How to approach green urban fabrics – identify, prioritize, act?

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Three urban fabrics

- Areas of walking urban fabric
- Areas of transit urban fabric
- Areas of automobile urban fabric
Three urban fabrics meet green infrastructure

Areas of walking urban fabric
Areas of transit urban fabric
Areas of automobile urban fabric
Three urban fabrics: walking, public transport and automobile urban fabrics
Newman et al. 2016:
"The three urban fabrics are quite distinct in their elements, functions and qualities though town planning has generally not recognised their differences, generally preferring the Modernist approach of one functional city with the one set of manuals to plan and manage them."
Finnish city regions have mainly expanded into forests

Distribution of land cover that was displaced by the expansion of residential, industrial and commercial areas in 2000–2012

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Proportion in the total developed land area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central pedestrian zone</td>
<td>22</td>
</tr>
<tr>
<td>Subcentre</td>
<td>19</td>
</tr>
<tr>
<td>Fringe of pedestrian zone</td>
<td>19</td>
</tr>
<tr>
<td>Intensive public transport zone</td>
<td>19</td>
</tr>
<tr>
<td>Public transport zone</td>
<td>7</td>
</tr>
<tr>
<td>Car zone</td>
<td>10</td>
</tr>
<tr>
<td>Areas outside localities</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
</tr>
</tbody>
</table>

The shares represent 34 city regions in Finland

On average 77% of the area of urban expansion was previously classified as green spaces suitable for recreation.
Car ownership and density in the Helsinki region (14 municipalities) in 2015
Identifying neighbourhoods and areas of three urban fabrics with three variable overlay analysis

**Density variable**
- D 3: Density of residents and jobs at least 48/ha within an area of 750 x 750 metres
- D 2: Density of residents and jobs between 20/ha and 48/ha within an area of 750 x 750 metres
- D 1: Density of residents and jobs below 20/ha within an area of 750 x 750 metres

**Service variable**
- S 1: At least one grocery shop within walking distance of 500 metres
- S 0: No grocery shop within 500 metres

**Public transport variable**
- T 3: Good service level of public transport (intensive public transport zone)
- T 2: Basic service level of public transport (public transport zone)
- T 1: Weak service level of public transport

**Legend**
- D 3
- S 1
- T 3
- D 2
- S 1
- T 2
- D 1
- S 1
- T 1
Automobile urban fabric

High potential for transit fabric

Low potential for transit fabric

Density variable

Service variable

Public transport variable

Walking and transit
Urban fabrics

DENSITY (D)

D 3  Density of residents and jobs at least 48/ha within an area of 750 x 750 metres
D 2  Density of residents and jobs between 20/ha and 48/ha within an area of 750 x 750 metres
D 1  Density of residents and jobs below 20/ha within an area of 750 x 750 metres

SERVICE (S)

S 1   At least one grocery shop within walking distance of 500 metres
S 0   No grocery shop within 500 metres

PUBLIC TRANSPORT (T)

T 3    Good service level of public transport (intensive public transport zone)
T 2    Basic service level of public transport (public transport zone)
T 1    Weak service level of public transport

D 3  S 1  T 3
D 2  S 1  T 3
D 1  S 1  T 3

D 3  S 0  T 3
D 2  S 0  T 3
D 1  S 0  T 3

D 3  S 0  T 1
D 2  S 0  T 1
D 1  S 0  T 1
The theory of urban fabrics – concepts

Figure 3  Conceptual combinations of three urban fabrics
Source: Kosonen, 2013; 2015
AREAS OF URBAN FABRICS

- Inner walking fabric
- Outer walking fabric – core area
- Outer walking fabric – other areas
- Subcentres
- Inner areas of the transit city fabric
- Outer areas of the transit city fabric
- Inner areas of the automobile fabric
- Outer areas of automobile fabric
- Border of the urban core area
- Distance to the city centre 1, 2, 5, and 8 km
Helsinki region future projection based on data gathered from municipalities

Areas outside localities
- Outer areas of automobile fabric
- Inner areas of the automobile fabric
- Outer areas of the transit city fabric
- Inner areas of the transit city fabric
- Subcentres

Outer walking fabric
- other areas
- Outer walking fabric
- core area
- Inner walking fabric

Graph showing the projection of areas outside localities, outer areas of automobile fabric, inner areas of automobile fabric, outer areas of transit city fabric, inner areas of transit city fabric, subcentres, outer walking fabric (other areas), outer walking fabric (core area), and inner walking fabric from 2010 to 2060.
Integrating green infrastructure and infill development

- Nature improves our health and well-being, sustains biodiversity, and helps cities to adapt to climate change. *Purposeful planning can make it easier to achieve the benefits we can gain from natural areas in our towns and cities.*
- Natural areas should remain accessible close to homes *even in increasingly densely populated cities.*
- Different planning-support tools are needed for integration, *since objectives of densification and green infrastructure may be contradictory.*
Spatial multi-criteria decision analysis for better integration

The method:

- includes structuring the problem with stakeholders → participatory
- is subjective, includes weights that are set for different criteria
- is about participants’ values projected on map: important to acknowledge who give the weights and how
- helps see the role of facts and the role of values
- is about understanding the objectives and indicators → a learning process
Value tree

Green Infrastructure
- **Objective**: Recognize and preserve the most important green areas

Infill development
- **Objective**: Recognize the most optimal sites for new infill development

GIS

Biodiversity
- **Objective**: Preserve biodiversity

Connectivity
- **Objective**: Preserve connectivity

Provisioning ecosystem services
- **Objective**: Preserve the provisioning ecosystem services

Regulating and maintaining ecosystem services
- **Objective**: Preserve the regulating and supporting ecosystem services

Cultural ecosystem services
- **Objective**: Preserve the cultural ecosystem services

Protected areas
- **CONSTRAINT**: Other important habitats
- Cultivated crops
- Wild plants and animals and their outputs (e.g. game, berries, mushroom)
- Water for drinking

Hydrological cycle and water flow maintenance, flood protection
- Pollination and seed dispersal
- Micro and regional climate regulation
- Recreational use of nature
- Educational use of nature
- Aesthetics and cultural heritage
- Sacred, spiritual, symbolic or iconic values of nature
- Intrinsic and bequest values of nature

Soil excavation price (€)
- Location efficiency (slope, potential sun radiance)
- Existing infrastructure (roads, sewage system, storm water management)
- City land ownership
- Pedestrian zone
- Fringe of pedestrian zone
- Public transport zone
- Car zone
- Distance to grocery shop
- Distance to healthcare
- Distance to school
- Distance to kindergarten
- Distance to sports and recreation facilities
- Noise level
- Air quality
- Disturbing odours
- Regenerating areas with landscape and townscape damages
Infill development values

Green infrastructure values
AREAS TO PRESERVE
High GI values, low infill development potential

Green infrastructure

AREAS WITH POTENTIAL CONFLICTS
High GI values, high infill development potential

AREAS WITH LOW INTEREST
Low GI values, low infill development potential

AREAS TO PRESERVE
Low GI values, high infill development potential

MOST SUITABLE AREAS
Low GI values, high infill development potential
Greatest benefits according to participating practitioners:

- The method helped them to **structure the variety of different factors** that impact infill development planning.
- The method brought about **discussion** between practitioners from different sectors of the municipality.
Four recommendations to develop and repair urban fabrics in the next decade

1. Use the development potential in the fringe of pedestrian zone

This area located at 1–2 km from the city centre is in transformation in several Finnish cities. Fringe zone of the centre provides good location for mixed use development.

2. From detached houses to townhouses

In the largest city regions the focus should be in transit city development. Subcentres and intensive public transport zone offer sustainable transport choices for masses. This is the zone where the integrated planning of land use and transport is crucial.

3. Build transit city that relies on intensive public transport

To avoid car city development we should not build new low-density housing areas. Bring single family houses into transit city using etc. the concept of townhouses. This will diversify the housing structure in transit city.

4. Take varying green infrastructure characteristics in different urban fabrics into account

Different solutions are needed for different fabrics. **Walking urban fabric**: nature-based solutions like green walls and roofs, in addition to tree alleys, parks etc. **Transit urban fabrics**: good public transport connections to large recreation areas, community gardens etc. **Automobile urban fabric**: balance between private and public green spaces, avoiding scattered housing to prevent fragmentation.
REFERENCES


Thank you!