

European Commission

**Regional Balkans
Infrastructure Study -
Transport**

Appendix 3 - Final Report

Traffic Projections

July 2003

European Commission

**Regional Balkans
Infrastructure Study -
Transport**

Appendix 3 - Final Report

Traffic Projections

July 2003

Report no. 2
Issue no. Final
Date of issue 23 July 2003

Prepared HHJ, MEB
Checked PCH
Approved ELH

Table of Contents

1	Purpose and methodology	2
2	Data used in the forecast model	3
3	Assumptions and elasticities	6
3.1	Model and elasticities - passenger cars	7
3.2	Model and elasticities - road freight transport	8
3.3	Model and elasticities - rail transport	8
3.4	Model and elasticities - inland waterways	9
3.5	Model and elasticities - air transport	9
4	Results from the forecast model	10
4.1	Overview by mode of transport	10
4.2	Results by country - Albania	12
4.3	Results by country - Bosnia and Herzegovina	15
4.4	Results by country - Croatia	17
4.5	Results by country - FYRO Macedonia	22
4.6	Results by country - Serbia and Montenegro	24

1 Purpose and methodology

In this appendix, the PC based forecasting model for goods and freight transport in the region is documented.

It is important to notice that the model has been developed specifically in order to establish a flexible and consistent basis for the screening process and the many pre-feasibility studies to be carried out within the REBIS project.

Even though forecasts are presented for each section of the network, it is important to keep in mind that only general data for the countries are used as input to the models. This means that the growth rate for a mode of transport will be the same for all sections in a country. If certain factors show that the traffic growth differs in a specific section to the overall growth rate, these should be analysed outside the model. Therefore, traffic data in pre-feasibility studies may, on specific links, vary from the general model results.

Traffic projections are made for the core network. The model is based on the existing traffic volumes and the output is the estimated level of traffic in 2006, 2015 and 2025. In the following paragraphs, detailed forecasts, based on the current version of the forecast model, are presented for each country and each mode of transport.

At this stage, the model is more flexible than the availability of data justifies. This has been done in order to consistently analyse and compare different scenarios in the region and to allow for changes to the models as more precise data became available or knowledge about the relevant elasticities improved. The features of the models not presently in use are also described in the following paragraphs.

The model covers road, rail, air and inland waterways transport. Specific seaport forecasts have not been prepared as part of the model but are dealt with separately in Chapter 9 of the main report.

2 Data used in the forecast model

Forecasts can be made for the following 4 modes of transport:

- road traffic
- rail traffic
- air traffic
- inland waterways

For road and rail transport, separate forecast models are made for passenger transport and freight transport respectively, as these two modes of transport are expected to grow at different rates once the GDP increases.

The input to the forecast models is comprised of the current traffic levels and the most important determinants for future traffic growth. Empirical evidence suggests that income growth is by far the most important determinant for traffic growth. The population growth and the relative price of transport services are also included in the model.

The forecasts are based on data of current traffic levels obtained from local authorities.

In order to obtain consistent long term forecasts of the GDP growth, two different sources have been used:

- The World Bank information on GDP and population by country as presented at their homepage (<http://www.worldbank.org/data/countrydata/countrydata.html>)
- The GDP forecasts presented in the report: "Traffic Forecast on the Ten Pan-European Transport Corridors of Helsinki", Final Report, PHARE, August 1999

There is of course major uncertainty related to the future economic and demographic development in the region, and none of the above sources provide forecasts up to year 2025. The two sources were therefore supplemented by the Consultants own estimations, in the form of three broad scenarios. Table 2.1 shows the expected growth in GDP and increase in population for each country in three different scenarios.

Table 2.1 Assumptions on annual GDP and population growth used in the forecast model.

Scenario	Country	GDP 2001-2005	GDP 2006-2025	Population 2001-2005	Population 2006-2025
High	Albania	8.00%	7.50%	1.0%	0.8%
Moderate		6.50%	6.50%	1.0%	0.8%
Low		5.00%	5.50%	1.0%	0.8%
High	Bosnia and Herzegovina	5.50%	5.75%	0.6%	0.5%
Moderate		4.40%	4.25%	0.6%	0.5%
Low		3.50%	2.75%	0.6%	0.5%
High	Croatia	5.00%	4.50%	1.2%	0.5%
Moderate		4.40%	4.00%	1.2%	0.5%
Low		4.00%	3.50%	1.2%	0.5%
High	FYRO Macedonia	5.00%	6.00%	0.5%	0.5%
Moderate		3.70%	4.25%	0.5%	0.5%
Low		3.00%	2.50%	0.5%	0.5%
High	Serbia and Montenegro	6.00%	7.00%	0.5%	0.5%
Moderate		4.30%	5.00%	0.5%	0.5%
Low		3.50%	3.00%	0.5%	0.5%

Source: Ten Pan-European Transport Corridors of Helsinki prepared under the Phare programme, World Bank and consultant's estimates.

As there are some measurement problems with regard to the GDP, the assumed growth rates should be broadly interpreted as the growth rates of the basic economic activity in the countries. This is also what determines the growth in traffic, regardless of whether or not it is registered in the National Accounts.

For the long term forecast - beyond 2006 - the forecast from the report Ten Pan-European Transport Corridors of Helsinki prepared under the Phare programme is used. During the period 1996 - 2001, the growth has been considerably lower than was initially forecast in this report. Also, the short term forecasts made by the World Bank have been lowered. However, this is assumed to be an immediate result of the global economic downturn. The fundamental drivers behind long term growth are not assumed to be considerably changed, and the long term potential for the region, in the 20 year period from 2005 to 2025, is assumed to remain intact.

For Serbia and Montenegro and Croatia no forecast was made in the Phare study. However, based on the other long term forecasts presented in the report, forecasts were made for these two countries taking into account their current level of GDP per capita.

The short term population growth might be affected by the repatriation of refugees. In the period 2005 to 2025 the growth rate of the population has been estimated at 0.5% for all countries except Albania where an annual growth rate

of 0.8% has been assumed as the country has the highest birth rate in Europe and a very young population.

For each mode of transport, a special forecast model has been prepared. The assumed growth rates of GDP and population and the assumed elasticities will jointly determine the forecasted level of traffic.

3 Assumptions and elasticities

In this section the basic assumptions of the model, the functional forms and the assumed elasticities are presented.

Basic assumptions that cannot be modified in the model:

- The complex relation between the fixed cost of owning a car and the variable costs of using it has not been modelled in detail. The decision to buy a car and the decision of how much to drive in it are seen as being independent. This means that car ownership is only affected by the fixed cost component whereas kilometres per car are only affected by the variable cost component.
- In the forecast models any substitution between the various modes of transport has not been dealt with explicitly.

Assumptions that can be modified in the model:

- The initial levels of GDP, population and traffic on the network can be changed in the model as more precise data becomes available.
- All elasticities can be changed.
- The expected growth rates of population and GDP can be changed.

For each mode of transport, the model and assumed elasticities are described in detail in the following sections. The elasticities used are consultants' estimates based on empirical evidence and an evaluation of the properties of the model. As detailed data for the five countries is not yet available, common elasticities have been used for all countries in order to ensure consistency.

In all the models below the log form (ln) is applied. This means that the parameters β_i can be interpreted as elasticities.

3.1 Model and elasticities - passenger cars

The forecast model for passenger cars is the most detailed model. The forecast of the total number of cars on the network is based on a car hold model and assumptions on average kilometres per car.

As no data is available, no distinction can be made between national and international traffic for passenger cars.

The car hold model assumes that the number of cars is determined by the income per capita (GDP per capita), the population and the fixed cost of car ownership. The average kilometre per car is determined by income per capita and the variable cost of driving.

The model determining number of cars is:

$$\ln \text{Number of cars} = \alpha + \beta_{GDP} \ln \text{GDP / capita} + \beta_{pop} \ln \text{Population} + \beta_{fixed} \ln \text{Fixed costs} + \varepsilon$$

Based on experience from other countries, the relation between the GDP and car ownership cannot be assumed to be linear. Thus, the saturation level can be determined based on the level of car ownership in the country. Different elasticities can be applied below and above this level.

In order to forecast the average number of kilometres per car, a distinction must be made between the existing stock of cars and the cars that are added to this stock.

As car ownership has become the norm, the average kilometres per car for the existing stock of cars will increase as the average income increases.

The average kilometres per car are determined in the following equation:

$$\ln \text{Average km} = \alpha + \beta_{GDP} \ln \text{GDP / capita} + \beta_{var} \ln \text{Variable costs} + \varepsilon$$

The total increase in kilometres per car will depend on the average number of kilometres per new cars added to the existing vehicle stock. Thus, a correction factor (CF) is needed in order to capture the fact that the average number of kilometres per car will be lower for these marginal cars than for an average car. This correction factor accounts for the plausible assumption that the people who buy cars first are the people who need them the most.

Thus, a CF of 0.8 means that the annual vehicle kilometres for extra cars will only be 80% of an average car.

The total traffic will be jointly determined by average kilometres per car, the level of car ownership and the correction factor.

Table 3.1 Model for cars: Applied elasticities.

Elasticity	Value	Notes
GDP/capita - car ownership	0.5 - 1.5	Depends on the level of car ownership
GDP/capita - average km per car	0.5	
Population - car ownership	1.0	
Fixed cost - car ownership	-0.5	
Variable cost - average km per car	-0.5	
Correction factor	0.8	

3.2 Model and elasticities - road freight transport

In the model, national freight transport is determined by national GDP and international freight is determined by regional GDP. However, as it has not been possible to get separate data for national and international traffic at present, an elasticity of 1.2 has been applied to the total amount of traffic in the country.

$$\ln Trucks(ADT) = \alpha + \beta_{gdp} \ln GDP + \varepsilon$$

3.3 Model and elasticities - rail transport

As for road transport, a distinction is made between passenger and freight transport.

Rail freight transport

In this version of the forecast model, the level of freight transport is only determined by the growth in total GDP.

$$\ln FreightRail = \alpha + \beta_{gdp} \ln GDP + \varepsilon$$

However, the composition of freight transport by rail is not as broadly based as freight by road. In future versions of the forecast model, the forecast of rail freight transport should be made based on the specific composition of the freight transported by rail.

Rail passenger transport

Passenger rail transport will be determined by income and population.

$$\ln PassengerRail = \alpha + \beta_{gdp} \ln GDP / capita + \beta_{pop} \ln population + \varepsilon$$

An elasticity of 0.5 from GDP to traffic volumes has been applied to both passenger and rail transport.

Table 3.2 Model for rail transports: Applied elasticities.

Elasticity	Value	Notes
GDP/capita - number of passengers	0.5	
Population - number of passengers	1.0	
GDP - tonnes of rail freight	0.5	

3.4 Model and elasticities - inland waterways

As for rail transport, the current level of freight on the Danube is considerably lower than the levels seen ten years ago. In the overall forecast of freight on inland waterways it is assumed that the growth rates will follow that of total GDP meaning that the elasticity is 1.

$$\ln FreightInlandWaterways = \alpha + \beta_{gdp} \ln GDP + \varepsilon$$

As for rail freight transport, the next version of the model should include a forecast of freight on inland waterways based on the composition of the present transport level as future growth will probably be determined by growth in only a few sectors of the economy.

Only transport of freight on the Danube is included in the model as no data on freight transport on the Save was available.

3.5 Model and elasticities - air transport

The air passenger network comprises domestic routes and international routes within the region. It is not possible to assign traffic data to this network yet because, for many airports, only data on the number of departures and arrivals is available and not the destination or origin.

For air transport only passenger transport is forecasted. The forecast is determined by GDP per capita and population.

$$\ln PassengerAir = \alpha + \beta_{gdp} \ln GDP/capita + \beta_{pop} \ln population + \varepsilon$$

An elasticity of 1.5 has been used to forecast air traffic, reflecting the tendency to spend a larger share of the average income on air transport as said income increases.

4 Results from the forecast model

In this chapter the results from the forecast model are presented. An overview is given for each mode of transport based on the Moderate Scenario. This is followed by more detailed results for each of the five participating countries.

4.1 Overview by mode of transport

4.1.1 Overall growth in road traffic

Table 4.1 Growth rates of road traffic (ADT) in the Moderate Scenario.

	2001-2006	2001-2015	2001-2025
Albania - Passenger cars	63%	299%	850%
Albania - Trucks and busses	46%	186%	507%
Bosnia and Herzegovina - Passenger cars	30%	108%	206%
Bosnia and Herzegovina - Trucks and busses	29%	102%	232%
Croatia - Passenger cars	25%	72%	144%
Croatia - Trucks and busses	29%	96%	214%
FYRO Macedonia - Passenger cars	25%	99%	207%
FYRO Macedonia - Trucks and busses	25%	96%	222%
Serbia and Montenegro - Passenger cars	30%	110%	226%
Serbia and Montenegro - Trucks and busses	30%	119%	292%

4.1.2 Overall growth in rail traffic

Passenger rail transport is determined by GDP per capita and population whereas freight transport is determined by total GDP.

The forecast for rail traffic presented in Table 4.2 should be interpreted with some caution. As the composition of freight transport on rail is not as broadly based as freight on roads, the growth rates will depend on factors specific to each country and in some cases to factors specific to the relatively few companies accounting for most of the rail freight transport in specific sections of the network.

In potential future versions of the model, the forecast of rail freight transport should be made on the basis of the composition of the freight transported by rail.

Table 4.2 Growth rates for rail traffic in the Moderate Scenario.

	2001-2006	2001-2015	2001-2025
Albania - Tonnes of freight	17%	56%	115%
Albania - Passengers	20%	65%	136%
Bosnia and Herzegovina - Tonnes of freight	11%	35%	66%
Bosnia and Herzegovina - Passengers	13%	39%	76%
Croatia - Tonnes of freight	11%	33%	62%
Croatia - Passengers	14%	39%	74%
FYRO Macedonia - Tonnes of freight	10%	33%	64%
FYRO Macedonia - Passengers	11%	37%	73%
Serbia and Montenegro - Tonnes of freight	12%	39%	78%
Serbia and Montenegro - Passengers	13%	44%	89%

The growth rates presented in Table 4.2 are based on elasticities of 0.5 from GDP to both freight and passenger transport. This reflects the well established fact that, as income increases the market share of rail transport is likely to decrease.

4.1.3 Overall growth in freight on inland waterways

As for rail transport, the current level of freight on the Danube is considerably lower than the levels seen 10 years ago. In the overall forecast of freight on inland waterways it is assumed that the growth rates will follow that of total GDP meaning that the elasticity is 1.

Table 4.3 Growth rates of freight on inland waterways in the Moderate Scenario.

	2001-2006	2001-2015	2001-2025
Bosnia and Herzegovina - Tonnes of freight	24%	80%	173%
Croatia - Tonnes of freight	24%	76%	160%
Serbia and Montenegro - Tonnes of freight	24%	93%	214%

4.1.4 Overall growth in passenger air traffic

The air passenger network comprises domestic routes and international routes within the region. It is not possible to assign traffic data to this network

because, for many airports, only the number of departures and arrivals are available but not the destination or origin.

The forecast of total number of passengers by air traffic is determined by GDP per capita and population.

Table 4.4 Growth rates for air traffic in the Moderate Scenario.

	2001-2006	2001-2015	2001-2025
Albania - Passengers	59%	268%	833%
Bosnia and Herzegovina - Passengers	37%	140%	344%
Croatia - Passengers	37%	131%	314%
FYRO Macedonia - Passengers	32%	130%	327%
Serbia and Montenegro - Passengers	38%	165%	445%

4.2 Results by country - Albania

In this section the traffic projections for each country are presented. It is noted that at some sections the traffic volumes turn out rather high, in spite of the fact that the car hold model includes a "damping" effect which limits the development in vehicle ownership. This reflects the fact that traffic is assigned to the present networks only. In certain areas and corridors - particularly around cities - additional links or networks are likely to be constructed within the forecast period, thereby dispersing traffic over a wider network.

Results - Albania

General results for Albania	Input - data	Forecast 2006	Forecast 2015	Forecast 2025
Population million	3.44	3.62	3.89	4.21
Index income per capita 2001 prices	100	130	214	371
Level of car ownership (cars/1.000 inhabitants)	33	51	113	232

Traffic growth rates

	2001-2006	2001-2015	2001-2025
Passenger cars	63%	299%	850%
Trucks - national	46%	186%	507%
Trucks - international	25%	87%	194%
Rail freight	17%	56%	115%
Rail passengers	20%	65%	136%
Air	59%	268%	833%

Passenger cars

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
Hani I Hoti - Shkoder	35	2,843	4,632	11,344	27,007
Shkoder - Lezhe	47	1,328	2,164	5,299	12,615
Lezhe - Fushe Kruje	42	1,967	3,204	7,847	18,681
Fushe Kruje - Vore	12	2,605	4,245	10,394	24,746
Vore - Durres	37	8,467	13,797	33,785	80,435
Durres - Rogozhine	23	7,645	12,457	30,505	72,624
Rrogzhine - Lushnje	17	6,891	11,228	27,496	65,462
Lushnje - Fier	33	5,842	9,519	23,310	55,497
Fier - Jorgucati	137	1,318	2,148	5,259	12,520
Jorgucati - Kakavile	10	1,434	2,337	5,722	13,622
Shkoder - Morine	172	361	588	1,440	3,429
Fier - Vlore	34	4,513	7,354	18,007	42,872
Vlore - Saranda	134	242	394	966	2,299
Saranda - Jorgucati	37	515	839	2,055	4,892
Vore - Tirane	16	10,584	17,246	42,231	100,544
Tirane - Bradahesh	48	1,834	2,988	7,318	17,422
Bradahesh - Elbasan	6	2,548	4,152	10,167	24,205
Elbasan - Qafe Thane	63	1,786	2,910	7,126	16,966
Qafe Thane - Progradec	23	1,374	2,239	5,482	13,052
Progradec - Korca	39	2,342	3,816	9,345	22,248
Korca - Kapshtice	37	1,458	2,376	5,818	13,850
Rrogzhine - Bradahesh	38	365	594	1,455	3,463

Trucks and busses

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
Hani I Hoti - Shkoder	35	1,874	2,728	5,363	11,366
Shkoder - Lezhe	47	958	1,395	2,742	5,811
Lezhe - Fushe Kruje	42	1,348	1,962	3,856	8,173
Fushe Kruje - Vore	12	1,737	2,529	4,971	10,535
Vore - Durres	37	2,707	3,941	7,748	16,420
Durres - Rogozhine	23	2,332	3,395	6,674	14,144
Rrogzhine - Lushnje	17	2,329	3,390	6,665	14,126
Lushnje - Fier	33	2,120	3,086	6,067	12,858
Fier - Jorgucati	137	457	665	1,308	2,772
Jorgucati - Kakavile	10	731	1,064	2,092	4,434
Shkoder - Morine	172	358	521	1,025	2,171
Fier - Vlore	34	2,672	3,890	7,647	16,206
Vlore - Saranda	134	120	175	343	728
Saranda - Jorgucati	37	153	223	438	928
Vore - Tirane	16	3,384	4,926	9,685	20,525
Tirane - Bradahesh	48	418	609	1,196	2,535
Bradahesh - Elbasan	6	2,203	3,207	6,305	13,362
Elbasan - Qafe Thane	63	783	1,140	2,241	4,749
Qafe Thane - Progradec	23	642	935	1,837	3,894
Progradec - Korca	39	568	827	1,626	3,445
Korca - Kapshtice	37	1,224	1,782	3,503	7,424
Rrogzhine - Bradahesh	38	802	1,168	2,295	4,865

Rail Passengers

Results for the network	Length km	Number of passengers 2001	Number of passengers 2006	Number of passengers 2015	Number of passengers 2025
Hani Hotit - Shkoder		0	0	0	0
Shkoder - Lezhe		200,000	239,884	330,576	472,081
Lezhe - Milot		200,000	239,884	330,576	472,081
Rrreshen - Milot		0	0	0	0
Milot - Vore		200,000	239,884	330,576	472,081
Vore - Tirane		1,000,000	1,199,419	1,652,881	2,360,407
Vore - Durres		800,000	959,535	1,322,305	1,888,326
Durres - Rogozhine		600,000	719,652	991,729	1,416,244
Rrogzhine - Elbasan		400,000	479,768	661,153	944,163
Elbasan - Librazhd		200,000	239,884	330,576	472,081
Librazhd - Prenjas		200,000	239,884	330,576	472,081
Prenjas - Pogradec		200,000	239,884	330,576	472,081
Rrogzhine - Lushnje		300,000	359,826	495,864	708,122
Lushnje - Fier		300,000	359,826	495,864	708,122
Fier - Balsh		0	0	0	0
Fier - Vlore		100,000	119,942	165,288	236,041

Rail Freight

	Length km	Tonnes of freight 2001	Tonnes of freight 2006	Tonnes of freight 2015	Tonnes of freight 2025
Hani Hotit - Shkoder		0	0	0	0
Shkoder - Lezhe		25,440	29,852	39,809	54,812
Lezhe - Milot		25,440	29,852	39,809	54,812
Rrreshen - Milot		600	704	939	1,293
Milot - Vore		178,172	209,069	278,805	383,885
Vore - Tirane		48,650	57,086	76,128	104,820
Vore - Durres		231,272	271,377	361,896	498,293
Durres - Rogozhine		0	0	0	0
Rrogzhine - Elbasan		196,622	230,718	307,676	423,637
Elbasan - Librazhd		36,890	43,287	57,726	79,482
Librazhd - Prenjas		36,890	43,287	57,726	79,482
Prenjas - Pogradec		14,650	17,190	22,924	31,565
Rrogzhine - Lushnje		149,790	175,765	234,392	322,734
Lushnje - Fier		149,790	175,765	234,392	322,734
Fier - Balsh		128,350	150,607	200,843	276,540
Fier - Vlore		5,342	6,268	8,359	11,510

Air traffic

Airport	Passengers			
	2001	2006	2015	2025
Rinas - Pristina	39,352	62,659	144,752	367,004
Rinas - International	417,286	664,442	1,534,962	3,891,732

4.3 Results by country - Bosnia and Herzegovina

Results - Bosnia and Herzegovina

General results for Bosnia Herzegovina	Input - data	Forecast 2006	Forecast 2015	Forecast 2025
Population million	4.06	4.18	4.38	4.60
Index income per capita 2001 prices	100	120	167	241
Level of car ownership (cars/1.000 inhabitants)	162	201	291	374

Traffic growth rates

	2001-2006	2001-2015	2001-2025
Passenger cars	30%	108%	206%
Trucks - national	29%	102%	232%
Trucks - international	25%	87%	194%
Rail freight	11%	35%	66%
Rail passengers	13%	39%	76%
Air	37%	140%	344%

Passenger cars

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
Banja Luka - D. Vakuf	90	1,844	2,405	3,832	5,643
Banja Luka - Doboj	117	7,975	10,402	16,576	24,406
Bihać - D. Vakuf	177	1,724	2,248	3,583	5,275
Bos. Gradiška - Banja Luka	50	6,105	7,962	12,688	18,682
D. Vakuf - Zenica	61	2,196	2,865	4,565	6,722
D. Vakuf - Tomislavgrad	194	1,261	1,645	2,621	3,860
Mostar - Sarajevo	119	4,565	5,953	9,487	13,969
Mostar - Doljani	51	8,856	11,551	18,407	27,103
Sarajevo - Šćepan Polje	78	1,553	2,026	3,228	4,753
Sarajevo - Vardište	119	1,081	1,410	2,247	3,308
Sarajevo - Tuzla	113	20,124	26,247	41,826	61,583
Sarajevo - Zenica	68	22,025	28,727	45,778	67,402
Tuzla - Zvornik	50	3,698	4,823	7,686	11,317
Tuzla - Orašje	71	5,071	6,614	10,539	15,518
Tuzla - Doboj	60	5,534	7,218	11,502	16,936
Zenica - Doboj	72	3,466	4,521	7,205	10,608
Doboj - Slavonski Samac border	49	4,822	6,289	10,022	14,757
Jajce - D. Vakuf	28	2,998	3,910	6,231	9,175

Trucks and busses

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
Banja Luka - D. Vakuf	90	305	394	616	1,014
Banja Luka - Doboj	117	1,320	1,704	2,667	4,385
Bihać - D. Vakuf	177	285	368	576	948
Bos. Gradiška - Banja Luka	50	1,010	1,305	2,041	3,357
D. Vakuf - Zenica	61	364	469	734	1,208
D. Vakuf - Tomislavgrad	194	209	270	422	693
Mostar - Sarajevo	119	755	975	1,526	2,510
Mostar - Doljani	51	1,466	1,893	2,961	4,870
Sarajevo - Šćepan Polje	78	257	332	519	854
Sarajevo - Vardište	119	179	231	361	594
Sarajevo - Tuzla	113	3,330	4,300	6,728	11,065
Sarajevo - Zenica	68	3,645	4,707	7,364	12,110
Tuzla - Zvornik	50	612	790	1,236	2,033
Tuzla - Orašje	71	839	1,084	1,695	2,788
Tuzla - Doboj	60	916	1,183	1,850	3,043
Zenica - Doboj	72	574	741	1,159	1,906
Doboj - Slavonski Samac border	49	652	842	1,317	2,166
Jajce - D. Vakuf	28	405	523	818	1,346

Rail Passengers

	Km	Number of passengers 2001	Number of passengers 2006	Number of passengers 2015	Number of passengers 2025
Results for the network					
Sarajevo - Konjic		150,203	169,643	209,375	264,526
Konjic - Mostar		118,803	134,179	165,605	209,227
Mostar - Žitomislići		92,403	104,362	128,805	162,733
Žitomislići - Šurmanci		92,996	105,032	129,632	163,778
Šurmanci - Čapljina		93,133	105,187	129,823	164,019
Čapljina - Ploče		28,976	32,726	40,391	51,030
Sarajevo - Visoko		56,600	63,926	78,897	99,680
Visoko - Kakanj		160,600	181,386	223,868	282,837
Kakanj - Zenica		128,200	144,792	178,704	225,776
Zenica - Zavidovići		63,000	71,154	87,819	110,951
Zavidovići - Maglaj		27,400	30,946	38,194	48,255
Maglaj - Doboj		98,945	111,751	137,924	174,255
Doboj - Modrića		98,945	111,751	137,924	174,255
Modrića - Šamac		66,250	74,824	92,349	116,675
Doboj - B. Luka		141,964	160,338	197,891	250,016
B. Luka - Omarska		153,149	172,970	213,482	269,715
Omarska - Prijedor		215,095	242,934	299,831	378,809
Prijedor - Svodna		178,959	202,121	249,460	315,169
Svodna - Novi Grad		178,959	202,121	249,460	315,169
Novi Grad - Dobrljin		115,292	130,214	160,711	203,044
Novi Grad - Blatna		160,892	181,716	224,275	283,351
Blatna - Bihać		139,103	157,107	193,902	244,978
Bihać - Ripač		27,600	31,172	38,473	48,607

Rail Freight

	Km	Tonnes of freight 2001	Tonnes of freight 2006	Tonnes of freight 2015	Tonnes of freight 2025
Results for the network					
Lujaba - N. Grad		275,000	310,592	383,336	484,309
B. Luka - Lujaba		286,500	323,581	399,366	504,562
Stacani - B. Luka		286,500	323,581	399,366	504,562
Doboj - Stacani		289,500	326,969	403,548	509,846
Doboj - Samac		75,000	84,707	104,546	132,084
Zavidovići - Doboj		69,300	78,269	96,601	122,046
Zenica - Zavidovići		70,800	79,963	98,692	124,688
Kakanj - Zenica		333,800	377,002	465,300	587,864
Podlugovi - Kakanj		350,800	396,203	488,997	617,803
Semizovac - Podlugovi		169,100	190,986	235,717	297,806
Alipašin Most - Semizovac		164,100	185,339	228,747	289,001
Sarajevo Ter. - Alipašin Most		149,500	168,849	208,395	263,288
Blazuj - Sarajevo Ter.		155,000	175,061	216,062	272,974
Konjic - Blazuj		178,600	201,715	248,959	314,537
Rastani - Konjic		177,600	200,586	247,565	312,776
Mostar - Rastani		191,069	215,798	266,340	336,496
Bacevići - Mostar		192,169	217,041	267,874	338,434
Čapljina - Bacevići		424,783	479,761	592,126	748,096
Metković - Čapljina		255,156	288,180	355,674	449,362
Ploče - Metković		500,496	565,273	697,666	881,436

Air traffic

Airport	Passengers			
	2001	2006	2015	2025
Sarajevo - n/a	305,000	418,956	730,675	1,355,564
Tuzla - n/a	10,000	13,736	23,957	44,445
Mostar - n/a	10,318	14,173	24,718	45,858
Banja Luka - n/a	37,000	50,824	88,639	164,446

4.4 Results by country - Croatia

Results - Croatia

General results for Croatia	Input - data	Forecast 2006	Forecast 2015	Forecast 2025
Population million	4.38	4.65	4.86	5.11
Index income per capita 2001 prices	100	117	159	224
Level of car ownership (cars/1.000 inhabitants)	269	322	393	490

Traffic growth rates

	2001-2006	2001-2015	2001-2025
Passenger cars	25%	72%	144%
Trucks - national	29%	96%	214%
Trucks - international	25%	87%	194%
Rail freight	11%	33%	62%
Rail passengers	14%	39%	74%
Inland waterways	24%	76%	160%
Air	37%	131%	314%

Passenger cars

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
Plovanija - Baderna(exir to Porec)	42	3,554	4,452	6,103	8,663
Baderna(exir to Porec) - Bale (exit to Rovinj)	21				
Bale (exit to Rovinj) - Galizana	14	888	1,112	1,525	2,165
Galizana - Pula	6				
Matulji - Pula	92	9,088	11,385	15,605	22,153
Lupoglav - Matulji	24	5,256	6,584	9,025	12,812
Matulji - Pasjak	24	4,072	5,101	6,992	9,926
Matulji - Rupa	17	4,501	5,639	7,729	10,972
Rijeka - Senj	70	6,000	7,517	10,303	14,625
Senj - Maslenica	128	1,526	1,912	2,620	3,720
Rijeka - Orehovica	5	16,735	20,965	28,736	40,793
Orehovica - Delnice	43	5,927	7,425	10,177	14,447
Delnice - Karlovac	78	5,723	7,170	9,827	13,950
Karlovac - Lucko	41	17,386	21,780	29,854	42,380
Lucko - Jankomir	5	8,236	10,318	14,142	20,076
Jankomir - Bregana	13	8,236	10,318	14,142	20,076
Jankomir - Krapina	56	9,082	11,378	15,595	22,138
Krapina - Macelj	9	6,645	8,325	11,410	16,198
Lucko - Ivanja Reka	22	18,709	23,438	32,126	45,605
Ivanja Reka - Varazdin	70	5,747	7,200	9,868	14,009
Varazdin - Cakovec	14	9,402	11,778	16,144	22,918
Cakovec - Gorican	16	1,349	1,690	2,316	3,288
Ivanja Reka - Slavonski border	176	11,994	15,026	20,595	29,236
Slavonski border - Slavonski Brod border	1	6,324	7,922	10,859	15,415
Slavonski border - Donji Miholjac	89	2,282	2,859	3,919	5,563
Slavonski border - Sikirevci	39	5,973	7,483	10,256	14,560
Sikirevci - Zupanja	22	776	972	1,332	1,892
Zupanja - Bajakovo	35	1,104	1,383	1,896	2,691
Sikirevci - Slavonski Samac border	13	1,095	1,372	1,880	2,669
Zupanja - Zupanja border	4	4,821	6,040	8,278	11,752
Sikirevci - Osijek	58	9,139	11,449	15,693	22,277
Osijek - Manastin	48	4,894	6,131	8,404	11,929
Karlovac - Grabovac	76	8,815	11,043	15,137	21,487
Grabovac - Licko Petrovo Selo	12	4,821	6,040	8,278	11,752
Grabovac - Gracac	101	7,045	8,826	12,097	17,173
Gracac - Maslenica	38	3,289	4,120	5,648	8,017
Maslenica - Zadar	29	7,817	9,793	13,423	19,055
Zadar - Split	153	8,917	11,171	15,312	21,736
Gracac - Sinj	125	3,645	4,566	6,259	8,885
Sinj - Kamensko	40	938	1,175	1,611	2,286
Sinj - Split	31	3,492	4,375	5,996	8,512
Split - Ploce	116	8,838	11,072	15,176	21,543
Ploce - Opuzen	15	6,090	7,629	10,457	14,845
Opuzen - Metkovic	10	6,260	7,842	10,749	15,259
Metkovic - Metkovic border	1	3,960	4,961	6,800	9,653
Opuzen - Dubac	98	3,892	4,876	6,683	9,487
Dubac - Gornji Brgat border	3				
Dubac - Karasovici border	31	1,321	1,655	2,268	3,220
Matulji - Rijeka	11	16,735	20,965	28,736	40,793

Trucks and busses

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
Plovanija - Baderna(exir to Porec)	42	552	711	1,084	1,732
Baderna(exir to Porec) - Bale (exit to Rovinj)	21				
Bale (exit to Rovinj) - Galizana	14	97	125	190	304
Galizana - Pula	6				
Matulji - Pula	92	471	606	925	1,478
Lupoglav - Matulji	24	821	1,057	1,612	2,576
Matulji - Pasjak	24	623	802	1,223	1,955
Matulji - Rupa	17	631	812	1,239	1,980
Rijeka - Senj	70	938	1,208	1,842	2,943
Senj - Maslenica	128	200	257	393	628
Rijeka - Orehovica	5	2,580	3,322	5,065	8,095
Orehovica - Delnice	43	718	924	1,410	2,253
Delnice - Karlovac	78	784	1,009	1,539	2,460
Karlovac - Lucko	41	2,803	3,609	5,503	8,795
Lucko - Jankomir	5	1,500	1,931	2,945	4,707
Jankomir - Bregana	13	1,500	1,931	2,945	4,707
Jankomir - Krapina	56	872	1,123	1,712	2,736
Krapina - Macelj	9	1,044	1,344	2,050	3,276
Lucko - Ivanja Reka	22	4,835	6,225	9,493	15,171
Ivanja Reka - Varazdin	70	953	1,227	1,871	2,990
Varazdin - Cakovec	14	1,093	1,407	2,146	3,429
Cakovec - Gorican	16	478	615	938	1,500
Ivanja Reka - Slavonski border	176	2,150	2,768	4,221	6,746
Slavonski border - Slavonski Brod border	1	1,081	1,392	2,122	3,392
Slavonski border - Donji Miholjac	89	517	666	1,015	1,622
Slavonski border - Sikirevci	39	1,144	1,473	2,246	3,590
Sikirevci - Zupanja	22	1,069	1,376	2,099	3,354
Zupanja - Bajakovo	35	303	390	595	951
Sikirevci - Slavonski Samac border	13	190	245	373	596
Zupanja - Zupanja border	4	683	879	1,341	2,143
Sikirevci - Osijek	58	1,446	1,862	2,839	4,537
Osijek - Manastin	48	257	331	505	806
Karlovac - Grabovac	76	1,247	1,606	2,448	3,913
Grabovac - Licko Petrovo Selo	12	683	879	1,341	2,143
Grabovac - Gracac	101	788	1,015	1,547	2,472
Gracac - Maslenica	38	636	819	1,249	1,996
Maslenica - Zadar	29	460	592	903	1,443
Zadar - Split	153	927	1,194	1,820	2,909
Gracac - Sinj	125	550	708	1,080	1,726
Sinj - Kamensko	40	89	115	175	279
Sinj - Split	31	636	819	1,249	1,996
Split - Ploce	116	658	847	1,292	2,065
Ploce - Opuzen	15	364	469	715	1,142
Opuzen - Metkovic	10	1,114	1,434	2,187	3,495
Metkovic - Metkovic border	1	592	762	1,162	1,858
Opuzen - Dubac	98	344	443	675	1,079
Dubac - Gornji Brgat border	3				
Dubac - Karasovci border	31	92	118	181	289
Matulji - Rijeka	11	2,580	3,322	5,065	8,095

Rail Passengers

Results for the network	Length km	Number of passengers 2001	Number of passengers 2006	Number of passengers 2015	Number of passengers 2025
Botovo border - Koprivnica	12	18,704	21,341	26,052	32,517
Koprivnica - Krizevci	31	1,002,093	1,143,369	1,395,801	1,742,155
Krizevci - Dugo Selo	36	1,635,694	1,866,295	2,278,333	2,843,679
Hrvatski Leskovac - Karlovac	42	1,013,197	1,156,038	1,411,266	1,761,458
Karlovac - Ogulin	56	1,334,093	1,522,174	1,858,237	2,319,341
Ogulin - Rijeka	120	556,454	634,903	775,076	967,403
Rijeka - Sapjane border	28	13,795	15,740	19,215	23,983
Savski Marof border - Zapresic	7	583,120	665,328	812,219	1,013,763
Zapresic - Zagreb	15	2,243,354	2,559,623	3,124,734	3,900,106
Zagreb (Velika Gorica) - Sisak Caprag	39	895,781	1,022,068	1,247,719	1,557,328
Sisak Caprag - Sunja	18	152,800	174,342	212,833	265,645
Sunja - Novska	45	56,533	64,503	78,744	98,284
Sesvete - Dugo Selo	10	3,770,474	4,302,037	5,251,836	6,555,027
Dugo Selo - Banova Jaruga	67	2,250,979	2,568,323	3,135,354	3,913,361
Banova Jaruga - Novska	17	981,893	1,120,321	1,367,664	1,707,037
Novska - Nova Kapela Batrina	57	1,061,248	1,210,863	1,478,196	1,844,996
Nova Kapela Batrina - Slavonski Brod	25	1,050,838	1,198,986	1,463,697	1,826,899
Slavonski Brod - Strizivojna Vrpolje	33	765,604	873,539	1,066,398	1,331,015
Strizivojna Vrpolje - Jarmina	23	414,084	472,462	576,772	719,892
Jarmina - Vinkovci	9				
Vinkovci - Tovarnik	32	56,539	64,510	78,753	98,295
Kotoriba - Cakovec	30	1,105,679	1,261,558	1,540,083	1,922,239
Cakovec - Sredisce border	12	30,468	34,763	42,438	52,969
Ostarije - Knin	121	611,775	698,023	852,132	1,063,580
Knin - Perkovic	54	266,084	303,596	370,624	462,590
Perkovic - Split	48	301,342	343,825	419,734	523,887
Knin - Zadar	95	47,852	54,598	66,652	83,191
Perkovic - Sibenik	22	111,126	126,792	154,785	193,194
Sunja - Volinja border	20	33,652	38,396	46,873	58,504
Martin Brod border - Knin	24				
Beli Manastir border - Osijek	28	133,037	151,792	185,305	231,287
Osijek - Strizivojna Vrpolje	48	158,359	180,684	220,575	275,309
Strizivojna Vrpolje - Sl. Samac border	20	16,109	18,381	22,439	28,006
Metkovic border - Ploce	22	14,512	16,558	20,214	25,230
Vinkovci - Borovo	15	25,756	29,387	35,875	44,777
Buzet border - Pula	87	201,473	229,877	280,629	350,264

Rail Freight

Results for the network	Length km	Tonnes of freight 2001	Tonnes of freight 2006	Tonnes of freight 2015	Tonnes of freight 2025
Botovo border - Koprivnica	12	2,224,906	2,475,799	2,958,809	3,606,772
Koprivnica - Krizevci	31	2,908,171	3,236,113	3,867,455	4,714,406
Krizevci - Dugo Selo	36	2,948,116	3,280,563	3,920,576	4,779,160
Hrvatski Leskovac - Karlovac	42	3,385,948	3,767,767	4,502,830	5,488,925
Karlovac - Ogulin	56	3,457,066	3,846,905	4,597,407	5,604,214
Ogulin - Rijeka	120	2,598,622	2,891,658	3,455,798	4,212,599
Rijeka - Sapjane border	28	724,800	806,533	963,881	1,174,966
Savski Marof border - Zapresic	7	1,661,508	1,848,869	2,209,570	2,693,453
Zapresic - Zagreb	15	1,949,251	2,169,060	2,592,227	3,159,911
Zagreb (Velika Gorica) - Sisak Caprag	39	767,948	854,546	1,021,262	1,244,913
Sisak Caprag - Sunja	18	545,295	606,786	725,165	883,972
Sunja - Novska	45	264,246	294,044	351,410	428,366
Sesvete - Dugo Selo	10	4,568,094	5,083,219	6,074,917	7,405,290
Dugo Selo - Banova Jaruga	67	2,169,202	2,413,814	2,884,731	3,516,471
Banova Jaruga - Novska	17	1,145,682	1,274,876	1,523,594	1,857,253
Novska - Nova Kapela Batrina	57	1,380,842	1,536,554	1,836,324	2,238,469
Nova Kapela Batrina - Slavonski Brod	25	1,413,131	1,572,484	1,879,264	2,290,812
Slavonski Brod - Strizivojna Vrpolje	33	1,345,947	1,497,724	1,789,919	2,181,901
Strizivojna Vrpolje - Jarmina	23	1,218,538	1,355,947	1,620,483	1,975,359
Jarmina - Vinkovci	9	1,216,806	1,354,020	1,618,179	1,972,552
Vinkovci - Tovarnik	32	772,464	859,571	1,027,268	1,252,233
Kotoriba - Cakovec	30	2,366,792	2,633,685	3,147,497	3,836,782
Cakovec - Sredisce border	12	2,657,430	2,957,097	3,534,005	4,307,932
Ostarije - Knin	121	1,313,507	1,461,626	1,746,778	2,129,313
Knin - Perkovic	54	1,017,986	1,132,780	1,353,777	1,650,247
Perkovic - Split	48	420,749	468,195	559,536	682,072
Knin - Zadar	95	184,197	204,968	244,956	298,600
Perkovic - Sibenik	22	511,568	569,255	680,313	829,298
Sunja - Volinja border	20	287,059	319,429	381,748	465,348
Martin Brod border - Knin	24	16,018	17,824	21,302	25,967
Beli Manastir border - Osijek	28	180,365	200,704	239,860	292,388
Osijek - Strizivojna Vrpolje	48	418,532	465,728	556,588	678,478
Strizivojna Vrpolje - Sl. Samac border	20	4,744	5,279	6,309	7,690
Metkovic border - Ploce	22	591,658	658,377	786,821	959,131
Vinkovci - Borovo	15	60,353	67,159	80,261	97,838
Buzet border - Pula	87	71,929	80,040	95,655	116,603

Inland waterways

Results for the network	Tonnes of freight 2001	Tonnes of freight 2006	Tonnes of freight 2015	Tonnes of freight 2025
Germany - Vukovar	35,000	43,242	61,547	91,104
Austria - Vukovar	4,000	4,942	7,034	10,412
Slovakia - Vukovar	10,000	12,355	17,585	26,030
Ukraine - Vukovar	4,700	5,807	8,265	12,234
Vukovar - Netherland	700	865	1,231	1,822
Vukovar - Austria	19,300	23,845	33,939	50,237
Germany - Osijek	19,000	23,474	33,411	49,456
Austria - Osijek	53,000	65,480	93,199	137,957
Hungary - Osijek	700	865	1,231	1,822
Ukraine - Osijek	38,600	47,689	67,877	100,475
Osijek - Germany	8,400	10,378	14,771	21,865
Osijek - Austria	48,600	60,044	85,462	126,504
Osijek - Hungary	10,600	13,096	18,640	27,591
Croatia - Osijek	13,105	16,191	23,045	34,112
Sl. Brod - Sisak	210,000	259,451	369,279	546,623

Air traffic

Airport	Passengers			
	2001	2006	2015	2025
Zagreb	1,173,000	1,605,583	2,712,598	4,857,850
Split	542,000	741,881	1,253,392	2,244,633
Dubrovnik	445,000	609,109	1,029,076	1,842,919
Pula	94,000	128,666	217,378	389,291
Zadar	34,000	46,539	78,626	140,807
Osijek	1,000	1,369	2,313	4,141
Rijeka (Krk island)	25,000	34,220	57,813	103,535
Brac (island)	32,000	43,801	74,001	132,524
M.Losinj (island)	2,000	2,738	4,625	8,283

4.5 Results by country - FYRO Macedonia

Results - Macedonia

General results for Macedonia	Input - data	Forecast 2006	Forecast 2015	Forecast 2025
Population million	2.04	2.10	2.19	2.30
Index income per capita 2001 prices	100	117	163	235
Level of car ownership (cars/1.000 inhabitants)	150	180	260	353

Traffic growth rates

	2001-2006	2001-2015	2001-2025
Passenger cars	25%	99%	207%
Trucks - national	25%	96%	222%
Trucks - international	25%	87%	194%
Rail freight	10%	33%	64%
Rail passengers	11%	37%	73%
Air	32%	130%	327%

Passenger cars

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
Kafasan - Struga	13	795	995	1,585	2,438
Podmolje - Struga	7.1	4,520	5,656	9,013	13,863
Podmolje - Botun	14.8	2,835	3,548	5,653	8,695
Kicevo - Botun	38.6	1,280	1,602	2,552	3,926
Novo Selo - Kicevo	33.5	2,020	2,528	4,028	6,195
Gostivar - Novo Selo	12.3	2,350	2,941	4,686	7,207
Totovo - Gostivar	24.1	3,860	4,830	7,697	11,838
Skopje - Tetovo	43.7	2,005	2,509	3,998	6,149
Kumanovo - Stracin	30.7	2,245	2,809	4,477	6,885
Stracin - Kriva Palanka	33.5	1,690	2,115	3,370	5,183
Kriva Palanka - Border	13.5	715	895	1,426	2,193
Yugoslavia border - Kumanovo	11.4	1,140	1,427	2,273	3,496
Kumanovo - Miladinovci	17.9	2,575	3,222	5,135	7,897
Miladinovci - Petrovec	5.9	2,820	3,529	5,623	8,649
Petrovec - Veles	29.1	2,120	2,653	4,227	6,502
Veles - Gradsko	21.3	1,350	1,689	2,692	4,140
Gradsko - Negotino	16	1,540	1,927	3,071	4,723
Negotino - Demir Kapja	16.5	1,810	2,265	3,609	5,551
Demir Kapja - Udovo	22.3	1,445	1,808	2,881	4,432
Udovo - Gwgelija (Greek border)	24.8	2,055	2,571	4,098	6,303
Podmolje - Ohrid	5	6,175	7,727	12,313	18,938
Ohrid - Resen	38	1,720	2,152	3,430	5,275
Resen - Bitola	28	2,025	2,534	4,038	6,211
Bitola - Prilep	32	2,235	2,797	4,457	6,855
Prilep - Rosoman	30	2,045	2,559	4,078	6,272
Rosoman - Gradsko	5	3,140	3,929	6,261	9,630
Veles - Stip	21.5	2,650	3,316	5,284	8,127
Stip - Krupiste	11.6	2,855	3,573	5,693	8,756
Krupiste - Kocani	16.2	4,185	5,237	8,345	12,835
Kocani - MaKedonska Kamenica	27.9	3,040	3,804	6,062	9,324
Makedonska Kamenica - Delcevo	24.1	1,200	1,502	2,393	3,680
Delcevo - Bulgarian border	11.1	230	288	459	705
Stip - Radovis		1,590	1,990	3,171	4,876
Radovis - Strumica		2,656	3,324	5,296	8,146
Strumica - Bulgarian border		2,232	2,793	4,451	6,845
gr. Makedonije (Den. Jankovic) - Skopje		3,330	4,167	6,640	10,213
Skopje - Miladinovci		1,940	2,428	3,869	5,950
Bitola - Niki (Greek border)		1,326	1,659	2,644	4,067

Trucks and busses

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
Kafasan - Struga	13	230	288	450	740
Podmolje - Struga	7.1	2,135	2,670	4,177	6,869
Podmolje - Botun	14.8	895	1,119	1,751	2,880
Kicevo - Botun	38.6	345	431	675	1,110
Novo Selo - Kicevo	33.5	635	794	1,242	2,043
Gostivar - Novo Selo	12.3	740	925	1,448	2,381
Totovo - Gostivar	24.1	1,540	1,926	3,013	4,955
Skopje - Tetovo	43.7	805	1,007	1,575	2,590
Kumanovo - Stracin	30.7	940	1,175	1,839	3,024
Stracin - Kriva Palanka	33.5	720	900	1,409	2,317
Kriva Palanka - Border	13.5	280	350	548	901
Yugoslavia border - Kumanovo	11.4	670	838	1,311	2,156
Kumanovo - Miladinovci	17.9	1,395	1,744	2,729	4,488
Miladinovci - Petrovec	5.9	1,850	2,313	3,620	5,952
Petrovec - Veles	29.1	1,250	1,563	2,446	4,022
Veles - Gradsko	21.3	785	982	1,536	2,526
Gradsko - Negotino	16	1,055	1,319	2,064	3,394
Negotino - Demir Kapja	16.5	1,245	1,557	2,436	4,006
Demir Kapja - Udovo	22.3	855	1,069	1,673	2,751
Udovo - Gevgelija (Greek border)	24.8	1,210	1,513	2,367	3,893
Podmolje - Ohrid	5	700	875	1,370	2,252
Ohrid - Resen	38	775	969	1,516	2,494
Resen - Bitola	28	905	1,132	1,771	2,912
Bitola - Prilep	32	1,005	1,257	1,966	3,234
Prilep - Rosoman	30	925	1,157	1,810	2,976
Rosoman - Gradsko	5	1,410	1,763	2,759	4,537
Veles - Stip	21.5	750	938	1,467	2,413
Stip - Krupiste	11.6	800	1,000	1,565	2,574
Krupiste - Kocani	16.2	850	1,063	1,663	2,735
Kocani - MaKedonska Kamenica	27.9	1,025	1,282	2,005	3,298
Makedonska Kamenica - Delcevo	24.1	280	350	548	901
Delcevo - Bulgarian border	11.1	125	156	245	402
Stip - Radovis		398	498	779	1,281
Radovis - Strumica		664	830	1,299	2,136
Strumica - Bulgarian border		558	698	1,092	1,795
gr. Makedonije (Den. Jankovic) - Skopje		832	1,040	1,628	2,677
Skopje - Miladinovci		869	1,087	1,700	2,796
Bitola - Niki (Greek border)		192	240	376	618

Rail Passengers

Results for the network	Length km	Number of passengers 2001	Number of passengers 2006	Number of passengers 2015	Number of passengers 2025
Tabanosci - Skopje	50	127,860	142,186	175,487	221,712
Skopje - Veles	49	1,006,750	1,119,550	1,381,760	1,745,726
Veles - Gevgelija	113	152,830	169,954	209,758	265,010
Veles - Kocani	86	13,035	14,495	17,890	22,603
Veles - Bitola	129	343,660	382,165	471,672	595,914
Skopje - Dorce Petrov	11	191,530	212,990	262,874	332,117
Dorce Petrov - Yugoslavia border	15	0	0	0	0
Dorce Petrov - Kicevo	115	107,600	119,656	147,681	186,581

Rail Freight

	Km	Tonnes of freight 2001	Tonnes of freight 2006	Tonnes of freight 2015	Tonnes of freight 2025
Tabanosci - Skopje	50	1,937,000	2,128,658	2,572,139	3,174,060
Skopje - Veles	49	1,590,000	1,747,324	2,111,358	2,605,449
Veles - Gevgelija	113	2,356,000	2,589,116	3,128,528	3,860,653
Veles - Kocani	86	30,535	33,556	40,547	50,036
Veles - Bitola	129	17,300	19,012	22,973	28,349
Skopje - Dorce Petrov	11	1,255,000	1,379,177	1,666,512	2,056,503
Dorce Petrov - Yugoslavia border	15	66,500	73,080	88,305	108,970
Dorce Petrov - Kicevo	115	17,800	19,561	23,637	29,168

Air traffic

Airport	Passengers			
	2001	2006	2015	2025
Zagreb - Skopje	7,434	9,815	17,118	31,758
Skopje -Zagreb	8,093	10,685	18,635	34,573
Belgrade - Skopje	2,798	3,694	6,443	11,953
Skopje -Belgrade	3,013	3,978	6,938	12,871
Sarajevo - Skopje	695	918	1,600	2,969
Skopje -Sarajevo	804	1,062	1,851	3,435
Tivat - Skopje	516	681	1,188	2,204
Skopje -Tivat	494	652	1,138	2,110
Podgorica - Skopje	413	545	951	1,764
Skopje -Podgorica	410	541	944	1,751

4.6 Results by country - Serbia and Montenegro

Results - Serbia and Montenegro

General results for Serbia and Montenegro	Input - data	Forecast 2006	Forecast 2015	Forecast 2025
Population million	10.64	10.91	11.41	12.00
Index income per capita 2001 prices	100	120	179	277
Level of car ownership (cars/1.000 inhabitants)	200	246	349	457

Traffic growth rates

	2001-2006	2001-2015	2001-2025
Passenger cars	30%	110%	226%
Trucks - national	30%	119%	292%
Trucks - international	25%	87%	194%
Rail freight	12%	39%	78%
Rail passengers	13%	44%	89%
Inland waterways	24%	93%	214%
Air	38%	165%	445%

Appendix 3 - Traffic Projections

Passenger cars

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
gr. APV (Batrovci) - Sremska Mitrovica	43	2,319	3,014	4,876	7,557
Sremska Mitrovica - Ruma	14	5,138	6,677	10,804	16,744
Ruma - Bgd (Novi Sad)	47	8,339	10,837	17,535	27,176
Bgd (Novi Sad) - Bujanj Potok	19	57,586	74,836	121,087	187,665
Bujanj Potok - Mali Požarevac	24	17,439	22,663	36,669	56,831
Mali Požarevac - Batočina	76	11,527	14,980	24,238	37,565
Batočina - Paraćin	45	8,285	10,767	17,421	27,000
Paraćin - Pojate	12	6,296	8,182	13,239	20,518
Pojate - Niš (Trupale)	59	6,040	7,849	12,700	19,684
Niš (Trupale) - Leskovac (Lebane)	43	3,023	3,929	6,357	9,852
Leskovac (Lebane) - gr. BJRM (Tabanovce)	112	3,351	4,355	7,046	10,920
Niš (Trupale) - gr. Bugarske (Gradina)	109	2,301	2,990	4,838	7,499
BGD (petlja Mostar) - BGD (Krnjača)	10	22,965	29,844	48,289	74,840
Bgd (Krnjača) - Pančevo 2 (Zrenjanin)	17	10,728	13,942	22,558	34,961
Pančevo 2 (Zrenjanin) - gr. Rumunije (Vatin)	77	3,325	4,321	6,992	10,836
gr. Crne Gore (Debeli Brijeg) - Petrovac	71	2,814	3,657	5,917	9,170
Petrovac - Podgorica	53	2,619	3,404	5,507	8,535
Podgorica - Ribarevina	114	2,115	2,749	4,447	6,893
Ribarevina - gr. Crne Gore (Špiljani)	78	1,570	2,040	3,301	5,116
gr. Crne Gore (Špiljani) - gr. APKM (Vitakić)	26	2,182	2,836	4,588	7,111
gr. APKM (Vitakić) - Mitrovica	34	760	988	1,598	2,477
Mitrovica - Pristina	35	5,475	7,115	11,512	17,842
Pristina - Ljapllaselle	6	11,094	14,417	23,328	36,154
Ljapllaselle - gr. Makedonije	53	3,117	4,051	6,554	10,158
Podgorica - Budva	58	3,027	3,934	6,365	9,865
Petrovac - gr. Crne Gore (Sukobin)	72	2,168	2,817	4,559	7,065
Loznica - gr. RS (Mali Zvornik)	21	4,006	5,206	8,423	13,055
gr. RS (Vardište) - Užice	54	1,454	1,890	3,057	4,738
Užice - Požega	22	5,830	7,576	12,259	18,999
Požega - Preljina	41	6,174	8,023	12,982	20,120
Preljina - Kraljevo	31	5,201	6,759	10,936	16,949
Kraljevo - Kruševac	61	6,523	8,477	13,716	21,258
Kruševac - Pojate	23	4,048	5,261	8,512	13,192
Paraćin - gr. Bugarske (Vrška Čuka)	97	1,575	2,047	3,312	5,133
gr. Crne Gore (Šćepan Polje) - Podgorica	136	1,918	2,493	4,033	6,251
Podgorica - gr. Crne Gore (Božaj)	24	2,216	2,880	4,660	7,222
Novi Sad (Petrovaradin) - Ruma	37	6,127	7,962	12,883	19,967
Ruma - granica APV (Šabac)	27	3,227	4,194	6,785	10,516
granica APV (Šabac) - Šabac	7	2,931	3,809	6,163	9,552
Šabac - Loznica	56	4,888	6,352	10,278	15,929
Užice - Nova Varoš	66	3,331	4,329	7,004	10,855
Nova Varoš - gr. CG (Gostun)	61	3,167	4,116	6,659	10,321
gr. Crne Gore (Barski Most) - Ribarevina	22	3,205	4,165	6,739	10,445
Horgoš (povezni put) - petlja Horgoš	4	3,610	4,691	7,591	11,765
petlja Horgoš - Novi Sad 6 (Temerin)	108	3,972	5,162	8,352	12,944
Novi Sad 6 - Bgd (Novi Sad)	75	9,358	12,161	19,677	30,496
Bgd (Novi Sad) - Bgd (Čukarica)	11	102,620	133,360	215,781	334,425
Bgd (Čukarica) - Čelije	57	11,394	14,807	23,958	37,132
Čelije - Preljina	77	4,768	6,196	10,026	15,538
Kraljevo - Raška	80	3,555	4,620	7,475	11,585
Raška - gr. APKM (donje Jarinje)	11	1,315	1,709	2,765	4,285
gr. APKM (Donje Jarinje) - Junction to Rudare	52	762	990	1,602	2,483
Niš (Knjaževac) - gr. APKM (Merdare)	95	2,155	2,801	4,531	7,023
Merdare - Pristina	34	4,896	6,363	10,295	15,955
Ljapllaselle - Prizren	63	4,405	5,725	9,262	14,355
Prizren - gr Albanije	21	2,044	2,656	4,298	6,661

Trucks and busses

Results for the network	Length km	ADT - 2001	ADT - 2006	ADT - 2015	ADT - 2025
gr. APV (Batrovci) - Sremska Mitrovica	43	409	530	896	1,604
Sremska Mitrovica - Ruma	14	812	1,053	1,778	3,185
Ruma - Bgd (Novi Sad)	47	1,186	1,537	2,597	4,652
Bgd (Novi Sad) - Bubanj Potok	19	7,423	9,622	16,257	29,114
Bubanj Potok - Mali Požarevac	24	3,587	4,650	7,856	14,069
Mali Požarevac - Batočina	76	2,711	3,514	5,937	10,633
Batočina - Paraćin	45	2,495	3,234	5,464	9,786
Paraćin - Pojate	12	2,493	3,232	5,460	9,778
Pojate - Niš (Trupale)	59	2,307	2,991	5,053	9,048
Niš (Trupale) - Leskovac (Lebane)	43	1,190	1,543	2,606	4,667
Leskovac (Lebane) - gr. BJRM (Tabanovce)	112	1,638	2,123	3,587	6,424
Niš (Trupale) - gr. Bugarske (Gradina)	109	706	915	1,546	2,769
BGD (petlja Mostar) - BGD (Krnjača)	10	1,184	1,535	2,593	4,644
Bgd (Krnjača) - Pančevo 2 (Zrenjanin)	17	608	788	1,332	2,385
Pančevo 2 (Zrenjanin) - gr. Rumunije (Vatin)	77	498	646	1,091	1,953
gr. Crne Gore (Debeli Brijeg) - Petrovac	71	392	508	859	1,537
Petrovac - Podgorica	53	397	515	869	1,557
Podgorica - Ribarevina	114	477	618	1,045	1,871
Ribarevina - gr. Crne Gore (Špiljani)	78	509	660	1,115	1,996
gr. Crne Gore (Špiljani) - gr. APKM (Vitakić)	26	235	305	515	922
gr. APKM (Vitakić) - Mitrovica	34	393	509	861	1,541
Mitrovica - Pristina	35	508	659	1,113	1,992
Pristina - Llapslaselle	6	4,806	6,230	10,526	18,850
Llapslaselle - gr. Makedonije	53	1,459	1,891	3,195	5,722
Podgorica - Budva	58	893	1,158	1,956	3,502
Petrovac - gr. Crne Gore (Sukobin)	72	283	367	620	1,110
Loznica - gr. RS (Mali Zvornik)	21	679	880	1,487	2,663
gr. RS (Vardište) - Užice	54	367	476	804	1,439
Užice - Požega	22	960	1,244	2,102	3,765
Požega - Preljina	41	997	1,292	2,184	3,910
Preljina - Kraljevo	31	1,416	1,836	3,101	5,554
Kraljevo - Kruševac	61	928	1,203	2,032	3,640
Kruševac - Pojate	23	1,193	1,546	2,613	4,679
Paraćin - gr. Bugarske (Vrška Čuka)	97	564	731	1,235	2,212
gr. Crne Gore (Šćepan Polje) - Podgorica	136	463	600	1,014	1,816
Podgorica - gr. Crne Gore (Božaj)	24	142	184	311	557
Novi Sad (Petrovaradin) - Ruma	37	937	1,215	2,052	3,675
Ruma - granica APV (Šabac)	27	745	966	1,632	2,922
granica APV (Šabac) - Šabac	7	694	900	1,520	2,722
Šabac - Loznica	56	987	1,279	2,162	3,871
Užice - Nova Varoš	66	705	914	1,544	2,765
Nova Varoš - gr. CG (Gostun)	61	760	985	1,664	2,981
gr. Crne Gore (Barski Most) - Ribarevina	22	386	500	845	1,514
Horgoš (povezni put) - petlja Horgoš	4	810	1,050	1,774	3,177
petlja Horgoš - Novi Sad 6 (Temerin)	108	912	1,182	1,997	3,577
Novi Sad 6 - Bgd (Novi Sad)	75	1,987	2,576	4,352	7,793
Bgd (Novi Sad) - Bgd (Čukarica)	11	10,596	13,736	23,206	41,559
Bgd (Čukarica) - Čelije	57	2,275	2,949	4,982	8,923
Čelije - Preljina	77	1,583	2,052	3,467	6,209
Kraljevo - Raška	80	1,053	1,365	2,306	4,130
Raška - gr. APKM (donje Jarinje)	11	344	446	753	1,349
gr. APKM (Donje Jarinje) - Junction to Rudare	52	240	311	526	941
Niš (Knjaževac) - gr. APKM (Merdare)	95	434	563	950	1,702
Merdare - Pristina	34	2,828	3,666	6,194	11,092
Llapslaselle - Prizren	63	2,567	3,328	5,622	10,068
Prizren - gr Albanije	21	1,181	1,531	2,586	4,632

Rail Passengers

Results for the network	Length km	Number of passengers 2001	Number of passengers 2006	Number of passengers 2015	Number of passengers 2025
Batajnica - Subotica	149	2,262,294	2,554,601	3,257,869	4,268,534
Resnik - Presevo	400	127,860	144,381	184,128	241,248
Nis - Dimitrovgrad	104	542,168	612,220	780,762	1,022,972
Stalac - Pozega	136	324,123	366,002	466,761	611,561
Pancevo (V) - Vrsac	79	78,464	88,602	112,994	148,047
Stara pazova - Sid	85	56,539	63,844	81,420	106,679
Resnik - Bar	455	2,053,335	2,318,642	2,956,953	3,874,267
Pancevo - Kikinda	157	35,674	40,283	51,373	67,310

Rail Freight

Results for the network	Length km	Tonnes of freight 2001	Tonnes of freight 2006	Tonnes of freight 2015	Tonnes of freight 2025
Belgrade - Resnik	12	810,000	903,987	1,128,956	1,445,160
Resnik - Vreoci	39	810,000	903,987	1,128,956	1,445,160
Vreoci - Valjevo	43	135,000	150,665	188,159	240,860
Valjevo - Uzice	96	180,000	200,886	250,879	321,147
Uzice - B. Polje	151	135,000	150,665	188,159	240,860
B. Polje - Podgor.	130	135,000	150,665	188,159	240,860
Podgor. - Bar	57	135,000	150,665	188,159	240,860
Beograd - Indjija	50	405,000	451,994	564,478	722,580
Indjija - Petrov.	29	405,000	451,994	564,478	722,580
Petrov. - N. Sad	11	495,000	552,437	689,918	883,153
N.Sad - Vrbas	41	405,000	451,994	564,478	722,580
Vrbas - Zednik	43	405,000	451,994	564,478	722,580
Zednik - Subotica	26	652,500	728,212	909,437	1,164,156
Stara pazova - Indjija	23	270,000	301,329	376,319	481,720
Indjija - Ruma	23	315,000	351,551	439,039	562,007
Ruma - Sid	58	180,000	200,886	250,879	321,147
Beograd - Rakovica	4	585,000	652,880	815,357	1,043,726
Rakovica - Resnik	6	585,000	652,880	815,357	1,043,726
Resnik - Lapovo	96	292,500	326,440	407,679	521,863
Lapovo - Nis	139	495,000	552,437	689,918	883,153
Nis - Presevo	161	225,000	251,108	313,599	401,433
Nis - Dimitrovgrad	110	427,500	477,104	595,838	762,723

Inland waterways

	Km	Tonnes of freight 2001	Tonnes of freight 2006	Tonnes of freight 2015	Tonnes of freight 2025
Danube - Hungarian border - Romanian border	588	8,526,813	10,595,300	16,436,788	26,773,796
Sava - Croatian border - Danube	207	1,330,114	1,652,781	2,564,006	4,176,496
Tisa - Hungarian border - Danube	164	126,709	157,447	244,252	397,860
Tamis - Romanian border - Danube	41	1,867	2,320	3,599	5,862
Begej - Romanian border - Tisa	77	48,047	59,703	92,618	150,865
Veliki Backi kanal - Danube - Tisa	123	40,323	50,105	77,729	126,612

Air traffic

Airport	Total passengers - Passengers			
	2001	2006	2015	2025
Belgrade	1,497,509	2,067,096	3,963,116	8,168,106
Podgorica	280,187	386,758	741,507	1,528,269
Tivat	351,465	485,147	930,142	1,917,053