

**World Bank**

Europe and Central Asia Region  
Energy and Infrastructure Unit  
Transport Sector

**Moldova: Transport Strategy Update  
With Emphasis on the Road Sector**

**December 2002**

## **Table of Contents**

	<b>Page</b>
<b>I. Introduction</b>	<b>6</b>
Purpose of the Study	
Organization of the Study	
<b>II. Transport and the Economy</b>	
Economic Growth	
Historic and Projected Traffic	
Progress of Reforms in the Moldovan Transport Sector	
Review of the National Transport Strategy	
Moldova's Transport Investment Program	
<b>III. Moldovan Railways</b>	
<b>IV. Civil Aviation</b>	
<b>V. Urban Transport</b>	
<b>VI. Roads and Road Transport</b>	
Road Network	
Road Management	
Road Financing Needs for 2003-2007	
The Road Financing System	
The Road Construction Industry	
Road Safety Management	
<b>VII. Recommendations</b>	
<b>List of Tables</b>	



### **Glossary of Acronyms and Abbreviations**

1995 TSR	Moldova Transport Sector Review of November 1995
ATC	Air Traffic Control
AITA	Association of Moldovan Road Hauliers
CIS	Commonwealth of Independent States
CFM	Moldovan Railways
EBRD	European Bank for Reconstruction and Development
EGPRSP	Economic Growth and Poverty Reduction Strategy Paper
EU	European Union
FSU	Former Soviet Union
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
IMF	International Monetary Fund
MOT	Ministry of Transport and Communications
TACIS	Technical Assistance for Commonwealth of Independent States
TIR	International Road Transport



## PREFACE

This report is an update of the Moldova Transport Sector Review, issued by the Bank in November 1995. It was prompted by the request of the Government in 2001 for a Road Project supported by the Bank, as a priority in Government's development agenda, which accounts for the paper to emphasize the road sub-sector. The update was prepared by Peter Ludwig, consultant for the Infrastructure and Energy Department (ECSIE) of the Europe and Central Asia Region based on the findings of a mission to Moldova in May 2002, and reviewed by Eva Molnar, ECSIE Transport Sector Manager, and Anca Dumitrescu, ECSIE Transport Specialist.

The report relies heavily on official sources of information and interviews with Government Ministries and Agencies. Their kind assistance is gratefully acknowledged. It also uses data and information from two important studies: *Moldovan Railways Restructuring* (NEI Consortium - March 2002), financed under TACIS by the European Union, and *Moldova Road Needs Study* (Roughton International and Partners - January 1997), financed by the European Bank for Reconstruction and Development (EBRD).

A special thanks goes to the World Bank office in Moldova, who was able to arrange meetings with Government officials, interviews with the private sector, with financing and donor agencies, and site visits, despite a major holiday period.

## I. Introduction

1. The Republic of Moldova, with the exception of a short frontage (500 to 800m) at the river Danube is landlocked and surrounded by Romania and the Ukraine. The country is a gateway between the former Soviet Union countries and the West: trade-wise, language-wise and culturally. Moldova is becoming increasingly important as a future border between the European Union (EU) and Eastern Europe once Romania joins the EU. The Pan European Corridor IX (Moscow-Kiev-Bucharest) crosses Moldova from East to West, going through the capital city Chisinau. Moldova's transport sector could become a hub for the region, were it not for its deteriorating infrastructure.

2. The first pillar of both the Government's Interim Poverty Reduction Strategy and the Bank's Country Assistance Strategy is sustainable economic growth. The foundation of this pillar can only be a sound and solid infrastructure. While infrastructure and in particular transport cannot claim to be a cost-effective policy instrument for the redistribution of welfare to the poor, it reduces absolute poverty mainly by increasing economic efficiency-by lowering costs and prices and enhancing opportunities. Efficiency improvements in transport investments and infrastructure management could free up scarce resources and make the country's traditional sectors more competitive and enhance the country's comparative advantages in trade and transit traffic.

3. After independence, demand for transport services declined at the same pace with the decline in economic activity. At the same time, existing infrastructure has been poorly maintained and no infrastructure has been added to address the needs for changing trade patterns, while reform in the transport sector management and financing has been slow. As a consequence, the transport infrastructure has become a significant impediment to expanded trade. It is therefore in need for substantial investment in maintenance and repair.

4. Moldova's economy and exports are largely based on agriculture and agro-industry. The main goal of the country's Agriculture Strategy is to improve market access for farmers, thus increasing their competitiveness. That is therefore highly dependent on a well functioning road transport industry and a solid road infrastructure. Unfortunately, the national road network has seriously deteriorated over the last 10 years and is long overdue for major rehabilitation. Further deterioration will cause major difficulties in road transport, high vehicle operating cost, and high reconstruction cost, when a timely surface treatment or bituminous overlay could avoid these problems.

5. The challenge of Moldova, similar to that of all low income CIS countries, is to provide easier access to EU markets to encourage foreign direct investment inflows into the country. In 2001 Moldova entered the World Trade Organization (WTO) and joined the Stability Pact for South-Eastern Europe. With its highly trade dependent economy, membership in the WTO is a significant achievement, which will help to attract foreign investments more easily. Membership in the Stability Pact will open better access to regional markets. The proposed Bank financed Moldova Trade and Transport Facilitation Project,

which aims to strengthen and modernize the Custom administration and other border controls, is currently under preparation.

6. The internal dispute over the status of the Transnistria region leaves Moldova separated de facto into two parts. The Moldovan Government has little control over this region, which had declared independence in 1994, but was never recognized by the central Government. Data and information contained in this study do not include the Transnistria region, if not otherwise stated.

## Purpose of the Study

7. The main objectives of the study are: (i) to update the Transport Sector Review carried out by the Bank in 1995; and (ii) to define the Bank's support to the Government on policy and institutional reforms in transport, and in particular in the road sector, in line with the Economic Growth and Poverty Reduction Strategy Paper (EGPRSP) currently under preparation by the Government. To that end the study includes:

- ? An overall update on the progress of reforms in the transport sector with regard to policy, regulatory, institutional and organizational changes in sector management, the level of competition, privatization of transport service provisions, the efficiency improvements or existing shortcomings of the public entities and State Owned Enterprises (SOEs)
- ? A brief review of the Moldova National Transport Strategy and the Transport Investment Program
- ? A detailed analysis of the road sector, with special attention to (i) national roads; (ii) the existing road financing schemes; (iii) road management: role and organization of the State Road Administration; (iv) construction industry and needs for reform; and (v) road safety management.

## Organization of the Study

8. The study follows to some extent the structure of the 1995 Transport Sector Review (1995 TSR). It contains seven chapters and a statistical annex. It does not deal with Transport and Trade facilitation, as these aspects of the transport sector are being dealt with under a proposed World Bank supported project, presently under preparation.

9. **Transport and the Economy.** Chapter II gives a summary description of Moldova's current economic situation and the prospects of future economic growth, drawn from various Bank documents. It examines the historic and projected traffic growth and gives a brief overview of the progress of Reforms in the Moldovan Transport Sector. It reviews the National Transport Strategy in the context of the EGPRSP, and the proposed transport investment program.

10. **Railways.** Chapter III gives an overview of the Moldovan Railways (CFM) and an assessment of the existing restructuring plan and approach framework, mainly based on a

recent study carried out by NEI consortium under TACIS and financed by the European Union.

11. **Civil Aviation.** Chapter IV gives a brief account of the present status of civil aviation, and of the progress made in addressing the institutional and financial issues as set out in the 1995 TSR.

12. **Urban Transport.** Chapter V is a short follow up of the status of the 1995 TSR recommendations and gives the latest statistics and forecast for the urban transport of Moldova's capital city Chisinau.

13. **Roads and Road Transport.** Chapter VI covers the current situation, main issues and the financial problems of this sub-sector. It describes the present condition of the road network, its impact on the country's poor, the organization of road and road safety management, the financing needs for the years 2003 to 2008, and the financing system to meet these needs. It gives an overview of the road construction and the road transport industry.

14. **Recommendations.** Chapter VII summarizes the recommendations made in the previous chapters, with an emphasis on the road sub-sector and poverty reduction.

## II. Transport and the Economy

### Economic Growth

15. Moldova enjoys a favorable climate and good farmland but has no major mineral deposits. As a result, the economy depends heavily on agriculture, featuring fruits, vegetables, wine, and tobacco. Moldova must import all of its supplies of oil, coal, and natural gas, largely from Russia. During the first decade of its independence, Moldova's economic performance was poor with its GDP shrinking by more than 60%. This can be attributed to several factors: political instability, with 12 governments in 10 years; an unresolved separatist conflict; a poor natural resource base beside fertile soils; energy shortages; limited institutional capacity, and inadequate reform measures. The economic troubles of Russia, by far Moldova's leading trade partner, also contributed to the decline of its economy.

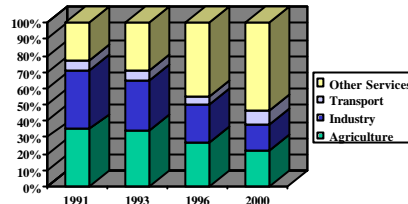
16. Moldova's economic performance in 2000 and 2001 is a commendable contrast to its achievements in 1990s. Starting with an impressive fiscal adjustment process in 1999 largely through deep cuts in inefficient public expenditures, the authorities stabilized the economy, initiated structural reforms to stimulate growth, and put in place an effective social protection system. The Government has instituted hard budget constraints; ensured prudent fiscal management by reducing public expenditures and improving targeting; established a sound regulatory framework and an independent regulatory agency in the energy sector; sold three-fifths of the power distribution companies; almost completed land distribution and farm privatization; and improved corporate governance through privatization. Both agriculture and industry are recovering, with growth in areas where Moldova has a comparative advantage such as textiles, light industry, winemaking, and communications. Services and construction are also growing. For the first time since independence, Moldova appears to be on a path of sustainable economic growth with the following actual and projected growth rates:<sup>1</sup>

	Actual			Projected		
	1999	2000	2001	2002	2003	2004
<b>GNP per Capita (US\$, Atlas method)</b>	410	390	390	440	480	520
<b>Real GDP Growth (% , calculated from 1995)</b>	-3.4	2.1	6.1	4.8	5.0	5.0

<sup>1</sup> Source: World Bank estimates

17. The shares of GDP by sector are represented in the following graph:<sup>2</sup>

Shares of GDP by Sector (%)

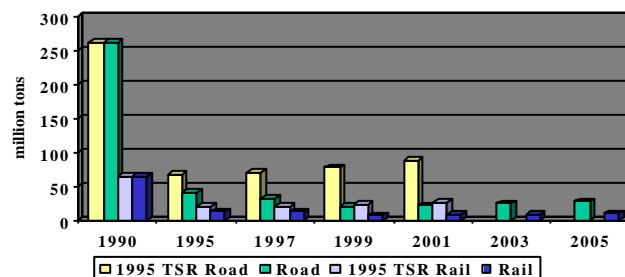


The restructuring of the economy is clearly shown by the change of various activities in GDP. In general the share of the services sector is growing rapidly, while the share of agriculture and industry is reduced. This is partly due to the transition from a socialist industry-oriented economy toward a mixed economy in which the service sector plays an important role. Also, the decline of industry and agriculture forces people into small-scale service activities.

## Historic and Projected Traffic

18. The following graph gives an overview of Moldova's freight traffic growth over the years since independence. It shows the actual data until the year 2000 and the projected traffic until the year 2005. The traffic projections assume a traffic growth close to the growth of GDP both for road and rail. The actual traffic is compared with the estimates made in 1995 by the TSR team. It graphically illustrates, that the restructuring efforts have obviously not gone as far and as fast as it was hoped at the time the estimates were made, but it also demonstrates how far off projections can be. Total traffic for the year 2001 was then

Actual and Projected Freight Traffic for Road and Rail, Compared with 1995 TSR Estimates



estimated to be more than double of what it actually came to be.

19. The following table offers some more detailed historic traffic figures:<sup>3</sup>

<b>Tons and Ton-km carried by Road and Rail</b>							
	<b>Years</b>						
	1990	1995	1996	1997	1998	1999	2000
<b>Tons Carried</b>	<b>million tons</b>						
Road	262.8	41.0	33.0	32.7	27.6	21.4	21.0
Rail	65.4	13.2	12.5	12.8	11.1	6.6	8.2
<b>Modal Split</b>	<b>%</b>						
Road	80.1	75.6	72.5	71.9	71.3	76.4	71.9
Rail	19.9	24.4	27.5	28.1	28.7	23.6	28.1
<b>Index</b>	<b>% (1985 = 100)</b>						
Road	84	13	11	10	9	7	7
Rail	92	19	18	18	16	9	12
<b>Ton-km Carried</b>	<b>million ton-km</b>						
Road	6,305	1,159	992	1,028	1,018	1,156	1,088
Rail	15,007	3,134	2,897	2,937	2,575	1,191	1,513
<b>Modal Split</b>	<b>%</b>						
Road	29.6	27.0	25.5	25.9	28.3	49.3	41.8
Rail	70.4	73.0	74.5	74.1	71.7	50.7	58.2
<b>Index</b>	<b>% (1985 = 100)</b>						
Road	102	19	16	17	17	19	18
Rail	90	19	17	18	15	7	9

It is a reflection of the economic decline observed in Moldova over the last decade that in the year 1999 road freight traffic (tons) has gone down to 7% of its 1985 level and to 19% if measured in ton-km. The railways fared similarly with a 9% traffic level measured in tons and 7% if measured in ton-km. For the railways, the share of domestic and international traffic in 2000 was as follows:

	<b>Domestic</b>	<b>Export</b>	<b>Import</b>	<b>Transit</b>
<b>% of tonnage</b>	7	20	28	45
<b>% of ton-km</b>	5	10	17	68

20. River traffic is negligible with about 20,000 tons or 180,000 ton-kms yearly traffic. Airfreight lies by about 1,800 tons.

21. Freight traffic projections for road and rail are based on an average 5% GDP growth, following this growth 1:1. There are models, which establish a relationship between real

<sup>2</sup>Source: Moldovan Railways Restructuring Study, and 1995 TSR.

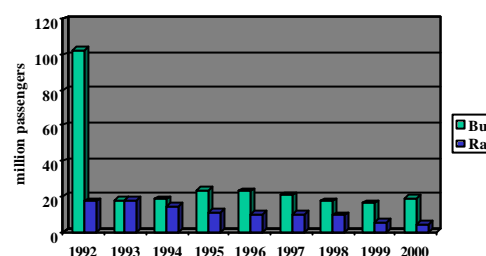
<sup>3</sup>Source: Moldovan Railways Restructuring Study

GDP growth and the freight growth of different commodities, ranging from a coefficient of 0.89 for oil to 2.59 for timber, meaning that if real GDP grows by 1.0% then transport of oil grows by 0.89% etc. In view of the difficulty to forecast GDP, the adoption of a 1.0 coefficient across the board appears to be appropriate. With this in mind and a constant modal split of 72% and 28% for road and rail respectively future could be as follows:

Year	2001	2002	2003	2004	2005
<b>Road (million tons)</b>	22.1	23.2	24.3	25.5	26.8
<b>Rail (million tons)</b>	8.6	9.0	9.5	10.0	10.5

22. Passenger traffic shows a similar decline as freight in the 1990s, but not quite as acute, as illustrated by the following graph: Data for 1985 and 1990 are not available, but the graph still shows the sudden disruption of road traffic in 1993. The more detailed table below<sup>4</sup> shows both the volume and the output in passenger-km. While there seems to be an upturn for road transport after the all-time low of 1999, the railways are in further decline. The consultants for the railway restructuring study forecast a continuous decline of passenger traffic into the year 2005 when total passenger volume will stagnate at around 5.5 million and output will decrease to 220 million passenger-kms. This decrease may partly be explained by the shift of the railways long distance journeys to the aviation sector as a result of the population's increased wealth.

Passenger Transport by Mode



Passenger Transport by Mode

	Year									
	Volume (million passengers)									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	
<b>Total</b>	120.4	36.4	33.8	35.94	33.4	31.1	27.3	21.8	23.9	
Bus	102.6	18	18.7	24	22.8	20.6	17.7	16.2	18.9	
Rail	17.5	18.2	14.9	11.7	10.4	10.3	9.4	5.4	4.8	
Air	0.30	0.20	0.20	0.24	0.23	0.24	0.22	0.23	0.25	
<b>Modal split (%)</b>										
Bus	85	49	55	67	68	66	65	74	79	
Rail	15	50	44	33	31	33	34	25	20	
Air	0	1	1	1	1	1	1	1	1	
	<b>Output (million passenger-km)</b>									
<b>Total</b>	4,557	2,711	2,138	2,235	2,116	1,951	1,676	1,195	1,215	
Bus	2,072	653	709	911	940	808	705	612	647	
Rail	1,718	1,661	1,204	1,019	882	789	656	343	315	

<sup>4</sup> Source: Moldovan Railways Restructuring Study

Air	767	397	225	305	294	354	315	240	253
<b>Modal split (%)</b>									
Bus	45	24	33	41	44	41	42	51	53
Rail	38	61	56	46	42	40	39	29	26
Air	17	15	11	14	14	18	19	20	21

Bus transport is expected to grow at the rate of GDP and should reach about 30 million passengers and about 825 million passenger-km in the year 2005. The 1995 TSR had estimated that total passengers for road and rail would be in the order of 100 million passengers in the year 2000, almost 5 times the actual traffic in that year.

## Progress of Reforms in the Moldovan Transport Sector

23. The reforms proposed in the 1995 TSR can be grouped under the following headings:

- ? Institutional restructuring;
- ? Trade and transport facilitation; and
- ? Cost recovery.

### Institutional Restructuring

24. Institutional restructuring includes defining a new role for the Government and increasing the participation of the private sector. Under the Soviet system the Government was both policy maker and operator. For example the Ministry of Transport was responsible for planning road construction and road maintenance, executing the works under force account and assuming quality control of the works executed. Or, it issued policy guidelines and restrictive regulations, which favored the Government owned transport industry and made it difficult for private enterprises to compete. Government transport enterprises assumed responsibilities for social services, such as housing, kindergartens etc. distracting them from their core business. Politicians, heading the Ministry of Transport interfered in the daily operations of railways, trucking industry and the road administration, frequently leading to technically and economically unsound actions. Much has changed since 1995, but there is room for further improvements. Sound reforms need to be introduced along with public administration reforms, particularly to reduce corrupt practices and conflicts of interest between being a civil servant in the transport sector and holding a private business or another job in the sector.

25. **Railways.** After nearly gliding into absolute bankruptcy, Moldovan Railways (CFM) proposed a restructuring plan in August 1999, which aimed at reorienting the state enterprise to the conditions of a market economy and to improve its operations by going from a “production” strategy to a “market” strategy. The restructuring was to be implemented in three phases: Phase I (short term 1999-2000) envisaged splitting passenger and freight services into self-contained business units, eradication of cross-subsidies, and regulation by the Government through the establishment of a special body to be created for this purpose. It also foresaw the merger of some structural units, closure of non-profitable lines, improving performance and reducing cost. Phase II (medium term) was to focus on commercialization, further elimination of subsidies, introduction of access charges and acknowledgement of

competition. Phase III then would include competition and privatization. The infrastructure was to be shared with other providers and the passenger and freight services were to be set up as joint stock units. CFM is assisted in this restructuring process by consultants NEI Consortium (NEI B.V., DE-Consult, ARRC, VTT), financed by the EU under TACIS.

26. To date, some of the targets under Phase I have been met: some uneconomical lines and stations have been closed, some spur tracks have been handed over to the enterprises using them, social services such as housing have been handed over to local authorities, and a realignment of the organizational structure has taken place. It should be mentioned that the CFM is placed in a difficult position with respect to its restructuring efforts because of the specific status of Transnistria. Unlike other sectors of the economy, which Transnistria is running independently, the railways are operated integrally. However, Transnistria's policies may have a negative impact on CFM, as recently demonstrated by the blocking of the export and import freight transport at the Transnistrian border.

27. Nevertheless, the restructuring efforts appear to show first results. Quite recently, the European Transport Forum has quoted the Moldovan Railways the best freight carrier of Central and Eastern Europe, based on the results of 2001. CFM had managed to some extent to renew its rolling stock and to improve track maintenance. It had an operating profit of US \$ 3.3 million in 2000 and US \$ 6.1 million in 2001. This trend is continuing into 2002, with an operating profit of US \$ 3 million during the first five months.

28. However, the Consultant feels that the restructuring plan fails to address some fundamental issues. There has been no committee set up to oversee the restructuring process; no ultimate target for the restructuring has been defined; and the Plan seems to concentrate on technical matters while avoiding the critical questions of reorganization and financial recovery. Also, the goals of the restructuring plan have not been widely accepted within the staff of CFM.

29. **Road Transport Industry.** Since 1995, 100% of the road freight transport industry has been privatized and 80% of the road passenger transport is in private hands. Freight transport is organized under the International Association of Road Hauliers of Moldova (AITA), established in 1992, who currently unites some 160 members with a total fleet of more than 4300 vehicles. However, road transport operators still face severe constraints – apart from the sharp decrease of transported goods – due to: (i) the limited number of permits made available for transiting neighboring countries; (ii) the difficulties to obtain permits for triangular routes (origin and destination in foreign countries); (iii) the complex and costly procedures for access to the road transport market, with licenses that have to be renewed annually; (iv) unwarranted licensing requirements for national transport, trailers and semi trailers; and (v) the inadequate road infrastructure.

30. AITA assists its members in issuing carnets TIR (19,600 carnets TIR issued in the year 2000), provides services required for the daily work of the transport operators through its association with organizations such as the EuroService Co (installation of tachographs, ESSO fuel cards, etc.), MoldCargo (insurance company), CIPTI (professional training of the

transport managers and international drivers) and issues the authorizations for the vehicles to be admitted to the transport of goods under the customs seals.

31. **Road Administration.** For a short time in 2001, the road administration existed as an autonomous and financially independent public road authority, which would obtain its revenues directly from the road users through a newly established “second generation” Road Fund. But after a few months of its activity, by Government decision the public authority was transformed into a State Enterprise, subordinated to the Road Department of the Ministry of Transport and Communications. In the meantime, the draft law for a new road fund, prepared by the road administration is languishing in Parliament, awaiting the first reading.

32. Contractors for road construction and road rehabilitation are totally or partially privatized. Those which were partially privatized have been transformed into so called joint stock companies. Government owns 22% of Magistrala, the country’s biggest national road construction company. In three other construction companies, the Government owns more than 60%. Of the 38 road maintenance contractors, the Government owns 70-90% of the shares. There are two road construction contractors owned 100% by private capital. With the Government’s expenditures for roads being as low as they are (about US \$ 6.0 million per year), turnover figures of the construction industry are low (about US \$ 1.0 million for Magistrala, although its capacity is reportedly more than ten times this amount). In search for revenues, many of the contractors have turned to other construction activities, such as building apartments or fabricating tiles. In a time when so little is spent on the Moldovan roads, no proficient road construction industry can develop. Many contractors complain about the loss of their most competent staff to contractors in the neighboring countries.

### **Trade and Transport Facilitation**

33. Trade and Transport still suffer from corrupt practices within the customs services, lack of modern and transparent border procedures based on interagency cooperation, and insufficient cross-border and regional cooperation and information sharing. The Government through its Moldovan Customs Department is preparing a Strategic Plan for (i) the modernization of Customs information; (ii) upgrading the capacity and effectiveness of border points; (iii) improving mechanisms of interaction and cooperation between border control agencies and the trade and transport communities; and (iv) implementing a set of new custom procedures. The Government is also considering a pre-shipment inspection scheme to facilitate trade while minimizing opportunities for fraud and fiscal evasion related to import operations.

34. The Bank is currently preparing a project for Trade and Transport Facilitation in South East Europe (TTFSE), which aims at reducing non-tariff costs to trade and transport and preventing smuggling and corruption at border crossings, through the following measures: (i) modernization of customs procedures and operations; (ii) upgrading of information systems and border crossing facilities; (iii) strengthening border inter-agency awareness and cooperation; (iv) improving private-public interactions and the delivery of transport and trade services; and (v) strengthening regional cooperation.

### **Cost Recovery**

35. While **railway** tariffs for freight are competitive with road transport tariffs, public service obligations for passenger transport imposed by the Government make it necessary for freight transport to cross-subsidize passenger transport. The Government should acknowledge these public service obligations and compensate the railways accordingly.

36. Revenues for the **road transport** industry were Lei 25.2 million in 2001, while expenses amounted to Lei 22.5 million, yielding a profit of about Lei 2.7 million (or about 11%), which indicates that the tariff structure is about correct.

37. The contribution of **road users** does not cover the cost of rehabilitating and maintaining the road network. Excise taxes paid on vehicle import, vehicle registration and fuel consumption is a fraction (less than 10%) of what is actually needed. This is not surprising if one compares Moldova's excise tax in particular for fuel with other countries in the region. Moldova collects a total of US \$ 0.059 per liter of super and US \$ 0.025 in excise taxes, 90% of which disappear in the general budget. In comparison Lithuania collects US \$ 0.27 and US \$ 0.22 per liter for super and diesel respectively, most of which is used for road rehabilitation and maintenance, or Italy, at the other extreme, collecting US \$ 0.86 and US \$ 0.59 per liter for super and diesel respectively. The lack of cost recovery in Moldova's road sector is a serious issue, which the Government must address in the near future. (see in this context paragraphs 83 to 88)

### **National Transport Strategy**

38. Moldova has no over-arching National Transport Strategy, covering all the sub-sectors. Instead, the two main players in the transport sector have issued their own strategy papers in 1999. The road administration has prepared a "Road Transport Infrastructure Sector Strategy" and the railway organization has proposed the "Restructuring Plan of CFM". In addition, a program called "The Moldovan Roads in the 21-st Century" was elaborated at the initiative of the President.

39. The objectives of **the road administration's** strategy are: (i) to improve the condition of the existing public road network; (ii) to establish the financial and technical environment to bring the road network to the level of European Standards; and (iii) to develop an express road network in stages, based on detailed feasibility studies. In the short term, the strategy aims at (i) the rehabilitation and maintenance of the road network to stop its exponential degradation; and (ii) at changing the legislative framework to give the road administration autonomous status, with its own financial sources. The longer term strategy (2004-2013) envisages to bring the main national road network (approximately 400 km) to the level of European standards and to bring the remaining national road network (2000 km) as well as the main network of local roads (750 km) to an adequate and maintainable condition. It also foresees the gradual development of an express road network for the country's main axis, in correlation with internal and transit traffic growth. This strategy is sound and its implementation should start as soon as possible.

40. The strategy as proposed by the **railways** is described in paragraph 25. Its implementation proceeds slowly with the assistance of consultants. There have been questions concerning the depth of the restructuring process, pointing out, that it may not go far enough as presently proposed to make the railway a viable entity in the long run. Counter proposals made by the Consultants should receive the Government's full attention.

41. No coherent strategy exists for the **air transport** sub-sector. After Government's initial encouraging measures of creating private airlines and privatizing the Chisinau airport, the recent history of the sector<sup>5</sup> illustrates an effort to eliminate competition in the industry and to strengthen the role of the state.

### **Moldova's Transport Investment Program**

42. Investment's in Moldova's transport sector have been relatively small and, with the exception of the European Bank for Reconstruction and Development (EBRD) and the European Union (EU) the presence of international financing institutions are scarce in the transport sector. The following is a description of projects implemented recently or about to be implemented:

- ? **Road Rehabilitation Project.** Financed by the EBRD (November 1995) this project intended to rehabilitate some 240 km of primary roads to the north of Chisinau (M2 and R 14), including the design and supervision of civil works, the provision of equipment for a pavement management system, and technical assistance. Only about 64 km were rehabilitated before US \$ 18 million of the US \$ 30 million loan were cancelled due to misprocurement.
- ? **Chisinau Airport Modernization Project.** Financed by the EBRD (US \$ 9 million plus US \$ 3 million Government contribution – June 1998), the project provided for: (i) the refurbishment of the existing passenger terminal; (ii) the improvement of the access road, car parking and terminal surroundings; (iii) the restructuring of the passenger flow arrangements to accommodate growth in international traffic, including the installation of specialized equipment; and (iv) the establishment of modern and commercially oriented business operations through the introduction of cost accounting and management information systems. The project was successfully completed in 2001.
- ? **Giurgiulesti Port Terminal.** This is a private sector project. A loan of US \$ 16.5 million was made by EBRD to Terminal S.A. in addition to a US \$ 9 million loan syndicated from three Greek banks and US \$ 2.5 million equity contribution by Terminal S.A. The terminal is to be built on the River Danube in the South of Moldova and will comprise riverside mooring facilities, pipelines from the mooring facilities to a storage area with a tank farm located 1 km from the river, and a pumping station for fuel transportation. S.A Terminal is a joint venture between Tirex-Petrol, the Moldovan state oil company, and Technovax S.A., a Greek joint

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<sup>5</sup> in November 2002 the State Authority for Civil Aviation refused to renew the operating license of Air Moldova International (a private company); in addition it induced withdrawal of private foreign investment in the state-owned Air Moldova.

venture company. Construction has not yet started, even though the loan has been signed in December 1996.

- ? **Rehabilitation of Bicului Bridge.** Financed by the European Union under TACIS (Euro 962,000) the project rehabilitated the bridge damaged in 1992 so that it can be reopened to traffic, providing again a direct connection between Moldova and Transnistria. The project was successfully completed in December 2001.
- ? **Reconstruction of the Bridge over River Prut between Radauti Prut and Lipcani.** Also financed by the European Union under TACIS the project proposes to reconstruct the bridge, which was destroyed in 1942. Estimated cost, including access roads would be in the order of Euro 7.3 million. The economic rate of return for this project, which would reestablish a link with Romania in the most northern part of Moldova is estimated to be about 11% per year. Construction has not yet started.

43. Projects which have been programmed by the Government, but for which no financing agreements have been reached so far, are as follows:

- ? **Electrification and Rehabilitation of the Railway Kuciugan – Novosavisaia – Bender – Chisinau – Ungheni.** The project would provide for the electrification of about 226 km, the improvement of electric networks, and the installation of signaling systems at stations. Total project cost are estimated at US \$ 65.3 million. A feasibility study is being carried out under TACIS, financed by the European Union.
- ? **Port Facility at Giurgiulesti.** This project is at an early phase of development. Russian and Greek interests have been approached to finance a river port facility for general cargo. No studies or cost estimates are available.
- ? **Improvement of the Leusheni Chisinau – Dubasari – Ukrainian Border Road.** The project would improve some 153 km of this East-West axis carrying traffic between 400 and 5700 vehicles per day. Total cost of this project, to be executed in 2 phases is estimated at US \$ 28.3. Economic rates of return range from less than 10% to 100%, depending on the road section. Dorsch Consult, financed under TACIS, is carrying out a feasibility study.
- ? **Improvement of the Chisinau Bypass.** The project aims to reduce travel time and vehicle operating cost and to improve road safety and roadside services on an 18.6 km section of the Chisinau Bypass, which at peak hours is close to congestion. A feasibility study, carried out by Dorsch Consult, also financed under TACIS, concluded that the US \$ 18.3 million project would yield economic rates of return between 29% and 47%.
- ? **Rehabilitation of 68 km of the Sarateni Vechi – Balti Road (R14).** This is part of the road improvement program unfinished under EBRD financing. It is one of the most heavily traveled routes, with an estimated cost of US \$ 18.5 million, yielding rates of return of about 39%. Feasibility studies and detailed engineering are available.
- ? **Rehabilitation of 74 km of Sarateni Vechi – Soroca Road (M2).** This is another unfinished road from EBRD financing. Costs are estimated at US \$ 12.4 million with rates of return ranging between 16% and 39%. Feasibility study and detailed engineering are also available.

- ? **Chisinau – Cimislia – Comrat – Vulcanesti – Giurgiulesti – Romanian Border Road.** The total length of this road project is 217 km. The first 34 km were built to high technical standards (concrete pavement, four lanes) between 1985 and 1990. For some further 8 km, earthworks have already been completed. Another 16 km of new construction are needed to reach Cimislia. From Cimislia onwards, the road follows an existing alignment to the vicinity of Bolgrad, where a bypass of about 20 km is needed to avoid crossing into Ukrainian territory. Estimates for total cost vary between 36.5 million and 60.7 million. The road would provide the connection to the future oil terminal and a proposed general cargo port at Giurgiulesti. According to a pre-feasibility study the rate of return would vary between 2% and 17%, with the Giurgiulesti access road section yielding the lowest rate of return.

### III. Moldovan Railways

#### Organization and Staff

44. The Moldovan Railways (CFM) were created in 1992 after the split of the former Soviet railway network. The structure is based on a production-oriented railway. It has (i) a transportation section including passenger and freight services and rolling stock, (ii) an engineering section including track maintenance, signaling and communications; and (iii) a safety and security section. In addition, it has a non-core activity section dealing with non-core assets and services, such as hospitals and housing. Its current structure is not well adapted to move to a market economy. There still does not exist a marketing department which would plan and analyze the railway's market and products and would attract customers.

45. The current legislation relating specifically to the Moldovan railway system was designed and adopted in 1962 during the Soviet period (Railway Code). Most of the provisions dating from the former Soviet Union, particularly in the technical field, are still in place. The same is also true for international freight and passenger agreements. At the present time and with the intention of introducing a full market economy and a liberalized transport market, efforts are made to modernize railway legislation. The third version of a draft Railway Law, after having received Government's approval was presented to Parliament in January 2002 and is now under consideration. The new law, once it is approved may be considered an important step in the Moldovan Railways restructuring process.

46. In July of 2001, the total number of railway employees in operational activities was 13,695. A detailed breakdown of staff distribution by department and service is shown in table 3.1. Most of the staff are employed in the Infrastructure (2,677) and Passenger Services (26,33), with a considerable number also placed in the workshops (1,579) and depots (1,558). As compared to staff employed in 1993, there has been a significant reduction of employees from 16,582 staff to 13,695 staff. This reduction is partly the result of the ongoing restructuring process. However, no further staff decrease is anticipated. The railway staff is well educated, with 1055 persons having received a university degree, 2,564 a specialized

education, 8,777 a secondary education and only 1,300 have not finished their secondary education.

## **Physical Description**

47. The present main track network in Moldova consists of 1,262 km, including industrial branch lines. The operational network, with regular train services, has a length of 1004 km. 866 km single line and 138 km double line. So far, there are no electrified lines. The network has the Russian gauge of 1,520 mm, except for 13.9 km with the European standard gauge of 1,435 mm near Romania (Prut-Ungheni). Railway stations serve both passengers and freight, with varying degrees of commercial emphasis between the business areas at individual locations. There are currently 159 operational stations, including un-manned halts, some of which are referred to as closed but are in fact still operational.

48. Locomotives in operation are down in number from 269 in 1994 to 165 in 2001. Of the 165 locomotives, only 97 are being used. All locomotives have diesel engines, with the exception of 4 additional steam locomotives. In total there are 10,206 wagons for freight transport (also down from 12,521 in 1994) in operation at CFM, of which only 46 % are being used. Of the 580 passenger coaches (658 in 1994), only 250 are in operational condition. There is a shortage of premium class coaches and the opportunity to re-build and upgrade stock is limited.

49. Maintenance is performed in various workshops. Since a few years, Moldova has facilities for major overhaul of locomotives and other rolling stock. There is, however, generally a lack of spare parts. Since 1992 there were almost no investments made in rolling stock or infrastructure. Even maintenance of infrastructure is problematic, and often carried out by using materials from existing double track sections to restore single track sections elsewhere. The average speed of passenger trains has gone down from 37 km/h in 1998 to 32 km/h in 2000, certainly a reflection of poor maintenance. The lack of investment and maintenance will in the medium to longer term cause major problems, which need to be resolved if rail transport is to survive in Moldova.

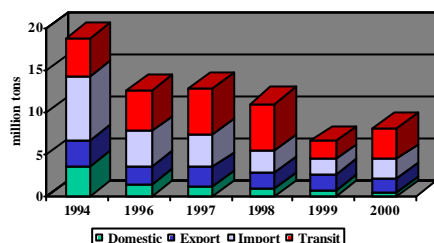
## **Traffic Levels**

50. General traffic trends have been discussed in paragraphs 17 to 22. A detailed listing of different freight categories is given in table 3.2. A break down of traffic trends by domestic and international traffic is shown in the graphs below:<sup>6</sup>

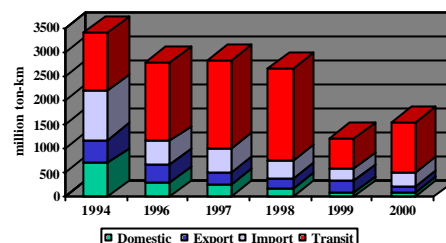
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<sup>6</sup> Source: 1995 TSR and Moldovan Railway Restructuring Study

**Rail Freight Traffic 1994 to 2000**  
million tons



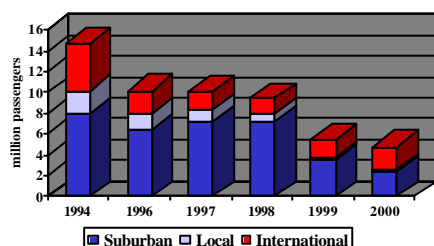
**Rail Freight Traffic 1994 to 2000**  
million ton-km



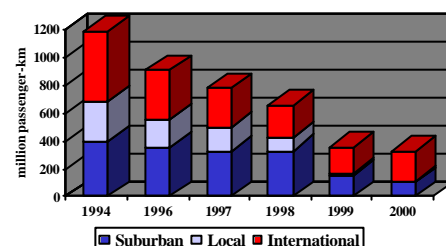
Beside the drop in traffic since 1994, the graphs clearly show the importance of transit traffic. If plans in the Ukraine to construct a new railway line in the South (to avoid transit traffic through Moldova) were to be realized, it would deal a lethal blow to the Moldovan railways.

51. The situation with passenger traffic is similar to freight traffic as the following graphs demonstrate:<sup>5</sup>

**Rail Passenger Transport 1994 to 2000**  
million passengers



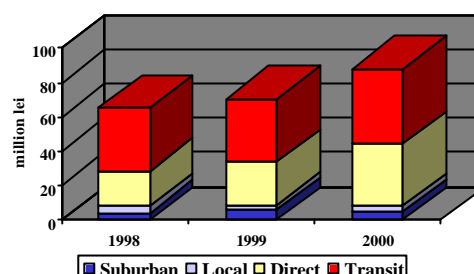
**Rail Passenger Transport 1994-2000**  
million passenger-km



Since 1994, passenger traffic has declined by about 65%, both in volume as well as in passenger-km. The sharpest decline can be noticed in local traffic, which in the year 2000 all but disappeared, probably lost to more convenient inter-urban bus transportation despite the fact that bus fares are almost double the railway fares. Increased ownership of private vehicles may also have contributed.

<sup>5</sup> Source: 1995 TSR and Moldovan Railway Restructuring Study

**Revenue by Type of Passenger**  
(million lei)



52. If one compares the revenues from different types of passengers the following picture emerges: In this graph international transport has been split into direct and transit, distinguishing between passengers, which step in or out in Moldova and those who just cross it in transit. The predominance of revenues for international traffic is obvious, to the point that revenues from local and suburban traffic can almost be considered as negligible. This is due to the low price of tickets for certain categories of travelers (veterans, students, children etc.) and to the high percentage of people traveling without tickets at all.

## Productivity

53. The following table compares certain performance indicators of the Moldovan Railways with those of its neighboring countries, Romania and Ukraine:<sup>7</sup>

Productivity Indicator	Unit	Moldova (CFM)			Romania (CFR)			Ukraine (UZ)		
		1994	1999	2000	1994	1999	2000	1994	1999	2000
Average haul freight	km	242.0	180.5	184.5	219.5	233.5	229.8	423.2	467.2	483.6
Average passenger trip	km	80.7	63.4	65.7	88.5	95.1	99.0	96.3	88.8	93.4
Freight traffic (tons per 1km railway length operated)	ths t/km	11.08	5.79	7.20	8.62	5.49	6.29	20.98	14.89	16.02
Employee productivity (tkm+pkm per 1employee in main activities)	thousand	297	145	179	249	276	295	706	829	910
Employee (in main activities per 1 km length of lines operated)	per km of line	12.1	9.3	9.0	14.3	8.5	8.4	17	13.5	13.6
Traffic density (TU per km)	thousand	3,594	1,346	1,605	3,388	2,354	2,469	24,128	9,075	10,071
Coach productivity (pkm per coach)	thousand	1,771	590	543	2,764	1,199	1,866	4,361	5,373	5,973
Loco productivity (tkm brutto per 1 locomotive a year)	thousand	32,363	32,300	42,480	18,403	19,580	18,680	34,087	74,430	77,830
Wagon productivity (tkm netto per 1 wagon a year)	thousand	289	108	143	137	104	140	1,596	790	970

<sup>7</sup> Source: Moldova Railway Restructuring Study – Overview of Related Studies.

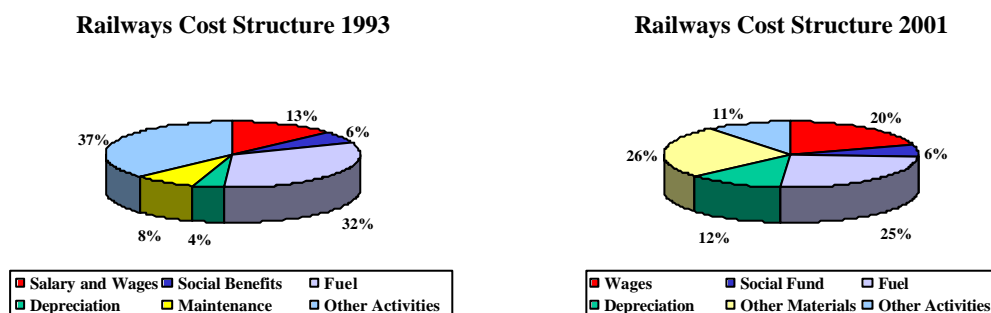
Passenger traffic (passengers per 1 km railway length operated)	thousand	11.32	4.75	4.21	18.19	11.28	10.34	32.63	23.86	24.84
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The indicators clearly show, that there is still a lot of room for improvement for CFM operations. The 1995 TSR had estimated a possible employee productivity of 500,000 (tkm+pkm)/km for the year 2000, if the recommended reforms and restructuring steps had been taken. The productivity actually achieved in 2000 was 179,000 (tkm+pkm)/km. More indicators on transport volume and rolling stock utilization are shown in table 3.3

## Finance

54. In the year 2000, CFM showed for the first time since independence, a small net profit of Lei 38.6 million Lei in 2000. This performance was repeated in 2001 with a net profit of Lei 77.5 million. For the first 5 months of 2002 a net profit of about Lei 35 million was reported. A consolidated Balance sheet, an income statement, and financial ratios are attached as tables 3.4 to 3.6.

55. A comparison between the CFM's cost structure in 1993 and 2001 gives the following picture:



A direct comparison between the two charts is not quite possible, as the labels were somewhat different in the analysis of the 1995 TSR from those used in 2001. In particular, it is not clear which expenditures were included in the label "Maintenance" and "Other Activities" in 1993. However, the charts show, that the cost distribution of the main items has remained, if not the same, but comparable. Noteworthy is the increase of depreciation in 2001. A detailed cost breakdown for the year 2001 is given in table 3.7

## Railway Restructuring

56. As described in paragraphs 24 to 27, CFM has started a restructuring process back in 1999, with the assistance of consultants NEI Consortium. First positive results from this restructuring process appear to be emerging in the form of net operating profits for the railways in 2000 and 2001. Despite these early successes, the consultants feel that the restructuring does not go far enough. They have identified three possible strategies:

- ? **Status Quo**, which would imply that CFM would carry on under the present concept without any radical change. Under this strategy manpower levels are maintained, passenger services continue as at present, and freight levels will be upheld despite increasing competition from road transport. The present level of infrastructure maintenance will be maintained, but with some further rationalization of the track and reconfiguring of main lines. The present CFM organization would remain intact. There will be no further line closures, cross-subsidization from freight to passenger traffic will continue and no other providers will obtain access to the infrastructure. The quality of rolling stock and other capital assets will further decline. The ultimate consequence of this strategy will be that CFM will become less and less competitive, with the possibility that transport providers will find alternative transit routes to the one through Moldova. This strategy, according to the consultant, would place the Railway on the route to eventual collapse.
- ? **Lean Organization**. Under this strategy, CFM would be reduced to a core network with operations principally on the main transit lines. On these lines transit traffic and international passenger services will continue, whereas services on other lines will only be maintained on a Public Service Obligation basis and supported by Government subsidies. This would give CFM the possibility to concentrate on those activities that bring the most revenue and would permit the rationalization of rolling stock and equipment. This strategy relies on the readiness of CFM to undertake the necessary reforms and especially to renew its asset base as quickly as possible. It also gives much of its responsibility over to third parties who will be responsible for operating the branch lines and peripheral services.
- ? **Commercialization**. This strategy is most in line with EU directives and restructuring measures undertaken by other railways. It involves a decentralization process, which in the final phases has business units for infrastructure, freight and passengers. The CFM management becomes a holding company, which owns the business units, and, at a later stage would provide for private investment in the independent companies formed out of the business units. This strategy also relies on Government subsidies for public service obligations. Government subsidies for loss making services such as passenger transport mean, that profits from core activities can be used for investments in the replacement of assets. However, the strategy would require a complete reorientation of CFM, and a reduction in personnel. Some services may have to be given over to road transport. It will also require the cooperation of the Government with respect to subsidies for public service obligations and a revision of the legal relationship between CFM and the Government.

At this time, the Government has not yet taken a decision on which strategy to follow.

## IV. Civil Aviation

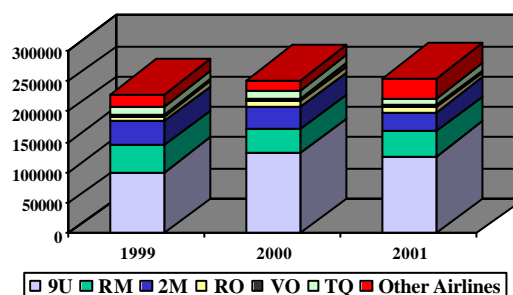
57. Moldova has three civil airports: Chisinau, Balti and Cahul. Only Chisinau airport, which is classified as international has regular scheduled flights to and from international

destinations. It is open 24 hours a day with customs control, air security checks and air survival equipment. There are no internal flights. The present airport of Chisinau, situated approximately 15 km from the center of the city was originally built in 1960. The airport terminal has been recently refurbished under an EBRD loan (see paragraph 41). It is now able to serve 425 passengers per hour. The airport's runway can receive planes up to the Airbus 310. An autonomous State Enterprise with a well functioning team manages the airport. It contributes annually about US \$ 700,000 to the Government's budget from taxes on ticket sales and landing fees.

58. Today, there are 17 airlines (7 airlines in 1994), which offer flights from Chisinau airport to more than eighteen countries in Europe and Asia. The national airline **Air Moldova (9U)** is entirely state owned and offers daily flights to Moscow and Istanbul and three flights per week to Bucharest, Paris, Prague and Rome. It has a fleet of 4 Antonov-24 and 4 Tupolev-134. The semi-private airline **Air Moldova International (RM)** (51% Government, 49% German interests), offers direct flights to Frankfurt, Berlin, Warsaw, Kiev and Odessa (see paragraph 41 above for recent developments). **Moldavian Airlines (2M)** is 100% private and offers two daily flights to Budapest, while their original destination Moscow has been temporarily suspended. They operate 1 Tupulev TU-134 and 2 Saab 340B. Other Moldovan private airlines servicing Chisinau are: Moldtransavia, Vichi, aerotaxi - TEPAvia - Trans, cargo flights - Renan, Tiramavia, Aerocom, and Valan. International Airlines coming to Chisinau are: Austrian **Tyrolean Airways (VO)**, the first to enter an agreement with Moldova; Romanian **Tarom (RO)** and Carpatair; Russian Transaero; Turkish Airlines; Ukrainian ICAR and Tavria.

59. Total passenger volume was about 254,000 passengers in 2001, an increase of 12% as compared with traffic in 1999 (see table 4.1). The market share of the different airlines operating from and to Chisinau over the last 3 years is depicted in the following graph:

**Moldova Air Transport**  
Number of Passengers by Airline



9U=Air Moldova, RM=Air Moldova International, 2M=Moldavian Airlines, RO=Romanian Airlines, VO=Tyrolean Airlines, TQ=Tandem Aero Moldova

By far the most important airline is Air Moldova with about 3 times the number of passengers to its next competitors. But the fact, that the 100% private Moldavian Airlines has survived since its foundation in 1994, and that many additional private airlines have

come into the market, seems to indicate that there is a healthy competitive environment. Air Moldova's financial statements are given in tables 4.2 to 4.4, showing a profit of some US \$ 155,000 for the year 2000.

60. The State Civil Aviation Administration (GAGA) is a Government department, which sets policies and regulations. Air Traffic control is operated by a separate, autonomous entity: MOLDATSA, which is controlling more than 70,000 flights per year. It has recently modernized the control tower and the traffic control equipment and has installed a new radar system for air traffic management.

61. Due to its central location between Eastern and Western Europe, Chisinau airport could be an excellent hub for international freight forwarders such as FedEx, UPS and DHL. These carriers cannot expand their present operations in Western Europe, because of air traffic congestion and curfews on nighttime landings and take-offs. Negotiations have started with 4 airports in the region: Chisinau, Bucharest (already crowded), Odessa, and a city in Turkey. Chisinau is still under used, is open 24 hours a day, and has an adequate infrastructure and Air Traffic Control, although the runways would have to be strengthened to receive wide-body jets. If successful in its bid this could transform Chisinau airport within the next two to three years and create jobs for sorting parcels, servicing the large number of aircrafts involved, and for developing spin-off airfreight operations.

## V. Urban Transport

62. Chisinau has about 1million inhabitants, including the suburbs (200,000 inhabitants). 2/3 of the Government tax revenue is collected in Chisinau. The municipality of Chisinau is responsible for the rehabilitation and maintenance of 1,100 km of roads, financed under the city budget. Each year about 10,000 vehicles are newly registered in Chisinau district, adding to the traffic congestion already prevalent at peak hours.

63. To relieve traffic congestion, the municipality of Chisinau considers two major projects:<sup>8</sup>

- ? Enlargement of Blvd. D. Cantemir between Puskin Street and Ismail Street. This Boulevard would run parallel to Chisianu's main axes, Blvd. Stefan Cel Mare and would take away some of its traffic. Total length is 4 km, estimated construction cost around US \$ 35 million
- ? A viaduct on Ismail street between 31 August Street and P. Halippa street. Estimated cost around US \$ 140 million.

Both projects are at an early stage of planning with no economic justification and no feasibility studies carried out so far.

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<sup>8</sup>Source: Chisinau Municipality Web Page

64. Urban transportation activities and their projection into the year 2005 are shown on the following table, and compared to the situation in 1993. As can be seen, few things have changed since then and no major changes are forecast for the future. One thing that has changed (beside the drop in passenger traffic) is the decrease in the number of buses from 337 buses in 1993 to 83 buses in 2001. This is mainly due to the emergence of private mini-buses, which operate throughout the city of Chisinau and who are also responsible for the drop in passengers carried by public transport.

**City of Chisinau - Urban Transportation  
Activity Projection**

Activity	Unit	Year			
		1993	2001	2003	2005
<b>Number of Trolley Buses</b>	Number	457	361	366	386
<b>Number of Buses</b>	Number	337	83	85	90
<b>Passengers Transported</b>	Million	<b>294</b>	<b>183.7</b>	<b>190.2</b>	<b>201.3</b>
<b>Paying Passengers Trolley</b>	Million	164	113.0	113.0	117
<b>Non-Paying Passenger Trolley</b>	Million	96	55.1	60.7	66.8
<b>Paying Passengers Bus</b>	Million	21	11.1	12.0	13
<b>Non-Paying Passenger Bus</b>	Million	13	4.5	4.5	4.5
<b>Passenger Turnover</b>	mln.pass.km	<b>689</b>	<b>667</b>	<b>691.0</b>	<b>732</b>
<b>Trolley</b>	mln.pass.km	559	572	590.0	625
<b>Bus</b>	mln.pass.km	130	95	101.0	107
<b>Average Trip Trolley</b>	km	2.15	3.40	3.40	3.40
<b>Average Trip Bus</b>	km	3.82	6.10	6.10	6.10
<b>Utilization Coefficient Trolley</b>	%	74	75	76	76
<b>Utilization Coefficient Bus</b>	%	40	45.9	46.3	47
<b>Total Staff</b>		3516	3680	3760	3810
<b>Trolley</b>	Number	2370	2915	3000	3050
<b>Bus</b>	Number	1146	765	760	760

65. Of the reforms proposed by the 1995 TSR not many have been implemented:

- ? The number of employees is still at the level of 1993, despite a reduction in passengers and the number of operating buses. The 1995 TSR had hoped for a staff level of about 2,000 employees in the year 2001, rather than the 3,516 that are on the payroll today.
- ? By the year 1996, all fare privileges should have been phased out. The percentage of non-paying passengers for trolley buses is still around 35% and for buses around 30%.

- ? After implementation of the financial adjustment and restructuring plan the rate of return should have been around 15%. Today, the public transport operations still run a deficit of about Lei 30 million.
- ? The proposed plan would have generated enough cash flow to renew a total of 350 buses and trolley buses between 1995 and 2002. Today, 90% of the trolley bus fleet needs renewal.

66. Attached are Income Statement Projections (table 5.1), Balance Sheet Projections (table 5.2) and a list of urgent investments in spare parts and the payment of electricity arrears (table 5.3), as submitted by the Municipality of Chisinau.

67. It is clear, that public transportation continues to be a drain on the Municipality's budget. The reform measures proposed in the 1995 TSR are still valid and should be given some urgent and serious consideration. Unless of course, the Government decides to let the private sector take over public transport, be it by default or by conscious action.

## **VI. Roads and Road Transport**

68. *“The Moldovan transport sector's major decline is especially noticeable in the road transport sub-sector. It is typified by falling traffic and a critical shortage of road maintenance funds. Consequently...the infrastructure is seriously deteriorated. The country's economy is highly dependent on road transport and it is clear that if economic recovery is to take place, the overall decline must be arrested and reversed”.* This paragraph was written in the 1995 Transport Sector Review, and how much more true is it today!

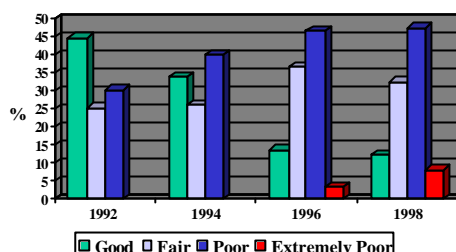
### **Road Network and Vehicle Fleet**

69. A graphic example of the decline of Moldova's infrastructure is given in the following chart, which shows the worsening condition of Moldova's road network:<sup>9</sup>

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<sup>9</sup> Source: Moldova Road Administration. This chart reminds one of the story of the water lilies, which have supposedly the characteristic to grow in such a way, that each year they double their surface on the water they occupy. There was this beautiful lake, in which people loved to swim and to sail, and in a corner there was this little patch of water lilies. Each year people came to swim, and each year the patch grew somewhat bigger. When it finally occupied one quarter of the lake, people, and in particular the politicians, were still not worried since they still had enough water for swimming and sailing. They just did not realize that in two years time the lake would be useless, because it would be completely overgrown with water lilies.

### Evolution of Road Condition



The road condition was measured on a stretch of about 2,000 km of National Roads. The results can be extrapolated to the entire national road network. While in 1992 about 70% of the network was still in good or fair condition and 30% was poor, in 1998 only 45% was good or fair and 55% was poor or extremely poor. It is estimated that today the relation has become the reverse of 1992: only 30% is good or fair and 70% of the network is poor or extremely poor.

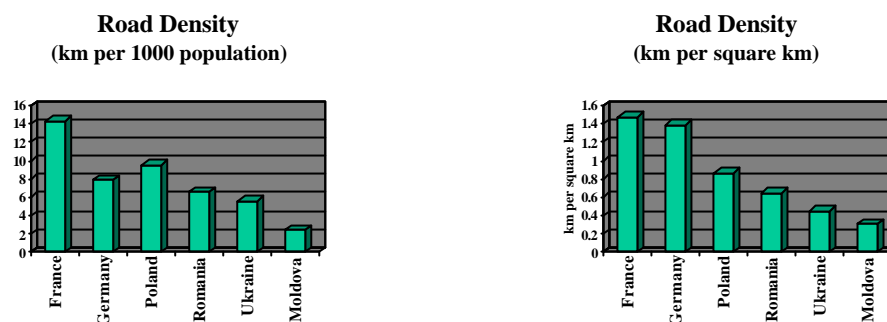
70. Moldova's road network is presented in the following table. The totals differ from the 1995 TSR, as the table does not include the roads of Transnistria. 78% of the national roads and 88% of the local roads have reached the end of their economic life and are technically outdated. This would explain their exponential deterioration over the last and the coming years.

Moldovan Road Network					
Type and Condition	National Roads			Local Roads	Total Roads
	Magistrale*	Republicane*	Total		
	km	km	km	km	km
<b>Total Network</b>	<b>816</b>	<b>1998</b>	<b>2814</b>	<b>6588</b>	<b>9402</b>
<b>Concrete</b>	424	--	424	--	<b>424</b>
<b>Asphalt Concrete</b>	365	1678	2043	2741	<b>4784</b>
<b>Surface Treatment</b>	18	167	185	426	<b>611</b>
<b>Macadam</b>	9	153	162	2935	<b>3097</b>
<b>Earth/Gravel Roads</b>	--	--	--	486	<b>486</b>

\*The Magistrale Roads were the primary links between the various republics of the former Soviet Union. The Republicane Roads are the principal links between the various districts of Moldova. With the independence of

Moldova, the distinction has become blurred, and the different nomenclature no longer implies a significant difference in importance and both are now considered to be national roads.

71. While the road network connects most settlements, the density of the network trails behind its neighboring countries as the following charts reveal:<sup>10</sup>



Moldova's road density (2.41 and 0.31) is less than half of both its neighbors Romania (6.59 and 0.65) and Ukraine (5.6 and 0.45), measured in km per 1000 population or in km per square km of territory. Highway design standards are generally adequate with the exception of some roads, which were designed under the Soviet era with strategic rather than economic principles in mind.

72. More than 70% of the country's road network are rural roads in varying conditions. About 50% of total budget allocations go to the maintenance of rural roads. In addition the Bank's Social Investment Fund Project and the Rural Investment and Services Project provide for the maintenance and rehabilitation of rural roads. However, surveys have shown that Moldovan farmers (particularly in the Central and Southern regions) are unable to commercialize about half of their products due to inability to access the market places, or lack of road access of wholesalers to the settlements of farmers. Furthermore, due to inadequate road network condition, about 40 settlements have no access to the national road network and, during the rainy and winter seasons, are isolated. People have little if any access to markets or social services. In a 2002 Social Assessment carried out by the Bank in 35 rural communities, the respondents indicated that the poor state of roads is the second serious problem faced by their community (after the need for potable water).

73. As shown in the following table, Moldova's vehicle fleet has grown at about 4% per year between 1994 and 1999:

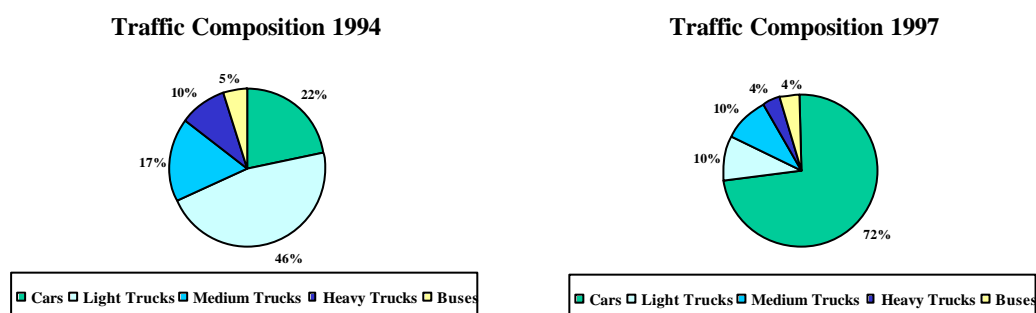
Moldovan Vehicle Fleet		
thousand of vehicles		
Vehicle Type	Year	
	1994	1999
Total Vehicles	263.8	315.1
Total Trucks	69.6	62.9

<sup>10</sup> Source: Road Administration and the World Factbook 2001

<b>of which Private Trucks</b>	4.7	16.5
<b>Total Buses</b>	10	14.1
<b>of which Private Buses</b>	0.8	7.4
<b>Total Cars</b>	169.1	235
<b>of which Private Cars</b>	163.6	225
<b>Special Vehicles</b>	15.1	3.1

The highest increase was in private trucks, which grew at almost 30% per year and private buses, which grew at almost 60% per year. Private cars increased by about 6% annually. Today's fleet is estimated to be in the order of about 375,000 vehicles.

74. Traffic flows on some of Moldova's main roads are given in table 6.1. The traffic composition on Moldova's roads has changed dramatically since 1994. Private cars have replaced the prevalence of light trucks:<sup>11</sup>



The substantial reduction of truck traffic goes in hand with the reduction of freight transport, which decreased by 50% during the same period, but does not quite explain such a sudden drop in the use of light trucks. One explanation could be the higher mobility of the population, using private cars. No newer data on traffic composition are available, as traffic counts have not been carried out on a regular basis. A system of regular traffic counts and origin-destination interviews should be introduced as soon as possible, to give the road administration the data needed for the management of the road network.

75. No new vehicle operating cost seem to be available as the Road Administration supplied the same cost as contained in the Annex of the 1995 TSR:

#### Estimated Vehicle Operating Costs (US\$ per Vehicle Km)

Vehicle Type	Road in Good Condition	Road in Fair Condition	Road in Poor Condition	Road in Very Poor Condition
Cars	0.066	0.072	0.079	--
Light Trucks/Pick-ups	0.138	0.15	0.164	--

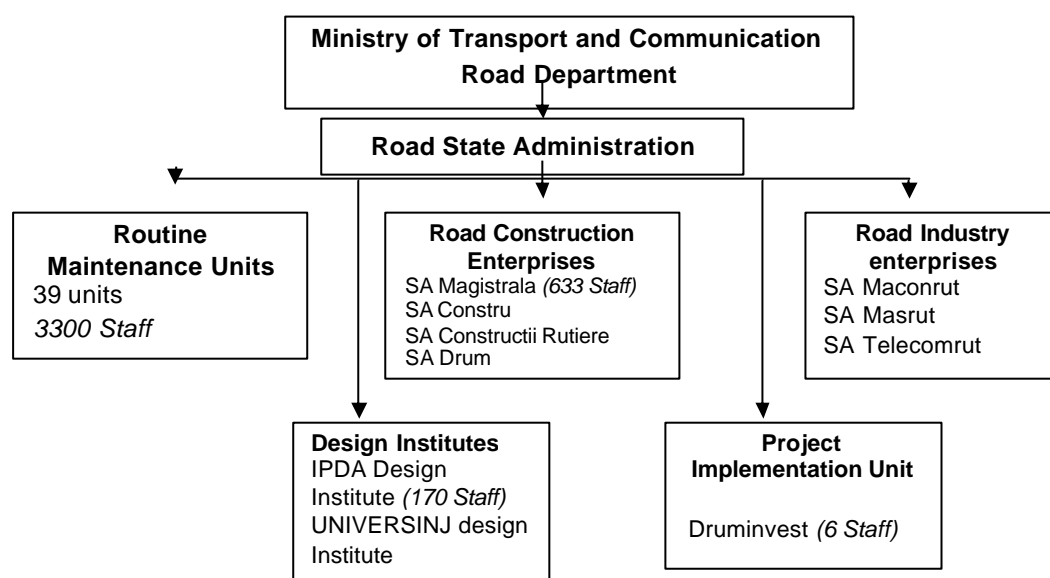
<sup>11</sup> Source: 1995 TSR and Moldova Road Needs Study

<b>Medium and Heavy Trucks</b>	0.152	0.166	0.186	--
<b>Buses</b>	0.375	0.417	0,466	
<b>Average Operating Cost*</b>	0.1028	0.1124	0.1244	0.1358

\* In view of the consistency of the traffic composition throughout the country, the consultants Roughton International provided in their 1997 Moldovan Road Needs Study a single average vehicle operating cost, which they used for their road screening study.

## Road Management

76. The organizations involved in road construction and maintenance are shown in the following organization chart:



The **Road Department** is one of the new departments, being a part of the Ministry of Transport and Communications. It is responsible for setting policies and regulations and road development planning. **UNIVERSINJ** and **IPDA** are the road design consultants in Moldova. They work together with foreign consultants whenever necessary and cooperate with **Druminvest** in the development of a pavement management system (PMS) and a Maintenance Management System (MMS) under projects funded by EBRD or TACIS. The State Enterprise '**Road State Administration**' is responsible for the planning and assignment of construction and maintenance works. It prepares tender documents for new construction and major rehabilitation works. **Druminvest** was created under the EBRD Road Rehabilitation Project as a Project Implementation Unit (PIU). After the cancellation of the EBRD loan, **Druminvest** continues to handle foreign funded projects. **The Routine Maintenance Units** are regional joint-stock companies (about 20% private capital). They operate mostly within their assigned districts and follow the instructions of the Road State Administration. There are four Road **Construction Enterprises** with a mixed form of

ownership. The biggest is S.A. Magistrala with 633 employees. Government ownership is 22%, 78% belonging to private interests. There are also two fully privatized enterprises with a total of about one thousand staff. Finally there are the **Road Industry Enterprises**, also joint-stock companies, which provide ancillary services to the road administration, such as quarry exploitation, and CB radio communication.

77. Table 6.2 gives some basic indicators of the Road Administration's maintenance budget and workload since 1991. It gives a clear picture of the declining maintenance funds available to the administration and the resulting small annual output, leading to the present condition of the roads. Every year Moldova loses some US \$ 10 to 20 million of its road assets, because once a road has deteriorated to a certain degree, it has to undergo a complete and costly reconstruction rather than a simple bituminous overlay or a surface treatment. Another US \$ 10 million are unnecessarily lost annually in higher vehicle operating cost.

78. While on paper the organization chart looks adequate, the reality is different. What is missing most is a more commercial and competitive approach to road construction and maintenance. The outline for such an approach is presented by C. Cannon et al in the Chapter Transport: Infrastructure and Services of a Bank paper on Transport and Poverty:

*“International experience suggests the national transport policy framework set the objectives and directions for sector reforms and that these aim to follow four guidelines:*

- ? *Manage transport infrastructure and services like a business with accountability, not like a bureaucracy*
- ? *Introduce competition in both transport infrastructure and service markets.*
- ? *Ensure sufficient funding for maintenance of core assets*
- ? *Develop mechanisms to give users and other stakeholders a strong voice and real responsibility.”*

79. The Moldovan Road Construction and Maintenance Organization does not adhere to any of these four guidelines:

- ? The Road Administration has to deal with Ministry interference in its day-to-day operations. It is not autonomous and financially not independent. Therefore, there is no accountability. Everything can be blamed on political interference. It is bureaucracy in its purest form.
- ? There is hardly any competition between the different road contractors in particular for road maintenance. Maintenance work is assigned to the regional joint-stock companies on the basis of direct letting, with unit prices calculated within the administration. Quality control is lax and forgiving. Again, there is no accountability in the contractor camp. However, there is an ongoing worthwhile technical assistance project financed by SIDA, which aims at developing and implementing procedures and specifications for maintenance by contract.
- ? Moldova's road assets are worth in the order of US \$ 600 million. Funding for the maintenance of this asset is a mere US \$ 6 million or 1% (see paragraph 83 and following).
- ? At this time, road users in Moldova have no voice in setting goals and priorities in the

rehabilitation and maintenance of their roads, other than with their votes at the next election (see paragraph 88 and following).

80. It should be possible, and the Government should give it serious consideration, to set up a Road Authority, which operates along commercial practices – like a water company or a power company – which is autonomous and financially independent and has not to deal with daily political interventions. An annual technical and financial audit, carried out by independent auditors, would help to keep the authority on a straight track. Improving the road management in Moldova and putting maintenance financing on a sustainable basis is sound business and would hold big benefits for poor people both in terms of improved access and employment opportunities. In this process significant amounts of public resources would be freed up.

### **Road Financing Needs**

81. The financing needs to bring Moldova's road network back into maintainable condition are enormous. Ten years of neglect and political shortsightedness now have their price. The consultants Roughton International estimated in their 1997 "Moldova Road Needs Study", that an amount of US \$ 270 million would be needed to rehabilitate some 1,900 km of national roads, spread over the next 10 years. If anything, the amount would be even higher, were the study repeated today. The only factor saving the road network from collapse was the low traffic level over the last years – which may change, if economic development picks up.

82. The Road Administration, aware of Moldova's financial limitations, have come up with a modified program for the reinforcement and rehabilitation of the main national road network (table 6.3), which foresees the urgent rehabilitation of some 265 km at a cost of about US \$ 48 million, a medium term program (2005-2010) of 340 km at a cost of about US \$ 50 million and a long term program (2011-2015) of 290 km at a cost of about US \$ 55 million. These estimates do not include the road investment projects listed under paragraph 42.

83. In addition, the consultants have calculated, that an annual amount of US \$ 18.3 million (and not the US \$ 3 million presently spent) would be needed for routine maintenance and repair of the national road network until proper rehabilitation is carried out. All these figures do not include the rehabilitation and maintenance of the local road network, which would need an additional US \$13 million annually for routine maintenance and repair (about US \$ 2000 per km).

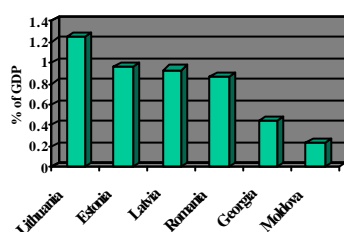
84. If all these estimates are added up, the Road Administration will need over the next eight years an annual budget of at least US \$ 45 million, not including any major investment projects such as the access road to Giurgiulesti Port and Terminal.

## The Road Financing System

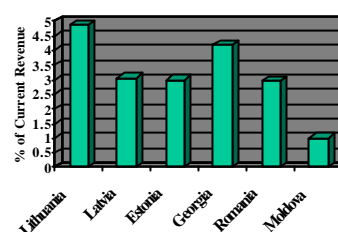
85. While there is a Road Fund (of the “first generation”), the money collected from road users in the form of fuel and various vehicle taxes is insufficient (about US \$ 5.3 million in 2000). Almost 60% of Road Fund revenues are from taxes on fuel. Yearly road budget allocations are discussed in Parliament resulting in budget amounts as shown in table 6.2, which are clearly insufficient. For the year 2002, the total budget for the rehabilitation and maintenance of the national and the local road network is Lei 84 million, or US \$ 6.1 million.

86. The lack of adequate road maintenance financing is shown in a graphic country comparison:<sup>12</sup>

**Maintenance Expenditure for National Roads as percentage of GDP**



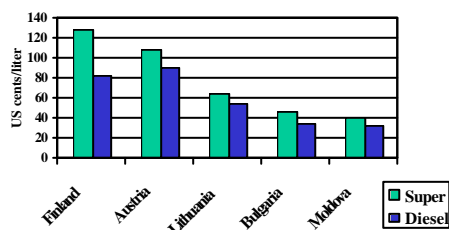
**Maintenance Expenditure for National Roads as percentage of Current Revenue**



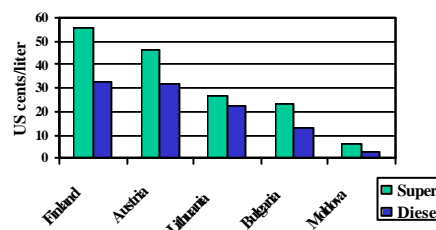
While Moldova is poor, there is no reason to have a maintenance to GDP or current revenue ratio different from other countries.

87. If Moldova wants to raise the budget allocation for its roads, it must collect the necessary funds from the road user. As the following graphs<sup>13</sup> show, Moldova trails way behind other countries in setting an adequate price for gasoline and diesel, and charging an appropriate percentage for the maintenance of its road assets:

**Fuel Prices  
(US cents per liter)**



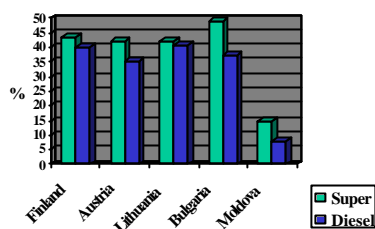
**Fuel Tax  
(US cents per liter)**



<sup>12</sup> Source: Road Administration and various Bank documents

<sup>13</sup> Source: Moldova Road Administration and various Bank documents

**Fuel Tax as % of Fuel Price**  
(%)



88. In 2001, Moldova imported about 140,000 tons of gasoline and 240,000 tons of diesel fuel. Therefore, if, the tax on super was raised by just US \$ 0.10, and on diesel by US \$ 0.05, Moldova would have an additional amount available for its road network of about US \$ 26 million, which would still be much less than other countries pay for their roads and not quite sufficient (see paragraph 82), but would go a long way in stopping the deterioration of the network.

89. However, experience teaches that, if the money raised from the road users goes into the general budget, the Government and the politicians will find ways to use it for other, certainly valuable purposes, such as social or health programs. The road user, who does not see any improvement in the condition of roads, will be justifiably unhappy.

90. A solution to this dilemma, practiced in many countries, is to establish a so-called "Second Generation" autonomous Road Fund fully separated from the budget, with participation of road users, transparent, and with technical and financial audits carried out annually by independent and internationally recruited auditing firms. It should be noted, that the idea of an autonomous Road Fund for Moldova is not being imposed by any outside international financing agency, but it originated within Moldova, from highway experts, who have seen the benefits of such a fund in other countries. Discussions with the International Monetary Fund (IMF) revealed, that it would have no objection to a road fund in the case of Moldova.

91. A proposed draft law for the creation of such a fund is still under debate within the Government. While the law has still some flaws, such as too little representation of road users in its Board, it would be a first and necessary step to stop the further decay of Moldova's road network.

## **The Road Construction Industry**

92. A sudden increase in the availability of funds for road rehabilitation and maintenance would be a mistake, as the country's construction industry, after many years of quasi hibernation, has not the capacity to carry out the works. For example, within the regional joint-stock companies, out of 1796 units of equipment, only 210 or 12% are in working order (see table 6.4). The capacity of the semi-private contractors (Magistrala and Constructuui Rutiere and some others) and the only 100% private contractors (ASIDCONS and TranscomM) is not sufficient to take on a workload, suddenly increased by a factor of five or

more. During the first years, while the local contractors are building up their capacity, the use of foreign contractors may be necessary, at least for major road rehabilitation jobs. If some of the road rehabilitation is financed by international financing agencies, Moldova's contractors would at present not be able to pass the stringent pre-qualification procedures on their own, but would need to associate themselves with foreign contractors in joint ventures or as subcontractors.

93. A program of technical assistance to the construction industry, should the Government decide to go for a higher budget allocation for the road network, could be very beneficial, in particular during the first years of increased maintenance work. SIDA is presently financing a program of technical assistance to introduce maintenance by contract, from which the Road Administration as well as the regional joint-stock companies should benefit.

### Road Safety Management

94. Road safety management continues to be an issue, although the rate of fatal accidents seems to have stabilized over the last three years as the following table indicates. However, compared to other countries, it is still quite dangerous to be a road-using citizen of Moldova.

<b>Year</b>	<b>No.of Reported Accidents</b>	<b>Injuries</b>	<b>Fatalities</b>
<b>1990</b>	9049	6687	1127
<b>1991</b>	5052	5554	968
<b>1992</b>	3739	4198	755
<b>1993</b>	2436	2704	422
<b>1994</b>	2646	2975	540
<b>1995</b>	2690	3062	543
<b>1996</b>	3208	3717	554
<b>1997</b>	3412	3986	569
<b>1998</b>	3037	3619	492
<b>1999</b>	2669	3096	395
<b>2000</b>	2581	3148	406
<b>2001</b>	2762	3388	419

The total number of deaths per million road vehicles is about 1120 and the number of deaths per million population is about 120, while for example in the United Kingdom these numbers are 150 and 70 respectively. With close to 2000 deaths per million vehicles Albania is the front-runner in this category, whereas Latvia with 250 deaths per million population is the "winner" in this category.

95. Clearly, this needs further investigation and major efforts, starting with proper horizontal and vertical signalization of the road network and a stricter control of driver behavior by the police, to reduce traffic accidents to a level that comes closer to the level of the countries of the European Community.

## VII. Recommendations

96. If there were but three recommendations to make for the transport sector, they would be: (i) maintenance; (ii) maintenance; and (iii) maintenance. This is true for the railways, which may lose their profitable transit traffic to better-maintained routings, and it is particularly true for the road sector, where the cost of transport could make the agricultural goods no longer competitive on the international market. The only reference to roads in the Bank's 1996 Public Expenditure Review highlights the priority of road maintenance.

97. The consultants who are advising CFM and the Government on the railway restructuring, have made many recommendations of which four need to be specifically highlighted:

- ? To tackle the problem of Public Service Obligations by either phasing them out or by reimbursing CFM for their full cost (para. 34);
- ? To take an urgent decision on the CFM restructuring alternatives (para. 39 and 55);
- ? To update the legal basis accordingly (para. 44); and, of course
- ? To put a major effort into track and rolling stock maintenance (para. 48).

98. For the road sector the following recommendations should get Government's earliest attention:

- ? The institution of regular and systematic traffic counts to give road planners and road engineers a sound basis for feasibility studies and road management (para 72);
- ? The creation of an autonomous and financially independent Road Authority (para 78);
- ? An increase in the tax on premium and diesel, to be used to increase the maintenance budget to a level that would stop further road deterioration (para. 86);
- ? The creation of a "second generation" Road fund, in which road users are sufficiently represented (para. 88); and
- ? An investigation into the causes of the high accident rates in Moldova together with an immediate program of standardized horizontal and vertical road signalization and stricter enforcement of the Highway Code (para. 93).

99. Possible Bank assistance to the transport sector should be made contingent on the creation of an autonomous Road Authority and a Road Fund. To have an impact the credit should be in the order of US \$ 30 million and could include the following elements:

- ? Rehabilitation of one or more road sections with high traffic volume, bringing them to European standards;
- ? Assistance to the contracting industry;
- ? Assistance to improve road safety; and
- ? Continuous assistance and advice on the operation of the Road Fund.

## **Moldova: Transport Strategy Update With Emphasis on the Road Sector**

### **List of Tables**

Table 3.1	Moldovan Railways (CFM), Staff in Operational Activities
Table 3.2	CFM, Freight Categories
Table 3.3	CFM, Transport Volume and Rolling Stock Utilization
Table 3.4	CFM, Balance Sheet
Table 3.5	CFM, Income Statement
Table 3.5a	CFM, Annex to CFM Income Statement
Table 3.6	CFM, Financial Ratios
Table 3.7	CFM, Cost Breakdown
Table 4.1	Passengers at Chisinau Airport
Table 4.2	Air Moldova, Balance Sheet
Table 4.3	Air Moldova, Profit and Loss Account
Table 4.4	Air Moldova, Cash Flow Statement
Table 5.1	City of Chisinau, Urban Transportation Income Statement
Table 5.2	City of Chisinau, Urban Transportation Balance Sheet Projection
Table 5.3	City of Chisinau, Urban Transportation, List of Urgent Spare Parts
Table 6.1	Roads, Comparison of Traffic Flows
Table 6.2	Road Administration, Basic Indicators
Table 6.3	Roads, Program for the Reinforcement and Rehabilitation of the Main National Road Network
Table 6.4	Road Administration, Technical Condition of Equipment