

Daily flows - medium and long term

Research in transport planning at Future Cities Laboratory

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



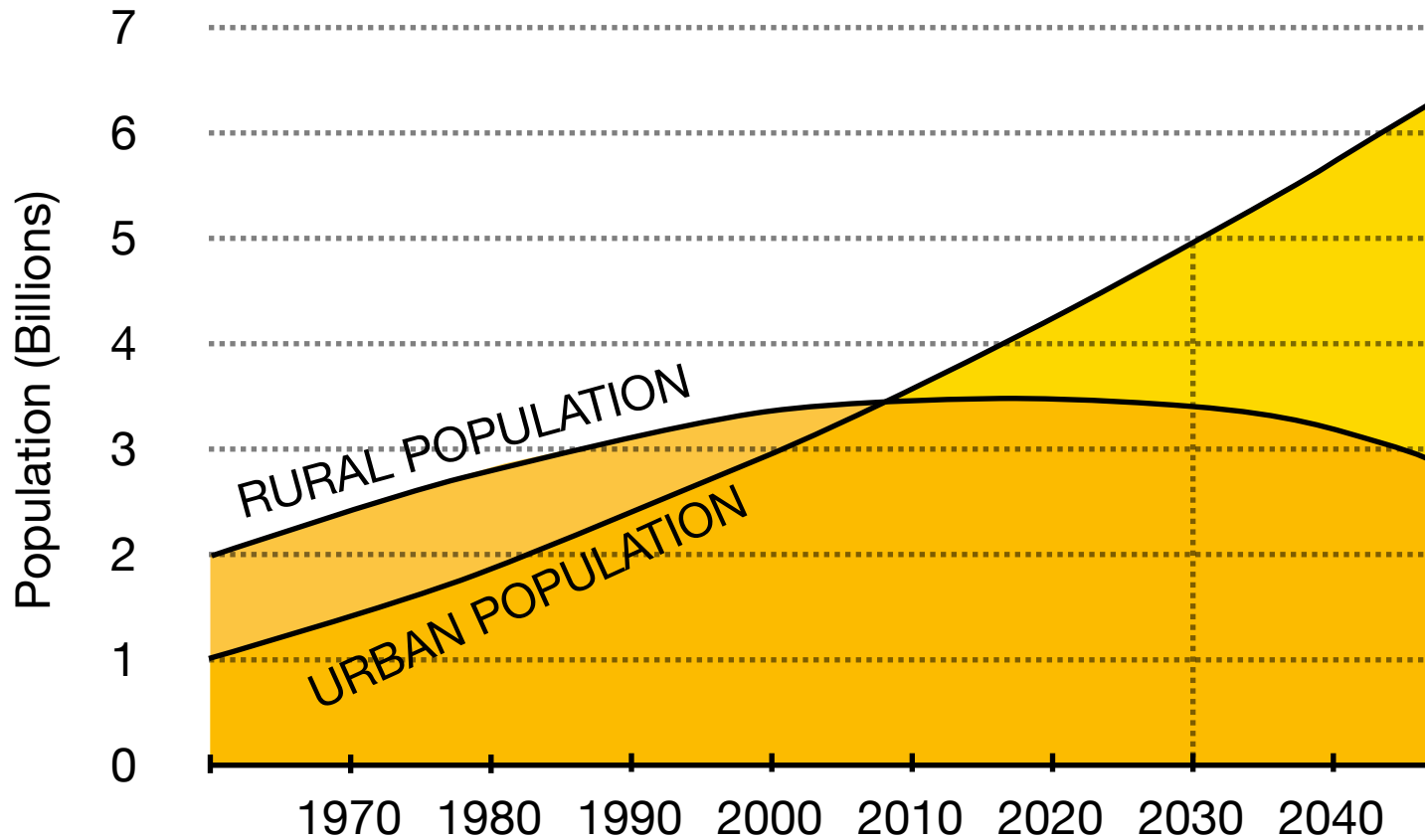
Agenda

Future Cities Laboratory and Singapore ETH Centre

Multi-agent transport demand modeling

Daily flows: medium and long term

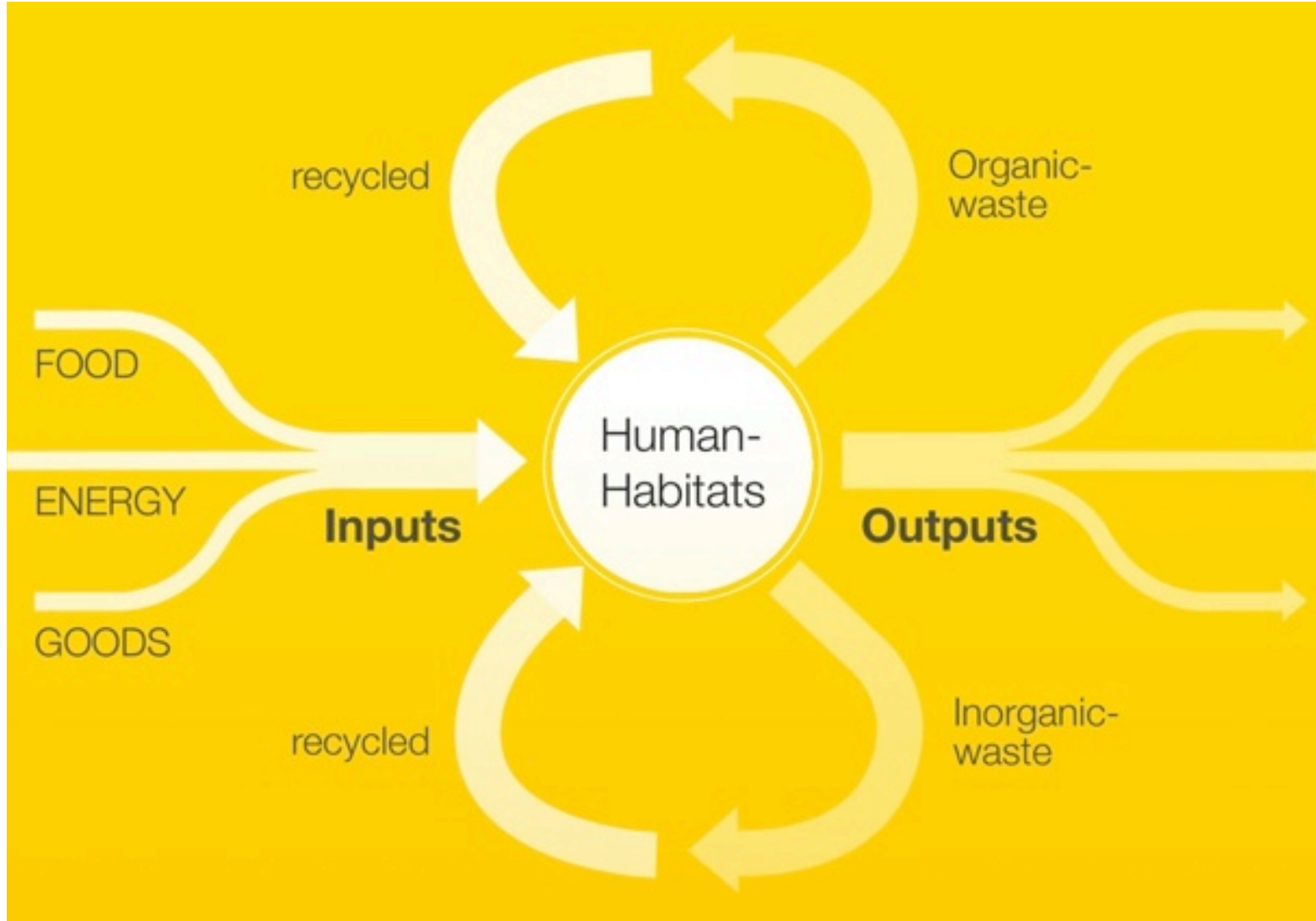
Future Cities Laboratory: Motivation



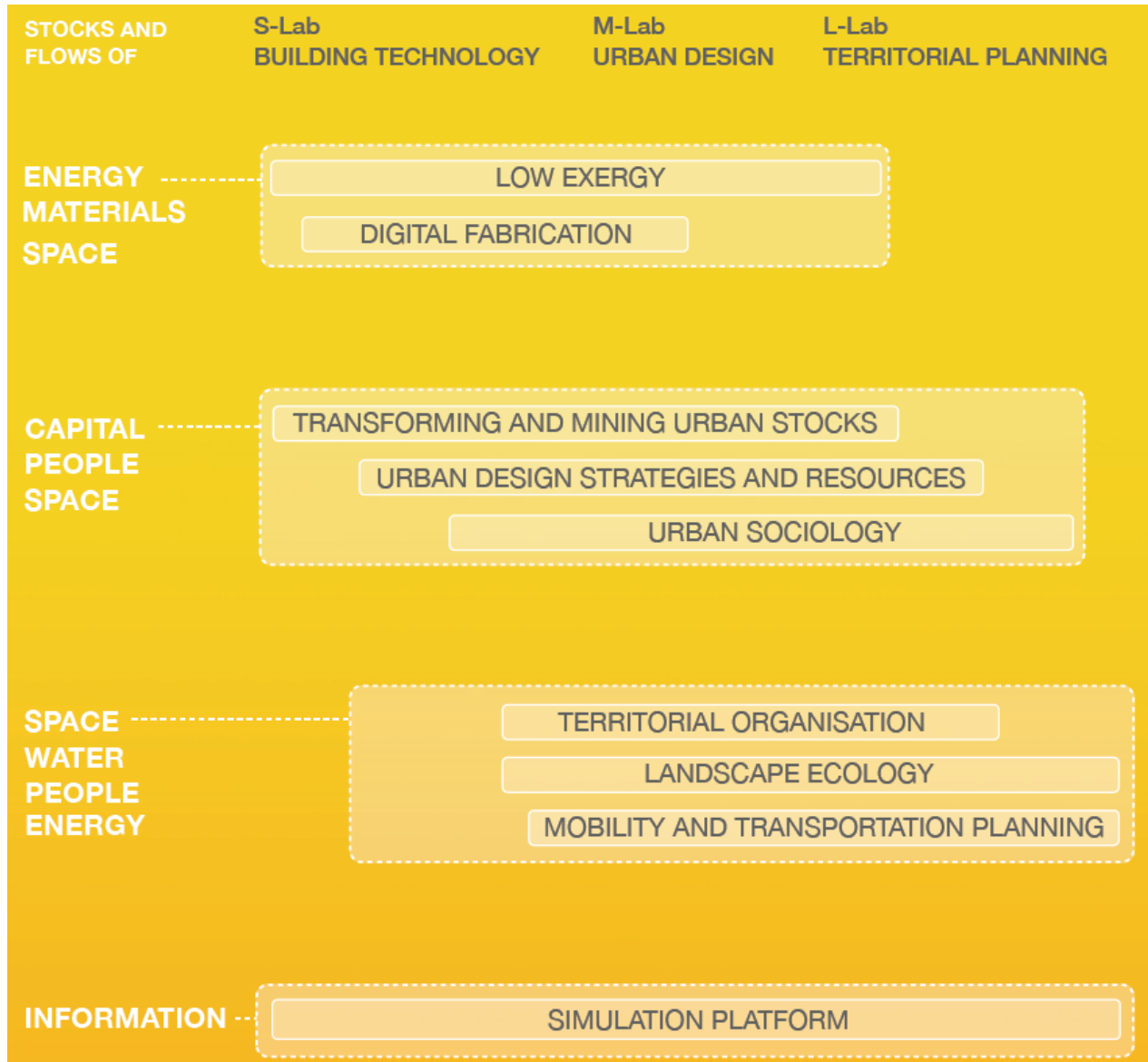
Expected urban and rural population growth
Source: GeoHive

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



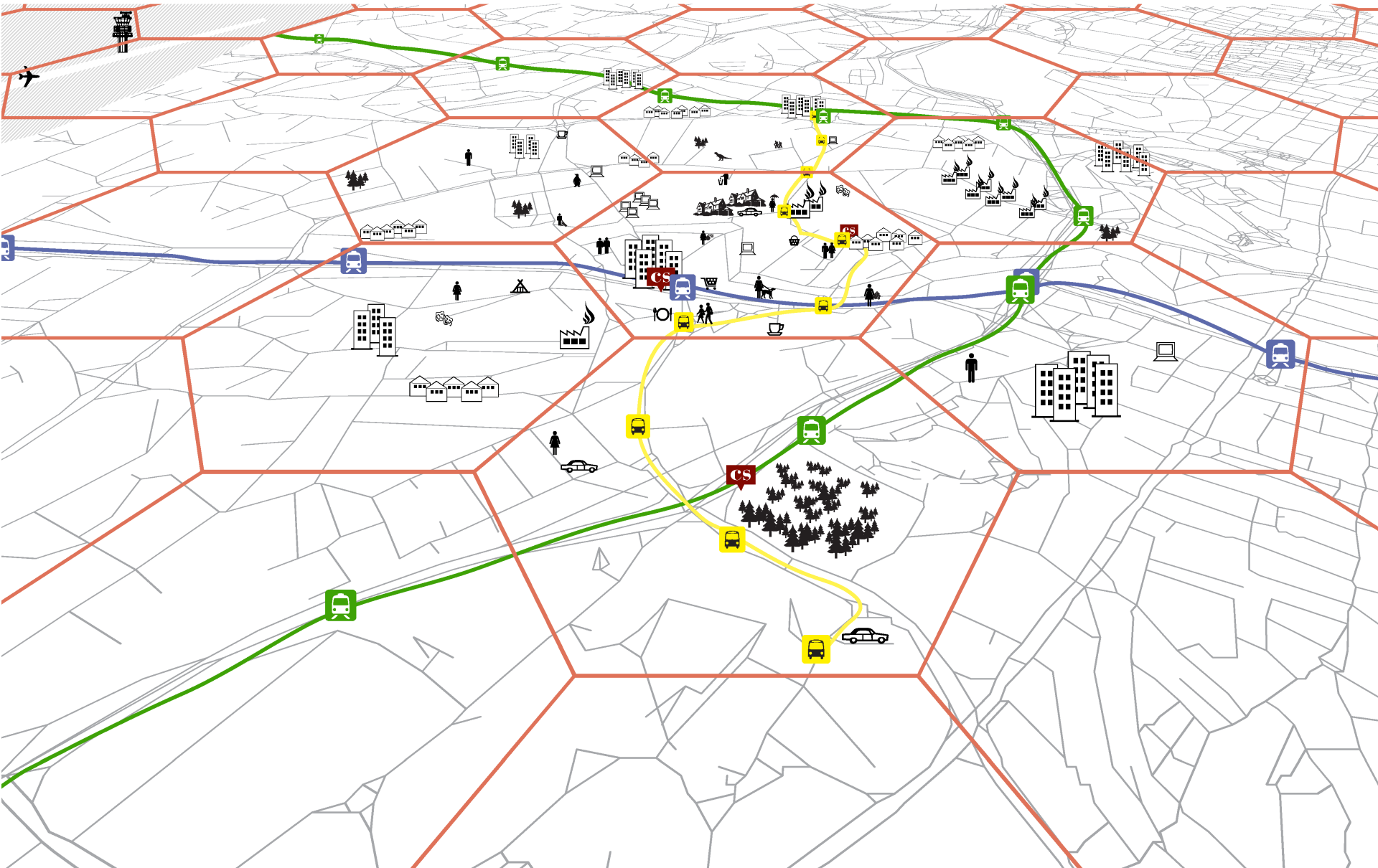
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Future Cities Laboratory and Singapore ETH Centre

Multi-agent transport demand modeling

Daily flows: medium and long term

Missing the diversity



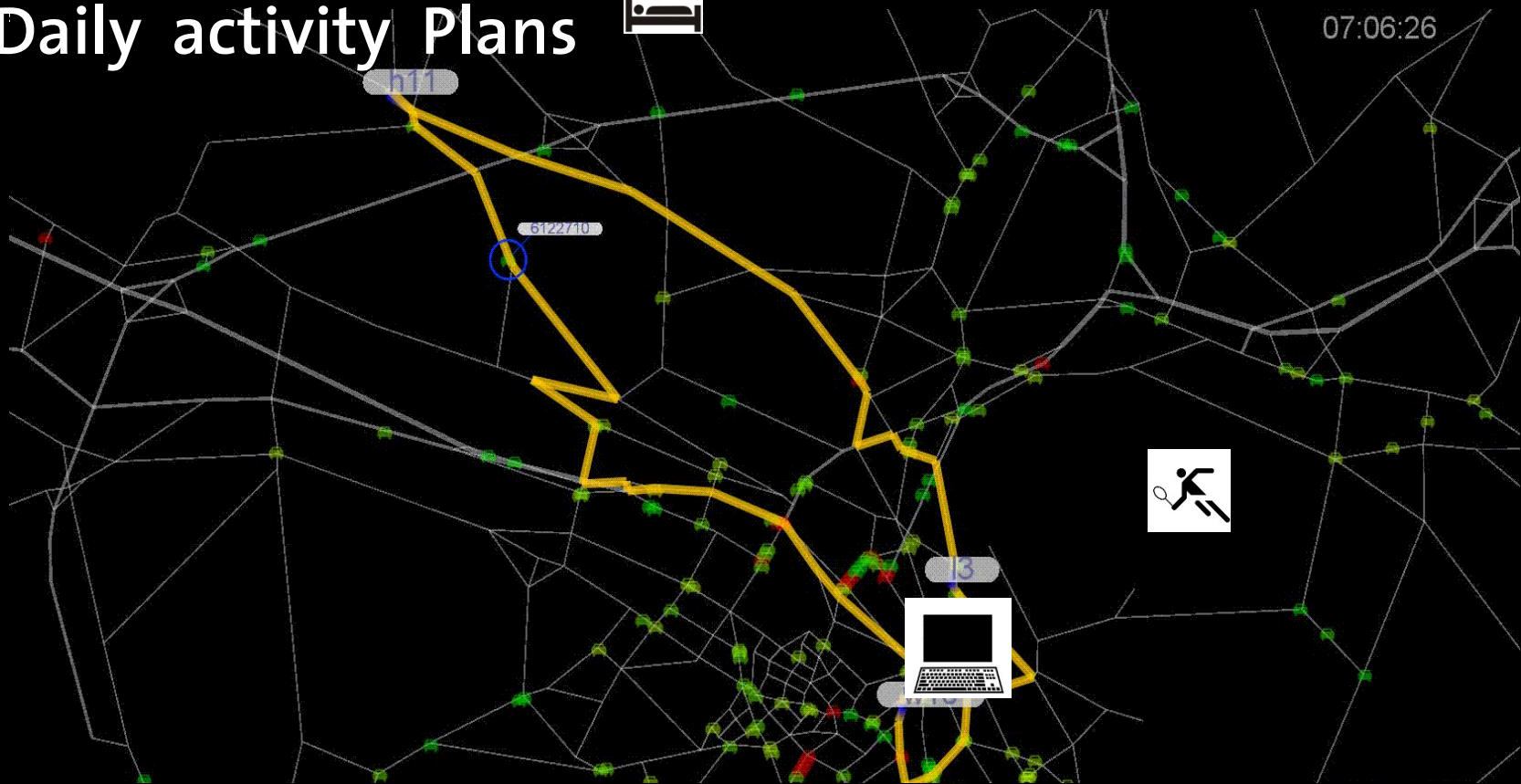
The diversity of the transport users



Daily activity Plans



07:06:26



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<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" />
  </plan>
</person>
```


... and simulation

fps: 1.9

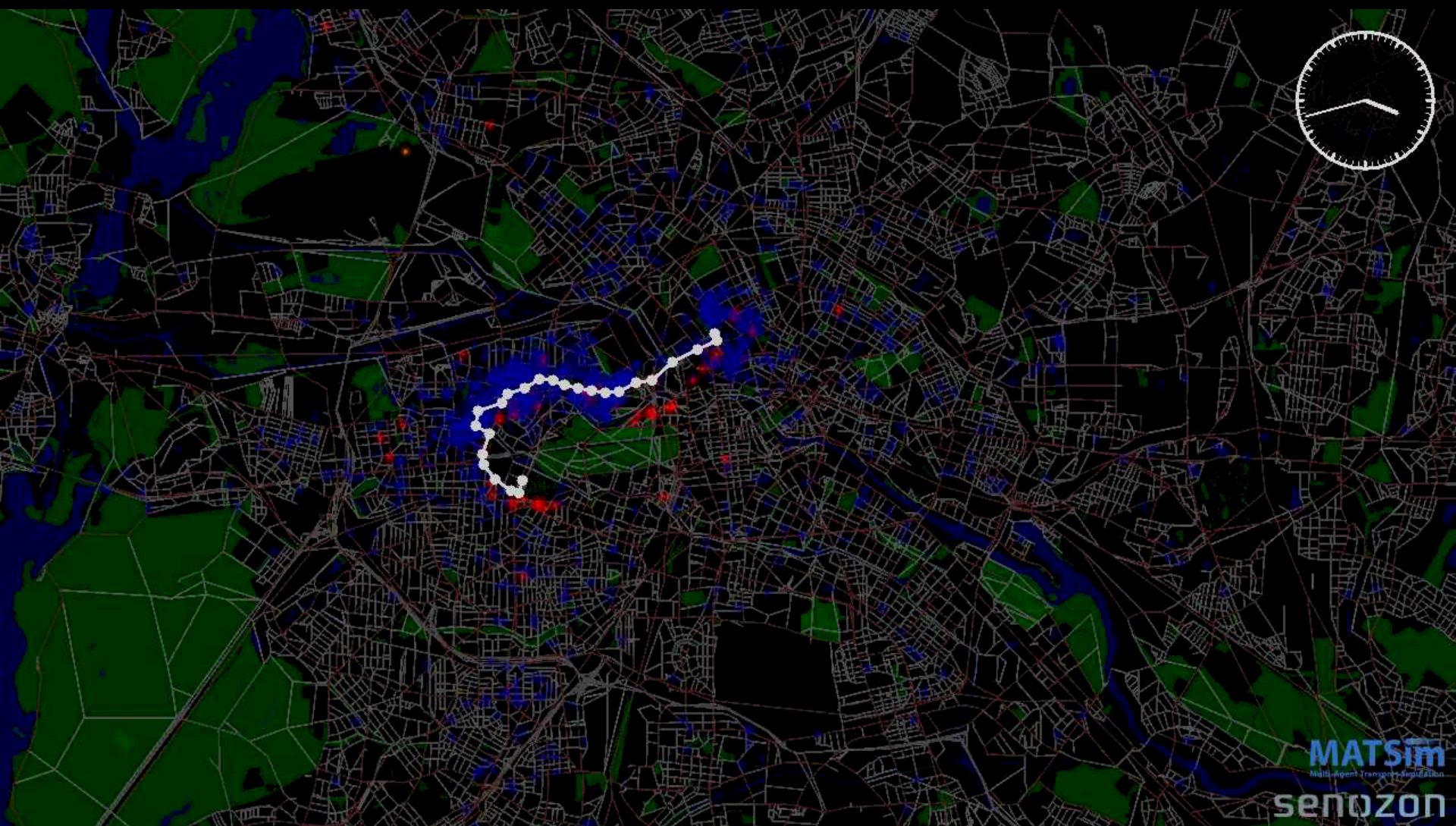


zoom: 0.03375224
Vehicles: # 16129 / 105049
LinkLayer: 79835 links

MATSim
Multi-Agent Transport Simulation
senozon

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>

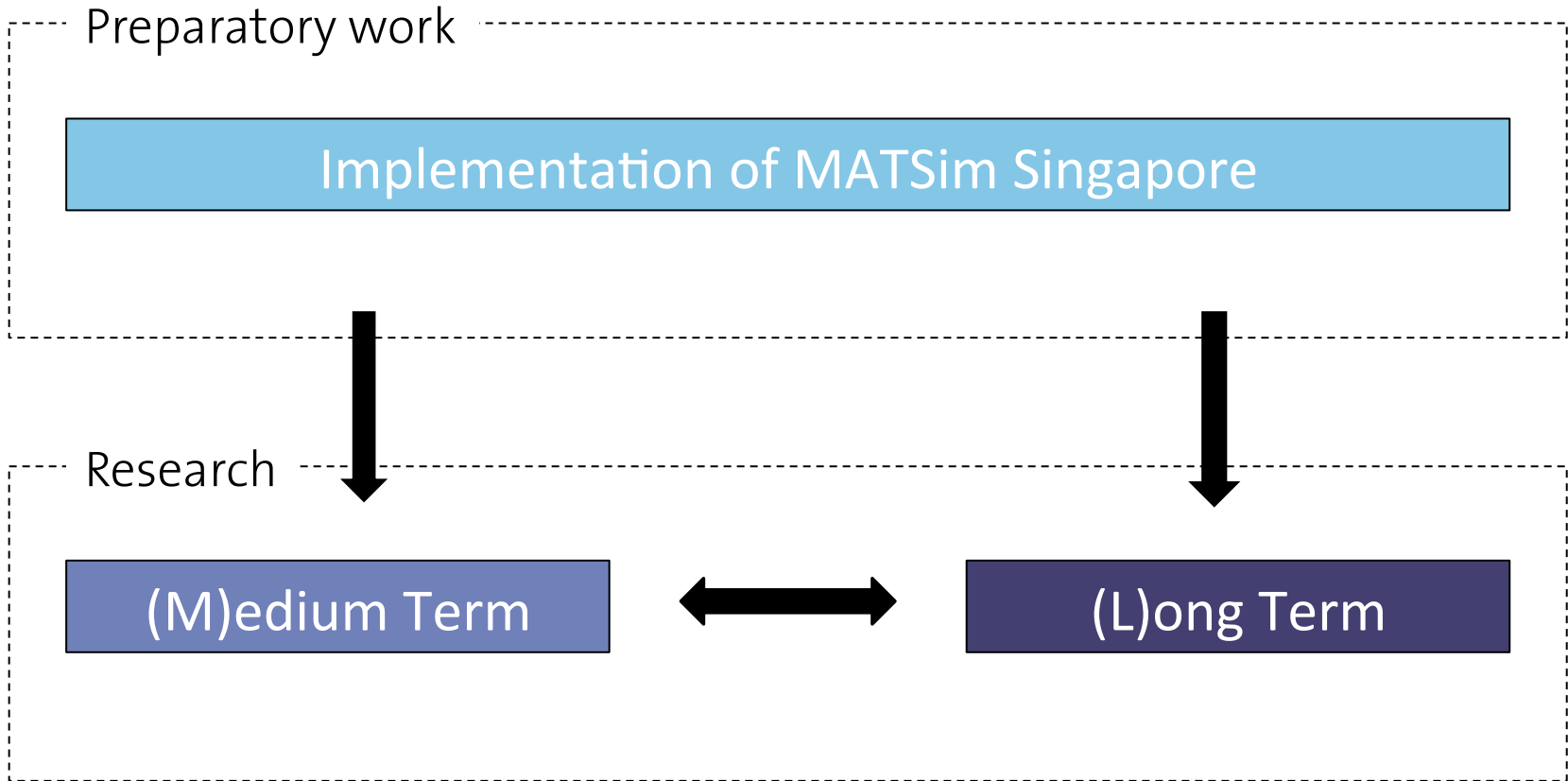
Agenda

Future Cities Laboratory and Singapore ETH Centre

Multi-agent transport demand modeling

Daily flows: medium and long term

Research Framework

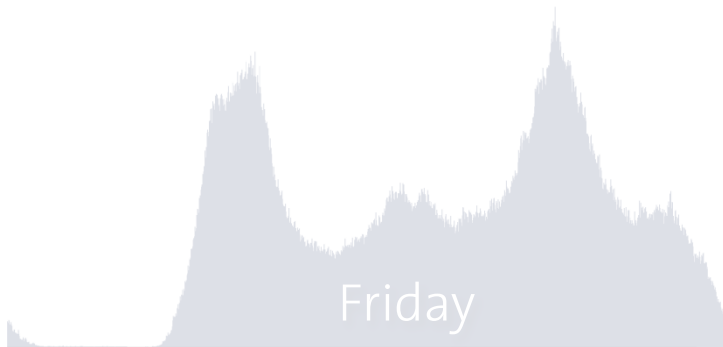


(M)edium term

Simulation based optimisation



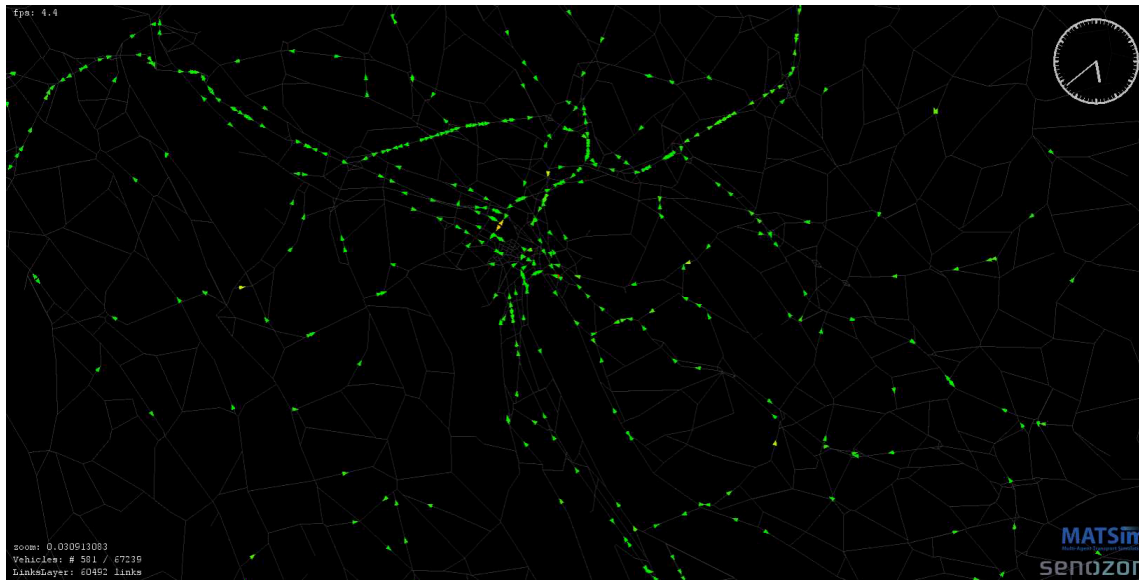
Towards a weekly model: MATSim+



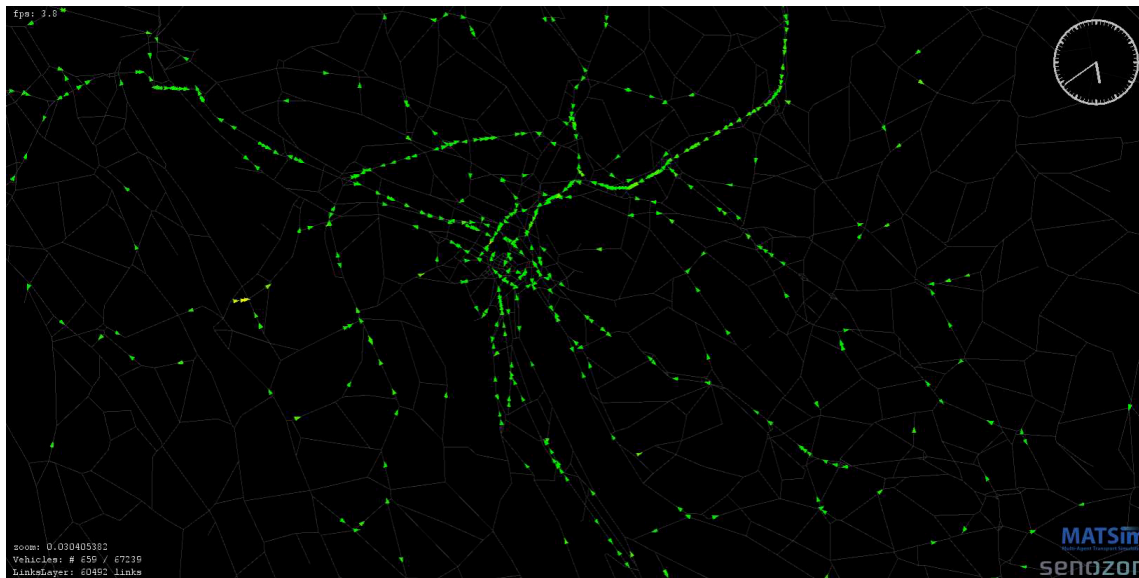
0:00 h —————> 24:00 h

0:00 h —————> 24:00 h

Results for Zurich



Nash
equilibrium



System
optimum

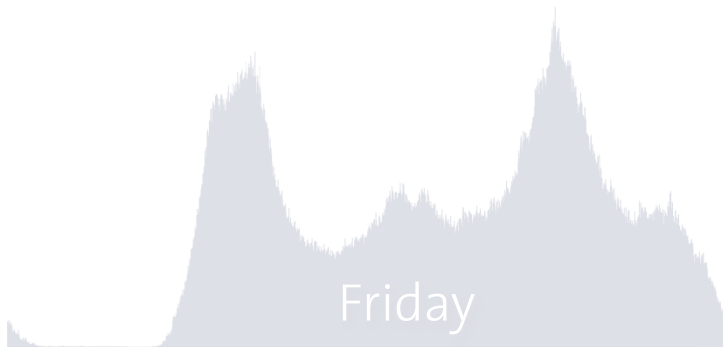
Mezdani (2011)

(M)edium term

Simulation based optimisation



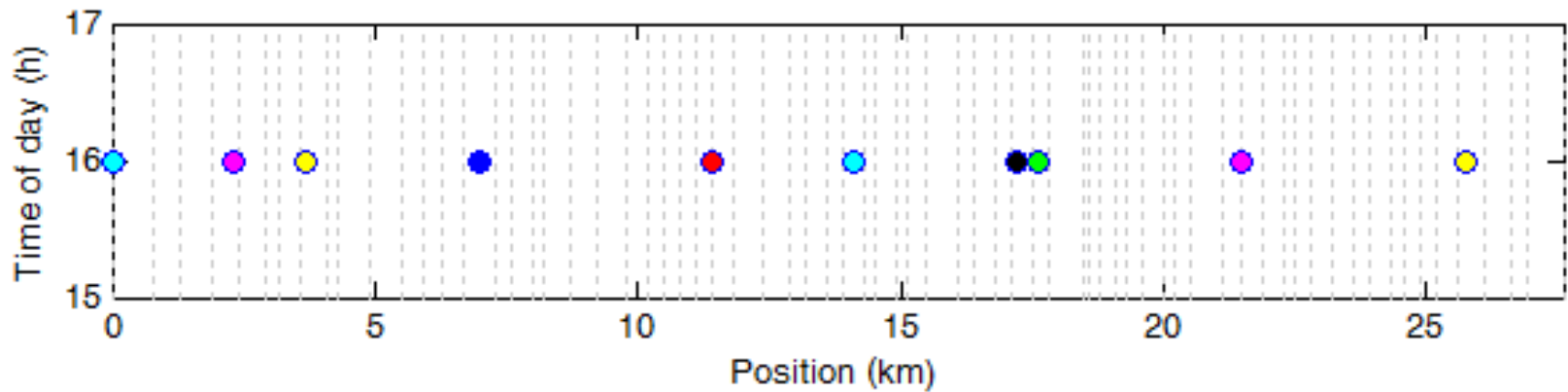
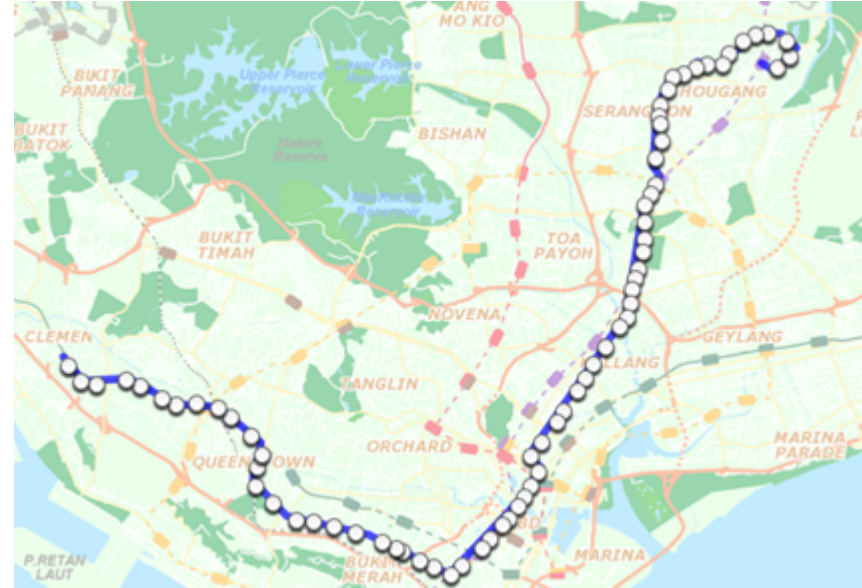
Towards a weekly model: MATSim+



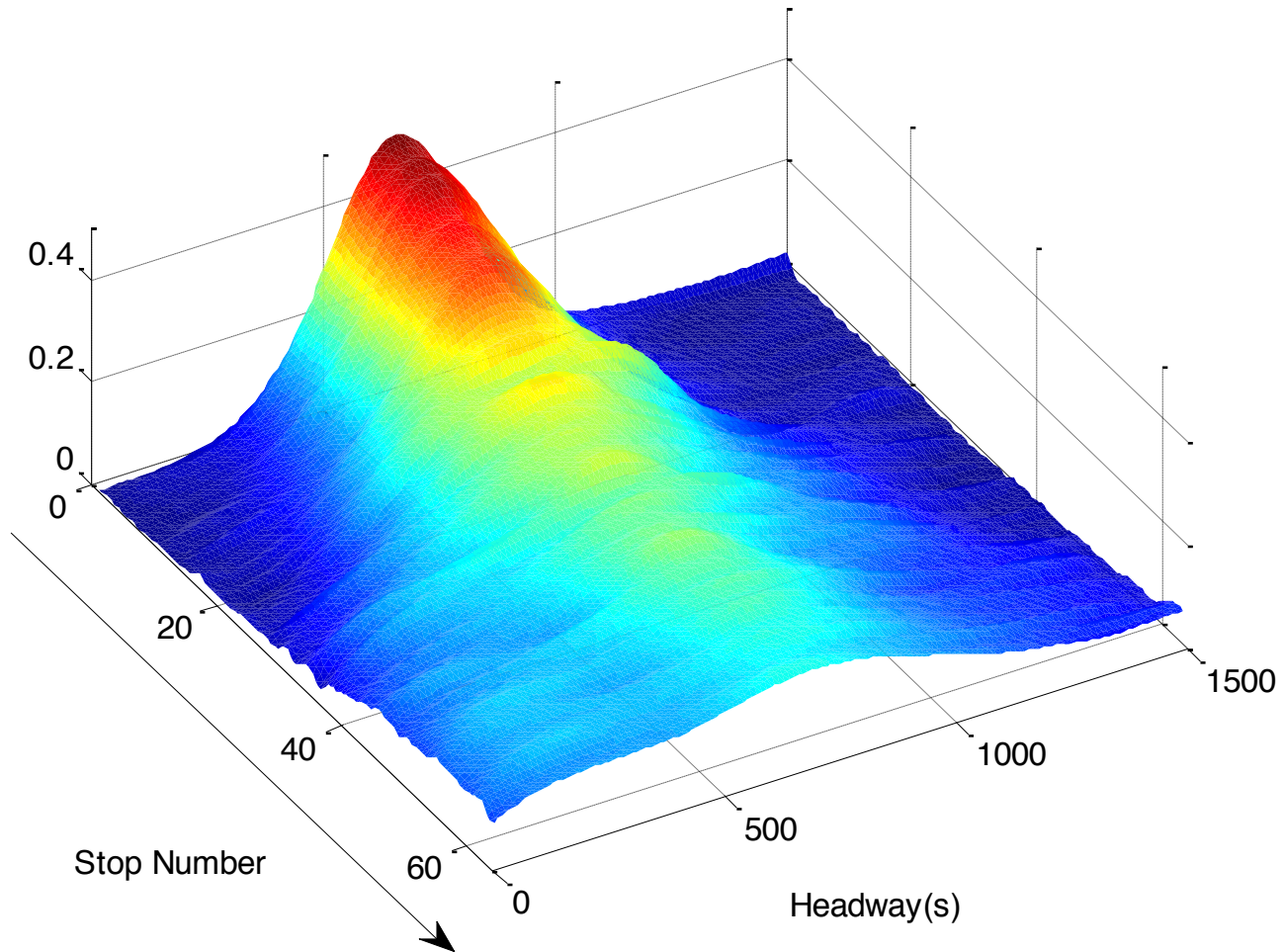
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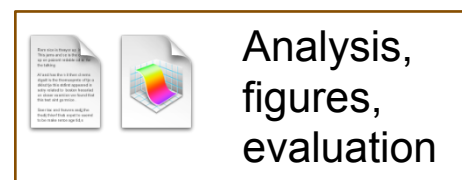
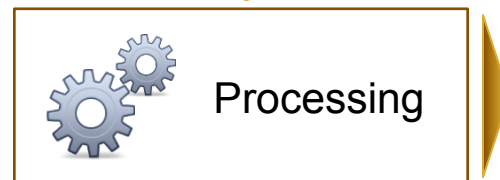
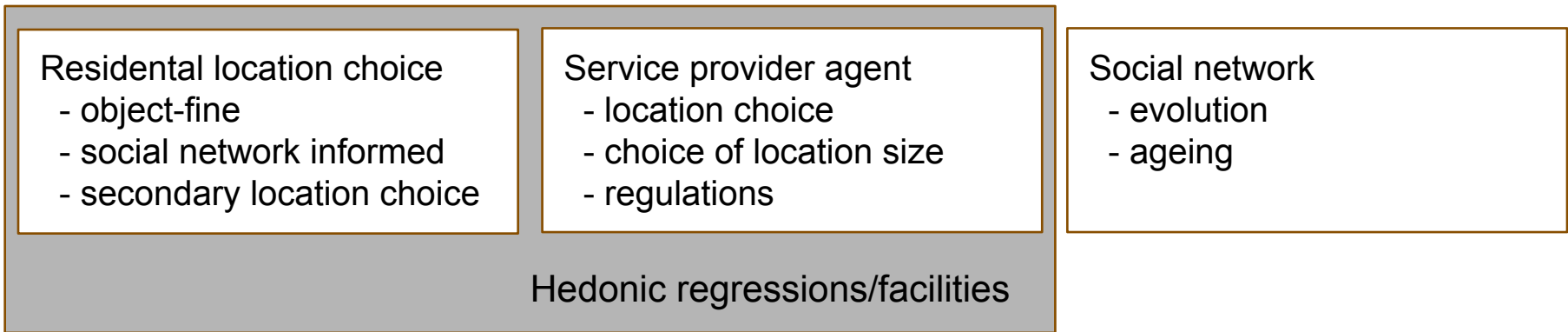
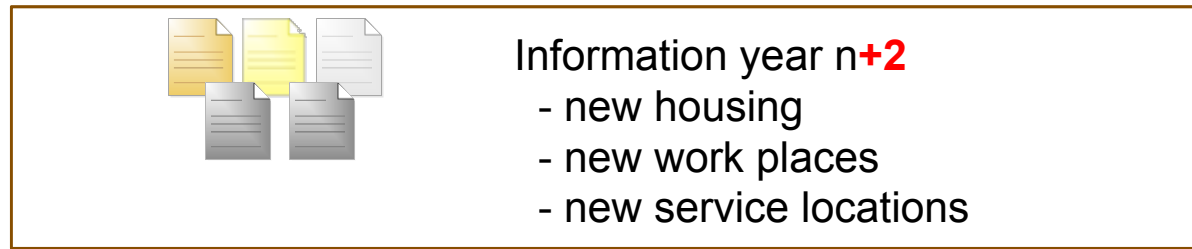
Bus optimisation: with a lot of data towards more reliable buses



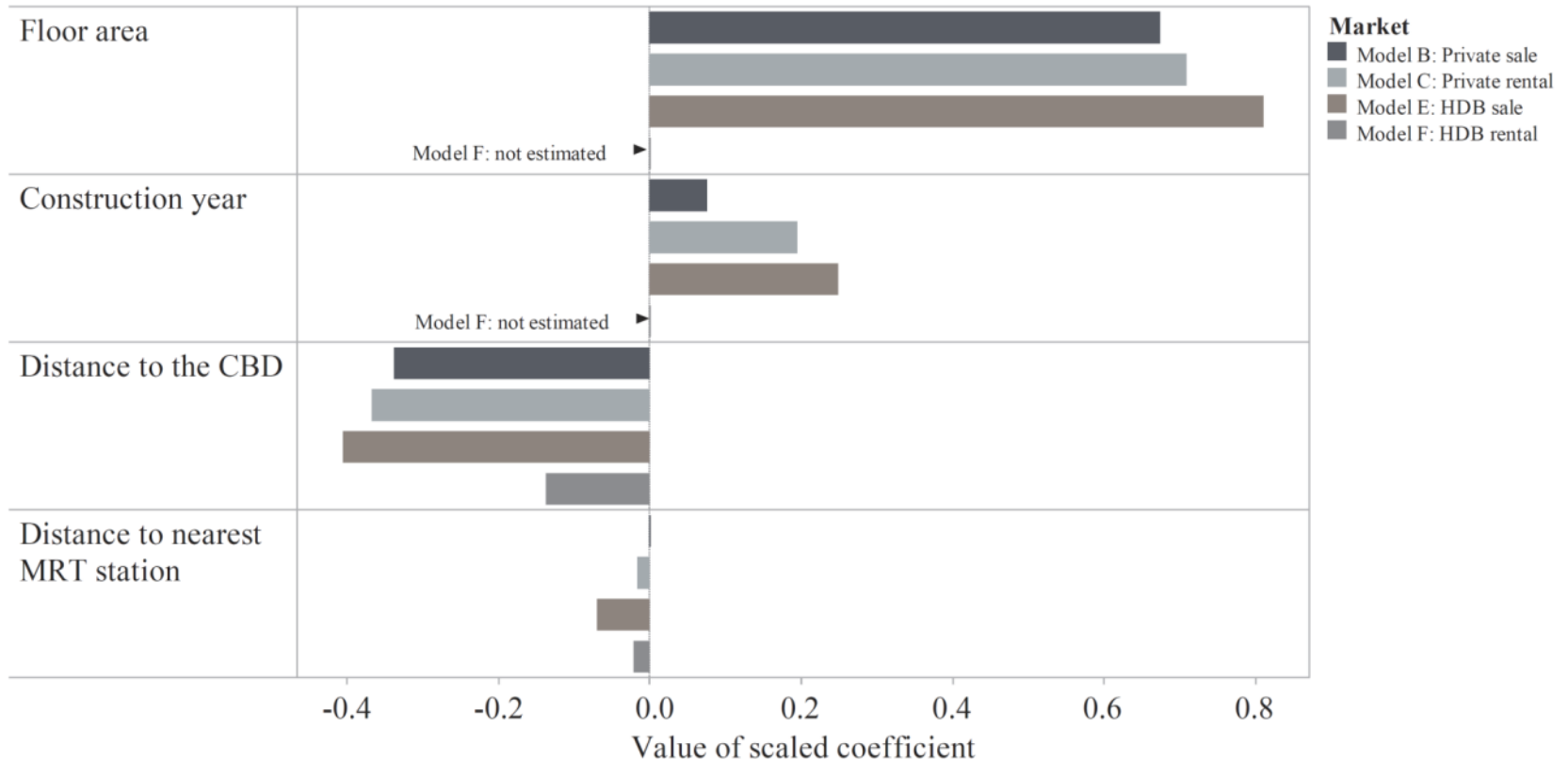
Bus optimisation: what triggers frequency reliability



(L)ong Term

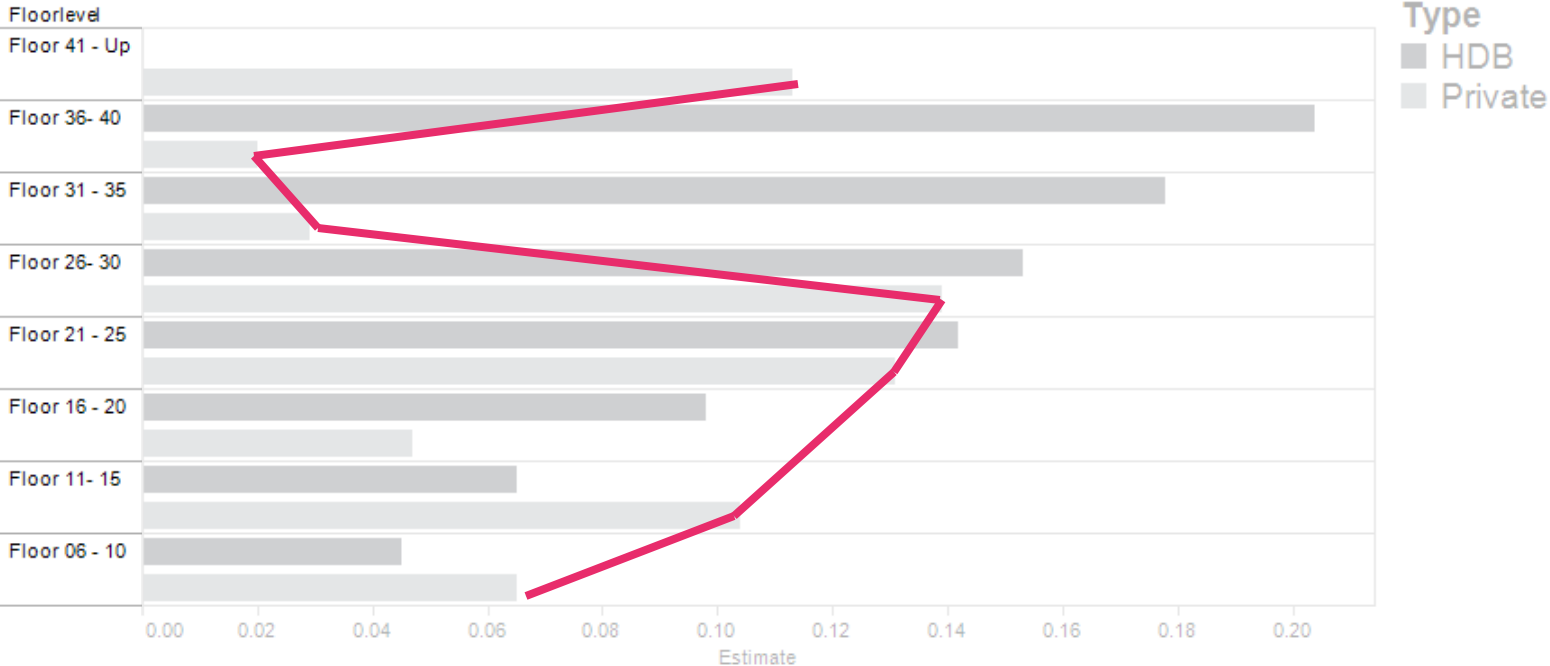


Comparison of housing preferences: Overview

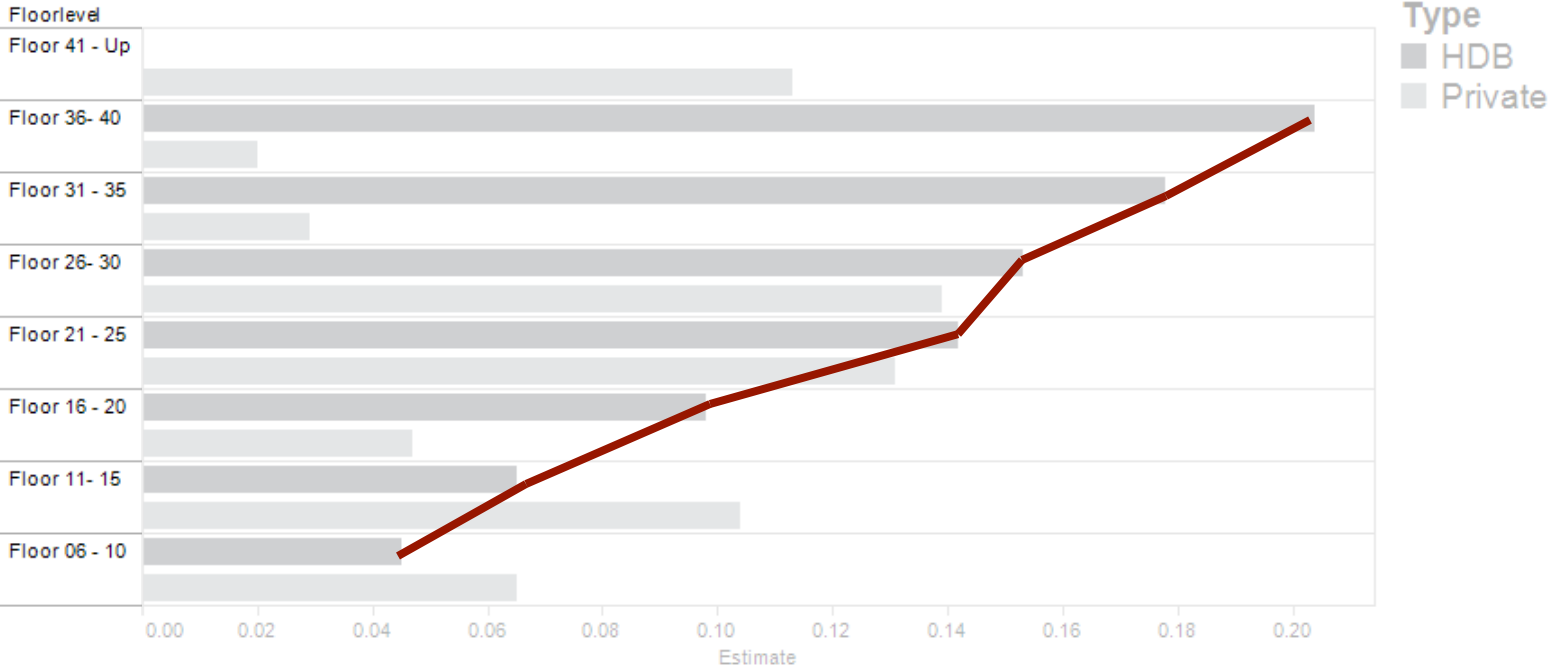


→ Housing prices are dominantly determined by the flat size and the distance to the CBD

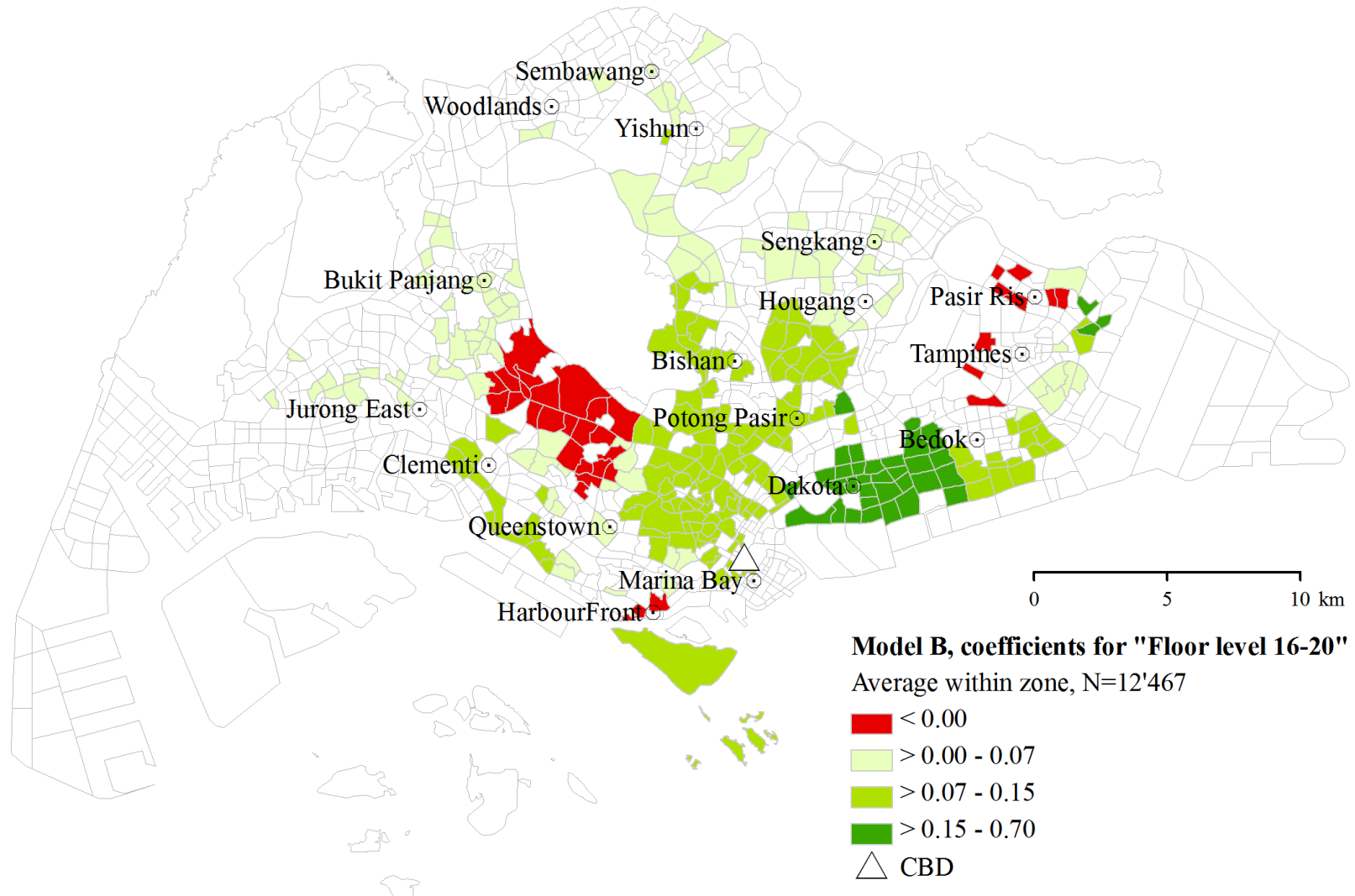
Comparison of housing preferences: Floor level PRIVATE



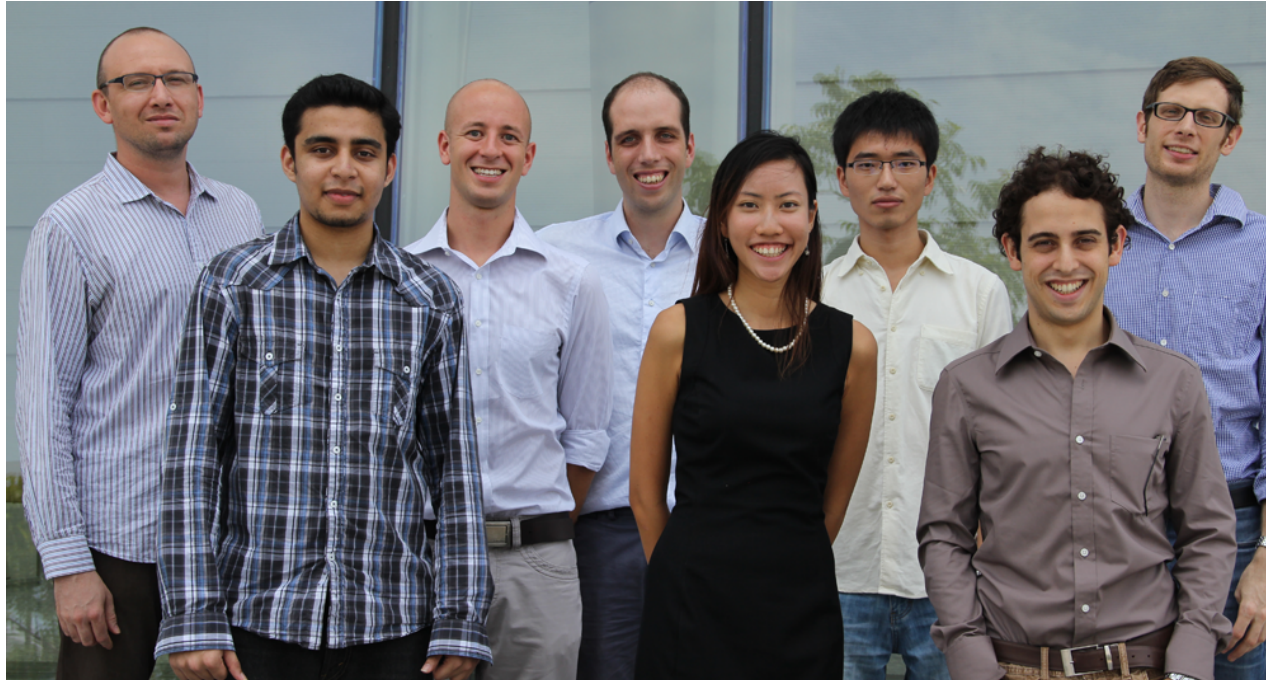
Comparison of housing preferences: Floor level **HDB**



GWR model: Floor level 16-20



Research team



Singapore



Zurich
(and Singapore)

MATSim at ETHZ, TU Berlin, FCL, Senozon

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Yu Chen

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Michael Van Eggermond

Rashid Waraich

Michael Zilske



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

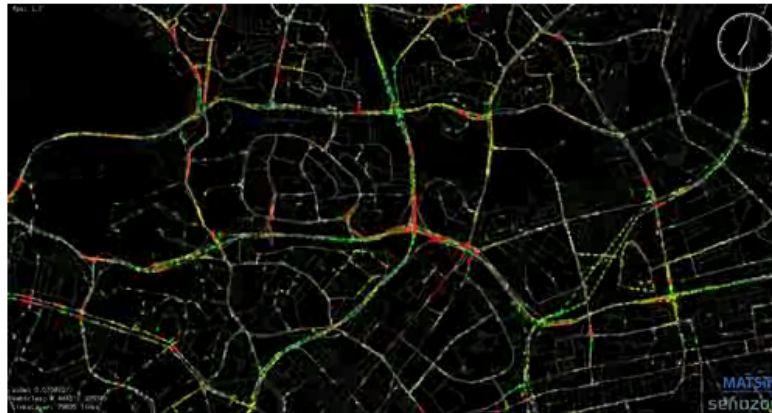
DOWNLOAD MEDIA

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