AUTOMated driving Progressed by the Internet Of Things
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Use IoT technologies to move Automated Driving towards a new dimension

- Enhance driving environment perception with “IoT enabled” sensors
- Integrate IoT platforms in the vehicles
- Use Cloud and IoT platforms to
  - Share IoT sensor data
  - Create new Mobility Services with fully automated vehicles
IoT?

Cloud Platforms

Communication (3G/4G, ITS-G5, LTE-V2X, WIFI, ZigBee, BT)

Real device

App Entity

Gateway

App Entity

App server

Data center

Virtual device

Objects/Sensors

Infra or Vehicle

IoT Capabilities Entity

Real device

App Entity

Gateway

App Entity

App server

Data center

IoT Capabilities Entity

Communication (3G/4G, ITS-G5, LTE-V2X, WIFI, ZigBee, BT)

Representations
Identification
Discovery
Location
Security
Device management
Analytics
Semantics

Interoperability
Standardisation

Virtual device

Virtual device

Virtual device

Virtual device

Virtual device

Virtual device
Overall concept

Automated Driving application and services

1. IoT eco-system
   - Provide data to IoT

2. IoT PLATFORM
   - Interoperable
   - Standardised
   - Secure
   - Open-access

IoT Device

- Local Dynamic Map (LDM)
- Autonomous driving functions
- Vehicle IoT enabled platform
- AD IoT Communication (3G/4G, ITS-G5, LTE-V2X)

In vehicle sensors
Driving modes and new services

Driving Modes
- Urban Driving
- Highway pilot
- Platooning
- Automated Valet Parking

Automated driving Services
- City chauffeur services for tourists
- Automated driving route optimisation
- Real time car sharing
- Driverless car rebalancing
- HD maps for automated driving vehicles
- 6th sense driving
- Dynamic eHorizon
Brainport, NL
- Automated Valet Parking
- Highway pilot
- Platooning

Tampere, FI
- Automated Valet Parking
- Urban Driving

Versailles, FR
- Automated Valet Parking
- Urban Driving
- Platooning

Daejeon, KR
- Urban Driving

Vigo, SP
- Urban Driving
- Automated Valet Parking

Livorno, IT
- Urban Driving
- Highway pilot
# Impacts - KPIs

<table>
<thead>
<tr>
<th>Key Performance Indicator</th>
<th>Project Target</th>
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<tbody>
<tr>
<td>Number of IoT devices integrated</td>
<td>&gt; 1000 IoT devices</td>
</tr>
<tr>
<td>Nr of Vehicles with IoT Platforms</td>
<td>&gt; 20 cars</td>
</tr>
<tr>
<td>Number of in-car sensor connected to IoT</td>
<td>&gt; 10 different sensors, &gt; 100 sensors</td>
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<tr>
<td>Number of Federated IoT Platforms</td>
<td>&gt; 10 platforms federated</td>
</tr>
<tr>
<td>External information sources used</td>
<td>&gt; 100 data streams</td>
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<tr>
<td>Number of Smart Edge Devices</td>
<td>&gt; 50</td>
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<tr>
<td>Number of Virtual Entities</td>
<td>&gt; 1000 entities</td>
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<tr>
<td>Improved Perception/Local Dynamic Map</td>
<td>&gt; 20 IoT data streams used</td>
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<tr>
<td>Number of hours in real traffic situations</td>
<td>&gt; 500 hours</td>
</tr>
<tr>
<td>Demonstrations</td>
<td>&gt; 20 demonstrations</td>
</tr>
<tr>
<td>Test rides</td>
<td>&gt; 200 test rides</td>
</tr>
<tr>
<td>New IoT/AD services</td>
<td>&gt; 7 IoT/AD services developed</td>
</tr>
<tr>
<td>Podium Discussion on business models</td>
<td>&gt; 12 podium discussions</td>
</tr>
<tr>
<td>End Users tested AUTOPILOT solutions</td>
<td>&gt; 1000 end users</td>
</tr>
<tr>
<td>Workshops organized</td>
<td>&gt; 4 workshops organized</td>
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<tr>
<td>Contributions to Standards</td>
<td>&gt; 5 contributions</td>
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Create new IoT devices for Mobility and Automotive

Improve automated driving with IoT

Contribute to IoT standardisation
Project information

5 Large Scale Pilots on IoT are funded by the European Commission

- AUTOPILOT is the Pilot 5: autonomous vehicle in a connected environment
- Innovation Action - 3 Years: 01/01/2017 – 31/12/2019
- 44 beneficiaries – coordinator: Francois Fischer, ERTICO
- Project costs: €25,425,252 - EU contribution: €19,924,984
- European Commission: DG CONNECT unit E.4 – IoT / H.2 Smart Mobility & living / A.1 Robotics & Artificial Intelligence

The 5 Large scale pilots are cross coordinated and supported by 2 CSA:

- CREATE-IoT (create-iot.eu)
- U4IoT (www.u4iot.eu)
Thank you

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