

Report No. 55015-ECA

Belarus: Transport Sector Policy Note

**Transport Unit, Sustainable Development Department
Europe and Central Asia Region**

December 14, 2010

Document of the World Bank

CURRENCY EQUIVALENTS

Exchange Rates as of March 19, 2010

Currency Unit – Belarus Ruble
US\$1 = BYR 2,968

Government Fiscal Year
January 1 – December 31

WEIGHTS AND MEASURES

Metric System

FISCAL YEAR

January 1st – December 31st

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ABBREVIATIONS AND ACRONYMS

BSR	Baltic Sea Region
CASPR	Country Assistance Strategy Progress Report
CEE	Central and Eastern Europe
CIS	Commonwealth of Independent States
CSCMP	Council of Supply Chain Management Professionals
CTC	Centralized Traffic Control
EBRD	European Bank for Reconstruction and Development
ECA	Europe and Central Asia
EECCA	Eastern Europe, Caucasus and Central Asia
EU	European Union
EurAsEC	Eurasian Economic Cooperation
FDI	Foreign Direct Investment
FTL	Full Truck Load
GDP	Gross Domestic Product
GETI	Global Enabling Trade Index
GRDI	Global Retail Development Index
HDM-4	Highway Development and Management Model
IFI	International Financial Institution
IMF	International Monetary Fund
IRU	International Road Transport Union
ITF	International Transport Federation
LPI	Logistics Performance Index
LTL	Less Than Truck Load
MOTC	Ministry of Transport and Communications
NRF	National Road Fund
PPP	Purchasing Power Parity
RMS	Road Asset Management System
TEN-T	Trans-European Transport Network
UNCTAD	United Nations Conference on Trade and Development
UNECE	United Nations Economic Commission for Europe
USA	United States of America
USA	United States of America
USD	United States Dollar
VAT	Value Added Tax

ACKNOWLEDGMENTS

This report was prepared by a team comprising of Cordula Rastogi (Task Team Leader), Elena Klochan (Senior Country Program Officer), Vasile Olievschi (Senior Railways Specialist), Romain Pison (Transport Engineer), Jukka-Pekka Strand (Financial Analyst) and Liljana Sekerinska (Transport Specialist) from the Europe and Central Asia Region of the World Bank, in close collaboration with the Belarusian authorities. Irina Trukhan (Project Assistant) and Elena Lukyanchikova (Program Assistant) kindly assisted the team with administrative matters. Barbara Catherwood provided editorial assistance.

The team also included Prof. Lauri Ojala (Professor at Turku School of Economics, Finland) and Dr. Harri Lorentz (Senior Research Associate at Turku School of Economics, Finland). They provided substantive contributions through the Belarus Trade and Transport Facilitation Diagnostic Study, which was prepared as an input for this report.

The team gratefully acknowledges the guidance of Martin Raiser (Country Director, Ukraine, Belarus, and Moldova) and Henry Kerali (Sector Manager, Transport). Andreas Schliessler (Program Team Leader) reviewed the draft versions of the document and provided numerous inputs and suggestions. The team would also like to thank peer reviewers Moustafa Baher El-Hefnawy (Lead Transport Economist) and Pablo Saavedra (Senior Country Economist) for their helpful comments on the draft of this report.

The team also gratefully acknowledges the many formal and informal contributions of representatives of numerous Government and non-Government institutions in Belarus who assisted during the course of the study and provided comments on draft versions.

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EXECUTIVE SUMMARY

Main Findings

The transport sector is an important economic sector in Belarus, contributing 6.7 percent of GDP in 2008 and 6.6 percent in 2009. Belarus has been a net exporter of practically all modes of transport services. The country serves as a transit transport corridor between the European Union (EU) and Russia and potentially between the EU and Asia; thus, the strategic geographical location of Belarus places the country on two of the Pan-European corridors that the EU has committed to promote.¹ In addition to a high geographical concentration of international trade, the trade patterns for specific commodity groups are also concentrated in Belarus. A relatively small number of industrial producers and main export companies dominate the market and generate a corresponding transport demand.

The trade logistics environment in Belarus has been improving in many areas. The *Doing Business* Index of 2010 ranks Belarus as having the 58th most conducive environment to the operation of business. While significant improvements have been achieved, some basic fundamentals for business remain very constrained. According to the Logistics Performance Index 2007 (LPI), Belarus outperformed its Commonwealth of Independent States (CIS) peers in three areas: efficiency of customs clearance process, transport infrastructure, and shipment tracking and tracing. However, Belarus seems to underperform in the affordability of arranging international shipments, as well as in the level of competence of the local logistics industry.

The evolution of freight and passenger transport markets shows that freight traffic movements have grown in line with GDP. The Belarusian railway predominantly operates international freight services and railway transport has a strong position in the transportation market in Belarus, compared to EU-25 countries.² The market demand for railway passenger transport services is consistently decreasing, losing market share particularly to roads, affected also by the global economic crisis that had a serious impact on railway transport volumes. The market for advanced logistics services is not highly developed in Belarus due to constraints in both supply and demand, and the supply of scheduled international and domestic groupage³ cargo services is scarce.

Belarus does have the equivalent of a National Transport Strategy and Action Plan. The *Program for Ensuring Efficient Use of Transit Potential of the Republic of Belarus for 2006 – 2010*, the draft *Program of the Development of Transit Potential of the Republic of Belarus for 2011 – 2015*, and the *Roads of Belarus* Program constitute the three key pillars of such a national transport strategy. In addition, the *Strategy for the Development of Transit Potential of the Republic of Belarus for 2011 – 2015* and the *Concept of Belarus' Transport System Development until 2025* have recently been approved by the Government. The Concept defines the goals, priorities, tasks, key focuses and parameters of Belarus' transport system development until 2025

¹ There are 3 Pan-European corridors through Belarus, 2 being promoted by the EU.

² This paper refers to EU-25 in case of lack of data for EU-27

³ Consolidation of freight Less-than Truck Load (LTL)

including mitigation of impacts generated by CO and CH² emissions. Finally, the Government's *Program of Social and Economic Development* (2006-2010) presently guides the development of the transport sector and aims at the "formation of a competitive transport system, further development of transport services, and associated infrastructure". Even though the Government of Belarus has established the key elements of a transport sector strategy, the detailed analytical work on which such strategy should be based is not available. The World Bank believes that a combined and consolidated Transport Sector Strategy for Belarus, based on comprehensive analytical work, would be beneficial. The MOTC is the central institution in the transport sector, although policy development is shared with the Presidential Administration. Climate change is an important element in formulating transport policy in Belarus, considering that transportation emissions comprise about 70 percent of total air pollutants and 9 percent of CO² emissions, in part because the majority of vehicles in use are old. Due to various Government initiatives, the overall trend for environmental protection in the road sector is improving. Like climate change, road safety is increasingly a social and economic issue, requiring a coordinated effort at all levels, and the Government of Belarus is aware that more is needed to be done to improve road safety in Belarus.

Belarus has a public road network length that is mostly adequate for current traffic levels. Overall, only 35 percent of the network of Republican roads is in good to satisfactory condition. The Government is therefore implementing a program to improve the overall condition of the road network and expand the capacity of parts of the Republican roads. Belarus has adopted a detailed road classification system and has initiated general revisions of its technical norms and standards in line with European standards and directives. Over the period 2005-2009, Belarus earned more revenues from fuel taxes and road user charges than was actually spent on road maintenance and investment. Despite the abolishment of the National Road Fund (NRF) in 2008, expenditures geared towards Republican and Local road networks have been modestly increasing in recent years, but additional resources are urgently needed to address the maintenance backlog. While general taxation and budget allocations may provide a steady stream of funding for the normal operation and maintenance of roads, it seems unlikely that it will provide sufficient funding to finance the full cost of rehabilitation or upgrading of roads. Given fiscal space considerations, the Government has identified priority road investment projects on the basis of strategic assessments. With the transfer of management of the Local road network to the oblasts in 2010, recurrent and capital expenditures for Local roads will be the responsibility of the regions; they will receive central government support by covering any financial shortfall for expected expenditures on Local roads.

The World Bank estimates that the level of recurrent expenditures required to maintain the Republican and Local road networks (without eliminating the backlog) is BYR1,060 billion (US\$360 million) on average per year. The capital expenditures necessary to address the backlog of maintenance for the Republican road network has been estimated at BYR588 billion (US\$200 million) on average per year. According to the Government's *Roads of Belarus* program, the development needs of the network entail spending additional BYR2,243 billion (US\$766 million) on Republican roads over the period of 2011-2016. A significant financing gap exists in the area of road infrastructure. The World Bank believes that the quality of spending could also be improved through the systematic use of a road asset management system which should lead to a better prioritization of road sector interventions (investment, rehabilitation and maintenance). The Government plans to close part of the financing gap in the road sector through the expansion of road tolling; the World Bank fully supports this approach.

The density and accessibility of the railway network in Belarus is comparable to other Central European countries, and the technical condition of railway infrastructure is satisfactory, however the railway infrastructure are rather old and require medium and long-term modernization. Belarusian Railways has excellent operational performance results and is very efficient – the asset utilization compares well with EU countries. In order to maintain high-quality transport services and offer new freight and passenger transportation services, Belarusian Railways needs to accelerate the renewal of its rolling stock. The vital element for the good operational performance of Belarusian Railways is the high traffic intensity on the network. In order to counter the negative trends in the market share of railway transport, adjustments is needed. The World Bank proposes that the cost of operating railway infrastructure in Belarus should be clearly identified and the State should take the lead role in setting unbiased rules for financing road and railway infrastructure.

The various types of transport services performed by Belarusian Railways are not equally profitable. International transport services are cross-subsidizing domestic transport, which makes the railway very dependent on an evolving international freight transport market that is an element beyond its control. Passenger rail transport services in Belarus are not financially self-sustaining, thus, Belarusian Railways should consider separating commercially viable services from non-commercial services in terms of cost and revenue accounting. The World Bank estimates that recurrent annual expenditures required to keep the railway network (infrastructure) at its current capacity amount to BYR292 billion (US\$98.4 million) on average. According to the Government's strategy for the railway sector, the development needs of the network entail spending additional BYR997 billion (US\$340 million). Belarus Railways is currently able to fully finance all expenditures related to maintenance, repair and new investment, but this situation may not last much longer. At present, there is no backlog in railway maintenance works; however, the current pace of investments is not sufficient for sustaining the long term development of Belarusian Railways.

Recommendations

A - Increase logistics performance: There is an apparent lack of class A and B warehouse space in Belarus; this results in relatively high rental prices for such premises. Further market research on logistics services demand should be conducted from the point of view of international shippers and logistics operators. That approach will offer a better understanding of the nature of demand and of the rationale for stopping and transshipment of cargo in Belarus. Additionally, the Government should address perceived issues in customs (zero-tolerance attitude and problems with certification) to facilitate shippers using the Poland – Belarus route to Russia.

B - Improve the institutional framework of the Belarus transport sector: This will require (i) preparing a consolidated National Transport Strategy and business plan based on detailed analytical work; (ii) improving road transport management, planning and budgeting; and (iii) re-assessing the legal and institutional framework of Belarusian Railways. The Government should prepare a consolidated Transport Sector Strategy, including a prioritized investment and expenditure plan for the transport sector, in which maintenance and upgrading of transport infrastructure for all modes of transport should be a central part. The MOTC should lead the development of the Transport Sector Strategy, which should be based on technical and analytical work and should also be linked to the multi-annual business plans to be developed by Belavtodor

and Belarusian Railways. To support the development of a sound road sector investment and expenditure plan, Belavtodor would need a road asset management system. To improve transport sector management, transport statistics kept in Belarus should be harmonized to conform to international standards. Considering the increased market pressure on Belarusian Railways, it is advisable to set up internal business units. These units would help the management of Belarusian Railways to have a clear understanding of the profitability of each line of business and to take appropriate corrective measures. The Government should also assess the best tariff policies to ensure a balance between affordable fares for railways users, and financial sustainability of Belarusian Railways.

C - Improve transport sector sustainability: This requires (i) placing greater emphasis on maintaining assets and specifically addressing the backlog in the maintenance of the road network; (ii) strengthening financing of the road sector through tolling of the major highways; (iii) investing strategically in the railway sector and assessing the possibility of introducing public service contracts; and (iv) further improving the operational and financial performance of the railways. The current level of maintenance spending on Republican Roads is close to sufficient to keep the condition of those roads in a “steady state”. For Local roads, however, the maintenance spending is clearly insufficient to sustain their present condition. The sustainability of road sector financing could be improved by increasing direct cost recovery from road users through the expansion of road tolling to all main motorways. Belarusian Railways has so far been able to cover all railway infrastructure investments from its own resources, but the further upgrading and modernization of railway infrastructure in Belarus may require State support in the medium and long term. Based on the current situation of Belarusian Railways, Public Service Contracts for passenger transport services should be introduced gradually on selected major railway routes. The implementation of Public Service Contracts must be transparent and based on the principle that the Government has full control of the utilization of State funds provided to Belarusian Railways.

1. INTRODUCTION

Background

1.1 **The Republic of Belarus achieved an average annual growth of 7.5 percent in the ten years from 1999 to 2008.** It benefitted from inherent economic strengths and favorable external conditions. High investment-to-GDP ratios and productivity gains from a well-educated and disciplined labor force were the main contributors to growth. The favorable external environment—including strong growth in Russia and the rest of the world, easy access to the Russian market, and low-cost energy imports from Russia—also encouraged rapid growth.

1.2 **The global economic crisis of 2009, however, exposed the economy’s vulnerability, in particular through the downward pressure on the Government’s fiscal space.** The external current account registered a sizable deficit for most of the past decade, as savings fell short of investment, leading to precariously low international reserves. Belarus’ exports, destined mainly to the Western European market for oil products and the Russian market for non-energy products, were hit hard when demand in both markets fell drastically as a result of the crisis.

1.3 **The Government recognizes the transport sector’s role as an important pillar of the economy.** According to proposals in the Government’s Program of Social and Economic Development (2006-2010), the transport sector is to be further strengthened through various sector reforms and specific targeted investments in trade-related infrastructure, thus providing economic stimulus in the short term and improved competitiveness for the national economy in the long term.

Report Objectives

1.4 **This report aims to contribute to the reflection and dialogue about policy and investment options in the transport sector, particularly in light of the present significant constraints in the Government’s fiscal space.** The report was commissioned to establish an analytical underpinning for the World Bank’s support to the transport sector in Belarus during the coming years. It provides the Government of Belarus with the World Bank’s policy recommendations for the transport sector. It reviews the main transport modes (rail and road) and suggests options for strategic directions and priorities which in the Bank’s view may help to further develop the transport sector in Belarus. The report does not substitute for a full transport sector strategy which needs to be developed and updated from time to time by the Government of Belarus.

1.5 **The Transport Sector Policy Note is targeted at stakeholders in Belarus who are interested in the role that the transport sector plays in the development of the country.** These are in particular the Ministry of Transport and Communications (MOTC), Belavtodor, Belarusian Railways, the Ministry of Finance, the Ministry of Economy and other stakeholders within the transport sector and the broader economy. The secondary audience of this report includes World Bank staff and other external stakeholders, such as the Eurasian Development Bank, the European Commission, and other international and bilateral financial institutions.

Report Scope

1.6 **The report focuses on land transport (road and rail subsector) given its dominant role in serving transportation demand in Belarus.** It also covers freight logistics as an underlying activity of road and rail transport. The World Bank's *Country Assistance Strategy Progress Report (CASPR)*⁴ for Belarus identified the transport and logistics sector as a bottleneck for the country's trade integration and competitiveness. It indicates that large investments are needed to increase the capacity of parts of the road network, to improve road safety and to increase energy efficiency of train operations.

1.7 **The objective of the report is consistent with two pillars of the CASPR.** First, in line with the pillar on "Entry, Regulatory Reform, and Competitiveness," the report identifies policy options and reforms in the transport sector that are likely to improve the sector's functional efficiency and promote investments. Second, in line with the pillar on "Public Sector Efficiency and Fiscal Discipline," the report identifies actions and measures that could help the Government to put the transport sector on a fiscally sustainable basis and ensure the efficient use of scarce resources. The report's findings are based on an objective assessment of the current status of the transport sector, including its financial and fiscal sustainability. It also seeks to benchmark the sector against international performance indicators and to present policy and investment options for consideration by the Government.

1.8 **This report is the World Bank's second review of the transport sector in Belarus.** The World Bank undertook a comprehensive Transport Sector Review in 1995, which was however not followed by World Bank funded investments in the transport sector. This new Transport Sector Review presents new analytical work which is meant to underpin future World Bank support to Belarus in the transport sector. The World Bank's Board of Directors has recently approved a loan of US\$ 150 million to support the *Road Upgrading and Modernization Project*. The World Bank has also indicated its willingness in principle to provide future financing for other transport sector investments.

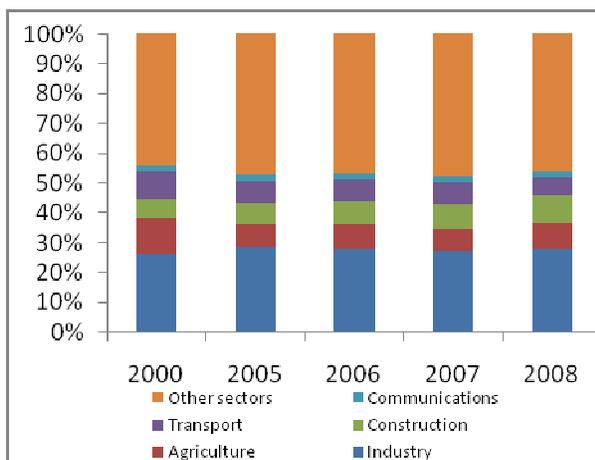
⁴ Approved by the World Bank on October 23, 2009.

2. DEMAND FOR TRANSPORT AND LOGISTICS SERVICES

Role of the Transport Sector in the Economy

2.1 **Contributing about 7 percent to GDP in 2008, transport is an important economic sector in Belarus.** The sector generates large revenues from transit services, facilitates internal and external trade, and contributes to the country's balance of payments. In addition, the transport sector accounts for about 6 percent of total employment in Belarus.⁵ In 2008, the largest proportion of transport-related employment was in roads (about 117,100 persons), followed by rail (about 70,400 persons) as presented in Table 1 and Table 2.

Table 1. Belarus GDP 2000-2008 Sectoral Structure



Source: Transport Statistical Yearbook of Belarus. 2009.

Table 2. Number of employees in the Transport Sector in Belarus 2000-2008 (in thousands of persons)

	2000	2008
Transport sector (total)	250.4	254.9
Of which:		
Roads	113.4	117.1
Rail	75.3	70.4
Tram and trolleybus	10.6	10.9
Pipeline	6	7.5
Air	6.1	5.6
Inland water	2	1.5
% of the total number of employees		
Transport	5.9	6.1

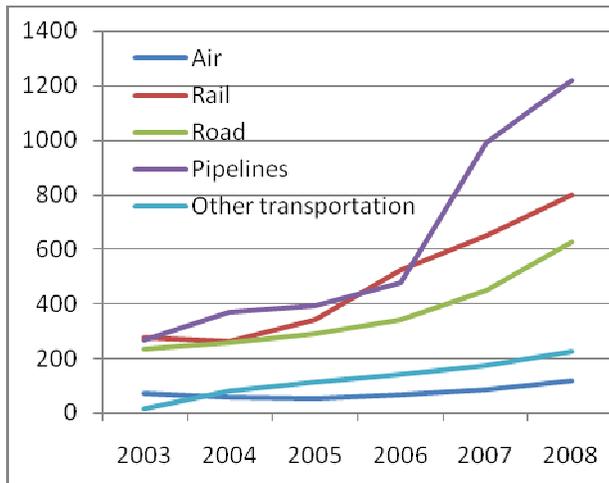
Source: Transport Statistical Yearbook of Belarus. 2009.

2.2 **Belarus has been a net exporter of practically all modes of transport services.** The main currency earner is pipeline transport, the transit fees from which exceeded US\$1.2 billion in 2008. The net balance of income from pipeline transport was approximately US\$700 million in 2007 and about US\$750 million in 2008. Road and rail transport are also significant net exporters. The net balance of earnings from transit fees in road and rail transport combined increased from about US\$300 million in 2006 to over US\$400 million in 2008. Much of the road-based earnings stem from transit traffic with third countries (trucking services provided by Belarusian truckers outside Belarus). The actual volume of cross trading is difficult to estimate given the lack of available data. Passenger transportation by buses owned by companies outside

⁵ Employment strictly refers to the actual impact on staffing (number of employees) in the sector

of Belarus are very small considering the size of the country, indicating a very low level of international traffic both into and out of Belarus (Figure 1, Figure 2, and Figure 3 illustrate transport services trends).

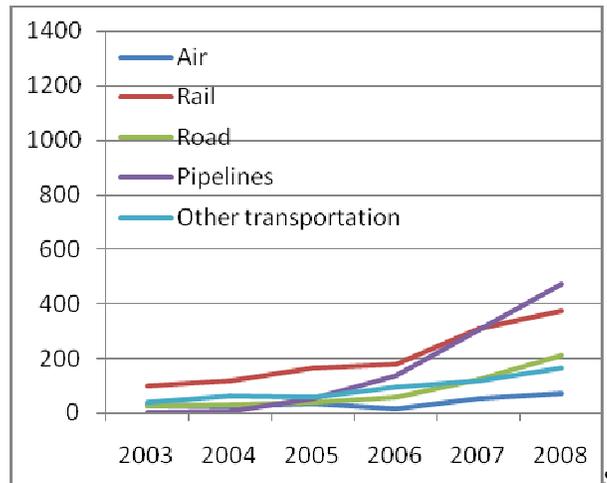
Figure 1. Belarus Trade in Transport Services 2003-2008: Exports (in million US\$)



Source:

Belarus State Customs Committee and UN Services Trade database.

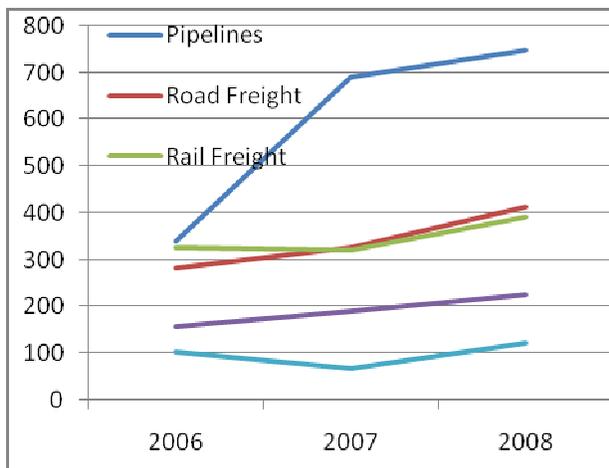
Figure 2. Belarus Trade in Transport Services 2003-2008: Imports (in million US\$)



Source:

Belarus State Customs Committee and UN Services Trade database.

Figure 3. Belarus Services Trade Balance (exports-imports) by Type of Transport Service 2006-2008 (in million US\$)



Source:

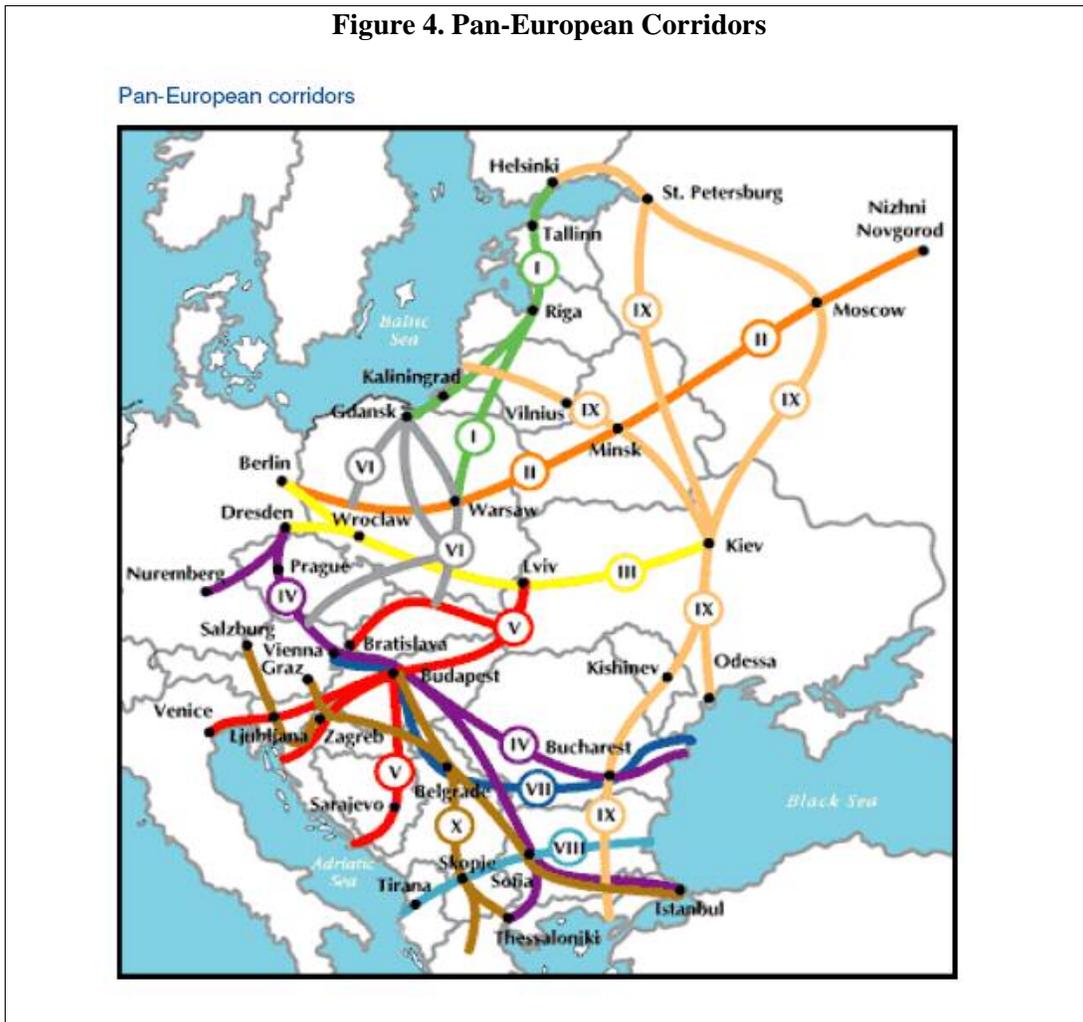
Belarus State Customs Committee and UN Services Trade database.

2.3 In terms of international trade, Belarus serves as a transit transport corridor between the EU and Russia and potentially between the EU and Asia, via the Trans-Siberian Railway. Movements along transit corridors in Belarus are from east to west and north to south (and vice-versa) given the country's directions of trade. In 2008, the main destinations for exports of goods and services from Belarus were Russia (32 percent), the Netherlands (16.8

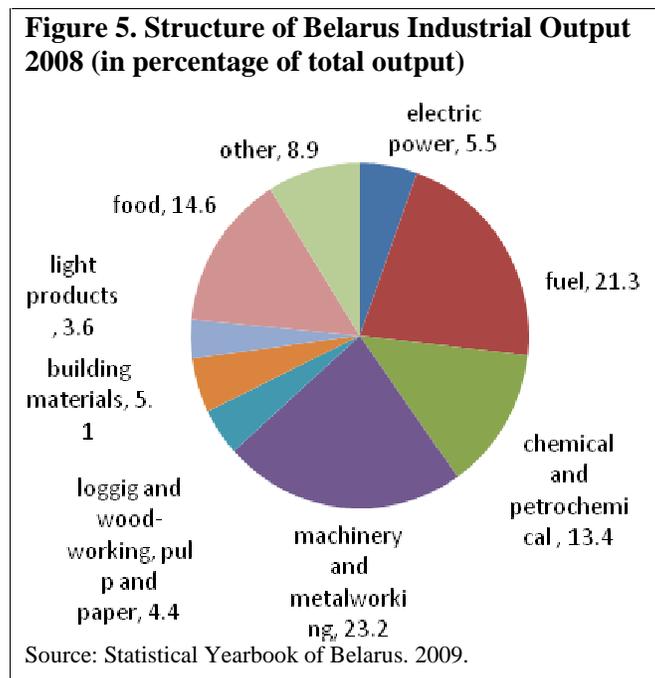
percent), Ukraine (8.4 percent), and Latvia (6.6 percent). The main import origins were Russia (60.7 percent), Germany (7.2 percent), Ukraine (5.4 percent), and China (3.6 percent) (UNCTAD). Russia is the dominant trade partner for Belarus, increasingly so with the newly established Customs Union among Belarus, Russia, and Kazakhstan. The European Union (EU) is the second most important trading region with 21.6 percent of imports and 43.9 percent of exports in 2008. Within the EU, the main export destinations after the Netherlands are Latvia, and Poland. The main EU countries of origin for imports to Belarus were Germany, Poland and Italy.

2.4 **The strategic geographic location of Belarus places the country on two of the Pan-European corridors that the EU has committed to promote** (Figure 4). In EU terminology these corridors are: Corridor II (Berlin-Warsaw-Minsk-Moscow) and Corridor IX (Black Sea-Kiev-Minsk-Baltics, including the sub-alignment through St. Petersburg-Moscow-Kiev). Since its enlargement in 2004, the EU now shares a common border with Belarus. The EU “High Level Group on the extension of Trans-European Transport Networks (TEN-T) to neighboring countries” established five main transnational transport axes that play a strategic role in the region. The transport network of Belarus is part of the northern and central axes.

Figure 4. Pan-European Corridors



2.5 **With its concentration in industrial production and trade, the structure of the Belarusian economy further contributes to the level of freight intensity.** The four main industrial sectors of the Belarus economy are machinery and metalworking, fuel, food, and chemical and petrochemical industries (Figure 5). Together, these four sectors produce 72.5 percent of the national industrial output in terms of value. A large share, 34.7 percent of industrial production, is made up of fuel and chemical/petrochemical products.



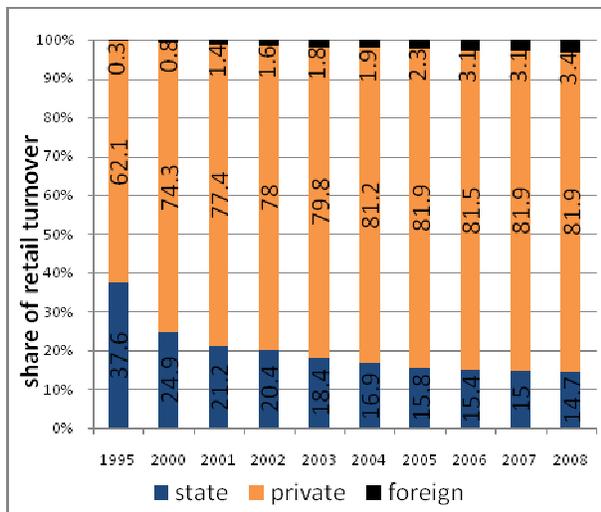
2.6 **In addition to high geographical concentration of international trade, the trade patterns for specific commodity groups are also highly concentrated in Belarus.** During the 2001-2008 period, the share of all imports from the top 10 countries was over 86 percent, with a maximum of 89 percent in 2004. Exports are similarly highly concentrated: the share of exports to the 10 most important countries remained at around 84 percent during the 2001-2008 period. The current trade pattern therefore leaves Belarus very vulnerable to outside economic uncertainties (such as international commodity prices) and to external political events in its main trading partners.

2.7 **A relatively small number of industrial producers and main export companies dominate the market and generate the corresponding transport demands.** Apart from the fuel and chemical industries, among the major Belarus industrial producers and exporters are firms such as JSC *Gorizont* (televisions and household appliances), ZAO *Atlant* (white goods), OJSC *Belshina* (tires), MAZ (heavy vehicles, buses, and trailers), JSC *Amkodor* (loaders and carriers), and JSC *Bobruiskmebel* (furniture). In addition to strong domestic market positions, these companies export their products mainly to the countries in the Commonwealth of Independent States (CIS) and also globally.

2.8 **Gorizont, which currently is the largest producer of television sets and radio electronics in the CIS, presents an interesting case in international trade logistics.** In the past, the company provided contract manufacturing services for Philips, Panasonic, Thomson, and Daewoo. Recent negotiations between the Government and Philips reportedly included the "delivery of components and the assembly of Philips television sets at the Belarusian enterprise, as well as production of some components for Philips television sets by Gorizont and the joint creation of a conceptual television set for the Belarusian market". The possible introduction of a re-export scheme for Philips will require high reliability levels for supply chain and border-crossing procedures.

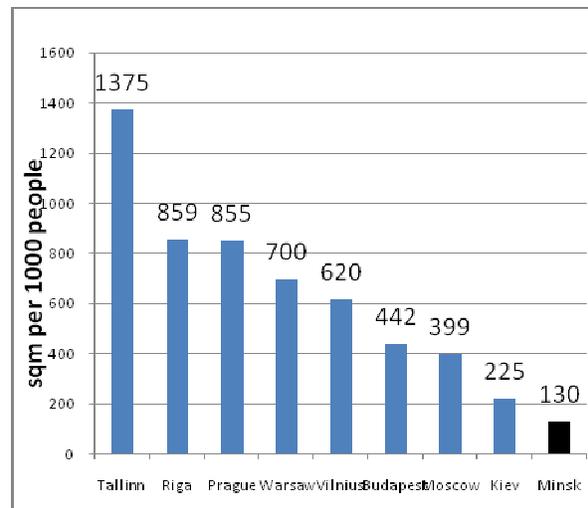
2.9 **The retail sector, one of the biggest drivers of the logistics market worldwide,⁶ shows growth prospects, but large international retail chains remain absent in Belarus.** During the 2000-2008 period, retail turnover in Belarus experienced two-digit annual growth rates, reaching US\$23.7 billion in 2008 (UNITER, 2009). Despite strong growth, Belarus does not perform well in comparison to other CIS and EU countries, such as Russia and Lithuania. In 2008 for the first time, non-food retail trade exceeded food trade; however, for 2009 food is expected to regain dominance due to developments related to the financial crisis. In 2008, there were 41,000 officially recognized retail trade organizations, up from 31,000 in 2000 (Belstat, 2009). The increase in the distribution of retail turnover among state, private, and foreign organizations indicates a diminishing role of the State in the retail sector, as well as a low participation of foreign companies in the market (see Figure 6).

Figure 6. Distribution of Retail Turnover by Ownership Types in Belarus 1995-2008 (in share of retail turnover)



Source: Statistical Yearbook of Belarus. 2009.

Figure 7. Floor Space for Modern Retailing in Selected CEE Capital Cities 2007 (per 1,000 people)



Source: UNITER. 2009.

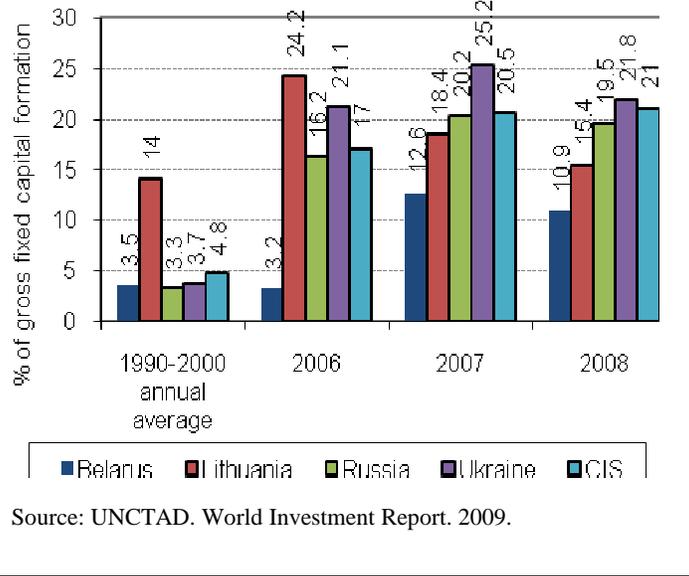
⁶ In the UK for example, some 60 percent of demand for large distribution centers comes from retailers (McKinnon, 2009), especially the more developed retail chains with differentiated store formats (hypermarkets, supermarkets, convenience stores). Their respective location strategies require separate locations for warehousing and materials management in order to fully exploit store space for consumer sales generation. These in-house or outsourced distribution centers may operate, for example, based on the cross-docking concept, allowing low inventory and transportation cost levels, while the coordination complexity may be high.

2.10 **The Government has taken measures to ease entry for private participation in retail business by introducing a Decree of the President of the Republic of Belarus dated September 1, 2010 “*On licensing of certain activities*”, through which the licensing of retail trade would be abolished.** Retail trade licensing accounts for some 40 percent of all licenses issued in Belarus. The Government is also attempting to reduce the share of non-organized retail trade (such as small vendors, small grocery stores in the neighborhood), which generated 31 percent of retail turnover in 2008 (in 2006 in Russia 19.7 percent, Poland 10 percent, Western Europe 5-6 percent) (Uniter, 2009). For example in 2006, the Ministry of Trade announced the development of 16 hypermarkets and 665 other trade points. Retail infrastructure, however, is poor in Belarus in comparison to international standards. The City of Minsk has the lowest amount of floor space for modern retailing among the capital cities in Central and Eastern Europe (CEE) (see Figure 7) with only 130 m² per 1,000 people in 2007.

2.11 **As foreign retailers typically offer foreign products and require predictable international logistics, difficulties in cross-border flows of goods may constrain their entry and the corresponding foreign direct investment (FDI) in the Belarus market.** A case in point is the experience of importers of branded alcoholic beverages in 2008 when imports were reduced by 38 percent due to "administrative constraints" (www.Product.ru). As a result, premium brands disappeared from the market, including retail stores and restaurants.

2.12 **The share of inward FDI flow to Belarus as a percentage of the gross fixed capital formation has been rather modest when compared to Lithuania and other CIS countries** (Figure 8). The level of inward FDI flow into Belarus reached US\$1,785 million in 2007 and US\$2,158 million in 2008, while the total inward FDI stock in Belarus was US\$6,679 million in 2008 (UNCTAD 2009). In 2007 the distribution of FDI inflow to various economic sectors in the Belarus economy was as follows: industry 43 percent, commerce 30 percent, communication 7 percent, transport 7 percent, trade and public catering 6 percent, and others 6 percent (Liuhto et al, 2009). The growth of FDI inflow is largely attributed to the purchase of Beltransgaz shares by Russian Gazprom. In accordance with the Protocol signed on 31 December 2006 between the Government of the Republic of Belarus and Gazprom and Beltransgaz Shares Purchase Contract, Gazprom bought 50 percent of Beltransgaz shares by 2010 in four 12.5 percent installments for the total of US\$ 2.5 billion

Figure 8. FDI Inflow to Belarus, Lithuania and CIS Countries



Trade Logistics Environment

2.13 Based on recent surveys and rankings (such as the World Bank’s *Doing Business Index*, the *Logistics Performance Index* and others), the trade logistics environment in Belarus has been improving over many areas. A report by *Business Eastern Europe* in 2009 however shows high operational risk ratings in Belarus (see Table 3). This is mainly due to the uneven development in the different areas. Annex 1 presents the concept of logistics costs and international reference data.

Table 3. Operational Risk Ratings of Selected CIS Countries (2009)

	Belarus		Moldova		Russia		Ukraine	
	Rating	Score	Rating	Score	Rating	Score	Rating	Score
Security risk	B	32	B	36	C	54	C	43
Political stability risk	C	55	C	60	C	60	D	65
Government effectiveness risk	E	93	D	79	E	82	E	82
Legal and regulatory risk	E	90	D	70	D	70	D	72
Macroeconomic risk	D	75	C	50	D	70	D	70
Foreign trade and payments risk	D	75	C	43	C	57	C	57
Tax policy risk	C	50	B	38	C	50	C	50
Labor market risk	C	50	C	54	C	54	C	54
Financial risk	D	71	D	71	D	63	D	71
Infrastructure risk	D	69	D	69	C	50	D	75
Overall risk assessment	D	66	C	57	D	61	D	64

Note: E= most risky; 100 + = most risky

Source: Business Eastern Europe, 2009.

2.14 **The *Doing Business* Index of 2010 ranks Belarus as the 58th most conducive environment to the operation of business.** This ranking points to remarkable improvements in the regulatory environment (see Table 4 and Table 5). As a result, Belarus fares better than many of its neighboring countries that have introduced fewer reforms. The Government of Belarus seems to place significant importance on the *Doing Business* Index, and the official goal for Belarus is to reach the top 30 countries in the rankings (Tatarchuk, 2009).

Table 4. International Comparison of Rank Changes in the Doing Business Index (2009-2010)

	2010 rank	2009 rank	Change
Singapore	1	1	0
Lithuania	26	28	2
Latvia	27	29	2
Belarus	58	85	27
Kazakhstan	63	70	7
Poland	72	76	4
Moldova	94	103	9
Russia	120	120	0
Ukraine	142	145	3

Source: Doing Business Index. 2010.

Table 5. Rank Changes in the Components of the Doing Business Index for Belarus (2009-2010)

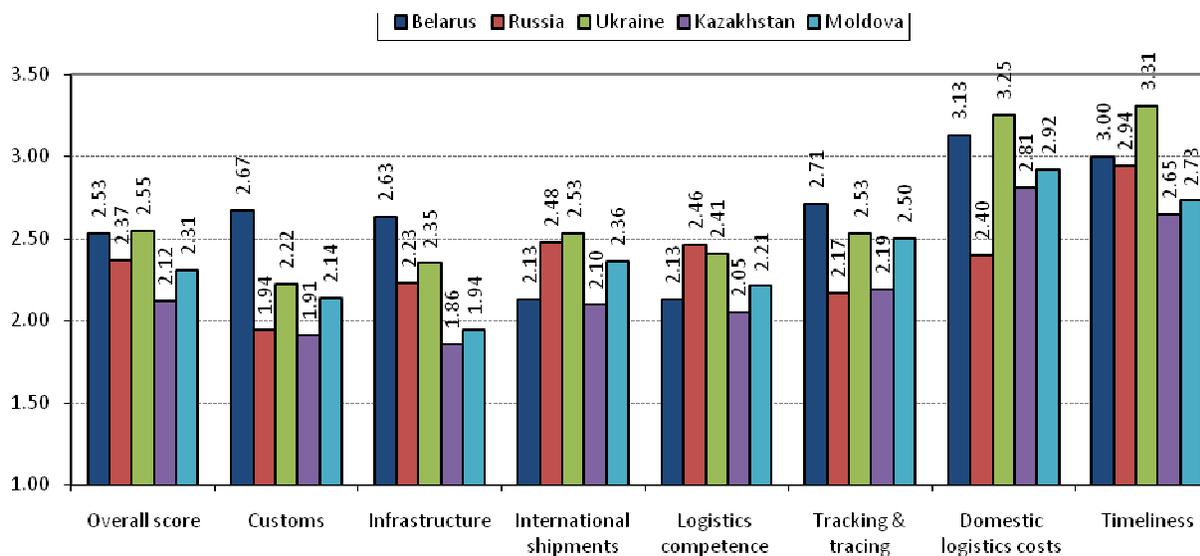
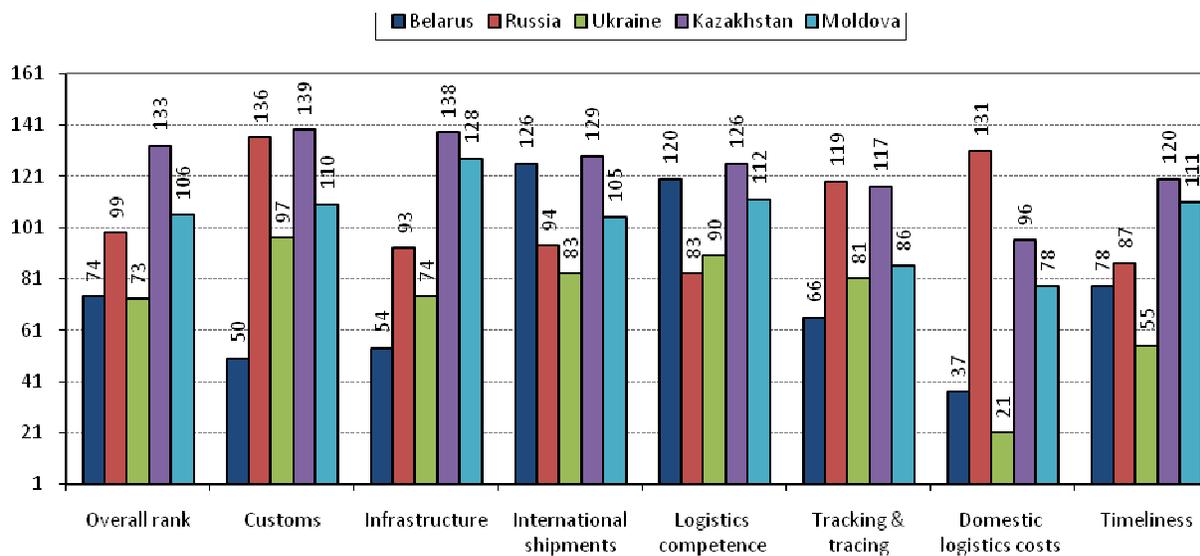
	2010 Rank	2009 Rank	Change
Starting a business	7	98	91
Dealing with construction permits	44	63	19
Employing workers	32	40	8
Registering property	10	13	3
Getting credit	113	109	-4
Protecting investors	109	105	-4
Paying taxes	183	183	0
Trading across borders	129	134	5
Enforcing contracts	12	14	2
Closing a business	74	74	0

Source: Doing Business Index. 2010.

2.15 **While significant improvements have been achieved, some basic fundamentals for business remain very constrained.** Setbacks in financing and protection of investments are reported (see Table 5) to be the main constraints. The ease of conducting international trade has improved only marginally and therefore remains on a somewhat low level in international ranking (129th place among 183 countries). The specific improvements in this field mentioned by the Doing Business Survey are implementation of a risk-based management system and reduction in cross-border transit times.

2.16 **According to the Logistics Performance Index 2007 (LPI), Belarus outperformed its CIS peers in three components:** efficiency of the customs clearance process; transport infrastructure; and shipment tracking and tracing. Out of 150 countries, Belarus ranked 74th in the LPI's overall index in 2007 (score 2.53). Other CIS countries fared worse in the overall ranking, with Russia as 99th (score 2.37), Moldova as 106th (score 2.31) and Kazakhstan as 133rd (score 2.2) (see Figure 9). Comparison of Belarus with EU peers (Poland, Latvia, Lithuania) indicated a relatively high quality of transport and communications infrastructure and a competitive level of direct domestic logistics costs (see Figure 9). According to the LPI 2007, customs clearance procedures were up to par with the respective ones in neighboring EU countries. It was however indicated that progress could be achieved in international shipments, logistics competence, and timeliness of shipments in reaching destination.

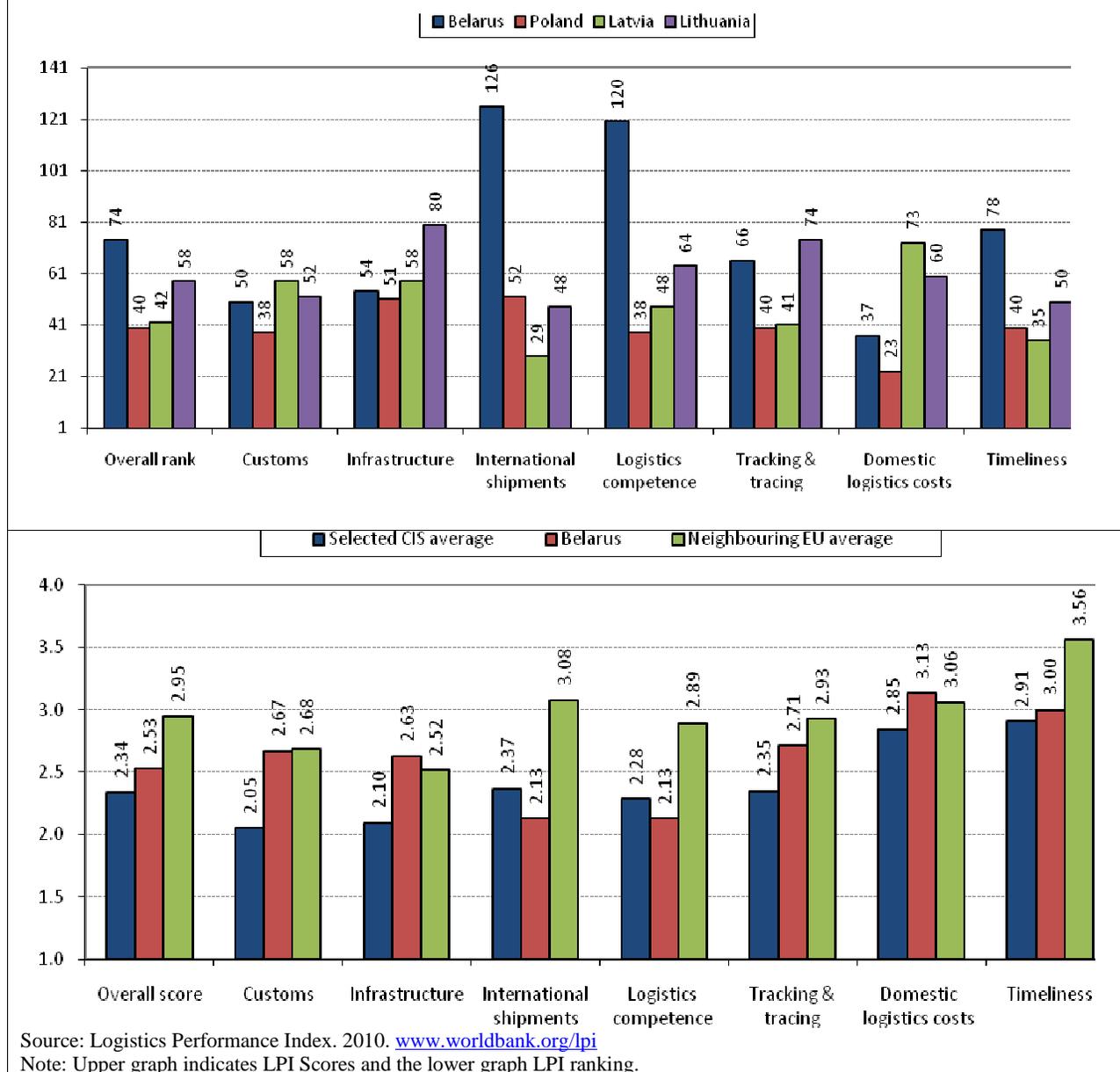
Figure 9. Logistics Performance Index: Performance of Belarus and Selected CIS Countries (2007)



Source: Logistics Performance Index. 2010. www.worldbank.org/lpi

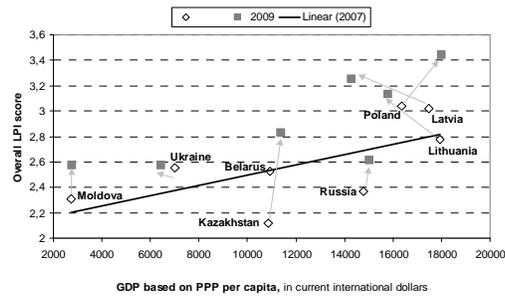
Note: Upper graph indicates LPI Scores and the lower graph LPI ranking.

Figure 10. Logistics Performance Index: Performance of Belarus and Neighboring EU Countries in the Logistics Performance Index 2007



2.17 **Belarus seems to comparatively underperform in the ease and affordability of arranging international shipments, as well as in the level of competence of the local logistics industry** (see Figure 10). Comparison of the LPI of several countries should correlate with the level of development, measured, for example, in terms of GDP (see Figure 11). Considering its GDP based on Purchasing Power Parity per capita (PPP per capita), Belarus seems to have performed as expected in 2007. On the other hand, Ukraine and especially Poland and Latvia over-performed in 2007 when the level of prosperity is taken into account. Due to insufficient number of responses during the survey, Belarus was not included in the LPI 2010, which was published on January 15, 2010.

Figure 11. Over and Underachievers in the LPI in 2007 and 2010: Belarus and Selected Countries



Evolution of Freight and Passenger Transport Markets

2.18 The transport intensity of the Belarusian economy is at a medium level in comparison with peers in CIS countries, but high compared with EU countries. In 2005, approximately 3 ton-km of freight transport were generated by US\$1 of GDP,⁷ compared to Russia and Ukraine where the same indicator was around 5.5 ton-km per US\$ of GDP. Moldova, the Caucasus, and Central Asian countries typically required 1 to 2.5 ton-km. On average, 0.3 ton-km per US\$ of GDP was required in the EU-25 countries in 2003.⁸ Against this benchmark, the relatively high transport intensity in Belarus reflects the structure of its economy and its transport infrastructure: 35.9 percent of GDP is generated by industry and agriculture and 7 percent by transport alone in 2008 (9.5 percent in 2000).

2.19 Freight traffic movements have grown with GDP in Belarus,⁹ similar to other countries in Eastern Europe, the Caucasus and Central Asia (EECCA).¹⁰ The emphasis is gradually shifting, however, from bulk transportation of raw materials to general cargo, e.g., semi-finished and finished products that have a higher value per ton. This has important implications for the preferred mode of freight transport, with an increasing shift to road transport and the associated use of containers and inter-modal services. Belarus is among the EECCA countries, such as Moldova and Kazakhstan, and to lesser degree Ukraine, where the modal split has shifted toward an increased preference for road transport over rail. Generally this is due to the role of Belarus as a transit country in international trade among countries in the EU and CIS,

⁷See: http://www.unece.org/env/europe/monitoring/EECCA_CSI/EECCA%20CSI%20_Eng/EECCA%20CSI%2030_freight%20transport%20demand_eng.doc

⁸ See page 13 at http://www.eea.europa.eu/publications/eea_report_2006_3. No data is available for EU-27

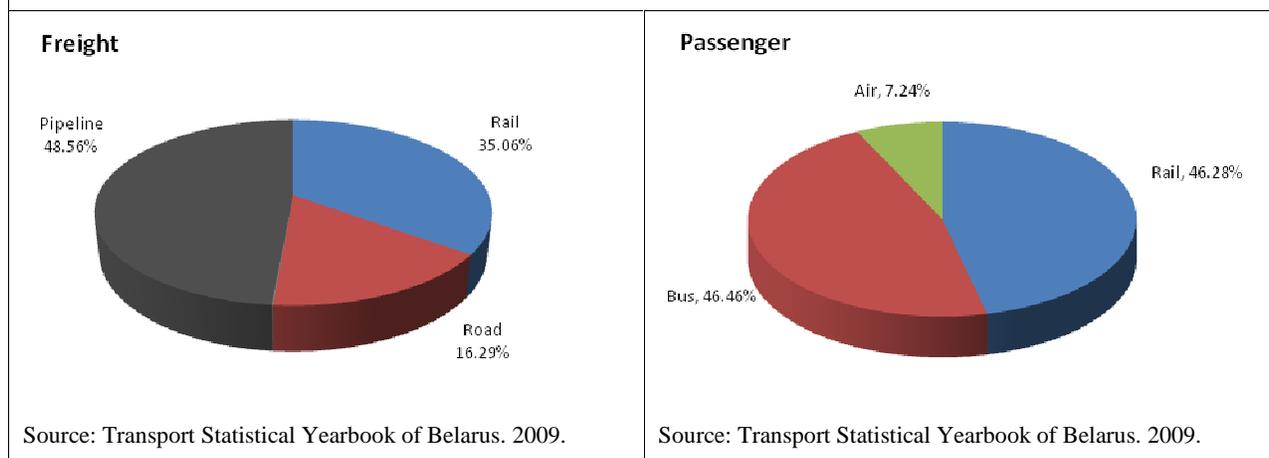
⁹ Report № 2 of the Research Work «Road Transport Review and Prospects» prepared in October 2010 by RUE Belarusian Research Institute of Transport «Transtehnika» of the Ministry of Transport and Communications of the Republic of Belarus provides a influence of Belarus' GDP on the growth rates of freight transportation volumes estimated at 21.8%.

¹⁰ There are 12 EECCA countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

and specifically the requirement for speed and flexibility of modern producers in transporting perishable and high-value goods.

2.20 Railway transport has a strong position in the transportation market in Belarus, compared to EU-25 countries. In 2008 railways carried 35 percent of the total volume of freight (in ton-km) transported in Belarus (including pipeline transport). This is a much larger market share than the average of 17 percent in the EU-25 (Figure 12). Passenger railway transport in Belarus has a market share of 46 percent;¹¹ this is much higher than the modest average of 7.42 percent for EU-25 countries. In 2008, the Belarusian Railways carried 49 billion ton-km of freight; it is thus one of the most important freight railways in Europe. Compared with railways of the European Union, only German Railways transports a higher volume of freight. From a total of about 49 billion ton-km transported in 2008, 72 percent represented import, export, and transit (40 percent transit only), and the remaining 28 percent was domestic freight transport. The average transport distance was 333 kilometers per ton of freight and 93 kilometers per passenger. The railway carries a broad mix of traffic, but about 70 percent of freight traffic is oil and petroleum products, construction materials, chemicals, and mineral fertilizers.

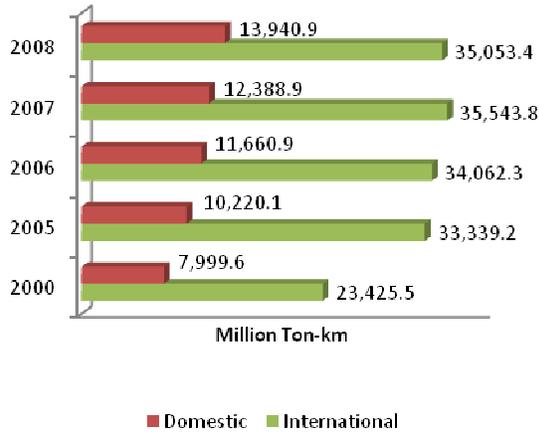
Figure 12. Transport Sector: Modal Split in Belarus 2008



2.21 Belarusian Railway predominantly operates international freight services. Each year, about 70 percent of the traffic operated by Belarusian Railway is international freight (import, export, and transit) as presented in Figure 13. The data shows continuous increases in the freight market since 2000 with the structure of services (domestic versus international) remaining unchanged. The increase in freight volumes transported on roads during the same period of time, however, was two times higher, marking the aggressive competition that truckers create through flexible services.

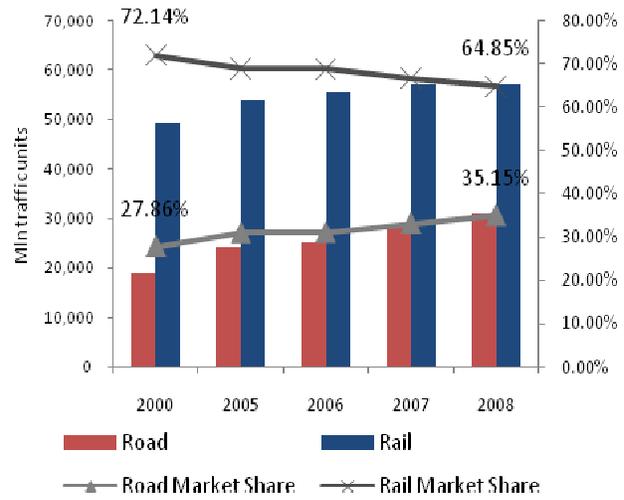
¹¹ This percentage does not take into consideration the volume of passengers transported in private cars.

Figure 13. Belarusian Railways: Structure of Freight Traffic 2000-2008 (million ton-km)



Source: Data reported by Belarusian Railways.

Figure 14. Evolution of Transport by Rail and Road 2000-2008 (volumes and market share)

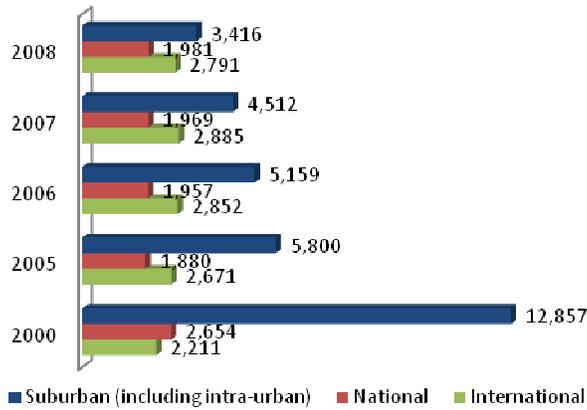


Source: Transport Statistical Yearbook of Belarus. 2009.

2.22 Railway transport is losing market share particularly to roads. Although railway freight volume increased in the period between 2000 and 2008 by 56 percent, road transport increased by 134 percent over the same period. In terms of passenger transport during the same interval, railways and public road transport lost 54 percent and 11 percent of their traffic, respectively. The dramatic loss of passenger traffic is almost certainly related to the increased rate of motorization in Belarus and the increased private car ownership. Compared to road transport, railways are however still the dominant mode of land transport, excluding pipeline transport (Figure 14). Its total market share for freight and passengers, however, decreased from 72 percent in 2000 to 64 percent in 2008. This declining trend is likely to continue. Therefore, to remain competitive in the market, Belarusian Railways must be prepared to face the stronger competition of road transport. Due to their high level of fixed costs, railways are very sensitive to reduced traffic intensity.

2.23 The market demand for railway passenger transport services is consistently decreasing. Since 2000, Belarusian Railways has lost almost half of its passenger transport volume (as measured in passenger-kilometers). Figure 15 presents the evolution of passenger railway transport in Belarus for various types of services. The data shows that the traffic for international and domestic long distance is almost the same, but that suburban traffic has dramatically decreased. This is probably due to increased levels of motorization and private car ownership, and it will be very difficult to recapture this lost railway traffic.

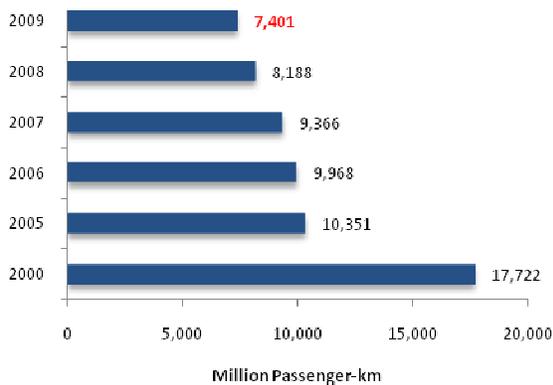
Figure 15. Belarusian Railways: Evolution of Passenger Transport Services 2000-2008 (million passenger-km)



Source: Reported data by Belarusian Railways.

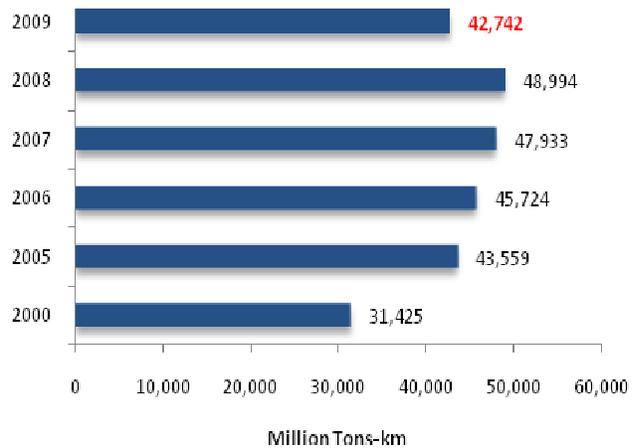
2.24 **The global economic crisis had a serious impact on railways transport volumes.** In 2009, Belarusian Railway lost significant volumes of freight and passengers, as shown in Figure 16 and Figure 17. The total volume of passenger-km transported in 2009 was 7,400.9 million, representing 90.4 percent of the traffic of 2008. It confirms the trend of the last decade of continuous loss of volumes of transport for railway. The situation is similar for freight volumes; the total volume of tons-km realized in 2009 by Belarusian Railways was 42,741.6 million, representing only 87.2 percent of the traffic of previous years; it is the first year in the decade with a negative growth rate.

Figure 16. Evolution of volumes of railway passenger traffic (2000-2009)



Source: Transport Statistics Belarus, 2010.

Figure 17. Evolution of volumes of railway freight traffic (2000-2009)



Source: Transport Statistics Belarus, 2010.

Freight Traffic Forecast (estimates)

2.25 **The baseline freight traffic forecast assumes the relatively swift recovery of the Russian economy from the economic crisis and is based on a 4 percent annual transport growth during 2011-2015 and 6 percent annual growth in 2016-2020.** The upside potential may be reached with higher than conservatively expected Russian GDP growth, as well as higher service level in the Poland-Belarus-Russia transport corridor (e.g., Lautso 2007). For future domestic freight volume, 2009 estimates are based on MoTC figures for road and the authors' own for rail. While in 2009 domestic road transport volume growth only slowed, the assumption is a 10 percent drop in rail freight volumes, due to the economic crisis. In 2010 for both road and rail, a 2 percent recovery is projected. Long-term forecasts are given separately for road and rail (the majority of Belarus freight turnover) freight transport volumes in the domestic, export, import, and transit categories. In the forecasts, no significant changes in modal split are assumed, although, for example, the use of road transport will grow more rapidly for imports. Also no major changes in international trade patterns of Belarus are projected to 2020 (see Annex 2).

2.26 **According to estimates based on data from other countries around the Baltic Sea, 50 to 60 percent of road-based transit volumes (measured per ton) to and from Northwestern Russia go through Belarus.** Due to the already high market share, a rapid increase of volumes, at least in the short term, is less likely than a possible decrease. Shift of transit volumes to alternative routes due to low service level are not impossible, as for example in Finland where a 16 day long strike in March 2010 caused immediate shift of some of the Russia-bound shipments from Finnish ports directly to e.g Russian ports (St. Petersburg). Finnish logistics and port operators fear that to some degree this shift may have been permanent

2.27 **For rail transit, the reports' estimates demonstrate more moderate dynamics, due to the nature of products transported.** The products are less sensitive to friction in border crossings and less prone to move elsewhere. The baseline assumes a 20 percent decrease in 2009, no growth in 2010, 4 percent annual growth during 2011-2015, and 6 percent annual growth in 2016-2020. Both upside and downside depend on the performance of the Russian and EU economies.

State of the Market for Transport Services

2.28 **The market for transport services, as well as for advanced logistics services, is not highly developed in Belarus due to constraints in both supply and demand.** More domestic demand for logistics services, or alternatively FDI by global logistics companies, would most probably enhance the development of logistics services in Belarus. This in turn would be crucial for offering high-quality logistics services to foreign manufacturing and trade companies and enable the expansion of the Belarusian role as a transit country beyond the traffic to Russia which now accounts for the vast majority of transit traffic through Belarus.

2.29 **The supply of scheduled international and domestic groupage (consolidated LTL) cargo services is scarce in Belarus.** Large manufacturing and trade companies have mostly in-house domestic truck fleets, while full truck load (FTL) to foreign destinations are usually outsourced. According to industry representatives, the demand for less-than truck load (LTL) services is low.

2.30 Because of the very high share of in-house logistics by manufacturers, trading firms and other shippers, the demand for logistics services bought from the market is still modest. According to official statistics, in 2000-2008 only 23 to 25 percent of road freight transport was bought from the market, whereas shippers produced most road transport services in-house. In most EU countries, the share of in-house road freight is typically less than 20 percent. As a consequence, in Belarus the structure, capacity, and quality of logistics service provision as a commercial activity is still at an early stage of development. This applies to the more developed forms of logistics service provision, in particular contract logistics and/or third-party logistics services.

3. TRANSPORT SECTOR STRATEGIES AND FREIGHT TRANSPORT FORECAST

Regional Context

Several existing initiatives aim at accelerating Belarus' regional integration with other CIS countries, such as the Customs Union with Russia and Kazakhstan, and the Eurasian Economic Community (EurAsEC).¹² Founded in 2000, EurAsEC perceives integration and coordination of its members' transport systems as one of its top priorities, as anchored in the charter. In particular, the organization strives to: (i) harmonize national transport legislation (the respective set of documents was adopted in 2003); (ii) develop EurAsEC transport corridors; (iii) remove non-physical barriers; and (iv) weave the transport policy into the development of the Belarus-Kazakhstan-Russia Customs Union, which will be fully operational by 2011.

Main Sector Objectives, Programs and Plans

Belarus does have the equivalent of a National Transport Strategy and Action Plan. The *Program for Ensuring Efficient Use of Transit Potential of the Republic of Belarus for 2006 – 2010*, the draft *Program of the Development of Transit Potential of the Republic of Belarus for 2011 – 2015*, and the *Roads of Belarus Program* constitute the 3 key pillars of such a national transport strategy. In addition, the *Strategy for the Development of Transit Potential of the Republic of Belarus for 2011 – 2015* and the *Concept of Belarus' Transport System Development until 2025* have been recently approved by the Government. The Concept defines the goal, priorities, tasks, key focuses and parameters of Belarus' transport system development until 2025 including mitigation of impacts generated by CO and CH² emissions. Finally, the Government's *Program of Social and Economic Development (2006-2010)* presently guides the development of the transport sector and aims at the "formation of a competitive transport system, further development of transport services, and associated infrastructure". Even though the Government of Belarus has established the key elements of a transport sector strategy, the detailed analytical work on which such strategy must be based is not available. The World Bank believes that a combined and consolidated Transport Sector Strategy for Belarus, based on comprehensive analytical work, would be beneficial. The development of such a comprehensive approach for a Transport Strategy and Action Plan covering all transport modes is key to better reflect the linkages that exist between different policy areas and to enhance coordination between different agencies involved in the transport sector.

The Government's *Program of Social and Economic Development (2006-2010)* presently guides the development of the transport sector. According to the Program, the transport policy of Belarus is aimed at the "formation of a competitive transport system, further development of transport services, and associated infrastructure." Actions include (i) improving the legal framework of the sector, (ii) developing safety and environmental standards, (iii) considering the

¹² The EurAsian Economic Community includes Russia and Kazakhstan, Belarus, Kyrgyzstan and Tajikistan.

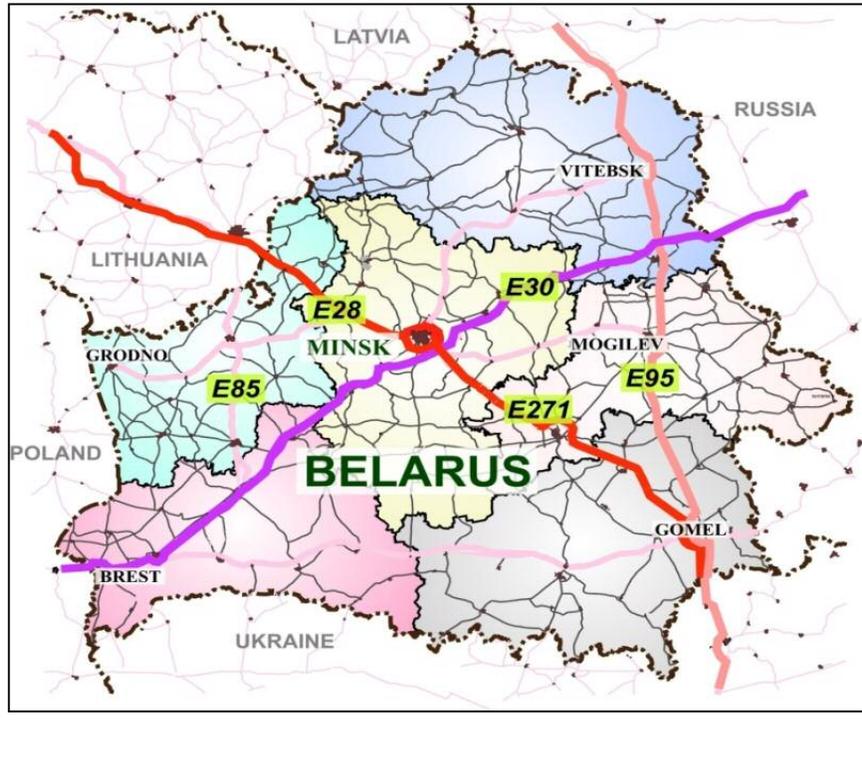
social aspects of access to transport services, (iv) improving the management of the sector, (v) increasing competition in passenger and freight markets, (vi) attracting investments, and (vii) increasing the export of transport services and creating favorable conditions for carrying out international transportation. An array of state programs is designed to achieve these steps.

The Government's program for the railway sector identifies a broad range of planned improvements. These include the technical upgrading of infrastructure, improvement of safety and quality of transportation services, development of modern information technologies, enhancement of Belarusian Railways' competitiveness in domestic and foreign markets for transport services, and integration of the Belarusian Railways into the international transport system. The *Development Plan of Belarusian Railways until 2010* includes (i) development and improvement of infrastructure; (ii) renewal and rehabilitation of rolling stock; and (iii) creation of an appropriate environment for transit transportation of passengers and cargo. The implementation of these railway transport subsector priorities requires concrete actions for the development and improvement of the core railway network, mainly the Trans-European Railway corridors II and IX crossing the country (see Figure 4), and the introduction of efficient technologies in the railway sector. Additionally, planned actions include parallel programming with Government innovation policy to enhance the competitiveness of Belarusian railways, the development of a new investment mechanism, and a new depreciation policy.

The Roads of Belarus Program¹³ defines the Government's plans for the strategic development of the road sector. Program activities aim to (i) increase the length of the motorway network; (ii) improve the road traffic operating conditions; (iii) upgrade the capacity of the most heavily used road sections; (iv) improve road traffic safety; and (v) attract private investment. The program includes a list of priority investments with some indicative cost estimates. The priority investments have been revised yearly based on the available fiscal envelope of the country. The main task within the *Roads of Belarus* Program is to upgrade the sections of the two international transport corridors (corridor II and corridor IX) passing through its territory. As presented earlier, these corridors are important West-East and North-South transit routes and the upgrading will increase their load-carrying capacity to the EU norm of 11.5 tons per single axle (see Figure 18). In 2009, the program was reviewed jointly by MOTC and MOF in order to prioritize the proposed major program investments, which are: (i) the upgrade of a section of the M5 road between Minsk and Gomel (74 km in total), (ii) the upgrade of M4 road from Minsk to Mogilev (97 km in total), and (iii) the construction of a bypass around Minsk (85 km in total).

¹³ The "Roads of Belarus" Program was approved by the Republic of Belarus Council of Minister's Resolution No. 468, April 6, 2006. The program was reviewed in 2009 jointly by the Ministry of Transport and Ministry of Finance to prioritize proposed investments.

Figure 18. Five Main Roads and Three Axes in Belarus 2009



At present, Belavtodor undertakes little multi-year works planning, and there is no up-to-date Road Asset Management System (RMS). An inventory of the technical characteristics and condition of the road network, and of the level of traffic on each road, is a requirement to perform a multi-year road sector maintenance and development plan, including annual data collection to maintain the inventory and update the strategic plan.

Transport Sector Organization Structure

MOTC is the central institution in the transport sector, although policy development is shared with the Presidential Administration. MOTC's statutes define its mandate and responsibilities; these includes (i) implementation of road transport policy; (ii) development of the legal framework for the transport sector; (iii) sector analysis and forecasts, and the preparation of strategic and planning documents; (iv) development of international cooperation and foreign economic relations in the transport sector; (v) promotion of cooperation between the transport organizations of the Republic of Belarus and other countries to attract investments; (vi) effective management of the State property in the area of transport; and (vii) issuance of licenses and monitoring compliance with licensing conditions. The minister, who is appointed and dismissed by the president, manages the work of the ministry and has the mandate to establish, reorganize, and liquidate public transport institutions with the exception of Belarusian Railways. MOTC consists of fifteen departments and various units (e.g., Human Resources, Public Relations, etc.)

Transport Policy, Climate Change and Road Safety

Climate change is one of the key elements in formulating transport policy in Belarus. Both vehicle ownership and travel demand have increased dramatically during the past two decades. Growing motor vehicle use has resulted in huge increases in fossil fuel energy consumption, contributing to greenhouse gas (GHG) emissions and to global climate change.

In Belarus, emissions from transport sector comprise about 9 percent in total CO₂ emissions in Belarus. Road transport contributes about 70 percent in total CO₂ emissions from transport sector (see Table 6). From 1998 to 2007 the total transport-related air pollution emissions decreased by 27 percent in spite of the fact that the number of motor vehicles, and in particular private cars, increased considerably. This is due to the modernization of the vehicle fleet. Transport contribution to total CO₂ emissions in Belarus is substantially lower than the world average (about 20 percent).

	2002	2003	2004	2005	2006	2007
Pollutant Emissions from mobile sources (thousand tons/year)	928	955	945	1013	1137	1123
Transport share of total (mobile sources) air pollutant emissions	69%	69%	69%	70%	71%	71%
Transport share of total CO ₂ emissions	11%	11%	11%	10%	9%	9%

Source: Data provided by MOTC and MNREP.

Vehicle ownership in Belarus is on average 235 units per 1000 inhabitants (300 units in Minsk). The increase in ownership from 1995 to 2009 was about 58 percent. Since Belarus does not produce cars, the vast majority of private cars, including second-hand cars, are imported from Western European countries. In some cases they are rather old cars not equipped with catalytic converters. A differentiated tax scale for imported cars has been imposed on owners, depending on the vehicle age.¹⁴ The tax varies from US\$0.9 to US\$4 per cm³ of engine displacement. The higher tax for the oldest cars aims to reduce imports of vehicles with the highest emissions. At the same time, higher rates are also due on cars under 5 years (usually the least polluting) mainly to boost budget revenues. Tax differentiation should be supplemented with measures to (a) update pollution standards for domestically manufactured trucks and smaller vehicles, (b) make catalytic converters compulsory for all newly imported vehicles (new and used) with petrol engines, and (c) adopt and enforce stricter norms for the quality of transport fuels. Since 2004, imports of cars and trucks increased by more than 12 percent. Since 2004, imports from Russia declined and imports from Germany and other non-CIS countries increased.

¹⁴ Please refer to Annex 3 for details.

The majority of vehicles in use are old. In 2005, about 50 percent of vehicles were more than 13 years old. The consequence is substantial air pollution, since emissions from old motor vehicles are 50 to 70 percent higher than three-year-old or newer vehicles, even if the trend is changing rapidly: in 2009, about 30 percent of vehicles were more than 13 years old. The MOTC makes efforts to encourage the replacement of old vehicles with new ones to mitigate overall environmental problems, as described in Table 7. In 2006 new buses and trucks replaced about 47 percent of old ones; whereas in 2003, this replacement rate was only about 14 percent. According to the estimates (the State Road Inspection of the Ministry of Internal Affairs of the Republic of Belarus, BAMAP Association, Transport Inspection of the Ministry of Transport, BAME, Euro NCAP), as of June 2010, 11 percent of vehicles operated in Belarus meet EURO-5 standards; 7.5 percent - EURO-4 standards, 22.5 percent - EURO-3 standards and the rest fall under EURO-2 standard and lower.

Table 7. Road Transport in Belarus: Number of Registered Vehicles by age 2003-2007

Vehicles ages	2003		2004		2005		2006		2007	
	Truck	Bus								
Up to 3 years	636	550	377	548	615	590	187	1074	360	1044
3 to 5 years	503	227	629	415	1066	429	381	611	217	409
5 to 8 years	1356	264	593	224	765	384	627	593	651	503
8 to 10 years	3736	1052	1451	432	825	224	477	207	281	145
10 to 13 years	4784	2419	5512	2296	4573	1721	3154	1143	141	384
More than 13years	253	2317	3224	2667	4241	3245	4204	4307	4844	3552

Source: Data provided by MOTC. Data provided by the Ministry of Internal Affairs of the Republic of Belarus present similar trends.

Due to various Government initiatives, the overall trend for environmental protection in the road sector is improving. These include (i) a ban on the use of leaded petrol since 1997; (ii) restructuring of the transport sector since 1995, resulting in the increase of smaller and more fuel efficient cars, trucks, and buses used by enterprises; and (iii) use of natural gas as a fuel. In addition, the incentive-based policy in the transport sector to replace old fleets of public and private vehicles with new and more fuel efficient private and public cars, buses, and trucks seems to be effective. Road traffic's contribution to total transport CO² emissions is substantially lower than in other CIS countries (Table 8).

Table 8. CO² Per Capita Emissions in Belarus and CIS countries 2007

Per capita emissions by sector in 2007								
<i>kg CO₂ / capita</i>	Total CO ₂ emissions from fuel combustion	Main activity producer electricity and heat	Unallocated auto-producers	Other energy industries	Manuf. industries and construction	Transport	of which: road	Other sectors
Armenia	1 595	358	-	-	577	170	170	490
Azerbaijan	3 218	1 398	109	193	247	423	389	847
Belarus	6 462	2 603	634	162	1 387	633	437	1 043
Estonia	13 449	9 815	148	149	1 100	1 796	1 667	441
Georgia	1 166	324	-	-	138	451	438	253
Kazakhstan	12 302	5 731	-	677	2 516	773	677	2 605
Kyrgyzstan	1 090	297	-	-	304	227	146	261
Latvia	3 663	861	57	-	525	1 649	1 523	571
Lithuania	4 278	906	31	486	992	1 486	1 384	377
Republic of Moldova	1 978	943	75	-	157	283	225	520
Russian Federation	11 207	3 777	2 418	535	1 705	1 615	848	1 158
Tajikistan	1 024	88	-	-	-	644	644	292
Turkmenistan	9 130	2 704	-	1 314	-	514	514	4 598
Ukraine	6 769	2 322	421	176	2 172	689	508	989
Uzbekistan	4 220	1 323	3	162	771	316	166	1 645
Former Soviet Union	8 498	2 974	1 303	389	1 508	1 106	661	1 218

Source: International Energy Agency. 2009.

Like climate change, road safety is increasingly a social and economic issue, requiring a coordinated effort at all levels. The impact of road traffic accidents is estimated at between 1.5-2.0 percent of GDP, as indicated in the World Bank's recent assessment of road safety in Europe and Central Asia (World Bank, 2009). In 2008, 7,238 registered road accidents occurred resulting in 1,564 deaths and 7,577 injuries. According to official statistics, the fatality rate of 16.2 per 100,000 people is slightly above the EU average of 13.4.¹⁵ However, pedestrian fatalities in particular (including bicyclists) are high, accounting for about 46.2 percent of all traffic fatalities. Recent data reported by national sources to the World Health Organization shows that alcohol consumption is estimated to be responsible for about 16.7 percent of all reported road traffic deaths in Belarus.¹⁶

The Government of Belarus is aware that more needs to be done to improve road safety in Belarus. Driver behavior, limited driver education, and significant growth in vehicle ownership and use (3.3 fold increase of vehicle ownership from 1991 to 2009) contribute to make Belarus a country with road safety records that need considerable improvements. In 2008, a "Black Spot Program" was initiated to identify the critical and most dangerous road locations and to improve them in order to mitigate the risks for road users (Table 9). Since January 2009, 190 traffic accident black spots were identified. While the program has been developed, no funds have yet been allocated for their actual improvement.

¹⁵ A recently published report by the World Bank on road safety records in Europe and Central Asian countries reports that the fatality rate per 100,000 population is about 15.7 which is slightly lower than the data reported by National Statistical Committee. This may be due to the different in sources of data.

¹⁶ These figures are influenced by legislative testing practices and it has been suggested that the actual figures are much higher.

Table 9. Government of Belarus “Black Spot Program” in 2008

Measures	Investment needed (USD million)
Restore adhesion coefficient on 3,000 km of national roads and on 5,600 km of local roads	102.0
Improve road marking – 29,000 km	15.9
Build and restore lighting of road sections – 187 km	8.7
Build and repair pedestrian ways, and bike lanes – 122 km	2.2
Install and replace road signs – 29,000 units	0.7
Total	129.5

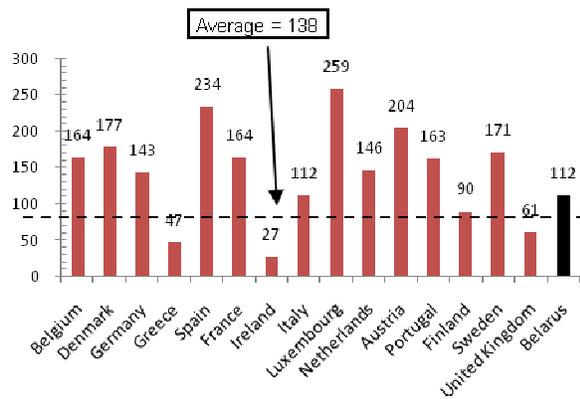
Source: Belavtodor, 2009.

4. THE ROAD SECTOR

Road Infrastructure and Service Provision

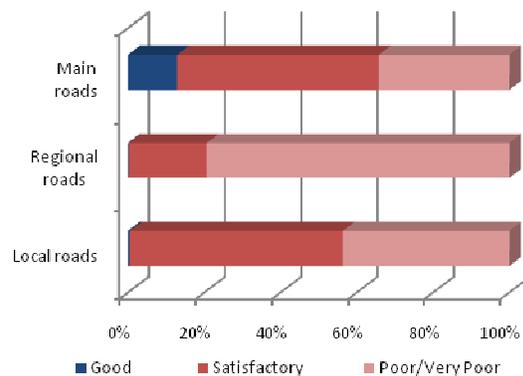
4.1 **Belarus has a public road network that is mostly adequate for current traffic levels.** It comprises a relatively dense *Republican* road network¹⁷ (including Main roads and Regional Roads) of about 15,000 km and a *Local* road network of about 70,000 km. The overall density of Belarus network of Category 1 roads (Motorways) is 112 kilometers of network per 1 million people, which is far higher than the average motorway density in the EU-25 countries, but slightly below the average for EU-15¹⁸ countries, as shown in Figure 19. As of 2009, 87 percent of the total length of its total road network (Republican and Local) was paved. About 58 percent of the paved network is in good or satisfactory condition (50 percent of the total network length). Whereas Main roads are mostly in good or satisfactory condition (60 percent), only less than 20 percent of the Regional roads are in good or satisfactory condition. Overall, only about 35% of the network of Republican roads (Main and Regional roads combined) is in good or satisfactory condition.

Figure 19. Motorway Network Density of Belarus and EU-15 Countries 2009 (km per one million people)



Source: Eurostat and data reported by Belavtodor.

Figure 20. Condition of the Road Network in Belarus 2008 (based on IRI)



Source: Data reported by Belavtodor.

4.2 **Although Belarus ranked 54th in infrastructure quality in the LPI (2007), 47 percent of the total road network is in poor or very poor condition—mainly regional and local**

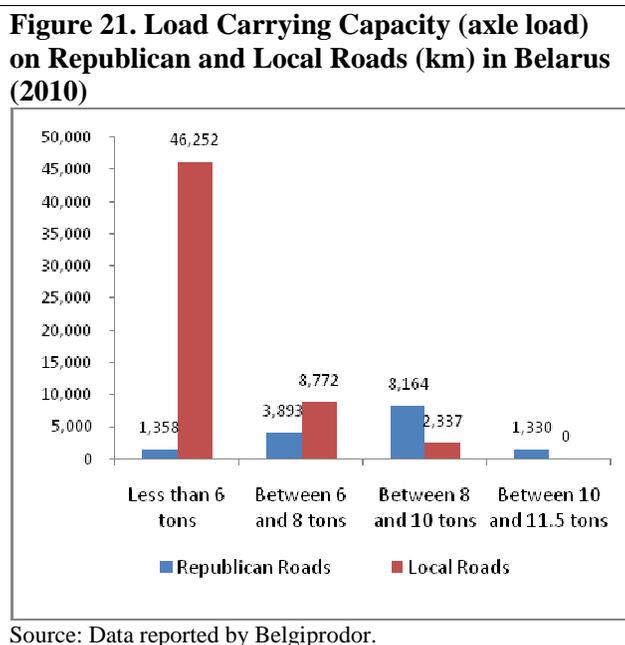
¹⁷ Public roads are classified as republican roads (main and regional) and local roads with the distinction between the two being related to their functional purpose. Law of the Republic of Belarus on Roads and Road Works, December 2, 1994, No. 3434-XII, (as amended by the Laws from 22.07.2003 No. 228-3, from 20.07.2006 No. 162-3, from 07.05.2007 No. 212-3, from 09.07.2007 No. 247-3, from 08.07.2008 No. 367-3)

¹⁸ EU-15 countries include Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, Netherlands, Austria, Portugal, Finland, Sweden, and United Kingdom.

roads¹⁹ (see Figure 20). While the overall condition of one third of the Republican roads (main and regional roads combined) is good and fair, two thirds need major repairs or rehabilitation, according to Belavtodor. Republican roads carry more than 75 percent of the total traffic. Delayed repair may result in irreversible deterioration of road condition and may require 2.5 to 3 times more funding for deferred reconstruction.

4.3 A continued and intensified program for repair and rehabilitation of the road network is necessary, given the significant increase in network use since 2000. Freight traffic density (ton-km per one km of road) on public roads, for example, has increased significantly from 76,900 ton-km in 2000 to 187,000 ton-km in 2008 (increase of 143 percent). In the same period, public transport passenger-kilometers have decreased slightly, while the number of private cars has more than doubled. Currently there are about 2.2 million private cars using the road network in Belarus with the number projected to reach 4 million by 2015.

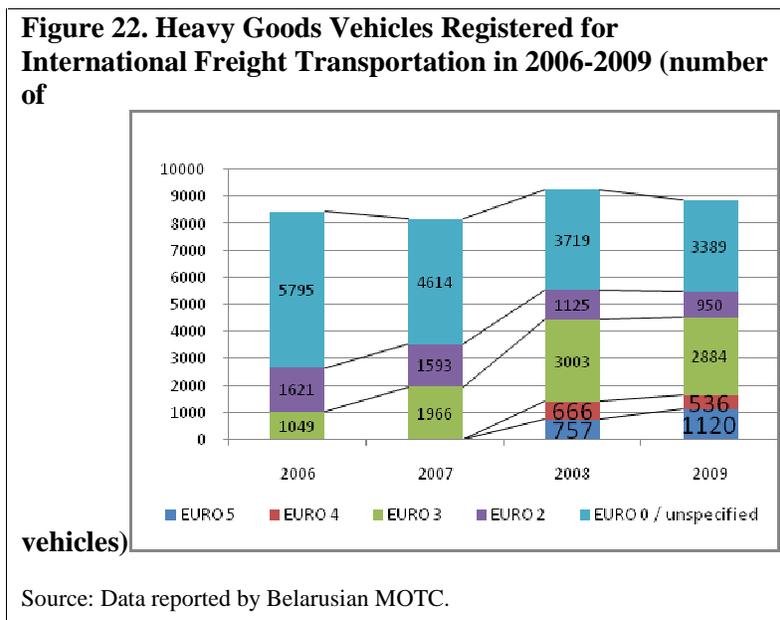
4.4 The Government is implementing a program to improve the overall condition of the road network and to expand capacity of parts of the Republican network. Only 8.6 percent of Republican roads are designed to carry vehicles with single axle loads of 10 or 11.5 tons. Of the roads connecting Minsk with regional centers, 89.4 percent have been built based on designs for single axle loads below 10 tons (Figure 21).. All roads are however being used by heavy vehicles with axle loads above 10 tons, resulting in accelerated road deterioration.



4.5 To support road transport operations, the Government has initiated various schemes to help transport companies upgrade their vehicle fleet. In January 2009 the total Belarus truck fleet was about 100,000. Truck import duties have been lowered, and duty free import made possible with domestic truck purchase. The purchase price of a Mercedes-Benz and a domestically produced MAZ trucks are practically the same.

¹⁹ Local roads provide transport links between administrative centers of village councils, towns under district jurisdiction, etc.

4.6 **The Belarus truck fleet serving international transport is still comprised mainly of low class, high emission vehicles.** In 2009, 38 percent of the total fleet for international transport (8,879 trucks), was of EURO 0 emission level or unspecified²⁰ (Figure 22). The share of vehicles of EURO 2 standard was 11 percent; EURO 3 was 32 percent, and EURO 4, 5 and 6 combined at 13 percent, respectively. Since 2006 the trend has been towards higher-class vehicles. Leasing of trucks has been very popular, providing a way to acquire an environmentally friendly, high EURO class truck that can be used for transport to and from EU countries. By law, however, Belarusian trucking firms are required to own at least one truck per two leased trucks.



Organizational Structure of the Roads Sector

4.7 **The Law on Roads and Road Works²¹ defines the regulatory and management arrangements associated with public roads,** including their classification, planning, design, development, and maintenance. As the central institution for roads, the MOTC: (i) defines and implements road development programs; (ii) manages various government organizations related to the roads sector; (iii) oversees road maintenance, repair, and construction; (iv) ensures safety; and (v) issues permits for the movement of heavy-weight and/or oversized vehicles on public roads.

4.8 **Belavtodor, a department within MOTC, manages most of the Republican road network; the Oblast Executive Committees with Belavtodor's assistance manage some Republican roads and most of the Local road network.** There is a variety of entities dealing with the management of Republican and Local roads; they are listed in Table 10. Physical road works are executed on a contractual basis by construction firms of various ownership structures,

²⁰ European emission standards define the acceptable limits for exhaust emissions of new vehicles sold in EU member states. These are classified as numbered EURO emission levels.

²¹ Law of the Republic of Belarus on Roads and Road Works, December 2, 1994 No. 3434-XII, (as amended by the Laws from 22.07.2003 No. 228-3, from 20.07.2006 No. 162-3, from 07.05.2007 No. 212-3, from 09.07.2007 No. 247-3, from 08.07.2008 No. 367-3).

most of them not controlled by MOTC or Belavtodor. Responsibilities of the Oblast Executive Committee include prioritizing maintenance, securing funds and managing Local road networks. This reflects good international practice in decentralizing the responsibility for local road networks to local governments. To ensure good road management, however, such decentralization must include adequate local-level capacity building and financing opportunities.

Table 10. Organizational Structure of the Road Sector

Organization	Mission and activities
<i>Belavtodor</i>	Central/national road managing entity with 51 managerial staff, in charge of the general strategy and supervision of all activities.
<i>Oblast Executive Committees</i>	Regional entities (one per oblast) in charge of the strategy for local roads. Since the dissolution of the Road Fund in 2010 they now supervise the collection of revenues at the local level and monitor current annual expenditures. Since 2010, they approve the budget for local roads at the regional (oblast) level.
<i>BeldorCenter</i>	Technical organization in charge of setting standards, norms, and policies in the road sector and providing technical and financial expertise to the road administration entities (290 staff).
<i>Belgiprodor</i>	Leading design institute for road and airport infrastructure in Belarus for the past 78 years. Certified ISO 9001:2008. (450 staff)
<i>Avtodor</i>	One in each of the six regions, managing and operating Republican roads. Each Avtodor has about 1,100 staff on average and is in charge of about 2,000 to 3,800 km of the road network.
<i>ObIDorstroy</i>	One in each of the six regions, managing and operating local roads. Since the dissolution of the Road Fund, they now collect local taxes for the local budgets. Each ObIDorstroy has about 2,600 staff and is in charge of about 8,000 to 15,000 km of roads.

4.9 **It remains to be seen if the recent transfer of the Local road network to local authorities in early 2010 will trigger similar deficiencies observed in other countries in the region.** These deficiencies that have been observed elsewhere include (i) unclear definition of responsibilities; (ii) lack of technical and managerial capacity; (iii) lack of appropriate design standards for local roads; and most importantly (iv) insufficient financing. In some countries, the length of the “active” local road network is simply not known, and the usage of the assets is not monitored. Consequently, proper planning and prioritizing for interventions on local roads is often not done.

4.10 **Belarus has adopted a detailed road classification system and has initiated general revisions of its technical norms and standards in line with European standards and directives.** Belarus uses a detailed set of norms and standards elaborated originally on the basis of the Russian SNiP and GOST norms; these have been continuously adapted to match Belarusian road and climate conditions and the local environment. The inclusion of EUROCODES, EUROCODES-equivalent, and Harmonized Standards on different areas (e.g. 11.5 ton axle load, road safety standards, etc.) has also shaped the continuing process of updating the Belarusian road standards.

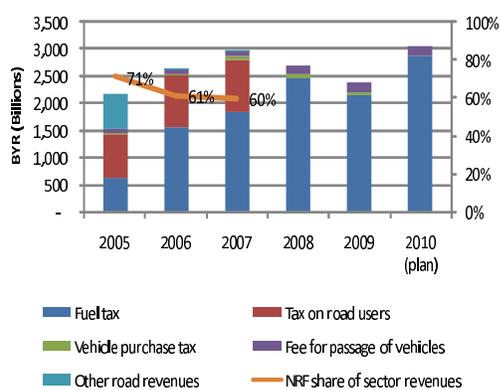
Sources of Finance and Road Sector Spending

4.11 **As in other sectors of the Belarusian economy, the public budget funds most of the public spending in the transport sector (with the exception of railways).** In the period

between 2005 and 2009, Belarus dedicated between 4 and 6 percent of total annual public expenditures to build, operate, and maintain transport infrastructure. Most of these expenditures were for roads, representing about 65 percent in 2009; down from 80 percent in 2006. Between 2005 and 2009, overall transport infrastructure expenditures as a percentage of GDP have fallen from 3 percent to less than 2 percent. For 2010, planned expenditures represent about 1.6 percent of GDP which is lower than the average spending by EU countries and in the other CIS countries.

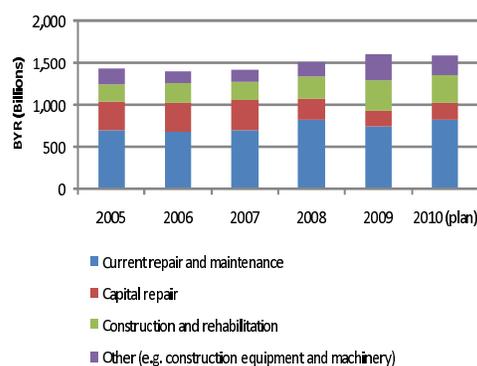
4.12 Over the period 2005-2009, Belarus earned more revenues from fuel taxes and road user charges (tariffs levied for the use of roads) than was actually spent on road maintenance and investment. As shown in Figure 23, in recent years taxes on road users²² and fuel accounted for over 90 percent of revenues from the sector. Revenues from road tolls, vehicle purchase taxes and other road user charges were small in comparison. A part of the revenues collected from road user taxes and a part of the fuel excise tax were transferred into the National Road Fund (NRF). Over the period 2005-2007, about 60 to 70 percent of all road sector revenues were allocated to the NRF and used for road infrastructure. The remainder was used for other general purposes by the Government. As of 2008, revenue collection by the NRF ended and road sector funding reverted to the general Government budget. As new budget guidelines were adopted on January 1, 2010, the NRF and the associated tax on road users (business turnover tax) were formally abolished. The road sector thus lost its specific earmarked sources of funding and is now fully dependent on allocations from the general Government budget. Experience from other countries suggests that this could entail the risk of a serious deterioration of road sector funding in the medium term.

Figure 23. Road Sector: Sources of Funds in 2005-2010 (in billion BYR)



Source: Data Reported by Ministry of Finance.

Figure 24. Road Sector: Capital Expenditure and Maintenance Spending 2005-2010 (in billion BYR)



Source: Data Reported by Ministry of Finance.

4.13 Despite the abolishment of the NRF and associated road user charges, expenditures geared towards Republican and Local road networks, when combined, have been modestly rising in recent years. The funds spent on routine maintenance remained stable over the period 2005-2007, rising thereafter from an annual allocation of about BYR 688 billion to

²² One percent business turnover tax on most business entities.

approximately BYR 780 billion in the period 2008-2009 (see Figure 24). During the same period, budget resources for capital expenditures similarly increased from an average BYR 224 billion to BYR 319 billion. These increases coincided with a noticeable drop in annual expenditures for road repair which fell by almost 40 percent. The planned general budget for 2010 shows total road expenditures to remain at the 2009 level. In 2010, the total expected spending from the general budget on maintenance and repair geared towards the Republican and Local road network is about BYR 1 trillion.²³ The above estimates do not take into consideration external financing.

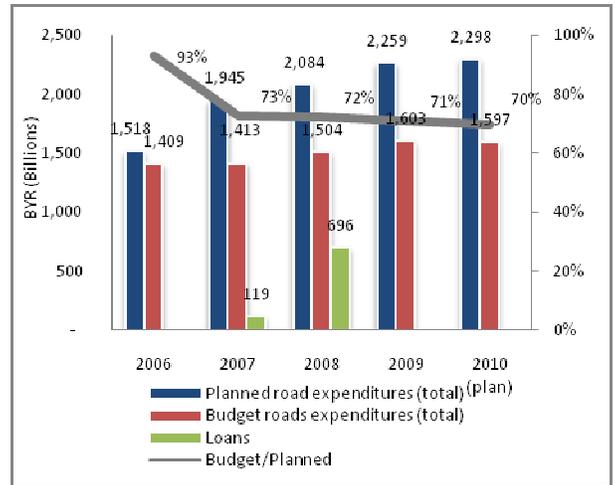
4.14 Belavtodor's current road sector development program states that additional resources are urgently needed to address the consequences of underfunding of maintenance expenditures from previous years (backlog). A review of the development of road network conditions over time (2006-2009) indicates that the annualized expenditure requirements necessary to clear the essential part of the current maintenance backlog have not been met, especially for Local roads. Some slight improvements in the riding quality (roughness pattern) of the road network can be found, but about half of the Republican roads (main roads, but mainly regional roads) are still in poor to very poor condition (45 percent), according to Belavtodor's condition survey of the network (see Figure 20Error! Reference source not found.).

4.15 While general taxation and budget allocations may provide a steady stream of funding for the normal operation and maintenance of road infrastructure in Belarus, it seems unlikely that it will provide sufficient funding to finance the full cost of rehabilitation or upgrading of roads. To finance a part of road network rehabilitation and upgrading, the Government of Belarus plans to borrow from international financial institutions (IFIs), such as the World Bank and the European Bank for Reconstruction and Development (EBRD) as well as other domestic and foreign sources. Because infrastructure assets have long service lives, domestic and foreign financial markets can provide alternative funding sources. Government borrowing however can have adverse macroeconomic consequences due to interest rate and exchange rate impacts. Such considerations place clear limits on borrowing for roads.

4.16 Budgeted road expenditures have fallen behind the plan laid out in the *Roads of Belarus Program for 2006-2015*; however, the plan may have been too optimistic. In the first year of the *Roads of Belarus* program, which is the guiding document of planned expenditures in the road sector (covering both Republican and Local roads), most of the planned spending was met from the general budget (see Figure 38). After 2006 however, expenditures grew only moderately and failed to meet the established targets of the program. In 2008, loans provided by the state-owned *Bank of Belarus* provided additional financing and total spending (budget plus loan) exceeded the amounts indicated in the program. In 2009 however, only 71 percent of the program was implemented due to lack of financing. The gap between stated needs and the resources actually allocated would warrant a closer examination of the budget planning process. In light of the discrepancy between established needs and actual implementation, the Ministry of Finance and Belavtodor would be well-advised to develop a coordinated program that strikes a balance between the needs and the resources available, and which is updated on a yearly basis.

²³ The above estimates do not take into consideration external financing (loans). In 2007-2008, Belavtodor received loans totaling BYR 814 billion from the Bank of Belarus. From this amount, BYR 435 billion was used for the reconstruction of the M1-E30 road and the remainder was spent on other republican roads. These loans will be repaid from the national budget over 2011-2015.

Figure 25. Planned versus Budgeted Road Expenditures 2006-2010 (BYR billion)



Source: Data provided by the Ministry of Finance of Belarus and Belavtodor.

4.17 **Given fiscal space considerations and the significant financing required for upgrades to the main road network to cope with future traffic demands, the Government has identified priority road investment projects on the basis of strategic assessments.** In line with the government’s transport policy, the priority investments that have been identified are the upgrading of the M4 and M5 roads to Category 1, and the construction of a new ring road around Minsk. Regarding the upgrade of the M5 road, the Government has obtained a World Bank loan of US\$ 150 million.²⁴ Additionally, the Government of Belarus is negotiating a line of credit of up to US\$ 10 billion with the Government of China, which would support projects in all sectors, including transport. The details of the line of credit are under discussion, but preliminary plans indicate that Chinese loans could be used to upgrade the roads from Minsk to oblast centers and the Minsk ring road, as shown in Table 11. The potential financing deal would however require 15 percent of co-financing from the Government of Belarus, which may be difficult to arrange in the current fiscal environment.

²⁴ Of this amount, US\$131 would be spent on upgrading M5/E-271 and US\$19 million on the introduction of e-tolling and institutional development.

Table 11. Road Sector in Belarus: Priority Investment Projects (as of January 2010)

Description	Length	Cost estimate	Possible sources of funding	Implementation timeframe	Status
Upgrade of M4 to Category 1 road (km 79-km 176)	97km	US\$ 340 million	Government of Belarus, loans arranged by Chinese government	2011-2012	Under construction
Upgrade of M5 to Category 1 road (km 57-km 131)	74km	US\$ 164 million	World Bank loan (\$US 131 million), Government co-financing (\$US 33 million)	2011-2012	Preparations underway
New ring road around Minsk	70km	US\$ 140 million	Government of Belarus, loans arranged by Chinese government	2011-2012	Feasibility study being prepared

Source: Data reported by Belavtodor.

4.18 **It is unclear if the Government's other investment priorities in the road sector are justified by traffic demand.** In addition to the projects identified in Table 11, the Government has developed plans to upgrade close to 500 kilometers on the remaining part of M5 and on some sections on M3, M5, M6, M7 and M8 roads. According to 2005 data, traffic on these sections had not reached the existing road capacity. While a traffic volume analysis was carried out in 2009 and clearly justified the upgrade of the section of the M5 road to be funded through the World Bank loan, such up-to-date traffic demand analysis is missing for the other projects. A new ring road around Minsk would probably generate sufficient traffic based on the high traffic levels on the existing ring road. Similarly, traffic on the M4 road is probably also sufficiently high to warrant an upgrade. However, only detailed traffic analysis on the other main sections of the road network would tell whether the investments could be justified by traffic demand.

4.19 **With the transfer of management of the Local road network to the oblasts in 2010, recurrent and capital expenditures for the local road network will be the responsibility of the regions.** The regions and municipalities are expected to fund these expenditures from a reallocation of VAT and profit taxes, land and real estate taxes and subsidies from the central government. While the Government undertook an administrative reform to increase the efficiency of spending, it is questionable whether sufficient capacity exists at the local level for project identification, design, appraisal, contracting and supervision. While the regions will receive more funding to finance their new spending mandates, institutional capacity may take longer to develop and may need special support from central road sector organizations. Regions (oblasts) will be held responsible for maintaining local roads in good condition with adequate planning and control.

4.20 **The central government will support regional governments by covering any financing shortfall for expected local road expenditures.** Under the new budget guidelines, if the expected expenditures exceed the available financial resources of regional governments, the central government will provide an up-front subsidy to close the financing gap. This arrangement will in principle help to guarantee adequate funding for local roads, which until 2010 were solely funded from the general budget. However, careful need assessments and coordination with national budget planning is required for the new arrangement to work in practice. Regions may therefore need central government support to develop capacity for needs planning and budgeting.

4.21 **Historical budget allocation patterns indicate that considerably more funding was allocated to maintenance of the Republican road network than to the Local road network.**

In 2009, total spending on Republican roads was BYR 881 billion, twice as much as the basic maintenance needs of BYR 413 billion. This means that funds were available not only to maintain the current condition of the network, but also to repair and upgrade the network to improve its quality. As noted previously, the condition of Republican roads has in fact improved in recent years. The situation of the Republican roads contrasts sharply with the funding for Local roads. Also in 2009, Local roads received less than half of the amount required to maintain those roads in their current condition and prevent further deterioration, based on the analysis undertaken by the World Bank for this report (see paragraph 4.25 onwards). However, an assessment of optimum spending on Local roads is needed; it must take into account the traffic levels on these roads, which are generally low. Such an assessment will also require more comprehensive traffic data for Local roads and new traffic counts; these were however not available at the time of the data collection for this report.

Estimated Financing Requirements for Road Infrastructure

4.22 The financing requirements of the road network include three categories of future expenditure needs: (i) recurrent expenditure needs in terms of routine, winter and scheduled periodic maintenance that are necessary to ensure that the road network is maintained in good condition (what can be termed as the “normal maintenance needs”); (ii) annualized capital expenditures necessary to clear any maintenance backlog and return the road network to a good condition; and (iii) additional capital expenditures to upgrade the network and to keep pace with growing traffic volumes. Table 12 presents the results of a brief analysis carried out by the World Bank on the first and second of those categories (“*normal road maintenance needs*” and “*eliminating backlog*”) for the period of 2010-2020. It does include recurrent expenditures (routine, winter and periodic maintenance) for both the Republican and Local roads. Annualized capital expenditures that are necessary to address maintenance backlogs are included for Republican roads only because it is certain that the traffic levels on Republican roads are sufficiently high to economically justify addressing the maintenance backlog, while this is not certain for all Local roads.²⁵ The scenario presented proposes to fully eliminate the backlog on the Republican road network within 10 years.

²⁵ Traffic intensity on Local roads (category III, V, and V) ranges from below 100 to a maximum of 7,000 vehicles per day. Specific traffic counts for the selected types of networks have not been studied for this report. The study therefore cannot determine the cost-effectiveness of such interventions. A more detailed study would be necessary to assess investments to upgrade priority sections of the local road network, taking into account both level of traffic, serviceability and actual road user costs.

Table 12. World Bank estimate for Road Maintenance needs 2010-2020 (US\$ million)

Road Class	Activity	2010 ²⁶	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Republican	Addressing Backlog	195	196	178	201	201	201	201	201	201	201	201
	Routine/Winter	78	82	86	90	94	99	104	109	115	121	127
	Periodic	49	54	60	62	62	67	67	73	73	78	78
	Total	322	332	323	353	358	368	373	383	389	399	405
Local	Routine/Winter	56	61	67	74	82	90	99	108	119	131	144
	Periodic	61	68	74	89	89	89	111	111	111	134	134
	Total	117	129	141	163	171	179	210	219	230	265	278
Grand Total		439	461	464	516	529	547	583	602	619	664	683

Source: Road Condition Data provided by Belavtdodor. Estimates developed by the World Bank team.

Average unit costs (as provided by Belavtdodor and compared with international prices) used for the analysis include the following cost items: (i) Milling (3cm), application of upper asphalt-concrete cover (4cm) with establishment of a leveling course: BYR50,000/m²; (ii) Single-layer surface treatment with establishment of a leveling course: BYR30,450/m²; (iii) Routine maintenance/patchwork: BYR27,000/m²; (iv) other standard maintenance works: BYR32,000,000 BYR/km.

4.23 The World Bank estimates that the level of recurrent expenditures required to simply maintain the Republican and Local road networks (without eliminating the backlog) is **BYR1,060 (US\$360 million) on average per year** (see Table 12). Within this amount, about US\$166 million would be needed on average to maintain the Republican roads only. This represents an average maintenance cost for Republican roads of about US\$11,000 per year per kilometer.²⁷ This average estimated unit cost of US\$ 11.000 per km and year takes into account the local cost levels in Belarus. However, actual average maintenance spending for Republican roads in Belarus is only US\$8,200 per year per kilometer (as budgeted in the 2009 general budget),²⁸ which is 25 percent lower than the World Bank estimate; this may be too low to ensure appropriate maintenance in the medium and long term.

4.24 For Local roads, the average maintenance cost estimated by the World Bank for one kilometer is about US\$2,600 per year. This figure is higher than the actual spending of US\$ 1,700 per km and year because the average condition of Local roads is expected to deteriorate in

²⁶ According to Belavtdodor, actual maintenance spending allocations in 2010 were US\$ 94 million (BYR 282 billion) and US\$ 64 million (BYR 192 billion), for republican and local roads respectively. Both spending allocations fall short of the total needs in 2010 as presented in the table above.

²⁷ This is less than the average normal maintenance cost for main roads in comparable countries. In France, it costs about US\$15,000 per year to maintain one kilometer of main road (see Table 13), but the French main roads have much higher traffic levels.

²⁸ The estimates presented in the study (eg. US\$127 million for routine and periodic maintenance of the republican road network for 2010) is similar to actual budgets allocated (eg. US\$124 for 2009) as presented in Table 18.

the coming years.²⁹ Actual spending for the maintenance of the Local road network in Belarus seems roughly adequate today, but will need to increase gradually by about 30 percent in order to avoid further deterioration of Local roads. The World Bank estimate is based on (i) the unit costs for specific activities, (ii) the low traffic levels on Local roads, (iii) the current length and type of Local roads, (iv) the current condition of the Local road network, (v) the needed interventions, and (vi) the overall objective of sustaining the current condition of the Local road network.

Table 13. Standard Unit Costs of Maintenance for Highways, Belarus and France in 2010 (US\$)

Unit cost of maintenance on national roads in France (in US\$, 2010)	Unit cost for 1,000 km (France)	World Bank estimate for unit cost, for 1,000 km (Belarus)
Winter maintenance, including		
Weather stations	286,000	165,880
Snow and Ice Removal	1,170,000	678,600
Silos for salt and fine gravel	260,000	150,800
Current maintenance, including		
Road operation and incident response	5,200,000	3,016,000
Road marking	1,170,000	678,600
Drainage and water management	650,000	377,000
Management of green areas	520,000	301,600
Guardrails	650,000	377,000
Dynamic signs	260,000	150,800
Current maintenance	8,450,000	4,901,000
Winter maintenance	1,716,000	995,280
Routine specific maintenance	1,300,000	754,000
Maintenance of Bridges	1,560,000	904,800
Maintenance of tunnels	1,040,000	603,200
Specific road safety	520,000	301,600
Total	14,586,000	8,459,880

4.25 **The capital expenditure necessary to address the backlog of maintenance for the Republican road network has been estimated by the World Bank at BYR588 billion (US\$200 million) on average per year, assuming a ten-year period for the full elimination of the backlog.** When compared with actual spending in 2009, it is however clear that at the current level of spending on Republican roads it will take longer than ten years to eliminate the backlog.

4.26 **According to the Government's *Roads of Belarus* program, the development needs of the network entail spending additional BYR2,243 billion (US\$ 756 million) on Republican roads over the period of 2011-2016.** As noted previously, the upgrading of certain sections of the M4 and M5 roads to Category 1 standard and the construction of a new ring road

²⁹ The current budget for the maintenance of the local roads network in Belarus of US\$116 million in 2009 for 67,500 km of local roads, resulting in an average expenditure of US\$ 1,700 per year and km.

around Minsk have recently been identified as priority investments in the sector. The M5 upgrade project (a section between Minsk – Bobrujsk) is the first to be implemented, with funding from the World Bank loan. Building a new ring road around Minsk and upgrading the M4 road depend on the availability of financing and are expected to be completed by 2014 and 2016 respectively. The M4 and M5 projects are included in the “*Roads of Belarus*” program and thus reflect the Government’s long-term plan to improve the carrying capacity of those roads. The new ring road is not included in Roads of Belarus program but rather represents a new initiative by the Government to respond to increasing traffic demand in the Minsk area. For the Government, these three projects are central to developing the road network in the next 6 years. A feasibility study for the upgrading of a section of the M5 between Minsk and Bobrujsk has been completed, confirming the economic viability of the project. The feasibility studies for the other two projects are currently under preparation. Whether the M4 upgrade and the new ring road can be economically justified will essentially depend on the results of the traffic demand analysis.

4.27 A significant financing need exists in the area of road infrastructure; but this relates not only to the level of spending but also to the management and allocation of these funds, in terms of efficiency of road maintenance related activities and level of services. There appears to be a significant financing gap without considering development plan requirements in the sector. Road network sustainability requires the timely execution of routine and periodic maintenance, which is in turn dependent on the existence of a steady and adequate flow of funds, good management, sufficient implementation capacity, and effective use of funds. While the issue of sufficient finance is a necessary condition, it is not a sufficient condition. The need to improve efficiency of road maintenance related activities is of equal, if not higher rank.

4.28 The Government plans to close part of the financing need in the road sector through the collection of road tolls. With the abolition of Road Fund and the associated 1 percent turnover tax on businesses, cost recovery in the road sector relies mainly on fuel taxes with some contribution from road user charges. Toll revenues would increase financial resources available for the road sector through a greater available government budget, which could be used to cover not only the basic maintenance needs but also improve network characteristics. The World Bank fully supports the Government’s strategy to expand road tolling to the main motorways and to introduce modern free-flow tolling technology.

5. THE RAILWAY SECTOR

Railway Infrastructure and Service Provision

5.1 **The density and accessibility of the railway network in Belarus is comparable to other Central European countries.** In general, the network density for railway lines at the national level is high in central Europe (including the Benelux countries, Germany, Czech Republic and Poland) and lower in the peripheral countries (including Scandinavia, the Iberian peninsula, western France, the Baltic States, Turkey, and Bulgaria). The highest network density can be found in the Czech Republic, Belgium, Luxembourg, and Germany (all above 100 km/1,000 km²). These nations are followed by Hungary, Austria, Poland, United Kingdom, Netherlands, and Slovakia with 65–80 km/1,000 km². At the lower end of the range are Norway, Finland, Turkey, Greece, and the Baltic countries with values of 20 km /1,000 km² or below.³⁰ With 26.5 km/1,000 km², Belarus has a railway network density similar to the other countries in the same region of the continent. Since 1990, there has been a significant drop in rail freight transport in many Central and Eastern European countries in terms of both total volume and modal share. Many of these countries have therefore reduced the size of their rail networks and as a result, the densities of their railway networks have decreased. This is not the case in Belarus where the railway transportation market is still significant and the traffic intensity is very high—well above the European average.

5.2 **The technical condition of railway infrastructure is satisfactory.** The Belarusian railway infrastructure needs an annual rhythm of track renewal works of about 175-250 km in order to preserve the designed parameters of operations³¹ on the existing 5,514.4 km of railway lines. Belarusian Railways has generally been able to carry out the necessary annual track renewal, thus avoiding the accumulation of backlogs and allowing the operation of traffic according to the designed functional parameters of the railway infrastructure. Table 14 presents the track renewal works executed since 2004 compared with the annual needs.

³⁰ While the significant differences in population density between the countries account for most of the differences observed, the relatively high values for the Czech Republic, Slovakia, Hungary and Poland exemplify the still strong relevance of their heritage for Europe's infrastructure landscape today.

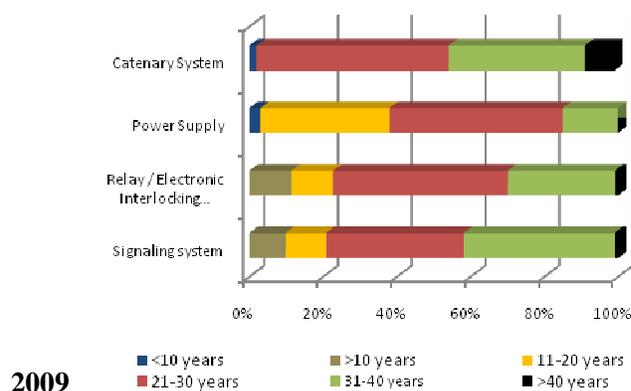
³¹ Based on the annual intensity of traffic and the life cycle of railway systems critical for traffic safety (signaling, power sub-stations, catenary equipment, interlocking) Belarusian Railways calculates, like any other railway in Europe, the annual number of km of track renewal works necessary for maintaining the existing transport capacity.

Table 14. Belarusian Railways: Annual Track Renewal Works 2004-2008 (kms)

Year	2004	2005	2006	2007	2008
Planned	150	175	175	177.6	175
Realized	144.8	152.6	177.4	178	173.5

Source: Data reported by Belarusian Railways.

Figure 26. Belarusian Railways: Age Structure of Railway Infrastructure Systems



Source: Data reported by Belarusian Railways.

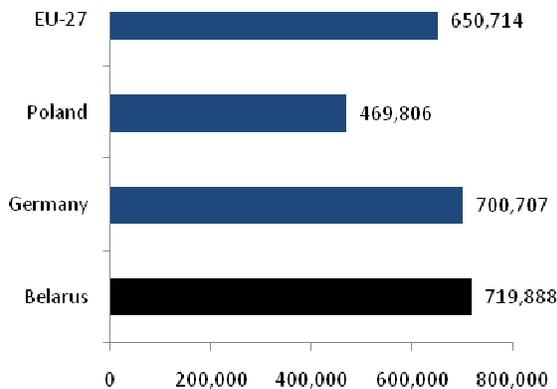
5.3 The railway infrastructure systems are rather old and require medium- and long-term plans for modernization. The Belarusian railway system is equipped with complex power supply, telecommunication, signaling, catenaries, and interlocking systems—vital components for a safe and efficient railway. Their current technical condition is satisfactory, but the average age of some of these systems is rather high, as presented in Figure 26. More than 40 percent of signaling systems and more than 45 percent of catenary systems are over 30 years old, and more than 75 percent of interlocking systems are over 20 years old. The World Bank recommends the development of medium- and long-term program for the modernization of the existing railway systems. Delaying such a program might have multiple negative impacts: (i) increasing the operating costs of the railway infrastructure; (ii) the need to pass on the additional costs as higher tariffs and therefore reducing the attractiveness of railway transport; and (iii) increasing the cost of systems over their life cycle and, thereby, creating an additional burden on the Belarusian Railways budget. At the same time, the medium- and long-term program for modernizing railway infrastructure should include an assessment of the need to increase the length of electrified lines and the implementation of the latest technology for electronic interlocking systems and CTC.³²

5.4 Belarusian Railways has excellent operational performance results and is very efficient. High quality transport services and good cash generation in railway operations depend on the efficient use of staff, wagons, coaches, and locomotives. High productivity of staff, high utilization of rolling stock, and high fleet availability for operations are important indicators for the ability to provide quality services and for enhanced market responsiveness. Figure 27 presents railway staff productivity in Belarus compared with selected EU countries, showing very good results for Belarus.

³² Centralized Traffic Control (CTC) consists of a centralized train dispatcher’s office that remotely controls the switches and the signals in a certain area in order to keep the traffic moving safely and smoothly across the railroad. The graphical depiction of the railroad and computer facilities allows oversight of train locations across the territory by dispatcher controls.

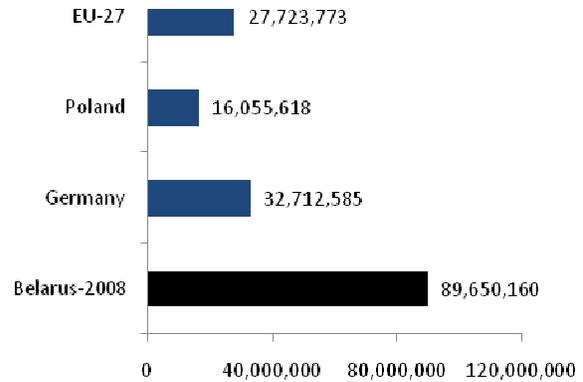
5.5 **Asset utilization also compares well with selected EU countries.** Figure 28, Figure 29, and Figure 30 present the productivity of locomotives, freight wagons, and coaches. The performance in operating freight traffic is impressive, far better than the EU average. Utilization efficiency of the passenger coaches is equivalent with EU figures, illustrating the existence of common problems all over Europe regarding the operation of passenger transport services.

Figure 27. Belarusian Railways: Staff Productivity Compared to Selected EU countries in 2008 (million traffic units/staff)



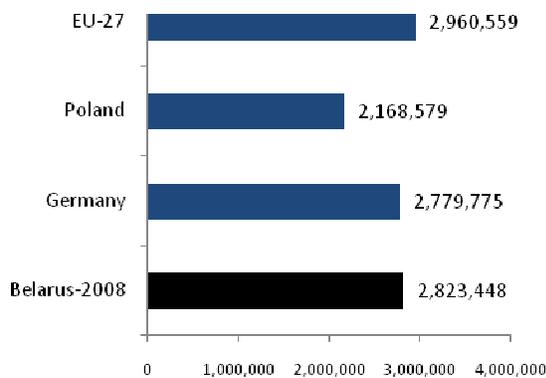
Source: UIC Statistics. 2009.

Figure 28. Belarusian Railways: Asset Utilization - Locomotives in 2008 (ton-km/locomotive)



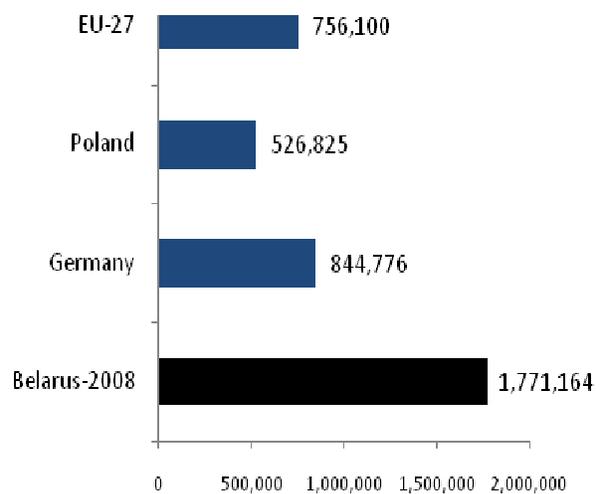
Source: UIC Statistics. 2009.

Figure 29. Belarusian Railways: Asset Utilization – Coaches in 2008 (passenger-km/coach)



Source: UIC Statistics. 2009.

Figure 30. Belarusian Railways: Asset Utilization – Wagons in 2008 (traffic unit/wagon)



Source: UIC Statistics. 2009.

5.6 **In order to maintain high-quality transport services and offer new freight and passenger transportation services, Belarusian Railways needs to accelerate the renewal of**

its rolling stock. The annual average capital expenditure necessary to modernize and renew rolling stock has been estimated by the World Bank at BYR750 billion (US\$253 million). Table 15 presents a scenario of necessary investments based on conservative estimates, including (i) a life cycle of 40 years for coaches and wagons (extremely long, especially when targeting to maintain high-quality services to passengers); (ii) units are kept in operation for 40 years (with investments into modernization after 20 years); and (iii) half of the passenger coaches are modernized and replaced using companies sub-ordinate to Belarusian Railways which can produce them at a cost that is below international market prices.

Table 15. Estimated Average Annual Investment Needs for the Modernization of Rolling Stock (US\$ million and thousands)

Type of Rolling Stock	Units	Potential Suppliers	Average unit cost (modernization) US\$ Thousands	Average unit cost (replacement) US\$ Thousands	Necessary investment US\$ Million/year
Freight wagons except tanks and refrigerators	24,937	Market	12,441	46,924	37.01
Passenger coaches	1,719	50% BR	367,177	692,658	22.77
		50% Market	679,077	2,186,627	61.58
Multiple unit sets	197	Market	3,232,406	8,081,014	55.72
Locomotives	833	Market	604,378	3,028,683	75.66
Grand Total					252.74

Source: Data reported by Belarusian Railways. Estimates developed by the World Bank team.

Organizational Structure of the Railway Transportation System

5.7 **A special law regulates the railway transportation system in Belarus.**³³ The Law of Railway Transport was published on January 6, 1999³⁴ and defines the legal and institutional framework for the railway transportation system in Belarus. According to the provisions of the law, the railway is organized as an “association” of state-owned entities with the name of Belarusian Railways. Belarusian Railways is a commercial organization (meaning that it has the right to sign commercial contracts) under the supervision of the Ministry of Transport and Communications. The national bodies of state regulations, of local regulations, public and other organizations, in principle, may not interfere with the activities of rail transport.

5.8 **Belarusian Railways is an “association,” which includes various units.** These units (i) operate freight and passenger transport services; (ii) maintain and repair infrastructure; (iii) maintain and repair rolling stock, power supply, signaling and telecommunications, information technology for railways; (iv) operate social activity units such as kindergartens, training centers,

³³ The business relations between Belarusian Railways and its clients are regulated by the Charter of Rail Transport of General Use, Resolution of the Council of Ministers of the Republic of Belarus on Approval of the Charter of Railways, August 2, 1999, No. 1196.

³⁴ Law on Rail Transport January 6, 1999, No .237-3 (as amended by Law of the Republic of Belarus on Mary 21, 2002, No. 100-3, on July 19, 2004 No. 306-3, and on June 20, 2008 No. 344-3).

health units and sport complexes, and (v) produce goods and services unrelated to railway operations, such as in agriculture. Considering the increased market pressure on the transport activities of Belarusian Railways, which is illustrated by the lost market share in favor of road transport, the World Bank recommends to analyze the conditions for setting up internal business units within Belarusian Railways and to keep separate statements of account for the different lines of business, but within a consolidated Belarusian Railways as the only legal entity for railway transport activities. In this way, management will have a clear image of the profitability of each line of business and will be able to take the appropriate corrective decisions that may be needed from time to time. The existing cross subsidies between various lines of business could be used to balance the overall accounts for short periods of time, but they are not appropriate as long-term policy instruments.

5.9 The principle of covering the marginal costs should govern tariffs on railway transport. According to the Railway Law,³⁵ the tariffs should cover all costs of Belarusian Railways, including the costs of operation and maintenance of railway assets. The President of the Republic of Belarus approves tariffs for domestic transport services. International agreements of the Republic of Belarus establish the tariffs for international transport services. The implementation of this principle must be carefully monitored to ensure the continued ability of Belarusian Railways to act as a commercial entity in a competitive transportation market. As described earlier in this document, the railway sector lost significant market share to road transport during the last years. The World Bank believes that a more flexible tariff policy for freight could help to recapture part of the lost volume.³⁶

5.10 According to the provisions of the railways laws, state support for the railway sector can be provided by national and local budgets for socially important passenger transportation. Additionally state support could be granted for the development of the railway network, modernization of rolling stock, and introduction of new technologies. Until recently, however, Belarusian Railways has been a financially self-sustaining entity and did not receive financial support from the State.

5.11 Belarusian Railways cannot refuse requests for transportation. According to the Railway Law, Belarusian Railways is obliged to fulfill all transport requests received from the domestic market. At the same time, Belarusian Railways has the right to not release cargo until the payment of the freight charge is made. The implementation of this principle, in correlation with the centralized policy of setting tariffs for freight transport, should be reassessed due to the strong competition from road transport. Since road transporters do not have the same constraints in terms of tariff setting, they have the strong advantage of being able to better respond to the market, and railway transport will continue to lose market share.

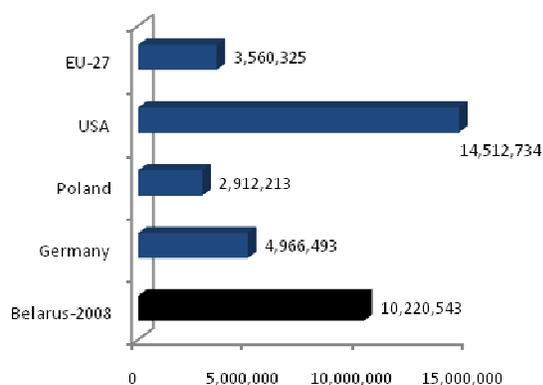
³⁵ Article 10 of the Law on Rail Transport.

³⁶ The Government of the Republic of Belarus (Resolution № 1356 dated 30 November 2005) endorsed a set of measures to improve functional efficiency of the Belarusian Railway for 2006-2010 stipulating that tariffs on freight transport by rail within the country should be brought to profitability level and tariffs on passenger transport by rail should be brought to cost recovery level.

Operational Performance of Belarusian Railways

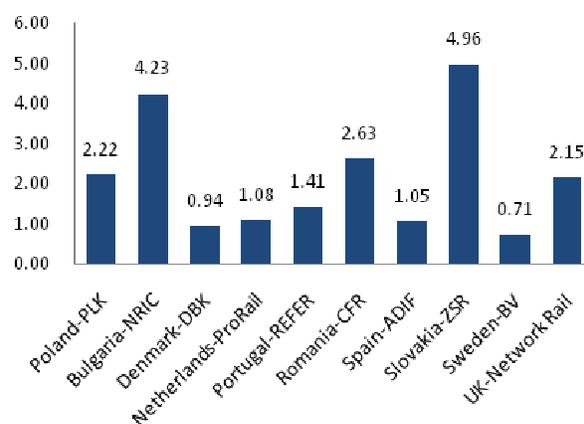
5.12 **The vital element for the operational performance of Belarusian Railways is the traffic intensity on the network.** Railway operations respond very much to economies of scale—the higher the traffic levels, the lower the unit operating costs. Traffic intensity in Belarus, with 10.2 million traffic units per rail line-km in 2008, is one of the best in the world (as illustrated in Figure 31). Considering the high percentage of the fixed costs of railway infrastructure within the total railway operating costs, declining traffic intensity would make railways more expensive compared to road transport. This in turn would increase the unit costs of railway operations, leading to higher tariffs to recover those costs - a vicious cycle that would have serious impacts on Belarusian Railways. As the current high traffic volumes are in favor of Belarusian railways, sufficient time is left for Belarusian Railways to make necessary adjustments in order to counter the negative trend in market share. The World Bank proposes several actions to be taken by Belarusian Railways and the Government; these are presented below.

Figure 31. Railways Traffic Intensity (million traffic units/rail route km)



Source: UIC Statistics. 2009.

Figure 32. Average Number of Staff per km of Track in various EU Railways



Source: UIC Statistics. 2009.

5.13 **The cost of operating railway infrastructure in Belarus must be clearly identified.** Belarusian Railways is the manager of railway infrastructure in Belarus and the sole operator of railway transport services in the country. The vertically integrated railway organization (infrastructure management, and operation of freight and passenger transport services) is a proven structure in many countries. It is currently working well in Belarus. The current organizational structure is not an obstacle for unbundling the management of the infrastructure as a separate unit in the structure of Belarusian Railways (not as a legal entity, but as an internal unit of Belarusian Railway keeping its own statement of accounts). It will allow Belarusian Railways to keep track of railway infrastructure costs and to monitor the share of infrastructure cost in freight and passenger tariffs. Such an exercise would not only help Belarusian Railways to control operating costs, but also would provide valuable information for implementing non-biased national transport policies.

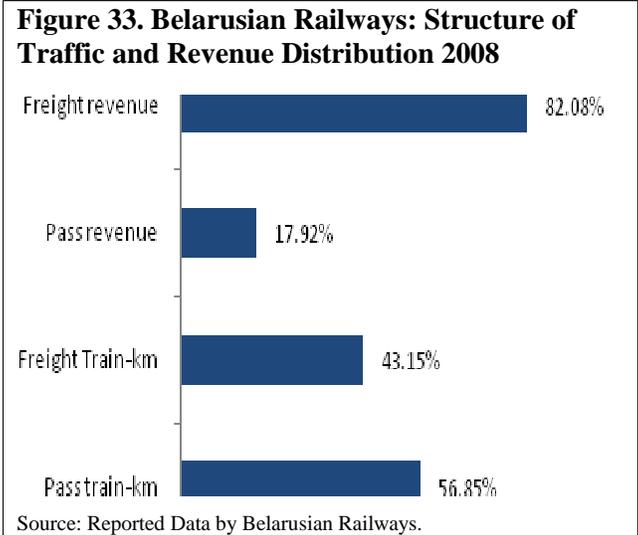
5.14 Considering the increased market pressure on Belarusian Railways, it is advisable to analyze conditions for setting up internal business units. These internal business units for core business activities (e.g. maintenance and repair of infrastructure, freight services, long-distance passenger services, suburban passenger services) as well as social activity units (eg. kindergartens, health units) would maintain separate account statements to be consolidated under Belarusian Railways as the only legal entity for railway transport activities. The separation of accounts would help management have a clear understanding of the profitability of each line of business and to take appropriate corrective measures, as needed. Cross-subsidies for various lines of business could be used as a short-term management instrument, but would be dangerous to maintain as a part of long-term policies.

5.15 The State should take the lead role in setting unbiased rules for financing road and railway infrastructure. In many countries road transport is treated favorably since at least a part of the cost of road infrastructure is paid through the State budget. In this context, the Government of Belarus should compare (i) cost recovery for road infrastructure from direct taxation and user charges collected from road users with (ii) cost recovery for rail infrastructure from tariffs and prices set in the railway sector. Additionally, the government should evaluate the social benefits of transport modes based on a set of criteria that should include environmental benefits and safety. This is particularly important when railway infrastructure serves a mix of traffic, including freight and passengers.

5.16 The continued efficient operation of railway infrastructure is vital for sustaining the competitiveness of Belarusian Railways. Railway infrastructure operating costs significantly affect the efficiency of railway transport services in general. A lower productivity in operating railway infrastructure leads to higher costs for railway transport services (freight and passengers), making railway transport less attractive to new clients and accelerating the shift of traffic from rail to roads. The long-term solution for improving the productivity in infrastructure would be to invest in efficiency-increasing measures for railway infrastructure operation (maintenance, repair, traffic control) through two interlinked actions: (i) mechanize and automate infrastructure operations as much as possible, and (ii) implement condition-based maintenance for railway infrastructure. The Belarusian Railways does not collect statistical data about the portion of staff that is exclusively used for the operation, maintenance, and repair of railway infrastructure. The average number of infrastructure staff per kilometer of track is a generally accepted efficiency indicator for infrastructure operation in Europe. For informative purposes only, Figure 32 presents the number of staff used by various railways in the EU; one or less than one staff per kilometer of track indicates an efficient management of railway infrastructure.

5.17 The distribution of costs of railway infrastructure between freight and passenger transport should avoid any cross-subsidization. Figure 33 shows that railway infrastructure in Belarus was used more by passenger trains (39 million train-km) than by freight trains (29 million freight train-km) in 2008. However, revenues generated by passenger services were much lower than by freight services. Passenger trains (i) used more than 50 percent of the existing railway transport capacity in Belarus; (ii) used almost all railway lines (main and secondary); and (iii) require higher speeds. On the contrary, freight trains (i) used only a section of the railway network (concentrated along main lines, using a limited number of local railway lines and stations), and (ii) do not go faster than 80 km/h. Based on the above, it seems that clients using railway infrastructure for freight transport services cross-subsidize passenger services offered by Belarusian Railways. International experience demonstrates that over the

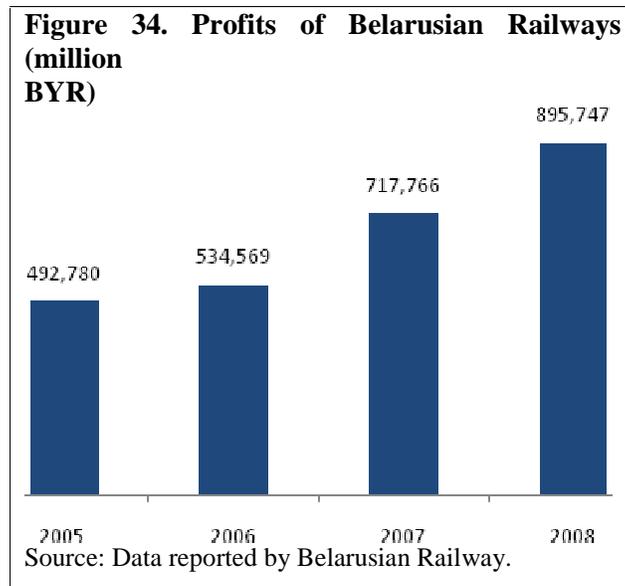
long term, this practice creates a vicious circle: (i) the market share of railways in freight transportation decreases because of non-competitive tariffs; and (ii) the infrastructure manager loses money and cannot preserve its assets or provide needed capacity to operators. This results in deteriorated railway operations and a non-competitive railway industry.



Financial Performance of Railway Operations

5.18 **Presently, the maintenance and repair of the railway network is fully financed by the Belarusian Railways without any financial contribution from the State.** The high intensity of traffic on the railway infrastructure allows the railway to cover from its own revenue the total repair and maintenance costs. There are no maintenance backlogs. Speed restrictions exist only on very limited distances and for short periods of time. It is vital for Belarusian Railways to maintain the same intensity of traffic to preserve the current policy of self-financing of infrastructure maintenance and capital repair. Belarusian Railways is one of only very few railways worldwide that are able to be financially self-sustaining without the support of the state budget.

5.19 **Financial performance of railway operations is a vital element in preserving a strong market share for railway transport.** The efforts to create a modern railway transport infrastructure and to install efficient infrastructure management are necessary but not sufficient conditions for maintaining or increasing the railway transport market share. The operational and financial performance of railway operations is also essential. The data available from Belarusian Railways allows for an analysis of its financial performance and its business lines. Efforts to consolidate financial stability of Belarusian Railways are visible (**Figure 34**); the company’s financial sustainability has improved each year, illustrating that the railway is currently one of the most profitable companies in the country.



5.20 Continuous improvement in the financial sustainability of railway operations shows that Belarusian Railways is in good financial health. Table 16 presents the evolution of the main operational and financial parameters of the company during 2005-2008. The transport volumes carried by rail have grown every year from 2005 to 2008, even though there was less growth than for road transport volumes during the same period. For 2008 the ratio of staff cost to total costs is better than the European average; with 25 percent of total costs for Belarusian Railways versus 40 percent or higher for the European average. The working ratio³⁷ and the operating ratio³⁸ are well above EU-25 averages for the whole period; this is another illustration of Belarusian Railways' financial health and operational efficiency (Figure 35). The only worrying element is the rapid increase of the road transport market share during the same interval: if this market trend continues, financial sustainability of the railway in Belarus will be endangered in the medium term.

³⁷ The working ratio is defined as the total operating expenses, less depreciation and debt service, and divided by revenues.

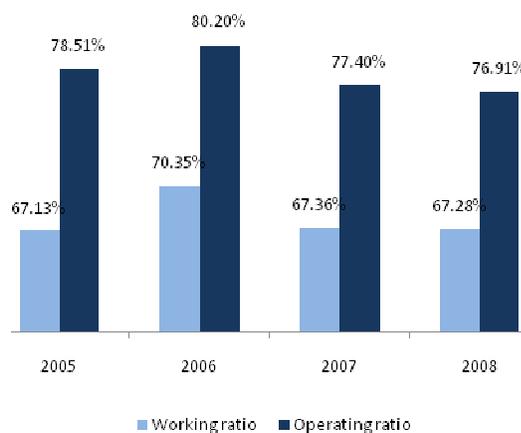
³⁸ The operating ratio represents the operating expenses divided by the operating revenue.

Table 16. Belarusian Railways: Evolution of operational and financial performance 2005-2008

Year	2005	2006	2007	2008	
Number of staff	78,316	77,975	77,649	77,958	
Passenger	Passenger Revenue [million BYR]	418,065	482,410	579,485	695,235
	Passenger-km [million]	10,351	9,968	9,366	8,188
	Passengers [thousand]	104,529	99,434	92,595	87,993
Freight	Freight Revenue [million BYR]	1,875,157	2,217,005	2,597,054	3,183,410
	Ton-km [million]	43,559	45,723	47,933	48,994
	Tons [thousand]	125,097	133,679	140,967	147,172
Total revenue	2,293,222	2,699,415	3,176,539	3,878,645	
Expenses [million BYR]	Materials	171,986	272,604	313,370	400,627
	Fuel, Electricity	309,319	356,589	461,054	557,187
	Wages and salaries	417,482	576,412	632,868	742,197
	Hired servicers and others	640,602	693,364	732,466	909,478
	Depreciation	261,053	265,877	319,015	373,409
	Total operating expenses	1,800,442	2,164,846	2,458,773	2,982,898
	Non-operating expenses	2,197	7,239	5,249	7,230
Total expenses	1,802,639	2,172,085	2,464,022	2,990,128	
Profit/loss	490,583	527,330	712,517	888,517	

Source: Data reported by Belarusian Railway.

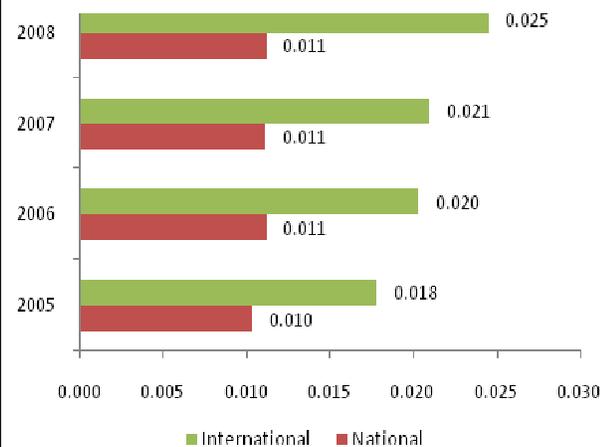
Figure 35. Financial Performance of Belarusian Railways 2005-2008



(percentage)

Source: Data reported by Belarusian Railway.

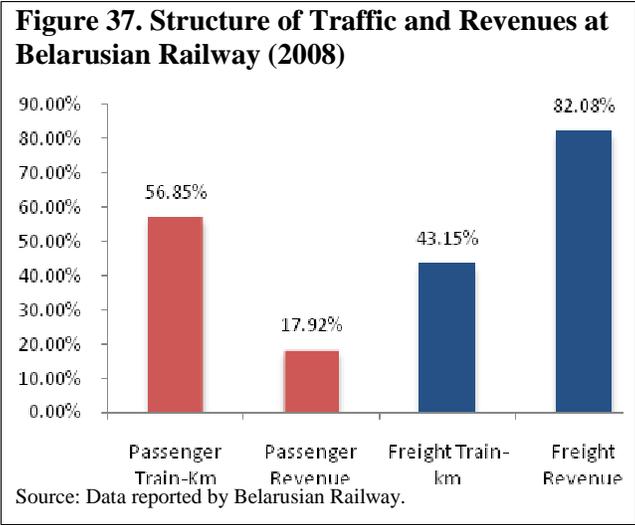
Figure 36. Traffic Unit Revenue for Domestic and International Freight Market 2005-2008 (in Euros)



Source: Data reported by Belarusian Railway.

5.21 The various types of transport services performed by Belarusian Railways are not equally profitable. Extending the assessment of financial sustainability to each major line of business reveals important elements to be considered for the future development of the company.

The structure of services operated by Belarusian Railways includes freight transport (transit, import, export, and domestic) and passenger transport services. For domestic services, the Government establishes tariffs while international conventions set tariffs for international traffic. A major issue observed is that domestic freight and passenger transport services generate losses and receive cross-subsidies from international freight service. Figure 37 illustrates that about 57 percent of the transport capacity of the railway network in Belarus is used by passenger trains, which generate only about 18 percent of the revenues. On the contrary, freight trains use only 43 percent of the transport capacity of the network, but generate 82 percent of revenues of Belarusian Railways.



5.22 The international transport services cross-subsidize domestic transport. Figure 36 presents the average unit revenue for international and domestic freight traffic during 2005-2008. The data presented in Figure 36 shows that one traffic unit (measured in ton/km) operated on the domestic market generates an average revenue of 0.011 Eurocents (per ton-km), and one traffic unit operated on the international market generated significantly higher revenue, between 0.018 Eurocents in 2005 and 0.025 Eurocents in 2008. If the entire freight traffic operated by Belarusian Railways generated revenue at only 0.011 Eurocents per transported ton-km,³⁹ the total annual revenue accumulated would not cover the operating costs of the railway. This proves that Belarusian Railways cross-subsidizes domestic rail traffic with the revenues from international traffic. This makes the railway very dependent on an evolving international freight transport market which is an element beyond its control. Any serious distortion of the international freight transportation market could seriously affect Belarusian Railways. The recent global crisis affecting international freight transport volumes is a demonstration of the railway's fragility in the face of declining freight volumes.

³⁹ This is the current unit rate for domestic traffic.

Table 17. Evolution of Operational and Financial Performance of Operating Freight Services 2005-2008⁴⁰

		2005	2006	2007	2008
Locomotives (units)	Total number	755	748	739	731
	Operational fleet	491	527	537	556
Freight wagons except tanks and refrigerators (units)		25,281	24,789	24,625	24,937
Net-tons (million)		125	134	141	147
Net-ton-km (million)		44,672	46,309	48,351	49,669
Freight revenue (million BYR)		1,875,157	2,217,005	2,597,054	3,183,410
Expenses [Mill BYR]	Materials	115,323	192,106	224,107	287,083
	Fuel, Electricity (including traction)	202,313	230,406	295,815	366,551
	Staff Cost	238,371	334,656	375,504	447,314
	Hired services and others	442,463	476,961	507,239	644,527
	Depreciation	187,932	188,715	224,708	269,991
	Total operating expenses	1,186,402	1,422,844	1,627,373	2,015,466
	Non-operating expenses	1,448	4,757	3,347	4,726
	Total expenses	1,187,850	1,427,601	1,630,720	2,020,192
Profit / Loss (million BYR)		687,307	789,404	966,334	1,163,218

Source: Data reported by Belarusian Railway.

5.23 Passenger transport services in Belarus are not financially self-sustaining. Table 18 presents the evolution of the main operational and financial parameters for operating passenger services during the period 2005-2008. The data illustrates decreasing rail passenger numbers from 2005 to 2008 and an unsatisfactory financial performance. In each year of that period, the operation of passenger services produced financial losses, as operating costs are higher than the operating revenue. According to the data in Figure 38, in 2008 average revenue generated for one passenger-km was 0.027 Eurocents, while average operating costs for one passenger-km was 0.038 Eurocents. In spite of constant increases in unit revenue per passenger-km since 2005, operating costs increased at a higher rate and the services continue to generate losses. As a consequence of the unbalanced ratio of costs and revenue, the working ratio for passenger services varied during the period 2005-2008 between 138 percent and 125 percent, reflecting the important losses generated every year (see last line of Table 16).

⁴⁰ Data provided by MoTC

Table 18. Evolution of Operational and Financial Performance of Operating Passenger Services 2005-2008⁴¹

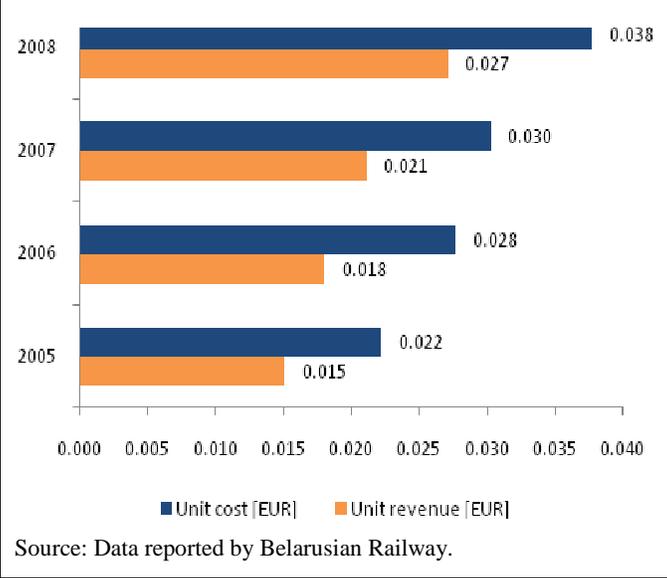
		2005	2006	2007	2008
Locomotives (units)	Operational fleet	133	132	134	133
Coaches (units)	Total number	1,720	1,698	1,681	1,704
	Operational fleet	1,548	1,529	1,513	1,534
DMU/EMU (units)	Total number	165	171	179	184
	Operational fleet	160	166	173	174
Passengers (million)		104,528.9	99,434.2	92,595.2	87,993.4
Passenger-Km (million)		10,351.3	9,967.6	9,365.7	8,188.3
Passenger revenue (BYR million)		418,065	482,410	579,485	695,235
Expenses (BYR million)	Materials	56,663	80,498	89,263	113,544
	Fuel, Electricity (including traction)	107,006	126,183	165,239	190,636
	Staff Cost	179,111	241,756	257,364	294,883
	Hired services and others	198,139	216,403	225,227	264,951
	Depreciation	73,121	77,162	94,307	103,418
	Total operating expenses	614,040	742,002	831,400	967,432
	Non-operating expenses	749	2,482	1,902	2,504
	Total expenses	614,789	744,484	833,302	969,936
Profit / Loss (BYR million)		(196,724)	(262,074)	(253,817)	(274,701)

Source: Data Reported by Belarusian Railway.

5.24 **In view of the significant financial losses from passenger services, the Belarusian Railways should consider separating commercially viable services from non-commercial services.** The fact that railway transport services for passengers are generating financial losses is a reality that is generally accepted throughout the world. The Government should consider compensating the Belarusian Railways for losses in domestic passenger services. Such compensation is provisioned in the current Railway Law but is not applied in practice. Introducing a Public Service Obligation (PSO) requiring the Government to compensate for non-commercial (loss-making) public transport services would support the sustainability of commercially viable operations.

⁴¹ Data provided by MoTC

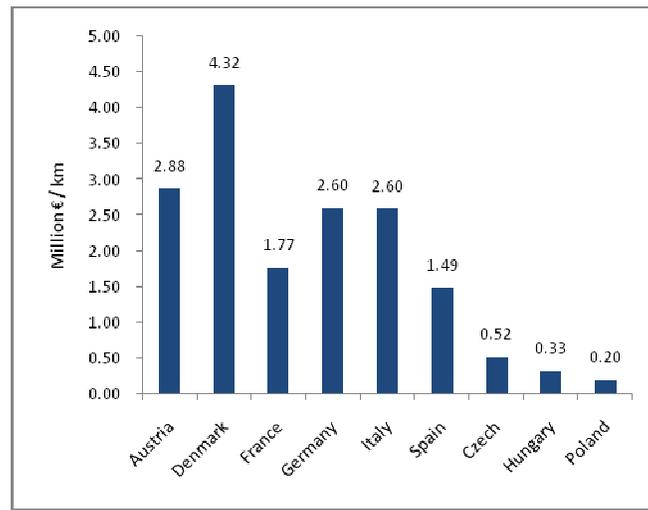
Figure 38. Passenger Unit Revenue and Cost of Services 2005-2008 (Euros)



Financing Requirements for the Railway Sector

5.25 **The financing requirements for Belarusian Railways include two categories of future expenditure needs:** (i) annualized capital expenditures needed to preserve the existing transport capacity of the railways infrastructure network; and (ii) expenditures for the development of the rail network and to modernize infrastructure and systems, mainly to keep pace with growing traffic demand on Corridor II and Corridor IX. Generally, financing requirements for railway infrastructure vary heavily from country to country depending on the condition of the network and related development needs. Figure 39 illustrates average funds allocated for track renewal in selected countries over the period 1992-1997.

Figure 39. Allocation of Funds for Track Renewal in Selected Countries 1992-1997 (million Euro per km of network)



Source: OECD Estimates.

5.26 The World Bank estimates that recurrent annual expenditures required to keep the railway network (infrastructure) at its current capacity amounts to about **BYR292 billion (US\$ 98.4 million) on average**. This estimate is based on average unit costs provided by Belarusian Railways for specific activities, such as for the maintenance of one kilometer of railway track, for catenary systems, for semi-/automatic block system, etc. (see Table 19). It is important to note that these estimates are rather conservative, as unit costs in Belarus are currently below international market prices and are expected to increase in Belarus over the next 10 to 20 years.

Table 19. Estimated Average Annual Railway Maintenance Needs (US\$ million)

Infrastructure	Total Length/ Number of Units	Life cycle (years)	Annual average	
			Annual average number overhaul/ replaced	Necessary investment
Total number of km of railway lines (main circulation lines + receiving / departure lines in stations)	11,771	50	235.42	76.70
Total number of km of electrified lines (AC and DC)	897	40	22.43	3.04
Total number of km of lines equipped with automatic block system	3696	30	123.20	10.04
Total number of km of lines equipped with semi-automatic block system	1,884	30	62.80	0.29
Total number of electric sub-stations for traction	16	30	0.53	3.62
Total number of relay interlocking systems on the network	385	30	12.83	4.15
Total number of electronic interlocking systems on the network	3	30	0.10	0.52
Grand Total				98.41

Source: Data reported by Belarusian Railways. Estimates developed by the World Bank.

Average unit costs for overhaul/replacement for the above calculations (as reported by Belarusian Railways):

1 kilometer of railway track (US\$325,957), 1 kilometer of catenary system (US\$135,815), 1 kilometer of automatic block system (US\$81,489), 1 kilometer of semi-automatic block system (US\$4,672), 1 kilometer of electronic sub-station for electric traction (US\$6,8 million), 1 relay interlocking system (US\$323,241), and 1 electronic interlocking system (US\$5.2 million)

5.27 According to the Government's strategy for the railway sector, the development needs of the network entail spending additional BYR997 billion (US\$340 million) on the modernization of Corridor II and IX over the next 25 years. In order to keep its current market position, Belarusian Railway needs to modernize the infrastructure and systems of Corridor II and IX to achieve full interoperability with the network of the EU. This includes the full electrification of lines, increased transport speed, increase in the use of electronic interlocking systems, extension of automatic block systems, and introduction of European train control systems. An extremely conservative estimate for financing these components as a package is about Euro 4.2 million (US\$5.5 million equivalent) per kilometer of railway track. This includes full rehabilitation of the track in order to accommodate speeds up to 160 km/hours. Based on the above assumptions, Table 20 presents estimated investment needs for the modernization of railway corridor II and IX.

Table 20. Estimated Investment Needs for the Modernization of Railway Corridor II and IX in Belarus (US\$ million)

Railway Corridors in Belarus	Length (km)	Modernization Cost (US\$ million)
Corridor II	611	3,485.29
Corridor IX (Terjukha - Gomel - Vitebsk -Ezerishche)	489	2,789.38
Corridor IX (Gudogai - Molodechno - Minsk - Gomel)	372	2,121.98
Total	1,472	8,396.65
Annual Average (25 Years Modernization Plan)	58.88	335.87

Source: Data reported by Belarusian Railways. Estimates developed by the Bank's team.

5.28 Belarusian Railways are currently fully financing expenditures related to maintenance, repair and new investment, but this favorable situation may not last much longer. Given the high volume of traffic, Belarusian Railways was able so far to finance the full costs of operation. At present, there are no backlogs in the maintenance works and speed restrictions currently only exist on very short sections and over short period of times. However, the current rhythm of investments is not sufficient for sustaining the long term development of Belarusian Railways. The proposed annual need of about 2 trillion BYR (more than US\$600 million) for investment in the Belarusian Railways system is a conservative estimate based on rough calculations. In 2008, Belarusian Railways accumulated 372,409 million BYR for depreciation and realized a profit of 888,517 million BYR; this totals 1,261,926 million BYR, which theoretically could be considered as a source of investment. Even if the entire sum would be allocated for investments, it would only cover the costs for maintaining the current business (current rolling stock and existing infrastructure), but will not be sufficient to develop the railway transport system so that it can preserve its market share. At present, there are no funds available to cover the development of Belarus' international railway corridors. An in-depth assessment is therefore needed to identify additional financing sources that are needed to finance a prioritized set of concrete projects that will allow further consolidation of Belarusian Railways.

5.29 **The future of Belarusian Railways is determined by the availability of adequate financing.** Four possible scenarios are presented below (Table 21) which summarizes the potential development strategies and the corresponding levels of needed investments. At present, Belarusian Railways seems to follow the scenario called "preserve current business". The levels of investments realized during the past 3 to 5 years however indicate that a tendency exists to move into scenario "focus on selected lines of business". The World Bank strongly recommends that Belarusian Railways develops a clear strategy for development and that the Government identifies sources of financing to move up to the scenario called "grow business".

Table 21. Scenarios for the Development of the Belarusian Railways system

Strategy	Scope	Effect	Estimated average annual financing requirements (million BYR)
Grow business	Upgraded lines Upgraded rolling stock	Corridors with more capacity Higher quality services	1,045,000 – 2,050,000
Preserve current business	Reliable lines Reliable rolling stock	Full capacity of existing network and rolling stock	1,045,000
Focus on selected lines of business	Reliable lines on selected routes Acceptable services on remaining routes	Reliable railway transport on lines important for commercial and public interest	700,000
Continuous reduction of business	Unreliable lines and rolling stock Dying network	No serious freight and passenger transport business	>700,000

6. RECOMMENDATIONS FOR IMPROVING TRANSPORT SECTOR PERFORMANCE

Take Steps to Increase Logistics Performance

6.1 **During the past twenty years, the former states of the Soviet Union have followed different development paths.** While the Baltic States, now members of the EU, developed highly versatile markets for logistics services, limited progress has taken place in many parts of Central Asia. Countries such as Belarus and Ukraine could be regarded as "partial performers," as defined in the LPI 2010 report. Table 22 illustrates these development paths and the current perceived position of Belarus.

Table 22. Belarus Impediments of Logistics Performance

Level of impediment	Trade related infrastructure	Quality and supply of logistics services	Core customs and border agency modernization	Integration of border agencies	Regional facilitation and transit
Major	Insufficient Class A & B and temperature controlled warehouse space	Weak 3PL/advanced services Insufficient Consolidated / groupage (LTL services) Marginal FDI in the sector	Mainly paper based clearance in imports with progressive introduction of electronic declaration	Goods technical certification, sanitary, Phytosanitary certification / inspection	Zero tolerance in customs: potentially a major problem in the Customs Union
Medium	Rail throughput Telecommunications	Lack of direct access to maritime transport Inefficient rail wagon reservation systems		Potential improvements in the interplay between border agencies with introduction of automated system	
Minor	Road infrastructure	Road transport capacity	Clearance in exports		TIR

Carry out a study of the market and future demand for logistics services

6.2 **There is an apparent lack of class A and B warehouse space in Belarus; which results in relatively high rental prices for such premises.** This issue has been addressed by the Government's plan to construct logistics centers throughout Belarus. However, it is recommended that the actual locations be carefully evaluated, keeping in mind the two sides of demand for warehouse space in the future. First, there is the domestic demand for warehouse space, which stems from the distribution activities in the economy. Although there has been development in the retail sector, it is not yet evident that modern retail chains will appear in great

numbers either as a result of domestic investment or in the form foreign entrants. Foreign entrants in particular require a more transparent regulatory environment and reliable cross-border supply chains. Second, there is a potential international demand for warehouse space generated by transit cargo flows through Belarus. Despite arguments in support of Belarus as a transshipment area for distribution in Russia,⁴² it is doubtful whether it makes business sense to break shipments of bulk cargo and store goods relatively far away from the major consumption centers in Russia. Even if transit freight volumes significantly increase in the future, it is questionable whether they will stop in Belarus as part of logistical arrangements.

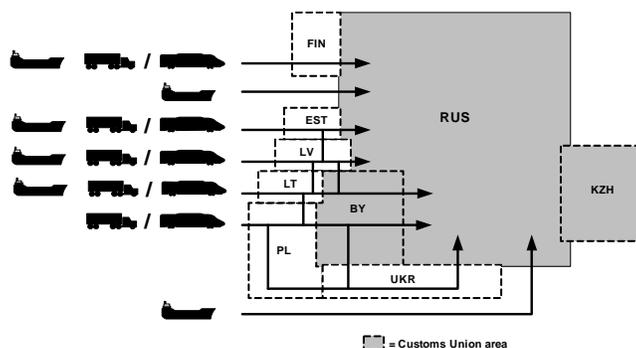
6.3 Further market research on logistics services demand should be conducted from the point of view of international shippers and logistics operators. This will offer a better understanding of the nature of demand and rationale for stopping cargo in Belarus. Additionally, advanced logistics service provision needs to be greatly improved in Belarus. Business culture favors in-house logistics arrangements, inhibiting the development of a domestic logistics service industry. Foreign logistics operators have not entered the market in earnest, limiting the demand for local logistics talent and competence, as well as market competition. Best practices such as LTL services and scheduled groupage cargo are in an early stage of development, not to mention for example the range of value-added logistics services on offer in countries such as Finland for high value and sensitive goods. The lack of advanced services places further doubt on establishing distribution centers for Russian transit cargo on Belarusian territory.

Address perceived issues in customs (zero-tolerance attitude and problems with certification)

6.4 Belarus Customs has made impressive improvements in its practices and thereby facilitating international trade in many ways. However, the perceived zero-tolerance attitude of Belarus Customs Services, as well as problems with certification, alienate some shippers from using the Poland - Belarus route to Russia, shifting them to other routes to enter the Customs Union area. Cargo flows shift easily to the least-cost routes; the total distribution cost depends on direct costs (e.g. transport, customs fees) and indirect costs (delays and rejections at the Belarus border).

⁴² In the near past, high cost of land and services in Moscow, changing from low emission trucks to high emission and low cost trucks in Belarus etc.

Figure 40. Available Transport Routes from Germany (2nd largest import origin) to Russia



Improve the Institutional Framework for the Belarus Transport Sector

Prepare a comprehensive National Transport Strategy and Business Plan

6.5 **The World Bank recommends that the Government should prepare and publish a comprehensive Transport Sector Strategy covering all modes and including a prioritized investment and expenditure plan for the transport sector.** The Transport Sector Strategy should cover all modes of transport and should state clear development goals and the actions needed to reach those goals. The Strategy should be based on detailed analytical work for each mode of transport. Among the major development goals that can be envisaged for the transportation sector in Belarus are: (i) the further development of transport infrastructure in response to transport demand and the broader development objectives of Belarus; (ii) to enhance the efficiency and quality of the transport system and transport services which are required to serve the economy and the society as a whole; (iii) further improvements in the integration of the Regions in the national economy; (iv) improve parameters of transport infrastructure to meet European standards; and (v) improve the quality and safety of transport infrastructure and to reduce negative effects of transport on the population and the environment. As mentioned above, the Transport Sector Strategy should include a prioritized investment and expenditure plan, based on clear technical, economic, social and financial considerations. It will also optimize the sequencing of policy actions and investments within existing and foreseeable funding constraints; and also determine the necessary changes in legislation, institutions, and financing arrangements.

6.6 **The maintenance and upgrading of transport infrastructure for all modes of transport should be a central part of the Government’s Transport Sector Strategy** along the lines of the Concept of Belarus’ Transport System Development until 2025. In this context, Belarusian Railways needs a comprehensive assessment of long-term investment needs, fully integrated into the European transportation market, taking into consideration not only EU objectives of developing international corridors but also all domestic needs. The new Strategy should also define the roles of the road and railway subsectors in the future transportation system of Belarus, answering the following questions:

- a) What will the transportation needs of Belarus be in the next 20-25 years, considering: (i) the predicted annual growth of GDP; and (ii) the worldwide trend that transport demand growth exceeds GDP growth rates?

- b) What is the target market share of railway in the Belarus transportation system in 20-25 years, considering economic criteria and social aspects, such as climate change, traffic safety and land utilization?
- c) How much of the predicted transportation volumes in the next 20-25 years could be carried on the existing infrastructure? What additional capacities are necessary and where are they to be developed?
- d) How should road and rail infrastructure projects be financed, avoiding a distortion in the transportation market and in the competition between rail and road transport? Belarusian Railways own funds will be insufficient for self-funding of railway infrastructure and alternate solutions may be necessary for an unbiased approach of road versus rail infrastructure. An expanded cost recovery mechanism for road infrastructure may be needed, such as a broader use of road tolling.
- e) What is the optimum and economically justified level of spending on Local roads, given the relatively low traffic volumes on Local roads? How will the condition of Local roads develop under different spending scenarios?

6.7 MOTC should lead the preparation of the Transport Sector Strategy, which should then be linked to multi-annual business plans to be developed by Belavtodor and Belarusian Railways (rolling 5-year programs). These business plans should not only identify annual maintenance and repair requirements for infrastructure (and also rolling stock in the case of railways), but also establish the financing sources.

Improve road transport management, planning, and budgeting

6.8 To support the development of a sound road sector investment and expenditure plan, Belavtodor would need a road asset management system. Such a system will help to prepare annual and multi-year plans for maintenance, rehabilitation, and reconstruction of the road network. The use of economic decision models such as the Highway Development and Management model (HDM-4) would assist the process of effective prioritization and planning.

6.9 Good management practices also require increased accountability not only for the use of money received (from the State budget) but also for the results achieved with that money in terms of road service quality provided to road users. This is achieved through: (i) strong financial management and auditing processes; (ii) surveys of road users on their satisfaction with the quality of the roads; (iii) assessment of road agency performance against pre-determined performance criteria; and (iv) preparation of annual reports of the road agency covering all of the above elements.

6.10 To improve transport sector management, transport statistics kept in Belarus should be harmonized to conform to international standards. The “Illustrated Glossary of Transport Statistics” published by the *International Transport Forum*, for example, represents a point of reference for all those involved in transport statistics worldwide. By following the

guidance contained in the glossary definitions, the quality and comparability of data will be much improved.

Re-assess the legal and institutional framework of Belarusian Railways

6.11 **Considering the increased market pressure on Belarusian Railways, it is advisable to set up internal business units.** These internal business units for core business (e.g. maintenance and repair of infrastructure, freight services, long-distance passenger services and suburban passenger services) as well as social activity units (e.g. kindergartens, health units) would maintain separate account statements to be consolidated under the umbrella of Belarusian Railways which would remain the only legal entity for railway transport activities. These separate account statements would help the management of Belarusian Railways to have a clear understanding of the profitability of each line of business and to take appropriate corrective measures, as needed. Cross-subsidies for various lines of business could be used as a short-term management instrument, but would be dangerous to maintain as a part of long-term sector policies.

6.12 **The vertically integrated railway⁴³ organization is a proven structure in other countries and currently works well in Belarus.** This structure is not an obstacle to unbundling the management structure of Belarusian Railways into separate business units (not as legal entities but as internal units of Belarusian Railways, keeping their own statements of accounts). Among other benefits, it will also allow Belarusian Railways to clearly identify railway infrastructure costs and to monitor the share of infrastructure cost in freight and passenger tariffs. Such an exercise would not only help Belarusian Railways to control operating costs, but also would provide valuable information for implementing non-based national transport policies. The internal accounting system of Belarusian Railways should establish separate accounts for at least the following activities: (i) maintenance and operation of railway infrastructure; (ii) operation of freight transport services; (iii) operation of long-distance passenger transport services; (iv) operation of suburban passenger transport services; (v) maintenance of rolling stock; (vi) social activity units (kindergartens, training centers, health units, sport complexes); and (vii) agricultural farms.

6.13 **The Government is to assess the best tariff policies to ensure a balance between affordable fares for railways users, and financial sustainability of Belarusian Railways.** At present, railway tariffs for domestic freight and passenger transport services do not fully cover operating costs. Considering the increased market pressures on Belarusian Railways, the current tariff setting policies will gradually increase problems of financing the maintenance of infrastructure and rolling stock. This is particularly true given that the profit from international freight transport will not be enough to sustain all current railway activities.

Improve Transport Sector Sustainability

Place greater emphasis on maintaining assets and address the backlog in the road network

6.14 **The current level of maintenance spending on Republican Roads is close to sufficient to keep the condition of those roads in a “steady state”. For Local roads, however, the maintenance spending is clearly insufficient to ensure their present condition.**

⁴³ Infrastructure management and operation of freight and passenger transport services.

Failure to address the accumulated maintenance backlog of Local roads could lead to accelerated road deterioration, increasing vehicle operating costs, loss of access and the need for costly reconstruction of Local roads. The Transport Sector Strategy should establish the “optimum” level of expenditures on Local Roads, given that it may not be economically justified to keep all Local roads in good condition.

Strengthen financing of the road sector

6.15 The sustainability of road sector financing could be improved by increasing cost recovery directly from road users through road tolling. The Government’s plans for the gradual expansion of road tolling to all major roads could be very helpful to generate considerable revenue and thus help ensure adequate road conditions and service quality for road users. The level of tolls for trucks is an important instrument not only to influence the modal split for freight transport between road and rail, but also to ensure the financial viability of both modes of transport.

6.16 More coordination between MOTC and Belavtodor on one side, and the Ministry of Finance on the other, would help improve the budgeting process in the road sector. Based on the proposed Transport Sector Strategy and national development priorities, rolling 5-year spending envelopes should be established to allocate adequate resources for the maintenance and development of the road network.

Invest strategically in the railway sector

6.17 Throughout Europe, investments in the railway sector are financed through the railways companies’ own resources, in addition to support from State Budgets. The particular ratio is usually a function of the history of railway development in the country combined with the strategic priorities of the country and the condition of the railways. Investments to acquire rolling stock are generally covered exclusively from the income of the railway company. In the case of passenger services, revenues of railway companies also include the compensation received from the State through Public Service Contracts for loss-making passenger transport services that the State wishes to maintain for social reasons. Investments in railway infrastructure, however, are usually covered by both incomes from the railways companies and transfers from State budgets. Belarusian Railways has so far been able to cover all railway infrastructure investments from its own resources, but the further upgrading and modernization of railway infrastructure in Belarus may require State support in the medium and long term.

Assess possibility of introducing gradually Public Service Contracts

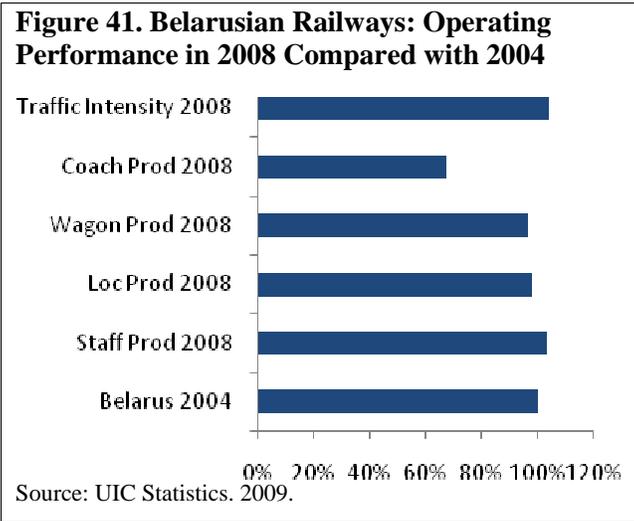
6.18 In any country, the State plays multiple roles in the provision of railway passenger transport services. This includes its role as policy maker, regulator, owner of the railway and also as a client demanding the regular provision of passenger transport. Railways passenger transport services are most often not commercially viable since revenues from those services do not cover the cost of providing the services. The Government however demands that railway passenger services must be provided for social reasons. In countries of the EU and in many other countries, railways receive compensation by the State for loss-making passenger services requested by the Government. This compensation covers the difference between operating costs and the revenues from regulated tariffs.

6.19 **Based on the current situation of Belarusian Railways, Public Service Contracts for passenger transport services should be introduced gradually on selected major railway routes.** The gradual introduction should be accompanied by an evaluation of its results. To determine the compensation scheme from the State budget, the needs for railways passenger services should be evaluated based on (i) a medium-term forecast for local and long-distance passenger demand considering different fare scales and service provision scenarios; (ii) the correlation between the passenger transport services provided on a social basis with the travel needs of the population and the Government’s ability to compensate; (iii) an identification of the extent, type and service level of passenger services needed; and (iv) an identification of measures to reduce the cost of passenger transport services at Belarusian Railways.

6.20 **The implementation of Public Service Contracts must be transparent based on the principle that the Government has full control of the utilization of State funds provided to Belarusian Railways.** It is advisable that contracts between the State and Belarusian Railways be signed for a period of time spanning 7 to 15 years in order to create a predictable environment for Belarusian Railways and to encourage investments. The contracts should contain a clear description of the services requested by the State (number of trains to be operated daily, capacity of trains) and the quality conditions for the provided services (punctuality, cleanliness, service on board, etc.) for each railway line. Lastly, contracts should contain provisions stipulating that the compensation is paid only for services that were actually provided at the level of quality indicated in the contract.

Improve further the operational and financial performance of the railways

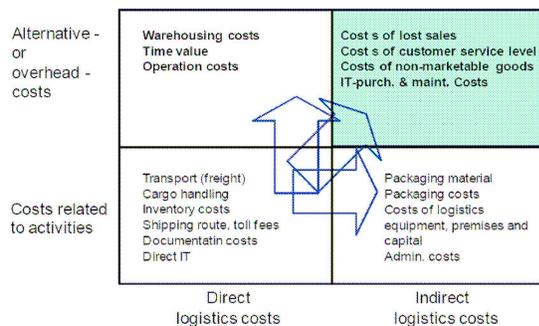
6.21 **The market conditions will continue to force Belarusian Railways to further improve their already excellent operational and financial performance.** The evolution with time of the productivity of staff and assets of Belarusian Railways illustrates the results of past efforts to improve operational performance. The data in Figure 41 presents the variation of operational performance in 2008 compared with the 2004 benchmark (100 percent). It reveals important improvements in staff productivity and traffic intensity, but a reduction in fleet utilization. In particular, utilization of passenger coaches dramatically decreased to only 68 percent compared to 2004, showing the effect of lost passenger traffic.



ANNEX 1: THE CONCEPT OF LOGISTICS COSTS AND INTERNATIONAL REFERENCE DATA

There is no uniform definition of logistics costs; companies have their own definitions of what constitutes logistics costs. Therefore, international comparisons should be regarded with caution. Figure 42 presents one useful typology of logistics costs, whereby direct logistics costs consist of transportation (cargo handling and packaging included) and warehousing costs. Indirect costs, on the other hand, include inventory carrying costs (also the capital tied up in inventory) and logistics administration costs. Knowledge of alternative and indirect costs for logistics, such as managerial costs, may be relatively vague. The arrows indicate the shift in the significance of indirect and/or alternative costs under competitive pressure.

Figure 42. Typology of Logistics Costs



Source: Adapted from Ojala, 2004.

Rodrigues, Bowersox, and Calantone (2005) estimated the level of logistics costs in relation to gross domestic product. Based on the econometric model they had developed for the purpose, global logistics costs in 2002 were around US\$6,700 billion, corresponding to 13.8 percent of global GDP. According to Rodriguez et al., global logistics costs have decreased between 1997 and 2002. In parts of Europe, however, logistics costs seem to have been rising during this period (Table 23 and Table 24).

Table 23. Global Logistics Costs in Selected Areas of the World

Region	1997		2000		2002	
	USD bill.	% of GDP	USD bill.	% of GDP	USD bill.	% of GDP
Europe	884	12,2 %	1100	12,8 %	1229	13,3 %
N. America	1035	11,0 %	1240	10,6 %	1203	9,9 %
Pacific Region	1459	14,5 %	1989	15,3 %	2127	15,7 %
S. America	225	14,3 %	280	14,4 %	272	14,3 %
Other areas	1492	15,4 %	1778	15,7 %	1902	16,0 %
Whole world	5095	13,4 %	6387	13,7 %	6732	13,8 %

Source: Rodriguez, Bowersox, and Calantone (2005).

Table 24. Comparison of Logistics Costs in Selected European Union Countries

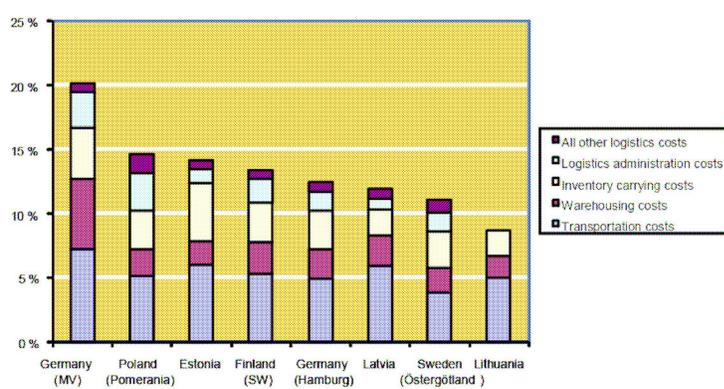
	1997		2000		2002	
	Billion USD	% of GDP	Billion USD	% of GDP	Billion USD	% of GDP
Belgium	27	11,4 %	33	11,6 %	35	12,1 %
Denmark	16	12,9 %	20	13,0 %	23	13,6 %
France	158	12,0 %	177	11,9 %	186	11,6 %
Germany	228	13,1 %	323	15,3 %	374	16,7 %
Greece	17	12,6 %	24	12,9 %	26	13,0 %
Ireland	8	14,0 %	19	15,3 %	21	14,9 %
Italy	149	12,0 %	167	11,8 %	186	12,2 %
Holland	41	11,9 %	50	11,8 %	56	11,8 %
Portugal	19	12,9 %	24	13,6 %	25	13,4 %
Spain	94	14,7 %	107	13,3 %	124	14,1 %
UK	125	10,1 %	157	10,7 %	174	11,3 %

Source: Rodriguez, Bowersox, and Calantone (2005).

Another estimate of national-level logistics costs is by the Council of Supply Chain Management Professionals (CSCMP, see www.cscmp.org). CSCMP estimates that India’s logistics costs are 11 percent of its GDP and China’s are as much as 21 percent. In contrast, logistics costs in the United States seem to have fallen from 14.5 percent to as low as 8 percent in the past 25 years. The CSCMP estimates that logistics costs in Europe are somewhat higher—at least 11 percent of GDP (The Economist, 2006).

A recent EU-financed project on the development of Baltic Sea Region (BSR) logistics, generated insight on the level and distribution in categories of logistics costs in several locations around the BSR. The estimated logistics costs of manufacturing companies by region range from about 8 percent in Lithuania to about 20 percent in Mecklenburg Vorpommern, Germany (Figure 43). Respondents from Mecklenburg Vorpommern, however, are predominantly very small firms and are located mainly in and around the city of Wismar, so the data is not representative of the whole state. In Lithuania it is notable that all other logistics costs are completely missing from the answers. Transportation costs form the largest portion of overall logistics costs and contribute to over one third of the total logistics cost followed by inventory carrying and warehousing costs.

Figure 43. Logistics Costs of Manufacturing Firms in Selected Baltic Sea Region Countries, Regions and Cities in 2006-2007

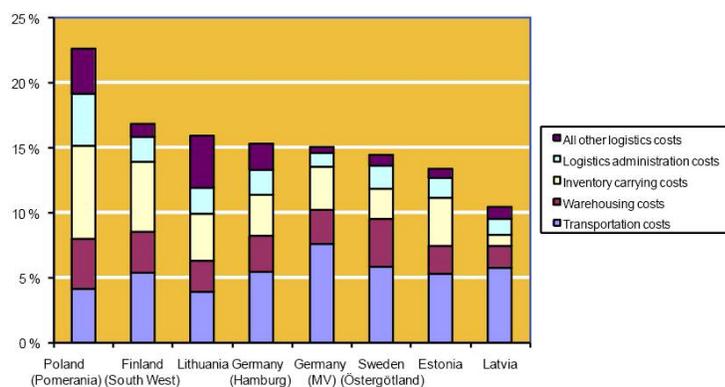


Source: LogOn Baltic Master Report 3:2007

1. In the LogOn Baltic study, the range of logistics costs by region seems to vary slightly more among trading firms than in the manufacturing industries: the range is from approximately 10 percent (Latvia) to about 23 percent (Pomerania, Poland) (

Figure 44). The logistics costs of the trading companies in Poland (Pomerania) amount to a notably greater part of the companies' turnover than in other regions. In Latvia overall logistics costs are significantly smaller than in the other areas. This could be due to the fact that the respondents in Latvia had a different concept of logistics costs than respondents in other countries; half of the costs are seen as transport related, whereas inventory-carrying costs are perceived as being very low in comparison with the other countries. Lithuanian trading companies report administrative costs as forming a large part of the total logistics costs.

Figure 44. Logistics Costs of Trading Firms in Selected Baltic Sea Region Countries, Regions and Cities in 2006-2007



Source: LogOn Baltic Master Report 3:2007

While the LogOn Baltic study gives valuable information on the level and distribution of logistics costs, it also highlights potential problems in the conceptualization and comprehension of logistics costs in companies, making exact assessment challenging.

Despite these shortcomings, the key message is clear: while transportation costs are an important part of logistics costs as a whole, other costs (e.g., indirect, overhead) need to be taken into account to understand the true cost of logistics, such as international operations in general or locations and transport corridors in particular.

Building on this foundation, a better understanding of firm behavior can be attained, enabling more successful policy making for economic development. Similar data on Belarus would be highly useful for both policy-making purposes, as well as benchmarks for manufacturing and trading firms in the country. Collection of this type of data requires a well-managed and time-intensive effort to provide reliable results.

Belarus is absent from some of the important indices that are followed closely by the international community, including the following:

- Global Enabling Trade Index (GETI) was first presented in summer 2008 by World Economic Forum (available at: www.weforum.org). It combines hard and soft data on 118 countries from a number of sources. A principal aim of the GETI is to measure the extent to which countries around the world have factors and policies in place to enable trade.
- Global Competitiveness ranking by the World Economic Forum does not include Belarus.
- The 2009 Logistics Performance Index does not include Belarus, as there were a low number of respondent answers evaluating its performance.
- Global Retail Development Index (GRDI) has been published since 2001 and does not include Belarus. The index aims to "help retailers prioritize their global development strategies by ranking the retail expansion attractiveness of emerging countries based on a set of 25 variables including economic and political risk, retail market attractiveness,

retail saturation levels, and modern retailing sales area and sales growth" (A.T. Kearney 2009). While the GRDI focuses on opportunities for mass merchant and food retailers, it also provides valuable information for consumer product manufacturers in planning their international marketing and distribution strategies.

The absence of Belarus in some of the private sector comparisons (such as the GRDI) may be interpreted as a result in its own right, indicating some lack of interest towards the Belarus market perhaps due to the perceived regulatory or logistics constraints for investments. Further, Belarus may be perceived as uncharted territory in the eyes of foreign investors, as a lack of reliable information makes it more complicated for investors to assess the feasibility of market entry.

To some extent foreign investor interest and opinion may be formed based on these indices; efforts should be undertaken to include Belarus in such comparative tools. As Belarus collects and makes available high quality data on trade and transport, the economy may benefit from international benchmarking and higher investor awareness.

ANNEX 2: BELARUS FREIGHT TRANSPORT FORECAST UNTIL 2020

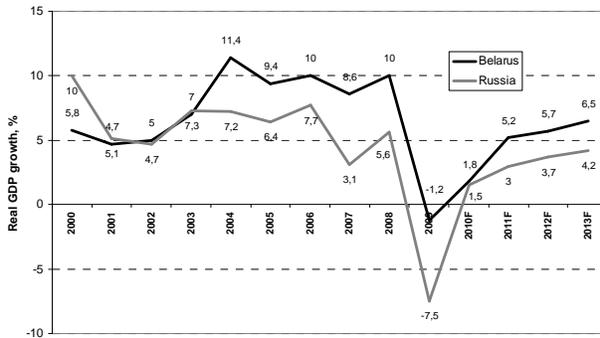
Annex 2 presents estimates for freight volume development in Belarus to 2020. To a large extent, the forecasts are based on limited time-series data, making the use of statistical techniques impossible. Additional sources of uncertainty include the absence of transport data on the following: (i) breakdown by cargo types and modes; (ii) breakdown by cargo types by countries of origin and destination; (iii) breakdown by modes by countries of origin or destination; (iv) no data on traffic through the Belarus-Russia border; and (v) Kaliningrad's share of transit traffic over Belarus territory which may be significant, especially in road-based transit in both directions. According to Belarus Customs Committee, customs declarations do not currently collect data by mode of transport.

Due to missing information, some of the forecasts are presented as indices. Even in more favorable circumstances, long-term forecasts are by nature highly uncertain; the reader's focus should therefore be on trends and development patterns instead of the exact numbers.

The main assumption behind the freight volume forecasts is the reasonably swift recovery of Belarus and Russia from the economic crisis, as projected by the IMF. The role of the Russian economy is emphasized for two reasons: (1) it is the driver of transit cargo flows through the territory of Belarus, and (2) it is also the main trading partner of Belarus. The real GDP growth rates are presented in

Figure 45. The cautious assumption is that in the long-term, i.e., until 2020, the economies of Belarus and Russia will remain in a growth trajectory.

Figure 45. Realized Real GDP Growth in Belarus and Russia 2000-2009 and Forecasts for 2010-2013



Source: IMF Data Mapper.

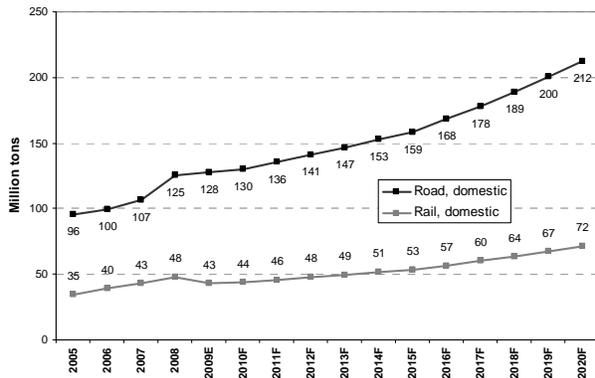
Long-term forecasts are given separately for road and rail (the majority of Belarus freight turnover) freight transport volumes in the domestic, export, import, and transit categories. In the forecasts, no significant changes in modal split are assumed, although, for example, the use of road transport will grow more rapidly for imports. Also no major changes in international trade patterns of Belarus are projected to 2020.

For future domestic freight volume, 2009 estimates are based on MoTC figures for road and the authors' own for rail. While in 2009 domestic road transport volume growth only slowed, the assumption is a 10 percent drop in rail freight volumes, due to the economic crisis. In 2010 for both road and rail, a 2 percent recovery is projected. As economic prospects improve, the annual freight volume growth rate is estimated at 4 percent in 2011-2015 and at 6 percent in 2016-2020

(

Figure 46).

Figure 46. Forecast for domestic freight volume (road and rail)



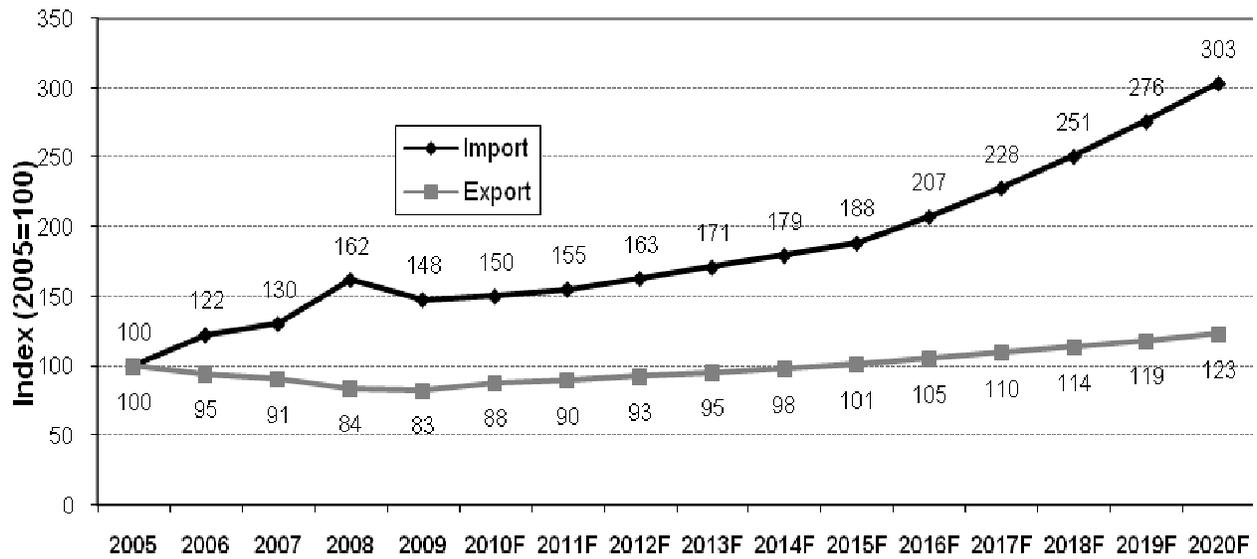
In 2008 domestic rail freight transport volume was 47,851 thousand tons, which equals 13,941 million ton-kilometers.

Due to requests to keep available data confidential, our forecasts for export, import and transit road freight volumes are presented as indices with the base year 2005 as 100. As indicated in

Figure 47 from year 2010 onwards are forecasts. Until 2008, import and export road freight transport developed quite differently. Imports in tons grew rapidly, with even two-digit annual growth rates. Exports in tons however have been declining since 2005. According to statistics provided by the Government, import road freight transport declined by about 9 percent in 2009, while export declined only by 1.5 percent.

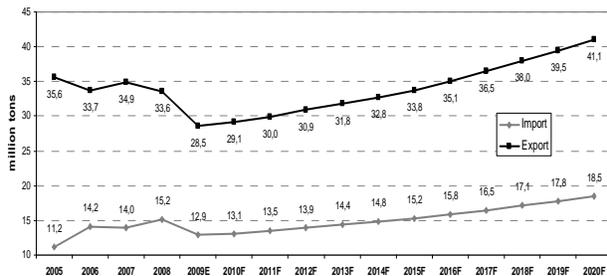
According to our forecast, imports recover 2 percent in 2010, grow 5 percent annually during 2011-2015, and grow 10 percent annually during 2016-2020. General economic growth, as well as specific increases in retail trade and consumer demand, results in increased use of relatively more flexible road transport. Export-related freight by road transport demonstrates slow growth: 3 percent during 2011-2015 and 4 percent during 2016-2020.

Figure 47. Forecast of Import and Export Freight Transport Volumes by Road (2005=100)



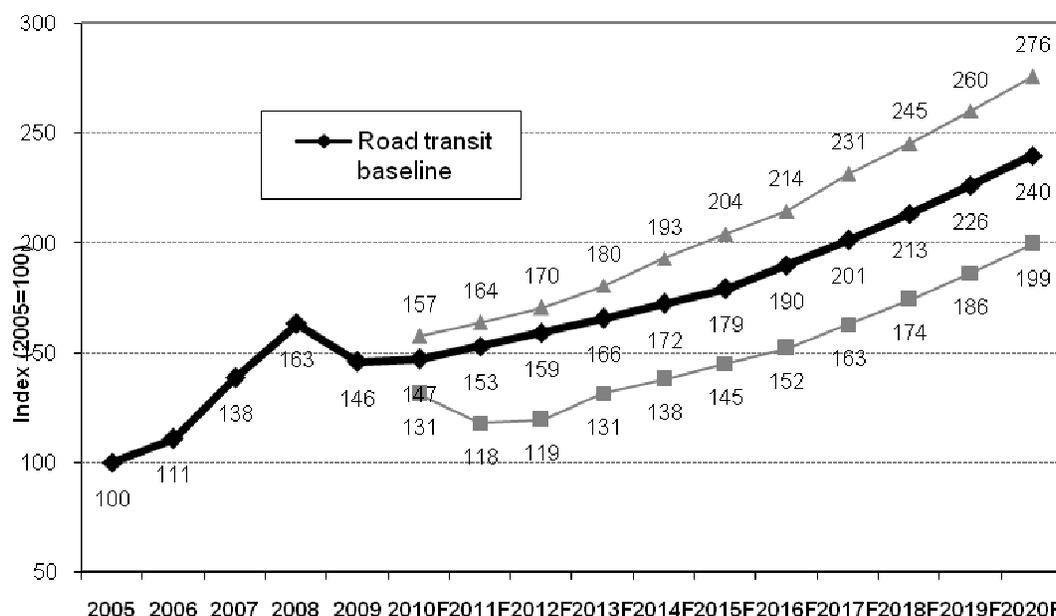
For rail, the assumed changes in import and export freight volumes are somewhat more moderate, resulting in forecasts presented in Figure 48. Both imports and exports decrease by 15 percent from 2008 to 2009, recover 2 percent in 2010, grow 3 percent annually in 2011-2015, and 4 percent annually in 2011-2015. Belarus MOTC provides the time series for the period 2005-2008.

Figure 48. Forecast of Import and Export Freight Transport Volumes by Rail



Transit transport by road, in tons, through the territory of Belarus grew at two-digit rates over the period of 2005 to 2008. In 2009, due to the financial crisis, transit transport declined by 10.6 percent (Figure 49). In comparison, the east-bound road transit volumes through Finland declined some 50 percent in 2009, compared to 2008. The nature of products moved along the route through Finland may be characterized as high-value, such as cars, and therefore the effect of the crisis was more serious than on the route through Belarus.

Figure 49. Forecast of Total Transit Transport Freight Volumes by Road through Belarus



Note: The available data does not distinguish between eastbound and westbound flows nor provide any data on flows between Russia and Kaliningrad.

The baseline forecast assumes the relatively swift recovery of the Russian economy from the economic crisis and is based on 4 percent annual transport growth during 2011-2015 and 6 percent annual growth in 2016-2020. The upside potential may be reached with higher than conservatively expected Russian GDP growth, as well as higher service level in the Poland-Belarus-Russia transport corridor (e.g., Lautso 2007).

According to our estimate based on data from other countries around the Baltic Sea, 50 to 60 percent of road-based transit volumes (measured per ton) to and from Northwestern Russia go through Belarus. Due to the already high market share, a rapid increase of volumes, at least in the short term, is less likely than a possible decrease.

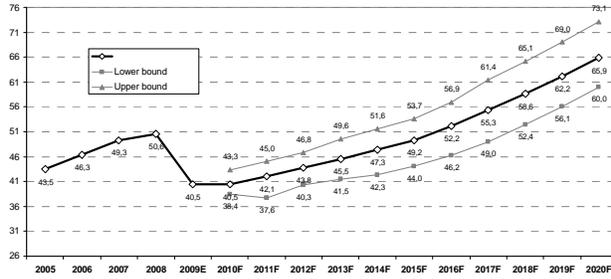
However, by presenting the fairly pessimistic lower-bound scenario, we want to point out that (i) the danger of inflicting increased friction for road transit transport, in the form of for example overly stringent Customs regime, as well as (ii) the uncertainty from the newly established Customs Union. Particularly, the former impediment could encourage the somewhat foot-loose road freight transport to move elsewhere, for example, to routes via Ukraine, the Baltic States, and Finland.

Shift of transit volumes to alternative routes due to low service level are not impossible, as for example in Finland where a 16 day long strike in March 2010 caused immediate shift of some of the Russia-bound shipments from Finnish ports directly to e.g Russian ports (St. Petersburg). Finnish logistics and port operators fear that to some degree this shift may have been permanent.

For rail transit, our estimates demonstrate more moderate dynamics (Figure 50), due to the nature of products transported, e.g. they are less sensitive to friction in border crossings and less prone to move elsewhere. The baseline assumes a 20 percent decrease in 2009, no growth in 2010, 4

percent annual growth during 2011-2015, and 6 percent annual growth in 2016-2020. Both upside and downside depend on the performance of the Russian and EU economies.

Figure 50. Forecast of Transit Transport Freight Volumes by Rail



ANNEX 3: CUSTOM DUTIES ON VEHICLES

«On the procedure of importing by private individuals across the customs border of the Republic of Belarus of goods not intended for production purposes or other commercial use» (approved by Decree of the President of the Republic of Belarus dated 5 February 2001 № 57 (as amended by Decree of the President of the Republic of Belarus dated 24 November 2005 № 547), customs duty depends on the number of cars submitted by a private individual for customs clearance during a calendar year, vehicle age and engine displacement. Customs duties imposed on private individuals and legal entities are summarized in the Tables below.

Customs duties imposed on individual vehicles

Number of vehicles submitted for customs clearance during a calendar year	Vehicle age	Engine displacement	Customs duties and tax rates (cm ³ of engine displacement)	
First vehicle	3 years and below	Not more than 1.500 cm ³ inclusive	0,6 euro	
		More than 1.500 cm ³ but less than 2500 cm ³	0,7 euro	
		More than 2 500 cm ³	0,75 euro	
	From 3 to 10 years inclusive	Not more than 1.500 cm ³ inclusive	0,35 euro	
		More than 1.500 cm ³ but less than 2.500 cm ³	0, 4 euro	
			More than 2.500 cm ³	0,6 euro
	From 10 to 14 years	Irrespective	0,75 euro	
	Older than 14 years	Irrespective	2 euro	
Second and subsequent vehicles	3 years and less	Less than 2.500 cm ³	3,5 euro	
		2.500 cm ³ and more	5 euro	
	From 3 to 7 years inclusive	Less than 1.000 cm ³	0, 85 euro	
		From 1.000 to 1.500 cm ³	1 euro	
		From 1.500 cm ³ inclusive to 1.800 cm ³	1,5 euro	
			From 1.800 cm ³ inclusive to 3.000 cm ³	2 euro
			3.000 cm ³ and more	2,25 euro
	Older than 7 years	Below 2.500 cm ³	2 euro	
		2.500 cm ³ and more	3 euro	

Effective 1 January 2010

Cars with petrol engine

Vehicle age	Engine displacement, cm³	Customs duty and tax rates as percentage of customs value, euro per cm³ of engine displacement
New vehicles		
	Not more than 1.000 inclusive	30 but not less than 1,2 euro
	1000-1500	30 but not less than 1,45 euro
	1500-1800	30 but not less than 1,5 euro
	1800-2300	30 but not less than 2,15 euro
	2300-3000	30 but not less than 2,15 euro
	More than 3000	30 but not less than 2,8 euro
Less than 5 years old		
	Not more than 1.000 inclusive	35 but not less than 1,2 euro
	1000-1500	35 but not less than 1,45 euro
	1500-1800	35 but not less than 1,5 euro
	1800-2300	35 but not less than 2,15 euro
	2300-3000	35 but less than 2,15 euro
	More than 3000	35 but not less than 2,8 euro
5 years and older		
	Not more than 1.000 inclusive	2,5 euro
	1000-1500	2,7 euro
	1500-1800	2,9 euro
	1800-2300	4,0 euro
	2300-3000	4,0 euro
	More than 3000	5,8 euro

Effective 1 January 2010
Cars with diesel engine

Vehicle age	Engine displacement, cm³	Customs duty and tax rates as percentage of customs value, euro per cm³ of engine displacement
New vehicles	Not more than 1500 inclusive	30 but not less than 1,45 euro
	1500-2500	30 but not less than 1,9 euro
	More than 2500	30 but not less than 2,8 euro
Less than 5 years old	Not more than 1500 inclusive	35 but not less than 1,45 euro
	1500-2500	35 but not less than 2,15 euro
	More than 2500	35 but not less than 2,8 euro
5 years and older	Not more than 1500 inclusive	2,7 euro
	1500-2500	4,0 euro
	More than 2500	5,8 euro

As for vehicle age (based on the data of the Ministry of Transport and Communications of the Republic of Belarus as of 1 July 2010), vehicles aged 5 - 10 years account for about 25 % of the total vehicle fleet. The data are summarized in the Table below.

Age structure of commercial truck fleet in Belarus in 2010						
Below 5 years		From 5 to 10 years		More than 10 years		Total
Number	Share, %	Number	Share, %	Number	Share, %	
57.715	11%	129.157	25%	313.594	64%	602.610

According to the estimates (the State Road Inspection of the Ministry of Internal Affairs of the Republic of Belarus, BAMAP Association, Transport Inspection of the Ministry of Transport, BAME, Euro NCAP), as of June 2010 11% of vehicles operated in Belarus meet EURO-5 standards; 7.5% - EURO-4 standards, 22.5% - EURO-3 standards and the rest fall under EURO-2 standard and lower.

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