Preferred citation style for this presentation

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Daily Flows: Medium and Long Term

Research in Transport Planning at the Future Cities Laboratory

K. W. Axhausen
A. Erath

Nov 2011

FUTURE CITIES LABORATORY

SEC

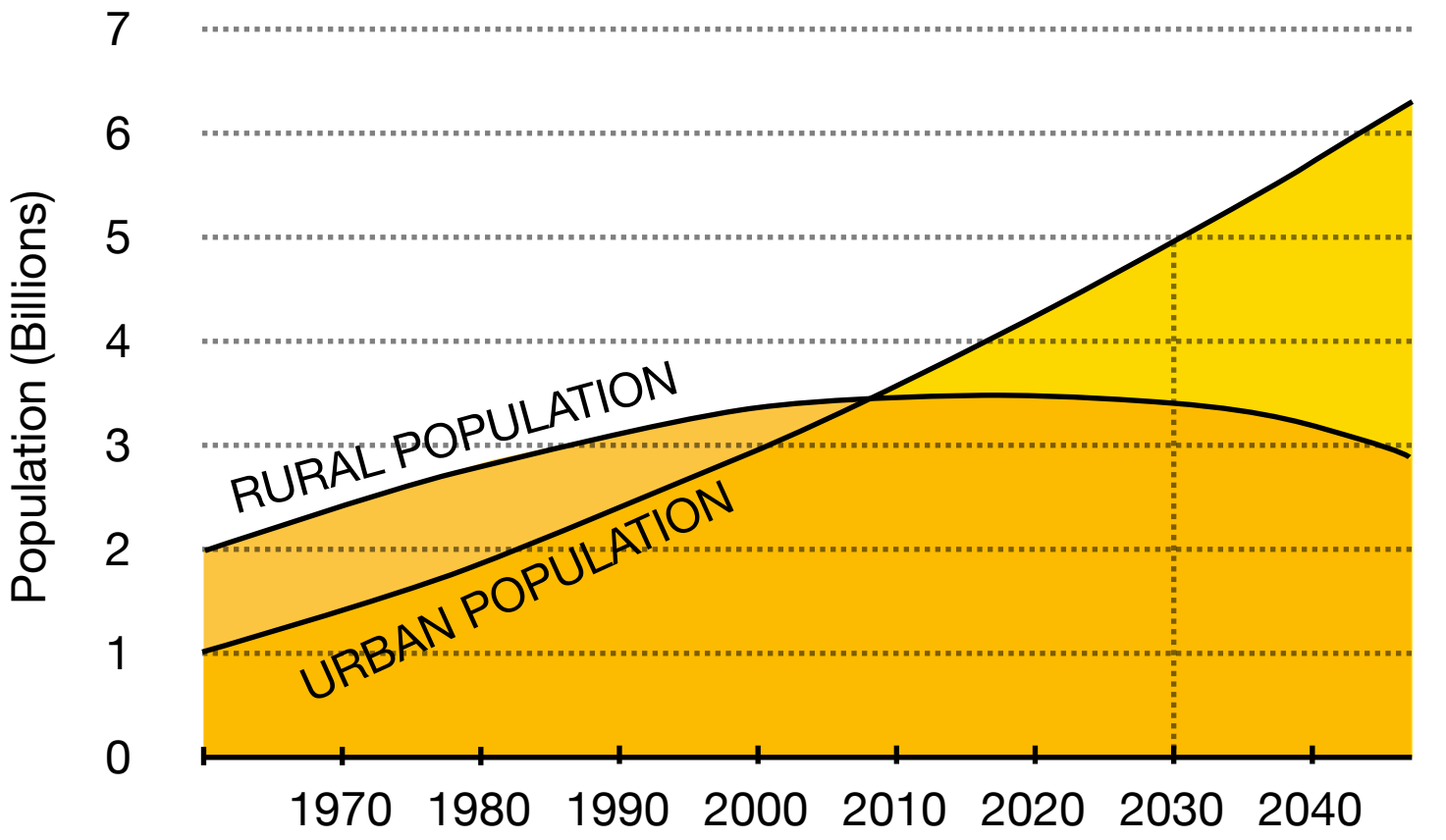
Agenda

Future Cities Laboratory and Singapore ETH Centre

Multi-agent transport demand modeling

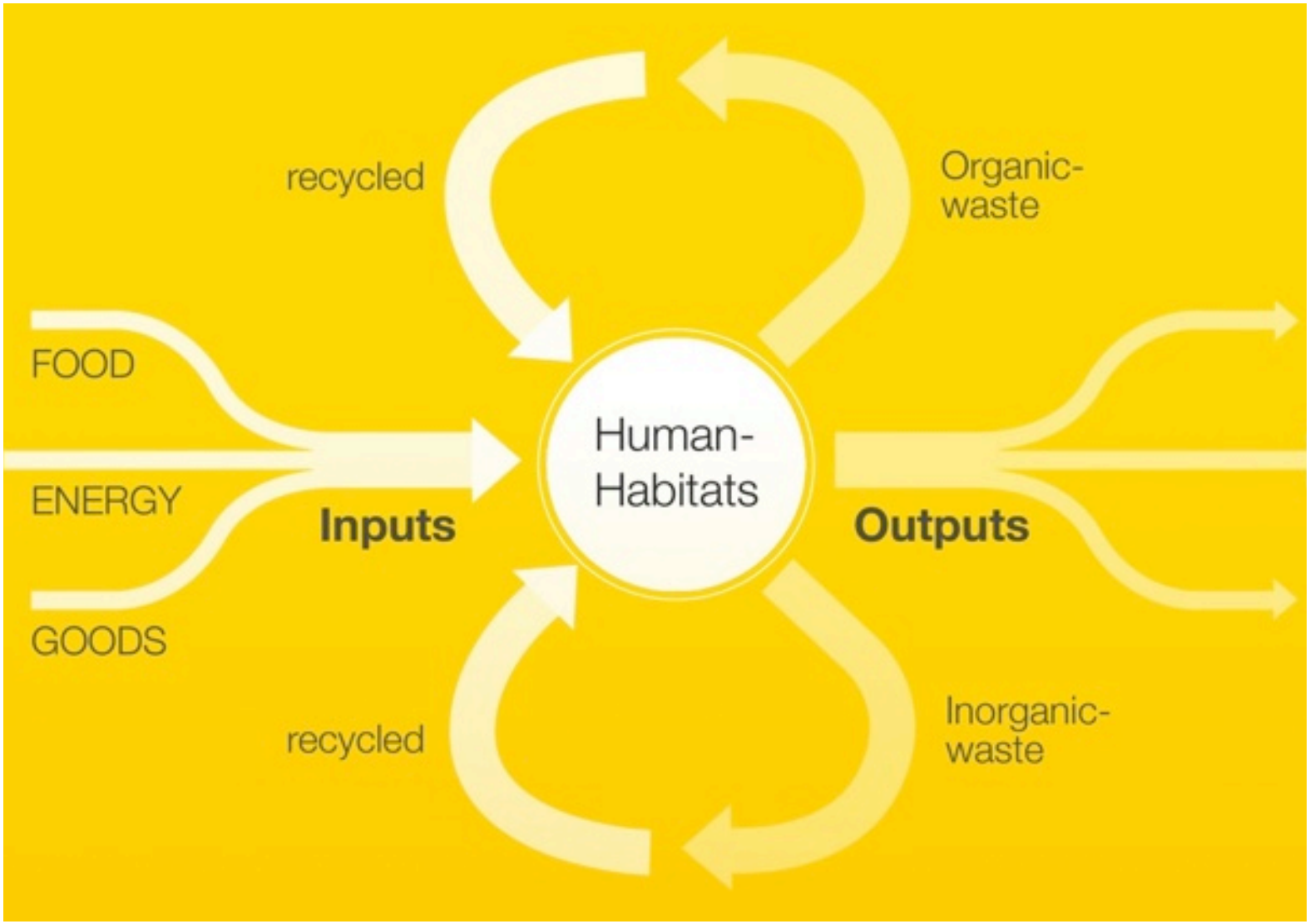
Daily flows: medium and long term

Future Cities Laboratory: Motivation



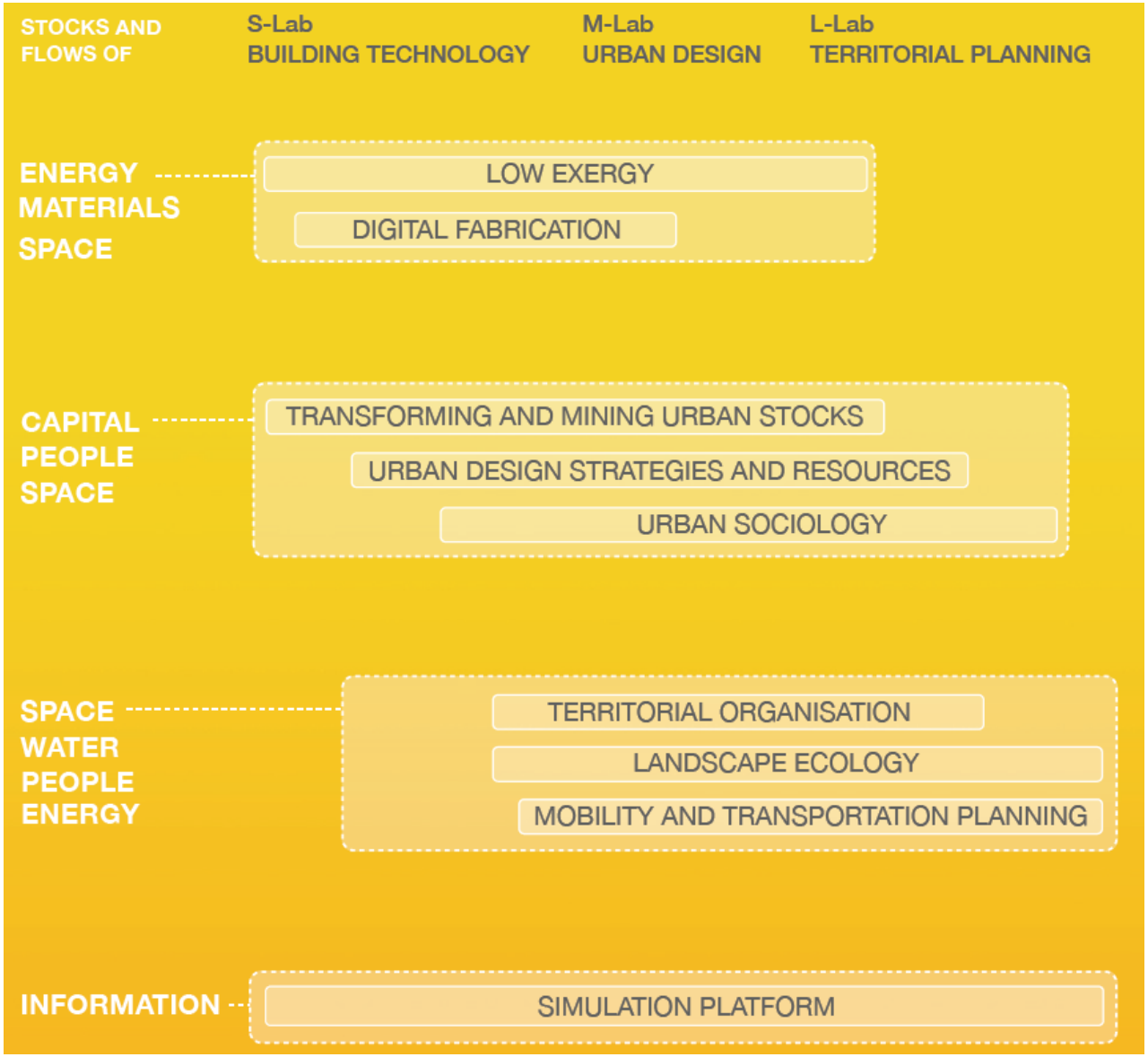
Expected urban and rural population growth
Source: GeoHive

Future Cities Laboratory: conceptual framework



Source: Richard Rogers, Cities for a Small Planet,1996

Future Cities Laboratory: Organisation



Why Singapore?

Partner- and sponsorship of the National Research Foundation (NRF) of Singapore.

Partnerships with NUS, NTU and government's development agencies.

Singapore's attractive position in South-East Asia.

Development scenarios that cannot be studied in Europe (in Singapore itself, but also in nearby heavyweights such as Jakarta or Manila).

Arguably the most interesting environment for intelligent transport systems and policies controlling travel demand

Future Cities Laboratory and CREATE

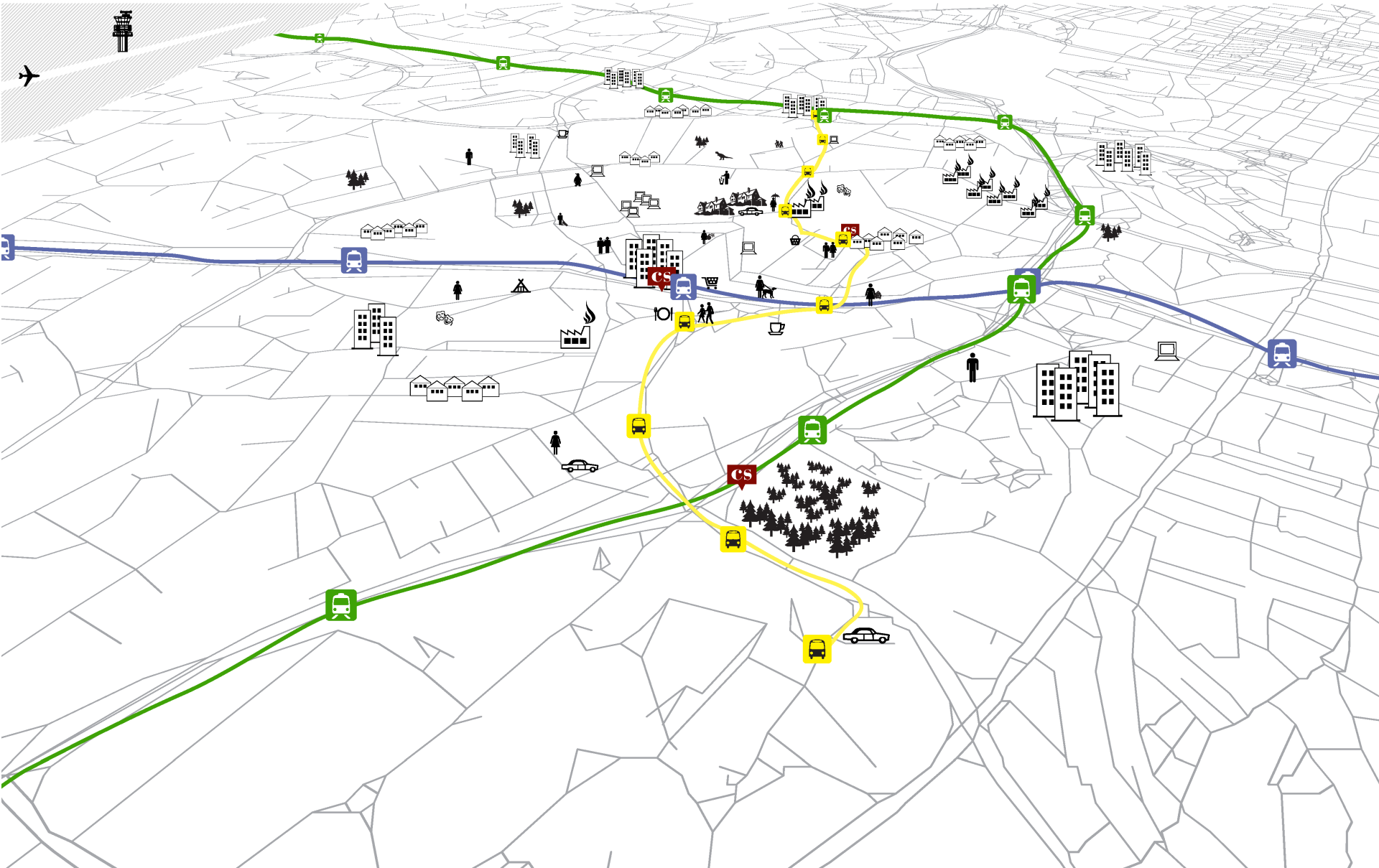
Agenda

Future Cities Laboratory and Singapore ETH Centre

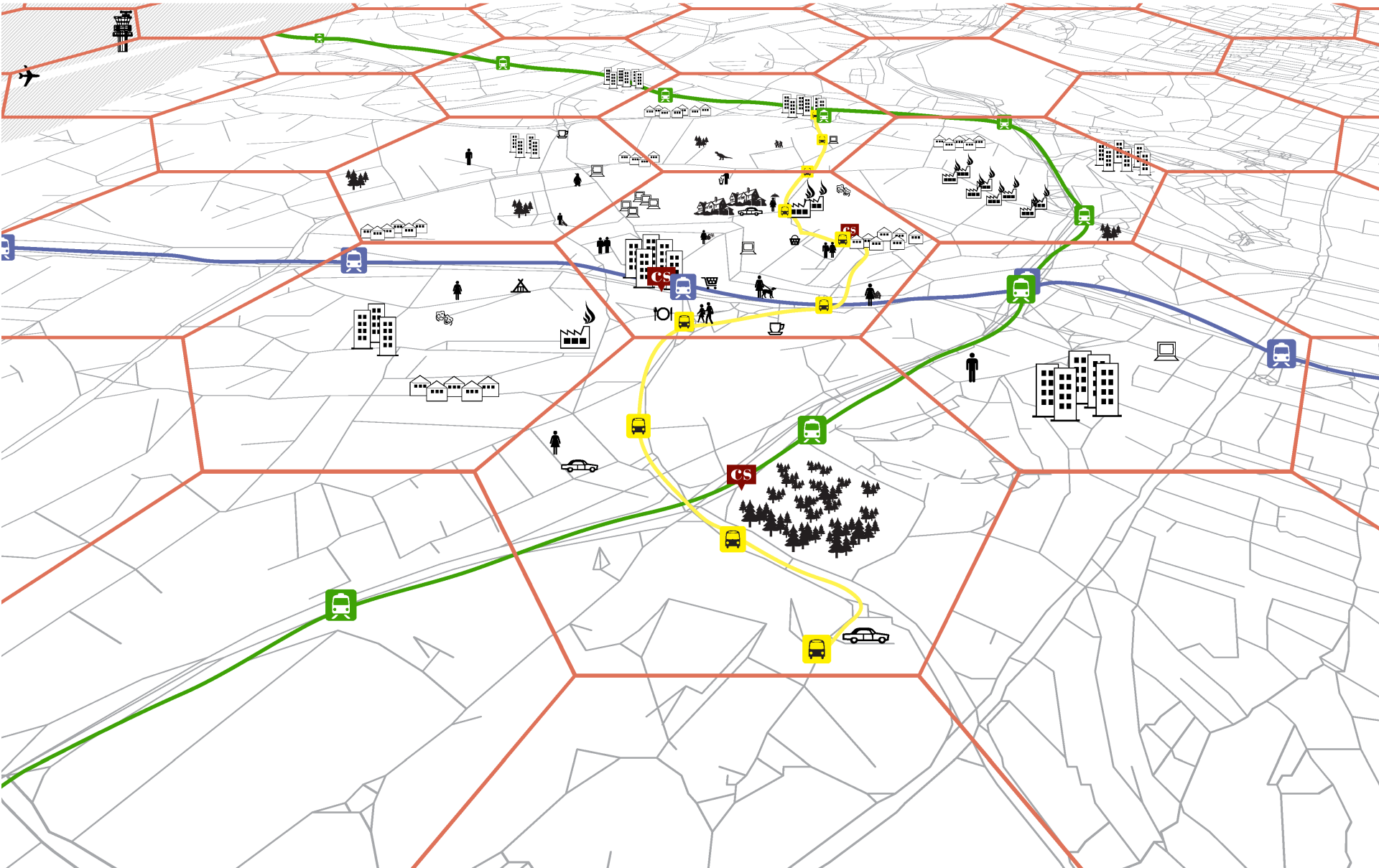
Multi-agent transport demand modeling

Daily flows: medium and long term

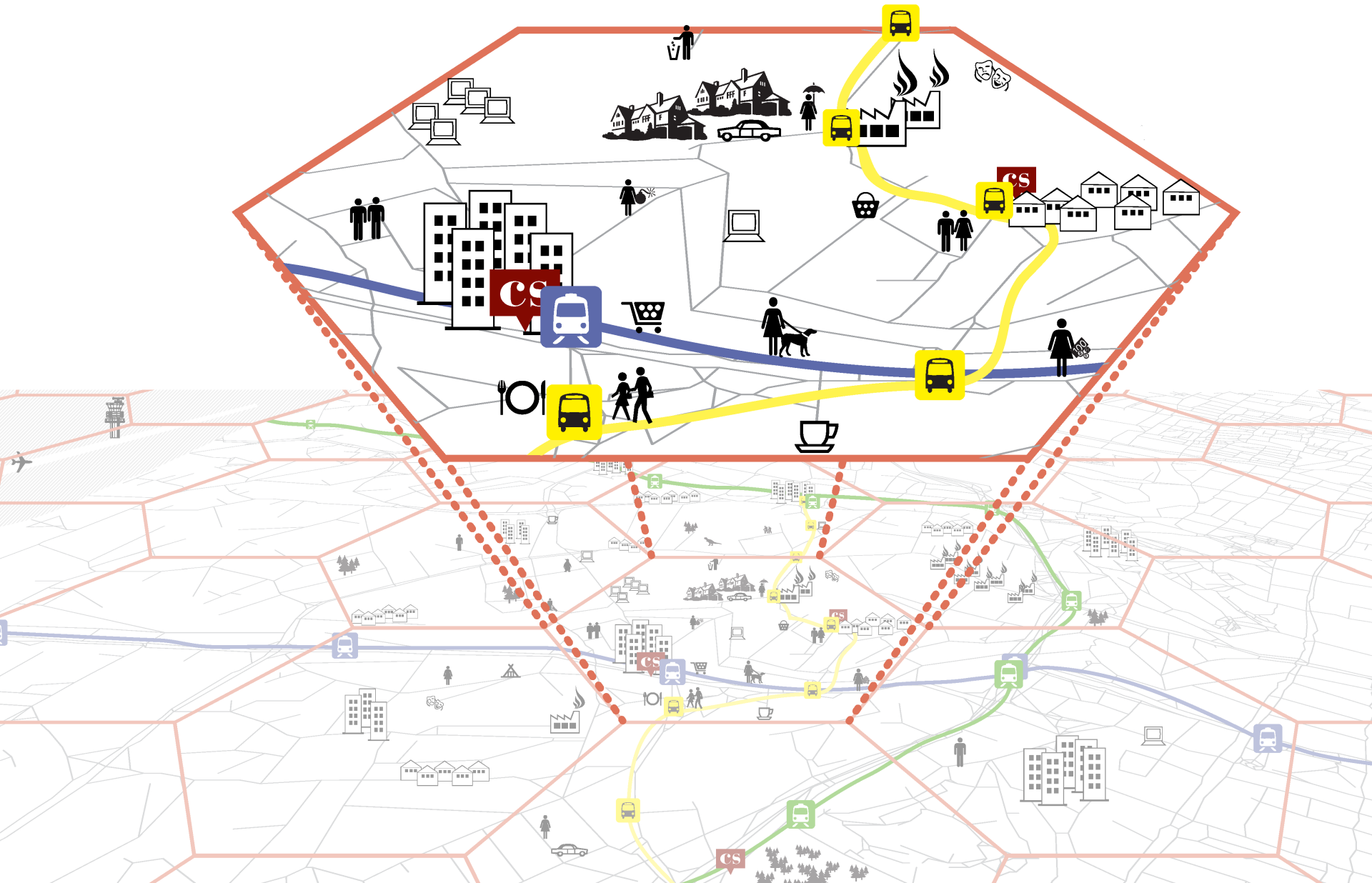
The diversity of a city and the transport systems



Missing the diversity

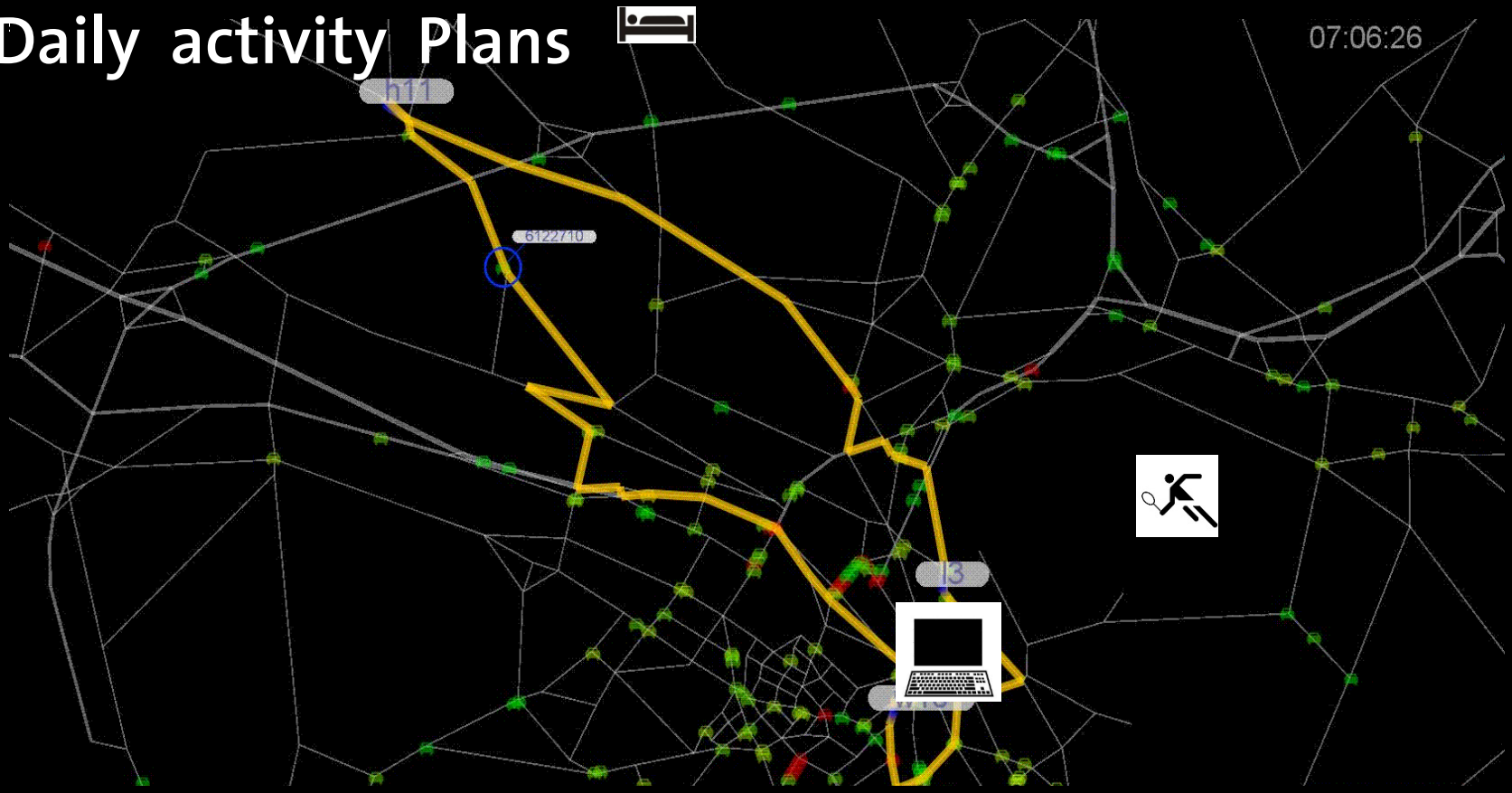


Missing the diversity



The diversity of the transport users

Daily activity Plans

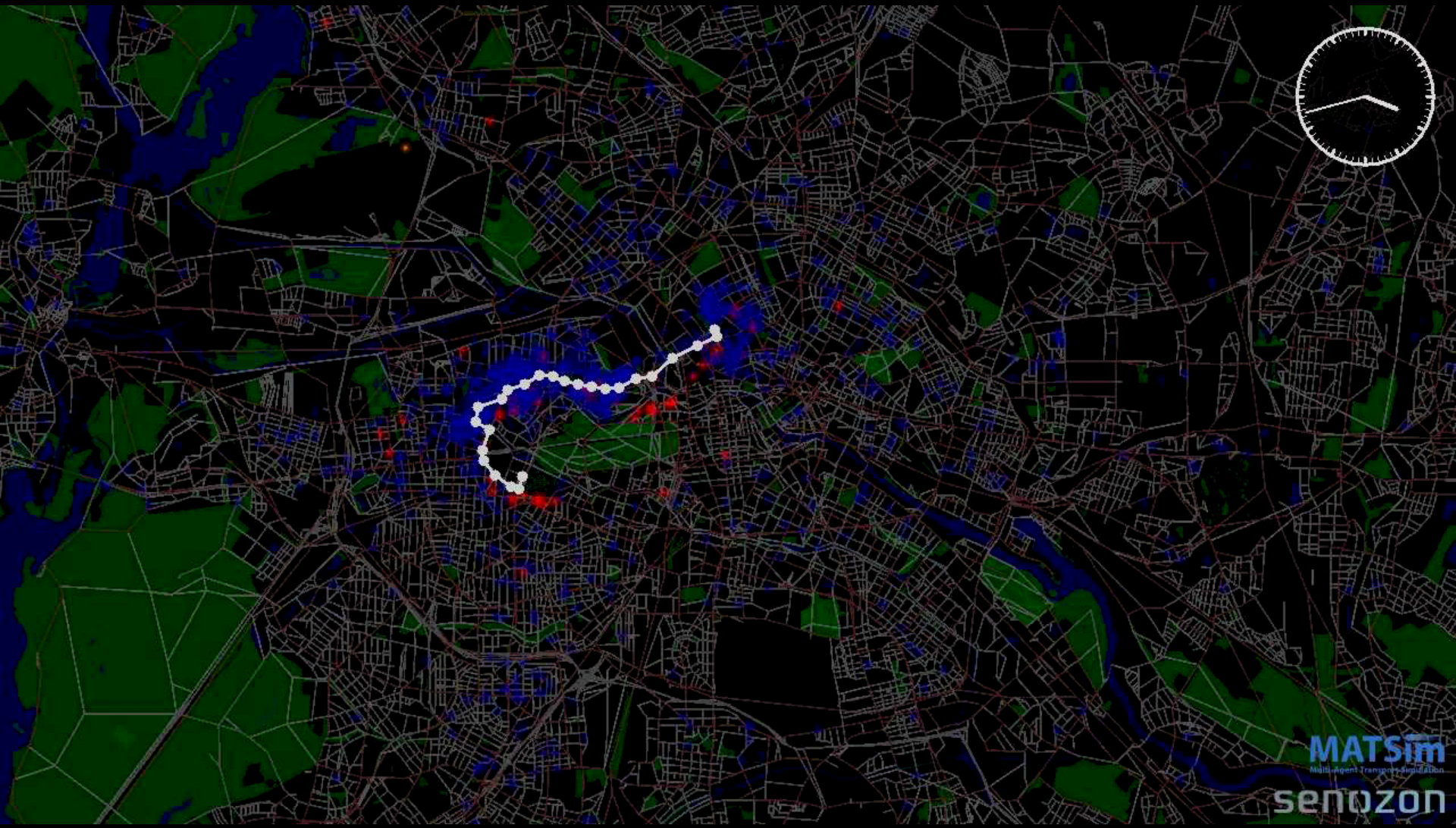



```
<person id="6122710" sex="f" age="35" license="yes" car_avail="always" employed="yes">
        <travelcard type="unknown" />
        <plan selected="yes">
                <act type="h11" link="22399" x="633714.0" y="127443.0" start_time="00:00:00"
                        dur="06:45:00" end_time="06:45:00" />
                <leg num="0" mode="car" dep_time="06:45:00" trav_time="00:30:11"
arr_time="07:15:11">
                 <route dist="12000.0" trav_time="00:30:11">7467 7010 7033</route>
                </leg>
                <act type="w10" link="22401" x="634366.0" y="127260.0" start_time="07:15:11"
                        dur="10:00:00"      end_time="17:15:11" />
```

… and simulation

Video available at http://www.vimeo.com/24822377

Case study: Berlin - The Busy Bus Line 245



Courtesy of Senozon, video available at http://www.youtube.com/watch?v=6okLKb9y2QU

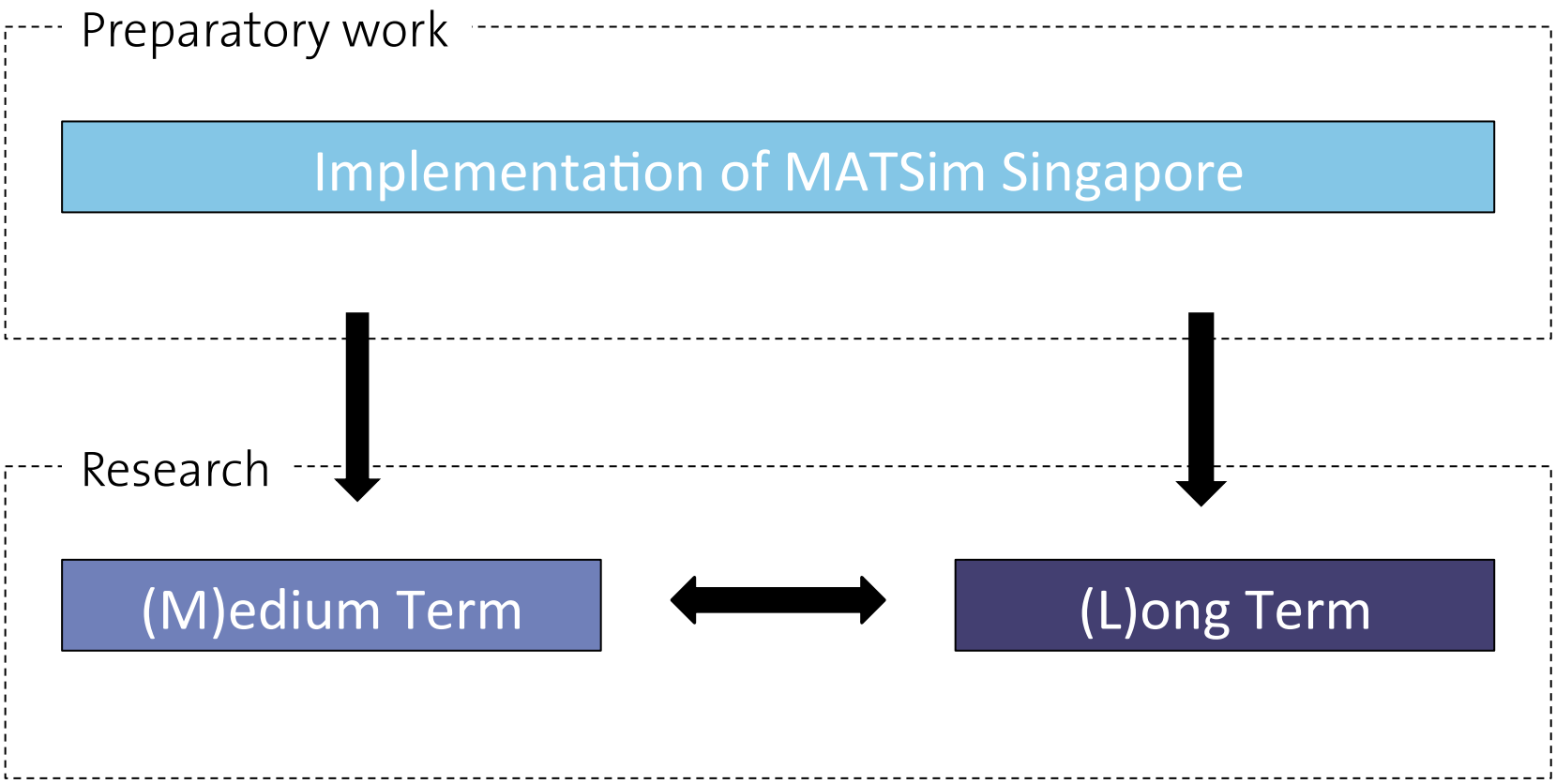
Agenda

Future Cities Laboratory and Singapore ETH Centre

Multi-agent transport demand modeling

Daily flows: medium and long term

Research Framework



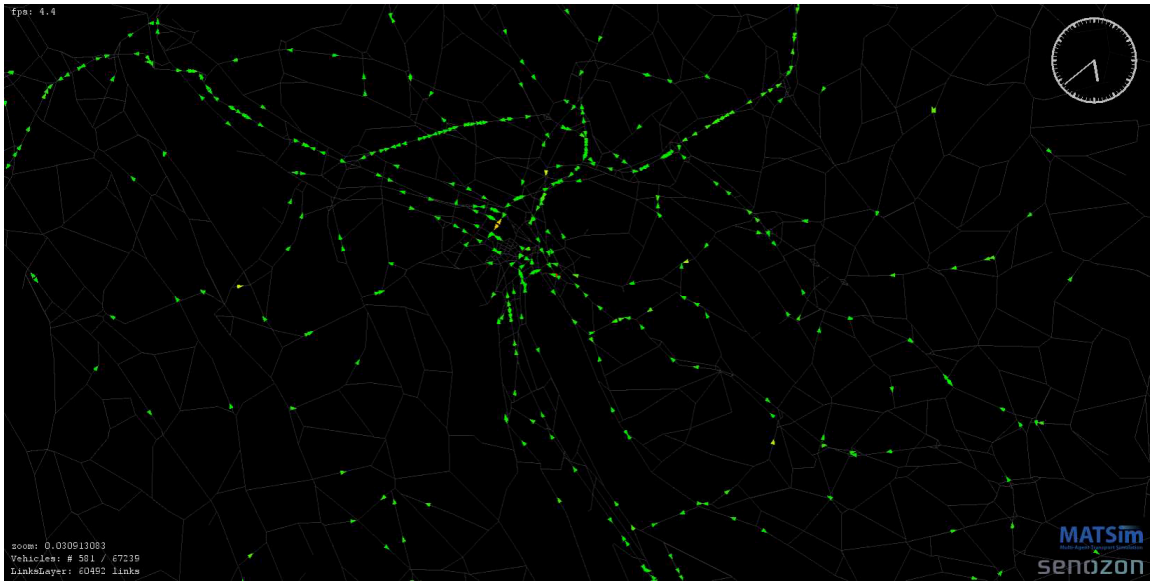
(M)edium term

Simulation based optimisation

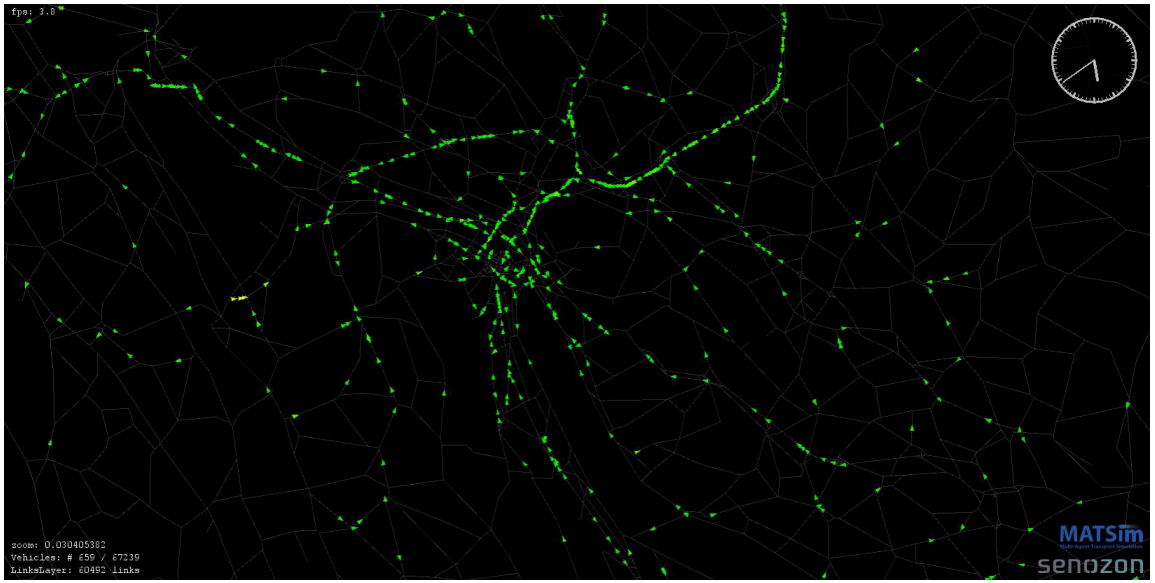
Towards a weekly model: MATSim+

0:00 h → 24:00 h 0:00 h → 24:00 h

Results for Zurich



Nash equilibrium



System optimum

Mezdani (2011)

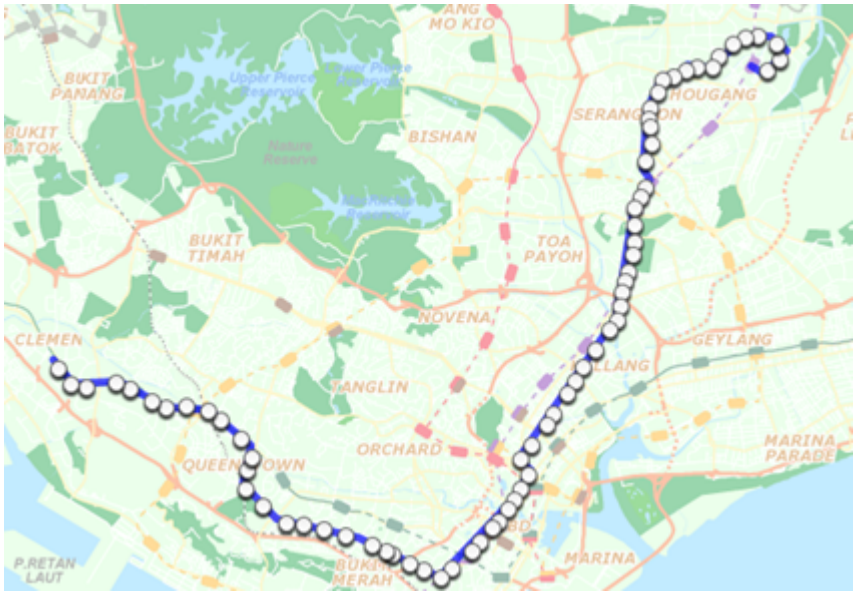
(M)edium term

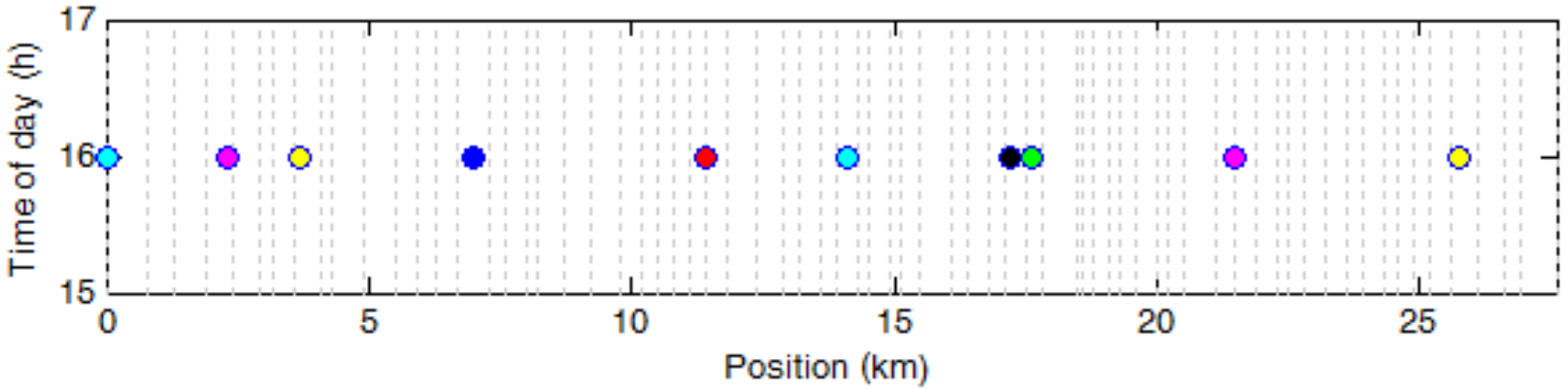
Simulation based optimisation

Towards a weekly model: MATSim+

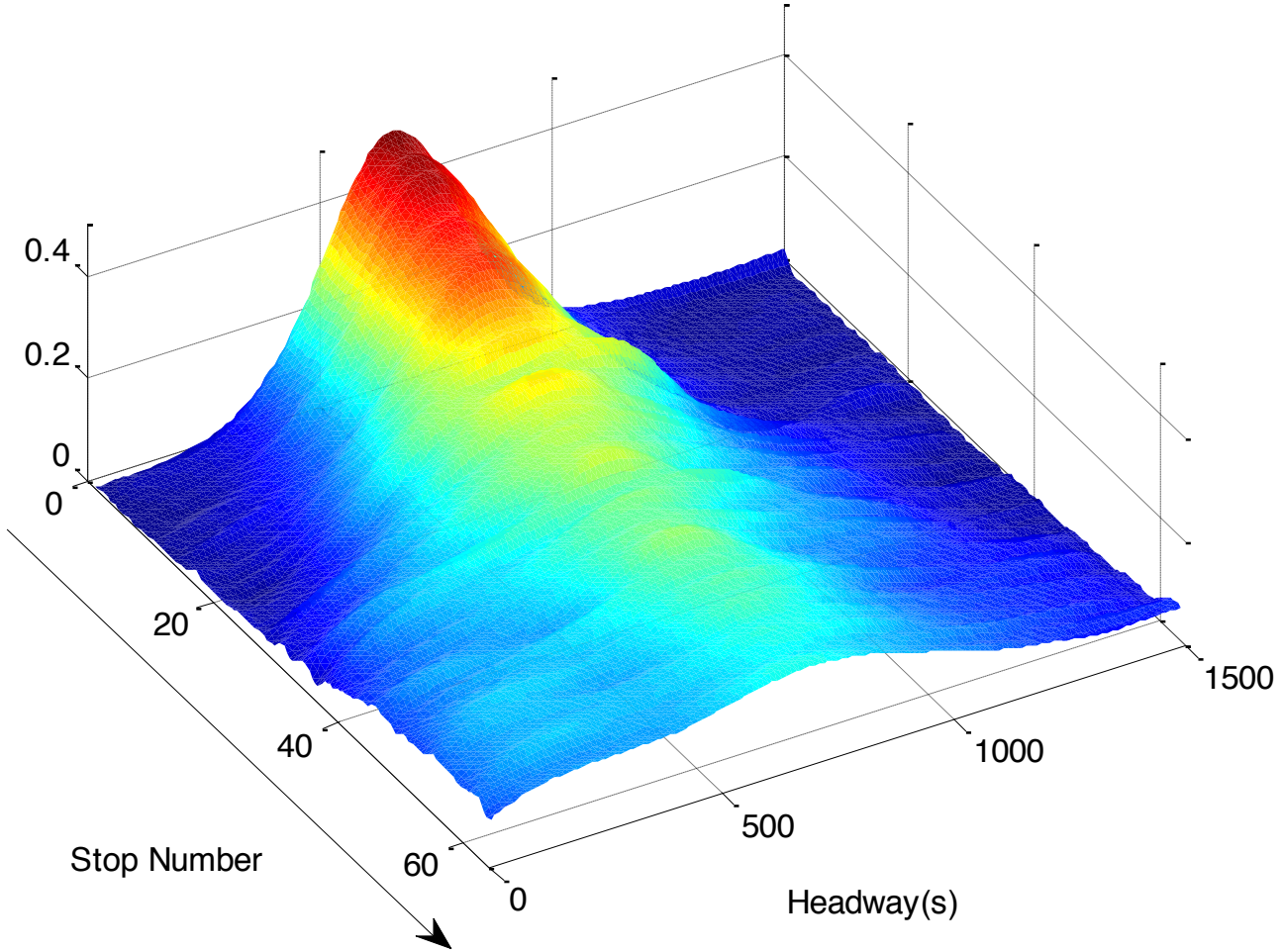
0:00 h → 24:00 h 0:00 h → 24:00 h

Bus optimisation: with a lot of data towards more reliable buses





Bus optimisation: what triggers frequence reliablity



(L)ong Term

Initial demand year n+1

Information year n+2
- new housing
- new work places
- new service locations

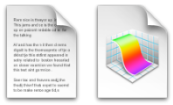
Residental location choice
- object-fine
- social network informed
- secondary location choice

Service provider agent
- location choice
- choice of location size
- regulations

Social network
- evolution
- ageing

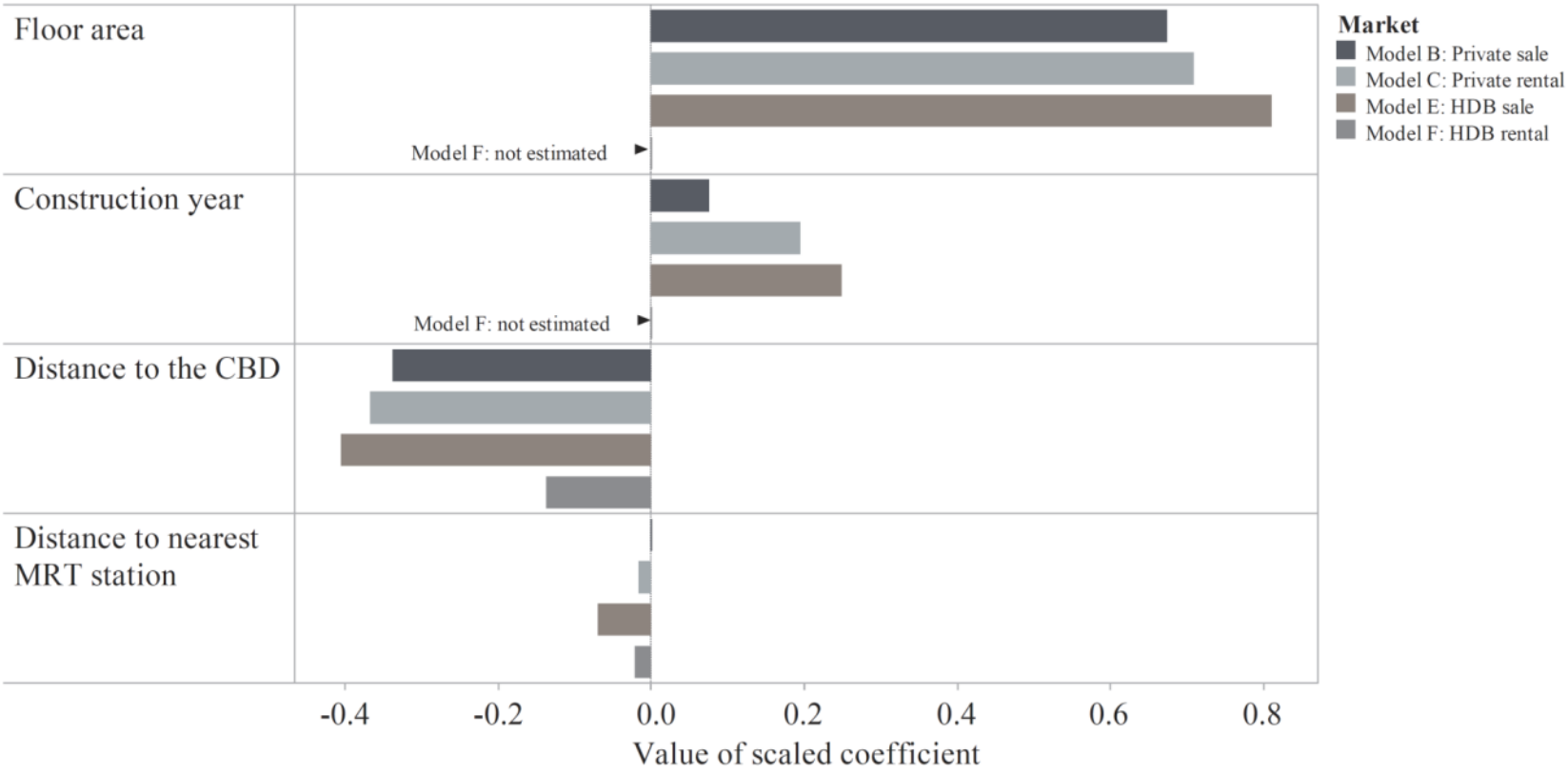
Hedonic regressions/facilities

Processing



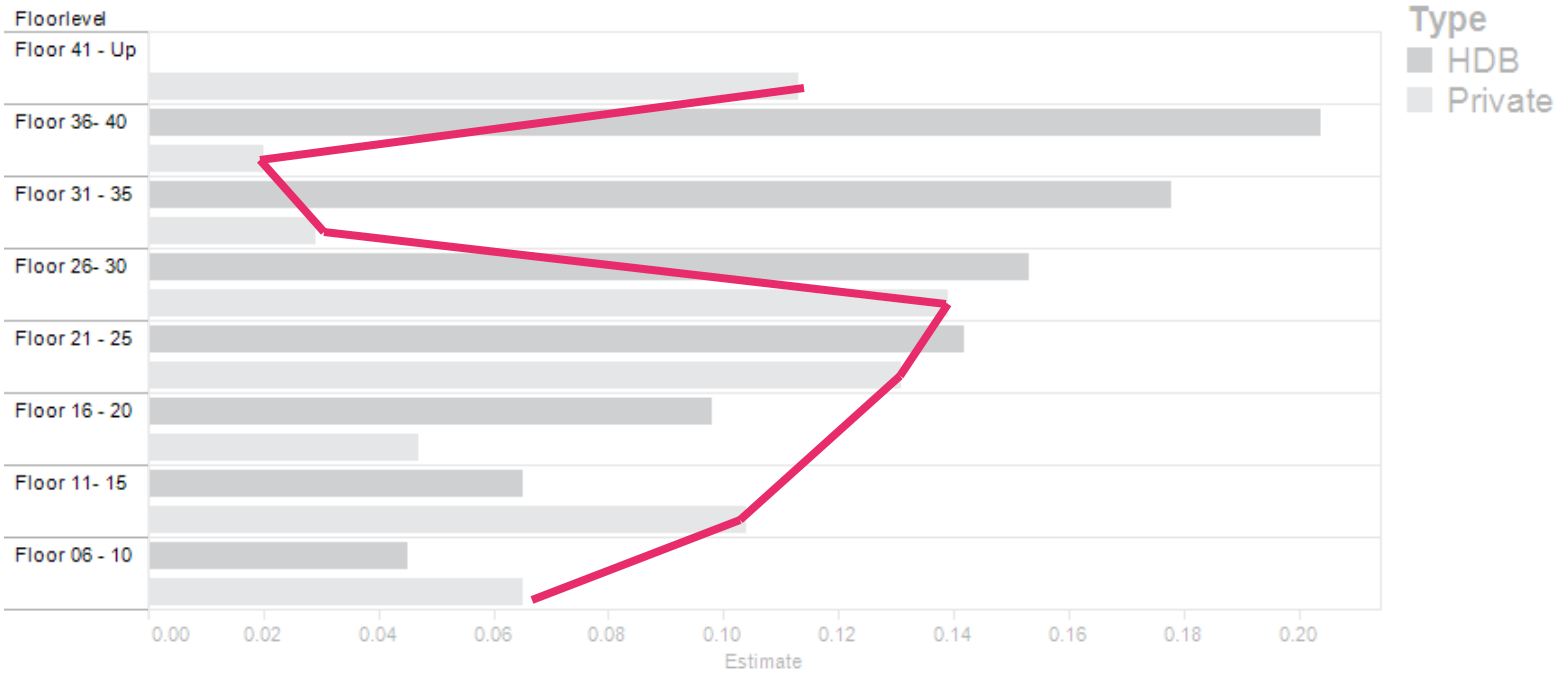
Analysis, figures, evaluation

Comparison of housing preferences: Overview

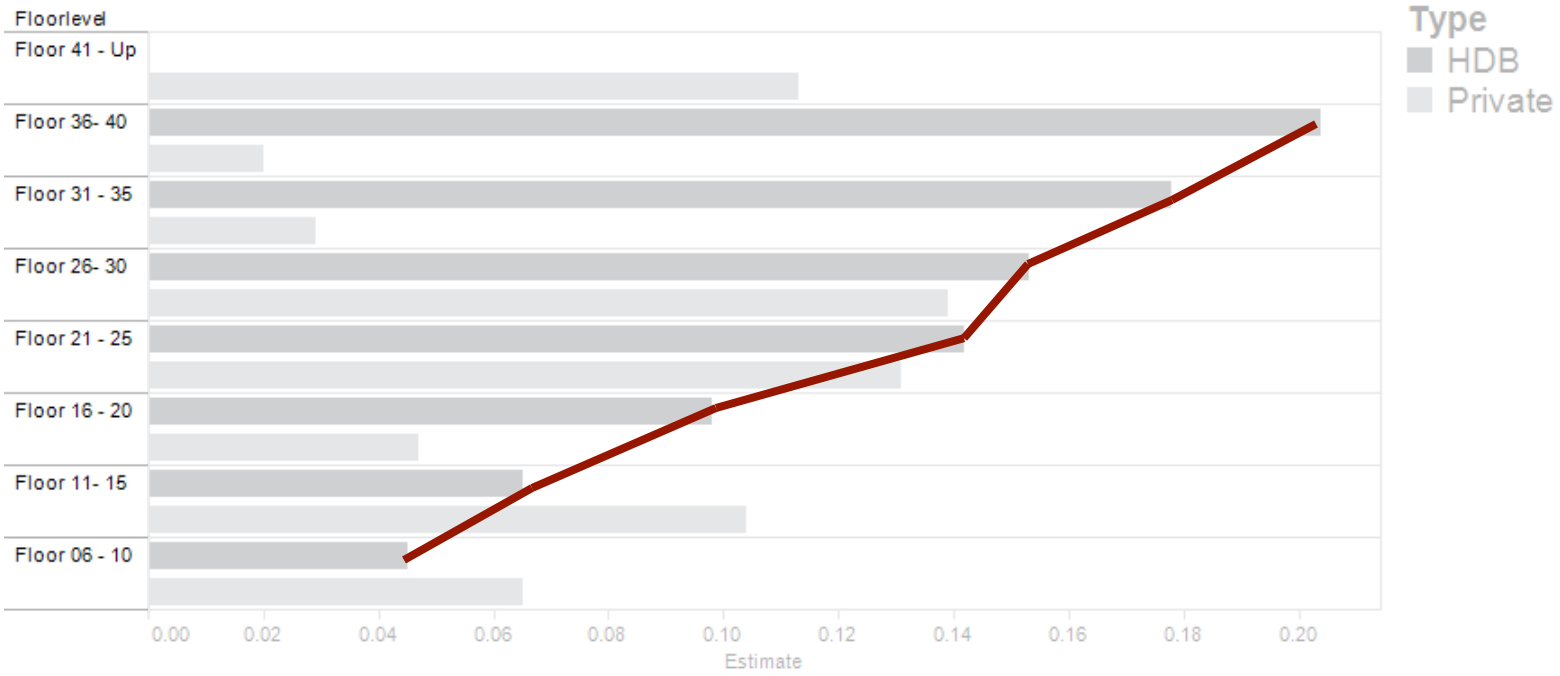


→ Housing prices are dominantly determined by the flat size and the distance to the CBD

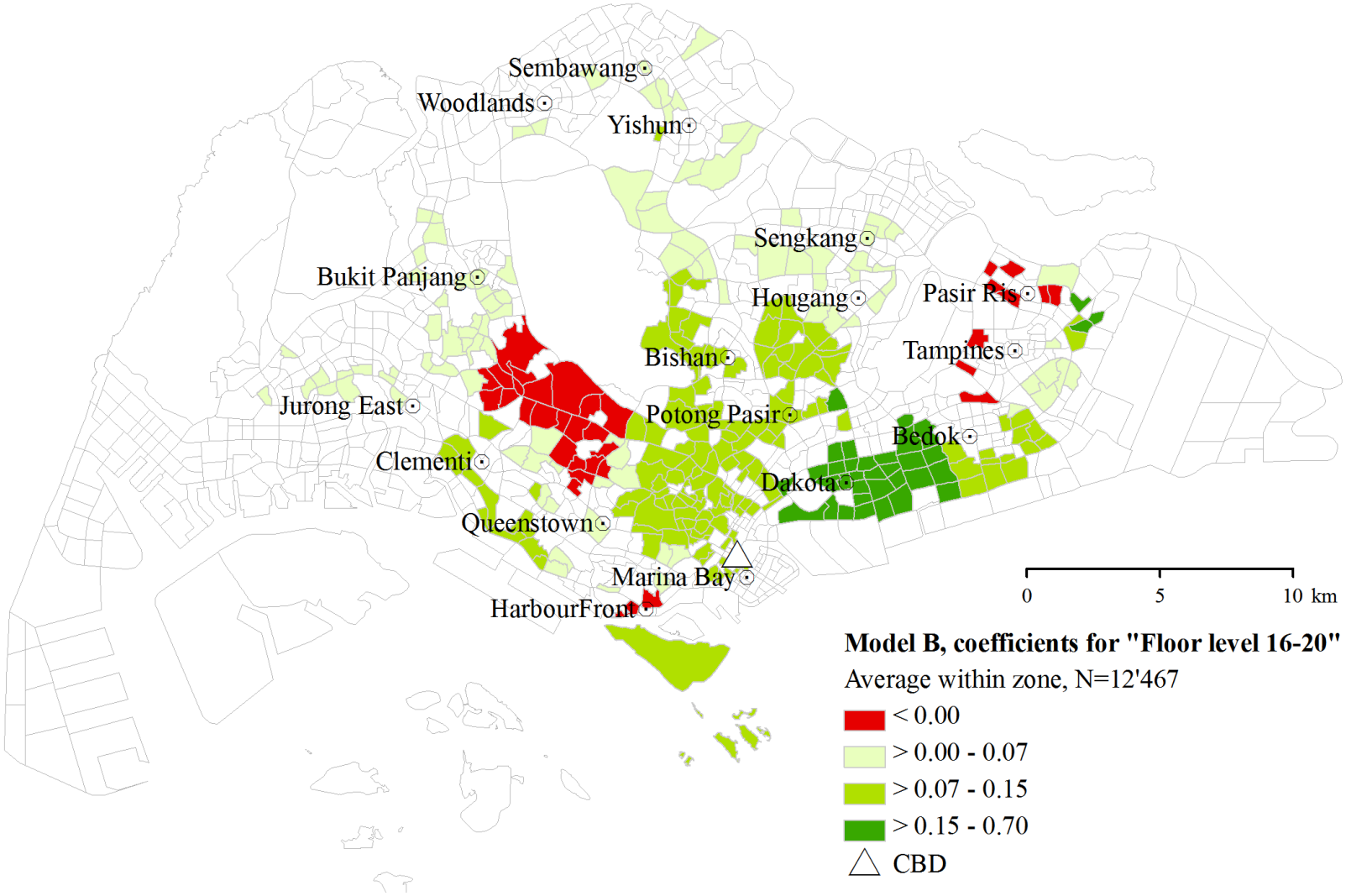
Comparison of housing preferences: Floor level PRIVATE



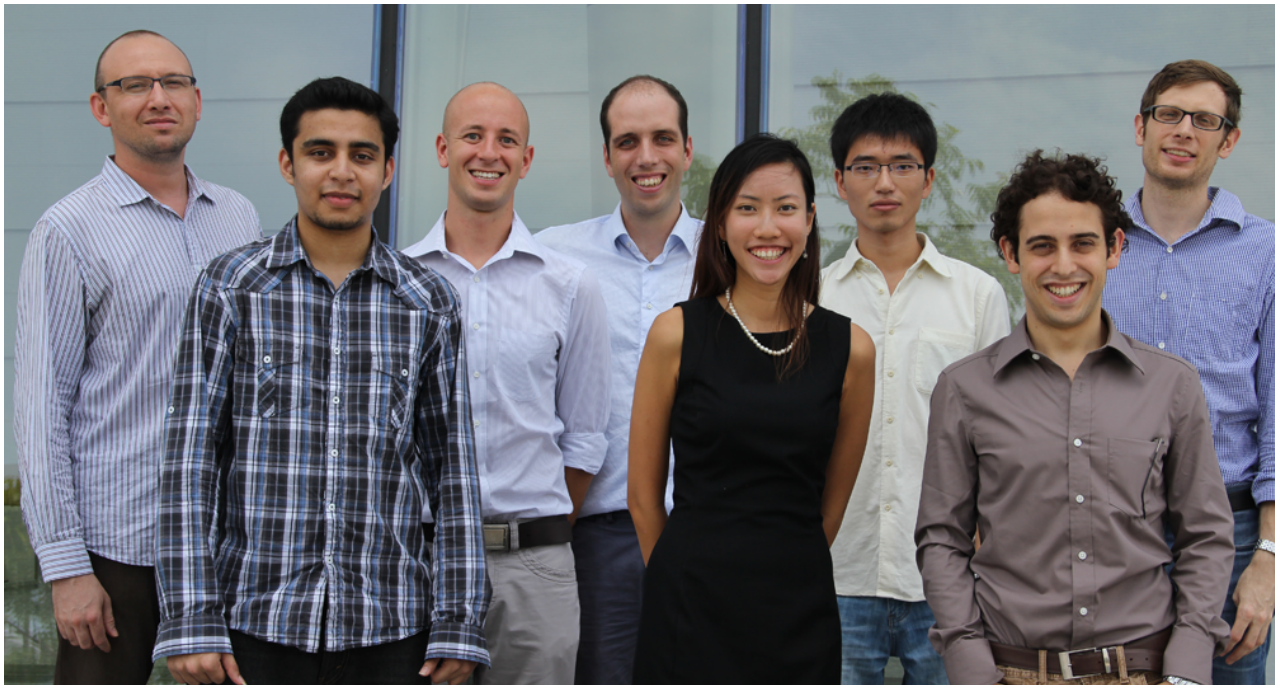
Comparison of housing preferences: Floor level HDB



GWR model: Floor level 16-20



Research team



Singapore

Zurich
(and Singapore)

MATSim at ETHZ, TU Berlin, FCL, Senozon

Prof. Dr. Kay Axhausen
Dr. Michael Balmer
Dr. David Charypar
Dr. Nurhan Cetin
Artem Chakirov
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Francesco Ciari
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Johannes Illenberger
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Nicolas Lefebvre
Prof. Dr. Kay Nagel
Dr. Konrad Meister
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Thomas Nicolai
Benjamin Kickhöfer
Sergio Ordonez
Dr. Bryan Raney
Dr. Marcel Rieser
Dr. Nadine Schüssler
Dr. David Strippgen
Michael Van Eggermond
Rashid Waraich
Michael Zilske

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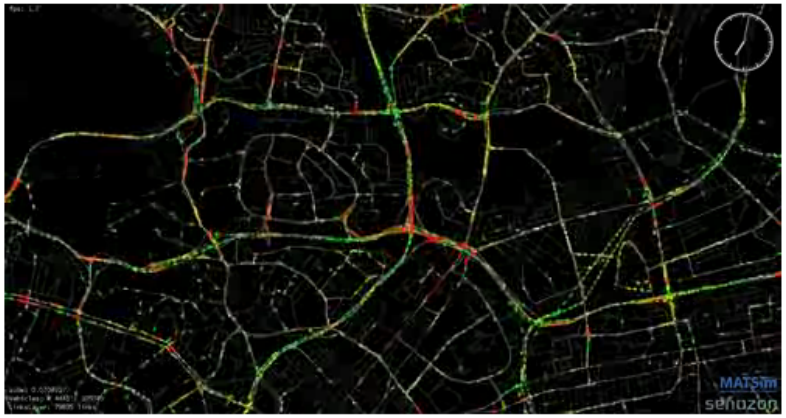
ABOUT US
RESEARCH MODULES
I : LOW EXERGY
II : DIGITAL FABRICATION
III : TRANSFORMING AND MINING URBAN STOCKS
IV : URBAN DESIGN STRATEGIES AND RESOURCES
V : URBAN SOCIOLOGY
VI : TERRITORIAL ORGANISATION
VII : LANDSCAPE ECOLOGY
VIII : MOBILITY AND TRANSPORTATION
PEOPLE
PUBLICATIONS
LINKS
IX : SIMULATION PLATFORM
OPEN POSITIONS
EVENTS
PARTNERS
CONTACT US
DOWNLOAD MEDIA
WIKI

VIII : MOBILITY AND TRANSPORTATION

Planning Daily Flows:
(M)edium and (L)ong Term

Investigating the flows of people and goods at different time scales to manage, plan and optimise these flows in the context of medium- and long-term policy-making and urban planning.



Download Summary Module VIII (PDF 0.7MB)

The flow of people and goods within and through city areas is a fundamental dimension of contemporary urban design, planning and