



# DIOMIS

## Evolution of intermodal rail/road traffic in Central and Eastern European Countries by 2020

MANAGEMENT REPORT



**Developing Infrastructure & Operating Models for Intermodal Shift**

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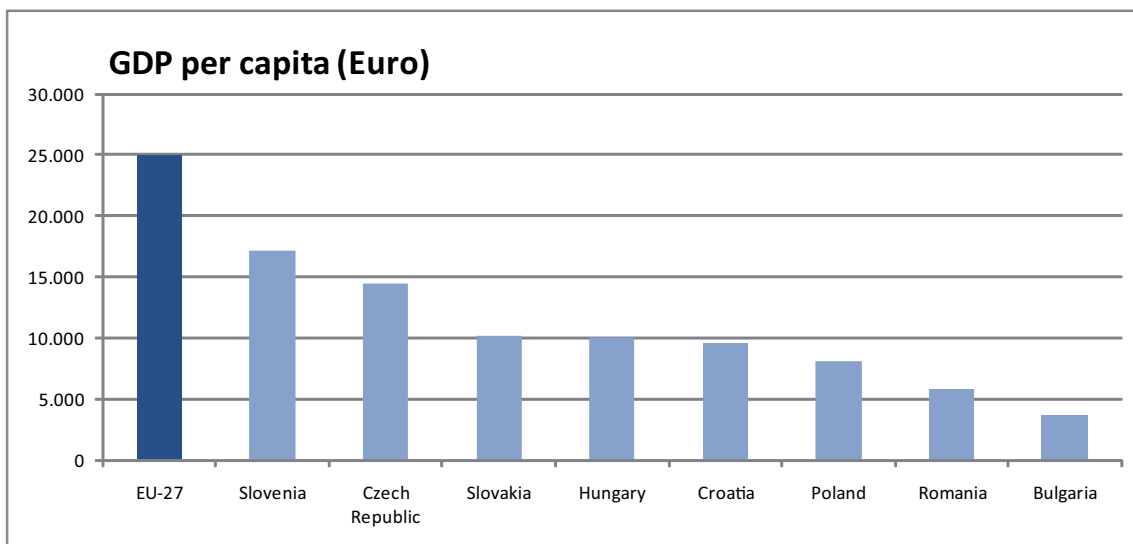
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## 1. INTRODUCTION

Intermodal transport is one of the driving forces of rail transportation. Since 2009, the International Union of Railways (UIC) led several specific studies on this topic in the context of its DIOMIS project (*Developing Infrastructure and Operating Models for Intermodal Shift*). In 2008, “*Agenda 2015 for Combined Transport in Europe*” was published. The report highlighted the role and responsibilities of all actors in the chain in order to grow this business but mainly focused on Central Europe. It was thus felt necessary to widen the geographic scope to carry out an in depth study of rail/road traffic in Central and Eastern European Countries.

**Figure 1-1: Gross Domestic Product (GDP) per capita at current prices, 2007**

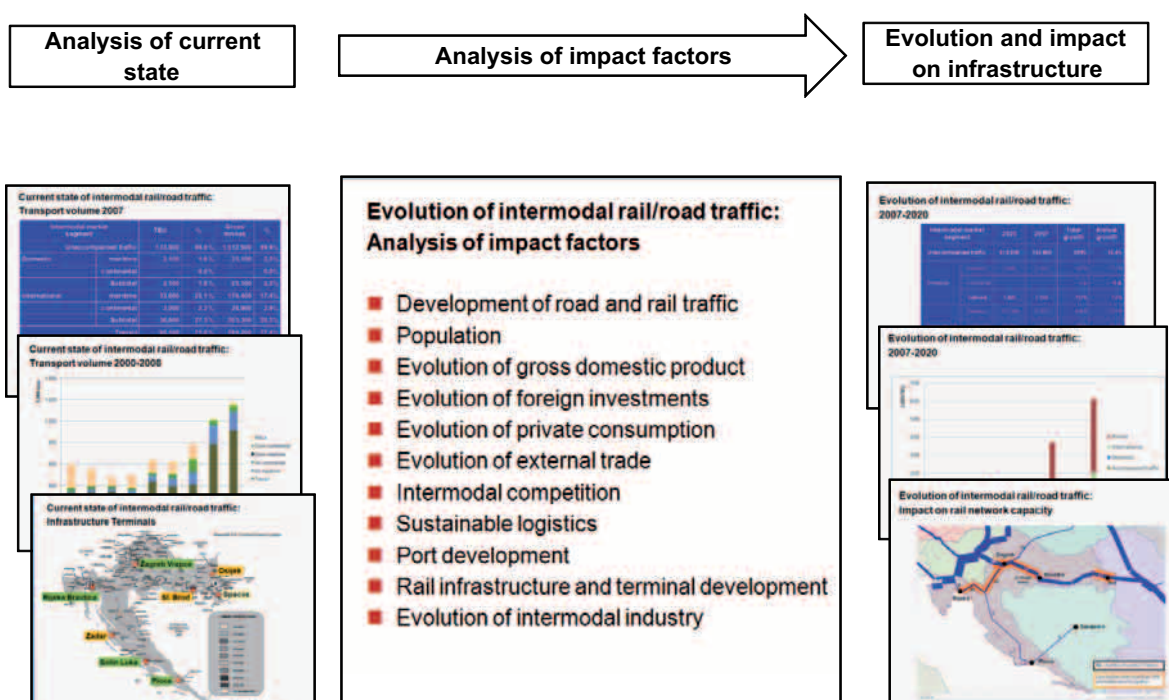


Source: Eurostat, KombiConsult analysis

The remit addressed by the UIC to KombiConsult (Frankfurt am Main) in association with K+P Transport Consultants (Freiburg) was to provide for that geographical area:

- a survey of intermodal rail/road traffic (based on 2007 figures);
- an evaluation of the impact factors on the development of unaccompanied intermodal rail/road transport by 2020;
- an evolution of the total intermodal rail/road traffic volumes by 2020;
- an assessment of the impact on the rail network and the terminals and
- recommendations on intermodal strategy.

Figure 1-2: Methodology for the present study



Source: KombiConsult

Detailed results are provided in respective *country reports* on Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia. These reports were completed at the end of 2009 and are available on the UIC website at [www.uic.org/diomis](http://www.uic.org/diomis).

The authors are confident that the reports and the present *management summary* provide a realistic framework for the encouraging evolution of intermodal rail/road traffic with, between and within central and eastern European countries. This summary is perceived to provide a regional perspective, both in terms of the impact factors and volumes as well as the recommendations on intermodal stakeholders at large. Detailed explanations, considerations and recommended actions to encourage growth can be found in the individual *country reports*.

## 2. CURRENT STATE OF INTERMODAL RAIL/ROAD TRAFFIC IN CEE COUNTRIES

The **main actors** who are co-operating in the organization, implementation and operation of intermodal rail/road services are railway undertakings, intermodal operators and infrastructure managers. Their market behaviour and involvement in individual countries in the years 2007/2009 are summarised in **Figure 2-1**. It shows that, depending on the country, the reform of the respective rail legislation and the market size has led to an increasing number of actors next to the incumbent railways and their subsidiaries.

**Figure 2-1: Suppliers of unaccompanied intermodal services in CEE countries, 2007/2009**

	Bulgaria	Czech Republic	Croatia	Hungary	Poland	Romania	Slovakia	Slovenia
Infra-structure Manager	NRIC	SŽDC	HZ Infra	GySEV	PKP PLK	CFR	ŽSR	SZ
				MÁV	Other 12 IM's			
Railway Under-takings	BDZ	CD Cargo	HZ Cargo	Floyd	PKP Cargo	CFR Marfa	ŽSSK Cargo	SZ
	Bulgarian Railway	OKD (2009)**		GySEV	PKP LHS	GFR		Adria Transport (09/2008)**
	Bulmarket*	Other 60 RU's		MÁV Cargo	PCC Intermodal	LSD		GKB (02/2008)**
	Other 3 RU's (2008)**			WLC	CTL	Servtrans Invest		RCA (07/2008)**
Intermodal service suppliers	Adria Kombi	Adria Kombi	AGIT	Adria Kombi	Argo	Adria Kombi	Adria Kombi	Adria Kombi
	ICA	Alpe Adria	Crokombi	Alpe Adria	ERS	CFR Marfa	Argo	Argo
	ICF	Argo	ICF	Argo	Hupac	Eurolog	CSKD Intrans	ERS
	Kombiverkehr	Bohemiakombi	Shipping lines and forwarders	ERS	ICF	ICA	ERS	ICA
	Transfesa	CSKD		Eurogate Intermodal	Kombiverkehr	ICA Romania	Kombiverkehr	ICF
		ERS		Hungaria Intermodal	PCC Intermodal	ICF	Mettrans	Kombiverkehr
		Eurolog		Hupac	Polzug	Pol-Rail	SKD Intrans	Mettrans
		ITL		ICA		Rocombi		Ökombi
		Kombiverkehr		ICF		TRW		Pol-Rail
		Mettrans		IFB				Shipping lines and forwarders
		RailRelease		Kombiverkehr				
		SAR		Mettrans				
				Navismart				
				Pol-Rail				


Source: KombiConsult analysis; \* not active in intermodal rail/road traffic in 2007,  
\*\* licensed after 2007 (year)



Figure 2-2: Intermodal rail/road traffic volume (TEU) in CEE countries, 2007

Intermodal market segment	Bulgaria	Croatia	Czech Republic	Hungary	Poland	Romania	Slovakia	Slovenia
Unaccompanied traffic	95 500	133 800	831 565	591 100	437 900	359 900	427 500	238 100
Domestic	2 300	2 100	-	15 300	-	180 000	-	44 500
	-	-	84 500	-	80 000	67 700	-	-
	2 300	2 100	84 500	15 300	80 000	247 700	-	44 500
International	14 500	33 600	523 365	280 400	148 600	-	291 300	114 200
	2 900	3 000	27 100	107 200	185 000	74 700	3 400	22 100
	17 400	36 600	550 465	387 600	333 600	74 700	294 700	136 300
Transit	-	8 500	189 200	21 500	-	-	125 100	45 900
	75 800	86 600	7 400	166 700	24 300	37 500	7 700	11 400
	75 800	95 100	196 600	188 200	24 300	37 500	132 800	57 300
Accompanied traffic	-	100	-	76 800	-	-	-	134 700
Total intermodal traffic	95 500	133 900	831 565	667 900	437 900	359 900	427 500	372 800

Source: K+P Transport Consultants, KombiConsult analysis based on railways and operators statistics



The transport volume measured in TEU conveyed on **unaccompanied intermodal services** in the CEE countries is made of domestic, international and transit traffic and includes trade with countries outside the studied area. Due to the interdependency of the flows the country figures cannot be summed up to a regional total in **Figure 2-2**.

The largest quantity of unaccompanied intermodal traffic was accounted in the Czech Republic where in total 831,565 TEU have been transported, with the majority on international services. Hungary ranks second in terms of volumes (591,000 TEU) followed by Poland (437,900 TEU), Slovakia (427,500 TEU), Romania (359,900 TEU), Slovenia (238,100 TEU), Croatia (133,800 TEU) and Bulgaria (95,500 TEU) in decreasing order.

In Slovenia, Hungary and Croatia **accompanied intermodal transport** (“RoLa”) has had and still plays an important role on selected South-East European transport lanes since it offers some advantages for the users, mainly:

- Reduction of fuel and other operative costs,
- Avoidance of road tolls,
- Avoidance of night and other traffic bans for heavy freight vehicles,
- Acceptance of resting times of drivers,
- Gain of transit permissions for non EU operators.

In the framework of further countries acceding to the European Union (Romania, Bulgaria, ...) these advantages were partly compensated by simplified operating conditions and thus costs on the road, so that the RoLa services could be maintained only with an even higher financial support from respective governments. Obviously the political acceptance of such kind of subvention is limited in CEE countries, because:

- truck transportation seems to be widely accepted or
- residents have more fundamental concerns than complaining about transiting trucks,
- the financial aid finally supports non residents and foreign truck operating companies.

Due the importance of the financial aid and thus political support for implementing or maintaining RoLa services - which cannot be determined in the medium term - we have focused on evaluating the evolution of unaccompanied intermodal transport 2007-2020 on the following chapters.



### 3. EVALUATION OF IMPACT FACTORS ON THE EVOLUTION OF UNACCOMPANIED INTERMODAL TRAFFIC IN CEE COUNTRIES BY 2020

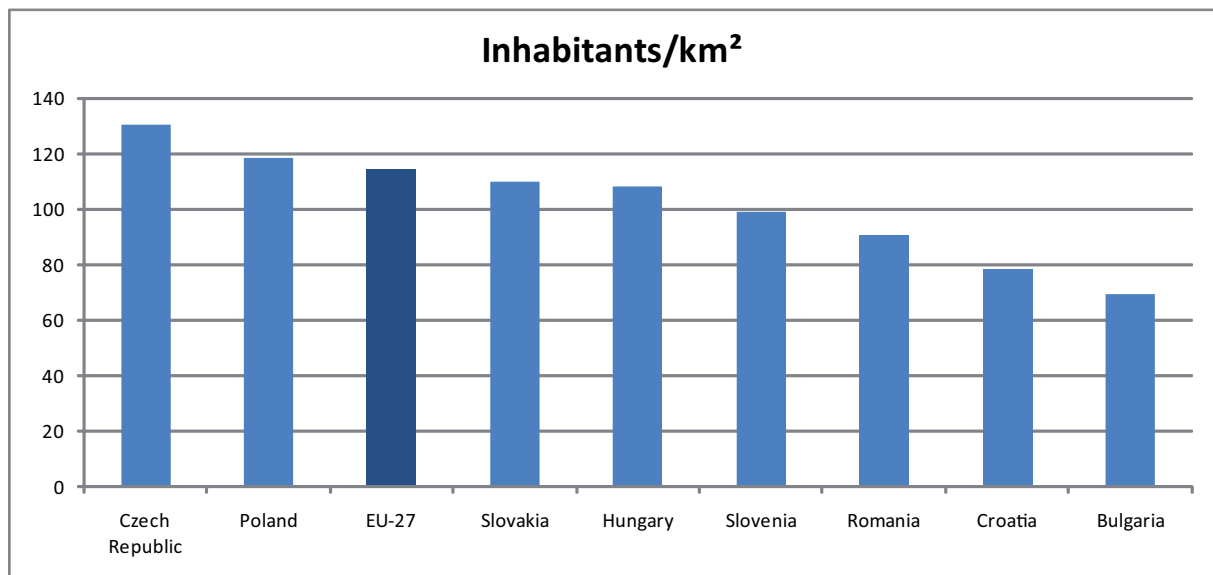
The implementation of efficient and sustainable intermodal services generally requires for a “critical mass” of regular shipments from and to a catchment area around an intermodal terminal. Sufficient volumes can be created through agglomerations of people resulting in a strong demand for consumer goods, when the area provides for major high-scale distribution centres or when it is strongly industrialized, or through a combination of all elements.

Against this background our investigation into the future of intermodal traffic in CEE countries has focused on the analysis and evaluation of relevant socio-economic factors. Moreover we have examined political, infrastructure and intermodal industry-internal factors. As a result we have identified the following key drivers of freight volumes and market potential for unaccompanied intermodal services within, from/to and through CEE countries in the period to 2020:

- Even though CEE countries have been severely hit by the global economic crisis 2008/09, the respective governments’ **economic and financial policies** are expected to achieve consolidation of state finances, restructure the economic and fiscal framework conditions and thereby contribute to stimulating domestic and international economic activities of the countries in a medium-term perspective.
- Slovenia and Slovakia are already members of the **Euro zone**. Within the next 3 to 5 years Hungary is likely to introduce the Euro as well. This will reinforce the stability of the country’s economic and fiscal system and improve the country’s attractiveness for foreign investments. Croatia is a recognized accession country while negotiations with Western Balkan states and Turkey are progressing, so that the country’s external trade particularly with other EU Member States is increasing.

- All these countries have a different size and total population, Poland and Romania being the larger ones, the average population density of the other countries is smaller than the European average. In many countries, e.g. Hungary, Czech Republic, Slovakia or Croatia, the **population** is already very much concentrated in the capital city, in Budapest, Praha, Bratislava or Zagreb and its vicinity. The trend of concentration in larger agglomerations, most likely the capital cities, is expected to increase in the years to come. Therefore the flows of goods and freight transport are strongly consolidated, which generally facilitates the supply of rail-based intermodal services.

**Figure 3-1: Inhabitants per area of selected CEE countries, 2007**



*Source: Eurostat, KombiConsult analysis*


- In spite of the current economic pressure on households, **private consumption** in Hungary, Czech Republic, Slovakia, Slovenia and Croatia still provides for a large growth potential in medium term:
  - Private households have tremendous “accumulated needs” especially as concerns durable consumer goods;
  - Hungary has a comparatively young society. The largest population groups are the 20 to 40 age group and the group of young people (10 to 20 year old);
  - Since we expect CEE countries – despite regional differences - to remain a preferential location for the manufacturing industry and foreign investments, the

population in both groups mentioned will have the opportunity to get rather good jobs and achieve rising incomes. Typically, those age groups are relatively “big spenders”.

- CEE countries, in particular Hungary or Slovakia, do provide for a strong, efficient and export-oriented **manufacturing industry**. Their strength is based on long-standing competences of their economy, which also have fostered massive flows of foreign direct investments (FDI). They offer a stable legal framework, a skilled work force, low labour costs, a high quality of work, a comparatively good standard of the transport infrastructure, and the proximity to consumer markets and other sites of integrated production networks in Western Europe, which help ensure a reliable supply chain. Our investigation into e. g. Hungary’s future as a location for industrial production resulted in the following findings:

- Hungary will remain one of the most preferential CEE countries for FDI;
- The industries for mechanical engineering, automotive, metal and plastic products, electronics, foods and pharmaceutical products will continue to be key to Hungary’s industrial production;
- Some labour-intensive industrial processes located in Hungary due to skilled workers and low wages will be transferred to other “lower-wage” countries;
- Hungary is in a favourable position to benefit substantially from a new economic trend. We expect that during the next decade certain production chains will be relocated from Far East Asia to Europe and especially to CEE countries. Most likely this will encompass finishing processes, high-performance products as well as fashionable merchandise. The main drivers are as follows: levelling out of labour and social security cost; unreliability of transcontinental supply chains; advantages in total working capital cost; flexibility of production and distribution; avoidance of breaking of industrial secrets and copying of products; increasing independence of East and South-east Asia from exports to other areas of the world.

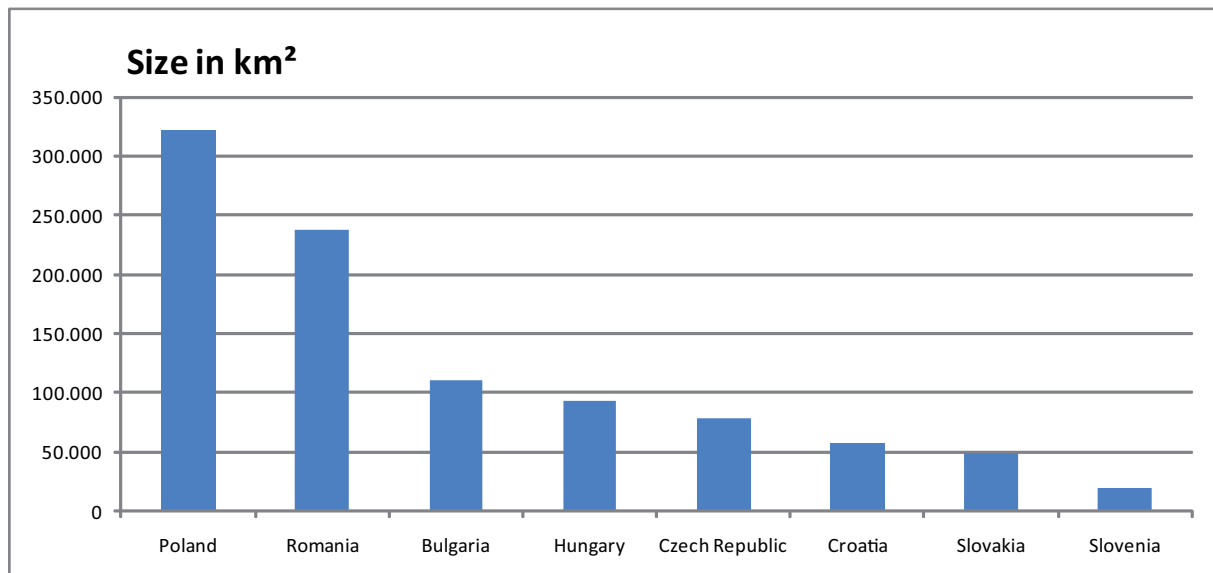
- The main driver for CEEC’s external trade will remain the **EU Single Market** and the countries integration into the intra-European trade. This applies both to existing and prospective new Member States. The following factors are considered to be crucial for this development:

- 
- The population will seek to achieve the western standard of living and demand for consumer goods produced to a certain extent in the EU.
  - In order to tap the full potential of productivity gains manufacturers and retailers will continue to extend the international division of labour and global sourcing. In the competition for locating new production sites or distribution centres Hungary, Czech Republic, Slovakia but also Slovenia and Poland with their ports, can offer comparative advantages. This is due to driving the volume of international long-distance freight transport and raise inbound and outbound transport of supplies, components, semi-finished and finished products with western markets.
  - The trade within CEE countries grows faster than with western European countries. Increasingly, the intra-CEE exchange of manufactured products will be integrated into European supply chains.
  - The enhancement of infrastructures in CEE countries improves the position of European production in global competition. In this respect Hungary is in a particularly favourable position on the intersection between major east-west and north-south corridors.
- Despite the expected strength of the EU Single Market we expect that **globalization** in terms of a transcontinental trade owing to the economic benefits of a global division of work, and the “off-shoring” of production to low-cost countries will continue to shape trade and logistics structures during the next decade. In the short- and medium-term the CEE consumers will continue to demand for a large quantity of goods produced in low-cost countries. This will stimulate inbound container traffic.
  - A particular impact on intermodal rail/road traffic is thus also created by the extra and **intra-regional maritime ports**. Next to the classical North-European – and Baltic ports with respect to Poland – a couple of seaports along the Adriatic coast, Trieste, Koper, Rijeka, Ploce, the Aegean sea: Thessaloniki, and the Black sea: Constantza, Burgas/Varna are used for the imports and exports of cargo to and from the region. In line with their ambitious extension programmes – mostly on the marine installations – also the intermodal hinterland transport of containers could develop. In our analysis, however, the extension of respective services is limited by good road infrastructure and cheap road transportation if domestic distribution is concerned. Adriatic port operators in Trieste, Koper and Rijeka claim they have benefited also from recent (2007/8) congestion

in North European ports so that trade companies have looked for alternatives for entering the European hinterland. In addition the port operators argue with the shorter transit time for Asian goods if they were transported via the „Southern Gateways“ into Europe rather than the traditional Northern ports. However we expect that these ports will act as secondary or feeder ports where no further transshipment will take place but all containers will be shipped by land transport, road or intermodal rail/road.


- The evolution of domestic rail/road traffic goes along also with the total size of the countries which, in case of Croatia, Slovenia or Slovakia do not provide favourable condition for (long) railway routes.

**Figure 3-2: Size of selected CEE countries (km<sup>2</sup>)**



Source: Eurostat, KombiConsult analysis

- The terms of competition of **intermodal traffic compared with road** are likely to improve significantly over the coming years. This is a result of the comparative advantages of rail-based services with respect to an anticipated growth of the cost of following resources: energy; driving staff; access to infrastructure; allocation of social costs.

- 
- The **climate policy** may become a key leverage for shifting shipments from road to more environmental-friendly supply chains, of which intermodal traffic can particularly benefit. Many companies are about to examine how they could reduce the ecological footprint of their logistics. According to our analysis the following influences are key to this move:
    - Companies anticipate that in the near future social costs will be allocated to causers fully or partly. This will definitely make their road-based operations much more expensive. So they are looking for more cost-efficient alternatives, which they assume can deliver a comparable service level. And this is intermodal traffic.
    - Wholesalers and retailers have observed changed consumer values and recognized that revenues from biologically produced products are increasing more than the average. These customers are a minority but they do influence the public opinion. For the owners of the supermarkets it is clear that these customers will at one time also require for a “politically correct” transport of biological products.
    - Finally, more and more shareholders ask the management of corporation what they are going to do to respond to the challenges of climate change.
  - In the course of integration of former and present accession countries into the EU the respective governments have elaborated comprehensive improvement programmes for the **transport infrastructure**. Amongst other it aims at linking up the modes of transport and improving the intermodality and the transport infrastructure of economic centres. It also foresees the upgrading of the Pan-European Corridors IV, V, IX and X effective by 2013 and beyond, including the upgrading or building of new double-track lines, their electrification, an increase of the maximum permitted axle weight to 22.5 tonnes and of the maximum speed as well as the improvement of the border crossing connectivity and access to ports (Koper, Rijeka, Constantza) and terminals. These railway lines are of paramount importance for bilateral and transit intermodal services in CEEC (see chapter 5).
  - Finally, how can the **intermodal industry itself** contribute to promote and grow intermodal traffic in CEE countries? Will and can intermodal actors develop capabilities, strategies and instruments to improve competitiveness? We have analyzed the industry and drawn our conclusions on its likely evolution as follows:



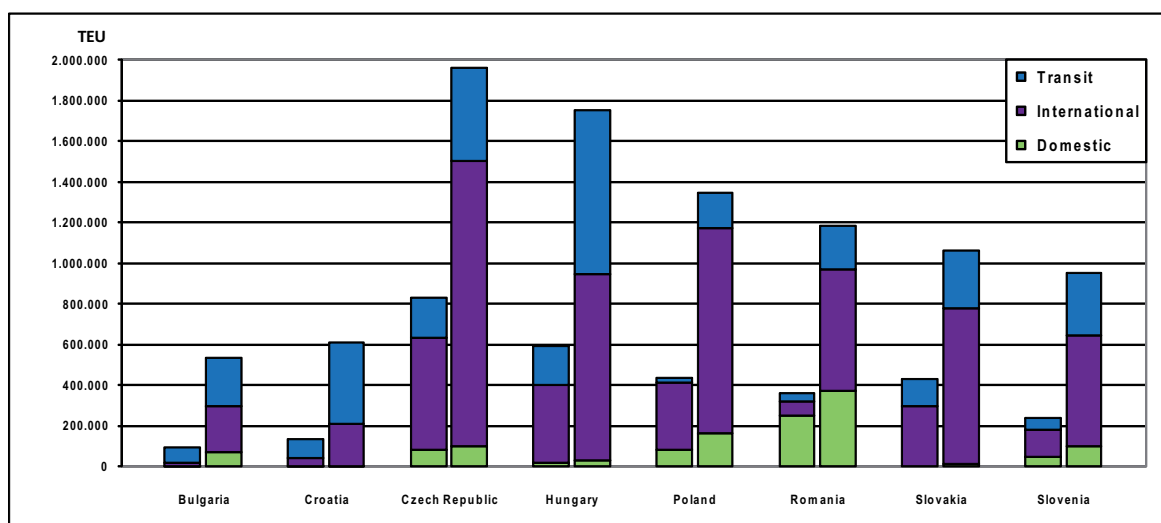
- The freight volumes are concentrated to a very large extent on the economic centres. Traffic flows are increasingly balanced east-west (CEE – Western Europe). Such framework conditions facilitate the implementation of point-to-point intermodal block train services.
- It will be necessary to expand terminal capacity (see chapter 6).
- Competition in the intermodal industry on the operator and railway level will continue to enhancing service quality and productivity and developing new markets and trade lanes (see **Figure 2-1**).
- In order to foster intermodal services on routes in CEE countries, which don't provide for full-trainload volumes from the start, it is required to establish hub-based rail production systems (gateway services). We expect that in addition to Intercontainer's platform in Sopron other operators will establish a hub in the Budapest area to achieve economies of scale on train services. Also intermodal terminals in the vicinity of the capitals Bratislava, Bucuresti, Ljubljana, Praha, Sofia and Zagreb, can be developed in this respect, so that additional volumes can be captured for rail.

## 4. EVOLUTION OF TOTAL INTERMODAL RAIL/ROAD TRAFFIC BY 2020

The **Figure 4-2** shows the total picture of the development of intermodal transport in CEE countries by 2020. According to our projection the total volume of unaccompanied intermodal transport will grow to about 1,963,000 TEU in Czech Republic, which will then have the largest quantities among the eight countries. Second largest volumes are on the territory of Hungary (1,754,000 TEU), while the other countries projected volumes are (in decreasing order): Poland (1,348,400 TEU), Romania (1,183,000 TEU), Slovakia (1,062,000 TEU), Slovenia (950,000 TEU), Croatia (613,000 TEU) and Bulgaria (533,000 TEU). Remarkable domestic volumes are forecasted for Romania and Poland due to the size of their country and the container hinterland transport with their “national” seaports.

Looking at the respective growth rates that can be achieved if the intermodal sector performs well the eight countries show different growth rates – depending on their initial starting point – where Bulgaria features the highest increase by 458 per cent (+14.2 per cent per year). Also the Croatian (+12.4 per cent per year) and Slovenian (+11.2 per cent per year) figures are in the two digit “class”, while Romania (+9.5 per cent), Poland (+9 per cent), Hungary (+8.7 per cent), Slovakia (+7.2 per cent) and Czech Republic (+6.8 per cent) show lower growth values due to the already large volume of intermodal transport in 2007.

**Figure 4-1: Unaccompanied intermodal traffic volume (TEU) in CEE Countries, 2007/2020**




Source: K+P Transport Consultants, KombiConsult analysis

Figure 4-2: Unaccompanied intermodal traffic volume (TEU) in CEE Countries, 2020

Intermodal market segment	Bulgaria	Croatia	Czech Republic	Hungary	Poland	Romania	Slovakia	Slovenia
Unaccompanied traffic	533 300	612 500	1 963 300	1 754 330	1 348 400	1 182 700	1 061 800	950 400
Domestic	70 200	5 400	-	32 400	-	306 000	-	97 200
	-	-	101 400	-	162 000	67 500	13 500	-
	70 200	5 400	101 400	32 400	162 000	373 500	13 500	97 200
International	48 000	173 300	1 206 900	589 000	299 100	192 000	683 500	397 500
	176 800	32 400	195 700	324 270	711 200	401 900	83 100	147 200
	224 800	205 700	1 402 600	913 270	1 010 300	593 900	766 600	544 700
Transit	-	107 500	433 300	157 600	-	-	205 700	146 500
	238 300	293 900	26 000	651 060	176 100	215 300	76 000	162 000
	238 300	401 400	459 300	808 660	176 100	215 300	281 700	308 500
Accompanied traffic	-	-	-	-	-	-	-	-
Total intermodal traffic	533 300	612 500	1 963 300	1 754 330	1 348 400	1 182 700	1 061 800	950 400

Source: K+P Transport Consultants, KombiConsult analysis



These figures include transit traffic between Western Europe and Central and Eastern European countries that could be routed through the countries along different transport corridors. In the European FP6 project CREAM we have analysed these alternatives which are:

- Intermodal road / sea connection using ferries from e.g. the port of Trieste to Greek and Turkish ports;
- Intermodal rail / road service along corridor IV: Hungary, Romania, Bulgaria, Turkey;
- Intermodal rail / road service along corridor X: Slovenia, Croatia, Serbia, Bulgaria, Greece/Turkey.

The modal choice for Western as well as Turkish truckers between these routings is very much depending in the reliability and the price of the rail product, and it can hardly be predicted whether the infrastructures managers and railway undertakings will continue to improve the service level considerably to compete with the pure truck transportation and the respective alternative routings (see chapter 5).

## 5. IMPACT OF EVOLUTION OF INTERMODAL TRAFFIC ON RAIL NETWORK CAPACITY

In order to assess the development of international intermodal volumes for the countries involved in this study, we analyzed every relevant trade lane between two catchment areas and evaluated if, by 2020:

- Their potential is likely to be sufficiently high to enable implementation of a regular full-trainload (FTL) intermodal service, e.g. a direct or shuttle train.
- The concerned actors could be considered capable of delivering an appropriate, road-competitive service specification.

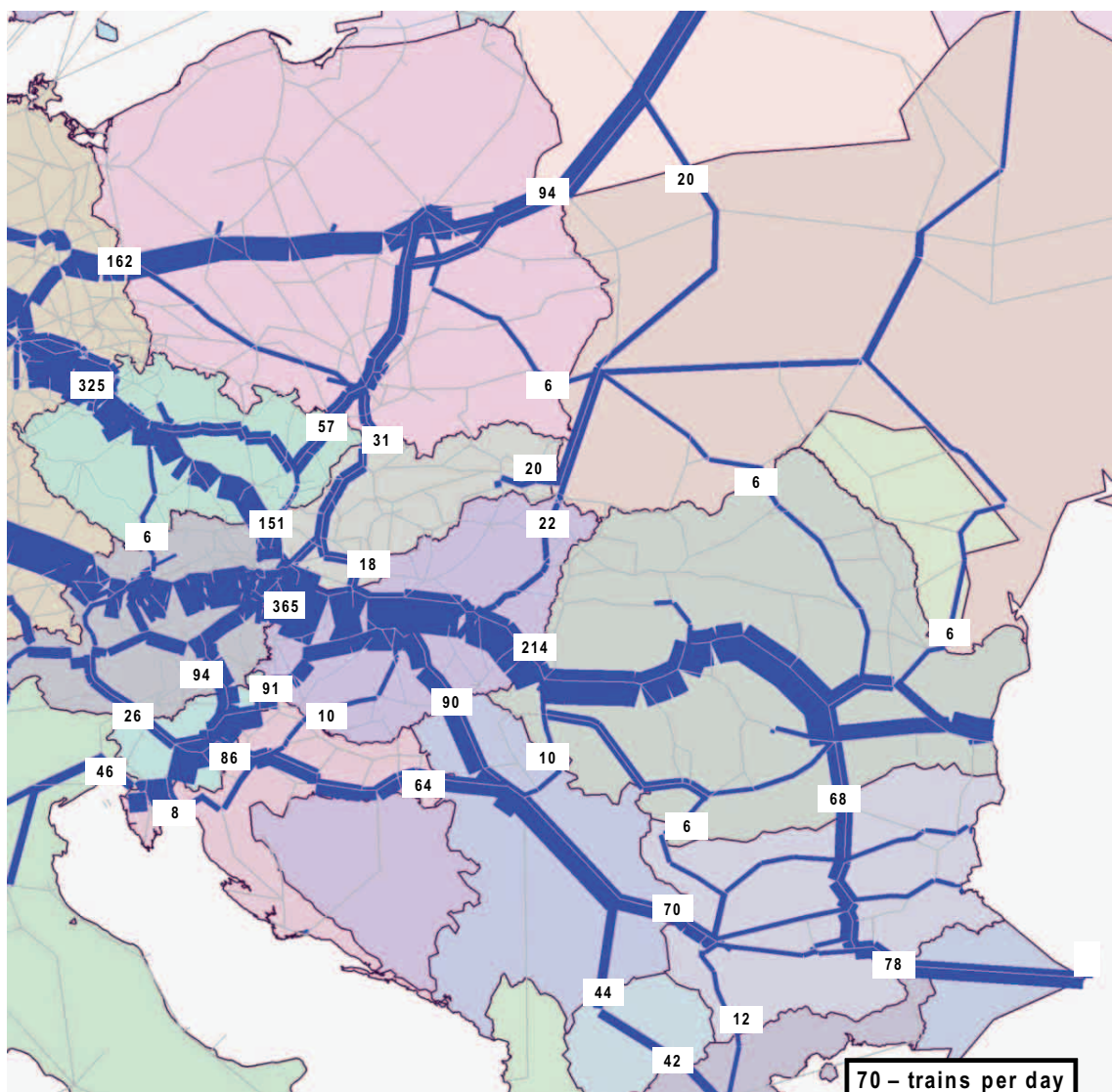
For those trade lanes, which matched both requirements, we “designed” a distinctive profile for an intermodal service particularly including the following items:

- The total train capacity;
- The average capacity load factor;
- The weekly and annual frequency of the service.

The inputs are mainly based on our expertise of current services on the trade lane in question – if there is a service – and the general economic conditions of intermodal trains, the forecasted goods and logistics patterns and the infrastructure parameters on the freight corridor by 2020. Through this comprehensive exercise we were able to determine the 2020 amount of intermodal shipments (in TEU) for each trade lane. These results were assigned to the corresponding country-to-country couple. The consolidated volume of all trade lanes between two countries delivers the total bilateral intermodal traffic volume. It goes without saying that this approach doesn't and couldn't take into account the possibility that, operationally, a part or even the total of shipments will be moved on gateway services. In such a case, these volumes would statistically be allocated to other bilateral links than the “original” trade lane of the goods concerned.

**Figure 5-1** shows the approximate assignment of the 2020 transport programme of block train services in, from/to and through the countries determined by our assessment of the evolution of unaccompanied intermodal traffic. It must be noted that smaller flows are not displayed in the map for graphical reasons. Since we expect that the majority of intermodal shipments will be carried on international trains between European countries of Germany, Austria and Hungary on the one hand and Romania, Bulgaria, Turkey and Greece on the other hand the rail lines via Hungary and Croatia which are part of the Corridor IV and X will have to bear the highest load of bilateral intermodal trains.

**Figure 5-1: Assignment of intermodal trains on the CEEC rail network, 2020**



Source: K+P Transport Consultants, KombiConsult analysis, K+P Transport Consultants graphics

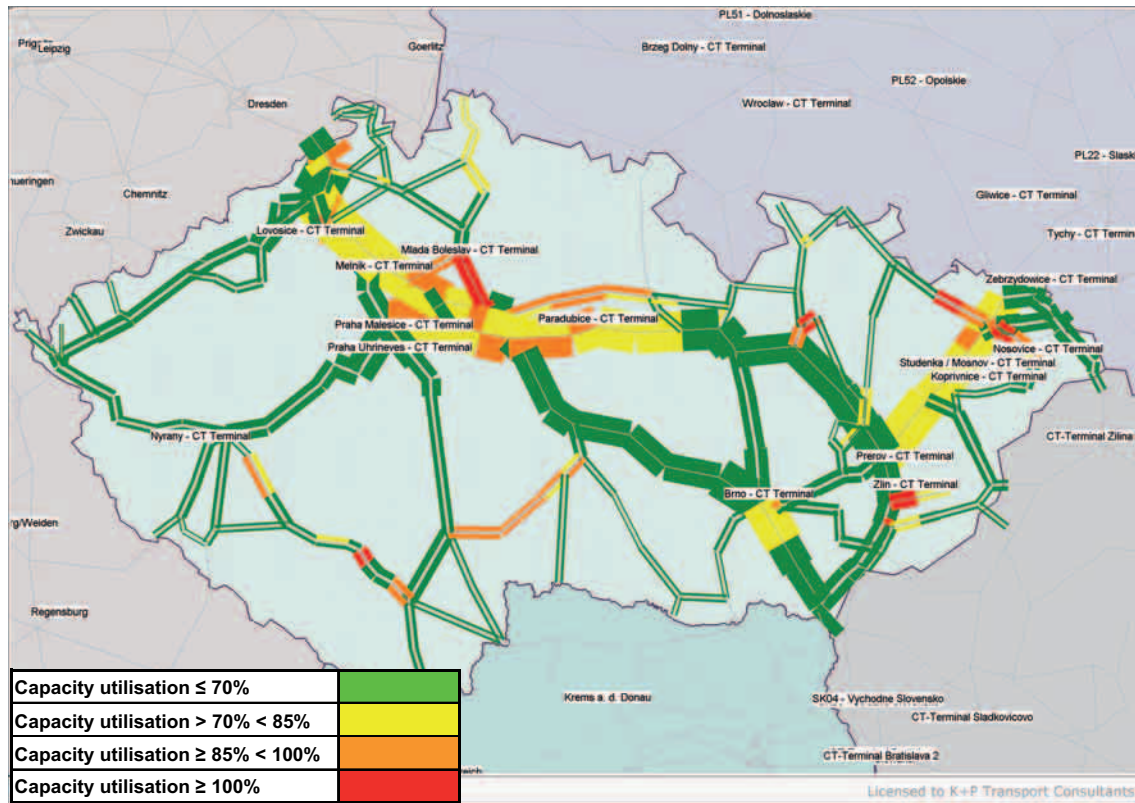


In spite of this substantial growth of intermodal trains until 2020 we basically don't anticipate major capacity constraints on the **Bulgarian** network also taking account of other freight and passenger trains. Considering several ongoing construction works, to be completed by the year 2020 the latest, the situation will significantly change compared to the existing state. Nevertheless, even if the large scale measures will be implemented parts of the network will still suffer from bad operating conditions due to not sufficiently financed railway infrastructure development: maintenance, access border crossing Giurgiu / Ruse, Dimitrovgrad - Sofia, Plovdiv – Dimitrovgrad / Svilengrad which will remain bottlenecks.

Due to this substantial growth of intermodal trains until 2020 we basically anticipate major capacity constraints on the **Croatian** network also taking account of other freight and passenger trains. Considering the slow implementation of several capacity enlargement works, to be completed by the year 2020 at the latest, the situation will however not significantly change compared to the existing state. Nevertheless, even if the large scale measures are implemented, parts of the network will still suffer from bad operating conditions due to insufficiently financed railway infrastructure development: maintenance on the entire network, east-west line linking the port of Rijeka via Karlovac and Zagreb to the Hungarian border, single lines south of Zagreb in particular Dugo Selo and Novska – for corridor Zagreb – Tovarnik – Belgrade -, which will remain bottlenecks.

Even though we assume that a couple of infrastructure investments for the **Czech** rail network will be implemented by 2020. **Figure 5-2** reveals considerable capacity bottlenecks on some links in the Prague region, between Olomouc and Ostrava, between Plzen and České Budějovice, as well as in the Brno and Zlin region.

Figure 5-2: Train load and capacity utilisation of the Czech network, 2020



Source: K+P Analysis; per cent utilisation of average daily maximum capacity

We would like to point out that the assumptions for the growth of conventional freight transports and passenger transport on which these projections are based follow a very conservative approach. Hence, the capacity situation in 2020 might be even worse, particularly in the Prague region.

In spite of this substantial growth of intermodal trains until 2020 we basically don't anticipate major capacity constraints on the **Hungarian** network also taking account of other freight and passenger trains. Considering several ongoing construction works, to be completed by the year 2020 at the latest, the situation will significantly change compared to the existing state

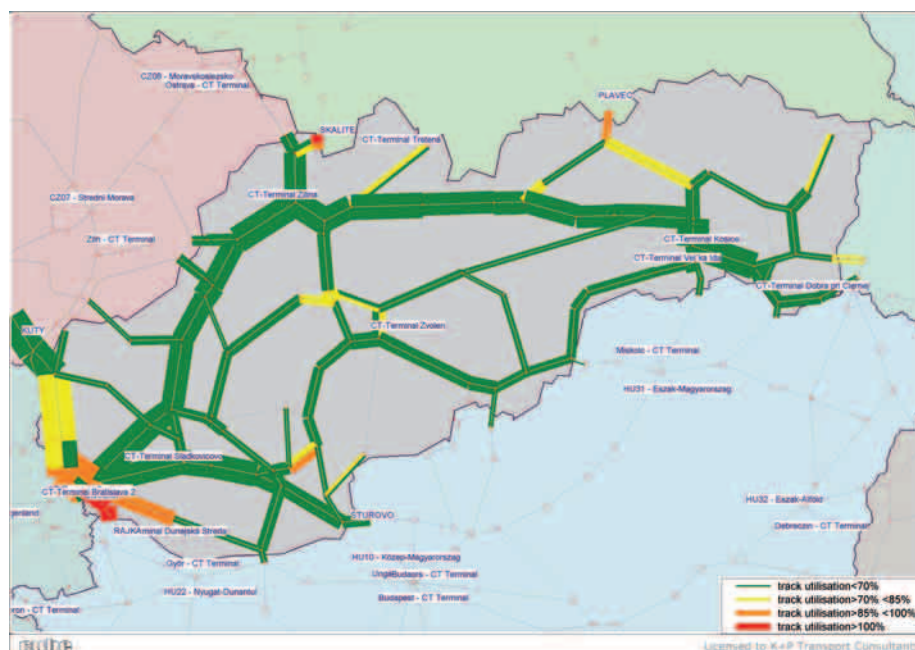
When analysing the network in **Poland** loaded with intermodal block trains the following five bottlenecks with more than 70 % use of capacity by 2020 can be clearly identified:

- on practically the complete West – East axis between Frankfurt/Oder, Warsaw and further to Lukow,
- on the access to the Baltic Sea ports Gdynia and Gdansk,
- between Wroclaw and Opole, and, finally,
- on the border crossing link to Slovakia between Skalite and Bielsko-Biala (see also section on Slovakia).


In spite of this substantial growth of intermodal trains until 2020 we basically don't anticipate any major capacity constraints on the **Romanian** network also taking account of other freight and passenger trains. Considering several ongoing construction works, e.g. on the Corridor IV to/from Constanta to be completed by the year 2020 at the latest, the situation will significantly change compared to the existing state. Nevertheless, even if the large scale measures are implemented, parts of the network will still suffer from bad operating conditions due to insufficiently financed railway infrastructure development: maintenance, access border crossing Giurgiu / Ruse, new bridge Vidin / Calafat, which will remain bottlenecks.

In **Slovakia** some capacity bottlenecks will occur between Bratislava and the Hungarian border, as well as on two cross border links to Poland.

**Figure 5-3: Train load and capacity utilisation of the Slovakian network, 2020**



Source: K+P Analysis; per cent utilisation of average daily maximum capacity



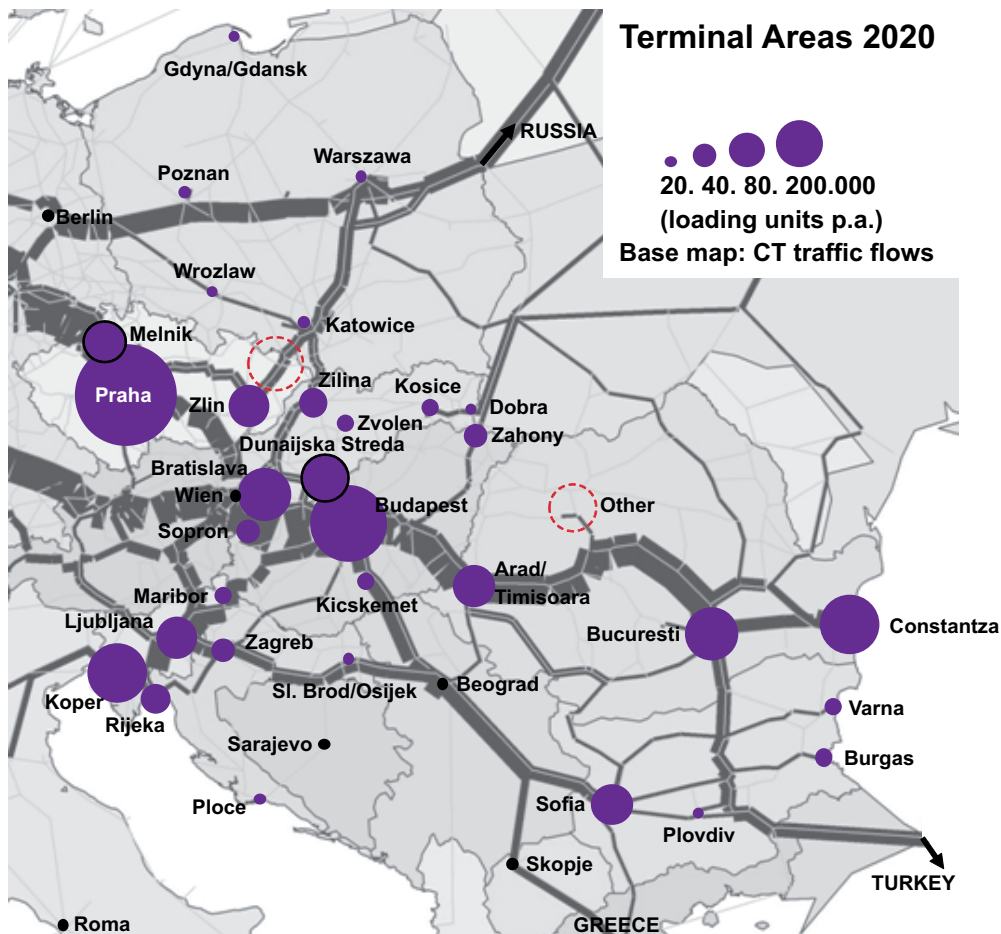
Since we expect that the majority of intermodal shipments will be carried on international trains between **Slovenia** and the European countries of Italy, north of Austria on the one hand and Hungary, Romania/Bulgaria on the other hand, the rail lines via Slovenia which are part of the Corridor V and X will have to bear the highest load of bilateral intermodal trains.

With regard to the ambitious rail network enlargement plans there should be sufficient capacity on the trunk lines in Slovenia also used by the overwhelming majority of intermodal services. This statement is basically confirmed by the ERIM 2020 study, which sees very few sections of the Slovenian rail network employed by an average of 70 per cent or more by 2020. Yet it should be qualified that this does mean that there will be sufficient capacity in general but not necessarily at the time-window required from the intermodal service supplier and its customers.


## 6. IMPACT OF EVOLUTION OF INTERMODAL TRAFFIC ON TERMINAL CAPACITY

The respective intermodal rail/road traffic flows have been assigned to intermodal terminal areas and have been converted from TEU to loading units, the physical entity handled in the transshipment terminals in order to calculate the required handling capacity by area. The “area” approach has been used in order to take into consideration existing terminals, extension plan and new builds irrespectively of the precise location which can only be determined after a detailed intra-regional or even local analysis.

**Figure 6-1: Handling capacity required by terminal area, 2020**



Source: K+P Transport Consultants, KombiConsult analysis and graphics



Generally, we expect a concentration process on medium to large performing terminals and some smaller and already outdated sites will not be operational in 2020, whereas additional capacity will be needed to support the modal shift from road to rail and create intermodal rail/road transport services

According to that analysis, intermodal traffic in **Bulgaria** will require a transshipment capacity of 216,000 loading units by 2020. The majority of which are related to the capital area of Sofia, where at least one performing terminal is required.

By the year 2020, intermodal terminals in **Croatia** will need a transshipment capacity for an annual volume of 211,000 TEU in unaccompanied traffic. Converted into loading units, Croatian intermodal terminals will require for a handling capacity for 133,000 loading units. According to our finding a terminal in the area of Zagreb should be able to offer at least 50,000 loading units per year. In the area of East Croatia, most probably Osijek or Slavonski Brod a terminal shall be foreseen to capture maritime cargoes related to the Croatian seaports and benefit from the “transit” corridor X.

In the **Czech Republic** for the time being no comprehensive terminal development plan exists. The government, terminal operators and infrastructure managers discuss more or less concrete projects for the further development of the terminal infrastructure:

- five new terminals (two in the Prague region, in Pardubice, Ostrava and České Budějovice) and
- the extension of two existing terminals (Lovosice and Brno).

By the year 2020, intermodal terminals in **Hungary** will require handling capacity for 611,000 loading units to be able to process the expected volume of unaccompanied traffic of 946,000 TEU. The only other locations, which we anticipate to play a role in intermodal traffic in Hungary, next to Budapest, are Kicskemét, Sopron and Zahony on the Ukrainian border, where transshipments between standard and wide gauge tracks are carried out.

In **Poland** a couple of intermodal terminals are operational and terminal capacity extension as well as totally new terminals are discussed. Currently no consistent terminal development plan exists. The future capacities have therefore not been quantified.

By the year 2020, intermodal terminals in **Romania** will need a transshipment capacity for an annual volume of 810,100 loading units in unaccompanied traffic. Currently transshipment



sites only provide for a consolidated annual handling capacity of about 522,700 loading units, which is 64 per cent of the required capacity. But, according to the findings of our investigations of the Romanian intermodal logistics market, we estimate that especially domestic intermodal traffic will continue to serve private sidings to a large extent, where only a few single block train services between intermodal terminals will run. Thus, those capacities could not be calculated. The main volume is concentrated in the Arad, Bucharest and Constanta area. In the respective areas the following terminals are gathered respectively:

- Arad: Railport Arad, Glogovat, Semenik (Timisoara),
- Bucharest: Bucuresti CPB, Bucuresti Noi, Bucuresti Sud, Bradu de Sus (Pitesti),
- Constanta: APM, CSCT, SOCEP, UMEX.

The growth projections for CT in **Slovakia**, requiring handling capacity for 7.2 million gross tonnes seem achievable –amongst others- under the following conditions:

- the construction of new terminals, replacing the mostly outdated terminals and allowing the handling of continental load units,
- these new terminals should grant open access to all intermodal operators and railway undertakings.

Regarding the situation in 2020 the predicted intermodal volumes would require additional handling capacity of nearly 2,000,000 gross tonnes. Starting from these ideas, the Slovak Ministry of Transports, Posts and Telecommunications launched a huge terminal investment programme, co-financed by the EU. This programme aims at covering the whole country with 4 new highly productive terminals in the Bratislava area, Žilina, Košice and Zvolen.

**Slovenian** intermodal terminals will require handling capacity for 452,000 loading units to be able to process the expected transport volume of 950,000 TEU (of which 308,500 are in transit). According to that the “growth poles” are the seaport terminal Koper, the gateway terminal in Ljubljana and the terminal Maribor in east Slovenia. The “other” handling capacity may be foreseen at existing or new sites depending on local needs, which can’t be anticipated in the framework of this study. The calculation shows, that in addition to the current capacity additional handling capacity of approximately 265,000 loading units should be installed in order to allow a further increase of intermodal traffic rail /road in Slovenia.



## 7. RECOMMENDATIONS ON INTERMODAL STRATEGY

To resume the analysis and forecasts presented in the previous chapters, the following key points summarise our recommendations for an intermodal strategy:

(1) The key success factors for **continental intermodal services** are:

- schedules geared to the movement of consumer goods: buffer time in departure but early morning arrivals,
- 95 % rate of punctuality in arrival,
- Consistency,
- Cost-efficient service,
- Fast dispatching at terminals (“fast lane”) to ensure efficient round trip schedules for trucking companies.

(2) The key success factors for **container hinterland services** are as follows:

- Coordinated implementation of seaport development projects, including marine, intermodal terminal and railside access measures are key: Constantza, Koper, Rijeka, for a inter-regional competition and in comparison with North Sea ports,
- Shuttle services with seaports, if possible several daily departures,
- Control and management of port-to-door chain,
- Flexibility: preparedness for additional trains; trucking container over the road,
- Cost-efficient service,
- Empty container depot at competitive rates.

(3) The market potential on most trade lanes is sufficiently high that intermodal operators in co-operation with railway undertakings should be able to **industrialize intermodal production** and thus realize major productivity gains, which in turn contribute to improving competitiveness with road:

- Standardization of processes and technology,
- Employment of efficient rail production systems: multi-frequency shuttle systems,
- Advanced interface management,
- Commitment to reliable and consistent services.

(4) Catch the opportunities which **climate policy** does create

(5) **Seamless international intermodal services:**


- Interoperability,
- Synchronization of processes between railways and operators,
- Data interchange: tracking of shipments.

(6) States shall ensure level playing field between road and rail concerning **infrastructure access charging** (e.g. in Slovakia with the highest rail infra access fees in Europe), and establish incentive schemes to support intermodal traffic.

(7) The **rail infrastructure** in CEE countries is required to be modernized particularly as concerns the axle weight (22.5 tonnes) and speed (100 – 120 km/h), while the loading gauge is sufficiently high on most rail sections, except in the Czech Republic where the profile should be enlarged to allow semi-trailer transportation (“P400”) and longer trains (> 600 m).

(8) With few exceptions, the overall capacity of the major lines in CEE countries is likely to be sufficiently high by 2020 assuming that the envisaged enlargement and upgrading investments are implemented.

- However, capacity constraints of the rail network in western European countries may stifle the growth of international intermodal traffic with CEE countries. Therefore the infrastructure managers and public authorities are called upon to put an emphasis on enlargement measures for connecting line sections.
- Sufficient financing of rail infrastructure upgrading project and timely completion of planned measures.
- Securing sufficient network capacities for freight (in particular in the vicinity of agglomerations where mixed traffic with regional and far distance passenger traffic take place).



(9) **Terminals:** new sites and upgraded infra- and superstructure capable for all types of intermodal loading units (not only container but also swap bodies and in particular semi-trailers).

(10) Change of attitudes of railways in CEE countries:

- Extending portfolio of services; not only focusing on “bread and butter” bulk cargo (comparable to situation of west European railways in 1980s/1990s).
- Facilitating transit traffic: take on responsibilities in co-operation with O/D railways.
- Develop “own” products for regional collection/distribution.

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