



LIVORNO (IT)

Lorenzo Pieri (AVR) – 24/09/2018



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Overview of the Italian PS



- **Specific features:**

- ✓ The testbed encompasses the area of the **Port of Livorno** and the **Florence - Livorno highway**.
- ✓ IoT devices are deployed in the car and along the roads in both the **Highway** and the **Urban Area**.
- ✓ 7 **JEEP Renegade prototype** vehicles are used: 2 connected and AD cars, 5 connected cars.
- ✓ A **connected bicycle prototype** is also included in the loop.
- ✓ The **MONI.C.A.™ Port Monitoring Centre, Traffic Control Centre** with **DATEX-II** node are integrated into the PS ICT infrastructure.

- **Use cases:**

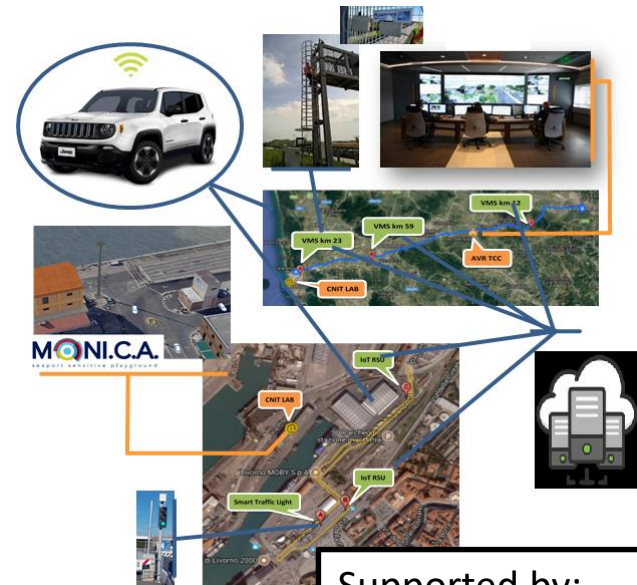


- **Highway Pilot:** road hazard events announced by IoT devices enable speed adaptation and lane change functions on the AD cars.



- **Urban driving:** vulnerable road user are detected at traffic light intersection and trigger brakes on the AD cars.

- **Partners involved:**



Supported by:



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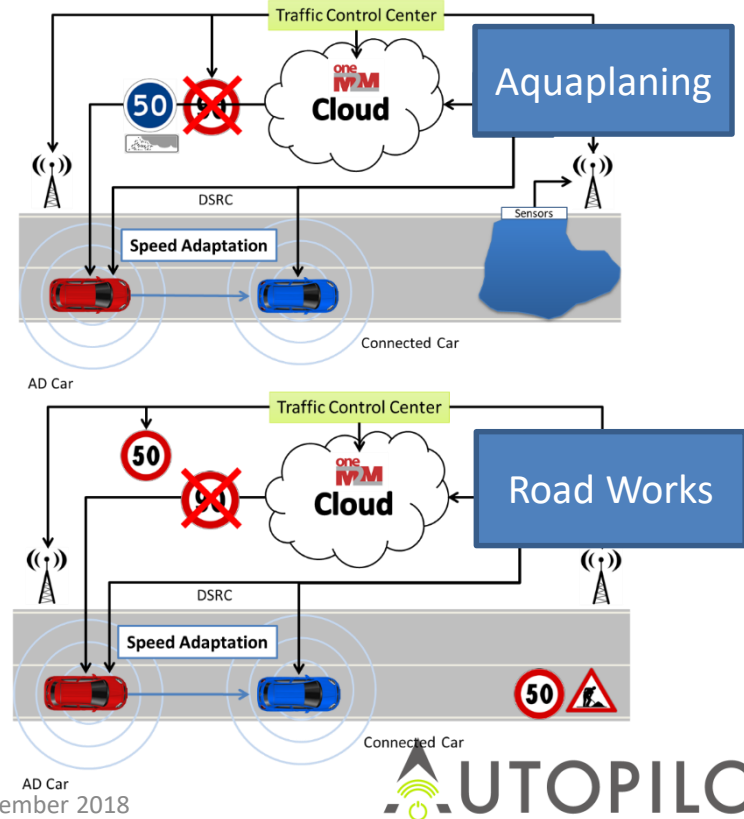
Continental

TIM

THALES

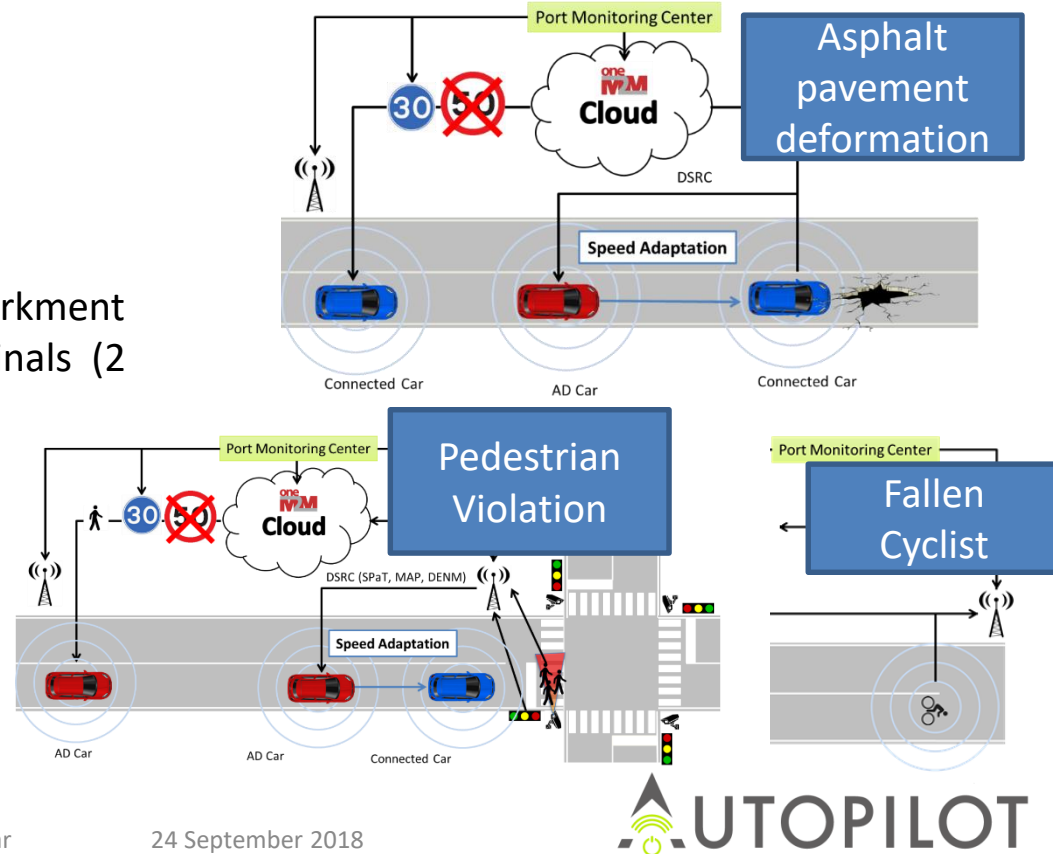
Use Cases - Highway

- **Scenario:**
 - Livorno- Florence public highway
- **Target:**
 - Avoiding accidents in a real-world dense environment featuring 40,000 vehicles / day (heavy trucks 20%)
- **Tackling with:**
 - common events:
 - road works (poorly flagged in case of urgent works)
 - specific events:
 - rain water standings (Tuscany is rainy in autumn/spring)



Use Cases - Urban

- **Scenario:**
 - Port of Livorno maritime terminal
- **Target:**
 - Avoiding accidents in a the embarkment area of the cruise and ferry terminals (2 million passengers / year)
- **Tackling with:**
 - urban-like typical events:
 - pedestrian traffic light violation
 - fallen cyclist in the intersection
 - pavement deformation



IoT components of the Italian PS

- **Devices**

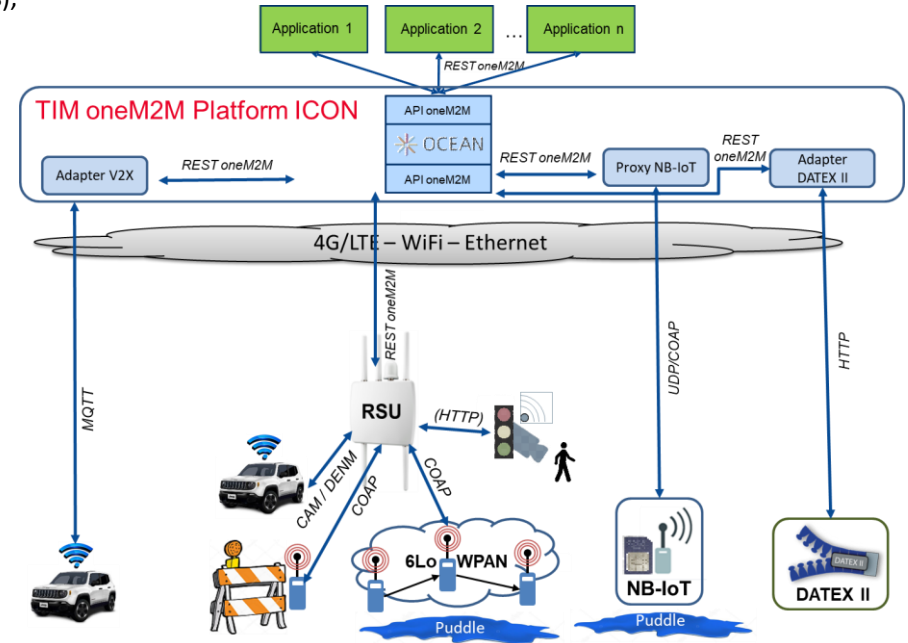
- Puddle IoT sensors (based on 6LoWPAN and NB-IoT technologies),
- Pothole detector,
- Smart Trailer (announcing roadway works),
- Road Side Units,
- On Board Units (cars and bicycle),
- Smart traffic light,
- Smart camera.

- **Networks**

- Port Wireless Backbone,
- Highway Backbone (Tuscan Institutional Cabled Network),
- ETSI G5,
- NB-IoT/6LoWPAN,

- **Platforms**

- Infrastructure OneM2M platform,
- In-vehicle IoT platform.



DENM validation interface



The screenshot displays the 'Interfaccia di amministrazione messaggi DENM' (DENM message administration interface). On the left, there is a sidebar with a list of DENM messages. The main area shows a map with a highlighted road section and a pop-up window for a specific DENM message.

Interfaccia di amministrazione messaggi DENM

AREA NOTIFICHE DENM

- Mezzo fermo** 12:05
Possibile mezzo fermo in direzione Pisa
Segnalato da: C-ITS
- Cantiere** 12:00
Cantiere per lavori su corsia di marcia in direzione Firenze
Segnalato da: C-ITS

DENM NON VALIDATI

- Mezzo fermo** 12:21
Possibile mezzo fermo in direzione Pisa
- Mezzo fermo** 12:00
Possibile mezzo fermo in direzione Firenze
- Pedoni** 11:10
Possibili pedoni in direzione Firenze

Valutazione in corso

Tipo: Cantiere
Segnalato da: C-ITS
Validità: 7

[CONVALIDA IOT DENM](#)

Firenze-Pisa-Livorno
Firenze-Pisa-Livorno

Via Lavoria
Lavoria

The DENM interface will be used by AVR TCC to geolocalize and validate events exchanged between the devices and the cloud platform



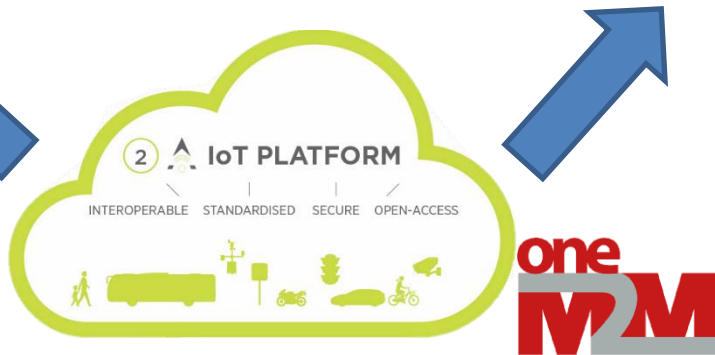
IoT final user services



MONI.C.A.
seaport sensitive playground



- **Enabling:**
 - Port Monitoring by IoT functions for drivers and VRU safety



- **Validating:**
 - IoT detections as (DATEX - formatted) events flowing through TCC



Thank you

