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Pregledni članak
Review

Pan-European Transport Corridors and Transport System of Croatia

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This paper covers Croatia's transport position in the context of pan-European tranport corridors. National transport policy priorities, the main transit routes in Croatia and their compatibility with the needs of pan-European links are all considered. The basic features of Croatia's transport system and its compatibility with the development of different traffic modes are analyzed. The significance of the potential Adriatic-Ionian transport corridor is considered in the end.

Key words: Croatia, pan-European transport corridors, transport system

Paneuropski prometni koridori i prometni sustav Hrvatske

U radu se raspravlja o prometnom položaju Hrvatske u kontekstu paneuropskih prometnih koridora. Razmatraju se prioriteti nacionalne prometne politike, glavni prometni pravci u Hrvatskoj i njihova kompatibilnost s potrebama paneuropskog povezivanja. Analiziraju se osnovne značajke prometnog sustava Hrvatske i usklađenost razvoja pojedinih vrsta prometa. Na kraju se razmatra značenje potencijalnog Jadransko-jonskog prometnog koridora.

Ključne riječi: Hrvatska, paneuropski prometni koridori, prometni sustav

INTRODUCTION

The development of the transport system of a country or region depends on numerous factors, and among the most important are physical-geographic, economic, technological, environmental, historical and social factors. A special set of factors can be referred to as political. The form and size of a territory and the political and territorial organization can be deemed internal political factors. External political factors include the political environment, formation of economic unions, and international treaties, as well as the impact of crises and wars.

The process of unification in Europe and enlargement of the European Union have signified an essential change in most of the aforementioned political factors. This implies the need for planning and regulating Europe's transport system on new foundations. Without a developed and well-organized transport system that will effectively integrate

the EU's entire territory, the economic and other effects of EU enlargement (common market, free movement of people, goods and capital, and so forth) cannot be achieved to the fullest extent. The loss would not only be endured by peripheral regions—which would continue to stagnate due to poorly developed transport systems and a lower level of transportation services—but also by core regions, where the economic benefits of expanded markets would fall short, and the latter would continue to allocate funds to assist lesser developed regions though various assistance funds. It therefore follows that coordinated planning and development of Europe's transport system is a common interest of all of its component parts. Given the evident differences between Eastern and Western Europe, two basic objectives imposed themselves: 1. implementing the transport standards of Western Europe in its eastern parts; and 2. incorporation of future EU member states into the consolidated European transport system. The first objective would be achieved through intense construction and improvement of the infrastructure which has lagged behind in every aspect, while the second would be achieved through common transport policies and coordinated planning of transport system development.

Here one more element that exercises a crucial impact on transport planning methods and transport policy implementation needs to be emphasized. The traditional, separate or individual approach to transport planning implies planning a network for a single mode of transport. Usually, international networks are formed by the linkage of national networks. As opposed to this, the joint or corridor approach signifies a new infrastructure planning method, based on exploitation of the advantages of individual modes of transport and their cooperative effect with the goal of establishing the most efficient transport system. It implies a concentration of infrastructure and integration of individual (complementary) forms of transport, and presents users with choices. Only a transport system planned in this manner can truly be a system, rather than just a collection of individual networks.

PAN-EUROPEAN TRANSPORT CONFERENCES

The first Pan-European Transport Conference was held in Prague in 1991. It marked the beginning of common planning of Europe's transport system and resulted in the establishment of some fundamental principles. These principles encompass the stance that only an efficient, safe and environmentally-friendly transport system will contribute to a better quality of life in Europe. Therefore, improvement of the transport system in Eastern European countries is not only in their interest, but also of the entire EU, whose members some of them became after enlargement in 2004. The need for careful planning of the transport system, particularly in light of the intense growth of traffic, which Europe has been confronted for some time and which will increase with the "opening" of Eastern Europe and the incorporation of transition countries in Europe's economic system. The second Pan-European Transport Conference was held on Crete in 1994. Although the dominant role of road transport was acknowledged, the need was also stressed for development of other forms of transportation and exploitation of their advantages. The transport system needs to be planned to take advantage of the essential complementarity of individual forms of transportation through cooperation and development of multimodal transportation. Besides providing a definition of these principles, this conference also resulted

in the proposal for nine pan-European transport corridors. Due to wartime conflicts and potential crisis flashpoints, the territory of the former Yugoslavia, including Croatia, were generally bypassed, even though this region always played a pivotal role in linking Central and Western Europe with its southeast and in opening links with Asia. The transport and geographic position of Croatia within the European framework was the subject of study by many authors (Roglić, 1971, Jelinović, 1971, etc.), while the famed Orient Express can serve as an illustration, since one of its sections passed through this region. Additionally, after World War II, when Europe was divided into blocs by the so-called 'Iron Curtain,' the transit route through the Yugoslavia of the time facilitated the most free circulation of people and goods.

Croatia only joined the deliberations on pan-European corridors at the third Pan-European Transport Conference, held in Helsinki in 1997. At that time the ten principal pan-European transport corridors and their branches were defined, and some of them were vitally important to Croatia. (Fig. 1.)

The most important is certainly Corridor **X**, which runs from Salzburg through Ljubljana, Zagreb and Belgrade to Thessaloniki, with branches going toward Athens (Xd)

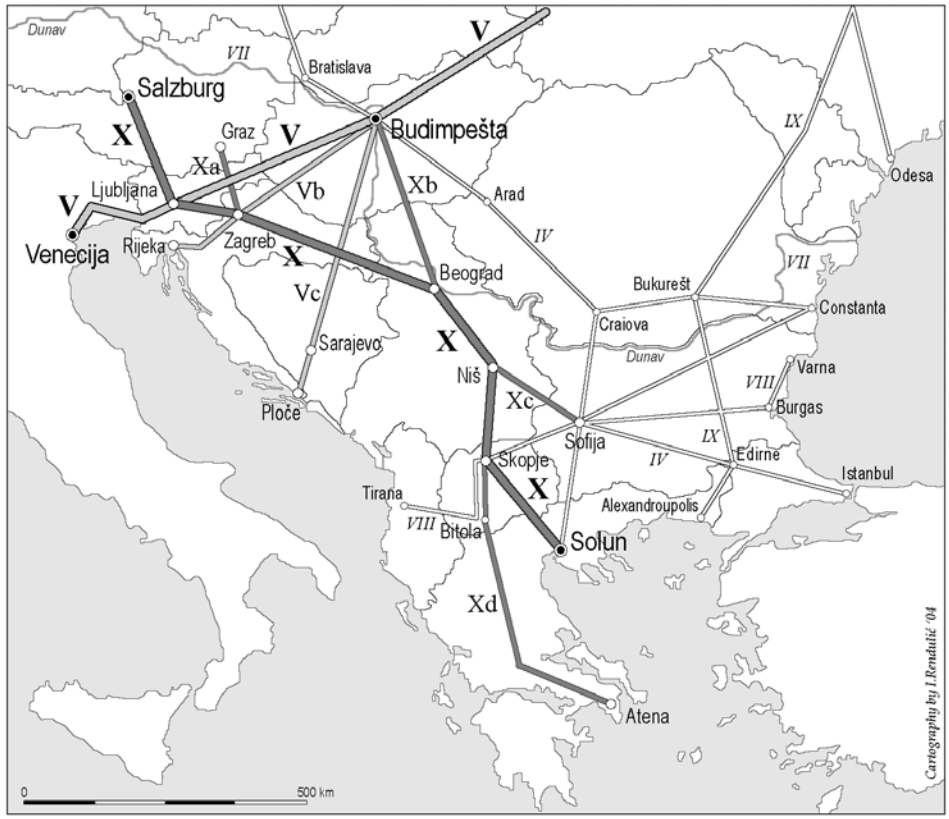

Fig. 1. Pan-European transport corridors in Croatia and surrounding countries
Sl. 1. Paneuropski prometni koridori u Hrvatskoj i okolnim zemljama

and Sofia (Xc), and a link to Corridor IV toward Istanbul. This corridor makes use of the shortest and geographically most advantageous route for linking Central and Southeastern Europe. For Croatia, and particularly for the Zagreb transport node, branch **Xa** is particularly important, as it links Zagreb, via Maribor, with Graz, and facilitates a further link to Vienna. At the Helsinki conference, a two new branches that pass through Croatia were added to the earlier projected Corridor V: branch **Vb** links the Pannonian basin with the northern Adriatic through the naturally and geographically most advantageous route, where the Dinaric mountain barrier is narrowest and lowest, leading from Budapest via Zagreb to Rijeka. Corridor **Vc** links the Pannonian basin and the central Danubian zone with the central Adriatic, and leads from Budapest, through Osijek and Sarajevo, to the Adriatic port of Ploče. The latter is particularly important to Bosnia-Herzegovina. This is the only part of the pan-European transport corridor network that passes through this country, and it also corresponds to that country's principal developmental axis. Finally, Croatia also participates in pan-European transport Corridor **VII**, the only one that consists of a waterway, as this is the Danubian navigational route. Even though it is peripheral given Croatia's national territory and major developmental centers, it reinforces Croatia's status as a Danubian country, and it holds great potential.

As noted previously, due to the war, Croatia became involved in the work of the pan-European transport conferences at a relatively late stage, and this was reflected in the value placed on its transport position. Nonetheless, it can be stated that the establishment of the transport corridors defined in Helsinki was a great endorsement of its transport position from several points of view.

First, it showed that Croatia plays an important role in linking Europe's large geographic units. In the longitudinal direction, these entail links between Central and Western Europe and Southeastern Europe, while in the transversal direction these encompass links between the Pannonian basin and the Adriatic Sea, and from a broader perspective, between the Baltic region and Eastern Europe and the Mediterranean.

Second, as a candidate for European Union membership, Croatia possesses a link with Europe through these corridors and is thereby incorporated in the unified European transport system. Transport integration creates the prerequisites for broader European integration.

Third, Zagreb, as Croatia's capital city and principal transport node at the national level, acquires a new function as a transport node in the pan-European transport network, i.e. as a transit node with broader importance in the transitional zone between Central Europe, the Adriatic and Southeastern Europe (Sić, 1994). Although this is not a node of the highest level, the intersection of a major corridor and two branches highlights the value of its transit position.

Parallel to aspirations to join the European transport system, Croatia's achievement of independence imposed the need for devising a national transport policy, while development of a national transport system became a factor in physical planning. Croatia's transport policy and transport system development became topics of interest by numerous authors who examined its various aspects (Božičević, 1992, Malić and Topolnik 1993, Padjen, 1992 and 1993, Radica, 1993, Sić, 1993 and 1999, etc.) and joined the ranks of key issues in debates on the country's developmental strategy.

Several principal objectives of national transport policy can be discerned. The form of the country's territory requires the linkage of two large units, Croatia's inland and littoral. The features of national development, urban systems and desired Adriatic orientation and reinforcement of the maritime position emphasize this need even more. In this sense the highest quality link between central Croatia and the northern Adriatic (i.e. a connection between the capital city and the main port) is absolutely necessary. This is the main transversal route in Croatia's transport system and it corresponds to pan-European Corridor Vc. The other major transversal route links central Croatia with the central Adriatic coast, meaning Zagreb and Split, the country's largest and second largest cities respectively. In broader sense, this is a part of the well-known Pyhrnean route that facilitates a link with the Central European hinterland and only partially, as branch Xa, participates in the pan-European transport corridors. The third transversal route is the one through Bosnia-Herzegovina, linking the eastern and southern portions of Croatia. The most important route in this link runs through the valleys of the Bosna and Neretva Rivers, and corresponds to branch Vc of the pan-European corridors.

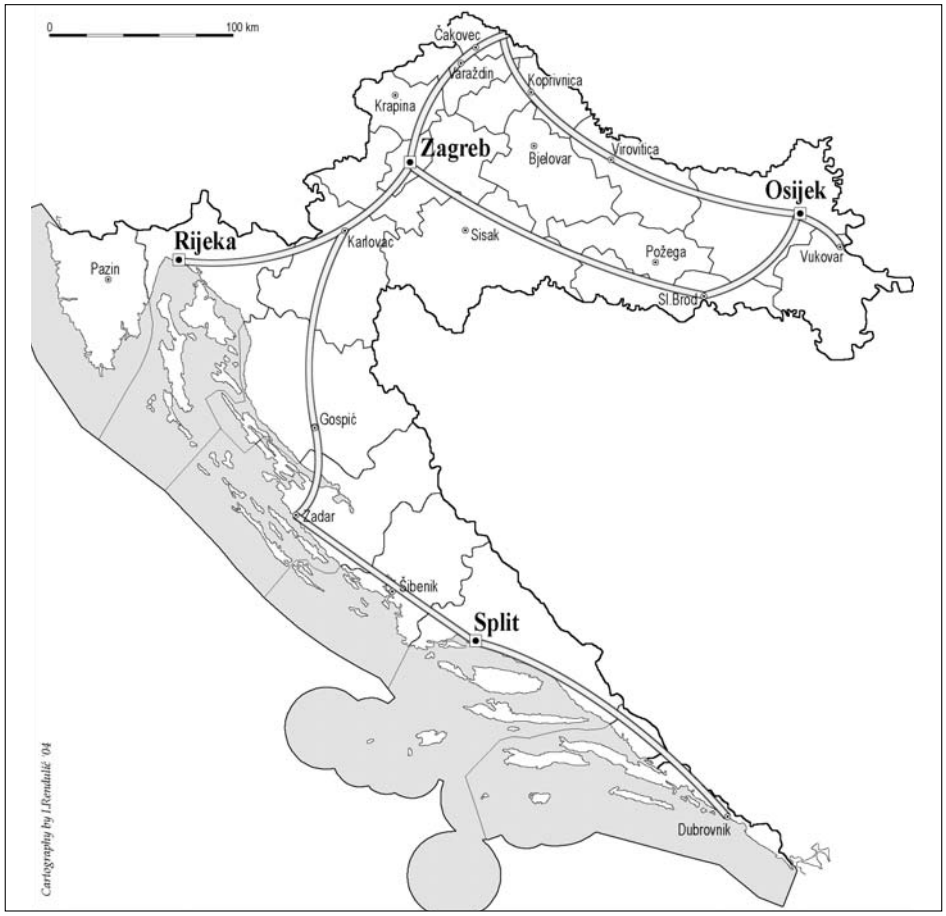

Fig. 2. Principal routes in transport system of Croatia
Sl. 2. Glavni pravci u prometnom sustavu Hrvatske

The second key objective of the national transport policy is to create quality transport links between regional centers, which is one of the conditions for balanced regional development. Three longitudinal transit routes stand out in this sense. The Posavina transit route along the Sava River links central and eastern Croatia, and in the broader zone it brings together several regional and sub-regional centers. It corresponds to pan-European Corridor X. The Podravina transit route performs a similar function in the border zone along the Hungarian border. Links running toward Slovenia and Serbia-Montenegro also have some international significance, but so far they have played only a secondary role in comparison to the Posavina route. The third longitudinal route is that running all down the Adriatic coast, which connects several large coastal centers and serves as the pillar in Croatia's littoralization processes and the creation of its maritime orientation, particularly with regard to the development of tourism. The latter two longitudinal routes do not correspond to any pan-European corridors.

From the aforementioned, it is apparent that the most important transport routes in the national transport system nonetheless largely correspond to the principal pan-European connecting routes. This certainly makes transport system planning easier and its construction more cost effective, primarily in light of expected transport flows as a principle element of this cost effectiveness.

SOME CHARACTERISTICS OF CROATIA'S TRANSPORT SYSTEM

Croatia's achievement of independence and the war that was imposed upon the country exerted a powerful impact on its transport system and the intensity of traffic during the 1990s. Certain developmental characteristics from the preceding period reversed, while others became more intense. The review of the Croatian transport system's characteristics will be conducted through a basic analysis of the networks of individual forms of overland transportation with emphasis on transit routes that are part of the pan-European corridors. The principal features of passenger and goods transport will also be analyzed.

Road transport

Road transport is the principal form of overland transportation in Croatia today, as in most other European countries. Its importance and rapid development are the result of numerous factors, and among the most important are its adaptability and high degrees of serviceability, the dense transport network that is relatively easily constructed and the rapid progress in transportation means. Road transport is additionally the main link between all other forms of transport in the system as a whole.

After Croatia gained its independence, road traffic became an absolute priority in transport system development, which was best reflected in intense motorway construction. Although the first high-speed motorway was constructed in Croatia in 1972 (Zagreb-Karlovac), at the time of independence Croatia had almost 300 km of high-speed motorways, while by 1997 it had 330 km, and by 2000 it only had a slightly more than 400 km of high-speed motorways. From 2001 to 2004, the length of high-speed motorways more than doubled, and by mid-2004 it was approximately 850 km[1)]. In 2004 alone, 177 km of high-speed motorways were open to traffic.

This intense construction program has provoked numerous debates. The explicit orientation toward development of the high-speed motorway network pushed other forms of transportation to the side and prevented any more substantial investments in their infrastructure. This approach is at odds with the principles of the Pan-European Transport Conference on development of a transport system that emphasizes the need for balanced development of different forms of transportation and their cooperation in the interests of sustainable transport development. However, there are also arguments in favor of such a transport policy. The new State, confronted with the consequences of war (direct damage to the transportation infrastructure, and to the entire economy) and the hardships of economic transition, was not economically capable of making parallel investments into the development of all forms of transportation. Under such conditions, the priority was placed on the form of transport that would most easily attract investors and that would yield the quickest returns, even though this orientation did not have to be so lop-sided. It should also be noted that this is a basic network of high-speed motorways with the bare minimum of integration that so far leaves open no possibility of alternative motorway links. In terms of its high-speed

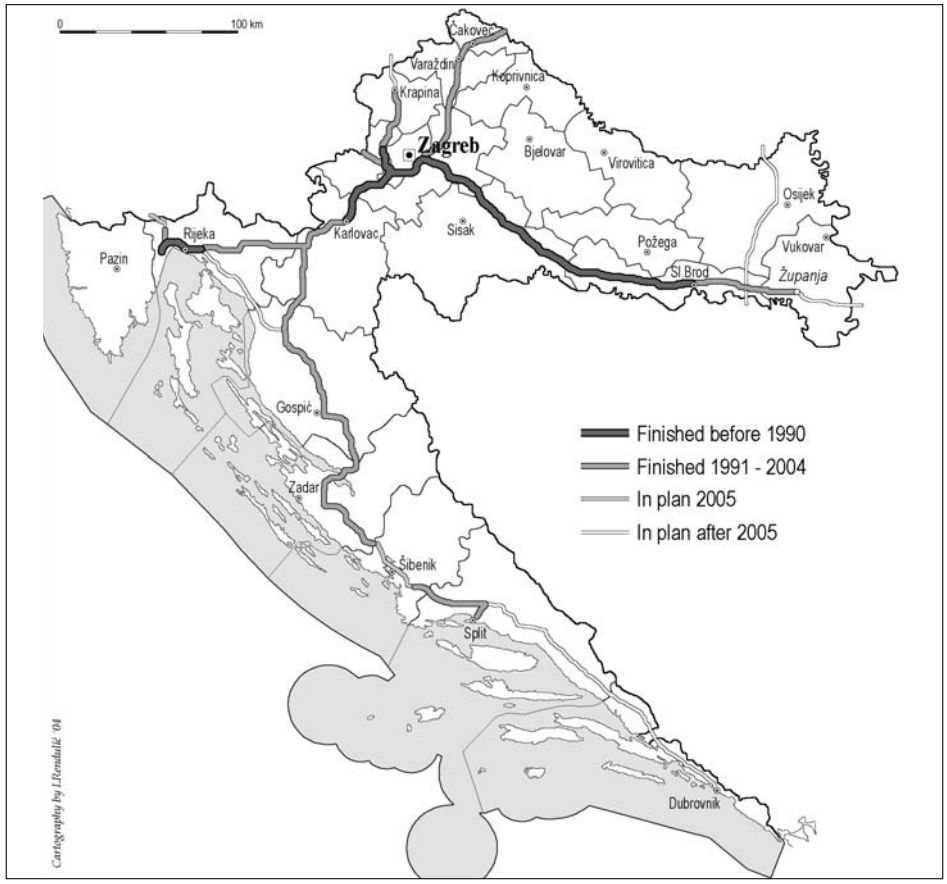

Fig. 3. Croatia's high-speed motorway network
Sl. 3. Autocestovna mreža Hrvatske

motorway network density of 1.5 km/100 km^2, Croatia surpasses most transition countries (except Slovenia), but it still lags behind most developed European countries.

The projected high-speed motorway network, both constructed and projected, serves to achieve the main objectives of Croatia's transport policy and it largely corresponds to the needs of infrastructure construction on the pan-European corridors (Fig. 3). Almost the entire section of Corridor X that passes through Croatia has been constructed. The largest portion, the Zagreb-Slavonski Brod section, was constructed before Croatia became independent, because this route was a transit priority in the former Yugoslavia and it also had great international significance (Sić, 1993). After Croatia's independence, the section from the Slovenian border to Zagreb was constructed, while in the east the section from Slavonski Brod to Županja was constructed. Only 30 km from Županja to the border with Serbia-Montenegro are needed for its completion, and this has been scheduled for the end of 2006. The full affirmation of this route has yet to come. This is because during the war traffic on the motorway was halted, and the collapse of Yugoslavia severed economic ties and traffic flows between the former federal republics, while through traffic was detoured on other routes (mostly to the corridor IV). The restoration of these traffic flows has been rendered difficult by the fact that the continuation of this motorway have still not been constructed in neighboring countries (Slovenia and Serbia-Montenegro). Branch Xa, in terms of number of vehicles and passengers and quantity of goods transported, is the second most important access route to Croatia (after the western section of Corridor X) and another approximately 20 km of high-speed motorway to the Slovenian border need to be constructed. The continuation of this motorway in Slovenia in this direction is not in any short-term plans.

The branches of Corridor V are at considerably different levels of development. The first phase of branch Vb from the Hungarian border to Rijeka via Zagreb and Karlovac has been completed with the opening of several sections in 2004. Its completion on a length of 60 km requires expansion of a semi-motorway into a full profile of high-speed motorway. In contrast, Corridor Vc is still in the planning stages, and the pace of construction will largely depend on agreements reached with Bosnia-Herzegovina.

Intense construction proceeded in the direction toward Split which, after completion of a tunnel and a 38 km section in Dalmatia, will be complete in 2005. This route that was selected has its advantages and drawbacks. The principle drawback pertains to its distance –one of the key issues in transport connections. The fact that this is not the shortest link between central and southern Croatia has as a permanent consequence increased costs in the exploitation phase. To a certain extent, this route is a compromise that satisfies the needs of two of Croatia's transport priorities: the transversal route toward Split and the longitudinal Adriatic direction. This has given Croatia's basic motorway network its form. There are plans for continuation of a coastal link toward Dubrovnik and beyond as part of the Adriatic-Ionian Initiative, which will be mentioned in more detail at the end of this study.

Railroad transport

With a total length of 2,726 km, the rail network in Croatia is 10 times shorter than the road network. In comparison with most European countries, even those with well-developed rail traffic, such a ratio could be considered quite high (e.g. in Sweden it is 1:14, in Germany 1:17, in France 1:31, in Slovenia 1:32)[2)]. However, the rail network in Croatia

lags behind considerably in terms of quality and connections. The current network has been completely inherited from earlier periods, and it bears the features of the transport needs of the time and it is the end-result of the transport policies of the States that developed it (Austro-Hungarian Empire and Yugoslavia). As opposed to developed European countries, in which revitalization of rail networks during the 1960s led to their rationalization, modernization and adaptation to modern needs, here these processes were lacking or they proceeded in a very limited extent. Furthermore, wartime destruction at the beginning of the 1990s inflicted great damage to the already-neglected infrastructure, even as transport flows were interrupted and the rail network disintegrated. Limited investment potential and transport policies that favored road transport rendered the renewal process very slow. Single-track lines greatly predominate in the network, as double-track lines form only 10% of the total length. Only 35% of the lines are electrified. The technical characteristics (sharp curves, low axle pressure) of the lines limit flow-through and speed. Additionally, the rolling stock is old: out of the total 500 passengers cars, only 13 were produced after 1990, while 70% are cars over 20 years old. In freight traffic, over 90% of the wagons over 20 years of age. Two thirds of the locomotive engines are over 30 years old (all data are from 2003). It is clear that under these conditions, not only is rail transport unable to compete with road transport, it cannot even participate in modern combined and intermodal transport.

The highest-quality rail infrastructure can be found on the Posavina transit route, meaning along pan-European Corridor X, due to its international and internal importance in the former State. The line is double-tracked, electrified, and it was partially modernized during the 1980s, enabling maximum speeds of 160 km/h.

The railroad line on Corridor Vb was constructed in 1873 as a link between Budapest and the port of Rijeka. The original route has never been reconstructed in a quality manner, so the line has a single track with considerable curves, and today it does not meet the criteria for modern rail transport. In this sense it became one of the factors limiting the development of Rijeka as a port. The construction of a new lowland line down the Kupa River valley, which has appeared in developmental plans many times, has become a necessity for fulfilling the potential of this corridor.

Besides investment possibilities, the exploitation of the rail link on Corridor Vc, like in road transport, depends on agreements and joint planning with Bosnia-Herzegovina. So far only a short section in the southern sector, in the hinterland of the port of Ploče, has been modernized.

In branch Xa there are no direct rail links going from Zagreb toward Graz and Vienna, rather this connection can be made by a longer route through Slovenia. A new line in this direction has also been proposed in various plans, but its construction can be deemed a priority in forming a link with networks of neighboring countries and fomenting the development of Zagreb as a trinomial node for high-speed transport (Sić, 1994).

Among the modest investments in rail transport, the modernization of the rail link between Zagreb and Split stands out. Reconstruction began in 2003, while in 2004, although not upgraded along its entire length, tilting trains were introduced. After reconstruction along the entire length, travel time from Zagreb to Split will be reduced by over 2 hours, taking a total of 5 hours.

Pipelines

The principal infrastructure pipeline facility in Croatia, and in the entire region, is the Adriatic Oil Pipeline (*Jadranski naftovod* – Janaf). Its general course runs from the northern Adriatic (port of Omišalj) along the current Corridor Vc toward central Croatia and further on into Hungary, where it is connected to Druzhba Pipeline, and thereby to a considerably wider pipeline network of European countries. From Sisak, one branch runs along Corridor X toward the east to Serbia-Montenegro. Janaf supplies six refineries in four countries: two each in Croatia and Serbia-Montenegro, and one each in Bosnia-Herzegovina and Slovenia. Since this pipeline's capacity is only being partially utilized (a little over 40% during years of most intensive use) (Ilić, 2003) and it is connected with a network of oil pipelines in Europe, it can supply a broader region. Additionally, under new circumstances reigning on the world market, the idea has emerged of using the Adriatic Pipeline for transport in a direction opposite to what has been customary so far, i.e. to use as one of the routes for exporting Russian crude oil to the world market (Druzhba-Adria Project). A similar idea is contained in the SEEP (South East European Pipeline) Project, which foresees supplying regional and world markets with crude oil from the Caspian region. The crude oil would be conveyed to the Romanian port of Constanţa, which would be linked to Janaf by a new pipeline through Romania and Serbia-Montenegro, while a link with Trieste (and the Transalpine Pipeline) has also been projected. Such ambitious plans provoke a number of questions in the broader sphere, from economic to environmental, but the utilization of pipeline transport complies with the corridor principle of complementary transport development.

Inland navigation

The seventh pan-European corridor in Croatia is located peripherally, because the Danube River forms part of Croatia's eastern border. Its transport function at the European-wide level has still not met expectations after the opening of the Main-Danube canal (1992), and the completion of the transcontinental navigation route between the North and Black Seas. One of the reasons for this was the war in the territory of the former Yugoslavia, which prevented exploitation of this navigation route's full potential. The bridges that were knocked down during the NATO air strikes against Serbia-Montenegro are still obstructing normal navigation. Slow economic transition and feeble economic growth, as well as tardy involvement in European integration (primarily with the EU) by the countries along the lower course of the Danube do not stimulate the creation of stronger transport flows.

Like in most countries in this part of Europe, the inland waterway network and integration of waterways with other forms of transport in Croatia are scarcely developed. International inland navigable waterways in Croatia encompass the Danube River, approximately 20 km of the Drava River from its mouth to Osijek, and the Sava River up to Sisak, and the planned Danube-Sava canal[3)], but normal traffic is only proceeding on the Danube and part of the Drava. The Sava navigational route, which could play an important role along Corridor X in combined transport[4)], was generally neglected during the war, and it has a low carrying capacity and has not been adapted to meet modern criteria. Today navigation only proceeds in individual sectors, accompanied by great limitations, and when water levels are low it is halted. A further problem is the inadequate, aged, and

largely devastated (during the war) fleet. The role of river-going transport in the transport system has been neglected for decades, which has been reflected in its development. Goods transport began to decline already during the 1980s, only to stop almost completely once the war began. Some mild growth occurred during the 1990s, but the share of river-going transport as part of the total has remained insignificant.

The revitalization of inland navigation will require a series of technological, infrastructure and organizational measures. Among the most important are reconstruction and modernization of the river ports in Osijek and Vukovar, the regulation of the Sava River (and ports on the Sava) for receiving standard Danube vessels, and construction of the Danube-Sava canal (Vukovar-Šamac) to shorten the route and to integrate river transport with other forms of transport. However, even after this there is the question of commodity flows, which can be created only by enhanced overall economic growth in Croatia and the region as a whole.

TRAFFIC FLOWS

An analysis of the physical volume of transportation and the transport output in passenger and goods traffic during the 1990s leads to the conclusion that the intense growth of transport activity from the preceding period was interrupted, and a drastic decline ensued. Although the number of passengers conveyed in public transport began to decline already in the early 1980s, at the beginning of the war a drastic fall was recorded, while the subsequent "recovery" proceeded slowly.[5)] Between 1989 and 1997, the number of passengers carried declined from over 220 million to 116 million (index 53), while actual transport output fell from over 11 to 6.5 billion passanger-kilometres (p/km) (index 59) (Sić, 1999). In freight transport (not including maritime) the decline was even more palpable: the quantity of goods carried was practically halved (reduction from 83 to 42 million tons, index 51), while transport output declined by a factor of three (from over 14 to not quite 5 billion tonne-kilometres (t/km), index 34) (Sić, 1999). The causes of these changes can be classified as external and internal. Among the external factors are war, followed by wartime or crisis situations in the wider region, loss of the former Yugoslav market which meant reduction of traffic flows, and new political and economic relations in Europe after 1990 that enabled bypassing of earlier and creation of new transport routes. Among the internal factors, the most important are economic transition, which led to a decline in traditional industry and the manufacturing sector in general, while compensation with new, high-technology export-oriented industries was lacking, nor were foreign investments attracted. This resulted in slow integration by Croatia into the European and global economy, and thus slower economic growth and higher unemployment. All of this, and some other factors, were reflected in reduced transport activities (Sić, 1999.).

On the other hand, these and other factors intensified changes in the structure of transportation with regard to transport types. Due to changes in the methodology for gathering and incorporating data[6)] these changes cannot be monitored continually, but a rough comparison can discern several main processes. The most important change is in the principal form of transportation. During the 1980s railroads were still the most important form of transportation, as it carried over half of the freight in inland transport, while its

share in transportation output (t/km) was somewhat greater. However, the total quantity of goods carried stagnated after the beginning of the 1980s, and as of 1985 a continual decline commenced, which became drastic after the beginning of the war (index 1992/1990 = 26.8). There was no significant growth in transport after the war, as it oscillated between 10 and 12 million tons annually, i.e. only a fourth of the quantity recorded in 1985. Road transport also experienced an intense decline in physical volume at the beginning of the war, but after the war it began to developed rapidly. Although the aforementioned methodological changes made it impossible to continually monitor developments in this form of transport, in 2003 4.5 times more goods were transported by these means than by rail. Road transport therefore became not only the most important but also the absolutely dominant form of overland transport (Table 1, Fig. 4a and 4b)

Tab. 1. Transport of goods and tonne-kilometres by transport types in 2003
Tab. 1. Prijevoz robe i tonski kilometri po vrstama prijevoza 2003. g.

transport type	goods carried		transport output	
	thous. Tons	%	mil. t/km	%
Rail	11723	15,92	2487	20,00
Road	52147	70,81	8241	66,27
Inland waterway	706	0,96	84	0,68
Pipeline	9070	12,32	1623	13,05
Total	73646	100,00	12435	100,00

Source: "Transport, Storage and Communication"; Statistička izvješća (Statistical Report) 1230, National Statistics Bureau, Zagreb, 2004.

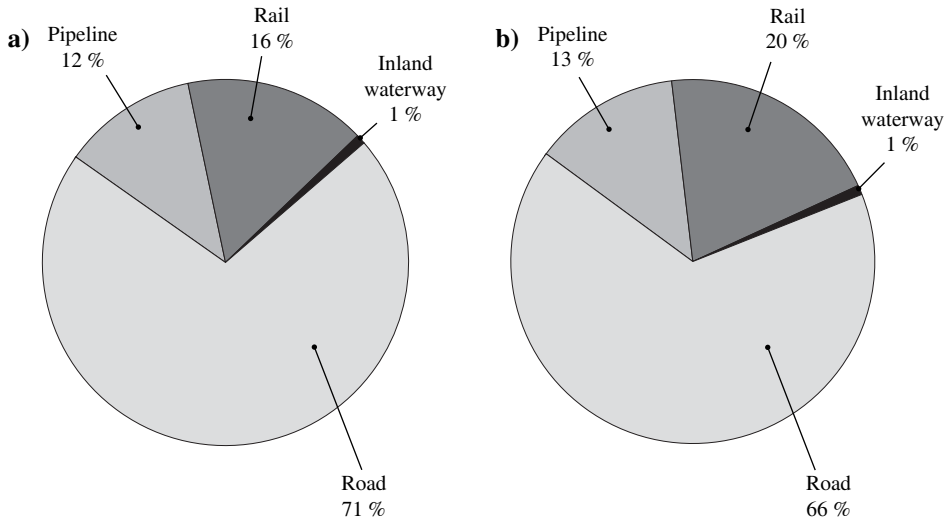

Fig. 4. Transport of goods (a) and tonne-kilometres (b) in freight traffic by overland transport forms in 2003
Sl. 4. Prijevoz robe (a) i tonski kilometri (b) u teretnom prijevozu kopnenim oblicima prometa 2003. g.

This predominance is particularly notable in the quantity of goods carried, wherein road transport has even surpassed maritime transport. The shorter distances in road transport than in other forms of transport makes these differences somewhat less in terms of transport volume (measured in tonne-kilometres), but road transport nevertheless records 3.3 times more transportation than rail transport. The intense development of road transport can also be monitored indirectly, through the number of registered freight vehicles. During the 1993-2000 period alone, the number of freight vehicles in Croatia grew almost 3 times (from 46,800 to 138,300), i.e. it grew by almost 10,000 vehicles every year. During that same period, the number of vans, which also participate in freight traffic, grew by 5,000.

POTENTIAL ADRIATIC-IONIAN CORRIDOR

The final document of Helsinki conference mentions one more transport route of interest to Croatia, although it was not officially proclaimed a pan-European corridor. This is the longitudinal link down the eastern coast of the Adriatic and Ionian Seas from Italy (Trieste)

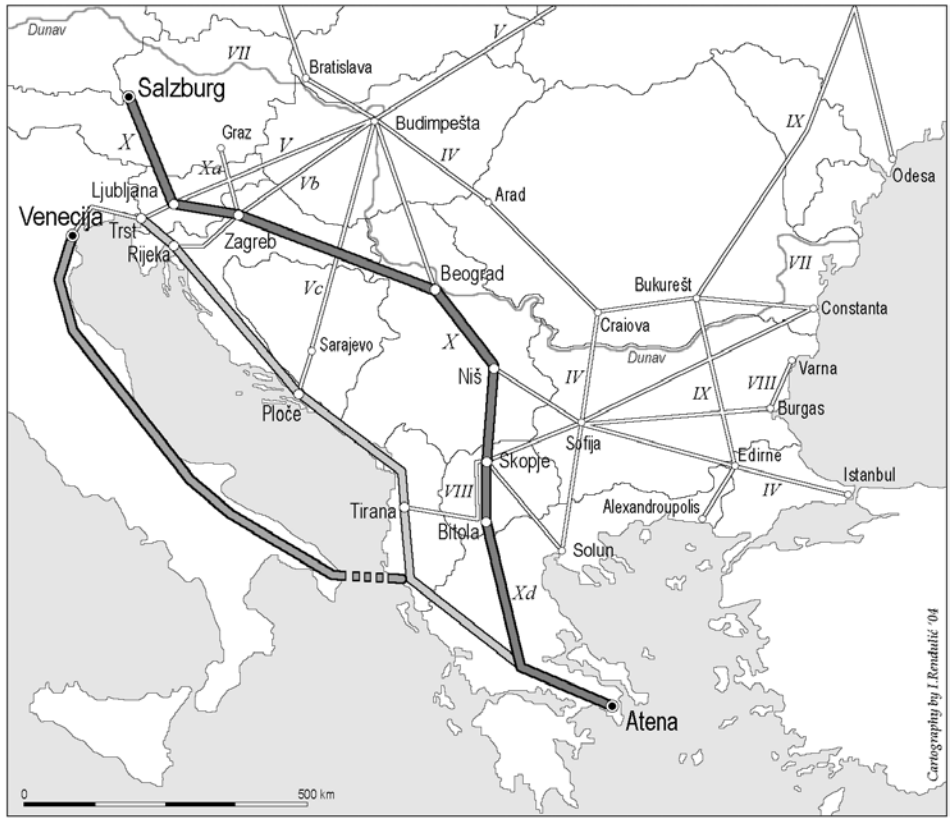

Fig. 5 Proposed Adriatic-Ionean transport corridor, Paneuropean corridor X and alternative transport route through Italia

Sl. 5. Predloženi Jadransko-jonski prometni koridor, paneuropski koridor X i alternativni prometni pravac kroz Italiju

to Igoumenitsa in Greece (with a possible continuation toward Athens). This proposal was endorsed by the seven countries belonging to the Adriatic-Ionian initiative which are linked by this route: Italy, Slovenia, Bosnia-Herzegovina, Serbia-Montenegro, Albania and Greece. Without delving further into the economic, environmental and other aspects of this proposal, from the geographic standpoint one can make several arguments in its favor.

If the network of pan-European corridors in this part of Europe is considered, it becomes apparent that it is relatively sparsely and poorly linked by several "dead-end" routes. Incorporation of this corridor would link Corridor V, the ends of its b and c branches, Corridor VIII and branch d of Corridor X. This would then complete the network and greatly improve its connections and create possibilities for alternative routes in linking Europe's core with its southeast, and even with the Middle East as needed. Today's principal link in this direction is Corridor X, which can be supplemented with a link down the western coast of the Adriatic, through Italy and by maritime route through the Straits of Otranto. In this sense, these routes should not be considered competitive but rather complementary (Mlinarić, 2000).

Furthermore, this route links seven countries at varying levels of development, of which three are European Union member states, one is a candidate, and three are still lagging behind in integration processes. Some of them, especially Albania, have been extremely isolated economically, politically and in the transportation sense. The creation of this link would have developmental significance because it would activate economic potential (tourism, possibility of foreign investment, etc.) and encourage economic growth, facilitate better mutual ties and ties with the European Union. This would in turn contribute to the more rapid economic transition of these countries, bring them closer to European integration, and also indirectly foment the region's political stabilization.

Out of the seven countries linked by the proposed corridor, Croatia participates with the longest section, almost half of its total length (Mlinarić, 2000.). In Croatia, it corresponds to the longitudinal Adriatic transit route – and the importance of the latter has already been noted. High-speed motorways have already been constructed on a considerable part of this route, while they are being constructed in other places, while the remaining portions are part of shorter- or longer-term plans (Fig. 3.). It incorporation into the pan-European corridor network would probably facilitate the speedier completion of the motorways, and its direct integration with the Italian motorway network would enhance its importance, bolster traffic flows and increase its developmental impact. However, this route would have the features of a transport corridor, so it would be necessary to develop other types of transport and enable their integration. This pertains to coastal navigation, while the perspective importance of an Adriatic rail line is also often stressed (Sić, 1993).

CONCLUSION

Croatia is a small European country, but due to its geographic position and form of its national territory, it plays an important role in the European transport system, meaning its serves as a link between Europe's major geographic units. This fact has been greatly

reinforced by Croatia's incorporation into the network of pan-European transport corridors. Additionally, through these corridors Croatia has established quality ties with the European Union, whose member it wants to become. Besides its primary nodal function at the national level, Croatia's capital city, Zagreb, is becoming a node for the pan-European corridors.

The objectives of transport policy that it has to achieve as a new State through formation of a national transport system largely correspond to the requirements of pan-European linkage. This greatly eases transport planning.

The tenth pan-European transport corridor in Croatia is the best equipped: a high-speed motorway has been constructed over almost its entire length, and the corresponding rail line is duble-track and electrified, enabling the highest speeds in Croatia (up to 160 km/h). An oil pipeline has also been constructed along a section of this corridor, which has an important international function. Only inland navigation is poorly developed, because the Sava River is not equipped for modern transport. Branch a of Corridor X only has a motorway constructed on it, and not over its entire length.

The seventh pan-European transport corridor (course of the Danube River) is peripherally located in Croatia, while at the European level it has not achieved its full potential. Nonetheless, it is on the bank of the Danube and in its immediate vicinity that the two largest river ports in Croatia, Vukovar and Osijek, developed.

Branch b of the fifth corridor depends on the high-speed motorway and pipeline (which partially moves away from the main corridor direction). There are also rail lines which to not meet modern transport criteria in terms of technology.

Branch c of the fifth corridor in Croatia has two segments (in Slavonia and Dalmatia). The development of modern infrastructure still lies ahead, and its planning is being conducted in cooperation with Bosnia-Herzegovina.

An analysis of the transport system has shown unequal development between individual types of transport, with the marked domination of road transport. This runs contrary to the concept of pan-European corridors, which stresses the need for balanced development of individual forms of transport and their cooperative operation through development of intermodal transportation. This will require careful planning and considerable investments in transport types that have been neglected until now, primarily rail transport and inland navigation.

NOTES

1. Computed based on data from: the statistical annual of the Republic of Croatia for 2003 and the report on transportation, storage and communication in 2003 (Statistički ljetopis Republike Hrvatske za 2003. g.; Prijevoz, skladištenje i veze u 2003., *S*tatistička izvješća 1230); Hrvatske autoceste d.o.o., http://www.hac.hr/autoceste.php, 14 September 2004; Autocesta Rijeka-Zagreb d.d. (Rijeka-Zagreb motorway concession company), http://www.arz.hr/, 14 September 2004; the stated 60 km in the Zagreb-Rijeka direction is not a full motorway (semi-motorway).

2. Computed based on data from: Prijevoz, skladištenje i veze u 2003., Statistička izvješća 1230.

3. Croatian Chamber of Commerce, Transportation and Communications Sector, http://www.hgk.hr/komora/eng/depts/transport/promet_pom_rjeccjev2004WEB.pdf, 8 October 2004.

4. Combined transport in the Danubian area-northern Adriatic direction has a tradition going back to the eighteenth century, when grains from the Pannonian basin were transported by river (Danube-Sava-Kupa) to Karlovac, and then carried by cart to the northern Adriatic. This link was known as the Danubian-northern Adriatic combined transport system (Rogić, 1982).

5. It is very important to note that increases in the number of passengers after 1992, when 104.5 million were ccarried, occurred primarily due to incorporation of rail transport into the public urban transport system in Zagreb. From 1992 to 2003, the number of rail passengers grew from 17.8 to 36 million, but since it was a matter of short distances, the transport volume expressed in p/km only grew 18%. During that same period the number of passengers in road transport fell from 80 to 65 million.

6. Since 2001 the data on road transport of goods have related to the operations of businesses that disposes freight vehicles and are engaged in goods transport for public or private needs. The data cannot be compared with preceding years (methodological explanations in the Croatian statistical annual for 2003: Statistički ljetopis Hrvatske 2003 and *Prijevoz, skladištenje i veze u 2003*)

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SAŽETAK

Paneuropski prometni koridori i prometni sustav Hrvatske

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Završetkom blokovske podjele Europe i širenjem Europske unije na istok, javila se potreba planiranja cjelovitog prometnog sistema Europe i bržeg razvoja prometne infrastruktuture u tranzicijskim zemljama radi dostizanja prometnih standarda zapadne Europe. Radi ostvarivanja tih ciljeva na konferencijama ministara prometa europskih zemalja (poznatima kao Paneuropske prometne konferencije), određeni su glavni pravci povezivanja Istoka i Zapada Europe. Hrvatska se pregovorima priključila na trećoj konferenciji (Helsinki, 1997.) kada je definirano deset glavnih paneuropskih koridora i njihovi ogranci. Kroz Hrvatsku prolazi X. paneuropski koridor (Salburg - Ljubljana - Zagreb - Beograd - Skopje - Solun), VII. paneuropski koridor (dunavski plovni put) te dva ogranka V. koridora: Vb (Budimpešta - Zagreb - Rijeka) i Vc (Budimpešta - Osijek - Sarajevo - Ploče). Time je Hrvatska afirmirala svoj prometni položaj kao zemlja važna u prometnom povezivanju pojedinih europskih regija, omogućila svoje veze s Europskom unijom čijem članstvu teži, a Zagreb je dobio čvorišnu ulogu u paneuropskom prometnom sustavu.

Istodobno, Hrvatska, kao nova država treba kreirati nacionalnu prometnu politiku i razviti nacionalni prometni sustav kao faktor organizacije prostora. Kao prioritet ističe se potreba povezivanja dvaju glavnih dijelova Hrvatske, kontinentskog i jadranskog. U tom se smislu izdvajaju tri transverzalna pravca: riječki, koji povezuje središnju Hrvatsku i sjeverni Jadran (Rijeku), splitski, koji povezuje središnju Hrvatsku sa srednjim Jadranom, te pravac koji kroz Bosnu i Hercegovinu povezuje istočnu i južnu Hrvatsku. Radi cjelovitog povezivanja kao preuvjeta uravnoteženog regionalnog razvoja izdvajaju se i tri longidudinalmna prometna pravca: jadranski (dužobalni), posavski i podravski. Može se ustvrditi da se glavni pravci nacionalnog prometnog sustava u velikoj mjeri podudaraju s paneuropskim prometnim koridorima u Hrvatskoj.

Kroz analizu prometnog sustava Hrvatske utvrđeno je da se pojedine prometne grane neravnomjerno razvijaju. Cestovni promet je u ekspanziji, što se ogleda u velikim investicijama u infrastrukturu, tj. intezivnu gradnju autocestovne mreže. Od osamostaljenja do 2004. g. duljina autocesta u Hrvatskoj je gotovo utrostručena, planira se daljnja gradnja, a cestovni promet dominira u putničkom i robnom prijevozu. Nasuprot tome, željeznički promet je u stagnaciji ili nazadovanju. Zbog malih ulaganja ratne štete na infrastrukturi sporo se uklanjaju, a investicje u modernizaciju su skromne. Cjevovodni promet ima dobre uvjete za razvoj, postupno raste. Kapaciteti naftovoda samo su djelomično iskorišteni, a prijevozni učinak još ispod prijeratne razine. Najslabije je razvijena unutrašnja plovidba koja u prijevozu robe sudjeluje u zanemarivom udjelu. Plovni putevi su zapušteni, a flota zastarjela. Takav neravnomjeran razvoj pojedinih vrsta prometa ne čini dobru predispoziciju za kvalitetno uključivanje u paneuropski prometni sustav. Njegovo osnovno načelo je upravo suprotno: uravnotežen razvoj pojedinih vrsta prometa i njihovo suradničko funkcioniranje radi što efikasnijeg odvijanja prometa. Da bi se to postiglo potrebne su znatne investicije i promišljeno planiranje prometnog sustava.

Zajedno s još šest zemalja Jadransko-jonske inicijative (Italijom, Slovenijom, Bosnom i Hercegovinom, Srbijom i Crnom Gorom, Albanijom te Grčkom) Hrvatska se zalaže za uključivanje jadransko-jonskog pravca u sustav paneuropskih koridora. Time bi se upotpunila koridorska mreža u ovom dijelu Europe, a zemljama koje povezuje dao poticaj u gospodarskom razvoju te olakšalo i

ubrzalo njihovo uključivanje u gospodarske i druge integracijske procese u Europi. Povoljno je za Hrvatsku što se predloženi prometni koridor podudara s jadranskim prometnim pravcem važnim za unutrašnje prometno povezivanje. Problem je što se za sada oslanja samo na cestovni promet.

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