



# ADASIS and SENSORIS

Jean-Charles Pandazis, ERTICO - ITS Europe

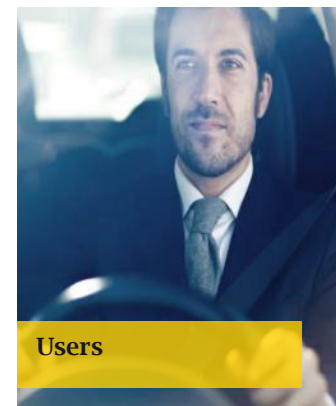
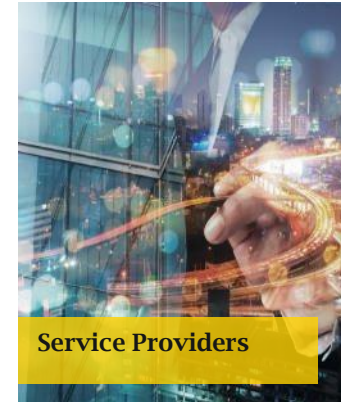
SIP-adus workshop, dynamic map (DM) session

Tokyo, 13 November 2019

# 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



# Training and capacity building

A need to fill the knowledge and experience gap for deployment of ITS

Additional programmes under development:

- Digital freight
- Electromobility
- European Commission project funding
- Mobility as a Service
- 5G & IoT

Tokyo, 13/11/2019

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# THE ACADEMY

by  
**ERTICO**  
PARTNERSHIP

Sharing knowledge

## Available courses



**ITS1:**  
**Introduction to ITS and C-ITS**  
Introductory course for anyone who wants to understand the fundamentals of ITS and C-ITS.



**ITS2:**  
**ITS and C-ITS user services**  
An overview of the benefits and challenges of existing and new C-ITS services for professional and non-professional drivers.



**ITS3:**  
**TMC and roadside technologies for ITS**  
Explore a C-ITS approach in the context of traffic control and management.



**ITS4:**  
**Standards, architectures and communication technologies for ITS and C-ITS**  
Learn about interoperability, testing and certification of ITS and C-ITS services.



**ITS5:**  
**Impact assessment of ITS and C-ITS systems**  
Learn about methods for evaluating ITS and C-ITS.



**ITS6:**  
**Financial incentives and business and procurement models for C-ITS deployment**  
Learn about stakeholder perspectives, governance schemes and data exchange.



**ITS7:**  
**Cost-benefit analyses of ITS services**  
Learn the main concepts for carrying out a cost-benefit analysis for the deployment of C-ITS services.



**ITS8:**  
**Guidance in deploying ITS and C-ITS**  
Introducing policy frameworks, implementation strategies and roadmaps for ITS and C-ITS.



**ITS9:**  
**Information security, data protection and privacy**  
Developing applied tools for privacy and data protection in C-ITS.

# ERTICO Start-up initiative



# International cooperation

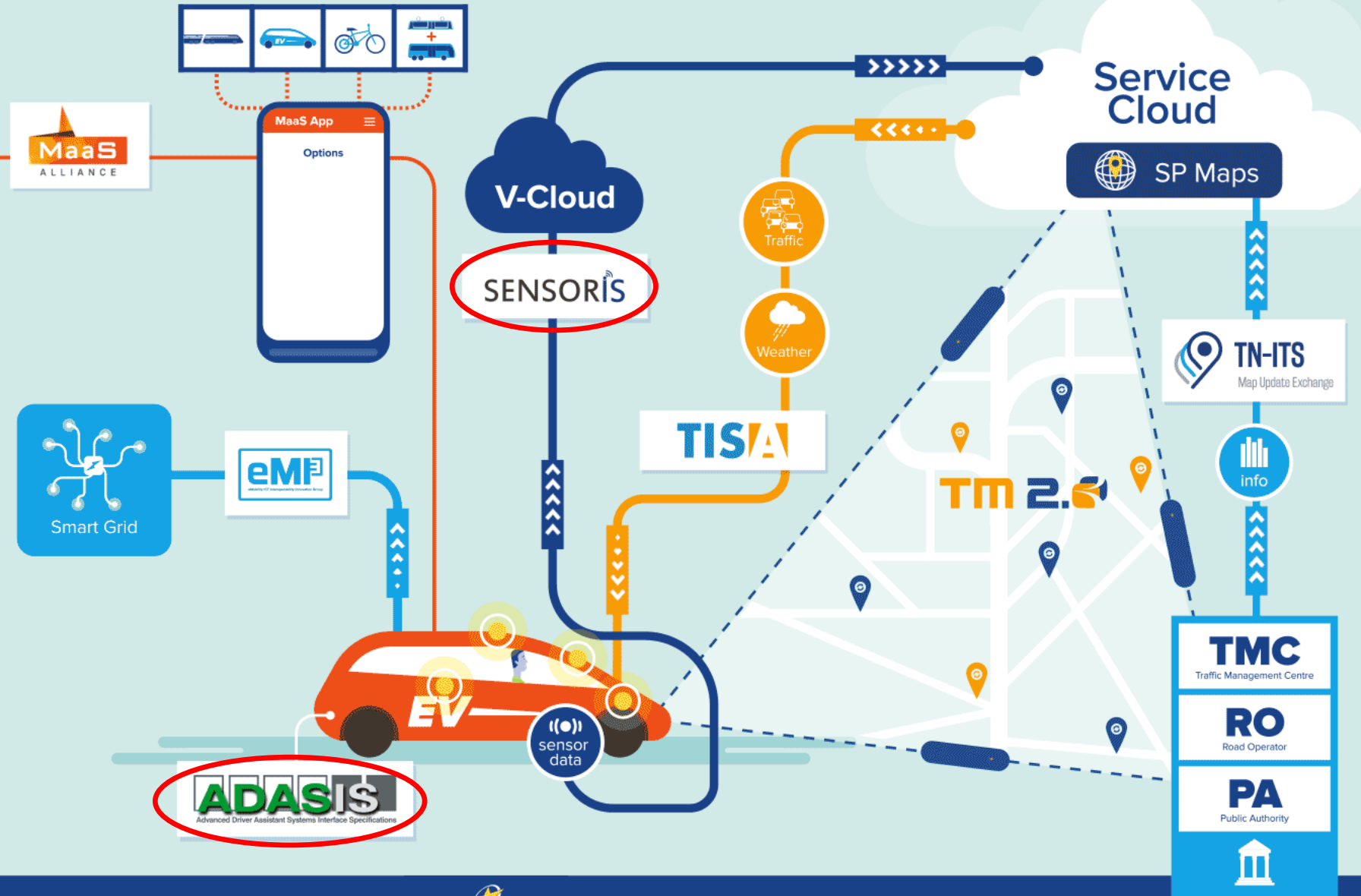
## ERTICO Partnership Delegation to Japan, 2020

ERTICO-ITS Europe plan to organise a delegation of our members to Japan in the second half of 2020. The goals of this delegation will be:

- To create opportunities for new business partnerships and cooperative projects
- To inform ERTICO Partners about the Japanese ITS market, and potential opportunities
- To visit innovative, cutting-edge ITS projects in Japan

If you are interested to meet with our delegation, or have suggestions for our itinerary, we would be interested to hear from you.

# SMART MOBILITY DEPLOYMENT BY ERTICO PARTNERSHIP



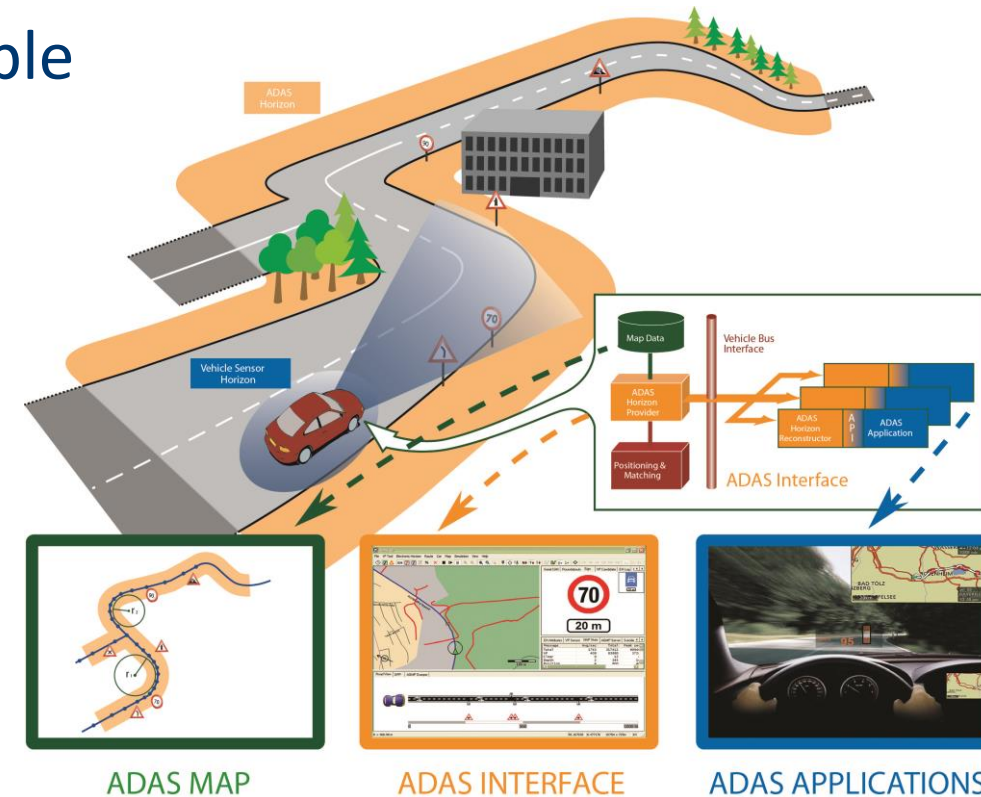


# Quick overview



- 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
- In 2018 ADASIS v3 is released internally to enable Automated Driving, public release end 2019
- Reference implementation is available for ADASIS members only

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



# ADASIS AISBL membership (59)



Vehicle manufacturers (13)
BMW
Daimler
Ford Forschungszentrum Aachen
Honda
Hyundai Mnsoft
Jaguar Land Rover
Nissan Motor Co.
Opel Automobile
Renault
Toyota Motor Europe
Volkswagen
Volvo Car
Volvo Group Trucks Technology

ADAS manufacturers (17)
Aptiv (former Delphi)
Continental Automotive
CTAG
DENSO
Denso Ten (Europe)
Hitachi Automotive Systems
Huawei
Huizhou Desay SV Automotive
Ibeo Automotive Systems
IVIS Inc
Knorr-Bremse
LG Electronics
MAGNA
Valeo Comfort and Driving Assistance
Visteon
Zenuity
ZF

Navigation system manufacturers (16)
AISIN AW
ALPINE ELECTRONICS
Banma Network Technology
Bosch SoftTec
CarLink Software Co.
Elektrobit Automotive
Garmin
Harman/Becker Automotive
Mappers Co.
Mitsubishi Electric Automotive
MXNavi
Neusoft
NNG
Panasonic Automotive
TeleNav
Veoneer (Autoliv)

Map & data providers (13)
AutoNavi (Alibaba Group)
Baidu
eMapgo
EnGis
HERE
Kuandeng
MOMENTA
NavInfo
Tencent
TomTom
Ways 1 Inc
Wuhan Kotei
Zenrin

ADASIS Chair, Michael Klingsöhr, Bosch SoftTec GmbH  
 ADASIS coordination, Jean-Charles Pandazis (ERTICO)

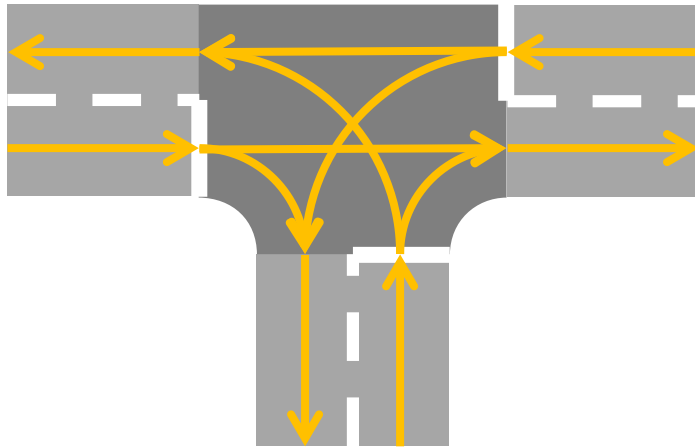
# What is new & roll out plan



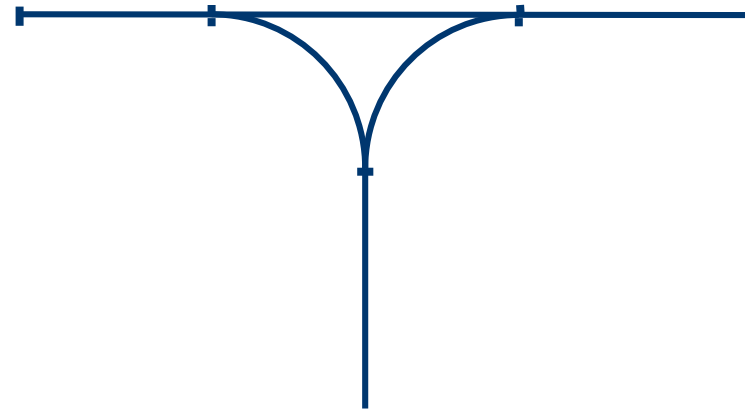
## New to be part of v3.2:

- extended list of traffic signs in reference document
- special traffic light profile including road attribute + including light phases
- localization objects: obstacles, traffic sign face
- Connecting paths

## Issue: HAD grade modeling of intersection



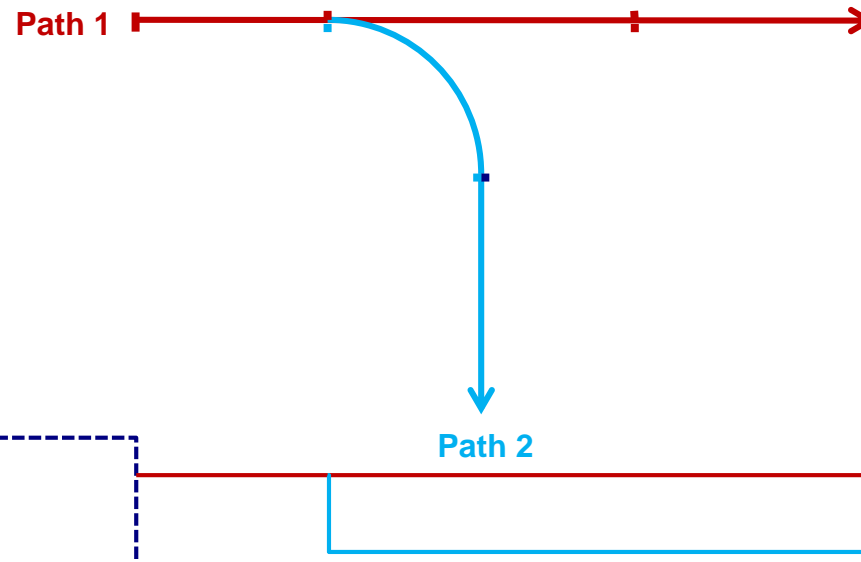
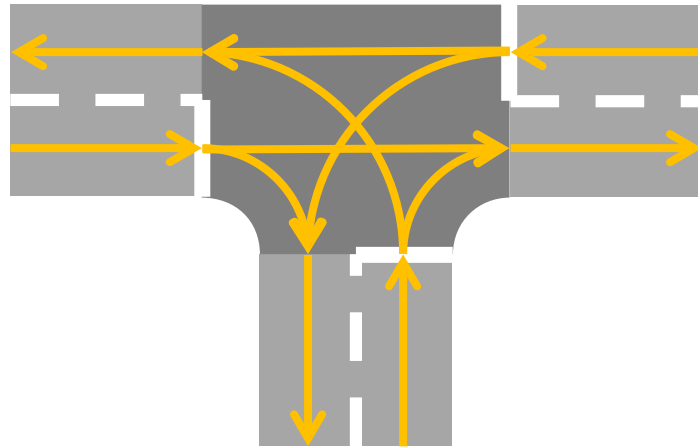
- Simple intersection



- Detailed logical topology
- This is what we need for HAD – how do we represent it in ADASIS v3?
- Note that in ADASIS v3, a piece of road can have lanes in both driving directions.

# Simple model

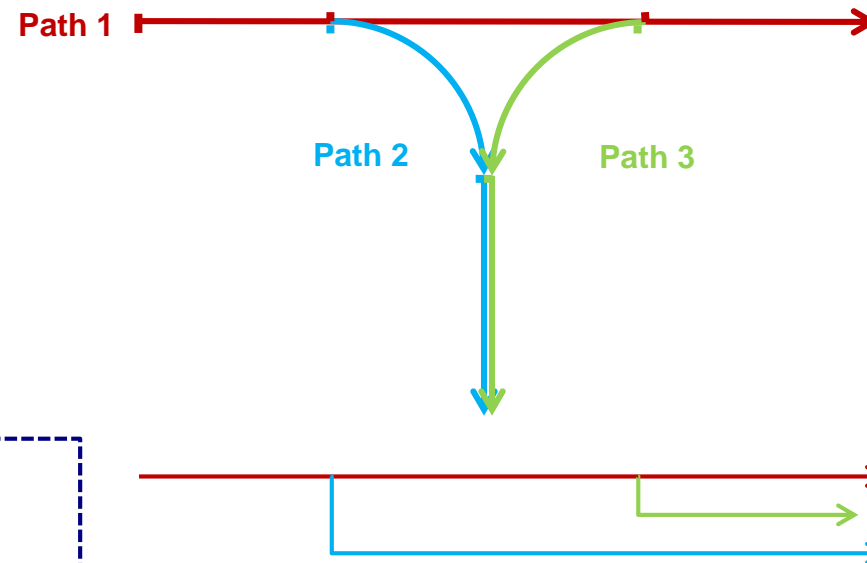
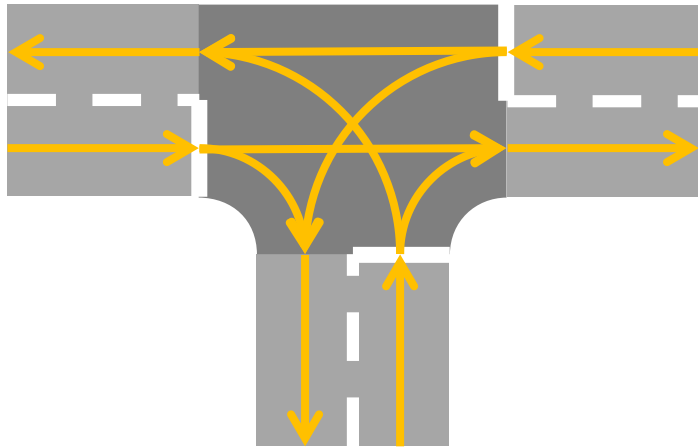
## Ego vehicle paths



- Simple path model
- Paths just for ego vehicle
- Connection from east to south not represented at all

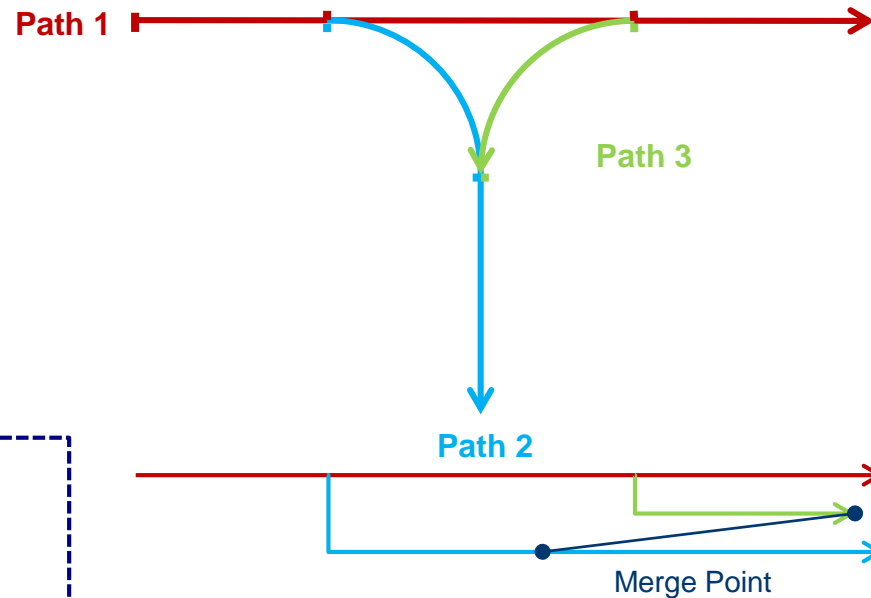
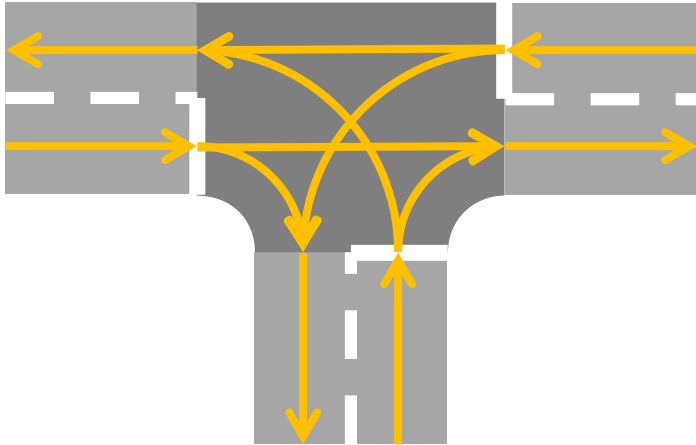
# ADASIS v3.2

## Full path tree



- ADASIS 3.1.0 solution
- All connections modeled
- Duplicated information between path 2 and path 3
- Missing information that locations on these paths are physically identical

## Solution: Merge Point profile



- Information that two path/offset locations are physically identical
- No need to send duplicate information
- New profile, attached to each path
- No more restriction to a tree – representing a full graph! (as overlay on the tree)

# What is new & roll out plan



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## Specification - Roll out plan

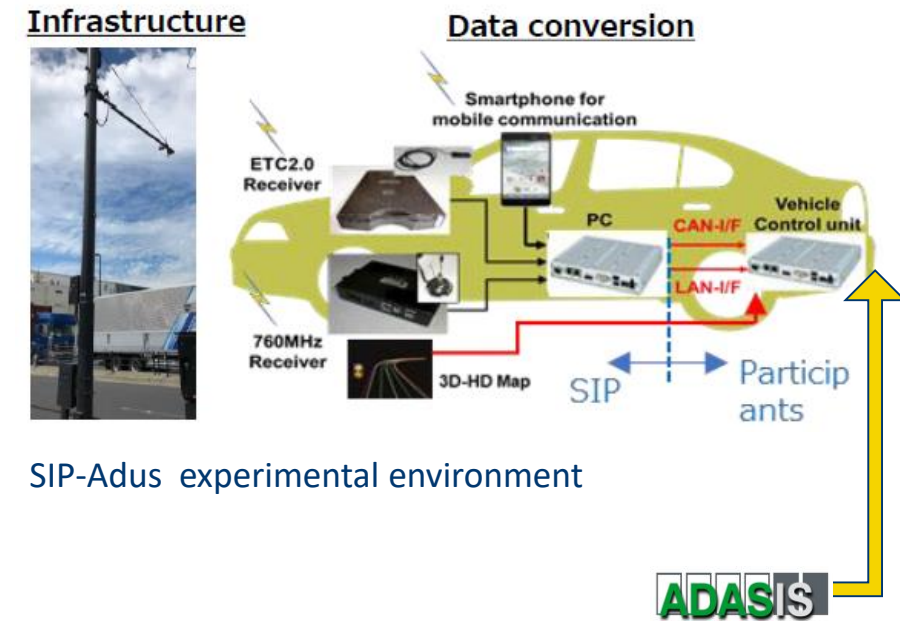
- *ADASIS v3.1.0: published first version 3.1.0 for AISBL members*
- ADASIS v3.2.0 draft
  - state: working mode, will have a few small incompatible changes to 3.1
  - global review phase planned for end of 2019
- ADASIS v3.2.0: release planned for early 2020
- Next update: plan to contain official Reference API, Low-Level Protocol implementation



# Liaison and potential collaboration



- ADASIS is an industrial defacto standard
- ADASIS presented to ITS Japan members
- Currently in discussion with SIP-adus:
  - First dicussion @ ADASIS meeting in Tokyo on 8 November hosted by Zenrin
  - aim is to use ADASIS v3 in FoT, between HD map and Vehicle functions
  - too late for 2020 testing, but considered for 2021 testing (tbc)



SIP-Adus experimental environment



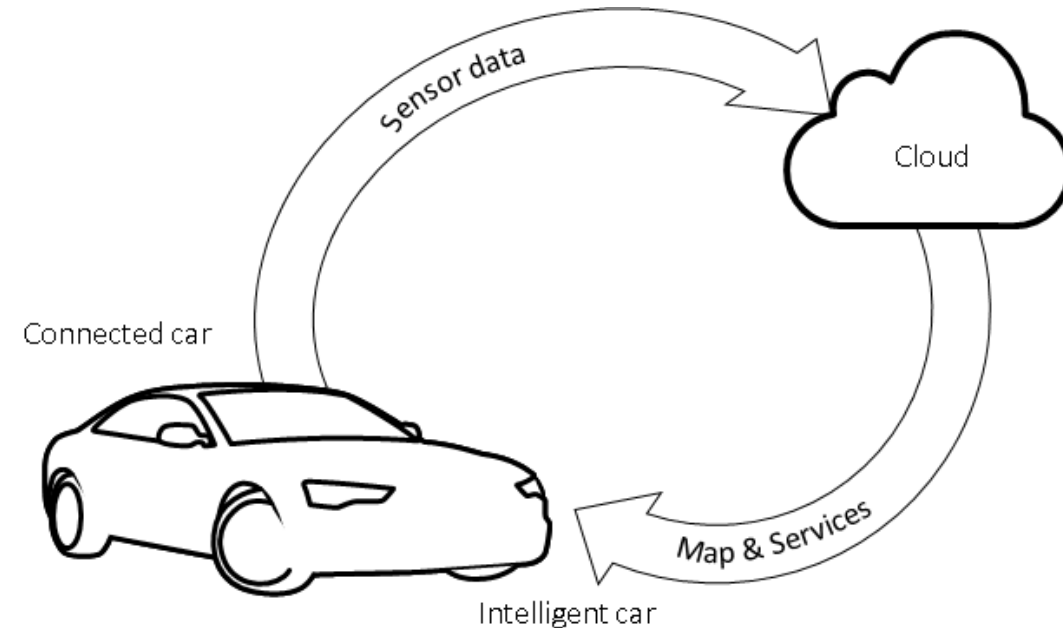
# SENSOR ingestion Interface Specification

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

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)



# SENSORIS : 39 members

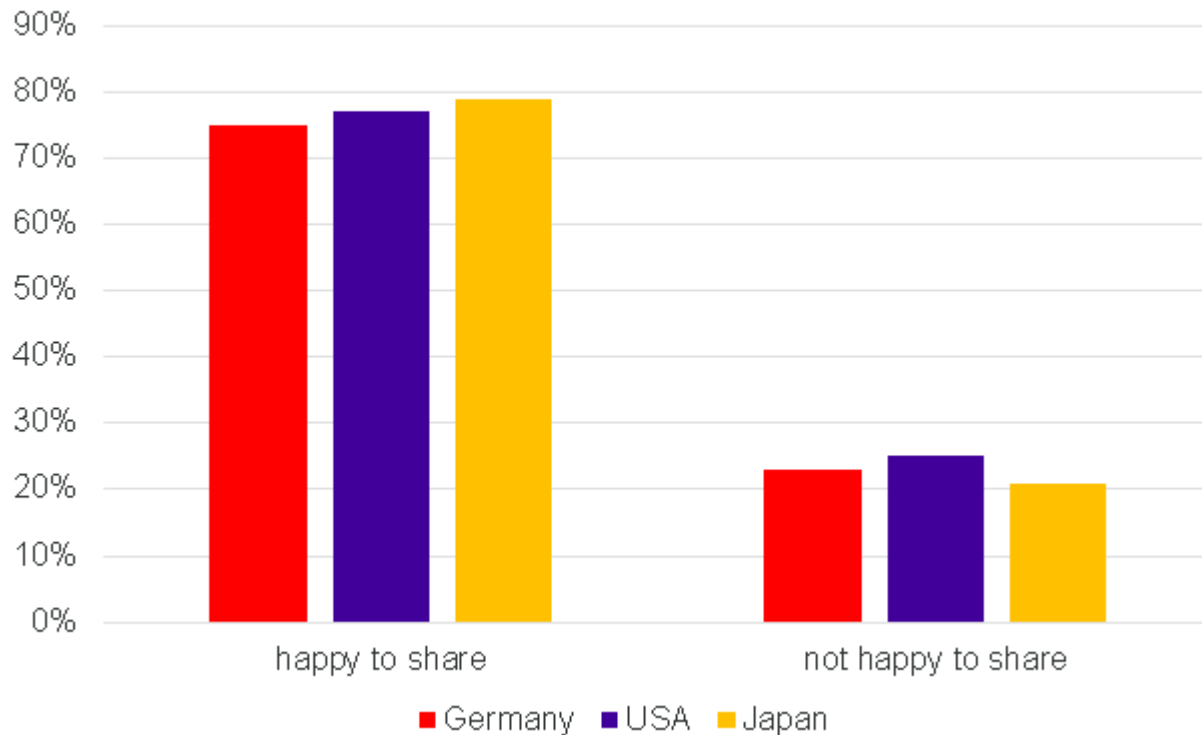
Main membership category	SENSORIS member
<b>ADAS manufacturers (10)</b>	AISIN AW
	Continental Automotive GmbH
	DENSO
	Denso Ten
	Huawei
	LG Electronics
	Robert Bosch Car Multimedia GmbH
	Knorr-Bremse
	Valeo Comfort and Driving Assistance
	ZF
<b>Vehicle manufacturers (6)</b>	Audi
	BMW AG
	Daimler AG
	Jaguar Land Rover Limited
	Nissan
	Volvo Car
<b>Telecom &amp; Cloud Infrastructure Providers (3)</b>	IBM
	Tencent
	Ways 1 Inc
<b>Other (2)</b>	CTAG
	ICCS

Main membership category	SENSORIS member
<b>Navigation System Suppliers (9)</b>	Elektrobit Automotive GmbH
	Harman
	Hyundai Mnsoft
	Mappers Co.
	MXNavi
	Neusoft
	NNG
	PIONEER Co.
	Telenav
<b>Location content &amp; Service providers (9)</b>	AutoNavi Software Co. Ltd.
	Baidu
	EnGis Technologies
	HERE Global B.V.
	INRIX Inc.
	Kuandeng
	NavInfo Co.Ltd.
	TomTom International B.V.
	Zenrin

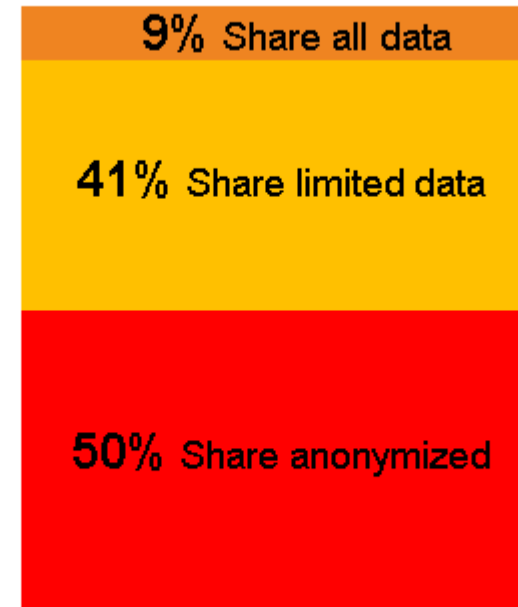
# Data sharing acceptance

More and more vehicles are connected, but how data sharing is accepted?

Willingness to share

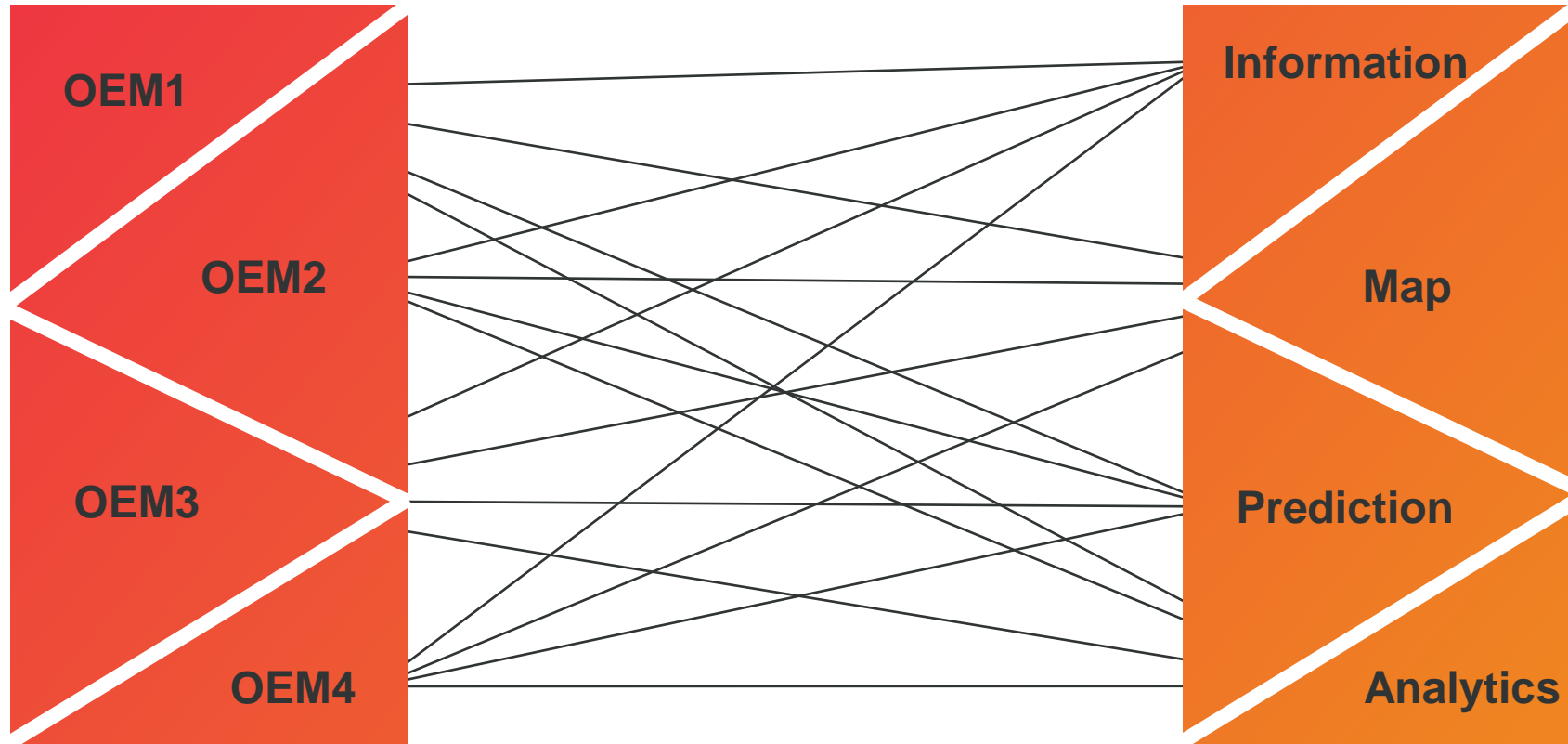


Privacy awareness

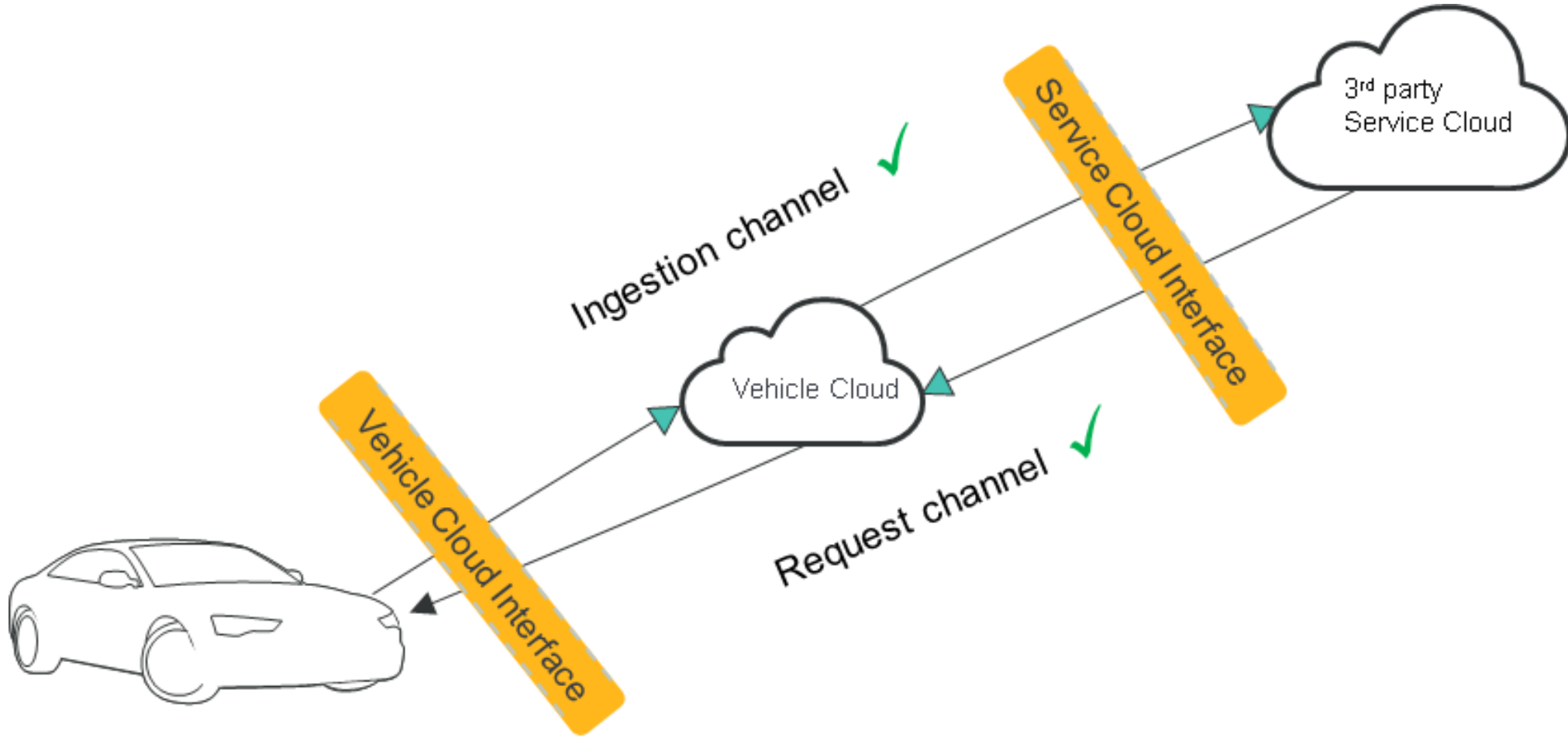


Source: SBD

# Fragmentation is a limiting factor



# Two ways data exchange



# Liaisons – interchange and interoperate

- European Commission
  - EU Data Task Force – Safety-Related Sensor Data
- HAD Projects
  - KO-HAF
  - SIP-adus
- ISO, SAE, CEN
  - Abstract Data Model
  - Discussion with ISO on where to place SENSORIS to become an ISO standard
- W3C
  - Taxonomy, Ontology
- Open Autodrive Forum
  - Automotive Ecosystem (NDS, ADASIS, TISA, SENSORSI, OpenDRIVE, SIP-adus)

**Innovation for tomorrow's journey.**

