

NAVIGATING THE LAST MILE ON WATER

How do Hamburg's transport & sustainability strategies align with the AVATAR concept of zero emission urban inland waterway transport?

Claudia Schlösser
02.06.2023



Picture: AVATAR
Project | Interreg NSR

CONTEXT IN THE CITY OF HAMBURG

Importance of managing urban freight distribution in a smart way

Interreg

North Sea Region

AVATAR

European Regional Development Fund



EUROPEAN UNION



 **66h**

extra time
spent driving
due to
congestion

Country rank	World rank ▼	City	Average travel time per 10 km ▼	Change from 2021 ▼	Time in rush hour per year
1	23	Hamburg	23 min	no change	201 hours
2	36	Berlin	22 min	+ 10 s	193 hours
3	52	Leipzig	21 min	no change	182 hours

Source: tomtom, traffic index, 2022

CEP-traffic
share of
total inner-
city traffic



Forecast 2030

163 m deliveries in 2030
compared to
95 m deliveries in 2017

RESEARCH APPROACH

Potential **synergies and conflict of goals** between the **AVATAR** project and **strategies** from the areas of **Last Mile delivery, sustainability and mobility transition** relevant for the City of **Hamburg**



City Logistics
and relevant
aspects

City Logistics
challenges for
the City of
Hamburg

AVATAR
project as
potential
solution

Qualitative
Content
Analysis &
interviews

Synergies &
conflict of
goals

CITY LOGISTICS & RELEVANT ASPECTS

City Logistics

means over which freight distribution can occur in urban areas and the strategies that can improve its overall efficiency while mitigating externalities such as congestion and emissions

Last Mile

traffic induced by
Courier, Express and Parcel (CEP) Services
as well as traffic caused by **supply of retail stores**

Sustainability

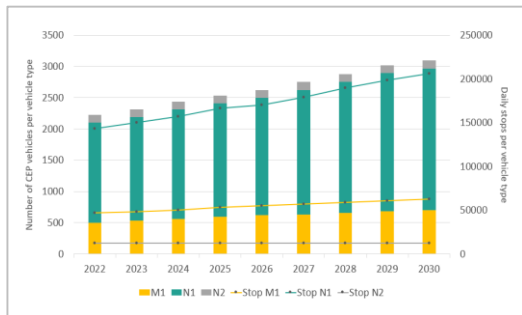
pillars of sustainability:
economic growth,
social equity,
environmental protection

Mobility Transition

relevant aspects for successful transition:
avoidance, relocation,
improvement of traffic



CITY LOGISTICS CHALLENGES FOR THE CITY OF HAMBURG



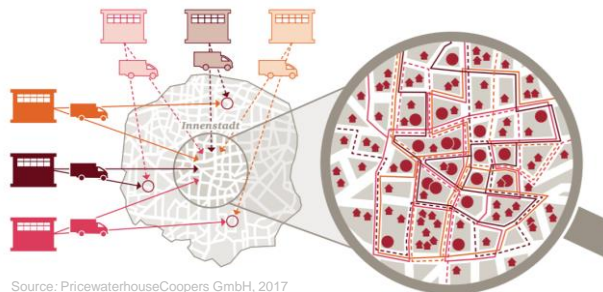
Source: Prognos AG, Gesamtstädtisches Konzept Letzte Meile, 2019



Source: Klinker, 2019



Source: Georg Wendt



Source: PricewaterhouseCoopers GmbH, 2017

Access restrictions

**Multidirectional traffic and
redundant distribution
structures**

**Road Congestion and scarcity of
land**

**Issues for city road
infrastructure**

**Greenhouse gas emissions and
nuisance of local residents**



AVATAR PROJECT AS POTENTIAL SOLUTION

AVATAR Project Contributions



consolidation of delivery flows



acting as temporary micro hub



establishing intermodal transport chains
by using alternative mode of transportation



transshipment of goods onto cargo bikes



optimization of delivery flows



optimization of space usage



emission-free delivery



reducing nuisance for local residents
regarding noise, odors, vibrations



Access restrictions

Multidirectional traffic and
redundant distribution
structures

Road Congestion and scarcity of
land

Issues for city road
infrastructure

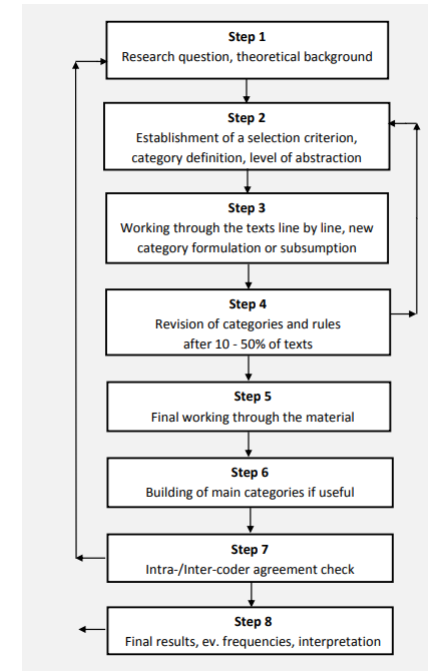
Greenhouse gas emissions and
nuisance of local residents



QUALITATIVE CONTENT ANALYSIS

Methodology

- Content analysis **most commonly used evaluation method**, examining documents as data sources within qualitative research
- **Advantages:** wide-ranging applicability, flexibility, data-reduction possibilities
- Analyzing meaning of collected data sources and **organizing information into categories related to central research question**
- Created **category system represents central instrument** of content analysis method



Source: Mayring, Content Analysis, 2014

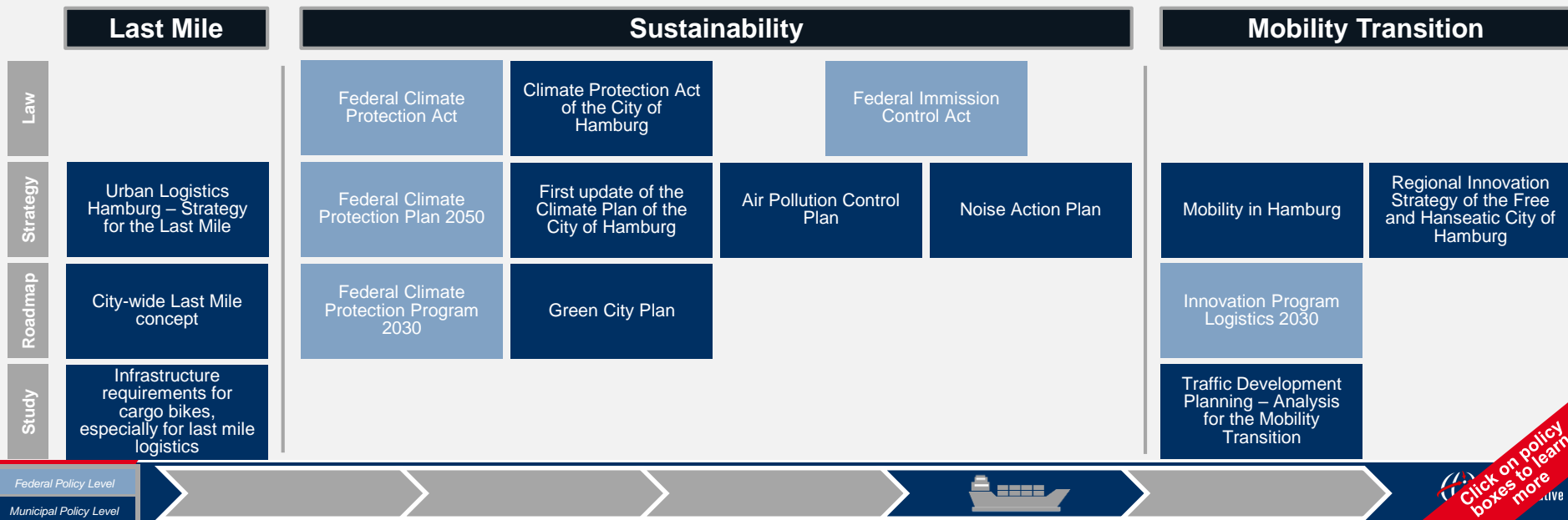


QUALITATIVE CONTENT ANALYSIS

Data Selection

- Theoretical sampling approach, guidance as to which data to collect next
- Being responsive to data, which results in being flexible to explore depth of conclusions derived from data
- Document selection done in iterative process

→ **16 documents** consisting of **in total 1,446 pages**



QUALITATIVE CONTENT ANALYSIS

Data Selection

Mobility in Hamburg

Published: 2017

With continuous growth of Hamburg, city sees necessity for far-sighted approach to infrastructure development to meet increase in mobility requirements.

Mobility Transition

City-wide Last Mile concept

Published: 2019

Hamburg aims at becoming model region for the last mile. Aim: Development of a Last Mile concept for the city of Hamburg including recommendations for actions.

Last Mile

First update of the Climate Plan of the City of Hamburg

Published: 2019

Setting CO2 reduction goals for the city of Hamburg incl. reduction goals for traffic and transportation to contribute to fulfillment of climate protection target.

Sustainability

Urban Logistics Hamburg – Strategy for the Last Mile

Published: 2021

Based on City-wide Last Mile concept. Aim: Reduction of CO2 emissions, air and noise pollution caused by traffic as well as improvement of traffic flow.

Last Mile

Traffic Development Planning – Mobility Transition Strategy

Published: 2022

Analysis of different scenarios and measures to reach traffic development goals as outlined in document Mobility in Hamburg. Baseline for alignment on strategic roadmap.

Mobility Transition



QUALITATIVE CONTENT ANALYSIS

Analysis Tool



Selection criterion for building category:

1 | AVATAR project contributions

VS.

Goals and measures mentioned in text

2 | Mentions of innovative solution for alternative forms of transportation

3 | Contradiction to the AVATAR project

The screenshot displays the QCMap interface for analyzing AVATAR project contributions. The main text area shows a document titled "Analysis of AVATAR and Strategies of the City of Hamburg". The text discusses the goal of reducing GHG emissions by 40% by 2030, achieved through various measures like promoting emission-free delivery vehicles and consolidation of logistics. The interface includes a sidebar with navigation options (Projects, Code Agreements, Privacy, Help, Logout) and a "Category system" panel on the right. The category system lists nine categories (RQ1-1 to RQ1-9) related to reducing GHG emissions and promoting sustainable transportation. A red box highlights a specific text segment: "Die Strategie Hamburgs für die Letzte Meile verfolgt das Ziel im Kurier-, Express- und Paketdienstleister-Verkehr (KEP-Verkehr) im Jahr 2030 mindestens 40 Prozent weniger CO2 zu emittieren als 2017. Dies bedeutet eine Verringerung des CO2-Emissionswertes im KEP-Verkehr von rd. 5.700 t im Jahr 2017 auf nur noch rd. 3.500 t im Jahr 2030. Dieses Ziel stellt einen wesentlichen Beitrag zum Klimaplan der Freien und Hansestadt Hamburg dar. Zudem soll über die Reduktion der darüber hinausgehenden Emission (NOx, Feinstaub) des KEP-Verkehrs die Lebensqualität in Hamburg im Sinne eines lebenswerten, verkehrswarmen urbanen Umfeldes weiter verbessert werden."



RESULTS SYNERGIES

Overlap between AVATAR project contributions and strategies of the City of Hamburg

Analysis of AVATAR and Strategies of the City of Hamburg

QC&Map

Question for analysis

Content analytical technique

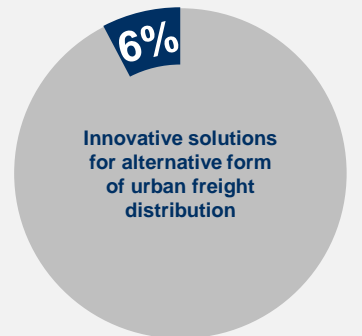
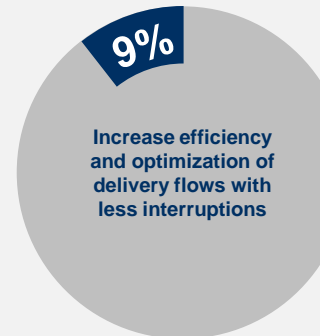
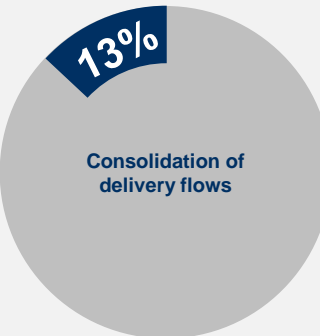
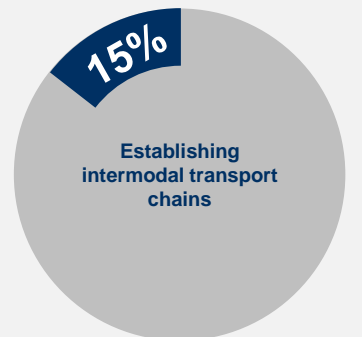
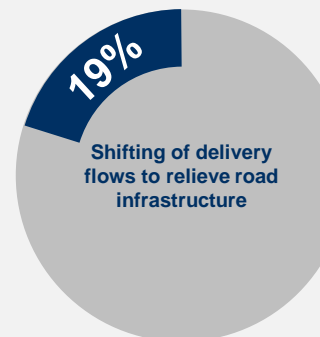
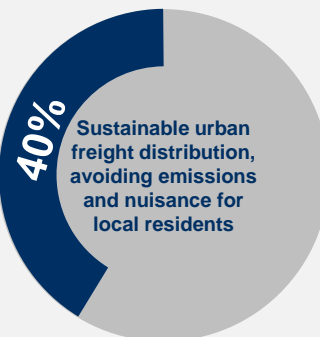
Definition of selection criterion

Match between what is planned in the AVATAR project regarding innovation of delivery flows with the strategy of the City of Hamburg regarding innovation of delivery flows

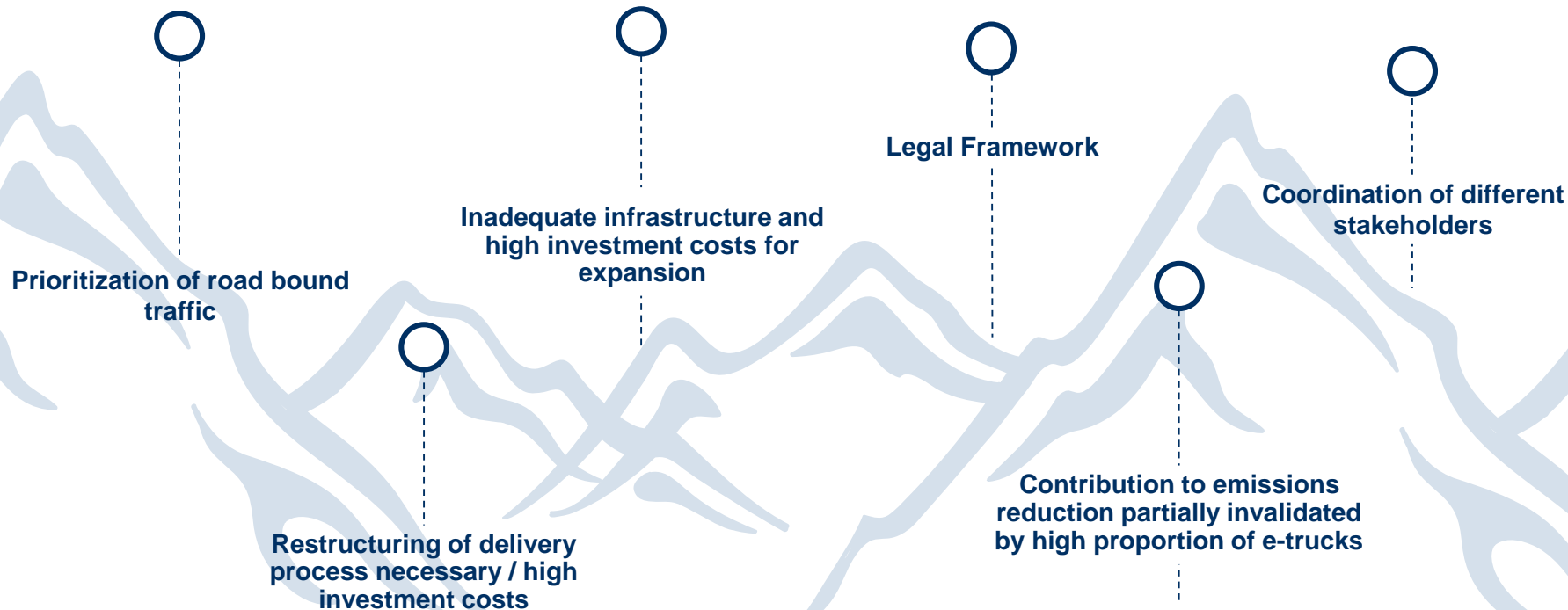
Category system

Category	Category Name	AVATAR	City of Hamburg	Match
Sustainable urban freight distribution, avoiding emissions and nuisance of local residents	R01-1 Reducing GHG emissions caused by traffic	49	40	16
	R01-2 Reducing nuisance for local residents and increase quality of life	55	52	15
	R01-3 Promotion of emission-free delivery vehicles and modalities	14	11	17
Consolidation of delivery flows	R01-4 Promotion of inland waterway vessels as more sustainable transportation mode	5	4	4
	R01-5 Consolidation of delivery flows across logistic service provider	16	13	13
	R01-6 Consolidation of deliveries via micro hubs	16	13	13
Establishing intermodal transport chains	R01-7 Consolidation of deliveries via city hubs	16	13	13
	R01-8 Shifting of deliveries with utilization of cargo bikes	16	13	13
	R01-9 Promotion of intermodal transport chains	16	13	13
Shifting of delivery flows to relieve road infrastructure	R01-10 Reduction of burden caused by delivery traffic	16	13	13
	R01-11 Reduction of road-based delivery traffic	16	13	13
	R01-12 Shifting of delivery traffic to alternative modes of transportation	16	13	13
Increase efficiency and optimization of delivery flows with less interruptions	R01-13 Optimization of space usage	8	6	6
	R01-14 Increase efficiency and reliability of deliveries, with less interruptions	11	9	7
	R01-15 Optimization of delivery traffic flow	6	5	6
Innovative solutions for alternative form of urban freight distribution	R01-16 Prioritization of innovative solutions	7	6	6
	R01-17	7	6	6

Main Categories



RESULTS POTENTIAL BARRIERS



CONCLUSION

- | **AVATAR Project** can make **strong contribution to Hamburg's agenda** in all three areas
- | Biggest barriers of **infrastructural prerequisites**
- | **Bureaucracy and fragmented responsibilities** impedes innovative potential of the city



Picture: AVATAR
Project | Interreg NSR

SOURCES

- Erd, J., 2015. Stand und Entwicklung von Konzepten zur City-Logistik. Wiesbaden: Springer Fachmedien Wiesbaden.
- Interreg North Sea Region. 2023. City freight distribution with highly automated vessels - Economic assessment and scenario development for urban IWT market uptake. Transport and energy use cases for Hamburg and Ghent., Hamburg: s.n.
- Interreg North Sea Region. 2023. Welcome to 21 new projects!. [Online]
Available at: <https://www.interregnorthsea.eu/our-news/welcome-to-21-new-projects>
- Interreg North Sea Region. Kein Datum AVATAR. Available at: <https://northsearegion.eu/avatar/>
- Kauf, S., 2016. City logistics - a strategic element of sustainable urban development. Transportation Research Procedia, p. 158 – 164.
- Mayring, P., 2014. Qualitative Content Analysis. Theoretical Foundation, Basic Procedures and Software Solution. Klagenfurt: Beltz.
- Mayring, P., 2022. Qualitative Inhaltsanalyse. Grundlagen und Techniken. 13. überarbeitete Auflage Hrsg. Basel: Beltz.
- Moussaoui, A. E. E. et al., 2022. Last Mile Logistics: Challenges & Improvement Way. 14th International conference of Logistics and Supply Chain Management LOGISTQUA 2022, 25-27 May.
- PricewaterhouseCoopers GmbH: Aufbruch auf der letzten Meile. Neue Wege für die städtische Logistik. <https://www.pwc.de/de/transport-und-logistik/pwc-studie-aufbruch-auf-der-letzten-meile.pdf>
- Prognos AG, ILS, KE CONSULT: Gesamtstädtisches Konzept Letzte Meile. Erstellung einer Roadmap für die Freie und Hansestadt Hamburg. Basel: 2019
- Rodrigue, J.-P. & Dablanc, L., 2017. What is City Logistics?. In: A. Conway, et al. Hrsg. City Logistics: Concepts, Policy, Practice. New York: MetroFreight.
- Tomtom, Hamburg traffic: <https://www.tomtom.com/traffic-index/hamburg-traffic/>
- VCD, 2021. Verkehrswende oder Mobilitätswende - was ist der Unterschied?. Available at: <https://www.vcd.org/artikel/verkehrswende-definition%20/>
- Verkehrswende, A. & Studio, E., 2021. Future Ahoy! An Infographic Novel About Sustainable Transport, Berlin: AGORA Verkehrswende.

SOURCES

Images

- Congestion Hamburg. Georg Wendt/dpa: <https://www.24hamburg.de/bilder/2023/01/10/92018726/30140771-sperrung-auf-der-a7-hamburg-staubildet-sich-2m8ECiP9tUfe.jpg>
- Vector graphic Hamburg city. Shutterstock: <https://www.shutterstock.com/de/image-vector/hamburg-city-modern-flat-line-style-1392121346>
- Vector graphic delivery truck. Flaticon: https://www.flaticon.com/de/kostenloses-icon/lieferwagen_1942615
- Vector graphic Package. PNG ALL: <https://www.pngall.com/wp-content/uploads/8/Cardboard-Box-PNG-Picture.png>
- City Logistic. IHK Region Stuttgart, Bopp, Pesch Partner Architekten Stadtplaner GmbH: https://motionist.com/wp-content/uploads/2021/10/dvv_motionist_studie.jpg
- Access restriction Jungfernstieg. Georg Wendt/dpa: https://cdn.prod.www.spiegel.de/images/7e6a693b-f1d6-4e08-8e51-152081cdb9c8_w948_r1.778_fpx56_fpy33.webp
- CEP-delivery vehicle parking in second row. Kirsten Havers: https://www.bund.net/fileadmin/_processed_/6/8/csm_lieferverkehr_berlin_56b2ab6a83.jpg