



# Dynamic Map

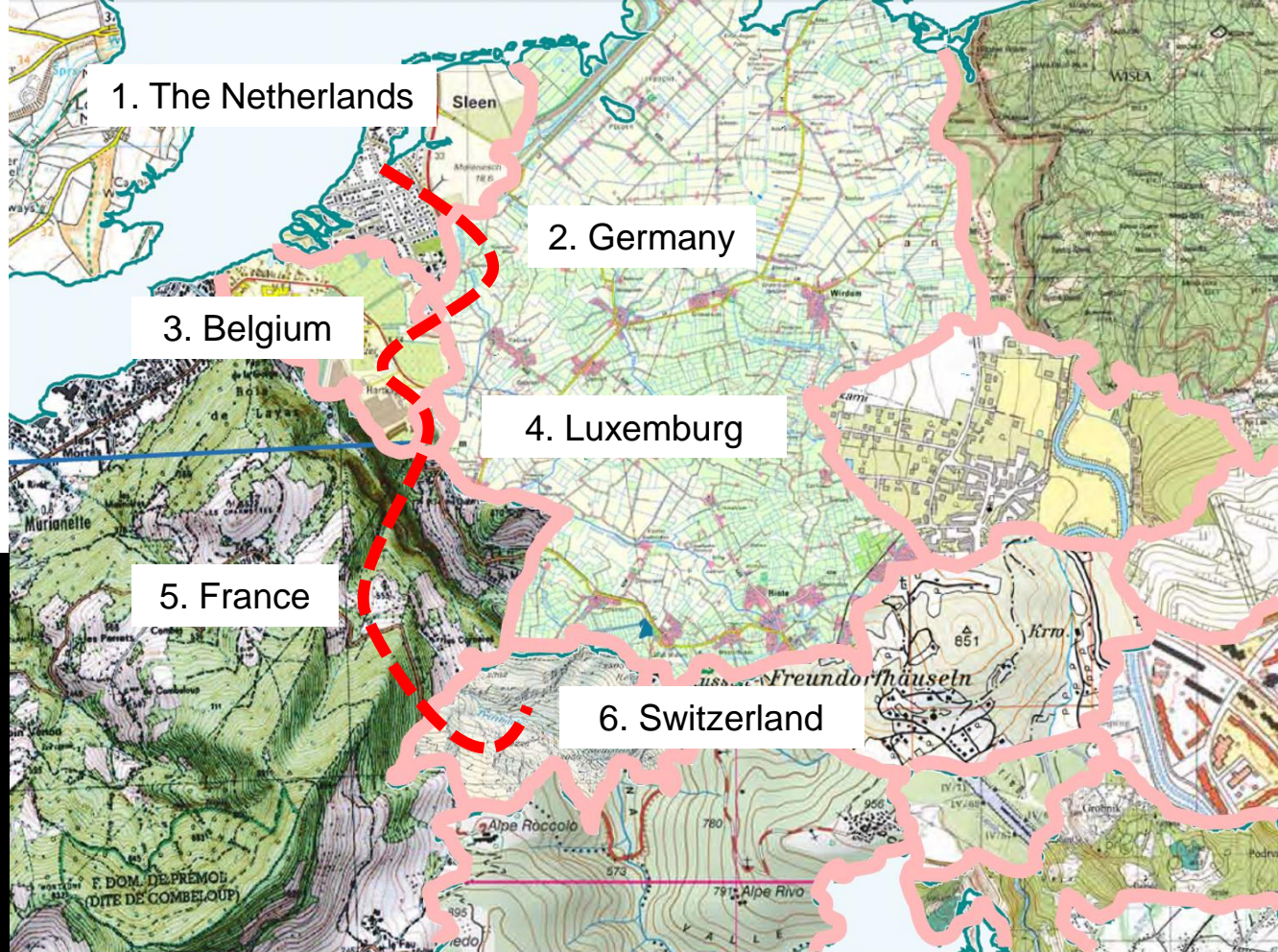
## *Back to Base*

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900 km  
6 countries





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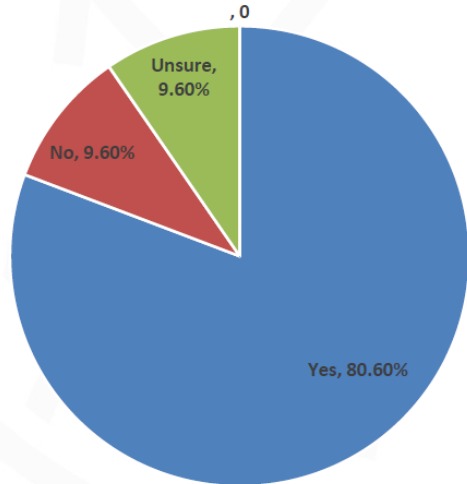


# Questions

- What happens if Kadaster/Government doesn't do anything?
- If we do act, what should be the **#1** step to take?

# Roles for National Governments

Is there a role for national governments in promoting or facilitating the development of the necessary static and dynamic geospatial infrastructure for *cooperative or connected vehicles*? (31 responses)



- Yes – 80.6%
- No – 9.6%
  - Digital map provider (1), Auto industry (1), University(1)
  - EU (2), Japan (1)
- Unsure – 9.6%

\* **Carl K. Andersen**  
U.S. Department of Transportation  
Federal Highway Administration  
ITS World Congress Bordeaux –  
October 2015

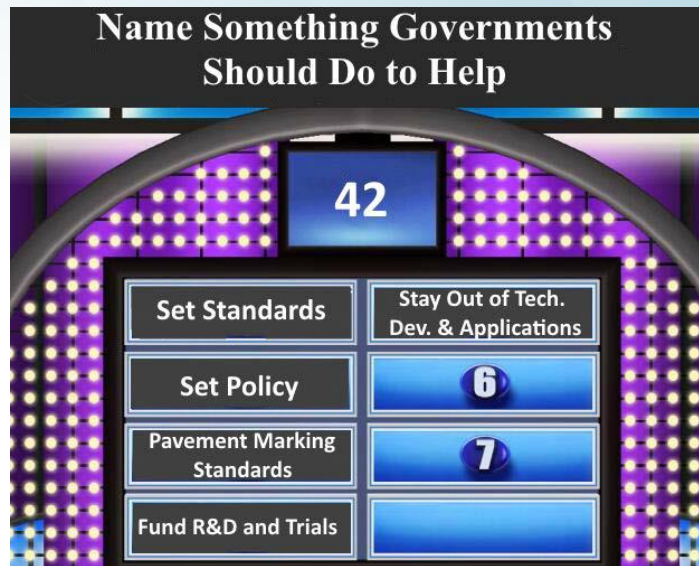
TOWARDS INTELLIGENT MOBILITY  
Better use of space

# Government role

- Set Standards
- Set Policy
- Support Funding

*But also*

- Supply Data!





Triangular Reference Network



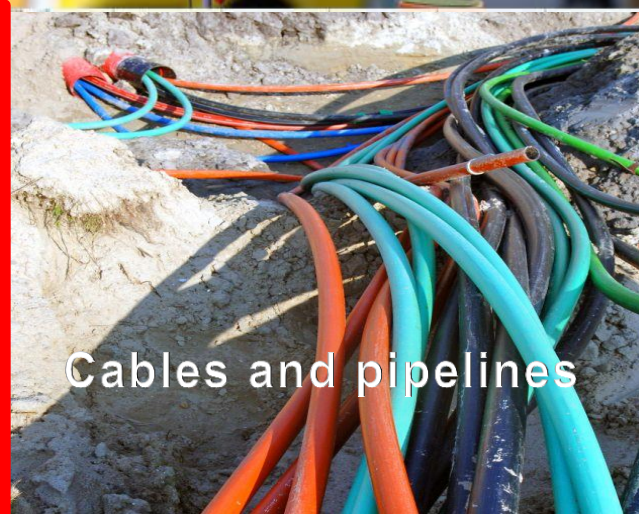
Land Survey



Land Registration



Mapping



Cables and pipelines



Information Services



# Kadaster Topographic Knowledge

- 2015: Celebrating 200th Anniversary Topographic Map NL!
- <http://topotijdreis.nl/> Topographic Time Travel
- The public geo-portal: PDOK
- Automated Generalisation 1:10.000 → other scale
- BGT – Key Register Large Scale Topography 1:1.000
- 3D-TOP10NL (Integration of LiDAR height information)

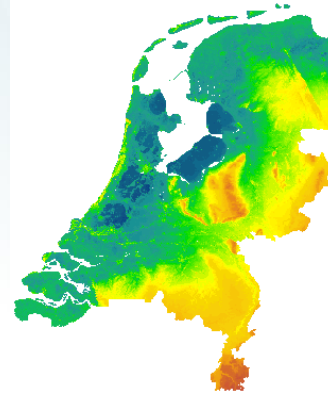
# The public geo-portal: PDOK

- Geo-services distribution portal
- Part of the Dutch public SDI
- Based on INSPIRE requirements
- Partnership of public organisations
- Using (inter)national GI standards
- Future growth ready
- **Open Data!**

The screenshot shows the PDOK website interface. At the top, there is a navigation bar with the PDOK logo and the text 'Publieke Dienstverlening op de Kaart'. Below the navigation bar, there is a search bar and a main content area. The main content area is divided into several sections: 'PDOK Kaart' (with a map thumbnail), 'What is PDOK and how to access PDOK?' (with a text block), 'National Georegister' (with a map thumbnail), 'PDOK Viewer' (with a map thumbnail), 'PDOK Kaart' (with a map thumbnail), 'News' (with a list of news items), 'Announcements' (with a list of announcements), and a sidebar with 'Downloads' and 'Statistics' sections.

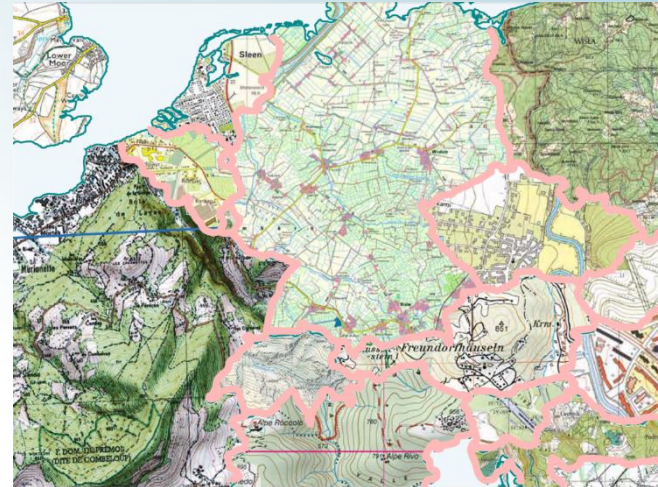
# New product: 3D Map NL

- Integration of high precision LiDAR altimetry (AHN-2): 8 points per m<sup>2</sup>
- Combined with 2D TOP10NL topographic data
- Complete coverage of the Netherlands
- Developed together with universities and private companies
- Open Data



# Spatial Data in Europe

- A lot of spatial data for each country
- Good, documented quality
- Many levels of detail to choose from
- Well organised on national level
- Not easy to find/get
- Different content
- Different coordinate reference systems
- Complicated usage conditions



- **Data not interoperable on European level**
- **Progress: INSPIRE, ELF, ELISE**

# National cooperation



- National Agency
- Public Collaboration
  
- Improving Access
- Improving Use
- Geo Standards

# International cooperation



**UN-GGIM**  
UNITED NATIONS INITIATIVE ON  
GLOBAL GEOSPATIAL  
INFORMATION MANAGEMENT

- ✓ Development of the global geodetic reference frame
- ✓ Adoption and implementation of standards by the global geospatial information community
- ✓ Identification of trends in national institutional arrangements in geospatial information management



- ✓ Development of the European Spatial Data Infrastructure
- ✓ Creating and implementing interoperability projects
- ✓ Producing pan-European products based on the datasets from National Mapping

# INSPIRE for Automated Driving?

- European Commission
- Support for **environmental policy**, cross-border issues like flooding, pollution, etc.
- INSPIRE Directive: **I**nfrastructure for **S**patial **I**nformation in **E**urope
- European Spatial Data Infrastructure (ESDI)
- Making data and services discoverable, available and interoperable, according to quality of service demands
- All EU member states producing data according to same rules, data models and specifications
- Service oriented architecture (SOA)
- Push for Open Data
- Implemented in national laws
- <http://inspire.ec.europa.eu/>

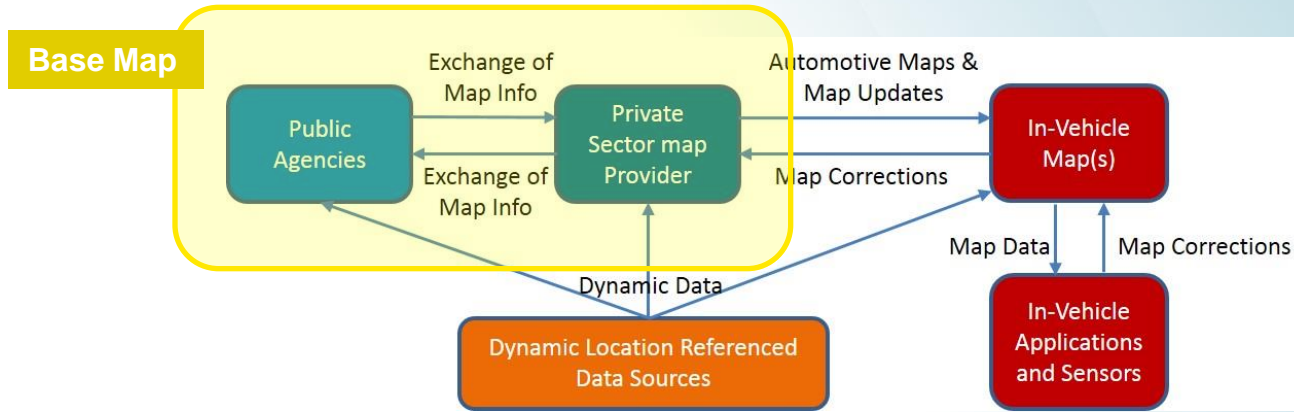




# Base Map for Automated Driving *Data in Advance*



# Reference Model for Interface Needs\*



\* Carl K. Andersen  
U.S. Department of Transportation  
Federal Highway Administration  
AUVSI - 21 July 2015

- Public agencies and private map providers each collect and use digital map data that is beneficial to the other party
- Map providers provide both static and dynamic map data to vehicle systems
- Emerging need to provide automated updates to maps

# Data needs for Base Map

## **What geo-data are needed?**

*Does the base map consist of static and dynamic data?*

*What data should be ready in advance?*

*Should all base map data be 'open'?*

## **What interface standards are needed?**

*For data formats, exchange, and transmission*

## **How can base map data be kept up to date?**

*Permanent changes, such as new roads or roadway alignments*

*Temporary changes such as work zones*

# For Discussion

- What happens if Kadaster/Government doesn't do anything?
- If we do act, what should be the **#1** step to take?

ありがとうございました！

