

# NDS Conference 2022

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## NDS Roadmap

Ottó Nyíró

NDS Product Manager



# Roadmap

*Roadmap is a high-level representation of the product strategy over time and where we are planning to get to.*

NDS Product strategy is defined by the Product Definition Group based on:

- Long-term strategic objectives
- Market trends
- Requirements by the NDS members
- Business Goals

# Long-term Strategic Objectives – how to realize NDS Vision

Ranking Matrix

		Urgency	
		low	high
Importance	high	3	4
	low	1	2

THEME	Rank
Automated Driving L3+L4	4
Competitiveness of NDS.Live	4
Connected map data platform	4
E-Mobility	4
New HMI Technologies	4
Online Connectivity and Communication Technology	4
Regulations and De-facto Standards	4
Security and Safety, Data Privacy	4
Simulation	4

THEME	Rank
Artificial Intelligence and Big Data	3
Automated Driving L5	3
Car Sensor Technology	2
Location Based Services	2
New Mobility / Shared Economy / Smart Cities	1
Smart Home	1

# Market trends, Needs of NDS members, Business goals

## Market trends

- Vehicles are increasingly equipped with data connectivity
- Map data is expected to be stored and processed in the cloud
- Market needs are evolving enormously - new use cases for map data are emerging all the time

## User needs of NDS members

- Standardize NDS.Live interfaces for Hybrid Navigation
- Use NDS.Live interfaces in the in-vehicle domain
- Support for future mobility use cases

## Business Goals

- Greater scalability
- Cost efficiency

# Long-term Strategic Objectives

THEME	2022.H1	2022.H2	2023	2024
Automated Driving L3+L4	<ul style="list-style-type: none"><li>Addressing challenges of L3+ related Operational Design Domain (ODD)</li></ul>	<ul style="list-style-type: none"><li>L4 Urban</li><li>Assessing the relevance of NDS.Live on the 'Unsettled Issues on HD map for AD and ADAS'</li></ul>	<ul style="list-style-type: none"><li>L4 Rural</li><li>NDS.Live to support ODD gaps for L3 and L4</li></ul>	

# Long-term Strategic Objectives

THEME	2022.H1	2022.H2	2023	2024
Competitiveness of NDS.Live	<ul style="list-style-type: none"><li>• NDS.Live interoperability with existing NDS.Classic solutions</li><li>• Relevance of in-vehicle map data distribution standards for NDS.Live</li></ul>	<ul style="list-style-type: none"><li>• NDS.Live supporting environmental sustainability</li></ul>		
Connected map data platform	<ul style="list-style-type: none"><li>• Standardize NDS.Live interfaces for Hybrid Navigation</li></ul>	<ul style="list-style-type: none"><li>• NDS.Live best practices to better support Hybrid Navigation</li></ul>	<ul style="list-style-type: none"><li>• Support first- and last-mile navigation</li></ul>	

# Long-term Strategic Objectives

THEME	2022.H1	2022.H2	2023	2024
E-Mobility		<ul style="list-style-type: none"><li>Minimizing range anxiety with NDS.Live</li><li>EV range observation</li><li>Optimized charging management</li></ul>		
New HMI Technologies		<ul style="list-style-type: none"><li>NDS.Live to support Augmented Reality use cases</li></ul>		
Online Connectivity and Communication Technology		<ul style="list-style-type: none"><li>Relevance of NDS.Live in Cooperative ITS services</li></ul>	<ul style="list-style-type: none"><li>NDS.Live to support Predictive 5G</li></ul>	

# Long-term Strategic Objectives

THEME	2022.H1	2022.H2	2023	2024
Regulations and De-facto Standards		<ul style="list-style-type: none"><li>• ADAS support to fulfill NCAP regulations</li><li>• RTTI &amp; SRTI EU regulation implications for NDS.Live</li></ul>		
Security and Safety, Data Privacy		<ul style="list-style-type: none"><li>• Safety aspect of NDS.Live service interface</li></ul>		
Simulation (MiL, SiL, HiL, XiL testing)	<ul style="list-style-type: none"><li>• Business case and Product strategy for OpenDRIVE converter</li></ul>			



# Long-term Strategic Objectives

THEME	2022.H1	2022.H2	2023	2024
Artificial Intelligence and Big Data			<ul style="list-style-type: none"><li>How can NDS.Live better support AI technologies?</li></ul>	
Automated Driving L5				<ul style="list-style-type: none"><li>Driverless Mobility Services</li><li>Driverless Delivery Services</li></ul>
Car Sensor Technology				<ul style="list-style-type: none"><li>NDS.Live to support perception for ADAS and AD</li><li>Map assisted sensor fusion</li></ul>

# Long-term Strategic Objectives

THEME	2022.H1	2022.H2	2023	2024
New Mobility Concepts / Shared Economy / Smart Cities				<ul style="list-style-type: none"><li>• Support door-to-door mobility with inter-modality</li><li>• Support non-automotive use cases (urban, smart city)</li><li>• Active Traffic management</li></ul>
Smart Home				<ul style="list-style-type: none"><li>• Connected cars with IoT</li></ul>

# Hybrid Navigation with NDS.Live

Evolution of navigation systems (in the connectivity context):

1. Embedded navigation without connectivity
2. Connected navigation (offline first)
3. Hybrid navigation (online first, offline fallback)
4. Online Navigation (online only)

Map provisioning options for Hybrid Navigation with NDS.Live:

- Application service interface (application functions, such as search, routing)
- Smart layer service interface (providing data layers – tile/path/object)
- Smart layer tile store (providing offline fallback database)

# NDS.Live Roadmap - Hybrid Navigation – Map Display

Function	Use case	Application service interface	Smart layer service interface	Smart layer tile store
Map Display	Basic Map Display	N/A	2022.H1	2022.H1
	Labeling names	N/A	2022.H1	2022.H1
	Displaying icons	N/A	2022.H1	2022.H1
	3D objects	N/A	2022.H1	2022.H1
	Satellite images	N/A	2022.H2	2022.H2
	Terrain Models	N/A	2022.H2	2022.H2

# NDS.Live Roadmap - Hybrid Navigation – Search, Speech

Function	Use case	Application service interface	Smart layer service interface	Smart layer tile store / offline fallback database
Search	Address Search	2022.H1	N/A	2022.H2
	POI Search	2022.H1	N/A	2022.H2
	Autocomplete	2022.H2	N/A	2022.H2
	Geocoding	2022.H2	N/A	2022.H2
	Reverse Geocoding	2022.H1	N/A	2022.H1
Speech	Speech Dialogue Search	TBD	N/A	2022.H2

# NDS.Live Roadmap - Hybrid Navigation – Routing, Traffic

Function	Use case	Application service interface	Smart layer service interface	Smart layer tile store
Routing	Route calculation	available	available	available
	Range calculation	available	available	available
	Truck routing	available	available	available
Real Time Traffic	Dynamic routing	available	2022.H2	N/A
	Traffic information	N/A	2022.H2	N/A
Real Time Travel Information Services	Parking, Weather, Fuel prices, EV charging station, etc.	TBD	2022.H2	N/A

# NDS.Live Roadmap - Hybrid Navigation – Guidance, Advanced Lane Guidance

Function	Use case	Application service interface	Smart layer service interface	Smart layer tile store
Guidance	Maneuvers	2022.H1	2022.H2	2022.H2
	Names	2022.H1	2022.H2	2022.H2
	SD Lane info	2022.H1	2022.H2	2022.H2
	Signpost	2022.H1	2022.H2	2022.H2
	Text to speech	2022.H1	2022.H2	2022.H2
	Junction view	2022.H2	2022.H2	2022.H2
	Natural guidance	2022.H2	2022.H2	2022.H2

# NDS.Live Roadmap - Hybrid Navigation – Advanced Lane Guidance, ADAS

Function	Use case	Application service interface	Smart layer service interface	Smart layer tile store
Advanced Lane Guidance	HD Lane Guidance	N/A	available	available
	HD Positioning	N/A	available	available
ADAS	ADAS map layer	N/A	available	available
	SD map matching	available	available	available
	Vehicle horizon	available	available	available
Venues	Parking garage, Indoor maps	N/A	available	available



# NDS High Level Roadmap 2022 – 2024

Focus	2022.H1	2022.H2	2023	2024
<b>NDS as a Service</b>	<ul style="list-style-type: none"> <li>NDS.Live services:                             <ul style="list-style-type: none"> <li>- Address Search</li> <li>- Map display</li> <li>- Guidance</li> </ul> </li> <li>NDS.Live for Hybrid Navigation:                             <ul style="list-style-type: none"> <li>- Advanced infotainment</li> <li>- Supporting offline use case</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Best practices for Hybrid Navigation</li> <li>ADAS support for NCAP regulations</li> <li>NDS.Live for Augmented Reality use cases</li> <li>Supporting RTTI &amp; SRTI services</li> </ul>	<ul style="list-style-type: none"> <li>First- and last-mile navigation</li> <li>Predictive 5G service</li> </ul>	
<b>Future Mobility</b>	<ul style="list-style-type: none"> <li>Supporting dynamic ODD management</li> <li>Addressing AD related HD map issues</li> </ul>	<ul style="list-style-type: none"> <li>Automated Driving (L4):                             <ul style="list-style-type: none"> <li>- Urban mobility</li> <li>- Transport (hub-to-hub)</li> </ul> </li> <li>e-Mobility:                             <ul style="list-style-type: none"> <li>- Minimizing range anxiety</li> <li>- EV range observation</li> <li>- Optimizing charging management</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Automated Driving (L4):                             <ul style="list-style-type: none"> <li>- Rural mobility</li> <li>- Supporting ODD gaps</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Autonomous Driving (L5):                             <ul style="list-style-type: none"> <li>- Driverless Mobility Services</li> <li>- Driverless Delivery Services</li> </ul> </li> <li>Door-to-door mobility with inter-modality</li> <li>Smart cities (active traffic management)</li> </ul>
<b>Connected Map Data Platform</b>	<ul style="list-style-type: none"> <li>NDS.Live interoperability with NDS.Classic</li> <li>NDS.Live running in the car</li> <li>OpenDRIVE converter business case and product strategy</li> </ul>	<ul style="list-style-type: none"> <li>NDS.Live supporting environmental sustainability</li> <li>Supporting Cooperative ITS services</li> <li>Safety aspect of NDS.Live</li> <li>OpenDriveConverter for NDS.Live</li> </ul>	<ul style="list-style-type: none"> <li>Supporting AI technologies with NDS.Live</li> </ul>	<ul style="list-style-type: none"> <li>NDS.Live to support perception for ADAS and AD</li> <li>Map assisted sensor fusion</li> <li>Connected cars and IoT</li> </ul>

# Join NDS Product Definition Group

Your contribution is needed!

- Help us to form NDS Product Strategy and Roadmap
- Join the NDS Product Definition Group:  
<https://members.nds-association.org/Groups>  
self-subscribe to the [pdg@nds-association.org](mailto:pdg@nds-association.org)  
distribution list, or contact [otto.nyiro@nng.com](mailto:otto.nyiro@nng.com)
- Bi-weekly calls to work on product requirement documents



Let's shape the future of NDS together!