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LUNCH & LEARN

Mapping the Urban Logistics Ecosystem

NOVEMBER 14th, 2024

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Green logistics for a just net zero carbon economy in the North Sea Region

Program

1 **GLEAM NSR Intro & Updates:**
Paul Buijs, Associate Professor, University of Groningen

2 **City of Rotterdam:**
Jos Streng, Transport Planner & Michiel de Bok, Managing Partner at Significance

3 **City of Aarhus:**
Mette Eika Grønvald, Sustainability Consultant & Lousie Overvad Jensen, Program Leader

4 **City of Leuven:**
Marij Lambert, Project Coordinator

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GLEAM NSR Project Intro

PAUL BUIJS
Associate Professor, University of Groningen

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Mapping the Urban Logistics Ecosystem

WEBINAR | NOVEMBER 14th, 2024

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Green logistics for a just net zero carbon economy in the North Sea Region

Agenda

1 Introduction

2 Interreg North Sea Region Programme

3 Consortium Partners

4 Current Challenges

5 Aims

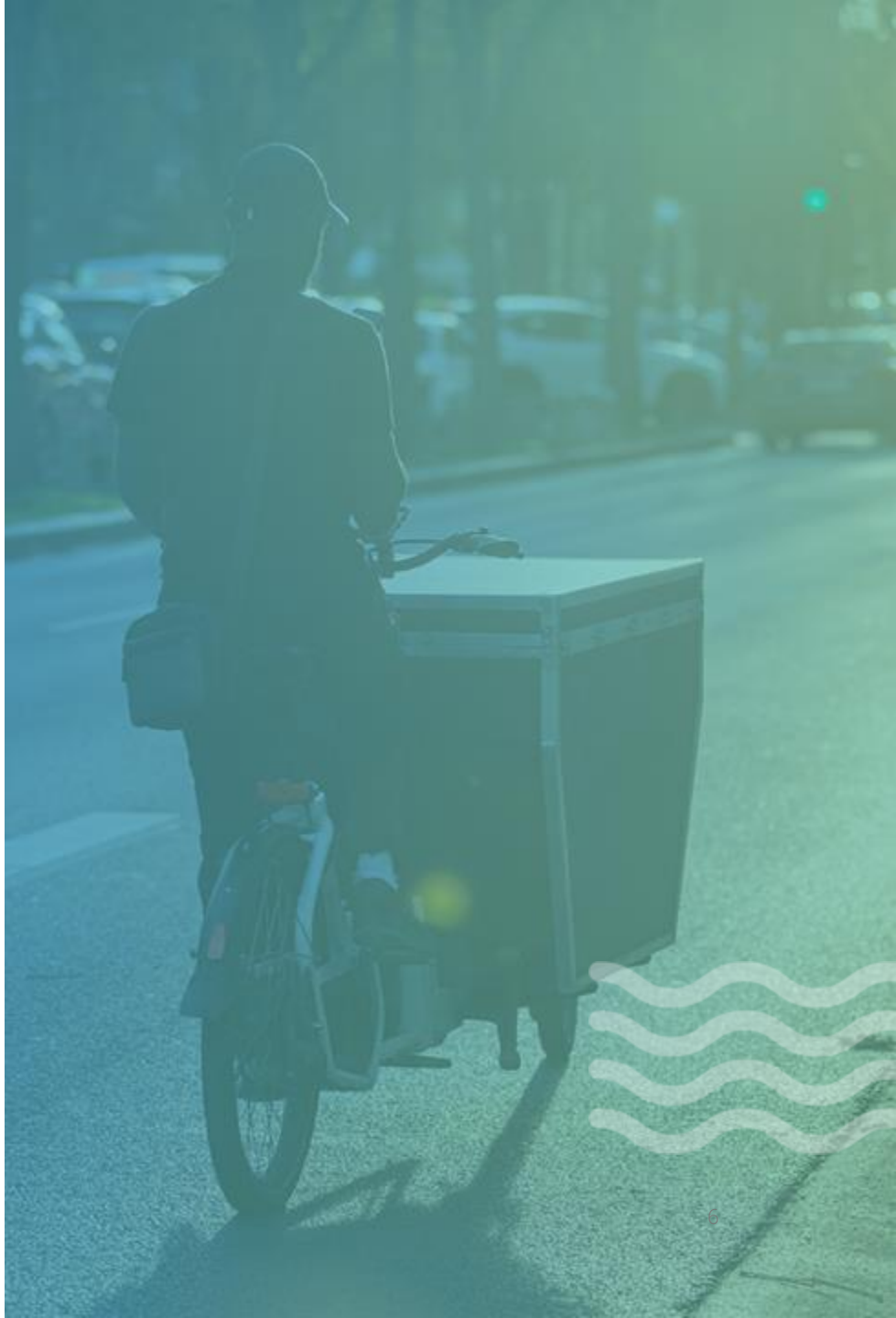
6 Objectives

7 Research Focus

8 SMEs and Urban Logistics

What is GLEAM NSR ?

- **3.5 years** Interreg North Sea Region project
- **Goal:** Facilitate the development and implementation of ambitious policies and governance frameworks to support sustainable urban logistics in an environment where both larger enterprises and SMEs are equipped to thrive.
- The project will create or upscale multi-level, multi-stakeholder collaboration platforms **to develop more efficient and equitable policies and actions** for just and green urban logistics.
- **Budget: €2.9 million**



Consortium Partners

rijksuniversiteit groningen

leuven

AARHUS KOMMUNE

LE HAVRE SEINE

GÖTEBORGS UNIVERSITET

LNC

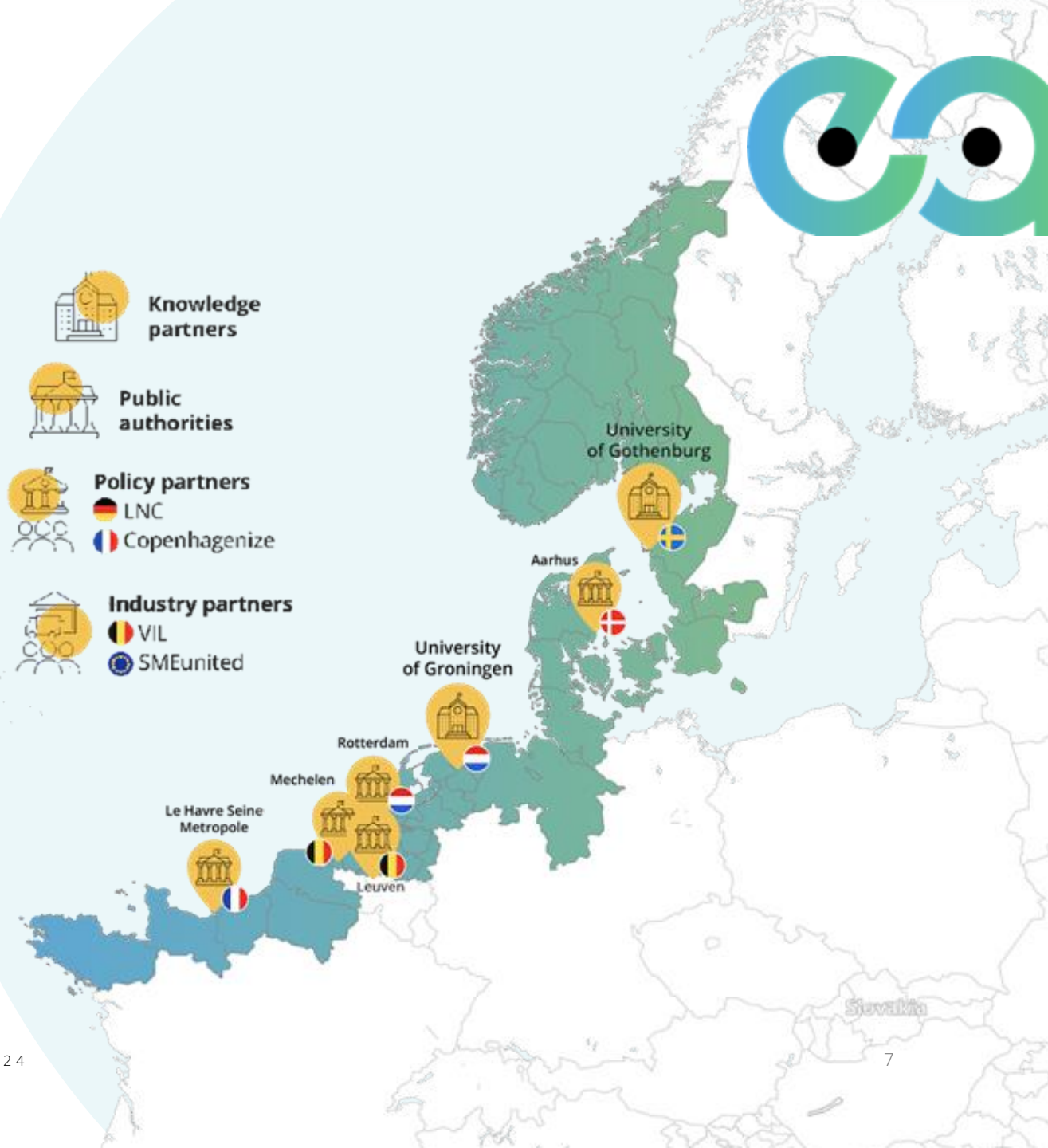
VIL EMPOWERING LOGISTICS

sme united

Gemeente Rotterdam

MECHELEN

COPENHAGENIZE Design Co.



Decarbonizing Logistics: Moving Forward with All Stakeholders Included

Lack of clear frameworks for widespread adoption and implementation.

Limited capacity of SMEs to adapt to rapidly evolving policies due to lack of awareness and resources compared to larger corporations.

Absence of consideration for the needs of all the diverse actors involved in the logistics sector when developing large-scale projects, specifically the experience of SMEs.

Fostering Just and Green Urban Logistics: Towards Efficient and Equitable Initiatives

Ensure that both larger enterprises and SMEs are equipped to thrive in this new environment.

Foster an environment conducive to just and green urban logistics.

Create or upscale multi-level, multi-stakeholder collaboration platforms where the inputs of governments, academics, industry actors, and citizens will be used to develop more efficient and equitable policies and actions.

Developing Impactful and Accepted Climate-Neutral Transportation Policies

How

Collaborate intensively to share best practices, enhance existing strategies, and scale-up local initiatives, especially regarding the development of digital platforms.

Primary objective

Ensure that local authorities comprehensively grasp the needs of SMEs and craft climate-neutral transportation policies that are both impactful and widely embraced.

What is our project really about?

Mapping data of logistics landscapes and SMEs

- Data sources and logistics flows.
- Segmenting data sources to discern nuances across different urban logistics sectors.
- Identifying data sources on the role of SMEs in different urban logistics segments.

What is our project really about?

Mapping urban logistics policy instruments

- **Inventory of urban logistics policy instruments, including governance structures and digitization initiatives.**
- **Investigate the correlation between policy motivations and instrument selection to assess their implementation and effectiveness.**

Why the focus on SMEs?

- The logistics sector, responsible for 25% of transport related CO2 emissions, has a large share of SMEs and is very diverse.
- SMEs often lack the awareness, knowledge, and financial capacities to innovate their business operations to fit rapidly advancing transport decarbonization policies.

GLEAM NSR puts transportation justice at the heart of the urban logistics transition, striving to represent SMEs in policy and governance structures.

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City of Rotterdam:
Using simulation to analyze cargo bike scenarios

JOS STRENG Transport Planner
MICHIEL DE BOK Managing Partner at Significance

Agenda

1 Introduction

2 Methodology

3 Expected outcomes

1 Introduction

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Why mapping your urban logistics system?

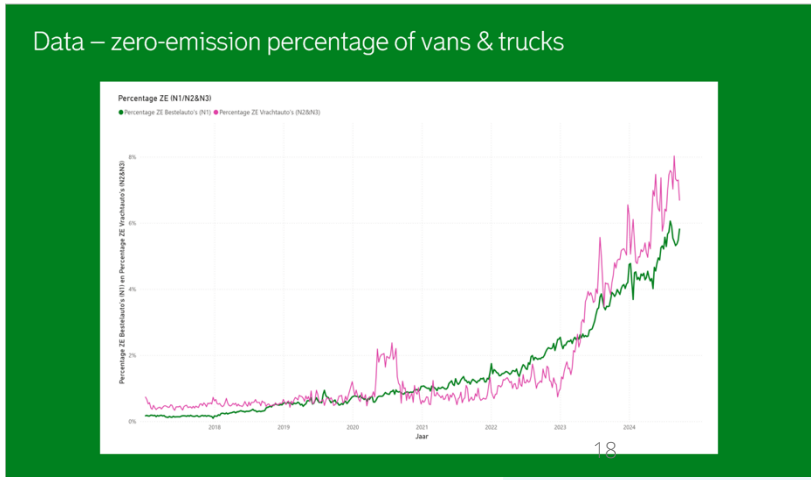
- Freight traffic (delivery of goods and services) is an essential element of urban economy. So there is public responsibility to assure the basic conditions.

- Motorized traffic in general, and motorized freight traffic as part of that traffic, burdens the city. So there is a public responsibility to (help) minimize this burden as far as possible

- To carry out this task, cities need to know what and whom they are talking about

Aspects of this mapping

- The actors in the logistics system. Here our approach is community building and management
  - *Covenant for the ZE zone*
  - *City Logistics Advisory Board*
  - *Logistic advisors (Ecostars)*
  - *www.logistiek010.nl*
- Vehicle fleet (composition, usage)
  - *traffic monitoring*
  - *traffic modelling (analysis+prediction)*
- The urban space involved (public and private)
  - *loading/unloading*
  - *consolidation*
- Developments within and around the city logistics sector
  - *EU projects and knowledge exchange*

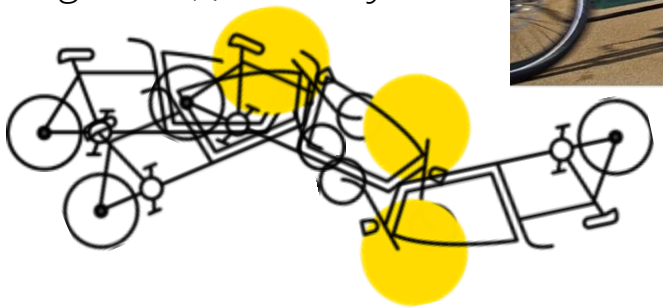


Mapping by model

- Emancipation of freight traffic of "traditional traffic models"
  - *TFS development in EU-project HARMONY*

- Keeping this model up to date
  - *integration of LEVVs and cargo bikes in the model concept*
  - *mapping the potential modal shift per logistic segment (cooperation with RUG-partner)*

- Using the model to analyse policy issues (use case)
  - *What if all vans that <u>could</u> be substituted by cargo bike(s), actually <u>would</u> be substituted?*



2 Methodology

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Methodology

Starting point for the simulation use-case is the Tactical Freight Simulator (TFS), developed for Rotterdam in project HARMONY.

Key design principles:

- Agent-based: producers, consumers, carriers, public administrators.
- Simulates logistic decision behind urban freight demand.
- Evidence based: using available transport data.

Developed and applied in H2020 projects: HARMONY, LEAD, URBANE

Shipment & parcel demand module

- Producer/supplier choice
- Shipment size & vehicle type

Scheduling module

- Tourformation
- Time-of-delivery choice

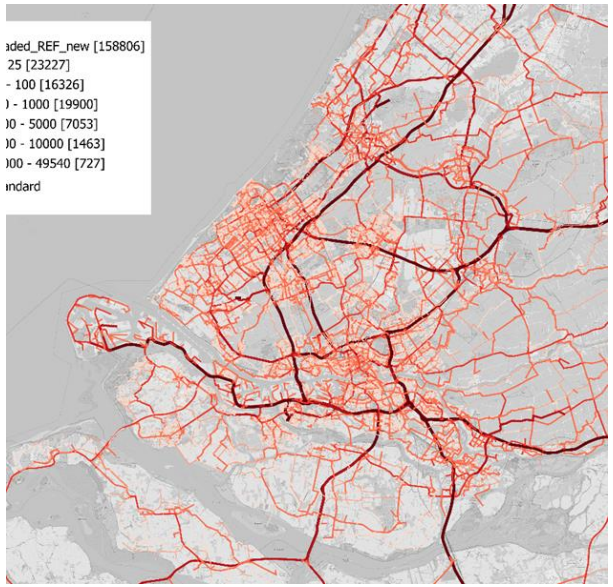
Networkmodule

- Routechoice
- Emissions

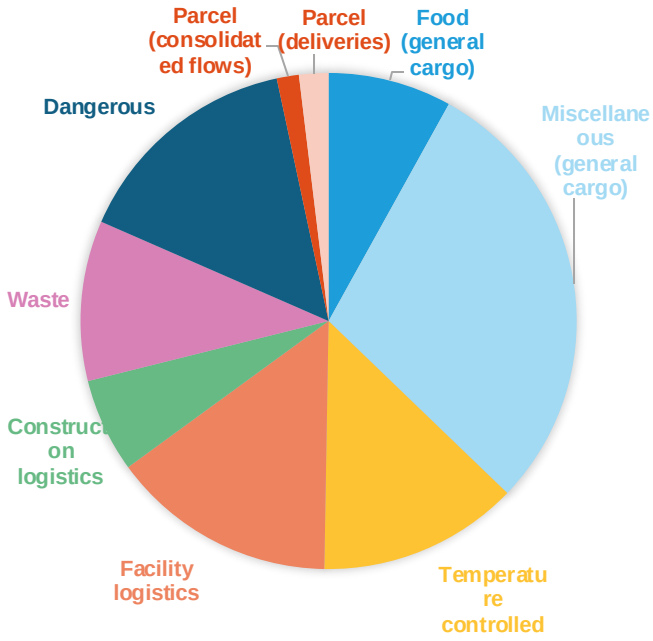
Type of use

The TFS provides a description of urban logistics ecosystem in Rotterdam

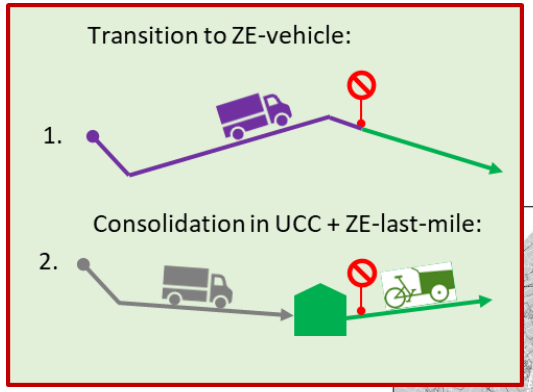
Delivery trucks on the network:

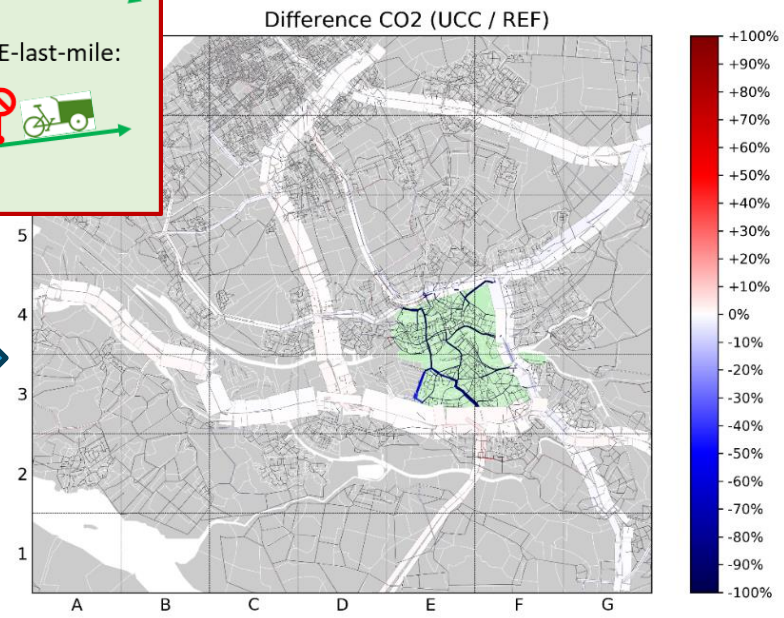


Vehicle kilometers (in Rotterdam):



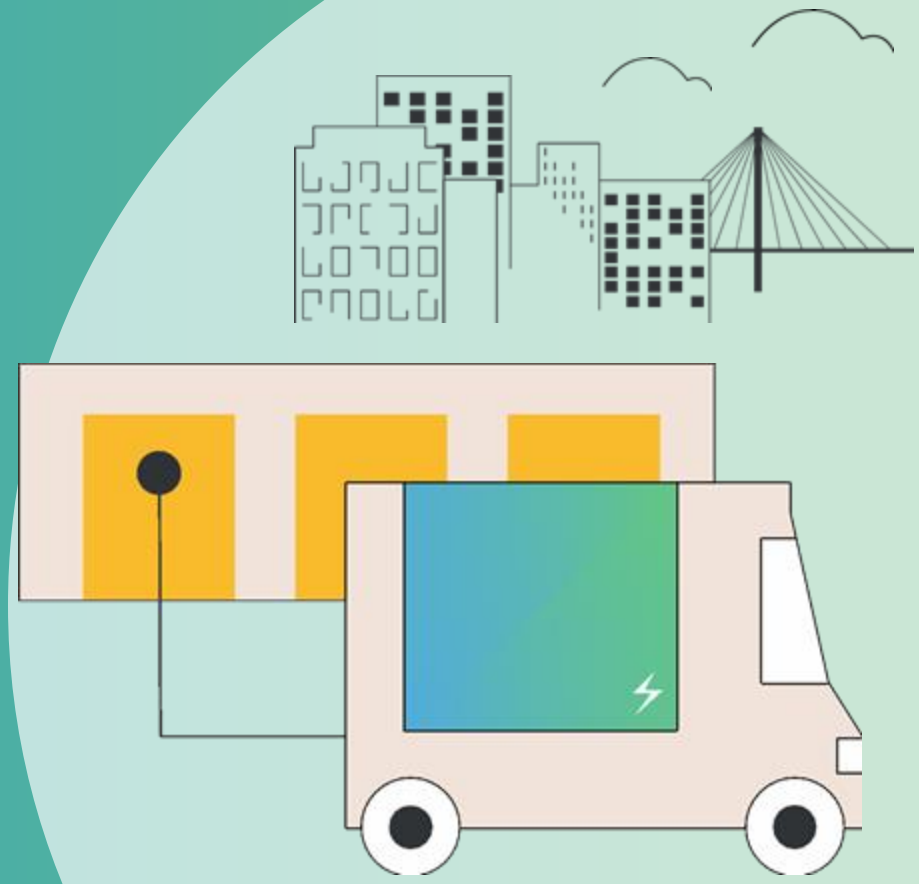
The simulator is used to calculate various KPI's to measure impacts of policy interventions, e.g. zero-emission zone





* Linkwidth is shown proportial to traffic intensity REF (max. = 42317 freight vehicles/day)

3 Expected outcomes



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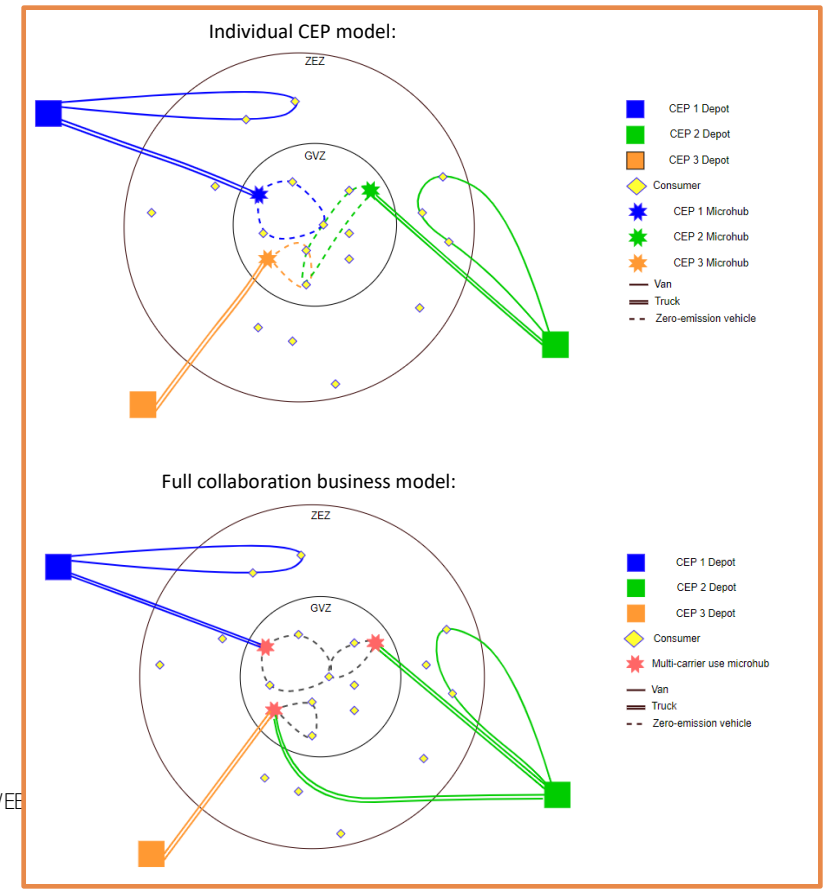
Simulation of cargo bike scenarios

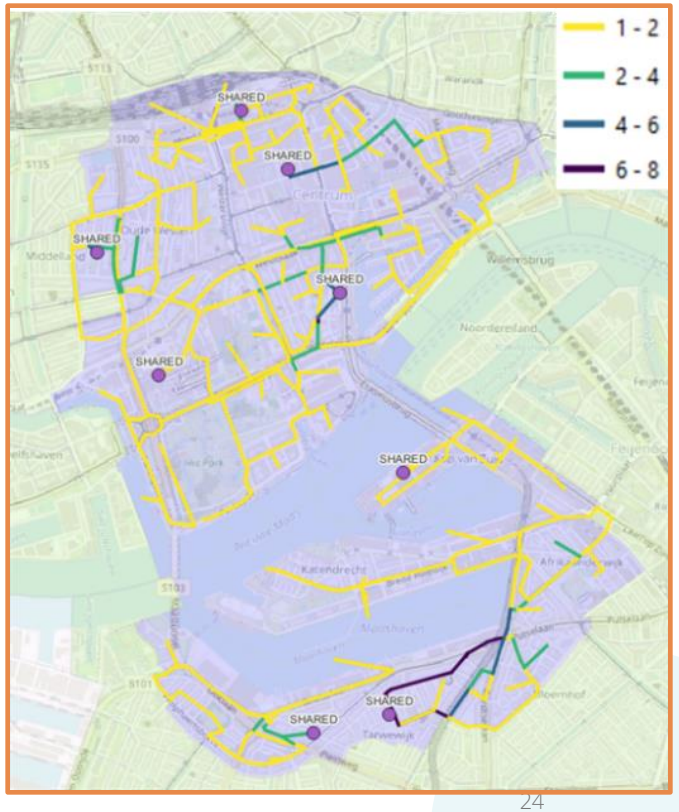
What are the impacts on urban traffic and livability under different policy design options?

HUB locations

Business models



Output: KPI's



Challenges

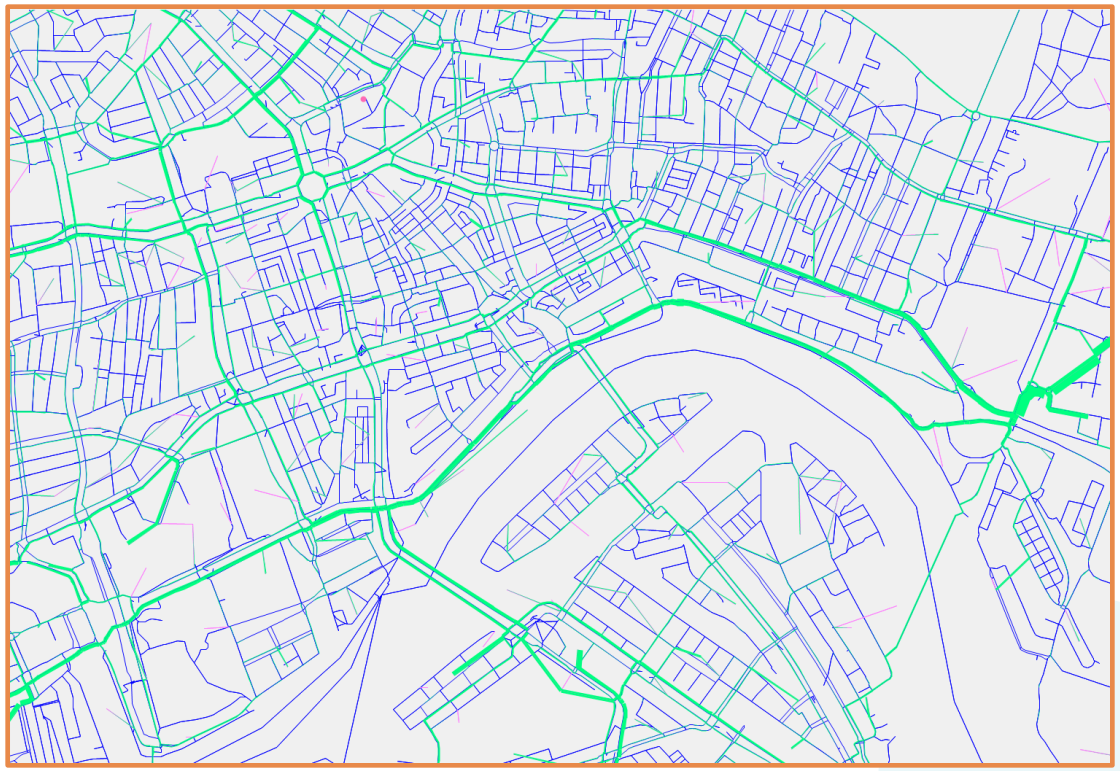
A previous study estimates *560 extra cargo bike tours* for parcel deliveries in the city center on a daily basis to replace 44 delivery vans.

What are impacts on bottle necks in bicycle network?

What are impacts on parking pressure on local walkways?

Particular modelling challenges:

- Cargo bikes have different route choice preference
- Need for a local assignment of trip ends



Digital bicycle network for Rotterdam

Key take-aways

A detailed simulation model for urban logistics is used to map the urban logistics ecosystem in Rotterdam.

Simulation is used as a tool to design plausible cargo bike scenarios for clean city logistics in Rotterdam

Research will contribute to:

- Formulation of cargo bike scenarios
- Network assignment of cargo bikes
- Generation of cargo bike KPI's:
  - Bottle necks in the cycle network
  - Parking pressure in urban streets

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Q & A

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City of Aarhus:
Analysis of Aarhus SMEs' Motor Vehicles

METTE EIKA GRØNVALD Sustainability Consultant
LOUISE OVERVAD JENSEN Program Leader

Agenda

1 Short intro to City of Aarhus

2 Analysis of Aarhus SME's Motor Vehicles

3 Next step

1

Short intro to City of Aarhus

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City of Aarhus – where is it?

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Gemeente Rotterdam | MECHELEN | COPENHAGENIZE Design Co.

A bit about Aarhus

- Second largest: The second largest city in Denmark with 367,000 inhabitants and 1.4 million in Greater Aarhus. Estimation to reach 400,000 inhabitants by 2030.
- Young city: Home to more than 50,000 students and a university. More than half of the population in the inner city are between 20-29 years old.
- Job Growth: Significant job creation in Aarhus between 2017 and 2022, especially in the private sector, with nearly 17,000 new full-time positions.
- International container port: Denmark's international container port with 56% of Denmark's total container traffic is located in Aarhus.

Green mobility - The bigger picture

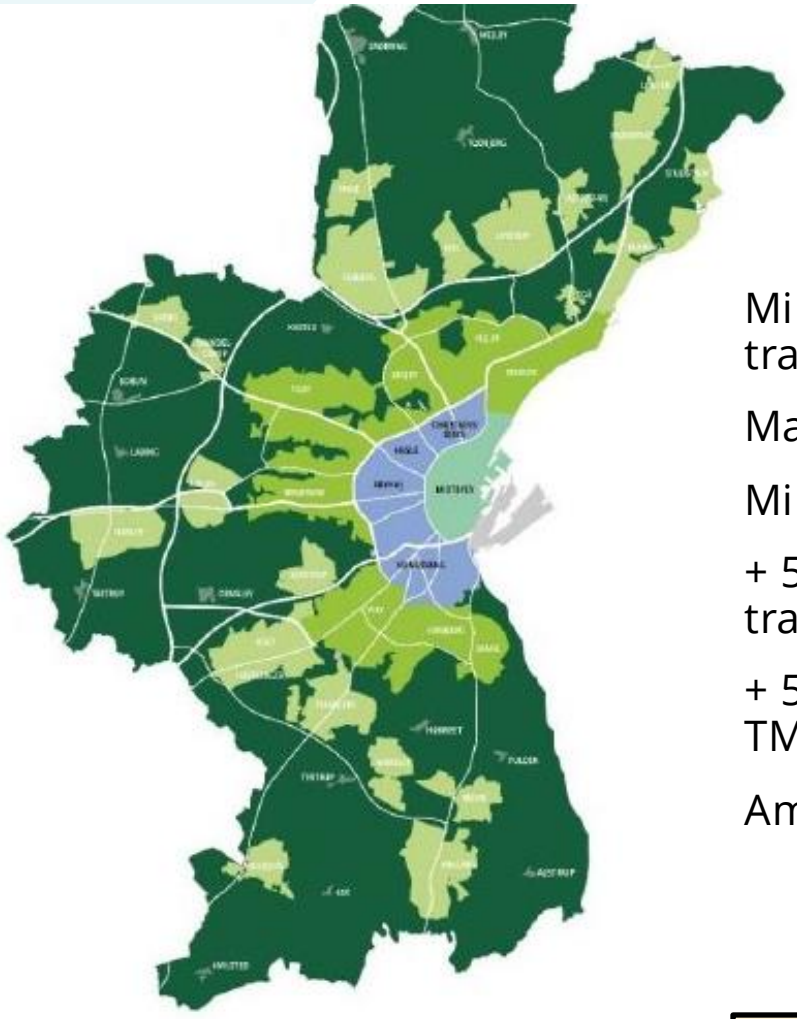
GOAL: CO2-neutral in 2030

- 270,000 tons CO2 reduction in transport in 2030

New GREEN MOBILITY PLAN

- Our largest mobility plan ever
- Investment of more than 130 mio. Euro
- First mobility plan with no investments in new large roads
- First plan with political binding targets

The bigger picture



Min. 60% trips by public transport, bike or walking.

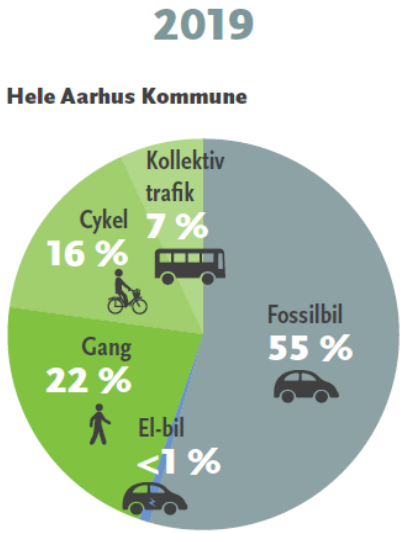
Max. 20% trips in fossil cars

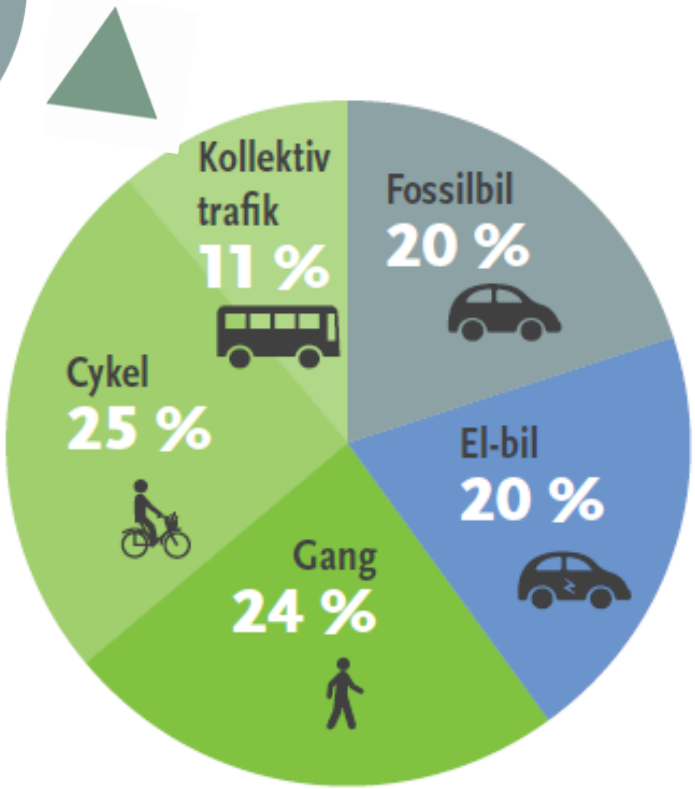
Min. 37% electric cars

+ 50% passengers in public transport

+ 50% trips on bike (25% i TMF)

Amongst others…





Consequences for the SMVs?

2

Analysis of Aarhus SME's Motor Vehicles

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Purpose of analysis

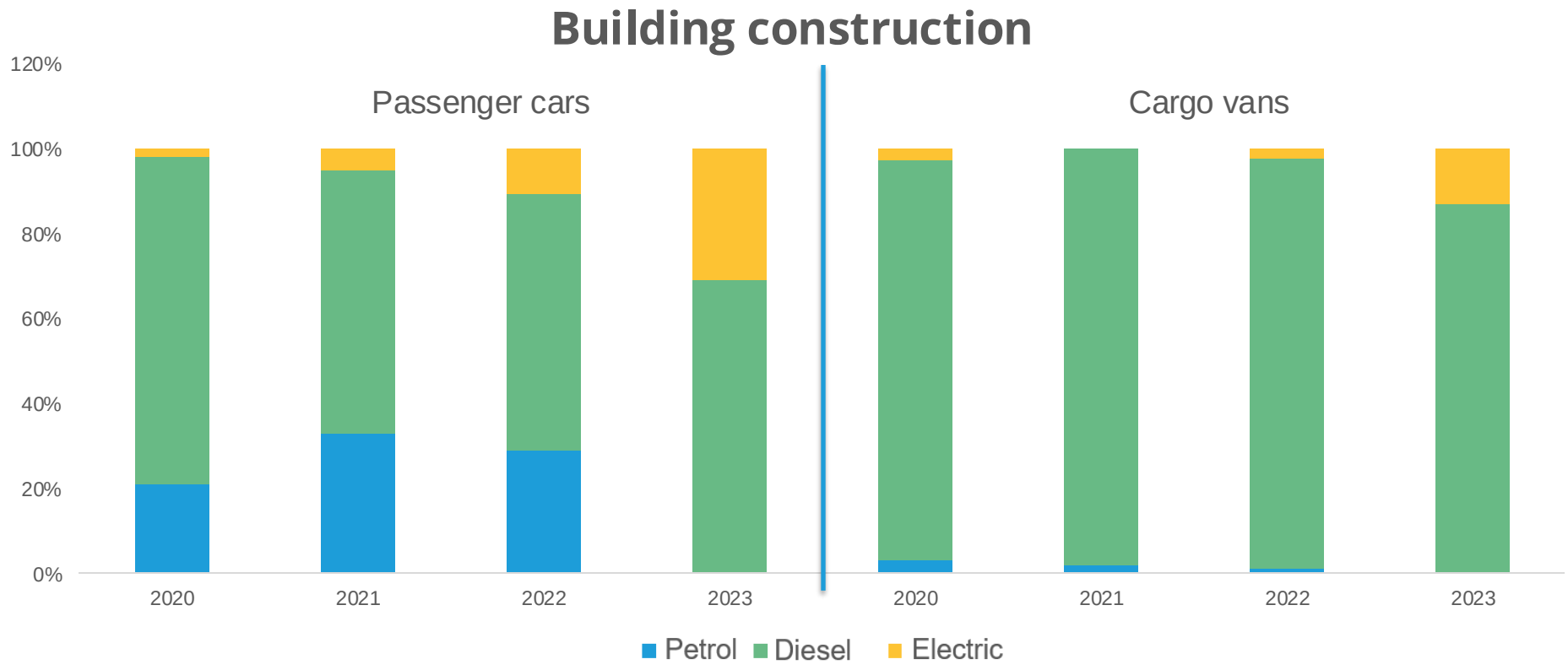
- Getting an overview of what industries have the most vehicles in Aarhus and whether or not they have started to replace their fleets with zero-emission vehicles
- Identify target groups for dialogue meetings in the GLEAM project

What we did

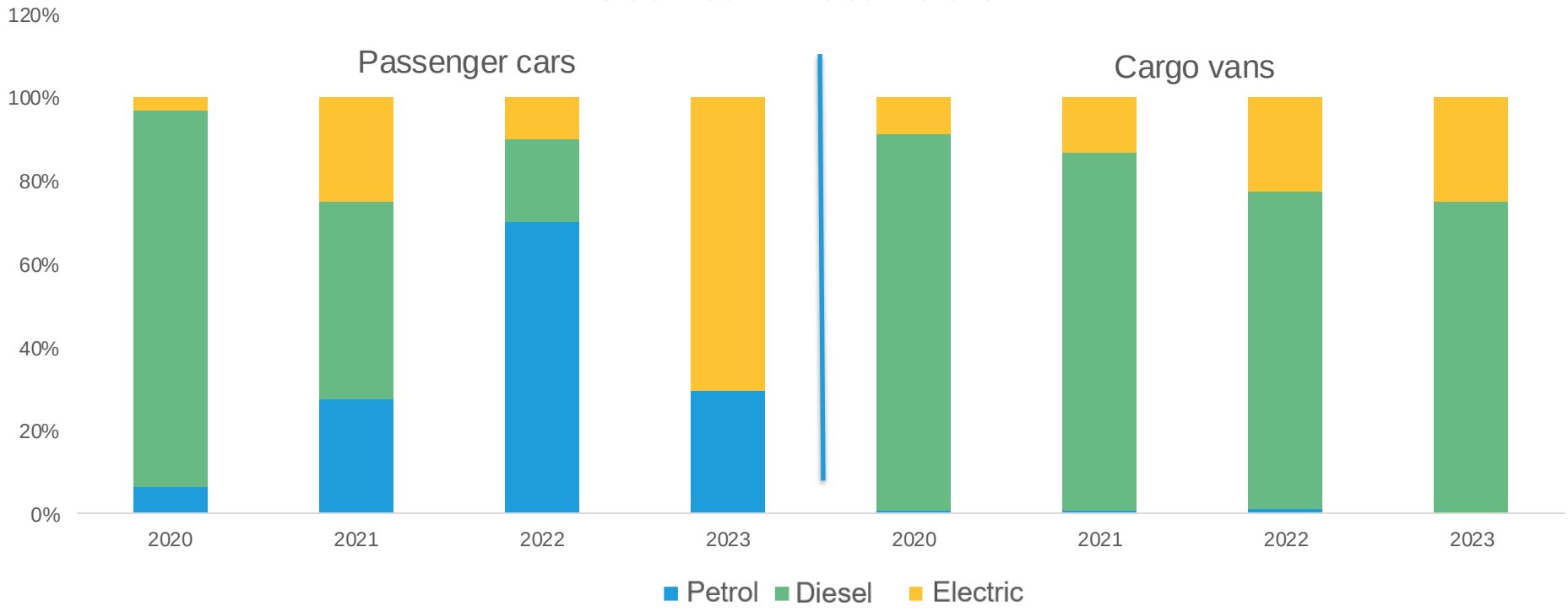
- **Data source:** Bilstatistik.dk
- **Data**: Car-registration data for company-owned vehicles from 2013-2023
  - Excluding companies selling and leasing cars
  - Sources of error: Leased vehicles is not part of the data
- **Most vehicles - assumption #1**: Industries that have registered the most cars within the last 10 years is an indicator for having the largest pools of vehicles
- **Have or haven't begun to replace - assumption #2**: Industries which haven't registered electric vehicles within the last four years is an indicator for not having started to replace their fleet of vehicles to electric vehicles and vice versa

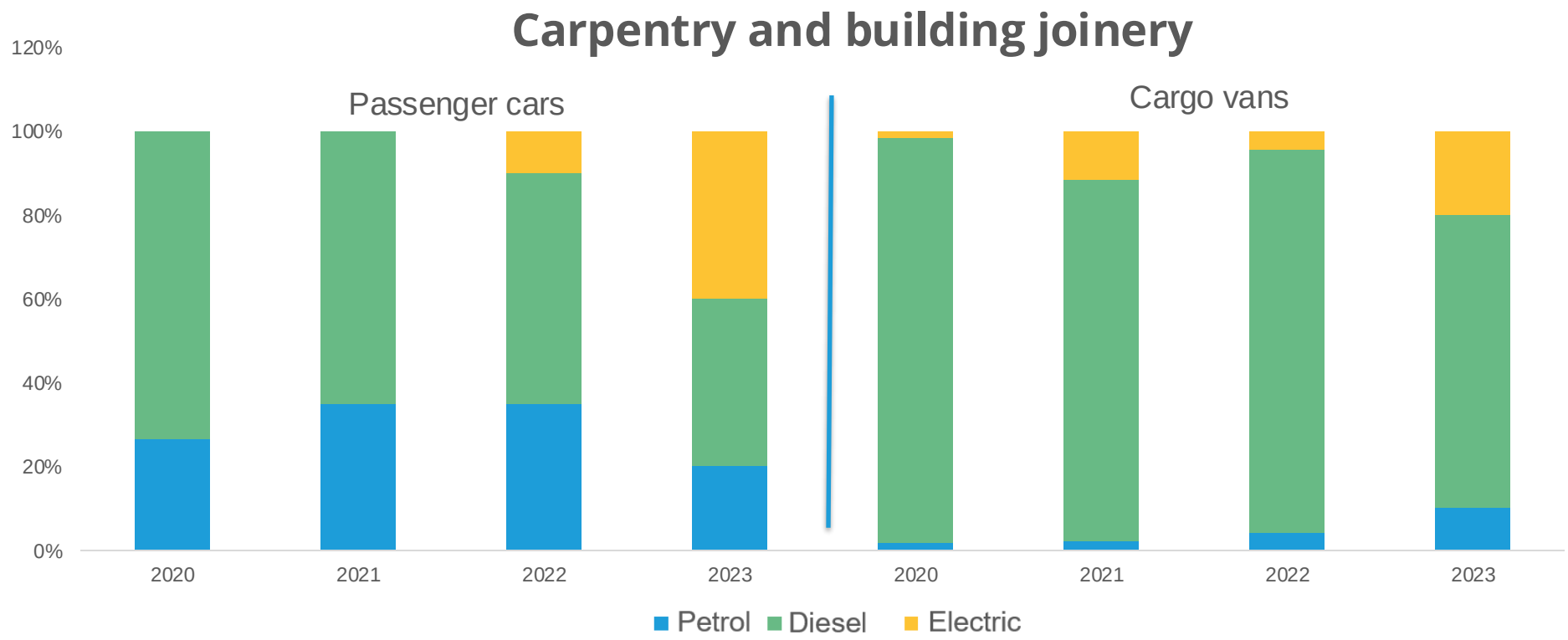
Industries with most registered vehicles

	Industry	Number of new registrations from 2013-2023
1	Building construction	2183
2	Electrical installation	1891
3	Other retail trade in non-specialized stores	1594
4	Carpentry and building joinery	1493
5	Wholesale trade in wood, timber, and building materials	1014
6	Other research and experimental development in natural science and technology	998
7	General public services	916
8	Landscape care	872
9	Construction of railways and underground railways	846
10	Road cargo transport	716
11	Mechanics etc..	700
12	Wholesale trade in other machinery and equipment	691
13	Plumbing and HVAC services	650
14	Manufacture of wind turbines and parts	629
15	Dairy and cheese production	558
16	General cleaning in buildings	533


Building construction
Passenger cars
Cargo vans
120%
100%
80%
60%
40%
20%
0%
2020
2021
2022
2023
2020
2021
2022
2023
Petrol
Diesel
Electric

Electrical Installation




Carpentry and building joinery
120%
100%
80%
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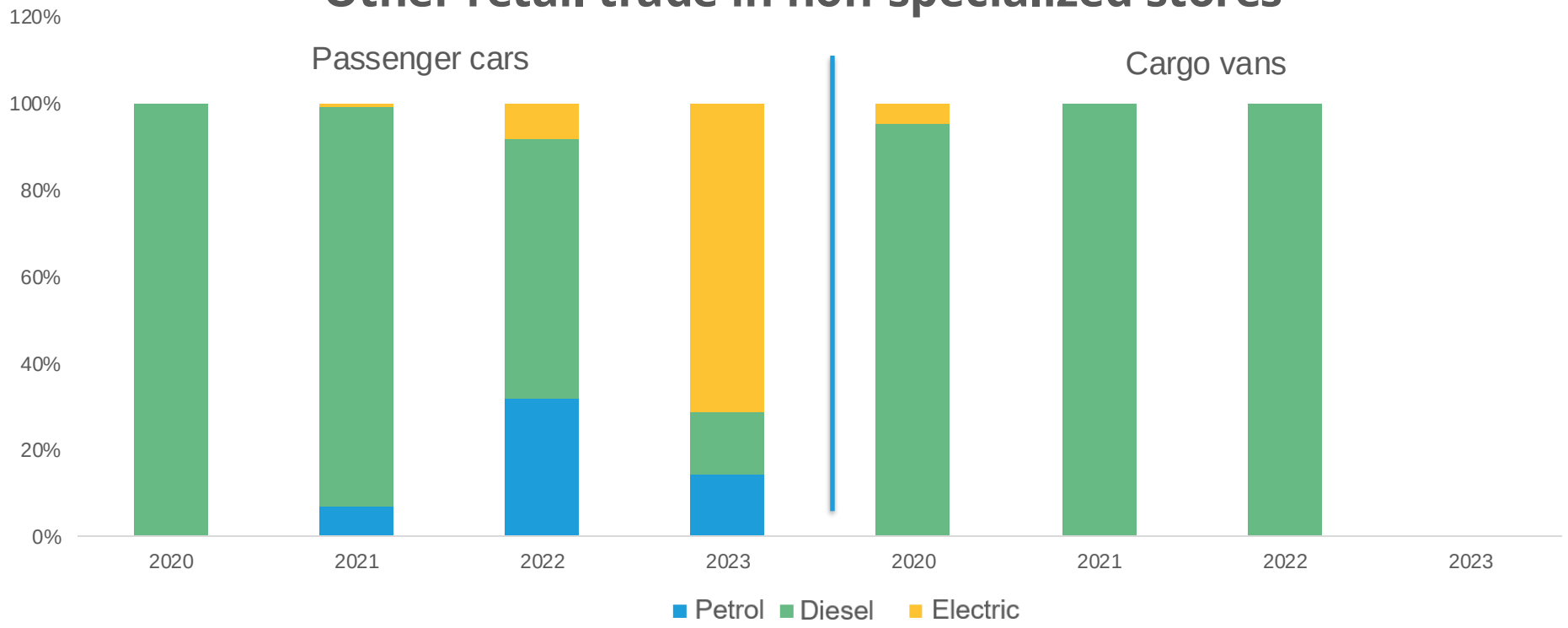
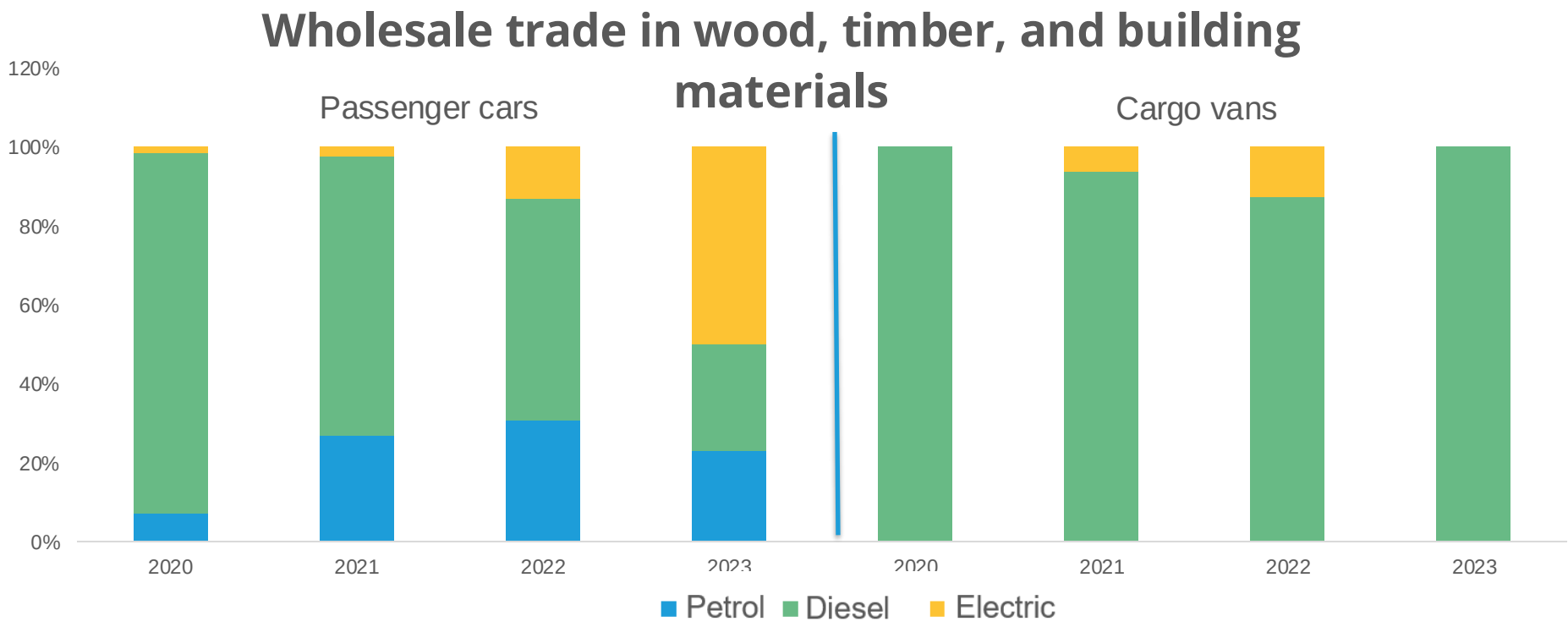
40%
20%
0%
Passenger cars
Cargo vans
2020
2021
2022
2023
2020
2021
2022
2023
Petrol
Diesel
Electric

Other retail trade in non-specialized stores




Wholesale trade in wood, timber, and building materials
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120%
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80%
60%
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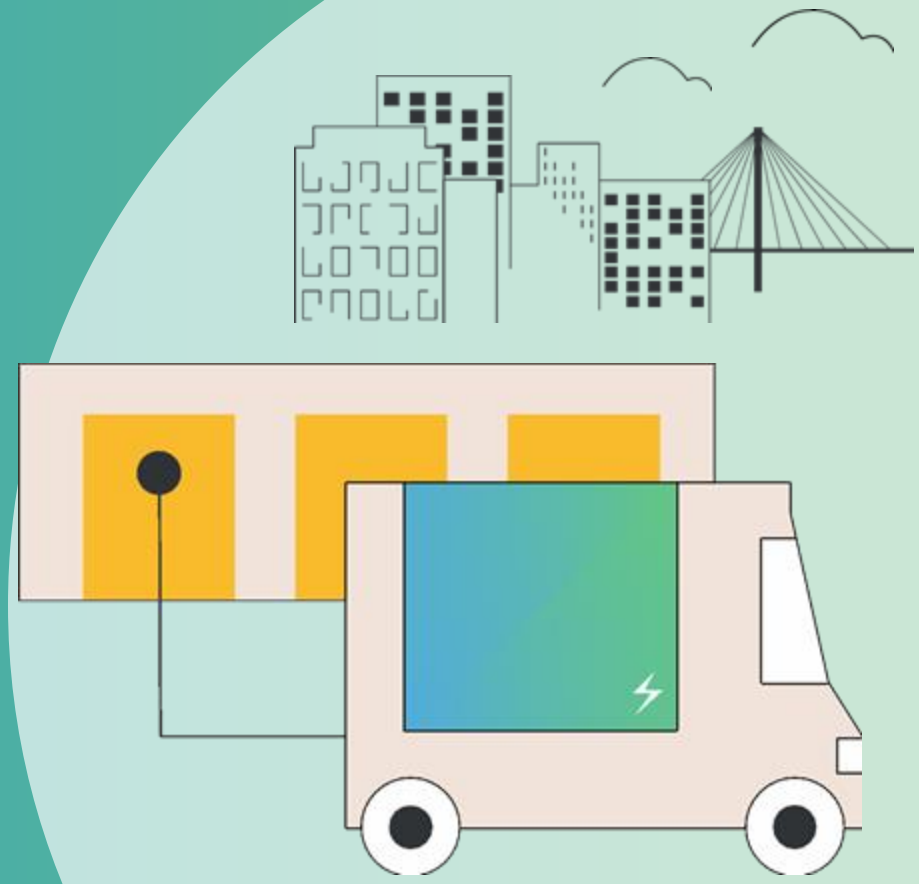
20%
0%
2020
2021
2022
2023
2020
2021
2022
2023
Petrol
Diesel
Electric

Preliminary conclusions

- New cargo vans:
  - Majority of new vehicles are diesel
  - Some industries have begun to buy electric cargo vans

- New passenger cars:
  - Positive development toward electric vehicles
  - Large share of new electric cars in 2023

3 Next steps



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Next step

- Contact companies leasing vehicles to find out which industries are leasing most vehicles – does this change our findings?
- Looking into each industry: Have the majority of companies started to buy electric vehicles or only a few? Which companies – large companies or SME's?
- Identify front-runner companies within each industry – potential for knowledge sharing with peers?

→ Choosing industries for dialogue meetings

→ There seems to be a target group around the tradesman industry with different sub-groups: carpentry, electricity etc

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City of Leuven

MARIJ LAMBERT Project Coordinator

Agenda

1 The urban logistics ecosystem in Leuven: facts & figures

2 Methodology of the city dialogues

3 Dialogue topic ideas

1

Urban logistics ecosystem in Leuven: facts & figures

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REBEL Group: a study of the current urban logistics ecosystem in Leuven

2022-2023: REBEL, VUB Mobilse/MOBI and the New Drive, commissioned by the Flemish Government (prep ZES).

- **Insight in current logistic flows for alle segments**
- Based on:
  - quantitative and qualitative data from Leuven and stakeholders per logistic segment
  - simulations of delivery profiles (Digital Platform for City Logistics tool)
- Study conducted in 3 cities (Leuven, Antwerp and Kortrijk) representing the “average Flemish city”
- Demographics Leuven: 100.000 inhabitants + 50.000 students

REBEL Group: a study of the current urban logistics ecosystem in Leuven

A **simulation model** was used to **estimate**:

- Volume of goods delivered weekly to a specific destination
- Vehicle types used to transport those volumes
- Routes
- Number of kilometers by logistics segment (by vehicle type)
- Share of trips and deliveries by logistics segment
- Emissions per logistics segment

- In the **local context** of Leuven's retail sector, number of households and road infrastructure!
- Analysis for the **city center** only!

Facts & figures city logistics

- 40.000 km/week
- 11.000 deliveries/week

Heatmap retail, hospitality and catering in Leuven
Source: 2023, REBEL, Digital Platform for City Logistics

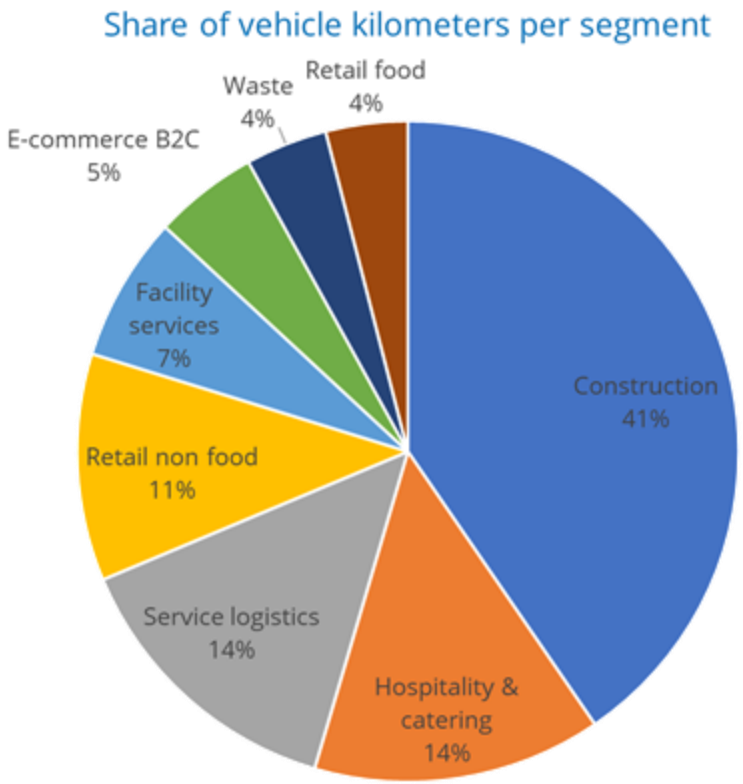
Facts & figures

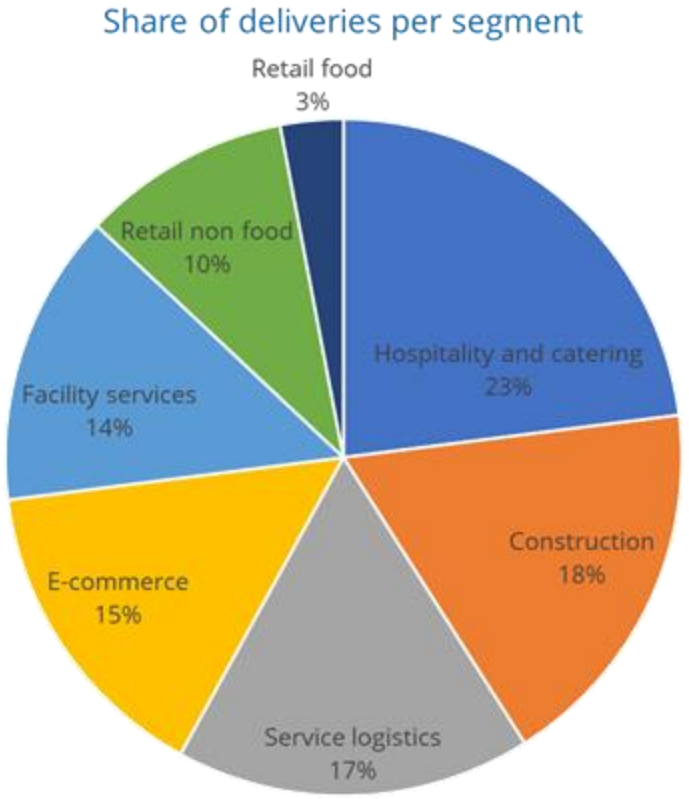
56% vans + 44% trucks

kilometers per week per vehicle type per logistic segment

	N1	N2/N3
Retail Food	82	1 542
Retail Non-Food	2 393	2 478
Horeca	540	5 566
Service logistics	5 592	-
Waste	-	1 677
Movers	225	174
Construction	12 470	4 698
E-Commerce	2.241	-
Facility services	718	2 416
Total week	24 262	18 551
Total year	**1 261 612**	**964 655**

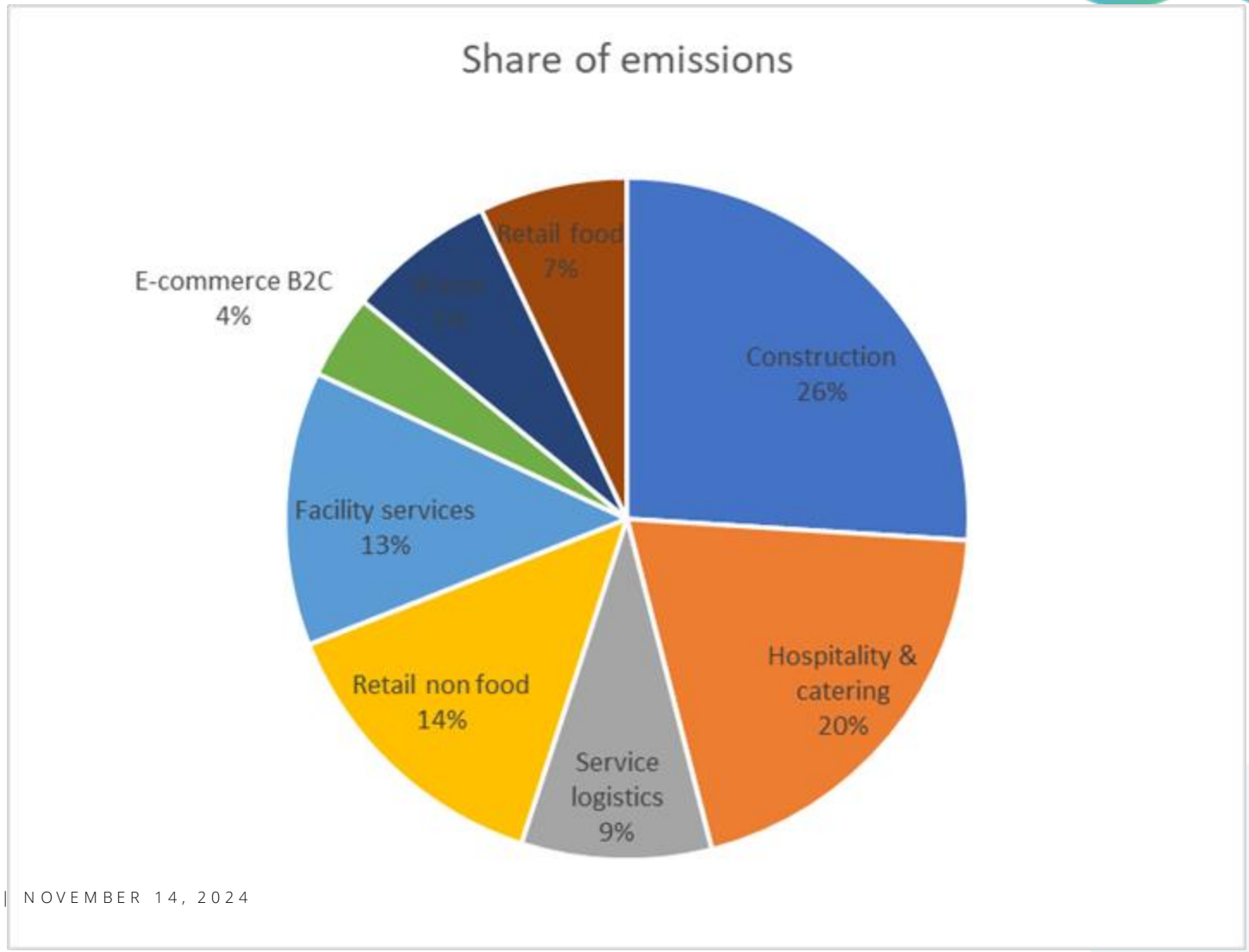
Facts & figures





Facts & figures

- Takes into account vehicle type and mileage
- **Retail food, catering, waste collection and facility deliveries** cause disproportionately more emissions than their share of vehicle kilometers



Conclusion: focus transition to green city logistics on 4 logistic segments

- Catering (horeca):
  - Catering industry is very present in Leuven, in a concentrated area
  - Mainly delivered in (refrigerated) trucks (slow electrification)
  - Largest share of deliveries, large share of kilometres and trips
- Construction logistics :
  - Largest share of kilometres and journeys: electrification only ensures cleaner kilometres, not fewer vehicle movements (on the contrary)
  - Large share of trucks

Conclusion: focus transition to green city logistics on 4 logistic segments

- Service logistics :
  - High share of kilometers and increasing number of households in the city
  - On street parking scarcity keeps service providers from servicing citizens
  - 50% of transport movements could be transferred to cargo bike
- Retail non-food:
  - High mileage share
  - Competition from large online players makes them vulnerable so efficiency gains are important
  - 55% of trade sector in Leuven
  - 42% delivered in trucks

Dialogue gaps for all 4 segments => which city dialogues & topics within the GLEAM project?

2

Methodology of the city dialogues

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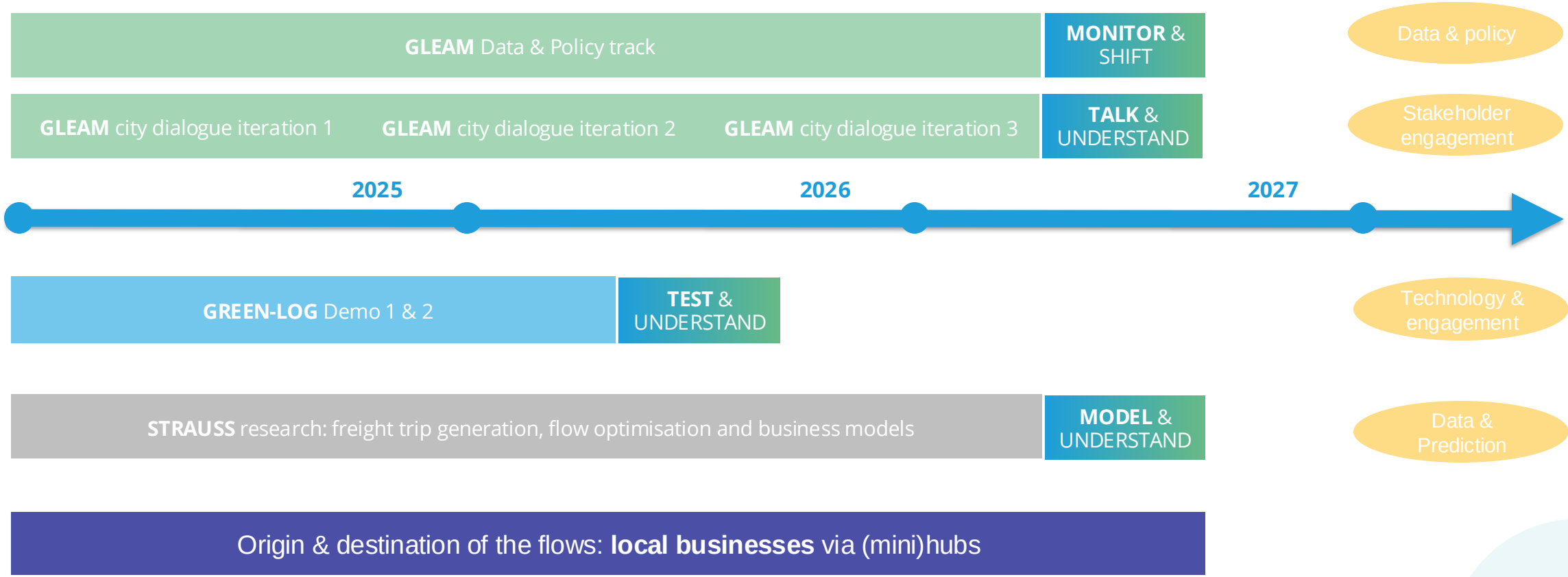
Timeline city dialogue

Outputs per step

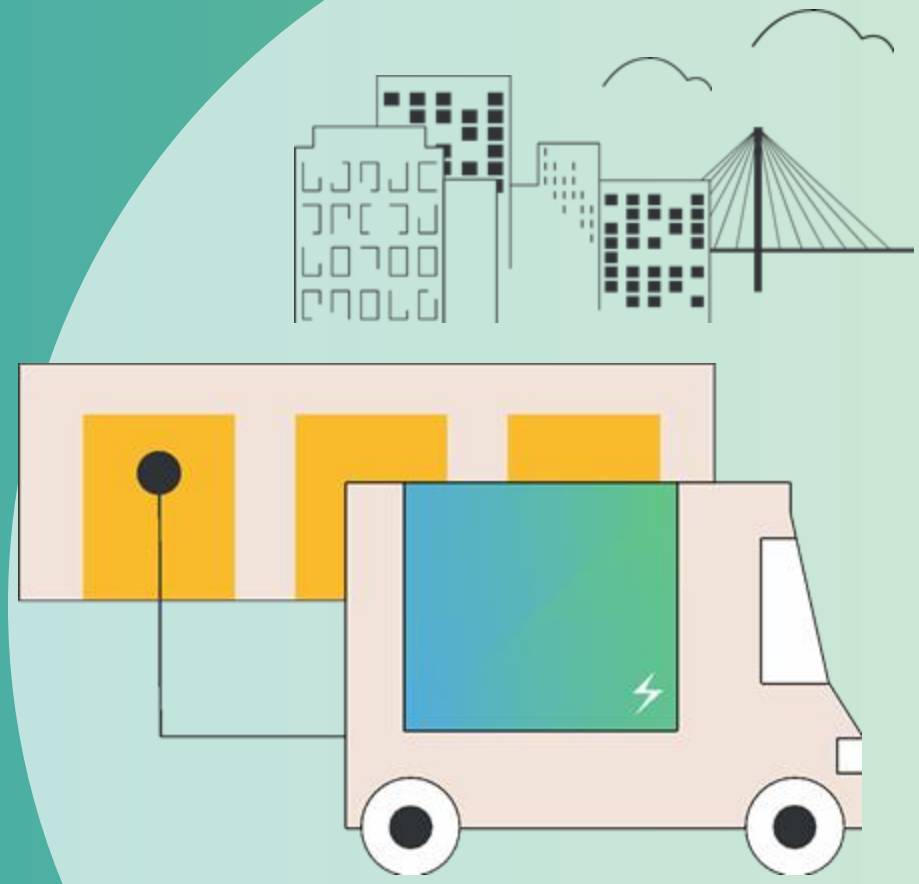
1. Mapping the dialogue gaps: selection of logistic segments with dialogue gaps:
    1. catering (horeca) as a Lighthouse city
    2. service & construction logistics as a follower city (Lighthouse Mechelen)
2. Identifying the dialogue stakeholders: list of companies and their contact details, industry organizations they belong to
3. Sparking the dialogue: (presentation of) library of best practices as a source of inspiration
4. Designing the city dialogues: preparation of the event (location, invitations, attendance list, program, format) in sync with assessment framework
5. Organizing the city dialogue: the actual event, with reporting and next steps
6. Assessing the city dialogue: full assessment of the dialogue and recommendations (practicalities/organization, communication channels, number and quality of attendees/registrants, goals, reporting, lessons learned, follow-up…)
7. Planning new city dialogues: high level content of each step in the next iteration + timing

=> Continuous and well focused dialogue

The bigger picture: interaction between GLEAM – GREEN-LOG - STRAUSS



3 Dialogue topic ideas



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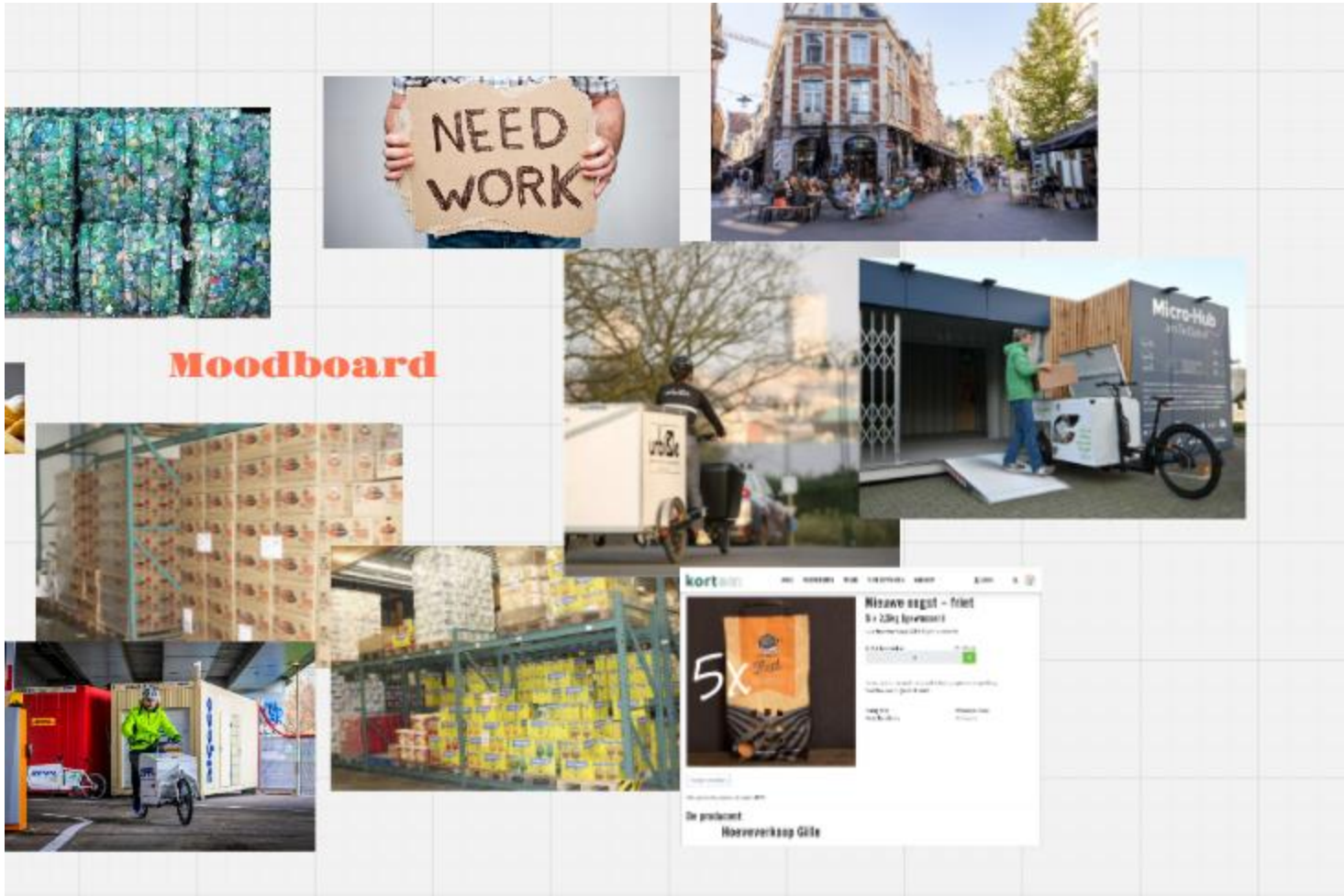
Horeca: Foodhub/UCC for consolidated last & first mile delivery?



Service logistics digital platform?

Needs:

- Citizens in dense city center need technicians
- Technicians need parking space and permits
- Local authority needs smart use of public domain

Solution:

- Platform on city website with trusted technicians willing to work in the city center
- (Automatic/facilitated) parking and access permit for selected technicians
- To be used by citizens (demand) and service logistic providers (supply) for CONSOLIDATED demand and supply
- Orchestrated by the local authority

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LUNCH & LEARN

Mapping the Urban Logistics Ecosystem

Q & A

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- Email *gleamnsr@copenhagenize.eu*

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Thank you!