

FEEDER SERVICE AND BLOCK TRAINS –  
THE VITAL LINKS TO PROMOTE RIJEKA’S TRANSPORT ROUTE

**FEEDER SERVIS I BLOK VLAKOVI –  
VITALNE VEZE ZA PROMOCIJU RIJEČKOG PROMETNOG PRAVCA**

DRAGO PUPAVAC,  
Polytechnic of Rijeka

**Summary:** *The reorganization process of the European logistics systems which is changing from a national to an international network is still going on. The aim of this scientific work is to prove that Port of Rijeka as logistic platform provides for involving the Republic of Croatia, parts of Middle Europe and Southeast European countries into contemporary world – traffic flows. Beside the infrastructure and equipment of the container terminal, feeder and block trains represents the most significant services for development and good standing Port of Rijeka. Accordingly, the working hypothesis is set: feeder services and block trains represent the vital links in the function to promote Rijeka transport route. Scientific methods applied in confirming this hypothesis are based on a detailed analysis of concrete statistical data.*

**Key words:** *Port of Rijeka, feeder service, block train, transport route.*

**Sažetak:** *Proces reorganizacije europskog logističkog sustava koji se mijenja od nacionalne ke međunarodnoj mreži još uvijek traje. Cilj ovog znanstvenog rada je dokazati da Luka Rijeka kao logistička platforma osigurava uključivanje Republike Hrvatske i dijela država srednje i jugoistočne Europe u suvremene svjetske prometne tokove. Osim infrastrukture i opreme kontejnerskog terminala, feeder servis i blok vlakovi predstavljaju snažnu logističku podršku Luci Rijeka. U skladu s tim, postavljena je radna hipoteza: feeder servis i blok vlakovi predstavljaju vitalne veze u funkciji promicanja riječkog transportnog pravca. Znanstvene metode primijenjene u potvrdi ove hipoteze temelje se na detaljnoj analizi konkretnih statističkih podataka.*

**Ključne riječi:** *Luka Rijeka, feeder servis, blok vlakovi, transportni pravac*

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## 1. Introduction

The structural transformation in logistics once started with the creation of the Single European Market. In line with the expansion of the European Union, logistics providers began to create pan-European networks. The current adjustments reflect both the accession of the peripheral economies in the central and eastern parts of Europe and the involvement of a global logistics structure. The logistics industry is very important to the European economy. In 2006 the total turnover of the logistics sector grew to €800- €900 billion. The figures differ as to how the boundaries of Europe are set. The long-term growth rate of the logistics industry before economic crises is between 4% and 8% and exceeds on average 2.5 times the GDP growth rate.

Port of Rijeka is the biggest and the most important Croatian port. During the pre-transition period port of Rijeka was a significant factor in accelerating the transport flows and developing many commercial activities, so much so that the commercial entities in former Counties Union of Rijeka were extremely export-oriented, having placed 26% of total foreign currency income of Republic of Croatia in 1988, and thus establishing relations with business partners from 75 different countries. When considering present and future flows of goods the port of Rijeka, as connection point between sea and land transport, deserves special attention in transport and logistics network of Middle and Southeast European countries. In order to correct the existing flows of goods, which have been diverted during the 90's to other transport routes, it is necessary for all transport companies active in connection to Rijeka's transport route to act in a unified and synchronised manner, thus forming the total transport cost.

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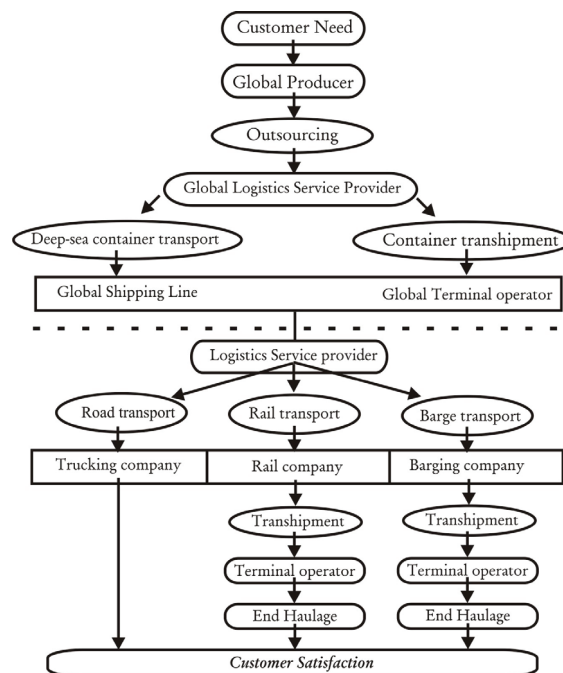
## 2. Relevant characteristics of logistics and logistics chain

Etymologically, logistics can be interpreted in different ways. In fact the Greek word “*logos*” referred to logic and reasoning, and the term we now use as supply function originated from the French word “*logis*” meaning to quarter so the term “logistics” become the art of moving and quartering troops, first used in the 19<sup>th</sup> century and subsequently for the supply of the army in the field. Over the years, logistics has been developing and it has been implemented in an ever-increasing scope of human activities. “Logistics” should be used simply to denote the supply function in the movement of goods from source point or store to a defined “customer”.

Logistics is the ...“process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from point of origin to point of consumption for the purpose of conforming to customer requirements (Council of Logistics Management). Logistics involves ... managing the flow of items, information, cash and ideas through the coordination of supply chain processes and through strategic addition of place, period and pattern values. (MIT Centre for Transportation & Logistics). The purpose of logistics management is to obtain efficiency of operations through the integration of all material acquisition, movement, and storage activities.

Good quality logistic system includes the total throughput of material, from accepting the raw material or reproduction material to the delivery of final products to end users. This means that storage, distribution and transport of goods represent an important component of logistic system. Such new concept, often based on relation marketing between numerous participants of different social economies, would be very hard to imagine without appropriate logistic chains that, through logistic networks and logistic system of all levels, connect potential sources of raw material, potential buyers, potential production centres, potential distributive centres and consumers with certain demands. All logistics chains start with customer needs and end with customer satisfaction. Most logistics chains start with a maritime part including continental pre-haulage, deep-sea transport and transshipment, after which continental part of logistics chains operation commences (see Figure 1).

Figure 1: Global logistics chain



Source: Prepared author according: Wiegman, W., et. al.: Intermodal Freight Terminals: An Analysis of the Freight Terminal Market, Research Memorandum 1998-55, Vrije Universiteit, Amsterdam, 1999.

## 3. PORT OF RIJEKA – LOGISTICS PLATFORM FOR THE COUNTRIES OF CENTRAL AND SOUTH-EAST EUROPE

The port of Rijeka is the biggest Croatian port which has no major competition within the Croatian port system. Port of Rijeka offers good connections to all transport means: rail, road, air and pipelines. These good connections accomplished by a significant rail, road and pipelines port infrastructure, facilitate the transport of all kind of goods in Rijeka Port. Rijeka Port is connected to the Pan European Corridors V and X.

During the 90's, in the past century, the bulk of harbour transport diverted to ports of Kopar and Trieste, so in year 2000 total harbour transport amounted to 50% of transport effect in 1990. Total income of Rijeka's port including the transshipment of dry cargoes is shown in table 1.

Table 1: Turnover Port of Rijeka by dry cargo structure 1980. – 2008. (in tons)

<i>Year</i>	<i>Total</i>	<i>General Cargo</i>	<i>Bulk Cargo</i>	<i>Timber</i>
1980.	7 374 000	1 664 000	5 230 000	480 000
1990.	5 796 000	1 641 000	3 908 000	247 000
1995.	3 705 033	990 771	2 562 943	151 319
1996.	2 309 281	682 976	1 488 252	138 053
1997.	2 523 581	702 732	1 686 585	134 264
1998.	3 288 377	620 076	2 526 207	142 094
1999.	2 545 747	726 097	1 683 546	136 104
2000.	2 564 133	795 399	1 603 483	165 251
2001.	2 908 230	831 951	1 925 659	150 620
2002.	2 726 012	791 239	1 733 067	201 706
2003.	3 557 206	1 061 748	2 327 629	167 829
2004.	4 654 618	1 392 089	3 080 723	181 886
2005.	4 840 981	1 435 225	3 186 176	219 580
2006.	5 009 142	1 572 997	3 199 707	236 438
2007.	5 623 575	2 155 506	3 142 518	325 551
2008.	6 027 000	2 371 057	3 362 494	293 449

*Source:* Port of Rijeka authority

Analysing the data in table 1, one can conclude that total transport of Rijeka's port is still below the level reached in 1990. It is an established fact that transport within port of Rijeka has been in steady growth since year 2000. Its dynamics structure is somewhat more favourable then before 1990, as high-tariff cargoes have increased in share. Thus, in 2008 general cargo had a share of 39.3%, while in 1990 it was 28.3% and only 22.5% in 1980. The goal to be reached is more than 50% of general cargoes, with steady growth of total transport. Port of Rijeka in liquid cargo realised 7.59 million tonnes in 2007.

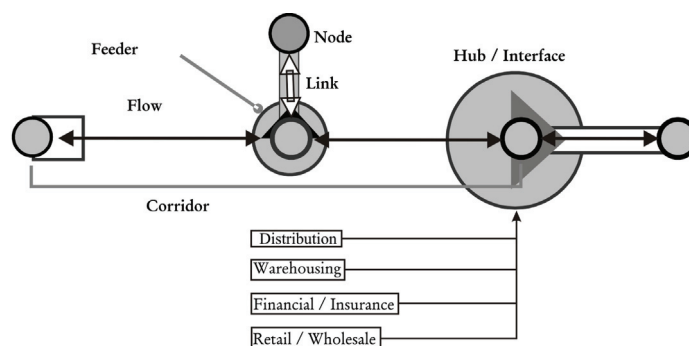
With the opening of China and India the Mediterranean is a centre of gravity for movement of goods all over the world, with Gioia Tauro the transshipment hub to handle cargo from Asia. The global economy only exists thanks to shipping, in particular container shipping. Worldwide seaborne dry cargo traffic has doubled from 1,8 billion tonnes in 1980 to a forecast 3.8 billion tonnes in 2005. In the last few decades, ever expanding global economy leads to rapid growth of container shipping container vessel carrying capacity and world container traffic both have maintained two digits annual growth rates ([www.ci-online.co.uk](http://www.ci-online.co.uk)). The world container fleet size also keeps growing around 10% pa according to the Institute of International Lessors ([www.iicl.org](http://www.iicl.org)).

The increasing dominance of containerised traffic is easy to see. In 1980 containers represented 6.3 per cent of world traffic. In 2003 they accounted for 23.8 per cent. By 2010 container port throughput should reach 500 million teu. More than 200 countries in the world have a port open to container traffic. The world's 20 largest ports shall be about 48% of the total world container port traffic.

#### **4. FEEDER SERVICE – FACTOR FOR PORT OF RIJEKA'S INCLUSION TO MACRO AND GLOBAL LOGISTICS SYSTEM**

Globalisation and rationalisation in shipping system have a result in adaptation and port's specialisation for maximum adherence to new commodities' flows. Global navigation routes for large container vessels have resulted in creation of transshipment centres (ports), and accordingly creation of appropriate connections between these centres and final destinations. In Mediterranean regional market, ports of Gioia Tauro, Algeciras and Malta have distinguished themselves as main container transshipment ports, while many traditional ports, including all Adriatic ports, have feeder services. Feeder service as a modern way of organizing container transport and linking two or more container terminals as well as supplying larger container ships, represents a higher form of the marine transport containerization. Smaller container ships and the role feeder service is playing in the upgrading of the marine transport are matters of permanent attention and research (cf. figure 2).

Figure 2: Transport Structures



Source: Jean-Paul Rodrigue: The Geography of Transport Systems, Hofstra University, Hempstead, NY, 11549 USA, available on <http://people.hofstra.edu/geotrans> (access: 10.08.2007.)

In Mediterranean regional market, ports of Gioia Tauro, Algeiras and Malta have distinguished themselves as main container transshipment ports, while many traditional ports, including all Adriatic ports, have feeder services. After "Croatia Line" has been terminated, port of Rijeka was left without an important national liner company, and Rijeka's transport without one of the most important links in transport logistics chain. Therefore, it was necessary to initiate certain revitalisation of liner service in Croatia. First step towards that direction was a joined project between Croatian government, Ministry of Sea Transport, Traffic and Connections, Rijeka Port Authority, Lošinjaska plovodba, Croatian Railroads and Port of Rijeka on starting a regular feeder service from port of Rijeka to Gioia Tauro. Regular weekly feeder line Rijeka – Malta – Gioia Tauro, the port of Rijeka has made part of Mediterranean container System. Although this feeder service creates losses for domestic shipper (Lošinjaska plovodba), in view of supporting the interests of Croatian exporters and importers those are partially covered by state.

This established feeder service has resulted in few positive results: 1) for each TEU serviced through Croatian ports there is a significant multiplicative effect an income for Croatian economy, 2) port of Ploče, that until introduction of feeder service had no container transport whatsoever, has transhipped more than 30 000 TEU in year 2007, 3) established feeder service has attracted new commercial weekly feeder services, even the spectacular callings of so called Mother ships, 4) Rijeka container terminal has increased its turnover from 6 866 TEU in 1999 to 168 761 000 TEU in 2008, 5) including Montenegro's port of Bar into this feeder service the project was expanded to one additional country.

The most valuable thing is that reliability of the existing weekly feeder services in port of Rijeka and the competitiveness of the entire route has resulted in extra feeder contacts with foreign companies, callings of Mother ships, new users, etc. In this way port of Rijeka is entering the phase of becoming regional hub port (cf. table 2).

Table 2: Port of Rijeka – total container throughput per container operator/user (in TEU)

Operator/year	1999.	2000.	2001.	2002.	2003.	2004.	2005.	2006.	Total
Hapag-Lloyd	1 360	2 225	3 714	3 580	4 742	4 294	4 107	5 213	29 235
Jadroplov-Canmar	641	0	0	0	0	409	351	0	1 401
Italia marittima	472	866	1 578	2 672	1 181	5 336	10 283	14 570	36 958
Evergreen mar. Corp.	0	0	0	13	1 291	10 852	19 615	25 349	57 120
CMA-CMG	145	862	2 830	4 184	12 454	19 060	19 192	26 658	85 385
Lošinjplov	28	670	1 730	959	762	597	242	428	5 416
MAERSK	48	2	13	226	1 746	5 805	11 024	16 694	35 558
ZIM	0	0	2	2	1 111	6 830	3 346	338	11 629
P&O Neddlloyd	0	47	448	493	874	478	626	10	2 976
Senator Co.	0	0	0	686	1 352	369	688	516	3 611
Hanjin	0	0	0	0	0	0	0	0	0
UASC	47	107	619	856	1 079	1 507	1 010	1 461	6 686
Ostali	4 125	4 146	1 777	1 544	1 706	515	1 656	2 935	18 404
Sermar Line	0	0	0	0	0	68	2	1	71
Norasia	0	0	0	0	0	3 460	3 497	8	6 965
APL	0	0	0	0	0	825	619	185	1 629
Safmarine	0	0	0	0	0	459	0	24	483
TOTAL	6 866	8 925	12711	15 215	28 298	60 864	76 258	94 390	303 527

Source: The Port of Rijeka Authority

## 5. BLOCK TRAINS RIJEKA – BUDAPEST AND RIJEKA – BEOGRAD IN THE FUNCTION OF INCLUSION OF RIJEKA'S PORT INTO LOGISTICS NETWORK FOR THE COUNTRIES OF CENTRAL AND SOUTH-EAST EUROPE

A successful connection between bigger port container terminals and their gravitating area is not possible without railway transport. However in the last decades good railway connections with container terminals require special container trains with special wagon and special time – table which assures good terminal connection and high efficiency. Croatian railroads are the main factor in combined transport in Croatia. Container transport is the most used technology of combined transport and takes 70% of total quantities. One of the most important segments in combined transport in Croatia is sea transport through seaport of Rijeka. In order to achieve the greatest possible economical effects through this segment and to establish competitive advantages of railroad transport there have been many attempts since 1989 to introduce and maintain a container train Rijeka – Budapest.

From train station Brajdica on November 28<sup>th</sup> 1989 the first container trains Rijeka – Budapest has departed. The reduction in industrial production, economy transition of central European countries, war operations (...) have had as a result the decrease in quantities of imported, exported and transported goods, so this train was reinstated to service in 1993/1994, than again cancelled in 1996/1997 due to lack of container shipments on behalf of Hungarian railroads. But, in 1999 the Hungarian state envoys have come to Rijeka to seek a long-term partner in port of Rijeka. The basis for such co-operation was the introduction of feeder service. Container shipment from port of Rijeka towards foreign railroad stations was done sporadically, using the international combined freight trains, which was not satisfactory. From the port of Rijeka twice a week with 60 containers per container train departs for Belgrade, as well as from the Slovenian port of Koper via Zagreb to Belgrade. Table 3 shows transport prices for different destinations including delivery times.

Table 3: Characteristics of sporadic container train shipments Rijeka – central European destinations and Rijeka – southeast European destinations

Relation	Rijeka-Budapest	Rijeka-Prague	Rijeka-Vienna	Rijeka-Sarajevo	Rijeka-Belgrade	Rijeka-Bratislava
Distance	594 km	1 021 km	577 km	746 km	677 km	609 km
Time of delivery	shipment: day A delivery: day C	shipment: day A delivery: day D	shipment: day A delivery: day C	shipment: day A delivery: day D	shipment: day A delivery: day B	shipment: day A delivery: day C
Average price 40' UTT-1*	249 EUR	548 EUR	440 EUR	390 EUR	334 EUR	302 EUR
possible condition of container train	Q = 2000 t L = 600 m	Q = 2000 t L = 600 m	Q = 1000 t L = 400 m	Q = 2000 t L = 500 m	Q = 1600 t L = 500 m	Q = 1500 t L = 550 m

\* Average price for UTT-1, in other words price for 40' loaded container weightinnes cca 25 t for one way

Source: Kobak, D.: Ulaganja u razvoj kombiniranog transporta, Željeznice 21, Stručni časopis inženjera i tehničara Hrvatskih željeznica, Hrvatske željeznice, Vol. 2, No. 2, Zagreb, 2003., p. 59

In 2003 container train Rijeka – Budapest was once more reinstated into service. The reactivation of this important transport link on Rijeka's transport corridor was a result of joint efforts on the side of Port, Port Authority and Croatian Railroads. This train's destiny has not changed much, and again since 2004 it is out of service on this route. It can be anticipated that the critical number of containers necessary for new permanent reinstatement of this service is reached now. Such prognosis is based on the fact that the container transport within port of Rijeka has increased for almost six times, and only in 2004 compared to 2003 it has doubled (cf. table 3).

Table 3: Container turnover at Port of Rijeka 1990. – 2007.

Year	Tonnes	TEU	Tonnes/TEU
1990.	403 083	50 282	8,02
1991.	304 239	41 729	7,29
1992.	350 842	47 953	7,32
1993.	365 025	49 913	7,31
1994.	297 724	46 516	6,40
1995.	244 670	43 705	5,60
1996.	188 399	29 492	6,39
1997.	132 000	15 858	8,32
1998.	82 000	12 182	6,73
1999.	66 524	10 134	6,56
2000.	92 084	14 500	6,35

2001.	115 606	17 852	6,48
2002.	137 860	18 078	7,63
2003.	249 939	28 298	8,83
2004.	510 000	60 000	8,50
2005.	565 062	76 258	7,41
2006.	718 507	94 390	7,61
2007.	1 272 150	145 040	8,77

Source: Port of Rijeka authority

As per data in table 3 it is obvious that the container transport in port of Rijeka has in year 2004 surpassed the results of 1990. Sudden increase of containers handled proves the importance of Rijeka's port on this transport route, and acknowledges port of Rijeka as one of the most important links in transport and logistics network for the countries of central and southeast Europe. In comparison port of Koper has doubled transshipment containers, and Trieste tripled. In 2008 year the port of Koper transhipped 350 000 TEU's, and Trieste 335 000. The years from 2003 to 2007 recorded considerable global economic growth, driven mainly by the economic growth of developing countries, in particular China. In 2008 economic development has stagnated in many countries, and so it is the trade. Knowing that a vast majority of world trade is done by maritime transport, the huge depression is clearly visible in this sector. Consequences of global crisis on the traffic of Rijeka Port felt during 2009 year. In the first eight months of 2009, Port of Rijeka achieved a turnover of 85,000 TEU's, which is about 20 percent less than last year, and by the end of the year is expected to be 130,000 TEU-loading.

## 6. Conclusion

As logistics platform the Port of Rijeka assures integration of Republic of Croatia and other countries of central and southeast Europe into modern world's transport and commodities flows. Besides infrastructure and equipment of a container terminal, feeder service and block trains Rijeka – Budapest, Rijeka - Beograd represent the powerful logistics support to the Port of Rijeka. Feeder service has directly contributed to container transport revitalizations to Croatian ports and reviving of container transport on Rijeka's transport route. The pre-condition for efficient functioning of feeder service is the connection of port's container terminals and gravitating inland by railroad transport. This is very important especially because Italian railway system announced alliances with Austrian and Slovenian railways. Italian ports Trieste, Ravenna and Venice and Slovenian port of Koper in November 2009 was founded by the Association of the Northern Adriatic ports (NAPA) with aim to serve EU' eastward expansion. Therefore Croatia should improve competitiveness of its major ports, first of all the port of Rijeka.

### Literature:

- [1] Žuvela, I.: Konceptija i strategija razvitka pomorskog gospodarstva Hrvatske, Pomorski zbornik, Društvo za proučavanje i unapređenje pomorstva Republike Hrvatske, Knjiga 38, Rijeka, 2000.
- [2] Mencer, I., Črnjar, M.: Prilog gospodarskoj strategiji razvitka Republike Hrvatske – Riječki prometni pravac, Ekonomski pregled, Hrvatsko društvo ekonomista, 51, 2000., 9-10.
- [3] The Times, Italy wants to act as great jetty for trade in Europe, 07.09.2004.
- [4] Trupac, I., Kolenc, J.: Port of Koper as Key Company of the Slovenian Transport Logistic Cluster, Promet-Traffic-Traffico, Fakultet prometnih znanosti Zagreb, Vol 16, no. 3, 2004., pp. 125-132.
- [5] Rodrigue, J.P.: The Geography of Transport Systems, Hofstra University, Hempstead, NY, 11549 USA, available on <http://people.hofstra.edu/geotrans>.
- [6] Rudić, D., Hlača, B.: Feeder servis u funkciji revitalizacije kontejnerskog prometa u jadranskim lukama, Collection of Papers, Volume 1, 3<sup>rd</sup> European Transport Congress, Transport Linking of the European North and South, 22-23. April, 2004., Opatija, Croatia.
- [7] Pupavac, D.: Feeder servis i kontejnerski vlak – logistička potpora luci Rijeka, Željeznice 21, Stručni časopis inženjera i tehničara Hrvatskih željeznica, Hrvatske željeznice, Vol. 4, No. 3, Zagreb, rujan 2005.
- [8] Pupavac, D., et.al.: Optimization of Management Logistics System – Challenge to Manage with Demand Fluctuations, ISEP 2005., 13<sup>th</sup> International Symposium on Electronics in Traffic, Ljubljana, Slovenia, 2005., U 6.
- [9] Kobak, D.: Ulaganja u razvoj kombiniranog transporta, Željeznice 21, Stručni časopis inženjera i tehničara Hrvatskih željeznica, Hrvatske željeznice, Vol. 2, No. 2, Zagreb, 2003.
- [10] Wiegman, W., et. al.: Intermodal Freight Terminals: An Analysis of the Freight Terminal Market, Research Memorandum 1998-55, Vrije Universiteit, Amsterdam, 1999.
- [11] [www.ci-online.co.uk](http://www.ci-online.co.uk)
- [12] [www.iicl.org](http://www.iicl.org)