

NRP 65 Project „SUPat – Sustainable Urban Patterns“ – Role and tasks of the Urban Design Group

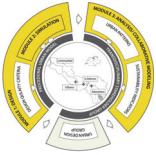
Explanation of the role, tasks and activities within the project SUPat as well as definition of essential applications of the simulation platform from the view of the Urban Design Group (results of the Urban Design Group Workshop, 28.10.2010).

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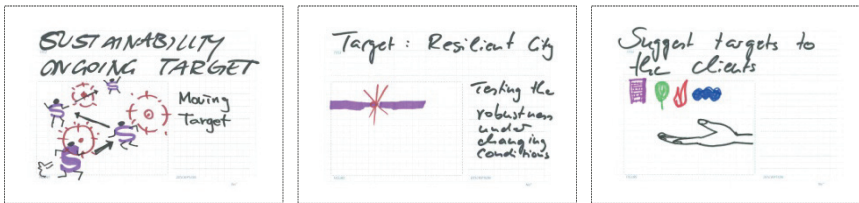
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1 Overview of the concept

The “Urban Design Group” comprises the five architecture offices Franz Eberhard, e2a, Hosoya Schaefer Architects, em2n, and Guagliardi Ruoss. The group is moderated by Franz Eberhard. Their goal is to **create visions and concrete targets for sustainable urban development and sustainable urban patterns through a scenario exercise**. The Urban Design Group will define and identify resilient urban patterns on the regional, community and project level as well as figure out borders/thresholds for the case study area, the Region Limmattal and the 3 focus areas, Altstetten, Schlieren and Siblern.

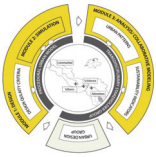


As urban sustainability is not a fixed state or equilibrium-based system due to non-linear, uncertain and sometimes surprising, perpetual transformation of the urban patterns through multidimensional processes, **sustainability** of the Region Limmattal and the selected focus areas **is a moving target**. Therefore, the identification of sustainable urban patterns is an ongoing inquiry that needs the analysis of different projects and a spiral refinement. Thinking about structures and processes in a dynamic fashion across scales and time is required (Folke, 2006).

The overall expectation of the Urban Design Group is that the simulation platform is able to advance urban design. Current urban plans are fixed for many years. Concepts of urban patterns (e.g. Alexander, 1977) are not precise and flexible enough to support urban design. The simulation platform is considered to rather **provide a solid basis for urban design** than control of urban design. It should be suitable to support creating of sustainable urban patterns. As the city is a contextually strongly interwoven and influenced entity (Eisinger, 2009), robust design and development strategies need spatial, infrastructural, ecological and socioeconomic readings, conceptual interpretations, and their testing.

Through testing different strategies, the robustness of possible urban patterns will be evaluated. The goal of the Urban Design Group is to find out the resilience of these patterns. In the workshop resilience was defined as robust structures, which are able to recover from changes affecting the whole system. One can look at specific resilience (according to known critical states and boundary levels) or general resilience (the structure’s ability to recover). In literature “**resilience**” has been defined as the amount of disturbance an (urban) system can absorb and still remain within the same state or domain of attraction, and the degree to which the system can build and increase its capacity for learning and adaptation (Folke, 2006). When a human or ecological system loses its resilience, it becomes increasingly vulnerable to disturbances that previously could be absorbed. Although the resilience perspective has been explored in many complex social-ecological systems (Folke, 2006) it has only recently been applied in the context of cities (Ernstson et al. 2010).

Resulting from the workshop the **role of the Urban Design Group and the overall project workflow has been refined**. First, the Urban Design Group is going to look deeper into the models (inputs, model system, outputs) enabling themselves to work with the modelling outputs competently. In addition, the group will be provided with the data available on the case study area for in-depth analysis and briefed on the basic regional Procedural 3D Urban Model. This information will be the basis for the Urban Design Group to decide on what level the group is actually going to work. It got



clear that the architects are not going to generate individual designs on project level because this would not be feasible with the time and money available in the SUPat project. They are rather providing **inputs in form of ideas, concepts and decisions**.

Moreover, the requirements for the collaborative urban simulation and modelling platform were further specified by the Urban Design Group. Figure 1 provides a schematic overview on the concept for interaction of the Urban Design Group with the Collaborative Platform based on the workshop results.

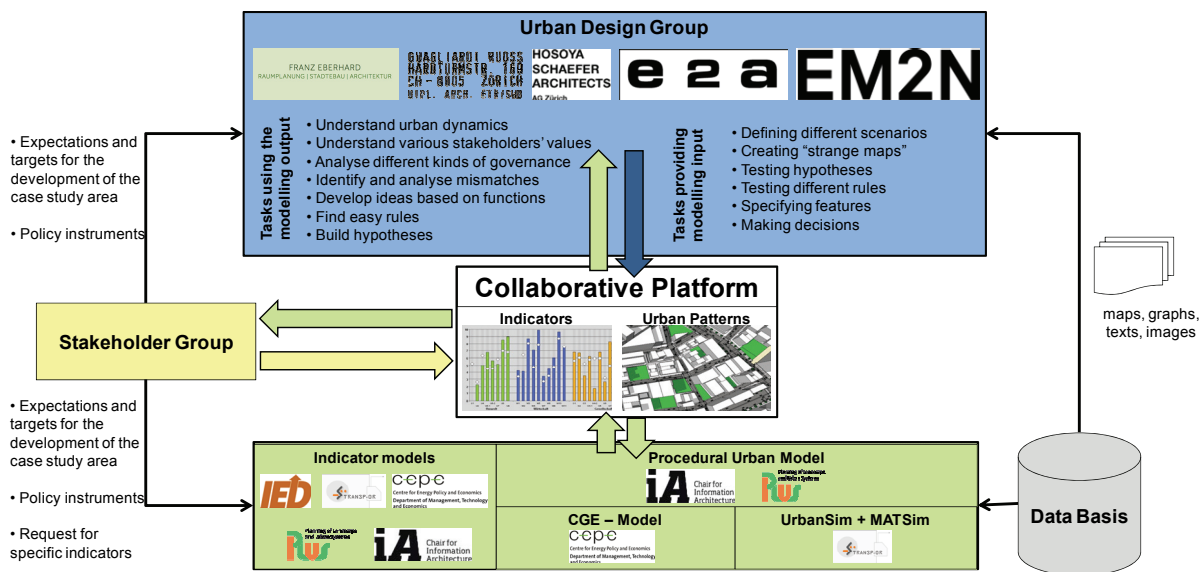
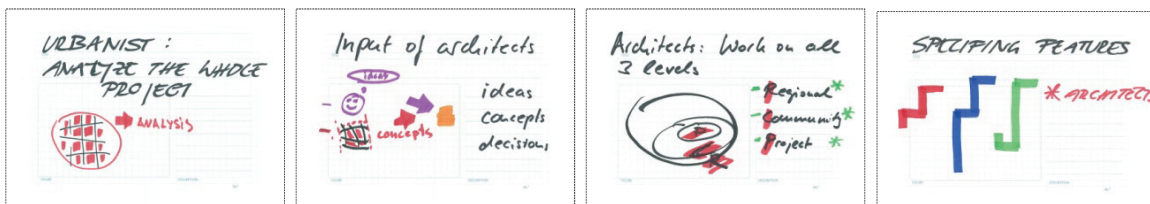


Figure 1: Concept for interaction of the Urban Design Group with the Collaborative Platform.

2 Definition of roles

2.1 Role of the Urban Design Group



Not conducting an architectural project: The Urban Design Group is not working on project level developing individual designs. Importing something into model and waiting for output is not enough.

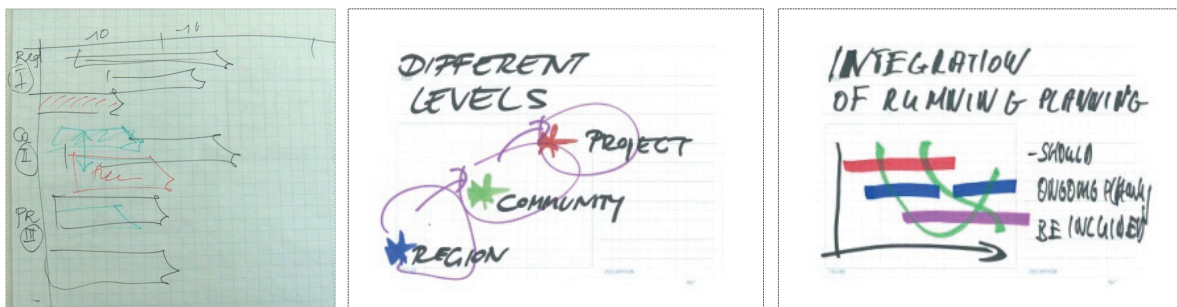
Intellectual and specific exercise: The goal is creating sustainable urban patterns. Therefore, the Urban Design Group is going to analyse the whole SUPat project. The group's special interest is in analysing the effects of decisions and of interesting scenarios with regard to the sustainability of urban patterns. Further, the Urban Design Group will support the development of rules, test existing and new rules and help in the verification of rules. Additionally, the group will provide input for specifying features.

Solving problems in scenarios: The Urban Design Group is interested in running through several scenarios and analyse the resilience of urban patterns under different framework conditions.



Inputs of the Urban Design Group: The group will provide inputs in form of ideas, concepts and decisions.

Planning level working on: There are 3 different planning levels one can look at: (1) The regional level (Region Limmattal), (2) the community level (3 focus areas Altstetten, Schlieren, Silbern), and (3) the project level (a specific project on building or neighbourhood level). The Urban Design Group wants to look at all levels. Running projects and ongoing planning in the Region Limmattal on all levels should be integrated into the analysis.



2.2 Role of the Stakeholder Group from the perspective of the Urban Design Group



Defining stakeholders: The Urban Design Group and the Modelling Group are also stakeholders.

Working on all planning levels: The Stakeholder Group should provide diverging perspectives. The members should be characterised by varying decision-power on different planning levels.

Scenario framework conditions: Important inputs from the Stakeholder Group are the expectations with regard to the future development of the Region Limmattal and the focus areas in form of driving forces and political targets.

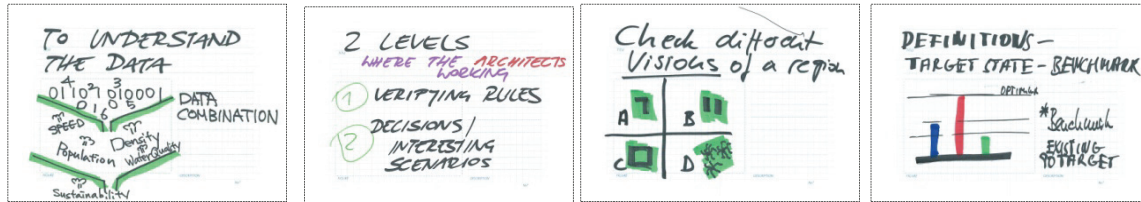
Pattern analysis: The Stakeholder Group should analyse alternative patterns.

Providing values and rules: Values and rules can only be figured out by personal contacts and not by literature review. One focus will be on life cycle. What kind of living do the stakeholders want to have? What are the projected basic needs of the stakeholders (Grundbedürfnisse)? What are the characteristics of “urban” in 50 years?

Weighting: The stakeholders should weight benefits of alternative urban patterns against each other (valuation) taking into account various diverging perspectives.



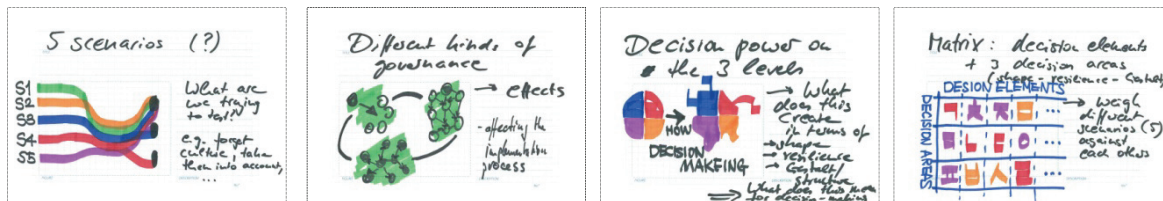
3 What do you want to do? – Tasks of the Urban Design Group



Develop visions for sustainable urban development: Come up with a future suggested to be desirable (=objective/benchmarks).

Getting familiar with the case study area: Analyse the available data of the Region Limmattal and the focus areas (morphology of built infrastructure / houses, historic development, GIS data, statistics,...). Through this analysis the Urban Design Group may get surprising insights, which are not considered today.

Understanding the models: The Urban Design Group wants to get a deeper understanding of the models to be able to work with the modelling outputs.



Scenario planning exercise/Understanding urban dynamics: A scenario exercise was chosen as the general approach for sustainability setting of urban patterns. Raising questions about the future and making the overlap of different futures, which in turn leads to further questions, builds the starting point for the design part of the Urban Design Group. On this basis the group will create new hypotheses, ideas and designs. For testing their hypotheses, they are interested in running through several interesting scenarios for detecting the resilience of urban systems. In this way, they are going to test the robustness of various urban patterns under changing conditions and to check different visions for a region. Particularly, they would like to weigh different scenarios (e.g. 5 scenarios) against each other according to a matrix of the decision elements in 3 decision areas (shape – resilience – gestalt/structure).

Test (political) decisions: The Urban Design Group wants to analyse different kinds of governance (top down – bottom up). What are the effects? How are they affecting the implementation process? What kind of decisions of concepts on an urban design scale has which impact? What does the decision power on the 3 planning levels (region – community – project) create in terms of shape, resilience and gestalt/structure? What does this mean for decision-making? What are political targets for the Limmattal and which effects would their implementation have?

Dialogue/Knowledge networking for discovering mismatches: A dialogue with all three groups on all planning levels should take place to analyse mismatches. The goal is to discover the total mismatches, i.e. on all levels. For this task, 3 parameters should be matched: shape, resilience/vulnerability and gestalt/structure. How can these parameters cause vulnerability or build resilience? How do they interplay, match and mismatch across scales and time? Do mismatches get solved on community level? As a result from the analysis of the dialogue suitable planning processes will be developed.

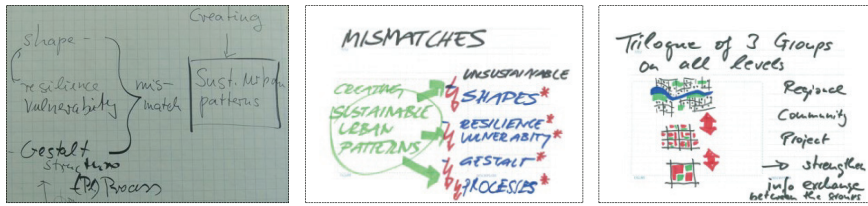
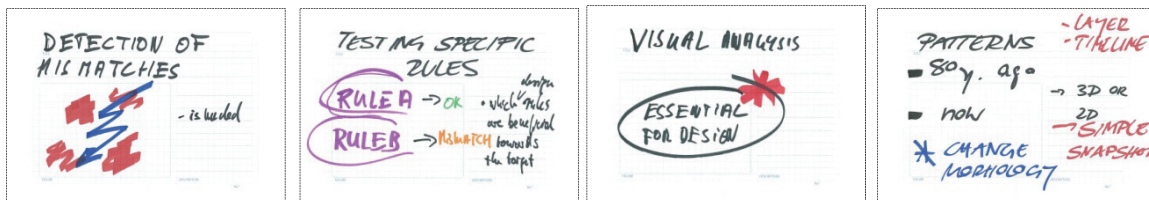


Figure: Concept for identifying mismatches. Resilience in cities is tightly linked to urban form and land-use patterns as well as local and spatial ecological processes (Ernstson et al., 2010).

4 What do you want to look at? – Usage of the Collaborative Platform from the users' perspective



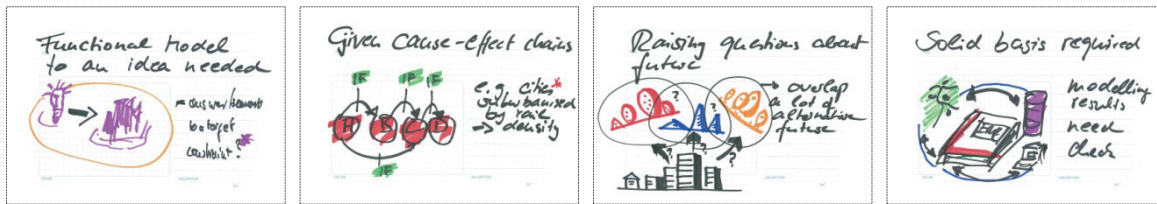
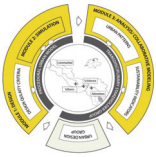
Input data: The Urban Design Group wants to find out what input is required for what question.

Mismatches: Mismatches were defined in the workshop as contradictions of social, ecological and spatial structures, which lead to unsustainable patterns. These mismatches are on specific levels. For example, on community level projects are not harmonized enough. On regional level the level of detail is missing crucial information causing contradictions on community level. From the analysis of mismatches, hypotheses can be developed how mismatches could be avoided. In this way, measures on a specific planning level can be developed and tested that might lead to more sustainable urban patterns. On which level can specific mismatches be solved? What measures are required for enhancing urban planning processes cross scale? Which ideal planning strategies can be identified by analysing mismatches?

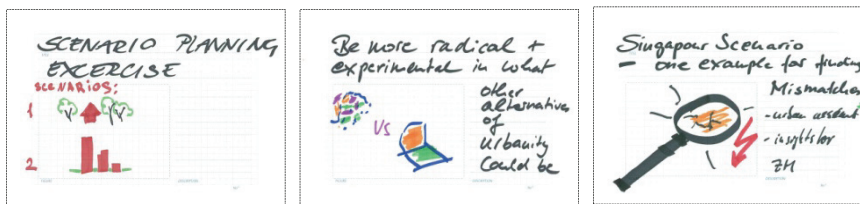
Rules: Which design rules are beneficial towards the target, i.e., which rules do not lead to mismatches? The Urban Design Group is trying to find easy rules for structure and shape that can guide urban development. An important example is Monte Carasso, where only 3 basic rules guide building development: (1) build out of stones, (2) build a certain border and (3) public acceptance of the project is mandatory.

3D Visualisation: Data linked to geography allows an analysis of abstract data in a concrete spatial context. The Urban Design Group stressed that visual analysis of urban patterns is essential for design. 3D visualisation of the modelling outputs will very likely support understanding the data and their combination. Visual effects combined with changes of indicator values should help to detect areas of change.

Historical patterns: The Urban Design Group wants to carry out an analysis of historical patterns. What was important in history? What could be the structure of the future? Which patterns/developments can we take from history and what can we learn from them for the future development? What could be the structure deduced from the analysis of historical development providing high urban quality?



Modelling output: The modelling output has to be used more specific than for “copying the world” (which will never be complete). The implementation of the models suggested in the kick-off meeting is too technical. The Urban Design Group stated that design provides quality, which cannot be created by the “machine”, i.e. by the modelling system. The modelling combines various urban features. It can give advice in advance for the design part or it can be an instrument for monitoring different alternatives. - **“From functions to ideas”:** The Urban Design Group wants to utilise the modelling output in a way that they look at functions and create ideas from these. The advantage of this approach is that the ideas have a reference to the method, i.e. linking data to geography, understanding the data, deriving hypotheses, testing and analysing designs. A prerequisite is that the modelling results are proved to provide a solid basis for testing and analysis.



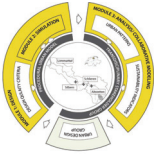
Radical scenarios (= experiments): The Urban Design Group wants to be more radical and experimental in what other alternatives of urbanity could be, e.g. by applying rules from Singapore on Zurich. What could it be like under different political conditions (top-down vs. bottom-up planning; collaborative planning)? Compare, analyse and overlap, for example, 5 different scenarios (e.g. change the cultural aspects, lifestyle...). These examples should be used for finding mismatches, learning about different concepts and cultures and getting insights for the case studies in Zurich. Another suggestion was to create “strange maps” based on the repository of available data provided by the simulation platform (creative process).

Indicators: The indicators should demonstrate the added value of certain urban patterns from different stakeholders’ perspectives.

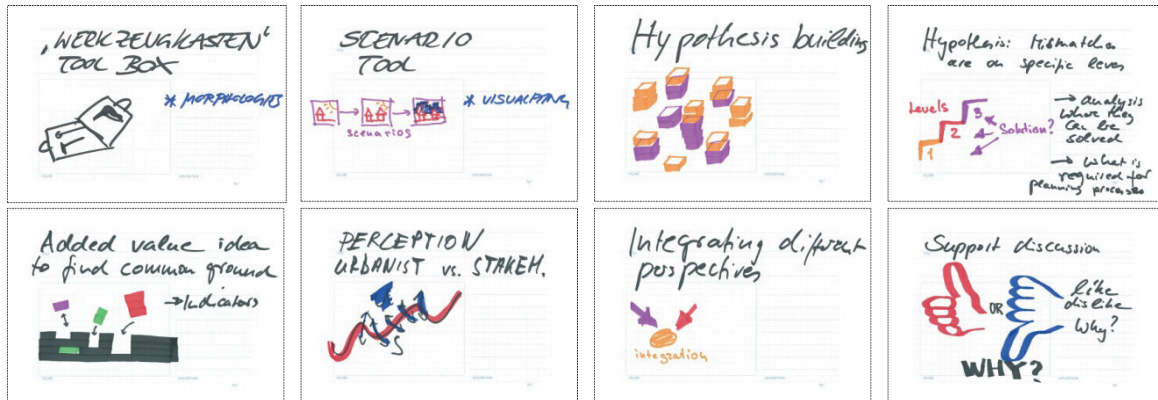
Stakeholders’ values: There are not only logical decisions but also basic needs of stakeholders. It is important that stakeholders identify qualities. Values have to be transformed. The Urban Design Group suggests stakeholders to say what they like in maybe 5 scenarios and then let them make a choice. A project should be used as a medium for discussion. In this way, values can be detected in deeper sense.

Planning levels: A dialogue of three groups on all levels (regional – communal – project level) is required because otherwise possible mismatches are not detected (e.g. in the project “S5-Stadt” the mismatch between the regional targets and the communal targets has not been considered). On which level can mismatches be solved and how? What happens if you have design power on different levels? With the modelling output different things can be shown on different levels.

Planning process: The simulation platform offers new ways of connecting instruments and values supporting decision-making processes. What does this new planning process look like? How can the collaborative simulation and modelling platform be implemented?



5 Overview of identified essential applications of the Collaborative Platform



Scenario Tool/Tool box:

- Repository of available data in a form supporting a creative process, e.g. for generating “strange maps”, developing ideas of new urban patterns etc.
- The models allow gaming the future for identifying urban patterns of high quality
- The Procedural 3D Urban Model provides morphology by visual means (3D visualisation)

Supporting hypothesis building:

- Visual evaluation tool (3D visualisation) showing visual effects combined with indicators
- Tool for showing effects of scenarios, of decisions or of various combinations of rules

Supporting hypothesis testing:

- To test in a scientific way
- On the general level: methods for basic information (UrbanSim)
- Testing specific rules
- Given cause-effect-chains are provided by the tool (e.g. cities suburbanised by rail leads to densification)
- Functional model - providing constraints but no fixed urban shape - as basis to create and test ideas
- Monitoring during development of alternatives

Supporting the identification of mismatches:

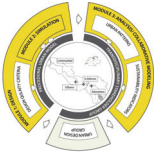
- Shape mismatches = design features
- Gestalt/Structure mismatches = networks
- Resilience mismatches = vulnerability
- Process mismatches = bottom-up mismatches and top-down mismatches

Integrating different perspectives and values:

- Elucidating diverging perceptions of urban planners and stakeholders
- Facilitating the added value idea to find common ground
- Medium to identify who likes what and why/transfer of values
- Supporting the transformation of values (?)
- Weighing benefits against each other (trade-off)

Supporting discussions between different stakeholders on all planning levels:

- Concrete 3D urban patterns as a medium to discuss with different stakeholders
- Support dialogue of 3 groups (regional, communal, project stakeholders) on all levels (regional, communal and project level)
- Strengthen information exchange between the groups
- Instrument fitting in all 3 levels of decision-making



6 Required information

6.1 Information required from the Modelling Group

The next step for the Urban Design Group is to get familiar with the case study area, the Region Limmattal and the 3 focus areas. Instead of already processed data the Urban Design Group asked for the original planning data, i.e. topography, morphology of the built environment, land cover/use, infrastructure networks, historic development patterns and statistical data. Particularly the overview of the historic development is needed in order to get first ideas why changes happen. Simple snapshots should be prepared for the time frame from 1930 – 2010 (= 80 years) in 10-years-steps to show the change in morphology. The general structure of the morphology can be provided as 3D visualisations or 2D maps. For the familiarisation with the case study area a workshop will be organised in March 2011.

In order to be able to work with the modelling results it is essential for the Urban Design Group to understand what the input data of the 3 different models (Computable General Equilibrium (CGE) Model, UrbanSim+MATSim, Procedural Urban Model) are. Further, the modelling system behind the different models should be explained. Additionally, definitions of the indicators and a description of their data basis should be provided. Therefore, the modelling group will prepare graphs and visualisations of the input data as well as a description of the modelling system that is understandable for everyone. Furthermore, the Urban Design Group wants to have a deeper understanding of the kind of visualizations (e.g. visualisation of structural changes, housing market, energy consumption) that can be provided. Thus, a first procedural 3D urban model of the current situation will be introduced in the workshop in March 2011.

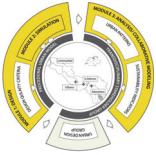
As for the procedural urban model rules are encoded to shape grammars generating 3D visualisations of urban patterns, information on the rules is necessary to understand the output of this model. First, a list of all basic information for these rules such as building type classifications (categories) should be provided. Further, it has to be described how specific the rules are. The following questions should be answered:

- Why are rules used?
- Rules have to be specific to the Limmattal. How specific are the rules?
- There have to be planning rules (design guidelines) and design rules (top-down rules). Which are these?
- How are these rules formulated (e.g. if...then)?
- Under what conditions can the rules be fired?

The weighting of values and trade-off decision-making is a crucial task in the project. How is this done? When? When are results available? Information on the weighting will be prepared.

6.2 Information required from the Stakeholder Group

The stakeholders' expectations with regard to the development of the Limmattal are required for the next workshop of the Urban Design Group. What are political targets for the Limmattal on community level? Each community might have its own ideas. Furthermore, an overview is required on who decides on what level and what. The stakeholders' targets and decision-making power will be determined in a workshop in February/March 2011. The results are also used for setting up the scenario framework conditions for generating scenarios with the 3 models (Computable General Equilibrium (CGE) Model, UrbanSim+MATSim, Procedural Urban Model).



7 Next steps - Time line

February 2011: Explanation of the modelling system (Reader, Presentations, Definitions)

- Description of the whole modelling system understandable for everyone
- Short presentations of all 3 *models* (purpose of the model - input data – processing – output data)
- Definition of the *rules* applied in the procedural 3D urban model
- Definitions of already known *indicators* and a description of their data basis

March 2011: Workshop (4 h) with the Urban Design Group in the ETH Value Lab

1. Get familiar with the area by screening the basis data
 - Different material available (land use/cover, morphology, networks, topography, statistics, monitoring data), plans on the wall
 - Stakeholders' expectations and targets with regard to the development of the Region Limmattal and the 3 focus areas, Altstetten, Schlieren and Silbern
2. Introduction of a basic procedural 3D urban model of the current situation of the Region Limmattal
 - Input data to the procedural model
 - Data processing in the procedural model (rules and their visual effects)
 - Interacting with the procedural model
3. Discuss on what level the Urban Design Group is going to work
 - Defining interesting scenarios

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