

ME100+

Proceedings of the conference
2024



ME100+

9th annual
student
scientific
conference on
economy at
the scale of
a city or region

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The conference took place at the Centre for Architecture and Urban Planning on 21 and 22 November 2024. The conference project entitled *MĚ100 Student Research Conference on Economy at City or Regional Scale* is supported by CTU grant 54/24/F5.

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Doc. Ing. arch. Jakub Vorel, Ph.D.

Ing. arch. Vít Řezáč

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Marie Lišková, Dis.

Other institutions:

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Ing. David Mazáček, Faculty of Finance and Accounting UEB Prague

Ing. Sylva Jablonská

Translations

Sylva Jablonská

MĚ100 for the ninth time

The MĚ100 conference thematically links spatial planning with the economy. The conference, organized by the Faculty of Architecture of CTU in cooperation with eight other universities, took place in Prague on 21 and 22 November 2024 and was held in a combined mode: with participants personally presented and connected online. The audience was from all over the country, one quarter from abroad. The papers were divided into two sessions: the first featured presentations by PhD students, the second featured papers of invited guests.

The aim of the conference

We open a topic that is seldom discussed in the context of spatial planning in central Europe. We would like to explore the connection between urban and regional planning and the economics. Since 2016 we invite every year academics from various universities and professionals in this field and moderate a discussion in an open forum with PhD students.

The conference concept

The conference combines presentations of PhD students' work with conference papers of invited experts, allowing for a scholarly and scientific debate and engagement to occur. To this end, the organizers invite professionals that work outside of the academic sphere: municipal representatives, especially those in departments responsible for the budgets of towns and regions; representatives of banks involved in financing public construction projects; or experienced managers of private sector interested in co-operation between public and private sector.

The attractiveness of the conference is underlined by the traditional use of the inspiring space of the Centre for Architecture and Urban Planning (CAMP) in Prague and the involvement of the professional streaming company Film CZ.

Around 90 people registered for the ninth edition, about a quarter of them from abroad. The entire conference was held in English without interpretation.

The focus of the conference is on the presentation of papers by young PhD students whose research work deals with urban and regional planning in relation to the economy. After a certain increase of these papers in the past years, the number of papers has decreased due to the new restrictive policy of Czech universities. The decrease was compensated by the interest of foreign universities in cooperation on the issue: three out of four PhD students were foreign this year.

The conference is annually enriched by lectures of foreign and domestic experts from practice. **Prof. Maciej Nowak**, a lawyer from the West Pomeranian Technical University in Szczecin, presented the results of an extensive international study involving a comparative analysis of the legislation in the field of spatial planning in the countries of Central and Eastern Europe. **Markéta Šimáčková** shared her experience from the real estate environment and planning practice in the Czech Republic. The unpreparedness of the territory and the lengthy permitting process reduces the attractiveness of the Czech Republic for foreign investment. **Prof. Alexandru Petrisor**, Director of the Doctoral School of Spatial Planning from the Ion Mincu University of Bucharest, discussed the different approaches used to assess the level of territorial development from a spatial planning perspective. The use of geographic information systems plays an important role. **Associate professor Petr Tománek** from the Faculty of Economics of the Technical University Ostrava in his contribution revealed to the audience the management of municipal associations. On the basis of the findings, the abnormally high number of self-governing municipalities in the Czech Republic compared to other EU countries makes space for deeper coordination among small municipalities. **Milan Dont**, Director of the Section of the State Transport Infrastructure Fund, in his last contribution informed the participants about the Fund's view on the state's transport policy.

A recording of the conference is permanently available for viewing on the conference website www.me100.info.

Supporting universities:

*The Bartlett School of Planning (UCL),
London*

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*Czech Technical University in Prague, Fac-
ulty of Civil Engineering*

*International Real Estate Business School,
Universität Regensburg*

*"Ion Mincu" University of Architecture and
Urbanism, Bucharest*

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*Prague Institute of Planning and Develop-
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*Prague University of Economics and Busi-
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*The Association for Real Estate Market Devel-
opment (ARTN)*

*Prague University of Economics and Busi-
ness, Faculty of Finance and Accounting*

The Association of Developers (AD)

Faculty of Architecture CTU Prague

doc. Ing. arch. Jakub Vorel, Ph.D.

Head of the Spatial Planning Department

The conference ME100 was initiated in 2016 by the Spatial Planning Department of Faculty of Architecture CTU Prague, which has long been involved in the issue of the economy in the territory. Thousands of graduates of the faculty have undergone short training in this field. We try to teach students to think rationally, to bring them closer to the economic background of the projects they will deal with in their creative work.

The conference ME100 is a long-term project for bringing together various professional groups interested in economics and spatial planning. We hope that the conference will strengthen the teaching of economics and project management at universities. For example, our faculty has just opened a learning course in real estate development.

We invite anyone to the ME100 conference who wants to see what is being researched at other universities in the planning field and to learn how city and regional planning affects the real estate market. Maybe by doing so we can help someone open a direction for their future professional career.



IX. annual conference

The conference was divided into two sessions: the first featured presentations by PhD students, the second featured papers of invited guest speakers.

PhD students

[Kateřina Kovářiková](#) presented digital tools that have been developed in her professional practice and that help urban development through the use of data and interactive visualization. The tools focus on the automatic evaluation and optimization of spatial planning and real-estate development designs as well as strategic planning and its implementation support. The aim of these tools is to increase the quality, flexibility and acceleration of urban development and its ability to communicate the need for development and its rationality to the public. Katerina also presented the research questions within her PhD thesis. This research aims to explore the link between real-estate and urban strategies and to design more effective linkage that would better define the objectives of the city towards real-estate and simultaneously more clearly demonstrate the benefits of real-estate in the implementation of urban strategies.

Research paper of [Cristina- Bianca Togoe](#) explores how urban planning can address the growing challenges of water scarcity in cities and metropolitan areas. As climate change exacerbates water shortages, metropolitan areas must balance the economic costs of infrastructure with sustainable water management solutions. The paper examines how resilient water systems can support both environmental sustainability and economic stability, ensuring that urban growth does not come at the expense of essential water resources. It highlights the need for cities to implement water-resilient strategies that not only secure long-term water supplies but also mitigate economic risks associated with resource depletion.

The research of [Alexandra Ivănescu](#) explores the dynamic relationship between tourism and urban mobility systems. It delves into how transportation networks adapt to the fluctuating demands of





tourists and the impact of mobility patterns on the sustainability and development of tourist destinations. The study highlights the theoretical frameworks that shape tourist mobility planning, examining strategies for optimizing transport infrastructure to enhance the visitor experience while minimizing environmental impact. This study provides valuable insights for urban planners seeking to balance tourism growth with sustainable mobility solutions.

Răzvan-Andrei Săvan focuses on the interplay and parallel between the concepts of smart cities and smart ecotopes are multifaceted and intricately interconnected. Smart cities harness the power of advanced technologies, such as the Internet of Things (IoT), artificial intelligence (AI), and data analytics, to optimize urban services and infrastructure, while smart ecotopes employ similar technological advancements to monitor, manage, and optimize ecological systems and their interactions with human activities. Both paradigms prioritize the efficient management of resources, with smart cities focusing on energy, water, and transportation, and smart ecotopes emphasizing the sustainable use of natural resources and waste minimization. Sustainability is a central tenet of both smart city initiatives and smart ecotopes, with the former promoting green technologies, renewable energy, and eco-friendly practices, and the latter inherently emphasizing the maintenance of ecosystem balance and health while accommodating human needs. Data-driven decision-making is a cornerstone of both approaches, with smart cities relying on real-time data collection and analysis to inform urban planning and management, and smart ecotopes leveraging data to understand ecological patterns, monitor environmental changes, and develop strategies for conservation and sustainable development.

Invited guest speakers

Prof. Maciej Nowak, a lawyer from the West Pomeranian Technical University in Szczecin, presented the results of an extensive international study involving a comparative analysis of the legislation in the field of spatial planning in the countries of Central and Eastern Europe. A broader topic on the role of law in spatial planning was addressed. On the one hand, the law should realize the goals of spatial planning. On the other hand, legal regulations must be

neither too general (in which case they are overlooked) nor too specific (they block development). From the perspective of Central and Eastern European countries, it is historical and cultural considerations that influence the interpretation of the law. The position of private property owners (and their right to develop land) is very broad. This hinders the law's effective implementation of spatial planning objectives and results in the development of uncontrolled development. Legal instruments respond to these problems only to a limited extent.

[Markéta Šimáčková](#) shared her experience from the real estate environment and planning practice in the Czech Republic. Sustainability in real estate development is no longer just a trend - it is a necessity. As climate concerns and urbanization grow, developers must adopt sustainable practices that balance profitability, environmental stewardship, and social responsibility. The unpreparedness of the territory and the lengthy permitting process reduces the attractiveness of the Czech Republic for foreign investment. Her presentation explored key aspects of sustainable real estate development, from preparation to execution, highlighting practical approaches and challenges. However, she documented that there are good examples of how to find solutions among stakeholders.

[Prof. Alexandru Petrisor](#), Director of the Doctoral School of Spatial Planning from the Ion Mincu University of Bucharest, discussed the different approaches used to assess the level of territorial development from a spatial planning perspective. There are approaches that use public or expert participation and scientific approaches based on data. While it is not infrequent for the first category to reach a consensus, the use of data can contribute to finding a better understanding between actors. The use of geographic information systems plays an important role.

[Associate professor Petr Tománek](#) from the Faculty of Economics of the Technical University Ostrava in his contribution revealed to the audience the management of municipal associations. By comparing the expenditures of municipal budgets in the Czech Republic and the budgets of municipal associations, it is possible to evaluate the role of municipal associations within the state. On the basis of the findings, the importance of municipal associations for inter-municipal cooperation was discussed, especially in view of the abnormally high number of self-governing municipalities in the Czech Republic compared to other EU countries.



Miland Dont, Director of the Section of the State Transport Infrastructure Fund, in his last contribution informed the participants about the Fund's view on the state's transport policy. The presentation focused on the development of regions as a result of the construction of transport infrastructure. Emphasis is placed on the development of motorway infrastructure, examining its impact on regional development in connection with their integration into the newly built motorway network. Further, he discussed the correlations with the development of gross domestic product, the state budget, and the budget of the State Fund for Transport Infrastructure, as well as the development of transport infrastructure construction. The final part assessed the impact of motorway construction on accident rates and the consequences of traffic accidents, and the potential savings in terms of societal losses from traffic accidents. He shed light on the current approach of the SFDI to the development of the transport network in the Czech Republic.



The next MĚ100 conference will take place in November 2025. Follow www.me100.info. Proceedings from previous years can be seen on www.me100.info (<https://vimeo.com/474656241>) or www.camp.cz.



Scientific conference committee

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ME100-

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Universität Regensburg, International Real Estate Business School

Slovak Technical University, Institute of Management

The auspice granted by the *Association for Urbanism and Spatial Planning of the Czech Republic, IPR Prague and Association for Real Estate Market Development.*



The organizers

Vít Řezáč is an assistant professor at the Institute of Spatial Planning, Faculty of Architecture, CTU in Prague. Since 1994 he has been working in international companies (e.g. Skanska Property CR) as a project manager. During his professional career he has always worked in the field of urban planning. Since the beginning of the 1990s, he has been working at the faculty on the issues of economics in urban planning, the management of large projects and planning processes and spatial planning legislation abroad.

David Mazáček heads the Institute of Strategic Investing at the University of Economics. Together with Jaroslav Kaiser, he is behind the creation of the MBA programme Valuation of Real Estate. He has been a member of the Royal Institution of Chartered Surveyors (RICS) since 2016. David works at the property development company Crestyl, where he is responsible for the acquisition of new projects.

Zuzana Poláková is a graduate of the Faculty of Architecture of the Czech Technical University in Prague. She has long been working on sustainable mobility in the context of urban development with a focus on accessibility and the promotion of active modes of transport. She works as an urban planner in the non-profit organization AutoMat. At the Faculty of Architecture she co-organizes the international student competition Urban Design Award.

Jan Bittner is a PhD student and researcher at the Institute of Spatial Planning, FA CTU in Prague. His dissertation examines the influence of the availability of local amenities on the transport behaviour of residents of the Prague metropolitan area. Jan is involved in national and international research projects such as ESPON NoStaGeo, focusing on the management of non-traditional geographic units, and SGS Analysis of the Impact of the Built Environment on Residents' Mobility Based on Mobile Operators' Location Data. He organises the international PhD conference People-City-Transport, and participates in the international ATHENS programme.

Sylva Jablonská studied music at the Academy of Performing Arts in Prague and later Arts Management at the University of Economics in Prague. In addition to her work in the arts she has long been involved in teaching, translation and organization of cultural activities. Since 2020 she has been a member of the organizational team of the MĚ100 conference and is involved in the preparation of the City development course.



Authors / PhD. Students

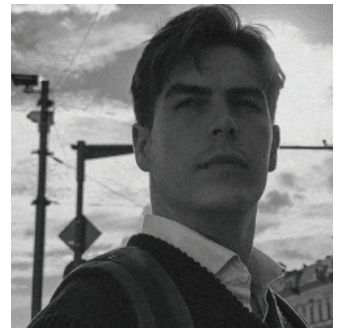
Alexandra Ivănescu

Alexandra Ivănescu is an urban planner and landscape designer, specializing in urban mobility. She holds a Master's degree in Urban Mobility and she is currently pursuing a Ph.D. in Urban Planning with a theme of Tourist Mobility. With a diverse background in urban advisory, landscape design, and traffic analysis, she has contributed to projects at the European Investment Bank and SwissTraffic Ag. Additionally, Alexandra participated in various international conferences and collaborated on urban mobility projects for several cities in Romania.



Răzvan-Andrei Săvan

Răzvan-Andrei is an urban planner and landscape architect, currently working together with a multidisciplinary team on the National Recovery and Resilience Plan of Romania (PNRR) which is based on the idea of ensuring the development of Romania, by supporting the level of adaptation to crisis situations, in the context of recovery after the COVID- 19, as well as harnessing the potential for economic development, through major reforms and key investments. He holds a Master's degree in Landscape and Territory. Using his knowledge of urban planning, landscape architecture, and knowledge of Romanian public administration, he contributed to urban development projects at all territorial scales together with the management of European funds for development regions of Romania. Additionally, he participated in various international conferences and collaborated on general urban plans for several cities in Romania.



Cristina-Bianca ȚOGOE, Iona Mincu v Bukurešti

Cristina is an urban planner. She graduated from the Faculty of Urban Planning in 2020 with a bachelor's degree, and in 2022, she completed my master's degree. Currently, she is a third-year PhD student at the Doctoral School of Urban Planning at the Ion Mincu University of Architecture and Urban Planning in Bucharest, Romania. Her research focuses on water deficit in the context of climate change, and how urban planning can help mitigate and manage this issue. In addition to her research activities and work in the private sector, Cristina is also a teaching assistant at Ion Mincu University, involved in various activities at both undergraduate and graduate levels.



Ing. arch. Kateřina Kovářiková, FA ČVUT, Praha

Kateřina Kovářiková is the founder of URBIQ, a data studio that creates digital tools for streamlining spatial and strategic planning through interactive and data-driven tools. She is currently a recent PhD student at the Faculty of Architecture at the CTU in Prague, from which she holds a Master's degree. In her research, she is investigating the role of real-estate development in the implementation of urban strategies. Kateřina is also involved in a faculty research project for The Prague Institute of Planning and Development and she is a member of an informal advisory board of the Czech Ministry of Science and Research.



Expert panel

Alexandru-Ionuț Petrișor

Prof. Alexandru-Ionuț Petrișor, PhD (Ecology), PhD (Geography), Habil. (Urban planning) Professor works as Director of the Doctoral School of Urban Planning at “Ion Mincu” University of Architecture and Urbanism, Bucharest. He also lectures at the Department of Architecture of the Faculty of Urbanism and Architecture, Technical University of Moldova, Chisinau. He works part time as senior Researcher and Scientific Director of the National Institute for Research and Development in Constructions, Urbanism and Sustainable Spatial Development URBAN-INCERC in Bucharest. Prof. Petrișor is involved in several international projects.



Maciej J. Nowak

Professor of the West Pomeranian University of Technology in Szczecin, head of the Department of Real Estate, legal counsel, specialist in urban planning law, member of committees of the Polish Academy of Sciences, co-author of international publications comparing urban planning law in different countries.



Doc. Ing. Petr Tománek, CSc.

Petr Tománek works as an associate professor at the Faculty of Economics of VSB - Technical University of Ostrava, he also works externally at the Silesian University in Opava and also works as a lecturer in the education of municipal and regional officials. He teaches public finance issues and is particularly involved in the management of territorial budgets. For a long time, he focuses on researching the issue of municipal and regional management in the Czech Republic and especially on the budgetary allocation of taxes. He has participated in a number of researches projects and publishes papers at conferences. Recently, he led a TAČR project focused on the issue of the management of city districts of the statutory city of Ostrava.



Ing. Milan Dont, Ph.D.

Milan Dont holds the position of Director of the Office of the Director of the State Fund for Transport Infrastructure (SFDI), where he is responsible for cross-cutting issues of transport infrastructure financing, digitization of construction, management, and maintenance processes of transport infrastructure. He studied at the Faculty of Transportation Sciences at the Czech Technical University in Prague. Subsequently, while working, he continued in the doctoral study program in Technology and Transportation at the same faculty, defending his Ph.D. in 2011. From 2010, he served as the Director of the Road Transport Department at the Ministry of Transport, where he expanded his focus to include the entire issue of road operation, management, and maintenance. Since 2015, he has been working at the State Fund for Transport Infrastructure.



Ing. Markéta Šimáčková, MBA

Markéta Šimáčková is a graduate of the University of Economics in Prague, where she studied MBA with a focus on commercial real estate and its valuation. Since 2024 she has been the CEO of BlackBird Real Estate, which has a portfolio of commercial and residential projects mainly in the regions. Previously, she served as Deputy CEO at Urbanity Development, focusing on building sustainable campuses in the Czech Republic, and as CEO and Managing Director of Torino-Praga Invest, a real estate group. Her experience also includes international consultancy Cushman & Wakefield.





Why study the connection between development and strategic plans of cities?

Abstract

The relationship between urban strategies and contemporary development remains a key but still under-researched area of urban development. The current linkages between these areas are not direct. Between the city's strategic plan and the implementation of spatial development there are various spatial planning instruments (zoning and regulatory plans, spatial studies), thematic concepts and methodologies as well as legal documents such as ordinances, planning agreements, memoranda or even tender documents. All these instruments contain both sub-objectives and various measures to help create the most beneficial development in cities. However, these measures are defined at different times, in different contexts, and thus often are not consistent even with each other. By the time development actually starts, these regulations are often in conflict with the current context and market conditions, making their implementation impractical and ultimately counteracting the strategic objectives of cities and causing further problems. This research, which is at an early stage, seeks in particular to contribute to the understanding of this dynamic urban strategy-development nexus in the Czech and international context, and to provide a basis for further investigation and practical application for more effective urban spatial development.

Introduction

Development, both in the sense of new construction and the renewal of existing ones, is a prerequisite for maintaining the competitiveness and survival of cities. So does strategic planning, which directs spatial development

and the energy expended on it; it gives reason, purpose and meaning to development. Strategies ensure that the energy expended is not wasted and that cities are not unnecessarily depleted by ill-targeted development, putting them closer to decline or extinction.

The explorations of the link between urban strategies and development are thus natural. Urban strategies define what should happen and why in cities in the future, and development creates the appropriate spaces for these events and purposes. Urban strategies provide the broadest general terms of reference for development. Several other planning tools of varying detail, rigidity, bindingness and procedural complexity serve cities to create a more detailed brief, which cities may or may not need to use at any given time.

But do strategies and other planning tools really help cities to develop and prosper? How are these tools used by developers? And how does development really contribute to the strategic development of cities?

In today's dynamic reality and the tense socio-economic situation of cities, it is appropriate to ask these questions and to subject the existing system to greater scrutiny and revision. The aim of this research is to look for strengths and weaknesses of urban development systems in the Czech Republic and abroad and to identify possible approaches and ways to make them more effective. So that urban development truly strengthens and creates a sustainable and resilient urban living environment for current and future generations.

This short paper presents the first findings of the research on this issue. Some of the statements are based directly on the source literature, some represent deductive conclusions from my own observations. These will be further verified and developed as part of the research.

Urban strategies

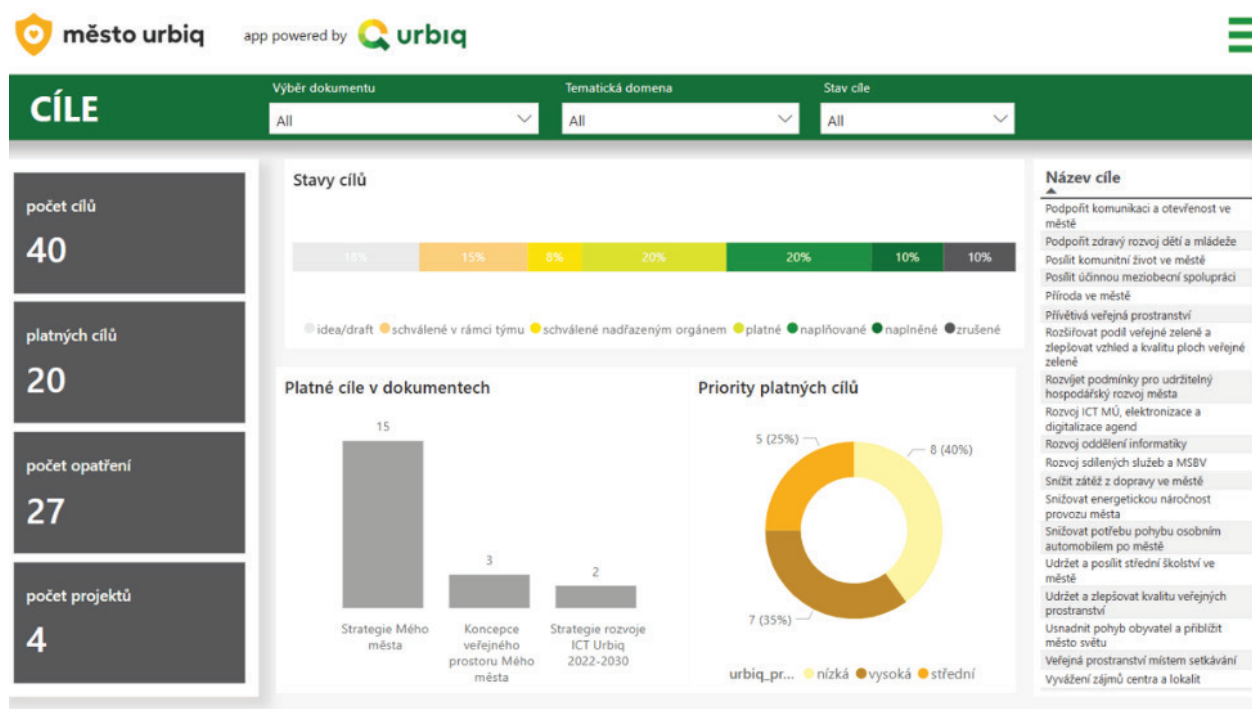
The structure and processes of developing city strategies are not subject to any law, the recommendations are presented within the framework of the ministerial methodology (MMR, 2018). The strategy usually consists of the city's vision, development priorities, strategic objectives and measures to help achieve these objectives and visions. The implementation of measures in cities is mainly the responsibility of mayors, politicians and civil servants. However, the long-term validity and accessibility of strategies is mainly ensured by the involvement of the public and other actors who are not limited by the length of the electoral term. Strategies are thus primarily social agreements that build on shared values and needs and thus promote social cohesion. Communicating strategic priorities, objectives, projects and the status of strategy implementation helps to make the functioning of cities transparent and mo-



Picture 1 –Number of strategies in the Czech Republic, web database of strategic documents of the Czech Republic, to the 21.11.2024

tivates citizens to become actively involved in the functioning of cities.

In the current situation, however, strategic planning in Czech cities does not serve its purpose of directing the development of cities towards their future prosperity. Strategies are created in cities primarily to identify key city projects for which public funding can then be obtained to support city budgets. Whether these identified projects are really what makes cities stronger in the long run is usually not the subject of close examination. The implementation of strategic objectives generally tends to be rather poor or not sufficiently measured, leaving cities without the basis for effective continuous strategic management (MMR, 2019). Moreover, strategies and concepts are created and communicated as lengthy static documents that are disproportionately nume-



Picture 2: Sample of urbiq strategic dashboard, urbiq (2024)

rous and lack the ability to effectively communicate information to the public, politicians and responsible officials themselves.

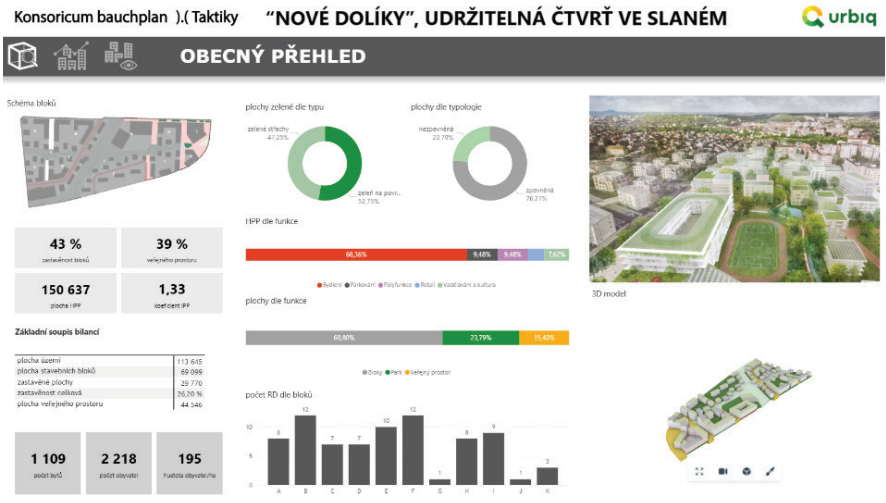
New approaches and tools for strategic urban planning based on data and flexible approach and form already exist and are being developed. However, they are still not as widespread and for smaller cities without a urgent development problem, they may appear to be more of a concern than a benefit.

Spatial and real-estate development

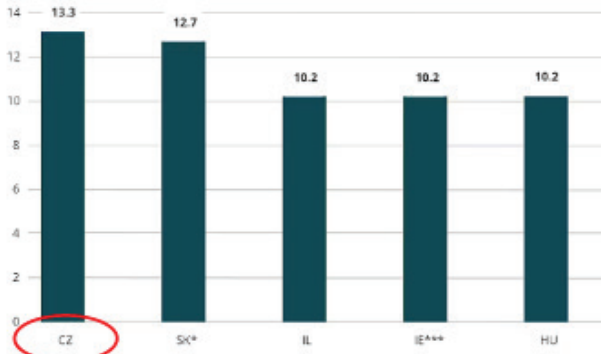
Real estate and spatial development drive the evolution of cities and the economic growth of the whole society. Spatial development brings investment, employment opportunities and supports local businesses. Through development, cities adapt to the dynamic needs of their inhabitants, environment

estate operates in a certain economic reality, in a certain set of supply and demand, which it constantly tries to balance. And this balancing of the market and the sum of other external influences and regulations is then matched by the prices of the resulting products (space for sale and rent).

Currently, real estate development is very slow and expensive in Czech cities due to permitting processes. The socio-economic situation is tense, housing unaffordability is worsening



Picture 4: Sample of urbiq spatial development dashboard, urbiq (2024)



Picture 3: Czech Republic as the country with the highest housing unaffordability, Deloitte Property Index (2024)

and economy. Real estate development is responsible for the entire process of building and often operating buildings of various functions that change the shape and functioning of the urban environment. The complexity of real estate development is embodied in the multitude of issues, actors and interests that need to be analysed, coordinated and satisfied in order to achieve the highest quality development.

The main objective of real estate is profit. Real

(Deloitte, 2024), and economic growth is stagnating. Cities do not have strong visions for development and the ability of real estate to bring benefits to cities is limited (Rezac, 2023). Thus, citizens and politicians do not trust and support real estate development, and the whole complex and multi-layered problem is exacerbated.

New tools and approaches exist in this area as well, which address the issue of managing and communicating the complexity and benefits of spatial development to stakeholders and the general public. These tools are intended to help create the most effective development and to provide context to spatial planning in the clearest and most transparent way so that meaningful agreements can be made over development objectives and so that real estate development can produce the highest quality outcomes.

Relationship between urban strategies and spatial development

As already mentioned, strategies provide the spatial development with the most general specifications in the form of events that are planned in cities in the future. However, the connection between strategies and spatial development and real estate is not direct. In order to achieve the target processes and conditions, specific interventions are proposed either directly in the strategies or in other related city planning documents.

Mandatory spatial plans are the standard as instruments of general functional zoning and regulation of the volume of development, with the possibility of refinement by a more detailed spatial study or regulatory plan. These spatial planning instruments are then supplemented by thematically oriented concepts, sub-plans, methodologies or manuals, usually of a recommendatory nature. Certain elements of the specifications or, more precisely, other restrictions and conditions for spatial development may then be defined by municipal bylaws. Depending on the importance of the development and the nature and motivations of the actors, memorandums, cooperation agreements or planning agreements are then voluntarily created to define further conditions of real estate for a specific project and its process.

Coordination of all these different tools, respectively static documents, is very challenging for cities and is usually not even attempted. It is therefore very difficult to know the limits and specific recommendations for spatial development, and developers use professional consultants for this activity and often spend considerable resources, which are again reflected in the final prices of development products. The permitting processes that make use of these regulatory and guidance documents are currently undergoing strong analysis and revision in the context of the digitisation of the building and planning process, and it is not clear at the moment exactly how they will work

within the digital environment.

It is important to note that these differently detailed and defined refinements of the spatial development briefs are produced at different times, in different socio-economic and market situations, and are thus in different alignment or conflict with the defined priorities and objectives of cities. This contradiction can be so fundamental that it becomes the reason why development ultimately intensifies existing problems, creates new ones, and thus goes fundamentally against the improvement of urban life as such.

Research

The whole issue of the relationship between urban strategies and development is highly complex and multi-layered. Thus, for meaningful research it will be necessary to define a main line, a supporting theory within which the research will operate. The current initial phase of the research focuses on literature research and familiarizing oneself with the experiences of major actors and researchers working on the issue.

The next phase will be devoted to quantitative research: in one strand, the impact of strategies on urban development and prosperity, and in the other strand, the impact of development on urban development and prosperity. For this analysis, key indicators will be defined to identify this influence and then link the influences to each other.

On the basis of the results of the quantitative analysis, outstanding cities will be identified, which will be further examined qualitatively, in the form of case studies, in the final phase of the research. Structured interviews and further in-depth exploration of city documents, processes, actors and the wider context will be used to develop these case studies.

Conclusion

The question of how contemporary real estate development fulfils the strategic plans of cities is highly actual and has a link to the whole system of planning and permitting processes and to the creation and use of regulatory and recommendatory instruments. New approaches to information management and the ongoing digitisation of national permitting processes create space for an in-depth review of the whole system and for identifying possible pathways to more efficient and flexible urban development. It is clear that this issue and its possible developments need to be addressed in cooperation with a variety of institutions and actors. Therefore, the research also aims to promote a wider discussion and testing of new approaches and tools.

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Climate Pressures on Metropolitan Areas: Urban Planning for Water Resilience



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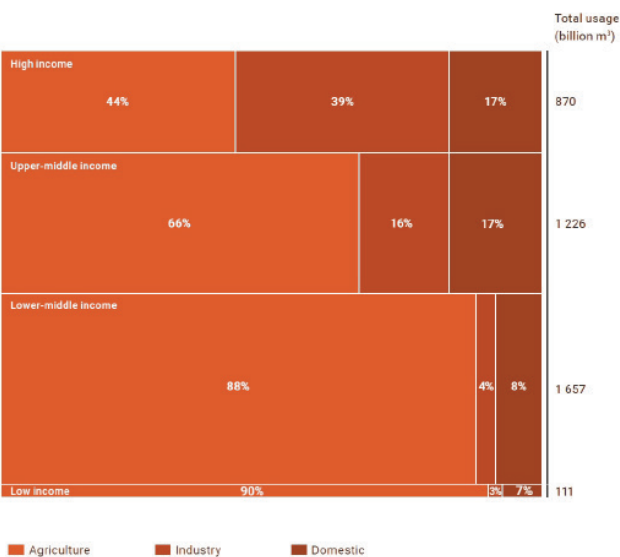
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Introduction

Climate change poses a profound impact on water resources in metropolitan areas, exacerbating issues like droughts, floods, and unpredictable weather patterns. These changes challenge traditional water management systems and demand innovative approaches to ensure sustainable water availability. Urban areas, with their dense populations and high demand for resources, are particularly vulnerable to these shifts, highlighting the need for adaptive strategies that incorporate climate projections into water resource planning (Intergovernmental Panel on Climate Change, 2022). Water scarcity disproportionately affects the economically disadvantaged segments of urban populations, who often have the least access to reliable and clean water sources. Urban planning must address these disparities through policies that ensure equitable access to water and promote social justice. This involves not only infrastructure development but also the implementation of tariff structures that balance affordability with the need to fund sustainable water management systems (United Nations Human Settlements Programme, 2023).

The severity of water scarcity varies widely

across different regions, influenced by economic disparities and development levels. High-income nations typically have better infrastructure and resources to manage water scarcity, whereas lower-income countries suffer more acutely due to limited technological and financial capacities. This disparity underscores the need for international cooperation and investment in water management technologies that can be adapted to diverse economic contexts (FAO, 2022). Developing climate-resilient water infrastructure is important to coping with the increasing frequency of extreme weather events, such as floods and droughts, that threaten water supply systems. Infrastructure such as permeable pavements, green roofs, and enhanced reservoirs are integral to a resilient urban water cycle (United Nations Environment Programme, 2023).



Water withdrawal by sector (% of total freshwater withdrawal) by income group, 2020

Source: UNESCO. (2024). *The United Nations world water development report 2024: Water for prosperity and peace*. UNESCO Publishing. Available at: <https://digitalibrary.un.org/record/4042870?v=pdf>

Industrial and agricultural sectors are major consumers of water in urban fringes, often competing with municipal needs. Strategies to reduce sectoral water footprints include promoting water-efficient practices and recycling wastewater. The adoption of these strategies can substantially lower water withdrawals, alleviating pressure on urban water supplies.

Case Study: Bucharest and Its Metropolitan Area

Bucharest, the capital and largest city of Romania, stands as a dynamic urban center with a population of approximately 1.8 million residents as of 2021. The economy of Romania is classified as upper-middle income, with Bucharest acting as its main economic driver. The city contributes significantly to the national GDP, hosting numerous national and international companies, and fostering a vibrant start-up environment. However, Bucharest also faces several challenges, including urban sprawl, traffic congestion, and environmental issues such as air and water pollution. The management of water resources is particularly critical, given the pressures of urbanization and the need for sustainable development strategies to ensure water resilience in the face of climate change and other environmental stresses (European Commission, 2023).

To address the metropolitan area's water challenges, Bucharest has fostered collaborations between municipal authorities, private sector stakeholders, and international organizations. These partnerships aim to pool resources, expertise, and funding for comprehensive water management projects. Such collaborative efforts are crucial for ensuring the sustainability of water resources and adapting to the growing urban demands (European Commission, 2023).

Bucharest's rapid urbanization has significantly pressured its water resources. The Glina Wastewater Treatment Plant upgrade, a €500

million project co-financed by EU funds, exemplifies efforts to enhance capacity and efficiency in response to urban demands. The Glina Wastewater Treatment Plant, which serves the larger Bucharest area, recently underwent a significant upgrade to enhance its capacity and technological capabilities. This upgrade included the installation of advanced biological treatment processes aimed at reducing nutrient loads in effluents, crucial for combating eutrophication in downstream water bodies. Additionally, the plant has integrated renewable energy sources, such as biogas production from sludge, to improve sustainability and reduce operational costs. This project not only aims to meet EU water treatment standards but also to set a benchmark for future wastewater management projects in Romania (European Environment Agency, 2022).

Meanwhile, the management of the Dâmbovița River and the challenges at the Otopeni Wastewater Treatment Plant highlight the ongoing issues with pollution and infrastructure overloads. The Otopeni Wastewater Treatment Plant, originally designed to bolster the northern outskirts of Bucharest, faced critical operational challenges that led to its failure. These issues stemmed from design oversights and underestimations of the region's growth, which resulted in capacity overloads and frequent system breakdowns. The subsequent environmental impact assessments prompted a reevaluation of the project, leading to the planning of a comprehensive overhaul that includes expanding capacity and upgrading technology to handle increased wastewater volumes and mitigate pollution risks (Romanian Ministry of Waters and Forests, 2022).

Case Study: Amman and Its Metropolitan Area

Amman, the capital city of Jordan, serves as a cultural, political, and economic hub in the Middle East. With a population of over 4 million, it is not only the most populous city in Jordan but



also one of the oldest continuously inhabited cities in the world. (Department of Statistics, Jordan, 2022). Jordan, characterized by its arid and semi-arid climate, faces significant natural water scarcity challenges. Despite its limited water resources, Jordan has developed complex water management systems to meet the needs of its growing population and expanding economic activities. The nation's efforts to enhance water security are critical given its strategic location, political stability, and role as a host for a large number of refugees, which further strains its limited water supplies (United Nations Development Programme, 2023).

The Disi Water Conveyance Project, an ambitious initiative aimed at addressing Amman's acute water shortage, involves transporting water from the ancient Disi aquifer in southern Jordan to the capital. This 325-kilometer pipeline is designed to deliver up to 100 million cubic meters of water annually, significantly bolstering the city's water supply. The project not only secures a new source of water but also plays a crucial role in alleviating the over-extraction of local groundwater sources, thus preserving the long-term sustainability of Jordan's water resources (Jordan Times, 2022).

The Zarqa River Rehabilitation Project, aimed at restoring one of Jordan's most crucial but polluted waterways, has unfortunately not yielded the expected outcomes. Despite significant investment and the implementation of various strategies, the project has struggled to achieve its primary goals of significantly improving water quality and restoring ecological balance. The project faced multiple challenges that hindered its effectiveness. One of the primary issues has been the persistent industrial pollution, with inadequate enforcement of environmental regulations allowing

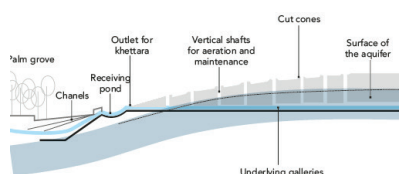
continued industrial waste discharge into the river. Additionally, infrastructural shortcomings and delays in upgrading water treatment facilities have contributed to less than satisfactory progress in reducing pollution levels. The failure to rehabilitate the Zarqa River has had broader implications for the region, affecting both the agricultural sector that relies on the river for irrigation and the communities that suffer from health issues due to poor water quality. This underscores the need for a revised approach that addresses the root causes of pollution and involves more robust governmental oversight and community engagement (World Health Organization, 2022).

Given the project's shortcomings, there is a pressing need to reevaluate the strategies employed and to develop a more comprehensive approach that includes stricter enforcement of pollution laws, enhanced community education programs, and upgraded infrastructure. The future of the Zarqa River rehabilitation effort depends on a concerted and integrated approach that leverages both technological solutions and active community involvement to achieve lasting environmental and social benefits.

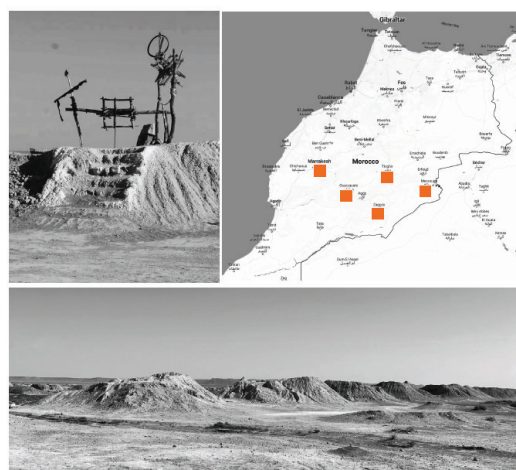
Khettara: Traditional Moroccan Water Management System

The khettara represents a traditional Moroccan method of water management, originating centuries ago in the arid landscapes of Morocco. This ingeniously designed system comprises underground canals that are used to transport

Traditional Moroccan method of accessing underground water
Originating in the 12th century
Cities like Ouarzazate and Marrakesh
Some 'khettara' systems are still in use today
Reduced water flow from diminished groundwater levels



Accessed after <https://www.agrimaroc.ma/les-khettara-un-systeme-traditionnel-ingenieux-de-drainage-eaux-en-danger-de-disparition/> and personal archive



Images from personal archive

water from aquifers or water tables to the surface, primarily for agricultural irrigation and drinking purposes. These systems, particularly in cities like Ouarzazate and Marrakesh, have historically contributed to water distribution and are a testament to the durability and efficiency of ancient water management practices. Despite their historical resilience, many khet-taras have fallen into disrepair due to modern water extraction methods and a lack of maintenance. Preservation efforts are now critical to maintain these ancient systems, not only to conserve water but also to preserve an important part of Moroccan heritage. These efforts involve both local communities and international organizations, aiming to restore and modernize khet-taras while maintaining their traditional essence (World Bank, 2023).

Conclusion

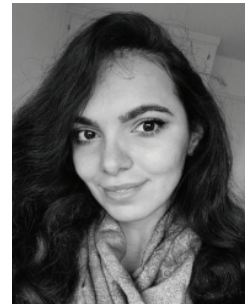
The complexity of urban water challenges requires multidisciplinary approaches involving urban planners, environmental scientists, policymakers, and the community. Such collaboration can foster innovative solutions that are not only technically sound but also culturally and socially acceptable. For instance, green infrastructure like bio-swales and rain gardens can enhance urban landscapes while managing stormwater effectively, thus contributing to the resilience of water systems (American Planning Association, 2021).

The urgency to address water scarcity in metropolitan areas calls for proactive measures and forward-thinking strategies. Effective urban planning for water resilience requires that planners and policymakers prioritize water resource management in their development strategies. The experiences of Bucharest, Amman, and traditional Moroccan water systems illustrate the importance of diverse approaches to managing water scarcity. By integrating traditional knowledge with modern technology, cities can achieve sustainability and resilience in the face of increasing climate pressures.

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TOURIST MOBILITY – A THEORETICAL APPROACH

27 ➤

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Introduction

The movement of people across geographic spaces has been a defining feature of human history, rooted in motivations such as survival, trade, exploration, and leisure. Over millennia, travel has transformed in response to evolving societal needs and technological advancements. Tourism, as a distinct form of travel, emerged alongside increasing destination accessibility and the development of infrastructure catering specifically to recreational activities (Urry, 2007). The concept of tourist mobility captures the dynamic interaction between individuals and places, encompassing not only the act of reaching a destination but also the nuanced patterns of movement within and between locations for purposes of leisure, cultural engagement, and personal growth.

The industrial and transportation revolutions of the 19th and 20th centuries marked a turning point in the study and practice of tourist mobility. These transformative periods expanded the scope and scale of travel, fueled by innovations such as railways, automobiles, and aviation. These developments democratized travel, a transition from an exclusive privilege of the elite to a widespread cultural practice. Simultaneously, the development of hospitality industries and the institutionalization of tourism as an economic sector laid the foundation for understanding tourist mobility as an inte-

grated system involving infrastructure, services, and individual behavior (Urry and Larsen, 2007).

Modern research highlights the multidimensionality of tourist mobility, analyzing it through physical, technological, and social dimensions. Physical mobility pertains to the transport systems, networks, and facilities that enable movement. Technological innovations, including digital mapping, real-time navigation, and mobile applications, have reshaped how tourists plan and execute their journeys, enhancing efficiency and accessibility. Social factors, such as cultural values, perceptions, and motivations, significantly influence travel behaviors and mobility patterns. Researchers also emphasize that tourist mobility operates within a networked framework, where movements between destinations contribute to global and regional connectivity. These interactions are analyzed through lenses such as network theory, accessibility modeling, and behavioral studies (Asero et al., 2016; Bifulco and Leone, 2014).

Recent scholarship has further expanded the conceptual boundaries of tourist mobility to consider its broader implications and impacts. The „mobilities“ paradigm, introduced by Sheller and Urry (2006), transcends physical displacement to include the flow of ideas, images, and virtual experiences that accompany and shape the act of travel. Simultaneously, researchers are increasingly addressing barriers to mobility, such as socioeconomic inequality and infrastructural inaccessibility, advocating for inclusive approaches to touri-

sm. Sustainability has also emerged as a critical focus, given the environmental consequences of travel. Efforts to reduce reliance on carbon-intensive transportation and promote greener alternatives, such as cycling, walking, and public transit, align with broader goals for sustainable tourism development (Høyer, 2000). These evolving perspectives underscore the centrality of tourist mobility in understanding the cultural, economic, and environmental dimensions of contemporary tourism.

Methodology

The study follows the theoretical framework construction methodology outlined by Myburgh and Tammaro (2013), which includes seven structured steps: declaration of axiological position, description of nomos, critique of existing theories, lexical clarification, development of alternative models, ontology and taxonomy construction, and teleological testing. The research begins by establishing the researcher's axiological stance, which views tourist mobility as an integrated product of the tourism offer and an attraction itself. This step ensures clarity in values and objectives, framing tourist mobility as both functional and experiential in enhancing the overall tourism experience.

The study proceeds with a description of nomos by conducting a thematic review of literature to analyze the current state of tourist mobility. This step identifies its prevailing utilitarian focus, which often overlooks its potential to provide meaningful cultural and experiential value. Following this, existing theories, including those related to transportation efficiency and sustainability, are criticized for their inability to fully address the experiential dimension of mobility. This critique informs us of the need for a new conceptual approach that integrates both functional and experiential elements of tourist transportation.

The final steps involve the systematic development of an alternative model, beginning with

a clear definition of key terms such as mobility and transportation-as-attraction to establish a coherent lexical register. An ontology and taxonomy are constructed to categorize and relate the functional and experiential aspects of mobility. This alternative model is then tested against teleological assumptions, evaluating its alignment with the goals of sustainable, meaningful, and memorable tourist experiences. This structured process offers a comprehensive theoretical basis for reconceptualizing tourist mobility as both a practical necessity and a cultural product.

Limitations

This study is conceptual in nature and does not include empirical testing. While the proposed model was evaluated through hypothetical scenarios, its practical applicability would require field testing and validation in real-world tourism contexts.

This methodology ensures a structured, theoretically grounded approach to rethinking tourist mobility, aiming to advance both academic discourse and practical applications in the tourism industry.

Tourist mobility – from ‘functional’ to ‘experiential’

Tourist mobility refers to the movement of people for leisure or tourism purposes. This concept acknowledges that travel is an inherent part of tourism, encompassing not only the journey to a destination but also the movement within it (Høyer, 2000; La Roca, 2015).

Tourist mobility is increasingly recognized as a central aspect of the tourism experience, yet its role has often been underexplored in academic discourse. Traditionally, tourist mobility has been understood in terms of functional transportation – simply as a means of getting tourists from one destination to another. However, there is growing recognition that mobility can serve a dual purpose: facilitating travel and

enriching the overall tourist experience. This paper adopts an axiological position that views tourist mobility as an integrated product of the tourism offer, where transportation is not only a functional necessity but also an attraction in itself. Drawing on the work of various scholars, this paper seeks to explore the theoretical dimensions of tourist mobility, considering both its practical and experiential aspects.

Theoretical foundations

The axiological stance adopted in this study argues that tourist mobility should extend beyond the facilitation of physical movement to actively enrich the overall tourism experience. Scholars such as Urry and Larsen (2007), in *The Tourist Gaze*, highlight the embodied and social dimensions of mobility, emphasizing how transportation acts as a medium through which tourists engage with landscapes and cultures. This perspective underscores the role of mobility as a lived experience, where the modes of transport and the journey itself mediate emotional, sensory, and cultural interactions. Sheller and Urry's (2006) mobilities paradigm further complements this view by integrating the emotional and sensory dimensions of travel, reinforcing the notion that mobility is an integral and enriching component of tourism.

This perspective challenges the traditionally utilitarian view of tourist transport, which has often been treated merely as a logistical necessity. Cohen (2004) advocates for a reimagining of transportation as a core element of the „total tourist experience,“ proposing that it can serve as a reflection of a destination's identity and cultural heritage. For instance, iconic transport systems like gondolas in Venice or bullet trains in Japan do more than facilitate movement—they become part of the tourist's encounter with the destination. Similarly, Gössling (2011) emphasizes the dual potential of mobility systems to enhance sustainability and visitor experience. He calls for the adoption of environmentally sustainable transport solutions that

not only minimize ecological impact but also contribute to the aesthetic and experiential quality of tourism.

Nomos the existing situation

Contemporary approaches to tourist mobility predominantly focus on efficiency, cost-effectiveness, and environmental sustainability. Scholars such as Gössling et al. (2012) emphasize the critical need to reduce the carbon footprint of tourist transportation, advocating for eco-friendly alternatives like cycling, walking, and public transit. These efforts align with the broader goals of sustainable tourism, addressing the pressing environmental challenges posed by traditional travel modes. However, this emphasis often sidelines the cultural and experiential dimensions of mobility, which are equally vital for fostering meaningful and engaging tourist experiences.

The current paradigm in tourist mobility prioritizes functional objectives, where transportation systems are designed to maximize efficiency and convenience. This utilitarian focus, particularly evident in urban public transit systems, frequently neglects opportunities to integrate cultural or touristic elements. As Hannam, Sheller, and Urry (2006) argue, mobility is more than a logistical activity; it is an experiential journey that shapes tourists' interactions with their destinations. Yet, as Bramwell (2004) points out, the prevailing functionalist approach risks reducing travel to a transactional process, missing the potential for transport to serve as a medium for cultural immersion and memorable experiences.

Despite these limitations, innovative practices are emerging to challenge this paradigm by incorporating cultural and experiential elements into transportation systems. Gössling and Peters (2015) highlight the growing trend of integrating local art, history, and culture into mobility infrastructures, transforming transportation into an engaging component of the

tourism offering. For instance, some cities have implemented themed transit vehicles, station designs reflecting local heritage, or audio-visual storytelling during travel, turning the journey itself into a form of cultural exploration.

Examination and critique of existing theories

While utilitarian theories of mobility emphasize logistics, efficiency, and sustainability, they often overlook the transformative potential of transportation as a core component of the tourism experience. Pearce (1987) underscores that tourist experiences are shaped not only by the destination but also by the journey itself, advocating for immersive and thematic transportation options that enhance the overall travel experience. Similarly, Lumsdon and Page (2004) argue that mobility systems should be seamlessly integrated into the broader tourism offering, fostering deeper emotional connections between travelers and destinations.

Traditional models of tourist mobility predominantly focus on addressing efficiency, sustainability, and accessibility. Frameworks such as Shannon and Weaver's (1949) communication theory, applied to transportation logistics, concentrate on the systematic transmission of „information“ through travel networks. However, these approaches often neglect the experiential dimensions of travel, treating mobility as a functional necessity rather than an opportunity for enrichment. Lumsdon and McGrath (2009) criticize this narrow perspective, emphasizing the untapped potential for mobility systems to offer scenic, thematic, or eco-tourism experiences that enhance the quality of travel.

In contrast, Steiner (1988) and Mowforth and Munt (2003) advocate for a reimagined role of transportation as an attraction. Steiner highlights the ability of transport modes—such as scenic railways, ferry systems, and heritage routes—to contribute to a destination's story-

telling, creating immersive experiences that connect travelers with its landscape, history, and culture. Building on this, Mowforth and Munt (2003) propose eco-friendly mobility solutions that serve dual purposes: reducing environmental impact while functioning as attractions themselves. This approach bridges the divide between functional utility and experiential value, illustrating how sustainable transport systems can elevate the tourist journey.

Conceptual analysis and lexical clarification

The theoretical framework for tourist mobility is built on key concepts such as mobility, 'transportation-as-attraction', tourist experience, and destination branding. These concepts emphasize the dual role of transportation as both a functional necessity and an integral part of the tourism experience. Sheller and Urry's (2006) notion of the tourist gaze highlights how modes of transport shape visual and emotional engagement with a destination, suggesting that mobility can be curated to enhance storytelling and cultural immersion. Examples include scenic railways, themed buses, and guided walking tours, which transform transit into an enriching component of the tourist experience.

To provide clarity, the central concepts are defined as follows:

- mobility refers to the physical movement of tourists between locations within a destination, encompassing transport types such as railways, buses, ferries, and walking.
- tourist experience is the holistic journey of the traveler, including attractions, accommodations, and the transportation modes used to explore the destination.
- 'transportation-as-attraction' conceptualizes mobility as an experiential element of tourism, where travel itself becomes immersive, such as scenic train rides or boat tours that showcase a destination's cultural and natural heritage.

- destination branding involves associating a destination with unique cultural, historical, or natural attributes, often through transport experiences that contribute to a sense of place.

These definitions underscore the potential of transportation to enhance the overall tourism product, moving beyond its utilitarian purpose to become a dynamic, experiential facet of travel.

Development of an alternative model

A novel conceptual model of tourist mobility is proposed, emphasizing its dual role in enhancing the tourism experience. The first role, functional mobility, focuses on ensuring accessibility, efficiency, and connectivity, aligning with sustainability goals as outlined by Gössling et al. (2012). The second role, experiential mobility, leverages transportation as an integral part of the tourism offers, transforming it into a narrative device or cultural exhibit. Examples include Norway's Flam Railway, which offers breathtaking scenic views, and London's iconic double-decker buses, which contribute to the city's cultural identity.

This dual framework draws on Pearce's (1987) perspective that the journey itself can be a meaningful experience and Lumsdon and Page's (2004) emphasis on integrating transportation into the tourism product. It challenges the traditional view of transport as merely functional, instead framing mobility as a vital element of a destination's identity. For instance, urban tram systems could be reimagined as mobile art galleries showcasing local artists or as educational tools narrating a city's historical and cultural landmarks.

Aligned with Gössling and Peeters' (2015) concept of „transportation-as-attraction," this model integrates sustainability with cultural and experiential dimensions. By transforming transport into a compelling part of the tourism experience, destinations can create more immersive, meaningful, and environmentally

conscious journeys, thereby enhancing their appeal and deepening tourists' connections with the place.

Ontology and taxonomy construction

The ontology of tourist mobility in this context identifies two core functions: (1) Functional Mobility (ensuring accessibility and efficiency of travel) and (2) Experiential Mobility (enhancing the emotional and cultural experience of travel). These categories allow for a taxonomy of tourist mobility that differentiates between various forms of transport:

- Functional mobility: Public transport, shuttles, taxis, etc., designed to efficiently move tourists from point A to point B.
- Experiential mobility: Scenic transport, heritage trains, eco-tours, bike rentals, etc., designed to offer tourists an immersive experience.

Testing against teleological assumptions

The new model is tested by considering its alignment with the teleological goals of tourism—promoting sustainable, memorable, and culturally enriching travel experiences. A practical example of this could involve the pilot implementation of eco-friendly buses that not only reduce the environmental impact of tourism but also offer guided tours that explain the local culture, history, and environmental concerns of the area. The success of such initiatives could be measured in terms of tourist satisfaction, sustainability metrics, and the extent to which mobility contributes to the overall tourist experience.

Conclusion

The evolving conceptualization of tourist mobility as both a functional and experiential element offers a comprehensive perspective on how travel shapes the tourism experience. Traditional mobility models, which emphasize efficiency and sustainability, often fail to

acknowledge the transformative potential of transportation as an integral part of the journey. By incorporating both functional and experiential dimensions, tourist mobility can be reimagined not as a mere logistical necessity but as a critical element of the tourism offering. This dual framework challenges conventional assumptions, urging the tourism industry to view transportation as an opportunity to foster emotional and cultural connections, thereby enriching the travel experience.

The proposed conceptual model highlights the interplay between sustainability and cultural engagement in tourist mobility. As global tourism continues to expand, the urgency for innovative mobility solutions that minimize environmental impact while enhancing visitor experiences becomes increasingly evident. The notion of „transportation-as-attraction“ exemplifies how transport systems can transcend their utilitarian roles, serving as platforms for storytelling and cultural expression. From eco-friendly transit options to scenic heritage railways, such innovations contribute to a destination's identity, foster deeper tourist engagement, and promote sustainable practices. These approaches illustrate that tourism can simultaneously be responsible and enriching.

Future research should further refine this theoretical framework by testing its application in diverse real-world contexts. Empirical studies could explore the impact of experiential mobility on tourist satisfaction, destination branding, and environmental sustainability. Such investigations would provide valuable insights into the role of mobility as both a practical infrastructure and a cultural phenomenon. By doing so, scholars and practitioners can advance a more integrated understanding of how mobility contributes to the overarching goals of sustainable and meaningful tourism development.

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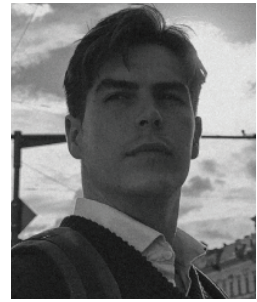
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Smart city *versus* Smart Ecotope

THE CONTEXT OF RAPID URBANIZATION AND THE CONTEMPORARY CHALLENGES OF CITIES

Faced with the major challenges confronting contemporary cities - from rapid urban population growth to the strain on natural resources and climate change - there is an urgent need to reimagine how cities are planned and managed. According to the latest estimates from the United Nations (2018), approximately 68% of the global population will reside in urban areas by 2050, and this phenomenon of rapid urbanization entails fundamental transformations of urban structures and their landscapes (Cordeiro, 2022).

The urban landscape of the future cannot be defined solely through the lens of conventional architecture or infrastructure. It is imperative for cities to adopt innovative concepts that harmoniously integrate **technology** and **nature**, ensuring both their functionality and long-term sustainability. In this regard, the concepts of **Smart City** within an **ecotope** represent the foundation for a radical transformation of the urban landscape, offering intelligent solutions for a resilient, sustainable, and inclusive urban future.

The term „ecotope“ is an interdisciplinary concept that combines ecology with systems theory and natural landscape theory. Both smart cities and smart ecotopes represent innovative visions for the urban future, but while the former focuses on integrating technologies and digitizing the environment to improve urban life,

the latter proposes a broader vision, actively incorporating nature and urban ecosystems into the development process. **The fundamental concept of a smart ecotope can be viewed as a natural extension of a smart city**, bringing balance between technological progress and environmental protection, thus harmonizing urban development processes. In an increasingly urbanized world, the correlation of these two approaches could represent the key to the cities of the future—a place where people and nature can coexist in sustainable harmony, to the benefit of both (Ballesta, 2016).

METHODOLOGY

This article examines the relationship between smart cities and smart ecotopes, focusing on their role in sustainable urban development. The research methodology combines a comprehensive literature review synthesizing concepts from smart city planning, urban planning, and ecotope studies, with case study analysis of smart initiative implementations in existing urban ecotopes. The case studies evaluate the effectiveness of these initiatives in visitor experience, resource management, and development outcomes. Through thematic analysis, the research identifies patterns in both literature and case studies, organizing findings to demonstrate how technology-based strategies can enhance urban ecological systems across different contexts. This methodological approach provides evidence-based insights into integrating smart technologies with urban ecological planning.

THE CONCEPT OF SMART CITY: PRINCIPLES, CHARACTERISTICS AND OBJECTIVES

The „smart city“ concept encompasses technological foundations, social implications, and objectives. Key principles include technological integration using ICT, a human-centric approach prioritizing quality of life and inclusion, and sustainable development balancing economic growth, environmental protection, and social responsibility.

Characteristics of smart cities include a smart economy fostering innovation, smart mobility enhancing transportation efficiency, and smart governance promoting transparency and citizen engagement. The primary objectives are enhancing residents' quality of life, achieving sustainable urban development, and improving economic competitiveness. The smart city concept transcends mere technological application, necessitating a holistic, citizen-centric approach to urban development (Ilaria Greco, 2014). Successful initiatives require effective integration of technology, people, and institutions, focusing on creating sustainable, equitable urban environments benefiting all residents.

DEFINING THE SMART ECOTOPE CONCEPT: THEORIES AND APPLICATIONS

An ecotope represents the smallest homogeneous unit of land (Sun-Kee Hong, n.d.), characterized by consistent substrate conditions, potential vegetation, and ecosystem functions (Natuhara, 2006). It can be seen as the building block of a larger landscape or ecosystem. A smart city employs technology and data-driven methods to improve urban sustainability, livability, and economic competitiveness by integrating systems like transportation, energy, waste management, and citizen engagement platforms. The concept of smart ecotope extends this approach to managing urban ecosystems within a smart city framework. It involves using smart city technologies and data

analytics to monitor and enhance the health of urban ecotopes, as well as integrating ecotope considerations into the design and planning of smart city initiatives. This includes recognizing the ecological value of urban spaces and incorporating principles of biodiversity conservation, green infrastructure, and ecosystem restoration into urban development projects (Legutko-Kobus and All, 2023).

OBJECTIVES AND THE IMPORTANCE OF INTEGRATING THE TWO CONCEPTS

The convergence of digital infrastructure and ecotope systems presents an emerging paradigm in urban development. While „smart ecotope“ remains a novel concept in urban planning discourse, it fundamentally aligns with established theories in urban ecology and smart city development (Cordeiro, 2022). This evolution integrates digital technologies with discrete ecological units within the urban fabric, enhancing both ecological functions and human interactions.

The integration objectives focus on three key areas: sustainability enhancement through dynamic „space transforming agents“ (Mike Jenks, 2005) comprehensive planning frameworks requiring integrated methodology (Angela Reeve, 2013), and improved urban quality of life metrics through technologically augmented environments (Thu Hoai Nguyen, 2023). The framework addresses pressing urban challenges including population density management, climate change adaptation, and resource optimization (Iwona Chomiak-Orsa, 2020); (Mozuriunaite, 2018)

Smart ecotopes provide measurable benefits in microclimate regulation, environmental purification, and biodiversity preservation. While smart cities and smart ecotopes operate on distinct principles - technological innovation versus ecosystem functionality - their synthesis creates urban environments maximizing both technological efficiency and ecological integri-

ty. This integration enhances cities' capacity to respond to challenges like climate change, natural disasters, and resource scarcity through improved resilience and adaptability.

Analysing both concepts is important to understand that smart cities and smart ecotopes operate on distinct foundational principles - technological innovation versus ecosystem functionality - their integration offers a robust framework for sustainable urban development. The synthesis of these approaches enables the development of urban environments that maximize both technological efficiency and ecological integrity.

THE CHALLENGES OF IMPLEMENTING AND MANAGING A SMART CITY

Implementing and managing a smart city presents multifaceted challenges across technological, social, economic, and institutional dimensions. Technologically, integrating complex systems, managing and securing vast amounts of data, and ensuring widespread accessibility pose significant hurdles. (Krivý, 2016) Socially and economically, smart city initiatives must address concerns about equity, inclusion, privacy, surveillance, and potential job displacement. Institutionally, clear vision, strategic planning, funding, and adaptive regulatory frameworks are essential for successful governance (Reyna, 2023).

Other challenges include resistance to change, (Jung Hoon Lee, 2013) balancing technological advancements with sustainability, and measuring impact. Overcoming these obstacles requires coordinated efforts among stakeholders, effective communication, and a focus on delivering tangible benefits to the community. Cities must develop robust metrics and evaluation frameworks to track progress and identify areas for improvement.

Interaction between technology and ecology within an ecotope

Recognizing the ecological significance of ecotopes within a smart city framework is crucial for creating truly sustainable urban environments (Natuhara, 2006). Integrating smart city technologies into ecotope management can enable more efficient resource allocation, enhance biodiversity conservation efforts, and promote the restoration of degraded urban ecosystems. By integrating Geographic Information Systems (GIS) and remote sensing technologies play a crucial role in mapping and analyzing spatial patterns within ecotopes. By integrating data from various sources, such as satellite imagery, aerial photography, and ground-based surveys, cities can create detailed ecotope maps that inform urban planning decisions. These maps can help identify critical habitats, assess the connectivity of green spaces, and plan for the development of green infrastructure networks that support biodiversity and ecosystem services (Wenche E., 1996). Technology can aid in the design, implementation, and maintenance of green infrastructure, such as green roofs, rain gardens, and urban forests, which provide multiple ecological benefits. For example, sensor-based systems can monitor the performance of green infrastructure, ensuring its optimal functionality in capturing stormwater, reducing urban heat island effects, and supporting biodiversity.

While technology can offer solutions for managing and enhancing ecotopes, it's essential to consider the potential environmental impacts of technology use, such as energy consumption and electronic waste generation (Mike Jenks, 2005). Cities need to prioritize the use of energy-efficient technologies, promote responsible recycling practices, and implement lifecycle assessments to minimize the overall environmental footprint of smart city solutions.

Smart cities and smart urban ecotopes represent complementary approaches to sustain-



nable urban development. While smart cities focus on operational efficiency through intelligent energy management systems and smart mobility solutions to reduce ecological impact, smart urban ecotopes integrate these technologies specifically to enhance environmental protection. For instance, smart cities employ renewable energy and traffic management to reduce emissions, whereas smart urban ecotopes utilize similar technologies to support urban gardens, green roofs, and stormwater management systems. These applications monitor plant growth conditions, optimize water usage, and prevent flooding while supporting urban vegetation. Although both concepts aim to minimize environmental impact, smart urban ecotopes distinctively prioritize the integration of nature into urban infrastructure, creating cities that achieve both operational efficiency and environmental harmony.

Both approaches, however, may have limits and constraints or even in the case of Smart City the possibility of leading to manipulation and control with irreparable repercussions on the health of the ecotope, the ecosystem, the environment and people, the community and life in general. That is why it is necessary to use a complex, transdisciplinary and integrated thinking of both smart concepts, integrating city and urban ecotopes in a truly eco-sustainable form and process, both in the urban planning and design process, as well as in the related public policies, monitoring, management and control of the natural, urban and territorial systems.

A possibility of integrating the two approaches that for now in common practice seem to be treated and implemented distinctly and totally separate, therefore not in a correct integrated approach, is the approach of smart city attitudes to the concept of the intelligent urban ecotope, through bionics and biophilia.

The biophilic city promotes a spatial and functional approach correlated with the urban me-

tabolism of urban organism (Crăciun, 2008) in the development process, which runs in a heuristic transdisciplinary system, integrating all scientific, technological and informational knowledge, but also the local urban morpho-typological particularity and the socio-cultural particular component. All of these, can be planned and developed in the different levels of life in general, from the ecotone, ecosystem, urban environment and pathology, the health of the urban and human community organism.

CASE STUDIES: EXAMPLES OF CITIES WITH SMART URBAN ECOTOPES

Three case studies illustrate how cities worldwide are integrating Smart City and Smart Ecotope concepts to create sustainable, efficient, and environmentally harmonious urban environments.

Copenhagen, Denmark, aims to become the first net-zero carbon emissions city by 2025. It employs smart energy management, sustainable transportation, and green solutions like rooftop gardens and urban parks with environmental monitoring technologies. Copenhagen combines Smart City solutions with an ecological approach, creating an intelligent urban ecotope where technology and nature support each other.

Singapore, an advanced Smart City, heavily invests in technology to address rapid urbanization and pressure on natural resources. It integrates green spaces, uses intelligent water management technologies, monitors environmental parameters through IoT, and implements smart mobility solutions. Singapore exemplifies the integration of Smart City solutions with intelligent urban ecotope concepts, promoting a sustainable urban ecosystem supported by green infrastructures and ecological solutions.

Freiburg, Germany, renowned for its innovative smart city and ecological sustainability approaches, implements ambitious policies such as

exclusive use of renewable energy and ecological public transportation. It integrates nature through intelligent urban parks and gardens, green facades, and roofs. Freiburg promotes sustainable mobility and has pioneered eco-sustainable neighbourhoods. It perfectly combines Smart City solutions with the development of an intelligent urban ecotope.

By combining advanced technology with ecological principles, they optimize resource use, reduce environmental impact, and promote the development of intelligent urban ecotopes where nature and technology coexist harmoniously, serving as models for the future of sustainable urbanism.

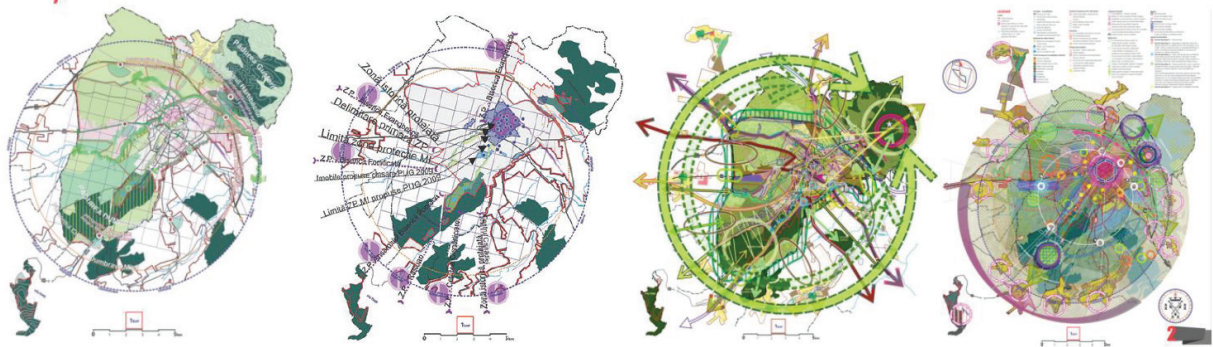
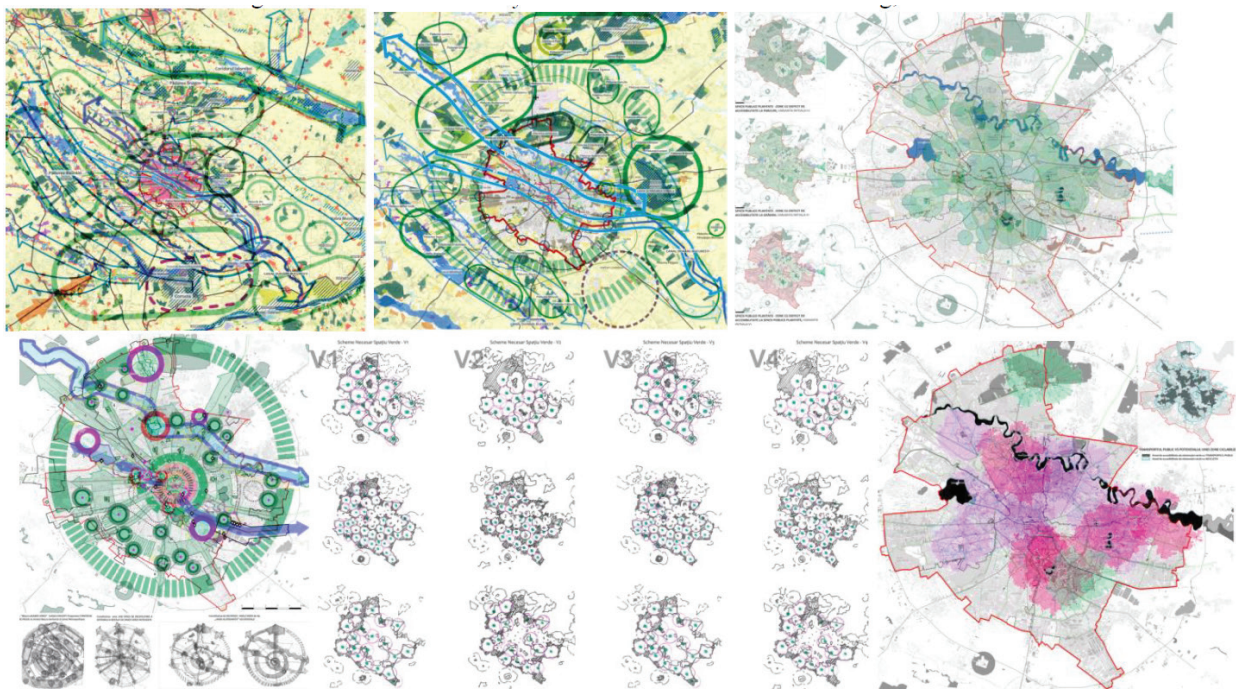


Fig 1: „Smart city versus Smart Ecotope“ transformed into „Smart City integrating Smart Ecotope“; *Source: Integrated Landscape Study, Sibiu Municipality and Bucharest City, the capital of Romania, Coordinator: arch. Cerasella CRĂCIUN PhD, Faculty of Urban Planning, Center for Research, Design, Expertise and Consulting - „Ion Mincu“ University of Architecture and Urban Planning, Bucharest*



DIRECTIONS FOR INTELLIGENT INTEGRATED SOLUTIONS FOR THE DEVELOPMENT OF A SMART URBAN ECOTOPE

Action Direction	Key Elements
1. Prioritize a Holistic and Integrated Approach	- Systemic Thinking: Recognize interconnectedness of urban components/ Multi-Target, Long-Term Solutions: Shift from single-sector, short-term solutions to comprehensive strategies/ Interdisciplinary Collaboration: Foster collaboration among diverse experts



Action Direction	Key Elements
2. Leverage Technology for Ecotope Monitoring and Management	- Smart Sensing Networks: Deploy sensor networks to gather real-time environmental data/ Data Analytics and Visualization: Utilize advanced tools to process sensor data and generate insights/Geospatial Technologies: Employ GIS and remote sensing to map and analyse spatial patterns
3. Enhance Ecotope Functionality through Smart Solutions	- Smart Irrigation Systems: Implement sensor-based systems to optimize water use efficiency/ Renewable Energy Integration: Explore integrating renewable energy sources into ecotope infrastructure/ Green Infrastructure Development: Incorporate elements like green roofs, rain gardens, bioswales, and urban forests
4. Empower Community Involvement and Stewardship	- Participatory Planning: Engage residents in planning through workshops, surveys, and participatory methods/ Citizen Science Initiatives: Encourage community-based monitoring through citizen science projects/ Collaborative Management: Establish co-management partnerships between local authorities, community groups, and stakeholders/ Education and Outreach: Develop programs to raise awareness, promote stewardship, and foster connection to nature
5. Establish a Robust Governance Framework	- Clear Objectives and Strategies: Define clear objectives and develop comprehensive strategies/ Adaptive Management Approach: Embrace flexibility, experimentation, and adjustments based on monitoring data and feedback/ Transparency and Accountability: Ensure transparency in decision-making and provide mechanisms for community input/ Performance Measurement and Evaluation: Establish a system for monitoring, evaluating, and demonstrating the effectiveness of implemented solutions

THE INNOVATIVE CITYSCAPE: HOW SMART CITY TECHNOLOGIES AND THE URBAN ECOTOP FRAMEWORK CONTRIBUTE TO THE FUTURE OF URBAN STRUCTURE

The combination of **smart city** and **smart urban ecotope** concepts into an **innovative cityscape** represents a holistic approach that not only transforms cities into a more efficient and comfortable environment for residents but also a place where technology and nature are integrated in a sustainable and resilient manner. By using intelligent technologies for resource management and environmental protection, cities not only become „smarter“ but also „greener“ and better prepared for future challenges, such as climate change and growing urban populations.

In the context of a **smart city** and a **smart urban ecotope**, intelligent solutions refer to the use of advanced technologies to create a sustainable, efficient, and ecologically integrated urban environment. These solutions can be applied to improve the quality of urban life and to support the management of natural resources in a way that protects biodiversity and promotes long-term sustainability.

An **urban ecotope** is a concept that combines ecological elements with urbanism, creating an urban environment that supports the balance between human life and nature. Smart solutions are essential in this context to transform cities into resilient and efficient ecosystems. Here are some intelligent solutions that can be integrated into a **smart urban ecotope**.

Opportunities	Challenges	Key Insights	Potential for resilient sustainable, and equitable urban environments
Enhanced Environmental Monitoring & Management	Data Privacy & Security	Holistic Approach	
Optimization of Resource Use	Social Equity & Inclusion	Community Engagement	
Improved Community Engagement & Stewardship	Integration Complexity & Interoperability	Effective Governance Frameworks	

Fig. 2: Future challenges and opportunities of the integration of Smart City and Smart Ecotope technologies *Source: authors own conception*

CONCLUSIONS

To summaries, smart ecotopes represent a fusion of urban ecological design and technological innovation, creating resilient urban spaces that address contemporary challenges. They integrate natural systems with digital infrastructure through green corridors, vertical vegetation, and intelligent resource management. While smart cities focus on operational efficiency, smart ecotopes combine technology with ecological principles to promote sustainability. This approach uses digital platforms for community engagement, adaptive frameworks for implementation, and interdisciplinary research for solution validation. The result is an advanced urban habitat where technology and ecology work together to create balanced environments supporting both human activity and natural processes in the face of climate change.

Cities are complex processors, which require the integration of various layers and levels, articulating the ecosystem, ecotope, microclimate, landscape and natural and cultural components, with the anthropic and urban artifact, built and technical directions, mobility and infrastructure, etc. These can be integrated into the scientific and technological knowledge of the smart approaching, only together with evolutionary-historical and specific cultural-anthropological particularities, societal and community or psycho-behavioural particularities.

Thus, „Smart city versus Smart Ecotope”, can be transformed into a „Smart city approach integrating Smart Ecotope”, through which cities tend through bionics, biophilia and nature-based solutions, to process current cities in a

living metabolic form and in perpetual transformation and metamorphosis[CITATION Cer23 \l 1033]. These need to integrate in a real bioethical form directions, oriented only towards the protection and

conservation of natural and anthropogenic heritage, by perpetuating life in general, using all smart directions: informational and technological, structural and functional, economic through capital system and power city directions, based on efficiency, management flows, productivity (including energy and food), monitoring and control, all of which through eco-sustainable and urban smart resilience.

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MACIEJ NOWAK

Challenges for comparisons of national spatial planning systems

in Central and Eastern European countries



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The issue of comparing spatial planning systems in different countries is addressed in diverse ways. The subject of the comparisons is the diverse features of the national systems. An important part of them includes legal and institutional issues. This text presents the key challenges for comparisons of legal and institutional conditions in the CEE countries.

First of all, it should be emphasised that spatial planning legislation cannot be compared in isolation from the social, cultural and economic characteristics of the respective systems. The same legal provisions in two different national systems may have completely different meanings and guide planning practice in completely different ways. For this reason, considerable caution should be exercised when juxtaposing specific legal solutions from different countries. Nevertheless, attempts at such comparisons (undertaken in a balanced way) are very valuable - both from a theoretical perspective and from the perspective of a realistic assessment of the solutions found in the different spatial planning systems.

Spatial planning law also has its own peculiarities, clearly distinguishing it from other areas of law. The sociocultural conditions of the countries concerned have a particular influence on both the formulation and interpretation of spatial planning law. At the same time, spatial

planning is interdisciplinary. It encompasses issues related to architecture, environmental and nature conservation, heritage protection, climate change adaptation, climate mitigation or social challenges. From the perspective of all these areas, certain expectations are expressed towards spatial planning law. However, the law has its own specificities. It is very difficult to transfer all non-legal demands into the legal sphere. Often, lawyers limit themselves to this statement and completely ignore the extra-legal perspective of spatial planning. However, this is also an important mistake. Despite the specificity of the law, extra-legal objectives and values should be taken into account to the maximum extent possible in spatial planning law. However, this is a serious, complicated (and at the same time very interesting) challenge.

The above specificity of the role of spatial planning law can be applied to Central and Eastern European countries. Undoubtedly, a key feature uniting the countries indicated is a common historical experience, primarily related to communism. During communism, spatial planning was part of the top-down social and economic planning imposed by the state. At the time, spatial planning instruments functioned to a moderate extent and were highly distorted. In the 1990s, a large part of the population in Central and Eastern Europe perceived spatial planning as a relic of communism: completely unnecessary, even harmful. Consequently, there was a so-called 'neo-liberal reaction'. According to it, the key value in spatial planning became private property ownership and the key task was to protect the rights of proper-

ty owners. The consequence of the above has been negative spatial processes: uncontrolled urbanisation and (as the Polish literature puts it) - spatial chaos. Spatial planning law in the surveyed countries attempts to respond to the indicated threats. However, it does so with moderate effectiveness.

The comparison of the legal conditions of spatial planning in the surveyed countries is carried out on the basis of the method developed. It is difficult to compare and contrast a large number of institutions at the same time. This is because there is a risk of making significant simplifications. Therefore, comparisons should focus on a specific institution. In the first instance, a common understanding of the institution should be developed (based on the universal international spatial planning literature) for all authors. The subject of comparison can be diverse: e.g. spatial plans at local level, regional spatial planning instruments, zones in planning, values in spatial planning law, national plans, etc. Once a common understanding of the institution has been developed, a questionnaire with common questions on the legal and practical dimensions of the institution being compared can be developed for all

co-authors of the article. On the basis of the answers given (and then the answers to the next round of detailed questions), synthetic results can be developed in tabular form.

The process of comparing the legal and institutional conditions of the CEE countries also has some barriers. The key ones are identified below:

- the size of the countries and the size of the basic units of local government (municipalities and their equivalents) are undoubtedly differentiating factors in the comparisons. This also differentiates how spatial policies are applied. Therefore, it is important to distinguish between, for example, the circumstances of Poland and Latvia, or Romania and Lithuania;
- political circumstances are also a differentiating factor, including membership of the European Union or whether a country was part of the Soviet Union (in which case it had to build its spatial planning system from scratch in the 1990s);
- the way in which a country approaches regional spatial planning is also important (not only in smaller countries: there are differing features of regional planning instruments);
- an important challenge is to compare the way in which values are included in the spatial planning law of the countries studied. In each case, key values are indicated at the beginning of the spatial planning law. It is important both to compare these values and how they are implemented in practice;



Picture 1: Countries selected for comparison of legal and institutional conditions in spatial planning

- a factor to be taken into account is the direction of change in the spatial planning law of the surveyed countries. However, this issue requires a separate method of comparison. Changes in the law can be varied - both in terms of content and in terms of consequences.

Among the selected features of the spatial planning systems of the CEE countries, one can distinguish:

- a broader attachment to the role of private property in spatial planning;
- limited activity in the implementation of climate challenges in spatial policies;
- terminological discrepancies between different spatial planning instruments (e.g. two types of spatial plans at the municipal level). These discrepancies cause constraints to the efficient conduct of spatial policies.

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MARKÉTA ŠIMÁČKOVÁ

DEVELOPMENT OF SUSTAINABLE REAL ESTATE PROJECTS



45



Markéta Šimáčková is an MBA graduate from the University of Economics in Prague with a focus on commercial real estate and valuation. Since 2017, she has held several executive positions in the private real estate development sector, managing a portfolio of commercial and residential projects primarily in Czech regions. She has worked as Deputy CEO at Urbanity Development, focusing on building sustainable campuses in the Czech Republic, and as Managing Director of the real estate group Torino-Praga Invest. Her experience also includes international consultancy services at Cushman & Wakefield.

Sustainability in real estate development is no longer just a trend - it is a necessity. As climate concerns and urbanization grow, developers must adopt sustainable practices that balance profitability, environmental stewardship, and social responsibility. This article explores key aspects of sustainable real estate development, from preparation to execution, highlighting practical approaches and challenges.

Project Preparation

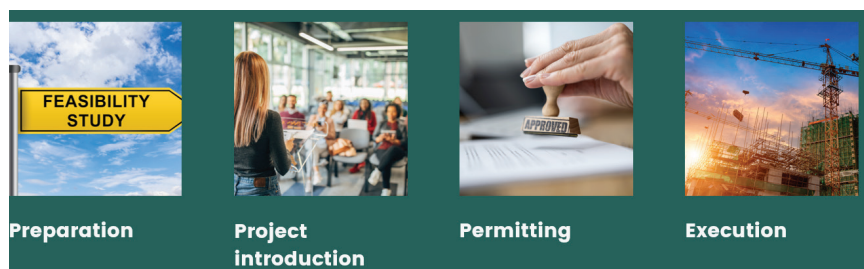
A successful real estate project begins with a thorough feasibility study. This critical step

ensures the proposed project aligns with the area's demographics and socioeconomic conditions. It is essential to verify at the beginning whether the project is suitable for the selected area. The feasibility study can be supported by demographic and socioeconomic analysis, which provides valuable insights.

Collaboration with municipalities is equally vital. Establishing clear agreements and fostering positive relationships with local authorities can streamline processes and mitigate potential conflicts. The level of cooperation should be defined in a cooperation agreement, which outlines conditions for both sides regarding the project's development.

Engaging with the local community early allows for the integration of public feedback, minimizing opposition and delays during the permitting phase. Projects with significant impacts are often subject to public hearings or discussions at municipality councils. Developers should proactively communicate and present future steps and updates of their projects.

Civic amenities should be an integral part of development projects. Alternatively, developers should create partnerships with existing public facilities and community organizations to enhance or expand civic amenities, ensuring the development meets broader societal needs.



Picture 1: Project development phases



Picture 2: Project development phases

The Role of Architecture in Development

Architecture is more than aesthetics; it defines the character and functionality of a project. It is crucial to incorporate architectural design into every real estate project. In selected locations, the visual appearance of buildings may be subject to rules and statements issued by the Heritage Office. Frequently, developers or public authorities organize architectural competitions to ensure high-quality design.

Architecture should be an integral part of residential, office, industrial, and other commercial projects. Close collaboration between architects and project management teams is necessary at this stage to achieve a balance between cost, design, and functionality.

The Permitting Process

In the Czech Republic, permitting is often a lengthy and complex process. Overloaded officers and authorities frequently fail to meet prescribed deadlines, and third parties have multiple opportunities to challenge or delay proceedings. This can extend project timelines by months or even years, significantly affecting project economics.

Key permitting stages include:

- **Study registration** - or selected development zones, it is necessary to prepare and register a zoning study defining the structure and future use of the area.

- **Environmental Impact Assessment (EIA)**¹ This process examines and assesses the potential environmental impact of the planned development.

- **Statements of the Authorities** - For a smooth permitting process, developers must collect all necessary statements from concerned public authorities and utility owners.

- **Application for a Building Permit** - This is the final stage of the permitting process, after all required documents have been collected.

- **Valid Building Permit**

Despite these steps, delays caused by objections or inefficiencies remain common, requiring patience and meticulous project documentation. Third parties can still challenge the issued building permit.

Sustainability in Real Estate

Developers should prioritize projects that are environmentally efficient, socially responsible, and economically viable. Using local resources,



Picture 3: Sustainability in real estate projects

¹ Co je to EIA ? Online. Dostupné z: <https://www.kr-karlovarsky.cz/temata/zivotni-prostredi/posuzovani-vlivu-na-zivotni-prostredi-eia-sea/co-je-eia>. [cit. 2025-01-12].



reliable suppliers, incorporating energy-efficient technologies, and revitalizing brownfields instead of developing greenfield are exemplary strategies. Sustainability is more than just a trend; it reflects a commitment to future generations.

Real Estate Certifications

Modern real estate projects can leverage certifications to validate their environmental and social credentials. These certifications now extend beyond measurement of construction quality to encompass the entire project's impact, such as BREEAM Communities and similar certifications.

ESG Integration

Environmental, Social, and Governance (ESG) principles are essential for long-term sustainability. The EU Taxonomy provides a framework for assessing the sustainability of investments, emphasizing climate neutrality and responsible practices. Aligning with ESG can help real estate developers secure better financing terms due to the sustainability and social responsibility of their projects. ESG principles contribute to a responsible and sustainable approach to investment and real estate as a whole.

Project Execution

Delivering on promises is paramount. This also includes using reliable, responsible suppliers and maintaining transparency with stakeholders. Beyond profitability, developers should consider the lasting impact of their projects on communities and the environment.

Conclusion

Sustainable real estate development demands a commitment to quality, collaboration, and environmental responsibility. By prioritizing these principles, developers can create long lasting projects benefiting both current and future generations.

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Picture 4: ESG in real estate

Approaches to assessing the level of development from a geo-statistical perspective



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Abstract

The article outlines several approaches used to assess the level of development in a spatial planning and regional development view. There are planning approaches that make use of public participation or experts, and scientific, data-driven approaches. While for the first categories reaching consensus is a major issue, the other may find solutions. While there are simple solutions, such as treating all pillars and regions evenly, the best results are obtained when integrating the Principal Component Analysis in a Geographic Information System.

Key words: *geo-statistics, territorial development, urban planning, territorial planning, data-driven approaches*

This article addresses specifically the issue of producing a hierarchy of territorial units with respect to their level of development based on statistical data on more indicators and mapping the hierarchy from a methodological geo-statistical perspective, but oriented to spatial planning and regional development. While several approaches are in place, each one has its advantages and disadvantages, and, from a planning perspective, differences due to the national planning systems appear across countries, even across those sharing a similar history and characteristics (Nowak et al., 2022). One important debate is the one concerning planning-based approaches, especially those based on participatory planning, as outlined by the European Union (EU) regulations, and scientific, data-driven approaches.

Several methodologies and approaches are discussed in this paper. For illustration purposes, we refer to already published articles, which are discussed in more detail here.

(1) Planning-based approaches can rely on the decision of planners or public administrations, involving public participation. Under correct settings, public administrators have a vision for developing their region or country, and planners have the tools for putting it into practice. However, this is not always the case. Sometimes, and especially in local and regional settings, administrators are more likely attempting to find short-term solutions to stringent problems instead of developing a long term vision, or there are communication issues. Although there are recommendations for planners to use a simple,

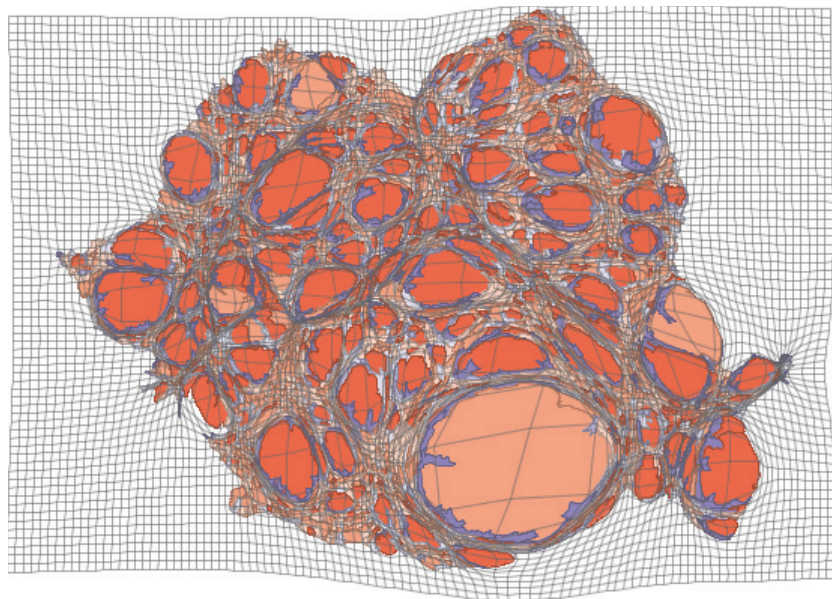
common language instead of their own jargon and provide short recommendations instead of long reports (Petrișor et al., 2021), this issue remains unresolved.

Planning-based approaches may rely on (1) visions of planners and/or public administrations alone, or (2) visions developed along with the public. The first category is subject to numerous shortcomings. An example from Romania is the attempt to develop a spatial development plan, meaning a territorial representation of the narrative vision based on socio-economic, environmental etc. issues. In 2005, the only success was adding a written description (not a map) to the National Plan of Development. However, this seed was productive, and in the 2010 National Conference of Planners representatives of two ministries (the one dealing, among others, with spatial planning, and the one dealing with the national economy) presented spatial visions for the development of the country. However, the visions were radically different, and consensus was not achieved. In addition, if local representatives are involved, each one tends to favor his/her region, especially in terms of budget allowance. Planners are also able to produce a vision, and present it in a territorial context. However, a 2010 survey of the Romanian order of architects revealed that more than 90% of the Romanian architects perceived themselves as demiurges (Chiribucă et al., 2010), so consensus is, again, hard to reach. In a nutshell, reaching consensus seems to me a major issue in developing visions of planners and/or public administrations.

Developing visions along with the public or experts may be a better approach. In this case, approaches like Delphi may provide a way to combine individual opinions and preferences

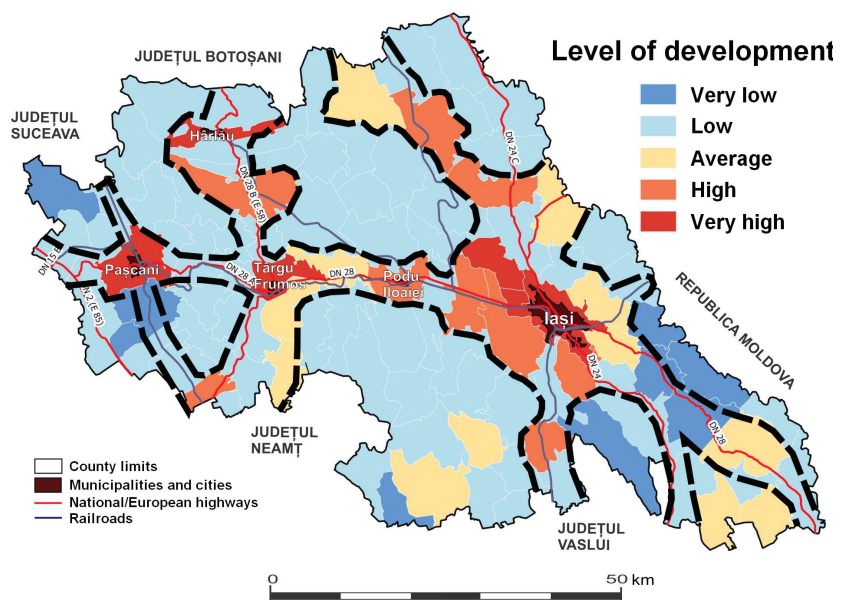
into a common vision (Petrișor and Petrișor, 2020). However, the issue of public participation in planning is a debated one, as there are planning cultures more prone to listening to the public, and others that favor top-down approaches. Another issue is that experts may favor one pillar or another based on their own background, and the public opinions may also be biased. Particularly the environmental side was subject to investigations that indicated a variety of attitudes and preferences (Petrișor and Petrișor, 2013), making the process of reaching consensus almost impossible (Petrișor and Petrișor, 2020).

From a statistical perspective, there are many approaches. Usually in the process of assigning probabilities or weights, the basic idea is to assign equal weights when there is no sufficient knowledge of the need to assign them differentially. But what means 'equal' differs in territorial statistics. For example, we could consider only an issue as simple as exploring the possibilities to create a territorial distribution of a single variable based on the available options in ArcView 3.X. (Petrișor, 2013). There are several options: (1) equal areas: in the resulting distribution, the different levels of a certain variable have approximately equal coverage in



Picture 1: Example of presentation technique: Scape Toad distorts the geographical space to emphasize the gaps: Population growth of Romania, source Petrișor, 2013

terms of the total area of administrative units with the same level of the respective variable. The resulting distribution is influenced by the units having different areas, but also provides a wrong image in an uneven distribution, characterized by the hypertrophy of capital cities and other large and important cities. In other words, a fake image of an even distribution is created. (2) Equal intervals, meaning that the values of the variable are assigned to equal intervals forming a level regardless of the number of administrative units reaching the respective level is very good to reveal the territorial gaps. However, in the case of huge gaps, the result is useless. For example, in Romania it separates Bucharest, the capital city, from the other cities and regions, but does not differentiate among the latest. (3) Natural break are a nice way of solving the problem scientifically, as there is a mathematical formula. However, when explaining it to planners, the example is counterintuitive. Moreover, the results are very contextual, varying from one region to another and from one period to another. (4) Quantiles are a statistical tool dividing the distribution of administrative units in intervals assigned to the same level of development. For examples, quartiles produce four intervals, quintiles five etc. The result is relatively similar to the 'equal areas' and has the same disadvantages. (5) The standard deviation is, again, a 'nice' approach, relatively simple to understand, but, again, very contextual. In addition to these, other approaches can be used. For example, if each administrative unit is reduced to its geometrical center and the value of the variable assigned to this center, kriging can be used to create a spatial distribution beyond the administrative limits. Similarly, Scape Toad is a utility that distorts the geographical space to emphasize the gaps, particularly the outliers



Picture 2: Principal Component Analysys (PCA) & GIS : spatial configuration of clusters of developed and underdeveloped areas, Iași County, *source Iurea, 2011*

(Petrișor, 2013). Combinations of simple territorial statistics and kriging can be used to map the distribution of the level of development based on more variables, against the real territorial limits or based on spatial interpolation.

The approach proposed here allows for using statistical data and integrates the Principal Component Analysis into a Geographical Information System. This method was developed as part of the doctoral thesis in Geography “*Geostatistical methods for the analysis of territorial systems*” (Petrișor, 2011a), defended at the University of Bucharest in 2011 and published in the same year (Petrișor, 2011b). Other doctoral students had already used it for their doctoral research at the defense time, and the results were summarized in the article “*Applications of Principal Component Analysis integrated with GIS*” (Petrișor et al., 2012). There were many other instances of its application, including a study on “*Exploring the Urban Strength of Small Towns in Romania*” (Stoica et al., 2020). Essentially, the approach consists of few steps: (1) use Principal Component Analysis to identify the variables with the highest influence on the assumed ‘level of development’, based on the correlation between the principal components and initial variables, along with their weights;



(2) rescale the weights so that they sum up to 100% and create an indicator representing a linear combinations of the variables identified in step 1; (3) map the values of the indicator using an appropriate approach (see the discussion in the paragraph above), and interpret the results.

In a nutshell, here are some examples of using this approach (for details, please refer to Petrișor et al., 2012 and Stoica et al., 2020).

(1) Looking at the level of development in Romania (Ianoș et al., 2013): The approach below was used to produce a national map revealing the disadvantaged areas that require a special attention. At the same time, the analysis revealed the role of some urban centers in spreading the development over adjacent poorer areas.

(2) Looking at the level of development in particular regions of Romania, i.e. Ialomița County (Ianoș and Petrișor, 2010), Danube Delta Biosphere Reserve (Văidianu, 2011), or Iași County (Iurea, 2011): The examples, very similar to the previous one, revealed the potential of replicating the approach at a micro-scale. Of particular interest is the latest example, where the author, based on the spatial configuration of clusters containing developed and underdeveloped areas, was able to reveal the regional axes of development and explain the processes and mechanisms beyond their spatial configuration.

(3) Exploring the urban strength of small towns in Romania based on creating three urban strength indices corresponding to socio-economic, demographic, and combined infrastructure and land-use issues to look at the influence of small towns on local development is a good example of using the approach to look at particular components of the territorial system in order to analyze processes driven by these components (Stoica et al., 2020).

It is very important to discuss an issue. While it seems that integrating Principal Component

Analysis in a Geographic Information System provides the best results, these results depend on the quality and availability of data. In this regard, it is always important to consider all pillars of development. Results of applying this approach in numerous cases indicated that data must be selected for all pillars and dimensions of development (economy, society, environment, and culture, and, respectively, infrastructure, administration, governance etc.) in order to obtain realistic results (Petrișor, 2014)

The presentation indicates that reaching consensus is a major issue for planning approaches that make use of public participation or experts, and scientific, data-driven approaches. Statistical approaches provide simple solutions, such as treating all pillars and regions evenly. Nevertheless, the best results are obtained when integrating the Principal Component Analysis in a Geographic Information System, especially when using data covering all pillars and dimensions of development.

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Focus of activities of associations of municipalities in terms of their budgets



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1. Introduction

In the conditions of the Czech Republic, the financing of territorial development from public budgets consists of, in addition to resources from the state budget, territorial budgets, which include the budgets of municipalities, regions and clusters of municipalities. The budgets of municipalities and regions are basically determined by a fixed territorial structure (municipalities and regions), but the territorial scope of associations of municipalities is changing, there is no permanent territorial form. From the territorial point of view, associations of municipalities can be established arbitrarily, each municipality can be a member of several unions of municipalities, and in addition to cooperation of municipalities from the territorial point of view, e.g. neighbouring municipalities or in the implementation of line projects, there can also be unions of municipalities without a closer territorial link. And these aspects of clusters of municipalities are then reflected in the budgets of unions of municipalities.

The cooperation of individual clusters of municipalities is thus not based on the cooperation of the entire scope of competence of municipalities, but it is a selected activity where the

cooperation of municipalities in the union is expected to bring some effect to the member municipalities.

The aim of this paper is to evaluate the focus of activities of unions of municipalities on the basis of the budgets of unions of municipalities. Just as the budget of municipalities is a reflection of their activities, so here are unions of municipalities conceived in a similar way from the point of view of their budgets.

2. Methodology

The status of unions of municipalities is regulated by the Act on Municipalities (Act 128/2000 Coll.); The current version of the Act on Municipalities (2024) has newly regulated the area of cooperation between municipalities. Act No. 128/2000 Coll. states that: „Municipalities have the right to be members of a union of municipalities for the purpose of protecting and promoting their common interests“ and defines very broadly the areas of possible cooperation between municipalities.

According to the law, the activities of a union of municipalities may include, in particular, tasks in the field of education, social care, health, culture, fire protection, public order, environmental protection, tourism and animal care, ensuring the cleanliness of the municipality, management of public greenery and public lighting, collection and removal of municipal waste and its safe processing, use or disposal, water supply, drainage and treatment of was-

tewater, Introduction, expansion and improvement of technical equipment networks and public passenger transport systems to ensure transport services in the area, tasks in the field of air protection, operation of quarries, sand pits and facilities used for mining and processing of mineral resources, management of municipal property, especially local roads, forests, housing and housing stock, sports, cultural facilities and other facilities managed by municipalities.

In a completely new way (from 2024), the Act also defines the concept of community of municipalities, where a community of municipalities is a union of municipalities that meets the conditions set out in this Act (128/2000 Coll.), and where the possibilities for the creation of unions of municipalities are already regulated for the community of municipalities, in particular in that the community of municipalities must have at least 15 municipalities (with exceptions), they must be municipalities from one administrative district of the municipality with extended powers, Each municipality can be a member of only one community of municipalities. In addition to the activities of the union of municipalities, the subject of the activities of the association of municipalities is to ensure the coordination of public services in the territory of the member municipalities and the strategic development of this territory. Unlike clusters of municipalities, the community of municipalities rigidly has defined bodies or the method of approving the strategy for the development of the community of municipalities. In the case of communities of municipalities, the possibility of cooperation within the delegated exercise of state administration to municipalities is assumed. However, the shortness of the existence of this form of community of municipalities cannot be evaluated in terms of the functionality of such unions of municipalities.

The paper is focused on the budgets of associations of municipalities, or their development in recent years. The establishment of unions

of municipalities is also associated with the creation of budgets of unions of municipalities. Unlike municipalities, however, neither the income nor the expenditure of associations of municipalities is stipulated by law, so theoretically they can be zero. The management of individual unions of municipalities is based on the focus of activities of the respective union. However, the structure of the budgets of clusters of municipalities is monitored according to the budget structure, as in the case of municipalities.

In general, the income structure of clusters of municipalities can be characterized in terms of the breakdown of income into tax, non-tax, capital and received transfers. Tax revenues do not arise in the case of associations of municipalities. Associations of municipalities are not entities within the budgetary allocation of taxes, nor do they exercise delegated state administration from which administrative fees could arise, and unions of municipalities cannot even introduce local fees. Non-tax revenues of associations of municipalities may arise, for example, in cases where the union as an entity provides certain services on its own behalf, for which a user fee is collected (e.g. water and sewerage charges). Capital income of associations of municipalities can only arise in the case of the sale of fixed assets created by the activities of the relevant union. The property that the municipalities themselves contribute to the union remains the property of the respective municipalities, so its sale cannot be income from the budget of the union of municipalities. The last part of the possible income of the unions of municipalities consists of transfers (subsidies). Obtaining subsidies for the implementation of joint projects is one of the main reasons for the establishment of voluntary associations of municipalities. Subsidies to the budgets of voluntary associations of municipalities therefore usually form the main source of budgets of unions of municipalities. However, none of these subsidies is of an entitlement nature, as is the case, for exam-

ple, with municipalities, where the entitlement subsidy for all municipalities is a contribution to the delegated performance of state administration. Subsidies for unions can be divided into the following parts:

- Member municipalities of the union of municipalities usually regularly contribute to the activities of the relevant union with an agreed amount per capita and the funds are primarily intended for the day-to-day operation of the union,

- The aim of the activities of municipalities in the union is to obtain subsidies from various subsidy programs for joint projects; Associations of municipalities apply for subsidies that are intended for municipalities, and a larger unit in the form of a union of municipalities may, for example, better meet the conditions for the allocation of subsidies than individual municipalities, or it may be the implementation of a joint project implemented by a union of municipalities in the territories of member municipalities,

- The subsidy obtained for a project implemented by a union of municipalities usually does not cover the total costs of the project, and therefore the participation of municipalities in the implementation of this project is usually needed, so in connection with such projects, municipalities must provide a subsidy from their budgets to co-finance joint projects on the basis of an agreed key.

	2019	2020	2021	2022	2023
Tax revenues	0,0	0,0	0,0	0,0	0,0
Non-tax revenues	1,4	1,4	1,6	1,7	1,9
Capital Gains	0,0	0,0	0,0	0,0	0,0

	2019	2020	2021	2022	2023
Transfers received	2,7	3,3	3,5	3,6	3,9
Total revenue	4,1	4,7	5,1	5,3	5,8

Table 1 Development of revenues of unions of municipalities in the Czech Republic (in CZK billions) *Source: Custom processing based on Monitor*

With zero tax revenues of unions of municipalities in the Czech Republic, the largest part of the income of unions of municipalities in 2023 was actually received transfers (67%) and then non-tax revenues (33%). The total size of their budgets has increased by around 41% over the last five years (see Table 1).

Part of the sources of the budgets of the unions of municipalities are based on the resources of the member municipalities, however, the total size of the budgets of the unions of municipalities in relation to the size of the budgets of municipalities in the Czech Republic is relatively small. The ratio of the budgets of clusters of municipalities to the budgets of municipalities was 1.2% in 2023, and over the last 10 years with various fluctuations, this share has decreased from 2.3% in 2014 (source: State Treasury Monitor). This points to the fact that the role of associations of municipalities in terms of their budgets is rather decreasing in the Czech Republic. In 2023, a total of 699 clusters of municipalities were registered (Monitor).

3. Analysis of the management of clusters of municipalities

The activities of associations of municipalities should help especially where there are small municipalities and where the cooperation of municipalities can bring effects for these small municipalities associated with the provision or concentration of activities, etc.

Based on the analysis of the budgets of the unions of municipalities, it is possible to show both their structure and interregional differences. The average size of municipalities in terms of population varies quite significantly between regions; on average, the largest municipalities are in the Moravian-Silesian Region, while the smallest municipalities are in the Hradec Králové Region (see graph 1). It turns out that from the point of view of the budgets of clusters of municipalities (based on the indicator of expenditures of clusters of municipalities per capita of the region in 2023), there is no clear tendency, which would indicate, for example, a greater degree of co-operation between municipalities (expressed by budgets of unions of municipalities) in regions with a smaller average size of unions of municipalities. For example, it is possible to point to significant differences, where on the one hand the Hradec Králové Region with the smallest average size of municipalities has some of the lowest expenditures of clusters of municipalities per capita, and on the other hand, the

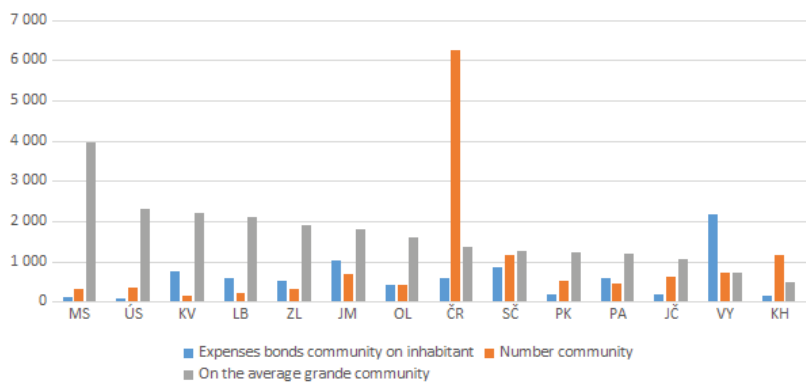


Chart 1: Expenditure of clusters of municipalities per capita, number of municipalities and average size of municipalities for individual regions of the Czech Republic in 2023 (Source: Own calculation based on Monitor)

Vysočina Region, which has the second lowest average number of inhabitants per municipality, has the highest expenditure of clusters of municipalities per capita (see graph 1). Apparently, there are more factors affecting the co-operation of municipalities in the regions than,

for example, just the average size of municipalities in the region.

On the basis of the expenditures of the budgets of associations of municipalities in the Czech Republic, it is possible to capture the development in the recent period in relation to the

Section Group	diameter 2014 - 2023	diameter 2019 - 2023	2023
1 Agriculture, forestry and fisheries	0,31 %	0,43 %	0,48 %
2 Industrial and other sectors of the economy	76,61 %	73,86 %	69,56 %
3 Services for individuals	17,20 %	20,78 %	25,49 %
4 Social affairs and employment policy	0,37 %	0,54 %	0,49 %
5 State security and legal protection	0,34 %	0,18 %	0,39 %
6 General public administration and services.	5,18 %	4,21 %	3,59 %
On the whole	100,00 %	100,00 %	100,00 %

Table 2: Structure of expenditures of unions of municipalities in the Czech Republic (Source: Treasury Monitor, own elaboration)

groups of expenditures according to the budget structure. It turns out (see Table 2) that in the long term, the expenditure of clusters of municipalities is focused mainly on the Industrial and Other Sectors of the Economy group, although their share has decreased somewhat and in 2023 the share of this group was almost 70%. The second most represented group consists of services for individuals, which, on the other hand, has grown recently and accounted for 25.5% in 2023. Other groups of expenditure are significantly less represented.

A look at the expenditures of clusters of municipalities through groups of expenditures is a rather rough view, because the names of the groups only indicate in which areas of expenditure the funds are spent. A more appropriate view is to look at the expenditure paragraphs, which cover the greatest detail in monitoring public budget expenditures. If we take into account paragraphs that have a larger share of more than one percent in the expenditure of associations of municipalities, there



Paragraph number	Paragraph - title	Share in %	Share of capital expenditure within the section
2321	Wastewater collection, treatment and sludge management	31,89%	81,9%
2310	Drinking water	27,38%	76,0%
3639	Municipal services and territorial development not elsewhere classified (e.g. expenditure on technical services)	11,78%	75,1%
3113	Primary schools	6,59%	85,2%
2219	Other road matters (pavements, parking lots, cycle paths, etc.)	4,88%	93,3%
6409	Other activities not elsewhere classified (transfer refunds)	2,89%	39,9%
3599	Other activities in health care	2,02%	15,2%
2143	Tourism	1,28%	56,0%
2292	Public Service Transport Services - Line	1,24%	0%
2369	Other management in water management (e.g. management of small watercourses)	1,20%	40,0%
3636	Territorial development	1,09%	40,7%

Table 3: The most important sections* of expenditures of associations of municipalities in the Czech Republic in 2023 (*Source: Own calculation based on Monitor*) *Expenditure paragraphs that account for more than 1% of the expenditure of associations of municipalities in 2023 are included.

are a total of 11 paragraphs (which together account for 92.2% of the expenditures of unions of municipalities in 2023, see Table 3).

The main part of the expenditure implemented by the associations of municipalities in 2023 went to wastewater collection and treatment, as well as to the construction of water mains, technical services, primary schools and other road matters (see the highest shares of paragraphs in Table 3), the other sections were represented by shares of less than 3%. In addition to the proportion of individual expenditure paragraphs, it is also possible to capture their structure of expenditure broken down into current and capital expenditure. In the case of sections with the highest weights (over a share of 3%), more than three-quarters of expenditures were capital expenditures (investments).

The expenditures of associations of municipalities are thus more significantly directed to the few above-mentioned paragraphs. In this context, we can formulate the question whether these most represented paragraphs are also reflected in

the expenditures of municipalities in the Czech Republic, or to what extent these expenditures contribute to the expenditures of municipalities in the Czech Republic. For this evaluation, only the most represented sections in the expenditures of associations of municipalities were chosen, i.e. five sections (from Table 3) were chosen, i.e. sections with the highest share in the expenditures of unions of municipalities.

A comparison of the expenditure of the monitored sections for unions of municipalities and

the expenditure of municipalities of the Czech Republic in 2023 shows a stronger role of unions of municipalities than their share in the total volume of the municipal budget, where in 2023 the share of expenditure of union of municipalities to municipal expenditure was 1.2% (see above). It turns out (see Table 4) that the role of expenditures of clusters of municipalities in relation to expenditures of municipal budgets of the Czech Republic is highest in the area of expenditure on water supply systems (Section 2310 Drinking Water), where unions of municipalities spent a quarter (25.95%) of what municipalities in the Czech Republic

Section	Paragraph - title	Expenditures of associations of municipalities in billions of CZK (a)	Expenditures of municipalities in billions CZK (b)	Share a/b
2321	Wastewater collection, treatment and sludge management	1,73	13,60	12,73%
2310	Drinking water	1,49	5,73	25,95%
3639	Municipal services and territorial development not elsewhere classified	0,64	21,63	2,96%
3113	Primary schools	0,36	40,22	0,89%
2219	Other road matters	0,27	12,57	2,11%

Table 4: Expenditures of unions of municipalities and municipalities of the Czech Republic in 2023 in selected sections (*Source: Own calculation based on Monitor*)

spent. This indicates a situation where clusters of municipalities are relatively significant-

ly involved in the construction of water supply infrastructure. About half (12.73%) is in the area of wastewater collection and treatment (Section 2321). Other expenditure paragraphs within the unions of municipalities are represented only by a small percentage of the size of the expenditures of all municipalities.

The above view captured the position of the five most important paragraphs in the expenditures of associations of municipalities. However, in the paragraph structure of the expenditures of associations of municipalities, there are about 120 sections in which it is possible to monitor their share in relation to the size of expenditures of municipalities in the Czech Republic in order to evaluate the expenditure

Section č.	Paragraph - title	Share of expenditures of unions of municipalities in expenditures of municipalities of the Czech Republic
2369	Other administration in water management	2778 %
2242	Public Railway Transport Operation	161 %
3148	Centres of Educational Care	120 %
3599	Other activities in health care	103 %
4229	Active unemployment policy not elsewhere	77 %
2239	Other inland navigation issues	52 %
6149	Other general internal administration not elsewhere classified	51 %

Table 5: Share of expenditures of associations of municipalities to expenditures of municipalities in the Czech Republic in selected sections in 2023 (*Source: Own calculation based on Monitor*)

res of unions of municipalities. If we take as a measure, for example, that the size of the share of expenditures of unions of municipalities is at least 50% compared to the expenditures of municipalities in the Czech Republic, it turns out that such a value is in seven sections (it is necessary to add that the share of these individual sections does not reach even one percent in the structure of expenditures of unions of municipalities).

From the above view of these seven paragraphs (see Table 5), it is interesting that in some cases of paragraphs the expenditures of associations of municipalities are even higher than the expenditures for all municipalities in the Czech Republic. These are expenditures on administration in water management (Section 2369), operation of public railway transport

(Section 2242), educational care centres (Section 3148) and other activities in health care (Section 3599).

4. Summary

The paper is focused on the budgets of associations of municipalities, through which municipalities of the Czech Republic partially implement their expenditures. The size of the budgets of clusters of municipalities compared to the expenditure of municipal budgets in 2023 is relatively small, at 1.2%, and this share has decreased from 2.3% over the last 10 years. Associations of municipalities can operate in a relatively wide area of competence of municipalities, and the expenditures of their

budgets more closely indicate the specific focus of the activities of unions of municipalities.

The expenditures of associations of municipalities are significantly affected (by the highest shares of expenditures)

by expenditures on sewerage and drinking water, which represent almost 60% of the expenditures of unions of municipalities.

These expenditures are mainly in the nature of investment expenditures, which in reality represents the construction of water supply and sewerage systems in the territory of the union of municipalities. In the area of technical infrastructure, expenditures on other matters of roads are also relatively significantly represented in the expenditures of associations of municipalities (Section 2219), which mainly reflects investment expenditures related to the construction of cycle paths. From the long-term point of view, however, the expenditures of associations of municipalities in the area of water supply and sewerage systems are decreasing, due to the fact that these are mainly investment expenditures and this tendency can probably be expected as the equipment of small municipalities with the mentioned infra-

structure will be completed. And the expenditures of associations of municipalities will probably have the character of expenditures on the administration and maintenance of these facilities, which has the character of the activity of administration in water management (Section 2369), which already has a much more significant representation in unions of municipalities compared to municipalities. This fact may be due to the fact that the administration of the water supply system in municipalities is ensured through the creation of specific entities or within the activities of municipal authorities (within the local administration without the allocation of sectoral competence), while in the case of clusters of municipalities these activities are carried out directly by these unions.

In the case of clusters of municipalities, the share of expenditure on services (for natural persons) has increased. In this area of expenditure, it is mainly investments in the area of technical services and education in part of primary schools.

Despite the relatively small size of the budgets of the unions of municipalities, the specifics of their activities are manifested in such a way that some paragraphs of expenditures of unions of municipalities are larger than the respective total expenditures of municipalities in the Czech Republic. These are mainly expenditures on administration in water management, railway transport, educational care centres, and other activities in health care, which from the point of view of budgets also shows the largest content of the activities of associations of municipalities.

Given that the expenditures of clusters of municipalities are largely made up of investments in the area of infrastructure, it can be assumed that after its completion, the structure of the budgets of unions of municipalities will change and it can be assumed that there will be a shift to services, which could also be facilitated by a new possible form of unions of municipalities,

i.e. associations of municipalities.

5. Discussion on the context of the formation and functioning of associations of municipalities as one of the forms of cooperation of municipalities

Associations of municipalities are one of the forms of cooperation between municipalities. The issue of the existence of clusters of municipalities is accelerated by the issue of the existence of a large number of small municipalities in the Czech Republic. A large number of small municipalities are often mentioned in connection with the existence of municipalities, pointing out that larger municipalities could more effectively perform some of the functions of municipalities. The budgetary allocation of taxes (Act No. 243/2000 Coll.) of municipalities tries to „solve“ a large number of small municipalities through financing, in the sense that it grants larger municipalities higher coefficients of gradual transitions, which are used for tax sharing. However, what is the reality of the operation of this principle; In 2014, there were 6248 municipalities, and in 2016 there were already 6254 municipalities, which still exist today. So it turns out that this rule does not work in this direction. How much the meaning of the rule here is can be demonstrated by the magnitude of the coefficients of gradual transitions. If we take as an example municipalities in the range of 50-2000 inhabitants (the interval of the coefficient of budgetary allocation of taxes), then if municipalities of this size were to merge into larger municipalities and thus obtain a higher coefficient, then this change in shared taxes per capita would mean an increase of about 8% in the revenue of taxes per citizen, which would be associated with the fact that for these municipalities that they would become part of another municipality (with different attributes), especially the expectation of a „distancing“ self-government for the citizens of the relevant municipality. The stated size of the benefit for a given municipality cannot be a more compelling argument for the inhabitants

of the municipality for affiliation with another municipality. By merging municipalities into larger units, it is possible to expect a reduction in the costs of self-government, but then it is already a question of whether the actual representation of a small municipality in the council of a new large municipality (which the Act on Municipalities does not strictly address). It is also not possible to assume, for example, economies of scale, especially in the case of building technical infrastructure or equipment of original small municipalities in the sense of, for example, playgrounds, etc.; On the other hand, it is possible to assume the need for higher costs of local transport in merged municipalities to ensure the availability of concentrated services in the municipality.

Resources:

Ministry of Finance of the Czech Republic. Treasury Monitor.

Decree No. 412/2021 Coll., on the budget structure.

Act No. 128/2000 Coll., on Municipalities.

Act No. 243/2000 Coll., on the Budgetary Allocation of Taxes.

MILAN DONT

Dopady budování dopravní infrastruktury na rozvoj regionů a České republiky



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Podle publikace OECD „Economic Benefits of Investments in Transport Infrastructure“ investice do dopravní infrastruktury přinášejí širší ekonomické efekty, včetně zvýšení produktivity a ekonomického růstu. Investice do dopravní infrastruktury totiž zvyšují kapacitu ekonomiky pro přepravu cestujících a nákladu, což vede k úsporám z rozsahu a vyšší ekonomické produkci. Jak se tyto souvislosti projevují v České republice?

V odborné veřejnosti panuje shoda, že dopravní infrastruktura má vliv na řadu oblastí národního hospodářství. Mezi nejčastěji zmiňované například u výstavby dálnic náleží:

• Zlepšení dopravní dostupnosti

- Dálnice propojují velká města, přístavy a důležité regiony, což přispívá k hospodářskému růstu a zlepšení dopravní dostupnosti

• Ekonomický růst

- Rozvoj dálniční sítě podporuje ekonomický růst tím, že usnadňuje přepravu zboží a služeb, což vede k vyšší produktivitě a konkurenceschopnosti regionů

• Zvýšení zaměstnanosti

- Výstavba a údržba dálnic vytváří pracovní příležitosti a podporuje místní ekonomiku

• Podpora regionálního rozvoje

- Dálnice zlepšují přístup k regionům, což

může přilákat investice a podpořit rozvoj místních podniků

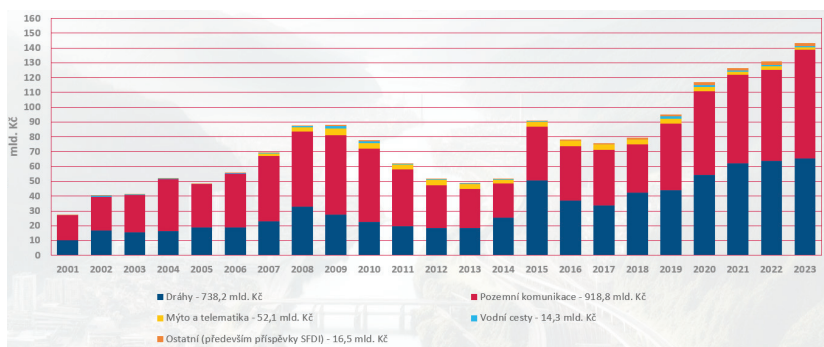
• Snížení dopravních nákladů

- Efektivní dálniční síť snižuje náklady na dopravu, což může vést k nižším cenám zboží a služeb pro spotřebitele.

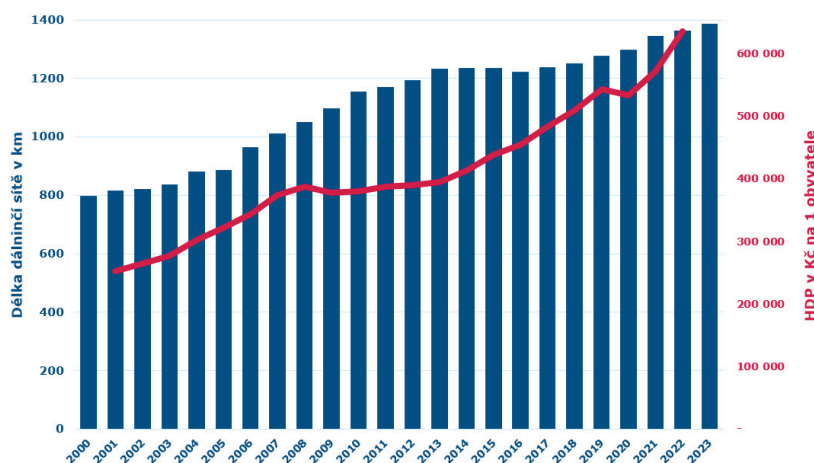
K čemu je Státní fond dopravní infrastruktury?

V České republice je výstavba páteřní dopravní infrastruktury organizována centrálně přes Státní fond dopravní infrastruktury (SFDI). Ten zřízen zákonem č. 104/2000 Sb., o Státním fondu dopravní infrastruktury, ze dne 4. dubna 2000 s účinností k 1. červenci 2000. Účelem SFDI je financování výstavby, modernizace, oprav a údržby silnic a dálnic, celostátních a regionálních drah a dopravně významných vnitrozemských vodních cest v rozsahu stanoveném zákonem. SFDI vykonává činnosti tzv. Zprostředkujícího subjektu Programu Doprava. Tento program pomohl nastartovat budování dopravní infrastruktury v České republice po vstupu od Evropské Unie v roce 2004.

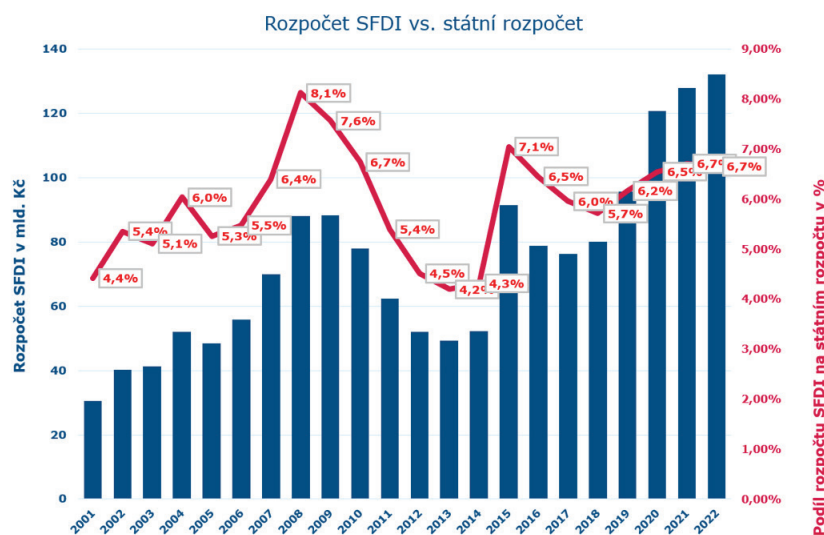
Náš stát vydává ročně významné částky na budování dopravní infrastruktury, jak ukazuje graf č.1. Současný rozpočet SFDI se pohybuje na skvělé vlně, blíží se 150 miliardám korun ročně, za rok 2025 to bude dokonce 160 mld. Jsou to velké částky, avšak pro naplnění cílů v budování naší dálniční a železniční sítě bychom potřebovali tempo výstavby vyšší, až 300 miliard ročně.



Graf č. 1: Financování dopravní infrastruktury z rozpočtu SFDI, Zdroj: SFDI, 2024



Graf č. 2: Vývoj HDP ve vztahu k délce dálniční sítě, Zdroj: ČSÚ, SFDI, 2024



Graf č. 3: Rozpočet SFDI ve srovnání se státním rozpočtem, Zdroj: ČSÚ, SFDI, 2024

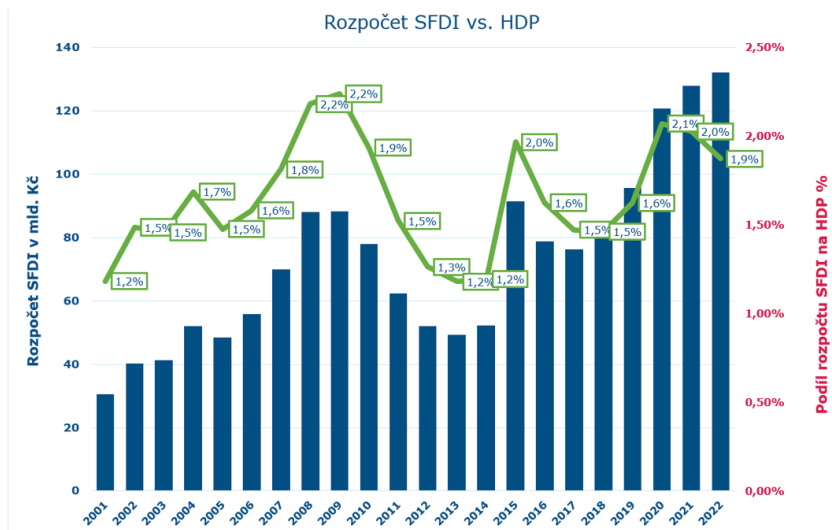
Z grafu 1 je zřejmé, že v letech 2012 až 2014 došlo vlivem chybné vládní politiky z zabrzdění výstavby dopravních staveb, což se promítlo i v následujících letech, kdy nebyly připraveny projekty, i když peníze ve fondu Dopravy byly k dispozici. Část zdrojů šla kvůli nedostatku jiných staveb na opravu D1, což ovšem neby-

lo cílem fondu EU. Následně se situace zlepšila a zejména investice do železniční dopravy v posledních letech významně rostou.

Fond tedy dnes finančními zdroji disponuje. Otázka je, zda jejich navýšení vede k růstu hrubého domácího produktu. Graf č. 2 ukazuje korelaci růstu HDP na obyvatele s rozvojem dálniční sítě. Na první pohled je souvislost vidět, i když asi není možné říci, že kdyby doprava stagnovala, tak by se růst HDP nedostavil. Rozhodně nelze pozitivní dopad rozvoje dopravní infrastruktury na národní hospodářství zpochybnit.

Jak se staví stát na základě pozitivní zpětné vazby vyplývající ze statistik k investicím do dopravní infrastruktury? Ukáží to na dvou grafech. Podíváme-li se kolik procent ze státního rozpočtu se investuje do dopravní infrastruktury (graf 3), pohybujeme se v posledním čtvrtstoletí kolem 4-8%. V roce 2024 jsme na 6,7%, což není nízký podíl. Navíc je třeba připočítat další příjmy SFDI, které nejsou vázány na státní rozpočet a tečou do fondu přímo ze zákona, jako např. výnosy z dálničních známek, mýtného kamionů, dále 9,1% ze spotřební daně z uhlíkatých paliv apod.

Graf č. 4 zase ukazuje vztah rozpočtu SFDI a HDP hrubého domácího produktu. Investice do dopravní infrastruktury se pohybují stále v hladině 1-2% celého HDP, dnes kolem 2% HDP. Z grafu je patné, že výkyvy nejsou velké. Dopravní stavby jsou totiž dlouhodobé investi-



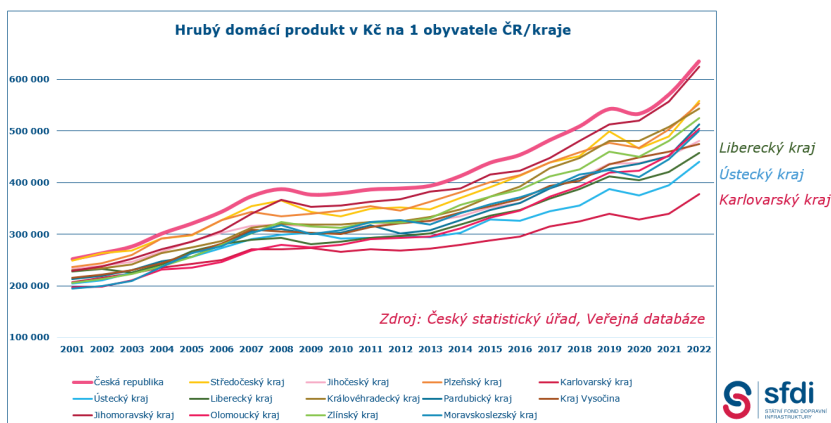
Graf č. 4: Rozpočet SFDI ve srovnání s HDP České republiky, Zdroj: ČSÚ, SFDI, 2024

ce, nelze z roku na rok zásadně měnit velikost rozpočtů.

Můžeme tedy učinit závěr, že všechny vlády bez ohledu na politickou reprezentaci cílily na budování dopravní infrastruktury zhruba obdobným tempem a že případné zpomalení tempa přípravy a výstavby dopravní infrastruktury se vždy negativně projeví i v dalších následujících letech.

Co rozvoj dopravní infrastruktury způsobuje v regionech a jak se dálnice zapojují do sídelní struktury?

Abychom získali celkový obraz, ukazují na grafu č. 5, jak vypadá HDP na obyvatele v jednotlivých krajích. Praha je záměrně pominuta,

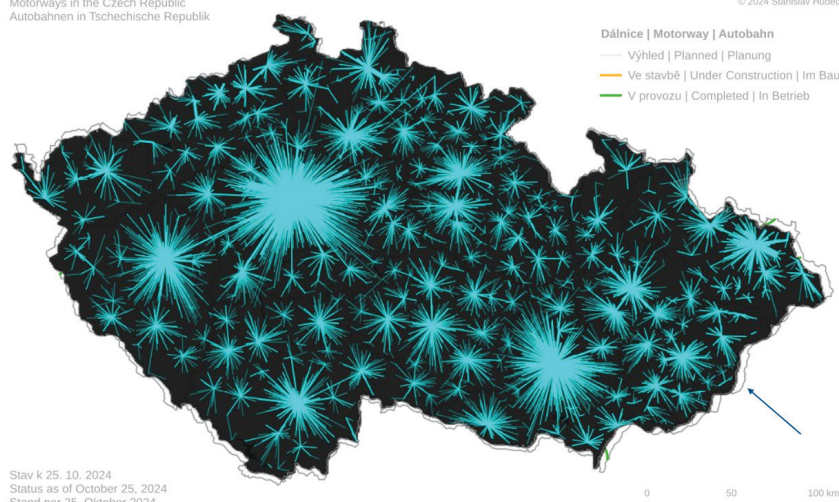


Graf č. 5: HDP na obyvatele, kraje ČR (bez Prahy), Zdroj: ČSÚ, 2024

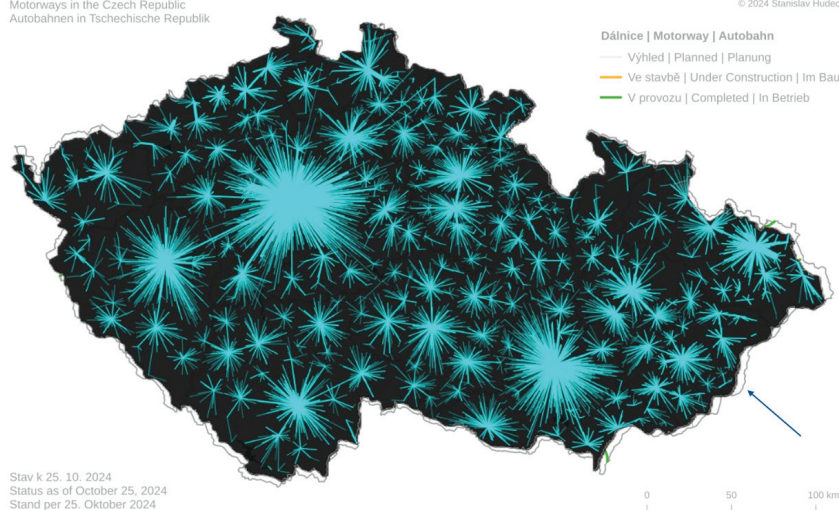
neboť má výrazně vyšší HPD/obyv. než ostatní kraje mj. i kvůli tomu, že nadnárodní firmy v ní odvádějí daně, i když pobočky mají v regionech.

Pro posouzení dopadu dopravní infrastruktury na regiony jsem vybral tři kraje: Karlovarský, Liberecký a Ústecký. Vybral jsem je proto, že mají nejnižší podíl HDP na obyvatele. Sledoval jsem, jakou mají tyto kraje dostupnou dálniční síť: Ústecký kraj má dokonce 2 dálnice D6 a D8. Liberecký má D10 včetně čtyřproudé rychlostní silnice I/35. Karlovarský kraj, který má v ČR nejnižší HDP/obyv., nemá dokončenou dálnici žádnou, i když D6 se nyní staví rychle. Ukazuje se, že rozdíly v napojení na dálniční síť jsou mezi těmito kraji velké, ale zdaleka se to neprojevuje tak výrazně na rozdílch HDP na obyvatele. Strukturální problémy jednotlivých regionů jsou evidentně hlubší, než abychom je dokázali vyřešit vybudováním jedné dvou dálnic. Dálnice je nutnou, nikoli však postačující podmínkou pro zlepšení hospodářského růstu.

Na webových stránkách ministerstva vnitra kamdojizdime.cz nalezneme velice zajímavý jiný statistický pohled na význam dálnic pro regiony. Z grafů vytvořených na základě anonymizovaných dat od operátorů mobilních telefonů můžeme vyvodit dojížděku z a do obcí. Na obr. 1 jsou zobrazeny cesty, které se uskuteční alespoň 13 krát do měsíce a respondent stráví v jiném místě alespoň 50 hodin. Graficky jsou zachyceny cesty s minimálně 500 osobami.



Obr. 1: Schéma denní dojížd'ky, Zdroj: kamdojizdime.cz, MV ČR, 2024



Obr. 2: Schéma občasné dojížd'ky, Zdroj: kamdojizdime.cz, MV ČR, 2024

Vidíme, že nejčastější dojížd'ka probíhá v rámci regionu, dlouhých pravidelných cest není mnoho. Dálnice tedy slouží velice dobře místní regionální dopravě, mezi regiony je pohyb nevýrazný. Výjimku tvoří dojížd'ka z regionů přiléhajících Praze, např. Plzeň - Praha. Z grafu lze také dovodit, že obvyklá doba dojížd'ky je asi 1 hodina. To jsou lidé ochotni obětovat cestě za práci a službami.

Jiná statistika zobrazená na obrázku 2 sleduje tzv. nepravidelné dojížd'ky, tj. skutečně minimálně pravidelně 2x měsíčně. V ní vidíme provázanost velkých měst nebo provázanost regionů s centry osídlení. Z něj můžeme odvodit vývoj dopravních výkonů v případě výstavby vysokorychlostních tratí. Hodinová izochrona výrazně rozšíří okruh pravidelné dojížd'ky do velkých měst. Např. pak z Jihlavy „uděláme Beroun“.

Ze srovnání obou statistik tedy vidíme, že výstavba dálnic nepodpořila tezi, že region se rozvine v tom smyslu, že každý den bude dojíždět do velkých center velké množství osob na velké vzdálenosti. Spíše dálnice posílily dojíždění za prací a službami v rámci regionu.

Nová dopravní infrastruktura a bezpečnost silničního provozu

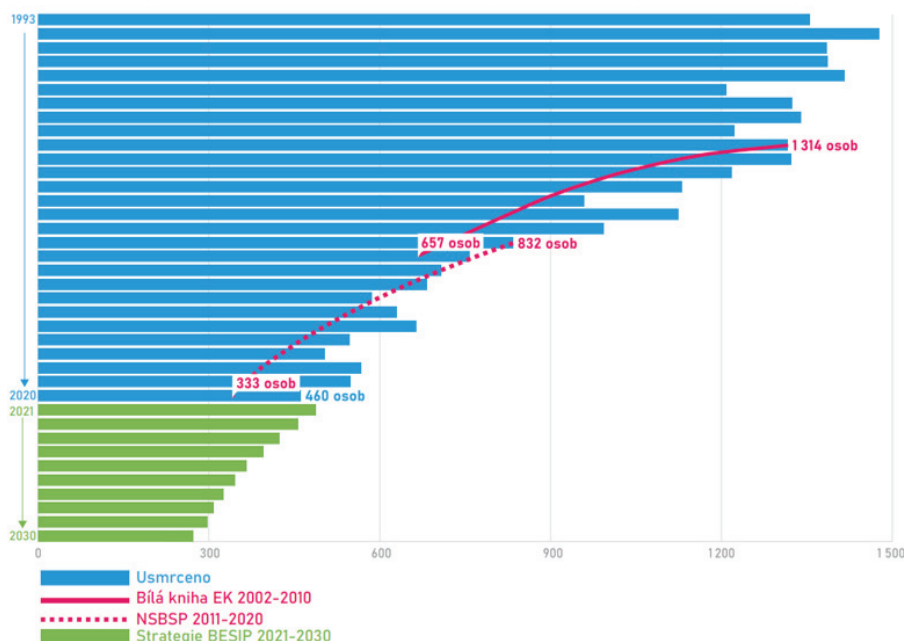
Smysluplnost výstavby dálnic se projevuje i v jiném ohledu – bezpečnosti silničního provozu. Česká republika má platnou Národní strategii bezpečnosti silničního provozu. Každé dva roky se dokonce projednává ve vládě, tj. nebere se jen na vědomí, ale ministři musí doložit, jak strategii naplňují. První strategie z roku 2002, kdy umíralo na silnicích přes 1000 osob ročně, stano-

vila cíl snížit počet usmrcených při dopravních nehodách do roku 2011 na 657 za rok. Druhá z roku 2010 byla přísnější a stanovila cíl do roku 2020 na 333 osob. Cíle se nepodařilo dosáhnout, ale v posledních letech mírně klesá počet usmrcených, i když se drží kolem stále vysokých 450 osob. Současná strategie směřuje do roku 2030 k počtu pod 300, což bude velice náročné.

Jakou souvislost má bezpečnost silničního provozu s výstavbou dálnic? Česká republika byla v nehodovosti dlouhodobě pod průměrem zemí EU. Teprve v roce 2023 jsme se dostali na úroveň průměru EU. Snížování počtu dopravních nehod má i ekonomický dopad. Odborné studie vyčíslily ekonomické ztráty z dopravních nehod v ČR na 144 miliard korun ročně. Každé jejich snížení tedy vede k dodatečným



VÝVOJ USMRČENÝCH OSOB V DŮSLEDKU NEHOD NA POZEMNÍCH KOMUNIKACÍCH V ČR



Zdroj výstupních dat: ŘSDP PP ČR; Copyright © BESIP/CDV

Graf č. 6: Vývoj usmrcených osob v důsledku dopravních nehod

Zdroj: ŘSDP PP ČR, 2021

příjmům státu, které mohou být využity k posílení hospodářství země.

Poslední graf č. 6 ukazuje pozitivní vliv výstavby dálnic na bezpečnosti silničního provozu. Na dálnicích, které svojí délkou tvoří 2% silniční sítě ČR, se realizuje necelá třetina dopravního výkonu (27%). Je to srovnatelné s dopravním výkonem na silnicích I. třídy (33%). Ale při pohledu na nehodovost vidíme, že jízda po dálnici je 5x méně riziková z hlediska rizika úmrtí než silnice s obousměrným provozem.

Zatímco na dálnici jsou 2 usmrcení na milion kilometrů ujetých jednou osobou, na silnicích, které nemají oddělené jízdní pruhy, je počet usmrcených za stejného dopravního výkonu více než 9. Směrové oddělení jízdních pruhů je výrazně bezpečnější. Nyní jde o to, zvolit trasy dálnic tak chytře, aby přenesly ještě větší podíl osobní a nákladní dopravy za silnic I. a nižších tříd a tím přispěly ke zvýšení bezpečnosti silničního provozu.

Více informací o SFDI a výstavbě dopravní infrastruktury v České republice můžete nalézt na www.sfdi.gov.cz.

	délka		dopravní výkon		těžce zraněných		počet usmrcených	
	km	%	vozokm / den	%	osob	osob	osob / mil. km	
dálnice	1 388	2%	42 611 600	27%	272	85	1,99	
silnice I. třídy	5 747	10%	52 297 700	33%	1 212	484	9,25	
silnice II. a III. třídy	48 729	87%	65 090 700	41%	2 040	593	9,11	
CELKEM	55 864	100%	160 000 000	100%	1162	3524	7,29	

Tab. 1: Porovnání následků dopravních nehod v souvislosti s kategoriemi komunikací, Zdroj: SFDI, 2024

Conference partners

Association for Real Estate Market Development ARTN

www.artn.cz



The Association for Real Estate Market Development (ARTN) is a non-profit civic association whose members are leading representatives of real estate development and investment companies, real estate, legal and consulting firms, banks and other organizations active in the market, as well as leading representatives and senior management of public administration. The intention of the association is to bring together teachers and university students interested in this field.

Thanks to its diverse membership base, which today includes more than 100 leading personalities active in all areas of the real estate market, ARTN represents a grouping unique in its universal competence, which in this sense is unparalleled in the Czech Republic.

Association of Developers AD

www.wedevelop.cz



The Association of Developers was established to have an open dialogue about the responsible role of developers in the development of modern society and their positive contribution within the professional and social community. The members emphasize the maintenance of strict ethical rules. They strive to ensure that developers treat their clients and the public sector responsibly and sensitively and that the reputation of developers in Czech society is gradually repaired.

The Prague Institute of Planning and Development (IPR Praha)

www.iprpraha.cz

The Prague Institute of Planning and Development (IPR Praha) is the main conceptual workplace of the City of Prague. The IPR Praha is the main department of architecture, urban planning, development, design and administration of the city. It prepares strategic planning, urban planning and territorial development documents. The Institute is the founder of the Centre for Architecture and Urban Planning (CAMP), whose main mission is to improve the public debate on the development of Prague. It is a basic source of clear and accessible information about the present and future of the capital city and functions as an open platform, a „base camp“ for everyone interested in joint planning and development of Prague.



Č Ā Ĭ Ĥ

auúp

Association for Urban Planning (AUÚP ČR)

www.urbanismus.cz

AUUP CR is a voluntary association of professionals involved in the creation and regulation of urban development, rural settlement and landscape. The members of the association strive for a better involvement of urbanism and spatial planning in the wider social context, for the improvement of the professional level of urban planners and the quality of their work, for the sharing of ideas and experience. As an independent and non-political organisation, it strives to be a professional background for public administration.



www.me100.info

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* Texty neprošly redakční ani jazykovou úpravou.

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