Preferred citation style

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Transport and Spatial Planning @ IVT

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IVT, ETH Zürich

Study Tour on Rail Transport in Switzerland
Zurich, September 2011
Ongoing research projects (selection)

Surveys / behavior
- Alexander Erath: Reliability of road networks
- Claude Weis: Induced demand
- Boris Jäggi: Modeling investment in energy efficiency

Social networks
- Matthias Kowald: Snowball sampling social networks

Agent-based microsimulation
- David Charypar: Continuous travel simulation
- Francesco Ciari: Optimization of car sharing supply
- Christoph Dobler: Evacuation modeling
- Nadine Schüssler: GPS survey methods and route choice modeling
- Andreas Horni: Disaggregated location choice modeling
- Fabiabian Märki: Continuous activity planning
- Konrad Meister: Equilibria in agent-based simulations
- Rashid Waraich: Plug-in hybrid and electric vehicle-to-grid

Urban planning
- Balz Bodenmann: (Re-)location choice of firms
- Kirill Müller: Shortest paths in agent-based simulations
- Patrick Schirmer: UrbanSim und grammars of urban planning
- Christof Zöllig: The role of real estate developers in spatial development

Network development
- Basil Vitins: Network optimization
- Veronika Killer: Functional commuting regions since 1970
Shrinking Switzerland: travel time improvements

PuT

PrT

Scherer, 2004
Network development: Travel time differences
## Cost-benefit analysis: MiniStadt

<table>
<thead>
<tr>
<th></th>
<th>ΔRTD</th>
<th>ΔRT</th>
<th>ΔR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔVroutes</td>
<td>68.79</td>
<td>111.50</td>
<td>102.74</td>
</tr>
<tr>
<td>ΔVtime</td>
<td>73.76</td>
<td>53.02</td>
<td>-15.31</td>
</tr>
<tr>
<td>ΔVdestination</td>
<td>133.34</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ΔRealised utility</td>
<td>275.88</td>
<td>164.52</td>
<td>87.43</td>
</tr>
</tbody>
</table>
Computer-aided GPS-based travel survey

GPS-Tagebuch

Bitte korrigieren und ergänzen Sie das Verkehrstagebuch. Hilfestellungen finden Sie auf der Startseite.

Bitte wählen Sie einen Zeitraum: 05.04.2011
Speichern Sie Änderungen bevor Sie den Zeitraum ändern.

<table>
<thead>
<tr>
<th>Abfahrt</th>
<th>Verkehrsmittel</th>
<th>Kosten in CHF</th>
<th>Ankunft</th>
<th>Tätigkeit</th>
<th>Lokalität</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:23</td>
<td>zu Fuss</td>
<td>0.0</td>
<td>08:26:24</td>
<td>Aufenthalt zuhause</td>
<td>Wohnung</td>
</tr>
<tr>
<td>08:31</td>
<td>Bus</td>
<td>0.0</td>
<td>08:49:16</td>
<td></td>
<td>-----------</td>
</tr>
<tr>
<td>08:51</td>
<td>Bus</td>
<td>0.0</td>
<td>08:59:23</td>
<td></td>
<td>-----------</td>
</tr>
<tr>
<td>09:09</td>
<td>zu Fuss</td>
<td>0.0</td>
<td>09:01:00</td>
<td></td>
<td>-----------</td>
</tr>
<tr>
<td>18:14</td>
<td>Fahrrad</td>
<td>0.0</td>
<td>18:16:42</td>
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</tr>
<tr>
<td>18:57</td>
<td>Fahrrad</td>
<td>0.0</td>
<td>18:59:28</td>
<td></td>
<td>-----------</td>
</tr>
<tr>
<td>19:59</td>
<td>Bus</td>
<td>0.0</td>
<td>19:25:17</td>
<td></td>
<td>-----------</td>
</tr>
<tr>
<td>19:26</td>
<td>Tram</td>
<td>0.0</td>
<td>19:32:04</td>
<td>Aufenthalt zuhause</td>
<td>Wohnung</td>
</tr>
</tbody>
</table>
Congratulations, you have reached the Target!

<table>
<thead>
<tr>
<th>chosen?</th>
<th>Measure</th>
<th>Scale</th>
<th>Lump Sum [CHF]</th>
<th>Annual costs [CHF/Jahr]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Replace windows</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Insulate roof</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>✔️</td>
<td>Install solar panels</td>
<td>8,000</td>
<td>-200</td>
<td></td>
</tr>
<tr>
<td>✔️</td>
<td>Insulate facade</td>
<td>50,200</td>
<td>-600</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Install ventilation system</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Buy heat pump</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>✔️</td>
<td>Temperature reduction of</td>
<td>2°C</td>
<td>0</td>
<td>-100</td>
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<tr>
<td>✔️</td>
<td>Reduction of annual kilometers driven to (Mercedes)</td>
<td>70%</td>
<td>0</td>
<td>-1,200</td>
</tr>
<tr>
<td>✔️</td>
<td>Replace with more efficient car (Mercedes)</td>
<td>5,000</td>
<td>-900</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sell car (Mercedes)</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>✔️</td>
<td>Reduction of annual kilometers driven to (VW Golf)</td>
<td>0%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>✔️</td>
<td>Replace with more efficient car (VW Golf)</td>
<td>18,000</td>
<td>-700</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sell car (VW Golf)</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Buy GA</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>✔️</td>
<td>Buy Half-fare card</td>
<td>2</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>✔️</td>
<td>Omit short-distance flights</td>
<td>1</td>
<td>0</td>
<td>-200</td>
</tr>
<tr>
<td>✔️</td>
<td>Omit middle-distance flights</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>✔️</td>
<td>Omit long-distance flights</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>✔️</td>
<td>Reduce meat consumption by</td>
<td>25%</td>
<td>0</td>
<td>-1,200</td>
</tr>
<tr>
<td>✔️</td>
<td>By CO2 certificate</td>
<td>1</td>
<td>0</td>
<td>1,000</td>
</tr>
</tbody>
</table>

**Sum**                                          | **81,200** | **-3,800** |
Social networks: Snowball sampling

Source: Kowald (2010)
SustainCity: Model structure of Zurich case study

- Demographic events model
- Home-based job choice model
- Workplace location choice model
- Job change model
- Household transition model
- Household relocation model
- Sub-model: dwelling cooperatives
- Household location choice model
- Employment events model
- Economic Transition Model
- Companies transition model
- Companies relocation model
- Companies location choice model
- Process pipeline events
- Real estate price model
- Expected sale price model
- Sub-model: Urban shape options
- Sub-model: dwelling cooperatives
- Development proposal choice model
- Building construction Model

- Geographical aggregations
- Plan types (development constraints)
- Accessibility
- Other parcel characteristics

Agents / tables
models
1st priority
2nd priority
3rd priority
SustainCity: rent model

Monthly gross rent
in CHF per sqm

- 12.01 - 16.00
- 16.01 - 18.00
- 18.01 - 20.00
- 20.01 - 25.00
- 25.01 - 35.00
- 35.01 - 45.00
SustainCity: Urban Typology

(Schirmer et al., 2011)
Integrated agent-based demand model: MATSim

http://matsim.org
Integrated agent-based demand model: MATSim

http://matsim.org
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http://matsim.org
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