DIOMIS

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

CZECH REPUBLIC

Developing Infrastructure & Operating Models for Intermodal Shift

November 2009

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Warning

CONTENTS

FOREWORD

In January 2008, the Combined Transport Group of the UIC presented the ***AGENDA 2015 FOR COMBINED TRANSPORT IN EUROPE***, which constituted the epitome of the work carried out over two years in the ***UIC DIOMIS project***: developing infrastructure and operating models for intermodal shift.

Previously, with KombiConsult and K+P Transport Consultants, we investigated whether enough capacity would be available for Combined Transport (CT) on the European railway infrastructure by 2015 considering the expectations placed on Rail Freight and particularly on Combined Transport. In other words, given the most realistic growth projections, taking into account the foreseeable evolutions of the other Railway activities and visualising, on the basis of the current and planned infrastructure realisations and projects, the railway infrastructure available in 2015, would there be sufficient and appropriate infrastructure? If not, what should be done, in terms of investments and organisations, including those related to terminals?

It was shown that severe bottlenecks would constrain many parts of the European railway network and that, in all fields (infrastructure network, operations, terminals, …), there was a need for innovative solutions leading to a deep re-evaluation of our current infrastructure and operating models.

A recent update of our growth projections for CT, in the light of the present recession, indicates that, despite the current traffic downturn caused by the recession, CT will have grown considerably by 2015, compared to 2005, and that, with unchanged methods of production and without considerable improvements in productivity, we will still be faced, on the central part of the European network covered by the initial phase of ***DIOMIS***, with severe capacity constraints in the field of railway infrastructure, CT terminals and even wagons.

DIOMIS established that CT has become the growth business segment of freight railways and provides the opportunity to increase the market share of rail freight in Europe. However, considering the prospective capacity constraints that were identified by 2015, ***DIOMIS*** considered how the stakeholders, i.e. railways undertakings, operators and terminal managers, besides inevitable infrastructure expansions, can, within the projected infrastructure constraints, increase capacity and optimize capacity use in order to face the expected strong growth of combined transport of 7,3 % domestic and 8,7 % internationally ?

The results published in this ***AGENDA 2015 FOR COMBINED TRANSPORT IN EUROPE*** constituted a call for action for all the decision makers of the stakeholders (Railway Undertakings, Combined Transport Operators, Terminal Managers, Infrastructure Managers etc.), including national and supranational authorities and port authorities. The ambition of ***AGENDA 2015*** is to become an integral part of their respective strategies.

The second phase of DIOMIS, covering 2008-9, has ensured the full dissemination of AGENDA 2015 and updated the overall detailed report on Combined Transport (CT).

Most importantly, it expanded to a number of Central and Eastern European Countries (CEEC) the geographical scope and the investigation methods of ***DIOMIS***. The countries investigated in the course of this second phase were Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, Slovakia, and Slovenia.

For each of these countries, the team identified the current situation of CT, its challenges and prospects, the prospective capacities of the railway infrastructure and of the CT terminals, and the related investment plans and needs. The impact of the current recession, that is hitting hard some of the countries involved, was also taken into account.

The result is a set of comprehensive reports, constituting for the deciders in these countries, and for the stakeholders of CT interested in developing CT business within and in relation with the CEEC countries, and in conjunction with ***AGENDA 2015***, a precious information source but, even more importantly, also a useful analytical and decision tool.

As was the case for the other ***DIOMIS 1*** and ***2*** modules, KombiConsult and K+P Transport Consultants carried out the work and prepared these reports. We are very thankful to Hans-Paul Kienzler, from K+P Transport Consultants, and to Rainer Mertel, from KombiConsult , and their respective teams.

DIOMIS was also coached by a very active Steering Committee, composed of Martin Burkhardt (Director General UIRR), Javier Casanas (Trenitalia, partim), Gerard Dalton (Infrastructure Director of UIC), Gilberto Galloni (Chairman Europlatforms), Sandra Géhénot (Senior Freight Advisor UIC), Eric Peetermans (SNCB Holding, Chairman CTG UIC), Eric Pfaffmann (DB Intermodal), Erich Rohrhofer (Head of Combined Transport, RailCargo Austria), Daniel Molcan (Head of Combined Transport, CD Cargo) and Oliver Sellnick (Freight Director UIC).

Our dearest wish is now that these papers be integrated into the strategies of the stakeholders and we are confident that all parties concerned will share our excitement at this perspective and will co-operate to this achievement. We certainly remain available to discuss with the interested parties the results and prospects detailed in these reports.

Eric Peetermans
Chairman
UIC Combined Transport Group (CTG)

Oliver Sellnick
Director Freight
UIC

December 2009

1. SOCIO-ECONOMIC INFORMATION ON CZECH REPUBLIC

The population of the Czech Republic currently amounts to approximately 10.2 million inhabitants. With a total area of 79,000 km², the population density reaches 130 persons/km². This is the highest density of all CEE countries covered by the DIOMIS study. To compare, in the German Länder, this figure varies between 73 and 529 persons/km².

Figure 1-1: Czech Republic

Source: Website mygeo info

The most important agglomerations besides Prague (1.17 million inhabitants) are Brno (370,000), Ostrava (311,000), Plzeň (160,000) and Olomouc (100,000). The economic activity in the Czech Republic concentrates on Northern Moravia (Ostrava region) and Central Bohemia (Prague region). Strong economic disparities do occur: the Prague region, on one hand, is the richest region of all CEE countries, with a GDP of 160.3 % of the EU average in 2005. On the other hand, the region of Central Moravia only generated a GDP of 59.8 % of the EU average during the same period.

Prague is not only the economic centre of the Czech Republic but also the centre of gravity of all major transport corridors for rail and road. Inland navigation plays a negligible role.

As can be seen from ***figure 1-2***, the economic situation in the Czech Republic proves to be very positive, since the country generates the second highest GDP per capita of all states concerned by the DIOMIS project, after Slovenia. One has to keep in mind that due to the disparities described above the relative prosperity in the economic centres is even higher.

Figure 1-2: Comparative socio-economic figures for the Czech Republic and the other CEE countries of the DIOMIS project in 2006

	Bulgaria	Croatia	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
Geography								
Area	100,994 km²	56,542 km²	***78,866 km²***	93,030 km²	312,685 km²	238,391 km²	49,034 km²	20,253 km²
Population	7,700,000	4,560,000	***10,200,000***	10,100,000	38,100,000	21,600,000	5,400,000	2,000,000
Pop. density	69 Persons/km²	81 Persons/km²	***130 Persons/km²***	108 Persons/km²	122 Persons/km²	90 Persons/km²	110 Persons/km²	99 Persons/km²
Economy								
GDP	19 billion €	26.4 billion €	***78 billion €***	66.9 billion €	228 billion €	57.4 billion €	29.9 billion €	25.9 billion €
GDP per capatia	2,475 €	5,796 €	***7,631 €***	6,642 €	5,988 €	2,661 €	5,539 €	12,940 €
Infrastructure								
Road network	37,300 km	28,400 km	***128,000km***	161,000 km	380,000 km	79,500 km	17,800 km	38,500 km
of which motorways	324 km	792 km	***564 km***	542 km	552 km		316 km	483 km
Rail network	4,320 km	2,730 km	***9,610 km***	7,670 km	20,300 km	11,100 km	3,660 km	1,200 km
Inland waterways	470 km	933 km	***664 km***	1,440 km	3,640 km	1,780 km	172 km	

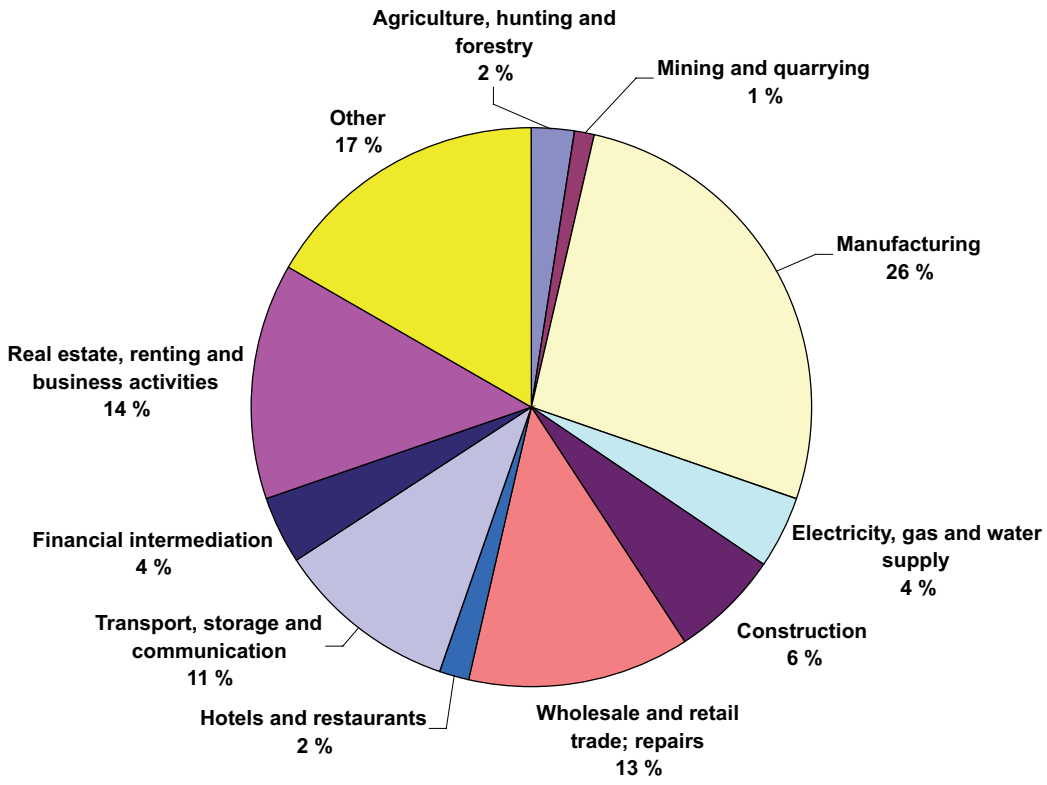
Source: progtrans

Contrarily to Slovakia and Slovenia the Czech Republic has not yet joined the Euro zone. Considerable variations of the exchange rate hamper the traffic and goods flows between Czech Republic and the other member states of the Euro zone. In the current period of economic crisis the situation is even more difficult since the exchange rate of the CZK has climbed from 23.040 € (July 2008) to 29.38 € (February 2009) and then dropped again to 25.19 € in September 2009, which means a growth of 28 % and again a drop of 14 % within a bit more than one year.

This considerably impacts on imports and exports and, consequently, on goods transport, which alone represented 11 % of the GDP in 2007 (***figure 1-3***).

Figure 1-3 shows that the manufacturing industry generates approx. 26 % of the GDP, which is relatively moderate compared to, for example, Slovakia where the respective share is 35 %. This in turn reveals the importance of the service industry. In summary, the Czech Republic is a relatively wealthy country due to a strong service sector. This structure results in a relatively low transport intensity (476 tkm per 1000 € GDP) compared to Poland (609 tkm) and Slovakia (589 tkm), for example.

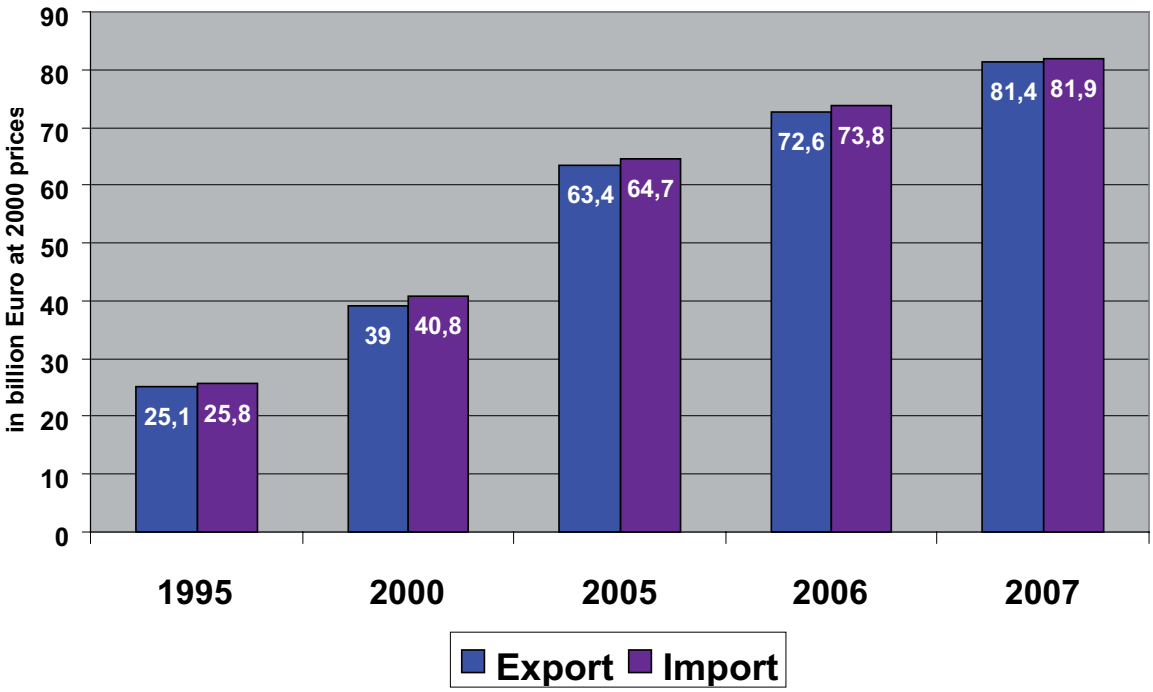
Figure 1-3: Share of GDP by categories of resources in 2007



Source: Czech Statistical Office

Figure 1-4 shows the growth of export (+258 %, in billion Euro at 2000 prices) and import (+250 %) between 1995 and 2008. These monetary figures include imports and exports generated by the service industry.

Figure 1-4: Development of Export / Import 1995-2008 in billion Euros (2000 prices)



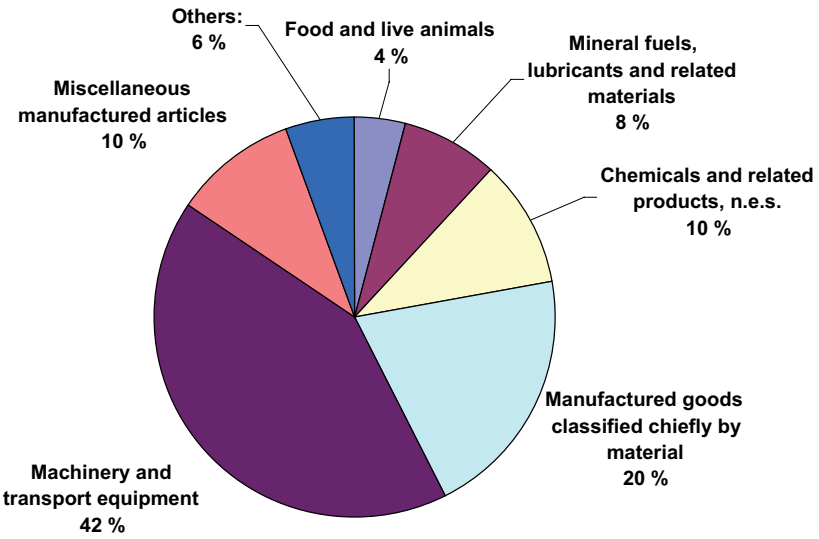
Source: progtrans

The following ***figures 1-5 and 1-6*** present the commodity structure in monetary terms (CZK current prices) of imported and exported goods in 2007.

Machinery and transport equipment represent 42 % of total imports. Together with manufactured goods and articles and chemical products these represent more than 80 % of all imported goods (***figure 1-5***).

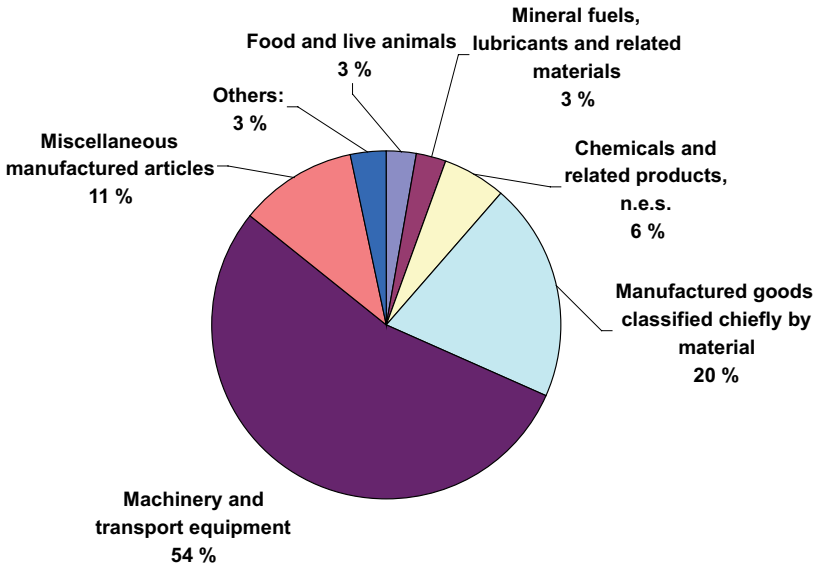
According to ***figure 1-6*** machinery and technical equipment with a share of 54 % is by far the dominating export product (in particular exports of the car manufacturer Škoda). Manufactured goods and articles represent another 31 %.

Figure 1-5: Share of imported goods by main commodities (sections of SITC) in billion CSK (current prices) in 2007



Source: Czech Statistical Office

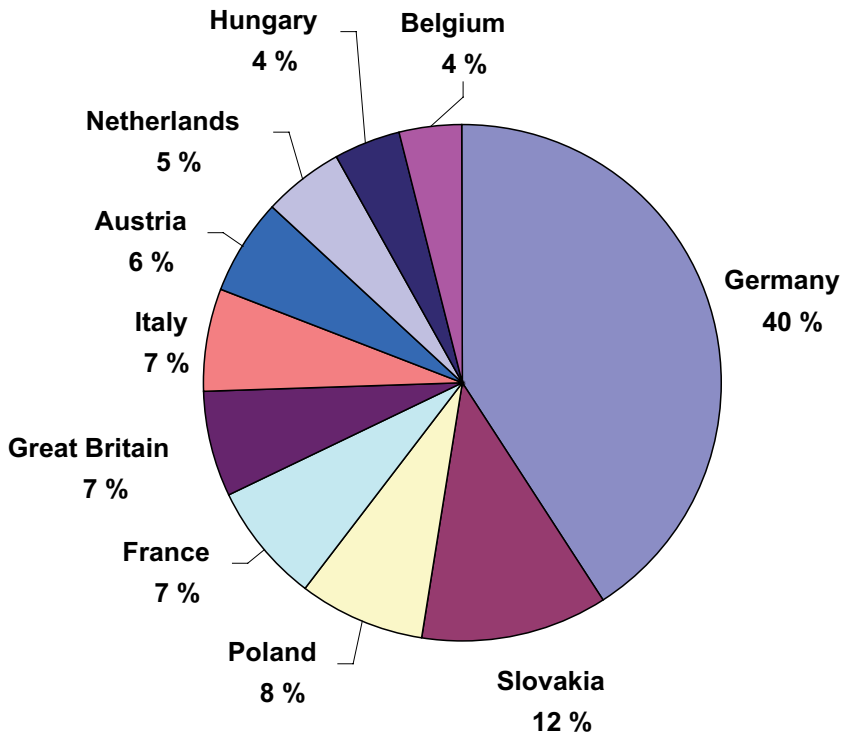
Figure 1-6: Share of exported goods by main commodities (sections of SITC) in billion CSK (current prices) in 2007



Source: Czech Statistical Office

Figure 1-7 shows the most important foreign trade partners of Czech Republic in 2007. The extraordinary importance of Germany as the major trade partner is obvious. Together with the neighbour Slovakia, these two countries represent more than 50 % of the external trade.

Figure 1-7: Share of main foreign trade partners of the Czech Republic in 2007



Source: Czech Statistical Office

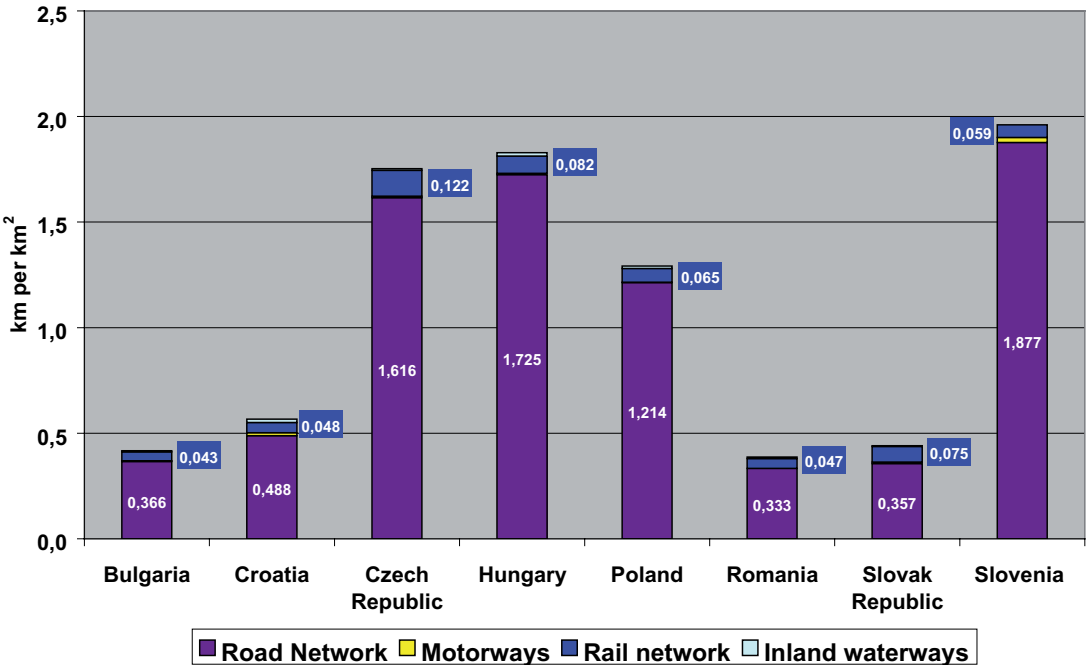
The analysis of the national economic figures has proven that the Czech Republic is a politically and economically stable and prosperous country. If the trend observed during the past decade continues, this country will offer very positive opportunities for the development of combined transport in the future. This will be shown in the following chapters.

The following key figures characterize the traffic infrastructure in the Czech Republic (see ***figure 1-2*** above):

- Total length of the road network 128,000 km, thereof 564 km motorways
- Total length of the rail network 9,610 km
- Total length of the inland waterway network 664 km.

Figure 1-8 presents a comparison of the infrastructure densities expressed in km per km² for the CEE countries covered by the DIOMIS study.

Figure 1-8: Infrastructure network density (km per km²) for the CEE countries covered by the DIOMIS study in 2007



Source: progtrans, K+P Analysis

After Slovenia and Hungary, the Czech Republic benefits of the most dense road network of all CEE countries concerned (1616 km per km²). The share of motorways in the total network length however is still very low compared to western European countries. The total of 564 km reflects that in fact only the Prague region is effectively connected with Germany.

The Czech railway network is by far the densest (0.122 km/km²) showing a network density two to three times as high as in most of the other CEE countries surveyed (expect Hungary). As will be shown later, the Czech network offers in principle one east–west backbone and three north–south corridors linking all its economic centres to the European network.

The Elbe and the Vltava form the Czech inland waterway network of a total length of 664 km. Nevertheless, their technical characteristics do not allow for high-capacity barge services, which results in a negligible market share of inland navigation.

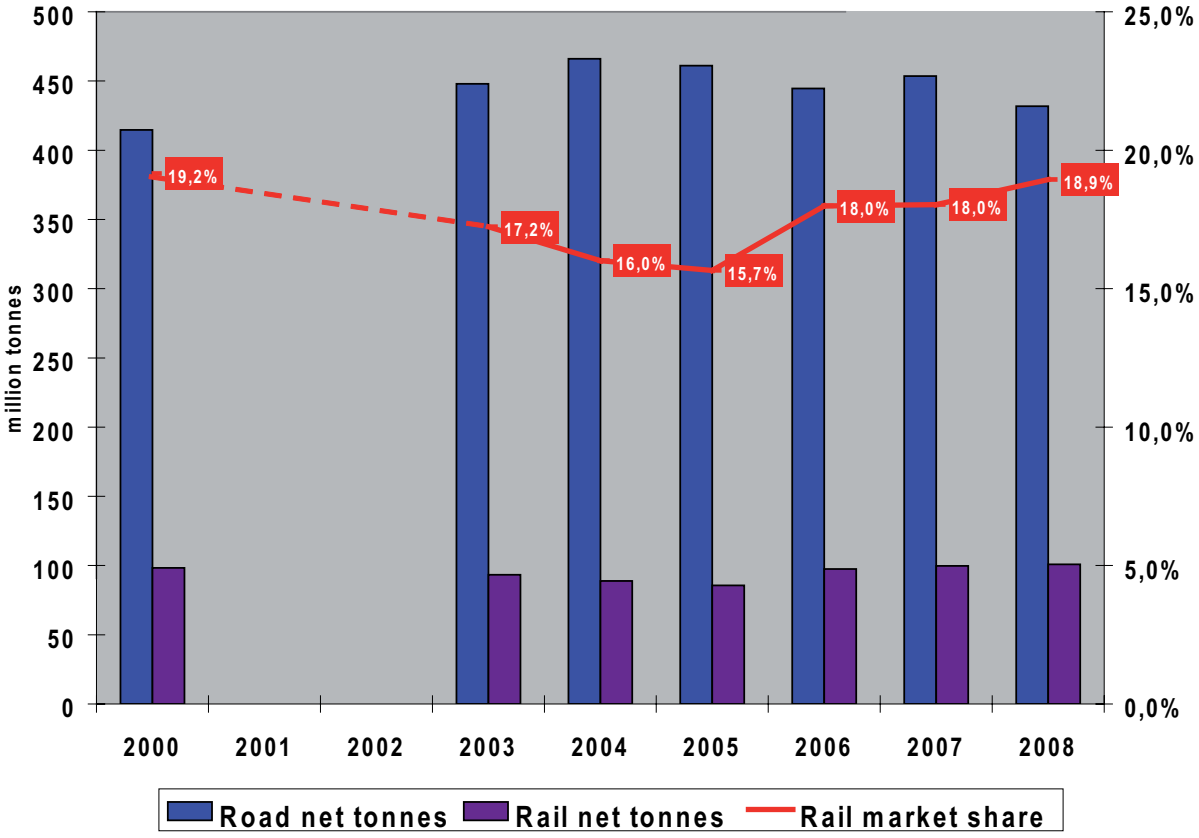
The market shares (measured in tonnes) of road and rail freight traffic can be summarized as follows (***Figure 1-9***):

- In the reporting period 2000 to 2008, road volumes vary between 420 and 470 million tonnes.
- In the same period, rail net tonnes in absolute figures show a relatively stable volume of 90 to 100 million tonnes

Both result in a variation of the total rail market share between a minimum of 15.7 % in 2005 and a maximum of 19.2 % in the year 2000. It seems interesting to mention that after having reached the minimum in 2005, rail volumes have recovered since then, in absolute figures as well as in the market share. This development is mainly due the following reasons:

- a slight decrease of road transport,
- the exploitation of new markets for rail transports, in particular new block train services for the automotive industry (TPCA Kolín, Volkswagen Bratislava, Škoda)
- transport of storm-damaged wood and transport of wood products
- and, last but not least, the strong growth of CT hinterland transports and the upcoming CT continental transports.

Figure 1-9: Development of transport modes (rail & road) in thousand tonnes (left axis) and rail market share (right axis) 1995 – 2008

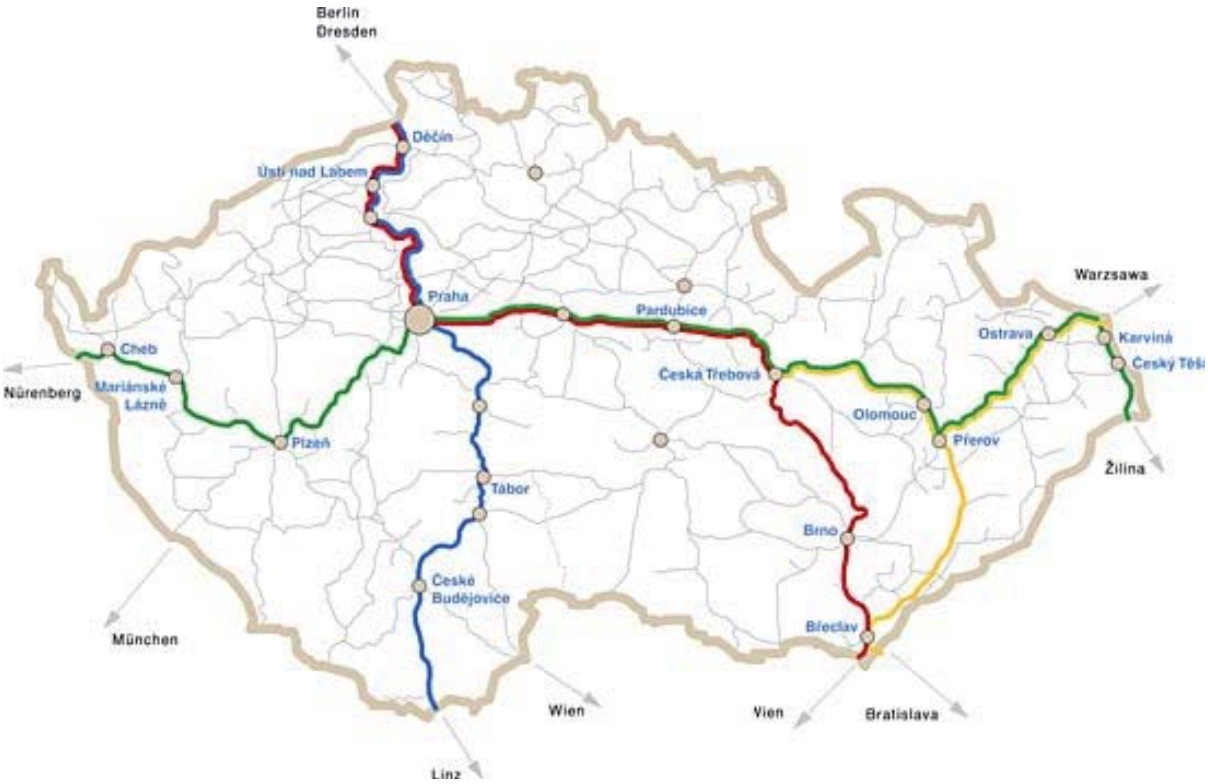


Source: progtrans

Four backbone corridors pass the territory of the Czech Republic (***figure 1-10***).

- East – west: Cheb – Plsen – Prague – Olomouc – Ostrava
- North –south: Dresden – Prague – České Budějovice – Linz
- North – south: Ùsti n. O. – Brno – Břeclav – Vienna
- North –south: Ostrava – Přerov - Břeclav – Vienna

Figure 1-10: Backbone (rail) corridors in the Czech Republic



Source: SŽDC

These main corridors belong partially to the pan-European corridors

- IV Dresden – Prague – Brno - Vienna
- IVa Nürnberg - Prague
- VI Zebrzydowice - Ostrava

With the some exceptions, Prague – Cheb (currently under construction) and Prague – České Budějovice – Linz, these axes are all double tracked. The complete backbone network is electrified.

2. CURRENT STATE OF INTERMODAL RAIL/ROAD TRAFFIC IN THE CZECH REPUBLIC

2.1 - Intermodal actors

Intermodal operators

The following intermodal operators are currently active in the Czech Republic:

- Metrans a subsidiary of the German HHLA
- ERS
- ČSKD Intrans a subsidiary of Intercontainer Austria ICA
- Argo
- Bohemiakombi/Kombiverkehr
- ITL
- Eurolog
- RailRelease
- Alpe Adria
- Adria Kombi
- SAR
- Maersk Czech Republic, s.r.o.

All operators offer regular services to and from terminals in the Czech Republic. With the exception of Bohemiakombi/Kombiverkehr, active in the continental market, and Argo, providing a special service for the automotive industry (CKD = “completely knocked down” in continental containers) to Kaluga, all operators are exclusively operating in the maritime market. The following ***figure 2-1***, provided by ČD Cargo, a.s. gives an overview of the monthly services per operator in 2008. For example, Metrans alone offers 115 departures from Praha Uhříněves to Hamburg, and 131 in the opposite direction. It must be understood that the ***figure 2-1*** represents scheduled services, which means that the actual number of departures may differ. ***Figure 2-1*** should therefore be interpreted as an indicator of the importance of the intermodal operators.

Figure 2-1: CT services offered in the Czech Republic per month in 2008

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	∑
1	Gliwice		4																																	4
2	Piacenza	3																																		3
3	Maschen				11																															11
4	Budapest			14			4																													18
5	Hamburg				5			131	9	20						25								13												203
6	Bremenhaven				4			29		8			41		13																	2				97
7	Praha Uhříněves					115	46		31	25	7	4																								228
8	Lípa nad Dřevnicí						4	40																												44
9	Dunajská Streda					12	3	21																												36
10	Nýřany							8																												8
11	Bremen																												1							1
12	Mělník						50							35	16			1	8													1			8	119
13	Rotterdam												35			6																				41
14	Bratislava						6						28																								34
15	Praha Malešice					20								7			6																				33
16	Sládkovičovo															1		19																			20
17	Děčín												1				15																				16
18	Budapest K.												9																								9
19	Valašské meziříčí																				1																1
20	Třebušice																					1															1
21	Bruntál																				2		1														3
22	Ostrava Střed																																				0
23	Lovosice					11																			1	7	5	4									28
24	Trieste																							1													1
25	Antwerpen																							11													11
26	Amsterdam																							5													5
27	Duisburg																																				0
28	Mladá Boleslav																													46							46
29	Terespol																												44								44
30	Veľká Ida																												1								1
31	Bratislava UNS						1						1																								2
32	Koper																																	1			1
33	Vratimov																																				0
34	Zeebruge												8																								8
∑		3	4	14	20	158	114	229	40	53	7	4	123	42	29	32	21	20	8	0	3	1	1	30	1	7	5	4	46	46	0	3	0	1	8	

Metrans
ERS
ČSKD Intrans
Argo
Bohemiakombi/Kombiverkehr
ITL
Eurolog
RailRelease
Alpe Adria
Adria Kombi
SAR

Source: ČD Cargo a.s.

The ***figure 2-2*** below summarises the operators' importance. It shows very clearly that out of 11 operators active in the Czech market the "big five" operators (Metrans, ERS, ČSKD Intrans, Argo and Bohemiakombi/Kombiverkehr) hold more than 95 % of the market shares in services offered.

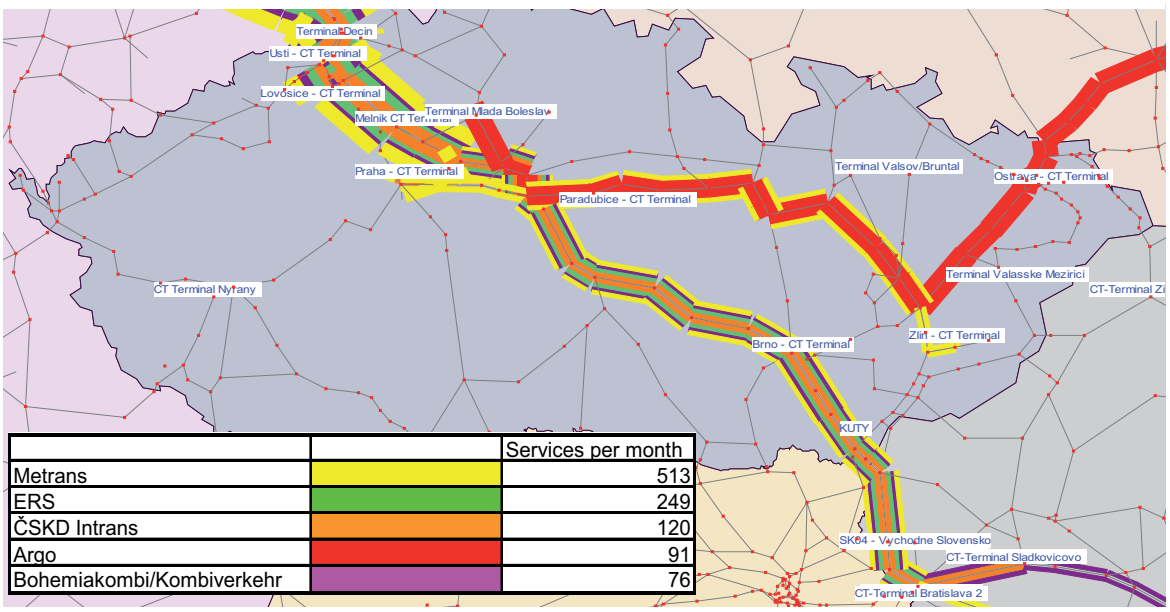
Figure 2-2: CT services per operator offered in the Czech Republic per month in 2008

	Services (month)	Market share	Cumulated market share
Metrans	513	47,9%	47,9%
ERS	249	23,2%	71,1%
ČSKD Intrans	120	11,2%	82,3%
Argo	91	8,5%	90,8%
Bohemiakombi/Kombiverkehr	54	5,0%	95,8%
ITL	32	3,0%	98,8%
Eurolog	7	0,7%	99,4%
RailRelease	2	0,2%	99,6%
Alpe Adria	2	0,2%	99,8%
Adria Kombi	1	0,1%	99,9%
SAR	1	0,1%	100,0%

Source: ČD Cargo a.s.

The ***figure 2-3*** below translates the information of ***figure 2-1*** into an assignment plot, in order to localise the itineraries, where the "big five" operators are active. It clearly indicates the importance of Prague as "turntable". From there, big flows are oriented either to Poland or to Slovakia – and further - to Hungary. The assignment plot (***figure 2-4***) hereafter visualizes the CT flows of the other operators. It is obvious that the "smaller" operators are in particular present on the north-south axes.

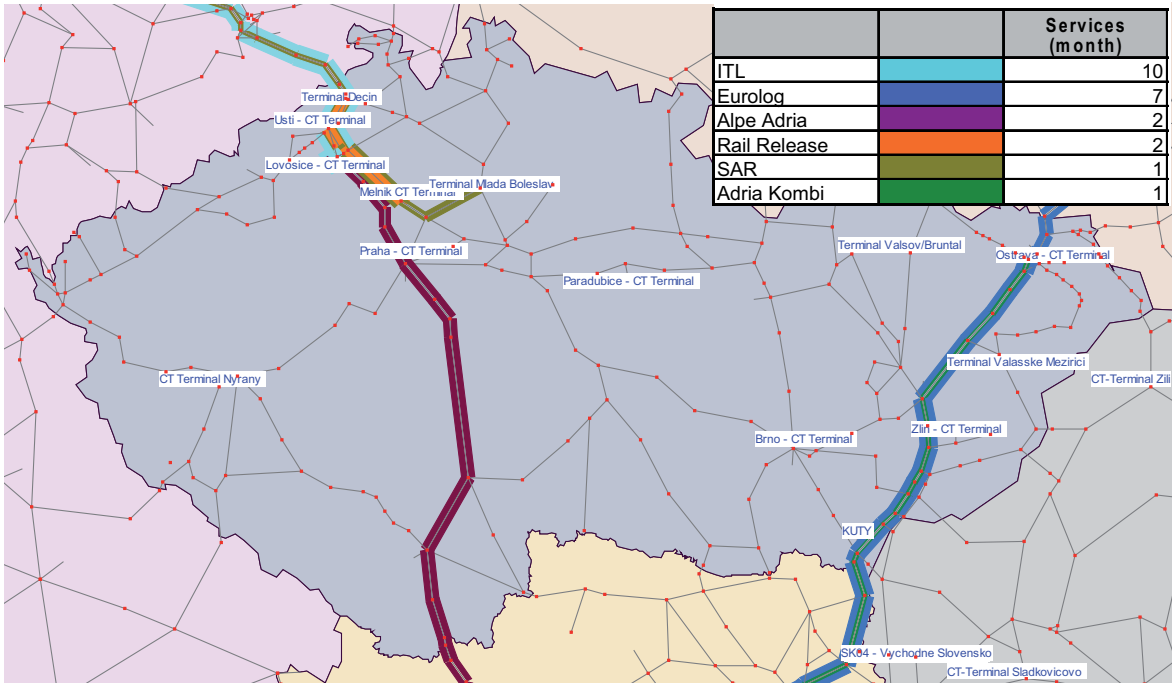
Figure 2-3: CT services in the Czech Republic by the "big five" operators, 2008



		Services per month
Metrans		513
ERS		249
ČSKD Intrans		120
Argo		91
Bohemiakombi/Kombiverkehr		76

Source: CD Cargo a.s., K+P Analysis

Figure 2-4: CT services in the Czech Republic by the other operators, 2008

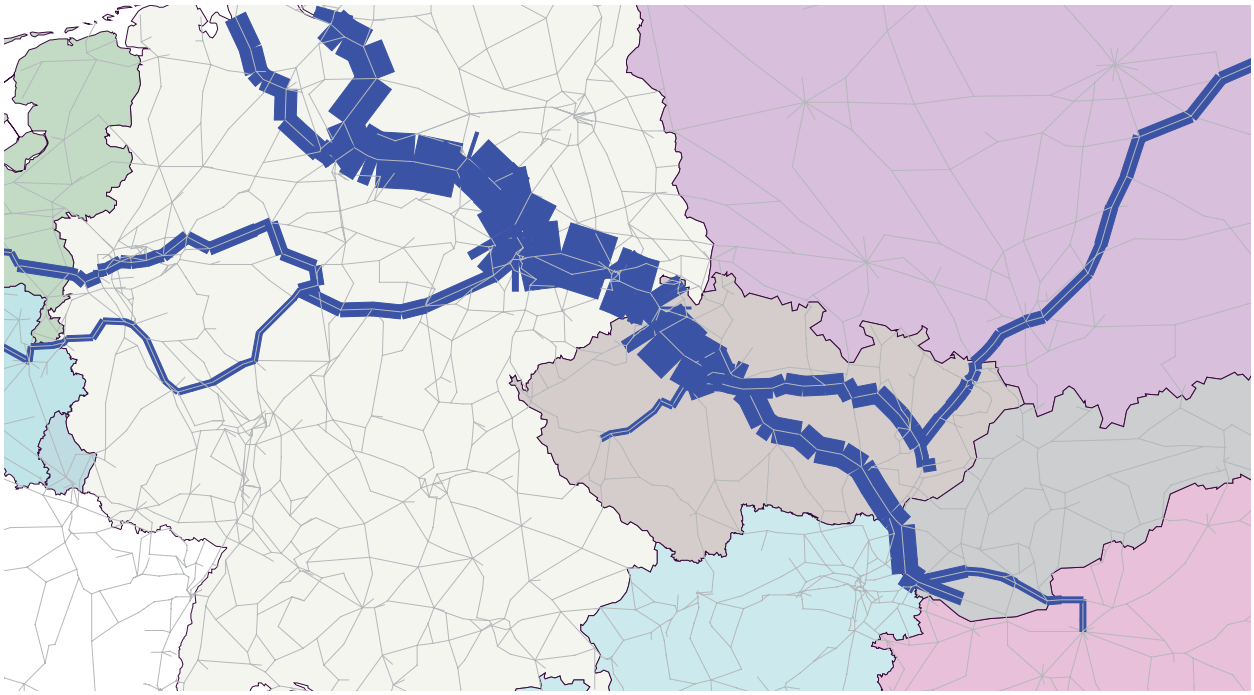


		Services (month)
ITL		10
Eurolog		7
Alpe Adria		2
Rail Release		2
SAR		1
Adria Kombi		1

Source: CD Cargo a.s., K+P Analysis

Figure 2-5, finally, gives an impression of the origins/destinations of the CT flows generated by the Czech Republic on a European scale. The current orientation of CT flows on the Seaports of the Antwerpen – Hamburg range (Antwerpen, Rotterdam and, in particular, Hamburg and Bremerhaven) becomes apparent.

Figure 2-5: European CT flows touching the Czech Republic in 2008



Source: CD Cargo a.s., K+P Analysis

Infrastructure managers

The entire Czech network of 9,610 km is managed by SŽDC (Správa železniční dopravní cesty), the state-owned infrastructure manager. SŽDC is responsible for the train path allocation for all types of trains (freight and passenger). The price fixing procedure for infrastructure access fees in the Czech Republic is as follows: The ministry of transport and the ministry of finance agree on a calculation formula. This formula is used by SŽDC as the basis for charging the railway undertakings. Given a 40 % discount for regular CT trains, the infrastructure access fees for these trains amount to 2 – 2.5 € per train kilometre.

Railway undertakings

Including ČD Cargo a.s., more than 60 railway operators hold a licence for the SŽDC network. Up to the year 2008, however, traction services for CT were exclusively provided by ČD Cargo a.s., a daughter company of the state-owned Czech railway company České dràhy, a.s. (ČD). Since 2009 OKD, Doprava a.s. provides services of container block trains from the German-Czech border to the terminal in Mělník.

Terminal operators

In the Czech Republic most terminals are privately owned with the exception of Lovosice, owned by ČD, a.s. and operated by a joint venture of ČD - DUSS Terminál, a.s. The other terminals are operated by Mělnik Intermodal Terminal, s.r.o. (Terminal Mělnik), Metrans, a.s. (Praha Uhříněves, Nýřany, Zlín - Želechovice/Lípa), ČSKD Intrans, a.s. (Přerov, Praha Žižkov). Besides these “public” terminals, three other important “private” sidings generating CT volumes are worth mentioning: Kopřivnice, operated by Škoda TATRA Forwarding, a.s., Ml. Boleslav operated by Škoda Auto, a.s., for the service to Kaluga (Argo Bohemia) and Nošovice operated by pac-tra Logistics (Czech), s.r.o., siding services - Raillex, a.s.. These private sidings provide services exclusively for the automotive industry (Škoda and HYUNDAI).

Each terminal will be presented more in detail later in this document, nonetheless it can be said that Praha Uhříněves operated by Metrans is by far the most productive and the most important terminal in all CEE countries.

2.2 - Legal framework

In 2009, the Czech Republic launched a programme aiming at promoting investments in equipment for continental combined transport. Within the framework of this programme 30 % of investments are paid for new services, up to 500,000 € per application. Due to the relative scarcity of funds, the period of application was very short (2 months). Nonetheless, the programme has fully been drawn down by the road hauliers industry.

In principle, EU legislation has been widely implemented in the Czech Republic (authorisation of the road pre- and on-carriage to/from the terminals of intermodal load units (LU) on Sundays, authorisation of an increased gross vehicle weight (GVW) of 44 tonnes for the pre- and on carriage of 40' ISO Containers, reduced taxes for road equipment exclusively operated in CT).

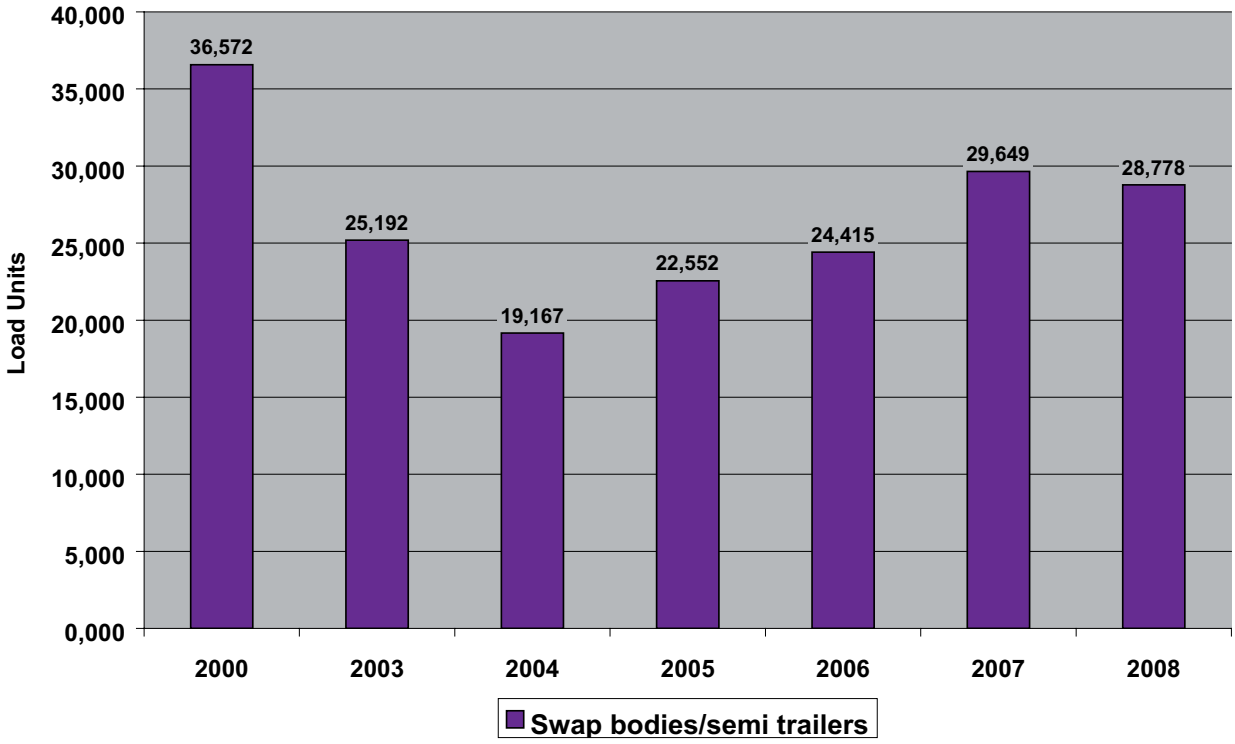
Even though in principal the non discriminating access to terminals and to the railway lines is fixed in the national regulation, in reality, this is not yet fully achieved: Almost all terminals are operated by private companies offering door-to-door services including pre- and on-carriage. This means for third party operators that they are charged higher fees for using the private terminal facilities.

2.3 - Overview on total intermodal market

The by far biggest part of CT from/to and through the Czech Republic is container hinterland traffic to/from the ports of Hamburg, Bremerhaven, Rotterdam, Antwerp and – with increasing importance - Koper.

The continental CT in the Czech Rep mainly operated from/to the Lovosice terminal by Bohemiakombi in cooperation with Kombiverkehr. Currently, this market reaches a share of 3-5 % of the total CT. In the following the development of this market in the period from 2000 to 2008 is described (***figure 2-6***).

Figure 2-6: Development of continental CT operated by Bohemiakombi/ Kombiverkehr in the Czech Republic 2000 – 2008 (load units)



Source: Bohemiakombi

As a result of the modest market share of continental CT on the whole, the development of volumes is still relatively "volatile", i.e. the introduction or suspension of one single new service directly affects the overall statistic.

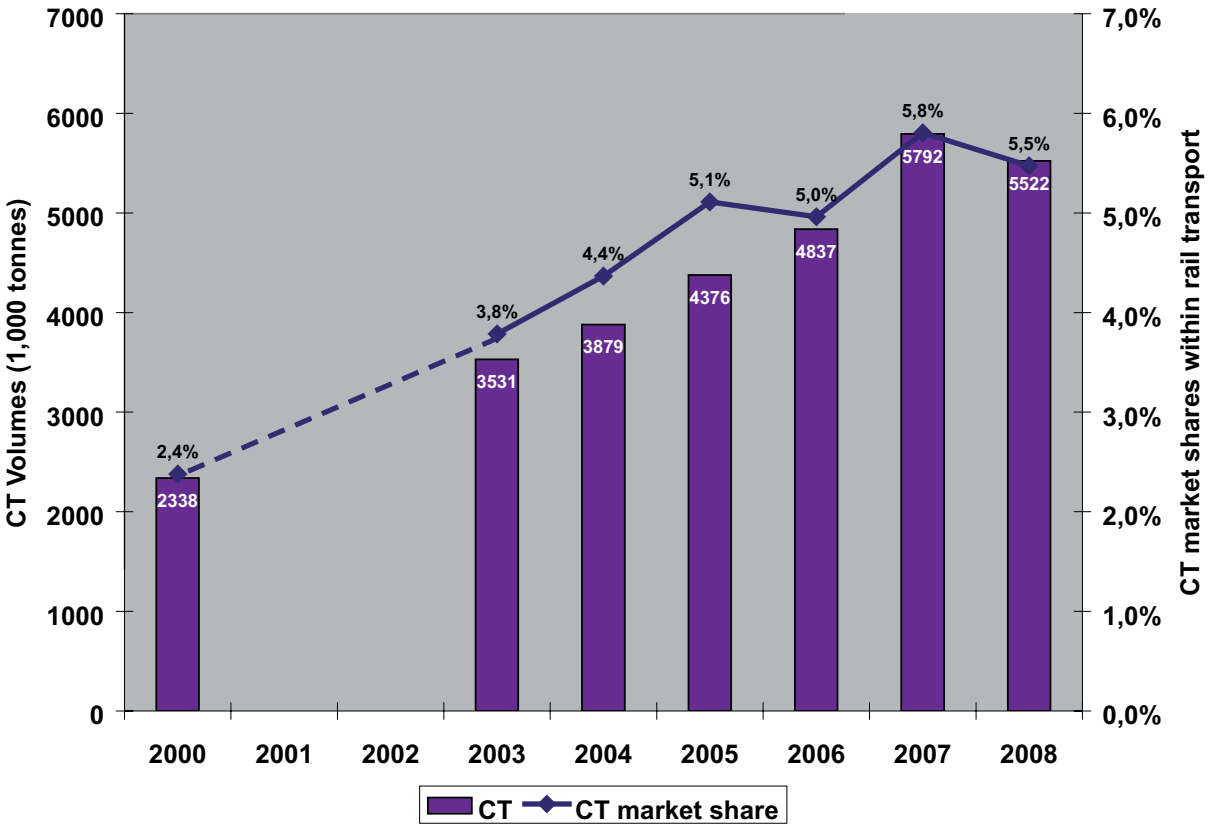
Hence, the drop of volumes between 2000 and 2003 is due to the suspension of the Skoda/ Rosner service in 2000/2001. On the other hand, the positive effect of the inauguration of Duisburg service (October 2005) and Hamburg Billwerder service (June 2006) on total volumes can easily be recognized.

Since the suspension of RoLa Dresden – Lovosice in 2004, accompanied CT has played no role in the Czech Republic anymore.

Figure 2-7 shows the development of the total CT volumes (maritime and continental). It becomes evident that it has known extraordinary growth rates during the last decade.

In the period between 2000 and 2008, this market has more than doubled, from 2.3 million gross tonnes in 2000 to approx. 5.5 million tonnes in 2008.

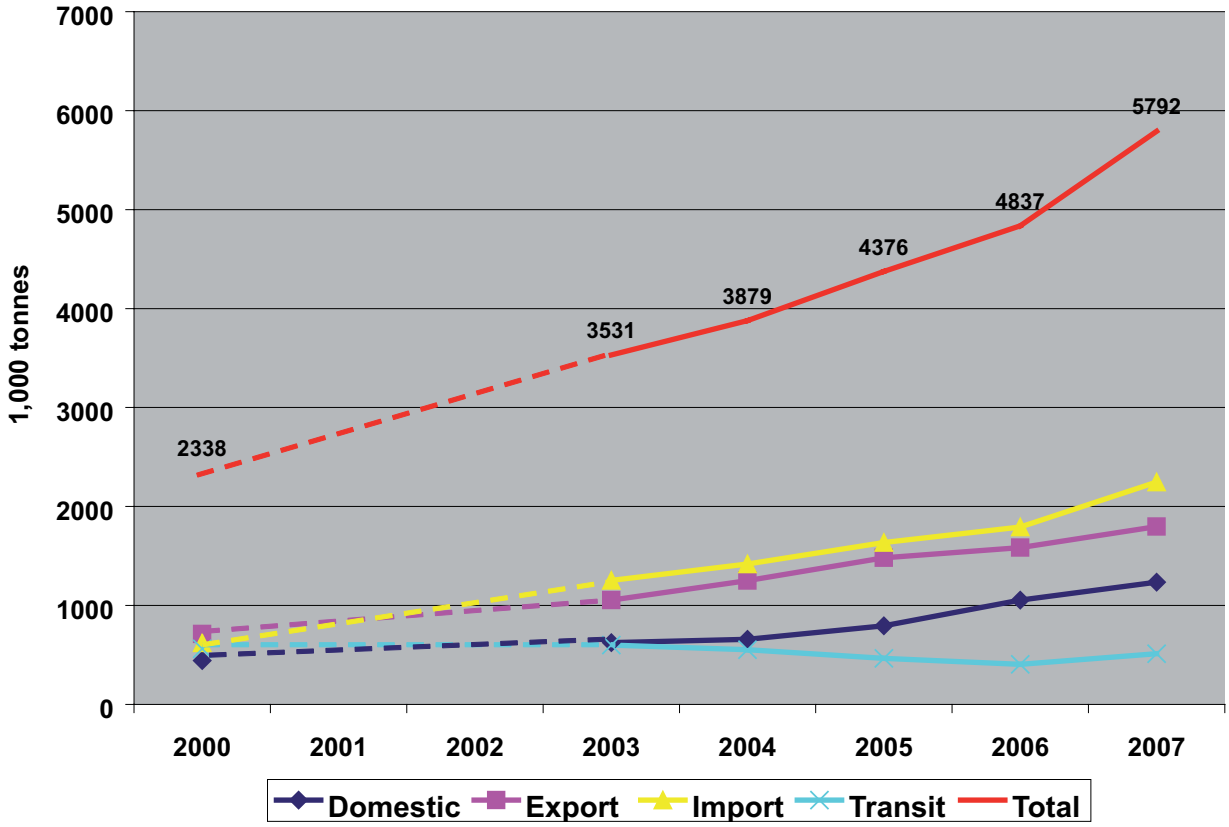
Figure 2-7: Development of CT volumes 2000 – 2008 in the Czech Republic (net tonnes)



Source: CD Cargo a.s.

In addition to growth rates, ***figure 2-7*** indicates the market share of CT in total railway volumes (blue line). Here again, a more than double increase can be observed. The market share which was only 2.4 % in 2000 grew to 5.5 % in 2008 after having reached its record high so far of 5.8 % in 2007. These results are even more positive on the background of the positive development of the conventional railway market presented in ***figure 1-9***, which reported a remarkable growth during the same period. It is worth mentioning that the total CT volume in France (5 million tonnes), which is 6 times bigger than the Czech Republic in terms of territory and population, does not even come close to CT volumes of the Czech Republic.

Figure 2-8: Development of combined transport per type of flow, 2000 - 2007



Source: CD Cargo a.s.

Figure 2-8 above reveals some interesting results. Between 2000 and 2007 a decreasing transit share can be observed, whereas domestic, import and export volumes show a practically consistent upward trend. This indicates that CT growth generated by the Czech Republic is directly depending on the performance of its economy and not generated by transit traffic, as is the case for example in Switzerland and Austria. One must not forget that in 2007 approx. 1.5 million tonnes represent "hidden transit" of gateway shipments, from/to the maritime ports, transhipped in Prague to Slovakia and Hungary, which nevertheless generates added value in the Prague terminals.

2.4 - Equipment

Regarding rolling stock currently in operation at ČD Cargo a.s. (March 2009) it becomes obvious that ČD Cargo a.s. disposes of a highly modern wagon fleet: 60 % of the rolling stock is made up of “ss” wagons, designed for a maximum speed of 120km/h. Actually nearly 30 % of the wagon fleet consists of completely new articulated wagons, most of which were built only in 2008.

Figure 2-9: Number by type of wagons in operation at ČD Cargo a.s.

Type	ČDC parc	Used by ČDC	In operation (March 2009)	Investments	
Sggmrss 90'	145	137	136	100 wagons	Apr 08
Sggrss 80'	200	200	200	200 wagons	Dez 08
Sgjs	179	179	112		
Sgnss	511	368	344		
Sgs	409	409	365		
Total	1444	1293	1157		

Source: ČD Cargo a.s.

To conclude, it can be said that the rolling stock – at least of ČD cargo a.s.- is very well adapted to the customers’ demands for modern CT services.

2.5 - Rail and intermodal terminal infrastructure

2.5.1 Rail infrastructure

The following figures describe the Czech rail network (see also ***figure 1-10***)

- Total length of the railway network: 9,501 km, thereof
  - single track lines: approx. 7,500 km
  - double or more track lines: 2,000 km
  - electrified: 2,943 km (thereof 60 % 3,000V DC and 40 % 25,000V 50 Hz AC)

2.5.1 Terminal infrastructure

Figure 2-10 presents an overview of the terminals in operation in 2007. Due to the fact that practically all terminals are privately owned, the volumes handled were published only for a few terminals

Figure 2-10: Terminals in operation in 2007 and volumes handled by selected terminals

Terminal	Volumes handled
Mělník	153.170 TEU in 2006
Lovosice	16.702 TEU in 2008
Zlín/Želechovice/Lípa	169.030 TEU in 2007
Praha Uhříněves	524.774 TEU in 2007
Ml. Boleslav	ca 24.000 TEU
Nýřany	no data available
Kopřivnice	no data available
Uherský brod	no data available
Přerov	no data available
Praha Žižkov	no data available
Brno	no data available
Nošovice	no data available

Source: Bohemiakombi (Lovosice), K+P Analysis of various publications

The most important terminal by far is Praha Uhříněves, With more than 524,000 TEU handled in 2007, this terminal ranks not only first in all CEE countries, it is also comparable to the big terminals in Germany or in other Western European countries..

Regarding the technical characteristics of the terminals currently in operation (including private sidings of the automotive industry), one can conclude of ***figure 2–11*** hereafter that, all in all, the technical equipment of the presently existing terminals is appropriate. Only some smaller terminals (e.g. Lovosice) offer insufficient rail length of less than 300 m.

Praha Uhříněves is an outstanding terminal also in terms of the technical standard of its equipment (sufficient track lengths and handling devices).

Figure 2-11: Technical characteristics of Czech terminals

Terminal	Owner	Operator	Tracks	Handling equipments
Lovosice	ČD, a.s.	ČD - DUSS Terminál, a.s.	1 x 240m, 1 x 280m	2 wheel freight handlers, 42 t (5 levels), 2 reachstackers Kalmar
Mělník	České přístavy, a.s. (Czech ports)	Mělník Intermodal Terminal, s.r.o.	1 x 600m, 2 x 618m	4 reachstackers 42 t
Praha Uhříněves	Metrans, a.s.	Metrans, a.s.	7 x 600m, 6 x 350m, 2 x 550m	4 locomotives, 6 Rail Mounted Gantry Cranes, 17 reachstackers: 6 reachstackers 42mt (5 high) 7 reachstackers 8 mt (7 high) 4 TEU reachstackers
Nýřany	Metrans, a.s.	Metrans, a.s.	1 x 350 m	2 reachstackers (Terex)
Zlín - Želechovice/Lípa	Metrans, a.s.	Metrans a.s.	2 x 350m, 3 x 550m	6 reachstackers 42 + 8 mt
Kopřivnice	Škoda TATRA Forwarding, a.s.	Škoda TATRA Forwarding, a.s.	1 x 150m, 1x 120m	1 portal crane, 2 side picks
Přerov	ČSKD Intrans, a.s.	ČSKD Intrans, a.s.	1 x 215m	1 wheel portal crane PD 38
Praha Žižkov	ČSKD Intrans, a.s.	ČSKD Intrans, a.s.	1 x 260m, 3 x 215m	3 reachstackers 45
Ml. Boleslav	Škoda Auto, a.s.	Škoda Auto, a.s., (Kaluga - Argo Bohemia)	1 x 155m, 1 x 175m	1 reachstacker
Nošovice	HYUNDAI Motor Czech s.r.o.	pac-tra Logistics (Czech), s.r.o., siding services - Raillex, a.s., provided exclusively for HYUNDAI	3 x 600m	2 reachstackers

Source: Terminal operators and various publications

2.6 - Conclusions

To sum up the observations made in the above chapters, it can be said that

- after having reached the minimum in 2005, rail volumes have recovered, in absolute figures as well as in the market share;
- CT has known extraordinary growth rates during the last decade. In the period between 2000 and 2008, this market has more than doubled from 2.3 million gross tonnes in 2000 to approx. 5.5 million tonnes in 2008;
- between 2000 and 2007 a decreasing transit share could be observed, whereas domestic, import and export volumes showed a practically constant upward trend, i.e. CT growth is directly depending on the performance of the Czech economy;
- out of 11 operators active in the Czech market, the “big five” operators (Metrans, ERS, ČSKD Intrans, Argo and Bohemiakombi/Kombiverkehr) hold more than 95 % of the market shares;
- the continental CT in the Czech Republic is mainly operated from/to the Lovosice terminal (Bohemiakombi/Kombiverkehr). Currently this market represents a share of 3-5 % of the total CT;
- by far the most important terminal is Praha Uhříněves (more than 524,000 TEU handled in 2007);
- the rolling stock – at least of ČD Cargo a.s. - is very well adapted to the customers’ demand for modern CT services.

CT is definitely the most dynamic transport market in the Czech Republic. The state of maturity of CT in the Czech Republic is apparently comparable to other western European countries. This not only refers to the terminals but also to rolling stock (wagons) and the number of daily departures, especially from/to Prague.

3. EVOLUTION OF INTERMODAL RAIL/ROAD TRAFFIC IN THE CZECH REPUBLIC UNTIL 2020

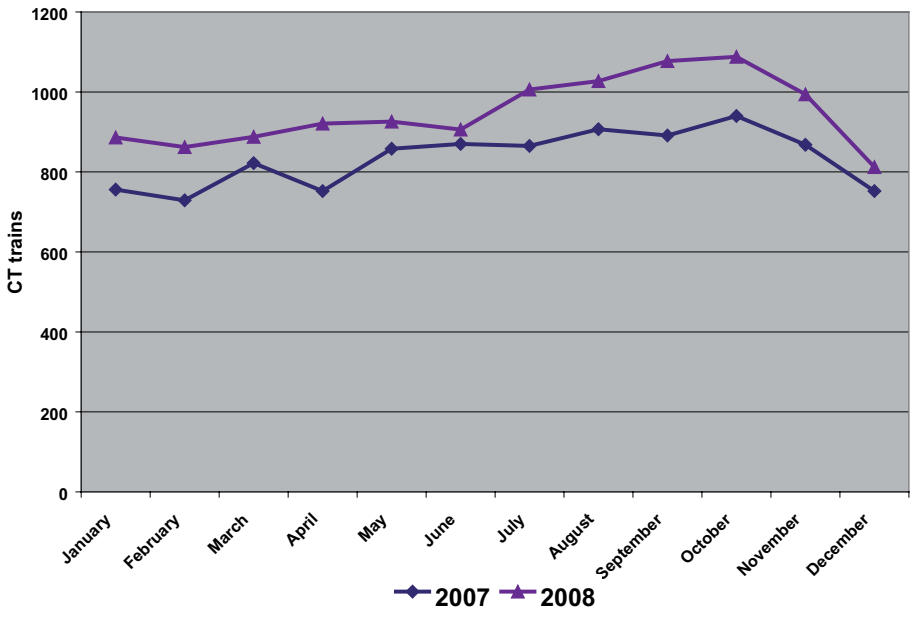
3.1 - Recent developments until 2009

All observations made in chapter 2, in particular regarding the growth of combined transport, refer to the situation before the economic crisis. It goes without saying that CT in the Czech Republic has also been hit by the recession.

Figure 3-1 presents a monthly comparison of CT volumes for the year 2007 and 2008. It is obvious that, in the period between January and October 2008, monthly volumes were constantly above the comparable figures of 2007. Only in November and December 2008 volumes considerably dropped, remaining slightly, however, above 2007 values. This situation finally led to still positive results for the whole year 2008 with an absolute growth of +14 % compared to the previous year.

Regrettably, the monthly figures for the first six months of 2009 are not yet available. CT actors however expect a drop in volumes. Different estimations expect a drop in the range of approximately 20 %.

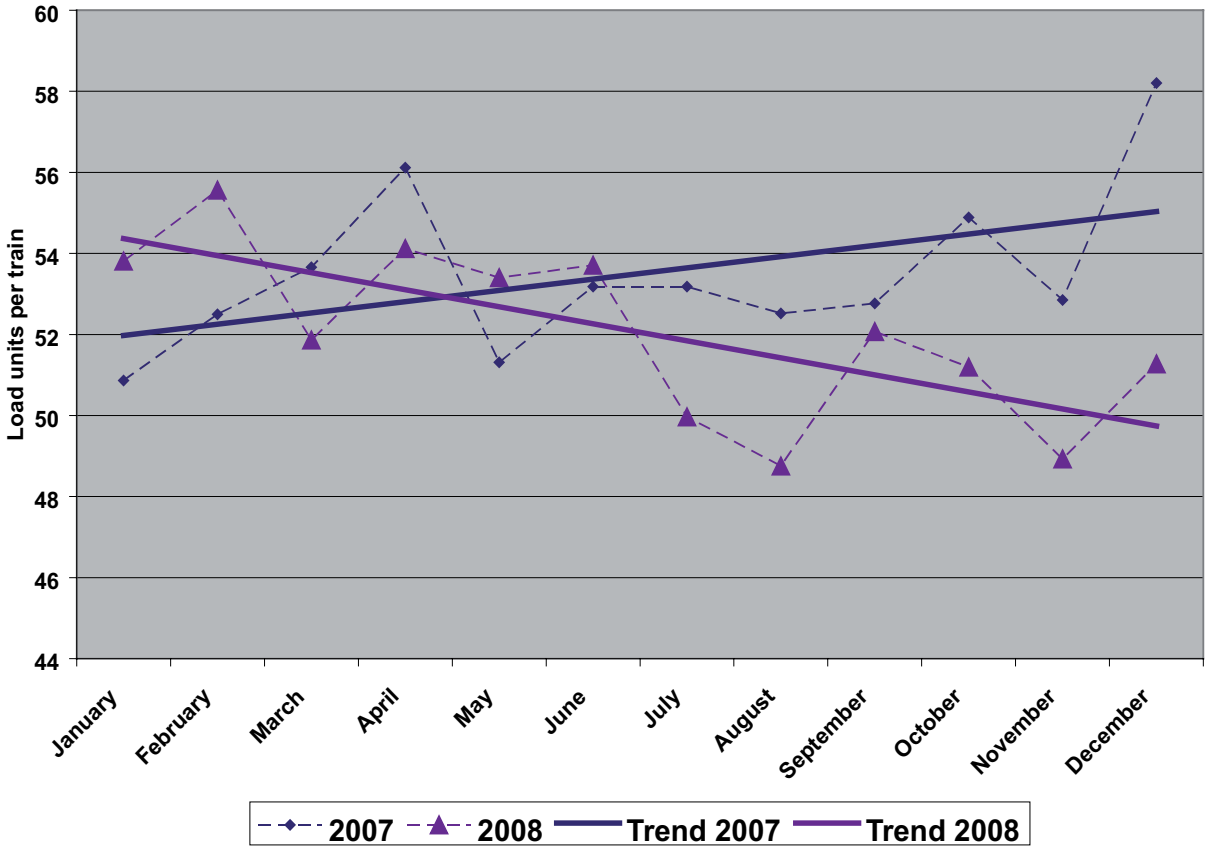
Figure 3-1: Comparison of monthly CT volumes 2007 - 2008



Source: ČD Cargo a.s.

The comparison of CT volumes 2007 and 2008 should be completed by an analysis of the average capacity use per train in this period (***figure 3-2***)

Figure 3-2: Comparison of the use of capacity per CT train 2007/2008



Source: ČD cargo

It can be seen that in 2007 (blue line) the average capacity utilization per train considerably increased from 52 load units (LU) to 55, corresponding to a 6 % growth. Contrarily, the 2008 trend, in particular during the second half of the year, shows a decline of -11 % from 55 LU to less than 50 LU. This observation confirms the impression stated by ČD Cargo a.s. that the competitiveness of CT is deteriorating.

3.2 - Analysis of impact factors

The preparation of a CT forecast in the framework of the DIOMIS project requires a comprehensive and consistent framework of general expectations concerning economic and logistic trends throughout Europe. This is crucial, since, as was pointed out in the previous chapters, the Czech combined transport is to a large extent dependent on the development of external trade in general, and maritime transport in particular. Therefore, the general expectations, the key drivers (opportunities) and the critical factors (threats) for the development of CT will be presented below:

For the forecast horizon until 2020, we expect in general that

- intermodal traffic on international lanes between CEE countries and western Europe will grow faster than the market on the whole
- container hinterland traffic will remain dominant in the Czech Republic due to increasing transcontinental trade
- in medium-term horizon (> 2012), however, a significant growth of continental intermodal transport will take place due to an increasing division of labour volumes of international long-distance freight traffic of semi-finished and finished products
- intra-CEE intermodal traffic's market share remains comparatively small
- increased integration of intra-CEE exchange of manufactured products into European supply chains
- growth of private consumption and state investments in CEE countries
- ongoing improvement of rail infrastructure as well as the construction and modernisation of terminals in the Czech Republic and the other CEE countries
- improved competitiveness of rail owing to a comparatively larger increase of road costs (drivers' working time, wages, fuel, Europe-wide implementation of toll systems)
- growing shippers' concern to secure durable supply chains
- industrialization of intermodal production:
    - standardization of processes and technology
    - employment of efficient rail production systems
    - advanced interface management
    - commitment to reliable and consistent services
    - interoperability

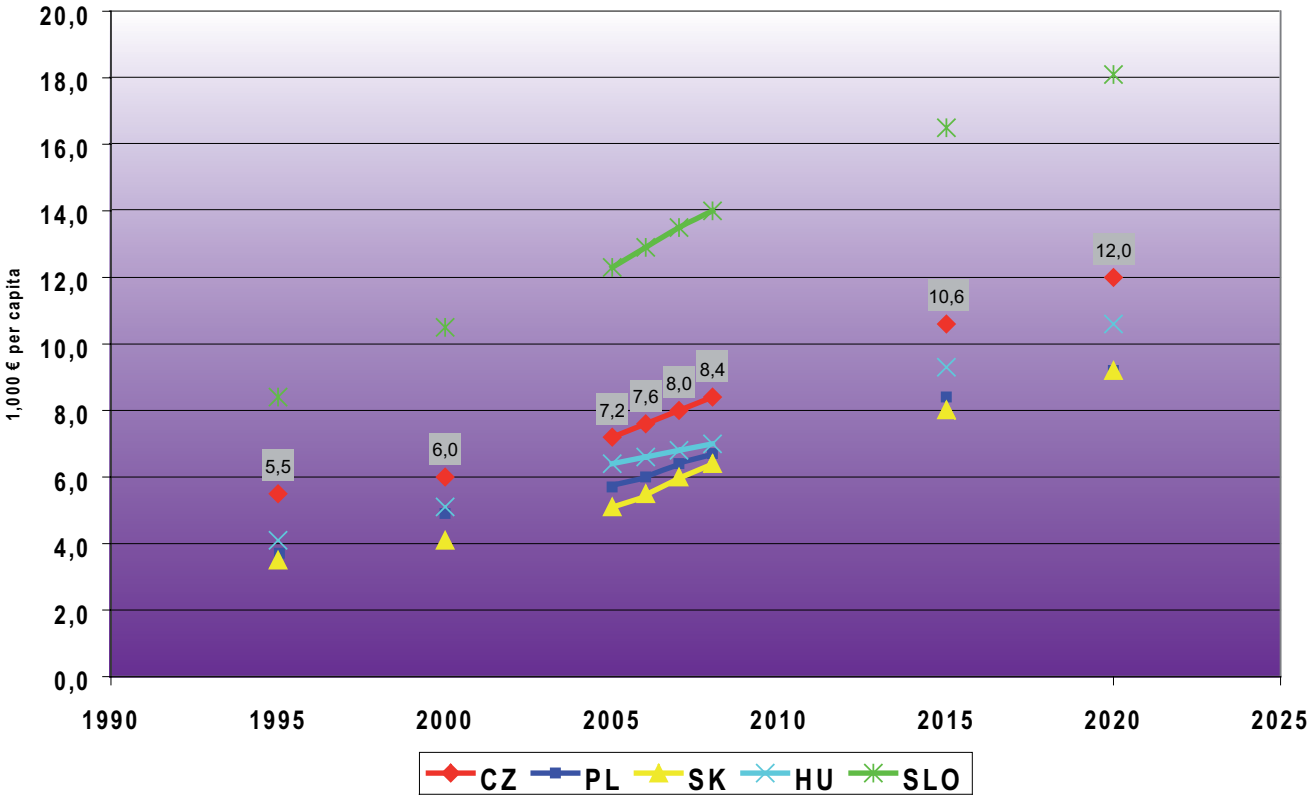
- synchronization of processes between railways and operators
- data interchange
- tracking of shipments

- sufficient capacities on western European rail network and on “connectors” with CEE countries (border crossings; elimination of Achilles’ heels) as a pre-requisite
- growing capabilities of CEE container ports in inter-regional competition and vis-à-vis the North Sea ports which however will remain by far dominant
- 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

In addition to these general expectations, we observe the following specific opportunities for the Czech Republic:

- According to the economic forecasts (e.g. progtrans) the GDP per capita will remain the highest – after Slovenia - in all CEE countries covered by the DIOMIS study (***figure 3-3***)
- Ongoing growth of foreign investments, in the long run (>2015) primarily into the economic growth poles Central Bohemia and Northern Moravia
- In the long run, the economy of current backward regions, in particular Middle Moravia (Olomouc) which generates only around 60 % of the average EU GDP per capita (in comparison: Prague generates 160 %), will catch up
- This will be a pre-requisite for the implementation of point-to-point intermodal (block train) services.

Figure 3-3: Development of GDP per capita in selected countries 1995 - 2025



Source: progtrans

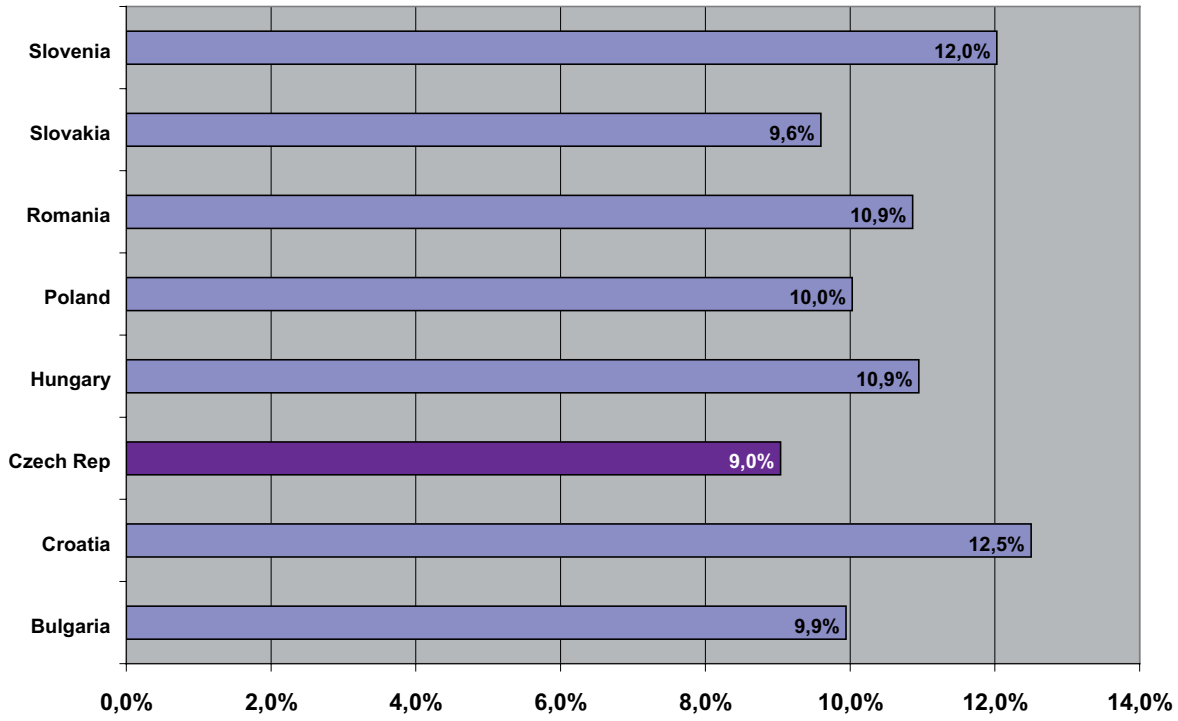
- Due to its geostrategic position the Prague region will remain the turntable between North Sea ports, in particular Hamburg and Bremerhaven, Slovakia and Hungary.

Besides these opportunities, however, CT in the Czech Republic has to face the following threats:

- Domestic intermodal traffic in the Czech Republic will be widely limited to distribution/ collection of international shipments on national services via gateways, but short distances between growth poles inside the Czech Republic, and between the country and its neighbours, hamper the implementation of hub/platform production systems to serve less-than-trainload volumes.
- Even if we expect the less developed regions to catch up, it seems probable that the concentration of the economic and logistic activity in the existing growth poles will continue in the mid term.

- For the time being non-discriminatory access to terminals is not always guaranteed.
- The positive economic development (***figure 3-3***) is mainly driven by the service sector. This leads to the expectation of a comparatively low growth for the traffic demand (expressed in tonnekilometers for road and rail).

Figure 3-4: Comparison of forecast growth in tonnekilometres (road + rail) in selected CEE countries 2007 - 2025



Source: progtrans

According to ***figure 3-4***, analysts expect the weakest growth of all DIOMIS CEE countries (+9.0 %) for the Czech Republic. These forecasts will however be offset by the general expectation that - as was pointed out above - intermodal traffic on international lanes between CEE countries and western Europe will grow faster than the market as a whole.

3.3 - Evolution of total intermodal rail/road traffic by 2020

Condensing the general expectations, the opportunities and the threats presented, we have developed the following forecast by 2020 for the Czech Combined Transport (***figure 3-5***)

Figure 3-5: Evolution of total intermodal rail/road traffic per market segment by 2020 (TEU/year)

Intermodal market segment		TEU	Market share	TEU	Market share	Total growth
Unaccompanied traffic		**831.565**	**100,0%**	**1.963.300**	**100,0%**	**120,3%**
Domestic	Gateway shipments	84.500	10,2%	101.400	5,2%	20,0%
	Subtotal	**84.500**	**10,2%**	**101.400**	**5,2%**	**20,0%**
International	maritime	523.365	62,9%	1.206.900	61,5%	130,6%
	continental	27.100	3,3%	195.700	10,0%	622,1%
	Subtotal	**550.465**	**66,2%**	**1.402.600**	**71,4%**	**154,8%**
Transit	maritime	189.200	22,8%	433.300	22,1%	129,0%
	continental	7.400	0,9%	26.000	1,3%	251,4%
	Subtotal	**196.600**	**23,6%**	**459.300**	**23,4%**	**133,6%**
Accompanied traffic			**0,0%**		**0,0%**	**-**
Total intermodal traffic		**831.565**	**100,0%**	**1.963.300**	**100,0%**	**136,1%**

Source: K+P Analysis

This can be summarized as follows:

- Total intermodal traffic in the Czech Republic will more than double (+136.1 %) until 2020 to nearly 2 million TEU.
- Despite a slight decrease, maritime CT will still hold the biggest market share in 2020 (2007: 85.7 %, 2020: 83.5 %).
- Continental traffic will reach by far the highest growth rates (international +622.1 %, transit +251.4 %).
- The market share of continental traffic will almost treble (+172 %).

For the purpose of the capacity analysis in the following chapter, forecast TEU have been converted into trains. In addition, we assumed an increase in productivity through 14 % additional capacity utilization per train for the year 2020. Consequently, the 136 % TEU growth forecast for 2020 can be achieved with less than the double number of trains (+96 %).

4. IMPACT OF EVOLUTION OF INTERMODAL TRAFFIC ON INFRASTRUCTURE

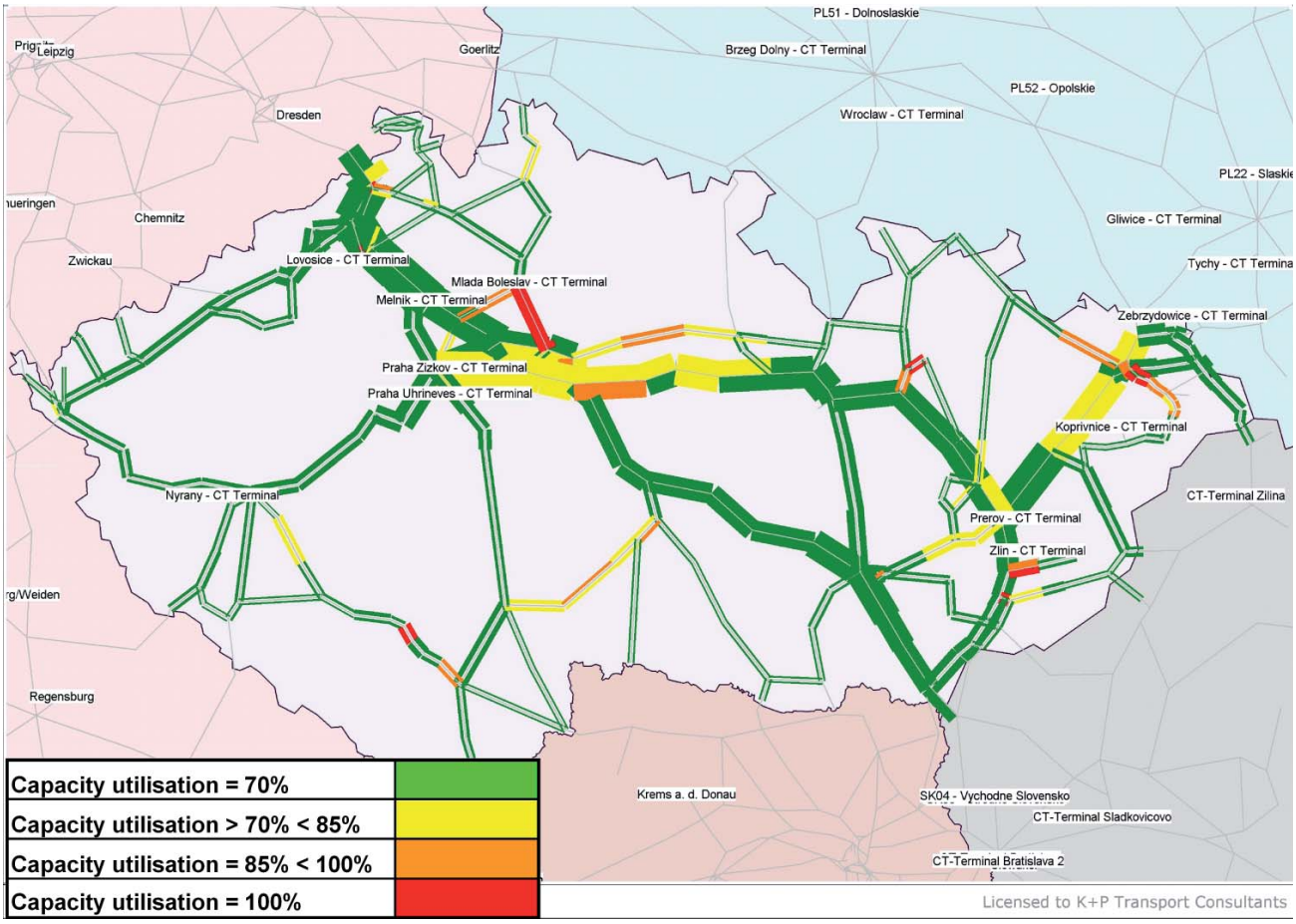
4.1 - Impact on rail network capacity

Both, the load on the Czech rail network as well as a capacity analysis for the year 2007 are visualized ***figure 4-1***. This assignment was based on the same method which has already been used successfully in the other DIOMIS studies: In a first step, the network was loaded with conventional freight trains and passenger trains. The relevant data for each track was supplied by SŽDC, the Czech infrastructure manager. In a next step, CT trains were assigned to the network. The capacity analysis was partially prepared on data again provided by SŽDC for the most important railway axes. For the rest of the rail network it was based on the assumption that a double-track electrified line offers a maximum theoretic capacity of 144 train movements per day and direction. The corresponding value for one-track lines is 40 train movements per day and direction. As can be seen in ***Figure 4-1***, some considerable capacity shortages exist throughout the rail network in 2007. These occurred in particular on the following network sections:

- east of Prague (Prague – Usti n.O.)
- in the eastern part of the republic, in the Olomouc region and further to Ostrava and the Polish border
- and on some sections in the south-western parts of the country.

These bottlenecks, which have been determined by a model have been discussed and validated with the experts of SŽDC.

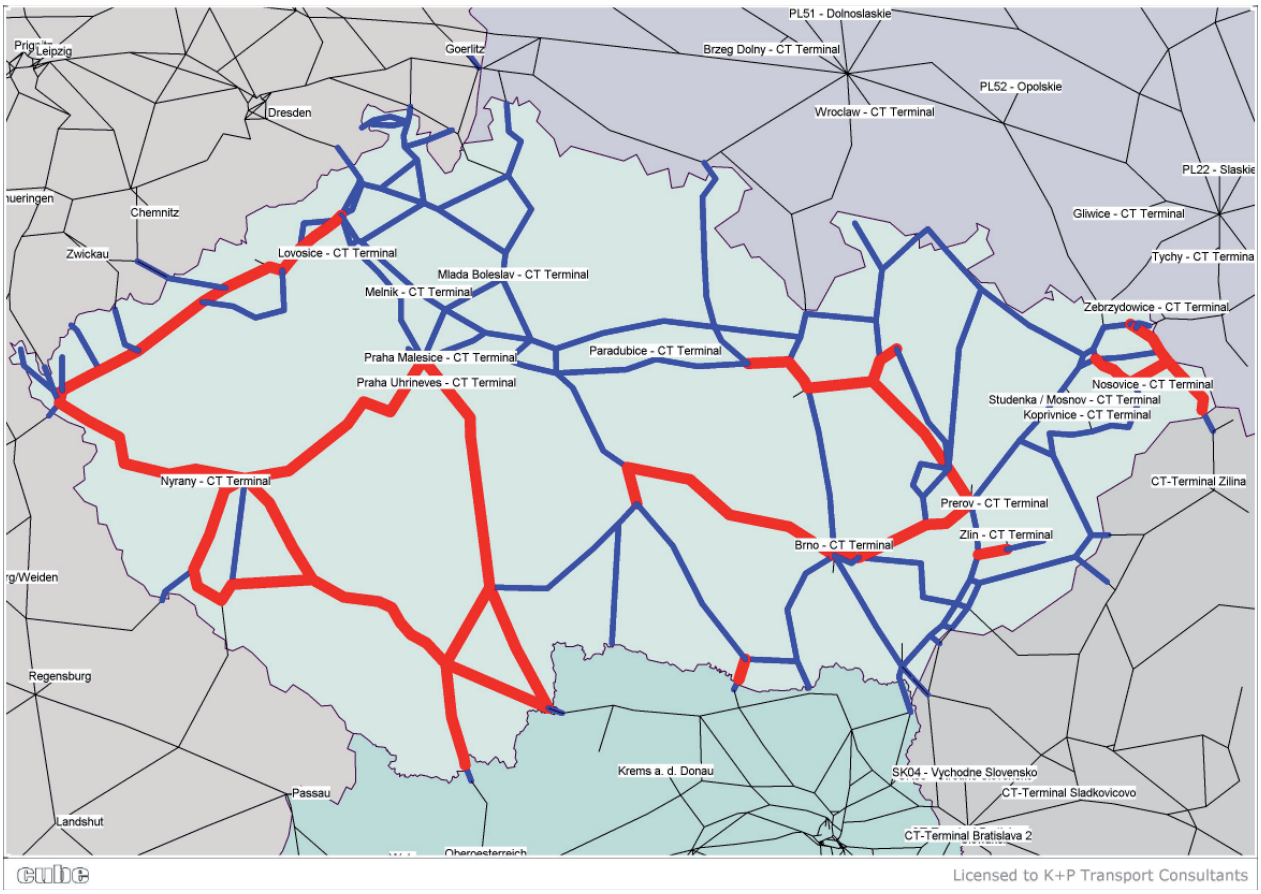
Figure 4-1: Train load and capacity utilisation of the network of the Czech Republic in 2007



Source: K+P Analysis

The capacity analysis 2020 was prepared as follows: We started with the assumption of a +26 % increase in conventional rail transport (on the basis of the forecast prepared by progtrans). The second assumption appears to be rather conservative: the number of passenger trains on the network was assumed to remain constant. For the Prague region in particular this is not true, since an expansion of local and regional public transport is scheduled, as is for the connection Prague – Plsen. Then, the following infrastructure investments planned for the Czech rail network were implemented.

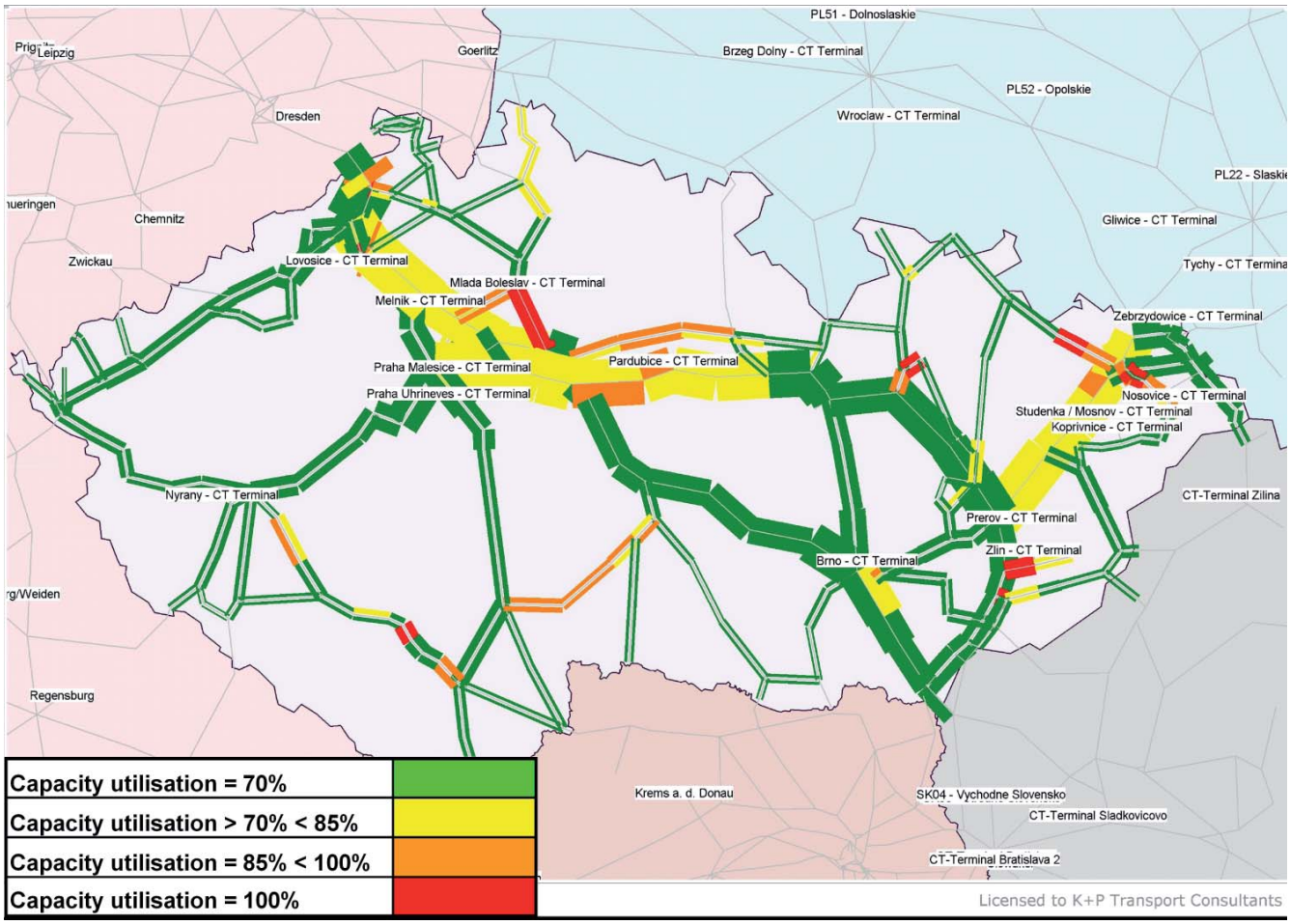
Figure 4-2: Planned capacity enlargement investments by 2020



Source: SŽDC, K+P Analysis

Finally, the CT trains carrying the demand forecasted in ***figure 3-5*** were assigned to the network. The result thereof can be seen in ***figure 4-3***.

Figure 4-3: Train load and capacity utilisation of the Czech network 2020



Source: K+P Analysis

Figure 4-3 clearly shows capacity bottlenecks (capacity utilisation > 85 %) for the year 2020

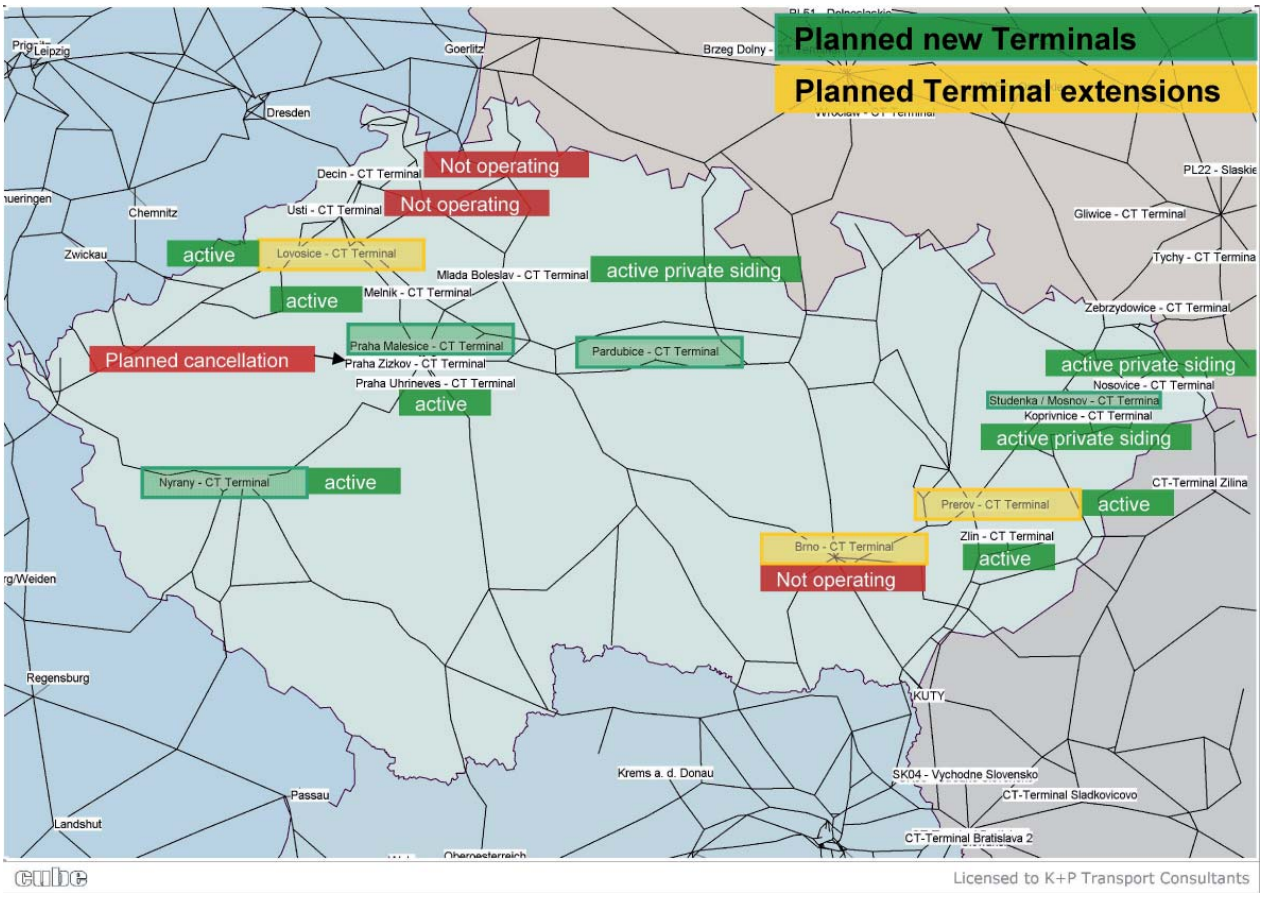
- on some links in the Prague region,
- between Olomouc and Ostrava,
- between Plsen and České Budějovice,
- as well as in the Brno and Zlin region.

We would like to remind 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.

4.2 - Impact on terminal capacity

Figure 4-4 presents an overview of the terminals, their localisation, the current state of operation, the planned extensions of existing terminals and the planned new terminals in the Czech Republic.

Figure 4-4: CT Terminals in the Czech Republic and planned investments



Source: SŽDC, ČD cargo, K+P Analysis

Figure 4-5 shows an overview – as far data was available – of present volumes handled, and, in addition, the results of the estimations of technical capacities available in 2007. This information was provided by a calculation model accounting for the capacity of the handling devices, the length and the number of tracks. According to the model overall capacities of 880,000 load units were handled in the year 2007.

Even if some terminal operators couldn't supply reliable data on the volumes actually handled, they all agreed during talks that capacities are sufficient for current volumes. Contrarily to e.g. Slovakia no coordinated terminal development plan exist in the Czech Republic for the time being. The ministry, terminal operators and infrastructure managers discuss more or less concrete projects for the further development of the terminal infrastructure. In this context five new terminals and the extension of two existing terminals are being discussed (***figure 4-5***). Consequently, the results of this study may help to further concretise the future needs for terminal capacity enlargement.

Figure 4-5: Terminal handling capacity in the Czech Republic by 2007 and planned extensions

Terminal	Volumes handled	Capacity 2007 (load units)	Capacity extensions planned
Mělník	153.170 TEU in 2006	110,160	
Lovosice	16.702 TEU in 2008	10,800	extension planned
Zlín/Želechovice/Lípa	169.030 TEU in 2007	141,000	
Praha Uhříněves	524.774 TEU in 2007	444,000	
Ml. Boleslav	ca 24.000 TEU	13,200	
Nýřany	no data available	14,000	will be replaced by a new terminal
Kopřivnice	no data available	10,800	
Uherský brod	no data available	no data available	
Přerov	no data available	8,600	
Praha Žižkov	no data available	54,300	will be replaced by a new terminal in the Prague region
Brno	no data available	no data available	extension planned
Nošovice	no data available	72,000	
Pardubice			new terminal planned
Ostrava			new terminal planned
České Budějovice			new terminal planned
Total		878,860	

Source: K+P/KC Analysis

5. RECOMMENDATIONS ON INTERMODAL STRATEGY

To resume the analyses and forecasts presented and discussed in the foregoing chapters, the following key points can be developed, which may serve as a guideline for an intermodal strategy in the Czech Republic:

In principle, CT is going strong:

- Hamburg – Prague is one of the biggest flows in the European CT.
- One departure in each direction every 6 hours makes this service a real “conveyor belt”.
- In terms of efficiency, the terminal in Praha Uhříněves is very well comparable to the major western European terminals.
- Prague functions as a turntable with regular gateway services to Slovakia and Hungary.
- Seamless international intermodal services (i.e. synchronization of processes between railways and operators, data interchange, tracking of shipments) work well with DB, ŽSSK and RCA.

At a closer look, however, some threats become apparent which could hamper the expected growth.

Currently, the CT in Czech Republic is geared to a large extend towards the maritime market, as is still the case in all CEE countries observed. According to our forecast, maritime CT will remain predominant in the future but the continental CT market will grow much more dynamically. On this background it is of utmost importance that continental transport benefits of non-discriminating access to CT and that an approach should be initialized to guarantee this.

Another aspect in this context is that the organisation of the internal flows and the storage of load units are completely different in maritime and continental terminals.

Hence, this would mean that in view of the expected growth of the continental market new terminals should be appropriate.

Another threat is that the lauding gauge limits the use of semitrailers in pocket wagons, especially beyond the Lovosice terminal. A particular bottleneck in this context is a tunnel in the Prague area, the enlargement of which is scheduled for the near future.

Another issue is posed by the focus on passenger transports. As a result, even newly built sections are designed for train lengths of maximum 600m only. This is clearly contrasting the overall tendency for longer trains aiming at a better utilization of track capacities.

Even though seamless international intermodal services work well with most neighbour countries some barriers, in particular with Poland still exist.

Our capacity analysis has clearly shown that even under very pessimistic growth assumptions for conventional rail freight and passenger transport considerable bottlenecks will occur by 2020, even if all planned capacity enlargement investments are assumed to have been realized by this time. Especially beyond Prague to the East these bottlenecks will make this axis the Czech Achilles' heel.

Overall, an increased awareness of CT in politics would be desirable. The dissolution of a special department for combined transport in the ministry may further illustrate this.

To conclude, we see the following central fields of action for the development of combined transport in the Czech Republic:

- Infrastructure capacity enlargement for terminals as well as for the railway network to cope with the expected growth of CT, in particular regarding the requirements of continental CT
- Further development of seamless international services, in particular with Poland
- Further development of continental CT
- Raising awareness among politicians and creating the appropriate environment for the development of combined transport.

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