The rise of electric micro mobility and the challenge of interoperability

Dr. Ir. S.P. Haveman
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IN THIS PRESENTATION:

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2. The rise of electric micro mobility
3. Interoperability
4. Conclusions
INTRODUCTION – Who are we?

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

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Responsibilities</th>
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<tbody>
<tr>
<td>Associate Professor</td>
<td>Dr. Ir. Maarten Bonnema</td>
<td>Chair of SEMD and Project Supervisor</td>
</tr>
</tbody>
</table>
| PostDoc Researcher        | Dr. Ir. Steven Haveman         | Lead Researcher
- Systems Engineering and Systems Modeling Research |
| Junior Researcher         | Marlise Westerhof, MSc        | Researcher
- User Centered Design Research of Electric Mobility Systems                      |
| Junior Researcher         | J. Roberto Reyes Garcia       | Researcher
- 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](http://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](http://www.pro-EME.eu)
136 electric mobility providers were identified in our research

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

### (e-)MICROMOBILITY PROVIDERS IDENTIFIED PER COUNTRY*

<table>
<thead>
<tr>
<th>Country</th>
<th>LEC Sharing</th>
<th>(e-)Bike sharing</th>
<th>(e-)Scooter sharing</th>
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<tr>
<td>Austria</td>
<td>2</td>
<td>8</td>
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<td>7</td>
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<td>The Netherlands</td>
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<td>UK</td>
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*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

*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

*More detailed results will be part of future publications*
INTEROPERABILITY – WHY?

• What happens if providers are “let loose”?

The Bike-Share Oversupply in China: Huge Piles of Abandoned and Broken Bicycles

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: MNN.com

Source: citylab.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

Example Additional Actors

- Smart City Dashboard
- Charge Point Operator

User → App → Maas Provider → Transport Operators → Maas Provider → App → User
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API
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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