DIOMIS

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

SLOVENIA

Developing Infrastructure & Operating Models for Intermodal Shift

December 2009

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Warning

CONTENTS

1. Socio-economic information on Slovenia 1

1.1 - Population 4

1.2 - Economy 5

1.3 - Freight traffic 13

2. Current state of intermodal rail/road traffic in Slovenia 18

2.1 - Intermodal actors 18

2.2 - Legal framework 21

2.3 - Overview on total intermodal market 23

2.4 - Unaccompanied intermodal traffic 26

2.4.1 - Domestic traffic 26

2.4.2 - International traffic 27

2.5 - Accompanied traffic 29

2.6 - Equipment 31

2.7 - Rail and intermodal terminal infrastructure 32

2.7.1 - Rail network 32

2.7.2 - Terminal infrastructure 34

3. Evolution of intermodal rail/road traffic in Slovenia by 2020 36

3.1 - Recent developments until 2009 36

3.2 - Projections of national transport policy 38

3.3 - Analysis of impact factors 38

3.3.1 - Development of road and rail traffic 39

3.3.2 - Population 40

3.3.3 - Evolution of gross domestic product 42
3.3.4 - Evolution of manufacturing industry and foreign investments 43
3.3.5 - Evolution of private consumption 44
3.3.6 - Evolution of external trade 44
3.3.7 - Intermodal competition 45
3.3.8 - Sustainable logistics 48
3.3.9 - Port development 49
3.3.10 - Rail infrastructure and terminal development 52
3.3.11 - Evolution of intermodal industry 57
3.4 - Evolution of domestic intermodal rail/road traffic by 2020 58
3.5 - Evolution of international intermodal rail/road traffic by 2020 59
3.6 - Evolution of total intermodal rail/road traffic by 2020 62

4. Impact of evolution of intermodal traffic on infrastructure ... 65
4.1 - Impact on rail network capacity 65
4.2 - Impact on terminal capacity 66

5. Recommendations on intermodal strategy 70

List of Figures 73

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

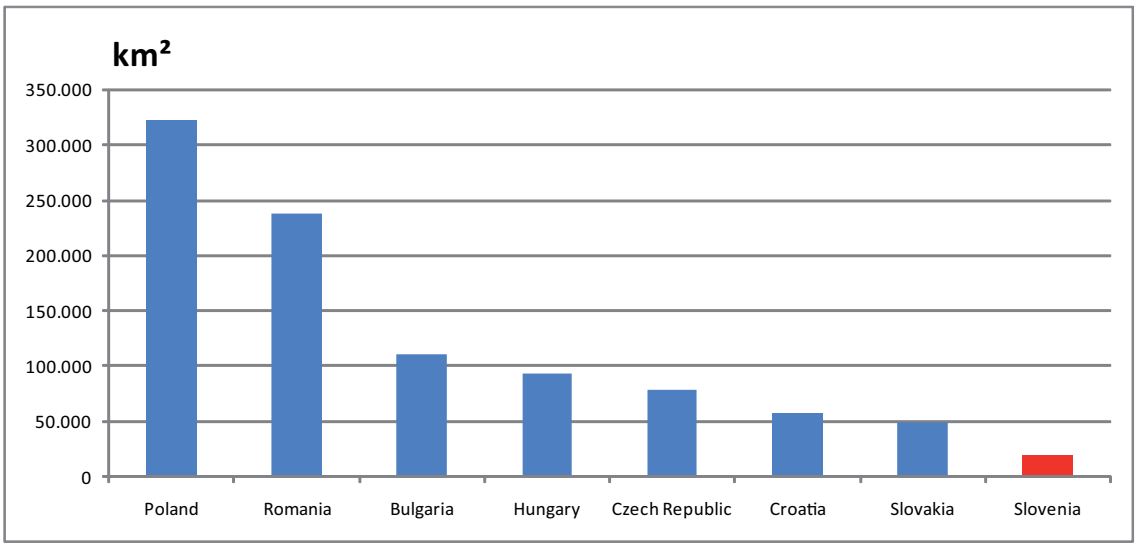
December 2009

1. SOCIO-ECONOMIC INFORMATION ON SLOVENIA

The Republic of Slovenia is located in South-East Europe and covers an area of 20,273 km² (half the size of Switzerland). It has borders with Italy, Austria, Croatia and Hungary, and stretches across the Alps, the Dinaric Alps and the Pannonian Plain to the Mediterranean. In spite of its geographically small size, it is a convergence point for a range of different landscapes, each of which has its own characteristics and unique features.

Forests cover half the territory of the country (10,124 km²); Slovenia is the third most forested country in Europe, after Finland and Sweden. Remnants of primeval forests can still be found, the largest in the Kocevje area. Grassland covers 5,593 km² of the country and fields and gardens 2,471 km². There are also 363 km² of orchards and 216 km² of vineyards. Among the DIOMIS study countries Slovenia is by far the smallest.

Figure 1-1: Size of selected CEE countries (km²)



Source: Eurostat, KombiConsult analysis

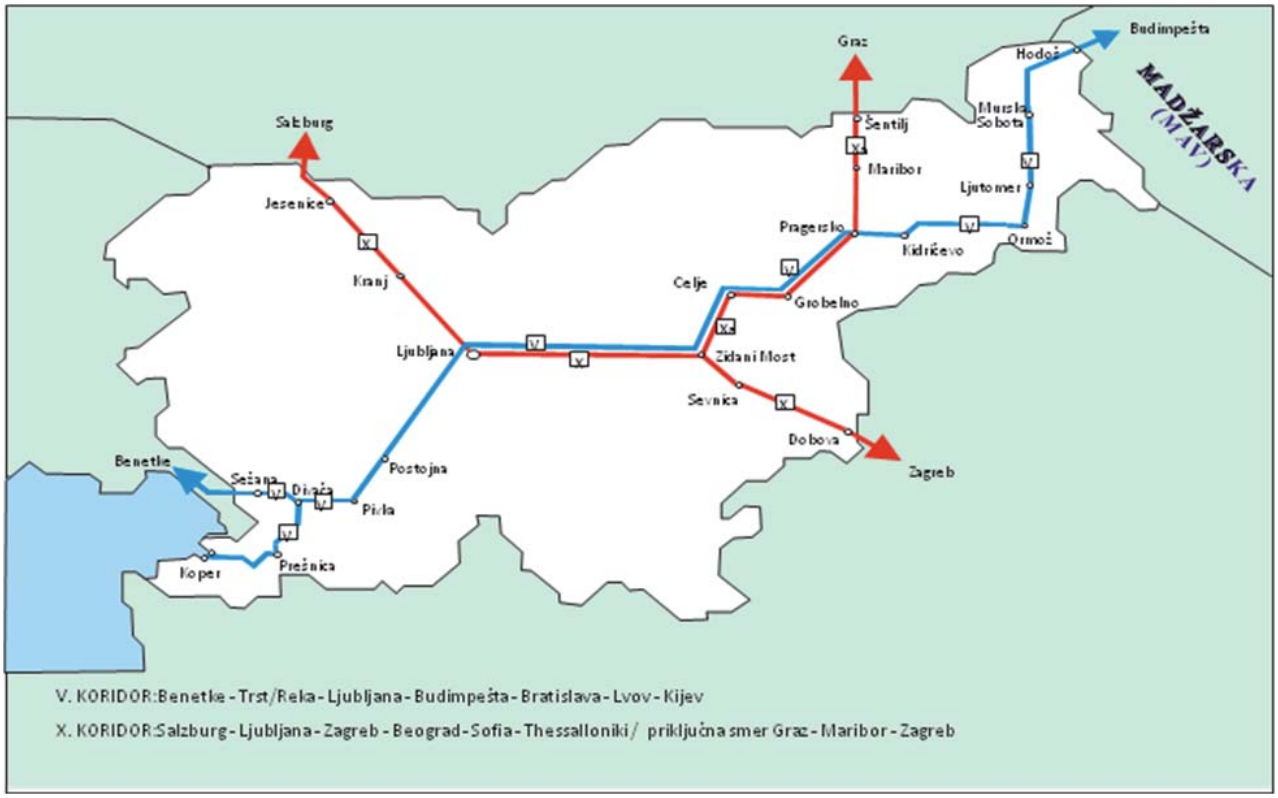
Due to its geographic position Slovenia is highly important for the establishment of effective transport links between Western European and the Balkans as well as for the connection between Central Europe and the Adriatic / Mediterranean Sea.

The following Pan-European Transport Corridors are intersected in the country:

- Corridor N° X (Salzburg – Villach) – Jesenice - Ljubljana / (Graz) - Maribor - Zidani Most - Dobova – (Zagreb – Novska - Vinkovici – Sid - Beograd – Nis - Skopje – Thessaloniki)
- Corridor N° Va : (Venezia - Trieste – Villa Opicina) - Sezana / Koper – Ljubljana – Maribor - Hodos - (Budapest – Uzgorod – Lvov - Kiev)

The latter is also subject to a TEN-T Priority Project under the chair of a European Co-ordinator, which should facilitate a co-ordinated implementation of measures.

Figure 1-2: Pan-European (rail) corridors crossing Slovenia

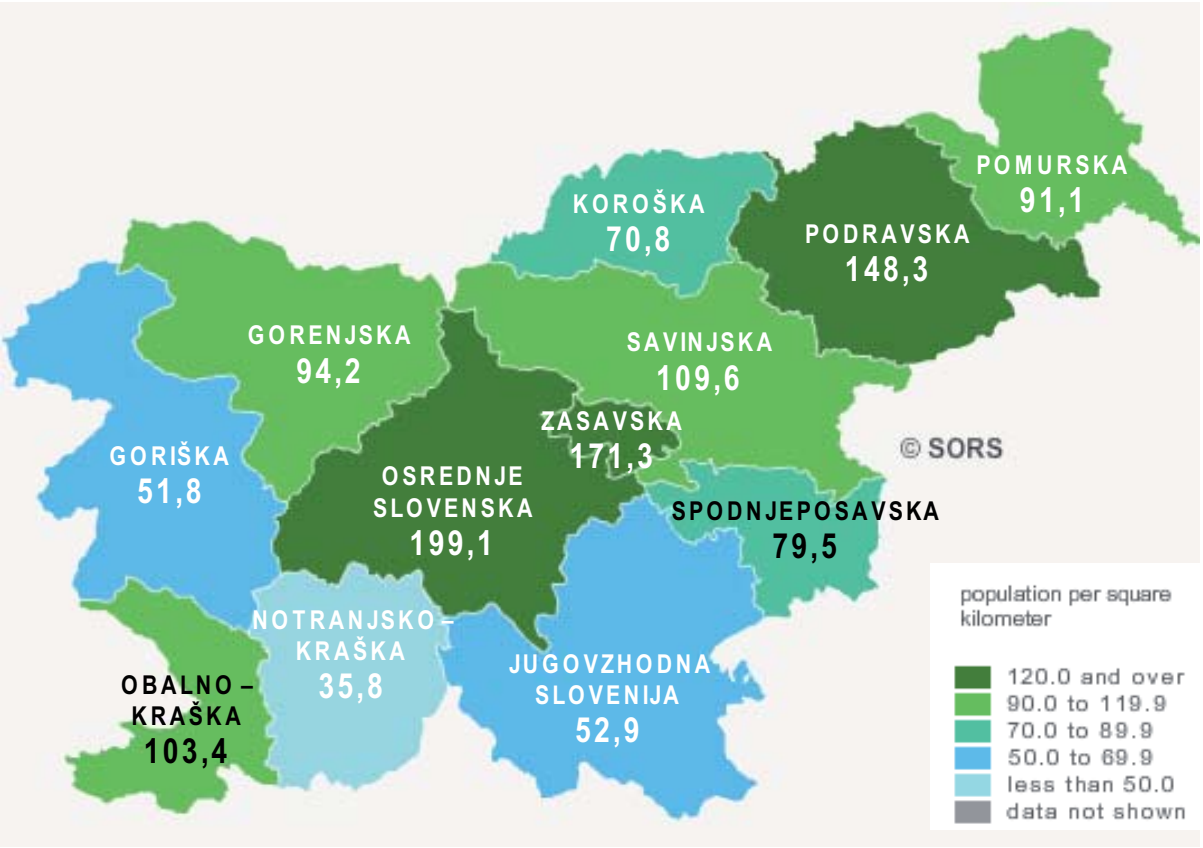


Source: SZ Infrastructure Network Statement

Nevertheless, the small size of the country with a diameter of not more than about 250 km create a real challenge for establishing competitive domestic rail freight services.

The Republic of Slovenia administratively is divided into 210 municipalities (*obcine*) which are grouped into twelve statistical regions (see ***Figure 1-3***). There is no further administrative or political power between the central government in these municipalities.

Figure 1-3: Slovenia: administrative division by counties and population density



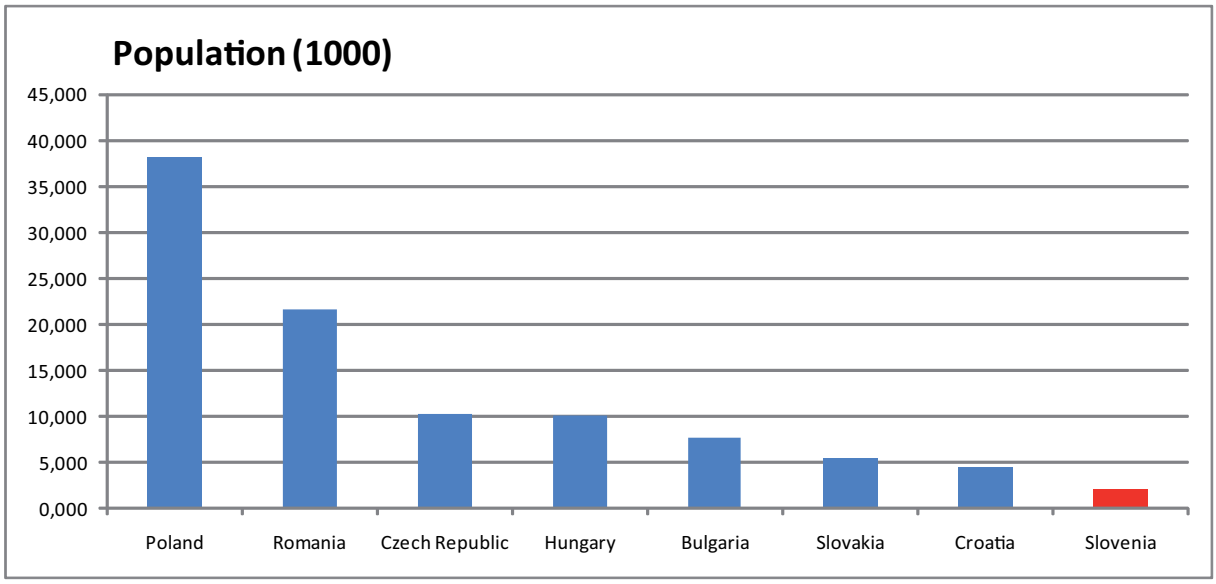
Source: SORS, Interactive Statistical Atlas of Slovenia, KombiConsult analysis

1.1 - Population

Similar to the administrative powers, the Slovenian population is concentrated in the Centre. 25 per cent of a total of 2,025,866 persons (31.12.2007) live in the region of Osrednjeslovenska in Central Slovenia with the capital of Ljubljana (268,000 inhabitants). In addition this region showed also the largest growth rates among all Slovenian regions in recent years. Even if Ljubljana is the largest city the second next is Maribor with 111,300 inhabitants. The next bigger settlements are the municipality of Kranj (53,900), Koper (50,700), Celje (49,500), Novo mesto (35,700), Valenje (34,100), Domzale (32,700) and Nova Gorica (32,200). All other municipalities have less than 30,000 inhabitants (see ***Figure 1-3***).

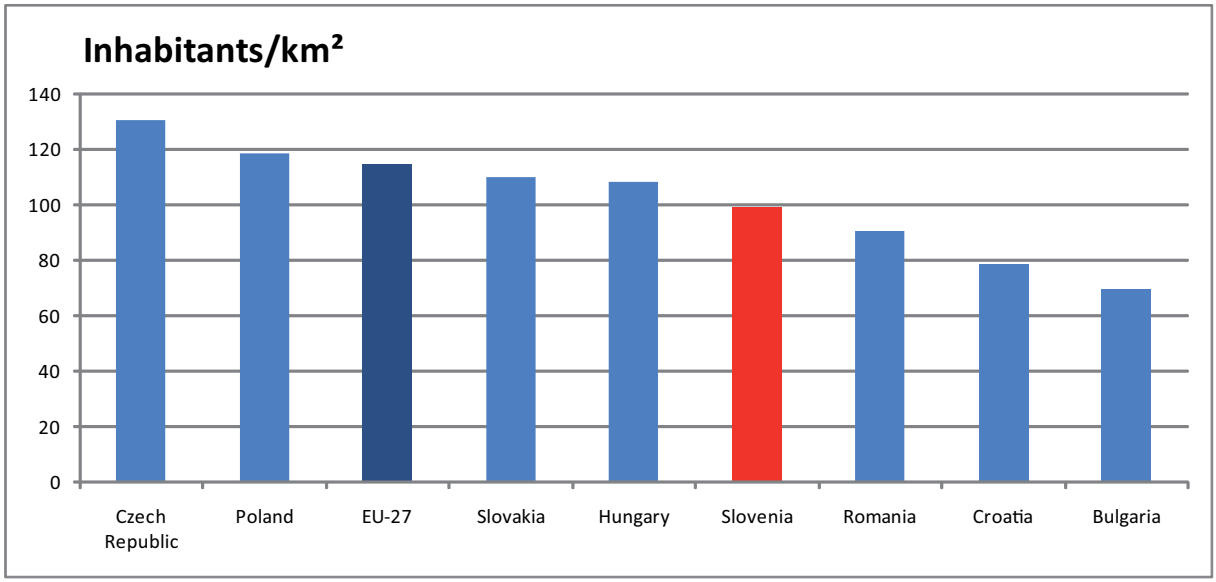
Among the CEE states covered by this DIOMIS study Slovenia is the smallest country both in terms of the population and the size of the territory, which accounts for 20,273 km² (see ***Figure 1-4***).

Figure 1-4: Population of selected CEE countries, 2007



Source: Eurostat, KombiConsult analysis

Figure 1-5: Inhabitants per area of selected CEE countries, 2007



Source: Eurostat, KombiConsult analysis

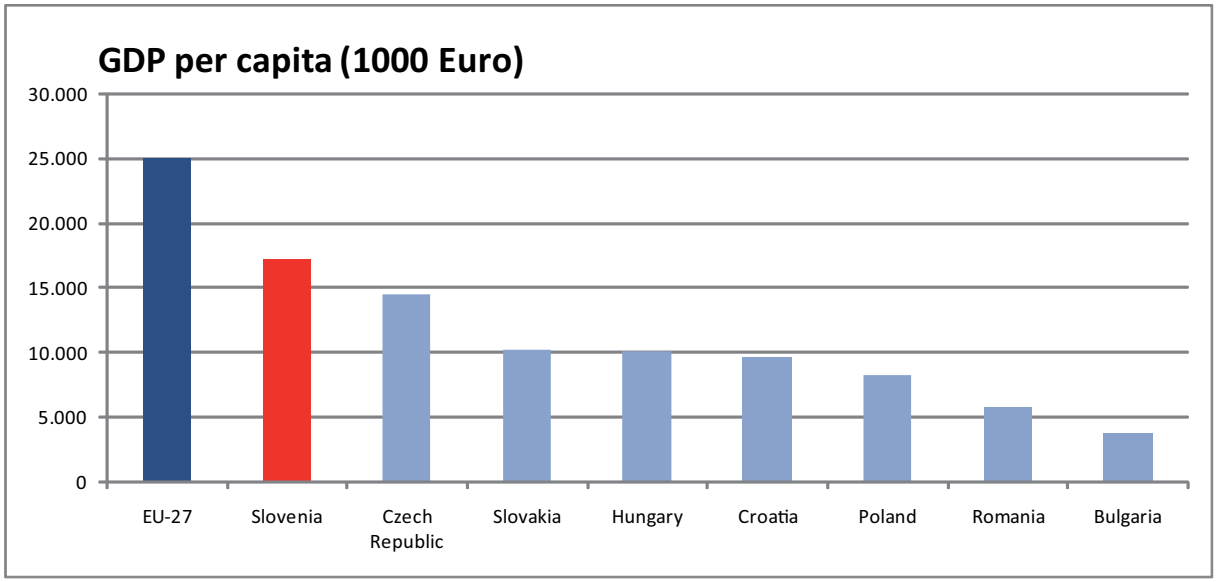
In 2007, this resulted in an average population density of 99.9 inhabitants per km², which is smaller than the EU-27 average and the 4th smallest among the DIOMIS Study countries (see ***Figure 1-5***). The population density is considerably smaller in rural areas of, Goriška, Notranjsko-kraška and Jugovzhodna Slovenija. It goes without saying that such patterns impact on the volumes of freight traffic and on the market potential for intermodal services.

1.2 - Economy

In Slovenia, GDP per capita was Euro 17,159 in the year 2007 corresponding to more than two thirds of the EU average of approximately Euro 25,000. With respect to the eight CEE countries involved this study Slovenia outperformed all other countries (see also ***Figure 1-6***).

The development of the GDP since 1991 when Slovenia became independent as the first former Yugoslavian States showed positive two digit growth rates and even compared to 2006 it increased by 11 per cent.

Figure 1-6: Gross Domestic Product per capita at current prices, 2007



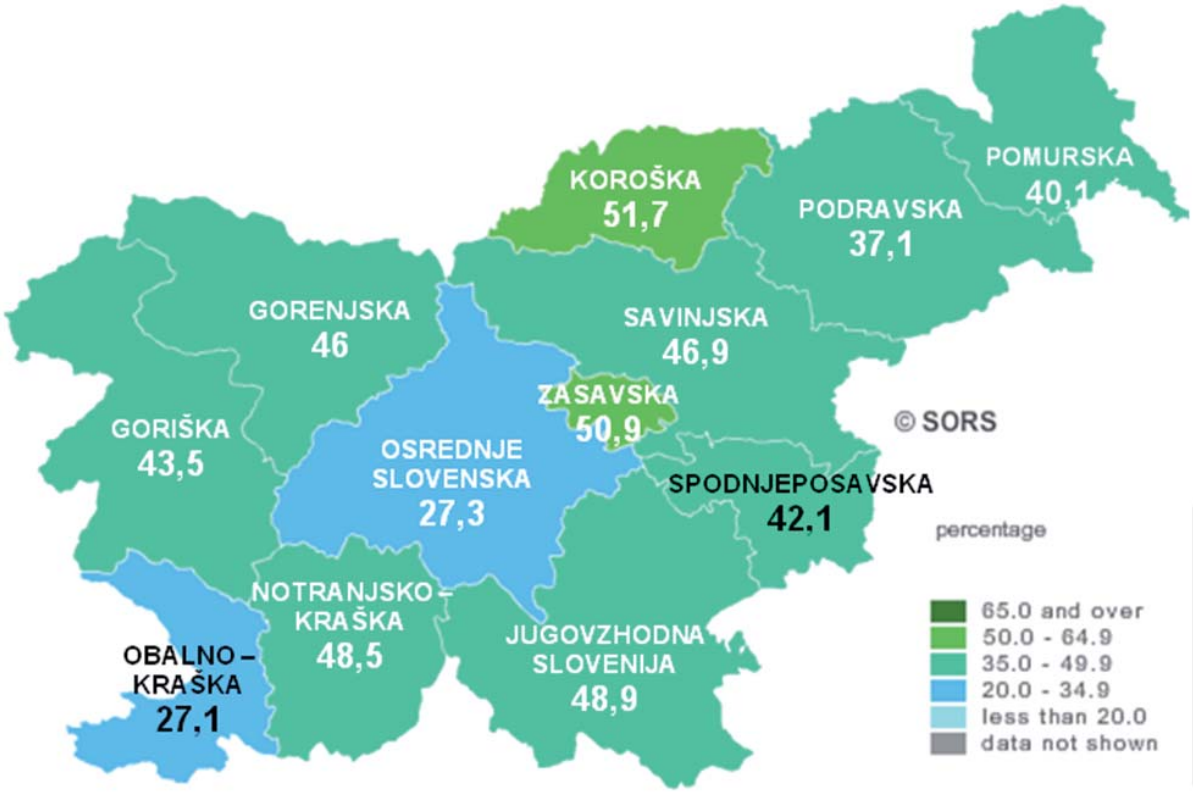
Source: Eurostat, KombiConsult analysis

The economic structure can be compared to developed Western European industrialized countries. The gross domestic product of about Euro 34.569 million in 2007 resulted from services (about 45 per cent). The agricultural sector plays a minor role with 2.2 per cent. The construction sector has a share of 6.9 per cent that resulted from the building boom in recent years. Manufacturing contributed 16 per cent, wholesale and repair 11 per cent, transport, storage and communication 8 per cent (see ***Figure 1-9***). The importance of the Slovenian trade and touristic industry, that recovered in recent years, for the wealth of the nation is mirrored in these data. Foreign direct investments in the drugstore, wholesale and do-it-yourself markets have an important impact in the economy. Slovenia has a relative high developed industrial sector which produces innovative and high value goods even for exports. Industry, quarrying and construction generate about one third of the GDP and employ about 30 per cent of the active population.

The industrial sector has been subject to a restructuring process in the last years: Thus chemical industry with a share of about 13 per cent and metal production (14 per cent) became the most important industrial sectors, followed by manufacturing of machines (11 per cent). The food and beverage sector, the most important branch in earlier years, has only a minor share of about 7 per cent.

A growing sector is the automotive industry because of the Renault plant in Novo Mesto and a series of supplying and components companies. Special importance has also the wood processing and furniture industry (8 per cent), the manufacturing of electronic products (6 per cent) and plastics (6 per cent).

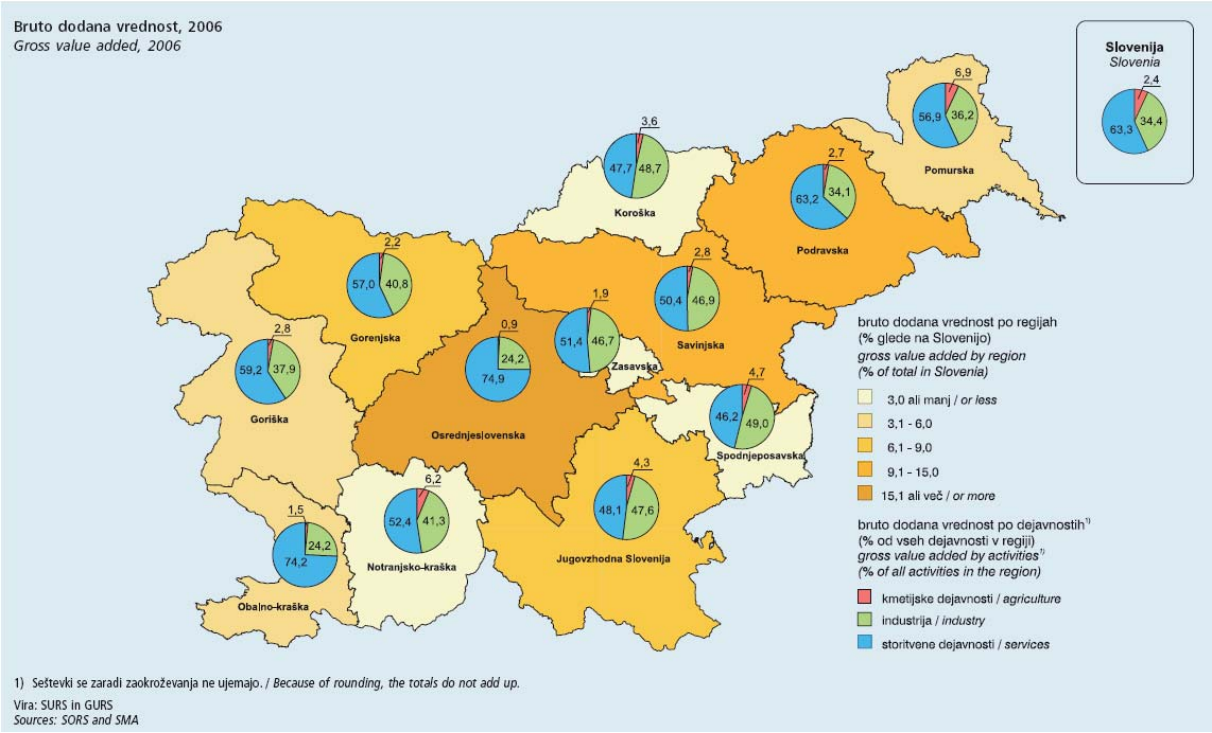
Figure 1-7: Employment in industry, 2007



Source: SORS, Interactive Statistical Atlas of Slovenia, KombiConsult analysis

The share of the gross value added by region and the share of the other sectors (agriculture, industry, services) is shown in ***Figure 1-8***.

Figure 1-8: Share of gross added value, 2006

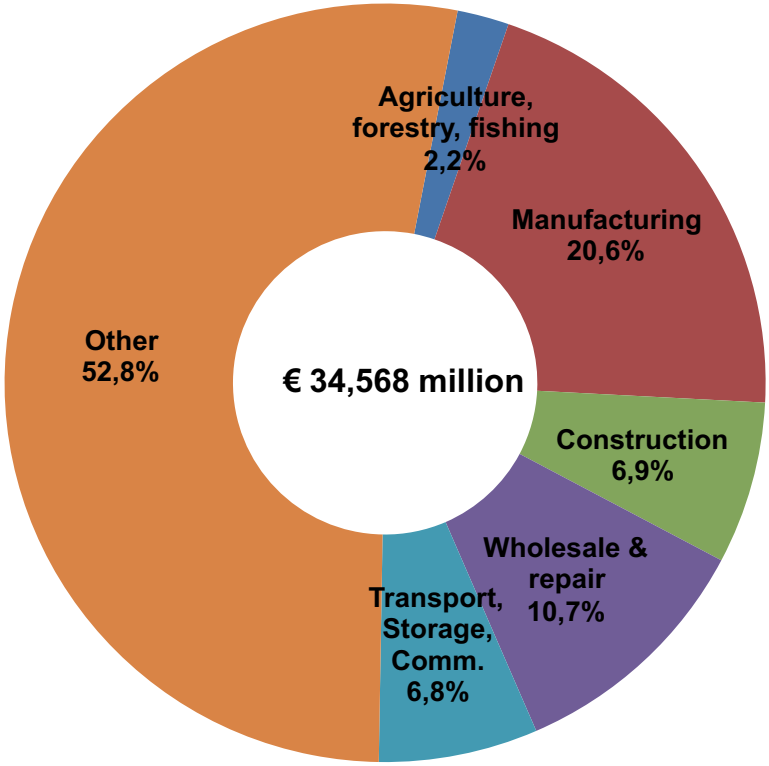


Source: SORS, Interactive Statistical Atlas of Slovenia

According to an analysis of the *German-Slovenian chamber of commerce*, in 2008, the industrial centres are in the region of Ljubljana/Kranj (machinery), Jesenice (steel), Trzic (manufacturing of shoes), Mezica (zinc and lead mining, batteries), Ravne na Koroskem (steel, engineering and machine building), Valenje (coal, construction, electronic household appliance / white goods), Maribor (material goods, manufacturing of machines, chemical industries, furniture) as well as Dravograd (wood processing). The eastern parts with Podravska and Pomurska compose some textile and foodstuffs producers, while the region of Gorenjska is most important for tourists.

The importance of the port of Koper and the logistics sector will be highlighted in section 3.

Figure 1-9: Share of Gross Domestic Product of Slovenia, 2007

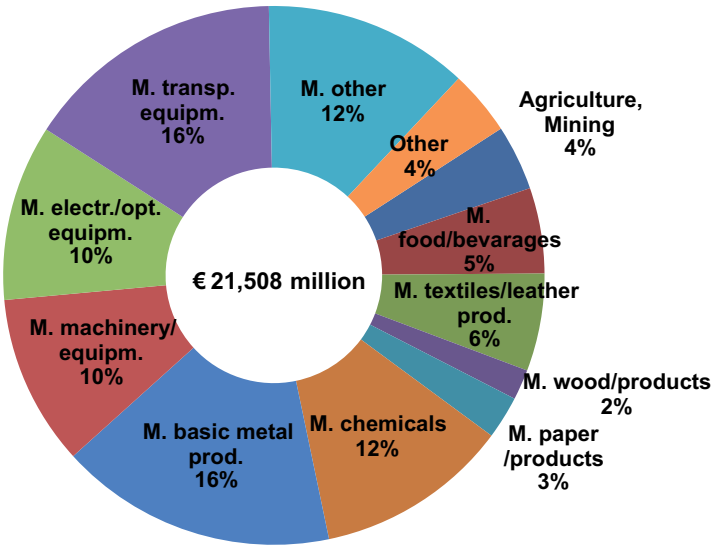


Source: SORS, KombiConsult analysis

The Slovenian economy is strongly involved in European and global trade relations. In 2007, Slovenia's external trade of goods and services amounted to Euro 40.913 bn with a slight surplus of imports over exports. Thus it accounted for about 118 per cent of GDP. The export/import ratio in terms of the value was 90 per cent in 2007, while it was 56 per cent with respect to the quantity (weight of the goods). Thus we encounter a large imbalance of transport flows where 21.7 million tonnes have been imported but only 12.1 million tonnes have been exported in 2007.

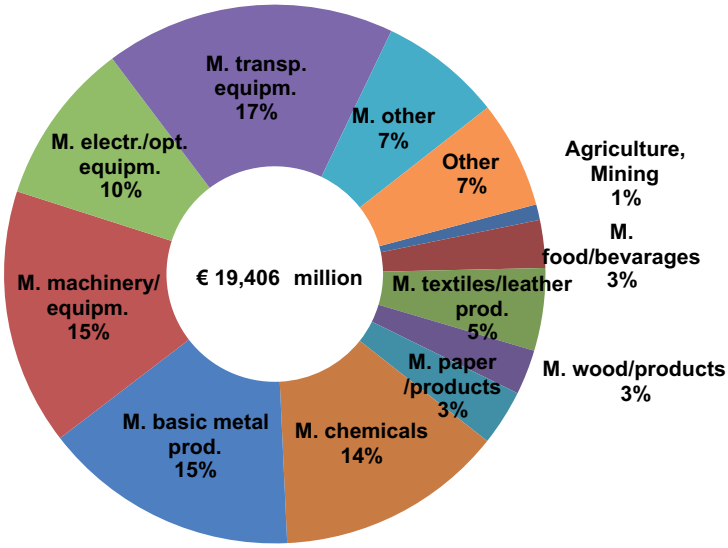
The structure of imported goods is shown in ***Figure 1-10***, while ***Figure 1-11*** is showing the exports by commodity.

Figure 1-10: Share of imported goods by commodity, 2007



Source: SORS, KombiConsult analysis

Figure 1-11: Share of exported goods by commodity, 2007

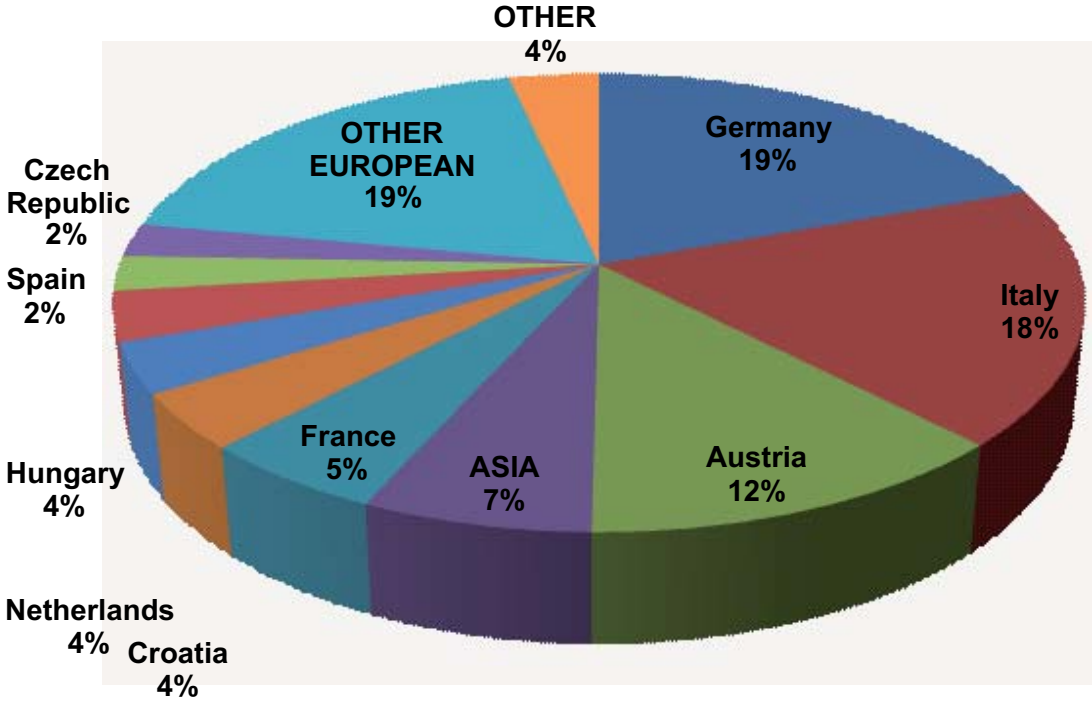


Source: SORS, KombiConsult analysis

Manufacturing of transport equipment, electrical and optical equipment as well as machineries make 36 per cent of the imported and 42 per cent of the exported goods, but also manufactured metal products and chemicals have a share of 24 per cent of imports and 29 per cent of exports. Normally, these types of equipments are sensitive to intermodal transport. This is in particular important if we analyse the origin and destination of the associated trade flows.

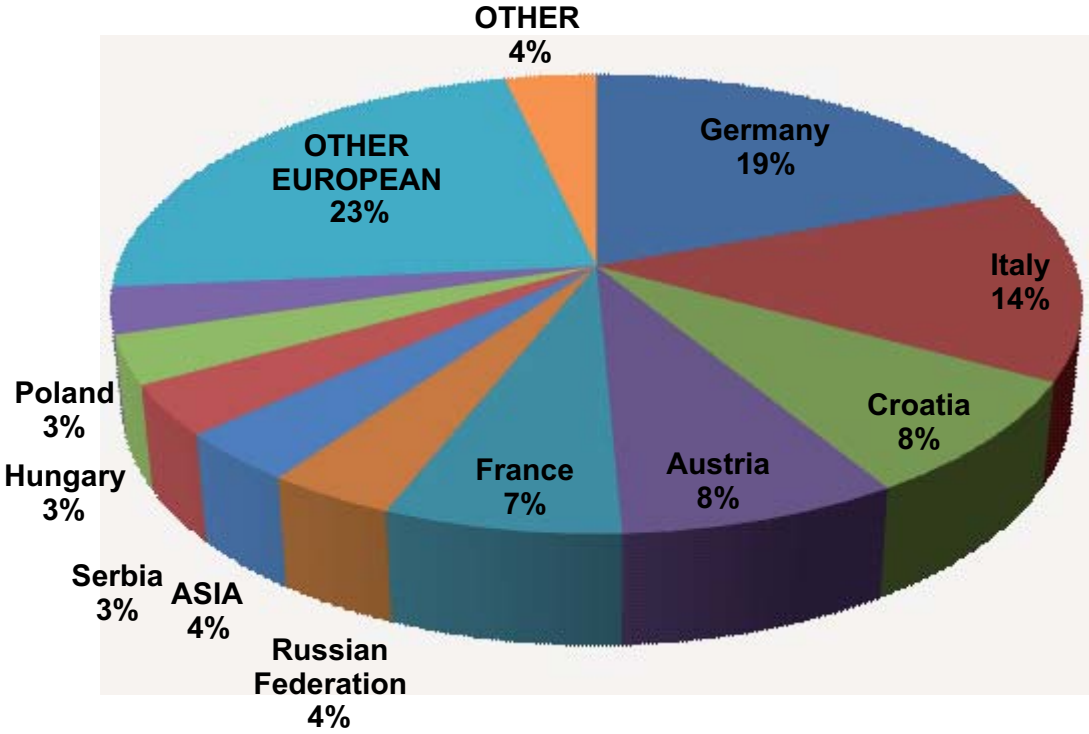
Slovenia's trade partners are located in the European Union to a very large extend: 93 per cent of deliveries (export) and 90 per cent of supplies (imports) are with European countries. The detailed share of supplying partner countries (imports) in 2007 are illustrated in the following ***Figure 1-12***, while ***Figure 1-13*** shows shares between the buying countries (exports).

Figure 1-12: Share of supplying partners by country, 2007



Source: SORS, KombiConsult analysis

Figure 1-13: Share of buying partners by country, 2007

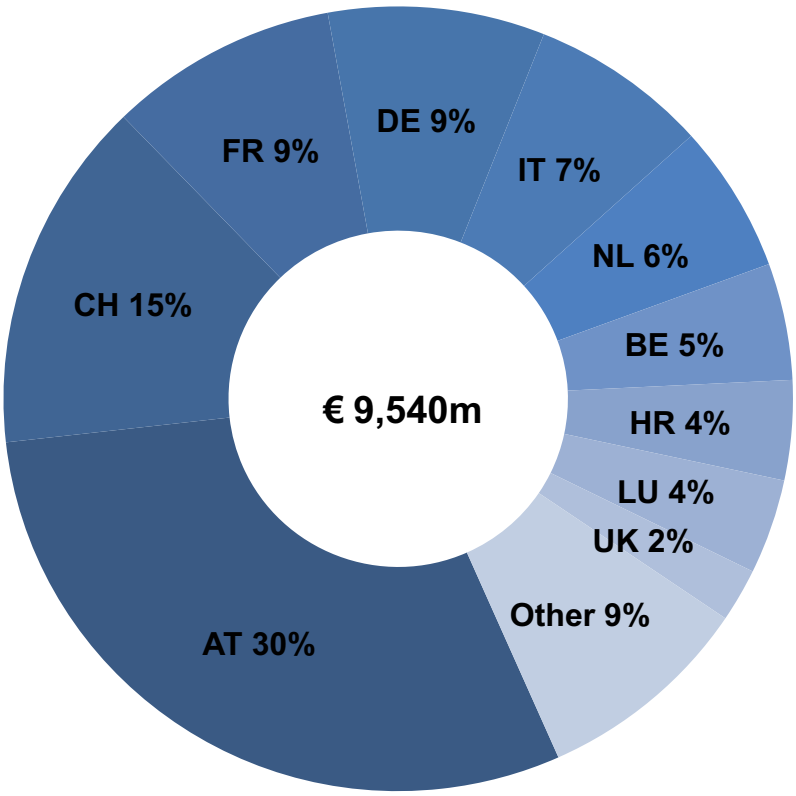


Source: SORS, KombiConsult analysis

Slovenia also has become an attractive place in Central and Eastern Europe for Foreign Direct Investments (FDI). In the year 2007 the foreign capital stock in Slovenia amounted to Euro 9,540 million. Main investing countries are Austria, Switzerland, France, Germany and Italy (see ***Figure 1-14***). Even if the majority of capital (22.9 per cent) went into financial services, the next important sectors are relevant for intermodal traffic, namely: manufacturing of chemical products (14.6 per cent), wholesale (8.7 per cent) and manufacturing of cars (4.3 per cent). In 2008 the FDI stocks amounted to Euro 10,777 million according to GTAI, Germanys' trade and invest agency and Slovenia is still considered to be an attractive business place.

Following the success story presented by Invest Slovenia, there are a series of well known brands from manufacturing (Bosch Siemens Hausgeräte, Danfoss, Goodyear Dunlop Tires, Grammar Automotive, Hella, Henkel, Kohnson Controls, Lafarge, Perlmoser, Mayr Melnhof, Palfinger, Pfleiderer, Renault, Safio Group, Sandoz, Siemens, Sogeti, Styria) as well as from retail (Aldi Süd, E. Leclerc, Eurospin Italia, Lidl, MOL, Spar) among the investors.

Figure 1-14: Foreign direct investments stocks in Slovenia by investing country, 2007

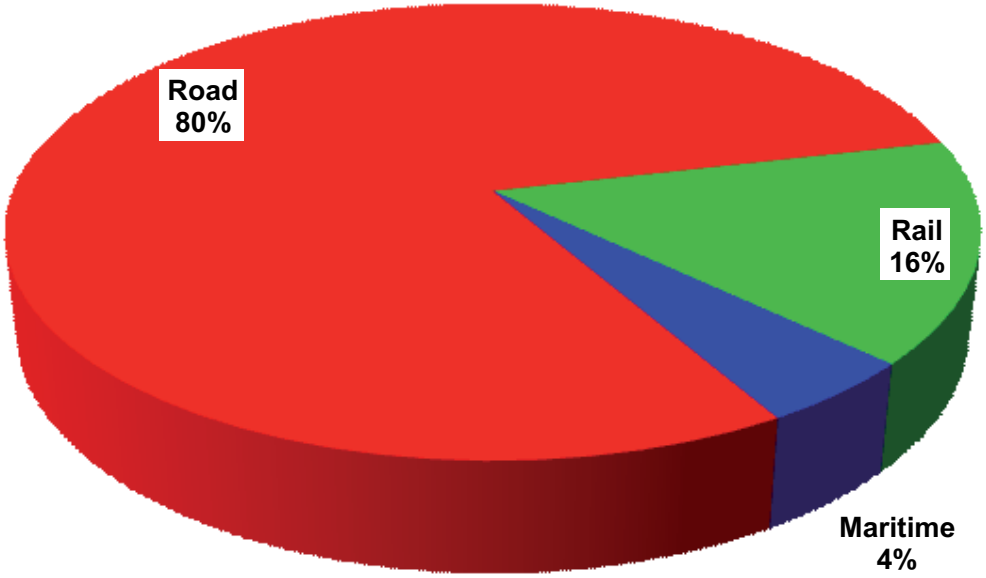


Source: GTAI, KombiConsult analysis

1.3 - Freight traffic

In 2007, road vehicles carried 80 per cent of the total volume of 111.8 million tonnes of goods, moved on national and international journeys in Slovenia. Yet this is not surprising since the majority of cargo (more than 80 per cent of all road cargoes) was moved in domestic traffic over short, local or regional distances (see ***Figure 1-16***). 16 per cent (17.6 million tonnes) were carried by rail and 4 per cent (5.2 million tonnes) by maritime transport.

Figure 1-15: Modal split of freight traffic in Slovenia (related to volume), 2007



Source: SORS, KombiConsult analysis

Even if rail could not compensate the transport volume lost since the early 1990th, since 2001 this transport mode increased the volume by 29 per cent, while road could gain volume by 54 per cent. In both transport modes this was mainly due to the increase of border crossing transports, but again while the bilateral international road transport grew by 89 per cent in the time 2003-2007 and the transit exploded by 417 per cent, the respective figures for the rail sector were only 12 per cent (international) and 29 per cent (transit) respectively.

This reflects not only the impact of a free choice of mode of transport in a market economy compared to the previous central planning state, a development effective since the 1990s, but even more the changed pattern of freight. The volume of rail- oriented bulk cargo is more or less stagnating whereas the transportation of consumer goods and finished and semi-finished industrial products has been grown strongly. The latter have comparatively demanding logistics profiles, which road apparently is much more capable of complying with than rail.

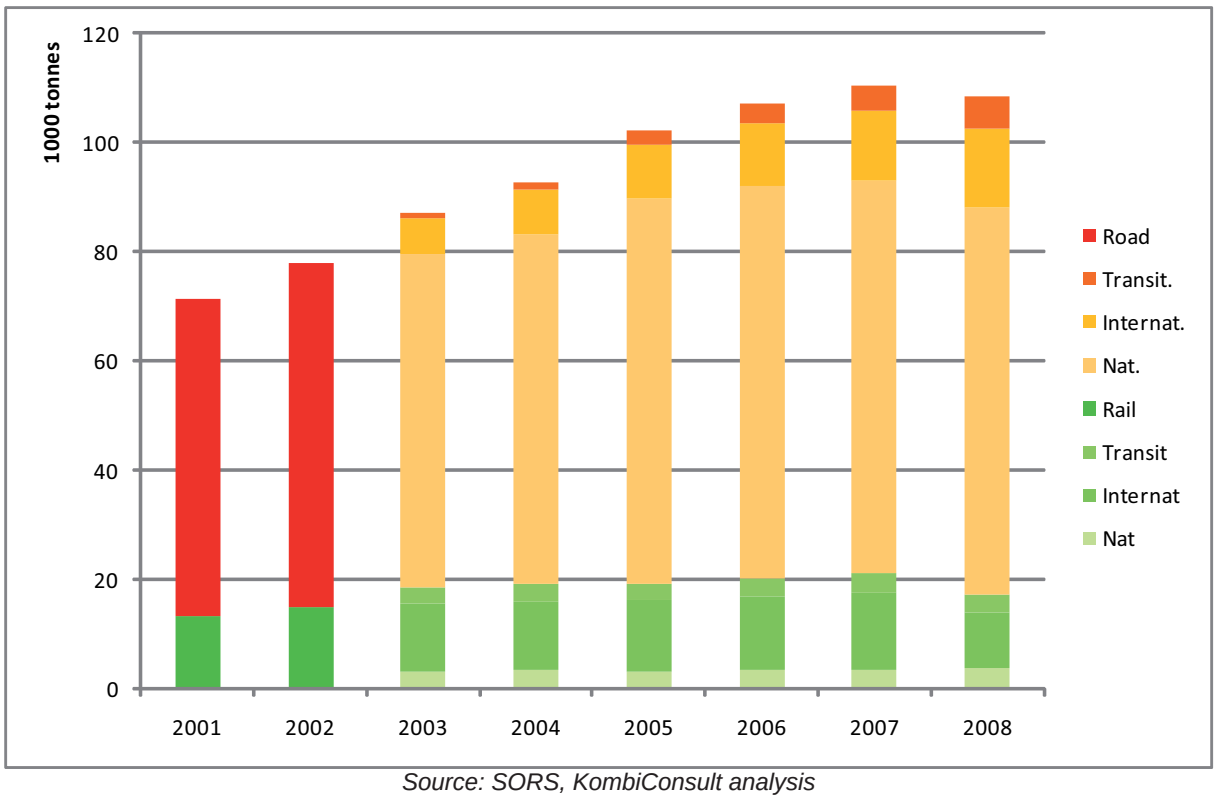
As a consequence the modal split of total freight traffic in Slovenia increasingly has turned towards road. In 2007, road transport had a share of 80 per cent of total traffic and thus had won nearly 3 percentage-points within six years (see ***Figure 1-16***).

Figure 1-16: Freight traffic in Slovenia: transported goods (million tonnes) by mode and traffic type, 2001-2008

Year	Rail				Road			
	Total	Nat.	Internat.	Transit	Total	Nat.	Internat.	Transit
2001	13.588	n.a.	n.a.	n.a.	57.809	n.a	n.a	n.a
2002	14.969	n.a.	n.a.	n.a.	62.957	n.a.	n.a.	n.a.
2003	15.813	3.354	12.459	2.906	68.520	60.802	6.860	857
2004	16.193	3.508	12.685	3.174	73.577	63.859	8.380	1.338
2005	16.344	3.381	12.963	3.110	82.750	70.431	9.921	2.398
2006	17.052	3.620	13.433	3.311	86.896	71.659	11.422	3.815
2007	17.575	3.619	13.956	3.750	89.036	71.647	12.956	4.432
2008	17.271	3.998	9.940	3.333	91.239	70.774	14.663	5.802

Source: SORS, KombiConsult analysis

Figure 1-17: Development of road and rail transport volume in Slovenia, 2001-2008



Source: SORS, KombiConsult analysis

Analysing the transport performance, road freight transport could increase its mileage by 95 per cent, while rail was able to gain 19 per cent in particular by the increase of transit (+31 per cent) and international transports (+21 per cent) compared to +13 per cent in domestic services.

Figure 1-18: Freight traffic in Slovenia: performance (billion tonne-kilometres) by mode and traffic type, 2003-2008

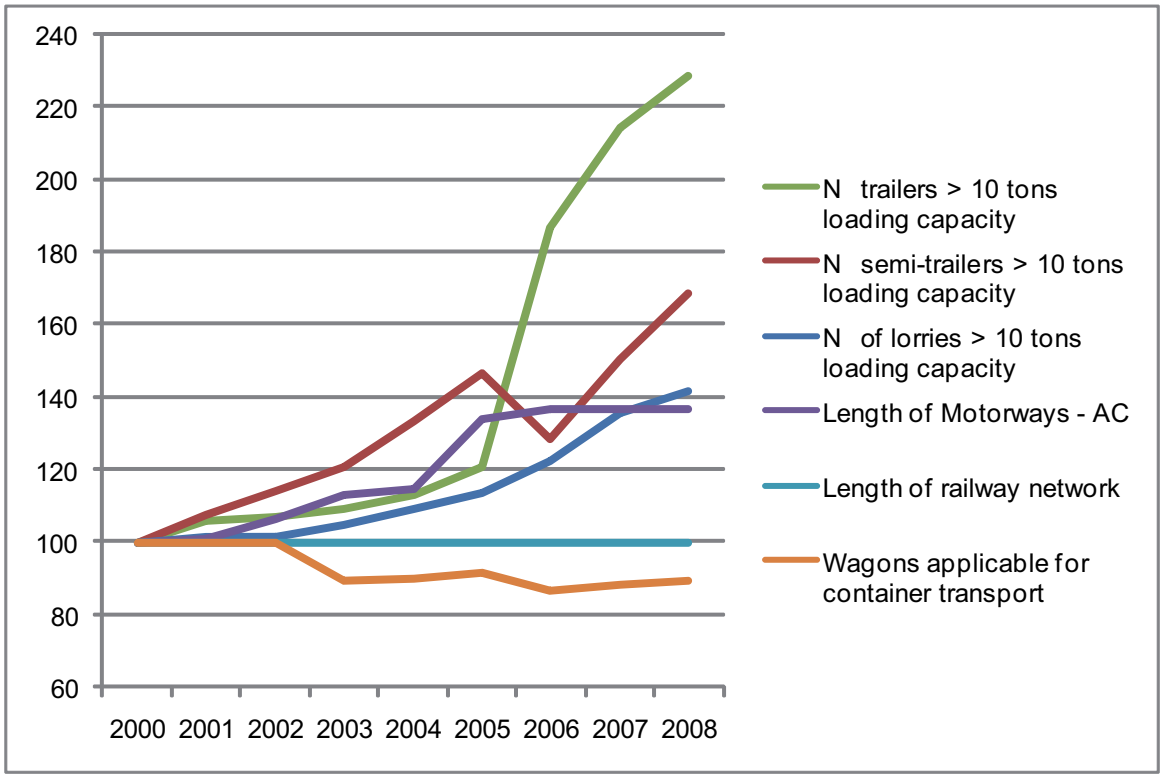
Year	Rail				Road			
	Total	Nat.	Internat.	Transit	Total	Nat.	Internat.	Transit
2003	3.018	594	2.424	672	7.040	1.995	4.289	755
2004	3.149	642	2.507	785	9.007	2.267	5.348	1.392
2005	3.245	620	2.625	781	11.032	2.361	6.400	2.272
2006	3.373	650	2.723	802	12.112	2.279	7.189	2.644
2007	3.603	671	2.932	878	13.734	2.573	7.608	3.554
2008	3.520	740	2.007	773	16.261	2.636	8.613	5.012

Source: SORS, KombiConsult analysis

With respect to the transport performance the data of the different transport modes is however not comparable, since road transport includes transport, on the territory of Slovenia and abroad, performed by vehicles registered in Slovenia, while railway transport includes transport by trains on the territory of Slovenia, air transport includes transport by the Slovenian air carrier in international transport, from foreign countries, to foreign countries and in foreign countries, and finally the maritime transport includes transport by the Slovenian maritime carrier abroad.

In the period 2000 to 2008 the length and condition of the Slovenian motorway network grew by almost 40 per cent, while the length of the rail network remained stable. In the same period (2008/2000) the number of heavy (> 10 tons loading capacity) road freight vehicles (trailers, semi-trailers and lorries) registered in Slovenia more than doubled, while the number of wagon capable for container transport decreased by 10 per cent points (see also chapter 2.6).

Figure 1-19: Development of indices in Slovenia, 2000-2008 (2000 = 100)



Source: SORS, KombiConsult analysis

2. CURRENT STATE OF INTERMODAL RAIL/ROAD TRAFFIC IN SLOVENIA

2.1 - Intermodal actors

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.

Like in virtually each EU Member State the public nation-wide rail network is managed by a single company which originated from the former state railway administration.

Figure 2-1: Organisation of Slovenian railways, 2009

Abbreviations:
BU – Business unit; SP – Traffic Management Section; SVP – Infrastructure Maintenance Section;
SVTK – Signalling and Telecommunication Section, SEE – Electric Energy Section; STP – Freight Transport Section;
SKP – Combined Transport Section; SMP – Small Consignements Section; SPP – Passenger Transport Section;
SV – Traction Section;

Source: SZ website

The Slovenian Law on Railways takes up relevant European legislation in the field although the different activities are still under the roof of the Holding Slovenian Railways Ltd:

- management, maintenance and construction of railway infrastructure;
- traffic management;
- train traction and technical vehicle management;
- passenger transport;
- freight transport.

In October 2009 the European Commission has warned the Member States, including Slovenia, over the lack of implementation of the "first rail package" (Directives 91/440/EEC as amended, 95/18 EC as amended and 2001/14 EC), because important issues remain to be solved for opening up the railway markets competition, e.g. with respect to independence of the infrastructure manager in relation to railway operations, tracks access charging, performance regime and independence of the regulatory body.

Infrastructure manager(s)

The public railway infrastructure in the Republic of Slovenia is a public good in general use, owned by the Republic of Slovenia, and can be used on equal terms by all interested railway undertakings, under conditions prescribed by the Law on Railways Act and in particular in the respective Network Statement which is updated and published annually. The Network Statement is prepared by SZ Traffic Management Business Unit the in cooperation with the Rail Transport Public Agency (AZP). In addition, in the Port of Koper, railway infrastructure under the concession of the port is existing.

Railway Undertakings

Due to the operation of "open access" the following railway undertakings are allowed to operate on the Slovenian rail network:

- Holding Slovenske železnice d.o.o., Ljubljana (since 2004)
- Adria Transport d.o.o., Koper (since September 2008)
- GKB – Graz Köflacher Bahn und Busbetrieb GmbH, Graz (Austria) (since February 2008)
- RCA – Rail Cargo Austria AG, Wien (Austria) (since July 2008)

Adria Transport was founded in 2005 by the Port of Koper and the GKB as a strategic partnership with equal shares and is the first private railway undertaking on Slovenian territory since 2008 when it obtained the safety certificate (via the GKB license).

The **GKB (Graz Köflacher Bahn)** developed from a regional Austrian railway with passenger and freight business to an internationally active railway undertaking in co-operation with other parties (e.g. LTE).

RCA and **SZ** are the well known incumbent railways.

Intermodal operators

In the sphere of intermodal service suppliers the following companies were relevant as customers of the railways in Slovenia:

- Adria Kombi (Ljubljana),
- ARGO Group (Brno)
- European Rail Shuttle (ERS) / Maersk,
- Intercontainer Austria / ICA (Wien)
- Intercontainer-Interfrigo / ICF (Basel),
- Metrans (Praha),
- Pol-Rail Srl (Roma / Udine)
- Ökombi (Wien) as partner of Adria Kombi with respect to RoLa services,
- Shipping lines and forwarders to a small extend.

Adria Kombi, Ljubljana, is a limited liability company, founded by forwarders and railways to develop intermodal transport n Slovenia. Its business portfolio covers Being a member of UIRR it operates „terminal-terminal" transport services jointly with its partner organisations namely Kombiverkehr as regards the connection to Germany and Ökombi with respect to organising accompanied intermodal services (RoLa services).

Argo Group is a logistics company based in Brano (Czech Republic) with subsidaryies and branch offices in several other countries and activies inall modes of transport including intermodal transport on dedicated routes. In 2008 they started organising container transports Koper – Budapest ("Bora Express").

Intercontainer Austria / ICA, the RCA subsidiary responsible for unaccompanied intermodal services mainly in relation with seaports and RCA's agency for continental

intermodal traffic, in 2007 was mainly involved in organising transports in transit through Slovenia (company trains from Austria to Turkey and Greece).

ICF is a European network operator serving the Slovenian market in single wagon load traffic on demand via their South-East European hub in Sopron (Hungary), and by a regular shuttle train Koper - München. ICF trains to South East Europe (including Turkey and Greece) are transiting via corridor X.

Metrans, is a Prague based European intermodal operator which is mainly involved in the hinterland transportation of seaborne containers fro/to German seaports but has recently expanded its service network to south-East Europe by connecting Koper with Dunajska Streda (Slovakia) and Budapest (Hungary) by regular block trains. Services of Metrans cover the intermodal rail road transportation, the terminal handling, depot/repair and trucking services.

2.2 - Legal framework

The legal system currently regulating the field of railway transport in Slovenia comprises of:

- The Railway Act – RTA (ZzelP) Official Journal of the Republic of Slovenia N° 22/07)
- The Safety of Railway Transport Act – SRTA (ZVZelP) (OJ N° 61/07)
- Decree in train path allocation and the Public Railway Infrastructure usage charge (OJ 38/08)
- Commission Decision 2002/844/EC on the amendments of the Directive 2001/14/EC regarding the data of change of the railway timetable;
- Commission Decision 2004/881/EC of the European Parliament and the Council on establishing a European Railway Agency;

With the aim of alliances in the railway sector, Slovenia has entered into a couple of bilateral and multilateral agreements with its neighboring countries (see ***Figure 2-2***):

Figure 2-2: Bilateral and multilateral agreements on railways in Slovenia

Agreement on	AT	BG	CZ	HR	HU	IT	SK
Border Railway	0	-	-	➽	➽	0	-
International Combined Transport	0	➽	➽	➽	➽	0	➽

Source: KombiConsult analysis

- As regards international organisations in the field of railway transport, the Republic of Slovenia has acceded to COTIF and is a member of OTIF.
- With regards to UN membership, representatives of the Republic of Slovenia regularly participate in UN-ECE meetings related to the railway transport. Slovenia is also a signatory to AGC and AGTC agreements and a member of TER.

Specific incentive schemes with respect to intermodal traffic Rail/Road in Slovenia are - according to the 2008 survey performed by the Combined Transport working party of the *United Nations Economic Committee on Europe* in ***Figure 2-3***:

Figure 2-3: Potential actions in favour of intermodal rail / road traffic in Slovenia

Item	Support Action
International co-operation	AGC /AGTC agreements signed and experts involved in international bodies working groups
Networks and terminals	No specific governmental action; Railways and intermodal operators are responsible for finance of respective installations
Financial support	No governmental support for investments and services
Fiscal support	Exemption for the payment of road usage fees (except motorway and tunnel tolls) using the Port of Koper as the port of entry and exit, or using combined transport in Slovenia , if ▪ its axle weight is < 10 tones ▪ its axle weight is > tons, up to a distance of 30 km from the terminal.
Regulatory support	Exemption of traffic bans on weekends and national holidays, if involved in combined transport by rail or by ship.
	Weight exemptions: The increase of the total mass up to 44 tons allowed for ▪ Vehicles carrying ISO containers of 40‘ length ▪ Trailers reinforced for loads in unaccompanied CT ▪ Articulated vehicles for the transport of swap bodies with five or more axles travelling in CT in arrival or departure from terminals

Source: UN ECE WP24, 2008, KombiConsult analysis

It's remarkable that in particular non financial support actions are applied, while the establishment of terminals and traffic services is left to the engagement of the private sector.

As an EU Member State Slovenia benefits also from various European schemes such as the Marco Polo Programme of the European Commission, so that start up international services can benefit from the tone-kilometers performed on Slovenian territory.

2.3 - Overview on total intermodal market

For this DIOMIS study, the intermodal traffic performed in the year 2007 has been selected as the reference year, on which the assessment of the evolution of the industry by 2020 should be based. In order to establish the 2007 data base for the entire intermodal rail/road traffic in Slovenia we advanced from the statistics supplied by the *Statistical Office of the Republic of Slovenia* (SORS). SORS data, in particular, provides for a consistent time series by market segment (see ***Figure 2-6***).

In addition to the SORS data base we had access to the 2007 statistics of almost every railway undertaking and intermodal operator performing intermodal services in, with or through Slovenia. A thorough analysis and comparison proved that, even if two co-operating companies were concerned, the majority of data sets were not consistent neither on an aggregate level such as the volume of a country-country link nor in sub-categories.

Owing to these inconsistencies we approached the "statistical reality" iteratively. First of all, we determined the transport volume of routes or market segments where we could rely on two independent and fairly congruent data sources. In a second step, we analyzed the statistics on intermodal services, for which we provided for in-depth market knowledge and/or reliable auxiliary information like frequency of departure, maximum train length or weight. By carrying out plausibility analyses and cross-checks for example with SORS data we were able to pinpoint traffic volumes and assign them rather precisely to market segments and traffic types. As a result, only a small percentage of less than 10 per cent of the total volume, which we have derived from the SORS data set (see above), could not be allocated to a specific category of intermodal traffic. On the other hand the "transit" volumes routed through Slovenia differ by 10 per cent, too. To complete the data base, however, we performed estimates based on our own expertise.

One of the main results of this extensive exercise is the overview on the 2007 total intermodal traffic in Slovenia and the allocation of volumes of unaccompanied traffic to traffic types (domestic, international, transit) and intermodal market segments (maritime, continental), given in ***Figure 2-4***.

In 2007, the total volume of intermodal traffic in Slovenia amounted to 3.845 million gross tonnes, of which 2.238 million (58.2 per cent) were conveyed on unaccompanied intermodal services. Almost two thirds of that volume (1.468 million tonnes) was handled in Slovenia as part of bilateral international intermodal transports. 421,400 tonnes was moved in transit through Slovenia along the trans-European corridors V (Italy – Hungary) and X (Austria – Croatia/Serbia), while 348,700 tonnes were carried in pure domestic services. The statistical differentiation between international and transit tonnage is however not easy due to the reloading of loading units in gateway terminal Ljubljana.

Figure 2-4: Intermodal rail/road traffic volume in Slovenia, 2007

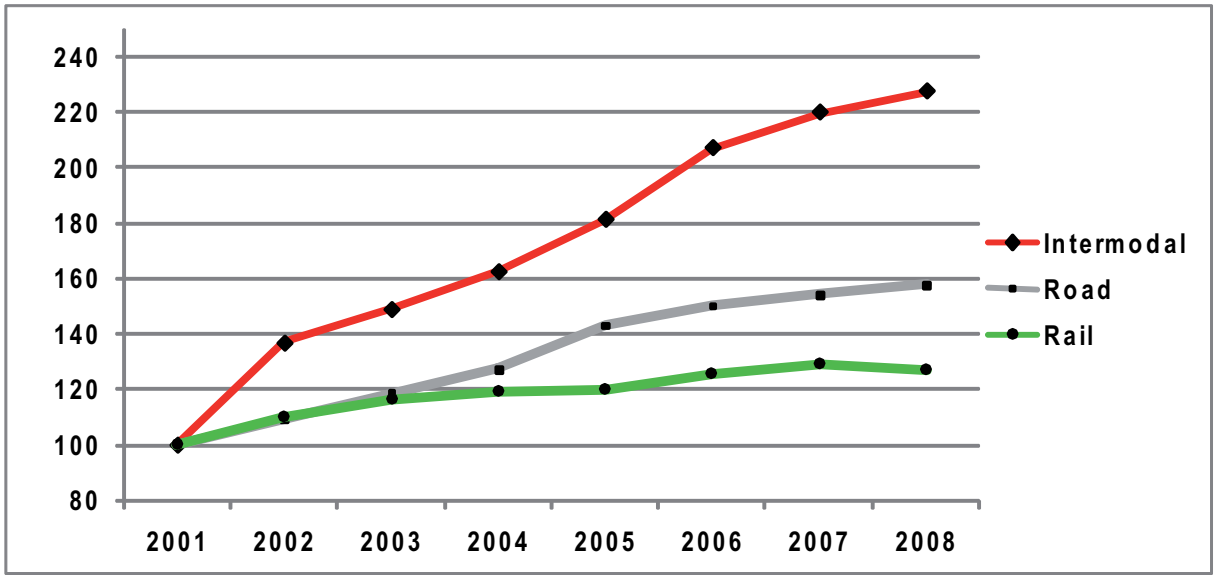
Intermodal market segment		TEU	%	Gross tonnes	%
Unaccompanied traffic		**238.100**	**63,9%**	**2.237.600**	**58,2%**
Domestic	maritime	44.500	11,9%	348.700	9,1%
	continental	-	0,0%	-	0,0%
	Subtotal	**44.500**	**11,9%**	**348.700**	**9,1%**
International	maritime	114.200	30,6%	1.250.000	32,5%
	continental	22.100	5,9%	217.500	5,7%
	Subtotal	**136.300**	**36,6%**	**1.467.500**	**38,2%**
Transit	maritime	45.900	12,3%	263.500	6,9%
	continental	11.400	3,1%	157.900	4,1%
	Subtotal	**57.300**	**15,4%**	**421.400**	**11,0%**
Accompanied traffic		**134.700**	**36,1%**	**1.607.000**	**41,8%**
Total intermodal traffic		**372.800**	**100,0%**	**3.844.600**	**100,0%**

Source: KombiConsult analysis based on railways and operators statistics

Compared to the total of 131.4 million tonnes of freight transported in 2007 the intermodal rail/road traffic in Slovenia can be neglected: It represents only 4.3 per cent of the total road freight transport, but about 21.6 per cent of the rail freight transport. Even if the road freight transport figures include local delivery and the large proportion of construction material transported over small distances, only, a further increase of intermodal transport would mean a huge challenge for Slovenian intermodal stakeholders.

Intermodal rail/road traffic, however, showed the largest growth rates since 2001, when comparative data against the other modes of transport are available (see ***Figure 2-5***). The average linear annual growth rate was about 17 per cent which means 10 percent points higher than road and 13 points higher then rail.

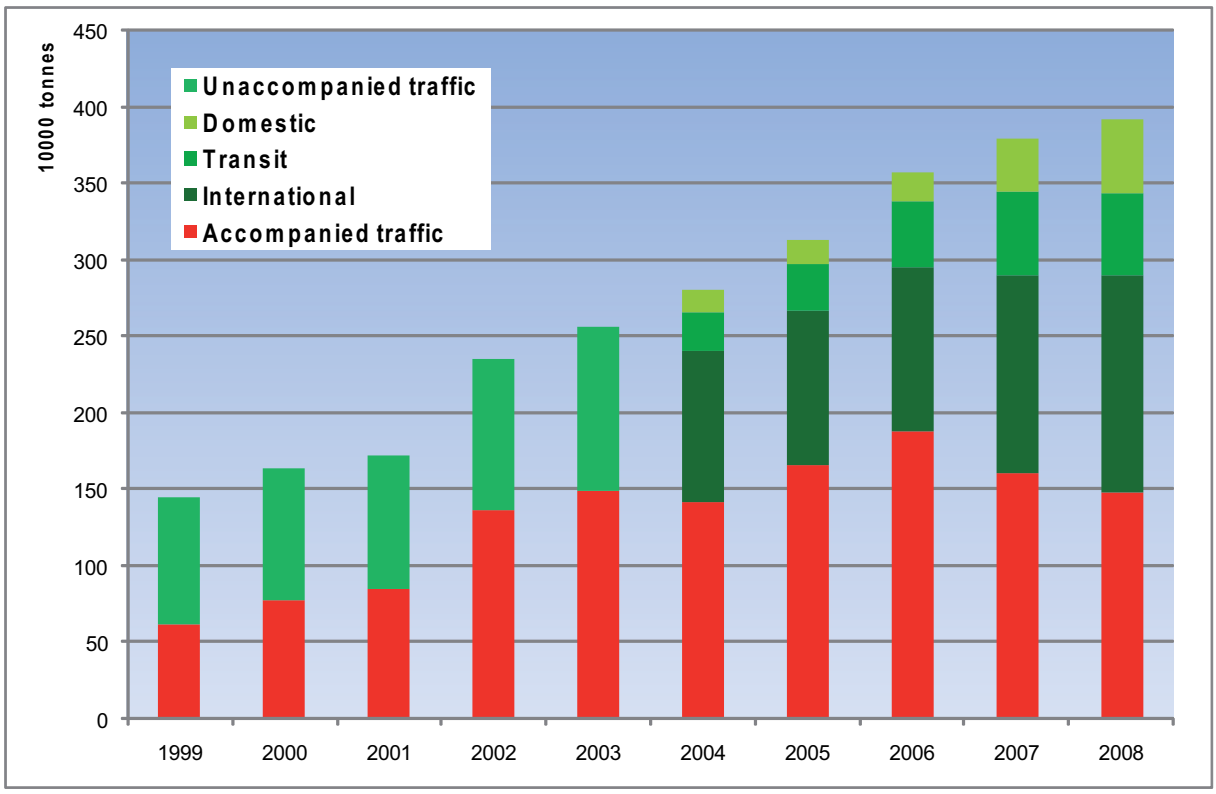
Figure 2-5: Development of total rail, road and intermodal rail/road volume in Slovenia, 2001-2008 (2001 = 100)



Source: SORS, KombiConsult analysis

The development of the different segments of intermodal rail/road transport in Slovenia is illustrated in ***Figure 2-6***. It shows the increasing importance of the unaccompanied intermodal transport. Within that sector the international traffic in particular but also the domestic traffic in relation with the port of Koper has outperformed the other segments.

Figure 2-6: Development of intermodal rail/road traffic volume in Slovenia, 1999-2008



Source: SORS, AdriaKombi, KombiConsult analysis

2.4 - Unaccompanied intermodal traffic

2.4.1 - Domestic traffic

In 2007, 44,457 TEU of intermodal units were carried on inland links in Slovenia; the total freight accounted for 348,720 gross tonnes. Even if this was already an increase of almost 32 per cent to the previous year it was gain topped in 2008 (57,407 TEU).

Domestic intermodal rail / road traffic in Slovenia is only composed of continental transports which are collected / distributed as initial / final leg of an international service via the intermodal terminal of Ljubljana Moste ("gateway") and of maritime transport, that means relations to / from the port of Koper, e.g. performed in the "KOMAR" network. Within KOMAR Adria Kombi links Koper, Ljubljana and Maribor in effective round trip schedules.

Figure 2-7: Development of domestic intermodal rail/road transport volume in Slovenia 2004-2008

TEU	2004	2005	2006	2007	2008
Domestic	17.638	23.088	33.727	44.457	57.407

Source: SORS, Adria Kombi, KombiConsult analysis

2.4.2 - International traffic

The total unaccompanied international traffic in Slovenia (excluding transit) accounted for 136,421 TEU or 1,296,000 gross tonnes respectively in the reference year 2007. The international intermodal Rail/Road in Slovenia composes both segments, the maritime and continental transport. In 2007 the maritime transport accounts for 84 per cent of the international CT traffic, while 16 per cent were carried on continental services. Also this segment showed positive growth rates in the past years and an increase by 9.4 per cent to the year 2008.

Figure 2-8: Development of international intermodal rail/road transport volume in Slovenia 2004-2008

TEU	2004	2005	2006	2007	2008
International	104.421	106.526	112.421	136.421	149.263

Source: SORS, Adria Kombi, KombiConsult analysis

In Slovenia bilateral international traffic operationally is performed to a large extend in dedicated intermodal shuttle train service already.

According to our investigations the following companies supplied consignments for bilateral international traffic to and from Slovenia in 2007:

- Adria Kombi (Ljubljana),
- Argo Group (Brno), started in 2008 only,
- European Rail Shuttle (ERS) / Maersk (Rotterdam/Hamburg),
- Intercontainer Austria / ICA (Wien),
- Intercontainer-Interfrigo / ICF (Basel),
- Metrans (Praha),
- Shipping lines and forwarders to a small extend.

Figure 2-9 gives a breakdown of the bilateral international traffic by transport corridor.

It shows that the neighbouring countries Hungary, Austria, Croatia next to Slovakia and Serbia are the most important countries for international intermodal traffic in Slovenia. As already explained the maritime hinterland transport of the port of Koper where different rail operators have established competitive services have a major role in these volumes. One service relates the Kia vehicle plant in Zlina (Slovakia), another backbone is Budapest where different terminals are connected and the historically natural "port of Hungary", Koper, was able to win grounds compared to Hamburg and Bremerhaven.

Figure 2-9: International unaccompanied traffic in Slovenia by corridor, 2007

Corridor		TEU
Slovenia	Hungary	76,000
	Slovakia	21,500
	Austria	15,000
	Germany	11,200
	Serbia	7,900
	Croatia	3,300
	Other	1,400
Total		136,300

Source: KombiConsult analysis based on railways and operators statistics

One further element of "international" transport is also transit traffic, where 57,263 TEU or 544,000 gross tonnes were transported in Slovenia in 2007. Also the transit shows a huge increase in the year 2007 compared to 2006, when trains to Turkey were re-routed via Slovenia, Croatia, Serbia and Bulgaria due to the pricing scheme of the Romanian railways.

Figure 2-10: Development of transit intermodal rail/road transport volume in Slovenia, 2004-2008

TEU	2004	2005	2006	2007	2008
Transit	26.105	32.842	45.158	57.263	56.421

Source: SORS, Adria Kombi, KombiConsult analysis

Like the majority of the bilateral traffic almost all intermodal transit volume through Slovenia was shipped in dedicated intermodal block trains in 2007. According to our survey the following companies provided transit services through Slovenia:

- Adria Kombi (Ljubljana), in C-operation with other UIRR companies
- Intercontainer Austria / ICA (Wien)
- Intercontainer-Interfrigo / ICF (Basel),
- Pol-Rail (Udine),
- Railog (Kelsterbach).

For the corridors through Slovenia, which accounted for the largest numbers of shipments in 2007 were the following:

- Hungary - Italy,
- Italy – Romania,
- Germany – Croatia/Bosnia-and-Herzegovina/Serbia
- Belgium – Croatia and other Balkan countries,

2.5 - Accompanied traffic

Accompanied intermodal transport ("RoLa") has had and still plays an important role on selected South-East European transport lanes since it offers some advantageous for the users, mainly:

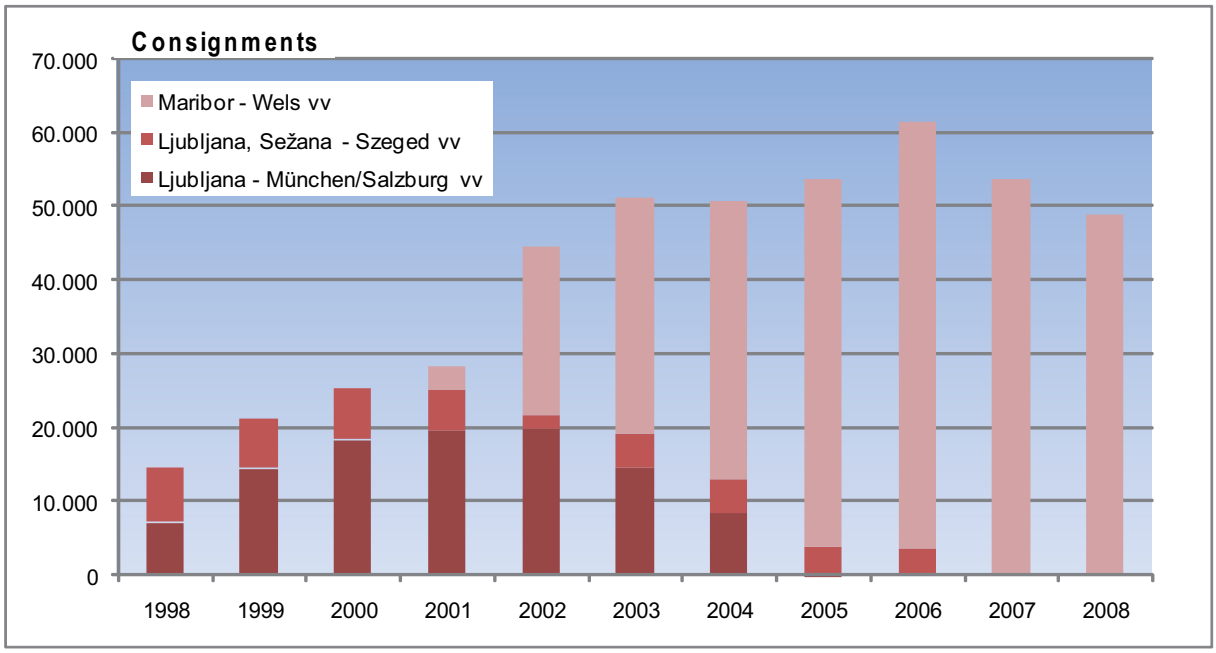
- Reduction of fuel and other operative costs
- Avoidance of road tolls
- Avoidance of night and other traffic bans for heavy freight vehicles
- Acceptance of resting times of drivers
- Gain of transit permissions for non EU operators

In the framework of the accession of further countries to the European Union (Hungary, Romania, Bulgaria, …) these advantages were compensated by simplified operating conditions and thus costs on the road so that the RoLa services could be maintained only with an even higher governmental financial support. Obviously the political acceptance of such kind of subvention is limited if it supports foreign drivers, truck transportation is widely accepted or residents have more fundamental concerns than complaining about transiting trucks.

In this respect the volume of accompanied intermodal transport rail/road in Slovenia saw a volatile development in the past ten years with an all time high of 61,500 consignments in 2006 and a small decline to 53,900 consignments equivalent to about 134,700 TEU in 2007. These volumes include three rail services, namely on the lines Ljubljana – München/ Salzburg to Western European destinations and Ljubljana, Sezana – Szeged (Hungary) with a transhipment terminal further to CEE, which are both terminated, and the Maribor – Wels service jointly operated by Ökombi and Adria Kombi that is still in service. The 2009 time table shows about 22 planned departures per week.

The ***Figure 2-11*** is showing the development of accompanied traffic in Slovenia in the last years.

Figure 2-11: Development of accompanied traffic volume in Slovenia, 1998-2008



Source: Adria Kombi, UIRR, KombiConsult analysis

The future prospect of the RoLa service is depending on the economic crisis with the general reduction of transport demand but also the availability of relatively cheap truck transportation resulted in smaller demand than expected.

2.6 - Equipment

The utilisation of intermodal transport is also depending on the availability of or access to appropriate equipment such as intermodal wagon and intermodal loading units.

In 2007, the 678 wagons applicable for container transport were registered in Slovenia according to the national Statistical Office SORS. They provided an entire carrying capacity of 33,177 tonnes (49 tonnes on average) and are owned by SZ (89 per cent) and private companies (11 per cent). Due to recent railway regulations the place of register is less and less important since intermodal wagon can circulate freely on the European rail network and are available from leasing companies or dedicated wagon managers (see DIOMIS Report on Intermodal Rolling Sock in Europe 2007/2015).

Figure 2-12: Intermodal wagon registered in Slovenia, 2007

Owner	N° of wagon	Carrying capacity [tonnes]	Ø carrying capacity [tonnes]
SZ Holding	606	27,702	47
Private	72	4,475	62
Total	678	33,177	49

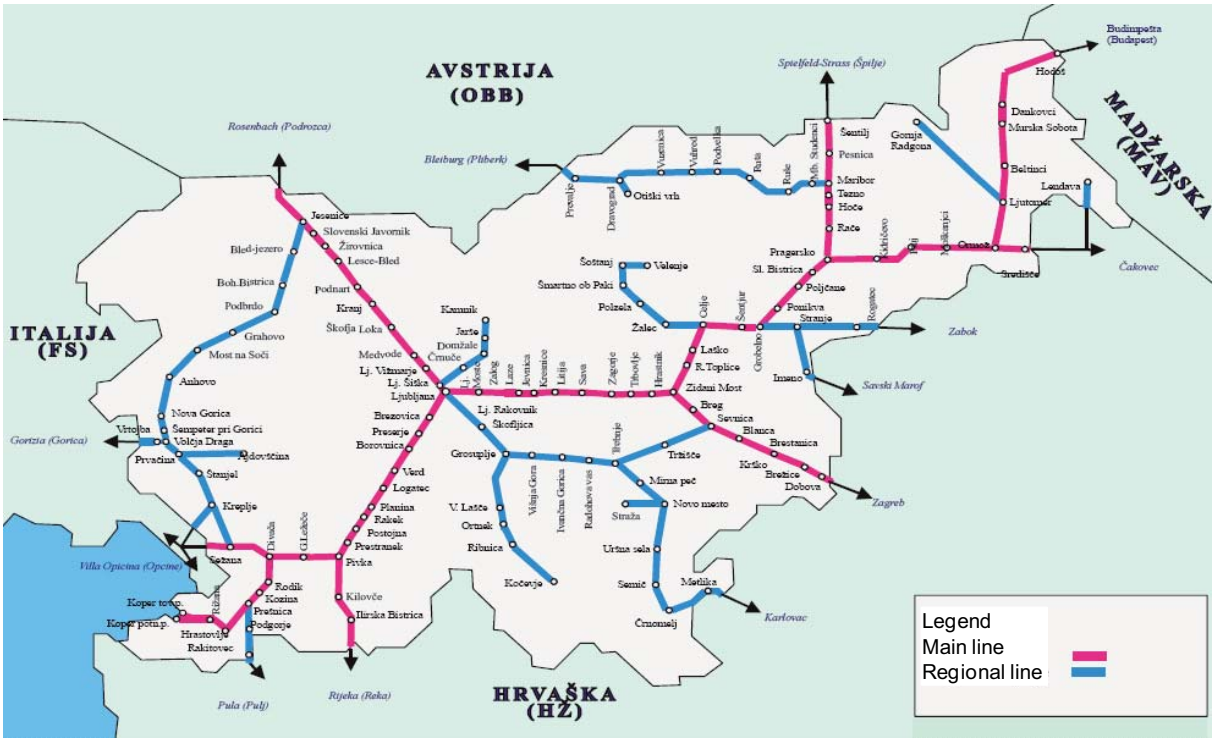
Source: SORS, KombiConsult analysis

2.7 - Rail and intermodal terminal infrastructure

2.7.1 - Rail network

Relevant infrastructures for intermodal traffic rail/road are the main railway lines, border stations, marshalling yards and CT-terminals in Slovenia.

Figure 2-13: Line classification of the Slovenia rail network

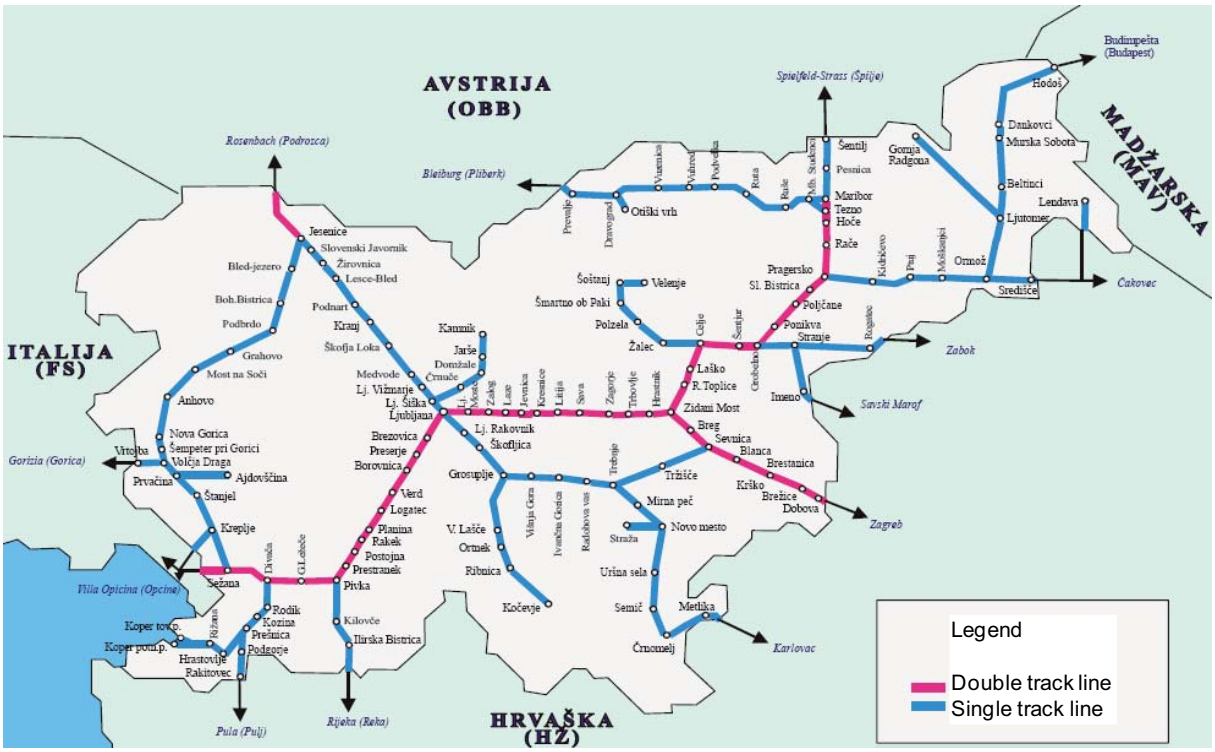


Source: SZ Infrastructure Network Statement 2010, KombiConsult

The railway network in Slovenia is operated by SZ Infrastructure which belongs to the state-owned Holding SZ. The entire normal gauge rail network length is about 1,228 km of which 897.7 km are single (73.1 per cent) and 330.9 km double track (26.9 per cent). About 502.7 km of the rail lines are electrified, mostly with 3 kV Direct Current power system (41 per cent). Only the section Jesenice / Austrian border is in 15 KV Alternate Current 16 2/3 Hz, equivalent to the Austrian system, and the section Dobova / Savski Marof is in 25 kV Alternate Current 50 Hz which corresponds to the Croatian power supply.

Unfortunately a serious percentage of lines relevant for bilateral and transit intermodal services, in particular along corridor X, are not double track (see ***Figure 2-14***).

Figure 2-14: Types of lines (track) of the Slovenia rail network

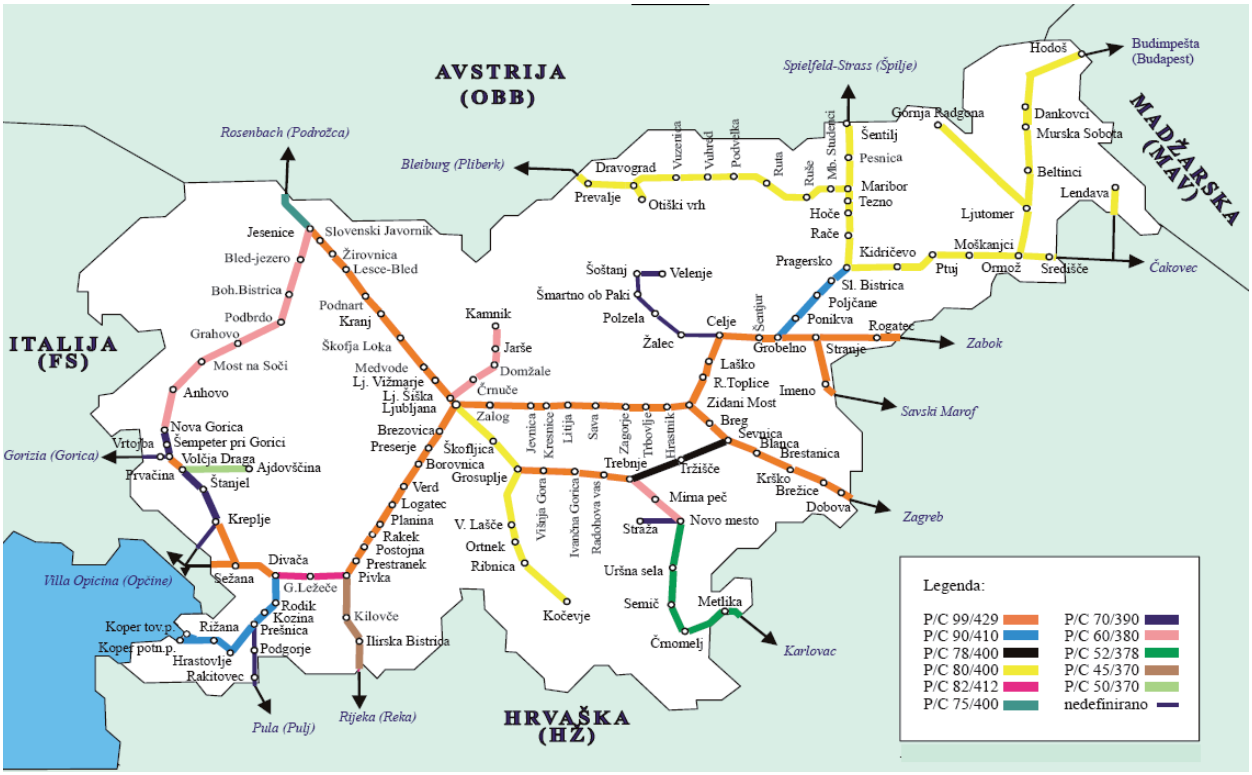


Source: SZ Infrastructure Network Statement 2010

The loading profiles of the Slovenian railway lines are favorable for intermodal traffic since they offer at least PC70/400 on almost all sections along the TEN-Corridors X and V.

Nevertheless, some alternative routing in the west Jesenice – Nova Gorica, Pivka – Rijeka and in particular the connection to the terminal Novo mesto which is important for the Renault plan and automotive goods does provide a smaller loading profile only.

Figure 2-15: CT loading profiles of the Slovenian rail network



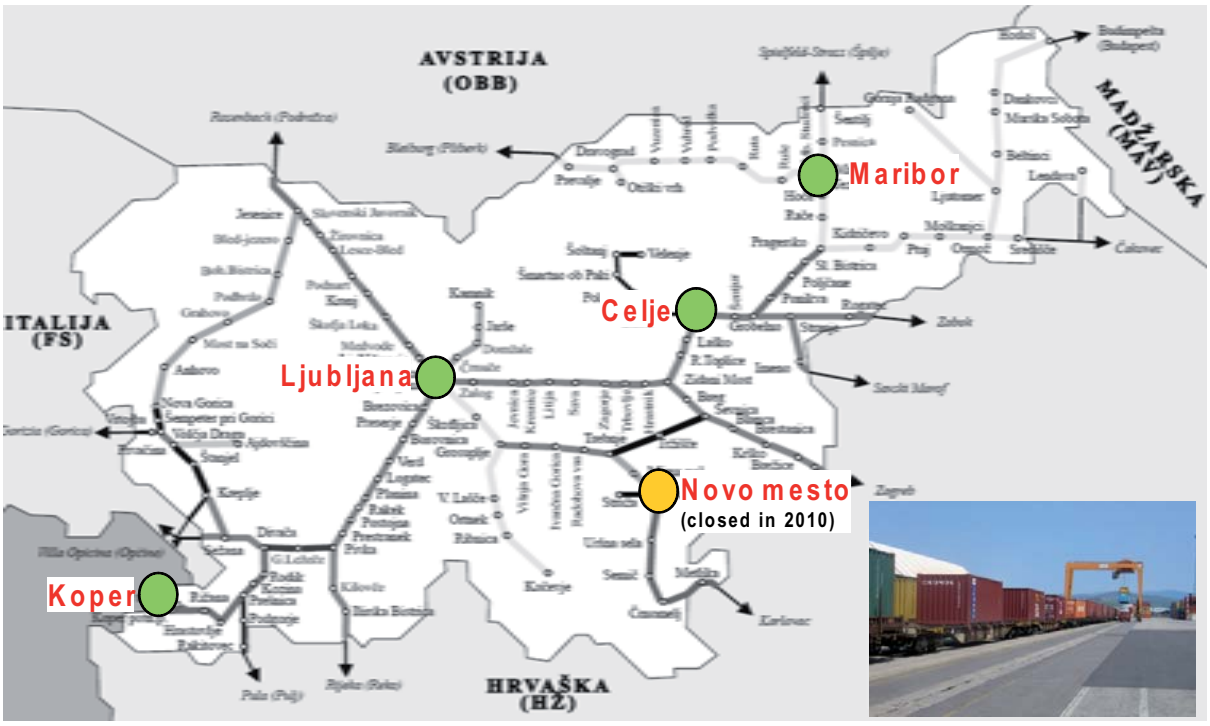
Source: SZ Infrastructure Network Statement 2009

Next to the before mentioned physical characteristics also the compliance with AGTC standards and moreover the operational condition of the rail tracks are important to evaluate whether they are suitable to facilitate reliable intermodal transport services. Here the Network Statement 2010, already identified a couple of temporary and permanent bottlenecks that impede the service quality of (intermodal) trains on the Slovenian rail network (see chapter 3.3.10)

2.7.2 - Terminal infrastructure

The Network Statement 2008 of the Slovenia rail infrastructure company SZ Infrastructure is listing five “stations with container terminals” (see ***Figure 2-16***), namely Maribor Tezno, Celje, Ljubljana, Koper and Novo mesto, while in the most recent Network Statement for 2010 the station of Novo mesto is not included any longer. The terminal in Maribor and Ljubljana do offer RoLa tracks, in addition. The terminals, despite Ljubljana Moste and Koper, are relatively small and their equipment does not allow to handle all types of loaded intermodal units.

Figure 2-16: Location of combined rail/road transport terminals in Slovenia, 2008



Source: SZ Network Statement, UIRR, KombiConsult analysis

Figure 2-17: Characteristics of intermodal rail/road transport terminals in Slovenia, 2007

Terminal	Handling tracks		Handling equipment		Annual handling capacity (LU)		Handling volume 2007		Utilisation rate
	N°	Length (m)	Gantry	Mobile	Reported	Calculated	TEU	LU	%
Koper Luka KT	3	1.989		4	100.000	120.000	151.300	94.600	79%
Ljubljana Moste	4	2.000	2	2		45.000	54.000	33.800	75%
Maribor Tezno KT	2	518		1		15.000	10.000	6.300	42%
Celje Cargo	1	200		1		8.000	5.000	3.100	39%
Novo mesto	1			1		8.000	5.000	3.100	39%
Total					100.000	196.000	225.300	140.900	72%

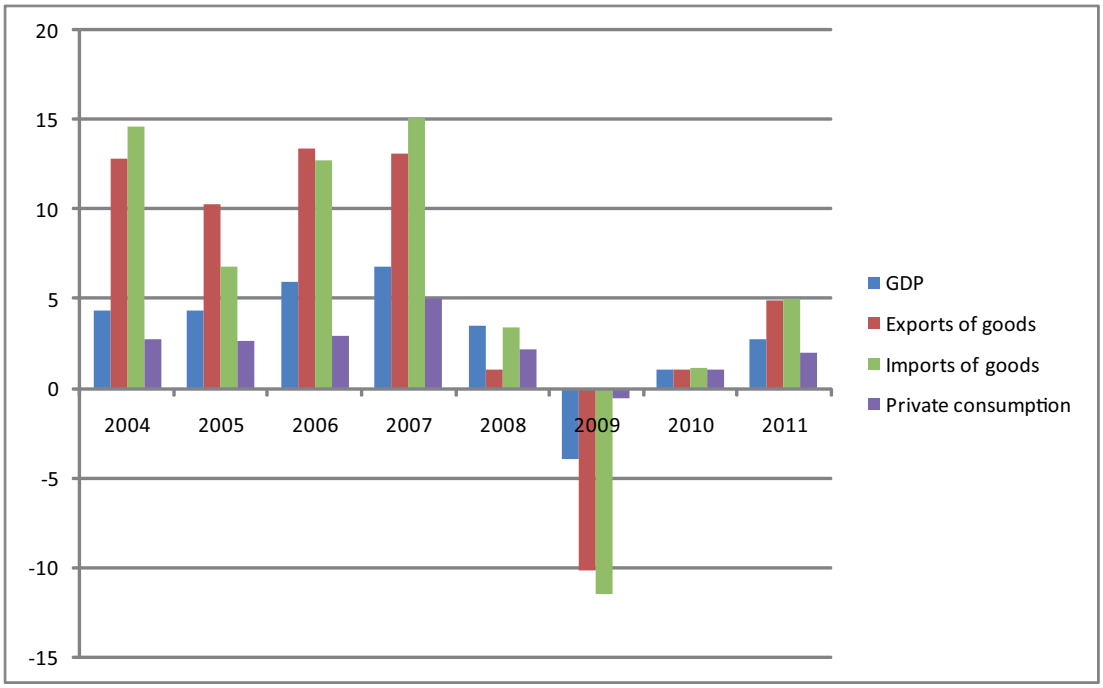
Source: SZ Network Statement, Adria Kombi, KombiConsult analysis, volumes partly estimated from totals

3. EVOLUTION OF INTERMODAL RAIL/ROAD TRAFFIC IN SLOVENIA BY 2020

3.1 - Recent developments until 2009

Slovenia's gross domestic product rose by 86.5 per cent between 2000 and 2007. Due to the current economic crisis it is expected to decline massively in 2009, but to rise again in 2010 and 2011, already, according to the *Institute of Macroeconomic Analysis and Development (IMAD)* that specialises in Eastern European countries and has issued the *Slovenian Economic Mirror, June 2009.* The same applies to the private consumptions, and import and exports.

Figure 3-1: Evolution of economic indicators for Slovenia, 2003-2011



Source: Institute of Macroeconomic Analysis and Development (IMAD), KombiConsult analysis

The impact of these economic developments on unaccompanied intermodal traffic was already mirrored in the data. However, mostly due to a still good first 8 months of the 2008, the total volume still grew by 3.4 per cent compared to the previous record year 2007. This was mainly due to an increase of domestic volumes (+29 per cent) and international traffic (+9.5 per cent), while transit and accompanied intermodal traffic already declined. The intermodal industry in Slovenia transported about 385,300 TEU in 2008 (see ***Figure 3-2***).

Figure 3-2: Unaccompanied intermodal traffic in Slovenia by traffic type, 2007-2008

Intermodal market segment		2007 TEU	2008 TEU	2008/2007 Growth rate
Unaccompanied traffic		**238.100**	**263.100**	**10,5%**
Domestic		**44.500**	**57.400**	**29,0%**
International	maritime	114.200	n.a.	n.a.
	continental	22.100	n.a.	n.a.
	Subtotal	**136.300**	**149.300**	**9,5%**
Transit		**57.300**	**56.400**	**-1,6%**
Accompanied traffic		**134.700**	**122.200**	**-9,3%**
Total intermodal traffic		**372.800**	**385.300**	**3,4%**

Source: SORS, Adria Kombi, KombiConsult analysis

According to the market survey we have carried out the decline of traffic volume generally continued in 2009. Depending on intermodal service provider in the first-half the number of intermodal shipments decreased between 10 and 30 per cent compared to the first six months in 2008. Yet various sources such as operators, railways and terminal reported that they recognized at least a preliminary stop of the downturn trend at the end of the second quarter 2009.

3.2 - Projections of national transport policy

The Republic of Slovenia, in 2007, has adopted the "Operational programme of environmental and transport infrastructure development for the period 2007 – 2013", which includes, among others, a thorough analysis of current shortcomings in the transport infrastructure and anticipates future trends of transport. According to that "Railway represents a huge potential, despite current negative trends and stagnation in recent years. The development of railway system in Slovenia needs to be directed towards re-structuring and preparing for open market (inter-operability, cabotage, international transport) for only in this way new, international needs related to freight transport can be met. Opening of the all-European railway network will make possible for foreign railway operators to operate in Slovenia; at the same time our national operator will have an opportunity to operate on foreign markets."

It concluded to undertake those economic activities which are to be stipulated by the provision of adequate and sustainable transport infrastructure with particular attention to the restructuring and upgrading of the railway system. The expected results of the priority measures are:

- Intermodal competition to be restored,
- Links with neighboring countries along the trans-European corridors will be improved,
- Level of safety considerable improved,
- Traffic bottlenecks will be reduced,
- Travel times for freight and passengers will be reduced.

Thus the relevant items, including investments in port and rail infrastructure, have been identified in the Countries' development programme. Recent communication in the press reports that investments in the rail sector may even be starting earlier than planned as a component of the countries anti-crisis action plan.

3.3 - Analysis of impact factors

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 either through agglomerations of people resulting in a strong demand for consumer goods or when the area provides for major high-

scale distribution centres or when it is strongly industrialized, which is due to generating a high level of inbound and outbound movements of industrial products like prefabricates or semi-finished goods or consumer goods, or through a combination of all elements.

Against this background our investigation into the future of intermodal traffic in Slovenia particularly has focused on the analysis and evaluation of multiple socio-economic factors such as those mentioned above, which essentially impact on the opportunities for intermodal transport.

Moreover we have examined existing prognoses on road and rail traffic, political, infrastructure and intermodal and rail freight industry-internal factors and evaluated whether they may foster or even boost, jeopardize or impede intermodal services in, with or through Slovenia and – if so - to what extent. The conclusions and the key impact factors, on which the quantified forecast of intermodal traffic by 2020 is based (see sections 3.4 to 3.6), are summarized at the end of this section.

3.3.1 - Development of road and rail traffic

How can intermodal traffic increase volumes? It can grow by participating in the growth of the entire freight market or by capturing goods currently moved over the road. Statistical data clearly show that, in Slovenia, road traffic has been the most dynamic mode during the past decade and raised its market share. Consequently, there is a vast **theoretical** market potential on international trade lanes. It's however another story if service suppliers are capable of designing a product, which matches customer requirements and is competitive with road. Against this background it is useful to spotlight the expected evolution of the relevant long-distance freight market since it helps to locate the global growth potential of the demand for intermodal services.

According to the results of our inquiries with Slovenian stakeholders there are no recent official long-term prognoses on goods transport and its modal split for the horizon 2015 or 2020 published. We analyzed other sources, but the results were not encouraging: early reference years, so that reality has already overtaken the forecasts; non-harmonized data; lack of transparency regarding the assumptions for forecasts.

The only source that appeared to be methodologically clear and suitable for establishing a frame of future freight traffic is *Progtrans'* "European Transport Report 2007/2008". It supplies several freight-related performance indicators for the years 2015 and 2020

generated through a trend forecast. This means that recently observed developments of several socio-economic factors were more or less extrapolated and used as inputs into a quantitative transport model. The results for Slovenia are presented in ***Figure 3-3***. It shows the growth rates for several freight market segments between 2005 and 2015 and 2020 respectively. We used 2005 as reference as this was the last year *Progtrans* provided for actual figures, while their 2007 figures were already forecasted.

Figure 3-3: Prognosis of Slovenian freight traffic related to performance (tkm)

		Growth rate		Average annual growth rate	
		2015/2005	2020/2005	2015/2005	2020/2005
Domestic traffic		20,00%	30,00%	1,84%	1,76%
International traffic		74,29%	105,71%	5,71%	4,93%
	Export	64,29%	100,00%	5,09%	4,73%
	Import	130,00%	190,00%	8,69%	7,36%
	Transit	27,27%	36,36%	2,44%	2,09%
Total freight traffic		49,23%	70,77%	4,08%	3,63%
Total road freight traffic		51,52%	75,76%	4,24%	3,83%
Total rail freight traffic		50,00%	65,63%	4,14%	3,42%
Total inland waterway traffic		n.a.	n.a.	n.a.	n.a.

Source: Progtrans: European Transport Report 2007/2008; KombiConsult calculations

Progtrans forecasts that the total international freight market will rise by nearly 106 per cent in the period 2005 to 2020. More than proportionate growth rates are expected for the import (+190 %) while the export (+100 %) and in particular the transit of goods (+36.4 %) grows less than proportionate. Since we do not know to what extend a modal shift from road to rail is already been included in Progtrans data, we consider a further growth potential for intermodal rail/road traffic if appropriate measures are set by the stakeholders.

3.3.2 - Population

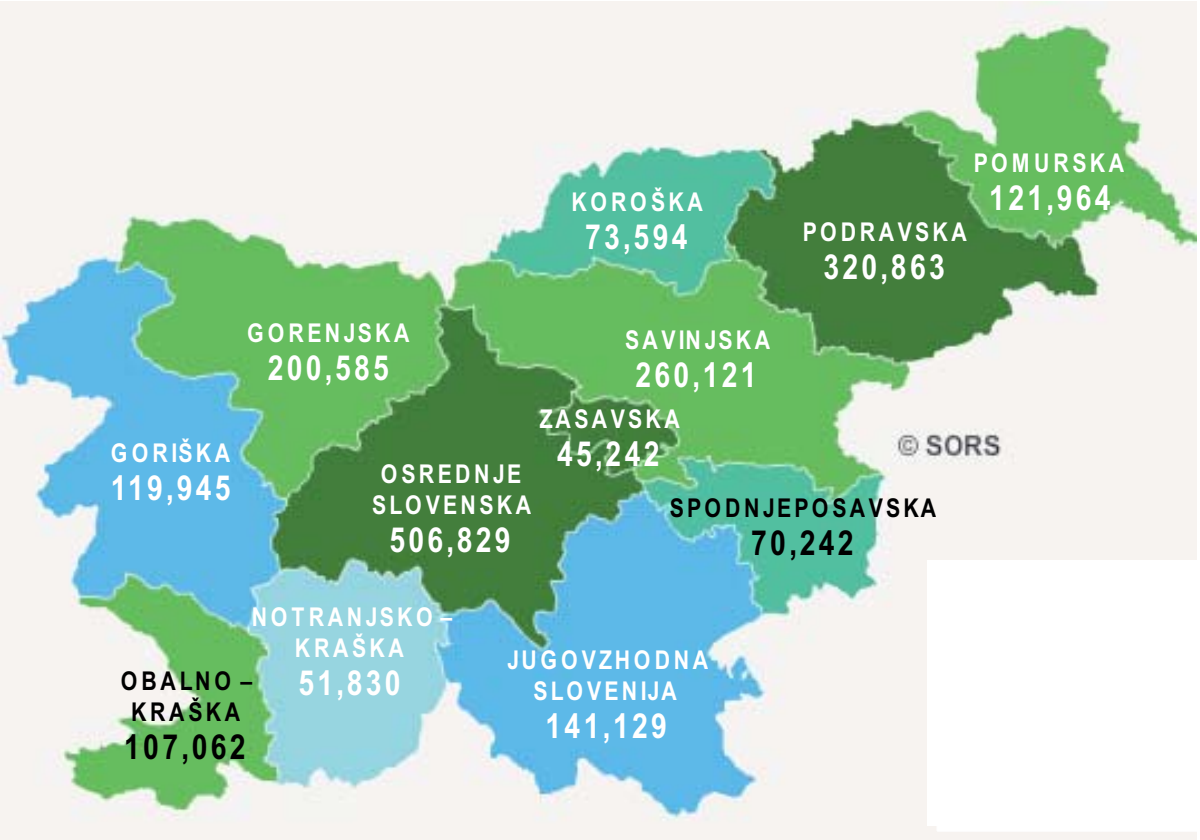
The size of the population and the regional distribution of population have a major influence on the total freight traffic as well as on the logistic patterns and modal choice in particular with regard to the capability for consolidating volumes.

In 2007, Slovenia had a population of 2,025,866 persons. The Swiss-based consultancy *Progtrans* has forecasted in its "European Transport Report 2007" that Slovenia will win about 10,000 inhabitants (+0.5 per cent) by the year 2020.

There are no projections about the likely future distribution of population available so we have to assume that the present growth poles namely the capital region Ljubljana/Kranj will remain important.

Such a small growth would not considerably influence freight in general and intermodal transport specifically. What is much more important for the potential demand for transport services is the distribution of the population. It is obvious that Slovenia's population is not equally distributed over the territory (see ***Figure 3-4***). These data prove that Slovenia is developing along the major European axis.

Figure 3-4: Population by county, 2007



Source: Interactive Statistical Atlas of Slovenia, KombiConsult analysis

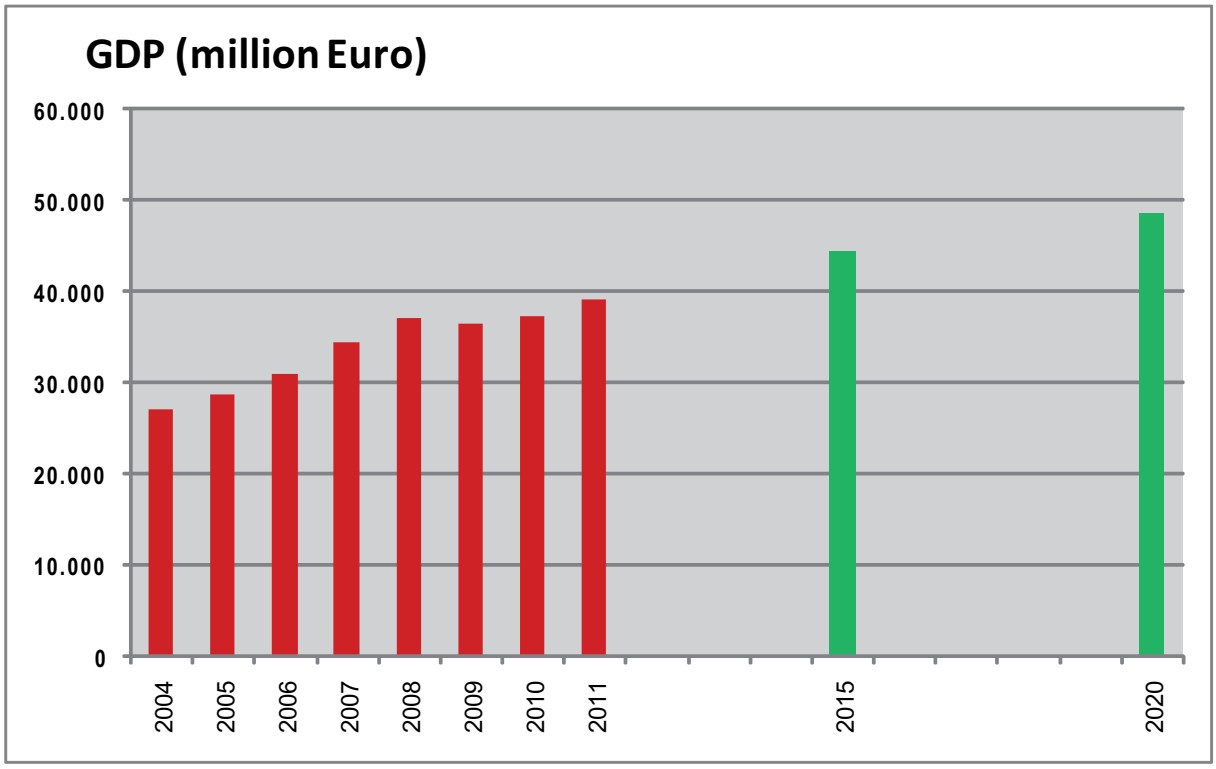
3.3.3 - Evolution of gross domestic product

As concerns long-term GDP forecasts we again established our own assessment on the basis of the *Progtrans* report. *Progtrans* expects that Slovenia's real GDP (at 2000 prices) will rise in the period 2005-2015 by 35 per cent and in the period 2005-2020 by 48.4 per cent (see ***Figure 3-5***). This corresponds to following average growth rates:

- 2005 – 2015: 3.0 %
- 2005 – 2020: 2.7 %

As – unlike *Progtrans* - we had access to the *Slovenian statistical office* data on the actual evolution of Slovenian GDP until 2008 and the recent IMAD data, we applied the above growth rates as of the year 2008 and calculated the development until the year 2020 (see ***Figure 3-5***).

Figure 3-5: Evolution and forecast of Slovenian GDP (at current prices), 2004-2011, 2015, 2020

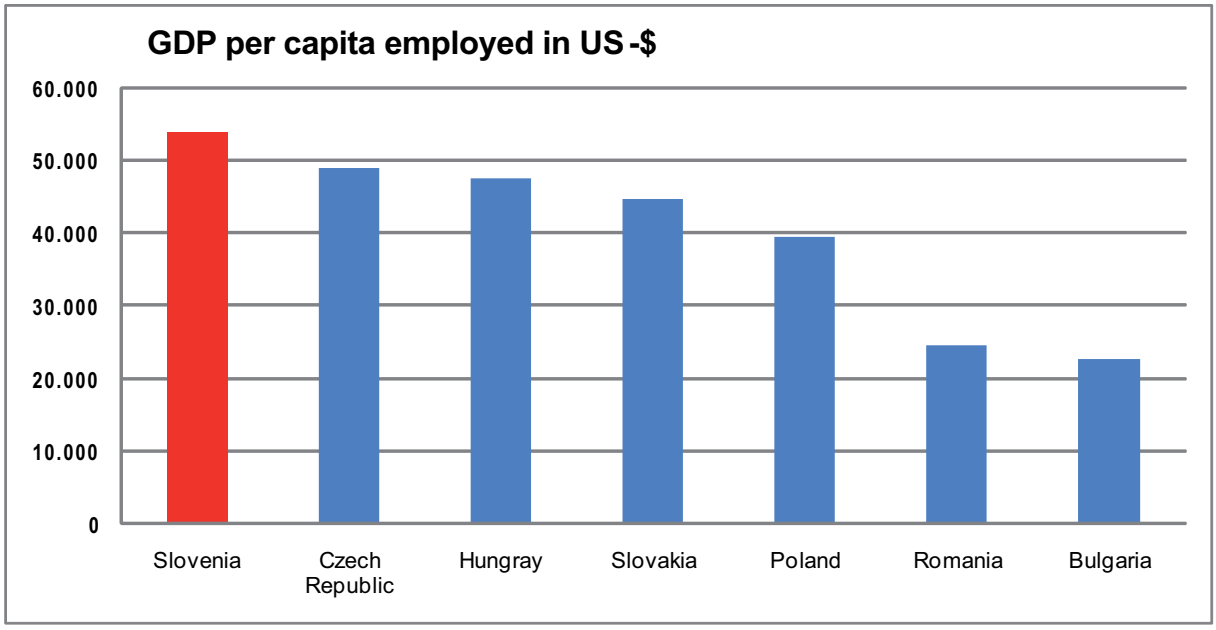


Source: Institute of Macroeconomic Analysis and Development (IMAD 2004-2011), Progtrans, KombiConsult calculations

3.3.4 - Evolution of manufacturing industry and foreign investments

The manufacturing industry has a share of about 34.4 per cent in Slovenia's GDP in 2007. The Slovenian workforce is among the most productive in Europe (see ***Figure 3-6***). And generally said to be of highly educated, trained and reliable. The sectorial mix composes of small and medium sized industries as well.

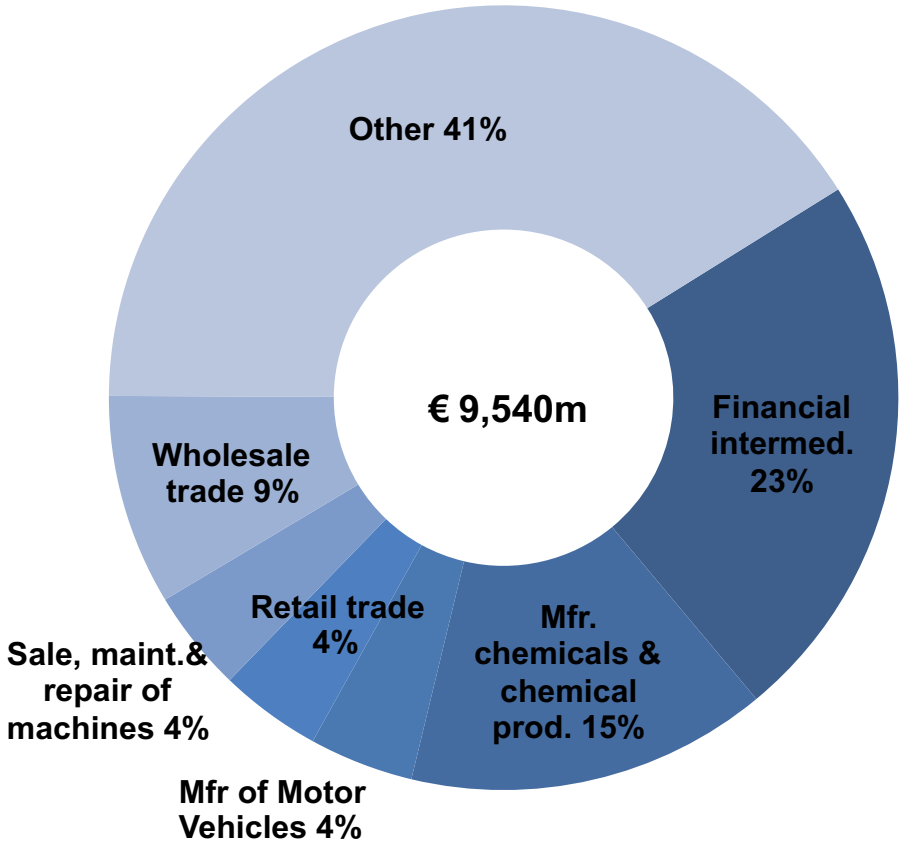
Figure 3-6: Productivity (GDP per capita employed), 2007



Source: IMD World Competitiveness Yearbook, 2008 according to Invest Slovenia, KombiConsult analysis

In 2007 the foreign direct investment stocks (FDI) in Slovenia totaled to Euro 9,540 million (see ***Figure 3-7***). The majority of investments were in the financial sector (23 per cent) followed by manufacturing of chemicals and chemical products (15 per cent), manufacture of motor vehicles (4 per cent), retail trade (4 per cent), wholesale trade and commission trade (4 per cent), and various other.

Figure 3-7: Foreign direct investments stocks in Slovenia by industry, 2007



Source: GTAI, KombiConsult analysis

3.3.5 - Evolution of private consumption

In recent years the private consumption was growing. Again using *Progtrans* long-term projections the following growth rates are forecasted for Slovenia:

- 2005 – 2015: 2.8 %
- 2005 – 2020: 2.5 %

3.3.6 - Evolution of external trade

Progtrans is using the following data for their long-term projections of exports, imports and external trade that is also supporting a further increase of the transport volumes with and within Slovenia.

Figure 3-8: Evolution of economic indicators 2005 - 2020

Indicator	Growth rate		Average annual growth rate	
	2015/2005	2020/2005	2015/2005	2020/2005
Inhabitants	1,00%	1,00%	0,10%	0,07%
GPD	34,96%	48,37%	3,04%	2,67%
Private consumption	32,35%	45,59%	2,84%	2,54%
Export	76,79%	111,90%	5,86%	5,13%
Import	74,42%	108,72%	5,72%	5,03%
External trade	75,59%	110,29%	5,79%	5,08%

Source: Progtrans: European Transport Report 2007/2008; KombiConsult calculations

3.3.7 - Intermodal competition

While the previous sections examined the potential development of the total all-mode including size and structure of trade and transport volume of Slovenia's economy, this and the following sections investigate into the opportunities and competitiveness of intermodal traffic in Slovenia with regard to road transport.

The Slovenian road operators are among the moderate-cost carriers in Europe. This is mainly due to the fact that their equipment (truck and spare parts) generally is not cheaper than the one of their western European counterparts and that their labour costs have increased with the growth of wealth in Slovenia in the past 20 years.

Against this background this section is intended to analyze how the terms of competition on cost between truck operators and intermodal traffic are likely to develop and whether intermodal services have an opportunity to catch up with road. It highlights the following issues:

- Cost of energy
- Cost of staff
- Cost of access to infrastructure
- Allocation of social cost

(1) The recent years saw a tremendous increase of energy prices. Particularly the price of oil and its derivates such as diesel fuel soared. The global economic downturn seems to have stopped a further upward movement and calmed down prices. There is, however, no expert who entertains any doubt that fuel prices will grow again. The debate is only on the question when the next jump will hit the economy and to what extent prices will be skyrocketing.

Even if intermodal transport will not be able to escape a rise of energy prices completely they will not be hit as violently as the diesel-based road transport business. This could be observed during the last oil price rally when the market prices for road traffic virtually exploded. Not only that the electricity supply for electric locomotives, which are overwhelmingly employed on intermodal services from/to and through Slovenia, is less dependent on fossil energy than trucks the share of energy cost of total transport cost is also considerably smaller– about 10 versus 30 per cent. Thus in future the comparative cost relationship is likely to change to the benefit of intermodal rail traffic.

(2) For some years the costs of driving staff in road transport have been increasing considerably and improved the competitiveness of intermodal traffic where personnel costs remained rather stable. This development has three reasons:

- In western European countries a shortage of truck drivers in relationship to the de-mand has arisen. First of all, it results from the fact that the armed forces, which were a “natural” trainer on truck driving licences, have reduced the number of draftees. Secondly, more and more truck drivers don’t want to spend their life on motorways. They prefer jobs in regional or local traffic.
- The accession of the CEE countries to the EU has “saved” the western European road-based logistics because many CEE residents were willing to work as low-cost truck drivers instead of being unemployed at home. Yet the more the economy in CEE countries prospered the more truck drivers changed to more pleasant industrial jobs in their country.
- The strongest and most sustainable impact on road cost can be expected from the new EC regulation on drivers working and resting times and the obligatory application of the digital speedometer (“blackbox”). Both measures are due to reducing the effec-tive working time per driver and require from road operators to employ more drivers for the same scope of services. Forwarders estimate that personnel cost in road transport

have increased by 10 to 25 per cent depending on the level of compliance with current rules. Considering that drivers' cost make up about 30 per cent of total road transport cost the market price level is due to rise by 3 to 8 per cent.

(3) The reduction of the effective drivers' working time in the long run will have another positive effect for intermodal services. It causes that a driver who complies with the regulation, generally will not be capable of performing a round trip on a route of about 300 to 350 km in one shift, loading/unloading included. Even if road operators will elaborate smart operational solutions such as new relay systems of interchanging trucks or drivers, the working time re-gime is likely to lead to a significant increase of transport cost and result in reducing the break-even distance intermodal versus road correspondingly.

(4) As regards infrastructure charging road operators still are in a better position than rail freight services. Even if Slovenia has introduced road tolls for using motorways the level is comparatively low. This means that, in Slovenia, road operations can be carried out at costs that take into account at least parts of the building and maintenance costs of the roads, exemplary calculations show an average cost of about 25 Euro-Cent per truck-km (toll calculator of www.dars.si).

On the other side, railway undertakings – and consequently intermodal operators and their customers – have to pay track access fees for the usage of virtually any European network. In Slovenia the track access charges amount to about Euro 2.23 per train-km for a freight train with more than 1,500 tonnes gross weight on main lines if the path has been requested and assigned in the annual time table request. For ad-hoc paths a fine of 20 per cent has to be paid, while lighter trains (<1,500 tonnes) have to play half of the paths price.

(5) Whereas intermodal services currently are penalized as concerns infrastructure access charging compared to road operations, they might considerably benefit from a regime, which off-charges social costs to each mode of transport proportionally to social costs generated. Any calculation shows that rail is causing much less social costs per tonne-kilometre as road with regard especially to air emissions and non-covered costs of accidents.

Our analysis provides evidence that two of the major cost drivers of road freight transport, fuel and personnel cost, are due to rise noticeably in the next years. If the plans for allocating social cost to causers were enforced in due time intermodal services could gain an additional benefit and thus could compensate – at least partly – for the cost disadvantage

in infrastruc-ture access charging systems. In total we expect that in contrast to the past 20 years that saw a continuous decline of market prices, the level of road freight rates will increase by a mean annual rate of 1.5 to 2.0 per cent by 2015. If authorities, however, felt that the transport industry is not doing enough for reducing its carbon dioxide and ecological footprint they might even tighten their measures and increase the “price” on road traffic.

3.3.8 - Sustainable logistics

The climate policy, which is responding to the threats of a change of the world climate, may become a key leverage for shifting shipments from road to more environmental-friendly supply chains, of which intermodal traffic can particularly benefit.

During our market survey we have identified several companies, which are about to examine how they could reduce the ecological footprint of their logistics systems. What is remarkable or even spectacular is that it is not only the chemical industry, which is rail inclined anyway, but other industries, which, to date, were comparatively “road-minded” and were virtually keen to stand away from rail.

Since recently several major European wholesalers and retailers are driving sustainable, “green” logistics. They have started to examine where, in their own logistical system, they could reduce the environmental impact of their supply chains for foodstuffs and non-food consumer goods. But even more so they are requesting from their suppliers to contribute to this objective. We learnt that particularly the big producers of food and non-food consumer goods have understood the message. It has immediately become obvious that the majority of them is looking for solutions where they could shift current road-based tonnage to intermodal services. They are analyzing which of their trade lanes correspond with existing intermodal services, and if there aren’t any, they expect intermodal operators to devise appropriate supply.

What is suddenly driving these industries to care for the climate impacts of their logistics and transport? According to our analysis the following influences are key for this move:

- The major driver of green logistics is economics. The 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 retailer have observed changed consumer values and recognized that the revenues from biologically produced products are increasing more than the average even if their share is still modest – less than 10 per cent. Customers that buy those products are a minority but they are an “avant-garde” and 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. The companies affected try to anticipate this development by restructuring parts of their logistics.
- Finally, more and more shareholders ask the management of corporation what they are going to do to respond to the challenges of climate change.

If the intermodal industry responds appropriately to the requirements of shippers concerned of their ecological footprint and ensure reliable and cost-efficient service we expect that climate policy will effectuate a tremendous push for intermodal traffic and raise volumes. According to our findings both shippers and intermodal operators will be interested to do the first steps on western European corridors. Provided that they are successful we anticipate that shipments from and to Slovenia may be integrated as well. The corridors with Slovenia provide for several favourable conditions: They have a good rail infrastructure and involve long transport distances, which allow for recording large environmental savings effects.

3.3.9 - Port development

Slovenia is in the lucky position to have a direct access to the Adriatic sea with the seaport of Koper for freight transport.

The following Figure is showing the existing container terminal in the port of Koper. The rail containers are handled on dedicated tracks on the land side of the terminal.

Figure 3-9: Birds-eye-view to the Port of Koper container terminal

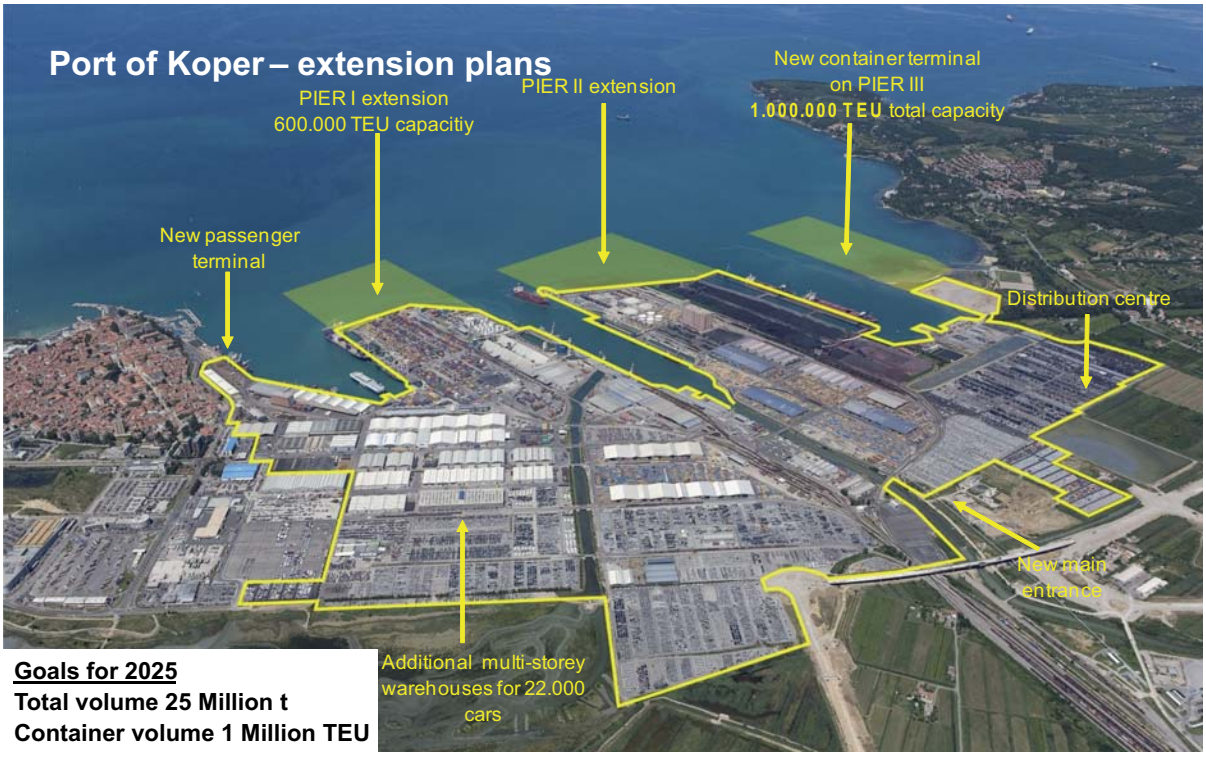
Superstructure facilities:

Total port area	2.720.000 m²		
Closed warehouses	247.000 m²	Quay length	3.134 m
Roofed warehouses	76.000 m²	Railway tracks	30 km
Open storage areas	900.000 m²	Berths	25
Shore tanks	50.000 m³	Maximum sea depth	- 18 m
Silo (unique capacity)	80.000 tons		

Source: Port of Koper, Adria Transport, KombiConsult analysis

In the light of the further European integration along the corridor V the port of Koper faced an increase of transshipment volume of all commodities, not only containers, in recent years and have prepared for a stepwise extension of the ports infra and supra-structures, that target at building a totally new Pier on which 1 million containers can be handled by 2025.

Figure 3-10: Birds-eye-view to the Port of Koper container terminal, extension plans



Source: Port of Koper, KombiConsult analysis

Maritime container traffic developed with steady two-digit growth rates over the past years. Reasons are the growth of the world economy and the integration of the Eastern European countries in transcontinental trade flows after the fall of the iron curtain and the end of the war on Balkan.

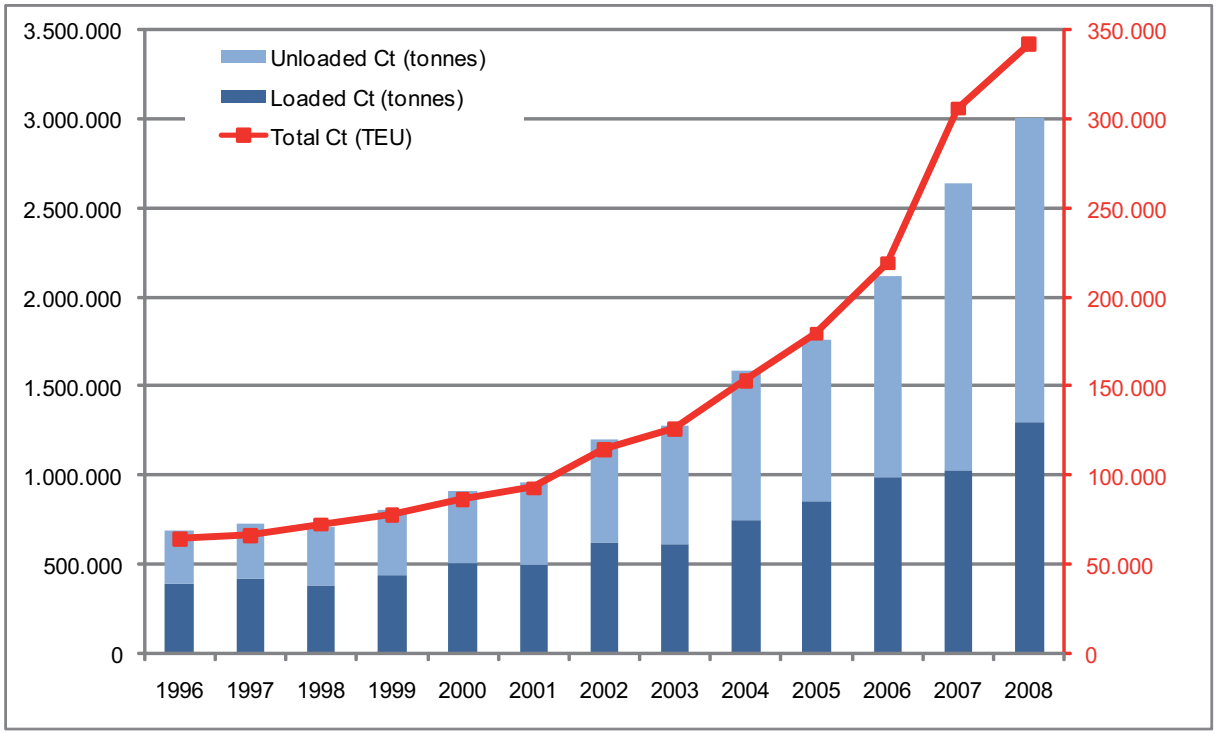
The total volume of container traffic of Koper was almost 350,000 TEU in 2008.

In 2009 the port received the first of four Post-Panamax-Portal cranes for Pier 1 They will allow receiving and handling vessels with a capacity of 9,000 TEU.

Adriatic port operators in Trieste, Koper and Rijeka claim to having benefited also from recent (2007/8) congestion in North European ports so that trade companies have looked for bypasses 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.

Figure 3-11: Development of the container traffic of the Port of Koper, 1971-2008



Source: Port Authority, KombiConsult analysis

It can be expected that the port will act as secondary or feeder ports where no further transhipment will take place but all containers will be shipped by land transport. Given the current or aimed at railshare of approximately 60 % and a use of the installed capacity of 80 % we could expect an intermodal traffic of about 320,000 TEU annually. Assuming a normal utilisation, that would lead to about 8 pairs of trains by day (5 days/week) for domestic and international routes.

3.3.10 - Rail infrastructure and terminal development

The 2010 Network Statement of SZ Infrastructure already lists a couple of rail infrastructure bottlenecks in the Slovenian rail network. There are permanent and temporary bottlenecks. The permanent ones are the lines where long-term modernisation of the infrastructure is needed. The temporary bottlenecks are connected to operative solutions. The temporary bottlenecks are defined on the following rail sections:

- Ljubljana – Jesenice;
- Pragersko – Ormoz;
- Maribor – Prevalje;
- Ljubljana – Kamnik;
- Jesenice – Nova Gorica;
- Divaca – Koper;
- Novo mesto – Metlika;
- Ljutomer – Hodos.

Compared to that permanent bottlenecks are mostly found on the rail sections:

- Divaca - Koper,
- Ljubljana – Jesenice and
- Pragersko – Ormoz – Ljutomer - Hodos.

Modernisation is taking place on the lines Divaca – Koper, Sezana – Ljubljana - Zidani Most – Maribor and Pragersko – Ormoz – Ljutomer – Hodos.

The development projects on the Slovenian railway infrastructure are devided into three stages in accordance with the proposed Resolution on the National Development Programme of the public rail infrastructure.

The targets of the stage 1 are to manage temporary speed restrictions and ensuring an axle load of 22.5 tons on lines which are part of the trans-European transport corridors V and X. Projects of the first stage are financed by Railway Transport Agency with support of the Republic of Slovenia co-financed by the European Union. Projects within this stage are:

- Rail line renewal of 21.8 km of tracks and 57 swtches on the lines Ljubljana – Zidani Most and Zidani Most – Maribor;
- Modernisation the safety signalling technique on line Divaca – Koper;
- Increasing the capacity of the line Divaca – Koper, including the station capacity
- Preparing the documents for the new construction of the line Koper – Divaca,
- Preparing the line Pragersko – Hodos for electrification,
- Beginning the installation of ERTMS/ETC and GSM-R systems,
- Managing temporary speed restrictions on the V and X corridor, and
- Other activities

Projects within the stage 2 target at:

- Increasing the speed on the entire rail line to 160 km/h;
- Managing permanent speed restrictions;
- Electrification of the remaining lines in the corridor V;
- Building rail lines on the single tracks sections of the corridors V and X;
- Improving safety on railway level crossings;
- Modernisation signalling and safety devices with the intention to managing the traffic from three traffic management centres;

Projects within this stage are:

- Electrification of the line Pragersko – Hodos;
- New construction of a second track Ljubljana – Jesenice
- New construction of a second track Maribor – Sentilj;
- New construction of the double-track line Koper – Divaca when checking the possible connections Trieste - Koper

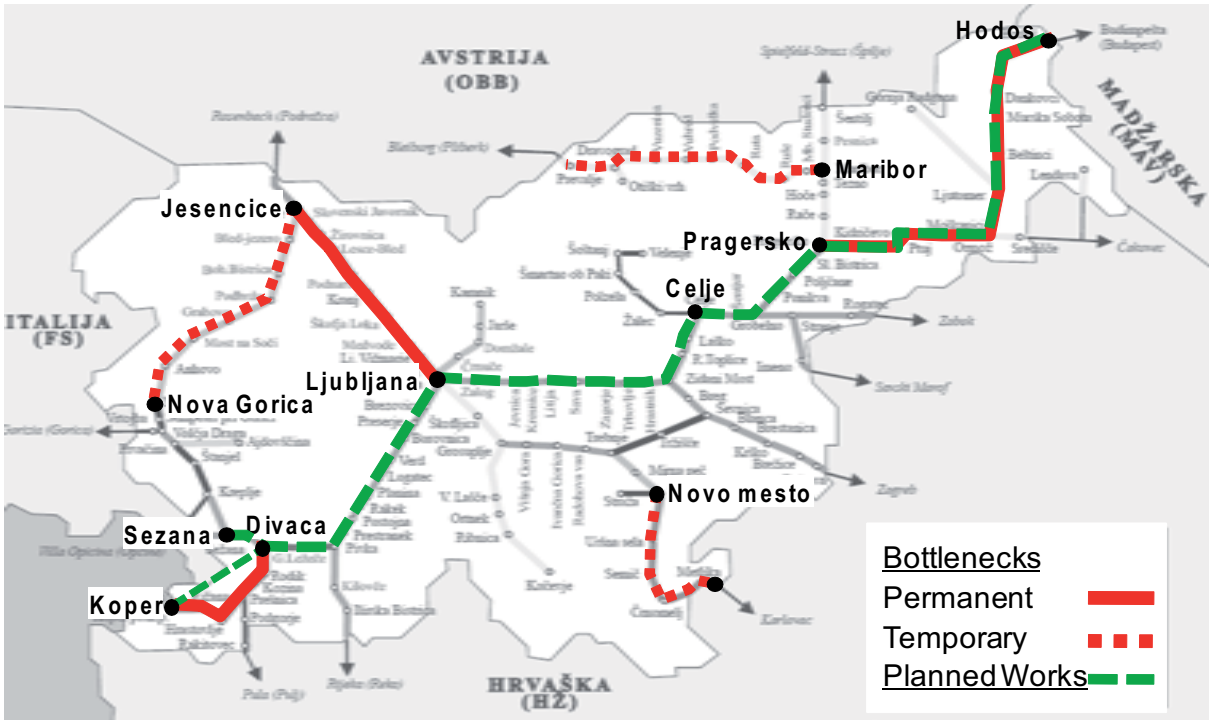
Stage 3 projects include a rail building programme for a speed of 160 km/h at particular rail sections.

Dependent on the formal adoption of the National Development Plan by the Slovenian government and the availability of funding, the projects are to be completed over the next 15 years (2008/2023) at an estimated total cost of around € 9bn. This is the equivalent of €300 per person per year for the country's entire population.

According to *railway gazette (11/2008)* by far the biggest proportion of the investment is destined for the Primorska line running west from the capital towards the Adriatic, splitting at Divaca to reach the Italian border near Sezana and the busy port of Koper.

With the steeply-graded single-track branch to the port forming a serious bottleneck, work is already underway to increase capacity. A consortium including Thales began a €41.8m resignalling project in 2006 which is due to be completed by the end of this year. On top of this, the ministry has allocated €45m for improvements to the 27 km Divaca - Koper line in 2009-10, split into €35m for infrastructure and €10m for stations. Another €82·5m is envisaged for track improvements including some double-tracking in 2010-15.

Figure 3-12: Rail bottlenecks and planned works in Slovenia, 2009



Source: KombiConsult based on SZ Network Statement 2010 ad National Development Plan

EU Priority Project 6 envisages construction of a new double-track line between Divaca and Koper by 2015. In addition, the existing route between Divaca and the Italian city of Trieste is not seen as adequate for the longer term, and studies for a new line have been underway for some time. An intergovernmental working party reached agreement in July on the alignment for a direct connection from Trieste to the new Divaca - Koper line, of which around 80 % would be in tunnel or on viaduct. The ministry has already started purchasing land, and construction is expected to get underway in 2012 with a budget of €800m.

Some stakeholders would like to see the new line extended all the way from Divaca to Ljubljana to create a high-capacity corridor for international passenger and heavy freight trains, leaving the existing line for local traffic. This is provisionally costed at €1,642m, but would not start until after 2020. Meanwhile, work has recently started on upgrading the existing 80 km main line between Ljubljana and Sezana.

On the Zasavje main line between Ljubljana and the Croatian border, work is due to start on enhancement of the section from the major junction at Zidani Most to Dobova; this line was double-tracked during World War II, but now needs additional capacity. Reconstruction of Dobova station began last year and is due to be finished in 2009, but upgrading of the border inspection post to meet the EU's Schengen standards has already been completed.

If traffic continues to grow in line with projections, the ministry envisages that a high capacity line will be needed between Ljubljana and Zidani Most in 2010-15. The €1,282m price tag reflects the fact that building a 250 km/h route through the tortuous Sava gorge will not be a simple job. The new line could be extended to Dobova after 2020, although no money has been allocated for this beyond the initial planning phase.

Capacity is also a major issue on the Gorenjska line running northwest from Ljubljana to Jesenice and the Austrian border, with increasing volumes of international freight having to be squeezed through the 71 km route, which is largely single track.

Work started earlier this year on upgrading works valued at €111m, which are to be completed by 2011. Double-tracking is envisaged for the longer term, with the 30 km first phase to Kranj scheduled for 2015-20, along with construction of a loop serving Ljubljana International Airport, which lies a short distance east of Brnik. The remainder of the line would be double-tracked after 2020.

On the Štajerska line heading towards Wien, extensive track renewals are underway on the Zidani Most - Celje - Pragersko section. This line is to be upgraded for 160 km/h operation in 2015-20, but otherwise needs little in the way of capacity enhancement. A tranche of €128m has been allocated for double-tracking the 15.4 km from Maribor to the border at Šentilj, which will also be upgraded from 120 to 160 km/h operation.

The fifth branch is the Prekmurje line from Pragersko to the Hungarian border at Hodoš, which has become an increasingly busy through route since the Murska Sobota - Hodoš line was reopened in May 2001. Planning began in 2006 for a major upgrading of this single-track route by 2013, including electrification throughout.

The Hungarian section of the line is already being wired at 25 kV 50 Hz, but the Slovenians plan to stick with the existing 3 kV DC and establish a changeover point at the border. The 77.9 km Pragersko - Murska Sobota section is to be upgraded for 160 km/h operation, with bypass tracks around Ljutomer and Murska Sobota planned for the longer term.

3.3.11 - Evolution of intermodal industry

The previous sections have presented evidence that influences external to the intermodal industry are expected to create an additional large market potential for intermodal services in a medium-and long-term perspective. What is necessary to be competitive with Eastern European low-cost road carriers now and in the future are cost-efficient and reliable services.

The question is if the intermodal industry will and can develop capabilities, strategies and instruments to improve its competitiveness and what conditions are beneficial to this end. We have analyzed the industry and drawn our conclusions on its likely evolution as follows:

(1) The freight volumes are concentrated to a very large extent on the Osrednje Slovensska, Zasarska, Sarinjska area in central Slovenia, with the exiting terminal in Ljubljana, on the one hand in the Port of Koper on the other hand. Traffic flows are increasingly balanced east-west. Such framework conditions facilitate the implementation of - multi-frequency - point-to-point intermodal block train services with these installations.

(2) With the full implementation of the European legislation in the transport (rail) sector, competition in the intermodal industry on the operator and railway level will be further improved in Slovenia; the first “private” rail operators are already starting services. Slovenia has become interesting for transiting railway undertakings and railways and intermodal operators which access the countries’ seaport. This should contribute to improving service quality and productivity and developing new markets and trade lanes.

(3) In order to foster intermodal services on routes beyond Slovenia to the West-Balkan States, which don’t provide for full-trainload volumes from the start, it is required to establish hub-based rail production systems (gateway services). Starting with the relatively low volumes such a system should combine domestic and international services, which are physically crossing in the area of Ljubljana, where they could be merged with local volumes for the agglomeration. For this reason we expect that intermodal operators will further stabilize and expand the role of Ljubljana as a gateway terminal. Such a hub would be suitable for serving the following trade lanes:

- Germany – Slovenia and further countries;
- Italy – Slovenia for continental cargoes;
- Ljubljana – Beograd – Bucuresti / Sofia / Thessaloniki;
- From/to the port of Koper: Austria, Hungary, Budapest in particular, Slovakia, and domestic centres in the east (Maribor)

The prerequisites for such a hub terminal are amongst others sufficient interim storage area, competitive handling and interim storage rates, flexibility, and the capability to compensate for operational deficits of others e.g. delays caused during the rail trip.

3.4 - Evolution of domestic intermodal rail/road traffic by 2020

It is virtually impossible to forecast Slovenia's domestic traffic neither to next year nor to 2020. Given the geo-economic conditions there are not many opportunities to establish road-competitive domestic services. Therefore the demand for carrying an intermodal shipment on a domestic line will remain extremely volatile and dependent on the decisions of individual companies. Those decisions can't be predicted in the frame of such a global assessment.

We expect that – just like today - one part of the volume will be sourced from loading units re-forwarded after or prior to an international movement and the other part from the carriage of empty containers. With respect to our prognosis that the international container hinterland traffic between seaport and Slovenian inland terminals will more than double by 2020 (see section 3.5) we assume that the domestic intermodal traffic, whose volume correlates with international traffic, will grow at nearly the same rate and volume rise to 97,200 TEU. This corresponds to an increase by 118 per cent compared to the year 2007.

A major impact may result from Slovenia's own seaport Koper, in particular after solving the sea access problem between the Slovenian and the Croatian governments, which have therefore planned infrastructural improvement projects and which may also lead to an increase of the intermodal rail volume in their domestic hinterlands, in particular, if an appropriate production form, e.g. via a gateway terminal in Ljubljana can be established. The development of these transports is however depending also on the completion of works in the ports and of the new railway line Koper – Divaca that will improve the capacity considerably.

3.5 - Evolution of international intermodal rail/road traffic by 2020

In order to assess the development of the international volume of intermodal traffic of the countries involved in this study we analyzed every relevant trade lane between two catchment areas whether, by 2020, it may provide for a potential, which:

- First of all, is sufficiently high to enable implementing a regular full-trainload (FTL) intermodal service, e.g. a direct or shuttle train;
- Secondly, we considered to be suitable for being captured by an intermodal service featuring an appropriate service profile.

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 as presented in ***Figure 3-13***.

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.

Intermodal traffic on bilateral intermodal services with Slovenia is expected to improve by 300 per cent in the period between 2007 and 2020. Even if the growth rate seems impressive, one has to take into consideration the absolute figures: The total amount of shipments will rise from 136,300 TEU to 544,700 TEU (see ***Figure 3-20***). That volume corresponds to about 28 daily trains (14 relations), and will mainly result from the maritime sector (72 per cent).

Figure 3-13: Bilateral international unaccompanied intermodal traffic by corridor, 2007/2020

Slovenia from/to	2007			2020			% change on total
	Maritime	Continental	Total	Maritime	Continental	Total	
Austria	15.083		15.083	63.000		63.000	318%
Bosnia-and-Herzegovina	180		180	2.250		2.250	1150%
Bulgaria			-	16.200		16.200	n.a.
Croatia	800	2.521	3.321	35.000	10.800	45.800	1279%
Czech Repubik	552		552	19.500		19.500	3433%
France	-		-	25.200		25.200	n.a.
Germany	11.232		11.232	27.000		27.000	140%
Hungary	76.242		76.242	154.000		154.000	102%
Italy	906		906	10.800		10.800	1092%
Romania		341	341	35.000	6.300	41.300	12011%
Serbia		6.957	6.957	35.000	21.600	56.600	714%
Slovakia	21.493		21.493	56.000		56.000	161%
Turkey	-		-	27.000		27.000	n.a.
Total	126.488	9.819	136.307	505.950	38.700	544.650	300%

Source: KombiConsult analysis

The two main intermodal market segments will develop distinctively. While container hinterland traffic will "only" increase by 248 per cent the volume of freight shipped on continental services is forecasted to increase from 22,100 TEU in 2007 to 147,200 TEU by 2020. Based on our findings on the evolution of Slovenia's external trade and the terms of competition between intermodal and road continental intermodal traffic is expected to grow particularly strongly on trade lanes with the following countries (see ***Figure 3-13***):

- Hungary, in particular maritime cargoes to and from the Adriatic seaports
- Austria, both maritime and continental (to and from Adriatic seaports)
- Slovakia, in particular maritime cargoes to and from the Adriatic seaports
- Germany, both continental and maritime (to and from German seaports)
- Croatia, Serbia and Bosnia-and-Herzegovina (where Gateway services to other further Balkan countries can be realised)

Intermodal **transit** through Slovenia is going to soar in the years to come. It will more than quadruple from 57,300 TEU (2007) to 308,500 TEU (2020). The main reason for this development is that we expect that the bilateral intermodal traffic between western

European countries, on one end, and Bulgaria, Serbia, Greece and Turkey, on the other end, will grow substantially (see ***Figure 3-14***).

There are more details in the other country reports on bilateral intermodal trade lanes, in which they are involved.

At first sight the total absolute and relative increase of the transit traffic may appear to be not realistic. But the following aspects should be taken into account:

- Within two years from 2005 to 2007, intermodal transit through Slovenia has grown by 74 %.
- The transit traffic serving primarily continental trades was much less hit by the current economic crises than the international maritime traffic.
- We do expect a considerable increase of external trade between the old and new EU Member States as well as with Turkey.
- Each of the corridors, which we assume intermodal traffic will grow strongly, has very long rail-oriented transport distances and is due to providing for more than a daily full-trainload point-point freight potential.

Figure 3-14: Unaccompanied intermodal traffic in transit through Slovenia by corridor, 2007/2020

Transit Corridor		2007	2020	% change
Austria	Croatia	65	47.600	73131%
Belgium	Croatia	5.000	-	-100%
Bulgaria	Italy		21.600	n.a.
France	Greece	585	-	-100%
Germany	Croatia	9.400	37.500	299%
Germany	Greece		23.400	n.a.
Germany	Serbia	5.000	37.500	650%
Germany	Turkey		25.200	n.a.
Hungary	Italy	18.911	72.500	283%
Italy	Romania	9.747	43.200	343%
Other	Other	8.592	-	-100%
Total		57.300	308.500	438%

Source: KombiConsult analysis

In contrast to today's situation, in 2020, continental cargo will dominate the transit traffic. The volume of this market segment will grow from 11,400 TEU (2007) to 162,000 TEU (2020). The calculative growth rate is 1321 per cent, but this is a statistical effect. The growth rate of container hinterland services through Slovenia is expected to be 219 per cent. The market segment accounted for 45,900 TEU in 2007 already, and it is estimated to rise to 146,500 TEU by 2020. The total transit may thus raise by 438 per cent from 57,300 TEU to 308,500 TEU by 2020 (see ***Figure 3-14***).

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

The following ***Figure 3-15*** shows the total picture of the development of intermodal transport in Slovenia 2020/2007. According to our projection the total volume of unaccompanied intermodal transport will grow to about 950,400 TEU.

Figure 3-15: Unaccompanied intermodal traffic in Slovenia, 2007/2020

Intermodal market segment		2020	2007	Total growth	Annual growth
Unaccompanied traffic		**950.400**	**238.100**	**299%**	**11,2%**
Domestic	maritime	97.200	44.500	118%	6,2%
	continental	-	-	n.a.	n.a.
	Subtotal	**97.200**	**44.500**	**118%**	**6,2%**
International	maritime	397.500	114.200	248%	10,1%
	continental	147.200	22.100	566%	15,7%
	Subtotal	**544.700**	**136.300**	**300%**	**11,2%**
Transit	maritime	146.500	45.900	219%	9,3%
	continental	162.000	11.400	1321%	22,6%
	Subtotal	**308.500**	**57.300**	**438%**	**13,8%**
Accompanied traffic		**-**	**134.700**	**n.a.**	**n.a.**
Total intermodal traffic		**950.400**	**372.800**	**299%**	**11,2%**

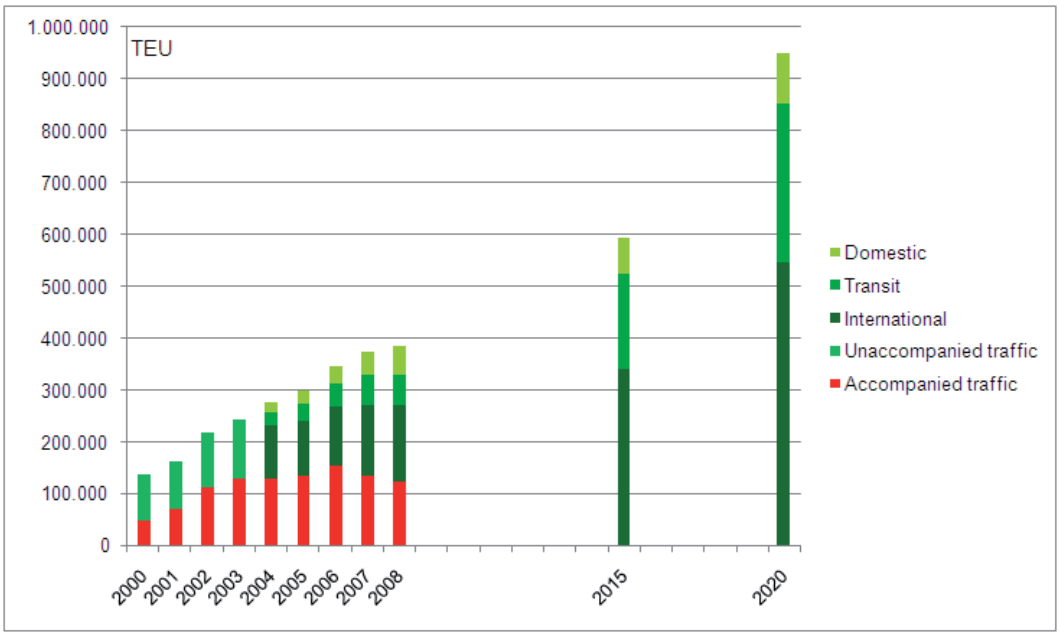
Source: KombiConsult analysis

These figures include transit traffic between Western Europe and Central and Eastern European countries that could be routed through Slovenia along transport corridor X. It should however be noted that this routing is one alternative amongst other. 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 Greece 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 be continued to improve the service level considerably to compete with the pure truck transportation and the respective alternative routings.

Figure 3-16: Unaccompanied intermodal traffic in Slovenia, 2000-2008, 2015, 2020



Source: KombiConsult analysis

The total (or annual) growth rates expressed in per cent might be surprising but the increase in absolute figures should be assessed in the light of the currently underdeveloped intermodal transport in Slovenia, the relation to international road transport and the envisaged measures to further strengthen the intermodal industry.

4. IMPACT OF EVOLUTION OF INTERMODAL TRAFFIC ON INFRASTRUCTURE

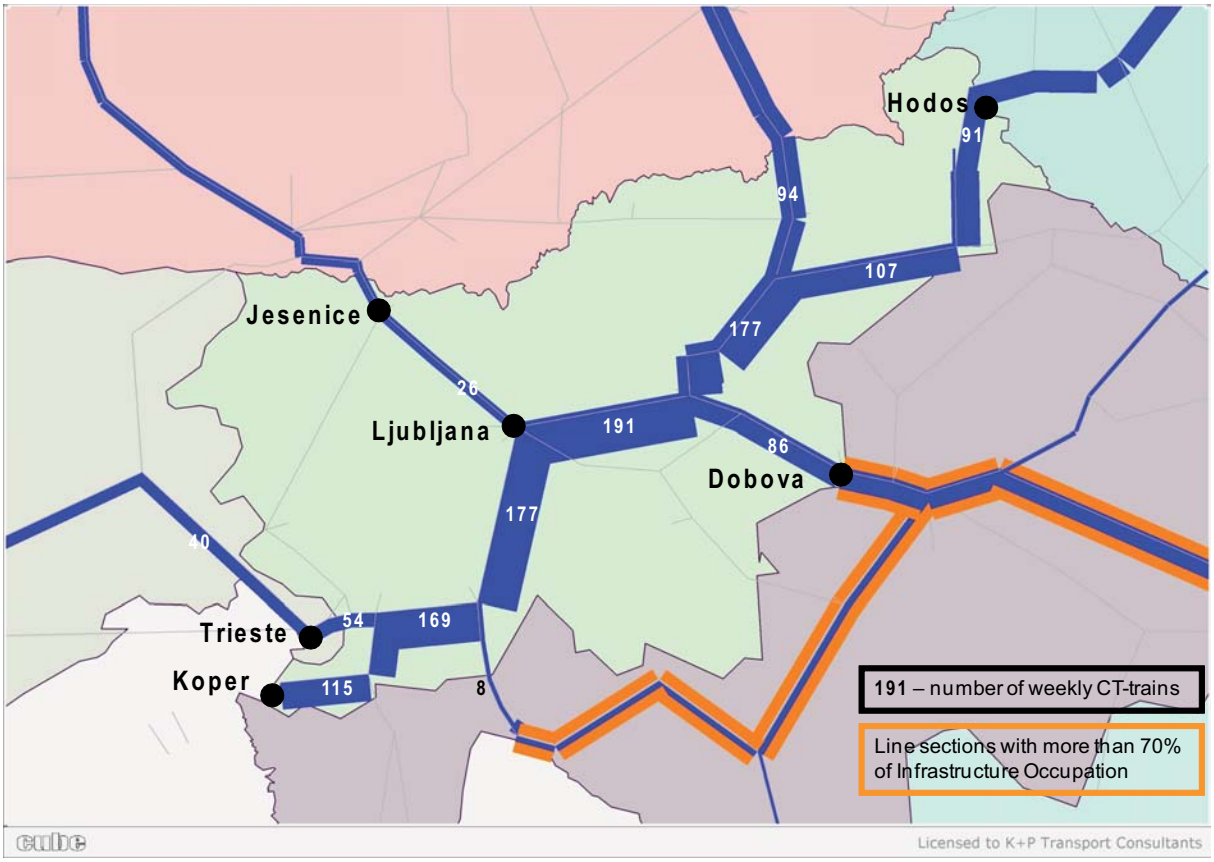
4.1 - Impact on rail network capacity

Figure 4-1 shows the approximate assignment of the 2020 transport programme of block train services from/to and through Slovenia determined by our assessment of the evolution of unaccompanied intermodal traffic, on the Slovenian rail network. Since we expect that the majority of intermodal shipments will be carried on international trains between Slovenia and the European countries of north of Italy, Austria and further in the north 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.

In spite of this substantial growth of intermodal trains until 2020 we basically don't anticipate major capacity constraints on the Slovenian network also taking account of other freight and passenger trains. Thus the situation will not significantly change compared to the existing state (see section 2.7.1).

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. These sections are marked orange in ***Figure 4-1***. Yet it should be qualified that this does mean that there will be sufficient capacities on general but not necessarily at the time-window required from the intermodal service supplier and its customers.

Figure 4-1: Assignment of intermodal trains on the Slovenian rail network, 2020



Source: K+P Transport Consultants

4.2 - Impact on terminal capacity

By the year 2020, intermodal terminals in Slovenia will need a transhipment capacity for an annual volume of 641,900 TEU in unaccompanied traffic. This is the consolidated volume of the expected intermodal shipments on domestic and bilateral international services and corresponds to 68 per cent of total intermodal traffic in Slovenia in 2020, amounting to 950,400 TEU. Only these two market segments affect terminals located in Slovenia since we assume that transit shipments will be carried between terminals in other countries and basically not handled at Slovenian sites in the framework of gateway or hub systems.

In order to determine the handling capacity required to process the transport volume of 641,900 TEU it is necessary to translate the amount of TEU in number of loading units (LU). Loading units are the objects, which terminals physically lift, and therefore the appropriate calculation parameter.

In this respect we need to distinguish maritime from continental traffic since the mix of loading units is expected to be quite different. Based on observable trends we expect that, by 2020, on container hinterland services with Slovenia one loading unit will correspond to 1.6 TEU.

Current continental intermodal services are strongly focused on the chemical industry and therefore move a large amount of 20' (1 TEU) and 30' (1.5 TEU) tank and bulk containers. 45' units used for continental trades between Austria and Greece in 2007 were carried in transit through Slovenia, only. For this reason, the TEU-loading unit ratio is comparatively low, lower than on maritime services. We, however, expect that over the next decade intermodal operators will be successful to capture general cargo freight markets, as explained in chapter 3. Then we will see a significant change of the pattern of loading units employed. To carry general cargo such as foods dry cargo domestic containers, semi-trailers and swap bodies are required. An equivalent of a full truckload of such a continental intermodal shipment corresponds to on average of 2.3 TEU. We determined a 1.8 TEU-LU-ratio as the weighted average of dry cargo and bulk units.

An increase of the international and domestic intermodal traffic volume does not equally influence the terminal capacity. While the transit traffic does not need terminal capacity at all, international consignments require one terminal call in Slovenia and domestic transports requires two terminal calls in Slovenia. Given the proportion of international services to/from the terminal in the port of Koper as major source of handling, the total required handling capacity has been calculated on the estimated growth of intermodal rail/road traffic volume (see ***Figure 4-2***).

Figure 4-2: Conversion of TEU-related intermodal volume into loading units (LU) in Slovenia, 2020

Market segment	Volume 2020 (TEU)	TEU/LU ratio	Volume 2020 (LU)	Handling ratio	Handling 2020 (LU)
Domestic	97.200	1,60	60.800	2,00	121.600
International Maritime	397.500	1,60	248.400	1,00	248.400
International Continental	147.200	1,80	81.800	1,00	81.800
Transit	308.500	1,80	171.400	-	-
Total	**950.400**		**562.400**		**451.800**

Source: KombiConsult analysis

The exercise shows that by 2020 Slovenian intermodal terminals will require a handling capacity for 451,800 loading units to be able to process the expected transport volume of 950,400 TEU (of which 308,500 are in transit).

In ***Figure 4-3*** we have estimated the handling need by terminal area by 2020. The table includes the current (2007) handling capacity provided by existing terminals in Slovenia and the anticipated capacity by 2020 for the same transport area.

Based on the information received for the existing terminals and likely expansion plans, we have derived the transhipment capacity need by terminal (see ***Figure 4-3***). 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 in the magnitude of 265,000 loading units should be installed in order to allow a further increase of intermodal traffic rail /road in Slovenia.

Figure 4-3: Estimation of handling need (loading units – LU) in Slovenia by terminal, 2007/2020

Terminal	Handling capacity	Capacity Need	Additional Need
	2007	2020	2020
	LU	LU	LU
Koper Luka KT	120.000	260.000	140.000
Ljubljana Moste	45.000	155.000	110.000
Maribor Tezno KT	15.000	30.000	15.000
Other	16.000	6.800	
Total	196.000	451.800	265.000

Source: KombiConsult analysis

5. RECOMMENDATIONS ON INTERMODAL STRATEGY

(1) The key success factors for **continental intermodal services** from/to Slovenia and in transit with South-East European countries are as follows:

- Upgrade rail infrastructure to increase operational speed and reduce travel time in particular on corridor X (Salzburg) - Jesenice - Ljubljana - (Zagreb - Tovarnik - (Belgrade), and corridor V (Trieste) - Divaca / Koper - Ljubljana - Pragersko - Hodos - (Budapest)
- Time-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
- Processing at intermodal terminals (see item 8, below) to ensure efficient round trip schedules for trucking companies

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

- Facilitate “Port of Koper development project” to increase its handling capacity on the sea- and landside (rail terminal)
- Realise the new railway line Koper – Divaca, possibly with an extension to Ljubljana, to reduce travel time and raise capacity
- Increase share of rail in hinterland connections by shuttle services with Port of Koper to major hinterland connections: Koper – Ljubljana – Graz (Austria), Koper - Ljubljana – Budapest (Hungary)
- Control and management of port-to-door chain by intermodal operators and shipping lines
- Flexibility: preparedness for additional trains; trucking container over the road
- Cost-efficient service
- Empty container depot at competitive rates

(3) The market potential on trade lanes from/to and through Slovenia 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 contributes to improve competitiveness with road:

- Standardization of processes and technology, including tracking and tracing of consignments
- Employment of efficient rail production systems: shuttle systems between gateway terminals
- Advanced interface management
- Commitment to reliable and consistent services

(4) Catch the opportunities given by a "**climate policy**". This argument, in Slovenia, comes along with the need for environmental protection and facilitating of tourist traffic to/from and along the Adriatic coast and the natural resorts, where heavy truck traffic may be seen as a burden for the development and intermodal rail/road transport can be used to relieve the congested roads

(5) Seamless international intermodal services:

- Interoperability on the borders where technically possible
- Synchronization of processes between railways and operators
- Data interchange; tracking of shipments

(6) State shall ensure **level playing field** between road and rail:

- Harmonised infrastructure access charging for road and rail, including a performance regime on rail that takes into account the current bad running conditions and stipulates infrastructure upgrading
- Improve border crossing procedures to reduce processing time by one common border station and working times synchronised between state authorities (border police, customs), infrastructure managers and railways working related to train time table where it is not yet implemented, e.g. Slovenia/Croatia
- Encourage competition with road rather than competition on rail (also towards other routings, e.g. corridor IV Wien – Budapest – Belgrade)

(7) On the basis of information and experience of European countries, the development of intermodal traffic will require **incentive measures** undertaken by the state, consisting of the following:

- tax exemption / tax reduction or favourable credits when purchasing means of intermodal traffic (intermodal wagon, craneable semi-trailers, swap bodies),
- exemption from various traffic bans on transport of loading units by road vehicles from and to terminals,
- investment policy in the sector of intermodal traffic, e.g. intermodal terminals, which is very important for its successful development, because initial investments in the development of intermodal traffic are large and only a process with well-planned material and organizational concept can yield good results.

(8) Develop CT-Terminal Ljubljana Moste as a gateway terminal to from Slovenia.

LIST OF FIGURES

Figure 1-1: Size of selected CEE countries (km²) 1

Figure 1-2: Pan-European (rail) corridors crossing Slovenia..... 2

Figure 1-3: Slovenia: administrative division by counties and population density..... 3

Figure 1-4: Population of selected CEE countries, 2007..... 4

Figure 1-5: Inhabitants per area of selected CEE countries, 2007..... 5

Figure 1-6: Gross Domestic Product per capita at current prices, 2007 6

Figure 1-7: Employment in industry, 2007 7

Figure 1-8: Share of gross added value, 2006 8

Figure 1-9: Share of Gross Domestic Product of Slovenia, 2007..... 9

Figure 1-10: Share of imported goods by commodity, 2007..... 10

Figure 1-11: Share of exported goods by commodity, 2007 10

Figure 1-12: Share of supplying partners by country, 2007..... 11

Figure 1-13: Share of buying partners by country, 2007 12

Figure 1-14: Foreign direct investments stocks in Slovenia by investing country, 2007 13

Figure 1-15: Modal split of freight traffic in Slovenia (related to volume), 2007 14

Figure 1-16: Freight traffic in Slovenia: transported goods (million tonnes) by mode and traffic type, 2001-2008..... 15

Figure 1-17: Development of road and rail transport volume in Slovenia, 2001-2008 ... 15

Figure 1-18: Freight traffic in Slovenia: performance (billion tonne-kilometres) by mode and traffic type, 2003-2008 16

Figure 1-19: Development of indices in Slovenia, 2000-2008 (2000 = 100) 17

Figure 2-1: Organisation of Slovenian railways, 2009 18

Figure 2-2: Bilateral and multilateral agreements on railways in Slovenia 21

Figure 2-3: Potential actions in favour of intermodal rail / road traffic in Slovenia 22

Figure 2-4: Intermodal rail/road traffic volume in Slovenia, 2007 24

Figure 2-5: Development of total rail, road and intermodal rail/road volume in Slovenia, 2001-2008 (2001 = 100) 25

Figure 2-6: Development of intermodal rail/road traffic volume in Slovenia, 1999-2008 26

Figure 2-7: Development of domestic intermodal rail/road transport volume in Slovenia 2004-2008 27

Figure 2-8: Development of international intermodal rail/road transport volume in Slovenia 2004-2008 27

Figure 2-9: International unaccompanied traffic in Slovenia by corridor, 2007 28

Figure 2-10: Development of transit intermodal rail/road transport volume in Slovenia, 2004-2008 28

Figure 2-11: Development of accompanied traffic volume in Slovenia, 1998-2008 30

Figure 2-12: Intermodal wagon registered in Slovenia, 2007 31

Figure 2-13: Line classification of the Slovenia rail network 32

Figure 2-14: Types of lines (track) of the Slovenia rail network 33

Figure 2-15: CT loading profiles of the Slovenian rail network 34

Figure 2-16: Location of combined rail/road transport terminals in Slovenia, 2008 35

Figure 2-17: Characteristics of intermodal rail/road transport terminals in Slovenia, 2007 35

Figure 3-1: Evolution of economic indicators for Slovenia, 2003-2011 36

Figure 3-2: Unaccompanied intermodal traffic in Slovenia by traffic type, 2007-2008 ... 37

Figure 3-3: Prognosis of Slovenian freight traffic related to performance (tkm) 40

Figure 3-4: Population by county, 2007 41

Figure 3-5: Evolution and forecast of Slovenian GDP (at current prices), 2004-2011, 2015, 2020 42

Figure 3-6: Productivity (GDP per capita employed), 2007 43

Figure 3-7: Foreign direct investments stocks in Slovenia by industry, 2007 44

Figure 3-8: Evolution of economic indicators 2005 - 2020 45

Figure 3-9: Birds-eye-view to the Port of Koper container terminal 50

Figure 3-10: Birds-eye-view to the Port of Koper container terminal, extension plans ... 51

Figure 3-11: Development of the container traffic of the Port of Koper, 1971-2008 52

Figure 3-12: Rail bottlenecks and planned works in Slovenia, 2009 55

Figure 3-13: Bilateral international unaccompanied intermodal traffic by corridor, 2007/2020 60

Figure 3-14: Unaccompanied intermodal traffic in transit through Slovenia by corridor, 2007/2020 61

Figure 3-15: Unaccompanied intermodal traffic in Slovenia, 2007/2020 62

Figure 3-16: Unaccompanied intermodal traffic in Slovenia, 2000-2008, 2015, 2020 63

Figure 4-1: Assignment of intermodal trains on the Slovenian rail network, 2020 66

Figure 4-2: Conversion of TEU-related intermodal volume into loading units (LU) in Slovenia, 2020 68

Figure 4-3: Estimation of handling need (loading units – LU) in Slovenia by terminal, 2007/2020 69

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