

# Bevorzugter Zitierstil für diesen Vortrag

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Axhausen, K.W. and M. Rieser (2012) MATSim: Background and current progress, presentation, 13<sup>th</sup> IATBR workshop “Simulation Frameworks for Integrated Modelling”, Toronto, July 2012.

# MATSim: Background and current progress

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July 2012

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understanding mobility

# DUE, SO & SUE

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Wardrop (1952):

1. The journey times on all the routes actually used are equal, and less than those which would be experienced by a single vehicle on any unused route.
2. The average journey time is a minimum.

Daganzo and Sheffi's (1977) define SUE for the aggregate case:

“In a SUE network, no user believes he can improve his travel time by unilaterally changing routes.”

# Packing problem of the DUE, SO & SUE

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Given the

Agent's daily schedules of predetermined detail

Subject to some

Max F

upto the resolution of the agents, links and facilities

Matching the

Expected elasticities with respect to the generalized costs

Known correlations between the details of the plans

Capacity constraints on the link and facilities

Minimum loads for some of the facilities

# Schedule detail possibilities (in current **stable MATSim**)

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Number and type of activities  
Sequence of activities

(Feil, 2010)

- **Start and duration of activity**
- Composition of the group undertaking the activity (Kowald)
- Expenditure division
- **Location of the activity** (Horni)
  - Movement between sequential locations
    - **Location of access and egress from the mean of transport**
      - Parking search and type (Waraich)
    - **Vehicle/means of transport** (Ciari)
    - **Route/service**
    - Group travelling together (Dubernet)
    - Expenditure division

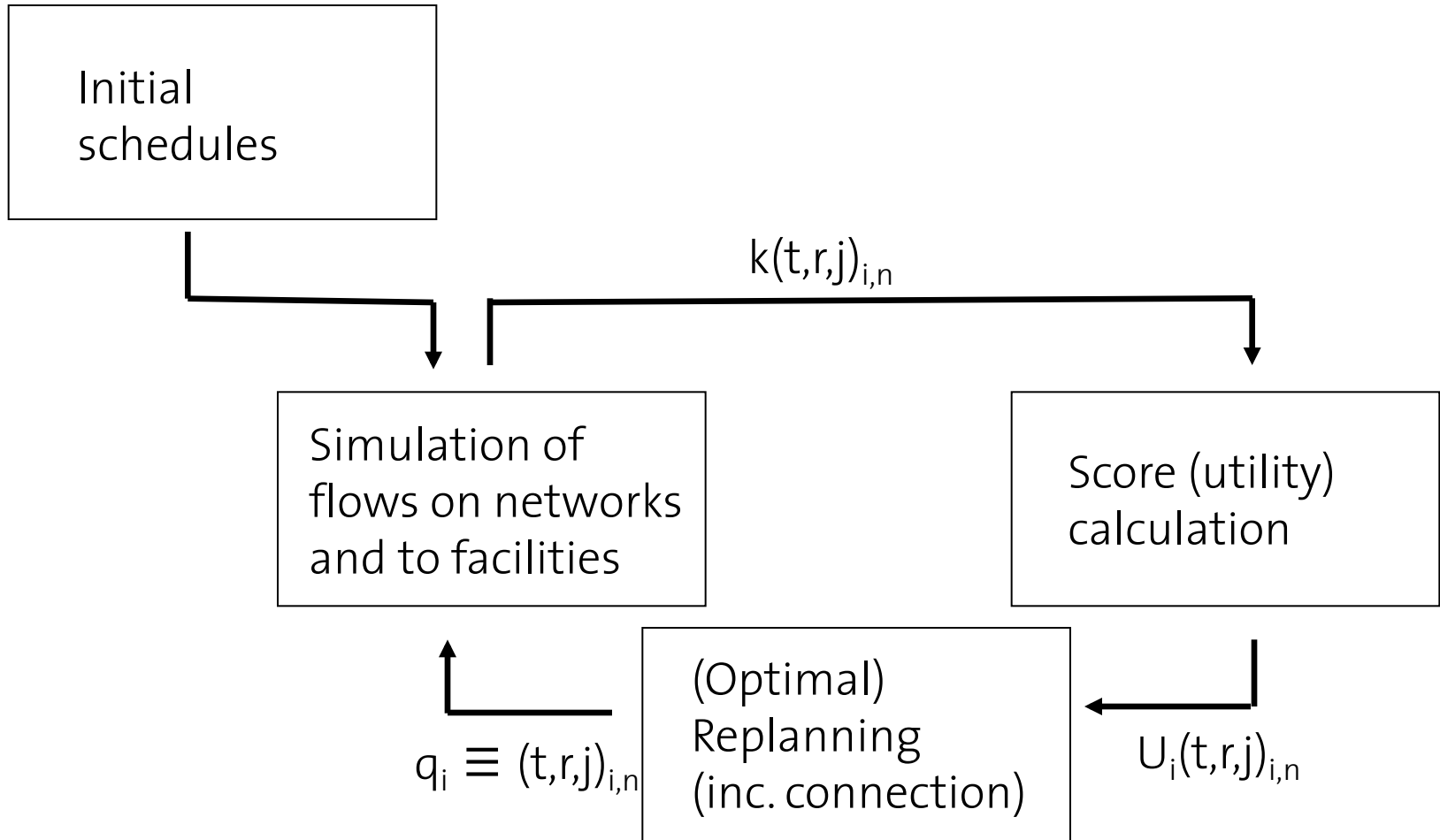
# Current alternative approaches

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Approach	Schedules	k	Equilibrium
ABM	NL	Link CR	Flow SUE
CEMDAP	RUMs	Link CR	Flow SUE
Albatross	Rule based informed RUMs	Link CR	Flow SUE
“Eindhoven”	Supernetworks	(Link CR)	(Flow SUE)
MATSim	Conditional probabilities/RUMs	Flow simulation (links & facilities)	Schedule SUE

# Equilibrium search in MATSim (Discrete „MSA“ of plans)

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# Current progress: Berlin

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Network: 113 000 links

Population: 4,5 million agents

Public Transport: 530 lines, 96 transit vehicle types

Mode choice, Departure time choice, Route choice (car + transit)





# Current progress: Switzerland

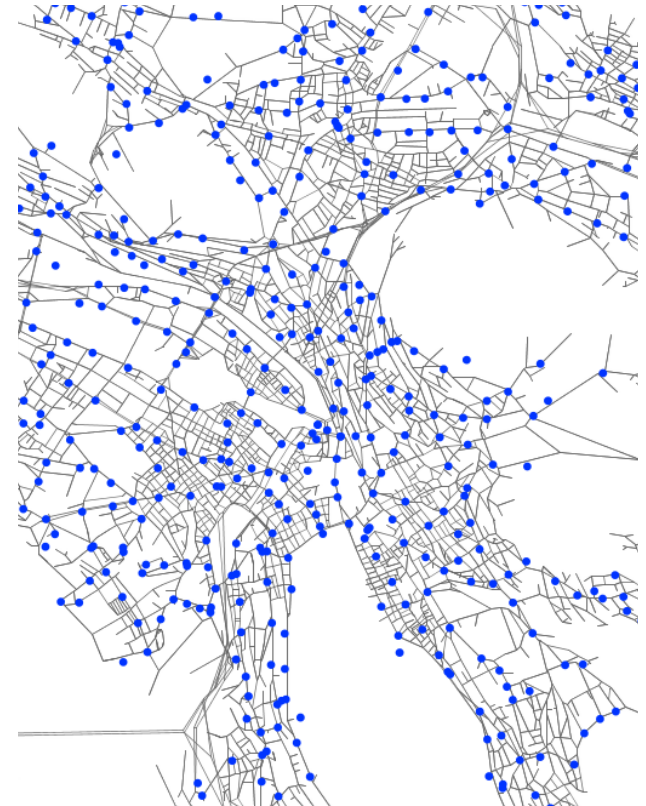
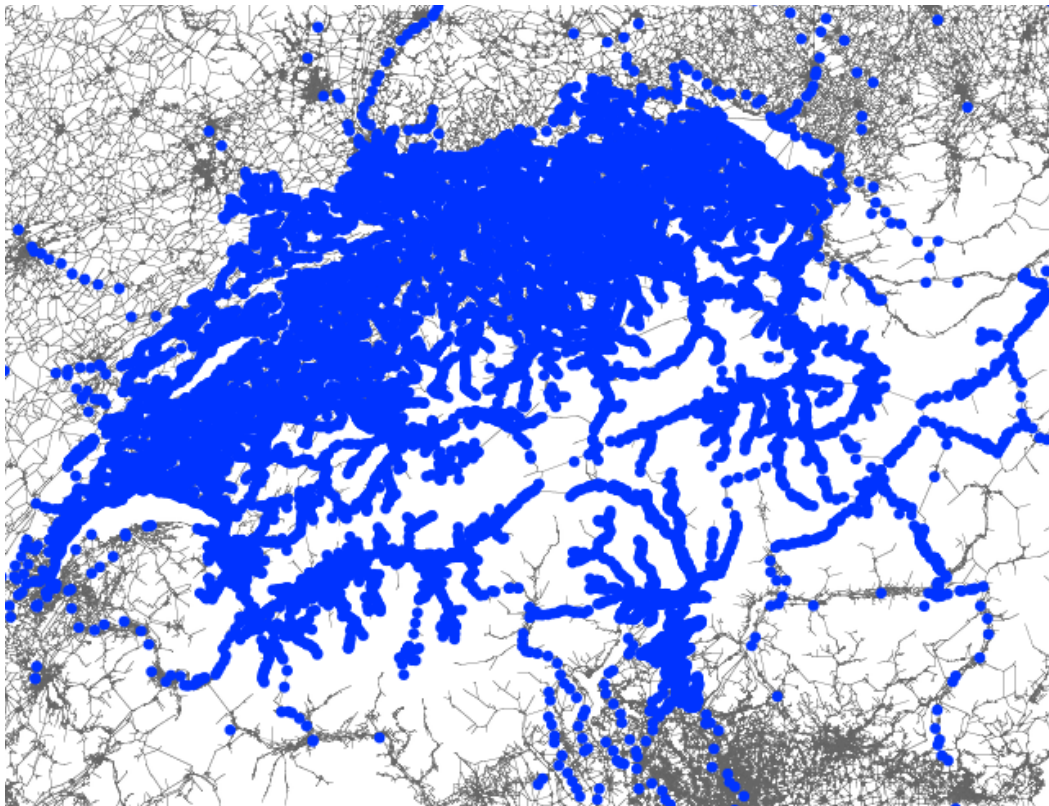
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Network: ~ 1 million links (navigation network)

Population: 8 million

Complete public transport (all trains, buses, trams, cablecars, ...)

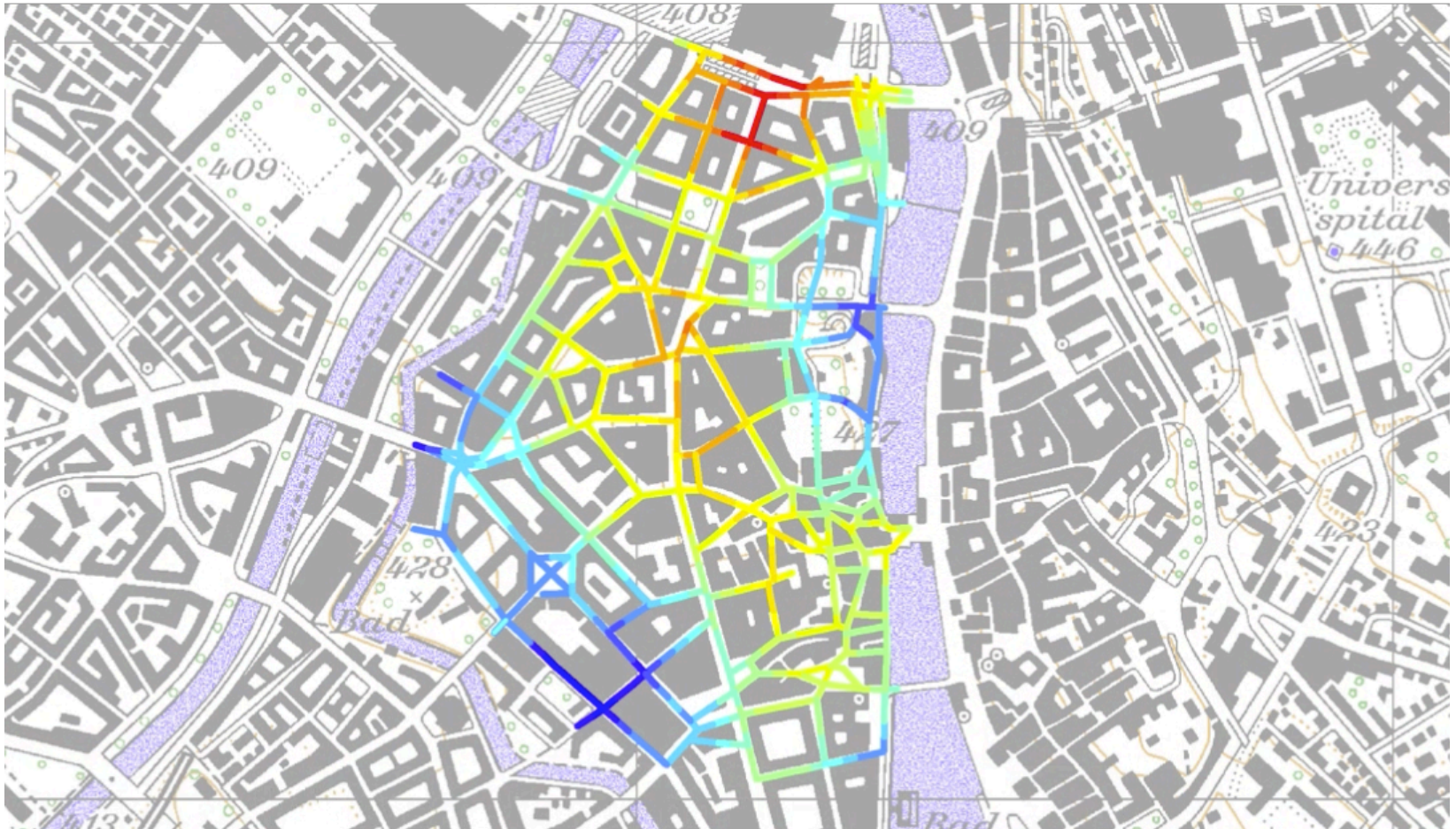
Mode choice, Departure time choice, Route choice (car + transit)



## Current progress: Switzerland (cont'd)

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Using the model also for site assessment and pedestrian counts



# Current progress: Los Angeles

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Network: 108 000 links

Population: 10+ million agents

Public transport: Estimated travel times only

Mode choice, Departure time choice, Route choice



# Current progress: Singapore

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Network: 80 000 links

Population: 5 million

Complete public transport (bus, MRT)

Mode choice, Departure time choice, Route choice (car + transit)



# Current progress: Singapore

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# Known implementations

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Location	Scale (agents)	Schedules	DTA	Equi- librium
Switzerland	$10^6$	MATSim	MATSim	Yes
Berlin	$10^6$	MATSim	MATSim	Yes
München	$10^6$	MATSim	MATSim	Yes
Singapore	$10^6$	MATSim	MATSim	Yes
Gauteng	$10^6$	MATSim	MATSim	Yes
Cape Town	$10^6$	MATSim	MATSim	Yes
(Seoul)	$10^7$	MATSim	MATSim	Yes
(Shanghai)	$10^7$	MATSim	MATSim	Yes
Tel Aviv	$10^6$	ABM	MATSim	-
Toronto	$10^7$	Tasha	MATSim	-
Los Angeles	$10^7$	CEMDAP	MATSim	-
Netherlands	$10^7$	Albatross	MATSim	-
(London)	$10^7$	ABM	MATSim	-

# MATSim @ ETHZ, TU Berlin, FCL, Senozon (past & present)

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Questions ?

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[www.matsim.org](http://www.matsim.org)

[www.ivt.ethz.ch](http://www.ivt.ethz.ch)

[www.futurecities.ethz.ch](http://www.futurecities.ethz.ch)

[www.senozon.ch](http://www.senozon.ch)