AUTOPILOT

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

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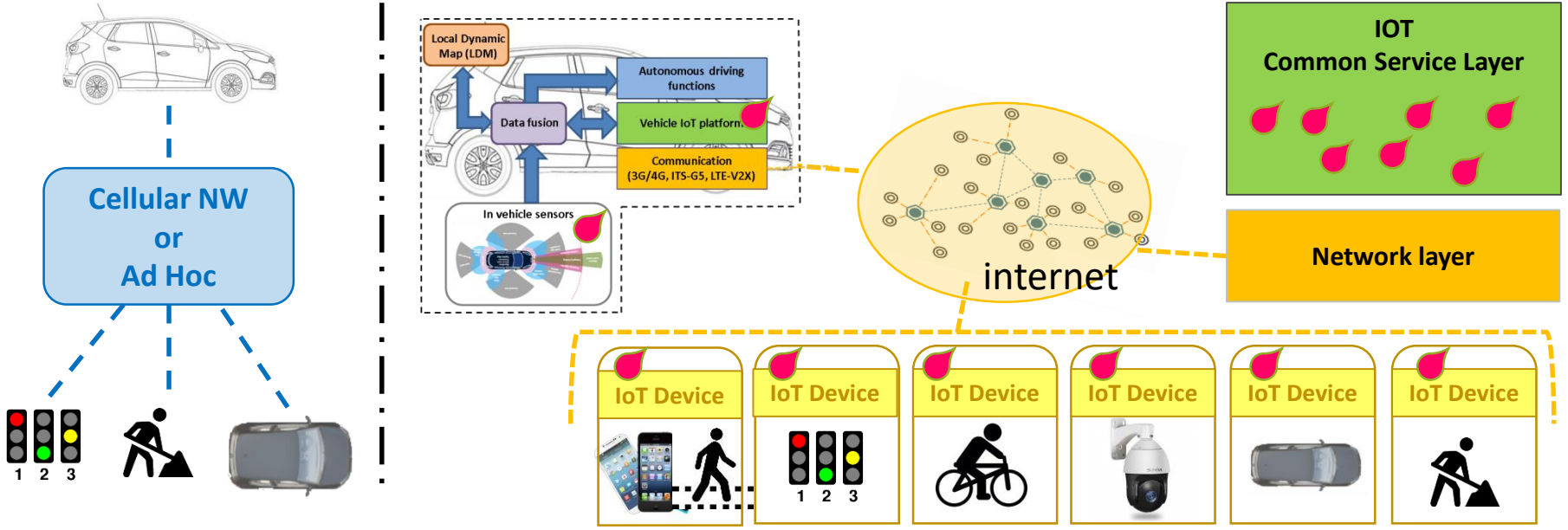
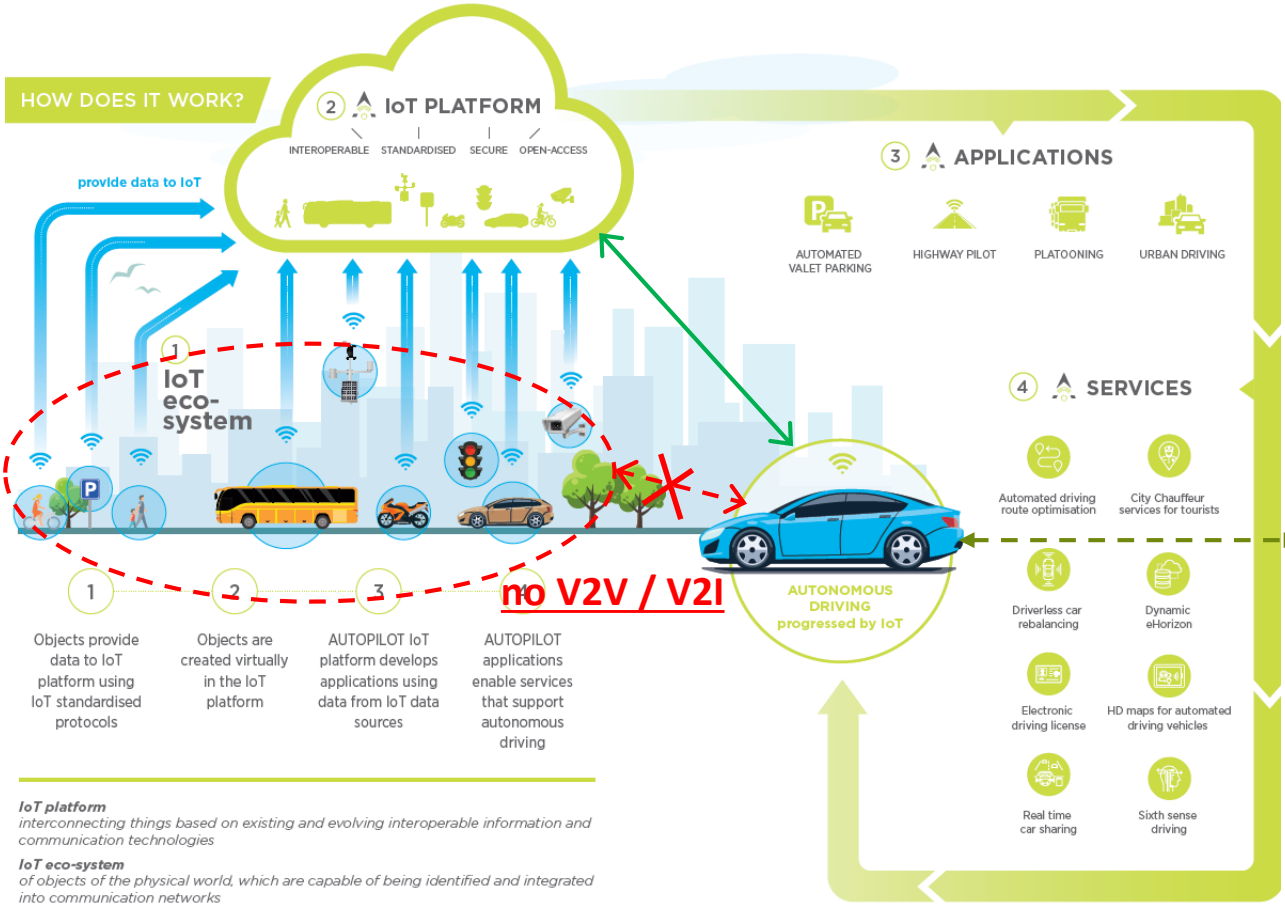
Vehicle centric and Cloud approaches



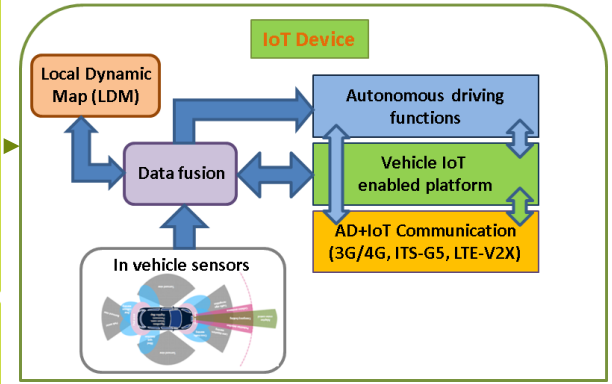
New connectivity paradigm: Cloud and IoT

- 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



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 BigData for Automated driving

- Hybrid approach for access to BigData:
  1. Centric approach for OEMs:
     - Sensitive data with relevance only for OEM
     - Contains vehicle specific data
       - Cannot be shared (confidential)
       - Long term relevance for analytics and deep learning for instance
  2. Distributed and open data access
     - Essential for sharing **safety** relevant data (e.g. CAM/DENM data)
       - It is as important for each user that other vehicles get as much useful data as my vehicle get – accident may occur from another vehicle
       - Data consolidation for higher integrity
     - 2 levels of time relevance
       - For open data access – only **short term relevance for cooperative and automated driving**
         - Disable access to “older data”
       - Older data has relevance for **investigation in case of incident/accident**
         - Limited access – only for relevant organisations (police/justice – insurance)
         - Similar as the situation with the signalling data in TelCo networks

Thank you

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