



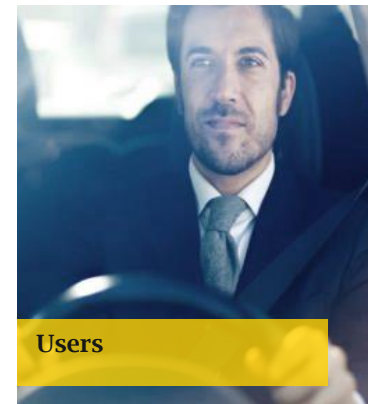
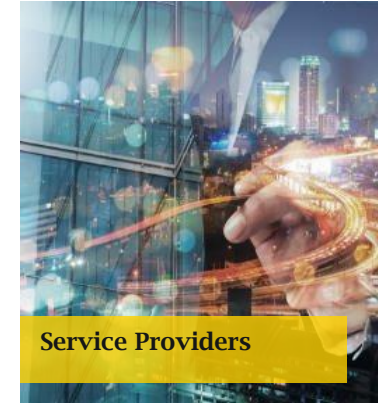
# **ADASIS and SENSORIS**

Jean-Charles Pandazis, ERTICO - ITS Europe  
SIP-adus workshop, dynamic map (DM) session  
Tokyo, 10 November 2021 (online meeting)

# Content

- ERTICO in two words
- Innovation platforms for Smart Mobility deployment
- Update on ADASIS
- Update on SENSORIS

ERTICO is bringing together 8 mobility sectors to make **mobility cleaner, safer and more efficient.**



# ERTICO Partners

## MOBILE NETWORK OPERATORS



## PUBLIC AUTHORITIES



## RESEARCH



## SERVICE PROVIDERS



## SUPPLIERS



## TRAFFIC AND TRANSPORT INDUSTRY



## USERS



## VEHICLE MANUFACTURERS





# 4 focus areas of mobility



CONNECTED AND AUTOMATED  
DRIVING

Accelerating  
automation and  
connectivity for safer  
and smarter mobility



CLEAN MOBILITY

Reducing  
environmental impact



URBAN MOBILITY

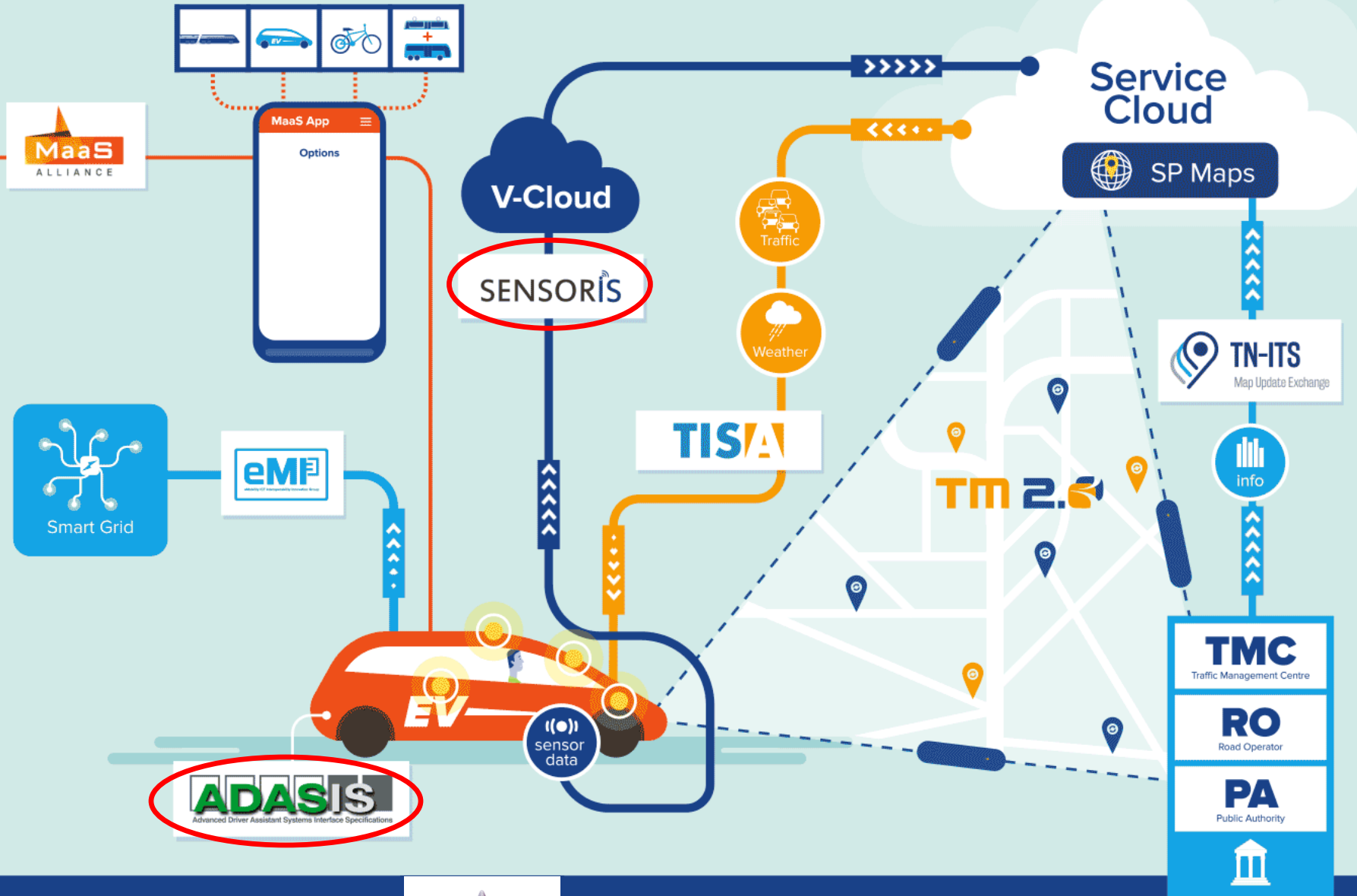
Delivering seamless  
mobility for all



TRANSPORT AND  
LOGISTICS

Creating the digital  
infrastructure for  
freight transport and  
logistics operations

# SMART MOBILITY DEPLOYMENT BY ERTICO PARTNERSHIP



- Initiated by Navtech, Constituted 2002 by ERTICO industrial partners
- ADASIS v1 in 2005, tested & validated in EU project MAPS&ADAS until 2007
- **ADASIS v2 in 2010 enabled first predictive applications on the road in 2012**
- Since May 2018 is a Non-Profit International Association
- **End 2018 ADASIS v3.1 is released internally to enable Automated Driving, public release 09/2020**
- 09/2021: **ADASIS v3.2** was released internally
- Reference implementation developed and available for ADASIS members only

**ADASIS horizon addresses all major future mobility trends: connected, electrified and automated**





# Membership (59), status October 2021

Vehicle manufacturers (11)	ADAS manufacturers (16)	Navigation system manufacturers (18)	Map & data providers (14)
BMW	Aptiv (former Delphi)	AISIN AW	AutoNavi (Alibaba Group)
Daimler	Continental Automotive	ALPINE ELECTRONICS	Baidu
Ford Forschungszentrum Aachen	CTAG	Banma Network Technology	BaoNeng Group (2021)
Honda	DENSO	Bosch SoftTec	DeepMap (2020)
Hyundai Mnsoft	Elektrobit Automotive	CarLink Software Co.	eMapgo
Nissan Motor Co.	Hitachi Automotive Systems	EnGis	Heading Data Intelligence (2021)
Opel Automobile (STELLANTIS)	Huawei	Garmin	HERE
Renault	Huizhou Desay SV Automotive	Harman/Becker Automotive	Kuandeng
Toyota Motor Europe	IVIS Inc (2019)	JOYNEXT (2021)	MOMENTA
Volvo Car	Knorr-Bremse	LG Electronics	NavInfo
Volvo Group Trucks Technology	MAGNA	Mappers Co.	Tencent
	Mando (2020)	Mitsubishi Electric Automotive	TomTom
	Valeo Comfort and Driving Assistance	MXNavi	Ways 1 (2019)
	Visteon	Neusoft	Zenrin
	Zenuity	NNG	
	ZF	Panasonic Automotive	
		TeleNav	
		Veoneer (Autoliv)	
New members in 2021			



# Examples: Product applications based on ADASIS



## Advanced Driver Assistant Applications

### Driver assistance

- ▶ Display of dynamic speed signs
- ▶ Warning for end of traffic jam tailback
- ▶ Hazard spot warning (e.g. slippery road)

### (Hybrid) Electric vehicles

- ▶ Precise range estimation for electric vehicles
- ▶ Battery management for (hybrid) electric vehicles
- ▶ Driving strategy for hybrid vehicles

### Intelligent ACC

- ▶ Calculation of optimal speed on country roads based on topography, curves, speed limits and up to dynamic information

### Highly automated driving

- ▶ Detailed lane model
- ▶ Provision of 3D objects for localization
- ▶ NDS Auto Drive & ADASIS V3 support



# v3 architecture



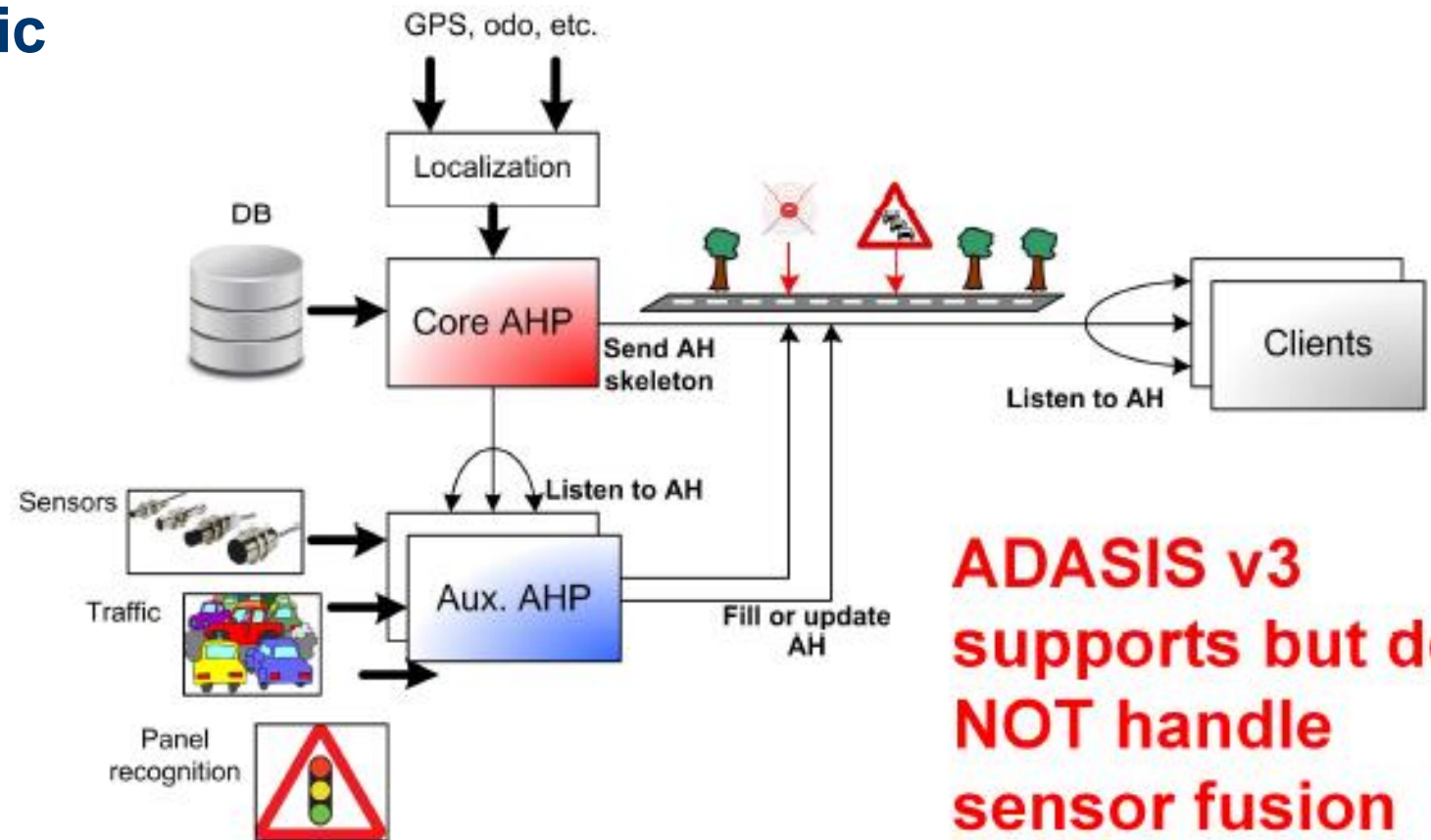
ADASIS v3 supports progressive development of future autonomous vehicles

ADASIS v3 brings flexibility thanks to **multiple AH providers architecture**

ADASIS v3 must be **agnostic** about automated vehicle architecture



**ADASIS v3 brings flexibility thanks to multiple AH providers architecture**



**ADASIS v3 supports but does NOT handle sensor fusion**



1. Knowing the importance of prediction for the anticipation and optimization of vehicle dynamic and system, what external vehicle-data should be linked to or represented in the ADAS-Horizon? (Multiple Choice) \*

56/56 (100%) answered



### Version 3.1

*July 2018*  
Release Candidate

*October 2018*  
Internal Release

*October 2020*  
Public Release

### Version 3.2

*December 2018*  
1st draft published

*April 2019*  
2nd draft published

*Later 2019 & 2020*  
Further drafts

***February 2021***  
***Global Review v3.2.0/1***

*April 2021*  
Final Release v3.2.0/1

### Reference Sys

*October 2018*  
1st release v3.1

*October 2019*  
2nd release v3.1

***Summer 2021***  
***3rd release v3.2.0***

### Version 3.3

*Main Features for 2021*

- Aux. Provider
- Low Level Protocol  
Serialization /  
Deserialization
- Localization



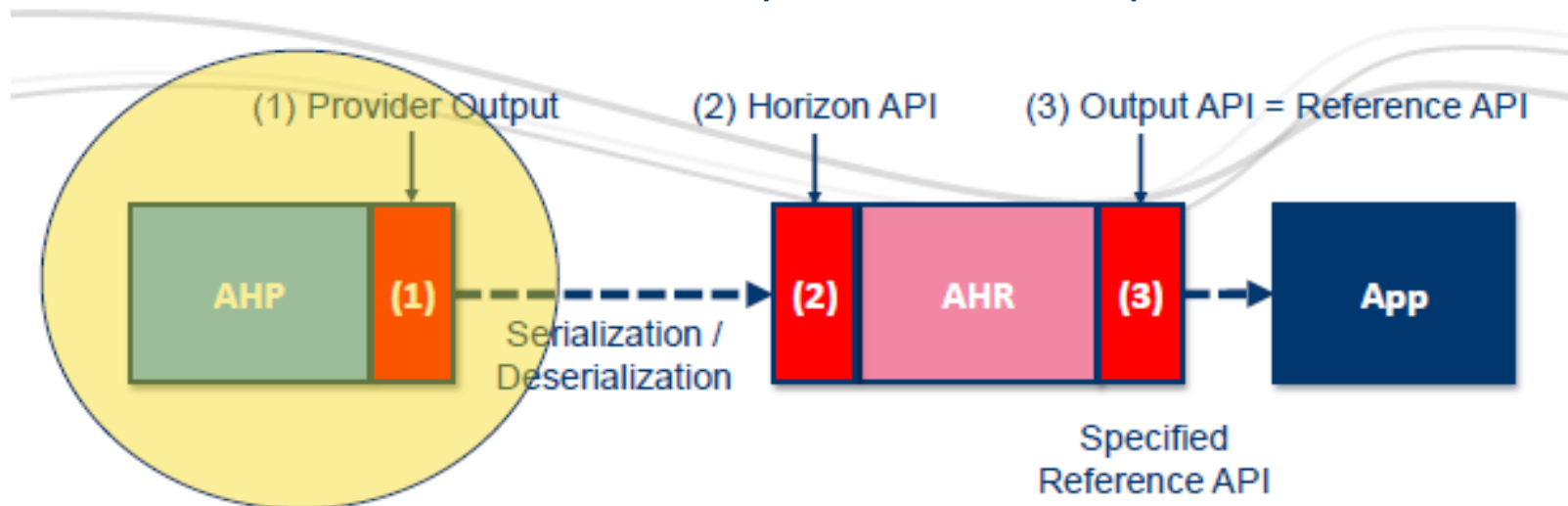
- Benefit for ADASIS:
  - Independency of Provider and Reconstructor
  - including road attribute + including light phases (worldwide)
- Approach for ADASIS v3
  - collect list of available standards
  - evaluate advantage/disadvantages
  - concentrate on Serialization / Deserialization, will become part of ADASIS specification



### Version 3.3

*Main Features for 2021*

- Aux. Provider
- Low Level Protocol  
Serialization /  
Deserialization
- Localization







# Assessment of ADASIS results and impact

**Goal:** ERTICO targets to assess activities results & measure impact on Environment (e.g. air quality, noise) as well as Safety

Approach:

1. identify results contributing to the impact (e.g. specifications v2, v3 to come, etc.)
2. identify applications/functions using or enabled by the identified result, establish roadmap,...
3. **Focus on one example e.g. Predictive Powertrain Control (PPC)**
4. ask for the potential or already measured impact of the PCC(with v2, then v3)
5. ask for how many vehicles use PCC with v2 Trucks, cars), then plan for v3
6. Develop a communication concept to present how ADASIS contributes to the impact of this applications / functions



2. Most relevant application enabled by ADASIS contributing to reduction of CO2 emissions? (Multiple Choice) \*

56/56 (100%) answered

Predictive Powertrain Control (PCC) (31/56) 55%

Eco-routing (34/56) 61%

Intelligent ACC (Calculation of optimal speed on country roads based on topography, curves, spee... (35/56) 63%

I have no opinion to this question (6/56) 11%

## ITS World Congresses (Hamburg October 2021)

- ADASIS stand on ERTICO stand
- Participation to two Special Interest Sessions:
  - SIS93:** "Impact of CCAM and Digital Infrastructure Standards on Air Quality Target"
  - SIS86:** "The evolving Ecosystem of Automated Driving - Requirements and Approaches facilitating standards"

## ADASIS in Japan (November 2021)

- Participation to SIP-adus conference and workshop (online)
- Collaboration with SIP-adus FOT by providing:
  - ADASIS v3.2 (now)
  - ADASIS v3.3 (when ready)



# Specification - Roll out plan

- ADASIS v2.0.5 public release planned Q2/2022
- ADASIS v3.1.0 public release 09/2020
- ADASIS v3.2.0
  - internal Final release 09/2021
  - *public release planned 09/2022*
- Reference implementation for v3.2.0, Q1/2022 (ADASIS members only)
- Next updates plan to contain in priority:
  - **Priority:** Low-Level Protocol implementation (in v3.3), e.g. serialisation using Ethernet
  - Auxiliary Provider
  - Localisation

## SENSOR ingestion Interface Specification

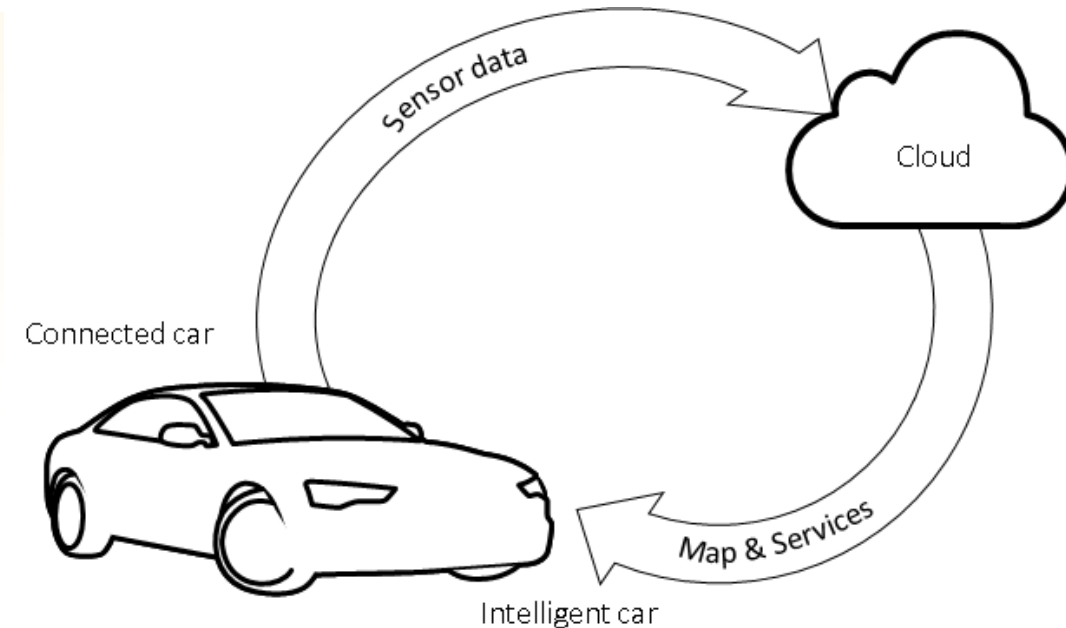
Automated vehicles need to be connected, have access to and share data with other vehicles and infrastructure.

SENSORIS specify the interface for exchanging information between in-vehicle sensors and dedicated cloud as well as between clouds to:

- enable broad access, delivery & processing of vehicle sensor data
- enable easy exchange of vehicle sensor data between all players
- enable enriched location based services and automated driving

### Main steps:

- 06/2015: First specifications released by HERE
- **06/2016: SENSORIS platform created & coordinated by ERTICO with major industrial stakeholders**
- 12/2017: First draft of new specifications ready
- **06/2018: v1.1.0 specifications** as de-facto industrial standard (public release July 2019)
- **06/2019: Request channel** specification released internally (public release July 2020)
- 2020: start discussion with CEN/ISO and 2021 release of v1.2.2

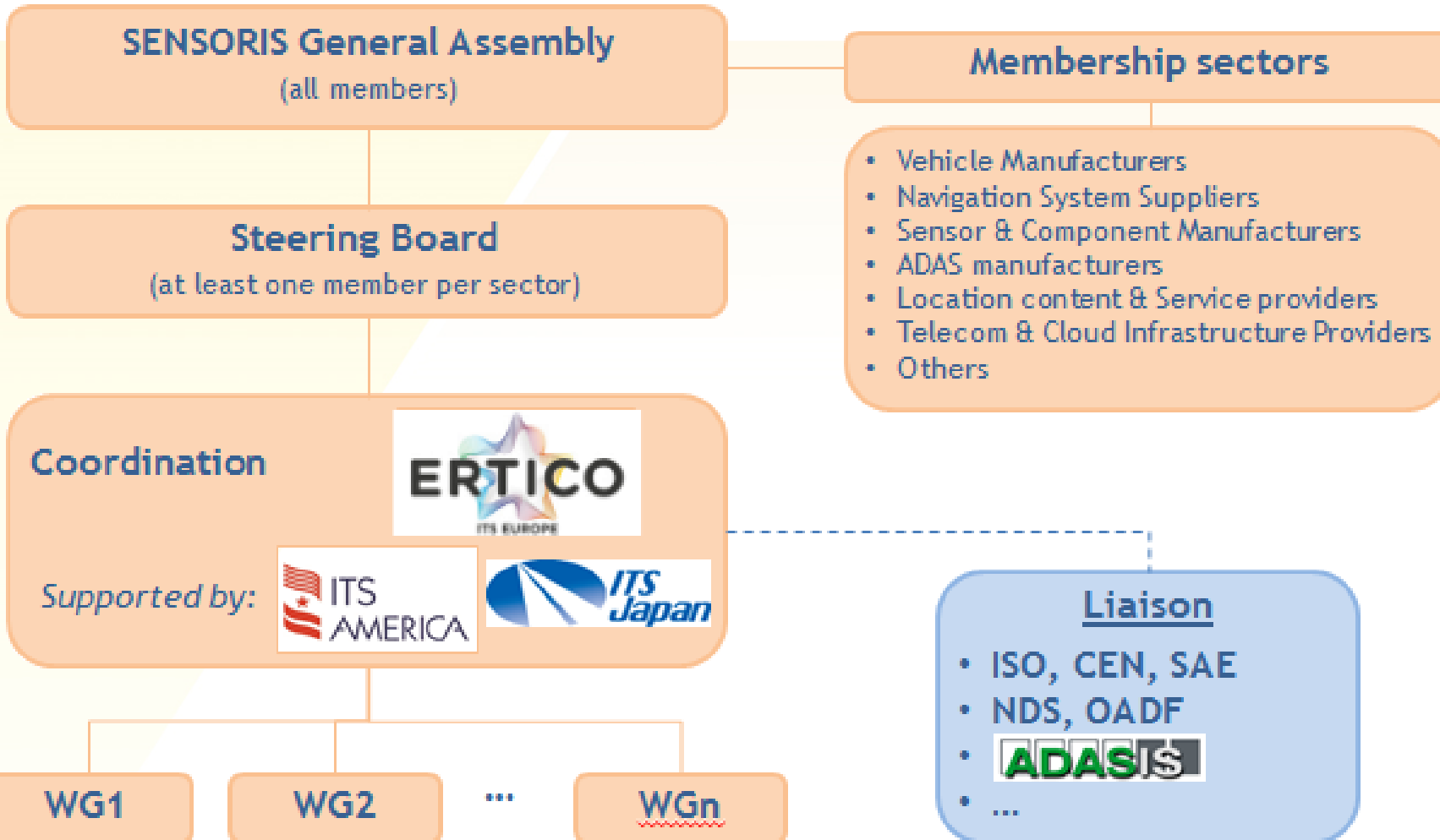




## Members (37)



## SENSORIS organisation

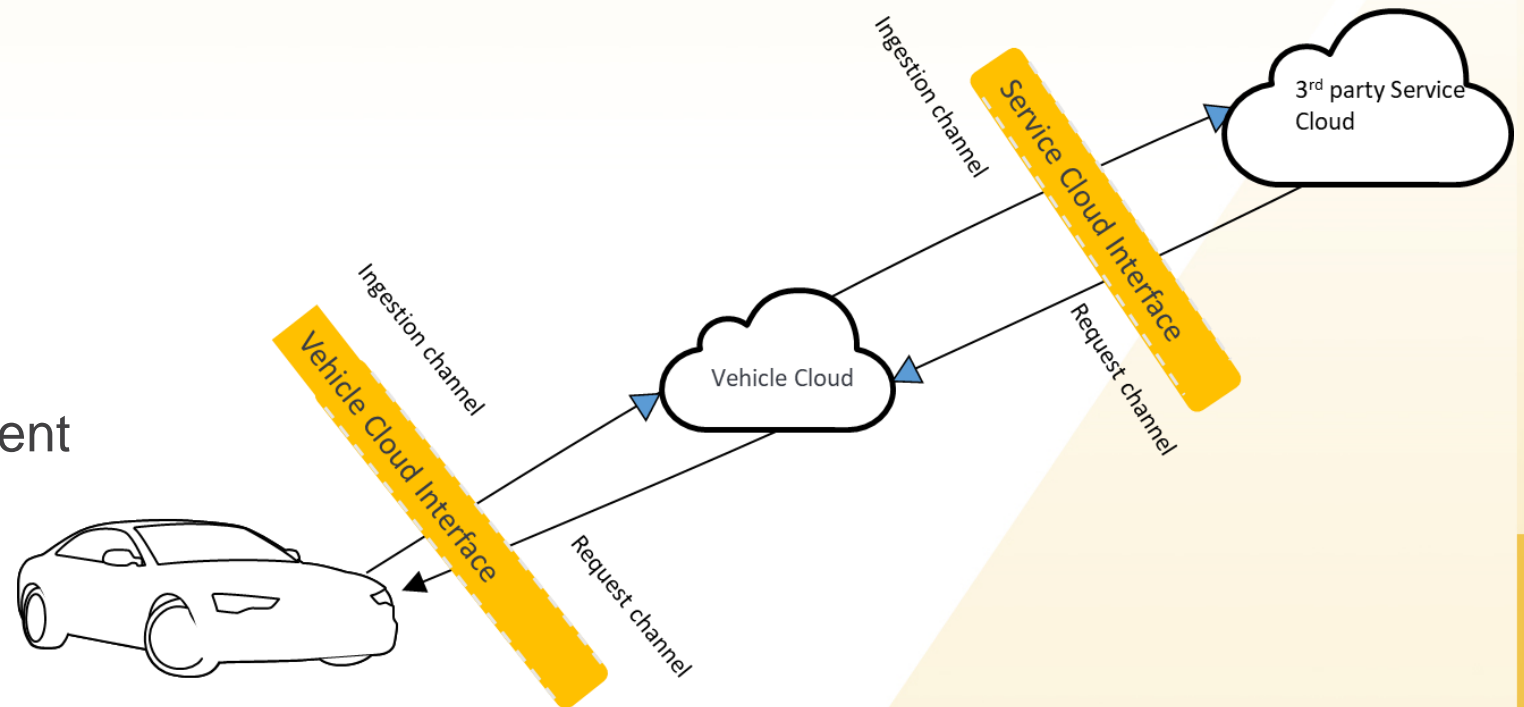


Two co-chair:

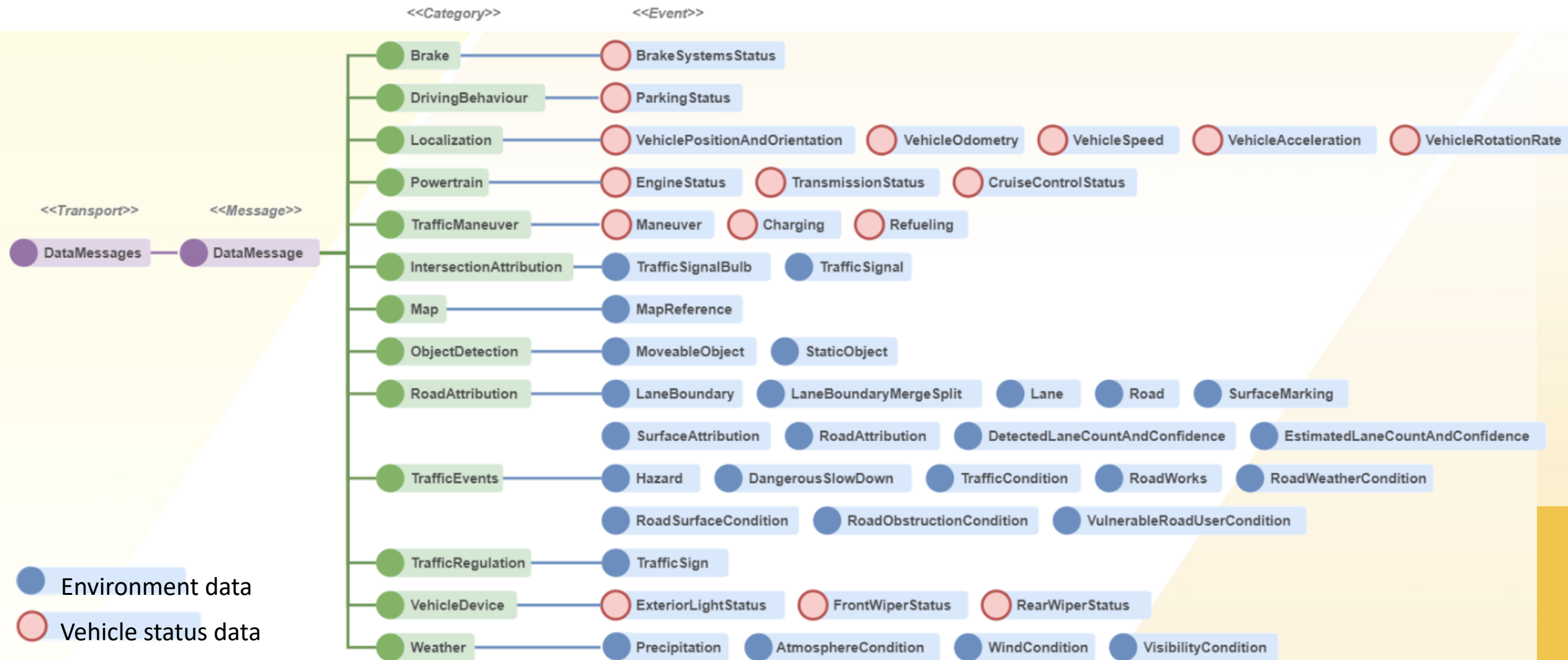
- Christian HEYNE (HERE Technology)
- Andras CSEPINSZKY (NNG)

## What is SENSORIS today?

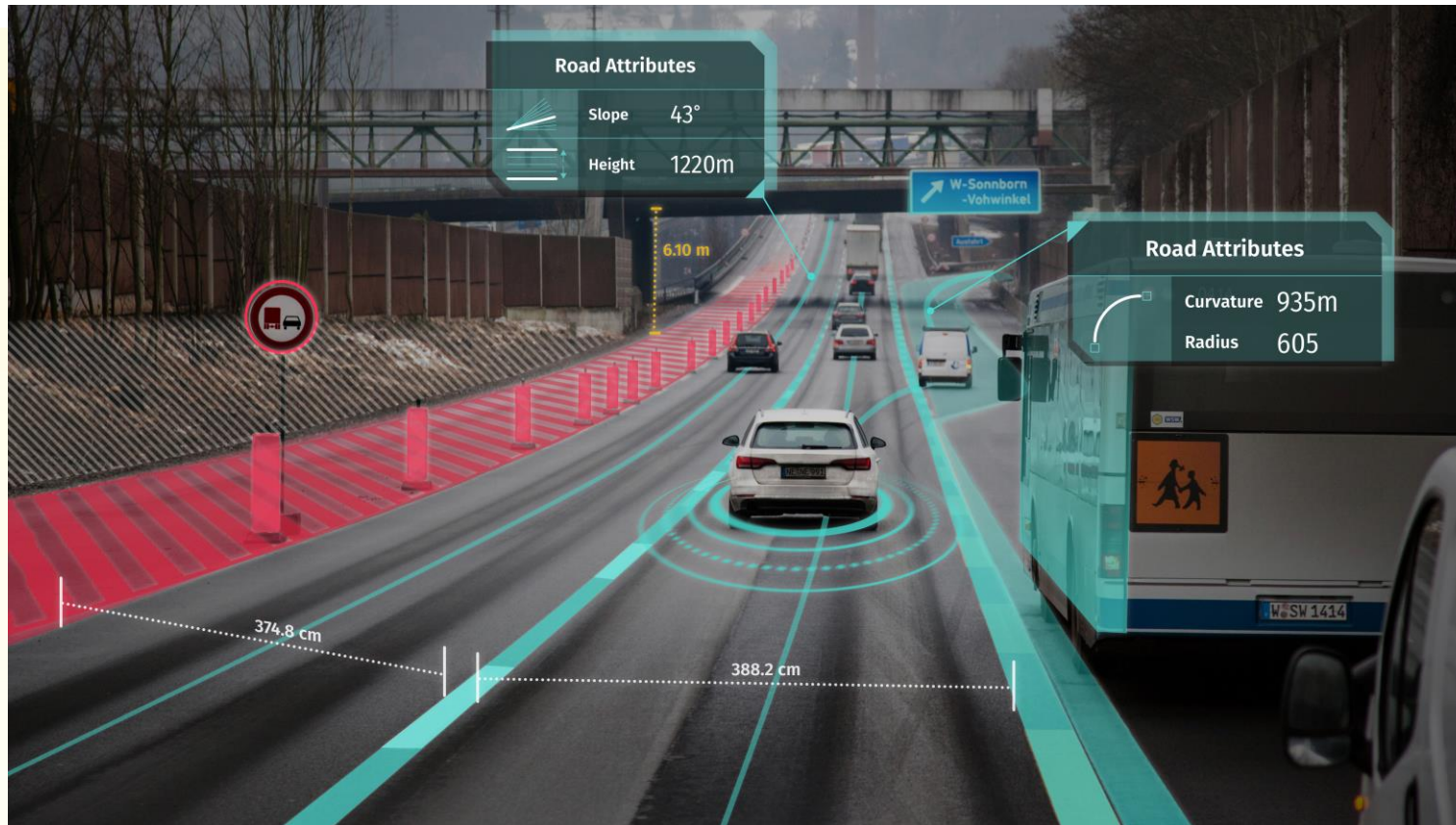
- A flexible map-specific Vehicle Probe Data specification
  - Specifying:
    - Data Model
    - Data Dictionary
    - Data Serialization
  - But also defining:
    - Interface architecture
    - Job (session) management
    - Test procedures
      - Sample files
      - Sample methods



## What data in SENSORIS today?



# Use Case: Self-healing map



Road geometry and attributes

Lane geometry and attributes

POI entries and exits

Road conditions



## Use Case: Real-time services



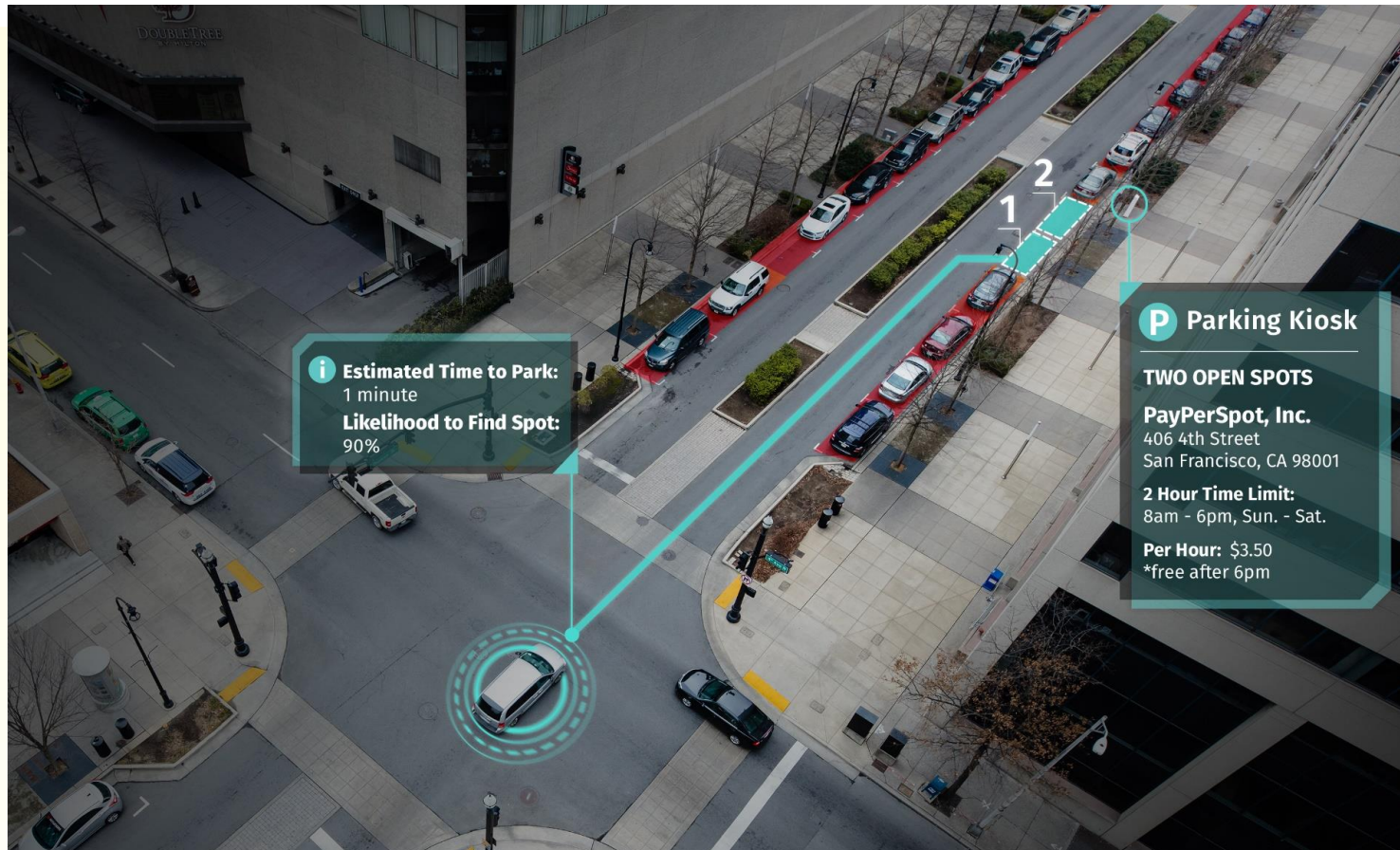
Traffic flow  
Traffic incidents

Hazard warnings

Environmental  
conditions

Traffic signage

## Use Case: Statistical analysis



Historical and real-time data analysis

Personal preference learning

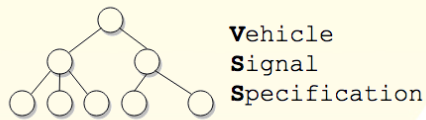
POI recommendations



# Active Alliances & Liaisons



Member of the Open Autodrive Forum together with NDS, ADASIS, TISA, TN-ITS, SIP-adus



Vehicle Signal Specification (VSS)



DataforRoadSafety project



Working with CEN TC278 WG7 ITS spatial data



Liaison being established with ISO TC22 SC31 (for **SENSORIS Interface Architecture**, referencing the data model and data dictionary part)



Liaison being proposed to ISO TC204 WG3 in collaboration with CEN TC278 WG7 under the umbrella of the Vienna Agreement (for **SENSORIS Data model and data dictionary**)



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