

# SUPat - SUSTAINABLE URBAN PATTERNS

<http://www.supat.ethz.ch/>

Urban growth - natural resources - better life?

## Motivation

With the expansion of Swiss cities and the shortage of resources, urgent targeted, transdisciplinary planning of urban qualities is needed. How can we develop cities which are lively and pleasant to live in and which do not over-exploit resources?

## Aim

The project integrates qualitative and quantitative design and research activities through exploration of regional scenarios to propose sustainable urban patterns. Visualization and simulation tools will facilitate balancing social, ecological and economic aspects in collaborative urban planning processes.

## Significance

Overall, the collaborative modeling platform will serve as an operative tool to support planners, architects, policy makers and concerned parties in assessing the conditions under which specific urban qualities have a good chance to achieve their environmental, social and economic goals.

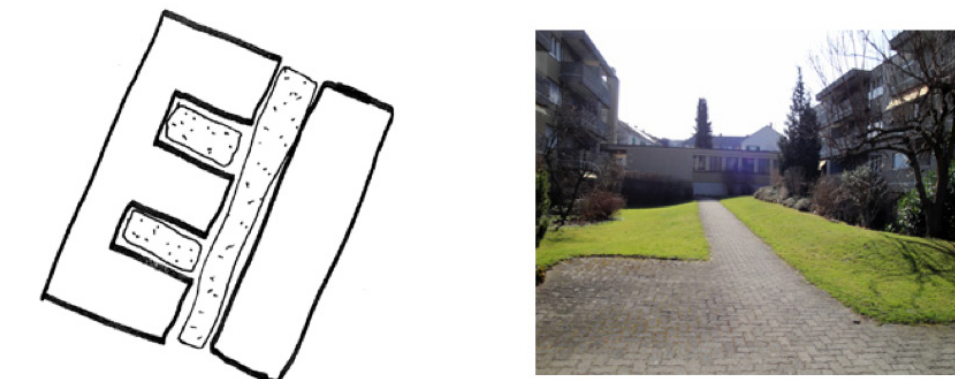
## HARD/SOFT INDICATORS + RULES

Dimension	Indicators
Design	Gestalt and Form
Ecology	Quality of Ecosystem Services
Social	Satisfaction of Needs
Economy	Accessibility, Mobility, Flexibility



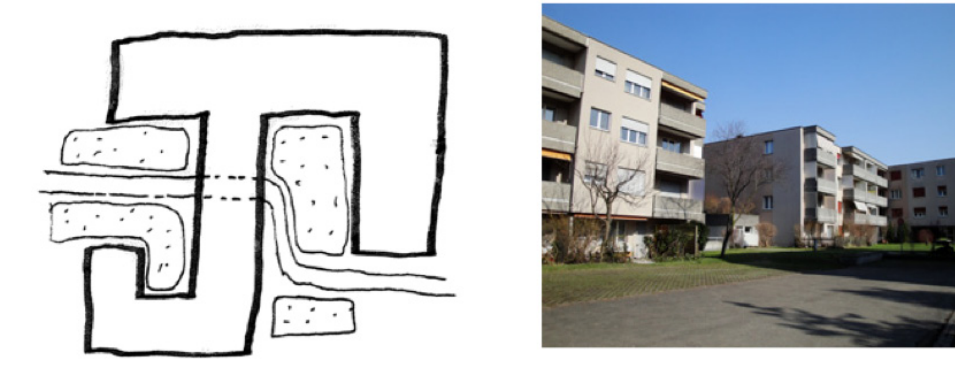
## URBAN TYPOLOGY

### Patterns

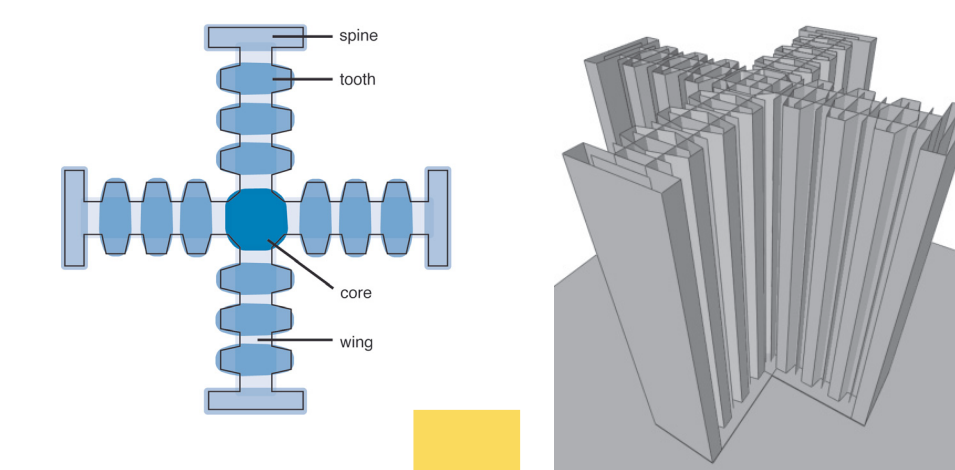


### Description

- Deep residential blocks
- Continuous street facade
- Balconies on south, west and east facades allowed



- Continuous 'uniquely shaped' residential blocks
- Changing orientations
- Open space between blocks



BUILDING\_H = 220  
BUILDING\_W = 100  
GROUNDFLOOR\_H = 6  
WING\_W = 16  
SPINE\_W = 50  
TEETH\_PROJ = 10  
TEETH\_DIST = 12

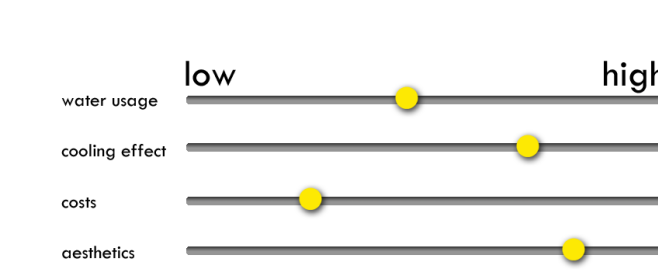
## URBAN QUALITY EVALUATION PROCESS

### Exploration Parcours



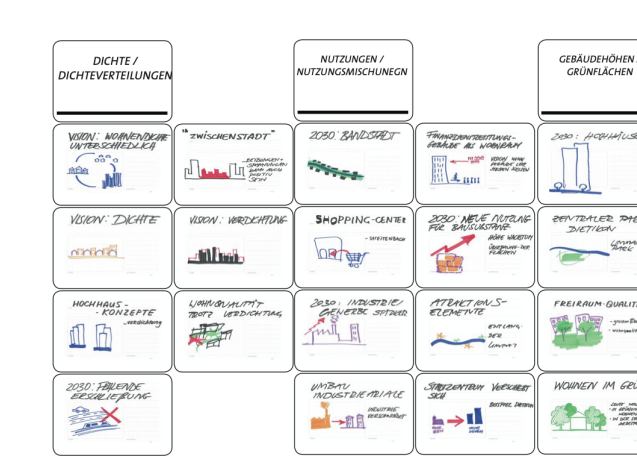
Stakeholder groups are guided through different urban patterns in the ETH Value Lab to determine dissent and consensus between different stakeholder groups about future development.

### Weighting and Trade-offs



Stakeholders' preferences give weight to certain indicator levels and a trade-off model calculates and visualizes adapted urban patterns in real-time for iterative assessment.

### Architectural Programming



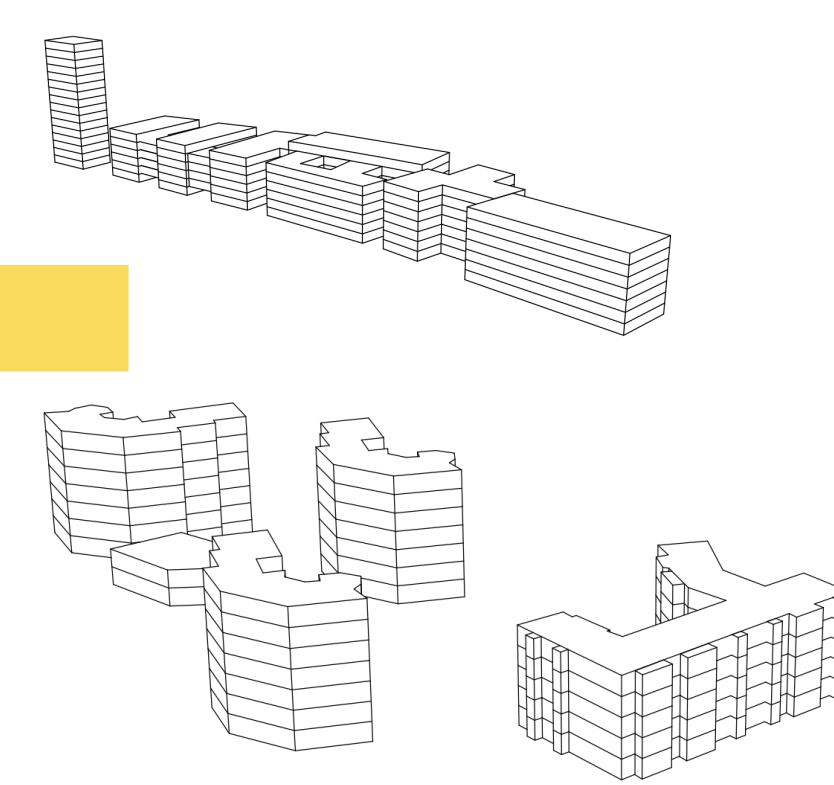
A matrix structures stakeholders' requirements that are linked to possible urban patterns visualized in the procedural urban model for weighting, evaluation and iterative enhancement of alternative urban patterns.

## PROCEDURAL MODEL



Final result of an initial procedural urban model of 'Altstetten'

## BUILDING TYPES



- Single-family detached
- Single-family attached
- Multi-family
- Office, hotel, school
- Light industrial, warehouse
- Industrial, heavy industrial
- Strip mall retail, big-box retail
- Residential-focus mixed, retail-focus mixed
- Employment-focus mixed

## UrbanSIM + MATSim

### Computable General Equilibrium (CGE)



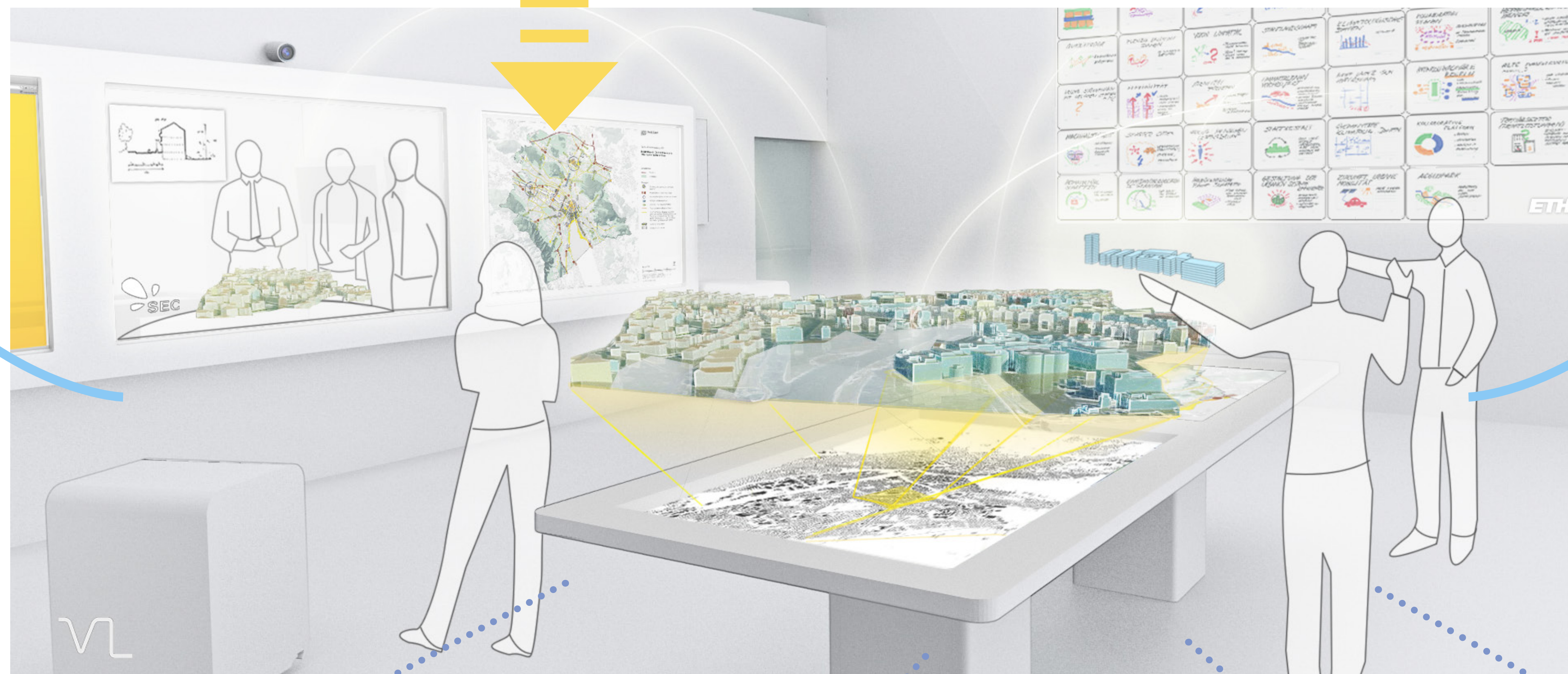
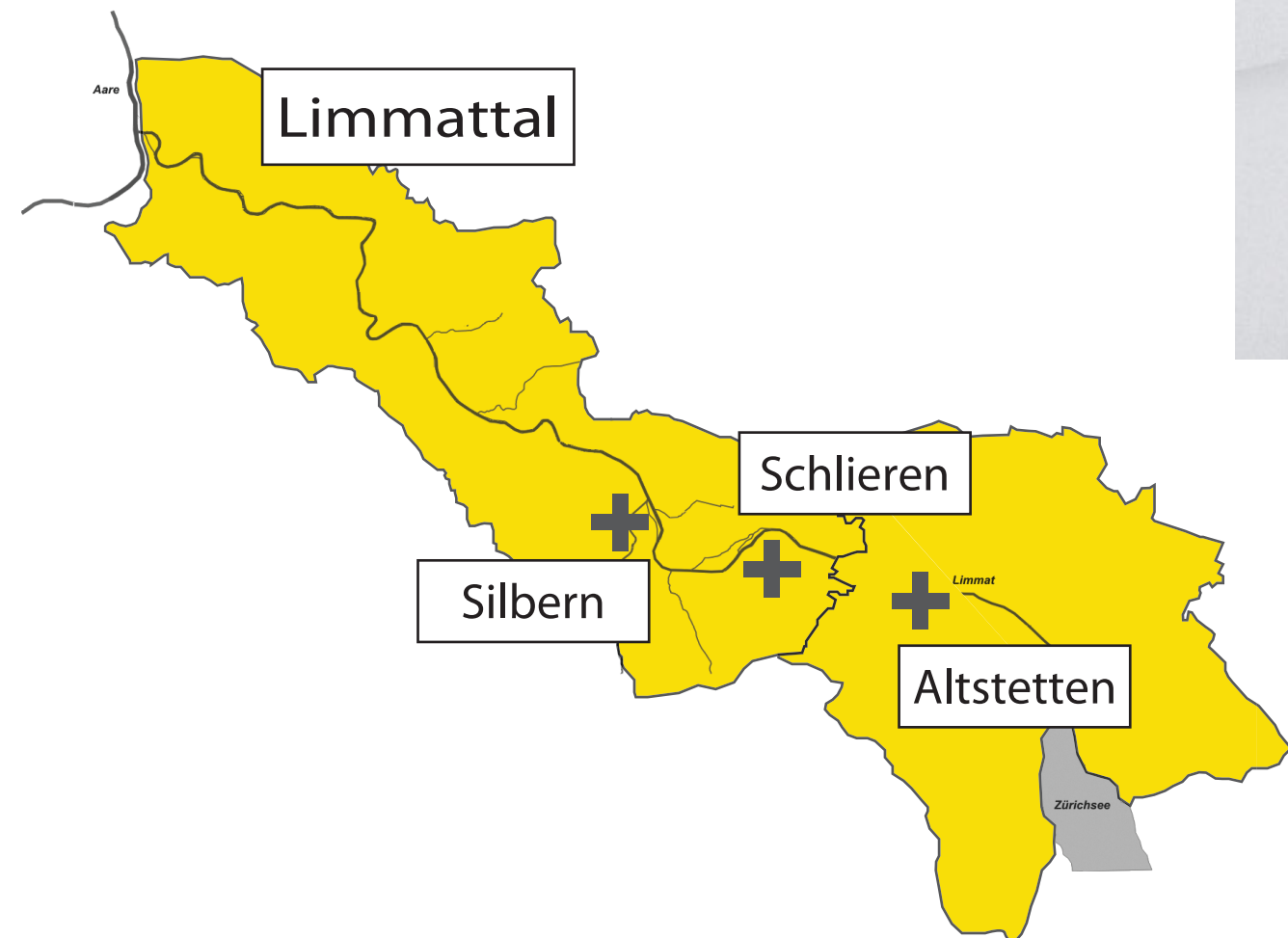
Visualization of the MATSim model of Zurich, IVT, IA, ETH Zurich

## COLLABORATIVE URBAN PLANNING PLATFORM FOR SUSTAINABLE URBAN DEVELOPMENT

## Stakeholder



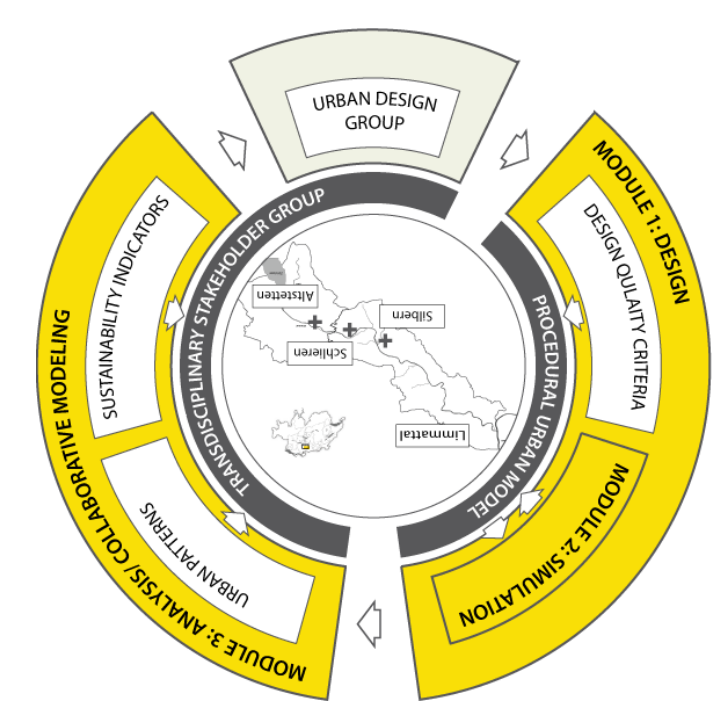
- Federal administration
- Canton
- Region
- Private
- Research



## Urban Design Group



- Franz Eberhard, Zurich
- e2a, Zurich
- em2n, Zurich
- Guagliardi Ruoss, Zurich
- Hosoya Schaefer Architects, Zurich



## REGIONAL SCENARIOS: LIMMATTAL 2030/2050

### Character City

Strong identity that preserves the tradition and utilizes the dynamic as opportunity.

### Smart City

Energy efficient, cross-linked, smart, demanding life style groups.

### Pure Dynamic

The market rules the development.

### Charming Valley

An integrated human ecosystem characterizes the attractive living environment Limmattal.

