Responsive Neighbourhoods

Pattern language for user-control facilitating urban design in large-scale neighbourhoods. The Case of Riga.

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Motivation for the study

There are two main reasons which motivated to start this project. First is life-long experience of living in Riga's large-scale neighbourhoods, which are also called housing estates — from early period when the neighbourhood was built, through changing social and economic circumstances of transition economy with all negative consequences, and rapid and uncontrolled developed which sparked for a short time period during growth period of mid 2000s. Second is urban design education learning curve and previous practice in architecture during economic growth period.

One the one hand, large-scale neighbourhoods seems to enter downward spiral of decay if one is looking at those areas from perspective of West-European experience: there are enough evidence for that. On the other, social, economic and cultural context is different, and rarely taken into the account. Appropriate understanding of issues is lacking when it comes to urban planning and design. There is a need for an explicit conceptual and methodological framework to link problems of large-scale neighbourhoods with practical application in urban design and planning.

This project puts conceptual and methodological framework in the centre and links it to the problems experienced by users in large-scale neighbourhoods on a one hand and to design and planning process on the other. Frame-semantic networks developed by Alexander Tzonis and pattern language originally proposed by Christopher Alexander are tools which are tested in this project: first makes design thinking explicit and second allows to elaborate complexity of the user and built environment relationships. Literature on a problem is studied in line with observations of the field — two large-scale neighbourhoods in Riga. Two information sources serve as an input for the framework, which is then tested by design.

In this Thesis Plan, besides problem statement, research questions and methodology, research and design procedures and conclusions are included, thus providing insight into the work progress.

The author is a student of Explore Lab graduation studio. Taking into the account main interest to explicate in a project conceptual and methodological frameworks which link data, often qualitative and fuzzy, about performance of the built environment and design practice, it was hard to find a place in other design studios.

Figure 1. Development of explicit conceptual and methodological framework
1 Problem definition

1.1 Analysis of the context

1.1.1 City

Figure 2. Latvia in Europe and large-scale housing estates in Riga

Riga is a capital of Latvia, country in the North East of Europe with population of two million inhabitants. Population in Riga is seven hundred thousand, in terms of area it is comparable with Amsterdam. Founded in 1201, it was Hanseatic city and was capital of Livonia for three centuries. The territory of current Latvian state was under rule of several countries: Germans, Swedes, Polish, Russian. From 1918-1940 it was independent for the first time, until it had been occupied by Soviet army and after that was for five decades under Soviet rule. It regained independence from Soviet Union in 1991.

History is reflected in urban fabric: ring of boulevards embracing medieval town, the core within the railway developed during first decades of 20th century is typical European city. Vast extensions built after second world war, consisting of large mono-functional residential and industrial zones, are characteristic for many Socialist cities in Central and Eastern European cities. Next chapter describes large-scale neighbourhoods which constitute urban residential fabric of the Soviet extensions in Riga.
1.1.2 Large-scale neighbourhoods in Riga

Large scale neighbourhoods is main object of this project. These neighbourhoods were built in five decades, when the city was growing exponentially due to industrialization under Soviet rule. Currently these accommodate sixty percent of the residents and constitute more than forty percent of the building stock. First districts were built in 1950s and early 1960s. During early post-war years, small district were built close to the railway ring which also accumulated major industries. In 1970s real boom in housing production started. Construction industry was finally established and large districts for tens thousands of inhabitants were built. The stagnating economy of 1980s in Soviet Union slowed down the speed of production, thus many neighbourhoods were finished only in 1980s, when country was already independent from Soviet Union. Today there are totally 13 large-scale districts in Riga, accommodating around 450,000 (2010) residents. Each district vary in terms of population, from 10,000 up to 60,000.

For the day of completion, these districts were well-functioning living environments, despite all shortcomings of socialist production of housing. Districts designed and built to support the needs of primary group of nuclear family, with two working parents. Therefore each district provided all necessary services to support daily life. On the level of district, shopping facilities and medical centre were provided. In most of the cases, large, natural green space was incorporated in a masterplan for a district. Each district consisted of two or more neighbourhoods, population size and area of which were defined as a catchment area of a school. Pre-school facilities had smaller catchment areas, and each neighbourhood included three to four kindergartens. Main means of mobility of the population was public transportation: bus, tram and trolley-bus. There were plans to build a subway in Riga, but those were abandoned in late 1980s, but many urban plans of large-scale neighbourhoods taken into account prospective metro stops. Thus today large-scale housing districts are well accessible by public transportation, however, these were not prepared for rising individual car ownership which increased dramatically after regaining independence in 1991.

Basic unit of the district is a neighbourhood with population of 10,000 and size up to fifty hectares. Neighbourhood was defined by major roads, neighbourhood streets were limited to the service and access roads. Thus inner space of neighbourhood was intended as primarily pedestrian realm, where car access was of secondary role and traditional street as a form of public space was abandoned in favour of spacious green areas. In initial plans, the immediate living environment was supposed to support daily life of primary groups — families with children. Facilities such as playgrounds for children, active recreation and socialisation were planned in a courtyards. Not everything intended was implemented, but institutions like schools and kindergartens played pivotal role in organisation
of community life. Thus each school was equipped with stadium and pitches for football and basketball, and modest facilities for sport and physical culture are still present in virtually every neighbourhood.

Dominant housing type in large-scale neighbourhood is flats in staircase access building. The most common is nine-storey prefabricated slab. Second type is five-storey slab, corridor-access buildings for elderly or single-parent families and sixteen storey towers are less frequent typologies. First prefabricated buildings were built in the late 1950s, real boom was during late 1970s and 1980s. Although technology developed substantially over time, technical condition of housing stock is close to critical nowadays, especially those nine-storey slabs built in late 1970s. The method of construction and building technology, together with general approach to housing production, was limiting ability of architects and planners of the time; the basic task in many instances was to reference urban planning schemes produced in Moscow to local context. Only in 1980s building types and urban morphologies specific to local context were allowed to design and realize.

1.1.3 Post-socialist neighbourhoods

After regaining independence in 1991, changing political and economic conditions affected large-scale districts. Privatisation policy of the nineties gave property rights to the residents of neighbourhoods which resulted in high ownership rates: currently virtually every household residing in large-scale housing estates owns a flat it occupies.

Today on the housing market, flats in neighbourhoods are the only option for affordable dwelling. Current economic conditions and purchasing power keeps these flats as the only option for the vast majority of the population. This means that residents to large extent will stay in the neighbourhoods, keeping this real estate market sector active. This makes situation in large-scale neighbourhoods distinct from that in Western Europe, where post-war housing often is second choice home and marginal. In Latvia, large-scale neighbourhoods still accommodate households with various range of income, various nationalities (Latvians and various minorities, which constitute more than half of the population in Riga).

During rapid economic growth started in early 2000s many new residential construction developments took place. Need for new housing was not supported by growing population, but to increase floor space per person and speculation. After financial crisis, however, construction sector of the economy was the one which suffered the most. Many development projects were abandoned.

Privatisation reform has resulted in dual ownership: multi-family buildings and land are two separate property units. Large scale neighbourhoods were built disregarding ownership of land established during first period of independent Latvia (1918-1940). After 1991, land had been returned to the owners or their relatives who claimed initial ownership rights. For residents of neighbourhoods built during Soviet periods, it resulted in obligation to pay both land taxes and rent.

It means, that the land residents are obliged to pay is larger that functionally necessary area around residential building. Rent and land tax vary depending on the area of land associated with building and the number of flats. By many stakeholders involved in management of neighbourhoods, such as City Council and Housing Managers, and even by those indirectly involved like Ministry of Justice, this regarded as a pure legal problem and negative consequence of privatisation policy. Payment is especially inadequate in situation where relatively small residential buildings are associated with large land divisions stemming from agricultural land use in 1930ies n comparison to much lower costs where nine-storey slab with 300 families is located on small land units where previously were allotments or gardens.

To summarise, large-scale neighbourhoods in Riga is important component in urban fabric and will be critical component of quality of life of vast majority of population. Specific issues which large-scale neighbourhoods are facing today are summarised in the next chapter.
1.1.4 Study areas

For more thorough analysis of current issues of large-scale neighbourhoods, two districts were chosen as study areas. They are similar in terms of area and population size, but have different urban and social context. Using two cases allows to better test applicability of the conceptual and methodological framework. Basic characteristics are summarised in **Table 1**.

![Figure 4. Location of two study areas in Riga](image)

<table>
<thead>
<tr>
<th>Name</th>
<th>Imanta</th>
<th>Pļavnieki</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inhabitants</td>
<td>10644</td>
<td>11119</td>
</tr>
<tr>
<td>Area</td>
<td>49 ha</td>
<td>57 ha</td>
</tr>
</tbody>
</table>

**Table 1. Data about locations**

1.1.4.1 **Urban context**

**Imanta** is a district in a Western edge of the city. It was developed in 1965–1975. Totally in district live 49,698 residents (2010). District consists of five neighbourhoods arranged concentrically around forest park in the middle. Forests surrounding city from western edge of the district. On eastern edge large factory was built in parallel with district, it produced consumer electronics and now is no longer operating. There is railway line to the south and forests and industrial areas to the north. District lies on the Eastern bank of river Daugava. This part of the city before Soviet urbanization were characterized by manors and gardens, small allotments and forests. In the masterplan for Imanta, many of previous land-use features had been retained, thus borders of the district are to large extent defined by natural and cultural features of landscape. Many of allotments
and historical roads are still present within urban fabric of large-scale neighbourhood.

Study area is Imanta-5 — the latest neighbourhood implemented according to the plan (figure 10). Area of the neighbourhood is 49 hectares within main roads, population 10644 residents (2010). Neighbourhood consists of three blocks, with kindergarten in centre of each (figure 7 left). One of the kindergartens was transformed to the nine-storey residential building in 2007. Each block consists of five and nine-storey buildings arranged to form courtyards of various size. One of the courtyards was equipped with volleyball, basketball pitches in each block, others served only access functions and contained amenities related to residential buildings: laundry stands, some benches and pedestrian paths. Some courtyards contain allotments with detached houses retained from previous land use. Nine storey residential buildings on the eastern edge has commercial spaces oriented towards the boulevard separating neighbourhood and forest in the middle of the district. Three blocks are separated with large green area which also contains school and its stadium (figure 5). This neighbourhood is characteristic for second phase of large scale district construction — with relatively green character and courtyard arrangement of buildings.

Figure 6. Replication of the traditional street in Pļavnieki

Pļavnieki is the latest instance of large-scale district. It is located on the Eastern edge of the city (figure 4). The design is dating back to 1976, but last prefab slab was completed in 1991, and after that some residential and commercial buildings were added with and without reference to the initial plan. Till today, district has vast areas of vacant land along major roads. Totally in district live 48,176 residents (2010). District consists of five neighbourhoods separated by orthogonal grid of major roads. Northern and Southern edges are formed by major arteries, busy four lane roads, which are important connections on regional level. Large industrial area lies to the South, and another large scale district and former landfill area which now is undergoing transformation to the North. There is area of detached houses to the West and forest with cemetery to the East. Territory of the district was included to the administrative area of the city in early 1970ies, prior to district here were agricultural land and farm on the South-Eastern corner. Green areas within the district were created anew in low places where construction was not efficient.

Study area is in Pļavnieki-2 — largest and the most complete neighbourhood in Pļavnieki district (figure 11). Area of the neighbourhood is 57 hectares within main roads excluding small wedge of forest between arterial road on the Eastern corner, population 11119 residents (2010). In Pļavnieki district, main architectonic idea was to replicate traditional street, arranging buildings linearly from western to eastern edge. There are three such “streets” in the study neighbourhood (figure 6). To limit sight lines, axis were turned sixty degrees thanks to achievements in construction technology which allowed joints of buildings in various angles. These streets accommodated some commercial functions, and are oriented towards public transportation stops to the West and school and forest to the East. Each street contained access road for one side of apartment blocks, and elevated pedestrian path lined with trees. Pre-school facilities were located in-between these strips, in open space of tremendous scale, together with playgrounds and ball-game courts. School with stadium located on the Eastern side of the neighbourhood. In Pļavnieki, nine-storey buildings were predominately used: staircase-access in the “strips” and corridor access housing for elderly in between. There are few groups of sixteen storey towers on the edges of the neighbourhood. This neighbourhood is characteristic for last phase of large scale district construction — with characteristic large blocks or strips and vast open spaces in between (figure 7 right).
Figure 10. Composition of apartment buildings in Imanta

Figure 11. Composition of apartment buildings in Plavnieki
In the next chapters, specific issues known for these large-scale districts are described in detail. Demographically two districts have different structure. In **Imanta** (figure 10) age groups are diverse with inclination towards elderly groups. Initially workers of electronics factory settled in and Russian army officers. The later group moved out in the beginning of 1990ies. Except large elderly group (25%) the population is highly mobile — as residents expressed in the interviews, people move in and out quite frequently, especially in last five years. The population trend of last decade (1997–2010) was negative, decrease of population was -6.75 percent. Population in terms of nationality is mixed.

**Pļavnieki**, has two age groups which are dominating the age pyramid (figure 11). First, 45-60 year old are those who moved in the neighbourhood after it was built. Second, from 20 to 35 are their children, who were born when their parents moved in to a new neighbourhood. Initially construction workers settled here with their families. Social ties exist, their children chose to live in the same neighbourhood. In comparison with Imanta, Pļavnieki has larger group of young people. The trend of last decade (1997–2010) show same negative trend, which however is lower than in Imanta, decrease of population was -4.75 percent. In terms of nationality, population is predominantly Russian.

In the next chapters, specific issues known for these large-scale districts are described in detail.
1.2 Issues

1.2.1 Problem field of large-scale neighbourhoods

Today both large-scale neighbourhoods face several issues: technical condition of the buildings, decay of collective space, dual ownership. In this thesis, issues related to collective space are emphasized over the others, while remaining two are kept as a part of the context. In this chapter, preliminary problem field known from the media, personal experience and observations are summarised.

Collective space, originally intended to support community nowadays “has no caring owner”. Neglected figure is accelerated by poorly maintained green areas, roads and paths, graffiti and vandalised amenities. Open spaces of neighbourhoods are dominated by cars. Neighbourhoods were built when car ownership was rare, which changed dramatically during last two decades. For the first time, every free spot was used for parking, which however changed lately when fines were raised and collected for parking cars on green areas — lawns and on pedestrian paths. Seen from another perspective, the layouts of inner neighbourhood spaces could be redesigned to fit more parking, but there were ambiguity in ownership and communication with and among users.

The most obvious problem is actual and perceived level of safety in neighbourhoods. Physical conditions of neighbourhoods set stage for crime. Residents expressed in surveys that they feel especially unsafe in their neighbourhoods — realm between main road and entrance to their apartment (Baltic Institute of Social Sciences, 2009). Car burglary is the most common type of property damage. Amenities such as playgrounds, benches, lamps in collective space suffer from vandalism. It is hard to find a bench or light pole even at the stadiums, which are regularly used by large amount of residents in the neighbourhoods. Recently in Pļavnieki due to complaints by the residents municipality started patrolling streets on a regular basis also during the day, in Imanta patrols are limited to the night-time (SKDS, 2010).

Residential buildings are detached from the ground: ground floor apartments are raised half level above the ground, thus relationship with space right beyond the apartment is not established. This limits responsibility of the residents to their apartment. Due to planning ideas of the time and technical constraints of mass-housing production, today the ability of individual or group to intervene into the physical condition and improve social security of the neighbourhood is extremely limited.

Collective space is undergoing transformation; new housing and commercial programmes are being built. In both neighbourhoods it happens on the edge of the neighbourhood, where new commercial functions are added. Elsewhere, it takes place inside the neighbourhood, following guidelines of the initial plan: in Imanta kindergarten is transformed to luxury residential building and in Pļavnieki seven new residential buildings were built by private developers and municipality. And occasionally it is conflicting with existing residential uses — if new development is taking place in collective space, which residents perceive as such. In Imanta, for example, residents banned several projects initiated by private developers which were planned inside blocks. This building initiative provoked unseen public protests against developments inside large-scale neighbourhoods, which resulted in
building ban issued by the City Council in 2007. In Pļavnieki however some new residential buildings were erected, which show how inappropriate these new developments can be if context of the original plan is not taken into the account (figure 14).

1.2.2 Residents' view on their neighbourhood

But what do residents feel about their neighbourhoods? To what extent do they see their environment problematic or otherwise? Is there any need for change and are they motivated to improve their neighbourhood? In order to answer these questions, several focused interviews were held with residents of both neighbourhoods. For methodology and coding procedures, see Appendix.

Safety, lack of caring attitude and responsible behaviour of residents and insufficient maintenance were mentioned as the main issues according to the residents. In both neighbourhoods, the list is approximately the same. Thus security issues residents described are related to the offences in public space. The careless attitude of some residents (drivers, dog owners) towards other people in the neighbourhood were identified as an even more important safety issue than crime. Most of the respondents mentioned neglected figure of the environment and insufficient maintenance. However, some residents expressed a commitment to start to take care themselves of their living environment beyond the apartment. There are issues which are indirectly related to the built environment

Next chapter is focused on theory of the neighbourhood: what is the meaning and importance of the neighbourhood as a part of living environment of the individual?

1.2.3 Theoretical view on issues

What is the function of the neighbourhood — immediate environment of the individual beyond his dwelling?

According to Jane Jacobs, there are three types of neighbourhoods: street neighbourhood, large district, city as a whole, and the main function is self-government (Jacobs, 1963). Lynch describes importance of the neighbourhood as a weapon of control — to defend environment, own territory, from destruction and is a part of mental equipment of the individual (Lynch, K., 1981). Large scale neighbourhoods are primary residential settings. The physical settings of neighbourhoods are typical examples of modernist urban design where the role of collective space were overemphasized (N. Habraken, 1998). Control over built environment only by architects, and management by external party. Large scale neighbourhoods rely on formal management and therefore are vulnerable (Dorst, 2005, 2010). To rely solely on formal management, be it police or other external authority is not a long-term solution if one considers their sustainable liveability 1. Safety problems in relation to built environments are partially caused by design (Newman, 1978) Territoriality, natural surveillance refers to social control facilitated by built environment. figure and milieu are important factors related to spatial relations among neighbourhoods and other facilities and perceived figure of the environment. These features of the environment rise awareness about relation of the physical environment in large-scale neighbourhoods to social safety. On the other hand, neighbourhoods are not new, there are many who live there for more than three decades. Therefore, established relationships between social and physical environment must be understood. There are other factors, describing quality of the built environment than functional, aesthetic and economic ones and these should be taken into account, which is normally not done in the regeneration projects (Werner, 1984). Residents form emotional links to their environment, which should be taken into account.

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1 "A living environment that depends on formal management to function is vulnerable though. Here the involvement of residents is not a requirement and formal management is seldom guaranteed over the long term. An anonymous living environment separated from individual needs is also socially undesirable, as in such a setting there is no threshold against antisocial behaviour” (Dorst, 2010)
1.3 Problem statement

Large-scale neighbourhoods, like Imanta and Pļavnieki, are living environment of large amount of residents in Riga. Many residents associate themselves with their neighbourhoods and would like to improve them. Their major concerns are safety, ambiguous territoriality and inability to regulate behaviour in public space. Problem has legal, organisational, social and physical dimensions: design of neighbourhoods, formal management, and current use are parts of the problem.

Performance of control and degree to which users can assert it in the large-scale neighbourhoods — quality of use, modification possibilities and involvement in design — should be re-considered.

In short, project or design goal is to design transformations, with a programmatic requirement of redistributing control of living environment to make it safe, responsibly controlled, and congruent with needs of changing users. There are some disadvantages of these neighbourhoods which cannot be resolved: distance from the ground, feelings of anonymity, limited attractiveness for certain social groups such as high income, young professionals and others. There are certainly advantages which can outweigh unresolved disadvantages, if these positive qualities are emphasized and sustained (Marcus & Sarkissian, 1986). These type of living environment is suitable for certain groups like elderly, families with children with various levels of income. What improvements cannot bring is solution to the structural problems like inequity in income or lack of tolerance on a national basis. Physical environment, in this case large-scale neighbourhoods, are settings for residents' behaviour and action. There are those disadvantages which can be mitigated: social control, more responsible attitude and greater level of control over immediate living environment, better management of public space, which is still relevant feature for many social groups. What improvements can bring is more positive and unproblematic coexistence, more legible and responsible attitude and more effective social control, better support for daily activities.

The desired quality is responsiveness — the degree to which built environment can support users' needs for control.
2 Research and Design Project Methodology

2.1 Research questions

Main research question: How to alter existing features of the large-scale housing estates to ensure responsive built environment to the user needs of control?

1. How user control is related to the built environment? Which spatial features support control?
2. How control of built environment is distributed in two large-scale neighbourhoods? Which qualities of control are currently lacking? What kind of control problems are there?
3. Which qualities of control are desirable in large-scale neighbourhoods? Which design elements are crucial to user control of the built environment?
4. How knowledge of the control performance informs design process? How control performances can be influenced by design?

Figure 15. Research questions

Main research question is subdivided to four groups of sub-research questions. Each group imply specific method, however, each method is related to the others. First method is theoretical overview of the problem of user control of built environment. Second is empirical inquiry about the specific features of control of the two chosen neighbourhoods. Third is related to the design objective. Forth group of sub-research questions are related to the explicit conceptual and methodological framework and is closely related to the other three research questions.
2.2 Analytical framework

2.2.1 FOP

Control is a complex feature of the built environment. To understand how user control is related to the built environment and how control performance is affecting the existing theoretical knowledge and concepts should be seen in line with how knowledge is informing the design (research questions 1 and 4). One possible solution is to use frame-semantic network »form-operation-performance« (F-O-P) proposed by (Tzonis, 1990) to both use the existing knowledge and to diagnose existing situation to find proper solution using precedents from previous experience and collected empirical knowledge. Frame-semantic network is a restriction which allows to structure the problem in relation to form (morphology), operation and performance of the built environment. Initially it was intended as a knowledge system able to capture essentials of intuitive and experienced thinking in architectural design. In this project methodology is used to build an knowledge system of problem of user control, to be used later for urban design using precedents. This chapter focuses on the part of analytical framework which help to link spatial and physical features of the environment with the user control by extracting the reasoning researchers were using.

When designers such as architects use knowledge, they do not use isolated facts. This knowledge is highly organized information about form, operation performance and context. Representation of architectural knowledge developed by Tzonis (1990) elaborate aspects of “how artifacts are made out, how they work, what they do in respect to what has to be done, how they fit into the environment, and how all these aspects relate to each other.” He introduced a method of Artificial Intelligence called frames to represent architectural knowledge. Visually frames can be displayed as graph with nodes and links. Nodes capture standard cases like form, operation or performance. Slots spreading out of this graphs capture particular facts which link frames.

<table>
<thead>
<tr>
<th>Form(morphology)</th>
<th>Operation</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial relations</td>
<td>Movement</td>
<td>Quality of movement</td>
</tr>
<tr>
<td>Spatial organisation</td>
<td>Perception</td>
<td>Quality of perception</td>
</tr>
<tr>
<td>Size, elevation, shape</td>
<td>e.g. Sitting</td>
<td>e.g. Quality of sitting</td>
</tr>
</tbody>
</table>

Table 2. Form-operation-performance slots

The restriction of form, operation and performance first was coined analysing texts where architects described their buildings (table 2). Form (morphology) is the most basic concept to describe architecture. Operation is a way how function works; thus for example operation of the corridor is circulation. Performance is a quality of operation.

Two kinds of reasoning can be used to link these constraints. First is called design diagnostics, which identify operational and formal causes for performance of the building, whether anticipated or not. Diagnostics answer questions such as “why this apartment complex is unsafe” or “why this office layout makes people come face to face so rarely?” A second type of reasoning processes information the opposite direction. From morphology it predicts operation, and from operation performance. This makes it possible to predict how close the performance of the artifact is to normative one, it answers the questions such as: “Is this sequence of rooms making people wasting time going from task to task?” or “Which of these different locations of the entrance gives to users more information about events in the complex?”

2 "Morphology is the study of forms of things” “Morphology is a study of morphemes, and includes the study of inflectional as well as lexical units (Oxford Grand Dictionary) “... a morpheme is the smallest meaningful unit of a composition in the sense that 'the smallest meaningful unit' is a relative concept since it depends on scales and context” (Ali Guney, 2008 p. 99)

3 “Seen from a different perspective, that of the physiology so to speak, of architectural artifacts, buildings contain operations. The form of buildings controls, holds or channels, people, objects, equipment associated with activities.” (Tzonis, 1990)
2.2.2 Overall research and design methodology

Urban design is a process of both analysis and synthesis. To build knowledge of problems and possible solutions, F(M)-O-P frame-semantic network will be used. For design, reversed method is elaborated. Ali Guney described it as a design by constraint; a recursive process (2008).

In analysis form(morphology) affords operation which affords performance. In design, revered process takes place: performance or program of requirements asks for accordances from operation, and operation from form.

My interpretation is like this: Theory and empiricism serve as input for analysis and synthesis (fig. 16). Cases described as form and operation and then performance is studied in a fieldwork. Precedents chosen for their operation, then their form and operation described.

This is an initial stage of analysis (fig. 17 left). In this case, large-scale neighbourhoods are perceived as an artefact and describe it by its spatial relations, spatial organization or as a collection of objects in a context. Operation which form affords, for example sunlight penetration affords normative hygiene level but also lack of orientation and human scale. Operation and performance of control in large-scale neighbourhoods are the main topics of inquiry in my empirical research.

In synthesis, I can use programmatic requirements for user control from theory as a performances, which would ask for affordances from operation which would lead to specific form or physical conditions. A tool is necessary to describe desired operation and form (fig. 17 right).

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4 “the solution of the problem by means of a procedure that uses a copy of itself as one of its steps so that the problem is simplified with each execution of the procedure until a simplest case is reached for which the solution has been defined and the basic solution is applied to complete solutions of the more complex versions” (Merriam Webster-unabridged, 2002). Like in many other disciplines, there are many recursive processes in (architectural design activities, especially when complicated. Designers (architects) can accomplish their desired performances if they are well aware of it since they would use the same structure as they have been using during the whole process.” (Ali Guney, 2008 p. 106-107)
2.3 Analytical questions from the theory

In order to answer to the first group of sub-research questions, 'How user control is related to the built environment?' and 'Which spatial features support control?' three theoretical views on the topic elaborated: control as a performance dimension of good city form by Kevin Lynch; concept of territoriality explained by John Lawson and that of Defensible Space, as originally developed by Oscar Newman and later transformed to checklist by Voordt & Wegen.

2.3.1 Diagnostic questions

According to Lynch, control is “the degree to which the use and access to spaces and activities, and their creation, repair; modification, and management are controlled by those who use, work, or reside in them”. Control primary refers to the human need to regulate space and associated behaviour to save life and resources. In order to tell something how variations of control affect the quality of space, Lynch suggests three dimensions of control: congruence, responsibility and certainty. Congruence of use and control is “the extent to which the actual users or inhabitants of a space control it, in proportion to the degree or permanence of their stake in it.” High congruence has many advantages: the space is controlled by the most informed and motivated to improve, which results in sense of satisfaction, security and freedom to act. In some situations, however, there are doubts whether the users by their nature are able to control the place therefore Lynch suggests »competence« or responsibility as a criteria which balances congruence. This means, that place control should be developed step-by-step, where level of congruence is rising together with user competence. Third control dimension is certainty, the degree of which people understand the control system and can predict its scope. Lynch suggests questions to access the dimension of control quality in the built environment:

- Is there a consensus among users about the reality and the rightness of control? Do they feel free to act as they wish and as they think proper for the place? Are there control intrusions by outside groups, or problems which escape control? Are there ambiguities and conflicts of control? Informal or illegitimate controls? Do those in control have the information have the information, motives and ability to do it well?

- Are groups excluded from control who might have a legitimate present or future stake in it? Who can be present here and who are excluded? Who can modify and use its resources? Who owns this place or system? Are there diverse sets of ownership within it? Who regulates whose behaviour?

- How do variations in control affect the goodness of place?

These questions can be used in order to understand the (operational and formal) causes of control problems.

One of the most obvious problems of user control of built environment in large-scale neighbourhoods is crime and/or fear of crime. The topic of relation between crime and built environment has been elaborated thoroughly by Oscar Newman in his »Defensible Space« hypothesis. In order to make Defensible Space theory usable in design, the evaluation/diagnostic
checklist may help. (Voordt & Wegen, 1988) has developed one which can be applicable in the design brief, while testing design for alternatives, evaluating existing environments prior to urban renewal. Framework of the checklist constitute essentials of Defensible Space. Although much attention paid to the physical and spatial characteristics, checklist include questions of social environment and maintenance. Checklist is easily applicable in form-operation-performance analytical framework. Its predictive power had been tested in field projects in the Netherlands. Authors concluded that it is impossible to pinpoint exact crime locations because it is a matter of coincidence. Nevertheless it is possible to check the design or area for vulnerability, especially to distinguish those areas which are extremely vulnerable.

The presence of people: - Does mixed land use promote actual or perceived presence of people during daytime and at night? - Are sufficient amenities available, especially for youngsters? - Are there alternative routes (e.g. a quiet cycle track through greenery during the day, a route past houses at night)?

Involvement/responsibility: - Does the appearance of the environment prevent people from developing feelings of anonymity and isolation? - Do exterior places have characteristics of both traffic areas and residential areas?

Visibility/clarity: - Are exterior places visible from inside the dwellings ("eyes on the street")? - Is there sufficient lighting? - Is it clear who is responsible for what and for what activities places are planned?

Accessibility/escape routes: - Which places are/should be accessible to police patrol and maintenance services? - Is it possible to call for help in case of danger (e.g. to ring a doorbell, to telephone)?

Vulnerability thus may indicate the places which escape user control due to some reasons. The task of prediction therefore is to understand the spatial components of vulnerability. The same way as questions formulated by Lynch can be used Defensible Space performance checklist, formulated by (Voordt & Wegen, 1988).

![Figure 19. Frame representing defensible space checklist developed by Voordt & Wegen (1988)](image-url)
2.3.2 Prediction questions

When the control performance is not clear, prediction line of reasoning is appropriate.

One possible source is the same Defensible Space as formulated originally by Newman in the book: it is possible to distinguish clear design features which are related to certain operations and finally performances of territoriality, natural surveillance, figure and milieu.

Yet another way to start prediction is to look for the formal features of the territory, then to relate territorial behaviour, as explained by Lawson (2001).

2.3.3 Empirical research

The knowledge of the house is not limited to the builder alone. The user or master of the house will even be a better judge than a builder, just as the pilot will judge better of a redder than the carpenter, and the guest will judge better of a feast than the cook.— ARISTOTLE.

Empirical research is necessary to understand the reality of control in large-scale neighbourhoods. For empirical research I have chosen toolbox by Zeisel: observing physical traces, observing environmental behaviour and focused interviews (1984).

Observing physical traces is a natural skill but if done systematically can become an effective tool; it is unobtrusive and can be easily space-related. Results can increase designers’ control over effects of their designs and to increase everyone’s ability to make settings better suited for their activities. Main research questions are “How do people use environment as means to an end? And to what ends?”; “How do people change environments to meet their needs?”

Observing environmental behaviour is dynamic and variably intrusive. Generates data about people's activities and the relationships needed to sustain them; about quality of use and about behavioural opportunities and constraints that environments provide. Main research questions are «Who does what with whom? In what relationship, sociocultural context and physical setting?»

Focused interviews follow three main objectives. First, definition of the situation by a user, it helps to interpret data gathered through observational methods. Second, strength of respondent's feelings helps to make decisions about priorities. Third, intentions of actions help to distinguish conscious
2.3.3.1 Interview guide: »User perspective on the problem of control«

To proceed with problem definition and to test it, several interviews were held in early November 2012 and January 2013. Focused interviews (Zeisel, 1984) was chosen with the aim to find out respondent definition of the situation. The idea is to set loose interview guide to list topics needed to be covered. Interview is guided using probes — non-directional questions, expressions, body movements etc. to continue conversation and get users' insight onto the problem of control.

Interview guide covered aspects of control of neighbourhoods formulated in theoretical overview above: how congruent, responsible and certain control levels is from the users' perspective. In other words, do residents are in control of their environment and how its limits are defined spatially, whether the knowledge and power of those in control is adequate, and can residents rely on control system. Interview started with questioning general response to the environment: “describe your neighbourhood, what do you think of your neighbourhood” and so on. If conversation was not moving further, more specific questions about neighbourhood were raised, like “What is your opinion about police patrols in the Neighbourhood? Do you think it is necessary” Although in these instance interview became no longer unguided, several useful explanations, beliefs and attitudes were gained. If conversion went proceeded, less guiding probes were used. Sometimes questions like “how long are you already leaving in this neighbourhood?” helped to begin conversation.

If respondent expressed appreciation with the neighbourhood, feelings for safety were questioned, experiences in the environment, features of the environment which relate to the appreciation ascertained. In case respondents expressed depreciation, relevance of conditions of the environment were ascertained and in case actors were involved in negative events mentioned. Relations to other residents, social network, range of acquaintances, social ties, degree of anonymity, need for socialisation and means to achieve that were expressed as a general response to the environment; probes to find out relation of socialisation and physical environment helped to pinpoint important places from users' perspective. Familiarity with the environment (social, physical, managerial), spatial and behavioural preferences were questioned in relation to the expressed appreciation and described experiences.

Last group of topics related to the history and vision of the future of the neighbourhood. Actual and potential involvement in the shaping of the environment was questioned directly, using directional questions. Sometimes it was easy to start with evaluation by the respondent of changes and ongoing processes in the neighbourhood.

2.3.3.2 Coding of interview data

Five classes of causes of the issues were distinguished: residents themselves, people not identified as residents, places, conditions of the environment, and institutions and organisations (see table 5). Nearly everyone claimed that residents does not have responsible and caring attitude to the environment in the neighbourhood and therefore external control is necessary though not desirable. Second, the presence of unknown people causes feelings of insecurity, they are blamed for vandalism and often identified as criminals. Third, specific places were identified as opportune for criminals, whole neighbourhood was identified as dangerous in comparison to other places in the city. Third, conditions of environment in the broad sense were emphasized. Here, the causes related to people, society in general, and local environment can be distinguished. In this category, however, it is hard to make clear separation between places, people, or quality or performance of the environment. And fifth group of causes relate to institutions and organisations which performance affects neighbourhoods. The issues were grouped together, than form-operation-performance links were identified (table 3). The only group of issues is not included in this FOP analysis is the one related to the institutions.
Table 3. Interview coding as an input for diagnostic frame

<table>
<thead>
<tr>
<th>Performances</th>
<th>Operations</th>
<th>Form (morphology)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains adjective or judgement</td>
<td>Contains verb or derivation from</td>
<td>Contains noun</td>
</tr>
<tr>
<td>1 careless attitude</td>
<td>1 walks with the dogs, through rubbish from the window</td>
<td>1 paths and spaces to walk, apartment and outside</td>
</tr>
<tr>
<td>2 traffic not safe</td>
<td>2 drive (like crazy) congested traffic</td>
<td>2 roads</td>
</tr>
<tr>
<td>3 feelings of insecurity</td>
<td>3 presence of (bad people, Russians, criminals, homeless and drunk, offence in the staircase, )</td>
<td>3 spaces</td>
</tr>
<tr>
<td>4 vehicular police control not effective</td>
<td>4 drive on roads only</td>
<td>4 roads and their relations to the spaces</td>
</tr>
<tr>
<td>5 Lack of safe space</td>
<td>5 people not present, illumination</td>
<td>5 spaces, roads, places</td>
</tr>
<tr>
<td>6 environment is not legible</td>
<td>6 go everywhere</td>
<td>6 houses and their position</td>
</tr>
<tr>
<td>7 Lack of clarity of situation</td>
<td>7 presence of unknown people</td>
<td>7 Spaces, places</td>
</tr>
<tr>
<td>8 street is anonymous</td>
<td>8 presence of unknown people</td>
<td>8 spaces, places</td>
</tr>
</tbody>
</table>

2.3.4 Diagnosis conclusions

On this stage, it is possible to arrive at general conclusions about user control in the neighbourhood as a whole. In preliminary conclusions, theoretical control performances are used to describe the actual situation with control in relation to the features of the built environment. General diagnostic line of reasoning is used.

Control is generally not congruent, not responsible however there is a tendency to change to more responsible control by residents, certainty is low with few striking exceptions where space is privatized or managed by one party. Overall performance between wasteland and oppression — in general space is barely controlled although some places has powerful external control.

Insecurity in public spaces and restricted freedom to act in it to improve results in low congruence in major part of both neighbourhoods, is caused by ownership (ownership as activity and execution of spatial rights, willingness to gain from their land, legal ownership) of the territory, and lack of control forms such as tenant management, community controls etc. — thus new or improved control systems are necessary to improve the situation.

Responsibility of control mostly by external agencies like Riga City Council, housing management company, police varies from absent to the first signs of interest and awareness, because people start to have new motives and information, but most lack power, due to fuzzy boundaries of responsibility, control system, symbols and size — the initial spatial organisation of neighbourhoods, defined by initial masterplan, should be restructured. High responsibility is
characteristic for some territories, like big-box shopping sites, kindergartens and new building sites due to formal management.

Certainty is low, people feel insecure with control system, because it is hard to understand control system; people (subjects) attack one another because of fuzzy boundaries — communication systems established by current activities, should be re-adjusted. High responsibility is followed by high certainty (in case of gated territories) but low congruence: the users never control these places.

There is a need for tool, which is able to translate rather abstract problem description to operable parts. What is control system, spatial organisation and communication systems?
2.4 Analysis: a pattern language of user control

How to link theoretical view on the problem of user control with the spatial reality? Built environment is a complex artifact. Complicated or simple artifacts have many parts, may have hierarchical structure, predictable. Complex artifact have many parts, may have hierarchical structures but are unpredictable, non-linear. Problem defined generally on the level of the neighbourhood, should be translated to the hierarchical structure of complex artifact. A pattern language will be used to associate problem with spatial patterns.

In practice, pattern languages arise from two very different needs: as a way of understanding, and possibly controlling, a complex system; as necessary design tools with which to build something that is functionally and structurally coherent. (Salingaros, 2008)

Research results are going to be presented in a pattern language-like structure, and finally design tool will be created to facilitate user control in neighbourhoods.

2.4.1 Pattern language theory

In order to describe form and operation, pattern language can be used. Christopher Alexander defined patterns as a space and event combination (Alexander, Ishikawa & Silverstein, 1977; Alexander, 1979). These patterns form a language, which has certain depth and wholeness. Objective for the research is to find the ways how control pattern is shaped and distributed in neighbourhoods. Patterns are linked to other patterns. The structure of pattern relationships should not be a tree in its topology, i.e., there are horizontal, vertical and oblique relations among patterns (Dorst, 2005).

The notation of this structure can serve different purposes. They can be structured according to scale or level of abstraction (figure 24 left). Recurrence of certain patterns can signify their importance. Links originating from different issues traced.

The internal structure of pattern representation follows FOP analytical model. It uses empirical knowledge, field studies and theory.

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5 “hierarchy we propose for pattern languages is not an inverted tree, because it has multiple tops and horizontal connections; i.e., several times more connections than a tree has. A hierarchical inverted tree structure is too restrictive, since all communication has to pass through higher-level nodes. Inverted tree-like hierarchies are associated with systems that exert top-down control” (Alexander, 1966).
2.4.1.1 Initial example of a pattern

Operation is derived from observation. For example, ubiquitous »elephant paths« in neighbourhood is a good behavioural traces to study (fig. 25).

»Elephant paths« network mapped and compared with isovist field property of occlusivity: form suggests the movement direction (fig. 26).

Patterns of movement and patterns of community life

»Elephant paths« were mapped using satellite figure for Imanta (figure 26 left). It can be linked to the properties of form: I used isovist field property of occlusivity, or visual uncertainty, to find relation between form and operation (figure 27 right) (Batty, 2001; Benedikt, 1979). Thus form affords unintended operation of circulation, but its relation to performance should be investigated in a field.

Thus, elephant paths of Imanta, as an unintended operation of form, is related to several Alexander’s patterns of pedestrian movement, safety and comfort (figure 27 left). On the other hand, open space path network intersects can be linked to other family of patterns, related to communal space and less to the movement (figure 27 right). Hence the difference in links among patterns imply there are several sets of types of patterns though which differ in scale but share some properties of linking to other patterns and function. The scale however is not the only category.
2.4.1.2 Hierarchy/structure of pattern language

Pattern languages help to minimise choices of designers in favour of human needs. (Salingaros, 2008). How is it possible to use pattern language to make design restraints or choices to facilitate human needs of control over built environment? Patterns are discovered in empirical observations. Others arise from informed conjectures. What kind of structure underpin pattern language? How spatial elements are linked to each other? The connective information of the pattern language help to validate the pattern — to prove whether it is relevant or »working« in the context of the problem at hand.

Salingaros (2008) gives five examples how patterns connect to each other:

1. One pattern contains or generalizes another smaller-scale pattern. 2. Two patterns are complementary and one needs the other for completeness. 3. Two patterns solve different problems that overlap and coexist on the same level. 4. Two patterns solve the same problem in alternative, equally valid ways. 5. Distinct patterns share a similar structure, thus implying a higher-level connection.

2.4.1.3 Expert systems: structure and representation

Pattern language can be used to understand complex system; thus it can be used as a representation of knowledge about its properties and specific problems. Such knowledge or expert system can be based on pattern language, but careful attention should be paid to both structuring and representation of information, and to user friendliness of the system for designers. (Andel, 1988).

![Diagram](image.png)

Figure 28. Structure of knowledge system for playgrounds developed by (1988)

For example, in the expert system for playgrounds (Andel, 1988) has used semantic network of subjects and keywords that can be related to each other on different levels.

In her network, Andel used sort of hierarchical structure which allowed to refer to a more general, »higher« level subjects and more detailed, »lower« level. Or, similarities or interferences with similar subjects on the same level without connection to the higher level structure.

![Diagram](image.png)

Figure 29. Representation of a subject in knowledge system of playgrounds developed by (1988)

For the representation of the existing knowledge she used drawing and text combination: a kind of fixed format is necessary in order to be able to compare the subjects and find necessary information. In this case, knowledge about the problem of control will be structured and presented. What kind of semantic network is appropriate for user control of the environment?
2.4.1.4 Model of built environment: complex artifact

Every complex system has a hierarchical structure; i.e., different processes are occurring on different scales or levels. Connections exist both on the same levels, and across level. The same is true for a pattern language. (...) Many failures in describing a complex system are due to not allowing for enough levels. (Salingaros, 2008)

It is precisely in the existing city that making fine distinctions among the various layers is essential, not just between the ground and the buildings, but right into the buildings themselves. Within the architecture too an approach in terms of layers is relevant. The footprint, the supporting structure, the facade and the address determine the long-term sustainability of a building in the city. Installations, layout and finish are in the service of use, which must be able to be altered in the short term. An intelligent distinction among the various layers produces the elements for sustainable interventions that can pass the test of time.— (Palmboom, F., 2010:117)

Habraken (1987) suggests to look at complex artifacts as control hierarchies. This hierarchy is composed of control units that lend themselves for control by separate agents in charge of design or maintenance of it. He distinguished three types of control hierarchies. First is assembly hierarchy – in which higher level agent is an assembly of parts on lower level and these parts are control units. Second is dependency hierarchy. There are dominance relations in complex artifacts. Hierarchical structures isolate entities on the same level and establish vertical relations on the one hand and control distribution on the lower level is free. Dependency hierarchies are constituted from dominance relations: of enclosure, supply and gravity. According to this relations, control units can be distinguished. Third is territorial hierarchy. In complex artifacts like environmental forms control of the physical parts is not the same as control over space. It means, that control agents control certain territory. If there are multiple agents, there is a single territory which encompasses their territories. It means, each agent can step out of its own territory to some kind of public space of this encompassing territory. But moving to the other direction, from public space to the territory of the agent is restricted — thus each encompassing territory has public and private space. The definition is related to the movement: movement from within is towards public space and inwards is towards private.

Figure 30. Model of built environment suggested by Habraken, five levels of physical systems related to a territorial hierarchy

Habraken (1988) suggests to use levels for physical systems with assembly and dependency hierarchies, and territorial units with territorial hierarchies: they form interdependent hierarchy of structural systems and territories (figure 30). He suggests five levels which actually are physical systems which are designed and constructed. On the other hand, the territorial units which are also by part designed, are in between two adjoining levels of physical structure. These territorial units are given names such as »room«, »dwelling«, »neighbourhood« etc. However, he notes that “any given configuration of physical parts can be interpreted in territorially in different ways.” (Habraken, 1988).

Here, hierarchies of Habraken are starting point. It is important to bear in mind that pattern language that links human needs in the built environment is not tree-like structure which allows connections only through higher levels. However, the design actors can be understood from the diagram Habraken suggested. First question to examine complex artifacts: how physical systems are interpreted territorially? Is it possible to validate patterns using this structure?
2.4.2 Pattern language of user control

2.4.2.1 Structure and representation of the knowledge system

For the global structure control hierarchies defined by Habraken used making distinction between sets of physical structures and territories. Each level is related to certain actors and control agents: the subjects enabled to create units, control them, remove them, and posses spatial rights to act in territory.

Territorial units consists of: edge, hearth and control hierarchy — relations to neighbours and place in the nested system. These are sets of actors, activities and related territories (Lawson, 2001). Definition of edge and hearth of the territory may be formal or by convention and informal, strict or loose, intentional and unintentional (J Habraken, 1987). Physical structure consists of routes, barriers, and terminals to establish or prevent exchange of people, information, energy and resources, to isolate and connect (Lynch, K., 1981). Consist of elements designers put in place: physical structure. Addition: set of interfaces — relative hierarchies: connections of infrastructure: road crossings, transitions, gates, doors — descending level of control and contrast on both sides (Salingaros, 2008). These are very similar to those patterns of Alexander related to the urban interfaces like »subculture boundary«, »neighbourhood boundary«, »connected buildings«, »arcades«, »building fronts« and others.

2.4.2.2 Relations among patterns

The solution space, which is distinct from the parameter space, is rarely one-dimensional, which means that knowing what doesn't work cannot give what works simply by doing the opposite. Linkage between the patterns are important. (Salingaros, 2008)

Five general types of relations among patterns were found, referring to the Pattern Language of Alexander (1977) and suggestions of Salingaros (2008). Every pattern have at least two relations to the other patterns, some of them relate to others in five different ways.
Horizontal: relation between patterns on the same level. It can be interaction where patterns has reciprocal relationships or isolation if patterns co-exists without influencing each other on this level. **Vertical top-down:** pattern consist of patterns from lower levels. **Vertical bottom-up:** pattern constitute higher level pattern, together with other patterns on the same or different levels. **Oblique top-down:** pattern consist of other patterns from lower levels and from different category: for example, »neighbourhood edge« as an interface pattern consist of »parking lots«, »big-box shopping sites«, »front-« and »back yards« — territorial patterns. **Oblique bottom-up:** pattern constitute the other pattern from higher level and from different category: e.g. »Public shelter« is a territorial pattern but it is a part of »gates« which is an interface pattern. Other relations are possible: for example, patterns need other patterns to connect to patterns on the same level: e.g. »school site« is related to »courtyard sites« via »city streets«.

### 2.4.2.3 Analysis

In order to start with analysis, 33 patterns were found, applicable in both large-scale neighbourhoods (figure 34). Initial selection was based on pattern language by Alexander. Pattern is place-event: it means, that certain physical configuration is related to some sort of human activity and has relation to the user control of space. Patterns distinguished from the studies of morphology, activities and events taking place and known issues of the neighbourhoods. They are recurring space-events inherent to all 13 large-scale districts in Riga. Each pattern has a name, description of problem, and analytical procedures. However universal, some patterns have important differences which is expressed in specific pattern relations.

Primary source for pattern definition were interviews with residents. For example, they mentioned activities like shopping or using public transportation and feelings of insecurity in some places like school campus sites. Thus here it is possible to distinguish network of roads and paths residents use to commute; web of shopping or public transportation stops which form nodes of road and path network for pedestrians and there are territories which are not safe for the people who are commuting through them. Hence patterns for the stage of analysis are products of interview coding. Unlike patterns of Alexander, in initial stage of elaboration pattern language is about complex problem of large-scale neighbourhoods: they are found through empirical research, site analysis, and observation.

Each description primary follows “diagnostic” sequence of reasoning. Some patterns, which are recurring multiple times, can be analysed using “prediction” reasoning (figure 34) (Tzonis, 1990).
2.4.2.4 Representation of a pattern

Two types of representation are required. First type follows diagnostic line of reasoning: given the performance description operation and form (morphology) is derived. It is used for patterns which have single non repetitive configuration in a neighbourhood and where vertical bottom-up and oblique relationships are not plural and diverse. Some patterns like school campus sites or big-box shopping sites are singular for the neighbourhood or district. These patterns are characteristic for clear control by one party. Real issues — facilitating measures. Diagnostics are appropriate if we know performance: e.g. »school campus site« in terms of safety, possibility for social contact and appearance. Critical morphologies and relations to other patterns can be traced. Graph as representation. It is possible to count links and thus understand importance of patterns in relation to control performances. Relative position is represented: who is in charge and what is the impact? For some patterns, like »neighbourhood boundary« or »common« the issues and relations to other patterns may differ: thus two problem statements are presented. Nevertheless, the aim is spatial and relational translation of issues of control.

Second is a prediction line of reasoning: from formal and morphological characteristics performances are derived. These patterns have diverse vertical relationships and are recurring with variations in the neighbourhood. Hypothetical issues — preventive and encouraging measures. Prediction is appropriate when performance is questioned on a global level: for example, »courtyard site« in terms of shape, surface, edge, openings and respective affordances for operation and performance. Typologies in relation to performances can be mapped. Map as a representation. It is possible to map performances of control. Spatial distribution: points with values on the map.

Pattern examples are on following pages — first, »school campus site« follows diagnostic line of reasoning, second, »courtyard site«, follows prediction line of reasoning.
School campus site

School campus site is a popular place for socialising in large-scale neighbourhoods, however it has poor maintenance and is vulnerable to crime. Residents, especially elderly, mentioned it as a proffered recreational area during the day and unsafe area in the evenings which is attracting delinquents. Questions of control performances (Lynch, K., 1981) and defensible space check-list (Voordt & Wegen, 1988) is used to understand crucial pattern relations.

Questions of control performances (Lynch, K., 1981) and defensible space check-list (Voordt & Wegen, 1988) is used to understand crucial pattern relations.

There are two theoretical inputs for diagnostics frame (figure 35). First, control performances are linked to operations and knowing operations to slots of territory — edge and hearth. For edge, it is crucial whether it is »city streets« (this means visibility of the area form outside which is good for visibility and hence surveillance) or »back yards« which means low presence and hence surveillance. Control is not congruent because of conflict of use due to undefined border with the »common«. This line of reasoning is applicable for other two performances and then critical relations are traced on a graph (figure 36).

Thus in both cases vertical bottom up relations are crucial: school site is a part of »common« (figure 36). In Imanta, »school campus site« is related to lower territorial levels (»front yards«) through »city streets« and to »courtyard sites« through »gates«. In Pļavnieki, lower territorial levels like »back yards« has a direct relationship with the site. These are the crucial relationships which are defining control performance: the oblique relationships with higher and lower territorial units via physical structure is always preferable. However better transition to lower and higher territorial levels is desirable — this may be achieved introducing patterns of physical structure like streets with lighting, or introducing interface elements such as edges and gates.
Figure 37. School campus site in Imanta

Figure 38. School campus site in Pļavnieki
In large-scale neighbourhoods, there were attempts to create a kind of secondary territories for residents for recreation which would immediately relate to the dwellings — courtyards. In reality however courtyards are used by diverse groups and their quality is different: some are well-functioning as a places for socialisation, some are neglected and some are not safe. Here, control performances are mapped and legend is formulated using framework originally proposed by Oscar Newman in »Defensible Space« (1978).

In Imanta, there are 15 courtyards of various size. It is possible to distinguish three functional types of courtyards. First, with »parking lots« »building entrances«. Second, with »backyards«. And third, which can contain »city streets«, »front-yards«, »building entrances«. Each however include »roads and paths« and may include »signs of history«, »new building sites« and »kindergarten site«. In Pļavnieki, there are two or three courtyards which can be seen as attempts to create a secondary spaces for the residents. There are however larger spaces which can be regarded as such but can be regarded as parts of »common space« as well. There are those which contain only »parking lots« »building entrances«. There are those with »backyards« only. Third are part of common and can be distinguished if are related to »public shelter« or not. In a graph on figure 39 two types of relations are traced: red arrows mean relations which prevent surveillance or territorial definition and green which encourage both control performances.

Then, crucial patterns are linked to operations and four groups of control performances are mapped distinguishing four categories (figure 40): courtyards with good territoriality and surveillance, bad territoriality but good surveillance, bad territoriality and surveillance, and finally, »traps« — especially vulnerable places with bad surveillance but good territoriality.
Figure 41. Courtyard sites in Imanta

Figure 42. Courtyard sites in Pļavnieki
2.5 Preliminary conclusions

Figure 43. Distribution of control performances according to level and system (physical, interface, territorial).

Initial sub-research questions for the »problem definition« part were: “How control of built environment is distributed in two large-scale neighbourhoods? Which qualities of control are currently lacking? “It is linked to the methodological question “How knowledge of the control performance informs design process?” Two patterns illustrated on previous pages uncover way how answers can be given. It then leads to the application question “Which design elements are crucial to user control of the built environment?” (see figure 15).

Preliminary it is possible to conclude that control distribution can be illustrated using level diagram. This however does not imply strict distinction of control agents and territories, but rather variations where control of big agents like Riga City Council ends and how far local social control penetrate higher levels. Second it is possible to conclude that there are different control qualities and hence problems on different levels. Higher levels are characteristic for very certain control but not responsible and congruent control: controlling agents are not users and are not aware of their problems. Middle levels below district (i.e. neighbourhood unit) and above address unit level, escaping control and is hardly characterizable as a distinct unit. Here control is not congruent, responsible and certain which causes territoriality problems and safety issues. The only reason to take these levels into the account is that some actors and institutions are claiming control rights on these levels: entrepreneurs, municipality, schools and non-governmental organisations like sport clubs. Lower levels, like building units, have much more congruent control quality, however, responsibility is low, residents, the main control agents, are struggling with control of their environment. This is very general description and hence not very useful; therefore recursive process for all 33 patterns is necessary.

In a diagram above (figure 43) existing control performances represented for each neighbourhood, Imanta and Pļavnieki, in a form-operation-performance frames, representing the most crucial levels for the problem of user control uncovered thus far.

Finally, it is possible to arrive at lacking control qualities in large-scale neighbourhoods. In short, these can be described in relation to physical structure, interface and territorial system. In Imanta, control is not effective as a consequence of physical structure, interfaces lead to territorial conflicts, and territorial system is not congruent which results in insecurity in public space.6 In Pļavnieki, conclusions are similar, with important difference in problematic levels: here, interface plays more important role than territorial system in Imanta: neighbourhood boundary, crossings and gates are not controlling interaction, lead to confrontation.

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6 Notion of public space used here as Habraken suggested, as a “public part of the territory” (1987).
3 Expected outcome

Final product is expected to be an explicit design tool, represented in three parts.

The pattern language of user control in large-scale neighbourhoods, to be used as a common ground across levels and actors. To illustrate the use of the pattern language in coherent design process, two applications will be elaborated: spatial vision and local interventions.

Spatial vision for large-scale neighbourhoods using two neighbourhoods, Imanta and Pļavnieki, as cases. Physical structure, territorial structure and interface systems are parts of the spatial vision. The aim is to set general method and using two cases allows to show how it is working in different local contexts.

Third part is a set of interventions on various levels. These are closely related to spatial vision and use pattern language as input for design. The main purpose of these design tests is to understand how patterns can be used to solve concrete design problems and how new patterns are invented where necessary.7

3.1 Further steps

For the P2, overall methodology of research and design has been set up. During second semester, attention shifts from theoretical view on the problem of user control towards study of precedents and design.

Therefore further steps are:

- Search for precedents using established FOP restraint and pattern language. See chapter 3.2.
- Adjustment of pattern language from analytical to prescriptive and normative, using precedents and design tests. Recursive design tests, evaluating effectiveness, feasibility and validity of the pattern language. See chapter 3.4.
- Parallel development of spatial vision and urban design tool, see chapter 3.3.

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7 New patterns are necessary if paradigm shifts occur. In large-scale neighbourhoods, the most substantial is the introduction of private property and discussions about place identity and development vision. “A new pattern is superior if it increases the connectivity with the majority of established patterns compared with the old pattern it is replacing.” (Salingaros, 2008)
3.2 Design methodology

3.2.1 Design by analogy

When the new problem is faced, thinking by analogy may help to find an appropriate solution: similar situation is recalled, matched with the new one and conclusions are made (Winston, 1980). Experts in various disciplines like law, economics and medicine use analogy to relate new situations to case studies. Analogical reasoning is an important process for creativity. Creativity is a novel generation fitted to the constraints of a particular task. Novelty and constraint are key components in analogical reasoning (Green, Kraemer, Fugelsang, et al., 2012). Novelty of design is determined by semantic distance of analogy: more distant relations are generally less obvious and so they tend to be more novel. Design is a creative domain, therefore distant analogies are frequently used. However, close analogies involve greater similarity and are easier to access; distant analogies, on the other hand, may be related to originality of design (Christensen & Schunn, 2007).

Creative design process represented by Tzonis (1990) illustrates how distant analogies are used in architectural design by giving the example of Le Corbusier's Unite d'Habitation. It starts with formation of presuppositions and design input which is followed by design process. First, sort of causal theory of design is formulated as principles linking form-operation-performance. Second, topological theory of design is formulated to specify how objects can be decomposed and recomposed in parts. Third, architectural program is formulated as performance norms. And, »design thesaurus« of precedent projects and artefacts is one of the most crucial parts of input to creative design process: it starts with identification of operation in planned project. Then designer searches in her memory for precedents with operation slots which correspond to those of the planned project. The matched component is extracted out of the precedent and finally integrated into the new product.

Tzonis uses the same frame form-operation-performance used for diagnostic and description reasoning in sections 2.2.1 of this thesis plan for design explanation. Given performance descriptions: do not disrupt the natural continuity of terrain; have independent commanding vistas, have public spaces with commanding horizon vistas which are related to three form slots: base, top and body respectively. Search in the memory and finds three artefacts: the »peasant hut« which does not disrupt terrain continuity; the »wine-bottle rack« which has bearing framework which is relatively independent from the shell of the bottles; the »ocean liner« which has a deck with commanding vistas. Each precedent frame has many slots, but the only one is related to the total form of designed artefact. This so-called »syntactic« slot restricts the possible connection of a part of an artifact to the rest of its parts. It constraints the way parts from precedents may be put together to form a new design product.

Creative cognitive process in design is supported by external representational systems, such as sketching, and unsupported cognitive structures (visual patterns, object forms, or mental models) (Christensen & Schunn, 2007). Pattern language, its structure and representation (2.4.2.1 and 2.4.2.4) are essentially representation systems which serves as input and topological theory for user-control-facilitating urban designs in large-scale neighbourhoods.

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8 “Reasoning takes place when analogy is used to answer question about one situation, given another situation that is supposed to be a precedent, as when we answer questions about Hamlet by way of knowledge about Macbeth." (Winston, 1980)

9 “Analogical reasoning (e.g., blizzard is to snowflake as army is to ?) centres on analogical mappings, which can constitute novel connections between situations or representations that do not seem similar on the surface (e.g., the mapping between the relational representations [blizzard : snowflake] and [army : soldier]). In addition, analogical reasoning must fit particular constraints. As an example, attempting a mapping between [blizzard : snowflake] and [army : war] may be novel, but it does not succeed as an analogy because it does not adequately fit the constraints of analogical reasoning. In this case, a pertinent constraint is that the words within the second relation [army : ?] must not only be related to each other but must be related to each other in a way that is similar to the way in which the words in the first relation [blizzard : snowflake] are related.” (Green, Kraemer, Fugelsang, et al., 2012)
3.3 Design objectives

The challenge is not to erase this utopia, but to disentangle it and make it time-resistant. How can different speeds and rhythms of change be received by the projects, now and in the future? Can we escape the tendency to radically demolish and start over from scratch, repeating the tabula rasa approach? Over the long run, in what factors does that which is solid and sustainable about these once ‘ideal cities’ reside? —(Palmboom, F., 2010)

The putting into practice of this strategy generates new analyses with parameters as potentially diverse as the balustrades, partitions, balconies, passages, perforations, etc., in the case of the flats; of the stairways, landings, hallways and passageways, in the case of communal spaces; and of the parking places, play areas, parks or the road system, for example, where public spaces are concerned. All this leads us to ask ourselves about the need to add secondary facilities or certain amenities, to integrate tertiary activities, to have recourse to the presence of a caretaker, etc. It’s from here than one can generate a part of the city. Not knocking things down enables us to go much further. All the project tools are already in place; all that’s needed is to reorganise, modify and complete them.—(Druot, 2007)

This chapter formulates the input to the design process. The frame for design consist of three slots: spatial system (of territorial units), communication systems (physical structure) and control systems (interfaces). Design objective is formulated as a »how« question, following form-operation-performance structure. Then, objective is re-formulated as a search phrase for precedents in design by analogy process.

Communication systems → physical structure

**Keywords:** connections, physical networks, borders, channels.

How is it possible to improve communication systems to manipulate access of people and information, in order to make territorial control more certain and effective?

Which communication systems can facilitate more congruent connection and separation of territories and people in order to achieve more certain and effective control?

Spatial system → territorial units

**Keywords:** spatial organisation, territory, nodes, catchment areas, nested system

How is it possible to provide, organise and structure space in order to facilitate spatial process of defence, more productive use and willingness to take care of territory to ensure order and security of daily lives of residents, physical comfort, to prevent decay and social problems and protracted misery as residents battle between neighbours and with delinquents?

Which spatial system can facilitate territorial behaviour in order to achieve congruent, responsible and certain control?

Variations and systems of control → interface

**Keywords:** spatial relations, gates, extended territories, interfaces.

How is it possible to change variations and systems of control in order to facilitate spatial process of defence, participation in maintenance to achieve positive social consequences.

Which variations and systems of control relative to land use, characteristics of routes, vacancy rate etc. can facilitate presence of people, activities, surveillance, exclusion of enemies out of territory, participation in maintenance in order to achieve congruent, responsible and certain control?
3.3.1 Frames for precedents

In order to start with the search for precedents, design objectives were represented using form-operation-performance frames for physical structure, interface and territorial system. The diagram and text explanation illustrates how frames help to search for precedents. Here, form, operation and performance slots are formulated using theory of user control — see chapters 2.3.1 and 2.3.2. Casual theory of design was also derived from theory — using hypothetical relationships among form-operation-performance.\(^\text{10}\)

Communication systems are kind of physical structures. Form of the physical system has horizontal, vertical elements and control hierarchy. Horizontal elements are kind of infrastructures and vertical are kind of buildings. Control hierarchies have two variations: assembly and dependence hierarchies. These slots of form are related to the slots of operation: horizontal elements are for connecting, vertical are for separating and control hierarchies are for building and for managing/supplying. Design performances are respectively fast and direct connection, independent separation and low-cost construction and management.

Systems of control are kind of interfaces. Form can be described as physical control systems, as edge of the interface and two sides interface is between. Operations are confronting, exchanging and interacting respectively. Design performances are avoidable, congruent to needs and controllable.

Spatial system is kind of territorial system. Its form has control hierarchy, hearth and edge. Operation consists of belonging, habitation and cohabitation. Design performances are local patriotism, prosperous and peaceful.

\(^{10}\) At this moment, various linking slots are considered. The causal relations explained in theory of control may be complemented with the concept of affordance, as Gibson defines it: "The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill. The verb to afford is found in the dictionary, but the noun affordance is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment." in Gibson, J. J. (1986): The Ecological Approach to Visual Perception. Lawrence Erlbaum, Hillsdale.
3.4 Design test

In Pļavnieki, neighbourhood boundary is permeable. It is a key issue for qualities of control such as congruence and responsibility. Pattern »neighbourhood boundary« has multiple oblique relations. It is shaped by territorial units of »district green«, »web of shopping« and »big shopping site« and »parking lots«. It is connected to »common space«.

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**Figure 45.** Graph representing neighbourhood boundary

The search phrase for interface is “Which variations and systems of control relative to land use, characteristics of routes, vacancy rate etc. can facilitate presence of people, activities, surveillance, exclusion of enemies out of territory, participation in maintenance in order to achieve congruent, responsible and certain control? “ In this situation, neighbourhood boundary is not asserting certain and responsible control, because of permeating movement in all directions and has territorial users with one-sided oriented control from outside, due to character of edge and physical control system. Hence I searched for precedent for interface which: has one-sided control from within, not permeating movement in all directions, with wide edge and control system related to movement.

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**Figure 46.** Representation of pattern »neighbourhood boundary« and precedent — Free and Hanseatic city of Hamburg
In interface frame of «neighbourhood boundary» in Pļavnieki, there syntactic slots and empty slots representing control issues (figure 47). Both are related to slots in Hamburg precedent. Thus, the shape of «city streets» and «blocks» are resembling waterways and gates to the city. «Big-box shopping sites», «district green» and «parking lots» are similar to city/surrounding landscape interface condition of Hamburg (dashed line). There are two performance problems of «neighbourhood boundary»: insecure isolating of physical control system and not congruent communication through the boundary's edge. These are replaced by respective slots of the precedent.

Resulting new design solution (figure 48) changes the nature of the interface, making edge sharp and not permeable (canal or ditch) for walking, thus establishing clear territories which belong to the neighbourhood's common and for other, road-related uses like «big-box shopping site», «new building site», «parking lots». Expected control performance of congruence (distinguishing neighbourhood and district users) is reached by isolating levels making city streets as connections more important.
3.5 Urban design tool

For Instrumentation of patterns in order to come up with spatial vision, tool developed by Palmbout Urban Landscapes can be appropriated (Palmboom, F., 2010). It has been developed in order to “direct relationship between the ground plan and the building in long time-span of development and by multiple designers (figure 49)”.

Framework, printed circuit, envelope and idiom are keywords for these tools. Framework is the most stable and is defined mostly by infrastructure. Printed circuit is a shape of public spaces; envelope is a cloud of possibilities for a building; idiom is a prevailing tone of architecture. These can be substituted with physical structure, interface and territorial system described in chapter 2.4.2.1.

According to different design tasks, tool can be transformed.

3.5.1 Example 1

In a project for Staalmanpleinbuurt, part of Western Garden Cities, in Amsterdam, Framework is an urban context of extension plan, printed circuit defined public space of the neighbourhoods territory which is supported by envelopes of new and existing buildings, idiom as a restfulness, rhythm and regularity of modernist architecture (figure 50).
Thus, in Poptanhof in Delft, solutions for problems of post-war neighbourhood were translated to the new design of printed circuit and envelope. This vision «prepares ground» for restructuring process with duration of 15 years. Spatial quality is spacious due to the diagonal sightliness of open courts surrounded by residential high-rises. Infrastructure lines bordering site on both edges have character of a parkway, and there are few residential buildings with addresses on this streets, thus emphasizing inward orientation of the neighbourhood. The main idea of new territorial organisation is to recreate the original spatial qualities of the neighbourhood in a contemporary way, respecting privacy performance achieved by rising the level of secondary spaces — courtyards while maintaining visual relationship to the common space in the middle of the neighbourhoods and with other courtyards. Better territoriality is thus introduced satisfying the need for new parking.
4 Societal and scientific relevance

This work is an attempt to look at issues of neighbourhoods from the perspective of the user and to facilitate conditions for better control of the living environment on different levels.

The outcome can be useful to two actors involved in neighbourhoods: municipality and residents. It is intended to link the two at the first place, as J. Jacobs described the true use of the neighbourhood (1963). Pattern book together with design tools, could become an inspiration for municipality to coordinate its actions and as a reference and evaluation material when discussing development proposals.

Since two cases will be studied, the results may be applicable to a larger scope of similar areas, not only in Latvia. However conditional, the choice of cases reflect the wide variety of social and spatial conditions of large-scale housing estates.

Nevertheless the most important aspect which makes project relevant is development of frame-semantic networks in a line with pattern language to develop explicit conceptual and methodological framework, which can be both used in practice to support decision making in design and planning and to guide empirical research and survey of changing situation in large-scale neighbourhoods.

5 Ethical problems

First ethical challenge is to understand who is the user, i.e., what is the primary group of the neighbourhood's users to study and to build argumentation. Residents are definitely the most important one; however, the group is heterogeneous, large, and hard to comprehend. Is it necessary to take into account needs of future users, and how to rank them with the needs of existing users? Or, how the interest of minor groups of users are represented — for example, those who are maintaining neighbourhood, and how it is affecting the needs of main users? In this work, the attention should be paid at those who are likely to exercise responsible control (Lynch, K., 1984).

Another ethical challenge in the project is interpretation of qualitative data. Several techniques will be used to check its validity. Judgements will be translated into assumptions and used as a starting points for inquiry.
# 6 Time plan

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7 Appendix

7.1 Bibliography


Baltic Institute of Social Sciences (2009) RĪGAS IEDZĪVOTĀJU DROŠUMSPĒJA UN TĀS PAAUGSTINĀŠANAS INICIATĪVAS (Survey of sense of security and improvement initiatives in Riga).


Dorst M (2010) Sustainable liveability Privacy zoning as a physical condition for social sustainability. Delft, the Netherlands, Faculty of Architecture, TU Delft.


Tzonis A (1990) Huts, ships and bottleracks: design by analogy for architects and/or machines.


7.2 Interview guide

To proceed with problem definition and to test it, several interviews were held in early November 2012. With above mentioned considerations, fieldwork was structured.

Focused interviews (Zeisel, 1984) was chosen. The idea is to set loose interview guide to list topics needed to be covered. Interview is guided using probes, non-directional questions, expressions, body movements to continue conversation and

Interview guide covered aspects of control of neighbourhoods formulated in theoretical overview above.

General response to the environment: describe your neighbourhood, what do you think of your neighbourhood and so on. If conversation was not moving further, more specific questions about neighbourhood were raised, like “What is your opinion about police patrols in the Neighbourhood? Do you think it is necessary” Although in these instance interview became no longer unguided, several useful explanations, beliefs and attitudes were gained.

Topics covered:

- Feelings for safety, experiences in the environment, features of the environment, conditions and actors involved in events if mentioned.
- Relations to other residents, social network, range of acquaintances, social ties, degree of anonymity, need for socialisation and means to achieve that.
- Familiarity with the environment (social, physical, managerial), spatial and behavioural preferences,
- Actual and potential involvement in the shaping of the environment
- Vision of the environment.
- Evaluation of changes and ongoing processes — historical overview.

7.2.1 Example interview and use of probes

<table>
<thead>
<tr>
<th>Probes (Zeisel, 1984)</th>
<th>Questions</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>General unstructured question</td>
<td>Describe your general opinion about Pļavnieki.</td>
<td>It's quiet: no one is disturbing us.</td>
</tr>
<tr>
<td>Probe requesting specification</td>
<td>Hence, you are feeling yourself safe here?</td>
<td>Safe? We are walking during daytime here, thus everything is fine.</td>
</tr>
<tr>
<td>Cued probe.</td>
<td>And how it is in the evenings?</td>
<td>Well, I have bad experience. My sister was injured in the staircase, here, in Pļavnieki, on Jukuma Vācieša street, at the door of her apartment. She died because of the injuries.</td>
</tr>
<tr>
<td>Response moved back to interview topic: safety</td>
<td>Are there any places you prefer in Pļavnieki?</td>
<td>We are going to the school campus site …</td>
</tr>
<tr>
<td>General question requesting reaction to environment</td>
<td>Why there?</td>
<td>Is is close to our home, it is easy to get there and other elderly people also are there. But for us it is important that it is just around the corner.</td>
</tr>
</tbody>
</table>

Table 4. Example interview with two elderly ladies and use of probes
### 7.2.2 Classes of issues defined by residents

**Coding of causal links described by respondents.**

<table>
<thead>
<tr>
<th>By US — residents</th>
<th>By OTHERS — identified as not residents</th>
<th>PLACES</th>
<th>Conditions of Social/physical environment</th>
<th>Institutional/governance/management</th>
</tr>
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<tbody>
<tr>
<td>Residents are not aware of cleanliness of the environment. Awareness of threat of dogs to passers-by, especially children. Residents through rubbish from their windows. Residents cannot regulate their behaviour therefore police patrol is the only way to maintain safety, cleanliness and order in the neighbourhood.</td>
<td>Residents of council housing are those who cause nuisance and trouble. Drivers, especially those who live for short time in the neighbourhood and especially visitors, have bad driving behaviour and therefore causing threats to pedestrians, other drivers and property. Criminals are causing feeling of insecurity, they remind of their presence perpetually offending people in the neighbourhood. There are “bad people”, Russians, in the neighbourhood and they don't have to be here. Homeless and drunk people constantly present in some places causing bad figure and feelings of insecurity. Loitering youth vandalising property with graffiti.</td>
<td>Causality in staircase. Area around supermarket: Lubānas street area. Whole neighbourhood, Pļavnieki, used by criminals. Hideouts scattered in the neighbourhood: small scale objects inside blocks. Hideout at the medical centre. Latvia as a place with high costs of living. Area around supermarket in Imanta, due to …. Blocks – Allotments; Stadium – Allotments; Blocks – 24h shop are places were ambiguous situations take place.</td>
<td>Not safe in the night-time therefore presence is limited to the daytime and areas close to home. Capacity of madmen is not enough. Vehicular police patrol is not effective due to layout of access roads. Lack of safe space. Lack of lightening in public spaces used by residents to walk. Lack of legibility. Worn pavement. Lack of tolerance among residents to the expression of national belonging. Condition of roads causes bottleneck of various modes of traffic thus making commuting in the neighbourhood not safe. Vandalism: damage of public art due to belonging to other national group. Inability to help/lack of interest/sympathy to other people in trouble in the neighbourhood. Community=building; street is anonymous. Yardmen annoyed with public green. Lack of leisure for adults. Lack of special areas, for example for dogs.</td>
<td>Management company: urgent issues solved inefficiently, lack of special equipment and people; less urgent issues are postponed and often left without attention for years; general inefficiency due to lack of communication, interest and awareness of authorities. Community=building; street is anonymous. Bureaucracy, lack of time, finance prevent residents from taking action.</td>
</tr>
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*Table 5. Issues defined by residents*