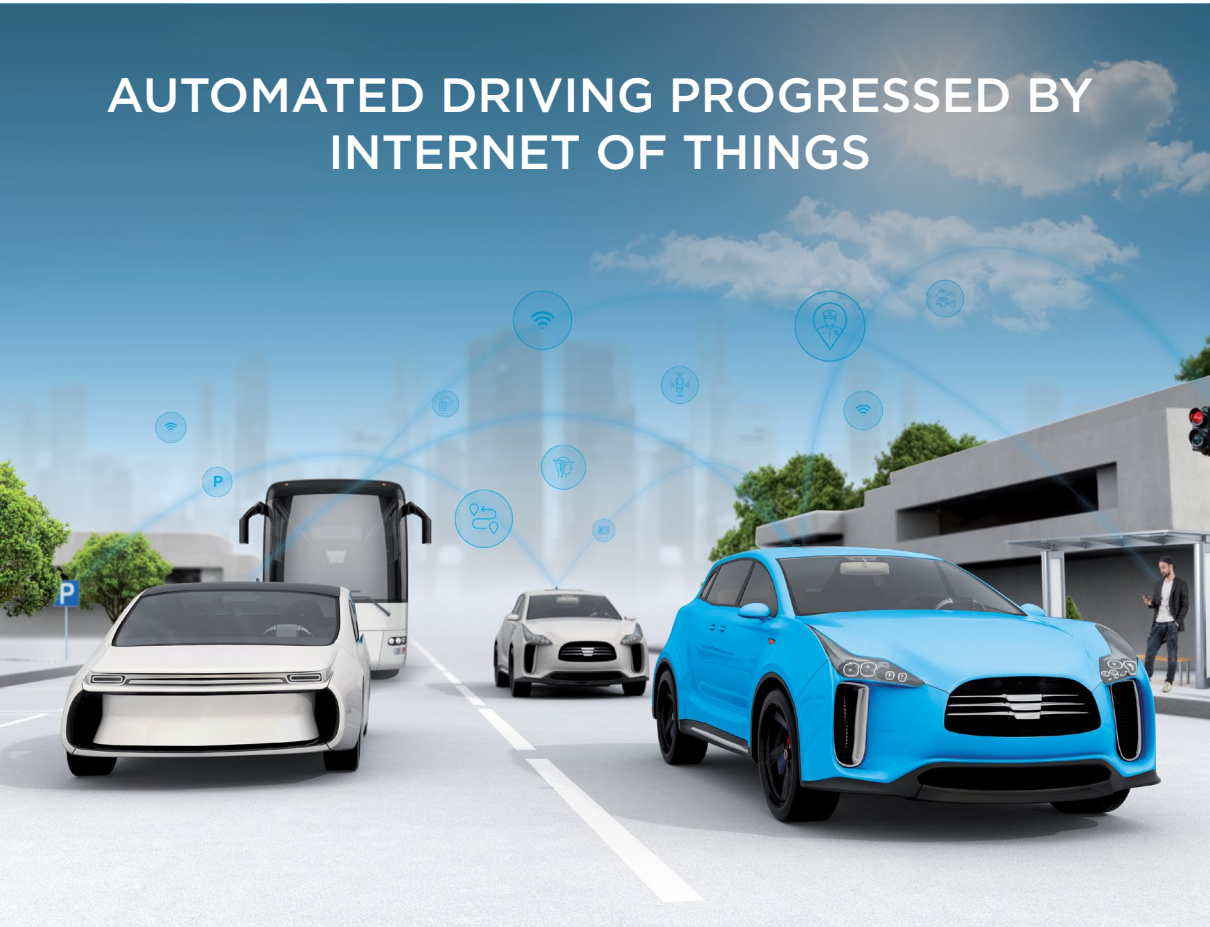
AUTOPILOT

AUTOMATED DRIVING PROGRESSED BY INTERNET OF THINGS



Urban Driving

Valet Parking

Car Sharing

Highway Pilot

Platooning

Unlocking the potential of the Internet of Things to take autonomous driving to the next level

OBJECTIVES

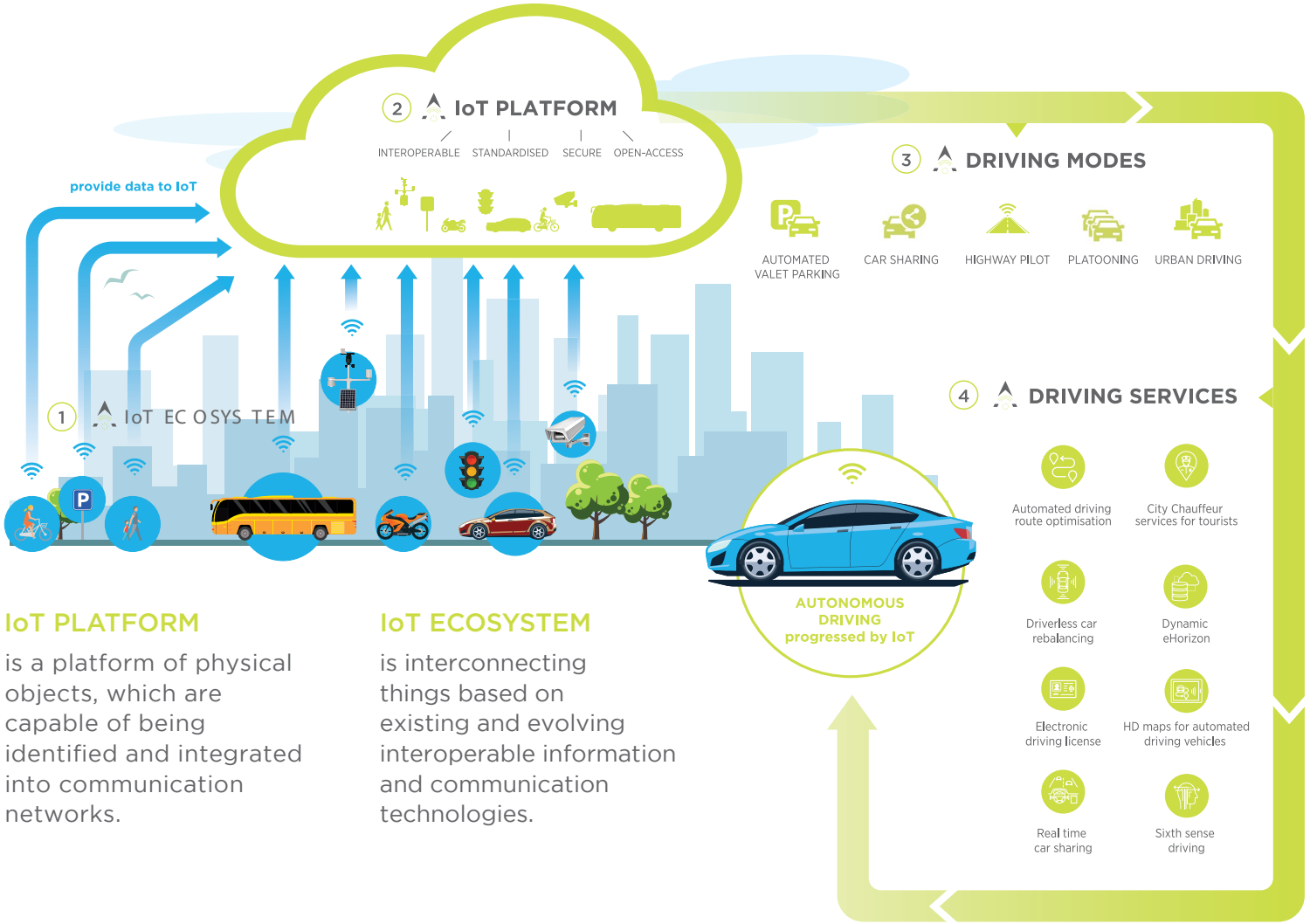
AUTOPILOT brings together relevant knowledge and technology from the automotive and the IoT value chains in order to develop IoT-architectures and platforms which will bring automated driving towards a new dimension

WHAT IS OUR VISION

- Enhance the vehicle's understanding of its environment with IoT sensors enabling safer highly automated driving
- Foster innovation in automotive, IoT and mobility services
- Use and evaluate advanced vehicle-to everything (V2X) connectivity technologies
- Involve users, public services, businesses to assess the IoT socio-economic benefits
- Contribute to the IoT standardisation and eco-system

HOW DOES IT WORK?

1. Objects provide data to IoT platform using IoT standardised protocols
2. Objects are created virtually in the IoT platform
3. AUTOPILOT IoT platform develops applications using data from IoT data sources
4. AUTOPILOT applications enable services that support autonomous driving



IoT PLATFORM

is a platform of physical objects, which are capable of being identified and integrated into communication networks.

IoT ECOSYSTEM

is interconnecting things based on existing and evolving interoperable information and communication technologies.

OVERVIEW

PROJECT DURATION
01.01.2017–31.12.2019

CONSORTIUM
43 beneficiaries,
coordinated by ERTICO

PROJECT COST
€25,425,252

EU CONTRIBUTION
€19,924,984 under Horizon 2020
Grant Agreement no 731993

	Brainport	Livorno	Tampere	Versailles	Vigo
Urban Driving	●	●	●	●	●
Valet Parking	●		●		●
Car Sharing	●				
Highway Pilot	●	●			
Platooning	●			●	

Brainport Pilot Site

BRAINPORT PILOT SITE

Providing real-time car sharing with automated driving functionalities

DRIVING MODES

- Urban Driving
- Car Sharing
- Valet Parking
- Highway Pilot
- Platooning

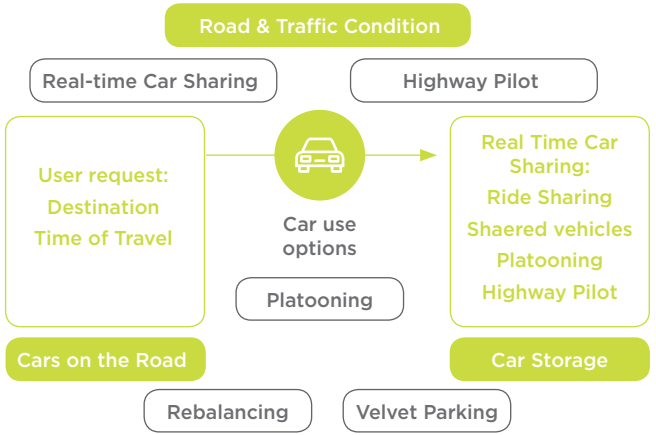
DRIVING SERVICES

- Real-time Car Sharing
- Driverless Car Rebalancing

The Brainport permanent pilot site consists of three pilot areas: driverless car rebalancing service on the Eindhoven University campus, automated valet parking on the automotive campus parking and highway pilot and the platooning on the A270 motorway. We target users between two cities in the region of Brainport that are requesting car transport through different IoT enabled services. The user can select ride-sharing or car-sharing options, and can opt for different levels of automated driving.

KEY PERFORMANCE INDICATORS

Urban Driving	Large community Vulnerable road user (VRU) detection (> 1000 persons)
Valet Parking	Three different vehicle types, variety of routes
Car Sharing	Waiting time less than 1 minute from reservation
Highway Pilot	Detection of 5 different road incidences
Platooning	Uninterrupted crossing of intersections



Extensive IoT Utilisation

A great variety of IoT sources are involved such as road-side cameras (e.g. from a270 test site), traffic lights, drones, Smart-phones (VRU and legacy vehicles), automated vehicles and more.

Integrated Services

The Brainport site will provide various options for car travel. Road and traffic situations are assessed, resulting in route options for automated driving. Different automated driving vehicles can be on-route or be obtained from storage or through rebalancing.

PILOT LEADERS

TNO innovation for life · IBM · DLR · TU/e Technische Universiteit Eindhoven University of Technology · Valeo

PILOT PARTNERS

gemalto security to be free · Gemeente Helmond · NEC · NEVS · NXP · HUAWEI · Technolution · TOMTOM · sensinov · vicomtech

Livorno Pilot Site

LIVORNO PILOT SITE

IoT assisted automated driving (AD) in “smart roads”

DRIVING MODES

- Urban Driving
- Highway Pilot

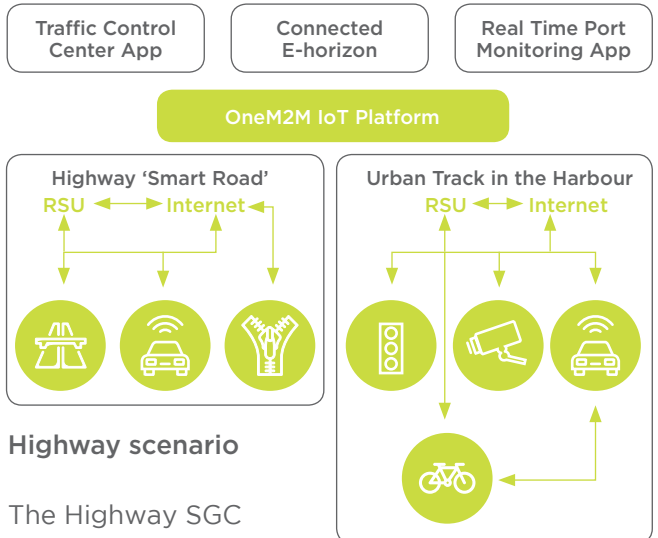
DRIVING SERVICES

- Sixth Sense Driving
- Connected E-Horizon

The Italian permanent Pilot Site is a testing infrastructure encompassing the Florence – Livorno highway together with road access to the Livorno sea port settlement. IoT enabled manoeuvres are demonstrated with AD cars traveling from Florence to Livorno. “Sixth sense” IoT devices are deployed in the car and along the roads in both the Highway and the urban area. The Traffic Control Centre with DATEX-II node and the oneM2M platform are preeminent actors in the operations.

KEY PERFORMANCE INDICATORS

Urban Driving	2 km test track under real-life conditions
Highway Pilot	More than 100 hours in real traffic situations
Communication	3G/4G, LTE, NB-IoT, 6LoWPAN, ITS G5 and 802.11 b/g/n networks



Highway scenario

The Highway SGC Fi-Pi-Li (Florence-Pisa-Livorno) has been adapted as “smart road” in order to allow the piloting activities:

- A DATEX II node has been deployed for real time traffic information;
- A pervasive sensing infrastructure has been deployed.

Urban scenario

A road circuit inside the free public area of Livorno Sea Port has been equipped in order to test vulnerable road users warnings at traffic light intersection.

PILOT LEADER

cnit

PILOT PARTNERS

avr, Continental, FCA, ISMB, THALES, TIM

SUPPORTED BY

Regione Toscana, AdSP MTS

Tampere Pilot Site

TAMPERE PILOT SITE

Traffic cameras assist in improving efficiency and safety of automated driving

DRIVING MODES

- Urban Driving
- Valet Parking

The permanent Pilot site in Finland is located in Tampere, which is the second biggest urban region in Finland. The city has taken strategic movement to be one of the major urban area test hubs for automated and connected cars.

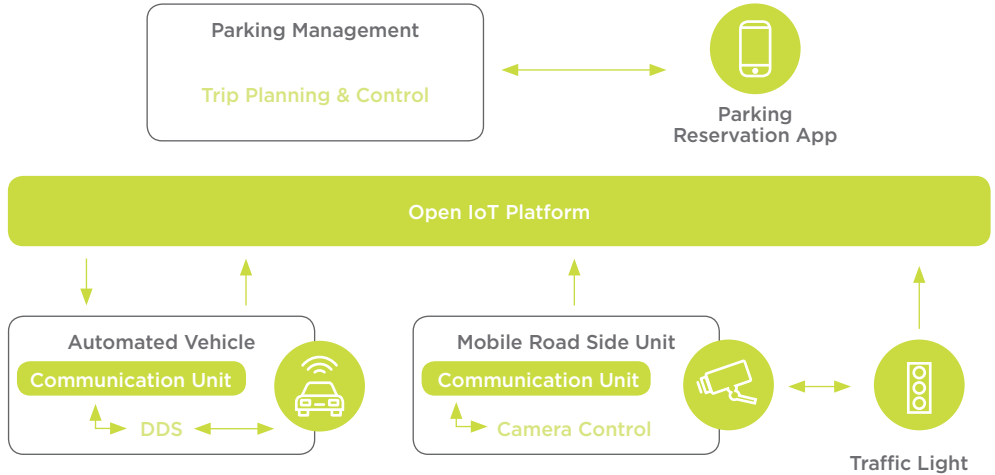
AUTOPILOT explores how new Connectivity Technologies can support autonomous vehicles at intersections and parking places.

DRIVING SERVICES

- Parking Reservation
- Intersection Support

KEY PERFORMANCE INDICATORS

Valet Parking	Improved efficiency through camera support
Intersection Support	Improved safety through VRU detection by camera
VRU Communication	3G/4G



Traffic cameras

Assist in detecting objects and Vulnerable Road Users outside the range of the vehicle sensors. They hence provide valuable information for planning parking tasks incl. routing and for assuring the safety of all road users at intersections.

Parking space reservation

A parking space reservation application assures a place is available for the automated vehicle when arriving at the parking area.

PILOT PARTNER

VTT

Versailles Pilot Site

VERSAILLES PILOT SITE

Provide mobility services for touristic applications

DRIVING MODES

- Urban Driving
- Platooning

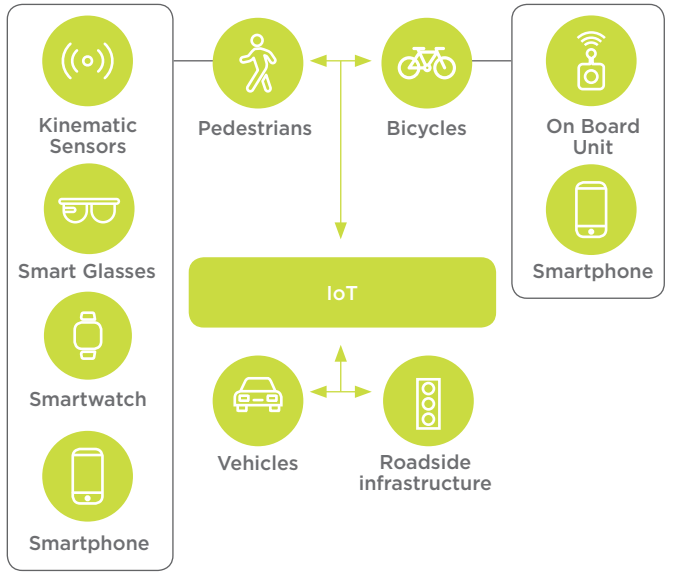
DRIVING SERVICES

- In City Chauffeur Service for Tourists
- Driverless Car Rebalancing

AUTOPILOT enables tourists to explore the city of Versailles and the Castle's gardens. Visitors pick up a ride in a connected and autonomous vehicle at one of the two car sharing stations via a smartphone application. While driving through the city, the vehicle alerts the tourist of interesting spots in their surroundings. At the Castle's gardens, the user can switch to a fully automated driving mode before giving the car back at another station. AUTOPILOT will also evaluate the added value of IoT and AD technologies in a business model of fleet management (automated fleet rebalancing).

KEY PERFORMANCE INDICATORS

Platooning	3 identical vehicles, 20 km/h
Urban Driving	10 km of urban driving including 2 km of autonomous driving
VRU Communication	3G/4G, LTE V2X and 802.11 OCB networks



Sensoric Equipment

Collaborative perception considers information exchange among VRUs and the AD car in order to enhance its perception and improve the VRUs safety. To be part of the IoT, the VRUs will be equipped with smart devices.

Point of Interest Notification

The pilot cars are equipped to generate announcements for local touristic points of interest based on close-range detection (Bluetooth Low Energy beacons).

PILOT LEADERS

PILOT PARTNERS

SUPPORTED BY

Vigo Pilot Site

VIGO PILOT SITE

To offer new services for autonomous vehicle through IoT and connectivity technologies in urban and indoor parking scenarios

DRIVING MODES

- Urban Driving
- Valet Parking

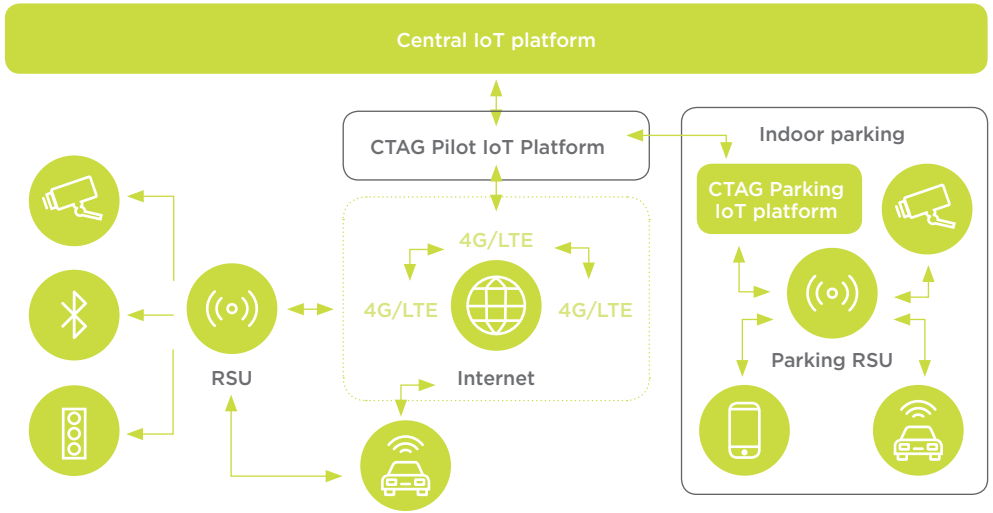
DRIVING SERVICES

- Vulnerable Road User Sensing
- HD Maps for Automated Vehicle

The permanent Spanish test site is located in Vigo, Galicia, in the north west of the country. As a result of the participation in European Compass4D & CO-GISTICS and through local initiatives, the city integrates the urban part of SISCOGA corridor (120km). AUTOPILOT will explore how new Connectivity Technologies will enhance the perception and the functional behaviour of autonomous vehicles in complex scenarios.

KEY PERFORMANCE INDICATORS

Urban Driving	Improved safety, user acceptance and fuel efficiency
Valet Parking	Enhanced comfortability, safer parking and time savingautonomous driving
VRU Communication	IoT, 3G/4G, ITS G5, C-V2X



Urban area

Automated vehicles receive data about VRU crossing the street (through smart cameras), traffic light status and road hazard warnings (provided by Traffic Management Centre), following a cooperative security approach.

Parking area

Parking Control Centre sends to the vehicle information about the parking map and route to follow inside. AVP app receives in “real time” the status of the vehicle.

PILOT LEADER

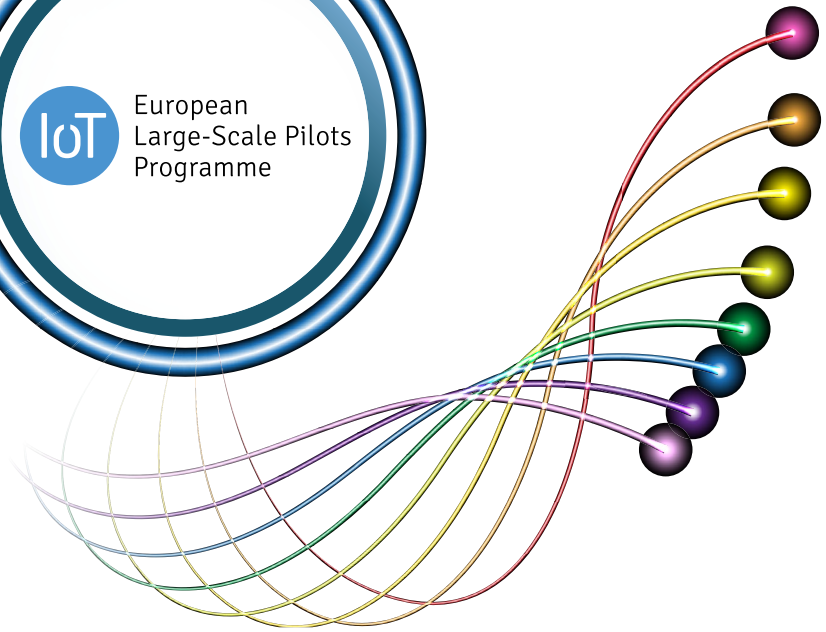
CTAG

PILOT PARTNERS

PSA GROUPE

CONCELLO DE VIGO

European
Large-Scale Pilots
Programme



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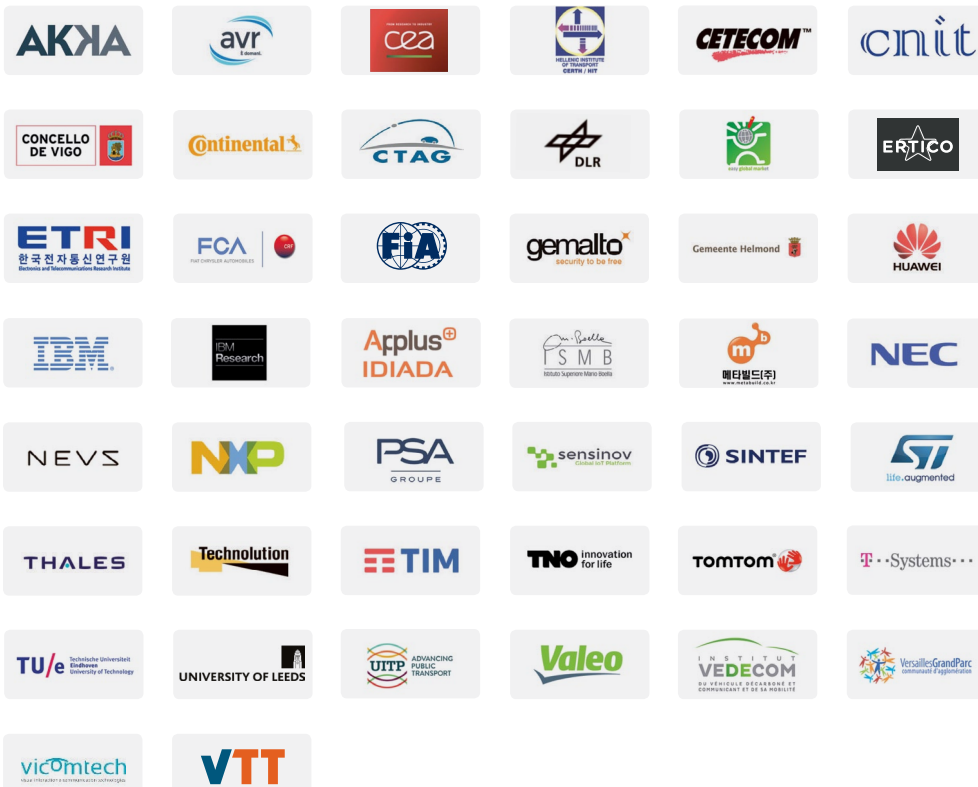

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