MODULE
for residential district.
Alternative to a micro-district

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In cooperation with Institute for Regional and Urban Planning, Belarus
Typical micro-district in post-soviet city

(European inner-city)

Compact build-up

SHOWED IN SIMILAR SCALE
Problems of existing micro-districts (microraiions)

- Lack of social infrastructure meanwhile huge volumes of housing put-in-place;
- Non-efficient land use and low density;
- Residential yards covered with cars;
- Unreasonable scale of build-up;
- Complicity of maintenance of big territories, including landscape accomplishment, arrangement of green spaces and cleaning;
- Air pollution and lack of trees;
- Lots of empty spaces;
- Lack of social communication;
- High load on city public transport and traffic-jams;
- Dependence of centralized engineering infrastructure;
- Low accessibility of territory;
- Absence of public spaces and places for going-out;
- Shortage of kindergartens, sport facilities, places for adult and elderly residents
## Indicators of density of build-up in big and large cities of Belarus and in Minsk

<table>
<thead>
<tr>
<th>City</th>
<th>Housing stock, th.sq.m</th>
<th>Square of residential territories, hectares</th>
<th>Density of stock, sq.m/hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minsk</td>
<td>33731,3</td>
<td>8230</td>
<td>4100</td>
</tr>
<tr>
<td>Brest</td>
<td>5261,0</td>
<td>2500</td>
<td>2104</td>
</tr>
<tr>
<td>Vitebsk</td>
<td>6491,0</td>
<td>3921</td>
<td>1656</td>
</tr>
<tr>
<td>Gomel</td>
<td>9558,8</td>
<td>3426</td>
<td>2790</td>
</tr>
<tr>
<td>Grodno</td>
<td>5704,6</td>
<td>4424</td>
<td>1290</td>
</tr>
<tr>
<td>Mogilev</td>
<td>6795,5</td>
<td>4181</td>
<td>1625</td>
</tr>
<tr>
<td>Baranovichi</td>
<td>3462,2</td>
<td>1874</td>
<td>1848</td>
</tr>
<tr>
<td>Molodechno</td>
<td>2015,5</td>
<td>1198</td>
<td>1680</td>
</tr>
<tr>
<td>Soligorsk</td>
<td>2097,7</td>
<td>578,5</td>
<td>3626</td>
</tr>
<tr>
<td>Polotsk</td>
<td>1327,3</td>
<td>1030</td>
<td>1290</td>
</tr>
<tr>
<td>NewPolotsk</td>
<td>2038,5</td>
<td>955,6</td>
<td>2133</td>
</tr>
<tr>
<td>Orsha</td>
<td>2331,7</td>
<td>983</td>
<td>2372</td>
</tr>
<tr>
<td>Pinsk</td>
<td>2437,5</td>
<td>1960,6</td>
<td>1240</td>
</tr>
<tr>
<td>Zhlobin</td>
<td>1571,0</td>
<td>1253</td>
<td>1254</td>
</tr>
<tr>
<td>Bobruisk</td>
<td>4539,9</td>
<td>2083,5</td>
<td>2180</td>
</tr>
</tbody>
</table>

### Minimum normative standards
(according to planning technical code TKP 45-3.01-116-2008)

<table>
<thead>
<tr>
<th>Type of build-up</th>
<th>Density of housing stock, sq.m/hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multistoried and higher block-of-flats</td>
<td>9000</td>
</tr>
<tr>
<td>Multistoried block-of-flats</td>
<td>5000</td>
</tr>
<tr>
<td>Middle- and low-storied block-of-flats</td>
<td>2500</td>
</tr>
<tr>
<td>Cottage build-up of high density (size of plots 0,02 to 0,04 hectares)</td>
<td>1500</td>
</tr>
<tr>
<td>Cottage build-up of middle density (size of plot 0,04 to 0,10 hectares)</td>
<td>1000</td>
</tr>
<tr>
<td>Cottage build-up of low density (size of plot 0,10 to 0,15 hectares)</td>
<td>750</td>
</tr>
<tr>
<td>Mixed build-up of high density</td>
<td>2000</td>
</tr>
<tr>
<td>Mixed build-up of middle density</td>
<td>1000</td>
</tr>
</tbody>
</table>
Different options of build-up with similar density

(Source: Urban planning for Mayors, 2013, UN-HABITAT)

Density: 75 units/ hectare,
*Characterized as:*
One high-rise dwelling, low build-up square

Density: 75 units/ hectare,
*Characterized as:*
Low-storied, high build-up square

Density: 75 units/ hectare,
*Characterized as:*
Middle-storied, middle build-up square
**What is a module?**

**Multifunctional module** of residential district is planning element of 15-20 hectares. Its territory is limited by main roads outside, and is divided by local streets inside. Module has compact build-up of mixed-storied buildings (3-5 floors).

**Yard** – half-closed green territory of residential building created by mixed-storied buildings (at architect's discretion).

**Neighborhood** is group of yards. Its not divided with roads and streets and it has common public space and green facilities. Neighborhood stresses on social cohesion of planning element
Scheme of a module (I)

Typology of a module and a compositional view of build-ups of different types

By size of territory and number of population module can be:

- Middle dense (density – 3-4 th. sq.m/he // apr. 60 flats/he)
- High dense (density – 5-6 th. sq.m/he // apr. 80 flats/he)
- Advanced height density (density – 6-7 th. sq.m/he // apr. 100 flats/he)

By priority function module is classified into following types:

- Dwelling (D)
- Industrial (I)
- Administrative and business (B)
- Recreational (R)
- Creative and cultural (C)

<table>
<thead>
<tr>
<th>Type of buildings</th>
<th>Number of floors by type of module</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>I</td>
</tr>
<tr>
<td>Dwelling</td>
<td>3-5 / 5</td>
</tr>
<tr>
<td>Public</td>
<td>2-3 / 3</td>
</tr>
<tr>
<td>Industries</td>
<td>-</td>
</tr>
</tbody>
</table>
Main advantages of a new module

- Compact build-up of high density
- Reduction of expenses during the construction
- Use of underground and vertical space for parking
- Free-of-cars neighbourhoods
- Creation of jobs in the district
- Reduction of in-city migration “job-home”
- Improvement of living standards
- Dense road grid
- Facilities for all ages
- Use of first floors for social, cultural and educational infrastructure
- Poli-functionality and diversity
- Rise of investment attractiveness of territory
## Key indicators of a module

<table>
<thead>
<tr>
<th>№</th>
<th>Qualification</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Territory</td>
<td>15-20 he</td>
</tr>
<tr>
<td>2</td>
<td>Population</td>
<td>2 500-3 000 inh.</td>
</tr>
<tr>
<td>3</td>
<td>Housing stock density</td>
<td>4 000-5 000 sq.m/he</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60-75 flats/he</td>
</tr>
<tr>
<td>4</td>
<td>Number of floors in dwellings</td>
<td>3-9</td>
</tr>
<tr>
<td>5</td>
<td>Number of floors in public buildings</td>
<td>2-16</td>
</tr>
<tr>
<td>6</td>
<td>Density of population</td>
<td>150-190 inh/he</td>
</tr>
<tr>
<td>7</td>
<td>Share of jobs in number of population</td>
<td>22-40%</td>
</tr>
<tr>
<td>8</td>
<td>Share of dwellings provided with parking places</td>
<td>60-90%</td>
</tr>
<tr>
<td>9</td>
<td>Share of green spaces</td>
<td>57-60%</td>
</tr>
<tr>
<td>10</td>
<td>Capacity of school</td>
<td>400-600 pupils</td>
</tr>
<tr>
<td>11</td>
<td>Capacity of kindergarten</td>
<td>125-160 children</td>
</tr>
<tr>
<td>12</td>
<td>Density of roads</td>
<td>3 275 sq.m/he</td>
</tr>
<tr>
<td>13</td>
<td>Density of build-up</td>
<td>5 970-6 100 sq.m/he</td>
</tr>
</tbody>
</table>
Criteria & principles

Safety
- No need to pass the roads with intensive traffic, in particular for children and elderly people;
- Reduction of noise pollution, improvement of insolation and aeration of territory;
- Free-of staircase and barriers territory;
- Adequate maintenance and cleaning;
- Night lightening;
- Social cohesion;
- Non-stop service of territory.

Comfort
- Human size build-up of low- and middle-storied buildings with active first floors;
- Green spaces and good accomplishment and greening;
- Recreational facilities for the residents of all ages;
- “Step” accessibility of services;
- Public spaces, “trird places” and cultural-entertaining facilities;
- Pedestrian lanes, bicycle infrastructure and free-of-barriers sidewalks.

Effectivity
- Compactness;
- Adequate transport system;
- Certain number of jobs at “step’ accessibility;
- Active use of non-traditional energy sources;
- Prioritized use of buildings of class A+, A и B by indicators of energy-efficiency;
- Energy saving while create architectural units;
- Recycling.
Scheme of transport

- Public transport stops
- Bicycle grid
- Pedestrian passes
- Pedestrian lanes
- Main pedestrian ways
- Underground parking (for residents)
- Guest parking
Scheme of social infrastructure, attractive places linked by pedestrian and bicycle roads (example of Industrial module I)

1. Active first floors with social facilities
2. Public centre
3. Separately located kindergarten linked with in-built kindergarten
4. School

Social services
Overflowing spaces of public centre
Public spaces
Pedestrian links
Public transport stops
System of green spaces

- Roads
- Build-up
- Greening of pedestrian routes
- Greening of yards
- Greening of public territories
- Greening of parks
- Greening of sport territories
- Specialized greening (protected)
Территория опытно-демонстрационного проекта

УСЛОВНЫЕ ОБОЗНАЧЕНИЯ территории:

- Жилая многоквартирная: 21.3 га
- Ландшафтно-рекреационная: 17 га
- Административно-деловая, торговая: 12.3 га
- Коммунально-складская: 2.8 га
- Санитарно-защитная: 4.1 га
- Производственная: 16.5 га
Thanks for attention