

# TRAFFIC AND ITS IMPACT ON MORPHOLOGICAL AND FUNCTIONAL URBAN DEVELOPMENT IN HISTORICAL CONTEXT: A CASE STUDY OF BJELOVAR, SISAK AND KOPRIVNICA

## PROMET I NJEGOV UTJECAJ NA PROSTORNI RAZVOJ I FUNKCIONALNU STRUKTURU GRADA U POVIJESNOM KONTEKSTU: SLUČAJ BJELOVARA, SISKA I KOPRIVNICE

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### SUMMARY

*This paper will analyse the relationship between traffic and the development of three different Croatian towns: Bjelovar, Sisak, and Koprivnica. These towns developed under significantly different historical and geographical conditions. Traffic played a crucial role in the development of each one, but with significantly different results.*

**Key words:** urban development, traffic network, morphological urban structure, functional urban structure, urban history

**Ključne riječi:** urbani razvoj, prometna mreža, morfološka struktura, funkcionalna struktura, urbana povijest

### INTRODUCTION

Traffic is one of the dominant factors that influence the location of emerging towns, their spatial development (i.e., their morphological structure), and their functional structure (i.e., the spatial order of their functional zones and buildings with central functions)<sup>1</sup>. Although the extent of human mobility and the transportation of goods changes significantly over time, traffic always has a significant impact on the construction of urban morphology and the spatial distribution of a town's activities. As a rule, towns are important intersections of roads that serve a wide area. Therefore, in order insure a better understanding of the spatial structure and development of a town, attention will be paid to both traffic within a town and traffic between that town and its surrounding area or region.

#### CASE 1: BJELOVAR/ SLUČAJ 1: BJELOVAR

Bjelovar was a military-border town that was established by an Act of Empress Maria Theresa in 1756 as the new seat of the Varaždin Generalate (a part of the Croatian Military Border).<sup>2</sup> Before this,

<sup>1</sup> VRESK, 1990: 138-140

<sup>2</sup> The Generalate was named after the town of Varaždin, where the seat of the Generalate was located until 1731, after which it was moved to Koprivnica.

the placename referred only a guard-house on the border located in the general area of the future town. This station can be found for the first time on Johan Winkler's map of 1639, where the traffic network of the future town of Bjelovar can also be seen. According to this map, we can see that even before the formal establishment of the town of Bjelovar, its location was on the local route connecting Slavonia (at that time still under Ottoman rule) and Križevci (an important military fortress). That route was not of great importance in terms of traffic, and this is the case today as well.<sup>3</sup>

### **Impact of the traffic network on the location of a future town Utjecaj prometne mreže na lokaciju budućeg grada**

The town was established in this quite unfavourable communications position due to security reasons. After the territorial reorganisation of the Varaždin Generalate and legal reforms which significantly reduced the Military Border Rights, in nearby Severin there was a rebellion amongst the soldiers of the Military Border (the Severin Rebellion)<sup>4</sup>. Although the Habsburg Monarchy succeeded in putting down the rebellion at the Military Border, a decision was made to designate a new seat of the Generalate which had to be somewhere in the centre of the Military Border territory so that the border soldiers could be kept under better control.<sup>5</sup> Therefore, in 1756 the decision to plan the building of the town of Bjelovar had already been made. Bjelovar was placed right on the boundary separating of the Križevci and Đurđevac regiments, which were both part of the Varaždin Generalate. Thus, the designation the new town's position was made administratively, primarily in accordance with the needs of the Military Border territory, by the central government in Vienna (at the moment of the establishment of Bjelovar, the Varaždin Generalate no longer had its earlier defensive importance against the Ottomans). The planned development and construction of the town was intended to improve the poor traffic links of the newly established town, but unfortunately without any significant success.

### **Impact of traffic on the primary structure of the town Utjecaj prometa na primarnu strukturu grada**

The town was designed as a quadrangle with streets organized in a grid pattern.<sup>6</sup> The basis of the town was created by four streets which joined in the town's main square. In this way the whole traffic network was directed into the centre of the Generalate<sup>7</sup>. However, the central traffic position of Bjelovar was artificial and has never been completely realised. Only the main street which led from the square towards the western exit from the town and created the beginning of the road to Zagreb partly fulfilled this function. At the same time, its counterpoint, the street which led from the center of the town towards Slavonia, never achieved its intended importance. This can be confirmed by the fact that within 10 years of the establishment of the town, when the new parish church was built on the main square, the church was positioned in such a way as to block the Slavonian Road, preventing it from entering this square. The north axis of the town, the road which led from the main square towards

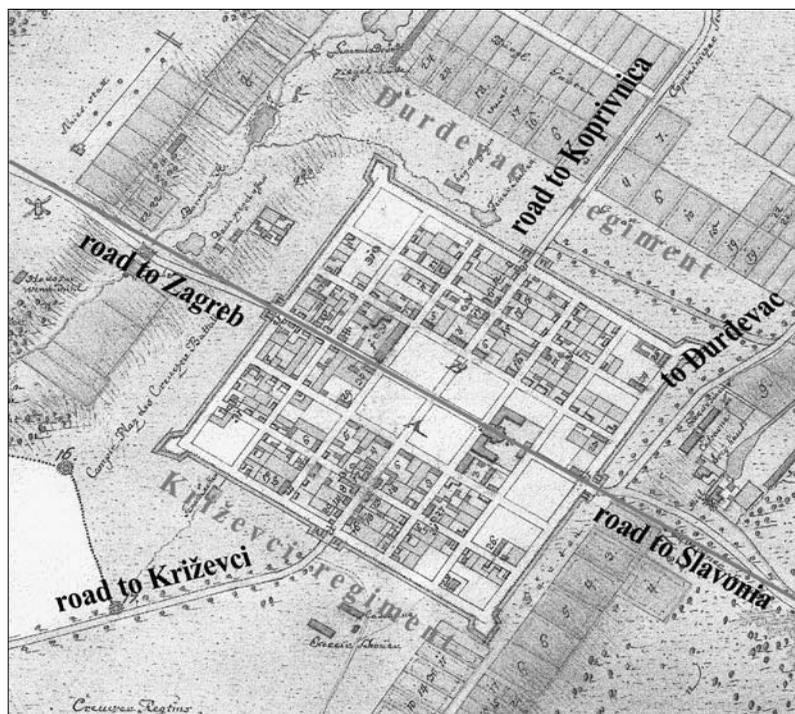
<sup>3</sup> One of the most important problems in the town of Bjelovar even today is its bad traffic position. The important traffic routes that connect Slavonia with northwest Croatia follow the rivers Sava and Drava. Bjelovar is located between the two rivers and is bordered on the west by the Bilogora mountain massif, which creates a traffic dead end at the town.

<sup>4</sup> MOAČANIN, 1984: 23-56

<sup>5</sup> The previous seat of the Generalate, Koprivnica, was located on the northernmost edge of the Military Border territory. In addition, Koprivnica had the status of a free royal town, which caused problems with the Military Border administration. There was constant disagreement between the civil and military authorities, which restricted the development of the town. Comp. KASER, 1997: I, 104-105.

<sup>6</sup> The oldest representation of the spatial organisation of the town of Bjelovar can be seen on the map entitled 'Plan der Umliegenden Gegend des Generals- und Generals-Stabs-Orts Bellovar in Warasdiner Generalat', scale 1:2,700, drawn in 1772. Kriegsarchiv, Wien, Kartensammlung, G.I.h.20. The map is published in SLUKAN ALTIĆ, 2003: 138-139.

<sup>7</sup> SLUKAN ALTIĆ, 2003: 33



Map 1  
Bjelovar on the map dating from 1772 – two mirrored sides of the town (marked by author)

Karta 1  
Bjelovar na karti iz 1772 s dvije zrcalne polovice grada (označi autor)

Koprivnica, never fulfilled any traffic importance either (a later development of the town the north was due to planned measures rather than a consequence of the natural development of the town northwards), while the street which led from the main square southwards passed through an insignificant settlement, the village of Sredice, which today is a rural suburb of Bjelovar. At the same time, the most important connections, which led from Bjelovar towards the important fortresses of the Generalate - Đurđevac and Križevci - did not fit into the grid structure of the town, and thus kept their old direction, entering the town via their old routes. The Križevci road enters diagonally from the southwest and the Đurđevac road enters from the north-west. Along with Zagrebačka ulica (Zagreb Street), these roads were the most important, a fact which can be seen from the later spatial development of the town which was influenced by these roads. The Slavonian (eastern) and Koprivnica (northern) roads never fulfilled their traffic functions, and the majority of the traffic directed to Slavonia or Koprivnica passed along the Đurđevac road, while some of the traffic headed towards Zagreb went via Križevci.

The placement of buildings with central functions in Bjelovar during the first phase of its development was also not the result of spontaneous development. It was rather developed according to a plan that was based upon the needs of the centralised military administration.<sup>8</sup> In addition to being the seat of the Generalate, Bjelovar had another function: it was the seat of the two regiments and was therefore placed exactly on the line of demarcation that separated them. As a result, the town was divided both functionally and in terms of property law into two equally sized halves – the part of town north of the Zagreb and Slavonian roads belonged to the Đurđevac Regiment and the territory south of those roads belonged to the Križevci Regiment. According to this division, the layout of the administrative buildings and their central functions was planned.<sup>9</sup> All of the important buildings were placed in the

<sup>8</sup> SLUKAN ALTIĆ, 2003, 33-34

<sup>9</sup> The spatial order of the central functions of the town of Bjelovar can be seen on the map 'Warasdiner Generalat nach der eigentlichen Lage und Entfernung aller inliegenden Ortshaften, Lauf der Umfänglichen Grenzen, durchläufigen Flüssen und vorzüglichen Flüssen, Strassen und Hauptwegen, Grösse der Gebürgen, Mörasten und Waldungen: Territorium von dem Militär-Stabsorte Bellovar', scale 1:9,000, drawn ca. 1772. Kriegssarchiv, Wien, Kartensammlung, B.IX.a.796. The map is published in SLUKAN ALTIĆ, 2003: 140.

main square, including the parish church. Other military buildings were placed along the four main streets, and the less important streets created housing zones with some commercial or military buildings. So the importance of the streets, which at the same time created the starting points of all regional roads, was also confirmed by the importance of the buildings that were built on these roads. In this way, at least inside the town, on the functional level, the impact of the town's lack of real transport functions on the regional level was minimalised. Moreover, it is interesting that the division between the two regiments also meant that each of the regiments had its own buildings in its own half of the town. Therefore, in the town there were two military hospitals, two prisons, two judges, two chemists, etc.

### **Impact of traffic on the further spatial development of the town Utjecaj prometa na daljnji prostorni razvoj grada**

The strict grid pattern of the town of Bjelovar was immediately reinforced by soil ramparts.<sup>10</sup> In this way the town was defined and physically separated from its surroundings, developing inside its ramparts, in advanced subdivided house blocks. This kind of planned town and its limitation by soil ramparts meant that the regional roads did not have any significant impact on the direction of the town's construction in the first phase of Bjelovar's development. All building work was kept inside the ramparts and in advanced subdivided sites. The major traffic importance of some streets can be observed in the concentration of buildings with public functions. Thus the four main streets together with the town's main square were at the same time the main business-trade zones of the town and the less important streets had mostly residential characteristics.

The impact of the transport functions of some streets would be realised later, when the town started its development across the ramparts at the beginning of the nineteenth century.<sup>11</sup> Then, the town star-



Map 2  
Bjelovar on the eve of the  
disbanding of the Military Border –  
from the 1867 cadastral map

Karta 2  
Bjelovar uoči raspuštanja Vojne  
Krajine na katastarskom planu iz  
1867.

<sup>10</sup> An representation of the layout of the town of Bjelovar at the end of the 18th century can be seen on the map 'Bellovar Stabsorth des Warasdiner Kreutzer und St. Georger Regiments', scale 1:7,200, drawn ca.1795. Kriegsarchiv, Wien, Kartensammlung, G.I.h.21. The map is published in SLUKAN ALTIĆ, 2003: 144.

<sup>11</sup> The development of the town of Bjelovar at the beginning of the 19th century can be seen on 'Plan der Militair=Communitaet Bellovar', scale 1:3,600, drawn in 1828. Town's Museum Bjelovar, Nr. 849. The map is published in SLUKAN ALTIĆ, 2003: 145-146.

ted its stronger development along the main roads, especially towards Zagreb and Križevci and under the influence of the importance of these roads. Important Bjelovar suburbs developed along the Križevci and Zagreb roads. The importance of the part of the town between these two roads can be additionally confirmed by the fact that the trade-fair grounds were transferred to the western edge of the town alongside the Zagreb road and very near the Križevci road. Thanks to the trade-fair and traffic function of these two roads, the south and west edges of the town became an area of more dynamic construction. In the 1820s, this part of the town became the most important trade and crafts area. The area around the central square kept the function of a military and administrative centre and less important streets inside the historical nucleus were mainly a housing zone which was expanded, according to plan, northwards from the historical nucleus. However, it should be emphasised here that the relatively unfavourable position of the town resulted in a very slow rate of construction. Bjelovar developed in its early beginnings thanks to its military and administrative functions, while trade and crafts had local importance. With the lack of other development potential, it grew quite slowly. Bjelovar accelerated its development after the Military Border ceased to exist and when the town was included in the transport network of Civil Croatia in 1871, and when in 1874 it received the status of a free royal town. Bjelovar's major traffic routes – towards Zagreb and Križevci – were no longer severed by the Military Border frontiers.<sup>12</sup> This caused an intensification of the movement of people and goods in and out of the town. This certainly sped up the spreading of the town along its approach roads, which resulted in a stronger radial development of the town. However, regarding the location of the town's central functions, it still remained extremely centralised.

A highly significant change in the functional and morphological development of the town was caused by the arrival of the railway in 1894.<sup>13</sup> The position of the railway and railway station on the eastern edge of the town became the new centre of the town's development. However, the impact of the railway, which was placed right next to the historical nucleus, was quite unfavourable. The development of industry, which located all buildings alongside the railway, very soon resulted in the construction of industrial buildings immediately adjacent to new representative housing zones. In this sense, a special problem was created by the industrial railroad, which closed off the town on the northern side and alongside which the major industrial buildings of the town were built right next to the town's hospital and lower-class housing. The development of the industry facilitated by the railway initiated faster construction work. The direction of building at this time was not the result of spontaneous building, but the result of the decision to build a new housing zone north of the town's nucleus. The northern part of Bjelovar was therefore built according to planned measures, right next to a newly established industrial zone. The development of the town towards the west and south, caused by the important traffic functions of the Zagreb and Križevci roads, continued without planning, but at the same rate. This resulted in consequences which are still visible in Bjelovar today – the northern part of town has a well-organized, planned layout, in which large industrial buildings are interspersed with residential structures, while the town's disorganised southern and western suburbs have retained their rural character.<sup>14</sup>

Bjelovar's unfavourable position in terms of transportation has never been compensated for. The town's unfavourable traffic approach, coupled together with its centralised traffic system, where regional roads lead right into the centre of the town (a problem of transit), have been a problem for Bjelovar's development up to the present day. Although Bjelovar has recently received the status of a county town, its development has been based on the success of agriculture and farming in the Bilogora

<sup>12</sup> Bjelovar at that time is represented by the map »Militär Communität Belovar mit den Ortschaften Mühldorf und Schweizerei«, scale 1:2 880, drawn in 1867. Croatian State Archive, fond of State Geodetic Directorate. The map is published in SLUKAN ALTIĆ, 2003: 149.

<sup>13</sup> Bjelovar with the railway can be seen on the map 'Tlocrt grada Bjelovara' (Ground Plan of the Town of Bjelovar), scale 1:5,760, drawn in 1912. State arhiv of Bjelovar, Cartographic Collection. The map is published in SLUKAN ALTIĆ, 2003: 161.

<sup>14</sup> Compare the map of the town from 1980. The map is published in SLUKAN ALTIĆ, 2003: 180-181.

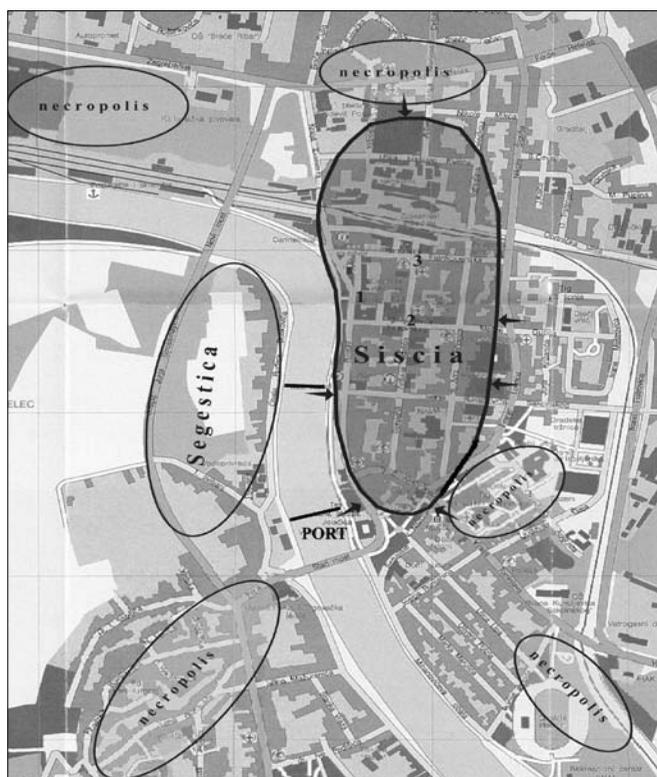
region. Regarding its centrality, Bjelovar is a subregional urban centre of the north-west of Croatia, serving a comparatively small area of gravitation.

## CASE 2. SISAČ/ SLUČAJ 2: SISAČ

The town of Sisak developed in the far southwest part of the Pannonian Basin, at the place where the River Kupa joins the River Sava and very near where the River Odra flows into the Kupa. The position of Sisak has a crucial role in connecting the Danube-Pannonian region with the Dinaric region of Bosnia. The rivers Sava, Odra, and Kupa greatly dictated the position of this settlement and assured a significant strategic importance from its beginning. Its exceptional geographic and transportation position with the possibility of connecting river, railway, and road traffic have been the dominating factors in its development<sup>15</sup>.

### Impact of traffic on the location of the town and its development in Antiquity Utjecaj prometa na lokaciju grada i njegov razvoj u antici

Sisak has had continuity from Roman times. In the period between 35 BC and AD 25, Romans established a military camp named Siscia, where today the historical nucleus of Sisak sits. Siscia very soon rose to the status of a town with especially strong military, transport, and administrative functions.<sup>16</sup>



Map 3 Position and spatial organisation of the Roman town of Siscia  
Karta 3 Položaj i prostorna organizacija rimske Siscije

In AD 297 Siscia became the capital of the province of Pannonia Savia and the centre of the Siscia diocese, which places it among the most important ancient towns of today's continental Croatia.<sup>17</sup> The town was established where the River Kupa joins the Sava, on a high plateau which allowed secure settlement as well as use of the river and control over river navigation on the Sava and the Kupa. In addition to these favourable topographic conditions, the joining of river and road traffic was certainly one of the most important factors in the location of the town. Transport always had a dominant role here.

Not much is known about the inner structure and functional organisation of ancient Siscia. Nevertheless, the major contours of the town are known. This was a fortified town placed on the river bank. Navigation on the rivers Sava and Kupa was of great importance to the economy of Sisak, which can be

<sup>15</sup> KLEMENČIĆ, 2000: 37-50

<sup>16</sup> The town of Sisak is one of the most ancient towns in the Croatian regions. The Illyrian-Celtic settlement of Segestica, which was established in the Sisak locality of Pogorelec in the 4th century BC, was mentioned for the first time in 119 BC. Romans established ancient Siscia after they destroyed Segestica.

<sup>17</sup> It has been estimated that Siscia had between 25,000 and 35,000 inhabitants at the peak of its development. Inside the ramparts where numerous Roman places which had heating and town water supply, a bath near river banks of the Kupa, a forum, a town basilica, a wheat store, and a range of craft shops. Sisak's mint was one of the largest in the Roman Empire. VUKOVIĆ, 1994: 231.

seen in the position of two of the town's gates, which were situated right on the river. The inner structure of the town was planned – the basis of the town was formed by a decumanus and a cardo, between which were placed proportional blocks of houses.<sup>18</sup> This was an advanced predisposed form known from other Roman settlements which allowed easy movement within the town. Hence, the structure of the town was subordinate to the traffic inside the town, while the outside traffic did not significantly influence the plan of the streets because of the advanced, ordered structure. At the same time, the town's function as a traffic hub was one of its major development factors. The port which was placed next to the ramparts had a special importance.

The early medieval period was marked by a break in the continuity in the development of the ancient Roman system of administration and spatial organisation based on a network of urban centres connected via road communications. When Pannonian Croatia was defeated by the Franks (819-822), Sisak completely lost its function, and a long period of ruralisation of Sisak's settlements began<sup>19</sup>. During the Middle Ages, Sisak completely lost its function as a town and existed as a small settlement and later as the centre of a church feudal property.

### **Traffic and the development of Sisak in modern times Promet i razvoj Siska u novom vijeku**

After the long wars against the Turks, in which Sisak's fortress played an important role,<sup>20</sup> a significant period of renewal of the settlement started in the seventeenth and eighteenth centuries. This is the time when the first drawings of Sisak were made, and they confirm the renewed development of this town under the influence of its function as a traffic hub. The great importance of navigation along the Kupa and Sava rivers, which made up part of the Dunav-Sava-Kupa river journey,<sup>21</sup> meant that Sisak began to develop alongside the banks of those two rivers.<sup>22</sup> The layout and direction of the streets were also determined by traffic on the River Kupa – almost the whole of one of Sisak's streets strictly follows the line of the river-bank, and its eastern suburb, Gladovo, developed alongside the river-bank of the Sava. This kind of settlement structure clearly shows its relationship with the river, especially because of its traffic functions. In 1783 the Military Border government started preparing for the building of a new settlement on the right bank of the river Kupa – so-called Military Sisak.<sup>23</sup>

<sup>18</sup> Compare the map of the reconstruction of the inner structure of ancient Siscia, published in VUKOVIĆ, 1994: 154

<sup>19</sup> HORVAT, 1954: 94.

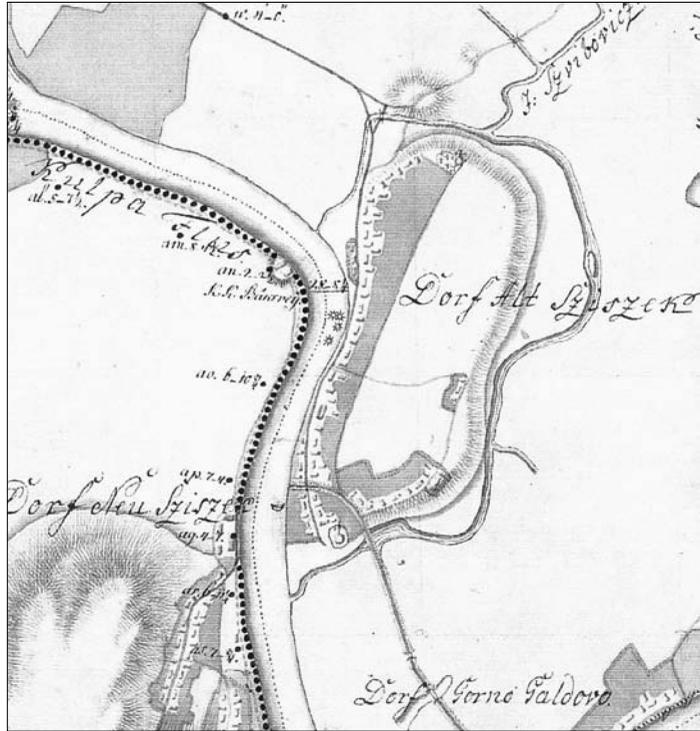
<sup>20</sup> In order to defend the Croatian Kingdom, in 1544 Zagreb's episcopal settlement, Kaptol, began to build a strong fortress in the area of Sisak located where the River Kupa joins the River Sava. This fortress had a crucial role in the history of Croatia as well as in the whole of Europe. On 22nd June 1593 a historical battle took place there when the Croatian army fought and defeated the Ottomans, preventing them from further penetrating towards Europe. KRUIHEK, 1995: 134.

<sup>21</sup> Repelling the Ottomans in the area south of the Sava allowed the revitalisation of old traffic routes, both roads and rivers, and the resulting peace, which lasted over a long period, until the end of the 18th century, allowed large investment in the revitalisation and building of the traffic infrastructure. When the Habsburg Monarchy encompassed large areas of fertile Slavonia, Vojvodina, and Banat, which became the new bread basket for the entire Monarchy, it was necessary to look for new, more favourable routes for the transport of grain from southern Hungary towards the Adriatic ports. It was decided that the goods would be transferred via the rivers Danube and Sava to Sisak, from where the goods would be transferred onto smaller ships and transferred down the Kupa to Karlovac. From Karlovac, the goods were transferred by road to Adriatic ports. On this trade-traffic route, Sisak was one of the most important traffic and trade centres. KARAMAN, 1966, 263-312.

<sup>22</sup> The structure of Sisak during the renovation of river navigation can be seen on the map 'Charte von dem sogenannten Lonszkopolier Terrain der Überwässerung, welche sich in die Löbliche-Agramer-Kreuzer und Poseginner Gespanschaften, dan in die Warasdiner Kreuzer 2-Banal und Gradiscaner Regiments Cantonen erstreckt worauf zugleich die zur Entwässerung dieses Terrains erforderliche Mitteln angezeigt werden', scale 1:14,400, drawn in 1793. Croatian State Archives, Cartographic Collection, sign. D.XII.5. The map is published in SLUKAN ALTIĆ, 2004: 172-173.

<sup>23</sup> The position and structure of Military Sisak was first shown on the map 'Plan aus welchen die Lage des Dorfes Neu-Sziszek, der dortigen Aerial-Magazine, Pontonier-Stadels und sonstigen Aerial-Gebäude, wie

The location of this part of Sisak was determined by point where the road (Petrinjska cesta) connecting the Military Border hinterland with the River Kupa. The port and granary were built at that point on the river-bank, which became the nucleus of the newly established Military Border settlement. In this way, the creation of this part of Sisak was determined by its function as the junction of river and road traffic. The impact of the intersection of river and road traffic determined the structure of the settlement. The military part of Sisak developed alongside the approach road to the port and alongside the river-bank (more precisely, just next to the flood line of the Kupa). All crucial buildings of this part of the town were related to the traffic functions and were placed right next to the riverbank and alongside this road. Military as well as civil Sisak lived primarily from general function as a busy traffic hub<sup>24</sup>.



Map 4 Civil (old) and Military (new) Sisak in the time of developed river trade on a map dating from 1793  
Karta 4 Civilni (Stari) i Vojni (Novi) Sisak u vrijeme razvijene riječne plovidbe na karti iz 1793.

At the beginning of the nineteenth century the first town-planning map was created in order to renew the antique heritage of Sisak.<sup>25</sup> Consequently, the town lost its extremely elongated character for the first time and started to develop based upon a planned grid pattern, which was created by three longitudinal and five transversal streets.<sup>26</sup> However, traffic continued to have a crucial impact on the development of the town. The new street plan was less indicative of how traffic flowed, but the functional structure of the town still clearly showed the importance of traffic. All important buildings with central functions were placed alongside the river-bank. In general, the river-bank was the commercial zone, where the port and all the most important buildings in the town were located (including the nearby parochial church), while the residential zone was forced to develop inland, away from the river. Traffic functions related to the river also influenced the social topography of the town. Going from the river-bank towards the hinterland, the importance and quality of the buildings dropped. Thus rich traders and craftsmen lived in the first street in spacious brick buildings, while poor inhabitants lived in small, ramshackle wooden houses in the third street.

In 1862 Old Sisak was connected with Zagreb, Vienna, and Trieste by the railway. This was one of the most important turning points in the town's development, which allowed Sisak to become one

auch die nächst der Culpa gelegenen Grundstücke zu ersehen,' scale 1:5,040, drawn ca. 1790. Kriegsarchiv, Wien, Kartensammlung, G.I.h.638. The map is published in SLUKAN ALTIĆ, 2004: 171.

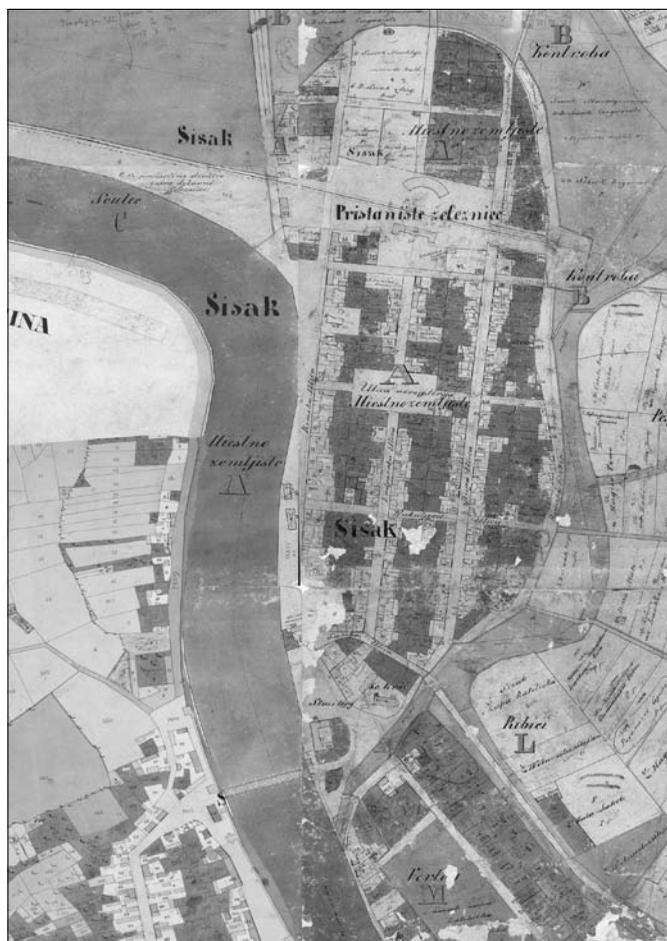
<sup>24</sup> MAROEVIĆ, 1998: 35.

<sup>25</sup> The first town-planning map of Sisak, 'Planum neo regulandi Oppidi Sissek tam fundorum intravillanorum quam et tenenturum extravillanorum ad idem oppidum spectantium' was passed in 1829. For the status before the regulation compare the 1824 map of Sisak. SLUKAN ALTIĆ, 2004: 176-178.

<sup>26</sup> Sisak as it appeared after the realisation of the first town planning document is visible on the cadastral map of 1861 made in the scale 1:2 880. Land-registry Office, Sisak. Reproduction in SLUKAN ALTIĆ, 2004: 183.

of the most important industrial centres in Croatia. Along with its function as a traffic centre, industry became a major factor in the development of Sisak<sup>27</sup>. The position of the railway and the railway station caused some important functional changes in the northern part of Old Sisak. The railway and the railway station became the central factor in the location of industry. In fact, the sole function of the entire part of the town situated north of the railway became industrial, while the residential zone was restricted to the area south of the railway.<sup>28</sup> The passenger and the cargo railway stations were both built in Old Sisak, next to the river port on the Kupa. This created one of the largest junctions of river and railway traffic in Croatia, which has had a dominant role in the economic development of Sisak up to the present. At the same time, Military Sisak, was left without any railway connection, and its development depended exclusively on river traffic. As a result, Military Sisak began to fall behind in its development. Its isolation from rail traffic was slightly compensated for when a bridge was built between Old Sisak and Military Sisak in 1862.

Though Old and Military Sisak formed one town in a functional sense, they developed under separate governments (Old Sisak as part of Civil Croatia and Military Sisak as part of the Military Border) for about two centuries. In 1873 Military Border was abolished, and in 1874 the two Sisak settlements were finally united as the Free Royal Town of Sisak. At the end of the nineteenth century, river navigation lost its importance. Road traffic started to have a significant impact on the development of Sisak again. At the end of the nineteenth century, the development of the town was not restricted to the town's historical nucleus alongside the river anymore, and for the first time intensive building activity could be seen in contact zones on the majority of the routes connecting Sisak with Zagreb, and slightly less in the direction of Moslavina (the importance of this second route had been reduced by the position of the railway, which cut off an area of the town on the eastern side and made natural development towards the east difficult for a long period).<sup>29</sup> The ex-Mili-



Map 5  
Civil and Military Sisak at the time of construction of the railway, from a cadastral map dating from 1861  
Karta 5  
Civilni i Vojni Sisak u vrijeme izgradnje željeznice na katastarskom planu iz 1861.

<sup>27</sup> KOVAČ, 2008: 65.

<sup>28</sup> The situation of the town of Sisak after the railway can be seen on the map »Planum neo regulandi Oppidi Sissek.. sa svimi novoti do listopada 1869«, scale 1:3,600. Kaptol Archives in Zagreb, sign. A.I.186. Reproduction in SLUKAN ALTIĆ, 2004: 187.

<sup>29</sup> Nacrt grada Siska, scale 1:12 500, published in 1925 in the town of Sisak. Reproduction in SLUKAN ALTIĆ, 2004: 194.

tary part of Sisak started to direct its development along Petrinjska cesta, which assumed the function of main street (before, it led to the river-bank). Although this part of Sisak lacked a railway station, the town's largest industrial zone was built there at the point where the railway crosses the Kupa, near the village of Caprag, and it has kept its importance to this day.

Today, when cargo transport over the river Kupa is no longer of great importance, the town's structure has grown mostly under the influence of its roads.<sup>30</sup> During the last decade of the twentieth century, the problem of bridging the railway, which used to break the town longitudinally, was solved by underpasses, and the town started to spread to the east of the railway all the way to the river Sava. At the same time, on the right bank of the Kupa, the position of a modern port built alongside the industrial zone to the centre of the town (Caprag) has stimulated the further growth of the industrial zone, especially the refinery related to the port, which today is one of the largest industrial zones in Croatia. Alongside this zone, in the second half of the twentieth century a large housing zone was built which connected the nucleus of the previous Military Border settlement on the river-bank of the Kupa with the industrial zone and the port to the south.

River traffic, the centuries-old backbone of Sisak's development, today has no influence on the spatial development of this town. Today, the town of Sisak develops mostly alongside the main roads which lead to the centre of the town. Although river traffic today does not have a significant impact on the development of Sisak, the functional structure of the town was conditioned by the importance of Sisak's port and railway, which was created at the beginning of the twentieth century and has continued to develop up to the present day. Therefore, river traffic, which today almost does not exist, still dictates the functional structure of this Croatian town.

### **CASE 3. KOPRIVNICA/ SLUČAJ 3: KOPRIVNICA**

The town of Koprivnica developed in an extremely important transit and geo-political position and has functioned over the centuries as the Croatian state's northern gate to the Hungarian lands and towards the area of central and eastern Europe. Koprivnica is located in the north-western part of the Pannonian Basin, on the crossroads of the longitudinal roads which, together with the Drava River valley, connect the Pannonian area with the Alpine area and the transversal routes which cross the middle of Croatia, connecting central Europe with the Adriatic. This border position on the north of the Croatian state made Koprivnica a natural hub for the regions of central, southern and south-eastern Europe.

Koprivnica was a medieval trade town that developed along an important medieval traffic route (Koloman's Road).<sup>31</sup> In the beginning, it developed mainly as a castrum with an important military-strategic position, and in the later Middle Ages it developed as a fortified centre of a feudal property. Thanks to its favourable traffic position, the development of trade and crafts, and its rich agrarian surroundings, Koprivnica established itself as one of the most important urban centres of northern Croatia by the end of the fourteenth century. As was the case with Sisak, traffic always played an important role in the development of Koprivnica. However, while Sisak grew under the influence of river traffic, it was road traffic that affected Koprivnica's development.

#### **Impact of traffic on the development of the town in the Middle Ages Utjecaj prometa na i razvoj grada u srednjem vijeku**

Koprivnica's placement next to the important traffic route of Koloman's Road in the first phase of its development resulted in the extremely longitudinal development of the settlement. One part of the road which passed through the settlement at the time took characteristics of a street with some resi-

<sup>30</sup> Compare the 1997 map of the town of Sisak. Reproduction in SLUKAN ALTIĆ, 2004: 205

<sup>31</sup> Koprivnica is a medieval settlement whose name was recorded in documents for the first time in 1272. In 1337 Koprivnica was mentioned as a place of trade and in 1356 King Ludovic granted it the status of a Free Royal Town, KLAJIĆ, 1987: 67-68.

dential buildings as well as buildings with central functions related to trade and crafts. Although we know very little about the topography of Koprivnica and its first centuries of existence, it has been presumed that the initial street around which the settlement developed was today's Đuro Ester Street, which has retained the function of a central street because of its significant width.

In the fourteenth century, Koprivnica was fortified, and wooden palisades and a moat were built around it. The nucleus of this medieval settlement was created by three parallel streets, with some shorter transversal streets which can be recognised in the topography of the town's nucleus.<sup>32</sup> All buildings with central functions of the time (the Church of the Virgin Mary, mentioned in 1337, the monastery, the market, and the fairgrounds) were placed along Đuro Ester Street. The main (northern) town gate was situated at the beginning of this street, where the roads from the directions of Varaždin and Hungary entered the town. The position of the southern gate was determined by the path of the road which proceeded towards Slavonia and later towards Bjelovar. It is clear that, already then, in a functional sense, there was a certain degree of specialisation among the streets, and this was mostly determined by their transport functions. Oružanska Street, at the end of which was the arsenal and southern town gate had a military role, Vijećnička Street had a predominately residential function, while Đuro Ester Street, as the main thoroughfare leading into the town, was used as the main street: all buildings with central functions – administrative, military, educational, and trading - were placed here. Hence, the traffic function of Koprivnica as a market town on Koloman's Road, in the Middle Ages, was one of its main development factors. Therefore, the functional structure of the settlement was also created under the strong influence of the traffic significance of some of Koprivnica's streets.

### **Traffic functions and the development of Koprivnica in modern times Prometne funkcije i razvoj Koprivnice u novom vijeku**

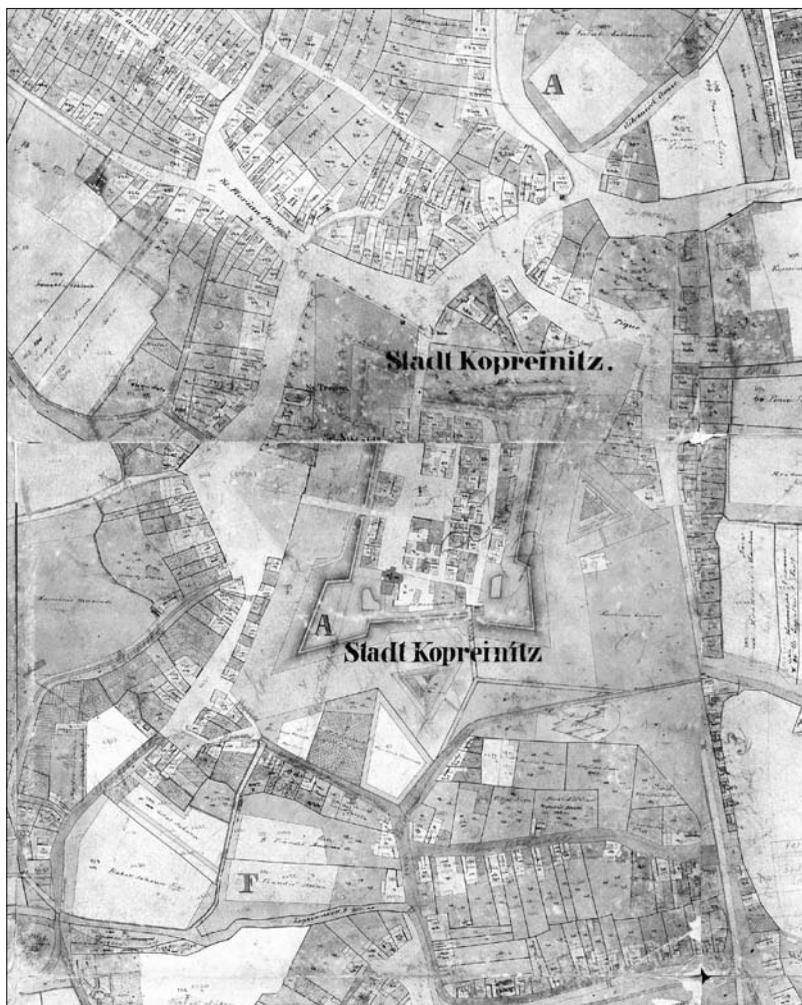
The turning point in the development of Koprivnica was the appearance of the Ottomans, who at the beginning of the sixteenth century conquered almost the entire area of Slavonia. Koprivnica, together with Varaždin, was the most important fortress of this part of the Military Border, because of its position inside the Border.<sup>33</sup> Koprivnica's fortress was modernised by the adaptation of the old feudal fortress to the new military conditions. Owing to the strength of its fortifications, in 1548 Koprivnica became the seat of the Captaincy and rose to be one of the most important fortresses of the Slavonian Military Border. The new square system of ramparts and trenches around the settlement was first reinforced with three corner towers and a citadel with a separate moat, and later with four broad bastions. In addition, four ravelins were built during the seventeenth century, giving Koprivnica the characteristic star-shaped ground plan which significantly influenced the later urban development of the town, as well as the surrounding suburbs, which began to develop outside the fortress. Traffic and trade lost their previous importance because of the Ottomans and the close demarcation line. At that point, the town's military functions were practically the sole factor in the town's development. However, the functional structure of the town's design from the Middle Ages under the influence of the traffic functions of the town mainly survived during the early modern period. Đuro Ester Street still functioned as the main street. Along this street, a large number of military buildings were built during the Military Border period. The only changes were made to some of the town gates. The southern gate, which led towards Slavonia, lost its importance (Slavonia was occupied by the Ottomans) and the western gate was opened because it led towards Zagreb. The position of the town's western gate increased the importance of the western part of the town (Ester Street), and therefore, the town's

<sup>32</sup> PLANIĆ-LONČARIĆ, 1986: 35

<sup>33</sup> In order to provide defence against the Ottomans in the 16th century, on the rest of the territory between the Sava and the Drava, the Slavonian Military Border was created (later the Varaždin Generalate). This military district had a crucial role in the defence of the Croatian Kingdom until 1699. KASER, 1997: 78

main square was created here (today's Leander Brozović Square), which took over the function of the market place.<sup>34</sup>

After 1606, when the process of repelling the Ottomans started and they moved farther eastward from the town, the town's life started to experience a revival. At the beginning of the seventeenth century, the process of renewing Koprivnica's status as a significant trade and traffic centre began. The intensification of traffic and trade initiated the building of Koprivnica's suburbs, which during the seventeenth and eighteenth centuries were built under the influence of the regional roads which entered the town.<sup>35</sup> More precisely, suburbs developed alongside the fortified town's northern edge (the road to Varaždin) and western edge (the roads to Križevci and Zagreb). The calming of the military situation influenced the development of the suburbs, and in the middle of the seventeenth century it was decided that Koprivnica's markets would take place outside the fortress, on a location west of the ramparts (today's Square of Youth). Besides the approaching regional roads, the star-shaped form



Map 6 Koprivnica on the cadastral map of 1869- dismantling of the fortress began  
Karta 6 Koprivnica na katstarskom planu iz 1869. nakon početka razgradnje utvrde

of the Koprivnica fortress was the main influence of the town's ground plan when the market place was moved to the western suburb. This resulted in a ring of squares being built around the fortified historical nucleus. Outside this ring, the suburbs of the town spread out along the roads which led to Varaždin, Hungary, Zagreb, and Križevci. Among these four, the roads connecting Koprivnica to Hungary and Varaždin had the most importance. Because of this, the town's northern suburbs grew faster, and a new trade and business centre was established right on the crossroads of these two roads in front of the town gate.

The demilitarisation of Koprivnica and its integration into the economic system of Civil Croatia in the nineteenth century brought significant changes to the town in terms of

<sup>34</sup> It is possible that this square has existed in continuity since medieval times, but no archaeological evidence to this effect has been found.

<sup>35</sup> »Plan Territory der Stadt Copenrinitz«, scale 1:21 600, drawn in 1768. Hofkammerarchiv, Wien, Kartensammlung, sign. O 22. Reproduction published in SLUKAN ALTIĆ, 2005: 192. »Plan des befestigten Platzes Koprernitz sammt dessen Vorstädten und dem umliegenden Terrain: Militair Jahr 1850, scale ca 1:3 000. Kriegsarhiv, Wien, Kartensammlung, Inl.C.VII No. Reprduction in SLUKAN ALTIĆ, 2005: 197-198.

economy and politics, which made it possible for a significant jump to occur in the demographic and spatial development of the town. Thanks to the strong development of traffic, trade, and crafts, Koprivnica's suburbs became the most dynamic parts of its urban web. Although some of the town's institutions (town council, school, hospital) were still located inside the fortified town, this part of the town was no longer the most prestigious residential area.<sup>36</sup> This function was taken over by the northern suburb where Zrinski Square and Ban Jelačić Square (the northern town's nuclei) were created as the town's elite residential zone. The commercial and administrative functions were located in a ring around the historical nucleus where the business centre of the town was created. The ramparts and large moats prevented road communication, and so the entrance of the large roads into this part of the town and its historical nucleus was gradually abandoned. Finally, in the late 1860s, a decision was made to destroy the ramparts and fill up the moats.<sup>37</sup> The dismantling of the fortress, which lasted until the end of the nineteenth century, allowed for the better utilisation of the nucleus and enabled its traffic connection with the suburbs, but this did not lead to change in the plan of the streets. A characteristic star-shaped sequence of streets was created around the nucleus during the existence of the fortress, and since they were completely built up, it was not possible to adjust them (especially on the western side of the town, where the market place used to be). Thus the star shape of the former fortifications can be still seen today in Koprivnica's street plan.

At the same time, the impact of road traffic on the development and structure of Koprivnica was significant, and the railway connected Koprivnica with Budapest in 1870 without any significant impact<sup>38</sup>. The railway and its station was built to the west and was separated from the town by large tracts of farmland. The empty space between the railway station and the town centre only started to be built up during the period between the two world wars, when the Koprivnica railway junction became more important, after the railway to Varaždin was built (1937), but this building was very slow because of the economic crisis. The town grew radially along the regional roads, between which were expansive agricultural lands.<sup>39</sup> The radially growing town retained the rural characteristics of its surroundings, and Koprivnica, although a functional town, continued to have the physical appearance of a village.<sup>40</sup> Although traffic was an important initiator of the town's development, its impact on the physiognomic structure and development of the town from the eighteenth to the twentieth century was the cause of extremely dispersed development, which was concentrated only along the approach roads, which also created a whole range of communal problems in the development of the town of Koprivnica (a small town with a very large area).

The urban web began to consolidate only after the Second World War, under the influence of the strong development of industry: the Podravka company was established, becoming the largest food concern in Croatia<sup>41</sup>. Podravka's factory has always been located adjacent to the railway. In addition, organised physical planning of the town stopped the initial radial building tendencies. The town continued its expansion by development of the open spaces between the main approach roads, which were previously used for farming.<sup>42</sup> In this way Koprivnica, with its strong traffic functions, has finally achieved balanced spatial development, where traffic still has one of the most important roles but is not the only criterion for construction.

<sup>36</sup> Compare the cadastral map date from 1869, scale 1:2 880. Land-registry Office Koprivnica. Reproduction in SLUKAN ALTIĆ, 2005: 200

<sup>37</sup> This process was very slow because of unsorted property and juridical conflicts with the Military Border government, so the process of dismantling the fortress lasted until the end of the 19th century.

<sup>38</sup> FELETAR, 1987, 11-20

<sup>39</sup> The town-planning regulations between the two world wars which directed building toward the railway station did not succeed in stimulating building in this direction.

<sup>40</sup> Compare the 1959 map of the town of Koprivnica. Reproduction in SLUKAN ALTIĆ, 2005: 214

<sup>41</sup> FELETAR, 1984: 72-73

<sup>42</sup> Compare the 2005 map of the town of Koprivnica. Reproduction in SLUKAN ALTIĆ, 2005, 219.

### Concluding remarks/ Zaključna razmišljanja

Taking into consideration the interdependence of traffic and urban development, each of these three towns exhibits characteristics of an extremely centralised town where the main traffic routes are related towards the town center (in Bjelovar and Koprivnica this is the main square, and in Sisak the river-bank has this role), and the importance of the radial roads which connect the central part with the peripheral part of the town dominates in the transport grid. The crossroads of these regional roads that create main town streets at the same time create a business centre in each town with a concentration of buildings that have central functions.

Bjelovar represents a model of a planned established Military Border town of orthogonal structure where the position of the pre-existing roads did not have a significant impact either on the location of the future settlement or on its previous morphological and functional structure. After the town was built, thanks to its strong central functions, the traffic network adapted to the location of the town in such a way that the town became the starting point of the main streets which at the same time represented the beginning of the regional roads, where, during the eighteenth and nineteenth centuries, the majority of the building took place.

Sisak was an ancient town which was established on an important junction of river and continental routes, where the traffic on the River Kupa had a stronger influence on the creation of the settlement than the continental roads. This resulted the building of a longitudinal river-bank town which, over time, developed some streets in the hinterland. At the same time, this pattern did not apply to the part of Sisak that developed on the right side of the river Kupa (Military Sisak), whose establishment and functional structure was certainly influenced by the traffic on the river, but whose morphological structure due to flooding from the Kupa was more strongly determined by the old traffic route to Petrinja, which today has remained one of Sisak's most important streets.

Koprivnica was a medieval trade town established alongside an important medieval traffic route (Koloman's Road), which in the first phase of the town's development resulted in the extremely longitudinal development of the settlement. In the early modern period, the building of a star-shaped fortress resulted in the radial building of the roads into the town whose starting points were both the town's main streets as well as the ends (or starting points) of the regional roads which connected the town with its broader region. In fact, the building of the Koprivnica fortress significantly changed the possibilities of building in the town as well as traffic links around the town. While before, the roads met in the centre of the town, the high fortress now prevented the roads from entering the main square. They entered into a ring around the fortress which took the place of the town's main square. In the past century, the impact of road traffic on building in the town began to restrict the town's development, but in the last 50 years, due to deliberate planning, the town has mostly built inward, filling up the non-developed open areas between the main roads which lead towards the town.

Translated by Alexander D. Hoyt

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- Land-registry Office, Koprivnica / Područni ured za katastar, Sisak
- Town's museum Koprivnica, Cultural-historical Collection/ Muzej grad Koprivnice, Kulturno-povijesna zbirka

## SUMMARY/SAŽETAK

Promet je jedan od dominantnih čimbenika koji utječu na lokaciju nastanka grada, njihov prostorni razvoj (morfološka struktura) te funkcionalnu strukturu (prostorni raspored funkcionalnih zona i objekata s centralnim funkcijama). Naime, iako su se mogućnosti prostorne pokretljivosti ljudi i roba tijekom povijesti bitno mijenjale, utjecaj prometa oduvijek se snažno odražavao na način urbane izgradnje kao i prostorni razmještaj gradskih djelatnosti. Kako gradovi u pravilu uvijek predstavljaju

prometna čvorišta šireg prostora, zbog boljeg razumijevanja prostorne strukture i razvoja grada, u ovom radu analizirali smo utjecaje prometa u gradu kao i promet u smjeru grad - okolica tj. regija.

S obzirom na međuovisnost prometa i urbanog razvoja sva tri grada pokazuju odlike izrazito centraliziranih gradova u kojima su glavni prometni pravci usmjereni prema središtu grada (u Bjelovaru i Koprivnici to je središnji trg a u Sisku ulogu središta ima obala) a u prometnoj mreži dominira važnost radijalnih prometnica koje povezuju središnji dio s rubnim dijelovima. Križište spomenutih regionalnih prometnica koje čine glavne gradske ulice ujedno čine poslovno središte grada s najvišom gustoćom objekata s centralnim funkcijama.

**Bjelovar** predstavlja model planski osnovanog vojnokrajiškog grada ortogonalne strukture u čijem nastanku položaj postojećih prometnica nije imao veći značaj u lokaciji budućeg naselja kao niti u formiranju njegove prvotne morfološke i funkcionalne strukture. Nakon njegove izgradnje zahvaljujući njegovim snažnim centralnim funkcijama prometna mreža se prilagođava se lokaciji grada na način da gradski trg postaje ishodištem glavnih ulica koje ujedno predstavljaju početke regionalnih prometnica duž kojih će se u 18. i 19. stoljeću odvijati najveći dio izgradnje grada.

**Sisak** je antički grad koji je nastao na važnom čvorištu riječnog i kopnenog prometa pri čemu je prometni put rijeke Kupe u pravilu imao snažniji utjecaj na oblikovanje naselja od kopnenih prometnica. To je rezultiralo izgradnjom longitudinalnog obalnog grada koji je tek s vremenom izgradio ulice u zaleđu. Istodobno, ta pravilnost ne vrijedi za dio Siska koji se razvija s desne obale Kupe (Vojni Sisak) čiji je nastanak i funkcionalna struktura svakako snažno utjecana riječnim prometom, ali je sama morfološka struktura zbog poplavnosti Kupe snažnije određena starim prometnim pravcem prema Petrinji koji je i danas ostao jedna od glavnih sisačkih ulica.

**Koprivnica** je srednjovjekovni trgovački grad nastao duž značajnog srednjovjekovnog prometnog pravca (Kolomanov put) što je u prvoj fazi njezina razvoja rezultiralo s izrazito longitudinalnim razvojem naselja. U ranom novom vijeku zbog izgradnje zvjezdolike utvrde razvoj grada rezultirao je izgradnjom duž radijalnih prometnica čija su ishodišta ujedno bile glavne gradske ulice ali i završetci (odnosno ishodišta) regionalnih prometnica koje su grad povezivale sa širom okolicom. Naime, izgradnja koprivničke utvrde bitno je promijenila ne samo mogućnost izgradnje grada već i prometne komunikacije oko grada. Dok su se do tada ceste susretale u samom gradu, visoka utvrda sada utječe na činjenicu da se prometnice više ne slijevaju na glavni trg već na ring oko utvrde koji preuzima funkciju glavnog trga. U novije vrijeme utjecaj cestovnog prometa na razvoj Koprivnice bio je u nedostatku ostalih razvojnih čimbenika toliko jak, da je radijalna izgradnja grada počela ometati njegov razvoj, pa se grad posljednjih 50-tak godina uglavnom razvija prema unutra, izgrađujući neizgrađene površine između magistralnih prometnica koje ulaze u grad.