

PRAXIS OF URBAN
MORFOLOGY



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INTRO

ISUF2023 PRAXIS OF URBAN MORPHOLOGY

Coming from 20 architects, geographers, planners and historians, to more than 600 individual and institutional members across the globe, ISUF presents the important international organization of urban form both for researchers and practitioners. Due to its orientation to both of these fields, ISUF 2023 presents a great opportunity to rethink the praxis, perceived as process by which theory/idea is enacted, embodied and realized.

The theme for ISUF 2023 is drawn from the previous experience and ideas, directed toward systematization and synthesis of intellectual knowledge.

Following this line of reasoning, the Conference tracks are envisioned to confront the topics that are represented as being opposed in order to open up a debate how to transfer ideas to operational knowledge.

A. Good in Planning, Landscapes and Townscapes

A1. Urban planning vs. Urban design

A2. *Fringe growth* vs. *Urban belt*

A3. Prescription vs. Description

B. Culture Space, Common Space and Personalities

B.1. East vs. West

B.2. South vs. North

B.3. Networks vs. Individuals

C. History of Ideas and Challenges

C.1. History vs. Future

C.2. Preservation vs. Transformation

C.3. Pre vs. Post

D. Programming and Rethinking Concepts

D.1. Strategies vs. Measures

D.2. Education vs. Practice

D.3. Quantitative vs. Qualitative research

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Decline or Growth? (Re) considering the Development Patterns of the Border Towns in the Republic of North Macedonia

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ABSTRACT

The paper focuses on the border towns of the Republic of North Macedonia (RNM), geographically located in the eastern and western part of the country, highlighting the specificities of their morphology in the context of their recent development and/or decline. The selected examples belong to two different planning regions of the RNM: the East region – Delchevo, and the Southwest region - Struga. Providing an overview of the identified directions and patterns of their urban expansion, it will be possible to determine the morphological features which have both affected and reflected their general urban transformations. Currently, the condition of the border towns from the East region indicates the increasing marginalisation and, consequently - decline, while those from the Southwest region register progress and growth on the socio-economic and spatial level. Due to these drastic differences, the paper will provide a comparative analysis of their urban form, simultaneously targeting both the micro and the macro level. Considering the latest studies on urban morphology and its relationship with overall urban development, the paper will also address the identified problems and trends, proposing the planning recommendations for the future transformations and their sustainability in the long run.

Keywords: Border town, urban form, urban morphology, development, sustainability

INTRODUCTION:

The study presented in this paper is focused on the aspect of urban morphology, i.e., the transformations of urban matrix due to the specific socio-economic processes characterising the local contexts of two selected border towns in the RNM - Struga and Delchevo. In general, the urban centres in the RNM are the facing rapid and unplanned changes triggered by the ongoing political and economic circumstances of the country. These alterations cause difficulties in their functioning, which also has an impact on citizens. Consequently, the demographic structure of the country indicates that the cities and towns in the western part of the RNM currently experience growth and development in all urban aspects, while stagnation and decline are noticeable in the eastern part (SSO, 2022). Considering this, the elements of urban morphology (blocks, streets and squares) are used for the analysis of two selected towns, representing the foundation for the future spatial development and its planning, especially in the conditions of unfavourable urban development of the towns in the eastern region.

METHODOLOGY

Based on the comparative analysis of two case studies, the paper relies on the necessary primary sources - general and detailed urban plans of the selected towns, as well as the strategic plans adopted by the municipalities. Particular attention was given to the analysis of the cadastral data that allowed insight into the demarcation of the public and the private domain (land ownership). Additionally, the study used the relevant secondary sources, i.e., the contributions of relevant scholars to the field of urban morphology, as well as the study visits to the selected towns, during which the necessary information were gathered and the local specificities of both towns were detected and addressed.

THE MORPHOLOGICAL DISCOURSE OF THE STUDY

The term urban morphology is applied to the studies of urban form and its main physical elements, their transformation and the processes influencing the change (Schirmer & Axhausen, 2015; Tayebi and Ghaffari, 2012; Lau, 2011). Therefore, the urban morphology allows the perception of numerous aspects which shape the essence of built structure and public spaces in every city. Although the morphological research is accepted by architects and urban planners, the definition of urban morphology originates from geography, representing a branch of urban geography which studies the morphological structure of the city with its three-dimensional features (Vresk 1986).

The position of a city in relation to the immediate surrounding is one of the most significant morphological features. The natural, geographical and topographic characteristics of an environment have the greatest influence, but other characteristics such as historical development, economy, communications and connectivity are also important. Consequently, it can be concluded that both the position and the form of a city depend on three conditions/locational features (Đokic, 2004):

- Privilege - the position chosen due to the advantages – the proximity of water, accessibility, the fertility of land, etc.;
- Protectiveness – in order to physically protect (mostly from wars and enemy attacks) the cities are positioned on high hills, mountains, rough terrain, surrounded by water etc., allowing separation, enclosure and privacy;
- Constitution – various communication flows (by land or water), as a possibility for combining and separating elements, represent an important advantage for the creation and development of a city.

According to this, cities can be classified according to their relationship to water (e.g. riverside city, bay city, peninsula city, island city and the city surrounded by canals) and/or their topographical features (e.g. by bay, on ridge, on hilltop and on slope, etc.).

City spaces, apart from their location, are also conditioned by their built form, which determines their character, diversity and specificity. The form of urban spaces is their key morphological characteristic because it captures structural diversity in the best way. In urbanism, two main approaches to creating cities are emphasised: spontaneous, often called organic (cities created without the participation of professionals), and planned, as the result of planning activities and procedures (Krier, 2007).

Kostof (1991) makes a classification of cities according to their topography and their development over time, distinguishing six types - cities on a river (mostly organic or star-shaped), coastal cities (mostly radial), defensive cities (surrounded by walls and gates), linear cities, mountain cities (mostly circular, organic or star-shaped) and terraced cities (on mountain slopes, mostly orthogonal).

The applied development matrix greatly influences both the function and the form of a city. According to Lynch (1961), there are at least three important factors influencing its application - the

density of construction and the condition of facilities; the capacity, type and scheme of circulation; the location of existing activities (e.g. public facilities, health facilities, parks, etc. Consequently, several types of matrixes could be distinguished: lattice form (with subtypes - square, rectangular, triangular and hexagonal), star, ring and complex forms.

Summarising the classifications of all the aforementioned authors, the spatial organisation of a city can be categorised into one of the following forms:

- Compact - usually cities with smaller area, higher density and surrounding walls;
- Linear - suitable for continuous expansion and staged growth and development. There is an equal relationship of all territories, without centre and periphery.
- Orthogonal - allows rational land division and easy orientation. It is suitable for urban expansion in all directions, easy traffic and the regularly shaped public spaces;
- Radial - advisable for small and medium sized cities, suitable for expansion. It allows excellent connectivity between the centre and the periphery;
- Ring - favourable for the organisation of transport and communications, allows the formation of multiple centres distributed along a ring;
- Axial - consists of symbolically important and visually dominant points, suitable for capital city
- Circular - cities with small area, the shape does not allow rational land division and expansion;
- Combined form - combination of two or more different types (usually orthogonal, radial and axial matrixes).

Since the shape of the city derives from the geographical position and the spatial configuration of terrain, small towns in the RNM, mostly in mountainous and hilly/mountainous areas, have organic form. Some of them have kept their original form to this day, but there are also local cases which emerged spontaneously, but later gradually developed according to plans. In this case, two types could be found - 1) the merging of two different forms and 2) the preservation of inherited organic matrix in old city cores, while developing new parts according to plans.

STRUGA & DELCHEVO URBO-MORPHOLOGICAL DEVELOPMENT: A HISTORICAL OVERVIEW

The Republic of North Macedonia is located on the Balkan peninsula with the surface area of 25,436 km². It borders with two EU member states - Bulgaria and Greece and two EU candidate countries - Albania and Serbia. The RNM has eight economic regions: Skopje, North-East, East, South-East, Vardar, Pelagon, Polog and South-West. According to the 2022 data, 219,379 inhabitants live in the South-West region, 174,314 inhabitants live in the Eastern region, while total population of the RNM counts 2,076,694 inhabitants (SSO, 2023). Struga belongs to the South-West region, while Delchevo belongs to the East region of the RNM (Figure 1).



Figure 1. The South-West (red) and the East region (blue) of the RNM, photo credit: Authors

The South-West planning region abounds with mountain and valley relief. It is dominated by high mountains with over 2000 m.a.s.l. and is one of the most forested in the RNM. The largest valley is the Ohrid-Struga valley, by the Lake Ohrid. The East planning region is predominantly mountainous, rich in forests, rivers, artificial lakes and fertile lands which provide favourable conditions for life, growth and development. The main features of Struga and Delchevo are provided in Table 1, indicating that Struga is a waterfront city (on Lake Ohrid), while river represents an integral part of both towns.

Table 1. The natural-geographical features of selected towns

City / Position	Struga	Delchevo
River	✓	✓
Lake	✓	✗
Lowland	✓	✗
Hilly-mountainous terrain	✗	✓

Following the genesis of the settlements on the territory of today's RNM, it can be concluded that their origin dates back to ancient times. The purpose of their establishment was strategic - shelters and strongholds which represented economic, cultural, administrative or religious centers of provinces. However, their autonomous urban physiognomy was established during the Ottoman rule (Nikoloska, 2003). With the development of crafts and trade, especially with highly developed European cities, the way of life changed and previously small settlements have been gradually upgraded into urban nodes. The towns located in the border regions of the RNM were small settlements at the beginning of the 20th century but they slowly began to develop their urbanity. After the Second World War, many industrial complexes with production halls were built and operated, increasing the employment rate of the local population in a short period of time. Simultaneously, new residential blocks and complexes were built, but without high architectural aspirations (Cipan, 1974). In the small border towns (especially in the East region), the central government led a policy of opening the affiliate plants of large factories in order to avoid migration to big cities, but during that period the rural-urban migration intensified precisely because of that strategy. In this region, the textile industry and the wood-processing industry were dominant.

During the 1960s and 1970s, within the SFRY, along with the industrial development, the urban development was also emphasised, damaging rural areas. The sharp differences between rural and urban areas still exist, but there is a recent tendency toward their balanced development. However, the post-war urbanisation period also caused huge contrast between larger and smaller cities. This condition was further increased during the economic transition, when the industrial technology became obsolete, triggering a mass exodus from the smaller cities and towns to the capital or abroad the country (Dunovski et al., 2020).

Struga

Struga (Figure 2) is one of the oldest towns in the RNM. The part of the town, representing a cultural-historical and architectural heritage, dates from the 18th and 19th century, although there are records that the settlement was formed in the 11th century (Mulickovski, 2002). The location of contemporary

Struga had been dated between the 14th and the 15th century, while the original Turkish settlement on the right bank of The Black Drim (established between the end of the 19th century and WWI) has not changed much and its urban structure was refurbished and upgraded with new buildings. Its significant feature was a harbor for fishing boats.



Figure 2. Struga – aerial view, photo credit: Google Earth

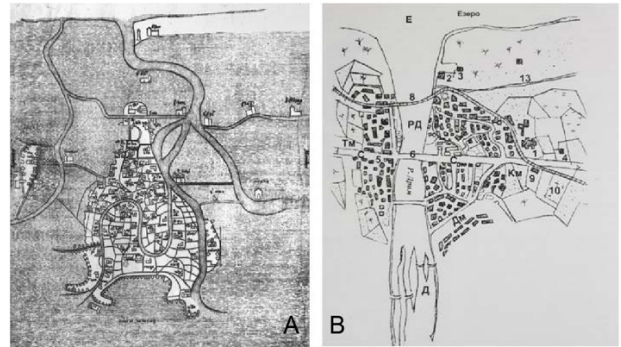


Figure 3. The comparison of morphological features of Venice (A) and Struga (B), photo credit: Mulickovski (2002)

The city of Struga is characterised by many specific urban and natural elements shaping its identity. Historically, it has been perceived as a lake city whose landscape represents the part of the outflow of Lake Ohrid forming the river Black Drim (Mac. *Crn Drim*). Its natural features, therefore, represent an indivisible element of urban identity and a symbol of the city.

The processes of settlement formation in the Middle Ages, with similar natural conditions, can also be observed in Venice, which was formed in the 12th century. Comparing the urbo-morphological features of these cities (Figure 3), many similarities can be observed, especially canals, which are deeply intertwined in the urban fabric (Balkoski, 2023).

Delchevo

Delchevo (i.e. Tsarevo Selo) was mentioned as a settlement for the first time in a charter of Tsar Dushan in 1347. Until the 17th century the settlement was situated on the right bank of the Bregalnica river (Municipality of Delcevo, august 2023).



Figure 4. Delchevo – aerial view, photo credit: Google Earth

Until the 19th century Delchevo was a village, a Turkish colony, inhabited by Turks. In the middle of the 19th century the bazaar started developing and the settlement grew, while the Macedonian population also increased. After the area *Sredno Maalo* (Eng. Middle hill) had been fully built and populated (today it represents the central area), the expansion began through *Gorno Maalo* (Eng. Upper hill), the area which nowadays represents the 1st district. On the left bank of the river Bregalnica, on the narrow flat area where the squares and inns used to be, the construction of the commercial and craft shops along two narrow streets began in 1863, forming a bazaar. Finally, Delchevo became an urban settlement in 1878.

THE PHASES OF URBAN DEVELOPMENT AND TRANSFORMATION

Struga

The town is accessed via two regional roads. One road passes through Struga and leads to the neighbouring tourist settlements of Kalishta (5 km away from Struga) and Elen Kamen (7 km away), while the second road, which bypasses the town, leads to the border crossing with Albania, 13 km away.

The town in its current state has a combined form, consisting of irregular orthogonal and organic matrices (Figure 5). However, following the current direction of urban expansion, along the natural coastline of Lake Ohrid, it could be stated that Struga gradually evolves into a radial shape. The urban fabric is developed in a planned manner on both riverbanks of The Black Drim, while peripherally, organic matrix connects the town with the surrounding villages.



Figure 5. The urban matrix of Struga, photo credit: Author's drawing



Figure 6. The schematic representation of urban zones, photo credit: Author's drawing.

Visually, the city can be divided into several zones (Figure 6) which are connected by the collector streets:

- the urban core, along The Black Drim riverbanks, where the main square, bazaar and major public administrative facilities are located;
- the residential zones with individual family houses, urban villas and small multi-family buildings;
- the newly built residential zones with tall multi-family buildings;
- the tourist zone with catering facilities and beaches;
- the industrial zone.

Consequently, during the last twenty years Struga has experienced a large spatial expansion triggered by fast demographic growth and village-to-town migration. The urban matrix in the downtown area (Figure 7) has remained unchanged, but the parcels within blocks have been exposed

to significant transformations. Old family houses have been upgraded or replaced, becoming apartment buildings. There is also a noticeable change in the physical structure of the peripheral urban areas along the lake, where the ex-industrial sites have been replaced by the zones of multi-family housing.



Figure 7. The satellite images of Struga 2003-2023, photo credit: Google Earth.

The changes of urban setting, caused by the demographic growth, mostly occur in the western outskirts, targeting the most attractive land along the lakefront exposed to unplanned activities and construction. The expansion of Struga is currently conducted through two types of interventions: 1) the spatial enlargement along the East-West axis; 2) the increasing of urban density in the central area (Figure 8). The newly designed facilities in the central area are intended for temporary accommodation such as boarding houses, overnight stays and weekend houses, while the lakefront is occupied by large hotel complexes which include necessary services. Due to this, the intensified construction of a road network is visible, introducing new access roads, as well as local and minor collector streets (marked by green lines in Figure 8).



Figure 8. The urban change of Struga, 2003-2023, photo credit: Google Earth, author's sketch

Delchevo

Delchevo is accessed via the regional road which passes through the town, leading to the neighboring towns of Makedonska Kamenica and Pehchevo, as well as to the border crossing with Bulgaria (11 km away).

The town in its current state has a combined form. On the right bank of the Bregalnica river the urban matrices are planned - circular and orthogonal, while the neighborhoods on the left riverbank have organic matrix, composed of narrow and winding streets and paths which follow the configuration of the terrain (Figure 9).

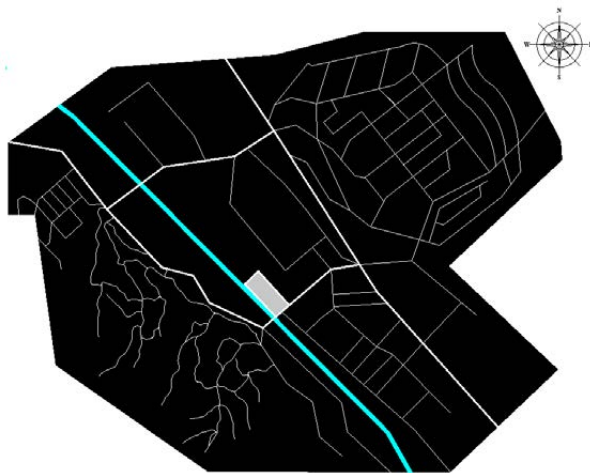


Figure 9. The urban matrix of Delchevo, photo credit: Author's drawing

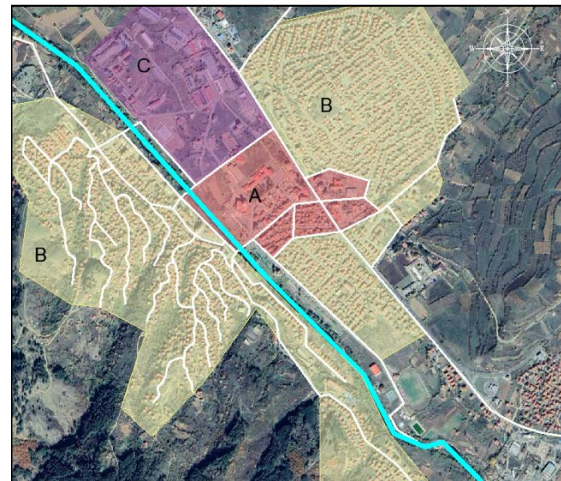


Figure 10. The schematic representation of urban zones, photo credit: Author's drawing.

Visually and functionally, the city can be divided into several zones (Figure 10):

- a) the urban core, with the main square and public administrative facilities;
- b) the residential zones - with individual family houses;
- c) the industrial zone located at the town entrance.

The urban blocks have different shapes, depending on the urban matrix and terrain features - besides regular geometric shapes (squares, rectangles and triangles), their layout could be distorted. A distinct "upper neighbourhood" is established on the right bank of the river, taking the form of an irregular hexagon composed of planned urban blocks of various shapes and sizes, defined by local and collector streets. In this area, the parcels are placed along the perimeter of the blocks, with the appearance of a central green space. On the left bank, the town matrix develops organically, where the winding and narrow streets form the urban blocks of a similar shape.

Unlike Struga, which has experienced economic, demographic and urban expansion and progressive growth during the last 20 years, Delchevo is a shrinking town, with limited economic, social and spatial resources, and without opportunities for large capital investments. Consequently, all these problems reflect on urban morphology and urban functionality and efficiency, which has remained in the same condition - without major changes of urban fabric, and without significant expansion in the peripheral parts (Figure 11).

However, some changes are noticeable in the urban fabric of the downtown, as well as in the industrial zone. In these areas, the construction of a new road infrastructure which supports housing and industry has begun (Figure 12).



Figure 11. The satellite images of Delchevo 2004 (a) – 2023 (b), photo credit: Google Earth.



Figure 12. The urban change of Delchevo, 2004 (a) – 2023 (b), photo credit: Google Earth, author's sketch

CONCLUSION: THE COMPARATIVE ANALYSIS OF URBAN MATRIX

The analysis presented in this paper showed that two selected border towns, situated in different regions of the RNM, have had a different pace and trajectory of spatial development for the last twenty years.

The first case, Struga, a border town with Albania, recorded a demographic growth of its mostly multiethnic population. However, the migration from Struga to the EU countries is noticeable, as well as a specific trend of investments into new local industrial facilities with modern technology, by the emigrants whose families still live in the town. This contributes to an increased economic growth, development and expansion of both Struga and the surrounding rural areas, which gradually

transform into suburban areas. In the case of Delchevo, which is a border town with Bulgaria, a demographic decline represents an important problem. Unlike Struga, the population outflow to the EU countries is constant, causing an intensive reduction of working-age population, a drastic decline of the local economy and, consequently, a poor growth and development.

Each of the analysed towns does not have a strictly defined urban form. Both of them consist of several types of urban blocks, while their urban matrices include both planned (mostly orthogonal and radial) and spontaneous, organic patterns which interconnect, overlap and/or amalgamate (Figs. 13, 14).

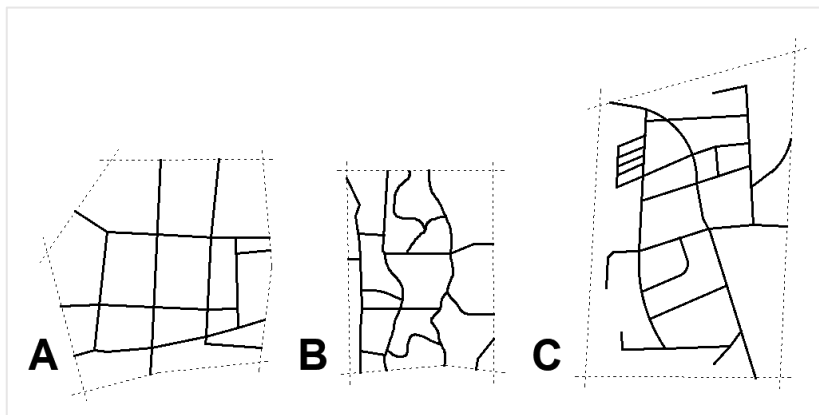


Figure 13. The main types of urban patterns of Struga: (a) orthogonal; (b) organic; (c) combined, photo credit: author's sketch

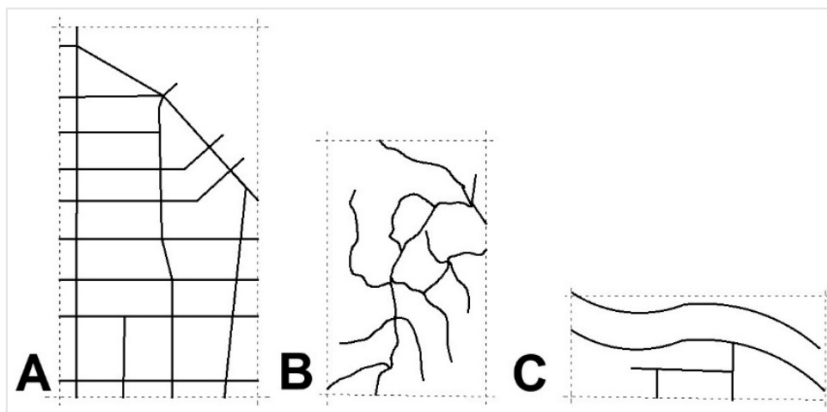


Figure 14. The main types of urban patterns of Delchevo: (a) orthogonal; (b) organic; (c) combined, photo credit: author's sketch

The orthogonal urban matrix in both towns could have regular or irregular geometry, depending on the local historical and morphological circumstances, occasionally resulting in hybrid, mesh urban patterns. The radial matrix is also noticeable in both towns. With the gradual growth and development of Struga along the lakefront and the regional road that bypasses the town, the emerging of a radial shape is evident. Simultaneously the largest residential zone on the northern side of Delchevo also demonstrates a fragment with a radial layout.

The organic matrix appears in the peripheral parts of Struga, where it expands and connects with the surrounding villages. In Delchevo, it is also visible in the areas of urban expansion, where streets follow the local topography.

Table 2. The elements of urban form: Struga vs. Delchevo

The elements of urban form	Struga	Delchevo
Urban pattern	Combined / irregularly radial	Combined
Blocks (shape)	Orthogonal / Organic / hybrid	Circular / Orthogonal / Organic
Process	Peripheral urban expansion, noticeable morphological changes in both the central area and the periphery, the addition of new blocks, the expansion of road network	Without the visible expansion, minor morphological changes in the central area, minor expansion of road network

A common feature for both towns is a river which passes through their urban structure and divides it into two parts. Their urban cores, formed in the 19th century, are centrally located, with a bazaar. After the Second World War, both towns expanded linearly, adding new activities - industry and housing (both individual and multifamily). The new urban plans envisage the expansion of the zones dedicated to light industry, as well as of touristic areas (mountain tourism in the towns of the East planning region, and lake tourism in the towns of the South-West region). Due to clean environment and favourable geographical position, the potential for this kind of development is very high.

In the dynamic landscape of urban development, the challenges posed by the inherited urban morphology are visible in sprawling towns, as well as in the shrinking ones. When it comes to shaping their form and introducing new activities, both types are facing a number of obstacles, such as:

- Infrastructural problems - in growing and developing towns and cities, the main problem represents an inadequate sewage infrastructure. In Struga, the possibility of building a new sewage network with treatment plants should be considered (particularly important for the protection of the Ohrid Lake and the surrounding environment), while in Delchevo the river Bregalnica should be protected.
- Transportation problems - one of the crucial topics in urban planning and design, particularly for the future urban growth, is the morphological study of urban fabric, which is always closely related and dependent on a traffic network. Therefore, a special attention must be paid to the development and maintenance of the street network. In touristic towns, such as Struga, with an increased number of vehicles and tourists in the summer period, a reconstruction and expansion of traffic network and an updated regulation are needed. It is necessary to create an efficient, compact and sustainable system which will connect all parts of the town, while enabling all modes of transportation (pedestrian, bicycle, car, public, alternative).
- Environmental problems - the urban form plays a significant role in the overall environmental, social and economic sustainability of cities. Urban expansion should take place in a way that incorporates nature and public green spaces, contributing to the overall urban resilience.
- The problems of urban identity - in cities/towns with rich history and tradition, the urban form represents a physical manifestation of their identity. Its perception leads to an increased respect and acceptance of the place, stimulating the public participation. However, the

absence of these elements, which could be caused by a sudden change of physical structure during unplanned expansions, leads to a low or non-existent sense of belonging which triggers general negligence toward urban environment. Therefore, it is necessary to protect old urban cores by introducing new modes of legislation and increasing the level of their implementation.

The urban transformation and upgrading of the selected towns, their urban form and its elements, has to be conducted in accordance to their specificities, but the redefining of the whole planning processes of the RNM represents a necessity as well. The recently established stronger connections to the EU certainly provide opportunities for legal adjustments and professional cooperation, which might open new directions for the comprehensive inclusion and progress of all border towns within a wider European region. In this way, both Struga and Delchevo could improve their local development strategies in order to grow into sustainable urban nodes which emphasise their competitive advantages.

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