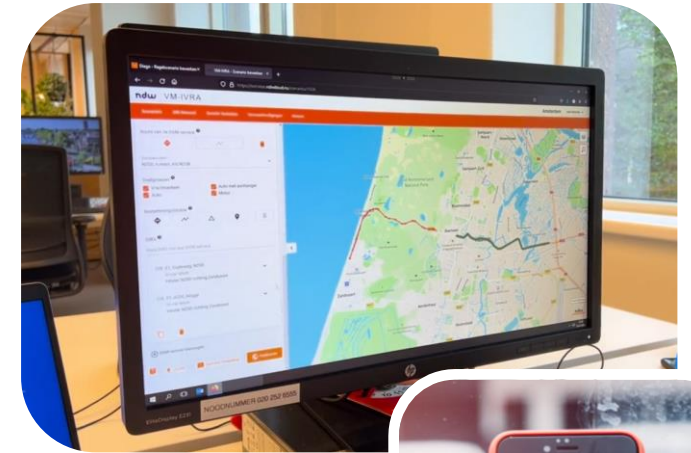


From road operators to road users



The technology works!

A set up data chain, an initiated dialogue about the pass-on data conditions by service providers and a determined number of services that will add value for road authorities, service providers, road users and society.



Informing

Sharing policy information on socially desirable routes



Disruptions

Informing road users about current disruptions on the road network



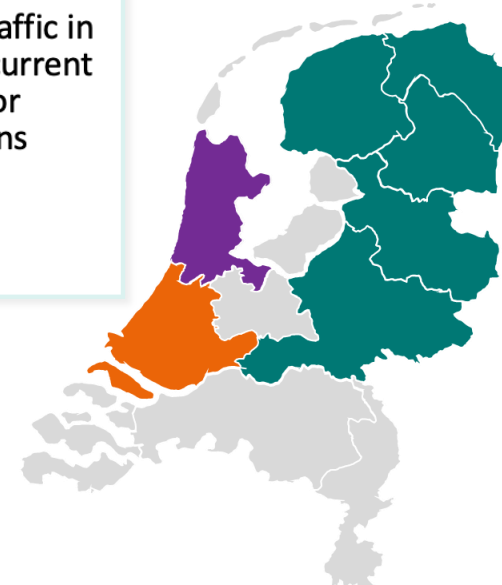
Pre-announcements

Informing road users about planned road works and events (announcements)



Redirecting

Redirecting traffic in the event of current and major disruptions

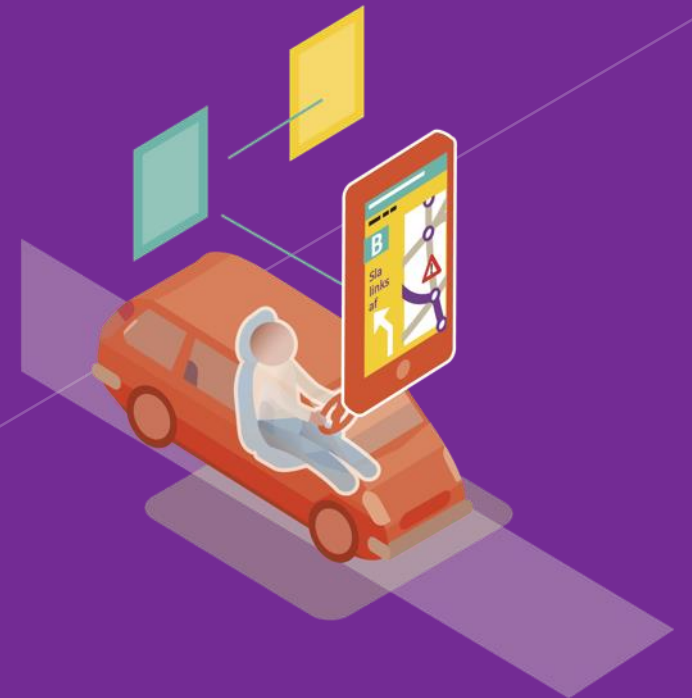


VM-IVRA best practices

- Environmental zone indications were used in **Flitsmeister** app in 2022:
 - Reach of 2 million route advices monthly
- Deployment of services at **Formule 1 Dutch Grand Prix**, measured reach in 2022 :
 - 2 Avoids en 15 Digital Information Messages
 - 150.000 road users were informed in-car
- From the schoolzone trial of 2023, it was found that 2/3 of drivers appreciated the in-car alert and **adjusted their driving behaviour**
- Arnhem-Nijmegen region in 2022: **at 33 major incidents in the region**, traffic scenarios were directly shared with service providers
- In Zeeland in 2022 and 2023: **in-car warnings were deployed for hazardous weather conditions** (replacing Variable Message Signs)
- In Amsterdam: **tunnel closures were automatically updated in Google Maps within 5 minutes**

Thank you for your attention!

For more information: www.vm-invra.nl

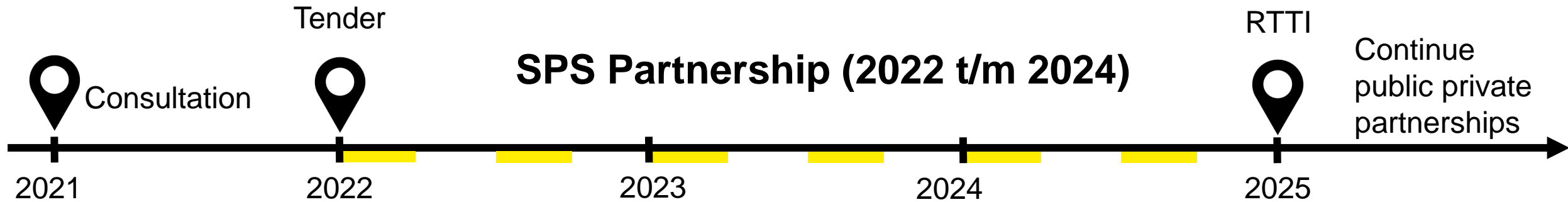


Safety Priority Services

➤ INTRODUCTION ➤ RESULTS ➤ NEXT STEPS

Ronnie Poorterman
Ministry of infrastructure and water management

Three-year program (2022-2024)



Introduction

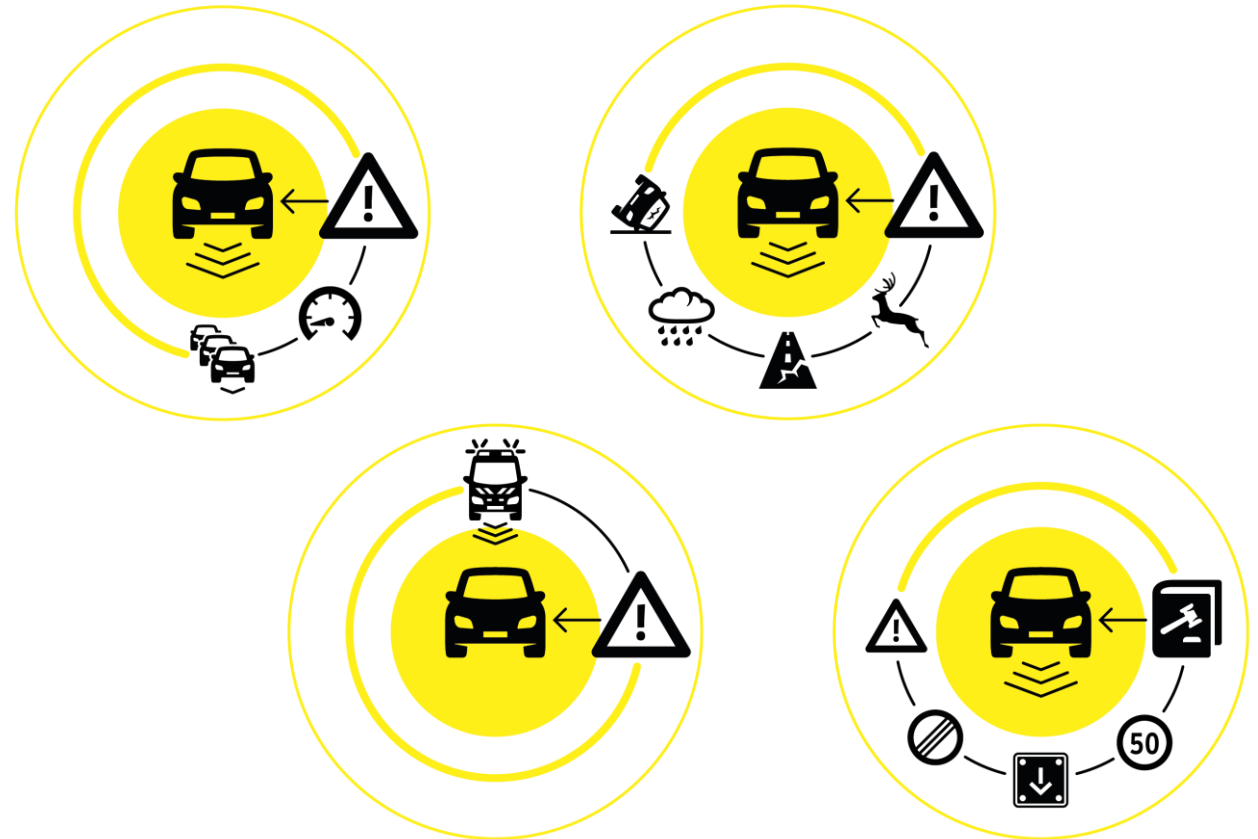
SAFETY ———
— PRIORITY ———
SERVICES



Smart mobility.
Dutch reality.

Services

- ▶ Traffic Jam Ahead Warning
- ▶ Emergency Vehicles Approaching
- ▶ Safety Related Traffic Information
- ▶ Traffic Laws
- ▶ Smart Routing

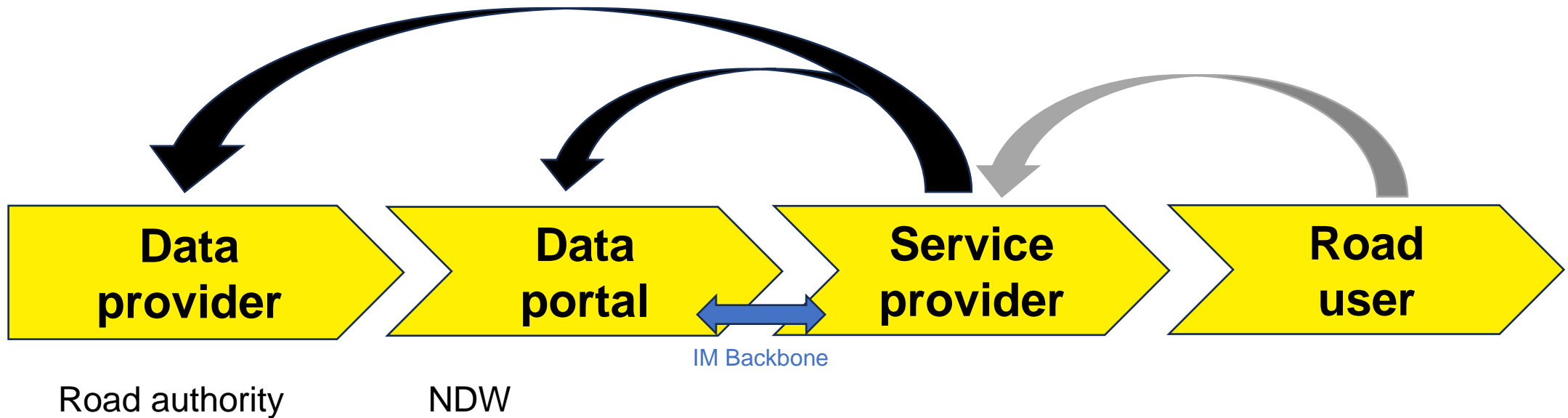


For the whole of the Netherlands. Therefore relevant **for all road authorities.**

In anticipation of EU legislation regarding Real Time Traffic Information (RTTI)

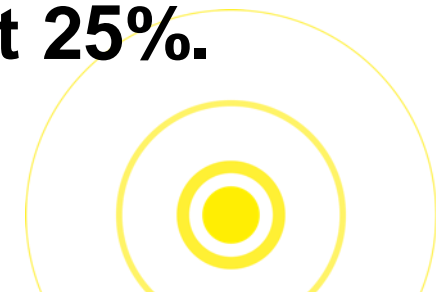
Continuous improvement of public data

User insights (survey & measured behavior)

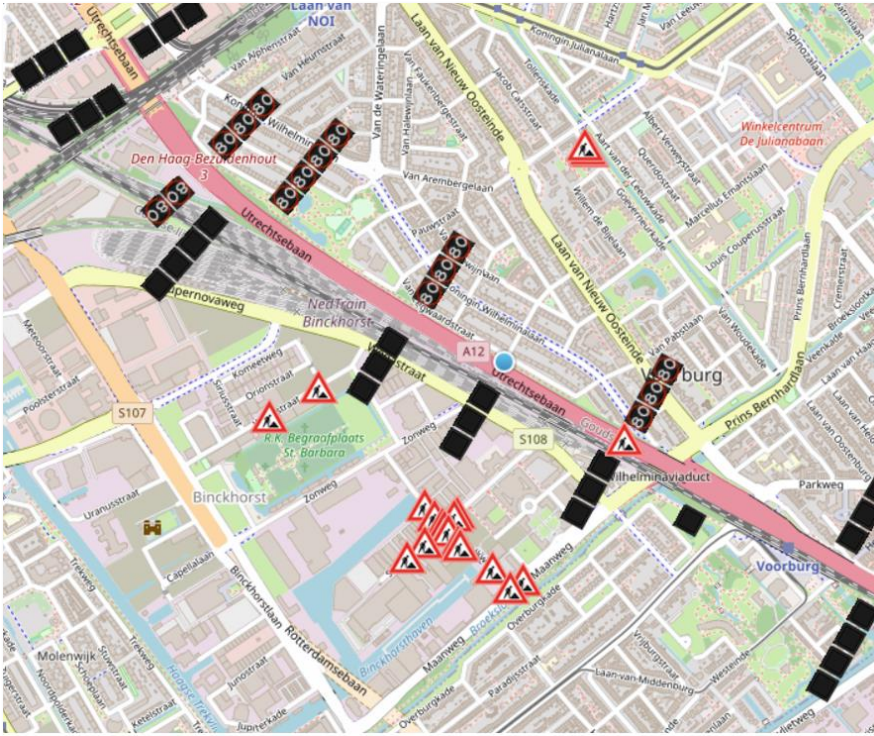


25%

In 2023, the number of vehicle kilometers traveled in the Netherlands using the services of the Partners active in the vehicle increased by about 25%.



Traffic laws

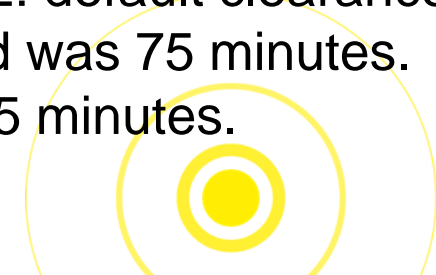


Feedback example 1: Faulty location matrix signs in feed.
→ Correction data feed.

SRTI



Feedback example 2: default clearance of incidents in data feed was 75 minutes.
→ Brought back to 25 minutes.



TJAW

- ▶ Digitally generated traffic jam ahead warnings are as accurate for the recipients as traditional jam tail warnings using induction loops and portals.
- ▶ Where there is no signage, jam tail protection is still provided in a qualitatively good manner.
- ▶ User insights indicate that drivers adjust their speed and drive more attentively after receiving a warning.

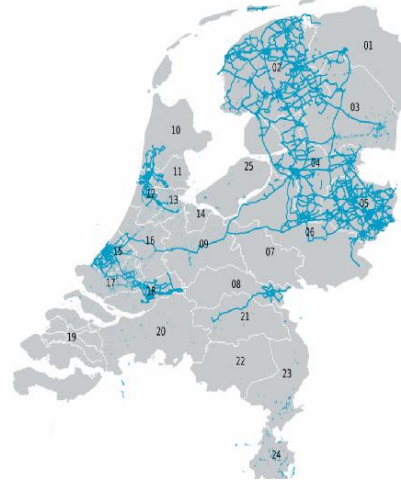




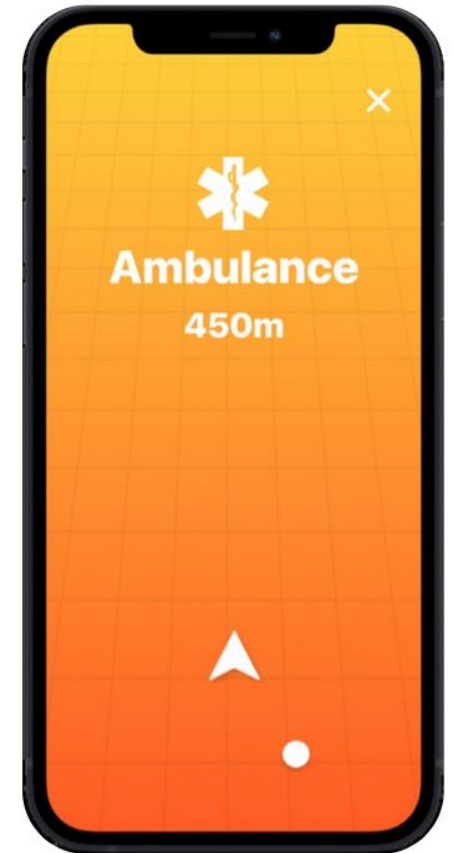
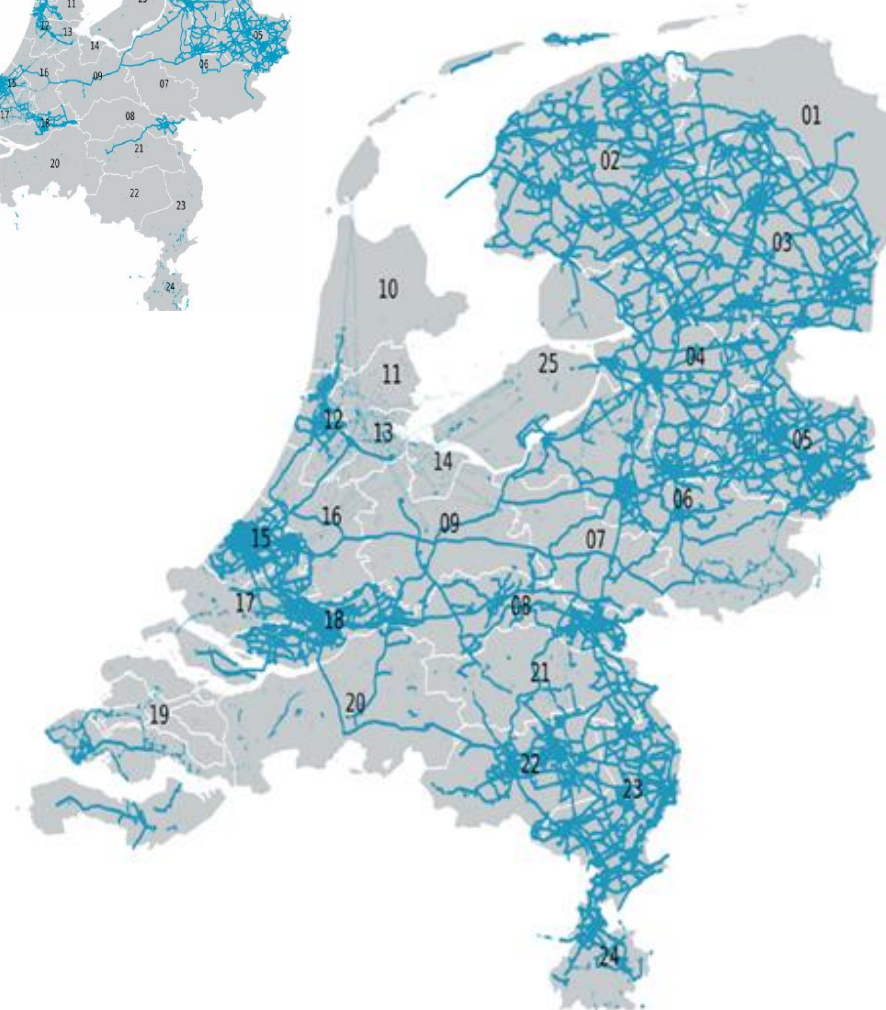
EVA

- ▶ Coverage is nearing 100% of all 25 Dutch safety regions
- ▶ Up to 100% of drivers who received a warning actually saw the ambulance.
- ▶ 84% indicate that they make space for the ambulance based on the notification.

April 2023



October 2023



Next steps

- ▶ Several companies have shown interest in joining the Safety Priority Services initiative. One-on-one meetings are being organized with existing partners to shape further collaboration.
- ▶ The year 2024 marks the final year of SPS. This means that after this year, the financial construct will end.
- ▶ However, what does not end is the strong public-private partnership we have built together and which will continue to be developed in the context of European legislation, the so-called Real Time Traffic Information delegated regulation.



Eager to join or learn more

Go to www.safetypriorityservices.nl

or email: samenwerkingserviceproviders@minienw.nl



Rijkswaterstaat
Ministerie van Infrastructuur en Waterstaat

Ambition Rijkswaterstaat for **Smart Mobility**

Michiel Bontenbal
16 april 2023

**Smart Mobility is our daily
practice en future.**

**Our aim: Ensure a safer and
sustainable road and
waterway**

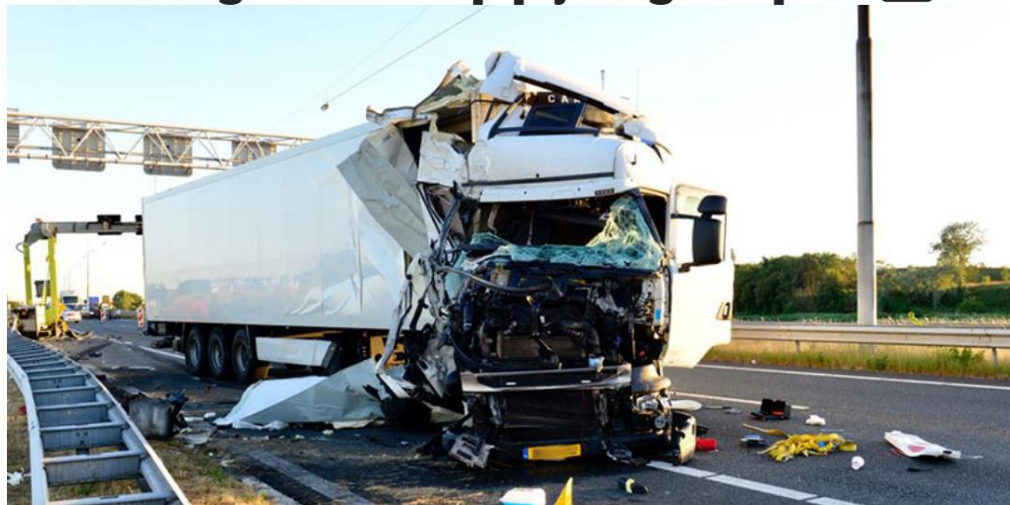




C4Safety



Vrachtwagen botst op pijlwagen op A9



DeGooi- en Eemlander HOME REGIO'S SPORT EXTRA

02-07-2018 22:24 | Ongevallen

Dienstauto van Rijkswaterstaat geramd door vrachtwagen vol met post op de A27 [video]



© Foto Caspar Huurdeman

Internetredactie

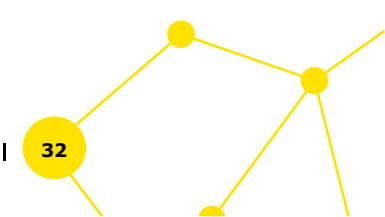
16/06/2020 om 07:30





Objective C4Safety

The primary objective of the project is to (automatically) generate accurate, trusted, and internationally aligned digital (safety) messages from the infrastructure to vehicles in order to improve the safety of road users, inspectors, and workers.





- Generate accurate and trusted digital messages to improve the safety of road inspectors, road workers, and road users.
- Utilize the experience gained from the development of the data chain in the international C-ITS corridor project (cooperation of Austria-Germany-Netherlands).
- Implement the data chain into Rijkswaterstaat's operational processes.
- International (European) standards, cooperation C-Roads (membership & using profiles).
- Provide a base for future communication of autonomous vehicles.
- Keep all options open for communication with vehicles.
- ITS Directive cooperation Ministry; follow European development.

Note: C4Safety focuses on generating and enabling available messages, not on establishing communication channels to vehicles.

IM Backbone Function NDW



- Crowd Sourced Data
- Probe Vehicle Data
- WIS data
- Bots- en pijlwagen info
- ONDA
- SRTI VCNL (niet ONDA)
- On the fly feedbackloop

Datasources

Aggregate data + other datasources

- Aanbrengen relaties tussen info uit diverse bronnen m.b.t. zelfde verkeerssituatie
- Vaststellen meest waarschijnlijke info m.b.t. locatie, type verstoring en aanwezigheid op de weg
- Consistent maken van info voor diverse verstoringstypes o.b.v. voorgaande stap
- Plausibiliteitscontrole om te constateren of een incident impact op het verkeer heeft en indien dat het geval is, wordt hiermee de detectie confidentiality verhoogd alsmede de persistence confidentiality betrouwbaarder gemaakt.

Backbone

Combine

- IMBB-incident
- SRTI bericht
- WIS data
- Bots- en pijlwagen info i.r.t. incidenten (niet werkzaamheden)
- ONDA als bergmelding
- SRTI VCNL als onderdeel geharmoniseerd
- MTM beeldstanden
- Filemeldingen

- Service specifieke filtering
- Service specifieke verrijking (b.v. locatiereferentie en traces)
- Service specifieke toevoeging trust / data authenticity

- DATEX II
- OTM
- DENM
- TPEG
- DATEX II tbv satnav
- IVI

Trusted messages



Roadmap connecting

	Q1 2024	Q2 2024	Q3 2024	Q4 2024	FUTURE
CROWD SOURCED DATA FASE 1 SRTI (HOT FEEDBACKLOOP)		<ul style="list-style-type: none"> Srti feed verrijkt met CSD in test bij SPS partners. Bergingsverzoeken (ONDA) Weginspecteurs RWS 	<ul style="list-style-type: none"> SRTI Feed in productie voor alle SP's 		
PROBE VEHICLE DATA FASE 2 SRTI	<ul style="list-style-type: none"> Mercedes Volvo 	<ul style="list-style-type: none"> BMW 			<ul style="list-style-type: none"> Tesla
AANNEMERS IN BACKBONE (C-4SAFETY) FASE 3 AVM	<ul style="list-style-type: none"> VEDEGRO EBO van WEEL 	<ul style="list-style-type: none"> Heijmans Pijlkarren/ Botsabsorbers (HOT) 	<ul style="list-style-type: none"> Traffic&More 		<ul style="list-style-type: none"> Strooiwagens Bergers
TUNNELSLUITINGEN EN STREMMINGEN (VM IVRA) AVM	<ul style="list-style-type: none"> Tunnelsluitingen via Diego 		<ul style="list-style-type: none"> Gevalideerde IDEA datastroom van AVG 		
WEGWERKZAAMHEDEN (IDEA) ANALYSE STROOM		<ul style="list-style-type: none"> IDEA validatie ww & tunnel 	<ul style="list-style-type: none"> IDEA Dashboard IDEA validatie met mogelijkheid om meldingen te seponeren 		

HEADERS BACKBONE

VERDEGRO®



Traffic & More

≡ provincie
Gelderland

Planning

Incremental approach: start with available data “as-is” and improve in next steps.

Main activities:

- Building and developing IM Backbone.
- Connect contractors, active on the roads.
- Connect road inspector vehicles.
- Build a trusted and secure messaging.
- Adapt operational processes.
- Transmit Trusted messages.



Q1-2024	Q2	Q3	Q4	Q1 2025	Q2	Q3
IM Backbone						
Road works						
Road inspectors						
Trust						
Operational processes						
Transmitting						

Thank you for your attention

