



INTERMODAL INFRASTRUCTURAL NETWORK - BASE FOR INTERMODAL TRANSPORT DEVELOPMENT AND CREATION OF NEW ADDED VALUE

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Abstract

Croatian membership in the EU and membership of neighbouring countries will fundamentally change the prospects and significance of the Danube-Adriatic transport region. Providing transport services is perhaps the most important potential source of new added values to Croatia. The Republic of Croatia is well placed geographically in relation to transit traffic, with the result of substantial potential for intermodal transport development. The connection of the Pan-European Transport Corridors v, vii and x with the Adriatic ports and the Sava and Danube river places Croatia at a comparative advantage.

To use the geographical position, it is necessary to immediately proceed with the preparation of documentation, followed by the construction of infrastructure-objects in the area of transport, especially intermodal transport. This intermodal transport network in the Danube-Adriatic region can be achieved as part of the European Transport Network (TEN-T).

The paper presents main projects whose purpose is to remove bottlenecks in infrastructure and logistics, so that the Croatian transport network would become permeable in linking Central Europe, the Danube region and the Adriatic.

Keywords: intermodal transport, Danube-Adriatic region, European Transport Network (TEN-T)

1 Introduction

Croatian membership in the EU and membership of neighbouring countries will fundamentally change the prospects and significance of the Danube-Adriatic transport region. Providing transport services to Croatia is, beside agriculture and tourism, perhaps the most important potential source of new added values. To use the geographical position, it is necessary to immediately proceed with the preparation of documentation, followed by the construction of infrastructure - objects in the area of transport, especially intermodal transport. Intermodal transport is the carriage of freight in units combining at least two modes of transport, where most of the journey is conducted by railway, inland waterway or ocean shipping and where the road part at the beginning and end of the journey is as short as possible.

2 Geo-transport position of the Republic of Croatia and the Danube–Adriatic region

Croatia is well placed geographically in relation to transit traffic, with the result of substantial potential for intermodal transport development. The connection of the Pan-European Transport Corridors v, vii and x with the Adriatic ports and the Sava and Danube river places Croatia at a comparative advantage.

The Adriatic Sea is a bay of the Mediterranean Sea that penetrates deepest into the European mainland. The north Adriatic uses the cheaper sea route till as far as possible and the expensive land transport leg is shortened to its minimum. As such it is the natural, the shortest and the most economical route that links Europe with the Mediterranean and - with further sailing through the Suez Canal - with most Asian and African countries and Australia (Figure 1.).

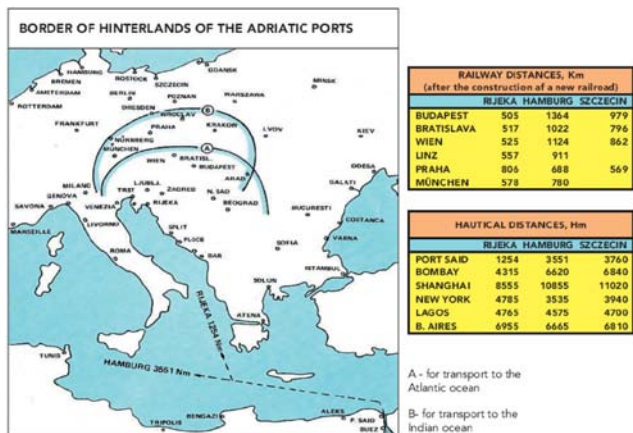


Figure 1 Border of hinterlands of the Adriatic ports

If the Adriatic ports are linked with the Danube region and further with Central Europe (by land and sea) if the railway, inland waterway and road networks are modernised, built up and suitably equipped with IT systems, and if cargo and logistic centres for intermodal transport are established, the intermodal transport network in the Danube-Adriatic region (Figure 2.) can be achieved as part of the European Transport Network (TEN-T). If the Danube-Adriatic intermodal network is established, the Adriatic ports could become “the Adriatic gateways to Europe” and Zagreb, which is located at the interface of a number of trans-European routes (European corridors X, Xa, Vb and VII - the Danube) could become the “Gateway to south-east Europe.”

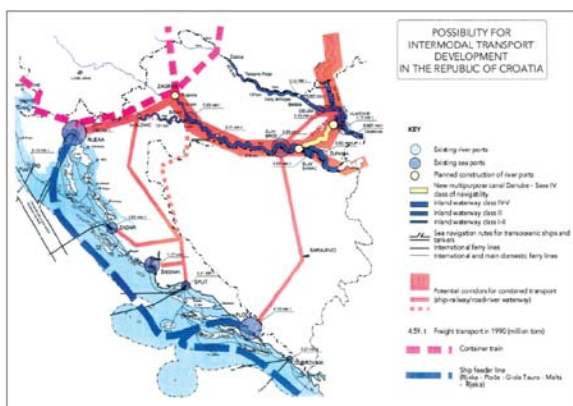


Figure 2 Intermodal network Adriatic–Danube–Central Europe

3 Transport capacity in Europe and Croatia

There is an evident trend of railway transport losing market share (Figure 3.). It declined from 12% in 2000 to estimated 9% in 2010 and 8 % in 2020 beside overall growth of transport capacity. Despite the positive aspects of rail transport (including energy consumption, environmental protection, traffic congestion, etc.) that have been achieved, the contribution of railways to transport as a whole is constantly decreasing, which begs the question of the economic strategy of the national economies and the EU in general, which supports vast financial investment in modernising and developing rail transport, while at the same time rail’s share of the market is on the decline.

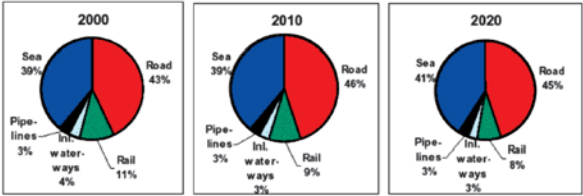


Figure 3 Modal split in freight transport in Europe

Freight transport structures given in Figure 6. are showing that there is no organised, efficient and optimum transport system for freight in Croatia. The result, if this trend continues, will be that the railway will not become the basic land carrier, which will remain the roads. This means that the consequences for the environment will be increasingly severe and the cost of transport in the price of products will increase. Therefore, now it is the time to analyse the structure and state of the entire freight transport system in depth in order to find an organised, efficient and optimal solution, with the railway as a fundamental land carrier in an overall intermodal transport chain. A properly structured freight transport system will provide new added value.

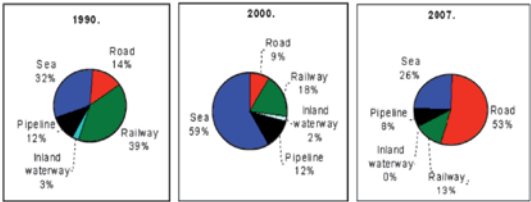


Figure 4 Modal split in freight transport in Croatia

4 Proposal of projects necessary for creating unique transport system and enlargement of the TEN-T network to south-east Europe

For the purpose of realization of TEN-T network in the Danube-Adriatic region, it is necessary to remove bottlenecks in infrastructure and logistics, so that the transport network would become permeable in linking Central Europe–Danube–Adriatic, and it is necessary to create a series of projects. The main of these projects are described in the following text. Constructing and modernization of river ports in Vukovar, Osijek, Slavonski Brod, and Sisak (Zagreb) and building a new port on the future canal Danube–Sava according to the standards of the AGN agreement. Above-mentioned ports are included in a port network of international significance of the AGN agreement.

Building the Danube–Sava multipurpose canal in length of 61.5km on the VII or Danube corridor (Figure 5.) - this canal is included in the AGN waterway network of the European Agreement on Main Inland Waterways of International Importance with the international rating E–80–10 that was ratified by the Croatian Parliament. This project is a strategic interest of the Republic of Croatia and of great significance for transport, water management and agriculture.



Figure 5 Route of the Danube–Sava multipurpose canal

Modernization of a railroad Vukovar–Vinkovci - main goal of this project is to connect Vukovar port with the transport corridors x and Vc.

Construction and reconstruction of road network around Vukovar port - for the purpose of linking main traffic routes on corridor x and c branch of corridor v with the most important cargo centres, ports and cargo transport centres.

Construction and modernization of rail and road infrastructure on the c-branch of v Pan-European transport corridor - this project has an important role in linking the Danube region and the Adriatic, and the Port of Ploče and Vukovar. This is the shortest and ideal transport connection between Central Europe and the southern Adriatic.

Modernisation of the Port of Ploče - the proposal is based on better links between the port and its hinterland, adaptation of transshipment capacities, particularly for intermodal transport. Ploče is the second largest seaport in Croatia and is connected by roads from three directions. The most important link is the north-south direction on the c-branch of Pan-European Corridor v, where there is also a railway line. Ploče also offers high-quality maritime links with Italian ports on the other side of the Adriatic. There is an airport for small aircraft in the harbour.

Project of regulation of the river Sava – envisages the regulation of the waterway from the canal mouth in Šamac to Sisak (Zagreb) and upgrading it to international class IV and Vb according to the AGN agreement. The river Sava is a part of the AGN waterway network and has a mark E-80-12. Modernization of Pan-European Corridor x (Salzburg – Ljubljana – Zagreb – Belgrade – Dimitrovgrad – Bulgaria – Turkey border in the total length of about 1450km) – in order to achieve technical and technological standards of Pan-European corridors and to define the framework of commercial rail operations in the corridor with the aim of rail freight transport on this route to become a competitive to road and that freight shifts from roads to railway.

Construction of transport infrastructure in Zagreb (Figure 6.) at the interface of trans-European routes on the future TEN-T network (European corridors x, x, Vb and VII-the Danube corridor) and the development of Zagreb as the European transport capital of south-east Europe.

Building the “Krapina railway” on Corridor Xa where there is a gap in the Maribor – Krapina – Zagreb railway link. The absence of a railway line between Pragersko and Krapina creates a bottleneck between central and south-east Europe and the Adriatic. The new Pragersko – Krapina line (Figure 7.) would be a joint operation and give new value to the Central Europe – South-east Europe – Adriatic transport route by shortening trips from Zagreb to Vienna and Linz (via Maribor – Graz) from 1 to 1 ½ hours.

Revitalization of “Una railway” with a goal of better linking mid-Adriatic ports (Split, Šibenik, Zadar) with corridors x, Xa, Vb and VII – Danube corridor (Sava – canal – Danube). An agree-

ment between Croatia and Bosnia and Herzegovina is necessary because the railway crosses the border seven times.

Modernisation of the Mid-Adriatic ports of Zadar, Šibenik and Split for the purpose of qualifying them for their role and further developing them as the “Adriatic Gateway to Europe”.

Constructing the new railway line Rijeka–Zagreb and the second track on the line Dugo Selo – Koprivnica on Corridor Vb on the traffic route Rijeka – Zagreb – Budapest, to enable railroad transport capacity of over 25 million tons a year and more than 100 train pairs per day.

Construction and modernisation of the Port of Rijeka - the port must be accessible to bigger vessels carrying up to 15,000 containers. The Port of Rijeka is the only port on the Adriatic Sea with a depth sufficient to accommodate larger draught vessels. Infrastructure in the vicinity of the port (roads and railways) needs to be upgraded in order to transport/tranship the resulting new volumes of cargo. A reloading terminal for quick reloading of containers should be built, because at the Port of Rijeka, there are currently no possibilities for storing large numbers of containers. With the new railway to Zagreb, the Cargo Center in Zagreb would become a dry hinterland port for Rijeka.



Figure 6 Railway hub Zagreb



Figure 7 Possible route of “Krapina railway”

Boring the railway tunnel through Učka (Figure 8.) with a goal of linking Istrian railways with the Croatian railways network and realisation of a link with the ports of Koper, Trieste, Monfalcone and thereby linking the Corridors v and Vb as a possibility of the fastest connection of southwest and southeast Europe via Istria. European significances of the link with Istria and the new railroad Rijeka – Zagreb are shortening connection towards the southeast of Europe (instead of existing connection via Budapest, Vienna and München to Paris and further west, new link via Zagreb, Rijeka, Trieste, Milan, Lyons toward the west), renewal of “Simplon express” route (Paris, Trieste, Rijeka, Zagreb, Belgrade, Sophia, Istanbul), shortening travel time (Trieste – Ljubljana – Zagreb from around 4,5 to 2,0 hours by building new railroad).



Figure 8 Učka railway tunnel

Building Cargo Centre Zagreb – Zagreb is the strongest industrial and economic centre in the country and one of the leading centres in the region. Therefore it is necessary to build a modern cargo distribution centre (similar to the existing one in Graz, where the town of Graz had played crucial role), for which certain preconditions in Zagreb already exist. Following the plan for cargo centres it is also necessary to build Satelit cargo centres in other larger economic centres in Croatia in Ploče, Vukovar, Osijek, Slavonski Brod and Knin – hinterland of the Mid Adriatic ports (Figure 9.).



Figure 9 Cargo terminals in Croatia

Building and modernisation of Industrial railway tracks - it is necessary to build a number of container terminals in all more significant industrial centres and other objects of transport infrastructure, and at the same time to plan and assure appropriate financial means for technological qualification for certain number of existing and building the new industrial railway tracks (where there is a need for them) and equip them for handling transport units for combined and intermodal transport. Industrial railway tracks are, beside container terminal network and equipment for handling containers, important factor for the future intermodal transport development.

Building and modernisation of Industrial railway tracks - it is necessary to build a Railway of the sea - "Euroorient" project is the working title for the Middle East – Europe intermodal route via the Adriatic ports for containers shipped via road-sea-rail-inland waterway-road (Figure 10.). The task of the IPC is to promote the implementation of the project "Railway of the Sea", and participation of all relevant IPC members in its founding. The project is based on the principle of the involvement of national industry: railway wagon factory at Čakovec, Croatian shipping companies, operators, ports and the railways of Croatia, Slovenia, Germany, Austria, Bosnia & Herzegovina and Turkey. This project was submitted 2006 to the EC under the Marco Polo programme with the name "Euroorient" in the hope of obtaining financial support from the EU's pre-association funds, especially those of the Marco Polo programme itself. Following the proposition of this fund, documentation was made, that outlines the justification of this project, expressed through concrete benefits, according to calculations, and each € invested would make profit of 52.5 €. Due to shifting transport from road to rail/sea, transport of every tkm would make public benefit of € 0.95.



Figure 10 Intermodal transport Route Euroorient

Organising and development of supporting industries - manufacturer of road and railway vehicles, shipbuilding and handling mechanisation, infrastructure industry and informatics support

5 Conclusion

Given its favourable geo-traffic position, Croatia could have a far greater and more important role in freight transport. Providing transport services to Croatia could be, next to agriculture and tourism, perhaps the most important potential source of new added value. This requires the construction of an intermodal infrastructure network with construction of terminals in the Danube-Adriatic area and the removal of bottlenecks in the transport network and at existing terminals, as well as the harmonisation of Croatian transport network with that of Europe and integration into the system.

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