

# CROATIAN TRANSPORT SYSTEM IN THE PROCESS OF EUROPEAN INTEGRATION

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## ABSTRACT

Complementary transport development is the strategic orientation of Croatia within the enlarged European Union, with the backbone of infrastructure development predetermined by the set of Pan-European corridors and the Trans-European transport network. In compliance with the interests of Croatia in the European integrations, the necessary precondition is the harmonization of the transport system regards to regulations, infrastructure and management, with the application of international, mainly European Union references. Therefore, the transport system development of Croatia, apart from the physical dimensioning of the infrastructure network, needs to be harmonized with the referent strategic provisions of the European Union Common Transport Policy, which assumes incorporation of the principles of integrity, interoperability and sustainability into the national transport policy.

In terms of integrity, the planning of infrastructure network with the aim of integration into a wider regional network determinates the development priorities. The implementation of the interoperability principle dictates the development of intermodal transport options with the aim of optimizing the application of natural resources. From the aspect of sustainability, transport development is marked by coordinated approach to modelling the economic growth, ecological balance and social development.

Research in this paper is targeted to the valorisation of the national transport system status, detecting the geo-strategic position within the initiatives of the regional transport networks and the methodological conceptualisation of the transport development of Croatia in the process of European integrations.

**Key words:** transport strategy, transport policy, infrastructure network development

## 1 INTRODUCTION

Transport is in its nature global, and the result of a very widespread and complex interaction between governments, manufacturers, operators, procedures and technological systems, and as a system it has to comply with the international standards and uniform practice.

The development of the transport system, including the branch development, is planned as a long-term process regardless of the complexity of criteria that influence its optimisation, complex procedures of harmonising conditions and interests, relatively long deadlines to realise the plans, substantial capital investments into infrastructure and transportation capacities and the duration of effects of the realised investment ventures.

Strategic planning and identification of relevant elements of the transport policy is the starting point in adopting the development guidelines in the bodies of executive authorities, which imposes the need for collaborative decision making at all governing levels.

The conceptual assumptions of transport strategic planning should be based both on the global and on the European regulatory context of transport development, best practice at national levels, and on recognising the specific features of the local and regional environment. The elements of strategic transport planning include key aspects of transport policy:

institutional and legal framework, infrastructure, and management of transport operative as well as personnel resources.

Negative experiences and damaging consequences of conventional transport planning indicate the need for a more radical target-oriented approach in conceiving the transport strategy. By the measures of the government policy, it is necessary to introduce adequate models of the tax policy and the pricing policy, supporting the implementation of the strategic goals of the progressive development of railway, water, combined and urban public transport, and the restrictive ones for the uncontrolled development of road transport. For the implementation of the strategic guidelines of the transport development, the legal instruments should primarily solve the following:

- fair determination of the costs of infrastructure usage (external costs internalization),
- commercialization / privatization of the service providers,
- insuring the competitiveness of the operators,
- preventing monopoly,
- tax and pricing policy in compliance with the strategic goals of the sustainable development of the transport system on the principle of integrity and intermodality,
- involving of the private sector in the investment programs of the transport infrastructure.

Strategic planning of the transport development in Croatia has to be in the function of the overall economic development and dynamically adapted to objective investment possibilities of the public sector. The conceptual approach should not be nationally restricted here, but should be in the context of the regional development instead. The planning means a systemic preparation of decisions, and the strategic attribute represents the following characteristics [1]:

- long-term planning,
- comprehensiveness – wider physical scope,
- manageability at the network level,
- applicability of all transport modes,
- focus on comprehensive objectives of greatest interest for the community.

The guidelines of the necessary legal changes result from the status of Croatia in the process of political and economic transition, as well as the strategic objective of integrating into the European Union.

## **2 POSTULATES OF TRANSPORT INFRASTRUCTURE DEVELOPMENT**

### **2.1 Background and EU recommendations**

As consequence of political changes and establishment of new states in South East Europe, the European Union should have:

- formulated new transport routes;
- divided the transport routes/corridors taking into consideration new political subjects, new national borders and new economies of transition countries;
- helped in the transport and infrastructure networking of the new countries – EU accession candidates in the region, and informed them about the needs to adapt the national regulations with *acquis communautaire* and the standards of the European Union in the fields of traffic, environmental protection, four basic freedoms and competitiveness.

The first step forward in this context was made in 1997 at the Third Pan-European Transport Conference in Helsinki, where ten multimodal corridors were supplemented by the segments in the area of south-eastern Europe, including Croatia – by Corridors X and VII, as well as Corridor branches Xa, Vb and Vc.

Since Croatia did not have the status of EU accession candidate between 1996 and 1999, when the verification and estimate of the transport requirements of these countries was made as part of the Transport Infrastructure Needs Assessment (TINA), this meant that no definition was made there of the adequate complementary transport network of Croatia in the network of Pan-European corridors.

Therefore, the respective European institutions observed Croatia and its potential priority projects in the field of transport infrastructure on several occasions as part of conceiving the South East Europe regional core network.

In the documents of the European Union, for the development of the Croatian transport sector the Memorandum on Understanding on the development of core regional network for South East Europe is of ultimate importance, signed in 2004 in Luxembourg by six regional Ministers of Transport and a representative of the European Commission, and the related SEETO development plan [2].

This document summarizes all the previous Pan-European transport strategies and documents of the European Union, networks (TEN) and processes (TINA) that are characteristic for this region. Regional Balkans Infrastructure Study (REBIS) represents the basis of a new regional cooperation in the transport sector, proposes a definition of multimodal basic network, which can be changed and modified over time. The purpose of this document is at the same time insuring the optimum of interoperability.

The last document in the overview of the European studies and recommendations, which characterize the development of the transport system in Croatia, is the Transport Protocol of the Agreement on Stabilization and Accession between the European Union and Croatia. In the sense of the development of the transport infrastructure, Protocol 6 on inland transport emphasizes the measures for development of multimodal transport infrastructure, especially on Pan-European corridors V, VII, X and the Adriatic-Ionian Pan-European region that is connected by Corridor VIII.

Although the European Commission has not established TINA network in Croatia, that would mean a selection of priority projects for ISPA and other pre-accession fund programmes of the European Union, it should be emphasized that Croatia initiated in 2000 completely independently of the above strategic projections, an ambitious program of constructing a modern network of highways, already mostly realized. This program, which from the aspect of transport sciences and profession, did not result from the transport demand, has articulated the political and economic willingness for significant improvement of the territorial integration of Croatia and opening of modern infrastructure facilities towards the neighbouring countries, that have recently become European Union members.

## **2.2 Strategic frames of Croatian transport development**

The basis for pre-accession negotiations [3, 4] in the field of transport the strategic document from 1999 [5] and the White Paper of the European Union from 2001 [6] have been noted as the fundamentals of the National Transport Development Strategy. The transport policy, development and corridors defined in accordance with TINA methodology and determined Pan-European transport network have also been taken into consideration.

The assumptions of the transport sector development in Croatia are as follows:

- Systemic improvement of transport infrastructure through reconstruction, extension and construction of new infrastructure facilities;

- Development of the free market practice in the transport sector;
- Competitiveness on the market of transport services in accordance with the European Union regulations;
- Retaining of government ownership control over infrastructure facilities of national importance;
- Development of the national system regarding support of the public/collective transport and increased attractiveness of public passenger transport in all transport modes;
- Implementation of the taxes and prices policy in the transport sector on the principles of market economy, and according to the standards of the European Union in direct charging of costs;
- Improvement of the transport operational and administrative capacities;
- Implementation of public-private partnership in the organization of the transport operative;
- Long-term planning of the transport safety program, mainly in road transport;
- Modelling of the transport infrastructure modernization program with financial instruments of national sources, and loans of international financial institutions and help with a set of programs of pre-accession funds of the European Union;
- Improvement of operational systems at border crossings.

### **3 PRIORITIES OF TRANSPORT SECTOR ADAPTATION**

#### **3.1 Regulatory frame**

Since their establishment i.e. the 1957 Rome Agreement, the European Communities have the objective of conceiving a common transport policy. More concrete measures were undertaken in the middle of the 1980s, so the first White Paper on Common Transport Policy was adopted in 1992. The basic principle of this document was the opening of the transport market regarding the introduction of liberalization and free competition. At the same time the Maastricht Agreement defined the so-called concept of the Trans-European networks (TEN) for the development of the transport infrastructure.

In order to satisfy the increased transport demand, during 1990s the transport policy concept spreads also to four basic principles of the development of the European Union transport systems – balancing of the differences between single transport branches, elimination of bottlenecks, users oriented of the transport policy and resolving of issues required from the transport systems under the conditions of globalization and enlargement of the European Union. In 2001 a new White Paper «European Transport Policy for 2010: Time to Decide» was published, and in 2006 a Mid-term review [7].

The legal framework of regulating transport activities at the level of the European Union covers for all the transport branches the following relevant subjects – access to the transport services market, social aspects of transport, transport safety and environmental protection, as well as horizontal legal regulations in relation to the transport infrastructure of the Trans-European network. Besides, the European Union develops also cooperation with other countries in transport field.

The transport policy towards the countries that are not European Union members has been articulated in the sense of transport infrastructure development by the definition of the so-called multimodal Pan-European transport corridors. Transport Infrastructure Needs Assessment Project (TINA) has been implemented for the European Union accession candidates.

For the South-eastern region of Europe, which includes also Croatia, the cooperation in the South Eastern Europe Transport Observatory (SEETO) regional program of transport development is imperative, as strategic draft of regional transport network, based on the previous technical studies – Transport Infrastructure Regional Study (TIRS) and Regional Balkans Infrastructure Study (REBIS), which define the priorities for Albania, Bosnia and Herzegovina, Montenegro, Croatia, Macedonia and Serbia.

As accession candidate, in the integration process Croatia has to harmonize the national regulations with the Acquis Communautaire of the European Union.

This process understands pre-accession negotiations about 35 chapters of the Acquis Communautaire. Transport acquis refers to Chapter 14 –Transport Policy, and Chapter 21 – Trans-European Networks.

### 3.2 Transport infrastructure

The aim of the development of transport infrastructure is based on the assumption of the existence of potential extensive transport needs and available resources for their satisfaction. From the aspect of geo-traffic position and in the context of predictable market expansion in a wider environment as consequence of the European Union enlargement, the industrial growth in transition countries of central-eastern Europe and intensifying of trade relations with south-eastern Europe, Croatia has solid predispositions to attract international traffic flows, mainly the transit ones.



**Figure 1:** The backbone of Croatian transport network

However, the economic situation and the investing ability of the state, on the one hand, and subsidiary objectives of the transport development, on the other, dictate the strengthening of intermodality in the transport network development concept. At the current non-balanced transport branches development, this means in fact favouring of the investments into the transport infrastructure of railway, combined and water transport.

The network of the main international transport corridors through Croatia, as the backbone of the targeted transport planning of complementary routes of different transport branches, and the transport nodes and terminals, consists of (Fig. 1):

- X Corridor: (SLO) Bregana-Zagreb-Slavonski Brod-Lipovac-Belgrade (SR)
- XA Branch: (A) Graz-Maribor-Zagreb

- VB Branch: (H) Budapest-Zagreb-Rijeka
- VC Branch: (H) Budapest-Osijek-Sarajevo-Ploče
- VII Corridor: Danube waterway system.

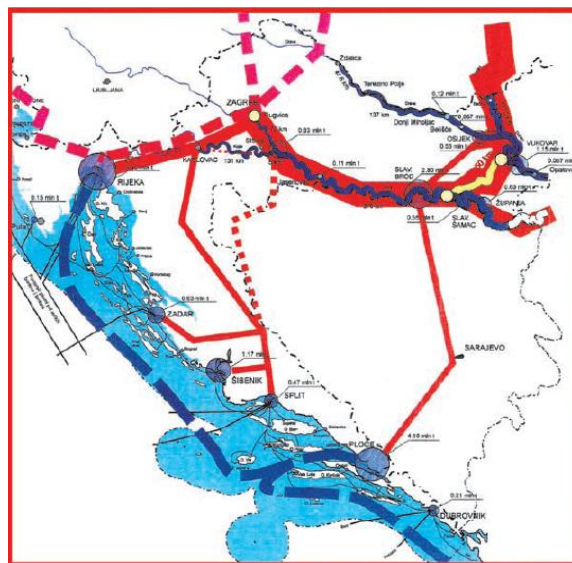
In the long-term development concept with the existing international corridors through Croatia, the significance of single transport routes and the extensions of the corridor routes in the long-term development of the European transport network need to be evaluated:

- Adriatic-Ionian sea motorway,
- Zagreb-Split-Dubrovnik-Bar,
- Rijeka-Koper-Trieste,

The instruments of the transport policy, especially in urban transit, should be used to stimulate the alternative to road motorized transport – non-motorized transport, high-speed railways, and modal shift of demand from individual to public transport.

An especially important aspect in planning and designing, especially of capital transport infrastructure, is the standardization of conditions for efficient transport sector management, i.e. standardization of the application of intelligent transport systems in the network design.

Apart from the special sensitivity in (re)modelling of the chronically lagging behind facilities in the transport system development – public local transport and ITS applications, there is one more segment of transport development that is strategically dominant – intermodal transport.



**Figure 2:** Danube-Adriatic intermodal network system;

Source: First International Conference «Intermodal Transport in South-East Europe: Adriatic ports – The Adriatic gateway to Europe», Opatija, 24-25 Nov. 2005

From the aspect of regional importance and compatibility of the transport network, in the projection of possible optimal options of infrastructure development in Croatia, the Danube–Adriatic intermodal network project is highlighted (Fig. 2) This project would completely address all the principles of the European transport strategy and complementary transport policy – principles of integration, interoperability and sustainability.

The combination of inland waterways transport of the Pan-European Corridor VII, assuming the construction of a multipurpose Danube-Sava Canal, of adequate upgrading of the Sava river navigability and the expansion of the port capacities (Vukovar, Osijek, Slavonski Brod and Sisak); railway transport on Corridor Vb, assuming the construction of

double-track electrified railway line; combined transport on Corridor Vc; and extension of maritime transport, with adequate expansion and specialization of sea port capacities (Rijeka, Ploče), by the set of 21<sup>st</sup> priority route of the Trans-European transport network – Adriatic-Ionian sea motorway, in all aspects of regional development may be considered priority infrastructure project.

Regarding integration capabilities, the top development priority has been to the greatest extent adapted to the needs of regional development – the existing sections of Pan-European corridors – VII, Vb and Vc, have already been incorporated into the TEN-T network.

The principle of interoperability that correlates with the principle of intermodality or with the increasingly used term co-modality, has been fully recognized in the projection of priorities in the development of the Danube-Adriatic transport network development. It is precisely this development priority that is based on the establishment of a logistic chain which combines different transport options water-rail-water.

From the aspect of sustainability, the predicted development of the transport network has been marked by coordinated approach to the modelling of the economic growth, environmental balance and social progress. The represented transport options of water and rail transport environmentally address best the principle of sustainability in the transport policy.

Apart from the Danube-Adriatic intermodal network, other priorities in the transport network development also address the principles of complementarity – Pan-European Corridor X and the extension Xa, and also the route Zagreb-Split (Dubrovnik), in previous strategic plans often marked as extension of Corridor Vb, have been incorporated as priority routes in the core regional network of South-eastern Europe.

The realization of the above project would mean assurance of an extremely important geo-strategic position for the Croatian transport system in the European transport network. This intermodal set of international routes i.e. traffic flows represents at the same time the base for planning and development of logistic centres in Croatia.

### **3.3 Transport sector governing and management**

In the past worldwide practice both public and private sectors were included in the management and financing of the transport infrastructure and services. However, the division of roles and functions varies greatly depending on time, countries and different transport modes. These differences are the reflection of many influencing factors:

- availability of technologies and amount of the necessary investments,
- change in awareness on importance of systemic planning and management,
- resources of managerial and technical skills,
- government financial situation and budget circumstances,
- historic experiences and institutional heritage.

The government should concentrate on creating and maintaining of the legal and regulatory framework in order to attract private operators, and at the same time protect the interests of the poor, improve the environmental conditions and coordinate inter-sector activities.

At the government level the alternative of minimally regulated private monopoly has to be weighed, which may expand the service and achieve reasonable operational efficiency, according to the alternative of the public monopoly, which will provide inadequate service with high budget costs. In order to reduce the risks for public assets in case of concessions or privatization, the public information and transparency are of extreme importance. The introduction of competitiveness is in many cases the most important step in creating the conditions of greater efficiency both for the private and the public operators.

The problems of transport development, and especially the development of the transport infrastructure, similar to other important infrastructure sectors – energy and water supply, has been marked by extremely specific features, that directly address the role of the government and private sector in their development and management:

- At national and metropolitan levels the transport infrastructure correlates closely with the spatial arrangement and has high effect on the spatial structuring of the total economy. These are the fields of highest government responsibility, which require pro-active planning together with adequate price and tax policies.
- The transport activity, especially in the road branch, has substantial negative external effects – congestion, pollution, and accidents that are reflected with greater seriousness than the generated externals in other sectors directly in the structure of prices and charges. This means that the government interventions in improving the allocation of financial resources are necessarily.
- The transport infrastructure with efficient maintenance tends to have a long life-cycle and investing priorities depend to a great extent on the uncertain projection of the demand in the far future. Additionally, capital charging often represents the highest share of total costs of services and therefore it is necessary for the government to absorb certain risks in the realization of the desired structure of the space and economic organization of a country.

In considering the applicable models and scenarios of the development of urban public transport in Croatia, the starting basis lies in evaluating the status of its establishing level, regulation level and organization level. About 70 per cent of population and about 80 per cent of traffic are concentrated in the urban areas of Croatia.

The regulation of this transport segment at the government level does not exist, and the authority of managing urban transport has been delegated to the level of local authorities. The municipal authorities have no autonomy of action in the transport regulation, there is a lack of integration of the segments of planning, monitoring, management and controlling of urban transport, and a large number of cities in Croatia have no organized urban public transport.

While in bigger towns, such as Zagreb, Split or Rijeka, the solving of urban transport issues, due to negative impacts of uncontrolled growth in individual road transport on the quality of living has become a question of sustainability of further development, in smaller towns and urban settlements the failure to organize this transport mode endanger the basic rights of citizens to mobility and freedom of movement.

The complexity of the problems regarding urban transport management is reflected in different, yet interdependent factors of influence:

- economic, regarding efficiency and effectiveness of the public transport system expressed in the value of transport effect and economic benefits,
- social, regarding provision of public services and the accessibility principles for all the citizens in all areas, and
- ecological, regarding provision of mobility which will not endanger the environment and the health of people.

The areas of demographic policy, urban planning policy and environmental protection have to be integrated into the strategic planning and the policy of urban transport. It is not possible to realize the required integration and implementation in the existing regulatory and organizational regime of urban transport in Croatia since in the existing system of “deregulated” urban transport management, the public authorities at the local level have neither the authority nor the autonomy, nor the competencies for such action.



Therefore, the solution model assumes the regulatory organization of urban transport at all decision-making levels – state level and local levels of county and municipal authorities. The regulatory organization of urban transport, apart from the mentioned vertical coordination and cross-sector integration, assumes as well the horizontal coordination of the transport sector, particularly in the issues of modal structure of urban transport (modal share) [8].

Apart from regulatory, investment and fiscal, the transport management is one of the key areas of transport policy, which has marked social and economic effects – on the one hand in reducing the external costs of transport, and on the other hand in the affirmation of intermodal transport and logistics. The social and economic benefits of implementing intelligent transport systems as superstructure, in transport engineering are expressed in: [9]

- reduction of transport congestion and waiting,
- reduction of the travelling costs,
- increase in safety,
- reduction of harmful emissions and fuel consumption,
- increase in efficiency of carriers,
- improvement of effectiveness of investments into the network infrastructure.

The implementation of the principles of integration, interoperability and sustainability in transport policy necessarily assume the implementation of ITS solutions in all phases of transport engineering – from planning, design, construction to organization and exploitation, and in all the segments of the transport system – from development of transport routes and vehicles, transport terminals to the transport management system [10].

The development of the European satellite system Galileo will significantly contribute to the integration of ITS solutions in the transport sector, and affect the efficiency, safety and costs of all the transport modes. This refers especially to the implementation of the European Rail Traffic Management System/European Train Control System (ERTMS/ETCS), Single European Sky ATM Research Programme (SESAR) and River Information Services (RIS).

Social and economic efficiency of the transport system is not indicated by the technical elements of the transport network or volume of transport work only, expressed by the length and density of the transport routes or transport performance, but also through qualitative aspects of transport demand management, which are articulated by transport safety and environmental protection, and finally by spatial, demographic and economic cohesion of the region.

## **4 CONCLUSIONS**

Considering the significance of transport sector there are two levels of influence that may be identified – one on the quality of living of the population and the other on the overall economic development of a country. Transport has direct impact on the lives of people, on the one side regarding individual mobility and accessibility, and on the other side regarding rational time usage and in the most general sense of the quality of living. Transport policy greatly determines the extent to which the influence of transport will have positive, i.e. negative effects.

There is no doubt that transport infrastructure directly contributes to the activation of economic potentials, and that transport sector revenues have a significant share in the GDP structure. A coherent transport policy can also contribute to the reduction of budgetary expenses for transport sector, either by providing conditions for efficient infrastructure management, or by instruments to reduce external transport costs.

Modelling of the strategic development of the Croatian transport system in the context of regional development and integration into the European Union is based on the research of

the methodologically analysed complex of adaptation of the institutional-legal frames, infrastructure network and management models in the transport sector.

The development priorities refer to the solving of critical problems of the current status of the national transport system:

- problems of the sector responsibility for strategic transport planning,
- problems of the legal regulations and harmonisation of the regulation in the process of economic transition and in the process of integration into the European Union,
- problems of commercial management in the public enterprises,
- problems of state administration reforms in the transport sector,
- problems of investment policy into infrastructure projects.

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