

Public NDS Conference 2021

## Future of NDS: Why NDS.Live will play an outstanding role in the future?

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# Agenda

- Two short “Science Fiction” stories for the near future
- The important “USP’s” of NDS.Live
- NDS.Live Roadmap and next dissemination steps

# The self-driving Container: “A Container gets Motor and Wheels”



Foto: HHLA

A self-driving “robot-truck” is parking outside the container terminal of the harbor in Hamburg.

- The “robot-truck” gets an order to transport a certain container from Hamburg harbor to a production factory in Munich
- The “robot-truck” asks the harbor terminal control system for the location of the desired container and the scheduled pick-up time
- The “robot-truck” asks “the cloud”
  - for a local map of the container terminal
  - for the best route from the current outside position to the location of the container and the needed driving time.
- The “robot-truck” drives to the pick-up location just in time where the “container gets the motor and the wheels”.

The “self-driving Container” asks for the route to the destination in Munich and drives away.

# The self-driving Container: How is NDS.Live involved?

- map services providing
  - maps of the public road network
  - the detailed local map of the parking facility outside the container terminal incl. connections to public road network
  - the detailed local map for the container terminal incl. connections to the public road network
- (map related) application services providing
  - the route from current parking position outside the terminal to the pick-up position inside the terminal
  - the travel time for that route
  - the route from the pick-up position to Munich
  - the valid speed limits for the road segments while driving along the route



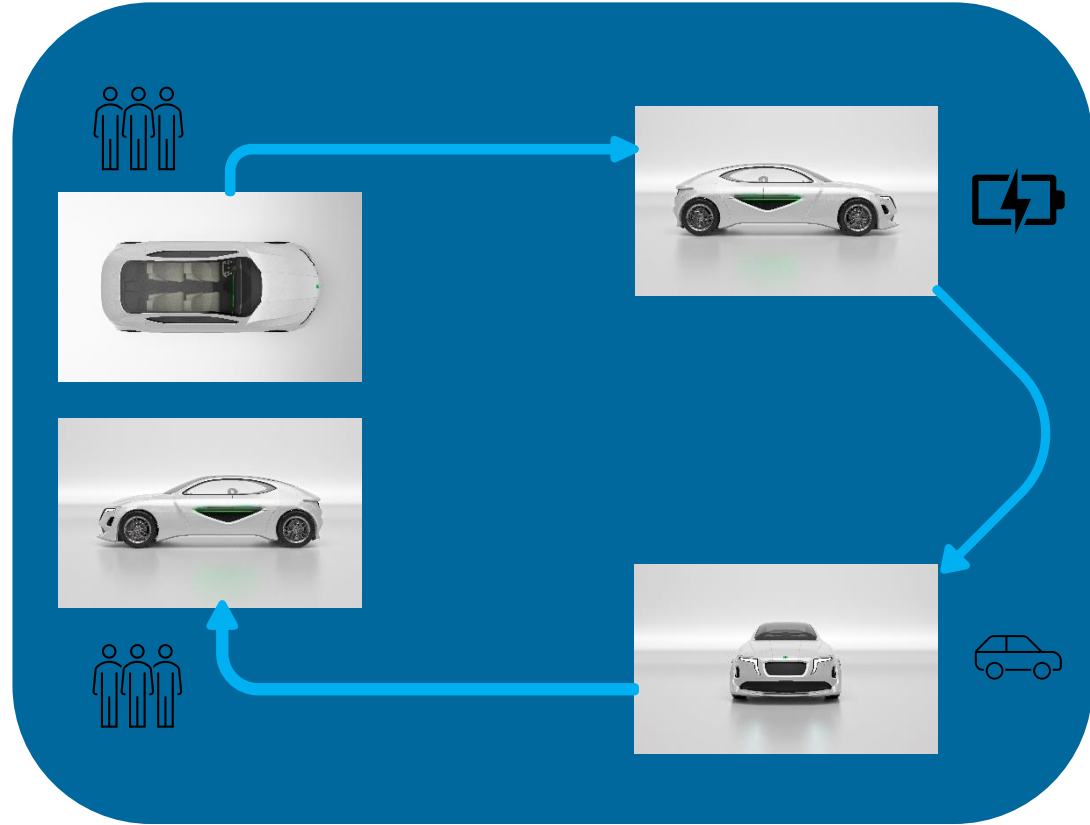
Foto: HHLA

# The eCar Ballet: “eCars dancing in the parking garage”

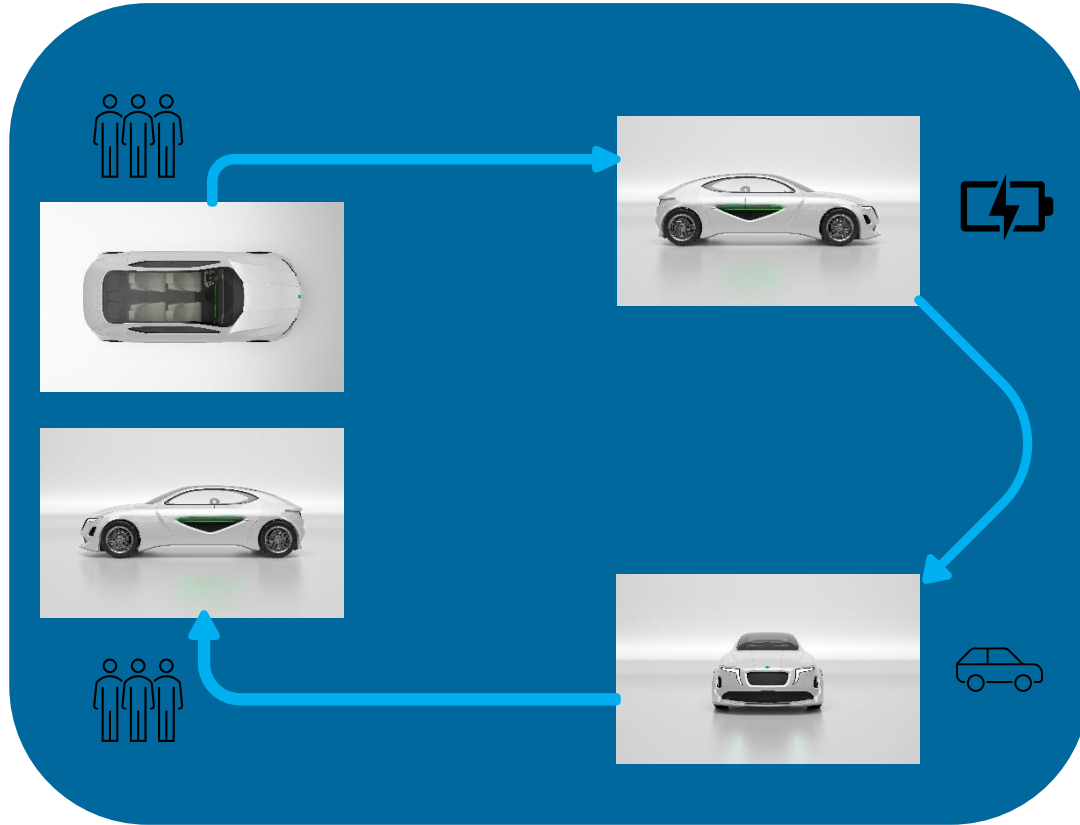
Visitors of a concert event leave a self-driving eCar at the drop off zone of an event hall.

- The eCar asks “the cloud” for a nearby parking slot for the next 4 hours with the possibility to charge 10 kWh within this time.
- “The eCar gets the location of a parking slot equipped with an induction loop for charging in a nearby parking garage, the local map of the parking garage and the route to the assigned parking slot.
- The eCar drives autonomously to the parking garage and parks at the assigned parking slot and the charging of the batteries is started
- When the batteries are charged, the local control service instructs the eCar to move to another free parking slot.

The eCar is waiting until the passengers are calling them back to the drop on zone of the event hall after the event is finished.



# The eCar Ballet: How is NDS.Live involved?



- map services providing
  - maps of the public road network
  - detailed local map for the drop off/on zones at the event hall incl. the connection to the public road network
  - the detailed local map for the parking garage incl. connections to the public road network
- (map related) application services providing
  - the route between drop on/off zone to the entrance /exit areas of the parking garage
  - the routes to drive inside the parking garage
    - from the entrance to a charging slot
    - from the charging slot to a parking slot
    - from a parking slot to the exit

# What makes NDS.Live unique?



## Interoperability

- 1 vehicle using different service providers
- 1 service connecting to different car brands

## Worldwide Applicability

- standard covering the worldwide requirements
- technology and IP development meets transparency criteria to avoid trade restrictions

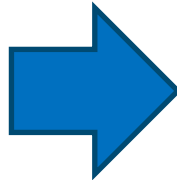
# Current Roadmap of NDS

Result in Focus	2021	2022	2023 (subject to change)	2024 (subject to change)	2025 (subject to change)
<b>Future Mobility (Use Cases)</b>	Intelligent Speed Assist (ISA) Automated Driving (L3+L4) <ul style="list-style-type: none"> <li>Trucks Hub to Hub (DRAFT)</li> <li>Automated Valet Parking (DRAFT)</li> <li>Driving in Urban environments</li> </ul>	Automated Driving (L4) <ul style="list-style-type: none"> <li>Trucks Hub to Hub (series ready)</li> <li>Automated Valet Parking (series ready)</li> </ul> Hybrid Navigation	Automated Driving (L5) <ul style="list-style-type: none"> <li>Driverless Passenger Cars</li> <li>Driverless commercial vehicles</li> </ul>	Smart Cities (Active Traffic Management)	
<b>NDS as a Service (service capabilities)</b>	<ul style="list-style-type: none"> <li>Combined use of independent Map Services</li> <li>Basic Navigation Services (online and hybrid)</li> <li>Map related e-Mobility Services</li> </ul>	<ul style="list-style-type: none"> <li>Connectivity Map Layer</li> <li>Support of dynamic ODD management</li> </ul>			
<b>Connected Map Data Platform (environment, architecture, collaboration)</b>	<ul style="list-style-type: none"> <li>Cloud Platform (series ready)</li> <li>Functional Safety Concept</li> <li>NDS Developer Portal incl. NDS Islands Map Service</li> <li>NDS.Live certification toolkit (V1)</li> </ul>	<ul style="list-style-type: none"> <li>Car to X Extension</li> <li>„Consumer centric lessons learned“</li> </ul>	Car to Car Extension	Decentralized Map Provision (5G-Technology)	



# Dissemination of NDS.Live Technology

- experiences of NDS.Live evaluation in the „Joint development team“
  - small effort to migrate from NDS.Classic to NDS.Live due to very similar map data models
  - small investments to migrate proprietary map delivery and application services to NDS.Live compliant services



- next important step:
  - OEMs ordering the NDS.Live technology
    - connected vehicles using
      - NDS.Live map delivery services instead of static NDS maps
      - cloud services for destination search, route calculation, range observation, ISA speed limit services etc.
    - autonomous driving vehicles using local maps, routes, driving instructions for driving on
      - public road network
      - on local facilities like logistic hubs and terminals, automated parking facilities, etc.

# What will change in the NDS Product Definition Process?

- acting NDS Product Manager will change
  - I will change from professional life into retirement
  - Ottó Nyírő from NNG will be the responsible NDS Product Manager from now on



- Product definition process and Product Definition Group PDG will stay
  - Product Managers of all NDS Members are invited to contribute
    - to features and the prioritization
    - to the roadmap of the further development of the NDS.Live standardization

*Thank you!*