



iMobility Forum WG Automation in Road Transport

Sub-WG on Digital Infrastructure

Maxime Flament, ERTICO

Ahmed Nasr, HERE



Outline

- Introduction to VRA
- Definition of Digital Infrastructure (EU) and motivation
- Role of Digital Infrastructure
- How and who will provide the data

VRA in Short

VRA – Vehicle and Road Automation is a support action funded by the European Union to create a collaboration network of experts and stakeholders working on deployment of automated vehicles and its related infrastructure



Objectives of VRA Support Action

Create an active European network of experts on Vehicle and Road Automation and foster cooperation within the Automation WG



Contribute to EU-US-JPN trilateral WG on road vehicle automation (EC – US DoT – MLIT)



Identify deployment needs for Vehicle and Road Automation

Deployment paths, Regulatory issues, Testing, Connectivity, Benefits, Maps, Cybersecurity, Human Factors, Decision and Control

VRA-net.eu/wiki

Promote the Research on Vehicle and Road Automation



VRA: Major topics of the Automation WG

Deployment paths (VOLVO)

- Viable business models and deployment paths including socio-economic implications

Regulatory issues (ERTICO)

- Clarify current regulatory and liability issues among European countries

Road Worthiness Testing (IDIADA)

- Identify needs for standardisation, testing, compliance and certification

Connectivity (ICCS)

- Identify additional requirement on C-ITS

Digital infrastructure (HERE - ERTICO)

- Identify role of digital maps for automation

Human factors (DLR-TRL-LEEDS)

- Identify solutions for driver and other road user interactions

Evaluation of benefits (CTL)

- List potential direct and indirect benefits of automation

Controls and decisions (DLR)

- Identify gaps in current control and decision solutions

Reliability and CyberSecurity (→HTG6)

- Clarify reliability concerns and make recommendations

Digital Infrastructure (for Road Transport Automation) (EU)

Definition

Static and dynamic digital representation of the physical world with which the automated vehicle will interact to operate. This includes sourcing, processing and information.

Motivation

- Along with the investment needed on the physical road infrastructure, a “digital representation of the road infrastructure” will be needed.
- Need cooperation from the vehicles and the infrastructure operators to collect, update and correct eventual changes made on the physical infrastructure

Roles of the DI for Automation

Static

Provide accurate map data (e.g. HD Maps)

Provide apriori knowledge along the road (Electronic Horizon)

Enable high relative position accuracy (landmarks)

Reproduce human like driving (driving patterns)

Allow or not automated functions on specific roads (e.g. managed lanes)

Dynamic

Notify the vehicle about situations ahead that may require human attention or even intervention (L4→L3→L2...)

Provide dynamic information around the vehicle (LDM)

Suppliers to the 2015 BMW X4

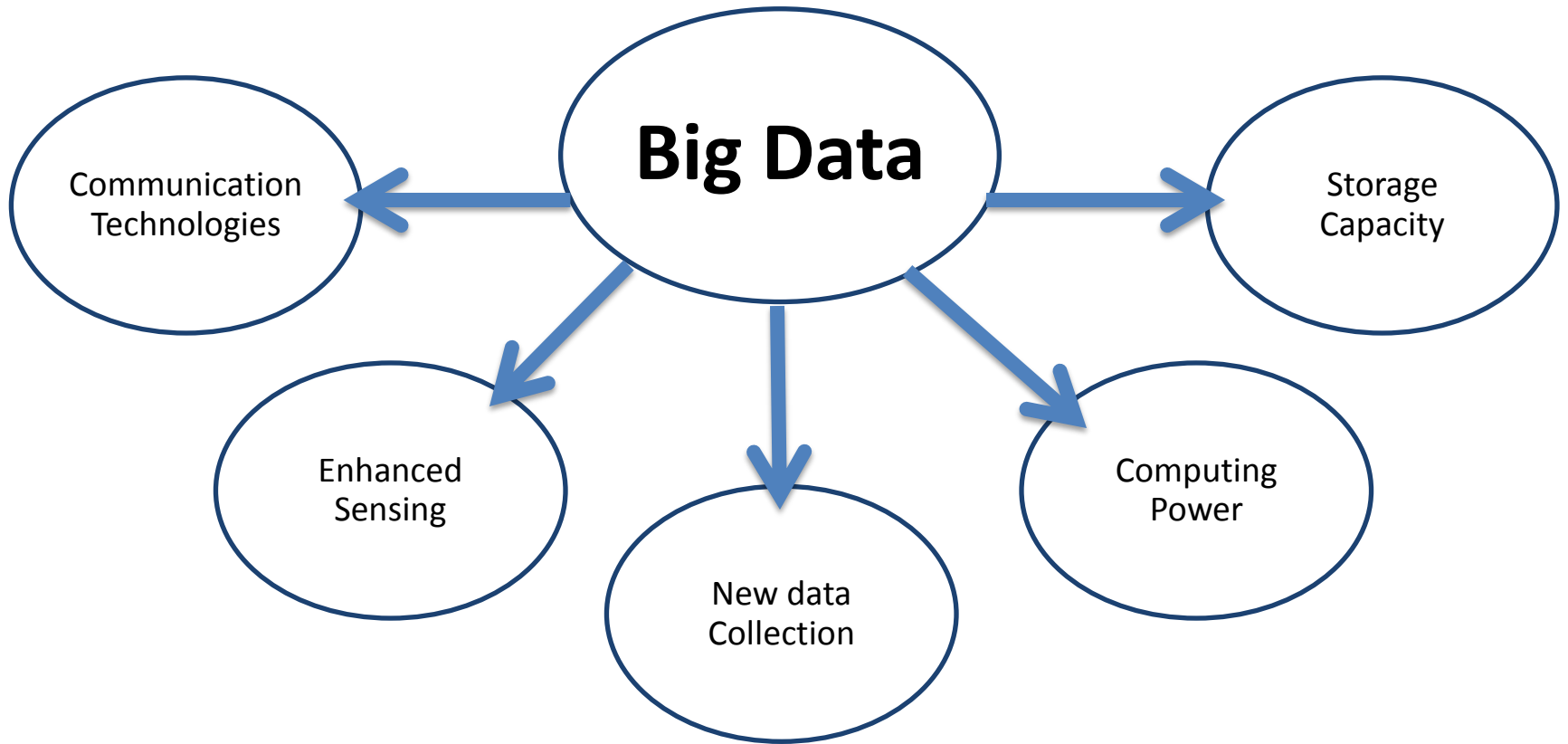


SUPPLIERS WANTED: If you are a supplier and have questions or want your information considered for our car cutaways, contact Supplier Business at: automotivenews@supplierbusiness.com

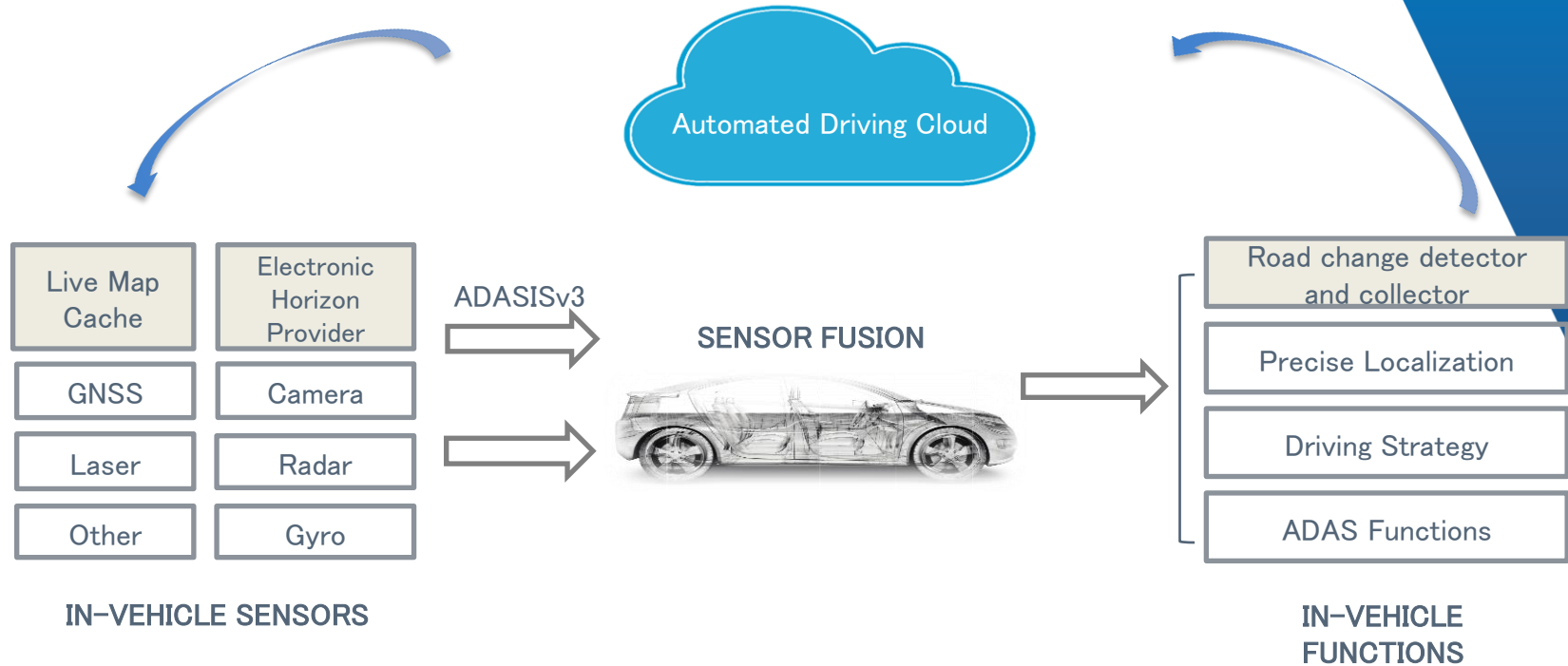
Source: SupplierBusiness



SupplierBusiness



HAD sensors overview

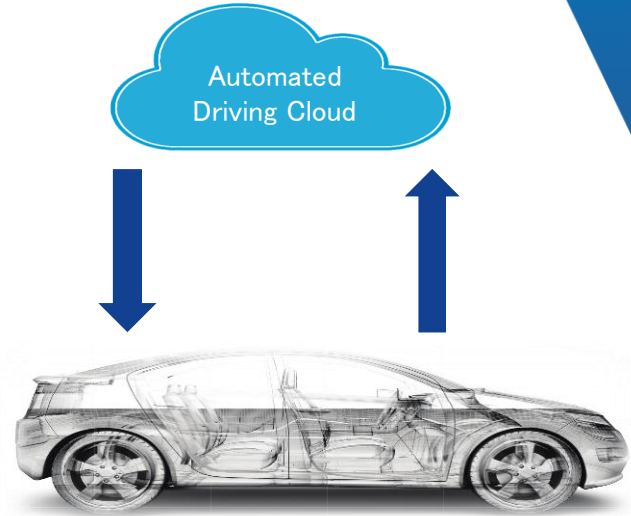


Source: HERE, ITS World Congress, 2015

Flament, SIP-ADUS WS, Tokyo

Digital Infrastructure: The most intelligent car sensor

A cloud providing **highly accurate live map** is the **most intelligent car sensor** for Highly Automated Driving



Source: HERE, ITS World Congress, 2015

Flament, SIP-ADUS WS, Tokyo

Digital Infrastructure: Acts as a sensors

- A sensor that learns
- A sensor that extends beyond visible range
- A sensor that provides an accurate reference of the world

Digital Infrastructure: Role of the Public Authority

For Level 3 and beyond:

If a Road Operator encourages to use automated L3+ operation on its roads, it will have to interact in real-time with the vehicles with:

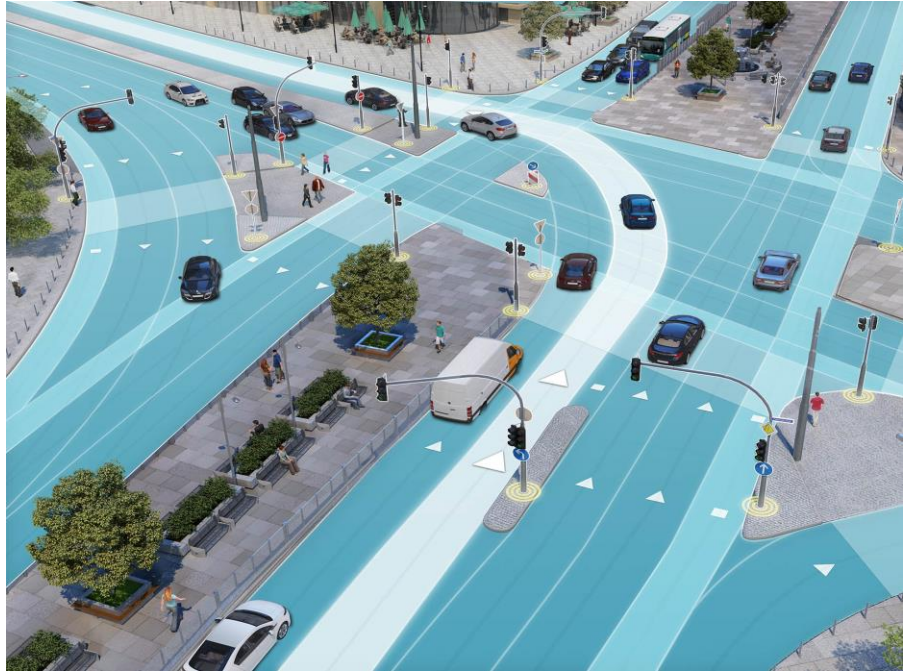
- Infrastructure information (such as VMS and SPaT),
- Traffic dangers ahead of the vehicle in automated mode

Summary

A self learning, highly accurate living map enables the **safest and most comfortable Highly Automated Driving**

The location cloud big data, sensor ingestion algorithms, real time software and services **power the most intelligent car sensor**

HERE HD Live Map is currently being used in **10 HAD OEM projects**



Source: HERE, ITS World Congress, 2015

Flament, SIP-ADUS WS, Tokyo

Thank you for your attention...

Any questions?

VRA.info@mail.ertico.com

Maxime Flament, m.flament@mail.ertico.com

ERTICO – ITS EUROPE