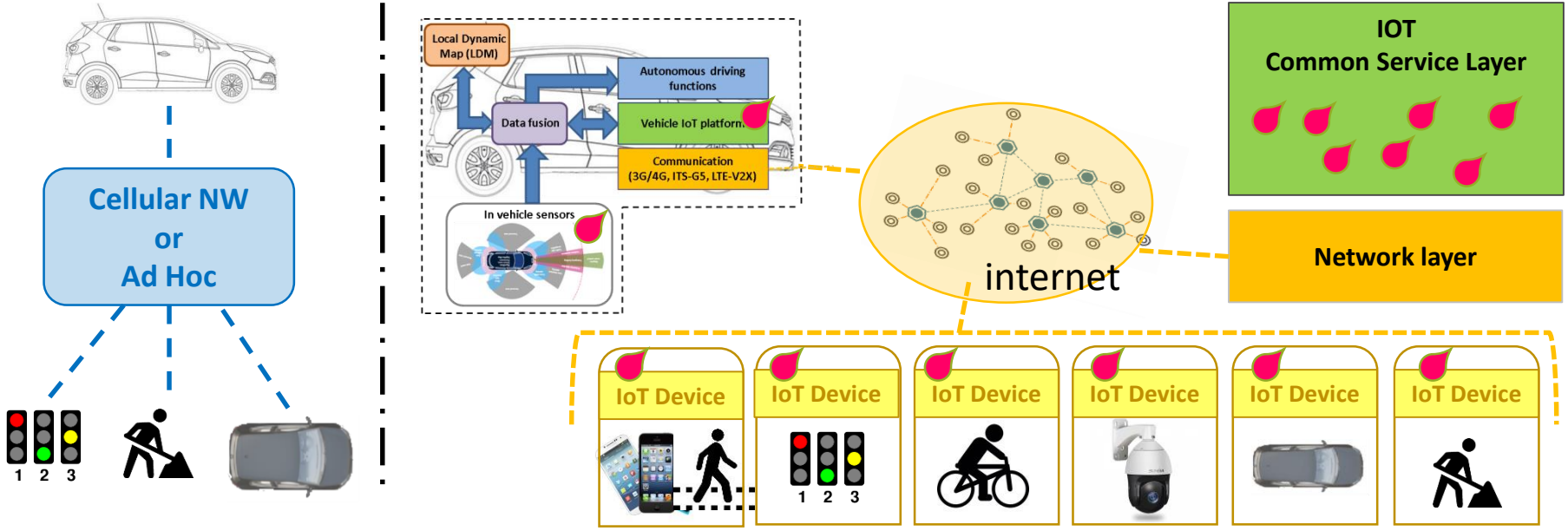
AUTOPILOT

AUTOmated driving **P**rogressed by the **I**nternet **O**f **T**hings

This project has received funding from the European Union's H2020 research and innovation programme under Grant Agreement No 731993

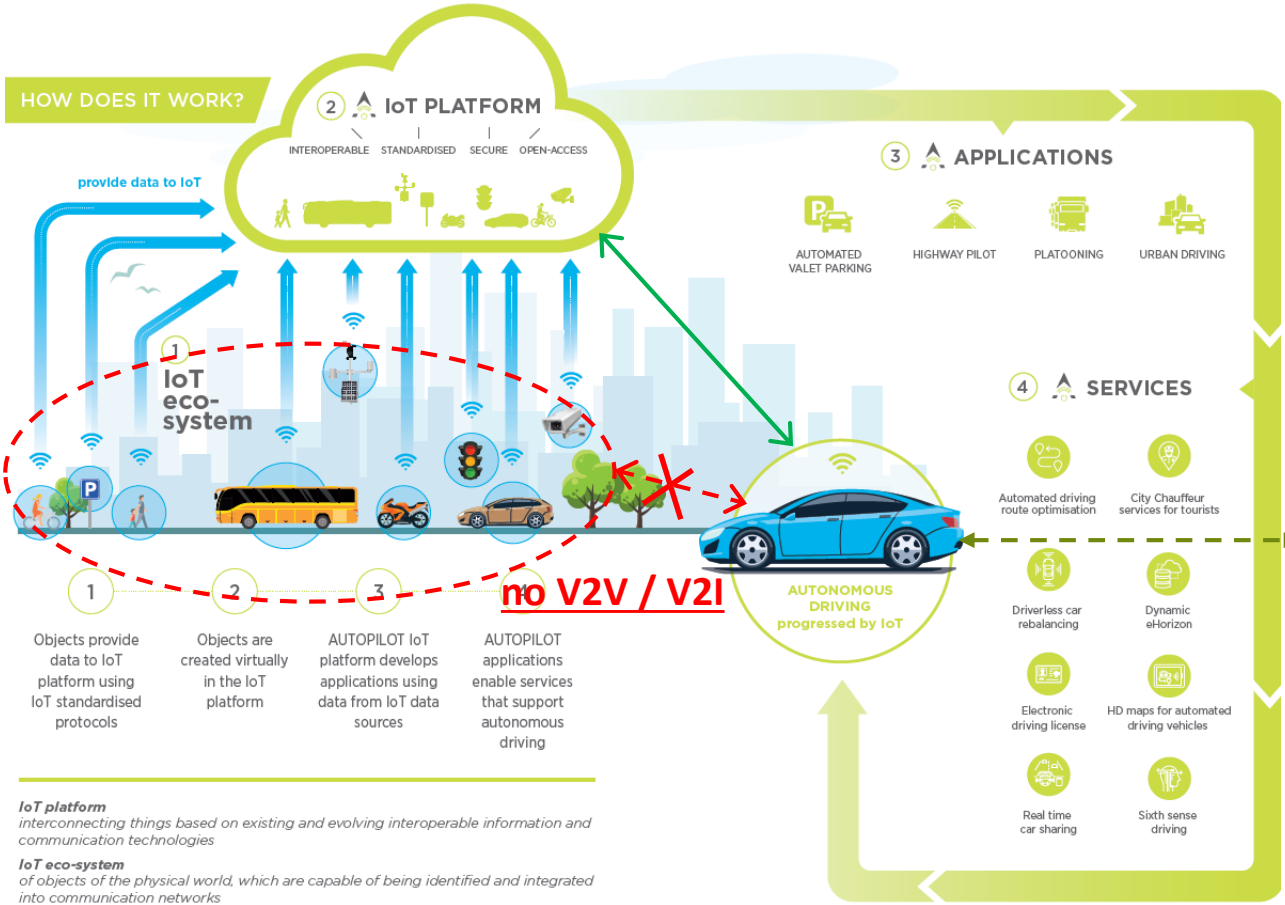
Vehicle centric and Cloud approaches



New connectivity paradigm: Cloud and IoT

- V2X approach - vehicle centric
  - limited scope: only device with compatible connectivity
  - Limited functionalities – missing connected devices diversity – “mere” data (no filtering / augmentation)
- Cloud IoT approach – augmented data provided as a service
  - Connectivity agnostic
  - Semantics enhancing device representation (metadata)
  - 2 levels management: device and context
    - “Augmented” data representation out of the context management
    - E.g. traffic jam or other hazards / traffic : environment events from individual Things’ data
  - Easy cross domain service integration - aggregation
  - Standardised data models - platform openness – higher cyber-security

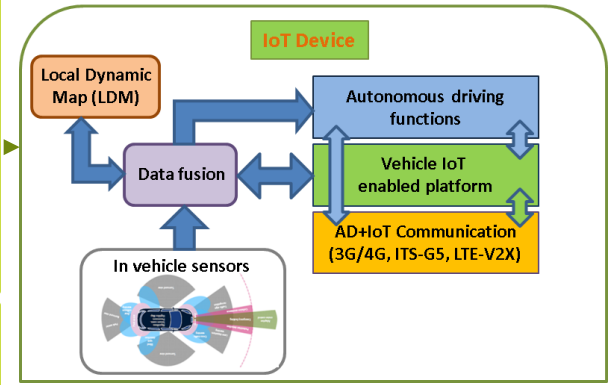
IOT to transform automated driving



IoT platform
interconnecting things based on existing and evolving interoperable information and communication technologies

IoT eco-system
of objects of the physical world, which are capable of being identified and integrated into communication networks

Vehicle IoT integration



Perspective of IoT for automated driving

- Current use cases (AUTOPILOT)
  - Enhance driving environment perception for the AD DDT and RT HD maps update
  - Provide SaaS/PaaS for mobility (OEM vehicle management platform or MaaS)
- Future usages
  - Driven by usage of AI and data analytics in the IoT cloud platforms
  - Enabled by future Cellular network performances:
    - Massive IOT providing more information for the AD functions – (mMTC)
    - Higher data rates (eMBB) allowing high volume data representation (videos)
    - Lower latency (URLLC) and MEC enabling
    - use of IoT for RT DDT in the vehicle and DDT combined with Infrastructure control

IoT and Security for Automated driving

- Cyber-security - Standards
  - IT security standards: ISO/IEC-27000 series - ISA/IEC-62443 series:
  - IoT security: OneM2M - TS-0003, TS-0008, TR 0012, TR 0016
- Security for the means of communication - Standardised – built-in (TCUs)
- Data integrity
  - Identifying data source – authentication
  - Solving false information with data fusion, data analytics or AI
- Functional Safety
  - Existing and next generation of standards
    - ISO 26262 - Road vehicles – Functional safety
    - UNECE – WP29

Thank you

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