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CROATIAN RAILWAYS AS A SUBJECT IN THE EUROPEAN TRANSPORT MARKET

SUMMARY

The paper considers the environment and the tasks that the Croatian railways need to carry out in order to gain importance within the European transport market. It deals with the economic values that may be expected from the modernised railways. Therefore, the Croatian railways will have to undergo technical, technological and organisational restructuring. The marketing concept of meeting the customers' needs and demands has to be developed. The marketing is meant and, among other things, the selection and definition of those segments in which the Croatian railways could do business successfully. These include: passenger traffic - suburban, then interurban (domestic and international in and out) and, according to the needs of the European railways, transit traffic. In goods transport - to identify the needs of big users and define the size of the offer accordingly.

Although the paper could not deal with concrete restructuring tasks (which is the first and foremost task of the Croatian Railways), it indicates the main directions. These include redefining of the local traffic on railway lines class II, then the employees, reorganisation and all the other transformations which will be carried out in continuity.

1. INTRODUCTION

Over a longer period recently, extensive studies have been carried out within the European railways regarding the organisation, technological, economic and other developments. Their aim is to meet the increasingly fastidious demands appearing on the transportation market. The railways are reorganising their technological structure, since they have been given an important role in the traffic development by the current government policy. Because of less required space, less energy, higher safety, better environmental protection, less noise, and less adverse impacts emitted by traffic, some governments, or, better still, the united Europe, modernises the existing and constructs new tracks for the railway traffic.[1]

Europe is repairing and constructing a railway network which are divided according to their significance into: main - major railway lines (class I) and main - secondary (class II) railway lines. These are primarily the high-speed lines of the European network.

The tendency is to treat each railway line as a production unit by monitoring the costs. Generally, the problem is viewed from the aspect of covering the variable costs. Based on this aspect, the authorised institutions make decisions regarding exploitation, especially on those railway lines where the costs significantly exceed the revenue. The solution can be found in additional subsidising by the society or by renting the unprofitable lines to interested companies. All the other activities (apart from exploitation) which do not belong to the so-called basis, are reorganised into limited liability companies or similar subjects. Based on these guidelines, the demand on the European railways market is established.

2. TRANSPORTATION MARKET

The offer in transportation market, in its static position includes the relations of the transportation flows. Several relations make up a set or network of traffic lines, so that the network is said to be the static part of the offer. Its dynamic part consists of the means of transport, traction and transportation ones, for transporting passengers and goods. The passenger and goods transportation demand includes the users, i.e. those who require and can pay for the service. The demand includes also those who cannot pay, but secretly need (require) transportation service. In such a situation it is said that there is a latent demand for transportation services. Latent demand will exist until it is fulfilled - realised. Vice versa, if it is not fulfilled, then it can only be considered that it had existed but remained unfulfilled.

According to the physical criterion, the market is divided into local, including the ratio of offer and demand on a local territory, national - within a country, and international and world-wide market including these ratios on the territories of several countries or the whole world. Railway traffic includes mainly the domestic and international transportation market.

The sensible West-European society uses railways, especially for fast long-distance transport. It is to be expected in the South-east of Europe following the settling down of the political situation. Public works will be started which will initiate economic development. This is one of the main interests of the European Union. Therefore, Croatia is interested in participating in these big developments. It would mean employment for her population, increase in the capital circulation and the purchasing power. The aim is to develop an economy which will then become an integral part of the European market.

2.1. Croatia as a participant in the international transportation market

Considering and evaluating the position of Croatia within the general concept of the European flows, there are two traffic corridors which include Croatia. These are the Adriatic-Danube corridor, linking Ukraine, Poland, Czech Republic, Slovakia, and Hungary with the Adriatic Sea and the Adriatic corridor, which in its widest sense is extended by the traffic routes in Switzerland, Italy, Austria, Slovenia, Bosnia and Herzegovina, Albania, Macedonia and Greece.

It is well known that the Central and East European countries gravitate towards the Adriatic-Danube corridor. Their traffic routes have been supplemented by the opening of the Rhine-Main-Danube canal, and by the construction of the tunnel underneath the English Channel, the need has arisen for redirecting the traditional transportation routes which would transit Croatia by the Adriatic railways towards the South of Europe and Asia. These routes would include the following relations: London – (Bruxelles) – Paris – Bern – (Lyon) – Milan – (Genoa, Marseilles, Barcelona) – – Trieste – Rijeka – (Ljubljana, Zagreb, Vienna, Budapest) – Zadar – Šibenik – Split – Dubrovnik – Tirana – Thessaloniki – (Athens) – Istanbul. Apart from these two, the Adriatic being a new one, there is also an existing corridor, which is known in Croatia as the Sava region corridor. All the three corridors connect Croatia with the European transportation market, i.e. they are the reason for Croatia to become a participant in this market.

The repaired and constructed high-speed railway lines in these corridors would attract new transport, especially the one from the harbour import-export and transit traffic. Thus, the Croatian corridors would gain international significance since they would be treated from the European point of view as an integral part of its high-speed railway network.

The high-speed railway projects in Croatia would find their efficiency in the international and national environment. From the international aspect, the development of the European network of high-speed railway lines would increase the competitiveness of the railway. The construction of the Vukovar-Šamac canal would mean a connection of the sea and river waterways in the South-eastern part of Europe, as provided by the North-western combination Rotterdam-Rhein-Main-Danube. The significance on the national level would be achieved by the more natural connection of Croatia with the European territory gravitating to the mentioned corridors, higher increase in the productivity of the Croatian railway traffic, and all this would enable the integration of the Croatian and European economy.

2.1.1. Identification of the factors influencing transportation demand

Among the numerous factors influencing the passenger and goods transportation demand, those that result from the political, social and economic sphere need to be stressed. Out of these global factors within the macro and micro environment, the influential ones are identified. If considered in long terms, some of them are the following:

- the attitude of the government towards the demographic problem as a stimulating programme for quick recovery
- the safety, political, and the international relations have a great influence on the migrations of population (tourists, sportsmen)
- recognition of a country regarding the classical social issues in offering support and subsidies to the general public
- the social and economic development of Croatia respects the regional, so-called poli-centric principle of the physical development based on comparative advantages. Such approach to development (counties) will cause an increase in travelling rates and exchange
- general reconstruction of the destroyed and devastated economic and other facilities will initiate goods transportation demand.

All this will result in further restructuring of the economy based on comparative advantages. This will refer to the transformation of the existing programmes, by privatisation into smaller highly productive and ecologically more friendly ones.

Based on these and other assumptions the transportation market will identify the demand for the services of both domestic and international traffic. The demand will be met by that subject that will counterbalance it with an offer according to the marketing principles. The realisation lies in fulfilling the defined segments of demand.

2.1.2. Passenger traffic

The structure of passenger transport services identifies clearly three segments: the suburban, interurban as domestic and international in-out and transit.

2.1.2.1. Suburban traffic

In communication between the city and its surroundings there are many physical, energy, ecological, economic, and other problems which are reflected mostly in traffic. The reason for this is because of big daily migrations, when masses of people enter and leave the city area. This is an inevitable way of living of a great number of people on small physical space, and the contradictions caused by traffic need to be solved adequately. The passengers need to be transported from the place of living to the place of employment and vice versa, continuously every day, except on their days off. Therefore, daily migrations are a fixed category since the changes in the places of living or working are minimal. For such mass short-term transport, railway is a very suitable means.

In the close vicinity of towns and cities, the suburbs develop, from and towards which a huge number of passengers are transported. Therefore, these passenger flows depend on the arrangement of these settlements and the places of employment (schools, shops). As a rule, the intensity of passenger flows decreases with the increase in the distance from the town. Therefore, it is possible to organise the traffic according to the zones.

Based on this model, the Zagreb suburban traffic can be organised. Following this, or simultaneously, every major town should organise its mass transport of suburbanites. This already indicates that the suburban traffic segment is the central point in the interest of the county (one or several). This means that the suburban traffic belongs to the authority of the counties and they should organise it.

2.1.2.2. Interurban traffic

One of the significant forms of structuring the railway services is their classification according to the tracks, which can then refer to the traffic between major towns. Major towns are usually also the county centres, which would mean that the interurban traffic is in fact traffic between the counties. However, since not all counties (20) in Croatia have a railway line, the number of major towns requiring interurban traffic can be reduced to 12, instead of 15.

The need for organising interurban traffic can be determined on the basis of analysing the traffic between the towns. After analysing the transportation

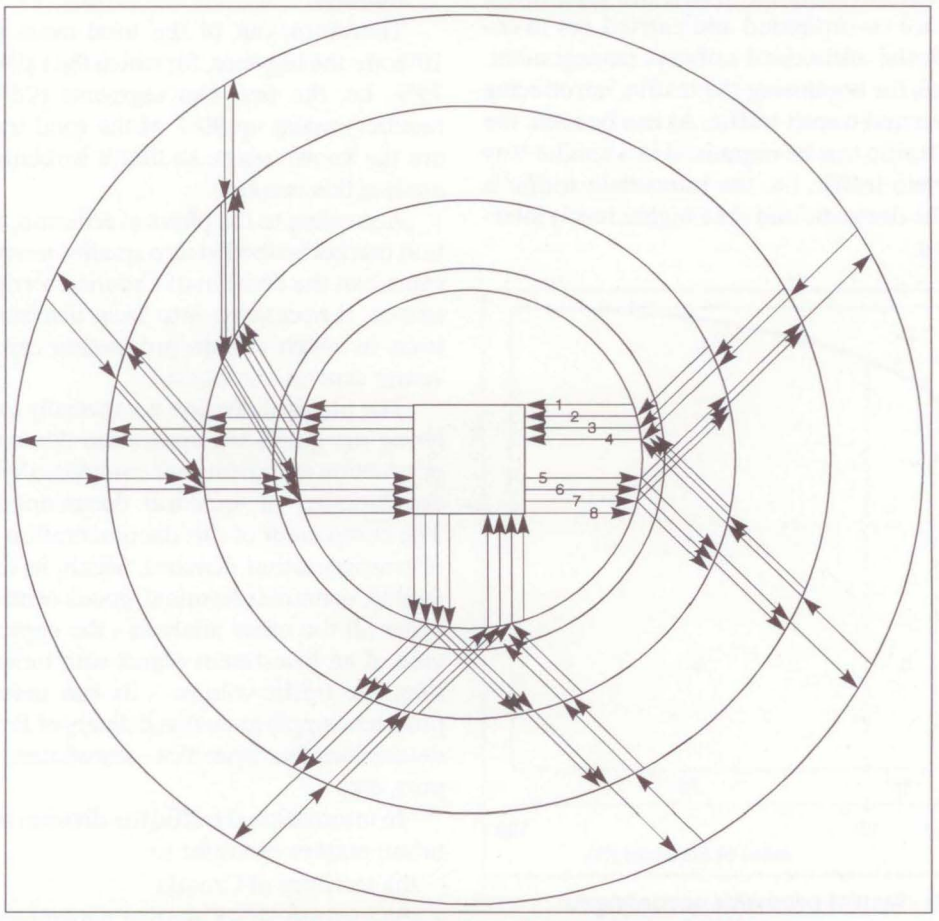

Figure 1 - The zone-based model of suburban traffic

market, the demand can be quantified according to intensity, distance, duration, and other parameters, such as the number of passengers per seat, wagon and train. All this can be clearly analysed and presented in the form of a "diagonal" table (the term refers to the diagonal which includes no data).

i \ j	a)	b)	c) . . .	n	Σ		
a)	-	+	+	+	+	+	+
b)	+	-	+	+	+	+	+
c)	+	+	-	+	+	+	+
. . .							
n	+	+	+	-	+	+	+
Σ	+	+	+	+	+	+	+
	+	+	+	+	+	+	+
	+	+	+	+	+	+	+

Figure 2 - Passenger transport matrix

The organisation of the interurban traffic is defined at the level of major towns where the given counties are the agents, and above them is the government (the authorised ministry).

In a similar way, by analysing the passenger traffic, the needs in the international traffic are quantified. The analyses are co-ordinated and carried out in co-operation with the authorised railways management. This is the basis for organising the traffic, introducing trains for in-out and transit traffic. As can be seen, the international traffic can be organised in a similar way as the interurban traffic, i.e. the interurban traffic is organised in the domestic and (at a higher level) international region.

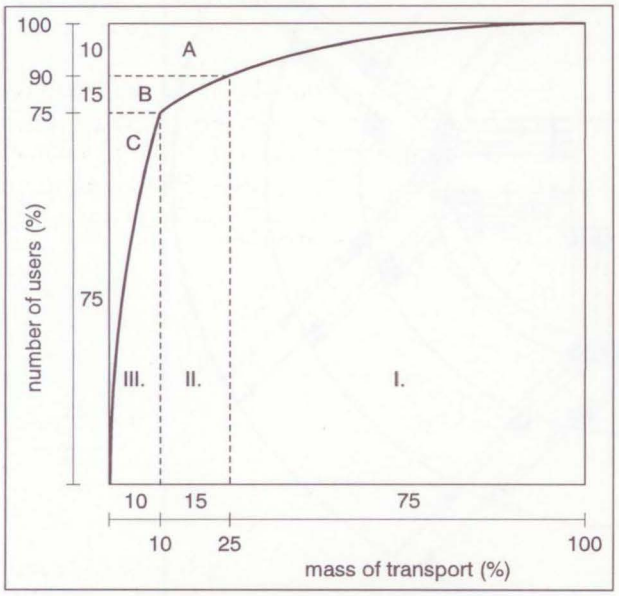

Figure 3 - Market segments according to the number and size of the user

2.1.3. Goods traffic

In goods traffic the market can be segmented in more details. For the Croatian region in the railway traffic the transportation market could be divided according to:

- number and size of the users,
- principle of physical space.

According to the number and size of the users, the railway services in Croatia, the result of segmentation can be the analysis and division of the market into three parts: A, B, and C, i.e. groups I, II and III.

All the users of the Croatian goods railway transport are classified into three groups. They all make up 100% of the goods transport. The curve divides the area of the square into two parts. The upper (small) part of the area A, B, and C represent the number of users, and the lower (big) part , I, II, and III represent the volume (mass) of the goods transport. One can see that:

1. only 10% of big railway users "provide" 75% of the total amount of its transport
2. 15% of the total number "gives" about 15% of the transport and
3. 75% of the total number are small users that "provide" barely 10% of the transport substrate to the railways.

Therefore, out of the total users (100%), about 10% are the big ones, for which the railways transports 75%, i.e. the first two segments (25% of the total number) make up 90% of the total transport. These are the known users, so that it is relatively simpler to analyse this market.

According to the physical criterion, the transportation market is divided into smaller territory units. This can mean the division of Croatian territory into counties or, if necessary, into local districts - several districts in which certain production capacities or consumer centres are located.

The physical division is especially suitable for analysing the goods transportation demands of a future production and consumer complex, already during the development of technical documentation - project. The component of this documentation is the estimate of transportation demand, which, in case of a traffic facility, container terminal, goods centre, road..., precedes all the other analyses - the capacity volume. In case of an investment object with industrial purpose, then the traffic volume - its raw material and half-products supply as well as delivery of finished products determines the capacities - storehouse, internal transport, etc.

In international traffic the division of the transportation market can refer to:

- the territory of Croatia
- the territory of a Croatian neighbouring country

– the territory of several European countries.

The division of the transportation market according to the countries surrounding Croatia, can include one or more countries. Their import and export or their transit can form a part of the transportation market.

The division of the territory of several European countries is of importance for the branch oligopolies (ports, railways) when their experts study the transportation market of the gravitating hinterland.

The international transportation market can be divided in such a way that one country represents one segment (e.g. Hungary) or that it is divided e.g. into the Western, Central and Eastern part.

The possibility of dividing the transportation market is of great importance for the study. In this way, all the needs can be spotted, since a range of information are obtained on the basis of which an adequate service can be offered. By dividing the market, the needs are identified, the market more easily analysed according to the absorption capacity, dynamic, substitution and competitiveness. The division is the first activity carried out by the transportation service providers, in order to determine and quantify the needs of their users and offer the transportation means according to the kind, type, and capacity, so that the production technology could be set then - to satisfy the user of the transportation services.

3. RESTRUCTURING OF THE CROATIAN RAILWAYS SERVICES

In considering the Croatian Railways environment it is obvious that they (should) participate in the offer of the European transportation market. In the general assumption, such as that the Croatian region belongs to the European territory, so does its railway belong to this traffic system. Therefore, just as Croatia, since its constitution, has been gradually integrating into the European Union, the railways have to be restructured according to the models applied by the European railways. How can this be achieved? What does it mean in practice? The answer is far from simple. The approach is multi-level and complex, even difficult to present.

It could be generally said that Croatia needs new railways. How and when could this requirement be met? It will take time and it will be difficult. The process begins with economic restructuring. Namely, a new system, a new structure should be built out of the existing ones. The existing institution for providing services in the public interest, should be restructured into a commercial company which will satisfy the needs and requirements of its users. The aim is to produce top-quality services which will make maximum revenue in marketing.

3.1. The scope of operation

The basis for the existence of the railway traffic is its infrastructure - the railway tracks. Out of the total network (2974.4 km) about 20% (605.9 km) are railway tracks of category II, which are of local significance. These railway tracks should be given to the local counties in concession. The traffic will be organised only if required by the needs of the county. Therefore, the counties should consider their needs and interests, which means that they should analyse the needs and possibilities for the services on the local level. The concession might refer to the period of five or more years. During this time the needs for organising traffic would be confirmed or rejected in practice, as well. If, or when the needs come to an end, the railway lines stop functioning.

The Croatian Railways have 258 official places (main railway stations, and stops). All these places, except for the tracks out of operation, are more or less served by trains. Such low operation at so many places generates high expenses, and small revenue, sometimes no revenue. Therefore, the role and task of each official place need to be defined. It could be assumed that a serious study would indicate that the current number of official places can be reduced by 30 to 40%. According to the location in the network, operation (loading, unloading, passenger handling) and other parameters, the systematisation for the rest of the places could be carried out in three groups (categories), e.g.:

– I - major marshalling, container, goods, passenger main stations
– II - minor goods handling and passenger stations
– III - all the other stops.

With thus redefined role each official place would be "assigned" a quite concrete commercial and traffic task.

Handling of piece goods should be organised on the principle of collecting in the transport centres which have been assigned a small number of loading-unloading and local (district) stops. These centres are

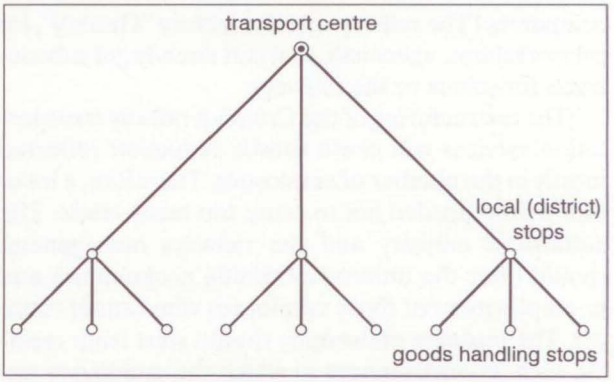

Figure 4 - The model of the transport centre with the related stops

located at main stations with greater volume of operation and at separate stops.

The transport centre should be selected according to the principle of operation concentration at a smaller number of major stops. At these stops the piece goods are collected in the area, accepting them from the consignor and transporting them to the transport centre, or the consignee. For collection and delivery, road vehicles are used, and for transportation the railways according to adequate regime.

3.2. Employees

In the technological transportation process, the employees connect the technical factors and other material components and thus organise transport. The direct transportation agents are important here. Apart from the direct employees, there are also a number of others who indirectly participate in the railway traffic as service, and are already organised in various companies with limited liability.[2]

The CANAC analysis (Benchmarking)[3] comparing the Croatian Railways with ÖBB (Austria), CD (Czech Republic), MAV (Hungary), SZ (Slovenia), SJ (Sweden), shows disastrous results for the Croatian Railways: productivity is half the productivity of SZ, a bit more than a half of MAV, one third of ÖBB and about one eighth of SJ.

The given data indicate that the Croatian Railways do not need so many employees (25,213), i.e. that the estimated traffic volume could be organised by about 60% of the currently employed persons.

Since it is difficult (almost impossible) to reach the pre-war traffic volume in the scope of operation of the Croatian Railways in the following several years, due to the lack of production, the system efficiency needs to be sought at the input side - costs. This means that rationalisation can only follow after reducing the production costs. The reduction in operation means also that fewer employees will be needed. It can be assumed that over the following five years the number of employees will be reduced by about two thousand per year. The most will be with the organisation of various companies (The railway vehicles factory "Gredelj", local workshops, agencies), that can already get subcontracts for others or the railways.

The restructuring of the Croatian railway transportation services will cause drastic reduction reflected mostly in the number of employees. Therefore, a lot of skill will be needed not to cause too many crises. The authorised ministry and the railways management should offer the unions re-training programmes and re-employment of those employees who cannot retire yet. The business philosophy should start from creating such an environment in which the employees understand and want to contribute themselves, thus resulting already at the beginning in a positive effect of the restructuring.

SAŽETAK

HRVATSKE ŽELJEZNICE KAO SUBJEKT EUROPSKOG TRANSPORTNOG TRŽIŠTA

U radu se sagledava okružje i razmatraju zadaci koje Hrvatske željeznice moraju poduzeti da bi postale subjekt europskog tržišta transporta. Sagledava se i ističe gospodarska vrijednost koja se od osuvremenjene željeznice može očekivati. U tom smislu Hrvatskim željeznicama predstoje veliki zadaci preoblikovanja svoje tehničke, tehnološke i organizacijske strukture. Trebaju usvojiti marketinšku koncepciju zadovoljavanja potreba i zahtjeva svojih korisnika. Radi se o tržišnom poslovanju, između ostalog, o odabiru i definiranju segmenata na kojima Hrvatske željeznice moraju uspješno poslovati. To su: u putničkom prometu prigradski, zatim međugradski (unutarnji i međunarodni ulazno-izlazni) i, prema potrebama europskih željeznica, tranzitni promet. U robnom prometu identificirati potrebe velikih korisnika i prema njima odrediti veličinu ponude.

Iako se u članku nisu mogli konkretizirati zadaci restrukturiranja (to je prvi i najvažniji zadatak Hrvatskih željeznica), njime se naznačuju glavni pravci koji u tome smjeru predstoje. To su redefiniranje lokalnog prometa na prugama II. reda, zatim zaposlenici, organizacijska i sva druga preoblikovanja koja će se u kontinuitetu izvoditi.

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1. TER - Trans-European Railway, which, under the auspices of the United Nations (European Committee), plans the modernisation of the existing railway tracks (bottlenecks) and the construction of new ones: 30,000 km high-speed tracks by the year 2010, out of which 10,000 km new ones and 20,000 km modernised ones. - According to the Economic Commission for Europe, Inland Transport Committee.
2. HŽ (Croatian Railways) with the limited liability companies employed in 1996, 25,213 employees, out of which 14,680 in commercial transportation (traffic activity - 10,429, haulage of trains and railway vehicles - 425) or 33.6% less compared to 1990, in the business infrastructure - 5236 (civil engineering - 3471 and electrical engineering 1765) or 34.6% less than in 1990, in other activities 311 (limited liability companies) or 35.6% less than in 1990, in administration 1207 or 61.5% less, and in management 979 or 11.1% less than in 1990. Source: **J. Božičević**, *Stanje i budućnost Hrvatskih željeznica*, Institut za promet i veze, Zagreb, 1996
3. The expert team of the Canadian firm CANAC, International Inc., in co-operation with the railway employees, government, Faculty of Transport and Traffic Engineering and others, completed in December 1996 a Study on restructuring the Croatian railways. The study had the aim to redefine the role of HŽ (the Croatian Railways) in order to form a modern and efficient railways, which will fulfil the transportation needs.

The team has done a great intellectual and professional effort in elaborating a scenario (means, personnel, organisation, technology) and that solutions were provided. The study "sees" the organisation of the Croatian Railways (among other things) as mainly functional in three integrated territory operating units (the Adriatic, Central and Eastern region) with departments: marketing, transportation, infrastructure, human potential, finances and accountancy.

Restructuring would be carried out continuously. During the first five years, the traffic would seize at 493 km of secondary tracks of category II, the personnel would be reduced to 14365 by the year 2001. The need for 4000 goods wagons and 400 passenger wagons is defined. Restrictions are introduced to all the structures. Regardless of the possibility to cause numerous social and political problems, the restructuring process has to be carried out. Therefore, CANAC should be thanked - they have considered, analysed and suggested - shown the way of changing the structure of the Croatian Railways (HŽ). It should be said that this firm has suggested restructuring of HŽ by "looking at" the railways from the outside.

Simultaneously, beginning somewhat earlier (1995), The Institute for Traffic and Communications, Zagreb, completed the Croatian Railway Traffic System Development Strategy which engaged about twenty scientists and experts who gave their vision (Strategy) of the Croatian Railways. Restructuring is not the direct goal of the Strategy, although it deals with it, too. CANAC used the results of the Strategy analysis, and could therefore suggest restructuring of almost all activities. Therefore, CANAC study may be also called The Croatian Railways Restructuring Project.

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[3] **CANAC** International Inc.: *Studija restrukturiranja Hrvatskih željeznica*, Zagreb, 1996

[4] Institut za promet i veze, *Strategija razvoja željezničkog prometnog sustava Republike Hrvatske*, working material, Zagreb, 1996