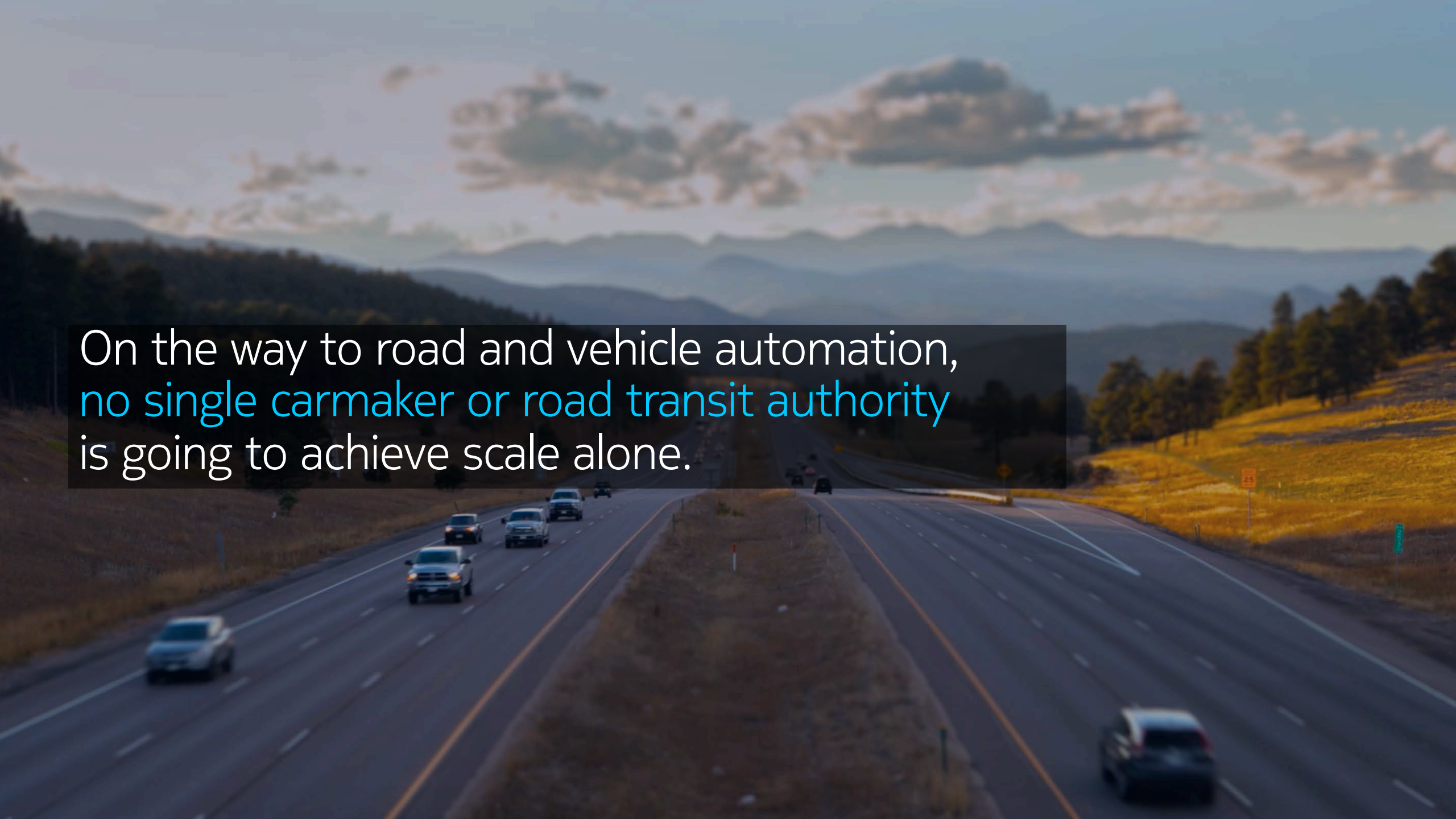
SENSORIS: Closing the sensor data feedback loop

Ahmed Nasr

Head of Industry & Government Relations EU
20 July 2016

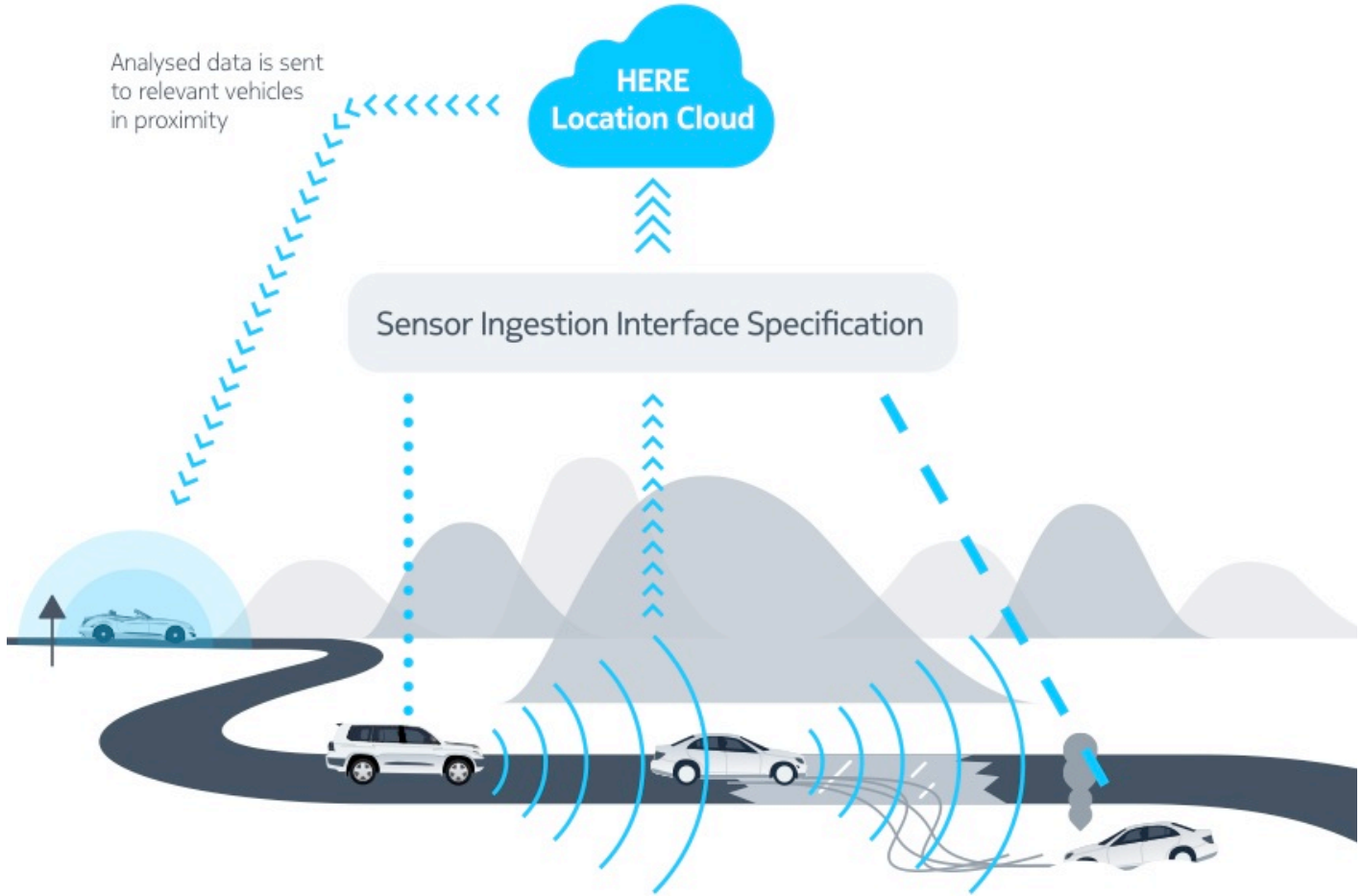
here


On the way to road and vehicle automation,
no single carmaker or road transit authority
is going to achieve scale alone.

June 2015: Publishing the HERE Interface Specification

- The Sensor Data Ingestion Interface Specification describes the needed technical requirements of data sets for vehicles submitting rich data gathered by on-board car sensors.

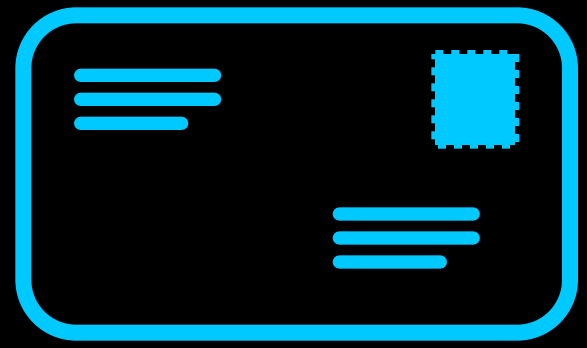
- With a common interface specification, the data generated would be analogous regardless of vehicle manufacturer and could thus be pooled, processed and analyzed to create a detailed live view of road and traffic conditions.



The definition of a "message"

The Envelope

The envelope provides fundamental information about the originating vehicle. It does not identify a single vehicle or driver.

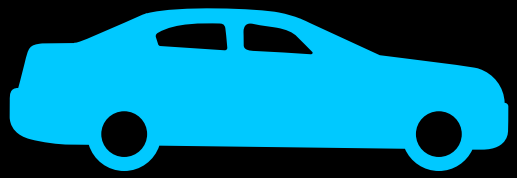


The Path

Each message contains one single Path and is a sequential list of Position Estimates, ordered by UTC Timestamp.

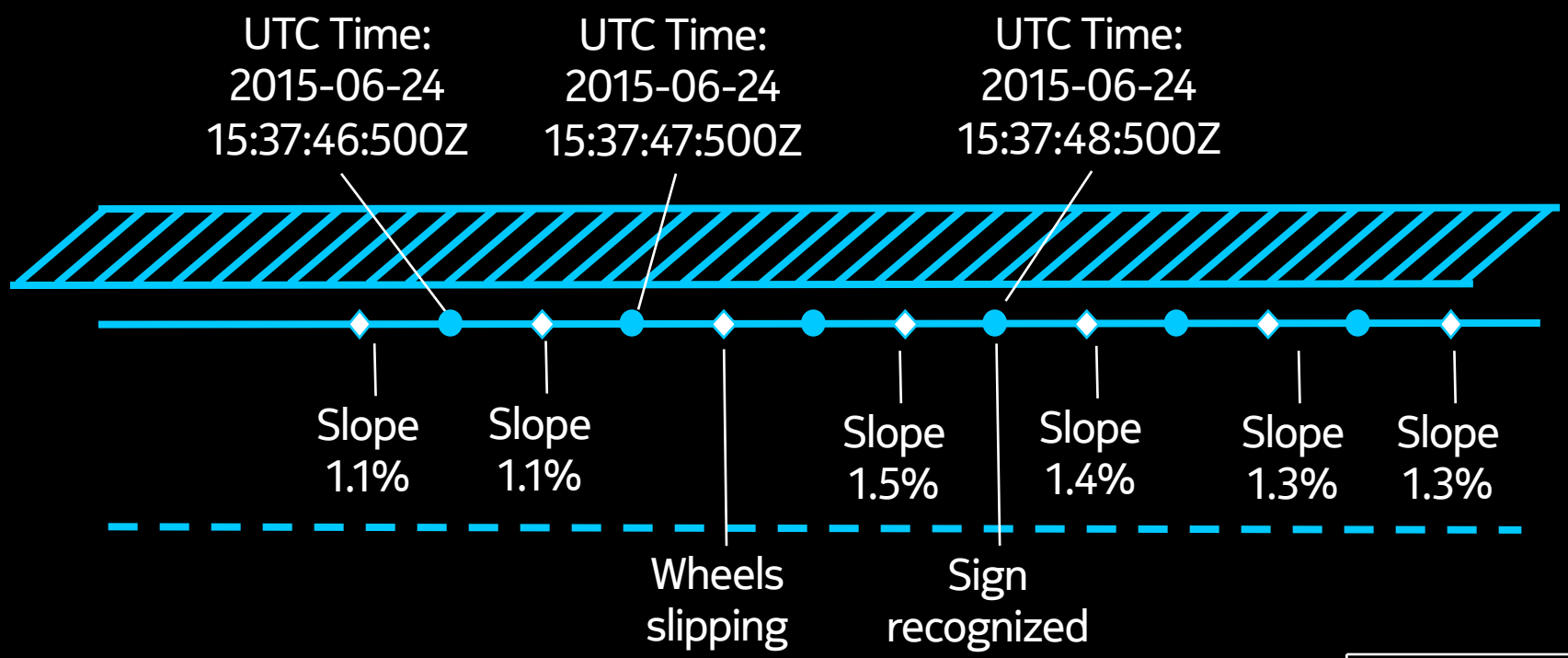
The Path Events

Path Events provide additional information along a Path that may be of singular or continuous nature.



here

A closer look at the path events



Source: HERE, sensor ingestion interface specification

Path Events
Different Classification and Reporting Frequencies

Information about the Vehicle

- Vehicle Status → Initial report, changes reported
- Vehicle Dynamics → Reported in intervals
- Exceptional Vehicle State → Occurrences reported
- OEM Proprietary → reporting interval OEM dependent

Information about the Road (from a vehicles point of view)

- Sign Recognition → Occurrences reported
- Lane Boundary Recognition → Reported in intervals

By uniting around a single data specification,
together we can better and faster make sense of
vehicle data to increase trust and adoption
of automated technologies.

Initial Forum Meetings

July 2015 | Berlin

25 Participants

16 Companies

SENSORIS

October 2015 | Auburn Hills

23 Participants

13 Companies

November 2015 | Tokyo

35 Participants

20 Companies

here

July 2016: ERTICO – ITS Europe to coordinate SENSORIS.

- HERE as part of the forum
- Other members of SENSORIS are:
  - AISIN AW
  - Robert Bosch
  - Continental
  - Daimler
  - Elektrobit
  - HARMAN
  - NavInfo
  - PIONEER
  - TomTom…

Thank you

ahmed.nasr@here.com

Regulatory framework for the provision of Real-Time Traffic Information in Europe

Maxime Flament, ERTICO – ITS Europe

EU Policy Framework

EU Policy framework for the coherent and cost efficient deployment of ITS across Europe

ITS Action Plan 2008: *24 actions for the Deployment of Intelligent Transport Systems in Europe*

ITS Directive 2010: *Legal Framework for the coordinated Deployment of ITS for road transport and interfaces with other modes*

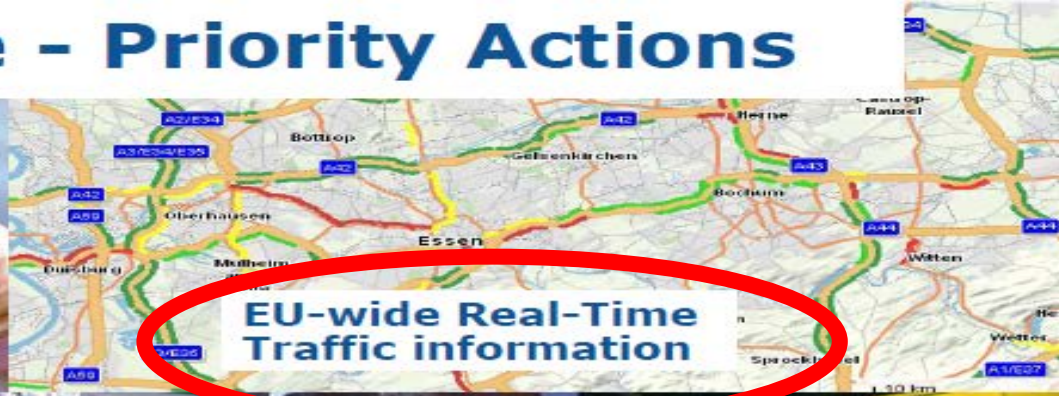
>> Development of specifications to ensure interoperability and continuity of services

White Paper for Transport 2011: *Roadmap to a Single Transport Area and an Intelligent, Multimodal, Integrated, Efficient Transport System*

EETS Directive 2004: *mandates interoperability of electronic tolls*

ITS Directive - Priority Actions

EU-wide Multi-Modal
Travel Information



EU-wide Real-Time
Traffic information

Free safety-related
minimum Traffic Info

Interoperable
EU-wide eCall

Information & Reservation
services for Truck Parking

Commission Delegated Regulation on the Provision of EU-wide Real-time Traffic Information Services

Transport

Scope

- **Focus on enabling framework conditions for the provision of reliable and content rich real-time traffic information**
  - Data access and sharing (access point, standards, update)
  - Data scope (static and dynamic road data, traffic data)
  - Geographical scope (beyond TEN-T)

- **The specification are binding only if the Member States or stakeholders deploy the applications and services covered by the legal act or intend to deploy them in the future**

National access point

- **Member States shall set-up a national access point** offering a **single window** of access to data provided by road authorities, road operators, service providers, on the corresponding **national territory**
- National access points will regroup the existing public and private access points if any
- National access points shall provide **discovery services**
- Road authorities, road operators, service providers shall provide appropriate **metadata** accompanying their dataset
- Member States can set-up a common access point

Standards

- **Data and corresponding metadata incl. information on quality** shall be accessible for exchange and re-use
  - In a machine readable format or a **standardised format** if available
    - INSPIRE (static road data)
    - **DATEX 2** (dynamic road status data, traffic data)
  - On a non discriminatory basis (when no commercial implication)
  - Within a timeframe ensuring timely provision of RTTI service
  - **Through the national access point**
- Where relevant, inaccuracies spotted by data (re-)users shall be signalled to the data originators

Static road data	Dynamic road status data	Traffic data
Road network links and physical attributes (e.g. geometry, road width, number of lanes, gradients, junctions)	Road / lane / bridge closures, Accidents, Incidents	Traffic volume
Road classification	Overtaking bans on HGV	Speed
Traffic signs on traffic regulations and dangers (e.g. access conditions for tunnels / bridges, permanent access restrictions, other)	Road works, Poor pavement conditions	Location and length of queues, Travel times
Speed limits	Dynamic speed limits	Waiting time at border crossings to non-EU countries
Freight delivery regulations, Traffic circulation plans	Temporary traffic management measures	
Location of tolling stations	Direction of travel on reversible lanes	
Tolled roads, fixed RUC, payment methods	Variable RUC, payment methods	
Location of parking places / service areas	Availability of parking places, cost of parking	
Location of charging points for EV and conditions of use	Availability of charging points for EV	
Location of CNG / LNG / LPG stations	Availability of delivery areas	
Location of public transport stops and interchange points	Weather conditions affecting road surface and visibility	
Location of delivery areas		

Geographical Scope

- **Specifications apply on**
  - the ***comprehensive trans-European road network as well as other motorways not part of the TEN-T***
  - + Member States can ***voluntarily include "Priority zones"***, in particular in suburban and urban areas

"Road sections identified, where relevant, by the national authorities, in particular in urban areas, that are not part of the comprehensive trans-European road network and are not motorways, based on the levels of recurring traffic congestion or other traffic management considerations"

C-ITS PLATFORM

ERTICO ITS EUROPE

C-ITS Platform Phase I

- **Ended in the 21 January 2016 plenary**
- **Final report fully endorsed, contains MANY expert recommendations + MANY annexes**
- **Addresses amongst others**
  - Hybrid Communication / Spectrum
  - Access to in-vehicle data
  - Data Protection & Privacy
  - Standardisation & Interoperability
  - Security
  - List of Day 1 (Day 1,5) applications
  - Cost Benefit Analysis

ERTICO ITS EUROPE

C-ITS Platform Phase II

- **Support and contribute to the shared strategy for connected and automated vehicles in the EU**
- **Continue supporting C-ITS deployment**
- **Implement recommendations of Final Report First Phase C-ITS Platform**
- **Converging connectivity and automation**
  - C-ITS and automation in urban areas
  - Enhanced Traffic Management
  - Road Safety
  - Physical and digital Road Infrastructure
- **Complementing GEAR 2030 (focusing on the vehicle)**

ERTICO ITS EUROPE

Digital Road Infrastructure

- **Accurate, dynamic and live digital representation of the physical infrastructure**
- **Potentially much more cost effective than updating or modifying the physical infrastructure**

- **How do we guarantee and maintain quality ?**
- **Data exchange between private and public sector ?**
- **Communication infrastructure to transmit live updates ?**
- **Coverage of the road network ?**
- **Will providers of data need to assume some liability risk ?**

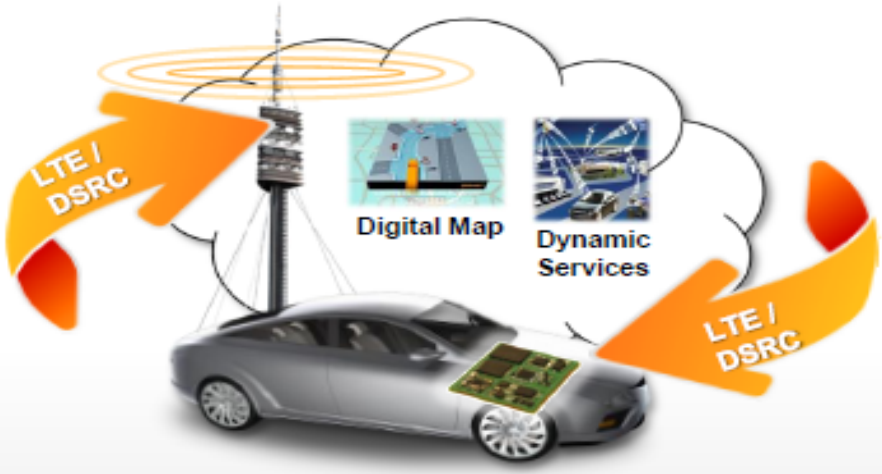
ERTICO
ITS EUROPE

WHY DOES IT MATTER

Automated Driving: "Fresh Data" from the cloud

Highly Precise Map and Dynamic Data – crowd sourced

Source: CONTINENTAL



Digital Map

Functions

- Static Basic Map
- HAD Map Extension (lane, landmark, …)
- Dynamic Events (Speed Limit, …)

Features

- Highly precise (location, time)
- Highly up-to-date (real-time)
- Learning map (via crowd sourcing)

Dynamic Services (Reference List) - based on Traffic Management Information

ITS Action Plan and Directive

http://ec.europa.eu/transport/its/road/action_plan_en.htm

C-ITS Platform

http://ec.europa.eu/transport/themes/its/news/c-its-deployment-platform_en.htm

ERTICO ITS EUROPE

Maxime Flament
ERTICO – ITS Europe
m.flament@mail.ertico.com