

# 3.3

FINLAND

## HIMMELI FOR COMPREHENSIVE TRANSPORT PLANNING AND DEVELOPMENT PLANNING

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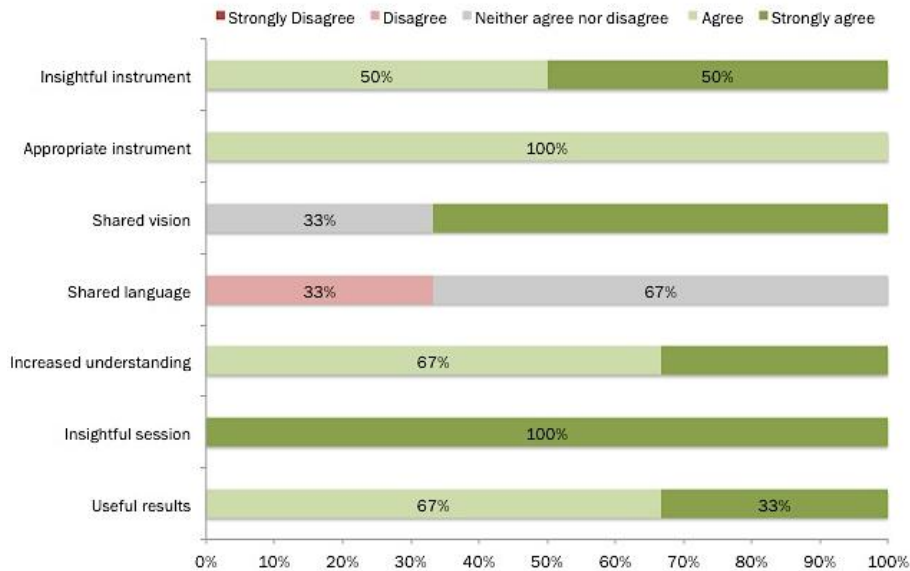
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| Participants' profile             | # Participants: 3 |
|-----------------------------------|-------------------|
| Male   Female                     | 2   1             |
| 31–45   46–60                     | 1   2             |
| Transport planner   Urban planner | 2   1             |
| Public organisation               | 3                 |

### Views about the session and the instrument



## HIMMELI

The focus of the modelling tool is to observe how transportation infrastructure-based accessibility factors influence the spatial organisation of retail units, and how this process can be simulated by using agent-based modelling methodologies. The model emphasises the spatial aspects of the self-organising phenomena, particularly the accumulation of the effects of accessibility factors through manifold mechanisms on locations of retail services. These assessments are related to the network city theory, with the following overall model structure. The simulation model comprises all three level elements of a concept of network urbanism, as developed by Gabriel Dupuy (1991): infrastructural networks, networks of production and consumption, and agent level networks. However, these elements are reduced in the retail model; with households (as level three operators) creating the connections between the operators on level two by forming their spatial territories.

The model consists of two major modules: an initialisation module and a simulation module. The initialisation module includes all functions that read all the input data for the model. The input data includes information concerning households, retail services and transportation system. The actual processing of the data then happens in the simulation module, which runs the given number of simulation cycles.

The model increases the knowledge about the relationship of retail dynamics and the structural properties of the urban physical environment (e.g. transportation networks). The simulations produce a series of different development paths of spatial self-organisation of retail units. These development paths can reveal the phase transitions that are related to the boundary conditions defined in the model. The model enables the observation of factors behind the location choice that take into account consumers' shopping strategies as related to the urban structure. Thus, it enables observation of how the distribution of retail units emerges from individual agents' decisions, which are based on several accessibility measures.

The model also helps the assessment of planning scenarios (e.g. how new road alignments or new residential growth affect service locations). Generally, the tool helps planners approach their task of steering development as a process, instead of attempting to define the end result without knowing the process.

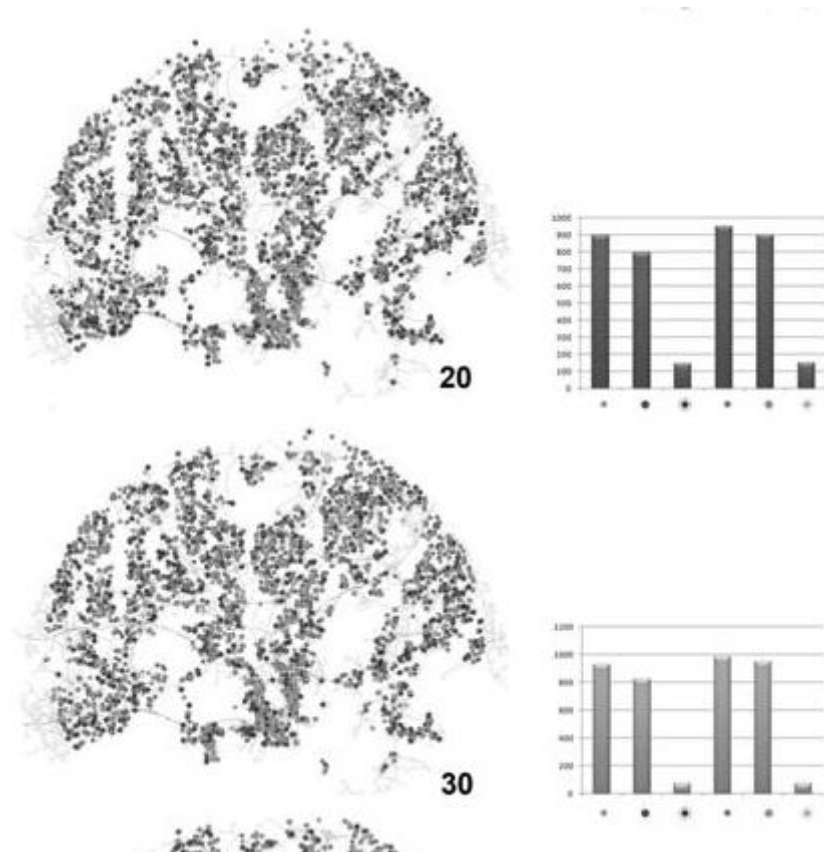


Figure 3.6: Part of HIMMELI output as transferred to print (the actual output is an animation)

### Setting the scene

The participants came from very different positions: a senior project manager, a senior academically inclined consultant and a young transport planner. Two planned participants were absent from the workshop: a consultant dealing with accessibility/mobility planning for several planning institutions, and a planner who utilises an accessibility instrument in region-integrated LUT planning.

As an unintended consequence of the absences, the participants had little experience in accessibility planning per se, but some in mobility planning/transport modelling and GIS-based land use planning. Therefore, the concept was novel but the approach and visualisations relatively easy to comprehend. Nevertheless, they were not familiar with the actual instruments.

Considering the developmental stage of the main instrument (experimental, with limited capacity to adjust the instrument to address new planning issues),

the team chose not to define a planning problem, but to discuss the use of accessibility instruments in more general terms. This resulted in the decision to also explore other accessibility models, eventually deciding to present MCA. The composition of the workshop followed this logic: half of the participants using one or more of the accessibility instruments, while the other half had less knowledge and no use experience.

### **Describing the workshop**

#### *Step 1*

The team chose not to define a planning problem, but to discuss the use of accessibility instruments in more general terms. The experimental nature of both the instrument and the workshop meant that not many persons were interested to spend the time and effort for a purely hypothetical planning problem (even when based on real-life issues); thus, the decision was taken to adopt a more general approach. In the region, all of the planning authorities and consultancies utilise accessibility instruments. As HIMMELI is still in its experimental phase, it was thought that getting points of view from a range of practitioners, in order to improve HIMMELI, was the best option. However, in the workshop itself, the researchers did use specific planning problems, thus providing focused information and examples to the participants.

#### *Step 2*

First, the two-day course before the workshop, when the accessibility instruments, theory and practical applications were presented, provided the participants (four out of five participated) with a prolonged introduction to the workshop discussions. Second, the workshop timetable was reorganised to enable more discussions on each participant's own practice and how various accessibility instruments and concepts relate to their daily work. In the workshop, the participants indicated that it would be possible to agree on a collective understanding if presented with a real-life planning problem; as an extension of this necessary hypothetical understanding the models were first discussed as tools; their outputs were critiqued; and the understanding of their abilities and limitations was discussed. Next, the models were discussed in relation to each participant's own current planning problems, with the other participants providing additional points of view.

#### *Step 3*

Since neither of the tools work in real time, step 3 could not be completed with full accuracy. Nevertheless, in the flow of the workshop step 3 was a seamless continuation of the previous step, in relation to the participants' planning

problem discussions. This was done through questioning and explaining the variables, parameters and underlying assumptions of the model(s). However, for the MCA tool, several intervention-type options had also been modelled for the presentation, and these provided an account of the effect of the interventions. The changes were examined by qualitatively producing the approximate results when introducing changes into the models, indicating the direction (+/-) and strength of the effects in each intervention.

#### *Step 4*

In the discussions concerning the interventions, the viability/usefulness of the interventions was approached in relation to the participants' own past experiences on how to develop such interventions without accessibility tools and with real-life problems; it was noted that the types of interventions discussed in the workshop could provide alternative knowledge and new ideas to existing practices. The evaluation was carried out in this way, thus not purely in the context of the tool(s). Strategy development was limited, mostly because the altered workshop schedule stressed the previous steps, and because, due to the absence of the accessibility experts, more time had to be used for building up step 2.

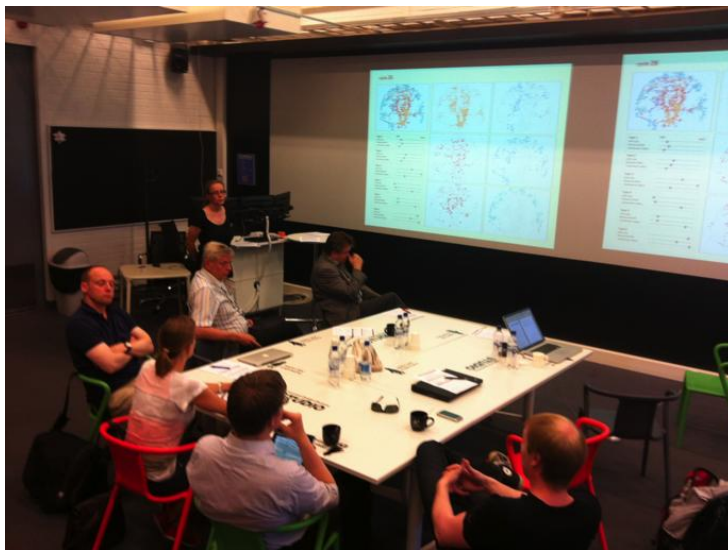


Figure 3.7: Workshop discussing HIMMELI

#### **Lessons on usability**

In addition to what this documentation shows, the general feeling was that the usability of an instrument is much more related to how creatively it is adapted

to the planning process: 1) at what stage (e.g. early, if the results provide for visions, alternative realities, etc.; on time, if the tool is geared for specific problem-solving; at crucial points, if the outcomes point at choices needed in decision-making); 2) with whom (between professionals of similar knowledge, in interdisciplinary/sectoral discussions, with decision-makers, with the public); and 3) for which purpose (common goal setting, mutual understanding, overall efficiency/optimisation, system development, problem solving, political decision-making support, public acceptance, etc.).

HIMMELI is at this point intended to be developed as a modelling experiment, to be expanded later as a strategic tool for developing ideas and visions of changes in accessibility through self-organisation. It needs a user-friendly interface to reach broad usability. Nevertheless, the basic idea was well received in the workshop because its agent-based dynamic and self-organising method, which connects with and illustrates the explanatory power of the network urbanism model, provide a novel view into accessibility issues.

Real-time capabilities are limited at the moment; while improvements could be made, the investments in computing power would have to be substantial. However, the instrument is not intended as a play-tool in real-time situations, but as an expert tool for understanding how self-organising principles form different development paths in relation to changes in underlying assumptions and conditions (real-life). It is useful for producing knowledge concerning the feedback loops and causal relations between changes in infrastructural or other attributes and the reactions or the behaviour of urban actors (from individuals to institutions).

In the workshop, several suggestions were made, including the development of a user-friendlier interface that would provide slider-like controls for changing (and visualising) the parameters and boundary conditions.

### References

- Dupuy, G. 1991. Les Réseaux pour un Nouvel Urbanisme: Éléments de Théorie, in Dupuy, G: *L'Urbanisme des Réseaux: Théories et Méthodes*, 107–126G. Paris: Armand-Colin.