

From Vision to Practice: Key Enablers and Measures to Achieve Zero-Emission City Logistics

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Background

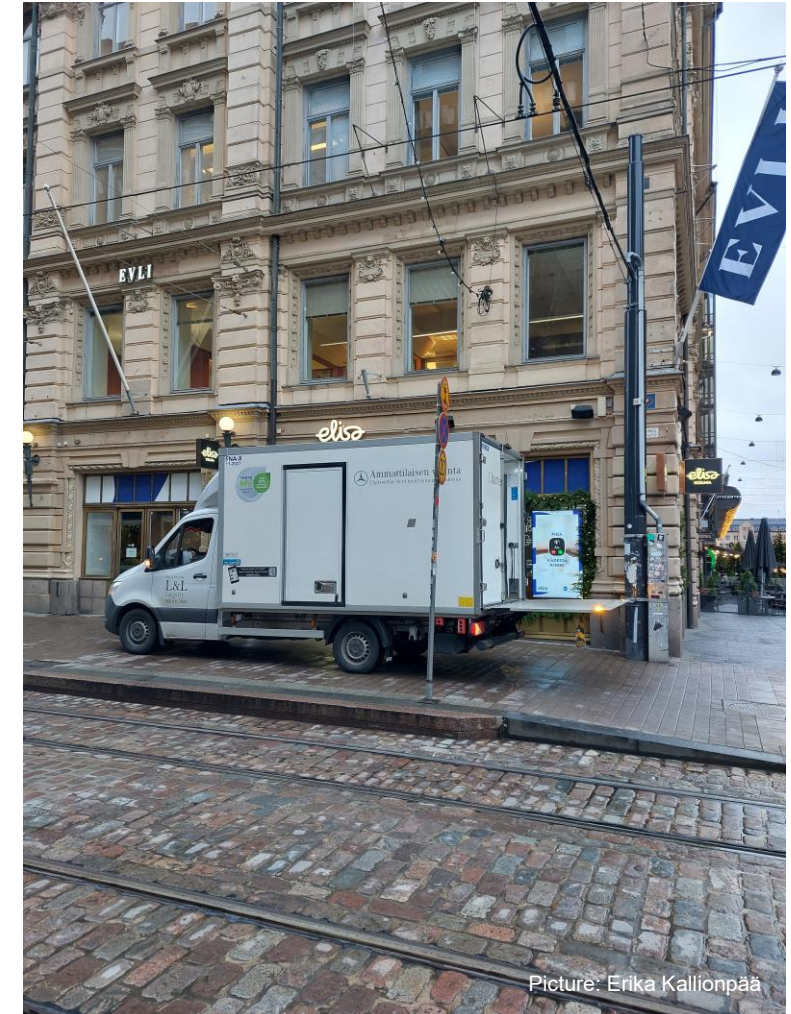
- EU has set the goal of being carbon neutral by 2050 and Finland by 2035
- Helsinki aims to reduce GHG emissions by 85% by 2030 and to achieve net-zero carbon emissions by 2040 at the latest
 - Traffic was identified as the biggest source of emissions
 - Addressing the set targets requires several green actions and measures from the transport sector and the development of city logistics
- MADLESS –project
 - Meta-Analysis Driven Logistics Emission Solutions through Stakeholder Collaboration
 - The City of Helsinki as the lead implementer, Transport Research Centre Verne from Tampere University as a partner
 - Funding: Horizon Europe / NetZeroCities / Enabling City Transformation – Program
 - Project duration: 3/2025 – 9/2026



Picture: Paul Williams

Aim and research questions

- Purpose of this study is to support the development of zero-emission city logistics in Helsinki
- Aim is to study stakeholders' views and perceptions about the key enablers and measures to develop zero-emission city logistics
- Research questions
 - 1) *What are the key enablers of zero-emission city logistics development?*
 - 2) *What measures do stakeholders perceive as most impactful for advancing zero-emission city logistics?*



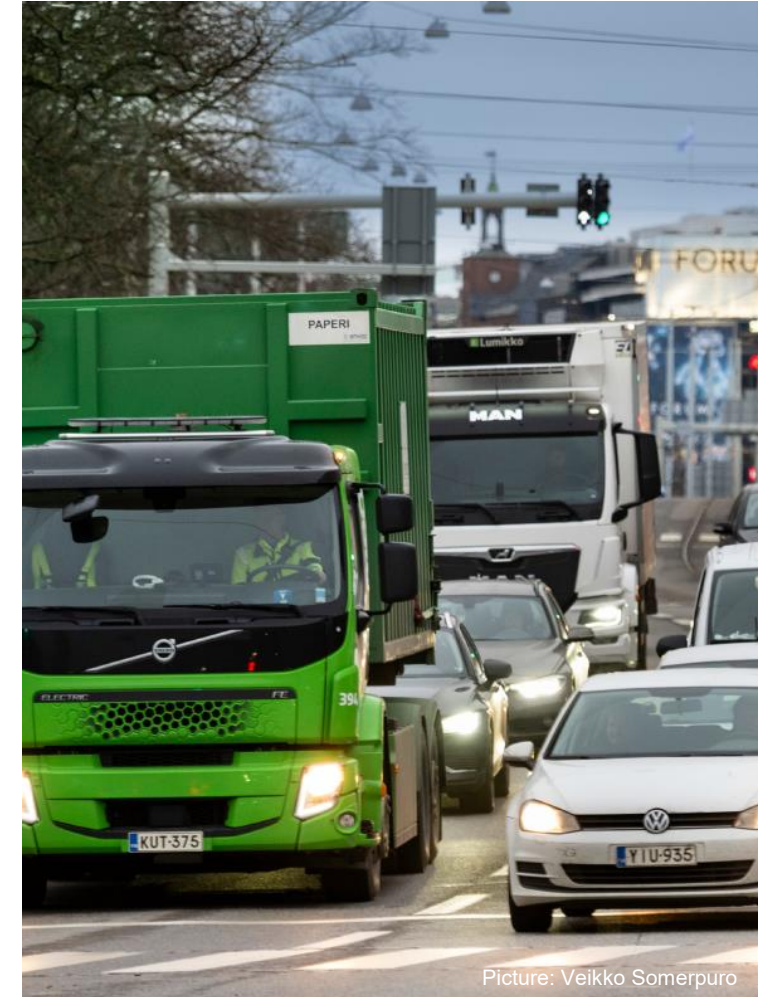
Methods

Background: MADLESS -project

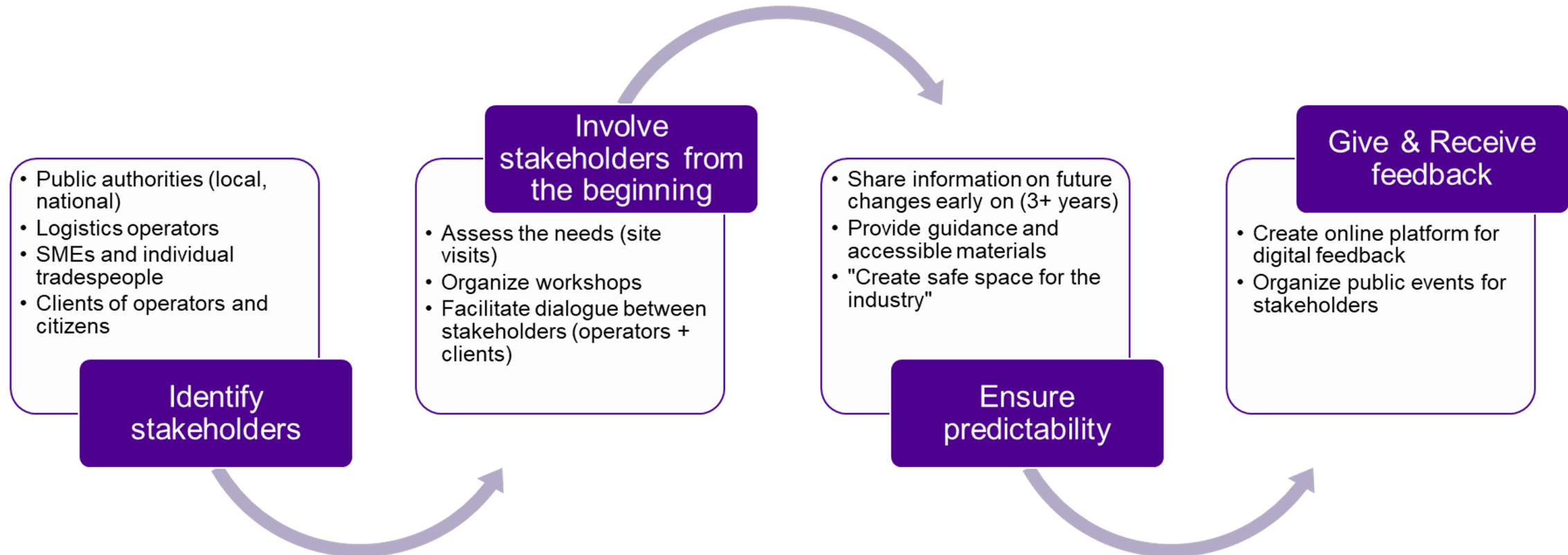
- 3 stakeholder workshops, organized in 2025 & 2026
- Benchmarking, study trips to Stockholm, Göteborg & Hamburg
- 4 completed master's theses

Focus of this study:

- 2 stakeholder workshops
 - Organized in December 2025 and in February 2026, in Helsinki, Finland
 - Participants: trade and industrial companies, freight transport companies, authorities, consultants, city representatives & other experts
- Literature review

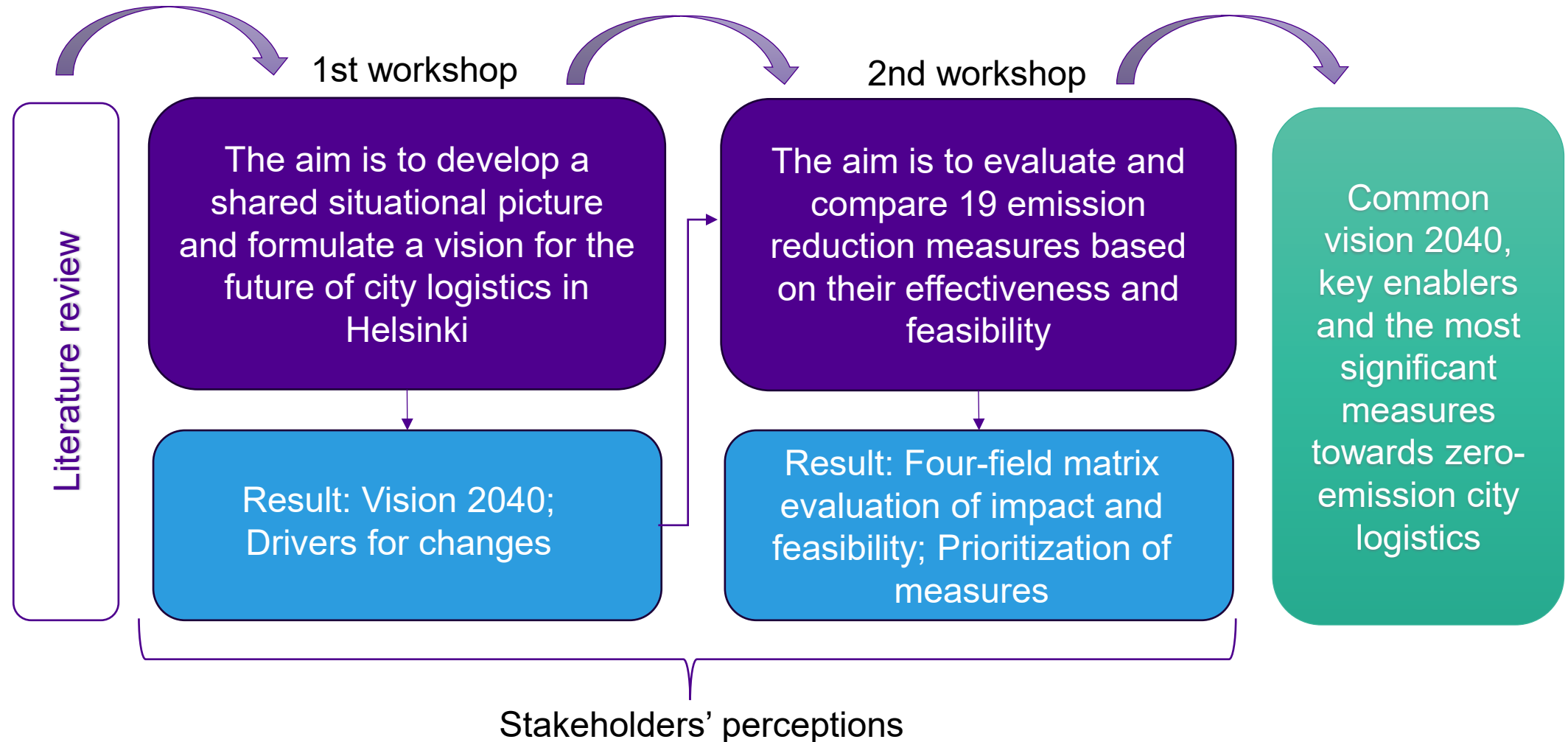


Stakeholder engagement



(Zhumabayeva, 2025)

Structure of the study - Workshop Analysis Process

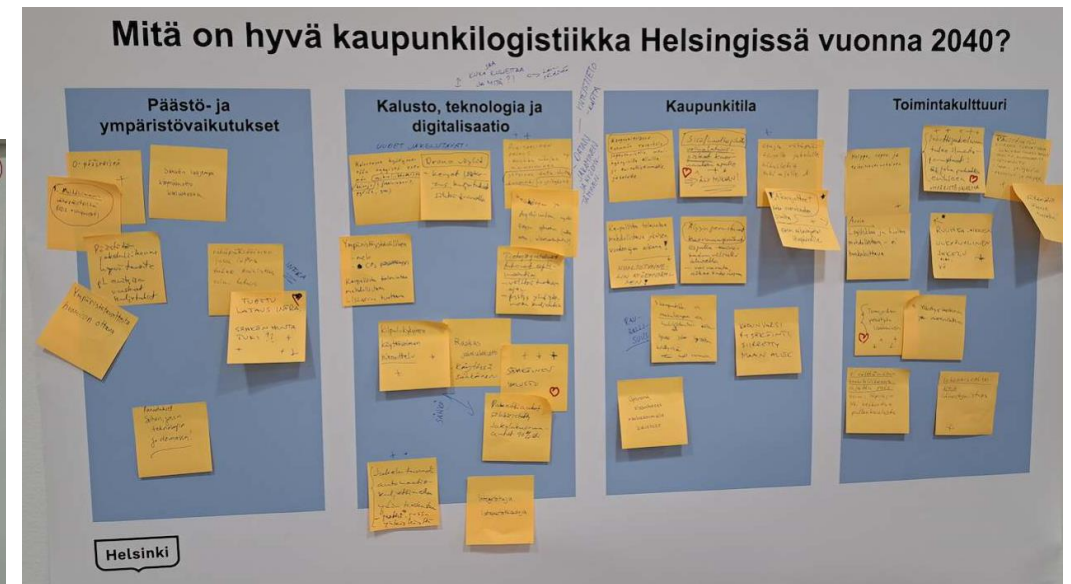
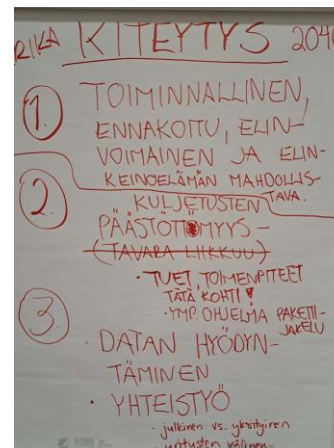


Creating a common vision for 2040



Picture: Lauri Rotko

- Group discussions: *What is good city logistics in Helsinki in 2040?*
- The vision was built around the following themes:
 - emission and environmental impacts
 - fleet, technology and digitalisation
 - urban space
 - operational culture

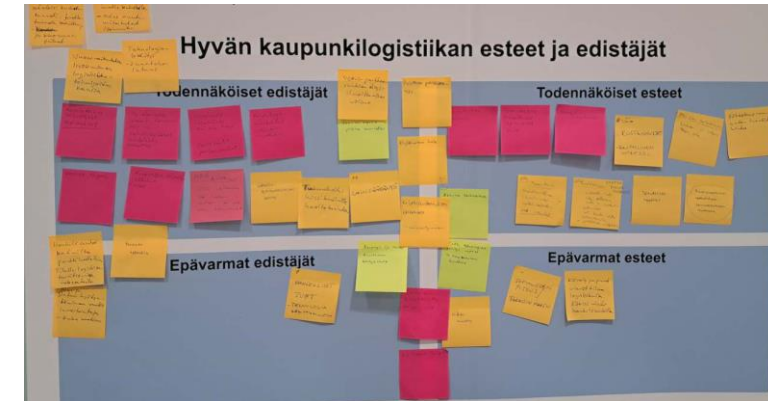


Vision for good city logistics in 2040

Emissions and Environmental impacts	Fleet, technology, digitalisation	Urban space	Operational culture
Greenhouse gas emissions from delivery traffic nearly zero	Electricity, biogas, and hydrogen established as energy sources	Sufficient loading and unloading areas; safe parking (not on sidewalks / bike lanes)	Permanent forum/working group with regular meetings; broad stakeholder engagement
Phased implementation of practices, considering limitations and exceptions	Charging infrastructure comprehensive and smart; reservation systems in use	Real-time information on loading places and reservation options reduces circling and unnecessary stops	Business-friendly and smooth operating culture, understanding companies' daily realities
Improving air quality and reducing noise, fine particles, and street dust	Quiet vehicle fleet, including control of noise from refrigeration units	Night-time deliveries supported by noise management and local practices; area-specific differences (city centre vs suburbs)	"Undriven kilometer" – reducing unnecessary driving, consolidated deliveries, denser distribution
A standard model for transparent emissions reporting, for both service providers and buyers	Predictability for investments: clear outlook for energy sources, infrastructure, and regulation; procurement criteria that guide investments	Space needs for depots, terminals, and logistics hubs; charging/fuelling networks as part of the whole	Continuous dialogue between the city and operators; low-threshold feedback and interaction
Emission reporting integrated into annual reporting	Real-time guidance of deliveries and AI-assisted route optimisation	Hubs and microhubs as last-mile solutions and sufficient space for parcel lockers	Regional cooperation across municipal borders; unified rules and governance strategies

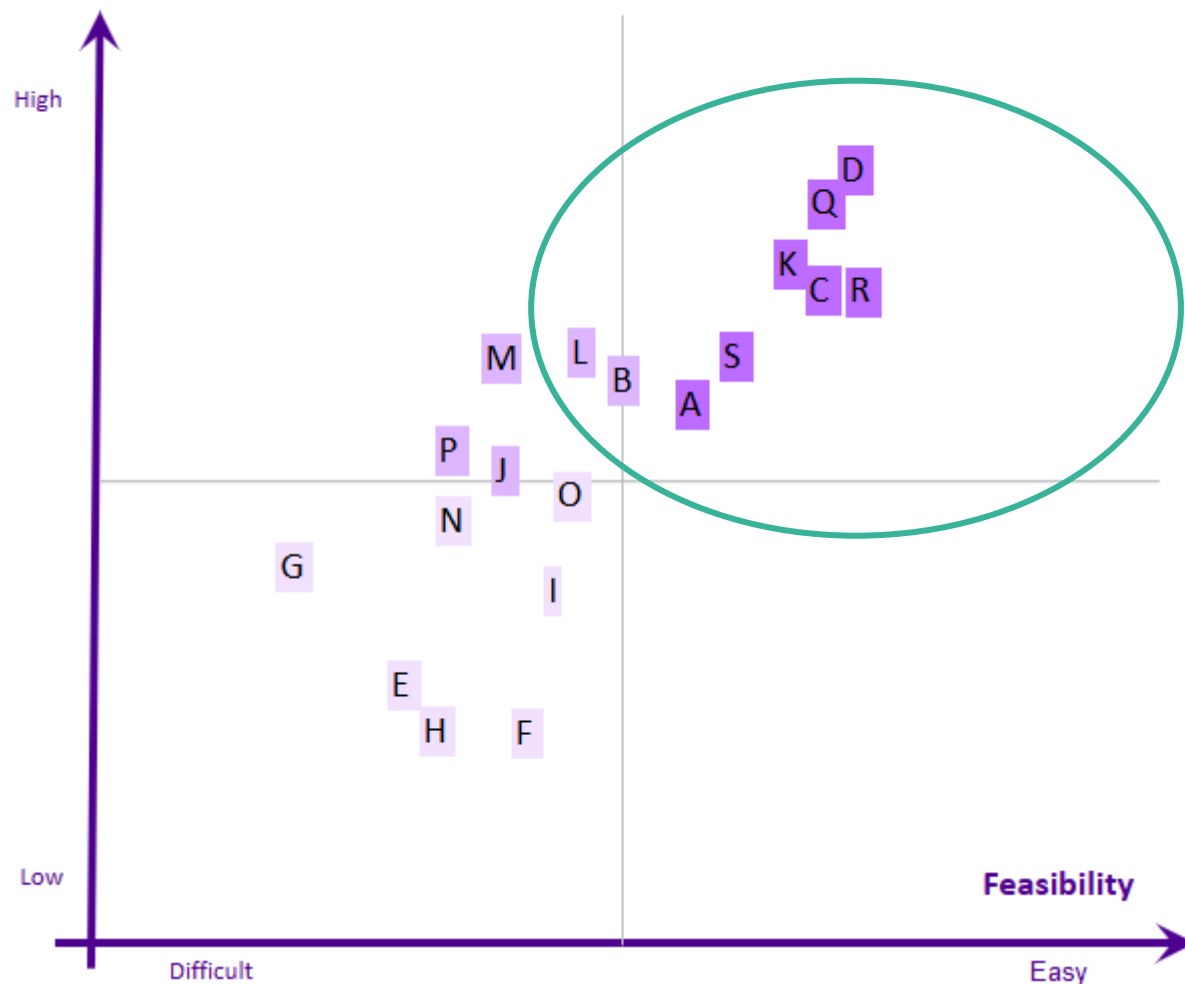
Key enablers of change

- **Economic incentives and cost development:** TCO of electric vehicles becomes competitive with high mileage; technological development and decreasing prices accelerate investments.
- **Regulation and governance:** EU emission standards, minimum requirements for delivery infrastructure, and Green Deal commitments steer development. Consistent, predictable regulation and subsidies increase investor confidence.
- **Infrastructure:** Charging networks, sufficient loading spaces, and logistics hubs enable smooth distribution.
- **Technology and digitalisation:** Electric vehicle technology, high-power charging, and quiet fleet create win-win situations. Route optimisation and better data utilisation improve efficiency.
- **Cooperation:** Continuous transparent dialogue, shared rules between city and operators, companies' own emission reduction goals and responsibility work support change.
- **Operational culture:** Electric fleet becoming a standard; quiet vehicles and new work practices enable night deliveries and efficiency. Consumer expectations support responsible solutions.



Evaluation of emission reduction measures

Emission impact

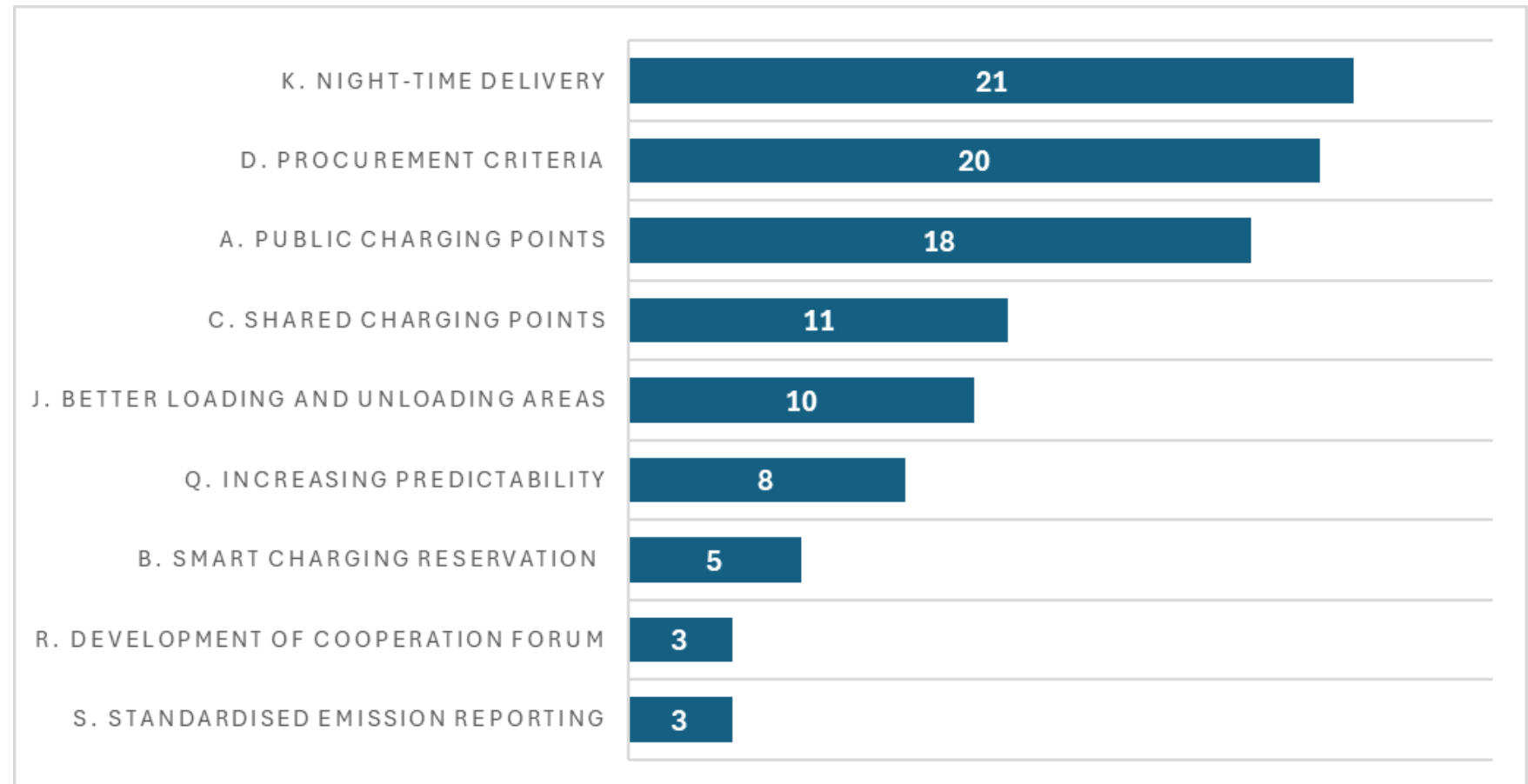


- A. Public charging points**
- B. Reservation system**
- C. Shared charging points**
- D. Procurement criteria**
- E. Traffic privileges**
- F. Loading bay reservation system**
- G. Real-time logistics data**
- H. Space needs for drones and robots**
- I. Use of bus lanes**
- J. Sufficient loading / unloading areas**
- K. Night-time deliveries**
- L. Consolidation centre**
- M. Cargo bike logistics hub**
- N. Increased use of service tunnel**
- O. Zero Emission Zone**
- P. Parcel-locker network**
- Q. Increased predictability in the sector**
- R. Development of cooperation group/forum**
- S. Standardized emission reporting**

The measures were positioned on the four-field matrix by four separate groups. The figure presents the aggregated results based on each group's separate matrix.

Results of the 100-point prioritisation

- *The prioritisation included measures assessed as the most impactful in the four-field matrix*
- *Participants distributed 100 points freely among the measures based on which they wished to propose for further analysis*
- *Consolidation centers, cargo bike logistics hubs, and parcel-locker networks were omitted from prioritisation due to technical malfunction*



Key takeaways

- Achieving emission reduction targets in city logistics requires **cooperation and interaction** among different stakeholders as well as **a common vision**
- **Predictability** was seen among companies as the basis for the entire change
- Reducing emissions is particularly related to technological development and increasing the share of **environmentally friendly vehicles** → One of the most effective and feasible measures identified in this study was favoring environmentally friendly freight vehicles in **procurement**
- **Night-time delivery for zero-emission vehicles** and **public charging points** were seen important measures as well
- **Implementation** of measures requires careful planning—requirements, timelines, responsibilities, and stakeholder roles

Further steps - Recommended measures

- As an outcome of the Madless - project, 10 measures are recommended for implementation in Helsinki
- Each recommended measure is accompanied by an action card – validated with stakeholders

Helsinki should take a predictable and long-term approach	Urban environment supports sustainable city logistics	Comprehensive charging infrastructure enables fleet renewal
• Regular and transparent stakeholder collaboration • Defining a zero-emission zone for logistics • Utilising data in the development of city logistics • Procurement criteria for vehicles and logistics services	• Sufficient and appropriately located loading/unloading zones • Allowing off-peak deliveries for zero-emission vehicles • Using public transport lanes and streets as an advantage for zero-emission vehicles • Establishing consolidation center in or near the city center	• Increasing the number of public charging points • Operational model and incentives for shared changing points

Future aspects to study

- Quantitative studies on impact of most important measures on emission reductions in Helsinki
- Future comparison studies on city logistics needs in cities of capital region
- More international context & comparison between different countries



Picture: Veikko Somerpuro

Thank you!

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Transport Research Centre Verne
Tampere University

For more information: MADLESS project website



Picture: Erika Kallionpää