Exploring potentials of the socialist city
In search for relevance of the socialist urban structures in the future of sustainable city
The case of Kaunas, Lithuania

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2011 | TU Delft
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4051327
Master Thesis Report
MSc Urbanism | Complex Cities Studio
June 2011 | TU Delft
Acknowledgements

I would like to thank my mentors Stephen Read and Willem Hermans for the guidance through the complex process of research and comprehension. I would also like to thank Complex Cities Studio teachers and students for ideas, insights and encouraging academic environment. Thanks to my dear friends and colleagues, special thanks to Justina Muliulytė and Tadas Jonauskis for inspiration, discussions and for sharing research material, Rasa Anaiytė for daily critique and encouragement, Dovilė Bukauskaitė for support on information. Last but not least I would like to express my deepest gratitude to my family for all the support and understanding.
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I. Introduction & Working framework

In this chapter the main outline of thesis is introduced given brief descriptions of study case, basic structure of the project, social and scientific relevance, defining problem field and approach principle. Furthermore, working framework is introduced including research questions, applied methods and techniques and theoretical framework.
1. Introduction to the case of Kaunas

After almost 50 years of soviet occupation Lithuania became independent in 1990 and since then has been going through the transitional phase. It has been a challenging period of political, social and economic reforms that had similar patterns in all post-socialist countries. Furthermore it had particular impact on the spatial organization of cities. A historical city of Kaunas, a second largest city in Lithuania and the fourth largest city in Baltic states is put under scrutiny as a post-socialist city. Decentralization, suburban growth, automobileization, commoditization of land are just some of the interrelated ongoing processes and trends that situate Kaunas within the context of post-socialist urban transformation next to the cities in Central and Eastern Europe. Recognizing Kaunas from that perspective allows to understand specificity of the transformation and trends that are shaping future of the city. These trends, however, seem to be directed towards the ways that do not lead towards sustainability (Tosics, 2004). Furthermore, to make things even more complicated, the legacy of socialist housing estates, that currently house 65% of the urban population in Kaunas, is a subject of grim prognosis which derives from the western experience: “As soon as the housing shortage is eliminated, apartments in the estates go to the bottom of the market, segregation and urban problems can be triggered” (Dekker, 2005). Nevertheless, post-socialist countries and their cities have proved their strength to overcome deepest crises and achieve enormous positive changes so far (Stanilov, 2007) and Kaunas is no exception. There is no better time than now to be critical about the most recent past and the future it is about to bring and start evolving ideas for a sustainable alternative. This is precisely the aim of this project.

2. Structure of thesis

This master thesis is a research, planning and design project in the academic field of urbanism. Research is centered on the post-socialist city in transition of which Kaunas is the case study. The main interest of this project is transformation potential from the current transitional state to sustainable structure in the future. With established awareness on this larger task at hand, focus is brought on problems of the massive socialist housing estates in particular, which is an actual and increasingly threatening issue of the post-socialist cities (Stanilov, 2007; Tsenkova 2000; 2006; Dekker, 2005; Tosics, 2004, 2005, 2006).

In order to approach the issue of transformation, research is focused on two main stages, the socialist city and the post-socialist city. Transitional phases from socialist to post-socialist as well as from post-socialist to future (post post-socialist) city is the main subject of analysis. The post-socialist city and ongoing trends are criticized as unsustainable development (Tosics, 2004), while some of the still present structures and features of the socialist city might be seen as potential (Tosics, 2005; Stanilov, 2007). Challenge is taken to identify and find ways to employ the potential legacy of the socialist city which could be integral to the future vision of a sustainable city. As a result, vision for the polycentric compact city is introduced. The study then is brought to the scale of city district in order to further investigate the actual potential of the proposed vision. Based on that study a twofold strategic concept is generated, which consists of two integral parts: [1] reinforcement of centrality; [2] restructurization of the socialist housing estates. Both parts of the strategy are spatially tested in series of urban design proposals. Thesis is concluded with the reflection that summarizes the whole project, highlights key findings and situates this thesis in the context of research on post-socialist city (body of knowledge).

3. Keywords

socialist city/ socialist housing estates/ post-socialist city/ urban transformations/ sustainability/ compact city/ centrality/ mobility/ urban restructuring/ intensification/

4. Project objectives

The project objective might be resolved into three constituent parts referring to the main elements of the project, particularly to research, strategy and design. The main objective of the research is to understand the characteristics, principles and effects of the urban transformations which have been taking place in the post-socialist city of Kaunas. Moreover, in that context to understand the role of socialist structures (housing estates in particular) in relation to the larger urban development problem at hand.

In this way research part would facilitate strategic planning with a goal to establish ways of favourable transformation leading to the more sustainable urban structure. Having awareness of sustainability as a complex concept encompassing social, economical and environmental spheres the strategy is expected to bring particular focus on social and environmental sustainability. In terms of social sustainability the goal is to decrease threats of socio-spatial fragmentation on the city scale and prevent deprivation of the socialist housing estates. In terms of environmental sustainability the goals would focus on retaining and providing incentives for more sustainable mobility patterns (public transportation) as well as more optimal patterns of land use (alternative to suburban expansion).

Subsequently, the main role of design proposal(s) would be to illustrate possible and desirable outputs of the strategy. Therefore the main purpose and objective of design would be to envision and ‘materialize’ the most characteristic physical and functional features of desirable transition as well as to test the probability and possibility of the strategy.
5. Societal relevance

In the context of post-socialist transition importance of urban planning has been partially neglected by many governmental institutions of different levels (Stanilov, 2007). Situation is common to the case of Kaunas. There has been a lack of clear visions and strategic planning concepts for the city. Consequently urban development has fallen under strong influence of neo-liberal market conditions that ignore long term effects and wider interests of society. As a result, series of problems related to issues of traffic and parking, maintenance of housing stock and public space, provision of public services and facilities have emerged.

6. Scientific relevance

Recent decade has shown and increasing academic interest in the post-socialist transition. This has been manifested in fields of social, economic, cultural studies as well as urban studies. As an indication of the need for scientific research and debate in the field is the recent emergence of literature on the studies of post-socialist transformations in field of urbanism and related. The key literature includes volumes by Stanilov et. al. (2007), Dmitrieva and Kliems (2010), Tsenkova and Nedovic-Budic (2006) as well as a series of separate publications by such authors as Tosics (2004), Nuiissl and Rink (2005), Ourednicek and Sykora (2007) and many more. 

This master thesis could be seen as a continuation of the discourse set in the described scientific studies by applying the most recent knowledge in the research and analysis of particular case study of Kaunas which is to a large extent a representative of many post-socialist cities in the Eastern and Central European countries, and particularly Baltic Countries.

7. Personal motivation

Motivation for this study could be seen as a threefold aspect, which includes elements of academic research, professional interest and personal knowledge of the study case. Here this thesis could be understood as a momentum of knowledge generation where these components are synthesized by making advantage of each other. Firstly I find this particular academic environment of the Department of Urbanism at the TU Delft an engaging academic environment that enables to establish international perspective towards the subject of research. Secondly, this study is a potential insight to my professional interest in urban transformations and relation between societal and spatial functions, fields of their most active interaction, the points of connection and friction as well as transformative power relation. Finally, in the aspect of personal knowledge I refer to the general experiential knowledge of the study case with its multi-faceted context. The city of Kaunas (Lithuania) is my home city and for the recent years an urban structure of my interest, which is in many cases also serves as a point of reference in comparative comprehension.

Within this interrelation of the discussed elements, there are many potentially beneficiary connections, which might result in qualities of knowledge generation. Considering that many potential links are possible, I would like to highlight the interrelation between academic environment and experiential knowledge of the study case, which allows to understand the study case of Kaunas from two perspectives simultaneously: first, perspective of a citizen that allows to understand ongoing processes from its actual societal realm, second, perspective of international academic platform that allows take distance from the study case, as a research subject. The main fascination is to discover the city of Kaunas - a personally well known context- from the professional field of urbanism, which also brings challenge of managing conflict between personal bias and professional objectivity.
8. Problem field

deterioration of socialist housing estates:
- poor spatial qualities;
- physical deterioration;
- lack of facilities;
- threats of stigmatization and social decline.

housing shortage:
- 49% overcrowding rate
- limited housing types
- limited tenancy forms
- low affordability of housing

fragmented inner city developments:
- uncoordinated on the scale of the city
- non-integral to the surroundings and therefore causing fragmentation and segregation
- low urban design and architecture quality

urban sprawl:
- lack of infrastructure, services and facilities
- negative environmental impacts of commuting and inefficient land use
- threat to the city in terms of social segregation, and loss of urbanity

automobilization:
- traffic problems in the city and regional connections
- parking problems
- environmental pollution

housing shortage: LT 22,4 sq.m./cap
housing shortage: EU 30 sq.m./cap

9. Values

Coherent municipal development and long term livability in terms of social and environmental sustainability.

1. Social sustainability

- Social coherence in and between all the parts of the city
- Livable and vital living environment
- Equal access to facilities
- High quality of individual and communal life

Adopted definitions of social sustainability:

Definition 1:
Social sustainability is “development (and/or growth) that is compatible with harmonious evolution of civil society, fostering an environment conducive to the compatible co-habitation of culturally and socially diverse groups while at the same time encouraging social integration, with improvements in the quality of life for all segments of the population.” (Polese and Stren, 2000, cited in Bramley and Power, 2009 p. 15)

Definition 2:
Urban social sustainability is “the continuing ability of a city to function as a long-term, viable setting for human interaction, communication and cultural development.” Yiftachel and Hedgcock (1993, page 140)

2. Environmental sustainability

- Low emissions through mobility patterns
- Efficient use of natural assets (land and natural surroundings)
10. Research objective

Research objective

The objective of this research is to identify elements and systems in current urban structures (particularly housing estates) of the socialist city, which could facilitate transformation of the post-socialist city into the more sustainable city model.

11. Research questions

Main research question

How to shift the trends in post-socialist city towards more sustainable urban model employing potentials of the socialist housing estates?

Sub-research questions


_What are the elements of the socialist city? What are the conceptual models?
_How was the socialist city developed in Kaunas? What elements could be seen in the current spatial configuration? To what extent socialist city was realized in Kaunas?
_What structures of the socialist city are still functioning, what is their current condition?
_What is the future of socialist housing estates? Prognosis: threats and potentials?


_ How does the functional model of the post-socialist city work?
_What are the constituent spatial-functional elements of the post-socialist city?
_How does the infrastructure function in relation to daily mobility patterns?
_What are the major activity areas, functions, centralities?
_What are the main development trends?

3. Vision of the sustainable city. Possible relation to the socialist city and socialist housing estates.

_What could be alternative development models for Kaunas city?
_What is the (possible) relevance of structures and characteristics of the socialist city and the housing estates in particular, in the vision of sustainable city?
_What elements of the socialist legacy should be retained and enhanced to meet sustainability goals?


_What could be the possibilities to shift development towards more sustainable urban form and structure?
_What could be the way to prevent social segregation and ensure social diversity and vitality in the potential problem areas?
_What could be the possibilities to alter mobility patterns?
_What are the ways to improve public transportation?
_What are the potential ways of restructuring large housing estates?
_What is European urban planning and design experience in the field? What could be the transferability problems of those projects to the case of Kaunas.
_What are the possibilities for densification in the housing estates? To what extent is the densification (a)possible and (b)desirable? What potential spatial capacity for new developments do the socialist housing estates contain within the framework of set general values and strategic goals of the project?
12. Methods and techniques

The list introduced here is a selection of methods that were applied to answer the research questions described above. It is important to note, that methods presented here are not intended to be used only in pure forms directly attached to particular research questions but rather could were applied in combinations or combinations of those methods.

**Literature review (source studies)**

applications: historical analysis, contextual analysis, theoretical argumentation, formulation of hypotheses.

**Mapping**

types: contextual maps, analytical maps
applications: historical study, comparative study, morphological study, identification of localizations, descriptions of urban conditions, visualization of social statistics

**Statistics**

techniques: data collection and interpretation
application: context analysis, insights, support and argumentation, testing of hypotheses

**Observations**

types: observation of physical environment and behaviour.
applications: evaluating existing spatial qualities, physical conditions, uses.

**Drawing & modelling (Klassen, 2002)**

types: conceptual descriptive, explorative, predictive.
techniques: visualized verbal models, spatial models, schemes and diagrams, sections and plans, visualizations, ambience models.
applications: testing design proposals; summarizing conclusions, conceptualizing principles, conditions; communicating strategic elements, ideas.

**Case studies**

case studies: policies, strategies, designs, historical processes
application: developing strategic concepts, design proposals, recognizing particularities of conditions, recognizing threats and potentials of different strategic inputs.
13 Theoretical framework

Theoretical framework is formulated from three main theoretical lines in relation to the research questions stated above.

The main line and the core of theoretical framework is context related part which is focused on the post-socialist city in transition countries and particularly Central and Eastern European (CEE) countries. Literature includes studies on post-socialist city by Stanilov, (2007); Tosics, (2005); Tsenkova, (2000; 2006).

This review provides with better recognition and evaluation of the context and the problem field as well as an input to formulate guidelines for the possible alternative development directions. Literature on the post-socialist city brings forward problems in relation to current transitional phase as well as the socialist legacy.

The following line of research is the analysis of socialist (Soviet) city by Di Maio (1974), Morton (1984), French and Hamilton (1979), which in combination with literature of the post-socialist city could allow to understand the part of post-socialist reality.

The main focus of this review is on the production of residential space, which was one of the main development sectors in the former USSR. From this perspective spatial conditions brought in the socialist period are studied.


As part of this theoretical line, focus on the social aspects of urban intensification is studied in the Literature Review Paper. Societal effects of dense and diverse urban environments are discussed on the scale of community.

Literature review paper

What makes high density neighbourhoods socially beneficial? A review on claimed social implications of dense residential environments

Abstract - Discussions of the last decades in the field of urbanism were increasingly focused on the sustainability issues encompassing environmental, economic and social aspects. The debate that is centred on the sustainable urban form introducing concepts such as ‘compact city’, ‘smart growth’ or ‘new urbanism’ has highlighted the importance of density. Moreover, density is the aspect of urban form that has received the most attention in the literature with regard to its social impact, as in the ‘compact city’ versus ‘sprawl’ debate (Barton, 2000; Breheny, 1992a; 1992b; DETR, 1999b; Ewing, 1997 cited in Bramley and Power, 2009) and in the related ‘new urbanism’ literature” (Calthorpe, 1993; CNU, 2004; Katz, 1994 cited in Bramley and Power, 2009).

The main interest of this literature review is on the relations between residential (or population) density and claimed social implications on local level, raising the main research question as ‘what social benefits (or threats) could be potentially inflicted by high densities in residential environments (neighbourhoods)?’.

The aim of this review is to identify the main spatial aspects that affect the positive or negative relation between high density and social implications, therefore rephrasing and specifying the initial question as ‘what spatial conditions (design solutions) could possibly enable the potential social benefits (and reduce threats) in high density neighbourhoods?’.

The conclusion would point out that relation between density and social implications could not be considered without the spatial context and its variables, that indicates the potential of planning and design to alter the effects of high density residential environments in positive way through spatial and functional interventions (Raman, 2010).

Key words - social sustainability; neighbourhood; high density; urban form; design variables.
II. Research. City of Kaunas: development phases and transformations

In this chapter the main body of research on the city scale is presented. Topics relate to the research questions on the socialist and post-socialist city phases and processes of transformations and are concluded with the problems statement on the city development. Chapter consists of five parts: Spatial and historical context; Socialist city in post-socialist context; Processes and trends of post-socialist city; Urban activity studies; Conclusions and problem statement.
1. Spatial and historical context
1.1. Lithuania in European context

Geographical context

Lithuania is a country in the North-East Europe. It is a part of The Baltic Sea Region and the southernmost country of the Baltic states, situated on the eastern side of the Baltic sea. With the position on the edge of the central Europe Lithuania holds a strategic location in the region, functioning as the transition south-north and east-west directions. With the population of 3,281,000 inhabitants and area of 65,200 km² Lithuania is the largest of the Baltic States. However, since the 1990’s country has been shrinking in population.

Political-economic context

On March 11, 1990 Lithuania re-established the independent state declaring independence from the USSR. In the political-economic context of the post-communist countries Lithuania is regarded as a Central and Eastern European Country (CEE). Since 2004 Lithuania is also a member of European Union (EU) and NATO.

Factsheet:
Lithuania [Lietuva]
language: Lithuanian
capital: Vilnius
population: 3,281,000 inh.
area: 65,200 km²
density: 50.3 inh/ m²
1.2. Kaunas in Lithuania and region

Kaunas in the region

Following Riga, Vilnius and Tallinn, Kaunas is the fourth largest city in the Baltic States. Kaunas is the second largest city in Lithuania after the capital city Vilnius, the third is a port city Klaipeda.

The distance between Kaunas and Vilnius is 100 km and between Kaunas and Klaipeda 200 km. Three largest Lithuanian cities are connected by highway, which is also a part of the international east-west transport corridor. The main international south-north route Via Baltica connecting the central and the northern Europe intersect the east-west road by the city of Kaunas situating the city as an important international logistics node.

Urban structure in Lithuania

Because of the forced urbanization and industrialization processes imposed in the soviet period, urban living now accounts for 67% of the population. In the period of intense urbanization, the planning policy of deconcentration (a rare case in the USSR) was introduced by local planners and adopted by the authorities. This type of development has formed the existing urban structure of the country resulting in more equally developed territory with many small and medium-sized cities.

The planning structure adopted in Latvia and Estonia was completely different, therefore resulting in monocentric development. However in the recent decades the lack of urban concentration in the country has become an unfavourable condition preventing from the higher recognition of Lithuanian cities in the Baltic Sea region.

Administrative structure

There is a three level administrative structure in Lithuania: counties, districts and city municipalities. Kaunas is referred to all three levels. With the population of 677,270 it is the second largest county, the 7th largest district of 85,733 inhabitants and the second largest municipality with 348,635 inhabitants.
Kaunas municipality in geographical context. Source: Google Maps, drawing by author.
1.3. Kaunas municipality

General information

The city of Kaunas is situated in a rich natural setting of river valleys, on the confluence of two largest rivers in the country. At the eastern side city borders with the Kaunas Sea (an artificial lake) and at the north-east with the Gaiziunai forest array.

Kaunas is a second largest city and an important economic pole of Lithuania. It is a large industrial center accounting for 20% of national industrial sector. Kaunas has a developed knowledge economy with a variety of independent research institutes and their strongest branches in IT and electronic engineering. With the largest technical university in the Baltic States, five other universities and a number of colleges Kaunas has a student population of 50,000.

Kaunas has a well developed infrastructure with international highway (Via Baltica) and railway connection (Rail Baltica, starting to operate in 2013) and an international airport. The city has a well developed public transportation system accounting for 60% of journeys.

Factsheet:

2\textsuperscript{nd} largest city in LT
4\textsuperscript{th} largest city in Baltics
population: 348,635 inh
student population: 50,000
area: 157 m\textsuperscript{2}
density: 2,279 inh/km\textsuperscript{2}
distance to the capital: 100 km
distance to the port: 200 km
10\% of LT population;
20\% of national industry;
international logistics cntr.;
international airport;
knowledge economy;
5 universities;
largest TU in Baltics


Built area: 68 km\textsuperscript{2}
Green area: 22 km\textsuperscript{2}
Roads and streets: 10 km\textsuperscript{2}
Water surface: 12 km\textsuperscript{2}
Agricultural land: 18 km\textsuperscript{2}
Other: 27 km\textsuperscript{2}

source: Kaunas General Plan, 2003
1.4. Historical development of Kaunas

Research on historical development of Kaunas reveals main periods and their characteristics of the city evolution. As it is shown below, development of the city has been largely influenced by the subsequent changes of contrasting political regimes, each of which has brought significantly different notions and interpretations of the role of the city and herewith particular emphases on the spatial developments.

**Medieval City (14th cntr.- 1795)** (Jonauskis, 2010)
Kaunas city was firstly developed as a compact city based on water trading and merchant activities in the inner city. Small scale environment was developed for the reason of being closer to the water and to each other. Old town still has the character of compact and small scale environment which now is used for tourism, cultural activities and high quality residential living. Car free environment creates pedestrian friendly spaces which provides quality for the local residents.

**Tsarist Gubernia (1795-1915)** (Jonauskis, 2010)
Industrial city was started when Kaunas was under Tsaristic Russia control and new rather functional part of the city was added together with railway tracks and station. The railway station and city centre was connected with first horse tram line. Large amount of new industrial activities clustered around the train station pushing away the residents to the upper hill of the river valley where the garden city type neighborhoods were created. Now this part of the city have still similar functions as they were created: train station area is still occupied by industrial territories however most of them are already moved away leaving the sites empty. Garden type neighborhoods became high quality living areas because of proximity to the city centre and high quality urban environment. Horse tram line was replaced by more advanced trolleybus line.
Medieval city
source: drawing by Jonauskis, 2010

Urban expansion in period of Tsarist Gubernia
source: drawing by Jonauskis, 2010
Socialist city (1944-1990) (Jonauskis, 2010)

Socialist city was a continuation of industrial city however in much more larger scale. The expansion was based on public transport which enabled to place industrial territories and residential ones further away from each other. Modernist design principles were used for new residential projects therefore large and dense urban blocks were placed in the green environment and only residential neighborhoods were provided with daily centres which connected with the city centre that provided with non-daily functions and activities. Industrial territories were meant to be only working districts.

Post-socialist city (since 1990) (Jonauskis, 2010)

After the independence in 1990 Kaunas became a post-socialist city. Cars and road network enabled to use the region which was previously difficult to access therefore suburbanisation is the most visible and active process that changes the city. Moreover, investments in the road networks and increased amount of cars draws the future of even larger suburban area than the actual plans for the future.
Urban expansion in the period of Soviet occupation
source: drawing by Jonauskis, 2010

Urban expansion in the period of Republic of Lithuania
source: drawing by Jonauskis, 2010

Plan for urban expansion in the post-socialist period
source: Kaunas City General Plan, 2003; drawing by Jonauskis, 2010
1.5. Main functional models in phases of historical development

Research presented below identifies the major periods of city development, where the functional principles of the city are reduced to abstract functional models showing principal relation between the characteristics of territory and mobility.

**Medieval town (14th cntr.- 1795)** (Jonauskis, 2010)

Kaunas city was founded on the confluence of the two main rivers. Rivers were the most important networks for the trading where merchants were trading with the west of the Europe. Kaunas was part of Hanseatic league. City was used for living and for trading.

**Industrial city (1795-1915)-(1918-1940)** (Jonauskis, 2010)

Railway was introduced along which first industries were started. City grew still as a still as a compact city with distances suitable to walk. However new expansion of the city centre was developed with much larger urban blocks than the old centre. New horse tram was introduced which connected trains station and town hall. Living functions moved further away from the city to more natural environments and industries were clustered along the railway tracks.
Industrial socialist city (1944-1990) (Jonauskis, 2010)
Public transport was introduced which allowed to spread the functions further away from the city centre meanwhile the city centre was became administrative centre and a centre for leisure and culture. New socialist neighborhoods were mostly mono functional - only residential or only industrial which were connected together via public transport.

Post-socialist city (since 1990) (Jonauskis, 2010)
New possibility to have a private car enabled to use Kaunas region for all sorts of activities. Residents moved further away from the dense urban areas to suburbia. Commercial activities started to cluster along the main roads. New big shopping areas were created which attracts people from all over the region. City centre started to become a shopping area for the metropolitan users.
2. Socialist city in post-socialist context
2.1. Model of the socialist city in Kaunas

The socialist city as it was implemented in Kaunas could be characterized by four major components.

1. The city centre which agglomerates administrative functions and non-daily services.
2. The city parts (city districts) situated in a semi-circle around the existing city fabric. Districts consist of the microrayons (a kind of neighbourhood units) housing the largest part of inhabitants facilitated with daily services in close proximity.
3. Industrial areas are concentrated in the eastern part of the city, distant from the city center, spatially separated and distant from the largest part of the residential areas. However some of the industrial areas are spread in the city with smaller concentrations on the east and south parts situated along the rivers and main roads. All the industrial areas are also connected to the railway network which was initially the major mode of industrial transportation.
4. Public transportation system is the element which connects three spatially separated parts, it facilitates the largest concentrations of residents allowing them to reach daily destinations in the industrial part of the city as well as to the city centre.

All the rest of the city fabric is a low density mainly residential areas which to a large extent are ignored by the structure of the socialist city. Those areas could be characterized as a kind of a passive 'background' without which the socialist city could function.
2.2. Socialist housing estates

In terms of scope and extent socialist period left definitely the strongest impact on the urban structure as a whole as well as on the physical shape and patterns of urban fabric. Residential extension was the most significant spatial structure of the socialist construction. This development was based on the modernistic planning principles promoting residential blocks and towers in green surroundings. However adapted to soviet ideology and practicalities such as shortage of housing, enforced industrialization and urbanization as well as limited financial capacities, it produced extensive monofunctional areas with dense typical layouts of identical apartment blocks, much more dense and monotonous that their western counterparts (Di Maio 1974; Morton, 1984; French and Hamilton, 1979).

- monofunctional residential neighborhoods with daily services
- 40% of housing / 80% of population
- period of construction: 1960’s - 1980’s
- mass housing for mass urbanisation to accommodate the doubling of the population
- multi-storey mainly 5-9 level blocks of flats
- few standardized typologies and architecture of houses and facilities (service & shopping centers, schools, kindergartens) constructed from prefabricated elements
- integrated with public transportation system

Model of the socialist city source: drawing by author

Densely built housing estates source: Jonauskis, 2010

Population change in Kaunas source: drawing by Jonauskis
Model of the socialist city source: drawing by author
Urban villas, Capital City of Republic of Lithuania, 1918-1940

Modernist housing blocks, Socialist city, 1944-1990

Suburban housing, Post-socialist city, since 1990

Compact blocks, Medieval City, 14th cntr.- 1795

Urban grid, Tsarist Gubernia, 1795-1915

Urban villas, Capital City of Republic of Lithuania, 1918-1940

Dominant housing typologies  source: drawing by author
2.3 Socialist urban residential system: hierarchy of scale and function

The structure of residential element in the socialist city followed pattern of a 4 to 5 (in very large cities) level hierarchy. The whole system was based on the ‘optimized’ residential needs in relation to facilities needed to service certain amount of population within certain radius of mobility directly related to hierarchy of scales.

5 levels

1. Primary service level directly connected with dwelling (post delivery, vending machines, dining rooms, recreation hall, nursery, premises for storage)

2. Microdistrict (rus. microrayon), 3000- 8000 inh., 15-30 ha. Residential area include grocery store, service offices for laundry and repair, dining room, restaurant, housing office and daily service centre, schools, kindergartens, sporting fields, club, garages for private cars. All the facilities had to be reachable operating within the radius of 350-400 metres.

Soviet planners stated that not the size of micro-district that was to define the amount of services, but vice versa. That was considered a key to successful planning.

3. City district consisted of 25,000-75,000 inhabitants. Centres include more specialized services: club, cinema, health centre, sporting halls, barbershop, savings bank, photo studio, café, pharmacy also grocery stores, department stores, catering services for entire district. All the facilities had to be reachable within the radius of 900-1300 m

4. City level (medium sized) consisted of 100,000-300,000 inh. Facilities were meant to form a self-sustainable urban area. A top level, regardless of the population had a centre with public and administrative buildings (administrative institutions, cultural institutions, higher educational and research institutions), transportation terminals, large shopping centres, specialized shops etc. The radius of service was defined by time of 30 min. (considering public transportation).

Planing principles of hierarchical structure of residential system in the socialist cities

a. very large cities
b. medium sized cities

source: Vanagas, 2003
2.4. Problems of the socialist housing estates

Socialist housing estates is one of the major concerns of the most post-socialist cities (Stanilov, 2007a; Tsenkova 2000; 2006; Dekker, 2005; Tosics 2005). Recognizing extent and condition of the socialist housing legacy in this study case it could be stated that the general problems and future threats of post-socialist cities are highly relevant in the city of Kaunas.

Brief initial observations indicate the problems of physical deterioration to an extent of 28%, deterioration of public space, monotony of spatial character, insufficiencies of parking places, safety problems.

However, the most threatening concern according to some researchers is the prognosis for social degradation which could be interpreted partly as a derivative of the conditions in which socialist housing estates could be found today, partly in the initial properties of the applied modernist planning and partly of the transition to the free real estate market where more affluent tend to choose for other housing alternatives. “As soon as the housing shortage is eliminated, apartments in the estates go to the bottom of the market, segregation and urban problems can be triggered” (Dekker, 2005).
2.5. Industrial areas

Industry was the most important sector in the socialist system which always had most investments and gained most governmental attention. Therefore up to 1/3 of the territories in post-socialist cities now are occupied by industrial land. Kaunas could be seen as a typical example of that. In the socialist period city was developed as one of the main industrials centres of Lithuania. Industry still occupies 26% of the economic sector.

The main concentration of industrial development is in the east side of the city, next to the housing estates. Similarly as the housing estates this area was constructed in the suburban area the city.

First industrial expansion in socialist city, Petrašiūnai district source: www.panoramio.com
2.6. Public transportation system

Public transportation is one of the most important elements of the socialist city, which allowed to connect distant and functionally different city parts. Therefore public transportation system is embedded in the socialist city and the micro-districts of housing estate areas. The population density is highest in the socialist housing estates, therefore high enough to support the PT system. However, as the density of socialist housing has a potential tendency to decrease (due to the low space per capita), the viability of the PT has a threat to decrease. Due to high rates of automobilization strong decline in the use of public transportation is a trend in the post-socialist countries and in Lithuania as well (Grava, 2007). Kaunas is no exception of that. The usage of public transport has declined by 20% in the period of 1995-2008. However, still 60% of trips are made by public transport which is a comparably high rate in Europe (Grava, 2007).
Intensity of bus network  
source: drawing by author

Intensity of trolleybus network  
source: drawing by author
3. Processes and trends of post-socialist city
3.1. Model of the post-socialist city in Kaunas

Socialist city model was only possible under the conditions of repressive regime and command economy. Liberated from the rigorous political-economical restrictions of the socialist period, city in the post-socialist period gradually became dominated by liberal market conditions (Stanilov, 2007). That caused an explosion of the structure that suddenly became more spread and diverse. Process of decentralization and commercialization directed the transformation. The historical city centre started to lose its dominance as one centre, all the activity zones and commercial and public functions sprung freely over the city and established positions in the available land or built structures next to the best accessed roads and streets. As the levels of automobilization started to rise dramatically the city structure became gradually dominated by car transport that enabled areas not accessible by public transportation.
3.2. Urban sprawl and decentralization

Through the reconstruction of historical development of the city the concentric expansion could be seen as the main prevailing principle of growth. However the most recent development in the post-socialist period as well as the planned development of the next decade indicate urban sprawl and decentralization. The role of mobility patterns based on private automobile came to play a dominant role in urban transformation as it did in other post-socialist cities (Grava, 2007). New residential developments have been build in the city periphery and out in the region in forms of low density houses in the open countryside or more organized suburban developments and village extensions, all of which well connected to main roads and highways. Logistics terminals and warehouses are the other particularly dominant types of development around Kaunas, situated along the main highways of national and international importance.
3.3. Automobilization

Automobilization is one of the most significant and most influential features of the post-socialist transformation. As the numbers of private cars almost tripled within a period of thirteen years, it had completely altered patterns of mobility that in turn has dramatically changed the way the city became used and perceived. As the accessibility of the region increased that triggered urban sprawl; new low-rise suburban areas and highway oriented commercial and industrial developments emerged.
3.4. Residential development

Residential development is one of the most significant processes in Lithuania and in Kaunas that represents many trends and aspects of the post-socialist development.

3.4.1. Lithuanian housing strategy

The research on Lithuanian housing policy by Muliuolyte (2010) summarizes the key elements of the Lithuanian Housing Strategy (2004) and also explains the recent situation and major problems of housing in Lithuania based on comparison of key characteristic indicators of national and European average values.

Main conclusions:
- There is a housing shortage;
- Weak rental housing sector;
- Limited housing choices;
- Low affordability;
- Low income families have poor opportunities in selecting houses;
- Houses in housing estates are very poorly maintained (common use property, too many private homeowners, not clear who is responsible).

Main strategic goals:
- Expand housing choices, more type variety;
- Provide social housing (for low in come, young families);
- Provide housing for higher and average income families;
- Renovate and modernize buildings in housing estates;
- Use dwellings that are not in demand of the market for social housing;
- Preserve social diversity in housing estates.

3.4.2. Housing problems of Lithuania in EU context

From the data presented by the Eurostat (2010) it could be seen that Lithuania holds an unfavourable position among the countries of European Union in terms of housing conditions. Overcrowding rate in the country is 49% compared with the EU average of 18%. Lithuania holds the fifth and fourth worst positions respectively in categories of severe housing deprivation and overcrowding rate. Here Lithuania is situated close to the other post-socialist countries, the former members of soviet block and is far behind the western European countries.
Housing conditions: severe housing deprivation

Source: Eurostat (ilc_mdho06a)
(provisional value)
EA-16 - Euro area (16 countries)

Housing conditions: overcrowding rate

Source: Eurostat (ilc_lvho06a)
(provisional value)
EA-16 - Euro area (16 countries)
3.4.3. Construction & real estate market in Lithuania

After the stagnation which marked the end of the massive socialist construction period in the early 1990’s in all of the post-socialist countries (Stanilov, 2007a), construction and real estate market in Lithuania has been increasingly growing since the mid 1990’s reaching its peak in 2008, just before the global financial crisis. In 2008 the sector accounted for the 27% of the total gross value added by the economic activity.

A significant part of the construction works is the new residential constructions, which constitute 18%. That indicates the demand for new residential space. Residential constructions are carried out exceptionally only by private sector. The fact that the majority of the residential constructions are constituted by (semi)-detached housing indicates the demand for housing qualities and comfort. However the real estate market and especially the residential sector in Lithuania as a country in transition is very dependant on the bank credit opportunities (Venclauskienė & Snieska, 2009) which is also very related to the income and house price ratio, discussed above.

Facts and figures

- Construction & real estate constitutes 27% of the total gross value added by economic activity;
- 18 % of all construction works are new residential buildings;
- 34 % of all dwelling constructions are (semi) detached houses;
- 66 % of all dwelling constructions are apartments in blocks of flats;
- 100% of all dwellings are build by private sector of which 35% by natural persons, 64% by private enterprises, 1% by construction cooperatives.
3.4.4. Suburban expansion

Suburbanization in Kaunas district

Analysis of the development of Kaunas city since 1990 within the administrative area of Kaunas district show the emerging patterns of urban sprawl (Lekaviciute and Gadai, 2007). As supporting indication of that is the change in population in the recent decade (2001-2010). While Kaunas city has been shrinking in population by 7%, Kaunas district has been experiencing growth of 8.7%. Urban sprawl in Kaunas district region takes place mainly in form of either small separate new developments branching from the roads in the open countryside or extensions of the villages or small towns, where the advantage is made of the already existing infrastructure. Most of the new developments are set in locations easily reachable from the main roads and highways.
Suburbanization processes in post-socialist context

Suburbanization is one of the most common features of the post-socialist countries (Stanilov, 2007a). Although it shares similar features with the western (European or North American) suburbanization such as primacy of private over public interests, deregulated land markets, automobile dependency and reliance on public subsidies (in direct and indirect ways) it also has a set of unique features, namely rapid evolution of applied development models (learning from the examples of the West), simultaneous decentralization in all the sectors (residential, retail and office), slower rate of suburbanization, denser development patterns, different territorial administration (due to availability of open land within the metropolitan borders), more homogenous (affluent) suburban population (Stanilov, 2007a). These characteristics were formed by particularities of transition, common in post-socialist countries, however there are also differences between each of the post-soviet countries (Brade et al., 2009; Nuissl and Rink, 2005; Ourednicek and Sykora, 2007; Stanilov, 2007a).

Suburbanization in Lithuania, appearing around the largest cities, is related to the economic trends, spatial development policies and newly emerged living patterns as well as the aspects of mentality and tradition.

Fundamentally, there is a relation between suburban development and mobility patterns based on private automobile (Dieleman and Wegener, 2004), therefore a significant increase in the number of cars per inhabitant had a striking effect on urban development patterns in Lithuania (Grava, 2007). Along with increased mobility and improvement of living standards there has been a dramatic turn to celebration of consumerism in the society, which previously had been constrained by a number of limitations and insufficiencies of the communist regime. These elements were crucial for the emergence of the new living patterns which made commuting between large supermarkets and suburban housing a regular part of daily routine. Fundamentally, there is a relation between suburban development and mobility patterns based on private automobile (Dieleman and Wegener, 2004), therefore a significant increase in the number of cars per inhabitant had a striking effect on urban development patterns in Lithuania (Grava, 2007). Along with increased mobility and improvement of living standards there has been a dramatic turn to celebration of consumerism in the society, which previously had been constrained by a number of limitations and insufficiencies of the communist regime. These elements were crucial for the emergence of the new living patterns which made commuting between large supermarkets and suburban housing a regular part of daily routine.

Secondly, the shortage of housing, inherited from the soviet period has been reinforced by the shrinkage of the household, which has lead to the rise of the real estate property and land value in the inner city. Herewith the price of an apartment in the socialist housing estate became comparable to the price of a self organized construction of a private house on the plot out of the city. Moreover, the ‘escape’ from the socialist housing estate has a deep symbolic meaning (Stanilov, 2007a).

Thirdly, as it happened in many CEE countries, deregulation of land market and uncomplicated conversion of the agricultural land to urban uses became a standard procedure (Stanilov, 2007). In Lithuania, as an example, even with some legal restraints, many suburban housing was build on the agricultural land under the cover of country homesteads.

Finally, it is important to understand the aspect of rural mentality and tradition. The majority of the urban population in Lithuania and in Kaunas has emerged only since the beginning of forced mass urbanization in 1960’s. Herewith the urban tradition is still very weak. Privately owned house out of the city is therefore considered as the ultimate goal of most of the households. Moreover the tradition of craftsmanship is very prevalent, which allows many households to perform or at least organize construction on their own, allowing to significantly reduce investments.

Threats of suburbanization

This kind of suburban development is already causing particular problems in Kaunas, which might become a serious threat in the future. Lack of infrastructure, daily services, basic facilities and public transportation is not only the problem of emerging suburbia and its residents, but on the larger scale of the whole city it is a potential environmental and societal threat in terms of pollution caused by dispersed traveling patterns as well as social segregation and loss of urban social life (Dieleman and Wegener, 2004; Sennett, 1970).
New living patterns

Traditional Lithuanian house

Socialist housing estates in Kaunas
source: photo by Buineviciute

Construction of a private house
source: http://www.ukrorna.lt/muriniai_namai/straipsniai

Evolution of residential concept: ‘back to the village’
3.4.5. Inner city developments

Density and inner city development potentials

As it could be seen from the residential density map there are large areas of low densities in the inner city of Kaunas. This is due to the low rise low density morphology patterns of the detached residential houses dominant in the territory of the city. The highest densities could be found in the modernistic planning based socialist housing estates areas in the northern parts of the city.

Kaunas has a relatively low density in comparison to the cities of western Europe. Comparison schemes between Kaunas and Amsterdam show extreme differences in density. However, this could be interpreted as a certain potential for densification of the inner city areas.

In fact, the inner city intensification, as a form of compaction (Williams et al, 2000) in its various forms of residential densification as well as intensification of functions actually could be noticed as a recent trend in the post-socialist city. Locations of high commercial potential have been occupied by new shopping centres and offices, occupying open land and replacing small houses or former public functions, new residential blocks have been inserted into the residential areas, where the land could be easily accessible for development.

Inner city densification: residential developments

New inner city residential developments have been taking place in the recent decades. Majority of such developments are situated in squares and parks, next to the existing residential areas, often near the socialist housing estates due to the vast areas of public space. All of these developments are built by private investors, often large real-estate companies and construction companies.

Such developments have been undertaken in the locations where it was possible for the developer to acquire the land. Then the land use of the plot is changed based on the detailed plan (see chapter Planning system in Lithuania). Therefore such developments are not be based on larger urban considerations or local needs and so they often do not integrate to the surroundings.

As soon as the housing mortgages became available for a majority of middle class and especially young families, construction boom started. Because of the extremely high demand and yet low supply of newly build apartments, flats were often reserved even before the beginning of the construction works. At the peak of the demand there were precedents of speculation on reservations, were reservations were resold to the third parties for higher prices. In such circumstances buildings have been often based on very primitive master plans architectural solutions. Such developments often take form of residential tower blocks, or rows of blocks, typologically and often aesthetically very similar to those of the socialist housing estates, just far more compact. Constructed very fast, using cheap materials buildings often result in poor quality.

Summarizing the trend it is possible to conclude that in terms of applied development principles new inner city residential developments follow the line of the socialist tradition, just adjusted to neo-liberal market principles. This is, however very logical because of very similar conditions, namely housing shortage leading to ‘optimization' on one hand, and yet unchanged knowledge of planning and urban design tools leading to some kind of derivative of modernist principles on the other. Last, but not least, it could be noticed that this is also perhaps very related to the inert mentality of people, who accept the same well known principles yet fully not understanding their new sub-conscious power, consumer demand.

Main characteristics:

- random locations
- low availability of land due to legal problems and planning and building regulations
- inefficient process based on detailed plans largely dependant on bureaucracy, developers profit, lack of transparency, denial of social participation etc.
- non-integral projects
- new developments consume the communal assets and do not contribute to the quality of adjacent urban fabric often evoking conflicts with local communities
- low quality of architecture and construction morphological principles and building typologies often based on soviet prototypes
Bustuva Quarter, 2010
source: www.bustuva.lt

Apartments in Kreves street, 2008
source: www.miestai.net/forumas/

Smelai, 2010
source: www.smelai.lt

Apartments in Archyvo street, 2007
source: www.miestai.net/forumas/
3.4.6. Renovation of the socialist housing stock

The need of the renovation is emphasized in the Kaunas City General Plan (2003) and the first projects were realized in 2005, however since then the process has been slow and unpromising. Financial burdens have been largely left to the owners of apartments, management has been weak and unsuccessful. Many projects ended in the court leaving all participating parties unsatisfied. Only recently national government has taken active steps to strengthen the financing and management in order to activate renovation process. However, even though this initiative is positive and could be a good starting point in the transformation needed for the socialist housing estates, in the way as it is understood now (mainly as an improvement of physical condition of houses) can not solve the larger urban problems nor prevent from the threats of social degradation.

Aims
- focus on reduction of heating costs
- physical maintenance
- cosmetics facade improvements

Problems
- only renovation of buildings, urban problems remain unsolved
- only few projects realized
- financial problems
- frequent problems and conflicts between involved parties

Potentials
- new pilot projects intend to include solutions for:
  - building renovation
  - city infrastructure
  - car parking
  - waste disposal
  - recreation places
  - greenery
3.5. Planning system in Lithuania

Post-socialist transition has appeared to be an incredibly complicated task for planning institutions in the post-socialist countries. Post-socialist planners had to face challenges of rapidly and dramatically changing socio-economic and political conditions, while undergoing crises of relevant knowledge, professional legitimacy and control mechanisms (Stanilov, 2007b). Therefore it could be understood that contemporary planning system in Lithuania as well has some weak or missing elements.

Current planning system in respect to the city planning consist of three types of planning documents, which correspond to two different levels. **General Plans** (**land use plans**) and **Special plans** are usually prepared on the scale of the city while **Detailed plans** are prepared on the very local levels.

Such system does not cover the medium levels of developments necessary on the city districts or neighbourhood scale. Current planning and development practice based on the detailed plans in relation to city scale land use plan (**General Plan**) contribute to chaotic and corrupt developments. It is a common practice to alter the land use initially defined by the land use plan of the city according to the emerged private interests represented in the detailed plans which opens possibilities for manipulations in favour of narrow interest groups.
4. Urban activity studies

This section presents studies of the activity zones as they could be seen in the current state of post-socialist city and discuss some more significant transformations. Study is based on mapping of location and concentration areas of the main public activities present in the city embracing medical services, education facilities, administrative institutions, main shopping centres, cultures and recreation facilities. The results would indicate potential activity zones—centralities, their relation to the mobility patterns and socialist housing estates.
4.1. Medical services

Medical services are represented by the:
_ institutions providing health care (health centres, hospitals, private medical practices, odontology practices);
_ institutions manufacturing and/or trading pharmaceuticals in form of retail or wholesale.

This mapping does not indicate distinction in the importance, intensity or size of the facility, therefore it serves for determining the overall distribution of the medical services through the territory of the city.

Mapping indicates more concentrations in the city centre and along the main southwest-northeast axis of the city.

More equal distributions could be seen in the north-east part of the city also including the northern semi-circle of the socialist housing estates with combinations of medical services in all neighbourhood centers.

Few facilities could be found in the southern and western parts of the city as well as in the areas which have more industrial functions.
4.2. Culture and recreation

Culture and recreation services are represented by the:
- institutions providing culture (museums, theatres, cinemas);
- religious institutions (places of worship, religious organizations);
- tourism and recreation facilities (mostly outdoor facilities including parks, squares, observation facilities and leisure related to natural resources);
- sporting facilities (indoor sporting centres, arenas, outdoor playing fields, stadiums).

This mapping does not indicate distinction in the importance, intensity or size of the facility, therefore it serves for determining the overall distribution of the services through the territory of the city.

Mapping indicates more concentrations of cultural and religious institutions in the city centre (medieval city and the 19th century extension). However such institutions could also be found in socialist housing estate areas where the cultural institutions are mainly represented by local libraries in the microrayon centres (regardless of the local cinemas which have disappeared with the mass privatization of the 1990’s) and the churches which have been added in the post-socialist period.

Tourism and recreation facilities are mainly situated near the water areas in the natural settings.

Sporting facilities, usually in forms of open playing fields and small stadiums could be found in all the socialist neighbourhoods.
4.3. Educational institutions

Medical services are represented by the:
- institutions providing higher and professional education, including universities, colleges, professional schools;
- institutions providing extracurricular education such as art, music or sport schools as well as special schools for particular social groups;
- institutions providing primary and secondary education (regular schools);
- institutions providing children care and pre-school education (mainly kindergartens and nurseries).

This mapping does not indicate distinction in the importance, intensity or size of the facility, therefore it serves for determining the overall distribution of the medical services through the territory of the city.

Mapping indicates concentrations of higher and professional education as well as extracurricular schools in the city centre. Particular agglomeration of professional education could be found in the north-east part, at the edge of the socialist residential semi-circle and the large industrial zone.

Schools and kindergartens could be seen more equally distributed in the city, except the southern and eastern parts of the city. Complexes of such educational institutions could be seen systematically distributed in the socialist housing areas, where schools and kindergartens determine the centres of microrayons (according to the principles of the neighbourhood unit).
4.4. Shopping centres

Shopping services are represented by the:
- main supermarkets of local neighbourhood level as well as shopping malls of the municipal and regional level;
- large specialized retail stores which supply with special equipment (e.g. cars, sporting inventory, domestic appliances, etc.), department stores, home improvement centres;
- indoor and outdoor markets.

This mapping does not indicate distinction in the importance, intensity or size of the facility, therefore it serves for determining the overall distribution of the services through the territory of the city.

Mapping indicates concentrations of shopping centres along the main roads. Here the main southwest-northeast axis, the old city road leading to the centre is of the greatest significance. Some linear patterns of other old city roads leading west and south from the centre could be seen.

The socialist residential neighbourhoods have a quite equally distributed network of supermarkets serving all the neighbourhood units. Many of these contemporary supermarkets are the transformations and enlargements of the local shopping centres and cultural institutions of the microrayon centres. However, some new supermarkets were also build in the high density areas to facilitate the increasing demand for consumption.

Some larger shopping malls were found along the city ring road, by the city entrances and the main roads, well accessed by car.
4.5. Facilities: public institutions

Public services are represented by the: administrative, law institutions, police, post offices etc.

This mapping does not indicate distinction in the importance, intensity or size of the facility, therefore it serves for determining the overall distribution of the medical services through the territory of the city.

Mapping indicates concentrations of public institutions in the historical city centre where most of the administrative institutions are situated in close agglomerations. Other public institutions are more equally distributed in the city with some local administrative institutions in the city district centres also including police and post offices.
4.6. Specialized centres

Contrary to the previously discussed maps of the facilities, this mapping does indicate distinction in the importance, intensity and size of the facilities or the agglomerations of the particular kind of facilities, therefore it serves for determining the specialized public centres. The centres are classified in to the following categories: shopping, medical, recreation, education and administrative.

The largest diversity of centres could be found in the historical city centre, dominated however by the commercial function. The other dominant commercial centre is situated along the main southwest-northeast axis, the old city road leading to the centre. The other distinct linear commercial centre could be found on the east side of the city in the industrial strip situated along the main road connecting to the city ring road.

Overall most of the centres are found in the northern part of the city with only a few exceptions in the southern part. All the larger commercial centres or larger agglomerations of smaller centres are close to the highway connections. Most of the smaller commercial centres are situated in the socialist residential areas as well as on the edges of the main industrial area on the eastern part of the city.
4.7. Centralities

The mapping represents all previously separately discussed facilities in one map. Here the concentrations of facilities indicate centralities. Five areas with highest concentrations of facilities were schematically defined. The highest concentrations of facilities could be seen in the historical city centre consisting of two parts: one is the medieval city, the compact concentric old town, the other one is the 19th century extension situated east from the medieval part with more elongated spatial character. Particular concentration of the facilities is the main southwest-northeast axis, the old city road leading to the centre. Other two distinctive concentrations could be found in the northern part of the city by the highway entrances to the city in the northeast and northwest. The northwest centrality is overlapping the main southwest-northeast axis forming higher concentrations. Both of these centralities are situated in the socialist residential areas. Less significant concentrations could be found along the main roads and in denser residential neighbourhoods, especially in the socialist housing estates.
4.8. Facilities in the socialist housing estates

The mapping represents all previously separately discussed facilities in one map also in combination with the build up of the socialist residential areas and the microrayons (socialist neighbourhood units). Here it could be seen that each of the microrayons has a certain combination of facilities which were already set in the initial development of those neighbourhood units. The complex of facilities usually include schools and kindergartens, sporting fields, club, shopping and other daily services. These elements have remained largely unchanged except from the more commercialized character it gained in post-socialist transformations which brought enlargements of the shops and reduction in public facilities namely community places and clubs.

On the larger scale of the socialist residential areas neighbourhood units are combined into the city district which has a wider complex of facilities including non-daily services and cultural facilities such as cinema, health centre, shopping centre, sporting complex. These elements could be still found along the main streets between the microrayons. In the recent decades of post-socialist transformations these centres have undergone strong commercialization which introduced large shopping centres meanwhile all the cinemas were transformed into other commercial functions. However there were new facilities such as churches, leisure centres, home improvement centres, domestic appliances and specialized shopping centres, cafes, restaurants, banks, beauty shops, new health centres which adjoined and strengthened the district centres. This accelerated the redefinition and diversification of the originally artificial hierarchy of initially equally important district centres.
4.9. Facilities and intensity of the public transportation network

The combined map of public transportation network intensity and the facilities show strong correlation between those two elements. This indicates that the largest concentrations of the facilities appear to follow the most intensive segments of the public transportation network. From here it is possible to conclude that public transportation network still holds a relatively strong position in the mobility patterns of the contemporary city.
4.10. Facilities and intensity of the road network

The combined map of road network intensity and facilities indicate certain correlation between the two elements. However, in comparison to the intensity of the public transportation network, road network show less correlation to the concentrations of facilities. Most of the correlation could be found in the street segments directly connected to the main entrances to the city from the highway.

The intensity of the road network is highest on the highway which functions partly as the city ring road. This is well related to the recent and prospective developments, however the concentrations of facilities in these areas are very low if existent.

However, there is a case of a particular highway-related facility development (a typical highway shopping and leisure centre) by the northwest node at the entrance to the city.
5. Conclusions & Problem statement
5.1. Model of the post post-socialist city: most probable scenario

According to the current development trends and municipal development plans (Kaunas General Plan, 2003-2009), the next city diagram would probably develop further away from sustainable model extending towards the region with massive mono-functional zones, either highway oriented industrial and commercial centres or vast low-rise residential areas.

Sprawling Post-Socialist City (in terms of structure)

A city sprawling further into the region with extensive low-density private automobile dependant housing areas served by large highway shopping malls and connected to the inner city by freeways (Stanilov, 2007). The historical city center and adjacent areas of the inner city are gentrified, while the surrounding inner city with extensive socialist housing estates - a daughnut of decay (Smyth, 1998) - are degraded into urban slums (Tossics, 2004; Szelenyi, 2006 cited in Stanilov, 2007).

Private City (in terms of the public space)

“The public realm is shrunk to the corridors serving exclusively the utilitarian function of moving motorized traffic, with a heavy accent placed on the needs of the private automobile. Places for gathering are limited to: the parks (some of which are also private); the streets downtown (dominated by the offices of private corporations); and a few market places (developed by corporate sponsors as theme parks for shopping and entertainment). Cities in the southern parts of the U.S., such as Atlanta, Phoenix, and Houston, come to mind as fitting this description” (Stanilov, 2007).
5.2. Problem statement

Insufficient management of the socialist legacy and unbalanced development of the post-socialist city bring threats of social and environmental sustainability, particularly in terms of social segregation, loss of urban vitality, inefficient land use and environmental pollution.
In this chapter alternative position towards problematization and approach towards vision are introduced. Vision for the city and its constituent parts are presented.
1. Approach
1.1. Changing aspect of problematization

From problematization of the socialist city to problematization of the integrity of the socialist city.

- Development of the post-socialist city shows weak integration of the socialist urban structures.
- Socialist city is seen not as a potential functional complexity but rather as a poor material heritage, the appropriateness of which is considered very limited, doubtful and uncertain if not overall impossible.
- Post-socialist city should be problematized as unsustainable development.
- Perspective towards socialist legacy should be changed concentrating on the potentials of the socialist structures.

Interpreting problems and potentials: socialist city vs. post-socialist city

Potentials of the legacy of the socialist city.
Adopted from Stanilov (2007b).

"If the positive aspects of post war housing could be preserved Europe would gain a lot to reach her very ambitious sustainability goals" (Tosics, 2005).

- High usage of public transportation (60% of all journeys)
- Compact in form and density
- High enough residential density to support public facilities and infrastructures (and public transport)
- Well defined boundaries of the city
- Vast open spaces (parks, squares, streets)
- Availability of public facilities (schools, kindergartens, sport facilities, shops, libraries, post offices etc.)
- High degree of social coherence
- Large share of land under the public ownership


"While Europe is looking towards sustainable development for future, cities in post socialist countries appear to be moving opposite direction – away from sustainability" (Tosics, 2004).

- Socio-spatial fragmentation
- Urban sprawl
- Incoherent spatial transformations
- Commercialization of public space
- Automobilization (decreased public transport use by 20%)
- Lack of spatial-functional integrity
1.2. General approach: Inverted transformation of layers

Because of the weak appropriation of the socialist city in the post-socialist city, understanding of historical transformation, when new layers of structures transform preceding layers is not relevant.

More relevant approach could be the inverted, ‘downward’ transformation approach, which would establish perspective from the socialist city herewith recognizing the potential relevance of the spatial structures of the socialist city in the future sustainable city.

This new interpretation of the socialist legacy would allow to exploit advantages and explore possibilities to integrate and reuse (‘recycle’) structures of the socialist legacy by applying new spatial and functional connotations. In other words, structures of the socialist city (public transportation system and socialist housing estates) could be used as a framework to form a new, alternative city diagram.

1.3. Ambition

Ambition is to shift the course of current post-socialist city transformation towards the more sustainable urban structure and herewith to shift the focus of current development from quantitative production to the comprehensive strategic introduction of qualitative urban environments in relation to broader development aims, with particular emph-
Recycling elements of the socialist city: public transport and socialist housing estates  

source: drawing by author
2. Vision
2.1. New diagram for the city: Compact polycentric city

A compact polycentric city model is proposed, that would refer to the qualities of Compact City and Open City models. The new model emphasize on the developments within the city (urban restructurization and regeneration), development of sub-centres, and improvements in public transportation system.

Compact City (in terms of structure)

Compact city is “a relatively high-density, mixed-use city, based on an efficient public transport system and dimensions that encourage walking and cycling “ (Burton, 2000: 1970)

Open City (in terms of public space)

“ Its features are best exhibited by some of the most celebrated cities of Western Europe such as Paris, Vienna, and Amsterdam. Public space here is treated as an integral element of the urban fabric, structuring space and movement in the city. This framework is supported by an excellent public transit system in an overall transportation scheme that treats the automobile as an equal participant in the urban circulation. Priority is placed on the needs of the people experiencing the city by foot “(Stanilov, 2007).

2.2. Vision

Vision A: Upgrading public transport system

_ Introducing high quality urban transport system: Bus Rapid Transit system (BRT) 
_ Improving existing public transport 
_ Integrating public transport and public space

Vision B: Developing city sub-centres and regenerating socialist housing estates

_ Reinforcing peripheral centralities to serve as city sub-centres 
_ Regenerating socialist housing estates around the sub-centres.

New city model is expected to:

_ reduce suburban expansion; 
_ facilitate suburban periphery; 
_ increase usage of public transportation; 
_ increase quality of public space 
_ regenerate socialist housing estates
3. Vision A: Upgrading public transport system
3.1. Bus Rapid Transit (BRT) system

What is a BUS RAPID TRANSIT (BRT) system?

The Institute for Transportation and Development Policy defines a Bus Rapid Transit as a “high-quality, customer-orientated transit that delivers fast, comfortable and low-cost urban mobility.” The ITDP regards a system as Bus Rapid Transit when it comes with most or all of the following elements:

- Dedicated bus corridors with strong physical separation from other traffic lanes.
- Modern bus stops that are more like bus “stations”, with pre-board ticketing and comfortable waiting areas.
- Good station access for taxis, pedestrians and cyclists, and adequate storage facilities for bikes.
- Land-use reform to encourage higher densities close to BRT stations.
- Large, high capacity, comfortable buses, preferably low-emission.
- Differentiated services such as local and express buses.
- Prioritization at intersections either as signal priority or physical avoidance (e.g., underpasses)
- Co-ordination with operators of smaller buses and paratransit vehicles to create new feeder services to the bus stations.

Why BRT in Kaunas?

- High quality service (adequate to tram)
- Economically viable
- User attractive
- Contributes to the city identity
- Flexible to implement and adjust to urban changes
- Environmentally friendly
- Suitable for inter-modality (bicycle on board)
- Suitable for specifics of urban form
- Suitable for specifics of terrain
- Rapid implementation

European cases: Paris (France); Nantes (France); Eindhoven (Netherlands); Dublin (Ireland) etc.
3.2. Main BRT poles

BRT routes consist of [1] the circle-shaped line and [2] the main axis line. The main principle of BRT lines is to strengthens links inside the inner city and improve connectivity between the main centralities of the city. Main BRT poles are city centre, that is connected from both, east and west sides and city sub-centres (defined in vision) at the north-east and north west peripheries, at the main entrances to the city.
3.3. Activating public space

BRT routes would bring impulse to reconstruct transport corridors into quality public space as well as extend potentials of the existing public space and enhance commercial development opportunities around the BRT stops.
3.4. Embracing activity zones and places

_BRT routes would embrace objects of city and district importance creating reinforcing public places and improving accessibility to services, also bringing reinforcing potential for new developments of services around the stations.

_BRT routes would connect zones of the highest activity as well as specialized centres in the city.

Objects of city/district importance:

- _administrative (municipality/ court/police)
- _public space (park/square)
- _transport (station/bus terminal)
- _sports and recreation (sports complex/ sporting halls/universal halls/ playfield/stadium)
- _shopping mall
- _market (open-air market/ indoor market)
- _leisure (cinema/games/casino/café/bars/restaurants)
- _specialized shops (home improvement centre/ domestic appliances/ clothing/ automobile/ furniture etc.)
- _services (banks/repair shops/beauty shops)
- _district centre (containing typical elements: shopping centre, services, schools, kindergartens, stadiums, local squares)
- _culture (theater/concert hall/open stage/museum/library)
- _science & education (campus/university faculty/gymnasium/ research institute/ R&D centre)
- _religious (church/mosque/ chapel/monastery)
- _medical (hospital, health centre, clinic)
Specialized centres along BRT routes source: drawing by author

Activity concentrations along BRT routes source: drawing by author

BRT stop service area:
r= 400 m / 5min walking distance
R= 800m /10min walking distance
3.5. Serving most of the population

_BRT catchment area would cover most of the inner city area within the reach of 800m radius (10 min walking distance).

_BRT routes would serve most of the inner city population connecting along the most densely populated districts of the city, including socialist housing estates.
BRT routes in the socialist housing estates  
source: drawing by author

BRT routes along the densest residential areas  
source: drawing by author
3.6. Strengthening other public transport routes

Next to the BRT service that improves mobility along the main lines of the city, upgrades of other public transport along some other segments are necessary in order to improve connectivity in areas where BRT service is not viable. Such lines would improve accessibility to the smaller concentrations of public facilities as well as the specialized service centres more distant from the main BRT lines.
Improving PT connectivity to the specialized centres  source: drawing by author

Improving PT connectivity to the activity areas  source: drawing by author
3.7. Stakeholder analysis:
BRT system

Public sector

Ministry of Transport;
Ministry of Environmental Affairs;
Ministry of Energy:
  _ coordination on the governmental level
  _ financial support from the national government
  _ coordinating EU funding

Kaunas City Municipality:
  _ ownership of land and infrastructures
  _ coordination of the project
  _ finance for implementation and maintenance
  _ promotion of the system

Civil society

Citizens:
  _ participate in choosing design (identity) and some
    functional elements of the system

Private sector

Developer of the BRT system:
  _ implementation and maintenance

Operator of the BRT system:
  _ investments in implementation and maintenance
  _ promotion of the system
  _ ensuring quality of performance

Other PT operators:
  _ collaboration in terms of efficiency of routes and transfer nodes

Trolleybus company:
  _ transfer of the trolleybus service as a PT mode into
    BRT and bus service
  _ potential (co)operator of the BRT

Bus company:
  _ potential (co)operator of the BRT

Owners and operators of infrastructure networks:

Electricity provider:
  _ improvements of infrastructure in relation to the requirements for the new system

Heating provider;
Water/sewage provider;
Gas provider;

Electricity provider:
  _ improvements of (underground) communications due to reconstructions of streets

Real estate developers:
  _ TOD development along corridors and nodes
    (offices, residential units, multifunctional centres)

Enterprises/ retail/ service providers/ local entrepreneurs:
  _ development of commercial activities around nodes
4. Vision B: Developing city sub-centres and regenerating socialist housing estates
4.1. Reinforcing centralities

Centralities in the northern periphery of the city and northern end of the main axis would be reinforced by introducing more urbanity and spacial-functional quality: public functions and places, better public space, access to different modes of transportation. Territories adjacent to new city sub-centres (mainly socialist housing estates) would be integral to the development of the centres.

Reinforcing centralities would allow to:

- serve for the suburban areas;
- bring more urbanity to the fringes of inner city;
- establish multi-modal change points;
- generate impulse for restructurization (regeneration) of the socialist housing estates
4.2. Consolidating activity areas

Sub-centres would be formed by upgrading existing centralities and most important activity zones in the periphery of the city. Development of the sub-centres would consolidate existing concentrations and enhance their performance.
Centralities have potential to be organized at the highway gates to the city, where is a high potential of connectivity to the region. In that respect socialist housing estates have a favourable location for the development of urban centres.
4.4. Centralities as hubs for multi-modal integration

...work as hubs for multi-modal transfer.

Modal interchange nodes would enable convenient, efficient and sustainable patterns of mobility. As one of the key examples would be the possibility for regional commuter or city visitor who arrives by private car to park it near the city entrance and use public transport system to reach the city centre or other destination in the city by fast and convenient public transport herewith avoiding possible traffic or parking problems and causing less pollution in the city. Similarly, in order to make inter-city express bus service more efficient, bus terminal at the peripheral centrality would allow to avoid detour to the central station.
In this chapter analysis of the study area at the scale of city part (district) is presented. This part of research intends to scan the main functional elements and systems that are relevant to the socialist housing estates and bring forward the main problems and potentials that could be found in the area. Research is organized along the topics of Public facilities and commerce, Housing, Mobility and Open space. The aim of this research is to analyze feasibility of the vision defined on the city scale and raise strategic tasks for development of the strategy.
1. **Study area. Location and general characteristics**

The study location is situated in the north-west part of the city, next to the national highway Klaipėda (the national port city, 200 km)- Vilnius (capital city, 100km) and in between Kaunas international airport (8 km) and historical city centre. The area embrace part of the main city axis, Savanorių av. and large part of the socialist housing estates.
Study area, 3 x 4.5 km

Bijlmermeer housing estates, Amsterdam, 3 x 4.5 km

Kaunas historical city centre and surroundings, 3 x 4.5

Amsterdam centre, 3 x 4.5 km

Study area
2. Housing
2.1. Socialist housing estates

Housing estates are the densest areas in the city. Districts are constituted of residential neighbourhoods, ‘micro-districts’ (russ. microrayon), which in this study area vary from approximately 2,500 to 10,000 inhabitants or 1,000 to 4,000 dwellings. It is important to note that the existing (data 2009) numbers of inhabitants are from 47% to 82% lower than it was originally planned in the period of 1970’s and 1980’s.
2.2. Housing typologies

The area has mainly two typologies. It is dominated by modernist housing blocks with some urban villas types mingled in between.
2.3. Urban villas

Main characteristics:
plot: 600 m²
architecture: 2-3 main types of standard projects with one dominant project: 1 level with attic, 128 m², pitched roof, white brickwork.
parking: inside the plot, next to the house, in the shed or the garage.
Such houses have been undergoing major reconstructions in the post-socialist period. Typically reconstructions involve transformations of the attic into the first floor acquiring additional living space. In some cases extensions on the ground floor are built in forms of garages sheds and small buildings for utilities, recreational or dwelling uses. Many streets are wide and have sidewalks, street sides are often used as additional parking space.
2.4. Modernistic apartment blocks

Apartment blocks were developed according to the few standard projects that had several modifications. This allowed industrialized construction methods based on the prefabricated parts - an array of typical panels that could be assembled in the construction site. Such methods allowed to build fast and satisfy never ending housing shortage with satisfactory quality dwellings.

The most typical in the area are 5 storey and 9 storey apartment blocks designed of typical sections that could have several modifications for a limited urban design solutions of the micro-districts. 5 storey walk-in blocks were often designed in 5 section rows or three section angled arrangement, 9 storey blocks, that have elevators, usually were designed in two or three section combinations.

Main typologies of modernist appartment blocks source: drawing by author

5 storey 5 section row, courtyard; source: photo by author

9 storey varied number of sections combination source: photo by author
2.5. Post-socialist housing developments

The area have several locations of post-socialist housing developments. In principle there are four locations, where developments occupied the edged of parks, undefined open green areas or incomplete micro-districts. These housed are varied in typologies ranging from suburban houses (in the north of the area), row houses (east of the area), small apartment houses (west of the area) and large apartment blocks (centre and east of the area). Such developments indicate favourable position of the district in the city. However they are often developed as small enclaves, similar to gated communities, which are not well integrated into the surrounding urban fabric.
Typologies in the area source: drawing by author

Typologies and micro-districts in the area: study samples source: drawing by author
2.6. Integration of urban villas and modernistic apartment blocks

Most of the area is dominated by modernistic housing typologies, that have their systems of array which vary in different districts and micro-districts depending on the period of construction. However, there are zones in the area (mostly south-west and centre-north) that are dominated by urban villas typology. These zones are parts of the urban structures of the pre-modernist planning; quarters and streets of the city extension and rudiment structures of the old villages. Some modernist structures were re-arranged in non-typical arrays to react on the existing element. Therefore not all districts or micro-districts have homogenous structures. Also zones dominated by urban villas typologies have elements of modernist structures. A number of combinations exist that vary in proportion between there typologies.
3. Public facilities & Commerce
3.1. Main axis
Strip of commercial and public functions

Non-residential post-socialist developments reinforced the main axis with new commercial and public functions. New banks, insurance companies, interior design shops, shopping malls, specialized shops, service centres, gas stations, fast food restaurants etc. have emerged next to the distantly located shopping centres, public institutions and domestic service centres. The main axis became filled with international brand names and other attributes of the globalized world.
Non-residential buildings built in post-socialist period, situation in 2010  
source: drawing by author
3.2. Post-socialist non-residential development

It could be seen that non-residential (mostly commercial) development that sprung up in the area have certain patterns. Most developments have been built along the main axis of the city - Savanoriu av. and the main district streets where there was more open land available for construction.
3.3. Micro-district centres

Micro-district centres are usually located on the edges of the micro-districts to serve part of the residential district and to cover the whole area of estates within the service area of 250-500 m. There is one district centre, that was supposed to serve area within a radius of 1000 m.

Micro-district centres provided a range of functions for daily service including grocery store, domestic supply shops, such facilities as library, culture centre, post-office, barbershop, laundry service, repair-shops. The district centre had more facilities that also included facilities for non-daily use such as health centre, cinema, cafe, specialized shops and services.

In post-socialist period micro-district centres have been commercialized by extending the area for shopping centres and some services at expense of cultural functions, also parking plots were extended at expense of public space.
Micro-district centres with associated public spaces; source: drawing by author

Micro-district centres with service radius of 350 m; source: drawing by author
Kalniečiai district centre: main buildings and associated public space; source: drawing by author

Main centrality axis (Savanoriu av.): public buildings with associated public space; source: drawing by author
Kalniečiai district centre was one of the main centres in the socialist housing estates of this study area. While some other district centres have been losing their dominance in the post-socialist period due to the spread of commercial services, Kalniečiai district centre have been reinforced. Similarly to the micro-district centres, this district centre has expanded as a commercial centre, while losing cultural facilities. New shopping mall, market place and series of specialized shops, services and leisure facilities have emerged next to the district health centre, Kaunas regional municipality and district shopping centre. The area, which was the district centre in the socialist period, has been turning into the epicentre of the larger city-scale sub-centre (main city axis- Savanoriu av.).

3.4. Kalniečiai district centre

From top left to right: shopping centre/ indoor market/ Kaunas region municipality and health centre/ shopping mall

Source: photo by author and www.panoramio.com
3.5. Small scale businesses

Mixed-used, residential-commercial buildings

Most of the mixed use buildings appeared in the early 90’s with the rise of small businesses. It did not appear as particular new typology but arrived from the combination of single family dwelling and family owned business. The fashion of large dwellings, often with a gross floor space of 350-700 m² appeared in the early 90’s during the time when the building materials and service costs were very low. Such houses often had intended or unintended surplus of living and utility area that could be applied for various businesses such as shops, offices, garage services etc. This could be considered as a first generation commercial architecture.
Small scale businesses

**Integrated commercial premises**

Many small scale businesses are found in the ground floors of the apartment blocks. Such activities encompass daily services such as health care, stomatology practice, pharmacy, hairdressers, repair shops and grocery stores. Premises for the activities are acquired by transforming the interiors of apartments: using part of an apartment, replanning the whole flat or joining few, in some cases common-use spaces of the apartment blocks are used. In many cases such functional transformations result in exterior changes adding such elements as new stair cases, ramps, elevators, entry-ways etc.
Small scale businesses

Kiosks

Kiosks have been the primal form of businesses that appeared in the socialist housing estates in the early stage of the post-socialist city. In the early 90’s such form of temporary architecture sprung all over along the main streets of the micro-districts in often clustering around the public transport stops. Most of the kiosk sold all kinds of small goods, snacks, prints, groceries, soft drinks, alcohol and provided services. Some of the businesses gradually started to specialize in particular goods and services often growing into larger units with walk-in shops, cafes, bars, night shops.

The arrays of diverse amateurish designs of private kiosks were gradually complemented by the typical kiosks of municipal and national print companies selling certain variety of goods and wide selection of prints. These kiosk are as well official distributors of all types of public transportations tickets.

In relation to the emergence of dense network of new generation of super-markets and shopping malls operated by large corporations many small businesses including kiosks were pushed out of the market. Many kiosks have been pulled down and some are still remaining closed and decaying. However in the recent years of economic downturn the ‘renaissance’ of the kiosks could be seen. Most of the successful ones specialize in good quality fresh food products providing market prices and are favoured by the public transport users on their way home as an alternative to the large and crowded super-markets.
3.6. Schools and kindergartens

Schools and kindergartens are located in the middle of the micro-districts. They are the core of the neighbourhood unit concept introduced by Clarence Perry, that was also adopted by the socialist modernist planners. The concept is based on the accessibility of schools by children, so that they would not need to go out of their neighbourhood or cross any busy streets.

There was always a lack of facilities in the socialist housing estates, and even though the estates have significantly less inhabitants than it was originally planned, there is a lack of kindergartens.

The system of education has changed and schools have been diversified into specializations on different educational levels. Some high-schools and gymnasiums, that became of larger importance than micro-district or district level, became too much 'hidden' within the inside of the neighbourhood.
3.7. Parking facilities

Parking facilities occupy large areas of the housing estates. Besides the parking areas within or outside the courtyards next to the apartment blocks, there are large areas of garages in the north of the territory. However, the existing parking is not enough. According to the recent calculations, the actual need for parking places within the estates according to nowadays standards (1.2 parking place per dwelling) is up to 8 times bigger than there is place available (Kauno Planas, 2009). Micro-districts are overcrowded with cars parked in every possible space and often at the expense of the most valuable public space within the courtyards, pedestrian paths, green squares and even playgrounds, became gradually and informally turned into parking lots. Meanwhile, the existing garages are no longer relevant as most people in the estates nowadays use their cars daily (which was not the case in 1980’s) and garages are too far away from the houses.
4. Mobility
4.1. Street network
Main roads and superblocks

This map shows division of blocks in the study area. The area is dominated by modernist districts and micro-district superblocks which are separated by main streets, very few streets subdivide micro-districts. Denser network of streets (and finer grain of blocks) is in the south-west area, that is of pre-modernist planning structure.
There is no continuity in the street network of the lower level (that is excluding the main district streets). Most of the streets within the micro-districts are dead-end streets and approach roads that have tree-like structure. Such passages are winding through the micro-districts connecting parking lots in the courtyards of apartment blocks. Even though local residents have adapted to using the structure, it makes extremely complicated for the visitors to find the address or to approach it.

Despite that the area is dominated by the modernist structures, there are also parts that have denser street network or separate streets as rudiments of the village structures. Therefore a range of hybrid structures exist.
4.2. Public transport network

Public transportation system is overall satisfactory in the modernist districts. There are three modes of public transport available.
Most of the stops are accessible within the 400 m radius (or 5 min walking distance), however, that is a theoretical measure, that does not take into account the barriers, that might influence the approach time significantly. It is also important to note, that the best public transport service is available only on one side of the micro-district superblocks, which means that the access to best available service might differ significantly within the estates.

Bus stops

In the socialist period stops did not have almost any small architecture. The only elements used were benches and pole with stop sign.
In the post-socialist period bus stops became appreciated by small businesses as nodes of flow guaranteeing constant customers. This led to the development of kiosks around the most vital bus stops.
The arrays of diverse designs of private kiosks were gradually complemented by the typical kiosks of municipal and national print companies selling certain variety of goods and wide selection of prints as well as public transport tickets.
Together with the standardised kiosks the first typical designs for the bus stations were introduced providing uniform image for the buss stops.

Stations provided public transport users with more comfort serving as shelters from the wind, rain and snow as well as serving as screens for advertisements. Regrettfully rather simple design of the stops appeared not pragmatic enough to resist frequent acts of brutal vandalism.
Catchment area of public transport stops, R= 400 m / 5 min walking distance; source: drawing by author

Catchment area of public transport stops, R= 200 m / 3 min walking distance; source: drawing by author
4.3. Micro-mobility

Pedestrian and bicycle movement in the socialist housing estates is quite complicated. Pedestrians often have to find their way through the ‘maze’ of apartment blocks arranged in the typical ‘stamp’ arrangements that often make access towards the main facilities (neighbourhood centres, schools, kindergartens, bus stops) complicated. However, over the time people local residents have appropriated these structures to make their mobility less complicated. Territories of schools, kindergartens, open stadiums and sporting fields often became trespassed by large flows of pedestrians. Nevertheless, cycling, which was totally disregarded as means of mobility in the initial plans, is still almost impossible inside the micro-districts. There is no alternative infrastructure cyclists could use other than the one used by pedestrians or cars. There are a number of physical limitations and barriers such as narrow paths, level changes, high curbs etc. that make cycling almost impossible. Cycling has become more of a recreational activity for children and adolescents who enjoy their mountain bikes to jump over the curbs and steps.
5. Open space
Open space character source: drawing by author
5.1. Communal spaces

There is surplus of communal space. Undefined ‘floating’ space between the apartment blocks in the micro-districts is ubiquitous. After the privatization of housing stock all the apartments (97%) became privately owned, while all the land around the buildings in the estates remained in public ownership. Even though groups of apartment blocks have cooperative administrations, they often fail to take care of maintenance. While the most adjacent areas around the houses are informally appropriated by the inhabitants and are often quite well maintained, the rest of the ‘floating’ space often becomes no-one’s responsibility and depend on local initiatives that not always exist. It could be noticed that there are certain zones that people relate to and take care of and other zones, such as open strips along the streets or inarticulate patches in between blocks, that associate as neither collective nor communal. Such clearly undefined spaces lack communal attention and maintenance and often are vandalized.
5.2. Private space

The private open space is mainly the courtyards of residential or commercial buildings. They have well defined borders that are always fenced. Some private lots could be found surrounded by collective or communal spaces, these lots are either a part of pre-modernist structures or plots that were 'carved out' from parks or squares, during the post-socialist privatization.
5.3. Communal- private space relation

The communal-private borders are well defined and fenced, however such borders might leave-out unfunctional interstitial spaces, that might appear in the case of private plot located right next to the apartment block. That often brings backyards in front of the apartment block facade blocking view from the ground and first floors as well as reduce privacy of the private courtyards. Therefore such borders are potentially conflicting.

Distance is kept between the buildings source: photo by author

Closed interstitial space source: photo by author
5.4. Semi-public spaces

Territories of schools and kindergartens are the typical semi-public spaces within the socialist housing estates. They occupy wide open spaces between the housing blocks while still preserving openness of space.
5.5. Communal- semi-public borders

Communal and semi-private borders, that are often borders of the schools and kindergartens within the open space in the housing estates, are very open. Territories of schools have no fences and the kindergartens are fenced by low fences or vegetation. That enables these areas to be accessed for public also after their working hours and allows residents of the estates to use the stadiums, sporting facilities, children playgrounds. However, the lack of control and surveillance over these territories also causes problems of vandalism.
5.6. Collective (green) space

The most valuable are green areas: forest, parks and squares. There are many wide street edges, that form green barriers from the streets. However, there is a lot of left-out land, open green spaces with unclear spatial character or purpose. Generally there is too much ineffective and poor quality collective space maintenance of which is costly and economically not feasible.
5.7. Space for infrastructure

There is a lot of land that is dedicated for infrastructure. Apart from the parking garages (in the north of the area) and parking lots, most of infrastructural land-use are dedicated for mobility corridors. Modernistic planning principles brought separation of roads and residential areas, therefore roads are very wide, with broad buffer zones on both sides of the streets to keep distance from housing blocks or other buildings.
Main district street, 95 m between buildings source: drawing and photos by author

Main axis, 85 m between buildings source: drawing and photos by author

Inner micro-district street, 65 m between buildings source: drawing and photos by author
6. Conclusions

Housing

Problems:
- Housing stock is very limited to mainly two typologies: urban villas and modernist blocks.

Potentials:
- Integration of typologies of urban villas and modernist apartment blocks might be applied in the models of restructurization as a way to introduce diversity.

Public facilities and Commerce

Problems:
- Commercialization of the micro-district centres displaced cultural functions and reduced quality of public space.
- There is a severe lack of parking facilities, up to 8 times more parking is required. The problem increasingly affects quality of valuable public space in the immediate surroundings of the apartment blocks.

Potentials:
- The main city axis - Savanoriu avenue has been developing as a linear centrality over the post-socialist period.
- Developments of small scale businesses in the estates indicate that centralization of facilities are no longer relevant.
- Appropriation of the ground floors of apartment blocks for commercial activities indicate certain capacity of flexibility for transformation.
- Successful kiosk development next to the public transport stops shows that commercial activity, public space and mobility could be important integral parts.
- Most micro-district centres are still functioning, through their profiles have changed to more commercialized.

Mobility

Problems:
- Pedestrian movement within and between micro-districts is very complicated.
- There is no infrastructure suitable for cycling.
- Mobility in general is strongly determined by the structure of superblocks and is very complicated within the micro-districts.

Potentials:
- Public transportation system is still and important integral system of the socialist housing estates.
- Limitations for car mobility within the micro-districts might be seen an asset of developed public appreciation of car-free environment.

Open space

Problems:
- There is surplus of public space and communal space in particular.
- There is lack in differentiation of communal space and distribution of ownership and responsibility that results in problems of maintenance.

Potentials:
- There is availability of open space (mainly open communal spaces and wide infrastructure corridors) that could be used for new developments.
- More enclosed communal spaces, usually courtyards of apartment blocks, function better.
- District parks are well used and could contribute to the quality of the environment.

General conclusions

The study area that is dominated by monofunctional socialist housing estates has been influenced by post-socialist transformations, of which commercialization is the most significant feature. Commercialization patterns indicate strong relation to mobility networks (main streets and public transport nodes), where the main city axis strongly dominates as a linear centrality.

There is surplus of public space in the area, of which majority is still under the public ownership. It is an important asset, that could enable various restructurization opportunities.
In this chapter strategy proposed for reinforcement of centrality and regeneration of socialist housing estates is presented. In the first section strategic approach and concepts are introduced. In the following sections two parts of the strategy with series of design tests are introduced separately.
1. A twofold strategy
Strategic goals

There are two main strategic goals that derive from the vision on the city scale:

1. Upgrading centrality to city sub-centre that could to serve periphery;

2. Regeneration (restructurization) of the socialist housing estates (as spin-off effect acquired from the development of centrality).

Two strategies

Two part of the strategy are introduced in accordance to the strategic goals:

1. Reinforcing axial centrality at the nodes;

2. Establishing network for restructurization
2. Strategy part one: Reinforcing centrality
2.1. Axial-nodal development

Strategic concept

The axial-nodal development is a systematic development of linear centrality with particular emphasis on the reinforcement of nodes as multifunctional public places. Centrality is proposed to be developed along the main city axis Savanoriu avenue with reorganization and intensification of the areas around main street intersections.

Preconditions for the strategic concept

There is a set of conditions for axial development of the city sub-centre in the area:

_ the axis is historically most important entrance road to the city and has been reinforced as such through many layers of subsequent transformations;
_ patterns of post-socialist development has shown the potential of development along the axis;
_ there is already a diversity of public and commercial functions along the axis that could become integral to the new developments
_ there is spatial capacity to develop in a strip shaped structure.

Reinforcement of nodes along the centrality would:
_ strengthen integrity to the surroundings through the networks;
_ enable more potential development directions for future expansion.
2.2. Creating modal interchange nodes for mobility

Modal interchange nodes enable to switch between different mobility modes related to networks of different levels. Networks of international/ national/ regional/ municipal/ city district/ local (neighbourhood) levels could be made simultaneously accessible from one locality. These levels correspond do the networks of (inter-)national highways, mains city ringroads, streets, pedestrian pathways and bicycle tracks and modes of private car, international, inter-city and regional bus service, inner-city public transport, bicycle and pedestrian mobility. Importance of modal interchange node depend on the number and range of networks and modes it serves.

Modal interchange nodes would enable convenient, efficient and sustainable patterns of mobility. As one of the key examples would be the possibility for regional commuter or city visitor who arrives by private car to park it near the city entrance and use public transport system to reach the city centre or other destination in the city by fast and convenient public transport herewith avoiding possible traffic or parking problems and causing less pollution in the city. Similarly, in order to make inter-city express bus service more efficient, bus terminal at the peripheral centrality would allow to avoid detour to the central station.
2.3. Functional intensification

Inter-modality could be seen as a potential for the node, that, in order to function, requires certain ‘hardware’ for the modal interchange to take place. These are the build structures such as bus terminals, ‘park and ride’ or ‘park and bike’ facilities, public transportation stations etc. which enable transfer from one mode of mobility to another. Furthermore, these transfer nodes need to be integral to a set of public functions.

All the nodes in along the axis already have a certain range of public functions such as shopping malls, health centres, shops, administrative institutions etc. (lists in grey on the scheme). This part of the strategy offers to intensify functional capacity of the nodes with new complementary functions (lists in yellow).
2.4. Activating public space

Public space is an integral part of the development of nodes. In order for the nodes to be functionally effective, building structures with a set of public functions need to be integrated with public space. The combination of three elements: mobility, public functions and public space could create places that would reinforce centrality. The main input for activation of public space is the Bus Rapid Transit (BRT) line that would change street profile into better articulated high quality public space.
2.5. Spatial capacity for new programs

Development of centrality and reinforcement of nodes requires space for new programs and public space to be organized. The location has spatial capacity for axial development, firstly because of the wide infrastructure corridor that could be densified, secondly because of several blocks of industrial areas situated along the axis that could be easily transformed into public and commercial use. There is also spatial potential for the development of nodes, as there still exist many vacant plots or open parking lots around the street intersections.
3. Design test: Intensification of Kalnieciai node
3.1. Kalniečiai district centre. Existing situation

Kalniečiai district centre was one of the main centres in the socialist housing estates of this study area. While some other district centres have been losing their dominance in the post-socialist period due to the spread of commercial services, Kalniečiai district centre have been reinforced. Similarly to the micro-district centres, this district centre has expanded as a commercial centre, while losing cultural facilities. New shopping mall, market place and series of specialized shops, services and leisure facilities have emerged next to the district health centre, Kaunas regional municipality and district shopping centre. The area, which was the district centre in the socialist period, has been turning into the epicentre of the larger city-scale sub-centre (main city axis- Savanoriu av.).

Intensification program:
- Inter-city (international) bus terminal
- Multifunctional centre
- Offices
- Cinema
- Culture centre
- Commerce
- Services
- Parking facilities
- Market
- Park ‘n Ride facilities
- Regional municipality square
- Hotel
- Mixed function blocks
- Shops and horeca

Design principles:
- Reorganizing street profile and integrating BRT corridor
- Forming street as a public space: integrating space for mobility and public space
- Intensifying along the axis: new public front with diverse programs
- Better articulation of existing public spaces
- Adding vertical dominants

Main axis: reorganizing street section
Kalnieciai centre: functional and spatial intensification, birds-eye view from the north-west
Centrality axis: proposed spatial character source: collage by author

Centrality axis: existing situation source: photo by author
3.3. Stakeholders

Program and levels of interest

**national/regional/municipal**
- inter-city (international) bus terminal
- park ‘n ride facilities

**regional/municipal/local**
- regional municipality square
- hotel

**municipal/local**
- multifunctional centre
- offices
- culture and leisure facilities
- culture centre
- commerce
- services
- parking facilities
- market
- mixed function blocks
- shops and horeca

Public sector

**Ministry of Transport**
- financial support from the national government
- EU funding

**Kaunas City Municipality**
- ownership of land and infrastructures
- coordination of the project
- finance for implementation and maintenance

**Kaunas Region Municipality**
- finance in accordance to the representative aspects of the region through administrative building and square

Civil society

**Citizens**
- participation in the design process of the squares and public buildings

**Local communities**
- participation in design process of intensification next to the apartment blocks

Private sector

**Inter-city bus companies**
- organizing bus terminal, contribution in financing

**Operator of the BRT system**
- investments in implementation and maintenance
- promotion of the system
- ensuring quality

**Other PT operators**
- collaboration in terms of transfer points and stations and stops

**Shopping centre “SAVAS” owner**

**Land owners**
new market pavilion with square

national:
  _Ministry of Transport
  _Inter-city bus companies

municipal:
  _Kaunas City Municipality
  _Public transport operators

local:
  _Shopping mall owner/operator
  _Real estate developers
  _Enterprises/retail/service providers/local entrepreneurs

hotel and regional municipality square

[inter] national:
  _Hotel network operator
  _Developer

regional:
  _Kaunas Region Municipality

municipal:
  _Kaunas City Municipality

new market pavilion with square

municipal:
  _Kaunas City Municipality

local:
  _Retail/service providers
  _Market entrepreneurs

mixed function attachments

local:
  _Real estate developers
  _Apartment owners
  _Enterprises/retail/service providers/local entrepreneurs
4. Strategy part two: Establishing network for restructurization
4.1. Establishing network for restructuring

Strategic concept

The system defines generic principles for the restructuring of the city district. The network system with nodes creates a restructuring framework that opens various possibilities for interventions.

Aims of regeneration:
- Bring urban vitality and diversity to the mono-functional area
- Sustain residential density
- Sustain social diversity and cohesion

Strategic goals:
- Better public transport
- Better accessibility of facilities
- Functional diversity
- Diversity of housing
- Better quality of public space
4.2. Public transport network

Upgraded public transport network is a backbone for restructurization and integration of the socialist housing estates. Besides the improved quality of existing modes of public transportation system, Bus Rapid Transit is introduced as a completely new quality of public transport. New public transport network will improve connectivity within the estates and to the central axis and would improve accessibility of places in the other parts of the city. However, the key aspect of this network is to bring new impulse for regeneration of the main structure in the area. This would allow to bring along new set of functions, improve quality of public space and reinforce places. In particular, that would bring conditions to change street profiles into integrated active public space with new programs along public transport lines and stops, and it would enable to reinforce micro-district centres as public spaces and places.
4.3. Street network

The main aim of improvements in street network is to enhance continuity and permeability. Existing separate street segments are extended and connected, new streets are introduced to break superblocks of micro-districts into smaller parts. New streets would improve accessibility of inner neighbourhood areas. However, the inner quality of micro-districts car free environment is appreciated, so only few new streets are introduced were it is most effective and viable.
4.4. Soft mobility network

Soft mobility network is dedicated to non-motorized transport modes based on routing that connects main collective green areas (parks and squares), inner micro-district facilities (schools, kindergartens, stadiums, playing fields) and micro-district centres on the edges of neighbourhoods. In that way this network would improve connectivity within and between micro-districts and enable redistribution of communal spaces within superblocks.
Proposed soft mobility network and micro-district centres

Proposed soft mobility network and inner micro-district facilities

source: drawing by author
4.5. Integration of networks

Integration of networks is crucial in order to achieve strategic effects. Nodes of the intersections of different networks are most important. These places are the main activity zones that also enable modal interchange. Most important of such nodes are micro-district centres where all networks intersect. This would reinforce micro-district centres as important places, would activate their public spaces and enable development of new programs.
<table>
<thead>
<tr>
<th>Network type</th>
<th>Physical elements</th>
<th>Traffic</th>
<th>Strategic goals</th>
<th>Layout principle</th>
<th>Physical specifications</th>
<th>Modal integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public transport network</td>
<td>Upgraded existing public transport corridors</td>
<td>public transport</td>
<td>• bring new spatial and functional qualities to the main structure of the socialist housing estates</td>
<td>changing profiles of the main streets between the micro-districts</td>
<td>set along main wide streets</td>
<td>• separate lanes for BRT transport in the, often in the centre of the street profile</td>
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<td></td>
<td></td>
<td></td>
<td>• improve spatial quality of transit space</td>
<td>establishing BRT stops next to the micro-district centres and other PT stops at double density</td>
<td>mostly straight trajectories</td>
<td>• other PT share the same space with other modalities</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• reinforce micro-district centres as places</td>
<td></td>
<td>two-way traffic</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• improve connectivity within the socialist housing estates and from the estates to the rest of the city</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• integrate socialist housing estates to the centrality axis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Street network</td>
<td>New (upgraded) streets (or street segments)</td>
<td>car/transit/bicycle/pedestrian</td>
<td>• bring new spatial and functional qualities to the inner areas of modernistic residential ‘superblocks’</td>
<td>adding segments to existing dead-end streets and approach roads</td>
<td>mostly straight trajectories</td>
<td>• depending on the adjoining streets</td>
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<td></td>
<td></td>
<td></td>
<td>• redistribute inner collective space of the modernistic ‘superblocks’ (defining smaller pieces and assigning to particular communities)</td>
<td>establishing as long as possible routes linked by crossings (partially substitute to the main roads)</td>
<td>two-way traffic</td>
<td>• separated from pedestrian</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• distribute concentrated traffic (unloading the main streets)</td>
<td></td>
<td></td>
<td>• space might be shared with bicycle lanes</td>
</tr>
<tr>
<td>Soft mobility network</td>
<td>new (transformed) streets</td>
<td>car/restricted/bicycle/pedestrian</td>
<td>• bring new spatial/functional qualities (diversity and vitality) to the inner areas of modernistic residential ‘superblocks’</td>
<td>establishing routing between places/nodes/areas</td>
<td>often narrow and winding trajectories</td>
<td>• shared space for car, bicycle and pedestrians</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• redistribute inner collective space of the modernistic ‘superblocks’ (defining smaller pieces and assigning to particular communities)</td>
<td>paralleling the main roads</td>
<td>two-way traffic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• improve soft mobility within and between socialist housing estates</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• link public facilities (schools/kindergartens/sporting facilities) inside the micro districts and public facilities (micro-district centres and shopping centres) on the edges of micro-districts</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• link semi-public and collective space that partly belongs to the facilities listed above.</td>
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<td></td>
<td></td>
<td></td>
<td>• link important recreation areas and places (parks/squares)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• link micro-district centres and public facilities (micro-district centres and shopping centres) on the edges of micro-districts</td>
<td></td>
<td></td>
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</tbody>
</table>

Comparative analysis of three networks source: table by author
4.6. Expected structural effects of the strategy

The set of new and altered networks would introduce structural changes: block structure would become of a smaller grain enabling better integrated grid; redistribution of communal space would introduce differentiation.
4.7. Regeneration concept

Alternative strategic concepts for regeneration (restructurization) of the socialist housing estates

There is a number of possible strategic ways that could be applied in restructurization of large housing estates which might depend on the particularities of social, cultural, economic contexts (van Kempen et al.). Presented alternative regeneration principles conceptualize a wide range of possibilities that are applied in different countries into three more extreme (puristic) approaches.

1. Renovation (Rehabilitating modernist structures)

The all-embracing renovation and improvement of housing stock, infrastructure, facilities and public space reference: Berlin, East Germany

**Potentials:**
- densities could be kept at the same level
- old qualities could be rehabilitated and upgraded according to contemporary needs

**Problems and threats:**
- the principles of modernist planning are no longer relevant to nowadays lifestyles
- the existing structures are limited in terms of adaptation
- renovation costs might be inadequate to the achieved overall quality
- might be ineffective in long-term

2. Rebuilding (Neglecting modernist structures)

Most of existing houses are demolished and replaced by new contemporary structures:
- multi-functional buildings
- diverse housing typologies
- new public spaces


**Potentials:**
- cost-effective (new programs and new spatial qualities could be added without demolition)
- space-effective

**Problems and threats:**
- various spatial and structural limitations
- potential conflicts of new and old structures
- social segregation on micro scale
- densities are increasing in already densest areas of the city
- new structures might still not be attractive because of the context
- old structures might lose inherent qualities

3. Intensification (‘Trading’ modernist planning principles)

Using the potential of existing open space new housing typologies, non-residential programs and public spaces are introduced.

historical reference: Tehran, Iran critique: Vanstiphout, 2009

**Potentials:**
- cost-effective (new programs and new spatial qualities could be added without demolition)
- space-effective

**Problems and threats:**
- various spatial and structural limitations
- potential conflicts of new and old structures
- social segregation on micro scale
- densities are increasing in already densest areas of the city
- new structures might still not be attractive because of the context
- old structures might lose inherent qualities
Adopted strategic concept: Integrated intensification (Renovation + Intensification)

reference: Jarva, Stockholm, Sweden

Restructurization based on integration of new and existing structures in order to gain qualitatively new unity (system):

- rehabilitation of the best qualities of modernist planning principles (spatial: open space, vegetation, insulation; social: cohesion, diversity, social networks)
- integral implementation of qualitatively new structures, programs, public spaces

Potentials:
- cost-effective (reusing of existing structures, no demolition)
- space-effective (new programs are situated within existing urban fabric)
- old qualities could be retained
- allows greater diversity (as historical layer- genius loci- is preserved) (Jacobs, 1961)
- avoiding rehousing (providing with new possibilities for housing in the same area)
- win-win situation possible:
  - new structures benefit from the existing infrastructure, facilities, open space
  - old structures benefit from improved infrastructure, new facilities, improved public space
  - allowing to develop on the available land for new development would finance renovation of existing structures
  - allows to sustain residential density

Problems and threats:
- various spatial and structural limitations
- potential conflicts of new and old structures
- social segregation on micro scale
- new structures might still not be attractive because of the context
- old structures might lose inherent qualities

Preconditions:
- New housing is needed: overcrowding rate in Lithuania is 49%, compared to EU average of 18% (Eurostat, 2009)
- Suburban settlements fail to provide with adequate infrastructure and public facilities

Integrated intensification scenarios:

There could be a number of possible scenarios under the integrated intensification strategy that could be based on different aspects. Here three principle scenarios in terms of level of intensification are introduced. All three scenarios establish different approaches towards the intensification as means of restructurization and raise different research questions for development tasks.

1. Minimum - Minimal intensification based on urban acupuncture

RQ: What are the crucial and most effective interventions in order to achieve maximal results?

2. Medium – Moderate intensification based on equilibrium

RQ: How to establish coherence between the existing and new structures?

3. Maximum – Maximal intensification based on capacity

RQ: What is the maximum capacity of current urban fabric to accommodate new structures without negatively affecting existing qualities?

Adopted scenario: Medium intensification

1. Medium – Moderate intensification based on equilibrium

RQ: How to establish coherence between the existing and new structures?

This strategic scenario could establish a flexible starting position for public discussion or pilot projects and allow changes of future strategic directions or tuning of strategies both towards more intensified and less intensified.

This scenario would require a set of regulations for urban design and planning that would focus on the realm (physical and non-physical borders) where existing and new structures might interact. The general approach is that existing socialist structures should not just passively absorb the impacts of new structures, but be active elements in forming qualitatively new environment as a whole new entirety.
4.8. Spatial capacity for intensification

There is an extensive potential for intensification within the existing structure. There could be two distinctive patterns of spatial capacities defined as having most potential for intensification:
1. open spaces (vacant plots and edges) along the existing infrastructure corridors
2. communal spaces within micro-districts
Communal spaces source: drawing by author
5. Design test: Integrated intensification along networks
Centrality axis and adjacent areas of socialist housing estates  source: model by author
5.1. Integrating to centrality

The main principle is introducing functional / spatial / typological diversity to the monofunctional spatially and typologically uniform socialist housing estates.

Development of the centrality could trigger regeneration processes in the adjacent areas of socialist housing estates. Network structure would enable to use potential spin-off effect that would be beneficiary for housing estates.
5.3. Regenerated micro-district centre

Intensification program:
- culture centre
- commercial facilities
- parking facilities
- public space: market square
- regeneration of green square

Design principles:
- better articulation of existing public spaces
- public facilities integrate to the street and public space
- enclosure by intensification
- leaving permeable edges to existing housing blocks
5.2. Street network: inner (inter-) micro-district street

Intensification program:

- small scale commerce and services
- parking facilities
- housing

Design principles:

- reorganizing street profile and integrating soft mobility
- intensifying along the axis: new public front
- better articulation of existing public spaces
- public facilities integrate to the street via public space
Design proposal: continuous inner neighbourhood street source: model by author
5.4. Public transport network: main district street with BRT line

Intensification program:
- offices
- shops and horeca
- services
- parking facilities
- housing

Design principles:
- reorganizing street profile and integrating BRT corridor
- forming street as a public space: integrating space for mobility and public space
- intensifying along the axis: new public front with diverse programs
- better articulation of existing public spaces
- integrating existing apartment blocks via public space
- reacting on the composition of existing buildings
5.5. Design detail: integration of existing and new structures

Existing situation

The existing site is occupied by five apartment blocks forming an oblong courtyard. The blocks are at the edge of the micro-district and therefore are situated parallel to the main streets of the district. There is a green zone between the streets and apartment blocks, however, this green edge is poorly maintained as the responsibility borders (communal-collective) are vague.

Integration principles

This design detail illustrates intensification along the edge of micro-district. The main design task is integration of existing housing blocks and new structures. This design test concentrates on the redistribution of communal space and organizing the border.

The crucial element of integration is shared communal space—terrace. Being accessed from private courtyards communal terrace would become an actively used space and a place for community events. This would and allow social contacts to happen between residents of old and new structures and eventually enable shared responsibility for maintenance of communal space.

Design principles:

- transforming street profiles with public front
- renewal of the existing apartment buildings
- creating shared communal space
- introducing functional flexibility
Existing situation: deteriorated edge of the micro-district

source: model by author
Existing situation source: model by author
Design proposal for integrative intensification source: model by author
EXISTING FABRIC

- green area: 12,000 m²
- housing: 17,300 m² (net floor area) / 452 units

REFURBISHMENT

- private terraces: 5,350 m²
- private courtyards: 4,900 m²
- collective deck terrace: 3,300 m²
- collective parking garage: 170 places
  [instead of 88 existing open parking places]

NEW PROGRAM

- private terraces: 860 m² = 50 m² per unit [semi-detached]
- residential space: 3,600 m² [net floor area]
  21 unit = 13 semi-detached + 8 apartments
- flexible space [residential /commerce /parking]: 1,250 m²
- office space: 2,230 m² [net floor area]
- commercial space [net floor area]: 1,150 m²
- courtyards: 930 m² / 80 m² per unit
- private parking garage [offices+commerce]: 190 places
- private parking garage [housing]: 16 places
- side-street parking: 55 places

- residential space: 4,850 m² [net floor area]
  28% of the existing residential space
- TOTAL new space [net floor area]
  [residential+commercial+office]=8,230 m²
  48% of the existing [residential] space

- private outdoor space: 10,250 m²
  60% of the residential space
Design proposal: integral space between old and new structures  
source: model by author
Stakeholders

Such restructurization project could have a wide range of stakeholders that would be involved in decision making as well as financing. There are two majors aspects of the implementation structure. Firstly, the local inhabitants (owners of the existing apartments) should participate in decision making (design and planning) through organizations of local communities. Secondly, municipality would sell development rights (to build on the existing land) to the developers of a new program and in that way intensification of the area would at least partially allow to finance refurbishment of the existing housing stock. Nevertheless, some financial contribution of the owners of the existing housing is necessary to finance the refurbishment.
In this chapter the whole thesis project material presented in the previous chapters is summarized and the key aspects and findings are highlighted. The distance is taken from the project in order to have a critical reflection and situate this work in wider scientific context. Finally, potential directions for possible further research are discussed.
1. Key themes. Potentials and challenges

New city model

The initial problem statement set in this research pointed out the problems of sustainability embracing such threats as social segregation, loss of urban vitality, inefficient land use and environmental pollution. To address these issues the conceptual models of Open city (Stanilov, 2007), (in terms of public space) or Compact city model (Burton, 2000:1970), (in terms of urban structure) could be feasible alternatives for urban development of Kaunas. Further elaboration on the relevance of these concepts within the particular context of case study (Kaunas) brought forward a set of leading themes. The complexity of factors situated around the themes of urbanity, mobility and public space could be seen as main priority towards the new vision.

Urbanity

Potentials| Reconsideration of existing urban structures and re-evaluation of their functional and spatial potentials could open a whole new range of diverse inner city developments that could contribute to the urban character of the city. Reinforcement of centralities and intensification of adjacent city districts could be attractive alternative to suburban expansion for many parties.

A desired product of intensification is a diversified urban environment which enables series of residential, employment and recreational choices within the currently mono-functional area. Nevertheless, the significant part of the intensification is housing. While the overcrowding rate in Lithuania is 49% (Eurostat, 2011), the need for new housing is a long term tendency (Stanilov, 2007). By offering new residential choices or a ‘housing career’ within the socialist housing estates, the area can maintain its critical mass of residents and sustain social diversity while enabling social re-configurations within. This is crucial in order to address threat of social segregation. As an illustrative instance of that could be a possibility to develop (among the other types) suburban housing typologies on the available land within socialist housing estates.

Challenges| There are factors that could work against the reinforcement of urbanity.

Firstly, there is limited ability of society to understand or appreciate urbanity. On one hand large share of urban population in Kaunas has a young, modernist-based and regime framed urban tradition (socialist mass urbanization started in 1950’s and by the 90’s population increased five times). On the other hand the contemporary urban lifestyles in Kaunas have started to enjoy bluntly consum-erist shopping-mall culture, detached from the city life. On the local scales of neighbourhoods intensification and spatial densification might confront resistance of local communities, who often perceive new constructions as invasions in their collective ownership (Stanilov, 2007). The ultimate way to deal with that situation is to start public debate, provide information about the potentials and benefits of the intensification and find effective ways to involve communities in the planning and implementation process.

Secondly, there are risks in changing patterns of social segregation. Even if the intensification strategies would succeed to prevent the problem on the higher scale, this does not automatically prevent from the segregation on the local scales, which might lead to the gated enclaves within the socialist housing estates. Therefore it is crucial to prevent such problems in urban design solutions up to the level of architectural detailing as well as ensure coherent implementation.

Mobility

Potentials| The increasing domination of private automobile is a great challenge of the post-socialist city, whereas decline of public transport is another (Grava, 2007). Bringing more emphasis on sustainable modes of transportation (Bus Rapid Transit system, cycling and pedestrian) and developing their networks as well as modal change nodes could be a relevant strategy. However, in order to make mobility strategies effective, it is crucial to make mobility networks integral to the networks of public space. Therefore the recognition of ‘non_places’ (Auge, 2008) is fundamental. Reorganizing space for mobility brings qualitatively new approach to the public space in the post-socialist city. The performance of streets, public transport carriages, stops and transfer places as public spaces is not overall a new phenomena in post-socialist city or in the case of Kaunas (eg. kiosk development by the public transport stops), but it has never been treated as quality public space. By addressing ‘non_places’ as important integral part of the city and as a valuable public space the attitudes towards mobility might be altered.

There is a physical and functional capacity to form soft mobility (non-motorized transport) networks within the socialist housing estates even without significant interventions. However it has even more potential as an integral system to the overall intensification strategy that would a) change the perception of scale and distance b) generate stronger attraction points and lines within the existing structure.

Challenges| Alteration of travelling patterns is not only a complex urban design task, but a challenge for the mindset of the post-socialist and herewith post-modernist society in transition. It is very likely, that the process of automobilization will continue to prevail (Grava, 2007), however there is still a large capacity (spatial and qualitative) for considerable improvements of alternative mobility systems and that potential has to be exploited.

Public space

Potentials| Public space is an integral and unifying element of the mobility and urbanity aspects and it serves as a link between the realms of diverse scales ranging from the city to the neighbourhood and community. The main problem in terms of public space in Kaunas is the surplus of public space. That condition was inherited from the soviet socialist ideology of commonweal that neglected any presence of private ownership and made all land public. That resulted in lack of spatial quality and consequently in lack of management or simply maintenance that became too expensive.
However, it is essential to address the issue as an asset and potential (Stanilov, 2007) for inner city development and herewith trading quantity into quality. The same could be valid for the land which is still under the municipal ownership as well as already privatized land. The other aspect which stems from the same problematic context is the surplus of communal space in socialist housing estates. The period of transition showed that principle of communal ownership is no longer relevant and needs to be reconsidered. Redistribution and differentiation of the communal spaces is necessary to make the space functional. In this respect integrated intensification along the mobility networks could be a tool to enable this reorganization. Synergies of old and new urban structures would enable series of new configurations of public space and thus bring different modes of commonality under scrutiny.

**Challenges** Intensification as a strategic drive for restructuring public space brings along a serious challenge as well. Intensification is not only a matter of accumulating more functional intensity and functional mix, residential density and diversity but also a matter of organizing these elements in spatial array that would enhance the quality of space and enable public activity to take place. If these aspects are not integrated into intensification process it might result into even more complex problems of spatial fragmentation. Redistribution of communal spaces within the socialist housing estates also brings series of challenges such as introduction of different levels of commonality, distributing ownerships, achieving consensus on communal responsibilities, inclusion of new memberships in existing communal organizations (formal and informal). Here the organizational aspects as well as urban design and architectural detailing hold an essential role in order to ensure integrity, prevent conflicts and spatial segregation. The process requires sensitive approach and inclusion of local groups formal as well as informal, existing as well as potentially new into the decision making on planning and design.
2. Strategic planning and process initiation

Initiation, strategic planning, changing attitudes: What initiatives are required to achieve the vision? What political will is necessary?

Strategic planning is still in an experimental stage in Lithuania and the post-socialist cities generally (Tsenkova, 2007). A set of changes are necessary to enable successful implementation of strategic planning.

- Change of attitude in governmental (municipal) planning institution and national legislative system is crucial to consider new planning directions. The relevance of municipal plans should be reconsidered. The effectiveness of land-use planning should be reconsidered (Tsenkova, 2007; Stanilov, 2007). Alternatives in planning system should be considered; strategic planning could be set as relevant planning principle.

- Municipal initiative is necessary as a starting point. Municipality could take the proactive (entrepreneurial style) role (Tsenkova, 2007) and initiate open discussion of the vision with potential stakeholders.

The change of hierarchical structure in planning system. Strategic planning could be a major tool to initiate participatory planning (Tsenkova, 2007). Emphasis should be put on the dialogue with civil society. That should be considered within the relation between public authorities and local communities as well as between private sector and local communities. The fundamental change of attitude is necessary within the society in general and on the level of community in particular. The lack of public engagement and sense of community could be related a) to the socialist systems that had strong vertical hierarchy in decision making (Tsenkova, 2007); b) to the post-socialist implementations which often lack transparency and public involvement (Stanilov, 2007). These factors resulted in lack of engagement of the society in the public realm and area of planning in particular. In order to change this attitude new planning principles should be initiated from the municipal levels. The precedent of strategic planning has to take place with qualitatively new approach and emphasis on public participation. The stake of communities and individual households should be emphasized and even quantified and power in decision making should be clarified.

- Institutional changes should be made to establish qualitatively new organizational units for initiation, implementation, communication and coordination of strategic development (Tsenkova, 2007). Such new groups as strategic planning teams/ committees/ stakeholder representatives/ NGO’s etc. should be established. Particularly new well managed and supported by government NGO’s are necessary to protect the interests of communities on the general issues.

Challenge Strategic planning is a new planning paradigm in the post-socialist context, very different from conventional land-use planning. Therefore inertia of performance and inexperience in strategic planning of public sector might bring various complications. Furthermore the society might also be incapable of taking the advantage of decision making within the process.

Potential Nevertheless, “there are reasons to be optimistic about the future of the post-socialist city... these reasons include: the proven ability of the countries in the region to come out of the greatest crises; the growing political, financial, legal, and institutional power of local governments to control urban development; the increasing role of citizen participation in the planning process; the rising awareness of developers of the benefits of planned growth; the increasing importance of the quality of the urban environment in economic development; the integration of urban and regional development onto the framework of EU policies and planning; and the spread of knowledge on the theory and practice of sustainable urban growth.” (Stanilov, 2007- chapter 1, p15)
3. Contribution to the body of knowledge

Statements:

Kaunas, as a case of post-socialist city
• Most of the research on the post-socialist cities is undertaken on the capital cities. The case of Kaunas- a middle sized city- confirms many of the features common to post-socialist cities of the CEE countries. Therefore it is possible to assume that some of the elements of the proposed strategic principles might be partly relevant in the other cases.
• Many assets of the socialist city model, such as high residential density in the socialist housing estates, public transport usage, land under public ownership, have been (partially) preserved. That created many opportunities for transformations towards more sustainable city model.
• As a case of post-socialist city, Kaunas has a potential to become a compact (poly-centric city). At least some of the compact city principles have structural and spatial potential to be realized.
• Integrated intensification might be one of the effective restructurization strategies that would enhance both, existing socialist structures and new structures by creating new system based on synergy of existing and new qualities. That principle could be applicable to many cases of post-socialist cities.

Restructurization of housing estates
• The restructurization of housing estates in Kaunas (and possibly in many post-socialist cities) has to find a new strategic principles, many of which are different from western models. For instance, the high overcrowding rate and herewith the housing deprivation does not allow demolition as integral principle of strategy (Bijmermeer,NL; Leinefelde, DE). The extent and position in the city could have a crucial role to the restructurization profile.
Bibliography


Williams K, 2000, „Does intensifying cities make them more sustainable”, in Achieving Sustainable Urban Forms Eds KWilliams, L Burton, M Jenks (Spon, London) pp 30 - 45