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Public and privat institutions plan
What are the effects of these plans

Testing options for cantonal and municipal authorities’ intent on e.g. attracting firms or residents:

- improvements in transport infrastructure
- designation of new building zones
- tax reductions

Effects of improvements in transport infrastructure

Real projects according to cantonal directive plans (see Bodenmann, 2011)
Effects of new building zones: additional residents

![Map of Eglisau with new building zones highlighted, showing residents in 2015 (Bodenmann et al., 2009).]

Effects of new building zones: additional young families

![Bar chart showing the number of kindergarten pupils in Eglisau from 2008 to 2020 (Bodenmann et al., 2009).]
Experimental games with real decision makers

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FaLC (working title)

Software tool for

Facility Location Choice Simulation

FaLC and UrbanSim

UrbanSim is an integrated microsimulation model system for planning and analysis of urban development, incorporating the interactions between land use, transportation, and public policy.

It is intended to explore the effects of

- infrastructure
- policy choices

(www.urbansim.org)
FaLC: Goals + idea

- **Modular** choice model system
- Using just **one database** (avoiding redundant data)

- **Open source** (based on Java – versus Python)
- Connection to **MATSim**
- **Only simulations** – no estimations

- Models adapted to **Switzerland/Europe**
- **No historical ballast** in source code
- Allows **fast runs** for experimental game simulations

- Level of **municipalities** – later city quarters

---

Questions to be answered: what are the effects of

**Political decisions**
- **infrastructure projects** (roads, public transport)
- Changes of **taxes / incentives**
- Changements of **law / regulatives** (e.g. building zones)

**Economy**
- **Economic crises** (decreasing number of employees needed)
- Changements in **market mechanisms** (land, buildings)
- Location decisions of (very) **large firms**
Questions to be answered: in regard of 1

**Demographics**
- **Number** and **age** of population
- Stage in life cycle: school – employment – retirement
- **Income** / **taxes**
- Spatial **segregation**

**Firmographics**
- **Sectors** and **size** of companies
- **Jobs supplied**
- **Taxes**

Questions to be answered: in regard of 2

**Social and political goals**
- Affordability of land and housing
- Reliability of land and housing market
- Use of public transport
- Traffic congestions
- Distances travelled each day (commuting, leisure)
- greenhouse gas emissions
- protection of open space
Interaction concept: FaLC – MATSim – SUA

FaLC
- Residents
- Households
- Jobs
- Firms
- Buildings
- Land development

Transport
- Accessibility
- Distances

Facilities
- Transport externalities

MATSim

SUA Database

Economy

Politics

Modelling Transport in FaLC and UrbanSim

<table>
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<th>Scopes</th>
<th>Implement. Effort</th>
<th>Processing Speed</th>
<th>Requirement Data</th>
<th>Established Proceeding</th>
<th>Market</th>
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<td>Spacial Planning</td>
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<td>Cost-benefit Analysis</td>
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<tr>
<td>Transport Planning</td>
<td>+++</td>
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<tr>
<td>Transport Simulations</td>
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</tbody>
</table>

| MATSim                     |                   |                  |                  |                        |        |
| Transport Simulations      | +++               | +++              | +++              | +                      | ++     |
Modelling concept

FaLC tables and agents (2012)
FaLC base models (2012)

Spacial, economic and sociocultural framework

- Demographic events model
- Household change model
- Household choice model
- Household transition model
- Household relocation model
- Household location choice model
- Transport simulation
- Building park transition

- Firm transition model
- Firm relocation model
- Firm location choice model

- Job change model
- Workplace choice model

- Household
- Firm
- Location

- Persons
- Economy
- Politics
- Developers
- Investors
- Developers

- Agents
- Tables
- Models

FaLC base models: model types (2012)

Spacial, economic and sociocultural framework

- Demographic events model
- Household change model
- Household choice model
- Household transition model
- Household relocation model
- Household location choice model
- Transport simulation
- Building park transition

- Firm transition model
- Firm relocation model
- Firm location choice model

- Job change model
- Workplace choice model

- Household
- Firm
- Location

- Persons
- Economy
- Politics
- Developers
- Investors

- Agents
- Tables
- Models

- Probabilistic models
- Discrete choice models
- Complex models
FaLC base models: model types (2013+)

- Demographic events model
- Household change model
- Household choice model
- Household transition model
- Household relocation model
- Household location choice model
- Firm transition model
- Firm relocation model
- Firm location choice model
- Job change model
- Workplace choice model
- Transport simulation
- Building park transition
- Building transition model
- Building (re-)construction model

Types of models:
- Household
- Firm
- Location
- Persons
- Quarters
- Building

Agents:
- Geography
- Socio-cultural values
- Economy
- Politics
- Authorities
- Investors
- Developers

Tables:
- Models
- Model options

Real estate price model
Sub-model: Urban shape options
Sub-model: Dwelling cooperatives

Partners

- ETH
  Eidgenössische Technische Hochschule Zürich
  Swiss Federal Institute of Technology Zurich

- regioConcept AG
  Raum + Verkehrsentwicklung

- Further partners would be appreciated
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Next steps

• Start of SUA-Project 04/2012
• Concept FaLC 05/2012 (paper)
• Implementation core of FaLC 12/2012 (paper)
• Modell of Switzerland (municipalities) 12/2012 (paper)
• Spatial regressions of e.g. speed, loadings 2012- (paper)
• Zurich case study for SUA 12/2013 (report)
• Game simulation (regioConcept) 12/2013
• Connection to MATSim 2013-
• Other enhancements 2013-
Thank you for your attention

Literature