
What About
People in
Urban
Sprawl?

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Addressing Accessibility & Social Cohesion Challenges in Residential Urban Sprawl Areas in Vilnius

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2026, June 15

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AR4U020 Urbanism Graduation Studio
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ABSTRACT

Since the 90's, Vilnius region (Lithuania) has been experiencing rapid and poorly managed market-driven development of urban sprawl - a result of institutional, economic and societal shifts in the post-socialist European context. This has resulted in extensive car-dependent residential areas which lack infrastructure, services and quality public spaces, creating major accessibility and social cohesion challenges. This thesis explores how and why these accessibility and social cohesion challenges manifest themselves in residential urban sprawl areas in Vilnius region, and how spatial, governance and policy interventions in both dimensions can mutually reinforce each other to create more inclusive and sustainable living environments.

Analysis revealed that a lack of daily amenities and public spaces, as well as a lack (and poor organization) of appropriate mobility infrastructure in urban sprawl areas drives people away from local public spaces through a lack of local meeting places, dependence on the inner city, as well as hostile and car-centric streets. Furthermore, insights showed that urban sprawl and its associated challenges in Vilnius region are the result of a set of systemic failures and dysfunctions, including missing governance scales, flawed financial systems and legal structures, as well as mismatches between formal and real spatial planning tool powers.

This thesis proposes an integrated exploratory framework of spatial, governance and policy interventions which directly responds to these findings. Utilizing SE Vilnius as a case study, the spatial design proposes the development of a network of walkable, mixed-use compact centralities, while the policy and governance interventions directly target the structural fail points. Together, these create a framework to improve accessibility and social cohesion in urban sprawl areas, transforming them towards more sustainable and inclusive living environments.

ACKNOWLEDGMENTS

Positron from QGIS was used as a background base for the maps. Georeferenced base maps (LT: georeferencinio pagrindo žemėlapis GRPK) used for spatial data for Vilnius and Lithuania, retrieved from (VšĮ Statybos sektoriaus vystymo agentūra). Google Earth Pro software was used to retrieve satellite images. ChatGPT and Claude was used for finding relevant sources (articles and academic literature) and brainstorming throughout the thesis development process.

TABLE OF CONTENTS

GLOSSARY OF TERMS

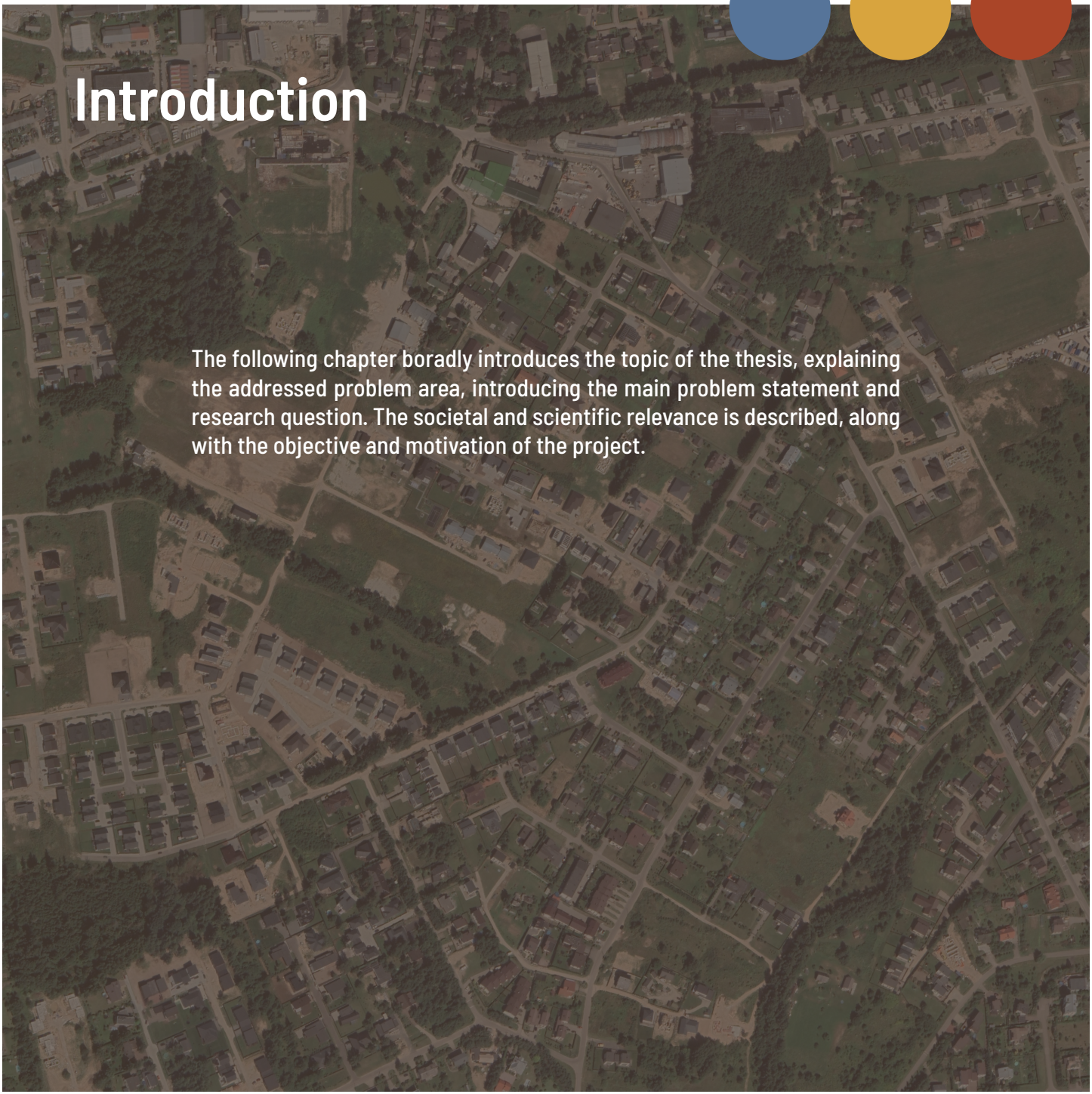
Vilnius MP - Vilnius metropolitan area, the functional region of Vilnius (capital of Lithuania), including Vilnius City Municipality (VCM), Vilnius District Municipality (VDM) and Trakai Municipality (TM)

Urban sprawl - a pattern and process of urban development characterized by low-density, fragmented and chaotic expansion towards the outskirts of the city. Commonly associated with car dependence, inefficient land use, poor regulations and planning.

Accessibility - the extent to which land use patterns and transportation systems enable people to reach relevant activities and destinations.

Social cohesion - the strength of relationships among individuals, and between individuals and their governance institutions. A sense of trust and belonging, civic participation and solidarity are attributes commonly associated with social cohesion, while inequality and social exclusion are recognized to be detrimental to it.

Socio-spatial segregation - the separation of social groups (based on income, education, ethnicity, household type, etc.) in the urban environment. This can result in unequal access to facilities, infrastructure and opportunities, and can reinforce inequality and social exclusion.



Introduction

The following chapter boradly introduces the topic of the thesis, explaining the addressed problem area, introducing the main problem statement and research question. The societal and scientific relevance is described, along with the objective and motivation of the project.

Problem Field

Urban Sprawl in Europe

Urban sprawl can be defined as the chaotic, spread out, poorly facilitated and low-density urban expansion into the outskirts of a city. Urban sprawl has existed for as long as cities have. However, the scale of the development of urban sprawl seen in the past century has been worrying. This form of development is known to be unsustainable and is associated with problems such as inefficient land use, high infrastructure costs, environmental degradation, decreased physical health, increased inequality and socio-spatial segregation. Despite its negative economic, environmental and societal implications, urban sprawl continues to develop in Europe. In the context of multiple crises such as rising inequality, growing polarization, climate change, environmental degradation and mass migration (both domestic and international), urban sprawl is becoming an increasingly pressing challenge to address. Unfortunately, the future of urban sprawl areas (and their associated challenges) have remained largely unaddressed in urban planning in Europe (European Environment Agency, 2016).

Urban Sprawl in Lithuania

While the West started experiencing rapid urban sprawl after World War II, in Lithuania this development only started in the 90's. After regaining its independence from the Soviet Union, the country transitioned from a communist state with a closed and centrally-planned economy to a global market economy, grounded in neoliberal and capitalist ideals (Cirtautas, 2013).

Lithuania's integration into the global economy resulted in the economic boom of the main cities in Lithuania (in particular in Vilnius, the capital region), and the crash of regional economies. 35 years later, in 2025, nearly half of Lithuania's GDP is generated in the capital region (Official Statistics Portal, 2024). The economic opportunities offered by the city, coupled with the rapid decline of regional economy has been a major driver for rural-urban migration in Lithuania, as many individuals move to the city in search for better opportunities in work, education and quality of life. These major demographic shifts, coupled with market-driven urban development with little to no planning, has resulted in the gentrification of the inner Vilnius city, and the rapid development of urban sprawl, something that the responsible governance systems failed to foresee and react to. These developments have resulted in increasing traffic congestion, environmental degradation, socio-spatial segregation, inequality and social exclusion in Vilnius MP (Ubarevičienė, Kalm & Tammaru, 2024).

Lithuania and its capital region continues to prioritize economic development, while rural-urban migration remains a major challenge. Urban sprawl rates (and its associated negative consequences) are only expected to grow, while the country's governance system still lacks any vision or action plan for the management and development of these areas. Because of this, urban sprawl areas in Vilnius metropolitan region desperately need a vision and strategy for its future.

Accessibility Challenges in Vilnius

Accessibility refers to the extent to which land use patterns and transportation systems enable people to reach relevant activities and destinations (Geurs & van Wee, 2004). Accessibility strongly impacts the individual opportunities to participate in society, and inequality in accessibility can significantly amplify existing societal inequalities and social exclusion.

With the recent growth of urban sprawl, Vilnius has been dealing with serious accessibility challenges. Car use has increased dramatically over the past decade and traffic congestion in the inner city has become a daily sight. Meanwhile residents have to travel increasingly long distances to access basic facilities. For elderly people living in urban sprawl areas in Vilnius, taking the bus to a healthcare facility can take 1.5 hours, and there is a high likelyhood of getting stuck in traffic jams, so travel time remains unpredictable. Parents in urban sprawl areas have to drive their children to a school which only 2km away simply because there is no safe alternative when the transportation infrastructure is so poorly developed.

In the context of Vilnius, the poor accessibility infrastructure in urban sprawl areas is preventing individuals from being able to fully participate in society, access basic needs and limit opportunities. Populations which have limited capabilities, financial resources and access to a vehicle are placed in especially vulnerable situations in which their needs can not be adequately met.

Mobility Transition in Cities

In the context of a sustainability transition, cities have been shifting away from cars and moving towards improving public transport, pedestrian and cycling infrastructure. While great strides are being made in the urban mobility transition, the primary focus has been placed on inner city transformation, as measures such as emission-free zones and carbon taxing have been put in place to reduce car use in cities. While these measures have been effective in combating traffic congestion in inner cities, they can have negative accessibility implications for people living in urban sprawl areas, if alternatives are not provided. This can increase inequality in cities and is unjust towards people living in urban sprawl areas, especially considering the fact that people often choose to live in more remote areas due to financial circumstances, as housing in the inner cities are becoming increasingly unaffordable. Therefore, it is necessary to recognize and address car dependence and move towards a mobility transition. However, it is also vital to ensure accessibility in urban sprawl areas to ensure that the sustainability transition is inclusive, supportive and effective.

The Value of Social Cohesion

Social cohesion refers to the strength of relationships among individuals, and between individuals and their governance institutions. A sense of trust and belonging, civic participation and solidarity are attributes commonly associated with social cohesion, while inequality and social exclusion are recognized to be detrimental to it. Social cohesion is vital for the resilience, inclusion and productivity of a society (Chan, To & Chan, 2006).

Rising Inequality & Social Exclusion

Driven by uneven economic development, urban-rural divide and significant differences in income, social inequality in Lithuania has been on the rise. Meanwhile increasing socio-spatial segregation due to urban sprawl continues to amplify these existing social inequalities. Currently the country has some of the highest rates of inequality in Europe, with over 20% of the population being at risk of poverty. This significantly impacts individual living quality, education, health and social participation, and creates disparities in the access to opportunities. Increasing inequality is leading increasing social exclusion and creating challenges for social cohesion in the country. Meanwhile the incompetence of Lithuanian institutions in addressing these societal needs erases any opportunities for a more inclusive and supportive society.

Populism, Polarization & Public Disinterest

Inequality and socio-spatial segregation have been increasingly challenging social cohesion in Lithuania. Polarization and populism in the country have been on the rise, while many citizens are starting to question the effectiveness and legitimacy of democratic institutions, and whether it is worth participating in politics at all.

The interactions between Lithuanian institutions and its people has been desperately poor, and the the political landscape in Lithuania in recent years has been worrying. Surveys show that there is a lack of trust towards public institutions in the country, and the political participation rates reflect this – civic engagement is among the lowest in Europe. Lithuania has also been dealing with a surge in populism and polarization, with the growing popularity for a right-wing pro-Russian party led by an anti-semitic politician. Meanwhile dialogue between different political parties and institutions (e.g. between the government and the president) has nearly disappeared and instead has been replaced by attacks, blame and accusations.

This disappearance of dialogue between (and among) the people and its institutions are challenging the pillars of democratic society and questioning its ability to create an inclusive society in which citizens can actively engage, discuss and reflect on the existing inequalities and injustices experienced in society.

Loneliness in Lithuania

Lithuania also has been dealing with major mental health challenges, with significant parts of its population feeling lonely, anxious or depressed. The country has some of the highest suicide rates in the world, and one of the highest alcohol consumption rates in Europe. There are many reasons for these associated challenges, but these statistics say a lot about the need for social connection, inclusion and empathy in Lithuanian society.

The Need for Inclusive Urban Environments

Lithuania is dealing with multiple challenges involving growing inequality, social exclusion and socio-spatial segregation. Accessibility to opportunities is becoming increasingly uneven and the communication between the institutions and (among) its citizens is being challenged. These trends are especially visible in the capital region of Vilnius. More than ever the country and the capital region needs to prioritize the development of inclusive urban environments which ensure accessessibility to opportunities for all and facilitate dialogue, not only among citizens but also between the people and the country's institutions. Instead what citizens receive is market-oriented and unregulated urban sprawl which segregates, increses inequality, limits accessesibility, creates conflict and polarization.

Vilnius MP needs to strive to be an urban environment which is equitable, democratic and diverse. Urban development needs to create space for citizen engagement, discussion and reflection on the existing inequalities and injustices. This means addressing urban sprawl areas and paying attention to the accessibility and social cohesion challenges that its residents face, along with the inequality and exclusion that it this market-driven development creating.

Problem Statement

Due to multiple institutional, economic, political and societal transformations in Lithuania since the 90's, Vilnius metropolitan region has been experiencing rapid and unregulated urban sprawl.

This poorly planned and market-driven development has produced car-dependent residential areas which lack essential facilities, services and infrastructure (e.g. paved roads, lighting, schools), creating major accessibility challenges for its residents.

Existing inequalities are becoming more amplified, as urban sprawl drives socio-spatial segregation, growing inequality and social exclusion. Meanwhile, the governance and policy system has proved to be incapable of addressing these socio-spatial issues.

There is a clear need to address the accessibility and social cohesion challenges associated with residential urban sprawl areas in an integrated way, creating more inclusive, and therefore more sustainable urban living environments (see fig. 1).

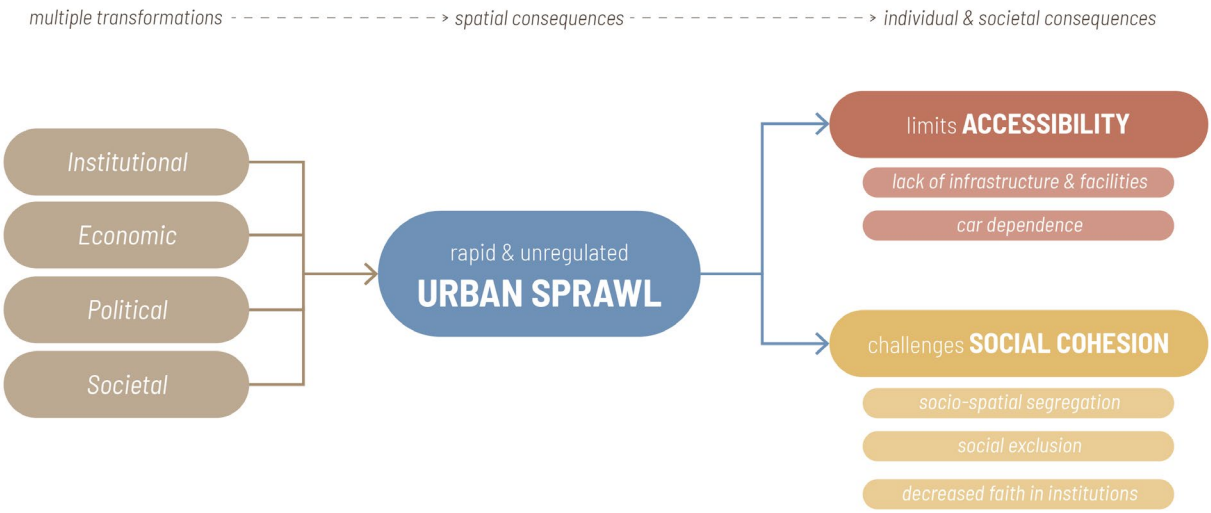


Figure 1. Problem statement diagram.

Relevance

Societal Relevance

This thesis addresses the increasingly urgent challenges of social cohesion and accessibility in residential urban sprawl, a development form that takes up significant parts of land in Europe but is often overlooked or avoided due to its chaotic form. Urban sprawl is associated with various environmental sustainability challenges, inequality and social exclusion. Especially in the current context of growing polarization, populism, geopolitical tensions and inequality, it is urgent to address the challenges in urban sprawl areas. By focusing on synergies between accessibility and social cohesion, this thesis responds to the need for more inclusive and sustainable urban environments which allow individuals to fully participate in social, economic and civic life.

The thesis will be addressing car dependence and therefore dealing with traffic congestion. This is especially urgent for Vilnius MP to solve due to the current geopolitical climate. The city needs to be ready to evacuate at any moment, and the current infrastructure and modal split would immediately result in a road blockage, trapping people in the city. Therefore addressing accessibility in urban sprawl areas will also strengthen public safety and preparedness in case of an emergency. In the context of national security and resilience, facilitating dialogue and strengthening communication, trust, solidarity and participatory processes creates a society which is more resilient, organized and prepared to react to threats such as disinformation, external influences and hybrid warfare.

Scientific Relevance

This thesis contributes to a deeper understanding of urban sprawl in post-communist contexts, where the driving forces (and their rate) differ significantly from urban sprawl in the well-studied Western context.

This project deepens design knowledge on how urban sprawl could be transformed into more sustainable and inclusive urban environments. As sustainability transitions have been primarily focused on inner cities, urban sprawl areas are being overlooked. These areas have underutilized potential for transformations that could make great strides for social inclusion and sustainability of urban environments. By exploring how accessibility and social cohesion in urban sprawl areas can be improved, the project contributes to a more comprehensive understanding of just urban transitions.

A key contribution of this thesis is the approach to search for synergies between accessibility and social cohesion, as these concepts have been primarily studied and designed for in isolation. Accessibility is viewed through the spatial lens, while social cohesion is viewed through policy and governance. This project aims to deepen the knowledge of how these dimensions can come together to create a positive feedback loop. This integrated perspective contributes to a more holistic and interdisciplinary view of urban planning and design.

Project Objective & Motivation

The aim of this thesis is to explore and propose possible interventions (spatial, policy & governance) to transform residential urban sprawl areas in Vilnius MP into more inclusive and sustainable living environments. The thesis prioritizes the search for overlaps in accessibility and social cohesion improvements which could act as positive feedback loops. On a broader scale, the objective is to create a framework for the transformation of residential urban sprawl areas into more inclusive and sustainable urban environments (in particular for the post-communist context). Crucially, this will be done by finding synergies between accessibility and social cohesion interventions, therefore advancing design knowledge for more holistic urban planning approaches.

Current urban planning trends have been overly focused on city cores in order to address the various urban challenges, such as the sustainability transition or public health concerns. While this is important, overly focusing on the inner city and dismissing more remote urban areas can result in gentrification, pushing out lower-income households towards the periphery, where land is cheaper and the infrastructure is less developed. This amplifies existing inequality and can create societal tensions, segregation and unintended injustices. Because of this, it is equally important to pay attention to the development and quality of residential urban sprawl areas, especially considering that they are are recognized to be significantly contributing to multiple crises, e.g. climate change, environmental degradation, rising inequality and social exclusion. Urban sprawl areas have become integral to the functioning of cities, as significant parts of the population move between them and the inner city. Therefore, their design and planning needs to be taken as seriously as that of dense urban city cores, and their associated challenges need to be urgently addressed.

Urban challenges combine economic, social, environmental, technical, spatial, institutional and political dimensions. They are multi-dimensional and multifaceted, therefore requiring holistic approaches in order to provide successful and efficient outcomes. Because of this, the thesis combines themes of accessibility, social cohesion and inclusion, while exploring spatial, governance and policy interventions which could mutually reinforce each other.

Research Question(s)

Main Question

How can the improvement of **accessibility** and **social cohesion** through **spatial, policy and governance** interventions **mutually reinforce** each other in different **types** of **residential urban sprawl areas** in **Vilnius metropolis** (MP) to create more **inclusive** living environments?

Research & Analysis

SQ1: What are the different **types** of residential urban sprawl areas in Vilnius MP and how are they characterized?

SQ2: What (socio-)**spatial, policy and governance** configurations are associated with **(a) accessibility** and **(b) social cohesion challenges** (and benefits) in different types of residential urban sprawl areas in Vilnius MP?

Fieldwork

SQ3: What are the **local (a) accessibility** and **(b) social cohesion experiences, needs and preferences** of **diverse** residents in different types of residential urban sprawl areas?

Design

SQ4: What **spatial (a) accessibility interventions** can also strengthen **(b) social cohesion** in different types of residential urban sprawl areas in Vilnius MP? (**a -> b**)

SQ5: What **policy and governance interventions** for **(b) social cohesion** can also improve **(a) accessibility** in different types of residential urban sprawl areas in Vilnius MP? (**b -> a**)

Study Area

This chapter introduces and provides context on the study area of the thesis, namely Vilnius metropolitan area in Lithuania. Brief relevant information is provided on the geographical, societal, economic, institutional and historical dimensions. Since the 90's, a post-socialist context has shaped multiple transofmations in the institutional, societal and economic systems, impacting spatial planning and development.The transition towards market-driven development with little planning or oversight has resulted in rapid and large-scale development of poor quality and underserviced urban sprawl.

Vilnius, Lithuania

Lithuania in Europe

Lithuania is a small country located in the Baltics, North-Eastern Europe. It is a flat, low-lying country, characterized by its many lakes, rivers, forests and swamps (see fig. 2, 3). The country has had a turbulent history, first being united in the 13th centrury under the Grand Dutchy of Lithuania, becoming one of the largest states in Europe in the 14th-15th century, and merging into a Polish-Lithuanian Commonwealth in 1569. In the late 18th century, the state was partitioned and Lithuania was put under the rule of the Russian Empire. The country declared independence in 1918 and enjoyed a brief period of freedom, but was then occupied and annexed by the Soviet Union in 1940, then by Nazi Germany in 1941-1944, and then by the Soviet Union again in 1944. Lithuania remained under Soviet rule until 1990, when it became the first Soviet republic to declare its restoration of independence.Since 2004 the country is a member of the European Union and NATO. Since its independence, Lithuania is a democratic republic with a capitalist market economy. (Valstybės Duomenų Agentūra, 2025; Lietuvos Respublikos Seimo Kanceliarija, n.d.).

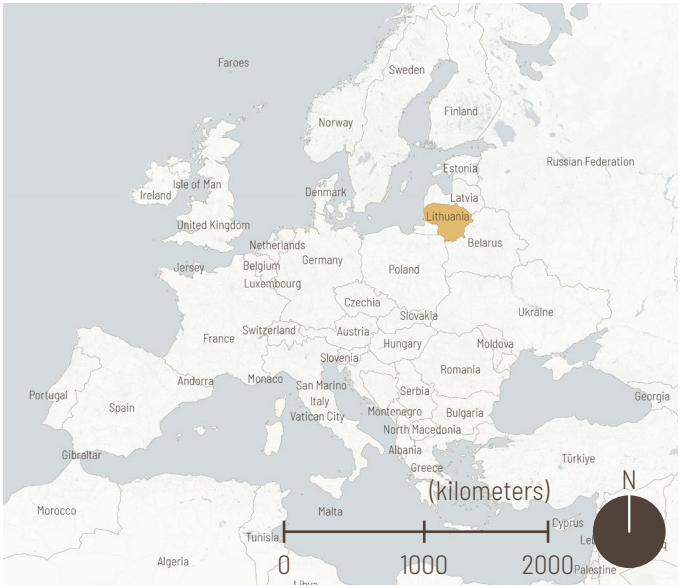


Figure 2. Lithuania in Europe.

Eurostat (2024).

Located in:

The Baltics, North-Eastern Europe

Population:

2.8 million

Land area:

65,300 km²

Population density:

44 people/km²

For reference (people/km²)
Netherlands - 430.5
Poland - 117.3
Finland - 16.5

Nominal GDP (2025, est.):

$95.27 billion

GDP PPP (2025, est.):

$165.23 billion

Valstybės Duomenų Agentūra (2025).
United Nations Economic Commission for Europe (2023).
International Monetary Fund (2025).

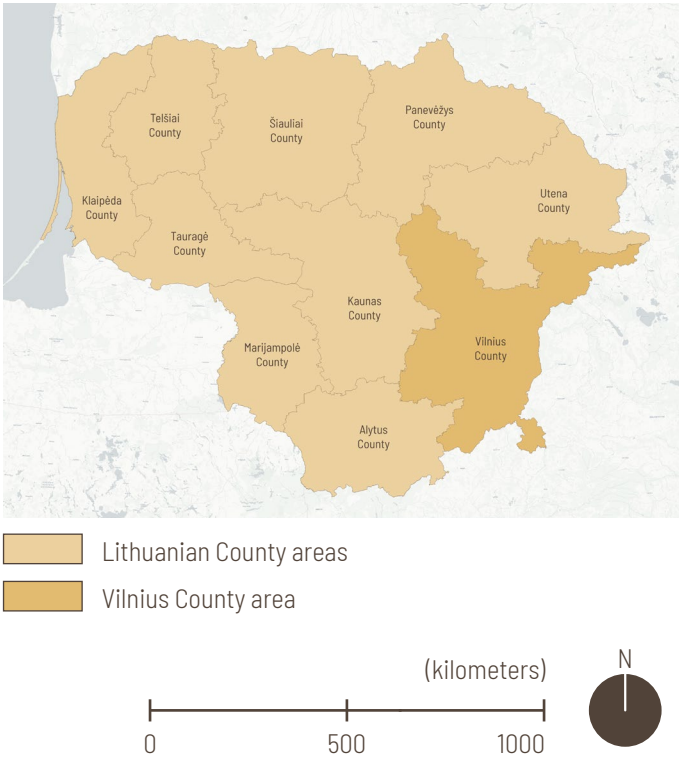
Figure 3. Aukštaitija National Park.

(Venema, 2026)

The Capital Region

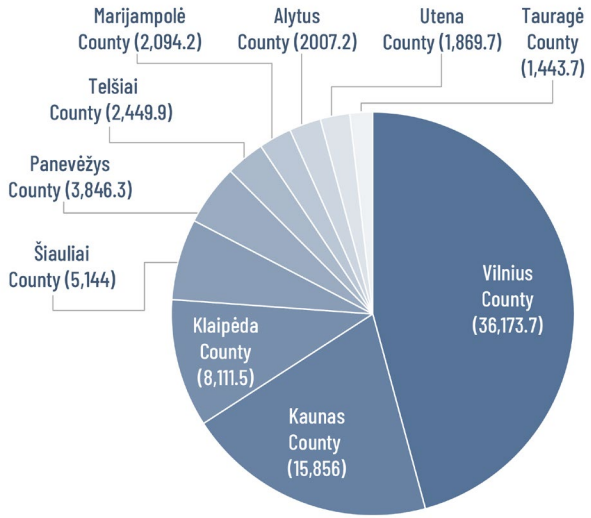
The Capital Region of the country is the Vilnius County in the East of Lithuania (see fig. 4). There is a strong divide in economic opportunities and activity between the counties, with 3 major city counties producing over 75% of the national GDP, and Vilnius county alone accounting for nearly 50% of the national GDP (see fig. 5). The strong regional divide can also be seen in the GDP per capita (see fig. 6), where Vilnius County is more than 2.5 times higher than that of the 4 lowest-scoring counties, and the only county surpassing the national average on 27.5 thousand Euros per capita (Official Statistics Portal, 2024).

Figure 4. Counties in Lithuania.



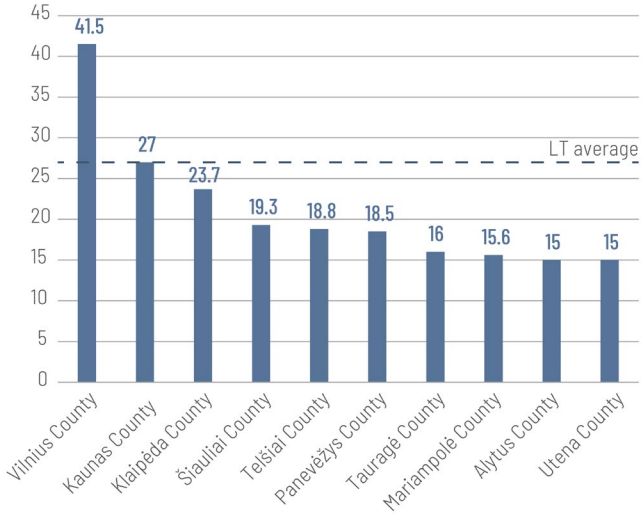
VšĮ Statybos sektoriaus vystymo agentūra (2025).

Figure 5. Gross Domestic Product per County (million EUR, 2024).



Official Statistics Portal (2024).

Figure 6. Gross Domestic Product per Capita per County (thousand EUR, 2024).

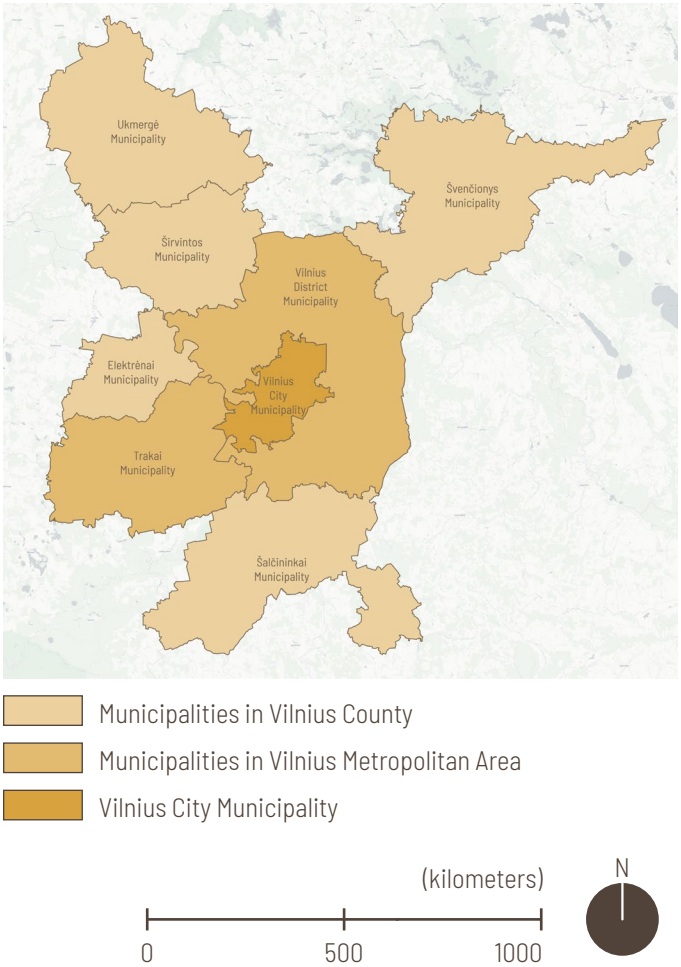


Official Statistics Portal (2024).

Vilnius City & Metropolitan Area

The capital of Lithuania is Vilnius, governed by Vilnius City Municipaliy (VCM). However, the functional area of the city extends to municipalites surrounding it, namely Trakai Municipality (TM) and Vilnius District Municipality (VDM, independent from VCM). In recent decades, the regional municipalities have been experiencing development spillover from VCM, accommodating major housing and economic development. These three municipalities form the Vilnius Metropolitan Area (Vilnius MP from now onwards). This is the area with the majority of economic activity and population in the region, and this is the primary focus area of this thesis (see fig. 7).

Figure 7. Municipalities in Vilnius County.



VšĮ Statybos sektoriaus vystymo agentūra (2025).

Located in:

Eastern Lithuania

Vilnius city population:

632,476

Vilnius MP population:

789,115

Vilnius city population density:

1581,19 people/km²

Vilnius city land area:

400 km²

Center of Registers (2025a).
Valstybės skaitmeninių sprendimų agentūra (2025).

A Country in Transformation

Insitutional Transitions of The 90's

On March 11, 1990, Lithuania regained its independence from the Soviet Union and started taking steps towards re-integration into the Western world (see fig. 8). During this institutional transition, the country shifted from a single-party communist state to a democratic parliamentary republic. Under communist rule, the institutions were based on socialist ideology, had a closed market and a highly centrally planned development and highly centralized governance model. Over the span of a few months, the country switched to a decentralized governance model with a multi-party and democratically elected government. The country adopted a free and global market and a capitalist ideology. Since then, most development has been primarily market-driven, including urban development (Ubarevičienė & Burneika, 2020; Cirtautas, 2013).

Figure 8. The Moment of The Restoration of The Independence of The State of Lithuania.

Lileikis (1990).

The institutional transition of Lithuania resulted in major systemic changes and consequences for urban planning and development.

Soviet-Era Urban Planning

Under Soviet rule, any form of development of cities and regions was decided by the state, meaning that all housing stock was nationally planned, developed and owne. Urban development was based on the decentralized and polycentric city model, and urban development was limited to the construction of apartment block micro-districts (see fig. 9, 10). Primarily meant for residential use, they contained essential amenities such as schools and grocery stores, but were severely limited in leisure and work opportunities due to a strict separation in land use. In current days they are referred to as 'sleeping districts' due to their monofunctional character. Land in the periphery was exclusively used for agriculture and industry. Under such conditions, private property and the private real estate market could not exist. Therefore, up until the 90's suburbs structurally could not exist in cities in Lithuania and urban development remained relatively compact (Ubarevičienė & Burneika, 2020; Cirtautas, 2013). Under these conditions, population migration and economic development remained heavily planned and controlled (Cirtautas, 2013).

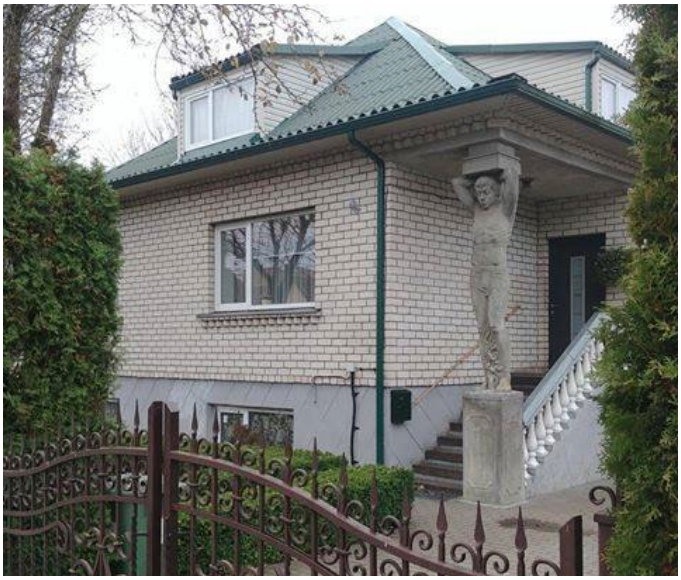
Shift to Market-Driven Development

Immediately after regaining independence in the 90's, Lithuania transitioned from a centrally planned to a market economy. The transition was driven by reforms such as land restitution, mass privatization and the introduction of the free market. This meant that private real estate property could once again exist, enabling the development of private owner-occupied houses, which was previously not possible. The mindset at the time was to have minimal state intervention in any form

Figure 9, 10. Lazdynai, a 70's Soviet-Era Microdistrict in Vilnius.

Rakauskas (n.d.).

Figure 11, 12. Collective Farm Baroque: Early Independence Private House Architecture in Lithuania.



Kolūkinis Barokas (2019).

Kolūkinis Barokas (2018).

of economic development, including the private real estate market. This, in combination with a lack of foresight and the poor performance of responsible institutions, resulted in an overall lack of planning regulations and policies for urban and regional development. This meant that (1) all of a sudden people (and businesses) could buy and develop private property, and (2) urban development was almost entirely left up to the private developers.

This institutional transformation created the conditions for major cities in Lithuania to experience a suburban boom, in addition to the commericalization of the city center and the gentrification of neighbourhoods in the inner city (see fig. 13). Suburbs in cities in Lithuania began to grow with little to no regulation or planning, while the inner cities became increasingly unnaffordable and rural regions began to decline (Cirtautas, 2013; Burneika, 2008; Sykora & Bouzarovski, 2012).

Private home architecture of the 1990's Lithuania encapsulate the spirit of the first decade after the institutional transition, visualizing the chaos, confusion, excitement and freedom of a society exploring the new typology of private houses. Lacking references for modern private residential home architecture, people took inspiration from monumental buildings such as churches or castles, forming a unique style, ironically named Collective Farm Baroque (in Lithuanian: Kolūkinis Barokas) (see fig. 11, 12).

Contemporary Urban Development

As the country transitioned to a free and global market, international companies and foreign direct investment began shaping the local economy. In this regard cities had a major advantage compared to regions or small towns due to their more international orientation. This

meant that the country was integrated into the global economy in a highly uneven matter, boosting urban and destroying regional economies. This resulted in the majority of economic activity and opportunities being concentrated in a few major cities, especially in the capital region. In the past few decades this has fueled urban-rural migration in the country, also contributing to a demographic crisis in regional Lithuania (Sykora & Bouzarovski, 2012).

These economic changes led to rapidly growing wages, but also growing income inequality. This has significantly contributed to social polarization in the country, and while socio-spatial segregation levels are still low, they have been increasing over the past few decades. In Vilnius this shift is visible in the form of gentrifying neighbourhoods, new apartment blocks in attractive inner-city areas and even the development of gated communities (see fig. 13, 14) (Burneika, Baranauskaitė & Ubarevičienė, 2017). At the same time, suburbs are becoming increasingly more segregated by income. Suburbs have become attractive for high-income households, meanwhile middle- and lower-income households, especially young home-seekers are becoming increasingly priced out of the inner city (Ubarevičienė, Kalm & Tammaru, 2024; Sykora & Bouzarovski, 2012).

Figure 13. Paupys: Urban Renewal & Gentrification in Vilnius.

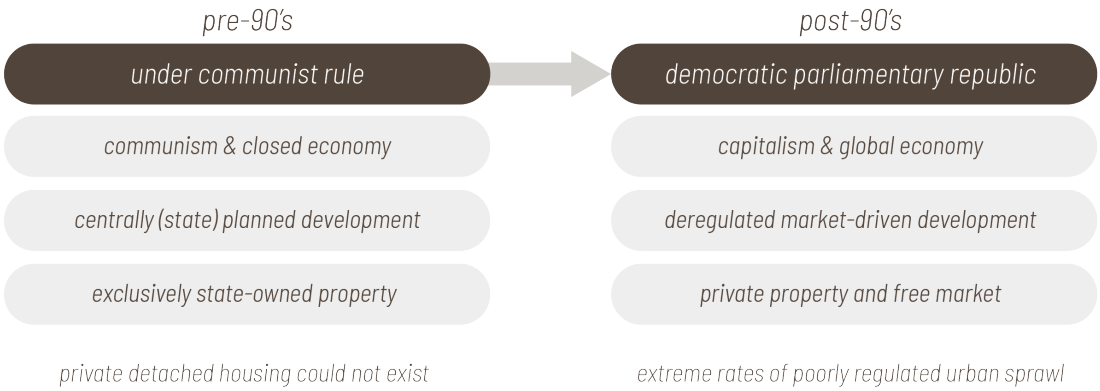
Stakėnas (2022).

Figure 14. Suburban gated community project near Vilnius.

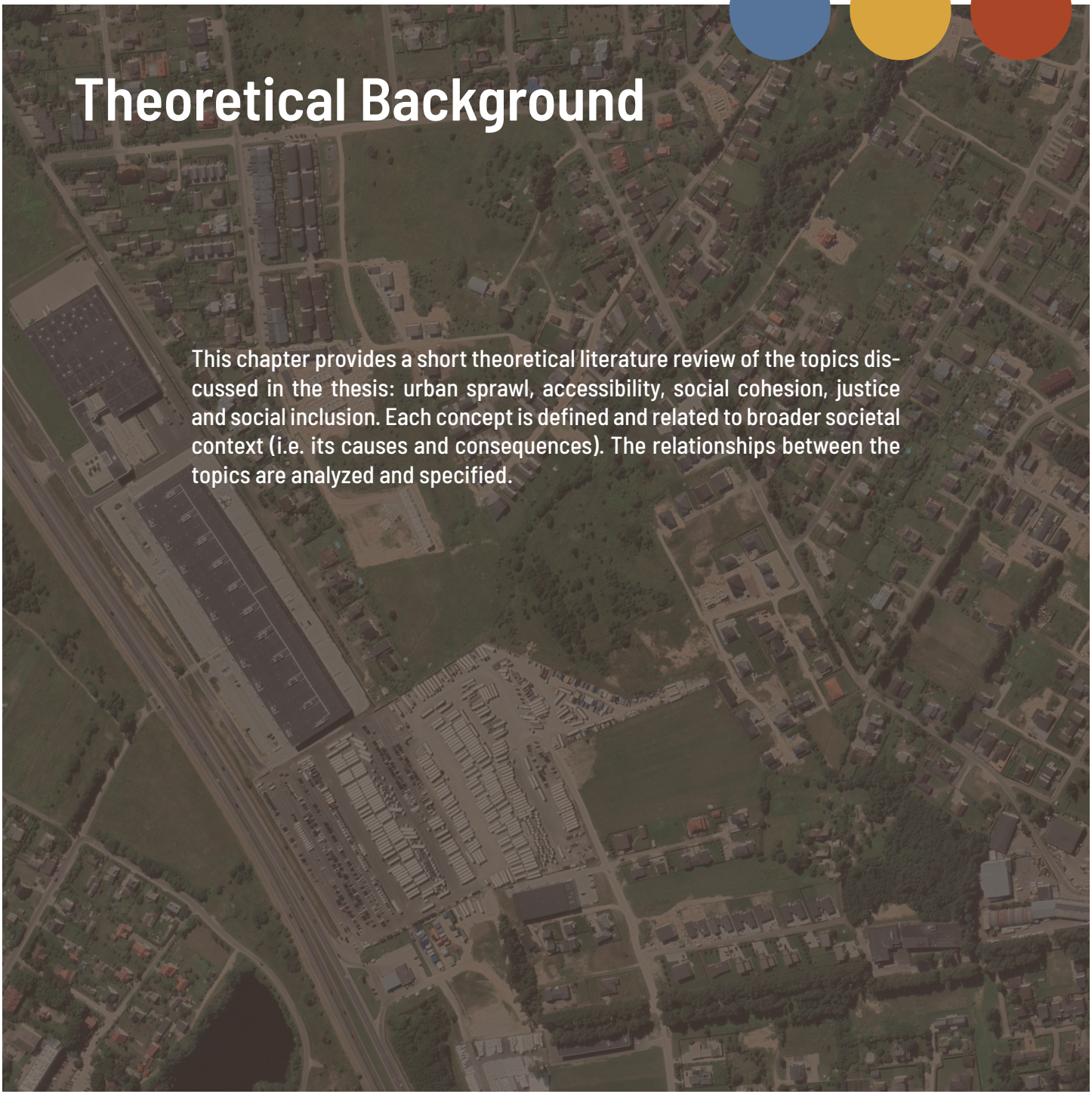
Numo (2025).

In the past few decades, Lithuania has undergone major institutional, economic, societal shifts, resulting in visible spatial changes (see fig. 15). Changes towards market-driven development with little to no planning has resulted in extreme urban-rural migration, the gentrification of the inner city and the rapid development of urban sprawl.

Figure 15. Institutional shifts in Lithuania result in spatial consequences.



Theoretical Background



This chapter provides a short theoretical literature review of the topics discussed in the thesis: urban sprawl, accessibility, social cohesion, justice and social inclusion. Each concept is defined and related to broader societal context (i.e. its causes and consequences). The relationships between the topics are analyzed and specified.

Urban Sprawl

Multiple Definitions of Urban Sprawl

Urban sprawl is an debated concept which can be described through various perspectives or fields of study. There is no widely agreed-upon definition of urban sprawl, but general features include low density, high dispersion rate, car-dependence and various associated social and environmental consequences.

In the field of urban planning, urban sprawl is generally described as a process. Staley (1999) descibes it as the process of moving out from congested urban areas in the inner city, while Dutton (2000) refers to urban sprawl as the low-density and chaotic urban expansion to the outskirts of the city along major roads. Similarly, in the field of geography urban sprawl is a low-density development pattern, characterized by ribbon or leapfrog development (Harvey & Clark, 1965; Pirotte & Madre, 2011). In urban economics, urban sprawl is defined as the excessive growth of urban space which is linked to the disproportionate urbanization rate in relation to urban population growth (Han, 2020).

From a sociology perspective, Putnam (2000) describes urban sprawl through its various lifestyle implications. Since the emergence of the automobile, trip length and travel time has increased, while home has been increasingly separated from work, leisure, education or other functions. Meanwhile life has slowly moved from public space to indoors, into the private detached house. Putnam associates these urban sprawl implications with increased social segregation, decreased participation in society and a reduced sense of responsibility for one's living environment, emphasizing the weakening of social networks and interactions.

In a systematic literature review, Dadashpoor & Shahhossein (2024) synthesize 6 main perspectives for urban sprawl in the academic discourse:

1. Urban sprawl based on ***growth patterns*** emphasizes features such as low-density, ribbon development, leap-frogging, monofunctionality & diffuse boundaries;

2. As a ***growth process***, urban sprawl entails land use change, unplanned expansion and the transformation of land from rural to urban;

3. Based on its ***nature of growth***, urban sprawl is characterized by low densities, car dependence, inefficient, fragmented and segregated land use, as well as a lack of planning in its development;

4. Based on ***location of occurrence***, urban sprawl is characterized into three main types: infilling (non-urban land in the city getting ubanized), edge (unplanned and uncontrolled expansion of urban areas into nearby non-urban areas) and outlying (expansion of urban areas into the deep periphery, possibly beyond current administrative boundaries);

5. Considering the ***actors which shape*** urban sprawl, the

movement of low- and high-income households is emphasized, with the private real estate market playing a significant role in the development of urban sprawl;

6. Defining urban sprawl based on its ***driving factors***, it is defined as the result of market trends, along with economically-oriented neoliberal and capitalist development policies.

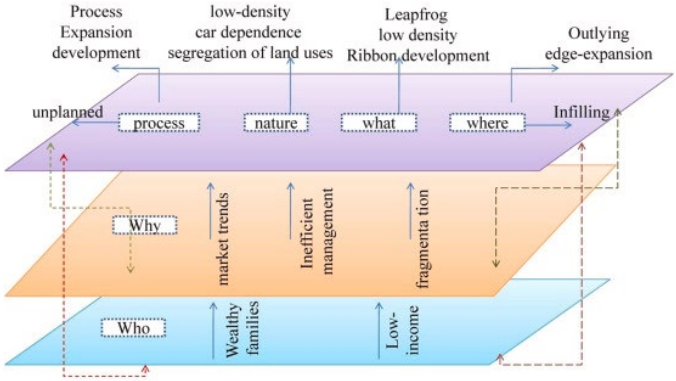
Dadashpoor & Shahhossein argue that these definitions do not have to be mututally exclusive, instead offering a multi-dimensional way to view urban sprawl, synthesizing it into a framework that integrates its process, nature, pattern and location, connecting the concept with its causes and consequences (see fig. 16). This proposed perspective helps to paint a picture of urban sprawl and place it in the societal, economic, environmental and spatial context. Nevertheless, its holisitc and all-encompassing character makes it difficult to operationalize in mapping and analysis.

Urban Sprawl as a Land Use Pattern

One of the most influential papers on characterizing urban sprawl is by Galster, Hanson & Ratcliffe (2001). In their paper, the authors criticize that academic literature often confuses causes and consequences with definitions of urban sprawl (as seen in previous definitions). Instead they emphasize that urban sprawl implies a characteristic of an urban area (or a part of it, at a given time), therefore it needs to be compared in relation to the urban area it is associated with. Urban sprawl is therefore defined as a condition of land use characterized by low values (compared to its urban area) in one or more of the following 8 distinct land use patterns:

1. ***Density*** refers to how many residential units there are per square kilometer of developable land in an urban

Figure 16. Layers of The 6 Definitions for Urban Sprawl.



Dadashpoor & Shahhossein (2024).

area. The paper argues that residential units are more reliable for measuring sprawl than non-residential developments as they are less likely to clump together. It is also argued that residential unit density is more reliable than population density for measuring sprawl as a spatial condition. Finally the paper argues that considering developable land (i.e. excluding areas which act as developmental barriers, e.g. mountains, rivers, regulatory barriers) will provide more accurate results. This is the most commonly used indicator for urban sprawl;

2. ***Continuity*** assesses how continuous (i.e. unbroken) the development is accross the developable land. This dimension can only indicate the extent to which urban sprawl is happening in a leapfrog form of development. Barriers which break up development patterns are not considered as interruptions.

3. ***Concentration*** looks at the extent to which the development is concentrated in a proportionally limited area, rather than being spread out evenly throughout the entire urban environment. This pattern distinguishes urban areas in which most housing units or jobs are located in relatively few places but at high densities, compared to

places where the development is more evenly spread out throughout the landscape;

4. ***Clustering*** is the extent to which the development has been concentrated in a minimal amount of land. While density and concentration is primarily concerned with large-scale development patterns, clustering considers the footprint of of these patterns (on a smaller scale). Clustering may reduce the travel distances in an urban area;

5. ***Centrality*** defines the degree to which development is located close to the central business district (CBD) of an urban area. The centrality increases as distance decreases;

6. ***Nuclearity*** considers the extent to which an urban area is mononuclear (opposite of polynuclear) in its form of development. If the CBD is the only intensely developed area, the urban area is mononuclear. Meanwhile, if the development is spread out over several intensely developed areas, the structure is polynuclear. The centrality measure is the most relevant for mononuclear areas;

7. ***Mixed uses*** refers to the degree to which different land uses coexist in the same small area. Urban sprawl commonly has a high level of segregation of land uses (such as home, work, leisure, even income levels among communities). As the mixture of uses decreases, the travel time and distance increases, leading to car dependence and traffic congestion;

8. ***Proximity*** examines how close the different land uses and functions are to each other in a given area.

This definition based on land-use patterns provides the possibility of distinguishing different types of urban sprawl, but it also provides the possibility of seeing urban sprawl as a process of change in land use patterns over time. These dimensions will be utilized for the analysis and characterization of different types of urban sprawl areas in Vilnius Metropolis.

Urban Sprawl vs. Peri-Urban vs. Suburban

The terms urban sprawl, peri-urban areas and suburbs are often used interchangeably, but they are not exactly synonyms.

As previously discussed, ***urban sprawl*** is primarily defined as a development pattern or process. It is characterized by fragmented, inefficient and low-density land use patterns, often extending far beyond the inner city. Urban sprawl can include residential, industrial, commercial or other urban functions. Functions can be mixed, but they can also be segregated (see fig. 17) (Ewing & Hamidi, 2015).

Different from urban sprawl, ***suburbs*** are a build-up typology that develops closer to city cores, commonly developing in its immediate outskirts. They are primarily monofunctional residential areas which are dependent on the city functions and facilities. Suburbs are commonly characterized as having a stable and non-varying population density which is closer to the inner city compared to urban sprawl and peri-urban areas (see fig. 18) (Zborowski, Gałka & Surmacz-Wybrańczyk, 2023).

Peri-urban areas are defined as transition zones where urban and rural features and functions come together and interact, often occuring in processes of rapid urbanization with little to no planning. They are characterized by a chaotic mixture of land uses, such as residen-

Figure 17. Urban Sprawl Near Vilnius.

Google Earth (2025).

Figure 18. Suburban Area in Vilnius.

Google Earth (2025).

Figure 19. Peri-Urban Area Near Vilnius.

Google Earth (2025).

tial with agriculture and light industry. They often lack properly developed infrastructure, facilites and services, and have detrimental societal and environmental impacts for its context. Peri-urban development can be as a predecessor to fully suburban developments which form a fully functional area integrated into the larger metropolis (19) (Sahana et al., 2023; Zborowski, Gałka & Surmacz-Wybrańczyk, 2023).

Urban sprawl creates suburbs or peri-urban areas. However, suburbs and peri-urban areas are not defined by urban sprawl alone, but by their individual characteristics.

Urban Sprawl vs. Compact City

Urban sprawl can not be mentioned without explaining its antithesis – the compact city. If urban sprawl is seen as being scattered, low-density and monofunctional, being associated with poor accessibility and lack of usable public space, compact urban development is seen as the opposite. Compactness is characterised by the presence of continuity in development, strong centers, mixed functions, high (or medium) densities, and is associated with great accessibility and functional public spaces (Ewing & Hamidi, 2015).

Just as urban sprawl, compact developments can come in a variety of forms. Concepts such as the polycentric city, 15-minute city, mixed use development and transit-oriented development are only some of the concepts associated with compact urban development forms. In contrast to urban sprawl, compact development is associated with benefits such as improved accessibility and individual health, increased social interaction, reduced air pollution, higher productivity of infrastructure and so on (Ewing & Hamidi, 2015; Ahlfeldt & Pietrostefani, 2017).

Causes of Urban Sprawl

Urban sprawl is caused by a mixture of economic, institutional and societal forces.

The concentration of economic and education opportunities in cities result in people moving in for work, education and other life opportunities. This results in increasing demand for housing in and around cities, pushing urban development towards the periphery. If population growth is particularly fast, policies and urban planning can struggle to keep up and regulate the outward expansion of the city (Brueckner, 2000).

Increased household income creates higher demand for private homes with more open space and privacy, and increase the budget for longer commutes. At the same time, higher income means that people are more willing to pay extra for location (e.g. more central location, close to public transport, parks or commercial centers). This drives up prices in attractive city centers, resulting in gentrification and pushing lower- and middle-income households further away from the urban core (Bartholomew & Ewing, 2011; Brueckner, 2000).

Technological developments such as the internet and the automobile make it unneccesary to have businessess, commerce or other functions densely clustered together, instead allowing for more dispersed development patterns. Decreasing fuel prices and increased fuel efficiency of vehicles have made long-distance travel cheaper (Arribas-Bel, Nijkamp & Scholten, 2010).
Policies & regulations.

Since the 80's and 90's the urban planning of many cities have been grounded in neoliberal and market-oriented reforms, prioritizing economic development, competition and infrastructure development in urban environments, creating favorable conditions for gentrification and urban sprawl.

Land prices & speculative development also impact urban sprawl development. Land is cheaper in the outskirts of the city, therefore the overall costs of development are lower. This draws businesses and individuals to settle in the outskirts of the city, encouraging outward expansion (Arribas-Bel, Nijkamp & Scholten, 2010).

Consequences of Urban Sprawl

Urban sprawl is considered an inneffective and unsustainable urban development model. It has highly inefficient land use patterns associated with a variety of economic, environmental and societal challenges.

It is true that urban sprawl can stimulate economic growth in the short-term, bringing in tax-payer money and increasing demand in the construction field. However, in the long-term, this land use patterns is highly economically inefficient. Urban sprawl increases trip length and car dependence, which means it increases average travel costs and creates vulnerability due to dependence on fluctuating fuel prices. In addition, low-density urban sprawl has high infrastructure construction and maintenance costs. Since this form of development is highly spread out, it requires more infrastructure per person, including road infrastructure, water, sewage, education facilities and other services. This makes urban sprawl infrastructure highly cost-inefficient (Ewing & Hamidi, 2015).

From an environmental perspective, urban sprawl is considered a threat. It is associated with major negative environmental effects, such as increased air and noise pollution, habitat loss and fragmentation, and increased energy consumption. This form of development also in-

creases soil sealing, leading to worse water absorbtion, fragmentation of local ecosystems and decresed soil health (Johnson, 2001; Camagni et al., 2002; European Environment Agency, 2016).

Urban sprawl also has major societal implications, as it has been associated with negative health implications such as decreased physical activity, higher obesity rates and increased traffic-related deaths and injuries (Sturm & Cohen, 2004; Ewing et al., 2003). Urban sprawl has also been found to contribute to increased inequality and socio-spatial segregation, separating households by income or by race. Urban sprawl is particular detrimental to lower-income households who have decreased access to local jobs (which would not require a car) and have to spend a large proportion of their income on transportation costs (Ewing & Hamidi, 2015).

Accessibility

Accessibility in urban sprawl is a challenge that is repeatedly emphasized in literature. But before we can look at what how this development pattern impacts accessibility, it is important to clearly define accessibility as a concept. One of the first attemts to define accessibility was by Hansen (1959). In his paper, accessibility is defined as the ease of reaching various activities (e.g. work, studying, leisure) from a given location with the given transportation system. The primary components of this definition is the ***land-use*** component (i.e. the supply, characteristics and spatial distribution of opportunities) and the ***transport*** component (i.e. the supply and characteristics of the mobility infrastructure). While this definition is logical and easily quantifiable, it fails to recognize that accessibility strongly depends on the needs, time constraints and capabilities of the individual.

Time Geography

In a critisism on regional transport planning of the time, Hägerstrand introduces the individual component in mobility and accessibility. In the time geography concept, Hägerstrand (1970) argues that the movement of people is determined not only by the physical space (e.g. land use and transport infrastructure, traffic flows between two location points), but also by personal schedules, routines and time constraints.

Hägerstrand criticizes traditional spatial analysis and planning practices for being purely focused on aggregate models, traffic flows and other large-scale parameters. This approach dismisses the individuality of people and treats their movement in the same way as that of money and goods. In fact, people are have their own schedules and activities which have to be carried out at a given time and place, sometimes with specific people or equipment. The sequence of these activities may need to organized in a specific and inflexible order. It is argued that by understanding and accounting for these individual behaviours and routines on the small scale, movement can be improved on the large-scale.

Time geography introduces key concepts that can help to analyze the individual dimension. The ***time-space path*** (see fig 20) consideres the path of movement of a person throughout space and over time. The ***time-space prism*** (see fig 21) defines all of the places that a person may reach, considering their available time, travel speed and agenda. The width of the prism (i.e. the possible places that may be reached in the available time) can be drastically impacted by the speed and access to various mobility systems. At the same time, the prism does not need to be so wide if the locations for required activities are nearby.

In addition, Hägerstrand identifies three main ***constraints on individual behaviour*** which can help to explain the capabilities and decision-making processes of different individuals:

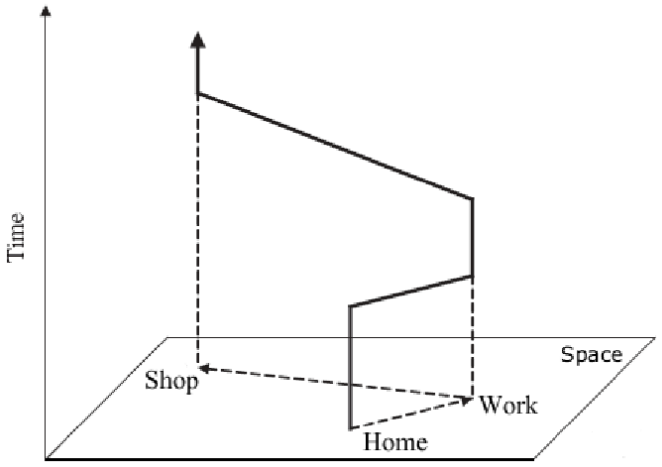
1. Capability constraints (i.e. physical and biological lim-

itations);
2. Coupling constraints (i.e. the need to be at a specific location at a specific time, at the same time as other people);
3. Authority constraints (i.e. institutional or legal limitations).
In relation to accessibility, the time geography concept can help explain the individual variations in behaviour, personal schedules, responsibilities and time constraints that impact their accessibility needs. In the context of this project, the time-space path and prism approach can help to understand the diverse individual accessibility and mobility patterns of residents in residential urban sprawl areas.

Defining Accessibility

Building on previous efforts, Geurs & van Wee (2004) offers a definition of accessibility which considers both the spatial, time and individual components, while keeping the components clear and measurable:

Figure 20. Time-Space Path.



Ellegård (2009).

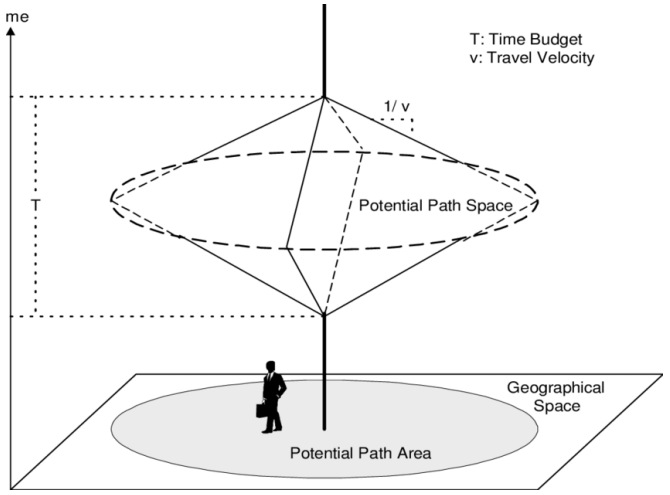
> "
> The extent to which ***land-use*** and ***transport*** systems ***enable*** (groups of) ***individuals*** to reach activities or ***destinations*** by means of a (combination of) transport mode(s).
> "

Geurs & Van Wee (2004).

This definition includes four key components that impact the overall accessibility: land-use, transport, temporal and individual (see fig. 22). These four components interact and influence each other. The ***land-use*** component considers:

1. Quantity, quality and spatial distribution of opportunities present at a given location (e.g. jobs, schools, recreational facilities);
2. The demand for the opportunities present at a given location (e.g. where people live).
The (mis)match between the supply and demand of the

Figure 21. Time-Space Prism.



Miller (2001).

lans-use opportunies may result in competition and decreased accessibility (e.g. not enough schools in a neighbourhood with many children may result in competition and the need to travel longer distances for the same service).

The ***transport*** component considers the mobility system and infrstructure. It refers to how difficult it is for a person to travel from origin to destination using a certain mode of transport. The difficulty depends on the supply, characteristics (e.g. public transport timetables) and location of the infrastructure, and includes:

1. Travel time (travelling itself, waiting and parking);
2. Travel costs (both fixed and variable);
3. Individual effort (incl. reliability, comfort and safety).

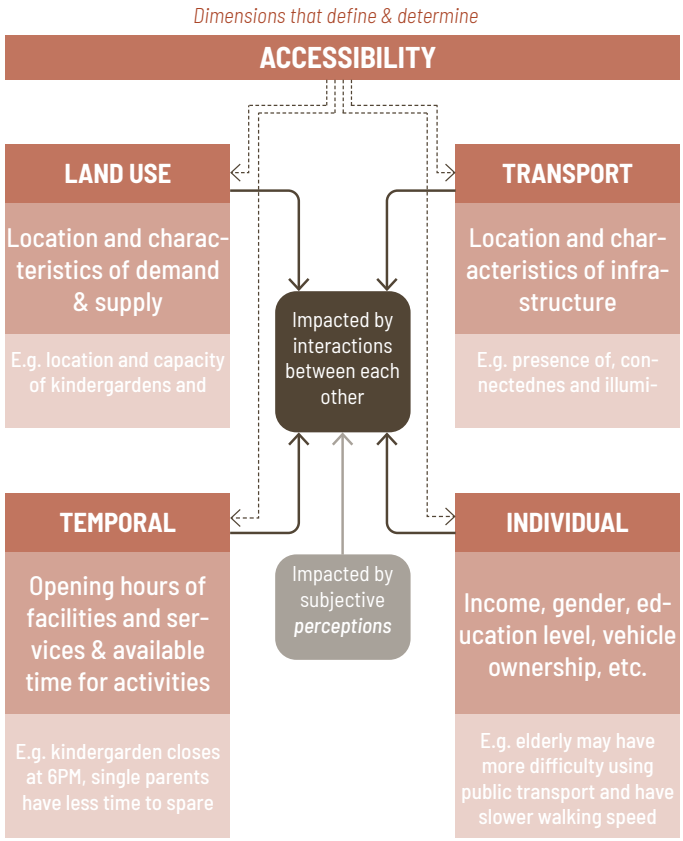
In this case the difficulty is determined by the (mis) match between the demand and supply.

The ***temporal*** component considers the time limitations, such as work hours of certain facilities and the available time of an individual for travelling or participation in certain activities.

The ***individual*** component considers the needs, abilities and opportunities of individuals. These can be impacted by variables such as age, income, education levels or health. These variables impact individual accessibility to the transport (e.g. being able to use a car) and land use component (e.g. qualifying for jobs near their area of residence) and can strongly influence the overall individual accessibility.

Recent research suggests that the individual perception of accessibility components can strongly impact the overall accessibility of an individual, as the perceived

Figure 22. Time-Space Path.



Adapted from Geurs & Van Wee (2004).

accessibility is the basis of individual decision-making. For the purpose of this project, the perception will be made part of the individual component and will not be used as a seperate component, as changing accessibility perceptions is not the main objective of this project (Pot, van Wee, Tillema, 2021).

Mobility vs. Accessibility

Mobility and accessibility are terms that are often used interchangeably or in combination with each other. However, they are distinct and have very different implications for urban planning and development.

Mobility considers the ease of individual movement along a transport network and reaching various destinations, therefore primarily concerns itself with the means (movement), rather than ends (destination).

Meanwhile accessibility focuses on the ease of reaching valued destinations, thus considering the ends (destination), rather than the means (movement). Improving mobility does not necessarily improve individual accessibility (Van Wee, 2016).

Accessibility, Urban Sprawl & The Automobile

Urban sprawl and car dependence has major negative consequences for accessibility, as it results in inefficient land use patterns which increase travel costs, trip length, inequality and socio-spatial segregation.

Evaluating accessibility based on the core components defined by Geurs & van Wee (2004) reveals that urban sprawl and car-centric development has created more challenges for accessibility than it solved.

Land use component. Urban sprawl has resulted in fragmented, inefficient and low-density land use. This made various functions and amenities highly spread out, forcing people to travel long distances. This change in land use patterns also made many alternative modes of transport uncompetitive (e.g. walking or cycling), further enforcing car dependence.

Transport component. Car-centric urban development resulted in the neglect of the infrastructure for other modes of transportation, reducing the choice, quality and competitiveness of modes such as public transport.

Individual component. Car-centric urban sprawl failed to accommodate various individual needs, differences and capabilities (e.g. based on age or income), instead amplifying the existing disparities.

Temporal component. Urban sprawl has resulted in increased distances between home, work, leisure and other functions, therfore increasing the average trip length. In addition, car-centric urban development has eliminated many of the options for transport, forcing the majority of the trips to be made by car. This has resulted in traffic congestion which further prolongs trip length.

Ironically, the main reason why the automobile failed to improve accessibility was due to car-centric development of urban sprawl, which forced excessive car use in urban environments. In current days, urban sprawl and high car use are recognized to have major challenges, such as environmental pollution, traffic congesiton, inequality and segregation.

Therefore, it is no surprise that contemporary urban planning has been shifting away from car-centric development towards more compact land use patterns which can accommodate other forms of mobility. This can be seen in the growing popularity of concepts such as the 15-minute city, polycentric city and compact city (Van Wee, 2016).

Social Cohesion

Social cohesion is a much more elusive concept than accessibility, as academics and policy-makers often struggle to provide a clear, consistent and concrete definition in their works. Instead social cohesion is often used as a catch-all term for societal questions such as well-being, societal participation, tolerance or inequality. There are hundreds of possible definitions for social cohesion and not one generally agreed upon. Two main discourses exist regarding social cohesion: academic and policy (Chan, To & Chan, 2006).

Policy Discourse

Policymakers often have a problem-driven and solution-oriented definition which relate social cohesion to various measurable societal challenges, such as inequality, social inclusion or political participation.

For example, OECD (2011) defines a cohesive society as one that *"works towards the well-being of all its members, fights exclusion and marginalisation, creates a sense of belonging, promotes trust, and offers its members the opportunity of upward mobility"* (OECD, 2011).

Alternatively, the Council of Europe defines social cohesion as: *"the capacity of a society to ensure the well-being of all its members—minimising disparities and avoiding marginalisation—to manage differences and divisions and ensure the means of achieving welfare for all members"* (CoE, 2010).

In a European Commission report on measuring social welfare Berger-Schmitt (2000) argues that social cohesion requires:
1. The reduction of inequality, disparity and social exclusion (e.g. ensuring equal opportunities between gender and socio-economic groups);
2. The strengthening of social relationships, interactions and networks (e.g. engagement in political groups or civil societies).

Policymakers recognize that governance systems make a strong impact on social cohesion. Therefore, they state that that new forms of governance are necessary:
1. Promoting trust and solidarity through policies;
2. Strengthening participatory processes in policymaking;
3. Having a more holistic and flexible approach to policy design and implementation (Chan, To & Chan, 2006).

Policy-oriented definitions have been critizied for confusing causes and consequences with the definitions of social choesion, or failing to provide any definition at all. While broad and inconsistent, core components of social cohesion are visible in the policy discourse, including themes of social inclusion, integration, inequality, participation in society, trust and shared values. These are valuable in the overall understanding on how social cohesion manifests itself in society, and why it is even important (Chan, To & Chan, 2006).

Academic Discourse

The academic world instead has attempted to conceptualize and define social cohesion in a way that is consistent and measurable. Chan, To & Chan (2006) propose a definition for social cohesion which combines the core elements reoccuring in the academic discourse, while seperating the concept from its causes and consequences:

> "
> ***Social cohesion*** is a state of affairs concerning both the ***vertical*** and the ***horizontal interactions*** among members of society as characterized by a set of ***attitudes*** and ***norms*** that includes trust, a sense of belonging and the willingness to participate and help, as well as their behavioral manifestations.
> "

Chan, To & Chan (2006).

In this definition, vertical interactions refer to relationships between the state and society at large (such as interactions between people, insitutions, government), while horizontal interactions refer to the engagement between different individuals and groups in society.

The behavioral manifestations critically point out that social cohesion is not only about inner feelings or attitudes, but also about how people act out these feelings of trust, considering both the subjective and objective component.

This is the primary definition of social cohesion that will be used in this project, avoiding confusion with causes and consequences and primarily focusing on the interactions existing within a society.

Social Capital

One term that is commonly used together with social cohesion is social capital (which in itself is also an elusive concept). The key difference between these terms is the scope. Putnam defines social capital as "features of social organization, such as networks, norms and trust, that facilitate coordination and cooperation for mutual benefits" (Putnam, 1993: 36).

Social capital primarily focuses on individuals or groups of individuals, while social cohesion has a broader scope, considering the general condition of a society. (Chan, To & Chan, 2006). Therefore, while related, the term social cohesion, in my perspective, is more inclusive of all members of society, as having high social capital among some members of society does not necessarily imply that there is social cohesion. Therefore, for the purpose of this project, social cohesion is a more fitting term.

Positioning on Justice & Inclusivity

Justice

Built on the work of John Rawl (1971), social justice commonly refers to the fair distribution of burdens and benefits in a society, where all individuals have equal opportunities and their freedom is protected. Different to equality, where every individual gets the same treatment, justice considers the individual differences in needs and abilities and accounts for them in the decision-making process.

Dimensions of Justice

Justice is commonly divided into the following dimensions: distributive, procedural and recognition.

Distributive justice emphasizes the distribution of burdens and benefits in response to the needs, vulnerabilities and resposibilities of different groups in society.

Procedural justice focuses on who is involved and who has influence over the decision-making process. Procedural justice prioritizes the inclusion of diverse social groups in the decision-making process, ensuring availability of information and equal access to legal processes.

Justice as recognition considers who is given respect and who is marginalized, devaluing some groups in respect to others in society. The priority in this dimension is to recognize the existing structural imbalances (cultural or institutional) which lead to unjust outcomes (e.g. racism, gender inequality). Justice as recognition aims to recognize and respect the rights, needs, values and experiences of various marginalized social groups (Fraser, 2001). This project positions itself at the center of these dimensions, trying to holistically approach the challenge of urban sprawl in Vilnius MP.

Lenses For Viewing Justice

Decision-making for justice can be viewed through the following lenses:

Utilitarianism: producing the greatest good for the largest number of people, i.e. the combined well-being. This approach is the most prominent in public policies (e.g. in cost-benefit analysis).

Egalitarianism: aiming for equal distribution of resources and equal treatment of individuals.

Sufficientarianism: ensuring a baseline for meeting the needs of individuals (guaranteeing a minimum).
Prioritarianism: focusing on improving the situation for individuals who are the worst off.

This thesis has the egalitarian and sufficientarian approach to justice, aiming to reduce inequalities in opportunities and facilitate inclusive societies.

Spatial Justice & The Just City

Spatial justice is described as "the the fair and equitable distribution in space of socially valued resources and opportunities to use them" (Soja, 2009). Spatial justice emphasizes that justices are not only societal or economical, but they are physically embedded in space and urban form. This means that space actively produces societal outcomes, such as inequality and injustice.

Soja relates spatial injustices to the dominant neoliberal ideology in urban development and policymaking which prioritizes economic development based on the free and global market. The author argues that planning practices such as the privatization of spaces, gentrification and unequal investment shape injustice in space, concentrating wealth and opportunities in some locations and depriving others (Buchholz, 2011 & Soja, 2010).

Spatial justice is linked to the concept of the Just City: *"a city in which public investment and regulation would produce equitable outcomes rather than support those already well off"* (Fainstein, 2011). The concept argues that urban planning, governance and policy should prioritize justice over economic development or efficiency. Fainsten establishes 3 key criteria for a just city: equity, democracy and diversity.

Equity emphasides the fair distribution of resources, benefits and burdens, aiming to reduce structural disparities. Fainsten prioritizes equity over equality, as it focuses on fair and supportive policies, rather than the equal treatment of every individual.

Democracy entails citizen participation and control in the decision-making process for their local environment. However, sometimes democracy can produce unfair outcomes (e.g. marginalized minorities), thus it is important that democratic processes are not purely procedural, but facilitating and inclusive.

Diversity emphasizes social, economic and physical variety in urban spaces in the city, arguing that cities thrive in diversity of functions and population. It is vital that diverse groups are actively included in broader society and are not just physically living next to each other.

The Right to The City

Spatial justice and the just city, emphasizing equity, democratic processes and diversity, imply social inclusion. Social inclusion in urban development dates back as far back as the 60's. Lefebvre (1968) in his The Right to The City describes the possibility to participate in the decision-making process for urban development and the accommodation of societal needs in urban environments. Lefebvre critcizes modern urbanization trends shaped by capitalist ideology which exclude marginalized groups (such as lower-income or ethnic minorities) from meaningful participation in society by promoting segregation, consumption and the commodification of public space. More recent literature further builds on and attempts to clarify the definitions of social inclusion and the inclusive city.

Social Inclusion

Social inclusion can be best understood by explaining its polar opposite – exclusion. Levitas et al. (2007) describes social exclusion as a process which entails the denial of resources, facilities and rights to certain groups of people, essentially limiting their accessibility. This exclusion disables them from participating in society by limiting their opportunities for building relationships, participating in economic, social, cultural or policitical activities. For example, limited access to quality educational facilites can reduce social mobility opportunities

for low-income individuals, essentially trapping them in a cycle of poverty. Social exclusion is associated with negative impacts on individual quality of life, as well as the equity and social cohesion of a society (Bailey & Otsuki, 2025). Social exclusion in urban environments exists on spatial, societal and institutional levels.

As the polar opposite, social inclusion is seen as a concept grounded in justice (Fitzgiboons & Mitchell, 2019). It is argued that inclusion in society is a basic human right which should challenge the currently existing structural inequalities an injustices in urban environments. Therefore, an inclusive city demands addressing social segregation in urban environments (Espino, 2015). Bailey & Otsuki (2025) argue that inclusive cities should not promise utopia, but allow its residents to constantly engage, discuss and reflect on the existing inequalities and injustices in the urban evironment and development process.

Social Inclusion For Sustainable Development

One of the most common frameworks for sustainability are the three pillars of sustainability: social, econmic and environmental. The framework emphasizes the need for these three dimensions to work together in order for development and systems to be truly sustainable. Overemphazising one dimension without giving attention to the other will lead to unsustainable outcomes (Purvis, Mao & Robinson, 2018). This paper prioritizes social sustainability through concepts of justice and social inclusion. However, it is necessary to recognize that prioritizing social inclusion does not have to mean that economic development or environmental protection will become neglected.

Inclusion & Economy

Anttiroiko & de Jong (2020) argue that the major socio-economic and inequality challenges in urban areas today are the result of the technocratic and neoliberal approaches to urban development of the past few decades. The prioritization of economic efficiency, profit and technological development (such as in the concept of the smart city) has resulted in urban environments which fail to accommodate for the social dimension which is so vital for the prosperity and resilience of its communities, and amplify various negative environmental impacts. The authors argue that social and economic development are not mutually exclusive or contradictory, and instead can be bound by the notion of social inclusion. Therefore, social inclusion is not only a human right, but it is also a strategic resource for urban development and health, which can tap into underutilized resources, enable more people to participate in the creation of value, and strengthen the resilience, innovation and sustainability urban environments.

Just Sustainability

Chancel (2020) argues that social inequaliy and envionmental degradation are not separate issues, but are in fact reinforcing each other. Environmental challenges such as climate change and biodiversity loss are both caused by and amplify economic, social and political challenges. Therefore, it is necessary to to address environmental together with justice in order to achieve sustainable development.

In this regard, traditional environmental and climate policies have been criticized for overly focusing on environmental goals, regardless of the societal implications on social justice, equity and well-being (e.g. taxing gas while ignoring the existence of energy poverty). This approach is dangerous because it can create resistance towards the sustainability transition and produce inefficient solutions.

The concept of just sustainability brings together social justice and environmental sustainability, arguing that environmental protection and social equity are not mutually exclusive, but must instead go hand in hand. The idea is to ensure that environmental policies and strategies do not disproportionately disadvantage any social groups, and everyone is included equally in this societal transition (Agyeman, 2013).

Thesis Positioning of Justice & Social Inclusion

This project grounds itself in justice through social inclusion. The project aims to create more inclusive societies by reducing inequalities in accessibility and facilitating social cohesion, therefore addressing distributive, procedural and recognition justice through the egalitarian/sufficientarian lens. By facilitating social inclusion (i.e. enabling residents to engage, discuss and reflect on the existing inequalities and injustices in the urban space), urban development can become more sustainable socially, economically and environmentally.

Theoretical Definitions Contextualized

Urban Sprawl

For the purpose of this thesis, urban sprawl is defined both as a process and as a land use pattern which is commonly low-density, fragmented, chaotic and car-centric. It is understood to be a result of various economic, systemic and societal processes such as economic development, migration, neoliberal policies and market forces. Urban sprawl is socially, environmentally and economically unsustainable as it increases infrastructure costs, environmental degradation, public health problems, social inequality and socio-spatial segregation (see fig. 23).

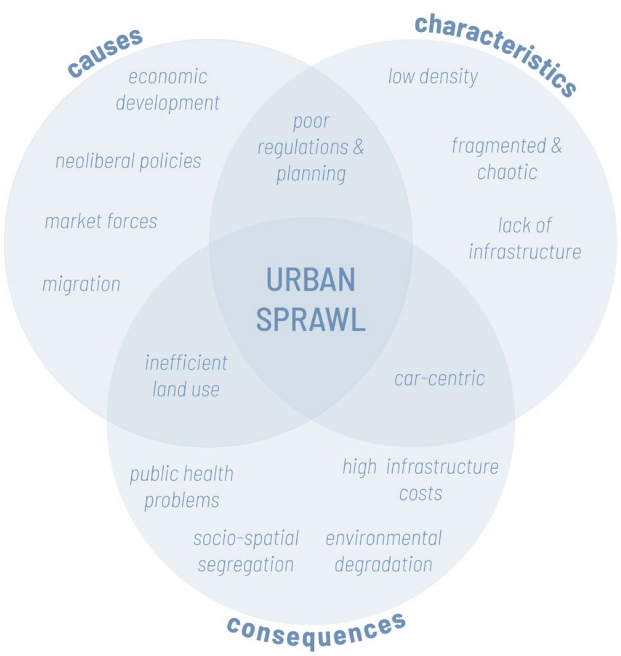


Figure 23. Concluding Urban Sprawl Definition Diagram.

Accessibility

In the context of this thesis, accessibility describes the extent to which individuals can access opportunities by using the available transportation system (see fig. X). Accessibility can strongly determine the quality of life and participation in society of an individual. The concept commonly has four components: land-use (supply and demand), transport (supply and demand), temporal (time) and individual (needs and capabilities). However, for the purpose of this project, only the spatial components which can be directly impacted through urban planning and design will be considered (i.e. land use and accessibility) (see fig. 24).

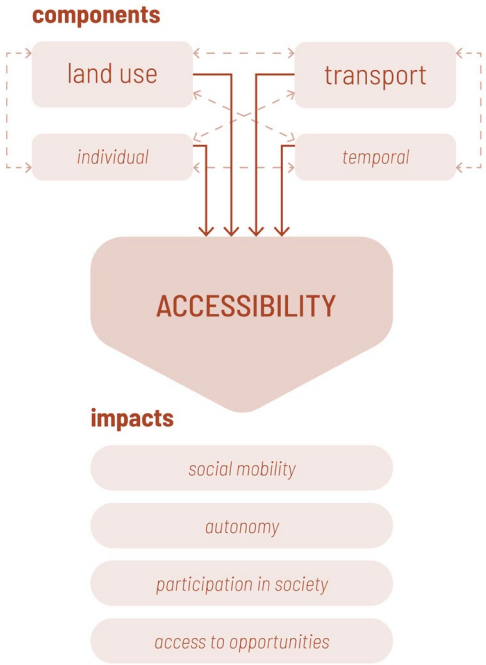


Figure 24. Concluding Accessibility Definition Diagram.

Social Cohesion

In this thesis, social cohesion defines the strength of the relationships among (and between) individuals and their institutions. Social cohesion commonly manifests itself through generalized trust, a sense of belonging and participation in societal life (e.g. through voting, volunteering or simply helping a stranger). Social cohesion is commonly discussed in in the context of societal challenges of individual well-being, social inequality, social exclusion and civic engagement. To build social cohesion, policymakers emphasize the need to create trust, strengthen participatory processes, and be flexible and holistic with policy implementation (see fig. 25).

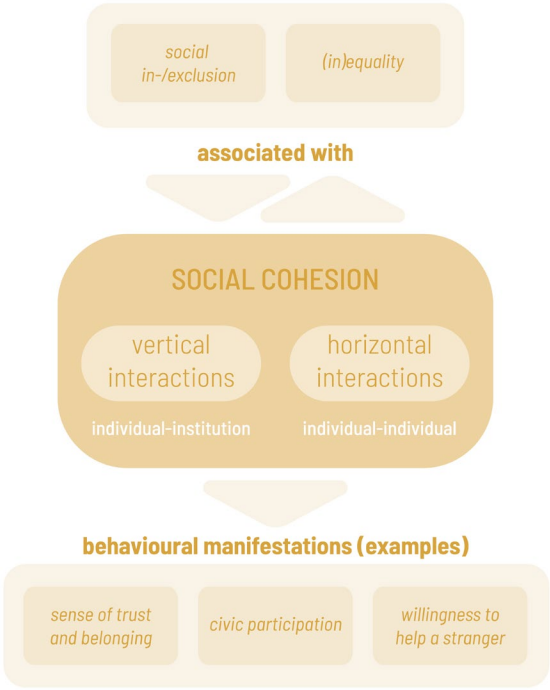
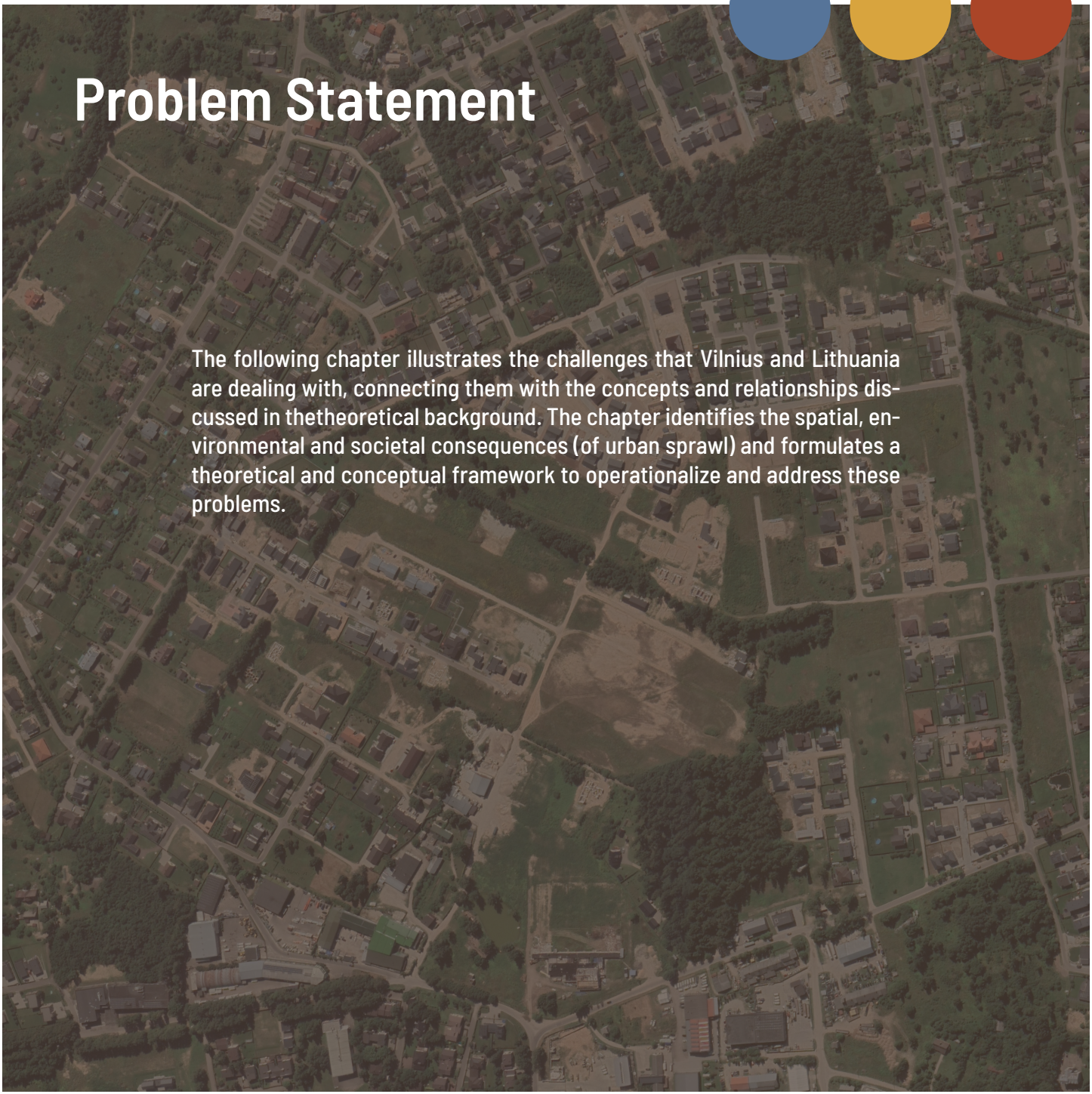


Figure 25. Concluding Social Cohesion Definition Diagram.

Problem Statement



The following chapter illustrates the challenges that Vilnius and Lithuania are dealing with, connecting them with the concepts and relationships discussed in thetheoretical background. The chapter identifies the spatial, environmental and societal consequences (of urban sprawl) and formulates a theoretical and conceptual framework to operationalize and address these problems.

Urban Sprawl in Vilnius & Lithuania

Demographic Shifts in Lithuania

By 2020, Lithuania lost nearly a million (i.e. ~25%) of its population compared to the 1992 due to mass migration, ageing population and declining birth rates. In recent years the population trends have reversed and began to steadily increase due to growing migration rates from Eastern Europe (namely Ukraine and Belarus) and from Central Asian countries (e.g. Uzbekistan, Tajikistan, Kazachstan). This recent trend brings its own social inclusion challenges (namely integration and ensuring equal opportunities). While growing migration has somewhat stabilized the population, overall the country is still facing a deepening demographic crisis (Lietuvos Respublikos Seimo Kanceliarija, 2025).

Fig. 26 shows that while the majority of the country is in crisis, the population in the 3 largest cities in Lithuania is rapidly growing due to migration (both domestic and international). Upon closer inspection though, with the exception of Vilnius, the population is growing in surrounding municipalities, not the cities themselves. In fact, the urbanization rate in Lithuania has mostly plateaud since the 90's (see fig. 27). This illustrates multiple shifts happening in Lithuania: rural decline, rural-urban migration and urban sprawl.

Population loss of

24.6%

in Lithuania between 1992 and 2020

(Official Statistics Portal, 2026).

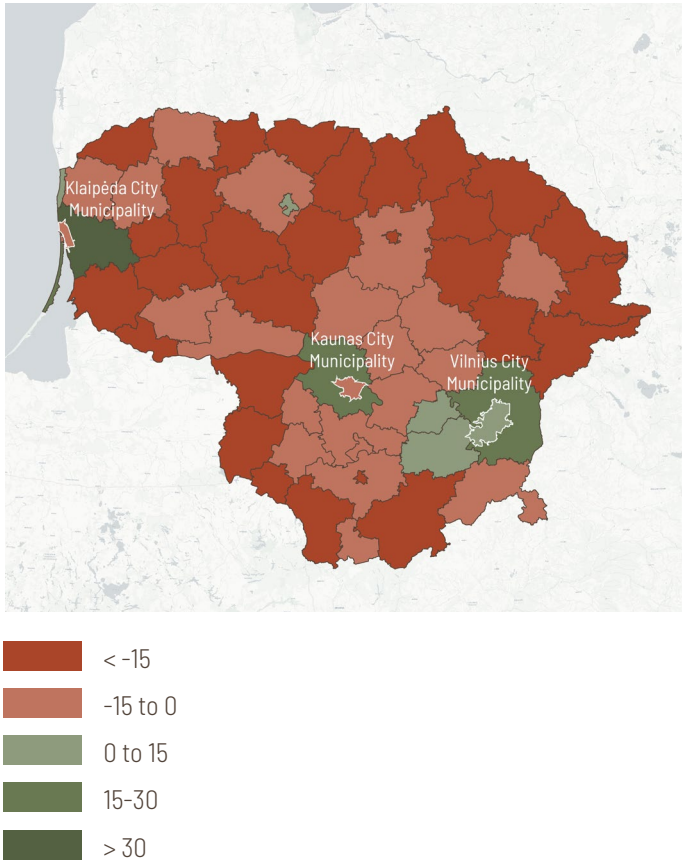
Fertility rate of

1.18

in 2023 in Lithuania

(Lietuvos Respublikos Seimo Kanceliarija, 2025).

Figure 26. Population Change per Municipality (2015-2025, %)



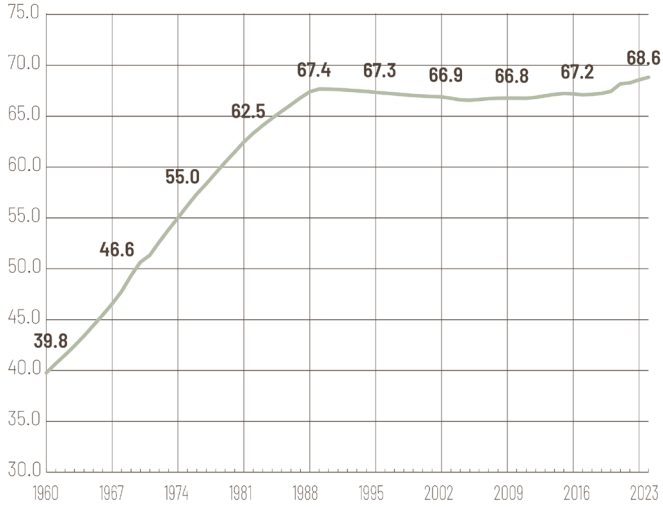
**3 largest cities in Lithuania highlighted in white.*

Center of Registers (2025a).

Urban Sprawl in Vilnius MP

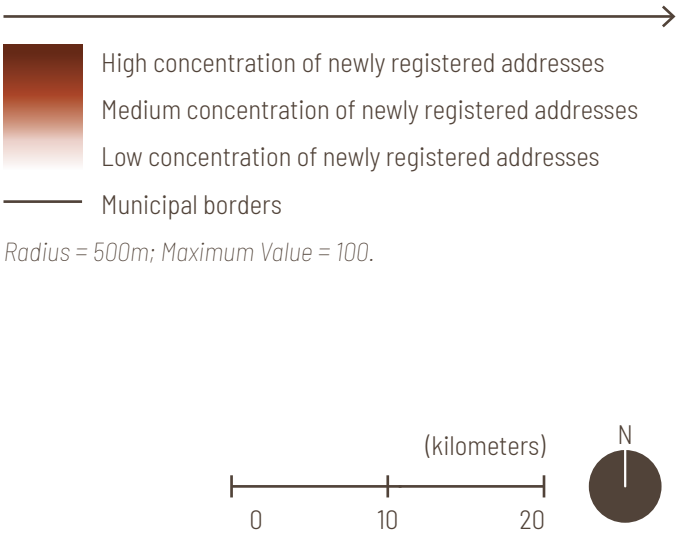
In Vilnius MP, a heatmap of newly registered addresses since 2015 (see fig. 28) further details what the population change map suggested. The majority of urban development is happening along the borders of Vilnius City Municipality, spilling over to Vilnius District Municipality and Trakai Municipality in the form of urban sprawl. Over the past few decades the sprawl rate has only increased, and it is showing no signs of stopping. A satellite image of Tarandė, a suburb at the edge of North-West of Vilnius visualizes the rapid growth rate of urban sprawl along the municipal borders (see fig. 29).

Figure 27. Urbanisation Rate in Lithuania (1960-2024, %).



World Bank Group (2024).

Figure 28. Heatmap of Newly Registered Addresses Since 2015.



Radius = 500m; Maximum Value = 100.

Center of Registers (2025b).

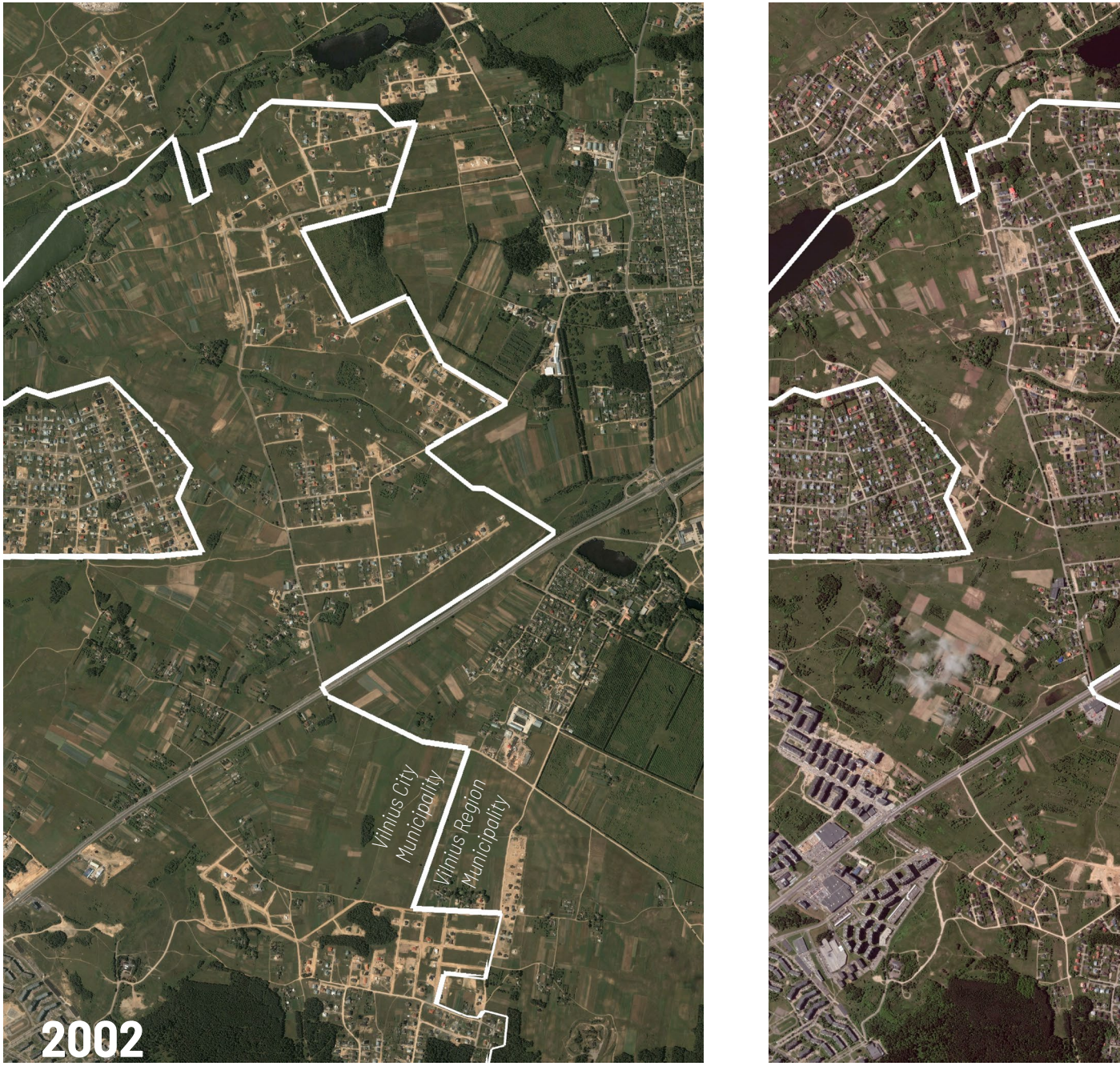


Figure 29. Tarandė in 2002, 2015 and 2023.

Google Earth Pro (2026).

(meters)

N

0 500 1000

A Collage of Spatial Challenges

Residential urban sprawl in Vilnius usually develops without much planning or foresight, leading to a variety of spatial challenges (see fig. 30). The inefficient land use patterns result in highly spread out residential areas, creating large distances between home and work, school or other activities. This makes it impossible to complete daily activities without a car. Residential urban sprawl areas can be extremely underfacilitated, lacking essential infrastructure such as paved roads or lighting, sometimes even missing proper sewage or electric systems. Ironically, this also creates challenges not only for carless commuters, but also for car traffic. Dirt roads filled with puddles, potholes and wet patches of mud act as obstacles for mobility. The lack of infrastructure and marking means a lack of traffic organization, leading to unnavigable roads and ambiguous street rules. This results in inefficient traffic flow and traffic jams during morning and evening rush hours.

Large private plots are often highly fenced off and introverted, making them feel antisocial, and promoting sedentary, introverted and individualistic lifestyles. This characteristic build-up makes the streets and public spaces in residential urban sprawl areas dead and uninviting. Commonly residential urban sprawl area development is quite patchy. In Mileišiškės it can be seen that some plots are long abandoned, some are used for storage, while others are turned into offices which are private houses in pretend. New luxurious houses pop up alongside run-down properties. These chaotic characteristics result in residential areas which are highly inaccessible and provide no opportunities for social engagement.

Figure 30. Pictures of Mileišiškės in Vilnius.


NO LIGHTIN
INTROVERTED PLOTS


OLD ABANDONED PLOT


CLOSED OFF PLOTS
POTHOLES


AMBIGUOUS ROAD INFRASTRUCTURE RULES
BUMPY DIRT ROADS


DEAD END
UNCLEAR OWNERSHIP


DIRT ROADS IN BAD CONDITION


TALL FENCES


OFFICE PRETENDING TO BE A PRIVATE HOME


HALF-ABANDONED PLOTS
NO LIGHTING
BUMPY GRAVEL ROAD


CLOSED OFF PLOT


NO LIGHTING
ABANDONED PLOTS
DIRT ROADS

Accessibility Challenges in Vilnius MP

Poor Accessibility in Outer City

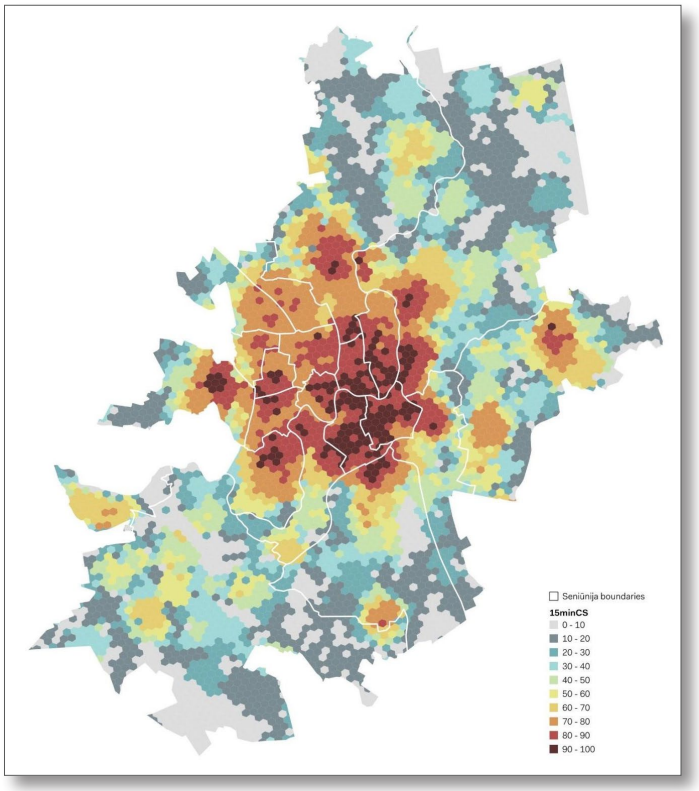
Since the recent growth of urban sprawl, Vilnius has been dealing with numerous accessibility challenges.

Urban sprawl areas commonly lack facilities or services and are highly spatially dispersed. This results in long travel distances, therefore urban sprawl residents are dependent on the car for nearly all form of travel.

The difference between accessibility levels in the inner city and the outer urban sprawl areas are significant (see fig. 31). As most of the job, education, leisure, commercial and cultural opportunities are concentrated in the inner city, people need to travel to the inner city and back for the most basic amenities.

This increases travel expenses and air pollution, and puts pressure on the infrastructure in the inner city.

Figure 31. Vilnius Accessibility Index (Valentinavičius, 2025).



How easily can residents reach essential services by walking in under 15 minutes: local services, healthcare, local shops, education facilities, sports facilities, cultural entertainment, outdoor leisure, mobility services.

Traffic Congestion in The Inner City

As people move to the periphery of the city, car use and ownership increases (see Fig. 32), which puts increasingly more pressure on the infrastructure of the inner city. In recent years, Vilnius has seen some of the worst traffic congestion in decades (see fig. 33). Congestion has become a daily occurrence and people regularly spend hours standing in traffic. In January of 2026, staggering average of 4.5h of traffic congestion per day was recorded (JUDU, 2026).

Daily minutes of traffic congesion (average of Jan 16-21):

81 in morning rush hour

116 in evening rush hour

68 in non-rush hour

results in

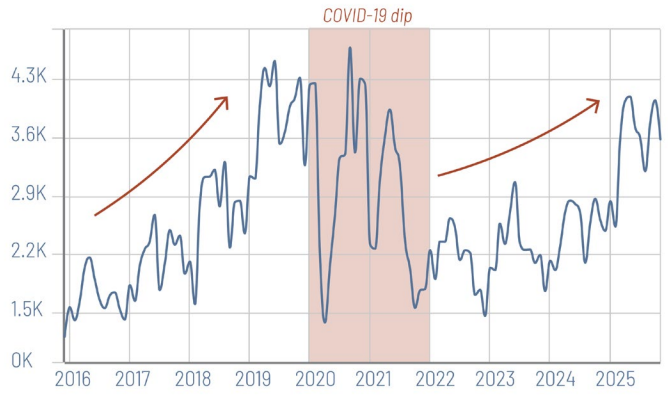
4.5 hours

of ***traffic congestion***

daily

(JUDU, 2026).

Figure 32. New passenger car registrations in Lithuania



European Automobile Manufacturers' Association (2025).

Figure 33. Traffic congestion in Vilnius (Stacevičius, 2023).

Social Cohesion Challenges in Vilnius MP & Lithuania

Generalized societal trust (both in institutions and among individuals) has been strongly undermined in the years that Lithuania was under the Soviet Union, as the regime was primarily used force, oppression and manipulation to control its citizens. This resulted in Lithuania being a low-trust society at the start of its independence in the 90's. While the country is slowly making strides in building trust, the poor communication, lack of accountability and top-down decision making processes in Lithuania's governance systems are preventing any significant improvements of the relationships between the individual and the institutions.

Individual & Institutions

Surveys show that Lithuanians do not trust their governance institutions. Only 41% of Lithuanians can say that they trust the government, and support for the president of Lithuania is the lowest it has been since the impeachement of former president R. Paksas – only 38,2%. Similarly low rates can be seen in the trust for local municipalities, with only 35% of Lithuanians stating that they trust the municipality (World Population Review, 2026a; Lietuvos Rytas, 2026; Lietuvos Rytas, 2025). While minor improvements in public trust in the government can be seen, the country still desperately needs improvements (see fig. 34).

Due to this lack of faith in the institutions, Lithuanians barely participate in their national politics. The national government elections in 2024 resulted in only 52% voter turnout (Lietuvos Respublikos Vyriausioji Rinkimų Komisija , 2024b). Civic engagement in the country is recognized to be weak and have limited impact on governance insitutions, while only around 37% of Lithuanians state that they would actively take action in case of a political problem (Civil Society Insitute, 2022).

Lithuania has also been dealing with populism growth, with a right-wing pro-Russian party led by an anti-semitic polititian getting nearly 15% of the public vote. In a recent survey, 40% of people agreed that Lithuanians tend to believe in politicians' populist statements (Lietuvos Respublikos Vyriausioji Rinkimų Komisija, 2024b; Kaunas University of Technology, 2024).

Only **52%** of citizens ***voted*** in **national government elections** in 2024.

(Lietuvos Respublikos Vyriausioji Rinkimų Komisija , 2024b).

Over **40%** of people agree that Lithuanians tend to ***believe*** in **populist politicians' statements**.

(Kaunas University of Technology, 2024).

Over **70%** of respondents agree that there are **conflicts** between **citizens and the state**.

(Kaunas University of Technology, 2024)

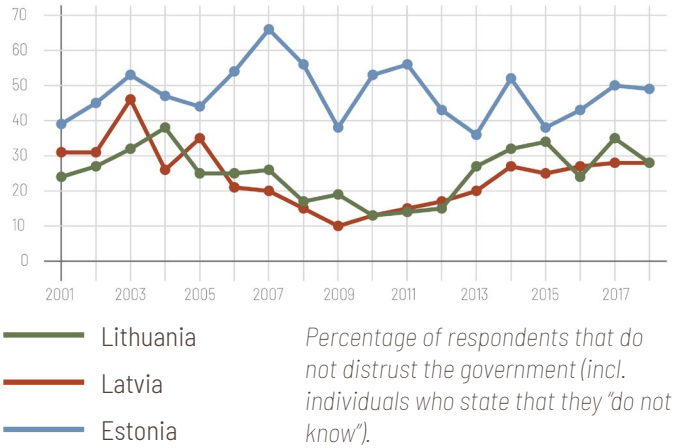
Trust in **parliament, political parties and politicians** in Lithuania is among **lowest** in Europe.

(OECD, 2024).

Only **41%** of Lithuanian citizens ***trust*** in the **government**.

(World Population Review, 2026a).

Figure 34. Public trust in government per Baltic state.



Percentage of respondents that do not distrust the government (incl. individuals who state that they "do not know").

Gužauskaitė (2019).

Self-reported **trust** in others in Lithuania among **lowest** in Europe.

(Eurostat, 2025).

Lithuania ranks **5th** globally in **suicide** rates.

(World Population Review, 2026b)

54% of respondents agree that **Lithuanians are divided**.

(Kaunas University of Technology, 2024)

8 in 10 young people feel **lonely** in Lithuania.

(Narkūnas, 2025).

Lithuaina ranked **157th** (out of 169 countries) in **social tolerance** indicators.

(Legatum prosperity index, 2023).

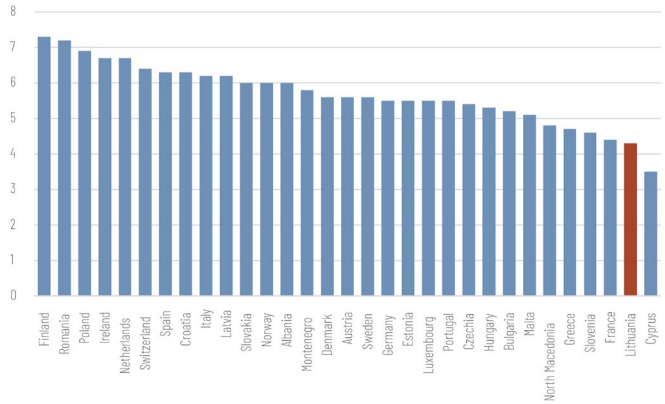
Nearly **1 in 7** Lithuanians feel **lonely most or all of the time**.

(European Commission, 2022).

Interpersonal Interactions

Interpersonal social cohesion in Lithuania has also been seeing some struggles. The country regularly ranks among the lowest in Europe in measures such as trust in others, social tolerance and strength of social networks (see fig. 35). Over 54% of people agree that Lithuanians are divided (Kaunas University of Technology, 2024). In addition, the country has major issues with mental health and social isolation. For decades now, the country has had some of the highest suicide rates in the world. These statistics indicate that the country needs to find ways strengthen interpersonal social cohesion and to facilitate social inclusion.

Figure 35. Trust in others in European countries.



Self-reported (on a scale from 0 'do not trust at all' to 10 'trust completely').

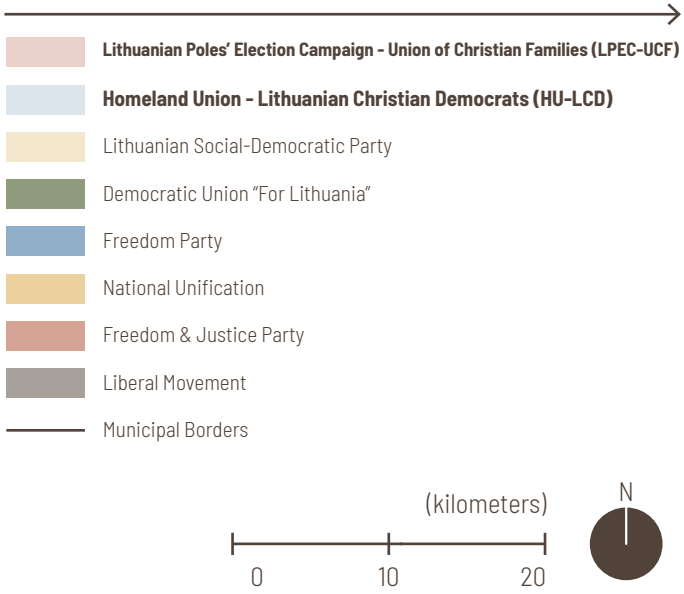
Eurostat (2023).

The Unique Case of Vilnius

In Vilnius MP, urban sprawl has had an especially strong impact on local social cohesion. Due to historical reasons, Vilnius region (outside of the city) has been the poorest and most ethnically diverse regions in Lithuania, as it is home to significant Polish minorities which are have lower income and education levels, and are overall more excluded in Lithuanian society. The local Polish have a strong local identity in this region, having more rural lifestyles, speaking Polish and being strongly religious.

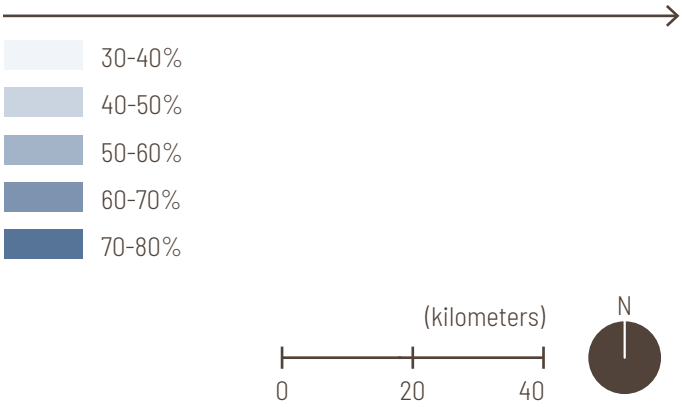
However, the urban sprawl of Vilnius has brought in many Lithuanians of higher income, education and social standing to the region. Being market-driven development, these trends have not been particularly inclusive or empathetic towards the historical residents. This has created socio-ethnic clashes between the historical locals and Lithuanian newcomers, which can be seen in the change in voting behavior (see fig. 36, 37).

Figure 37. 2024 Governmental Election Results (Single-Mandate, 2nd Tour)

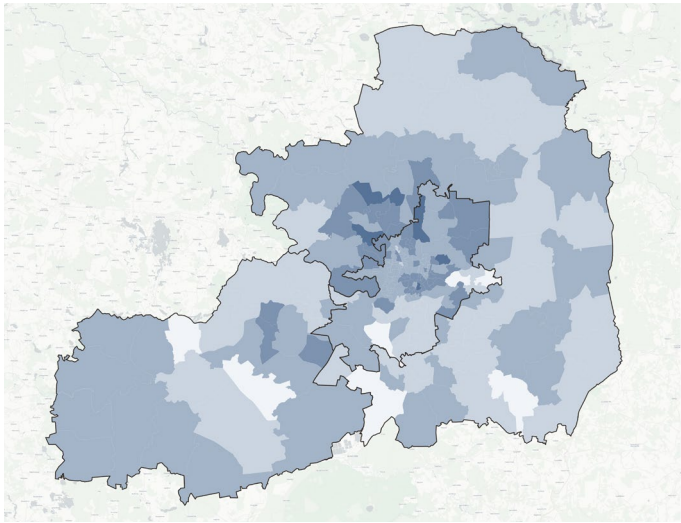


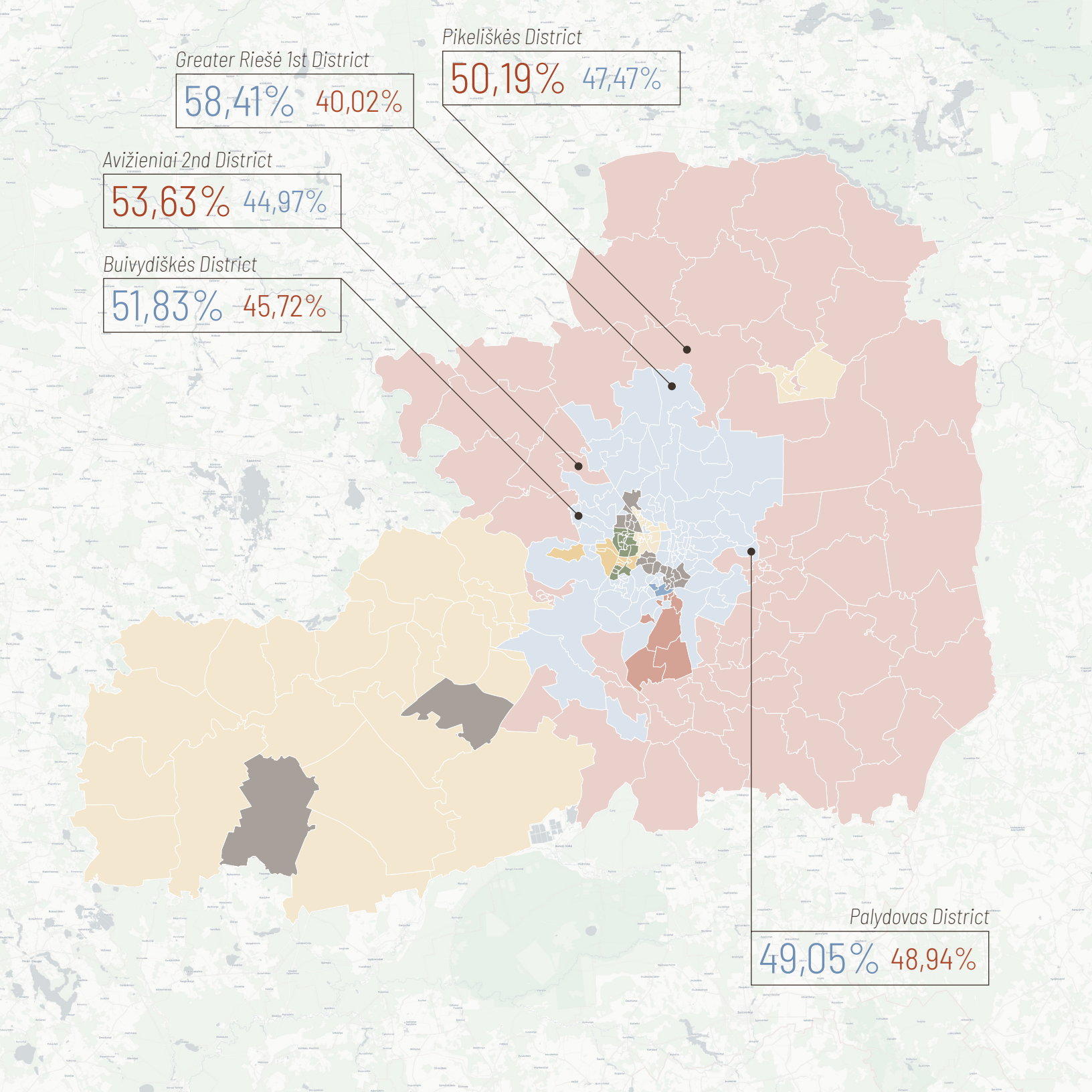
Lietuvos Respublikos Vyriausioji Rinkimų Komisija (2024a).

Figure 36. 2024 Governmental Election Turnout (1st Tour).



Lietuvos Respublikos Vyriausioji Rinkimų Komisija (2024b).




Greater Riešė 1st District
58,41% 40,02%
Pikeliškės District
50,19% 47,47%
Avižieniai 2nd District
53,63% 44,97%
Buivydiškės District
51,83% 45,72%
Palydovas District
49,05% 48,94%

In the past few decades, the most popular party in Vilnius region has been Lithuanian Poles' Election Campaign - Union of Christian Families (LPEC-UCF), i.e. the 'Polish party'. LPEC-UCF are a local minority regional party of Christian conservatives promoting traditional family values. They are strongly focused on religious identity and prioritize minority rights (in particular for the local Poles in the Vilnius Region). The party is anti-LGBT, is against the Istanbul Convention for women's rights and leans towards pro-Russian.

The popularity of this party in the region can be seen as the result of the unequal social standing and social inclusion of the historical Polish residents in Lithuanian society. In fact, statistics show that Polish minorities in Vilnius region earn significantly lower income, are less educated and less opportunities social mobility (also due to the language barrier), which puts them at an uneven playing ground compared to Lithuanians.

Over the past few decades there has been a decreasing share of votes for LPEC-UCF in Vilnius region. Now the LPEC-UCF is competing with Homeland Union - Lithuanian Christian Democrats (HU-LCD), one of the most popular parties in the country, primarily favored by middle and upper class Lithuanians. HU-LCD are also Christian conservatives, but have more pluralistic and pragmatic values. Being center-right, they promote liberal conservatism, are pro-EU and pro-NATO. The 2024 national government election results in districts at the edges of Vilnius show a high level of competition between the two parties (see fig. X).

While the share of votes for LPEC-UCF have been decreasing, the total number of votes for this party has only increased in urban sprawl areas. In an attempt to protect their weakening position in regional politics, Polish minorities have increased their political presence and doubled-down on preserving their radical regional party. This tension can be seen in the voting turnout rates in Vilnius MP districts, where the areas which have seen the most significant urban sprawl are also the areas where voting turnout is higher (see fig. x) (Ubarevičienė, Burneika & van Ham, 2015).

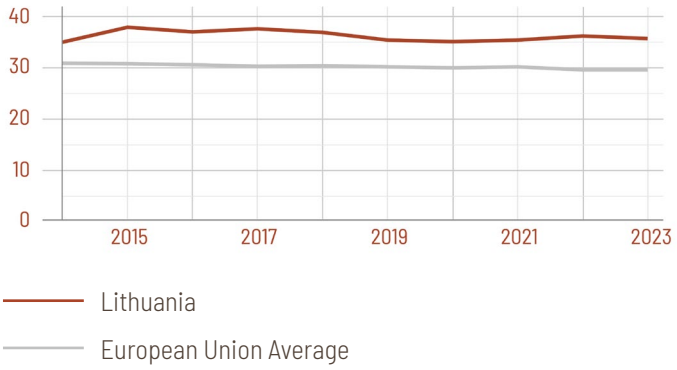
Inequality & Social Exclusion in Lithuania

Inequality in Lithuania

Since its independence, Lithuania has been dealing with some of the worst inequality rates in the European Union, only being surpassed by Bulgaria (see fig. 38, 39). 21.5% of Lithuanians are at risk of poverty, among the highest numbers in the EU (Eurostat, 2025b). Major differences in income and economic opportunities can be seen between the Capital region and the rest of the country. However, the highest income inequality is in fact in Vilnius County, as it has the highest income and lowest income populations in the country (Skučienė, D., 2019).

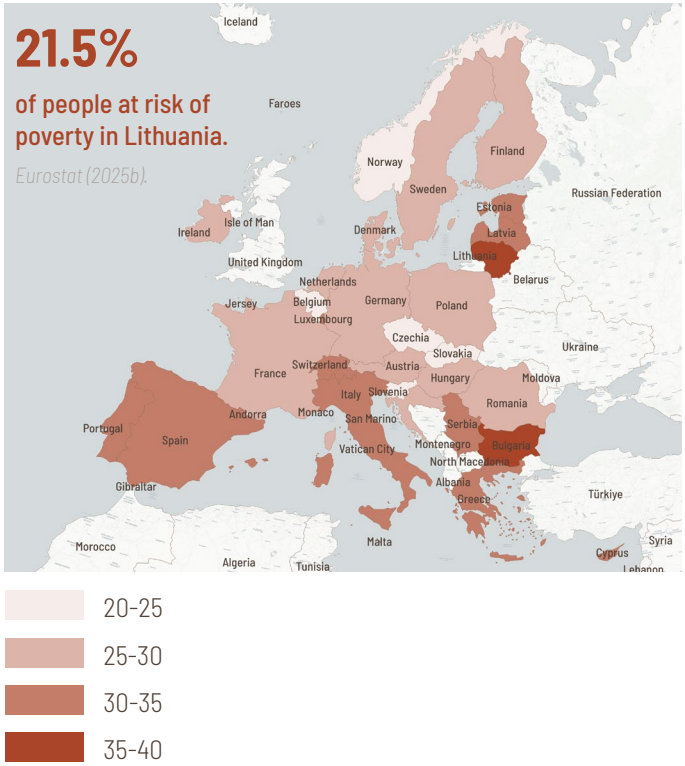
Unfortunately, socio-spatial segregation has been on the rise in Vilnius MP due to urban sprawl and the gentrification of the inner city. This trend will only increase existing inequalities (in access to opportunities) and social exclusion, and further hinder the building of social

Figure 38. GINI Coefficient in Lithuania over time.

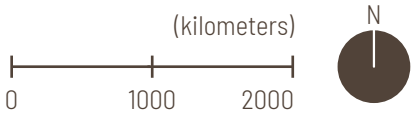


European Environment Agency (2025).

Figure 39. GINI Coefficient in Countries in the European Union.



GINI coefficient for equivalised disposable income per inhabitant, 2024. High coefficient means high inequality, low coefficient means low inequlity. Highest coefficient in Bulgaria (38.4), Lithuania (35.3) and Latvia (34.2), lowest in Slovakia (21.7), Czech Republic (23.7) and Slovenia (23.8).



Eurostat (2025a).

cohesion (as the case of Polish minority and Lithuanian clashes showed).

As Lithuania has been seeing growing migration rates from Ukraine, Belarus and Central Asia (e.g. Uzbekistan, Tajikistan and Kazachstan), challenges for social inequality and exclusion in Lithuania are only expected to increase.

There is a mixture of reasons on why inequality in Lithuania is so high. The multiple transformations after the restoration of independence and transition to a market economy resulted in big winners and losers in the country. Urban economies boomed, while the region crashed. Some people fell behind and were never able to fully catch up to the rapidly transforming society and economy. In addition, the wealth and income redistribution systems in Lithuania are fairly ineffective, as low and limited progression tax rates limit the expenditure budget and enable wealth accumulation. Mass brain drain and the ageing population are also limiting the resource pool. This creates a system where social security and support is weak and unable to facilitate social mobility.

Theoretical Framework

The theoretical background, along with the problem statement shows that urban sprawl results in poorly planned development which lacks essential facilities, services and infrastructure and is car dependent. It is caused by market-driven development, neoliberal policies and the poor management of the built environment by governance and policy systems. Studies show that urban sprawl contributes to social exclusion, socio-spatial segregation and inefficient land use patterns.

The various implications of urban sprawl result in accessibility and social cohesion challenges. Rising inequality, social exclusion and incompetent governance systems result in growing distrust in society, decreased participation in politics and social life, as well as overall downgrades in quality of life. At the same time, inefficient land use and infrastructure, and insufficient facilities and services in urban sprawl areas lead to reduced opportunities for upward social mobility and participation in society and economy.

Low accessibility amplifies already existing social inequalities, which further erodes social cohesion.
At the same time, poor social cohesion results in reduced trust in others and mutual support, damaging (perceived) accessibility. This turns into a negative cycle where the problems amplify and reinforce each other (see fig. 40).

Designing and planning for social inclusion in urban sprawl areas can turn this cycle into a positive one, where improved accessibility strengthens social cohesion, and vice versa. This process could turn urban sprawl areas into more inclusive and sustainable living environments (see fig. 41).

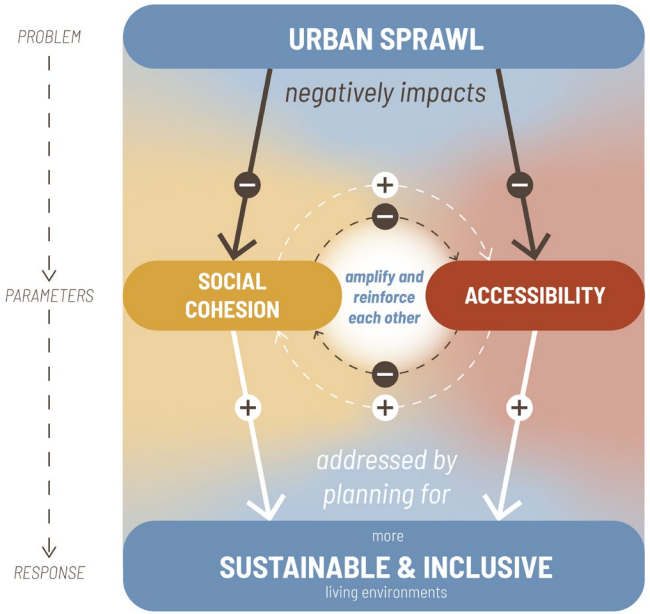


Figure 40. Theoretical framework hypothesis.

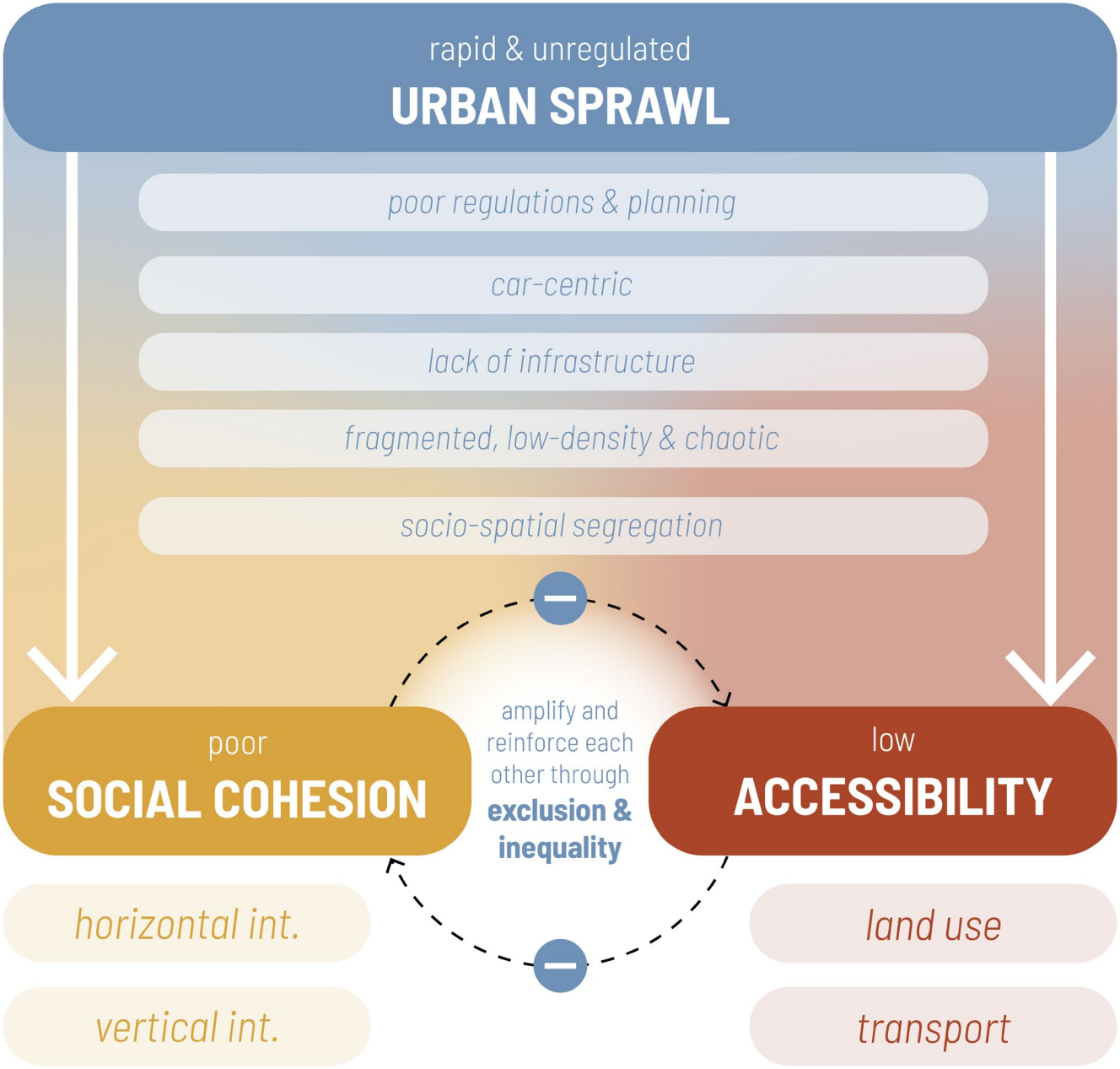


Figure 41. How urban sprawl impacts social cohesion and accessibility.

Conceptual Framework

This project aims to turn residential urban sprawl areas in Vilnius MP into more inclusive and sustainable living environments by strengthening social cohesion and improving accessibility. In order to make these concepts more operational for the limited scope of the project, the accessibility dimension will be addressed through a primarily spatial approach, and social cohesion primarily through governance and policy interventions.

In the conceptual framework (see fig. 42), social cohesion has two parameters: vertical interactions (individual - governance institutions) and horizontal interactions (individual - individual). Accessibility has the transport and land use parameter. These four parameters are not independent, but instead are influenced by each other. For example, by improving pedestrian infrastructure (transport) and creating more meeting places (land use), the interactions between neighbors can increase (horizontal interactions). Alternatively, facilitating participatory decision-making processes in urban planning (vertical interactions) can create more efficient public transport networks (transport) and better address the service and facility needs of residents (land use).

The ripple effect continues, as increasing interactions between neighbors (horizontal interactions) through pedestrian oriented infrastructure (transport) can further encourage people to choose alternatives to the automobile thus reducing traffic congestion congestion (transport). These interdependencies create a web of impacts. However, in order to operationalize the conceptual framework for the thesis, the two strongest relationships are chosen.

The first relationship is between vertical interactions, and transport and land use. Strengthening the relationship between individuals and governance institutions can lead to improved decision-making processes and outcomes for transport and land use. The second relationship is between transport and land use, and horizontal interactions. By improving accessibility to certain transport alternatives, facilities and services in urban sprawl areas, interpersonal interactions can be facilitated.

Interventions in social cohesion and accessibility parameters should mutually reinforce each other by facilitating inclusive and accommodating urban development. This should lead to urban sprawl becoming a more inclusive and sustainable living environment.

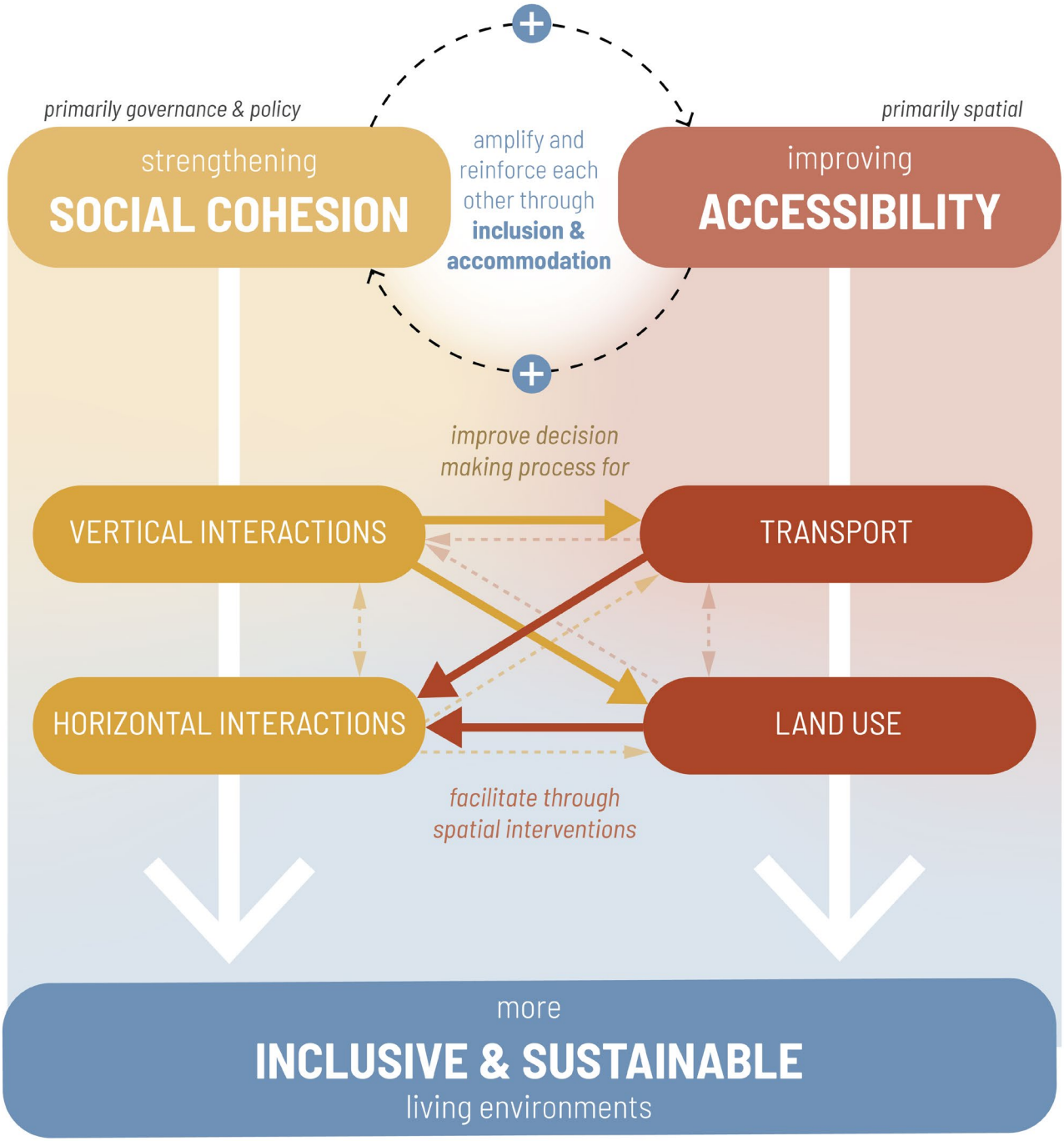


Figure 42. Conceptual framework.

Problem Statement

Due to multiple institutional, economic, political and societal transformations in Lithuania since the 90's, Vilnius metropolitan region has been experiencing rapid and unregulated urban sprawl.

This poorly planned and market-driven development has produced car-dependent residential areas which lack essential facilities, services and infrastructure (e.g. paved roads, lighting, schools), creating major accessibility challenges for its residents.

Existing inequalities are becoming more amplified, as urban sprawl drives socio-spatial segregation and social exclusion. Meanwhile, the governance system has proved to be incompetent in addressing these societal issues, limiting opportunities for the strengthening of Lithuania's struggling social cohesion.

Planning for inclusivity presents an opportunity to address these accessibility and social cohesion challenges associated with urban sprawl in a way that is mutually reinforcing, creating more inclusive, and therefore more sustainable urban living environments.

Methodology

The following chapter outlines the set-up, goals, methods and expected outcomes of the thesis, discussing the main and sub-questions. A timeline and flow of the methods are provided.

Research Questions & Their Methods

Main Question

How can the improvement of **accessibility** and **social cohesion** through **spatial, policy and governance** interventions **mutually reinforce** each other in different **types** of **residential urban sprawl areas** in **Vilnius metropolis** (MP) to create more **inclusive** living environments?

Sub-Question Structure

The project is divided in three key phases: research and analysis, fieldwork and design. Sub-questions (SQ) 1 and 2 in the research and analysis phase aim to understand and operationalize the context of Vilnius region. SQ3 aims to gain and understanding of how the local residents perceive the urban sprawl accessibility and social cohesion challenges. SQ1-SQ3 inform the design phase, which is addressed through SQ3 and SQ4. These questions are opposite lenses, the former one aiming to implement spatial accessibility interventions which would also improve social cohesion, while the latter sub-question exploring policy and governance interventions for social cohesion which would also address accessibility (see fig. X and Y). The overview of the timeline and planning can be found in figure 43, 44 and appendix I.

Research & Analysis

SQ1: What are the different **types** of residential urban sprawl areas in Vilnius MP and how are they characterized?

GOAL

Identify main residential urban sprawl typologies in Vilnius MP based on land use patterns.

METHODOLOGY

1. *Typological analysis: QGIS mapping of land use patterns in Vilnius MP;*
2. *Literature review: exploring previous works defining types of urban sprawl areas in Vilnius region.*

PRODUCTS

Typology catalogue, location of typologies mapped in Vilnius MP.

Fieldwork

SQ3: What are the **local (a) accessibility** and **(b) social cohesion experiences, needs and preferences** of **diverse** residents in different residential urban sprawl areas in Vilnius region?

GOAL

Collect diverse local perspectives of accessibility and social cohesion, understand the perceived barriers, needs and preferences of urban sprawl residents and communities.

METHODOLOGY

1. *Interviews with local community representatives in different residential urban sprawl areas (community NGO representatives, Sub-Elders, Elders)*

PRODUCTS

Interview analysis and synthesis, insights triangulated with literature reviews, spatial analysis, expert interviews and fieldwork.

SQ2: What (socio-)**spatial, policy and governance** configurations are associated with **(a) accessibility** and **(b) social cohesion challenges** (and benefits) in different types of residential urban sprawl areas in Vilnius region?

GOAL

Understand how spatial, policy and governance configurations correlate with the (a) accessibility and (b) social cohesion in each residential urban sprawl typology and in Vilnius region as a whole.

METHODOLOGY

1. *Mapping of residential urban sprawl areas in Vilnius MP (mobility infrastructure, functions, services, land parcellation, demographics);*
2. *Site visit to different residential urban sprawl types (pictures);*
3. *Brief literature review (if available) for additional spatial analysis insights on residential urban sprawl in Vilnius region;*
4. *Literature review of papers analyzing policies and governance systems impacting urban planning and development in Vilnius regoin;*
5. *Analysis of policy and governance (e.g. municipal and government) documents impacting urban planning and development in Vilnius MP (in relation to urban sprawl);*
6. *Interviews with experts (heads of Elderships in Vilnius MP dealing with urban sprawl) to gain broader understanding of policy and governance systems and how they impact urban planning and development for accessibilty and social cohesion;*
7. *Short media review for additional insights on policy and governance challenges.*

PRODUCTS

Spatial analysis outcomes of urban sprawl areas in Vilnius region (critical mapping, insights from site visits and literature reviews); identification of associated challenges with accessibility and social cohesion; diagrams and schemes explaining policy and governance system findings; identifying correlations with accessibility and social cohesion; insights from literature, media and policy/governance document review; key takeaways from expert interviews.

Design

SQ4: What **spatial (a) accessibility interventions** can also strengthen **(b) social cohesion** in residential urban sprawl areas in Vilnius region? (**a -> b**)

GOAL

Propose suitable spatial accessibility interventions which could improve social cohesion for urban sprawl areas; outline key possible spatial interventions with the use of research by design.

METHODOLOGY

1. *Spatial design exploration for selected study area (research by design);*
2. *Prototype concept and vision development for spatial interventions for selected study area;*
3. *Design and approach principles outlining key spatial interventions for accessibility and social cohesion (based research by design on study area).*

PRODUCTS

Concept and masterplan of study area interventions; design principles outlining key spatial interventions; outline of proposed design approach for urban sprawl area transformation.

SQ5: What **policy and governance interventions** for **(b) social cohesion** can also improve **(a) accessibility** in residential urban sprawl areas in Vilnius region? (**b -> a**)

GOAL

Propose suitable policy and governance interventions for social cohesion which would also improve accessibility for residential urban sprawl areas in Vilnius region.

METHODOLOGY

1. *Literature review of successful policy and governance interventions for social cohesion (complementing accessibility);*
2. *Exploration and development of policy and governance interventions for Vilnius region;*
3. *Development of prototype strategy (timeline, policy and governance configurations).*

PRODUCTS

System of strategies (timeline, policy and governance configurations) for Vilnius region and Lithuania; outline of key policy and governance interventions for accessibility and social cohesion.

Methodology Explanation

Typological analysis examines the built form (buildings, neighborhoods, cities) and its underlying configurations, variations and dynamics in relation to social or environmental contexts. Categorizing the built form into 'types' allows for the operationalization of further analysis and decision-making in urban planning. Considering the diverse forms of urban sprawl in Vilnius MP, distinguishing 'types' will enable an organized analysis and synthesis of the diverse land use patterns and their associated impacts on urban sprawl and social cohesion.

Research by design is a methodology which produces knowledge and insights through the design process itself. Through design exploration and experimentation, complex spatial and societal topics can be better understood when traditional analysis methods can not provide sufficient answers.

Literature review is a systemic approach which analyses existing academic literature, policy documents and other literature to gain a theoretical, historical and research-based knowledge. This approach brings various literature works together to gain a deeper understanding of a topic, enabling informed decisions for the urban planning and design process.

Expert interviews are a qualitative research approach in which in-depth interviews are conducted with individuals which have specific knowledge on the relevant topic, field and/or location of analysis. For this thesis, expert interviews were utilized to gain a qualitative understanding on the detailed spatial and governance conditions, challenges, needs and opportunities that urban sprawl areas are dealing with, expert interviews were conducted.

A total of 13 interviews were conducted of individuals with diverse expertise, bringing in a mix of technical planning knowledge and local perspectives (the following list is anonymized to preserve the privacy of the individuals):
- two heads of local community NGOs in VCM;
- two researchers from Lithuanian Center For Social Sciences;
- two Elders (one from VCM, one from VDM);
- three Sub-Elders (all from VCM);
- one head of a department in JUDU (VCM mobility and transportation authority);
- two heads of departments in VCM (one of them former);
- one head of department in VDM.

Figure 43. Project methodology process.

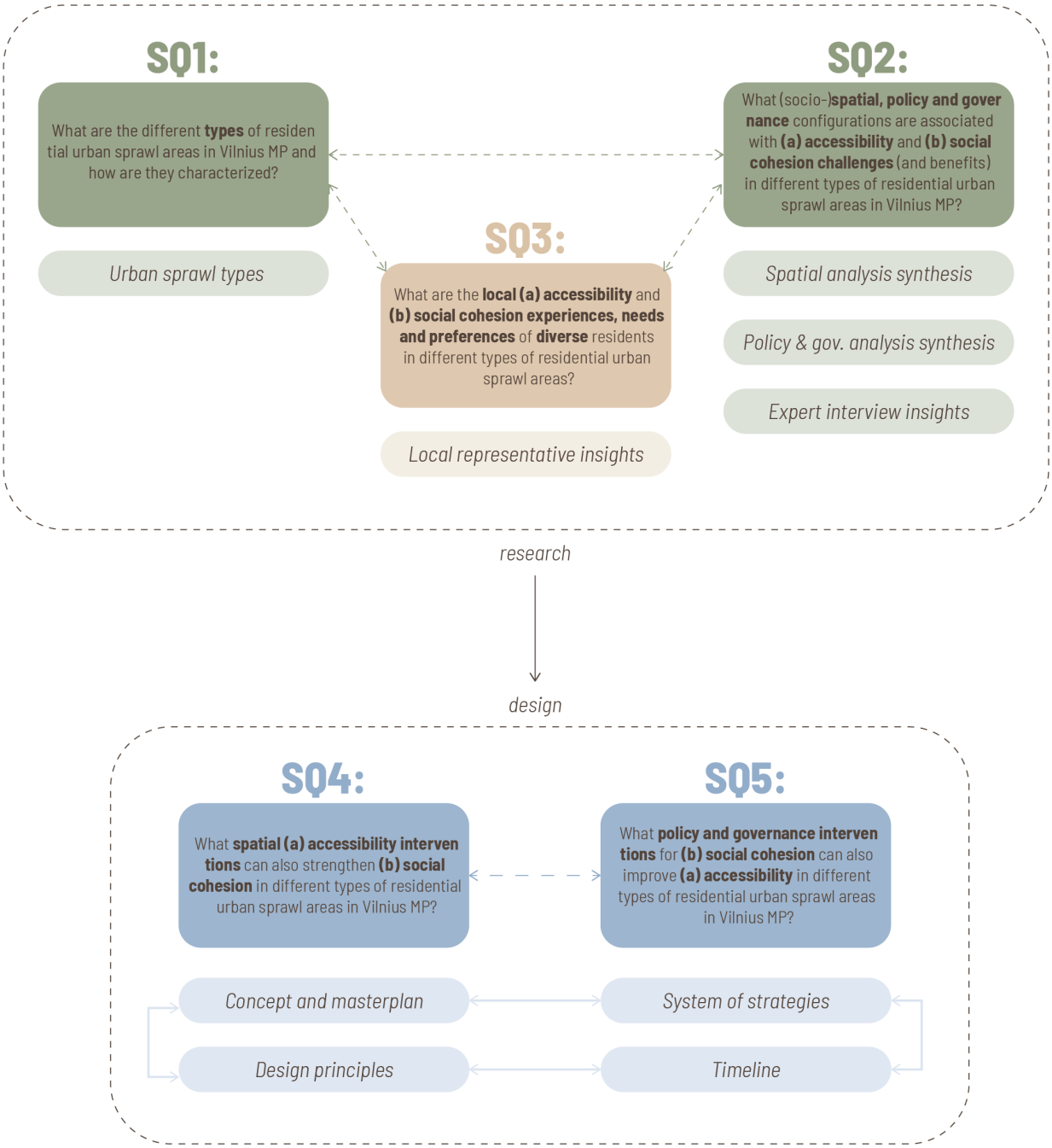
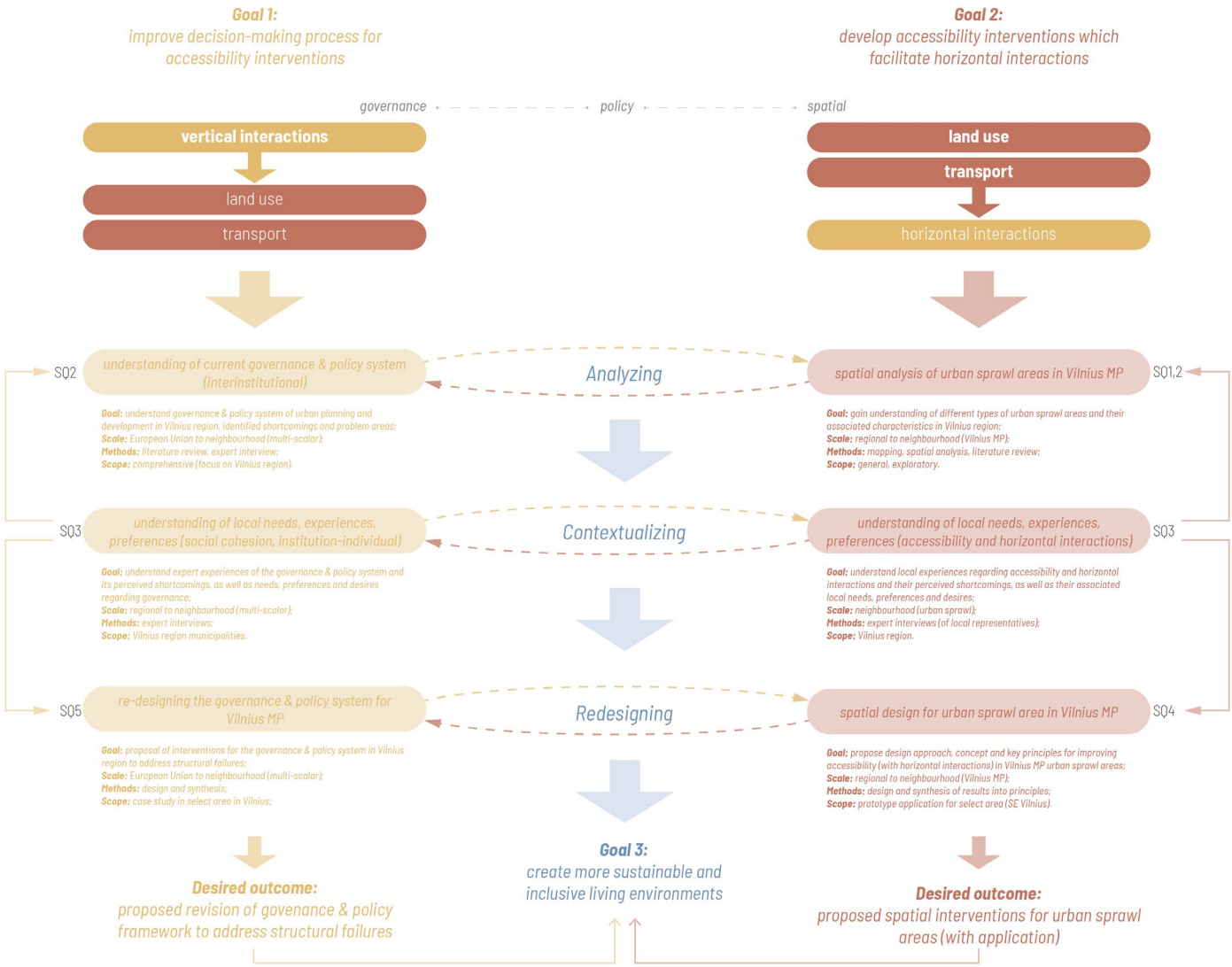
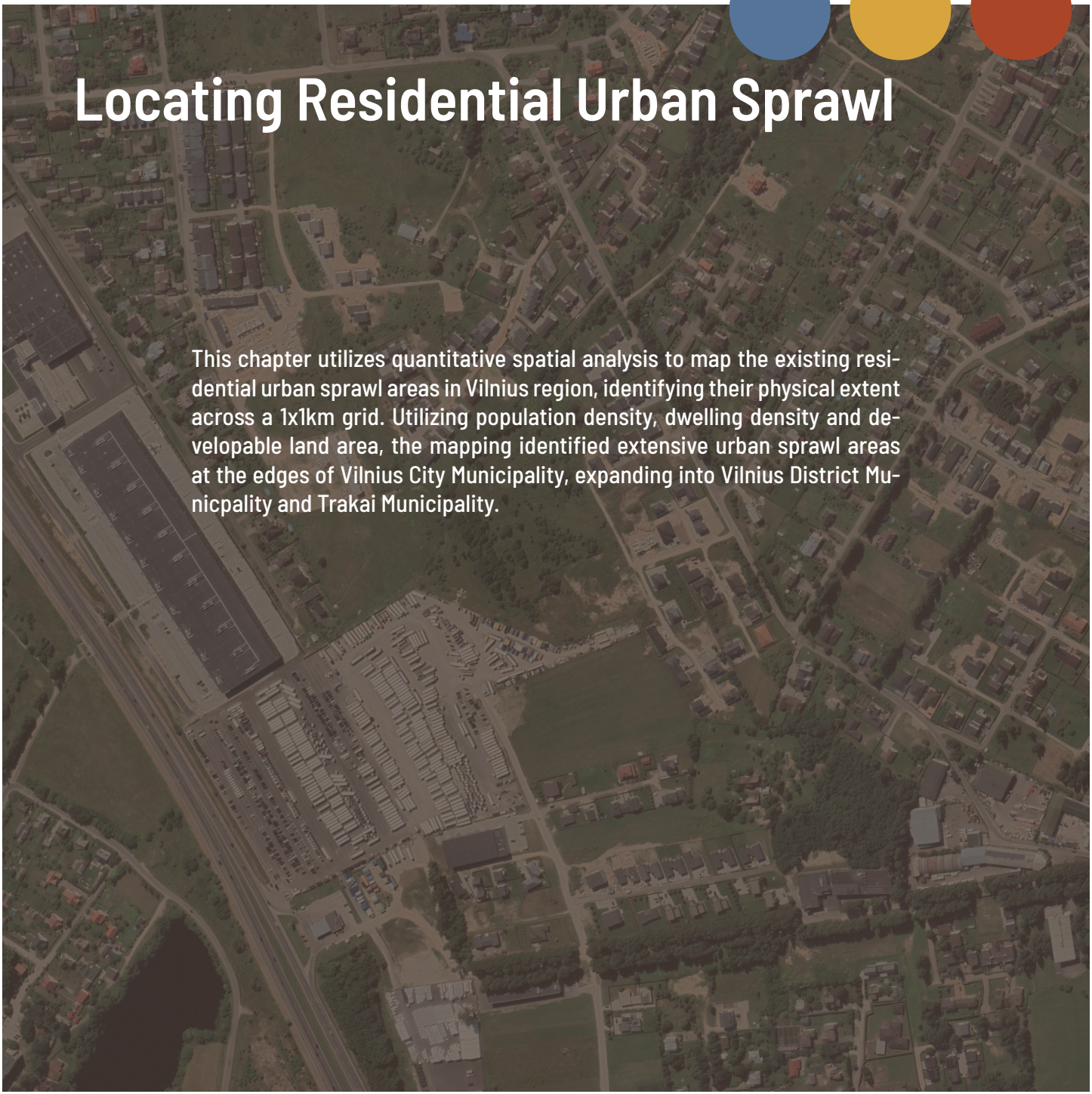


Figure 44. Project methodology process (see appendix for methodology timeline).



Locating Residential Urban Sprawl



This chapter utilizes quantitative spatial analysis to map the existing residential urban sprawl areas in Vilnius region, identifying their physical extent across a 1x1km grid. Utilizing population density, dwelling density and developable land area, the mapping identified extensive urban sprawl areas at the edges of Vilnius City Municipality, expanding into Vilnius District Municpality and Trakai Municipality.

Locating Residential Urban Sprawl in Vilnius Region

Densities

Based on Galster, Hanson & Ratcliffe (2001), density is used as the primary metric to determine urban sprawl areas. Housing unit density is used to capture the spatial conditions of land use, while population density is shows the crowdedness.

Two datasets from Valstybės duomenų agentūra (2021) are used. By now this data is somewhat outdated, but it remains the most recent data available in such high detail. A 1x1km grid (LKS-94 standard) with data for population density and housing unit density per square kilometer are utilized (Valstybės duomenų agentūra, 2025, 2021a, 2021b) (see fig. 45, 46). The maps show that the highest densities cluster in the inner city. The densities quickly drop immediately outside of the central area. The lower-density settlements surrounding the core make up an area around 3 times the size of the higher-density core, illustrating the scale and directions of sprawl.

One major nuance to keep in mind is that the national population density data, while being the best official estimate, may not be entirely accurate. This is because it is common for residents living outside of Vilnius City Municipality to register their living address as somewhere inside the city (the reasons for this will be explained in later chapters). Therefore, overlaying this data with housing unit density provides a more accurate evaluation.

Developable Land

Previous academic literature reviews showed that urban sprawl estimates are more accurate when density is considered in the context of developable land area. This means taking into account land which has natural, practical or administrative barriers for development. For identifying developable land, two INSPIRE datasets were used: the CORINE land cover (published 2018, last revised 2026) and the protected sites (published 2015, last revised 2026) (Statybos sektoriaus vystymo agentūra, 2026a, 2026b).

From the 2018 CORINE Land Cover, the following land uses are considered as undevelopable: natural features (coniferous forests, inland marshes, mixed forests, peat bogs, transitional woodland-shrub and water bodies) and sites with a different existing public function (dump sites, industrial or commercial units, mineral extraction sites, green urban areas, road and rail networks and associated land) (see fig. 47). The dataset for protected areas (such as national/regional parks or UNESCO sites) were overlayed onto these undevelopable land covers to get the final result – all undevelopable land areas (see fig. 48). Considering these areas ensures the exclusion of outliers in which compact development meets undevelopable areas within a single cell, or areas where the context or conditions simply do not allow for urban sprawl to occur (see fig. 49, 50). The maps reveal that a large part of the land around Vilnius is in fact undevelopable, leaving only a few fragmented pockets for possible development.

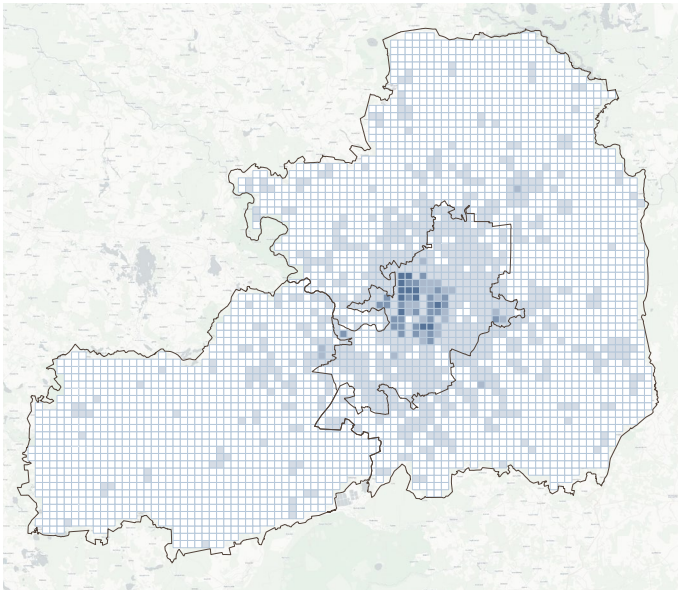
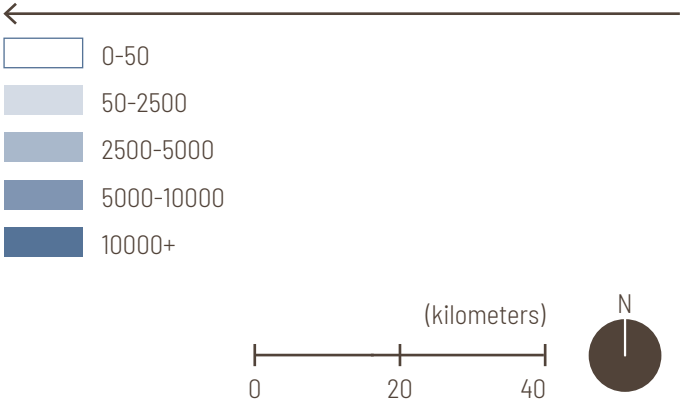


Figure 45. Population density per 1x1km in 2021.



Valstybės duomenų agentūra (2021b).

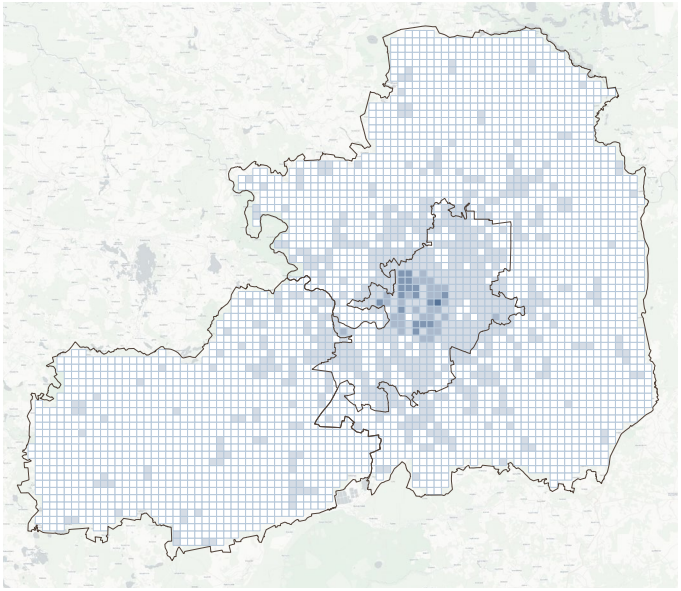
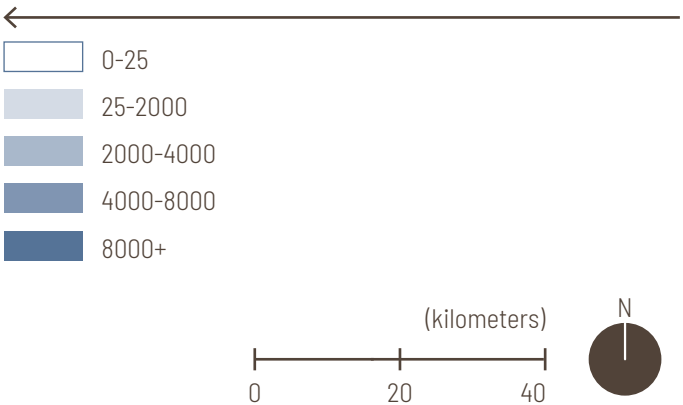


Figure 46. Dwelling density per 1x1km in 2021.



Valstybės duomenų agentūra (2021a).

Natural features (such as forests, swamps or water bodies) make much of the land undevelopable around Vilnius. Various anthropogenic land cover, mostly in the Vilnius City Municipality, make land unsuitable for new development (of urban sprawl). In addition, numerous protected sites inside and outside city borders severely limit development potential.

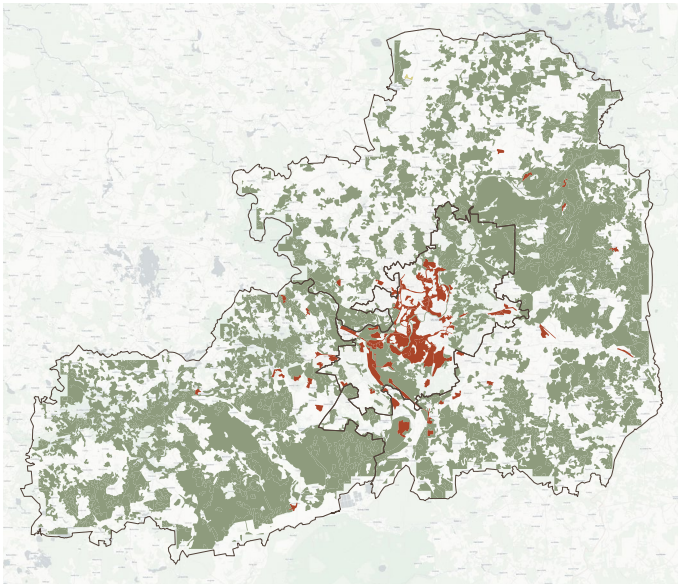


Figure 47. Undevelopable land cover based on CORINE Land Cover.

Natural features (coniferous forests, inland marshes, mixed forests, peat bogs, transitional woodland-shrub and water bodies)

Existing anthropogenic land cover (dump sites, industrial or commercial units, mineral extraction sites, green urban areas, road and rail networks and associated land)

(kilometers)
0 20 40
N

Statybos sektoriaus vystymo agentūra (2026a).

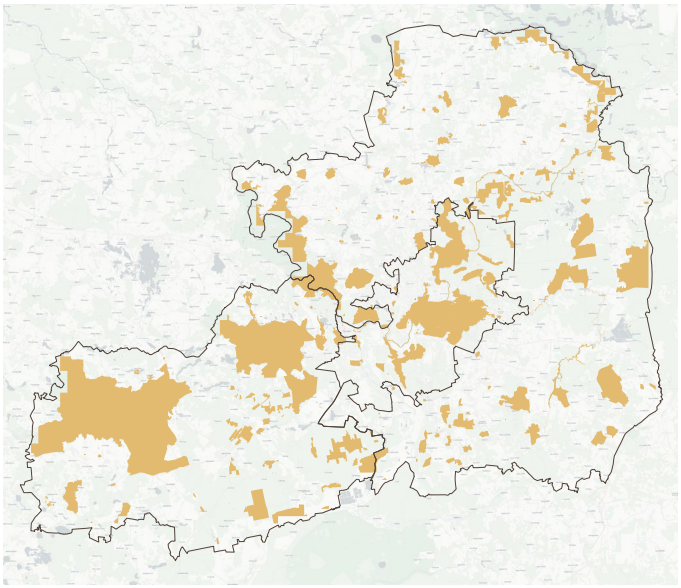


Figure 48. Protected sites.

Protected sites (national/regional parks, reserves, polygons, UNESCO world heritage sites, Natura2000 sites, protective buffer zones)

(kilometers)
0 20 40
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Statybos sektoriaus vystymo agentūra (2026b).

Spatial analysis shows much of the land around Vilnius is unsuitable for development. Main developable patches of land can be seen in the North-West and South-East of Vilnius, in Vilnius District Municipality. This can also partially explain why the urban sprawl development and the overall urban fabric of Vilnius has such a high level of fragmentation.

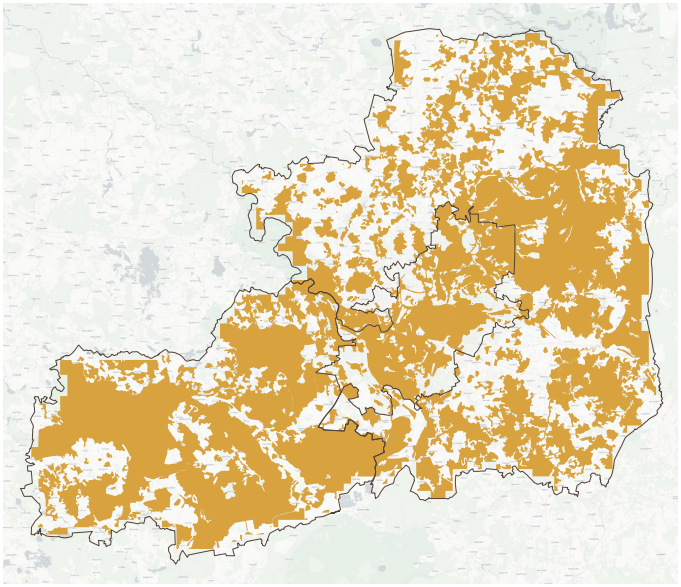
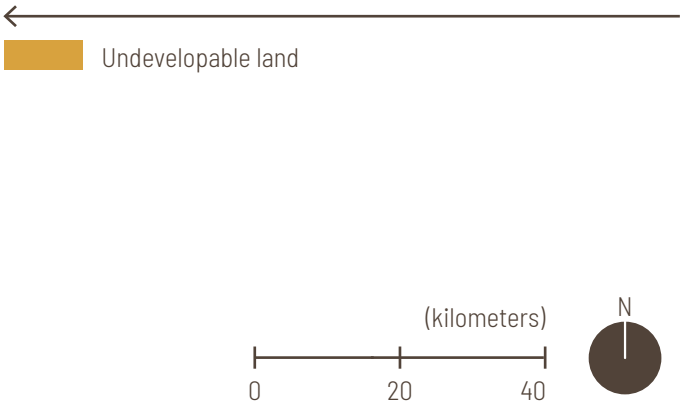


Figure 49. All undevelopable land areas.



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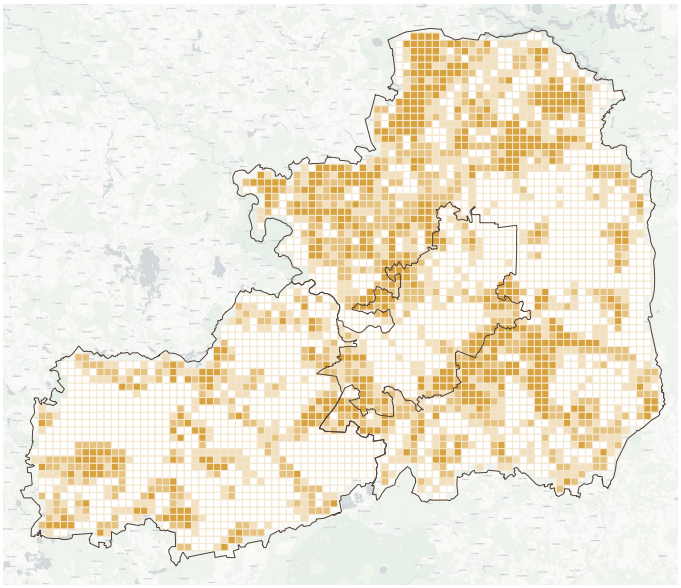
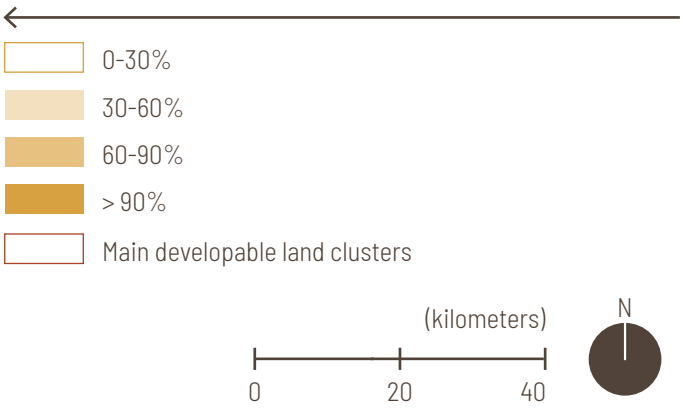


Figure 50. Developable land area percentage per grid cell.



Statybos sektoriaus vystymo agentūra (2026a).

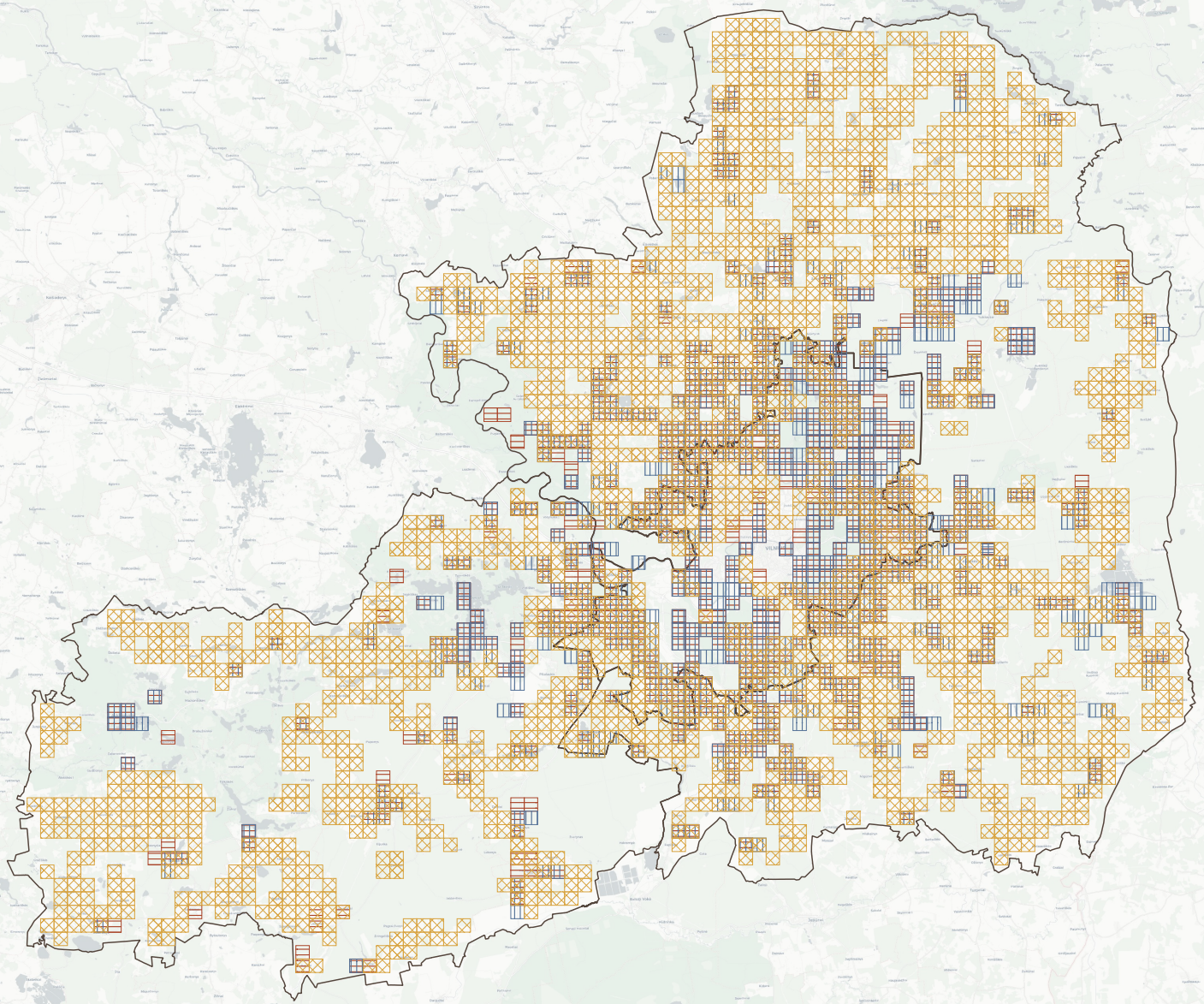


Figure 51. Overaly of urban sprawl criteria.

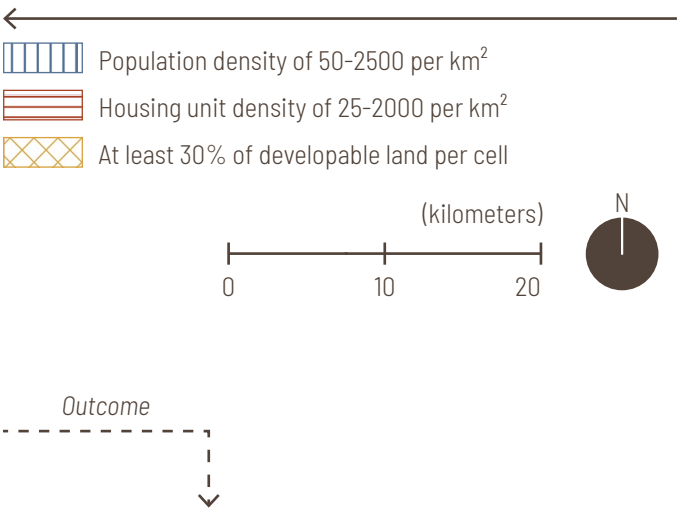
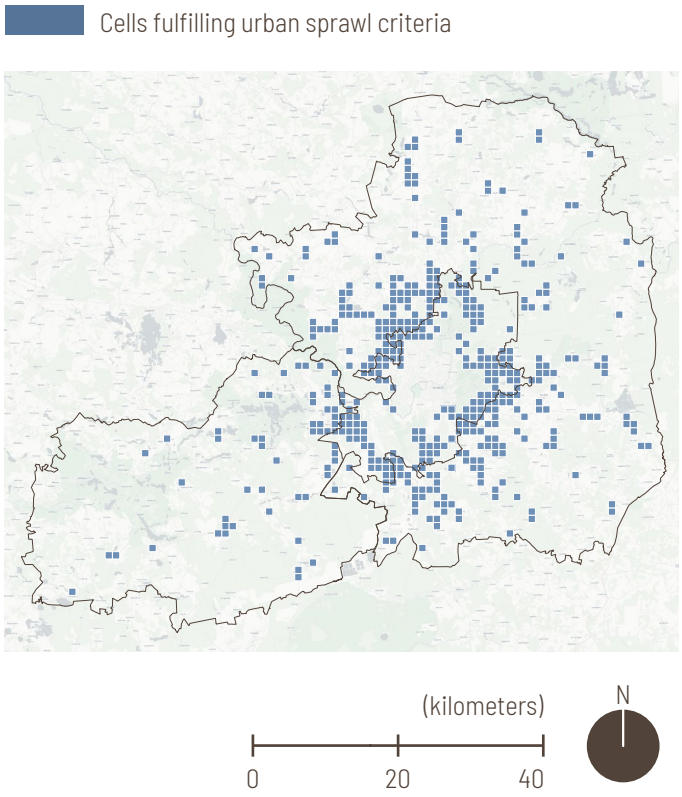


Figure 52. Cells fulfilling urban sprawl criteria.



The final selection for the urban sprawl areas is 1x1 km2 grid cells which meet all of the following criteria (see fig. 51):
- density of 50-2500 persons/km2;
- density of 25-2000 dwelling/km2;
- developable land at least 30% of the cell.

Specific numbers were based on values used in academic literature and EU policy. Visual referencing with satellite imaging helped to further specify the values to fit the specific conditions of Vilnius and its context.

The outcome shows clustering around Vilnius, but also more sparsely scattered cells further away from the city (see fig. 52). These areas are villages and rural settlements which happen to meet the criteria for urban sprawl parameters. However, they have a different development process than urban sprawl, which primarily develops relative to its urban environment and infrastructure. Furthermore, this project considers urban sprawl areas, meaning that clusters of cells are required. Based on these specifications, the final residential urban sprawl area definition excludes cell clusters with less than 8 cells (the cells have to be touching each other either at the corners or at the angles). Finally, cells with seemingly no houses seen from satellite imagery were removed. The reason for the mismatch between the dataset analysis outcomes and the satellite images is likely inaccuracies of the population and dwelling data resulting from administrative registration and reality mismatch.

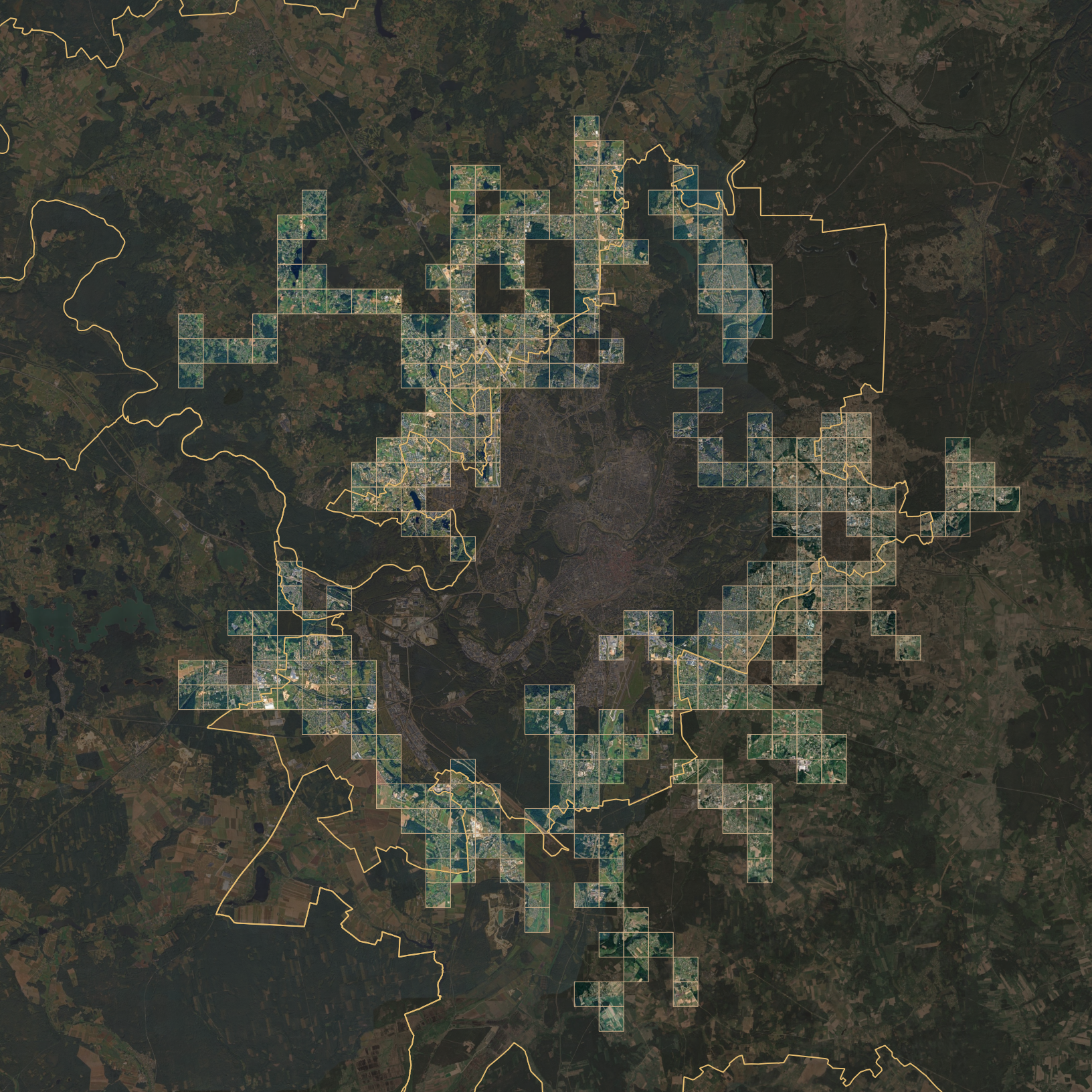
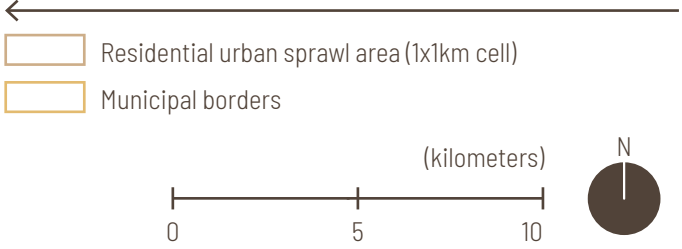


Figure 53. Final residential urban sprawl areas around Vilnius (overlayed on satellite view).

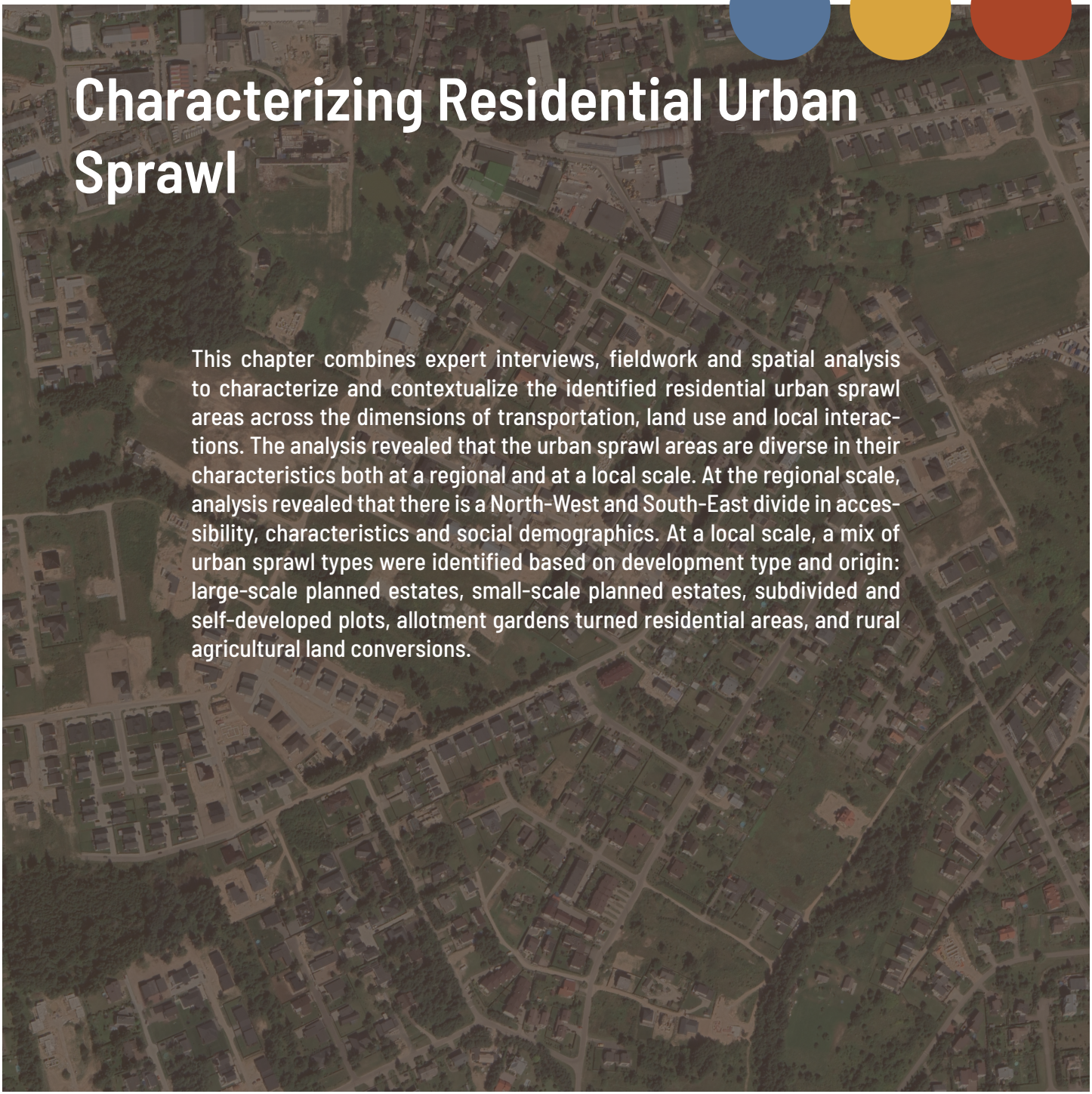


The final outcome of residential urban sprawl area mapping (see fig. 53) show that much of these territories are concentrated along the edges of the municipality, with clear clusters in the North-West, South-East and South-West directions. The clusters are discontinuous and fragmented, some growing in a linear direction, others having a more radial form. Zoom-ins of various cells show a variety of build-up forms and features (see fig. 54).

This method of urban sprawl definition is by no means perfect. For one, the population density and dwelling density data is clearly not fully accurate, as some cells with no buildings visible in satellite images are shown as having a few dozen residents. The cells also statistically split up or cut off areas which may in reality be continuous in terms of characteristics. This also means even a slight shift of grid cell orientation would may have yielded quite different results. It is also important to note that urban sprawl around Vilnius is still an ongoing process. Many more cells will likely be considered urban sprawl within a few years, but simply can not be defined as such yet. Areas like this fall outside of the scope of the thesis and are therefore not considered. Nevertheless, based on the available data, this method provided a sufficiently operational outcome of residential urban sprawl areas.

Figure 54. Examples of 1x1 km urban sprawl cells.

Characterizing Residential Urban Sprawl



This chapter combines expert interviews, fieldwork and spatial analysis to characterize and contextualize the identified residential urban sprawl areas across the dimensions of transportation, land use and local interactions. The analysis revealed that the urban sprawl areas are diverse in their characteristics both at a regional and at a local scale. At the regional scale, analysis revealed that there is a North-West and South-East divide in accessibility, characteristics and social demographics. At a local scale, a mix of urban sprawl types were identified based on development type and origin: large-scale planned estates, small-scale planned estates, subdivided and self-developed plots, allotment gardens turned residential areas, and rural agricultural land conversions.

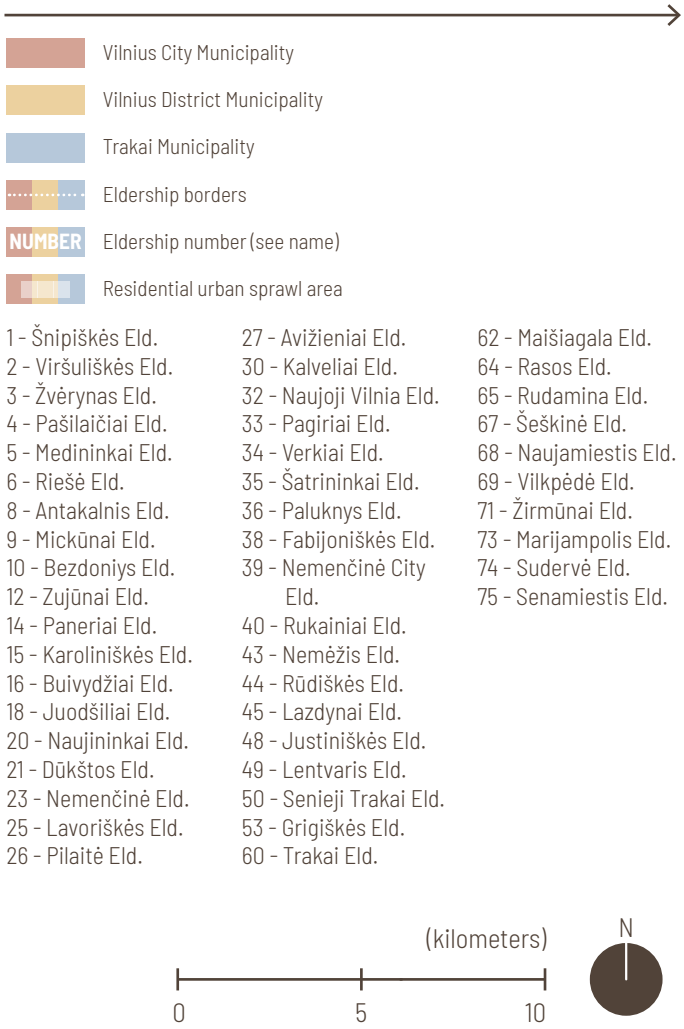
Regional Context

In this sub-chapter, residential urban sprawl areas are characterized and contextualized at a regional scale based on spatial analysis.

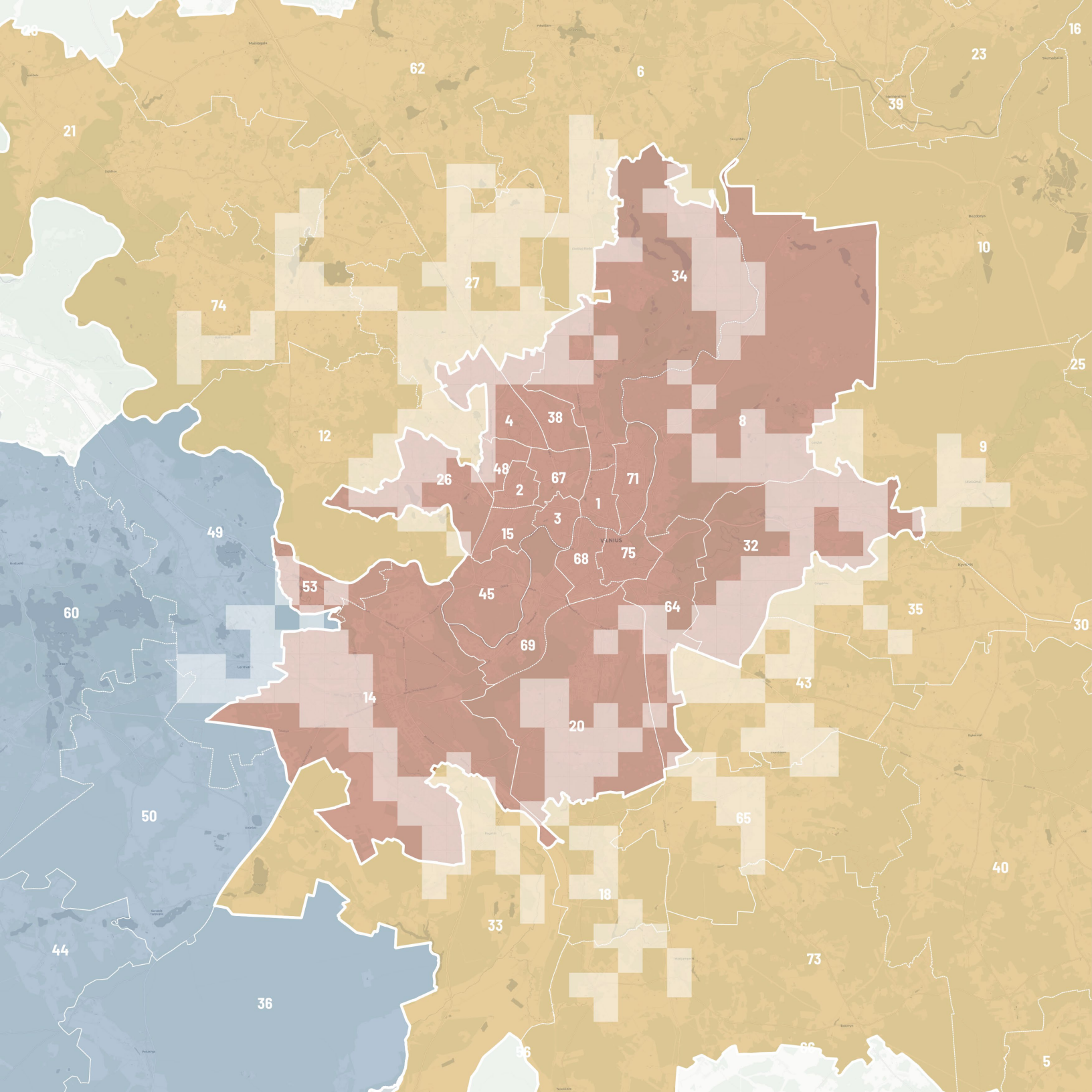
Administrative boundaries

The residential urban sprawl areas are spread out throughout Vilnius City Municipality, Vilnius District Municipality and Trakai Municipality. The different areas within the municipality are further split up into Elderships, which act as administrative units within the municipality (see fig. X). Extensive urban sprawl areas are concentrated in Paneriai (14), Naujininkai (20), Naujoji Vilnia (32), Antakalnis (8) and Verkiai (34) Elderships in Vilnius City Municipality, Avižieniai (27), Sudervė (74), Zujūnai (12), Riešė (6), Mickūnai (9), Šatrininkai (35), Nemėžis (43), Rudamina (65), Juodšiliai (18) and Pagiriai (33) in Vilnius District Municipality, and Lentvaris (49) in Trakai Municipality (see fig. 55).

Figure 55. Elderships in Vilnius metropolitan area municipalities.



Statybos sektoriaus vystymo agentūra (2026).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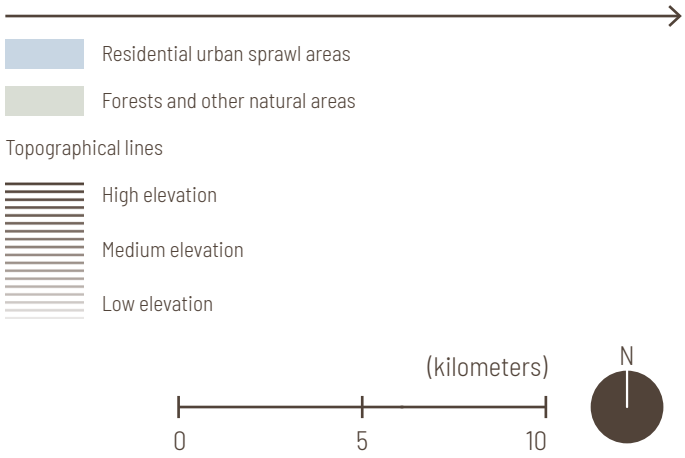
Topography

Vilnius sits in a river valley that has been carved by the glacial advance and retreat of the last glacial period. Because of this, the terrain in the city is varied and hilly (see fig. 56).

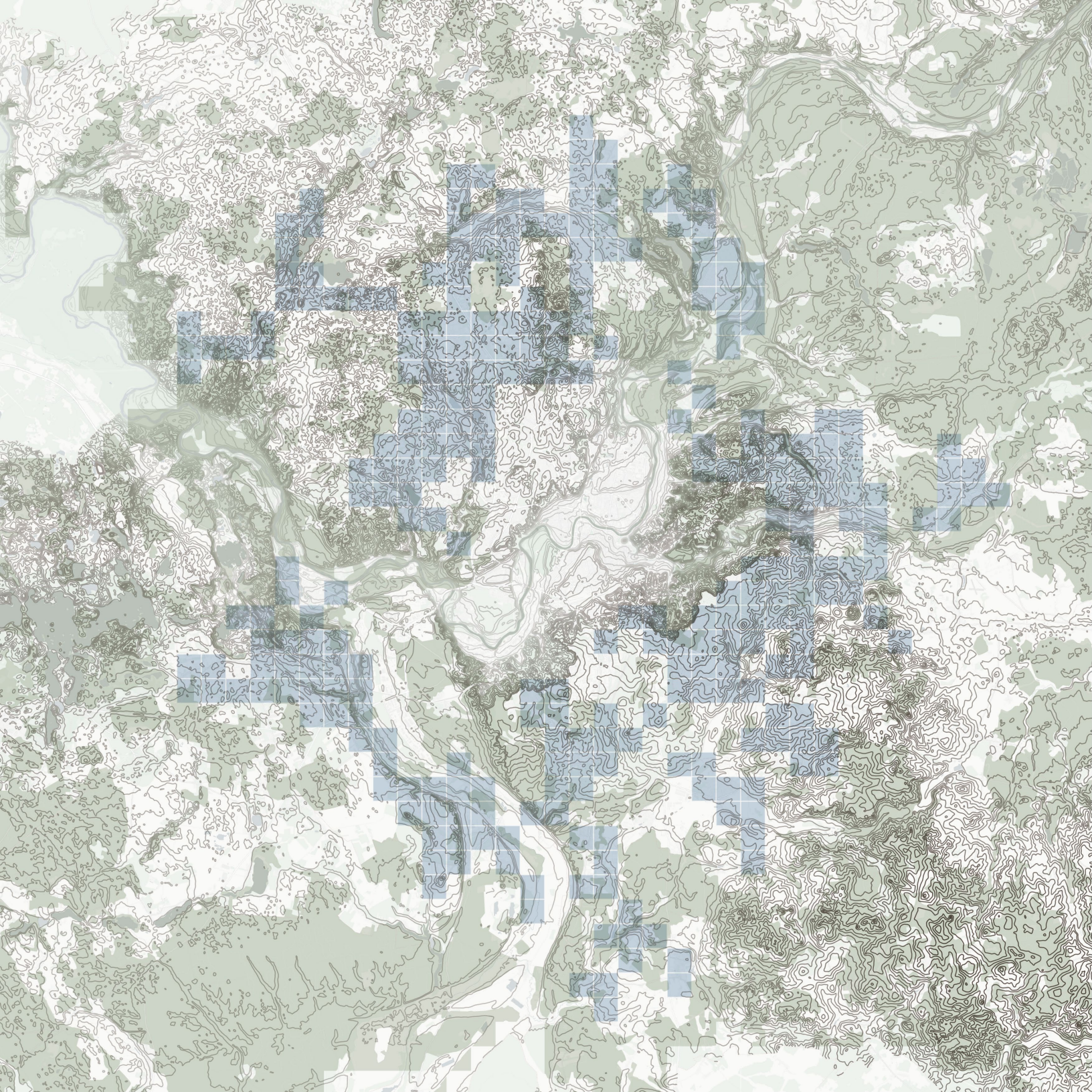
The western and northern parts of the city lay on mostly flat, low-lying terrain, where the valley floor is broad and the change in elevation is gradual. This allows for more continuous urban development and fairly straightforward transportation networks.

In comparison, the southern and eastern parts of Vilnius are defined by steep and hilly terrain that has been carved by glaciers. Dramatic changes in elevation and irregular ridges make extensive parts of land undevelopable. This enabled the preservation of extensive natural areas situated deep within the urban fabric which now function as nature reserves and green spaces in the city. However, they also act as a major physical barrier and an accessibility challenge, as they fragment the urban fabric and make direct mobility infrastructure connections near impossible to develop. The makes urban sprawl areas in the southeastern part of the city notably less accessible at a regional scale.

Figure 56. Topographical Map of Vilnius.



SOURCE (date).



Industrial Land Use

Analysis revealed that there is a higher concentration of industrial, logistics, warehouse or military land use areas in the South of the city, making it a less desirable residential location in terms of spatial quality (see fig. 57). Notably, nested between urban sprawl areas in South-East there is the Vilnius International Airport, causing additional noise pollution and nuisance in these areas.

These industrial and logistics land use areas also act as physical barriers, segregating different residential urban sprawl areas and spatially separating them from the city center (this is especially the case for areas in the South, such as Paneriai, Naujininkai, Pagiriai, Juodšiliai and Lentvaris Elderships.

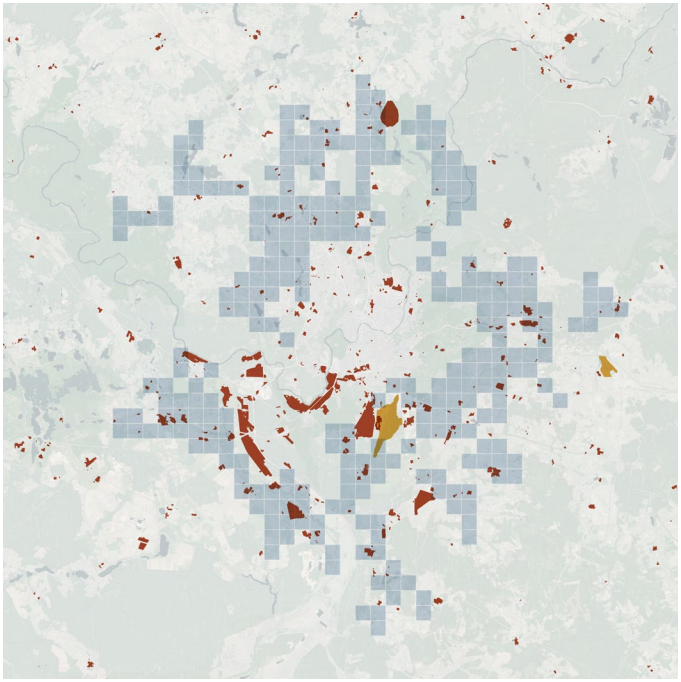


Figure 57. Industrial and logistics land use in Vilnius.

SOURCE (date).

Daily Amenities

A heatmap of daily facilities shows an extreme concentration at the inner city and a significantly lower presence of daily facilities in the urban sprawl areas (see fig. 58). Commercial areas, offices, recreational and cultural facilities are mostly concentrated in the inner city. Because of this, urban sprawl areas are highly dependent on the city center for their daily activities.

However, there are some notable concentrations of amenities in some urban sprawl areas, such as Lentvaris, Grigiškės, Salininkai, Naujoji Vilnia, Nemėžis, Avižieniai, Pilaitė and Riešė. However, these cenralities are mostly concentrated along major road networks, making them highly car-centric, unwalkable and offering little in terms of spatial quality or local recreation and leisure opportunities.

The heatmap also shows that the southern and eastern urban sprawl areas are notably more spatially separated from the inner city, where most amenities are concentrated. This makes them more spatially isolated compared to the North-West urban sprawl areas, and creates additional accessibility challenges.

Figure 58. Heatmap of daily amenities in Vilnius.

**daily amenities combine data from OSM and SSVA, removing any duplicating data points. OSM (2026): cafe, fast food, mall, park, pitch, playground, sports centre, stadium, track, kiosk. SSVA (2026): commercial, services, catering, culture, culture & education, healthcare, sport, religious, educational.*

OpenStreetMap (2026), Statybos sektoriaus vystymo agentūra (2026).

Public Transport Network

The public transportation (PT) system in Vilnius is overall limited considering its population size and the fact that it is the capital city. The public transportation system relies on a network of buses and trolleybuses (operated by VVT - Vilniaus Viešasis Transportas) (see fig. 59).

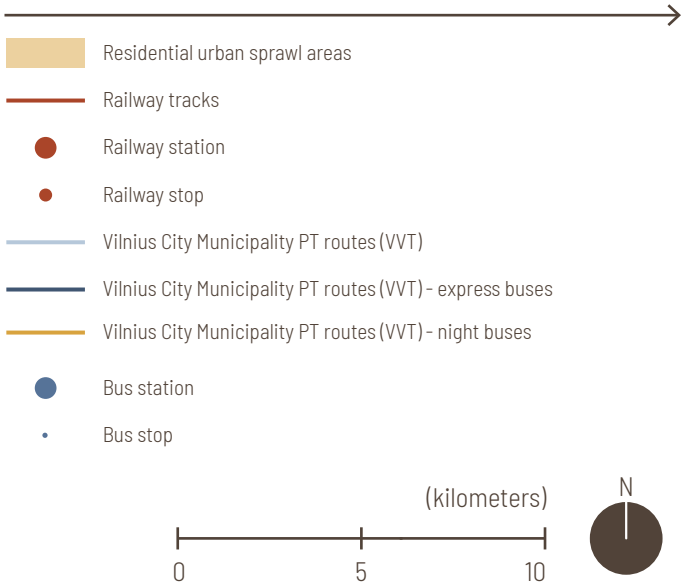
The public transport system is heavily oriented around its city center. While the inner city has an extensive and decently developed public transport network, the urban sprawl areas have notably less coverage. These areas become worse serviced as distance from the city core increases. Notably, the fact that public transport often has to share the roads with car traffic in urban sprawl areas means that the are often affected by traffic congestion, making them unreliable. The inconsistency, low coverage, large walking distance to stops and infrequent running times make public transport impractical for everyday use in urban sprawl areas, which reinforces car dependence.

The South-East of Vilnius has railways which run through extensive urban sprawl areas. Mainly used for freight and industrial functions (instead of passenger transport), the rail is notably underutilized in the city's public transport system.

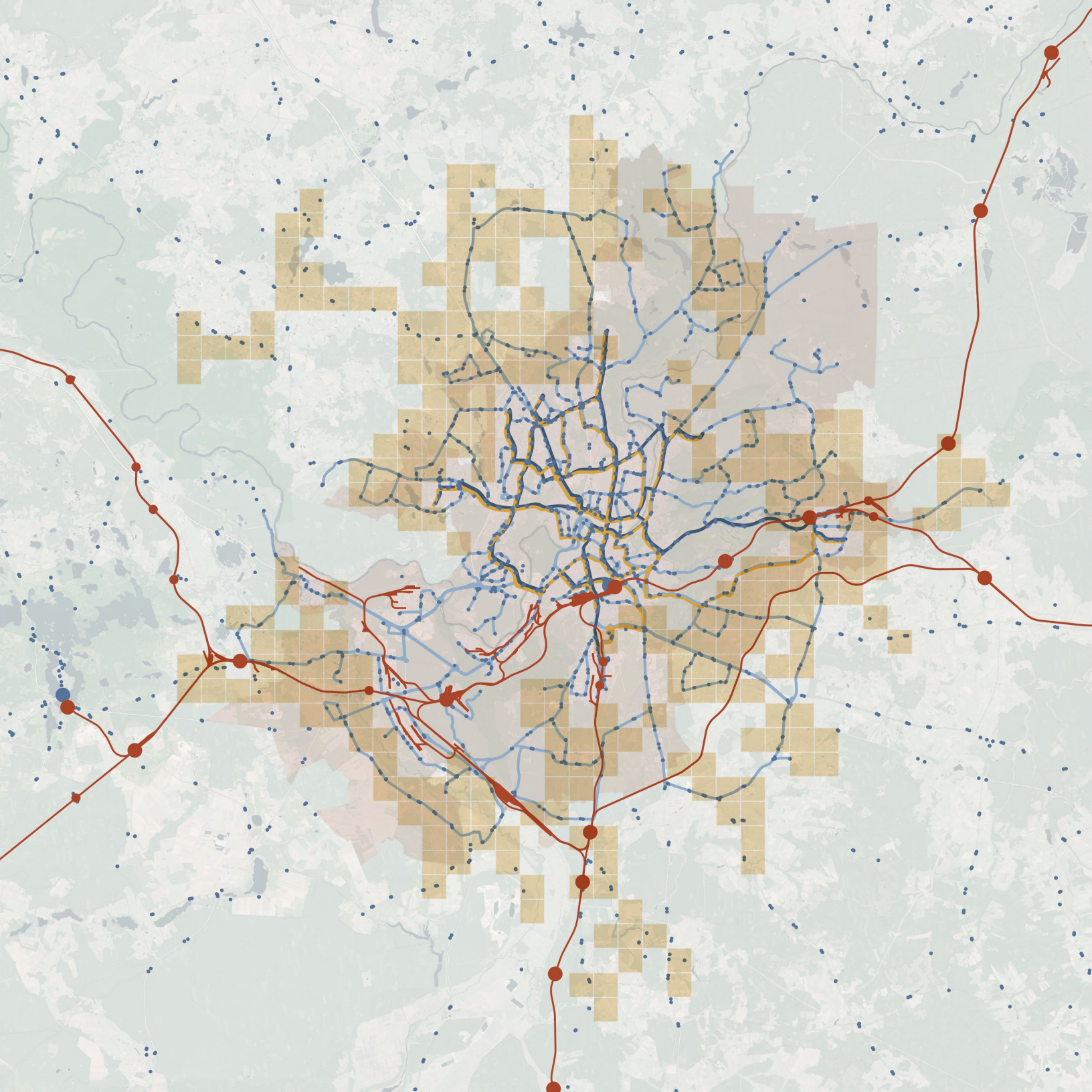
Vilnius City Municipality is invested in expanding and improving the public transport network to shift the modal split away from car use. While the Vilnius Sustainable Urban Mobility Plan (SUMP) 2030 focuses on expanding and electrifying the existing bus and trolleybus network, municipal officials express the ambition to introduce a new mode of public transport in Vilnius by 2040 (although it is not formalized in any document).

Vilnius City Municipality admits that the current bus and trolleybus system has reached its operational capacity. There are ongoing discussions about integrating the existing railway into the public transportation network, and the municipality has been pushing for the establishment of some sort of new public transportation mode (the most preferred option would be a new light-rail transit system). In this context, the existing underutilized rail network shows opportunities to be integrated into the future plans of the municipality.

Figure 59. Public transport infrastructure.



OpenStreetMap (2026), ID Vilnius (2024)



Cycling Network

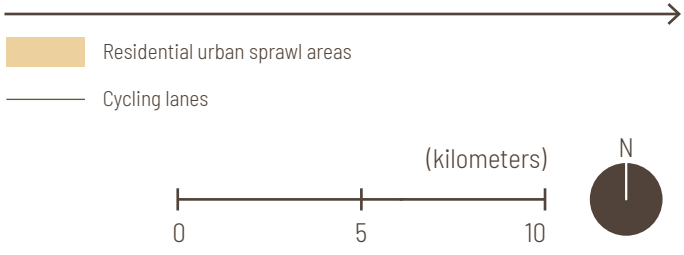
The cycling network in Vilnius shows structural limitations similar to that of the public transport network. While the infrastructure is decently developed in the inner city, urban sprawl areas have a notably more fragmented and limited cycling network (see fig. 60).

There is a notable difference between the provision of cycling infrastructure between Vilnius City Municipality and the regional municipalities. Within VCM boundaries, the cycling infrastructure, while fragmented, is still somewhat present in most areas. The presence of the infrastructure notably decreases on the other side of the municipal boundary. In addition, cycling network development does not seem to be coordinated between the municipalities. Numerous cycling paths can be seen ending at the borders (from both VCM and VDM sides) (show zoom-in X).

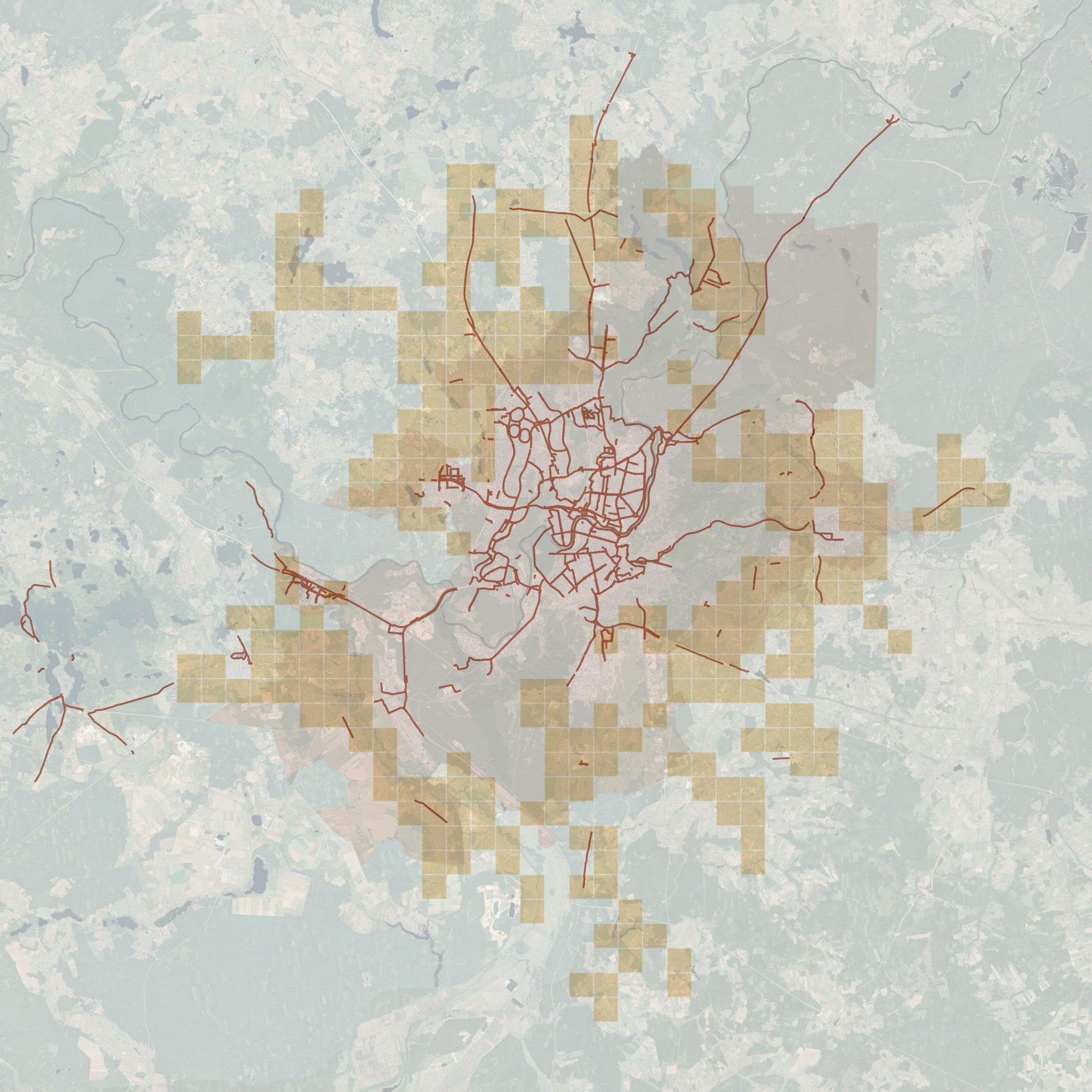
The topography of South-East Vilnius creates additional challenges for developing cycling infrastructure. In the northern and western urban sprawl areas, where the topography is more flat and elevation change is gradual, the cycling network is comparatively more developed and well-connected. Meanwhile the South-East of Vilnius features steep hills and extreme elevation changes which result in terrain that acts as a physical barrier for development. Because of this, the southeastern urban sprawl areas are comparatively worse connected with cycling infrastructure.

However, many of these lanes are discontinuous, offering no continuous route to the inner city (see fig. X-X). At the same time, there are no cycling routes connecting the different urban sprawl areas, as all infrastructure leads towards the inner city. Other notable cycling lanes connect the inner city to urban sprawl areas in Grigiškės, Rasos, Naujoji Vilnia, Nemėžis and Antakalnis Elderships. Extensive areas remain largely unconnected by cycling infrastructure, especially the South of the city (Paneriai and Naujininkai) and the deeper outskirts in VDM and TM.

Figure 60. Cycling infrastructure.



Registry Centras (2025).



Regional Road Accessibility

Overall traffic organization in Vilnius region is quite poor. The city lacks any ring road for vehicle traffic, instead the main roads go through the city center. On one hand, this puts heavy pressure on the infrastructure in the inner city. At the same time, it enforces dependence on the inner city and relates all urban sprawl areas to the city center. This makes accessibility between different urban sprawl areas notably worse, even if they are near each other. A regional angular integration analysis (with a radius of 10km) revealed that the highest regional accessibility is in the city center (see fig. 61). The most accessible urban sprawl areas (by car) are in the North-West and South-East. Meanwhile urban sprawl areas in South-West and North-East are less accessible. Unsurprisingly, areas further from the inner city became progressively less accessible by car.

Neighbourhood Accessibility

A angular integration analysis (with a radius of 5km) of the road infrastructure revealed that local accessibility (by car) is the best in North-West urban sprawl areas. Eastern urban sprawl areas closest to the inner city also have relatively good local accessibility. The southern, especially the southwestern urban sprawl areas have particularly poor local accessibility (see fig. 62).

Figure 61. Road network angular integration analysis (r = 10 km).

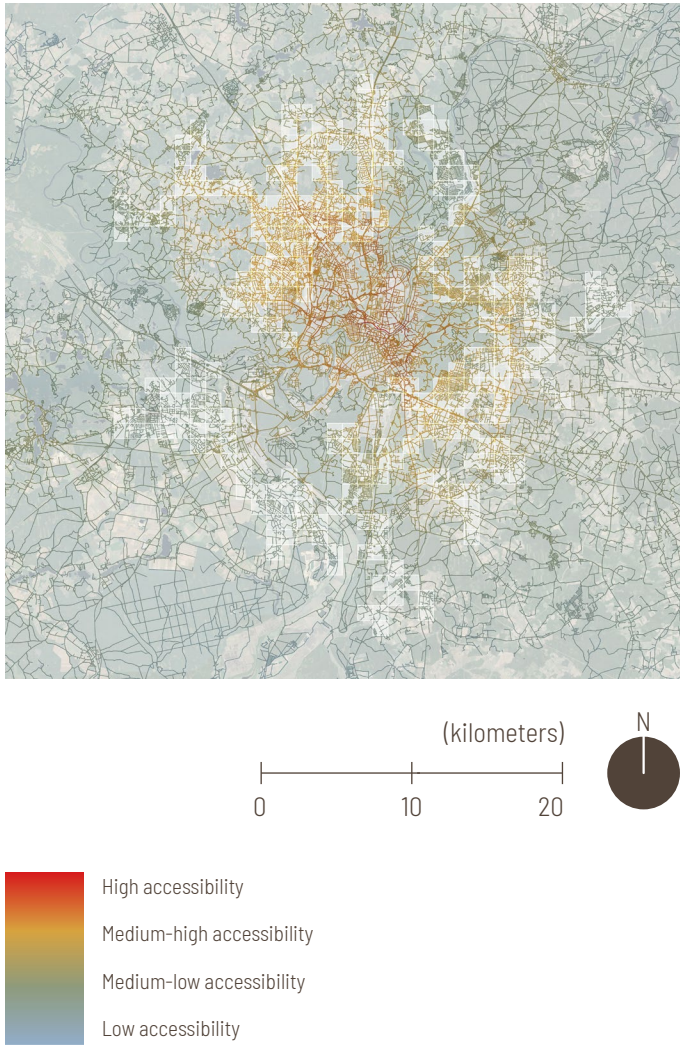
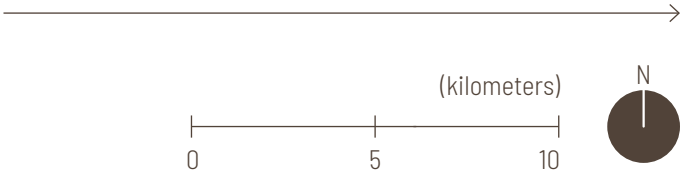
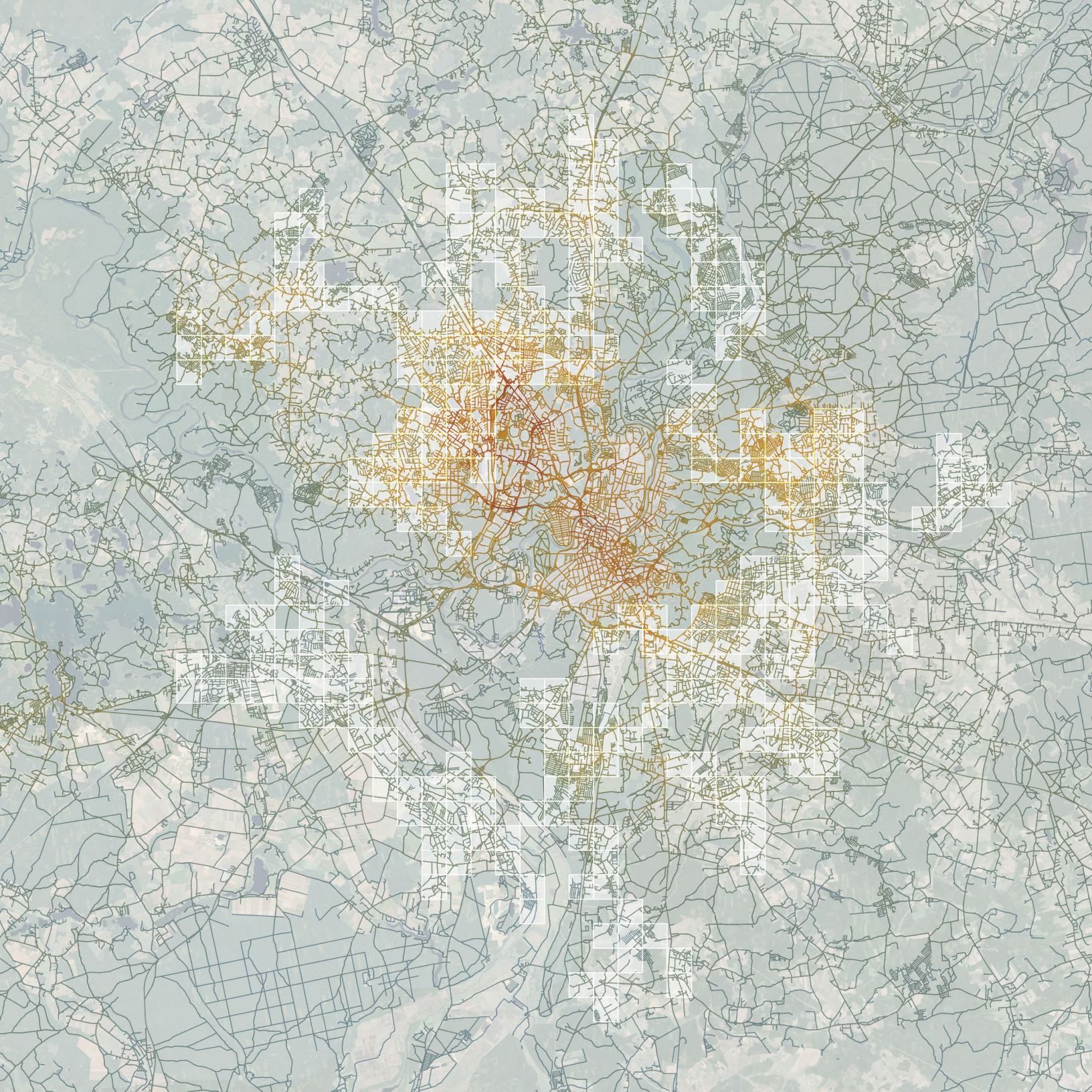


Figure 62. Road network angular integration analysis (r = 5km).



Statybos sektoriaus vystymo agentūra (2025).

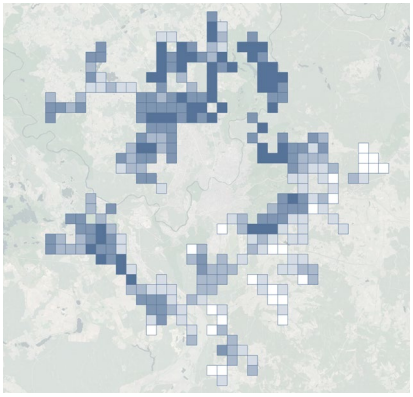


Socio-Demographics

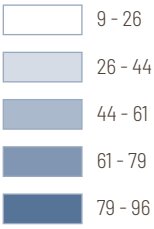
Due to historical context, the broader Vilnius region has long been home to major Polish and other non-Lithuanian populations. These communities have traditionally been concentrated in the more rural and peri-urban areas surrounding the city. However, as urban sprawl extends and consumes these territories, the socio-demographic trends have been shifting.

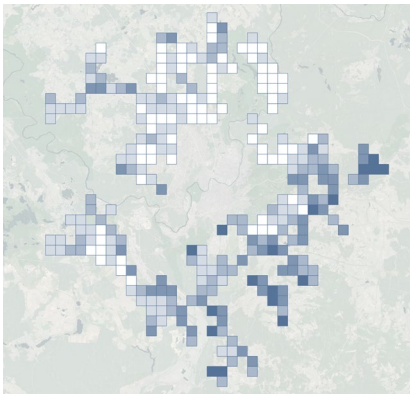
The northwestern urban sprawl areas, which have developed recently and rapidly in the past decades and were seen as desirable places to live, have attracted more economically secure, socially mobile and predominantly Lithuanian populations (see fig. 63-66). These populations depend on Vilnius inner city for work, education and leisure opportunities. On the other hand, the southeaster urban sprawl areas have a higher concentration of historical locals who are older, more economically vulnerable, Polish (or other minority) populations (see fig. 67-70). They live more rural lifestyles and depend less on Vilnius inner city for economic opportunities or daily needs. Urban sprawl areas housing these populations are the result of urban sprawl consuming rural settlements and villages.

Because of the historical socio-demographic contexts of the broader Vilnius region, this vulnerability pattern can also be observed in relation to distance from the inner city. The urban sprawl areas which are physically and structurally (due to infrastructure provision and land use characteristics) further from the inner city are also those with the most vulnerable and economically deprived populations. This spatial overlap turns socio-spatial segregation into a structural problem.

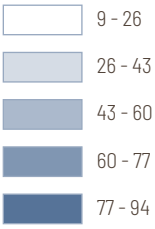


63. Population of Lithuanian Nationality (%)

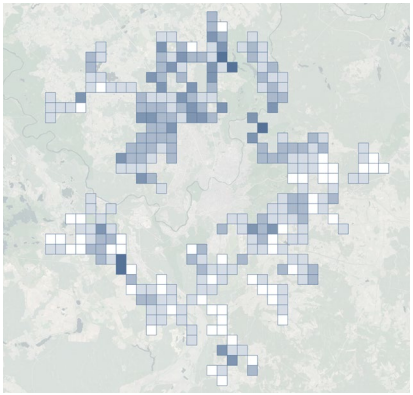




67. Population of Non-Lithuanian Nationality (%)

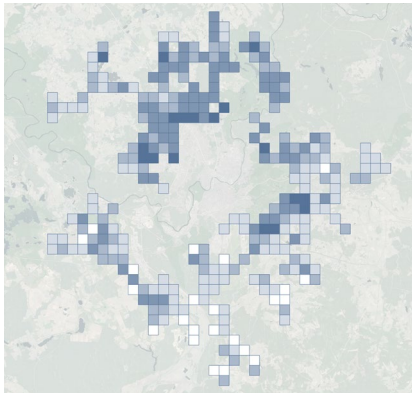


Registrų Centras (2025).



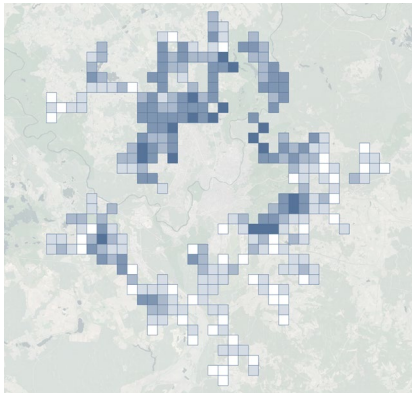
64. Population Employed as Managers (%)

- 0 - 5.1
- 5.1 - 10.3
- 10.3 - 15.4
- 15.4 - 20.5
- 20.5 - 25.6



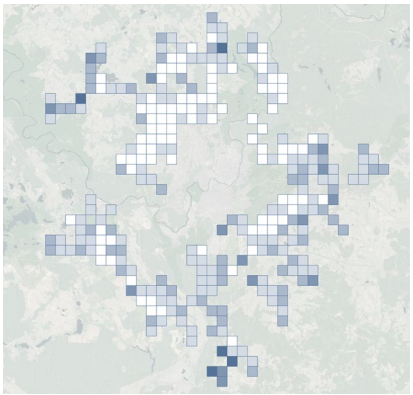
65. Population Employed in Professional Fields (%)

- 3.2 - 8.1
- 8.1 - 13.1
- 13.1 - 18.1
- 18.1 - 23.1
- 23.1 - 28.1



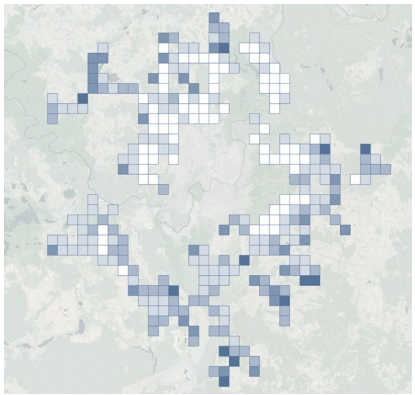
66. Population With Higher Education (%)

- 8 - 20
- 20 - 32
- 32 - 44
- 44 - 56
- 56 - 68



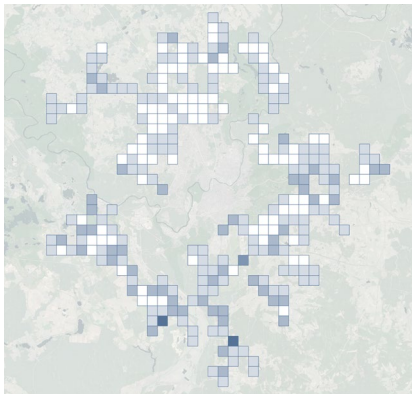
68. Population Unemployed (%)

- 2.7 - 5.7
- 5.7 - 8.7
- 8.7 - 11.7
- 11.7 - 14.7
- 14.7 - 17.7



69. Population Employed in Unqualified Jobs (%)

- 0 - 3.2
- 3.2 - 6.3
- 6.3 - 9.5
- 9.5 - 12.6
- 12.6 - 15.8



70. Population Receiving Pensions (%)

- 1.5 - 9.5
- 9.5 - 17.6
- 17.6 - 25.7
- 25.7 - 33.7
- 33.7 - 41.8

Synthesizing Urban Sprawl Area Characteristics

An attempt at a k-medians clustering typological analysis revealed that the urban sprawl areas in Vilnius are not easily differentiated by type at a regional level. Instead, the urban sprawl areas can be better distinguished by qualitative characteristics (see fig. 70).

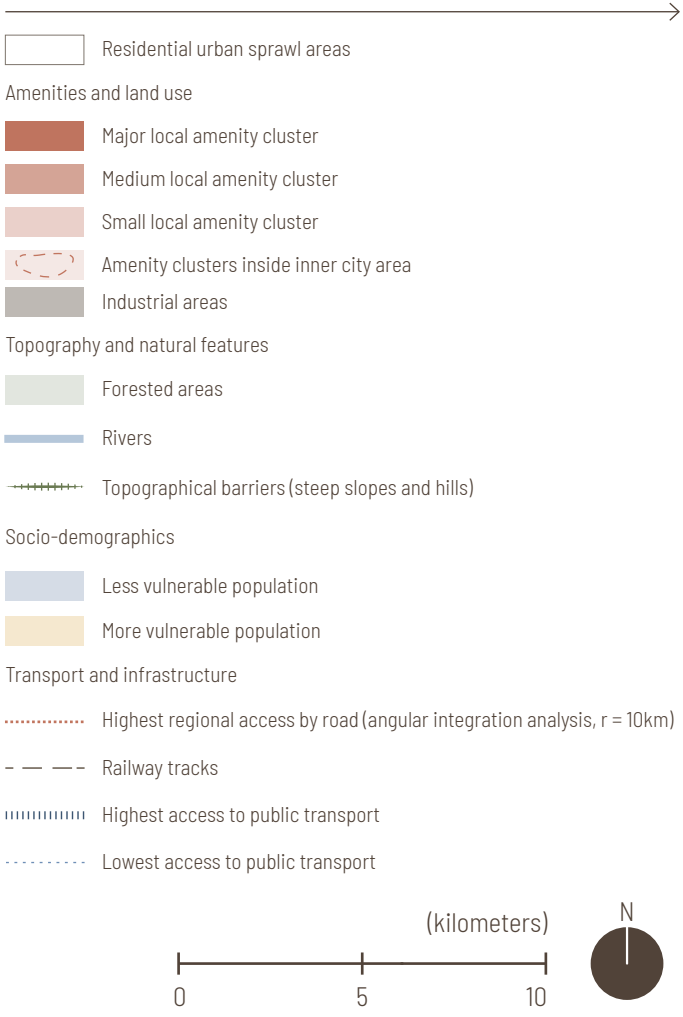
Urban sprawl areas in the North of Vilnius have by far the best overall accessibility, being physically closer to the city center, having the best regional access by road, along with multiple dispersed amenity clusters. Notably, this area also has a less vulnerable population.

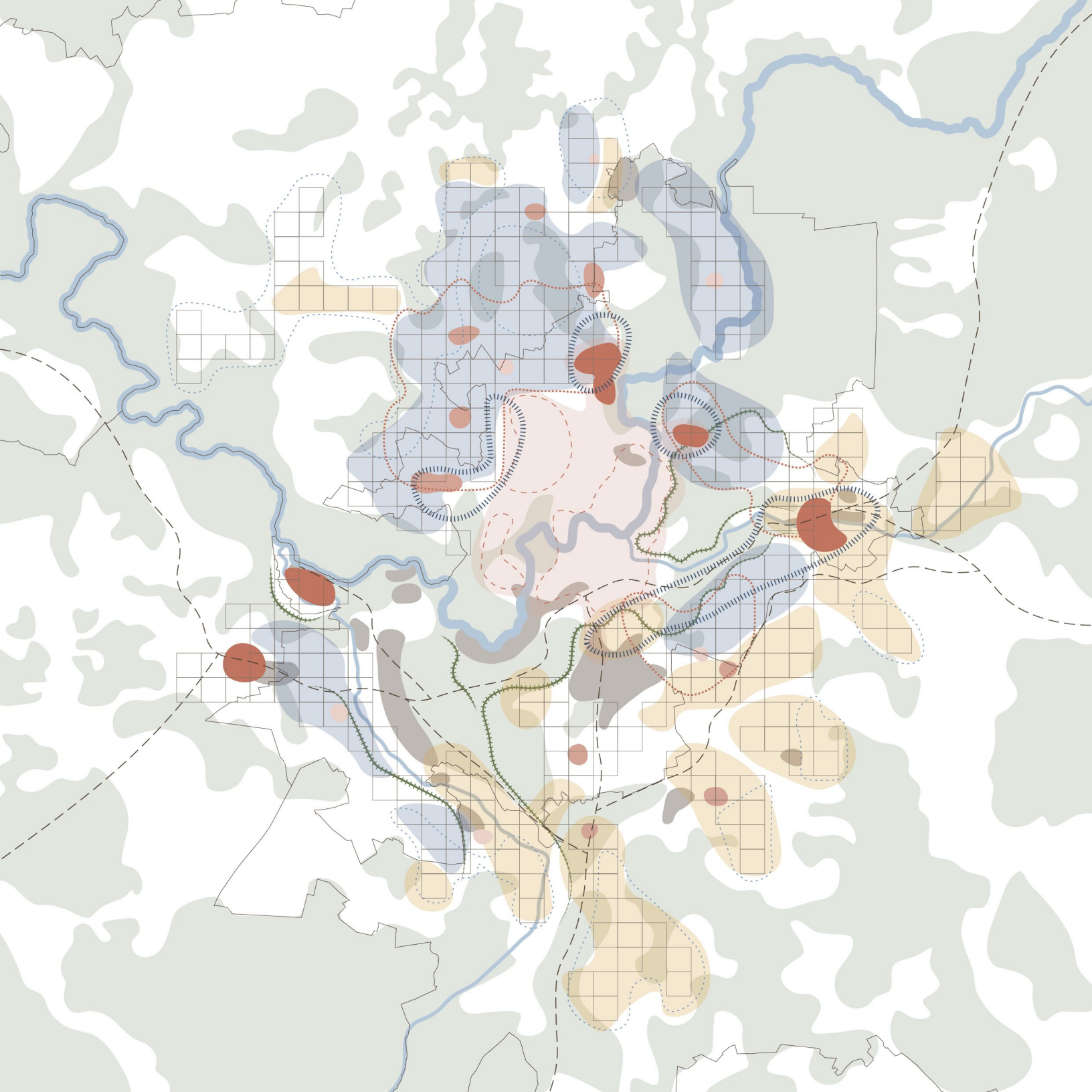
Comparatively, the South of Vilnius has a more vulnerable socio-demographic and is also less accessible and more fragmented. Access by road and public transport is severely limited, while steep topography and extensive forested areas separate it from the inner city. These areas have railway tracks which are notably underutilized for passenger transport. Instead they primarily serve the existing extensive industrial facilities in the area (along with Vilnius Airport).

The railway tracks run to the East, where they connect to Naujoji Vilnia, a major centrality with diverse industrial and daily functions. This area is particularly accessible at a regional level and by public transport. However, it also is highly spatially separated from the inner city and houses more vulnerable populations. To the West, the railway tracks connect to other local centralities, along with some industry. This area is also highly spatially separated but has comparatively less vulnerable socio-demographics.

As a whole, the analysis revealed that urban sprawl areas closer to the inner city have higher accessibility and a less vulnerable population, while the opposite is true for areas further away. The connection between spatial conditions and socio-demographics turn socio-spatial segregation into a structural issue, reducing opportunities for individuals who are already worse off.

Figure 70. Synthesis of Vilnius region urban sprawl areas analysis.





Urban Sprawl Types by Development Origin

Regional spatial analysis revealed that residential urban sprawl around Vilnius cannot be easily categorized into types based on spatial characteristics. However, zooming into a more local scale, some spatial differences can clearly be seen. Based on analysis conducted by Ubarevičienė & Burneika (2020), residential urban sprawl areas in Vilnius region can be differentiated based on their development origin. An overview of these types, their spatial characteristics and administrative context are visualized in figures 72 and 73.

Figure 72. Residential Urban Sprawl Areas in Vilnius by Development Type.

Figure 73. Characteristics of Residential Urban Sprawl Areas in Vilnius by Development Type.

	Large-scale planned estates	Small-scale planned estates	Subdivided and self-developed	Allotment gardens turned residential areas	Rural agricultural land conversions
Developing stakeholder	Private real estate companies	Private real estate companies	Private real estate companies & private residents	Private residents	Private residents
Frequency	Somewhat common	Somewhat common	Common	Common	Uncommon
Legality	Legal	Legal	Legal	Illegal	Somewhat illegal
Development scale	Block	Few plots	Sub-divided into block, sold and developed per plot	Plot	Plot
Spatial context	- Has basic infrastructure, but car-centric; - Generally large, but varied plot sizes; - Sometimes gated; - Monofunctional & monotonous;	- Lacks basic infrastructure and functions; - Generally large, but varied plot sizes; - Sometimes gated; - Often semi-detached houses;	- Lacks basic infrastructure and functions; - Larger plots; - Sometimes gated; - Visual chaos;	- Lacks basic infrastructure and functions; - Smaller plots and narrow roads; - Mixing of gardening and residential land use - Visual chaos;	- Lacks basic infrastructure and functions; - Very large plot size; - Rural context;
Administrative context	- Private real estate company only responsible to develop infrastructure within plot; -Infrastructure development legally binding for real estate companies; - Sometimes legal responsibilities are avoided by utilizing legal loopholes; - Private or public ownership of infrastructure;	- Private real estate company only responsible to develop infrastructure within plot; - No one responsible for broader infrastructure development (before housing development); - Private or public ownership of infrastructure;	- No one responsible for initial infrastructure development (before housing development); - Private or public ownership of infrastructure;	- Formal land use differs from reality; -Municipality not legally responsible for infrastructure development or maintenance; - Semi-legal resident status makes them have limited power;	- Utilization of legal loopholes to build residential housing on agricultural farmland. - Formal land use differs from reality; - Municipality not legally responsible for infrastructure development or maintenance.

The Case of Allotment Gardens

A very particular case of Soviet-era planning heritage visible in Vilnius region is the case of sodų bendrijos (literally translated into garden associations) or simply sodai (gardens) (see fig. 74). These are collective allotment garden settlements which were developed under the Soviet rule as an additional food production source to combat existing shortages. Individual plots of land at the urban periphery were allocated for workers and residents, where people would grow vegetables, fruit trees and other plants. Small summerhouses intended for seasonal use were permitted in these plots (see fig. 75).

Following the Lithuanian independence in 1990 and the transition towards a capitalist market economy, allotment gardens around major cities began to be informally used as permanent residential homes. Three decades later, many of these gardens have transformed into permanent residential areas, while still being formally classified for agricultural land use. This is illustrated in figure X, where extensive private agricultural plots can be found deep in urban sprawl areas (LRT, 2022).

These allotment gardens are possibly the most problematic type of urban sprawl area, as their formal classification as agricultural land use and distinctively narrow street network creates major challenges for local infrastructure and service provision, and leaves residents legally vulnerable and powerless (see fig. 76). Municipalities actively avoid addressing this issue, as it would either require to move out hundreds (if not thousands) of families from their permanent homes, or to legitimize their existence which would make municipalities legally responsible for their infrastructure and service provision (something that municipalities are already struggling to provide).

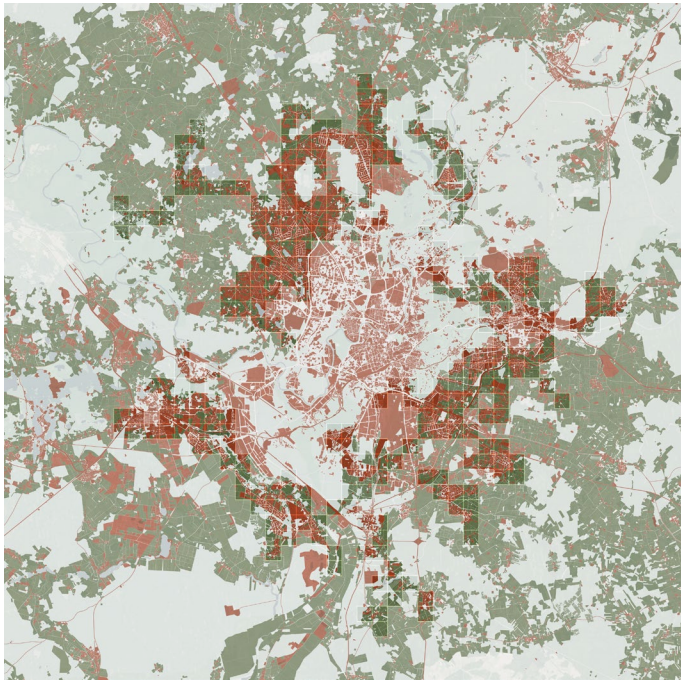


Figure 74. Plot function.

Registrų Centras (2025).

Figure 75. Allotment garden house in Vilnius.

(RUPA, 2016).

Figure 76. Formal allotment gardens act as residential areas in reality in Bajorai, Vilnius City Municipality.

Other (sic) - urbanized land

Agriculture

(kilometers)

0 5 10

N

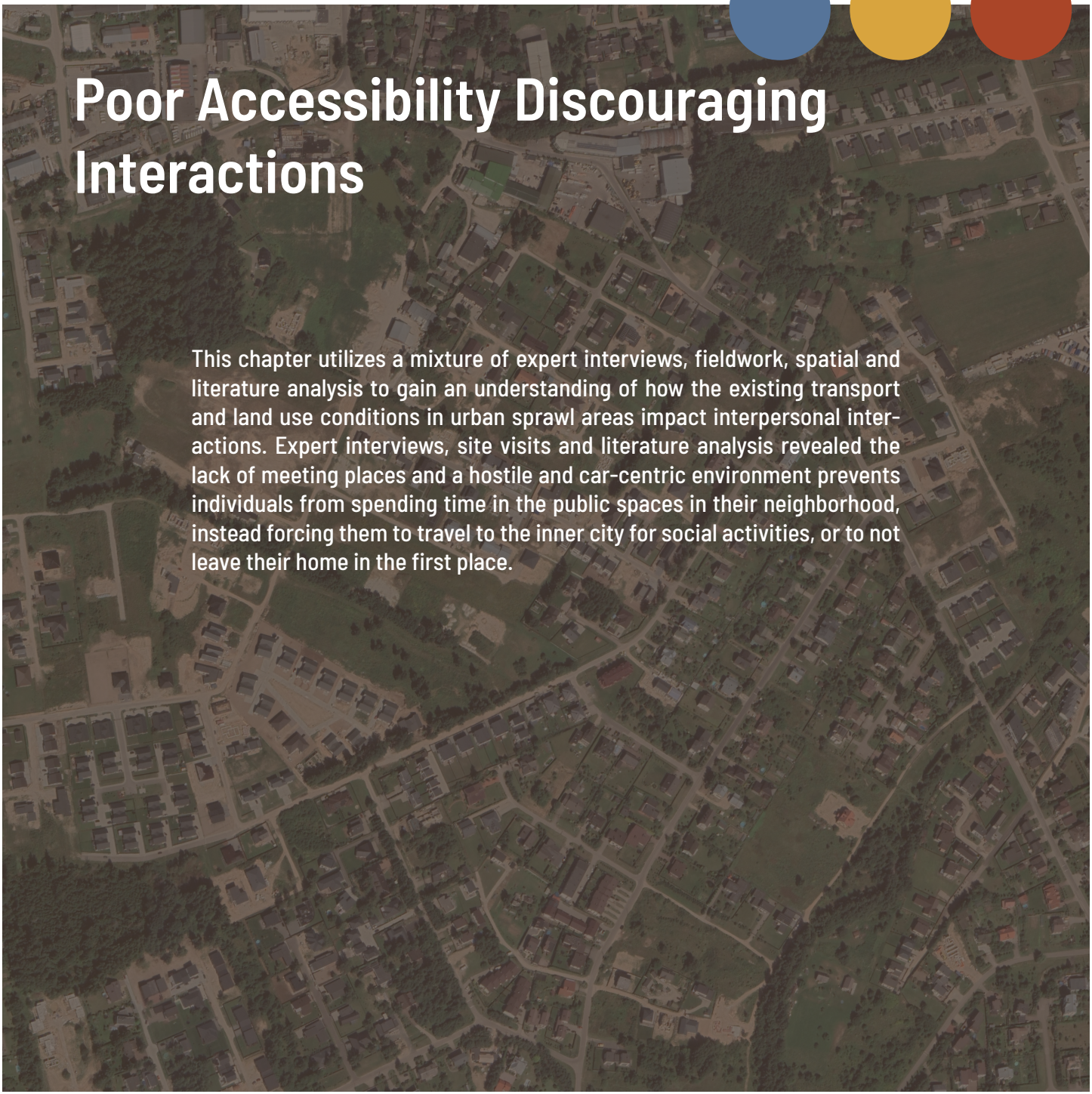
Registrų Centras (2025).

Small Grain Size

The different development origin types mix at a fine grain and are difficult to clearly locate at a glance (see fig. 77). However, observing the plot structure, street layout and building morphology it is possible to distinct them between each other on a map. Comparing them side-by-side it can be seen that the allotment gardens have a finer building grain size and a more organized spatial structure compared to the more recent developments. In comparison, the more recent developments have a more chaotic road and plot structure due to the fragmented land ownership impact on the development process.

Figure 77. Residential urban sprawl areas by development type (top: morphology, bottom: satellite image of same area).

Registrų Centras (2025).



Poor Accessibility Discouraging Interactions

This chapter utilizes a mixture of expert interviews, fieldwork, spatial and literature analysis to gain an understanding of how the existing transport and land use conditions in urban sprawl areas impact interpersonal interactions. Expert interviews, site visits and literature analysis revealed the lack of meeting places and a hostile and car-centric environment prevents individuals from spending time in the public spaces in their neighborhood, instead forcing them to travel to the inner city for social activities, or to not leave their home in the first place.

Lack of Meeting Places

Lack of Daily Facilities

Interviews confirmed that a major accessibility challenge for urban sprawl areas was the lack of daily facilities (such as commercial or healthcare facilities, libraries, recreation/leisure or other daily needs).

A lack of activities for young people in particular have been expressed, as interviewees specifically expressed the need for playgrounds, sports and leisure facilities, local work opportunities and youth centers.

Lack of Educational Facilities

Interviews with local resident representatives and municipal workers revealed that the most detrimental facility deficit in urban sprawl areas is the lack of local educational facilities, i.e. schools and kindergartens. A map of educational facilities reveals a strong concentration in the inner city and long distances from urban sprawl areas to educational facilities (see fig. 78).

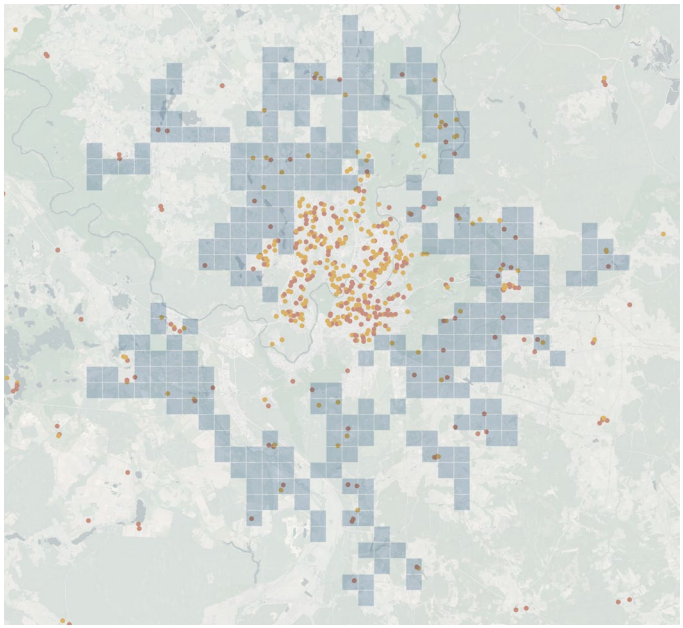


Figure 78. Educational facilities in Vilnius MP.

Nacionalinė švietimo agentūra (2022).

The situation is especially desperate in VDM, where lower municipal budget, lower population density and significant minority populations make it expensive to maintain multilingual educational facilities, let alone open new ones. One interview revealed that some VDM Elderships lack Lithuanian-speaking schools altogether.

These conditions reinforce reliance on the city center and car dependence, as many parents decide to send their children to schools which are a long way from home. The scale of impact that this deficit has can be observed during school holidays, as traffic congestion reduces dramatically:

"

*During **students'** and **children's holidays**, **traffic intensity** on city streets **decreases** by an average of **4 to 10 percent**.*

"

- A. Apanovičius, head of the Traffic Management Center at "Susisiekimo Paslaugos" (Monkevičius, 2022).

Fieldwork showed that the educational facilities that do exist in the area provide great opportunities for supportive local amenities. Many schools also feature sports facilities which are open outside of school hours (see fig. X). Meanwhile the high traffic of young people also provides well-needed liveliness on the streets and provides local businesses with bored and hungry buyers (see fig. 79-81).

Lack of Local Meeting Places

Local representatives observed that the high dispersal of local facilities and a lack of clear street hierarchy results in a lack of a clear local center or attraction point. It was even expressed that there is a lack of public spaces as a whole, since most property is privately owned:

"

Nowhere to put the neighborhood Christmas tree

"

- Sub-Elder in VCM (expert interview)

Local NGOs and Sub-Elders stressed that this lack of meeting places has negative effects on citizen engagement and participation in neighborhood affairs. The lack of a local center or attraction point prevents residents from spontaneously meeting and engaging with their neighbors, possibly chatting about a local road renovation. The lack of local public spaces or facilities

79. Young people hanging out at sports field near school.

80. Local kebab shop attracts young people from nearby school.

81. Local students sitting on stairs outside of the grocery store.

also heavily complicates organizing local events, meetings or activities. Local community organizations often have to resort to organizing them at people's homes or backyards, which is undesirable.

Representatives of NGOs which were able to open up a community center or develop a public space expressed that it had major improvements in local engagement with the community. Examples of NGO-led initiatives can be seen in neighborhoods such as Pavilnys and Pilaitė (see page 124).

Dependence on Inner City

As a whole, the interviews revealed that there is frustration about the reliance on the city center. It was clear that residents would be more than happy to spend their free time in their neighborhood if the facilities allowed it. However, the lack of daily facilities, meeting places and public spaces prevents residents from engaging with their local environment and community. The few facilities that exist in the urban sprawl areas are highly dispersed, car-centric and offer little in terms of human-scale spatial quality that is necessary to facilitate local interactions (see fig. 82).

82. Uninviting environment around bakery at local centrality.

Car Centricity & Hostile Streets

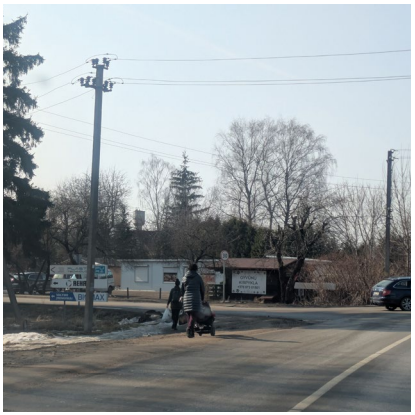
Poor Conditions For Pedestrians

Expert interviewees described poor or non-existent pedestrian infrastructure as both an accessibility and a safety problem. Most commonly mentioned frustrations were the lack of continuous sidewalks and lighting. Pedestrian infrastructure in urban sprawl areas is highly fragmented, lacking safe crossings, lighting and intentionality (see fig. 83-85). This creates unsafe situations for pedestrians, where they are forced to go onto high traffic roads without any pedestrian infrastructure. Technically illegal, this also leaves pedestrians legally vulnerable in case of an accident. The pedestrian infrastructure that does exist is often poor quality, narrow, bumpy or full of holes.

These kinds of pedestrian conditions reinforce car dependence. For example, it negatively impacts public transport use, as people are unwilling to endanger themselves to walk to the bus stop. One interview revealed that parents sometimes avoid letting their children go to school by themselves, as they are concerned for their safety. Parents instead choose to drive them, even if the school is nearby.

*Parents **avoid** letting their children **walk** to school due to **unsafe conditions**: lack of pedestrian infrastructure, high car traffic, potholes, lack of lighting.*

In addition, this unsafe and inconvenient pedestrian infrastructure is generally used by more vulnerable populations (such as young people, the elderly, women and mothers, lower-income individuals), which raises justice and equity questions regarding accessibility and personal safety.



83. Woman with stroller on intense road.

84. Lack of crossing to PT stop.

85. Pedestrian tripping hazard.

Lack of Cycling Infrastructure

Cycling infrastructure in urban sprawl areas deals with much of the same challenges as pedestrian infrastructure: fragmented (or non-existent) infrastructure, lack of lighting or safety features (see fig. 88). In addition, interviews revealed that the existing cycling infrastructure fails to bring people to relevant destinations. Interviewees mentioned the lack of a continuous cycling route to the inner city as a major cycling infrastructure limitation.

Fieldwork revealed that the integration of cycling infrastructure with other modes of transportation (namely public transport) is severely limited, as key bus stops in urban sprawl areas often lack any bicycle parking. This means that cycling infrastructure is not well integrated into the broader mobility network of Vilnius.

In areas of lower-traffic or where there is some infrastructure, more cyclists can be found. Especially around schools, restaurants and cafes, young people were seen using bicycles and electric scooters to get around (see fig. 85). In more rural urban sprawl areas (in VDM), students were seen utilizing more heavy-duty electric bicycles to get themselves and their friends to and from school (see fig. 86), while more elderly people were using bicycles to get around as well. This shows that there is interest and demand for cycling infrastructure, particularly for destinations relevant for young people and elderly, i.e. individuals who have limited access to cars.

*There is **demand** for **cycling** infrastructure for **individuals** with **reduced car access** (e.g. young people and elderly) to bring them to relevant **destinations**.*

86. Taking Electric Road Bike To School.

87. Intensely used sidewalk in Riešė,

88. Cycling infrastructure ends nowhere.

Unusable Public Transport

Expert interviews, field trips and spatial analysis confirmed that urban sprawl areas challenges such as low public transport (PT) coverage, inconvenient schedules and routing, and long distances to PT stops. The interviews showed dissatisfaction with the existing PT routes in urban sprawl areas (see fig. 89-91). A mismatch between transport planning and land use and a lack of a ring connection that would bypass the inner city were expressed. Multiple local representatives also emphasized that public transport routes often fail to cover local amenities (such as educational and commercial facilities).

The public transport schedules were another point of frustration. Residents largely rely on Vilnius inner city for their daily needs. However, in many urban sprawl areas, public transport is highly infrequent, coming as infrequently as once every 1.5 hours. Another observation was that the buses in urban sprawl areas stop running very early, eliminating public transport as an option for evening activities in the city or for flexibility. One local representative expressed frustration that organizing a community event without a car is impossible because of this.

Public transport in urban sprawl areas is also fairly unreliable because it often gets stuck in traffic jams. Interviews revealed that some people have to leave as much as half an hour earlier than they are supposed to simply to make sure that they get to their doctor's appointment in time. The unreliability, inconvenience, low flexibility and poor coverage makes public transport an unattractive mobility option for urban sprawl areas. This reinforces car dependence even in situations where individuals would otherwise actively choose to leave the car behind. At the same time, municipal transport authorities recognize that expanding public transport coverage in urban sprawl areas is highly financially inefficient due to low coverage:

> *There needs to be at least **40 people per hectare** for a bus stop to make sense. Buses in Vilnius already sometimes stop in areas of **15-20 people per hectare**.*
>
> *- JUDU transport authorities at VCM (expert interview)*

89. Public transport in Riešė, VDM.

90. School bus in Bukiškis, VDM.

91. Bus stop in Antakalnis, VCM.

Poor Car Traffic Organization

Fieldwork and interviews revealed that the road infrastructure in urban sprawl areas is unevenly developed, poorly organized and unsafe.

Commonly mentioned problems were poor traffic organization, lack of lighting, paving or sidewalks, and the presence of mud, potholes and puddles (see fig. 92). A lack of clear markings and mismatches between road category (and rules) and actual infrastructure results in unsafe driving. One example of this is overly wide local roads with no markings or other safety elements, enabling cars to drive at dangerously high speeds (see fig. 93).

Such poor car traffic infrastructure and organization is not only a safety concern but also results in regular traffic jams. One Sub-Elder proposed that organizing car traffic into a one-way loop could help improve the situation. Intersections and access points to main roads were mentioned as a major problem area (see fig. 94).

92. Potholes and puddles in Riešė, VDM.

93. Oversized road with no lighting

94. Mid-day traffic jam at road exit.

The angular integration analysis (at r = 10km) shows that car traffic is poorly organized at the regional level, while also providing insights on how street network organization can impact accessibility and traffic pressure in residential areas.

In theory, main roads and highways neighbourhoods should be the most accessible at the regional scale. However, the analysis shows that some residential urban sprawl areas have entire street networks which have higher accessibility than main roads (see fig. 95). This creates high through-traffic pressure on residential areas, which creates less favourable conditions for slow traffic (such as pedestian or bicycle) - something that was also observed in the fieldwork.

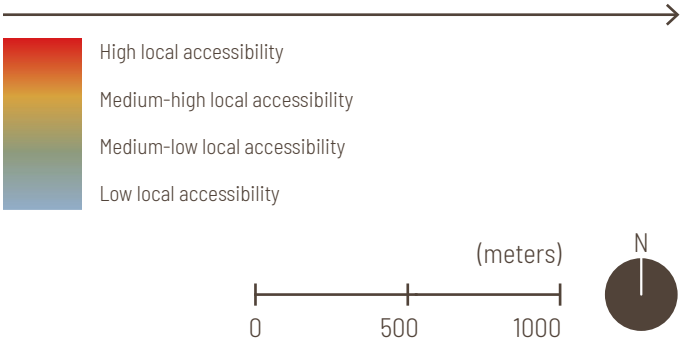
Residential areas organized in a grid network or lacking a clear main road were shown to have more dispersed accessibility, which disperses car traffic throughout the neighbourhood. Meanwhile cul-de-sacs reduce regional accessibilities for cars, while also enforcing some level of street hierarchy.

95. High regional accessibility also puts high traffic pressure on residential areas.

96. Grid network and lack of clear street hierarchy disperses car traffic pressure.

97. Dead ends decrease regional accessibility while enforcing street hierarchy.

Figure 95-97. Road network angular integration analysis (r = 10km)



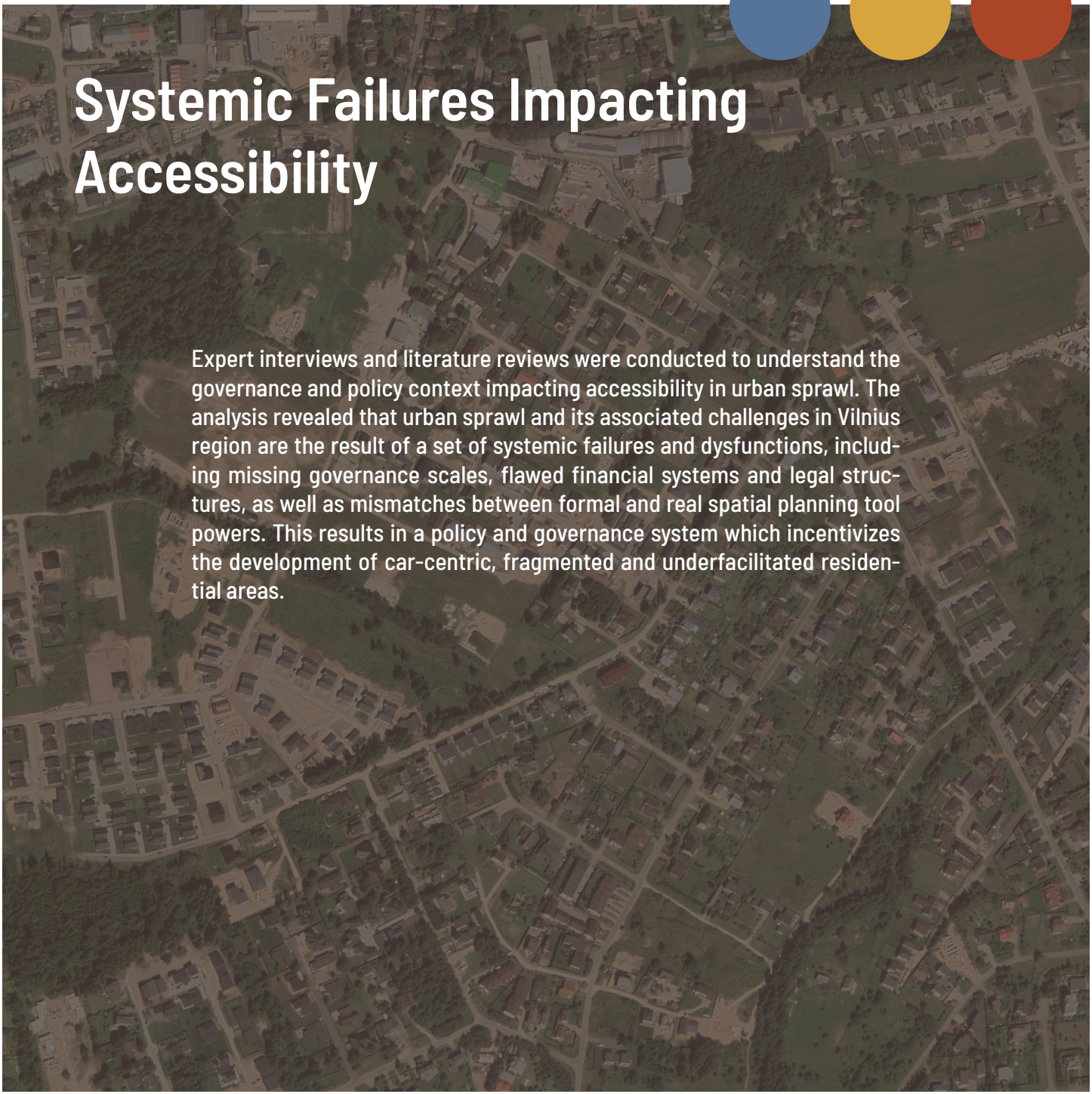
Key Takeaways

Expert interviews, site visits and literature analysis revealed that the lack of daily facilities (especially educational facilities), public spaces or a clear local center enforces dependence on the inner city, even for socialization. The lack of local meeting places in urban sprawl areas means that residents have no real opportunities to meet and interact with the neighbors.

At the same time, unreliable poor infrastructure conditions for pedestrians and cyclists (and even cars) creates a hostile environment which disincentivizes individuals from going onto the streets where they could meet and interact with their locals. Meanwhile unreliable and inconvenient public transport systems further reinforce car dependence.

These land use and transport conditions create an environment in which people avoid spending time in their local public spaces, instead choosing to spend their time indoors or in the inner city, where pedestrian conditions are more favorable. This eliminates any opportunities for spontaneous interactions between local resident (see fig. 98).

98. Spatial accessibility consequences for social cohesion.



Systemic Failures Impacting Accessibility

Expert interviews and literature reviews were conducted to understand the governance and policy context impacting accessibility in urban sprawl. The analysis revealed that urban sprawl and its associated challenges in Vilnius region are the result of a set of systemic failures and dysfunctions, including missing governance scales, flawed financial systems and legal structures, as well as mismatches between formal and real spatial planning tool powers. This results in a policy and governance system which incentivizes the development of car-centric, fragmented and underfacilitated residential areas.

Limited Local Engagement Mechanisms

Expert interviews revealed that spatial planning in Vilnius has severely limited public participation mechanisms which would help to build trust and improve the decision-making process.

Elders (Seniūnai)

Elderships are the smallest formal administrative unit in Lithuania, which cover neighborhood sub-divisions in municipalities (see fig. X). Each Eldership has an Elder, who is appointed my the municipal administration. Formally, Elders are responsible for coordinating local public services, maintaining roads and public spaces, registering residents and acting as the first point of contact between the residents and the municipality (Infolex, 2026). However, interviews revealed that in practice most residents are entirely unaware that these Elders exist and that they can come to them with any local matters. Therefore, Elders are best understood not as community representation or engagement bodies, but as local municipal departments responsible for organizational, bureaucratic and administrative matters.

Nevertheless, expert interviews revealed that Elders have a good understanding of what the neighborhood needs, working on-site and communicating regularly with the locals. But even as administrative bodies, Elders expressed that they have limited power to effectively fulfill their formal duties and to address local challenges. Their budgets are severely limited, which means that they are unable to meaningfully address the infrastructure deficits in residential urban sprawl areas. Elders cannot sign contracts, apply for funding or initiate independent projects. Instead, they have to go through the municipal administration. This results in a structural disconnect in which formal local bodies with the knowledge of local needs have no real power to act upon it.

Sub-Elders (Seniūnaičiai)

Sub-Elders were revealed to be an even bigger local representation without empowerment challenge. Sub-Elders are elected by the local residents every 4 years. In theory, their role is to represent the local residents' needs and interests in the Eldership and municipality (Vilnius City Municipality, 2026c). However, expert interviews revealed that the legal role of the Sub-Elder has no meaningful influence or power over the local decision-making or planning outcomes, while also having a severely restricted budget. One Sub-Elder expresses that the lack of power means that the local residents see no point in engaging with them:

> *"**Not much** can be achieved through Sub-Elderships, while residents want to see **results** from their **engagement**"*
>
> *- Sub-Elder (expert interview)*

Sub-Elders explained that formally municipalities, Elderships and other relevant institutions are required to be attentive and responsive to the Sub-Elderships, actively communicating and collaborating to solve local problems. However, these formal responsibilities are not being followed in practice. Sub-Elders feel that municipalities, Elderships and other relevant institutions see them as an annoying inconvenience, claiming that they are often actively ignored and avoided. Regarding planning concerns (such as public transport routes or new local spatial plans) allegedly, local residents get a response from these institutions sooner than the Sub-Elder does:

> *"**Regular citizens** have more **power** than we do."*
>
> *- Sub-Elder (expert interview)*

As local resident representatives, they are responsible for engaging, collaborating and representing their residents. However, they have no available mechanisms, tools or resources to do so. With no real power or rights, Sub-Elders are limited to advocation through collecting signatures, sending e-mails to responsible institutions, participating in project public hearings, organizing local events – activities that a regular citizen can do. As one Sub-Elder playfully summarized:

> *"Whoever invented **Sub-Elders** was **not really sure** what they wanted them to **do**"*
>
> *- Sub-Elder (expert interview)*

Interviews revealed that many Sub-Elders are actively trying to empower themselves and to be productive for their community. They do so by partnering with and supporting local community NGO's. They collaborate by trying to raise money for them, supporting and advertising their activities and trying to find ways to collectively address local challenges. In addition, in 2024 the Sub-Elders of VCM established the Vilnius City Sub-Elder Association, which aims to advocate for their empowerment.

Their goals include:
1. Raising awareness of the existence of sub-elders as local resident representatives;
2. Encouraging discussion about the role of sub-elders in politics and policy;
3. Ensuring the rights of the sub-elders to directly participate in the development and decision-making of local projects (Vilniaus Miesto Savivaldybė, 2026).

Non-Governmental Organizations

Expert interviews revealed that Elders and Sub-Elders are ineffective as local organizational and public engagement bodies. The failure of formal institutions to address local needs have resulted in an empty role which began to be filled by active local residents. Local community NGO's and civic organizations have emerged as effective and important actors in the management of urban sprawl challenges in Vilnius region.

In successful examples, NGOs initiate and organize infrastructure projects, open and manage community centers, organize local events, partner with universities for spatial proposals and advocate in public consultations (see fig. 99-107). In essence, they perform the governance functions that Elderships and Sub-Elderships are responsible for but lack the structural mechanisms to fulfill. Expert interviews revealed that in many cases NGOs informally collaborate directly with Elders and Sub-Elders, with the NGO providing organizational capacity, knowledge and networking to address local needs.

Local NGO representatives explained that they primarily operate through lobbying and networking directly with municipal officials and councils. The mechanism works by community organizations initiating planning proposals, arranging organizational and management details and then going to the municipality for approval, fast-tracking and funding (see fig. 108):

> *There needs to be a **partnership** for ideas to become reality.*
>
> *- head of community NGO (expert interview)*

However, this form of partnership is not formalized, which means that the success of these projects rely entirely on the will and interests of the municipality. This makes NGO operational capacities vulnerable to political interests and priorities:

> *The **municipality** only **listens** when it is **convenient** for them.*
>
> *- head of community NGO (expert interview)*

NGO representatives explained that funding is a major challenge for them. Membership fees provide a stable, but low income. For genuine project development, NGOs generally rely on one-off municipal grants, which are difficult to arrange and apply for. Crowd funding for individual projects was also mentioned as an important source of income.

Interviews revealed that the dependence on lobbying for organizational capacity means that the NGOs require highly motivated and competent individuals to function effectively. However, the voluntary nature of these organizations make them vulnerable to burnout or demotivation. Because of this, NGO representatives say that regular rotation is vital for sustaining them. However, engaging residents in urban sprawl areas in these community organizations was consistently described as challenging, as society is still experiencing the effects of the Soviet-era legacy of civic disempowerment.

Critically, not all NGOs are created equal. Interviews revealed that most NGOs only consist of a few active members, or are entirely inactive at all. Some have been established by private real estate companies to create

99. Community center with basketball court in Pavilnys.

100. Platform at community center in Pavilnys.

101. Voleyball court and street art at community center in Pavilnys.

102. Play area in green space in Pilaitė urban sprawl area.

103. Canopy with tables in green space in Pilaitė urban sprawl area.

104. Sign about bees shows both community NGO and Vilnius City Municipality logos.

105. Volleyball court in green space in Pilaitė urban sprawl area.

106. Beehives in green space in Pilaitė urban sprawl area.

107. Picnic tables with stationary grills in green space in Pilaitė urban sprawl area.

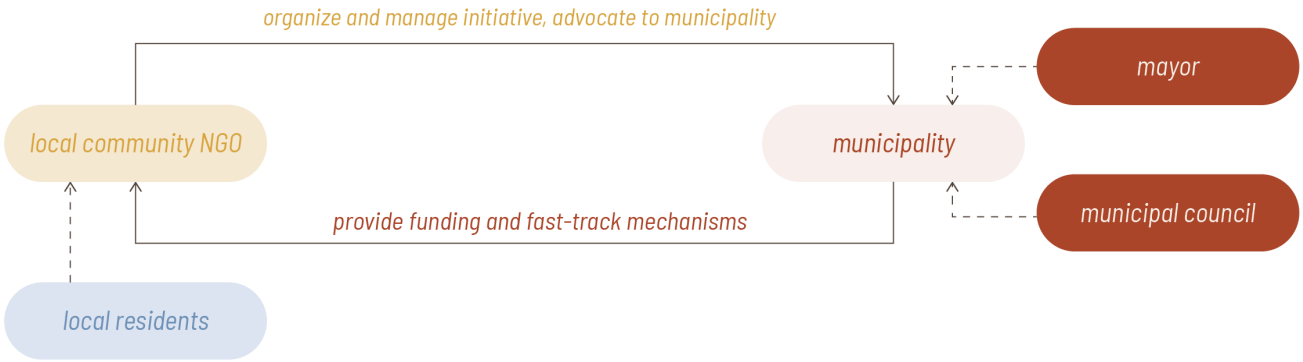
the image of a community. Community organization representatives expressed that this discredits the genuine and active NGOs towards the municipality, meaning that they have to work especially hard to prove their legitimacy.

Ultimately, NGO representatives say that this form of local community organization has proven to be an effective approach to address local urban sprawl challenges and to engage local residents in the decision making process. However, NGOs deal with structural challenges which limit their operational capacity. Their collaboration with the municipality remains informal, making them vulnerable to political interests and shifts, and having to resort to intense lobbying directly with municipal officials. In addition, they deal with funding, resource and capacity limitations, which make it challenging to sustain NGO activity.

Recent Developments In Public Participation

It is important to note that there have been recent initiatives by the municipalities to expand their public participation mechanisms. VCM, VDM and TM have all introduced a participatory funding scheme, while VCM recently hosted its first ever citizens' assembly on the topic of sustainable mobility (Lithuanian Ministry of Internal Affairs, 2026; Vilnius City Municipality, 2025). VDM established a new Active Society Organization Department to formalize collaboration between the municipality and NGOs and to build the powers and competences of the communities (Vilnius District Municipality, 2025). These are all very positive developments, as it increases community engagement and decision-making in municipal planning processes. However, these efforts remain insufficient in genuinely and effectively engaging local residents in spatial planning and development processes.

Figure 108. Collaboration mechanism between municipality and local community organizations.



Formal vs. Real Municipal Powers

Formally municipalities in Lithuania have many spatial planning powers and responsibilities, ranging from territorial planning, to local infrastructure development and maintenance, to public services and education (see appendix II) (PROWD, 2025). However, in reality municipal autonomy and powers are constrained by limited financial autonomy, as well as the lack of spatial planning and intermunicipal collaboration tools, mechanims and resouces.

Lack of financial autonomy

Funding for municipalities comes from a mix of local income and national budget allocations. However, most of that income generated through tax and revenues first goes to the national government (ministries) before getting distributed to the municipalities. This means that the municipal budget relies primarily on national budget allocation based on personal income tax and national budget allocations. This system places municipalities under a high level of financial dependence on the government, which limits their real autonomy and decision-making power (Strata, 2024; OECD, 2021). This is a major problem for spatial planning decisions because it limits the autonomy, creativity, flexibility and adaptiveness of municipalities, while also incentivizing competition and expansion.

Regulatory limitations

At a regulatory level, all municipal planning decisions must be consistent with national plans, norms, laws and regulations. Municipalities are given limited flexibility on how to utilize existing spatial planning and development tools. One case of this was the attempt of the VCM mayor to introduce additional requirements (such as environmental evaluations) for real estate developers to cut down mature trees. This effort was overruled in court, deemed illegal and abolished, and no genuine alternative was offered to address the environmental challenges that the municipality attempted to solve (Ambrulaitytė, 2025). This case shows that ultimately municipalities have limited decision-making power over local spatial planning.

Limited planning capacity

Another major limitation for municipal autonomy was revealed to be the lack of administrative planning capacity and expertise, showing up both in expert interviews and literature reviews (ESPON, 2021; Kaunas Technical University, 2023). This means that municipalities facing urban sprawl pressure rely on external private consultancies for spatial planning functions. This capacity limitation means that many municipalities cannot fully exercise their legal powers.

No collaborative mechanisms

Interviews with various municipal-level authorities revealed that a major obstacle for utilizing existing spatial planning tools (such as the infrastructure tax) is the lack of any form of regional collaborative mechanism. As one municipal worker described, without any real intermu-

nicipal collaborative mechanism, municipalities plan and develop as if they were islands, while in reality decisions made have strong effects across administrative

Strong property rights

Surporisingly, multiple interviews revealed that strong property rights are a major challenge for spatial planning and development for municipalities (see fig. 109). Since Lithuania's time under USSR rule was marked by mass seizing and nationalization of private land and property, the new Lithuanian constitution made sure to establish strong private property right – a cultural experience that has written itself into law. The rights are written into the constitution as such:

> *Property is **untouchable**.*
> *Property rights shall be protected by law.*
> *Property may be taken only in accordance with the procedure established by law for public needs and with fair compensation.*

(Lietuvos Respublikos Seimo Kanceliarija, 1992, article 32).

Buying out private property for public needs is a legal procedure that can be initiated by governmental institutions and municipal councils, or authorized financial institutions or governmental companies upon request to the National Land Service. However, if the land owner does not want to sell their property, the initiators must go to court and request for the land to be taken for public needs (Nacionalinė žemės tarnyba prie Aplinkos ministerijos, 2024). However, municipal workers explained that in cases of legal disputes between the municipality and the private land owner (e.g. for land consolidation), the courts almost always side with the owner. This makes it nearly impossible to take private property for public needs, even for basic infrastructure such as electricity lines (based on legally binding Special Plans).

Municipal authorities mentioned that the only spatial planing document that can provide a legal basis for demanding specific infrastructure requirements from a developer is the Detailed Plan. However, a 2014 reform made it possible to develop areas without a Detailed Plan, reducing their impact and effectiveness. In addition, an interview with a municipal worker revealed that even changing the land use in the Municipal General Plan or a Detailed Local Plan is complicated because land owners feel entitled to their former land use expectations and can put up a major fight.

Interviews revealed that these strong private property rights make the existing municipal spatial planning tools less effective, making it difficult to impact what and how gets developed. This also results in a power dynamic which makes it easy for private landowners to pressure municipalities into compliance with developments which may contradict official requirements or spatial planning documents. Ultimately, it is easier for municipalities to say yes than to get dragged into court and lose. As one researcher put it:

> *In residential development, **private interest always wins over public**.*

- Researcher (expert interview)

The outcome of these power dynamics puts the responsibility of managing urban sprawl at the municipal level without providing the genuine tools, resources and frameworks to do so effectively (see fig. 110).

Figure 109. Mechanism for municipalities to acquiring private land favours the private landowner.

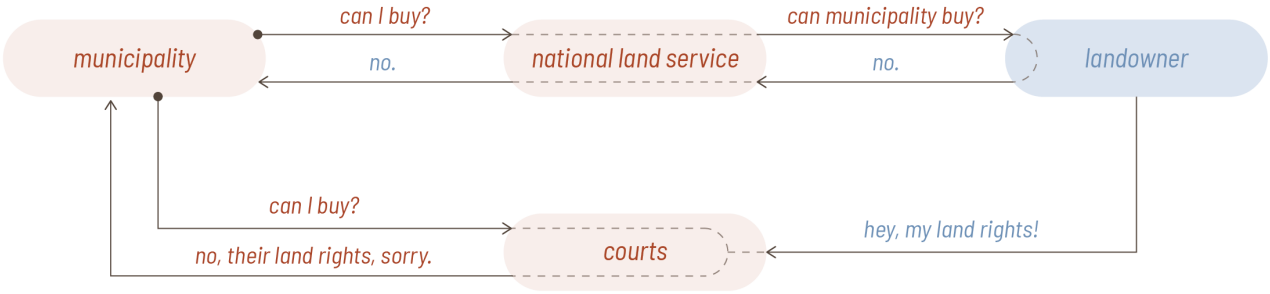
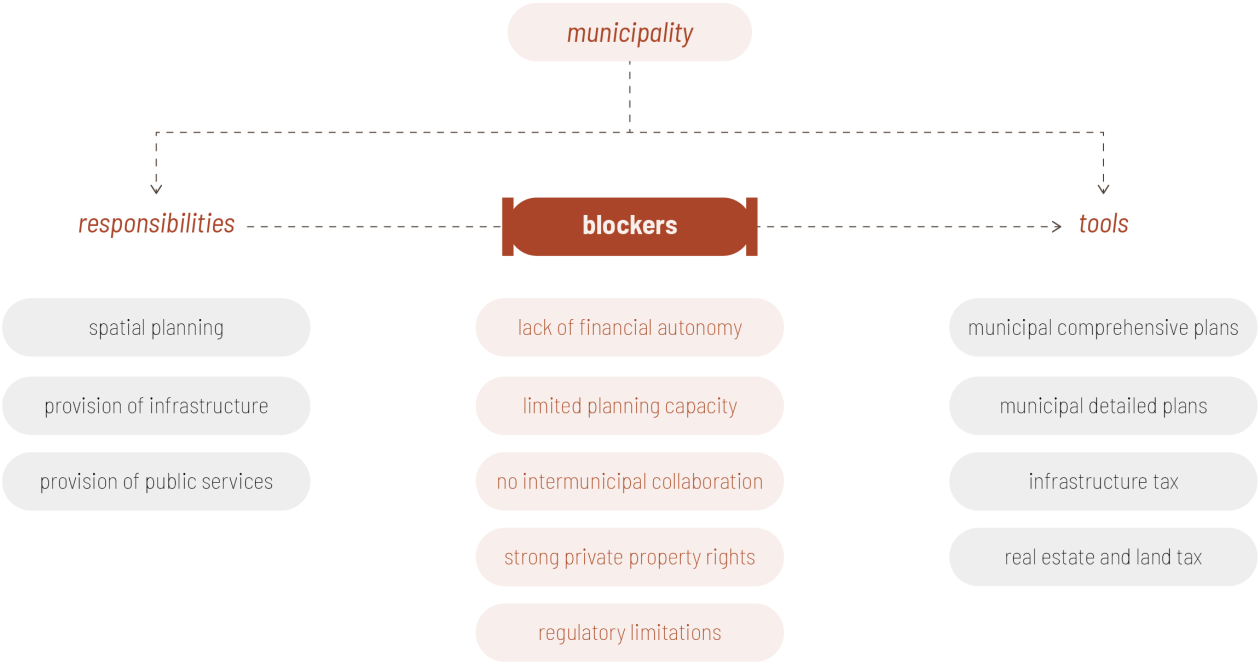


Figure 110. Overview of mismatch in formal versus real municipal powers.



No Regional Spatial Planning Level

Urban sprawl in Vilnius has long outgrown municipal boundaries, demanding a regional approach to spatial planning of land use and planning systems. However, the absence of a regional administrative authority means that there is no long-term collaboration, vision, plan or strategy for its future development and for that of urban sprawl (see appendix II). This leaves any regional level planning or development possible only through national level effort or one-off agreements between municipal councils or mayors (Strata, 2024).

Interestingly, this governance gap only emerged in 2010, when the county-level administrative tier was abolished under the grounds of financial and administrative efficiency and duplicating roles (ESPON, 2021). Before that, counties provided some degree of regional coordination, and since its abolition there has been no replacement mechanism for the regional level of planning.

Region Development Council

The Vilnius Region Development Council (RDC) is the only existing intermunicipal coordination body for Vilnius region. This council has initiated multiple spatial plans, encompassing cross-municipal development (see fig. 111-113). However, interviews with municipal representatives revealed that it has no planning powers, no enforcement capacity and no long-term responsibility for strategic planning or collaboration - it is essentially powerless. In fact, interviews confirmed that RDC was set up primarily to access EU Structural Funds, rather than being a genuine effort to create a functioning regional planning and development authority. Municipal workers described the council as bringing some improvements, but ultimately having severely limited influence and outcomes. Therefore, while the council facilitates some level of regional collaboration, it remains surface-level and low-reaching.

There was unanimous agreements between experts that the lack of a regional planning authority is one of the biggest obstacles in managing urban sprawl in Vilnius region, and that Vilnius metropolitan area needs a new regional planning system to be able to effectively deal with urban sprawl and its associated challenges:

> *Without a **fundamental restructuring** of the governance system, all efforts to facilitate **regional collaboration** and **planning** will remain **cosmetic**.*
>
> *- Researcher (expert interview)*

Interviewees expressed that what is needed is a regional body that is multifaceted, long-term and formalized, one that facilitates active interinstitutional partnership and collaboration in spatial planning and development,

i.e. all aspects which are currently missing in regional planning at the national and municipal scales.

Current Regional Planning Approach

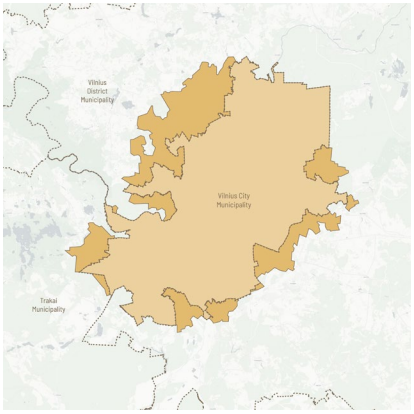
The lack of regional authority leaves any regional level planning or development possible primarily through national level effort or one-off agreements between municipal councils or mayors.

For example, a VCM transport authority representative noted that regional mobility development projects happens primarily through one-off agreements between mayors and municipal councils. They expressed that these agreements are highly politically volatile and frustrating to work with for transport planning and development. Since all decisions have to be made by the municipal council and/or mayor themselves (with elections held every 4 years), municipal transport authorities have to advocate and coordinate under a constant race against time. Transport development being a long-term effort, it was revealed that often projects come to a halt or have to be restarted at the end of the term, making the entire transport planning and development process highly inefficient.

These failures at the national and municipal level produce direct consequences for spatial planning and transport across Vilnius region. Transport authorities explained that there is little coordination between the municipal transportation systems, as they often have independent duplicating routes and have separate ticketing systems. VCM representatives expressed a similar frustration about municipal general plans, as spatial planning decisions at border areas often conflict each other.

111. Vilnius Regional Development Plan 2022-2030 cover area.

112. Strategy for the Vilnius Functional Zone 2024–2029 cover area.



113. Vilnius City Sustainable Development Strategy 2024–2029 cover area.

Fiscal Systems Incentivising Sprawl

Research and expert interviews revealed that the financial structure guiding spatial development is structured in a way that incentivises urban sprawl for every stakeholder. This is an outcome not of intentional policy choice, but of numerous conflicting incentives operating at the same time. This incentive comes through taxation, development funding and infrastructure cost allocation.

Land & Real Estate Tax

The most significant financial driver of urban sprawl is the land and real estate tax. Land holding costs (without development) in Lithuania are very low, ranging from 0.01% to 4% of appraised values. However, the official land valuations are significantly lower than real market values, and are re-evaluated only once every five years (source). This means that the effective tax burden for holding undeveloped peripheral land is minimal, which enables speculative investment. This makes land holding at peripheral territories in Vilnius attractive for investors. Land is bought out and held until infrastructure development or a land use reclassification into residential raises the land value, at which point it is sold or developed for profit. This trend also fragments land ownership, making coherent and coordinated development nearly impossible (ESPON, 2021).

Cheap Peripheral Development

In addition, the financial structures for development make greenfield development significantly cheaper and faster to develop compared to urban regeneration or densification. Peripheral greenfield development often involves lower land costs, easier site conditions and less regulatory complications compared to development in urban environments. The 2014 reform of the law on territorial planning enabled the development without a detailed municipal plan, which further reduced the developmental financial burden and reduced municipal control over private development. This creates a financial system where private developers are systemically rewarded for urban sprawl development, and an obvious choice for private developers (ESPON, 2021).

Infrastructure Tax

The infrastructure tax system further diverts the financial burdens of urban sprawl development from private investors. The immediate infrastructure costs for new residential development are covered by the municipal infrastructure development fee introduced in 2021, or paid for by the developer under the planning conditions. However, the long-term maintenance costs of the newly developed infrastructure (e.g. road or drainage system maintenance, providing public transport and public services) fall entirely on the municipality. These costs are delayed, diffuse and are distributed in the municipal budget in a way that is hard to trace back to specific developments. This makes poor planning decisions invisible in the immediate term and accumulate into excessive spending over time, leaving little resources for other projects in the municipal budget (ESPON, 2021).

Fiscal Systems Disincentivizing Collaboration

Expert interviews and literature reviews revealed that municipal funding mechanisms are one of the most powerful yet invisible structural drivers of urban sprawl, enforcing competition and conflicting interests. The income for municipalities in Lithuania directly depends on the number of residents registered within the municipal boundaries, as around half of municipal income comes from nationally allocated funding from personal income tax. This means that municipalities are rewarded for attracting new residents. In a metropolitan context where urban development crosses municipal boundaries this incentivizes intermunicipal competition and discourages collaboration (OECD, 2021).

In this financial context, Vilnius District Municipality and Trakai Municipality, which historically have been one of the poorest regions in Lithuania (opposite to VCM, holding the majority of economic output and population), directly gain from urban sprawl, as more residents move in and bring in more funding. This drives regional municipalities to approve planning applications, allocate excessive land for residential development and accommodate developer requests, regardless of where and how that development looks like. At the other side of the municipal border, this development results in a financial loss. Urban sprawl puts pressure to accommodate financially inefficient road infrastructure, diverting resources away from other developments. The difference in perspectives regarding urban sprawl could be clearly seen in the expert interviews:

*Vilnius City Municipality representatives see urban sprawl as a **threat**, while Vilnius District Municipality representatives see it as an **opportunity**.*

This competition extends beyond the personal income tax, also impacting infrastructure investment decisions at border areas (OECD, 2021). For example, intermunicipal public transport investment by Vilnius City Municipality results in increased land value and improved accessibility in VDM and TM. However, all tax revenues flow to regional municipalities, not to VCM. Because of this, regional municipalities are directly incentivized to freeride on external investment. An interview with a VCM transport authority accurately describes the consequences of these financial incentives for intermunicipal collaboration:

> *Other municipalities only see us as a **moneybag**...*
>
> *- VCM transport authority (expert interview)*

The financial burdens and benefits of intermunicipal development directly disincentivizes collaboration and instead turns neighboring municipalities into competitors. This directly weakens the power of existing municipal spatial planning tools.

One example given by a VCM authority is the infrastructure development fee introduced in 2021, which attempted to address the unequal distribution of burdens and benefits of development by allowing muncipalities to demand developers to contribute to infrastructure costs. However, it was revealed that the effectiveness of this tool is severely limited because of the lack of intermunicipal collaboration incentives. Each municipality can set their own infrastructure development fee. However, since municipalities are incentivized to attract more development, they set their rates lower to remain

competitive with their neighboring municipalities, creating a race-to-the-bottom effect.

Ultimately the expert interviews revealed that, until the financial system is restructured in a way that incentivizes intermunicipal collaboration, addressing urban sprawl at a regional scale will continue to be financially and politically irrational for regional municipalities.

133

Disconnect Between Land Use & Transport Planning

A literature review revealed that the Lithuanian spatial planning system for land use and transport planning is managed by separate institutions at both municipal and national levels, sometimes with conflicting interests, and often with little to no coordination between each other (see appendix II). This results in a mismatch between transport and land use planning, which ultimately favors car-centric urban sprawl development. In the context of Vilnius region, this results in extensive residential areas planned and developed without sufficient transportation infrastructure (ESPON, 2021).

Conflicting Ministry Policy Directions

At the national level, transport and land use planning are fragmented between different ministries (see fig. X). The Ministry of Environment is responsible for land use and environmental protection policy. The Ministry of Transport and Communication is responsible for national transport policy. The Ministry of Internal Affairs is responsible for regional development, with the Regional Development Council operating under it. Finally, the Ministry of Economics and Innovation is responsible for the development of Free Economic Zones, which have recently received criticism for failing to consider where new workers will live and how they will travel to work. Often the interests of these ministries overlap and contradict. The Ministry of Environment promotes compact and sustainable land use, meanwhile the tax system favors car travel and road infrastructure development, facilitating car-centric urban sprawl.

The National Comprehensive Plan (made in collaboration between ministries and led by The Ministry of Environment) has planned for the establishment of additional financial mechanisms to encourage local planners and to prioritize compact development. In that same document, transportation plans focus on accommodating vehicle traffic growth by providing additional road capacity. Alternatively, the document sets out to plan and install road connections to all new railway stations under the development of the new high-speed lines of Rail Baltica (Ministry of Environment of The Republic of Lithuania, 2022). These conflicting objectives appear in the same strategic document without any clear resolution, illustrating how deep the disconnect between transport and land use planning is.

Notably, several departments within the Ministry of Environment do engage with transportation issues — for example, the Territorial Planning, Urban Development and Architecture Department is responsible for sustainable urban planning. There are also various commissions and inter-institutional working groups which facilitate collaboration and coordination for policy and strategic documents. However, these coordination bodies fail to ensure a fully integrated and long-term approach to planning and development, as could be seen in the National Comprehensive Plan (OECD, 2021).

In space, this results in compact residential area development without the necessary pedestrian-oriented

transport infrastructure to support it, or transportation infrastructure development in seemingly illogical locations. A clear example of this is the national cycling infrastructure development plan announced by the Ministry of Transportation & Communication in 2022. Many of the planned routes go through the urban sprawl areas in Vilnius metropolitan area (see fig. 114). However, this infrastructure is planned along major roads, which creates questions regarding the quality, deliberateness and attractiveness of the planned development (Via Lietuva, 2026). For these reasons, the integration between transport and land use planning remains a challenge at the national level.

The Case at Municipal Scale

The transport and land use planning disconnect at the national level directly trickles down to municipal spatial planning, especially since much of the main transportation infrastructure (e.g. highways and railways) is nationally owned. The infrastructure development in municipalities also seems to be largely opportunistic. For example, Vilnius City Municipality has made genuine progress in the expansion of the cycling network, building over 100 kilometers of new cycling lanes since 2016. However, the development is opportunistic, creating a highly fragmented network which does not lead to any meaningful destinations. This patchiness forces cyclists to navigate unsafe busy roads, which fails to make cycling a realistic mode for daily trips in urban sprawl areas.

However, slow steps towards integration at municipal level are visible. An interview with a transport authority revealed that VCM is working on connecting the fragmented cycling infrastructure and further expanding it in the urban sprawl areas in VCM as part of the Vilnius Sustainable Urban Mobility Plan (SUMP). The goal of these plans is to facilitate a shift towards more sustainable mobility modes such as walking, cycling, and public transport. For the development of these plans, municipal general plans had to be considered, which shows some progress towards improved coordination. In Vilnius City Municipality, the adoption of the 15-minute city model as a spatial framework somewhat explicitly links land use and transportation planning decisions at a conceptual level.

Nevertheless, coordination between land use and transport planning remains limited. The practical outcome of this is extensive residential areas being developed in distant locations with no sufficient transport access. This results in high infrastructure development and maintenance costs, increased car dependence and decreased accessibility for incoming residents (OECD, 2021).

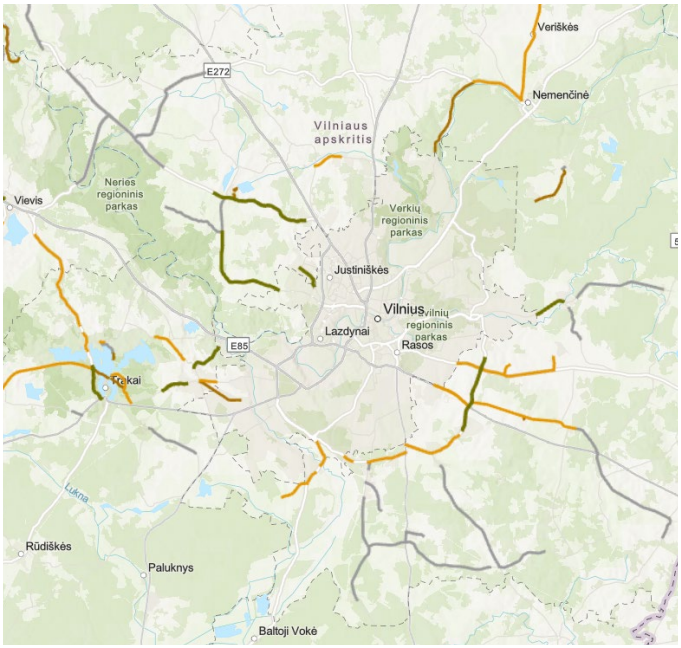
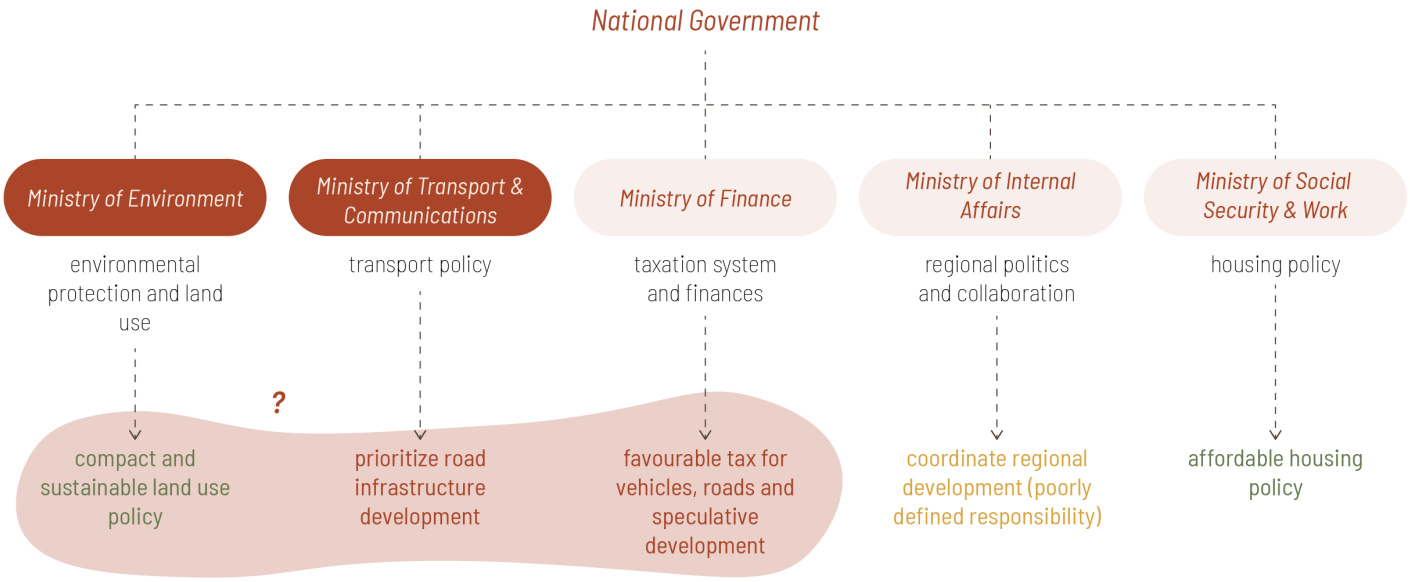


Figure 114. Development plan for bicycle and pedestrian infrastructure along roads of national significance (Via Lietuva, 2026).

Figure 115. Conflicts between ministry spatial policies.



Monitoring, Control & Enforcement Failure

Literature reviews and expert interviews revealed that Lithuania's spatial planning system suffers from gaps not only in the legal framework, but also in the enforcement, monitoring and quality control of the existing tools and mechanisms. This means that many of the existing spatial planning instruments and documents are made less effective due to poor implementation, often resulting in contradicting or conflicting outcomes and limiting the possibility to control what gets built where and how.

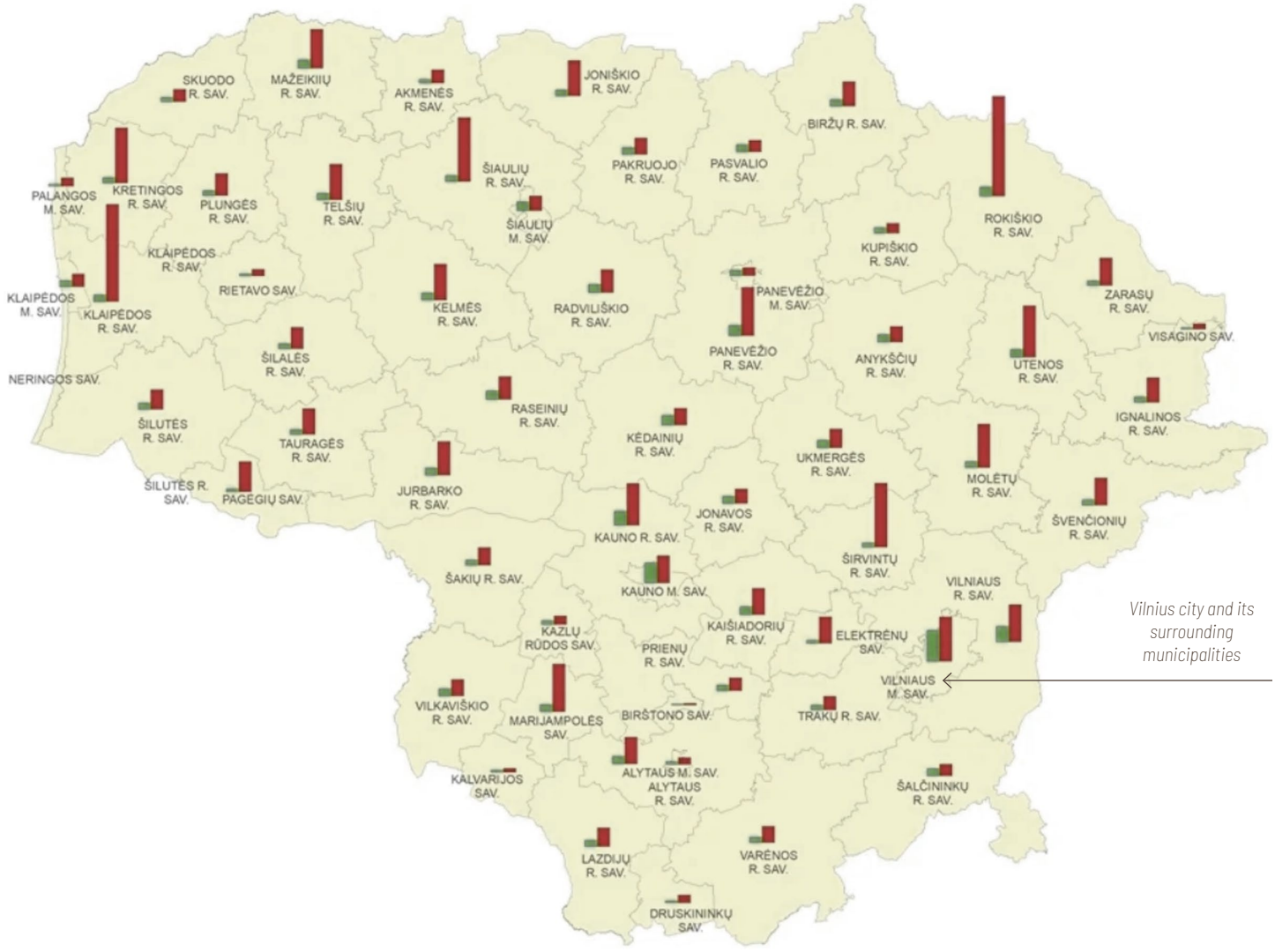
Municipal General Plans

An obvious example of this is the Municipal General Plans, which are the primary land use planning tool for municipalities. In theory, these plans should match with National Comprehensive Plan (the highest order spatial planning document in Lithuania) and provide a coherent spatial framework which guides the municipal spatial development over the next few decades. However, the preparation of these plans lack quality control or expectation enforcement to match with the national spatial policy (ESPON, 2021; Statybos Sektoriaus Vystymo Agentūra, 2024).

Generally, Municipal General Plans are commissioned by municipalities from private planning consultancies through a public tender. This creates a designer-client dynamic in which spatial plans are made to accommodate the interests of the commissioning municipalities, which are financially incentivized to maximize development. Expert interviews revealed that municipalities are sometimes pressured by private land-owners and developers to make decisions favorable for investors, adding another layer of biased interest into the public spatial planning realm. The outcome of this is municipal general plans which fail to respond to real spatial needs or trends, and do not match the national spatial policy and expectations (Kaunas Technical University, 2023; ESPON, 2021).

A review of municipal general plans between 2005 and 2020 revealed that municipalities constantly overallocated land for residential land use and other forms of urbanization. While the 2014 amendment on national territorial planning norms introduced a maximum of 20% permitted land area urbanization for the municipal general plans, this cap has been largely disregarded, with municipalities overallocating from 2 to 9 times of the permitted land area for urbanization, even in muncipalities with rapid population decline (see fig. 116). The reason for this is that, while there are institutions responsible for the review and quality control of these documents (namely SSVA and VTPSI), they lack the capacity, resources and formal enforcement authority. This lack of monitoring, quality control and enforcement also produces situations where municipal general plans contradict each other at border areas (Kaunas Technical University, 2023; Statybos Sektoriaus Vystymo Agentūra, 2024).

Figure 116. Currently vs. planned built-up land per municipality, based on comprehensive municipal plans (2005).



Kaunas Technical University (2023).

Informality in Living

The lack of enforcement extends into the daily life of many residents in urban sprawl areas, who live in permanent legal ambiguity. A major example of this is the allotment garden settlements (sodininkų bendrijos) around Vilnius. These areas started as Soviet-era seasonal gardening plots, but have over the past few decades transformed into extensive residential areas which thousands of people call home. However, these areas remain formally classified as agricultural or gardening land use (see pages X-X), and residents living there have no legal right to public infrastructure or services (such as schools or road infrastructure). There has been no targeted initiative from the municipalities or national government to address these informal residential areas, as it would require either the displacement of hundreds of households, or the commitment to develop infrastructure which municipalities cannot afford. Therefore, the easiest thing for institutions to do is to allow this legal grey zone to persist (Sinušaitė-Petreikienė & Naimavičienė, 2020).

A similar grey zone exists in the registration of residence. Expert interviews revealed that it is not uncommon for families living in VDM to register residence at a home of a friend or family member in VCM so that the children have access to better education opportunities - and it seems that the municipalities are well-aware of this but do not penalize them for doing so. This results in the displacement of valuable municipal income and makes it challenging to conduct accurate recording and

*One Vilnius District Municipality Elder estimates that the **real population** of their Eldership is **20% higher** than what is registered **on paper**.*

Flawed Legal Structure

Ultimately, a large part of the urban sprawl challenge are ineffective national regulations which are easy to bypass, are contradicting simply fail to properly guide development. These are slowly getting patched up through reforms and amendments, but progress remains slow.

Poor Differentiation Between Different Contexts

For a long time, National Territorial Planning Norms failed to meaningfully differentiate between different types of spatial conditions and their associated regulations and requirements. This meant that urban sprawl areas would consistently fall through the regulatory gaps. A municipal representative gave an example of the minimum green space requirement, which only applied to urban areas, but not to urban sprawl areas (as these were technically not categorized as 'urban'). Notably, the National Territorial Planning Norms were updated in May 2026, specifying the distinction between different spatial contexts and setting specific and measurable requirements for each type. It is still too early to tell how these new adjustments will affect the spatial planning and development of urban sprawl areas (Žinių Radijas, 2025).

Poorly Specified Regulations

Research and expert interviews revealed that many of the existing regulations for spatial planing and development are easy to bypass due to lack of specification and ambiguous terms (ESPON, 2021). A national planning authority gave the example of the definition of "compact development" in the National Territorial Planning Norms. Until the revision in May 2026 which specifies concrete numbers, measurements and expectations, the term remained ambiguous and easy to interpret - making it essentially useless in practice, as private developers could mold it into whatever fits their interests. The interviewee stressed that providing specific and measurable requirements makes a significant difference in their effectiveness as spatial planning tools.

Legal Loopholes

It was revealed that the laws and regulations in place for development lack a comprehensive approach, making them easy to bypass through legal inconsistencies. One interesting example of this is the fact that:

> *Vilnius county has the **most registered farmers** in all of the country, while also having the **smallest average farm size**.*
>
> *(Žemės ūkio duomenų centras, 2024).*

This statistic can be explained by the fact that, until 2023, people could easily register themselves as farmers, and then buy and build a house on land which is allocated for agricultural land use. A law amendment has been made in order to make this more difficult (Ministry of Environment of The Republic of Lithuania, 2023). This shows that the government is aware of the legal gaps and is actively trying to fill them in. However, many interviewees feel that this is happening far too slowly.

Urban Sprawl as Structural Failure

The analysis provided an overview of the key stakeholders and their dynamics that result from a flawed governance and policy system (see fig. 117-122).

Interviews with local community representatives revealed that there are no genuine local engagement mechanisms in spatial planning processes. The existing formal community representatives (Elders and Sub-Elders) have no real powers or resources to advocate for their community. Meanwhile successful collaboration between the municipality and local community NGOs remain informal (with the exception of the Active Society Organization Department in VDM) (see fig. 120, 121).

At the municipal scale, the formally existing tools and mechanisms are made significantly less effective due to structural failures relating to financial autonomy, regulatory limitations, limited planning capacity, lack of collaborative mechanisms and strong property rights (see fig. 120, 121, 122).

The governance system has a clear gap at the regional level, with a lack of spatial planning tools or collaborative mechanisms to address urban sprawl, a challenge which has crossed municipal borders and requires strong intermunicipal coordination to address (see fig. 120, 121, 122).

The financial systems were revealed to incentivise urban sprawl development through favorable conditions for greenfield development and speculative investment. Meanwhile a growth-oriented funding system for municipalities incentivizes the accommodation of development regardless of what, where and how it is built (see fig. 119, 122).

At the national level, different ministries are responsible for land use and transport planning (and other relevant spatial planning issues). The lack of coordination between these ministries results in conflicting policy priorities, where compact land use practices are promoted alongside the development of road infrastructure (see fig. X). In addition, the lack of monitoring, control and enforcement, as well as a flawed legal structure makes formally existing spatial planning tools ineffective and easy to bypass (see fig. 120, 121, 122).

These findings reveal urban sprawl in Vilnius region as a structural failure in which various policy and governance elements build towards favorable conditions for the development of poor quality, fragmented, car-centric and severely underfacilitated urban sprawl (see fig. 117).

Figure 117. Systemic failures consequences for spatial planning.

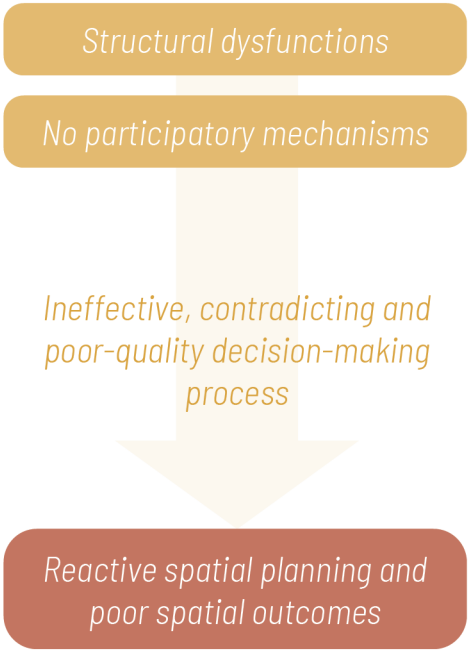


Figure 118. Stakeholder hierarchy in Vilnius region urban sprawl.

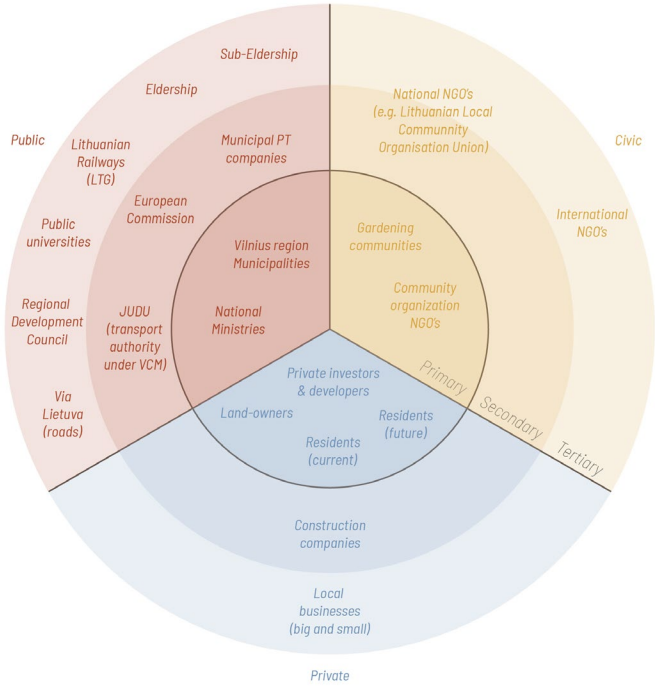


Figure 119. Stakeholder interactions in urban sprawl development (current system).

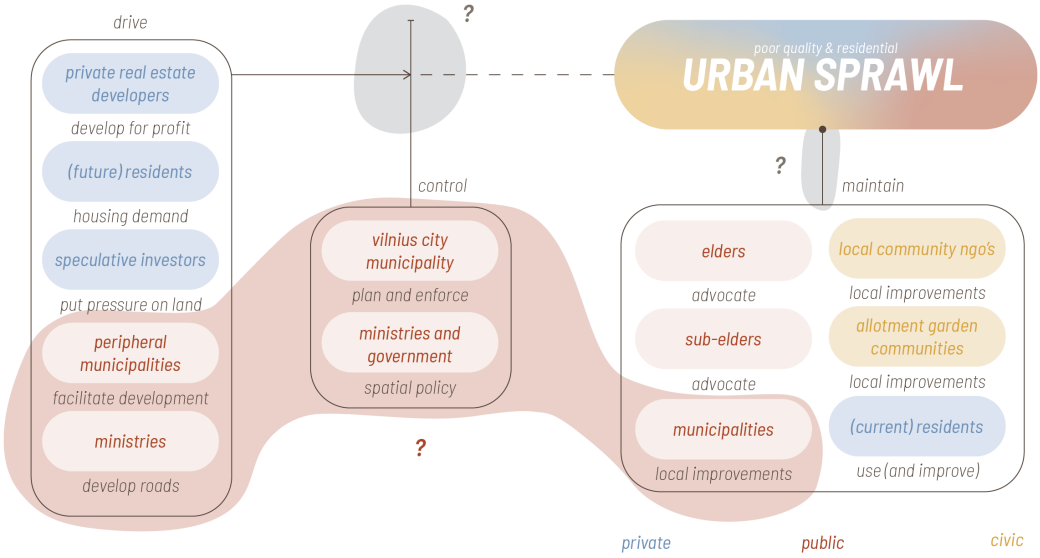


Figure 120. Overview of governance structure in Lithuania.

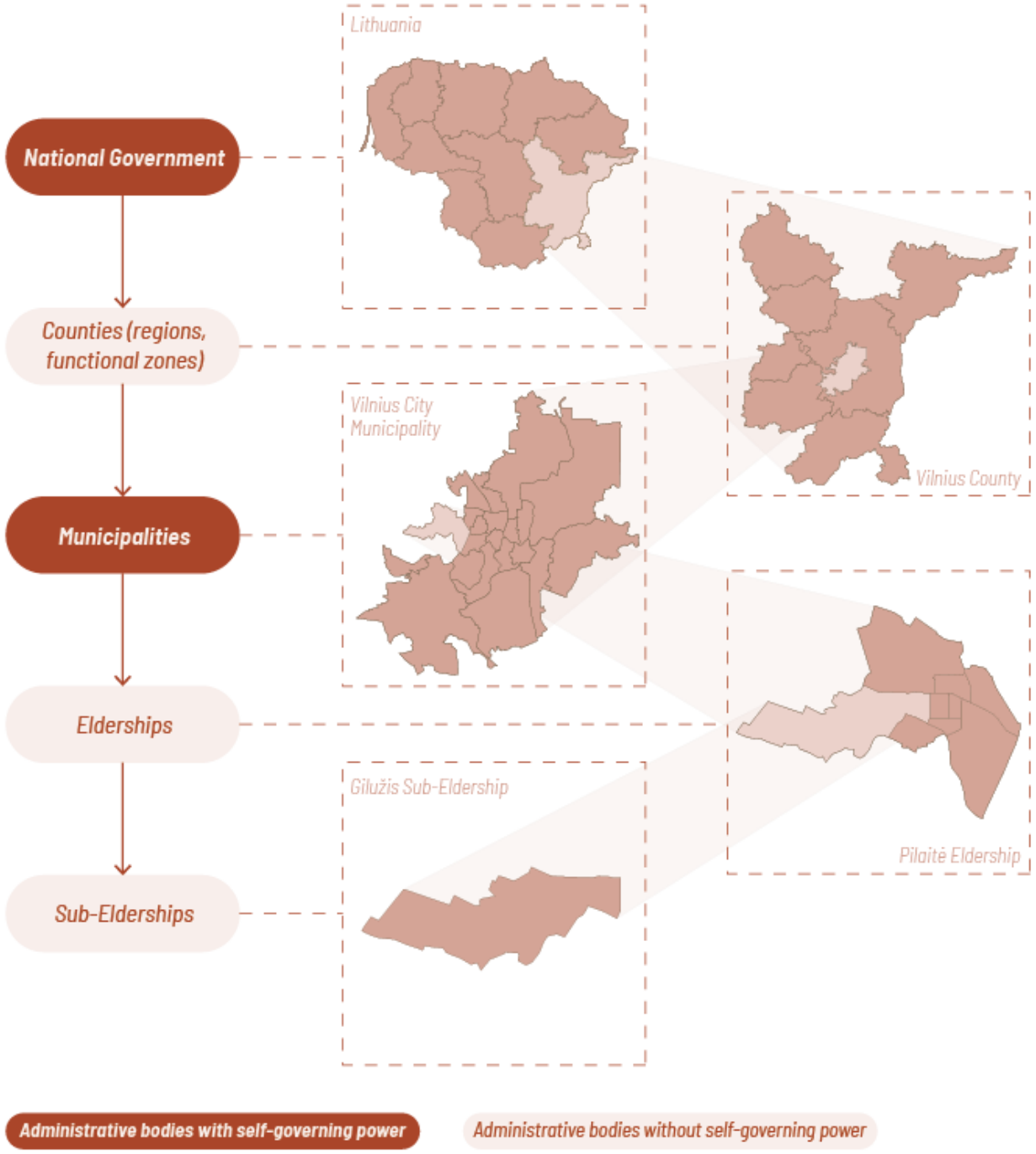


Figure 121. Stakeholder formal decision-making power.

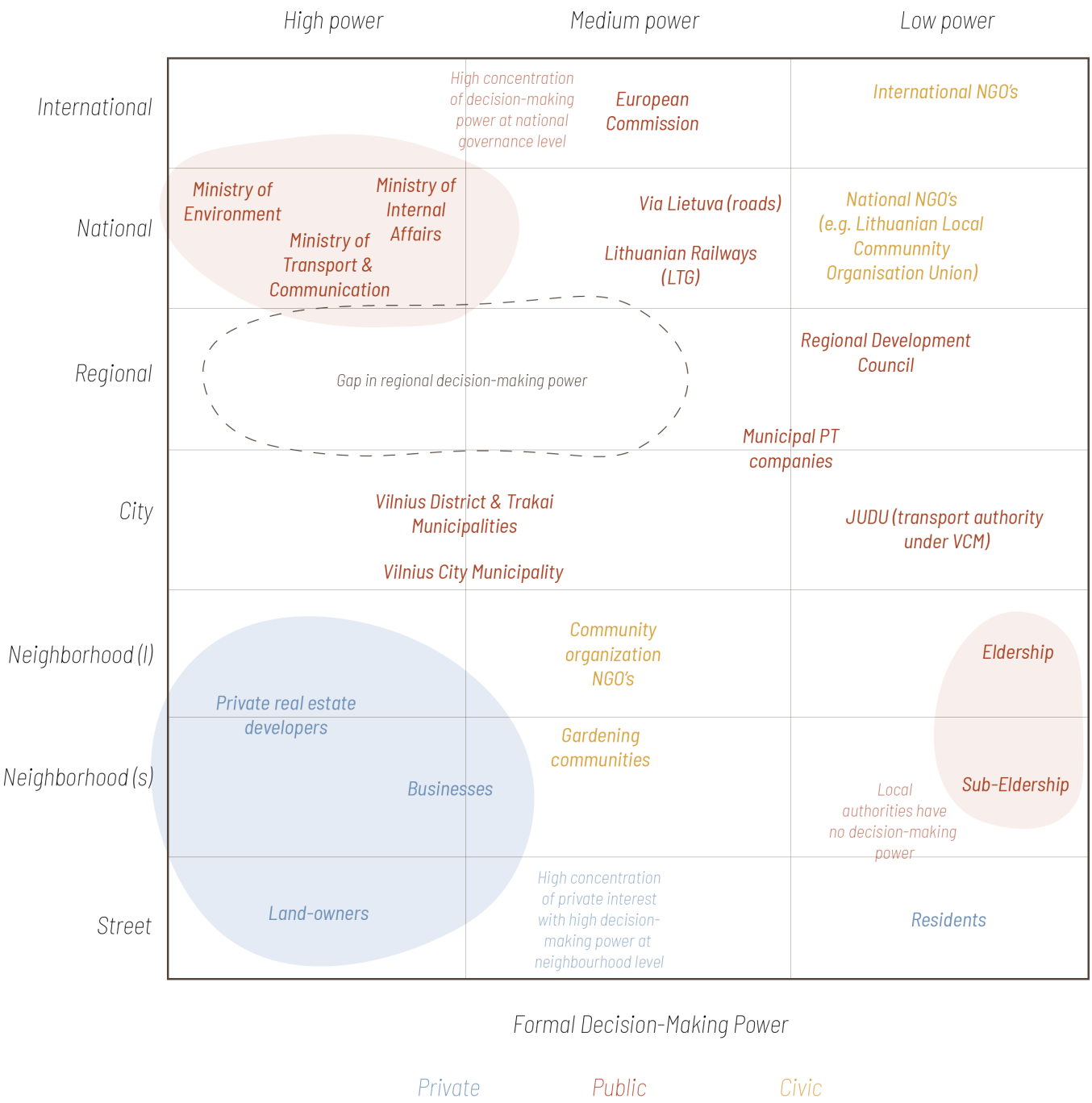
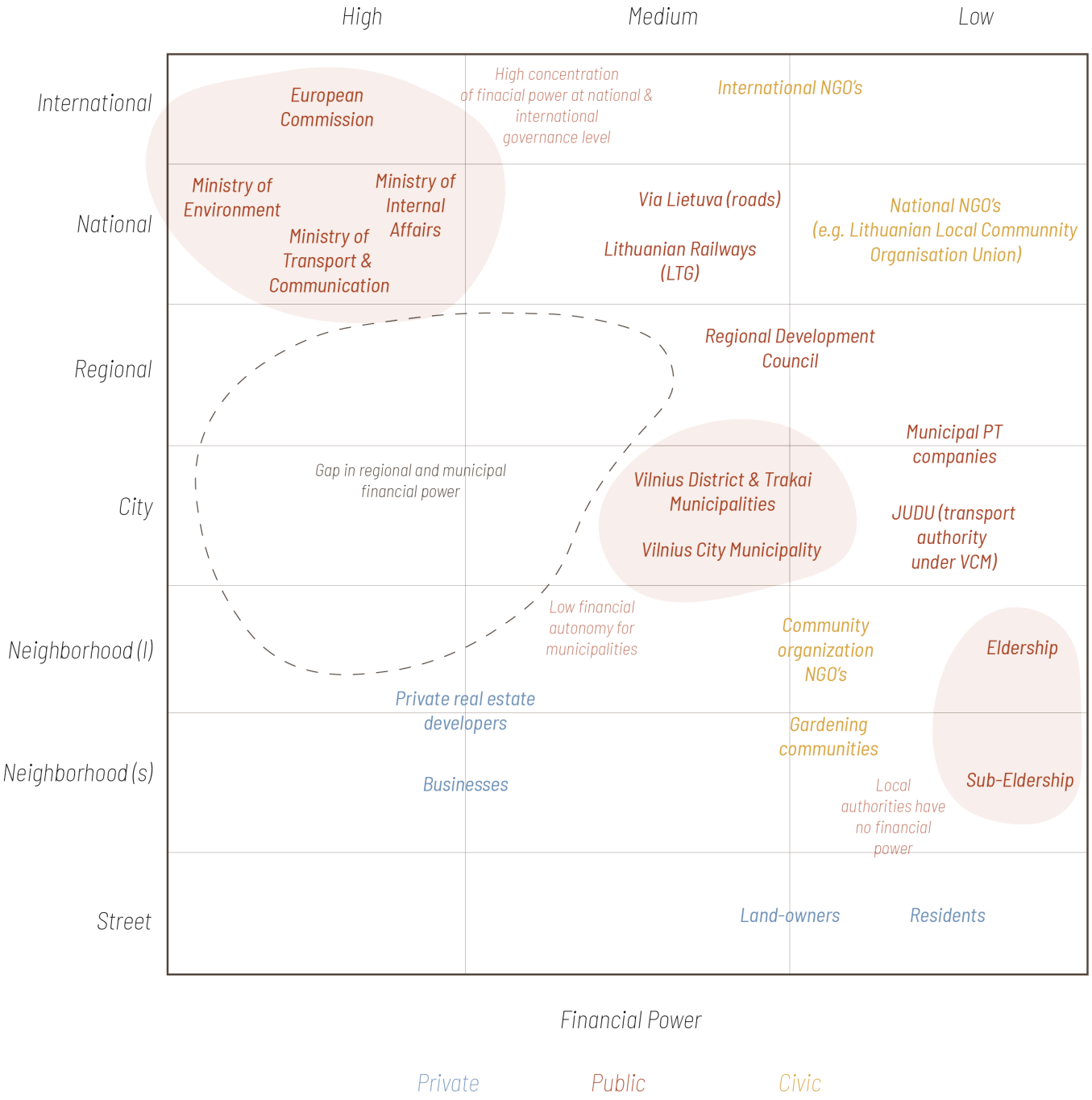


Figure 122. Stakeholder financial power.



Spatial Design For Accessibility & Interpersonal Interactions

This chapter utilizes input from the spatial analysis, expert interviews and literature reviews in order to propose exploratory spatial solutions to improve accessibility and social interactions in South-East Vilnius. The design process follows a structured framework in which specific objectives and requirements form a basis for the spatial design approach and outline. Due to the chaotic nature of urban sprawl, the design approach deconstructs the different land use and transport elements in SE Vilnius, redefines and reorganizes them in a way that improves accessibility and facilitates interactions. Namely, the proposal is to establish a hierarchical and interconnected network of centralities independent from Vilnius inner city. The chapter elaborates on the design process and the proposal, and provides impressions of the possible spatial qualities.

Design Framework

The chaotic and disorganized nature of urban sprawl areas in Vilnius region demanded a structured design approach. First, it was necessary to define a clear objective. Based on that, the specific requirements are drawn. The requirements inform the design approach and solutions, which are based on the research by design approach. The design outcomes are then reflected upon and key takeaways are drawn (see fig. 123).

Design Objective

The spatial design approach for residential urban sprawl area transformation takes the first angle of the conceptual framework. It explores how interventions in transport and land use components could improve accessibility, while also facilitating more interpersonal interactions. The desired outcome of the interventions is a more inclusive and sustainable living environment (see fig. 124).

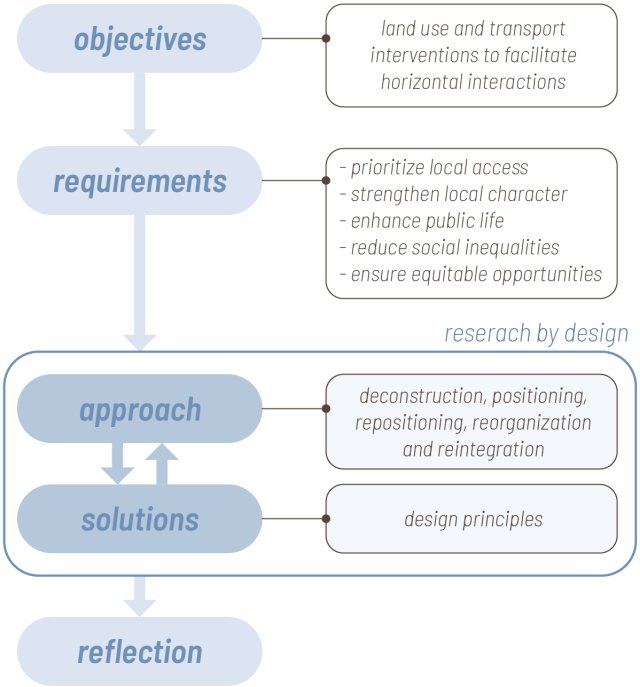


Figure 123. Conceptual approach for spatial design in urban sprawl.

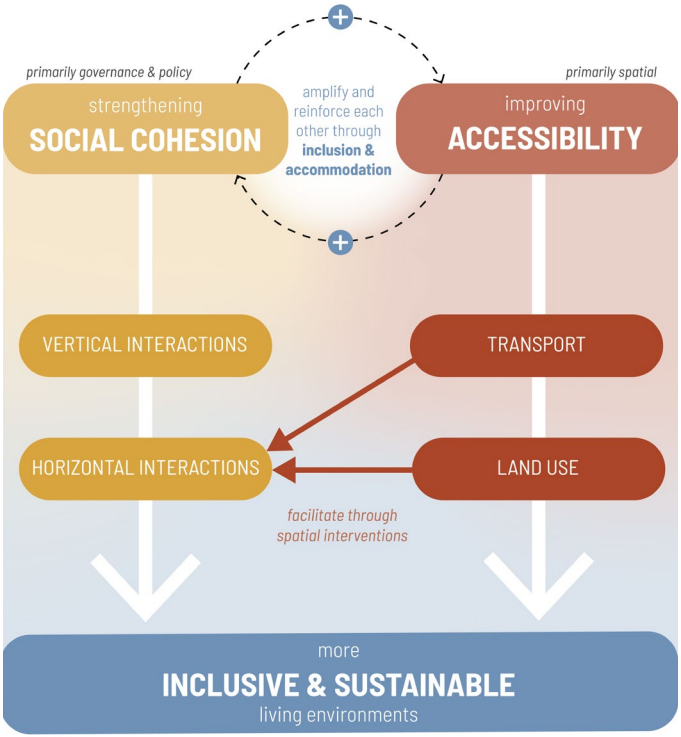


Figure 124. Conceptual framework for spatial design objective.

Specifically, expert interviews revealed that the dependence on the inner city for amenities and meeting places, as well as the lack of a clear centrality or meeting place in urban sprawl areas results not only in accessibility challenges, but also in a local environment in which neighbors never have the chance to meet, engage with and get to know each other. Therefore, the spatial design must directly respond to these frustrations by creating utilizing land use and transport interventions not only to improve access to opportunities, but also to develop local meeting places and provide the means to get there (see fig. 125). Cruicially, this means reorganizing the land use and mobility

Spatial Design Requirements

Based on the core design objective and research findings (expert interviews, spatial analysis and site visits), the design requirements are drawn. These address accessibility (transport and land use) and interpersonal interactions to different extents (see fig. 126). Addressing these requirements is necessary to reach the ultimate design objective, which is to bring people together in meeting places through accessibility interventions in land use and transportation.

Figure 125. Core design objective.

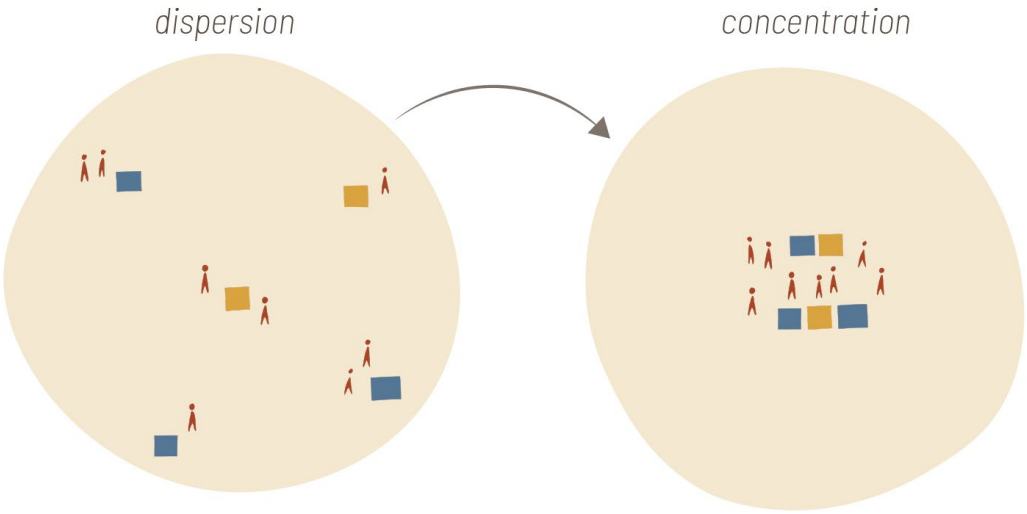
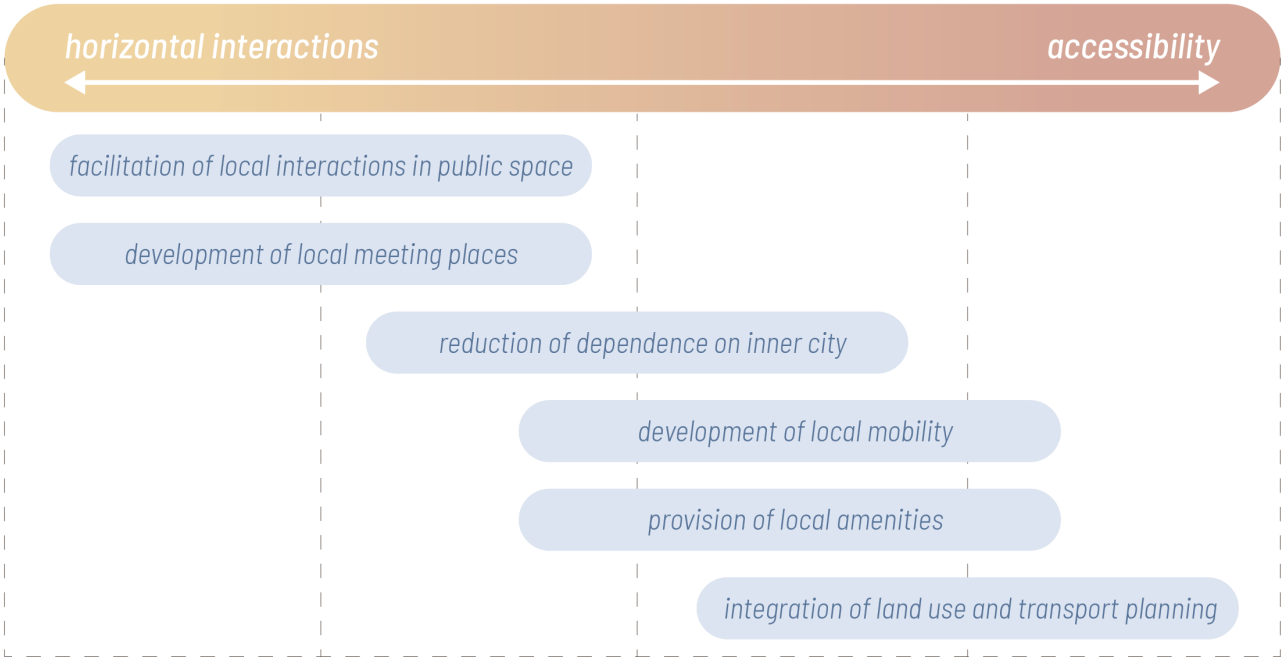


Figure 126. Spatial design requirements for residential urban sprawl areas.



Spatial Design Approach

The spatial design approach was derived through reflective research by design on the Pavilnys urban sprawl area (see fig. 127). Urban sprawl is characterized by chaos, lack of planning and organization and lack of structure. Therefore, the first step of the design is the deconstruction of different land use and transport. The existing elements are identified, characterized (identification) and related to each other (positioning).

Once this is done, the second phase is reintegration, the principles of which are based on the design objectives and requirements. The characteristics of the elements are reprogrammed, and then the relationships between the different land use and transportation components are repositioned. The final step of reintegration is to define a organizational logic for the elements. This reorganization spatializes the new program and positioning of transport and land use elements. This transformation is visualized in fig. 128. Cruically, research by design revealed that the land use reorganization must come before transportation. This corresponds with the theoretical research, which emphasizes that transportation only improves accessibility if it connects individuals to meaningful destinations.

The organizational logic for the spatial design approach proposes to develop hierarchical land use and transport structures which form a network of centralities (rather than the current structure of one big center) which are connected with a hierarchical network of traffic flows (as opposed to the current lack of traffic organization and separation of traffic flows). Figure 129 illustrates this structural logic.

Figure 127. Spatial design approach for residential urban sprawl areas.

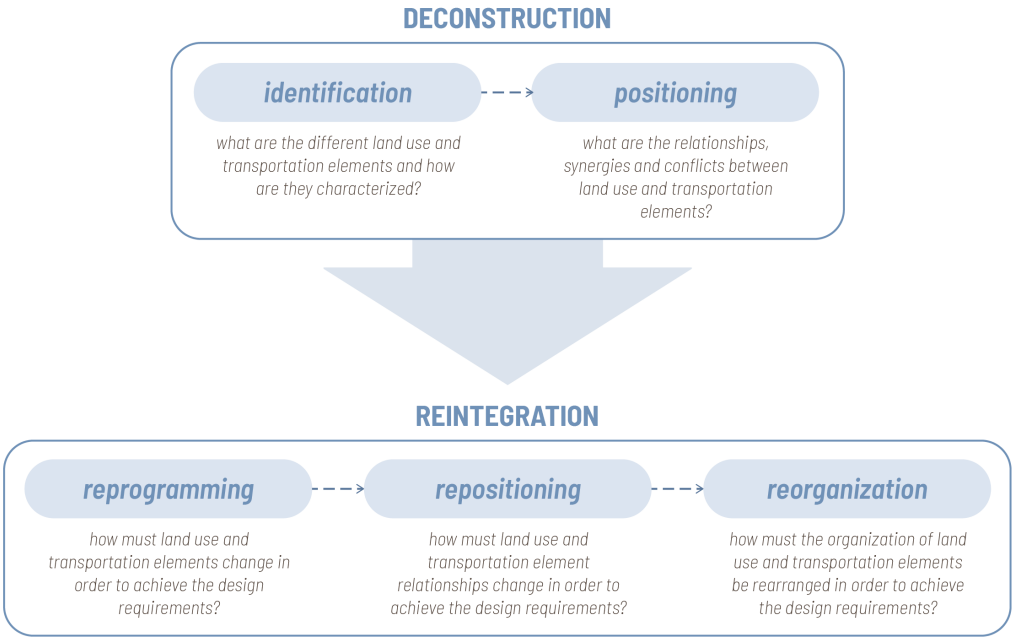


Figure 128. Spatial design approach applied to land use and transportation components.

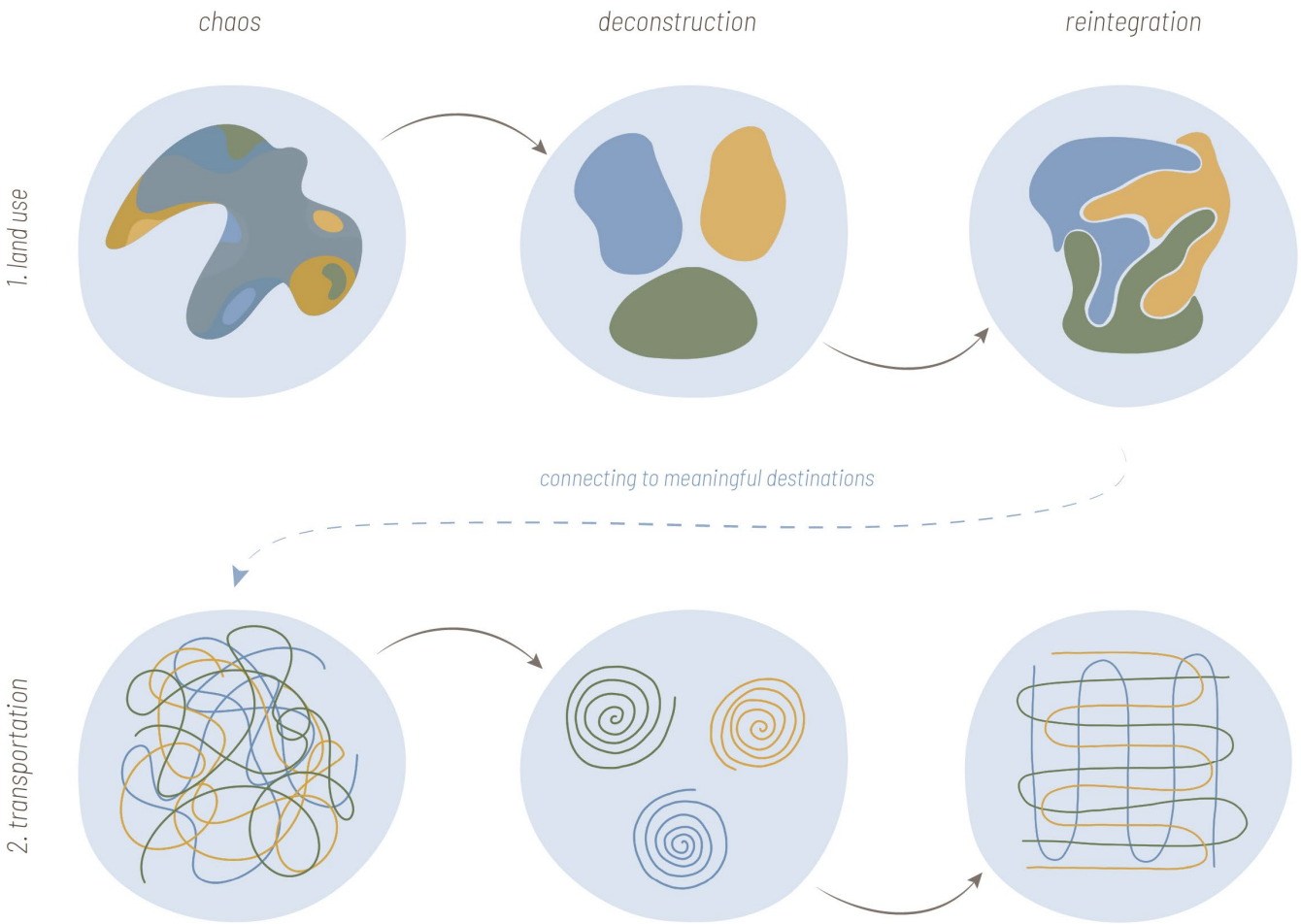
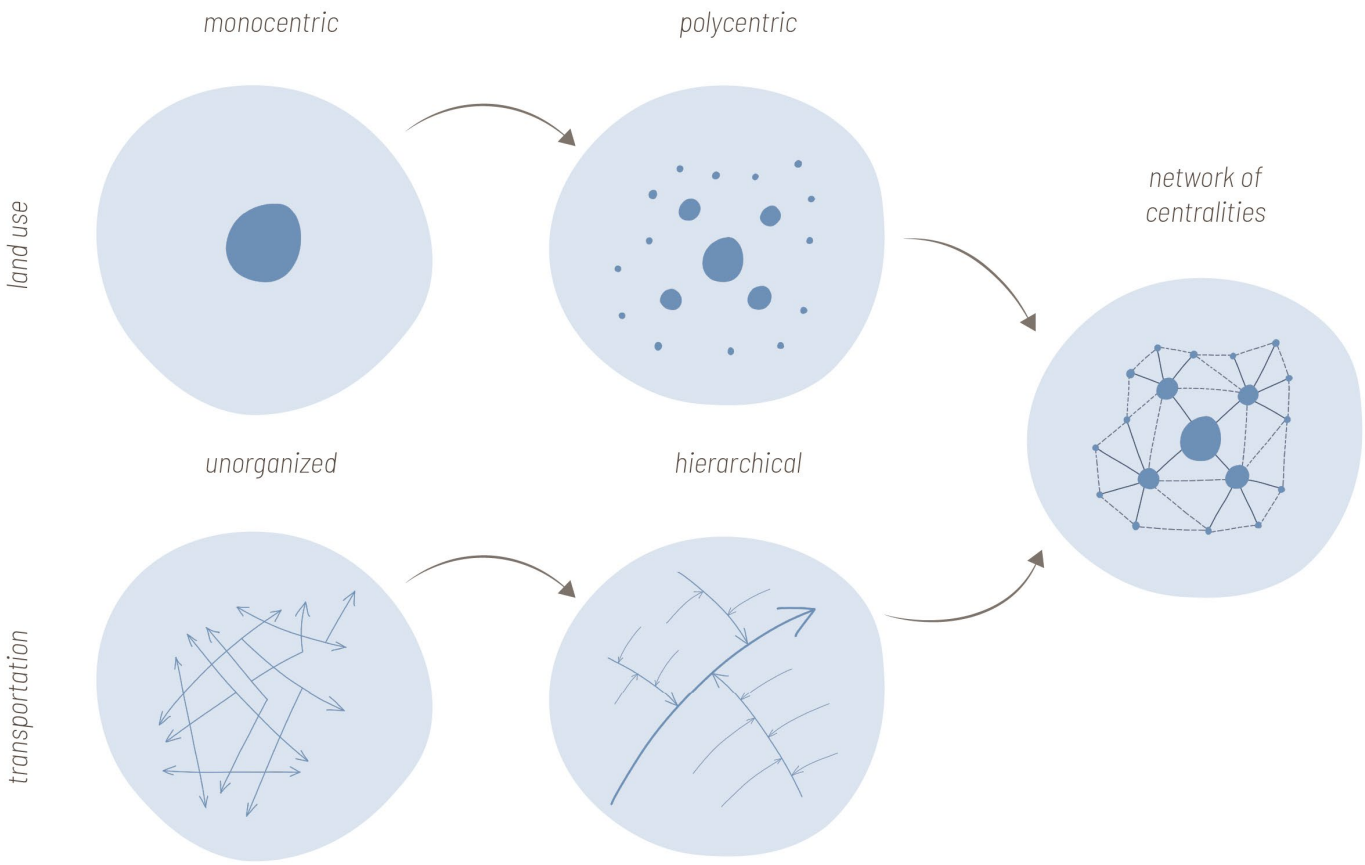


Figure 129. Spatial design approach applied to land use and transportation components.



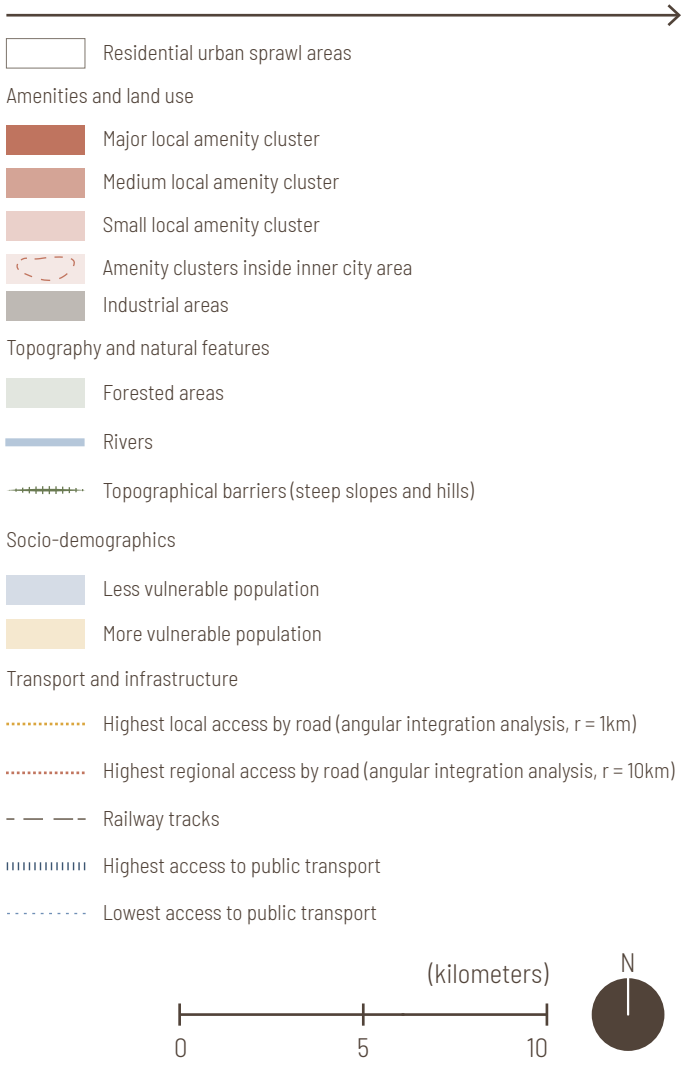
South-East Vilnius

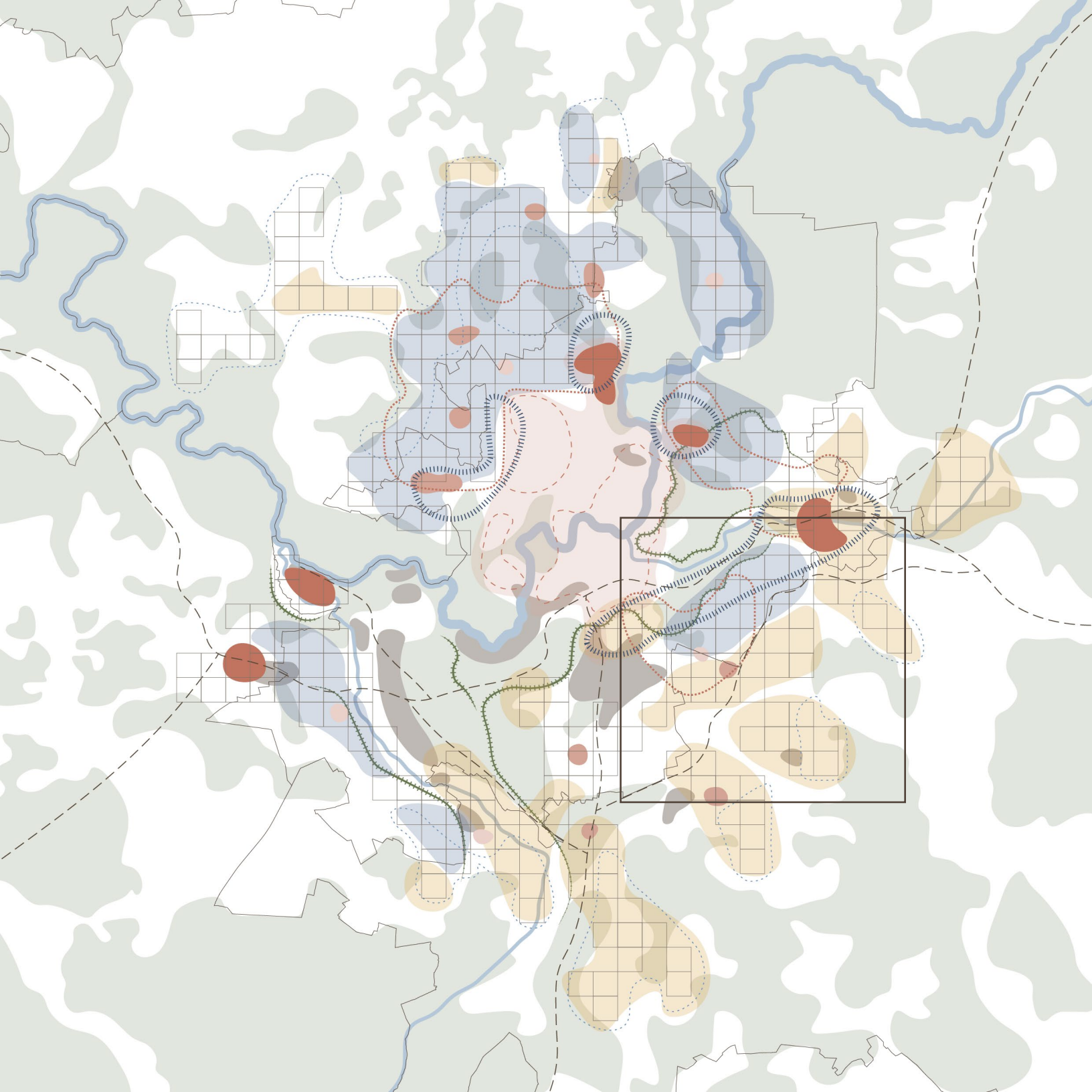
South-East Vilnius was chosen as a case study are to apply the previously discussed design framework and to work out in detail what kind of spatial interventions are required. Based on previous regional analysis (see fig. 130), this urban sprawl area is characterized by:

- the municipal border splitting the area;
- a clash of different social groups;
- the presence of an underutilized railway;
- strong spatial divide from inner city due to topography and land use;
- presence of industrial areas;
- airport in the west side;
- differences in accessibility throughout the area;
- diversity of urban sprawl types based on development origin (mixture of allotment gardens, subdivided and self-developed, and private real estate company develpoments of various scales).

These characteristics make South-East Vilnius a representative urban sprawl area with core challenges relevant for the priorities of this design thesis of addressing social cohesion and accessibility.

Figure 130. Synthesis of Vilnius region urban sprawl areas analysis.





Land Use

South-East Vilnius has a mixture of land use elements, including agricultural areas, forestry, industry, urban sprawl, rural settlements (see fig. 131, 132). Characteristic to urban sprawl, these different land uses are highly fragmented, resulting in unclear boundaries of where urban development ends and rural areas start.

The area is characterized by extensive industry and logistics warehouses, along with Vilnius International Airport in the West. In the North-West, the area is spatially separated from the inner city with extensive forests. In the North-East there is Naujoji Vilnia, a major residential area and local center with various amenities.

Notably, Pavilnys (a major residential urban sprawl area in the North-West of the map, inside VCM) is strongly spatially separated from other urban sprawl areas in the South and East. Extensive agricultural and natural land, along with the municipal administrative boundaries separate it from extensive residential areas across the municipal boundaries.

The various residential areas also greatly differ. Notably, Pavilnys (in the North-West in VCM) is a historical area planned and built in the 20th century as a railway workers' residence. That historical area is characterized by a coherent grid structure and continuous development. Later on, Pavilnys was expanded (towards Kalnėnai, Guriai and Naujoji Vilnia) with developing allotment gardens, and now it continues to expand with self-developed plots and real estate company developments. On the other side of the municipal border (in VDM) there is Nemėžis and other settlements (such as Rudamina, Skaidiškės, Pakalniškės, Didžiasalis and Grigaičiai). Some of these are historical villages, others are Soviet-era industrial and/or collective farm developments.

Figure 131. Land use types in South-East Vilnius.

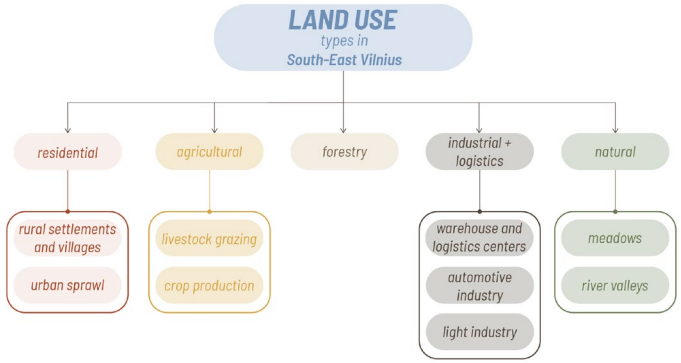
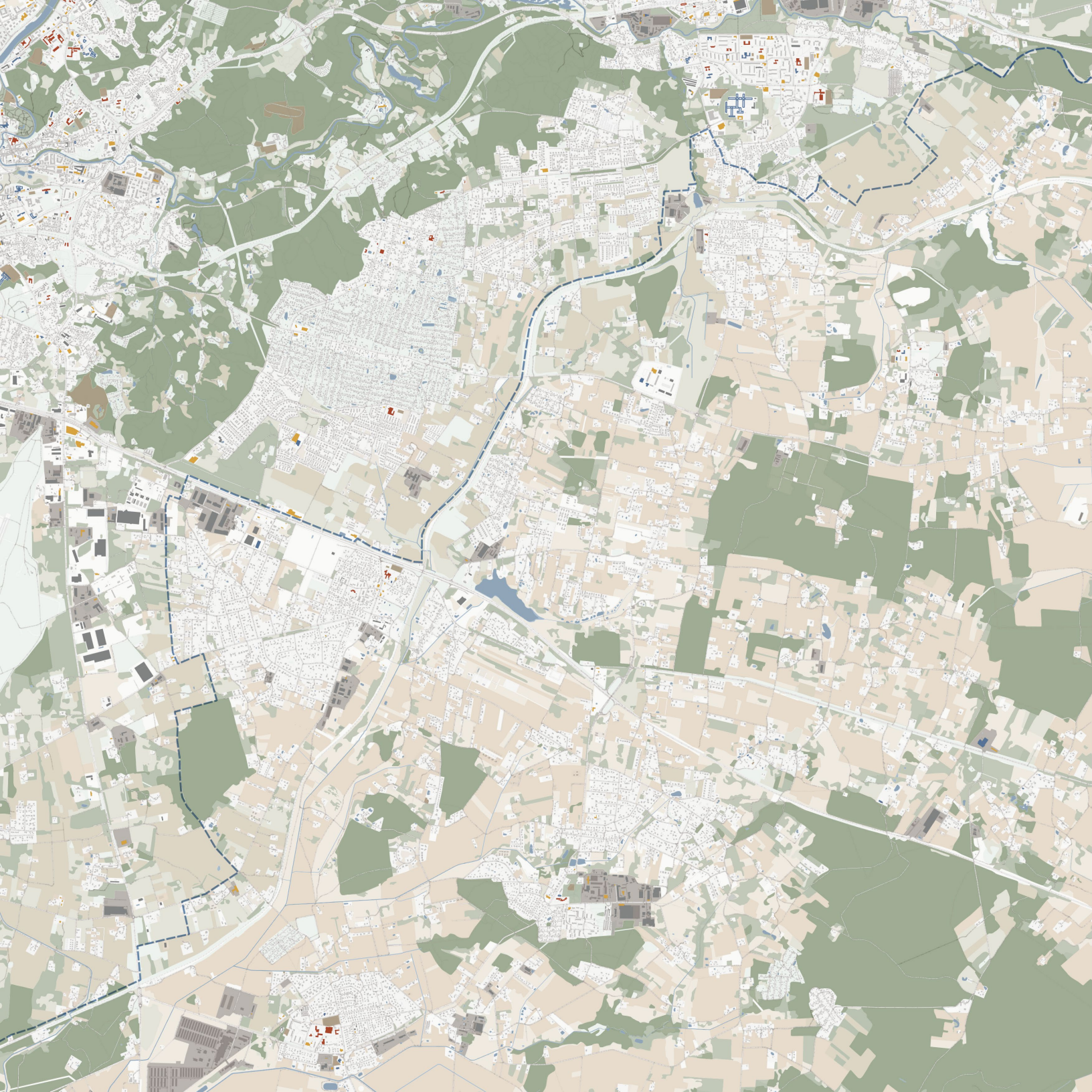


Figure 132. Land use in South-East Vilnius.



Transport

South-East Vilnius is characterized by a highly fragmented and car-centric mobility network, with limited opportunities for walking, cycling and public transport (see fig. 133).

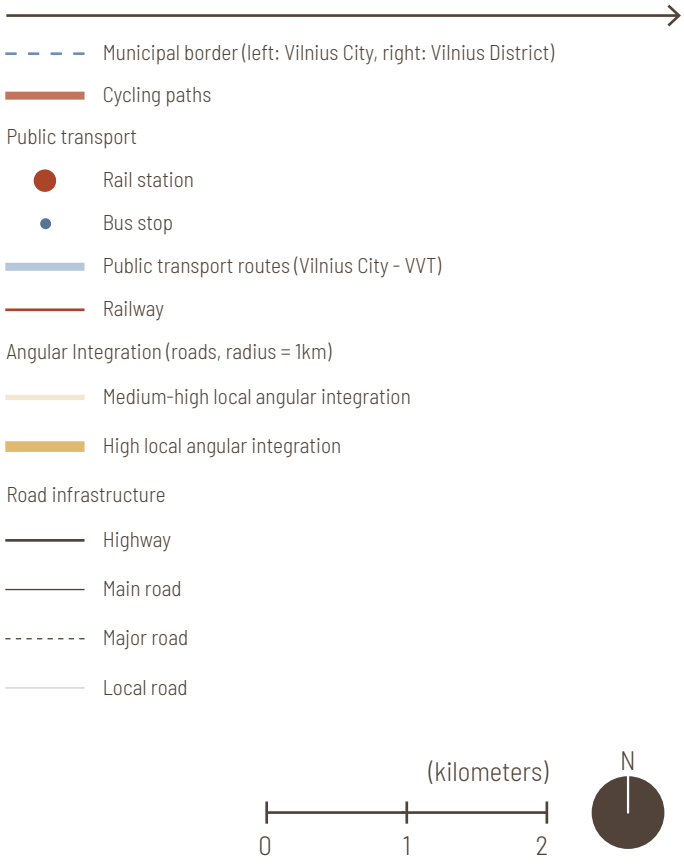
The public transportation network remains sparse, with some bus routes going through the existing residential areas and (minor) centralities. However, the public transport network remains centered around the inner city, offering limited connections between the existing urban sprawl areas and reinforcing dependence on the inner city. Notably, a railway line splits the urban sprawl area in half, acting as a physical barrier. The railway is notably primarily utilized for industrial use and remains severely underutilized in the public transport network in Vilnius as a whole.

The cycling network in the urban sprawl areas is noticeably much more sparse compared to the inner city (seen in the North-West of the map in fig. X). Some fragmented cycling infrastructure exists, but it fails to meaningfully and continuously connect individuals to relevant destinations. Many of the cycling paths are also along major roads, raising questions for the spatial quality and appropriateness of scale in relation to land use.

The angular integration analysis (r = 1km) shows multiple attraction points with highest accessibility. However, these do not always correspond with the land use and relevant functions, meaning that relevant destinations in the area remain inaccessible for pedestrians and instead are more suited for vehicles. It is (important to remain critical about these findings, because road infrastructure was used instead of pedestrian for the analysis. The abundance of cul-de-sacs also severely limits pedestrian accessibility in the area.

The road network itself remains patchy and fragmented, with a major highway (Minsko plentas) and other major roads going through the are. These also act as major physical barriers, splitting up the different residential areas. Notably, the road infrastructure is also fragmented and clearly lacks hierarchy.

Figure 133. Transportation in South-East Vilnius.



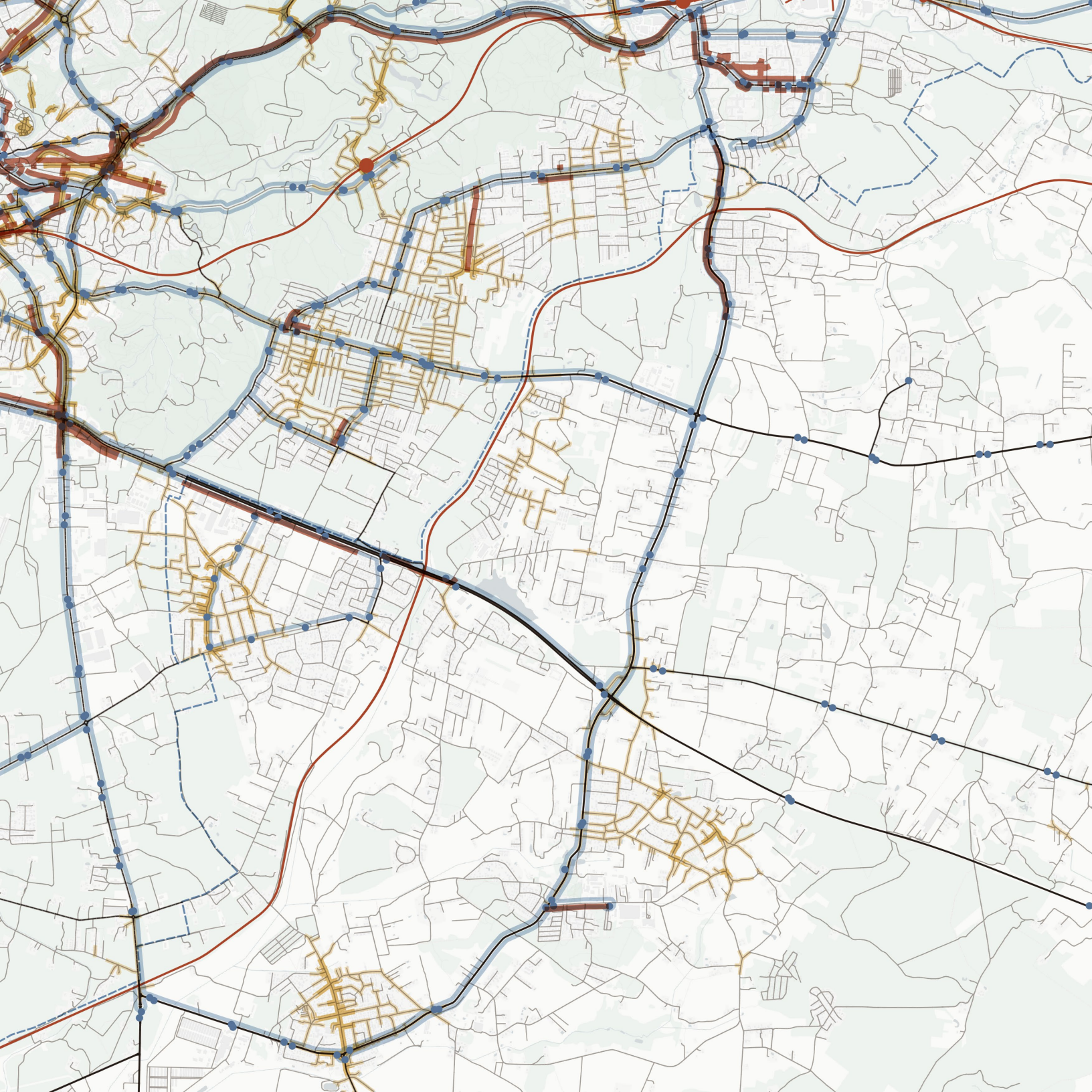


Figure 134. Ecological areas & corridors.

National (primary) migration corridor
District (secondary) migration corridor
Regional (tertiary) migration corridor
Regional (primary) inner stabilization habitat
Microregional (secondary) inner stabilization habitat
District-level (tertiary) inner stabilization habitat

(kilometers)
0 2 4
N

Vilnius City Municipality (2021).

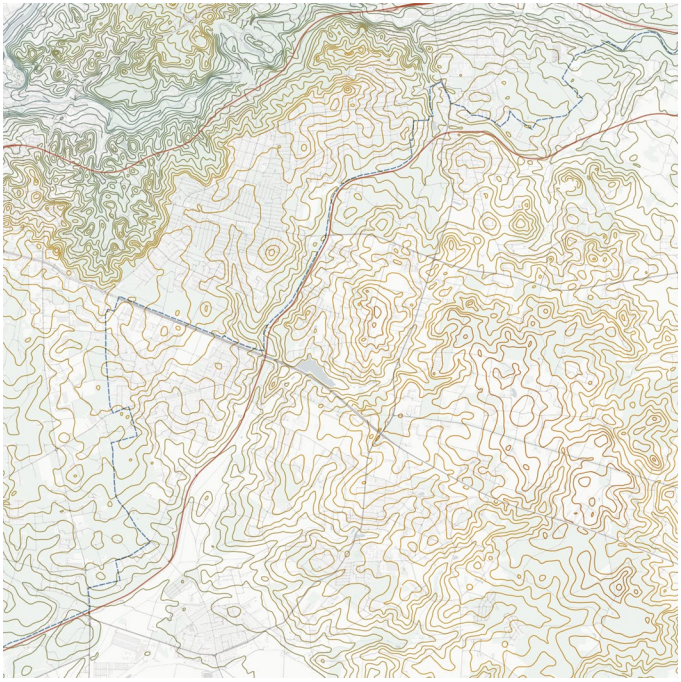


Figure 135. Topography.

High elevation
Medium-high elevation
Medium-low elevation
Low elevation

(kilometers)
0 2 4
N

SOURCE ().

A brief ecological network analysis revealed that South-East Vilnius has notably less ecologically valuable areas compared to other parts of the city. Nevertheless, there is an extensive ecological area of regional importance in the North-East of the city, an area which is also characterized by hilly terrain which is difficult to develop (see fig. 134, 135).

Interestingly, there is also a local ecological corridor running along the railway - an illustration of how underutilized the rail is in this area. There are also some fragmented secondary and tertiary ecological areas scattered throughout the area, a fragmented mixture of forests, agricultural areas, wetlands and meadows. Existing agricultural and forestry areas could be further ehanced in terms of ecological value in order to connect the fragmented ecological network.

The topography of the area is characterized by soft rolling hills and flatlands, with some depressions along the railway, where there are also some polder drainage systems. These depressions also offer great potential for the restoration of the ecological network.

South-East Vilnius is experiencing great development pressure throughout the entire site (see fig. 136). The outer edges and unfilled patches in Pavilnys (inside VCM) are being developed particularly intensively. At the same time, extensive greenfield sites are being developed further away from the urban fabric in VDM, where there is little infrastructure or facilities, and travel distances are significant. Even some ecologically valuable areas are being pressured by sprawl. This confirms the urgency that urban sprawl areas need targeted measures to be contained and addressed.

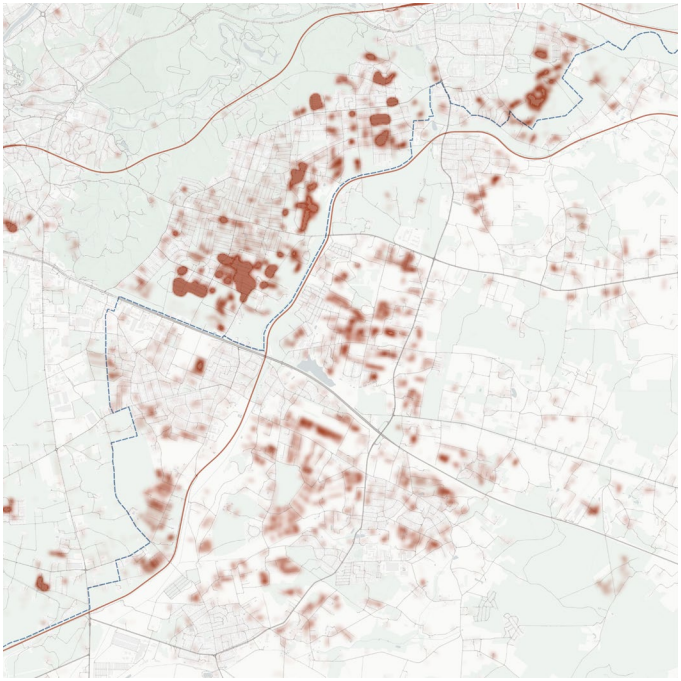
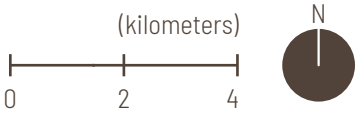


Figure 136. Development pressure.

New addresses since 2015 (heatmap, r = 100m, max value = 10).



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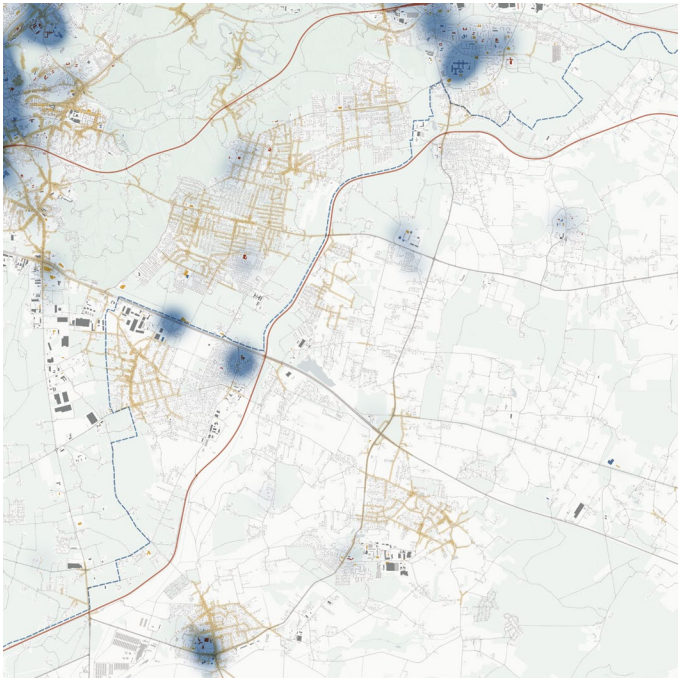


Figure 137. Local angular integration vs. concentration of amenities.

SOURCE ().

Analyzing the concentration of amenities in the area and comparing them to a local angular integration analysis revealed that they are highly centered around major road infrastructure, rather than local accessibility (see fig. 137). The local centralities exist in Nemėžis and Rudamina (historical villages), as well as Ašmenos Kelias (industrial area). Meanwhile Pavilnys in VCM and other scattered residential areas lack any clear centrality with concentrated amenities.

Alternatively, a brief socio-demographic analysis illustrates the socio-spatial segregation in the area (see fig. 138, 139). Residents are separated by ethnicity and economic class by physical borders such as the railway, highway, extensive agricultural and natural areas - making this a structural issue. Interestingly, the map also shows which urban sprawl areas are more recent, and which ones are more historical - the most recent developments have predominantly Lithuanian residents, while the historical ones are more minority-dominated.

Finally, a population density map (see fig. X) shows that most of the population is concentrated in the North-West of Pavilnys, where the inner city is closer and the urban fabric is more fully developed. Historical villages can also be seen having a higher population density, such as Nemėžis and Rudamina. Notably, the population density is particularly low along the railway, further in the outskirts and near the industrial area in the West.

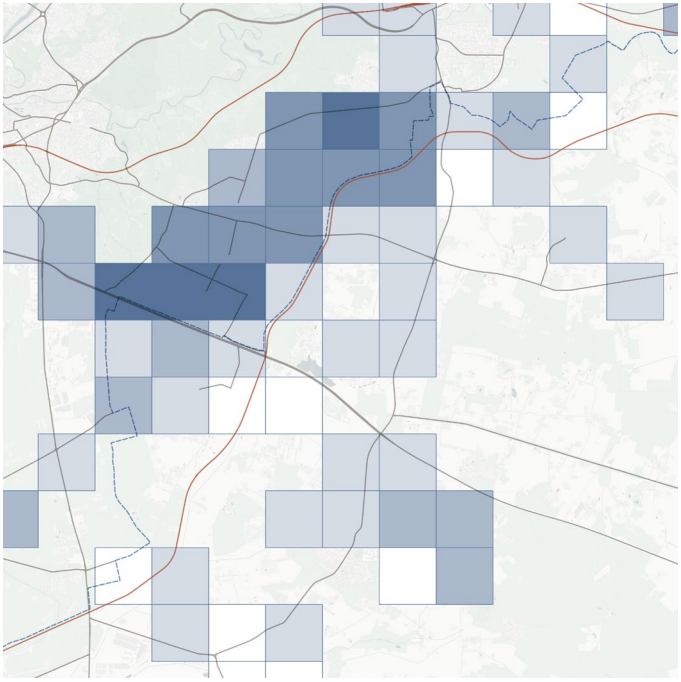


Figure 138. Percentage of residents with Lithuanian nationality in residential urban sprawl areas.

- 9 - 26
- 26 - 44
- 44 - 61
- 61 - 79
- 79 - 96

(kilometers)
0 2 4
N

SOURCE ().

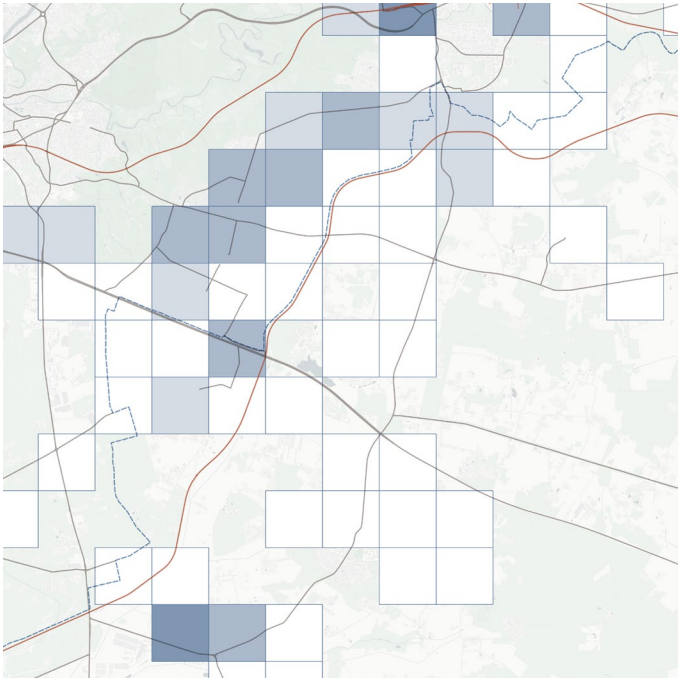


Figure 139. Population density (residents per square kilometer).

- < 500
- 500 - 1000
- 1000 - 1500
- 1500 - 2000
- 2000 <

(kilometers)
0 2 4
N

SOURCE ().

Reprogramming & Repositioning Land Use Elements in South-East Vilnius

Since the purpose of the project is to improve the living conditions in urban sprawl areas, the different land use areas in SE Vilnius are positioned in relation to residential urban sprawl. An overview of the synergies and possible conflicts can be seen in figure 140. The proposed objectives for reprogramming and repositioning land use areas in SE Vilnius can be found in figure 141.

Figure 140. Reprogramming & repositioning land use areas in relation to residential characteristics (synergies and conflicts).

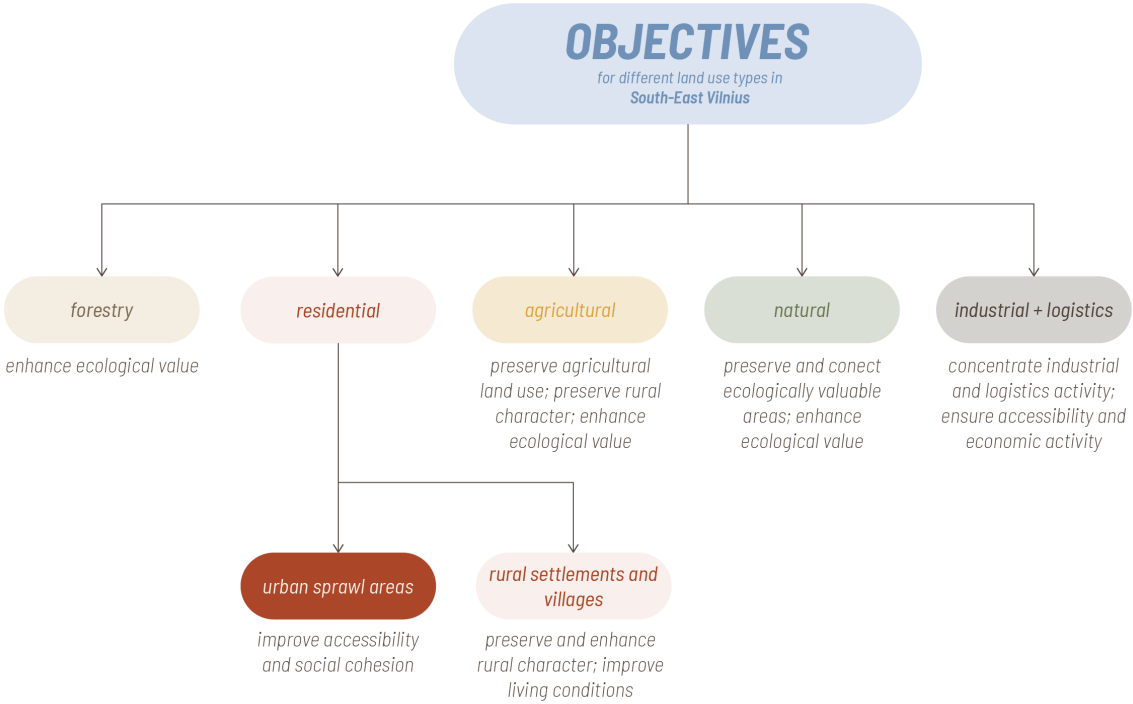
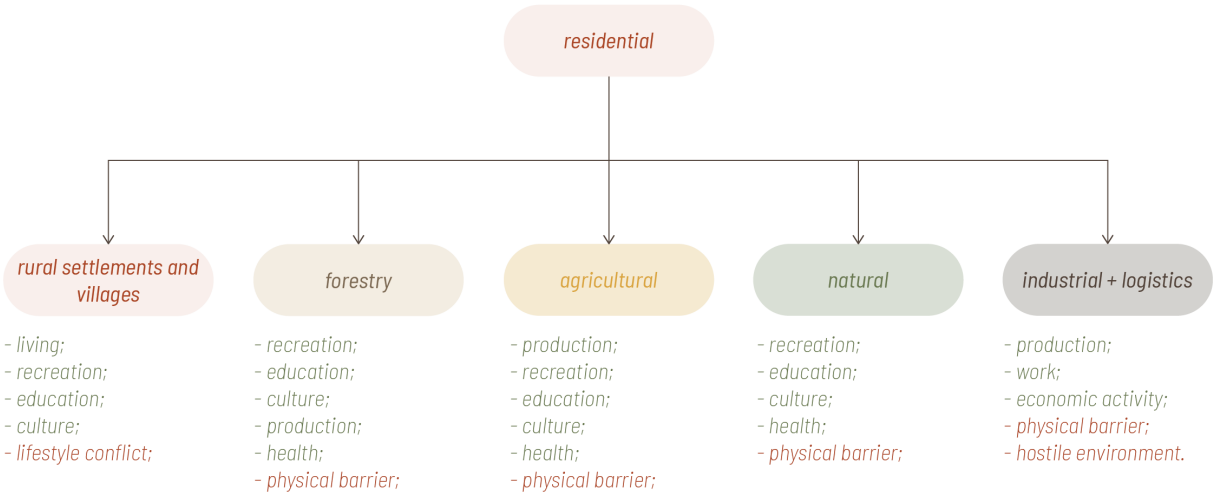


Figure 141. Positioning land use areas in relation to residential characteristics (synergies and conflicts).



Reprogramming Urban Sprawl Areas

Earlier fieldwork and research revealed that it is unsustainable to continue facilitating the expansion of urban sprawl. However, up until now there are no clear set boundaries where urban sprawl is supposed to end, and the boundaries continue to expand and diffuse each year. At the same time, there are extensive urban sprawl areas where people have already settled. It is known that the population of Vilnius will continue to grow in the following decades due to international and domestic migration. However, it is not justifiable to allow for the continued sprawl in South-East Vilnius which is the

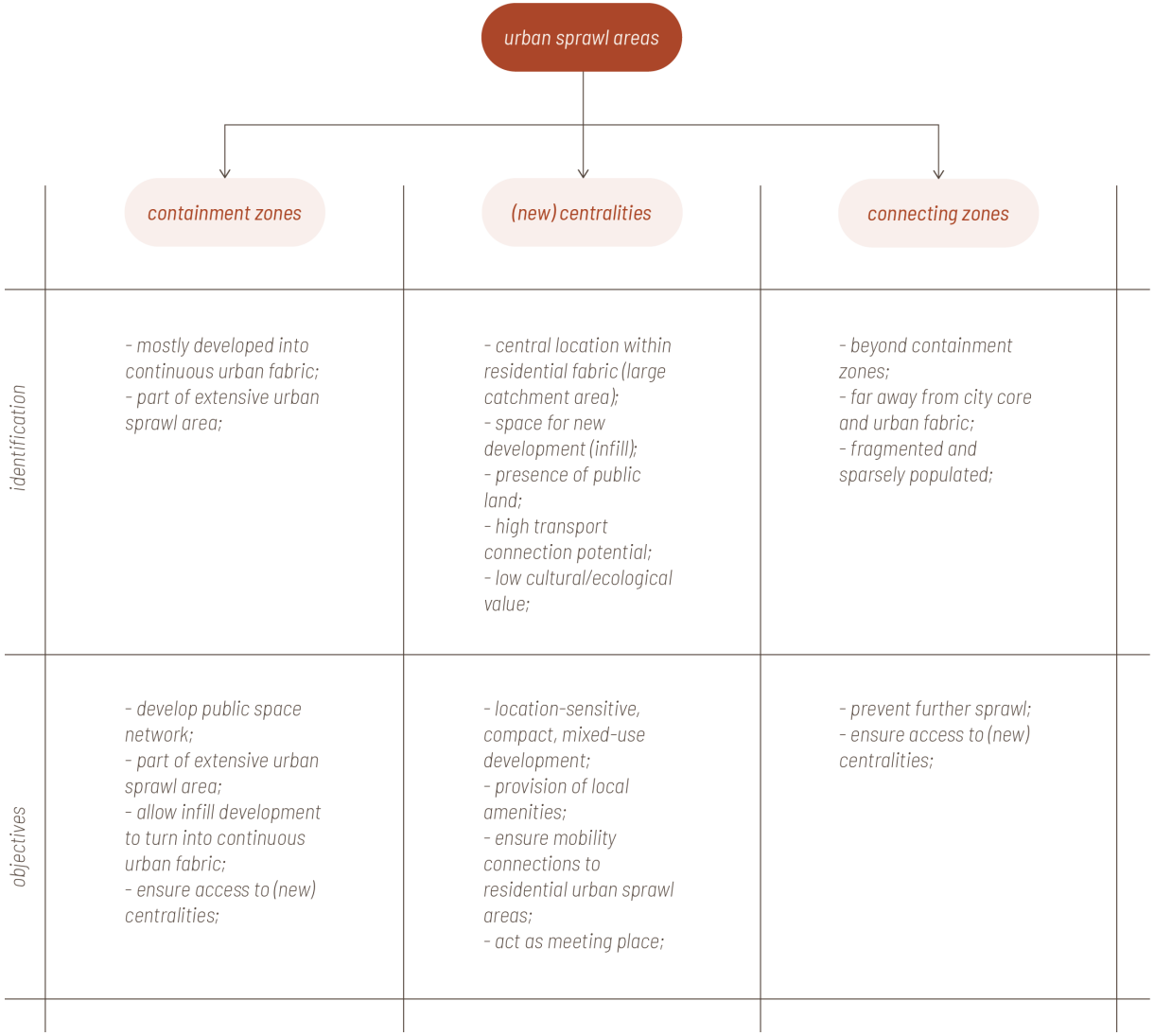


Figure 142. Reprogramming residential urban sprawl areas (selection identification and objectives).

same size of the inner city. Because of this, the urban sprawl areas are reprogrammed into three types: containment zones, (a hierarchy of new) centralities and connection areas. An overview of their selection and primary objectives can be seen in figure 142. The new centralities must serve as local meeting places, but also as places where residents can get their daily amenities without depending on the inner city. Based on these requirements and insights from previous analysis and fieldwork, a program of functions is developed for each centrality (see fig. 143-145).

Figure 143. Requirements for new centralities (primary centrality).

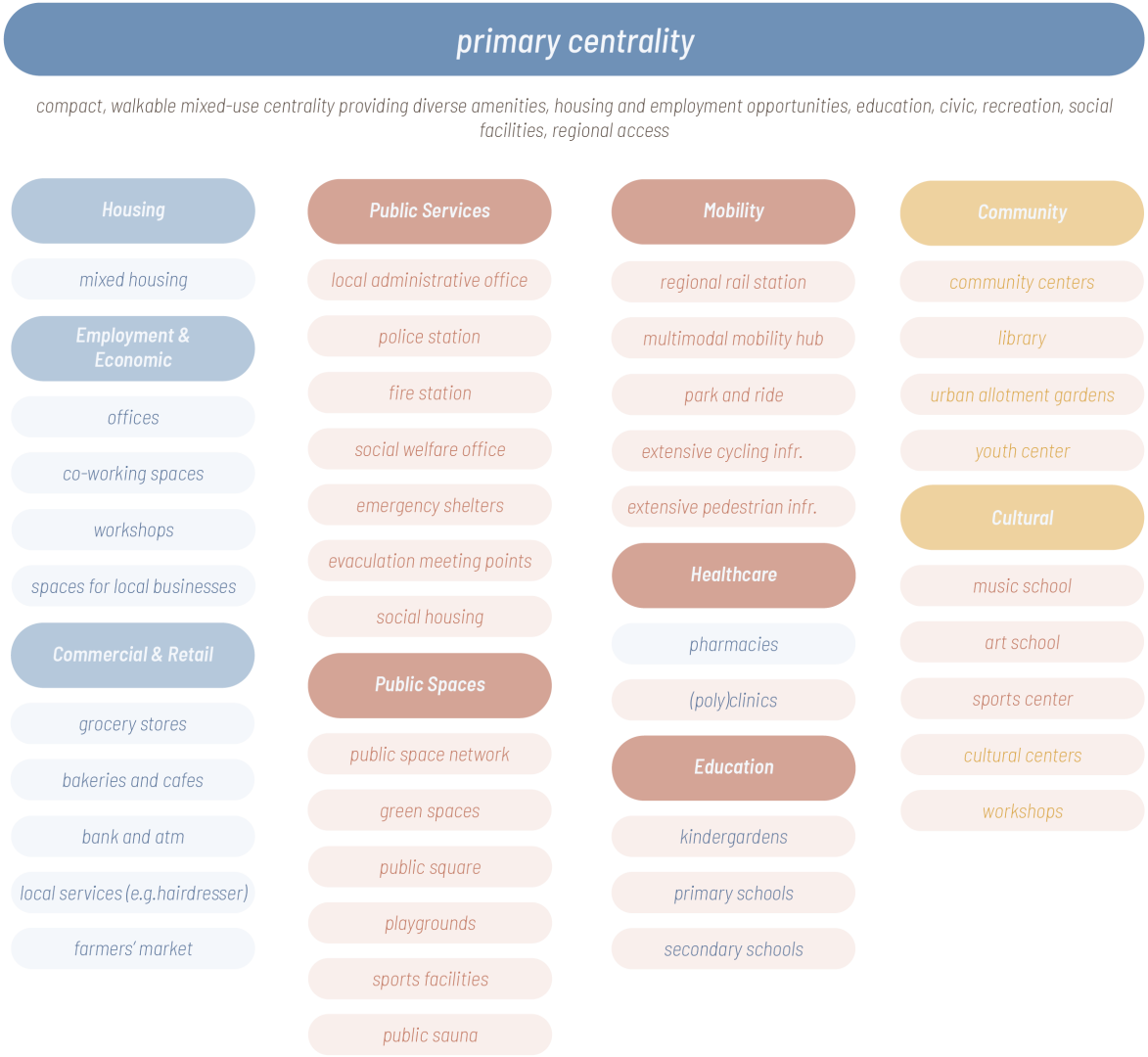


Figure 144. Requirements for new centralities (secondary centrality).

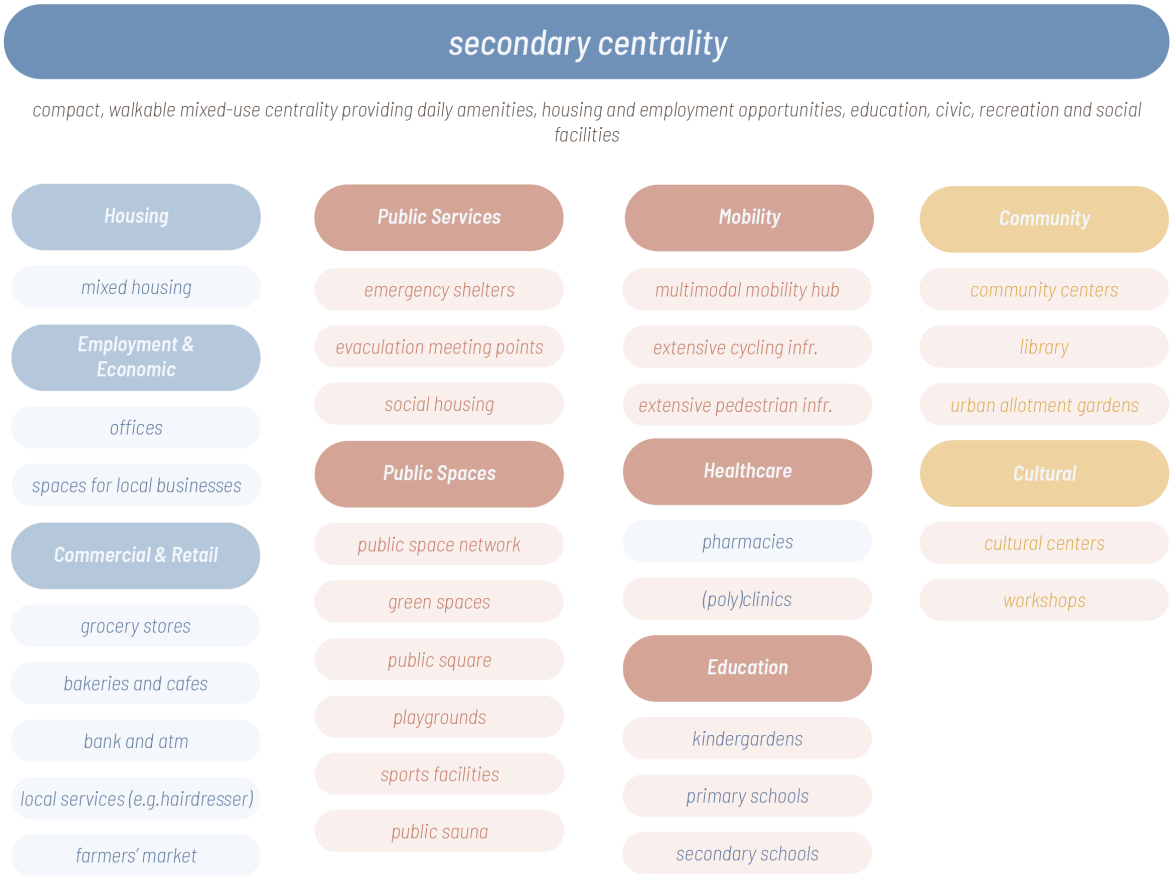
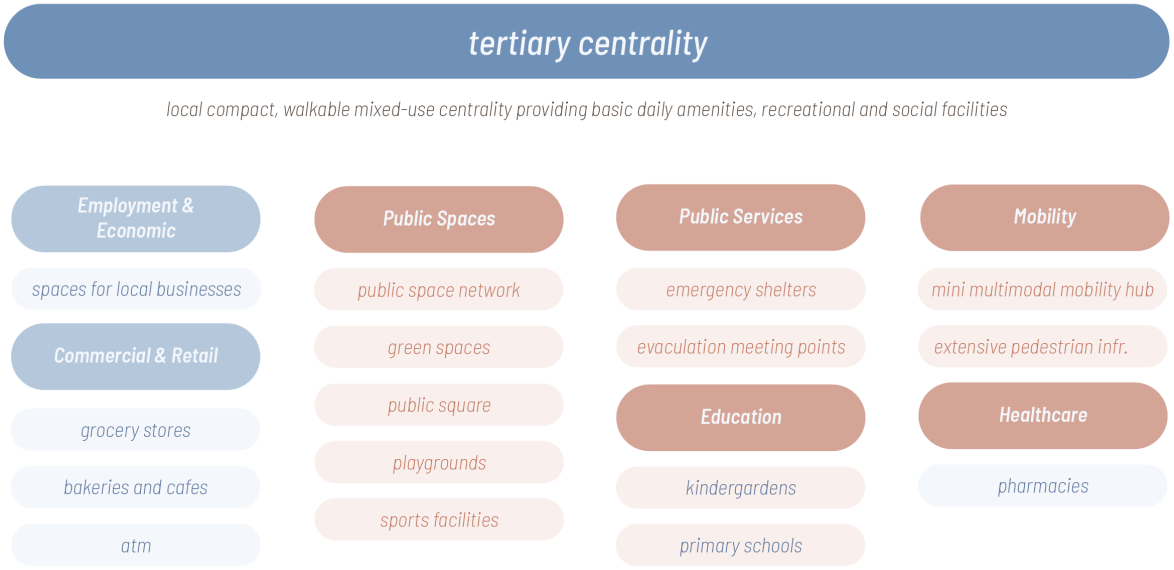


Figure 145. Requirements for new centralities (tertiary centrality).



Repositioning Land Use

Based on the existing synergies and conflicts, residential urban sprawl areas are reintegrated with other land use functions with the appropriate mobility forms (see fig. 148). Rural settlements and small villages demand connections for accessibility, but do not financially justify the expansion of public transport. Along with forestry, agriculture and natural areas, they also offer opportunities for daily needs, recreation, leisure, education and/or other activities. Because of this, the priority is to connect them to urban sprawl areas and the new centralities with active mobility infrastructure (namely pedestrian and cycling, see fig. 147).

As for industry, it offers job opportunities and amenities for the local residents, but they also present conflicts, such as hostile urban environments and pollution. Industrial areas also need to ensure access to vehicles, creating conflicts for more pedestrian-friendly residential areas. Because of this, residential urban sprawl areas must be connected to industry through active mobility and public transport infrastructure. However, major car access has to avoid overlap with these modes and must be spatially separated from residential areas if possible (see fig. 147).

Repositioning Residential Urban Sprawl

To ensure accessibility and facilitate social interactions in urban sprawl areas, the different types of urban sprawl areas must be connected to the new centralities by appropriate mobility systems (see fig. 149). At the same time, the newly established hierarchical centralities must also be integrated into a network in order to ensure ease of movement for daily needs and to decouple urban sprawl areas facility provision from the inner city.

Figure 146. Active mobility routes connecting land use synergies.

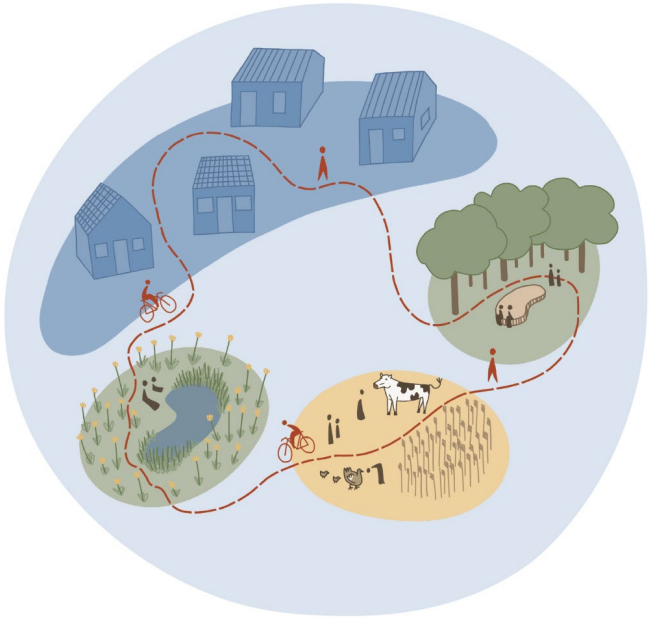


Figure 147. Ensuring connections while mitigating conflicts for industrial land use areas.

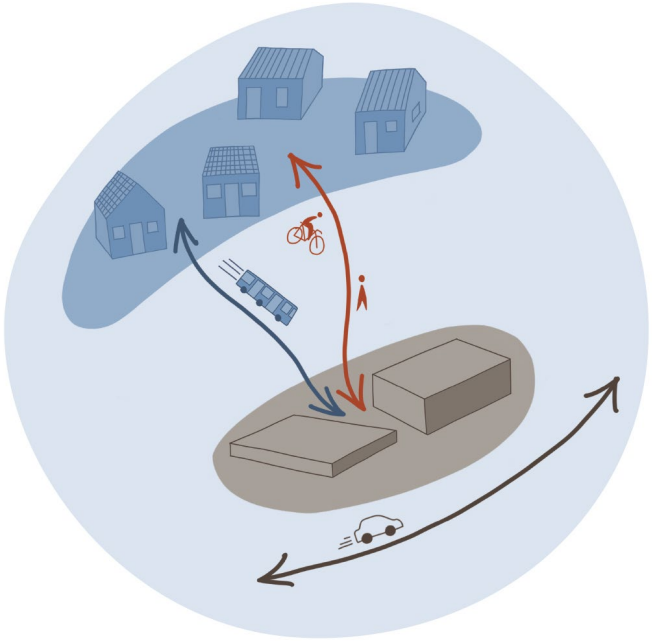


Figure 148. Repositioning and integrating land use with transportation infrastructure.

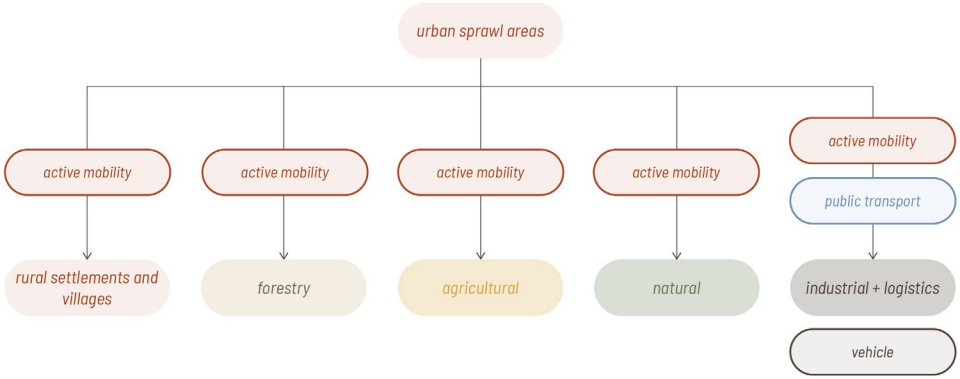
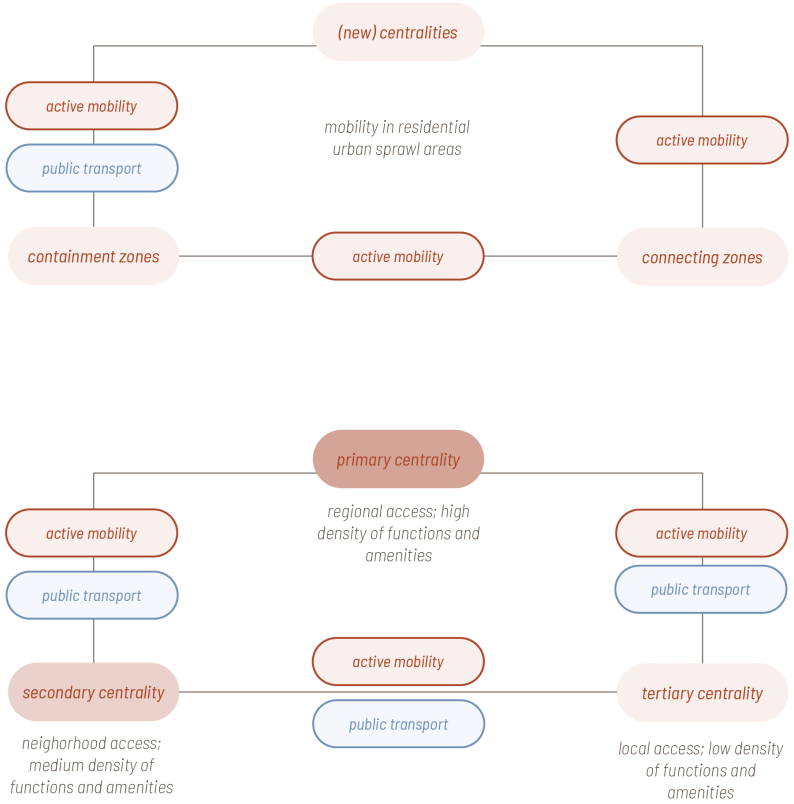


Figure 149. Repositioning and integrating different residential urban sprawl areas with transportation infrastructure.



Application of Proposed Restructuring (SE Vilnius)

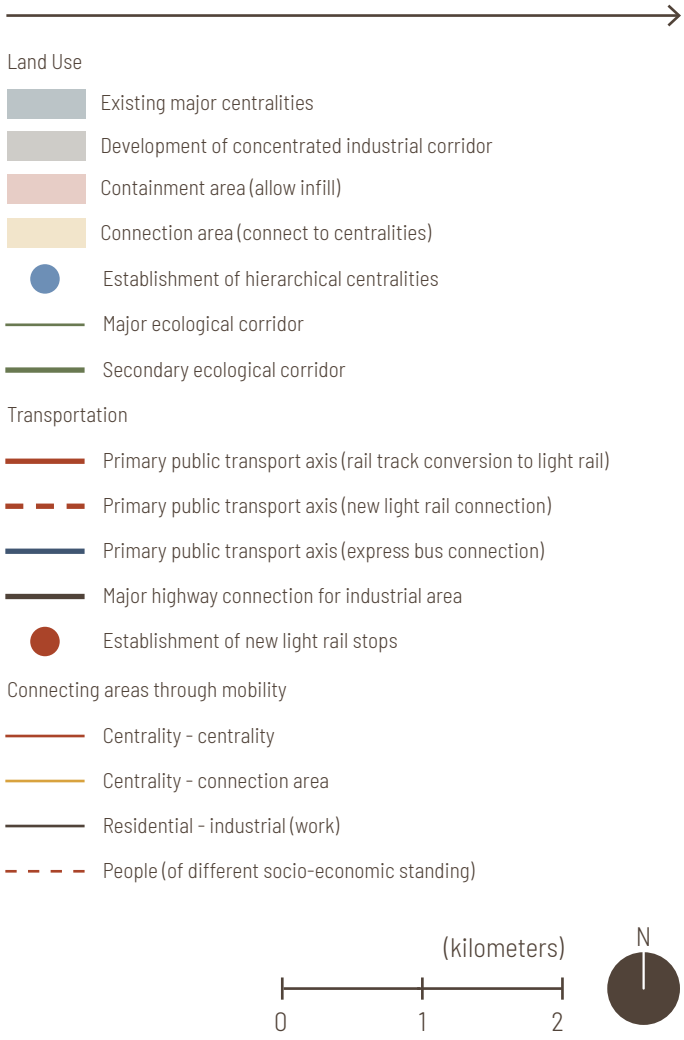
The spatial concept for South-East Vilnius (see fig. 150) directly follows the previously discussed design framework, establishing new centralities in areas where there is already some concentration of amenities and/or where there is still space for infill but the location remains central. This creates a network of centralities, with the main and biggest one stretching from Nemėžis (near railway) to Ašmenos Kelias - a proposal that aims to balance development in both VCM and VDM. The centralities are interconnected with public transport and active mobility infrastructure to further build autonomy from the inner city.

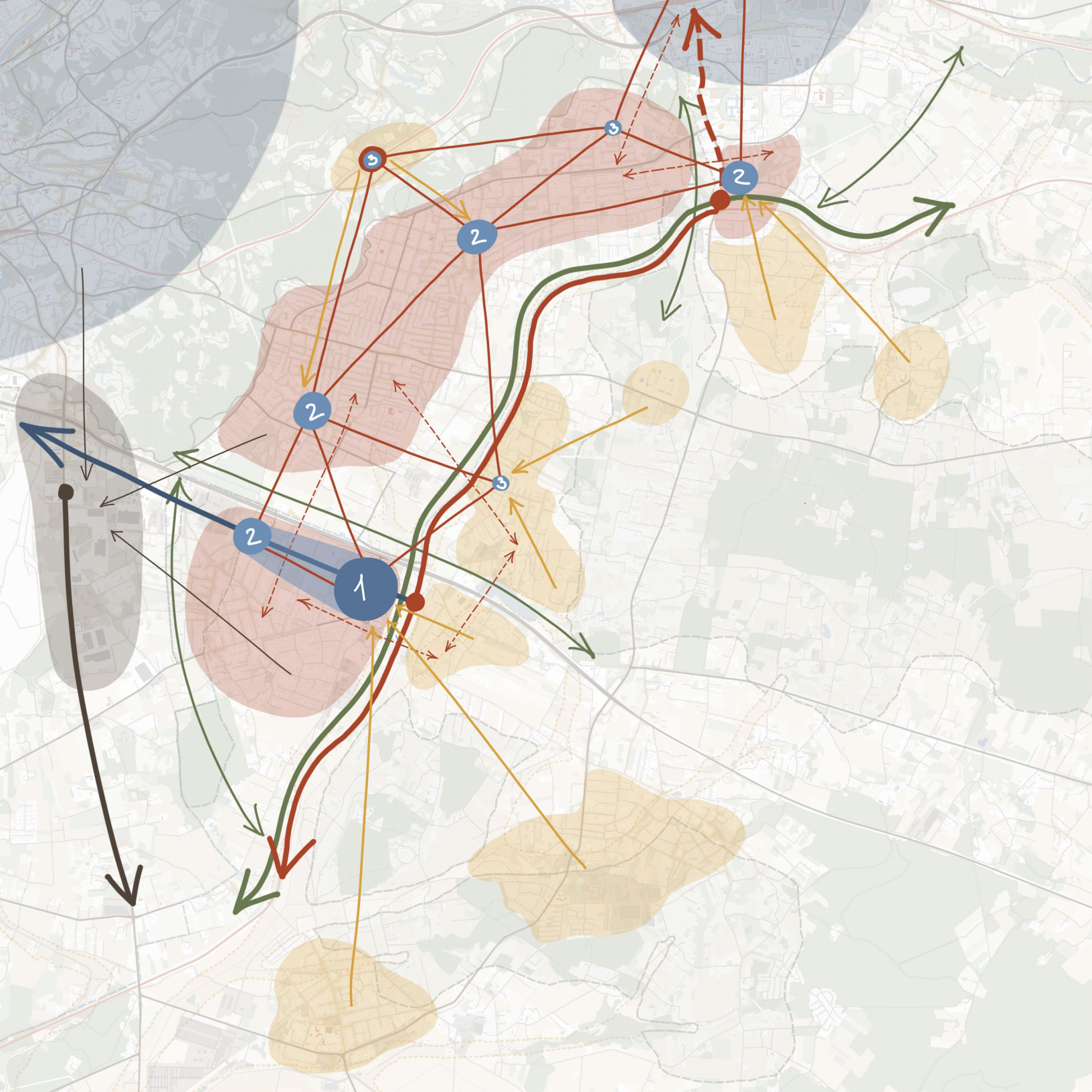
Notably, transforming the currently underutilized railway into a light rail system and establishing a new station can connect the new centrality to other major regional centers (namely Vilnius inner city and Naujoji Vilnia).

Containment and connection areas are defined based on the previously discussed criteria and connected to the network of centralities through active mobility (both areas) and public transport (only containment areas). An industrial axis is proposed to concentrate all existing industrial development in the area along a major highway, ensuring transport connections but mitigating negative consequences such as pollution and a hostile environment.

Ecological corridors are designated in accordance to the existing ecological network, including along the proposed repurposed railway. The choice to preserve the natural areas and to contain development essentially preserves some of the physical barriers which contribute to socio-spatial segregation. To mitigate this, additional mobility connections and land use interventions must be made in order to better integrate these areas.

Figure 150. Design Concept for SE Vilnius.




3
2
3
2
2
3
2
1

SE Vilnius Masterplan

The masterplan works out the main concept in higher detail, showing specific areas where and how land use and transport is planned (see fig. 151).

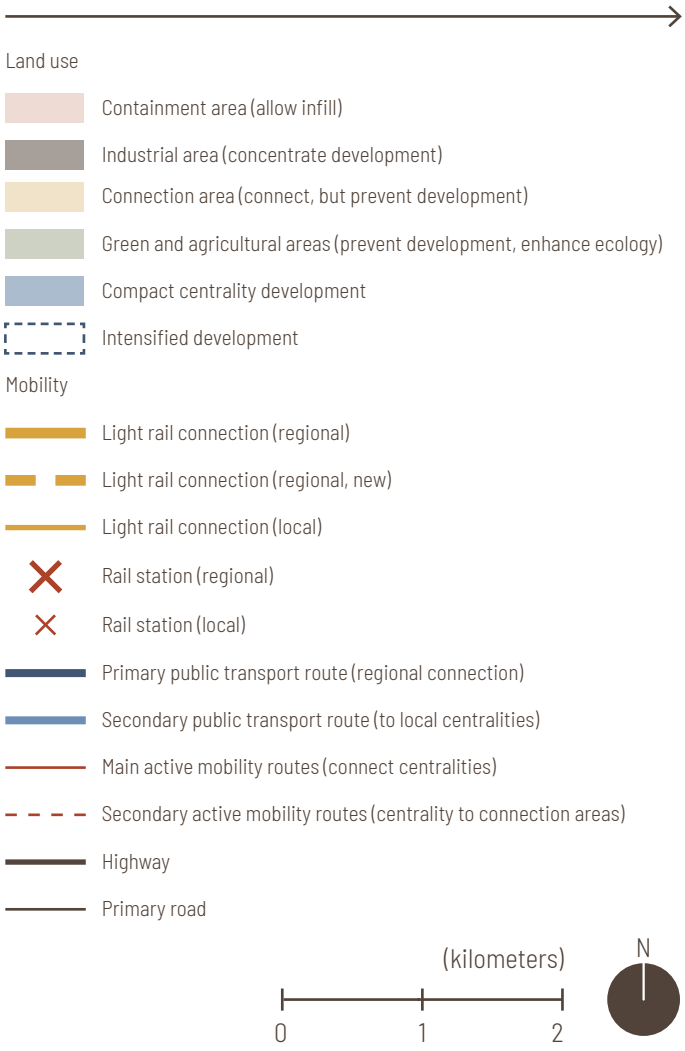
Where possible, centralities are located in areas with highest local accessibility. The masterplan details the main centrality, which prioritizes densification around the transport corridor and is provided with extensive transport connections.

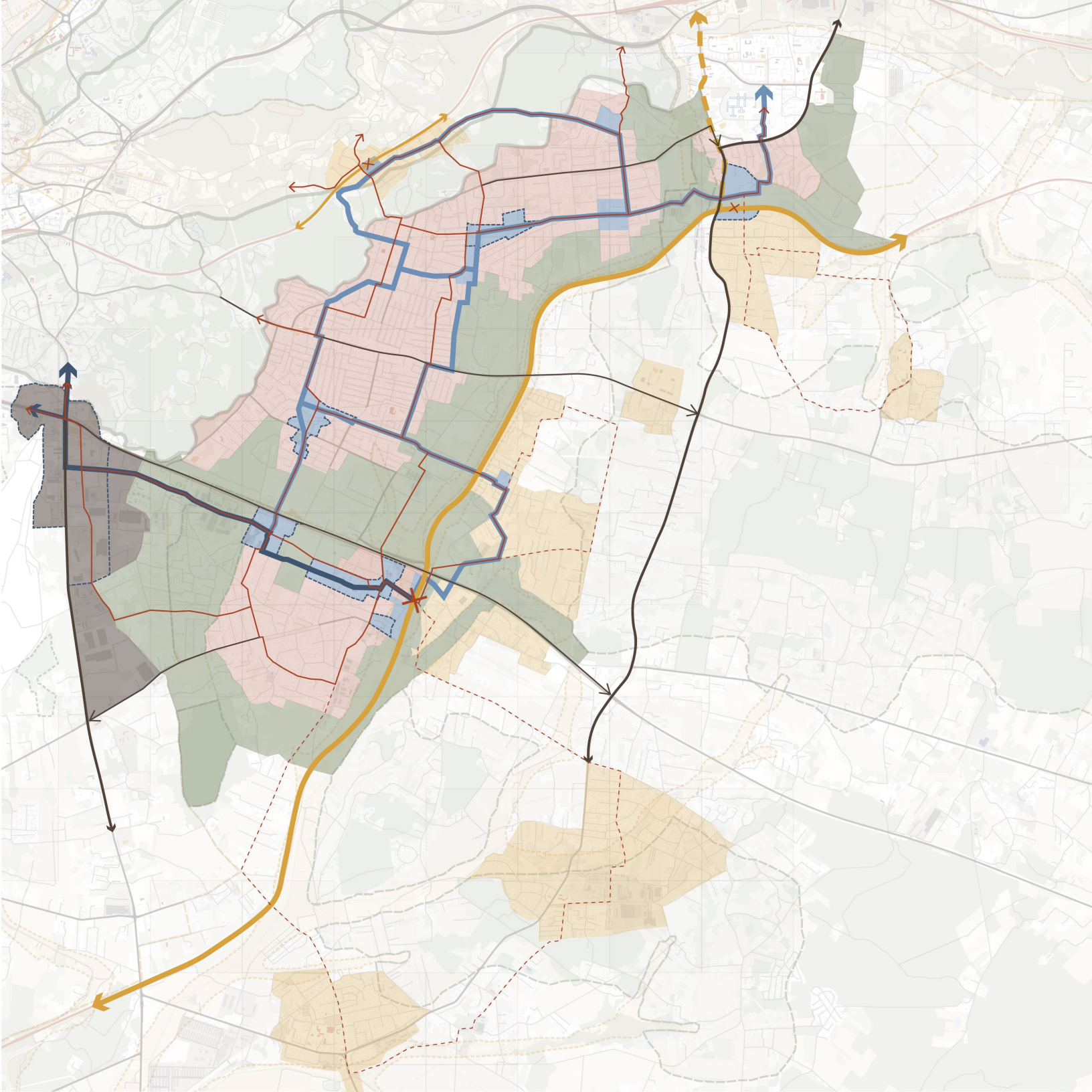
The primary public transport route is decoupled from the nearby main road, ensuring that centrality development around the public transport stops remain attractive, compact and walkable. The main PT route also connects to the industrial axis and continues to Vilnius inner city, offering many opportunities for urban sprawl residents. The secondary PT network connects the centralities into a network and ensures connections for containment areas. These routes also avoid main roads, but take routes with sufficient widths for public transport.

Active mobility routes (pedestrian and cyclist) connect containment and connection areas to the new centralities through independent routes, also connecting individuals to economic opportunities in the industrial area. A road infrastructure hierarchy is established to divert car traffic away from residential areas and centralities and to improve traffic organization. Car traffic is organized in a way that minimizes conflicts and interactions with active mobility and public transport.

Extensive agricultural and half-developed areas are allocated for green and agricultural areas, which will require interventions to improve the connectivity between different residential areas to address segregation.

Figure 151. South-East Vilnius plan.





North Side (VCM)

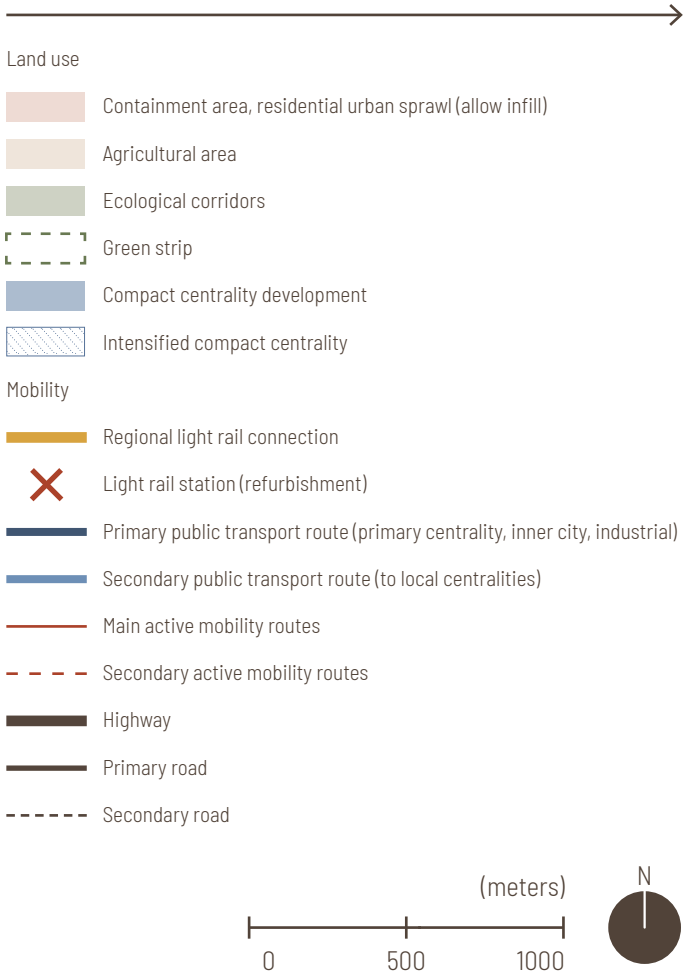
The north-western part of Pavilnys has a historical suburban area and extensive allotment gardens. Both of these are characterized by narrow roads which cannot support much traffic. In these specific locations, active mobility routes, public transport and road infrastructure are fully decoupled and organized into parallel road networks, developing cycling streets or PT-only streets (see fig. 152).

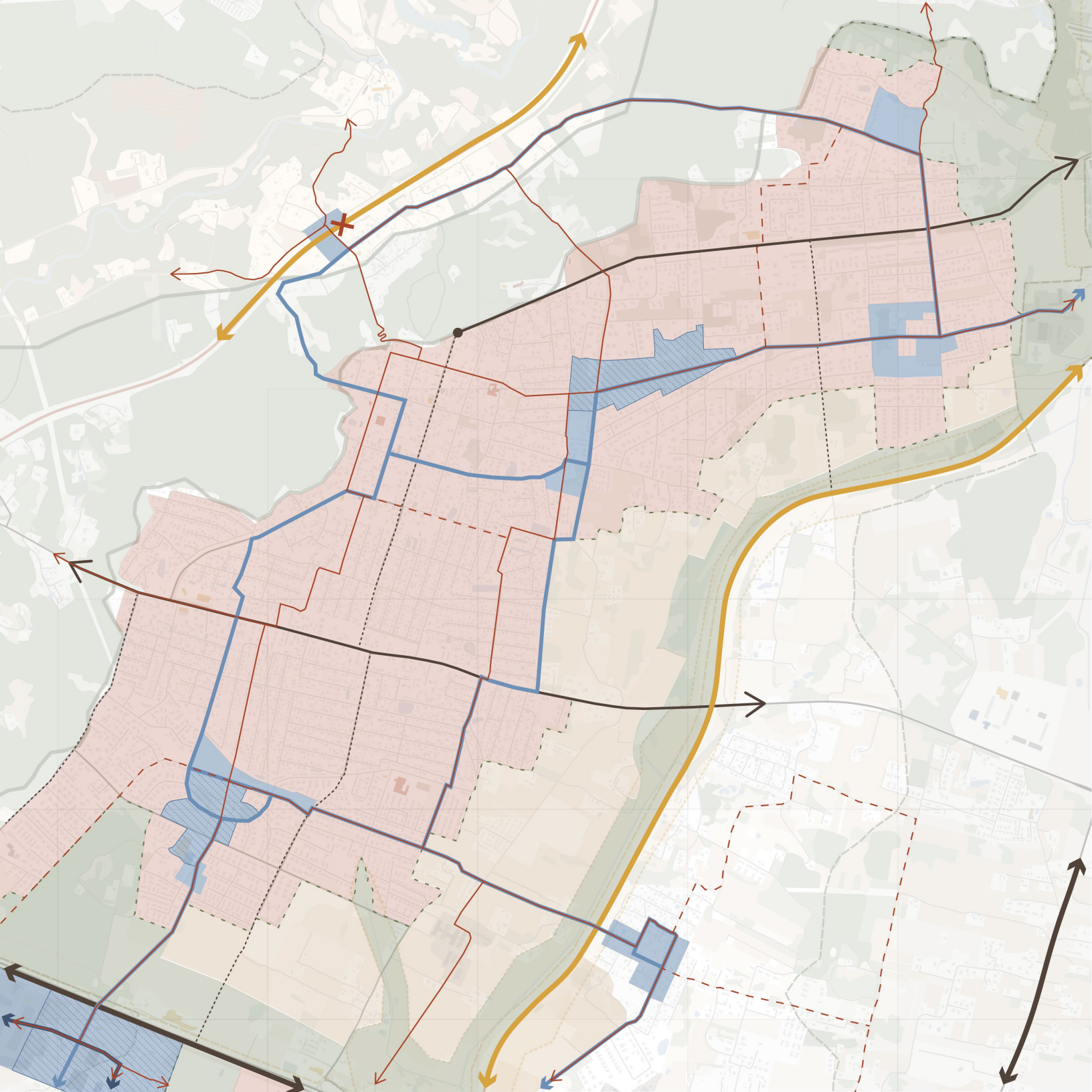
Notably, in the North there is also an existing but underutilized railway station which connects directly to Vilnius inner city. This area is sparsely populated and is located in a regional park of high ecological and cultural value. Because of this, it is undesirable to densify and intensify this area excessively. Instead, this area can serve as a light rail stop at an extensive recreational green area for residents coming from the inner city and other urbanized areas.

An ecological corridor is designated in areas with ecological value and where rural areas along highways require physical pollution barriers. The designated ecological corridors are a mixture of drained wetlands (which require restoration), existing forestry sites and agricultural areas. These designated ecological zones can serve multiple functions, also offering recreational, health and educational functions for residents.

The remaining undeveloped areas are designated for agriculture. These agricultural areas can be transformed into low-intensity farms, combining ecological farming practices, permaculture and agroforestry. Not only can this offer added value to the ecological corridors, but it can also allow for these agricultural areas to serve as extensive recreational, educational and (to an extent) commercial spaces for urban sprawl residents.

Figure 152. Plan for North side of SE Vilnius.





South Side (VDM)

The design integrates Nemėžis and Ašmenos Kelias into one major centrality corridor (see fig. 153). The core connects to other centralities across the municipal border, as well as the industrial area axis, and continues directly to the inner city. At the edge of the centrality, the PT corridor integrates to a new light rail station, which further leads to other regional centers.

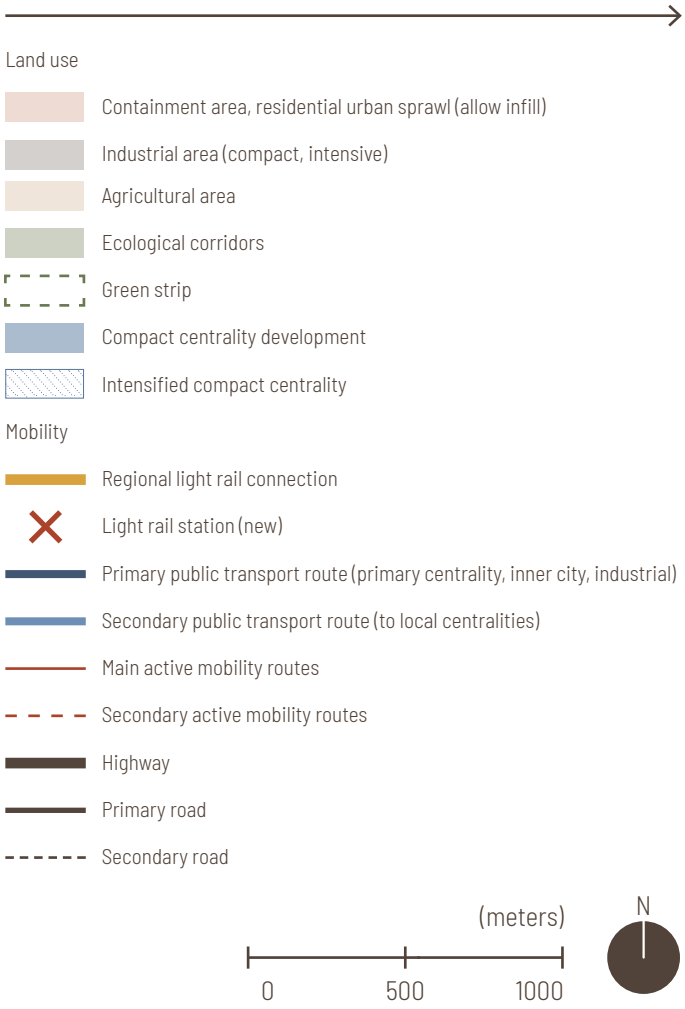
Nemėžis and its surrounding area are characterized by a mixture of diverse land uses and residential typologies. The area immediately along the railway has a rural village-like character, with sparsely scattered low-rise detached houses and patches of agricultural land use. This area requires minimal densification which still responds to the rural village-like context.

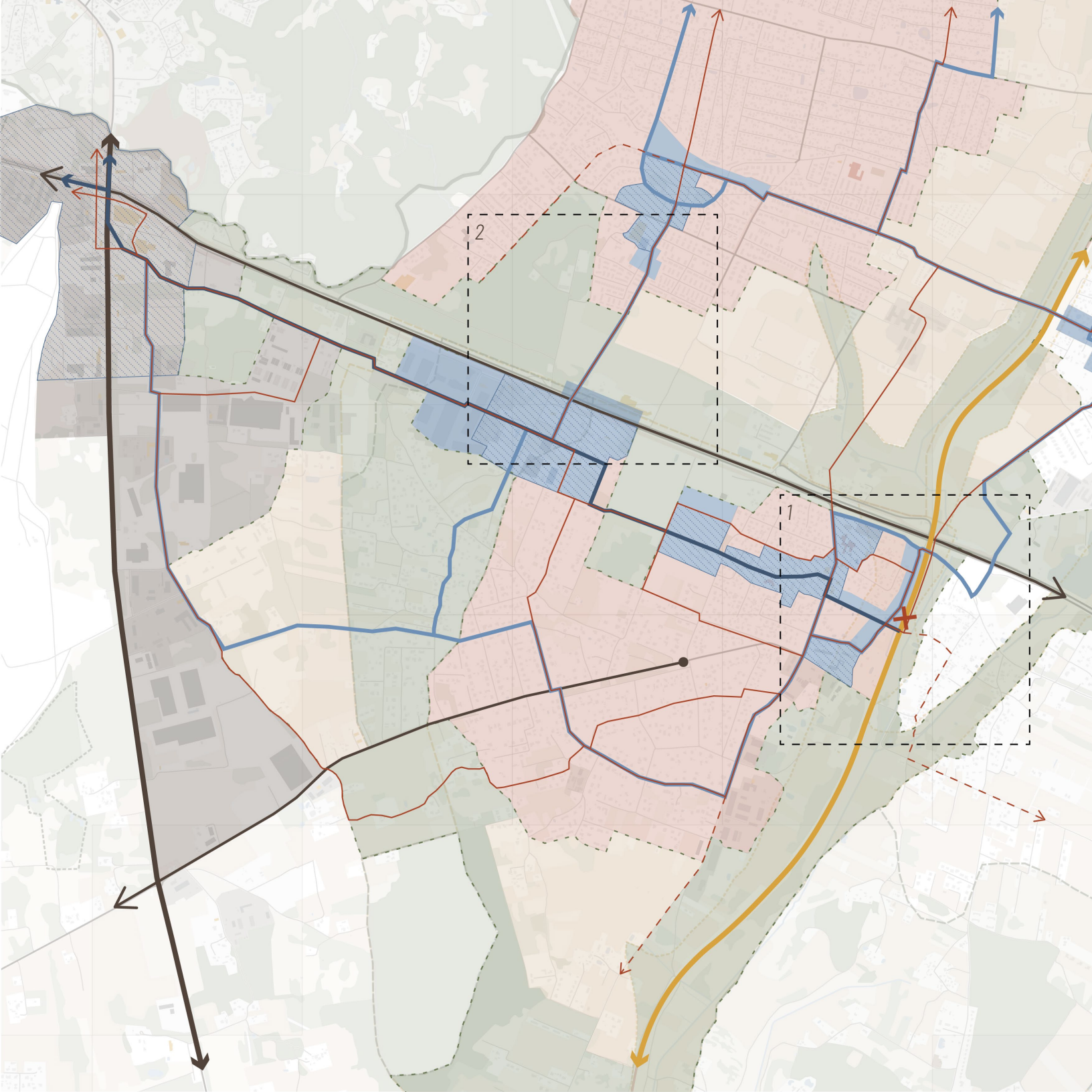
Deeper into Nemėžis, Soviet-era modernist housing blocks (and school) can be found, having wide underutilized green spaces, wide roads and 3-4 storey apartment blocks. This area poses great potential for intensification, urban revival and compact development. A park (currently used for forestry) breaks the major centrality in two to create breathing room and to avoid more unnecessary greenfield development.

Beyond the park there is Ašmenos Kelias, a mostly industrial area with some detached housing development. The design proposes to move these facilities to the industrial core and to transform this area into a mixed-use compact centrality, offering mixed housing options and diverse work, leisure and education opportunities.

Notably, the industrial core is separated from the industrial area by agriculture and natural areas. This creates breathing room, while public transport and active mobility routes still ensure a connection for job opportunities, and major road connections ensure that freight transport can get where it needs to go without bothering local residents.

Figure 153. Plan for South side of SE Vilnius.

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Nemėžis as Centrality & Light Rail Connection

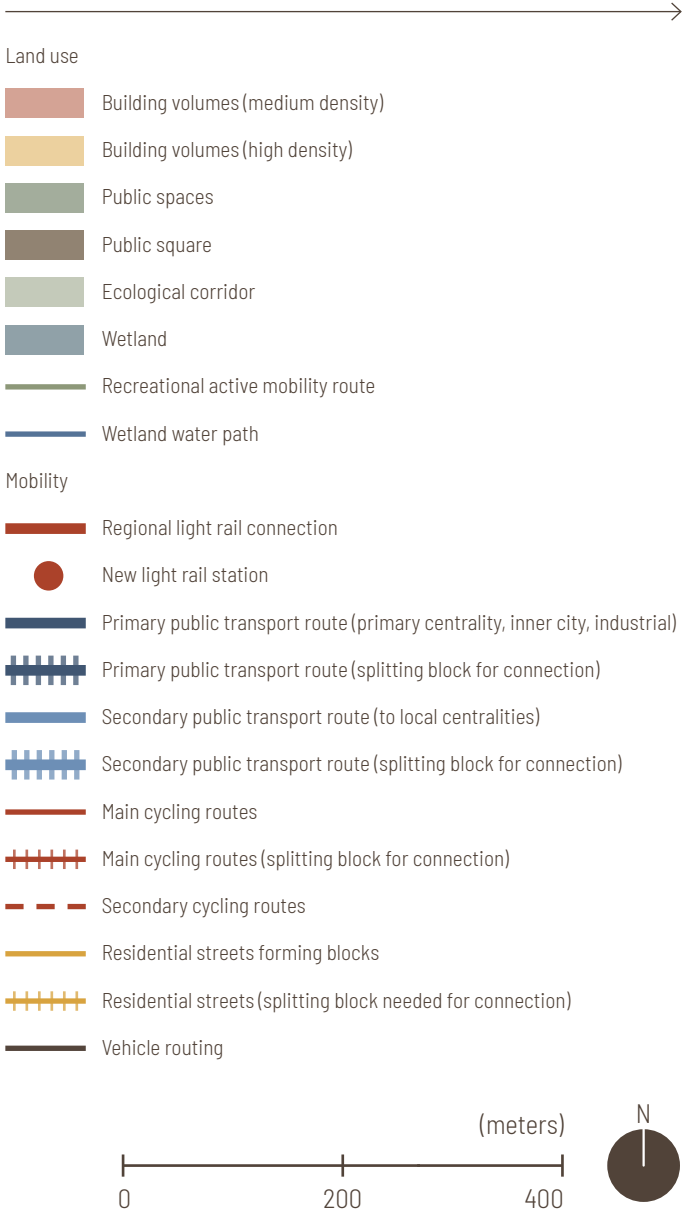
A zoom-in to Nemėžis details the spatial implications of the proposed new centrality and its mobility connections (see fig. 154-156). Currently the site near the proposed station has a rural character, with sparse detached timber houses and patches of agricultural land. By utilizing context-sensitive development, the rural qualities of this area can be enhanced.

The proposal is to minimally intensify the West side of the railway, splitting up blocks and utilizing agricultural land to develop detached and semi-detached low-rise houses which match the rural character while improving walkability and access to amenities. The other side of the station is left undensified. Instead, the drained agricultural area is reverted back into a wetland as part of the ecological corridor.

While not ideal for transit-oriented development, more intensive, dense and compact development is proposed only 400 meters away from the station, in the Soviet-era blocks (seen in yellow) and in a run-down industrial facility cluster (in the South). This should ensure that the light rail has an adequate user supply.

To improve the walkability in Nemėžis, car traffic is diverted to the edges. All local streets with low traffic are designated as residential, limiting speeds, preventing through-traffic and facilitating mixed mobility through spatial design. A major walkability challenge in this area is the excessive size of the residential blocks, spanning at over 200 meters. The proposal to split up these blocks into smaller ones (especially in the intensification areas) to reduce walking distances. This is done by extending existing dead ends and utilizing public land.

Figure 154. Nemėžis area plan (zoom-in 1).



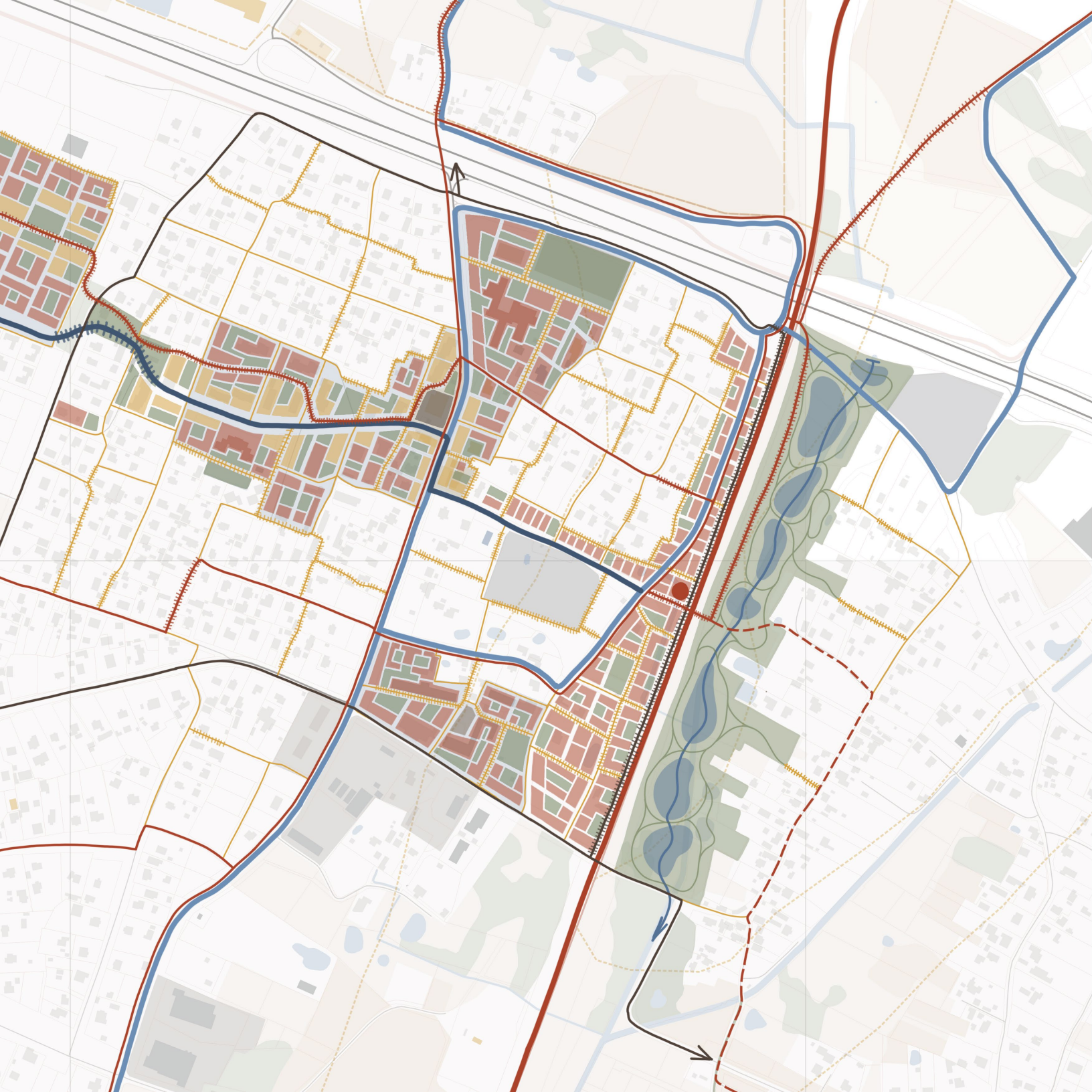


Figure 155. Collage of rural spatial characteristics of Nemėžis centrality (see bibliography for image sources).

Figure 156. Collage of urban spatial characteristics of Nemėžis centrality (see bibliography for image sources).

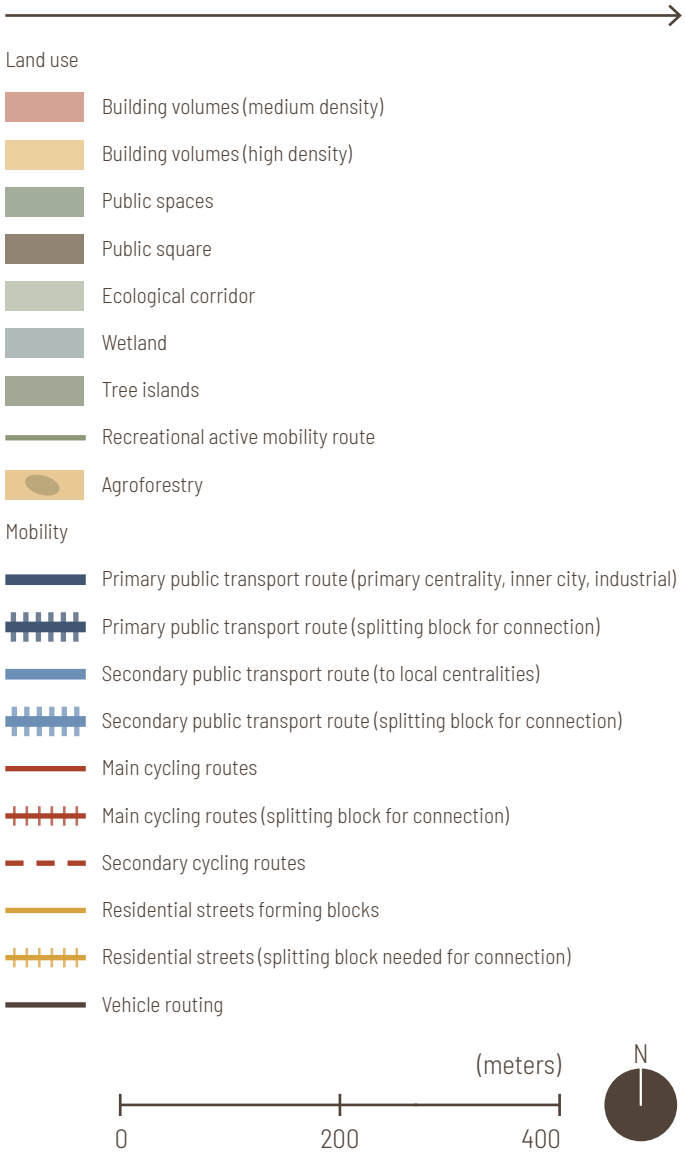
Building Bridges Between VCM and VDM

Zooming into the border between VCM and VDM, a major highway, forestry and agricultural areas split up two extensive urban sprawl areas, spatially segregating residents of different socio-economic groups. To address this split, it is necessary to build connections and to improve the accessibility between the two areas. At the same time, the solution must avoid excessive greenfield development and contribute to the expansion of the ecological network. The design outcome addresses these needs by developing Ašmenos Kelias (main centrality area) over the highway, into VCM and towards the secondary centrality in Kalnėnai (see fig. 157). The development of a cap over a highway provides the needed connections between the two segregated areas (see fig. 158).

At the same time, public transport and active mobility routes and direct local roads connect the centralities through extensive agricultural and natural areas which are left undeveloped and are instead utilized for recreation, ecology and other valuable functions. Forestry areas double as natural barriers from highway pollution, while parts of drained depressions are transformed back into natural wetlands. Agricultural land is designated for low-intensity nature-based farming practices, such as agroforestry or permaculture, making them more compatible with residential land use.

The proposed centrality intensification follows a mixed-use compact development logic, where block are highly permeable, facilities and public spaces are abundant, and car traffic has last priority. Development around the proposed corridors are made comparatively more dense and intensified for an efficient integration between land use and transport.

Figure 157. Connection strip over highway plan (zoom-in 2).



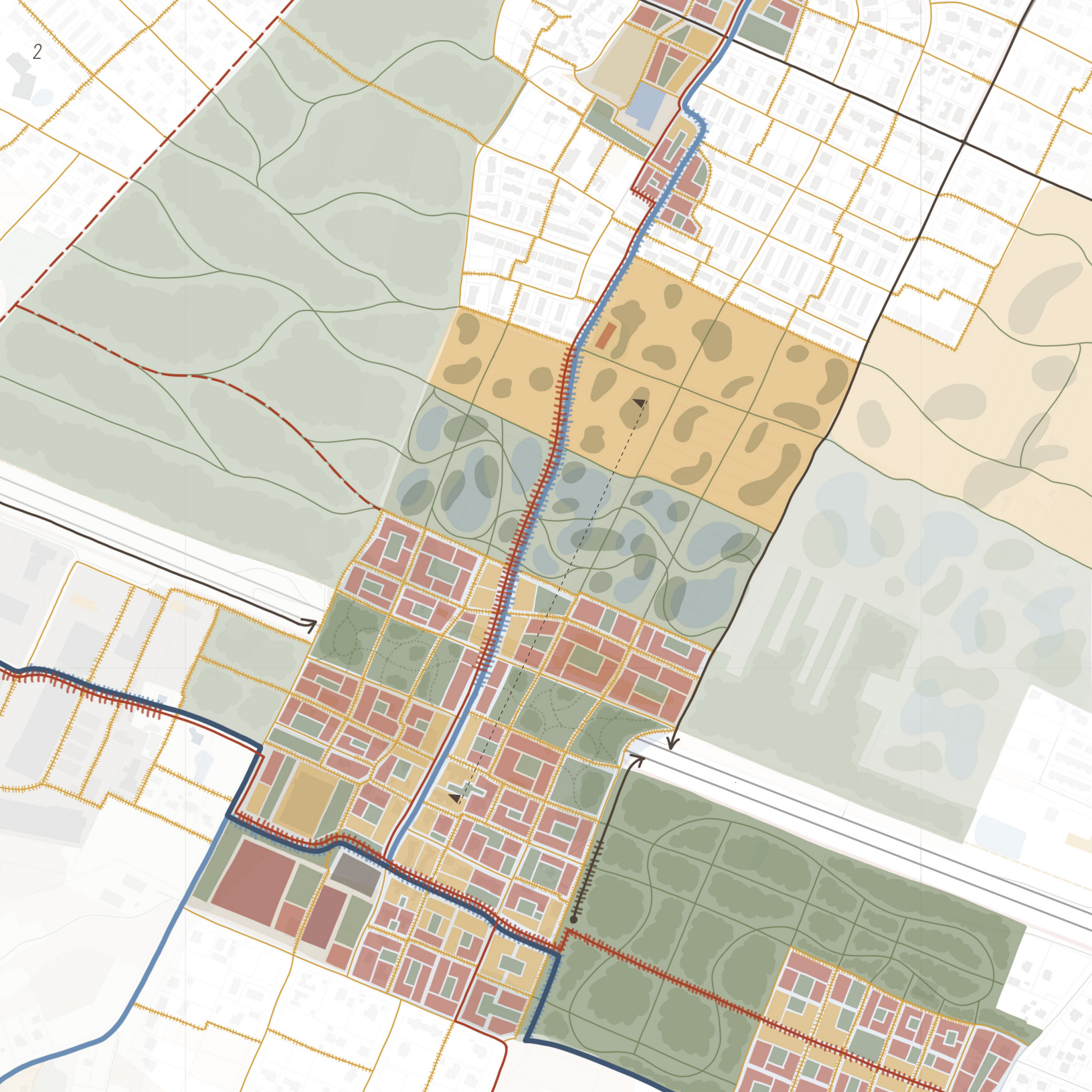
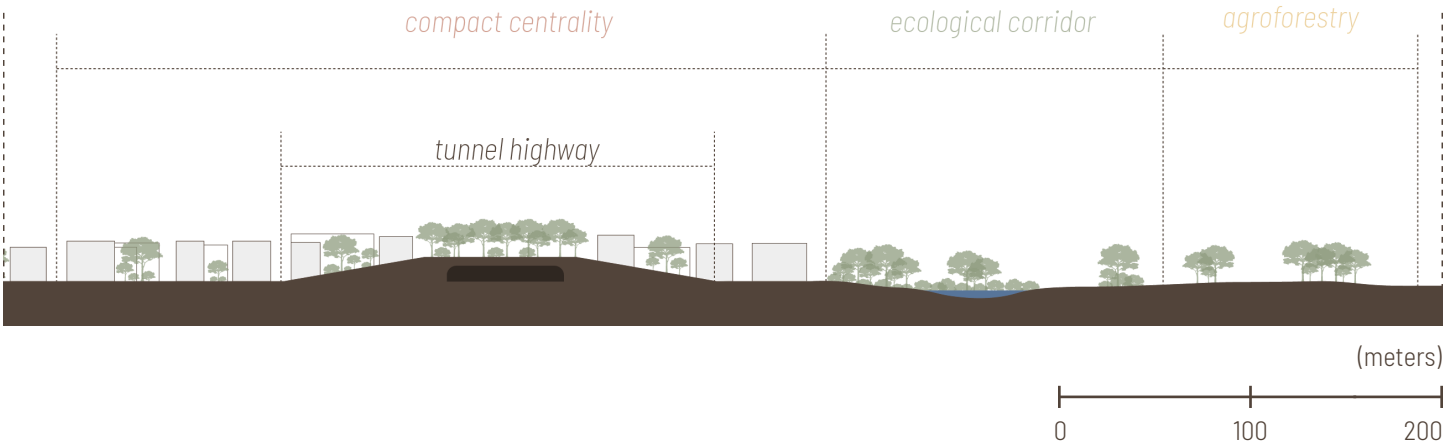


Figure 158. Section of connection strip over highway.



Key Insights For Spatial Design

The design exploration on SE Vilnius revealed that transforming barriers into destinations and ensuring mobility connections can help address structural barriers enforcing socio-spatial segregation. An overview of the key insights are visualized in figures 159-161. The process also revealed valuable possible solutions for improving walkability and accessibility in existing residential urban sprawl areas. An overview of the main insights can be found in figure 162. An example application of the principles in space can be seen in figures 163-166.

Figure 159. Addressing socio-spatial segregation through mobility infrastructure.

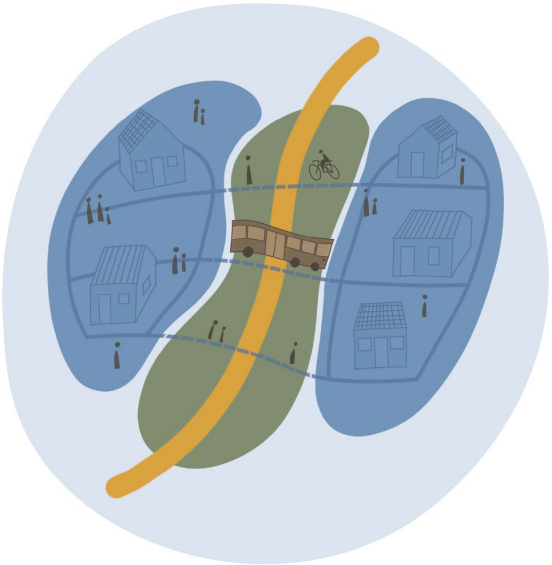


Figure 160. Addressing land use as socio-spatial segregation barrier.

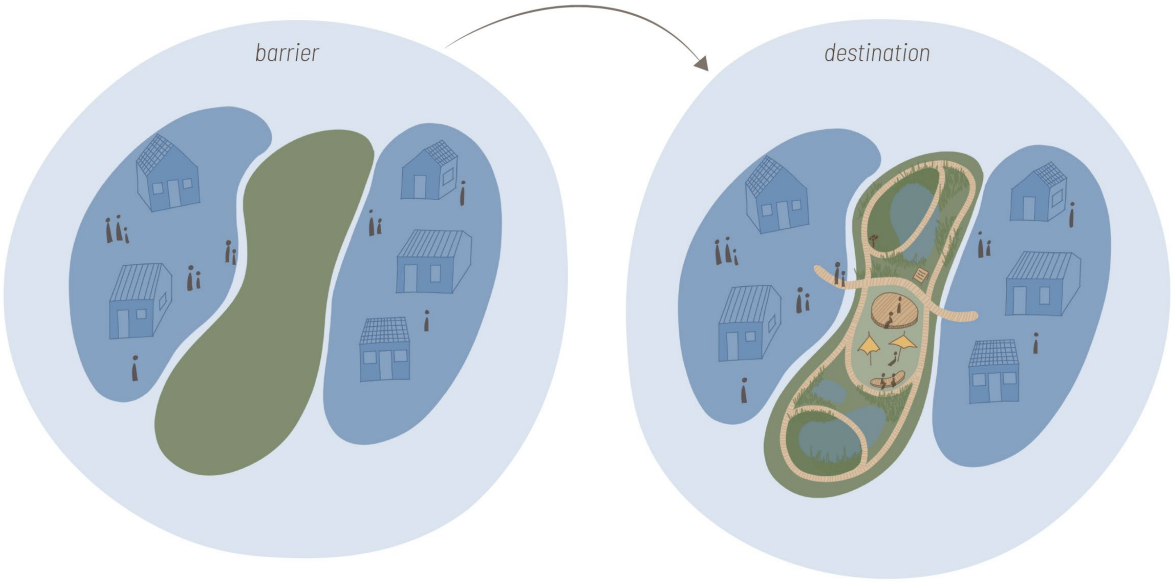


Figure 161. Addressing transport as socio-spatial segregation barrier.

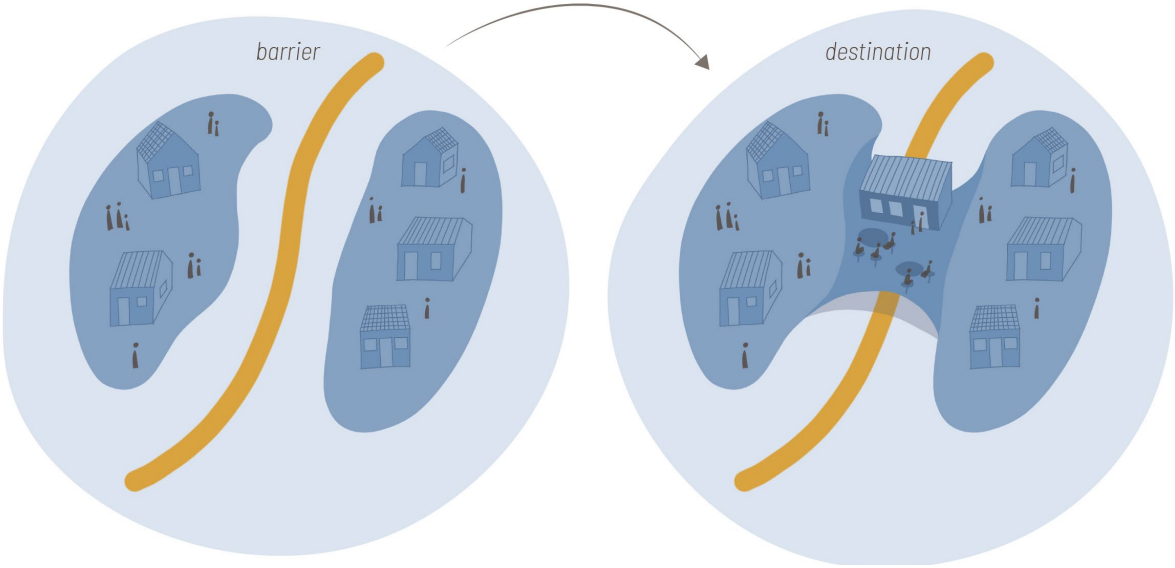
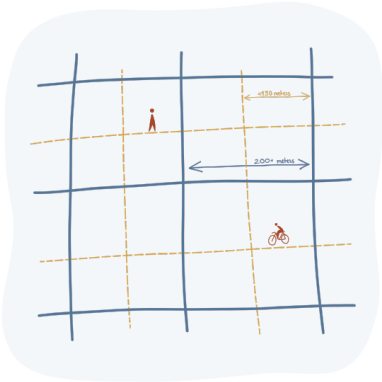
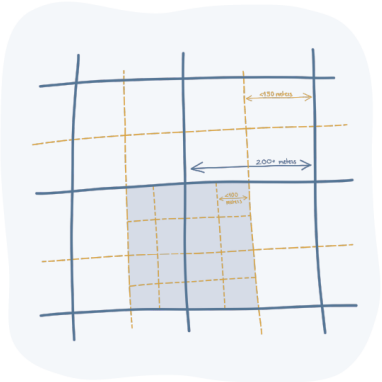


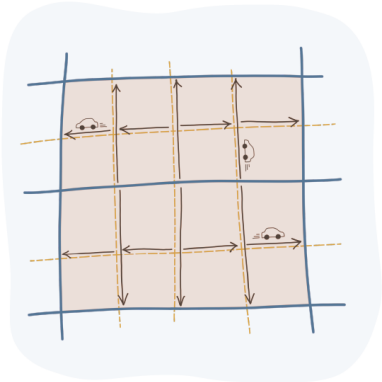
Figure 162. Design principles for accessibility in urban sprawl areas identified through research by design in SE Vilnius (1-9: mobility, 10-12: land use).



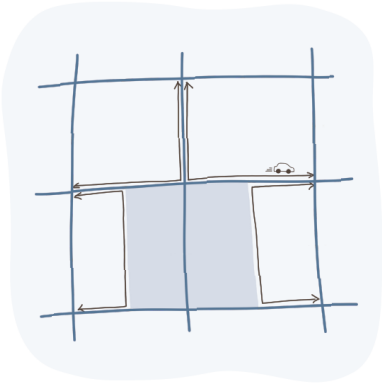
1. reduced block sizes in containment areas



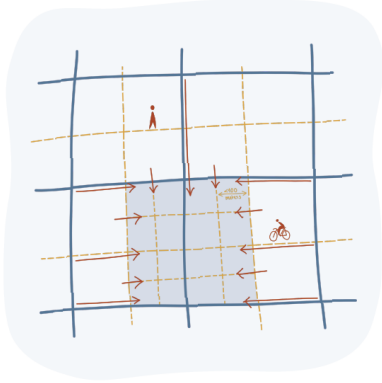
2. heavily reduced block sizes in centralities



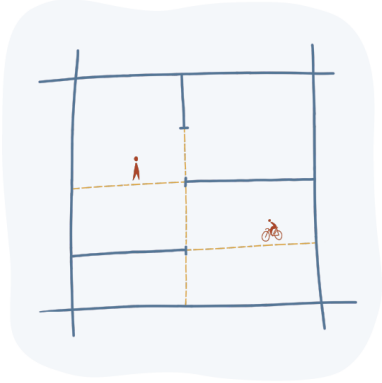
3. one way car traffic in residential areas



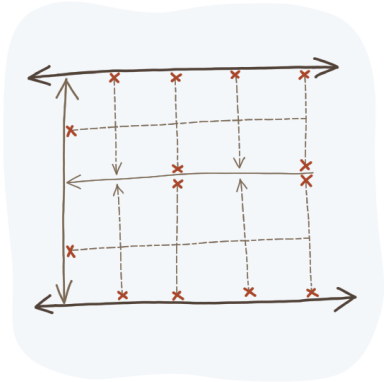
4. divert car traffic from centralities



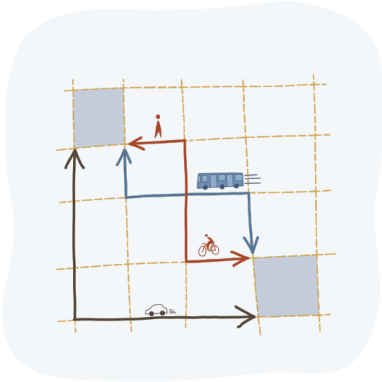
5. prioritize active mobility traffic in centralities



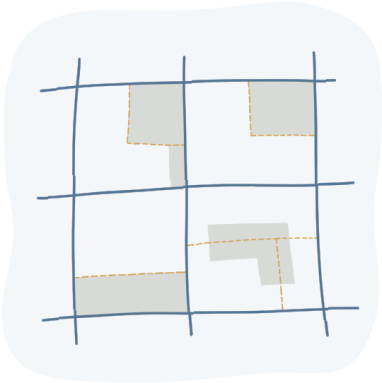
6. connect dead ends for active mobility



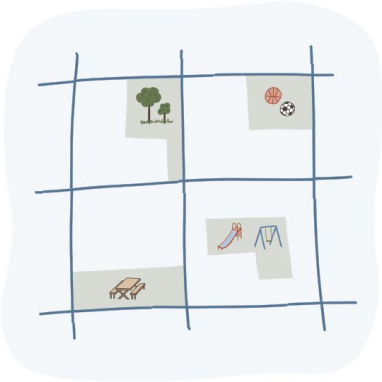
7. limit access points to organize car traffic



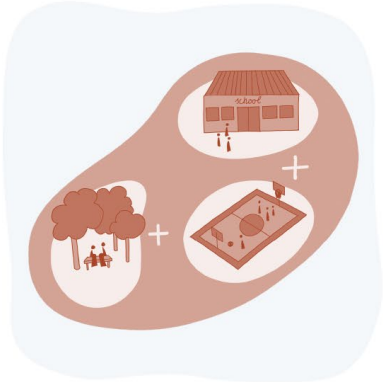
8. independent traffic flows



9. utilize public land to split up blocks



10. utilize public land for public spaces



11. intensify function mix in public land

12. active ground floor in centralities

Figure 163. Current situation in fenced off public plot.

Figure 164. Application of design principles 1, 6, 9, 10, 11 on the fenced off public plot in Pavilnys.

Figure 165. Current situation in residential street.

Figure 166. Visualisation of possible residential street transformation.

Regional Perspectives

In the regional context, the proposed design principles for urban sprawl areas can connect SE Vilnius to other major relevant destinations, further reducing dependence on the inner city and facilitating regional collaboration (see fig. 168). The proposed preservation of natural and agricultural areas and enhancement of their ecological value also offers opportunities to expand the ecological network of Vilnius, which sits in a location of international ecological importance (see fig. 167).

Figure 168. Future perspective for South-East Vilnius design in the regional context - connecting regional centralities.

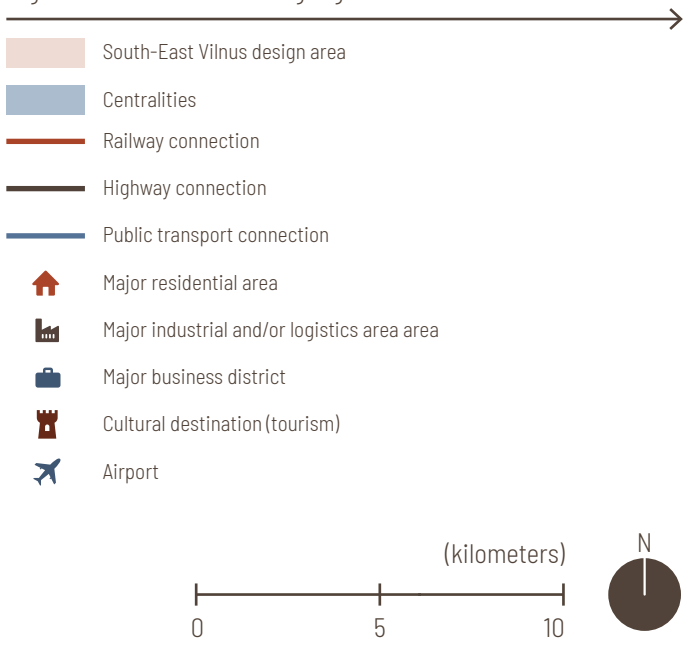
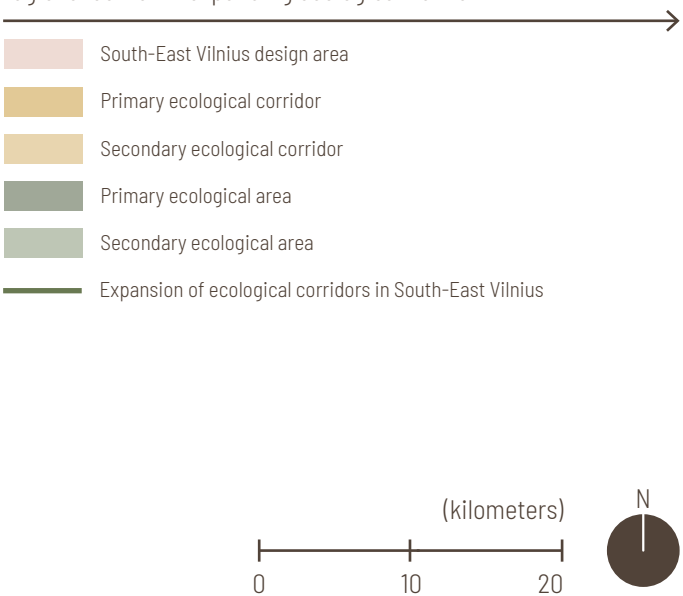
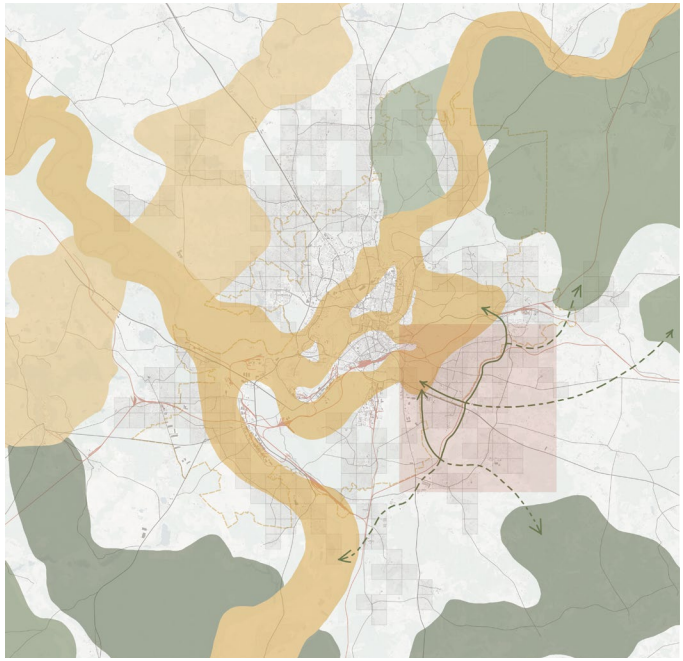
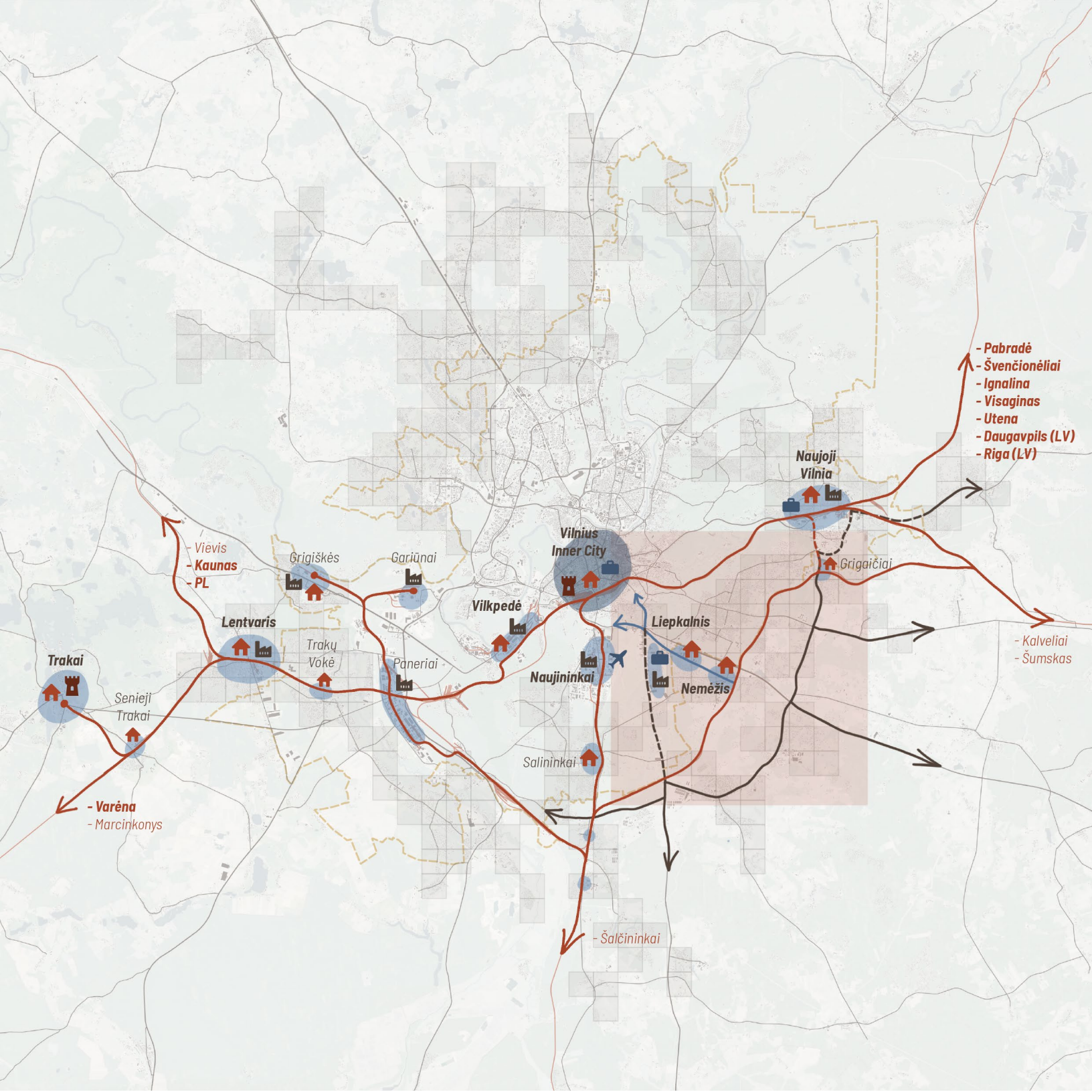


Figure 167. Future perspective for South-East Vilnius design in the regional context - expanding ecological network.



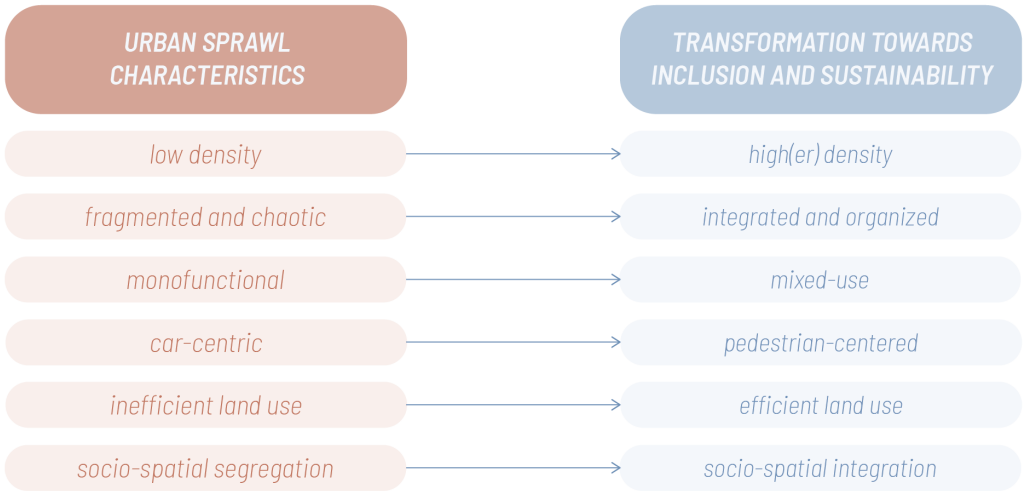



- Pabradė
- Švenčionėliai
- Ignalina
- Visaginas
- Utena
- Daugavpils (LV)
- Riga (LV)
Naujoji Vilnia
Vilnius Inner City
Grigaičiai
- Vievis
- Kaunas
- PL
Grigiškės
Gariūnai
Vilkpedė
Liepkalnis
Lentvaris
Trakų Vokė
Paneriai
Naujininkai
Nemėžis
Trakai
Senieji Trakai
- Kalveliai
- Šumskas
Salininkai
- Varėna
- Marcinkonys
- Šalčininkai

Design Retrospective

Eventually, the design proposes a targeted inversion of urban sprawl to address its accessibility and social cohesion challenges (see fig. 169). Sparse, low-density monofunctional developments are replaced by compact mixed-use centralities. Instead of prioritizing car infrastructure, the proposal is to connect residential areas and centralities with active mobility networks and public transport. Everything that makes urban sprawl unsustainable, hostile, inequitable and exclusionary is inverted in target areas order to produce more inclusive and sustainable urban environments.

Figure 169. Design retrospective diagram.



Systemic Changes For Better Spatial Outcomes

The following chapter offers solutions for the structural failures in the policy and governance system resulting in urban sprawl and its associated accessibility challenges in Vilnius region. The proposal is to directly address specific failure points in the system through interventions in financial, planning, capacity-building and collaborative tools and mechanisms, transforming the spatial planning approach in Vilnius region from a reactive to a proactive one. The first part of the chapter provides an overview of the specific structural changes needed in order to realize the spatial interventions proposed in the previous chapter. The second part focuses on strengthening individual-institution interactions by developing participatory spatial planning mechanisms. The proposed policy and governance changes are integrated within EU frameworks and mechanisms, and a timeline connects the proposed policy and governance changes to specific spatial outcomes.

Approach For Policy & Governance Design

Due to the structural failure of the governance and policy systems, the current spatial planning and design approach for Vilnius region can be described as reactive (see fig. 170). Private developers build residential areas in greenfield sites with no necessary infrastructure or facilities. Residents move in and quickly realize the deficit, and blame the public institutions for it. Then the municipality reacts by spending excessive money on infrastructure development for these sites, leaving little financial resources for other spatial investments. This is an approach that is highly financially inefficient and which further accommodates the development of urban sprawl areas. These structural failures must be solved in order for participatory planning processes to be successful, otherwise they risk being unproductive or tokenist, leading to further conflict and distrust between individuals and institutions.

The objective of the policy and governance design proposal is to create a system of necessary tools, mechanisms and processes to ensure that spatial planning processes and practices can prevent and proactively plan for challenges, and where infrastructure and facility provision is planned along with residential development. This requires addressing the structural mismatch between formal and real municipal powers, building regional planning and intermunicipal collaboration mechanisms, restructuring financial mechanisms, creating a complex national policy response to urban sprawl, and expanding participatory processes (see fig. 171, 172).

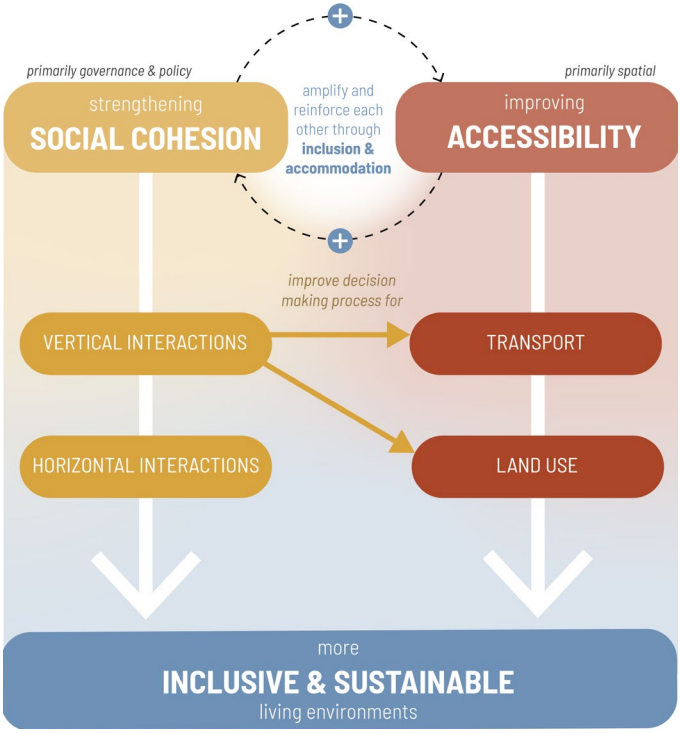


Figure 170. Governance and policy design lens, based on the conceptual framework.

In this regard, the revised policy and governance system demands a rebalance of powers (see fig. 171), in which the regional, municipal and local scale are given more autonomy and decision-making power. At the national scale, institutional capacity must be built in order to ensure effective policy systems and their monitoring, enforcement and implementation.

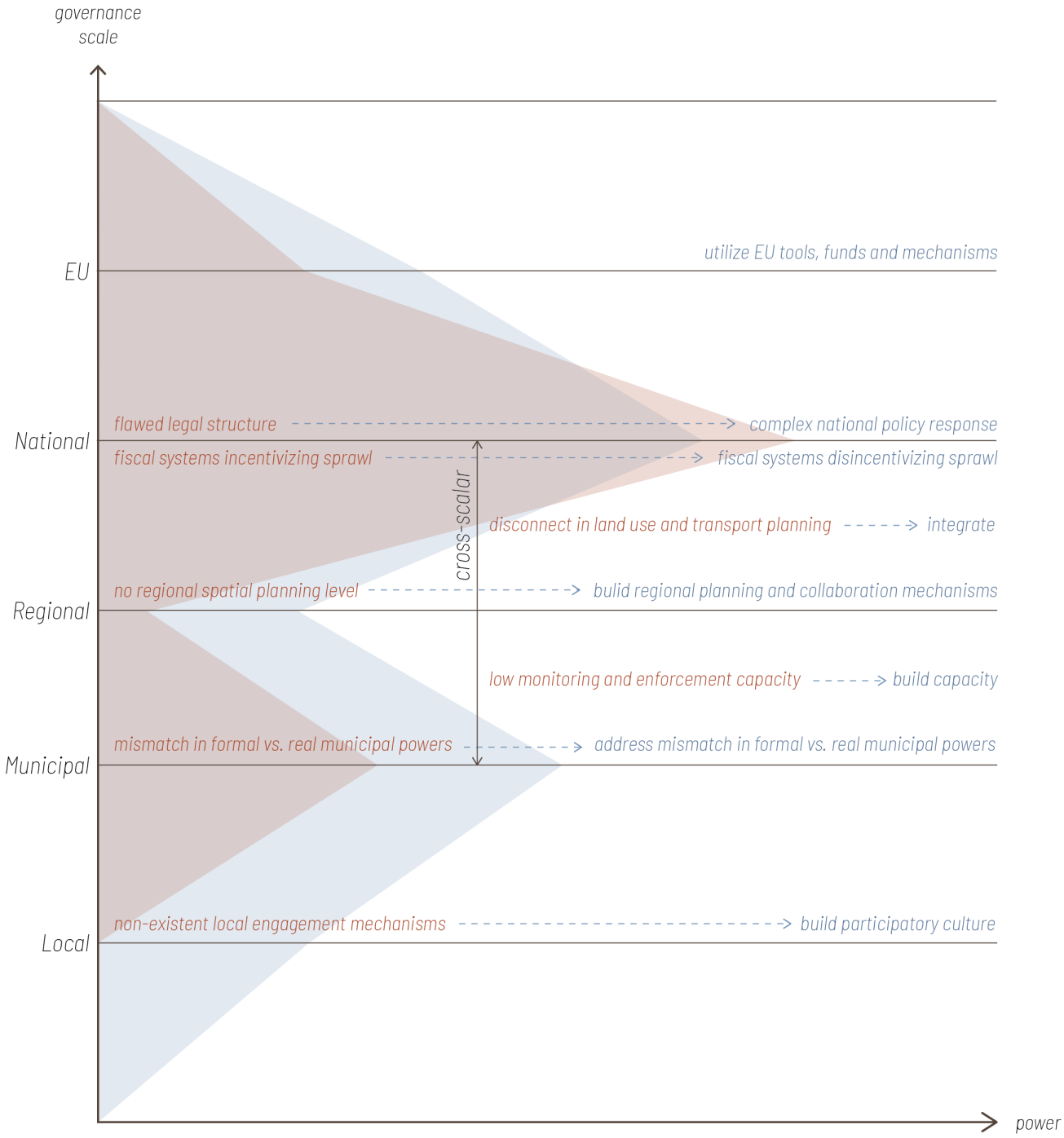


Figure 171. Systemic changes in the power balance for spatial planning.

However, the power distribution in the public governance structure is not the only power misbalance which was observed. The power, burdens and benefits misbalance, and the dysfunctional relationships between the public, private and civic sector must also be revised (see fig. 173). This is done first of all by ensuring that each player has the resources and capacity to fulifll their roles and responsibilities, but also by developing the right frameworks for effective and successful partnerships, which can bring together resources and capacity, while also building legitimacy through engagement, communication and knowledge exchange.

In this context, the European Union can offer great opportunities in terms of financial resources, knowledge building, utilizing existing frameworks and directives to fast-track the transformation.

This chapter is structured in two layers: interventions needed for the proposed spatial design and interventions required to strengthen institution-individual interactions.

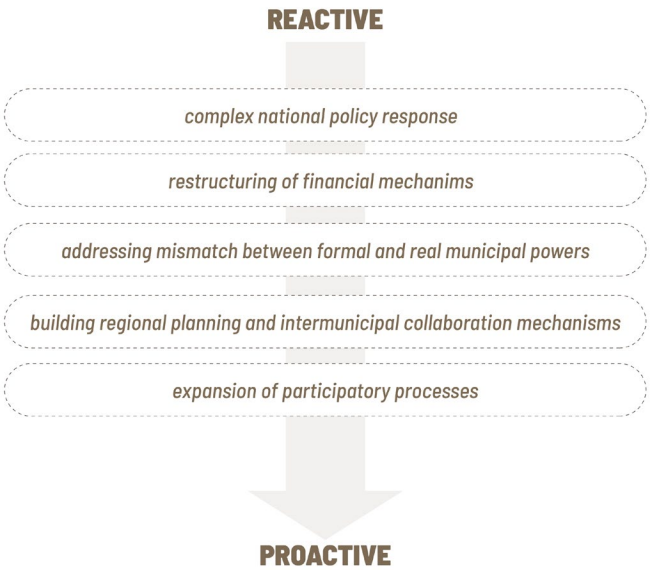


Figure 172. Addressing systemic failures to transition from a reactive to a proactive approach.

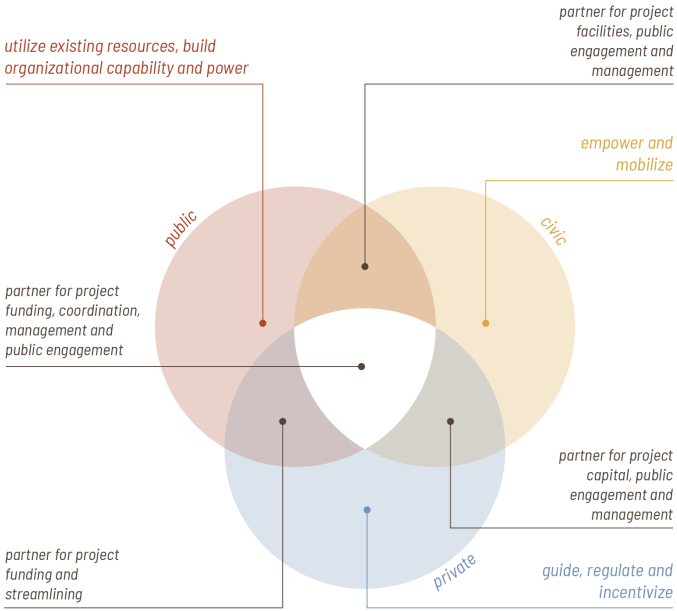


Figure 173. Addressing stakeholder roles, responsibilities and relationships to build capacity and partnerships.

Structural Changes for Spatial Interventions

This part of the design addresses the policy and governance interventions required for the spatial design interventions proposed in the previous chapter. Since there will be a separate in-depth dive into the dimension of civic engagement, this part primarily focuses on the public and private stakeholder roles and interactions in the policy and governance systems. Fig. 174 provides an overview of the main objectives for the roles, responsibilities and interactions for each stakeholder. The different interventions for policy and governance change are structured based on the following categorization:

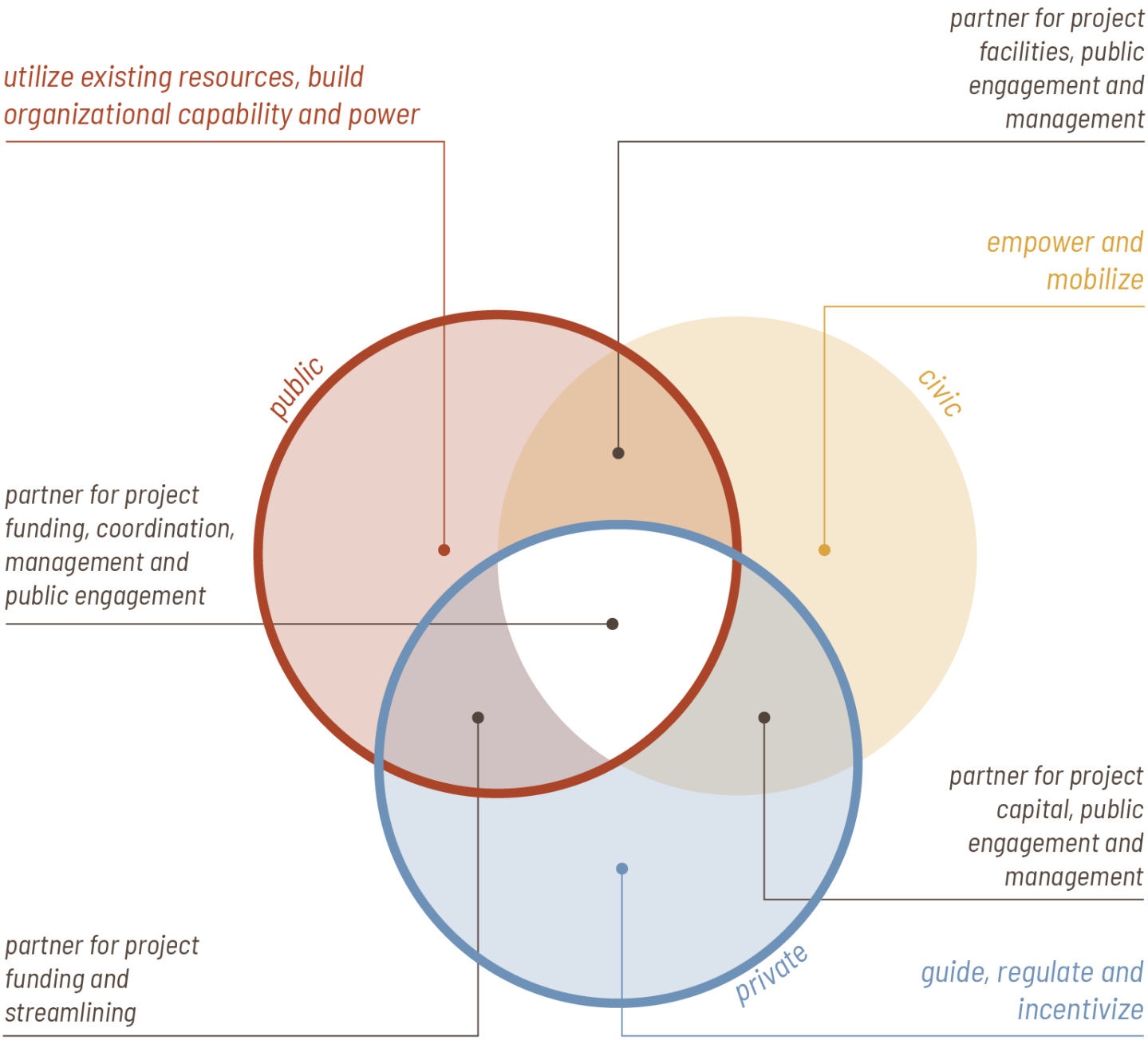


Figure 174. Public-private stakeholder roles, responsibilities and partnership objectives.

Building Municipal Powers

A major structural limitation that was revealed in the research phase is that of the mismatch between formal and real municipal powers. On paper, municipalities have high adminsitrative autonomy and are armed with a strong set of existing spatial planning tools and mechanisms. However, the lack of financial autonomy, limited planning capacity and strong private property rights result in a reality where existing spatial planning tools are severely limited. The objective is therefore to reverse these limitations through a mixture of spatial planning, financial and capacity/knowledge mechanisms and tools (see fig. 175). A mixture of EU support systems and frameworks can be utilized for the implementation of the proposals.

To create more public agency in the privatized and fragmented urban sprawl landscape, a land consolidation mechanism (for urban sprawl areas) is proposed. At the same time, legally binding infrastructure agreements will ensure the accountability of private developers in infrastructure provision towards the municipality.

In order to build municipal financial autonomy, the objective is to create more independent and flexible sources of income. The proposal is to allow municipalities to issue infrastructure bonds in on capital markets, utilizing private funds to fast-track public infrastructure development. At the same time, a defined (and differentiated) share of the current municipal taxes must go directly to municipalities in order to create a more independent municipal budget. This will also create immediately visible financial outcomes for municipalities, which can counter-act the diffuse long-term costs of urban sprawl development.

Finally, all municipalities, but especially VDM and TM, must build their planning capacity in order to have a strong long-term spatial and transport planning team. This will remove the buyer-client dynamic from the planning processes and ensure that the planning decision-making processes at these municipalities remain grounded and well-informed.

Regional Planning Collaboration

The urban development of Vilnius has long outgrown its municipal boundaries. However, the lack of a regional planning and collaboration scale makes it impossible to properly address Vilnius urban sprawl. Therefore, the proposal is to transform the existing RDC into a metropolitan planning partnership with its own transport authority, budget and spatial planning tools (see fig. 176). Crucially, this partnership has to be voluntary and fundamentally different from the current RDC in its powers, responsibilities and mechanisms (see fig. 177). Considering that there are already ongoing active efforts to collaborate between VCM, VDM and TM, a formalized partnership could fast-track any ongoing efforts and provide opportunities for future collaboration.

The establishment of a regional partnership and transport authority will provide municipalities with the medium to address spatial challenges crossing municipal borders, and to plan at a cross-municipal level accordingly. Having a dedicated budget will remove the financial barriers which are currently disincentivizing regional collaboration, while also providing the finances for necessary infrastructure development (e.g. intermunicipal cycling or public transport routes). The newly proposed spatial planning tools, such as the metropolitan spatial plan, metropolitan spatial data and metropolitan planning table, will unify disconnected municipal spatial plans into a regional scale vision and strategy which is consistent and fair across administrative borders.

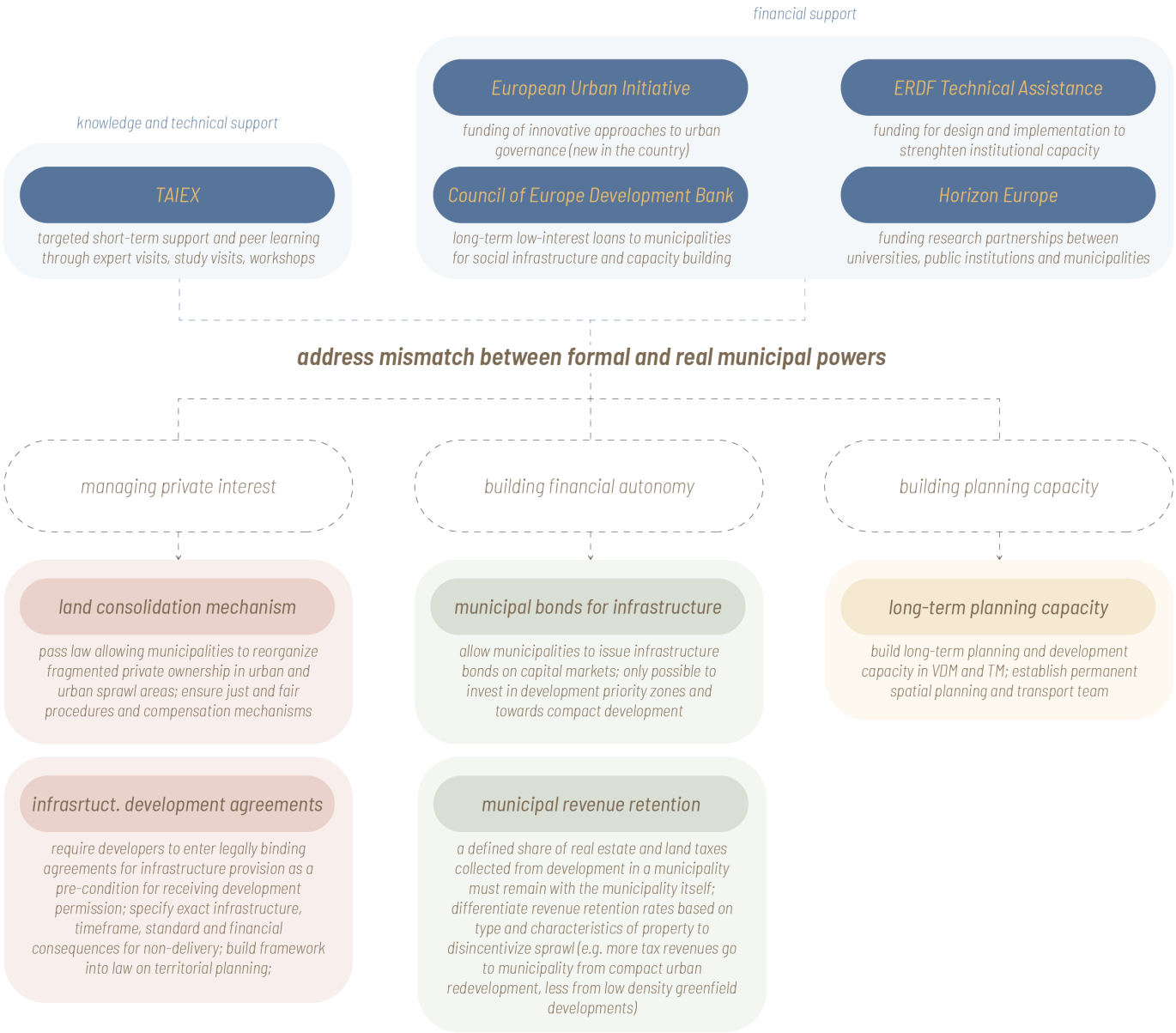


Figure 175. Governance and policy change proposals for building real municipal powers.

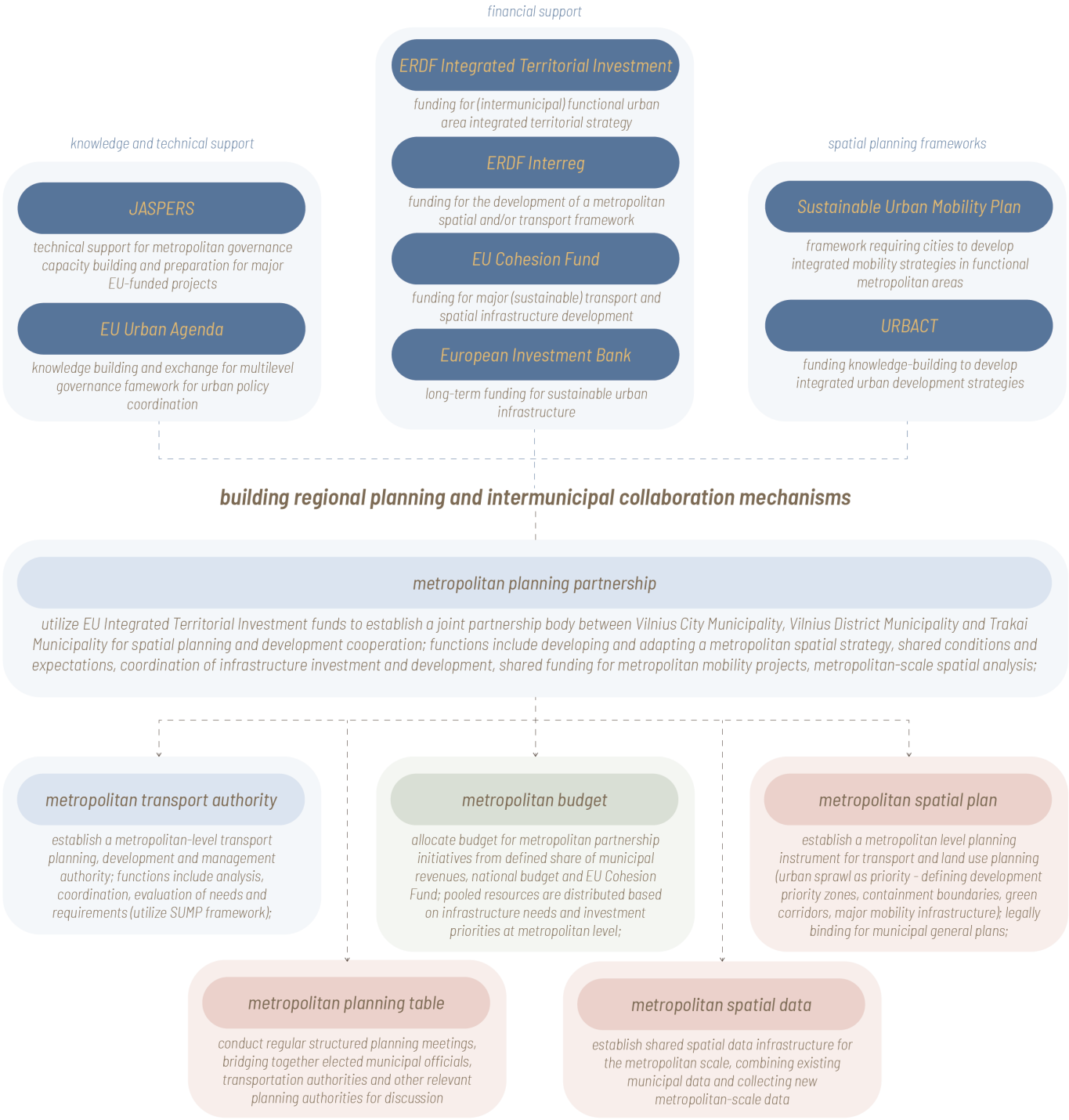

financial support
ERDF Integrated Territorial Investment
funding for (intermunicipal) functional urban area integrated territorial strategy
ERDF Interreg
funding for the development of a metropolitan spatial and/or transport framework
EU Cohesion Fund
funding for major (sustainable) transport and spatial infrastructure development
European Investment Bank
long-term funding for sustainable urban infrastructure
knowledge and technical support
JASPERS
technical support for metropolitan governance capacity building and preparation for major EU-funded projects
EU Urban Agenda
knowledge building and exchange for multilevel governance famework for urban policy coordination
spatial planning frameworks
Sustainable Urban Mobility Plan
framework requiring cities to develop integrated mobility strategies in functional metropolitan areas
URBACT
funding knowledge-building to develop integrated urban development strategies
building regional planning and intermunicipal collaboration mechanisms
metropolitan planning partnership
utilize EU Integrated Territorial Investment funds to establish a joint partnership body between Vilnius City Municipality, Vilnius District Municipality and Trakai Municipality for spatial planning and development cooperation; functions include developing and adapting a metropolitan spatial strategy, shared conditions and expectations, coordination of infrastructure investment and development, shared funding for metropolitan mobility projects, metropolitan-scale spatial analysis;
metropolitan transport authority
establish a metropolitan-level transport planning, development and management authority; functions include analysis, coordination, evaluation of needs and requirements (utilize SUMP framework);
metropolitan budget
allocate budget for metropolitan partnership initiatives from defined share of municipal revenues, national budget and EU Cohesion Fund; pooled resources are distributed based on infrastructure needs and investment priorities at metropolitan level;
metropolitan spatial plan
establish a metropolitan level planning instrument for transport and land use planning (urban sprawl as priority - defining development priority zones, containment boundaries, green corridors, major mobility infrastructure); legally binding for municipal general plans;
metropolitan planning table
conduct regular structured planning meetings, bridging together elected municipal officials, transportation authorities and other relevant planning authorities for discussion
metropolitan spatial data
establish shared spatial data infrastructure for the metropolitan scale, combining existing municipal data and collecting new metropolitan-scale data

Figure 176. Governance and policy change proposals for building regional planning collaboration.

Figure 177. Powers, responsibilities and mechanisms of a new metropolitan planning partnership (compared to Regional Development Council).

Restructuring Financial Mechanisms

Analysis revealed that the current fiscal policies incentivize urban sprawl development for private investors and municipalities. Therefore the revised financial structures must make it financially unattractive to develop (or permit development of) greenfield sites and urban sprawl areas, or to engage with speculative investment and land use change. The costs of urban sprawl development must be made immediately visible through a mixture of taxes and financial incentives (see fig. 178). The European Union offers financial and knowledge support, as well as spatial frameworks which could legitimize and support this fiscal restructuring.

The proposal is to adjust the already existing tax systems (e.g. differentiated infrastructure tax) into a more differentiated and graduated one which changes based on development type and site location. This way, greenfield development can be made more expensive and therefore unattractive, meanwhile, infill and compact development can be incentivized. At the same time, the introduction of a land value capture mechanism aims to disincentivize speculative investment and land use change by making it more expensive and therefore unprofitable. These changes will also redistribute the financial burdens of urban sprawl infrastructure development from the municipality to the private developer, which will open up new funding streams for infrastructure and facility development by reducing financial pressure on the municipality.

Another proposal is to replace the current growth and development oriented municipal income system with a more quality-based one. This way, instead of municipalities permitting development at all costs because it brings income, it will encourage them to be more selective and intentional about what developments they permit, where and under what conditions.

Complex National Policy Response

An overall flawed legal structure was shown to weaken the institutional capacity to comprehensively address urban sprawl and its associated challenges. Key target areas include forming a comprehensive policy respones to urban sprawl (incl. addressing informal residential areas in allotment gardens), integrating land use and transport planning and ensuring accountability and quality in spatial planning applications (see fig. 179). Diverse EU frameworks, funds and knowledge exchange frameworks exist in order to support these needs, such as the EU Cohesion Policy, the European Urban Initiative or TAIEX.

A targeted urban sprawl policy response should legitimze the existing informal residential areas, which will enable infrastructure and service provision. A targeted policy response for addressing the infrastructure deficiency and developing targeted improvements will further allow for spatial improvements to happen in these urban sprawl areas. Cross-ministry collaboration will create national policies which will allow for the integration of mobility investment with land use development, diverting resources away from road infrastructure development towards more sustainable modes of transport, such as cycling and public transport.

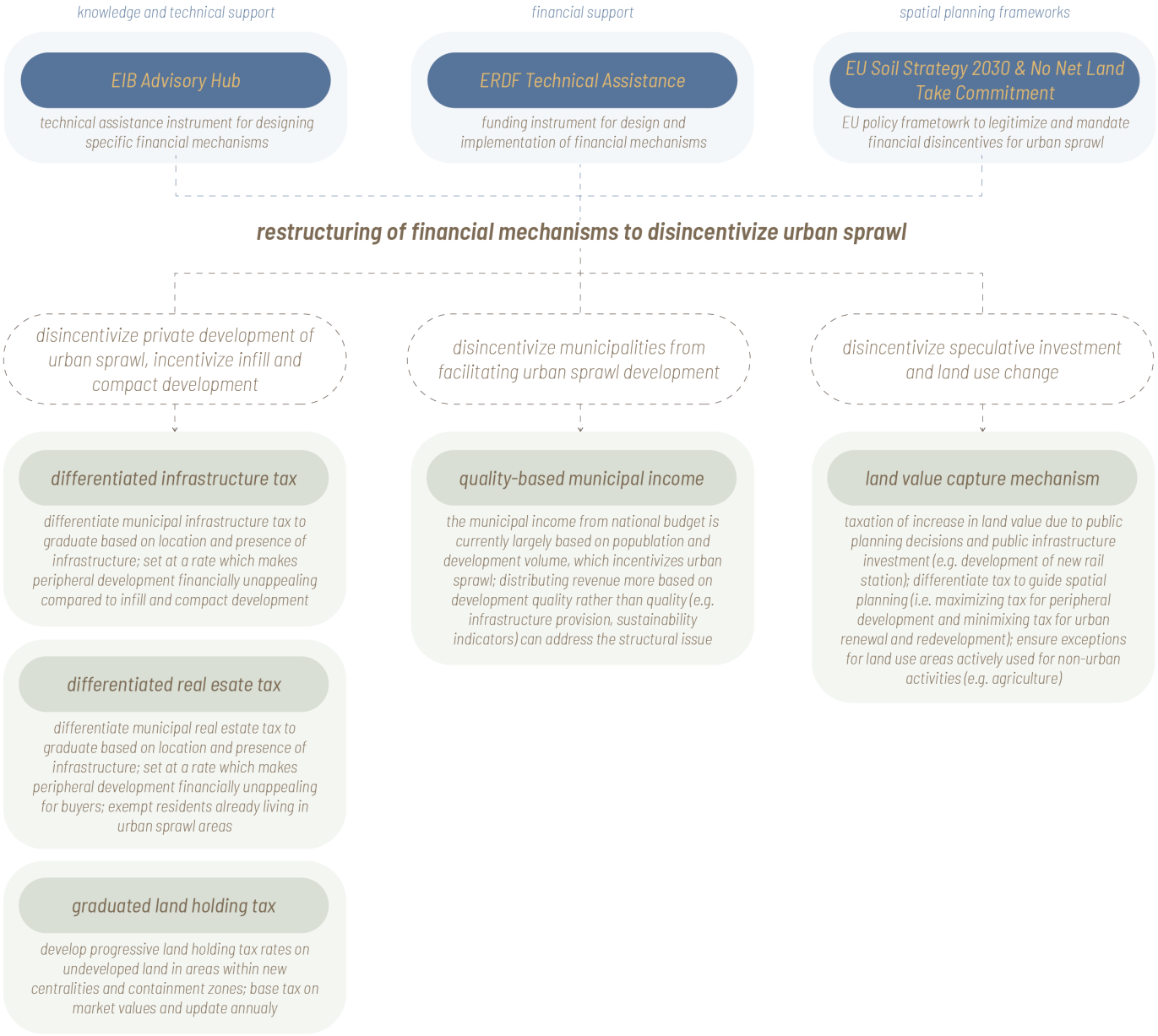


Figure 178. Proposed interventions for the financial system.

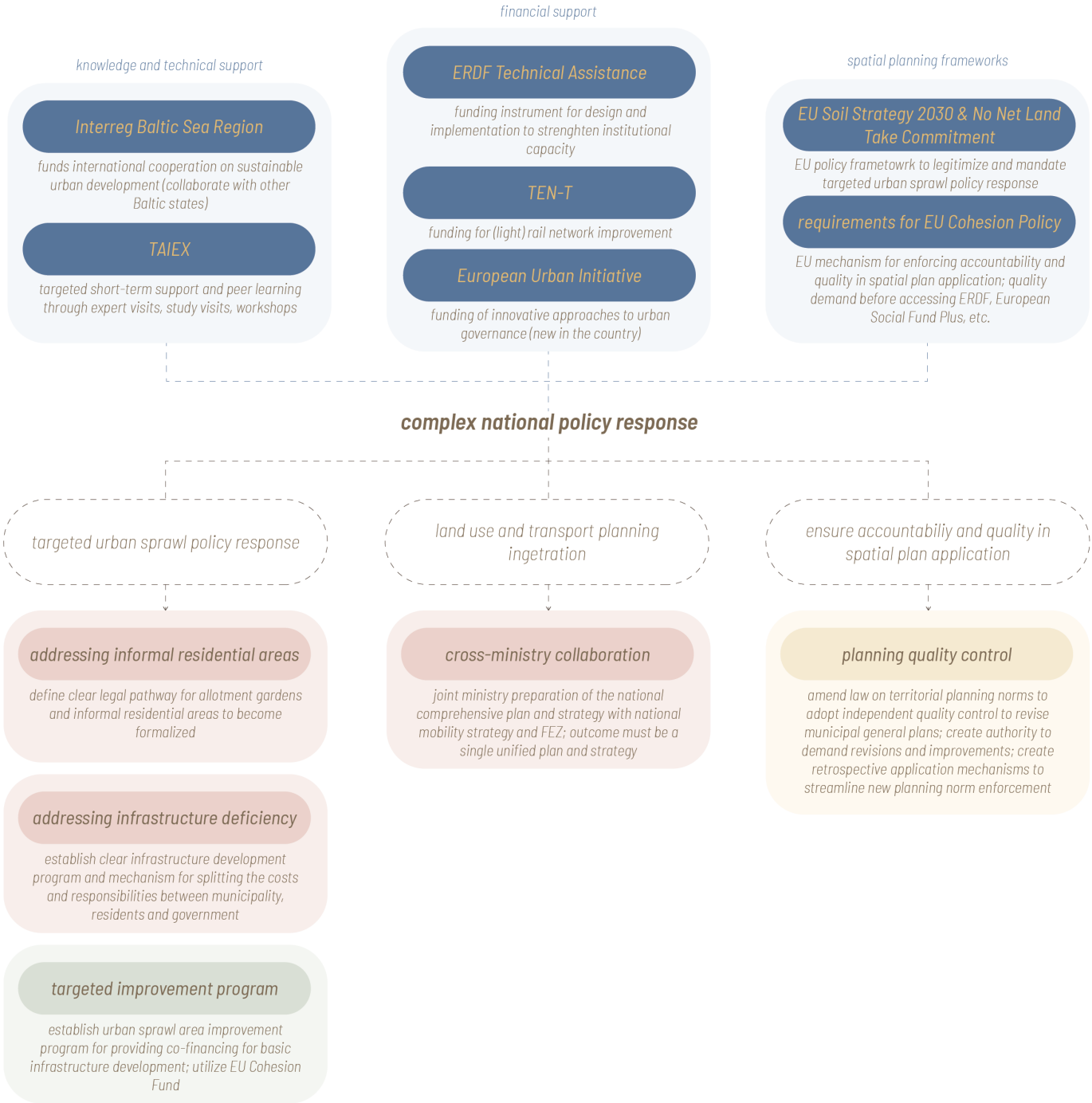


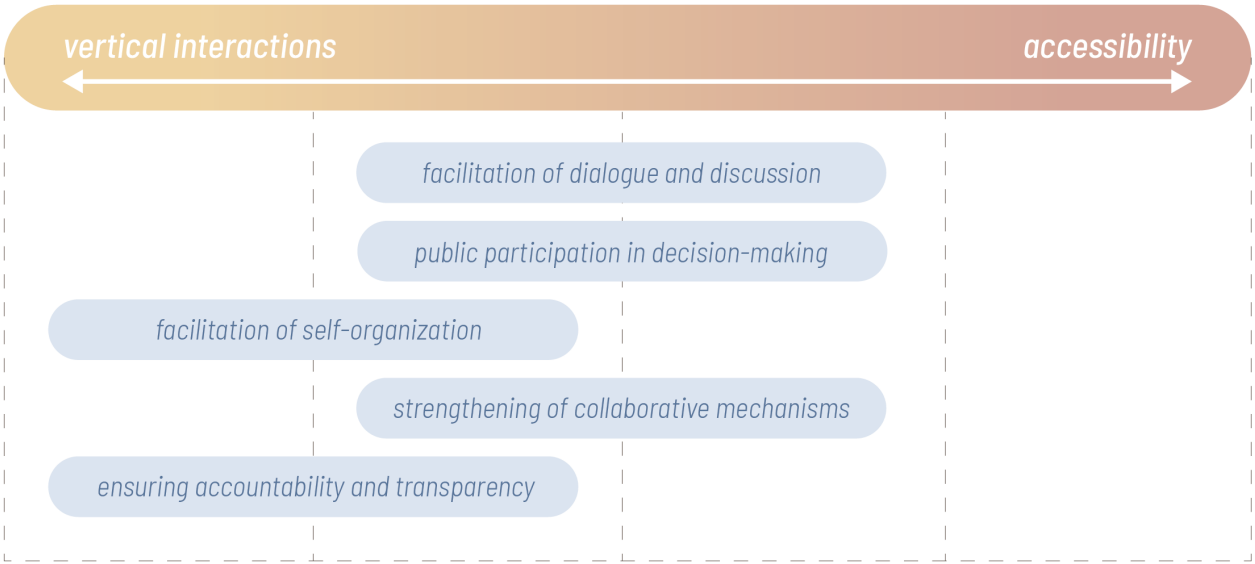
Figure 179. Policy and governance interventions for a complex national policy response.

Strengthening Individual-Institution Collaboration

This part of the chapter addresses the policy and governance interventions which are required to strengthen interactions between individuals and institutions (vertical interactions). In particular, the objective is to empower and mobilize civil society, while enabling partnerships with the public and private sectors (see fig. 181).

This requires for systemic mechanisms and processes to facilitate dialogue and discussion, public participation in decision-making, facilitation of self-organization, strengthening of collaborative mechanisms and ensuring accountability and transparency. The extent to which these goals target spatial improvements in accessibility or purely strengthening vertical interactions can be seen in fig. 180.

Figure 180. Requirements for policy and governance change to facilitate individual-institution interactions.



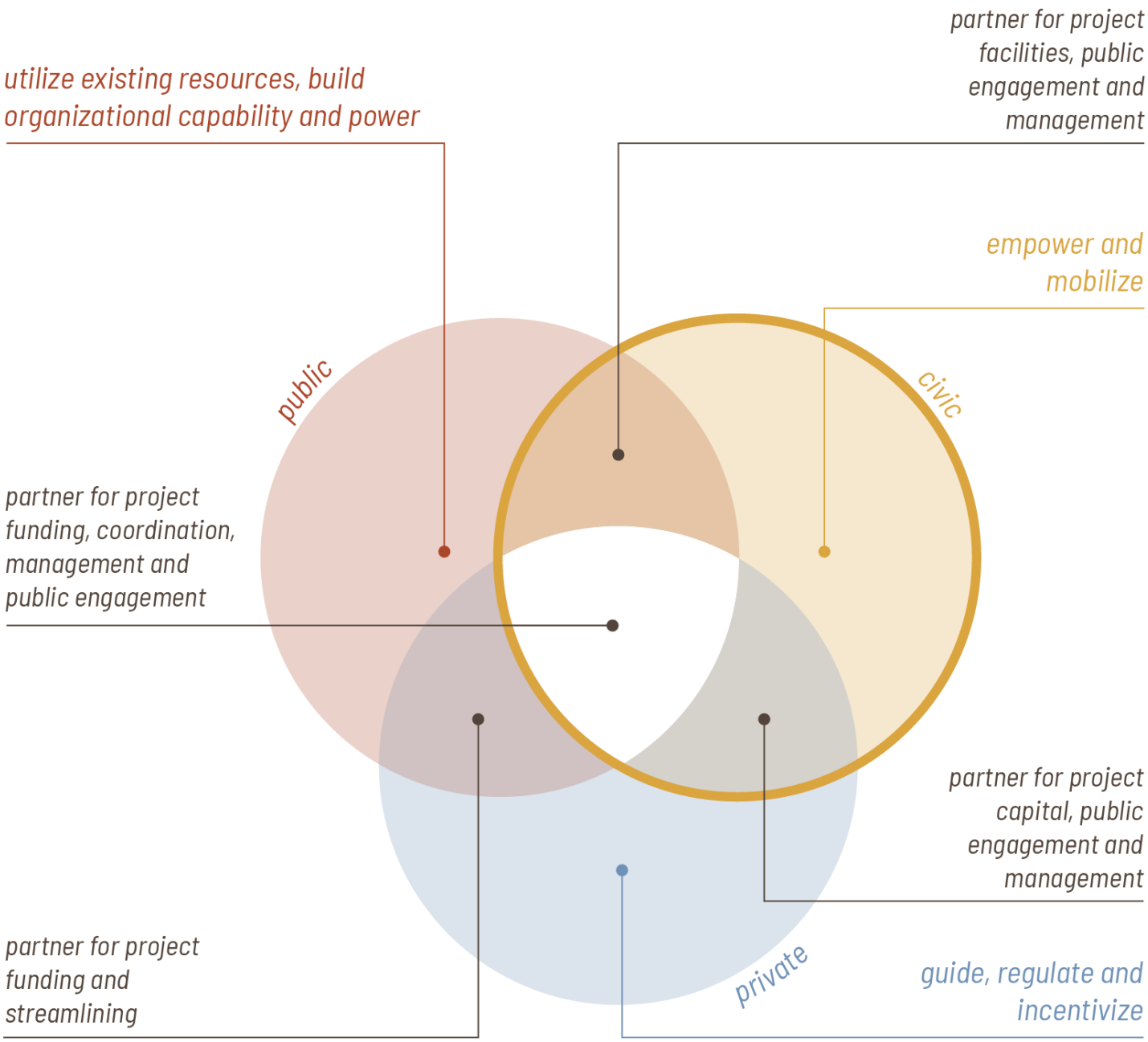


Figure 181. Civic stakeholder roles, responsibilities and relationship objectives.

Based on the previously defined requirements and stakeholder (relationship) objectives, specific and actionable objectives for governance and policy are defined in fig. 182.

The policy and governance proposals for the expansion of the participatory process are structured around three interdependent aspects, combining both successful ongoing mechanisms and establishing new ones (see fig. 183). The first target is to stop gatekeeping access to participatory processes. This means ensuring access to information, reducing structural barriers for public participation and providing resources for self-organization. The second dimension is the engagement and empowerment of civil society of urban sprawl area residents. This concerns expanding the participatory budget scheme, formalizing collaborative mechanisms and providing meaningful entry points for participation (beyond consultations and feedback at the end-phase). Finally, it is necessary to build transparency and trust between the public, private and civic stakeholders to ensure that partnerships and participatory processes are legitimate, valuable and productive.

These dimensions are independent, therefore must be implemented through an integrated process, rather than a one-by-one step. Each dimension can be directly financially supported by EU initiatives, funding or frameworks, allowing fast-tracking their development.

Figure 182. Detailed governance and policy design objectives.

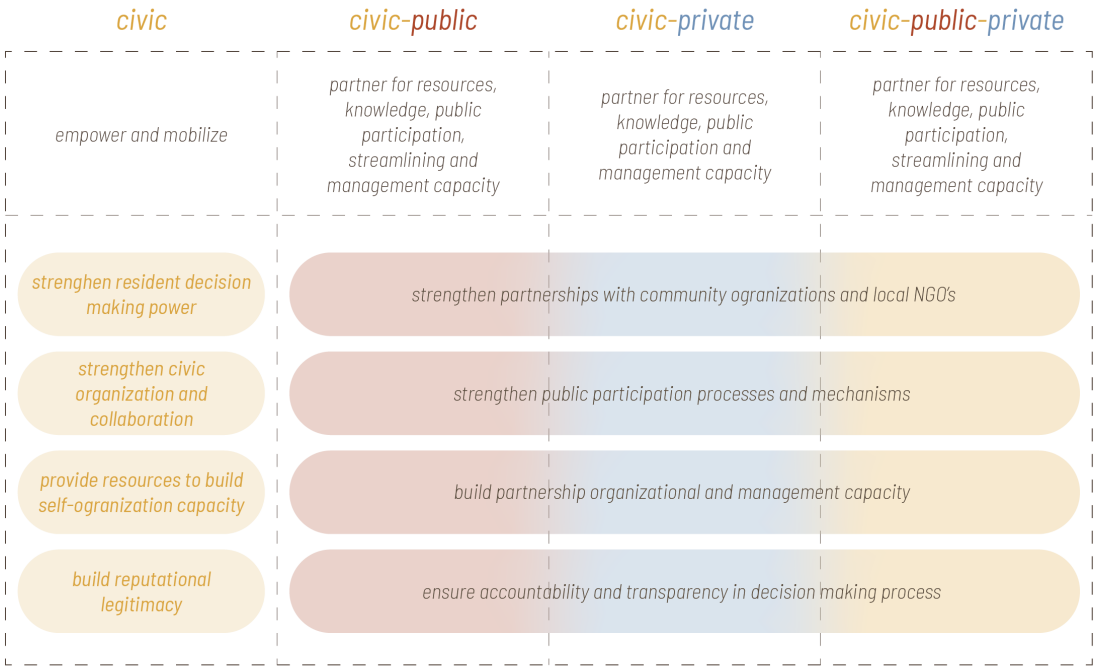


Figure 183. Three dimensions for expanding the participatory process.

Expanding Engagement & Empowerment Mechanisms

The expansion of the engagement and empowerment mechanisms for civil society combines the expansion of already successful mechanisms with the development of new ones (see fig. 184). Notably, the participatory budget has proven to be highly successful in engaging communities in the decision-making process. The improvements concern expanding and improving the participatory budget scheme by providing more implementation flexibility, linking it to spatial plans, establishing a local infrastructure fund specifically for basic local infrastructure, and providing the possibility to incorporate capital investment.

Formalizing collaboration between community organization and institutions not only provides more certainty for the projects, but can also fast-track their development. This can be done by establishing a legal framework for co-production agreements, having long-term (public) community mediators and establishing a framework for developer-community agreements.

Finally, it is necessary to provide residents with access points to participatory processes at meaningful points, where discussions and raised concerns can become genuine input for local spatial planning and development. This requires establishing participation quality standards, multi-stage and multi-scale participatory processes, as well as creating a framework for the development of community-led neighborhood plans.

Stop Gatekeeping The Right to Participate

In order to break down structural barriers preventing people from participating in the spatial planning and decision-making process, it is necessary to provide the resources for self-organization, legitimize local action and break down barriers preventing people to access the participatory process. This means ensuring the provision of community spaces, financial support, knowledge exchange networks and accessible information platforms (see fig. 185).

Additionally, the establishment of a neighbourhood council combines diverse local players and interests (local civic organizations, sub-elders, local businesses, etc.) and provides the decision-making power that has been missing at the local scale (see fig. X). In regard to community NGOs specifically, the establishment of an accreditation system can weed out fake and/or inactive NGOs, while legitimizing active, motivated and productive organizations.

Building Trust & Transparency Between Stakeholders

Crucially, none of the previously proposed policy and governance interventions will be effective if there is no trust and transparency between the diverse stakeholders (see fig. 186). Some of the previously discussed interventions already partially address the transparency (such as the NGO accreditation system). However, successful participatory processes require comprehensive transparency and accountability systems to build trust, consensus and legitimacy. Therefore, specific interventions are proposed which demand accountability and transparency from public institutions and private businesses, as well as ensuring access to spatial planning and development information. Registers and other information platforms ensure that spatial planning and development decisions (and who made them) can be accessible and traceable, allowing for relevant stakeholders to be held accountable. For civic society in particular, it is necessary that information is easy to understand, access and act upon.

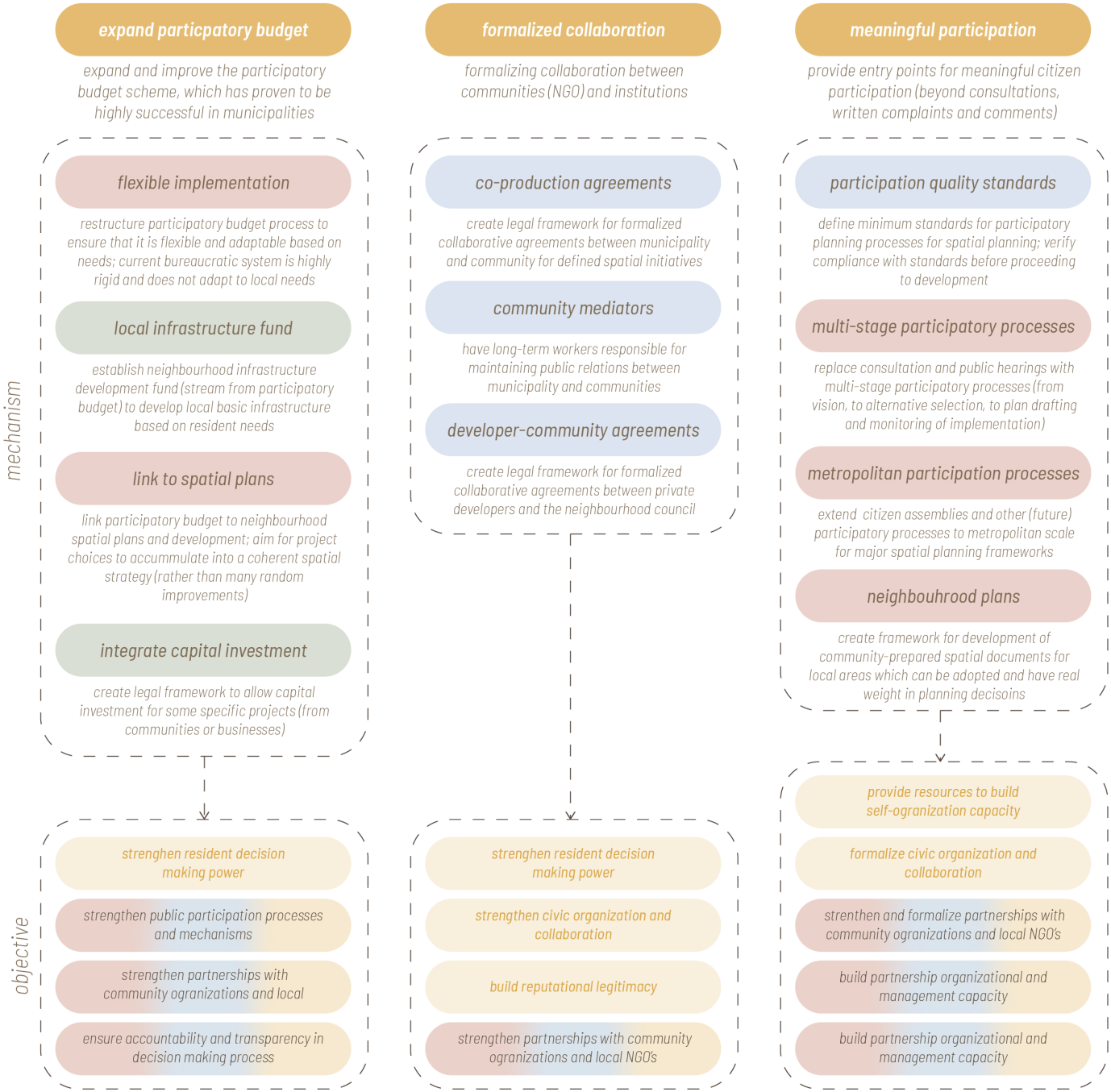


Figure 184. Policy and governance interventions to engage and empower residents and civil society.

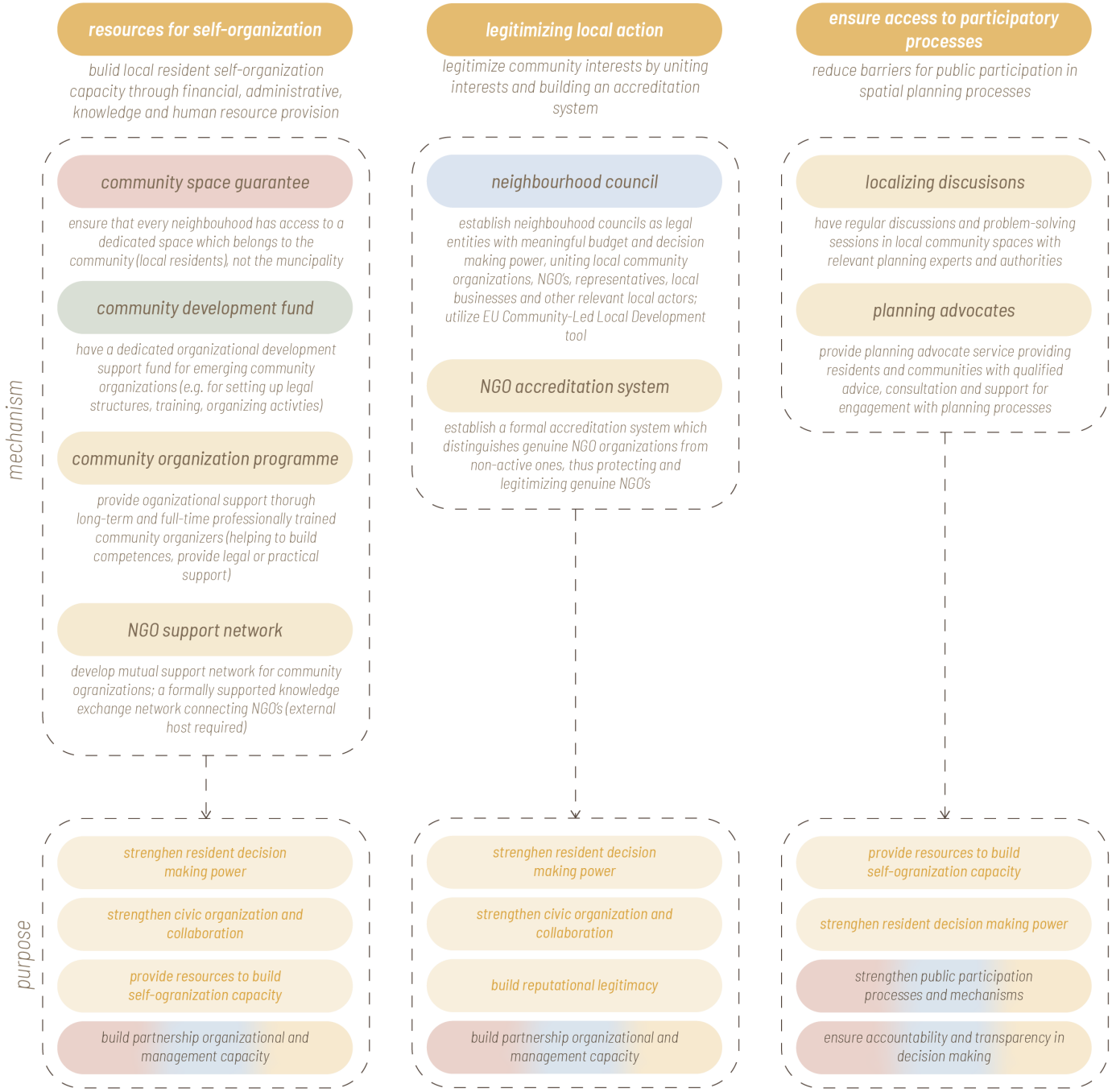


Figure 185. Policy and governance interventions to stop gatekeeping access to the participatory process.

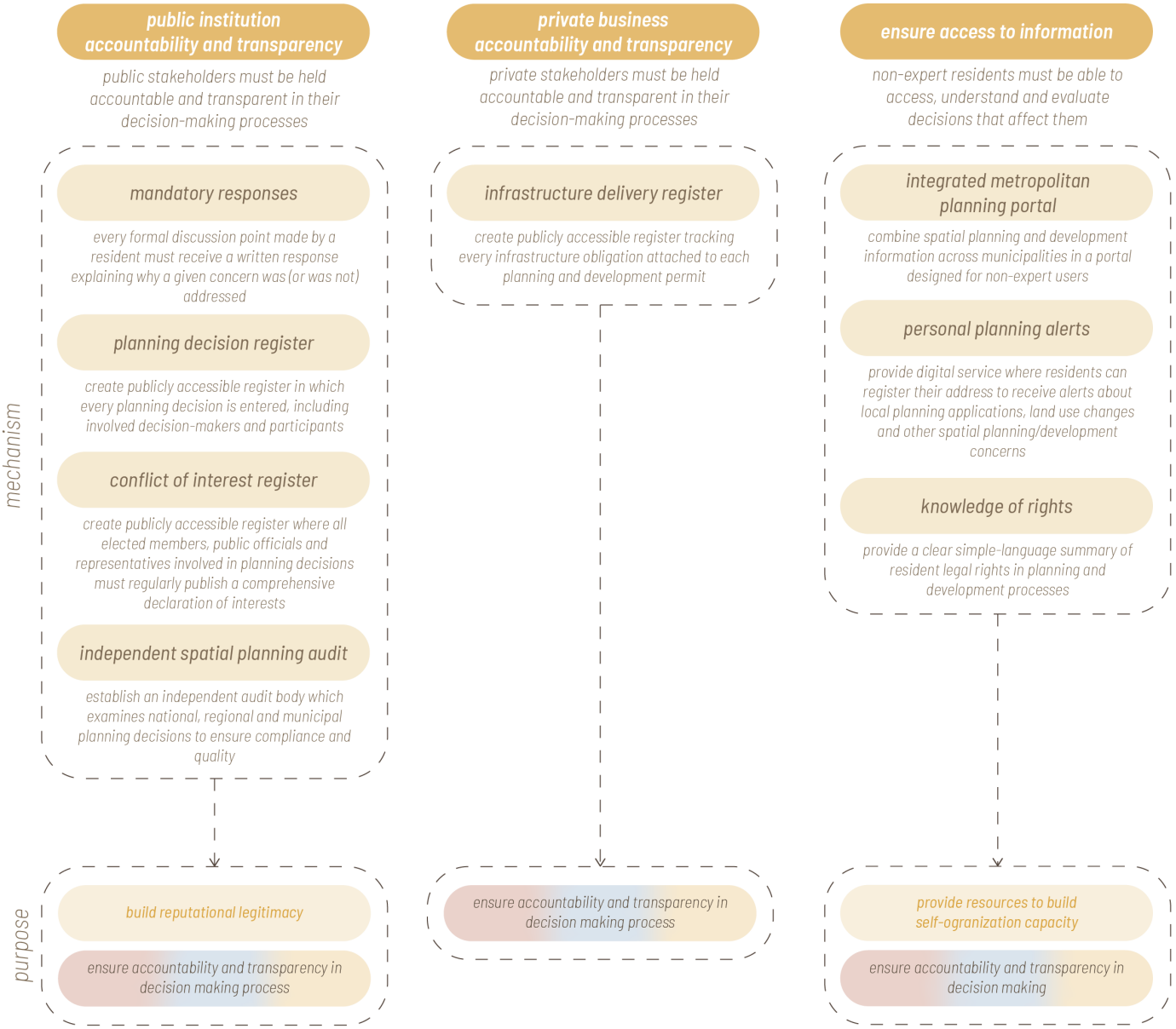


Figure 186. Policy and governance interventions to build trust and transparency between stakeholders.

Timeline & Consequences for Spatial Planning

The previously discussed interventions proposed direct, actionable solutions for systemic changes in the governance and policy system, as well as proposals to strengthen participatory processes. These two components must be approached at an integrated matter to achieve the desired outcome of an improved decision-making process for land use and transport planning.

Fig. 187 integrates the diverse proposals into a timeline based on EU funding and project scheme timelines, as well as explains the spatial purpose and consequences of each policy and/or governance action.

Immediate Actions

There are many already existing successful tools and mechanisms in place for spatial planning, development and local engagement which can be utilized for easy spatial wins in urban sprawl area, such as rezoning land use, developing pedestrian and cycling routes, incentivizing mixed-use and compact development in the proposed centralities, converting underutilized public land into lively public spaces. Financial support can be immediately accessed through scheme such as the EU ERDF Integrated Territorial Investment fund and the EU European Social Fund Plus. Scaling up the participatory funding scheme can also enable communities to have a say in what specific spatial needs must be prioritized in local development.

Short-Term

The short-term timeframe considers the upcoming EU funding and project timeframe of 2028-2034. In this phase, new mechanisms must be built and structural blockages must be addressed in order to start taking steps towards systemic improvement of the living conditions in urban sprawl areas. Larger-scale projects, such as the integration of the existing railway into the mobility system and addressing the allotment garden situation must gain speed at this phase.

Long-term

In the long-term (after 2034), the policy and governance system should transform into one that structurally incentivizes urban sprawl areas to develop towards sustainability and social inclusion. This means finishing developing the cycling network, fully connecting the centralities (which should be mostly formed by now) and integrating allotment gardens as genuine residential areas.

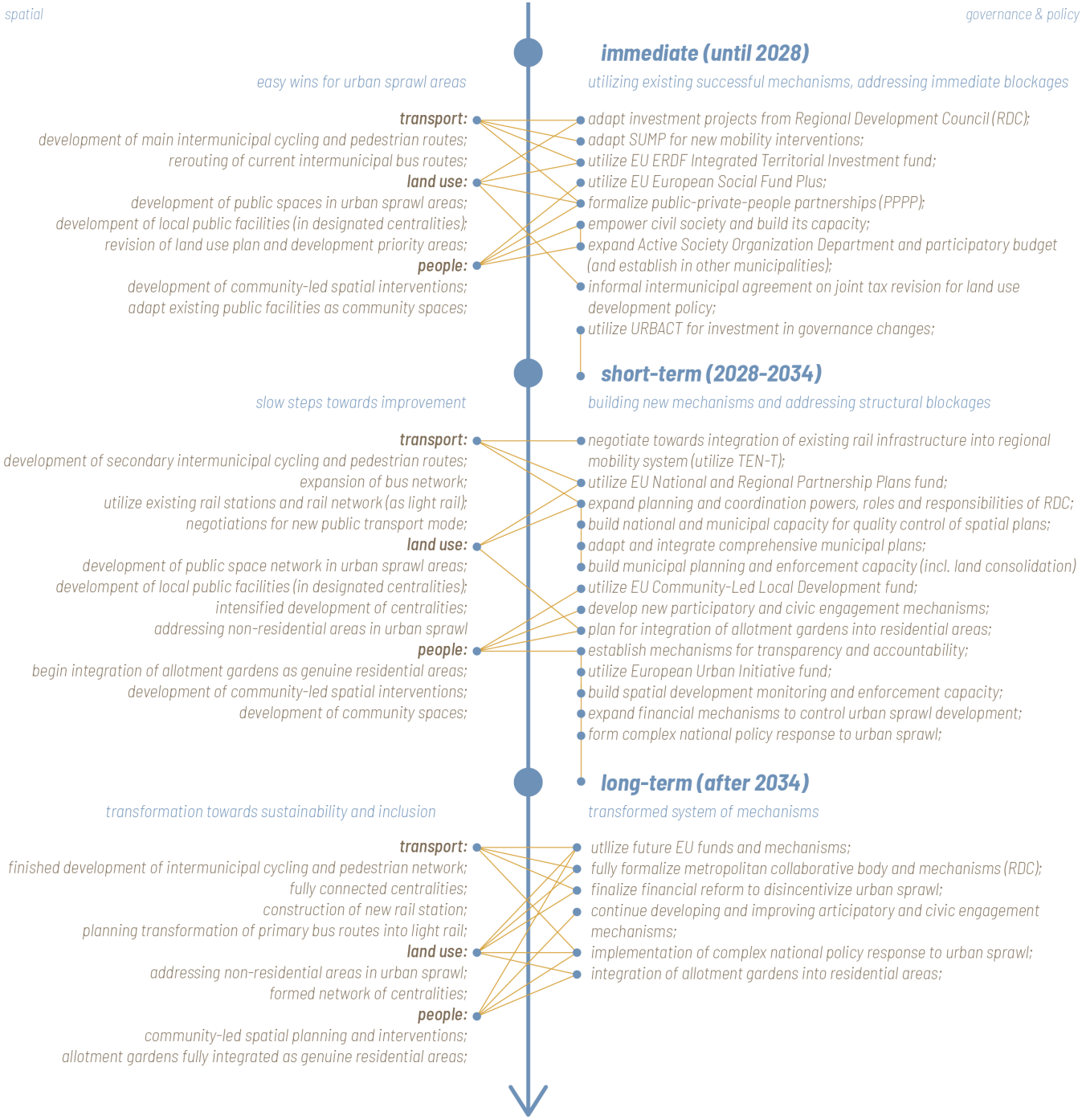
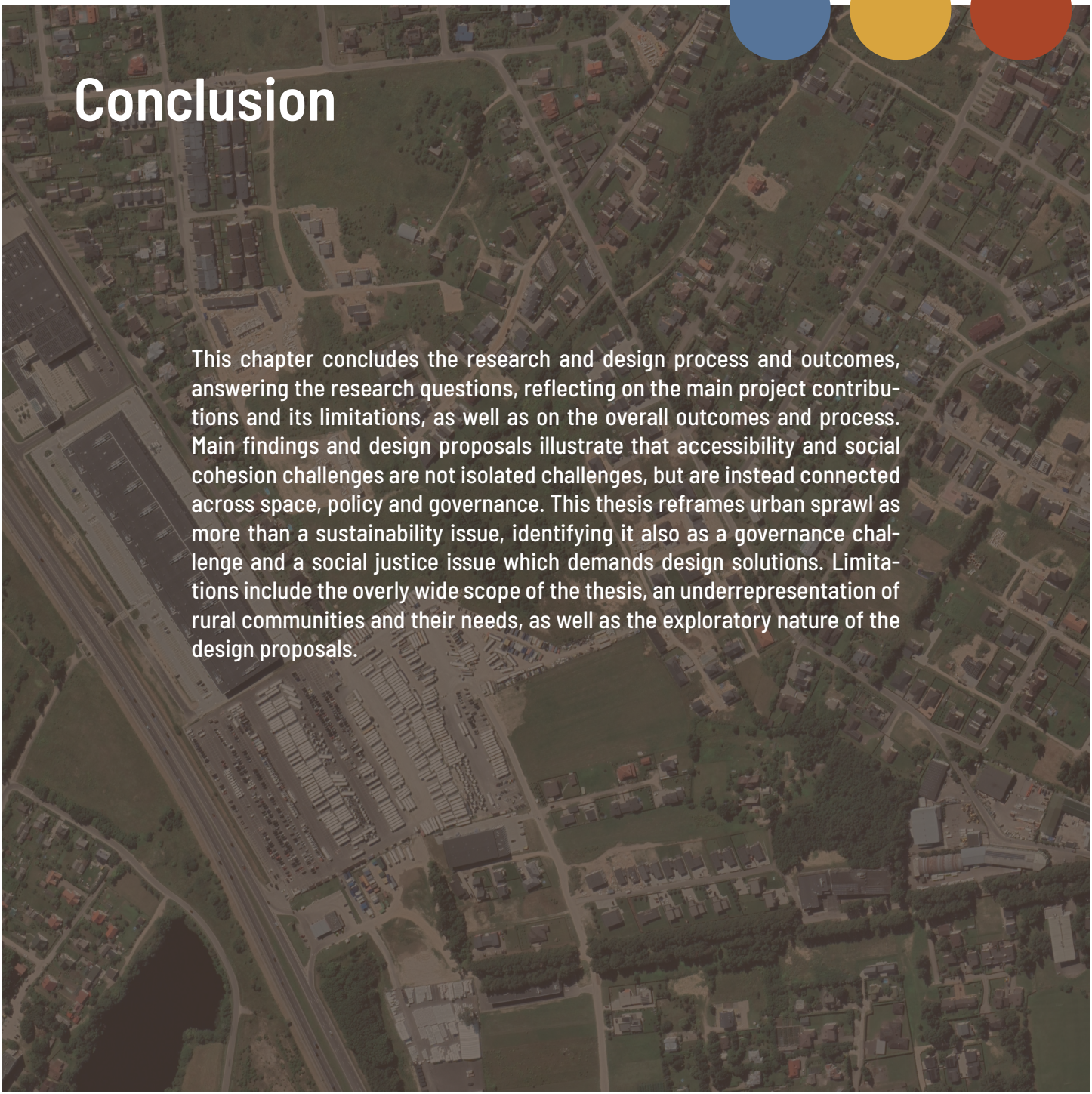


Figure 187. Policy and governance timeline and its spatial implications.

Conclusion



This chapter concludes the research and design process and outcomes, answering the research questions, reflecting on the main project contributions and its limitations, as well as on the overall outcomes and process. Main findings and design proposals illustrate that accessibility and social cohesion challenges are not isolated challenges, but are instead connected across space, policy and governance. This thesis reframes urban sprawl as more than a sustainability issue, identifying it also as a governance challenge and a social justice issue which demands design solutions. Limitations include the overly wide scope of the thesis, an underrepresentation of rural communities and their needs, as well as the exploratory nature of the design proposals.

Main Project Outcomes

The objective of this thesis was to answer the following research question utilizing a mixture of spatial analysis, literature review, expert interviews, fieldwork and research by design. An overview of the key insights can be seen in figure 188.

How can the improvement of **accessibility** and **social cohesion** through **spatial, policy and governance** interventions **mutually reinforce** each other in different **types** of **residential urban sprawl areas** in **Vilnius metropolis** (MP) to create more **inclusive** living environments?

Research & Analysis

SQ1: What are the different **types** of residential urban sprawl areas in Vilnius MP and how are they characterized?

SQ2: What (socio-)**spatial, policy and governance** configurations are associated with **(a) accessibility** and **(b) social cohesion challenges** (and benefits) in different types of residential urban sprawl areas in Vilnius MP?

Fieldwork

SQ3: What are the **local (a) accessibility** and **(b) social cohesion experiences, needs and preferences** of **diverse** residents in different types of residential urban sprawl areas?

Design

SQ4: What **spatial (a) accessibility interventions** can also strengthen **(b) social cohesion** in different types of residential urban sprawl areas in Vilnius MP? (**a -> b**)

SQ5: What **policy and governance interventions** for **(b) social cohesion** can also improve **(a) accessibility** in different types of residential urban sprawl areas in Vilnius MP? (**b -> a**)

SQ1:

What are the different **types** of residential urban sprawl areas in Vilnius MP and how are they characterized?

Due to the chaotic nature of urban sprawl in Lithuania, these areas can not be strictly categorized into typologies based on physical characteristics alone. Instead, their physical characteristics exist on a spectrum, with a large diversity and variation. At a regional scale, each urban sprawl area has its own unique quirks and characteristics, with variations in socio-demographics, transportation infrastructure, presence of amenities, topography and land use. Instead, urban sprawl areas can be best characterized by their development origin:
- Allotment gardens turned into residential areas;
- Subdivided and self-developed plots;
- Large-scale planned estates;
- Small-scale planned estates;
- Rural agricultural land conversions;

(based on Ubarevičienė & Burneika, 2020).

Different development types lead to certain spatial outcomes. For example, allotment gardens notably have more narrow roads and a lack of amenities. Meanwhile large-scale planned estates generally have basic infrastructure but remain car-centric and hostile at a human scale. However, within these development types there is also great variability, therefore these types cannot be generalized.

Importantly, understanding the development origin of the residential urban sprawl areas also provides meaningful insights for their administrative consequences. For example, allotment garden residential areas are formally illegal and characterized as agricultural land use, therefore municipalities are not responsible for providing infrastructure and services to these areas. Understanding these variations within urban sprawl areas in Vilnius region provides valuable input for answering the following sub-research questions.

SQ2:

What (socio-)**spatial, policy and governance** configurations are associated with **(a) accessibility** and **(b) social cohesion challenges** (and benefits) in different types of residential urban sprawl areas in Vilnius MP?

Overall, there is not a big difference in the types and scale of accessibility and social cohesion challenges in different types of urban sprawl areas. The challenges are interconnected across space, policy and governance dimensions, amplifying and reinforcing each other.

Research revealed that urban sprawl development in Vilnius region and its associated accessibility and social cohesion challenges are not the result of any single failure, but is instead the result of a deeply flawed structural mechanism in which different elements reinforce each other.

Spatial Challenges of Urban Sprawl

At the spatial level, the disconnect between market-driven residential development and infrastructure, facility and public space provision result in living environments which are unable to support the daily needs of individuals. Daily amenities are highly concentrated in the inner city and are almost non-existent in urban sprawl areas, which creates a need for long-distance commutes on a daily basis.

Combined with hostile conditions for pedestrians and cyclists, as well as unreliable and inconvenient public transport, this creates conditions which enforce car dependence on individuals and disincentivize local interactions through the absence of meeting places. Socio-spatial segregation further adds to the challenge, as the most vulnerable populations are also those which have the worst accessibility conditions. This overlap transforms inconvenience into structural social exclusion.

Urban Sprawl as Systemic Failure

Research revealed that the rapid and poor quality development of urban sprawl in Vilnius region is a structural failure.

In governance, there is a mismatch between formal responsibilities and real capacity at every scale. At the national level, there is poor coordination between ministries responsible for land use and transport policy, resulting in conflicting investments and development priorities.

In Vilnius region, urban sprawl has far outgrown the municipal boundaries and demands a regional response, but such a spatial planning level does not exist. Instead, municipalities are responsible for managing urban sprawl development, but lack the tools, financial resources and collaborative frameworks to do.

At the local scale, Elderships and Sub-Elders are supposed to represent local resident interests, but have no real powers, tools or mechanisms to do so. Self-organization of local communities through NGOs have filled in the local representation gap in some locations, but their collaboration with the municipality remains informal.

Research revealed that urban sprawl is also a policy problem. The financial system was revealed to incentivize urban sprawl by creating favorable conditions greenfield development and speculative investment, while removing the infrastructure financial burden from private investors and putting it onto the municipality.

At the same time, growth-oriented national funding for municipalities creates financial incentives to attract development regardless of quality or location, while disincentivizing intermunicipal collaboration necessary to address urban sprawl. On top of this, many of the existing policies or frameworks suffer from legal gaps, as well as monitoring, control and enforcement failure, making them less effective as tools for spatial planning.

SQ3:

What are the **local (a) accessibility** and **(b) social cohesion experiences, needs and preferences** of **diverse** residents in different types of residential urban sprawl areas?

Due to the limitations of the methodology, timeline, scope and capacity of this project, this question remains somewhat unanswered. Due to a self-selection bias, input on the needs and preferences of residents were primarily gathered from less vulnerable socio-demographics (i.e. newcoming urban, higher-educated, more financially stable Lithuanian residents). Unfortunately, attempts to get in touch with the more vulnerable urban sprawl residents (i.e. historical, rural-dwelling, lower-income minority populations) were unsuccessful. The small sample size and nature of the expert interviews are also significant limitations. This makes the gathered data unrepresentative and heavily biased to-

wards the needs and interests of the less vulnerable communities (see page X for elaboration of limitations). Nevertheless, significant insights on the needs and desires of the communities were gained from interviews with community NGO representatives and Sub-Elders.

Accessibility

Regarding facilities and land use, a major frustration was revealed to be the dependence on the inner city, which concerns the lack of daily services, educational facilities and public spaces, as well as the dispersal of existing facilities. Expert interviews revealed that these conditions result in low accessibility living environments which lack the meeting spaces needed to facilitate local interactions.

Expert interviews revealed that the mobility infrastructure in urban sprawl areas are seen as unsafe and inefficient. Patchy (or overall lack of) infrastructure and poor traffic organization were revealed to be major concerns for vehicles, pedestrians and cyclists. At the same time, the unreliability, inconvenience and limitations of the public transport network disincentivize residents from using it.

Interviews also revealed that the little infrastructure that does exist fails to bring individuals to relevant destinations. Local representatives expressed desire for the expansion of public transport, pedestrian and cyclist infrastructure, but explained that the road infrastructure needs major improvements as well. The hostile streets in urban sprawl areas reinforce car dependence and disincentivize local interactions, as residents actively avoid spending time on the streets, cycling or walking.

Social Cohesion

Interviews with local representatives (heads of commu-

SQ4:

What **spatial (a) accessibility interventions** can also strengthen **(b) social cohesion** in different types of residential urban sprawl areas in Vilnius MP? (**a -> b**)

The spatial accessibility interventions directly address limitations revealed in the expert interviews, fieldwork and spatial analysis. A zoom-in into South-East Vilnius demonstrates how the design approach, priorities and principles could be applied in a specific context.

Centralities as Meeting Place

The proposal to create local centralities addresses the lack of local meeting places and the frustration around the dependence on the inner city. Having compact, mixed-use and walkable centralities which provide local amenities, public spaces, public services and community spaces can both improve local accessibility and facilitate local interactions.

Crucially, the design proposes to create a hierarchy of interconnected centralities of various scales. This enables some facilities to be brought closer to home and creates localized meeting places which can further enhance horizontal interactions. At the same time, connecting the centralities through active mobility and public transport routes ensures that residents have access to a diversity of opportunities and choices, while also connecting individuals with different socio-demographics and lifestyles.

Specific design interventions, such as having an active ground floor, utilizing public land for public space and mixing public land use functions can help achieve the development of lively local centralities.

Mobility for Interactions

In terms of transportation, the problem for urban sprawl areas is that the environment remains highly car-centric and hostile. To encourage people to spend more time in public spaces, it is necessary to reduce car dependence by developing attractive pedestrian, cycling and public transport infrastructure.

Crucially, this development needs to be connected to relevant destinations, namely the newly developed centralities. This development should bring people out into the streets and out of their cars, as well as concentrate them in meeting places – all favorable conditions for facilitating local interactions.

Specific spatial interventions, such as connecting dead ends to split up blocks, enforcing one-way car traffic in residential areas and diverting car traffic from centralities can help achieve a mobility network which is more pedestrian and cyclist friendly.

Barriers & Socio-Spatial Segregation

In the case of South-East Vilnius, there is a socio-spatial divide between urban sprawl areas, as major physical barriers (i.e. railway, municipal border, extensive undeveloped land) separate less vulnerable socio-economic groups from more vulnerable ones. To address this, the design proposes to transform the physical barriers into destinations by utilizing synergies between residential urban sprawl areas and other land use functions (e.g. agriculture, wetlands or industrial areas), while mitigating conflicts. These environments must remain highly permeable by ensuring pedestrian, cyclist and public transport infrastructure.

SQ5:

What **policy and governance interventions** for **(b) social cohesion** can also improve **(a) accessibility** in different types of residential urban sprawl areas in Vilnius MP? (**b -> a**)

The proposed policy and governance interventions have two layers: addressing structural causes of urban sprawl and strengthening vertical interactions. The reason for this is that, in order to strengthen individual-institution interactions, the governance and policy system must also address its own structural dysfunctions and limitations. Otherwise, any participatory processes or local empowerment initiatives risk being tokenistic, unproductive and ineffective, which may cause more harm than good to social cohesion in these areas.

Addressing Structural Causes

The first one targets the structural challenges which have created the conditions for the development of such poor quality and underserviced residential urban sprawl areas. An overview of the recommendations for systemic changes can be found in fig. X. Addressing these systemic limitations can prevent further development of such urban sprawl, while also creating the conditions to address their accessibility and social cohesion challenges. The proposed interventions are not a menu of possible solutions, but instead a proposed system of different elements which must work together in order to properly address the urban sprawl challenges.

Strengthening Vertical Interactions

The second governance and policy layer directly addresses the interactions between the individual and the institution (social cohesion). The primary objective here is to strengthen civil society at the local scale by

providing residents with the necessary tools, resources and knowledge, while also creating mechanisms for people-public-private partnerships (PPPP). Strengthening these mechanisms will increase local resident participation in spatial planning and decision-making processes, which should better address local accessibility needs and challenges.

Timeframe

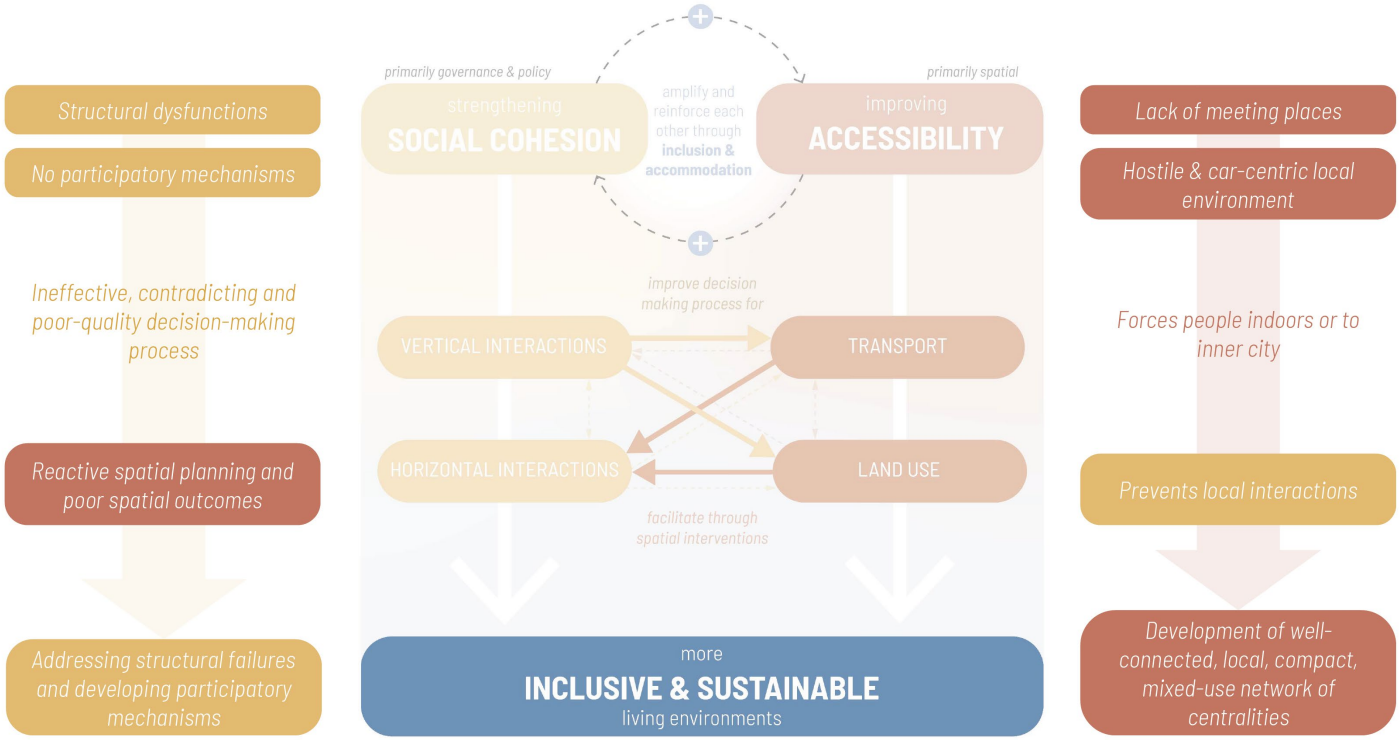
In the immediate timeframe, it is already possible to utilize and expand existing successful governance and policy mechanisms (e.g. utilizing the EU ERDF Territorial Investment Fund to invest into the development of intermunicipal cycling infrastructure, or expanding the participatory budget to give more power to local communities). This can result in quick, easy wins for residential urban sprawl areas.

In the short-term, new structural mechanisms have to be built, and structural blockages must be addressed. For example, building institutional capacity for quality control and enforcement is necessary in order to address the vertical and horizontal mismatch in (national, municipal and detailed) comprehensive spatial planning. Alternatively, the establishment of transparency and accountability mechanisms in spatial planning is necessary to ensure resident access to information and to build trust between people and institutions.

The long-term perspective must build towards a systemic shift which also enables urban sprawl areas to transform into more sustainable and inclusive living environments. This includes the legal integration of allotment gardens into residential areas to ensure just and equitable access to facilities, mobility and opportunities, as well as the formalization of a metropolitan collaborative body for intermunicipal spatial planning.

Crucially, most of the proposed governance and policy changes can be supported through EU funds, frameworks, partnerships or mechanisms.

Figure 188. Overview of key insights in relation to the initial conceptual framework.



Main Project Contributions

On Urban Sprawl

In the European context, urban sprawl areas represent a significant part the urban fabric and cause many challenges for sustainability, social inclusion and justice. However, they have been systematically under-addressed in urban research and design, which generally focuses on dense and compact urban cores. Notably, urban sprawl in post-socialist Europe differs fundamentally from the traditionally better researched Western context. Major differences exist in terms of causes, consequences, characteristics, pace, institutional conditions and societal dimensions. Therefore, this thesis investigates the post-socialist European context of urban sprawl by exploring the case of Vilnius region. This thesis directly responds to these gaps by building knowledge on urban sprawl conditions, causes and consequences, as well as offering possible solutions.

In addition, by focusing on communities and residents of urban sprawl, the thesis frames urban sprawl as more than an economic, land use or environmental issue, but also a justice and inclusion challenge.

On Vilnius, Lithuania & The Post-Socialist Context

For Lithuania particularly, this thesis provides a comprehensive spatial, governance, policy and social analysis of the urban sprawl conditions in Vilnius region, combining spatial analysis, expert interviews, fieldwork and literature reviews into an integrated body of knowledge. In particular, the governance and policy analysis, which combines diverse local expert interviews with literature reviews, provides entirely new and valuable insights into the structural dysfunctions causing urban sprawl in Lithuania.

However, the challenges documented in Vilnius (rapid, market-driven urban sprawl, weak regulatory frameworks, fragmented governance systems and a weak civil society) are not unique to Lithuania but are also present in other post-socialist (or post-communist) European cities. Poland, Latvia, Estonia and other Central and Eastern European countries have all been dealing with similar development directions and challenges. Therefore, the methodological approach, the spatial, policy and governance findings, as well as proposals based on EU structures mechanisms all offer transferable valuable insights to other comparable post-socialist European cities and countries.

On Accessibility & Social Cohesion

Distinctly, this thesis integrates the topic of accessibility with social cohesion, which in research has been generally studied separately. By studying how accessibility impacts social cohesion through spatial and transport planning, and how social cohesion impacts accessibility through policy and governance, the thesis demonstrates how these dimensions are interconnected. The thesis also demonstrated that the current negative feedback loop between these two dimensions could be turned into a positive one, in which accessibility strengthens social

cohesion, and vice versa. These reframing advances urban planning, design and policy towards a more holistic and integrated approach.

Findings revealed that a lack of facilities, public spaces and safe active mobility infrastructure enforces dependence on the inner city for daily amenities and meeting places, while offering no real alternative in the local area. This disconnects individuals from their local environment and discourages local interactions.

At the same time, structural flaws in policy and governance result in a weak institutional system which is unable to guide and control development. The lack of a regional planning tier, a financial system that rewards urban sprawl development, a weak regulatory framework which is unable to enforce formally existing tools, and a community engagement system which offers representation without empowerment – all of these systemic failures compile into an environment which makes rapid, poor-quality and underserviced urban sprawl development easy.

On Triangulating Knowledge

This thesis shows the importance of combining different forms of analysis and demonstrates the importance of local knowledge to ground theory and academic knowledge in reality.

The approach of this thesis triangulates quantitative and qualitative spatial analysis, expert interviews, fieldwork observations and literature reviews, observing the same topic from different angles. This made it possible to compare, confirm, nuance or challenge insights and knowledge to form a full picture.

Especially fieldwork and local knowledge showed revealed information that would have never been found in literature reviews or spatial datasets. Interviews with diverse local representatives and experts (municipal officials, transport authorities, researchers, sub-elders and NGO representatives) revealed complicated informal relationships between municipalities, institutional frustrations and limitations, as well as the lived experience of local experts, all of which are invisible formal documents. Without these interviews, the spatial analysis and design would have remained superficial, while the complex structural failures of the governance and policy system would have remained invisible.

On Design & Policy Relevance

Building on research findings, the thesis provides actionable spatial design proposals, as well as governance and policy recommendations and interventions which are applicable directly to Vilnius region. In this regard, this thesis not only identifies core problems, but also offers actionable, concrete solutions for transformation which various stakeholders can immediately and directly engage with.

Key spatial proposals include the development of walkable local meeting places and connecting mobility development to meaningful destinations. Policy and governance interventions propose a direct revision of the systemic failures in the financial and procedural system. At the same time, the establishment of a regional and local collaborative planning bodies is proposed. The proposals connect to EU mechanisms, funding schemes and frameworks to enable a more immediate and feasible transition.

Project Limitations

Data & Methodology

The data used for spatial analysis and urban sprawl area definition in Vilnius region remains flawed. Due to the limited availability of data, outdated and possibly inaccurate data has been used in the analysis. There is concern for the outdated land use data from CORINE Land Cover (from 2021) and population census data (from 2021 and possibly does not accurately represent reality) used in the definition of urban sprawl areas. Data cleaning partially helped mitigate these challenges, but the accuracy limitation remains.

The limited data availability also weakened the value of the space syntax analysis, which used road infrastructure for analysis on local accessibility (radius of 1km), producing flawed results. Conducting local space syntax analysis specifically with pedestrian and/or cyclist infrastructure would produce more accurate and valuable insights for local accessibility analysis.

In addition, the methodology used to define urban sprawl areas requires revision and is up for debate. The question of whether rural villages being consumed by urban development deserve to be constituted as urban sprawl remains unresolved. This raises questions about the physical boundaries of the study scope of this thesis and may affect the validity of the spatial analysis and design outcomes.

Representativeness & Bias

The expert interviews and spatial analysis remain biased towards Vilnius City Municipality. Few Vilnius District Municipality or Trakai Municipality representatives responded to the outreach for an expert interview compared to Vilnius City Municipality. At the same time, Vilnius City Municipality has significantly more comprehensive spatial (and non-spatial) data publicly accessible online compared to other municipalities. Because of this, there is an underrepresentation of regional municipalities in the analytical phase.

Another key limitation is the fact that this thesis identifies the tension between newcoming and historical resident communities as a major challenge. However, the interviews only engaged with the newcomer community representatives. The perspectives, needs and experiences of the historical residents (incl. rural ethnic minority groups) remain absent from the analysis. The thesis makes generalized assumptions about the needs of these residents, but it is entirely possible that the assumptions and design proposals are out of touch with reality.

In addition, the voluntary approach to arranging the expert interviews introduces a self-selection bias. This means that the interviews paint a picture which is likely more biased towards active, passionate and successful community groups. Because of this, it is possible that the capacity and activity of civil society in Vilnius region

has been overstated in the context of this thesis.
Finally, the expert interviews did not form a representative sample of stakeholders. This is due to the limited number of interviewees (13 individuals) and the fact that the interviews did not cover all of the main relevant stakeholders (such as private developers, national government officials, regional municipality stakeholders).

Conceptual & Framing Challenges

Throughout the project, the concept of social cohesion has gradually departed from its initial theoretical definition. Initially focusing on individual-individual and individual-institution interactions, the analytical process has gradually shifted the focus more towards institutional systems and interactions. This is something that was necessary as a response to the realities that were revealed in the expert interviews. However, this means that the initial conceptual framing is weakened and possibly requires reframing.

At the same time, the accessibility dimension receives much more analytical and design attention in this thesis compared to social cohesion, despite the conceptual framework positioning them at an equal level. Because of this, the social cohesion dimension of the thesis remains more speculative compared to accessibility.

Scope & Depth

By attempting to address accessibility, social cohesion, spatial conditions, policy and governance all at the same time, this thesis addresses all of these topics at a surface level. In this regard, the wide scope of this thesis is both its strength and its weakness, as many of the addressed topics lack analytical depth and remain only partially resolved. Each topic (and combination of topics) could be an in-depth research and design project in its own right.

The governance and policy analysis identifies main conflict areas and structural failings, but lacks the depth to position the findings within the broader policy and governance context. More in-depth analysis and clarification is needed before the conclusions could be made with confidence. The proposals for policy and governance also remain surface-level, lacking the depth, comprehensiveness and positioning in the broader system. The potential conflicts and unintended consequences of the proposals remain only partially addressed, therefore needs more targeted analysis and design.

As for the spatial design, its proposals remain exploratory, surface-level and heavily based on current urban design and planning trends (compact, transit-oriented development, mixed-use, walkability, etc.). While these are appropriate responses to the spatial challenges in urban sprawl, they do not fully engage with the unique local nuances, character and history of Vilnius and its periphery, as well as the Lithuanian (urban) culture. Because of this, the design proposals risk being context insensitive and failing to respond to the real needs of residents. Further development and iterations are needed for the design to be fully developed, robust and comprehensive in addressing the identified challenges and target goals.

Reflection

On Planning vs. Real Process

The research and design process went off-track almost immediately after the planning was made for the A1. The research chapters kept expanding, as the analysis kept getting more in-depth and covering increasingly more components. While this produced highly valuable insights, it also resulted in insufficient time left for the design phase. The scope and depth of this phase had to be significantly reduced.

There are two reasons for this mismatch in planning. Firstly, the large scope of the thesis proved to be too ambitious for the existing timeframe. The planning left little space for flexibility and unexpected blockages. Secondly, the inherent nature of the research and design process demands flexibility and adaptability throughout the process. An approach that seems at the beginning of the project may prove to be completely unfitting with the new knowledge gained throughout the process. An example that clearly illustrates this is that of the expert interviews – the divergence from the initial definition and approach to social cohesion proved necessary considering the new knowledge on the structural governance and policy systems that produce its dysfunction.

Despite the mismatch between planning and process, the core research objectives were achieved, and the main research question (and sub-research questions) were answered sufficiently, proving that the analysis and design process does not have to be linear as long as the end objectives are clear.

On Research Process

Governance and policy analysis was an entirely new field for me, and the difficulty of synthesizing and drawing meaningful conclusions from all of the research findings proved to be more challenging and time-consuming than anticipated. Expert interviews presented a similar challenge, as every small detail shared by interviewees seemed crucial and unfair to exclude, making it difficult to draw meaningful conclusions. Despite these challenges, engaging with governance, policy and expert interviews has been an incredibly valuable learning experience, broadening my understanding of how people and the systems that they produce impact spatial development. The expert interviews additionally showed the value of grounding projects in local knowledge and fieldwork, as without them the governance and policy analysis would have remained superficial.

On Design Process

Due to the intensive research phase and difficulty concluding the main findings, the design process was much shorter than it deserved to be. After two quarters of rigorous analysis and gathering knowledge, it proved incredibly difficult to design, it felt as though that skill had been lost.

The initial attempt to perfect every design and visualization that I produced resulted in significant time lost

in the design phase. Becoming stuck on a single scale map and trying to make the design immediately bullet-proof prevented me from moving forward and further developing the design. The eventual realization of this inefficient tendency forced me to instead jump between scales and develop ideas and designs up to 80% before moving on. This allowed for different scales to inform each other, providing a much more effective and efficient approach.

Surprisingly, an important part of the design outcome was the design approach itself. The chaotic, fragmented and illogical nature of urban sprawl resisted the conventional design approach, and instead required a process of reflective engagement, and the deconstruction and reorganization of its elements.

On Research & Design Dynamics

The relationship between research and design differed between spatial, policy and governance components. The governance and policy analysis pointed to specific structural failings, which allowed for a problem-solution approach. Spatial design of urban sprawl areas proved to be more complicated, as the research findings did not point to clear and specific spatial solutions, and the difficulty to apply conventional design principles to urban sprawl areas demanded a more reflective approach.

Because of this, research by design proved to be the most productive approach for spatial design in urban sprawl areas. Having clear objectives in mind, but moving between scales, testing ideas and trying out different angles enabled the design process to produce knowledge about the kind of design approaches urban sprawl areas respond well to, namely the deconstruction and reorganization of different spatial components.

The triangulation of diverse methods (literature review, spatial analysis, expert interviews, research by design) produced highly valuable insights connecting spatial, policy, governance and societal dimensions which no methodology could produce by itself.

On Sustainability in Design Outcomes

Based on the conceptual framework, the thesis aimed to utilize interventions in accessibility and social cohesion (in governance, policy and space) to transform urban sprawl areas into more sustainable and inclusive living environments.

The South-East Vilnius spatial design of urban sprawl areas tries to balance between improving conditions for urban sprawl residents, while avoiding further greenfield development. This was proven to be highly challenging, as the half-developed character of urban sprawl areas is also one of its core problems.

The design proposes some level of greenfield development but tries to keep it to a minimum. Emphasis is placed on infill and compact development, walkability, cycling and public transport improvements to reduce car dependence. As a whole, these developments should push urban sprawl areas towards becoming more sustainable – not only environmentally (less emissions and land use change), but also economically (more financially efficient infrastructure development and maintenance) and socially (more just and equitable opportunities).

One major limitation concerns the development of new accessibility infrastructure encouraging further greenfield development. In particular, the establishment of a new rail station in Nemėžis, which is at the edge of the proposed urban sprawl containment area, may potentially generate more urban sprawl and greenfield devel-

opment, which the design aims to contain.

On Inclusivity in Design Outcomes

The initial theoretical framework defines social inclusion as the right to challenge the currently existing structural inequalities and injustices in urban environments. This means addressing social segregation in urban environments, but also facilitating engagement, discussion and reflection on the existing inequalities and injustices in the urban environment and development process. Crucially, the definition concerns urban environments, which does not necessarily accurately apply to urban sprawl areas, where urban and rural environments meet.

In this regard, the proposed designs raise major unresolved questions regarding inclusivity. While the design improves accessibility and autonomy for residents as a whole, it is inherently biased towards urban lifestyles and users, and may not reflect the genuine needs or desires of the historic communities, which are older, more rural and predominantly Polish.

The proposed centralities, densification and infill development risk gentrification, displacement and possibly marginalization of the very communities that the thesis attempts to include. In addition, the proposed design fails to address the rural needs and lifestyles of these communities, which are likely entirely different to that of the urban communities. The possible difference in lifestyles raises a crucial question of whether integration is desired by these communities in the first place. Because of this conflict, it is also genuinely questionable to what extent the design proposals will enhance social cohesion. The proposal risks amplifying existing conflicts and inequalities by failing to clearly identify and address the needs of the rural populations.

As for the policy and governance proposals, they should eventually produce better spatial outcomes by slowing down urban sprawl and improving the decision-making process. However, the proposals carry a risk of unintended consequences for social justice and inclusion, therefore need to be treated with caution. For example, the proposed land consolidation mechanism may make small land owners and rural residents even more socially vulnerable than they are now. Alternatively, the establishment of a regional collaboration authority may produce a technocratic body which produces a more top-down spatial planning approach which fails to address local needs and sensitive social issues.

On Personal Insights

Throughout the research and design process, I cared deeply about giving this thesis my all and doing it as well as I possibly could. This resulted in a perfectionist-oriented approach which created both challenges and benefits. On one hand, it allowed for rigorous analysis which produced highly valuable insights. However, it also often resulted in difficulty to see the bigger picture and to make meaningful conclusions, as well as spending excessive time on details which did not add much to the value of the project. For future reference, it is necessary to be mindful about the potential pitfalls of this approach and aim to avoid them. An effective way that I found to address this is to force myself to finish reaseaching, writing or visualizing not at 100%, but at 80% and then moving on.

The choice to engage with completely new methods (namely policy/governance analysis and expert interviews) was a risky approach which ultimately paid off very well. These methods produced possibly the most valuable insights of the entire thesis, and painted a more nuanced and multidimensional understanding of urban

sprawl as an urban challenge. It also gave me valuable new skills and knowledge which will advance my future work and understanding of urban systems.

A major challenge of this thesis was the width of the scope, which proved to be both its main strength and its weakness. It allowed to develop the bigger picture of urban sprawl and its associated social cohesion and accessibility challenges, causes, consequences and characteristics, connecting complex dynamics, relationships and spatial outcomes. At the same time, it prevented any single dimension from being addressed comprehensively and in-depth, particularly in the design chapter. It also caused major challenges in organization, management and prioritization, especially considering the given timeframe of this thesis. Ultimately the scope of this thesis deserves more time for further and deeper exploration, as well as integration.

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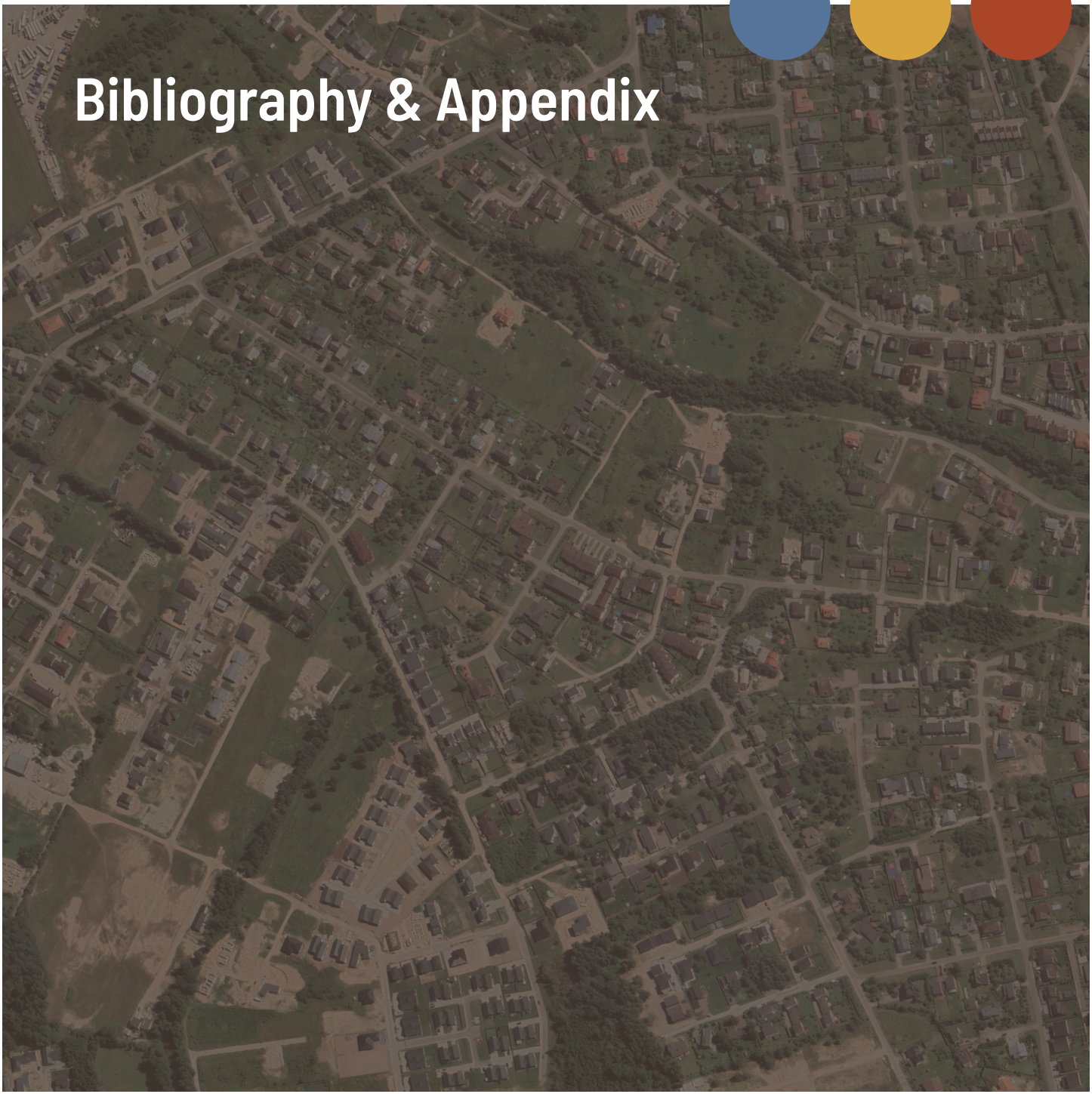

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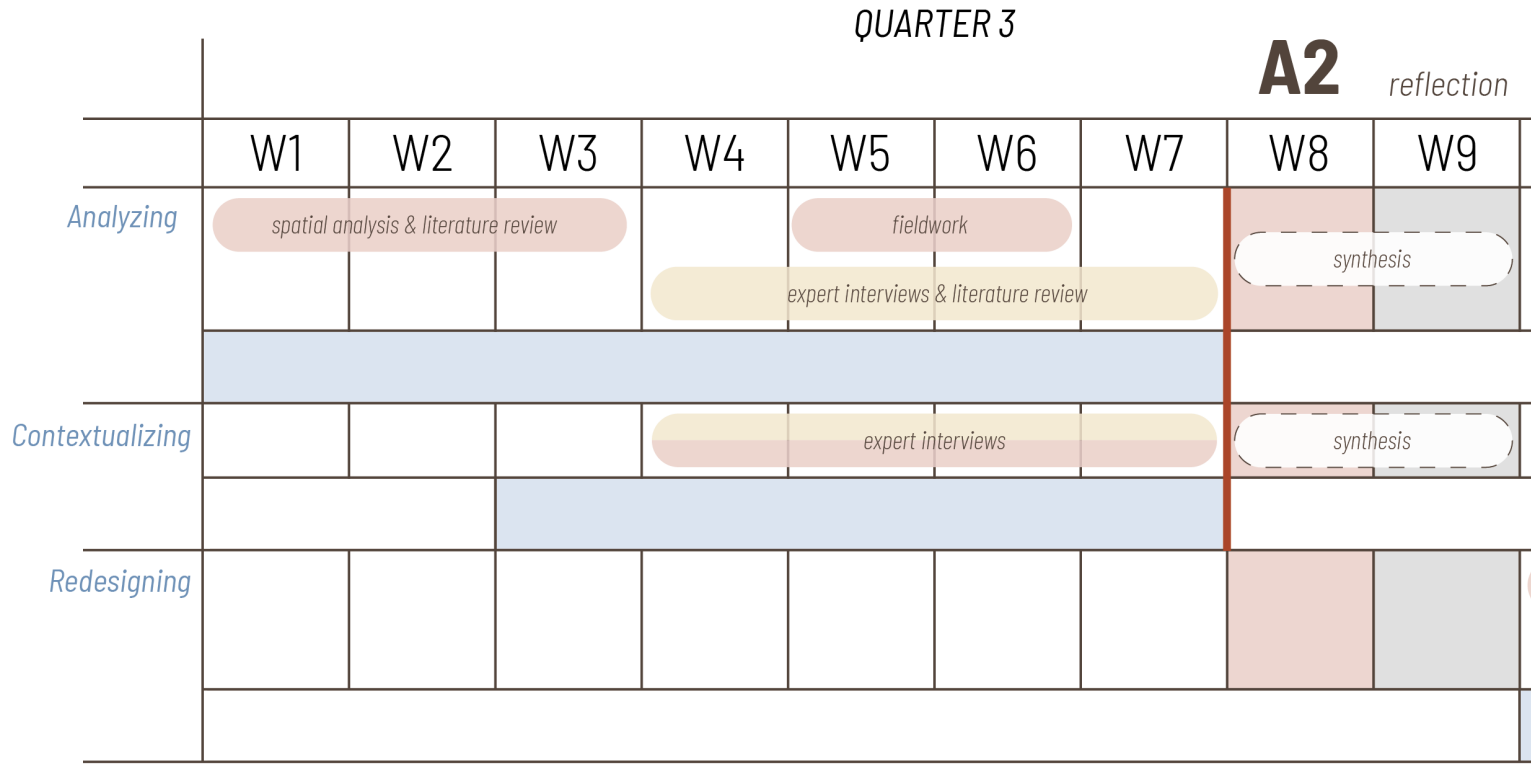
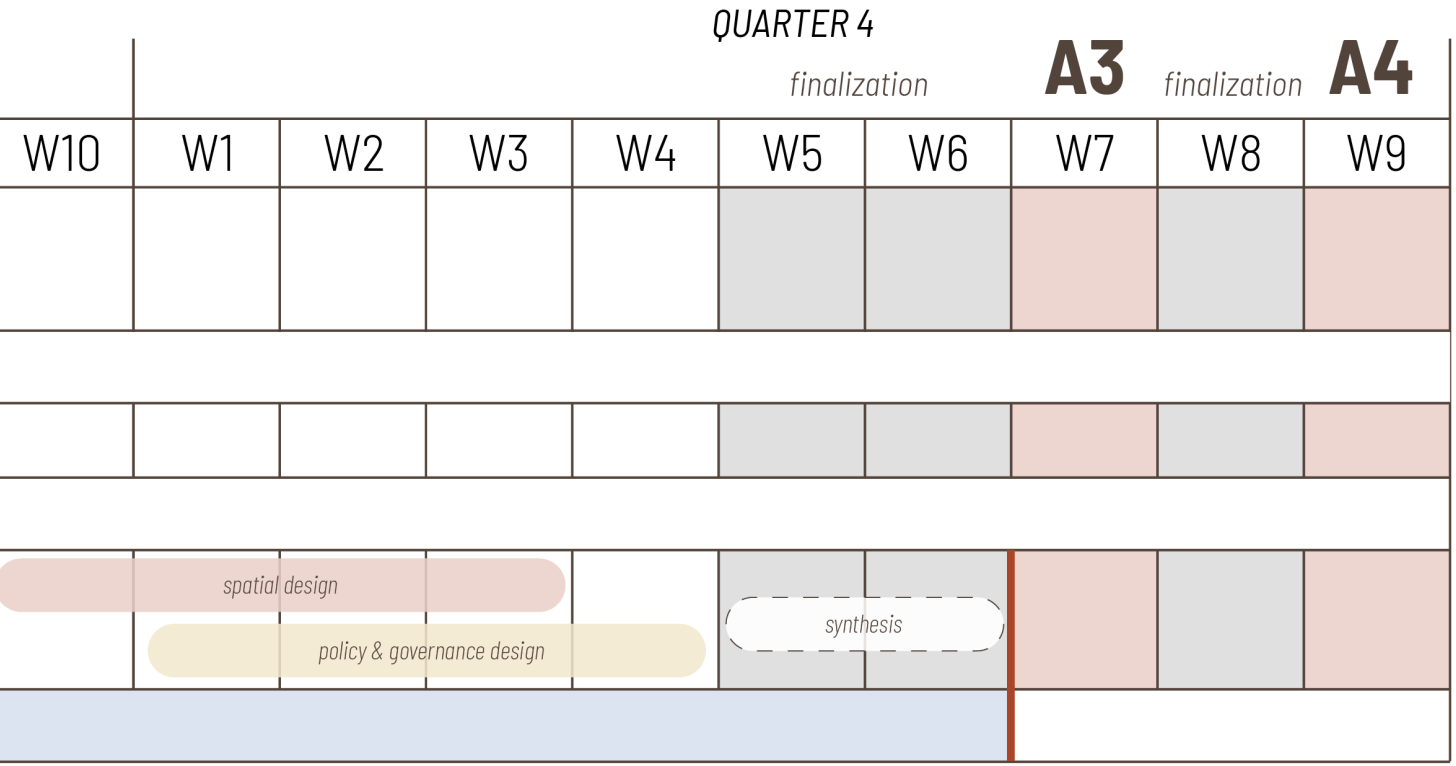
Appendix I. Project methodology timeline.




QUARTER 4
finalization
A3
finalization
A4
W10
W1
W2
W3
W4
W5
W6
W7
W8
W9
spatial design
policy & governance design
synthesis

Appendix II. List of main spatial planning and development tools.

European Union

Name	Type	Description
EU Nature Protection Framework (Natura 2000)	Legal and spatial framework	Strict limitations on construction and development in ecologically sensitive locations. Major Natura 2000 territories in and around Vilnius.
EU Cohesion and Structural Funds	Funding scheme	EU funding conditions directly shape development outcomes. Until 2020 much of these funds were disproportionately used for developing road infrastructure, but since then the fund primarily supports development of sustainable transport. Regional Development Council primarily exists to access these funds.

National

Law on Territorial Planning	Legal framework	Foundational legal framework for all spatial planning in Lithuania. Defines the hierarchy of spatial planning documents, participants and procedures of the planning process.
National Territorial Planning Norms	Legal framework	Standards for controlling urban sprawl quality (e.g. minimum/maximum density thresholds, green space requirements). Currently based on 15-minute concept and legally binding for planning documents and developers. Updated in May 2026 for more detailed differentiation between different types of built-up areas, now explicitly differentiating urban sprawl areas.
National Comprehensive Plan	Spatial development plan	Main national territorial spatial plan defining development vision, spatial structure, mandatory land use allocations. Legally binding and superior to other lower-level plans. Directs infrastructure investment, determines Free Economic Zones and urban center hierarchies. Land use and transport contradiction - prioritizes compact built forms, but also road infrastructure investment (especially for freight transport and paving of dirt roads). Lacks monitoring for realization.

Regional

Vilnius Regional Development Plan 2022-2030	Strategic development plan	Socio-economic regional strategic development plan adopted by Vilnius Region Development Council (including ALL municipalities in Vilnius region). Aimed to get EU funding, prioritizes sustainable development (infrastructure, economic, social cohesion, education, environmental). Not a spatial plan, but instead sets investment priorities and project developments (see fig. X).
Strategy for the Vilnius Functional Zone 2024-2029	Strategic development plan	Strategic document defining intermunicipal cooperation in work, knowledge and organisational resources, specifies joint use of developed projects. Signed by all municipalities in Vilnius region, excluding Vilnius City Municipality. Prioritizes tourism, education and creative industries. Targets EU funding (see fig. X).

Vilnius City Sustainable Development Strategy 2024–2029	Strategic development plan	Parellel to the Strategy for the Vilnius Functional Zone, adopted seperately by VCM with TM and VDM. Prioritizes VCM spatial development agenda (15-minute city and sustainable mobility), focuses investments towards improving access to education, public spaces, services and healthcare in border areas in order to improve the living quality. Targets EU funding (see fig. X).

Municipal

Municipal General Plans	Land use plan	Main land use planning document at municipal level. Defines functional zoning, build-up intensity, height requirements and infrastructure priorities. Legally binding for lower level documents. Ordered from private consultancy teams through public tenders. Systemic problems: absence of quality control leads to overestimation of development land, bias for narrow interest group and sometimes contradiction between municipalities (at borders). Notably difficult to update.
Vilnius Sustainable Urban Mobility Plan (SUMP)	Spatial plan and strategy	EU-initiated planning instrument, requires cities to develop integrated sustainable mobility strategies. Vilnius SUMP implementation primarily focuses on the inner city. Provides some transport–land use coordination, but the disconnect remains significant in planning.
Municipal Infrastructure Development Fee	Financial instrument	Enables municipalities to charge developers fees towards public infrastructure development. Established in 2021, before then the municipalities had to cover all infrastructure costs while getting none of the tax benefits . Usability and effectiveness is limited due to lack of coordination with surrounding municipalities - developers just build across the border.
Real Estate Tax and Land Tax System	Financial instrument	Enables municipalities to set real estate and land tax rates (within legal bounds, generally low rates). Taxes based on official appraisal values which are significantly lower than market values. Tax goes directly to national government. Systemic failure enables speculative investment and fails to create disincentive to not develop peripheral land. 2026 real estate tax reform shows genuine effort to tighten taxation system: lower exemption threshold, progressive taxation, improved valuation system. Too early to see impacts on urban sprawl.

Neighbourhood / street

Detailed Local Plans	Land use plan	Detailed planning documents for specific areas. Determine precise land use, building measurements, road layouts and infrastructure requirements. Provides the most direct power for imposing development requirements for developers. Power weakened in 2014 reform allowing for development without detailed plan, but decision partially reversed in 2021 reform.
Special Plans	Specialized spatial plan	Planning document determining the use, maintenance and/or protection tools for specific purposes (such as cultural heritage or engineering infrastructure). Determine specific requirements and regulations which complement the general and detailed plans. Provides legal basis for allocating private land to be taken for societal needs (e.g. for infrastructure development), but does not give the right.