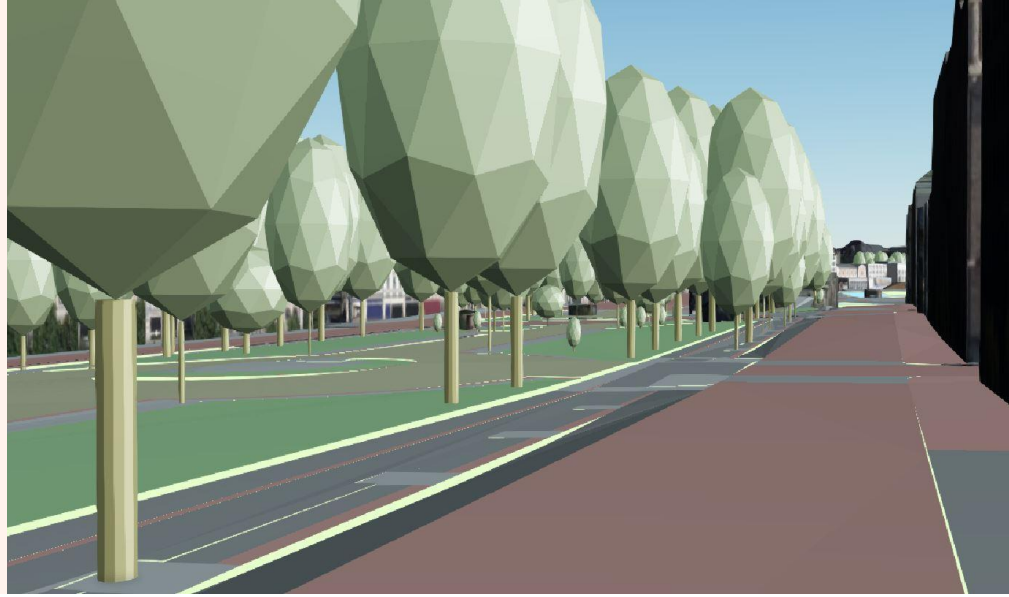


FORUM VIRIUM HELSINKI



Mobility & urban digital twins— Is there a connection?

*Smart traffic infrastructure and traffic management
Smartly together towards sustainable mobility*

What is Forum Virium Helsinki?



- A non-profit innovation company of the City of Helsinki
- established in 2005.
- Three programmes: smart city, smart mobility and data.
- Employs 60 top experts.
- Annual project funding of EUR 6–10 million.
- The company is financed by the City of Helsinki and the EU.
- Customer satisfaction 4.4/5.
- Impact:
 - New companies
 - Smart Kalasatama
 - Open data



We will strengthen Helsinki's ability to utilise data, new technologies and digitalisation.



We will help businesses utilise Helsinki as a development platform.



We will be a revitalising and agile expert organisation.

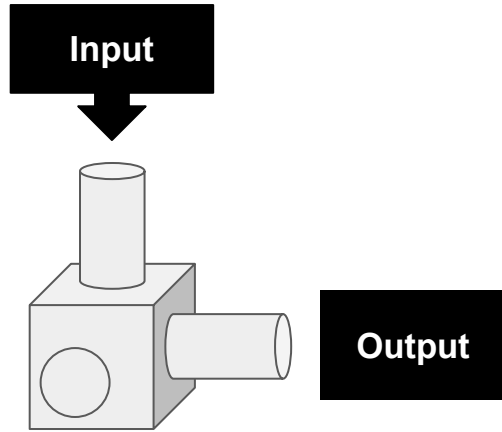
“
VISION:
Helsinki will be the most functional smart city in the world.”



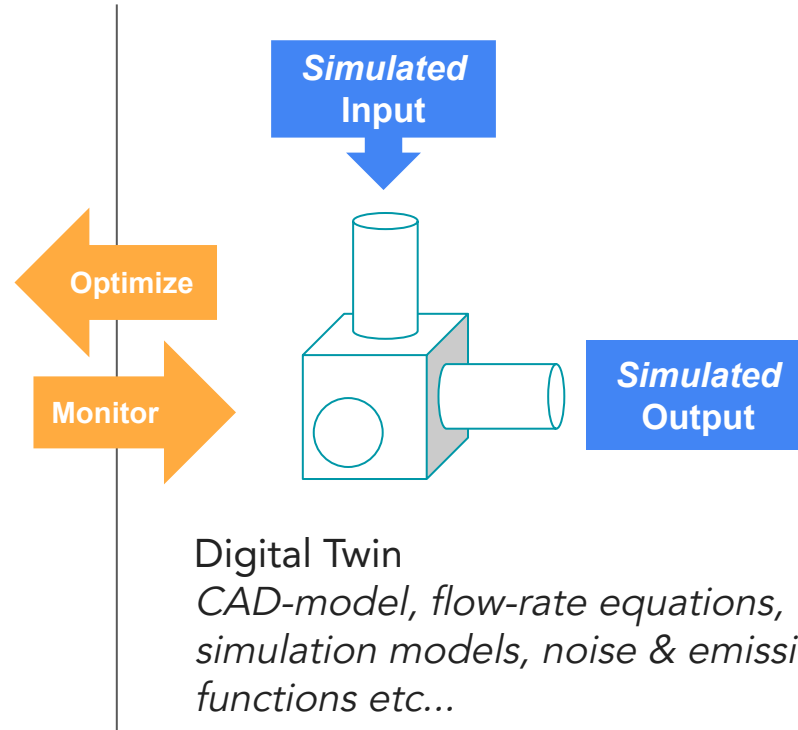
What actually is an
urban digital twin?

What is a digital twin?

The "traditional" definition



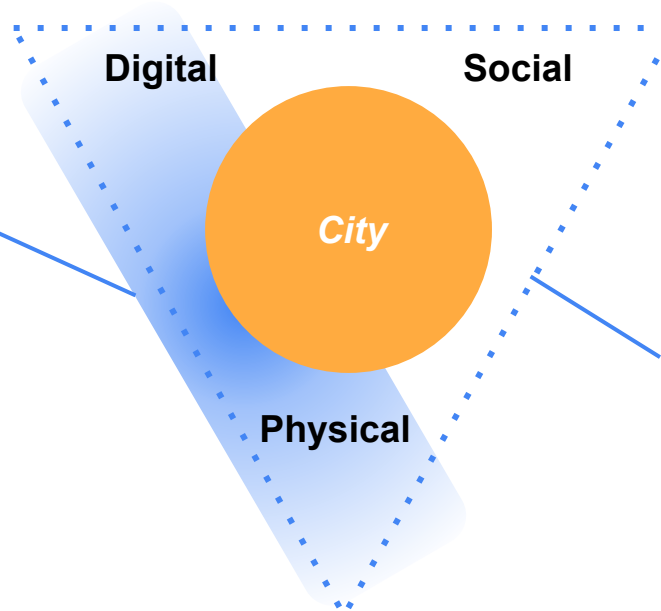
An industrial component
Pumps, drives, valves, meters...



Digital Twin
*CAD-model, flow-rate equations,
simulation models, noise & emission
functions etc...*

A digital twin of a city

In industry, the digital twin reflects physical entities in a digital form



The digital twin of the city should also include urban processes and human behaviour

Digitally first



The Urban digital twin: an entity of co-operating datasets and systems.
Awareness of data sources allows the combination and further processing.

City model
Geospatial data
Registers



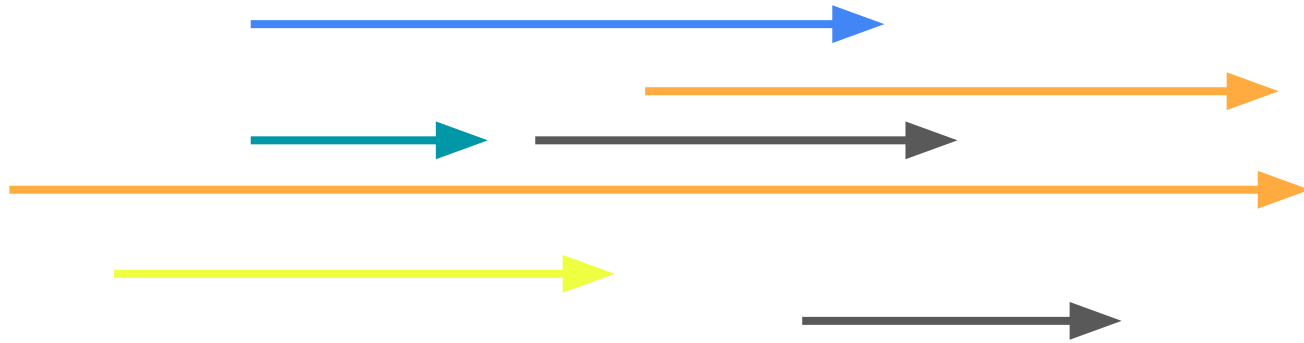
Sensor data, simulations & plans

Digitally first:
Plan the full life cycle before building
Simulated impacts before changes are made

Better understanding → Better decisions → Better city → Quality of life



Why is this difficult?



Different stages of
digitalization

Multiple ongoing
processes

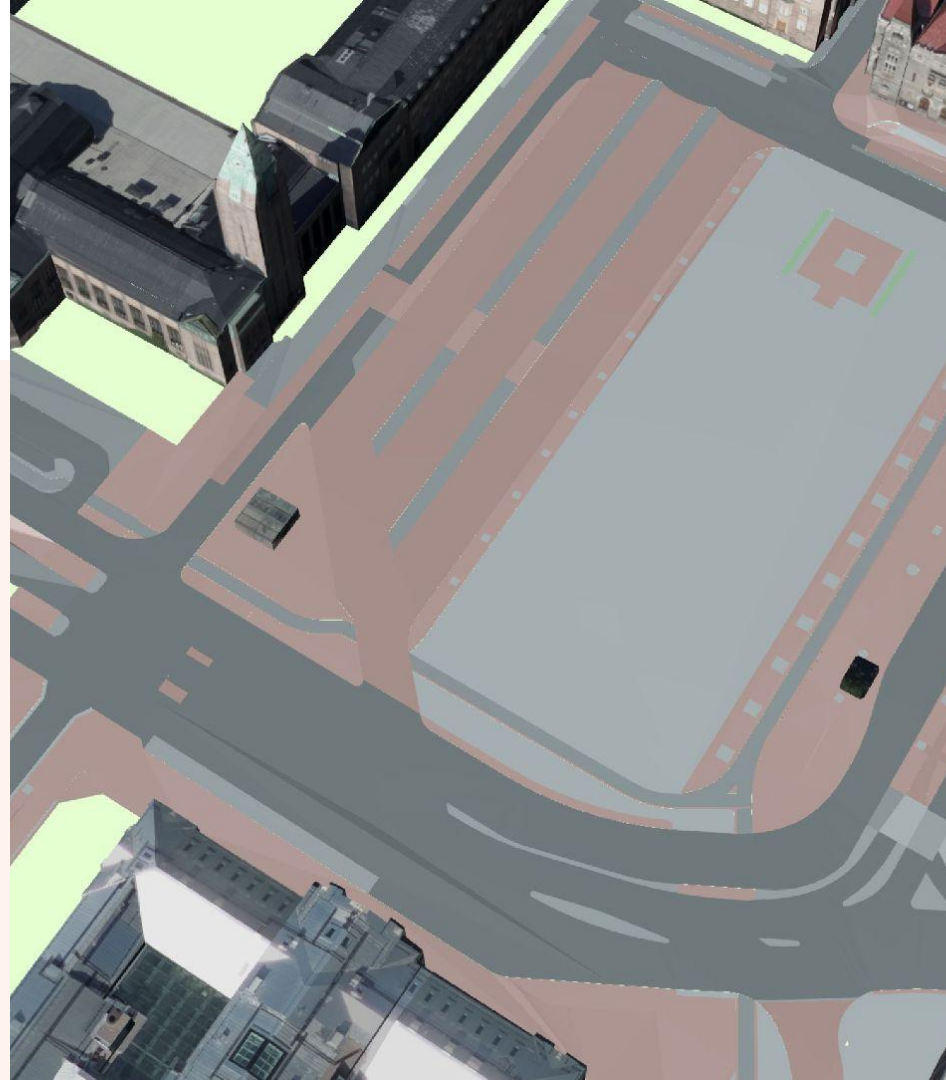
Interdisciplinary topic

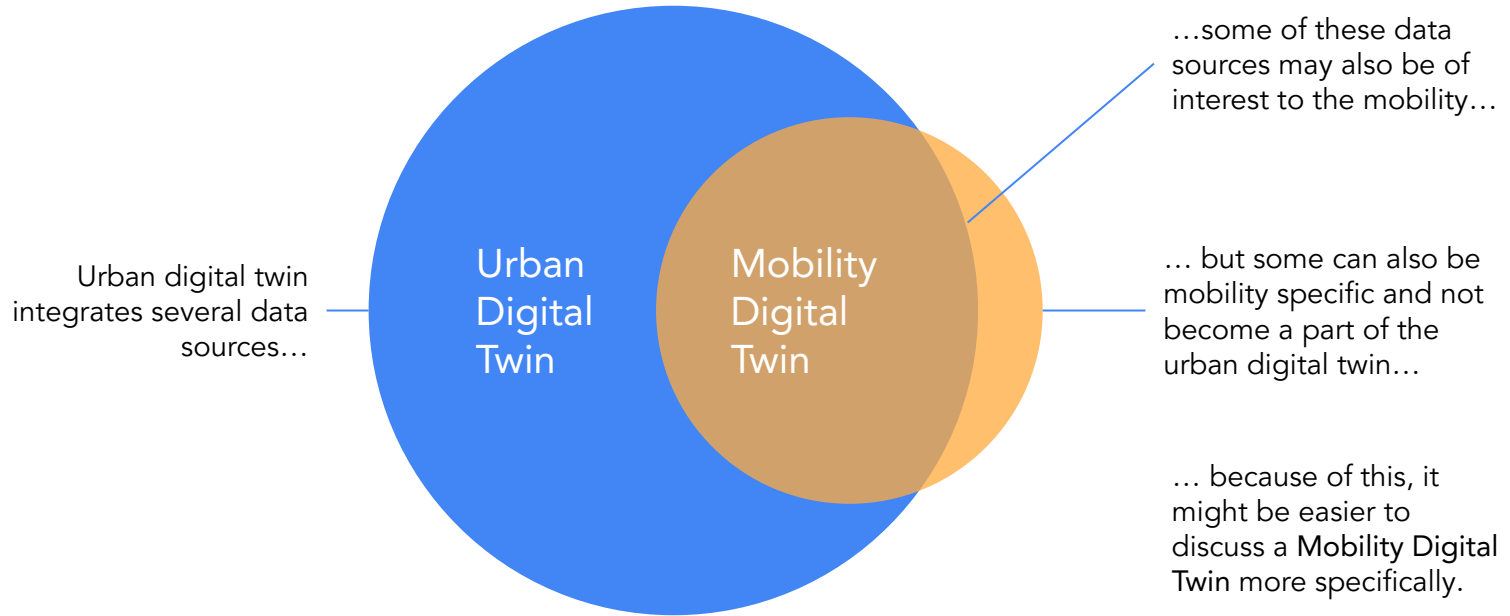


What about the
mobility then?

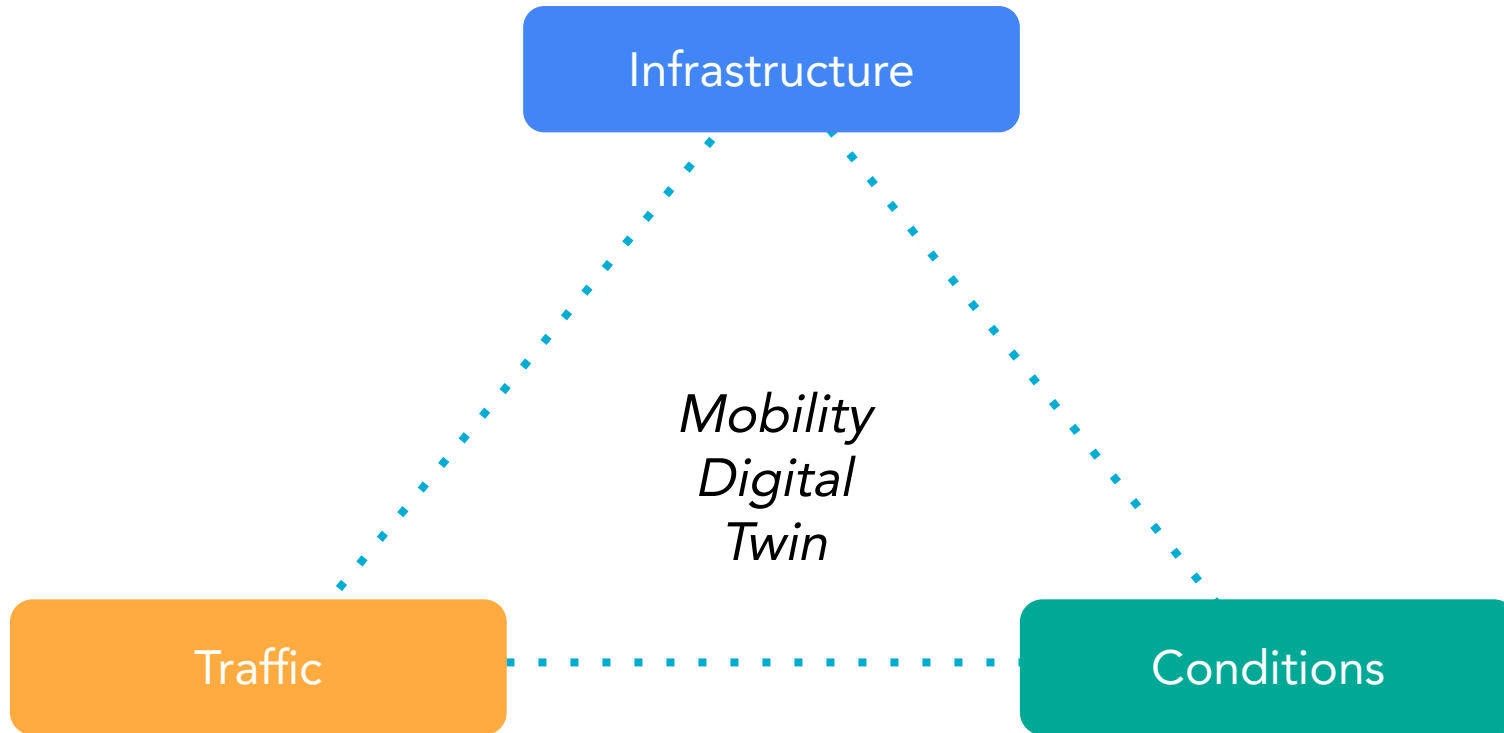
How is mobility present in urban digital twins?

- Streetscape can be represented in 3D city models
 - *Planning use*
 - *Infrastructure management*
- Traffic counters are a potential real-time data source
- Noise, particles & people flow are “conditions” present in the city

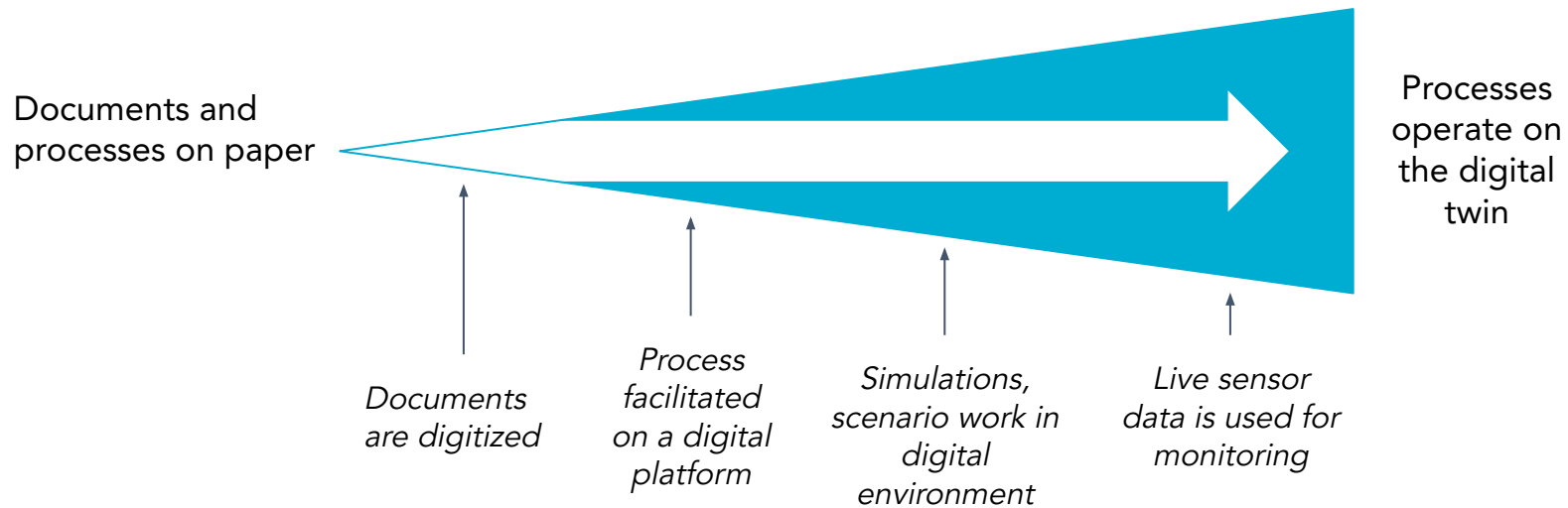




Working paper available at:
<https://mobilitylab.hel.fi/uploads/2022/09/Digital-Twin-for-Mobility-Working-paper-version-9-September-2022.pdf>



Working paper available at:
<https://mobilitylab.hel.fi/uploads/2022/09/Digital-Twin-for-Mobility-Working-paper-version-9-September-2022.pdf>



Working paper available at:
<https://mobilitylab.hel.fi/app/uploads/2022/09/Digital-Twin-for-Mobility.-Working-paper-version-9-September-2022.pdf>

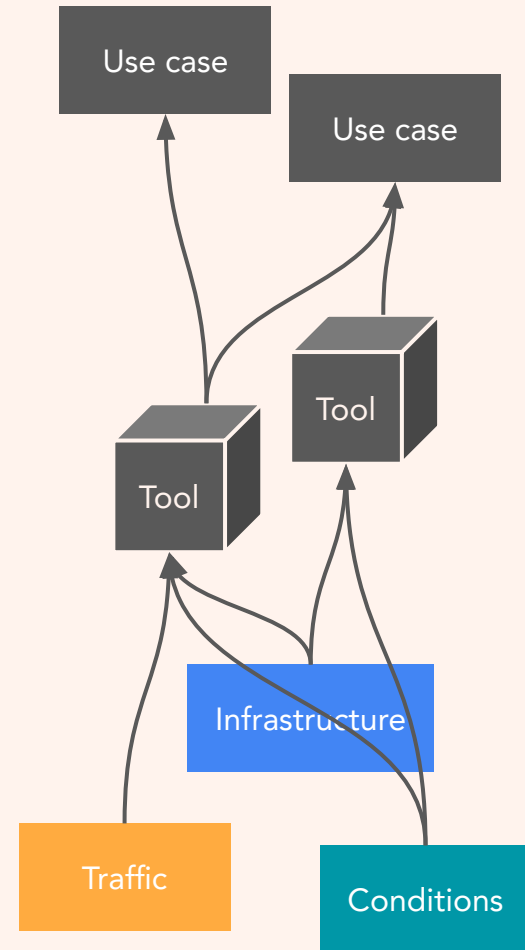


First steps towards a
digital twin of urban
mobility

From data, towards applications

- Identifying potential data sources & making them available over APIs
 - Data catalogues
 - Commercial data
 - <https://mobilitylab.hel.fi/data/>
- Identifying the first use cases & tools needed
- Prototype development...
- Documentation...

Working paper available at:
<https://mobilitylab.hel.fi/app/uploads/2022/09/Digital-Twin-for-Mobility-Working-paper-version-9-September-2022.pdf>

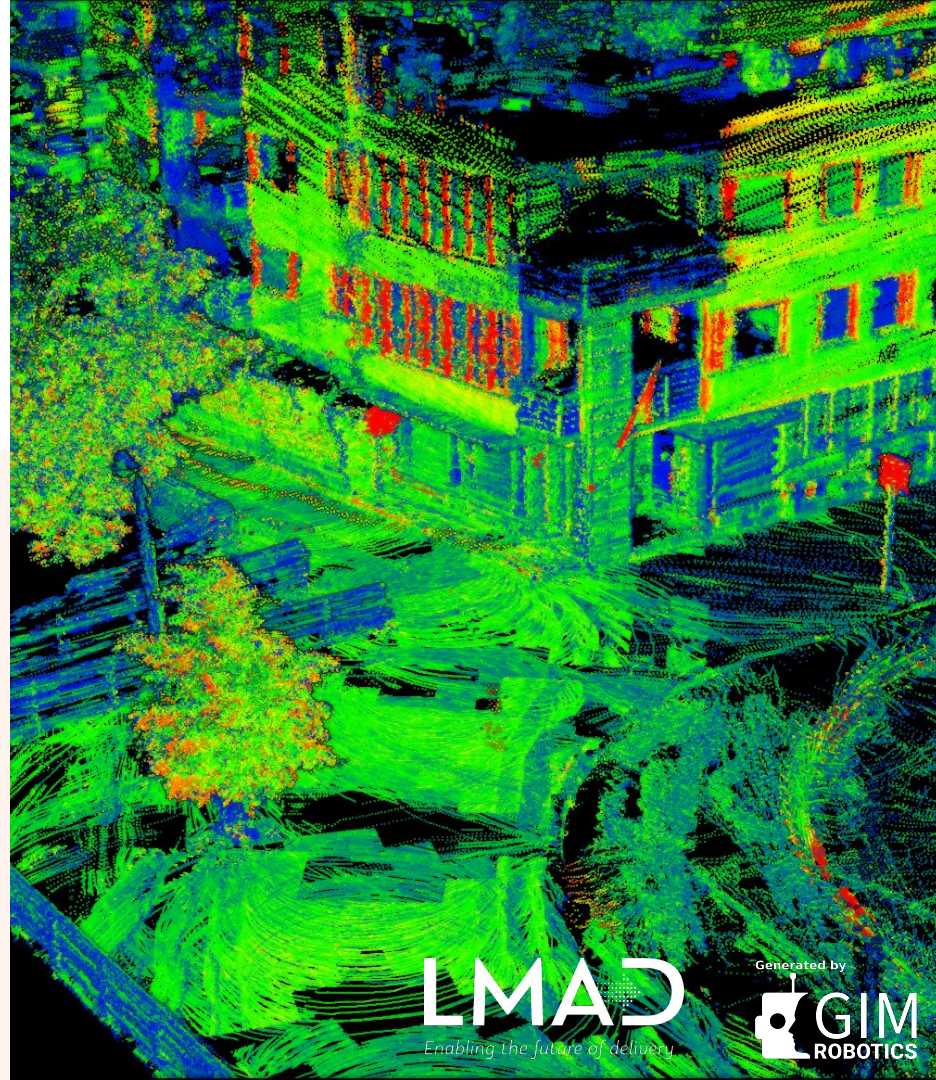


New data sources of urban mobility

- Floating car data & vehicle telemetry

<https://mobilitylab.hel.fi/app/uploads/2023/01/Mobility-Lab-Helsinki-xyzt.ai-Geo-Mobility-public-summary.pdf>

- Crowdsourced and/or distributed mapping
- Feedback data
- ...



Case example: Winter maintenance telemetry, conditions and feedback

<https://forumvirium.fi/projektit/liidi2-liikkumisen-digitaalinen-kaksonen-avaa-vaylaa-uusille-palveluille/>

Demo set of open data released:
<https://hri.fi/data/fi/dataset/staran-tuotantoajon-euvojen-liikkeet-ja-toimenpiteet-helsingissa>

Viewer for data:
https://fvh.io/stara_demo



Follow our progress:
<https://forumvirium.fi/liity-liikenteen-digitaalisen-kaksosen-postituslistalle/>

FORUM VIRIUM HELSINKI

@forumvirium | forumvirium.fi



Juho-Pekka Virtanen

juho-pekka.virtanen@forumvirium.fi

