

## Preferred citation style

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Bodenmann, B.R. and B. Vitins (2012) Implementation of a land use transport interaction model for experimental game simulations, presentation at *STRC*, Ascona, Mai 2012.

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## Implementation of a land use transport interaction model for experimental game simulations

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STRC  
Ascona, March 2012

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Institute for Transport Planning and Systems

  
Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

  
Raum + Verkehrsentwicklung

## Content

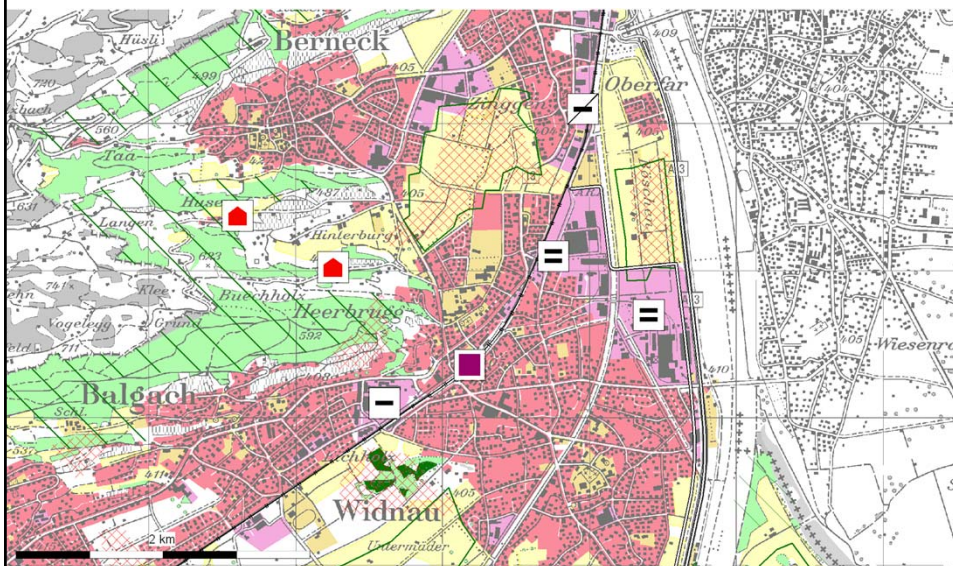
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1. Why modelling land-use
2. FaLC-Project
  - a. Goals / idea
  - b. Possible applications
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  - d. Partners
3. Next steps

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## Public and privat institutions plan

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## What are the effects of these plans

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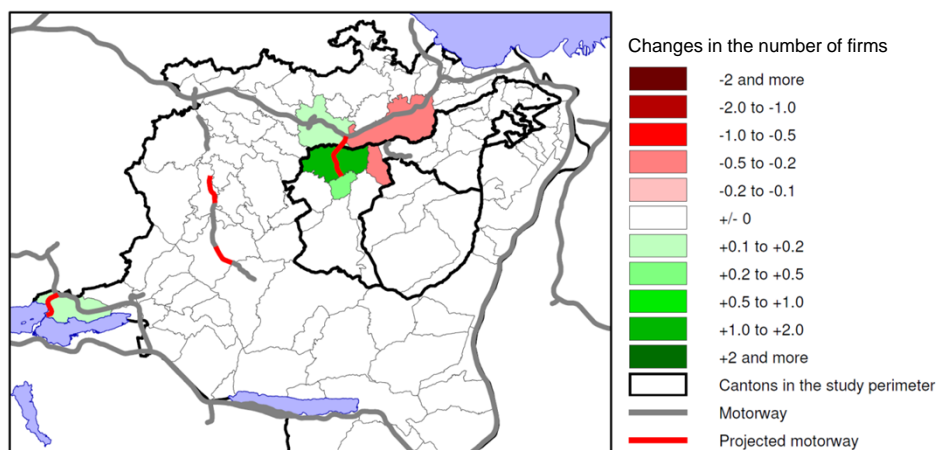
**Testing options** for cantonal and municipal authorities' intent on e.g. attracting firms or residents:

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

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## Effects of improvements in transport infrastructure

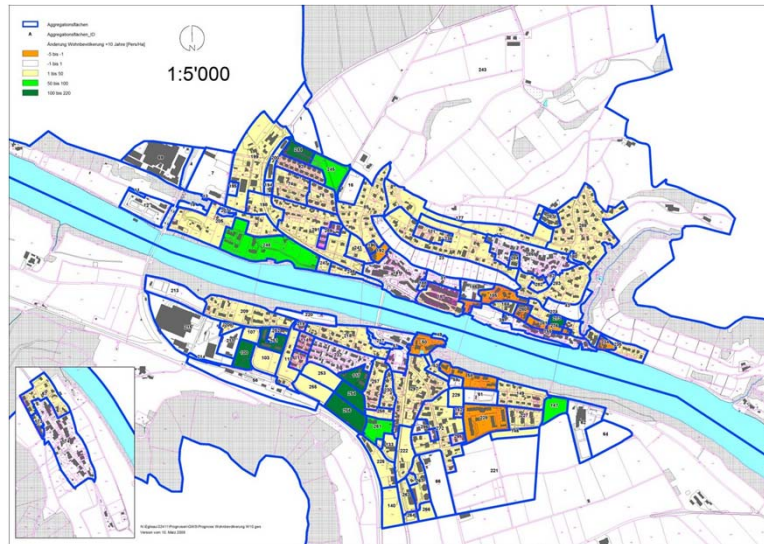
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Real projects according to cantonal directive plans (see Bodenmann, 2011)

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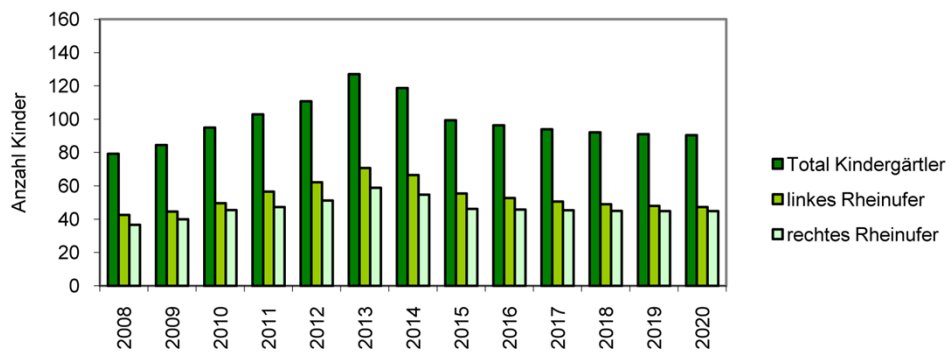
## Effects of new building zones: additional residents



Scenarios for Eglisau: residents 2015 (Bodenmann et al., 2009)

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## Effects of new building zones: additional young families



Scenarios for Eglisau: kindergarten pupils 2008-2020 (Bodenmann et al., 2009)

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## Experimental games with real decision makers

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## FaLC (working title)

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Software tool for

Facility Location Choice Simulation

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## FaLC and UrbanSim

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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](http://www.urbansim.org))

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## FaLC: Goals + idea

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- **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

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## Questions to be answered: what are the effects of

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### **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, bildings)
- Location decisions of (very) **large firms**

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Questions to be answered: in regard of

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**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**

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Questions to be answered: in regard of

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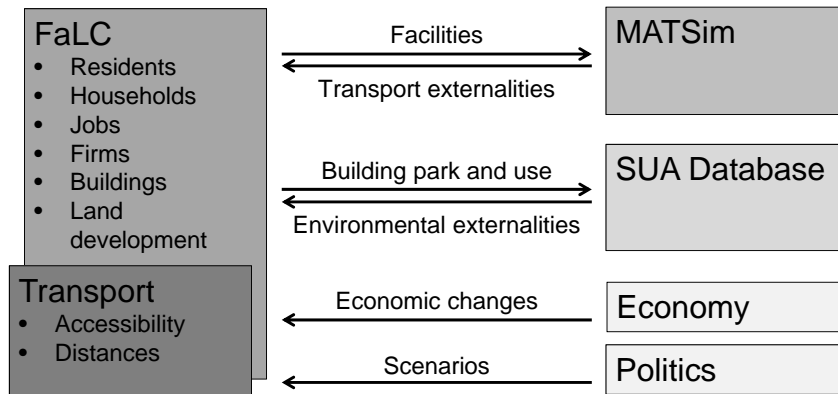
**Social and political goals**

- 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

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## Interaction concept: FaLC – MATSim – SUA



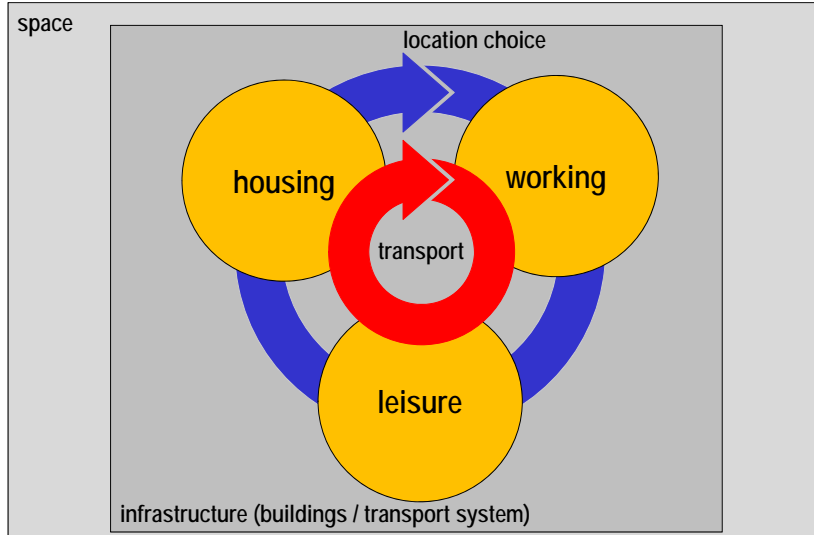
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## Modellig Transport in FaLC and UrbanSim

	Scopes	Implement. Effort	Processing Speed	Requirement Data	Established Proceeding	Market
<b>FaLC</b>	Accessibility	+	+	+	+++	++
	Spacial Planning	++	+	+	++	++
<b>MATSim</b>	Cost-benefit Analysis	++	+	+	+++	+++
	Environment / Climate	+++	+++	+++	++	+
	Transport Planning	+++	++	++	+++	+++
	Transport Simulations	+++	+++	+++	++	++

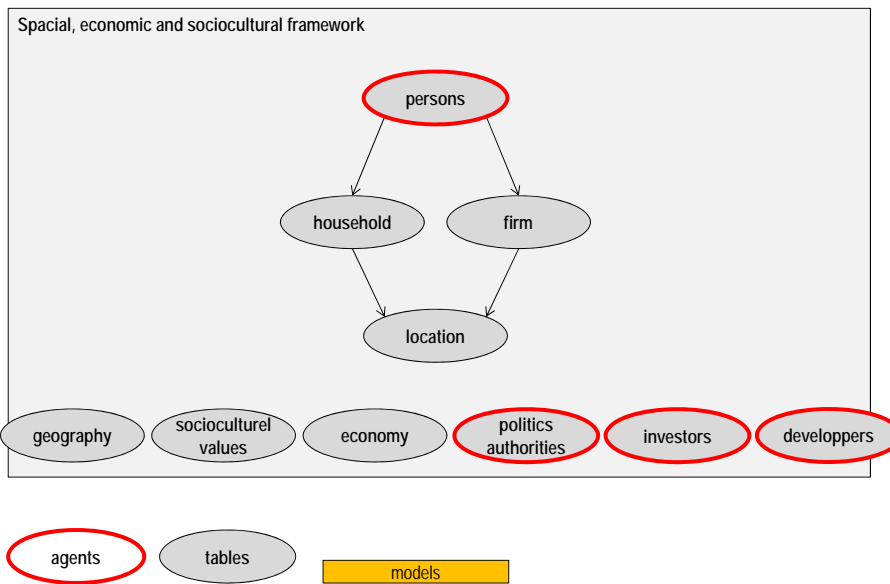
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## Modelling concept

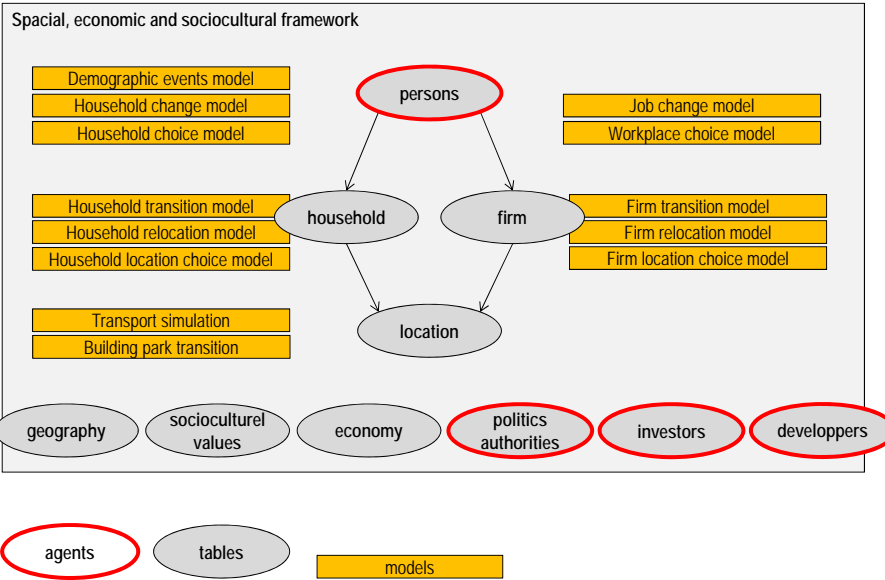


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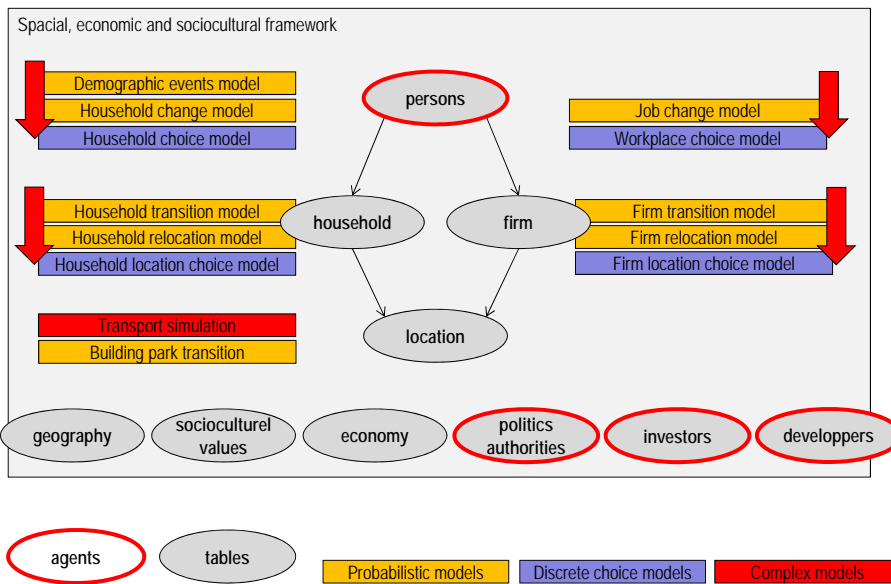
## FaLC tables and agents (2012)



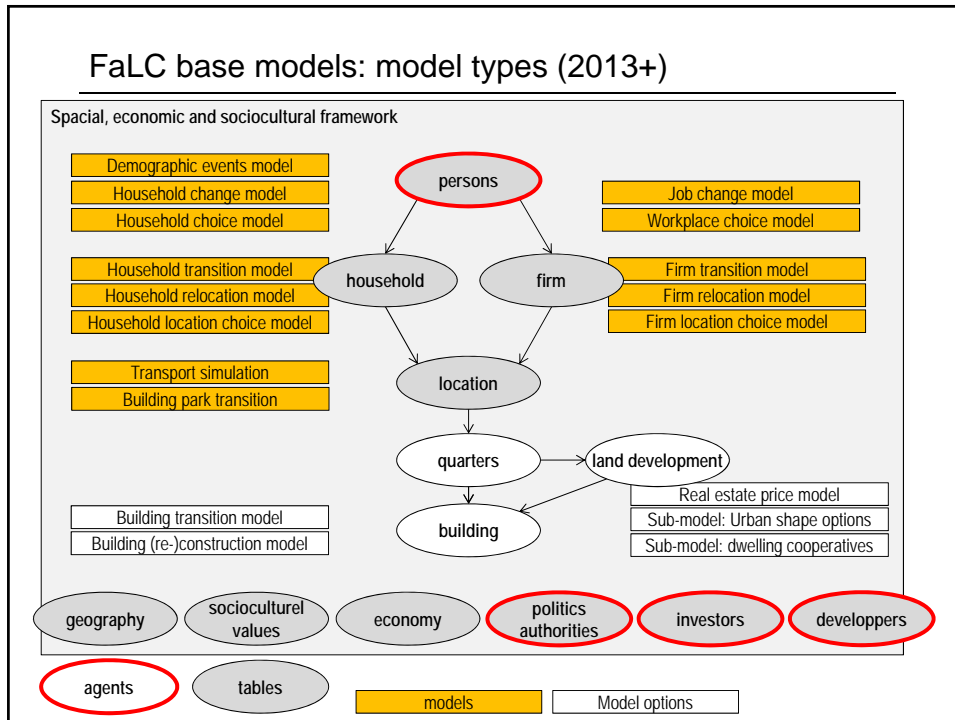
## FaLC base models (2012)



## FaLC base models: model types (2012)



## FaLC base models: model types (2013+)



## Partners

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 Institut für Verkehrsplanung und Transportsysteme  
 Institute for Transport Planning and Systems

**ETH**

Eidgenössische Technische Hochschule Zürich  
 Swiss Federal Institute of Technology Zurich

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 regioConceptAG  
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- Further partners would be appreciated

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## Next steps

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- 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-

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Thank you for your attention



## Literature

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