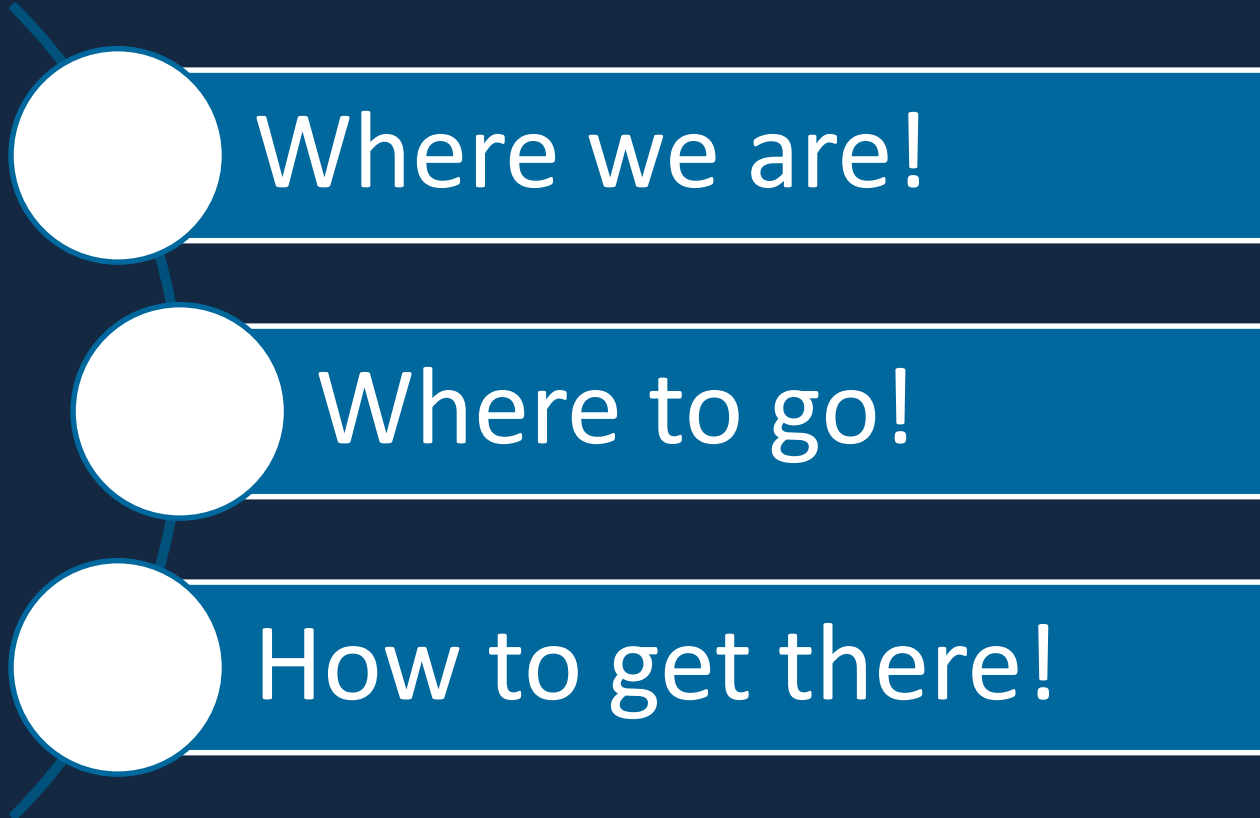


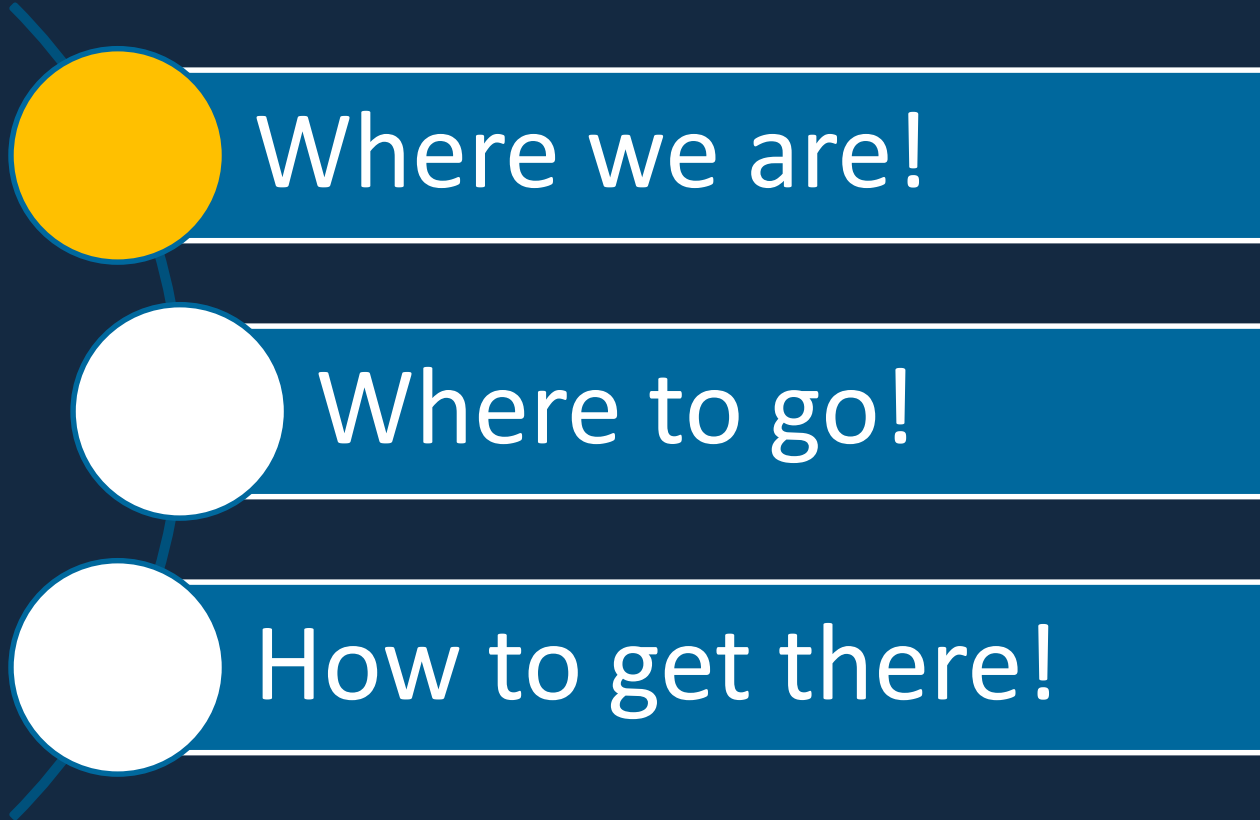
Future of NDS

**NDS Conference 2020
Frankfurt am Main**

Georg Horn







Worldwide Interoperability

- Standardized Map Storage Spezification for static onboard maps
- Standardized Map Access via SQLite Query Language
- Standardized Map Update Client Interface Specification

Scalability

- SD map based Entry – Mid - High Onboard Navigation applications
- SD map based ADAS support applications
- (static) HD map based support for Automated Driving applications

Worldwide Interoperability

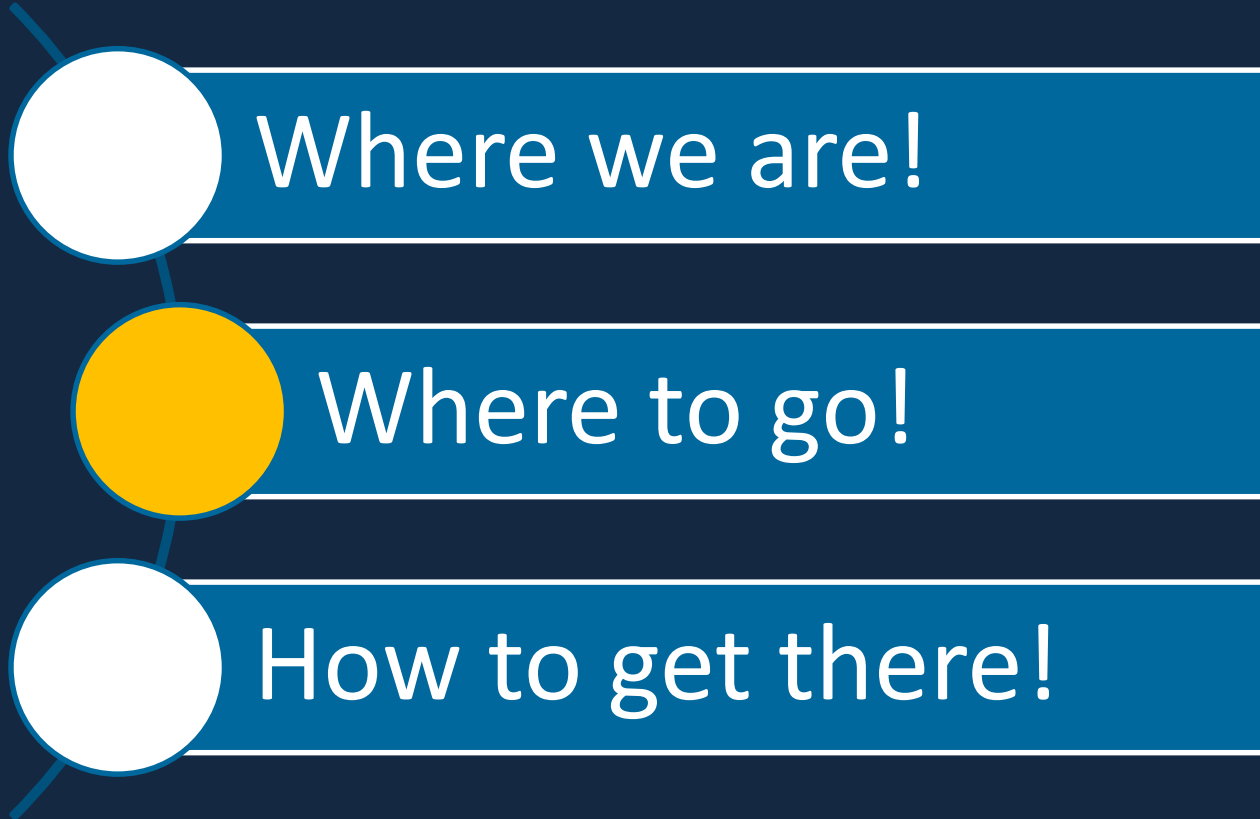
- **Standardized Interface Specification for Map Streaming Services**
- Standardized Map Data Model Spezifikation for streamed map
- Harmonization with other automotive Standardization Groups

Scalability

- ADASISv2 applications for Intelligent Speed Assist (ISA) (SD)
- ADASISv3/v2 applications for Automated Driving Car Architectures (SD + HD)
- support of Flexible Node Based Service Architecture (onboard – online)
- Data Layers supporting different vehicle types and need of different car lines

Distributed Map Service Landscape

- Registry and Smart Layer concept for Map Delivery Services
- Local Object Maps
- Localization References (SD – HD – Map Agnostic)
- Realtime Data Enrichment



Market Requirements: Commercial Automotive Projects coming „through the Door“

Projects (representative examples)	key features covered by NDS.Live	enhancements needed	(commercial) benefits
support of streamable Intelligent Speed Assist (ISA) solutions	<ul style="list-style-type: none">streaming services for SD road data (topology, geometry (2D), static Speed Limit attributes)realtime smart layer for variable speed limits		fulfill mandatory request of European Commission to sell new cars after 2022
support of streamable Truck Fuel Saving Assist solutions	<ul style="list-style-type: none">streaming services for SD road data (topology, geometry (3D), truck attributes)realtime smart layer for weather / road conditions	<ul style="list-style-type: none">(maybe) addition of a few truck specific attributes to the NDS.Live Map Data Model	<ul style="list-style-type: none">reduce fuel costsreduce maintenance intervalsreduce emissions

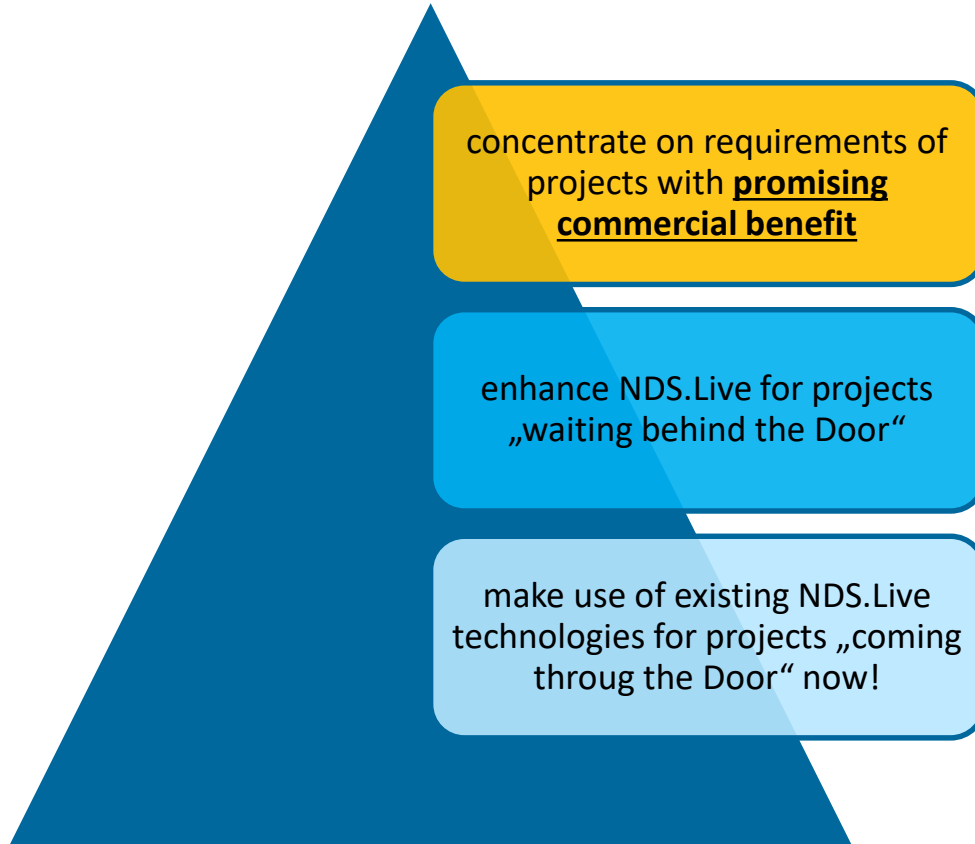
Market Requirements: Commercial Automotive Projects waiting „behind the Door“

Projects (representative examples)	key features covered by NDS.Live	enhancements needed	(commercial) benefits
support driverless truck hub-to-hub solutions (L4 = protected environment like highway, special lanes on rural connecting roads, hubs)	<ul style="list-style-type: none"> streaming HD data for lanes and localization support for public road network streaming of HD data for hubs by local service operators 	<ul style="list-style-type: none"> Car-to-X support (e.g. traffic lights) NDS.Live Map Data Model to describe hubs for logistic use cases 	<ul style="list-style-type: none"> save costs for truck driver accelerate delivery by connecting hubs with higher frequencies
support driverless bus solution (L4 = protected environment like campus, explicit released roads / special lanes)	<ul style="list-style-type: none"> streaming HD data for lanes and localization support for public road network streaming of HD data for campus areas by local service operators 	<ul style="list-style-type: none"> Car-to-X support (e.g. traffic lights) NDS.Live Map Data Model to describe bus stops and bus stations 	<ul style="list-style-type: none"> save costs for bus drivers lower waiting time by running smaller busses on higher frequencies
support driverless parking solutions (L4 = protected environment)	<ul style="list-style-type: none"> streaming of HD data for parking facilities by local service operators 	<ul style="list-style-type: none"> addition of parking facility specific localization object 	<ul style="list-style-type: none"> save costs for „Valet Parking“

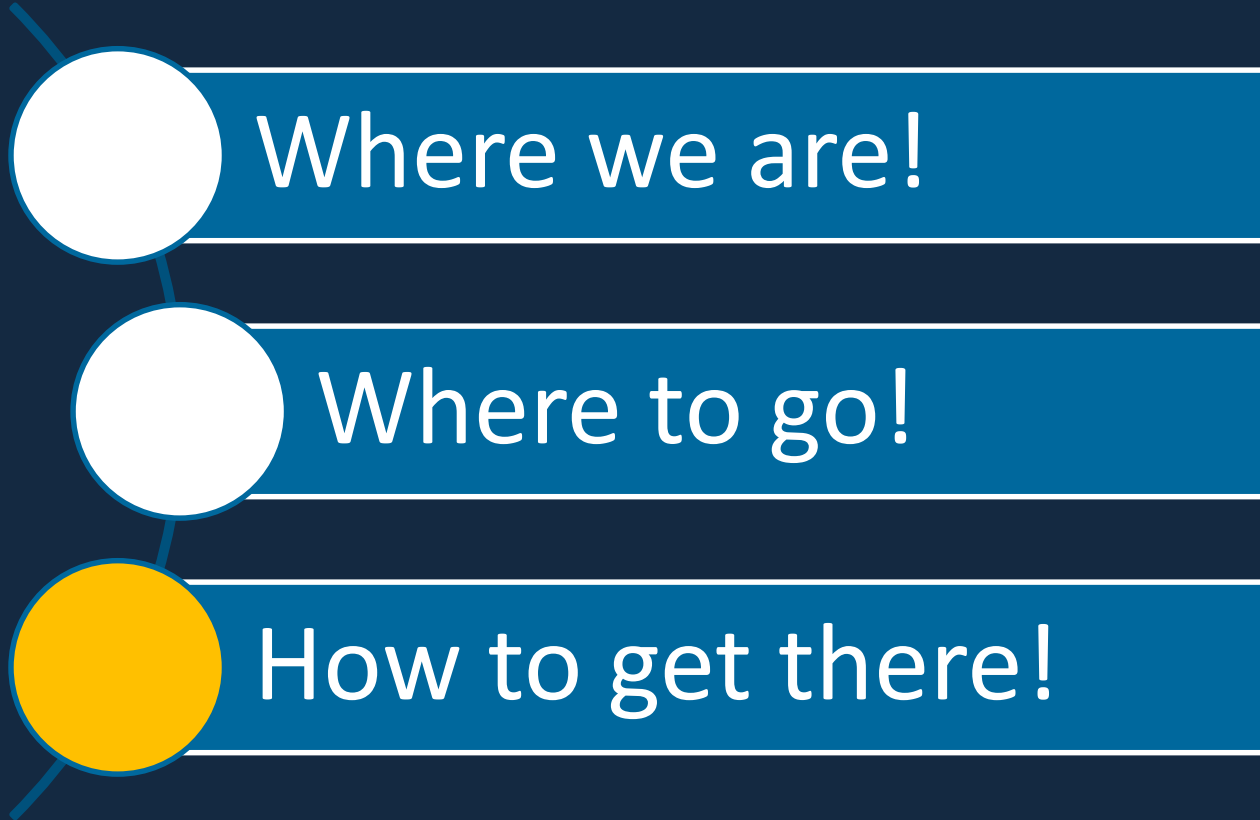
Market Status: Projects for New Mobility Solutions „approaching the Door“

Projects (representative examples)	key features covered by NDS.Live	enhancements needed	(commercial) benefits
support driverless delivery solutions (L5)	<ul style="list-style-type: none">streaming HD data for lanes and localization support for public road networkstreaming of HD data for non public road network at customer facilities	<ul style="list-style-type: none">Car-to-Car support (e.g. communicate planned maneuver infos)	<ul style="list-style-type: none">save costs for drivers
support driverless car-sharing solutions (L5)	<ul style="list-style-type: none">streaming HD data for lanes and localization support for public road networkstreaming of HD data for local parking facility, campus / company areas by local service operators	<ul style="list-style-type: none">Car-to-Car support (e.g. communicate planned maneuver infos)	<ul style="list-style-type: none">reduce land consumption for private car parking

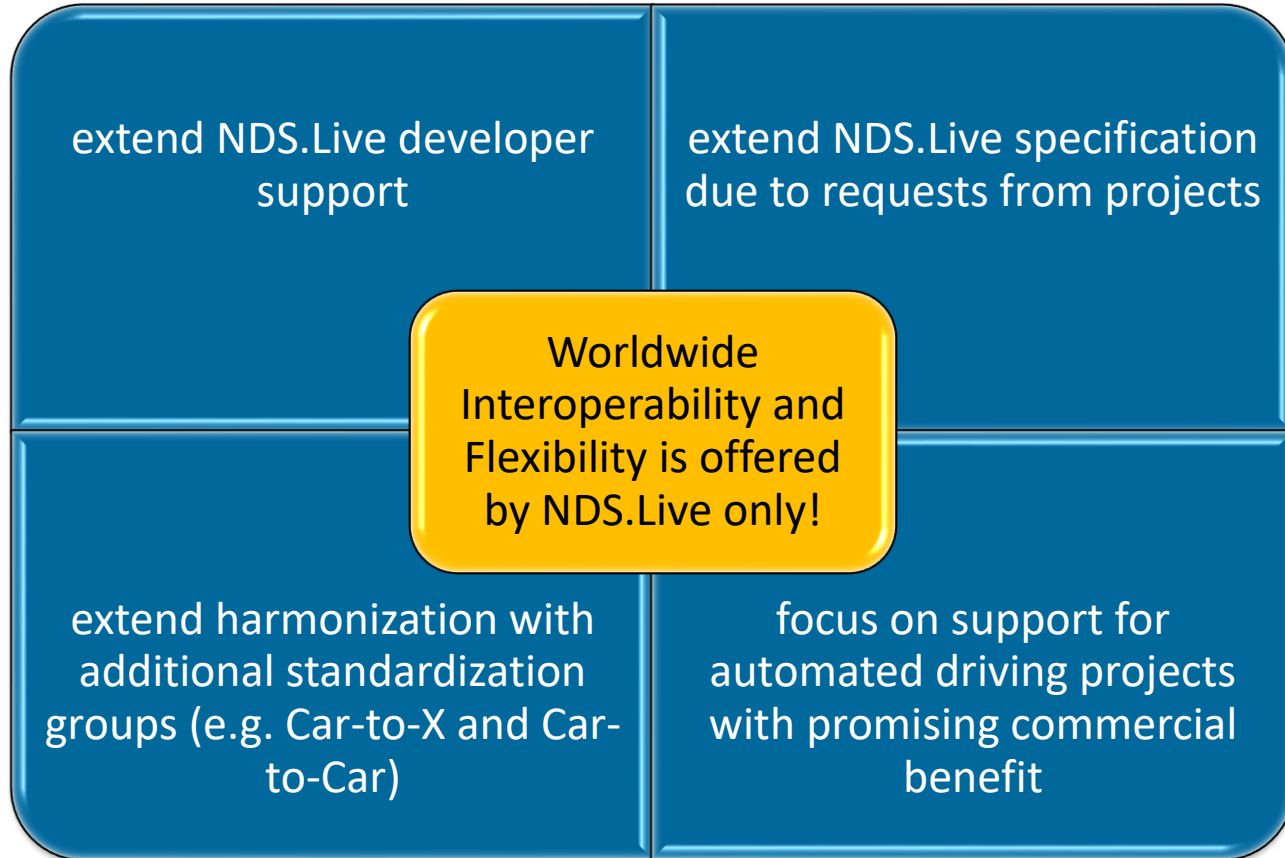
Strategy to meet Market Requirements for NDS.Live



NOTE: big part of commercial projects is for Trucks, Busses, Delivery Vans



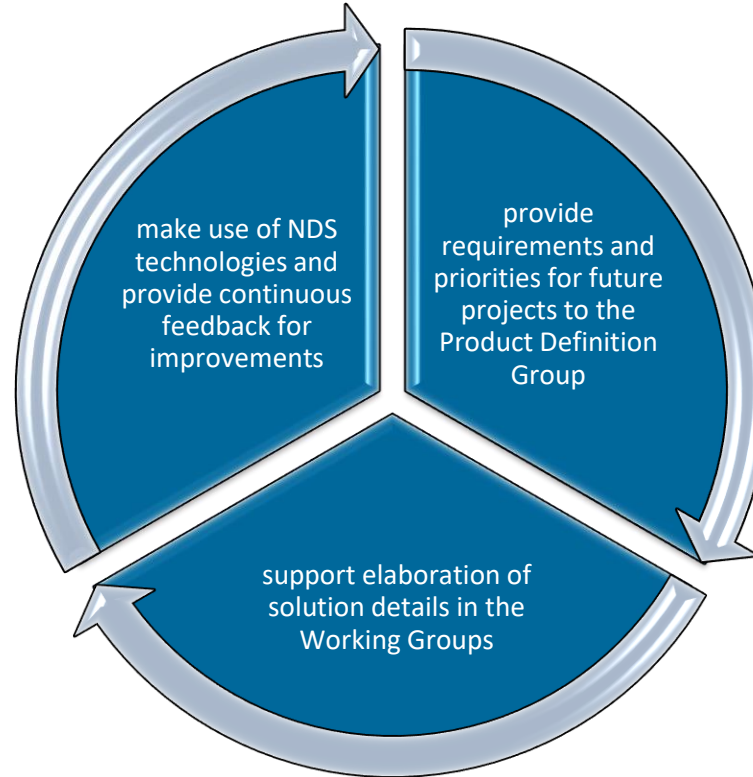
How to get there: Measures to take!



NDS Roadmap 2020 (High Level)

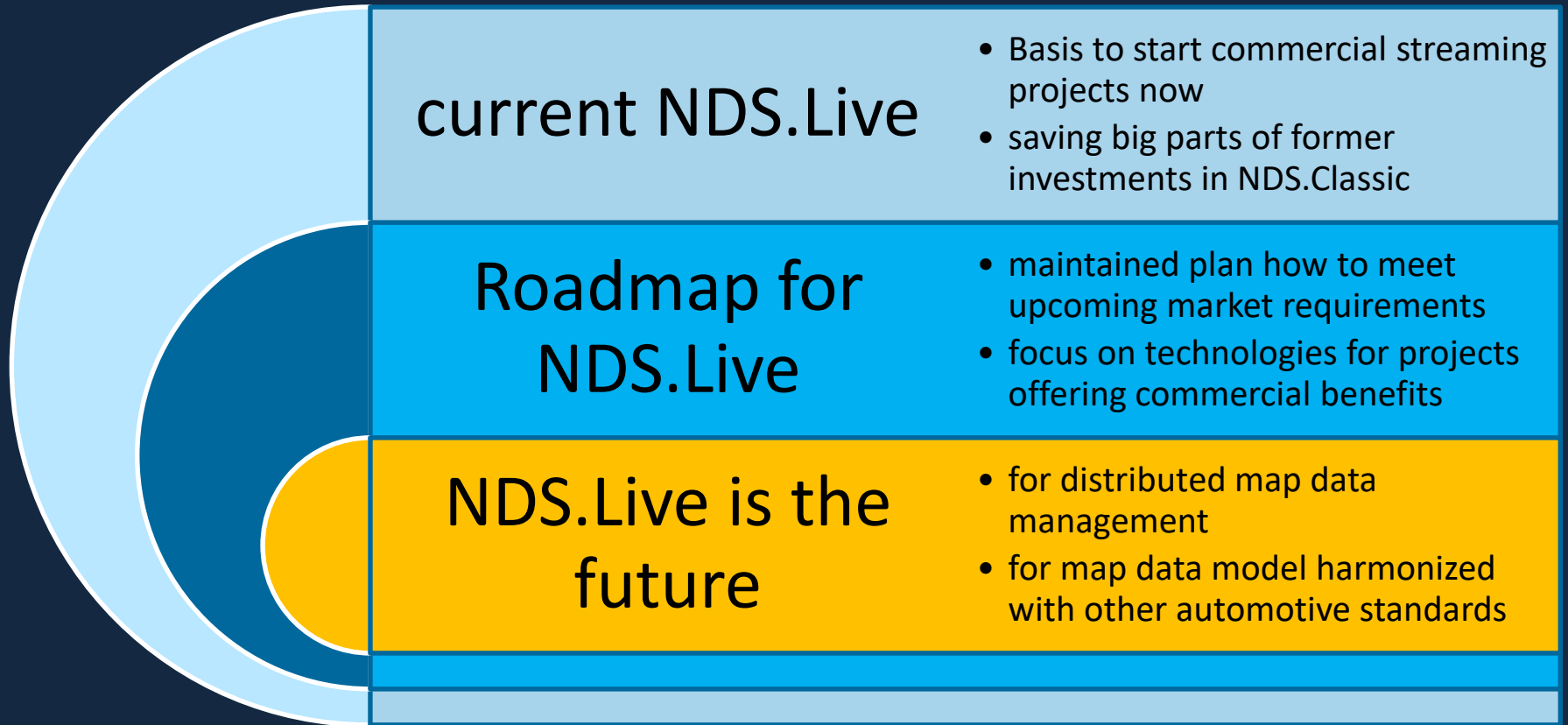
Focus	2020	2021	2022 (subject to change)	2023 (subject to change)	2024 (subject to change)
Future Mobility	Automated Driving (L4) <ul style="list-style-type: none"> Highways Parking (Basics) 	Automated Driving (L4) <ul style="list-style-type: none"> Trucks Hub to Hub Urban Roads Parking (full featured) 	Automated Driving (L4) <ul style="list-style-type: none"> Rural Roads 	<ul style="list-style-type: none"> Driverless Cars (L5) Smart Cities (Active Traffic Management) 	
NDS as a Service	<ul style="list-style-type: none"> Living Map Architecture Electronic Horizon Map Services 	<ul style="list-style-type: none"> Use of multiple map services and service types Basic Navigation Services (online and hybrid) e-Mobility map related Services (e.g. Range Calculation) 			
Connected Map Data Platform	<ul style="list-style-type: none"> Cloud Platform: validated Functional Safety Concept documented 	<ul style="list-style-type: none"> Cloud Platform: series ready Functional Safety Concept implemented 	Car to X Extension	Car to Car Extension	Decentralized Map Provision (5G-Technology)

Future of NDS: Member Contributions



NOTE: future of NDS is driven and controlled by NDS members

Summary: Future of NDS



Future of NDS



Questions ???



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Thank you ... for
your attention!