Daily Flows: Medium and Long Term
Research in Transport Planning at the Future Cities Laboratory

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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

STOCKS AND FLOWS OF

ENERGY
MATERIALS
SPACE

LOW EXERGY
DIGITAL FABRICATION

CAPITAL
PEOPLE
SPACE

TRANSFORMING AND MINING URBAN STOCKS
URBAN DESIGN STRATEGIES AND RESOURCES
URBAN SOCIOLOGY

SPACE
WATER
PEOPLE
ENERGY

TERRITORIAL ORGANISATION
LANDSCAPE ECOLOGY
MOBILITY AND TRANSPORTATION PLANNING

INFORMATION

SIMULATION PLATFORM
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
A Day Plan

14

Daily activity Plans

<person id="6122710" sex="f" age="35" license="yes" car_avail="always" employed="yes">
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<plan selected="yes">
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</leg>
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</plan>
</person>
... 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
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Multi-agent transport demand modeling

Daily flows: medium and long term
Research Framework

Preparatory work

Implementation of MATSim Singapore

Research

(M)edium Term ↔ (L)ong Term
(M)edium term

Simulation based optimisation

Towards a weekly model: MATSim+
Results for Zurich

Nash equilibrium

System optimum

Mezdani (2011)
(M)edium term

Simulation based optimisation

Towards a weekly model: MATSim+
Bus optimisation: with a lot of data towards more reliable buses
Bus optimisation: what triggers frequency reliability
(L)ong Term

Residential 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

Initial demand year n+1

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

Processing

Analysis, figures, evaluation
Housing prices are dominantly determined by the flat size and the distance to the CBD.
Comparison of housing preferences: Floor level

![Bar chart showing comparison of floor levels for HDB and Private housing types.](image)
Comparison of housing preferences: Floor level HDB
GWR model: Floor level 16-20

Model B, coefficients for "Floor level 16-20"
Average within zone, N=12'467

- < 0.00
- > 0.00 - 0.07
- > 0.07 - 0.15
- > 0.15 - 0.70
- CBD
Research team

Singapore

Zurich
(and Singapore)
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