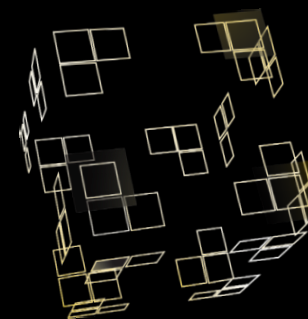
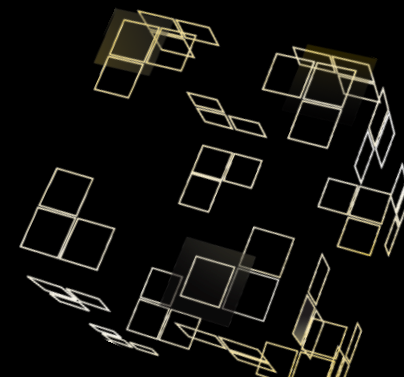
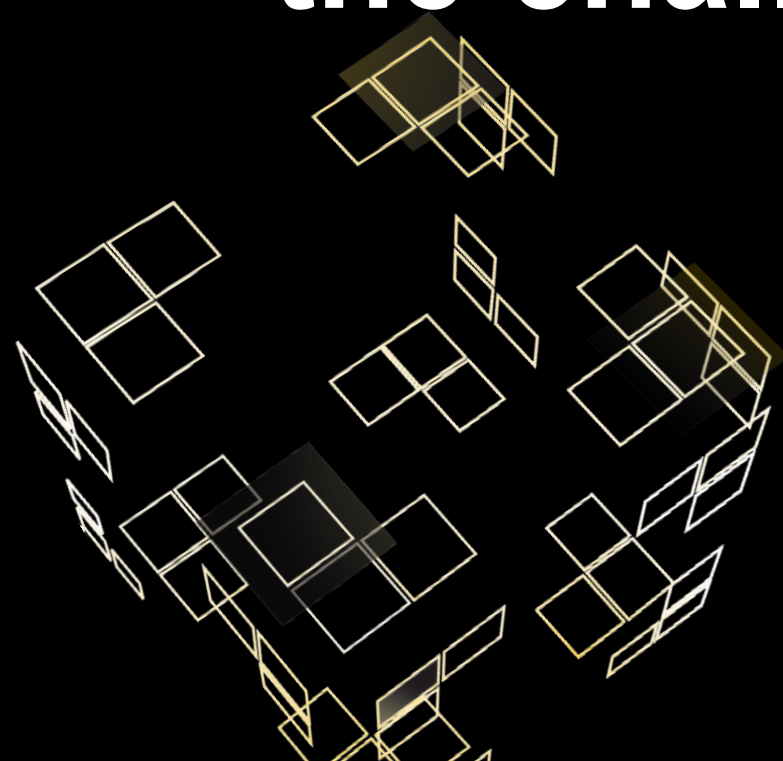




The rise of electric micro mobility and the challenge of interoperability

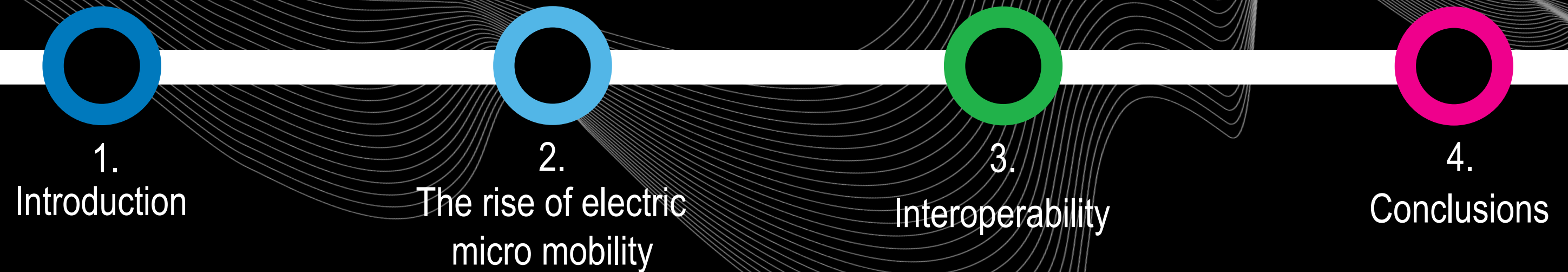


Dr. Ir. S.P. Haveman
Hanover, 02-05-2019

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IN THIS PRESENTATION:





INTRODUCTION – Who are we?

Department of Design, Production and Management Systems Engineering and Multidisciplinary Design (SEMD) - Electric Mobility Team

	Associate Professor	Dr. Ir. Maarten Bonnema	Chair of SEMD and Project Supervisor
	PostDoc Researcher	Dr. Ir. Steven Haveman	Lead Researcher <ul style="list-style-type: none">• Systems Engineering and Systems Modeling Research
	Junior Researcher	Marlise Westerhof, MSc	Researcher <ul style="list-style-type: none">• User Centered Design Research of Electric Mobility Systems
	Junior Researcher	J. Roberto Reyes Garcia	Researcher <ul style="list-style-type: none">• Data Driven Architectures and Knowledge Sources for Electric Mobility Systems Research



INTRODUCTION – Our Projects & Roles



eMaaS

Electric Mobility as a Service

- Design of eMaaS architecture
 - Market Analysis
 - Functional Design, including APIs
- Advancing state-of-the-art in:
 - Data Driven Architectures
 - User Centered Design of Maas

www.eMaaS.eu



proEME

Promoting Electric Mobility Europe

- Advancing state-of-the-art / sharing knowledge on:
 - Incentive Effectiveness
 - Behaviour of Market Actors
- EV Uptake Model to study, understand and steer EV market

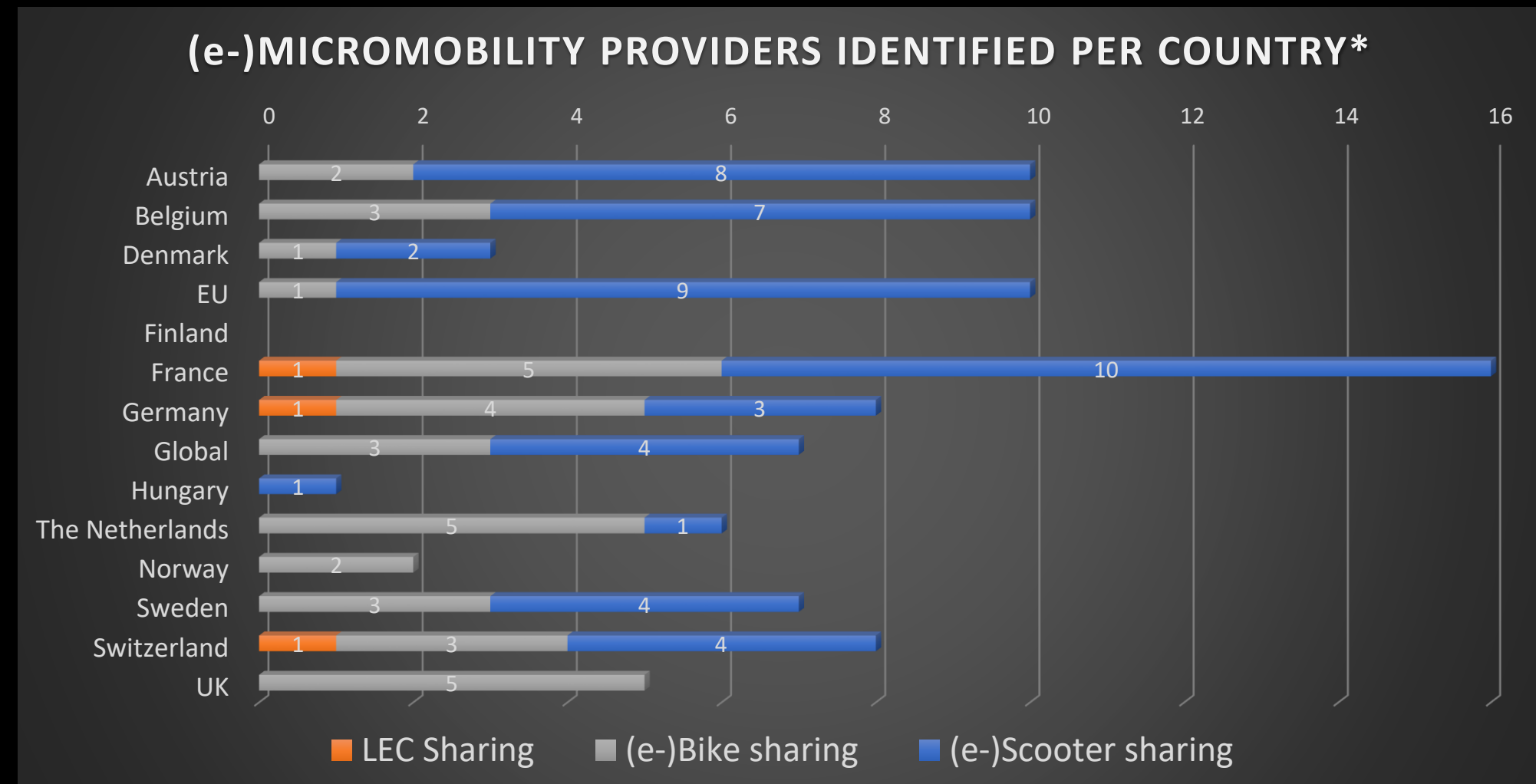
www.pro-EME.eu



THE RISE OF ELECTRIC MOBILITY – AN OVERVIEW

136 electric mobility providers were identified in our research

- 45 in electric micro mobility
- Database is extensive - but not complete



**More detailed results are planned as part of future publications*

THE RISE OF ELECTRIC MOBILITY – AN OVERVIEW

Different electric micro mobility providers were identified

46 Micro mobility Providers*

- 29 – Exclusively micro mobility
- 17 – Partly micro mobility
- 23 – Offer (e)Bike sharing
- 20 – Offer (e)Scooter sharing
 - 8 – eKick-Scooters sharing
 - 12 – (e)Moped sharing
- 3 – LEC sharing



Examples

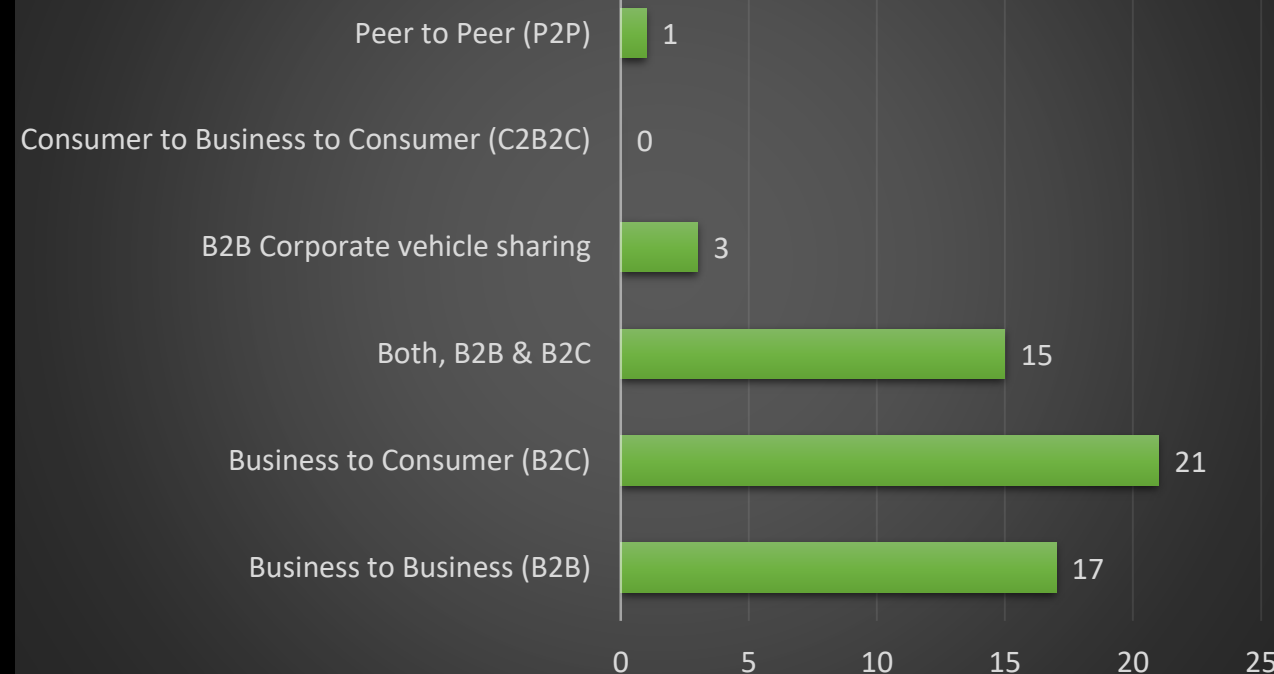
**More detailed results are planned as part of future publications*

THE RISE OF ELECTRIC MOBILITY – BUSINESS MODELS

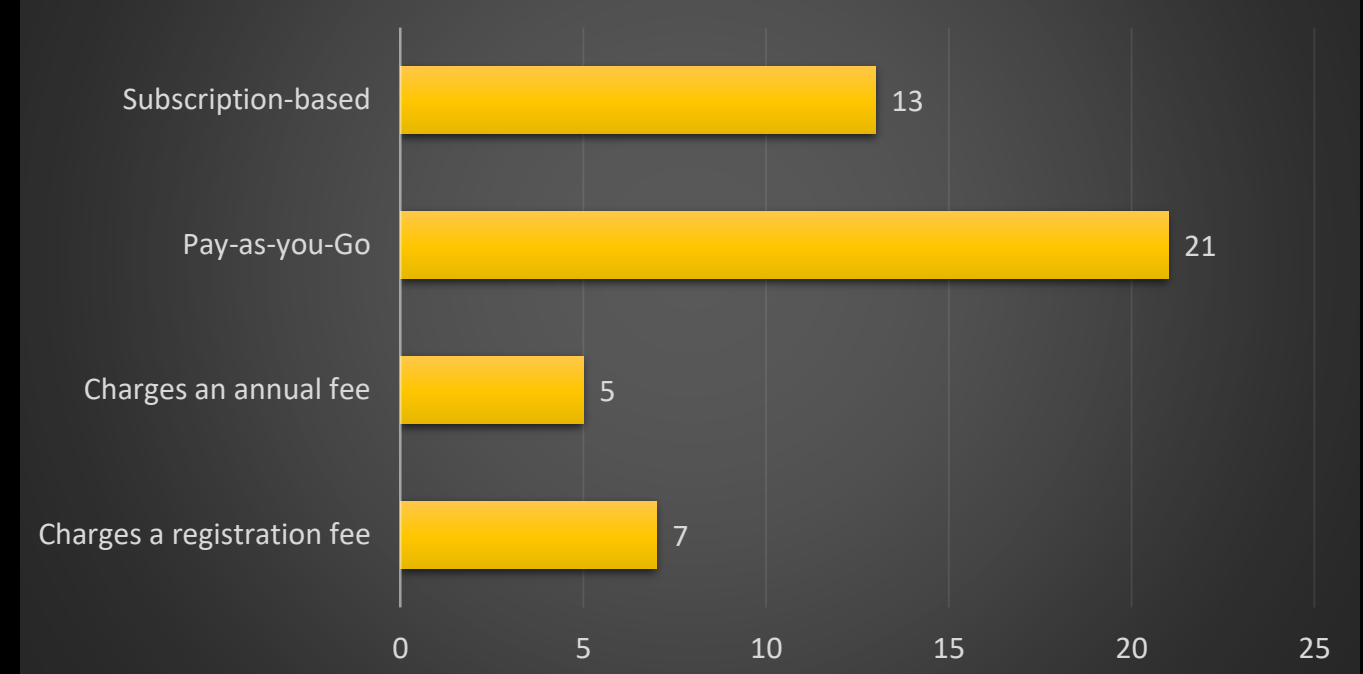
Business Model Analysis

- Detailed data for 85 of 136 identified providers
- 23 of these 85 offer electric micro mobility

Business models in the shared electric micro mobility market (N=23)



Payment models in the shared electric micro mobility market (N=23)



**More detailed results will be part of future publications*

INTEROPERABILITY – WHY?

- What happens if providers are “let loose”?



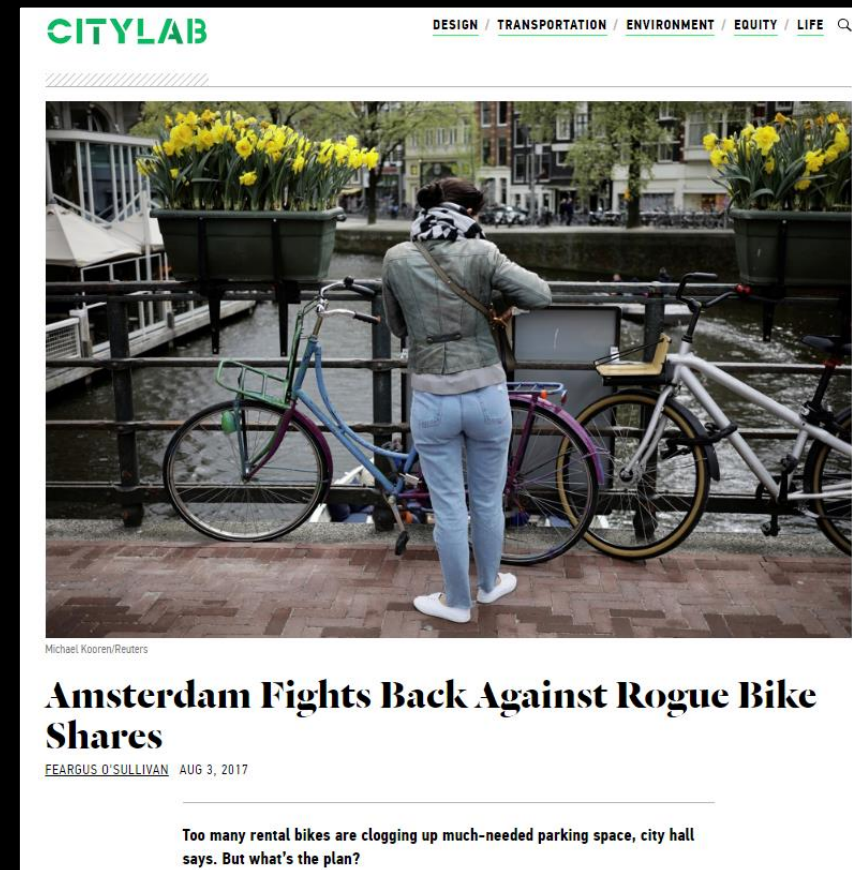
Source: *The Atlantic*



Source: *MNN.com*

INTEROPERABILITY – PART OF THE SOLUTION?

- What happens if providers are “let loose”?
 - Oversupply / No regulations
- As a consequence:
 - Cities fight back!



Source: citylab.com

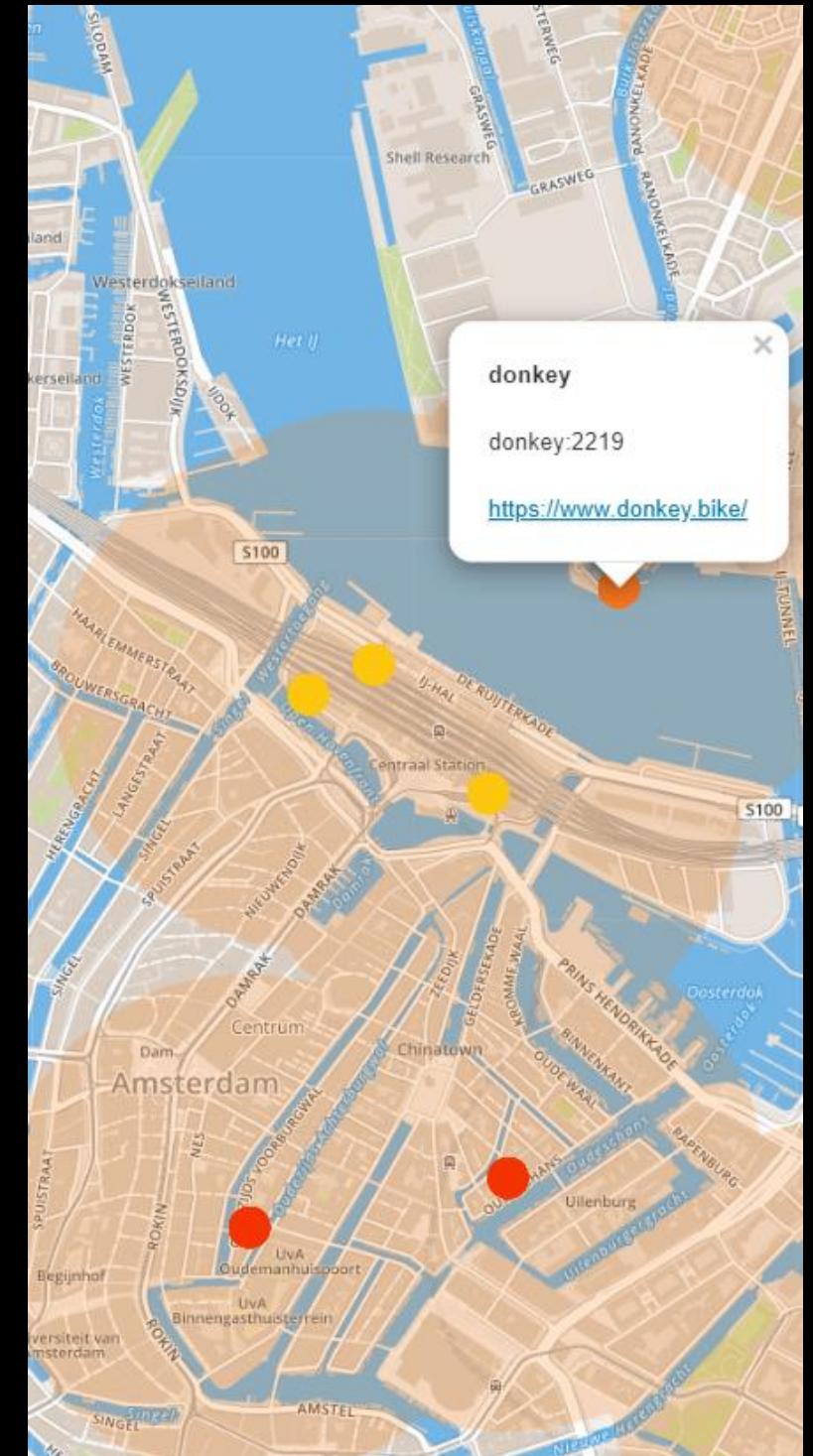


Source: MNN.com



INTEROPERABILITY – HOW?

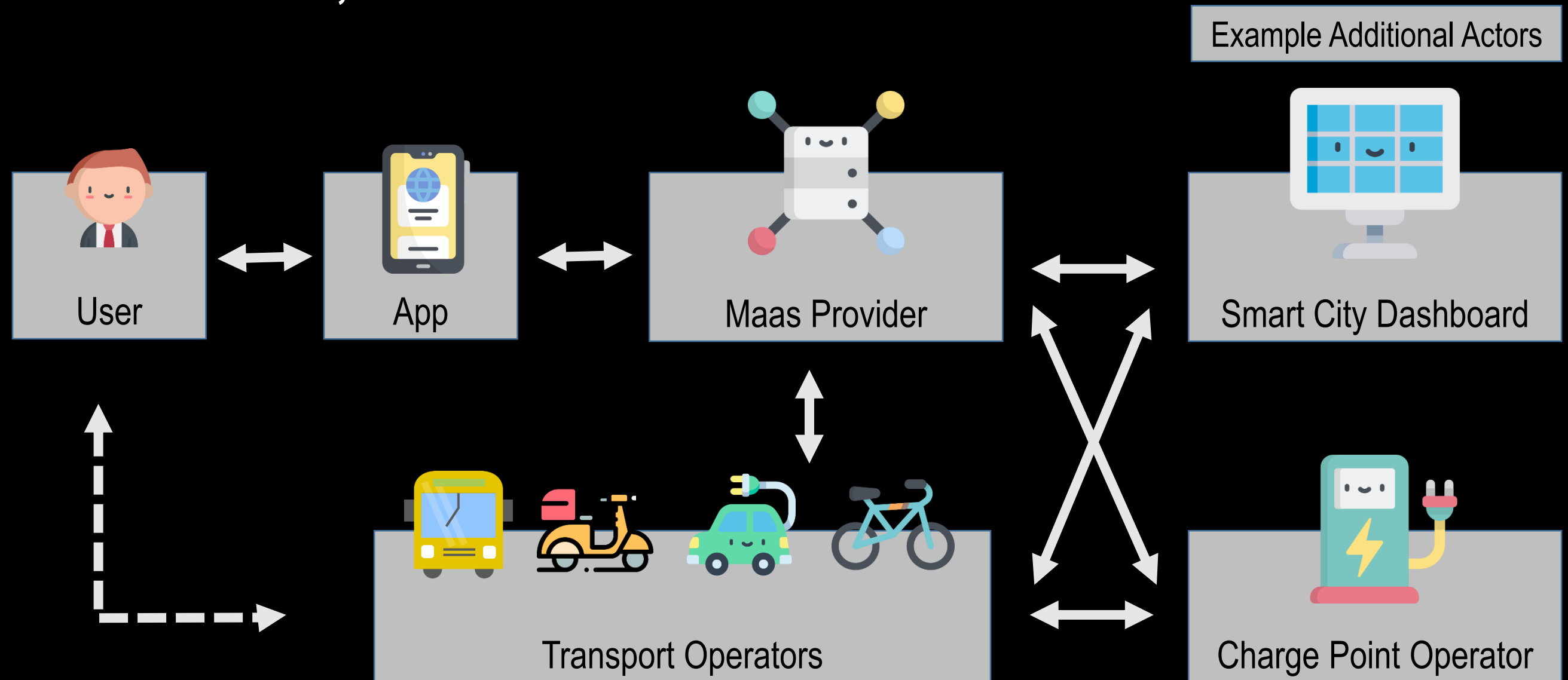
- Micro Mobility sharing market
 - Self Regulation not working
- Amsterdam & other major Dutch cities
 - Initiated the “Shared Bike Covenant”
 - Signed by 11 providers
- Interoperability is a cornerstone of the covenant
 - Other providers visible in app
 - First step: <https://openbike.nl/>
 - Based on GBFS+ standard, only static information



Source: openbike.nl

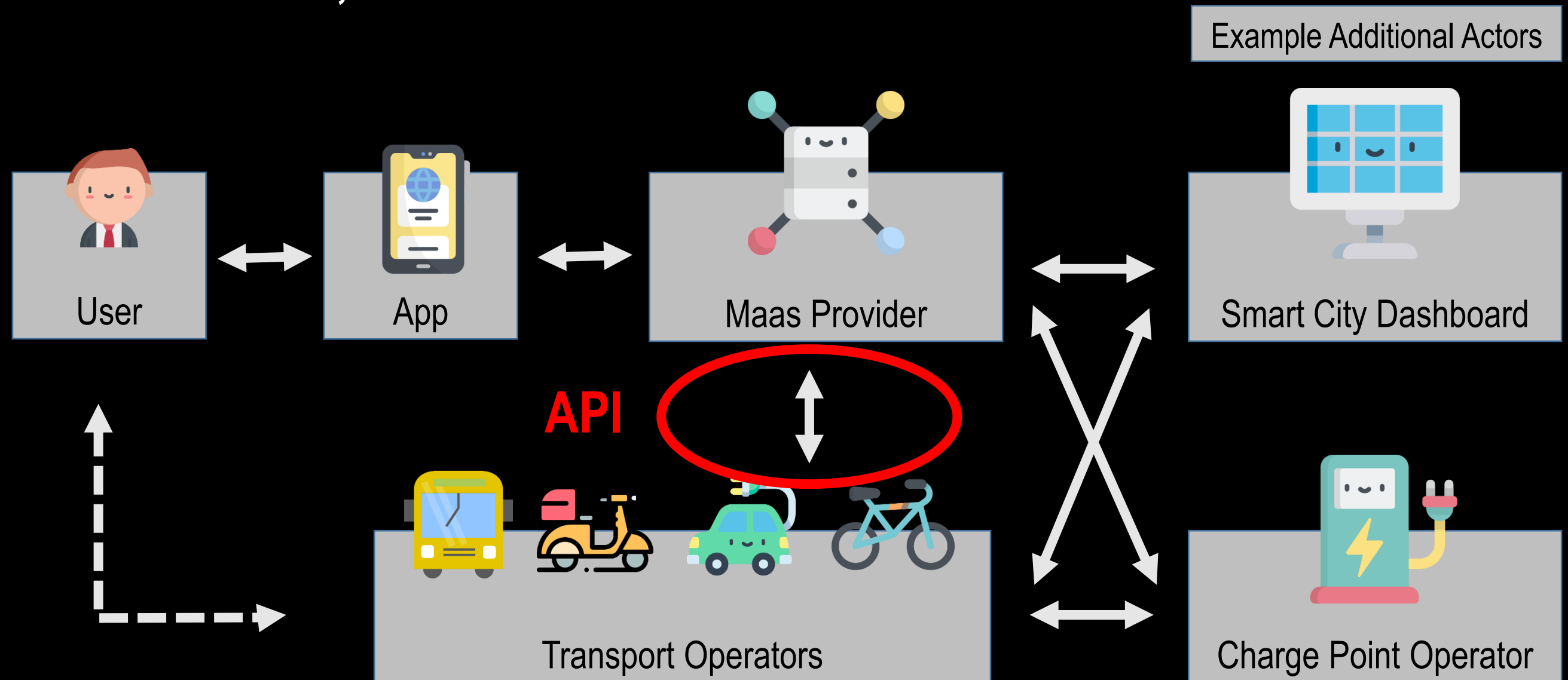
INTEROPERABILITY – The eMaaS Ecosystem

- Electric Mobility As A Service
 - Roles, Actors & Connections



INTEROPERABILITY – The eMaaS Ecosystem

- Electric Mobility As A Service
 - Roles, Actors & Connections



INTEROPERABILITY – TO-MP API

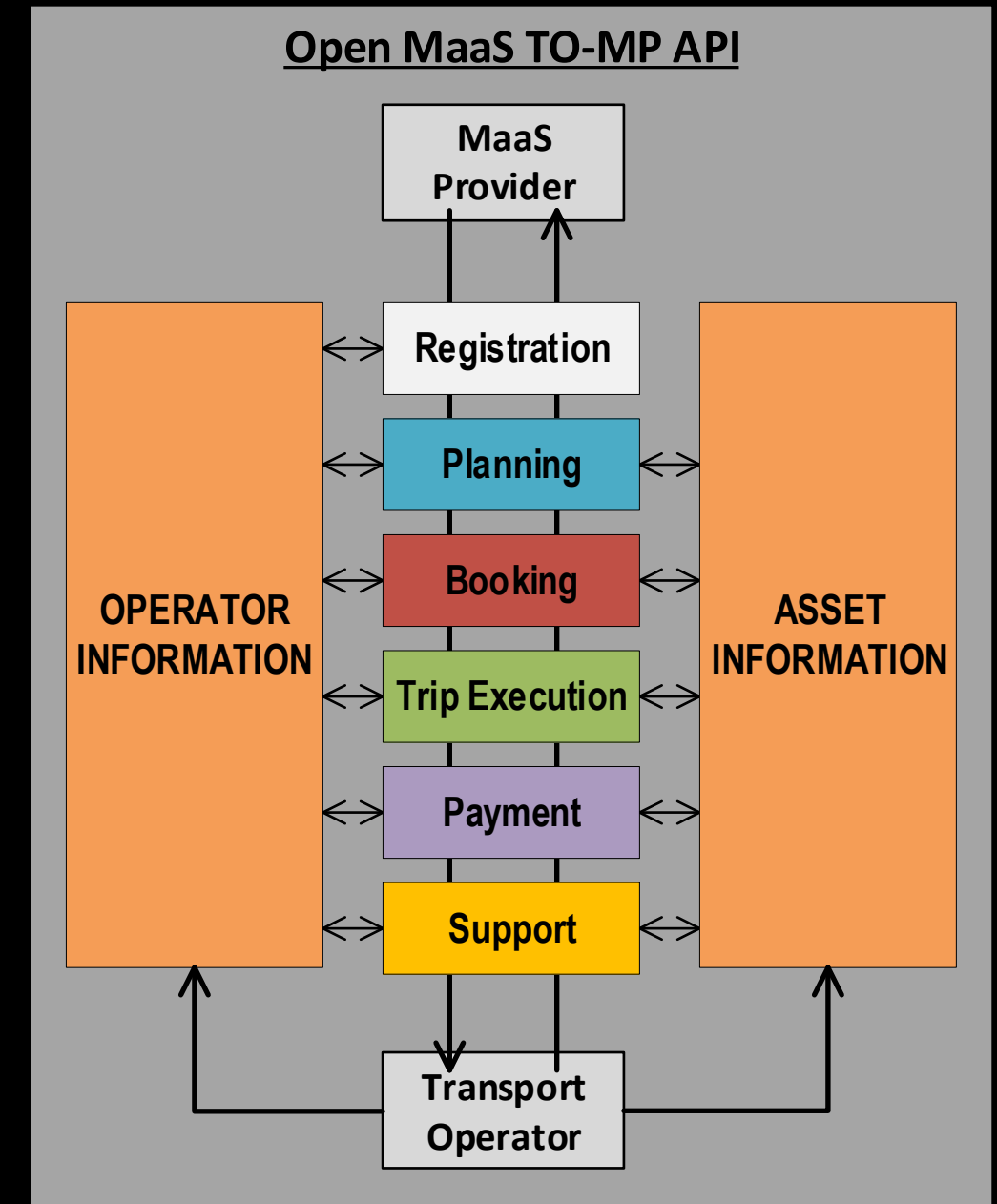
Transport Operator – Maas Provider API

By whom?

- Initiated by Dutch Ministry of Infrastructure & Water Management
- Supported by UT: functional design
- Involvement of shared bike/car operators & MaaS providers

Application

- 7 large MaaS pilots in NL
- Aligned with MaaS Alliance Efforts





CONCLUSIONS – What's Next?



- Micro mobility is growing fast and sometimes “uncontrolled”
- Next steps for the market
 - Integration in wider mobility packages / MaaS
 - Interoperability is needed
 - Alignment with competitors to meet demand appropriately
 - Interoperability is needed
- Interoperability is key!



THANK YOU
FOR YOUR ATTENTION

QUESTIONS?



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