

USING TRAFFIC REGULATION DATA FROM LOCAL AUTHORITIES FOR GUIDING HGV- TRAFFIC IN CITIES – CHALLENGES AND OPPORTUNITIES



1.

Challenges with HGV-Guiding and -Navigation in Cities

2.

Role of Local Authorities as Data Provider

3.

Evaluation Results of SEVAS

4.

Simulation of Effects of HGV-Restrictions in Cities

Challenges with HGV-Guiding and -Navigation in Cities

- Compared to cars and light goods vehicles (LGV), heavy goods vehicles (HGV) are subject to various restrictions when choosing routes due to
 - Vehicle dimensions and weights
 - Infrastructural deficits
 - Environmental policies

Challenges with HGV-Guiding and -Navigation in Cities

Road network geometry

Challenges with HGV-Guiding and -Navigation in Cities

Construction Site, Wuppertal Germany, Photo: radiodresden.de

Road network geometry

Technical specifications & construction



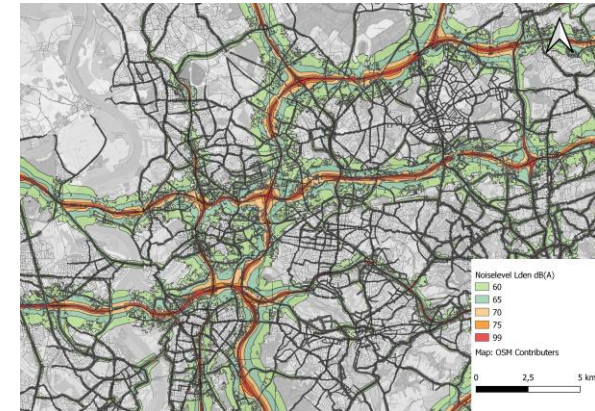
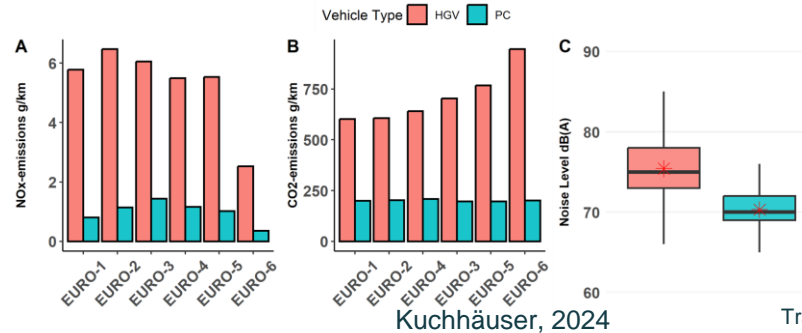
Railway Bridge, Wuppertal, Germany

Challenges with HGV-Guiding and -Navigation in Cities

Road network geometry

Technical specifications & construction

Environmental policies



Traffic noiselevels according to noise action plan, Duisburg, Germany

Challenges with HGV-Guiding and -Navigation in Cities

- Not every street in cities should be used for HGV-traffic
- Mislead HGVs are a problem for local authorities as well as logistics service providers
- Without local knowledge logistics service providers are dependent on navigation applications
- Navigation applications for HGV as well as planning processes have a **high demand on data**

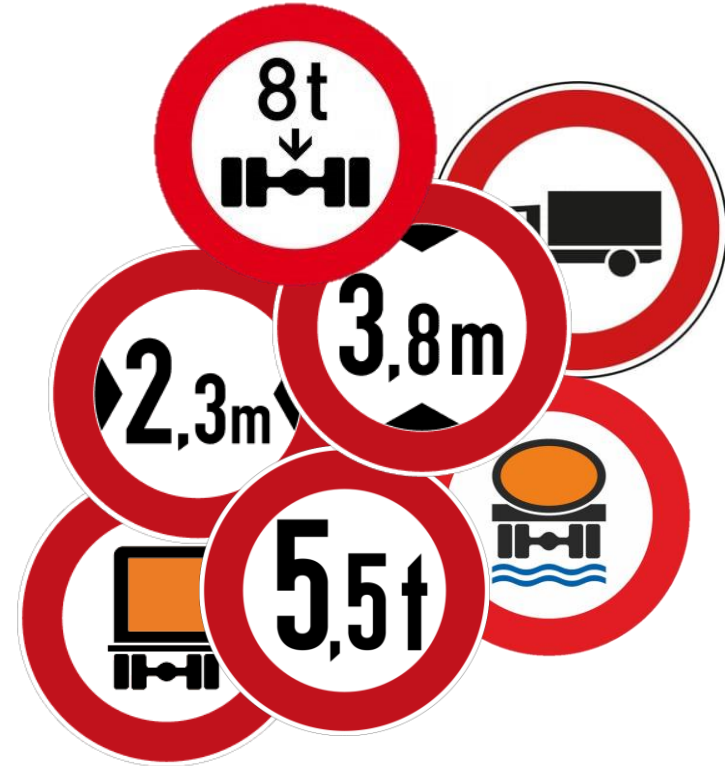
HGV-Navigation & Guiding

Data Demand

- Road network accessible to motorised traffic
- Permitted maximum speed
- General transit bans



- Height, weight, length-, width-restrictions
- General or good specific HGV-restriction
- Access conditions/delivery time window



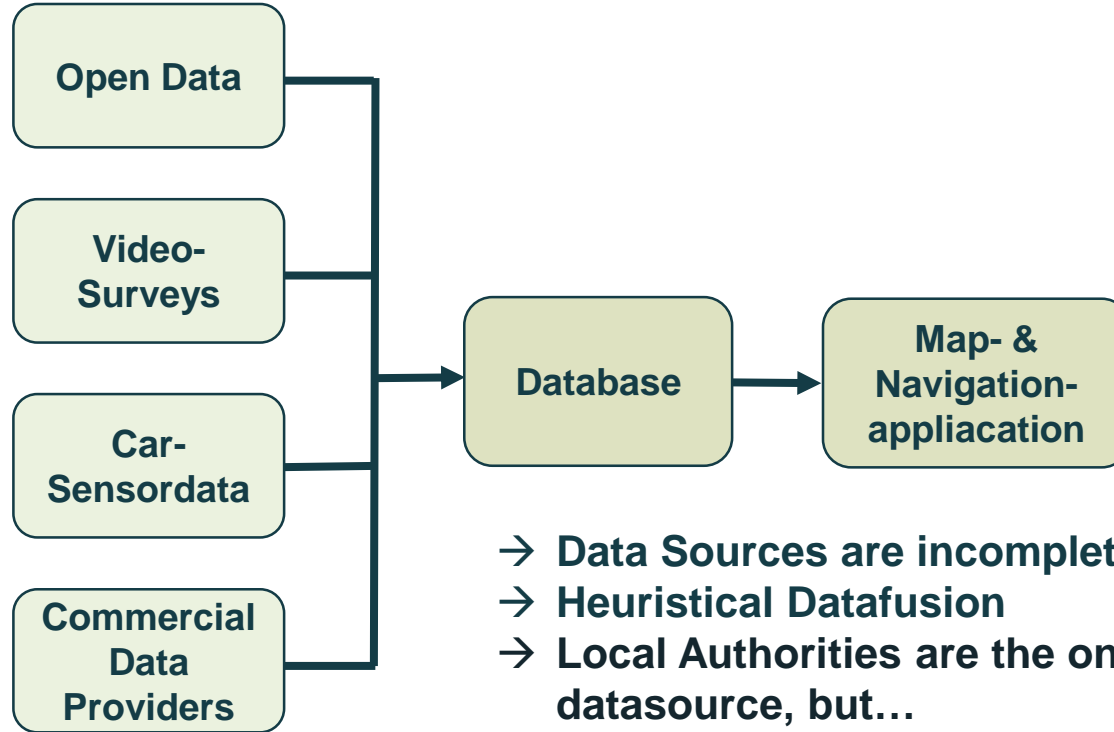
Role of Local Authorities as Data Provider

Data Sourcing Processes

OpenStreetMap



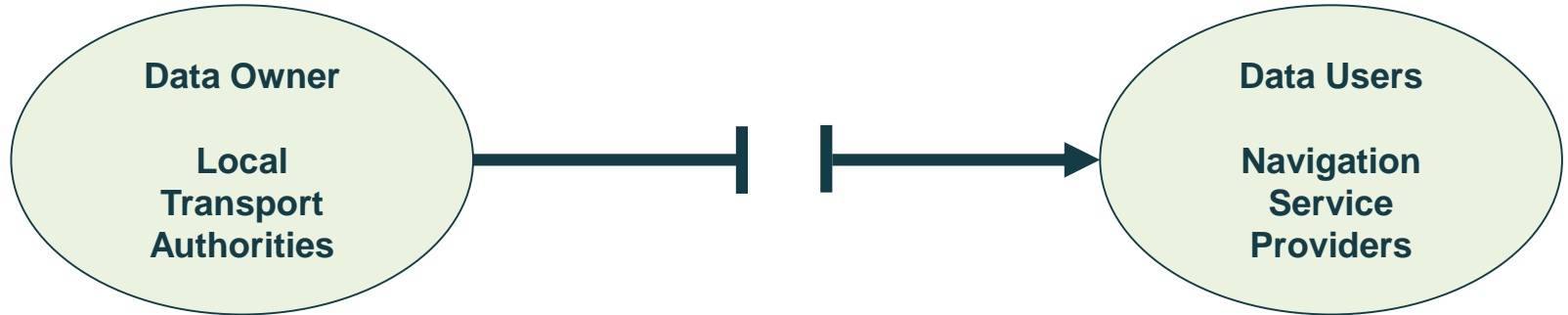
Video-Survey



- Data Sources are incomplete
- Heuristical Datafusion
- Local Authorities are the only trusted datasource, but...

Role of Local Authorities as Data Provider

→ Existing data exchange is mostly a bilateral Process



- Protection of sensible areas
- Traffic safety
- Traffic flow
- Truck guiding plans
- ...

- Digital Maps
- Navigation Software
- Tourplanning Tools
- ...

Role of Local Authorities as Data Provider

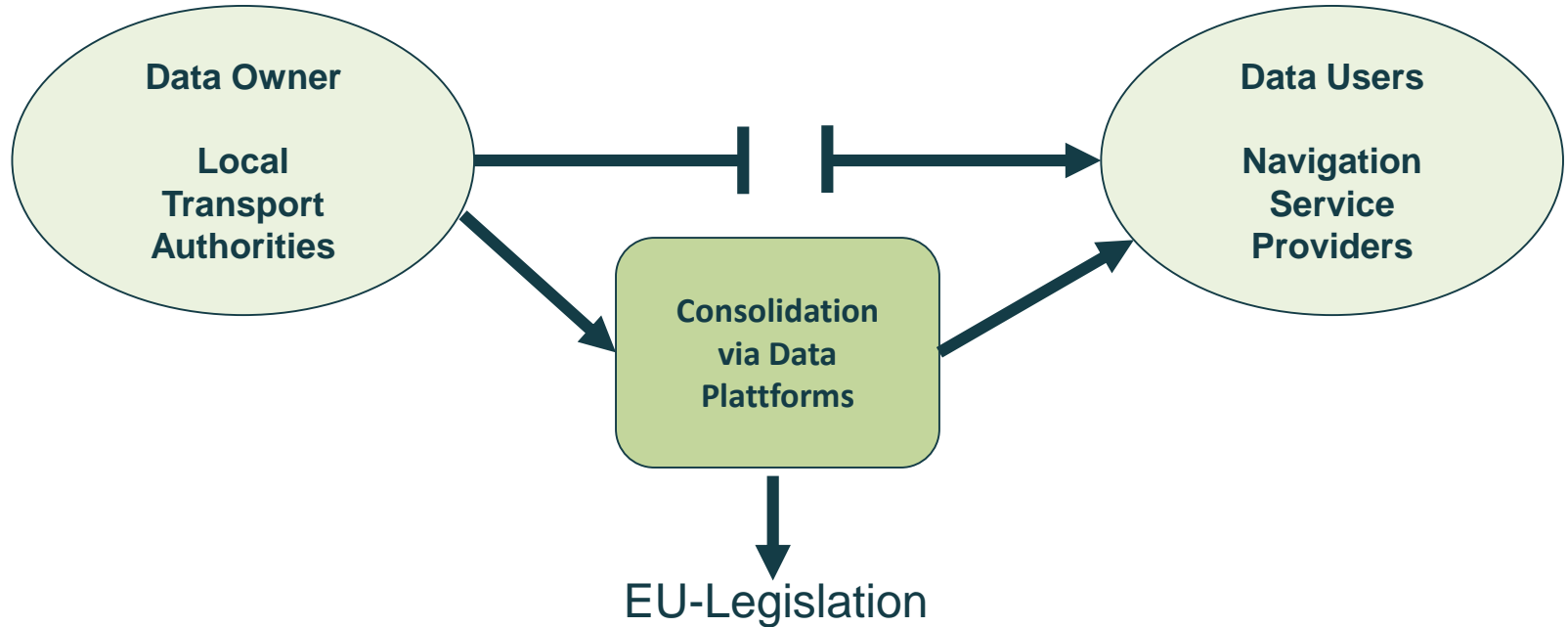
→ Dataexchange is mostly a bilateral process



Data Owner regarding traffic regulations:

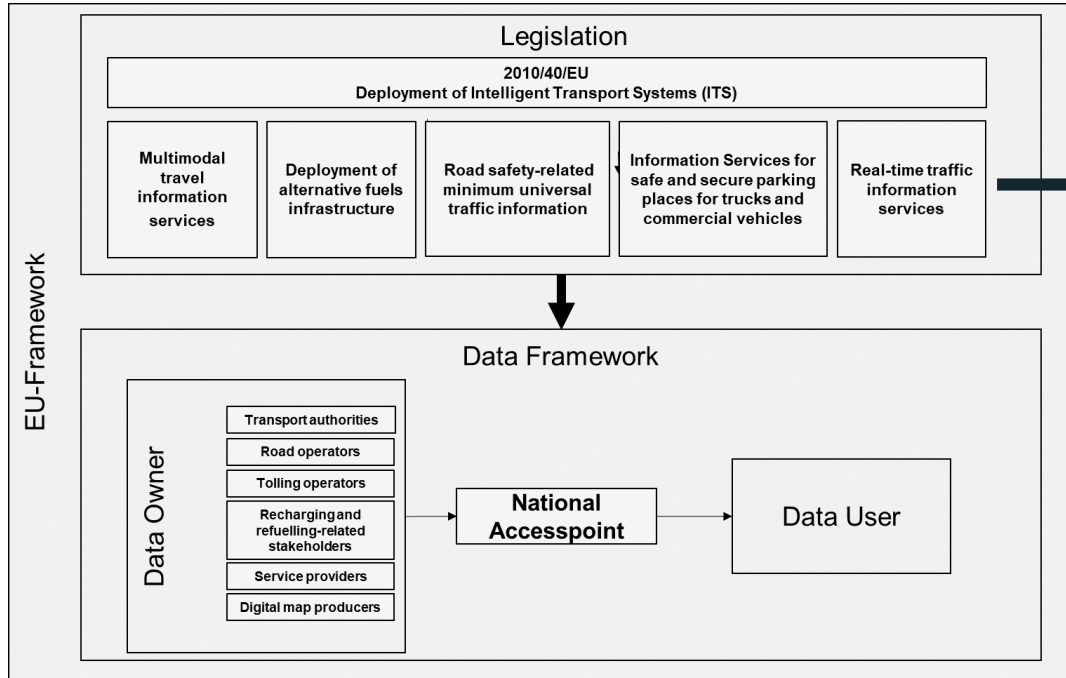
→ Transport Authorities on county level

Role of Local Authorities as Data Provider



Role of Local Authorities as Data Provider

ITS-Directive and EU-Dataframework



Kuchhäuser, 2024

ANNEX III

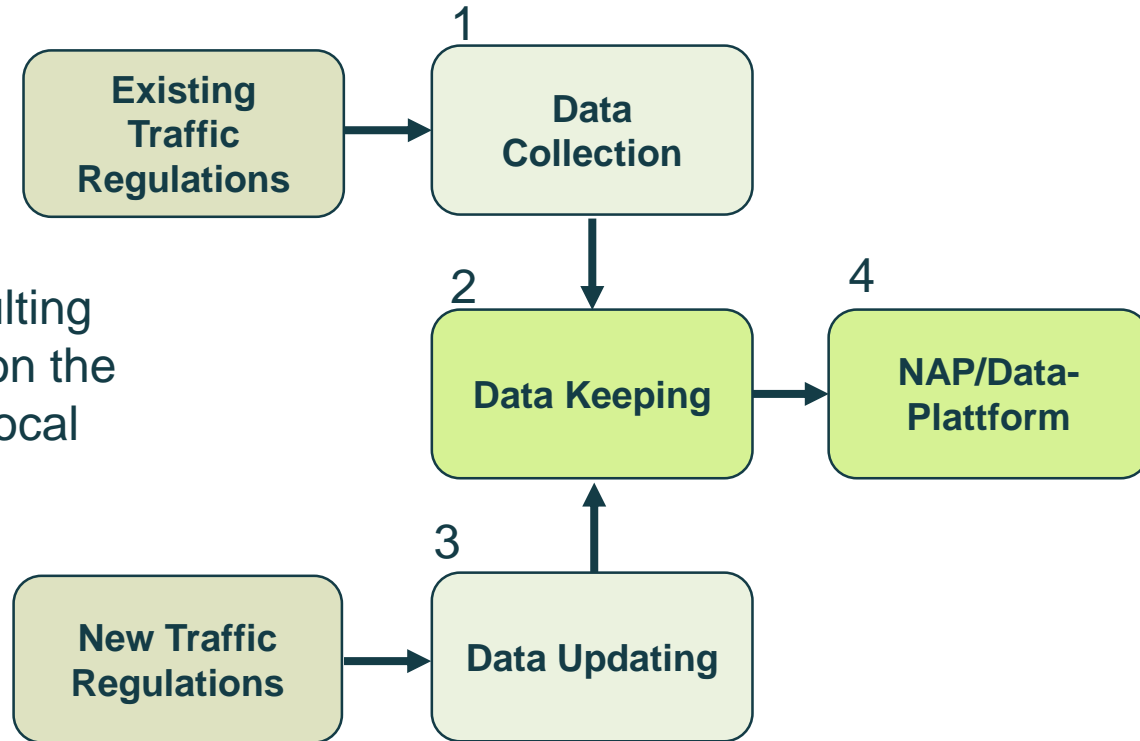
List of data types

Data type	Geographical coverage
1. Data relating to the provision of EU-wide road traffic information and navigation (area I, paragraphs 1.2, 1.3):	
1.1. Category: Static and dynamic traffic regulations, where applicable, concerning Subcategory:	The trans-European core network for roads
<ul style="list-style-type: none"> -access conditions for tunnels -access conditions for bridges -speed limits -overtaking bans on heavy goods vehicles -weight/length/width/height restrictions 	The comprehensive trans-European network for roads, other motorways and sections of primary roads, where the total annual average daily traffic is more than 8 500 vehicles, and all

Role of Local Authorities as Data Provider

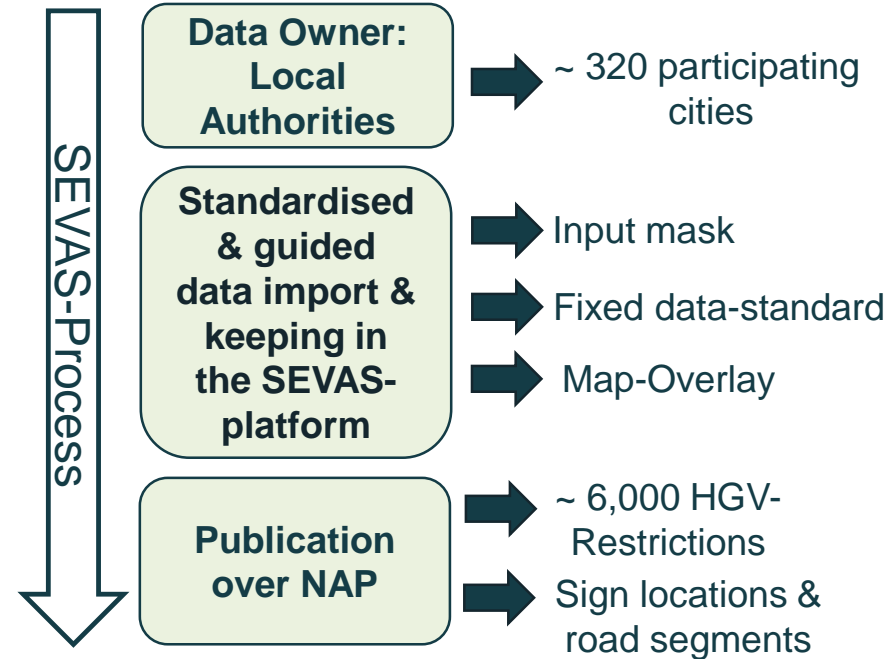
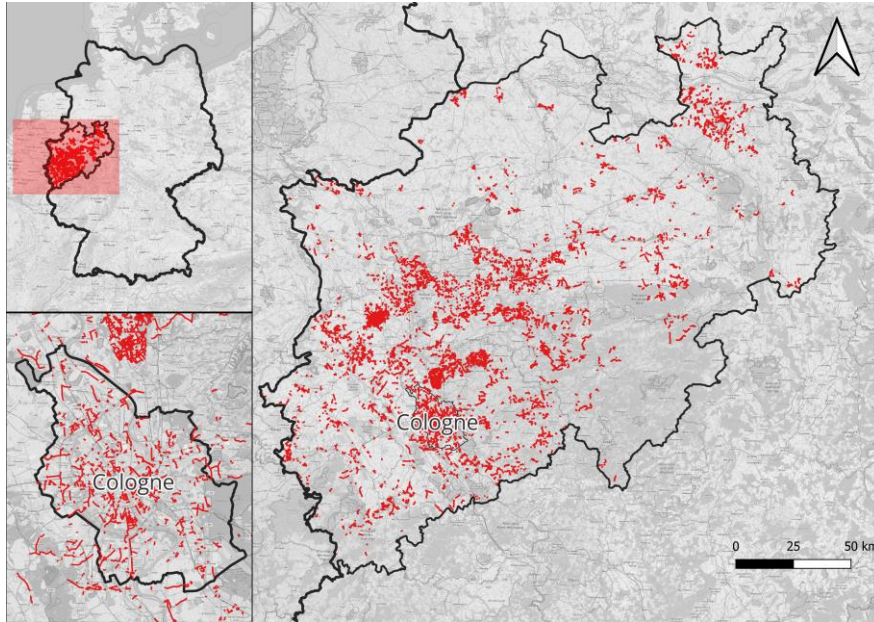
Challenges in Data Processes

→ Quality of the resulting dataset depends on the processes of the local authorities



Local Authorities as Data Provider – Best Practice in Germany

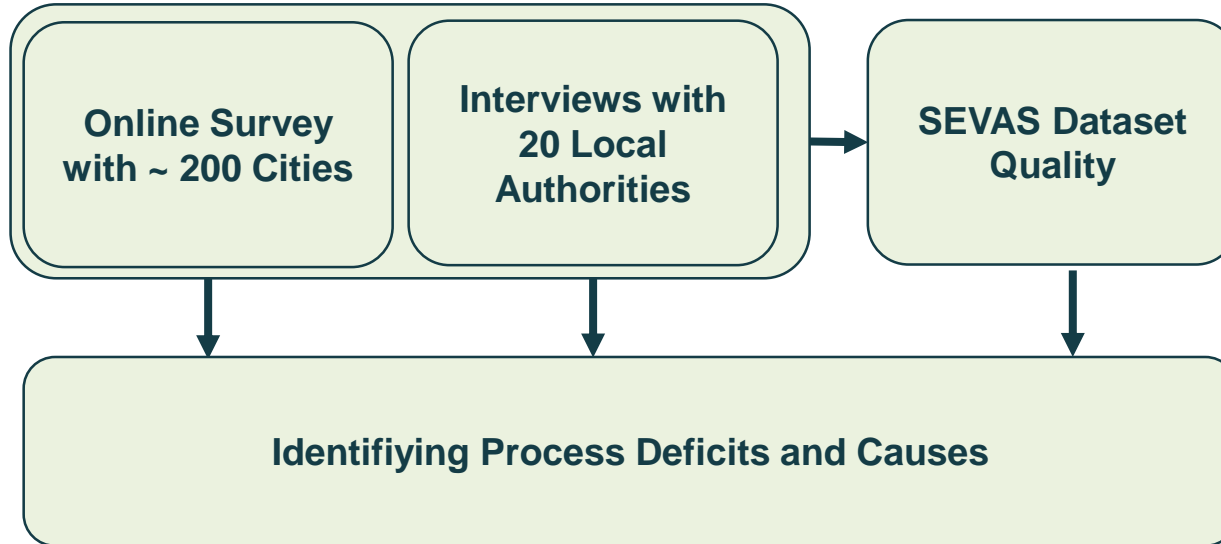
SEVAS – Plattform for Digitalisation of HGV-Restrictions



<https://sevas.nrw.de/karte>

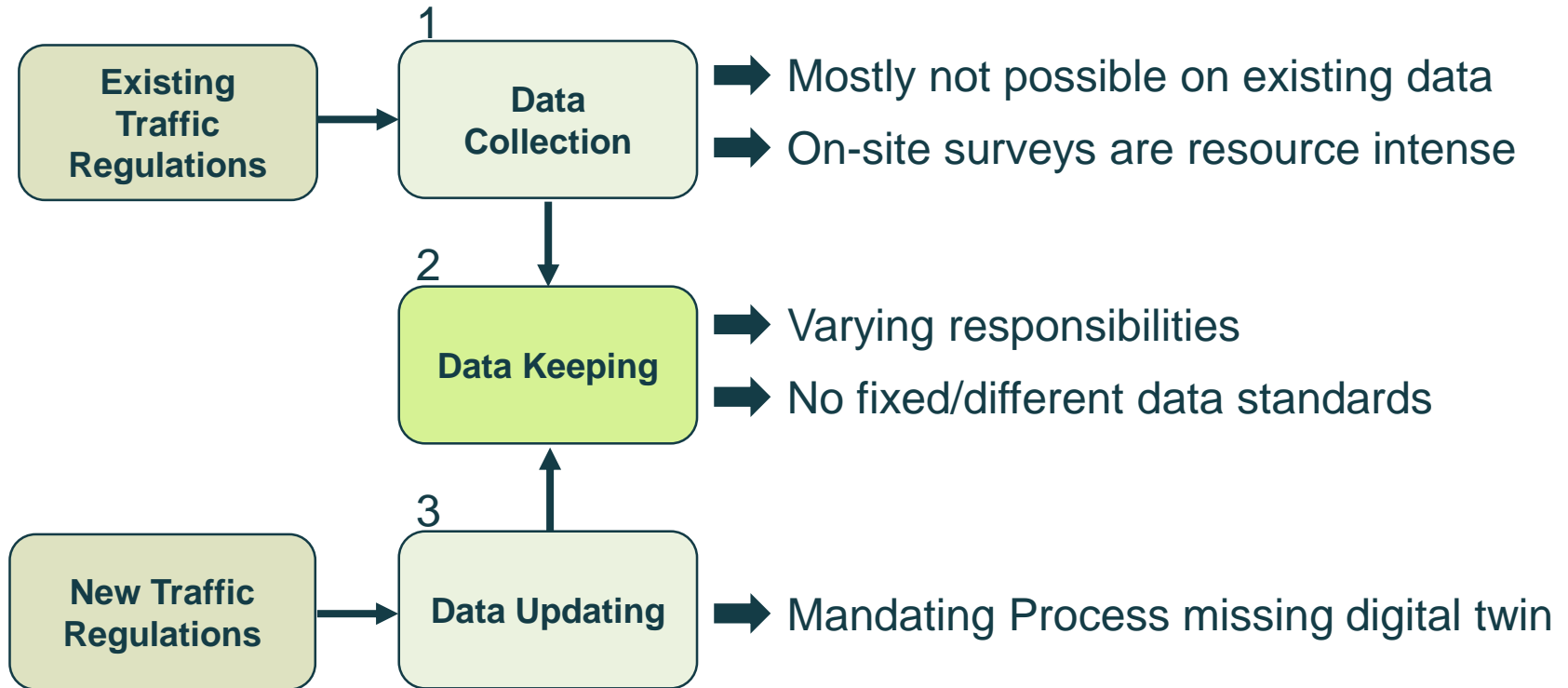
Local Authorities as Data Provider – Best Practice in Germany

Evaluation of SEVAS



Local Authorities as Data Provider – Best Practice in Germany

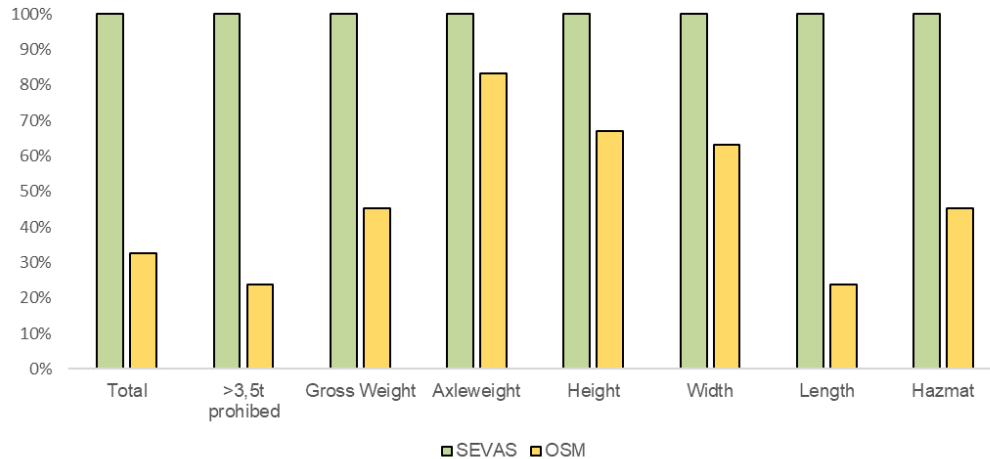
Evaluation of SEVAS processes and process quality



Local Authorities as Data Provider – Best Practice in Germany

Comparing SEVAS and Open-Data Sources

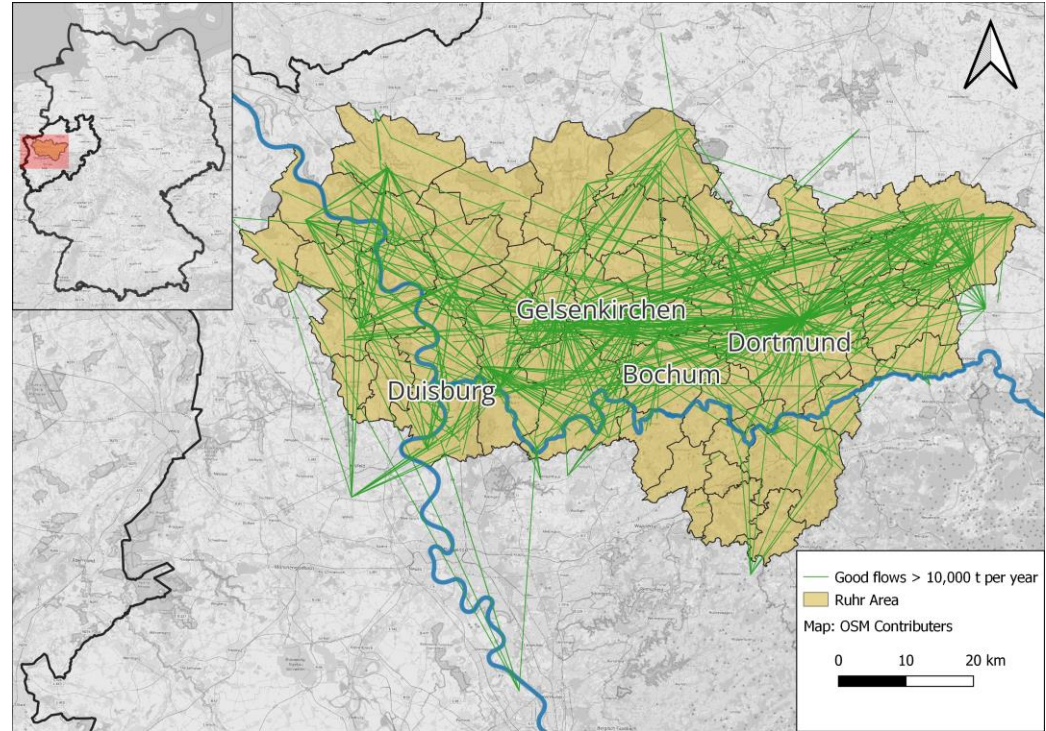
Relative comparison of SEVAS and OSM data for SEVAS-Cities
(100 % = number of SEVAS restrictions by restriction type,
N = 27,766)



- OSM lacks 70 % of the HGV-restrictions of SEVAS
- The distribution differs depending on the restriction type

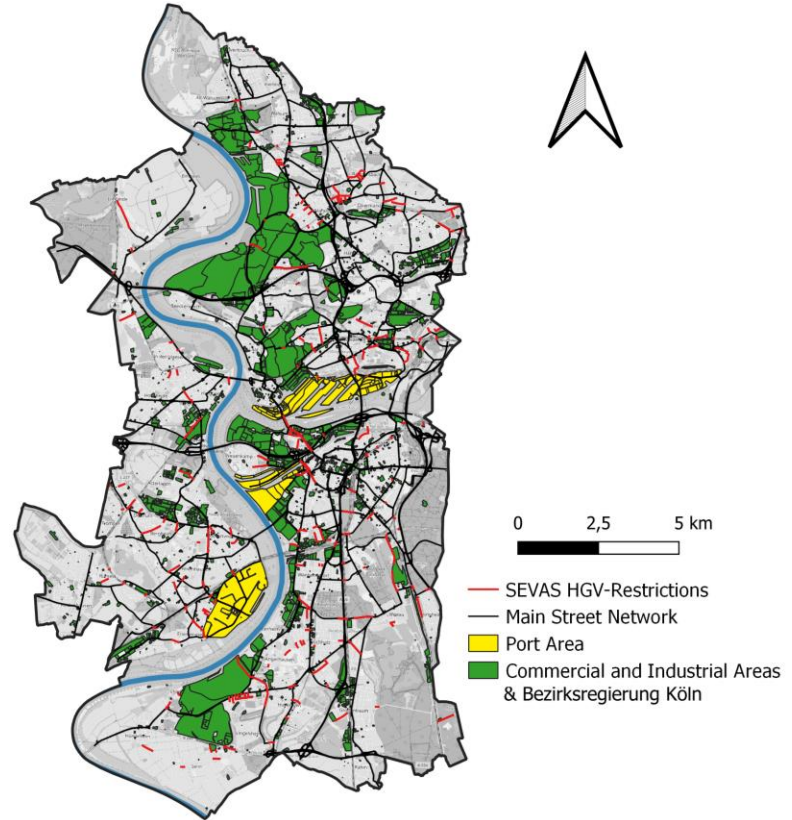
Simulation – Importance of Datasets on HGV-Restrictions

- Simulation of HGV-Traffic outgoing of the port of Duisburg
- Ruhr Area „Ruhrgebiet“, Germany
- Origin destination matrix of HGV derived from national good flows



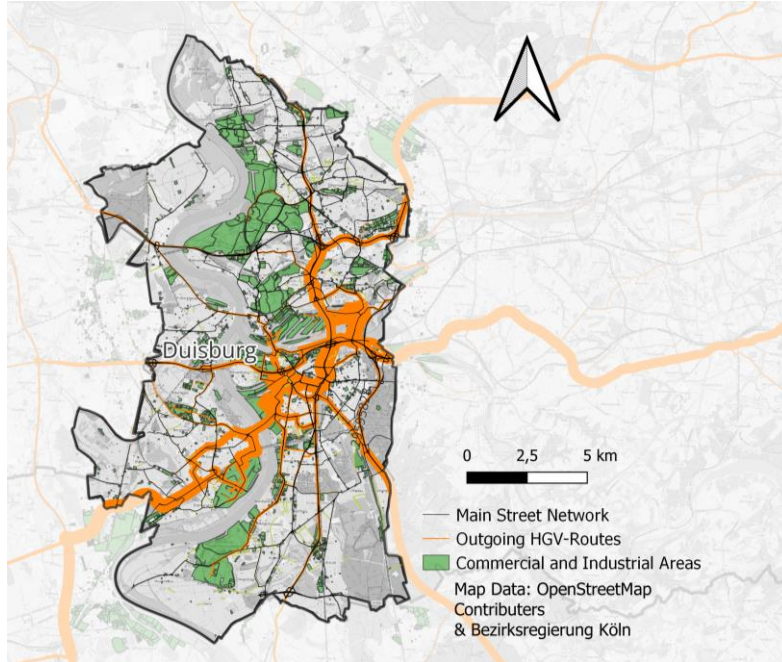
Simulating Effects of HGV-Restrictions in Cities

- Biggest Inland Port in Europe
- 209 HGV-restrictions based on SEVAS
- „HGV-Suited“ Street Network
- Simulation using Graphhopper
- Implementation of HGV-Restrictions in underlying OSM-Network
- 40 t HGV

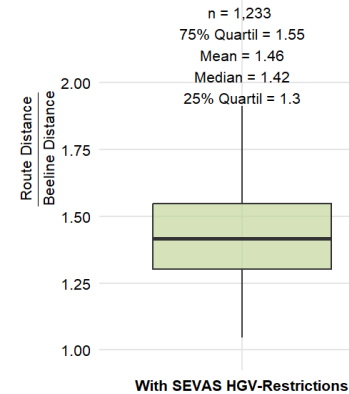


Simulating Effects of HGV-Restrictions in Cities

1. Run: with SEVAS Data

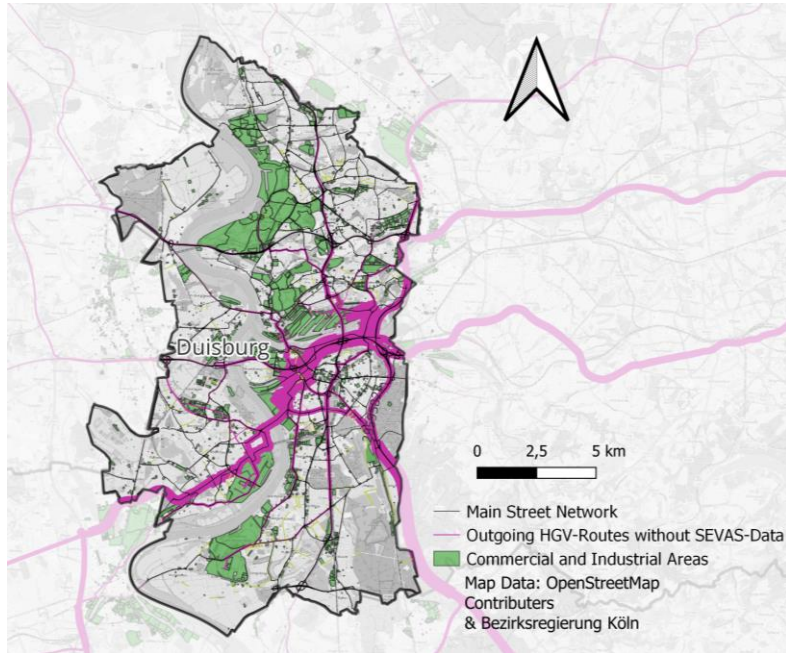


- Simulation of 1,233 Relations
- Using SEVAS Data: Median detourfactor of 1.42 within the city area

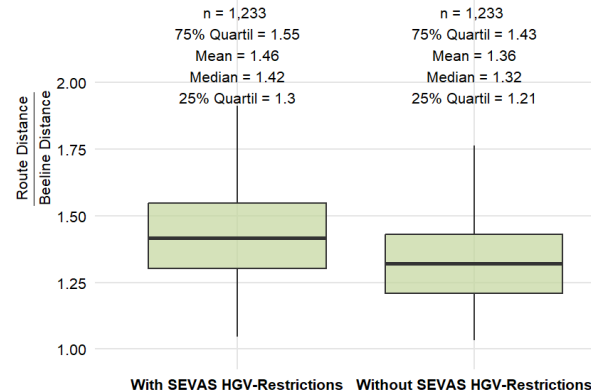


Simulating Effects of HGV-Restrictions in Cities

2. Run: without SEVAS-Data



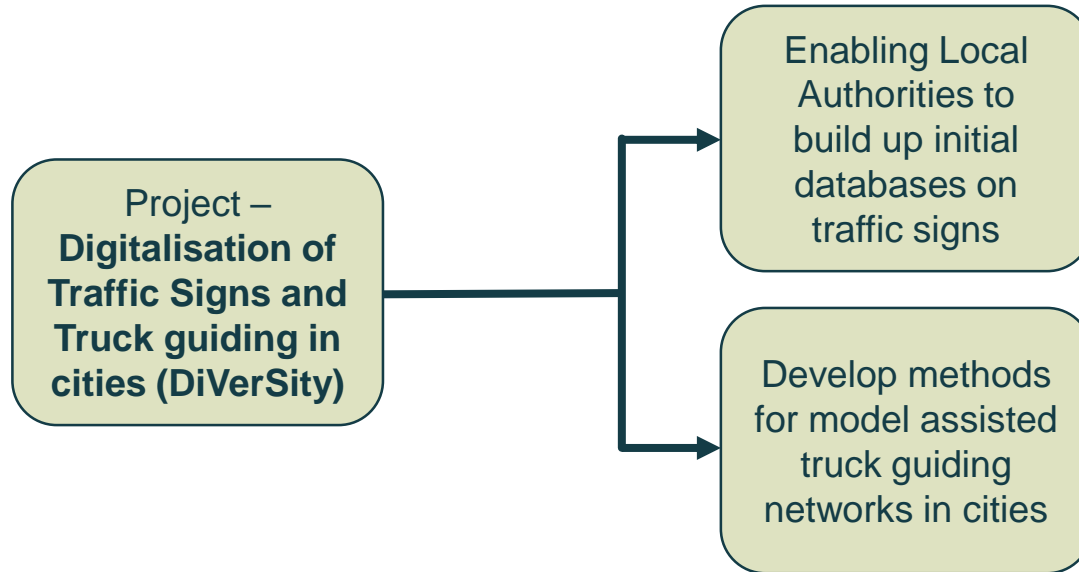
- Overall 3,000 conflicts
- On 64 individual streetsegments
- Decreasing detour Factor (Median 1.32)



Conclusion

- Data on Restrictions is crucial for HGV-navigation and guiding in cities
- Only local authorities can provide complete information on restrictions
- By now processes for sourcing, keeping and maintaining data are mostly not suited for developing complete datasets
- Technical regulations for those processes are needed

Further Work



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Bezirksregierung
Düsseldorf



Projectpage:



Thank you for your Attention!

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